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Draft Report:

PROBABILISTIC HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT OF FINAL CLOSURE AND REMEDIATION PLAN FOR FARO MINE COMPLEX



Prepared For:

Government of Yukon

Prepared By:

SENES Consultants Limited

June 2010

DRAFT

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Prepared for:

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SENES Consultants Limited
121 Granton Drive, Unit 12
Richmond Hill, Ontario
L4B 3N4

June 2010

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EXECUTIVE SUMMARY

A human health and ecological risk assessment (HHERA) for the Faro Mine Complex was completed for the Government of Yukon in support of the Environmental Assessment process for the Final Closure and Remediation Plan. This work was carried out as an update of the risk assessment completed in April 2006, which evaluated several remediation scenarios covering a range of assumptions and encompassing current and future conditions. The current report investigates the effects and risks associated with existing conditions and the final closure and remediation plan, as determined by the project team and stakeholders.

The Faro Mine Complex includes facilities at two locations, the Faro site and the Vangorda/Grum site. The Faro site is located within the Rose Creek watershed, a tributary of the Anvil Creek watershed, while the Vangorda/Grum site is located within the Vangorda Creek watershed. Both watersheds empty into the Pelly River. Therefore, the assessment evaluated potential adverse effects on the Faro Mine Complex watershed (including the Rose Creek watershed), the Vangorda Creek watershed and the Pelly River from an aquatic environment perspective.

The risk assessment was carried out within a probabilistic framework for the existing conditions and the final closure and remediation plan for the Faro Mine Complex site. The probabilistic framework was used to characterize the variability and uncertainty in the input parameters, such as measured site concentrations, literature-based transfer factors, and receptor characteristics. The probabilistic framework allows for an evaluation of the likelihood of impacts and the degree of significance. The variability in input parameters was represented by distribution functions and was selected to cover the potential range of values, but also remain conservative. Therefore, the expected values (represented in this assessment by the arithmetic mean) are the most likely results, yet remain conservatively biased. The upper-bound values (represented by the 95th percentile) define the range of results and in the case where these upper-bound values are below the selected benchmarks, it can be confidently stated that negative effects are not expected.

The assessment considered the effects of both measured chemical levels in the aquatic environment and in the terrestrial environment at the site for the existing conditions. Data from 2002 to 2007 were used in the aquatic environment and data from 2002 to 2005 were used in the terrestrial environment. Predicted chemical levels in the aquatic environment were used with measured chemical levels in the terrestrial environment for the final closure and remediation plan, since the activities associated with the remedial option result in changes to water quality. This report details the methodology and assumptions used for the assessment. Water quality predictions for the final closure and remediation plan developed by Gomm Environmental

Engineering Consulting. The full details of the future predictions are provided in Faro Mine Complex Site Wide Water Quality Model (GEEC 2010).

A selection process was used to identify the chemicals of potential concern (COPC) at the Faro Mine Complex. The concentrations in water and soils in the affected area were compared statistically to background/baseline concentrations in the study area. Those chemicals that were found to be significantly different from background/baseline were then compared to CCME guidelines for water (for protection of aquatic life) and/or for soil (for residential/parkland use). If the measured levels exceeded either a guideline value or if guidelines were not available then the chemicals were carried through the risk assessment. Chemicals were dropped from the assessment if toxicity data were not available. Data collected from the Faro and Vangorda-Grum seeps were also considered in the selection process, since these seeps would lead to higher concentrations in the surface water in the future. The selection process also considered data from sediment and vegetation samples collected at the site. The results of the screening procedure identified the following COPC: antimony, arsenic, beryllium, boron, cadmium, chromium, cobalt, copper, lead, manganese, nickel, selenium, silver, strontium, tin, vanadium, and zinc.

The assessment of potential ecological effects considered ecological receptors for the aquatic environment; namely, aquatic plants, phytoplankton, benthic invertebrates, zooplankton, forage fish and predator fish. Ecological receptors considered for the terrestrial environment included black bear, beaver, woodland caribou, red fox, grouse, snowshoe hare, mallard, hoary marmot, merganser, moose, scaup, Fannin sheep, and wolf. These receptors were selected based on information provided by the First Nations people who use the site as well as various sources that contain information on terrestrial species in the Yukon and site-specific baseline studies for the Faro Mine Complex. The potential pathways of exposure for the terrestrial receptors included the ingestion of water, soil/sediment, vegetation, and other animals, as appropriate. Besides taking into consideration the amount of food consumed by each receptor, the home range of each of the species was taken into consideration when linking the species to food sources. Smaller animals, due to their small home range, were evaluated at several places across the Faro Mine Complex whereas larger animals, with large home ranges, were evaluated on a site-wide basis. Exposure information, such as soil ingestion, ingestion rates and body weight, were obtained from literature sources for the ecological receptors.

The assessment of potential risks and effects on human health from exposure to COPC at the site considered results presented in a traditional knowledge study. Based on the traditional knowledge, for the existing conditions it was assumed that no one would camp on site and that fish camps would be located on Pelly River at Pelly Crossing and at Pelly River above Vangorda Creek. For the final closure and remediation plan, it was assumed that hypothetical individuals who would camp at the site (near the Faro site and near the Vangorda/Grum site) while hunting

and gathering. It was assumed that the time that a hypothetical camper might spend on-site would be similar to the times that people reported staying on the land in the traditional knowledge study. An adult, child and toddler were considered in the assessment. It was assumed that for both existing conditions and the final closure and remediation plan that individuals would be at the site for approximately 1.5 months of the year. As discussed in the traditional knowledge study, this represents a conservative estimate of the time spent on the land and would encompass trapping and drying meat and fish.

Dietary data from a regional survey of First Nations people in the Yukon were used to define the dietary characteristics for campers who would be present at the Faro Mine Complex. Other exposure data, such as drinking water consumption and body weight, were obtained from a survey of the general Canadian population and are acceptable for use in the current assessment. Pathways considered in the human health risk assessment included the ingestion of water, soil and food from the site and dermal exposure to soil at the site. The inhalation pathway was not included, as it is generally insignificant, as well as exposure to COPC through supermarket foods.

For the ecological risk assessment, a range of ecological receptors was examined from different trophic levels in the aquatic and terrestrial environments. The results of the ERA showed that:

- Generally, there are fewer exceedances of the applicable CCME water quality guidelines in the final closure and remediation plan, as compared with the existing conditions. However, for cadmium, copper and zinc, predicted water quality concentrations are higher for the final closure and remediation plan due to the releases of soluble chemical loads within the groundwater plume that reach the receiving environment;
- There are no expected adverse effects on benthic organisms in Rose Creek and sediment quality will generally improve in Pelly River after implementation of the final closure and remediation plan. There may be some potential adverse effects on Vangorda Creek at V27 (near the Vangorda/Grum pits). However, this area is limited spatially. Benthic surveys on Rose Creek and Vangorda Creek should continue as part of the monitoring program to evaluate the effectiveness of the final closure and remediation plan;
- The results of the aquatic assessment indicate that there may be potential effects in some very sensitive algal species but not in many other species found in Rose Creek and Vangorda Creek from exposures to cadmium and zinc for the final closure and remediation plan. Again, this is limited to a small spatial area.
- For terrestrial ecological receptors, it is unlikely that there will be adverse effects due to the final closure and remediation plan as only the upper bound concentrations resulted in any SI values above the respective SI benchmark.

For the human health assessment, a number of hypothetical individuals (toddler, child, adult) were considered to use the site for the gathering of berries, trapping, hunting, and fishing; therefore, it was considered that individuals would be on site for only 1.5 months per year during these activities with consumption of food items from the site over a 6 month period. The results of the HHRA showed that:

- At the expected (mean) level of exposure, there are no adverse effects predicted in humans for the final closure and remediation plan.
- The risk levels calculated for arsenic exposure at the Faro Mine Complex are lower than those calculated for the existing site conditions and indicate that camping for 1.5 months near Faro mine site and the Vangorda/Grumm pits is unlikely to result in adverse health effects.

The ingestion of moose and caribou at measured concentrations at the site represent the largest pathways of exposure for the human receptors considered in the assessment. Caribou have large home ranges and would be expected to spend time outside of the site area. For the samples collected from the site, it is not possible to define the exposures that are due to chemicals present at the site versus exposures that are from other areas off-site. However, the measured concentrations represent actual potential exposures to humans from the ingestion of moose and caribou, with no definition of the exact contribution from the site. The calculations presented in this assessment indicate that it is unlikely that there will be adverse effects to human receptors arising from the final closure and remediation plan. It is known that some metals such as cadmium accumulate in the liver and kidneys, so that it is expected that the organs of the moose and caribou have higher concentrations than muscle tissue. Therefore, consumption of moose and caribou organs should only occur on an occasional basis.

A summary table of the conclusions of the risk assessment is provided in Table ES.1. From the table it can be seen that predicted effects are acceptable for aquatic receptors in Pelly River, benthic organisms in Rose Creek, Vangorda Creek and Pelly River, terrestrial receptors at the Faro Site and Vangorda Site, and human receptors at off-site locations under the existing conditions. There are potential effects that are not expected to be significant for aquatic receptors in Rose Creek and Vangorda Creek under the existing conditions. For the final closure and remediation plan, the predicted effects are acceptable for aquatic receptors and benthic organisms in Pelly River, as well as terrestrial receptors at the Faro Site and Vangorda Site and human receptors at Faro Site and Vangorda Site. There are potential effects in sensitive algal species and benthic organisms that are not expected to be significant in Rose Creek and Vangorda Creek. Human receptors at present on the Faro and Vangorda sites for the final closure and remediation plan are not anticipated to experience adverse effects at the expected level of exposure. There are no anticipated significant adverse effects for any receptors

considered in the assessment for either existing conditions or the final closure and remediation plan.

Table ES.1 Summary of Risk Assessment Conclusions

Existing Conditions	**Rose Creek Upstream**	**Rose Creek Downstream**	**Vangorda Creek Upstream**	**Vangorda Creek Downstream**	**Pelly River Upstream**	**Pelly River Downstream**
Aquatic Receptors	Predicted effects in sensitive algal species exposed to zinc	Predicted effects in sensitive algal species exposed to zinc	Predicted effects in sensitive algal species exposed to zinc	Predicted effects in sensitive algal species exposed to zinc	Predicted effects in sensitive algal species exposed to zinc	Predicted effects in sensitive algal species exposed to zinc
Benthic Organisms	Field evidence suggest no adverse effects observed from mine-related activities	Field evidence suggest no adverse effects observed from mine-related activities	Field evidence suggest no adverse effects observed from mine-related activities	Field evidence suggest no adverse effects observed from mine-related activities	No adverse effects observed from mine-related activities	No adverse effects observed from mine-related activities
	Faro Site			**Vangorda Site**		
Terrestrial Receptors	Expected (mean) concentrations do not result in adverse effects			Expected (mean) concentrations do not result in adverse effects		
Human Health	No likely adverse effects for consumption of berries, medicinal teas, wild game and fish from the site					
Final Closure and Remediation Plan	**Rose Creek Downstream-X14**	**Vangorda Creek Downstream – V8**	**Vangorda Creek Downstream – V27**	**Pelly River Downstream of Vangorda Creek**	**Pelly River Downstream of Anvil Creek**	
Aquatic Receptors	Predicted effects in sensitive algal species and benthic organisms in water column exposed to zinc and cadmium	Predicted effects in sensitive algal species and benthic organisms in water column exposed to zinc and cadmium	Predicted effects in sensitive algal species and benthic organisms in water column exposed to zinc and cadmium. Barrier to fish presence	Predicted effects in sensitive algal species exposed to zinc	Predicted effects in sensitive algal species exposed to zinc	
Benthic Organisms	Elevated zinc concentrations but similar to historic concentrations in Rose Creek	Elevated zinc concentrations but similar to historic concentrations in Vangorda Creek	Elevated zinc concentrations may result in potential adverse effects	No predicted adverse effects	No predicted adverse effects	
	Faro Site			**Vangorda Site**		
Terrestrial Receptors	Expected (mean) concentrations do not result in adverse effects			Expected (mean) concentrations do not result in adverse effects		
Human Health	No likely adverse effects for expected exposures from the site			No likely adverse effects for expected exposures from the site		

Note:

Significant adverse effect – based on risks to several species and SI values >10 times benchmarks.
No significant adverse effect – based on SI values all <10 times benchmarks.
Acceptable – based on no exceedances of benchmarks.

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1.0 INTRODUCTION

The Government of Yukon commissioned SENES Consultants Limited to carry out a human health and ecological risk assessment (HHERA) for the Faro Mine Complex in support of the Environmental Assessment process for the Final Closure and Remediation Plan. The risk assessment was carried out within a probabilistic framework for the existing conditions and the final closure and remediation plan for the Faro Mine Complex site. The assessment considered the effects of both measured chemical levels in the aquatic environment and in the terrestrial environment at the site for the existing conditions. Predicted chemical levels in the aquatic environment are used with measured chemical levels in the terrestrial environment for the final closure and remediation plan, since the activities associated with the remedial option result in changes to water quality. This report details the methodology and assumptions used for the assessment.

The risk assessment process is iterative in nature and is typically revisited over the course of a project as remediation options are developed in greater detail and environmental conditions become better defined. The first stage of the iterative process involved a comparative risk assessment of different remediation scenarios. The results of the assessment of ecological and human health risks for remediation scenarios covering a range of assumptions encompassing current and future conditions was presented in the report *Anvil Range Mine Tier 2 Risk Assessment of Remediation Scenarios* dated April 2006 by SENES Consultants Limited.

The current report provides an update of the risk assessment completed in April 2006 to investigate the effects and risks associated with existing conditions and the final closure and remediation plan, as determined by the project team and stakeholders. The risk assessment was completed within a probabilistic framework to take into account natural variability and uncertainty in many of the model inputs. The advantage in carrying out a probabilistic analysis is that uncertainties in the environmental levels of chemicals of concern and risks they pose to ecological and human receptors can be explicitly taken into account and expressed in the HHERA results.

The focus of the risk assessment was on the effects of the final closure and remediation plan on the aquatic environment as this component of the environment has the potential to be the most impacted in the future. Nonetheless, the potential effects of elevated levels of chemicals in soil, vegetation and animals from a terrestrial perspective were also evaluated.

1.1 RISK ASSESSMENT SCENARIOS

The Faro Mine Complex includes facilities at two locations, the Faro site and the Vangorda/Grum site. The Faro site is located within the Rose Creek watershed, a tributary of the Anvil Creek watershed, while the Vangorda/Grum site is located within the Vangorda Creek watershed. Both watersheds empty into the Pelly River. Therefore, the assessment evaluated potential adverse effects on the Faro Mine Complex watershed (including the Rose Creek watershed), the Vangorda Creek watershed and the Pelly River from an aquatic environment perspective.

The assessment was based on measured data and water quality predictions for the final closure and remediation plan developed by Gomm Environmental Engineering Consulting. The full details of the future predictions are provided in Faro Mine Complex Site Wide Water Quality Model (GEEC 2010). Appendix A provides the predicted water quality concentrations provided by Gomm Environmental Engineering Consulting. In addition, information for the Pelly River Upstream locations was obtained from SRK Consulting.

The existing conditions and the final closure and remediation plan as well as the modeling assumptions applied are described below.

1.1.1 Existing Conditions

For existing conditions, current effects are evaluated by utilizing 2002 to 2007 monitoring data from receiving water locations on the respective watersheds identified previously. These results provide a point of reference against which the effects of the final closure and remediation plan can be compared. The data for the existing conditions do not take into account any of the soluble chemical loads that are currently being produced on the site, but which have not yet reached the receiving waters (i.e. chemical loads associated with groundwater plumes).

Existing conditions were based on data collected during the 2002 to 2007 period in various sampling campaigns (database from Site, Gartner Lee/AECOM, Access Consulting, Minnow Environmental, and Laberge). The current chemical loads measured in the receiving waters are significantly less than what is anticipated to occur in the future because some sources have not reached peak oxidation rates and some chemicals have not emerged from their source due to attenuation and/or long travel times.

1.1.2 Final Closure and Remediation Plan

The final closure and remediation plan is discussed in full detail in the Project Description. Briefly, all groundwater seepage from either the tailings area or the majority of the waste rock dumps will be collected and routed to Faro Pit on the Faro side and Vangorda Pit on the Vangorda Plateau side. Diversions will be upgraded to ensure effective conveyance of clean water around the site. The pit water will be treated using a high density sludge treatment system and discharged seasonally (May to September) to the receiving environment. On the Faro side, the discharge location is assumed to be immediately downstream of the confluence of the North and South Forks of Rose Creek. On the Vangorda side, the discharge location is assumed to be in the area where Vangorda Creek crosses the site access road, below the existing drop structure. It is assumed in the final closure and remediation plan that water in the Grum Pit will continue to be treated biologically and overflow naturally to Vangorda Creek. All waste rock dumps and the tailings will be covered and revegetated.

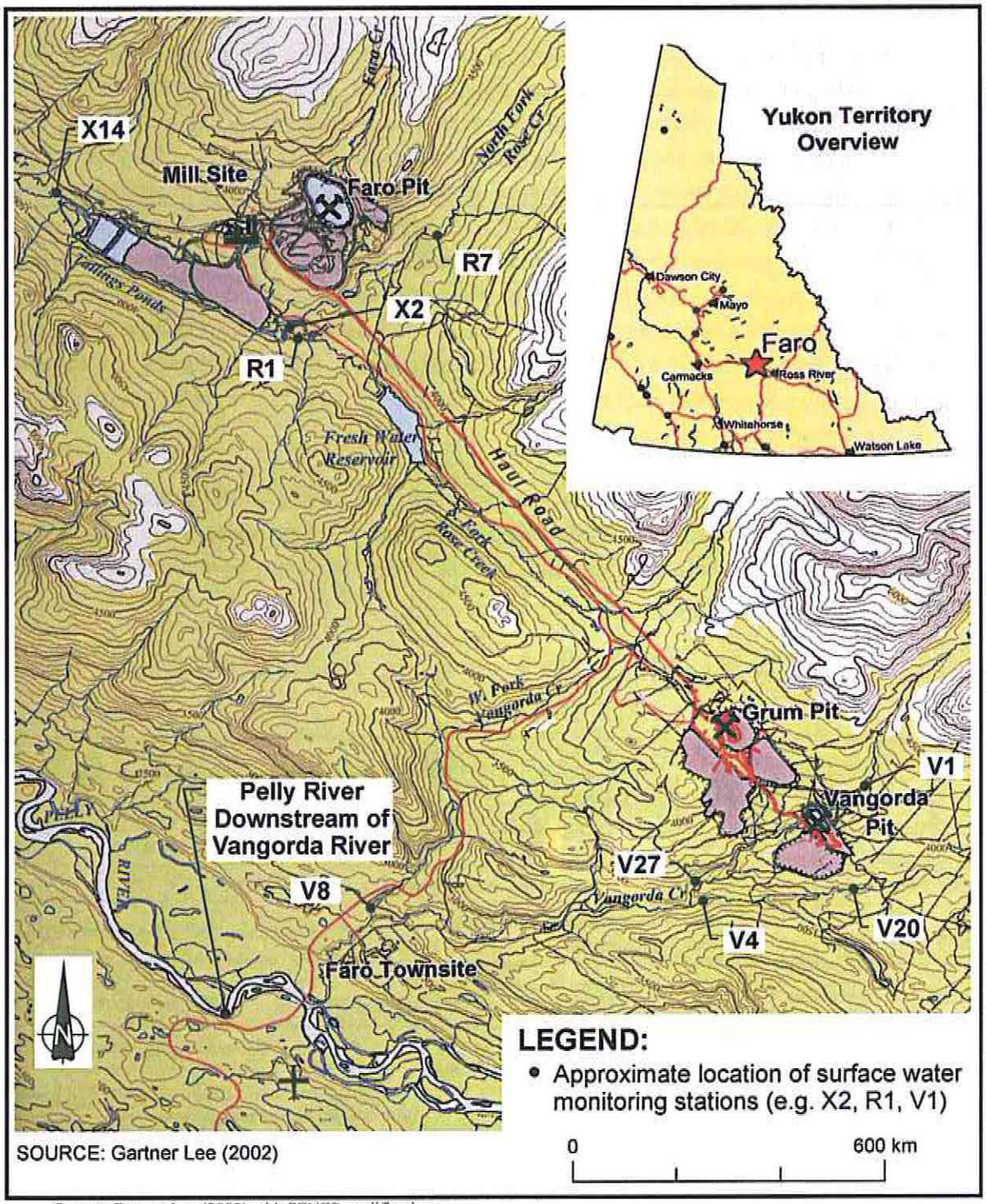
Table 1.1 provides a summary of the water quality assumptions used in the probabilistic risk assessment based on the discussions provided above and Figure 1.1 provides a site map of the Faro and Vangorda mine sites and the approximate locations of the sampling stations used in the assessment.

Table 1.1 Summary of Assumptions on Water Quality Used in the Probabilistic Risk Assessment

Scenario / Aquatic Areas	Existing Conditions	Final Closure and Remediation Plan
Rose Creek Upstream	Distribution based on measured data at Stations R1, R6, R7	
Vangorda Creek Upstream	Distribution based on measured data at Stations V1, V4, V20	
Rose Creek Downstream	Distribution based on measured data at Stations X2 & X14	Distribution based on model output for Station X14
Vangorda Creek Downstream	Distribution based on measured data at Stations V27	Distribution based on model output for Station V8 Distribution based on model output for Station V27
Pelly River Upstream	Distribution based on SRK data for Pelly River above Vangorda Creek	
Pelly River Downstream	Distribution based on measured data from MOE for Pelly River at Pelly Crossing	Distribution based on model output for Pelly River Downstream of Vangorda Creek Distribution based on model output for Pelly River Downstream of Anvil Creek
Site-Wide	Average of all aquatic areas	

Notes:
The water quality model spreadsheets are provided in Appendix A.

Figure 1.1 Faro Mine Complex Site Map and Local Creek Monitoring Stations



Source: Gartner Lee (2002) with SENES modifications.
Note: Approximate location of surface water quality monitoring stations (e.g. X2, R1, V1).

1.2 ASSUMPTIONS USED IN TERRESTRIAL ASSESSMENT

In the terrestrial assessment, the following assumptions were made:

- The main factors affected by the final closure and remediation plan are the metals levels in the downstream aquatic environment (i.e. metals levels in water, sediments, aquatic plants, fish and benthic organisms) in Rose Creek, Anvil Creek, Vangorda Creek and Pelly River. Hence, in the assessment of the effects of the remediation plan on terrestrial species, water quality predictions were used for the remediation plan whereas the terrestrial concentrations were assumed to be the same as for the existing conditions even though the tailings and waste rock areas will be covered.
- Metal levels in soils and vegetation in the vicinity of the mine facilities were assumed to be at or near peak levels as they would have been most impacted by emissions while the mine was operating. Metal levels in soils and vegetation would not be expected to decline rapidly and were therefore considered to be the same for both the existing conditions and the final closure and remediation plan.
- Also, it was assumed that direct remediation of soils adjacent to the tailings impoundment or waste rock dumps would not be required. The measured metal levels in soils and vegetation were used therefore in the pathways assessment of intakes by the terrestrial species for both the existing conditions and the final closure and remediation plan.

In summary, for the existing conditions, measured data in both the aquatic and terrestrial environments were used in the assessment. For the final closure and remediation plan, measured data in the terrestrial environment from the existing conditions were used in the assessment. For the aquatic environment, predicted water quality data for the final closure and remediation plan were used in conjunction with site-specific and literature value transfer factors to develop concentrations in various media (sediments, aquatic plants, benthic organisms and fish).

If measured soils or vegetation data were not available for a given medium at a specific location or in a particular area then chemical concentrations were estimated for the location or area by either: i) using measured data from other locations in the study area with similar characteristics or ii) through the application of site-specific transfer factors derived from measurements at other locations in the study area.

1.3 DATA USED IN THE ASSESSMENT

Table provides a summary of the data used for the assessment of existing conditions and the final closure and remediation plan.

Table 1.2 Summary of Data Used in the Probabilistic Risk Assessment

Data	Existing Conditions	Final Closure and Remediation Plan
Surface Water Quality	Measured data from January 2002 to December 2007	Predicted data provided by Gomm Environmental Engineering Consulting
Sediment	Calculated from measured water quality using site-specific water-to-sediment distribution coefficients developed from measured data collected from Rose Creek in 2004	Calculated from predicted water quality using site-specific water-to-sediment distribution coefficients developed from measured data collected from Rose Creek in 2004
Fish	Calculated from measured water quality using site-specific water-to-fish transfer factors developed from measured data collected from Rose Creek and Vangorda Creek in August 2004; calculated fish concentrations were validated using data from 2005	Calculated from predicted water quality using site-specific water-to-fish transfer factors developed from measured data collected from Rose Creek and Vangorda Creek in August 2004
Benthic Invertebrates	Calculated from measured water quality using literature-based water-to-benthic invertebrate transfer factors	Calculated from predicted water quality using literature-based water-to-benthic invertebrate transfer factors
Aquatic Vegetation	Calculated from measured water quality using literature-based water-to-aquatic vegetation transfer factors	Calculated from predicted water quality using literature-based water-to-aquatic vegetation transfer factors
Soil	Measured data from 2002 and 2004	
Terrestrial Vegetation	Measured data from 2002 and 2004	
Large Mammals	Measured caribou data from 2004 through 2007 and measured moose data from 2004 through 2006	
Small Mammals	Calculated using diet characteristics and literature-based feed-to-small mammal transfer factors; calculated beaver and hoary marmot concentrations were validated using data from 2005	
Birds	Calculated using diet characteristics and literature-based feed-to-bird transfer factors; calculated grouse concentrations were validated using data from 2005	

1.4 SELECTION OF CHEMICALS OF POTENTIAL CONCERN

A selection process was used to identify the chemicals of potential concern (COPC) at the Faro Mine Complex as described in Appendix B. To summarize, the concentrations in water and soils in the affected area were compared statistically to background/baseline concentrations in the study area. Those chemicals that were found to be significantly different from background/baseline were then compared to CCME guidelines for water (for protection of aquatic life) and/or for soil (for residential/parkland use). The CCME aquatic life guidelines

were lower than the CCME drinking water guidelines for the chemicals (metals) considered in this assessment. If the measured levels exceeded either a guideline value or if guidelines were not available then the chemicals were carried through the risk assessment. Chemicals were dropped from the assessment if toxicity data were not available as no quantification of risks can be completed.

To ensure that all COPC were identified in the screening process, an additional screening step which involved data collected from the Faro and Vangorda-Grum seeps were used since these seeps would lead to higher concentrations in the surface water in the future. In order to screen on the seep data, a dilution factor of 1:100 was applied to the maximum measured seep concentrations to account for attenuation before the seeps reached the surface water. The dilution factor of 1:100 was selected based on groundwater seepage to the creeks from the water quality model. These diluted seep concentrations were then compared to reference concentrations and CCME guidelines for aquatic life. If a chemical had a concentration with the applied dilution factor below reference concentrations, it was not considered further. Those chemicals that were found to be significantly different from reference concentrations were then compared to CCME guidelines for water (for protection of aquatic life). If the diluted seep concentrations exceeded the guideline value or if guidelines were not available then the chemicals were carried through the risk assessment.

Chemicals were dropped from the COPC selection process if toxicity data were not available since they could not be quantified in the risk assessment. This adds some uncertainty to the assessment; however, given that this risk assessment builds on previous risk assessments for the site and the lack of toxicity data generally denotes chemicals that are not toxic, the final COPC list captures the chemicals of major concern at the Faro Mine Complex.

For the vegetation samples, the measured concentrations in forage, browse and berry were first compared to background/baseline concentrations in the study area. Once again, those chemicals with concentrations that were found to be statistically different from background/baseline concentrations were then compared to reported phytotoxic levels in plants. This was done to determine whether chemical levels in the plant had the potential to be toxic to the plant. Chemical concentrations that were less than phytotoxic levels were automatically dropped from further consideration. Those chemicals which were significantly higher then background but for which there were no phytotoxic values, were also carried through the assessment. Chemicals were dropped from the assessment if toxicity data were not available.

Based on this screening procedure, the following chemicals were identified as COPC: antimony, arsenic, beryllium, boron, cadmium, chromium, cobalt, copper, lead, manganese, nickel, selenium, silver, strontium, tin, vanadium, and zinc.

Hydrocarbons are present in the soils at the Faro Mine Complex in areas with elevated metals levels. There may also be other organic chemicals present; however, consideration of hydrocarbons and other organic chemicals were beyond the scope of work for this assessment. It is understood that it is planned to remediate these soils hence, hydrocarbons and other organic chemicals were not considered in the risk assessment.

1.5 REPORT STRUCTURE

The report has been structured into several chapters, each of which describes specific aspects of the risk assessment. These aspects include:

Chapter 2 – Site Characterization: Describes the main features of the watersheds surrounding the Faro Mine Complex. A summary of the most pertinent information from recent surveys of surface water quality, sediment quality, and fish communities in Rose Creek, Anvil Creek and Vangorda Creek is provided to establish existing (baseline) conditions. These data were used in the subsequent assessment. Similarly, COPC levels measured in soils and vegetation in the study area were evaluated and input to the ecological and human health risk assessments.

Chapter 3 – Receptor Characterization: Identifies the aquatic and terrestrial species selected for inclusion in the risk assessment, as well as, the human receptors (i.e. adults and children) that may spend time in the study area.

Chapter 4 – Exposure Assessment: Describes the pathways model used to predict the fate of chemicals (chemical species) in the environment including their uptake by aquatic and terrestrial species. The pathways of exposure of human receptors and their respective dietary characteristics are described.

Chapter 5 – Hazard Assessment: Details the toxicity reference values used in the assessment for each of the chemical species to characterize the risks of potential effects on the health of ecological species and humans.

Chapter 6 – Risk Characterization: Presents the results of the pathways modelling and risk assessments.

Chapter 7 – Summary and Conclusions: Provides a synopsis of the basis used for the ERA and HHRA and the findings of these assessments.

Chapter 8 – References: Lists the reference sources used in this study.

2.0 SITE CHARACTERIZATION

The information provided in this chapter provides a summary of the measured data for the chemicals of potential concern (COPC) used to assess the existing conditions at the Faro Mine Complex. The detailed discussion of all the data is provided in Appendix C. This chapter also provides the methodology for the calculation of the concentrations of COPC in various environmental media for the final closure and remediation plan.

2.1 FARO MINE COMPLEX

The Faro Mine Complex, as shown in Figure 1.1, is located about 200 km northeast of Whitehorse and includes the Faro Mine site (in production from 1969 to 1992) and the Vangorda Plateau Mine site (in production from 1986 to 1998). The Faro Mine site is 15 km north of the town of Faro and contains a mill, open pit and tailings impoundment and other associated facilities. The Vangorda Plateau Mine site is 9 km northeast of the town of Faro and includes two open pits and associated mine facilities. The operation produced lead and zinc concentrates. The Faro Mine site is located within the Rose Creek watershed, which is a tributary of the Anvil Creek watershed, and the Vangorda Plateau Mine site is located within the Vangorda Creek watershed. Both watersheds empty into the Pelly River. This assessment evaluated potential effects of COPC in the aquatic environment in Rose Creek, Vangorda Creek and the Pelly River.

2.2 AQUATIC ENVIRONMENT

This section discusses existing surface water quality for the COPC within the Rose Creek and Vangorda Creek watersheds which were obtained from various sampling campaigns by Gartner Lee Limited. It also provides information for the Pelly River, which was obtained from the Environment Canada website. Distribution functions for the existing conditions are also provided in this section.

Distribution functions for the final closure and remediation plan are also provided in the section as well as distribution functions for transfer factors and distribution coefficients which were used to estimate COPC in sediment, fish flesh (muscle), benthic invertebrates, and aquatic vegetation are also provided in this section.

Surface water at Faro Mine site and Vangorda Plateau Mine site has been routinely sampled to assess water quality. Some stations are sampled regularly on a monthly schedule while others are sampled on a seasonal or annual basis. Measured water quality data for the period of 2002-2007 were provided by Gartner Lee/AECOM, Access Consulting, Minnow Environmental, and

Laberge and used in this study. The use of data for this time period provides a snapshot of the existing conditions at the site.

For the Pelly River, data from Environment Canada website up to 1996, and data from the Selkirk First Nations Report on the "Pelly River Aquatic Effects Assessment" (ACG, LES and WMEC 2005) were considered in the assessment.

Sediment data from the sediment monitoring program conducted in July 2004 (Laberge 2004) were used to develop site-specific distribution coefficients to estimate sediment quality for the probabilistic risk assessments of the existing conditions and final closure and remediation plan. Data from other monitoring programs in 2005 and 2006 were used to validate the predicted concentrations which were determined from the site-specific distribution coefficients.

Flesh samples from slimy sculpin and Arctic grayling collected during a field investigation (White Mountain Environmental Consulting 2004) conducted in the summer of 2004 were used to derive site-specific transfer factors for use in the probabilistic risk assessment for the existing conditions and final closure and remediation plan. Recent monitoring data for fish were used to validate the predicted fish flesh concentrations which were determined from site-specific transfer factors.

2.2.1 Surface Water Quality – Existing Conditions

The COPC concentrations in surface water measured at the Faro mine site and Vangorda mine site between January 2002 and December 2007 were used in the assessment. For copper, data prior to 2004 was excluded from the assessment due to detection limit issues. Samples measured on 15 April 2004 were not included in the analysis because of high method detection limit for some of the chemicals. The updated water database was provided by Gartner Lee Limited and included recent data through the end of 2008 (data from Site, Gartner Lee/AECOM, Access Consulting, Minnow Environmental, and Laberge). Some of the samples with measurements for arsenic, copper and silver had to be excluded due to the high method detection limits; for other detection limit issues, concentrations measured as less than the detection limit ("<") were considered as equal to ½ the detection limit. Even with the exclusion of selected data, the number of samples in both Rose Creek and Vangorda Creek were considered to be representative of the water quality in these two watersheds. Details are given in Appendix C.

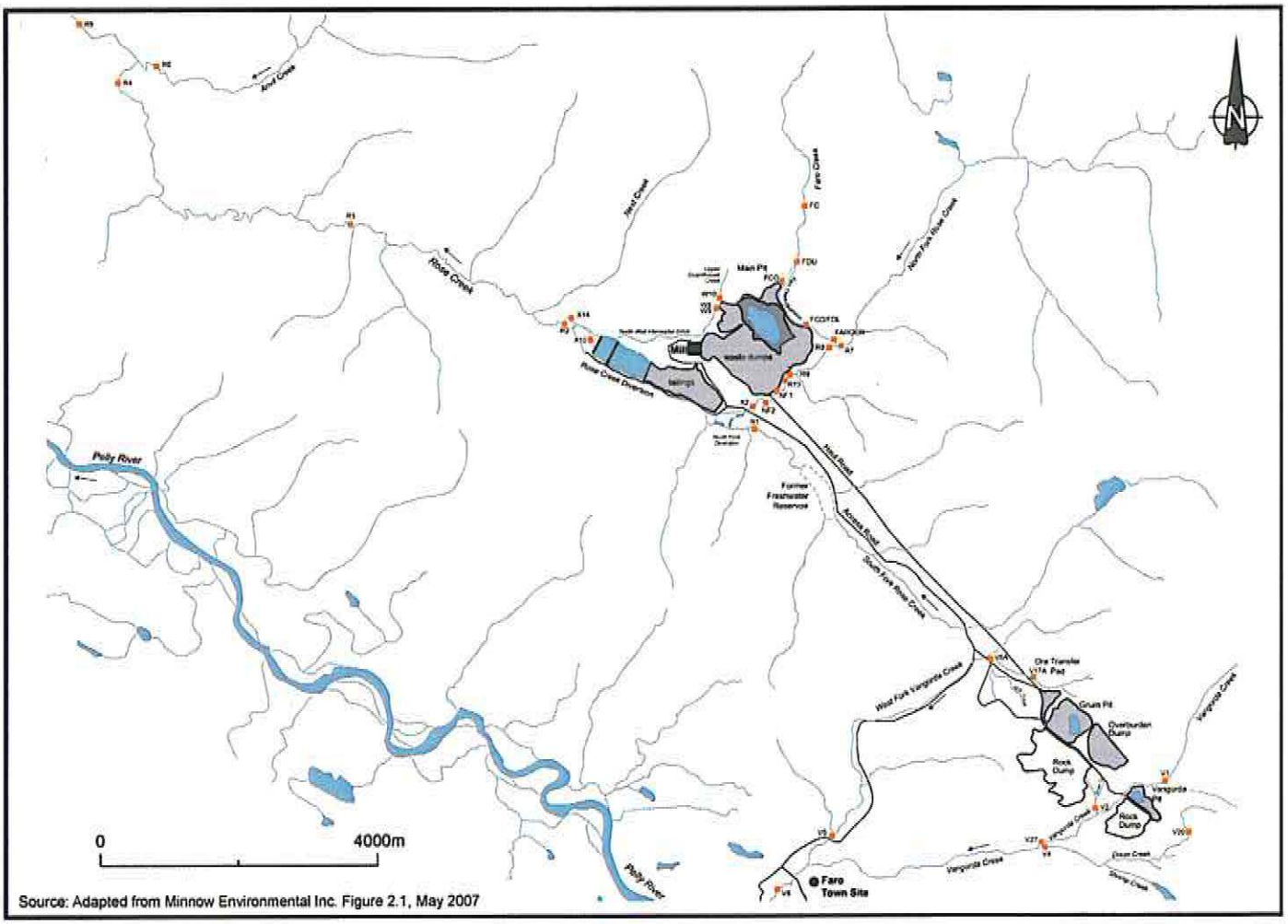
Data for the Pelly River was limited and no measurements were available after 1996; therefore data from 1992 to 1996 are summarized below. A detailed list of the water quality data is provided in Appendix C.

2.2.1.1 Rose Creek Watershed

Surface water quality data were collected at different locations in the Rose Creek watershed. Table 2.1 provides a list of monitoring stations in Rose Creek. Stations upstream of the mine are considered to be representative of background water quality conditions since pre-mining conditions in Rose Creek are not available.

As seen from the table, water quality data for Rose Creek were summarized into two aquatic areas identified as Rose Creek U/S (stations R1, R6 and R7) and Rose Creek D/S (stations X2 and X14). Figure 2.1 provides the location of these sampling stations.

Figure 2.1 Location of Sampling Stations in Aquatic Environment



Source: Adapted from Minnow Environmental Inc. Figure 2.1, May 2007

Table 2.1 Monitoring Stations in Rose Creek

UPSTREAM/BACKGROUND STATIONS	
R1	Upstream of the confluence of the North and South Forks of Rose Creek
R6	Anvil Creek upstream of Rose Creek
R7	North Fork of Rose Creek upstream of Faro Creek diversion
DOWNSTREAM	
X2	North Fork of Rose Creek upstream of mine access road
X14	Rose Creek, downstream of diversion channel

Sources: Gartner Lee Limited (2002) and Laberge (2004).

COPC concentration distributions in the Rose Creek watershed are summarized in Table 2.2. As seen in the table, lognormal distributions were developed for the measured site data. Lognormal distributions are generally representative of environmental data and considered appropriate for the data and the assessment.

Table 2.2 Summary of Water Quality Distributions for COPC in Rose Creek – Existing Conditions

COPC	Existing Conditions - Rose Creek Upstream		Existing Conditions - Rose Creek Downstream	
	Water Quality Distribution (mg/L)	95th Percentile Concentration (mg/L)	Water Quality Distribution (mg/L)	95th Percentile Concentration (mg/L)
Antimony	LN (4.3×10^{-4}, 4.3, 5.3×10^{-6}, 0.03)	0.005	LN (9.3×10^{-4}, 4.3, 1.2×10^{-5}, 0.07)	0.01
Arsenic	LN (5.6×10^{-4}, 2.0, 6.9×10^{-5}, 0.005)	0.002	LN (6.6×10^{-4}, 2.6, 3.9×10^{-5}, 0.01)	0.003
Beryllium	LN (4.6×10^{-4}, 1.2, 2.4×10^{-4}, 8.8×10^{-4})	6.5×10^{-4}	LN (1.7×10^{-4}, 9.0, 2.4×10^{-7}, 0.12)	0.006
Boron	LN (0.05, 1.2, 0.03, 0.10)	0.07	LN (0.03, 2.1, 0.003, 0.3)	0.1
Cadmium	LN (9.4×10^{-5}, 2.4, 7.2×10^{-6}, 0.001)	3.8×10^{-4}	LN (9.5×10^{-5}, 2.9, 3.9×10^{-6}, 0.002)	5.4×10^{-4}
Chromium	LN (4.0×10^{-4}, 3.0, 1.5×10^{-5}, 0.01)	0.002	LN (7.4×10^{-4}, 2.9, 3.2×10^{-5}, 0.02)	0.004
Cobalt	LN (4.9×10^{-4}, 1.6, 1.3×10^{-4}, 0.002)	0.001	LN (6.9×10^{-4}, 3.0, 2.6×10^{-5}, 0.02)	0.004
Copper	LN (5.6×10^{-4}, 2.3, 4.5×10^{-5}, 0.007)	0.002	LN (7.5×10^{-4}, 2.5, 4.9×10^{-5}, 0.01)	0.003
Lead	LN (3.5×10^{-4}, 3.8, 6.4×10^{-6}, 0.02)	0.003	LN (0.001, 4.5, 1.2×10^{-5}, 0.09)	0.01
Manganese	LN (0.02, 3.2, 6.1×10^{-4}, 0.6)	0.1	LN (0.42, 3.5, 0.01, 17.3)	3.2
Nickel	LN (4.2×10^{-4}, 4.5, 4.5×10^{-6}, 0.04)	0.005	LN (0.002, 2.6, 9.9×10^{-5}, 0.03)	0.009
Selenium	LN (6.0×10^{-4}, 2.1, 6.8×10^{-5}, 0.005)	0.002	LN (8.1×10^{-4}, 2.1, 8.9×10^{-5}, 0.007)	0.003
Silver	LN (1.0×10^{-4}, 2.7, 5.2×10^{-6}, 0.002)	5.2×10^{-4}	LN (1.3×10^{-4}, 2.7, 6.5×10^{-6}, 0.003)	6.7×10^{-4}
Strontium	LN (0.11, 1.5, 0.03, 0.4)	0.2	LN (0.17, 1.7, 0.04, 0.8)	0.4
Tin	LN (4.5×10^{-4}, 4.9, 3.9×10^{-6}, 0.05)	0.006	LN (7.1×10^{-4}, 4.9, 6.1×10^{-6}, 0.08)	0.009
Vanadium	LN (5.0×10^{-4}, 1.6, 1.3×10^{-4}, 0.002)	0.001	LN (3.2×10^{-4}, 3.6, 6.6×10^{-6}, 0.02)	0.003
Zinc	LN (0.005, 4.9, 4.3×10^{-5}, 0.6)	0.07	LN (0.03, 2.1, 0.004, 0.3)	0.1

Note:
LN = Lognormal distribution (geometric mean, geometric standard deviation, min, max)

From Table 2.2, it can be seen that the geometric mean COPC concentrations at the downstream stations are generally higher than the upstream concentrations. Manganese concentrations are over an order of magnitude higher in the downstream stations. Zinc concentrations measured at the downstream stations on Rose Creek are 83% higher than those measured at the upstream locations. The geometric mean concentrations at upstream stations were greater than the downstream stations for beryllium, boron, and vanadium.

2.2.1.2 Vangorda Creek Watershed

Existing water quality for locations upstream and downstream of the Grum and Vangorda mines were characterized by data collected from sampling locations on Vangorda Creek. Stations upstream of the mines are considered to be representative of background or baseline water quality conditions and the use of these stations as background water quality is consistent with Gartner Lee Limited (2002). For Vangorda Creek, the upstream locations of V1 (Vangorda Creek upstream of mine activities), V4 (Shrimp Creek) and V20 (Vangorda Creek northeast diversion ditch) were considered representative of background water quality. Stations downstream of the mine are assumed to be influenced by the mine workings. For this assessment, station V27 was selected as the most appropriate downstream location. These monitoring locations are described in Table 2.3 and shown on Figure 2.1.

Table 2.3 Monitoring Stations in Vangorda Creek

UPSTREAM/BACKGROUND STATIONS	
V1	Vangorda Creek upstream of mine activities
V4	Shrimp Creek
V20	Vangorda Northeast diversion ditch
DOWNSTREAM	
V27	Main Stem Vangorda Creek (Upper)

Source: Gartner Lee Limited (2002)

COPC concentration distributions in the Vangorda Creek watershed are summarized in Table 2.4. Similar to Rose Creek, lognormal distributions were developed for the measured site data. Lognormal distributions are generally representative of environmental data and considered appropriate for the data and the assessment.

From Table 2.4, it can be seen that the geometric mean metal concentrations at the downstream stations are generally similar to the upstream concentrations. The geometric mean concentrations at upstream stations were greater than the downstream stations for antimony, boron, chromium, manganese, selenium, silver, strontium and vanadium.

Table 2.4 Summary of Water Quality Distributions for COPC in Vangorda Creek – Existing Conditions

COPC	Existing Conditions - Vangorda Creek Upstream		Existing Conditions - Vangorda Creek Downstream	
	Water Quality Distribution (mg/L)	95th Percentile Concentration (mg/L)	Water Quality Distribution (mg/L)	95th Percentile Concentration (mg/L)
Antimony	LN (0.001, 3.6, 3.2×10^{-5}, 0.06)	0.01	LN (8.0×10^{-4}, 3.8, 1.5×10^{-5}, 0.04)	0.007
Arsenic	LN (8.6×10^{-4}, 3.9, 1.5×10^{-5}, 0.05)	0.008	LN (0.001, 3.4, 3.3×10^{-5}, 0.05)	0.01
Beryllium	LN (3.3×10^{-4}, 1.7, 7.1×10^{-5}, 0.002)	7.7×10^{-4}	LN (0.001, 5.0, 8.5×10^{-6}, 0.13)	0.01
Boron	LN (0.04, 2.0, 0.005, 0.4)	0.1	LN (0.03, 1.9, 0.005, 0.22)	0.09
Cadmium	LN (1.1×10^{-4}, 2.8, 4.9×10^{-6}, 0.002)	5.9×10^{-4}	LN (1.2×10^{-4}, 3.9, 2.0×10^{-6}, 0.007)	0.001
Chromium	LN (8.8×10^{-4}, 3.7, 1.8×10^{-5}, 0.04)	0.007	LN (6.9×10^{-4}, 3.3, 1.94×10^{-5}, 0.02)	0.005
Cobalt	LN (5.8×10^{-4}, 2.4, 4.2×10^{-5}, 0.008)	0.002	LN (0.001, 4.6, 1.1×10^{-5}, 0.10)	0.01
Copper	LN (9.9×10^{-4}, 2.3, 8.6×10^{-5}, 0.01)	0.004	LN (0.001, 1.7, 2.4×10^{-4}, 0.005)	0.002
Lead	LN (0.001, 2.5, 9.0×10^{-5}, 0.02)	0.006	LN (0.001, 2.7, 7.7×10^{-5}, 0.03)	0.007
Manganese	LN (0.01, 2.2, 0.001, 0.12)	0.04	LN (0.009, 2.2, 8.1×10^{-4}, 0.1)	0.03
Nickel	LN (0.001, 3.4, 2.8×10^{-5}, 0.04)	0.008	LN (0.001, 3.3, 2.8×10^{-5}, 0.04)	0.007
Selenium	LN (0.001, 2.5, 6.5×10^{-5}, 0.02)	0.005	LN (7.5×10^{-4}, 2.2, 7.3×10^{-5}, 0.008)	0.003
Silver	LN (1.4×10^{-4}, 3.6, 3.0×10^{-6}, 0.007)	0.001	LN (1.1×10^{-4}, 1.6, 2.9×10^{-5}, 4.3×10^{-4})	2.3×10^{-4}
Strontium	LN (0.11, 2.0, 0.01, 0.88)	0.3	LN (0.09, 1.6, 0.02, 0.4)	0.2
Tin	LN (0.001, 3.9, 2.0×10^{-5}, 0.07)	0.01	LN (0.001, 4.0, 1.9×10^{-5}, 0.07)	0.01
Vanadium	LN (4.8×10^{-4}, 1.7, 9.6×10^{-5}, 0.002)	0.001	LN (4.5×10^{-4}, 1.3, 2.1×10^{-4}, 9.8×10^{-4})	6.9×10^{-4}
Zinc	LN (0.007, 2.6, 3.7×10^{-4}, 0.12)	0.03	LN (0.04, 2.2, 0.003, 0.4)	0.1

Note:
LN = Lognormal distribution (geometric mean, geometric standard deviation, min, max)

2.2.1.3 Pelly River

Data for Pelly River from the Environment Canada website, as well as the Selkirk First Nations report, were evaluated. Table 2.5 summarizes the data from the Pelly River at Pelly Crossing that was used in the assessment. Pelly River Upstream concentrations were represented by data provided by SRK for Pelly River above Vangorda Creek. As described above, data for the Pelly River was limited and no measurements were available after 1996; therefore data from 1992 to 1996 are summarized below for Pelly River at Pelly Crossing.

Table 2.5 Summary of Water Quality Distributions for COPC in Pelly River – Existing Conditions

COPC	Existing Conditions – Pelly River Upstream	Existing Conditions – Pelly River at Pelly Crossing	
	Water Quality Distribution (mg/L)	Water Quality Distribution (mg/L)	95th Percentile Concentration (mg/L)
Antimony	n/a	C (3.0×10^{-4})	n/a
Arsenic	C (5.8×10^{-4})	LN (6.8×10^{-4}, 3.5, 1.5×10^{-5}, 0.03)	0.005
Beryllium	n/a	LN (4.2×10^{-5}, 2.8, 1.9×10^{-6}, 9.1×10^{-4})	2.2×10^{-4}
Boron	n/a	C (0.007)	n/a
Cadmium	C (5.0×10^{-4})	LN (1.9×10^{-4}, 3.3, 5.4×10^{-6}, 0.007)	0.001
Chromium	n/a	LN (0.001, 3.6, 2.9×10^{-5}, 0.07)	0.01
Cobalt	C (0.001)	LN (4.5×10^{-4}, 3.4, 1.2×10^{-5}, 0.02)	0.003
Copper	C (0.005)	LN (0.003, 2.8, 1.2×10^{-4}, 0.06)	0.02
Lead	C (0.004)	LN 6.9×10^{-4}, 3.6, 1.5×10^{-5}, 0.03)	0.006
Manganese	C (0.014)	LN (0.04, 3.3, 0.001, 1.3)	0.3
Nickel	C (0.001)	LN (0.003, 2.8, 1.3×10^{-4}, 0.07)	0.02
Selenium	n/a	LN (8.3×10^{-4}, 1.4, 2.9×10^{-4}, 0.002)	0.001
Silver	C (1.0×10^{-4})	LN (9.9×10^{-5}, 1.5, 2.7×10^{-5}, 3.6×10^{-4})	2.0×10^{-4}
Strontium	n/a	LN (0.17, 1.3, 0.07, 0.40)	0.27
Tin	n/a	C (5.0×10^{-4})	n/a
Vanadium	n/a	LN (0.002, 3.3, 4.4×10^{-5}, 0.06)	0.01
Zinc	C (0.008)	LN (0.01, 3.1, 4.2×10^{-4}, 0.35)	0.08

Note:
n/a = no data available
C = Constant (value)
LN = Lognormal distribution (geometric mean, geometric standard deviation, min, max)

2.2.2 Surface Water Quality – Final Closure and Remediation Plan

Predicted water quality at the Faro Mine Complex were provided for the final closure and remediation plan by Gomm Environmental Engineering Consulting, which are provided in Appendix A. Lognormal distributions defined by the geometric mean, geometric standard deviation, minimum, and maximum were developed for predicted water quality for the assessment of the final closure and remediation plan.

Geometric Mean: The geometric mean was calculated based on the mean values of the best estimate data set (see Appendix A), with consideration of the monthly data points from January 2028 to January 2212 (a total of 2209 data points).

Geometric Standard Deviation: The geometric standard deviation was calculated using the maximum of the maximum values for the upper bound data set (see Appendix A), with consideration of monthly data points from January 2028 to January 2212 (a total of 2209 data points), using the following equation:

$$GSD = \sqrt[3]{\frac{Max(MaxUB)}{GM}}$$

where:

GSD = geometric standard deviation

Max(MaxUB) = the maximum of the maximum values from the upper bound data set

GM = geometric mean, represented by the geometric mean of the mean values from the best estimate data set

Minimum: The minimum value was calculated for three standard deviations, using the following equation:

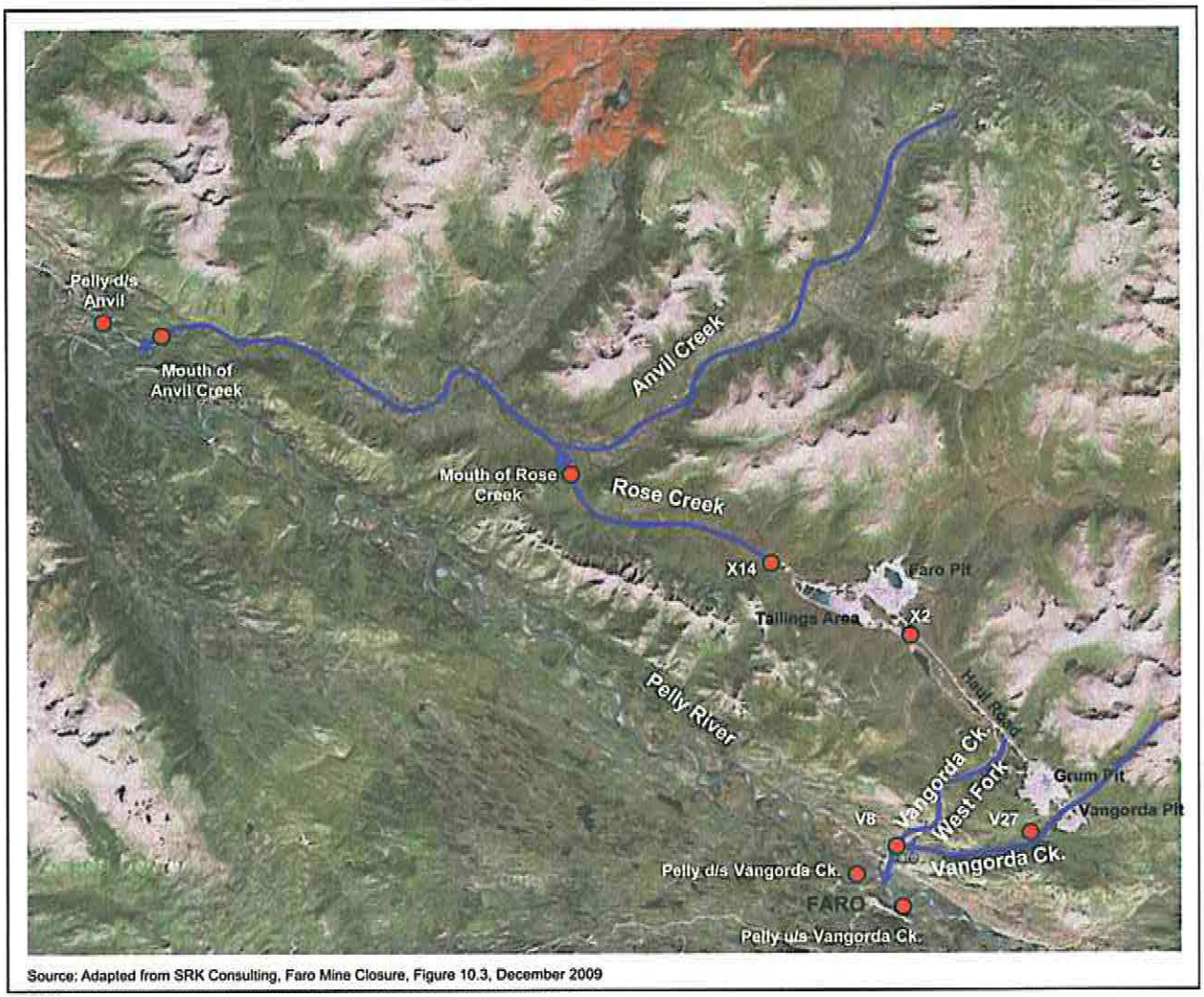
$$Min = \frac{GM}{GSD^3}$$

Maximum: The maximum value was calculated for three standard deviations, using the following equation:

$$Max = GM \times GSD^3$$

The following sections provide a summary of the distributions used for the final closure and remediation plan. Figure 2.2 provides the locations considered for the final closure and remediation plan.

Figure 2.2 Location Considered for Final Closure and Remediation Plan



Source: Adapted from SRK Consulting, Faro Mine Closure, Figure 10.3, December 2009

2.2.2.1 Rose Creek Watershed

The Rose Creek Watershed was represented by downstream model output location X14, and the derived water quality distributions for this location are provided in Table 2.6. For the human assessment, drinking water and fish consumption was assumed to occur from the Mouth of Rose Creek and therefore, data for the Mouth of Rose Creek is also provided in Table 2.6.

Table 2.6 Summary of Water Quality Distributions for COPC in Rose Creek – Final Closure and Remediation Plan

COPC	Final Closure and Remediation Plan – X14		Final Closure and Remediation Plan – Mouth of Rose Creek[a]	
	Water Quality Distribution (mg/L)	95th Percentile Concentration (mg/L)	Water Quality Distribution (mg/L)	95th Percentile Concentration (mg/L)
Antimony	LN (5.06×10^{-4}, 1.0, 4.82×10^{-4}, 5.31×10^{-4})	5.2×10^{-4}	LN (5.04×10^{-4}, 1.0, 4.87×10^{-4}, 5.22×10^{-4})	5.1×10^{-4}
Arsenic	LN (8.78×10^{-4}, 1.6, 2.16×10^{-4}, 0.004)	0.002	LN (7.89×10^{-4}, 1.6, 2.08×10^{-4}, 2.99×10^{-3})	1.6×10^{-3}
Beryllium	LN (5.85×10^{-4}, 1.1, 3.99×10^{-4}, 8.57×10^{-4})	7.2×10^{-4}	LN (5.63×10^{-4}, 1.1, 4.18×10^{-4}, 7.58×10^{-4})	6.6×10^{-4}
Boron	LN (0.026, 1.1, 0.023, 0.031)	0.029	LN (0.026, 1.0, 0.023, 0.029)	0.028
Cadmium	LN (1.90×10^{-4}, 3.7, 3.68×10^{-6}, 0.010)	0.002	LN (1.53×10^{-4}, 3.7, 2.94×10^{-6}, 7.91×10^{-3})	1.3×10^{-3}
Chromium	LN (8.70×10^{-4}, 1.8, 1.55×10^{-4}, 0.005)	0.002	LN (7.81×10^{-4}, 1.7, 1.66×10^{-4}, 3.67×10^{-3})	1.8×10^{-3}
Cobalt	LN (7.22×10^{-4}, 1.5, 2.17×10^{-4}, 0.002)	0.001	LN (6.68×10^{-4}, 1.5, 2.19×10^{-4}, 2.04×10^{-3})	1.2×10^{-3}
Copper	LN (0.004, 1.9, 5.05×10^{-4}, 0.026)	0.011	LN (3.28×10^{-3}, 1.9, 4.94×10^{-4}, 2.18x10-02)	9.2×10^{-3}
Lead	LN (7.47×10^{-4}, 1.3, 3.29×10^{-4}, 0.002)	0.001	LN (6.87×10^{-4}, 1.3, 3.46×10^{-4}, 1.37×10^{-3})	9.99×10^{-4}
Manganese	LN (0.037, 1.5, 0.010, 0.131)	0.074	LN (0.034, 1.5, 0.011, 0.11)	0.065
Nickel	LN (1.42×10^{-3}, 1.6, 3.56×10^{-4}, 0.006)	0.003	LN (0.001, 1.5, 3.3×10^{-4}, 0.004)	0.002
Selenium	LN (0.002, 2.8, 7.20×10^{-5}, 0.032)	0.008	LN (1.25×10^{-3}, 2.6, 6.73×10^{-5}, 2.32x10-02)	6.1×10^{-3}
Silver	LN (2.65×10^{-5}, 1.1, 2.27×10^{-5}, 3.10×10^{-5})	2.9×10^{-5}	LN (2.61×10^{-5}, 1.0, 2.32×10^{-5}, 2.93×10^{-5})	2.8×10^{-5}
Strontium	LN (0.178, 1.0, 0.168, 0.190)	0.184	LN (0.179, 1.0, 0.171, 0.187)	0.19
Tin	LN (4.90×10^{-4}, 1.0, 4.79×10^{-4}, 5.00×10^{-4})	4.95×10^{-4}	LN (4.92×10^{-4}, 1.0, 4.85×10^{-4}, 5.00×10^{-4})	4.97×10^{-4}
Vanadium	LN (5.18×10^{-4}, 1.2, 3.31×10^{-4}, 8.11×10^{-4})	6.6×10^{-4}	LN (5.13×10^{-4}, 1.1, 3.63×10^{-4}, 7.25×10^{-4})	6.2×10^{-4}
Zinc	LN (0.136, 2.3, 0.011, 1.658)	0.53	LN (0.108, 2.3, 0.009, 1.3)	0.42

Note:
LN = Lognormal distribution (geometric mean, geometric standard deviation, min, max)
a – only considered for human consumption of drinking water and fish

2.2.2.2 Vangorda Creek Watershed

The Vangorda Creek Watershed was represented by downstream model output locations V8 and V27, and the derived water quality distributions for these locations are provided in Table 2.7.

Table 2.7 Summary of Water Quality Distributions for COPC in Vangorda Creek – Final Closure and Remediation Plan

COPC	Final Closure and Remediation Plan – V8		Final Closure and Remediation Plan – V27	
	Water Quality Distribution (mg/L)	95th Percentile Concentration (mg/L)	Water Quality Distribution (mg/L)	95th Percentile Concentration (mg/L)
Antimony	LN (5.81×10^{-4}, 1.1, 4.53×10^{-4}, 7.46×10^{-4})	6.7×10^{-4}	LN (6.74×10^{-4}, 1.2, 4.41×10^{-4}, 1.03×10^{-3})	8.5×10^{-4}
Arsenic	LN (5.97×10^{-4}, 2.0, 7.66×10^{-5}, 0.005)	0.002	LN (6.69×10^{-4}, 2.0, 8.01×10^{-5}, 0.006)	0.002
Beryllium	LN (5.23×10^{-4}, 1.0, 4.59×10^{-4}, 5.96×10^{-4})	5.6×10^{-4}	LN (5.47×10^{-4}, 1.1, 4.21×10^{-4}, 7.09×10^{-4})	6.3×10^{-4}
Boron	LN (0.025, 1.0, 0.024, 0.026)	0.026	LN (0.025, 1.0, 0.022, 0.028)	0.026
Cadmium	LN (1.19×10^{-4}, 2.6, 6.90×10^{-6}, 0.002)	0.001	LN (1.86×10^{-4}, 2.4, 1.38×10^{-5}, 0.002)	0.001
Chromium	LN (5.37×10^{-4}, 1.3, 2.60×10^{-4}, 0.001)	0.001	LN (5.74×10^{-4}, 1.5, 1.81×10^{-4}, 0.002)	0.001
Cobalt	LN (7.53×10^{-4}, 1.7, 1.42×10^{-4}, 0.004)	0.002	LN (9.74×10^{-4}, 1.7, 1.93×10^{-4}, 0.005)	0.002
Copper	LN (0.002, 2.0, 2.54×10^{-4}, 0.017)	0.007	LN (0.002, 2.1, 2.24×10^{-4}, 0.021)	0.007
Lead	LN (6.00×10^{-4}, 1.1, 4.19×10^{-4}, 8.59×10^{-4})	7.3×10^{-4}	LN (6.95×10^{-4}, 1.2, 3.86×10^{-4}, 1.25×10^{-3})	9.6×10^{-4}
Manganese	LN (0.043, 2.2, 0.004, 0.456)	0.156	LN (0.055, 2.2, 0.005, 0.563)	0.196
Nickel	LN (0.003, 1.3, 0.001, 0.007)	0.005	LN (0.006, 1.2, 0.003, 0.011)	0.008
Selenium	LN (5.30×10^{-4}, 1.1, 4.04×10^{-4}, 6.95×10^{-4})	6.1×10^{-4}	LN (5.61×10^{-4}, 1.2, 3.43×10^{-4}, 9.18×10^{-4})	7.3×10^{-4}
Silver	LN (2.53×10^{-5}, 1.1, 1.91×10^{-5}, 3.36×10^{-5})	2.95×10^{-5}	LN (2.55×10^{-5}, 1.2, 1.51×10^{-5}, 4.29×10^{-5})	3.4×10^{-5}
Strontium	LN (0.193, 1.0, 0.170, 0.218)	0.206	LN (0.206, 1.1, 0.162, 0.261)	0.234
Tin	LN (8.19×10^{-4}, 1.7, 1.53×10^{-4}, 0.004)	0.002	LN (1.11×10^{-3}, 2.0, 1.39×10^{-4}, 0.009)	0.003
Vanadium	LN (5.93×10^{-4}, 1.8, 9.93×10^{-5}, 0.004)	0.002	LN (6.79×10^{-4}, 2.2, 6.53×10^{-5}, 0.007)	0.002
Zinc	LN (0.061, 2.9, 0.003, 1.475)	0.35	LN (0.095, 2.7, 0.005, 1.817)	0.47

Note:
LN = Lognormal distribution (geometric mean, geometric standard deviation, min, max)

2.2.2.3 Pelly River

The Pelly River was represented by model output locations Pelly River downstream of Vangorda Creek and Pelly River downstream of Anvil Creek, and the derived water quality distributions for these locations are provided in Table 2.8.

Table 2.8 Summary of Water Quality Distributions for COPC in Pelly River – Final Closure and Remediation Plan

COPC	Final Closure and Remediation Plan – Pelly River Downstream of Vangorda Creek		Final Closure and Remediation Plan – Pelly River Downstream of Anvil Creek	
	Water Quality Distribution (mg/L)	95th Percentile Concentration (mg/L)	Water Quality Distribution (mg/L)	95th Percentile Concentration (mg/L)
Antimony	LN (2.01×10^{-4}, 1.0, 2.00×10^{-4}, 2.02×10^{-4})	2.0×10^{-4}	LN (2.14×10^{-4}, 1.0, 2.09×10^{-4}, 2.20×10^{-4})	2.2×10^{-4}
Arsenic	LN (4.80×10^{-4}, 1.0, 4.66×10^{-4}, 4.96×10^{-4})	4.9×10^{-4}	LN (4.87×10^{-4}, 1.0, 4.35×10^{-4}, 5.44×10^{-4})	5.2×10^{-4}
Beryllium	LN (6.86×10^{-6}, 1.0, 6.13×10^{-6}, 7.68×10^{-6})	7.3×10^{-6}	LN (2.91×10^{-5}, 1.1, 2.14×10^{-5}, 3.95×10^{-5})	3.4×10^{-5}
Boron	LN (0.003, 1.0, 0.003, 0.003)	0.003	LN (0.004, 1.0, 0.003, 0.004)	0.004
Cadmium	LN (2.10×10^{-4}, 1.0, 2.03×10^{-4}, 2.17×10^{-4})	2.1×10^{-4}	LN (2.04×10^{-4}, 1.2, 1.16×10^{-4}, 3.62×10^{-4})	2.8×10^{-4}
Chromium	LN (8.69×10^{-4}, 1.0, 8.67×10^{-4}, 8.71×10^{-4})	8.7×10^{-4}	LN (8.59×10^{-4}, 1.0, 8.18×10^{-4}, 9.02×10^{-4})	8.8×10^{-4}
Cobalt	LN (1.42×10^{-4}, 1.0, 1.31×10^{-4}, 1.55×10^{-4})	1.5×10^{-4}	LN (1.61×10^{-4}, 1.1, 1.29×10^{-4}, 2.00×10^{-4})	1.8×10^{-4}
Copper	LN (1.40×10^{-3}, 1.0, 1.35×10^{-3}, 1.46×10^{-3})	1.4×10^{-3}	LN (1.45×10^{-3}, 1.1, 1.13×10^{-3}, 0.002)	0.002
Lead	LN (2.31×10^{-4}, 1.0, 2.30×10^{-4}, 2.32×10^{-4})	2.3×10^{-4}	LN (2.46×10^{-4}, 1.0, 2.37×10^{-4}, 2.57×10^{-4})	2.5×10^{-4}
Manganese	LN (0.021, 1.0, 0.020, 0.023)	0.022	LN (0.021, 1.0, 0.019, 0.024)	0.023
Nickel	LN (0.005, 1.0, 0.005, 0.005)	0.005	LN (0.005, 1.0, 0.005, 0.005)	0.005
Selenium	LN (1.20×10^{-3}, 1.0, 1.20×10^{-3}, 1.20×10^{-3})	1.2×10^{-3}	LN (1.18×10^{-3}, 1.1, 9.30×10^{-4}, 0.002)	0.001
Silver	LN (6.37×10^{-6}, 1.0, 6.33×10^{-6}, 6.40×10^{-6})	6.4×10^{-6}	LN (7.19×10^{-6}, 1.0, 6.85×10^{-6}, 7.55×10^{-6})	7.4×10^{-6}
Strontium	LN (0.220, 1.0, 0.220, 0.220)	0.22	LN (0.218, 1.0, 0.218, 0.219)	0.22
Tin	LN (2.20×10^{-5}, 1.1, 1.46×10^{-5}, 3.31×10^{-5})	2.8×10^{-5}	LN (4.25×10^{-5}, 1.1, 3.09×10^{-5}, 5.85×10^{-5})	5.1×10^{-5}
Vanadium	LN (6.10×10^{-4}, 1.0, 6.01×10^{-4}, 6.19×10^{-4})	6.2×10^{-4}	LN (6.05×10^{-4}, 1.0, 5.94×10^{-4}, 6.17×10^{-4})	6.1×10^{-4}
Zinc	LN (0.023, 1.1, 0.019, 0.028)	0.03	LN (0.025, 1.3, 0.012, 0.054)	0.04

Note:
LN = Lognormal distribution (geometric mean, geometric standard deviation, min, max)

2.2.3 Sediment Quality

Sediment samples were collected in July 2004 from seven sites (R1 to R7) located on Rose and Anvil Creeks as part of a biological and sediment monitoring program (Laberge 2004). Table 2.9 provides a brief description for the sampling stations. Stations R1, R6 and R7 are located upstream of site facilities and are considered as reference sites. Three replicate stream sediment samples were collected and analyzed from each site. Figure 2.1 shows the sample locations.

No sediment samples were collected from the Vangorda Creek watershed during the 2004 monitoring program.

Table 2.9 Sediment Sampling Stations

Site ID	Site Description
R1	Upstream of the confluence of the North and South Forks of Rose Creek
R2	In the mixing zone downstream of the intersection of the Rose Creek diversion canal and the outlet of the tailings pond
R3	Rose Creek approximately half way between the tailings pond outlet and Anvil Creek
R4	Rose Creek just upstream of Anvil Creek
R5	Anvil Creek approximately 150 m downstream of Rose Creek
R6	Anvil Creek immediately upstream of Rose Creek
R7	North Fork of Rose Creek upstream of the confluence with the Faro Creek diversion

2.2.3.1 Development of Site-Specific Distribution Coefficients

As mentioned previously, sediment measurements for Rose Creek for the 2004 monitoring program were used to predict sediment concentrations in the other watersheds as well as sediment concentrations for the final closure and remediation plan. The simplest and most commonly used methodology to predict sediment concentrations is to apply a distribution coefficient to the water concentration to predict the sediment concentration. It is recognized that the use of a distribution coefficient does not take into account the many different sediment processes (i.e. burial, resuspension etc.), however, it provides a reasonable estimate of the sediment concentration as will be demonstrated in Section 6.1.2.

In order to develop site-specific water-to-sediment distribution coefficients, water quality data measured at and adjacent to sampling locations R1 to R7 were summarized and matched with the sediment quality data measured at the same location. Water quality monitoring stations X2 and X3 were summarized with station R1 and stations X10 and X14 were summarized with station R2. For each site, the average sediment concentrations of the three replicates were then divided by the corresponding average water concentrations to obtain an estimate of the water-to-sediment

distribution coefficients for all COPC. For each COPC, if three water samples or less were measured with concentrations above the MDL for a sampling location, then the water-to-sediment distribution coefficient for this COPC was not calculated at this particular location.

Triangular distributions were developed using the site-specific water-to-sediment coefficients, as shown on Table 2.10. These values were based on three to nine samples which were considered to be adequate. Values derived from the literature are provided for perspective. It is generally accepted that site-specific distribution coefficients are better to use in assessments than literature derived values. Appendix D provides a description and support for the development of the statistical distribution for the water-to-sediment distribution coefficients used in the probabilistic assessment.

Table 2.10 Distributions of Site-Specific Water-to-Sediment Distribution Coefficient Factors for Faro Mine Complex Used in Risk Assessment

COPC	No. of Sampling Stations	Distributions of Site-Specific Distribution Coefficient (mg/kg (dw)/(mg/L))	Literature Distribution Cofficient[a] (mg/kg(dw)/(mg/L))
Antimony	1	T (158, 315, 473)	45
Arsenic	2	T (4550, 9100, 13650)	31
Beryllium	n/a	T (395, 790, 1185)	790
Boron	n/a	T (1.5, 3, 4.5)	3
Cadmium	3	T (1250, 3750, 6375)	4,300
Chromium	2	T (8000, 16000, 24000)	30
Cobalt	2	T (6000, 12000, 18000)	5,000
Copper	3	T (25000, 50000, 75000)	10,000
Lead	3	T (10133, 30400, 51680)	900
Manganese	3	T (6000, 18000, 30600)	1,000
Nickel	3	T (8550, 17100, 25650)	1,900
Selenium	n/a	T (1.1, 2.2, 3.3)	2.2
Silver	2	T (440, 880, 1320)	1,100
Strontium	3	T (127.5, 255, 382.5)	1,000
Tin	n/a	T (6500, 13000, 19500)	13,000
Vanadium	1	T (17750, 35500, 53250)	50
Zinc	3	T (2633, 7900, 13430)	500

Note: [a] - All literature values obtained from U.S. EPA (1998) with the exception of manganese and strontium from IAEA (1994) and boron from Baes et al. (1984) and chromium and cobalt from Bechtel Jacobs (1998).
- Based on 3 replicate samples at each station.
- n/a – site-specific data not available, so the distribution is based on the literature value.
- T = Triangular distribution (min, mode, max)

It should be noted that there is some uncertainty in applying distribution coefficients based on sediment measurements in Rose Creek to other watersheds. However, applying this

methodology to other watersheds was considered to be reasonable. Section 6.1.2 provides a validation of the predicted concentrations against measured sediment concentrations in Vangorda Creek.

Sediment concentrations were estimated using distribution coefficients from water as provided in equation (2-1).

$$C_{sediment} = C_{water} \times Kd_{water-to-sediment} \quad (2\text{-}1)$$

where:

$C_{sediment}$ = concentration of COPC in sediment [mg/kg dw)]
C_{water} = water concentration [mg/L]
$Kd_{water\text{-}to\text{-}sediment}$ = water-to-sediment distribution coefficient [(mg/kg (dw))/(mg/L)] {Table 2.10}

2.2.4 Fish Concentrations

Fish flesh samples from slimy sculpin and Arctic grayling were collected and analyzed for metals concentrations during the Aquatic Life Sampling and Testing Program conducted in August 2004. Table 2.11 lists the six sampling locations in the Rose Creek and Vangorda Creek watersheds that were selected for use in this assessment. Although sampling station R1 was not identified as a control station in the sampling and testing program report (White Mountain Environmental Consulting 2004), it was located upstream of the confluence of North and South forks of Rose Creek and was considered to be a background station for the purposes of this assessment.

Table 2.11 Fish Sampling Stations

ROSE CREEK	
R1	South Fork of Rose Creek immediately upstream of the confluence of North and South Forks of Rose Creek
R2	In the mixing zone downstream of the intersection of Rose Creek and the tailings pond discharge channel
R4	Rose Creek just upstream of the confluence with Anvil Creek
R6	Anvil Creek just upstream of the confluence with Rose Creek (control site)
VANGORDA CREEK	
V8	Lower Vangorda Creek below the town access road
B1	Blind Creek near the lower bridge (control site)

2.2.4.1 Development of Site-Specific Fish Transfer Factors

In order to calculate fish flesh concentrations in the Pelly River as well as concentrations in all waterbodies for the final closure and remediation plan, it was necessary to develop transfer factors to calculate fish flesh concentrations from water concentrations. Therefore, site-specific water-to-fish transfer factors were developed for the COPC. These transfer factors were applied to all waterbodies for the existing conditions and the final closure and remediation plan.

Water quality data measured at and adjacent to sampling locations R1, R2, R4, R6 and V8 were summarized and matched with the fish data measured at the same location. Water quality monitoring stations X2 and X3 were summarized with station R1 and stations X10 and X14 were summarized with station R2. No water quality data were available for station B1. For each site, the average COPC concentrations in fish samples were divided by the corresponding average water concentrations to obtain an estimate of the water-to-fish transfer factors for every COPC. If there were less than three water or fish samples with concentrations above MDL for a sampling location, then the water-to-fish transfer factor for this COPC was not calculated at this particular location.

Triangular distributions for the site-specific water-to-fish transfer factors were developed using the mean values and were based on at least 8 to 10 samples which was considered to be adequate. These values are presented in Table 2.12. Values derived from literature values are provided for perspective. As discussed previously, in risk assessments it is always better to use site-specific transfer factors than those derived from the literature. Appendix D provides additional support for the development of the distributions used in the probabilistic assessment.

Fish concentrations were estimated using transfer factors from water as provided in equation (2-2).

$$C_{fish} = C_{water} \times TF_{water-to-fish} \qquad (2\text{-}2)$$

where:

C_{fish}	=	concentration of COPC in fish [mg/kg ww)]
C_{water}	=	water concentration [mg/L]
$TF_{water\text{-}to\text{-}fish}$	=	water-to-fish transfer factor [(mg/kg (ww))/(mg/L)] {Table 2.12}

Table 2.12 Site-Specific Water-to-Fish Tissue Transfer Factor Distributions Used in Risk Assessment

COPC	Site-Specific Water-to-Fish TF Distributions (L/kg(ww))	Literature Water-to-Fish TF (L/kg(ww))	Reference
Antimony	T (20, 40, 60)[a]	40	U.S. EPA (1998)
Arsenic	T (33, 66, 99)	1,000	CSA (1987)
Beryllium	T (50, 100, 150)[a]	100	IAEA (1994), U.S. NCRP (1996)
Boron	T (3, 5, 8)[a]	5.0	U.S. NCRP (1996)
Cadmium	T (54, 215, 860)	200	U.S. NCRP (1996)
Chromium	T (142, 283, 425)[a]	283	U.S. EPA (1998)
Cobalt	T (30, 60, 90)	300	IAEA (1994), U.S. NCRP (1996)
Copper	T (467, 700, 1050)	200	IAEA (1994), U.S. NCRP (1996)
Lead	T (45, 68, 102)	300	IAEA (1994), U.S. NCRP (1996)
Manganese	T (100, 200, 400)	400	IAEA (1994)
Nickel	T (40, 78, 120)[a]	78	U.S. EPA (1998)
Selenium	T (65, 129, 194)[a]	129	U.S. EPA 1998, ATSDR 1997
Silver	T (173, 346, 692)	10	U.S. NCRP (1996), CSA (1987)
Strontium	T (27.5, 55, 83)	60	IAEA (1994)
Tin	T (60, 120, 180)	3,000	IAEA (1994)
Vanadium	T (125, 250, 375)	200	IAEA (1994), U.S. NCRP (1996)
Zinc	T (430, 1075, 2688)	1,000	IAEA (1994)

Note:
- a – based on literature data due to lack of site-specific data
- T = Triangular distribution (min, mode, max)

As noted in the sediment discussion, there are uncertainties in applying this methodology. However, the use of the site-specific transfer factors for fish was considered a reasonable estimate of the COPC concentrations in fish tissue. Validation of the model estimates for concentrations of COPC in fish flesh for the existing conditions was completed with a comparison of measured fish concentrations reported in Minnow (2007). These data were not used in the development of the site-specific transfer factors for fish and, therefore, provides an independent validation of the model. The comparison is shown in Table 2.13 and it can be seen that the use of site-specific transfer factors for fish (Table 2.12) provide a reasonable estimation of the actual measured concentrations in fish.

Table 2.13 Validation of Estimated Fish Concentrations

COPC	Rose Creek Upstream Fish Concentrations (mg/kg ww)				Vangorda Creek Downstream Fish Concentrations (mg/kg ww)			
	Existing Conditions - Estimated		R5 Measured Data 2005[a]		Existing Conditions - Estimated		V8 Measured Data 2005[a]	
	Mean	95th	Arctic Grayling Muscle	Slimy Sculpin Whole Body	Mean	95th	Arctic Grayling Muscle	Slimy Sculpin Whole Body
Antimony	0.05	0.19			0.1	0.3		
Arsenic	0.05	0.12	<0.3	<0.3	0.18	0.65	<0.3	<0.3
Beryllium	0.05	0.07			0.3	1.3		
Boron	0.28	0.43			0.21	0.49		
Cadmium	0.05	0.15	0.06	0.05	0.11	0.44	0.12	0.18
Chromium	0.20	0.68			0.38	1.37		
Cobalt	0.03	0.06			0.19	0.79		
Copper	0.58	1.65	0.76	1.12	0.90	1.82	0.67	0.95
Lead	0.06	0.23	<0.5	0.57	0.16	0.52	<0.5	<0.5
Manganese	8	29	8.3	25	3	8	2.76	7.37
Nickel	0.10	0.41			0.17	0.60		
Selenium	0.099	0.254			0.130	0.349		
Silver	0.07	0.22			0.05	0.10		
Strontium	6.8	13			5.5	12		
Tin	0.17	0.72			0.36	1.41		
Vanadium	0.14	0.28			0.12	0.19		
Zinc	23	95	13.1	30.1	70	198	17.7	45.7

Note: a – data from Minnow (2007), Table 6.4 and Table 6.6

2.2.5 Benthic Invertebrate Concentrations

Laberge Environmental (2004) has carried out benthic invertebrate sampling in Rose Creek, Anvil Creek and Vangorda Creek as part of their annual biological monitoring program. The benthic invertebrates are classified and enumerated; however, no metal analyses were carried out on the samples. In general, it is reported that the benthic communities in these three watersheds are healthy and do not seem to be influenced by high metal concentrations in the sediments.

Transfer factors for water-to-benthic invertebrates were used to estimate the concentrations of benthic invertebrates in all waterbodies for existing conditions and the final closure and remediation plan. Concentrations in these benthic invertebrates were predicted using literature transfer factors from water as provided in equation (2-3). Lognormal distributions, summarized in Table 2.14, were derived from literature values with the arithmetic mean of the lognormal distribution approximating the literature value. Appendix D provides additional support for the development of the distributions used in the probabilistic assessment.

$$C_{benthic} = C_{water} \times TF_{water-to-benthic} \quad (2\text{-}3)$$

where:

$C_{benthic}$ = concentration of COPC in benthic invertebrates [mg/kg fw)]
C_{water} = water concentration [mg/L]
$TF_{water\text{-}to\text{-}benthic}$ = water-to-benthic invertebrate transfer factor [(mg/kg (fw))/(mg/L)] {Table 2.14}

Table 2.14 Water-to-Benthic Invertebrate Transfer Factors Distributions Used in the Risk Assessment

COPC	Water-to-Benthic Invertebrate TF Distributions (L/kg(ww))	Reference
Antimony	LN (4, 5, 0.16, 100)	NRCC (1983)
Arsenic	LN (680, 5, 27.2, 17000)	U.S. EPA (1979)
Beryllium	n/a	-
Boron	n/a	-
Cadmium	LN (1600, 5, 64, 40000)	U.S. EPA (1979)
Chromium	LN (8, 5, 0.32, 200)	NRCC (1983)
Cobalt	LN (400, 5, 16, 10000)	assumed from copper, nickel and selenium
Copper	LN (400, 5, 16, 10000)	U.S. EPA (1979)
Lead	LN (40, 5, 1.6, 1000)	U.S. EPA (1979)
Manganese	LN (0.03, 5, 0.0012, 0.75)	Bird and Schwartz (1996)
Nickel	LN (40, 5, 1.6, 1000)	U.S. EPA (1979)
Selenium	LN (272, 5, 10.9, 6800)	U.S. DOC (1985) and measured data from Northern Ontario, Elliot Lake
Silver	LN (80, 5, 3.2, 2000)	NRCC (1983)
Strontium	LN (430, 2.1, 97, 1890)	Bird and Schwartz (1996)
Tin	LN (400, 5, 16, 10000)	NRCC (1983)
Vanadium	LN (40, 5, 1.6, 1000)	NRCC (1983), assumed same as niobium
Zinc	LN (115, 5, 4.6, 2875)	U.S. EPA (1979)

Note: n/a – not available.
LN = Lognormal distribution (geometric mean, geometric standard deviation, min, max)
Geometric standard deviation based on data presented in Bird and Schwartz (1996) and in the absence of data, an assumed geometric standard deviation of 5 was assumed based on data in Bird and Schwartz (1996).

2.2.6 Aquatic Vegetation Concentrations

Concentrations of COPC in aquatic vegetation were not available for the Faro Mine Complex. Therefore, transfer factors for water-to-aquatic vegetation were used to estimate the concentrations in aquatic vegetation in all waterbodies for existing conditions and the final closure and remediation plan. Concentrations in aquatic vegetation were predicted using

literature transfer factors from water as provided in equation (2-4). Lognormal distributions, summarized in Table 2.15, were derived from literature values with the arithmetic mean of the lognormal distribution approximating the literature value. Appendix D provides additional support for the development of the distributions used in the probabilistic assessment.

$$C_{aqveg} = C_{water} \times TF_{water-to-aqveg} \quad (2\text{-}4)$$

where:

C_{aqveg} = concentration of COPC in aquatic vegetation [mg/kg fw)]
C_{water} = water concentration [mg/L]
$TF_{water\text{-}to\text{-}aqveg}$ = water-to-aquatic vegetation transfer factor [(mg/kg (fw))/(mg/L)] {Table 2.15}

Table 2.15 Water-to-Aquatic Vegetation Transfer Factors Distributions Used in the Risk Assessment

COPC	Water-to-Aquatic Vegetation TF Distributions (L/kg(ww))	Reference
Antimony	LN (1000, 3, 111, 9000)	NRCC (1983)
Arsenic	LN (3.3, 3, 0.4, 30)	CSA (1987), Bird and Schwartz (1996) (geomean)
Beryllium	LN (25, 3, 2.8, 225)	Santschi and Honeyman (1989)
Boron	n/a	-
Cadmium	LN (19000, 1.4, 9700, 37240)	Bird and Schwartz (1996)
Chromium	LN (0.12, 1.4, 0.06, 0.24)	Bird and Schwartz (1996)
Cobalt	LN (800, 3, 89, 7200)	Bird and Schwartz (1996)
Copper	LN (667, 3, 74, 6000)	ORNL (1976)
Lead	LN (100, 3, 11.1, 900)	Bird and Schwartz (1996)
Manganese	LN (113, 3, 12.6, 1020)	Bird and Schwartz (1996)
Nickel	LN (33.3, 3, 3.7, 300)	ORNL (1976)
Selenium	LN (42, 3, 4.7, 378)	Santschi and Honeyman (1989)
Silver	LN (133, 3, 15, 1200)	NRCC (1983)
Strontium	LN (179, 2.9, 21.3, 1508)	Bird and Schwartz (1996)
Tin	LN (67, 3, 7.4, 600)	NRCC (1983)
Vanadium	LN (1333, 3, 148, 12000)	U.S. NRC (1977)
Zinc	LN (367, 3, 41, 3300)	U.S. DOC (1988), CSA (1987)

Note: n/a – not available.
LN = Lognormal distribution (geometric mean, geometric standard deviation, min, max)
Geometric standard deviation based on data presented in Bird and Schwartz (1996) and in the absence of data, an assumed geometric standard deviation of 3 was assumed based on data in Bird and Schwartz (1996).

2.3 TERRESTRIAL ENVIRONMENT

In the 2004 Terrestrial Effects Study for the Faro Mine Complex (Gartner Lee Limited 2005), soil and terrestrial vegetation samples were collected at locations around the Faro mine site and Vangorda Plateau mine site. Samples were also collected at control locations around the Swim Lake basin area. Data from a 2002 study (C.E. Jones & Associates Ltd. 2003) were also included in this assessment.

For the purpose of the ecological risk assessment, receptors were assumed to be present in different areas in the mining complex. These receptor locations were defined based on home range of the species and the spatial distribution of lead and zinc concentrations in soil. A detailed discussion of the receptors selected for the assessment, their home ranges and diets and the areas where the species were assumed to be present in the study area is presented in Section 3.1. A brief discussion of the species home ranges is provided below for the purpose of identifying the basis used to characterize soil and vegetation levels across the study area. This approach was the same approach as was used in the previous risk assessment (SENES 2006).

For small local mammals such as hares and marmots and terrestrial birds such as grouse, the site was divided up into five smaller locations since these animals have a small home range. These locations have been defined as follows: Background (around Swim Lake), Van-S (around Grum Mine Site), Faro-S (around Faro Mine Site), Faro-N (north of Faro-S) and Faro-W (west of Faro-S). The background area includes a couple of samples that were not originally classified as reference sites. Figure 2.3 shows the locations of these areas.

Slightly larger areas are defined for mammals such as bear and fox which have a larger home range. These are defined as: Van-M (a larger area around Grum Mine Site which includes Van-S), Faro-M (a larger area around Faro Mine Site which includes Faro-S) and Background (same as the background used for small local mammals). The risk for Fannin sheep was considered within the sheep area which includes the Mount Mye area, which is the area where Fannin sheep are located, as well as the Vangorda/Grum site through which sheep travel.

For mammals with a very large home range such as caribou, moose and wolf, it was assumed that they would be present across the entire site (i.e. the Faro and Vangorda/Grum site) and an overall concentration of COPC across this area was used.

2.3.1 Soil Data

Soil data were provided by Gartner Lee Limited (Gartner Lee 2005) from samples collected in 2002 and 2004. Both surface and subsurface samples were collected in affected area (around the

Faro mine site and Vangorda Plateau mine site), as well as reference sites (Swim Lakes area). Only the samples classified as "Surface Organic" and "Surface Mineral" were considered in this assessment.

The distribution functions for the concentrations of each COPC in soils at the various receptor locations that were considered in the assessment are summarized in Table 2.16. Samples collected from each of the eight defined terrestrial areas (Background, Faro-S, Faro-N, Faro-W, Faro-M, Van-S, Van-M and Sheep) were evaluated and fit to distributions for input to the probabilistic risk assessment. Appendix D provides supporting documentation for the development of the distributions.

Uniform distributions were applied in the case of measured concentrations reported as less than the detection limit. The minimum and maximum values of the uniform distribution were set equal to 0 and the detection limit, respectively. Triangular distributions were developed in the case of only a few samples (e.g., less than 4) and the minimum and maximum values were developed to encompass the range of the available data, while the mode value was set equal to the average of the available data. Lognormal distributions were developed when sufficient samples were available, with the parameters of the distribution derived from the statistical evaluation of the data set.

The COPC concentrations were generally highest close to the Faro mine site (Faro-S), providing a worst-case scenario, and lowest in background. When comparing COPC concentrations in soil measured around the Faro site and the Vangorda/Grum site, higher concentrations of manganese, nickel and tin concentrations were found in areas around the Vangorda/Grum site and higher mean concentrations for copper, lead, and zinc are found around the Faro site.

There was only one sample from the Mount Mye area and the COPC concentrations were generally lower or close to the background levels.

Figure 2.3 Terrestrial Assessment Locations

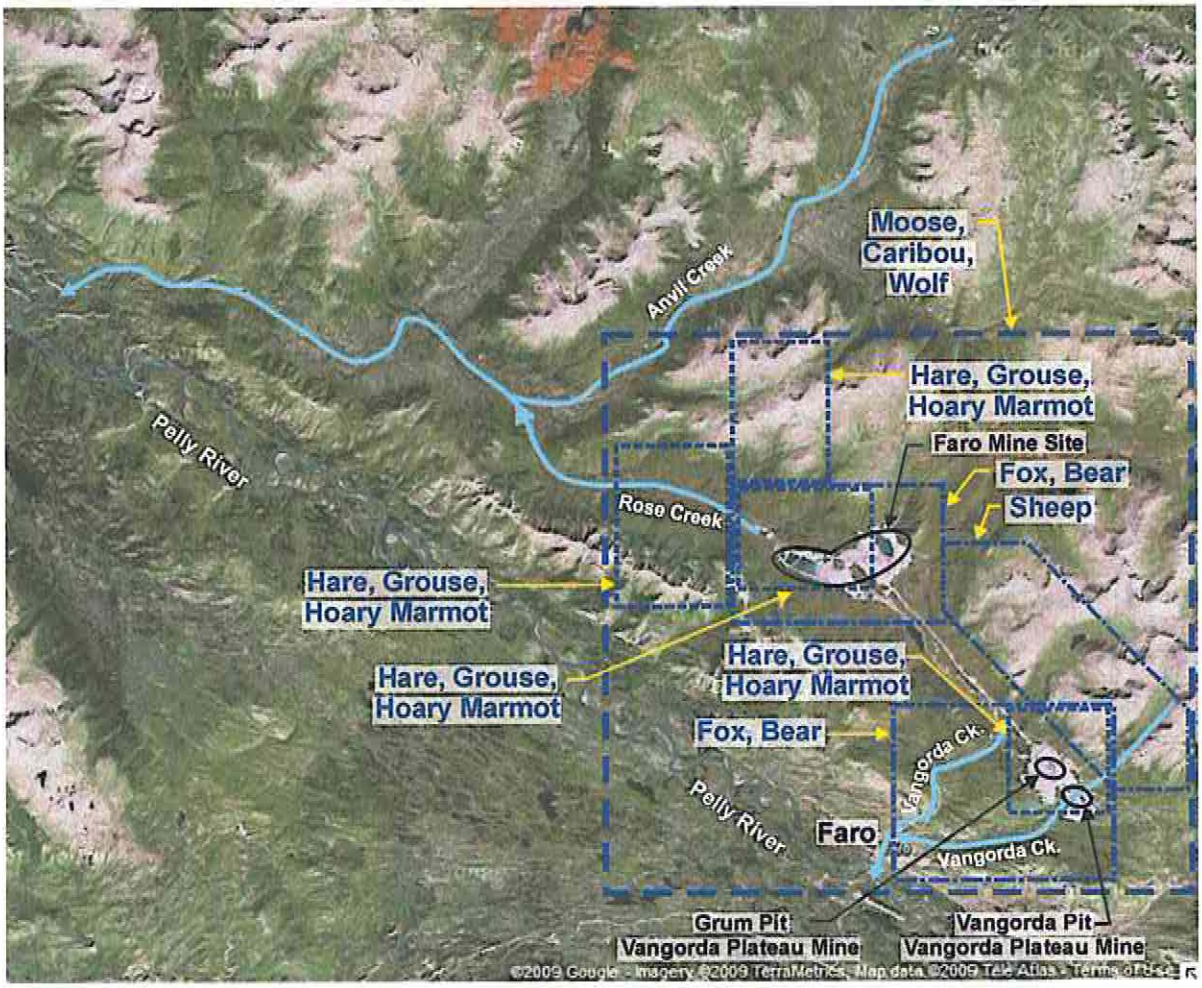


Table 2.16 Summary of Concentration Distributions of COPC in Soil by Location

	Soil Concentration Distributions (mg/kg dw)								
COPC	**Background**	**Van-S**	**Van-M**	**Faro-N**	**Faro-S**	**Faro-W**	**Faro-M**	**Sheep**	**Overall**
Antimony	U(0, 10)	U(0, 10)	U(0, 10)	U(0, 10)	U(0, 10)	U(0, 10)	U(0, 10)	U(0, 10)	U(0, 10)
Arsenic	LN(0.7, 2.8, 0.03, 15.8)	T(5, 10, 15)	LN(4.3, 2.1, 0.5, 38)	LN(2.7, 1.6, 0.7, 10.3)	LN(12.7, 1.9, 2.0, 81)	LN(6.2, 3.0, 0.2, 173)	LN(8.3, 2.2, 0.8, 83.7)	T(0.05, 0.5, 5.0)	LN(3.9, 3.0, 0.15, 101)
Beryllium	U(0, 1)	U(0, 1)	U(0, 1)	U(0, 1)	U(0, 1)	U(0, 1)	U(0, 1)	U(0, 1)	U(0, 1)
Boron	LN(5.5, 2.2, 0.5, 59)	T(1.3, 4, 12)	LN(4.6, 2.1, 0.5, 45)	LN(1.9, 2.4, 0.12, 27.4)	LN(3.7, 2.2, 0.3, 42.3)	LN(3.0, 2.3, .24, 36.1)	LN(3.1, 2.3, 0.3, 36.8)	T(0.4, 4, 40)	LN(3.7, 2.3, 0.3, 46)
Cadmium	LN(1.1, 2.5, 0.07, 18.1)	T(0.5, 0.9, 1.4)	LN(1.3, 1.5, 0.4, 4.2)	LN(1.4, 2.4, 0.1, 20)	LN(12.7, 1.9, 2.0, 81)	LN(1.3, 1.7, 0.3, 6.2)	LN(1.3, 2.0, 0.2, 10.4)	T(0.06, 0.6, 6.0)	LN(1.2, 2.2, 0.12, 12.3)
Chromium	LN(1.1,2.5,0.07, 18)	T(3.3, 11, 19)	LN(7.8, 1.6, 1.8, 33.5)	LN(3.7, 2.2, 0.3, 39)	LN(4.0, 2.9, 0.17, 98)	LN(3.6, 3.0, 0.14, 92)	LN(3.8, 3.1, 013, 113)	T(0.1, 1, 10)	LN(3.0, 3.0, 0.1, 81.5)
Cobalt	LN(1.1, 2.6, 0.06, 19.6)	T(0.8, 4, 7.2)	LN(3.1, 1.6, 0.7, 13)	LN (2.2, 1.4, 0.8, 6.6)	LN(2.8, 2.3, 0.2, 34)	LN(2.1, 2.4, 0.16, 28.6)	LN(2.5, 2.6, 0.14, 45.6)	T(0.05, 0.5, 5)	LN(1.9, 2.6, 0.11, 31.9)
Copper	LN(9.8, 1.8, 1.7, 57)	T(7, 24, 41)	LN(20, 1.4, 7.1, 55.5)	LN(16.7, 1.8, 2.9, 95)	LN(52.6, 2.2, 5.2, 530)	LN(36.5, 1.8, 6.2, 217)	LN(37.5, 2.3, 3.0, 477)	T(0.6, 6.0, 60)	LN(21.5, 2.5, 1.3, 347)
Lead	LN(9.3, 1.5, 2.9, 30)	T(14.5, 145, 276)	LN(72, 2.1, 8.0, 642)	LN(93, 2.1, 9.6, 908)	LN(874, 2.5, 56, 13517)	LN(618, 1.7, 124, 3083)	LN(558, 2.8, 25, 12150)	T(1.8, 18, 180)	LN(221, 3.4, 5.7, 8629)
Manganese	LN(331, 2.8, 15.5, 7062)	T(67, 670, 1273)	LN(712, 2.1, 80, 6331)	LN(203, 1.6, 54, 760)	LN(199, 1.9, 31, 1267)	LN(346, 3.0, 12.4, 9678)	LN(195, 2.2, 19, 1955)	T(66.5, 665, 6650)	LN(293, 3.0, 11.2, 7665)
Nickel	LN(3.2, 2.4, 0.2, 46)	T(1.4, 14, 26.6)	LN(12, 1.6, 3.1, 47)	LN(4.9, 1.2, 2.7, 8.9)	LN(5.2, 2.7, 0.3, 100)	LN(5.3, 2.3, 0.4, 67)	LN(4.8, 3.0, 0.2, 127)	T(0.1, 1.0, 10)	LN(4.7, 2.6, 0.26, 85)
Selenium	LN(0.5, 1.6, 0.12, 2.2)	T(0.16, 0.4, 1.0)	LN(0.38, 1.8, 0.06, 2.3)	LN(0.3, 1.9, 0.05, 2.2)	LN(0.5, 1.6, 0.14, 2.1)	LN(0.4, 2.1, 0.05, 3.8)	LN(0.5, 1.6, 0.1, 2.0)	T(0.01, 0.1, 1)	LN(0.44, 1.8, 0.08, 2.4)
Silver	LN(1.0, 1.2, 0.55, 1.9)	U(0, 2)	U(0, 2)	U(0, 2)	LN(1.4, 2.0, 0.2, 11)	U(0, 2)	LN(1.1, 2.0, 0.14, 9.1)	U(0, 2)	LN(1.0, 1.7, 0.19, 5.2)
Strontium	LN(52, 1.7, 11.5, 237)	T(8.3, 83, 165)	LN(76.7, 1.8, 12.7, 464)	LN(39, 1.9, 5.7, 269)	LN(43.4, 1.6, 11.1, 171)	LN(32.6, 2.1, 3.4, 309)	LN(40.6, 1.6, 10.6, 156)	T(4.1, 41, 410)	LN(45, 1.8, 7.2, 280)
Tin	T(0.25, 2.5, 25)	T(2.0, 5.0, 8.0)	LN(3.1, 1.7, 0.6, 15.6)	LN(2.8, 1.4, 1.0, 8.3)	LN(2.6, 1.4, 1.0, 6.8)	LN(2.8, 1.6, 0.7, 11)	LN(2.8, 1.6, 0.75, 10.5)	T(0.7, 7, 70)	LN(2.8, 1.5, 0.75, 10.1)
Vanadium	LN(1.9, 2.9, 0.08, 46)	T(0.8, 8, 15)	LN(6.7, 1.5, 1.9, 23.9)	LN(8.7, 1.9, 1.3, 57.6)	LN(4.8, 2.6, 0.3, 80)	LN(4.5, 2.7, 0.2, 90.8)	LN(4.4, 2.8, 0.2, 94.1)	T(0.05, 0.5, 5)	LN(3.9, 2.7, 0.2, 74)
Zinc	LN(84, 2.3, 7.4, 962)	T(56, 280, 504)	LN(230, 1.5, 65, 819)	LN(124, 1.9, 20, 786)	LN(690, 2.1, 78.5, 6050)	LN(470, 1.8, 80, 2750)	LN(519, 2.2, 48, 5583)	T(16.9, 169, 1690)	LN(266, 2.5, 16.1, 4407)

Note:

T = Triangular distribution (min, mode, max)

LN = Lognormal distribution (geometric mean, geometric standard deviation, min, max)

U = Uniform distribution (min, max)

2.3.2 Terrestrial Vegetation Data

Vegetation samples were collected in 2002 and 2004. Forbs, grasses, horsetails and Labrador tea, berries, willow, tree sap, bear root, mushroom and lichen samples were collected in affected areas and reference sites (Swim Lake basin). Only arsenic, cadmium, chromium, copper, lead, mercury, selenium, silver and zinc were analyzed on samples collected in the 2002 sampling program.

Forage, browse, berries and lichen are consumed by wildlife in the area. In the ecological risk assessment, forbs, grass, horsetail and Labrador tea were grouped as forage and willow as browse and their concentrations are summarized for each receptor locations as defined in Section 2.3 above. Table 2.17 presents the concentration distributions derived for berries, browse and forage at each area. Dry weight concentrations reported by the laboratory were converted to fresh weight based on the reported sample moisture content. However, moisture content was only reported in the 2004 data and not in the 2002 data. Average moisture content by each species was estimated using 2004 data and applied to the 2002 data. A moisture content of 40% was assumed for lichen. Appendix D provides supporting documentation for the development of the distributions.

There were no analytical data for antimony, beryllium, boron, cobalt, manganese, strontium, tin, or vanadium analyses on browse samples in areas Van-S, Van-M, Faro-N and Faro-S. Therefore, site-specific soil-to-browse transfer factors for these COPC were developed to estimate concentrations in browse as described in the next section.

Similar to the derivation of distributions for soil, uniform distributions were applied in the case of measured concentrations reported as less than the detection limit. The minimum and maximum values of the uniform distribution were set equal to 0 and the detection limit, respectively. Triangular distributions were developed in the case of only a few samples (e.g., between 2 and 4) and the minimum and maximum values were developed to encompass the range of the available data, while the mode value was set equal to the average of the available data. Lognormal distributions were developed when sufficient samples were available, with the parameters of the distribution derived from the statistical evaluation of the data set. In the case where only one value was available, a lognormal distribution was used with an assumed geometric standard deviation of 3.

Table 2.17 Summary of Concentration Distributions of COPC in Vegetation by Location

	Vegetation Concentration Distributions (mg/kg ww)								
COPC	**Background**	**Van-S**	**Van-M**	**Faro-N**	**Faro-S**	**Faro-W**	**Faro-M**	**Sheep**	**Overall**
Berries									
Antimony	U(0, 0.02)	U(0, 0.02)	U(0, 0.02)	U(0, 0.02)	U(0, 0.02)	U(0, 0.02)	U(0, 0.02)	U(0, 0.02)	U(0, 0.02)
Arsenic	LN(0.02, 2.7, 0.001, 0.32)	U(0, 0.02)	LN(0.02, 2.7, 0.001, 0.36)	U(0, 0.02)	T(0.005, 0.05, 0.5)	U(0, 0.02)	U(0, 0.02)	U(0, 0.02)	LN(0.016, 2.7, 0.001, 0.3)
Beryllium	U(0, 0.004)	U(0, 0.004)	U(0, 0.004)	U(0, 0.004)	U(0, 0.004)	U(0, 0.004)	U(0, 0.004)	U(0, 0.004)	U(0, 0.004)
Boron	LN(1.7, 1.7, 0.3, 9.0)	LN(1.7, 3.0, 0.06, 45)	LN(3.1, 1.4, 1.3, 7.7)	LN(0.93, 3.0, 0.03, 25)	LN(2.4, 1.4, 0.9, 6.3)	LN(1.6, 1.4, 0.6, 4.0)	LN(1.8, 1.6, 0.4, 7.7)	T(0.15, 1.5, 3)	LN(1.9, 1.6, 0.4, 8.2)
Cadmium	LN(0.01, 2.45, 0.001, 0.12)	LN(0.008, 3.0, 0.0003, 0.23)	LN(0.004, 3.3, 0.0001, 0.14)	LN(0.017, 3.0, 0.0006, 0.45)	LN(0.02, 1.8, 0.003, 0.11)	LN(0.04, 2.1, 0.004, 0.38)	LN(0.02, 1.7, 0.004, 0.1)	T(0.001, 0.01, 0.19)	LN(0.011, 2.6, 0.0006, 0.20)
Chromium	LN(0.01, 1.9, 0.002, 0.1)	LN(0.03, 1.6, 0.009, 0.12)	LN(0.02, 1.7, 0.005, 0.11)	U(0, 0.02)	LN(0.05, 1.8, 0.007, 0.3)	LN(0.03, 2.1, 0.003, 0.23)	LN(0.03, 2.1, 0.004, 0.31)	T(0.01, 0.1, 0.2)	LN(0.02, 2.5, 0.001, 0.34)
Cobalt	U(0, 0.02)	U(0, 0.02)	U(0, 0.02)	U(0, 0.02)	U(0, 0.02)	U(0, 0.02)	U(0, 0.02)	U(0, 0.02)	U(0, 0.02)
Copper	LN(0.6, 1.3, 0.3, 1.4)	LN(0.87, 3.0, 0.03, 24)	LN(0.87, 1.3, 0.4, 2.1)	LN(0.96, 3.0, 0.04, 26)	LN(1.0, 1.1, 0.7, 1.5)	LN(1.1, 1.5, 0.3, 3.6)	LN(0.9, 1.3, 0.4, 2.1)	T(0.1, 1.2, 2.3)	LN(0.80, 1.4, 0.27, 2.4)
Lead	LN(0.01, 1.8, 0.002, 0.07)	LN(0.09, 3.0, 0.003, 2.5)	LN(0.03, 2.9, 0.001, 0.71)	LN(0.019, 3.0, 0.0007, 0.5)	LN(0.5, 1.4, 0.2, 1.3)	LN(0.03, 2.2, 0.003, 0.37)	LN(0.32, 1.9, 0.05, 2.1)	U(0, 0.1)	LN(0.05, 3.4, 0.001, 1.9)
Manganese	LN(9.6, 2.8, 0.4, 221)	LN(9.3, 3.0, 0.3, 252)	LN(5.6, 2.6, 0.3, 94)	LN(42, 3.0, 1.6, 1134)	T(0.8, 8, 80)	LN(16, 2.2, 1.5, 167)	LN(7, 2.2, 0.6, 79)	T(1, 10, 19)	LN(9.1, 2.6, 0.51, 162)
Nickel	LN(0.06, 2.3, 0.005, 0.70)	LN(0.09, 3.0, 0.003, 2.5)	LN(0.15, 2.1, 0.02, 1.4)	LN(0.15, 3.0, 0.005, 4)	LN(0.08, 1.8, 0.01, 0.5)	LN(0.3, 2.4, 0.02, 4.2)	LN(0.09, 1.8, 0.01, 0.5)	U(0, 0.12)	LN(0.09, 2.7, 0.004, 1.8)
Selenium	LN(0.04, 3.6, 0.001, 1.6)	U(0, 0.2)	U(0, 0.04)	U(0, 0.04)	U(0, 0.12)	U(0, 0.04)	U(0, 0.1)	U(0, 0.04)	LN(0.02, 3.6, 0.0005, 1.0)
Silver	LN(0.001, 3.5, 0.0001, 0.045)	LN(0.002, 3.0, 6.2×10^{-5}, 0.05)	LN(0.0016, 2.2, 0.0001, 0.02)	U(0, 0.002)	LN(0.001, 1.4, 0.0004, 0.003)	LN(0.004, 2.4, 0.0003, 0.05)	LN(0.001, 1.4, 0.0004, 0.002)	U(0, 0.002)	LN(0.001, 3.0, 0.0001, 0.03)
Strontium	LN(0.6, 2.6, 0.03, 10)	LN(0.23, 3.0, 0.009, 6.3)	LN(1.3, 2.0, 0.16, 10)	LN(0.66, 3.0, 0.02, 18)	LN(0.49, 1.5, 0.15, 1.6)	LN(0.39, 1.4, 0.14, 1.1)	LN(0.44, 1.5, 0.14, 1.4)	T(0.02, 0.2, 0.4)	LN(0.5, 2.5, 0.03, 8.7)
Tin	LN(0.01, 1.9, 0.001, 0.06)	U(0, 0.02)	U(0, 0.02)	U(0, 0.02)	LN(0.017, 2.4, 0.001, 0.24)	U(0, 0.02)	LN(0.01, 2.5, 0.001, 0.18)	U(0, 0.02)	LN(0.008, 4.2, 0.0001, 0.55)
Vanadium	U(0, 0.1)	U(0, 0.1)	U(0, 0.1)	U(0, 0.1)	U(0, 0.1)	U(0, 0.1)	U(0, 0.1)	U(0, 0.1)	U(0, 0.1)
Zinc	LN(1.8, 1.6, 0.4, 7.6)	LN(2.0, 3.0, 0.07, 54)	LN(2.3, 1.4, 0.8, 6.6)	LN(2.5, 3.0, 0.09, 66.4)	LN(4.4, 1.5, 1.3, 14.6)	LN(4.0, 1.6, 0.9, 17.6)	LN(3.6, 1.6, 0.8, 16)	T(0.16, 1.6, 3)	LN(2.4, 1.7, 0.45, 12.6)
Browse (Willow)									
Antimony	U(0, 0.04)	n/a	n/a	n/a	n/a	U(0, 0.04)	U(0, 0.04)	U(0, 0.04)	U(0, 0.04)
Arsenic	LN(0.11, 1.8, 0.02, 0.66)	U(0, 0.4)	U(0, 0.4)	U(0, 0.04)	LN(0.25, 3.2, 0.008, 8.2)	U(0, 0.16)	LN(0.19, 3.3, 0.005, 6.9)	U(0, 0.16)	LN(0.13, 3.5, 0.003, 5.6)
Beryllium	U(0, 0.008)	n/a	n/a	n/a	n/a	U(0, 0.008)	U(0, 0.008)	U(0, 0.008)	U(0, 0.008)
Boron	LN(5.5, 1.9, 0.8, 36.8)	n/a	n/a	n/a	n/a	T(3, 4, 5)	T(2, 6, 10)	T(3, 3.3, 3.6)	LN(4.4, 1.9, 0.7, 28)
Cadmium	LN(1.2, 1.9, 0.18, 8.1)	T(0.5, 1.0, 1.5)	LN(1.3, 2.3, 0.11, 17)	T(0.03, 0.3, 3)	LN(1.0, 2.2, 0.1, 10.4)	LN(0.88, 1.8, 0.14, 5.5)	LN(0.95, 2.3, 0.08, 11.8)	T(0.3, 0.6, 0.9)	LN(0.97, 2.2, 0.09, 10.8)
Chromium	LN(0.23, 4.7, 0.002, 23.4)	T(0.07, 0.14, 0.21)	T(0.05, 0.16, 0.28)	LN(0.04, 3.0, 0.002, 1.2)	LN(0.09, 2.1, 0.01, 0.82)	T(0.01, 0.05, 0.09)	LN(0.08, 3.3, 0.002, 3.0)	T(0.02, 0.04, 0.06)	LN(0.07, 5.3, 0.0004, 9.9)
Cobalt	LN(0.11, 1.6, 0.03, 0.43)	n/a	n/a	n/a	n/a	T(0.07, 0.3, 0.6)	T(0.2, 0.3, 0.4)	T(0.25, 0.5, 0.75)	LN(0.22, 2.0, 0.03, 1.6)
Copper	LN(1.4, 1.5, 0.4, 4.6)	T(1.0, 1.5, 2.0)	LN(1.7, 1.6, 0.43, 6.5)	LN(1.7, 3.0, 0.07, 47.6)	LN(2.0, 1.5, 0.6, 6.6)	LN(1.7, 1.3, 0.8, 3.4)	LN(1.9, 1.5, 0.6, 6.1)	T(0.9, 1.8, 2.7)	LN(1.8, 1.5, 0.55, 5.7)
Lead	LN(0.06, 1.9, 0.009, 0.43)	T(0.3, 0.6, 0.9)	LN(0.6, 1.4, 0.24, 1.5)	LN(5.5, 3.0, 0.2, 149)	LN(3.6, 3.0, 0.13, 99)	LN(0.22, 1.6, 0.06, 0.88)	LN(2.2, 3.4, 0.05, 88)	T(0.01, 0.12, 0.24)	LN(1.2, 4.0, 0.02, 73.4)
Manganese	LN(61, 1.8, 10.4, 363)	n/a	n/a	n/a	n/a	T(30, 100, 170)	T(20, 200, 380)	T(150, 250, 350)	LN(110, 3.5, 2.6, 4705)
Nickel	LN(0.36, 3.1, 0.012, 10.5)	T(0.6, 1.1, 1.6)	LN(1.3, 1.2, 0.7, 2.3)	LN(0.23, 3.0, 0.009, 6.3)	LN(1.0, 1.9, 0.16, 6.9)	LN(0.7, 2.2, 0.07, 7.1)	LN(0.9, 2.0, 0.1, 7.7)	T(0.4, 0.8, 1.2)	T(0.2, 0.8, 1.4)
Selenium	LN(0.21, 2,8, 0.01, 4.5)	T(0.1, 0.25, 0.4)	T(0.024, 0.24, 2.4)	LN(0.2, 3.0, 0.007, 5.3)	LN(0.22, 1.7, 0.05, 1.0)	T(0.01, 0.1, 0.2)	LN(0.2, 2.0, 0.03, 1.6)	T(0.01, 0.2, 0.4)	LN(0.2, 2.3, 0.014, 2.3)
Silver	LN(0.002, 2.2, 0.0002, 0.02)	T(0.01, 0.02, 0.03)	LN(0.02, 1.8, 0.003, 0.09)	LN(0.004, 3.0, 0.0001, 0.11)	LN(0.02, 2.2, 0.002, 0.19)	T(0.002, 0.008, 0.014)	LN(0.013, 2.4, 0.001, 0.18)	T(0.002, 0.008, 0.004)	T(0.001, 0.008, 0.08)
Strontium	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Tin	LN(0.03, 2.5, 0.002, 0.43)	n/a	n/a	n/a	n/a	LN(0.02, 3.0, 0.0007, 0.5)	T(10, 20, 30)	U(0, 0.04)	LN(0.03, 2.3, 0.002, 0.3)
Vanadium	U(0, 0.2)	n/a	n/a	n/a	n/a	U(0, 0.2)	U(0, 0.2)	U(0, 0.2)	U(0, 0.2)
Zinc	LN(66.4, 1.6, 16.5, 266)	T(11, 22, 33)	LN(45, 2.3, 3.7, 549)	LN(74, 3, 2.7, 1985)	LN(114, 2.6, 6.8, 1918)	T(8, 80, 152)	LN(85.7, 2.7, 4.4, 1678)	T(22, 62, 102)	T(12, 62, 112)

Table 2.17 Summary of Concentration Distributions of COPC in Vegetation by Location (Cont'd)

	Vegetation Concentration Distributions (mg/kg ww)								
COPC	**Background**	**Van-S**	**Van-M**	**Faro-N**	**Faro-S**	**Faro-W**	**Faro-M**	**Sheep**	**Overall**
Forage (Grass, Forb, Horsetail, Lab tea)									
Antimony	U(0, 0.04)	U(0, 0.04)	U(0, 0.04)	U(0, 0.04)	U(0, 0.04)	U(0, 0.04)	U(0, 0.04)	U(0, 0.04)	U(0, 0.04)
Arsenic	LN(0.028, 2.3, 0.002, 0.36)	U(0, 0.36)	U(0, 0.36)	U(0, 0.04)	LN(0.14, 2.5, 0.009, 2.1)	LN(0.037, 2.5, 0.0025, 0.56)	LN(0.12, 2.5, 0.009, 1.8)	U(0, 0.1)	LN(0.1, 2.5, 0.006, 1.6)
Beryllium	U(0, 0.008)	U(0, 0.008)	U(0, 0.008)	LN(0.006, 2.3, 0.0005, 0.07)	U(0, 0.008)	U(0, 0.008)	U(0, 0.008)	LN(0.006, 2.8, 0.0003, 0.15)	LN(0.005, 2.9, 0.0002, 0.12)
Boron	LN(5.0, 1.8, 0.8, 30)	LN(7.7, 3.0, 0.3, 209)	T(6, 9, 12)	LN(3.7, 2.0, 0.44, 30.7)	LN(8.2, 1.4, 2.9, 23.4)	LN(5.6, 1.4, 2.0, 15.5)	LN(6.4, 1.6, 1.4, 28.8)	LN(4.1, 1.9, 0.63, 27)	LN(2.3, 1.7, 0.47, 11.2)
Cadmium	LN(0.073, 2.9, 0.003, 1.79)	T(0.04, 0.08, 0.12)	LN(0.02, 2.9, 0.0007, 0.44)	LN(0.06, 2.7, 0.003, 1.17)	LN(0.06, 2.0, 0.008, 0.54)	LN(0.11, 1.5, 0.03, 0.41)	LN(0.054, 2.2, 0.005, 0.55)	LN(0.02, 2.5, 0.0015, 0.33)	LN(0.03, 2.2, 0.003, 0.37)
Chromium	LN(0.09, 1.9, 0.014, 0.57)	LN(0.12, 1.9, 0.02, 0.8)	LN(0.1, 1.9, 0.01, 0.75)	LN(0.1, 1.7, 0.02, 0.4)	LN(0.11, 1.8, 0.02, 0.6)	LN(0.10, 1.6, 0.03, 0.37)	LN(0.1, 2.3, 0.008, 1.3)	LN(0.06, 2.5, 0.004, 0.9)	LN(0.10, 2.2, 0.009, 1.05)
Cobalt	LN(0.3, 3.0, 0.001, 0.82)	U(0, 0.04)	U(0, 0.04)	LN(0.02, 2.1, 0.002, 0.19)	LN(0.07, 2.6, 0.004, 1.3)	LN(0.23, 3.3, 0.006, 8.0)	LN(0.06, 2.7, 0.003, 1.1)	LN(0.08, 2.8, 0.004, 1.7)	LN(0.02, 1.3, 0.009, 0.04)
Copper	LN(1.64, 1.65, 0.36, 7.37)	LN(1.1, 1.4, 0.4, 2.9)	LN(1.14, 1.3, 0.48, 2.7)	LN(1.6, 1.2, 0.9, 2.9)	LN(1.5, 1.7, 0.3, 6.6)	LN(2.0, 1.3, 0.8, 4.9)	LN(1.3, 1.7, 0.27, 6.2)	LN(1.68, 1.6, 0.43, 6.5)	LN(1.16, 1.6, 0.3, 4.5)
Lead	LN(0.027, 2.1, 0.003, 0.25)	LN(0.4, 1.8, 0.08, 2.2)	LN(0.3, 1.9, 0.04, 2.4)	LN(0.15, 1.3, 0.07, 0.3)	LN(3.8, 2.9, 0.16, 90.3)	LN(0.22, 2.8, 0.01, 5.0)	LN(2.4, 3.3, 0.07, 83.2)	LN(0.08, 1.63, 0.02, 0.3)	LN(1.25, 3.9, 0.02, 72.3)
Manganese	LN(69.5, 2.5, 4.2, 1141)	LN(150, 3.0, 5.6, 4050)	LN(90, 3.0, 15, 550)	LN(90, 1.8, 15, 540)	LN(41, 2.5, 2.6, 640)	LN(117, 2.7, 5.8, 2343)	LN(67, 2.9, 2.6, 1710)	LN(92, 1.7, 20, 426)	LN(92.9, 2.7, 4.7, 1835)
Nickel	LN(0.2, 2.3,0.017, 2.35)	LN(0.5, 1.9, 0.07, 3.5)	LN(0.4, 2.0, 0.05, 3.6)	LN(0.27, 2.2, 0.02, 3.1)	LN(0.34, 2.3, 0.03, 4.3)	LN(0.88, 3.2, 0.03, 29)	LN(0.36, 2.3, 0.03, 4.2)	LN(0.4, 3.7, 0.007, 18)	LN(0.38, 1.8, 0.064, 2.25)
Selenium	LN(0.3, 3.1, 0.01, 9.0)	LN(0.16, 1.8, 0.03, 0.85)	LN(0.13, 1.9, 0.02, 0.92)	LN(0.04, 2.1, 0.005, 0.39)	LN(0.11, 1.8, 0.02, 0.67)	LN(0.04, 2.3, 0.004, 0.49)	LN(0.14, 1.7, 0.03, 0.71)	LN(0.05, 2.7, 0.002, 0.94)	LN(0.11, 2.7, 0.006, 2.2)
Silver	LN(0.003, 2.3, 0.0002, 0.03)	U(0, 0.016)	U(0, 0.014)	LN(0.006, 2.5, 0.0004, 0.09)	LN(0.008, 2.3, 0.0006, 0.1)	LN(0.010, 3.7, 0.0002, 0.48)	LN(0.005, 2.7, 0.0003, 0.10)	LN(0.002, 2.4, 0.0002, 0.034)	LN(0.005, 3.6, 0.0001, 0.2)
Strontium	LN(12.4, 2.0, 1.4, 106)	LN(1.9, 3.0, 0.07, 51)	T(1.5, 3.0, 4.5)	LN(11.4, 2.4, 0.87, 151)	LN(23.2, 1.8, 4.1, 132)	LN(33.8, 1.5, 11, 104)	LN(19.6, 1.9, 3.0, 129)	LN(18.3, 2.2, 1.7, 193)	LN(10.8, 1.4, 4.4, 26.7)
Tin	LN(0.06, 2.8, 0.0025, 1.32)	U(0, 0.036)	U(0, 0.036)	LN(0.03, 2.4, 0.003, 0.45)	U(0, 0.04)	T(0.035, 0.07, 0.11)	U(0, 0.048)	LN(0.04, 2.1, 0.005, 0.34)	LN(0.04, 3.1, 0.001, 1.18)
Vanadium	U(0, 0.2)	U(0, 0.2)	U(0, 0.2)	U(0, 0.2)	U(0, 0.2)	U(0, 0.2)	U(0, 0.2)	U(0, 0.2)	U(0, 0.2)
Zinc	LN(11.0, 2.4, 0.78, 156)	LN(35.6, 3.6, 0.79, 1615)	LN(28.8, 3.7, 0.56, 1480)	LN(18.2, 1.4, 6.9, 47)	LN(33, 2.5, 2.2, 488)	LN(16.1, 2.0, 2.0, 127)	LN(24.5, 2.6, 1.4, 441)	LN(9.9, 1.8, 1.8, 55.1)	LN(18.2, 3.2, 0.5, 613)
Lichen									
Antimony	U(0, 0.06)	LN(0.04, 1.4, 0.01, 0.1)	LN(0.03, 1.4, 0.01, 0.08)	LN(0.03, 1.3, 0.01, 0.08)	LN(0.20, 1.8, 0.04, 1.1)	LN(0.06, 2.0, 0.007, 0.50)	LN(0.08, 2.5, 0.005, 1.2)	U(0, 0.06)	LN(0.04, 2.7, 0.002, 0.77)
Arsenic	LN(0.08, 2.3, 0.006, 1.0)	LN(0.4, 2.0, 0.05, 3.1)	LN(0.27, 2.2, 0.02, 3.0)	LN(0.25, 1.6, 0.06, 1.0)	LN(1.5, 2.6, 0.08, 26)	LN(0.4, 2.6, 0.02, 6.9)	LN(0.7, 3.2, 0.02, 22.7)	LN(0.15, 2.4, 0.01, 2.1)	LN(0.3, 3.7, 0.006, 15)
Beryllium	LN(0.006, 1.2, 0.003, 0.012)	U(0, 0.12)	U(0, 0.12)	LN(0.007, 3.0, 0.0003, 0.17)	U(0, 0.12)	U(0, 0.12)	U(0, 0.12)	U(0, 0.12)	LN(0.005, 2.0, 0.0006, 0.04)
Boron	LN(0.67, 1.5, 0.19, 2.4)	U(0, 1.2)	U(0, 1.2)	U(0, 1.2)	LN(0.74, 1.7, 0.15, 3.6)	LN(0.64, 1.3, 0.3, 1.5)	LN(0.64, 1.6, 0.17, 2.5)	U(0, 1.2)	LN(0.63, 1.4, 0.22, 1.8)
Cadmium	LN(0.06, 3.7, 0.001, 3.1)	LN(0.06, 1.6, 0.02, 0.25)	LN(0.07, 1.8, 0.01, 0.4)	LN(0.14, 1.9, 0.02, 0.9)	LN(0.2, 1.9, 0.03, 1.4)	LN(0.09, 1.8, 0.02, 0.57)	LN(0.15, 2.1, 0.02, 1.4)	LN(0.06, 1.9, 0.008, 0.41)	LN(0.09, 2.6, 0.005, 1.6)
Chromium	LN(0.07, 2.1, 0.008, 0.64)	LN(0.45, 2.1, 0.05, 4.5)	LN(0.33, 2.3, 0.03, 4.1)	LN(0.2, 1.6, 0.05, 0.84)	LN(0.4, 2.2, 0.04, 4.0)	LN(0.13, 2.1, 0.01, 1.3)	LN(0.3, 2.3, 0.03, 3.5)	LN(0.2, 1.6, 0.05, 0.78)	LN(0.20, 2.5, 0.01, 3.0)
Cobalt	LN(0.036, 1.9, 0.006, 0.23)	LN(0.08, 1.8, 0.01, 0.47)	LN(0.06, 1.9, 0.01, 0.4)	LN(0.07, 1.4, 0.03, 0.22)	LN(0.3, 1.7, 0.06, 1.2)	LN(0.10, 1.9, 0.01, 0.72)	LN(0.13, 2.2, 0.01, 1.4)	LN(0.05, 1.7, 0.01, 0.22)	LN(0.07, 2.4, 0.005, 0.94)
Copper	LN(0.6, 1.3, 0.3, 1.5)	LN(1.2, 1.7, 0.2, 6.1)	LN(1.0, 1.8, 0.2, 5.6)	LN(1.3, 1.4, 0.5, 3.5)	LN(4.8, 2.0, 0.6, 40)	LN(1.6, 2.0, 0.2, 12.8)	LN(2.7, 2.4, 0.2, 39)	LN(0.8, 1.4, 0.3, 2.3)	LN(1.3, 2.8, 0.06, 28.3)
Lead	LN(0.7, 1.4, 0.24, 2.1)	LN(10, 1.9, 1.5, 69)	LN(6.9, 2.2, 0.7, 70.1)	LN(8.7, 2.6, 0.5, 156)	LN(106, 2.0, 13.1, 865)	LN(23, 2.6, 1.3, 388)	LN(55.5, 2.5, 3.5, 890)	LN(3.8, 1.8, 0.6, 23.3)	LN(17.8, 3.4, 0.5, 700)
Manganese	LN(39, 2.0, 5, 311)	LN(48, 1.4, 17, 135)	LN(51, 1.5, 14, 185)	LN(32, 1.5, 9.0, 116)	LN(28, 1.4, 11, 69)	LN(62, 1.9, 8.7, 438)	LN(26, 1.6, 5.9, 115)	LN(52, 1.5, 13.9, 193)	LN(40.5, 1.9, 5.7, 286)
Nickel	LN(0.14, 1.8, 0.02, 0.85)	LN(0.43, 2.0, 0.06, 3.3)	LN(0.3, 2.1, 0.04, 3.0)	LN(0.24, 1.5, 0.08, 0.75)	LN(0.5, 1.8, 0.08, 2.5)	LN(0.3, 1.7, 0.06, 1.5)	LN(0.36, 1.8, 0.06, 2.2)	LN(0.22, 1.3, 0.1, 0.53)	LN(0.3, 2.0, 0.03, 2.0)
Selenium	LN(0.09, 2.1, 0.009, 0.9)	LN(0.1, 2.1, 0.01, 0.97)	LN(0.08, 2.2, 0.008, 0.86)	LN(0.06, 2.2, 0.006, 0.63)	LN(0.23, 3.1, 0.008, 7.0)	LN(0.06, 3.5, 0.002, 2.7)	LN(0.17, 3.3, 0.005, 5.9)	LN(0.06, 2.2, 0.006, 0.65)	LN(0.09, 3.6, 0.002, 3.9)
Silver	LN(0.01, 3.1, 0.0004, 0.31)	LN(0.03, 1.8, 0.006, 0.21)	LN(0.04, 1.7, 0.007, 0.19)	LN(0.06, 1.5, 0.02, 0.18)	LN(0.22, 2.0, 0.03, 1.9)	LN(0.06, 2.3, 0.005, 0.78)	LN(0.13, 2.4, 0.009, 1.8)	LN(0.03, 1.6, 0.006, 0.11)	LN(0.05, 3.0, 0.002, 1.4)
Strontium	LN(3.6, 1.7, 0.7, 18.6)	LN(1.85, 1.5, 0.5, 6.6)	LN(1.8, 1.5, 0.6, 5.5)	LN(6.3, 1.7, 1.3, 29.9)	LN(4.6, 1.6, 1.0, 20.6)	LN(2.9, 1.8, 0.5, 16.6)	LN(3.3, 1.8, 0.56, 19)	LN(2.1, 1.7, 0.5, 9.9)	LN(3.0, 1.9, 0.43, 20.4)
Tin	LN(0.1, 5.0, 0.0008, 12)	LN(0.05, 2.7, 0.002, 0.89)	LN(0.05, 2.5, 0.003, 0.7)	LN(0.05, 2.8, 0.002, 1.0)	LN(0.06, 2.7, 0.003, 1.2)	LN(0.3, 5.5, 0.002, 45)	LN(0.05, 2.8, 0.002, 1.03)	LN(0.04, 2.6, 0.002, 0.69)	LN(0.05, 7.0, 0.0001, 16.7)
Vanadium	U(0, 0.3)	LN(0.22, 1.8, 0.04, 1.3)	LN(0.18, 1.8, 0.03, 1.0)	LN(0.21, 1.7, 0.04, 1.0)	LN(0.3, 1.4, 0.11, 0.85)	LN(0.2, 1.6, 0.05, 0.83)	LN(0.22, 1.6, 0.05, 0.88)	U(0, 0.3)	LN(0.18, 1.6, 0.04, 0.78)
Zinc	LN(10.7, 1.3, 5.0, 23.2)	LN(25, 1.7, 4.9, 129)	LN(20, 1.8, 3.2, 124)	LN(35.5, 1.6, 9.4, 133)	LN(135, 2.0, 16.75, 1101)	LN(38, 2.2, 3.4, 417)	LN(77, 2.4, 5.4, 1080)	LN(17.4, 1.3, 7.9, 38.4)	LN(31.7, 3.0, 1.2, 823)

Note: n/a = no data available
T = Triangular distribution (min, mode, max)
LN = Lognormal distribution (geometric mean, geometric standard deviation, min, max)
U = Uniform distribution (min, max)

2.3.2.1 Site-Specific Soil-to-Browse Transfer Factors

There were no browse samples for some of the COPCs (antimony, beryllium, boron, cobalt, manganese, strontium, tin, and vanadium) in Van-S, Van-M, Faro-N and Faro-S. Therefore, site-specific soil-to-browse transfer factors were developed using measured browse concentrations and measured soil concentrations.

The site-specific soil-to-browse transfer factors were developed using soil and willow samples collected in affected area from the 2004 sampling program. Soil data measured at sampling locations with willow samples collected were summarized and matched with the willow data measured at the same location. For each site, the average metal concentrations in the willow sample were divided by the corresponding soil concentrations to obtain an estimate of the soil-to-browse transfer factors. The transfer factors were used to estimate browse concentrations at the various assessment areas, as shown in equation (2-5), and the distribution functions of the transfer factors are summarized in Table 2.18. Values from literature are provided for perspective. Appendix D provides supporting documentation for the development of the distributions.

$$C_{veg} = C_{soil} \times TF_{soil-to-veg} \quad (2\text{-}5)$$

where:

C_{veg}	=	concentration of COPC in vegetation [mg/kg (dry weight (dw) or fresh weight (fw))]
C_{soil}	=	soil concentration [mg/kg]
$TF_{soil-to-veg}$	=	soil-to-vegetation transfer factor [(mg/kg (dw or fw))/(mg/kg)] {Table 2.18}

Table 2.18 Site-Specific Soil-to-Browse Distributions for Transfer Factors Used in the Risk Assessment

COPC	Site-Specific Soil-to-Browse Transfer Factor Distributions ((mg/kg browse)/(mg/kg soil))	Literature Values ((mg/kg browse)/(mg/kg soil))	Reference
Antimony	LN(0.2, 2.5, 0.013, 3.1)	0.20	Baes *et al.* 1984
Beryllium	LN(0.017, 2.5, 0.001, 0.266)	$4.5x10^{-4}$	U.S. EPA 1998
Boron	LN(1.4, 2.3, 0.11, 17.4)	0.03	U.S. NCRP 1996
Cobalt	LN(0.26, 3.3, 0.007, 9.2)	0.045	U.S. NCRP 1996, IAEA 1994, CSA 1987
Manganese	LN(0.15, 2.3, 0.013, 1.9)	0.29	U.S. NRC 1992
Strontium	LN(0.13, 2.5, 0.008, 2.0)	0.13	U.S. NRC 1992
Tin	T (0.01, 0.02, 0.03)	0.03	Baes *et al.* 1984
Vanadium	LN(0.02, 1.7, 0.004, 0.11)	$5.5x10^{-3}$	Baes *et al.* 1984

Note: T = Triangular distribution (min, mode, max)
LN = Lognormal distribution (geometric mean, geometric standard deviation, min, max)

2.3.3 Large Mammal Data

AECOM/Gartner Lee provided analytical data on 10 caribou (collected between 2004 and 2007) and 10 moose (collected between 2004 and 2006) that were captured in the study area. Table 2.19 provides the distributions developed for measured concentrations in the probabilistic assessment. The muscle concentrations were used in the risk assessment for human receptors and the whole body concentrations were used in a sensitivity analysis for human receptors and in the risk assessment for ecological receptors. Appendix D provides supporting documentation for the development of the distributions.

Concentrations for moose and caribou at background locations were represented by data collected from other Yukon locations. The moose and caribou samples were provided by the community and the Northern Contaminants Program and the data were summarized by EDI (2007). Dry weight concentrations were reported by the laboratory and were converted to fresh weight based on the reported sample moisture content.

A comparison of the moose and caribou concentrations presented in Table 2.19 for samples from the site area and other Yukon areas indicates that in some cases, the site samples are comparable to the samples from other Yukon areas. Arsenic, lead, selenium, vanadium and zinc concentrations in caribou flesh and selenium, vanadium, and zinc concentrations in moose fleshshow some influence from the mine site area.

Table 2.19 Summary of Concentration Distributions of COPC in Caribou and Moose Used in the Risk Assessment

COPC	Concentration Distribution (mg/kg ww)					
	Moose			Caribou		
	Site Muscle[a]	Site Whole Body[b]	BG Muscle[c]	Site Muscle[a]	Site Whole Body[b]	BG Muscle[c]
Antimony	LN (0.002, 2.9)	LN (0.002, 2.8)	LN (0.001, 2.4)	LN (0.003, 1.6)	LN (0.003, 1.5)	LN (0.001, 1)
Arsenic	LN (0.003, 4.2)	LN (0.004, 4.3)	LN (0.01, 1.3)	LN (0.02, 5.0)	LN (0.02, 4.5)	LN (0.005, 2.8)
Beryllium	LN (0.002, 1.6)	LN (0.002, 2.6)	LN (0.0003, 2.5)	LN (0.003, 1.5)	LN (0.003, 1.5)	LN (0.0003, 2.7)
Boron	LN (0.17, 3.0)	LN (0.18, 3.0)	C (0.1)	LN (0.54, 3.1)	LN (0.57, 2.8)	C (0.5)
Cadmium	LN (0.02, 3.0)	LN (1.2, 8.5)	LN (0.007, 1.5)	LN (0.01, 4.0)	LN (1.0, 3.6)	LN (0.03, 1.1)
Chromium	LN (0.06, 3.1)	LN (0.07, 3.0)	LN (0.04, 2.1)	LN (0.08, 2.2)	LN (0.09, 2.1)	LN (0.12, 1.1)
Cobalt	LN (0.007, 2.7)	LN (0.02, 2.1)	LN (0.003, 1.3)	LN (0.009, 3.1)	LN (0.03, 2.2)	LN (0.004, 1.1)
Copper	LN (1.4, 2.1)	LN (3.6, 2.3)	LN (0.7, 1.5)	LN (4.7, 1.7)	LN (6.6, 1.7)	LN (3.6, 1)
Lead	LN (0.006, 7.9)	LN (0.008, 7.3)	LN (0.003, 8.2)	LN (0.03, 2.1)	LN (0.15, 2.1)	LN (0.002, 1.9)
Manganese	LN (0.2, 1.8)	LN (0.40, 2.1)	LN (0.12, 1.2)	LN (0.65, 2.4)	LN (1.2, 1.9)	LN (0.4, 1.1)
Nickel	LN (0.01, 3.3)	LN (0.01, 3.2)	LN (0.007, 2)	LN (0.02, 1.5)	LN (0.02, 1.5)	LN (0.065, 1.1)
Selenium	LN (0.35, 1.6)	LN (0.52, 1.7)	LN (0.07, 1.6)	LN (0.32, 1.8)	LN (0.44, 1.8)	LN (0.05, 2.2)
Silver	LN (0.03, 6.5)	LN (0.04, 5.9)	LN (0.009, 1.4)	LN (0.06, 3.7)	LN (0.12, 2.2)	LN (0.03, 1.2)
Strontium	LN (0.04, 2.2)	LN (0.05, 2.0)	C (0.025)	LN (0.12, 1.5)	LN (0.13, 1.6)	LN (0.04, 1.1)
Tin	LN (0.004, 7.4)	LN (0.004, 7.2)	C (0.005)	LN (0.01, 8.1)	LN (0.01, 7.8)	C (0.005)
Vanadium	LN (0.01, 2.0)	LN (0.01, 2.0)	LN (0.001, 1.3)	LN (0.03, 2.2)	LN (0.03, 2.0)	LN (0.001, 1.3)
Zinc	LN (80, 1.7)	LN (76, 1.7)	LN (48, 1)	LN (118, 1.9)	LN (112, 1.9)	LN (26, 1.2)

Note: LN = Lognormal distribution (geometric mean, geometric standard deviation). Min and max were not specified.
C = Constant (value); due to lack of data
a – muscle concentrations were used for the pathways assessment for human receptors
b – whole body concentrations were used for the pathways assessment for ecological receptors and the sensitivity analysis for the pathways assessment for human receptors. Whole body concentrations were estimated assuming 5% liver, 5% kidney, and 90% muscle.
c – background (BG) muscle concentrations were used for the pathways assessment for the background human receptor (Camper2).
Dry weight concentrations were converted to wet weight (ww) concentrations using the moisture contents provided by the analytical laboratory.

2.3.4 Small Mammals and Birds

Concentrations in small mammals (i.e., beaver, hare, hoary marmot, sheep) for the ecological and human exposure estimates were predicted for the existing conditions and final closure and remediation plan using literature transfer factors for small mammals. Similarly, concentrations in birds (i.e., ducks and grouse) were predicted using literature transfer factors for birds. Table 2.20 summarizes the distributions of the transfer factors used to complete the ecological and

human exposure estimates. Lognormal distributions were derived from literature values (using an assumed geometric standard deviation of 2.5 for small mammals and 3.0 for birds) and are summarized in Table 2.20. Concentrations for waterfowl and other birds at the site were predicted using literature transfer factors as provided in equation (2-6), and concentrations for small mammals are predicted in a similar manner.

$$C_{bird} = Intake_{bird} \times TF_{feed-to-bird} \quad (2\text{-}6)$$

where:

C_{bird} = concentration of COPC in bird flesh [mg/kg fw)]

$Intake_{bird}$ = total intake of COPC by the bird [mg/d] {calculated in the ecological assessment}

$TF_{feed\text{-}to\text{-}bird}$ = feed-to-bird transfer factor [d/kg (fw)] {Table 2.20}

Table 2.20 Distributions of Feed-to-Small Mammal and Bird Transfer Factors Used in the Risk Assessment

COPC	Feed-to-Small Mammal TF Distributions (d/kg(ww))	Reference	Feed-to-Bird TF Distributions (d/kg(ww))	Reference
Antimony	LN (0.001, 2.5, 6.4×10^{-5}, 0.016)	(A)	LN (0.5, 3.0, 0.02, 13.5)	(A)
Arsenic	LN (0.002, 2.5, 1.3×10^{-4}, 0.03)	(A)	LN (1.0, 3.0, 0.04, 27)	(A)
Beryllium	LN (0.0023, 2.5, 1.5×10^{-4}, 0.04)	(A)	LN (1.15, 3.0, 0.04, 31)	(A)
Boron	LN (0.0007, 2.5, 4.3×10^{-5}, 0.01)	(A)	LN (0.34, 3.0, 0.01, 9.2)	(A)
Cadmium	LN (0.0005, 2.5, 3.3×10^{-5}, 0.008)	(A)	LN (0.8, 3.0, 0.03, 21.6)	(A)
Chromium	LN (0.0055, 2.5, 3.5×10^{-4}, 0.09)	(A)	LN (6.0, 3.0, 0.22, 162)	(A)
Cobalt	LN (0.0001, 2.5, 6.4×10^{-6}, 0.002)	(A)	LN (2.0, 3.0, 0.07, 54)	(A)
Copper	LN (0.01, 2.5, 6.4×10^{-4}, 0.16)	(A)	LN (0.5, 3.0, 0.02, 13.5)	(A)
Lead	LN (0.14, 2.5, 0.009, 2.2)	(B)	LN (0.2, 3.0, 0.01, 5.4)	(A)
Manganese	LN (0.0005, 2.5, 3.2×10^{-5}, 0.008)	(A)	LN (0.05, 3.0, 0.002, 1.4)	(A)
Nickel	LN (0.006, 2.5, 3.8×10^{-4}, 0.09)	(A)	LN (3.0, 3.0, 0.11, 81)	(A)
Selenium	LN (0.015, 2.5, 9.6×10^{-4}, 0.23)	(A)	LN (9.0, 3.0, 0.33, 243)	(A)
Silver	LN (0.003, 2.5, 1.9×10^{-4}, 0.05)	(A)	LN (2.0, 3, 0.07, 54)	(A)
Strontium	LN (0.005, 2.5, 3.2×10^{-4}, 0.08)	(A)	LN (0.06, 3.0, 0.002, 1.6)	(A)
Tin	LN (0.03, 2.5, 2.0×10^{-3}, 0.47)	(C)	LN (15.0, 3.0, 0.56, 405)	(A)
Vanadium	LN (0.0025, 2.5, 1.6×10^{-4}, 0.04)	(A)	LN (1.3, 3.0, 0.05, 35.1)	(A)
Zinc	LN (0.1, 2.5, 6.0×10^{-3}, 1.6)	(A)	LN (7, 3, 0.26, 189)	(A)

Note: n/a – not available.
LN = Lognormal distribution (geometric mean, geometric standard deviation, min, max)
(A) = IAEA 1994, U.S. NCRP 1996, Baes et al. 1984, U.S. EPA 1998, CSA 1987
(B) = Thomas 1997
(C) = U.S. NCRP 1996, Baes et al. 1984
(D) = PNNL U.S. DOE 2003

Measured data in beaver, grouse and hoary marmot were available from the Faro Mine Complex from 2005 and these concentrations were compared to predicted concentrations in beaver, grouse and hoary marmot for existing conditions. There were generally only 1 to 3 samples of measured data. Table 2.21 provides the comparison for beaver, Table 2.22 provides the comparison for grouse, and Table 2.23 provides the comparison for hoary marmot.

Table 2.21 Comparison of Measured and Predicted Concentrations in Beaver – Existing Conditions

	Predicted Beaver Concentrations (mg/kg dw) – Existing Conditions													
	Rose Creek Upstream		Rose Creek Downstream		Vangorda Creek Upstream		Vangorda Creek Downstream		Pelly River Upstream		Pelly River @ Crossing		Measured Muscle[a]	
COPC	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Min	Max
Antimony	0.01	0.03	0.01	0.06	0.02	0.07	0.02	0.06	7.6×10^{-5}	2.7×10^{-4}	0.01	0.03	<0.1	<0.1
Arsenic	2.0×10^{-3}	0.01	4.2×10^{-3}	0.01	3.7×10^{-3}	0.01	0.01	0.02	1.8×10^{-3}	0.01	3.5×10^{-3}	0.01	0.2	1.2
Beryllium	2.7×10^{-4}	8.8×10^{-4}	7.9×10^{-4}	2.6×10^{-3}	2.2×10^{-4}	7.4×10^{-4}	0.002	0.01	3.3×10^{-5}	1.2×10^{-4}	1.4×10^{-4}	5.1×10^{-4}	<0.02	<0.02
Boron	0.02	0.06	0.02	0.05	0.02	0.06	0.03	0.11	0.02	0.05	0.03	0.11	<2	<2
Cadmium	0.01	0.03	0.01	0.03	0.01	0.04	0.01	0.05	0.02	0.07	0.02	0.07	0.26	0.47
Chromium	0.02	0.07	0.01	0.04	0.03	0.10	0.01	0.04	0.01	0.05	0.02	0.09	<0.1	<0.1
Cobalt	3.4×10^{-4}	1.2×10^{-3}	8.1×10^{-4}	3.0×10^{-3}	5.0×10^{-4}	1.9×10^{-3}	2.4×10^{-3}	0.01	6.0×10^{-4}	2.1×10^{-3}	1.1×10^{-3}	4.0×10^{-3}	<0.1	<0.1
Copper	0.11	0.36	0.16	0.53	0.16	0.53	0.16	0.50	0.43	1.4	0.43	1.5	3.1	4.7
Lead	0.38	1.4	3.5	13.0	0.92	3.4	1.2	4.2	1.8	5.5	0.96	3.3	<0.1	<0.1
Manganese	0.17	0.58	1.3	4.7	0.15	0.50	0.40	1.4	0.15	0.50	0.46	1.6	0.5	2.3
Nickel	0.03	0.09	0.05	0.18	0.03	0.13	0.05	0.15	0.02	0.08	0.07	0.24	<0.1	<0.1
Selenium	0.02	0.08	0.02	0.06	0.03	0.09	0.05	0.18	0.02	0.07	0.05	0.17	0.4	0.5
Silver	4.3×10^{-4}	1.6×10^{-3}	7.2×10^{-4}	2.6×10^{-3}	7.9×10^{-4}	3.1×10^{-3}	5.1×10^{-4}	1.7×10^{-3}	2.8×10^{-4}	1.0×10^{-3}	4.7×10^{-4}	1.6×10^{-3}	<0.01	<0.01
Strontium	0.89	3.3	1.2	4.3	0.97	3.7	0.87	3.1	0.23	0.83	1.3	4.6	0.65	1.03
Tin	0.06	0.24	2.3	7.4	0.12	0.49	0.13	0.45	4.8×10^{-3}	0.02	0.03	0.09	<0.1	<0.1
Vanadium	0.01	0.05	0.02	0.07	0.01	0.05	0.01	0.05	8.9×10^{-4}	3.2×10^{-3}	0.08	0.32	<0.5	<0.5
Zinc	31.1	101.1	60.0	210.7	29.4	94.0	36.7	123.8	28.8	92.3	28.7	100.8	64.9	157

Note: Predicted concentrations were converted from a ww basis to a dw basis using an assumed moisture content of 80%.
a – measured data based on 3 samples.

Table 2.22 Comparison of Measured and Predicted Concentrations in Grouse – Existing Conditions

	Predicted Grouse Concentrations (mg/kg dw) – Existing Conditions							
	Background		Van-S		Faro-S		Measured Muscle[a]	
COPC	Mean	95th	Mean	95th	Mean	95th	Min	Max
Antimony	0.05	0.18	0.71	2.8	0.70	2.8	<0.1	<0.1
Arsenic	0.14	0.48	0.76	2.8	0.68	2.5	<0.1	0.1
Beryllium	0.01	0.05	0.02	0.09	0.02	0.08	<0.02	<0.02
Boron	2.1	7.5	8.7	35.1	3.0	11.6	<2	<2
Cadmium	1.1	3.9	0.76	2.6	0.97	3.6	0.11	0.16
Chromium	3.9	14.8	4.6	16.3	1.3	4.9	<0.1	<0.1
Cobalt	0.29	1.0	13.5	54.9	3.4	14.2	<0.1	<0.1
Copper	0.82	2.9	1.5	5.3	1.6	5.6	2.1	2.9
Lead	0.05	0.17	1.9	7.0	5.4	20.3	<0.1	<0.1
Manganese	3.7	13.3	26.5	102.8	2.5	9.8	0.5	0.7
Nickel	2.0	7.8	5.5	19.5	3.8	13.8	<0.1	<0.1
Selenium	2.9	11.2	2.3	7.8	2.1	7.4	2.7	3.9
Silver	0.04	0.14	0.07	0.25	0.10	0.35	<0.01	<0.01
Strontium	0.68	2.5	3.4	13.3	0.54	2.1	0.33	0.46
Tin	2.8	10.0	9.4	35.6	1.4	5.0	<0.1	<0.1
Vanadium	0.18	0.66	1.4	5.3	0.36	1.3	<0.5	<0.5
Zinc	461.3	1625.1	253.6	882.0	1161.3	4344.8	18.2	19

Note: Predicted concentrations were converted from a ww basis to a dw basis using an assumed moisture content of 80%.
a – measured data based on 2 samples.

Table 2.23 Comparison of Measured and Predicted Concentrations in Hoary Marmot – Existing Conditions

COPC	Predicted Hoary Marmot Concentrations (mg/kg dw) – Existing Conditions						
	Background		Van-S		Faro-S		Measured Muscle[a]
	Mean	95th	Mean	95th	Mean	95th	Value
Antimony	$4.4x10^{-4}$	$1.4x10^{-3}$	$4.5x10^{-4}$	$1.5x10^{-3}$	$4.5x10^{-4}$	$1.5x10^{-3}$	<0.1
Arsenic	$6.5x10^{-4}$	$2.2x10^{-3}$	$6.7x10^{-3}$	0.02	$4.3x10^{-3}$	0.01	<0.1
Beryllium	$1.3x10^{-4}$	$4.1x10^{-4}$	$1.5x10^{-4}$	$4.7x10^{-4}$	$1.4x10^{-4}$	$4.4x10^{-4}$	<0.02
Boron	0.03	0.09	0.06	0.22	0.04	0.12	<2
Cadmium	$4.8x10^{-4}$	$1.8x10^{-3}$	$3.7x10^{-4}$	$1.1x10^{-3}$	$3.3x10^{-4}$	$1.1x10^{-3}$	0.14
Chromium	$4.2x10^{-3}$	0.01	0.02	0.06	$6.7x10^{-3}$	$2.2x10^{-2}$	<0.1
Cobalt	$4.5x10^{-5}$	$1.6x10^{-4}$	$1.1x10^{-4}$	$3.5x10^{-4}$	$9.2x10^{-5}$	$3.2x10^{-4}$	<0.1
Copper	0.12	0.38	0.13	0.38	0.15	0.45	5.8
Lead	0.12	0.37	5.0	16.9	16.7	59.8	0.3
Manganese	0.35	1.27	0.93	3.4	0.21	0.76	0.8
Nickel	0.01	0.04	0.04	0.14	0.02	0.07	<0.1
Selenium	0.05	0.21	0.02	0.06	0.01	0.04	<0.2
Silver	$2.6x10^{-4}$	$8.0x10^{-4}$	$3.3x10^{-4}$	$1.0x10^{-3}$	$5.1x10^{-4}$	$1.7x10^{-3}$	<0.01
Strontium	0.51	1.8	0.2	0.7	0.87	2.9	0.2
Tin	0.04	0.12	0.04	0.13	$9.0x10^{-3}$	0.03	<0.1
Vanadium	$2.1x10^{-3}$	$6.8x10^{-3}$	$6.1x10^{-3}$	0.02	$2.7x10^{-3}$	$8.9x10^{-3}$	<0.5
Zinc	10.4	36.6	53.5	203.7	34.7	125.1	152

Note: Predicted concentrations were converted from a ww basis to a dw basis using an assumed moisture content of 80%.
a – measured data based on 1 sample.

Generally, predicted grouse and hoary marmot concentrations over-estimate the measured values reported from the site. For beaver, some COPC concentrations are over-estimated and some COPC are under-estimated. Nonetheless, the small sample size makes it difficult for a good comparison. Given that these species only represent a small fraction of the diet of other animals or humans, the predicted values were used in the assessment.

3.0 RECEPTOR CHARACTERIZATION

This chapter discusses the rationale behind the selection of ecological and human receptors for the purposes of the assessment from risks of exposure to chemicals of potential concern on the Faro Mine Complex. The receptors selected were the same as those selected in the previous risk assessment (SENES 2006).

3.1 ECOLOGICAL RECEPTORS

The receptor characterization phase involves selection of ecological receptors for inclusion in the risk assessment and identification of their pathways of exposure to the COPC. As it is not practical to assess risks to all ecological species, it is common practice to select representative species based on level of potential exposure, importance as a food source for other species and/or humans, importance for cultural reasons, or because they are endangered or rare species.

Therefore, ecological receptors are generally chosen to capture various levels of exposure via the different types of diets that they consume. They are also selected if they are considered important: (1) in the functioning of the ecosystem; (2) in the production of food for subsistence; or (3) due to their cultural or medicinal significance.

3.1.1 Aquatic Receptors

Figure 3.1 provides a schematic representation of the selected ecological receptors for the aquatic environment. The aquatic species chosen represent a typical food chain that would be found in aquatic systems and are expected to be found in Rose Creek, Vangorda Creek and Pelly River.

Primary Producers - Primary producers occupy the lowest level in the food chain. These organisms are generally plants that use the sun and inorganic molecules to produce food.

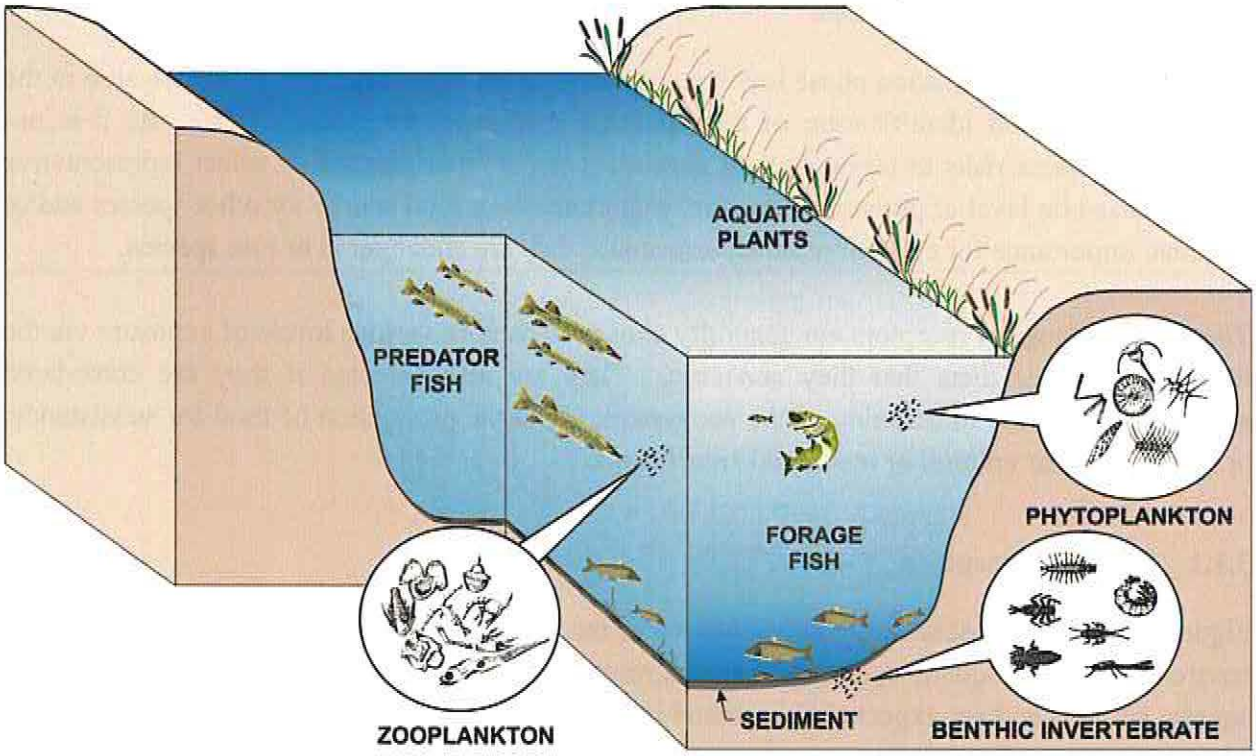
Aquatic plants in most ecosystems usually constitute the majority of the primary producer biomass. Aquatic plants are often consumed by moose, muskrat and other animals, thereby forming a link between aquatic and terrestrial ecosystems. Besides being an important food resource, aquatic plants also provide habitat to aquatic organisms.

Phytoplankton are also part of the first level in the aquatic food chain. Members of the division *Chlorophyta* have been studied extensively and are relatively common in most northern aquatic ecosystems. Even though the overall contribution of *Chlorophyta* to northern aquatic ecosystems is relatively small, they are a primary food resource for grazing zooplankton.

Primary Consumers - Primary consumers occupy the second level in the food chain. These organisms generally eat plant material such as phytoplankton.

Zooplankton such as *Cladocerans* are found in most northern aquatic ecosystems. Although *Cladocerans* may be seasonally quite abundant, their overall contribution to northern aquatic ecosystems is relatively small.

Figure 3.1 Aquatic Receptors Included in the Assessment



Benthic invertebrates both live and feed within sediments and therefore may be exposed to chemicals through ingestion of sediment-bound chemicals and also through exposure to interstitial waters within the sediment. Benthic invertebrates provide a link between aquatic and terrestrial ecosystems. For example, Chironomidae (midge) larvae are usually the most abundant benthic invertebrate taxa present in aquatic ecosystems in the northern climate. Many species feed on decaying organic matter and thereby form an important link between the decomposer and primary consumer levels. Furthermore, midge larvae are a main food source for small/juvenile fish and larger omnivorous fish. The adults are capable of flight and are frequently consumed by birds and bats. This life stage provides an important link between aquatic and terrestrial ecosystems in the region.

Secondary Consumers - Ecological receptors at the secondary consumer level include forage fish that feed primarily on benthic invertebrates and smaller individuals, and are an important food source for larger predatory fishes. Examples of forage fish are Arctic grayling and slimy sculpin, which are prevalent in the study area streams. From the environmental assessment completed for the site, arctic grayling and slimy sculpin were identified in the North Fork of Rose Creek (R7), Rose Creek (R2, R3, R4), Anvil Creek downstream of Rose Creek confluence (R5) and Vangorda Creek at mouth (V8). Arctic grayling and slimy sculpin were not found at Vangorda Creek (V5, V27, V1) due to barriers to access for fish.

Tertiary Consumers - Tertiary consumers are found at the top end of the aquatic food chain and consist of larger predatory fish species that consume other fish species. An example of a predator fish is the Chinook salmon, which is found in some of the study area rivers. From the environmental assessment completed for the site, Chinook salmon were found in Rose Creek (R2, R3, R4), Anvil Creek downstream of Rose Creek confluence (R5) and Vangorda Creek at mouth (V8). Chinook salmon were not found at Vangorda Creek (V5, V27, V1) due to barriers to access for fish. Predatory fish are also an important component of the human food chain. Both forage and predatory fish are an important component of the diet of omnivores (e.g., bear, merganser) and carnivores (e.g., eagle).

3.1.2 Terrestrial Receptors

The terrestrial receptors chosen for the assessment of potential impacts from the Faro Mine Complex were obtained from information provided by the First Nations people who use the site as well as various sources that contain information on terrestrial species in the Yukon and site-specific baseline studies for the Faro Mine Complex (Gartner Lee Limited 2002, Gartner Lee Limited 2005). The terrestrial species selected for the risk assessment are presented in Table 3.1. There are many other ecological species on the Vangorda Plateau that could be selected; however, the species presented in this table cover a range of exposure pathways that encompass the dietary habits of the other species.

Table 3.1 Terrestrial Receptors Chosen for the Faro Mine Complex Assessment

Herbivores	Omnivores	Carnivores
Beaver	Black bear	Mink
Woodland Caribou	Ducks (mallard, scaup, merganser)	Wolf
Grouse	Red fox	
Snowshoe hare		
Hoary marmot		
Moose		
Fannin sheep		

Black Bear –While berries, herbs and roots are their primary food source, they also consume fish and are thus potentially exposed via the aquatic pathways as well as terrestrial pathways.

Beaver – The beaver habitat is largely in the aquatic environment, although terrestrial vegetation comprises a significant part of their diet. Beaver are included in this assessment because they have been identified as being consumed by Yukon First Nations people and because they are an indicator of both potential aquatic and terrestrial effects.

Caribou – Caribou consume predominantly lichen, which are mostly impacted by chemical deposition from the air. Barren-ground caribou are found to the north and west of the site where as woodland caribou are known to be in the area. Caribou were chosen since they are in the area and represent a portion of the diet of the Yukon First Nations people.

Ducks - Waterfowl can be highly exposed ecological receptors, since their diet is almost entirely obtained from the aquatic environment. The waterfowl diet includes aquatic vegetation, fish, and aquatic (benthic) invertebrates. Three species were selected to take into account differences in the diets of mallard (consumes primarily aquatic plants), merganser (consumes mainly fish) and scaup (consumes mostly benthic invertebrates). Ducks are also part of the human food chain.

Grouse – Grouse (and ptarmigan) are terrestrial birds common in the northern environment. The diets of both species are primarily terrestrial, comprising primarily berries and browse. Grouse were selected to represent both species.

Red Fox - Foxes are predatory species and thus are exposed via food chain effects. They are omnivores and consume a varied diet including berries, ducks and hare.

Snowshoe Hare – The snowshoe hare is chosen as it may be trapped in the area and used as a food source. Browse and forage comprise most of the diet of hare.

Hoary Marmot – The hoary marmot feeds on grass and other green plants. The only aquatic pathway of exposure is from consumption of water. Hoary marmots are protected from being hunted in the Yukon, except by First Nations people.

Mink – Mink are found in the Yukon and consume aquatic plants, benthic invertebrates, ducks and fish and are thus potentially exposed via the aquatic pathways.

Moose – Moose consume aquatic macrophytes and browse and thus are potentially an exposed species. There is very limited aquatic macrophyte growth in Anvil Creek, Rose Creek or Vangorda Creek, thus the likelihood of moose being exposed to COPC downstream of the Faro

Mine Complex facilities is reduced. Nonetheless, moose may be exposed to COPC via terrestrial pathways and given that moose are an important source of food to people in the study area, they were included in the assessment.

Fannin Sheep - The Faro herd (approximately 80 in the nursery herd), which migrates directly through the Vangorda Plateau Mine site, are of particular importance and therefore are considered in this assessment. They are also a protected species but are hunted by First Nations people. Their diet consists of terrestrial vegetation (forage).

Wolf - The wolf is a predatory species that consumes a number of other species including caribou, hare and moose. Food chain effects were assessed in this study through the inclusion of the wolf.

All of the terrestrial species mentioned above were assumed to consume soil or sediment, depending on where they obtained their food from, in addition to the food sources noted above.

Figure 3.2 provides a schematic of the receptors selected for this assessment. The following section discusses the pathways that have been considered in this assessment.

3.1.3 Ecological Pathways

Several different pathways were considered in the ecological assessment. These pathways are linked to either the aquatic environment of Rose Creek, Vangorda Creek, or Pelly River and/ or the terrestrial environment including the Faro Mine Complex site and surrounding areas.

Figures 3.3 to 3.6 provide schematic representations of the potential pathways of exposure for each terrestrial receptor considered in this assessment. The figures also provide the typical ingestion rate (mode of the ingestion rate distribution) used for all the pathways considered for each of the terrestrial receptors. Appendix E provides the summary of the characteristics of these ecological receptors.

Besides taking into consideration the amount of food consumed by each receptor, it is important to consider from where they obtain their food and what the COPC levels are in the food items in the area(s) from which they obtain their food. In this regard, the home range of each of the species was taken into consideration when linking the species to food sources. Smaller animals, due to their small home range, were evaluated at several places across the Faro Mine Complex whereas larger animals, with large home ranges, were evaluated on a site-wide basis. Table 3.2 provides a summary of the home ranges of the different terrestrial receptors and the length of time they were considered to be present on the site.

Figure 3.2 Terrestrial Receptors Considered in the Assessment

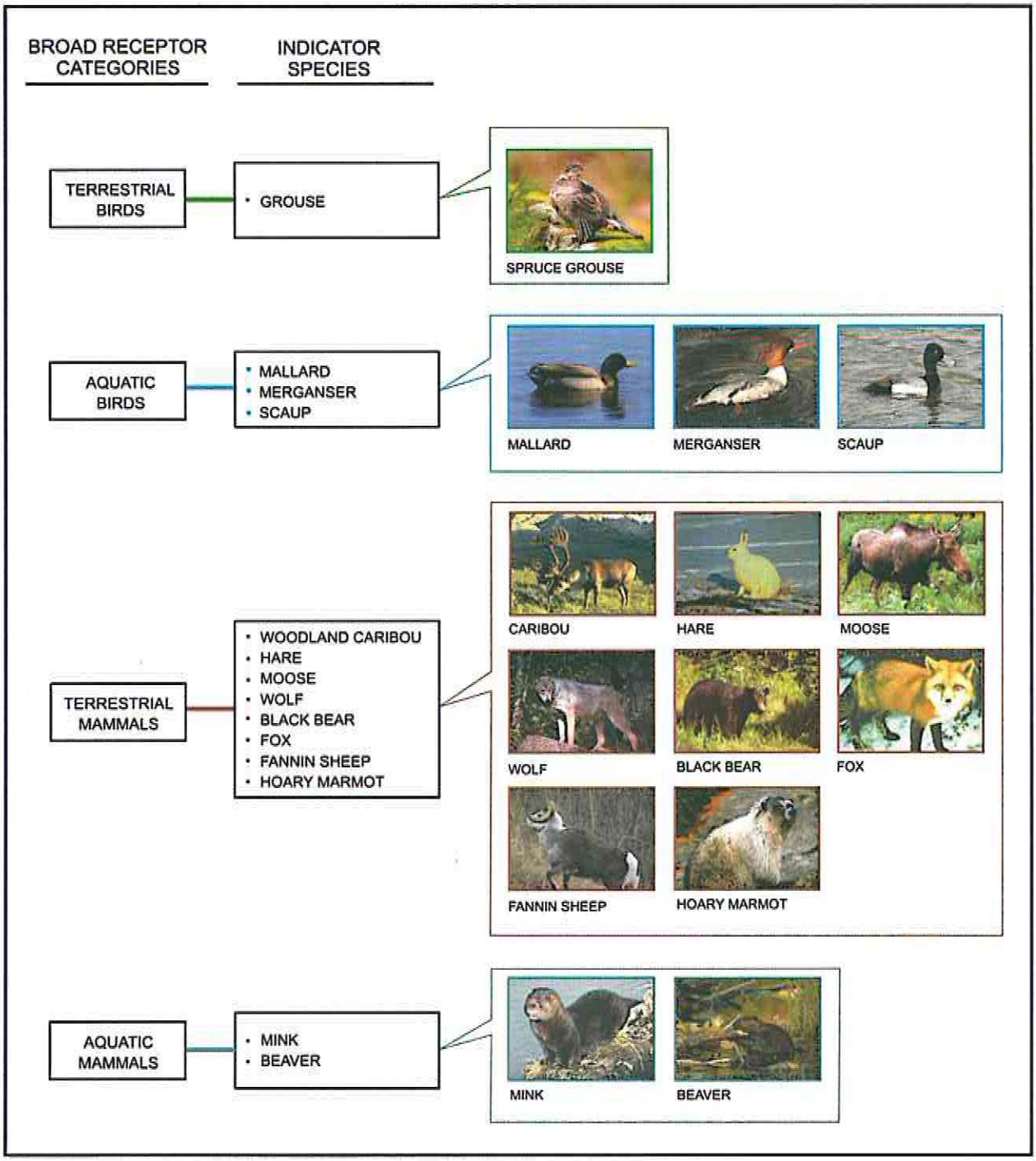


Figure 3.3 Potential Pathways of Exposure for Caribou, Grouse, Hare, Marmot and Sheep

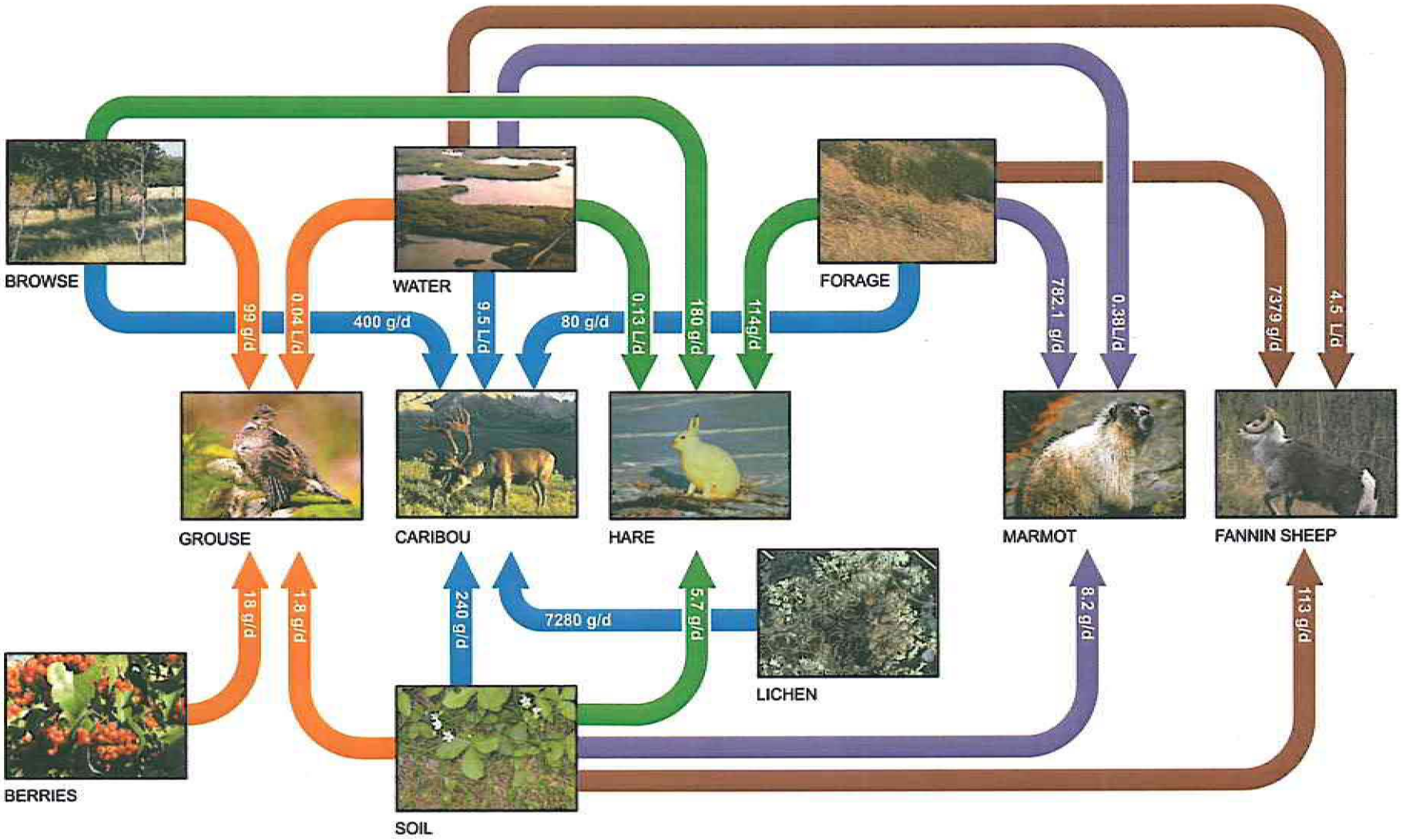


Figure 3.4 Potential Pathways of Exposure for Black Bear, Fox and Wolf

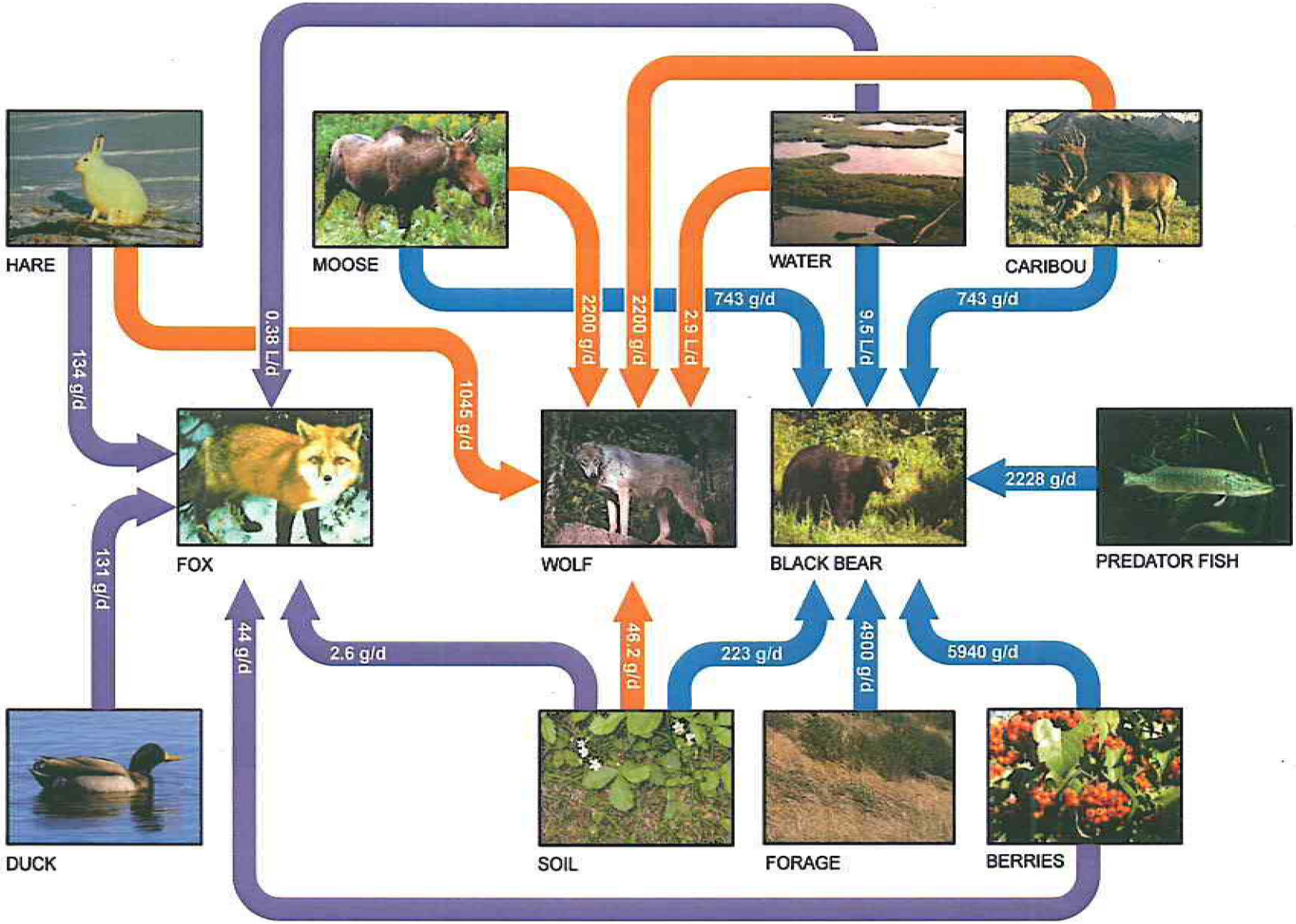


Figure 3.5 Potential Pathways of Exposure for Mallard, Merganser and Scaup

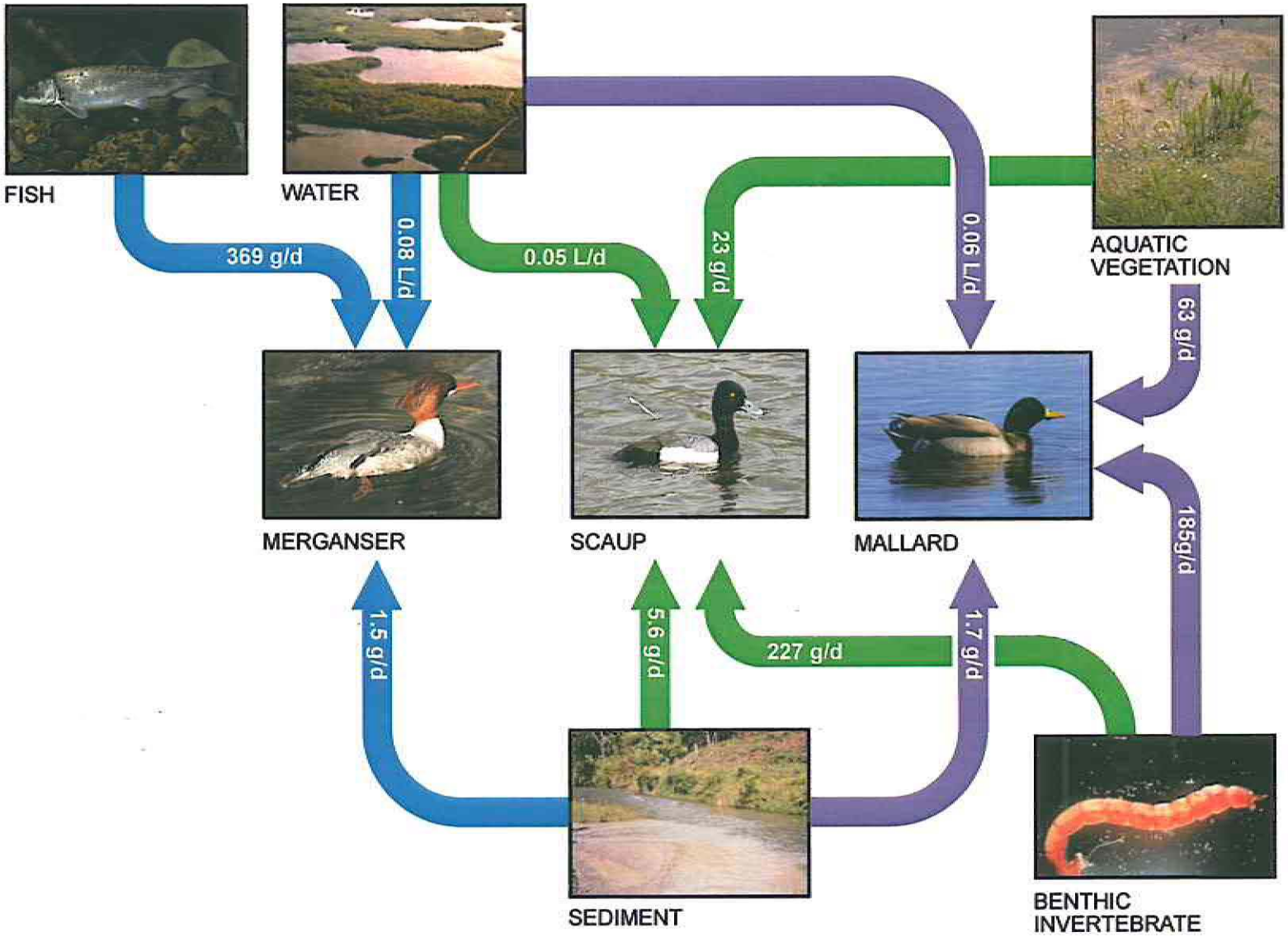


Figure 3.6 Potential Pathways of Exposure for Mink, Moose and Beaver

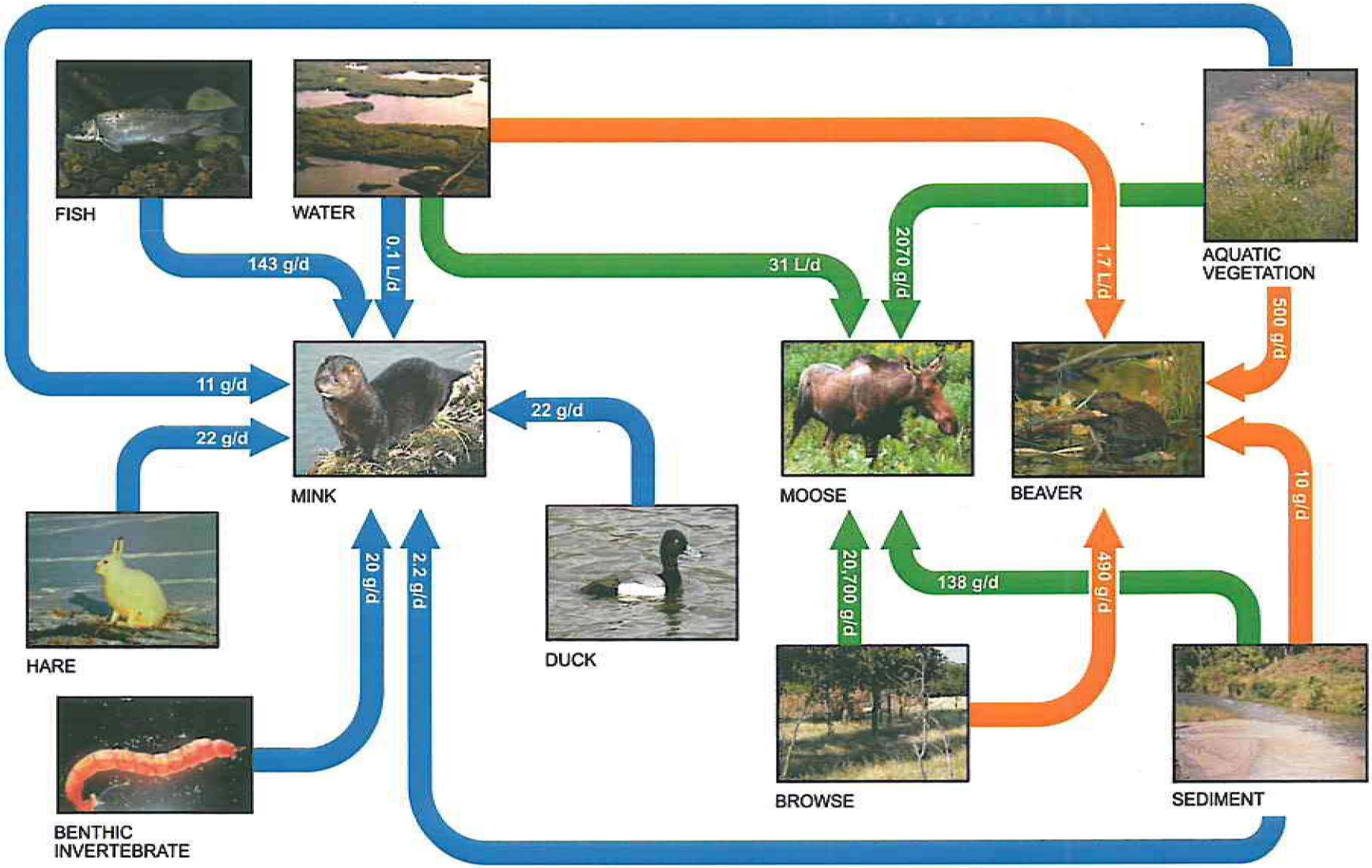


Figure 3.7 Locations Considered in Terrestrial Assessment

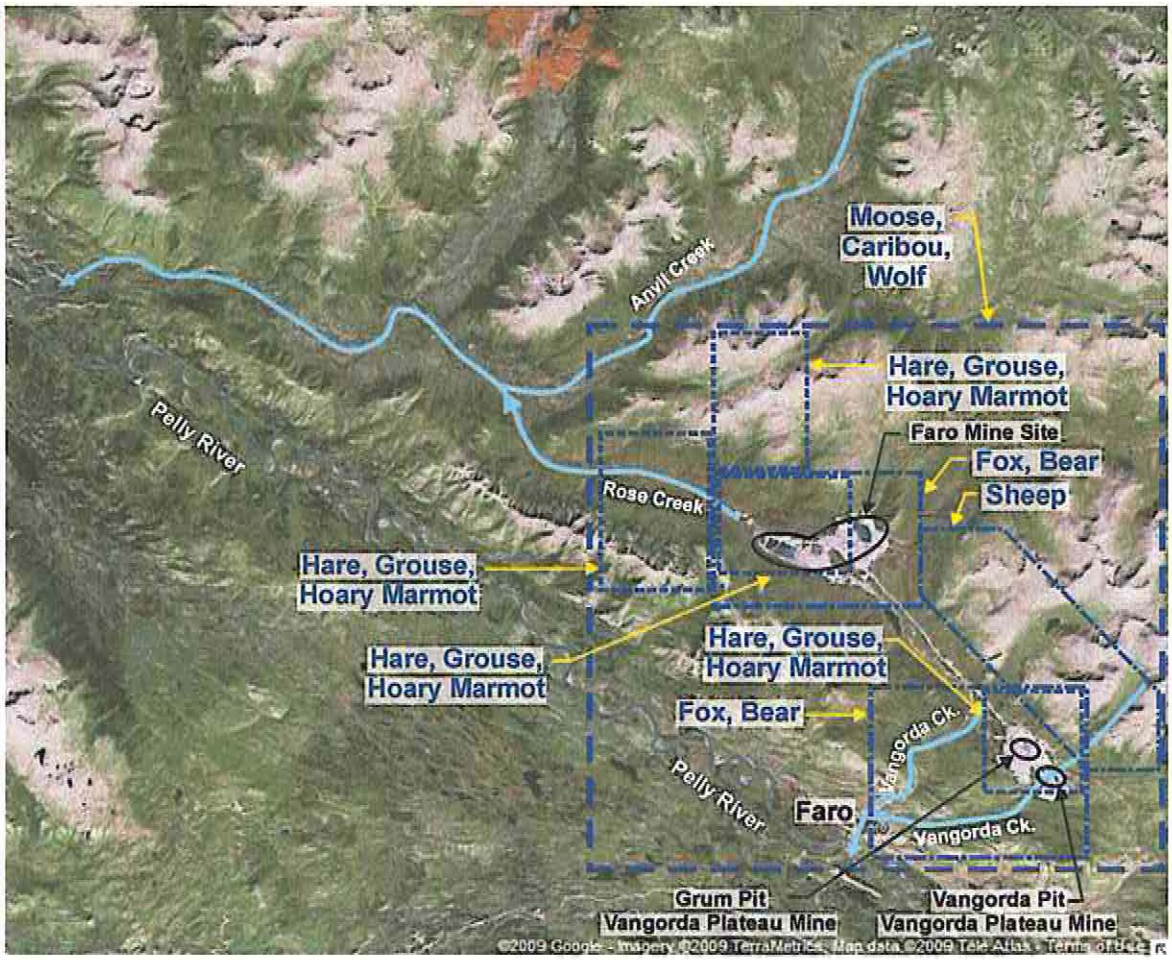


Table 3.2 also identifies areas where the various terrestrial receptors were considered to be present. These areas are shown on Figure 3.7. The areas were chosen based on the metal levels present in the soils and vegetation and consideration of the home range of the species. With exception of the large mammals, which were considered to be exposed to site-wide average values, all other terrestrial receptors (i.e. smaller animals) were placed at background locations as well as at exposed locations (or areas). Table 3.3 provides a more detailed summary of the exact locations of the water, soil and vegetation used for the various terrestrial receptors.

For small local mammals and terrestrial birds, five areas of concern at the Faro Mine Complex were identified as shown in Figure 3.7: Background (around Swim Lake), Van-S (around Grum Mine Site), Faro-S (around Faro Mine Site), Faro-N (north of Faro-S) and Faro-W (west of Faro-S).

Larger areas were considered for the medium ranging mammals (see Figure 3.7): Van-M (larger than and including Van-S) and Faro-M (larger than and including Faro-S) and Background (same as the background used for small local mammals).

For aquatic animals and birds, five areas of concern were considered: Rose Creek Upstream, Rose Creek Downstream, Vangorda Creek Upstream, Vangorda Creek Downstream and Pelly River at Crossing.

The Mount Mye area and the area around the Vangorda/Grum site were used for assessing the risk for Fannin sheep (see Figure 3.7).

Large broad ranging mammals were assumed to be at the site for only a portion of the year as their home range is much larger than the size of the Faro Mine Complex site.

Table 3.2 Exposure Characteristics Assumed for Terrestrial Ecological Receptors at Faro Mine Complex

Receptor	Pathways of Exposure	Area of Concern for Ecological Assessment	Fraction of time at site	Home Range
Bear	Water, soil, herbaceous vegetation, berries, fish, moose, caribou	Background Van-M Faro-M	1.0	20 km^2 (2.6 to 155 km^2) [a]
Beaver	Water, sediment, terrestrial vegetation, aquatic vegetation	Rose Creek upstream and downstream Vangorda Creek upstream and downstream Pelly River upstream and at Pelly Crossing	1.0	0.04 km^2 (varies throughout the year from 0.25 ha to 10 ha; focussed on waters edge) [b]
Woodland Caribou	Water, soil, summer forage, browse, lichen	Site-wide (not including background)	0.5	250 km^2 [c]
Fox	Water, soil, berries, duck, hare	Background Van-M Faro-M	1.0	6 km^2 (4 to 8 km^2 around den site) [d]
Grouse	Water, soil, browse, berries	Background Van-S Faro-N Faro-S Faro-W	1.0	0.2 km^2 (no migration - resident year round; 0.04 to 0.40 km^2) [e]
Hare	Water, soil, browse, herbaceous vegetation	Background Van-S Faro-N Faro-S Faro-W	1.0	0.08 km^2 (6 to 10 ha) [d]

Table 3.2 Exposure Characteristics Assumed for Terrestrial Ecological Receptors at Faro Mine Complex (Cont'd)

Receptor	Pathways of Exposure	Area of Concern for Ecological Assessment	Fraction of time at site	Home Range
Hoary Marmot	Water, soil, herbaceous vegetation	Background Van-S Faro-N Faro-S Faro-W	1.0	0.09 km^2
Mallard	Water, sediment, benthic invertebrates, aquatic vegetation	Rose Creek upstream and downstream Vangorda Creek upstream and downstream Pelly River upstream and at Pelly Crossing	0.5	5.8 km^2 [f] (home range in spring - possibly in area from Mar/Apr/May to Sept/Oct/Nov)
Merganser	Water, sediment, fish	Rose Creek upstream and downstream	0.5	Possibly in area from April to Sept/Oct
Mink	Water, sediment, aquatic vegetation, benthic invertebrates, duck, fish, hare	Rose Creek upstream and downstream Vangorda Creek upstream and downstream Pelly River upstream and at Pelly Crossing	1.0	0.14 km^2 [f] (7.8 to 20.4 ha depending on vegetation)
Moose	Water, sediment, browse, aquatic vegetation	Site-wide (not including background)	1.0	60 km^2 [g] (15 to to 100 km^2)
Scaup	Water, sediment, benthic invertebrates, aquatic vegetation	Rose Creek upstream and downstream Vangorda Creek upstream and downstream Pelly River upstream and at Pelly Crossing	0.5	0.89 km^2 [f] (possibly in area from Apr/May to Sept/Oct)
Sheep	Water, soil, herbaceous vegetation	Mount Mye and Vangorda/Grum site	1.0	Resident in the area year-round
Wolf	Water, soil, moose, caribou, hare	Site-wide (not including background)	0.25	1000 km^2 (100 to 2500 km^2) [h]

Notes:

a Home range for a female bear can range between 2.6 km^2 to 40 km^2; the home range for a male bear can range from 21 km^2 to 155 km^2 (American Bear Association 2003).

b Wheatley 1994; Kent Wildlife Trust (2003). c Rock (1992). d Hinterland Who's Who (Canadian Wildlife Service 2005).

e Home range for a female grouse is from 0.16 km^2 to 0.40 km^2; home range for a male grouse is from 0.04 km^2 to 0.20 km^2 (North Carolina State University 1995).

f U.S. EPA (1993).

g In northern Saskatchewan, it is reported that moose may range over 25 to 100 km^2 (Cameco 2004). Home range studies based on radio-collared individuals were reported to average 59 km^2 for the Copper River Delta in south-central Alaska (MacCracken et al. 1997). In more southerly regions such as Idaho, the home range for female moose has been observed to range from 15.5 to 25.9 km^2, and for male from 31 to 51.8 km^2 (Pierce and Peek 1984).

h In Alaska, the home range may include some 200 to 600 square miles (520-1560 km^2) of habitat (Woodland 2005). Home range is 100 to 2500 km^2 (Resources Inventory Committee 1998).

Table 3.3 Summary of Locations Evaluated in Terrestrial Assessment

Receptor	Area of Concern	Pathways of Exposure
Bear	Background	water and fish from Pelly River U/S soil, forage and berries from Background area
	Faro-M	water and fish from Rose Creek D/S soil, forage and berries from Faro-M
	Van-M	water and fish from Vangorda Creek D/S soil, forage and berries from Van-M
Beaver	Rose Creek U/S	water, sediment and aquatic vegetation from Rose Creek U/S browse from background
	Rose Creek D/S	water, sediment and aquatic vegetation from Rose Creek D/S browse from Faro-M
	Vangorda Creek U/S	water, sediment and aquatic vegetation from Vangorda Creek U/S browse from background
	Vangorda Creek D/S	water, sediment and aquatic vegetation from Vangorda Creek D/S browse from Van-M
	Pelly River U/S	water, sediment and aquatic vegetation from Pelly River U/S browse from Van-M
	Pelly River at Crossing (Existing Conditions)	water, sediment and aquatic vegetation from Pelly River at Crossing browse from Van-M
	Pelly River D/S Vangorda Creek (Final Closure and Remediation Plan)	water, sediment and aquatic vegetation from Pelly River D/S Vangorda Creek browse from Van-M
	Pelly River D/S Anvil Creek (Final Closure and Remediation Plan)	water, sediment and aquatic vegetation from Pelly River D/S Anvil Creek browse from Van-M
Caribou	Site-Wide	water from the average of the five aquatic areas soil, lichen, forage and browse from site-wide average
Fox	Background	water and ducks from Pelly River U/S soil, berries and hare from Background area
	Faro-M	water and ducks from Rose Creek D/S soil and berries from Faro-M; hare from Faro-S
	Van-M	water and ducks from Vangorda Creek D/S soil and berries from Van-M; hare from Van-S
Grouse	Background	water from Pelly River U/S soil, berries and browse from Background area
	Faro-S	water from Rose Creek D/S soil, berries and browse from Faro-S
	Faro-N	water from Rose Creek D/S soil, berries and browse from Faro-N
	Faro-W	water from Rose Creek D/S soil, berries and browse from Faro-N
	Van-S	water from Vangorda Creek D/S soil, berries and browse from Van-S

Table 3.3 Summary of Locations Evaluated in Terrestrial Assessment (Cont'd)

Receptor	Area of Concern	Pathways of Exposure
Hare	Background	water from Pelly River U/S soil, forage and browse from Background area
	Faro-S	water from Rose Creek D/S soil, forage and browse from Faro-S
	Faro-N	water from Rose Creek D/S soil, forage and browse from Faro-N
	Faro-W	water from Rose Creek D/S soil, forage and browse from Faro-N
	Van-S	water from Vangorda Creek D/S soil, forage and browse from Van-S
Hoary Marmot	Background	water from Pelly River U/S soil and forage from Background area
	Faro-S	water from Rose Creek D/S soil and forage from Faro-S
	Faro-N	water from Rose Creek D/S soil and forage from Faro-N
	Faro-W	water from Rose Creek D/S soil and forage from Faro-N
	Van-S	water from Vangorda Creek D/S soil and forage from Van-S
Mallard	Rose Creek U/S	water, sediment, benthic and aquatic vegetation from Rose Creek U/S
	Rose Creek D/S	water, sediment, benthic and aquatic vegetation from Rose Creek D/S
	Vangorda Creek U/S	water, sediment, benthic and aquatic vegetation from Vangorda Creek U/S
	Vangorda Creek D/S	water, sediment, benthic and aquatic vegetation from Vangorda Creek D/S
	Pelly River U/S	water, sediment, benthic and aquatic vegetation from Pelly River U/S
	Pelly River at Crossing (Existing Conditions)	water, sediment, benthic and aquatic vegetation from Pelly River Crossing
	Pelly River D/S Vangorda Creek (Final Closure and Remediation Plan)	water, sediment, benthic and aquatic vegetation from Pelly River D/S Vangorda Creek
	Pelly River D/S Anvil Creek (Final Closure and Remediation Plan)	water, sediment, benthic and aquatic vegetation from Pelly River D/S Anvil Creek
Merganser	Rose Creek U/S	water, sediment and fish from Rose Creek U/S
	Rose Creek D/S	water, sediment and fish from Rose Creek D/S
	Vangorda Creek U/S	water, sediment and fish from Vangorda Creek U/S
	Vangorda Creek D/S	water, sediment and fish from Vangorda Creek D/S
	Pelly River U/S	water, sediment and fish from Pelly River U/S
	Pelly River at Crossing (Existing Conditions)	water, sediment and fish from Pelly River Crossing
	Pelly River D/S Vangorda Creek (Final Closure and Remediation Plan)	water, sediment and fish from Pelly River D/S Vangorda Creek
	Pelly River D/S Anvil Creek (Final Closure and Remediation Plan)	water, sediment and fish from Pelly River D/S Anvil Creek

Table 3.3 Summary of Locations Evaluated in Terrestrial Assessment (Cont'd)

Receptor	Area of Concern	Pathways of Exposure
Mink	Rose Creek U/S	water, sediment, aquatic vegetation, benthic, fish and ducks from Rose Creek U/S hare from background
	Rose Creek D/S	water, sediment, aquatic vegetation, benthic, fish and ducks from Rose Creek D/S hare from Faro-S
	Vangorda Creek U/S	water, sediment, aquatic vegetation, benthic, fish and ducks from Vangorda Creek U/S hare from background
	Vangorda Creek D/S	water, sediment, aquatic vegetation, benthic, fish and ducks from Vangorda Creek D/S hare from Van-S
	Pelly River U/S	water, sediment, aquatic vegetation, benthic, fish and ducks from Pelly River U/S hare from background
	Pelly River at Crossing (Existing Conditions)	water, sediment, aquatic vegetation, benthic, fish and ducks from Pelly River at Crossing hare from Van-S
	Pelly River D/S Vangorda Creek (Final Closure and Remediation Plan)	water, sediment, aquatic vegetation, benthic, fish and ducks from Pelly River D/S Vangorda Creek hare from Van-S
	Pelly River D/S Anvil Creek (Final Closure and Remediation Plan)	water, sediment, aquatic vegetation, benthic, fish and ducks from Pelly River D/S Anvil Creek hare from Faro-S
Moose	Site-Wide	water, sediment and aquatic vegetation from the average of the five aquatic areas browse from site-wide average
Scaup	Rose Creek U/S	water, sediment, benthic and aquatic vegetation from Rose Creek U/S
	Rose Creek D/S	water, sediment, benthic and aquatic vegetation from Rose Creek D/S
	Vangorda Creek U/S	water, sediment, benthic and aquatic vegetation from Vangorda Creek U/S
	Vangorda Creek D/S	water, sediment, benthic and aquatic vegetation from Vangorda Creek D/S
	Pelly River U/S	water, sediment, benthic and aquatic vegetation from Pelly River U/S
	Pelly River at Crossing (Existing Conditions)	water, sediment, benthic and aquatic vegetation from Pelly River Crossing
	Pelly River D/S Vangorda Creek (Final Closure and Remediation Plan)	water, sediment, benthic and aquatic vegetation from Pelly River D/S Vangorda Creek
	Pelly River D/S Anvil Creek (Final Closure and Remediation Plan)	water, sediment, benthic and aquatic vegetation from Pelly River D/S Anvil Creek
Sheep	Mount Mye and Vangorda/Grum area	water from average of Vangorda Creek U/S and Vangorda Creek D/S soil and forage from Mount Mye area
Wolf	Site-Wide	water from the average of the five aquatic areas soil, moose and caribou from site-wide average; hare from the average of the five terrestrial areas for small local mammals

3.2 HUMAN RECEPTORS

A report from Weinstein (1992) indicates that in the 1990's the mine/townsite area was used for gathering activities. This activity stemmed from a fire which destroyed the Faro townsite in 1969 that promoted an abundance of berry producing plants and fire-killed timber. Hunting activities also occur at the site and surrounding area; however, there is a lack of fishing on the mine site creeks including Anvil Creek and creeks near the townsite. This is similar to information collected on the current usage of the site by AECOM/Gartner Lee. Based on the activities at the site discussed in the report by Weinstein (1992), this assessment considered the potential for adverse effects on hypothetical individuals who would camp at the site while hunting and gathering. It was assumed that the time that a hypothetical camper might spend on-site would encompass the time frame that trappers and other occasional users might be on the site.

A traditional knowledge (TK) study was carried in August 2008 out as part of the closure studies (Selkirk First Nation 2008). As part of the TK study, about 45% of the respondents noted that they used the vicinity of the Faro Mine site for various activities. It was noted that hunting was considered as the primary activity and fishing was considered as a close second. Gathering of berries, medicinal plants and mushrooms were also considered important when they were in season. Harvesting occurs in July, August and September. There are some established fish camps on the Pelly River near Pelly Crossing and the length of stay when out on the land varied from 4 to 5 days to 1 to 2 months depending on the activity. The average stay at fish camps was 10 to 14 days and longer stays were necessary for trapping or for drying meat and fish.

Based on the TK knowledge, the assumptions for the existing conditions were developed. For the existing conditions it was assumed that no one would camp on site and that fish camps would be located on Pelly River at Pelly Crossing and at Pelly River above Vangorda Creek. For the final closure and remediation plan, it was assumed that hypothetical individuals who would camp at the site while hunting and gathering. It was assumed that the time that a hypothetical camper might spend on-site would be similar to the times that people reported staying on the land in the TK study. An adult, child and toddler were considered in the assessment. The assessment of the final closure and remediation plan was carried out for campers on the Rose Creek watershed and the Vangorda Creek watershed separately. Based on the TK study, it was assumed that for both existing conditions and the final closure and remediation plan thatindividuals would be on the land for approximately 1.5 months of the year. As discussed in the TK study this represents a conservative estimate of the time spent on the land and would encompass trapping and drying meat and fish.

Based on the TK report, it was assumed that fishing only occurred on the Pelly River in the existing conditions. For the final closure and remediation plan, it was assumed that fishing activities would be carried out in both the Rose Creek and Vangorda Creek watersheds. In the past, fishing for Arctic grayling occurred in the freshwater reservoir which no longer exists. There are also references to miners fishing on the N. Fork of Rose Creek in the evenings at the pond above the haul road. The annual fisheries monitoring work has reported good angling for Arctic grayling at various locations and therefore it is reasonable to assume that a limited amount of fishing will occur on Rose Creek and Vangorda Creek. It was assumed that fishing would occur at the mouth of Rose Creek and at V8 on Vangorda Creek.

Dietary data from a regional survey of First Nations people in the Yukon were used to define the dietary characteristics for campers who would be present at the Faro Mine Complex. The TK study indicates that people consume moose and fish primarily and that when they went on the land that they took bottled water since they were concerned about pollution and *Giardia* in the water. No one indicated that they drank water from the Pelly River. Other exposure data, such as drinking water consumption and body weight, were obtained from a survey of the general Canadian population and are acceptable for use in the current assessment.

Chapter 4 provides a detailed discussion on the receptor locations and dietary characteristics of the hypothetical campers considered in the assessment.

3.2.1 Pathways Considered

The human exposure analysis focused on the pathways as shown on Figure 3.8. They include:

- consumption of drinking water containing COPC from Pelly River, Vangorda Creek or Rose Creek by humans (conservative assumption based on TK study);
- consumption of measured caribou flesh by humans;
- consumption of measured moose flesh by humans;
- uptake by sheep of COPC from water, soil and vegetation and consumption of sheep flesh by the human receptors;
- uptake by snowshoe hare of COPC from water, soil and vegetation and consumption of hare flesh by the human receptors;
- uptake by hoary marmot of COPC from water, soil and vegetation and consumption of marmot flesh by the human receptors;
- uptake by grouse of COPC from water, soil and vegetation and consumption of grouse flesh by humans;

- uptake by beaver of COPC in water, sediments and vegetation and consumption of beaver flesh by humans;
- uptake by duck of COPC in water, sediment, benthic invertebrates and vegetation and consumption of duck flesh by humans;
- uptake by fish of COPC from the aquatic environment (Pelly River, Vangorda Creek or Rose Creek) and consumption of fish flesh by humans;
- uptake of COPC in soil by berries/medicinal plants and consumption of berries/medicinal plants by humans; and,
- inadvertent ingestion of soil containing COPC and dermal contact with soil by humans.

There are no pathways for contamination to intersect groundwater that could potentially be used for drinking water; therefore, the groundwater pathway was not evaluated.

As indicated by Health Canada (2004a) in their PQRA Manual, the fugitive dust pathway (airborne respirable dust) is *"generally insignificant relative to direct ingestion of soil and water and to dermal absorption"*; therefore, this pathway was not considered in the assessment.

3.2.2 Location of Receptors and Time Spent On-Site

Based on the report by Weinstein (1992), an approximate pattern of land use and time spent at the Faro Mine Complex in the 1980's and 1990's was determined. Figure 3.9 provides a diagram of this pattern. As seen in the figure, no fishing occurs on the Faro Mine Complex; however, gathering and hunting/trapping activities occur on site. The TK study indicated that people stay out on the land for as long as 1 to 2 months, therefore, for purposes of this assessment it was assumed that individuals could potentially be present at the site for 1.5 months of the year. It was assumed that individuals would fish in the Pelly River and in the future, after remediation at the site, it was assumed that individuals would fish on Vangorda Creek (V8) and Rose Creek (mouth) and they would potentially camp at the Faro Mine Complex.

Figure 3.8 Potential Pathways of Exposure for Human Receptors

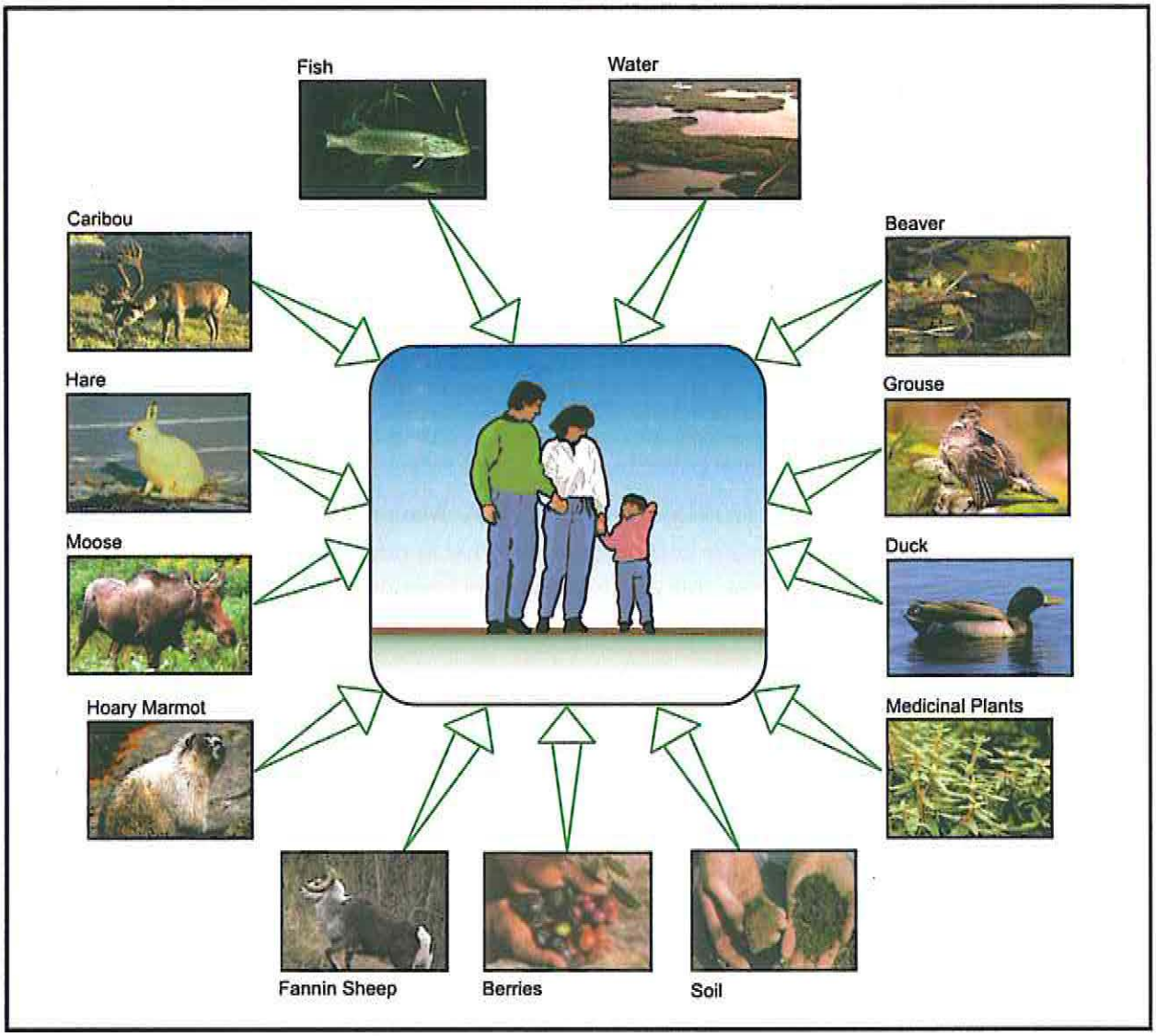
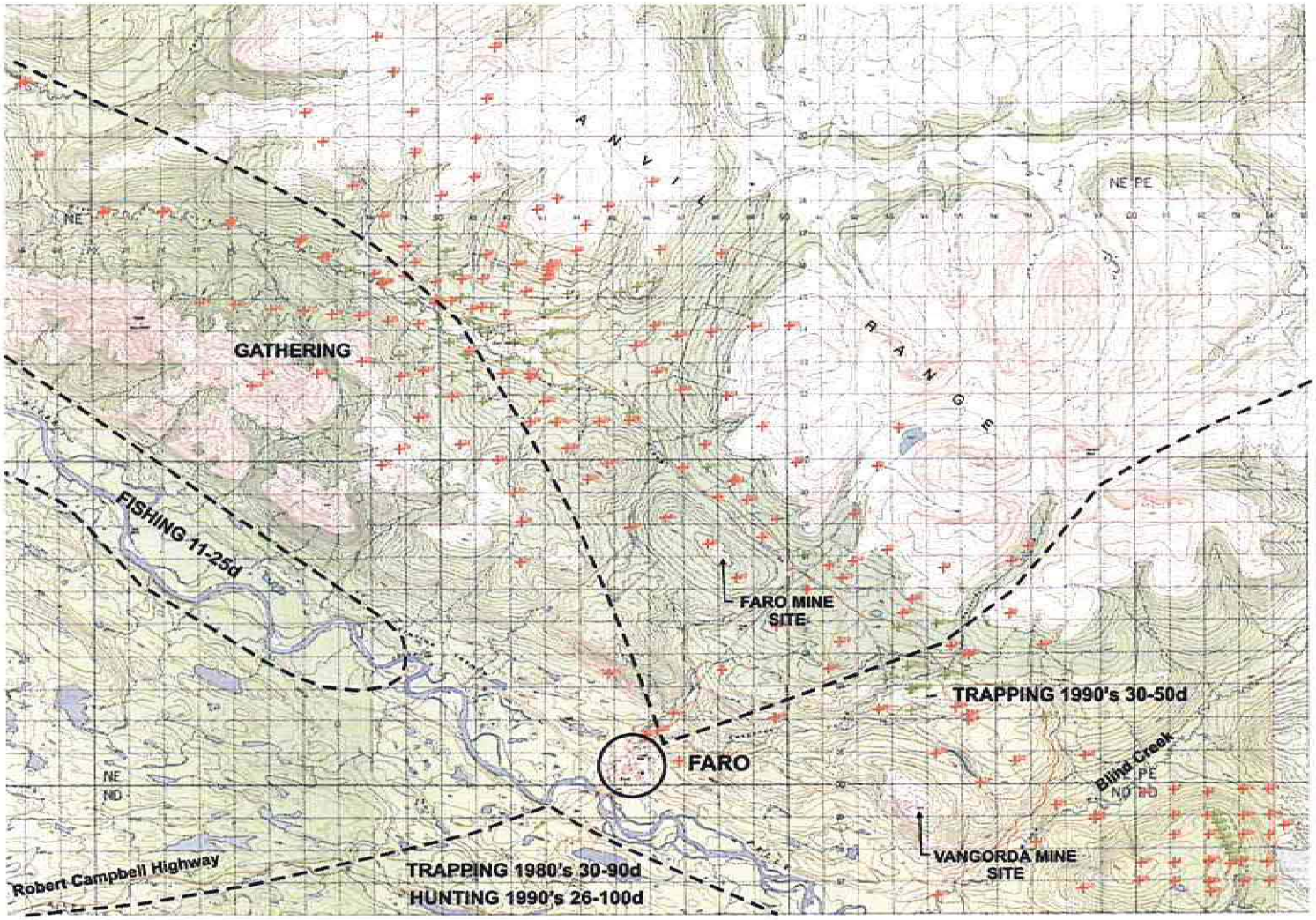


Figure 3.9 Land Use Map of Faro Mine Complex



The assessment assumes that all of these activities (hunting, trapping, gathering, fishing) occur at the same time; however, hunting and trapping generally occur in the fall and winter time and possibly spring whereas gathering, fishing and inadvertent ingestion of soil occur during the summer months. For the purposes of this assessment, it was assumed that some meat and fish would be taken from the Faro Mine Complex site and its vicinity and consumed by individuals over a six-month period whereas drinking water and soil exposure would only occur over the 1.5 month at the site. As noted in the TK study, no one drinks from the Pelly River, so the drinking water assumption is a very conservative estimate of exposure.

Table 3.4 provides a summary of the receptors considered in the assessment, the location of the various dietary components based on the information from the TK study (Selkirk First Nation 2008) and Weinstein (1992) and the terrestrial locations provided in Figure 3.7. Based on these studies it was assumed that, fish camps would be located on Pelly River at Pelly Crossing and at Pelly River above Vangorda Creek for the existing conditions. Both groups are assumed to get water and fish from the Pelly River as it is reported that fishing does not occur on the site. It was assumed that small mammals are trapped in the areas of highest contamination and that berries and medicinal plants are gathered in a larger area around the camp. The moose and caribou were considered at the measured concentrations. For the final closure and remediation plan, it was assumed that campers would be present in the Rose and Vangorda Creek watersheds and the assumptions are provided in Table 3.4.

Table 3.4 Location of the Various Dietary Components for the Human Receptors

Receptor	Drinking Water	Fish/Ducks	Large Mammals	Small Mammals	Sheep	Berries/Medicinal Plants	Soil	Time on Site
Existing Conditions								
Camper 1	Pelly River at Pelly Crossing	Pelly River at Pelly Crossing	Site Wide	Faro S	Sheep (Mt Mye)	Faro S/M/N/W	Faro W	1.5
Camper 2	Pelly River above Vangorda Creek (Background)	Pelly River above Vangorda Creek (Background)	Yukon Background	Background	Sheep (Mt Mye)	Background	Background	1.5
Final Closure and Remediation Plan								
Camper 3	Mouth of Rose Creek	Fish: Mouth of Rose Creek Ducks: Rose Creek Downstream (X14)	Site Wide	Faro S	Sheep (Mt Mye)	Faro S/M/N/W	Faro W	1.5
Camper 4	Vangorda Creek downstream (V8)	Vangorda Creek downstream (V8)	Site Wide	Van S	Sheep (Mt Mye)	Van M	Van M	1.5

3.2.3 Assumed Dietary Characteristics

The dietary characteristics for the assessment were based on a study of Yukon First Nations communities in 1998. It is acknowledged that this information was not collected for the purposes of this assessment; however, it is the best information available at present for conducting a quantitative assessment. Assumptions regarding the intakes of the adult, child and toddler receptors are outlined below.

Distributions were developed for human dietary intake characteristics for the Faro Mine Complex assessment using data provided by Receveur *et al.* (1998), Richardson (1997), Health Canada (1994), the U.S. EPA (1997a) and the Ontario Ministry of the Environment (2001).

3.2.3.1 Food Consumption

Traditional and market food intake rates for the Yukon First Nations' group were derived from Receveur *et al.* (1998). The use of region-specific dietary intake rates was deemed more appropriate than the use of other data sources and methods to estimate traditional and market food intakes, and is associated with less uncertainty.

Receveur *et al.* (1998) collected dietary intake data using methods including food frequency questionnaires and 24-hour recall surveys administered by trained interviewers during the late winter and fall of 1995. Ten communities in the Yukon participated in the study, including Dawson City, Mayo, Carmacks, Ross River, Watson Lake, Lower Post, Beaver Creek, Burwash Landing, Carcross and Atlin. Only adults in the communities were sampled, and included both men and women divided into age categories including ages 20-40, ages 41-60 and 61+ years.

Traditional food intake rates were available for both consumers only (people who only eat traditional foods) and consumers and non-consumers (people who eat a mixture of store bought food and traditional food). Rates for consumers and non-consumers provide an average estimate for the community, while rates for consumers only provide an upper bound on the average estimate for the community. Intake rates for both groups were derived for this assessment.

To derive average traditional food intake rates for an adult at Faro Mine Complex, rates provided by Receveur *et al.* (1998) were first averaged for both sexes over the three adult age groups for which data were available. Traditional food items were subsequently grouped into categories including meat and poultry, fish, and berries in order to calculate intake rates for these based on a summation of the group items. The food groupings chosen were those typically used in Canadian total diet studies (Richardson 1997, Health Canada 2005).

Traditional food items in the meat and poultry group contained some items for which concentrations of COPC could not be estimated in the risk assessment, such as moose bone marrow and heart. The amount consumed of each of these items was counted nonetheless so as not to under-estimate intake of traditional foods. However, it was assumed that the metals content of these items was the same as that in the flesh of the animal under consideration; this would provide an underestimate of the COPC intake as organs generally contain higher concentrations of COPC. A sensitivity analysis was performed to determine the effect of organ consumption.

The intake for a child was estimated assuming that the ratio of child to adult of a particular category of food for the general population (Richardson 1997) could be applied to the information for the Yukon First Nations region. A similar ratio was used to determine toddler intakes.

Table 3.5 provides the average traditional food intake rates (people who eat traditional food and a mixture of store bought food) derived from Receveur *et al.* (1998) for a Yukon First Nation adult, child and toddler.

Total meat and fish intake rates were derived for risk assessment purposes, as well as fractions of the intake rate attributable to different traditional foods. This rate is presented in Table 3.5 and the fractions are presented in Table 3.6.

Table 3.5 Intake of Traditional Foods for Yukon First Nation

Food Category	Mean Intake Rate (g/d)		
	Adult	Child	Toddler
Meat and poultry	173	128	90
Fish and shellfish	21.6	17.5	10.8
Berries/Fruit	1.63	1.78	1.57
Total meat and fish	195	145	101

Source: Receveur *et al.* 1998

Table 3.6 Composition of Different Fractions of Meat and Fish Intake for Yukon First Nation

Traditional Food Item	Dietary Fraction
Fraction that is caribou	0.06
Fraction that is moose	0.75
Fraction that is dall sheep	0.004
Fraction that is hare	0.03
Fraction that is hoary marmot	0.02
Fraction that is poultry	0.01
Fraction that is beaver	0.02
Fraction that is fish	0.11

Source: Receveur *et al.* 1998.

Table 3.7 provides the traditional food intake rates for consumers only derived from Receveur *et al.* (1998) for a Yukon First Nations adult, child and toddler.

Again, a total meat and fish intake rate was also derived for risk assessment purposes, as well as fractions of the intake rate attributable to different traditional foods. This rate is presented in Table 3.7 and the fractions are presented in Table 3.8.

Table 3.7 Intake of Traditional Foods for Yukon First Nation (Consumers of Traditional Food Only)

Food Category	Mean Intake Rate (g/d)		
	Adult	Child	Toddler
Meat and poultry	3790	2804	1971
Fish and shellfish	2086	1690	1043
Berries/Fruit	677	738	541
Total meat and fish	5876	4494	3014

Source: Receveur *et al.* 1998

Table 3.8 Composition of Different Fractions of Meat and Fish Intake for Yukon First Nation (Consumers of Traditional Food Only)

Traditional Food Item	Dietary Fraction
Fraction that is caribou	0.05
Fraction that is moose	0.36
Fraction that is dall sheep	0.03
Fraction that is hare	0.04
Fraction that is hoary marmot	0.02
Fraction that is poultry	0.05
Fraction that is beaver	0.11
Fraction that is fish	0.36

Source: Receveur *et al.* 1998

Intake rates for commercial market foods were also available in Receveur *et al.* (1998). Similar to the methods used for the intakes of traditional foods, adults of different age groups were interviewed regarding their consumption of market food using 24-hour dietary recall surveys conducted by trained interviewers during the late winter and fall of 1995. Intake rates for individual market food items for consuming and non-consuming adults of different age groups and sexes were subsequently calculated by Receveur *et al.* (1998).

To derive average market food intake rates for an adult at the Faro Mine Complex, rates by Receveur *et al.* (1998) for the Yukon First Nation were first averaged for both sexes over the three adult age groups for which data were available. Market food items were then grouped into their respective food categories, which included milk and dairy products, meat and poultry, fish and shellfish, soups, bakery goods and cereals, vegetables, fruits and fruit juices, fats and oils, sugar and candies, beverages and miscellaneous items based on a summation of individual items in the group. The food groupings chosen were those typically used in Canadian total diet studies (Richardson 1997, Health Canada 2005). Market foods intake rates were only available for consumers and non-consumers combined (zeros in).

Again, the intake for a child was estimated assuming that the ratio of child to adult of a particular category of food for the general population (Richardson 1997) could be applied to the information for the Yukon First Nation region. A similar ratio was used to determine toddler intakes.

Table 3.9 provides the market food intake rates derived from Receveur *et al.* (1998) for a Yukon First Nation adult, child and toddler.

Table 3.9 Intake of Market Foods Based on the Yukon First Nation

Food Category	Mean Intake Rate of Market Foods (g/d)		
	Adult	Child	Toddler
Milk and dairy products	70	52	36
Meat and poultry	178	132	93
Fish and shellfish	3.5	2.8	1.7
Soups	141	104	73
Bakery goods and cereals	185	137	96
Vegetables	193	143	100
Fruit and fruit juices	63	68	60
Fats and oils	19	14	10
Sugar and candies	34	25	18
Beverages	1379	1021	717
Miscellaneous	76	56	40

Source: Receveur *et al.* 1998

As a significant amount of the beverage intake is coffee and tea, the beverage intake for the child is likely overstated.

In this assessment, the dietary intakes for people who eat a mixture of traditional foods and store bought foods were used as this seems indicative of the community around the Faro Mine Complex.

Triangular distributions were selected to represent the available data and the mean intake rates for food presented above were used for the "mode" of the triangular distribution. To derive minimum food intake rates for an adult at Faro Mine Complex, the minimum rate by Receveur *et al.* (1998) was selected from both sexes over the three adult age groups for which data were available. Traditional food items were subsequently grouped into categories including meat and poultry, fish, and berries in order to calculate total minimum intake rates for these based on a summation of the group items. The food groupings chosen were compatible with those typically used in Canadian total diet studies (Richardson 1997, Health Canada 2005). Similarly, the maximum food intake rate was determined using the maximum rate from both sexes over the three adult age groups, and the maximum values for each food category were summed to represent a maximum total food intake for the food group. The minimum and maximum values for the child and toddler were determined using the assumed ratios of child to adult intakes and toddler to adult intakes (Richardson 1997).

3.2.3.2 Medicinal Tea Intake

First Nations People generally use Labrador tea and other teas made from natural plants for medicinal purposes. The Yukon dietary survey (Receveur *et al.* 1998), for the area only, indicated that in the winter 12% of the population consumes Labrador Tea 1.2 days/week and in the summer 23% of the population consumes Labrador Tea 1.4 days/week. This equates to an average Labrador Tea consumption of 1.3 days per week. The survey does not provide the amount of Labrador tea or other medicinal teas that are consumed.

In an attempt to determine the amount of medicinal tea consumed by members of the community, a web search was undertaken. The web search indicated that "*Labrador Tea contains small amounts of the toxin andromedotoxin which can cause headaches, cramps, paralysis and intestinal problems if too much is consumed. As a general rule, this tea should be consumed in moderation. One cup is often considered the safe amount.*" - http://www.laurentiancenter.com/plantkey/plants/labradortea.html

Therefore, it was assumed in this assessment that an adult (70kg body weight) would consume 250 mL (1 cup) of medicinal teas for 1.3 days a week. This equates to a consumption rate of

0.17 cups/day. There was no information available on the amount of fresh Labrador tea used in the brewing process. In this assessment, it was assumed that approximately 3 g were used. This is equivalent to a bag of regular tea. A triangular distribution was established around this value with an assumed range of +/- a factor of 2 to capture a range of possible consumptions.

3.2.3.3 Water Intake

The water intakes for an adult and child were obtained from the *"Compendium of Canadian Human Exposure Factors for Risk Assessment"* (Richardson, 1997). The average water intakes for an adult, child (5 to 11 years of age) and toddler (0.5 to 4 years of age) is estimated to be 1.5 L/d, 0.8 L/d and 0.6 L/d respectively. Lognormal distribution functions (from Richardson 1997) were selected to characterize the water intakes.

3.2.3.4 Soil Intake

Soil intake rates were obtained from Health Canada (1994), the U.S. EPA (1997a) and the Ontario Ministry of the Environment (2001). The daily soil intakes reported for an adult and child range between 20 to 50 mg/d (7.3 to 18.25 g/a) and were set on a uniform distribution for the adult and child receptors. For the toddler, soil intakes range from 50 to 150 mg/d (18.25 to 54.75 g/a) and were set on a triangular distribution with a mode of 100 mg/d.

3.2.3.5 Body Weight

The body weight (bw) of a toddler, child and adult are also necessary in order to calculate a daily intake (mg/(kg (bw) d)). In this assessment, the body weights used for the toddler, child and adult receptors were 16.5 kg, 32.9 kg and 70.7 kg, respectively (Richardson 1997). Body weights were held constant in the assessment.

3.2.3.6 Summary of Receptor Characteristics

The probability distribution functions for water, soil and traditional foods and berries that were assumed to be consumed by the adult, child and toddler receptors present at the Faro Mine Complex are summarized in Table 3.10.

Table 3.10 Probability Distribution Functions for Water, Soil and Local Food Intake Rates Used for Adult, Child and Toddler

	Receptor		
	Adult	**Child**	**Toddler**
Water (L/d)	LN (1.6, 1.65, 0.6, 4.4)	LN (0.8, 1.5, 0.4, 1.8)	LN (0.6, 1.5, 0.3, 1.4)
Soil Intake (mg dw/d)	U (20, 50)	U (20, 50)	T (50, 100, 150)
Local Meat (g ww/d)			
Caribou	T (5, 12, 21)	T (3.7, 8.7, 15.8)	T (2.6, 6.1, 11.1)
Moose	T (65, 146, 263)	T (48, 108, 194)	T (34, 75.9, 137)
Sheep	T (0.0, 0.7, 2.1)	T (0.0, 0.51, 1.6)	T (0.0, 0.4, 1.1)
Hare	T (1.2, 6.1, 13.2)	T (0.9, 4.5, 9.8)	T (0.6, 3.2, 6.9)
Hoary Marmot	T (0.8, 4.1, 8.8)	T (0.6, 3, 6.5)	T (0.4, 2.1, 4.6)
Beaver	T (0.0, 3.3, 18)	T (0.0, 2.5, 13.3)	T (0.0, 1.7, 9.4)
Local Poultry (g ww/d)			
Ground birds	T (0.0, 0.7, 2.6)	T (0.0, 0.5, 2.0)	T (0.0, 0.34, 1.4)
Water birds	T (0.0, 0.3, 1.3)	T (0.0, 0.24, 1.0)	T (0.0, 0.17, 0.7)
Local Fish (g ww/d)	T (4, 21.6, 50)	T (3.2, 17.5, 40.5)	T (2, 10.8, 25)
Berries (g ww/d)	T (0.1, 1.6, 8.3)	T (0.1, 1.8, 9.1)	T (0.1, 1.6, 8.0)
Medicinal Tea (L/d)	T (0.023, 0.043, 0.085)	C (0)	C (0)
Exposure Duration (yr) – carcinogenic effects only	C (63)	C (7)	C (5)
Averaging Time (yr) – carcinogenic effects only	C (75)	C (75)	C (75)
Adherence Factor of soil to skin (kg cm^{-2} $event^{-1}$)[a]	C ($1.88x10^{-8}$)	C ($2.03x10^{-8}$)	C ($2.29x10^{-8}$)
Skin Surface Area exposed to soil (cm^2)[b]	C (9110)	C (5140)	C (3010)

Note: Adult Weight = 70.7 kg; Child Weight = 32.9 kg; Toddler = 16.5 kg
LN = Log Normal (geometric mean, geometric standard deviation, minimum, maximum)
U = Uniform (minimum, maximum)
T = Triangular (minimum, mode, maximum)
C = Constant (value)

4.0 EXPOSURE ASSESSMENT

The exposure assessment phase of an ecological and human health risk assessment entails the quantification of exposure for the selected receptors. As previously noted, the pathways of exposure considered in this assessment are related to COPC present in various media (water, soils, vegetation (aquatic and terrestrial), sediments, etc.) in the vicinity of the Faro Mine Complex. The approach and assumptions applied in this assessment are described in this chapter.

The data provided in this chapter include the estimates of the potential intakes of the COPC by ecological species exposed to COPC in the aquatic and terrestrial environments. The implications of the predicted and measured exposure levels of the COPC are discussed in Chapter 6.

4.1 PATHWAYS ANALYSIS

Exposure of the receptors described in Chapter 3 to the COPC was calculated using a pathways modelling approach. Pathways modelling combines the receptor characteristics (described in Chapter 3) with environmental media concentrations of COPC (Chapter 2) to estimate exposure of each receptor.

When measured environmental media concentrations of COPC are not available, they can be estimated using transfer factors and certain assumptions. Transfer factors are empirical values that provide a measure of the partitioning behaviour of a COPC between two environmental media. Transfer factors are available from literature sources or from site-specific measurements to describe partitioning between many different media, including water-to-fish, water-to-sediment, water-to-benthic invertebrates, food-to-animal flesh and other media.

In this assessment, site-specific transfer factors were derived for sediment, fish and browse. The calculation of site-specific distribution coefficients and transfer factors did not consider measured values that were reported as less than the analytical method detection limit. Literature derived transfer factors were used in the aquatic environment for water-to-aquatic vegetation and water-to-benthic invertebrates as no measured data were available to derive site-specific values for the Faro Mine Complex site streams. Transfer factors were used to predict concentrations of COPC in the environmental media of interest based on concentrations in receiving waters for the respective scenarios.

In the terrestrial environment, measured concentrations were available for soil, berries and forage for the existing conditions. Site-specific transfer factors were used to predict concentrations in

browse in areas where there were no measured values. It was assumed that the remedial activities related to the covering of the waste rock and tailings areas would have a minimal effect on the soil and vegetation concentrations; therefore, measured concentrations from the existing conditions were also used for the evaluation of the final closure and remediation plan. Measured caribou and moose concentrations were used since the animals were obtained from the site. Literature derived transfer factors were used for the food-flesh transfer of COPC for all other animals since site-specific data were not available.

The assumptions, equations and transfer factor values used to conduct the pathways analysis are provided in Chapter 2 and a sample calculation is provided in Appendix F.

4.2 METAL BIOAVAILABILITY

Bioavailability of a chemical can be defined as the fraction of an administered dose that reaches the central (blood) compartment, whether through the gastrointestinal tract, skin or lungs (NEPI 2000). This type of bioavailability is known as "absolute bioavailability".

In risk assessments, oral exposures are generally described in terms of an external dose or intake, as opposed to an absorbed dose or uptake. Intake occurs as an agent enters the body of a human or animal without passing an absorption barrier (e.g., through ingestion or inhalation), while uptake occurs as an agent passes across the absorption barrier (IPCS 2000). Not all materials (e.g., metals, nutrients) that enter the body as intake are absorbed into the body as uptake. Many are passed through the body and expelled without effect.

When calculating the intake via the oral route of exposure, it is customary to take into account the food, water and soil pathways. As there was insufficient information to derive site-specific bioavailability/bioaccessibility factors, it was assumed that all the COPC were 100% available from all sources. This is a highly conservative assumption as in reality the bioaccessibility of COPC from soil/sediment is generally less than 100%.

4.3 TERRESTRIAL INTAKES

Intakes of COPC by terrestrial animals were predicted based on the dietary characteristics of the respective animals. In short, the concentrations of the various COPC in different environmental media that are part of the diet of terrestrial animals are considered in their intakes. Soil/sediment ingestion as well as water ingestion were also taken into account. The general equation used to calculate each of the intake routes is as follows:

$$I_n = C_n \times IR_n \times f_{loc}/1000 \qquad (4\text{-}1)$$

Where:

I_n	=	Intake of COPC via pathway "n" where "n" can represent all exposure routes such as water, soil, vegetation (mg/d)
C_n	=	COPC concentration in "n" media (mg/kg)
IR_n	=	intake rate of "n" by the receptor (g/d, see Figures 3.3 to 3.6 or Appendix D)
f_{loc}	=	fraction of time at site (see Table 3.2)
1000	=	unit conversion (g/kg)

The intake rates by the individual pathways can be summed to provide a total intake for the receptor. Appendix F provides a sample calculation and Appendix G provides the breakdown by pathway.

4.3.1 Existing Conditions

The predicted intakes of the COPC by the various receptors are provided on Table 4.1. As seen in the table, depending on the terrestrial animal, different locations across the site were examined. These locations depended on the home range of the animal, for example, for caribou, which has a large home range, the whole site is considered, for a hare with a much smaller home, 4 different hare were evaluated on 4 different areas spanning the Vangorda and Faro mine sites . These areas were selected based on data availability and home range. Van-S is the area of highest COPC concentrations in the vicinity of the Vangorda mine workings and Faro-S is the area of highest COPC concentrations in the vicinity of the Faro mine and workings. Background (Swim Lakes area) is also considered in the assessment.

In general, as expected, intakes associated with background exposures are lower than those at the Faro Mine Complex.

4.3.2 Final Closure and Remediation Plan

The predicted intakes of the COPC by the various receptors are provided on Table 4.2 for the final closure and remediation plan. Similar to the existing conditions, different locations across the site were considered.

Predicted intakes for the final closure and remediation plan are generally lower than for the existing conditions due to lower predicted water concentrations. For copper, manganese, nickel, strontium, vanadium and zinc, predicted intakes are higher for the final closure and remediation plan than for the existing conditions.

Table 4.1 Predicted Intakes by Terrestrial Animals for Existing Conditions

	Predicted Intakes (mg/kg-d) for Terrestrial Ecological Receptors - Existing Conditions																	
COPC	Bear						Beaver											
	B		VM		FM		RC US		RC DS		VC US		VC DS		PR US		PRX	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Antimony	$7.9x10^{-3}$	$1.48x10^{-2}$	$9.10x10^{-3}$	0.02	$9.58x10^{-3}$	0.02	0.04	0.15	0.08	0.35	0.10	0.40	0.09	0.30	$4.1x10^{-4}$	$8.7x10^{-4}$	0.04	0.12
Arsenic	$4.8x10^{-3}$	$1.01x10^{-2}$	0.02	0.03	0.02	0.05	$5.50x10^{-3}$	$1.09x10^{-2}$	$1.16x10^{-2}$	0.03	$1.1x10^{-2}$	0.03	0.02	0.05	$5.0x10^{-3}$	$8.6x10^{-3}$	$9.9x10^{-3}$	0.03
Beryllium	$9.2x10^{-4}$	$1.62x10^{-3}$	$5.89x10^{-3}$	0.02	$3.06x10^{-3}$	$9.95x10^{-3}$	$6.56x10^{-4}$	$1.52x10^{-3}$	$1.79x10^{-3}$	$7.09x10^{-3}$	$5.4x10^{-4}$	$1.4x10^{-3}$	$4.5x10^{-3}$	0.02	$8.2x10^{-5}$	$1.8x10^{-4}$	$3.5x10^{-4}$	$1.0x10^{-3}$
Boron	0.27	0.51	0.42	0.54	0.31	0.56	0.14	0.34	0.13	0.21	0.14	0.34	0.25	0.85	0.14	0.34	0.25	0.84
Cadmium	0.07	0.22	0.07	0.22	0.07	0.22	0.09	0.20	0.09	0.26	0.11	0.30	0.16	0.49	0.24	0.39	0.20	0.62
Chromium	$7.7x10^{-3}$	0.02	0.02	0.04	0.02	0.05	0.02	0.07	$1.19x10^{-2}$	0.03	0.03	0.10	$1.2x10^{-2}$	0.04	$1.5x10^{-2}$	0.06	0.02	0.08
Cobalt	$5.6x10^{-3}$	$1.26x10^{-2}$	$8.74x10^{-3}$	0.02	$9.94x10^{-3}$	0.02	0.02	0.06	0.04	0.15	0.03	0.10	0.13	0.45	0.03	0.09	0.06	0.21
Copper	0.21	0.30	0.17	0.25	0.22	0.38	0.07	0.14	0.09	0.20	0.09	0.21	0.09	0.17	0.24	0.50	0.24	0.73
Lead	$2.1x10^{-2}$	0.03	0.15	0.35	1.46	4.45	0.02	0.05	0.14	0.46	0.04	0.11	0.05	0.14	0.07	0.11	0.04	0.10
Manganese	4.6	11.6	5.6	13.6	7.2	20.3	1.9	4.1	14.0	40.7	1.6	3.5	4.3	14.8	1.6	3.5	5.0	15.8
Nickel	0.02	0.04	0.05	0.08	0.03	0.08	0.02	0.08	0.05	0.11	0.03	0.10	0.04	0.09	0.02	0.06	0.07	0.17
Selenium	0.03	0.07	$1.33x10^{-2}$	0.02	$1.47x10^{-2}$	0.02	$8.11x10^{-3}$	0.02	$6.70x10^{-3}$	0.02	0.01	0.03	0.02	0.04	0.01	0.02	0.02	0.04
Silver	$4.0x10^{-3}$	$7.3x10^{-3}$	$4.1x10^{-3}$	$7.6x10^{-3}$	$5.2x10^{-3}$	$1.1x10^{-2}$	$8.4x10^{-4}$	$3.0x10^{-3}$	$1.4x10^{-3}$	$4.3x10^{-3}$	$1.5x10^{-3}$	$6.0x10^{-3}$	$9.7x10^{-4}$	$2.3x10^{-3}$	$5.4x10^{-4}$	$1.5x10^{-3}$	$9.0x10^{-4}$	$2.1x10^{-3}$
Strontium	0.60	1.4	0.36	0.57	0.96	1.9	0.96	2.7	1.3	3.9	1.1	3.2	0.96	2.7	0.24	0.77	1.4	3.9
Tin	0.02	0.03	$1.1x10^{-2}$	0.03	$1.0x10^{-2}$	0.02	$1.1x10^{-2}$	0.04	0.42	0.67	0.02	0.08	0.02	0.09	$8.8x10^{-4}$	$2.7x10^{-3}$	$5.3x10^{-3}$	$8.3x10^{-3}$
Vanadium	$9.7x10^{-3}$	0.02	0.02	0.03	0.02	0.04	0.03	0.10	0.04	0.16	0.03	0.10	0.03	0.08	$2.0x10^{-3}$	$4.4x10^{-3}$	0.19	0.69
Zinc	1.9	3.4	4.5	10.2	4.2	7.7	1.8	3.7	3.5	10.0	1.7	3.4	2.1	5.1	1.6	3.3	1.6	4.2

Notes:
B – Background
VM – Vangorda-M
FM – Faro-M
RC US – Rose Creek Upstream
RC DS – Rose Creek Downstream
VC US – Vangorda Creek Upstream
VC DS – Vangorda Creek Downstream
PR US – Pelly River Upstream
PRX – Pelly River @ Crossing

Table 4.1 Predicted Intakes by Terrestrial Animals for Existing Conditions (Cont'd)

	Predicted Intakes (mg/kg-d) for Terrestrial Ecological Receptors - Existing Conditions																	
COPC	Caribou		Fox						Grouse									
	O		B		VM		FM		B		VS		FN		FS		FW	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Antimony	$7.9x10^{-3}$	$1.5x10^{-2}$	$3.0x10^{-3}$	$5.8x10^{-3}$	$4.4x10^{-3}$	$9.0x10^{-3}$	$5.2x10^{-3}$	$1.1x10^{-2}$	0.02	0.04	0.33	1.1	0.34	1.14	0.33	1.1	0.02	0.04
Arsenic	0.03	0.10	$5.8x10^{-3}$	0.02	0.03	0.10	$1.5x10^{-2}$	0.04	0.03	0.07	0.08	0.12	0.02	0.03	0.17	0.42	0.06	0.16
Beryllium	$8.5x10^{-4}$	$1.5x10^{-3}$	$3.1x10^{-4}$	$5.9x10^{-4}$	$2.1x10^{-3}$	$6.9x10^{-3}$	$1.0x10^{-3}$	$3.0x10^{-3}$	$2.8x10^{-3}$	$4.8x10^{-3}$	$4.9x10^{-3}$	$1.2x10^{-2}$	$4.7x10^{-3}$	$1.2x10^{-2}$	$4.8x10^{-3}$	$1.2x10^{-2}$	$2.9x10^{-3}$	$5.0x10^{-3}$
Boron	0.04	0.07	0.02	0.05	0.04	0.06	0.03	0.05	1.5	3.4	6.3	20.0	1.2	4.2	2.3	7.6	0.91	1.2
Cadmium	$9.2x10^{-3}$	0.02	0.02	0.05	$9.2x10^{-3}$	0.03	$5.6x10^{-3}$	0.02	0.31	0.72	0.21	0.30	0.24	0.52	0.29	0.80	0.23	0.52
Chromium	0.02	0.04	$1.3x10^{-3}$	$3.9x10^{-3}$	0.02	0.08	0.02	0.07	0.16	0.61	0.07	0.10	0.03	0.08	0.05	0.13	0.04	0.09
Cobalt	$7.3x10^{-3}$	0.02	$1.4x10^{-2}$	0.05	0.05	0.16	0.02	0.06	0.03	0.06	0.44	1.6	0.26	0.94	0.43	1.65	0.08	0.13
Copper	0.11	0.30	0.04	0.12	0.03	0.05	0.05	0.11	0.38	0.64	0.46	0.64	0.77	2.3	0.76	1.33	0.57	0.83
Lead	1.8	5.4	$9.7x10^{-3}$	0.02	0.06	0.15	0.58	1.8	0.05	0.09	0.68	1.0	2.5	7.6	6.3	16.5	2.8	5.9
Manganese	2.8	6.2	0.46	1.28	0.62	1.4	0.42	0.98	17.6	36.8	33.9	97.5	13.9	37.0	12.9	38.9	24.0	36.8
Nickel	0.02	0.05	$1.1x10^{-2}$	0.03	0.02	0.07	0.03	0.08	0.16	0.49	0.29	0.39	0.11	0.32	0.30	0.65	0.25	0.59
Selenium	$7.5x10^{-3}$	0.02	$1.2x10^{-3}$	$3.3x10^{-3}$	0.03	0.12	0.03	0.12	0.08	0.23	0.06	0.08	0.08	0.25	0.06	0.11	0.02	0.04
Silver	$4.7x10^{-3}$	$1.3x10^{-2}$	$1.1x10^{-3}$	$2.2x10^{-3}$	$1.1x10^{-3}$	$2.6x10^{-3}$	$1.7x10^{-3}$	$4.7x10^{-3}$	$4.7x10^{-3}$	$6.7x10^{-3}$	$8.1x10^{-3}$	$1.2x10^{-2}$	$5.3x10^{-3}$	$1.0x10^{-2}$	$1.2x10^{-2}$	0.02	$5.6x10^{-3}$	$9.5x10^{-3}$
Strontium	0.22	0.42	0.04	0.08	0.09	0.18	0.08	0.17	2.7	8.2	3.8	11.5	2.2	6.8	2.2	6.8	2.0	6.6
Tin	$1.3x10^{-2}$	0.04	$5.5x10^{-3}$	$1.2x10^{-2}$	0.26	0.90	0.22	0.75	0.04	0.09	0.04	0.06	0.02	0.04	0.02	0.04	0.02	0.04
Vanadium	$1.4x10^{-2}$	0.03	$2.3x10^{-3}$	$6.5x10^{-3}$	$8.4x10^{-3}$	0.02	$1.0x10^{-2}$	0.03	0.03	0.07	0.07	0.14	0.10	0.23	0.07	0.21	0.05	0.11
Zinc	2.6	7.2	0.50	1.3	2.3	8.0	2.3	6.9	15.8	30.6	5.8	7.9	28.1	92.0	40.2	117.53	18.9	30.4

Notes:
B – Background
VM – Vangorda-M
FM – Faro-M
O – Overall
VS – Vangorda-S
FN – Faro-N
FS – Faro-S
FW – Faro-W

Table 4.1 Predicted Intakes by Terrestrial Animals for Existing Conditions (Cont'd)

	Predicted Intakes (mg/kg-d) for Terrestrial Ecological Receptors - Existing Conditions																	
COPC	Hare										Mallard							
	B		VS		FN		FS		FW		RC US		RC DS		VC US		VC DS	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Antimony	0.02	0.04	0.22	0.72	0.22	0.71	0.22	0.69	0.02	0.04	0.05	0.21	0.12	0.50	0.14	0.58	0.08	0.35
Arsenic	0.03	0.05	0.08	0.12	0.02	0.03	0.14	0.32	0.06	0.17	0.11	0.45	0.15	0.61	0.32	1.20	0.42	1.8
Beryllium	2.9×10^{-3}	5.0×10^{-3}	4.3×10^{-3}	9.7×10^{-3}	4.4×10^{-3}	9.8×10^{-3}	4.1×10^{-3}	9.5×10^{-3}	3.0×10^{-3}	5.2×10^{-3}	8.4×10^{-4}	2.1×10^{-3}	2.5×10^{-3}	1.0×10^{-2}	6.8×10^{-4}	1.8×10^{-3}	6.2×10^{-3}	0.03
Boron	1.4	2.7	5.0	14.5	1.1	3.0	2.0	5.4	1.0	1.4	1.6×10^{-3}	2.5×10^{-3}	1.3×10^{-3}	3.5×10^{-3}	1.7×10^{-3}	4.5×10^{-3}	1.2×10^{-3}	2.9×10^{-3}
Cadmium	0.20	0.47	0.14	0.20	0.16	0.33	0.19	0.50	0.15	0.34	0.13	0.41	0.15	0.52	0.17	0.59	0.27	1.0
Chromium	0.11	0.39	0.07	0.10	0.04	0.08	0.05	0.12	0.04	0.10	1.0×10^{-2}	0.03	0.02	0.06	0.03	0.11	0.02	0.07
Cobalt	0.03	0.05	0.28	0.98	0.17	0.59	0.28	1.06	0.09	0.18	0.07	0.24	0.16	0.60	0.11	0.40	0.40	1.7
Copper	0.39	0.62	0.39	0.49	0.60	1.52	0.70	1.23	0.57	0.83	0.12	0.43	0.18	0.62	0.21	0.71	0.19	0.56
Lead	0.05	0.09	0.71	1.1	1.8	5.0	6.6	17.1	3.0	6.3	0.03	0.12	0.11	0.44	0.08	0.25	0.09	0.30
Manganese	20.1	42.4	43.6	113.9	16.1	33.9	12.9	33.0	30.9	65.6	0.70	2.5	16.9	62.0	0.30	0.84	0.24	0.69
Nickel	0.13	0.34	0.25	0.35	0.10	0.24	0.23	0.47	0.29	0.72	0.03	0.12	0.07	0.22	0.05	0.20	0.05	0.19
Selenium	0.09	0.26	0.05	0.07	0.05	0.16	0.05	0.08	0.02	0.03	0.05	0.19	0.06	0.26	0.09	0.39	0.06	0.26
Silver	5.0×10^{-3}	7.0×10^{-3}	7.3×10^{-3}	1.2×10^{-2}	5.7×10^{-3}	1.0×10^{-2}	1.1×10^{-2}	0.02	6.9×10^{-3}	1.3×10^{-2}	3.9×10^{-3}	0.02	5.0×10^{-3}	0.02	7.2×10^{-3}	0.03	2.9×10^{-3}	9.9×10^{-3}
Strontium	3.0	7.2	2.8	7.6	2.7	6.8	3.7	7.8	4.2	8.1	6.6	16.5	10.1	26.7	7.4	21.8	5.3	13.8
Tin	0.05	0.10	0.03	0.05	0.02	0.04	0.02	0.03	0.02	0.04	0.13	0.50	0.23	0.88	0.27	1.07	0.29	1.13
Vanadium	0.03	0.07	0.07	0.11	0.08	0.19	0.06	0.17	0.05	0.11	0.05	0.14	0.07	0.26	0.05	0.15	0.05	0.11
Zinc	11.3	21.1	10.1	26.7	19.1	58.8	30.3	78.1	14.2	22.4	0.80	3.3	2.0	6.6	0.50	1.8	2.4	8.1

Notes:
B – Background
VS – Vangorda-S
FN – Faro-N
RC US – Rose Creek Upstream
RC DS – Rose Creek Downstream
FS – Faro-S
FW – Faro-W
VC US – Vangorda Creek Upstream
VC DS – Vangorda Creek Downstream

Table 4.1 Predicted Intakes by Terrestrial Animals for Existing Conditions (Cont'd)

	Predicted Intakes (mg/kg-d) for Terrestrial Ecological Receptors - Existing Conditions																	
COPC	Mallard				Marmot										Merganser			
	PR US		PRX		B		VS		FN		FS		FW		RC US		RC DS	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Antimony	no data	no data	$1.4x10^{-2}$	0.04	$1.3x10^{-2}$	0.02	$1.3x10^{-2}$	0.02	$1.3x10^{-2}$	0.02	$1.3x10^{-2}$	0.02	$1.3x10^{-2}$	0.02	$6.0x10^{-3}$	0.02	$1.3x10^{-2}$	0.05
Arsenic	0.09	0.36	0.22	0.94	$9.8x10^{-3}$	0.02	0.05	0.09	$9.2x10^{-3}$	0.02	0.07	0.15	0.03	0.09	$9.2x10^{-3}$	0.02	$1.3x10^{-2}$	0.04
Beryllium	no data	no data	$1.3x10^{-4}$	$4.6x10^{-4}$	$1.7x10^{-3}$	$2.8x10^{-3}$	$1.9x10^{-3}$	$3.4x10^{-3}$	$2.5x10^{-3}$	$5.2x10^{-3}$	$1.8x10^{-3}$	$3.0x10^{-3}$	$1.8x10^{-3}$	$3.0x10^{-3}$	$6.1x10^{-3}$	$9.7x10^{-3}$	0.02	0.08
Boron	no data	no data	$2.2x10^{-4}$	$2.9x10^{-4}$	1.1	2.5	2.58	8.7	0.87	2.1	1.6	2.8	1.1	1.9	0.04	0.06	0.03	0.08
Cadmium	0.46	1.0	0.36	1.3	0.03	0.08	0.02	0.02	0.02	0.06	0.02	0.04	0.03	0.05	$6.7x10^{-3}$	0.02	$7.9x10^{-3}$	0.03
Chromium	no data	no data	0.04	0.16	0.02	0.05	0.05	0.08	0.03	0.06	0.04	0.08	0.03	0.07	0.03	0.11	0.06	0.18
Cobalt	0.13	0.42	0.12	0.48	$1.3x10^{-2}$	0.04	$1.1x10^{-2}$	0.02	$9.6x10^{-3}$	0.02	0.03	0.07	0.09	0.29	$7.3x10^{-3}$	$1.4x10^{-2}$	0.02	0.06
Copper	0.77	2.2	0.73	2.6	0.36	0.73	0.26	0.41	0.34	0.48	0.43	0.81	0.47	0.73	0.10	0.27	0.13	0.39
Lead	0.16	0.29	0.05	0.20	0.02	0.04	0.35	0.56	0.25	0.63	3.5	9.2	1.4	2.8	0.02	0.08	0.07	0.30
Manganese	0.27	0.45	1.4	5.0	20.4	60.9	50.9	169	20.5	46.6	12.1	36.2	36.1	112	1.4	4.9	33.7	125
Nickel	0.02	0.05	0.12	0.42	0.06	0.15	0.14	0.29	0.08	0.20	0.11	0.28	0.33	1.13	0.02	0.10	0.05	0.17
Selenium	no data	no data	0.05	0.22	0.11	0.38	0.04	0.08	$1.1x10^{-2}$	0.03	0.03	0.06	0.01	0.03	$1.2x10^{-2}$	0.03	0.02	0.04
Silver	$2.3x10^{-3}$	$7.8x10^{-3}$	$2.6x10^{-3}$	$8.8x10^{-3}$	$2.6x10^{-3}$	$4.2x10^{-3}$	$3.3x10^{-3}$	$5.7x10^{-3}$	$3.4x10^{-3}$	$6.9x10^{-3}$	$5.3x10^{-3}$	$1.2x10^{-2}$	$5.9x10^{-3}$	0.02	$8.4x10^{-3}$	0.03	$1.1x10^{-2}$	0.04
Strontium	no data	no data	9.5	22.7	3.1	7.7	0.80	2.3	3.1	8.7	5.2	11.3	6.8	12.2	0.87	1.7	1.3	2.9
Tin	no data	no data	0.05	0.19	0.03	0.08	$1.3x10^{-2}$	0.02	$1.5x10^{-2}$	0.03	$8.8x10^{-3}$	$1.4x10^{-2}$	0.02	0.03	0.03	0.12	0.05	0.20
Vanadium	no data	no data	0.31	1.14	0.02	0.05	0.03	0.05	0.04	0.07	0.03	0.06	0.03	0.06	0.03	0.05	0.03	0.13
Zinc	0.40	1.1	1.1	4.0	3.2	9.3	14.5	49.9	3.8	6.2	10.6	28.6	4.7	10.4	3.0	12.7	7.5	20.6

Notes:
B – Background
VS – Vangorda-S
FN – Faro-N
RC US – Rose Creek Upstream
RC DS – Rose Creek Downstream
FS – Faro-S
FW – Faro-W
PR US – Pelly River Upstream
PRX – Pelly River @ Crossing

Table 4.1 Predicted Intakes by Terrestrial Animals for Existing Conditions (Cont'd)

	Predicted Intakes (mg/kg-d) for Terrestrial Ecological Receptors - Existing Conditions																	
COPC	Merganser								Mink									
	VC US		VC DS		PR US		PRX		RC US		RC DS		VC US		VC DS		PR US	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Antimony	0.02	0.06	$9.8x10^{-3}$	0.04	no data	no data	$1.6x10^{-3}$	$2.2x10^{-3}$	0.03	0.11	0.06	0.25	0.08	0.29	0.05	0.18	$1.1x10^{-6}$	$3.8x10^{-6}$
Arsenic	0.03	0.10	0.04	0.13	$7.5x10^{-3}$	$9.7x10^{-3}$	0.02	0.07	0.05	0.15	0.07	0.23	0.14	0.53	0.19	0.76	0.04	0.12
Beryllium	$4.9x10^{-3}$	$1.1x10^{-2}$	0.04	0.19	no data	no data	$9.2x10^{-4}$	$3.1x10^{-3}$	$7.9x10^{-3}$	$1.2x10^{-2}$	0.02	0.11	$6.4x10^{-3}$	$1.4x10^{-2}$	0.06	0.25	$3.1x10^{-7}$	$1.0x10^{-6}$
Boron	0.04	0.10	0.03	0.07	no data	no data	$4.9x10^{-3}$	$6.8x10^{-3}$	0.05	0.07	0.04	0.10	0.05	0.13	0.03	0.08	$4.3x10^{-5}$	$1.4x10^{-4}$
Cadmium	$9.1x10^{-3}$	0.03	$1.4x10^{-2}$	0.05	0.02	0.05	0.02	0.07	0.05	0.16	0.06	0.21	0.07	0.24	0.11	0.43	0.19	0.35
Chromium	0.09	0.33	0.06	0.22	no data	no data	0.13	0.49	0.06	0.21	0.11	0.37	0.17	0.63	0.12	0.43	$2.7x10^{-5}$	$1.0x10^{-4}$
Cobalt	$1.1x10^{-2}$	0.03	0.04	0.16	$1.4x10^{-2}$	0.02	$1.2x10^{-2}$	0.04	0.04	0.10	0.10	0.34	0.07	0.21	0.24	0.96	0.08	0.17
Copper	0.16	0.44	0.14	0.30	0.59	0.76	0.55	1.8	0.20	0.58	0.28	0.85	0.34	0.95	0.30	0.64	1.3	1.7
Lead	0.05	0.16	0.06	0.19	0.11	0.14	0.04	0.13	0.07	0.27	0.26	1.0	0.18	0.55	0.20	0.63	0.35	0.51
Manganese	0.59	1.6	0.47	1.3	0.54	0.77	2.8	10.0	2.7	9.7	66.0	243	1.2	3.2	0.92	2.6	1.1	1.4
Nickel	0.04	0.15	0.04	0.14	0.02	0.02	0.10	0.31	0.07	0.30	0.16	0.52	0.13	0.47	0.12	0.44	0.06	0.08
Selenium	0.02	0.07	0.02	0.05	no data	no data	$1.4x10^{-2}$	0.03	0.04	0.13	0.06	0.18	0.08	0.29	0.06	0.19	$6.4x10^{-5}$	$2.3x10^{-4}$
Silver	0.02	0.06	$6.3x10^{-3}$	$1.3x10^{-2}$	$5.1x10^{-3}$	$7.9x10^{-3}$	$5.5x10^{-3}$	$1.1x10^{-2}$	$1.1x10^{-2}$	0.04	$1.5x10^{-2}$	0.05	0.02	0.08	$8.5x10^{-3}$	0.02	$6.9x10^{-3}$	$1.1x10^{-2}$
Strontium	0.98	2.4	0.70	1.5	no data	no data	1.3	2.2	2.7	5.6	4.2	9.7	3.1	8.0	2.2	5.0	$6.9x10^{-4}$	$2.4x10^{-3}$
Tin	0.06	0.22	0.06	0.24	no data	no data	$1.1x10^{-2}$	$1.4x10^{-2}$	0.18	0.71	0.32	1.2	0.37	1.4	0.39	1.4	$7.2x10^{-5}$	$2.4x10^{-4}$
Vanadium	0.03	0.06	0.02	0.04	no data	no data	0.16	0.55	0.08	0.16	0.10	0.39	0.08	0.18	0.07	0.11	$3.9x10^{-6}$	$1.2x10^{-5}$
Zinc	1.8	5.8	9.0	25.1	1.5	2.5	3.9	13.8	4.5	18.5	11.0	30.1	2.7	8.5	13.1	37.0	2.2	3.6

Notes:
RC US – Rose Creek Upstream
RC DS – Rose Creek Downstream
VC US – Vangorda Creek Upstream
VC DS – Vangorda Creek Downstream
PR US – Pelly River Upstream
PRX – Pelly River @ Crossing

Table 4.1 Predicted Intakes by Terrestrial Animals for Existing Conditions (Cont'd)

	Predicted Intakes (mg/kg-d) for Terrestrial Ecological Receptors - Existing Conditions																			
COPC	Mink		Moose		Scaup												Sheep		Wolf	
	PRX		O		RC US		RC DS		VC US		VC DS		PR US		PRX		S		O	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Antimony	$7.4x10^{-3}$	0.02	$8.8x10^{-3}$	0.03	0.03	0.12	0.06	0.26	0.08	0.29	0.05	0.18	no data	no data	$7.4x10^{-5}$	0.02	$1.0x10^{-2}$	0.02	$1.5x10^{-3}$	$2.8x10^{-3}$
Arsenic	0.10	0.39	$1.2x10^{-2}$	0.04	0.19	0.73	0.26	1.0	0.54	2.0	0.74	3.1	0.15	0.59	0.39	1.6	$8.4x10^{-3}$	$1.5x10^{-2}$	$2.8x10^{-3}$	$8.4x10^{-3}$
Beryllium	$1.2x10^{-3}$	$3.9x10^{-3}$	$5.0x10^{-4}$	$1.5x10^{-3}$	$1.5x10^{-3}$	$2.5x10^{-3}$	$4.7x10^{-3}$	$2.1x10^{-2}$	$1.2x10^{-3}$	$2.7x10^{-3}$	$1.1x10^{-2}$	0.05	no data	no data	$2.3x10^{-4}$	$7.8x10^{-4}$	$2.1x10^{-3}$	$4.8x10^{-3}$	$2.2x10^{-4}$	$3.6x10^{-4}$
Boron	$6.3x10^{-3}$	$8.6x10^{-3}$	0.18	0.41	$2.2x10^{-3}$	$3.3x10^{-3}$	$1.7x10^{-3}$	$4.7x10^{-3}$	$2.4x10^{-3}$	$6.1x10^{-3}$	$1.6x10^{-3}$	$3.9x10^{-3}$	no data	no data	$2.9x10^{-4}$	$3.7x10^{-4}$	0.55	1.3	0.02	0.05
Cadmium	0.15	0.54	0.06	0.15	0.11	0.40	0.14	0.51	0.16	0.58	0.24	0.92	0.42	1.3	0.33	1.3	$7.0x10^{-3}$	$1.4x10^{-2}$	0.18	0.59
Chromium	0.26	0.98	$1.3x10^{-2}$	0.04	0.04	0.14	0.07	0.24	0.11	0.42	0.08	0.29	no data	no data	0.18	0.65	0.02	0.04	$4.5x10^{-3}$	$1.0x10^{-2}$
Cobalt	0.07	0.26	0.02	0.04	0.11	0.36	0.24	0.90	0.17	0.60	0.59	2.5	0.20	0.66	0.18	0.72	0.02	0.05	$1.5x10^{-3}$	$3.3x10^{-3}$
Copper	1.2	3.7	0.10	0.16	0.26	0.82	0.37	1.2	0.44	1.4	0.39	1.0	1.6	3.9	1.5	5.1	0.23	0.42	0.17	0.34
Lead	0.12	0.45	0.12	0.40	0.10	0.39	0.35	1.4	0.26	0.82	0.29	0.94	0.52	0.81	0.18	0.65	0.12	0.25	0.13	0.44
Manganese	5.4	19.1	8.8	29.5	2.3	8.3	56.4	205	0.99	2.8	0.79	2.3	0.90	1.4	4.6	16.5	15.0	27.1	0.17	0.49
Nickel	0.29	0.95	0.05	0.10	0.10	0.38	0.21	0.67	0.17	0.61	0.15	0.57	0.07	0.12	0.37	1.2	0.10	0.34	$2.6x10^{-3}$	$6.9x10^{-3}$
Selenium	0.05	0.15	$8.8x10^{-3}$	0.02	0.07	0.30	0.10	0.42	0.14	0.62	0.10	0.41	no data	no data	0.09	0.36	$8.6x10^{-3}$	0.03	$1.5x10^{-2}$	0.03
Silver	0.01	0.02	$6.5x10^{-4}$	$1.7x10^{-3}$	$5.5x10^{-3}$	0.02	$6.9x10^{-3}$	0.03	$1.0x10^{-2}$	0.04	$4.0x10^{-3}$	$1.5x10^{-2}$	$3.3x10^{-3}$	$1.2x10^{-2}$	$3.6x10^{-3}$	$1.3x10^{-2}$	$2.0x10^{-3}$	$3.7x10^{-3}$	$5.1x10^{-3}$	$1.4x10^{-2}$
Strontium	3.9	7.7	0.49	1.4	9.5	24.5	14.7	41.1	10.7	31.5	7.7	20.4	no data	no data	13.7	33.8	2.8	7.3	0.02	0.04
Tin	0.07	0.18	$5.7x10^{-3}$	0.02	0.24	0.95	0.43	1.6	0.50	1.99	0.53	2.1	no data	no data	0.09	0.31	0.05	0.10	$2.7x10^{-3}$	$7.1x10^{-3}$
Vanadium	0.46	1.6	0.02	0.04	0.09	0.19	0.12	0.43	0.09	0.20	0.08	0.13	no data	no data	0.52	1.8	$1.4x10^{-2}$	0.02	$2.3x10^{-3}$	$6.0x10^{-3}$
Zinc	5.8	20.3	4.0	12.4	1.3	5.0	3.1	9.9	0.78	2.7	3.7	12.2	0.63	1.7	1.7	6.2	2.2	4.0	3.0	5.6

Notes:
O – Overall
S – Sheep (Mt. Nye)
RC US – Rose Creek Upstream
RC DS – Rose Creek Downstream
VC US – Vangorda Creek Upstream
VC DS – Vangorda Creek Downstream
PR US – Pelly River Upstream
PRX – Pelly River @ Crossing

Table 4.2 Predicted Intakes by Terrestrial Animals for Final Closure and Remediation Plan

	Predicted Intakes (mg/kg-d) for Terrestrial Ecological Receptors - Final Closure and Remediation Plan															
COPC	Bear						Beaver									
	B		VM		FM		RC DS - X14		VC DS - V8		VC DS - V27		PR DS VC		PR DS AC	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Antimony	$8.1x10^{-3}$	$1.5x10^{-2}$	$8.4x10^{-3}$	0.02	$8.3x10^{-3}$	0.02	0.02	0.05	0.02	0.06	0.05	0.15	$7.1x10^{-3}$	0.02	0.04	0.12
Arsenic	$4.7x10^{-3}$	$1.0x10^{-2}$	0.02	0.03	0.02	0.05	$1.2x10^{-2}$	0.03	$5.7x10^{-3}$	$1.1x10^{-2}$	$7.5x10^{-3}$	$1.4x10^{-2}$	$4.6x10^{-3}$	$8.2x10^{-3}$	$6.0x10^{-3}$	$1.1x10^{-2}$
Beryllium	$9.3x10^{-4}$	$1.6x10^{-3}$	$1.7x10^{-3}$	$2.6x10^{-3}$	$1.8x10^{-3}$	$2.6x10^{-3}$	$8.1x10^{-4}$	$2.0x10^{-3}$	$7.3x10^{-4}$	$1.7x10^{-3}$	$9.4x10^{-4}$	$2.2x10^{-3}$	$9.1x10^{-5}$	$1.9x10^{-4}$	$3.0x10^{-4}$	$9.5x10^{-4}$
Boron	0.27	0.51	0.41	0.55	0.31	0.55	0.12	0.21	0.14	0.33	0.25	0.87	0.13	0.33	0.24	0.87
Cadmium	0.08	0.22	0.08	0.21	0.08	0.21	0.21	0.70	0.11	0.28	0.15	0.38	0.12	0.19	0.12	0.22
Chromium	$1.1x10^{-2}$	0.02	0.02	0.03	0.02	0.05	$1.0x10^{-2}$	0.02	0.02	0.06	$7.4x10^{-3}$	$1.2x10^{-2}$	0.02	0.06	$9.1x10^{-3}$	$1.2x10^{-2}$
Cobalt	$4.8x10^{-3}$	$1.2x10^{-2}$	$7.1x10^{-3}$	$1.2x10^{-2}$	$9.6x10^{-3}$	0.02	0.03	0.08	0.03	0.09	0.07	0.20	$7.0x10^{-3}$	0.02	0.04	0.14
Copper	0.17	0.27	0.19	0.28	0.26	0.44	0.23	0.57	0.14	0.35	0.16	0.39	0.09	0.16	0.10	0.18
Lead	0.02	0.03	0.15	0.35	1.5	4.4	0.10	0.34	$1.1x10^{-2}$	0.02	0.02	0.04	$5.3x10^{-3}$	$8.4x10^{-3}$	0.02	0.03
Manganese	4.7	11.7	5.8	13.8	4.4	12.9	4.6	7.9	2.2	4.5	4.9	14.7	1.7	3.7	4.3	14.0
Nickel	0.02	0.05	0.05	0.08	0.03	0.08	0.04	0.08	0.04	0.08	0.08	0.11	0.05	0.09	0.07	0.09
Selenium	0.03	0.07	$1.2x10^{-2}$	0.02	0.02	0.03	$8.8x10^{-3}$	0.02	$7.9x10^{-3}$	0.02	0.02	0.04	0.01	0.03	0.02	0.04
Silver	$3.6x10^{-3}$	$6.7x10^{-3}$	$3.7x10^{-3}$	$6.9x10^{-3}$	$4.3x10^{-3}$	$8.8x10^{-3}$	$5.1x10^{-4}$	$1.3x10^{-3}$	$1.9x10^{-4}$	$4.6x10^{-4}$	$5.1x10^{-4}$	$1.1x10^{-3}$	$9.5x10^{-5}$	$2.2x10^{-4}$	$4.2x10^{-4}$	$9.4x10^{-4}$
Strontium	0.78	1.5	0.45	0.66	0.96	2.0	1.2	3.6	1.4	3.9	1.6	4.5	1.5	4.4	1.7	4.6
Tin	0.02	0.03	$9.1x10^{-3}$	0.02	$7.2x10^{-3}$	$1.2x10^{-2}$	0.41	0.65	$8.1x10^{-3}$	0.02	$1.2x10^{-2}$	0.03	$1.1x10^{-3}$	$2.9x10^{-3}$	$1.8x10^{-3}$	$3.7x10^{-3}$
Vanadium	$1.2x10^{-2}$	0.02	0.02	0.03	0.02	0.04	0.03	0.09	0.04	0.13	0.06	0.18	0.04	0.10	0.04	0.10
Zinc	2.2	3.7	6.4	15.9	7.0	14.7	5.7	15.4	3.1	7.6	3.6	9.8	1.9	3.5	1.7	4.1

Notes:

B – Background
VM – Vangorda-M
FM – Faro-M
RC DS – X14 – Rose Creek Downstream X14
VC DS – V8 – Vangorda Creek Downstream V8
VC DS – V27– Vangorda Creek Downstream V27
PR DS VC – Pelly River Downstream Vangorda Creek
PR DS AC – Pelly River Downstream Anvil Creek

Table 4.2 Predicted Intakes by Terrestrial Animals for Final Closure and Remediation Plan (Cont'd)

	Predicted Intakes (mg/kg-d) for Terrestrial Ecological Receptors - Final Closure and Remediation Plan															
COPC	Caribou		Fox						Grouse							
	O		B		VM		FM		B		VS		FN		FS	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Antimony	$7.9x10^{-3}$	$1.5x10^{-2}$	$3.9x10^{-3}$	$7.2x10^{-3}$	$3.6x10^{-3}$	$6.6x10^{-3}$	$3.4x10^{-3}$	$6.4x10^{-3}$	0.02	0.04	0.34	1.1	0.33	1.1	0.34	1.1
Arsenic	0.03	0.10	$6.7x10^{-3}$	0.02	$1.1x10^{-2}$	0.03	$1.4x10^{-2}$	0.04	0.03	0.07	0.08	0.12	0.02	0.03	0.16	0.42
Beryllium	$8.2x10^{-4}$	$1.5x10^{-3}$	$5.0x10^{-4}$	$1.0x10^{-3}$	$5.8x10^{-4}$	$1.2x10^{-3}$	$5.9x10^{-4}$	$1.2x10^{-3}$	$2.8x10^{-3}$	$4.8x10^{-3}$	$4.7x10^{-3}$	$1.2x10^{-2}$	$4.8x10^{-3}$	$1.3x10^{-2}$	$4.7x10^{-3}$	$1.3x10^{-2}$
Boron	0.04	0.07	0.02	0.05	0.04	0.06	0.02	0.04	1.5	3.3	6.2	20.0	1.2	4.2	2.2	7.3
Cadmium	$9.2x10^{-3}$	0.02	$4.8x10^{-3}$	$1.5x10^{-2}$	$8.1x10^{-3}$	0.03	$1.3x10^{-2}$	0.05	0.31	0.72	0.21	0.30	0.24	0.51	0.29	0.77
Chromium	0.02	0.04	$1.1x10^{-2}$	0.04	$1.3x10^{-2}$	0.03	0.02	0.06	0.15	0.59	0.07	0.10	0.03	0.08	0.05	0.13
Cobalt	$7.4x10^{-3}$	0.02	$8.0x10^{-3}$	0.03	0.02	0.06	$1.3x10^{-2}$	0.04	0.03	0.06	0.44	1.6	0.26	0.91	0.43	1.6
Copper	0.11	0.30	0.02	0.03	0.04	0.08	0.07	0.17	0.38	0.65	0.46	0.65	0.77	2.3	0.76	1.3
Lead	1.8	5.4	$6.9x10^{-3}$	$1.2x10^{-2}$	0.06	0.15	0.58	1.8	0.05	0.09	0.68	1.0	2.5	7.6	6.3	16.7
Manganese	2.8	6.1	0.47	1.3	0.63	1.4	0.25	0.54	17.8	37.6	33.4	92.3	13.7	35.6	13.0	39.0
Nickel	0.02	0.05	$1.3x10^{-2}$	0.04	0.05	0.16	0.02	0.05	0.15	0.48	0.29	0.39	0.11	0.31	0.30	0.66
Selenium	$7.4x10^{-3}$	0.02	0.03	0.09	0.02	0.07	0.08	0.30	0.08	0.24	0.06	0.08	0.08	0.25	0.06	0.11
Silver	$4.6x10^{-3}$	$1.3x10^{-2}$	$1.3x10^{-3}$	$3.4x10^{-3}$	$7.1x10^{-4}$	$1.3x10^{-3}$	$9.6x10^{-4}$	$2.2x10^{-3}$	$4.7x10^{-3}$	$6.8x10^{-3}$	$8.1x10^{-3}$	$1.2x10^{-2}$	$5.4x10^{-3}$	$1.0x10^{-2}$	$1.2x10^{-2}$	0.02
Strontium	0.22	0.42	0.08	0.15	0.12	0.23	0.08	0.15	2.7	8.5	3.9	11.6	2.2	7.1	2.2	6.6
Tin	$1.3x10^{-2}$	0.05	0.12	0.47	0.12	0.49	0.04	0.17	0.04	0.09	0.04	0.06	0.02	0.04	0.02	0.04
Vanadium	$1.4x10^{-2}$	0.03	$6.7x10^{-3}$	0.02	$1.2x10^{-2}$	0.03	$8.9x10^{-3}$	0.02	0.03	0.07	0.07	0.14	0.10	0.24	0.07	0.21
Zinc	2.6	7.1	0.83	2.8	6.7	25.0	8.5	30.8	15.8	30.7	5.8	7.9	28.1	93.7	39.7	114

Notes:
B – Background
VM – Vangorda-M
FM – Faro-M
O – Overall
VS – Vangorda-S
FN – Faro-N
FS – Faro-S

Table 4.2 Predicted Intakes by Terrestrial Animals for Final Closure and Remediation Plan (Cont'd)

	Predicted Intakes (mg/kg-d) for Terrestrial Ecological Receptors - Final Closure and Remediation Plan															
COPC	Grouse		Hare										Mallard			
	FW		B		VS		FN		FS		FW		RC DS - X14		VC DS - V8	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Antimony	0.02	0.04	0.02	0.04	0.22	0.72	0.21	0.70	0.22	0.71	0.02	0.04	0.02	0.08	0.03	0.09
Arsenic	0.06	0.16	0.03	0.05	0.08	0.12	0.02	0.03	0.14	0.31	0.06	0.18	0.14	0.60	0.12	0.48
Beryllium	2.8×10^{-3}	4.9×10^{-3}	2.9×10^{-3}	5.0×10^{-3}	4.1×10^{-3}	9.4×10^{-3}	4.4×10^{-3}	9.8×10^{-3}	4.1×10^{-3}	9.5×10^{-3}	2.9×10^{-3}	5.0×10^{-3}	1.1×10^{-3}	2.6×10^{-3}	9.5×10^{-4}	2.3×10^{-3}
Boron	0.91	1.2	1.4	2.6	4.9	14.0	1.1	3.0	2.0	5.3	1.0	1.4	8.2×10^{-4}	1.1×10^{-3}	7.7×10^{-4}	1.0×10^{-3}
Cadmium	0.23	0.52	0.20	0.46	0.14	0.20	0.16	0.33	0.19	0.48	0.15	0.33	0.39	1.48	0.17	0.58
Chromium	0.04	0.09	0.11	0.37	0.07	0.10	0.04	0.08	0.05	0.12	0.04	0.10	1.5×10^{-2}	0.03	7.9×10^{-3}	1.3×10^{-2}
Cobalt	0.08	0.13	0.03	0.05	0.28	0.97	0.17	0.58	0.28	0.97	0.09	0.18	0.10	0.32	0.11	0.37
Copper	0.57	0.84	0.39	0.62	0.39	0.50	0.60	1.6	0.70	1.2	0.57	0.84	0.70	2.2	0.41	1.3
Lead	2.7	5.7	0.05	0.09	0.70	1.1	1.8	4.9	6.7	17.6	2.9	6.2	0.03	0.06	0.02	0.04
Manganese	24.0	37.0	20.5	42.7	43.5	112	15.8	34.0	12.8	32.6	30.8	65.3	0.79	1.7	1.1	3.2
Nickel	0.24	0.57	0.12	0.33	0.25	0.35	0.10	0.24	0.24	0.48	0.29	0.70	0.04	0.09	0.08	0.18
Selenium	0.02	0.04	0.09	0.25	0.05	0.07	0.05	0.16	0.05	0.08	0.02	0.03	0.15	0.62	0.03	0.13
Silver	5.6×10^{-3}	9.4×10^{-3}	5.0×10^{-3}	7.0×10^{-3}	7.3×10^{-3}	1.2×10^{-2}	5.7×10^{-3}	1.0×10^{-2}	1.1×10^{-2}	0.02	6.8×10^{-3}	1.3×10^{-2}	6.3×10^{-4}	2.2×10^{-3}	6.0×10^{-4}	2.0×10^{-3}
Strontium	1.9	6.3	3.1	7.2	2.8	7.7	2.8	7.1	3.7	7.8	4.2	8.0	9.4	21.4	10.1	23.1
Tin	0.02	0.04	0.05	0.10	0.03	0.05	0.02	0.04	0.02	0.03	0.02	0.04	0.05	0.18	0.09	0.36
Vanadium	0.05	0.11	0.03	0.07	0.07	0.12	0.08	0.19	0.06	0.17	0.05	0.12	0.05	0.12	0.07	0.20
Zinc	18.9	30.4	11.2	20.7	10.1	26.2	19.0	59.0	29.9	75.8	14.2	22.1	8.8	29.8	4.9	18.5

Notes:
B – Background
VS – Vangorda-S
FW – Faro-W
RC DS – X14 – Rose Creek Downstream X14
FN – Faro-N
FS – Faro-S
VC DS – V8 – Vangorda Creek Downstream V8

Table 4.2 Predicted Intakes by Terrestrial Animals for Final Closure and Remediation Plan (Cont'd)

	Predicted Intakes (mg/kg-d) for Terrestrial Ecological Receptors - Final Closure and Remediation Plan															
COPC	Mallard						Marmot									
	VC DS - V27		PR DS VC		PR DS AC		B		VS		FN		FS		FW	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Antimony	0.03	0.10	$9.4x10^{-3}$	0.03	$1.0x10^{-2}$	0.03	$1.3x10^{-2}$	0.02	$1.3x10^{-2}$	0.02	$1.3x10^{-2}$	0.02	$1.3x10^{-2}$	0.02	$1.3x10^{-2}$	0.02
Arsenic	0.13	0.52	0.07	0.30	0.07	0.30	$9.7x10^{-3}$	0.02	0.05	0.09	$9.2x10^{-3}$	0.02	0.07	0.15	0.03	0.09
Beryllium	$9.9x10^{-4}$	$2.4x10^{-3}$	$1.2x10^{-5}$	$3.0x10^{-5}$	$5.3x10^{-5}$	$1.3x10^{-4}$	$1.7x10^{-3}$	$2.8x10^{-3}$	$1.7x10^{-3}$	$2.9x10^{-3}$	$2.4x10^{-3}$	$5.0x10^{-3}$	$1.7x10^{-3}$	$2.9x10^{-3}$	$1.7x10^{-3}$	$2.9x10^{-3}$
Boron	$7.7x10^{-4}$	$1.0x10^{-3}$	$8.0x10^{-5}$	$1.1x10^{-4}$	$1.1x10^{-4}$	$1.5x10^{-4}$	1.1	2.5	2.5	8.4	0.89	2.3	1.6	2.8	1.1	1.9
Cadmium	0.25	0.77	0.19	0.44	0.19	0.44	0.03	0.08	0.02	0.02	0.02	0.06	0.02	0.04	0.02	0.05
Chromium	$8.8x10^{-3}$	0.02	$1.2x10^{-2}$	0.02	$1.2x10^{-2}$	0.02	0.02	0.05	0.05	0.08	0.03	0.06	0.04	0.08	0.03	0.07
Cobalt	0.14	0.47	0.02	0.06	0.02	0.06	$1.3x10^{-2}$	0.04	$1.1x10^{-2}$	0.02	$9.6x10^{-3}$	0.02	0.03	0.07	0.09	0.30
Copper	0.44	1.5	0.22	0.62	0.23	0.65	0.36	0.73	0.26	0.41	0.34	0.48	0.43	0.82	0.47	0.74
Lead	0.03	0.05	$8.6x10^{-3}$	0.02	$9.1x10^{-3}$	0.02	0.02	0.04	0.35	0.55	0.25	0.61	3.6	9.5	1.4	2.8
Manganese	1.4	4.1	0.41	0.69	0.42	0.71	21.0	61.1	51.0	171	20.1	45.8	11.8	35.2	36.0	113
Nickel	0.14	0.34	0.12	0.27	0.11	0.26	0.06	0.15	0.14	0.31	0.08	0.20	0.10	0.27	0.32	1.1
Selenium	0.03	0.14	0.07	0.30	0.07	0.29	0.10	0.35	0.03	0.08	$1.1x10^{-2}$	0.03	0.03	0.06	$1.2x10^{-2}$	0.03
Silver	$6.2x10^{-4}$	$2.1x10^{-3}$	$1.5x10^{-4}$	$5.1x10^{-4}$	$1.7x10^{-4}$	$5.8x10^{-4}$	$2.6x10^{-3}$	$4.1x10^{-3}$	$3.3x10^{-3}$	$5.7x10^{-3}$	$3.4x10^{-3}$	$6.8x10^{-3}$	$5.2x10^{-3}$	$1.1x10^{-2}$	$5.8x10^{-3}$	0.02
Strontium	10.9	24.9	11.6	26.3	11.5	26.1	3.0	7.4	0.80	2.3	3.2	8.9	5.2	11.6	6.8	12.2
Tin	0.14	0.57	$2.2x10^{-3}$	$8.4x10^{-3}$	$4.2x10^{-3}$	0.02	0.03	0.08	$1.3x10^{-2}$	0.02	$1.4x10^{-2}$	0.03	$8.8x10^{-3}$	$1.4x10^{-2}$	0.02	0.03
Vanadium	0.09	0.28	0.06	0.14	0.06	0.14	0.02	0.05	0.03	0.05	0.04	0.07	0.03	0.06	0.03	0.07
Zinc	7.1	25.9	1.1	3.1	1.2	3.5	3.2	8.9	14.4	50.3	3.8	6.2	10.5	28.5	4.7	10.4

Notes:

B – Background
VS – Vangorda-S
FW – Faro-W
VC DS – V27– Vangorda Creek Downstream V27
FN – Faro-N
FS – Faro-S
PR DS VC – Pelly River Downstream Vangorda Creek
PR DS AC – Pelly River Downstream Anvil Creek

Table 4.2 Predicted Intakes by Terrestrial Animals for Final Closure and Remediation Plan (Cont'd)

COPC	Predicted Intakes (mg/kg-d) for Terrestrial Ecological Receptors - Final Closure and Remediation Plan																	
	Merganser										Mink							
	RC DS - X14		VC DS - V8		VC DS - V27		PR DS VC		PR DS AC		RC DS - X14		VC DS - V8		VC DS - V27		PR DS VC	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Antimony	2.6×10^{-3}	3.7×10^{-3}	3.0×10^{-3}	4.3×10^{-3}	3.5×10^{-3}	5.3×10^{-3}	1.0×10^{-3}	1.5×10^{-3}	1.1×10^{-3}	1.6×10^{-3}	1.2×10^{-2}	0.03	1.4×10^{-2}	0.04	0.02	0.04	5.0×10^{-3}	1.3×10^{-2}
Arsenic	1.3×10^{-2}	0.03	9.8×10^{-3}	0.02	1.1×10^{-2}	0.03	6.2×10^{-3}	8.1×10^{-3}	6.3×10^{-3}	8.3×10^{-3}	0.07	0.20	0.05	0.17	0.06	0.19	0.03	0.10
Beryllium	7.6×10^{-3}	1.1×10^{-2}	6.8×10^{-3}	9.6×10^{-3}	7.1×10^{-3}	1.0×10^{-2}	8.9×10^{-5}	1.3×10^{-4}	3.8×10^{-4}	5.5×10^{-4}	1.0×10^{-2}	1.4×10^{-2}	8.9×10^{-3}	1.2×10^{-2}	9.3×10^{-3}	1.3×10^{-2}	1.2×10^{-4}	1.6×10^{-4}
Boron	0.02	0.03	0.02	0.02	0.02	0.02	1.8×10^{-3}	2.5×10^{-3}	2.5×10^{-3}	3.5×10^{-3}	0.02	0.03	0.02	0.03	0.02	0.03	2.4×10^{-3}	3.3×10^{-3}
Cadmium	0.02	0.09	9.0×10^{-3}	0.03	1.3×10^{-2}	0.04	1.0×10^{-2}	0.02	1.0×10^{-2}	0.02	0.16	0.61	0.07	0.23	0.10	0.31	0.08	0.15
Chromium	0.04	0.10	0.02	0.04	0.03	0.05	0.04	0.05	0.04	0.05	0.09	0.20	0.05	0.08	0.05	0.10	0.07	0.10
Cobalt	1.1×10^{-2}	0.02	1.2×10^{-2}	0.03	0.02	0.03	1.9×10^{-3}	2.5×10^{-3}	2.2×10^{-3}	2.9×10^{-3}	0.06	0.14	0.07	0.17	0.09	0.22	1.1×10^{-2}	0.02
Copper	0.53	1.3	0.31	0.78	0.33	0.89	0.17	0.22	0.17	0.23	1.1	2.8	0.66	1.7	0.71	1.9	0.35	0.48
Lead	0.02	0.03	1.5×10^{-2}	0.02	0.02	0.03	5.7×10^{-3}	7.8×10^{-3}	6.1×10^{-3}	8.3×10^{-3}	0.09	0.16	0.05	0.08	0.06	0.10	0.02	0.04
Manganese	1.6	3.0	2.2	6.3	2.8	7.6	0.81	1.2	0.83	1.2	3.1	6.0	4.4	12.3	5.6	15.1	1.6	2.2
Nickel	0.03	0.06	0.06	0.10	0.11	0.17	0.09	0.12	0.09	0.11	0.09	0.18	0.18	0.31	0.35	0.55	0.28	0.39
Selenium	0.04	0.13	8.6×10^{-3}	1.3×10^{-2}	9.2×10^{-3}	1.4×10^{-2}	0.02	0.03	0.02	0.03	0.14	0.47	0.03	0.09	0.03	0.09	0.07	0.20
Silver	1.4×10^{-3}	2.1×10^{-3}	1.3×10^{-3}	2.0×10^{-3}	1.3×10^{-3}	2.2×10^{-3}	3.2×10^{-4}	5.0×10^{-4}	3.7×10^{-4}	5.6×10^{-4}	1.8×10^{-3}	2.8×10^{-3}	1.8×10^{-3}	2.7×10^{-3}	1.8×10^{-3}	2.9×10^{-3}	4.4×10^{-4}	6.8×10^{-4}
Strontium	1.3	1.8	1.4	1.9	1.5	2.1	1.6	2.2	1.5	2.2	3.9	6.9	4.2	7.4	4.5	8.1	4.8	8.5
Tin	1.1×10^{-2}	1.4×10^{-2}	0.02	0.05	0.03	0.08	4.8×10^{-4}	6.7×10^{-4}	9.3×10^{-4}	1.3×10^{-3}	0.07	0.18	0.13	0.38	0.19	0.60	3.0×10^{-3}	8.3×10^{-3}
Vanadium	0.03	0.04	0.04	0.08	0.05	0.12	0.03	0.04	0.03	0.04	0.08	0.12	0.10	0.24	0.13	0.36	0.09	0.13
Zinc	33.7	97.6	18.9	64.1	26.5	85.4	4.2	6.9	4.6	8.5	49.2	143	27.6	93.7	38.6	123	6.1	10.1

Notes:
RC DS – X14 – Rose Creek Downstream X14
PR DS AC – Pelly River Downstream Anvil Creek
VC DS – V8 – Vangorda Creek Downstream V8
VC DS – V27– Vangorda Creek Downstream V27
PR DS VC – Pelly River Downstream Vangorda Creek

Table 4.2 Predicted Intakes by Terrestrial Animals for Final Closure and Remediation Plan (Cont'd)

	Predicted Intakes (mg/kg-d) for Terrestrial Ecological Receptors - Final Closure and Remediation Plan																	
COPC	Mink		Moose		Scaup										Sheep		Wolf	
	PR DS AC		O		RC DS - X14		VC DS - V8		VC DS - V27		PR DS VC		PR DS AC		S		O	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Antimony	$5.3x10^{-3}$	$1.4x10^{-2}$	$3.8x10^{-3}$	$1.1x10^{-2}$	$1.3x10^{-2}$	0.04	$1.4x10^{-2}$	0.04	0.02	0.05	$5.0x10^{-3}$	0.02	$5.3x10^{-3}$	0.02	$1.0x10^{-2}$	0.02	$1.4x10^{-3}$	$2.8x10^{-3}$
Arsenic	0.03	0.10	$1.1x10^{-2}$	0.04	0.25	0.98	0.20	0.79	0.22	0.88	0.13	0.50	0.13	0.50	$8.3x10^{-3}$	$1.5x10^{-2}$	$2.8x10^{-3}$	$8.4x10^{-3}$
Beryllium	$4.9x10^{-4}$	$7.0x10^{-4}$	$2.7x10^{-4}$	$4.4x10^{-4}$	$1.9x10^{-3}$	$3.0x10^{-3}$	$1.7x10^{-3}$	$2.6x10^{-3}$	$1.8x10^{-3}$	$2.7x10^{-3}$	$2.3x10^{-5}$	$3.4x10^{-5}$	$9.6x10^{-5}$	$1.5x10^{-4}$	$2.0x10^{-3}$	$4.7x10^{-3}$	$2.1x10^{-4}$	$3.4x10^{-4}$
Boron	$3.2x10^{-3}$	$4.4x10^{-3}$	0.18	0.41	$1.1x10^{-3}$	$1.4x10^{-3}$	$1.0x10^{-3}$	$1.3x10^{-3}$	$1.0x10^{-3}$	$1.3x10^{-3}$	$1.1x10^{-4}$	$1.4x10^{-4}$	$1.5x10^{-4}$	$1.9x10^{-4}$	0.55	1.2	0.02	0.05
Cadmium	0.08	0.15	0.06	0.14	0.35	1.4	0.16	0.58	0.23	0.78	0.18	0.55	0.18	0.56	$7.0x10^{-3}$	$1.4x10^{-2}$	0.20	0.56
Chromium	0.07	0.10	$1.1x10^{-2}$	0.04	0.06	0.13	0.03	0.05	0.04	0.07	0.05	0.07	0.05	0.07	0.02	0.04	$4.5x10^{-3}$	$1.1x10^{-2}$
Cobalt	$1.2x10^{-2}$	0.03	$1.4x10^{-2}$	0.03	0.15	0.49	0.17	0.57	0.21	0.71	0.03	0.09	0.03	0.10	0.02	0.05	$1.5x10^{-3}$	$3.4x10^{-3}$
Copper	0.37	0.51	0.10	0.16	1.5	4.3	0.86	2.5	0.92	2.8	0.45	1.1	0.47	1.1	0.23	0.41	0.17	0.34
Lead	0.05	0.10	0.10	0.38	0.09	0.17	0.07	0.12	0.09	0.15	0.03	0.04	0.03	0.05	0.12	0.24	0.13	0.44
Manganese	1.6	2.2	8.2	29.5	2.6	5.4	3.8	10.6	4.8	13.6	1.4	2.1	1.4	2.1	15.0	27.3	0.16	0.49
Nickel	0.27	0.38	0.05	0.11	0.12	0.25	0.23	0.45	0.45	0.81	0.36	0.61	0.35	0.59	0.09	0.34	$2.6x10^{-3}$	$6.7x10^{-3}$
Selenium	0.07	0.20	$9.0x10^{-3}$	0.03	0.23	1.00	0.05	0.21	0.05	0.23	0.11	0.48	0.11	0.47	$8.7x10^{-3}$	0.03	$1.5x10^{-2}$	0.03
Silver	$5.0x10^{-4}$	$7.6x10^{-4}$	$5.2x10^{-4}$	$1.5x10^{-3}$	$8.9x10^{-4}$	$3.3x10^{-3}$	$8.5x10^{-4}$	$3.1x10^{-3}$	$8.6x10^{-4}$	$3.2x10^{-3}$	$2.1x10^{-4}$	$7.8x10^{-4}$	$2.4x10^{-4}$	$8.8x10^{-4}$	$2.0x10^{-3}$	$3.7x10^{-3}$	$5.3x10^{-3}$	$1.3x10^{-2}$
Strontium	4.8	8.5	0.56	1.5	13.7	32.5	14.8	35.1	15.8	37.6	16.8	40.2	16.7	39.9	2.9	7.1	0.02	0.04
Tin	$5.7x10^{-3}$	0.02	$2.6x10^{-3}$	$5.6x10^{-3}$	0.09	0.31	0.17	0.61	0.26	0.99	$4.1x10^{-3}$	$1.4x10^{-2}$	$7.9x10^{-3}$	0.03	0.05	0.10	$2.7x10^{-3}$	$7.3x10^{-3}$
Vanadium	0.09	0.13	$1.3x10^{-2}$	0.03	0.09	0.14	0.12	0.28	0.15	0.42	0.10	0.15	0.10	0.15	$1.4x10^{-2}$	0.02	$2.3x10^{-3}$	$5.7x10^{-3}$
Zinc	6.8	12.5	4.1	12.3	14.0	45.0	7.8	29.2	11.3	39.9	1.7	4.8	1.9	5.4	2.3	4.0	3.0	5.6

Notes:
O – Overall
S – Sheep (Mt. Nye)
RC DS – X14 – Rose Creek Downstream X14
PR DS AC – Pelly River Downstream Anvil Creek
VC DS – V8 – Vangorda Creek Downstream V8
VC DS – V27– Vangorda Creek Downstream V27
PR DS VC – Pelly River Downstream Vangorda Creek

4.4 HUMAN INTAKES

Intakes of COPC by humans located at the site were predicted based on the dietary characteristics provided in Section 3.2 and the locations in the study area from which the various components of the diet were assumed to be obtained (see Table 3.4). Appendix F provides the sample calculation for human intakes. The equations and assumptions used to calculate the intakes are provided in this section.

Ingestion of Water

$$I_{water} = \frac{C_{water} \times R_{water} \times F_{site}}{BW} \quad (4\text{-}2)$$

where:

I_{water}	=	exposure to COPC through the water pathway [mg/(kg-d)];
C_{water}	=	water concentration [mg/L];
R_{water}	=	water ingestion rate [L/d] {shown in Table 3.10};
F_{site}	=	fraction of time at site [-]{shown in Table 3.4};
BW	=	body weight [kg] {shown in Table 3.10}.

Incidental Ingestion of Soil

$$I_{soil} = \frac{C_{soil} \times R_{soil} \times F_{site}}{BW} \times \frac{1}{1000} \quad (4\text{-}3)$$

where:

I_{soil}	=	exposure to COPC through the soil pathway [mg/(kg-d)];
C_{soil}	=	soil concentration [mg/kg (dw)];
R_{soil}	=	soil ingestion rate [mg (dw)/d] {shown in Table 3.10};
F_{site}	=	fraction of time at site [-]{shown in Table 3.4};
BW	=	body weight [kg] {shown in Table 3.10};

Ingestion of Food

$$I_{food\ x} = \frac{C_x \times R_{ing} \times F_x \times F_{site}}{BW} \times \frac{1}{1000} \quad (4\text{-}4)$$

where:

$I_{food\ x}$	=	exposure to COPC through the food pathway [mg/(kg-d)], where x is fish, berry, grouse, hare, beaver, marmot, sheep, moose, caribou, as applicable;

C_x = concentration of COPC [mg/kg (ww)] for each x;
R_{ing} = food ingestion rate [g (ww)/d] {shown in Table 3.10};
F_x = fraction of diet that is x, where x is fish, berry, grouse, hare, beaver, marmot, sheep, moose, caribou, as applicable [-] {shown in Table 3.10};
F_{site} = fraction of food from site [-] {0.50};
BW = body weight [kg];
1/1000 = unit conversion factor [kg/g].

Dermal Exposure to Soil

The approach used for estimating the dermal exposure to COPC in soil was based on the equations given in U.S. EPA (2001).

$$I_{dermal} = \frac{C_{soil} \times SA \times SL \times RAF \times EF \times F_{site}}{BW} \quad (4\text{-}5)$$

where:

I_{dermal} = exposure to COPC in soil through the dermal pathway [mg/(kg-d)];
C_{soil} = soil concentration [mg/kg (dw)];
SA = skin surface area – total [cm^2] {shown in Table 3.10};
SL = loading to exposed skin [kg (dw)/(cm^2 event)] {shown in Table 3.10};
RAF = dermal absorption factor [-] – obtained from Health Canada (2004a);
EF = exposure frequency [events/d] {assumed to be 1/d};
F_{site} = fraction of time at site [-]{shown in Table 3.4};
BW = body weight [kg] {shown in Table 3.10}.

In short, the concentrations of the various COPC in different dietary components (by location) are considered in their intakes. In the existing conditions, it was assumed that campers were located at Pelly River near Pelly Crossing and in the Swim Lakes area (Background). After remediation, it was assumed that conditions at the site were improved such that campers would be present near Rose Creek and Vangorda Creek.

4.4.1 Existing Conditions

As discussed above, Camper 1 was assumed to be present at Pelly River near Pelly Crossing site but hunt, trap and gather berries on site. Camper 2 was assumed to be at a background location near Swim Lake. Adults, children and toddlers were considered. As seen from Table 4.3, intakes of COPC for toddlers are generally higher than for older children or adults. Not surprisingly, the intakes associated with background exposures (Camper 2) are lower than those associated with the Camper 1 who goes on the site to hunt large game, trap small mammals and

collect berries around the Faro Mine Complex. It has been assumed that these individuals spend 1.5 months of the year on site and consume meat and fish obtained from the site every other day for the rest of the year (or for six months of the year). Measured concentrations of caribou and moose flesh provided by hunters in the area were used in the calculations.

Figure 4.1 provides the percentage breakdown by pathway for the adult Camper 1 and Camper 2. As seen from this figure, the ingestion of moose represents the largest exposure pathways for antimony (Camper 2 only), beryllium (Camper 2 only), boron (Camper 1 only), chromium (Camper 2 only), selenium (both Camper 1 and 2), tin (Camper 2 only), vanadium (Camper 2 only) and zinc (both Camper 1 and 2). The the consumption of fish and moose represent the largest exposure pathways for antimony (Camper 1 only), arsenic (Camper 2 only), beryllium (Camper 1 only), cadmium (Camper 1 only), chromium (Camper 1 only), cobalt (both Camper 1 and 2), copper (Camper 2 only), nickel (both Camper 1 and 2), tin (Camper 1 only), silver (Camper 2 only) and vanadium (Camper 1 only). The consumption of moose, fish and caribou are the significant pathways of exposure for Camper 1 only for arsenic, copper and silver. For lead exposure to Camper 1, soil, hare and marmot consumption are the most significant, where as for lead exposure to Camper 2, the consumption of fish and soil are the most significant. For both Camper 1 and Camper 2, the consumption of fish, Labrador tea and berries were the most significant pathways for manganese. The consumption of fish was the most significant pathway of exposure for Camper 1 for strontium and for cadmium for Camper 2. For Camper 2, the consumption of moose and Labrador tea were the most significant pathways for boron and strontium.

4.4.2 Final Closure and Remediation Plan

The predicted intakes for the various receptors for the final closure and remediation plan are provided on Table 4.4. Camper 3 and Camper 4 were considered in this assessment to accommodate a change in activity patterns following remediation activities at the site. Most significantly, it was assumed that human receptors would fish from Rose Creek and Vangorda Creek. It has been assumed that the COPC concentrations in the terrestrial environment do not change from what are currently being measured and therefore only the COPC concentrations in water change as time progresses in this scenario. As seen from the table, the ingestion intakes for the final closure and remediation plan are lower than the existing conditions with the exception of antimony, beryllium, boron, selenium, tin and zinc. For antimony, beryllium, selenium and zinc, this is due to increased exposure from the consumption of fish caught at areas closer to the site. The increased exposure for boron is from water and tin is from beaver ingestion.

Figure 4.2 provides the percentage breakdown by pathway for the adult Camper 3 and Camper 4. As seen from this figure, the consumption of moose and fish represents the largest exposure pathway for Camper 3 and 4 for antimony, arsenic, cadmium, chromium, cobalt, nickel, tin (Camper 4 only) and vanadium. The consumption of fish represents the largest exposure pathways for Camper 3 and 4 for beryllium and strontium. Consumption of moose is the most significant pathway of exposure for copper, selenium, silver, and zinc for Camper 3 and 4. For Camper 3, consumption of marmot, hare and soil are the significant pathways of exposure for lead, while for Camper 4, consumption of marmot, hare and moose are the most significant pathways for lead. The consumption of moose, beaver and fish are the significant pathways of exposure for tin for Camper 3. The consumption of fish and Labrador tea are the significant pathways for manganese for Camper 3 and 4.

Table 4.3 Predicted Intakes by Human Receptors for Existing Conditions

COPC	Predicted Total Intakes (mg/kg-d) for Human Receptors – Existing Conditions											
	Camper 1						Camper 2					
	Adult		Child		Toddler		Adult		Child		Toddler	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Antimony	$9.9x10^{-6}$	$2.2x10^{-5}$	$1.6x10^{-5}$	$3.5x10^{-5}$	$2.5x10^{-5}$	$5.0x10^{-5}$	$2.7x10^{-6}$	$6.0x10^{-6}$	$4.4x10^{-6}$	$9.6x10^{-6}$	$9.2x10^{-6}$	$1.7x10^{-5}$
Arsenic	$4.2x10^{-5}$	$1.3x10^{-4}$	$6.8x10^{-5}$	$2.1x10^{-4}$	$9.7x10^{-5}$	$2.9x10^{-4}$	$2.3x10^{-5}$	$3.3x10^{-5}$	$3.7x10^{-5}$	$5.3x10^{-5}$	$5.7x10^{-5}$	$8.7x10^{-5}$
Beryllium	$4.1x10^{-6}$	$8.2x10^{-6}$	$6.5x10^{-6}$	$1.3x10^{-5}$	$9.2x10^{-6}$	$1.8x10^{-5}$	$6.4x10^{-7}$	$1.6x10^{-6}$	$1.0x10^{-6}$	$2.4x10^{-6}$	$1.8x10^{-6}$	$3.8x10^{-6}$
Boron	$5.9x10^{-4}$	$1.5x10^{-3}$	$8.3x10^{-4}$	$2.3x10^{-3}$	$1.2x10^{-3}$	$3.2x10^{-3}$	$2.8x10^{-4}$	$4.1x10^{-4}$	$3.5x10^{-4}$	$4.9x10^{-4}$	$5.3x10^{-4}$	$7.5x10^{-4}$
Cadmium	$8.0x10^{-5}$	$2.3x10^{-4}$	$1.3x10^{-4}$	$3.7x10^{-4}$	$1.8x10^{-4}$	$5.1x10^{-4}$	$5.1x10^{-5}$	$9.4x10^{-5}$	$8.7x10^{-5}$	$1.6x10^{-4}$	$1.1x10^{-4}$	$2.1x10^{-4}$
Chromium	$3.1x10^{-4}$	$9.4x10^{-4}$	$5.1x10^{-4}$	$1.5x10^{-3}$	$6.8x10^{-4}$	$2.0x10^{-3}$	$7.0x10^{-5}$	$1.6x10^{-4}$	$1.1x10^{-4}$	$2.6x10^{-4}$	$1.6x10^{-4}$	$3.6x10^{-4}$
Cobalt	$3.5x10^{-5}$	$9.6x10^{-5}$	$5.6x10^{-5}$	$1.5x10^{-4}$	$7.7x10^{-5}$	$2.1x10^{-4}$	$2.1x10^{-5}$	$3.2x10^{-5}$	$3.4x10^{-5}$	$5.2x10^{-5}$	$4.6x10^{-5}$	$7.0x10^{-5}$
Copper	$3.3x10^{-3}$	$7.1x10^{-3}$	$5.2x10^{-3}$	$1.1x10^{-2}$	$7.2x10^{-3}$	$1.6x10^{-2}$	$1.9x10^{-3}$	$2.8x10^{-3}$	$3.1x10^{-3}$	$4.6x10^{-3}$	$4.3x10^{-3}$	$6.3x10^{-3}$
Lead	$3.6x10^{-4}$	$9.9x10^{-4}$	$5.9x10^{-4}$	$1.6x10^{-3}$	$1.2x10^{-3}$	$2.7x10^{-3}$	$1.7x10^{-4}$	$3.0x10^{-4}$	$3.0x10^{-4}$	$5.2x10^{-4}$	$8.2x10^{-4}$	$1.5x10^{-3}$
Manganese	$6.0x10^{-3}$	$1.5x10^{-2}$	$7.4x10^{-3}$	$2.2x10^{-2}$	$1.0x10^{-2}$	$2.9x10^{-2}$	$3.1x10^{-3}$	$5.7x10^{-3}$	$2.7x10^{-3}$	$5.3x10^{-3}$	$4.3x10^{-3}$	$8.9x10^{-3}$
Nickel	$1.4x10^{-4}$	$3.8x10^{-4}$	$2.3x10^{-4}$	$6.4x10^{-4}$	$3.1x10^{-4}$	$8.3x10^{-4}$	$5.1x10^{-5}$	$8.5x10^{-5}$	$8.7x10^{-5}$	$1.6x10^{-4}$	$1.3x10^{-4}$	$2.4x10^{-4}$
Selenium	$5.0x10^{-4}$	$9.6x10^{-4}$	$7.9x10^{-4}$	$1.5x10^{-3}$	$1.1x10^{-3}$	$2.2x10^{-3}$	$1.0x10^{-4}$	$2.0x10^{-4}$	$1.6x10^{-4}$	$3.2x10^{-4}$	$2.3x10^{-4}$	$4.5x10^{-4}$
Silver	$2.0x10^{-4}$	$6.8x10^{-4}$	$3.2x10^{-4}$	$1.1x10^{-3}$	$4.4x10^{-4}$	$1.5x10^{-3}$	$2.1x10^{-5}$	$3.1x10^{-5}$	$3.4x10^{-5}$	$5.1x10^{-5}$	$4.6x10^{-5}$	$6.9x10^{-5}$
Strontium	$2.5x10^{-3}$	$4.5x10^{-3}$	$3.8x10^{-3}$	$7.2x10^{-3}$	$4.9x10^{-3}$	$9.1x10^{-3}$	$1.0x10^{-4}$	$1.6x10^{-4}$	$1.1x10^{-4}$	$1.8x10^{-4}$	$1.8x10^{-4}$	$3.1x10^{-4}$
Tin	$6.7x10^{-5}$	$1.9x10^{-4}$	$1.1x10^{-4}$	$3.1x10^{-4}$	$1.5x10^{-4}$	$4.3x10^{-4}$	$3.5x10^{-5}$	$5.1x10^{-5}$	$5.5x10^{-5}$	$8.3x10^{-5}$	$8.0x10^{-5}$	$1.2x10^{-4}$
Vanadium	$1.7x10^{-4}$	$5.6x10^{-4}$	$2.9x10^{-4}$	$9.8x10^{-4}$	$3.8x10^{-4}$	$1.2x10^{-3}$	$8.8x10^{-6}$	$1.2x10^{-5}$	$1.4x10^{-5}$	$2.0x10^{-5}$	$2.4x10^{-5}$	$4.0x10^{-5}$
Zinc	$1.2x10^{-1}$	$2.5x10^{-1}$	$2.0x10^{-1}$	$4.1x10^{-1}$	$2.8x10^{-1}$	$5.8x10^{-1}$	$5.9x10^{-2}$	$8.4x10^{-2}$	$9.5x10^{-2}$	$1.3x10^{-1}$	$1.3x10^{-1}$	$1.9x10^{-1}$

Figure 4.1 Percentage Breakdown by Pathway for Existing Conditions

Adult – Camper 1

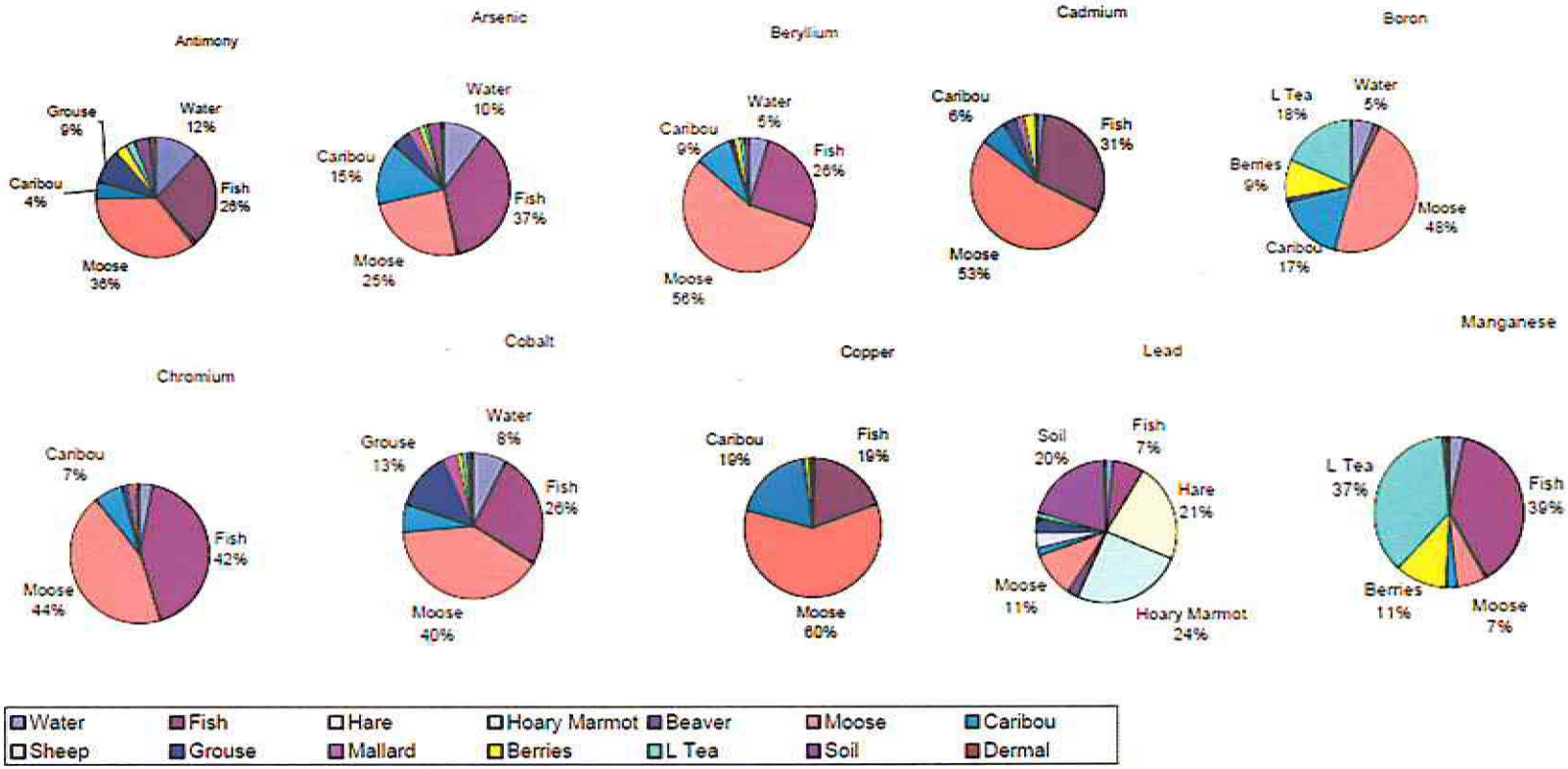


Figure 4.1 Percentage Breakdown by Pathway for Existing Conditions (Cont'd)
Adult – Camper 1

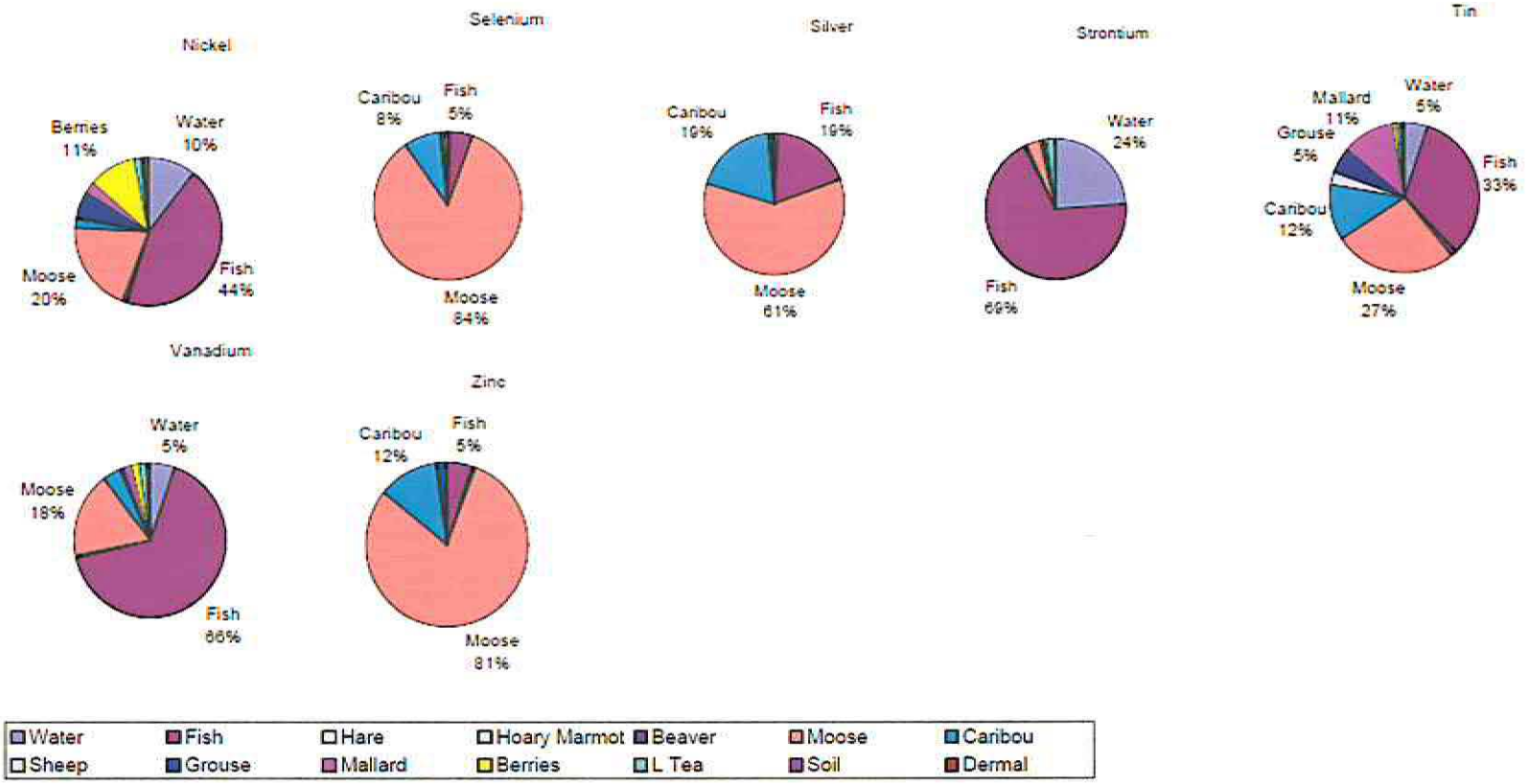


Figure 4.1 Percentage Breakdown by Pathway for Existing Conditions (Cont'd)
Adult – Camper 2

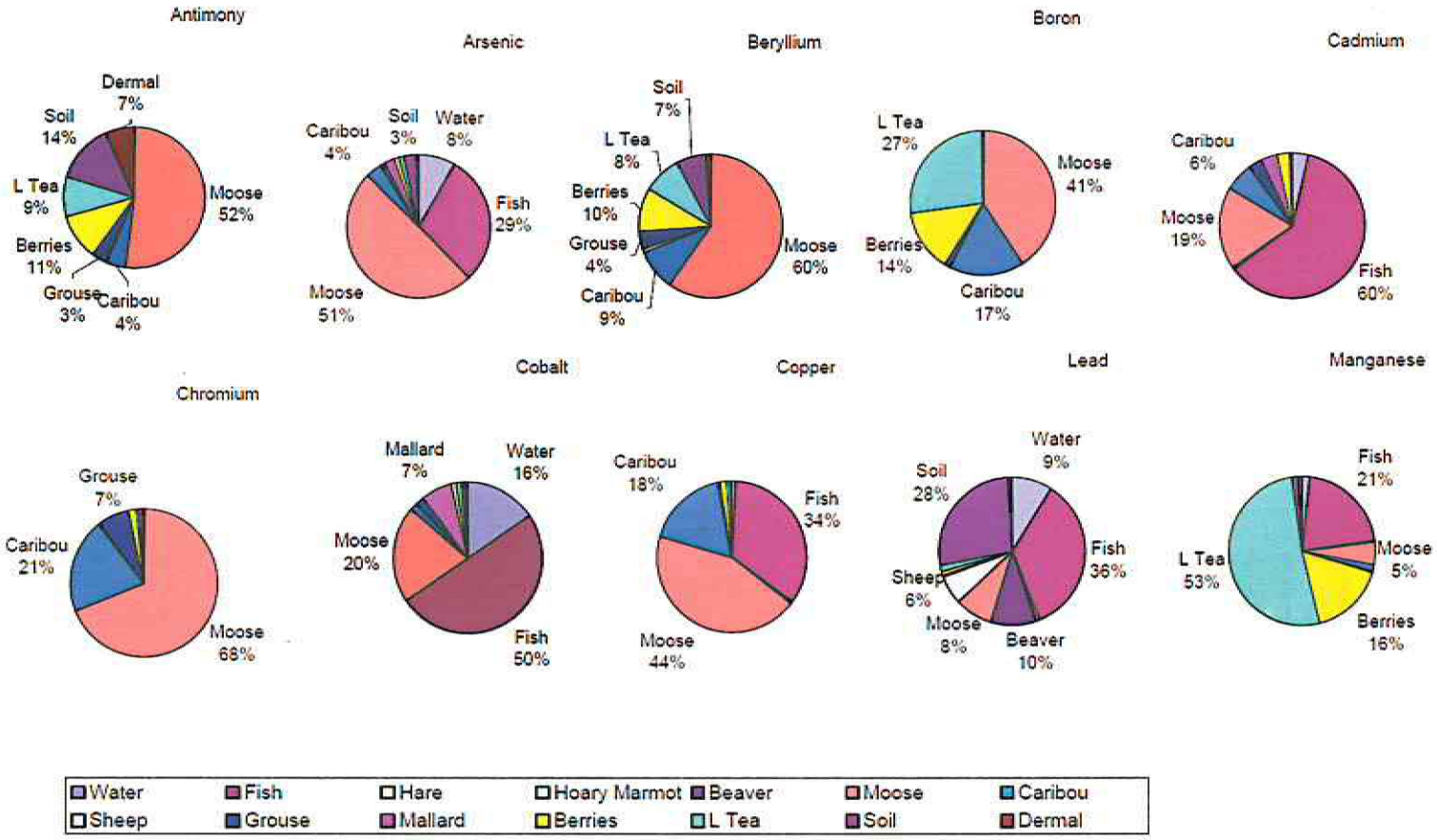


Figure 4.1 Percentage Breakdown by Pathway for Existing Conditions (Cont'd)
Adult – Camper 2

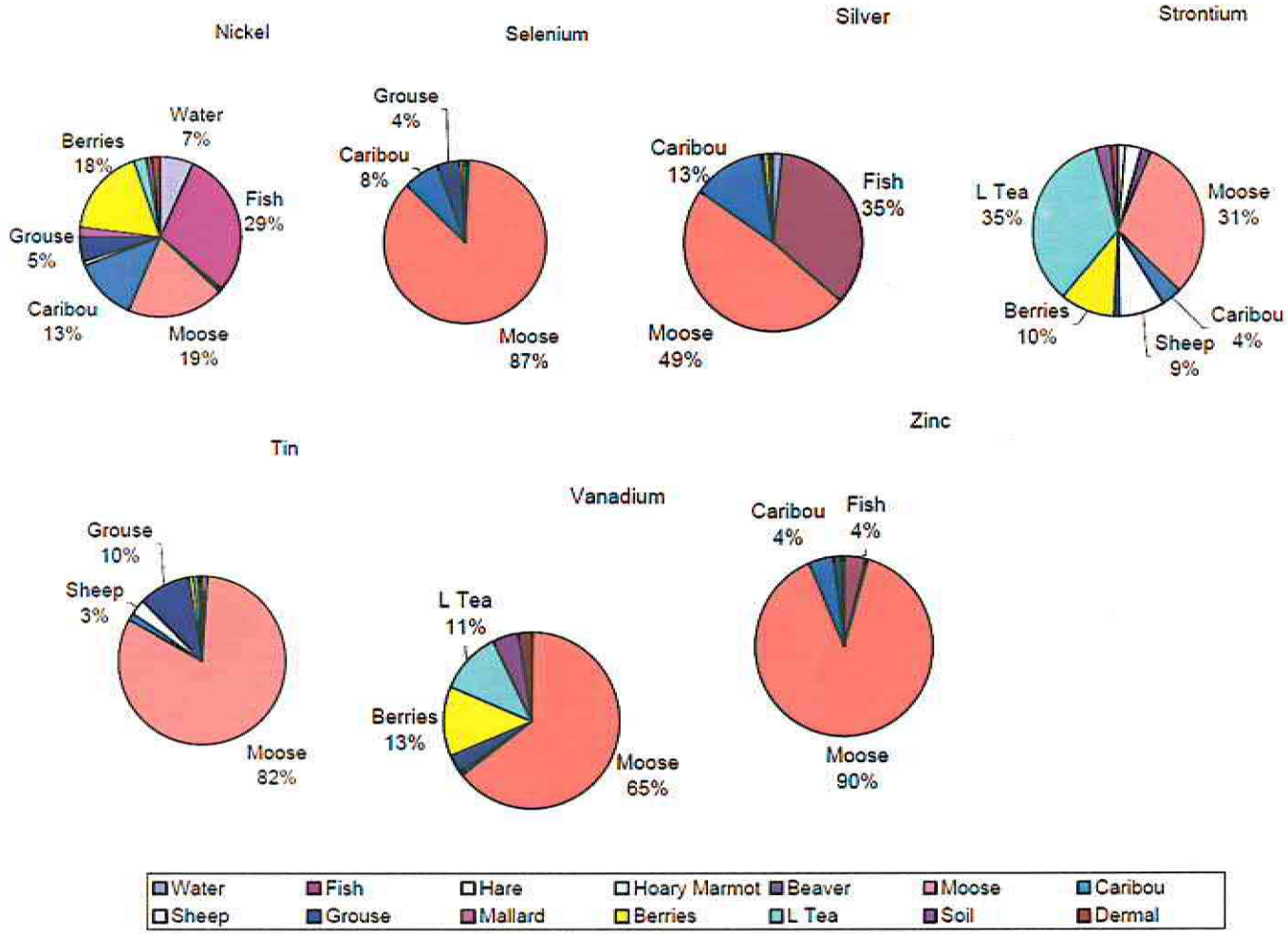


Table 4.4 Predicted Intakes by Human Receptors for the Final Closure and Remediation Plan

COPC	Predicted Total Intakes (mg/kg-d) for Human Receptors – Final Closure and Remediation Plan											
	Camper 3						Camper 4					
	Adult		Child		Toddler		Adult		Child		Toddler	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Antimony	$1.2x10^{-5}$	$2.4x10^{-5}$	$1.9x10^{-5}$	$3.8x10^{-5}$	$2.8x10^{-5}$	$5.5x10^{-5}$	$1.3x10^{-5}$	$2.5x10^{-5}$	$2.0x10^{-5}$	$4.0x10^{-5}$	$3.0x10^{-5}$	$5.7x10^{-5}$
Arsenic	$3.2x10^{-5}$	$7.5x10^{-5}$	$5.2x10^{-5}$	$1.2x10^{-4}$	$7.6x10^{-5}$	$1.7x10^{-4}$	$3.0x10^{-5}$	$7.4x10^{-5}$	$4.8x10^{-5}$	$1.2x10^{-4}$	$6.9x10^{-5}$	$1.7x10^{-4}$
Beryllium	$1.4x10^{-5}$	$2.3x10^{-5}$	$2.4x10^{-5}$	$3.9x10^{-5}$	$3.1x10^{-5}$	$4.9x10^{-5}$	$1.4x10^{-5}$	$2.1x10^{-5}$	$2.2x10^{-5}$	$3.6x10^{-5}$	$2.9x10^{-5}$	$4.5x10^{-5}$
Boron	$6.7x10^{-4}$	$1.6x10^{-3}$	$9.3x10^{-4}$	$2.4x10^{-3}$	$1.3x10^{-3}$	$3.2x10^{-3}$	$7.1x10^{-4}$	$1.6x10^{-3}$	$1.0x10^{-3}$	$2.5x10^{-3}$	$1.5x10^{-3}$	$3.5x10^{-3}$
Cadmium	$7.6x10^{-5}$	$2.2x10^{-4}$	$1.2x10^{-4}$	$3.6x10^{-4}$	$1.7x10^{-4}$	$4.8x10^{-4}$	$6.2x10^{-5}$	$1.7x10^{-4}$	$1.0x10^{-4}$	$2.8x10^{-4}$	$1.4x10^{-4}$	$3.9x10^{-4}$
Chromium	$1.9x10^{-4}$	$4.9x10^{-4}$	$3.1x10^{-4}$	$8.0x10^{-4}$	$4.2x10^{-4}$	$1.1x10^{-3}$	$1.7x10^{-4}$	$4.7x10^{-4}$	$2.8x10^{-4}$	$7.6x10^{-4}$	$3.8x10^{-4}$	$1.1x10^{-3}$
Cobalt	$3.2x10^{-5}$	$7.0x10^{-5}$	$5.0x10^{-5}$	$1.1x10^{-4}$	$7.4x10^{-5}$	$1.6x10^{-4}$	$3.4x10^{-5}$	$7.6x10^{-5}$	$5.4x10^{-5}$	$1.2x10^{-4}$	$7.6x10^{-5}$	$1.7x10^{-4}$
Copper	$3.1x10^{-3}$	$6.6x10^{-3}$	$5.0x10^{-3}$	$1.0x10^{-2}$	$7.0x10^{-3}$	$1.5x10^{-2}$	$2.9x10^{-3}$	$6.4x10^{-3}$	$4.7x10^{-3}$	$1.0x10^{-2}$	$6.6x10^{-3}$	$1.4x10^{-2}$
Lead	$3.6x10^{-4}$	$1.0x10^{-3}$	$6.0x10^{-4}$	$1.7x10^{-3}$	$1.2x10^{-3}$	$2.9x10^{-3}$	$1.1x10^{-4}$	$2.7x10^{-4}$	$1.8x10^{-4}$	$4.4x10^{-4}$	$3.0x10^{-4}$	$6.7x10^{-4}$
Manganese	$4.4x10^{-3}$	$7.5x10^{-3}$	$4.7x10^{-3}$	$9.0x10^{-3}$	$7.1x10^{-3}$	$1.3x10^{-2}$	$5.0x10^{-3}$	$1.0x10^{-2}$	$5.6x10^{-3}$	$1.4x10^{-2}$	$7.9x10^{-3}$	$1.9x10^{-2}$
Nickel	$6.9x10^{-5}$	$1.5x10^{-4}$	$1.2x10^{-4}$	$2.5x10^{-4}$	$1.7x10^{-4}$	$3.7x10^{-4}$	$9.9x10^{-5}$	$1.8x10^{-4}$	$1.6x10^{-4}$	$3.0x10^{-4}$	$2.2x10^{-4}$	$4.1x10^{-4}$
Selenium	$5.4x10^{-4}$	$1.0x10^{-3}$	$8.6x10^{-4}$	$1.6x10^{-3}$	$1.2x10^{-3}$	$2.3x10^{-3}$	$4.9x10^{-4}$	$9.4x10^{-4}$	$7.8x10^{-4}$	$1.5x10^{-3}$	$1.1x10^{-3}$	$2.2x10^{-3}$
Silver	$2.1x10^{-4}$	$6.9x10^{-4}$	$3.2x10^{-4}$	$1.2x10^{-3}$	$4.5x10^{-4}$	$1.6x10^{-3}$	$2.1x10^{-4}$	$6.9x10^{-4}$	$3.2x10^{-4}$	$1.2x10^{-3}$	$4.5x10^{-4}$	$1.6x10^{-3}$
Strontium	$2.5x10^{-3}$	$4.0x10^{-3}$	$3.8x10^{-3}$	$6.3x10^{-3}$	$5.0x10^{-3}$	$8.1x10^{-3}$	$2.7x10^{-3}$	$4.3x10^{-3}$	$4.2x10^{-3}$	$6.9x10^{-3}$	$5.5x10^{-3}$	$8.9x10^{-3}$
Tin	$8.7x10^{-5}$	$2.3x10^{-4}$	$1.4x10^{-4}$	$3.7x10^{-4}$	$1.9x10^{-4}$	$5.0x10^{-4}$	$8.3x10^{-5}$	$2.3x10^{-4}$	$1.3x10^{-4}$	$3.7x10^{-4}$	$1.8x10^{-4}$	$5.1x10^{-4}$
Vanadium	$4.7x10^{-5}$	$7.7x10^{-5}$	$7.6x10^{-5}$	$1.3x10^{-4}$	$1.1x10^{-4}$	$1.8x10^{-4}$	$5.6x10^{-5}$	$1.1x10^{-4}$	$9.2x10^{-5}$	$1.9x10^{-4}$	$1.3x10^{-4}$	$2.5x10^{-4}$
Zinc	$1.6x10^{-1}$	$3.1x10^{-1}$	$2.6x10^{-1}$	$5.1x10^{-1}$	$3.5x10^{-1}$	$6.9x10^{-1}$	$1.4x10^{-1}$	$2.9x10^{-1}$	$2.3x10^{-1}$	$4.8x10^{-1}$	$3.2x10^{-1}$	$6.5x10^{-1}$

Figure 4.2 Percentage Breakdown by Pathway for Final Closure and Remediation Plan

Adult – Camper 3

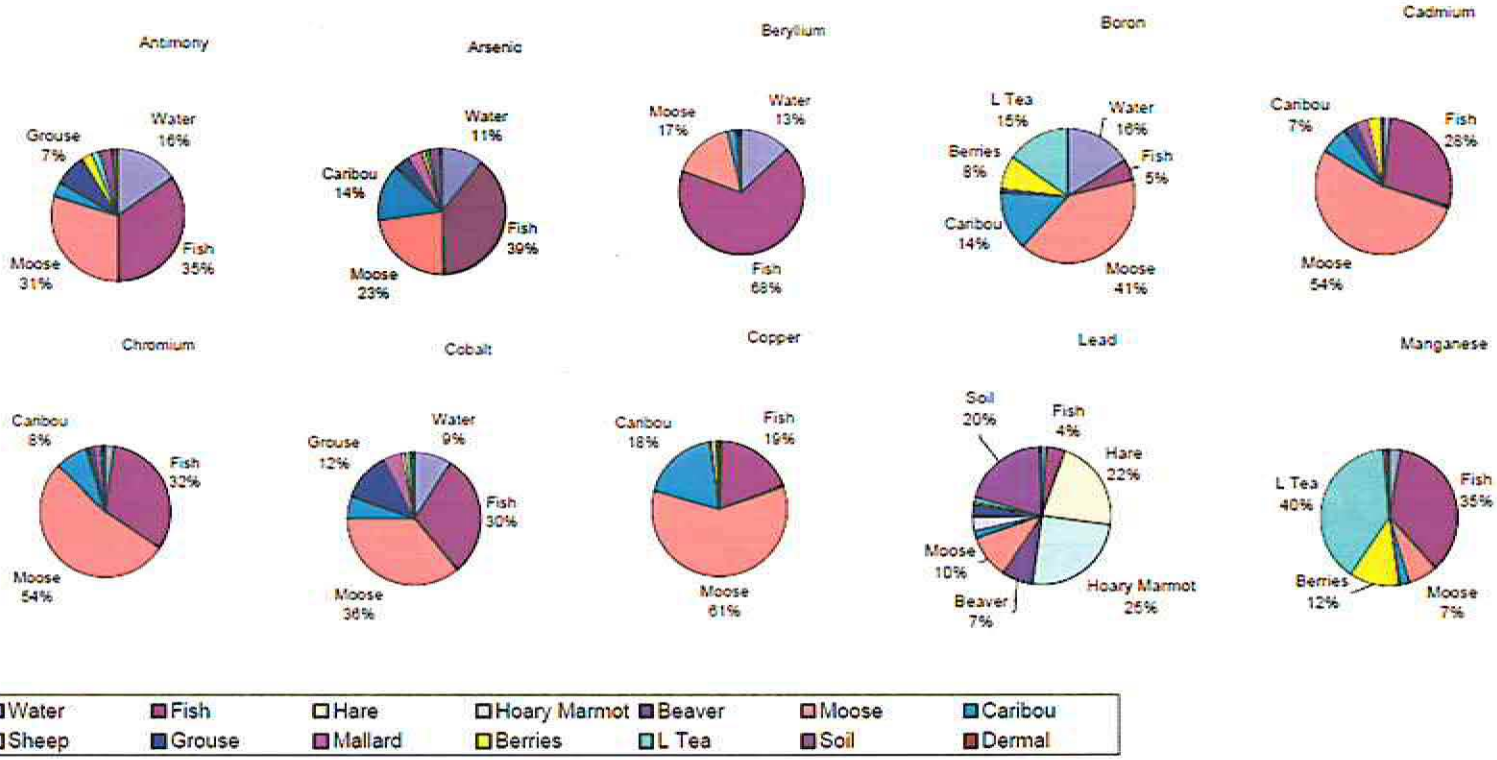


Figure 4.2 Percentage Breakdown by Pathway for Final Closure and Remediation Plan (Cont'd)
Adult – Camper 3

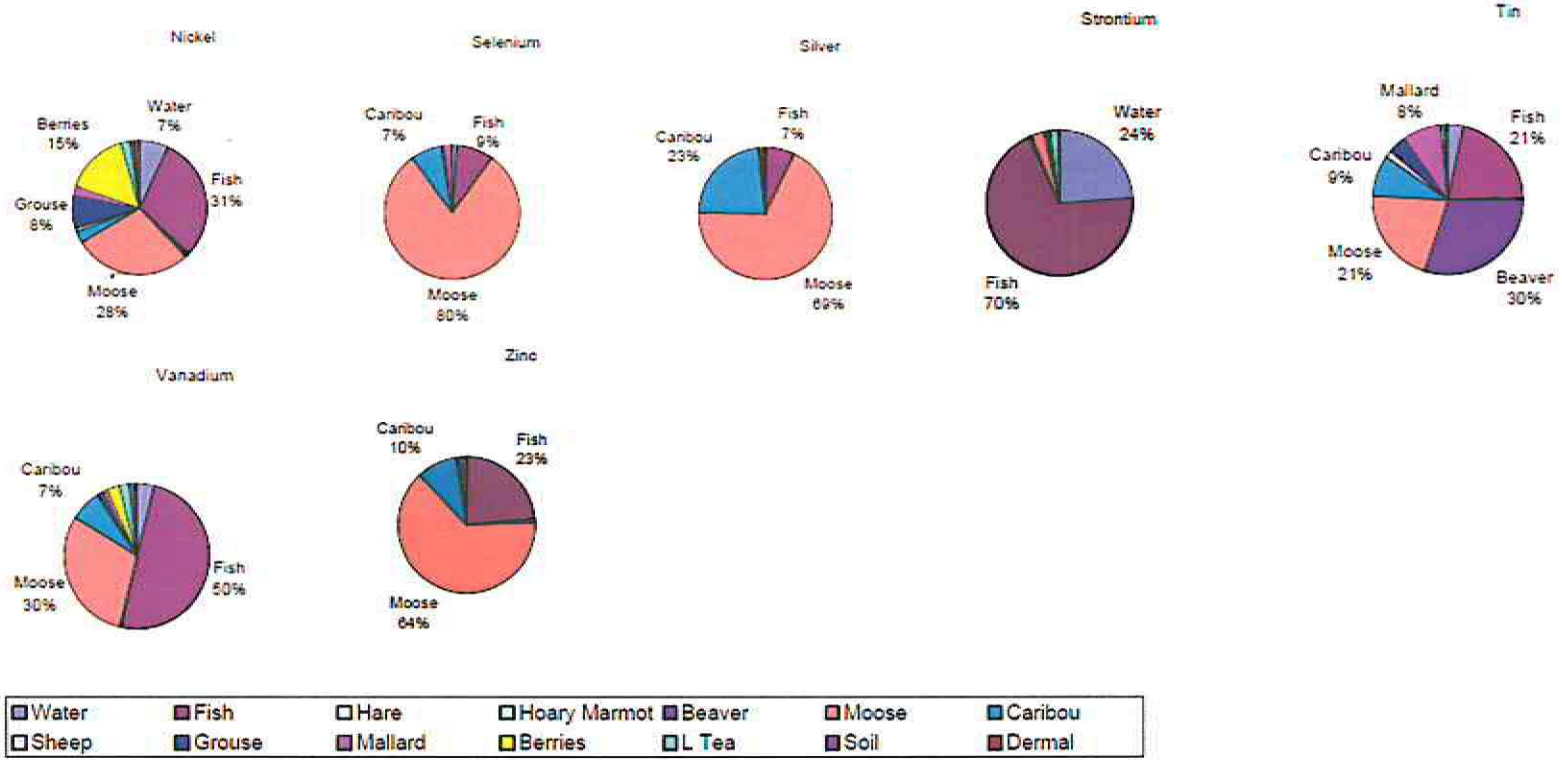


Figure 4.2 Percentage Breakdown by Pathway for Final Closure and Remediation Plan (Cont'd)
Adult – Camper 4

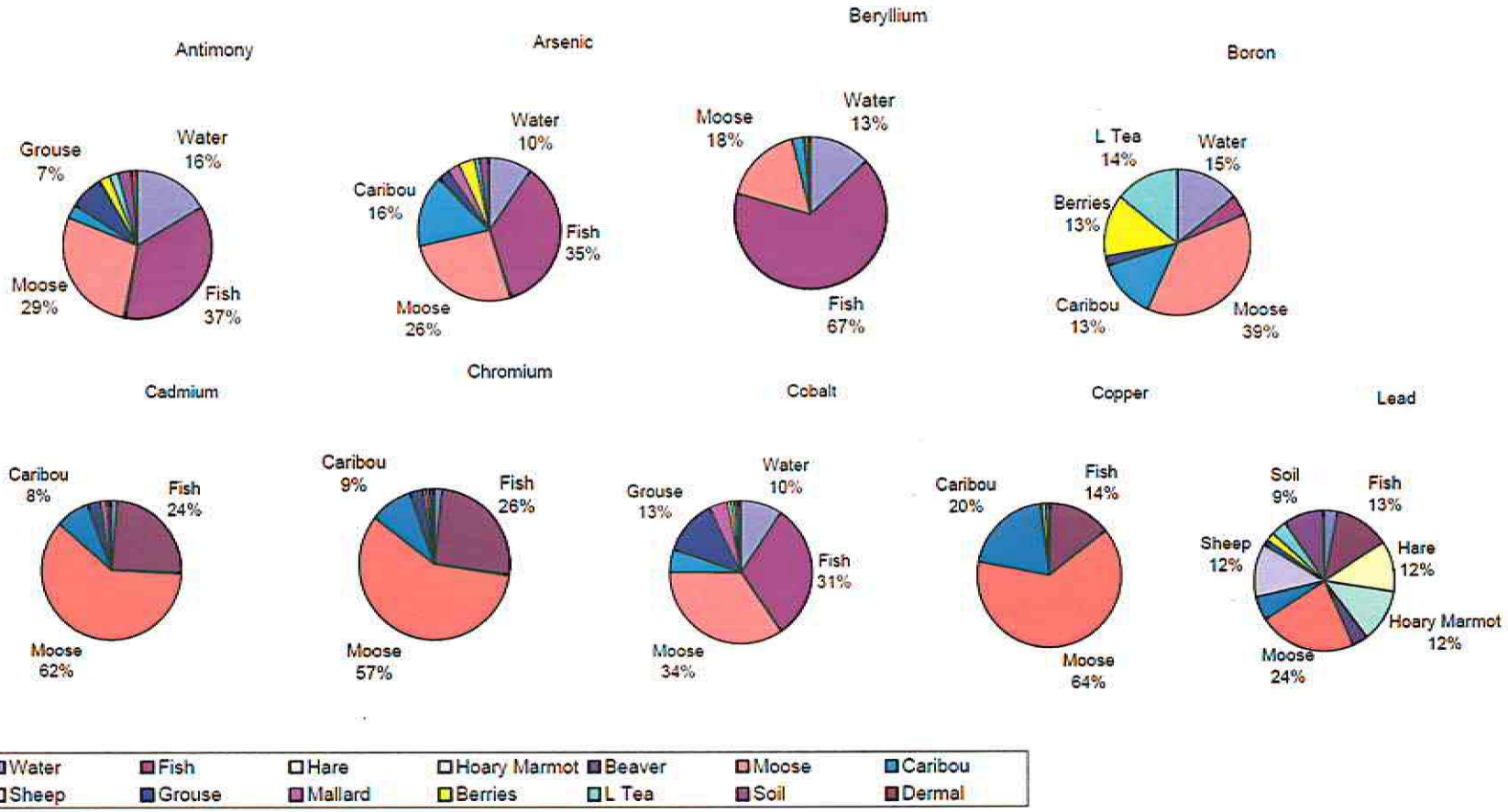
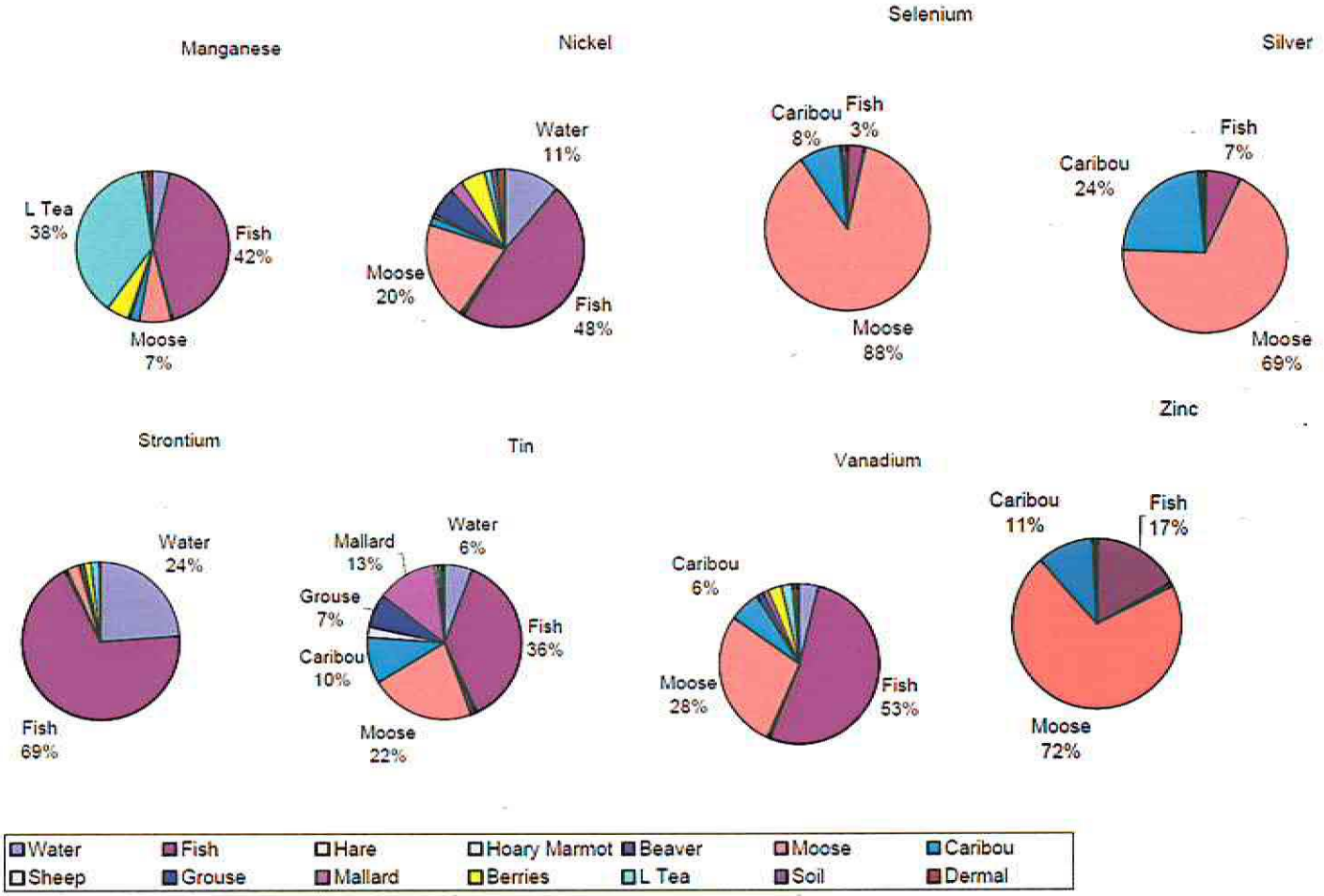


Figure 4.2 Percentage Breakdown by Pathway for Final Closure and Remediation Plan (Cont'd)
Adult – Camper 4



5.0 HAZARD ASSESSMENT

The hazard assessment phase of an ecological and/or human health risk assessment involves identification of chemical concentrations or doses which have been shown to have adverse effects on the receptors (ecological species or humans) of concern. The exposure concentrations or doses are generally determined from controlled laboratory tests or from epidemiology studies and are used to establish toxicity benchmarks which are protective of the receptors.

5.1 AQUATIC TOXICITY EVALUATIONS

Within the Ecological Risk Assessment (ERA), ecological receptor assessment endpoints represent potential effects at population or community levels. At these levels of biological organization, ecological receptor populations and community characteristics can be defined over fairly extended temporal and spatial scales making the potential for the direct measurement of effects challenging (Environment Canada 1997). This is particularly relevant to the predictive nature of this assessment.

Due to the difficulty in measuring direct effects on assessment endpoints, "*measurement endpoints*" are adopted to provide a framework for the evaluation of predicted effects. A measurement endpoint is defined as "*...a quantitative summary of the results of a toxicity test, a biological study, or other activity intended to reveal the effects of a substance*" (Suter 1993). In lieu of direct assessment endpoint effects measures, the adoption of measurement endpoints provides a consistent basis for the evaluation of potential effects due to exposure of assessment endpoints.

Measurement endpoints are commonly selected at the individual level of biological organization, and are typically based on exposure responses that represent key population and community characteristics such as reproduction and abundance (Environment Canada 1997). Such measurement endpoints are commonly based on literature-derived toxicity dose-response relationships, examined through laboratory experimentation (*i.e.*, the response of a particular organism to a certain level of exposure). When derived from toxicity studies, such measurement endpoints are often referred to as toxicity benchmarks or toxicity reference values.

These toxicity reference values are used in risk assessments to judge whether the predicted (estimated) exposures (or doses or intakes) may potentially have an adverse effect on ecological species. Site-specific information was incorporated into the selection process where available. A discussion of selected literature and the associated toxicity reference values consulted in this assessment is provided in the following sections. For this assessment, deterministic toxicity reference values were used as there was not enough information available to develop probability

distribution functions. To the best of our knowledge, no probabilistic assessments develop distribution functions for toxicity reference values.

In this assessment, EC_{20} (effects concentration) values which have the potential to affect 20% of the population were used to determine whether COPC are likely to cause adverse effects in aquatic receptors in Rose Creek, Vangorda Creek and the Pelly River. An EC_{25} value is suggested by Environment Canada for use in risk assessments (Environment Canada 1997). An EC_{20} concentration was chosen as a TRV because effects or changes in populations in this range are generally not distinguishable from natural variation. In addition, a 20% reduction in rapidly growing populations (e.g. phytoplankton or zooplankton) might be quickly offset by reproduction once the chemical stress is removed or may be offset by growth and immigration from non-affected nearby locations.

Where possible, effects concentration (EC) data were collected over lethal concentration (LC; mortality) data. Different models exist for translating chemical exposure (or dose) to toxic responses. For EC_{50} toxicity values, in the absence of detailed dose-response functions, a linear approximation is commonly applied assuming zero effect at zero exposure. This linearization is pessimistic since the predicted effect will be greater than that observed using the commonly encountered sigmoidal dose-response function for low dose exposures. For acute toxicity values (LC_{50} values derived from 96 hour tests) a factor of 10 was applied in the derivation of appropriate toxicity benchmarks (EC_{20} values) for this assessment (Environment Canada/Health Canada 2003). For LC_{50} data derived from chronic tests a factor of 4 was applied to determine the EC_{20} benchmark. This is an empirical factor based on the results of other toxicity tests.

It was not the intent in this assessment to extensively search the primary literature to obtain TRVs; rather, this assessment relied on TRVs that have been collated and peer reviewed by various agencies for use in risk assessments. The U.S. DOE database (Suter and Tsao 1996) on aquatic TRVs was the primary source of toxicity information. This database contains TRVs for the protection of aquatic life from chemicals in water. EC_{20} values provided in this database were selected as appropriate TRVs. The advantage in using these TRVs is that they were developed for use in risk assessments and have been peer reviewed. This database provides documentation on the sources and derivations of the values and discusses the relative conservatisms in the TRVs. The selection of the species was based species that are present at the site, but also encompassed species found in the general area.

If data were not available from the DOE database then the U.S. EPA database ECOTOX (U.S. EPA 2000) was examined for infilling purposes. The data summarized in this database are from a variety of sources, including peer reviewed literature. Toxicity information provided in the CCME Water Quality Guidelines (1999) was also used in the development of TRVs for this

assessment. For zinc and cadmium, recent toxicity information reviewed by Environment Canada as part of this project was used. TRVs were adjusted for a hardness level of 200 mg/L as $CaCO_3$. It is acknowledged that these databases may not have the most recent data; however, the TRVs selected are, in our opinion, appropriate.

Decision rules for the selection of test species were developed around the available data. For aquatic plants, the lowest of the toxicity values for *Lemna* sp. or *Myriophyllum* sp. test species was chosen. These two species are considered to be the most sensitive aquatic plant species for which toxicity data are available. For benthic invertebrates, the lowest available toxicity values for any invertebrate test species were used. For the fish species, data were chosen for the species based on feeding habits (i.e., predatory or forage). The lowest toxicity value of these species was chosen to represent the respective predatory or forage fish.

The TRVs for copper are all adjusted chronic EC_{20} values and were selected based on information obtained from the U.S. EPA ECOTOX database. EC_{50} chronic values were adjusted to EC_{20} values by linear extrapolation. LC_{50} values were adjusted using a factor of 4 based on an empirical relationship between a chronic LC_{50} and an EC_{20}. Since there were more than 20 acceptable records for all biotic groups the 5^{th} percentile value of the adjusted chronic EC_{20} data was used. However, if the selected TRV was lower than the existing CCME guideline (CCME 1999), as were the cases for zooplankton and benthic invertebrates, then the CCME value was selected as the TRV. Water quality affects the toxicity of copper to aquatic organisms. Many studies have examined the influence of water quality parameters such as pH, dissolved organic carbon and hardness on copper toxicity. In general, copper toxicity is reduced by increases in water hardness, increases in pH, increases in alkalinity and increases in natural organic matter. It is believed that since the free copper ion is responsible for the toxicity of copper, changes in water quality would be expected to decrease the activity of the free copper ion and thus decrease the bioavailability of copper.

The U.S.EPA has used a biotic ligand model (BLM) which considers the mechanistic aspects of the binding of copper and other ligands in solution in order to derive water quality criteria for copper. However, in trying to derive an empirical equation between water hardness and chronic toxicity using this model, the relationship was equivocal and so no overall relationship was derived. Although the previously used relationship between copper toxicity and water hardness was determined from meta-analyses in which variables other than hardness varied among at least some of the data sets that were not used (U.S. EPA 2003), these equations were used to calculate hardness-adjusted TRVs for lack of other suitable relationship. According to the U.S. EPA (2006), the copper hardness-dependent criterion continuous concentration (CCC) can be calculated from the following:

$$CCC = (e^{0.8545*\ln(\text{hardness})-1.702}) * 0.96 \qquad (5\text{-}1)$$

A conversion factor of 0.96 is used to convert the total mean concentration of copper to a dissolved copper concentration. For studies on chronic toxicity of copper to aquatic biota which reported the hardness of the water, H1, (in mg/L $CaCO_3$) the CCC for the study adjusted chronic TRV was calculated. This was then used to determine the hardness-adjusted TRV at five different water hardness levels, H2, (25, 50, 100, 150 and 500 mg/L $CaCO_3$) using the following relationship:

$$EC20_{H2} = (CCC_{H2}/CCC_{H1})*EC20_{H1} \qquad (5\text{-}2)$$

For cadmium and zinc the toxicity information compiled by Environment Canada (Minnow 2009, draft) were used to select appropriate toxicity values. This document provides a summary of the lowest effect endpoints reported for long-term exposure for a range of aquatic biota. The lowest concentration for each of the categories of biota considered was selected. Since the median water hardness at the surface water stations downstream of the Faro Mine Complex site are approximately 200-300 mg/L, the toxicity values which had been adjusted to a hardness of 200 mg/L were selected.

In summary, TRVs provided in Table 5.1 were obtained from the U.S. DOE (Suter *et al.* 1996), U.S. EPA ECOTOX database, CCME (1999) and Environment Canada (Minnow 2009, draft). This table outlines the references from which the TRVs were obtained, the test species and the rationale for selecting the appropriate values. It should be noted that the aquatic TRVs presented for benthic invertebrates are all based on water exposure only; sediment exposure is discussed and assessed separately using toxicity data based on sediment toxicity studies.

Table 5.1 Summary of Toxicity Reference Values for Aquatic Species

Aquatic Receptor	Antimony (mg/L)				
	Test Species	LC/EC_{50}	Toxicity Reference Value	Reference	Comments
Aquatic Plants	--	--	--	--	no data available
Phytoplankton	*Selenastrum capricornutum*	0.61	0.24	Kimball (n.d.)	from Suter and Tsao (1996); 4-d EC_{50}; derived an EC_{20} by linear extrapolation
Benthic Invertebrates	*Gammarus pseudolimnaeus*	26	2.6	Brooke *et al.* (1986)	4-day LC_{50} derived TRV using a factor of 10 based on an empirical relationship between an acute LC_{50} and EC_{20}
Zooplankton	*Daphnia magna*	5.4	1.35	Kimball (n.d.)	from Suter and Tsao (1996); 28-d LC_{50}; derived TRV using a factor of 4 based on an empirical relationship between a chronic LC_{50} and an EC_{20}.
Predator Fish	Rainbow trout	16	4	Doe *et al.* (1987)	30-day LC_{50}; derived TRV using a factor of 4 based on an empirical relationship between a chronic LC_{50} and an EC_{20}.
Forage Fish	*Pimephales promelas*	--	2.31	Kimball (n.d.)	from Suter and Tsao (1996); lowest chronic test EC_{20} – early life stage tests

Aquatic Receptor	Arsenic (mg/L)				
	Test Species	LC/EC_{50}	Toxicity Reference Value	Reference	Comments
Aquatic Plants	*Myriophyllum* sp.	0.63	0.25	Jenner and Janssen-Mommen (1993)	from U.S. EPA ECOTOX; 14-d EC_{50} (population); derived EC_{20} by linear extrapolation
Phytoplankton	*Scenedesmus* sp.	0.05	0.02	Vocke *et al.* (1980)	from CCME (1999); 14-d EC_{50} (growth); EC_{20} derived by linear extrapolation
Benthic Invertebrates	*Calanus* sp.	--	0.34	Borgmann *et al.* (1980)	From CCME (1999); 14-d EC_{20}; used as TRV
Zooplankton	*Daphnia* sp.	--	0.91	Call *et al.* (1983), Lima *et al.* (1984)	from Suter and Tsao (1996); lowest chronic test EC_{20} – life-cycle tests; used as TRV
Predator Fish	Rainbow Trout	0.55	0.14	Birge *et al.* (1979a)	from CCME (1999); 28-d LC_{50}; derived TRV using a factor of 4 based on empirical relationship between a chronic LC_{50} and an EC_{20}
Forage Fish	Goldfish	0.49	0.12	Birge *et al.* (1979b)	from U.S. EPA ECOTOX; lowest value for fathead minnow and goldfish based on 7-d LC_{50} (mortality); derived TRV using a factor of 4 based on an empirical relationship between a chronic LC_{50} and an EC_{20}

Table 5.1 Summary of Toxicity Reference Values for Aquatic Species (Cont'd)

Aquatic Receptor	Beryllium (mg/L)				
	Test Species	LC/EC_{50}	Toxicity Reference Value	Reference	Comments
Aquatic Plants	*Chlorella vannieli*	-	100	Karlander and Krauss (1972)	from Suter and Tsao (1996); a 10 to 20% reduction in autotrophic growth rates; used as TRV
Phytoplankton	*Entosiphon sulcatum*	-	0.004	Bringmann and Kuhn (1978)	from U.S. EPA ECOTOX; (population growth rate); lowest value of green algae, cryptomonad and flagellate euglenoid; used as TRV
Benthic Invertebrates	*Uronema parduczi*	-	0.017	Bringmann and Kuhn (1980)	from U.S. EPA ECOTOX; (population growth rate); lowest value of aquatic sobug, water flea and scud; used as TRV.
Zooplankton	*Daphnia* sp.	--	0.0038	Kimball (n.d.)	from Suter and Tsao (1996); lowest chronic test EC_{20} – 28-d life-cycle tests; used as TRV
Predator Fish	Rainbow Trout	0.380	0.095	Birge *et al.* (1980)	from U.S. EPA ECOTOX; LC_{50} (mortality) – 28-d
Forage Fish	Fathead Minnow	-	0.057	U.S. EPA (1980)	from Suter and Tsao (1996); lowest chronic value – life-cycle tests; used as TRV

Aquatic Receptor	Boron (mg/L)				
	Test Species	LC/EC_{50}	Toxicity Reference Value	Reference	Comments
Aquatic Plants	*Myriophyllum spicatum*	40	16	Butterwick *et al.* (1989)	50% inhibition of root growth after 32 days; used an EC_{20} from linear extrapolation
Phytoplankton	*Scenedesmus quadricauda*		0.58	Bringmann and Kuhn (1978)	LOEC for population growth rate
Benthic Invertebrates	*Chironomus decorus*	1376	137.6	Maier and Knight (1991)	48-h LC_{50} for mortality; derived TRV using a factor of 10 based on an empirical relationship between an acute LC_{50} and EC_{20}
Zooplankton	*Daphnia magna.*	141	14.1	Maier and Knight (1991)	48- h LC_{50} for mortality; derived TRV using a factor of 10 based on an empirical relationship between an acute LC_{50} and EC_{20}
Predator Fish	Coho salmon (*O. kisutch*)	447	45	Hamilton and Buhl (1990)	LC_{50} derived TRV using a factor of 10 based on an empirical relationship between an acute LC_{50} and EC_{20}
Forage Fish	--	--	--	--	no data available

Table 5.1 Summary of Toxicity Reference Values for Aquatic Species (Cont'd)

Aquatic Receptor	Cadmium (mg/L)				
	Test Species	LC/EC_{50}	Toxicity Reference Value	Reference	Comments
Aquatic Plants	*Hydra viridissima*	0.0004	0.0043	--	Lowest value for appropriate species obtained from Environment Canada (Minnow 2009, draft). NOEC/L from a 7 day test adjusted to a hardness of 200 mg/L.
Phytoplankton	Green Algae	0.01	0.02	--	Lowest value for appropriate species obtained from Environment Canada (Minnow 2009, draft). NOEC/L from a 96-hour test adjusted to a hardness of 200 mg/L.
Benthic Invertebrates	*Hyallela azteca*	0.00051	0.00036	--	Lowest value for appropriate species obtained from Environment Canada (Minnow 2009, draft). IC_{25} value from a 28 day test adjusted to a hardness of 200 mg/L.
Zooplankton	*Daphnia magna*	0.00014	0.00032	--	Lowest value for appropriate species obtained from Environment Canada (Minnow 2009, draft). EC_{10} value from a 7 day test adjusted to a hardness of 200 mg/L and adjusted to an equivalent EC_{20} using a linear extrapolation.
Predator Fish	Rainbow Trout	0.00091	0.00029	--	Lowest value for appropriate species obtained from Environment Canada (Minnow 2009, draft). MATC value from a 65-week test assumed to be equivalent to an EC_{50} and adjusted to an equivalent EC_{20} using a linear extrapolation. Also adjusted to a hardness of 200 mg/L.
Forage Fish	*Cottus bairdi* (Mottled sculpin)	0.00177	0.0014	--	Lowest value for appropriate species obtained from Environment Canada (Minnow 2009, draft). EC_{50} value from a 21-day test adjusted to an equivalent EC_{20} using a linear extrapolation. Also adjusted to a hardness of 200 mg/L.

Aquatic Receptor	Chromium – based on Cr (VI) (mg/L)				
	Test Species	LC/EC_{50}	Toxicity Reference Value	Reference	Comments
Aquatic Plants	*Microcystis aeruginosa*	--	0.002	U.S. EPA (1985)	from Suter and Tsao (1996); lowest chronic test EC_{20} – early life stage test
Phytoplankton	--	--	--	--	No data available
Benthic Invertebrates	--	--	--	--	No data available
Zooplankton	*Daphnia* sp.	--	0.006	Mount (1982)	from Suter and Tsao (1996); lowest chronic test EC_{20} – early life stage test
Predator Fish	Rainbow Trout	--	0.073	Sauter *et al.* (1976)	from Suter and Tsao (1996); lowest chronic test EC_{20} – early life stage test
Forage Fish	--	--	--	--	No data available

Table 5.1 Summary of Toxicity Reference Values for Aquatic Species (Cont'd)

Aquatic Receptor	Cobalt (mg/L)				
	Test Species	LC/EC_{50}	Toxicity Reference Value	Reference	Comments
Aquatic Plants	--	--	--	--	no data available
Phytoplankton	*Chlorella*	0.55	0.22	Coleman *et al.* (1971)	from MOE (1996); EC_{50} 21-d; derived EC_{20} by linear extrapolation
Benthic Invertebrates	Cyclops	16	1.6	Baudouin and Scoppa (1974)	from MOE (1996); this value is the lowest value for all test invertebrate species and is the same as the value for a mayfly. LC_{50} 48-hr (acute); derived TRV using a factor of 10 based on an empirical relationship between an acute LC_{50} and an EC_{20}
Zooplankton	*Daphnia* sp.	--	0.005	Kimball (n.d.)	from Suter and Tsao (1996); lowest chronic test EC_{20} – 28-d life-cycle tests; used as TRV
Predator Fish	Rainbow Trout	0.47	0.12	Birge (1978)	from MOE (1996); LC_{50} embryos 28-d; derived TRV using a factor of 4 based on an empirical relationship between a chronic LC_{50} and an EC_{20}
Forage Fish	Goldfish	0.81	0.20	Birge (1978)	from MOE (1996); lowest value of fathead minnow, tilapia, stickleback and goldfish. LC_{50} 7-d; derived TRV using a factor of 4 based on an empirical relationship between a chronic LC_{50} and an EC_{20}

Aquatic Receptor	Copper (mg/L)			
	Toxicity Reference Value	Hardness (mg/L $CaCO_3$)	TRV Adjusted for Hardness	Comments
Aquatic Plants	0.038	NR	--	5th percentile of chronic EC20 values from ECOTOX database
Phytoplankton	0.009	NR	--	5th percentile of chronic EC20 values from ECOTOX database
Benthic Invertebrates	0.004	180	0.004	used CCME value since calculated EC_{20} was less than CCME value
Zooplankton	0.004	180	0.004	used CCME value since calculated EC_{20} was less than CCME value
Predator Fish	0.004	34	0.014	5th percentile of chronic EC20 values from ECOTOX database; 6 studies are included in the 5th percentile, all of which reported hardness values. The hardness and hardness-adjusted TRVs are reported as averages of these 6 values.
Forage Fish	0.0053	40	0.009	5th percentile of chronic EC20 values from ECOTOX database; 11 studies are included in the 5th percentile, 10 of which reported hardness values. The hardness and hardness-adjusted TRVs are reported as averages of these 10 values.

Table 5.1 Summary of Toxicity Reference Values for Aquatic Species (Cont'd)

Aquatic Receptor	Lead (mg/L)				
	Test Species	LC/EC_{50}	Toxicity Reference Value	Reference	Comments
Aquatic Plants	*Myriophyllum* sp.	363	182	Stanley (1974)	from U.S. EPA ECOTOX; EC_{50} (population) 32-d; derived EC_{25} by linear extrapolation
Phytoplankton	*Chlorella* sp.	--	0.63	U.S. EPA (1985)	from Suter and Tsao (1996); EC_{20} (growth inhibition)
Benthic Invertebrates	*Hyallela azteca*	--	0.007		used CCME hardness adjusted value since calculated EC_{20} was less than CCME value. Hardness in waters are around 200 mg/L as $CaCO_3$
Zooplankton	*Daphnia* sp.	--	0.02	Chapman *et al.* (1980)	from Suter and Tsao (1996); lowest chronic EC_{20} 21-d tests
Predator Fish	Rainbow Trout	--	0.028	Sauter *et al.* (1976)	from Suter and Tsao (1996); lowest chronic test EC_{20}
Forage Fish	Goldfish	1.66	0.42	Birge *et al.* (1979b)	from U.S. EPA ECOTOX; lowest value of fathead minnow, snakehead catfish and goldfish LC_{50} (mortality) 7-d; derived TRV using a factor of 4 based on an empirical relationship between a chronic LC_{50} and an EC_{20}

Aquatic Receptor	Manganese (mg/L)				
	Test Species	LC/EC_{50}	Toxicity Reference Value	Reference	Comments
Aquatic Plants	*Lemna minor*	31	12.4	Wang (1986)	from U.S. EPA ECOTOX ; 4-d EC_{50} (growth); derived EC_{20} by linear extrapolation
Phytoplankton	*Spirostomum ambiguum*	92.8	37.1	Nalecz-Jawecki and Sawicki (1998)	from U.S. EPA ECOTOX; 24-hr EC_{50} (deformation); derived EC_{20} by linear extrapolation
Benthic Invertebrates	*Dugesia gonocephala*	46	46	Palladini *et al.* (1980)	from U.S. EPA ECOTOX; 8-d NOEC (locomotion)
Zooplankton	*Daphnia magna*	4.7	1.8	Baird *et al.* (1991)	lowest value from U.S. EPA ECOTOX; 48-hr EC_{50} (immobility); derived EC_{20} by linear extrapolation
Predator Fish	Rainbow Trout	2.91	0.73	Birge (1978)	lowest value from U.S. EPA ECOTOX; 28-d LC_{50} (mortality); derived TRV using a factor of 4 based on an empirical relationship between a chronic LC_{50} and an EC_{20}
Forage Fish	Goldfish	8.22	2.06	Birge (1978)	from U.S. EPA ECOTOX; 7-d LC_{50} (mortality); derived TRV using a factor of 4 based on an empirical relationship between a chronic LC_{50} and an EC_{20}

Table 5.1 Summary of Toxicity Reference Values for Aquatic Species (Cont'd)

Aquatic Receptor	Nickel (mg/L)				
	Test Species	LC/EC_{50}	Toxicity Reference Value	Reference	Comments
Aquatic Plants	*Lemna* sp.	0.45	0.18	Wang (1986)	From U.S. EPA ECOTOX; EC_{50} (growth) 4-d; derived EC_{20} by linear extrapolation
Phytoplankton	*Selenastrum capricornutum*	--	0.03	Chao and Chen (2000)	Based on an EC_{10} of 0.016 mg/L for 10% growth reduction in batch tests; derived EC_{20} by linear extrapolation
Benthic Invertebrates	*Chironomus* sp.	8.6	0.86	Rehwoldt *et al.* (1973)	From U.S. EPA ECOTOX; LC_{50} (mortality) 96-hr; derived TRV using a factor of 10 based on an empirical relationship between an acute LC_{50} and an EC_{20}
Zooplankton	*Daphnia* sp.	--	0.06	Munzinger (1990)	From Suter and Tsao (1996); lowest chronic test EC_{20}
Predator Fish	Rainbow Trout	--	0.06	Nebeker *et al.* (1985)	From Suter and Tsao (1996); lowest chronic test EC_{20}, early life stage test
Forage Fish	Fathead Minnow	2.9	0.29	Lind *et al.* (1978)	From U.S. EPA ECOTOX; LC_{50} (mortality) 96-hr; derived TRV using a factor of 10 based on an empirical relationship between an acute LC_{50} and an EC_{20}

Aquatic Receptor	Selenium (mg/L)				
	Test Species	LC/EC_{50}	Toxicity Reference Value	Reference	Comments
Aquatic Plants	*Lemna* sp.	1.7	0.68	Jenner and Janssen-Mommen (1993)	from U.S. EPA ECOTOX; EC_{50} (population) 14-d; derived EC_{20} by linear extrapolation
Phytoplankton	*Scenedesmus* sp.	--	0.19	Vocke *et al.* (1980)	from Suter and Tsao (1996); chronic 14-d EC_{20} for reduced growth
Benthic Invertebrates	*Chironomus* sp.	1.8	0.18	Ingersoll *et al.* (1990)	from U.S. EPA ECOTOX; LC_{50} (ITX) 48-hr; derived TRV using a factor of 10 based on an empirical relationship between an acute LC_{50} and an EC_{20}
Zooplankton	Daphnia sp.	--	0.025	Johnston (1987)	from Suter and Tsao (1996); lowest chronic test EC_{20}, 28-d
Predator Fish	Rainbow Trout	--	0.05	Goettl and Davies (1976)	from Suter and Tsao (1996); lowest chronic test EC_{20}, early life stage tests
Forage Fish	Fathead Minnow	0.6	0.15	Halter *et al.* (1980)	from U.S. EPA ECOTOX; LC_{50} (mortality) 14-d; derived TRV using a factor of 4 based on an empirical relationship between a chronic LC_{50} and an EC_{20}

Table 5.1 Summary of Toxicity Reference Values for Aquatic Species (Cont'd)

Aquatic Receptor	Silver (mg/L)				
	Test Species	LC/EC_{50}	Toxicity Reference Value	Reference	Comments
Aquatic Plants	--	--	--	--	no data available
Phytoplankton	--	--	--	--	no data available
Benthic Invertebrates	--	--	--	--	no data available
Zooplankton	*Daphnia* sp.	$5.8x10^{-3}$	$5.8x10^{-4}$	Erickson *et al.* (1998)	96-h LC_{50} (mortality); derived benchmark using a factor of 10 based on an empirical relationship between an acute LC_{50} and an EC_{20}.
Predator Fish	Rainbow Trout	$9.2x10^{-3}$	$9.2x10^{-4}$	Erickson *et al.* (1998)	96-h LC_{50} (mortality); derived benchmark using a factor of 10 based on an empirical relationship between an acute LC_{50} and an EC_{20}.
Forage Fish	Goldfish	$1.04x10^{-2}$	$1.04x10^{-3}$	Erickson *et al.* (1998)	96-h LC_{50} (mortality); derived benchmark using a factor of 10 based on an empirical relationship between an acute LC_{50} and an EC_{20}.

Aquatic Receptor	Strontium (mg/L)				
	Test Species	LC/EC_{50}	Toxicity Reference Value	Reference	Comments
Aquatic Plants	--	--	--	--	no data available
Phytoplankton	*Chlorella vulgaris*		150	Den Dooren de Jong (1965)	from U.S. EPA ECOTOX; LOEC (general population changes)
Benthic Invertebrates	*Biomphalaria glabrata*	--	10	Harry and Aldrich (1963)	from U.S. EPA ECOTOX; observed stress in snails, endpoint not reported but value is lower than other chronic values so is treated as a chronic EC value
Zooplankton	*Daphnia sp.*	--	42	Biesinger and Christensen (1972)	from Suter and Tsao (1996); results from a 21-d test resulting in 16% reproductive impairment
Predator Fish	Striped bass	92.8	9.3	Dwyer *et al.* (1992)	from U.S. EPA ECOTOX; LC_{50} 96-h; derived TRV using a factor of 10 based on an empirical relationship between an acute LC_{50} and an EC_{20}
Forage Fish	Goldfish	8.5	3.4	Birge (1978)	from U.S. EPA ECOTOX; LC_{50} 7-d; derived an EC_{20} by linear extrapolation

Table 5.1 Summary of Toxicity Reference Values for Aquatic Species (Cont'd)

Aquatic Receptor	Tin (mg/L)				
	Test Species	LC/EC_{50}	Toxicity Reference Value	Reference	Comments
Aquatic Plants	--	--	--	--	no data available
Phytoplankton	--	--	--	--	no data available
Benthic Invertebrates	--	--	--	--	no data available
Zooplankton	--	--	--	--	no data available
Predator Fish	--	--	--	--	no data available
Forage Fish	--	--	--	--	no data available

Aquatic Receptor	Vanadium (mg/L)				
	Test Species	LC/EC_{50}	Toxicity Reference Value	Reference	Comments
Aquatic Plants	--	--	--	--	no data available
Phytoplankton	*Scenedesmus quadricauda*	2.2	0.9	Fargasova *et al.* (1999)	12-day EC_{50} for growth inhibition; derived an EC_{20} based on linear extrapolation
Benthic Invertebrates	*Chironomus plumosus*	0.24	0.024	Fargasova (1997)	Increasing mortality from 24 to 96 hours; derived TRV using a factor of 10 based on an empirical relationship between an acute LC_{50} and an EC_{20}
Zooplankton	*Daphnia sp.*	--	1.9	Kimball n.d.	from Suter and Tsao (1996); lowest chronic test EC_{20}
Predator Fish	Fish species	--	0.04	Holdway and Sprague (1979)	from Suter and Tsao (1996); lowest chronic test EC_{20}
Forage Fish	Fish species	--	0.04	Holdway and Sprague (1979)	from Suter and Tsao (1996); lowest chronic test EC_{20}

Table 5.1 Summary of Toxicity Reference Values for Aquatic Species (Cont'd)

Aquatic Receptor	Zinc (mg/L)				
	Test Species	LC/EC_{50}	Toxicity Reference Value	Reference	Comments
Aquatic Plants	*Hydra viridissima*	0.0522	0.73	--	Lowest value for appropriate species obtained from Minnow (2009, draft). EC_{10} value from a 7-day test adjusted to a hardness of 200 mg/L and adjusted to an equivalent EC_{20} using a linear extrapolation.
Phytoplankton	Green algae	0.0011	0.0022	--	Lowest value for appropriate species obtained from Minnow (2009, draft). EC_{10} value from a 7 day test adjusted to an equivalent EC_{20} using a linear extrapolation.
Benthic Invertebrates	*Potamopyrgus jenkinsi* (snail)	0.091	0.044	--	Lowest value for appropriate species obtained from Minnow (2009, draft). MATC value from a 12-week test assumed to be equivalent to an EC_{50} and adjusted to an equivalent EC_{20} using a linear extrapolation. Also adjusted to a hardness of 200 mg/L.
Zooplankton	*Epeorus latifolium* (Mayfly)	0.0144	0.06	--	Lowest value for appropriate species obtained from Minnow (2009, draft). IC_{10} value from a 4-week test adjusted to a hardness of 200 mg/L and adjusted to an equivalent EC_{20} using a linear extrapolation.
Predator Fish	Rainbow trout	0.0345	0.20	--	Lowest value for appropriate species obtained from Minnow (2009, draft). LC_{10} multiplied by 5 for linear extrapolation between an LC_{10} and a chronic LC_{50}; divided by an empirical factor of 4 to get EC_{20}. Also adjusted to a hardness of 200 mg/L.
Forage Fish	Fathead minnow	0.047	0.33	--	Lowest value for appropriate species obtained from Minnow (2009, draft). EC_{10} value adjusted to a hardness of 200 mg/L and adjusted to an equivalent EC_{20} using a linear extrapolation.

5.2 SEDIMENT TOXICITY EVALUATIONS

The potential ecological effects on benthic invertebrates of COPC in sediments were addressed in part through a comparison to sediment toxicity benchmarks. Table 5.2 summarizes selected sediment toxicity benchmarks reported in the literature. As seen in the table, where several toxicity benchmarks exist for a particular metal, there is a range of data for possible effects. No sediment toxicity benchmarks exist for silver hence it is not included in the table.

The Canadian Council of Ministers of the Environment (CCME 1999) guidelines provide what are designated Interim Sediment Quality Guidelines (ISQGs) and Probable Effect Levels (PELs). In narrative description, an ISQG represents the concentration below which adverse biological effects are expected to occur rarely (i.e., an ISQG represents the upper limit of the range of sediment COPC concentrations dominated by no effects data). A PEL defines the level above which adverse effects are expected to occur frequently (*i.e.*, the PEL represents the lower limit of the range of COPC concentrations that are usually or always associated with adverse biological effects). The CCME acknowledge the associative basis of the guidelines and acknowledges that the use of SQGs in exclusion of other information (such as background concentrations of naturally occurring substances and biological tests) can lead to erroneous conclusions.

The sediment toxicity benchmarks from Thompson *et al.* (2005) were developed for mining industry applications in northern Saskatchewan. The benchmark values reported by these authors are seen to cover a much wider range than those proposed by the CCME.

Given the differences noted in Table 5.2 and the uncertainties associated with sediment toxicity evaluations, the assessment was carried out using the various toxicity benchmarks presented in the table. It is important to note that these benchmarks should only be used for screening purposes. An exceedance of any of these benchmarks does not mean that an adverse effect would be observed rather it means that further investigation is necessary.

Table 5.2 Sediment Toxicity Benchmarks

COPC (µg/g)	CCME 1999		Thompson *et al.*2005	
	ISQG	PEL	LEL	SEL
Antimony	-	-	-	-
Arsenic	5.9	17	10	346
Beryllium	-	-	-	-
Boron	-	-	-	-
Cadmium	0.6	3.5	-	-
Chromium	37.3	90	47.6	115.4
Cobalt	-	-	-	-
Copper	35.7	197	22	269
Lead	35	91.3	37	412
Manganese	460	1100	-	-
Nickel	18[a]	35.9[a]	23	484
Selenium	-	-	1.9	16.1
Silver	-	-	-	-
Strontium	-	-	-	-
Tin	-	-	-	-
Vanadium	-	-	35.2	160
Zinc	123	315	-	-

Note:
ISQG – Interim sediment quality guideline. PEL - probable effect level.
LEL - lowest effect level. SEL - severe effect level.
Dash (-) no data available. [a] - Nickel guideline under review by CCME.

5.3 TOXICITY TO WILDLIFE

In the absence of toxicity data for most of the terrestrial animal receptors, data for laboratory animals were used in the risk assessment calculations. For mammals, the data are generally available for mice and rats. For avian receptors the test species are generally ducks or chicks. Lowest Observable Adverse Effects Levels (LOAELs) were obtained from literature, primarily from the U.S. Department of Energy database by Sample *et al.* (1996). The background information for the toxicity reference values developed for the test species are provided in Table 5.3 for mammals and Table 5.4 for birds which include test species, study duration and toxicological endpoint. Both NOAELs (no observable adverse effect levels) and LOAELs are presented on the tables. A summary of the LOAEL toxicity reference values used in the study is presented in Table 5.5. The LOAELs were chosen for this assessment based on the consideration that all pathways of exposure were taken into account for the receptors and no credit was taken into account for the fact that not all of the COPC intake by the receptor is bioavailable (i.e. it was assumed that 100% of the metal intake was dissolved in the gut of the species and taken into the body).

Table 5.3 Summary of Toxicity Reference Values from Laboratory Animal Studies

COPC	Antimony	Arsenic	Beryllium	Boron	Cadmium	Chromium
Source of Reference values	Sample et al. (1996)	Sample et al. (1996)	Sample *et al.* (1996)	Sample *et al.* (1996)	U.S. EPA (2005)	Sample et al. (1996)
Original Reference	Schroeder et al. (1968)	Schroeder and Mitchener (1971)	Schroeder and Mitchner (1975)	Weir and Fisher (1972)	Doyle *et al.* (1974)	MacKenzie et al. (1958)
Form of chemical	Antimony Potassium Tartrate	Arsenite	Beryllium Sulfate	Boric Acid	Cadmium chloride	Cr+6 as K2Cr2O4
Test Species	Mouse	Mouse	rat	Rat	Sheep	Rat
Body Weight (g)	30	30	350	35	64330	350
Study Duration	lifetime (>1 yr)	3 generations (>1 yr)	lifetime (>1 yr)	3 generations (>1yr)	163 days	1 year
Endpoint	Lifespan, longevity	Reproduction	Longevity, weight loss	Reproduction	Growth and body weight	Body weight and food consumption
Comments	The study was carried out during a critical life stage and is considered to be chronic exposure.	Study carried out during critical life stage – taken as chronic exposure.	The study was carried out during a critical life stage and is considered to be chronic exposure.	The study was carried out during a critical life stage and is considered to be chronic exposure	The study was carried out during a critical life stage and is considered to be chronic exposure	Study carried out during critical life stage – taken as chronic exposure.
Logic	Median lifespan was reduced among female mice exposed to the 5 ppm dose level and the study considered exposure throughout the entire lifespan, this dose was considered to be a chronic LOAEL. NOAEL derived by applying an uncertainty factor of 0.1 to the LOAEL.	Mice displayed declining litter sizes with each successive generation at a dose of 1.26 mg/kg-d and thus this dose was considered to be a chronic LOAEL.	Weight loss by males was observed in months 2-6 at 5ppm in water. This dose level was considered to be a chronic NOAEL since weight loss was not considered to be an adverse effect.	No adverse effects were observed at the 28 mg/kg-d dose level. At the 93.6 mg/kg-d dose level, sterility resulted.	The study was conducted during the juvenile life stage period in which the male lambs were four months old. The rate of ingestion was 1.99 kg/day and the route of exposure was FD (Food).	No significant differences were observed at any dose level studied and the study considered exposure over 1 year, the maximum dose was considered to be a chronic NOAEL.
NOAEL (mg/(kg-d))	0.125	-	0.66	28	0.45	3.28
LOAEL (mg/(kg-d))	1.25	1.26	-	93.6	0.91	-

Table 5.3 Summary of Toxicity Reference Values from Laboratory Animal Studies (Cont'd)

COPC	Cobalt	Copper	Lead	Manganese	Nickel	Selenium
Source of Reference values	ATSDR (2009)	Sample *et al.* (1996)	Sample *et al.* (1996)	Sample *et al.* (1996)	Sample *et al.* (1996)	Sample *et al.* (1996)
Original Reference	Pedigo *et al.* (1988)	Auerlich *et al.* (1982)	Azar *et al.* (1973)	Laskey *et al.* (1982)	Ambrose *et al.* (1976)	Rosenfeld and Beath (1954)
Form of chemical	Cobalt Chloride	Copper Sulphate	Lead Acetate	Manganese Oxide	Nickel Sulphate Hexahydrate	Potassium Selenate
Test Species	Mouse	mink	rat	rat	Rat	rat
Body Weight (g)	35	1000	350	350	350	350
Study Duration	13 weeks	357 days	3 generations (>1 yr)	From gestation to 224 days	3 generations (>1 yr)	1 year through 2 generations
Endpoint	Reproduction	Reproduction	Reproduction	Reproduction	Reproduction	Reproduction
Comments	Study carried out during critical life stage – taken as chronic exposure.	Study carried out during critical life stage – taken as chronic exposure.	Study carried out during critical life stage – taken as chronic exposure.	The study was carried out during a critical life stage and is considered to be chronic exposure	Study carried out during critical life stage – taken as chronic exposure.	Study carried out during critical life stage – taken as chronic exposure.
Logic	Reversible testicular degeneration was observed at 23 mg/kg/d which were considered the LOAEL.	The survival of kits at 25 ppm was actually higher than the controls and this level was taken to be the NOAEL. At 50 ppm the percentage mortality in kits was increased and this was considered to be the LOAEL.	None of the Pb exposure levels affected the pregnancy rate, live birth rate or other reproductive indices. But, 1000 ppm exposure gave reduced offspring wt. and produced kidney damage in young - LOAEL. NOAEL100ppm	Decreased pregnancy percentage and fertility noted at the highest dose of 3550 ppm, while other reproductive parameters were not affected. This was taken as the LOAEL. No effects seen at 1100 ppm or lower and therefore NOAEL.	No adverse effects observed over 3 generations at a concentration of 500 ppm. Therefore this value considered to be a NOAEL. At 1000 ppm reduced offspring body weights observed. Thus considered LOAEL	No adverse effects on reproduction at a concentration of 1.5 mg/L. This value is the NOAEL. At 2.5 mg/L the number of second-generation young was reduced by 50% among females. This value is the LOAEL.
NOAEL (mg/(kg-d))	-	11.7	8	88	40	0.2
LOAEL (mg/(kg-d))	23	15.14	80	284	80	0.33

Table 5.3 Summary of Toxicity Reference Values from Laboratory Animal Studies (Cont'd)

COPC	Silver	Strontium	Tin	Vanadium	Zinc
Source of Reference values	ATSDR (2009)	Sample *et al.* (1996)	Sample *et al.* (1996)	Sample et al. (1996)	U.S. EPA (2007)
Original Reference	Walker (1971)	Skoryna 1981	Davis *et al.* (1987)	Domingo et al. (1986)	Hill *et al.* (1983), Brink *et al.* (1959), Hsu *et al.* (1975)
Form of chemical	Silver Nitrate	Strontium Chloride	bis(Tributyltin) oxide (TBTO)	Sodium Metavanadate	Zinc oxide
Test Species	Rat	rat	mouse	Rat	Pig
Body Weight (g)	350	350	30	260	167000
Study Duration	14 days	3 years	Days 6 to 15 of gestation	60 d prior to gestation as well as gestation, delivery and lactation	42 days to 12 months
Endpoint	Mortality	Body weight / bone changes	Reproduction	Reproduction	Reproduction and Growth
Comments	This study was based on short term exposure	Because the study considered exposure over three years the endpoint is considered to be chronic.	The study was carried out during a critical life stage and is considered to be chronic exposure	The study was carried out during a critical life stage and is considered to be chronic exposure.	The study was carried out during a critical life stage and is considered to be chronic exposure
Logic	A 2-week study on rats exposed to silver nitrate in their drinking water resulted in the death of 3 out of 12 test animals. Test animals were observed to drastically decrease their drinking water intake and appeared listless and poorly groomed. Lethality was not observed in the lower dose group.	No adverse effects were observed for any Sr dosage level.	Reduced fetal weight and fetal survival as well as increased frequency of litter resorption were noted at 35 mg/kg-d TBTO, thus LOAEL. No effects noted at lower doses, thus NOAEL is 23.4 mg/kg-d.	Significant differences noted in reproductive parameters such as litter size, number of dead per litter, weight of offspring etc. at all dose levels. Lowest dose of 2.1 mg/kg d considered to be a chronic LOAEL.	For the species of interest, the lowest NOAEL of 15.4 mg/kg/day and the accompanying LOAEL of 90 mg/kg/day was considered based on the geometric mean of all values obtained from different tests.
NOAEL (mg/(kg-d))	181.2	263	23.4	-	15.4
LOAEL (mg/(kg-d))	362.4	-	35	2.1	90

Table 5.4 Summary of Toxicity Reference Values from Laboratory Bird Studies

COPC	Antimony	Arsenic	Beryllium	Boron	Cadmium	Chromium
Source of Reference values		Sample *et al.* (1996)		Sample *et al.* (1996)	U.S. EPA (2005)	Sample et al. (1996)
Original Reference		USFWS (1964)		Smith and Anders (1989)	Numerous papers were used	Haseltine et al., unpubl. data
Form of chemical		Arsenite (As3+)		Boric Acid	Cadmium sulfate	Cr+3 as CrK(SO4)2
Test Species		mallard duck		mallard duck	Chicken	black duck
Body Weight (g)		1000		1000	619	1250
Study Duration		128 d (>10 wks)		6 wks	6 wks	10 months
Endpoint		Mortality		Reproduction	Growth and body weight	Reproduction
Comments		The study was carried out over a period greater than 10 weeks and is considered to be chronic exposure.		The study was carried out 3 weeks prior to, during and 3 weeks post reproduction and is considered to be chronic exposure.	The study was conducted during a critical life stage and is considered to be chronic exposure.	The study was carried out over 10 weeks and is considered to be chronic exposure.
Logic	No toxicity data available	Over 128 days, at a dose of 100 ppm sodium arsenite, the ducks experienced no mortality, and thus this value is considered to be the NOAEL. A dose of 250 ppm resulted in 12% mortality and is considered to be a chronic LOAEL.	No toxicity data available	Consumption of 1000 ppm (100 mg/kg/d) resulted in reduced egg fertility and duckling growth and increased embryo and duckling mortality and is thus considered to be a chronic LOAEL. No adverse rep. effects were observed at the other dose levels and thus 288 ppm (28.8 mg/kg/d) was considered to be the NOAEL.	For the species of interest, the lowest NOAEL of 0.97mg .kg.day and LOAEL of 4.38 mg/kg/day was considered based on the geometric mean of all values obtained from different tests. The studies were conducted during the juvenile life stage (1 day old chicks) and the study lasted for 6 weeks. The route of exposure was food.	While duckling survival was reduced at the 50 ppm dose level, no significant differences were observed at the 10 ppm Cr+3 dose level. Because the study considered exposure throughout a critical lifestage (reproduction), the dose 50 ppm dose was considered to be a chronic LOAEL and the 10 ppm dose was considered to be a chronic NOAEL.
NOAEL (mg/(kg-d))		5.135		28.8	0.97	1
LOAEL (mg/(kg-d))		12.84		100	4.38	5

Table 5.4 Summary of Toxicity Reference Values from Laboratory Bird Studies (Cont'd)

COPC	Cobalt	Copper	Lead	Manganese	Nickel	Selenium
Source of Reference values	No toxicity data available	Sample *et al.* (1996)	Sample *et al.* (1996)	Sample *et al.* (1996)	Sample *et al.* (1996)	Sample *et al.* (1996)
Original Reference		Mehring *et al.* (1960)	Edens *et al.* (1976)	Laskey and Edens (1985)	Cain and Pafford (1981)	Heinz *et al.* (1987)
Form of chemical		Copper Oxide	Lead Acetate	Manganese Oxide	Nickel Sulphate	Sodium Selenite
Test Species		1 day old chicks	Japanese quail	Japanese Quail	mallard duckling	mallard duck
Body Weight (g)		534	150	72	782	1000
Study Duration		10 wks	12 wks	75 d (>10 wks)	90 d (>10 wks)	78 d (>10 wks)
Endpoint		Growth, mortality	Reproduction	Growth, aggressive behaviour	Mortality, growth, behaviour	Reproduction
Comments		The 10-week study was considered to be chronic in duration.	The study was carried out over 10 weeks and is considered to be chronic exposure.	The study was carried out over longer than 10 weeks and was considered to be chronic.	The study was carried out over 10 weeks and was considered to be chronic.	The study was carried out through the reproductive cycle and is considered to be chronic exposure.
Logic		Consumption of copper up to 570 ppm had no effect on the growth of chicks and was considered to be the NOAEL. At 749 ppm there was a 30% reduction in growth and a 15% mortality. This level is considered to be the LOAEL.	Reproduction not impaired by the 10 ppm dose, but egg hatching success reduced at the 100 ppm dose. Therefore 10 and 100 ppm are considered the NOAEL and LOAEL, respectively.	The study noted no effect on growth in birds fed 5056 ppm Mn in the diet. Aggressive behaviour was noted to be reduced by 25 to 50% relative to controls but this was not considered an adverse effect. NOAEL was taken as 977 mg/kg-d.	Consumption of up to 77.4 ppm Ni in diet did not increase mortality or decrease growth and is thus the NOAEL. At 1069 ppm there was a 70% mortality which is considered to be a LOAEL.	Consumption of 1, 5 and 10 ppm had no effect on weight and survival of adults but 10 and 25 ppm resulted in significantly larger frequency of lethally deformed embryos as compared to 1 or 5 ppm. Therefore 10 ppm is the LOAEL and 5 ppm is the NOAEL.
NOAEL (mg/(kg-d))		47	1.13	977	77.4	0.5
LOAEL (mg/(kg-d))		61.7	11.3	-	107	1

Table 5.4 Summary of Toxicity Reference Values from Laboratory Bird Studies (Cont'd)

COPC	Silver	Strontium	Tin	Vanadium	Zinc
Source of Reference values	No toxicity data available	No toxicity data available	Sample *et al.* (1996)	Sample et al. (1996)	U.S. EPA (2007)
Original Reference			Schlatterer *et al.* (1993)	White and Dieter (1978)	Hamilton *et al.* (1981), Hamilton *et al.* (1979)
Form of chemical			bis(Tributyltin) oxide (TBTO)	Vanadyl Sulphate	Zinc carbonate
Test Species			Japanese Quail	Mallard duck	Japanese quail
Body Weight (g)			150	1170	23
Study Duration			6 weeks	12 weeks	7 to 14 days
Endpoint			Reproduction	Mortality, body weight, blood chemistry	Blood effects, growth, mortality
Comments			This study was carried out during a reproduction and was considered to be chronic	The study was carried out over longer than 10 weeks and was considered to be chronic.	The study was carried out during a critical life stage and is considered to be chronic exposure
Logic			Consumption of up to 60 ppm TBTO in diet did not affect reproduction, thus NOAEL. At 150 ppm, reduced egg weight and hatchability were noted and thus LOAEL.	No effects observed at any dose level. The maximum dose of 11.4 mg/kg-d considered to be chronic NOAEL.	The study was conducted during the juvenile life stage period in which both male and female quails were 1 day old. The NOAEL of 61.3mg/kg/day and LOAEL of 123 mg/kg/day was considered based on the geometric mean of all values obtained.
NOAEL (mg/(kg-d))			6.8	11.4	61.3
LOAEL (mg/(kg-d))			16.9	-	123

Table 5.5 Summary of LOAEL Toxicological Reference Values for Terrestrial Ecological Receptors

COPC (mg/(kg-d))	Bear	Beaver	Caribou	Fox	Grouse	Hare	Mallard	Hoary Marmot	Merganser	Mink	Moose	Scaup	Sheep	Wolf
Antimony	1.25	1.25	1.25	1.25	n/a	1.25	n/a	1.25	n/a	1.25	1.25	n/a	1.25	1.25
Arsenic	1.26	1.26	1.26	1.26	12.84	1.26	12.84	1.26	12.84	1.26	1.26	12.84	1.26	1.26
Beryllium	0.66	0.66	0.66	0.66	n/a	0.66	n/a	0.66	n/a	0.66	0.66	n/a	0.66	0.66
Boron	93.6	93.6	93.6	93.6	100	93.6	100	93.6	100	93.6	93.6	100	93.6	93.6
Cadmium	0.98	0.98	0.98	0.98	4.38	0.98	4.38	0.98	4.38	0.98	0.98	4.38	0.98	0.98
Chromium	3.28	3.28	3.28	3.28	5	3.28	5	3.28	5	3.28	3.28	5	3.28	3.28
Cobalt	23	23	23	23	n/a	23	n/a	23	n/a	23	23	n/a	23	23
Copper	15.14	15.14	15.14	15.14	61.7	15.14	61.7	15.14	61.7	15.14	15.14	61.7	15.14	15.14
Lead	80	80	80	80	11.3	80	11.3	80	11.3	80	80	11.3	80	80
Manganese	284	284	284	284	977	284	977	284	977	284	284	977	284	284
Nickel	80	80	80	80	107	80	107	80	107	80	80	107	80	80
Selenium	0.33	0.33	0.33	0.33	1	0.33	1	0.33	1	0.33	0.33	1	0.33	0.33
Silver	362.4	362.4	362.4	362.4	n/a	362.4	n/a	362.4	n/a	362.4	362.4	n/a	362.4	362.4
Strontium	263	263	263	263	n/a	263	n/a	263	n/a	263	263	n/a	263	263
Tin	35	35	35	35	16.9	35	16.9	35	16.9	35	35	16.9	35	35
Vanadium	2.1	2.1	2.1	2.1	11.4	2.1	11.4	2.1	11.4	2.1	2.1	11.4	2.1	2.1
Zinc	90	90	90	90	123	90	123	90	123	90	90	123	90	90

Note: n/a – no toxicity value available

5.4 TOXICITY TO HUMANS

Exposure of humans to COPC is conventionally assessed against toxicity reference values (TRVs). Toxicity is the potential of a chemical to cause some type of damage, either permanent or temporary, to the structure or functioning of any part of the body. The toxicity depends on the amount of the chemical taken into the body (generally termed the intake or dose) and the length of time a person is exposed. Every chemical has a specific dose and duration of exposure that is necessary to produce a toxic effect in humans. Toxicity assessments generally involve the evaluation of scientific studies, based either on laboratory animal tests or on workplace exposure investigations, by a number of experienced scientists in a wide range of scientific disciplines in order to determine the maximum dose that a human can be exposed to without having an adverse health effect. Levels that are likely to result in no appreciable risks or no measurable adverse effects are known as exposure limits.

For many non-carcinogenic effects, protective biological mechanisms must be overcome before an adverse effect from exposure to the chemical is manifested. For this reason, scientists generally agree that there is a level (threshold) below which no adverse effects would be measurable or expected to occur. These toxicity reference values are generally called reference doses (RfDs), tolerable daily intakes (TDIs) or acceptable daily intakes (ADIs) and are generally derived by regulatory agencies such as Health Canada and the United States Environmental Protection Agency (U.S. EPA). These TRVs are usually expressed as the quantity of a chemical per unit body weight per unit time (mg/(kg-d)).

These TRVs have generally been derived for sensitive individuals in the public using the most sensitive endpoint available. Additionally, these factors involve the incorporation of "safety factors" by regulatory agencies to provide additional protection for members of the public. As discussed above, there are several regulatory sources that report TRVs. Some of the most used sources are Health Canada, U.S. EPA Integrated Risk Information System (IRIS) database; U.S. EPA health assessment reports (HEAST), U.S. EPA National Center for Environmental Assessment (NCEA), the World Health Organization (WHO) and the Agency for Toxic Substances and Disease Registry (ATSDR). Given that this assessment is being conducted under the Federal Contaminated Sites Action Program (FCSAP), TRVs provided by Health Canada (2009) were preferentially selected for evaluation of the potential adverse effects on humans. In addition, the U.S. EPA IRIS database is another major source for TRVs and was used to infill data gaps from Health Canada (2009).

Table 5.6 provides a summary of the selected oral TRVs. Oral and dermal pathways are considered in this assessment; however, there are no dermal TRVs and it is a generally accepted practice in risk assessments to use the oral TRV to assess dermal exposure. The value,

toxicological endpoint and reference for each TRV are provided in the table. The inhalation pathway is not considered for the assessment, since the fugitive dust pathway (airborne respirable dust) is *"generally insignificant relative to direct ingestion of soil and water and to dermal absorption"* (Health Canada 2004a). Of the COPC, beryllium, cadmium, and nickel are considered carcinogens only through the inhalation pathway; therefore, for this assessment, these COPC are only considered as non-carcinogens.

Table 5.6 Human Toxicity – Oral Dermal Pathway

COPC	Oral/Dermal				Reference
	Carcinogenic Effects		Non-carcinogenic Effects		
	Carcinogenic TRV $(mg/(kg\text{-}d))^{-1}$	Endpoint	Non-Carcinogenic TRV (mg/(kg-d))	Endpoint	
Antimony	n/a		4×10^{-4}	Longevity, blood glucose, and cholesterol	U.S. EPA IRIS (2009)
Arsenic	1.8	Internal Cancers	n/a		Health Canada (2009)
Beryllium	n/a		0.002	Small intestinal lesions	U.S. EPA IRIS (2009)
Boron	n/a		0.0175	Testicular atrophy and spermatogenesis	Health Canada (2009)
Cadmium	n/a		0.001	Renal tubular dysfunction manifested as low molecular weight proteinuria	Health Canada (2009)
Chromium	n/a		0.001	hepatoxicity, irritation or corrosion of the gastrointestinal mucosa, encephalitis	Health Canada (2009)
Cobalt	n/a		0.01	Not given	ATSDR (2009)
Copper	n/a		0.1	hepatoxicity, gastrointestinal effects	Health Canada (2009)
Lead	n/a		0.0036	Significant increase in blood lead concentration in infants	Health Canada (2009)
Manganese	n/a		0.14	CNS Effects	U.S. EPA IRIS (2009)
Nickel	n/a		0.011	post-implantation perinatal lethality	Health Canada (2009)
Selenium	n/a		0.005	Clinical selenosis (environmental exposure)	U.S. EPA IRIS (2009)
Silver	n/a		0.005	Argyia	U.S. EPA IRIS (2009)
Strontium	n/a		0.6	Rachitic bone	U.S. EPA IRIS (2009)
Tin	n/a		0.6	Liver and Kidney Lesions	HEAST
Vanadium	n/a		0.005	Not given	Health Canada (2002a)
Zinc	n/a		0.566	increased growth of infant; length, weight and head circumference	Health Canada (2009)

Note:
IRIS Integrated Risk Information System (U.S. EPA, 2009).
HEAST Health Effects Assessment Summary Tables (U.S. EPA, 1997b).
n/a not applicable.

When data were available from more than one information source, a chain of precedence was established. Data from Health Canada were generally chosen first, followed by the IRIS

database as the next choice. If data were not available in these two sources, then data were obtained from HEAST, which is part of the U.S. EPA. The TRV for tin was obtained from HEAST.

5.4.1 Non-Carcinogenic TRVs

The COPC considered to be non-classifiable with respect to human carcinogenicity, indicating that there are no human or animal data to indicate that they are carcinogens, include antimony, beryllium, boron, cadmium, chromium, cobalt, copper, lead, manganese, nickel, selenium, silver, strontium, tin, vanadium and zinc.

For many non-carcinogenic effects, protective biological mechanisms must be overcome before an adverse effect is manifested from chronic exposure to a toxicant. This is known as a "threshold" concept. Non-carcinogens are often referred to as "systemic toxicants" because of their effects on the function of various organ systems.

Antimony

In its elemental form, antimony (Sb) is a silvery white metal that breaks easily and is found naturally in the earth's crust. Antimony has two oxidation states, (+3) and (+5), although it is usually found as a sulfide or oxide.

Human studies show that antimony is primarily excreted in urine, and that feces and other routes are secondary elimination pathways. Excretion pathways will vary according to different exposure pathways, animal species and oxidation state of antimony. For example, trivalent antimony is excreted mainly *via* the feces, while pentavalent organic antimony is excreted mainly in the urine (Health Canada 1997).

Symptoms of acute oral and inhalation exposures to antimony include GI disorders, dehydration, muscular pain, shock, and kidney and urinary disorders. Dermal exposure to antimonials in humans can result in eczema and dermatitis (Stemmer 1976). Populations especially susceptible to antimonials may include individuals with existing medical conditions affecting the respiratory system, the cardiovascular systems, and the kidney because antimony toxicity is primarily manifested through these organ systems (ATSDR 2009).

The U.S. EPA (2009 – last revised 1991) provide an oral reference dose (RfD) of 0.0004 mg/kg-d for antimony, based on a LOAEL of 0.35 mg/kg-d from a chronic oral toxicity study where rats were administered potassium antimony tartrate in water. The toxicological endpoint was decreased longevity and blood glucose, and altered cholesterol levels. An uncertainty factor of

1000 was used: 10 to account for interspecies conversion, 10 to account for human variability, and 10 because a LOAEL was used to derive the RfD. The overall confidence in this RfD is reported to be low. The RfD was last revised in 1991.

Health Canada (1997) provide an oral tolerable daily intake of 0.0002 mg/kg-d derived from a NOAEL of 0.06 mg/kg-d from a 13-week rat study involving oral administration of potassium antimony tartrate *via* drinking water. An uncertainty factor of 300 was used; 10 to account for inter-species variability, 10 for human variability, and 3 for use of a short-term study to derive a chronic exposure limit. The IRIS value was used in the assessment.

No exposure limits are provided for the potential carcinogenicity of antimony or antimonials. The U.S. EPA (2009) states that antimony has not undergone a complete evaluation and determination for evidence of human carcinogenic potential under the IRIS program yet.

Beryllium

Beryllium is a very lightweight and rigid metal that is used extensively in electronics, and in the aerospace and defense industries. Beryllium is naturally found in rocks, coal, soil and volcanic emissions. Atmospheric beryllium tends to deposit onto soil or gets scavenged by precipitation. Beryllium in water will tend to sequester into sediment. Beryllium tends to remain trapped in both soil and sediment.

Beryllium undergoes most absorption via inhalation compared to other routes of exposure. Animal studies show that absorption of beryllium via the gastrointestinal (GI) tract is generally poor, although some variation is seen across species (Furchner *et al.* 1973) and some chemical forms of beryllium are better absorbed than others (Watanabe *et al.* 1985). Beryllium appears to be only minimally absorbed via dermal exposure.

Animal studies show that following inhalation exposure, beryllium is transported in the blood to other body tissues. Following oral absorption, animal studies suggest that beryllium accumulates in the liver, kidneys, bone, lymph nodes, blood and GI tract (Watanabe *et al.* 1985, LeFevre and Joel 1986).

The ATSDR (2009) derived a chronic minimal risk level (MRL) for oral exposure to beryllium based on a chronic feeding study in dogs (Morgareidge *et al.* 1976). A MRL of 0.002 mg/kg-day was calculated using the benchmark dose (BMD_{10}) approach, defined as the "95% lower confidence limit of the dose corresponding to a 10% increase in the incidence of small intestine lesions compared to controls" (ATSDR 2009). An uncertainty factor of 100 was applied to the value to account for interspecies conversion and human variability. A modifying factor of 3 was

also applied because the endpoints found in the dog study are not supported by other studies, and for the uncertainty of using the benchmark dose approach to estimate a No Observable Adverse Effects Level (NOAEL)/MRL.

The U.S. EPA (2009) provide an oral reference dose (RfD) of 0.002 mg/kg-d for beryllium, based on a BMD_{10} of 0.46 mg/kg-d from a chronic toxicity feeding study where dogs were administered beryllium sulphate tetrahydrate (Morgareidge *et al.* 1976). The value was developed in 1998. The toxicological endpoint was small intestinal lesions. An uncertainty factor of 300 was used: 10 to account for interspecies conversion, 10 to account for human variability, and 3 for database insufficiencies. The overall confidence in this RfD is reported to be low to medium. This value was used in the assessment.

No exposure limits are provided for the potential carcinogenicity of beryllium compounds via the oral route. The U.S. EPA (2009) states that no human studies are available on the carcinogenicity of beryllium via oral routes, and animal studies that have been conducted have been insufficient for the derivation of an exposure limit.

Boron

Boron is a solid substance that widely occurs in nature. It usually does not occur alone, but is often found in the environment combined with other substances to form compounds called borates. Borax (sodium borate $Na_2B_4O_7.10H_2O$) and boric acid are used in Canada as insecticides; borax is also used as an antimicrobial agent. Borax is used extensively as a cleaning compound.

Urinary excretion studies in humans suggest there is very little absorption of boron through intact skin. Evidence suggests that boron is readily absorbed following contact with damaged skin (ATSDR 2009, Health Canada 2002b). The most sensitive non-cancer endpoint was developmental (ATSDR 2009).

Studies in humans, particularly infants, show that boron (as boric acid) can be lethal following ingestion. Boron (as boron oxide and boric acid dusts) has been shown to cause irritation of the upper respiratory tract in humans. Ingestion of boron in humans can cause gastrointestinal effects. Nausea, persistent vomiting, diarrhea, and colicky abdominal pain in infants has been observed. Vomiting was the only sign of boron toxicity in two adult females who had ingested boron however the subjects did not develop any further symptoms (ATSDR 2009).

Health Canada (2009) derived an Acceptable Daily Intake (ADI) based on the lowest reported NOAEL for adverse testicular effects of 8.75 mg/kg bw per day in dogs (Weir and Fisher 1972).

The actual intake may have been higher, as the boron content of the basal diet was not specified. The NOAEL is based on testicular atrophy and spermatogenesis obtained in a two-year study in dogs. An uncertainty factor of 500 was applied (10 for interspecies variation; 10 for intraspecies variation; and 5 for limitations of the critical study [i.e., small number of experimental animals exposed for a small proportion of their life span]). This results in an TRV of 0.0175 mg/kg bw per day. This value was used in the assessment.

The only inhalation toxicity value located was specific to anhydrous borax, which is not appropriate for application in this assessment.

Cadmium

Environmental exposure to cadmium can occur via the diet and drinking water. Cadmium is transported in the blood and widely distributed in the body but accumulates primarily in the liver and kidneys (Goyer 1991). Cadmium is excreted primarily in the urine. Long-term exposure to cadmium primarily affects the kidneys, resulting in tubular proteinosis although other conditions such as "itai-itai" disease may involve the skeletal system. Cadmium is considered to be carcinogenic via the inhalation pathway. However, this pathway is not being considered in this assessment.

Health Canada (2009) provides a TDI of 0.001 mg/(kgd). This was based on an epidemiological study of occupationally exposed workers. A NOAEL of 2.5 µg Cd/g creatinine in urine was obtained which was associated with a chronic oral intake of 0.5 to 2.0 µg/(kg d). Therefore Health Canada maintained the provisional tolerable weekly intake of 7 µg/(kg w) which is equivalent to 1.0 µg/(kg d). This value was used as the TRV in this assessment.

Chromium

Chromium (Cr) is an element of natural and anthropogenic origin. Naturally occurring chromium is found in rock, flora and fauna and volcanic dust and gases. Chromium is found in several different oxidation states, or forms, including the most common metallic chromium (Cr(0)), trivalent chromium (Cr(III)) and hexavalent chromium (Cr(VI)) compounds. Some chromium such as chromium (III) is naturally occurring, but chromium (VI) and (0) compounds are mostly of anthropogenic origin. Anthropogenic sources of chromium to the environment include fossil fuel combustion, iron and steel production, waste from the chemical industry and transportation-related sources.

Health Canada (2009) provide an oral non-carcinogenic tolerable daily intake of 0.001 mg/kg-d for total chromium, based on the Canadian Guidelines for Drinking Water Quality listed in

Health Canada (1986). This corresponds to a maximum acceptable concentration (MAC) of 0.05 mg/L which converts to the TDI using the consumption of 1.5 L/d of water and a body weight of 70kg. the health endpoint was related to hepatotoxicity, irritation or corrosion of the gastrointestinal tract and encephalitis. This value was used in the assessment.

Cobalt

In its elemental form, cobalt (Co) is a hard silvery-gray metal. Naturally occurring, cobalt has two valent states (+2 and +3) and is usually found in the environment combined with other elements such as oxygen, sulfur, and arsenic. Small amounts of these chemical compounds can be found in rocks, soil, plants, and animals. Cobalt is even found in water in dissolved or ionic form, typically in small amounts. The natural amount of cobalt present in soils and water is taken up by plants and bacteria to form Vitamin B_{12}., an essential in humans for the formation of red blood cells.

The absorption of cobalt and cobalt compounds *via* oral exposure has been well studied in literature. Gastrointestinal absorption in humans was found to vary considerably (18-97%) based upon the chemical species of cobalt, the amount administered, and the nutritional status of the subjects (ATSDR 2009). Cobalt, a component of vitamin B_{12}, is an essential nutrient, and as a result is found in most body tissues including the liver, muscle, lung, lymph nodes, heart skin, bone, hair, stomach, brain, pancreatic juice, kidneys, plasma, and urinary bladder of non-exposed subjects, with the highest amount in the liver. Similar distribution is expected as a result of inhalation and oral exposure to impacted materials.

Fecal elimination was found to be the primary route of elimination in both human and animal studies following oral exposure. The amount eliminated was found to be dependent on the amount administered, the type of cobalt ingested, as well as the nutritional status of the subjects.

Oral exposure to cobalt in human and/or animal studies resulted in respiratory, cardiovascular, gastrointestinal, hematological, hepatic, renal, endocrine, dermal, ocular, hypothermic and body weight effects (ATSDR 2009). In a study conducted by Berg and Burback (1972, as referenced in ATSDR 20069), the cancer mortality and trace metal concentration was compared. The study found no correlation between cobalt concentration and cancer mortality associated with oral ingestion. As a result, oral exposure to cobalt is not considered to be carcinogenic.

Health Canada, the California Environmental Protection Agency (CalEPA) and the U.S. EPA do not provide exposure limits for cobalt. The ATSDR (2009) provides an oral MRL of 0.01 mg/kg-d. The MRL is based upon a LOAEL of 1 mg/kg-d, using an uncertainty factor of 10 to account for the use of a LOAEL and an additional factor of 10 to account for human variability.

RIVM (2001) provides an oral TDI of 0.0014 mg/kg-d. However, the derivation of this value is unclear and the study is not reported. As such, it was not considered in the assessment. Thus the ATSDR value was selected in this assessment.

Copper

Toxicity resulting from acute oral exposure to copper has been shown to occur but is quite rare because copper is a potent emetic. There is very limited data available on the effects of chronic oral exposure to copper. The liver has been demonstrated to be the sensitive target organ for copper toxicity. Rat studies suggest that kidney damage is possible at doses causing liver damage, although kidney damage may be associated with a latency period (ATSDR 2009).

Dermal exposure to copper has been shown to result in pruritic and contact allergic dermatitis, and eye irritation (ATSDR 2009, Askergren and Mellgren 1975).

Health Canada (2009) provide TRVs for copper based on various age groupings. The TRVs for children to adults is 0.01 mg/kg-d and for toddlers is 0.009 mg/kg d. This is based on epidemiological studies and the endpoint is related to hepatotoxicity and gastrointestinal effects. Since the TRVs for toddlers is similar to that of the child and adults a TRV of 0.01 mg/kg-d was used in the assessment.

Lead

The most sensitive target organs for lead are thought to be the nervous system, the hematopoetic system, and the cardiovascular system. Toxic effects of lead are also manifested through the kidneys, immunological and reproductive systems (ATSDR 2009).

Lead has been designated as a probable human carcinogen, but currently its critical effect endpoint is considered to be neurological effects in children. Chronic exposure to lead can also lead to nephropathy in adults and children, but has not been detected at blood levels below 40 µg/dL (Health Canada 1992).

The Joint FAO/WHO Expert Committee on Food Additives (JECFA) established a provisional tolerable weekly intake (pTWI) of 0.025 mg/kg in 1986 for lead exposure to children, and has reconfirmed this value (WHO 1987). This is equivalent to an RfD (or tolerable daily intake, TDI) of 0.0035 mg/kg-d. This exposure limit is prescribed based on the knowledge that lead is a cumulative toxin and that any increase in lead body burdens should be avoided. The NOAEL of 0.003 to 0.004 mg/kg-d is taken from metabolic studies in infants, and was not associated with

any increases in blood lead levels or lead body burdens. A LOAEL of 0.005 mg/kg-d was identified to be associated with body retention of lead. An uncertainty factor of 2 was selected because the endpoint and receptor selected were conservative, and because the studies selected were of good quality.

Health Canada (2002a) adopted the JECFA pTWI. Health Canada (2009) provide an oral TDI of 0.0036 mg/kg-d based on the same studies with an endpoint of a significant increase in the blood lead concentrations in infants. This value was used in the assessment.

Manganese

Manganese is essential for normal physiologic functioning in all animal species. Several diseases in humans have been associated with deficiencies and excesses of manganese intakes. Thus, any quantitative risk assessment for manganese must take into account aspects of both the essentiality and the toxicity of manganese. In humans, there is a lot of information about the range of essentiality for manganese. Additionally, there are many reports of toxicity to humans exposed to manganese by inhalation; however, very little is known about the oral toxicity of manganese. Therefore, the toxicity information on oral exposures is related to safe dietary intakes.

The World Health Organization (1973) reported the average daily consumption of manganese in diets to range from 2.0-8.8 mg Mn/day. Higher manganese intakes are associated with diets high in whole-grain cereals, nuts, green leafy vegetables, and tea. From manganese balance studies, the WHO concluded that 2-3 mg/day is adequate for adults and 8-9 mg/day is "perfectly safe."

The U.S. EPA IRIS database (U.S. EPA 2009, updated 1996) provides an oral RfD of 0.14 mg/kg-d. This value is based on potential CNS effects based on human chronic ingestion data. The assessment focuses on what is known to be a safe oral intake of manganese for the general human population, which was taken as 10 mg/d. As the information used to determine the RfD was taken from many large populations consuming normal diets over an extended period of time with no adverse health effects an uncertainty factor of 1 was used. Health Canada (2009) derived TRVs based on different life stages. The TRV for infants to teens is 0.1 mg/kg-d and the TRV for adults is 0.2 mg/kg-d based on epidemiological studies which result in Parkinsonian-like neurotoxicity. Given that the IRIS number encompassed the different values for the life stages it was used in the assessment.

Nickel

The most common harmful health effect of nickel in humans is an allergic reaction. Approximately 10-20% of the population is sensitive to nickel. The most common reaction is a skin rash at the site of contact. Some sensitized people react when they consume food or water containing nickel or breathe dust containing it. Eating or drinking large amounts of nickel has been reported to affect the stomach, blood, liver, kidneys, and immune system in rats and mice, as well as their reproduction and development. Inhalation of nickel has been reported to cause carcinogenic effects; however, this pathway is not being considered in the risk assessment.

Health Canada (2009) provide a TRV for nickel for soluble chloride and sulphate salts which has been used to develop the soil quality guideline for nickel. A value of 0.011 mg/kg-d was based on a reproductive study in rats which resulted in a NOAEL of 1.1 mg/kg-d> The endpoint was post-implantation perinatal lethality. This value was used in the assessment.

Selenium

Selenium is a naturally occurring element. Metallic gray to black in colour, pure selenium is often found combined with other substances in the environment such as sulfide mineral, oxygen or with silver, copper, lead and nickel minerals. Selenium and selenium compounds are readily absorbed from the human gastrointestinal tract.

The U.S. EPA (2009 - last updated 1993) provides an oral RfD of 0.005 mg/kg-day, based on a NOAEL of 0.015 mg/(kg-day) from a study of clinical and biochemical signs of selenium intoxication in individuals living in an area of China with unusually high environmental concentrations of selenium (Yang and Zhou 1989, as cited in IRIS (2009)). To derive the RfD, a factor of 3 was applied to account for human variability, and was considered appropriate because the individuals in the study were sensitive individuals drawn from the larger study population. Health Canada (2009) provides age-dependant TRVs for selenium ranging from 0.0062 mg/kg-d for a toddler to 0.0057 mg/kg-d for an adult. These values are based on studies in adults (Yang and Zhou 1994) and in infants (Shearer and Hadjimarkos, 1975). The U.S. EPA value is a lower and thus more conservative TRV and thus it was selected for use in the assessment.

The U.S. EPA (2009 – last updated 1993) have categorized selenium and selenium compounds as a non carcinogen on the basis that existing studies are inadequate to assess its carcinogenicity. No slope factor is provided.

Silver

The critical effect in humans ingesting silver is a condition known as argyria. Argyria results from the deposition of silver in the dermis and also from silver-induced production of melanin and results in a permanent bluish-gray discoloration of the skin. Although the deposition of silver is permanent, it is not associated with any adverse health effects. Pathologic changes or inflammatory reactions have not been shown to result from silver deposition.

Health Canada (2009) does not provide a TRV for silver.

The U.S. EPA (2009 – last updated 1996) provides a reference dose of 0.005 mg/(kg-d) based on a 2 to 9 year study in humans. A Lowest Observable Adverse Effects Level (LOAEL) of 1 g (total dose) - converted to 0.014 mg/kg/day, was determined based on the development of argyria. An uncertainty factor of 3 was applied to the LOAEL to account for minimal effects in a subpopulation which has exhibited an increased propensity for the development of argyria. This value was used in this assessment.

Strontium

Once in the body, strontium behaves very much like calcium. A large portion of the strontium will accumulate in bone. In adults, strontium mostly attaches to the surfaces of bones. In juveniles, especially those with poor nutrition, strontium behaves as an imperfect surrogate for calcium and interferes with bone mineralization in the developing skeleton. Animal studies strongly support the identification of bone as the most sensitive target of strontium toxicity.

The U.S. EPA IRIS database (2009 – last updated 1996) provides a chronic RfD for oral exposure to strontium of 0.6 mg/(kg-d) based on liver rachitic bone in rats. This value was used in the assessment.

Tin

Swallowing large amounts of inorganic tin compounds may cause stomachache, anemia, and liver and kidney problems. Humans exposed for a short period of time to some organic tin compounds have experienced skin and eye irritation and neurological problems; exposure to very high amounts may be lethal.

Neither Health Canada or the U.S. EPA IRIS database have reported TRVs for Tin. HEAST (U.S. EPA 1997b) provides a chronic RfD for tin of 0.6 mg/(kg-d) based on liver and kidney lesions in rats. This value was used in the assessment.

Vanadium

Vanadium is a naturally occurring element and found naturally on the earths crust as well as in fuel oils and coal. It is a white to gray metal, often found as a crystal. In the environment, vanadium is usually combined with other elements such as oxygen, sodium, sulfur or chloride.

Based on animal studies, the distribution of vanadium following oral exposure is rapid, and primarily distributed to the bones. Following intermediate duration dosing studies, the amount of vanadium reaching the tissues are low, with the highest levels in the kidney, bones, liver and lungs, initially. Prolonged retention of vanadium occurs only in the skeleton.

The U.S. EPA (2009 – last updated in 1996) provides an oral reference dose of 0.009 mg/kg-day. The RfD is based on a NOAEL of 17.9 ppm (0.89 mg/kg-day equivalent) as determined by Stokinger et al. (1953, as cited in U.S. EPA IRIS 2009). An uncertainty factor of 100 was applied, 10 for interspecies extrapolation and a factor of 10 to provide added protection for unusually sensitive individuals.

The Health Canada Food Directorate provides a TRV for vanadium of 0.005 mg/kg-d (Health Canada 2002a). The basis of this value has not been provided.

Based upon data available in literature, vanadium was not considered a carcinogen for the purposes of this risk assessment.

Zinc

Zinc is an essential nutrient with Recommended Daily Allowance (RDA) values ranging from 5 to 15 mg/day for different age and sex categories. The RDA is an estimate of the zinc needed for growth, development, metabolism, and tissue maintenance for over 98% of the healthy population.

Health Canada (2009) provides age dependent TRVs for zinc of 0.5 mg/kg-d for toddlers and children and 0.6 mg/kg-d for adults based on reduced iron and copper status in adults and increased growth in infants. An average value of 0.566 mg/(kg-d) between the two life stages was used in the assessment.

5.4.2 Carcinogenic TRVs

Carcinogenesis is generally assumed to be a "non-threshold" type phenomenon whereby it is assumed that any level of exposure to a carcinogen poses a finite probability of generating a

carcinogenic response. Carcinogenic TRVs or slope factors are used to estimate an upper-bound lifetime probability of an individual developing cancer as a result of exposure to a particular level of a potential carcinogen. The carcinogenic TRV is, therefore, the lifetime cancer risk per unit of dose.

Arsenic

Of the chemicals selected for evaluation in this study, only arsenic is considered to be a human carcinogen or probable human carcinogen through the oral/dermal pathway. The slope factor used in this assessment represents an upper bound (95^{th} percentile) dose-response estimate. The slope factor is conservative and is meant to protect susceptible members of the public. The slope factor for arsenic of 1.8 $(mg/(kg\text{-}d))^{-1}$ was obtained from Health Canada (2009) and is related to the development of internal cancers, such as stomach and liver.

6.0 RISK CHARACTERIZATION

The risk characterization results presented in this chapter combines the information provided in prior chapters on COPC levels in the environment (Chapter 2), selection and characterization of ecological species and human receptors and their exposure pathways (Chapter 3), pathways modelling results of COPC intakes by the ecological species and human receptors (Chapter 4) and identification of safe levels (toxicity reference values) for the COPC for each species (Chapter 5). In this chapter: measured and predicted water quality and sediment quality for the COPC are compared to relevant guidelines; risks to aquatic species are assessed by comparing measured and predicted water quality levels of COPC to aquatic toxicity reference values; risks to terrestrial ecological species are assessed by comparing exposure estimates from all pathways for the COPC to toxicity reference values; and the potential effects on human health of individuals who may spend time on the Faro Mine Complex site are evaluated by comparing estimated intakes for of the COPC to toxicity reference values for non-carcinogenic COPC and estimating the incremental lifetime risk from exposure to carcinogenic COPC (i.e. arsenic).

6.1 AQUATIC ENVIRONMENT

6.1.1 Water Quality – Comparison to CCME Guidelines

The water quality for the existing conditions and the final closure and remediation plan were compared to Canadian water quality guidelines for the protection of aquatic life and for community water supplies from the Canadian Council of Ministers of the Environment (CCME 1999). CCME water quality guidelines were not available for beryllium, cobalt, strontium, tin and vanadium and therefore, these COPC are not included in the following discussion.

6.1.1.1 Existing Conditions

Table 6.1 provides a summary of the mean and 95th percentile predicted COPC water concentrations for the assessment locations considered for the existing conditions. Locations upstream of mine operations (Rose Creek Upstream, Vangorda Creek Upstream and Pelly River Upstream) were considered to be representative of baseline water quality conditions and the use of these stations as background water quality is consistent with Gartner Lee Limited (2002).

From Table 6.1:

- Mean and 95th percentile predicted water concentrations at all assessment locations considered for the existing conditions are below the applicable CCME water quality guidelines for boron and nickel;

- For antimony, the 95th percentile water concentrations were above the CCME drinking water guideline for Rose Creek Downstream, Vangorda Creek Upstream and Downstream;
- For arsenic, the 95th percentile water concentrations were above the CCME aquatic life guideline for Vangorda Creek Upstream and Downstream and Pelly River at Pelly Crossing; there were no exceedances of the CCME drinking water guideline for arsenic;
- Predicted mean and 95th percentile water concentrations of cadmium are greater than the CCME aquatic life guideline at all locations; there were no exceedances of the CCME drinking water guideline for cadmium;
- Only the 95th percentile chromium water concentration at Pelly River at Pelly River Crossing exceeded the CCME aquatic life guideline; there were no exceedances of the CCME drinking water guideline for chromium;
- For copper, the mean concentrations at Pelly River Upstream and the mean and 95th concentrations at Pelly Crossing exceeded the CCME aquatic life guideline; there were no exceedances of the CCME drinking water guideline for copper;
- For lead, only the 95th percentile concentrations at Rose Creek and Vangorda Creek Downstream exceed the water quality guidelines; there were no exceedances of the CCME drinking water guideline for lead;
- For selenium, the mean and 95th percentile predicted water concentrations at Rose Creek Downstream, Vangorda Creek Upstream and Downstream exceeded the CCME aquatic life guidelines. The 95th percentile predicted water concentrations for selenium exceeded the CCME aquatic life guidelines at Rose Creek Upstream and Pelly River at Pelly Crossing; there were no exceedances of the CCME drinking water guideline for selenium;
- For manganese, the predicted 95th percentile water concentration at Rose Creek Upstream and both mean and 95th percentile concentrations at Rose Creek Downstream and Pelly River at Pelly Crossing exceeded the CCME drinking water guideline;
- All predicted silver concentrations except the concentration at Pelly River Upstream exceeded the CCME aquatic life guideline; and,
- For zinc, the mean and 95th percentile water concentrations at Rose Creek Downstream and Vangorda Creek Downstream exceeded the CCME aquatic life guideline. The 95th percentile concentrations at Rose Creek Upstream, Vangorda Creek Upstream and Pelly River at Pelly Crossing also exceeded the CCME aquatic life guideline for zinc. There were no exceedances of the CCME drinking water guideline for zinc.

6.1.1.2 Final Closure and Remediation Plan

Table 6.2 provides a summary of the predicted mean and 95th percentile COPC water concentrations for the assessment locations considered for the final closure and remediation plan.

Generally, there are fewer exceedances of the applicable CCME water quality guidelines in the final closure and remediation plan, as compared with the existing conditions. However, for cadmium, copper and zinc, predicted water quality concentrations are higher for the final closure and remediation plan due to the releases of soluble chemical loads within the groundwater plume that reach the receiving environment.

From Table 6.2:

- All predicted mean and 95th percentile water concentrations at the assessment locations for the final closure and remediation plan were below the applicable CCME water quality guidelines for antimony (drinking water), arsenic (aquatic life and drinking water), boron (drinking water), chromium (aquatic life and drinking water), lead (aquatic life and drinking water), nickel (aquatic life) and silver (aquatic life);
- All predicted mean and 95th percentile cadmium concentrations exceeded the CCME aquatic life guideline and were below than the CCME drinking water guideline;
- 95th percentile copper concentration at V27 exceeded the CCME aquatic life guidelines, but there were no exceedances of the CCME drinking water guideline;
- For manganese, the mean and 95th percentile concentrations at Vangorda Creek Downstream (V8 and V27) and the 95th percentile concentrations at Rose Creek Downstream (X14) exceeded the CCME drinking water guideline;
- Predicted mean and 95th percentile selenium water concentrations at X14, Pelly River Downstream of Vangorda Creek and Downstream of Anvil Creek exceeded the CCME aquatic life guideline; there were no exceedances of the CCME drinking water guideline for selenium;
- Mean and 95th percentile zinc water concentrations predicted at X14, V8 and V27, as well as the 95th percentile concentrations at Pelly River Downstream of Anvil Creek, exceeded the CCME aquatic life guideline; there were no exceedances of the CCME drinking water guideline for zinc.

Table 6.1 Predicted Water Quality Comparison to CCME Guidelines – Existing Conditions

COPC	CCME Aquatic Life Guideline (mg/L)	CCME Drinking Water Guideline (mg/L)	Predicted Water Quality (mg/L) – Existing Conditions											
			Rose Creek Upstream		Rose Creek Downstream		Vangorda Creek Upstream		Vangorda Creek Downstream		Pelly River Upstream		Pelly River @ Crossing	
			Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Antimony	-	0.006	0.0012	0.0046	0.0026	0.01	0.0030	0.011	0.0019	0.0073	-	-	0.0003	n/a
Arsenic	0.005	0.025	0.0007	0.0018	0.001	0.003	0.0021	0.0079	0.0028	0.01	0.0006	n/a	0.0015	0.0056
Beryllium	-	-	0.0005	0.0007	0.0015	0.0061	0.0004	0.0008	0.003	0.015	-	-	0.0001	0.0002
Boron	-	5	0.053	0.073	0.041	0.11	0.056	0.14	0.04	0.09	-	-	0.007	n/a
Cadmium	0.00006[a]	0.005	0.00013	0.00038	0.00017	0.00056	0.00018	0.0006	0.00029	0.0011	0.00050	n/a	0.00038	0.00138
Chromium	0.0089	0.05	0.0007	0.0024	0.001	0.004	0.002	0.007	0.0014	0.0048	-	-	0.003	0.011
Cobalt	-	-	0.0005	0.0010	0.0013	0.0042	0.0008	0.0024	0.003	0.012	0.001	-	0.0009	0.0032
Copper	0.004[b]	1[c]	0.0008	0.0022	0.0011	0.0033	0.0013	0.0037	0.0012	0.0025	0.005	n/a	0.0047	0.015
Lead	0.007[d]	0.01	0.0008	0.0031	0.003	0.012	0.002	0.006	0.002	0.007	0.004	n/a	0.001	0.006
Manganese	-	0.05[c]	0.04	0.13	0.89	3.32	0.02	0.04	0.01	0.03	0.014	n/a	0.07	0.25
Nickel	0.15[e]	-	0.0012	0.0047	0.003	0.009	0.002	0.008	0.002	0.007	0.001	n/a	0.005	0.016
Selenium	0.001	0.01	0.0008	0.0020	0.001	0.003	0.0015	0.0044	0.001	0.003	-	-	0.0009	0.0015
Silver	0.0001	-	0.0002	0.0005	0.0002	0.0007	0.0003	0.0011	0.0001	0.0002	0.0001	n/a	0.0001	0.0002
Strontium	-	-	0.12	0.22	0.19	0.38	0.14	0.35	0.10	0.20	-	-	0.18	0.27
Tin	-	-	0.0014	0.0060	0.0021	0.0086	0.003	0.011	0.0028	0.0106	-	-	0.0005	n/a
Vanadium	-	-	0.0006	0.0011	0.0007	0.0026	0.0006	0.0011	0.0005	0.0007	-	-	0.003	0.011
Zinc	0.03	5[c]	0.02	0.07	0.04	0.11	0.01	0.03	0.05	0.14	0.008	n/a	0.02	0.07

Note: - – not available n/a – not calculated due to a lack of data

predicted concentration greater than CCME Aquatic Life Guideline (1999)

Underline predicted concentration greater than CCME Drinking Water Guideline (1999)

a – Cadmium guideline based on the equation of guideline = $10^{\{0.86 \log (\text{hardness})-3.2\}}$ assuming water with hardness 200 mg/L $CaCO_3$

b – Copper guideline for water with hardness >180 mg/L $CaCO_3$

c – Guideline for aesthetic concerns

d – Lead guideline for water with hardness >180 mg/L $CaCO_3$

e – Nickel guideline for water with hardness >180 mg/L $CaCO_3$

Table 6.2 Predicted Water Quality Comparison to CCME Guidelines – Final Closure and Remediation Plan

COPC	CCME Aquatic Life Guideline (mg/L)	CCME Drinking Water Guideline (mg/L)	Predicted Water Quality (mg/L) – Final Closure and Remediation Plan									
			Rose Creek Downstream - X14		Vangorda Creek Downstream - V8		Vangorda Creek Downstream - V27		Pelly River Downstream Vangorda Creek		Pelly River Downstream Anvil Creek	
			Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Antimony	-	0.006	0.0005	0.0005	0.0006	0.0007	0.0007	0.0009	0.0002	0.0002	0.0002	0.0002
Arsenic	0.005	0.025	0.001	0.0019	0.0007	0.0018	0.001	0.0025	0.0005	0.0005	0.0005	0.0005
Beryllium	-	-	0.0006	0.0007	0.0005	0.0006	0.0005	0.0006	0.00001	0.00001	0.00003	0.00003
Boron	-	5	0.03	0.03	0.03	0.03	0.02	0.03	0.003	0.003	0.004	0.004
Cadmium	0.00006[a]	0.005	0.0004	0.0016	0.0002	0.0006	0.0003	0.001	0.0002	0.0002	0.0002	0.0003
Chromium	0.0089	0.05	0.0010	0.0022	0.0006	0.0008	0.0006	0.0011	0.0009	0.0009	0.0009	0.0009
Cobalt	-	-	0.0008	0.0014	0.0009	0.0019	0.0013	0.0027	0.0001	0.0001	0.0002	0.0002
Copper	0.004[b]	1[c]	0.0044	0.0104	0.0027	0.0067	0.0031	0.0085	0.0014	0.0014	0.0015	0.0017
Lead	0.007[d]	0.01	0.0008	0.0012	0.0006	0.0007	0.0007	0.0010	0.0002	0.0002	0.0002	0.0003
Manganese	-	0.05[c]	0.041	0.075	0.058	0.16	0.091	0.25	0.021	0.022	0.0225	0.023
Nickel	0.150[e]	-	0.0016	0.0030	0.0032	0.0048	0.0063	0.0091	0.0049	0.0049	0.0047	0.0047
Selenium	0.001	0.01	0.0025	0.0081	0.0005	0.0006	0.0006	0.0007	0.0012	0.0012	0.0012	0.0013
Silver	0.0001	-	0.000027	0.000029	0.000025	0.00003	0.000026	0.000034	0.000006	0.000006	0.000007	0.000007
Strontium	-	-	0.18	0.18	0.19	0.21	0.21	0.23	0.22	0.22	0.22	0.22
Tin	-	-	0.0001	0.0002	0.0010	0.0021	0.0013	0.0052	0.00001	0.00002	0.00001	0.00002
Vanadium	-	-	0.0005	0.0007	0.0007	0.0016	0.0009	0.0025	0.0006	0.0006	0.0006	0.0006
Zinc	0.03	5[c]	0.19	0.52	0.10	0.34	0.21	0.65	0.02	0.03	0.03	0.04

Note: - – not available

predicted concentration greater than CCME Aquatic Life Guideline (1999)

Underline predicted concentration greater than CCME Drinking Water Guideline (1999)

a – Cadmium guideline based on the equation of guideline = $10^{\{0.86 \log(\text{hardness})-3.2\}}$ assuming water with hardness 200 mg/L $CaCO_3$

b – Copper guideline for water with hardness >180 mg/L $CaCO_3$

c – Guideline for aesthetic concerns

d – Lead guideline for water with hardness >180 mg/L $CaCO_3$

e – Nickel guideline for water with hardness >180 mg/L $CaCO_3$

6.1.2 Sediment Quality

As described in Chapter 2, the water quality for the existing conditions and the final closure and remediation plan were multiplied by a site-specific sediment distribution coefficient (k_d) in order to derive predicted sediment concentrations at the assessment locations in Rose Creek, Vangorda Creek and Pelly River. An implicit assumption in the estimation of sediment quality using distribution coefficients is that COPC exchange between the water column and sediments occurs rapidly in response to changes in water column concentrations resulting in a new equilibrium being established in the creek/river sediments. This is not a completely accurate representation of the processes controlling metal exchange, as a portion of the metal content in sediments is present as non-leachable chemical species (e.g. as sulphide minerals). Furthermore, a portion of the sediments may be comprised of fines washed from the waste rock dumps and tailings impoundment. Nonetheless, the distribution coefficient approach has generally been found to be sufficiently accurate for most applications.

The probability distribution functions associated with water-to-sediment distribution coefficients were described in Chapter 2. A summary of the predicted sediment concentrations used in the assessment is presented in Table 6.3 for the existing conditions and Table 6.4 for the final closure and remediation plan. In Table 6.2 a comparison is also made to measured sediment quality data in 2005 and 2006. As seen from Table 6.2, the use of the sediment distribution coefficients to predict sediment concentrations results in predicted sediment concentrations that are similar to measured concentrations in the Rose Creek and Vangorda Creek watersheds. Thus the predicted concentrations are a good representation of the measured data and hence are validated.

Table 6.3 Predicted Sediment Quality – Existing Conditions

COPC	Predicted Sediment Quality (mg/kg dw) – Existing Conditions														
	Rose Creek Upstream		Rose Creek Downstream			Vangorda Creek Upstream			Vangorda Creek Downstream			Pelly River Upstream		Pelly River @ Pelly Crossing	
	Mean	95th	Mean	95th	Measured at R8 (2006 Mean)[a]	Mean	95th	Measured at V1 (Overall Mean)[a]	Mean	95th	Measured at V27 (2005 Mean)[a]	Mean	95th	Mean	95th
Antimony	0.36	1.5	0.8	3.2	< 10	1	3.7	nd	0.6	2.3	nd	-	-	0.09	0.13
Arsenic	6.4	16.1	9	27.5	12.67	18.5	71	21.1	24.8	90	24.3	5.3	7	13.6	51
Beryllium	0.37	0.57	1.19	4.9	< 1	0.3	0.6	nd	2.8	11.3	nd	-	-	0.05	0.18
Boron	0.16	0.24	0.12	0.33	< 1	0.17	0.43	nd	0.12	0.29	nd	-	-	0.02	0.03
Cadmium	0.5	1.46	0.64	2.2	1.07	0.7	2.3	0.7	1.1	4.5	1	1.9	2.8	1.45	5.4
Chromium	11.5	39.6	19.9	66	44.67	32.3	124	34.2	22.1	80	40.3	-	-	47.5	176
Cobalt	6.5	13	15	50	17.33	9.8	28.9	12.7	37.7	155	15.3	12	16	11	40.3
Copper	39.5	114	55	167	47	67	187	31.2	61	129	36.3	249	337	238	772
Lead	24.8	94	94	374	17.33	66	201	37	72	232	188	132	192	47.3	178
Manganese	659	2314	16075	58329	773	277	780	786	224	631	697	255	375	1342	4837
Nickel	20.1	80	50	164	48.67	39.2	147	31	35.5	128	38.7	17.2	23	88	298
Selenium	0.002	0.004	0.002	0.006	0.73	0.003	0.01	nd	0.002	0.006	nd	-	-	0.002	0.003
Silver	0.15	0.48	0.19	0.6	< 0.3	0.28	1	0.16	0.11	0.21	< 2	0.09	0.12	0.09	0.19
Strontium	31.3	59	49.4	105	36.33	35.5	90	34	25.2	53	34	-	-	45.2	75
Tin	18.3	71	29.2	121	5	36	140	nd	36.4	146	nd	-	-	6.5	8.8
Vanadium	19.6	38.7	24.4	89	64	19.7	43.2	27	16.5	26.6	22	-	-	113	423
Zinc	131	534	334	899	141.67	81	259	122	399	1089	288	67	97	177	639

Note: - – not calculated due to a lack of water quality data

nd- no measured data

Sediment quality estimated using probability distribution functions of predicted water quality and water-to-sediment distribution coefficients.

a – data from Minnow (2007), Appendix B

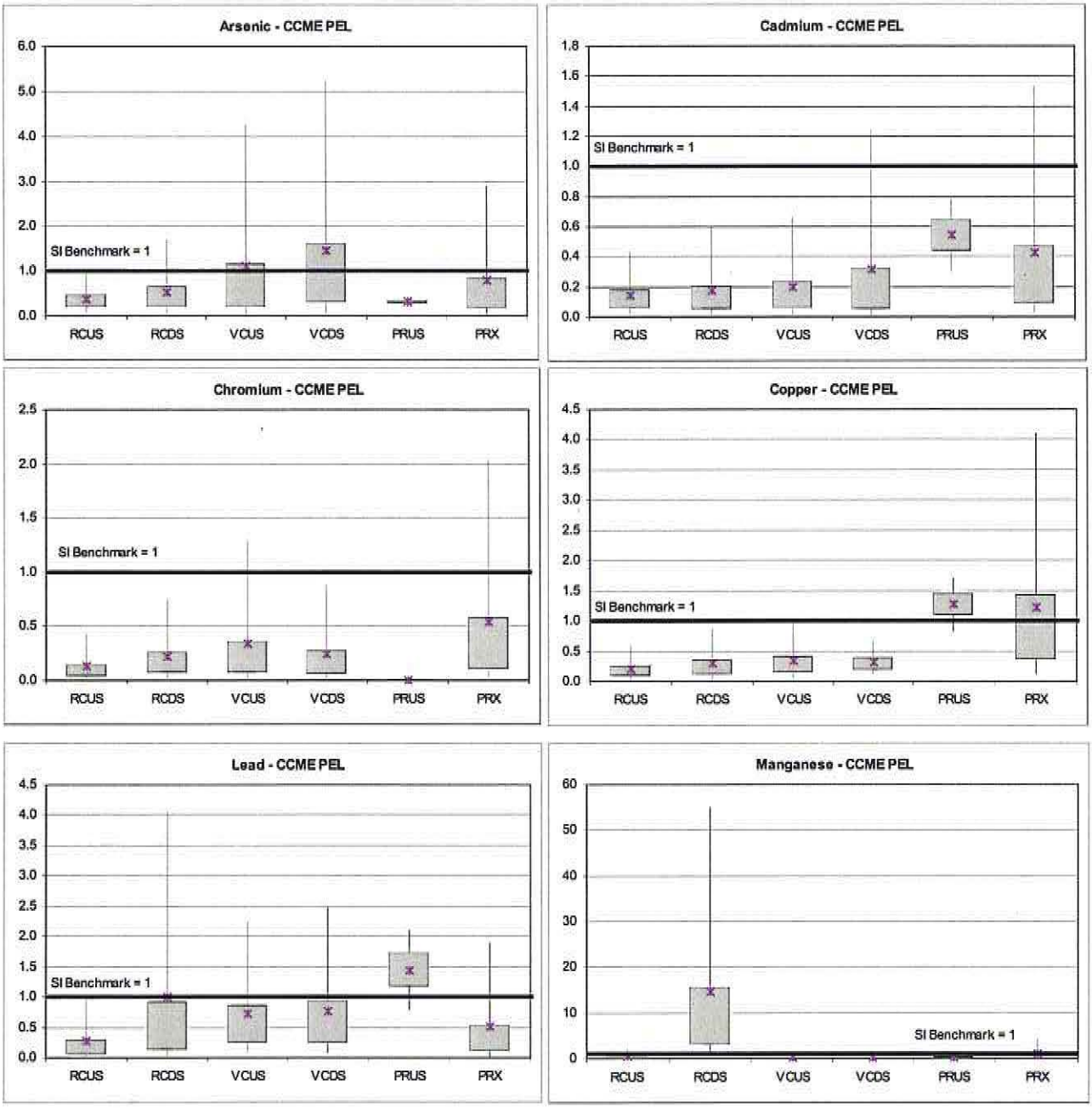
Table 6.4 Predicted Sediment Quality – Final Closure and Remediation Plan

COPC	Predicted Sediment Quality (mg/kg dw) – Final Closure and Remediation Plan									
	Rose Creek Downstream – X14		Vangorda Creek Downstream – V8		Vangorda Creek Downstream – V27		Pelly River Downstream Vangorda Creek		Pelly River Downstream Anvil Creek	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Antimony	0.36	1.37	0.16	0.21	0.18	0.25	0.21	0.31	0.06	0.08
Arsenic	6.4	16.4	9.0	18.3	6.8	17.2	8.6	22.7	4.4	5.8
Beryllium	0.37	0.58	0.47	0.66	0.41	0.56	0.43	0.6	0.01	0.01
Boron	0.16	0.24	0.08	0.11	0.08	0.10	0.07	0.10	0.01	0.01
Cadmium	0.51	1.49	1.63	6.2	0.70	2.2	1.28	3.9	0.79	1.17
Chromium	11.4	38.9	16.6	38.0	8.9	14.1	10.1	19.1	14.0	18.8
Cobalt	6.4	12.9	9.3	17.5	10.5	23.4	15.2	34.6	1.71	2.3
Copper	39.9	116	227	559	133	345	157	442	70	94
Lead	25.1	96	23.8	41.3	18.6	28.4	22.1	35.5	7.1	10.4
Manganese	650	2328	738	1472	1064	3023	1669	4759	383	561
Nickel	20.7	82	27.2	55.0	54	90	107	170	84	112
Selenium	0.002	0.004	0.01	0.02	0.001	0.002	0.001	0.002	0.003	0.004
Silver	0.14	0.46	0.02	0.03	0.02	0.03	0.02	0.03	0.01	0.01
Strontium	31.1	60	45.3	61	48.9	66	52	72	56	75
Tin	18.7	78	1.17	3.2	12.4	27.5	16.8	66	0.08	0.22
Vanadium	19.8	39.9	18.7	26.9	25.1	58	33.1	92	21.7	29.2
Zinc	133	557	1512	4448	828	2774	1634	5208	185	272

Note: Sediment quality estimated using probability distribution functions of predicted water quality and water-to-sediment distribution coefficients.

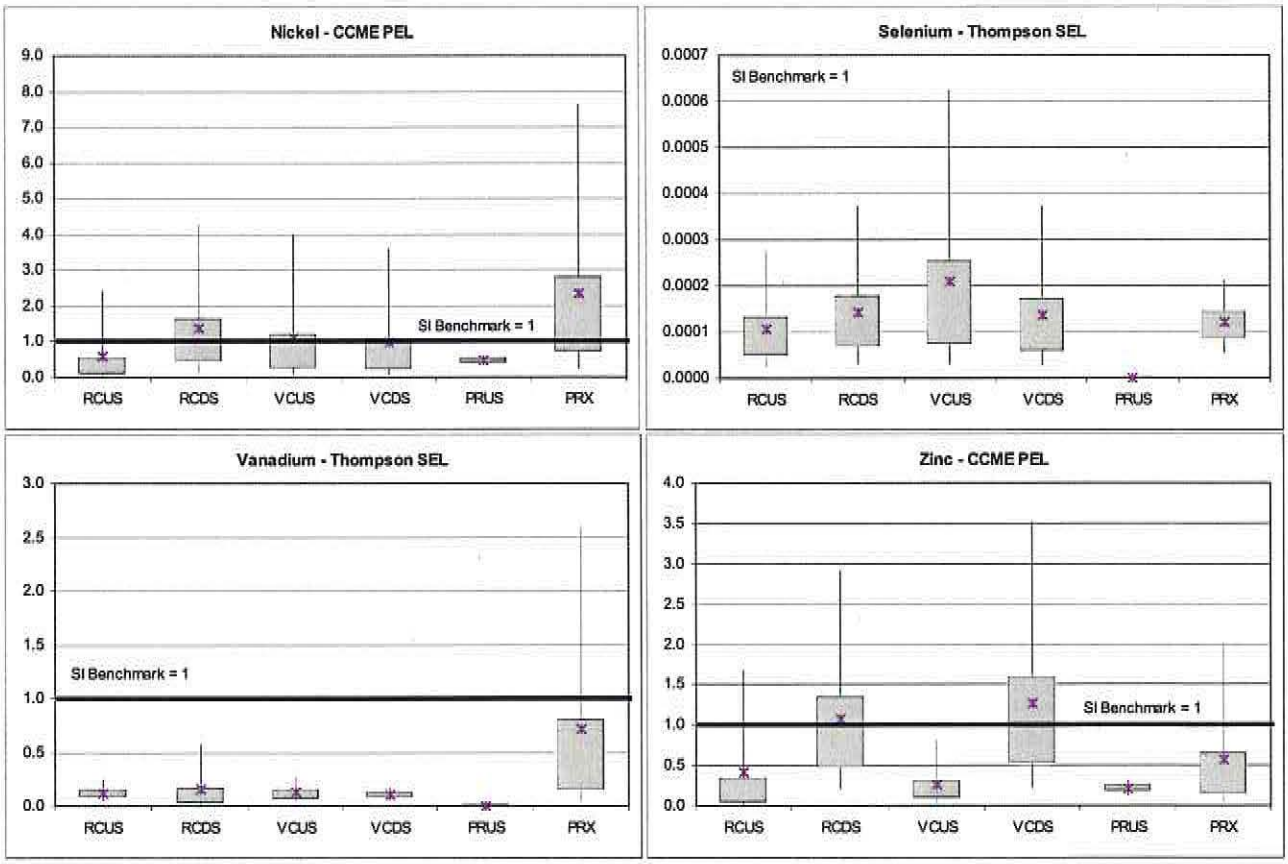
In order to determine the potential adverse effects on benthic organisms, predicted sediment concentrations were compared to sediment toxicity benchmarks presented in Table 5.2. Sediment concentrations were divided by the toxicity benchmarks to obtain screening index (SI) values. All SI values for the existing conditions and the final closure and remediation plan for the various toxicity benchmarks are presented in Appendix H. For ease of presentation, SI values associated with the probable effects level (CCME 1999) or severe effects level (Thompson *et al.* 2005) are presented in this section. The use of the PEL or SEL values indicates whether an effect on benthic organisms may occur. As the risk assessment for the final closure and remediation plan follows on other risk assessments for the site that have already highlighted sediment issues, it is our professional judgement that the use of the PEL and SEL values are appropriate for evaluating potential effects on benthic organisms for the final closure and remediation plan. The SI values are presented in Figure 6.1 for the existing conditions and Figure 6.2 for the final closure and remediation plan. Values greater than 1 suggest that there is a potential of observing adverse effects on some species.

Figure 6.1 Sediment Screening Index Values – Existing Conditions



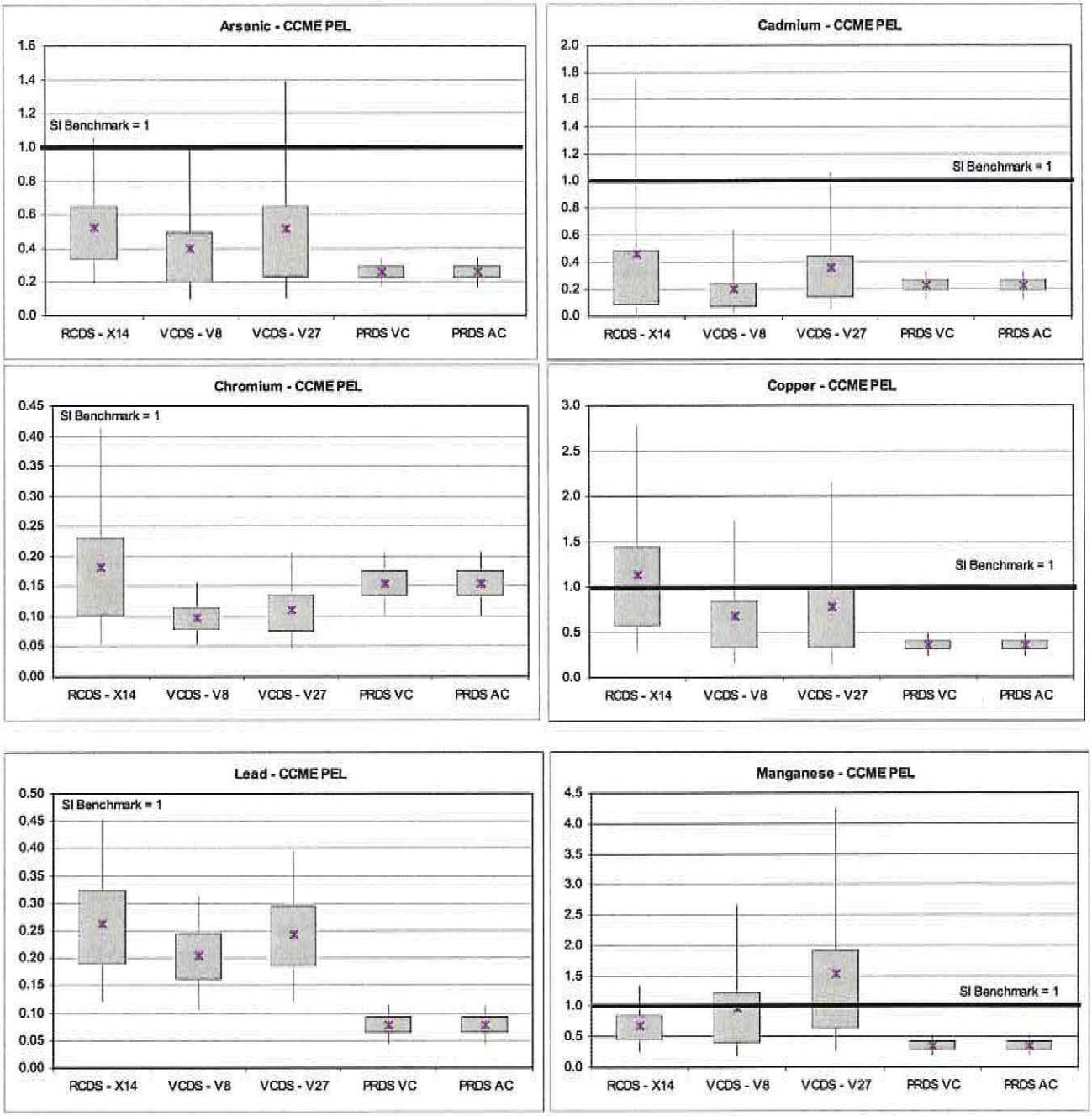
Note: The figures provide the predicted 5th, 25th, mean, 75th, and 95th percentile values as shown:
RCUS - Rose Creek Upstream; RCDS – Rose Creek Downstream; VCUS – Vangorda Creek Upstream; VCDS – Vangorda Creek Downstream; PRUS – Pelly River Upstream; PRX – Pelly River @ Pelly Crossing

Figure 6.1 Sediment Screening Index Values – Existing Conditions (Cont'd)



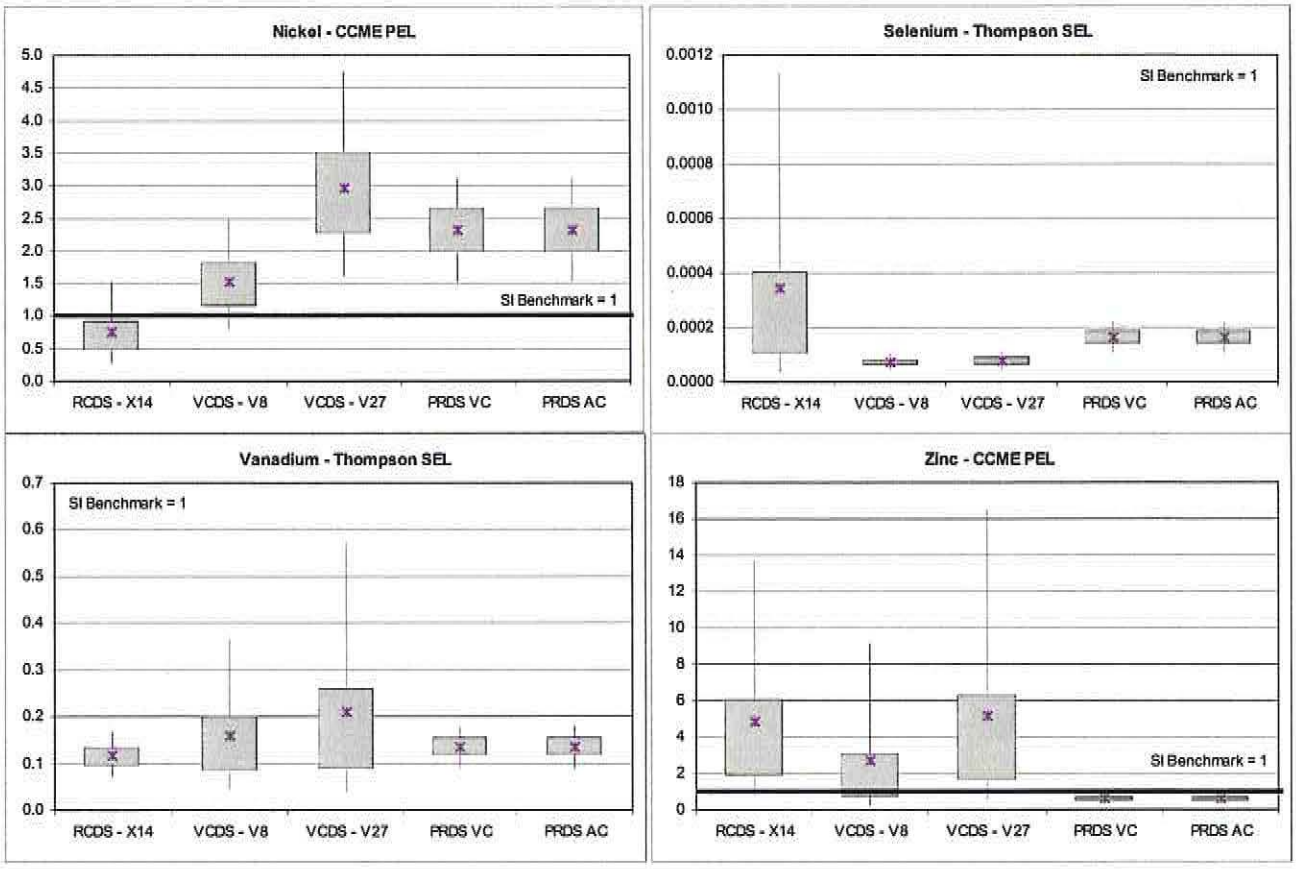
Note: The figures provide the predicted 5th, 25th, mean, 75th, and 95th percentile values as shown:
RCUS - Rose Creek Upstream; RCDS – Rose Creek Downstream; VCUS – Vangorda Creek Upstream; VCDS – Vangorda Creek Downstream; PRUS – Pelly River Upstream; PRX – Pelly River @ Pelly Crossing

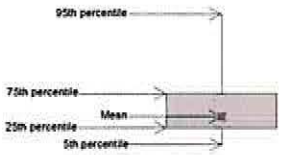
Figure 6.2 Sediment Screening Index Values – Final Closure and Remediation Plan



Note: The figures provide the predicted 5th, 25th, mean, 75th, and 95th percentile values as shown:
PRDS-X14 – Pelly River Downstream at X14; VCDS-V8 – Vangorda Creek Downstream at V8; VCDS-V27 – Vangorda Creek Downstream at V27; PRDSVC – Pelly River Downstream of Vangorda Creek; PRDSAC – Pelly River Downstream of Anvil Creek

Figure 6.2 Sediment Screening Index Values – Final Closure and Remediation Plan (Cont'd)





Note: The figures provide the predicted 5th, 25th, mean, 75th, and 95th percentile values as shown:
PRDS-X14 – Pelly River Downstream at X14; VCDS-V8 – Vangorda Creek Downstream at V8; VCDS-V27 – Vangorda Creek Downstream at V27; PRDSVC – Pelly River Downstream of Vangorda Creek; PRDSAC – Pelly River Downstream of Anvil Creek

6.1.2.1 Existing Conditions

Sediment toxicity benchmarks were not available for antimony, beryllium, boron, cobalt, silver, strontium and tin, and therefore these COPC are not evaluated.

As seen in Figure 6.1, predicted mean concentrations of cadmium, chromium selenium and vanadium are below the PEL toxicity benchmarks (cadmium and chromium) and the SEL toxicity benchmarks (selenium and vanadium) for the existing conditions. For cadmium, chromium and vanadium, the 95th percentile concentrations (as seen by the line above the bar), exceed the applicable toxicity benchmarks at Pelly River at Pelly Crossing; however, the extent of the line indicates the uncertainty in the predicted 95th percentile concentrations at this location. For cadmium, the 95th percentile concentrations at Vangorda Creek Downstream exceed the SI of 1 but are also uncertain. It is noted that many factors affect the availability of COPC in sediment and hence their toxicity (e.g., grain size distribution and organic content) and thus an SI value above 1 does not necessarily mean that an adverse effect will occur.

In Rose Creek, predicted mean lead, manganese, nickel and zinc concentrations are above an SI value of 1 indicating some potential effects in Rose Creek. Benthic community surveys were carried out on Rose Creek in 2004 and 2006 and summarized in Minnow (2007). The results indicated that at downstream locations on Rose Creek there is a high abundance of benthic communities. In addition, there was no difference in mean abundance between reference and downstream locations (Minnow 2007). Therefore, even though there are exceedances of PEL levels in Rose Creek, field evidence suggests that there are no adverse effects occurring in Rose Creek under the existing conditions.

In Vangorda Creek, mean and 95th percentile SI values are lower than Rose Creek and below a value of 1 for lead, manganese, nickel and vanadium. For arsenic, cadmium, chromium and copper, mean and 95th percentile SI values are above those in Rose Creek. For zinc, SI values are similar to Rose Creek. Benthic community surveys were carried out on Rose Creek in 2003 and 2005 and summarized in Minnow (2007). The results showed that there were significant differences between the reference station (V1) and the exposure station (V27 – downstream of the Grum/Vangorda site). However, the differences were related to habitat differences rather than mine related impacts. Therefore, even though there are exceedances of PEL levels in Vangorda Creek, field evidence suggests that there are no adverse effects occurring in Vangorda Creek under the existing conditions.

At the Pelly River Crossing, mean SI values for copper and nickel exceed a value of 1. However, benthic community surveys on these two watersheds and on Pelly River indicated that

benthic communities are not experiencing adverse effects; therefore, it is not expected that there are any adverse effects on benthic communities in the Pelly River under existing conditions.

6.1.2.2 Final Closure and Remediation Plan

Figure 6.2 provides the SI values for the same COPC as discussed above for the final closure and remediation plan.

A comparison of the results in this figure to the existing conditions for Rose Creek at X14 (Figure 6.1) indicates that the SI values for the COPC are generally higher for the final closure and remediation plan than for the existing conditions. In particular, predicted SI concentrations of zinc at X14 are at least an order of magnitude higher. It should be noted that the predicted zinc concentrations of approximately 1517 mg/kg (mean) are similar to measured concentrations at R2 (which is very close to X14) in 1999 (mean value of 1100 mg/kg) as provided by Minnow (2007). The results of benthic community surveys during this period indicated that there were no mine-related adverse effects on benthic communities. Therefore, it is not expected that there will be adverse effects on benthic organisms in Rose Creek. Nonetheless, benthic surveys on Rose Creek should be continued as part of the monitoring program to evaluate the effectiveness of the final closure and remediation plan.

SI values in Vangorda Creek (especially at V27 which is located close to the Vangorda/Grum pits) are predicted to be higher than the current conditions for copper, manganese, nickel and zinc indicating that for these COPC, sediment quality in Vangorda Creek in this location will be worse after implementation of the final closure and remediation plan. This may potentially result in adverse effects in Vangorda Creek. However, it should be noted that the zinc concentrations that are being predicted for the final closure and remediation plan are just slightly higher than those experienced previously in Vangorda Creek. The elevated zinc concentrations in the sediments in Vangorda Creek are limited spatially to the area around V27. Nonetheless, benthic community surveys on Vangorda Creek should be continued as part of the monitoring program for the final closure and remediation plan to ensure that benthic communities are not experience any adverse effects.

SI values for the Pelly River are generally all below the SI values for the existing conditions. For nickel, selenium and zinc, the predicted SI values are similar to the existing conditions. These results indicate that sediment quality in the Pelly River will generally improve after implementation of the final closure and remediation plan and it is not expected that there will be adverse effects on benthic communities.

6.2 AQUATIC ENVIRONMENT

The risk characterization phase combines the information gathered in the exposure and hazard assessment phases and characterizes the potential for adverse ecological effects. This section of the report evaluates the risks to aquatic species via comparison of exposure levels to toxicity reference values.

Potential toxic effects of COPC can be measured at different levels of biological and ecological organization. In this study, ecological impacts of different COPC on receptors in the aquatic environment were characterized by the calculation of screening index (SI) values. SI values provide an integrated description of the potential hazard, the exposure (or dose) response relationship and the exposure evaluation (U.S. EPA 1992, AIHC 1992). A SI is calculated by dividing the predicted concentration by the selected toxicity reference value for each aquatic receptor.

The aquatic receptors chosen for the assessment represent several trophic levels in typical creek and river ecosystems. The aquatic SI values for all species were estimated for the assessment locations for the predicted mean and 95th percentile COPC concentrations in the receiving waters.

It should be noted that the SI values reported in this section are not estimates of the probability of ecological impact. Rather, the SI values are positively correlated with the potential of an effect, that is, higher index values imply greater potential of an effect. Different magnitudes of the SI have been used in other studies to screen for the potential ecological effects. A SI value of 1.0 has been used in some instances (e.g. Suter 1991). In other work, Cardwell et al. (1993) suggested a SI value of 0.3, based upon a cautious approach designed to account for potential chronic toxicity and chemical synergism. In this study, a SI value of 1.0 was used to examine the potential adverse effects of COPC as the assessment is based on the application of chronic effects concentration (EC_{20}) endpoints for the aquatic species. SI values less than 1.0 indicate that the predicted levels are below the corresponding benchmarks. Values greater than 1 suggest that there is a potential of observing adverse effects on some species.

6.2.1 Existing Conditions

Aquatic SI values were calculated for each of assessment locations considered for the existing conditions and are presented in Figure 6.3. Aquatic toxicity reference values are not available for tin, therefore tin is not included in the figure. The numerical SI values are presented in Appendix H. From the figure, it can be seen that there are no potential adverse effects for aquatic receptors exposed to the following COPC: antimony, arsenic, boron, beryllium (mean

concentrations), cadmium, cobalt (mean concentrations), copper, nickel, lead (mean concentrations), nickel, selenium, silver (mean concentrations), strontium and vanadium for the existing conditions.

The toxicity reference values for selenium are for exposure to water only. Exposures for bioaccumulative COPC such as selenium can occur through pathways other than water alone and may be related primarily to the diet. Because it is recognized that selenium has the ability to bioaccumulate through aquatic food webs, a comparison to a fish tissue concentration of 2 mg/kg (ww) (U.S.EPA 2004) was done. Predicted fish concentrations in the Rose Creek and Vangorda Creek are presented in Table 6.5. As seen from Table 6.5, all selenium concentrations are below a value of 2 mg/kg (ww) indicating that there are no adverse effects in fish due to bioaccumulation of selenium.

Table 6.5 Predicted Selenium Concentrations in Fish Tissue – Existing Conditions

COPC	Predicted Concentrations in Fish Tissue (mg/kg ww) – Existing Conditions									
	Rose Creek Upstream		Rose Creek Downstream		Vangorda Creek Upstream		Pelly River Upstream		Pelly River @ Crossing	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Selenium	0.10	0.25	0.13	0.35	0.19	0.58	n/a	n/a	0.11	0.21

Note: n/a – not calculated due to a lack of water quality data at this location.
Concentrations in fish tissue were predicted using probability distribution functions of water quality and water-to-sediment distribution coefficients.

There are some cases where the 95th percentile SI values are above a value of 1 (e.g. beryllium, cobalt, lead and silver). As seen from the figure, the 95th percentile SI values for these COPC are uncertain and are related to phytoplankton, zooplankton and benthic invertebrates in Rose Creek and Vangorda Creek at downstream locations. Silver SI values are highly uncertain at both upstream and downstream locations,

SI values are above a value of 1 for aquatic plants exposed to chromium at Vangorda Creek upstream and Pelly River at Pelly Crossing. For cadmium, SI values are above 1 for benthic invertebrates, zooplankton and predator fish at Pelly River at both upstream and downstream locations. In fact, the SI values are lower at the downstream locations.

For zinc, SI values for phytoplankton are all above a value of 1 at all locations. This is due to the selection of a very conservative TRV for the protection of the green alga *Pseudokirchneriella subcapitata* of 0.0022 mg/L (Minnow 2009, draft). The results of the risk assessment indicate that there may be potential adverse effects in the green alga *P. subcapitata* for the existing conditions. The next highest TRV is related to the green alga *Chlorella vulgaris* and is a value of 0.014 mg/L (Minnow 2009, draft). The measured mean concentrations of 0.02 mg/L to

0.05 mg/L in the Rose Creek and Vangorda Creek at both upstream and downstream locations are also above this toxicity value indicating potential adverse effects in *C. vulgaris*. The next highest TRV for green algae is for *Chlorella pyrenoidosa* at 0.16 mg/L for a hardness of 200 mg/L $CaCO_3$. This value is above the measured mean concentrations in the Rose Creek and Vangorda Creek watersheds indicating that there will be no adverse effects in this alga.

The results of the assessment of the existing conditions indicate that there are potential adverse effects on sensitive algal species in Rose Creek and Vangorda Creek near the mine site and pits.

6.2.2 Final Closure and Remediation Plan

Aquatic SI values were calculated for each of assessment locations considered in the final closure and remediation plan, as presented in Figure 6.4. From the figure, it can be seen that there are no potential adverse effects for aquatic receptors predicted in the final closure and remediation plan exposed to the following COPC: antimony, arsenic, beryllium, boron, cobalt, lead, manganese, nickel, selenium, silver, strontium and vanadium. With the exception of cadmium, copper selenium and zinc, the predicted concentrations for the final closure and remediation plan are generally less than for existing conditions. From the figure, it can be seen that only cadmium and zinc have mean SI values above 1 for a number of aquatic receptors in Rose Creek and Vangorda Creek. There are no predicted effects in the Pelly River with the exception of the most sensitive algae exposed to zinc.

To examine the ability of selenium to bioaccumulate through aquatic food webs, a comparison to a fish tissue concentration of 2 mg/kg (ww) (U.S.EPA 2004) was also done. Predicted fish concentrations in the Rose Creek and Vangorda Creek are presented in Table 6.6. As seen from Table 6.6, all selenium concentrations are below a value of 2 mg/kg (ww) indicating that there are no adverse effects in fish due to bioaccumulation of selenium.

Table 6.6 Predicted Selenium Concentrations in Fish Tissue – Final Closure and Remediation Plan

COPC	Predicted Concentrations in Fish Tissue (mg/kg ww) – Final Closure and Remediation Plan							
	Rose Creek Downstream - X14		Vangorda Creek Downstream - V8		Pelly River Downstream Vangorda Creek		Pelly River Downstream Anvil Creek	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Selenium	0.32	1.09	0.07	0.10	0.16	0.21	0.16	0.21

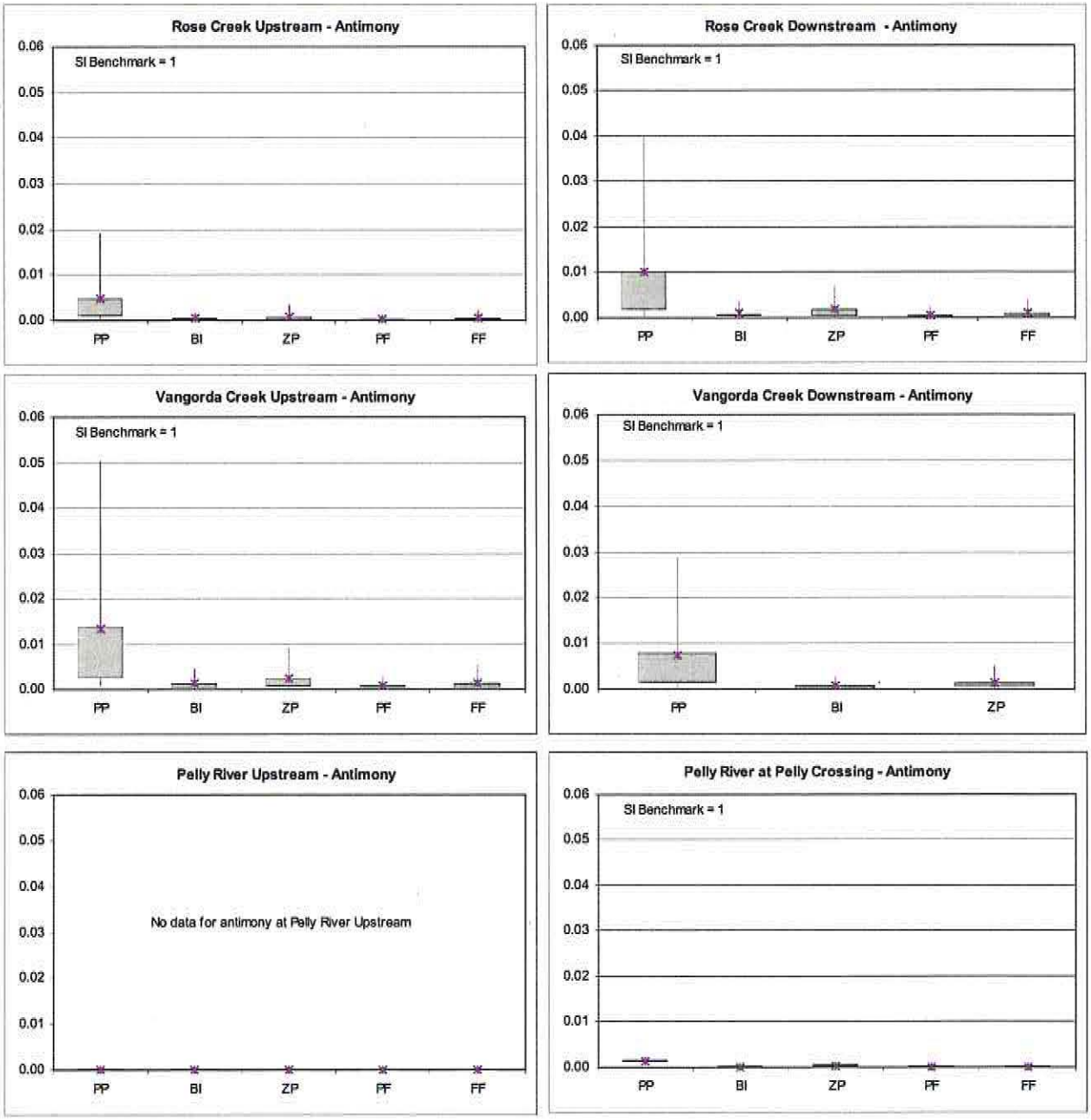
Note: Concentrations in fish tissue were predicted using probability distribution functions of water quality and water-to-sediment distribution coefficients.

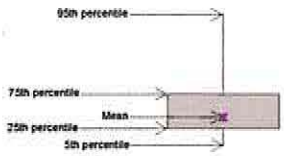
SI values are above 1 for benthic invertebrates, zooplankton, predator and forage fish exposed to cadmium. These values are due to the selection of the lowest TRVs for each given aquatic receptor. For example, the TRV for zooplankton is based on toxicity data for *Daphnia magna* which is a value of 0.00032 mg/L for a hardness of 200 mg/L $CaCO_3$, where as for *Ceriodaphnia dubia* the toxicity value is two orders of magnitude higher at 0.0174 mg/L (Minnow 2009, draft) which is above the predicted cadmium concentrations. Similarly, for predator fish the TRV for rainbow trout is an order of magnitude lower than for Atlantic salmon. The Atlantic salmon toxicity value is above the predicted cadmium concentrations.

Similarly, SI values are above 1 for phytoplankton, zooplankton, predator fish and forage fish exposed to zinc. As discussed for the existing conditions, SI values for phytoplankton are all above a value of 1 at all locations due to the selection of a very conservative TRV for the protection of the green alga *Pseudokirchneriella subcapitata* of 0.0022 mg/L (Minnow 2009, draft) whereas the TRV for *Chlorella pyrenoidosa* is approximately two orders higher at 0.16 mg/L for a hardness of 200 mg/L $CaCO_3$. Predicted mean concentrations in Rose Creek at X14 and Vangorda Creek at V27 are predicted to be marginally above this value. For rainbow trout, the TRV of 0.2 mg/L is equivalent to the predicted mean zinc concentrations in Rose Creek at X14, whereas the toxicity value for Chinook salmon is approximately 2.5 times higher.

In summary, the results of the aquatic assessment indicate that there may be potential effects in some very sensitive species found in Rose Creek (X14) and Vangorda Creek (V27) from exposures to cadmium and zinc for the final closure and remediation plan. These areas are limited spatially in comparison to the watershed area.

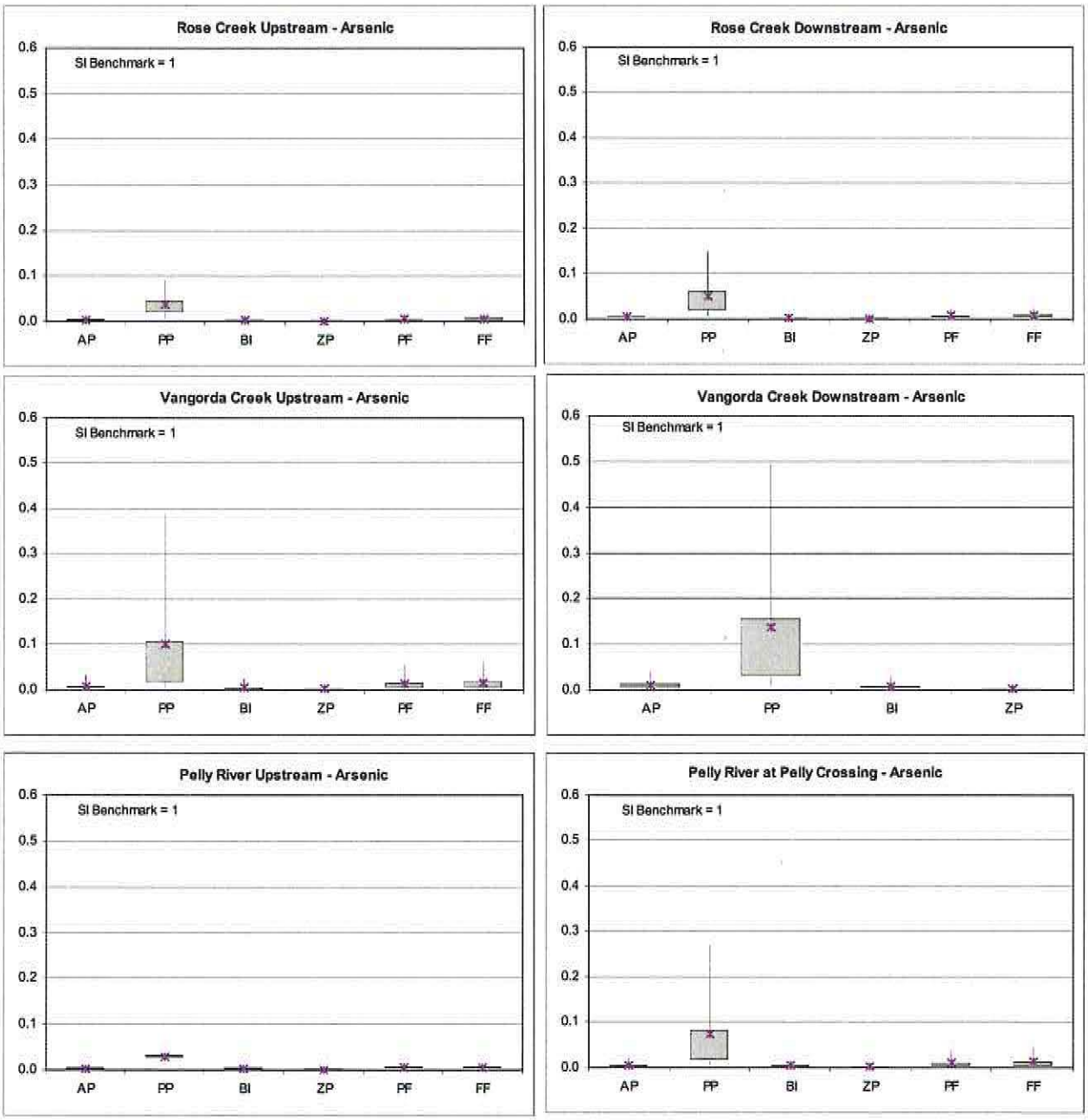
Figure 6.3 Aquatic Screening Index Values – Existing Conditions

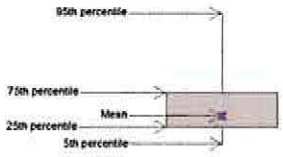




Note: The figures provide the predicted 5th, 25th, mean, 75th, and 95th percentile values as shown:
PP – phytoplankton, BI – benthic invertebrates, ZP – zooplankton, PF – predator fish, FF – forage fish

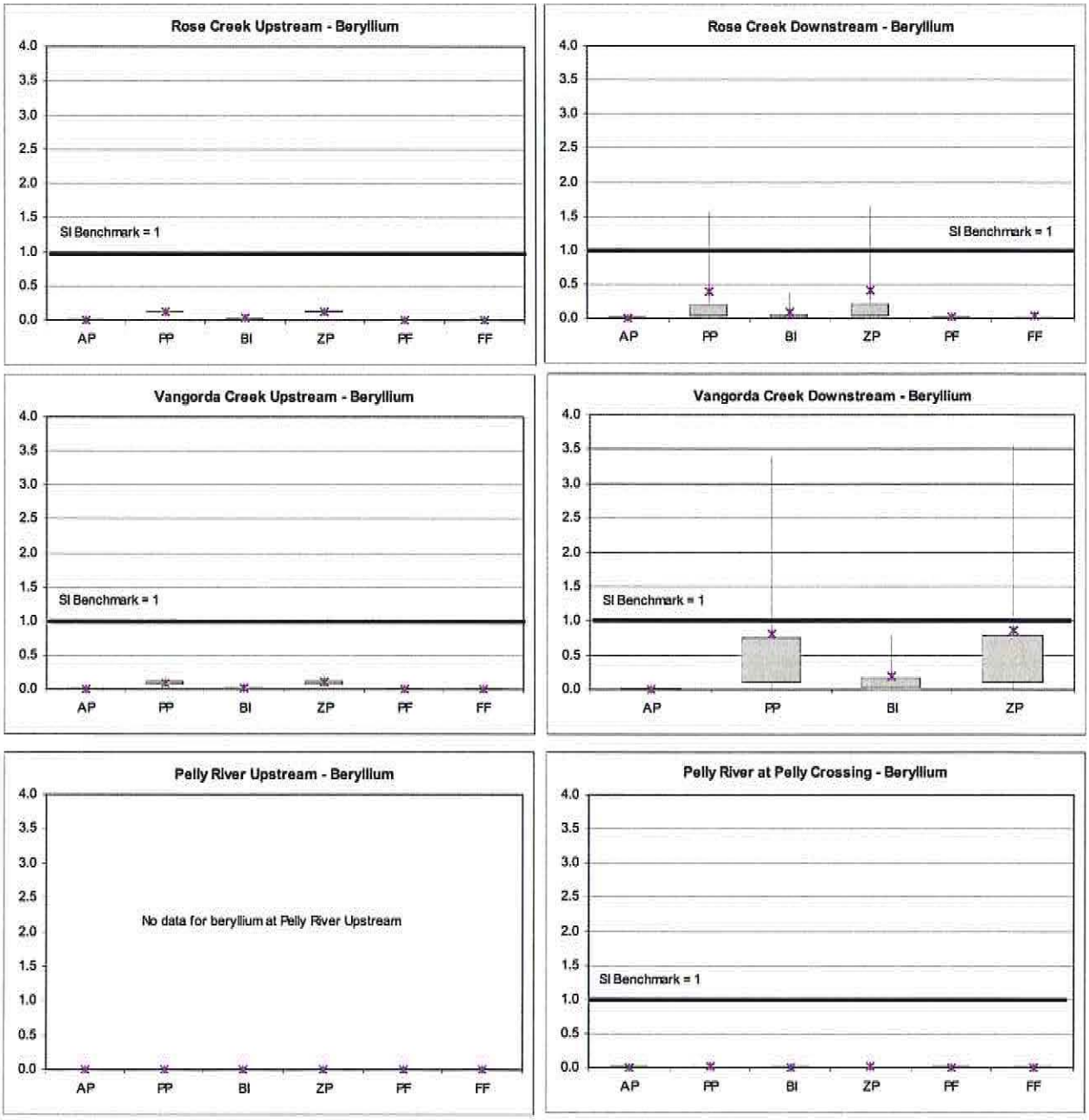
Figure 6.3 Aquatic Screening Index Values – Existing Conditions (Cont'd)

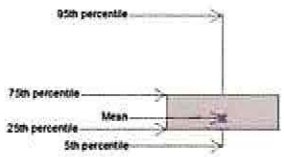




Note: The figures provide the predicted 5th, 25th, mean, 75th, and 95th percentile values as shown:
AP – aquatic plants, PP – phytoplankton, BI – benthic invertebrates, ZP – zooplankton, PF – predator fish, FF – forage fish

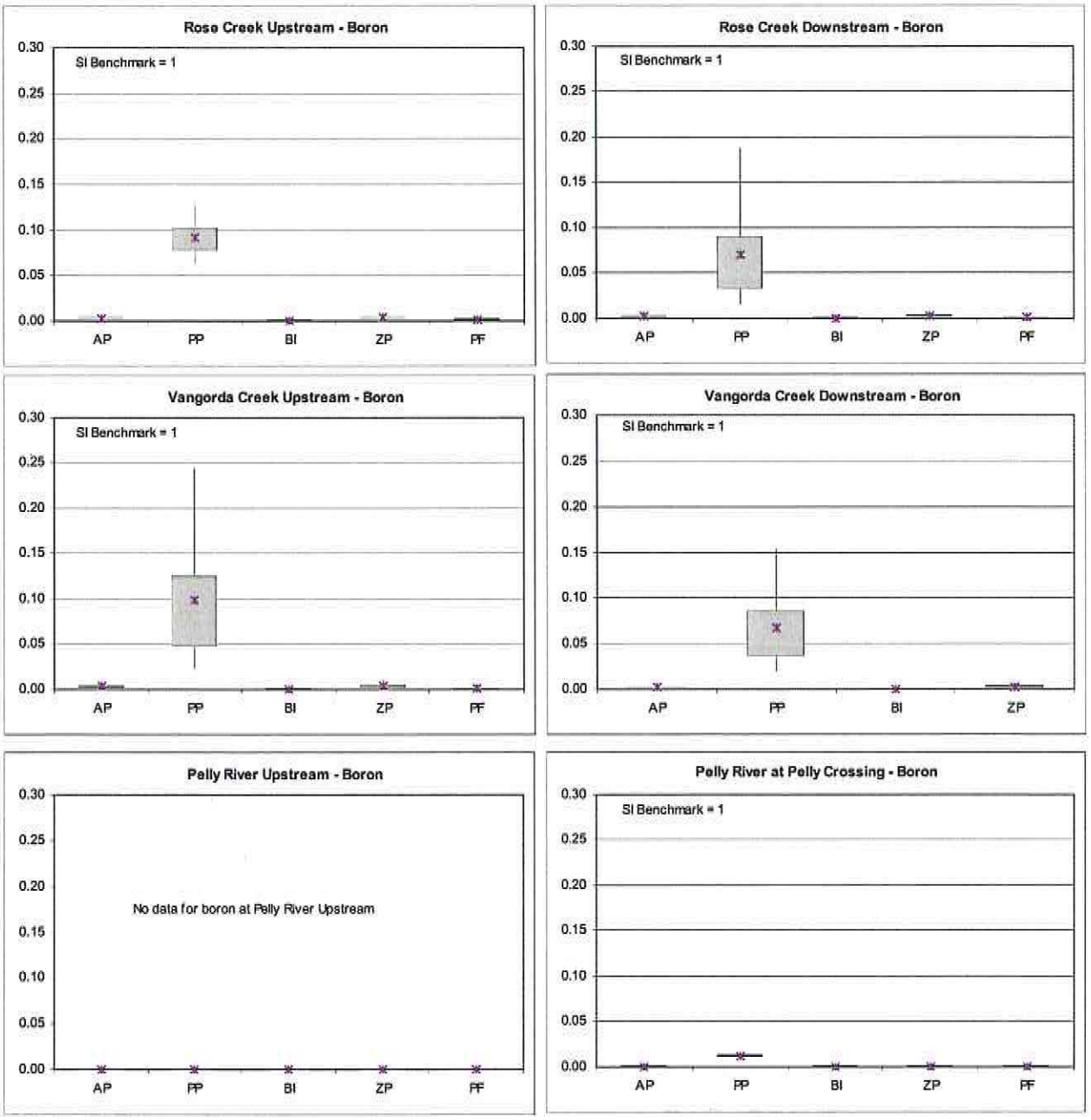
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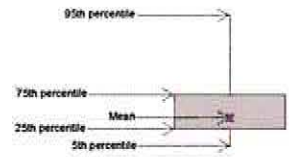




Note: The figures provide the predicted 5th, 25th, mean, 75th, and 95th percentile values as shown:
AP – aquatic plants, PP – phytoplankton, BI – benthic invertebrates, ZP – zooplankton, PF – predator fish, FF – forage fish

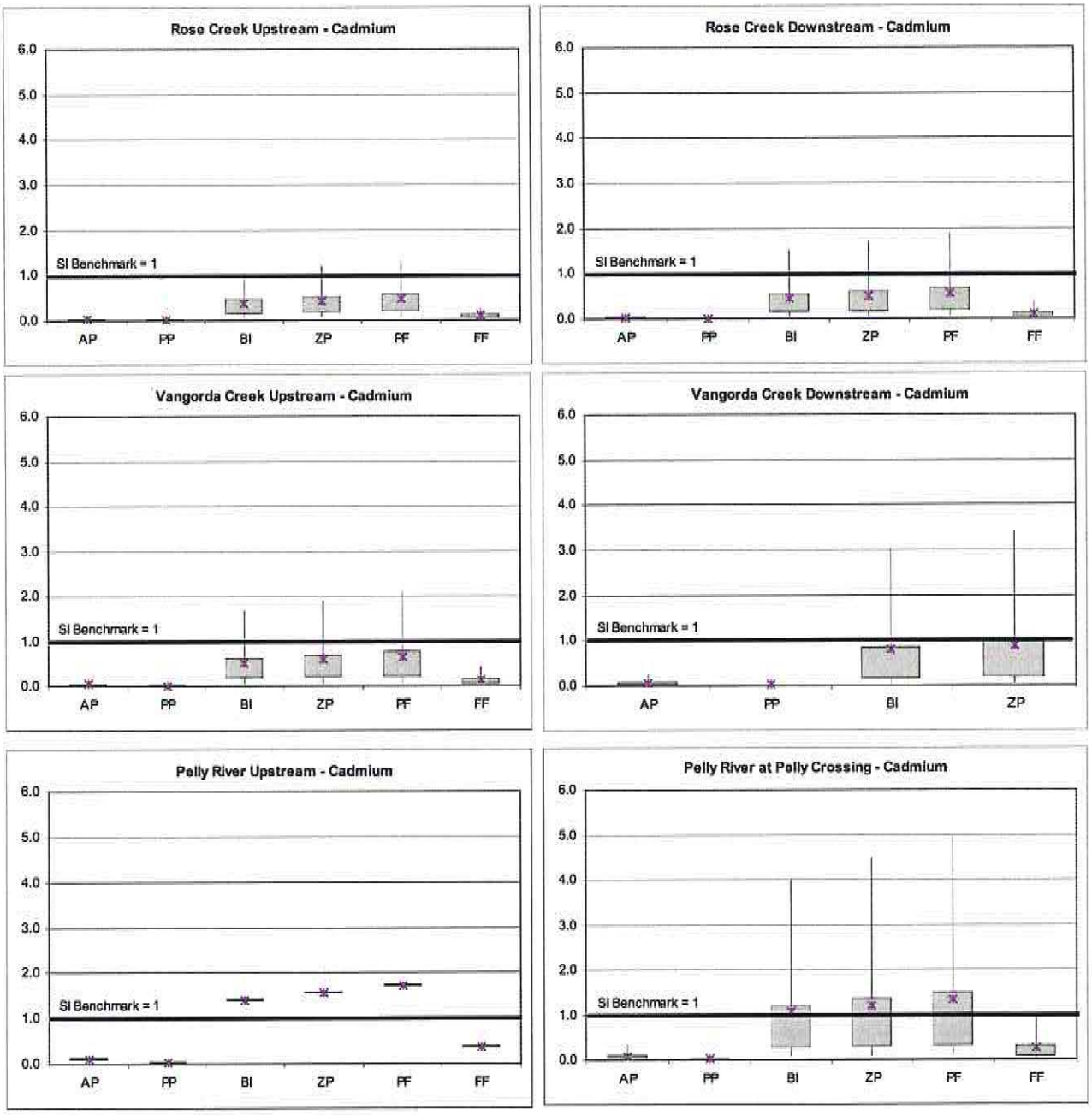
Figure 6.3 Aquatic Screening Index Values – Existing Conditions (Cont'd)





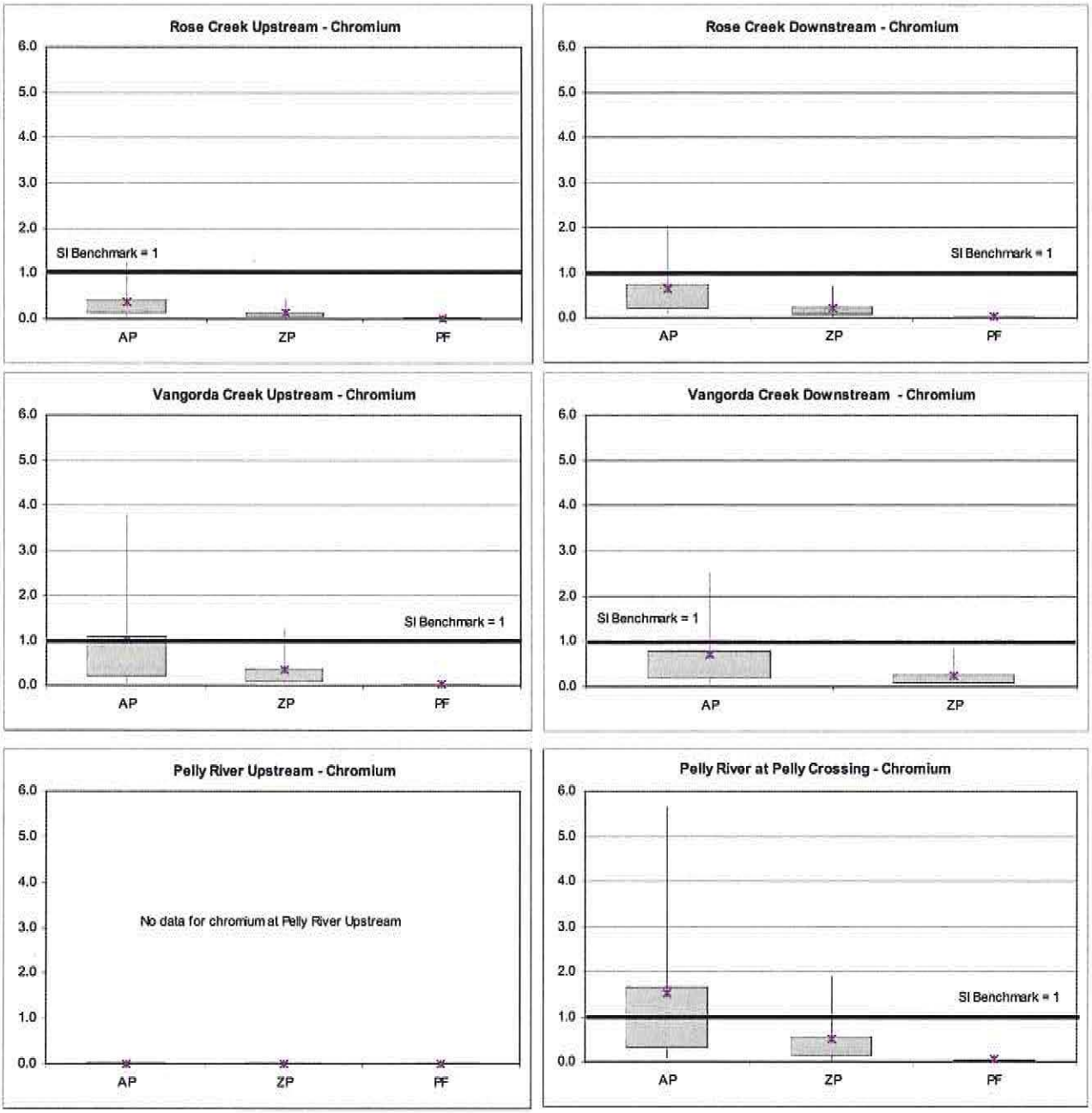
Note: The figures provide the predicted 5th, 25th, mean, 75th, and 95th percentile values as shown:
AP – aquatic plants, PP – phytoplankton, BI – benthic invertebrates, ZP – zooplankton, PF – predator fish, FF – forage fish

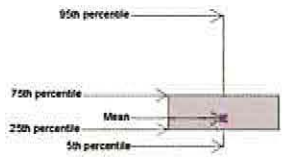
Figure 6.3 Aquatic Screening Index Values – Existing Conditions (Cont'd)



Note: The figures provide the predicted 5th, 25th, mean, 75th, and 95th percentile values as shown:
AP – aquatic plants, PP – phytoplankton, BI – benthic invertebrates, ZP – zooplankton, PF – predator fish, FF – forage fish

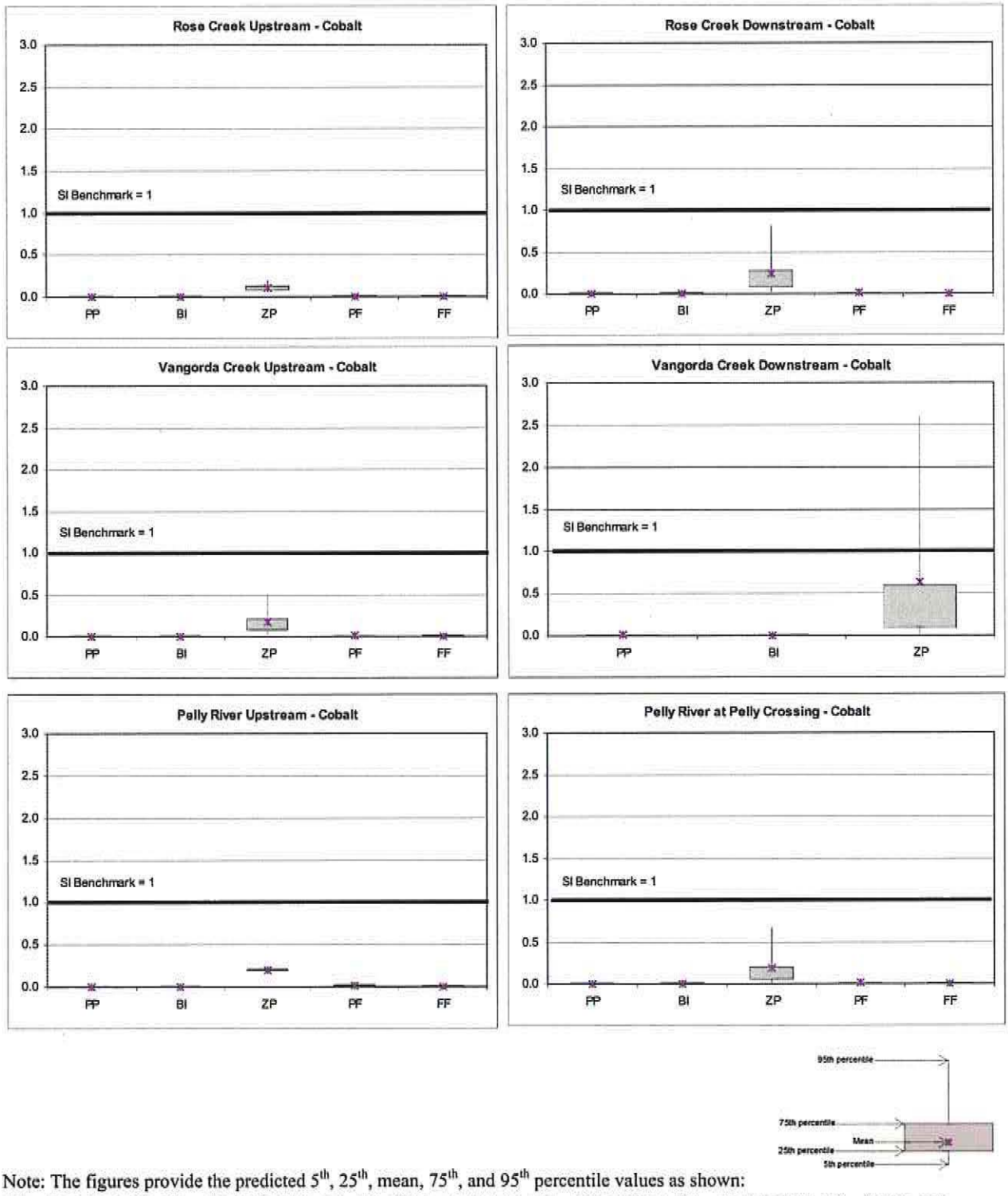
Figure 6.3 Aquatic Screening Index Values – Existing Conditions (Cont'd)





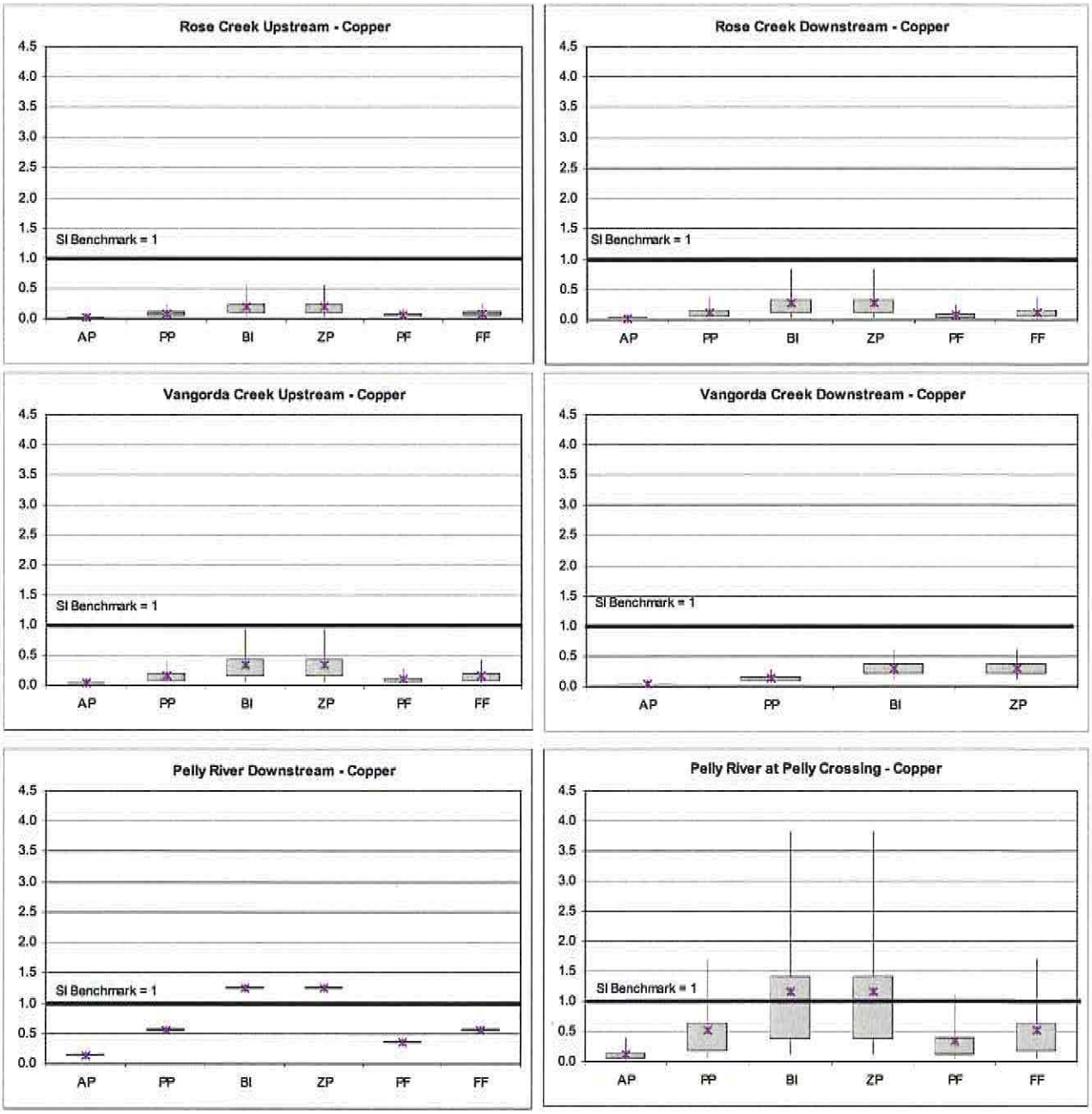
Note: The figures provide the predicted 5th, 25th, mean, 75th, and 95th percentile values as shown:
AP – aquatic plants, PP – phytoplankton, BI – benthic invertebrates, ZP – zooplankton, PF – predator fish, FF – forage fish

Figure 6.3 Aquatic Screening Index Values – Existing Conditions (Cont'd)



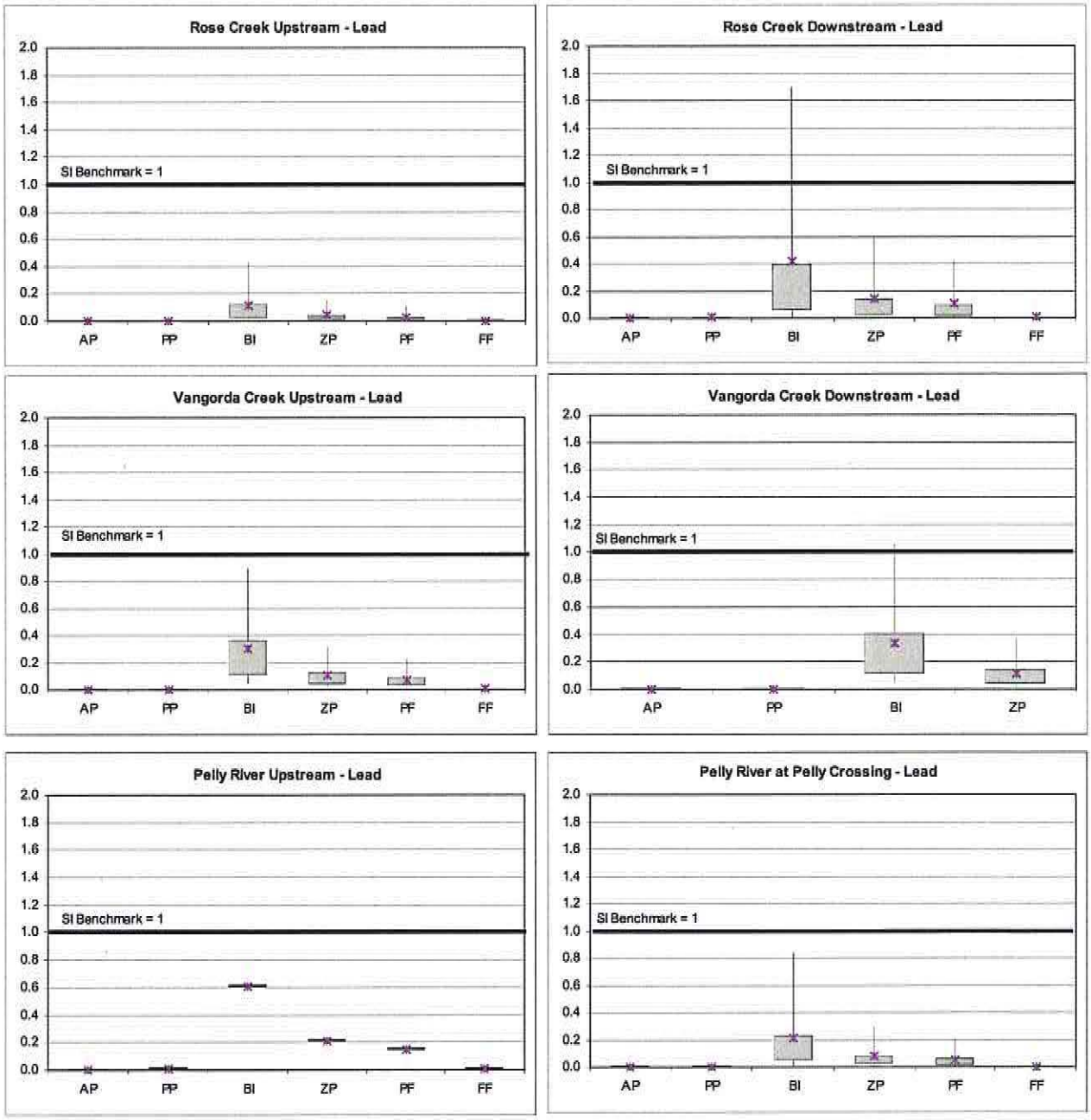
Note: The figures provide the predicted 5th, 25th, mean, 75th, and 95th percentile values as shown:
AP – aquatic plants, PP – phytoplankton, BI – benthic invertebrates, ZP – zooplankton, PF – predator fish, FF – forage fish

Figure 6.3 Aquatic Screening Index Values – Existing Conditions (Cont'd)



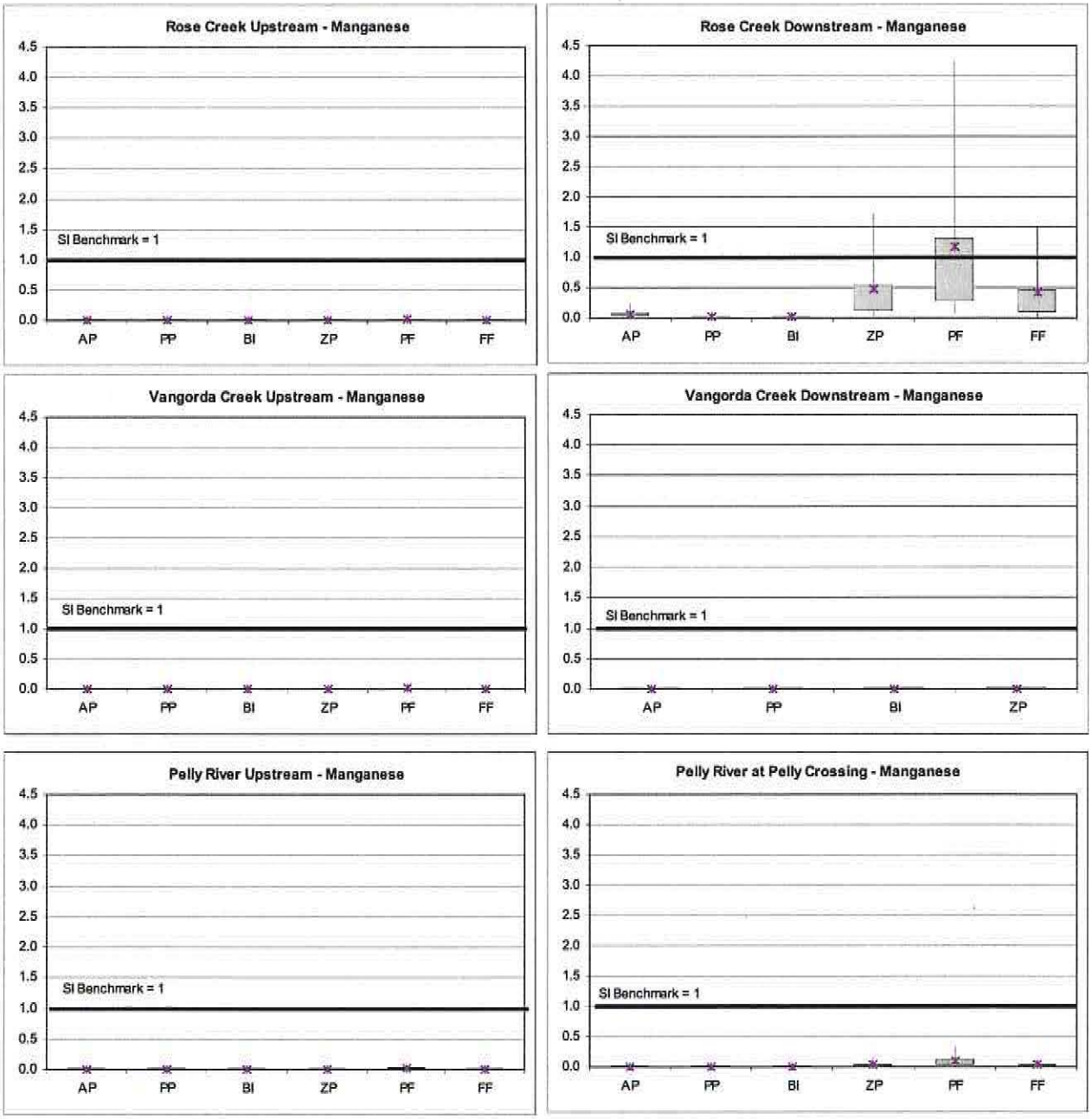
Note: The figures provide the predicted 5th, 25th, mean, 75th, and 95th percentile values as shown:
AP – aquatic plants, PP – phytoplankton, BI – benthic invertebrates, ZP – zooplankton, PF – predator fish, FF – forage fish

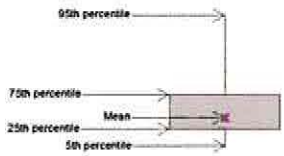
Figure 6.3 Aquatic Screening Index Values – Existing Conditions (Cont'd)



Note: The figures provide the predicted 5th, 25th, mean, 75th, and 95th percentile values as shown:
AP – aquatic plants, PP – phytoplankton, BI – benthic invertebrates, ZP – zooplankton, PF – predator fish, FF – forage fish

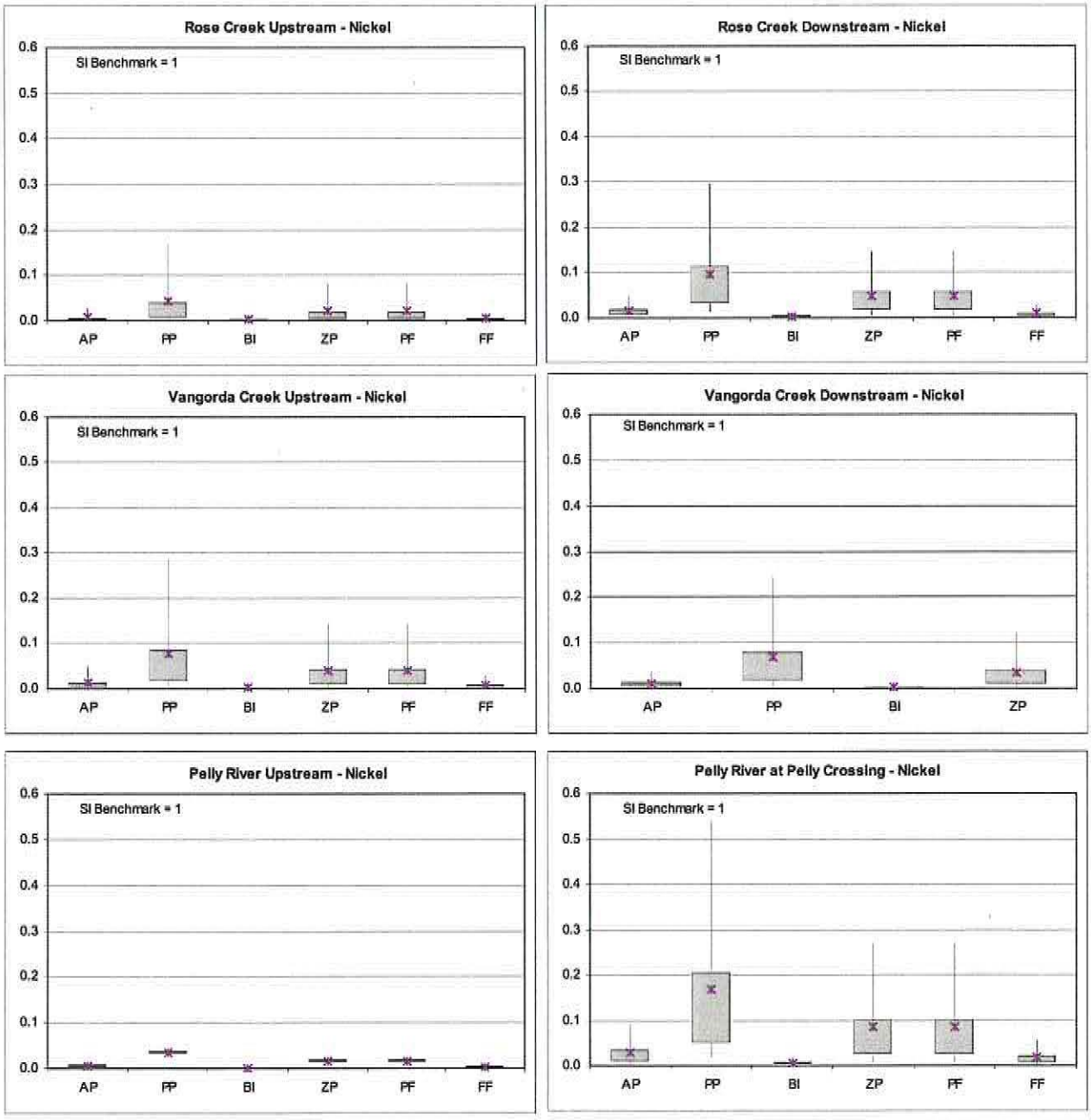
Figure 6.3 Aquatic Screening Index Values – Existing Conditions (Cont'd)





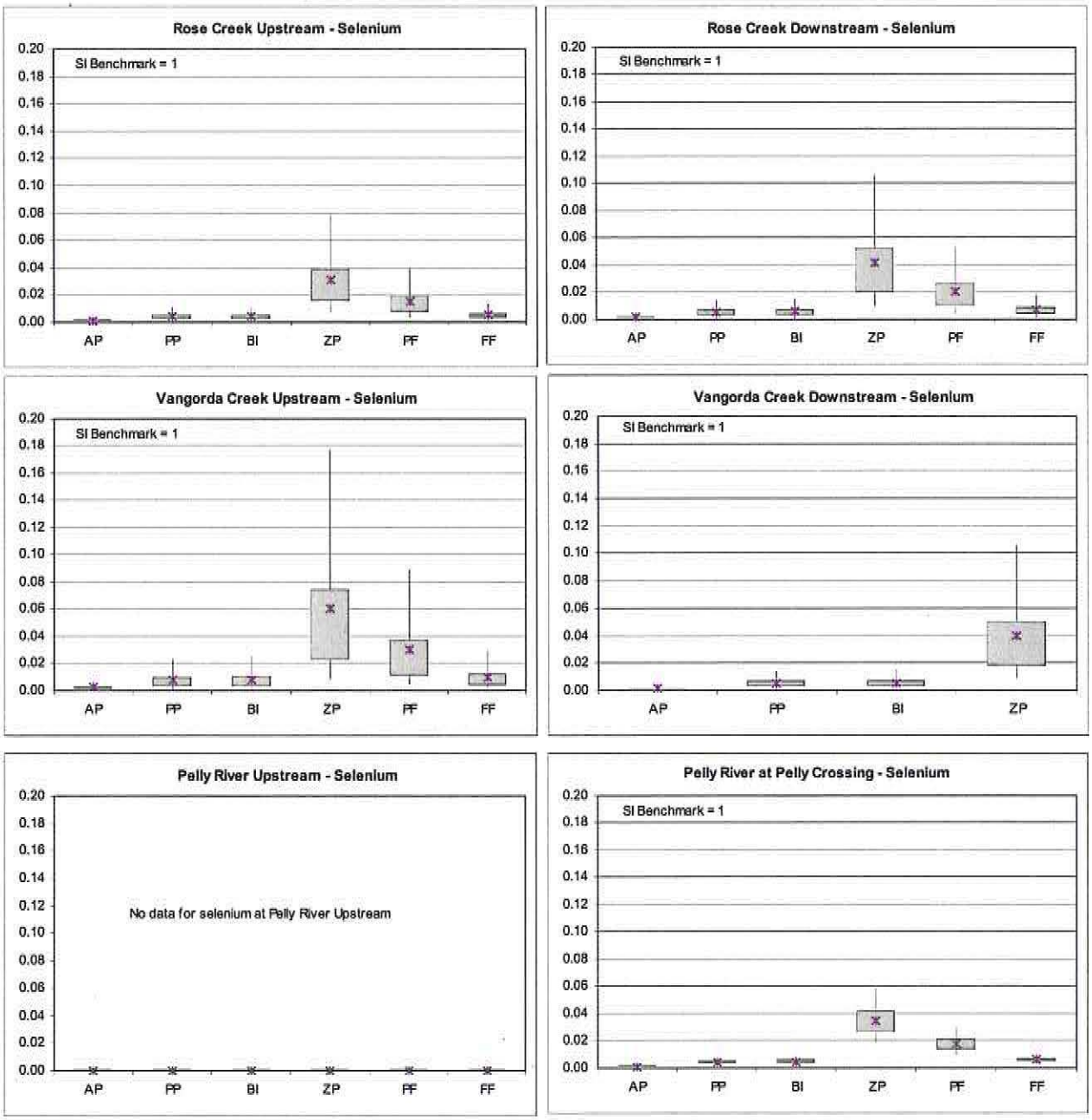
Note: The figures provide the predicted 5th, 25th, mean, 75th, and 95th percentile values as shown:
AP – aquatic plants, PP – phytoplankton, BI – benthic invertebrates, ZP – zooplankton, PF – predator fish, FF – forage fish

Figure 6.3 Aquatic Screening Index Values – Existing Conditions (Cont'd)



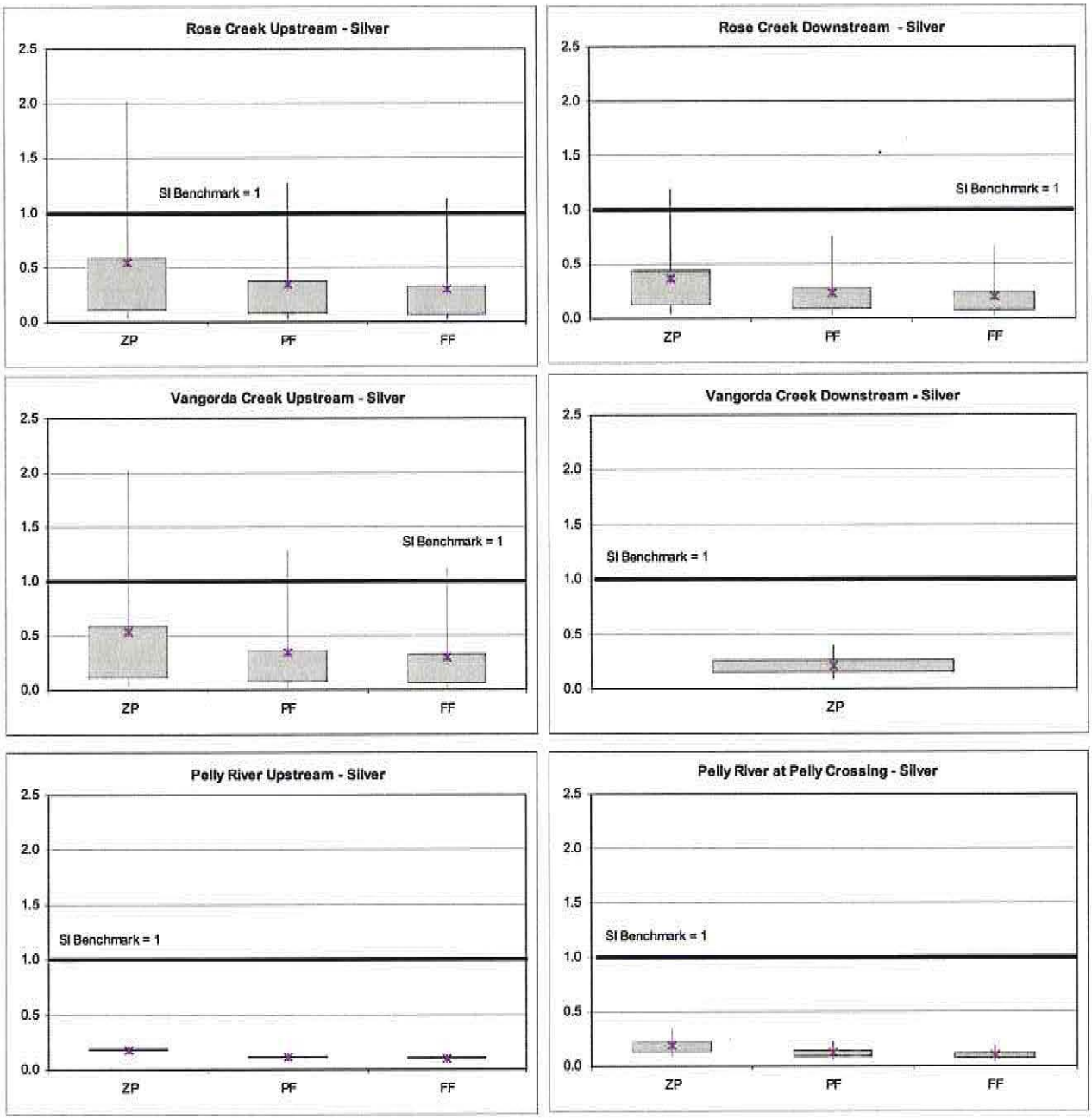
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Figure 6.3 Aquatic Screening Index Values – Existing Conditions (Cont'd)



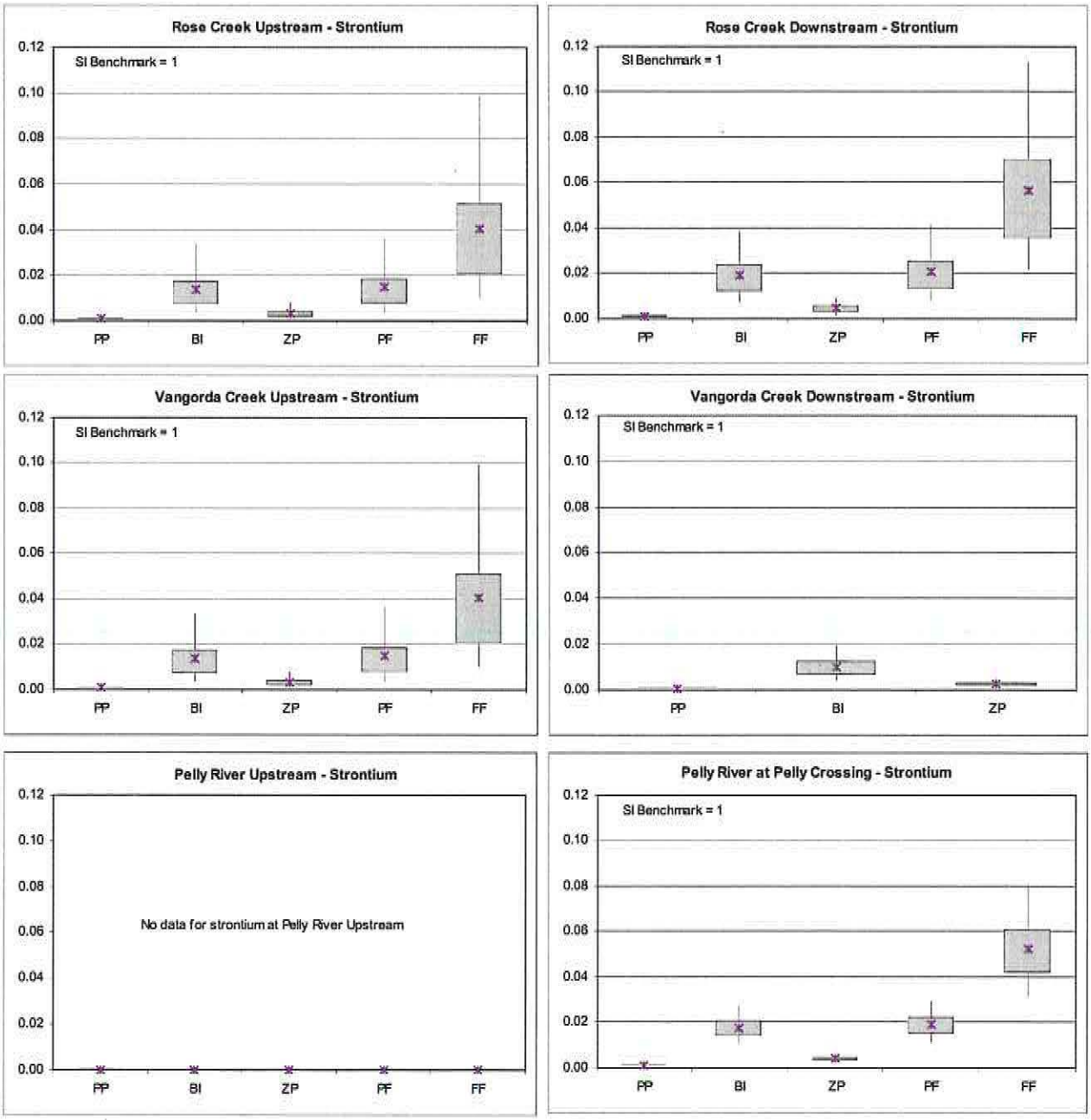
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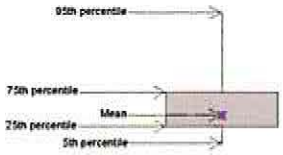
Figure 6.3 Aquatic Screening Index Values – Existing Conditions (Cont'd)



Note: The figures provide the predicted 5th, 25th, mean, 75th, and 95th percentile values as shown:
ZP – zooplankton, PF – predator fish, FF – forage fish

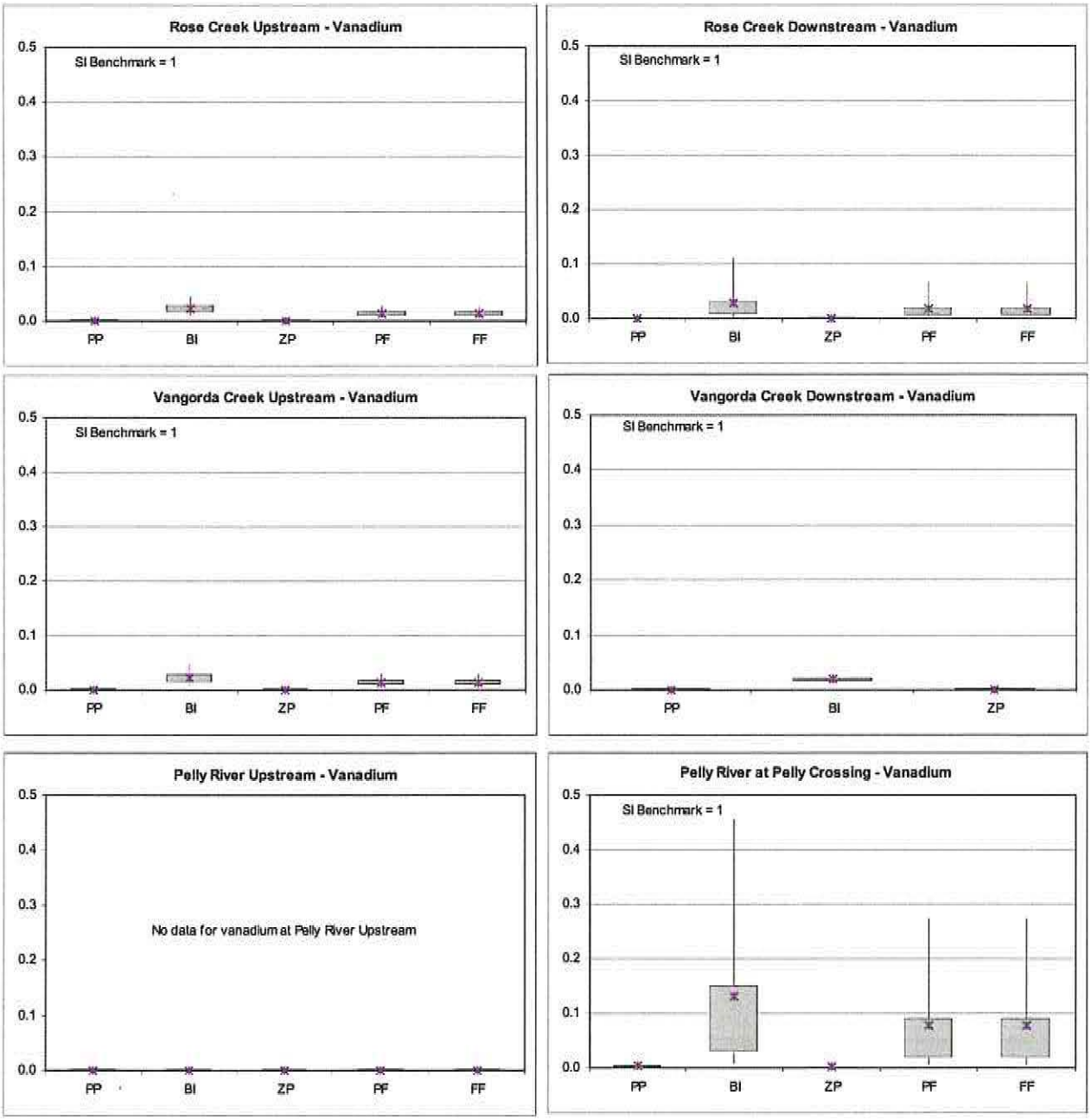
Figure 6.3 Aquatic Screening Index Values – Existing Conditions (Cont'd)





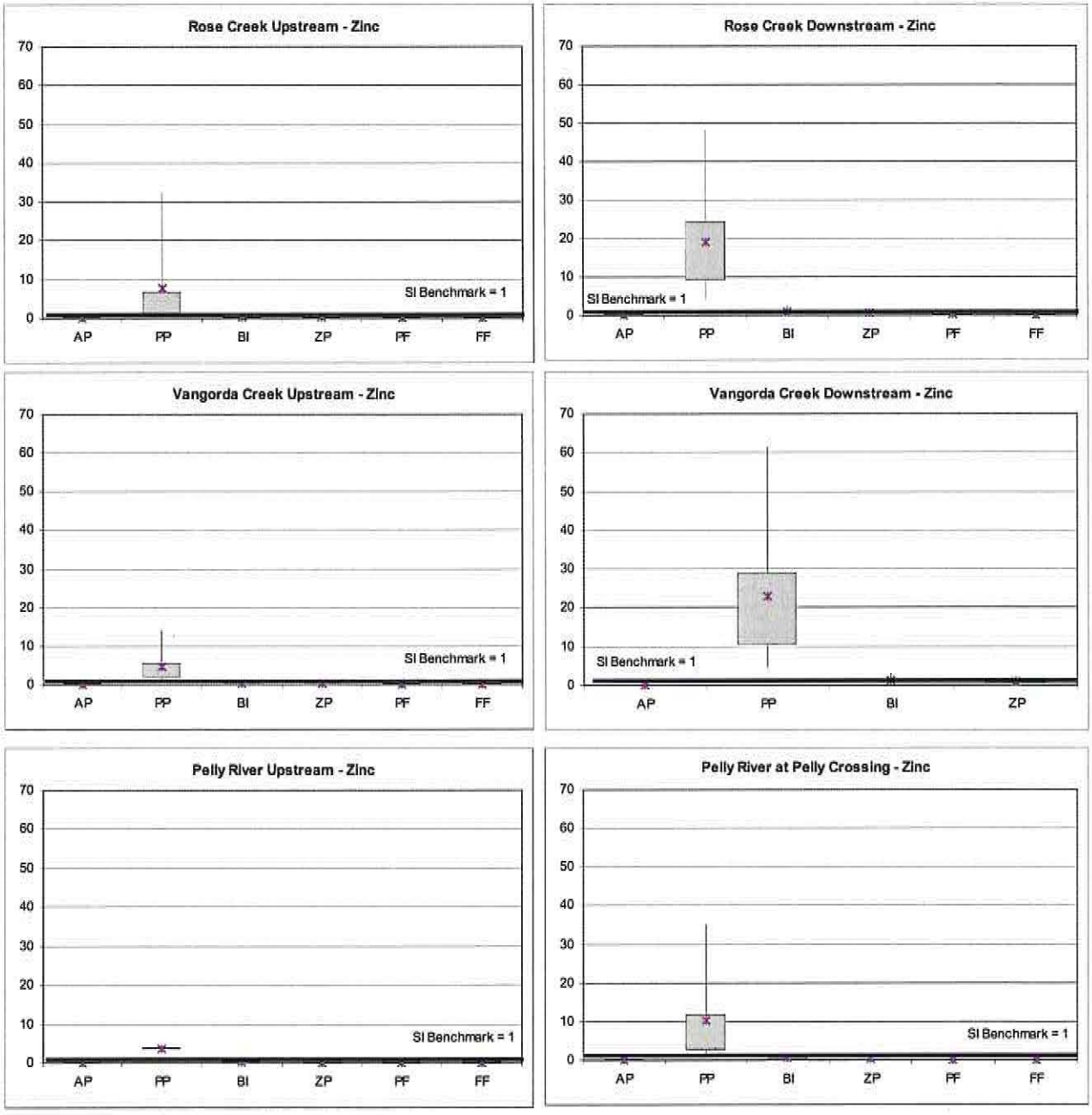
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Figure 6.3 Aquatic Screening Index Values – Existing Conditions (Cont'd)



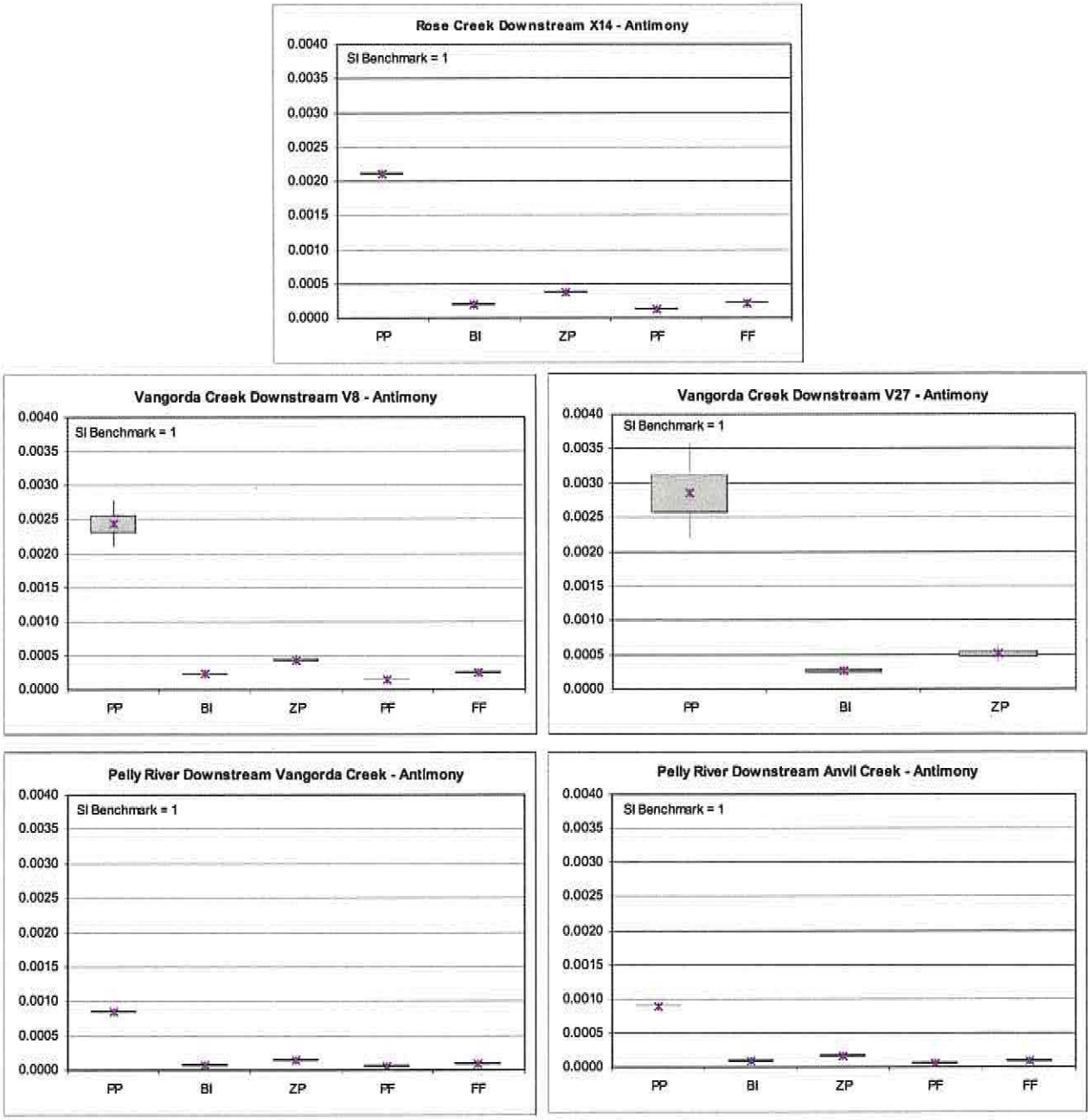
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Figure 6.3 Aquatic Screening Index Values – Existing Conditions (Cont'd)



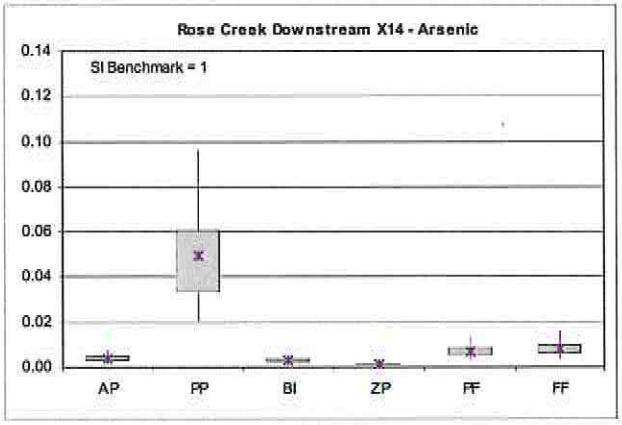
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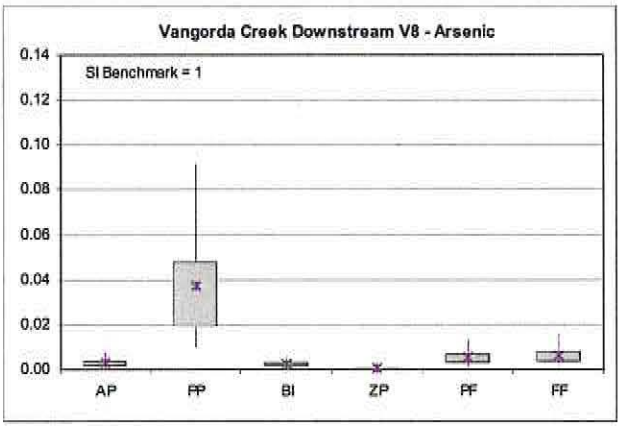
Figure 6.4 Aquatic Screening Index Values – Final Closure and Remediation Plan

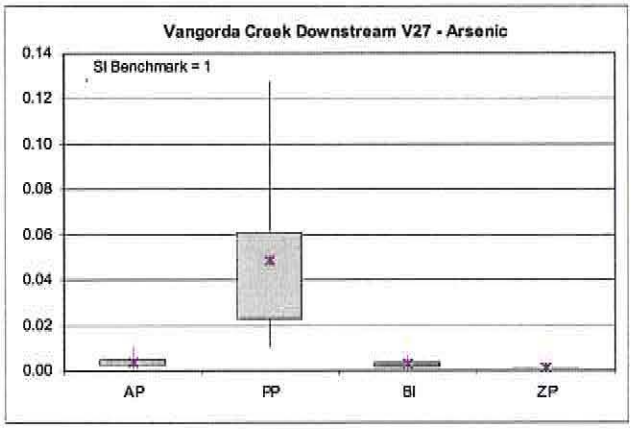


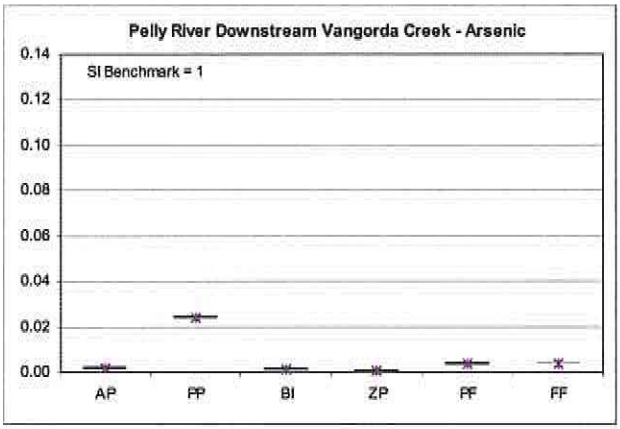
Note: The figures provide the predicted 5th, 25th, mean, 75th, and 95th percentile values as shown:
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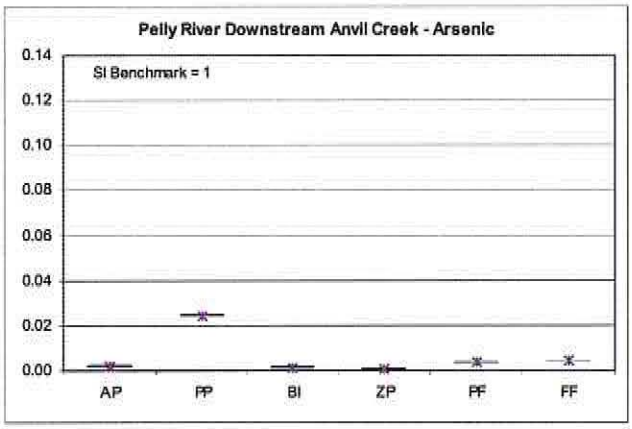
Figure 6.4 Aquatic Screening Index Values – Final Closure and Remediation Plan (Cont'd)

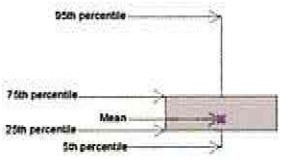






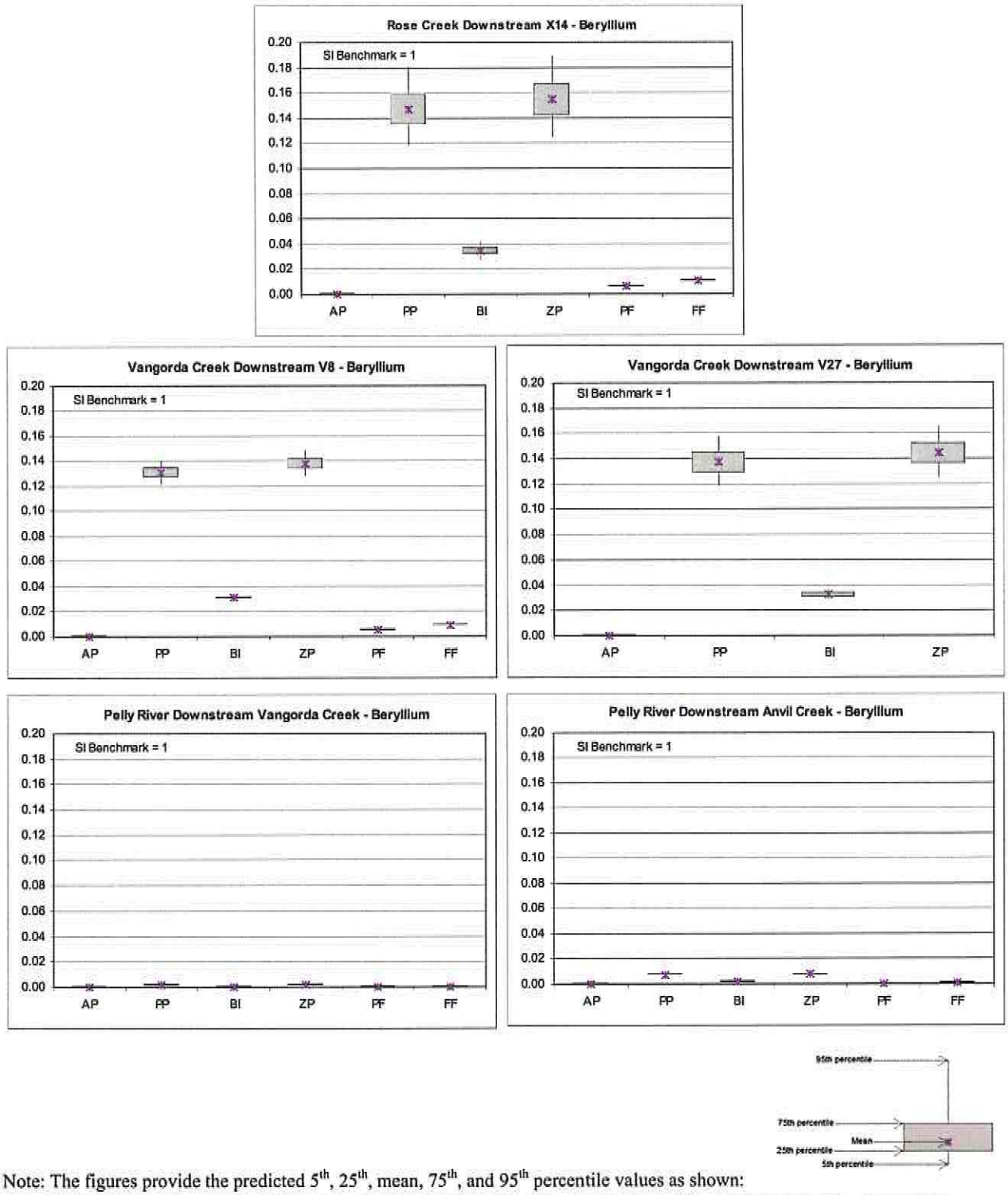






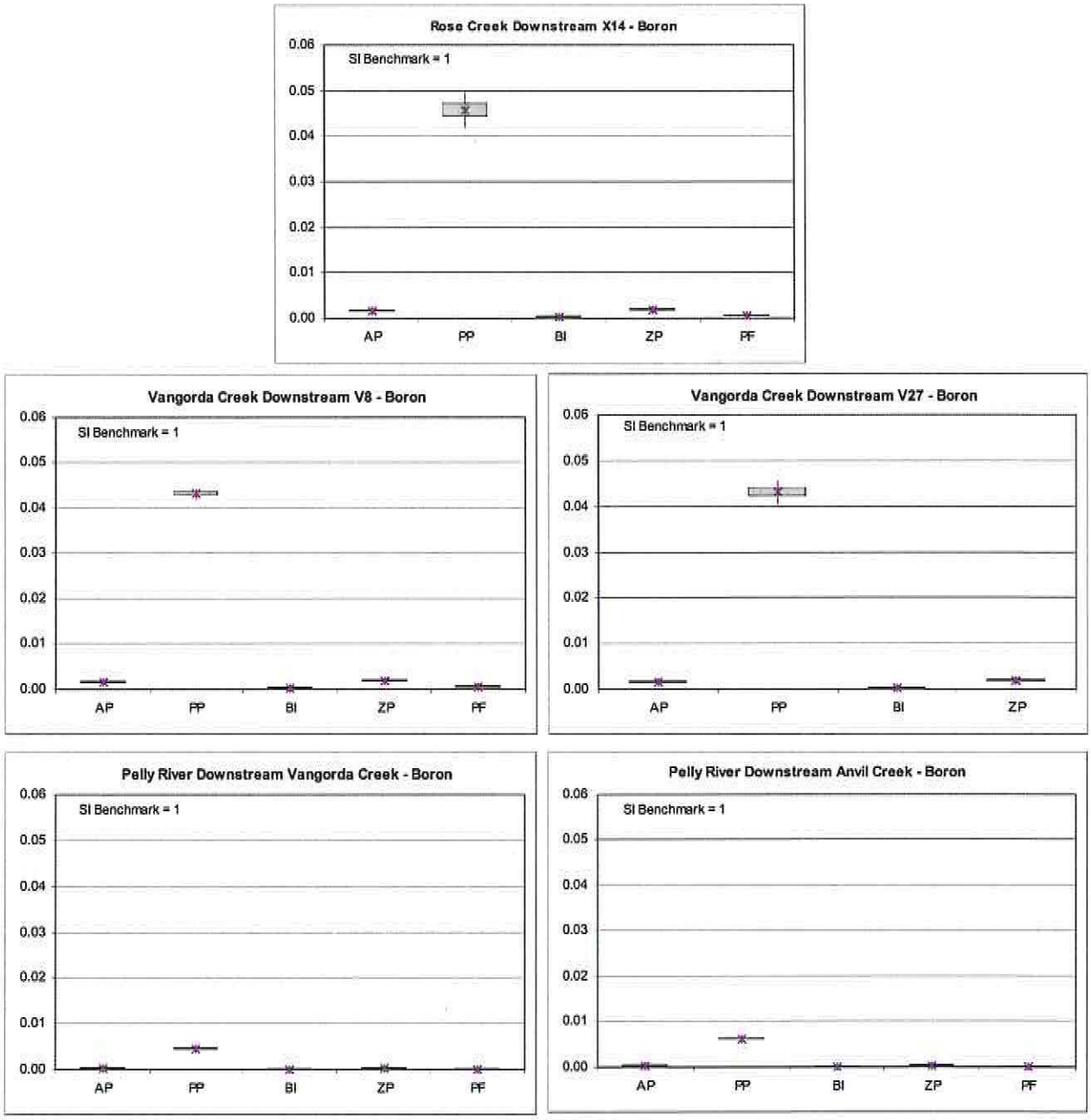
Note: The figures provide the predicted 5th, 25th, mean, 75th, and 95th percentile values as shown:
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Figure 6.4 Aquatic Screening Index Values – Final Closure and Remediation Plan (Cont'd)



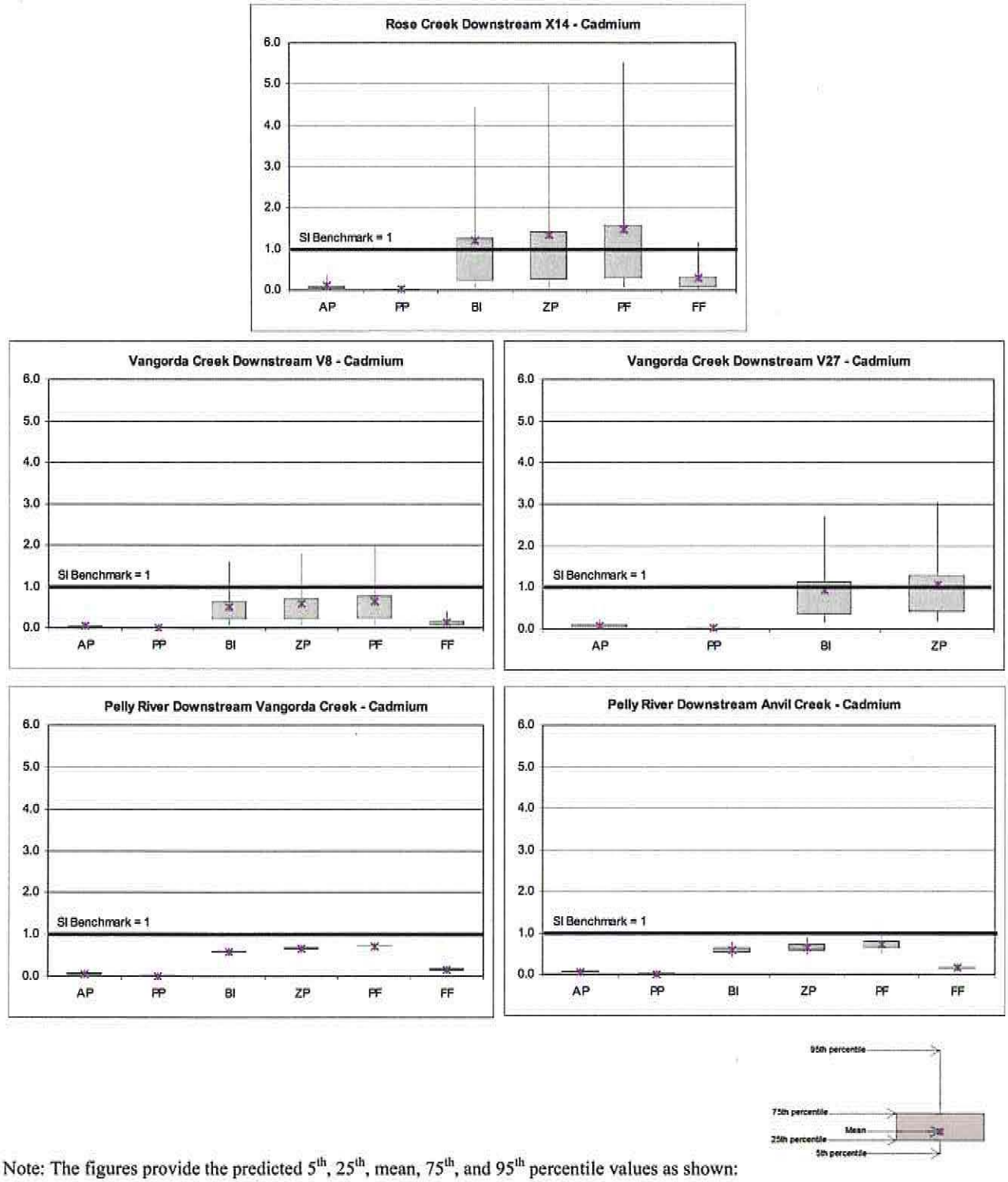
Note: The figures provide the predicted 5th, 25th, mean, 75th, and 95th percentile values as shown:
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Figure 6.4 Aquatic Screening Index Values – Final Closure and Remediation Plan (Cont'd)



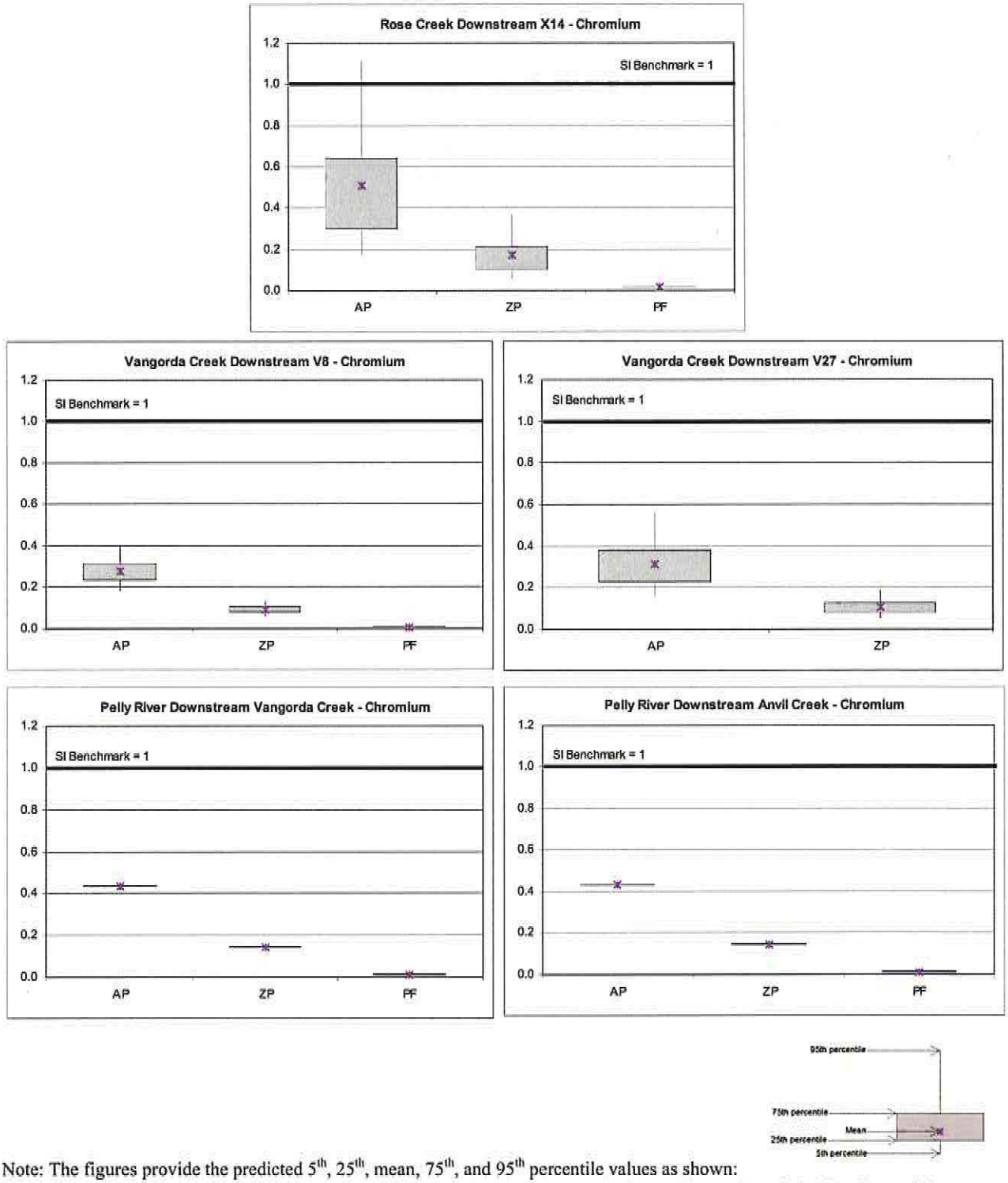
Note: The figures provide the predicted 5th, 25th, mean, 75th, and 95th percentile values as shown:
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Figure 6.4 Aquatic Screening Index Values – Final Closure and Remediation Plan (Cont'd)



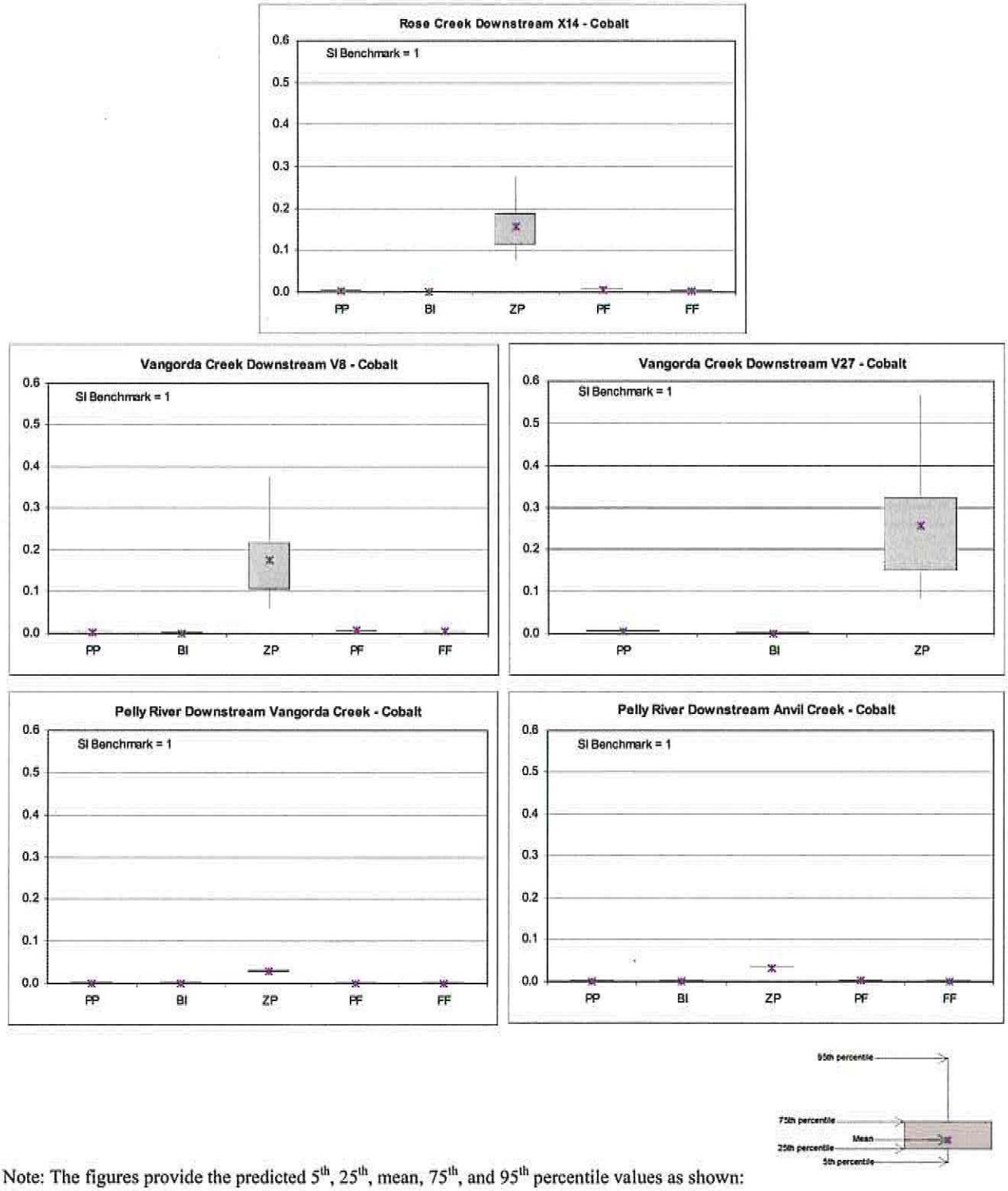
Note: The figures provide the predicted 5th, 25th, mean, 75th, and 95th percentile values as shown:
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Figure 6.4 Aquatic Screening Index Values – Final Closure and Remediation Plan (Cont'd)



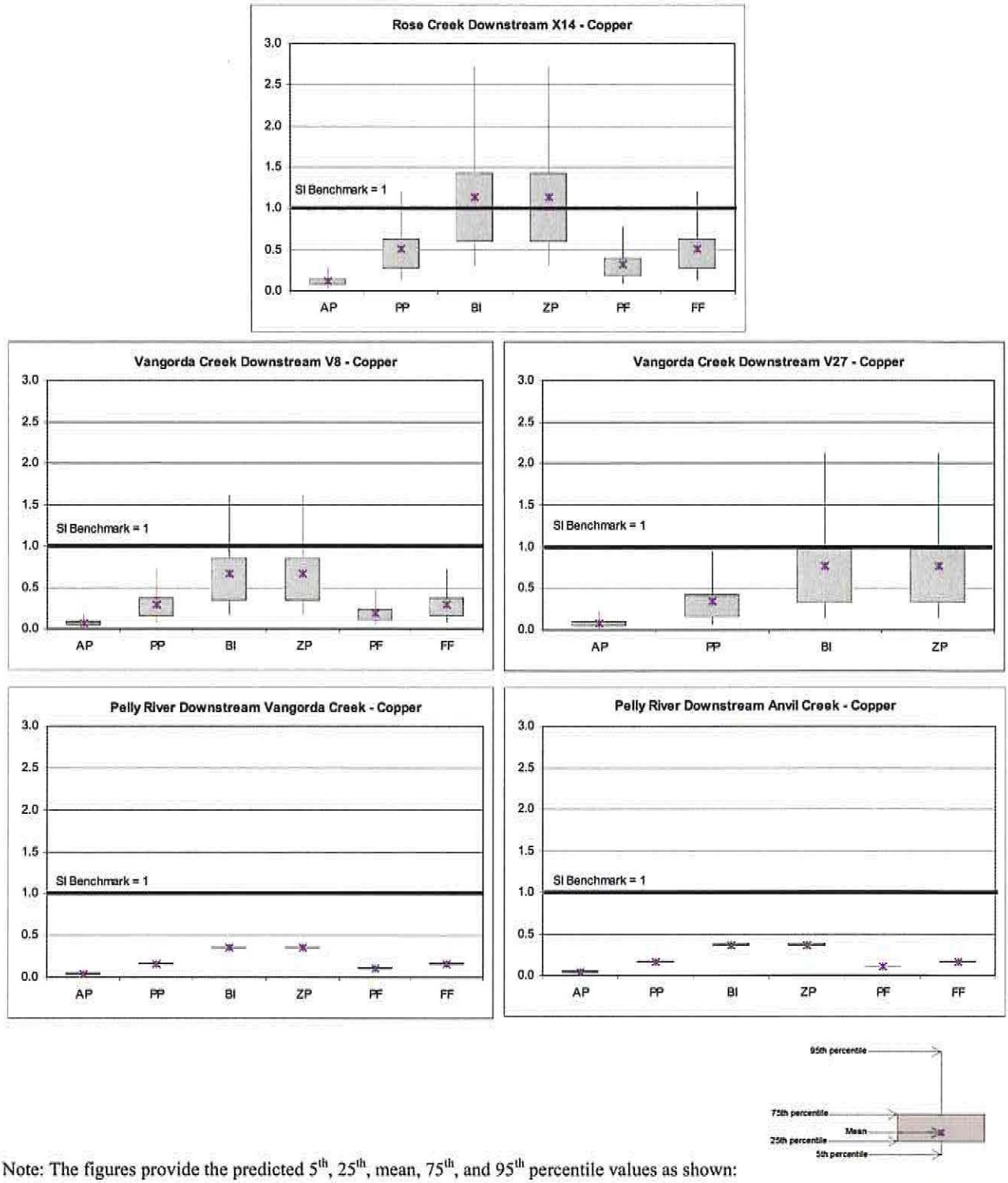
Note: The figures provide the predicted 5th, 25th, mean, 75th, and 95th percentile values as shown:
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Figure 6.4 Aquatic Screening Index Values – Final Closure and Remediation Plan (Cont'd)



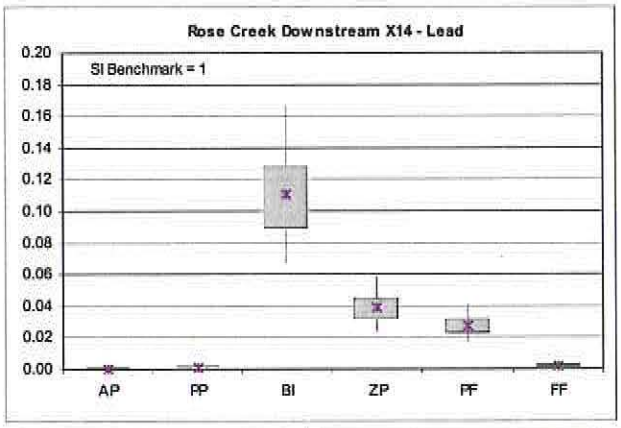
Note: The figures provide the predicted 5th, 25th, mean, 75th, and 95th percentile values as shown:
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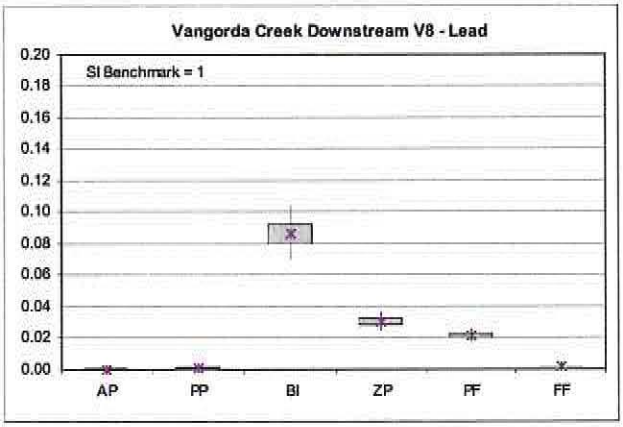
Figure 6.4 Aquatic Screening Index Values – Final Closure and Remediation Plan (Cont'd)

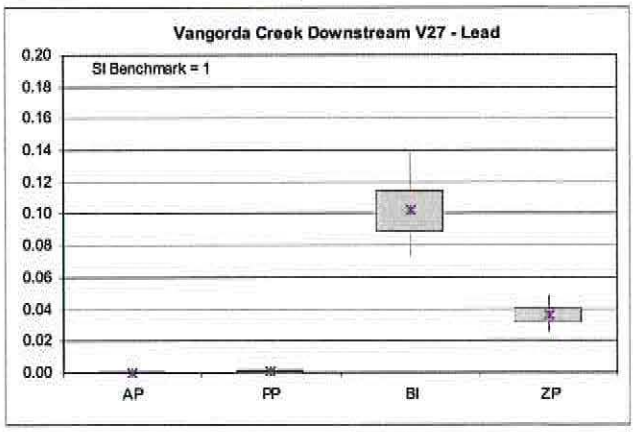


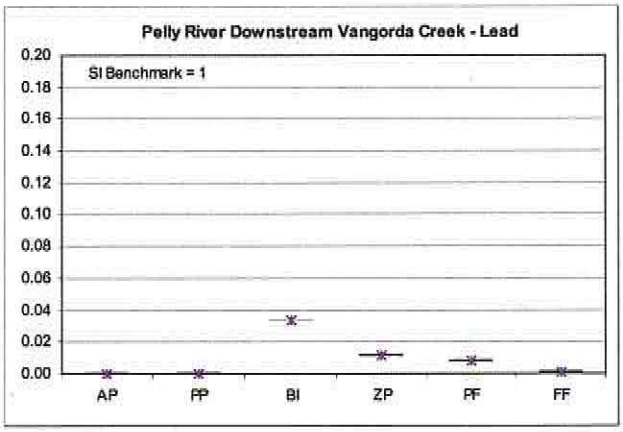
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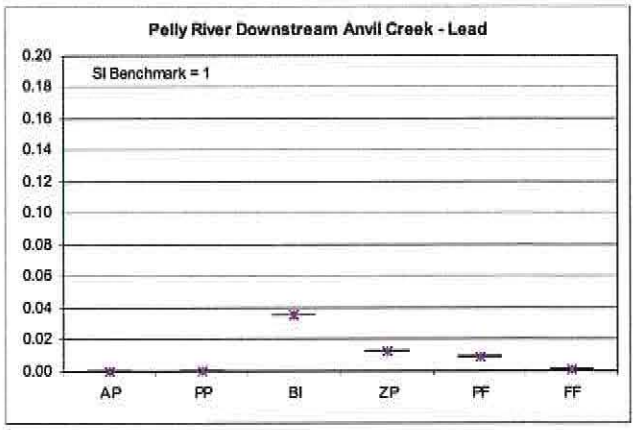
Figure 6.4 Aquatic Screening Index Values – Final Closure and Remediation Plan (Cont'd)

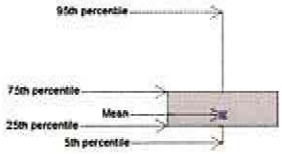






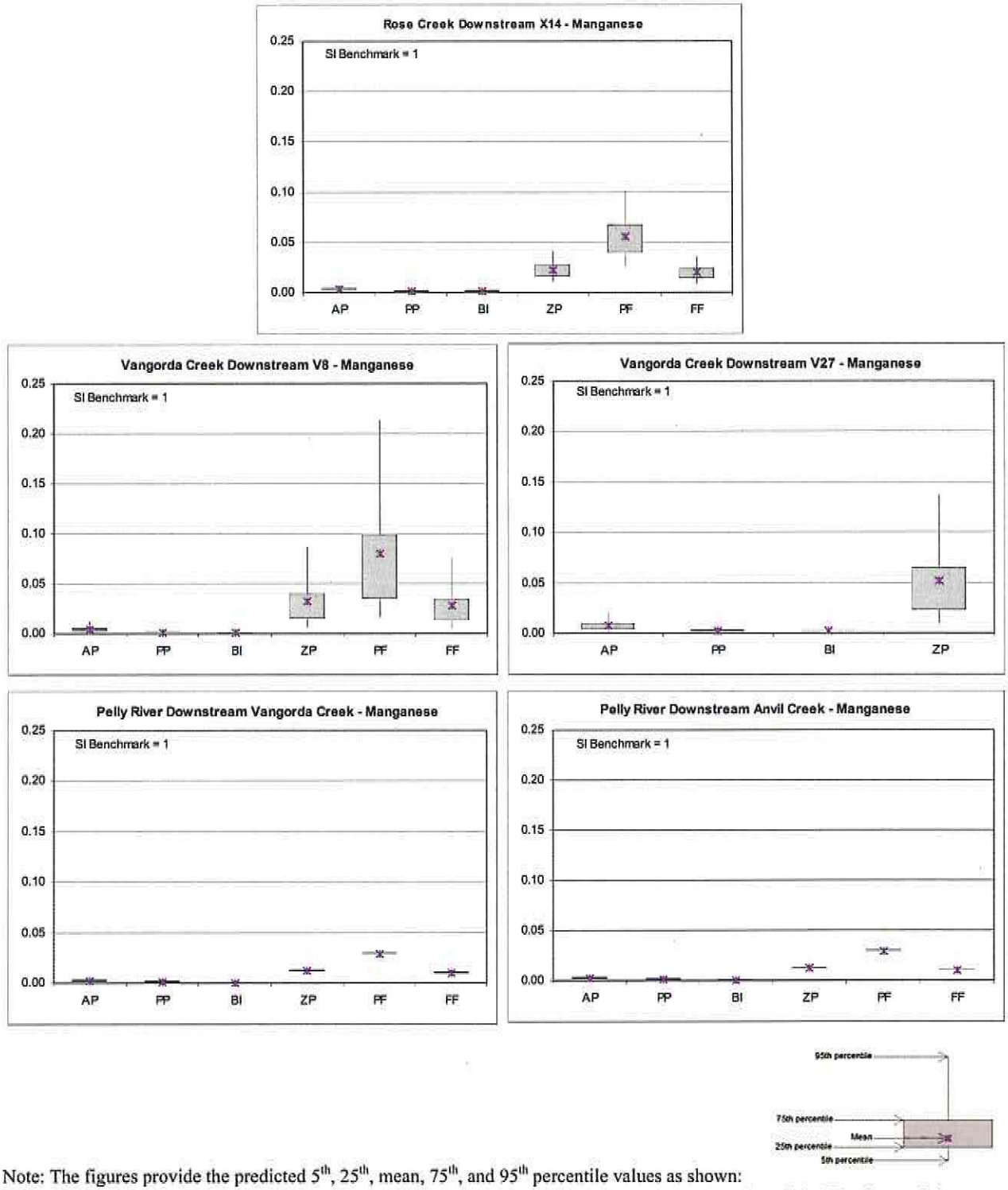






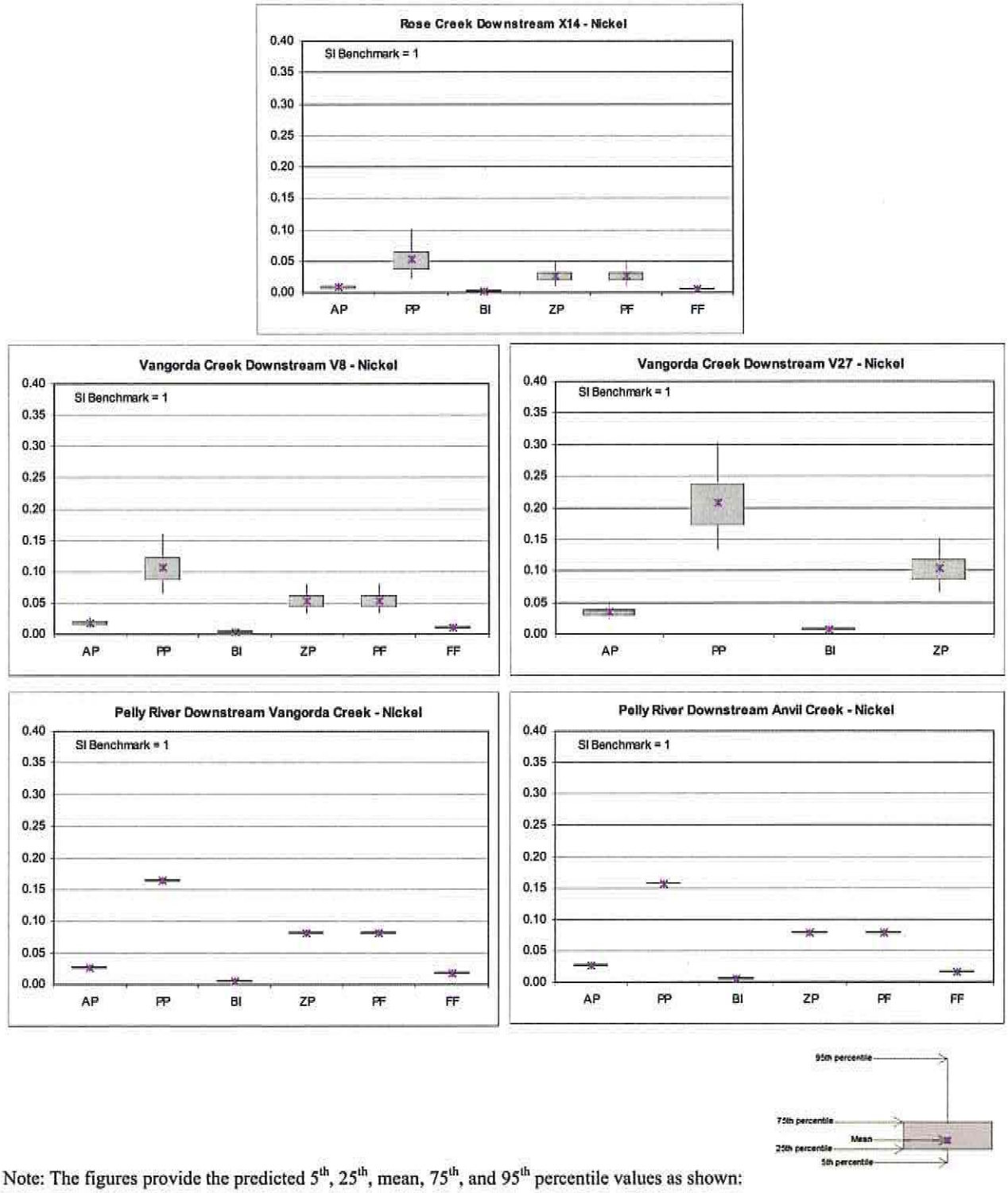
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Figure 6.4 Aquatic Screening Index Values – Final Closure and Remediation Plan (Cont'd)



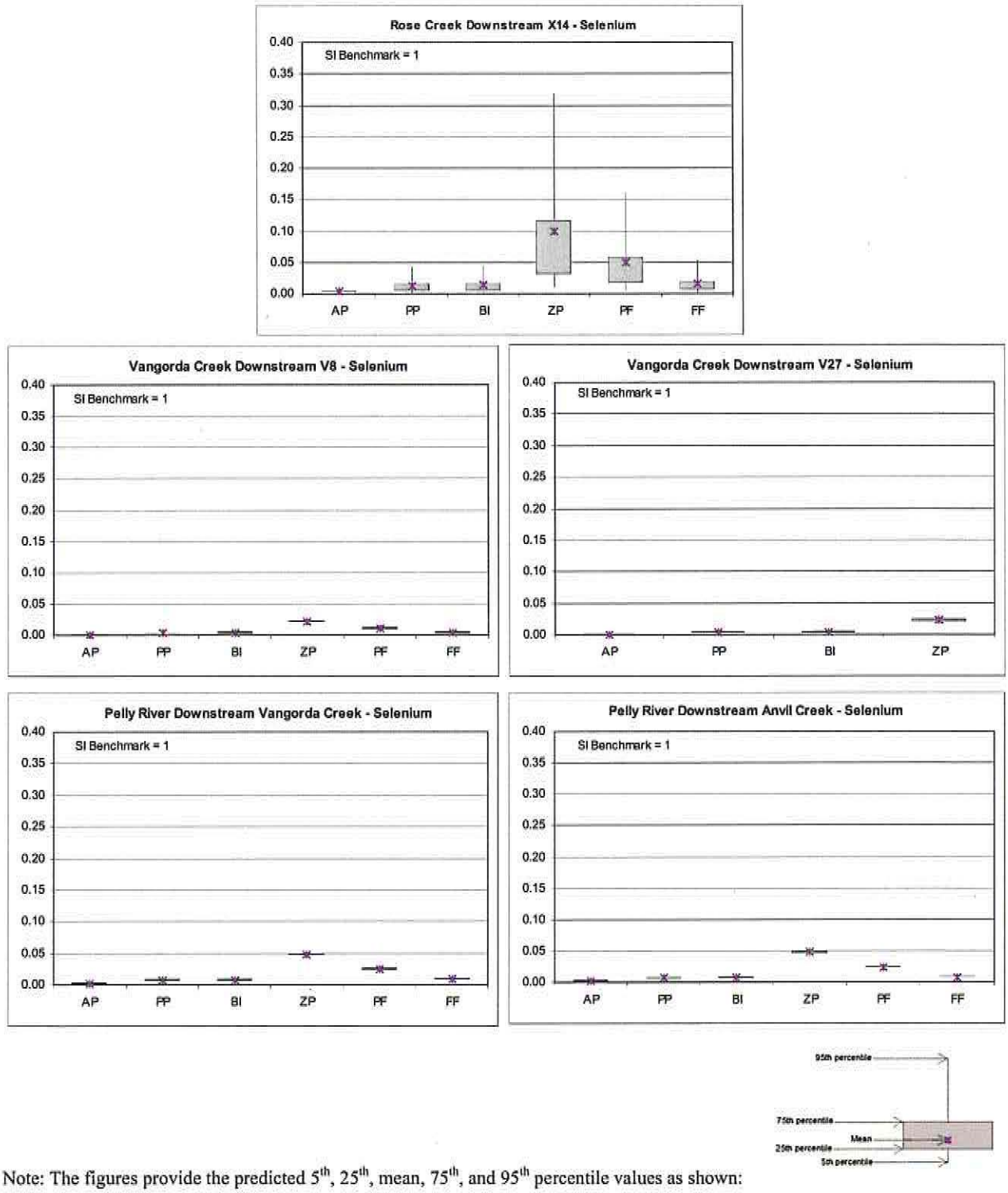
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Figure 6.4 Aquatic Screening Index Values – Final Closure and Remediation Plan (Cont'd)



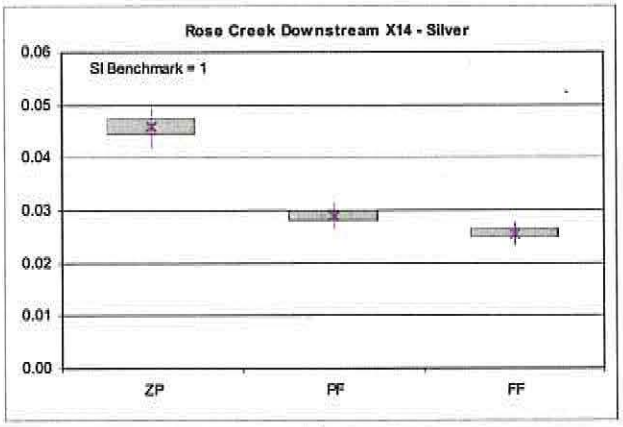
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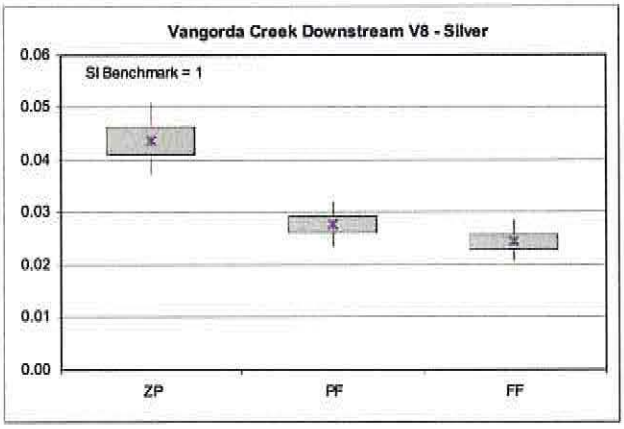
Figure 6.4 Aquatic Screening Index Values – Final Closure and Remediation Plan (Cont'd)

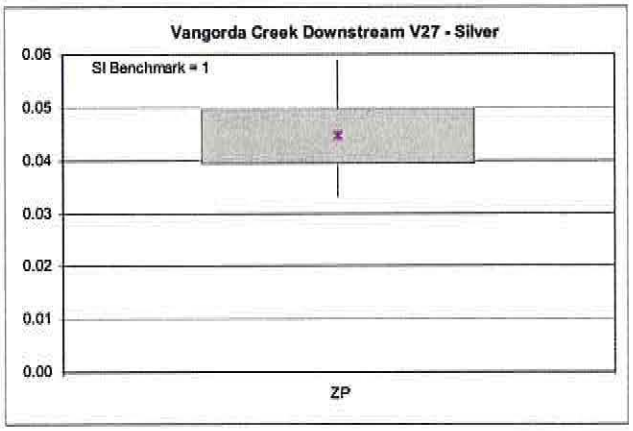


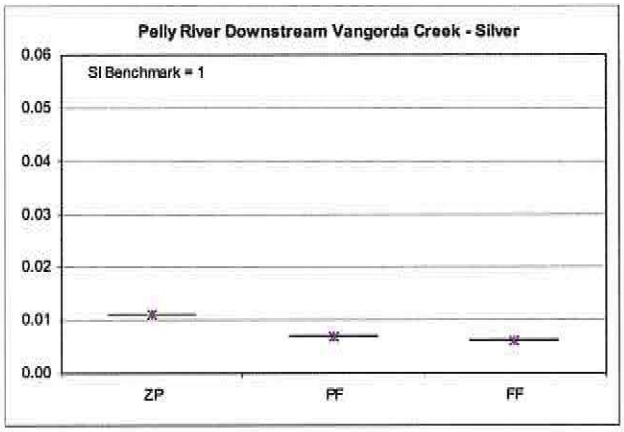
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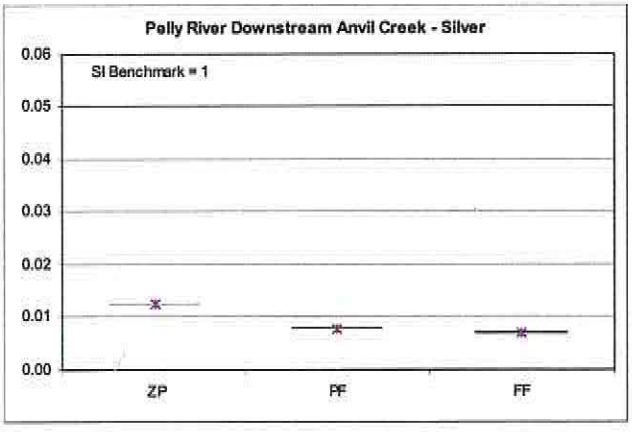
Figure 6.4 Aquatic Screening Index Values – Final Closure and Remediation Plan (Cont'd)

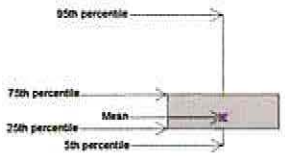






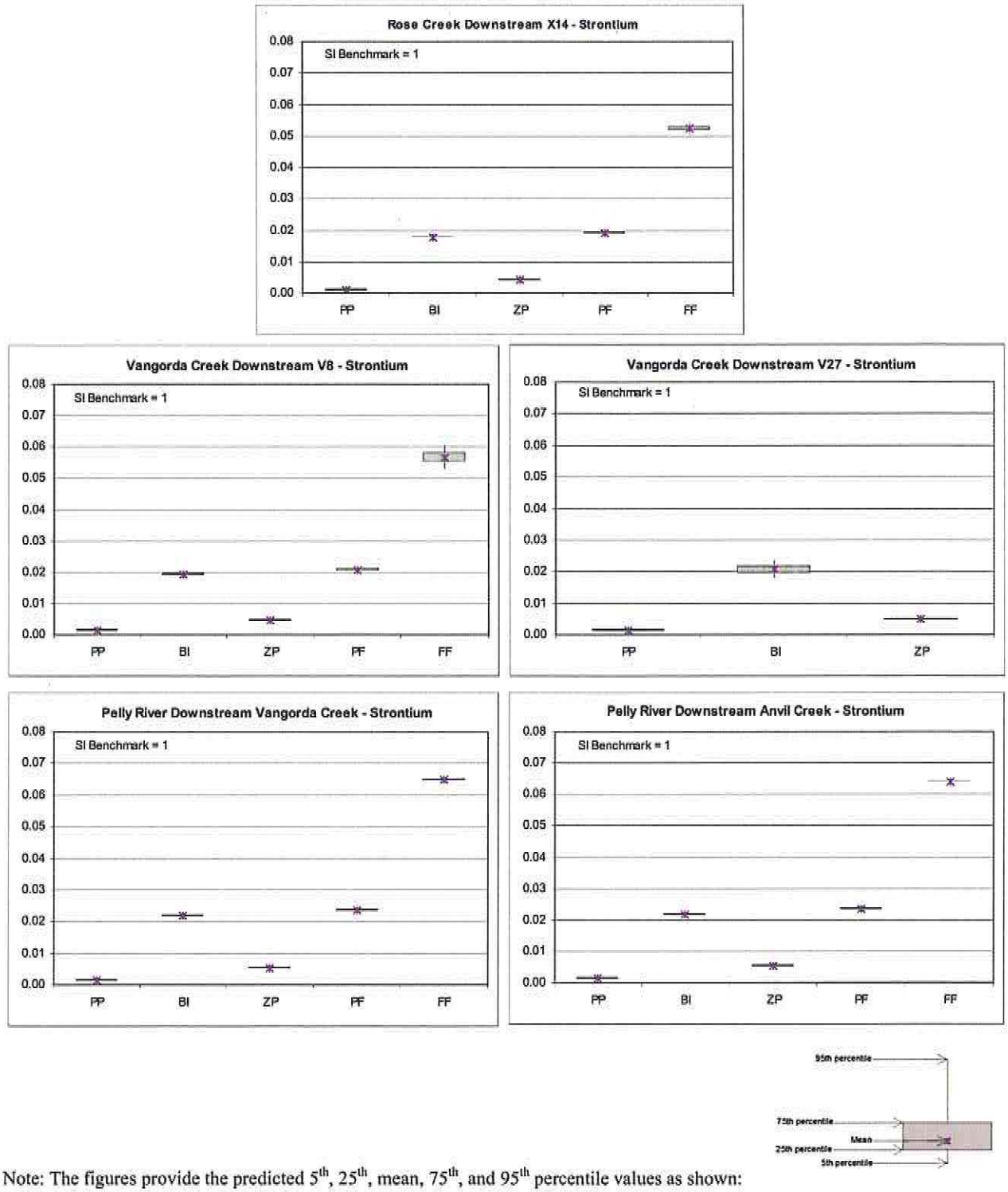






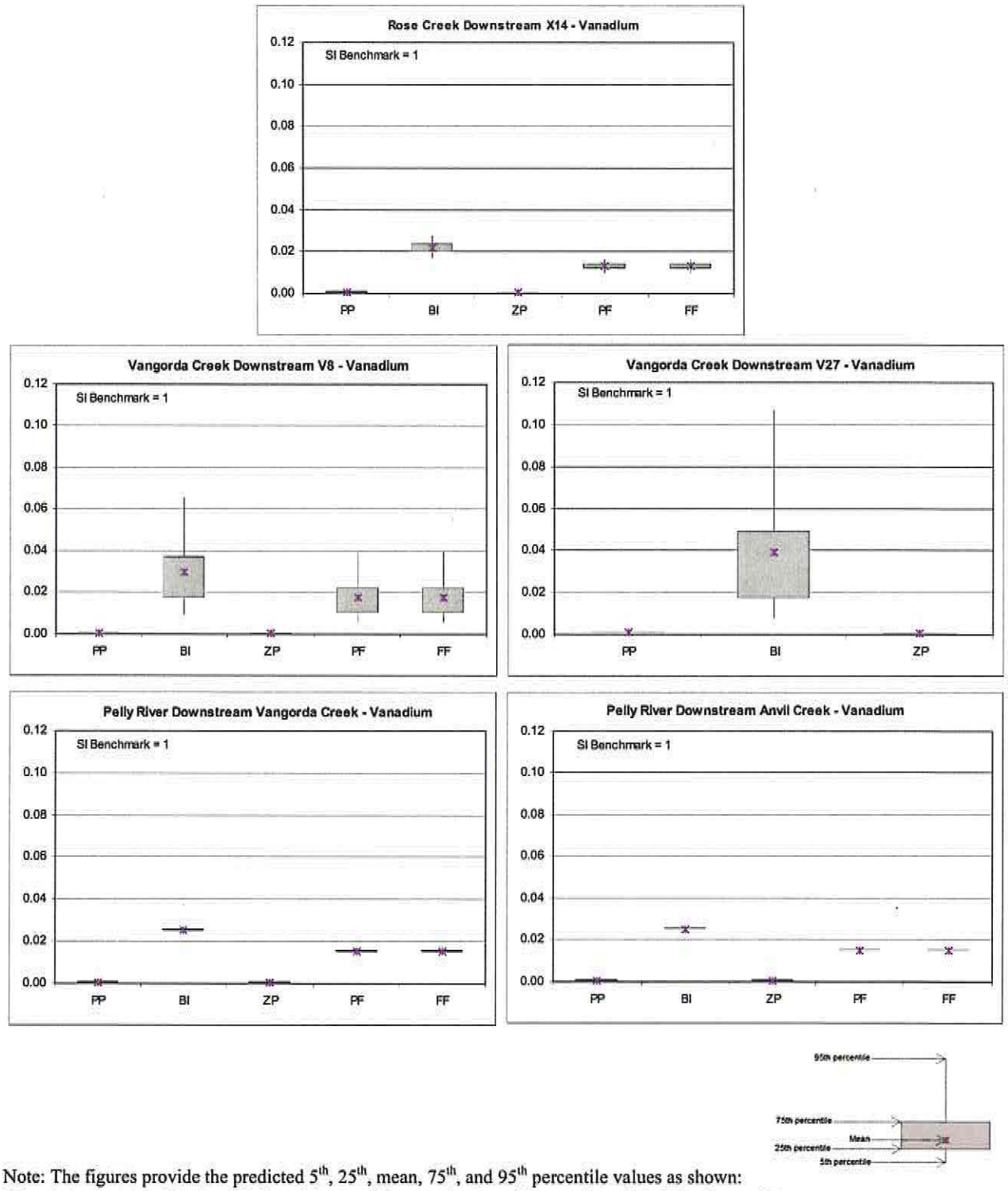
Note: The figures provide the predicted 5th, 25th, mean, 75th, and 95th percentile values as shown:
ZP – zooplankton, PF – predator fish, FF – forage fish

Figure 6.4 Aquatic Screening Index Values – Final Closure and Remediation Plan (Cont'd)



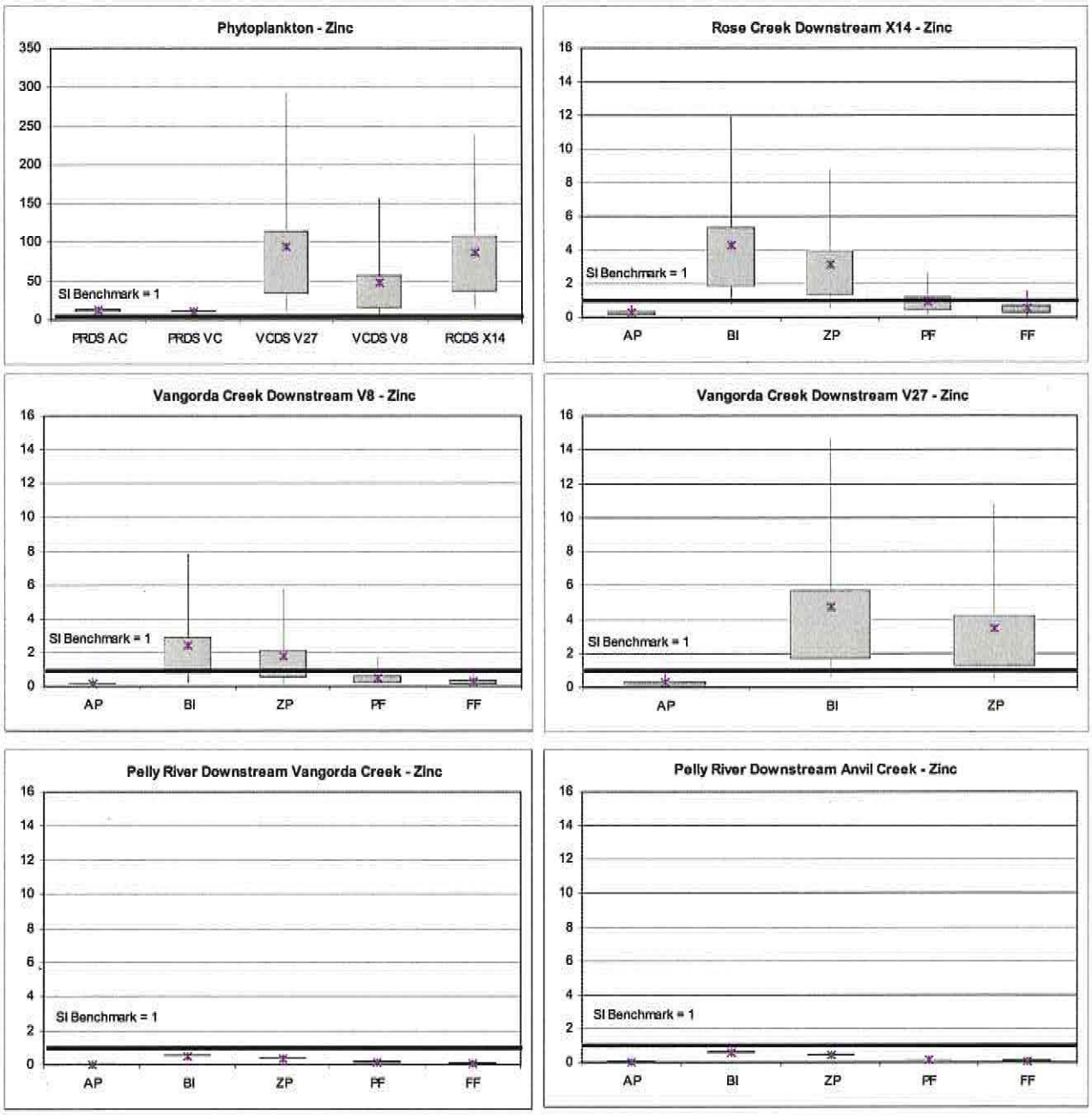
Note: The figures provide the predicted 5th, 25th, mean, 75th, and 95th percentile values as shown:
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Figure 6.4 Aquatic Screening Index Values – Final Closure and Remediation Plan (Cont'd)



Note: The figures provide the predicted 5th, 25th, mean, 75th, and 95th percentile values as shown:
PP – phytoplankton, BI – benthic invertebrates, ZP – zooplankton, PF – predator fish, FF – forage fish

Figure 6.4 Aquatic Screening Index Values – Final Closure and Remediation Plan (Cont'd)



Note: The figures provide the predicted 5th, 25th, mean, 75th, and 95th percentile values as shown:
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6.3 TERRESTRIAL ECOLOGY

This section presents the results of the risk characterization for terrestrial receptors assessed in the Faro Mine Complex area. In the assessment of risks to the terrestrial receptors, both aquatic and terrestrial exposure pathways for the COPC were taken into account. Hence, for all terrestrial receptors, the total intakes account for all major pathways.

Potential toxic effects can be measured at different levels of biological and ecological organization. Screening index values provide an integrated description of the potential hazard, the exposure (or dose)-response relationship, and the exposure evaluation (U.S. EPA 1992, AIHC 1992). In this study, adverse effects from exposure to COPC were characterized by the value of a simple screening index. This index was calculated by dividing the predicted exposure by the toxicity reference value for each ecological receptor, as shown in equation (6- 1).

$$Screening\ Index = \frac{Dose}{Toxicity\ Benchmark} \qquad (6\text{-}1)$$

The screening index values reported in this section are not estimates of the probability of ecological effect. Rather, the index values are positively correlated with the potential of an effect, i.e. higher index values imply a greater potential of an effect. Different magnitudes of the screening index have been used in other studies to screen for potential ecological effects. A screening index value of 1.0 has been used in some instances (e.g. Suter 1991). In this study, screening index benchmark values of less than 1 are used to reflect the home range of the species as presented in Table 3.2. That is, index values were chosen based on the time that each species is assumed to spend at the site and the components of the species diet accounted for in the assessment. The SI benchmark values used in this assessment are presented on each of the figures discussed below. The potential ecological effects of COPC were evaluated for the mean and 95th percentile results from the probabilistic risk assessment.

6.3.1 Existing Conditions

The screening index values for the terrestrial animals in the study area under the existing conditions are presented in Figure 6.5. Appendix H provides the numerical SI values. As seen from Figure 6.5, the predicted intakes of antimony, arsenic, beryllium, boron, chromium, cobalt, copper, manganese, nickel, silver, strontium, tin, vanadium and zinc for the terrestrial receptors do not exceed their corresponding SI benchmark. All mean SI values are below the applicable SI benchmark. The 95th percentile SI value for cadmium for wolf is above the SI benchmark of 0.25. For lead, the 95th percentile SI value for grouse at Faro-S is above the SI benchmark for

grouse. The 95th percentile SI selenium values for marmot (Background) and scaup (Vangorda Creek Upstream) are above the applicable SI benchmarks.

The intake of cadmium by the wolf is due to the ingestion of caribou and moose (whole body concentrations). The intake of lead by the grouse is due to lead in the terrestrial environment. For scaup, the most significant pathway of exposure to selenium in the Vangorda Creek Upstream location is the ingestion of benthic invertebrates (concentrations estimated using transfer factors from water). The marmot receives most of the intake of selenium at the background location from the ingestion of forage.

Since SI values only exceed their benchmark values for the upper bound concentrations (95th percentile) which may not occur, it is unlikely that terrestrial receptors are experiencing adverse effects under current conditions.

6.3.2 Final Closure and Remediation Plan

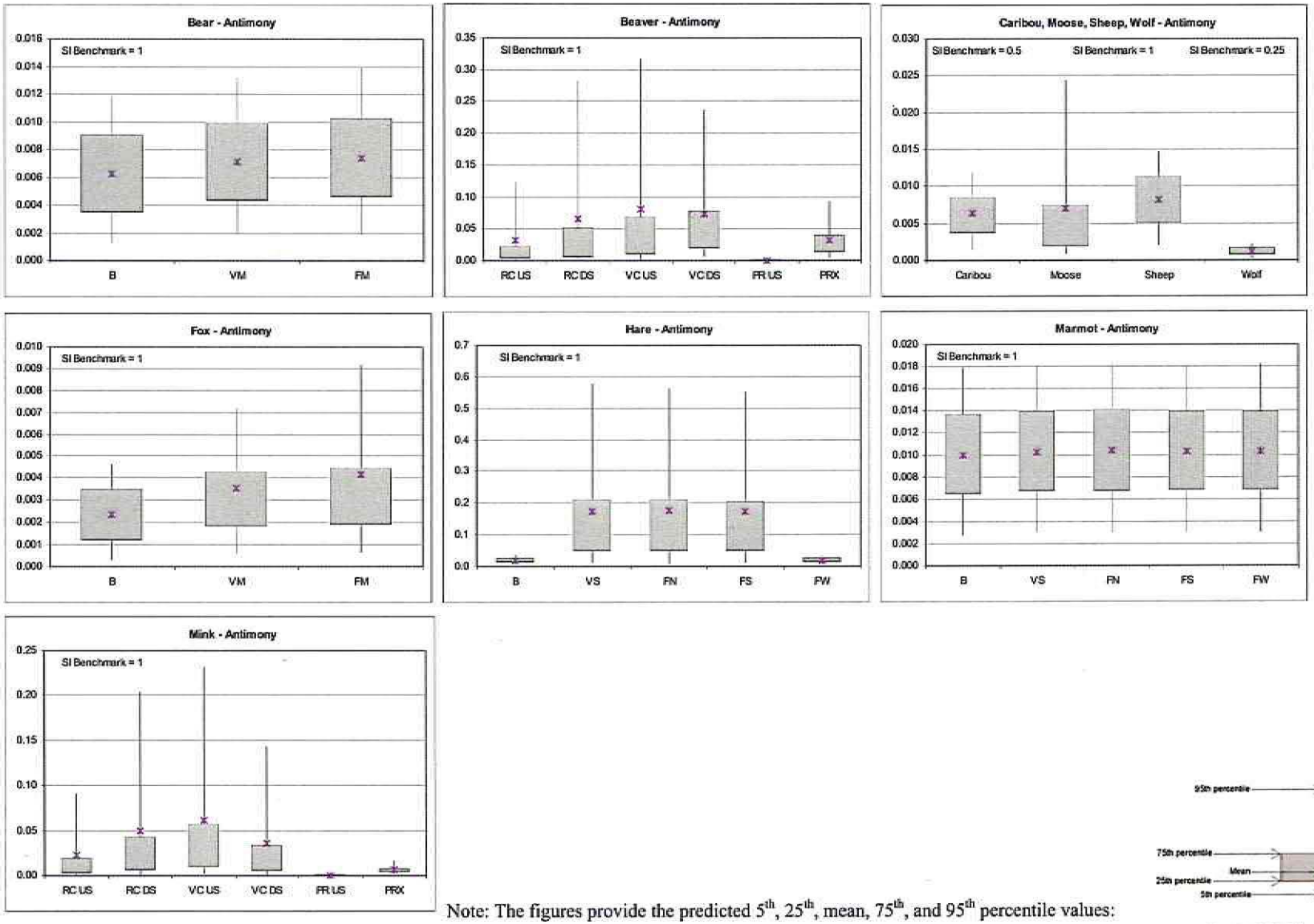
The predicted screening index values of the COPC for the various receptors are provided on Figure 6.6 for the final closure and remediation plan. Appendix H provides the numerical SI values. The only difference between the assessment for the existing conditions and the final closure and remediation plan is the change in water concentrations. As seen from Figure 6.6, the predicted intakes of antimony, arsenic, beryllium, boron, chromium, cobalt, copper, manganese, nickel, silver, strontium, tin, and vanadium for the terrestrial receptors do not exceed their corresponding toxicity benchmark for the final closure and remediation plan. All mean SI values are below the applicable SI benchmarks. The 95th percentile SI value for cadmium is above the SI benchmark for wolf. For lead, the 95th percentile SI value for grouse at Faro-S is above the SI benchmark for grouse. The 95th percentile SI selenium values for mallard (Rose Creek Downstream X14), marmot (Background), mink (Rose Creek Downstream X14) and scaup (Rose Creek Downstream X14) are above the applicable SI benchmarks due to an increase in the selenium concentration by a factor of 2 from the existing conditions. For zinc, the SI values calculated for the 95th percentile intakes for mink exceed the SI benchmark at Rose Creek Downstream X14, Vangorda Downstream V8 and Vangorda Downstream V27.

The intake of cadmium by the wolf is due to the ingestion of caribou and moose (whole body concentrations) at measured concentrations, and therefore it is not related to changes in the water concentrations as a result of the final closure and remediation plan at the site. Similarly, the intake of lead by the grouse is due to lead in the terrestrial environment, and therefore it is not related to changes in the water concentrations as a result of the final closure and remediation option at the site. For the mallard and scaup, the most significant pathway of exposure is the ingestion of benthic invertebrates (concentrations estimated using transfer factors from water).

The marmot receives most of the intake of selenium from the ingestion of forage. The mink receives most of its selenium intake from the ingestion of fish, and also benthic invertebrates and duck. The mink receives most of its zinc intake from the ingestion of fish.

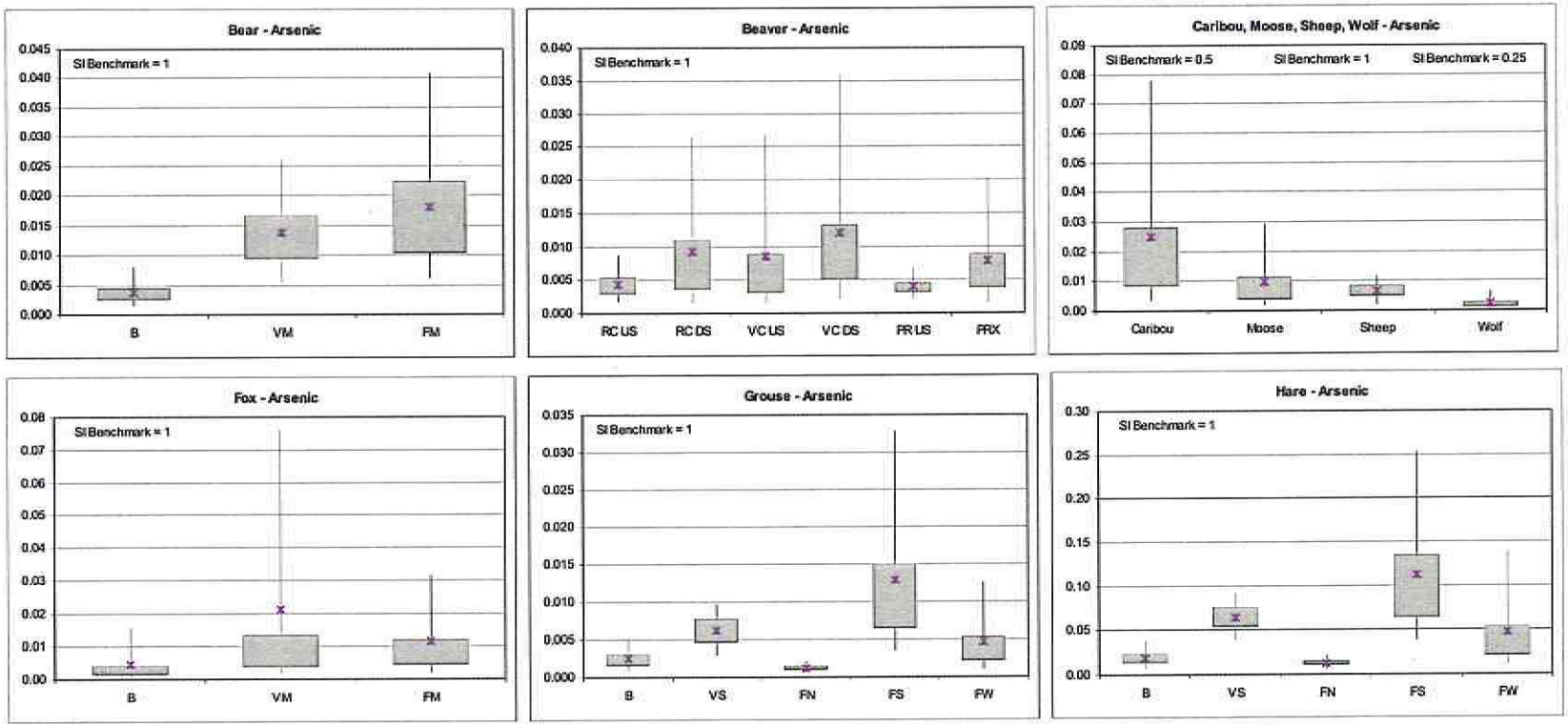
In summary, it is unlikely that there will be adverse effects in the terrestrial environment due to the final closure and remediation plan as only the upper bound concentrations (95^{th} percentile) resulted in SI values above the respective SI benchmark.

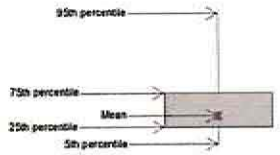
Figure 6.5 Screening Index Values for Terrestrial Ecological Receptors – Existing Conditions



Note: The figures provide the predicted 5th, 25th, mean, 75th, and 95th percentile values:
RC US – Rose Creek Upstream, RC DS – Rose Creek Downstream, VC US – Vangorda Creek Upstream, VC DS – Vangorda Creek Downstream, PR US – Pelly River Upstream, PRX – Pelly River @ Pelly Crossing, B – Background, VS – Vangorda-S, FN – Faro-N, FS – Faro-S, FW – Faro-W, VM – Vangorda-M, FM – Faro-M

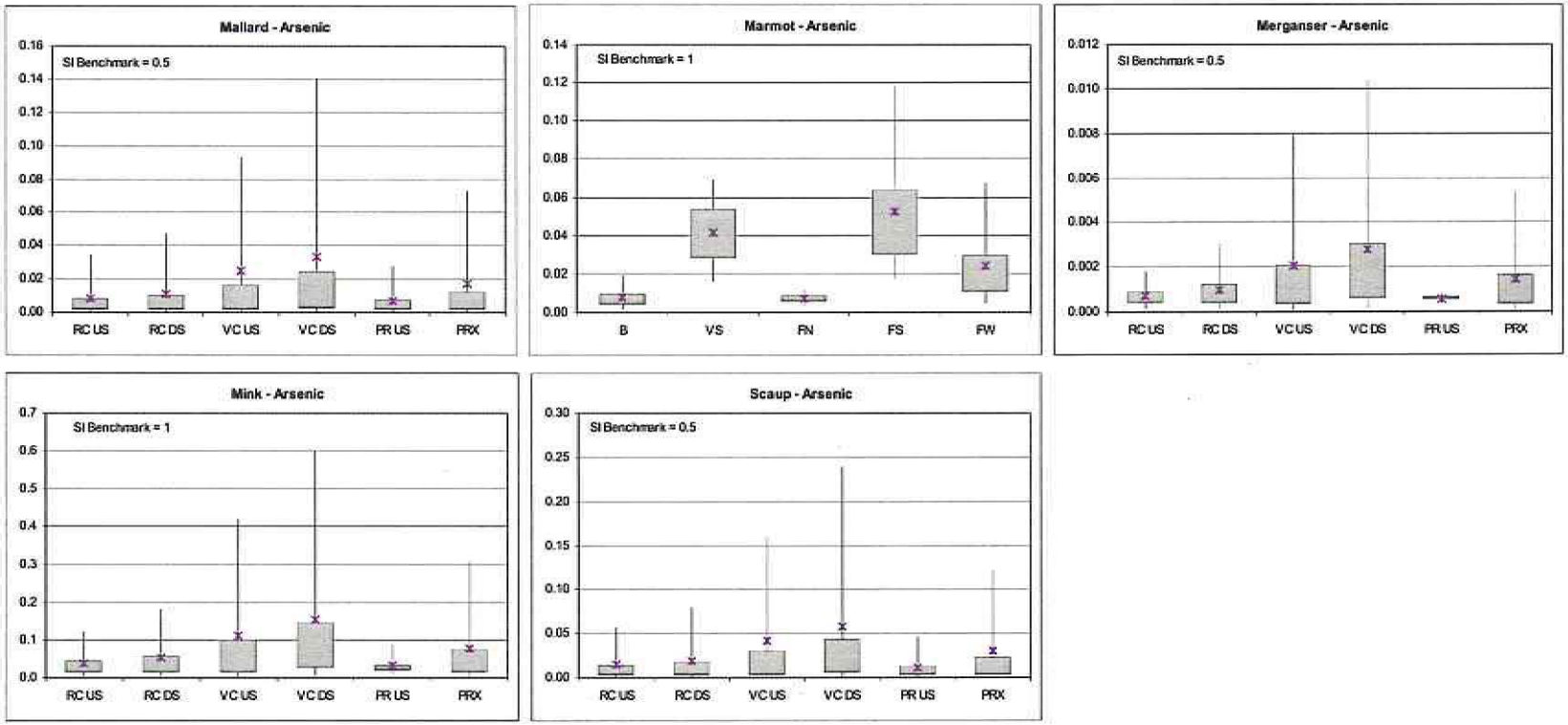
Figure 6.5 Screening Index Values for Terrestrial Ecological Receptors – Existing Conditions (Cont'd)

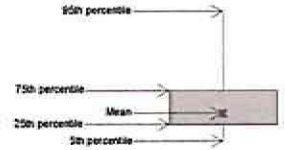




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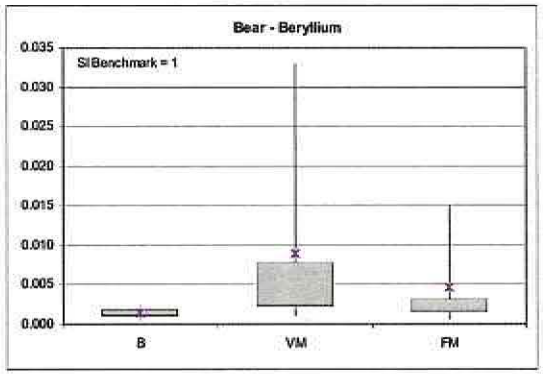
Figure 6.5 Screening Index Values for Terrestrial Ecological Receptors – Existing Conditions (Cont'd)

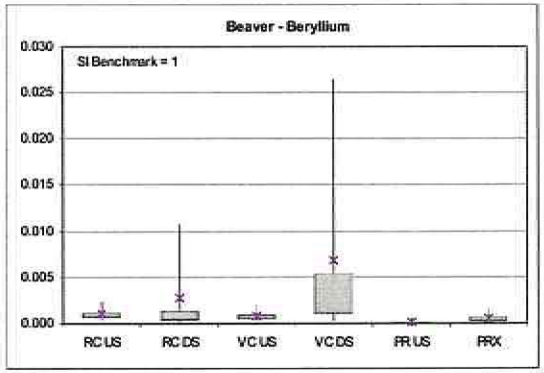


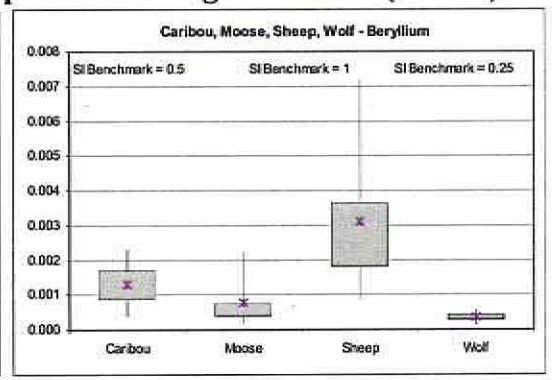


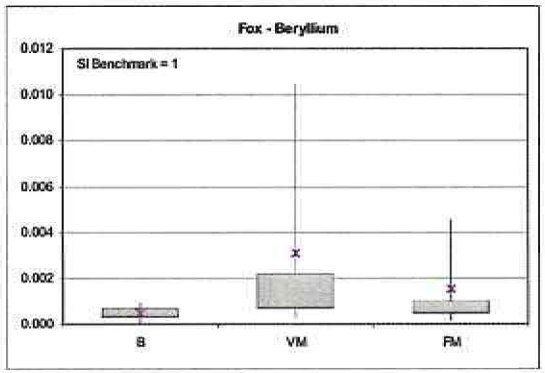
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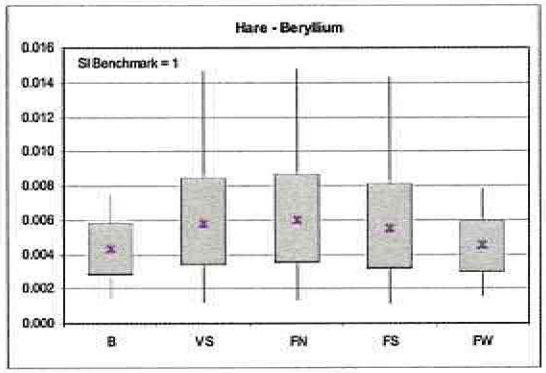
Figure 6.5 Screening Index Values for Terrestrial Ecological Receptors – Existing Conditions (Cont'd)

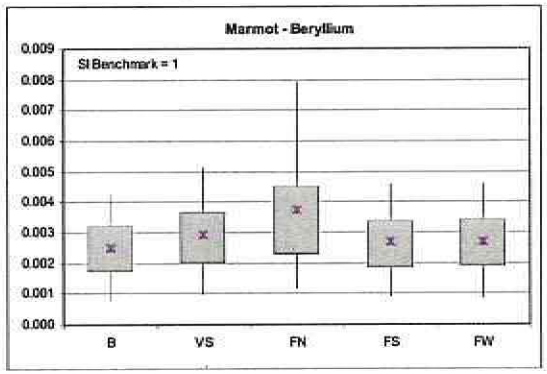


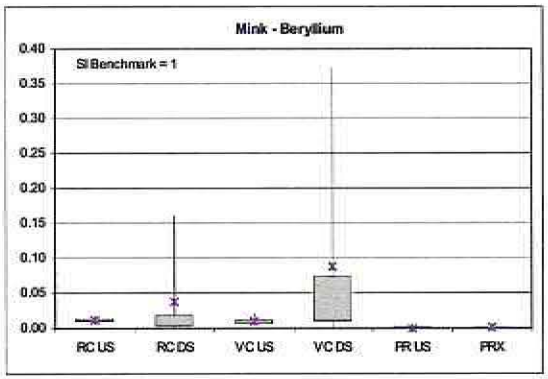


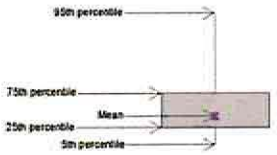






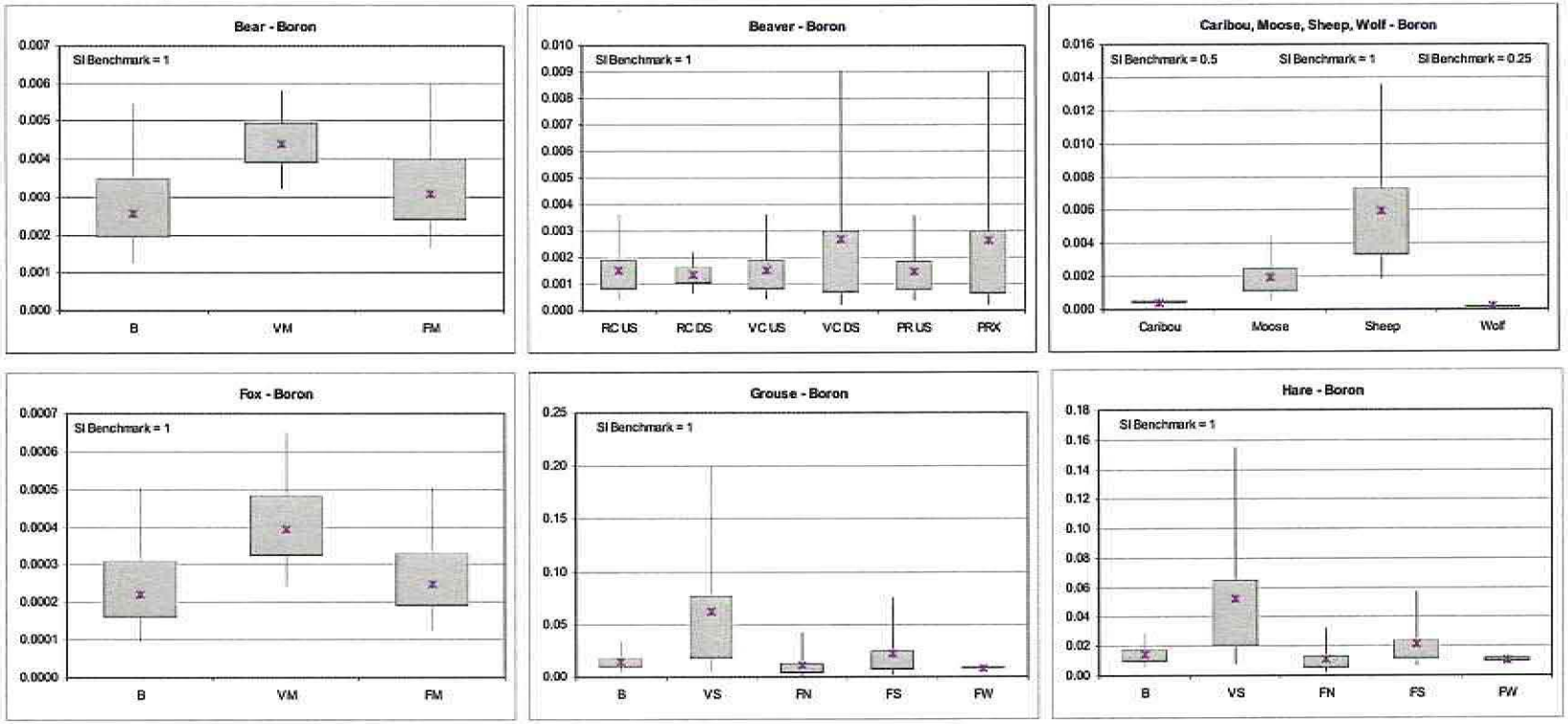


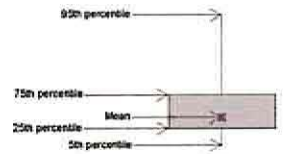




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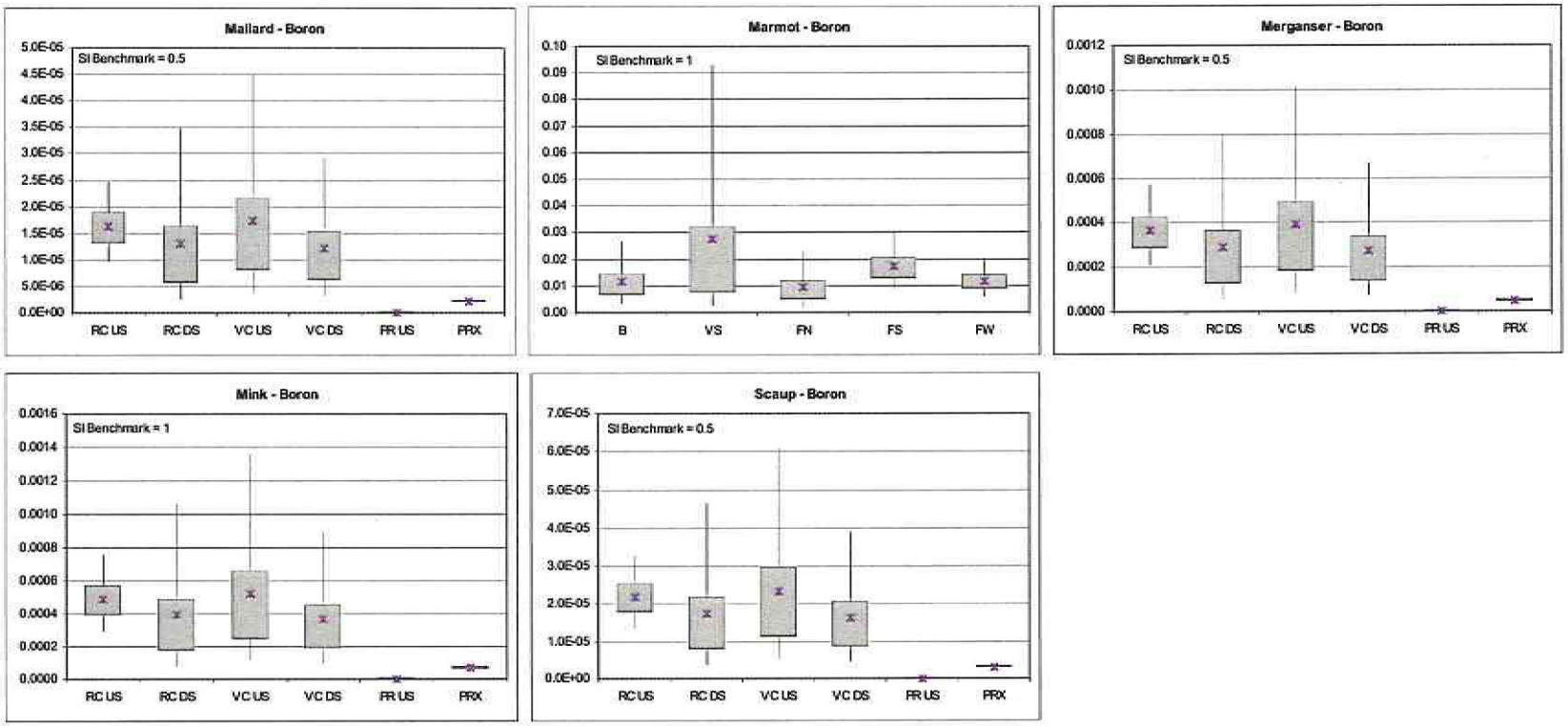
Figure 6.5 Screening Index Values for Terrestrial Ecological Receptors – Existing Conditions (Cont'd)





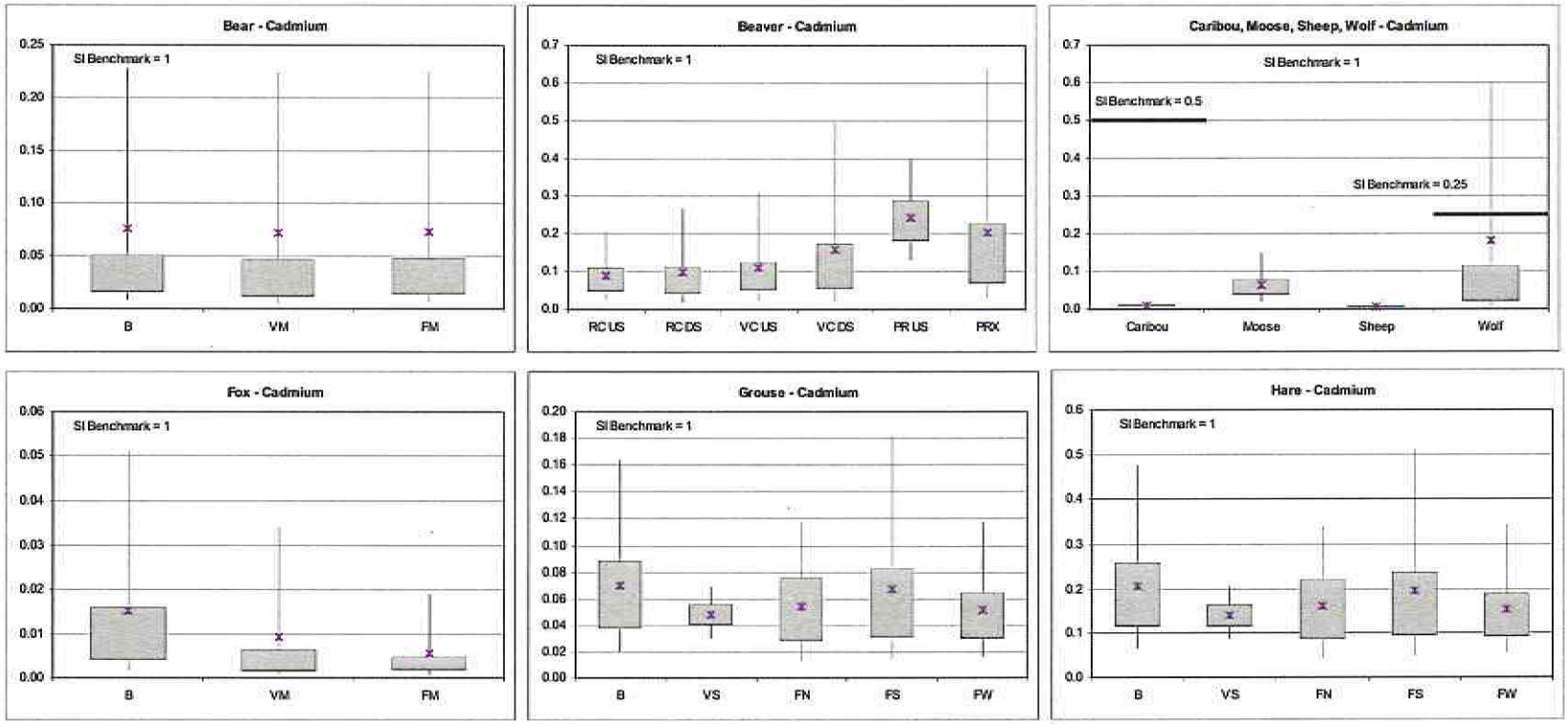
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Figure 6.5 Screening Index Values for Terrestrial Ecological Receptors – Existing Conditions (Cont'd)



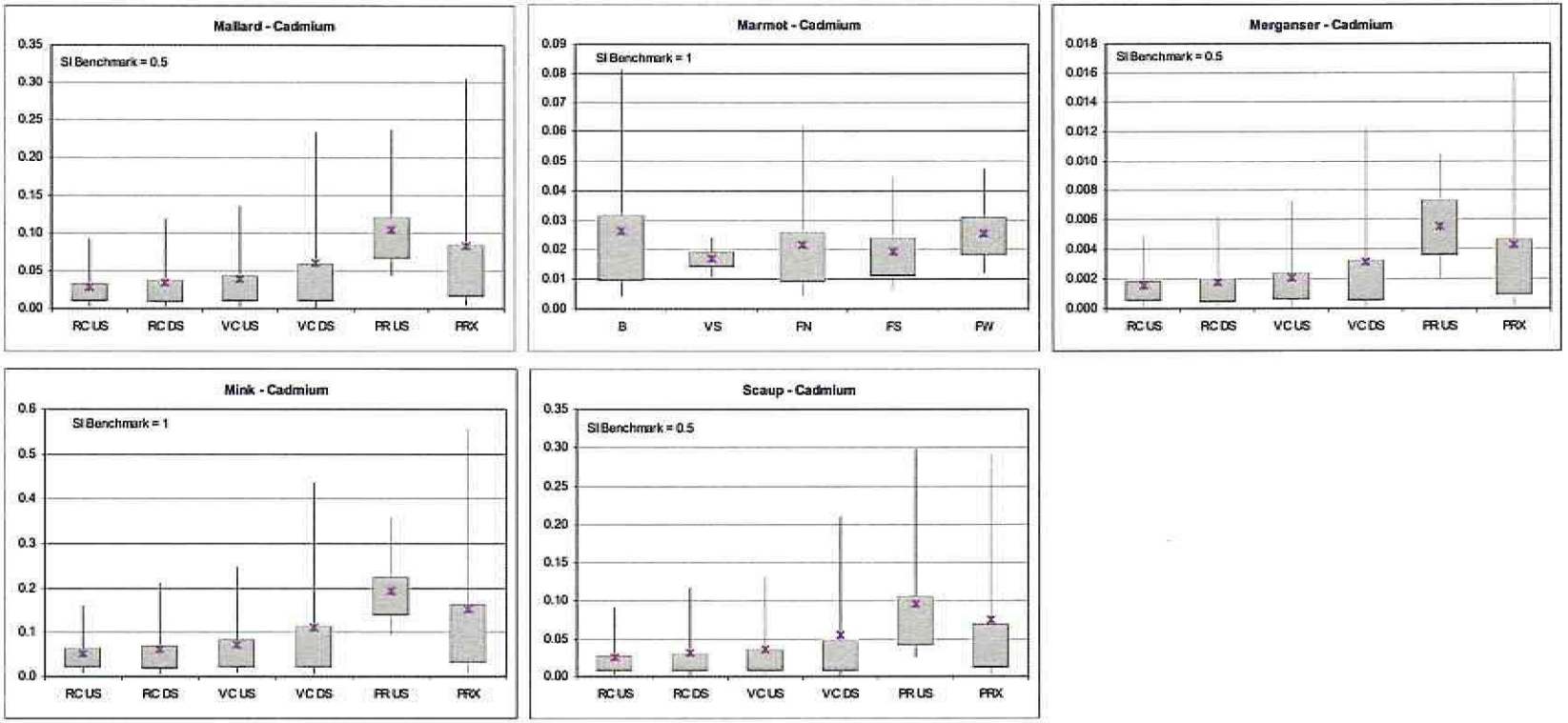
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Figure 6.5 Screening Index Values for Terrestrial Ecological Receptors – Existing Conditions (Cont'd)



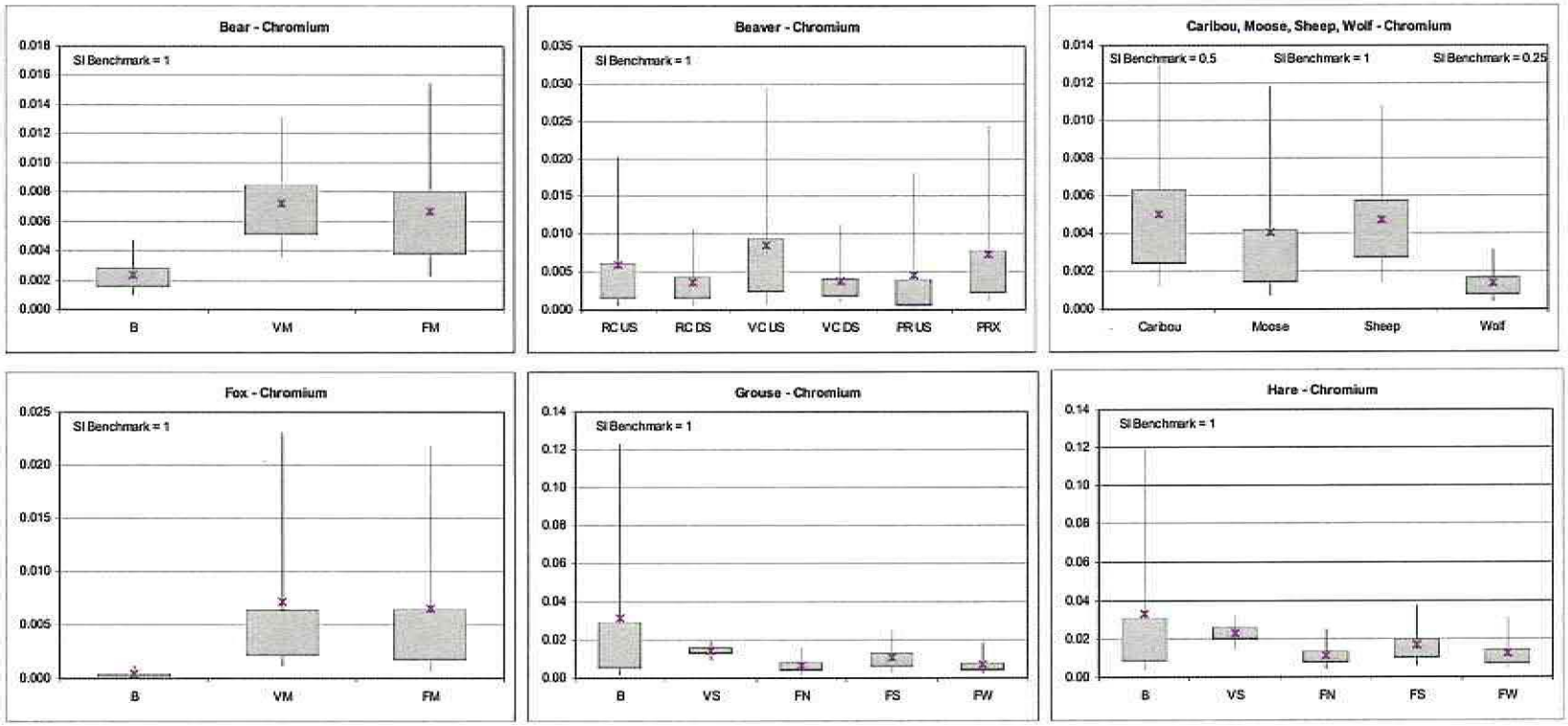
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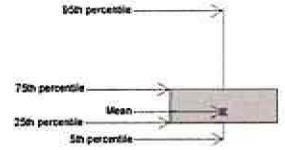
Figure 6.5 Screening Index Values for Terrestrial Ecological Receptors – Existing Conditions (Cont'd)



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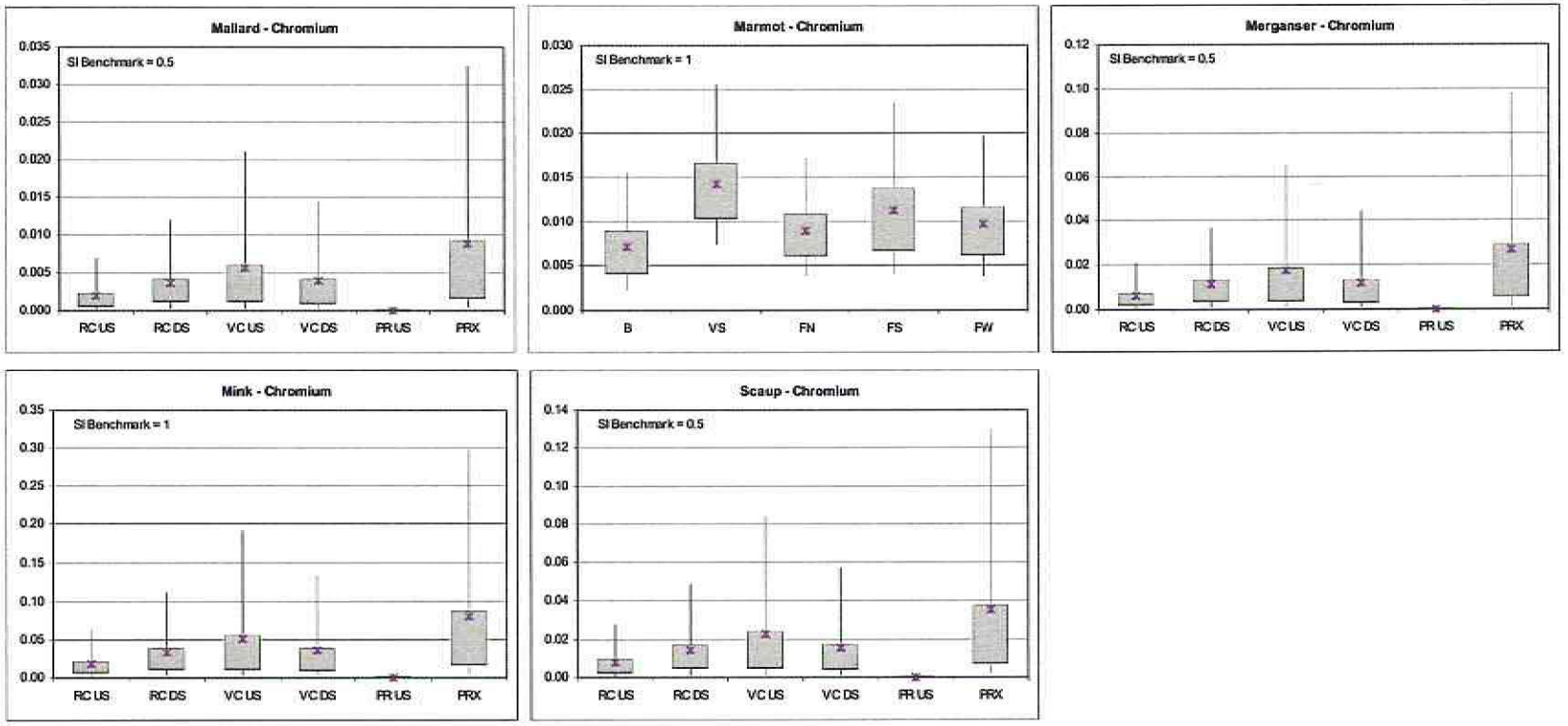
Figure 6.5 Screening Index Values for Terrestrial Ecological Receptors – Existing Conditions (Cont'd)





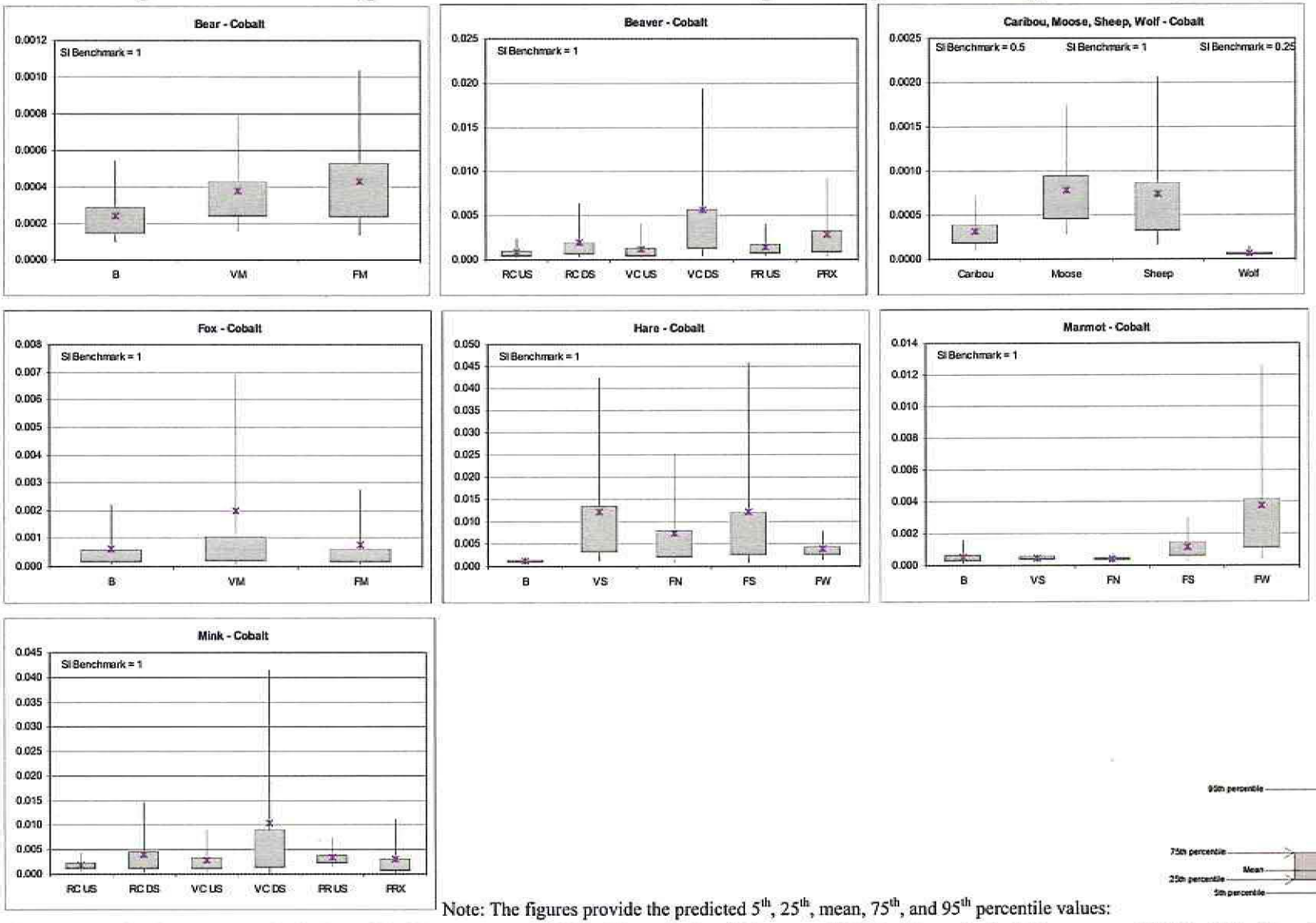
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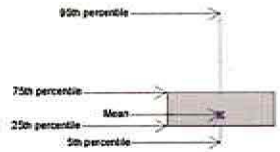
Figure 6.5 Screening Index Values for Terrestrial Ecological Receptors – Existing Conditions (Cont'd)



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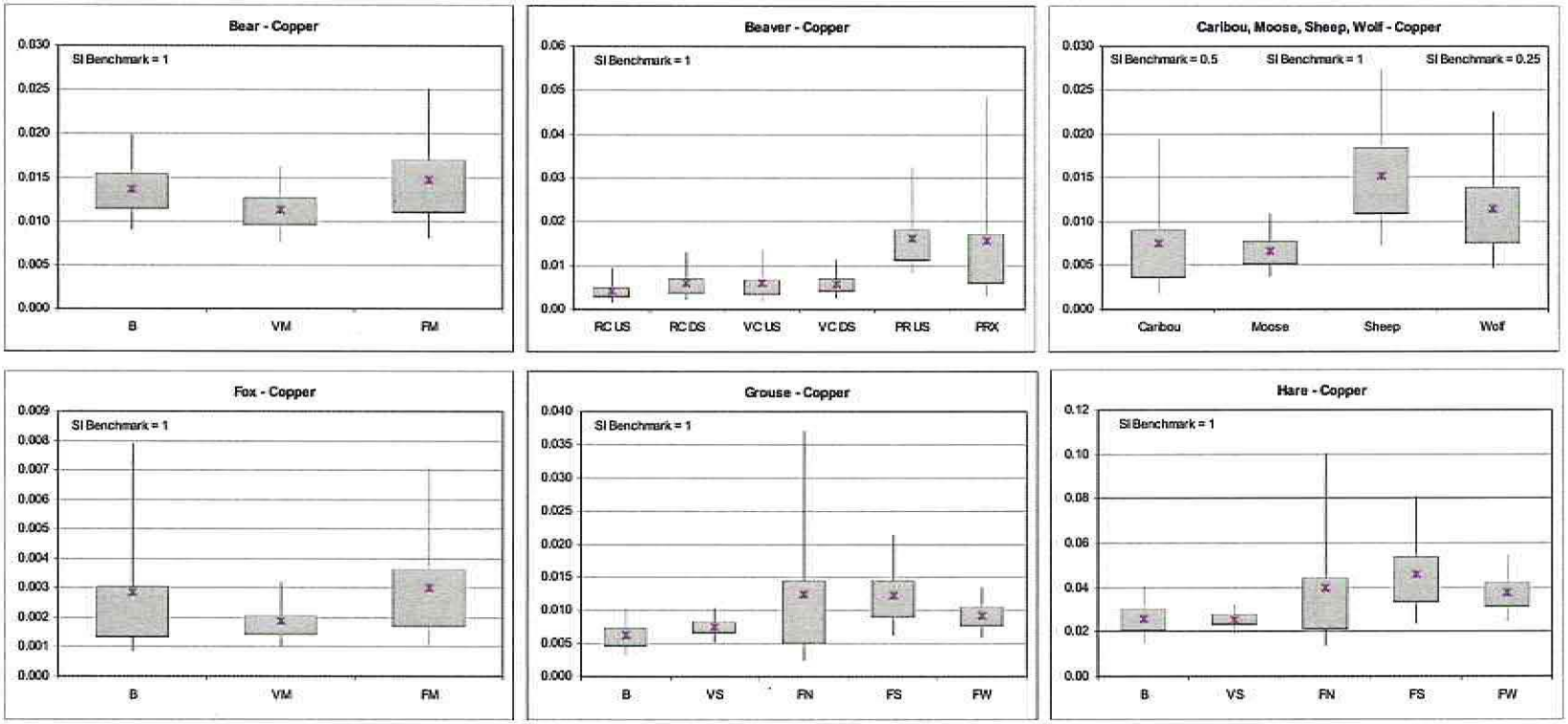
Figure 6.5 Screening Index Values for Terrestrial Ecological Receptors – Existing Conditions (Cont'd)

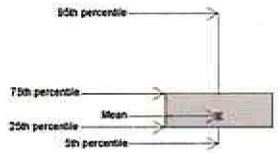




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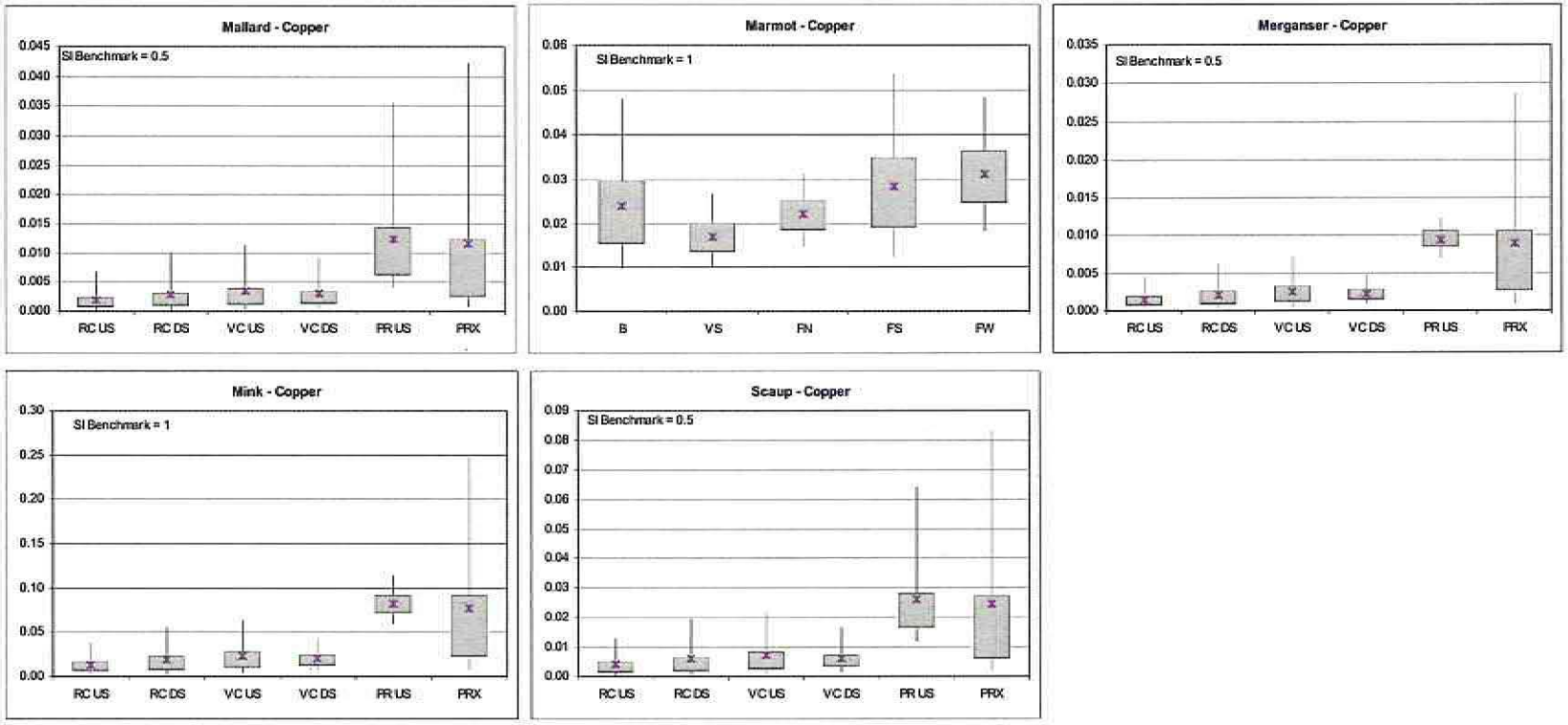
Figure 6.5 Screening Index Values for Terrestrial Ecological Receptors – Existing Conditions (Cont'd)





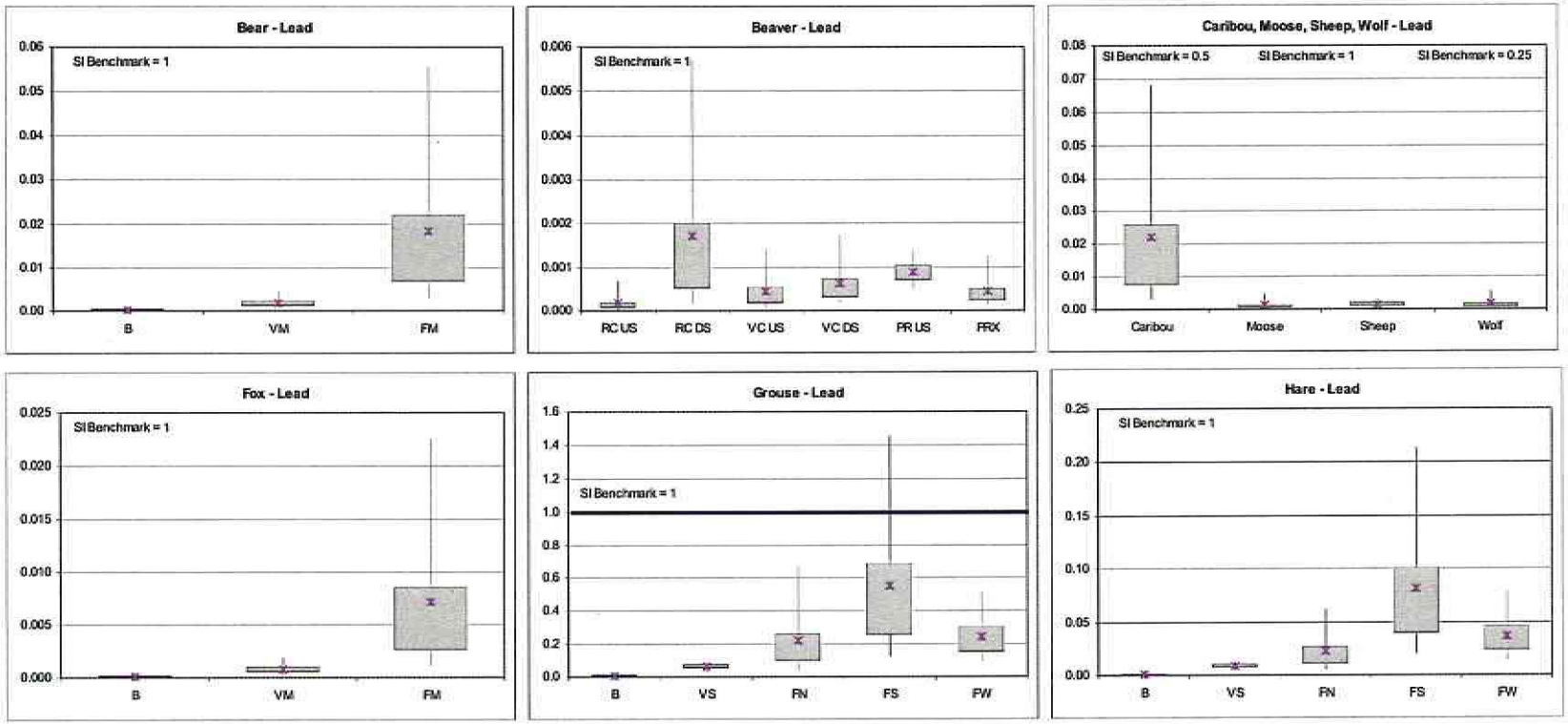
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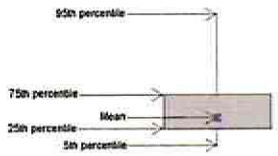
Figure 6.5 Screening Index Values for Terrestrial Ecological Receptors – Existing Conditions (Cont'd)



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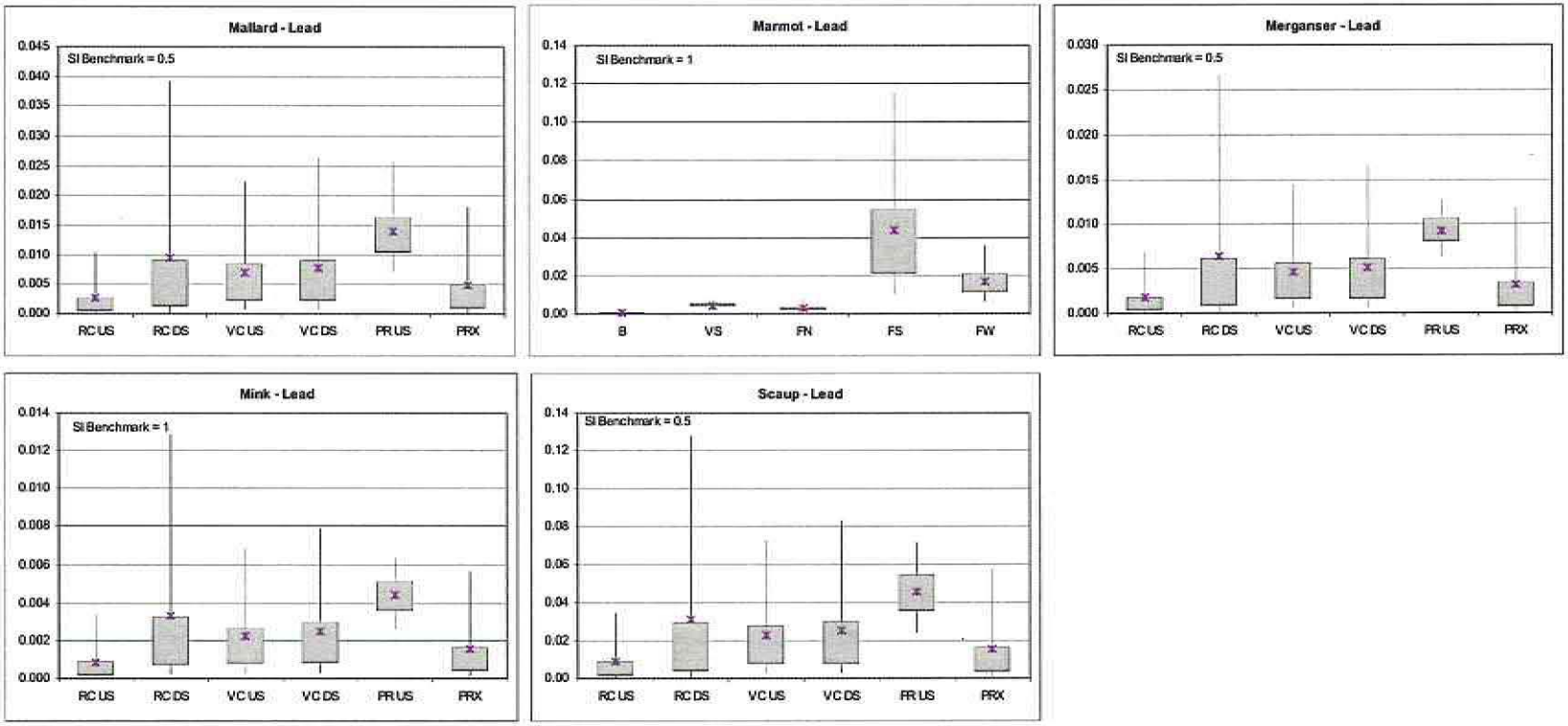
Figure 6.5 Screening Index Values for Terrestrial Ecological Receptors – Existing Conditions (Cont'd)





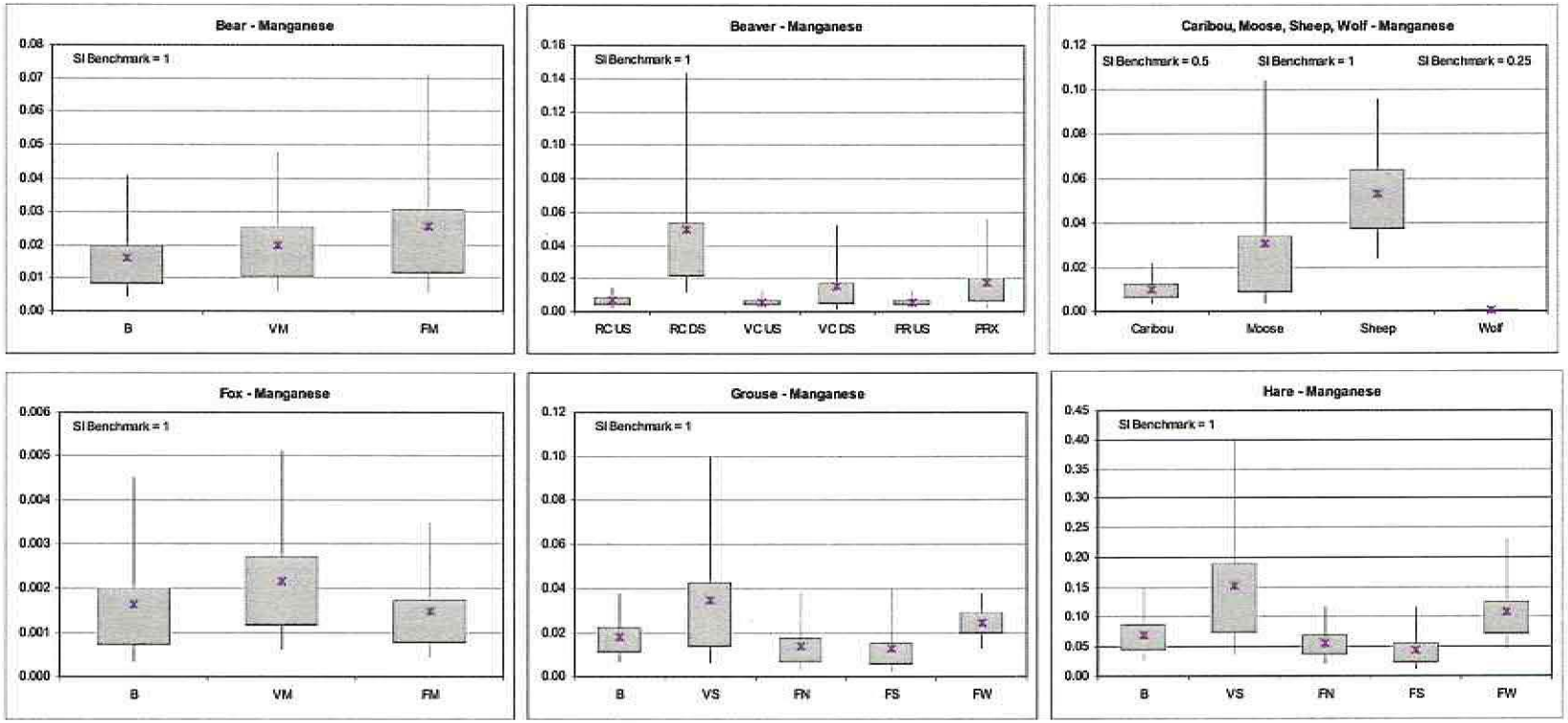
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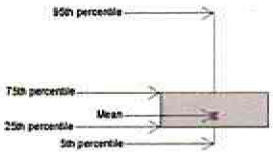
Figure 6.5 Screening Index Values for Terrestrial Ecological Receptors – Existing Conditions (Cont'd)



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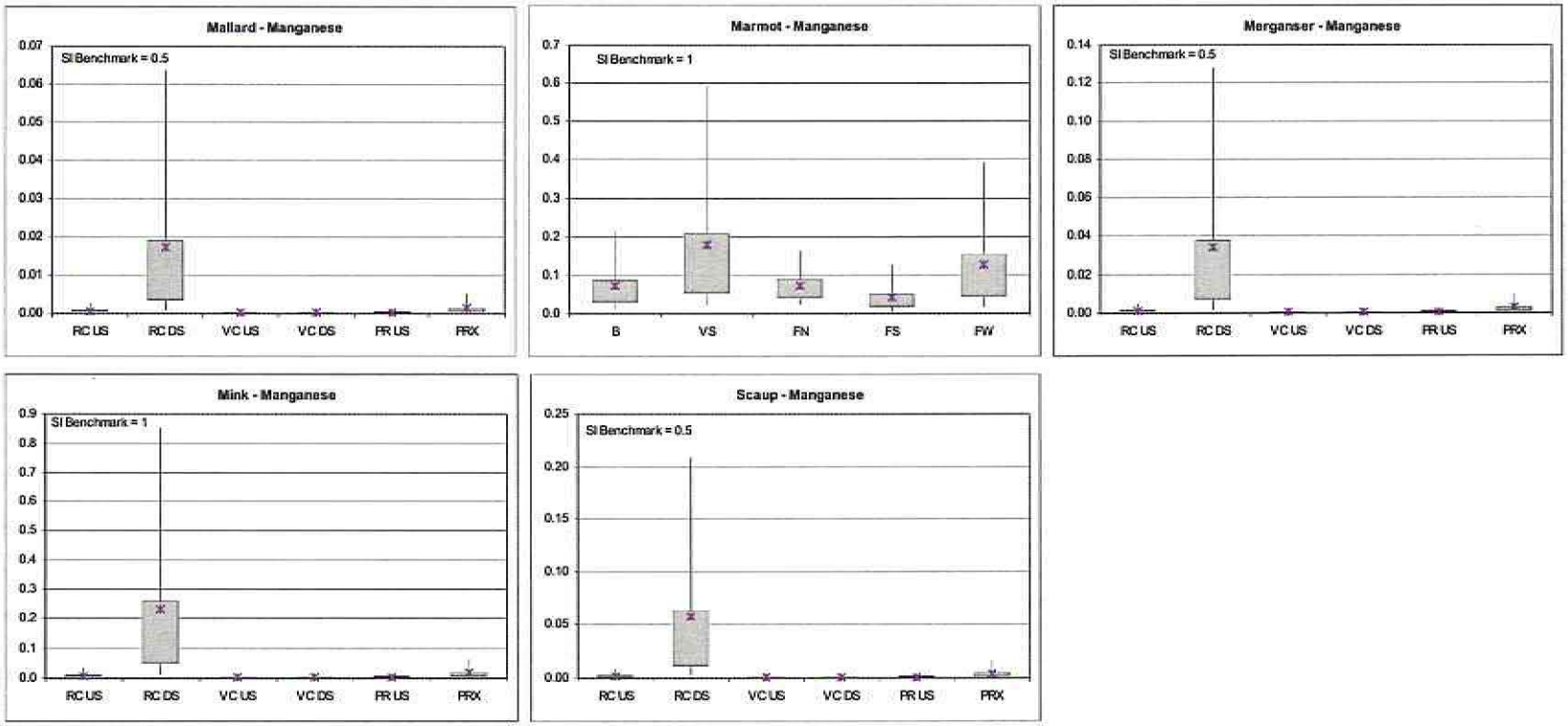
Figure 6.5 Screening Index Values for Terrestrial Ecological Receptors – Existing Conditions (Cont'd)





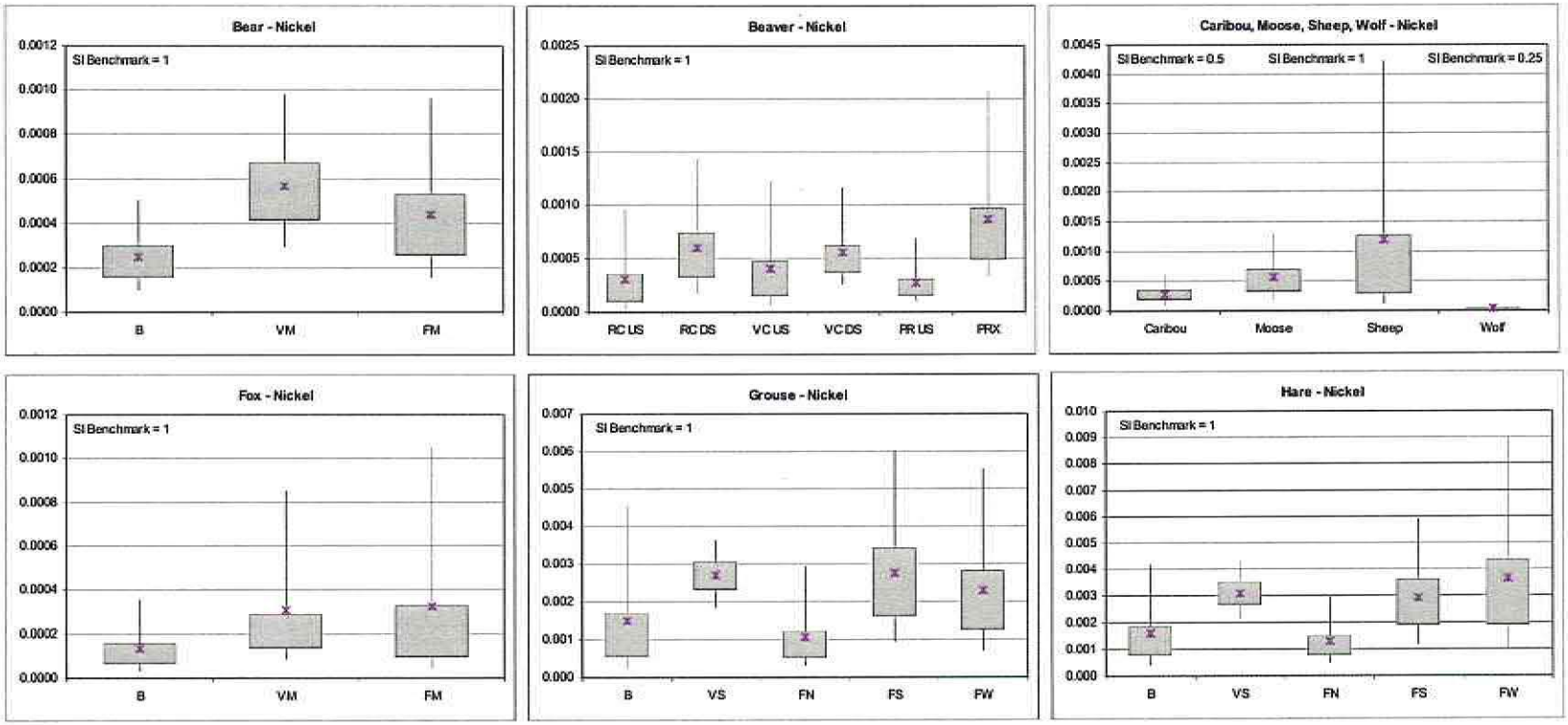
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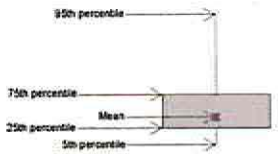
Figure 6.5 Screening Index Values for Terrestrial Ecological Receptors – Existing Conditions (Cont'd)



Note: The figures provide the predicted 5th, 25th, mean, 75th, and 95th percentile values:
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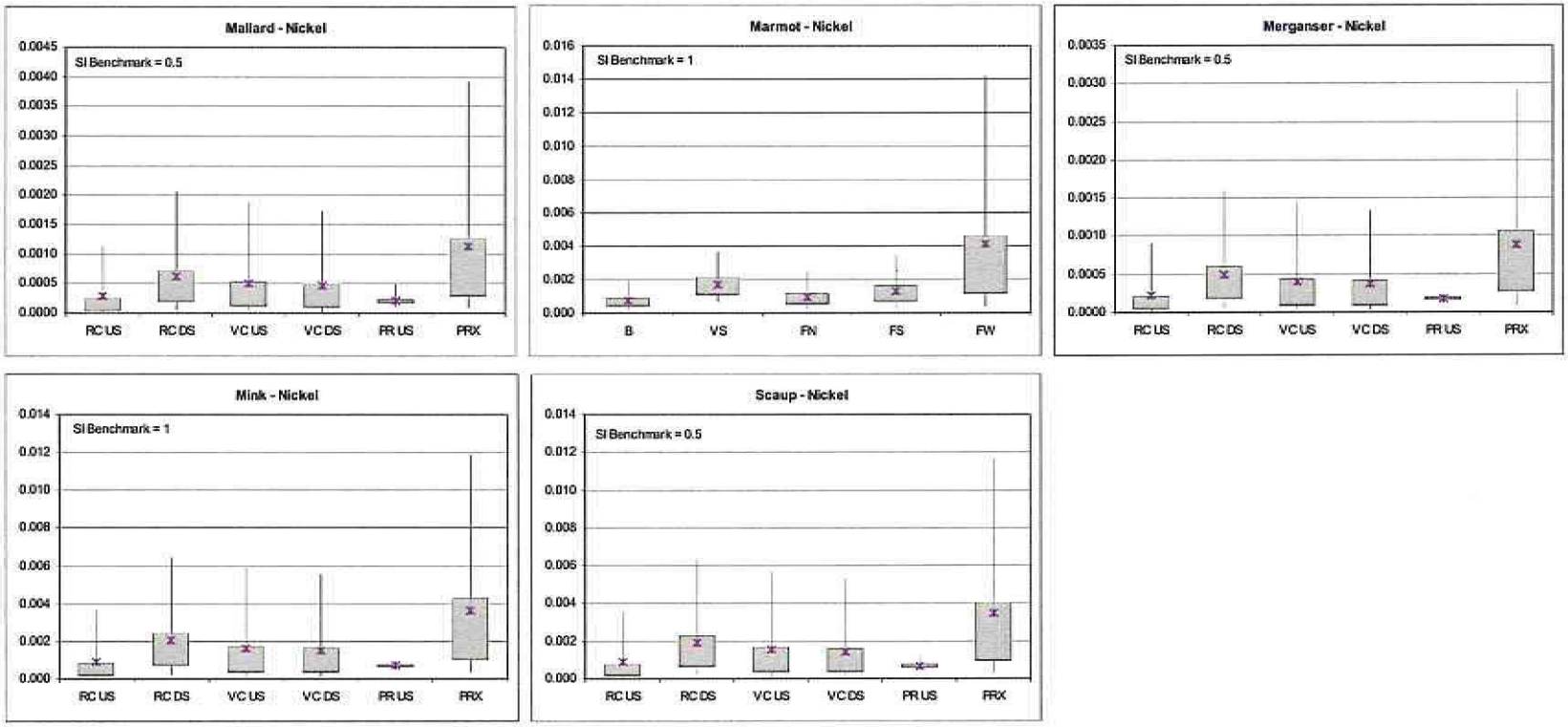
Figure 6.5 Screening Index Values for Terrestrial Ecological Receptors – Existing Conditions (Cont'd)





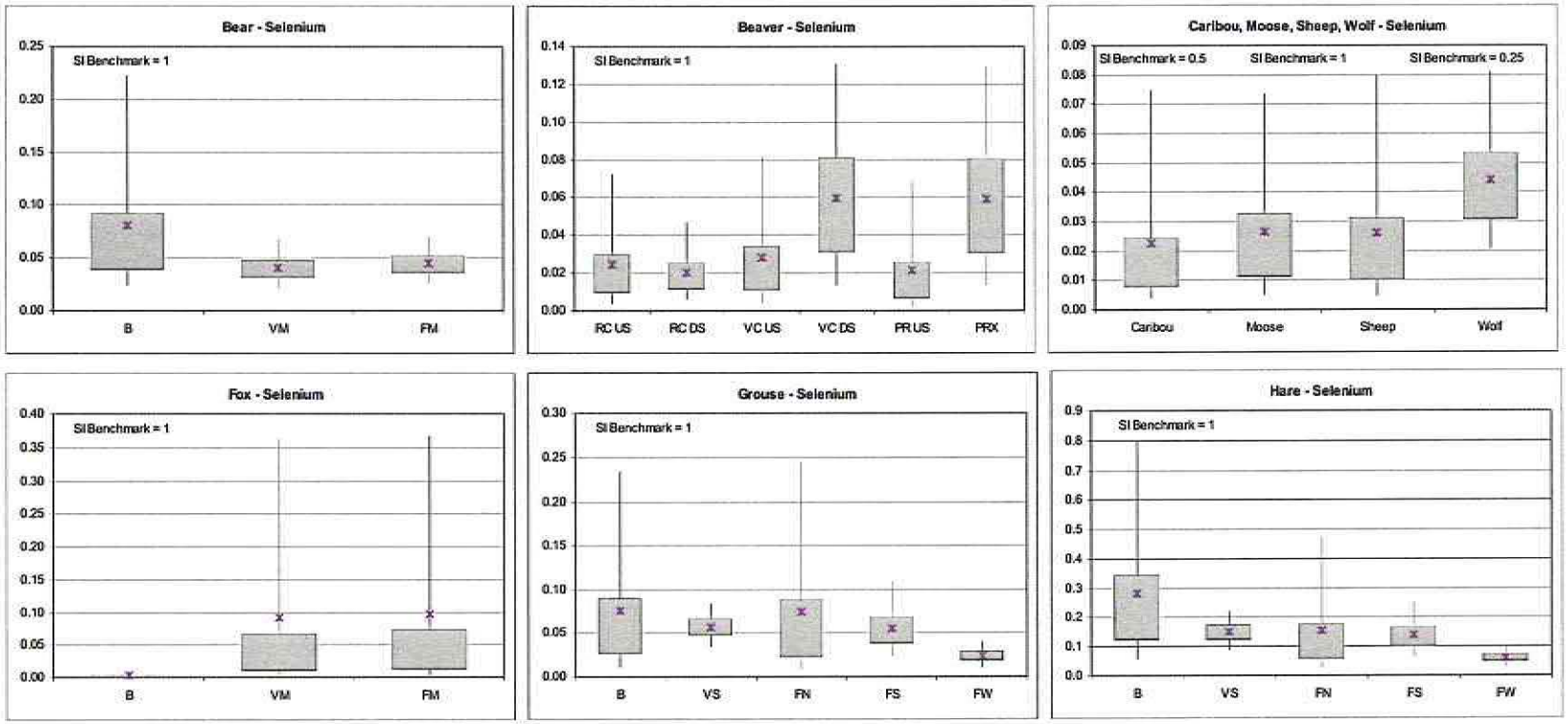
Note: The figures provide the predicted 5th, 25th, mean, 75th, and 95th percentile values:
RC US – Rose Creek Upstream, RC DS – Rose Creek Downstream, VC US – Vangorda Creek Upstream, VC DS – Vangorda Creek Downstream, PR US – Pelly River Upstream, PRX – Pelly River @ Pelly Crossing, B – Background, VS – Vangorda-S, FN – Faro-N, FS – Faro-S, FW – Faro-W, VM – Vangorda-M, FM – Faro-M

Figure 6.5 Screening Index Values for Terrestrial Ecological Receptors – Existing Conditions (Cont'd)



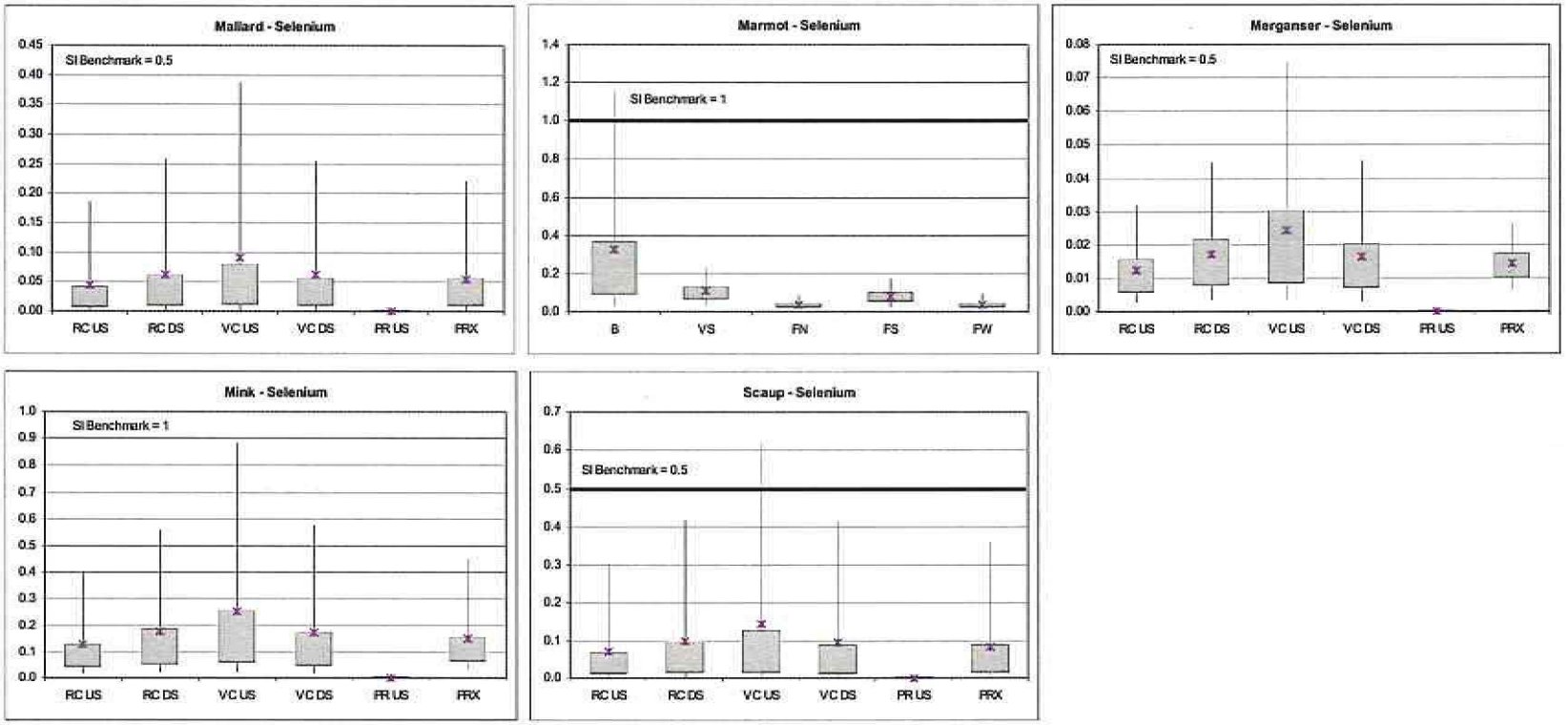
Note: The figures provide the predicted 5th, 25th, mean, 75th, and 95th percentile values:
RC US – Rose Creek Upstream, RC DS – Rose Creek Downstream, VC US – Vangorda Creek Upstream, VC DS – Vangorda Creek Downstream, PR US – Pelly River Upstream, PRX – Pelly River @ Pelly Crossing, B – Background, VS – Vangorda-S, FN – Faro-N, FS – Faro-S, FW – Faro-W, VM – Vangorda-M, FM – Faro-M

Figure 6.5 Screening Index Values for Terrestrial Ecological Receptors – Existing Conditions (Cont'd)



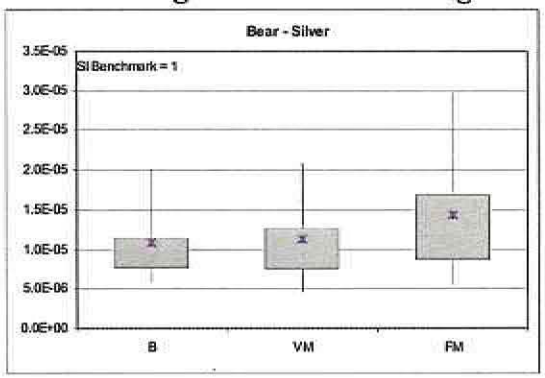
Note: The figures provide the predicted 5th, 25th, mean, 75th, and 95th percentile values:
RC US – Rose Creek Upstream, RC DS – Rose Creek Downstream, VC US – Vangorda Creek Upstream, VC DS – Vangorda Creek Downstream, PR US – Pelly River Upstream, PRX – Pelly River @ Pelly Crossing, B – Background, VS – Vangorda-S, FN – Faro-N, FS – Faro-S, FW – Faro-W, VM – Vangorda-M, FM – Faro-M

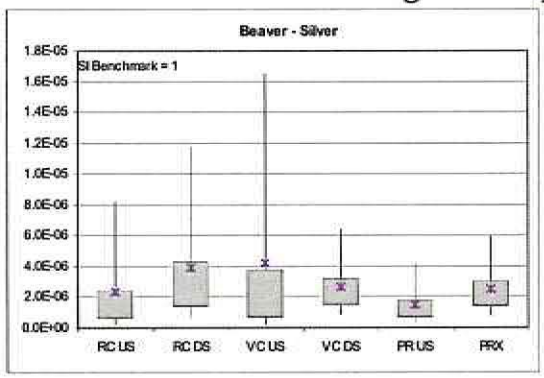
Figure 6.5 Screening Index Values for Terrestrial Ecological Receptors – Existing Conditions (Cont'd)

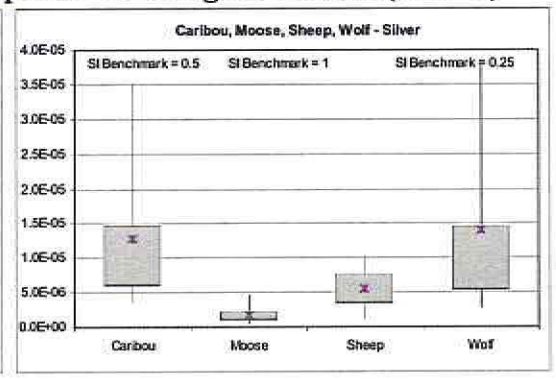


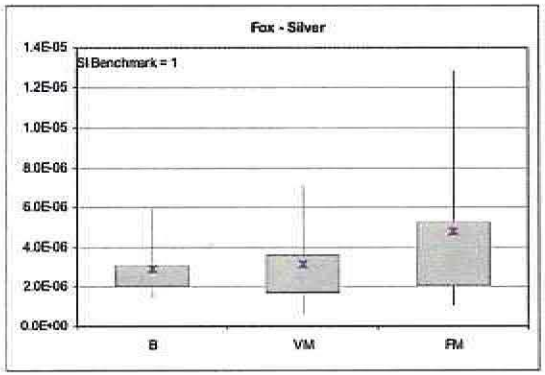
Note: The figures provide the predicted 5th, 25th, mean, 75th, and 95th percentile values:
RC US – Rose Creek Upstream, RC DS – Rose Creek Downstream, VC US – Vangorda Creek Upstream, VC DS – Vangorda Creek Downstream, PR US – Pelly River Upstream, PRX – Pelly River @ Pelly Crossing, B – Background, VS – Vangorda-S, FN – Faro-N, FS – Faro-S, FW – Faro-W, VM – Vangorda-M, FM – Faro-M

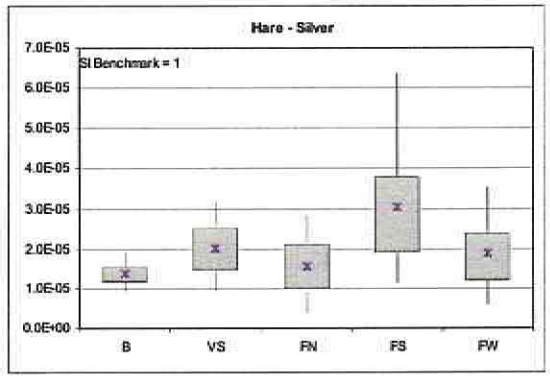
Figure 6.5 Screening Index Values for Terrestrial Ecological Receptors – Existing Conditions (Cont'd)

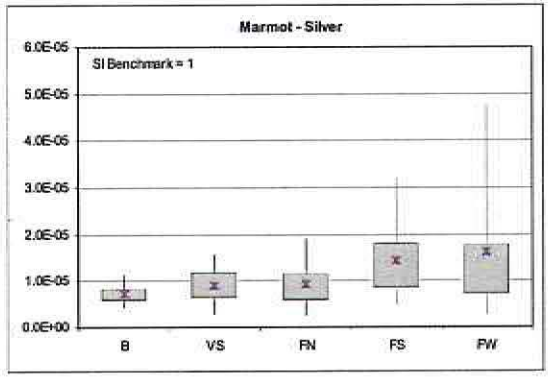


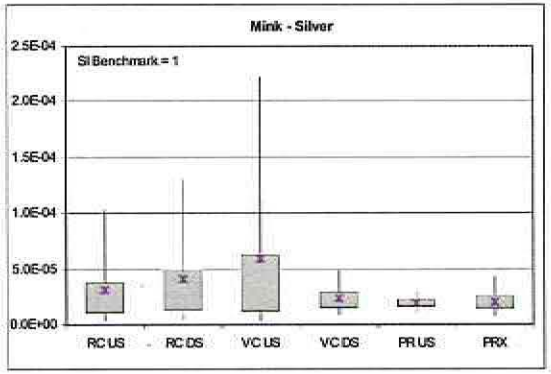


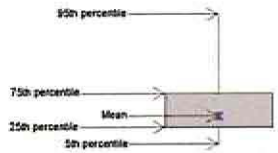








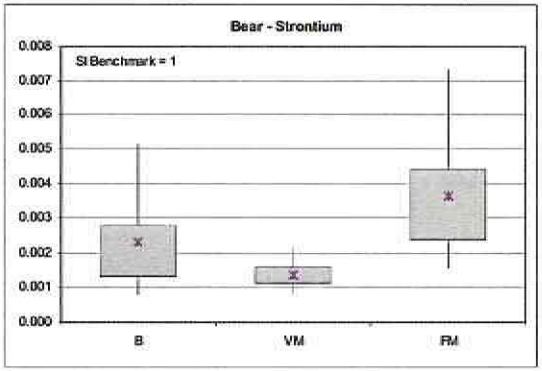


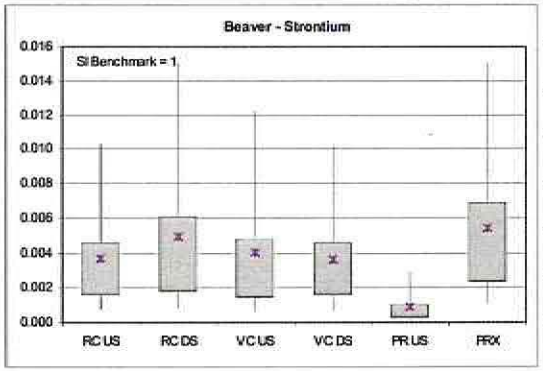


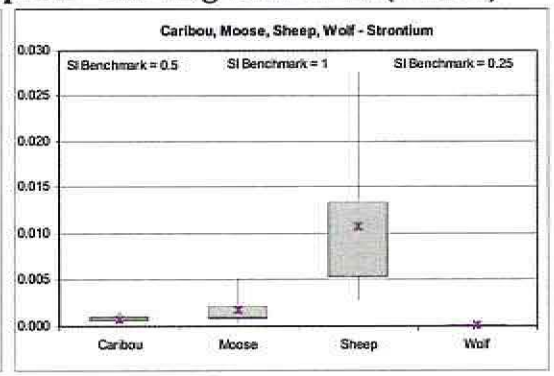
Note: The figures provide the predicted 5th, 25th, mean, 75th, and 95th percentile values:

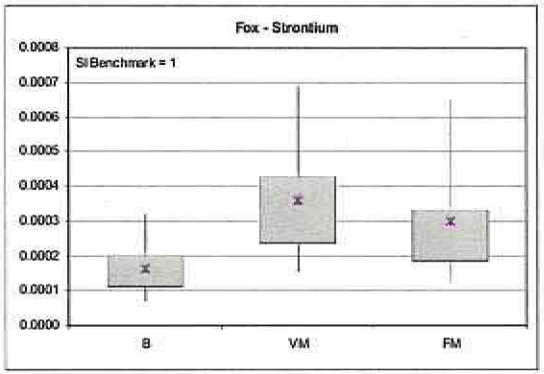
RC US – Rose Creek Upstream, RC DS – Rose Creek Downstream, VC US – Vangorda Creek Upstream, VC DS – Vangorda Creek Downstream, PR US – Pelly River Upstream, PRX – Pelly River @ Pelly Crossing, B – Background, VS – Vangorda-S, FN – Faro-N, FS – Faro-S, FW – Faro-W, VM – Vangorda-M, FM – Faro-M

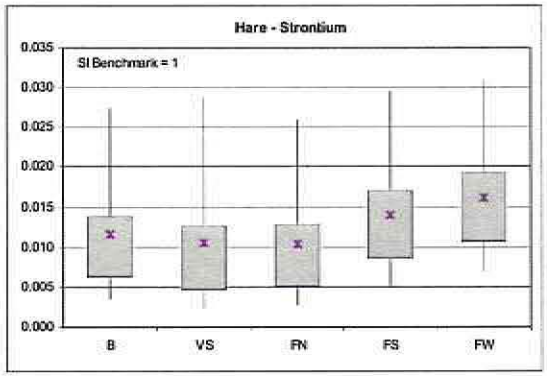
Figure 6.5 Screening Index Values for Terrestrial Ecological Receptors – Existing Conditions (Cont'd)

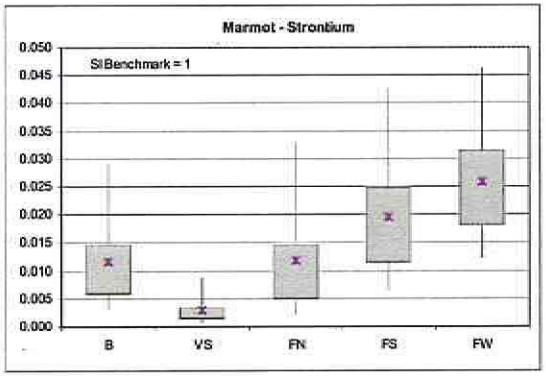


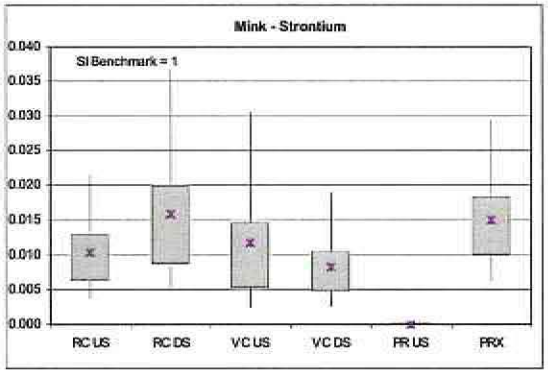


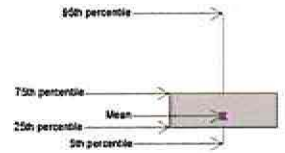






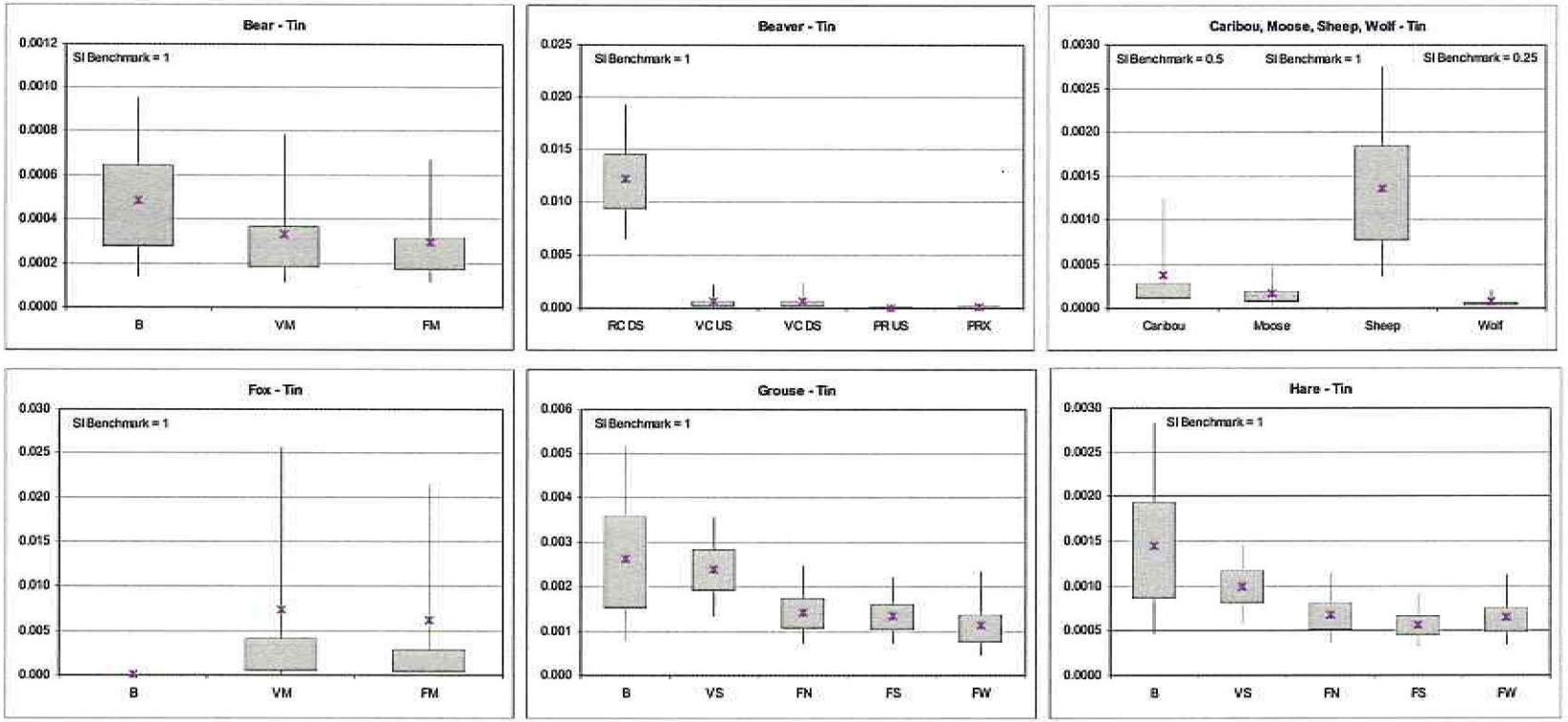






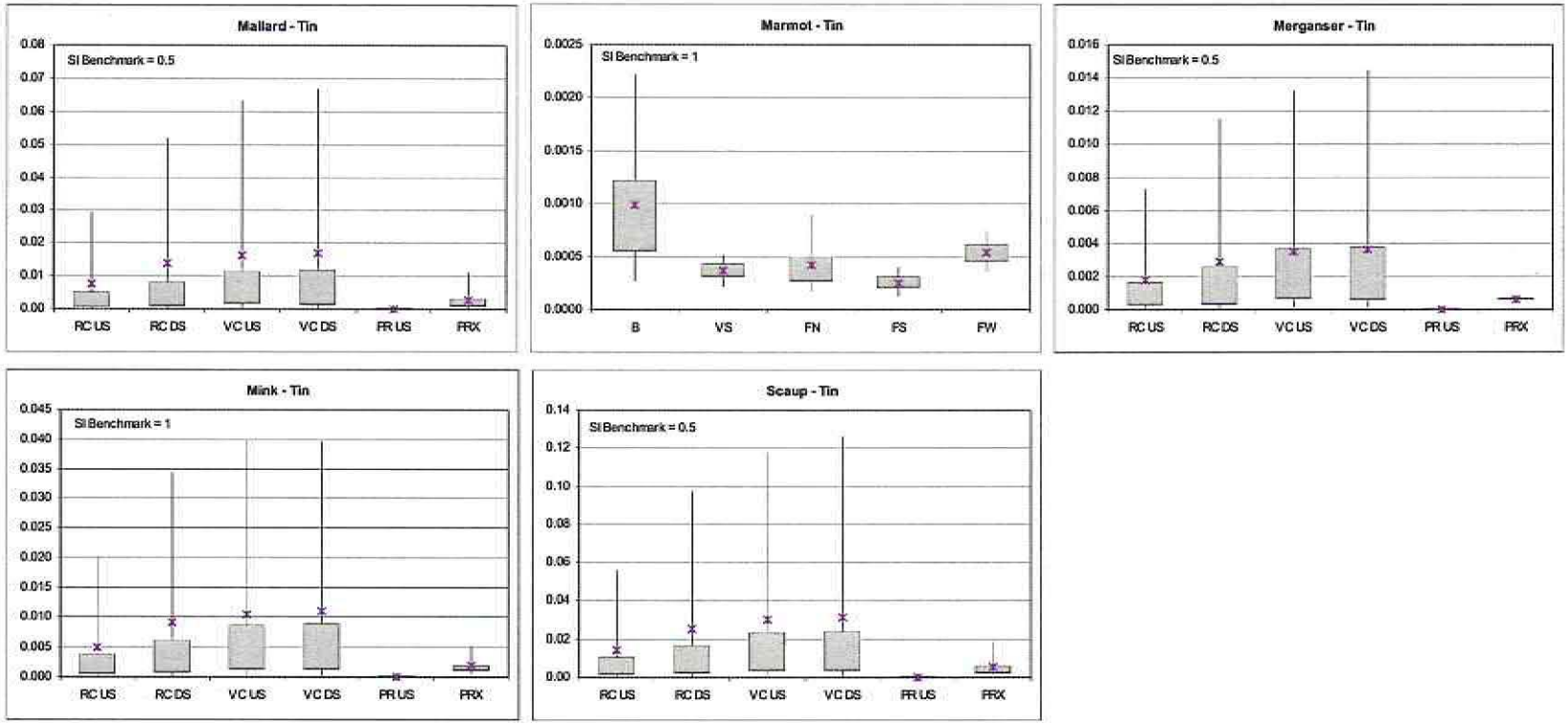
Note: The figures provide the predicted 5th, 25th, mean, 75th, and 95th percentile values:
RC US – Rose Creek Upstream, RC DS – Rose Creek Downstream, VC US – Vangorda Creek Upstream, VC DS – Vangorda Creek Downstream, PR US – Pelly River Upstream, PRX – Pelly River @ Pelly Crossing, B – Background, VS – Vangorda-S, FN – Faro-N, FS – Faro-S, FW – Faro-W, VM – Vangorda-M, FM – Faro-M

Figure 6.5 Screening Index Values for Terrestrial Ecological Receptors – Existing Conditions (Cont'd)



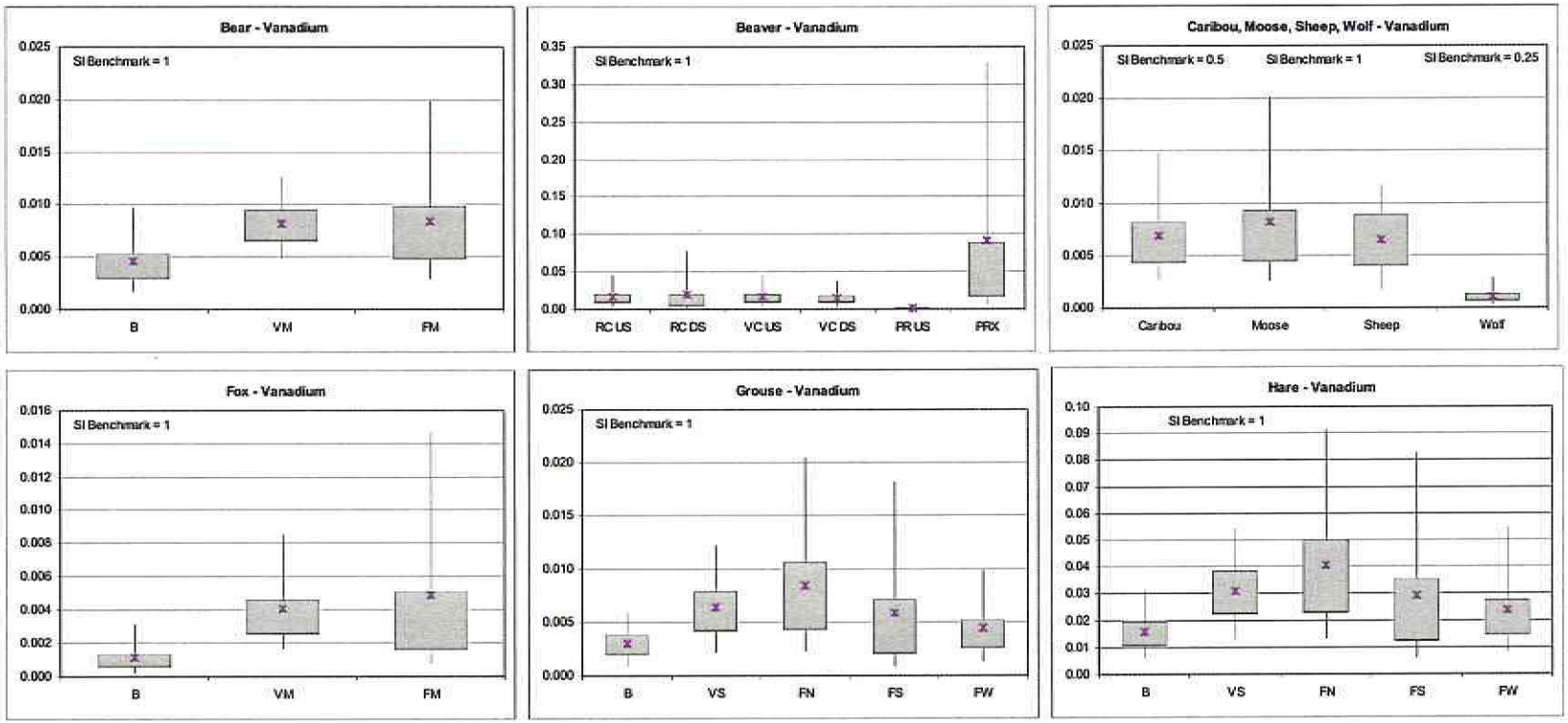
Note: The figures provide the predicted 5th, 25th, mean, 75th, and 95th percentile values:
RC US – Rose Creek Upstream, RC DS – Rose Creek Downstream, VC US – Vangorda Creek Upstream, VC DS – Vangorda Creek Downstream, PR US – Pelly River Upstream, PRX – Pelly River @ Pelly Crossing, B – Background, VS – Vangorda-S, FN – Faro-N, FS – Faro-S, FW – Faro-W, VM – Vangorda-M, FM – Faro-M

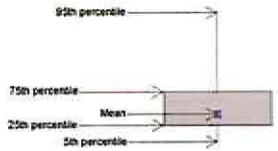
Figure 6.5 Screening Index Values for Terrestrial Ecological Receptors – Existing Conditions (Cont'd)



Note: The figures provide the predicted 5th, 25th, mean, 75th, and 95th percentile values:
RC US – Rose Creek Upstream, RC DS – Rose Creek Downstream, VC US – Vangorda Creek Upstream, VC DS – Vangorda Creek Downstream, PR US – Pelly River Upstream, PRX – Pelly River @ Pelly Crossing, B – Background, VS – Vangorda-S, FN – Faro-N, FS – Faro-S, FW – Faro-W, VM – Vangorda-M, FM – Faro-M

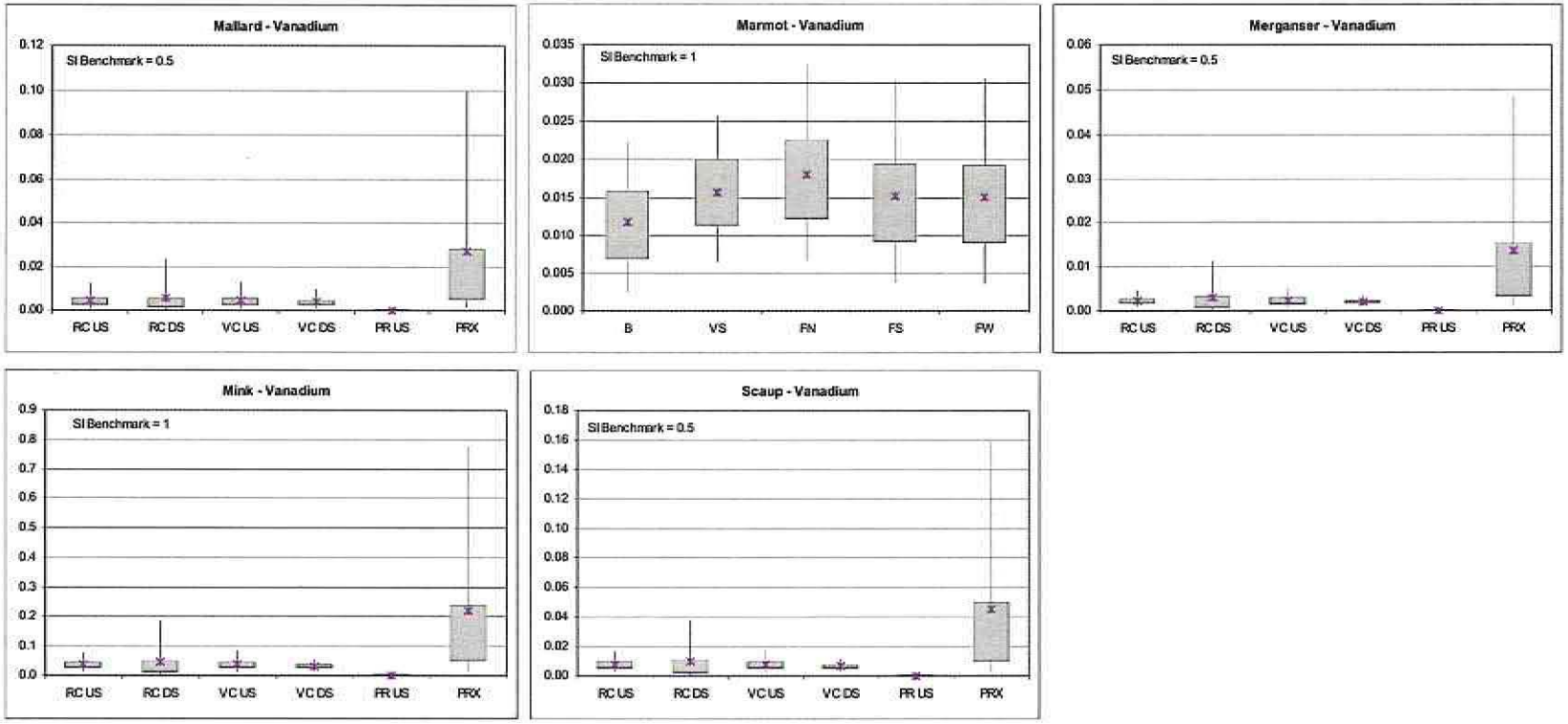
Figure 6.5 Screening Index Values for Terrestrial Ecological Receptors – Existing Conditions (Cont'd)





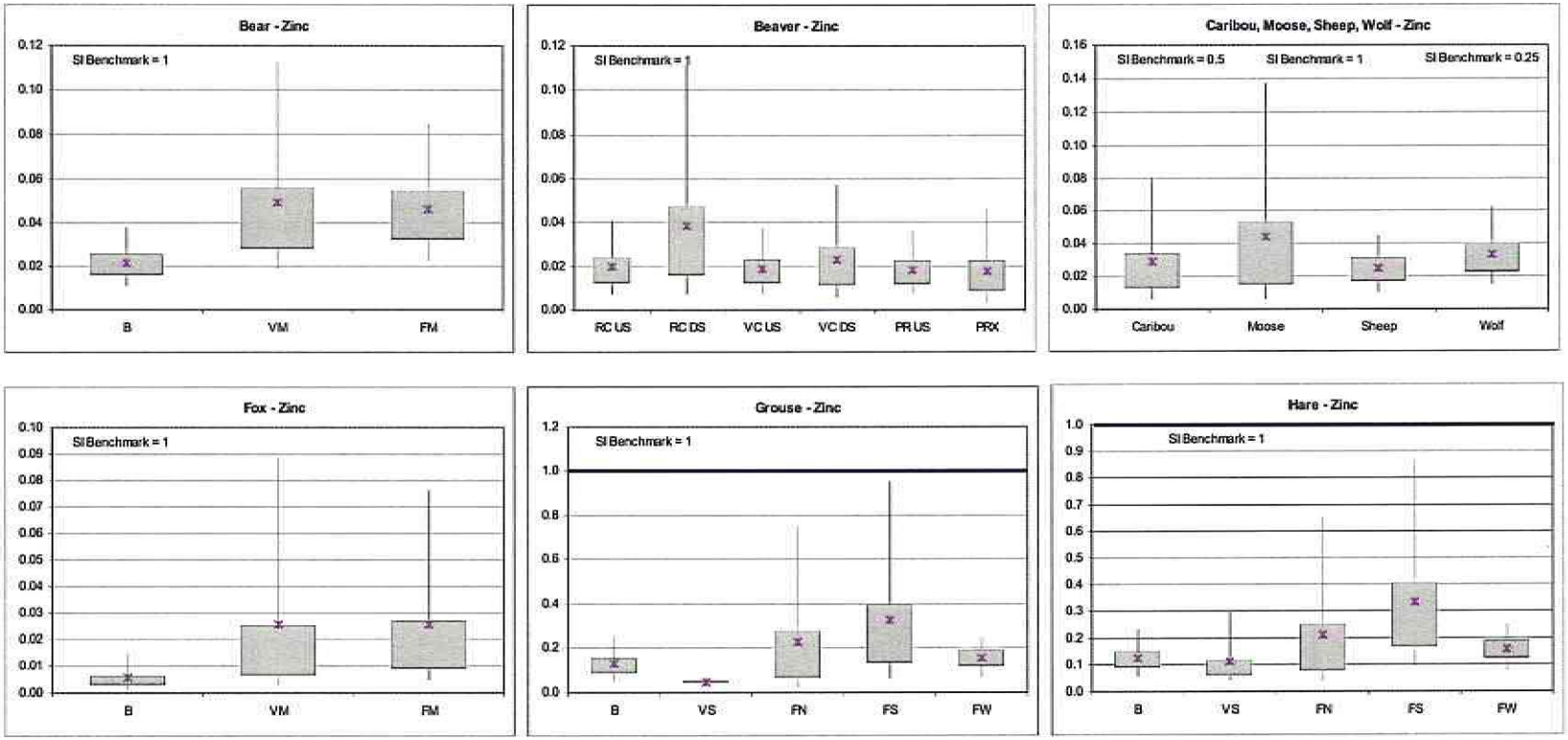
Note: The figures provide the predicted 5th, 25th, mean, 75th, and 95th percentile values:
RC US – Rose Creek Upstream, RC DS – Rose Creek Downstream, VC US – Vangorda Creek Upstream, VC DS – Vangorda Creek Downstream, PR US – Pelly River Upstream, PRX – Pelly River @ Pelly Crossing, B – Background, VS – Vangorda-S, FN – Faro-N, FS – Faro-S, FW – Faro-W, VM – Vangorda-M, FM – Faro-M

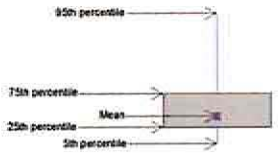
Figure 6.5 Screening Index Values for Terrestrial Ecological Receptors – Existing Conditions (Cont'd)



Note: The figures provide the predicted 5th, 25th, mean, 75th, and 95th percentile values:
RC US – Rose Creek Upstream, RC DS – Rose Creek Downstream, VC US – Vangorda Creek Upstream, VC DS – Vangorda Creek Downstream, PR US – Pelly River Upstream, PRX – Pelly River @ Pelly Crossing, B – Background, VS – Vangorda-S, FN – Faro-N, FS – Faro-S, FW – Faro-W, VM – Vangorda-M, FM – Faro-M

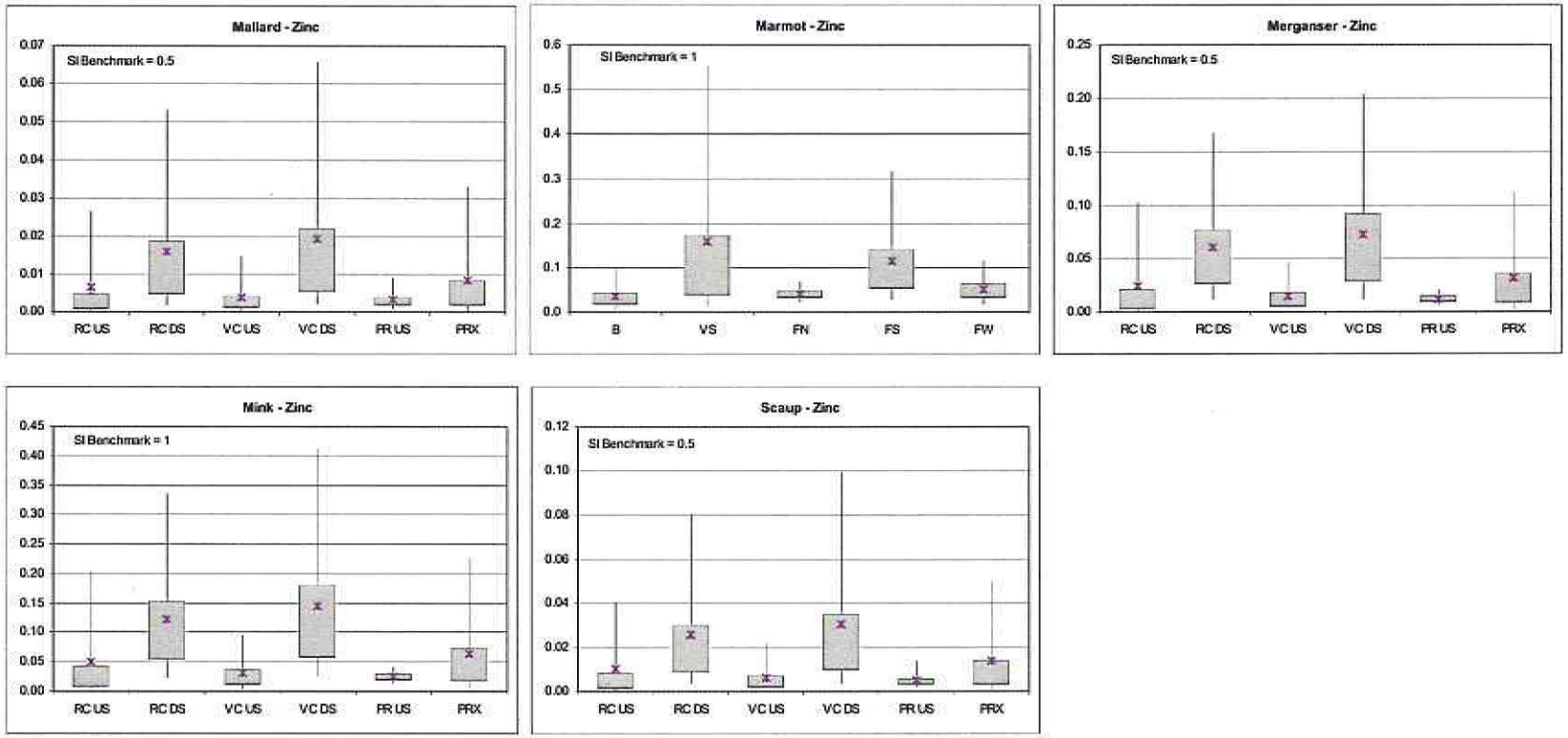
Figure 6.5 Screening Index Values for Terrestrial Ecological Receptors – Existing Conditions (Cont'd)





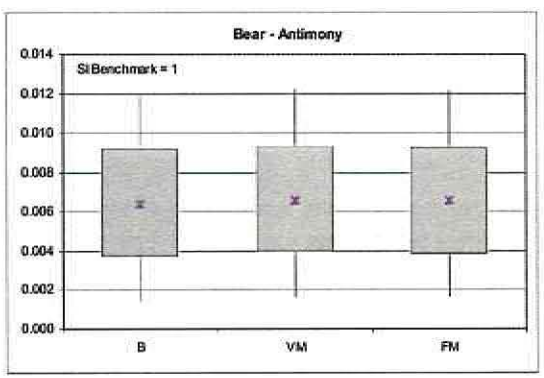
Note: The figures provide the predicted 5th, 25th, mean, 75th, and 95th percentile values:
RC US – Rose Creek Upstream, RC DS – Rose Creek Downstream, VC US – Vangorda Creek Upstream, VC DS – Vangorda Creek Downstream, PR US – Pelly River Upstream, PRX – Pelly River @ Pelly Crossing, B – Background, VS – Vangorda-S, FN – Faro-N, FS – Faro-S, FW – Faro-W, VM – Vangorda-M, FM – Faro-M

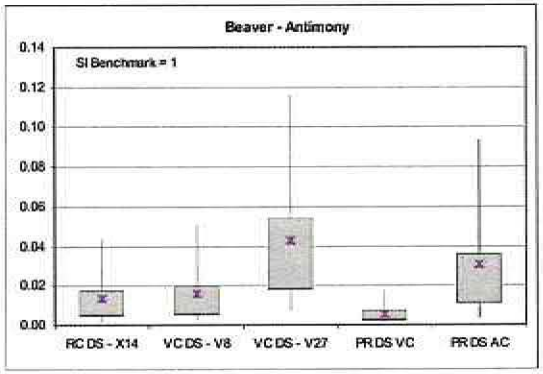
Figure 6.5 Screening Index Values for Terrestrial Ecological Receptors – Existing Conditions (Cont'd)

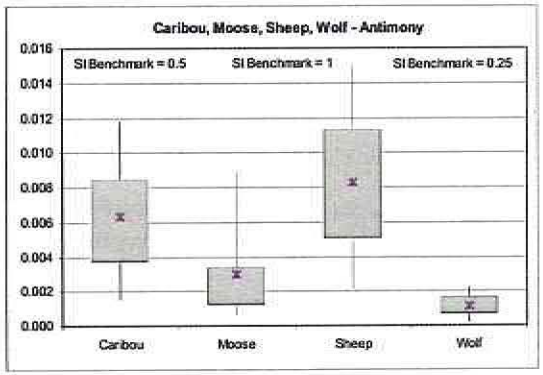


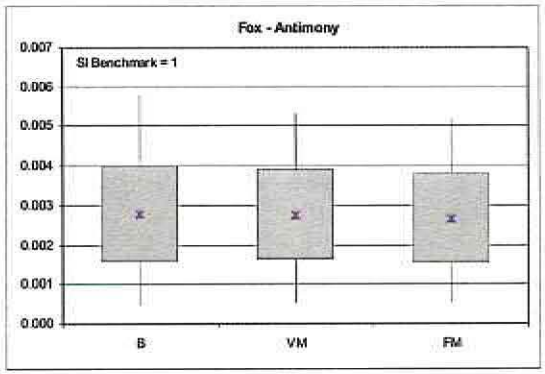
Note: The figures provide the predicted 5th, 25th, mean, 75th, and 95th percentile values:
RC US – Rose Creek Upstream, RC DS – Rose Creek Downstream, VC US – Vangorda Creek Upstream, VC DS – Vangorda Creek Downstream, PR US – Pelly River Upstream, PRX – Pelly River @ Pelly Crossing, B – Background, VS – Vangorda-S, FN – Faro-N, FS – Faro-S, FW – Faro-W, VM – Vangorda-M, FM – Faro-M

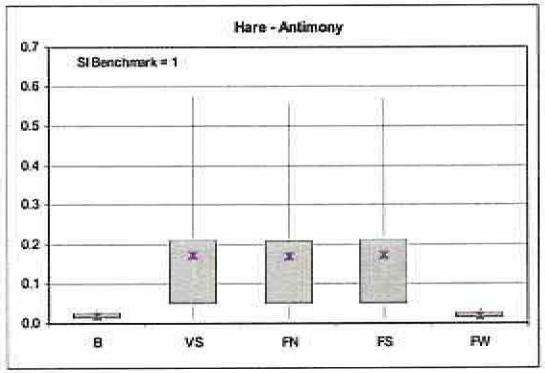
Figure 6.6 Screening Index Values for Terrestrial Ecological Receptors – Final Closure and Remediation Plan

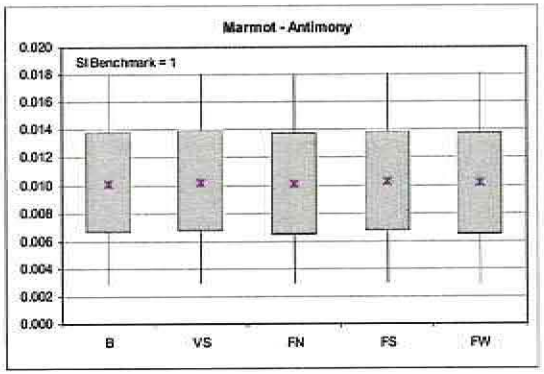


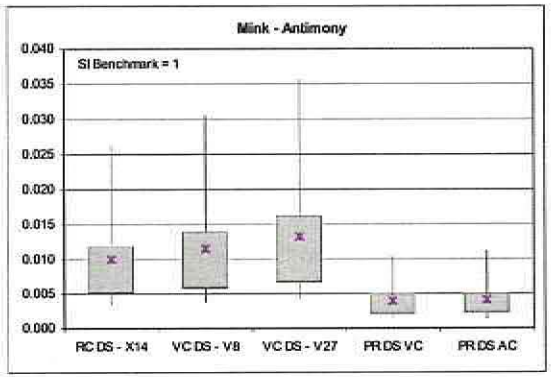


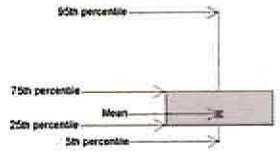








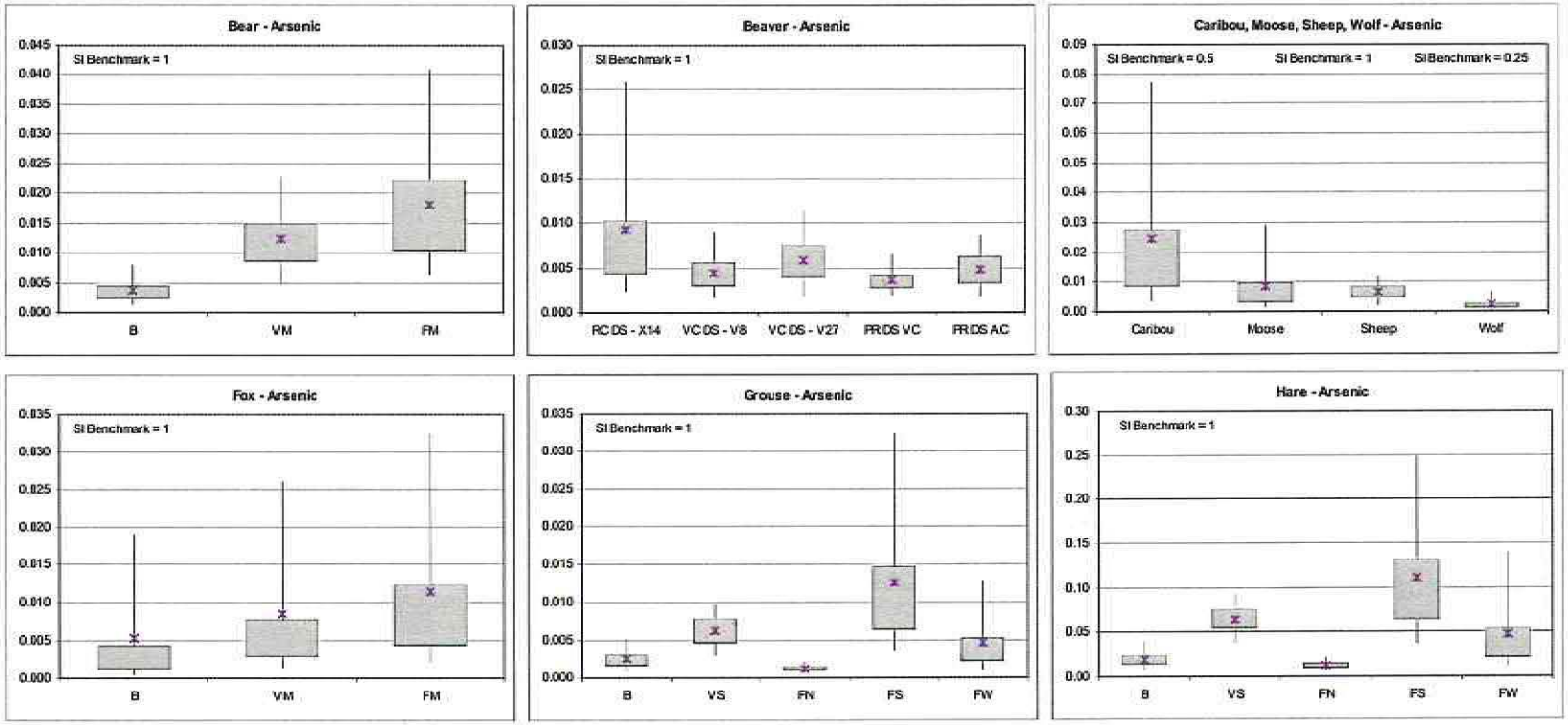




Note: The figures provide the predicted 5th, 25th, mean, 75th, and 95th percentile values:

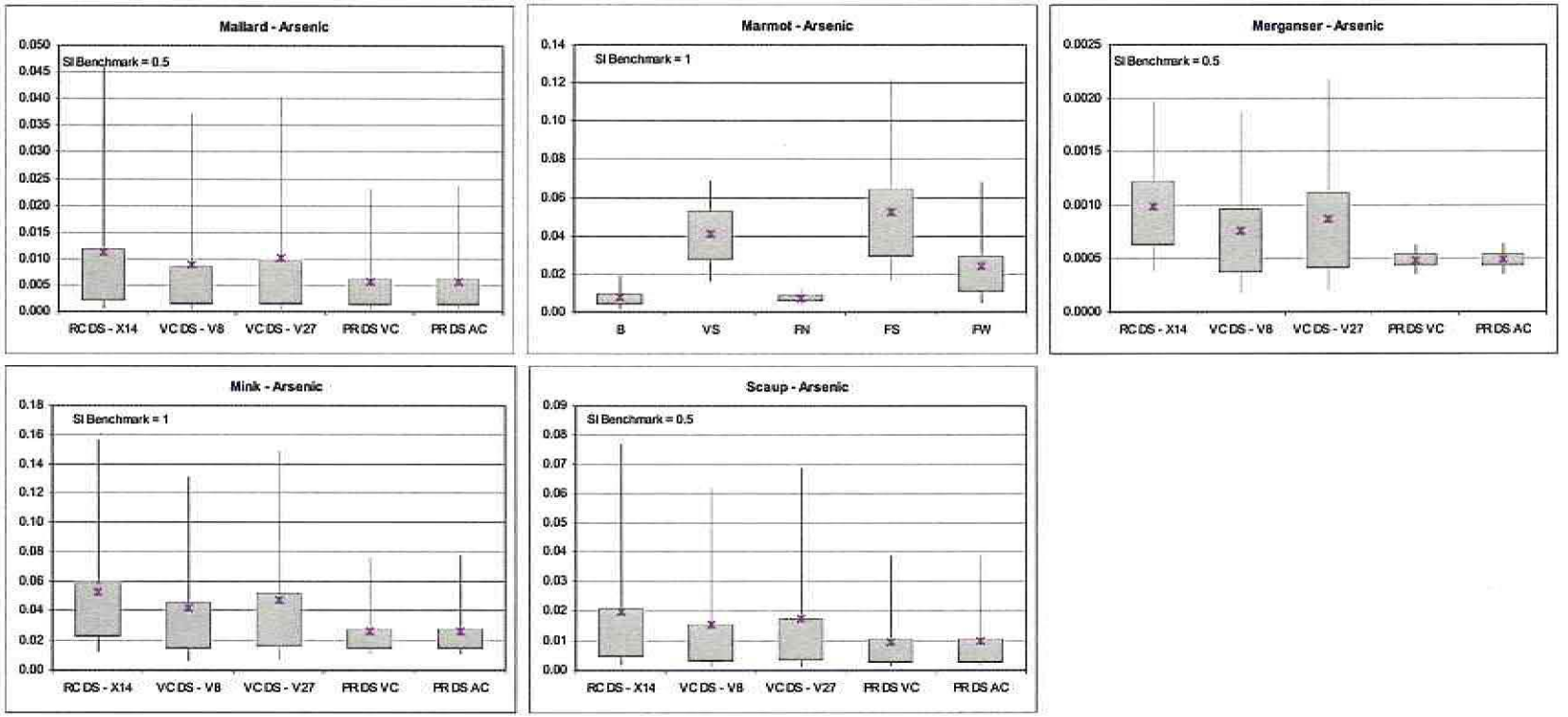
RC DS X14 – Rose Creek Downstream – X14, VC DS V8 – Vangorda Creek Downstream – V8, VC DS V27 – Vangorda Creek Downstream – V27, PR DS VC – Pelly River Downstream of Vangorda Creek, PR DS AC – Pelly River Downstream of Anvil Creek, B – Background, VS – Vangorda-S, FN – Faro-N, FS – Faro-S, FW – Faro-W, VM – Vangorda-M, FM – Faro-M

Figure 6.6 Screening Index Values for Terrestrial Ecological Receptors – Final Closure and Remediation Plan (Cont'd)



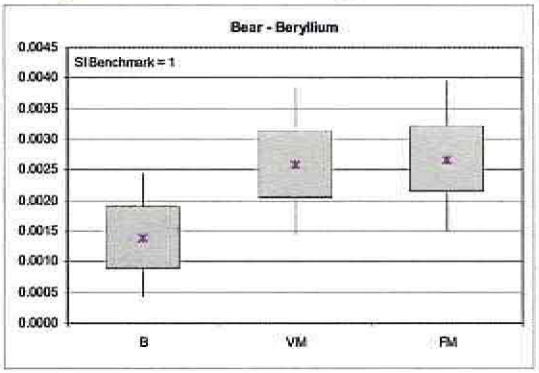
Note: The figures provide the predicted 5th, 25th, mean, 75th, and 95th percentile values:
RC DS X14 – Rose Creek Downstream – X14, VC DS V8 – Vangorda Creek Downstream – V8, VC DS V27 – Vangorda Creek Downstream – V27, PR DS VC – Pelly River Downstream of Vangorda Creek, PR DS AC – Pelly River Downstream of Anvil Creek, B – Background, VS – Vangorda-S, FN – Faro-N, FS – Faro-S, FW – Faro-W, VM – Vangorda-M, FM – Faro-M

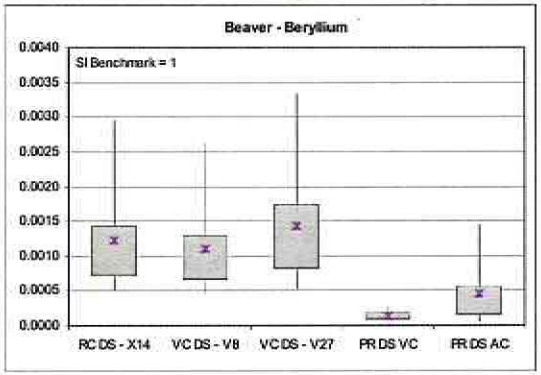
Figure 6.6 Screening Index Values for Terrestrial Ecological Receptors – Final Closure and Remediation Plan (Cont'd)

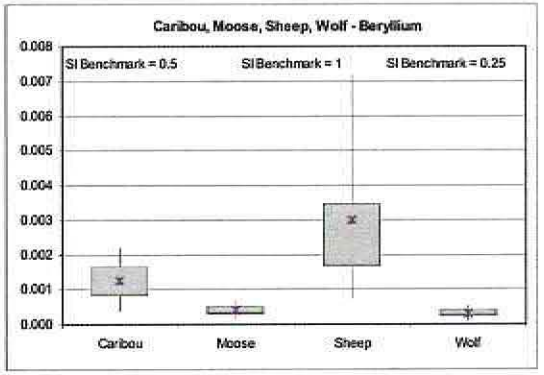


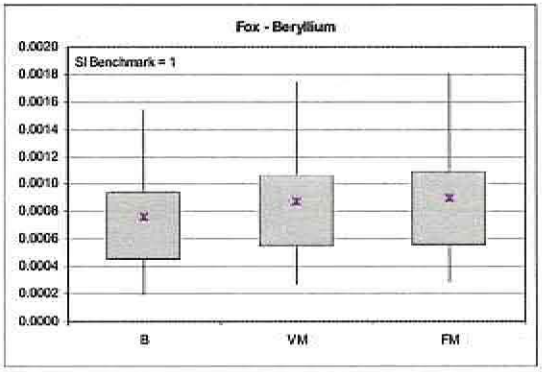
Note: The figures provide the predicted 5th, 25th, mean, 75th, and 95th percentile values:
RC DS X14 – Rose Creek Downstream – X14, VC DS V8 – Vangorda Creek Downstream – V8, VC DS V27 – Vangorda Creek Downstream – V27, PR DS VC – Pelly River Downstream of Vangorda Creek, PR DS AC – Pelly River Downstream of Anvil Creek, B – Background, VS – Vangorda-S, FN – Faro-N, FS – Faro-S, FW – Faro-W, VM – Vangorda-M, FM – Faro-M

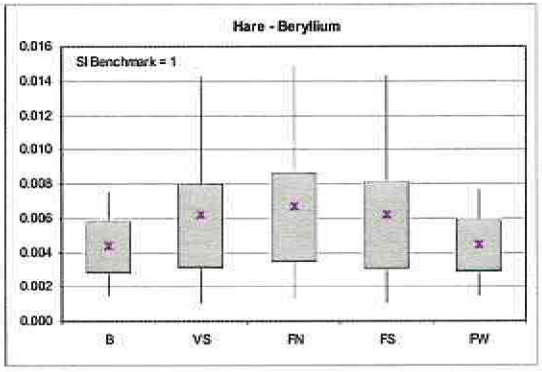
Figure 6.6 Screening Index Values for Terrestrial Ecological Receptors – Final Closure and Remediation Plan (Cont'd)

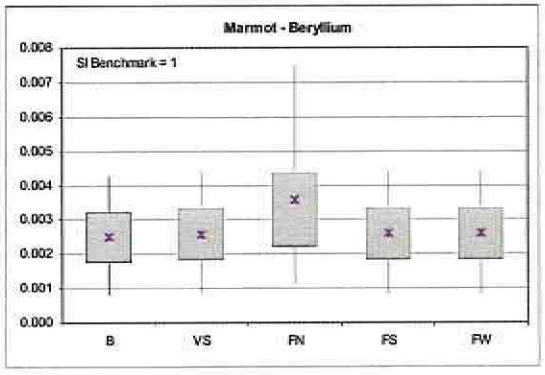


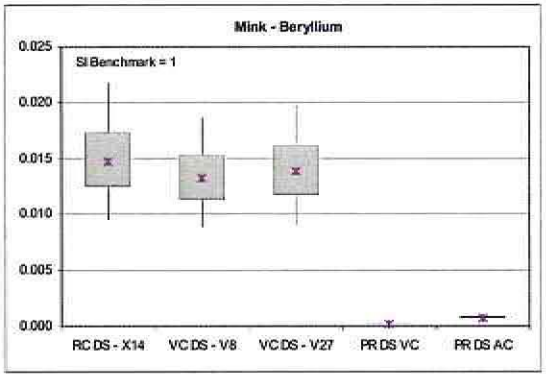


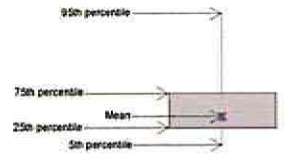






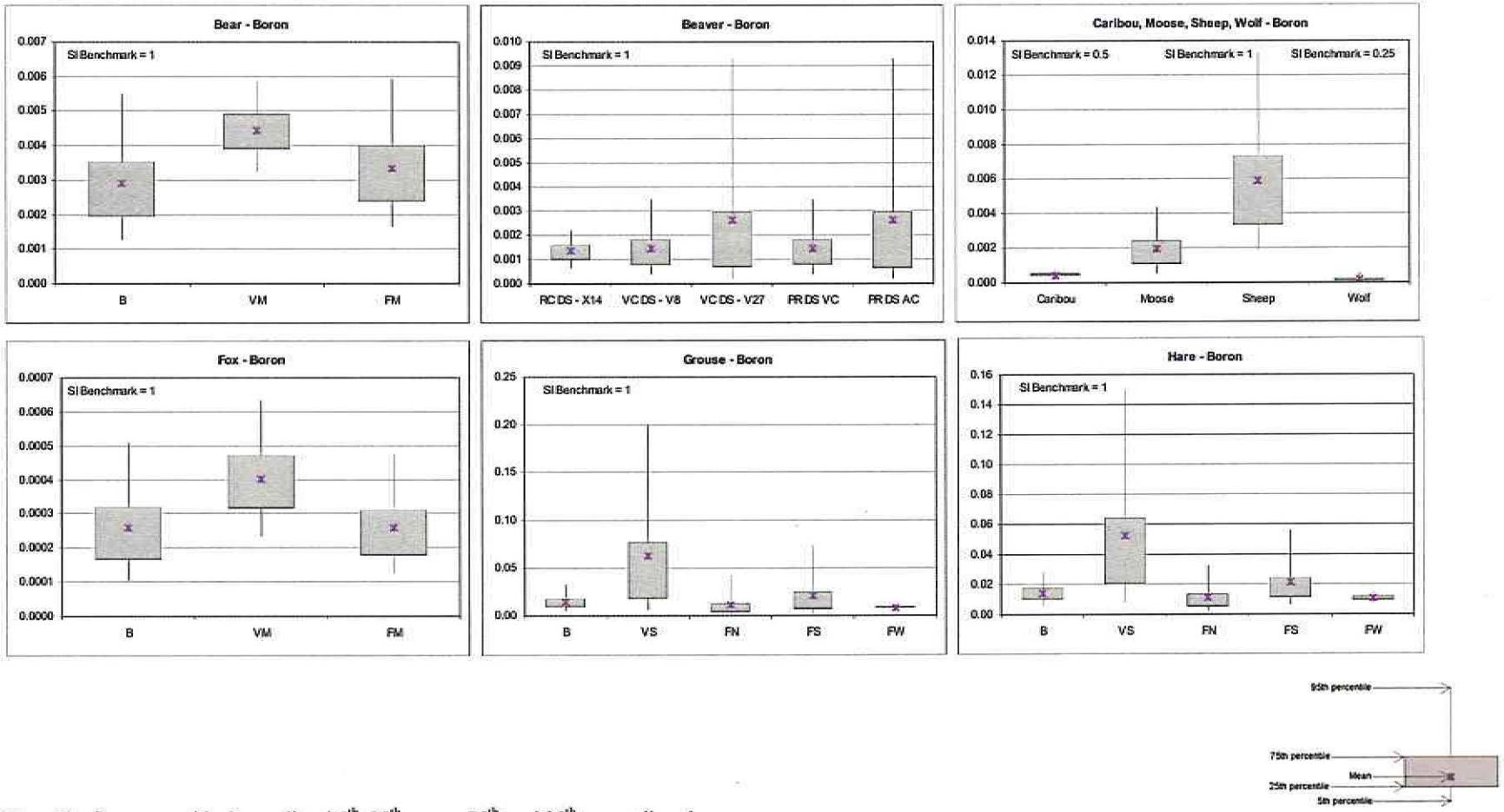






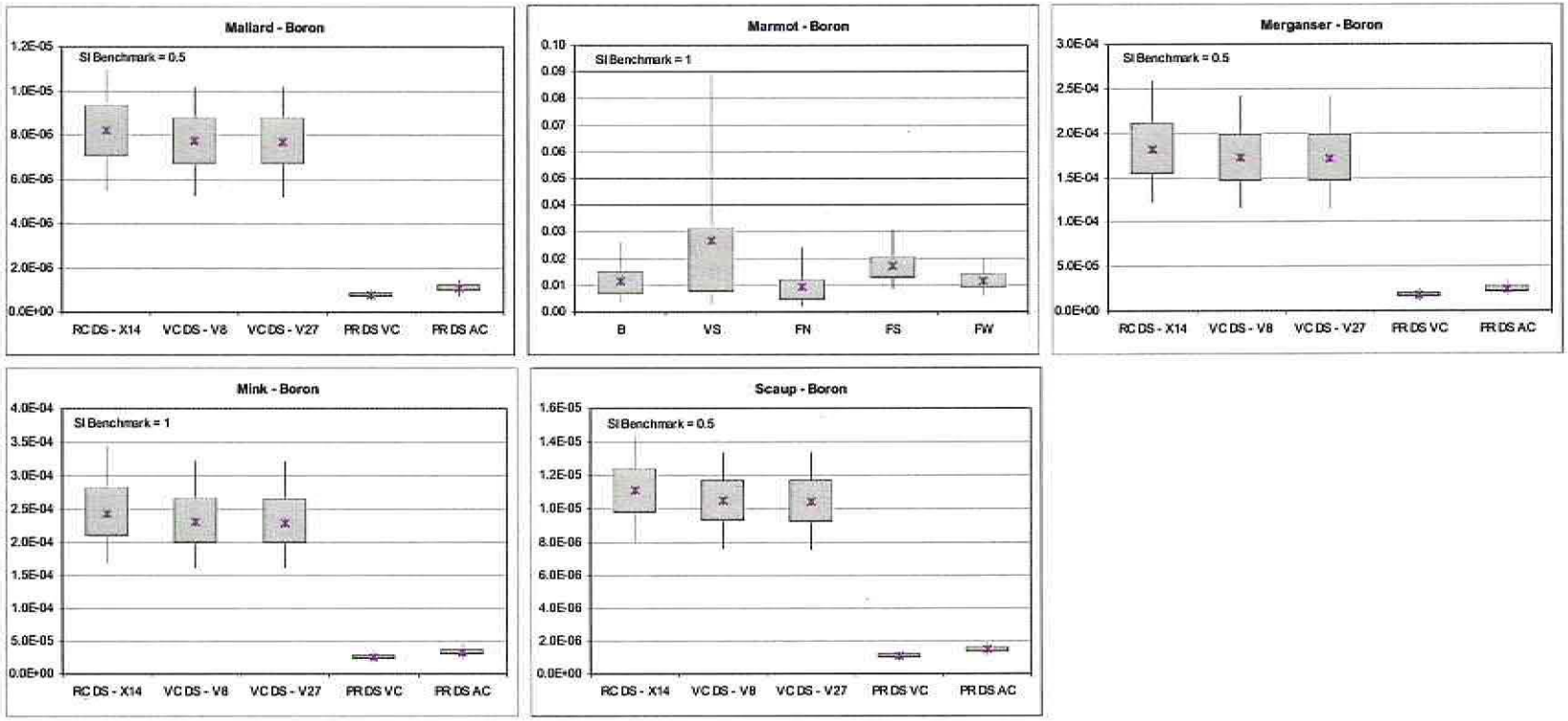
Note: The figures provide the predicted 5th, 25th, mean, 75th, and 95th percentile values:
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Figure 6.6 Screening Index Values for Terrestrial Ecological Receptors – Final Closure and Remediation Plan (Cont'd)



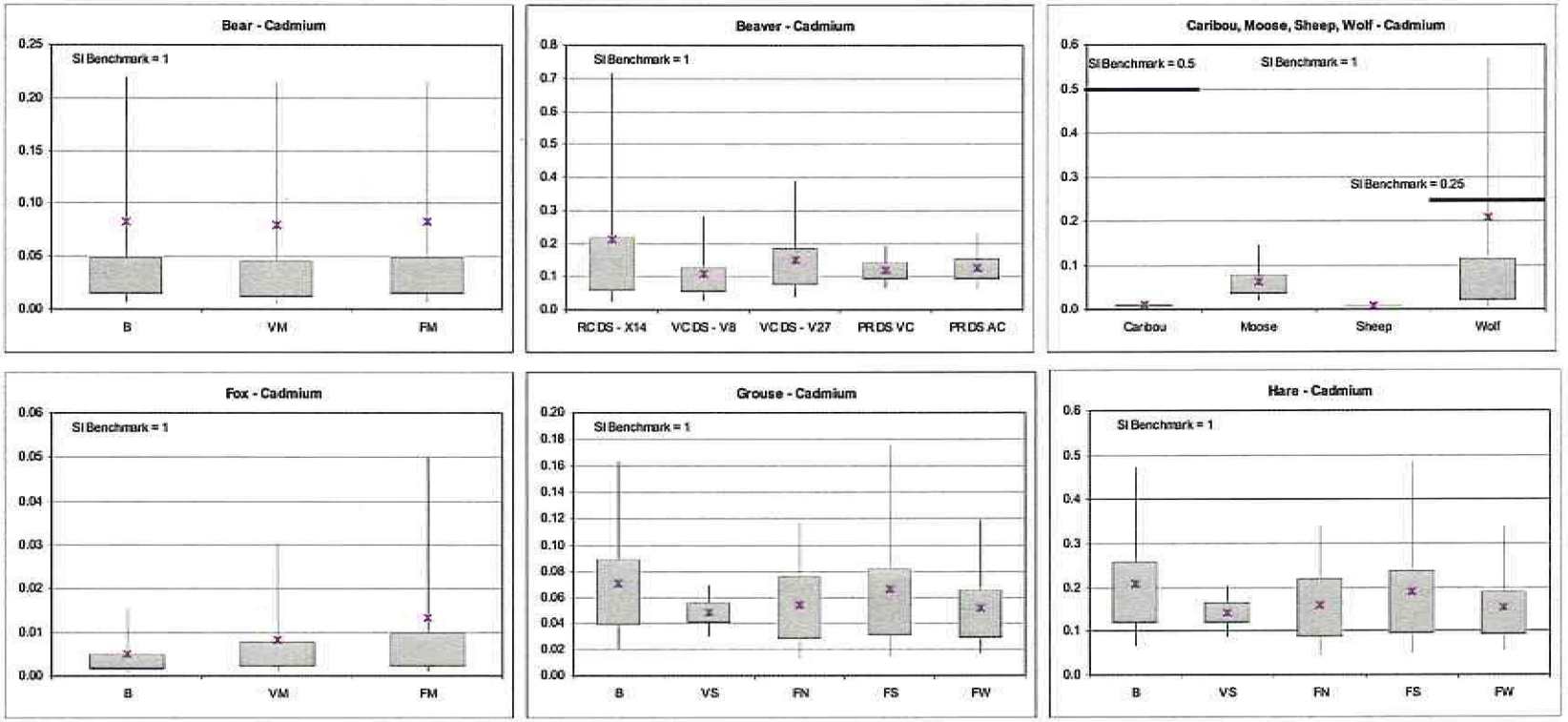
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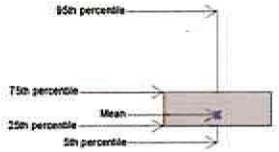
Figure 6.6 Screening Index Values for Terrestrial Ecological Receptors – Final Closure and Remediation Plan (Cont'd)



Note: The figures provide the predicted 5th, 25th, mean, 75th, and 95th percentile values:
RC DS X14 – Rose Creek Downstream – X14, VC DS V8 – Vangorda Creek Downstream – V8, VC DS V27 – Vangorda Creek Downstream – V27, PR DS VC – Pelly River Downstream of Vangorda Creek, PR DS AC – Pelly River Downstream of Anvil Creek, B – Background, VS – Vangorda-S, FN – Faro-N, FS – Faro-S, FW – Faro-W, VM – Vangorda-M, FM – Faro-M

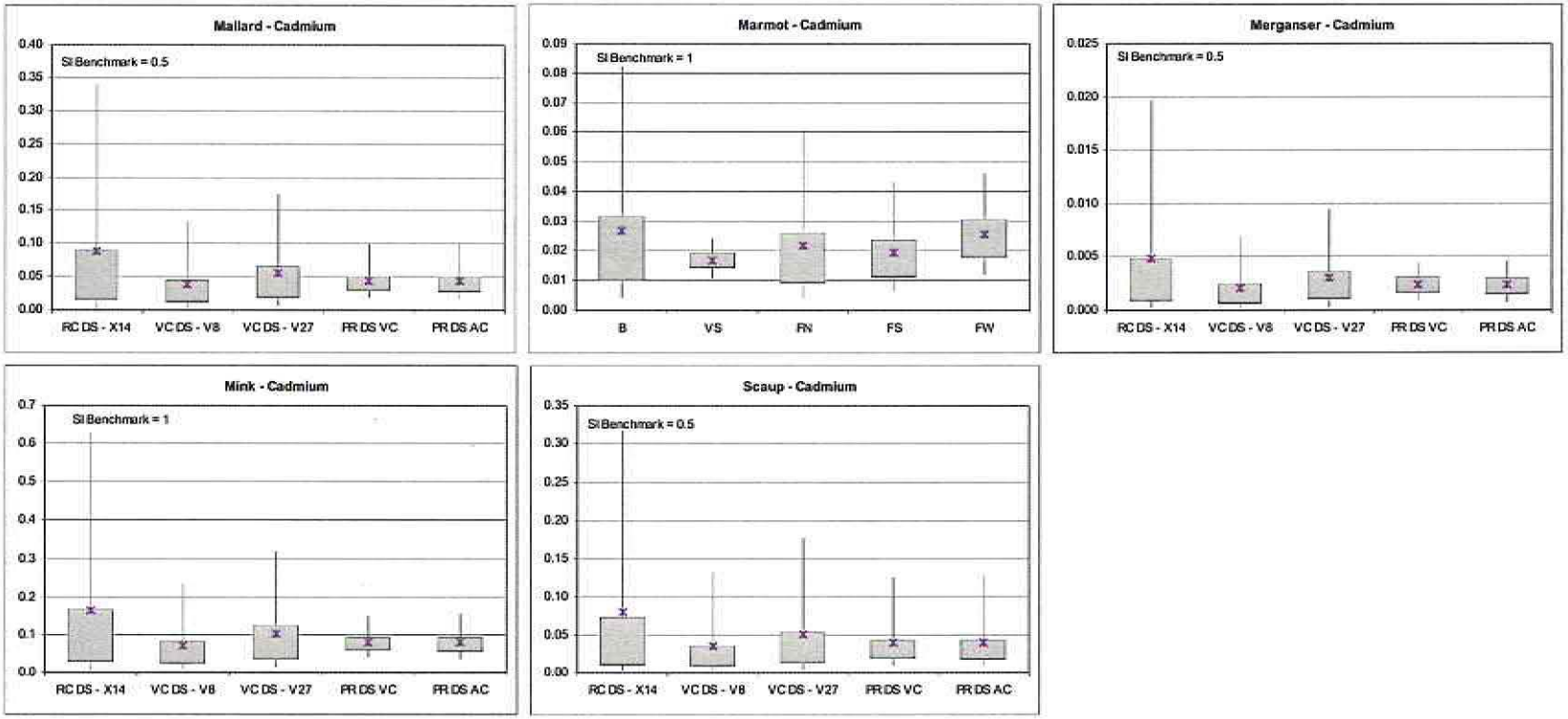
Figure 6.6 Screening Index Values for Terrestrial Ecological Receptors – Final Closure and Remediation Plan (Cont'd)





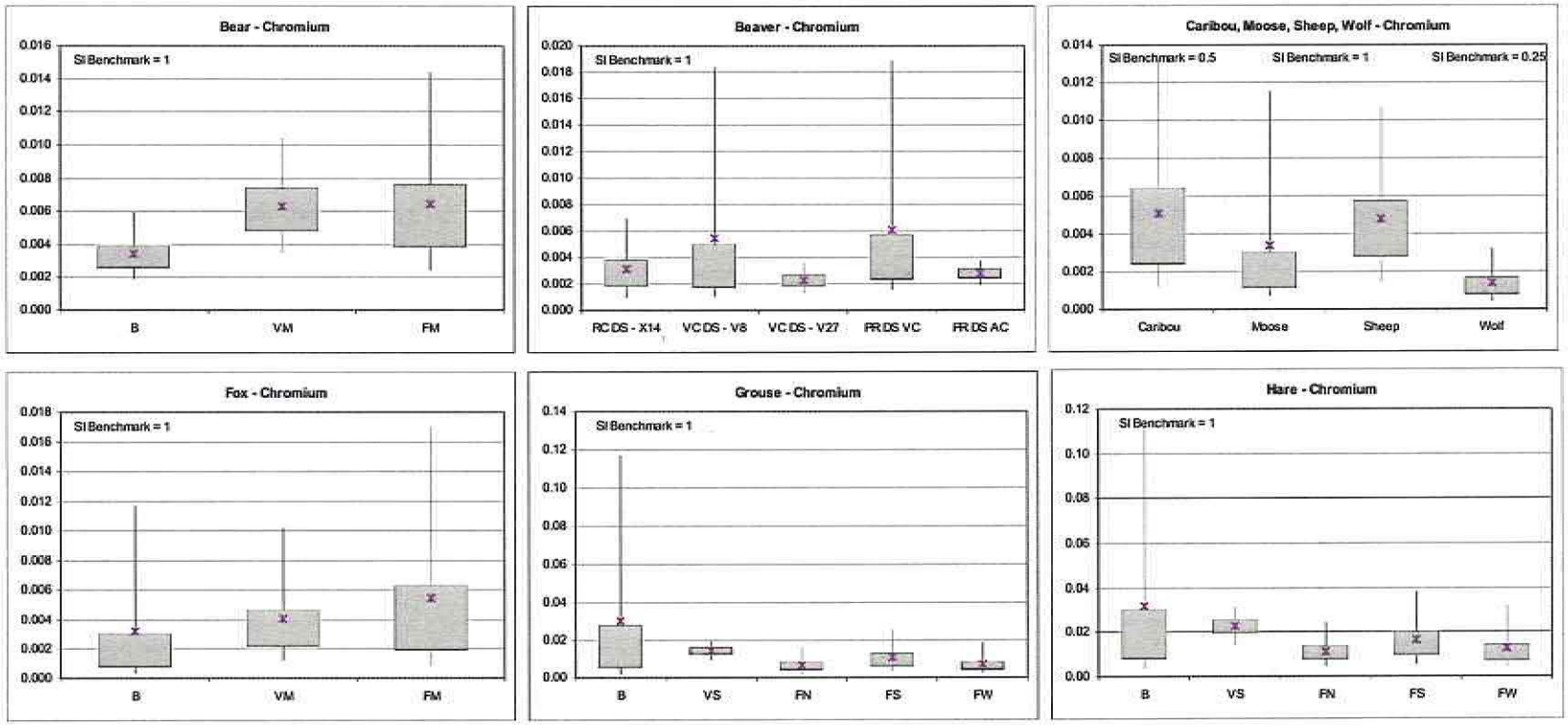
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Figure 6.6 Screening Index Values for Terrestrial Ecological Receptors – Final Closure and Remediation Plan (Cont'd)



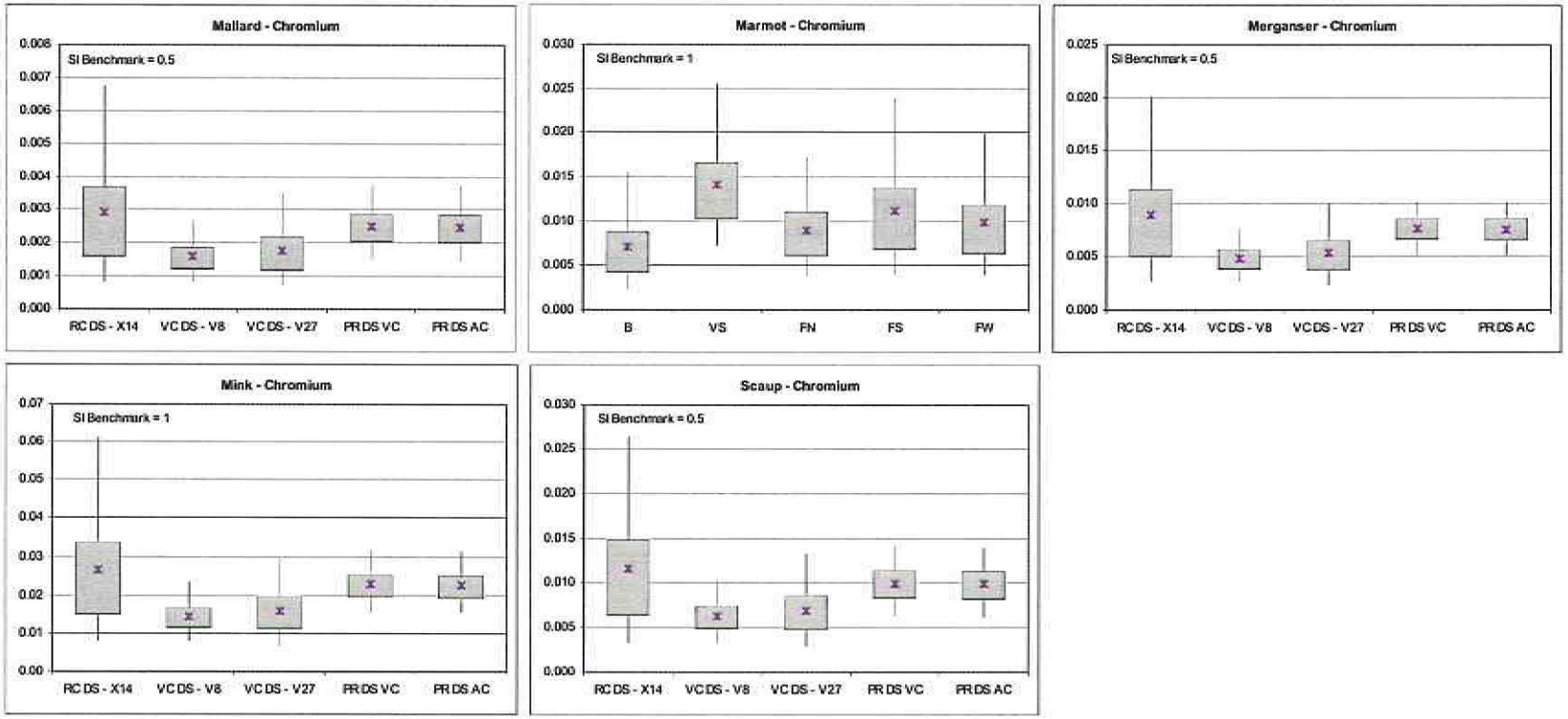
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Figure 6.6 Screening Index Values for Terrestrial Ecological Receptors – Final Closure and Remediation Plan (Cont'd)



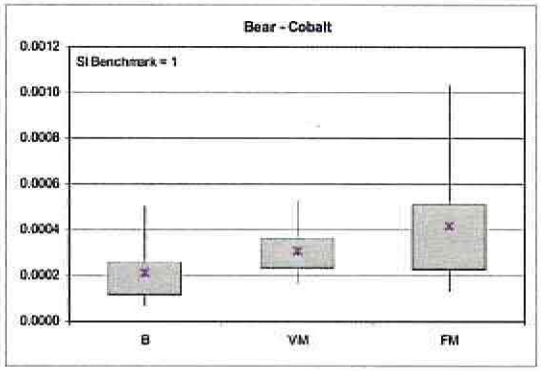
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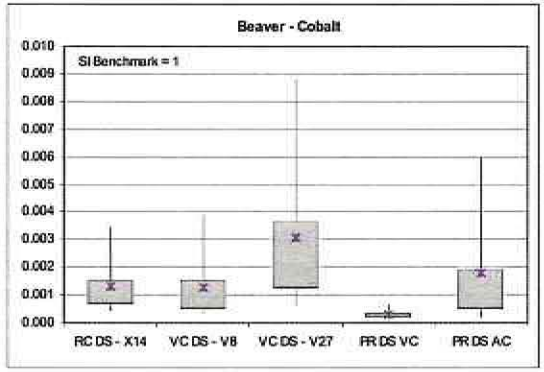
Figure 6.6 Screening Index Values for Terrestrial Ecological Receptors – Final Closure and Remediation Plan (Cont'd)

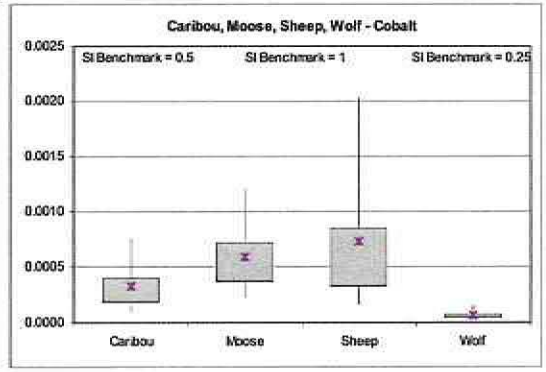


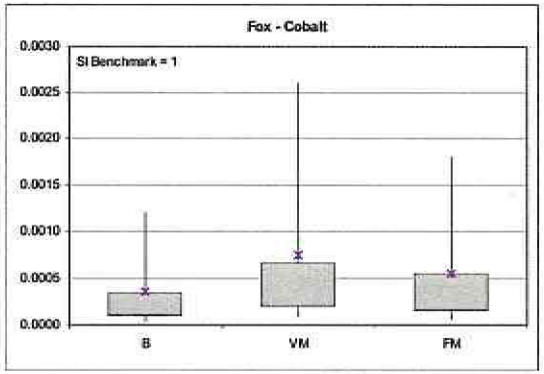
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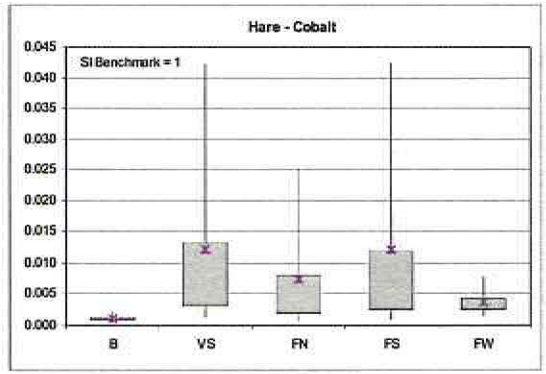
Figure 6.6 Screening Index Values for Terrestrial Ecological Receptors – Final Closure and Remediation Plan (Cont'd)

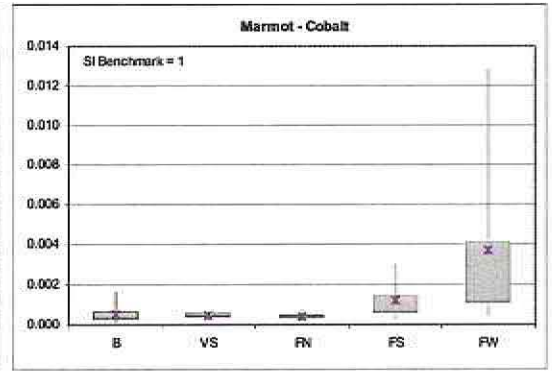


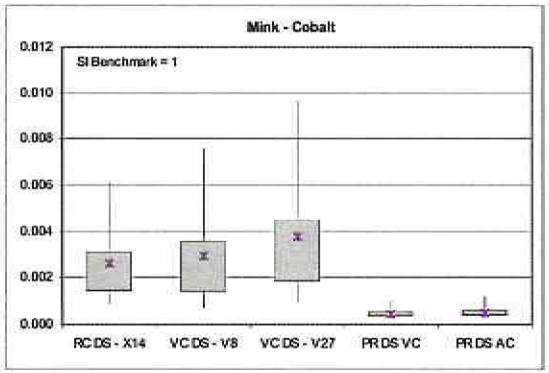


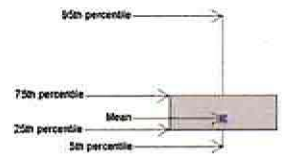








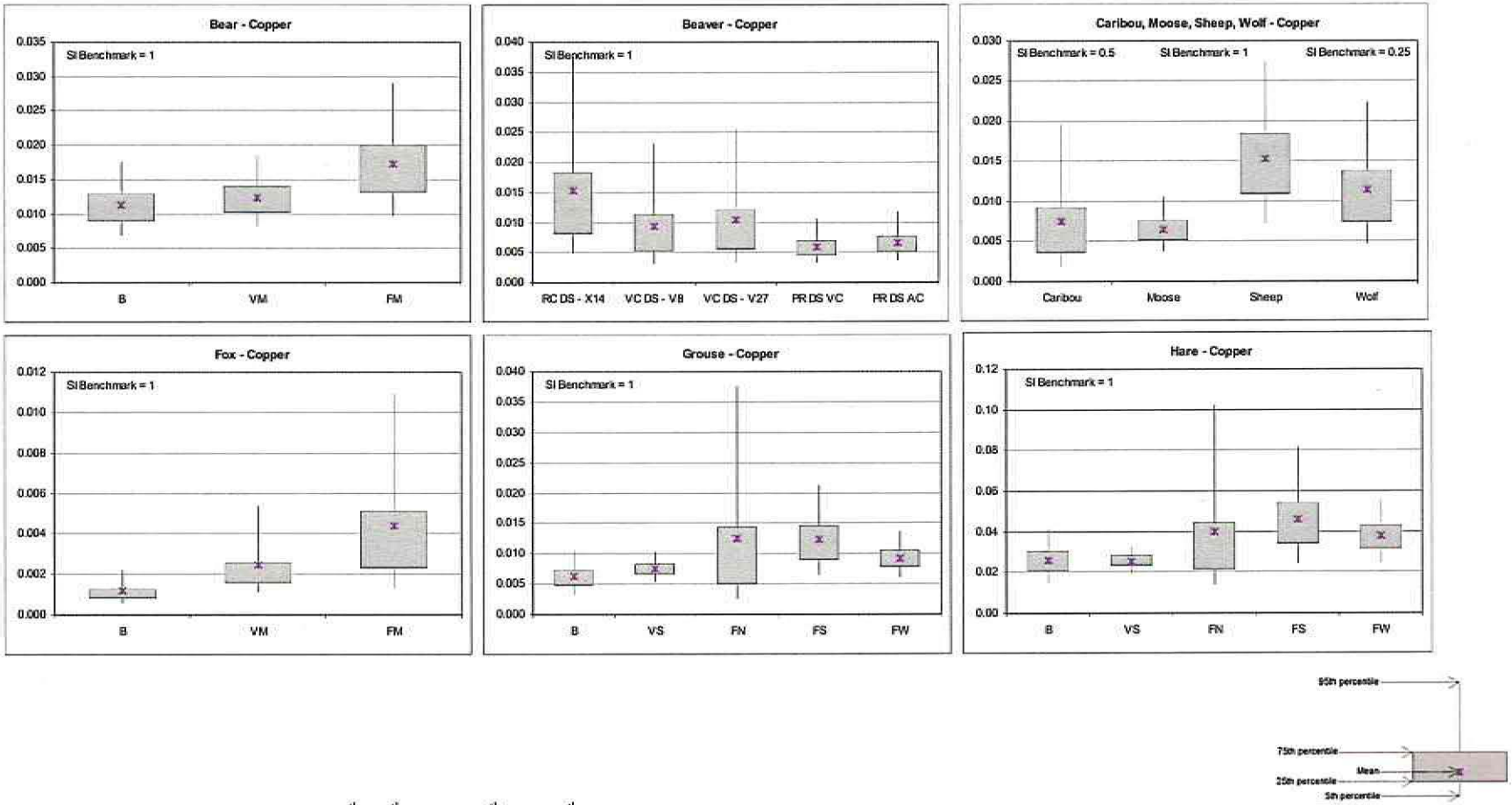




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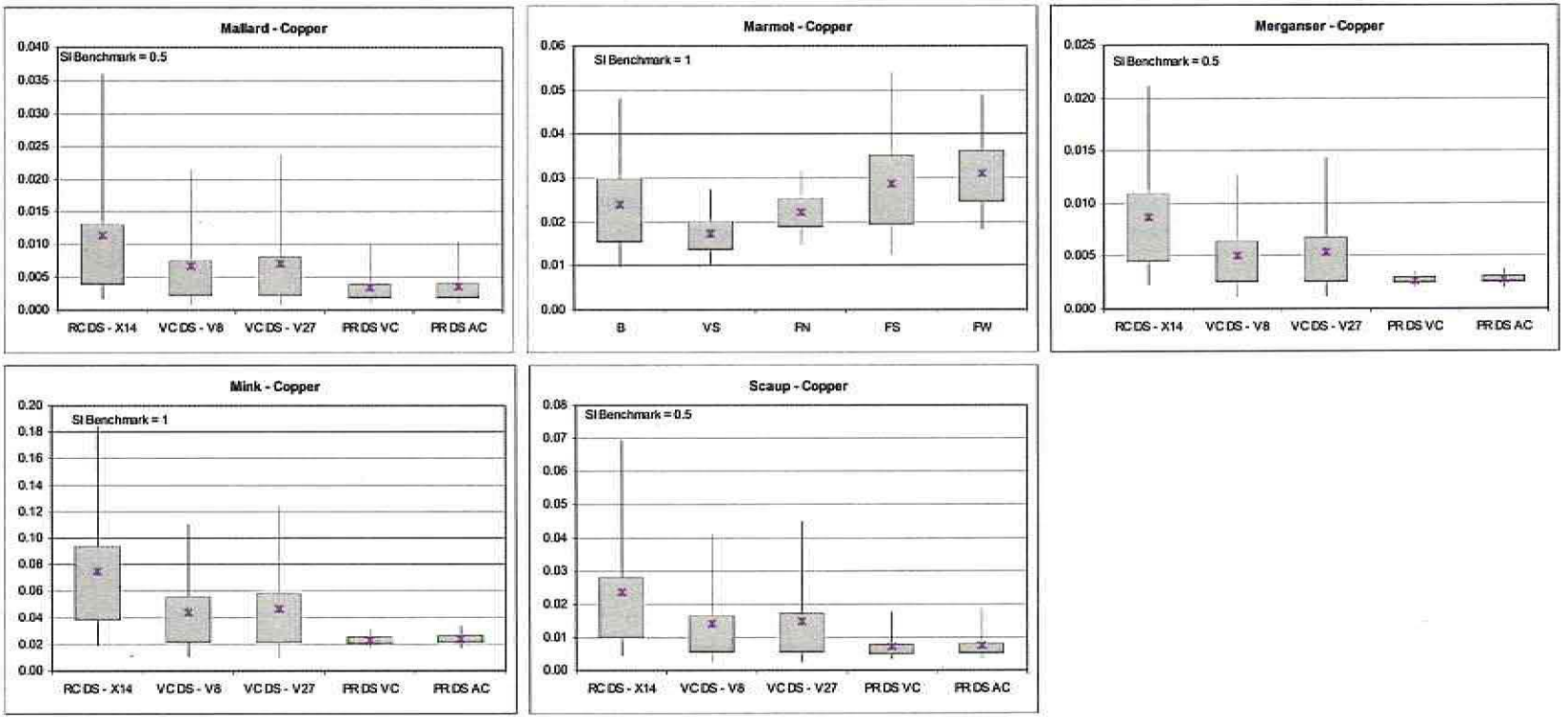
RC DS X14 – Rose Creek Downstream – X14, VC DS V8 – Vangorda Creek Downstream – V8, VC DS V27 – Vangorda Creek Downstream – V27, PR DS VC – Pelly River Downstream of Vangorda Creek, PR DS AC – Pelly River Downstream of Anvil Creek, B – Background, VS – Vangorda-S, FN – Faro-N, FS – Faro-S, FW – Faro-W, VM – Vangorda-M, FM – Faro-M

Figure 6.6 Screening Index Values for Terrestrial Ecological Receptors – Final Closure and Remediation Plan (Cont'd)



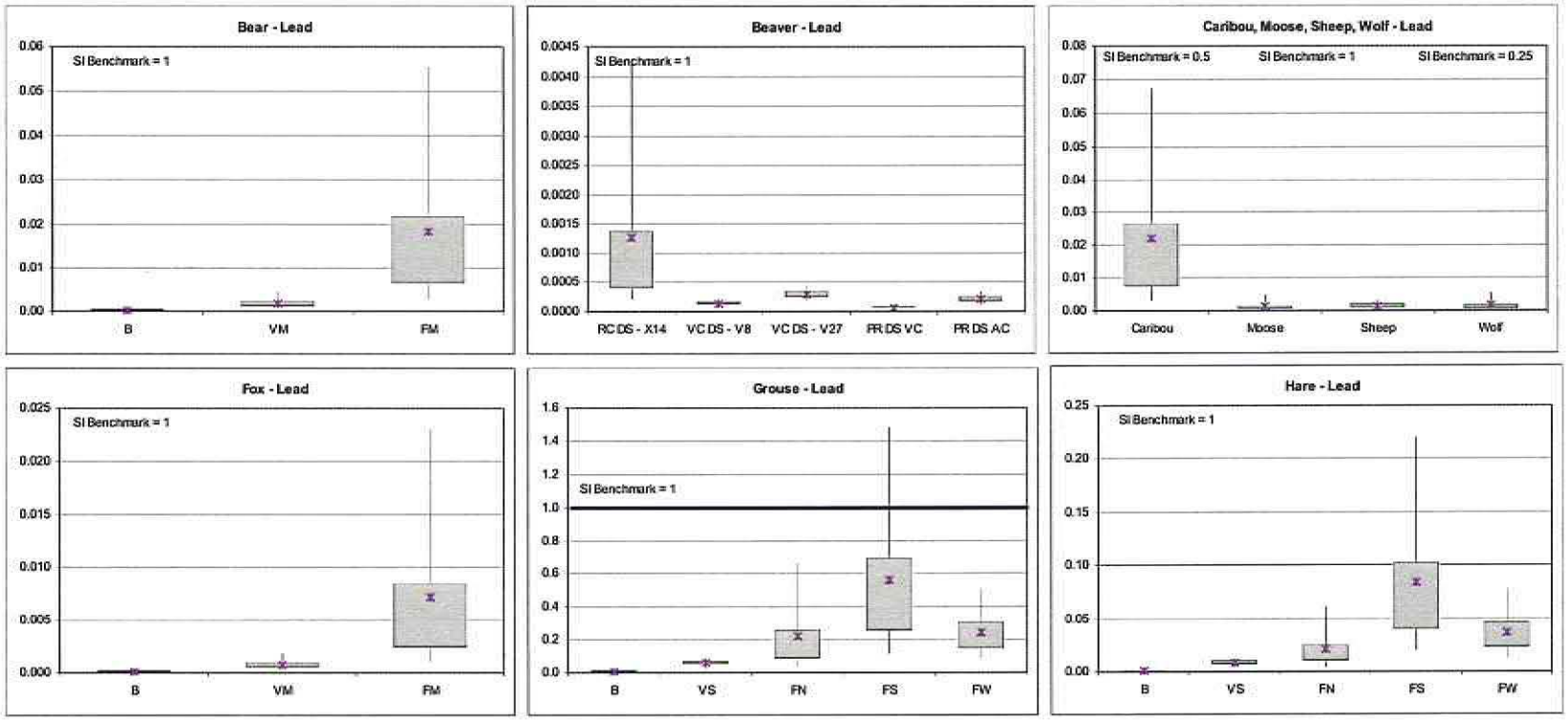
Note: The figures provide the predicted 5th, 25th, mean, 75th, and 95th percentile values:
RC DS X14 – Rose Creek Downstream – X14, VC DS V8 – Vangorda Creek Downstream – V8, VC DS V27 – Vangorda Creek Downstream – V27, PR DS VC – Pelly River Downstream of Vangorda Creek, PR DS AC – Pelly River Downstream of Anvil Creek, B – Background, VS – Vangorda-S, FN – Faro-N, FS – Faro-S, FW – Faro-W, VM – Vangorda-M, FM – Faro-M

Figure 6.6 Screening Index Values for Terrestrial Ecological Receptors – Final Closure and Remediation Plan (Cont'd)



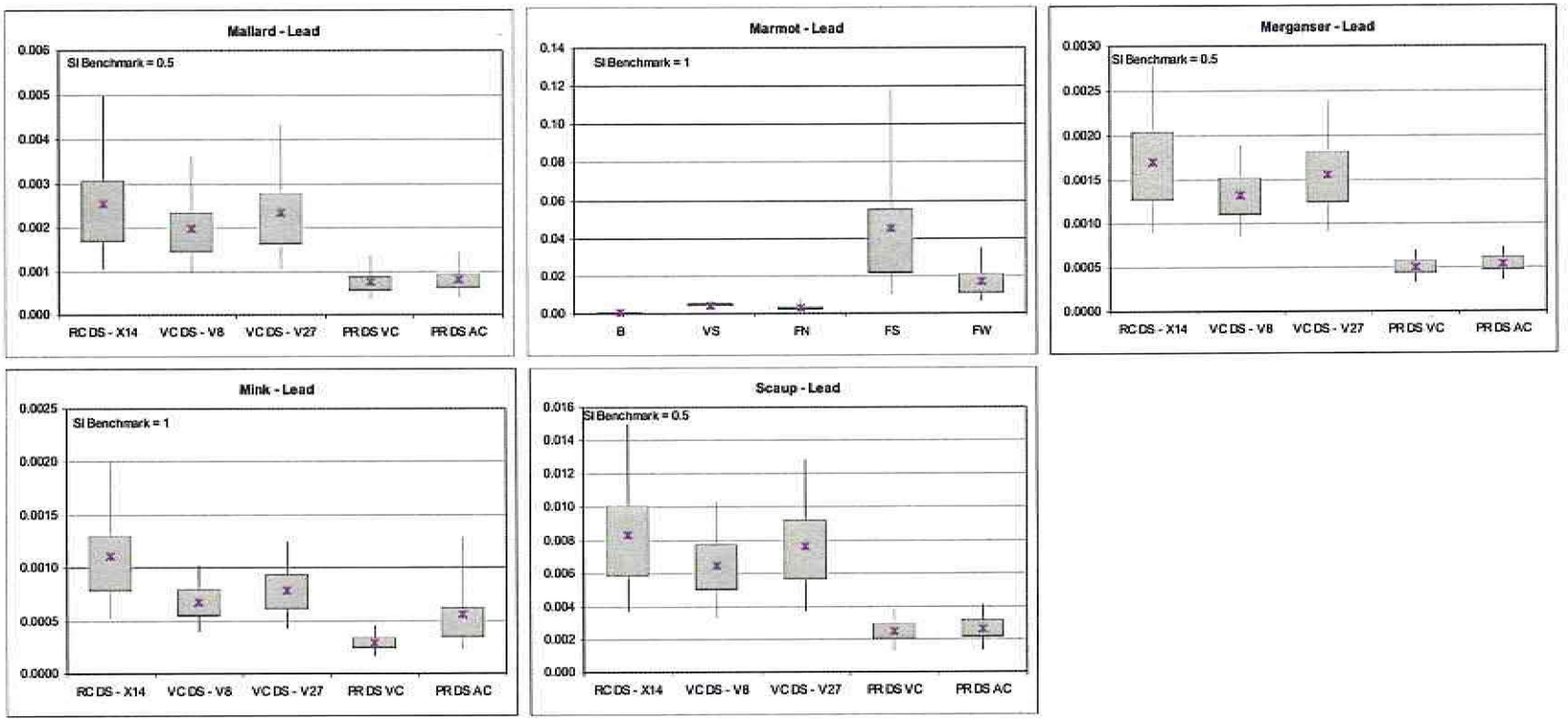
Note: The figures provide the predicted 5th, 25th, mean, 75th, and 95th percentile values:
RC DS X14 – Rose Creek Downstream – X14, VC DS V8 – Vangorda Creek Downstream – V8, VC DS V27 – Vangorda Creek Downstream – V27, PR DS VC – Pelly River Downstream of Vangorda Creek, PR DS AC – Pelly River Downstream of Anvil Creek, B – Background, VS – Vangorda-S, FN – Faro-N, FS – Faro-S, FW – Faro-W, VM – Vangorda-M, FM – Faro-M

Figure 6.6 Screening Index Values for Terrestrial Ecological Receptors – Final Closure and Remediation Plan (Cont'd)



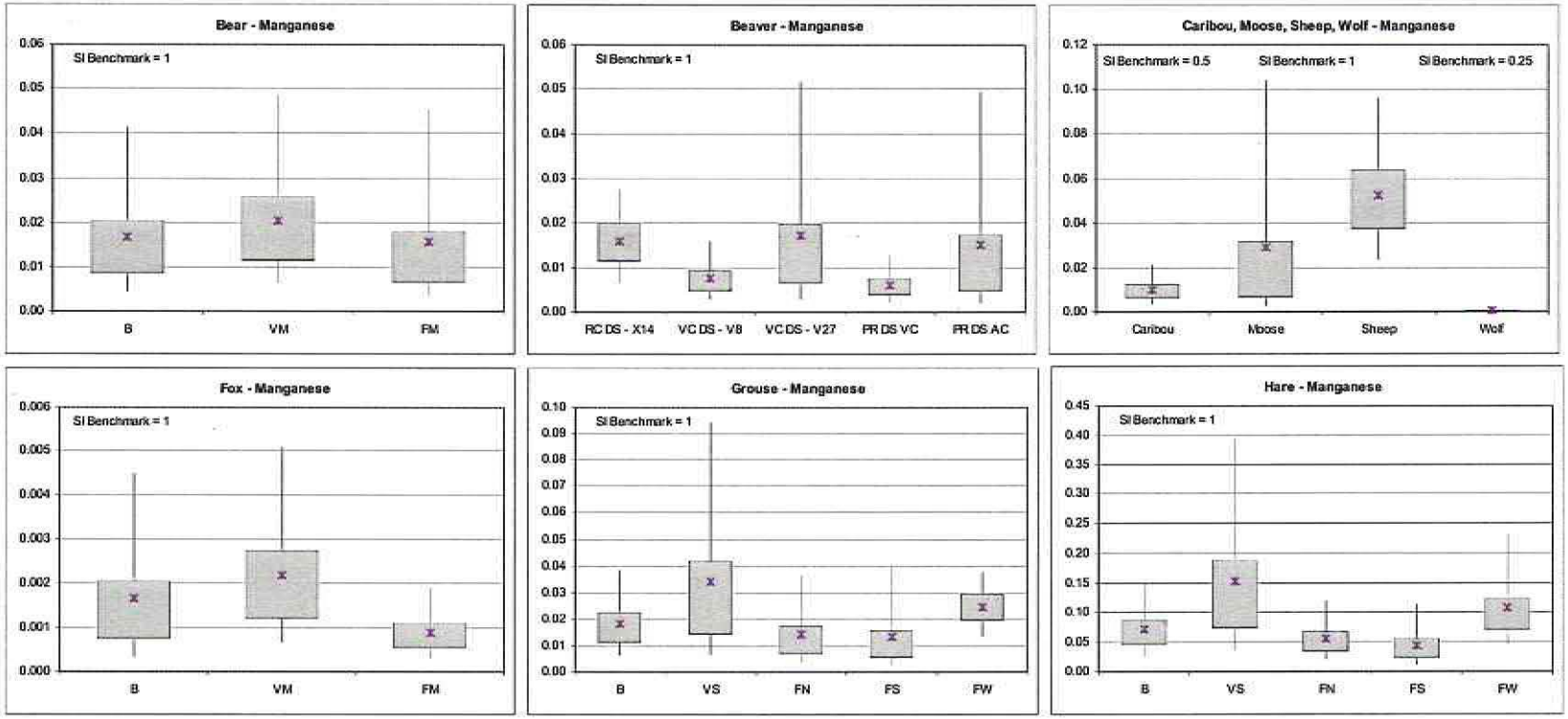
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RC DS X14 – Rose Creek Downstream – X14, VC DS V8 – Vangorda Creek Downstream – V8, VC DS V27 – Vangorda Creek Downstream – V27, PR DS VC – Pelly River Downstream of Vangorda Creek, PR DS AC – Pelly River Downstream of Anvil Creek, B – Background, VS – Vangorda-S, FN – Faro-N, FS – Faro-S, FW – Faro-W, VM – Vangorda-M, FM – Faro-M

Figure 6.6 Screening Index Values for Terrestrial Ecological Receptors – Final Closure and Remediation Plan (Cont'd)



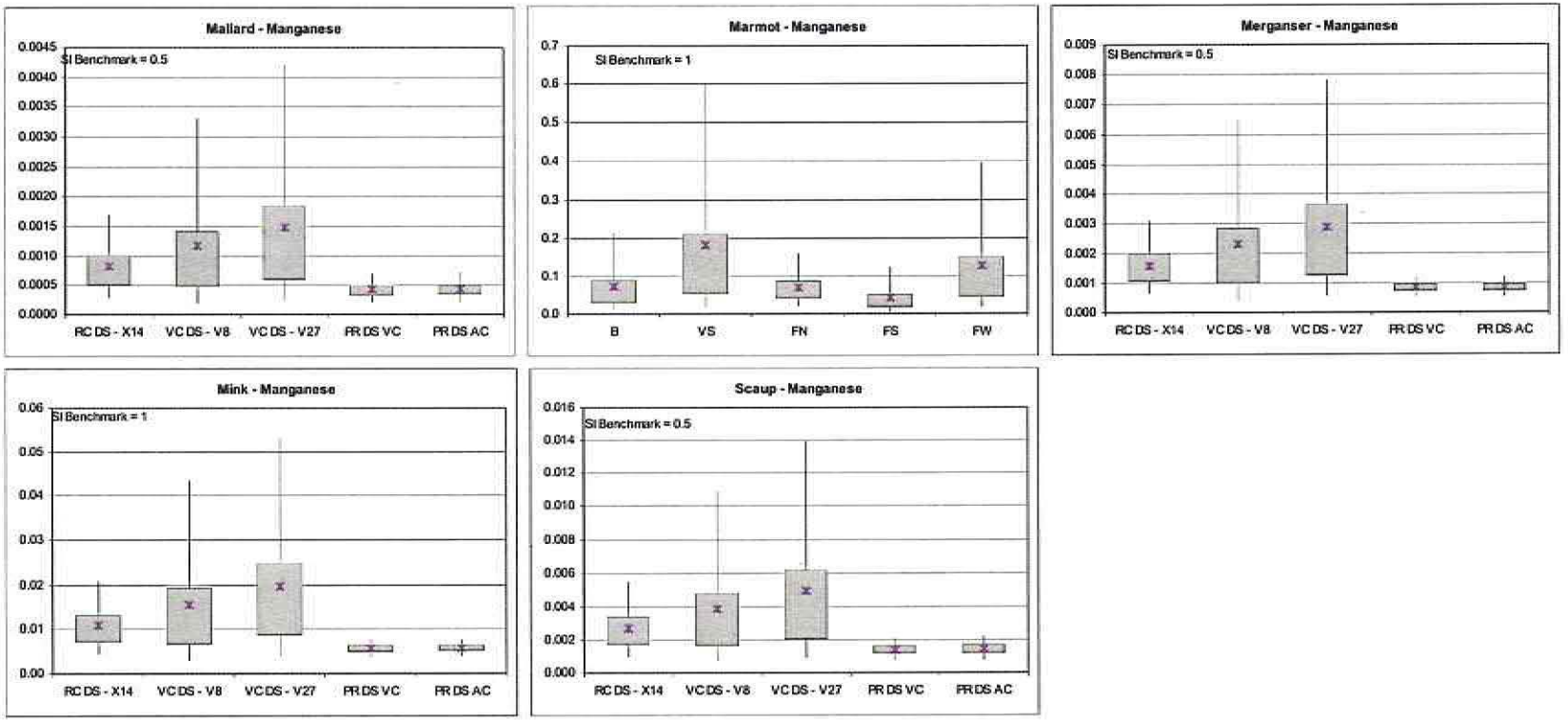
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Figure 6.6 Screening Index Values for Terrestrial Ecological Receptors – Final Closure and Remediation Plan (Cont'd)



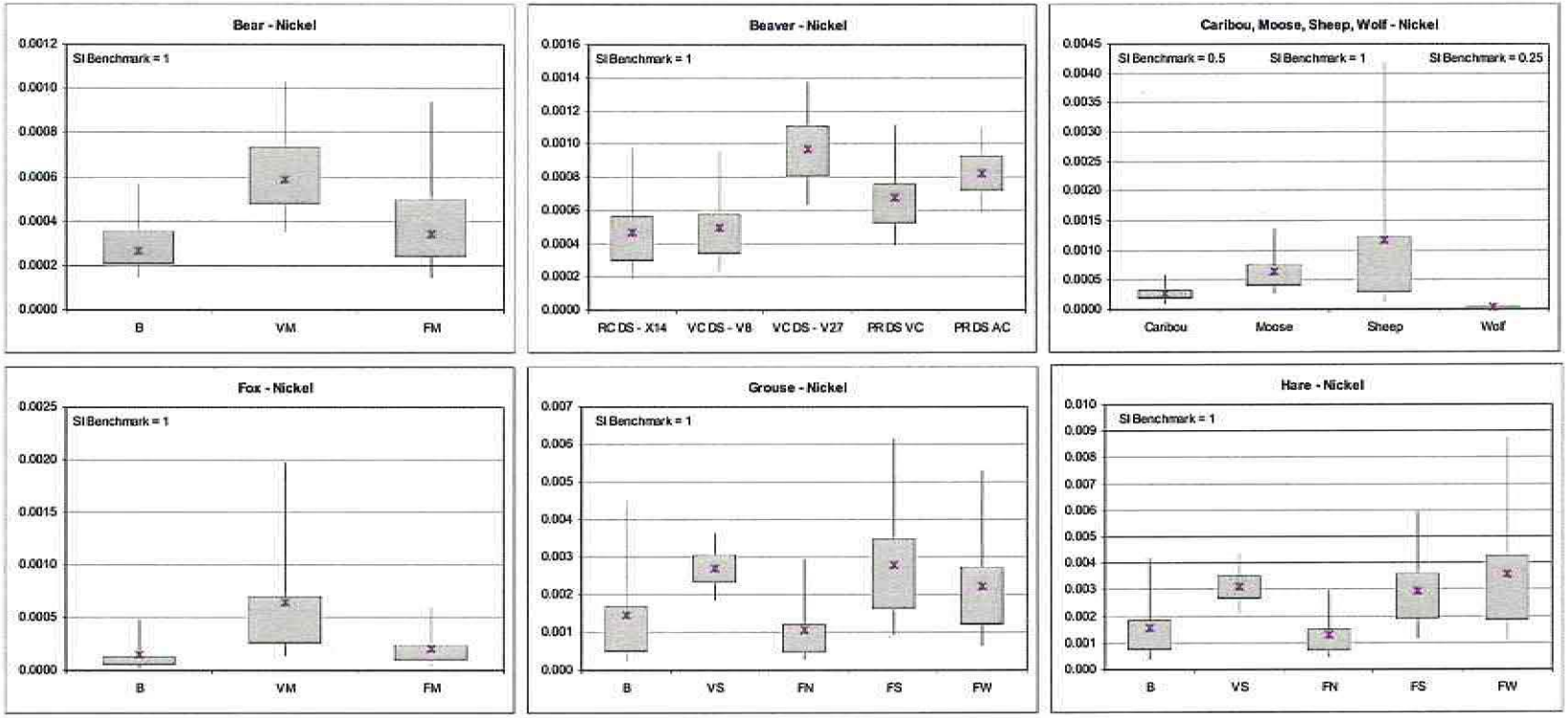
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Figure 6.6 Screening Index Values for Terrestrial Ecological Receptors – Final Closure and Remediation Plan (Cont'd)



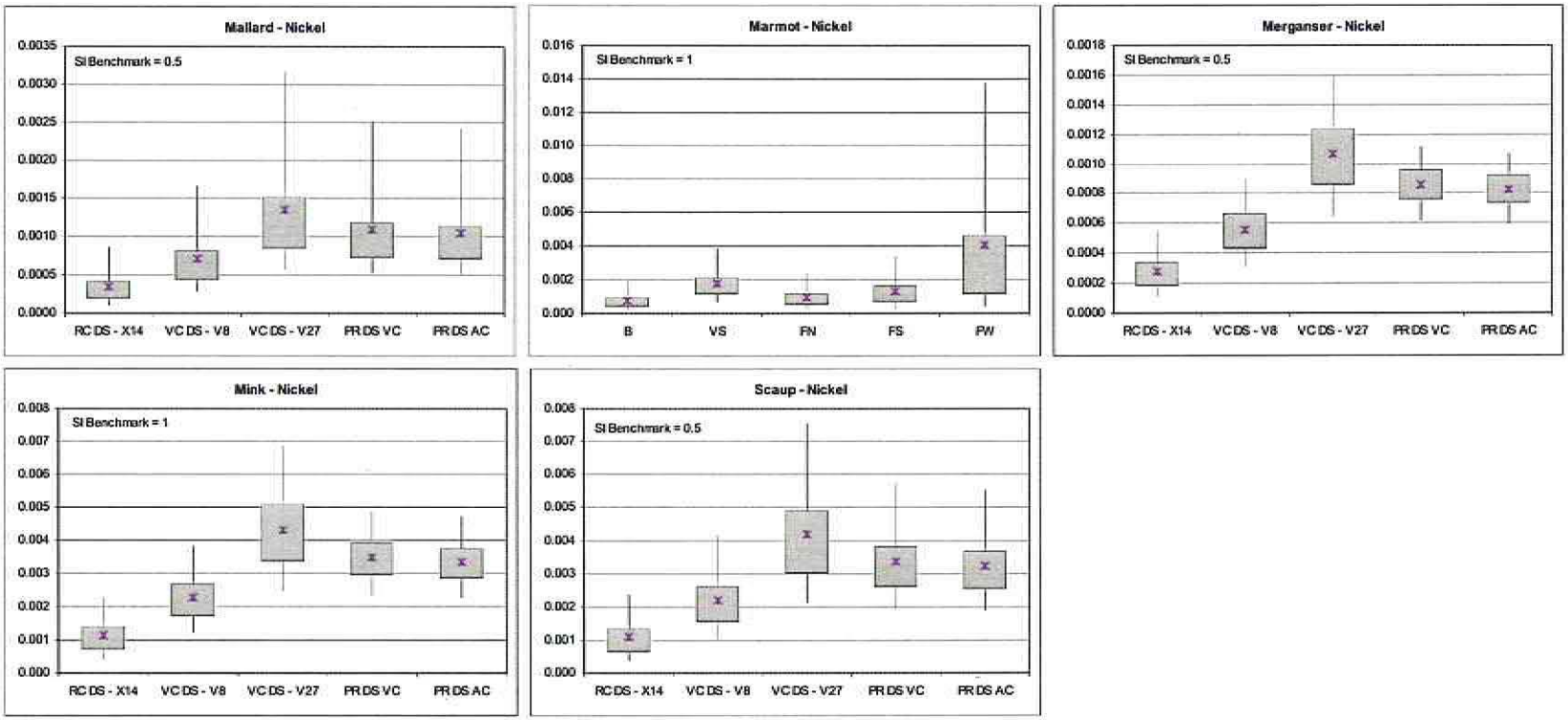
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Figure 6.6 Screening Index Values for Terrestrial Ecological Receptors – Final Closure and Remediation Plan (Cont'd)



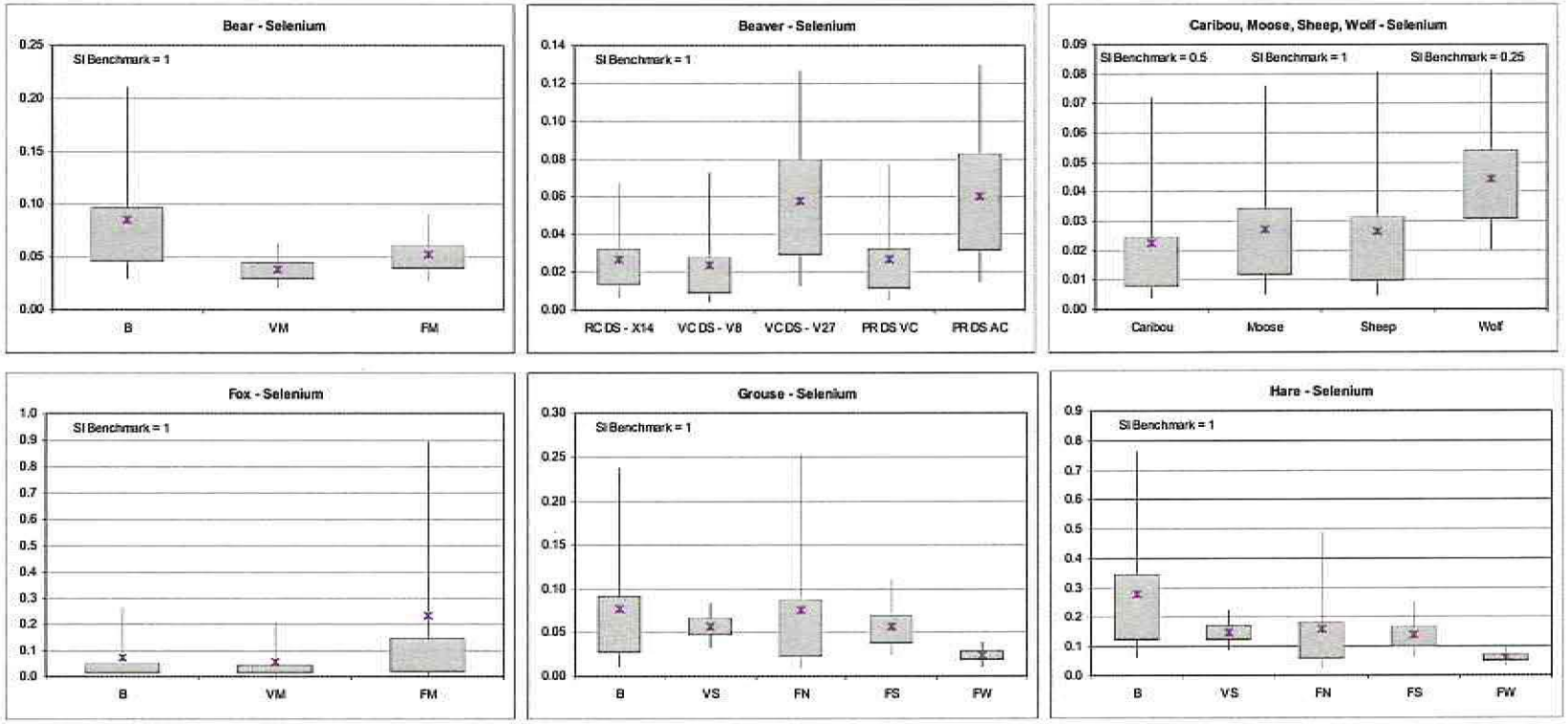
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Figure 6.6 Screening Index Values for Terrestrial Ecological Receptors – Final Closure and Remediation Plan (Cont'd)



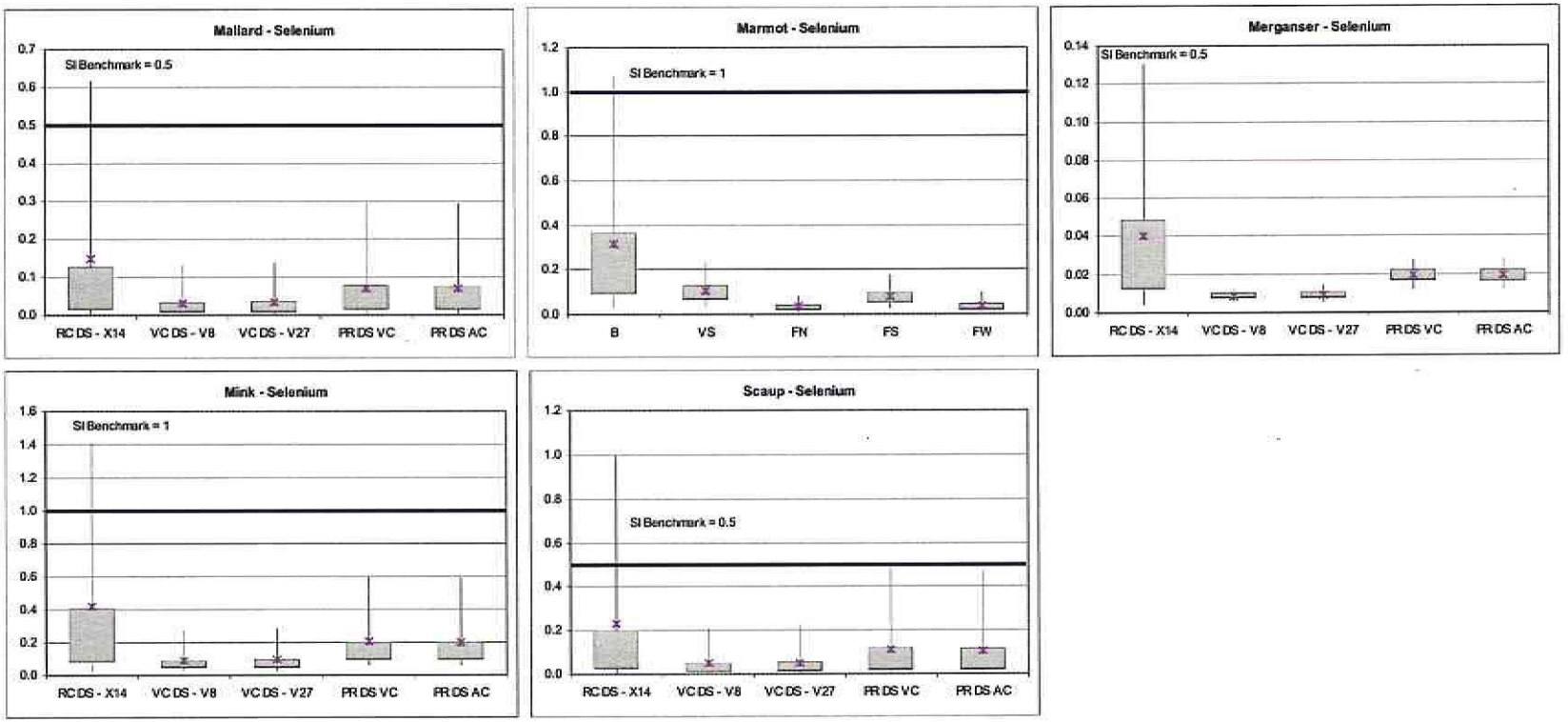
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Figure 6.6 Screening Index Values for Terrestrial Ecological Receptors – Final Closure and Remediation Plan (Cont'd)



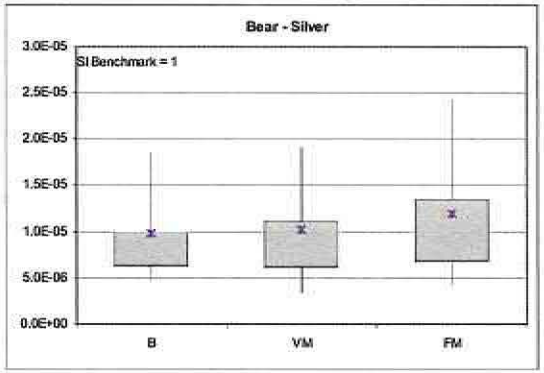
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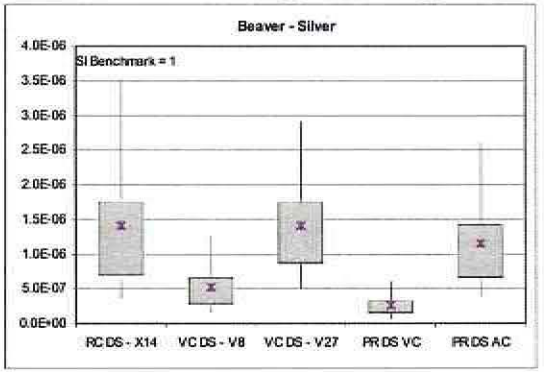
Figure 6.6 Screening Index Values for Terrestrial Ecological Receptors – Final Closure and Remediation Plan (Cont'd)

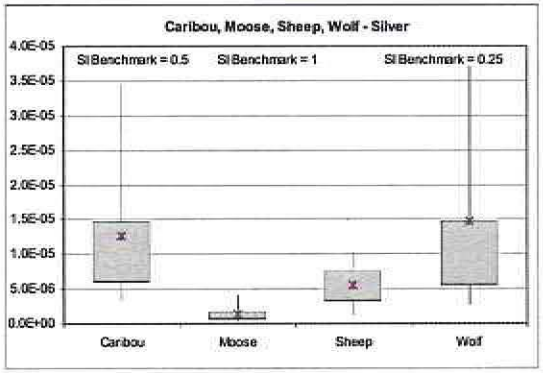


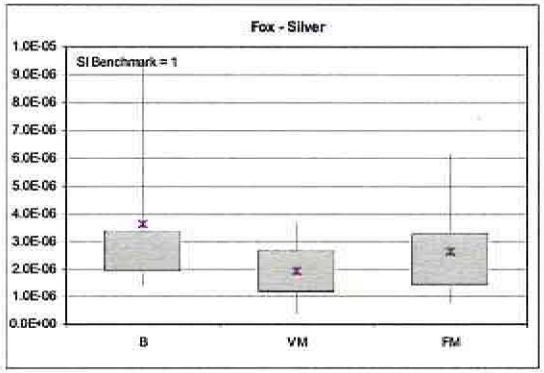
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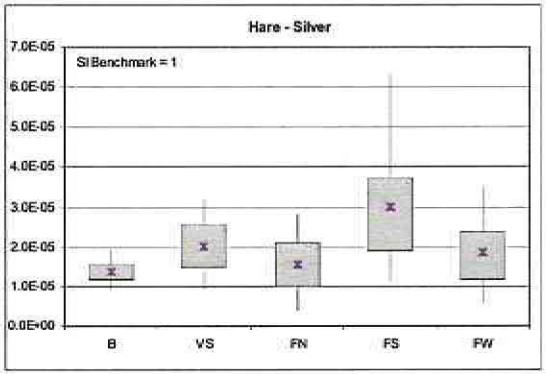
Figure 6.6 Screening Index Values for Terrestrial Ecological Receptors – Final Closure and Remediation Plan (Cont'd)

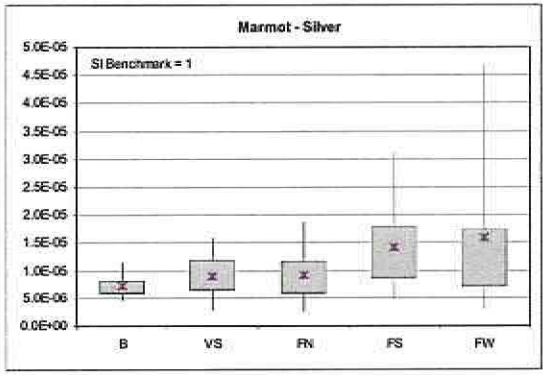


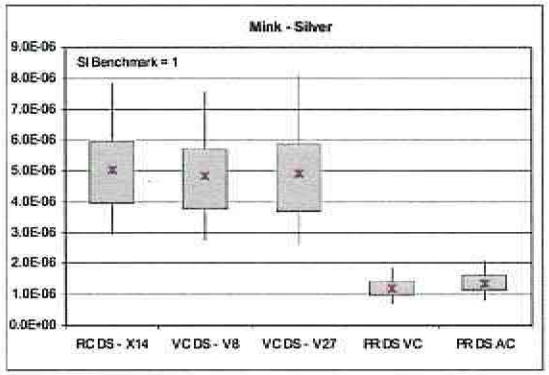


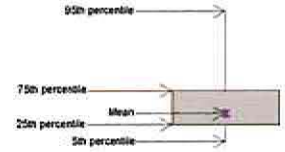






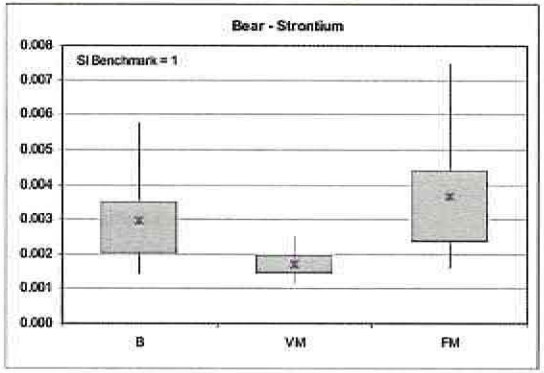


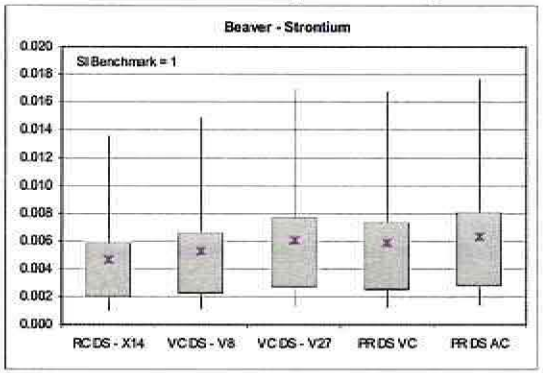


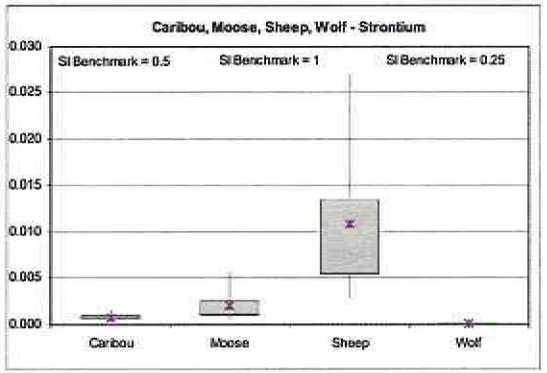


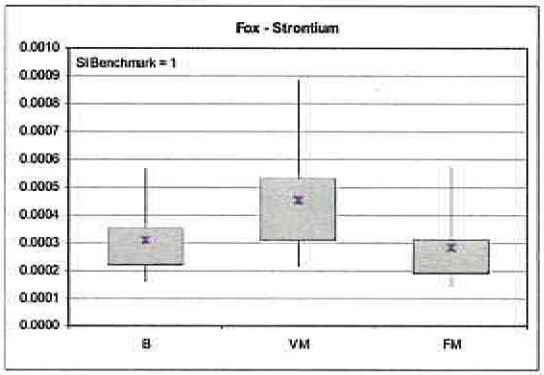
Note: The figures provide the predicted 5th, 25th, mean, 75th, and 95th percentile values:
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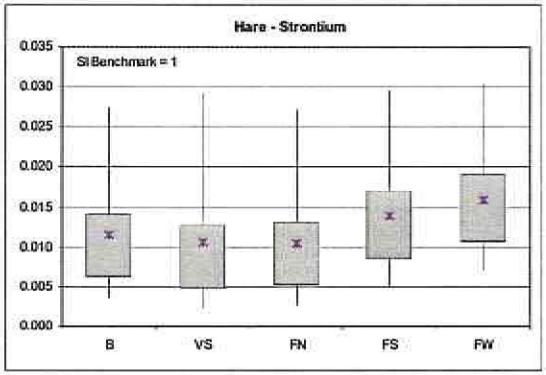
Figure 6.6 Screening Index Values for Terrestrial Ecological Receptors – Final Closure and Remediation Plan (Cont'd)

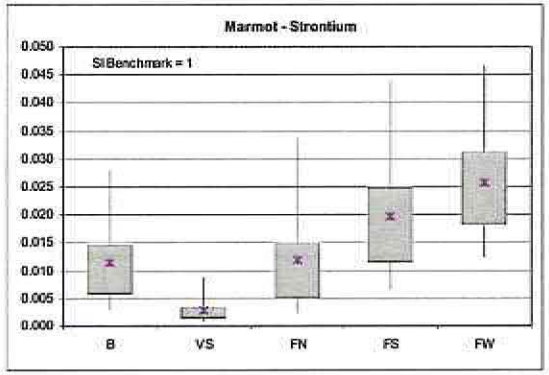


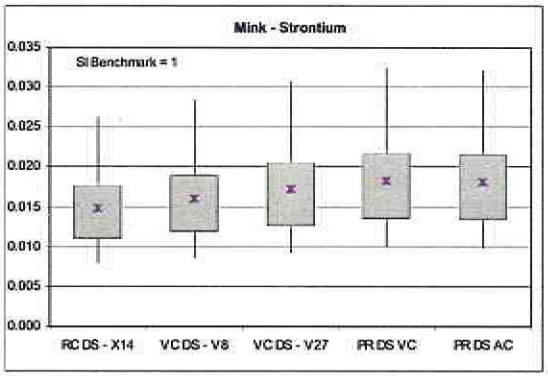


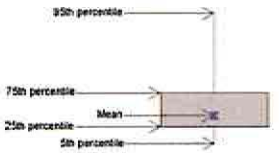








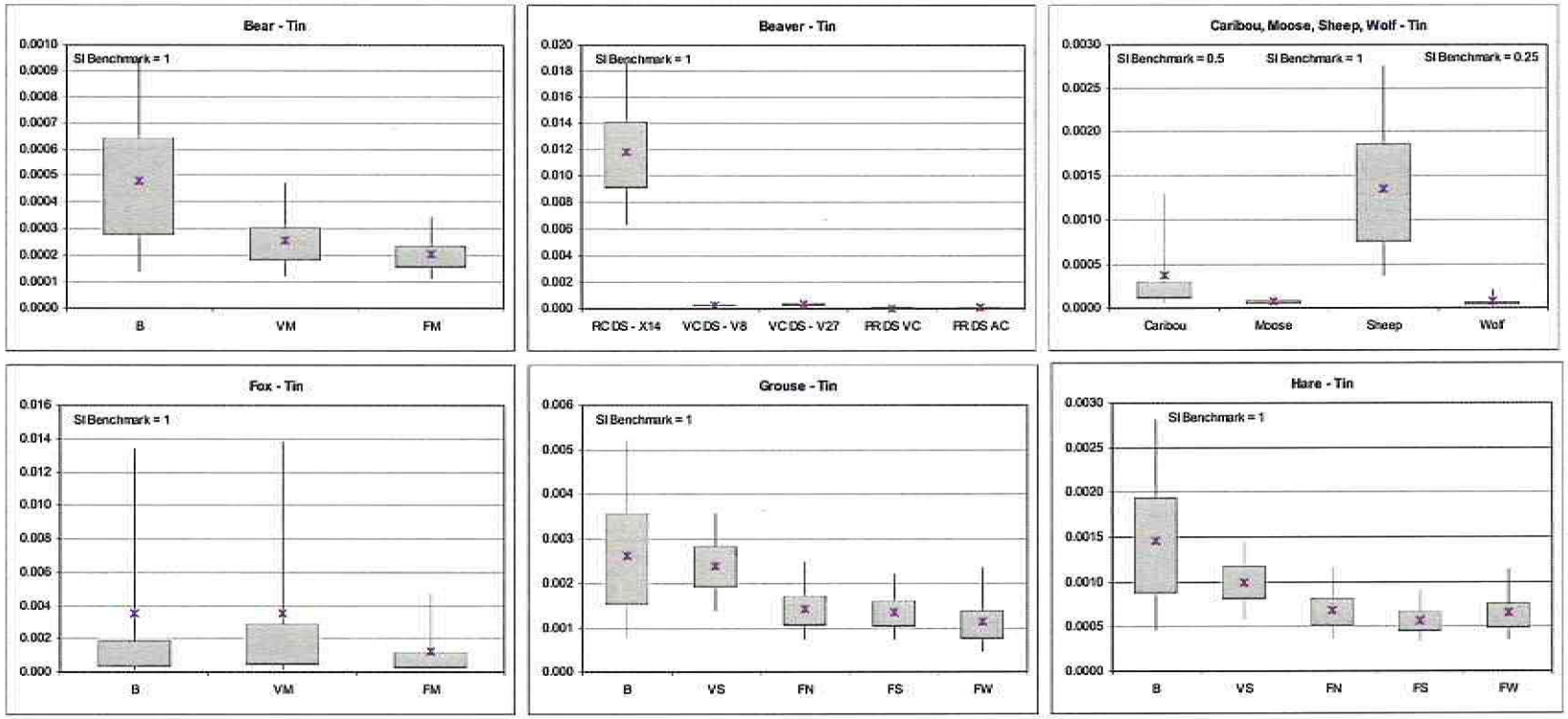


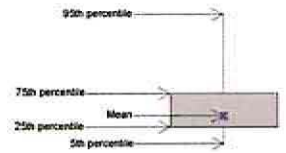


Note: The figures provide the predicted 5th, 25th, mean, 75th, and 95th percentile values:

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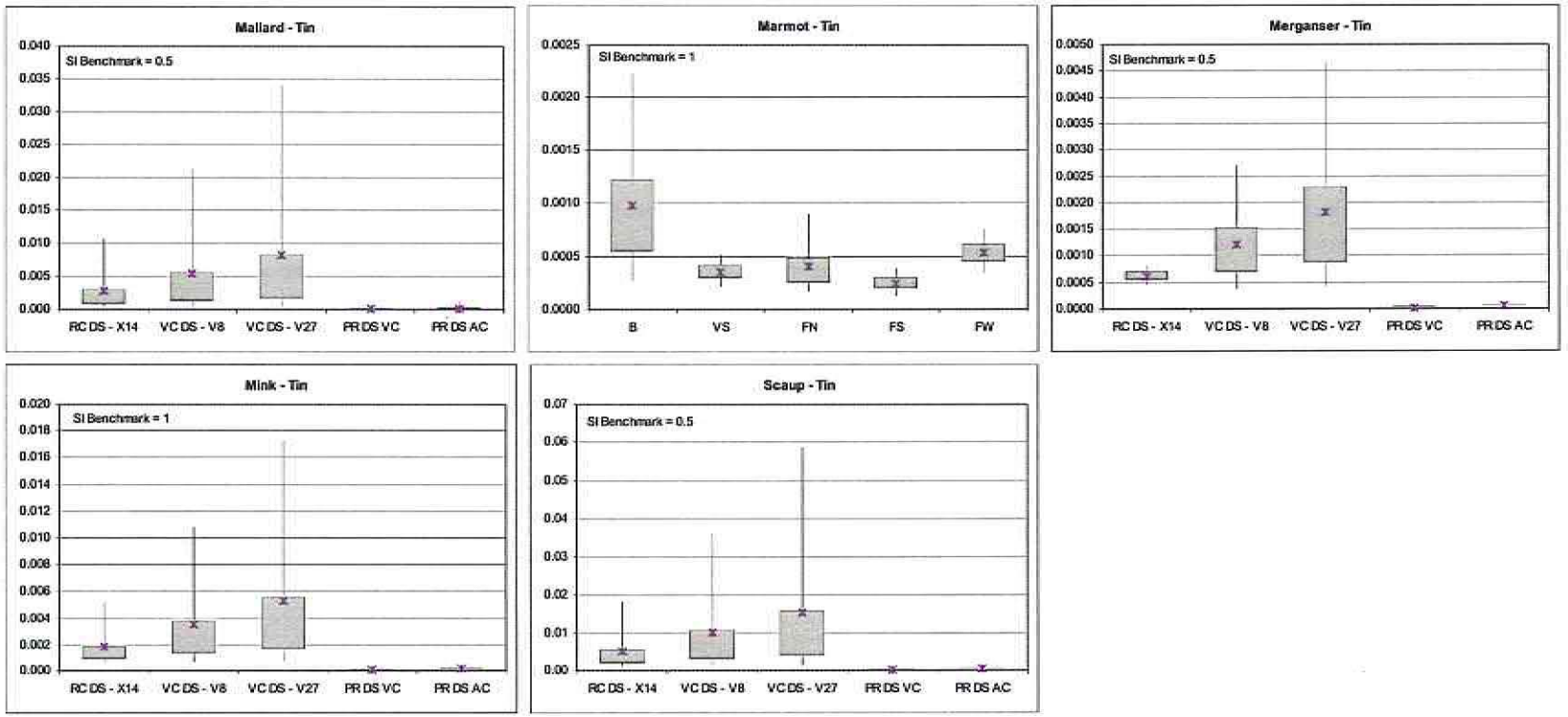
Figure 6.6 Screening Index Values for Terrestrial Ecological Receptors – Final Closure and Remediation Plan (Cont'd)





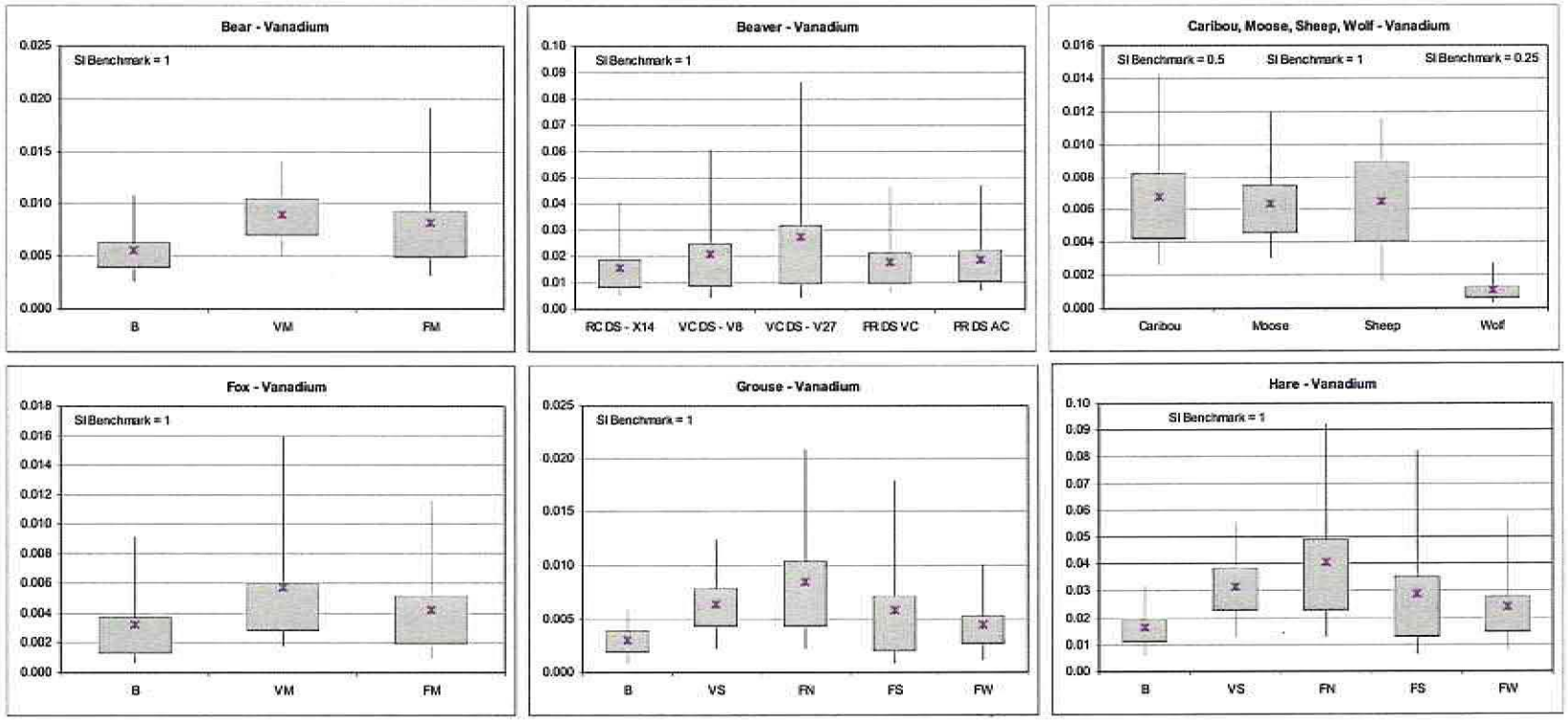
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Figure 6.6 Screening Index Values for Terrestrial Ecological Receptors – Final Closure and Remediation Plan (Cont'd)



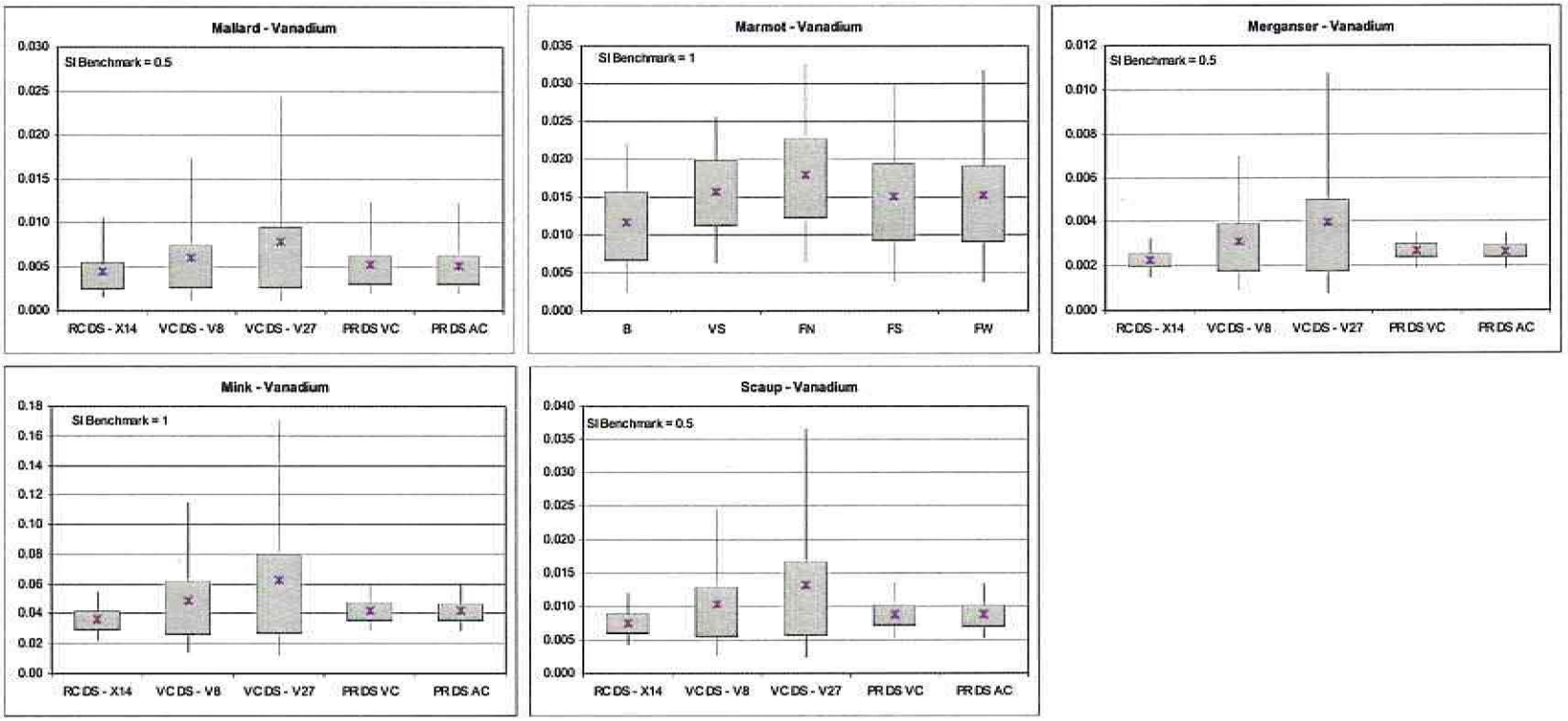
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Figure 6.6 Screening Index Values for Terrestrial Ecological Receptors – Final Closure and Remediation Plan (Cont'd)



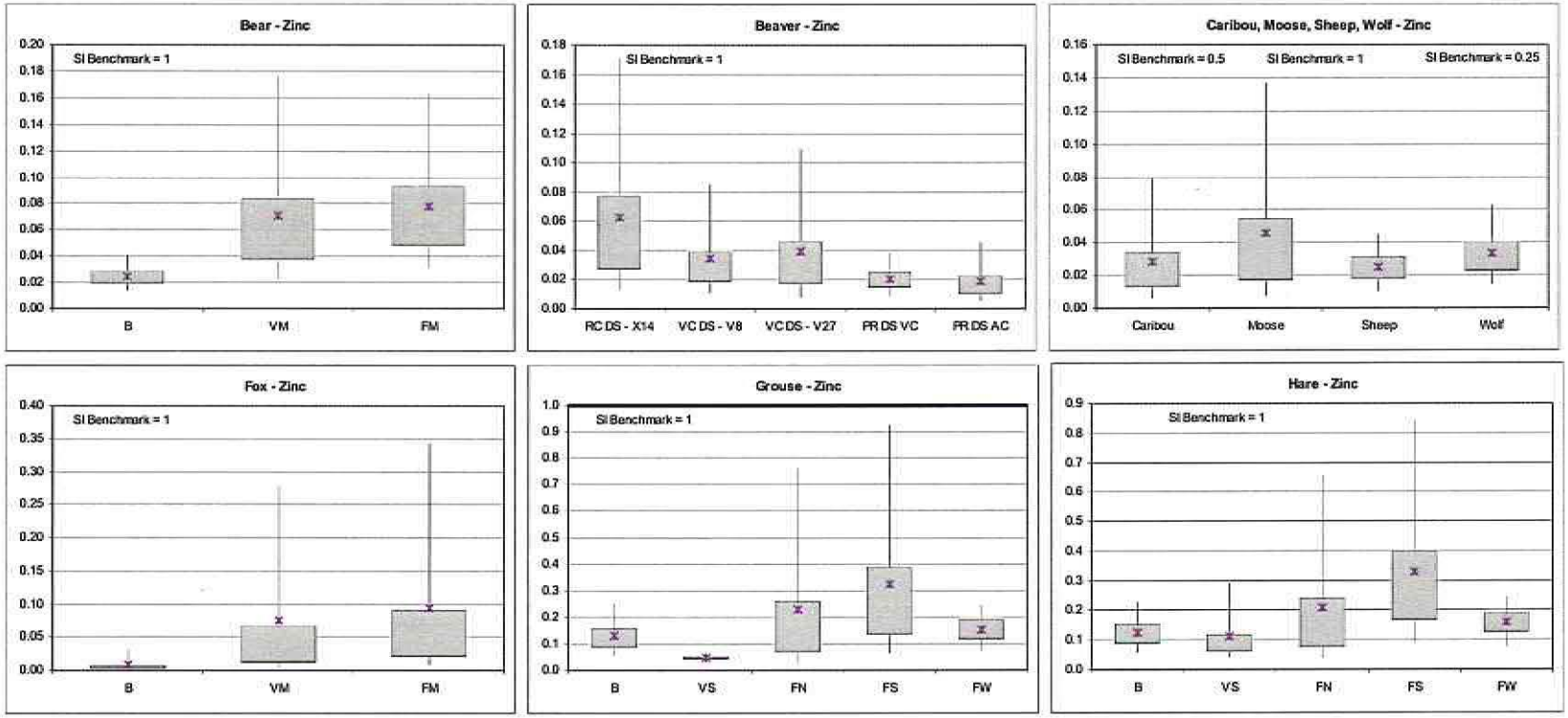
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Figure 6.6 Screening Index Values for Terrestrial Ecological Receptors – Final Closure and Remediation Plan (Cont'd)



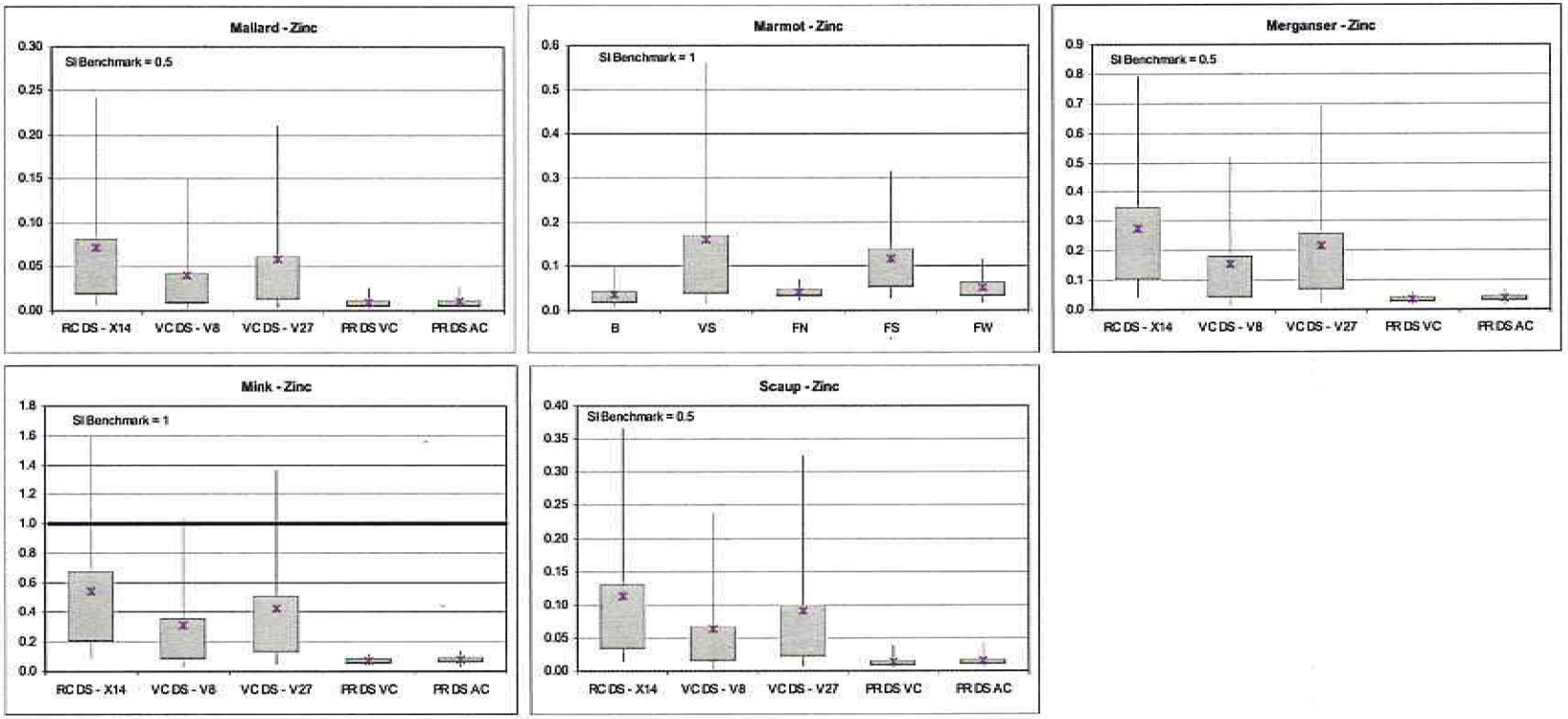
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Figure 6.6 Screening Index Values for Terrestrial Ecological Receptors – Final Closure and Remediation Plan (Cont'd)



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Figure 6.6 Screening Index Values for Terrestrial Ecological Receptors – Final Closure and Remediation Plan (Cont'd)



Note: The figures provide the predicted 5th, 25th, mean, 75th, and 95th percentile values:
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6.4 HUMAN HEALTH

Human health risk characterization involves the integration of the information from the exposure assessment and the toxicity assessment.

As discussed in previous sections, both the existing conditions and the final closure and remedial plan were evaluated. For the existing conditions, it was assumed that individuals may camp off the Faro Mine Complex (Camper 1) and would trap small mammals and gather berries around the Faro site, individuals would also be present in the Swim Lakes area (Camper 2) but would hunt large animals on site and trap and gather berries off site. The time on site was assumed to be 1.5 months per year. For the final closure and remediation plan, it was assumed that conditions at the site were improved and that individuals would camp on the Faro Mine Complex. Camper 3 was assumed to obtain water and fish from the mouth of Rose Creek and other food items from around the Faro mine area. Camper 4 was assumed to obtain water and fish from Vangorda Creek downstream of the mine site and other food items from the Vangorda/Grum area.

Non-Carcinogens

For many non-carcinogenic effects, protective biological mechanisms must be overcome before an adverse effect is manifested from exposure to the contaminant. This is known as a "threshold" concept. A reference dose (RfD) is the value most often used in the evaluation of non-carcinogenic effects. Reference doses are discussed in Chapter 5. For non-carcinogenic contaminants, the hazard quotient (HQ) is defined as follows:

$$HQ = \frac{D_o}{RfD_o} + \frac{D_d}{RfD_d} \qquad (6\text{-}2)$$

where:

Do	=	Dose due to oral (ingestion) exposure (mg/(kg-d));
Dd	=	Dose due to dermal exposure (mg/(kg-d));
RfDo	=	Reference Dose for oral exposure (mg/(kg-d));
RfDd	=	Reference Dose for dermal exposure (mg/(kg-d)) (assumed equal to RfDo).

In risk assessments, 20% of the dose or a hazard quotient of 0.2 is generally used to assess acceptable exposure from each individual pathway. In this assessment, soil and dermal exposures as well as water intakes and the majority of the diet (meat, fish, berries, and other traditional food consumption) over the year were evaluated; only the inhalation pathway (a relatively insignificant pathway for non-volatile chemicals), supermarket foods and some

background exposures were not considered therefore, a hazard quotient of 0.8 was considered to be appropriate for use at this site.

Carcinogens

For carcinogenic COPC (arsenic in this assessment), a risk is calculated by multiplying the estimated dose (in mg/(kg-d)) by the appropriate slope factor (in $(mg/(kg\text{-}d))^{-1}$). This is shown in equation (6-3). The estimate corresponds to an incremental risk of an individual developing cancer over a lifetime as a result of exposure. Risk is defined as follows:

$$Risk = (D_o \times SF_o) + (D_d \times SF_d) \qquad (6\text{-}3)$$

where:

D_o = Dose due to oral (ingestion) exposure (mg/(kg-d));
D_d = Dose due to dermal exposure (mg/(kg-d));
SF_o = Slope Factor for oral exposure $(mg/(kg\text{-}d))^{-1}$;
SF_d = Slope Factor for dermal exposure $(mg/(kg\text{-}d))^{-1}$ (assumed equal to SF_o).

The doses or intakes for the different pathways of exposure are presented in Chapter 4 and the slope factors used in this assessment are presented in Chapter 5. The calculated risk is then compared to acceptable benchmarks. In this assessment, an incremental risk level of 1×10^{-5} (1 in 100,000) was used to assess carcinogenic effects. Health Canada considers this value to represent an "essentially negligible" risk. Risk levels for child receptors are generally not calculated since the exposure of a child is not sufficient for carcinogenic effects to be observed. In this case, a composite receptor is assessed. This composite receptor encompasses the exposure of a toddler at the site for 5 years, then as a child on the site for 7 years, and the exposure of this child as an adult for another 63 years. In simple terms, the assessment considers that someone would visit the site throughout their lifetime from toddler to child to an adult.

Camper 2 represents the background arsenic exposure, and therefore, in order to calculate incremental risks for comparison to the acceptable benchmark, the risk levels calculated for Camper 2 adult and composite receptors were subtracted from the risk levels calculated for the other adult and composite receptors.

6.4.1 Chronic (Non-carcinogenic) Effects

Estimated exposures for the human receptors were presented in Section 4.4. Estimated exposures were divided by the toxicity reference values (RfDs), presented in Section 5.4, to calculate the hazard quotients (HQ).

6.4.1.1 Existing Conditions

Figure 6.7 summarizes the results for Campers 1 and 2 for the existing conditions. From the figure it can be seen that all predicted hazard quotients for Campers 1 and 2 are below the HQ benchmark of 0.8 for antimony, beryllium, boron, cadmium, cobalt, lead, manganese, nickel, selenium, silver, strontium, tin and vanadium.

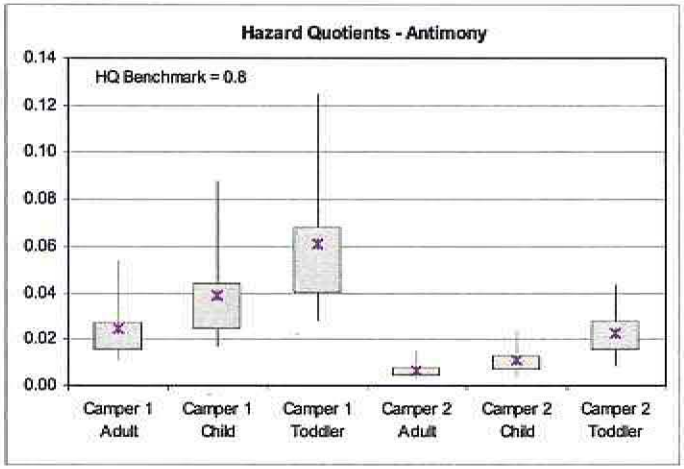
For chromium, the 95th percentile hazard quotients are above the HQ benchmark of 0.8 for the adult (Camper 1 only), child (Camper 1 only) and toddler (Camper 1 only). The ingestion of moose (at measured concentrations) and fish are the most significant (~44% each) pathways of chromium exposure for Camper 1.

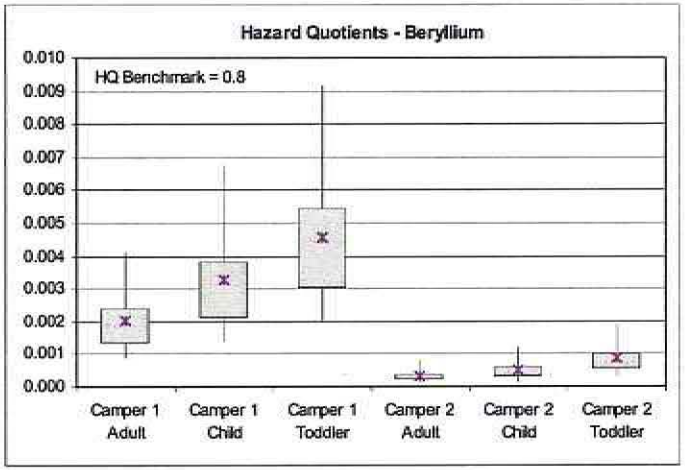
For copper, the 95th percentile hazard quotients for the child (Camper 1 only) and the 75th and 95th percentile hazard quotients for the toddler (Camper 1 only) are above the HQ benchmark of 0.8. The ingestion of moose (at measured concentrations) is the most significant pathway of copper exposure, with the ingestion of fish and caribou (at measured concentrations) as secondary exposure pathways.

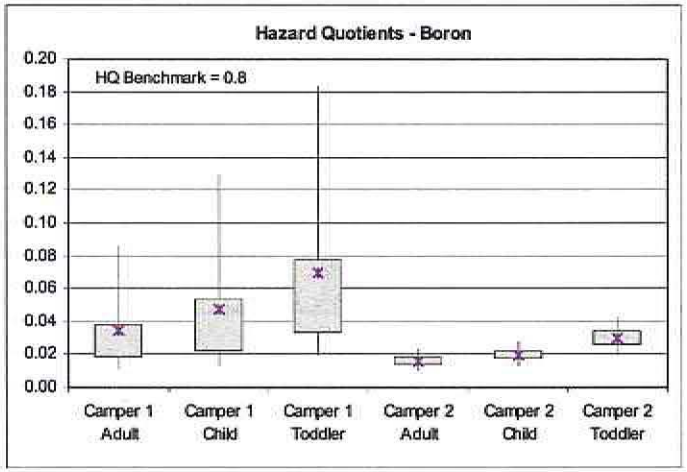
For zinc, all predicted hazard quotients are below the HQ benchmark of 0.8, with the exception of 95th percentile hazard quotients for the Camper 1 toddler. For toddler, the ingestion of moose (at measured concentrations) is the most significant pathway of zinc exposure.

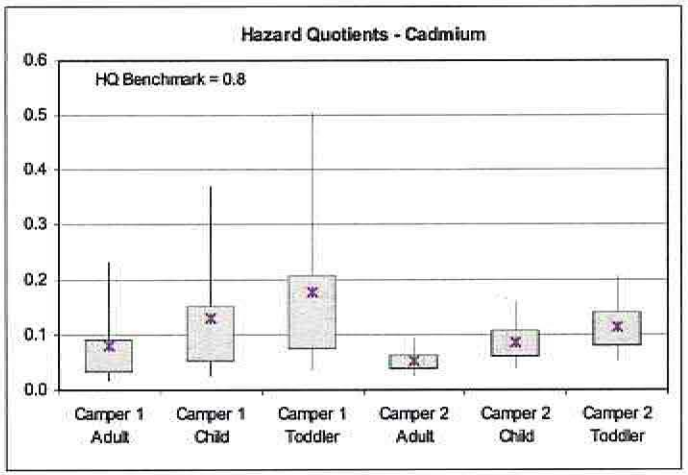
It is noted that the consumption of moose results in the exceedance of a benchmark value of 0.8 primarily at the upper bound (95th percentile value). As shown in Chapter 2, there are 10 samples of moose, thus the distributions around the moose concentrations are somewhat uncertain.

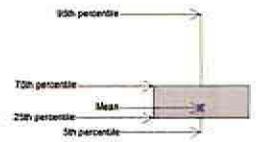
Figure 6.7 Hazard Quotients for Human Receptors – Existing Conditions





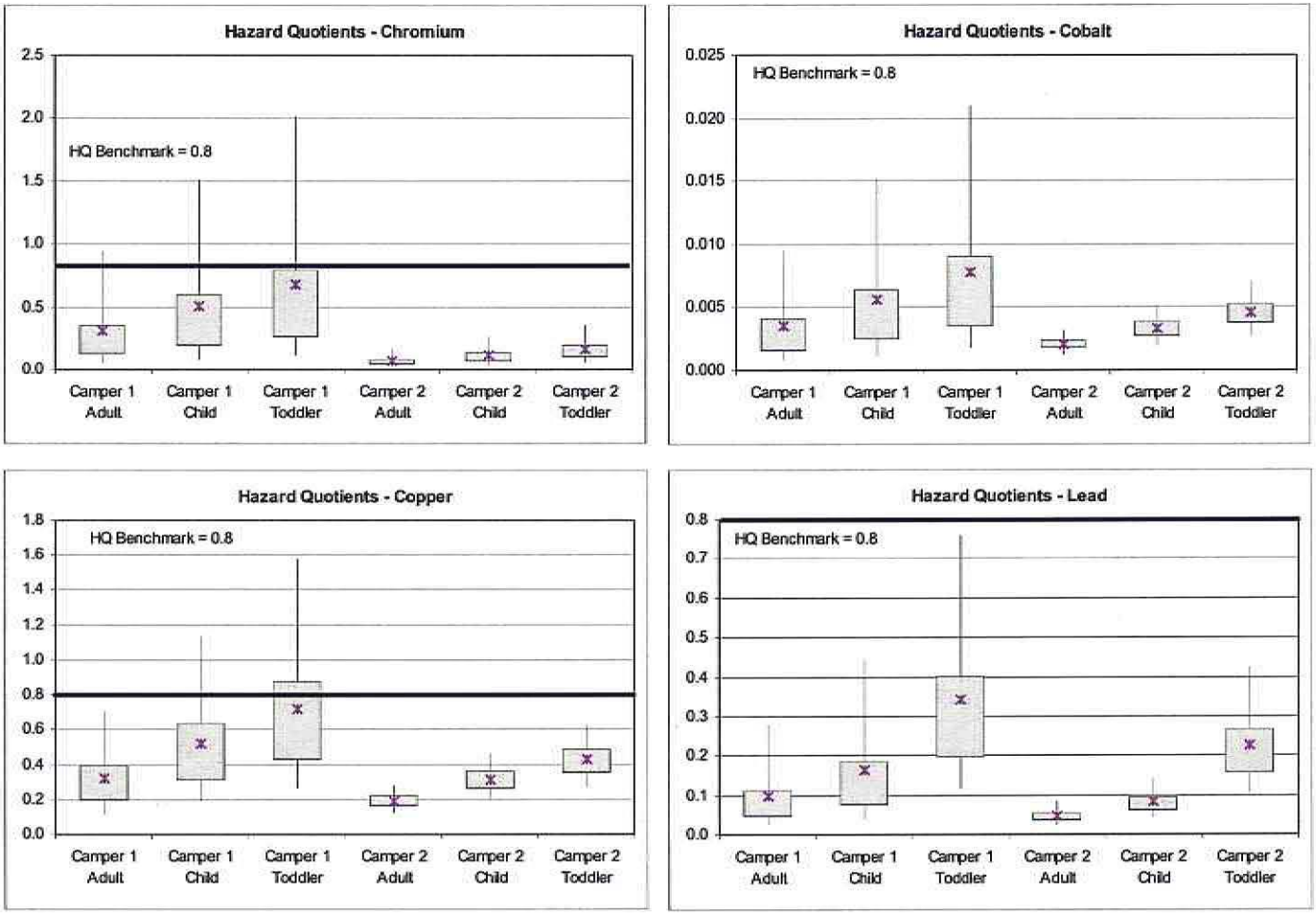


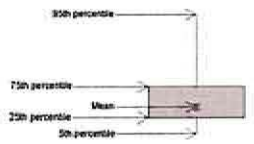




Note: The figures provide the predicted 5th, 25th, mean, 75th, and 95th percentile values:

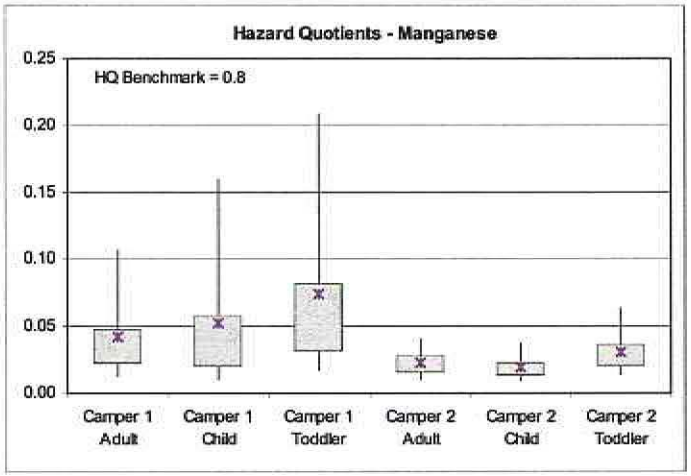
Figure 6.7 Hazard Quotients for Human Receptors – Existing Conditions (Cont'd)

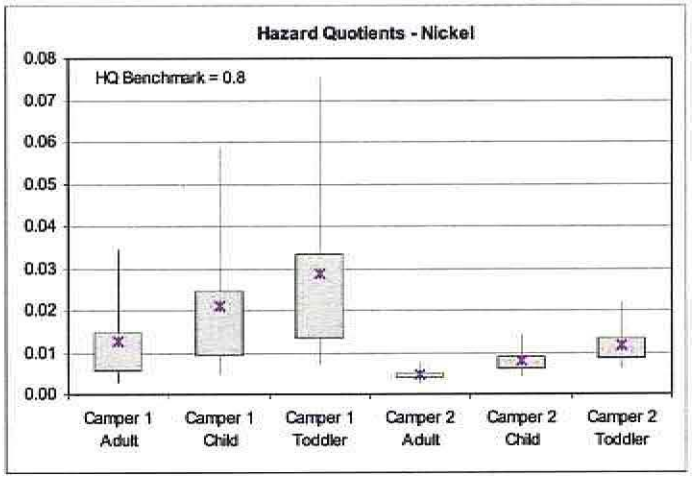


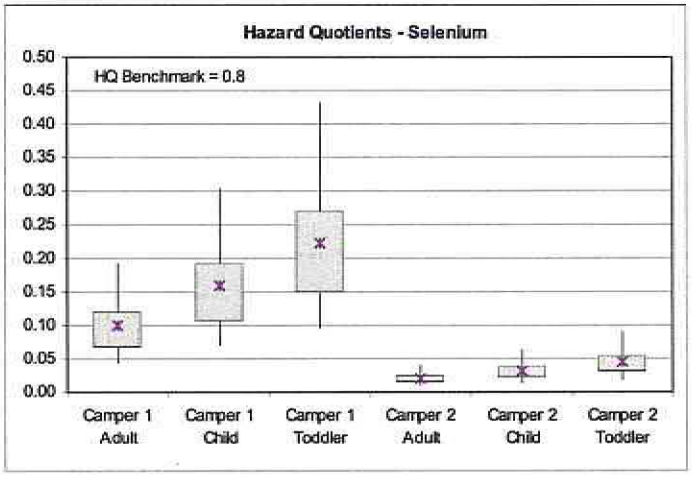


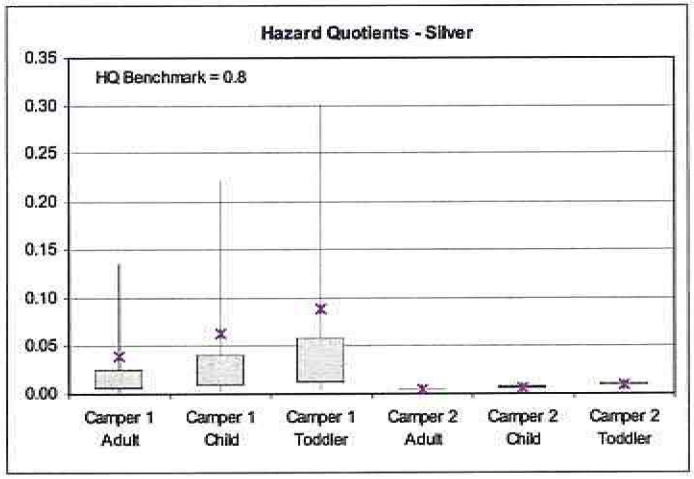
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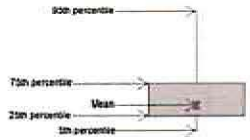
Figure 6.7 Hazard Quotients for Human Receptors – Existing Conditions (Cont'd)





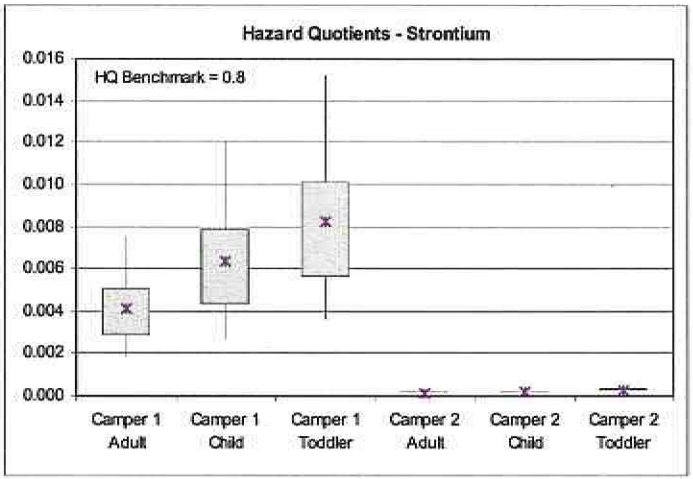


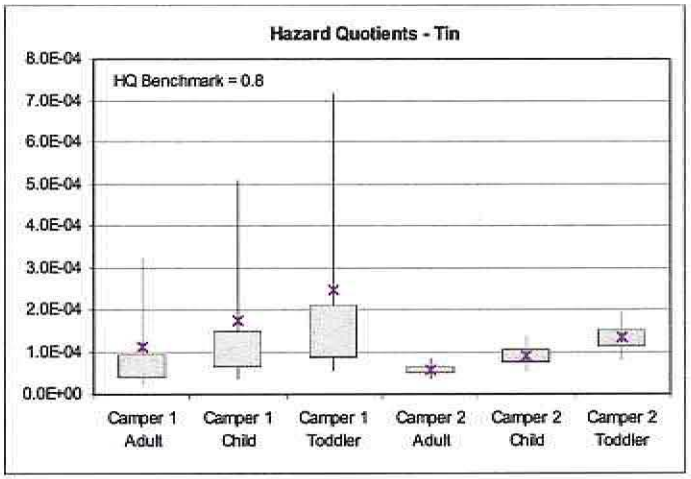


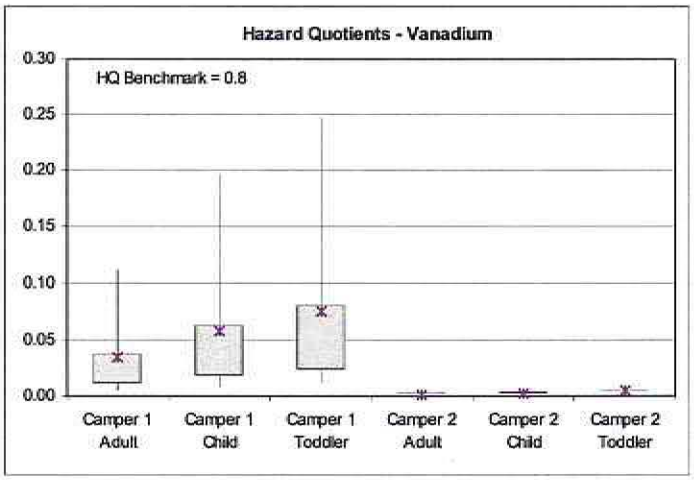


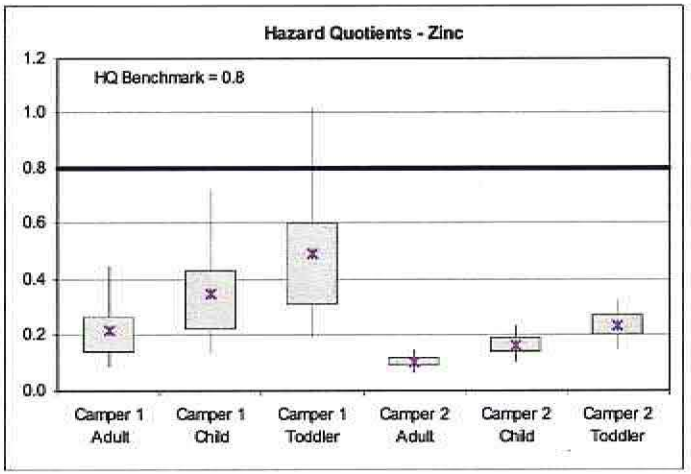
Note: The figures provide the predicted 5th, 25th, mean, 75th, and 95th percentile values:

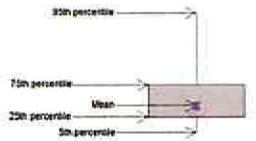
Figure 6.7 Hazard Quotients for Human Receptors – Existing Conditions (Cont'd)











Note: The figures provide the predicted 5th, 25th, mean, 75th, and 95th percentile values:

6.4.1.2 Final Closure and Remediation Plan

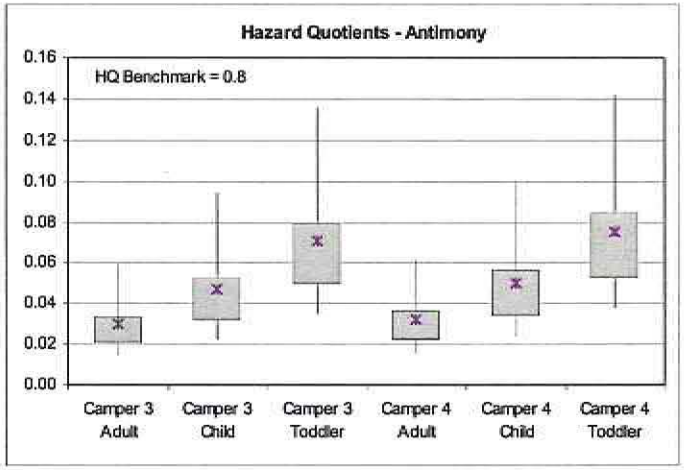
For the final closure and remediation plan, it was assumed that the aquatic environment on site and the surroundings is remediated to an extent that people would come on site and camp for a period of 1.5 months. For this assessment it has been assumed that no remediation has occurred in the terrestrial environment (although some cover and other activities are planned); therefore, terrestrial concentrations remain unchanged. The results for the final closure and remediation plan are shown for Camper 3 (near Faro mine site) and Camper 4 (near Vangorda/Grum site) are shown in Figure 6.8. From the figure it can be seen that all predicted hazard quotients for Campers 3 and 4 are below the HQ benchmark of 0.8 for antimony, beryllium, boron, cadmium, cobalt, lead, manganese, nickel, selenium, silver, strontium, tin and vanadium.

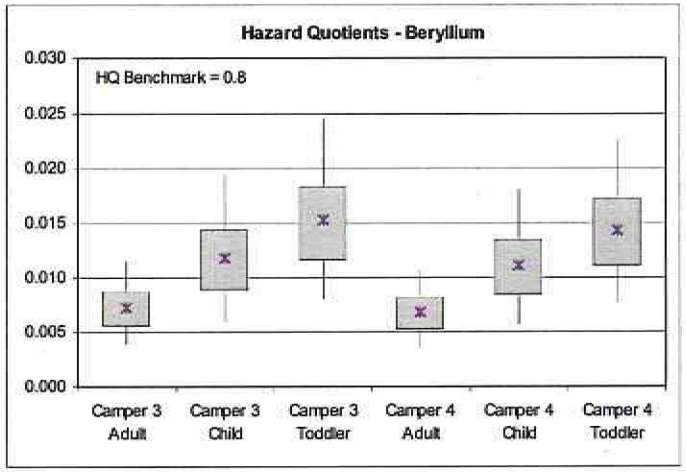
For chromium, the 95th percentile hazard quotients are above the HQ benchmark of 0.8 for the toddler (Camper 3 and 4). The most significant pathway of chromium exposure for the human receptors is the ingestion of moose (at measured concentrations). These results are similar to the existing conditions assessment.
For copper, the 95th percentile predicted hazard quotients for the child (Camper 3 and 4) and the toddler (Camper 4) are above the HQ benchmark of 0.8. The 75th and 95th percentile hazard quotients for the toddler (Camper 3) are above the HQ benchmark of 0.8. The most significant pathway of copper exposure is the ingestion of moose (at measured concentrations), with the ingestion of fish from X14 and V8 as a secondary exposure pathway. These results are similar to the existing conditions assessment.

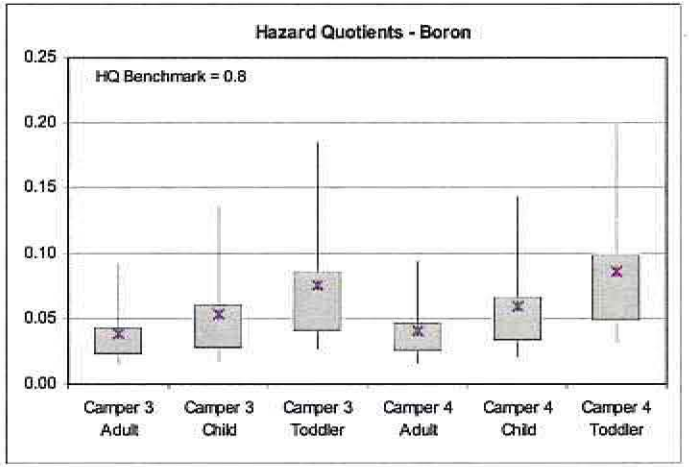
For zinc, all predicted hazard quotients are below the HQ benchmark of 0.8, with the exception of 95th percentile hazard quotients for the child (Camper 3 and 4) and toddler (Camper 3 and 4). The ingestion of moose (at measured concentrations) is the most significant pathway of zinc exposure. The ingestion of fish also contributes to the zinc exposure. These results are similar to the existing conditions assessment.

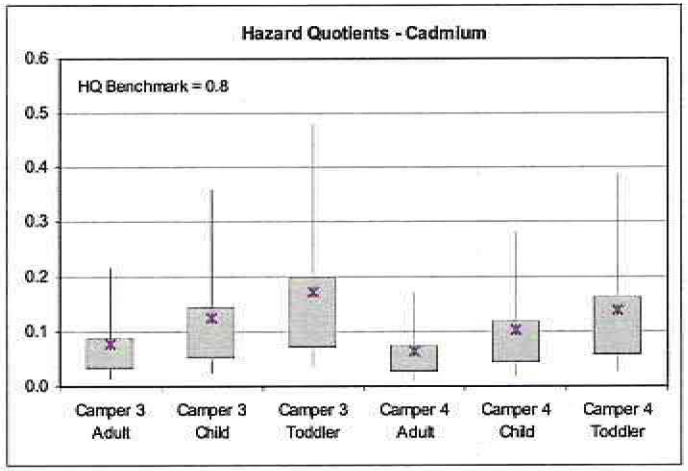
As discussed for the existing conditions, the moose concentrations are somewhat uncertain due to the small sample size (only 10 samples). In addition, the assessment did not account for any reduction in soil concentrations due to the covering of the tailings and waste rock piles.

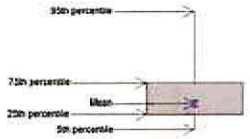
Figure 6.8 Hazard Quotients for Human Receptors – Final Closure and Remediation Plan





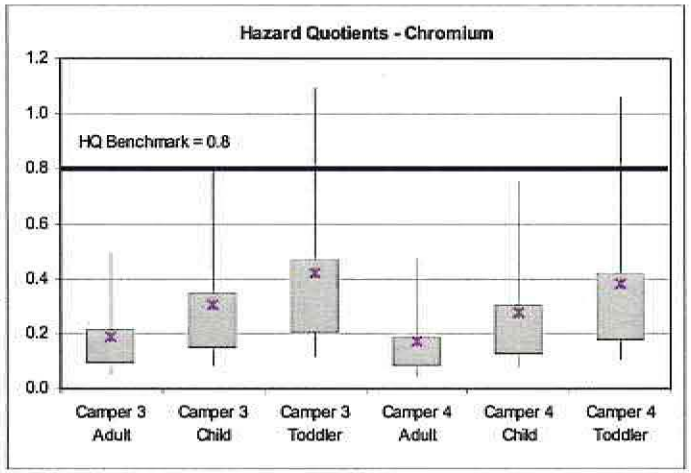


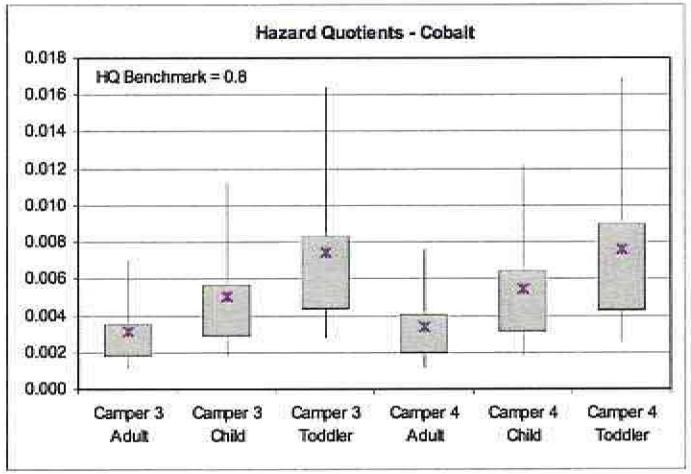


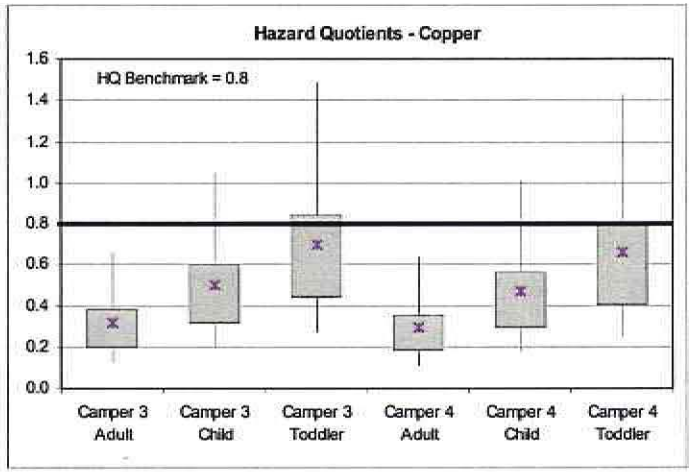


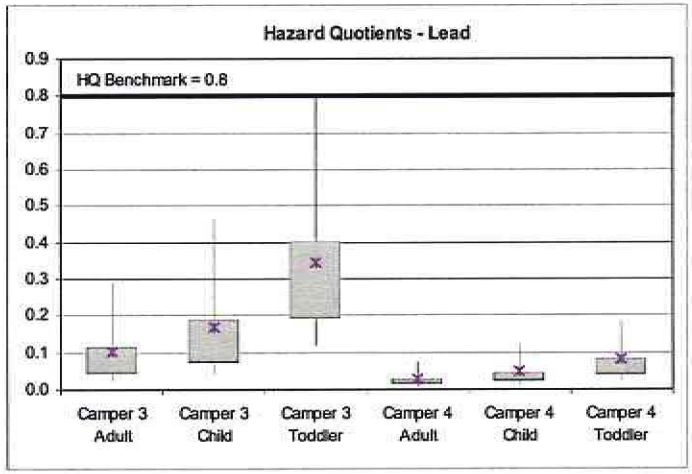
Note: The figures provide the predicted 5th, 25th, mean, 75th, and 95th percentile values:

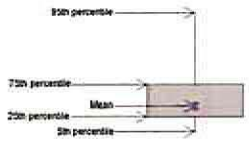
Figure 6.8 Hazard Quotients for Human Receptors – Final Closure and Remediation Plan (Cont'd)





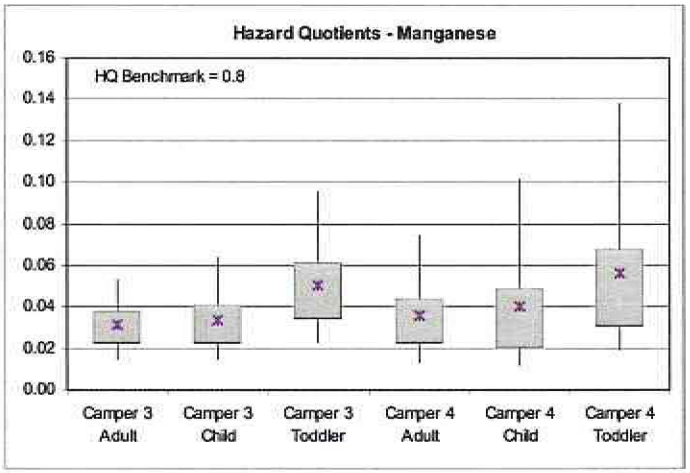


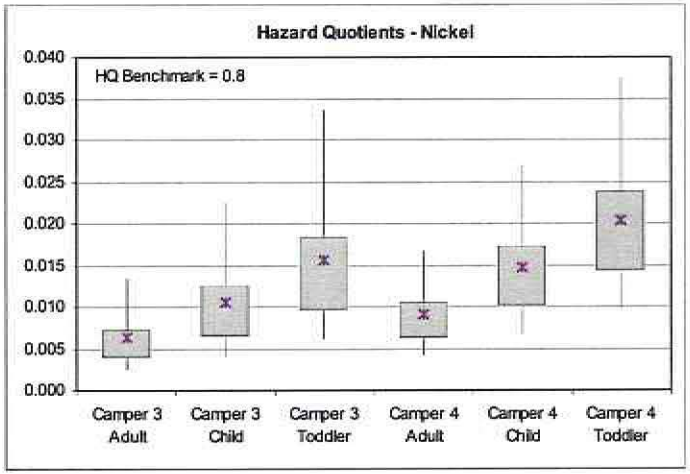


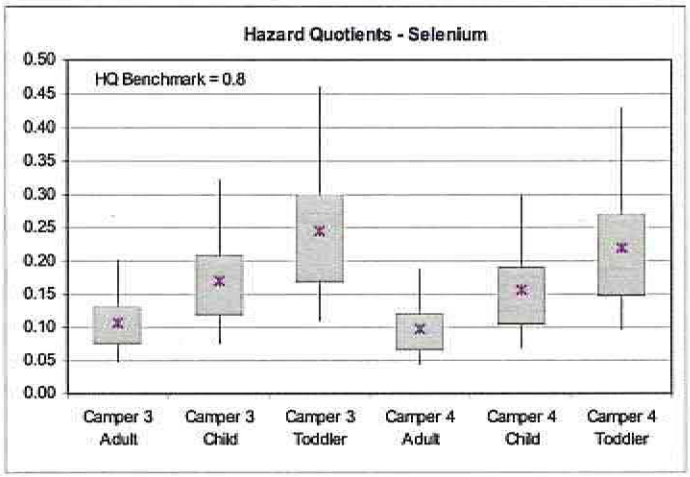


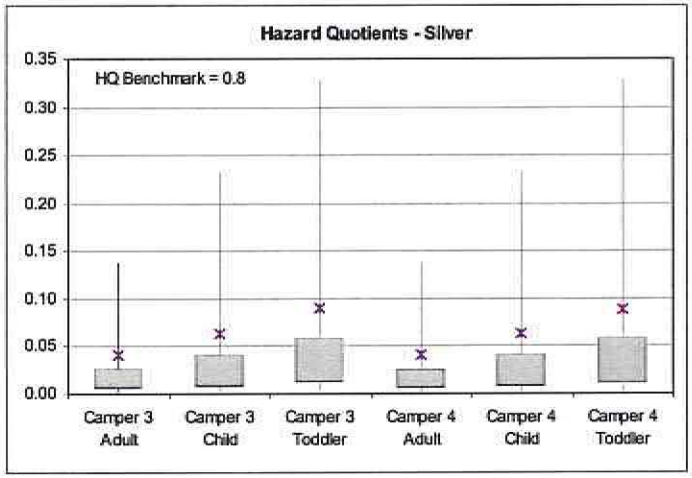
Note: The figures provide the predicted 5th, 25th, mean, 75th, and 95th percentile values:

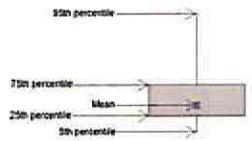
Figure 6.8 Hazard Quotients for Human Receptors – Final Closure and Remediation Plan (Cont'd)





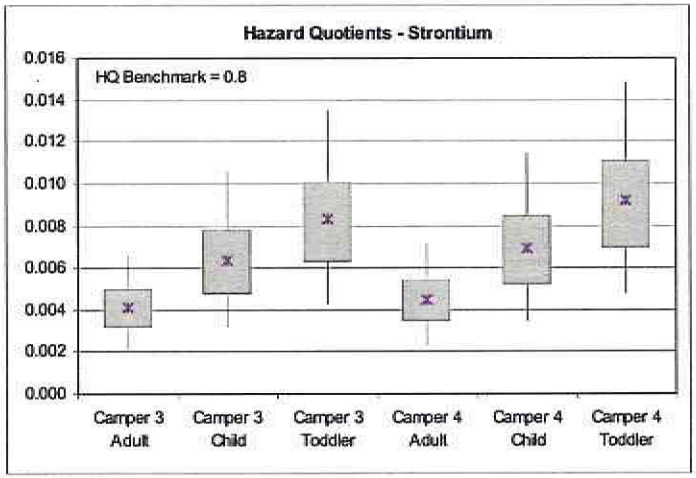


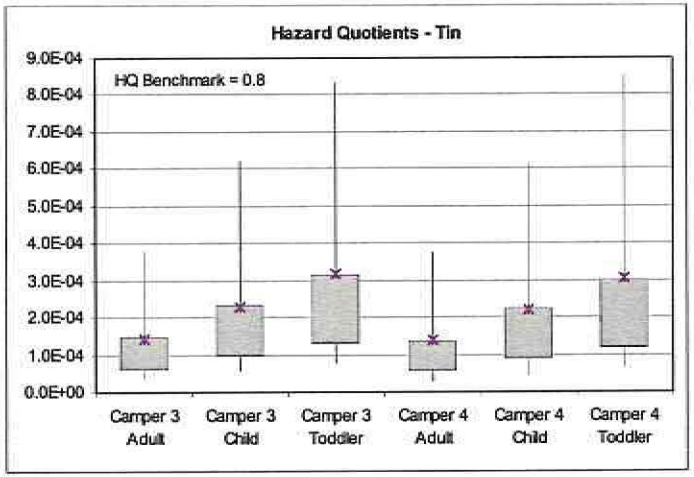


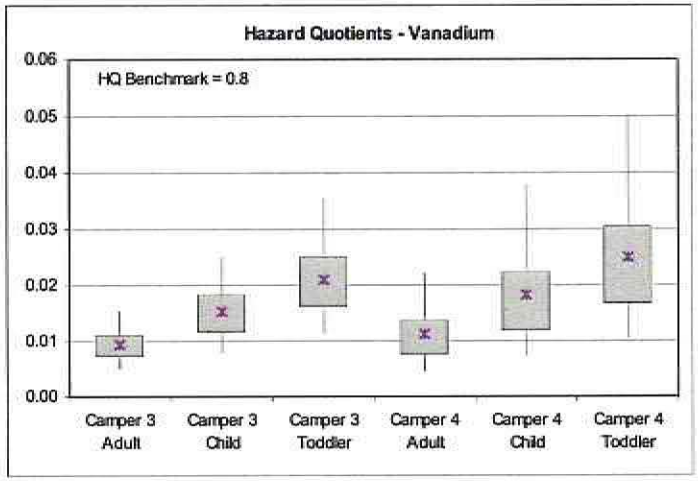


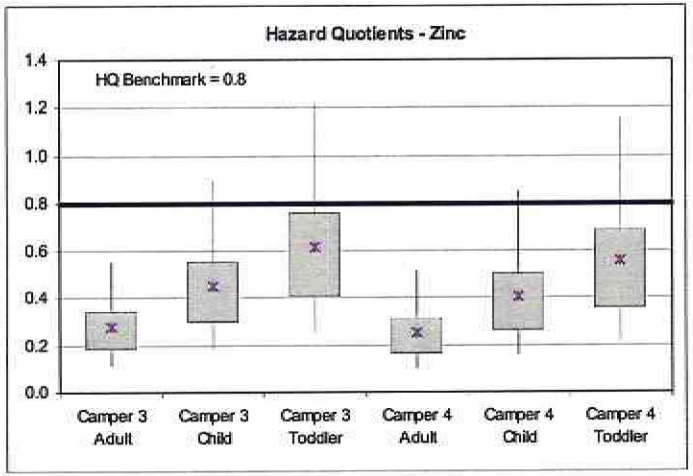
Note: The figures provide the predicted 5th, 25th, mean, 75th, and 95th percentile values:

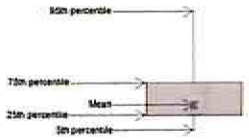
Figure 6.8 Hazard Quotients for Human Receptors – Final Closure and Remediation Plan (Cont'd)











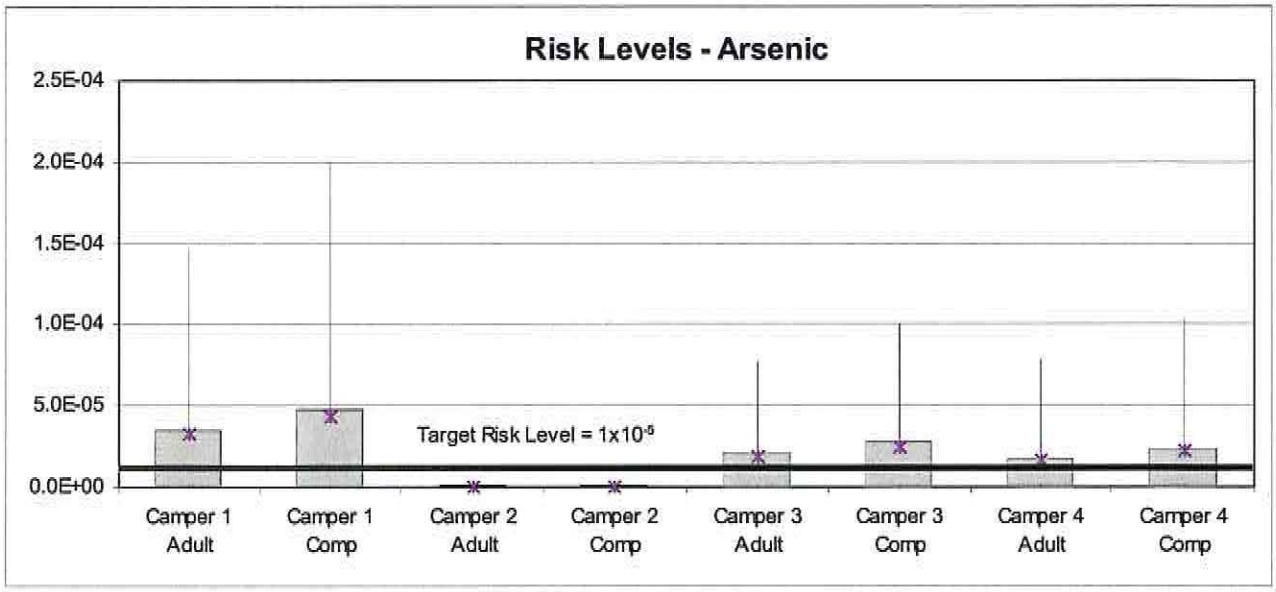
Note: The figures provide the predicted 5th, 25th, mean, 75th, and 95th percentile values:

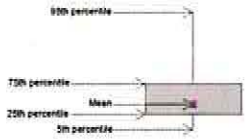
6.4.2 Carcinogenic Effects

Figure 6.9 shows the risk levels calculated for the composite receptor for the existing conditions and the final closure and remediation plan. A composite person is used to capture the exposure from being resident in the local area over a lifetime (75 years of exposure) spanning the toddler, child and adult years. The use of the composite receptor provides a cautious estimate of the risk due to carcinogenic COPC (in this case arsenic) exposure as it considers that individuals go to the site from infancy through adulthood.

Arsenic is the only carcinogenic COPC identified for the site. Health Canada (2009) provides a slope factor of 1.8 $(mg/(kg\text{-}d))^{-1}$ which corresponds to the development of internal cancers and this value was used in the assessment.

Figure 6.9 Incremental Lifetime Risks of Carcinogenic Effects for Arsenic Exposure for All Scenarios Considered in the Assessment





Note: The figures provide the predicted 5th, 25th, mean, 75th, and 95th percentile values:

As seen in the figure above, under the existing conditions, the mean, 75th and 95th percentile incremental risk levels for Camper 1 receptors, which are considered to be off site, are above a risk level of $1x10^{-5}$. For the final closure and remediation plan, the mean, 75th and 95th percentile incremental risk levels for the Camper 3 receptors (on Rose Creek) and Camper 4 receptors (on

Vangorda Creek) are lower than those of Camper 1 but still above a risk level of $1x10^{-5}$. The ingestion of fish and moose dominate the exposure for human receptors to arsenic. It has been assumed that all the arsenic present in fish and moose is in the toxic inorganic form. However, literature studies indicate that a significant portion of arsenic in meat and fish are in the non-toxic organic form.

As indicated above, the predicted risk levels associated with the final closure and remediation plan at the mean and 95th percentile levels are lower for Camper 3 and Camper 4 receptors than the risk levels calculated in the existing conditions for Camper 1. There is less variability in the predicted risk levels for Camper 3 and Camper 4 than in the risk levels for Camper 1. Camper 2 represents the exposure to background levels of COPC. To calculate the incremental risks to receptors, the calculated risks for Camper 2 were removed from the calculated risks for all receptors. Therefore, the incremental risks for Camper 2 are equal to 0.

The results indicate that the risks for arsenic exposure related to the final closure and remediation plan are lower than those for the existing conditions and are unlikely to present a potential risk even though the Health Canada benchmark has been exceeded since jurisdictions such as the U.S. EPA consider risks of 1×10^{-4} as acceptable risks.

6.5 UNCERTAINTIES

Many areas of uncertainty attend a risk assessment. This is due to the fact that assumptions have to be made throughout the assessment either due to data gaps, environmental fate complexities or in the generalization of receptor characteristics. To be able to place a level of confidence in the results, an accounting of the uncertainty, the magnitude and type of which are important in determining the significance of the results, must be completed. In recognition of these uncertainties, some conservative assumptions are used throughout the assessment to ensure that the potential for an adverse effect would not be underestimated. In addition probability distribution functions were used in the assessment to address the uncertainty in the assessment. Nonetheless, several of the major assumptions are outlined below.

The measured COPC concentrations used in the assessment were based on data on the aquatic and terrestrial environments provided by historical sampling at the site. Site-specific transfer factors and literature values were used to estimate concentrations for sediment, aquatic vegetation, benthic invertebrates, terrestrial vegetation, and small animals and birds. There is some uncertainty involved in the use of these transfer factors to predict concentrations in environmental media. Additionally, there is uncertainty in applying site-specific water-to-sediment distribution coefficients developed from Rose Creek to the other watersheds; however, model validation indicated reasonable results. It is recognized that the use of a distribution

coefficient does not take into account the many different sediment processes (i.e. burial, resuspension etc.), however, it provides a reasonable estimate of the sediment concentration. The probability distribution functions assigned to the transfer factors and sediment distribution coefficients were based on analysis of the available information as well as professional judgement which may lead to uncertainty in the results.

The characteristics (food, water and soil consumption) of ecological receptors were obtained from the literature. These values are generally obtained from animals in captivity and may not be fully representative of free-range animals in the wild. An underestimate of exposure might result from this but there are other conservative assumptions that may compensate (e.g. time spent in area exposed to the highest level of contamination). Additionally, in the probabilistic risk assessment, distributions were developed for these parameters to account for some level of variability in these parameters.

Similarly, the Yukon dietary survey (Receveur *et al* 1998) was used to characterize the exposure to humans. This survey is based on a 24-hour recall. The use of a 24-hour recall may overestimate exposures for some food items and underestimate exposures for other food items.

Toxicity reference values for the COPC are obtained from reputable sources (e.g., Health Canada, U.S. DOE and U.S. EPA); however, some assumptions are made in the absence of available data. For aquatic species, toxicity reference values for indicator species that were most similar to the receptor species were used. Given that no adequate toxicological database is available that determines the concentrations of COPC that cause adverse effects in all terrestrial ecological species, toxicity data from laboratory species such as rats and mice were used and scaled to the appropriate terrestrial receptor. Additionally, for terrestrial mammals and birds, toxicity information for a chemical was used regardless of its form in the test procedure, even though this may not be the same form used in the assessment (e.g., an oxide form compared to a more soluble form). It is hard to determine the effect of these assumptions. Only COPC with available toxicity data were considered in the assessment, because toxicity data is a necessary component for quantifying risk.

Another area of uncertainty is the use of a single value for toxicity. The slope factor is selected to be very protective. The slope factor for arsenic used in the human health assessment represent risks from upper bound (95^{th} percentile) dose-response estimates. The reference doses represent an exposure day-after-day for a lifetime. The use of an upper bound for the toxicity values ensures that the risk to humans is not underestimated.

It is currently not possible or practical to develop approaches to evaluate the validity of the toxicity benchmark assumptions on the overall assessment. As improvements occur in

toxicological/human health research and assessments, the uncertainties may be reduced. However, given that the predicted impacts are not significant, it is not anticipated that these improvements would change the overall conclusions of the assessment.

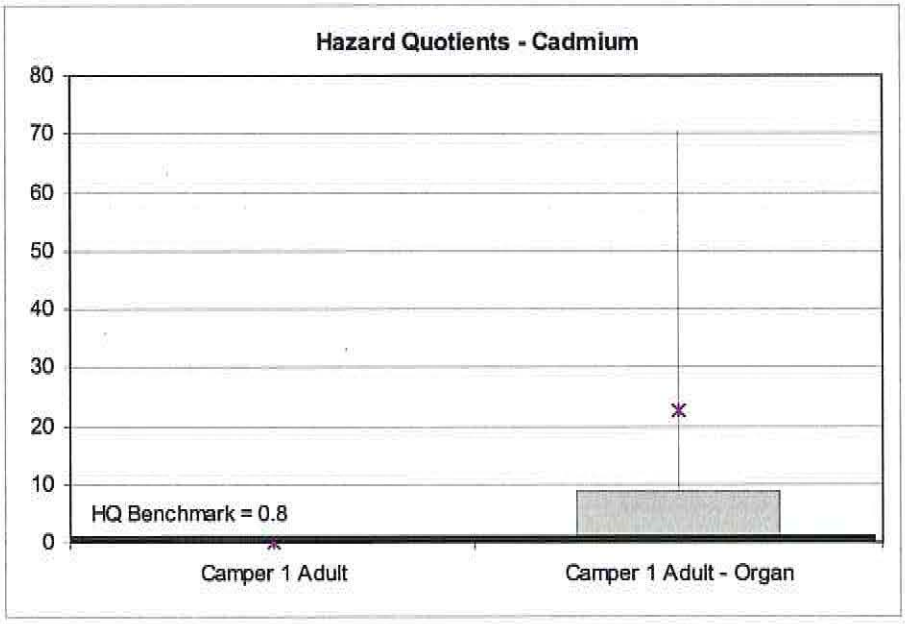
The amount of Labrador tea (leaves and stems) used to brew medicinal tea and the amount of tea consumed was assumed as the Yukon dietary survey (Receveur *et al.* 1998) did not provide this information. This leads to uncertainty in the assessment. As the consumption of Labrador tea only represented a small fraction (< 6%) of the intake for most of the COPC it is unlikely that the uncertainty in the consumption of Labrador tea would change the results of the assessment.

The moose and caribou concentrations used in the risk assessment were represented by ten samples, which reduces the level of confidence in these concentrations. Additionally, it is not possible to evaluate the specific behaviours and history of the individual moose and caribou samples collected from the site and determine whether they represent actual exposures from the site, if they have spent an unusual amount of time in a high contamination area, or if they have entered the site from other areas and are not accurate representations of site exposures. Caribou also have large home ranges and would potentially be exposed to contaminants in other areas outside of the site, and these exposures are captured in the measured concentrations.

In the risk assessment it has been assumed that humans only consume animal (i.e. caribou, moose, porcupine, hare, grouse) flesh (i.e. muscle). From Table 2.19, a comparison of the whole body concentrations with the muscle concentrations indicates that there is a significant difference for cadmium concentrations. A sensitivity analysis was carried out to determine the effect of consumption of moose and caribou organs on the intake of cadmium for the Camper 1 adult. The Yukon dietary survey (Receveur *et al* 1998) indicates that about 5 % of the population consumes caribou liver or kidneys 0.2 to 0.3 days a week and 25 % of the population consumes moose liver and kidneys 0.3 to 0.4 days per week. It has been assumed that only adults consume the organs.

For the purposes of the sensitivity analysis for cadmium, it was assumed that people would consume moose and caribou at the whole body concentrations presented in Table 2.19. From Figure 6.10, it can be seen that the ingestion of moose and caribou at the whole body concentrations for cadmium result in significant increases in the calculated hazard quotient for the Camper 1. It is known that cadmium accumulates in the liver and kidneys so that it is not unusual that high levels of cadmium would be found in the organs of the moose and caribou. Therefore, consumption of moose and caribou organs should only occur on an occasional basis.

Figure 6.10 Comparison of Hazard Quotients for Adult Human Receptors – Organ Ingestion Sensitivity Analysis



Another area of uncertainty in the risk assessment is the effect of multiple COPC. When dealing with toxic chemicals, there is potential interaction with other chemicals that may be found at the same location. It is well established that synergism, potentiation, antagonism or additivity of toxic effects occurs in the environment. A quantitative assessment of these interactions is outside the scope of this study and, in any event, would be constrained, as there is not an adequate base of toxicological evidence to quantify these interactions. This may result in an underestimate of the risk for some COPC.

Measured levels of some COPC were not available in all environmental media, specifically antimony, beryllium, boron, chromium, selenium, strontium, tin, and vanadium at Pelly River Upstream for the existing conditions antimony, beryllium, boron, cobalt, manganese, strontium, tin, or vanadium analyses on browse samples in areas Van-S, Van-M, Faro-N and Faro-S. This leads to an underestimate of the risk for some COPC and receptors. Additionally, analytical data was limited in some cases by reported concentrations at less than the method detection limit.

Table 6.7 provides a summary of the uncertainties discussed above. It can be seen from the table, that in general the uncertainties lead to an over-estimate of exposures and thus the conclusions of the assessment would remain unchanged.

Table 6.7 Summary of Uncertainties in the Assessment

Uncertainty	Leads to Overestimate	Leads to Underestimate	Neither Overestimate or Underestimate
Use of Site-Specific and Literature-based Transfer Factors to estimate concentrations in sediments, benthic invertebrates and aquatic vegetation	X		
Use of literature characteristics for ecological receptors		X	
Use of literature characteristics for human receptors	X		
Use of dietary survey for food consumption for humans	X		
Toxicity reference values for ecological receptors			X
Single value for toxicity for human receptors	X		
Assume all arsenic in meat and fish in inorganic toxic form	X		
Assumption for the consumption of Labrador tea			X
Small number of samples used to characterize the environment	X	X	
Synergism, potentiation, antagonism, additivity of toxic effects		X	
Absence of data		X	

7.0 SUMMARY AND CONCLUSIONS

The Government of Yukon commissioned SENES Consultants Limited to carry out a human health and ecological risk assessment (HHERA) for the Faro Mine Complex in support of the Environmental Assessment process for the Final Closure and Remediation Plan. The risk assessment was carried out within a probabilistic framework for the existing conditions and the final closure and remediation plan for the Faro Mine Complex site. The assessment considered the effects of both measured chemical levels in the aquatic environment and in the terrestrial environment at the site for the existing conditions. Predicted chemical levels in the aquatic environment are used with measured chemical levels in the terrestrial environment for the final closure and remediation plan.

The assessment included the following elements which are proposed and readily accepted by regulatory agencies such as Environment Canada and the U.S. EPA:

- receptor characterization;
- exposure assessment;
- hazard assessment; and
- risk characterization.

The COPC identified for the risk assessment included: antimony, arsenic, beryllium, boron, cadmium, chromium, cobalt, copper, lead, manganese, nickel, selenium, silver, strontium, tin, vanadium, and zinc.

The assessment was completed within a probabilistic framework to characterize the variability and uncertainty in the input parameters, such as measured site concentrations, literature-based transfer factors, and receptor characteristics. The probabilistic framework allows for an evaluation of the likelihood of impacts and the degree of significance. The results of the probabilistic assessment are a probability distribution of estimated risk, which illustrates the variability and uncertainty in the calculated risk and provides a basis for quantifying the likelihood of exceedances. The variability in input parameters was represented by distribution functions and was selected to cover the potential range of values, but also remain conservative. Therefore, the expected values (represented in this assessment by the arithmetic mean) are the most likely results, yet remain conservatively biased. The upper-bound values (represented by the 95^{th} percentile) define the range of results and in the case where these upper-bound values are below the selected benchmarks, it can be confidently stated that negative effects are not expected.

For the ecological risk assessment, a range of ecological receptors were examined from different trophic levels in the aquatic and terrestrial environments. The results of the ERA showed that:

- Generally, there are fewer exceedances of the applicable CCME water quality guidelines in the final closure and remediation plan, as compared with the existing conditions. However, for cadmium, copper and zinc, predicted water quality concentrations are higher for the final closure and remediation plan due to the releases of soluble chemical loads within the groundwater plume that reach the receiving environment;
- There are no expected adverse effects on benthic organisms in Rose Creek and sediment quality will generally improve in Pelly River after implementation of the final closure and remediation plan. There may be some potential adverse effects on Vangorda Creek at V27 (near the Vangorda/Grum pits). However, this area is limited spatially. Benthic surveys on Rose Creek and Vangorda Creek should continue as part of the monitoring program to evaluate the effectiveness of the final closure and remediation plan;
- The results of the aquatic assessment indicate that there may be potential effects in some very sensitive algal species but not in many other species found in Rose Creek and Vangorda Creek from exposures to cadmium and zinc for the final closure and remediation plan. Again, this is limited to a small spatial area.
- For terrestrial ecological receptors, it is unlikely that there will be adverse effects due to the final closure and remediation plan as only the upper bound concentrations resulted in any SI values above the respective SI benchmark.

For the human health assessment, a number of hypothetical individuals (toddler, child, adult) were considered to use the site for the gathering of berries, trapping, hunting, and fishing; therefore, it was considered that individuals would be on site for only 1.5 months per year during these activities with consumption of food items from the site over a 6 month period. The results of the HHRA showed that:

- there At the expected (mean) level of exposure, there are no adverse effects predicted in humans for the final closure and remediation plan.
- The risk levels calculated for arsenic exposure at the Faro Mine Complex are lower than those calculated for the existing site conditions and indicate that camping for 1.5 months near Faro mine site and the Vangorda/Grumm pits is unlikely to result in adverse health effects.

The ingestion of moose and caribou at measured concentrations at the site represent the largest pathways of exposure for the human receptors considered in the assessment. Caribou have large home ranges and would be expected to spend time outside of the site area. For the samples collected from the site, it is not possible to define the exposures that are due to contamination at

the site versus exposures that are from other areas off-site. However, the measured concentrations represent actual potential exposures to humans from the ingestion of moose and caribou, with no definition of the exact contribution from the site. The calculations presented in this assessment indicate that it is unlikely that there will be adverse effects to human receptors arising from the final closure and remediation plan. It is known that some metals such as cadmium accumulate in the liver and kidneys, so that it is expected that the organs of the moose and caribou have higher concentrations than muscle tissue. Therefore, consumption of moose and caribou organs should only occur on an occasional basis.

A summary table of the conclusions of the risk assessment is provided in Table 7.1. From the table it can be seen that predicted effects are acceptable for aquatic receptors in Pelly River, benthic organisms in Rose Creek, Vangorda Creek and Pelly River, terrestrial receptors at the Faro Site and Vangorda Site, and human receptors at off-site locations under the existing conditions. There are potential effects that are not expected to be significant for aquatic receptors in Rose Creek and Vangorda Creek under the existing conditions. For the final closure and remediation plan, the predicted effects are acceptable for aquatic receptors and benthic organisms in Pelly River, as well as terrestrial receptors at the Faro Site and Vangorda Site and human receptors at Faro Site. There are potential effects in sensitive algal species and benthic organisms that are not expected to be significant in Rose Creek and Vangorda Creek. Human receptors at present on the Faro and Vangorda sites for the final closure and remediation plan are not anticipated to experience adverse effects at the expected level of exposure. There are no anticipated significant adverse effects for any receptors considered in the assessment for either existing conditions or the final closure and remediation plan.

Table 7.1 Summary of Risk Assessment Conclusions

Existing Conditions	Rose Creek Upstream	Rose Creek Downstream	Vangorda Creek Upstream	Vangorda Creek Downstream	Pelly River Upstream	Pelly River Downstream
Aquatic Receptors	Predicted effects in sensitive algal species exposed to zinc	Predicted effects in sensitive algal species exposed to zinc	Predicted effects in sensitive algal species exposed to zinc	Predicted effects in sensitive algal species exposed to zinc	Predicted effects in sensitive algal species exposed to zinc	Predicted effects in sensitive algal species exposed to zinc
Benthic Organisms	Field evidence suggest no adverse effects observed from mine-related activities	Field evidence suggest no adverse effects observed from mine-related activities	Field evidence suggest no adverse effects observed from mine-related activities	Field evidence suggest no adverse effects observed from mine-related activities	No adverse effects observed from mine-related activities	No adverse effects observed from mine-related activities
	Faro Site			**Vangorda Site**		
Terrestrial Receptors	Expected (mean) concentrations do not result in adverse effects			Expected (mean) concentrations do not result in adverse effects		
Human Health	No likely adverse effects for consumption of berries, medicinal teas, wild game and fish from the site					

Final Closure and Remediation Plan	Rose Creek Downstream-X14	Vangorda Creek Downstream – V8	Vangorda Creek Downstream – V27	Pelly River Downstream of Vangorda Creek	Pelly River Downstream of Anvil Creek
Aquatic Receptors	Predicted effects in sensitive algal species and benthic organisms in water column exposed to zinc and cadmium	Predicted effects in sensitive algal species and benthic organisms in water column exposed to zinc and cadmium	Predicted effects in sensitive algal species and benthic organisms in water column exposed to zinc and cadmium. Barrier to fish presence	Predicted effects in sensitive algal species exposed to zinc	Predicted effects in sensitive algal species exposed to zinc
Benthic Organisms	Elevated zinc concentrations but similar to historic concentrations in Rose Creek	Elevated zinc concentrations but similar to historic concentrations in Vangorda Creek	Elevated zinc concentrations may result in potential adverse effects	No predicted adverse effects	No predicted adverse effects
	Faro Site			**Vangorda Site**	
Terrestrial Receptors	Expected (mean) concentrations do not result in adverse effects			Expected (mean) concentrations do not result in adverse effects	
Human Health	No likely adverse effects for expected exposures from the site			No likely adverse effects for expected exposures from the site	

Note:

Significant adverse effect – based on risks to several species and SI values >10 times benchmarks.

No significant adverse effect – based on SI values all <10 times benchmarks.

Acceptable – based on no exceedances of benchmarks.

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APPENDIX A

PREDICTED WATER QUALITY FOR THE FINAL CLOSURE AND REMEDIATION PLAN

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APPENDIX B

SELECTION OF COPC

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APPENDIX B: SELECTION OF CHEMICALS OF POTENTIAL CONCERN

A selection process was performed to identify chemicals of potential concern (COPC) at the Faro Mine Complex. The following sections describe the process followed for the selection of chemicals of concern.

The 32 chemicals that were considered for this assessment include: aluminum (Al), antimony (Sb), arsenic (As), barium (Ba), beryllium (Be), bismuth (Bi), boron (B), cadmium (Cd), chromium (Cr), cobalt (Co), copper (Cu), iron (Fe), lead (Pb), lithium (Li), magnesium (Mg), manganese (Mn), mercury (Hg), molybdenum (Mo), nickel (Ni), selenium (Se), silicon (Si), silver (Ag), strontium (Sr), thallium (Tl), thorium (Th), tin (Sn), titanium (Ti), tungsten (W), uranium (U), vanadium (V), zirconium (Zr) and zinc (Zn).

B.1 SELECTION PROCESS

A selection process for chemicals in soil and water (see Figure B.1) was used to identify the COPC for the risk assessment. Seep concentrations were also considered for the selection of COPC. A slightly different screening procedure was used to select chemicals based on measured concentrations in sediment and vegetation samples; this is discussed in more detail in the Section B.4.

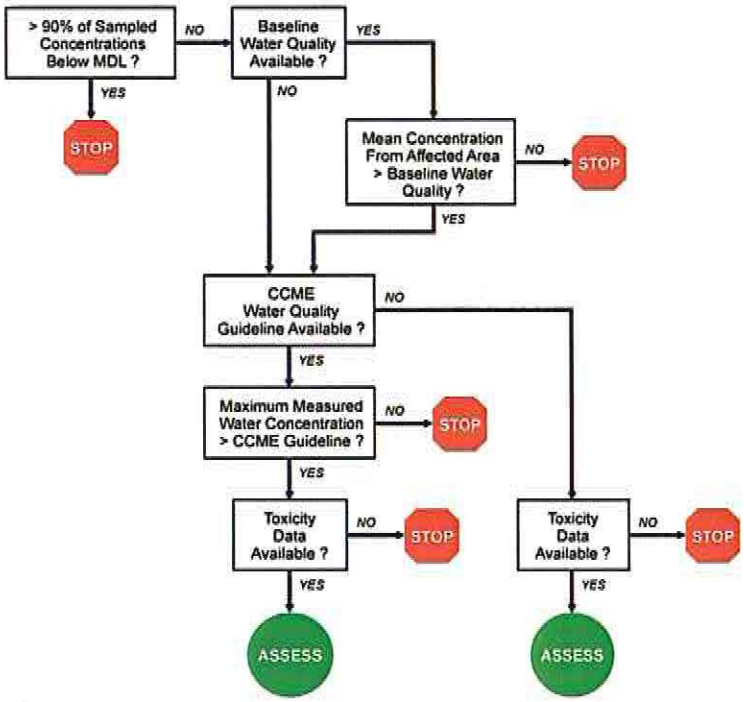
In general, the COPC selection process for surface water and soil involved the following steps:

Step 1 – Chemicals with more than 90% of sampled concentrations from the affected area reported as below MDL were considered as heavily censored and were not be considered further. Measurements reported as below the laboratory method detection limit (MDL) were assumed to be at half of the MDL.

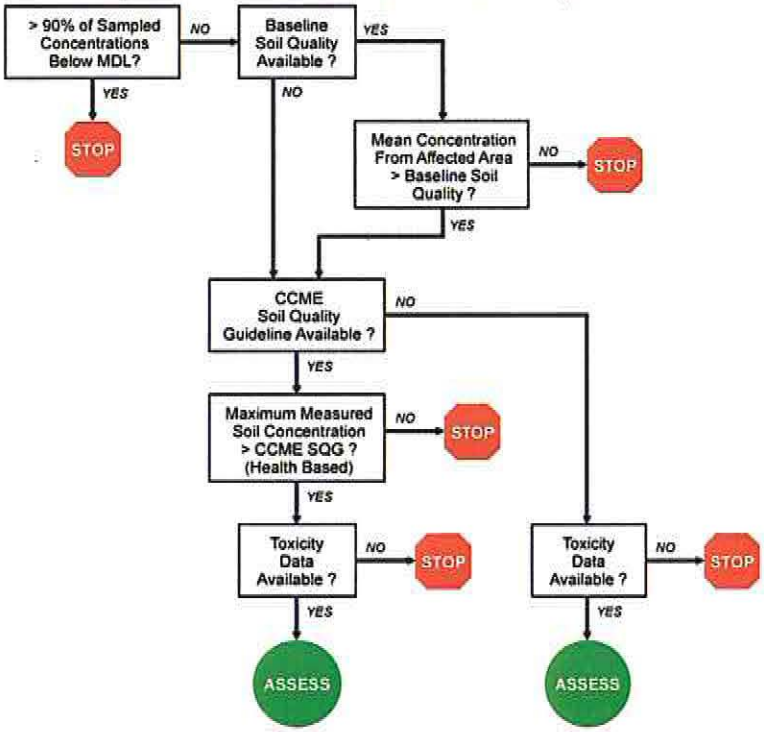
Step 2 – Concentrations in the affected areas were compared to concentrations obtained from reference sites. If the mean concentration from the affected area was higher than the reference mean, then the one-sided Wilcoxon rank-sum test was used to determine if the difference was statistically significant at a 0.10 level. The Wilcoxon rank-sum test is a non-parametric test for comparing two independent samples without any underlying assumptions of normality for the samples tested. Only chemicals with concentrations in the affected area that were significantly higher than reference concentrations were kept for further assessment.

Step 3 – The chemicals identified to have higher concentrations in the affected area than those at reference sites (i.e. from Step 2) were then compared to the appropriate screening criteria (e.g., the CCME guidelines for fresh water, soil and sediment). For chemicals with at least 20 site measurements, the 95^{th} percentile was compared to the screening criteria. For chemicals with less than 20 site measurements, the maximum was used instead. Chemicals with concentrations not higher than the screening criteria were dropped from further assessment.

Figure B.1 Selection Procedure for Chemicals of Potential Concern



Note:
Maximum is either the absolute maximum measured value
or the 95th percentile value where there were more than 20 samples.

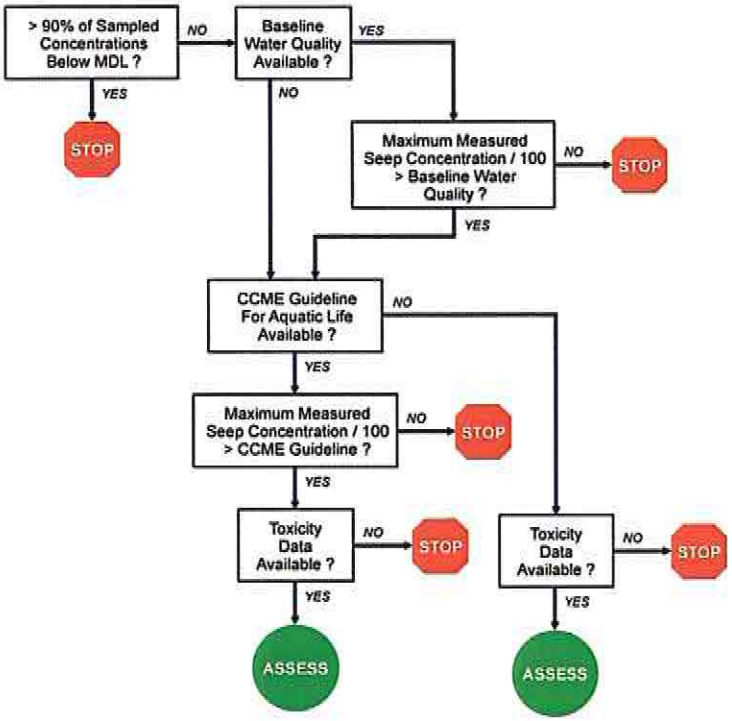


Note:
Maximum is either the absolute maximum measured value
or the 95th percentile value where there were more than 20 samples.

Step 4 – The chemicals identified in Step 3 were then checked to see if corresponding toxicity data were available. Chemicals without appropriate toxicity data were not assessed further since there was no means of quantifying risks.

Step 5 (water only) – Concentrations measured in the groundwater seeps were evaluated to ensure that all potential future COPCs were identified for surface water. A dilution factor of 1:100 was applied to the maximum measured seep concentrations and compared to reference concentrations and CCME guidelines for aquatic life. The dilution factor of 1:100 was selected based on groundwater seepage to the creeks from the water quality model. Figure B.2 summarizes the selection process for the seep data.

Figure B.2 Selection Procedure for Chemicals of Potential Concern – Seep Data



The following sections discuss the selection results, using the above methodology, for the different environmental media including surface water (at Faro mine site and Vangorda mine site), seeps, soil, sediment, and vegetation.

B.2 Surface Water Quality Data

The total metals concentrations in surface water measured at the Faro mine site and Vangorda mine site between January 2002 and December 2007 were used in the assessment. For copper, data prior to 2004 was excluded from the assessment due to detection limit issues. The Faro mine site (stations NF1, NF2, R2, R3, R4, R5, R8, R9, R10, X2, X3, X10 and X14) and

Vangorda mine site (stations V5, V8, V27 and VGMAIN) were assessed separately. Measurements from reference stations BEC, BLC, BTT, BUC, FC, FDU, GRC, HOC, STC, USFR, UWFV and VR were used to determine the background concentrations. Since most of the background samples were collected in 2008, they were also included in the assessment. The updated water database was provided by Gartner Lee Limited and included recent data through the end of 2008 (data from Site, Gartner Lee/AECOM, Access Consulting, Minnow Environmental, and Laberge).

Faro Mine Site

Samples measured on 13 April 2004 were excluded from the dataset considered in the analysis. These samples were analyzed by a different laboratory than the other samples and the method detection limit (MDL) for some of the chemicals was high: 0.01 mg/L for Ag, 0.03 mg/L for As, 0.01 mg/L for Cd, 0.02 mg/L for Co, 0.03 mg/L for Pb. Table B.1 provides a summary of the data set and selection process for the Faro Mine site.

As seen from Table B.1, several chemicals including Be, Bi, Hg, Se, Th, Tl, V, W and Zr were dropped from the selection process because more than 90% of the measurements were below the MDL.

The second step involved a comparison of the affected areas to reference locations. Surface water quality data measured from Rose Creek were compared to the concentrations measured at the reference sites for the chemicals with concentrations above the MDL. The reference concentrations were measured at stations that were not affected by mining activities. Some chemicals were dropped in this process and the following chemicals were found to have site concentrations that were not statistically higher than reference concentrations: Ag, Al, Cu, Si, and Ti.

The next step involved the comparison of the measured concentrations of the remaining chemicals to CCME guidelines (CCME 2002) for the protection of aquatic life. As, Cr, Mo, and Ni were dropped in this step. For uranium, the comparison was done to the CCME drinking water guideline of 20 µg/L since the CCME does not provide a guideline for the protection of aquatic life. The use of the drinking water guideline was considered to be reasonable as Saskatchewan has developed an aquatic life guideline of 15 µg/L; thus these values are very similar and would result in the protection of aquatic life. Uranium concentrations were below this value and were not considered further. Toxicity data are not available for Ba, Fe, Li and Mg and thus they are dropped from further consideration.

Overall, the chemicals in Rose Creek that satisfied the conditions in all of the four selection steps were considered as COPC and were carried through in the risk assessment include B, Cd, Co, Mn, Pb, Sb, Sn, Sr and Zn.

Vangorda Mine Site

Similar to the Faro Mine Site dataset, samples measured on 15 April 2004 were not included in the analysis because of high method detection limit for some of the chemicals. Approximately 230 samples were collected for most of the chemicals of interest as shown in Table B.2. As seen in the table, seven chemicals had a significant number of sample concentrations below detection limits and hence they were not considered further. These include Be, Bi, Hg, Th, Tl, W and Zr.

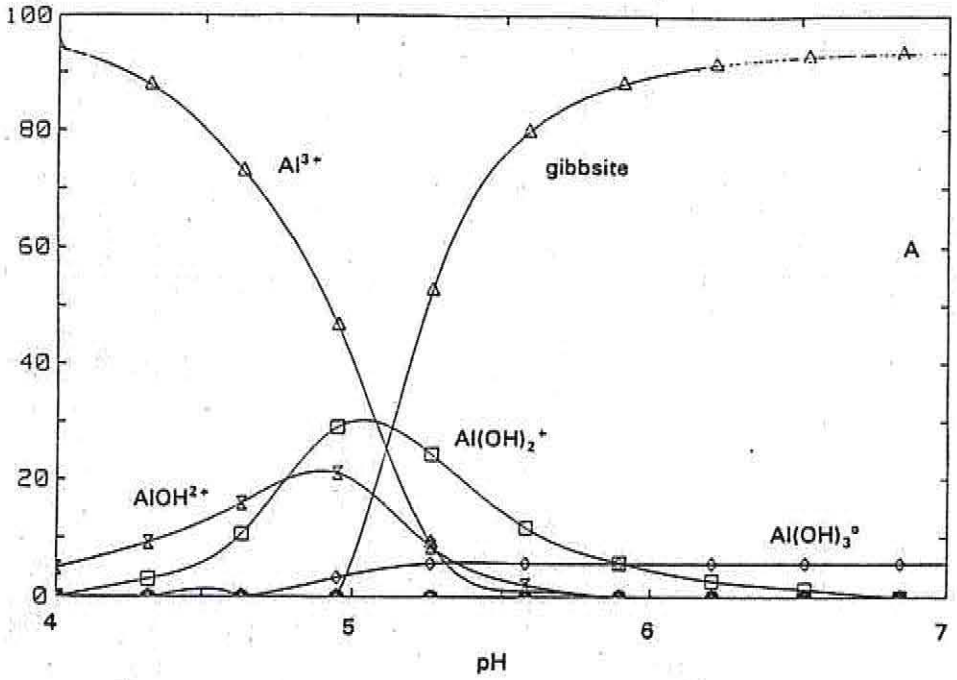
The second step involved a comparison of the affected areas to reference locations. The results of the comparison showed that Ag and Si concentrations at Vangorda Creek were not significantly higher than the background.

The next step involved the comparison of the measured concentrations of the remaining chemicals to CCME guidelines (CCME 2007) for the protection of aquatic life. Cr, Mo, and Ni were dropped in this step. For uranium, the comparison was done to the CCME drinking water guideline of 20 µg/L since the CCME does not provide a guideline for the protection of aquatic life. The use of the drinking water guideline was considered to be reasonable as Saskatchewan has developed an aquatic life guideline of 15 µg/L; thus these values are very similar and would result in the protection of aquatic life. Uranium concentrations were below this value and were not considered further. Toxicity data are not available for Ba, Fe, Li, Mg and Ti and thus they are dropped from further consideration.

In natural environments, aluminum is complexed by both inorganic and organic ligands. Below pH 6, organic complexes and the hydrated free ion tend to be the principal forms. As seen in Figure B.3, at higher pH, the dissolved species are only a small fraction of the total aluminum present (Gensmer and Playle 1999). Thus, at pH values between 5.5 and 9, there is very little aluminium that is in true solution and available for uptake by biological species. The pH in the water of Vangorda Creek typically measures between 6.4 and 8.6 pH units, thus it is not expected that aluminium is in solution to exert a toxic effect and it is dropped from further assessment.

In summary, the COPC considered from Vangorda Creek were As, B, Cd, Co, Cu, Mn, Pb, Sb, Se, Sn, Sr, V and Zn.

Figure B.3 Aluminum Speciation in Water from pH 4 to 7



from Gensmer and Playle (1999).

Table B.1 Selection of Chemicals of Concern in Surface Water in Rose Creek

Chemical	Units	N	N<MDL	Reference	Affected Area			CCME Guideline	Heavily		>CCME	With	
				Mean	Mean	P95	Max	Aquatic (FW)	Censored?	>Ref?	Guideline?	Tox Data?	COPC?
Ag	mg/L	550	484	0.00044	0.00026	0.0006	0.0237	0.0001	N	N	Y	Y	
Al	mg/L	550	26	0.083	0.069	0.28	2.26	0.005	N	N	Y	Y	
As	mg/L	550	471	0.00041	0.0010	0.0025	0.022	0.005	N	Y	N	Y	
B	mg/L	550	436	0.021	0.040	0.12	0.22		N	Y	-	Y	Y
Ba	mg/L	550	0	0.032	0.071	0.181	0.326		N	Y	-	Y	Y
Be	mg/L	550	531	0.00013	0.0011	0.0005	0.3		Y	Y	-	Y	
Bi	mg/L	550	522	0.00033	0.0031	0.025	0.03		Y	Y	-		
Cd	mg/L	550	488	0.000047	0.00016	0.0005	0.0053	0.000017	N	Y	Y	Y	Y
Co	mg/L	550	447	0.00024	0.00087	0.0025	0.015		N	Y	-	Y	Y
Cr	mg/L	550	443	0.00068	0.0011	0.005	0.018	0.0089	N	Y	N	Y	
Cu	mg/L	411	258	0.00103	0.00095	0.003	0.012	0.002	N	N	Y	Y	
Fe	mg/L	550	21	0.117	0.29	0.73	4.46	0.3	N	Y	Y		
Hg	mg/L	414	411	0.000012	0.000012	0.00001	0.00005	0.000026	Y	N	N	Y	
Li	mg/L	415	41	0.0022	0.0062	0.009	0.5		N	Y	-		
Mg	mg/L	550	0	4.46	9.25	20.6	49.8		N	Y	-		
Mn	mg/L	550	0	0.011	0.40	1.79	16		N	Y	-	Y	Y
Mo	mg/L	550	252	0.00038	0.00083	0.003	0.013	0.073	N	Y	N	Y	
Ni	mg/L	550	280	0.0011	0.0019	0.006	0.041	0.025	N	Y	N	Y	
Pb	mg/L	550	375	0.0011	0.0023	0.009	0.12	0.001	N	Y	Y	Y	Y
Sb	mg/L	550	473	0.00020	0.0022	0.015	0.07		N	Y	-	Y	Y
Se	mg/L	550	511	0.00061	0.0010	0.0025	0.003	0.001	Y	Y	Y	Y	
Si	mg/L	492	0	6.41	6.92	13.4	20.6		N	N	-		
Sn	mg/L	550	464	0.00055	0.0023	0.007	0.21		N	Y	-	Y	Y
Sr	mg/L	550	3	0.072	0.16	0.31	0.63		N	Y	-	Y	Y
Th	mg/L	395	387	0.00020	0.00027	0.00025	0.0025		Y	Y	-		
Ti	mg/L	550	325	0.0016	0.0023	0.009	0.11		N	N	-		
Tl	mg/L	476	453	0.000037	0.00018	0.001	0.003	0.0008	Y	Y	Y	Y	
U	mg/L	415	26	0.0011	0.0015	0.0029	0.0045		N	Y	-	Y	Y
V	mg/L	550	525	0.00033	0.00065	0.002	0.021		Y	Y	-	Y	
W	mg/L	135	135	0.015	0.015	0.015	0.015		Y	-	-		
Zn	mg/L	550	69	0.014	0.029	0.073	0.25	0.03	N	Y	Y	Y	Y
Zr	mg/L	415	410	0.0014	0.0048	0.005	0.005		Y	Y	-		

Note: * - CCME Drinking Water Criteria used for uranium.

Table B.2 Selection of Chemicals of Concern in Surface Water in Vangorda Creek

Chemical	Units	N	N<MDL	Reference	Affected Area			CCME Guideline	Heavily	>Ref?	>CCME	With	COPC?
				Mean	Mean	P95	Max	Aquatic (FW)	Censored?		Guideline?	Tox Data?	
Ag	mg/L	230	187	0.00044	0.00024	0.0007	0.003	0.0001	N	N	Y	Y	
Al	mg/L	230	11	0.083	0.26	1.174	6.95	0.005	N	Y	Y	Y	N**
As	mg/L	230	175	0.00041	0.0024	0.011	0.044	0.005	N	Y	Y	Y	Y
B	mg/L	230	155	0.021	0.048	0.13	0.21		N	Y	-	Y	Y
Ba	mg/L	230	0	0.032	0.093	0.201	0.331		N	Y	-	Y	Y
Be	mg/L	230	209	0.00013	0.00059	0.0005	0.05		Y	Y	-	Y	
Bi	mg/L	230	221	0.00033	0.0041	0.025	0.04		Y	Y	-		
Cd	mg/L	230	190	0.000047	0.00021	0.00055	0.0029	0.000017	N	Y	Y	Y	Y
Co	mg/L	230	193	0.00024	0.0010	0.0025	0.04		N	Y	-	Y	Y
Cr	mg/L	230	138	0.00068	0.0022	0.008	0.016	0.0089	N	Y	N	Y	
Cu	mg/L	133	53	0.00103	0.0026	0.008	0.052	0.002	N	Y	Y	Y	Y
Fe	mg/L	230	27	0.117	0.48	1.92	11	0.3	N	Y	Y		
Hg	mg/L	148	148	0.000012	0.000014	0.00005	0.00005	0.000026	Y	Y	Y	Y	
Li	mg/L	133	16	0.0022	0.0043	0.01	0.017		N	Y	-		
Mg	mg/L	234	0	4.46	25.8	44.5	71.3		N	Y	-		
Mn	mg/L	230	0	0.011	0.038	0.11	0.61		N	Y	-	Y	Y
Mo	mg/L	230	60	0.00038	0.0015	0.004	0.013	0.073	N	Y	N	Y	
Ni	mg/L	230	57	0.0011	0.0029	0.01	0.022	0.025	N	Y	N	Y	
Pb	mg/L	230	150	0.0011	0.0028	0.01	0.0203	0.001	N	Y	Y	Y	Y
Sb	mg/L	230	188	0.00020	0.0029	0.015	0.06		N	Y	-	Y	Y
Se	mg/L	230	197	0.00061	0.0017	0.0025	0.02	0.001	N	Y	Y	Y	Y
Si	mg/L	184	0	6.41	6.79	12	22.2		N	N	-		
Sn	mg/L	230	176	0.00055	0.0031	0.02	0.07		N	Y	-	Y	Y
Sr	mg/L	230	0	0.072	0.26	0.427	0.58		N	Y	-	Y	Y
Th	mg/L	133	126	0.00020	0.00032	0.0005	0.003		Y	Y	-		
Ti	mg/L	230	111	0.0016	0.0064	0.028	0.16		N	Y	-		
Tl	mg/L	179	175	0.000037	0.00029	0.001	0.002	0.0008	Y	Y	Y	Y	
U	mg/L	136	1	0.0011	0.0041	0.0084	0.0094		N	Y	-	Y	Y
V	mg/L	230	196	0.00033	0.0010	0.0025	0.015		N	Y	-	Y	Y
W	mg/L	94	92	0.015	0.015	0.015	0.04		Y	N	-		
Zn	mg/L	230	16	0.014	0.023	0.055	0.175	0.03	N	Y	Y	Y	Y
Zr	mg/L	136	136	0.0014	0.0049	0.005	0.005		Y	Y	-		

Note: * - CCME Drinking Water Criteria used for uranium.

** - dropped due to aluminum speciation considerations.

B.2.1 Seep Data

The Faro Seep and Vangorda-Grum Seep were sampled between 2002 and 2008 and the data was evaluated to ensure that all potential future COPCs were identified for surface water. A dilution factor of 1:100 was applied to the maximum measured seep concentrations and compared to reference concentrations and CCME guidelines for aquatic life. The dilution factor of 1:100 was selected based on groundwater seepage to the creeks from the water quality model. If a chemical had a concentration with the applied dilution factor below reference concentrations, it was not considered further.

Several anomalous reported concentrations for Tl were removed from the seep data set for both Faro Seep and Vangorda-Grum Seep. The anomalous readings were reported in 2003, 2004 and 2005 and were several orders of magnitude above other reported concentrations.

Faro Seep

Based on a comparison with reference location concentrations, maximum measured concentrations of B, Ba, Bi, Mo, Si, Sr and Zr in the Faro Seep with the applied factor of 100 were not higher than background and thus were not considered further. Ag, Al, As, Cd, Cr, Cu, Fe, Pb, Se and Zn concentrations including the dilution factor of 100 were above the available CCME guidelines for the protection of aquatic life. Be, Co, Mn and V were also identified as COPC since these chemicals had concentrations above background concentrations and toxicity data are available. Fe was dropped from consideration due to a lack of toxicity data. The consideration of aluminum speciation (Figure B.3) in the Faro Seep (average pH of 6.4) excluded Al from further consideration.

The result of the additional consideration of data from Faro Seep is that Ag, As, Be, Cr, Cu, Ni, Se and V were identified as additional COPC for the Rose Creek watershed, in addition to the other COPC identified above in Section B.2. Table B.3 summarizes the screening for the Faro Seep.

Vangorda-Grum Seep

For the Vangorda-Grum Seep, a comparison with reference location concentrations indicated that the maximum concentrations Ag, B, Ba, Bi, Cr, Li, Mo, Si, Sr, Ti and Zr with the applied factor of 100 were not higher than background and thus were not considered further. Al, As, Cd, Cu, Fe, Ni, Pb, Se and Zn concentrations including the dilution factor of 100 were above the available CCME guidelines for the protection of aquatic life. Be, Co, Mn, Sn and V were also identified as COPC since these chemicals had concentrations above background concentrations and aquatic toxicity data are available. Fe was dropped from consideration due to a lack of

toxicity data. The consideration of aluminum speciation (Figure B.3) in the Vangorda-Grum Seep (average pH of 6.7) excluded Al from further consideration.

The result of the additional consideration of data from the Vangorda-Grum Seep identified Be and Ni as an additional COPC for the Vangorda Creek watershed. Table B.4 summarizes the screening for Vangorda-Grum Seep.

Table B.3 Selection of Chemicals of Concern in Surface Water in Faro Seep (Rose Creek Watershed)

Chemical	Units	N	N<MDL	Affected Area			MAX/100	Reference	> Reference?	CCME Guideline	Heavily	> CCME Guideline?	With	COPC?
				Min	Mean	Max		Mean	Rose	Aquatic Life	Censored?	Aquatic Life	Tox Data?	
Ag	mg/L	248	207	0.00001	0.003	0.1	0.00	0.00048	Y	0.0001	N	Y	Y	X
Al	mg/L	248	128	0.0016	52	986	9.86	0.0835	Y	0.005	N	Y	Y	N**
As	mg/L	248	184	0.0001	19	450	4.50	0.00058	Y	0.005	N	Y	Y	X
B	mg/L	248	219	0.010	0.04	0.50	0.01	0.0396	N	-	N		Y	
Ba	mg/L	248	14	0.0055	0.03	0.09	0.00	0.0320	N	-	N			
Be	mg/L	248	199	0.00001	0.01	0.21	0.00	0.00025	Y	-	N		Y	X
Bi	mg/L	248	230	0.00001	0.0001	0.0007	0.00	0.00066	N	-	Y			
Ca	mg/L	248	0	6.45	245	675	6.75	-	-	-	N			
Cd	mg/L	248	69	0.00004	2.0	57	0.57	0.00007	Y	0.000017	N	Y	Y	X
Co	mg/L	248	57	0.00003	0.99	20	0.20	0.00037	Y	-	N		Y	X
Cr	mg/L	248	193	0.0001	0.12	1.2	0.01	0.00081	Y	0.0089	N	Y	Y	X
Cu	mg/L	248	75	0.0011	22	559	5.59	0.00109	Y	0.002	N	Y	Y	X
Fe	mg/L	248	73	0.0020	432	15100	151.00	0.118	Y	0.3	N	Y		
K	mg/L	248	54	0.01	7.9	29	0.29	-	-	-	N			
Li	mg/L	248	16	0.0014	0.09	1.3	0.01	0.00227	Y	-	N			
Mg	mg/L	248	0	1.09	301	3210	32.10	4.46	Y	-	N			
Mn	mg/L	248	0	0.0002	43	2360	23.60	0.0112	Y	-	N		Y	X
Mo	mg/L	248	212	0.0001	0.002	0.02	0.00	0.00046	N	0.073	N	N	Y	
Na	mg/L	248	11	1.45	20	216	2.16	-	-	-	N			
Ni	mg/L	248	49	0.0004	1.0	16	0.16	0.00122	Y	0.025	N	Y	Y	X
P	mg/L	204	186	0.03	2.3	22	0.22	-	-	-	Y			
Pb	mg/L	248	141	0.0001	0.44	4.9	0.05	0.00123	Y	0.001	N	Y	Y	X
Sb	mg/L	248	199	0.00004	0.06	1.5	0.02	-	-	-	N		Y	
Se	mg/L	248	193	0.0001	0.94	9	0.09	0.00085	Y	0.001	N	Y	Y	X
Sn	mg/L	248	225	0.00001	0.03	0.31	0.00	0.00068	Y	-	Y		Y	
Si	mg/L	248	4	0.49	7.3	82	0.82	6.41	N	-	N			
Sr	mg/L	248	0	0.03	1.2	4.4	0.04	0.072	N	-	N		Y	
Ti	mg/L	248	214	0.0002	0.10	3.1	0.03	0.00169	Y	-	N			
Tl	mg/L	245	195	0.00001	0.0011	0.0111	0.0001	0.00007	Y	0.0008	N	N		
U	mg/L	33	0	0.0001	0.12	1.7	0.02	0.00116	Y	0.02*	N	N	Y	
V	mg/L	248	206	0.0002	0.02	0.12	0.00	0.00049	Y	-	N		Y	X
Zn	mg/L	248	0	0.01	819	34800	348.00	0.0145	Y	0.03	N	Y	Y	X
Zr	mg/L	33	15	0.0001	0.002	0.02	0.00	0.00268	N	-	N			

Note: * - CCME Drinking Water Criteria used for uranium.
** - dropped due to consideration of aluminum speciation.

Table B.4 Selection of Chemicals of Concern in Surface Water in Vangorda-Grum Seep

Chemical	Units	N	N<MDL	Affected Area			MAX/100	Reference	> Reference?	CCME Guideline	Heavily	> CCME Guideline?	With	COPC?
				Min	Mean	Max		Mean	Vangorda	Aquatic Life	Censored?	Aquatic Life	Tox Data?	
Ag	mg/L	174	147	0.000005	0.004	0.026	0.0003	0.00048	N	0.0001	N	Y	Y	
Al	mg/L	174	105	0.001	53	687	6.8700	0.0835	Y	0.005	N	Y	Y	N**
As	mg/L	174	130	0.0004	1.5	47.8	0.4780	0.00058	Y	0.005	N	Y	Y	X
B	mg/L	174	150	0.01	0.03	0.05	0.0005	0.0396	N	-	N		Y	
Ba	mg/L	174	23	0.0047	0.04	1.03	0.0103	0.0320	N	-	N			
Be	mg/L	174	151	0.00001	0.01	0.082	0.0008	0.00025	Y	-	N		Y	X
Bi	mg/L	174	161	0.000005	0.00003	0.00003	0.0000	0.00066	N	-	Y			
Ca	mg/L	174	0	41.6	326	603	6.0300	-	-	-	N			
Cd	mg/L	174	66	0.00002	2	23.2	0.2320	0.00007	Y	0.000017	N	Y	Y	X
Co	mg/L	174	54	0.000102	5	38.3	0.3830	0.00037	Y	-	N		Y	X
Cr	mg/L	174	140	0.0001	0.05	0.573	0.0057	0.00081	Y	0.0089	N	N	Y	
Cu	mg/L	174	101	0.0008	4	180	1.8000	0.00109	Y	0.002	N	Y	Y	X
Fe	mg/L	174	70	0.006	708	8350	83.5000	0.118	Y	0.3	N	Y		
K	mg/L	174	42	0.92	7.4	28	0.2800	-	-	-	N			
Li	mg/L	174	9	0.0033	0.11	1.19	0.0119	0.00227	Y	-	N			
Mg	mg/L	174	0	23	855	8410	84.1000	4.46	Y	-	N			
Mn	mg/L	174	0	0.00144	411	4830	48.3000	0.0112	Y	-	N		Y	X
Mo	mg/L	174	138	0.0003	0.02	0.434	0.0043	0.00046	Y	0.073	N	N	Y	
Na	mg/L	174	23	0.3	7.5	17.9	0.1790	-	-	-	N			
Ni	mg/L	174	17	0.0157	3.9	38	0.3800	0.00122	Y	0.025	N	Y	Y	X
P	mg/L	153	134	0.03	0.09	0.32	0.0032	-	-	-	N			
Pb	mg/L	174	111	0.000063	0.39	2.5	0.0250	0.00123	Y	0.001	N	Y	Y	X
Sb	mg/L	174	141	0.0001	0.004	0.108	0.0011	-	-	-	N		Y	
Se	mg/L	174	135	0.0002	0.015	0.144	0.0014	0.00085	Y	0.001	N	Y	Y	X
Si	mg/L	174	5	0.42	6.6	74	0.7400	6.41	N	-	N			
Sn	mg/L	174	149	0.00001	0.35	3	0.0300	0.00068	Y	-	N		Y	X
Sr	mg/L	174	0	0.185	1.3	5.54	0.0554	0.072	N	-	N		Y	
Ti	mg/L	174	146	0.0002	0.015	0.364	0.0036	0.00169	Y	-	N			
Tl	mg/L	169	126	0.000018	0.0024	0.024	0.0002	0.00007	Y	0.0008	N	N		
U	mg/L	21	0	0.00191	0.19	1.72	0.0172	0.00116	Y	0.02*	N	N	Y	
V	mg/L	174	135	0.0002	0.10	2.58	0.0258	0.00049	Y	-	N		Y	X
Zn	mg/L	174	0	0.005	1272	16700	167.0000	0.0145	Y	0.03	N	Y	Y	X
Zr	mg/L	21	8	0.0002	0.0005	0.0007	0.0000	0.00268	N	-	N			

Note: * - CCME Drinking Water Criteria used for uranium.
** - dropped due to consideration of aluminum speciation.

B.3 SOIL QUALITY DATA

The soil quality data was a smaller data set than the water samples and did not include uranium and some other chemicals (trace metals) that were considered in the surface water samples. Nonetheless, the dataset contained the chemicals which were important to the Faro Mine Complex site and the screening was performed on this dataset which contained a total of 59 samples.

A review of the dataset in Table B.5 indicates that, soil samples with Ag, Be, Mo, and Sb have more than 90% of the measured data below detection limits. Thus, these chemicals were not considered further.

Of the remaining chemicals, 15 had measured concentrations that were statistically different from the reference concentrations. The reference concentrations were measured at locations that were considered to be away from the influences of the mine site. As a result, Al, As, Ba, Co, Cr, Cu, Fe, Hg, Ni, Pb, Sn, Ti, V, Zn, and Zr were carried through to the next selection step.

The screening criterion used for soil was the CCME soil quality guideline for agricultural land use (CCME 2007). Six of the 15 chemicals carried through exceeded the CCME soil quality guidelines. These include As, Cu, Pb, Sn, Ti and Zn. There were no guideline values for Al, Fe and Zr and therefore they were also still retained in the screening. Aluminum is an integral part of geological structures and thus it was not considered further. Finally, there are no appropriate terrestrial toxicity values for Fe, Ti and Zr and therefore these chemicals were dropped from the assessment. Overall, As, Cu, Pb, Sn, and Zn were selected as COPCs from the soil screening process.

Table B.5 Selection of Chemicals of Concern in Soils from Faro Mine Complex

Chemical	Units	N	N<MDL	Reference	Affected Area			CCME Guideline	Heavily	> Ref?	> CCME Guideline?	With	COPC?	Remarks
				Mean	Mean	P95	Max	Agricultural	Censored?		Agricultural	Tox Data?		
Ag	mg/kg	59	54	1.05	1.19	3	6	20	Y	N	N	Y		
Al	mg/kg	59	0	785.5	3323.17	12300	24200	.	N	Y	-	Y		An integral part of the geologic structure
As	mg/kg	59	0	0.73	8.65	32	64.8	12	N	Y	Y	Y	Y	
B	mg/kg	59	12	7.61	4.65	14	18	2	N	N	Y	Y		
Ba	mg/kg	59	0	206.08	330.41	748	961	750	N	Y	N	Y		
Be	mg/kg	59	59	0.5	0.5	0.5	0.5	4	Y	N	N	Y		
Ca	mg/kg	59	0	13685.53	11671.8	29600	36600	.	N	N	-			
Cd	mg/kg	59	9	1.76	1.81	5.2	12.4	1.4	N	N	Y	Y		
Co	mg/kg	59	9	1.39	3.4	11	21	40	N	Y	N	Y		
Cr	mg/kg	59	16	1.11	6.7	31	45	64	N	Y	N	Y		
Cu	mg/kg	59	0	10.63	39.64	113	272	63	N	Y	Y	Y	Y	
Fe	mg/kg	59	0	1074.97	7561.97	31900	37100	.	N	Y	-			
Hg	mg/kg	59	0	0.11	0.57	1.92	4.3	6.6	N	Y	N	Y		
K	mg/kg	59	0	1226.89	1139.63	1910	3610	.	N	N	-			
Mg	mg/kg	59	0	1582.5	1889.8	5630	10100	.	N	N	-			
Mn	mg/kg	59	0	628.26	487.11	1450	4360	.	N	N	-	Y		
Mo	mg/kg	59	56	2.58	2.17	5	6	5	Y	N	N	Y		
Na	mg/kg	59	9	31.84	51.07	194	324	.	N	N	-			
Ni	mg/kg	59	4	3.53	8.71	27	55	50	N	Y	N	Y		
P	mg/kg	59	0	930.32	917.29	1640	2360	.	N	N	-			
Pb	mg/kg	59	0	9.89	587.56	2410	5930	70	N	Y	Y	Y	Y	
Sb	mg/kg	59	59	5	5	5	5	20	Y	N	N	Y		
Sc	mg/kg	59	9	0.57	0.54	1.2	2	1	N	N	Y	Y		
Sn	mg/kg	59	49	2.5	3.14	7	8	5	N	Y	Y	Y	Y	
Sr	mg/kg	59	0	59.97	53.96	145.5	169	.	N	N	-	Y		
Ti	mg/kg	59	0	18.89	85.96	396	560	.	N	Y	-			
V	mg/kg	59	2	1.97	7.47	30	40	130	N	Y	N	Y		
Zn	mg/kg	59	0	118	496.11	1380	3050	200	N	Y	Y	Y	Y	
Zr	mg/kg	59	34	0.53	1.18	3	7	.	N	Y	-			

B.4 SEDIMENT AND VEGETATION SCREENING

The screening process in the surface water and soil is the general methodology used to select COPC for the risk assessment. However, the screening for the sediment and vegetation samples was carried out only to identify chemicals that were possibly not selected in the general screening process. A slightly different methodology was used in this case. Samples were still compared to background; however only chemicals with sediment quality criteria or reported phytotoxic levels were considered further to select additional COPC. If no sediment quality guidelines or phytotoxic levels were available, then these chemicals were not considered further.

B.4.1 Sediment Quality Data

A total of 12 samples were obtained from the affected area for sediments as seen in Table B.6. From this dataset it can be seen that Be had more than 90% of the measured concentration below detection limits and was therefore not carried through to the next selection step.

A total of 19 chemicals of interest had their concentrations that were statistically different from the reference concentrations. The reference sediment concentrations were measured at locations upstream of the mine site where there would be no influences from mining activities. Of these chemicals, only As, Cd, Cr, Cu, Hg, Pb and Zn have CCME Sediment Quality Guidelines. These chemicals were then considered in the screening step.

The screening criteria used for sediment was the CCME ISQG (interim Sediment Quality Guideline) and the PEL (Probable Effects Limit). As seen from Table B.6, Cd, Cr, Cu and Hg were measured at concentrations above the ISQG but below the PEL and thus were dropped from further consideration.

Only As, Pb and Zn were identified from the sediment screening and these were already selected in the water screening process.

Table B.6 Selection of Chemicals of Concern in Sediments from Faro Mine Complex

Analyte	Units	N	N<MDL	Reference Mean	Affected Area			CCME Guideline		Heavily Censored?	> Ref?	> CCME Guideline?		With Tox Data?	COPC?	Remarks
					Mean	P95	Max	ISQG	PEL			ISQG	PEL			
Ag	ug/g	12	2	0.09	0.29	0.5	0.5	.	.	N	Y	-	-	Y		
Al	ug/g	12	0	10351.11	11000	15100	15100	.	.	N	N	-	-	Y		
As	ug/g	12	0	12.07	15.2	24.3	24.3	5.9	17	N	Y	Y	Y	Y	Y	
B	ug/g	12	8	0.5	0.75	2	2	.	.	N	Y	-	-	Y		
Ba	ug/g	12	0	159.78	315.75	586	586	.	.	N	Y	-	-	Y		
Be	ug/g	12	12	0.5	0.5	0.5	0.5	.	.	Y	N	-	-	Y		
Ca	ug/g	12	0	4521.11	6147.5	11000	11000	.	.	N	Y	-	-			
Cd	ug/g	12	0	0.63	0.92	1.7	1.7	0.6	3.5	N	Y	Y	N	Y		Below PEL
Co	ug/g	12	0	9.89	14.17	21	21	.	.	N	Y	-	-	Y		
Cr	ug/g	12	0	24.78	31.75	41	41	37.3	90	N	Y	Y	N	Y		Below PEL
Cu	ug/g	12	0	18.56	46.5	89	89	35.7	197	N	Y	Y	N	Y		Below PEL
Fe	ug/g	12	0	19577.78	23091.67	29500	29500	.	.	N	Y	-	-			
Hg	ug/g	12	1	0.04	0.11	0.22	0.22	0.17	0.486	N	Y	Y	N	Y		Below PEL
K	ug/g	12	0	1008.78	1052.83	1580	1580	.	.	N	N	-	-			
Mg	ug/g	12	0	4508.89	5342.5	7280	7280	.	.	N	Y	-	-			
Mn	ug/g	12	0	1096.11	2682.33	6410	6410	.	.	N	Y	-	-	Y		
Mo	ug/g	12	0	1.23	1.46	2.4	2.4	.	.	N	N	-	-	Y		
Na	ug/g	12	0	149	165.25	209	209	.	.	N	N	-	-			
Ni	ug/g	12	0	25.56	35.83	48	48	18	35.9	N	Y	Y	Y	Y	Y	
P	ug/g	12	0	2627.78	3099.17	9040	9040	.	.	N	N	-	-			
Pb	ug/g	12	0	50.31	148.91	264	264	35	91.3	N	Y	Y	Y	Y	Y	
Sb	ug/g	12	0	0.61	1.28	2	2	.	.	N	Y	-	-	Y		
Se	ug/g	12	0	0.59	0.74	1.5	1.5	.	.	N	N	-	-	Y		
Sn	ug/g	12	10	2.5	6.58	40	40	.	.	N	N	-	-	Y		
Sr	ug/g	12	0	30.78	33.67	50	50	.	.	N	N	-	-	Y		
Ti	ug/g	12	0	267.11	326.33	575	575	.	.	N	Y	-	-			
Tl	ug/g	12	0	0.15	0.3	0.5	0.5	.	.	N	Y	-	-			
V	ug/g	12	0	30.56	29.75	38	38	.	.	N	N	-	-	Y		
Zn	ug/g	12	0	116	341.08	607	607	123	315	N	Y	Y	Y	Y	Y	
Zr	ug/g	12	1	1.67	1.54	3	3	.	.	N	N	-	-			

B.4.2 Vegetation Quality Data

A total of 116 samples were collected in the vegetation sampling program as shown in Table B.7. For screening purposes, only forb, grass, horsetail, labrador tea and willow samples were considered.

Chemicals that had concentrations below the detection limits for more than 90% of the measurements include Be, Sb, Te, U, V and Zr. These six chemicals were therefore not considered further.

Eight of the chemicals which included Ag, As, Cr, Fe, Hg, Ni, Pb, and Zn had concentrations that were statistically different to reference concentrations. The reference concentrations were measured at locations not influenced by mining activities.

Out of the eight chemicals carried through from the previous selection step, only Pb and Zn had 95th percentile concentrations exceeding the phytotoxic levels. Cd was also considered to be a COPC since its 95th percentile concentration was above its corresponding phytotoxic level even though it was not statistically different than the reference concentration. This is a conservative assumption.

Overall, Cd, Pb and Zn were identified from the vegetation screening. Of these only cadmium, was not identified in the soil screening process.

Table B.7 Selection of Chemicals of Concern in Vegetation from Faro Mine Complex

Analyte	Units	N	N<MDL	Reference Mean	Affected Area			Phytotoxic Level	Heavily Censored?	> Ref?	>Phytotoxic Level?	COPC?
					Mean	P95	Max					
Ag	ug/g dry	116	44	0.01	0.0325	0.12	0.34	.	N	Y	-	
Al	ug/g dry	42	0	12.99	14.952	39.8	49.6	50	N	N	N	
As	ug/g dry	116	96	0.24	0.5349	2	11	3	N	Y	N	
B	ug/g dry	42	0	15.85	16.262	31	37	.	N	N	-	
Ba	ug/g dry	42	0	51.7	63.545	122	269	400	N	N	N	
Be	ug/g dry	42	38	0.01	0.016	0.06	0.13	.	Y	N	-	
Ca	ug/g dry	42	0	13393.08	15081	32100	39800	.	N	N	-	
Cd	ug/g dry	116	12	2.11	1.7283	9.92	17.27	5	N	N	Y	Y
Co	ug/g dry	42	17	0.18	0.4679	1.4	5.4	3	N	N	N	
Cr	ug/g dry	116	9	0.21	0.5272	1.1	20.2	5	N	Y	N	
Cu	ug/g dry	116	0	4.39	4.7979	8.3	11.7	.	N	N	-	
Fe	ug/g dry	42	0	63.54	77.786	144	156	.	N	Y	-	
Hg	ug/g dry	116	60	0.01	0.0132	0.04	0.07	1	N	Y	N	
K	ug/g dry	42	0	22685.38	21008	47100	47900	.	N	N	-	
Mg	ug/g dry	42	0	4987.69	3827.6	8770	10300	.	N	N	-	
Mn	ug/g dry	42	0	310.18	363.85	1510	1820	.	N	N	-	
Mo	ug/g dry	42	6	5.45	0.7357	2.2	3.7	10	N	N	N	
Na	ug/g dry	42	5	20.35	22.655	52	312	.	N	N	-	
Ni	ug/g dry	116	1	0.87	2.5392	8.6	21.6	.	N	Y	-	
P	ug/g dry	42	0	6940	5244	8150	9230	.	N	N	-	
Pb	ug/g dry	116	4	0.16	7.0164	43.8	115	20	N	Y	Y	Y
Sb	ug/g dry	42	42	0.05	0.05	0.05	0.05	150	Y	N	N	
Se	ug/g dry	116	99	1.33	0.4526	1	3	5	N	N	N	
Si	ug/g dry	42	0	827.15	917.48	1820	1900	.	N	N	-	
Sn	ug/g dry	42	22	0.23	0.1167	0.3	0.4	.	N	N	-	
Sr	ug/g dry	42	0	44	64.376	148	176	.	N	N	-	
Te	ug/g dry	42	42	0.05	0.05	0.05	0.05	.	Y	N	-	
Ti	ug/g dry	42	0	1.84	1.069	1.9	2	.	N	N	-	
Tl	ug/g dry	42	36	0.01	0.0202	0.08	0.18	11	N	Y	N	
U	ug/g dry	42	42	0.02	0.02	0.02	0.02	.	Y	N	-	
V	ug/g dry	42	42	0.25	0.25	0.25	0.25	5	Y	N	N	
Zn	ug/g dry	116	0	116.14	186.83	663	2350	100	N	Y	Y	Y
Zr	ug/g dry	42	42	1.5	1.5	1.5	1.5	.	Y	N	-	

B.5 OVERALL LIST OF COPC CONSIDERED

A summary table with the selected COPC for the aquatic environment is provided in Table B.8 and includes Ag, As, B, Be, Cd, Co, Cr, Cu, Mn, Ni, Pb, Sb, Se, Sn, Sr, V and Zn.

Table B.8 Selection of Chemicals of Concern for Faro Mine Complex Aquatic Environment Assessment

		Rose Creek			Vangorda Creek		
Chemical	**Sediment**	**Water-Rose**	**Seep-Faro**	**List of COPC**	**Water-Vangorda**	**Seep-Vangorda**	**List of COPC**
Ag			Y	Ag			
Al							
As	Y		Y	As	Y	Y	As
B		Y		B	Y		B
Ba							
Be			Y	Be		Y	Be
Bi							
Cd		Y	Y	Cd	Y	Y	Cd
Co		Y	Y	Co	Y	Y	Co
Cr			Y	Cr			
Cu			Y	Cu	Y	Y	Cu
Fe							
Hg							
Li							
Mg							
Mn		Y	Y	Mn	Y	Y	Mn
Mo							
Ni	Y		Y	Ni		Y	Ni
Pb	Y	Y	Y	Pb	Y	Y	Pb
Sb		Y		Sb	Y		Sb
Se			Y	Se	Y	Y	Se
Si							
Sn		Y		Sn	Y	Y	Sn
Sr		Y		Sr	Y		Sr
Th							
Ti							
Tl							
U							
V			Y	V	Y	Y	V
W							
Zn	Y	Y	Y	Zn	Y	Y	Zn
Zr							

A summary table with the selected COPC for the terrestrial environment is provided in Table B.9 and includes As, Cd, Cu, Pb, Sn and Zn.

Table B.9 Selection of Chemicals of Concern for Faro Mine Complex Terrestrial Environment Assessment

Chemical	Terrestrial Environment		
	Soil	Vegetation	List of COPC
Ag			
Al			
As	Y		As
B			
Ba			
Be			
Bi			
Cd		Y	Cd
Co			
Cr			
Cu	Y		Cu
Fe			
Hg			
Li			
Mg			
Mn			
Mo			
Ni			
Pb	Y	Y	Pb
Sb			
Se			
Si			
Sn	Y		Sn
Sr			
Th			
Ti			
Tl			
U			
V			
W			
Zn	Y	Y	Zn
Zr			

B.6 REFERENCES

Gensmer, R.W. and R.C. Playle 1999. *The Bioavailability and Toxicity of Aluminum in Aquatic Environments*. Critical Reviews in Environmental Science and Technology, 29(4): 315-450.

APPENDIX C

SUMMARY OF DATA

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APPENDIX C: SUMMARY OF DATA

This appendix summarizes the available monitoring data for the study area.

C.1 Aquatic Environment

This section discusses surface water and sediment quality within the Rose Creek and Vangorda Creek watersheds. Flesh samples from slimy sculpin and Arctic grayling from a field investigation (White Mountain Environmental Consulting 2004) conducted in the summer of 2004 are also summarized.

C.1.1 Surface Water Quality

Measured water quality data collected over the 2002 to 2004 period within the Rose Creek and Vangorda Creek watersheds were provided by Gartner Lee Limited (2005a). Additional water samples from a biological and sediment monitoring program conducted by Laberge Environmental Services (2004) were also included in the assessment. Data for the Pelly River from the Environment Canada website (1992-1996) and the Selkirk First Nations report are summarized below.

After a preliminary review of the data, it was determined that there were some limitations in the 2002 to 2004 water quality database on Rose Creek and Vangorda Creek watersheds as several of the measurements were reported as less than method detection limits and some measurements were reported with high method detection limits. For the purpose of calculating summary statistics for these data, some of the samples with measurements for arsenic, copper and silver had to be excluded due to the high method detection limits; for other detection limit issues, concentrations measured as less than the detection limit ("<") were considered as equal to ½ the detection limit.

Rose Creek Watershed

Surface water quality data were collected at different locations in the Rose Creek watershed. Table C.1.1-1 provides a list of monitoring stations in Rose Creek. Stations upstream of the mine are considered to be representative of background water quality conditions since pre-mining conditions in Rose Creek are not available.

TABLE C.1.1-1
MONITORING STATIONS IN ROSE CREEK

Upstream/Background Stations	
R1	Upstream of the confluence of the North and South Forks of Rose Creek
R6	Anvil Creek upstream of Rose Creek
R7	North Fork of Rose Creek upstream of Faro Creek diversion
W10	Upper Guardhouse Creek upstream of the Northwest rock dumps
Downstream	
NF1	North Fork of Rose Creek upstream of haul road
NF2	North Fork of Rose Creek downstream of haul road
R2	In the mixing zone downstream of the intersection of the Rose Creek diversion canal and the outlet of the tailings pond
R3	Rose Creek approximately half way between the tailings pond outlet and Anvil Creek
R4	Rose Creek just upstream of Anvil Creek
R5	Anvil Creek approximately 150 metres downstream of Rose Creek
R8	North Fork of Rose Creek, 100 m downstream of confluence with Faro Creek diversion
R9	North Fork of Rose Creek, adjacent to BH-1 & BH-2
R10	North Fork of Rose Creek, at least 100 m upstream from maximum elevation of water impounded behind North Fork rock drain and 100 m downstream of R9
X2	North Fork of Rose Creek upstream of mine access road
X3	North Fork of Rose Creek at the pump house reservoir
X10	Rose Creek Diversion Channel, below weirs
X14	Rose Creek, downstream of diversion channel

Sources: Gartner Lee Limited (2002) and Laberge (2004)

The measured data are summarized for total metal concentrations in Rose Creek watershed and the results are presented in Table C.1.1-2 (upstream of Faro Mine Complex) and Table C.1.1-3 (downstream of Faro Mine Complex). For comparison purposes, the Canadian Council of Ministers of the Environment (CCME 2003) water quality guidelines for the protection of aquatic life in fresh water have also been included in both tables.

Tables C.1.1-2 and C.1.1-3 also summarize the varying method detection limit (MDL) for each metal.

- The differences between the lowest and the highest laboratory MDL can be up to a factor of 50: the MDL for bismuth ranged from 0.001 mg/L to 0.05 mg/L. The MDL for some of the metals are high and some of them (e.g. aluminum, cadmium, lead, selenium and silver) are even higher than the CCME guideline values.

- Concentrations of beryllium, bismuth, chromium, cobalt, mercury, selenium, silver, thallium, thorium and tungsten are found to be mostly (over 90%) below the MDL at the stations upstream of the mine site.

- Mean concentrations of aluminum, cadmium, copper and lead exceed the CCME guidelines. Mean silver and selenium concentrations also exceed the CCME guideline value, however, since all the measurements are below the MDL and most of the MDLs are higher than the CCME guideline, the comparisons are not meaningful.

- Mean metal concentrations at the downstream stations are generally higher than the upstream concentrations with the exception of beryllium, lanthanum, phosphorus and silicon. In addition to the four metals that exceed the CCME guidelines at the upstream stations, mean iron concentration is also higher than the CCME guideline.

- Concentrations of beryllium, mercury, selenium, thallium, thorium, tungsten and vanadium are found to be mostly (over 90%) below the MDL at the stations downstream of the mine site.

- For both upstream and downstream stations, almost all samples exceed the CCME guidelines for aluminum and cadmium. This may be a MDL issue for cadmium because over 80% of the measured cadmium concentrations are below the MDL and the MDL for cadmium is higher than the CCME guideline.

TABLE C.1.1-2
WATER QUALITY SUMMARY – ROSE CREEK UPSTREAM OF FARO MINE COMPLEX

Total Metals	Units	No. of obs.	No. of obs. <MDL	MDL	CCME Guidelines	No. of obs. >CCME	Minimum	Mean	Maximum
Aluminum	mg/L	19	0		0.005-0.1	19	**0.007**	**0.066**	**0.6**
Antimony	mg/L	19	17	0.001-0.03			0.0005	0.0028	0.023
Arsenic	mg/L	19	17	0.001-0.005	0.005	0	0.0005	0.001	0.003
Barium	mg/L	19	0				0.033	0.071	0.191
Beryllium	mg/L	19	18	0.0002-0.001			0.0001	0.00042	0.0005
Bismuth	mg/L	19	18	0.001-0.05			0.0005	0.0035	0.025
Boron	mg/L	19	15	0.05			0.025	0.039	0.11
Cadmium	mg/L	19	15	0.0002-0.001	0.000017	19	**0.0001**	**0.00019**	**0.0011**
Calcium	mg/L	19	0				10.7	29.6	50.2
Chromium	mg/L	19	18	0.001-0.005	0.0089	1	0.0005	0.0011	**0.009**
Cobalt	mg/L	19	18	0.001-0.005			0.0005	0.00063	0.0025
Copper	mg/L	14	12	0.001	0.002-0.004	1	0.0005	0.00086	**0.005**
Iron	mg/L	19	0		0.3	4	0.016	0.26	**1.71**
Lanthanum	mg/L	5	1	0.001			0.0005	0.0037	0.01
Lead	mg/L	19	16	0.001-0.01	0.001-0.007	3	0.0005	**0.0017**	**0.015**
Lithium	mg/L	6	0				0.002	0.0037	0.005
Magnesium	mg/L	19	0				2.2	6.5	11.3
Manganese	mg/L	19	0				0.006	0.028	0.19
Mercury	mg/L	6	6	0.00002	0.000026	0	0.00001	0.00001	0.00001
Molybdenum	mg/L	19	8	0.0005-0.001	0.073	0	0.00025	0.0011	0.007
Nickel	mg/L	19	13	0.001-0.005	0.025-0.15	0	0.0005	0.0011	0.004
Phosphorus	mg/L	19	15	0.01-0.15			0.005	0.083	0.4
Potassium	mg/L	19	0				0.4	0.92	2.1
Selenium	mg/L	19	19	0.001-0.005	0.001	5	0.0005	**0.001**	**0.0025**
Silicon	mg/L	17	0				4.4	9.8	18.5
Silver	mg/L	19	19	0.0002-0.001	0.0001	15	0.0001	**0.00014**	**0.0005**
Sodium	mg/L	19	0				0.9	2.27	5
Strontium	mg/L	19	0				0.047	0.11	0.222
Sulphur	mg/L	5	0				2.3	3.16	5.3
Thallium	mg/L	6	6	0.0001	0.0008	0	0.00005	0.00005	0.00005
Thorium	mg/L	14	14	0.0005			0.00025	0.00025	0.00025
Tin	mg/L	19	15	0.001-0.002			0.0005	0.0038	0.038
Tungsten	mg/L	5	5	0.03			0.015	0.015	0.015
Uranium	mg/L	6	0				0.0011	0.0014	0.0017
Vanadium	mg/L	19	17	0.001-0.005			0.0005	0.00066	0.0025
Zinc	mg/L	19	9	0.001-0.01	0.03	2	0.0005	0.026	**0.18**

Notes: CCME Guidelines = Canadian Council of Ministers of the Environment guidelines for protection of aquatic life (CCME 2003);
Shading indicates values that exceed CCME guidelines.
No. of obs. > CCME = number of observations greater than the CCME guideline. If the guideline is given as a range, the observations are compared to the lowest value.
Analytical results reported as less than method detection limit (MDL) were assumed to be equal to ½ method detection limit in the calculation of minimum, mean and maximum values.

TABLE C.1.1-3
WATER QUALITY SUMMARY – ROSE CREEK DOWNSTREAM OF FARO MINE COMPLEX

Total Metals	Units	No. of obs.	No. of obs. <MDL	MDL	CCME Guidelines	No. of obs. >CCME	Minimum	Mean	Maximum
Aluminum	mg/L	212	8	0.005-0.05	0.005-0.1	211	0.0025	**0.087**	**0.89**
Antimony	mg/L	212	156	0.001-0.03			0.0005	0.0045	0.042
Arsenic	mg/L	212	180	0.001-0.005	0.005	10	0.0005	0.0018	**0.022**
Barium	mg/L	212	0				0.013	0.098	0.326
Beryllium	mg/L	212	194	0.0002-0.001			0.0001	0.00031	0.0005
Bismuth	mg/L	212	184	0.001-0.05			0.0005	0.0071	0.03
Boron	mg/L	212	99	0.05			0.025	0.065	0.22
Cadmium	mg/L	212	175	0.0002-0.001	0.000017	212	**0.0001**	**0.00026**	**0.0053**
Calcium	mg/L	212	0				10.7	42.2	142
Chromium	mg/L	212	126	0.001-0.005	0.0089	5	0.0005	0.002	**0.018**
Cobalt	mg/L	212	162	0.001-0.005			0.0005	0.0011	0.014
Copper	mg/L	74	55	0.001	0.002-0.004	8	0.0005	0.00097	**0.006**
Iron	mg/L	212	0		0.3	76	0.015	**0.33**	**3.74**
Lanthanum	mg/L	134	45	0.001-0.005			0.0005	0.0033	0.011
Lead	mg/L	212	120	0.001-0.01	0.001-0.007	108	0.0005	**0.0038**	**0.047**
Lithium	mg/L	8	0				0.002	0.005	0.01
Magnesium	mg/L	212	0				2.24	8.8	29.5
Manganese	mg/L	212	0				0.011	0.26	2.37
Mercury	mg/L	8	8	0.00002	0.000026	0	0.00001	0.00001	0.00001
Molybdenum	mg/L	212	107	0.0005-0.002	0.073	0	0.00025	0.0013	0.009
Nickel	mg/L	212	113	0.001-0.005	0.025-0.15	1	0.0005	0.0023	**0.041**
Phosphorus	mg/L	212	135	0.01-0.15			0.005	0.053	0.5
Potassium	mg/L	212	0				0.4	1.3	4.2
Selenium	mg/L	212	212	0.001-0.005	0.001	134	0.0005	**0.0018**	**0.0025**
Silicon	mg/L	154	0				3.4	7.9	20.6
Silver	mg/L	212	159	0.0002-0.001	0.0001	152	0.0001	**0.00041**	**0.0237**
Sodium	mg/L	212	0				0.7	3.56	15
Strontium	mg/L	212	4	0.001-0.002			0.001	0.15	0.46
Sulphur	mg/L	134	0				2.1	12.1	70.8
Thallium	mg/L	8	8	0.0001	0.0008	0	0.00005	0.00005	0.00005
Thorium	mg/L	78	77	0.0005			0.00025	0.00025	0.0006
Tin	mg/L	212	135	0.001-0.01			0.0005	0.0062	0.322
Tungsten	mg/L	134	134	0.03			0.015	0.015	0.015
Uranium	mg/L	8	0				0.0014	0.0015	0.0017
Vanadium	mg/L	212	200	0.001-0.005			0.0005	0.00078	0.003
Zinc	mg/L	212	11	0.005-0.01	0.03	73	0.002	0.027	**0.11**

Notes: CCME Guidelines = Canadian Council of Ministers of the Environment guidelines for protection of aquatic life (CCME 2003);
Shading indicates values that exceed CCME guidelines.
No. of obs. > CCME = number of observations greater than the CCME guideline. If the guideline is given as a range, the observations are compared to the lowest value.
Analytical results reported as less than method detection limit (MDL) were assumed to be equal to ½ method detection limit in the calculation of minimum, mean and maximum values.

Vangorda Creek Watershed

There are three upstream sampling stations and four downstream sampling stations in Vangorda Creek to monitor the surface water quality. These monitoring locations are described in Table C.1.1-4.

TABLE C.1.1-4
MONITORING STATIONS IN VANGORDA CREEK

Upstream/Background Stations	
V1	Vangorda Creek upstream of mine activities
V4	Shrimp Creek
V20	Vangorda Northeast diversion ditch
Downstream	
V5	West Fork Vangorda Creek
V8	Lower Vangorda Creek
V27	Main Stem Vangorda Creek (Upper)
VGMAIN	Main Stem Vangorda Creek (Lower)

Source: Gartner Lee Limited (2002)

Summary statistics of the data collected from the upstream and downstream stations are presented in Tables C.1.1-5 and Table C.1.1-6, respectively. CCME environmental quality guidelines for the protection of aquatic life are also included in the tables for comparison purposes. Some general observations respecting the metal levels measured at the upstream and downstream locations are noted as follows:

- At stations upstream of the Vangorda Plateau mine site, mean concentrations of aluminum, cadmium, copper, lead, selenium and silver exceed the CCME guidelines. In addition to the list, mean iron concentrations also exceed the guideline value at downstream stations.

- The list of exceedances is very similar to the list observed in Rose Creek. As in Rose Creek, all samples exceed the CCME guidelines for aluminum and cadmium at both upstream and downstream stations. This may again be a MDL issue for cadmium because the MDLs of cadmium are all higher than the CCME guideline value.

- Over 90% of the samples collected at both upstream and downstream stations in Vangorda Creek were found to have concentrations below MDL for mercury, selenium, thallium, thorium and tungsten.

- Mean concentrations at upstream stations are found to be slightly higher than the downstream stations for antimony, bismuth, boron, chromium, cobalt, copper, nickel, silicon, silver and thallium.

Mean concentrations of aluminum, calcium, iron, magnesium, manganese, phosphorus and sulphur at downstream stations are found to be at least twice as high as the upstream stations.

TABLE C.1.1-5
WATER QUALITY SUMMARY – VANGORDA CREEK UPSTREAM OF VANGORDA PLATEAU MINE SITE

Total Metals	Units	No. of obs.	No. of obs. <MDL	MDL	CCME Guidelines	No. of obs. >CCME	Minimum	Mean	Maximum
Aluminum	mg/L	22	0		0.005-0.1	22	**0.013**	**0.083**	**0.381**
Antimony	mg/L	22	12	0.0002-0.03			0.0001	0.0059	0.029
Arsenic	mg/L	22	17	0.001-0.005	0.005	3	0.0002	0.0037	**0.027**
Barium	mg/L	22	0				0.016	0.092	0.208
Beryllium	mg/L	22	20	0.0002-0.002			0.0001	0.00026	0.001
Bismuth	mg/L	22	13	0.0002-0.05			0.0001	0.011	0.03
Boron	mg/L	22	6	0.01-0.05			0.005	0.083	0.23
Cadmium	mg/L	22	17	0.00004-0.002	0.000017	22	**0.00002**	**0.00027**	**0.0013**
Calcium	mg/L	22	0				6.8	35.1	101
Chromium	mg/L	22	8	0.001-0.005	0.0089	1	0.0003	0.0036	**0.028**
Cobalt	mg/L	22	16	0.0002-0.005			0.0001	0.0011	0.005
Copper	mg/L	5	2	0.001	0.002-0.004	1	0.0005	0.00132	**0.003**
Iron	mg/L	22	2	0.01-0.05	0.3	4	0.005	0.18	**0.837**
Lanthanum	mg/L	17	7	0.001			0.0005	0.0024	0.009
Lead	mg/L	22	9	0.0002-0.01	0.001-0.007	13	0.0001	**0.0037**	**0.008**
Lithium	mg/L	5	1	0.001			0.0005	0.0027	0.005
Magnesium	mg/L	22	0				0.9	10.8	39.5
Manganese	mg/L	22	2	0.001-0.01			0.0005	0.016	0.04
Mercury	mg/L	7	7	0.00002-0.0001	0.000026	2	0.00001	0.00002	**0.00005**
Molybdenum	mg/L	22	10	0.0001-0.001	0.073	0	0.00005	0.0019	0.007
Nickel	mg/L	22	9	0.001-0.005	0.025-0.15	0	0.0003	0.0039	0.021
Phosphorus	mg/L	22	13	0.01-0.15			0.005	0.024	0.075
Potassium	mg/L	22	0				0.3	0.74	1.4
Selenium	mg/L	22	22	0.0002-0.005	0.001	17	0.0001	**0.002**	**0.0025**
Silicon	mg/L	14	0				3.8	7.8	14
Silver	mg/L	22	17	0.00005-0.002	0.0001	11	0.00003	**0.00052**	**0.0037**
Sodium	mg/L	22	0				0.4	2.22	4.03
Strontium	mg/L	22	0				0.024	0.14	0.43
Sulphur	mg/L	17	0				1.2	6.2	18.4
Thallium	mg/L	13	12	0.00002-0.002	0.0008	8	0.00001	0.00071	**0.002**
Thorium	mg/L	5	5	0.0001-0.0005			0.00005	0.00021	0.00025
Tin	mg/L	22	13	0.0002-0.002			0.0001	0.0051	0.035
Tungsten	mg/L	17	17	0.03			0.015	0.015	0.015
Uranium	mg/L	5	1	0.0005			0.00025	0.003	0.0083
Vanadium	mg/L	22	20	0.0002-0.005			0.0001	0.00062	0.0025
Zinc	mg/L	22	5	0.001-0.01	0.03	3	0.0005	0.014	**0.054**

Notes: CCME Guidelines = Canadian Council of Ministers of the Environment guidelines for protection of aquatic life (CCME 2003);
Shading indicates values that exceed CCME guidelines.
No. of obs. > CCME = number of observations greater than the CCME guideline. If the guideline is given as a range, the observations are compared to the lowest value.
Analytical results reported as less than method detection limit (MDL) were assumed to be equal to ½ method detection limit in the calculation of minimum, mean and maximum values.

TABLE C.1.1-6
WATER QUALITY SUMMARY – VANGORDA CREEK DOWNSTREAM OF VANGORDA PLATEAU MINE SITE

Total Metals	Units	No. of obs.	No. of obs. <MDL	MDL	CCME Guidelines	No. of obs. >CCME	Minimum	Mean	Maximum
Aluminum	mg/L	123	2	0.05	0.005-0.1	123	**0.007**	**0.23**	**5.29**
Antimony	mg/L	123	84	0.001-0.03			0.0005	0.0047	0.06
Arsenic	mg/L	123	87	0.001-0.005	0.005	20	0.0005	0.0037	**0.044**
Barium	mg/L	123	0				0.023	0.12	0.331
Beryllium	mg/L	123	103	0.0002-0.002			0.0001	0.00028	0.001
Bismuth	mg/L	123	114	0.001-0.05			0.0005	0.0073	0.04
Boron	mg/L	123	48	0.05			0.025	0.068	0.21
Cadmium	mg/L	123	92	0.0002-0.001	0.000017	123	**0.0001**	**0.00029**	**0.0029**
Calcium	mg/L	123	0				16.7	71.9	142.9
Chromium	mg/L	123	53	0.001-0.005	0.0089	8	0.0005	0.0031	**0.015**
Cobalt	mg/L	123	98	0.001-0.005			0.0005	0.001	0.006
Copper	mg/L	26	4	0.001	0.002-0.004	5	0.0005	**0.0024**	**0.018**
Iron	mg/L	123	4	0.01-0.05	0.3	32	0.005	**0.42**	**8.93**
Lanthanum	mg/L	94	23	0.001-0.005			0.0005	0.0041	0.019
Lead	mg/L	123	64	0.001-0.01	0.001-0.007	70	0.0005	**0.0041**	**0.02**
Lithium	mg/L	29	0				0.001	0.0042	0.01
Magnesium	mg/L	123	0				4.2	27.4	71.3
Manganese	mg/L	123	0				0.003	0.033	0.34
Mercury	mg/L	41	41	0.00002-0.0001	0.000026	12	0.00001	0.00002	**0.00005**
Molybdenum	mg/L	123	34	0.0005-0.002	0.073	0	0.00025	0.002	0.013
Nickel	mg/L	123	38	0.001-0.005	0.025-0.15	0	0.0005	0.0031	0.022
Phosphorus	mg/L	123	73	0.01-0.15			0.005	0.053	1.4
Potassium	mg/L	123	0				0.5	1.38	3
Selenium	mg/L	123	119	0.001-0.005	0.001	95	0.0005	**0.0023**	**0.02**
Silicon	mg/L	80	0				3.7	7.4	22.2
Silver	mg/L	123	81	0.0002-0.001	0.0001	85	0.0001	**0.00035**	**0.003**
Sodium	mg/L	123	0				0.8	3.9	9.6
Strontium	mg/L	123	0				0.047	0.27	0.558
Sulphur	mg/L	94	0				8.1	36.4	89.8
Thallium	mg/L	72	71	0.0001-0.002	0.0008	43	0.00005	0.00063	**0.002**
Thorium	mg/L	29	28	0.0005			0.00025	0.0003	0.0016
Tin	mg/L	123	72	0.001-0.01			0.0005	0.0053	0.07
Tungsten	mg/L	94	92	0.03			0.015	0.015	0.04
Uranium	mg/L	29	0				0.0012	0.0039	0.0085
Vanadium	mg/L	123	107	0.001-0.005			0.0005	0.001	0.013
Zinc	mg/L	123	9	0.001-0.01	0.03	38	0.0005	0.027	**0.175**

Notes: CCME Guidelines = Canadian Council of Ministers of the Environment guidelines for protection of aquatic life (CCME 2003);
Shading indicates values that exceed CCME guidelines.
No. of obs. > CCME = number of observations greater than the CCME guideline. If the guideline is given as a range, the observations are compared to the lowest value.
Analytical results reported as less than method detection limit (MDL) were assumed to be equal to ½ method detection limit in the calculation of minimum, mean and maximum values.

C.1.2 SEDIMENT QUALITY

Sediment samples were collected in July 2004 from seven sites (R1 to R7) located on Rose and Anvil Creeks as part of a biological and sediment monitoring program (Laberge 2004). Table C.1.2-1 provides a brief description for the sampling stations. Stations R1, R6 and R7 are located upstream of site facilities and are considered as reference sites. Three replicate stream sediment samples were collected and analyzed from each site.

No sediment samples were collected from the Vangorda Creek watershed during the 2004 monitoring program.

TABLE C.1.2-1
SEDIMENT SAMPLING STATIONS

Site ID	Site Description
R1	Upstream of the confluence of the North and South Forks of Rose Creek
R2	In the mixing zone downstream of the intersection of the Rose Creek diversion canal and the outlet of the tailings pond
R3	Rose Creek approximately half way between the tailings pond outlet and Anvil Creek
R4	Rose Creek just upstream of Anvil Creek
R5	Anvil Creek approximately 150 m downstream of Rose Creek
R6	Anvil Creek immediately upstream of Rose Creek
R7	North Fork of Rose Creek upstream of the confluence with the Faro Creek diversion

Summary statistics for the upstream (reference) sites and downstream sites are provided in Table C.1.2-2. The CCME Interim Sediment Quality Guidelines (ISQG) and Probable Effect Levels (PEL) are also provided in Table C.1.2-2. The guidelines provide scientific benchmarks for evaluating the potential for observing adverse biological effects on benthic invertebrates in aquatic systems. The ISQG values represent the concentrations below which adverse biological erects are expected occur rarely. The PEL values represent the concentrations above which adverse effects are expected to occur frequently.

Bold shaded cells in Table C.1.2-2 indicate values that exceed ISQG. CCME ISQG levels were exceeded for arsenic, cadmium, chromium, copper, lead, mercury and zinc at the downstream sites. With the exception of copper, ISQG levels were also exceeded for these metals at the reference sites. PEL levels were exceeded for arsenic, lead and zinc for both downstream and reference sites.

TABLE C.1.2-2
SEDIMENT QUALITY AT ROSE AND ANVIL CREEKS

		CCME		Downstream Sites (N=12)					Reference Sites (N=9)				
Metals	**Units**	**ISQG**	**PEL**	**N<MDL**	**Min.**	**Average**	**Max**	**Std. Dev**	**N<MDL**	**Min.**	**Average**	**Max**	**Std. Dev**
Aluminum	mg/kg (dw)			0	8070	11000	15100	1998	0	6630	10351	13400	1876
Antimony	mg/kg (dw)			0	0.80	1.28	2.00	0.35	3	0.05	0.61	1.20	0.46
Arsenic	mg/kg (dw)	5.9	17	0	**8.0**	**15.2**	**24.3**	4.3	0	**8.9**	**12.1**	**18.0**	3.2
Barium	mg/kg (dw)			0	120	316	586	150	0	107	160	252	40
Beryllium	mg/kg (dw)			12	0.5	0.5	0.5	0.0	9	0.5	0.5	0.5	0.0
Boron	mg/kg (dw)			8	0.50	0.75	2.00	0.45	9	0.50	0.50	0.50	0.00
Cadmium	mg/kg (dw)	0.6	3.5	0	0.50	**0.92**	**1.70**	0.40	0	0.40	**0.63**	**1.20**	0.25
Calcium	mg/kg (dw)			0	4120	6148	11000	2116	0	2940	4521	7270	1302
Chromium	mg/kg (dw)	37.3	90	0	21.0	31.8	**41.0**	6.3	0	15.0	24.8	**39.0**	7.7
Cobalt	mg/kg (dw)			0	9.0	14.2	21.0	4.3	0	6.0	9.9	17.0	3.1
Copper	mg/kg (dw)	35.7	197	0	17.0	**46.5**	**89.0**	22.5	0	11.0	18.6	27.0	5.6
Iron	mg/kg (dw)			0	17900	23092	29500	3671	0	13400	19578	26800	4165
Lead	mg/kg (dw)	35	91.3	0	24.7	**148.9**	**264.0**	66.5	0	7.9	**50.3**	**249.0**	77.8
Magnesium	mg/kg (dw)			0	3860	5343	7280	988	0	3090	4509	5670	962
Manganese	mg/kg (dw)			0	923	2682	6410	1675	0	608	1096	2520	571
Mercury	mg/kg (dw)	0.17	0.486	1	0.005	0.110	**0.220**	0.067	3	0.005	0.038	**0.180**	0.056
Molybdenum	mg/kg (dw)			0	0.80	1.46	2.40	0.49	0	0.60	1.23	1.90	0.47
Nickel	mg/kg (dw)			0	23.0	35.8	48.0	8.1	0	17.0	25.6	35.0	6.7
Phosphorus	mg/kg (dw)			0	1700	3099	9040	1966	0	1580	2628	3380	616
Potassium	mg/kg (dw)			0	579	1053	1580	279	0	676	1009	1280	191
Selenium	mg/kg (dw)			0	0.50	0.74	1.50	0.31	0	0.40	0.59	0.90	0.15
Silver	mg/kg (dw)			2	0.05	0.29	0.50	0.14	5	0.05	0.09	0.30	0.08
Sodium	mg/kg (dw)			0	121	165	209	29	0	96	149	218	49
Strontium	mg/kg (dw)			0	20.0	33.7	50.0	8.0	0	18.0	30.8	43.0	8.8
Thallium	mg/kg (dw)			0	0.10	0.30	0.50	0.11	1	0.05	0.15	0.30	0.08
Tin	mg/kg (dw)			10	2.5	6.6	40.0	11.0	9	2.5	2.5	2.5	0.0
Titanium	mg/kg (dw)			0	224	326	575	94	0	135	267	403	80
Vanadium	mg/kg (dw)			0	24.0	29.8	38.0	4.7	0	20.0	30.6	41.0	8.2
Zinc	mg/kg (dw)	123	315	0	83.0	**341.1**	**607.0**	147.1	0	46.0	116.0	**336.0**	87.9
Zirconium	mg/kg (dw)			1	0.50	1.54	3.00	0.84	0	1.00	1.67	3.00	0.71

Notes: Shading indicates values that exceed CCME ISQG levels.
Observations reported as less than method detection limit (MDL) were assumed to be at half of the MDL.

C.1.2.1 Benthic Invertebrates

Laberge Environmental (2003) have carried out benthic invertebrate sampling in Rose Creek, Anvil Creek and Vangorda Creek as part of their annual biological monitoring program. The benthic invertebrates are classified and enumerated; however no metal analyses were carried out on the samples. In general, it is reported that the benthic communities in these three watersheds are healthy and do not seem to be influenced by high metal concentrations in the sediments.

The Selkirk First Nations report provides results on metal analyses for Anvil Creek and the Pelly River (White Mountain Environmental 2005). Table C.1.2-3 provides a summary of the data for Anvil Creek and Pelly River. As seen from the table, mean concentrations of manganese and zinc in benthic organisms are higher in Anvil Creek than in benthic organisms in Pelly River. All other COPC concentrations in benthic organisms are higher in Pelly River.

TABLE C.1.2-3
SUMMARY OF METAL CONCENTRATIONS IN BENTHIC ORGANISMS IN ANVIL CREEK AND PELLY RIVER

COPC	Measured Metal Concentrations (µg/g wet wt.) Anvil Creek Locations				Measured Metal Concentrations (µg/g wet wt.) Pelly River Locations						Mean Metal Concentrations (µg/g wet wt.) Anvil Creek	Mean Metal Concentrations (µg/g wet wt.) Pelly River
	A1	A2	A3	A4	PB	P1A	P2	P3	P6	P5&7		
Arsenic	0.11	0.18	0.17	0.1	0.38	0.07	0.18	0.09	0.09	0.39	0.15	0.2
Cadmium	0.0842	0.214	0.121	0.15	0.256	0.574	0.161	0.216	0.236	0.926	0.14	0.39
Copper	1.67	2.36	2.36	2.17	3.94	6.97	1.48	0.84	1.29	6	2.14	3.42
Lead	0.491	6.39	0.578	0.491	4.3	0.085	0.404	0.315	1.02	24.3	1.99	5.07
Manganese	43.8	28	47.2	65.1	32.2	5.9	10.7	17.7	7.6	31	46.03	17.52
Nickel	0.22	0.37	0.42	0.27	1.54	0.25	0.62	0.33	0.45	1.1	0.32	0.72
Silver	0.011	0.019	0.012	0.011	0.028	0.048	0.011	0.005	0.011	0.05	0.01	0.03
Tin	1.39	1.53	0.75	0.7	2.21	1.32	1.45	1.99	1.29	15.1	1.09	3.89
Zinc	35.1	48.9	44.8	63.6	46.3	45.9	18.3	14.5	19.6	112	48.10	42.77

C.1.3 FISH AND FISH HABITAT SURVEYS

Fish flesh samples from slimy sculpin and Arctic grayling were collected and analyzed for metals concentrations during the Aquatic Life Sampling and Testing Program conducted in August 2004. Table C.1.3-1 lists the six sampling locations in the Rose Creek and Vangorda watersheds selected for the program to track the presence, relative abundance and condition of fish. Although sampling station R1 was not identified as control station in the sampling and testing program report (White Mountain Environmental Consulting 2004), it is located upstream of the confluence of North and South forks of Rose Creek and considered as a background station in the water quality sampling program.

TABLE C.1.3-1
FISH SAMPLING STATIONS

Rose Creek	
R1	South Fork of Rose Creek immediately upstream of the confluence of North and South Forks of Rose Creek
R2	In the mixing zone downstream of the intersection of Rose Creek and the tailings pond discharge channel
R4	Rose Creek just upstream of the confluence with Anvil Creek
R6	Anvil Creek just upstream of the confluence with Rose Creek (control site)
Vangorda Creek	
V8	Lower Vangorda Creek below the town access road
B1	Blind Creek near the lower bridge (control site)

A summary of metal concentrations in Arctic grayling tissue collected in Rose Creek watershed is given in Table C.1.3-2 and a similar summary for Vangorda Creek watershed is given in Table C.1.3-3. Slimy sculpin tissue samples are summarized in Tables C.1.3-4 and C.1.3-5 for Rose Creek and Vangorda Creek, respectively.

Concentrations of aluminum, antimony, barium, beryllium, bismuth, chromium, lithium, molybdenum, nickel, silicon, uranium and zirconium in Arctic grayling are all below the laboratory MDL for both upstream and downstream stations in Rose Creek and Vangorda Creek. Metal concentrations in Arctic graylings sampled in the downstream stations are not consistently higher or lower than the upstream stations.

Concentrations of antimony, beryllium, lithium, molybdenum, uranium and zirconium in slimy sculpin are below the MDL for both upstream and downstream stations in Rose Creek and Vangorda Creek. The list is shorter than the one for Arctic grayling and concentrations of many metals are found to be consistently higher in slimy sculpin than in Arctic grayling. These include aluminum, arsenic, barium, cadmium, calcium, iron, lead, magnesium, manganese, phosphorus, silicon, sodium, strontium, titanium and zinc.

Mean aluminum, iron and silicon concentrations in slimy sculpin are found to be higher in samples collected at downstream stations than in samples collected at upstream stations for both Rose Creek and Vangorda Creek watersheds.

TABLE C.1.3-2
SUMMARY OF METAL CONCENTRATIONS IN ARCTIC GRAYLING – ROSE CREEK

		Upstream Stations (N=10)				Downstream Stations (N=8)			
Total Metals	**Units**	**No. of obs. <MDL**	**Minimum**	**Maximum**	**Mean**	**No. of obs. <MDL**	**Minimum**	**Maximum**	**Mean**
Aluminum	µg/g (ww)	10	1	1	1	8	1	1	1
Antimony	µg/g (ww)	10	0.05	0.05	0.05	8	0.05	0.05	0.05
Arsenic	µg/g (ww)	6	0.05	0.13	0.079	3	0.05	0.14	0.099
Barium	µg/g (ww)	10	0.25	0.25	0.25	8	0.25	0.25	0.25
Beryllium	µg/g (ww)	10	0.025	0.025	0.025	8	0.025	0.025	0.025
Bismuth	µg/g (ww)	10	0.1	0.1	0.1	8	0.1	0.1	0.1
Cadmium	µg/g (ww)	5	0.0025	0.03	0.0098	3	0.0025	0.042	0.012
Calcium	µg/g (ww)	1	50	1110	475	5	50	790	193
Chromium	µg/g (ww)	10	0.1	0.1	0.1	8	0.1	0.1	0.1
Cobalt	µg/g (ww)	7	0.025	0.075	0.039	4	0.025	0.11	0.051
Copper	µg/g (ww)	0	0.58	1	0.73	0	0.59	1.5	0.82
Iron	µg/g (ww)	3	2.5	15	6	4	2.5	15	5.4
Lead	µg/g (ww)	9	0.025	0.062	0.029	6	0.025	0.068	0.034
Lithium	µg/g (ww)	10	0.25	0.25	0.25	8	0.25	0.25	0.25
Magnesium	µg/g (ww)	0	160	200	185	0	160	200	184
Manganese	µg/g (ww)	10	1	1	1	7	1	4	1.38
Mercury	µg/g (ww)	0	0.015	0.1	0.042	0	0.017	0.055	0.034
Molybdenum	µg/g (ww)	10	0.25	0.25	0.25	8	0.25	0.25	0.25
Nickel	µg/g (ww)	10	0.1	0.1	0.1	8	0.1	0.1	0.1
Phosphorus	µg/g (ww)	0	2180	2850	2476	0	2180	2630	2386
Potassium	µg/g (ww)	0	3780	4440	4051	0	4050	4510	4200
Selenium	µg/g (ww)	0	0.99	1.68	1.35	0	0.95	1.91	1.37
Silicon	µg/g (ww)	10	10	10	10	8	10	10	10
Silver	µg/g (ww)	0	0.053	0.22	0.12	0	0.052	0.16	0.081
Sodium	µg/g (ww)	0	630	780	708	0	620	760	681
Strontium	µg/g (ww)	7	0.25	0.91	0.39	7	0.25	0.66	0.3
Tin	µg/g (ww)	0	0.69	0.9	0.83	0	0.79	0.88	0.84
Titanium	µg/g (ww)	10	0.1	0.1	0.1	6	0.1	0.26	0.14
Uranium	µg/g (ww)	10	0.1	0.1	0.1	8	0.1	0.1	0.1
Vanadium	µg/g (ww)	0	0.18	0.22	0.19	0	0.17	0.22	0.19
Zinc	µg/g (ww)	0	6.84	11.8	8.8	0	6.29	13.6	8.4
Zirconium	µg/g (ww)	10	0.25	0.25	0.25	8	0.25	0.25	0.25

Notes: N = total number of fish samples
Analytical results reported as less than method detection limit (MDL) were assumed to be equal to ½ method detection limit in the calculation of minimum, mean and maximum.
Upstream stations – R1 and R6
Downstream stations – R2 and R4

TABLE C.1.3-3
SUMMARY OF METAL CONCENTRATIONS IN ARCTIC GRAYLING – VANGORDA CREEK

		Upstream Stations (N=5)				Downstream Stations (N=5)			
Total Metals	**Units**	**No. of obs. <MDL**	**Minimum**	**Maximum**	**Mean**	**No. of obs. <MDL**	**Minimum**	**Maximum**	**Mean**
Aluminum	µg/g (ww)	5	1	1	1	5	1	1	1
Antimony	µg/g (ww)	5	0.05	0.05	0.05	5	0.05	0.05	0.05
Arsenic	µg/g (ww)	1	0.05	0.13	0.11	3	0.05	0.14	0.082
Barium	µg/g (ww)	5	0.25	0.25	0.25	5	0.25	0.25	0.25
Beryllium	µg/g (ww)	5	0.025	0.025	0.025	5	0.025	0.025	0.025
Bismuth	µg/g (ww)	5	0.1	0.1	0.1	5	0.1	0.1	0.1
Cadmium	µg/g (ww)	1	0.0025	0.022	0.012	0	0.02	0.056	0.033
Calcium	µg/g (ww)	2	50	690	276	3	50	710	262
Chromium	µg/g (ww)	5	0.1	0.1	0.1	5	0.1	0.1	0.1
Cobalt	µg/g (ww)	5	0.025	0.025	0.025	5	0.025	0.025	0.025
Copper	µg/g (ww)	2	0.25	0.63	0.44	3	0.25	0.88	0.44
Iron	µg/g (ww)	4	2.5	6.2	3.24	5	2.5	2.5	2.5
Lead	µg/g (ww)	5	0.025	0.025	0.025	3	0.025	0.083	0.043
Lithium	µg/g (ww)	5	0.25	0.25	0.25	5	0.25	0.25	0.25
Magnesium	µg/g (ww)	0	180	220	196	0	160	180	170
Manganese	µg/g (ww)	5	1	1	1	5	1	1	1
Mercury	µg/g (ww)	0	0.035	0.067	0.046	0	0.027	0.115	0.051
Molybdenum	µg/g (ww)	5	0.25	0.25	0.25	5	0.25	0.25	0.25
Nickel	µg/g (ww)	5	0.1	0.1	0.1	5	0.1	0.1	0.1
Phosphorus	µg/g (ww)	0	2220	2610	2356	0	2040	2450	2216
Potassium	µg/g (ww)	0	4020	4300	4182	0	3720	4190	4028
Selenium	µg/g (ww)	0	1.06	1.68	1.35	0	1.34	2.08	1.61
Silicon	µg/g (ww)	5	10	10	10	5	10	10	10
Silver	µg/g (ww)	2	0.025	0.15	0.082	0	0.056	0.12	0.089
Sodium	µg/g (ww)	0	650	680	670	0	630	700	656
Strontium	µg/g (ww)	4	0.25	0.63	0.33	4	0.25	0.6	0.32
Tin	µg/g (ww)	0	0.82	0.9	0.86	0	0.81	0.88	0.85
Titanium	µg/g (ww)	5	0.1	0.1	0.1	5	0.1	0.1	0.1
Uranium	µg/g (ww)	5	0.1	0.1	0.1	5	0.1	0.1	0.1
Vanadium	µg/g (ww)	0	0.18	0.19	0.18	0	0.17	0.2	0.18
Zinc	µg/g (ww)	0	6.02	7.05	6.5	0	6.1	11.6	8.1
Zirconium	µg/g (ww)	5	0.25	0.25	0.25	5	0.25	0.25	0.25

Notes: N = total number of fish samples
Analytical results reported as less than method detection limit (MDL) were assumed to be equal to ½ method detection limit in the calculation of minimum, mean and maximum.
Upstream station – B1
Downstream station – V8

TABLE C.1.3-4
SUMMARY OF METAL CONCENTRATIONS IN SLIMY SCULPIN – ROSE CREEK

		Upstream Stations (N=9)				Downstream Stations (N=6)			
Total Metals	**Units**	**No. of obs. <MDL**	**Minimum**	**Maximum**	**Mean**	**No. of obs. <MDL**	**Minimum**	**Maximum**	**Mean**
Aluminum	µg/g (ww)	3	1	30.5	11.4	0	3.6	126	40.2
Antimony	µg/g (ww)	9	0.05	0.05	0.05	6	0.05	0.05	0.05
Arsenic	µg/g (ww)	2	0.05	0.16	0.11	0	0.17	0.25	0.19
Barium	µg/g (ww)	0	0.96	6.64	2.34	0	1.5	4.7	3.28
Beryllium	µg/g (ww)	9	0.025	0.025	0.025	6	0.025	0.025	0.025
Bismuth	µg/g (ww)	8	0.1	0.47	0.14	6	0.1	0.1	0.1
Cadmium	µg/g (ww)	1	0.0025	0.0765	0.038	0	0.016	0.0773	0.053
Calcium	µg/g (ww)	0	3140	21900	10407	0	5410	14500	9567
Chromium	µg/g (ww)	9	0.1	0.125	0.11	5	0.1	0.31	0.14
Cobalt	µg/g (ww)	6	0.025	0.073	0.04	2	0.025	0.2	0.11
Copper	µg/g (ww)	2	0.25	1.1	0.7	0	0.85	1.6	1.16
Iron	µg/g (ww)	0	7.3	87.5	36.3	0	21	251	91.3
Lead	µg/g (ww)	0	0.058	1.41	0.28	0	0.19	0.31	0.24
Lithium	µg/g (ww)	9	0.25	0.25	0.25	6	0.25	0.25	0.25
Magnesium	µg/g (ww)	0	220	410	291	0	200	430	280
Manganese	µg/g (ww)	0	9.8	57.2	29.3	0	17	66.5	37.5
Mercury	µg/g (ww)	0	0.012	0.049	0.027	0	0.015	0.05	0.028
Molybdenum	µg/g (ww)	9	0.25	0.25	0.25	6	0.25	0.25	0.25
Nickel	µg/g (ww)	9	0.1	0.1	0.1	4	0.1	0.27	0.16
Phosphorus	µg/g (ww)	0	3690	12200	6962	0	4650	9060	6672
Potassium	µg/g (ww)	0	2620	3010	2861	0	2660	2740	2693
Selenium	µg/g (ww)	0	0.5	1.45	0.98	0	0.73	1.02	0.88
Silicon	µg/g (ww)	6	10	53	20.3	2	10	70	41
Silver	µg/g (ww)	9	0.025	0.025	0.025	5	0.025	0.078	0.034
Sodium	µg/g (ww)	0	1000	1300	1133	0	1000	1300	1083
Strontium	µg/g (ww)	0	3.3	20	9.5	0	8.14	21.1	12.7
Tin	µg/g (ww)	0	0.76	0.87	0.81	0	0.83	0.88	0.85
Titanium	µg/g (ww)	0	0.38	1.3	0.72	0	0.55	1.8	1.21
Uranium	µg/g (ww)	9	0.1	0.1	0.1	6	0.1	0.1	0.1
Vanadium	µg/g (ww)	0	0.1	0.23	0.17	0	0.1	0.58	0.26
Zinc	µg/g (ww)	0	30.5	75.8	47.7	0	31	57.6	42.4
Zirconium	µg/g (ww)	9	0.25	0.25	0.25	6	0.25	0.25	0.25

Notes: N = total number of fish samples
Analytical results reported as less than method detection limit (MDL) were assumed to be equal to ½ method detection limit in the calculation of minimum, mean and maximum.
Upstream stations – R1 and R6
Downstream stations – R2 and R4

TABLE C.1.3-5
SUMMARY OF METAL CONCENTRATIONS IN SLIMY SCULPIN – VANGORDA CREEK

		Upstream Stations (N=3)				Downstream Stations (N=5)			
Total Metals	**Units**	**No. of obs. <MDL**	**Minimum**	**Maximum**	**Mean**	**No. of obs. <MDL**	**Minimum**	**Maximum**	**Mean**
Aluminum	µg/g (ww)	0	8.6	11	9.7	0	9.8	34.7	21.3
Antimony	µg/g (ww)	3	0.05	0.1	0.067	5	0.05	0.05	0.05
Arsenic	µg/g (ww)	1	0.1	0.16	0.12	0	0.15	0.24	0.19
Barium	µg/g (ww)	0	2.7	5.7	4.43	0	1.6	3.2	2.34
Beryllium	µg/g (ww)	3	0.025	0.05	0.033	5	0.025	0.025	0.025
Bismuth	µg/g (ww)	2	0.1	0.83	0.34	5	0.1	0.1	0.1
Cadmium	µg/g (ww)	0	0.077	0.164	0.11	0	0.134	0.248	0.18
Calcium	µg/g (ww)	0	5260	13400	10320	0	7700	14600	10782
Chromium	µg/g (ww)	2	0.125	0.55	0.27	5	0.125	0.125	0.13
Cobalt	µg/g (ww)	3	0.025	0.05	0.033	4	0.025	0.059	0.032
Copper	µg/g (ww)	0	0.62	1.3	0.87	0	0.66	0.87	0.79
Iron	µg/g (ww)	0	14	50.6	29.9	0	33	75.5	51.1
Lead	µg/g (ww)	1	0.025	0.12	0.07	0	0.085	0.21	0.16
Lithium	µg/g (ww)	3	0.25	0.5	0.33	5	0.25	0.25	0.25
Magnesium	µg/g (ww)	0	220	340	277	0	250	320	284
Manganese	µg/g (ww)	0	7.1	12	9.2	0	4.6	9.2	6.7
Mercury	µg/g (ww)	0	0.032	0.042	0.036	0	0.022	0.055	0.043
Molybdenum	µg/g (ww)	3	0.25	0.5	0.33	5	0.25	0.25	0.25
Nickel	µg/g (ww)	3	0.1	0.25	0.15	5	0.1	0.1	0.1
Phosphorus	µg/g (ww)	0	3900	8410	6790	0	5680	9070	7198
Potassium	µg/g (ww)	0	2600	2880	2750	0	2290	2810	2604
Selenium	µg/g (ww)	0	1.2	1.6	1.42	0	2.39	3.25	2.67
Silicon	µg/g (ww)	2	10	29	21.3	0	25	61	43.2
Silver	µg/g (ww)	3	0.025	0.05	0.033	5	0.025	0.025	0.025
Sodium	µg/g (ww)	0	1000	1200	1067	0	1000	1100	1040
Strontium	µg/g (ww)	0	7.6	20.4	15.3	0	8.88	15.9	11.9
Tin	µg/g (ww)	0	0.7	1.6	1.01	0	0.7	0.77	0.74
Titanium	µg/g (ww)	0	0.57	0.82	0.72	0	0.53	1.2	0.91
Uranium	µg/g (ww)	3	0.1	0.25	0.15	5	0.1	0.1	0.1
Vanadium	µg/g (ww)	0	0.14	0.19	0.16	0	0.19	0.34	0.26
Zinc	µg/g (ww)	0	22	42.9	31.3	0	50.8	58.2	55.1
Zirconium	µg/g (ww)	3	0.25	0.5	0.33	5	0.25	0.25	0.25

Notes: N = total number of fish samples
Analytical results reported as less than method detection limit (MDL) were assumed to be equal to ½ method detection limit in the calculation of minimum, mean and maximum.
Upstream station – B1
Downstream station – V8

C.2 Terrestrial Environment

In a 2004 Terrestrial Effects Study for the Faro Mine Complex (Gartner Lee Limited 2005b), soil and terrestrial vegetation samples were collected at locations around the Faro mine site and Vangorda Plateau mine site. Samples were also collected at control locations around the Swim Lake basin area. Data from a 2002 study (C.E. Jones & Associates Ltd. 2003) were also included in this assessment.

C.2.1 Soil Data

Soil data were provided by Gartner Lee Limited (Gartner Lee Limited 2005). Both surface and subsurface samples were collected in affected area (around the Faro mine site and Vangorda Plateau mine site), as well as reference sites (Swim Lakes area). Only the samples classified as "Surface Organic" and "Surface Mineral" were considered in this assessment.

Table C.2.1-1 summarizes metal concentrations in reference surface soil samples and Table C.2.1-2 summarizes the soil samples from affected area. The CCME soil guidelines for agricultural land uses are also included (CCME 2003).

Mean boron and cadmium concentrations in soil exceed the CCME guidelines in both affected area and the reference sites, indicating the observed high concentrations of boron and cadmium in soil are probably natural to the area and not a result of the mining activities.

Mean lead and zinc concentrations in soil exceed the CCME guidelines in affected area, but not the reference sites. Since the Faro Mine Complex produced lead and zinc concentrates, the affected area is expected to have substantially higher lead and zinc levels in soil when compared to the reference sites. In general, the soil concentrations in affected area are higher than the reference sites for most metals.

For the purpose of ecological risk assessment, receptors are to be placed in different area in the mining complex. These receptor locations are defined based on the spatial distribution of lead and zinc concentrations in soil and they are shown in Figure C.2.1-1.

For small local mammals and terrestrial birds, five smaller receptor locations are considered: Background (around Swim Lake), Van-S (around Grum Mine Site), Faro-S (around Faro Mine Site), Faro-N (north of Faro-S) and Faro-W (west of Faro-S). The background area includes a couple of samples that are not originally classified as reference sites.

Larger areas are defined for the medium ranging mammals such as bear and fox: Van-M (a larger area around Grum Mine Site which includes Van-S), Faro-M (a larger area around Faro Mine Complex which includes Faro-S) and Background (same as the background used for small local mammals). Mount Mye area, where sheep habitat value was identified as high, was used to assess the risk for fannin sheep.

TABLE C.2.1-1
SOIL DATA SUMMARY – REFERENCE SITES

Metals	Units	No. of obs.	No. of obs. <MDL	CCME Guidelines	Minimum	Mean	Maximum
Aluminum	mg/kg	19	0	.	157	786	3100
Antimony	mg/kg	19	19	20	5	5	5
Arsenic	mg/kg	19	0	12	0.4	0.73	1.4
Barium	mg/kg	19	0	750	26	206	**787**
Beryllium	mg/kg	19	19	4	0.5	0.5	0.5
Boron	mg/kg	19	1	2	0.5	**7.6**	**26.5**
Cadmium	mg/kg	19	3	1.4	0.25	**1.76**	**9.7**
Calcium	mg/kg	19	0	.	2970	13686	29600
Chromium	mg/kg	19	18	64	1	1.11	3
Cobalt	mg/kg	19	13	40	0.5	1.39	7
Copper	mg/kg	19	0	63	3	10.6	29
Iron	mg/kg	19	0	.	287	1075	4250
Lead	mg/kg	19	1	70	2.5	9.9	17.5
Magnesium	mg/kg	19	0	.	310	1583	4090
Manganese	mg/kg	19	0	.	66	628	4390
Mercury	mg/kg	19	2	6.6	0.005	0.11	0.31
Molybdenum	mg/kg	19	16	5	2	2.58	**7**
Nickel	mg/kg	19	8	50	1	3.53	13
Phosphorus	mg/kg	19	0	.	586	930	1530
Potassium	mg/kg	19	0	.	677	1227	1970
Selenium	mg/kg	19	1	1	0.1	0.57	**1.1**
Silver	mg/kg	19	18	20	1	1.05	2
Sodium	mg/kg	19	5	.	2.5	31.8	138
Strontium	mg/kg	19	0	.	12	60	114
Tin	mg/kg	19	19	5	2.5	2.5	2.5
Titanium	mg/kg	19	0	.	5	18.9	70
Vanadium	mg/kg	19	8	130	0.5	1.97	8
Zinc	mg/kg	19	0	200	30	118	**480**
Zirconium	mg/kg	19	18	.	0.5	0.53	1

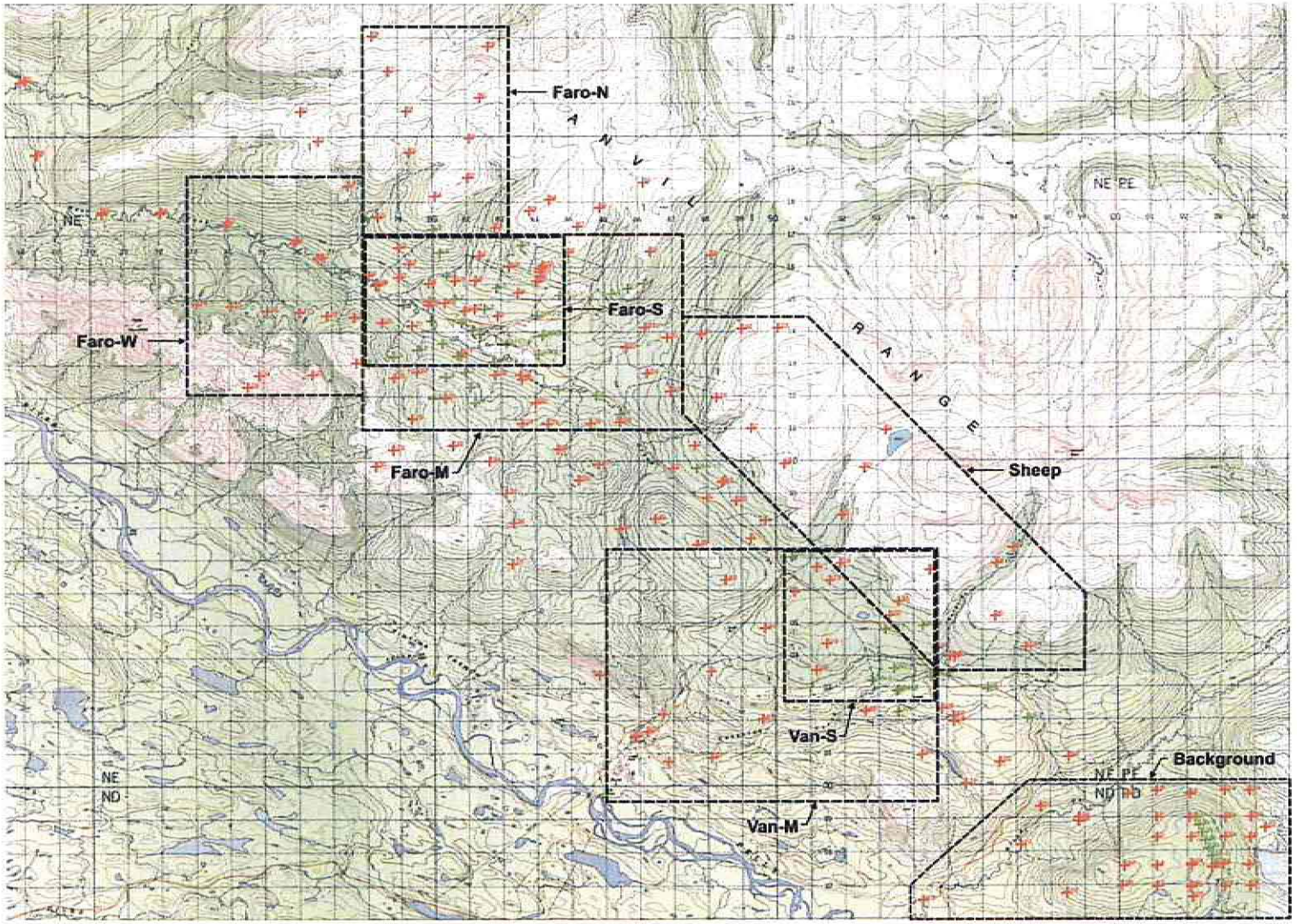
Notes: CCME Guidelines = Canadian Council of Ministers of the Environment guidelines for soil (agricultural land uses) (CCME 2003)
Shading indicates values that exceed CCME guidelines.
Analytical results reported as less than method detection limit (MDL) were assumed to be equal to ½ method detection limit in the calculation of minimum, mean and maximum.

TABLE C.2.1-2
SOIL DATA SUMMARY – AFFECTED AREA

Metals	Units	No. of obs.	No. of obs. <MDL	CCME Guidelines	Minimum	Mean	Maximum
Aluminum	mg/kg	59	0		247	3323	24200
Antimony	mg/kg	59	59	20	5	5	5
Arsenic	mg/kg	59	0	12	0.5	8.7	**64.8**
Barium	mg/kg	59	0	750	46	330	**961**
Beryllium	mg/kg	59	59	4	0.5	0.5	0.5
Boron	mg/kg	59	12	2	0.5	**4.65**	**18**
Cadmium	mg/kg	59	9	1.4	0.25	**1.81**	**12.4**
Calcium	mg/kg	59	0		848	11672	36600
Chromium	mg/kg	59	16	64	1	6.7	45
Cobalt	mg/kg	59	9	40	0.5	3.4	21
Copper	mg/kg	59	0	63	5	39.6	**272**
Iron	mg/kg	59	0		533	7562	37100
Lead	mg/kg	59	0	70	5	**588**	**5930**
Magnesium	mg/kg	59	0		374	1890	10100
Manganese	mg/kg	59	0		37	487	4360
Mercury	mg/kg	59	0	6.6	0.02	0.57	4.3
Molybdenum	mg/kg	59	56	5	2	2.17	**6**
Nickel	mg/kg	59	4	50	1	8.7	**55**
Phosphorus	mg/kg	59	0		552	917	2360
Potassium	mg/kg	59	0		408	1140	3610
Selenium	mg/kg	59	9	1	0.1	0.54	**2**
Silver	mg/kg	59	54	20	1	1.19	6
Sodium	mg/kg	59	9		2.5	51.1	324
Strontium	mg/kg	59	0		5	54	169
Tin	mg/kg	59	49	5	2.5	3.14	**8**
Titanium	mg/kg	59	0		8	86	560
Vanadium	mg/kg	59	2	130	0.5	7.5	40
Zinc	mg/kg	59	0	200	47	**496**	**3050**
Zirconium	mg/kg	59	34		0.5	1.18	7

Notes: CCME Guidelines = Canadian Council of Ministers of the Environment guidelines for soil (agricultural land uses) (CCME 2003)
Shading indicates values that exceed CCME guidelines.
Analytical results reported as less than method detection limit (MDL) were assumed to be equal to ½ method detection limit in the calculation of minimum, mean and maximum.

FIGURE C.2.1-1
LOCATIONS CONSIDERED IN TERRESTRIAL ASSESSMENT



The mean concentrations of each receptor location are summarized in Table C.2.1-3. An overall mean is also calculated for each metal for large broad ranging mammals (e.g. caribou, moose and wolf) which are assumed to be at the site for only a portion of the year as their home range is much larger than the size of the Anvil Range Mine site.

The metal concentrations are generally highest in Faro-S, providing a worst-case scenario, and lowest in background. When comparing metal concentrations in soil measured around the Faro mine site and the Vangorda mine site, higher mean calcium, chromium, magnesium, manganese, nickel, strontium and tin concentrations are found in areas around the Vangorda mine site and higher mean concentrations for copper, lead, mercury and zinc are found in Faro mine site.

There is only one sample from the Mount Mye area and the metal concentrations are generally lower or close to the background level.

TABLE C.2.1-3
SOIL DATA SUMMARY – BY RECEPTOR LOCATIONS

Metals	CCME Guidelines	Background	Faro-M	Faro-S	Faro-N	Faro-W	Van-M	Van-S	Sheep	Overall
		N=21	N=24	N=15	N=5	N=13	N=8	N=4	N=1	N=78
Aluminum		1255	3807	3662	4928	2448	3668	4735	247	2705
Antimony	20	5	5	5	5	5	5	5	5	5
Arsenic	12	1.24	11.2	**15.4**	3.02	11.5	5.6	9.3	0.5	6.7
Barium	750	217	347	389	174	322	398	250	46	300
Beryllium	4	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Boron	2	**7.5**	**4.33**	**5.2**	**2.8**	**4.19**	**6.1**	**4.13**	**4**	**5.4**
Cadmium	1.4	**1.71**	**1.69**	**2.01**	**2.12**	**1.5**	**1.41**	0.93	0.6	**1.79**
Calcium		13725	8945	10367	9318	10311	17645	15713	6890	12162
Chromium	64	1.95	7.2	7.1	5	6.5	8.8	10.8	1	5.3
Cobalt	40	1.74	4	4	2.4	3.08	3.44	4.25	0.5	2.91
Copper	63	11.7	53.8	**70.8**	19.8	43.5	21.1	23.8	6	32.6
Iron		2019	8778	9838	6318	8453	6430	8268	553	5982
Lead	70	10	**946**	**1325**	**124**	**713**	**93.5**	**141**	18	**447**
Magnesium		1748	1822	1809	1334	1599	2805	2568	942	1815
Manganese		625	433	263	247	408	875	671	665	521
Mercury	6.6	0.11	0.9	1.29	0.22	0.57	0.19	0.25	0.08	0.46
Molybdenum	5	2.52	2.29	2	2	2	2.38	2	2	2.27
Nickel	50	4.71	8.7	8.5	5	7.6	13.4	14	1	7.4
Phosphorus		933	915	840	948	827	1036	942	743	920
Potassium		1207	1192	1124	1002	1140	944	851	1080	1161
Selenium	1	0.57	0.52	0.6	0.4	0.55	0.45	0.43	0.1	0.54
Silver	20	1.05	1.46	1.73	1	1	1	1	1	1.15
Sodium		34.3	61.8	59.4	53.9	42.7	57.4	45.3	37	46.4
Strontium		59.3	44.9	48.3	48.2	43.2	91.8	82.8	41	55.4
Tin	5	2.5	3.08	2.73	3	3.12	3.63	4.75	**7**	2.99
Titanium		29.5	94.9	90.3	94.4	93.4	72.7	70	8	69.6
Vanadium	130	3.31	7.4	7.4	10.6	7.4	7.4	8	0.5	6.1
Zinc	200	117	**710**	**896**	150	**557**	**252**	**279**	169	**404**
Zirconium		0.6	1.33	1.63	0.6	1.38	1.25	1.88	0.5	1.02

Notes: CCME Guidelines = Canadian Council of Ministers of the Environment guidelines for soil (agricultural land uses) (CCME 2003)
Shading indicates values that exceed CCME guidelines.
All concentrations are in mg/kg and analytical results reported as less than method detection limit (MDL) were assumed to be equal to ½ of method detection limit in the calculation of the mean.

C.2.2 TERRESTRIAL VEGETATION DATA

Vegetation samples were collected in 2002 and 2004. Forbs, grasses, horsetails and Labrador tea, berries, willow, tree sap, bear root, mushroom and lichen samples were collected in affected area and reference sites (Swim Lake basin). Only arsenic, cadmium, chromium, copper, lead, mercury, selenium, silver and zinc were analyzed for samples collected in the 2002 sampling program.

Tables C.2.2-1 to C.2.2-10 summarize metal concentrations for each vegetation type. Mean lead and zinc concentrations in samples from affected area are consistently higher than background samples with the exception of horsetail, in which higher zinc concentration is found in the single background sample.

Forage, browse, berries and lichen are consumed by wildlife in the area. In the ecological risk assessment, forbs, grass, horsetail and Labrador tea were grouped as forage and willow as browse and their concentrations are summarized for each receptor locations as defined in Section C.2.1. Tables C.2.2-11, C.2.2-12 and C.2.2-13 present the mean concentrations in berries, browse and forage at each area, respectively. Dry weight concentrations reported by the laboratory are converted to fresh rate based on the reported sample moisture content. However, moisture content was only reported in the 2004 data and not in the 2002 data. Average moisture content by each species was estimated using 2004 data and applied to the 2002 data.

Mean lead and zinc concentration are highest in Faro-S for all three vegetation types with the exception of zinc in forage, which is consistent with the soil data. Mean concentrations in berries are found to be highest in Van-M for most of the metals.

TABLE C.2.2-1
SUMMARY OF METAL CONCENTRATIONS IN BERRIES

Metals	Units	Background					Affected Area				
		No. of obs.	No. of obs. <MDL	Minimum	Mean	Maximum	No. of obs.	No. of obs. <MDL	Minimum	Mean	Maximum
Aluminum	µg/g (dw)	11	0	2	6.5	21.1	22	0	1.3	7.1	41.3
Antimony	µg/g (dw)	11	11	0.05	0.05	0.05	22	22	0.05	0.05	0.05
Arsenic	µg/g (dw)	14	14	0.05	0.15	0.5	30	29	0.05	0.17	0.5
Barium	µg/g (dw)	11	0	1.4	8.4	22	22	0	2	9.5	20.1
Beryllium	µg/g (dw)	11	11	0.01	0.01	0.01	22	22	0.01	0.01	0.01
Boron	µg/g (dw)	11	0	3	9.6	20	22	0	3	12.2	24
Cadmium	µg/g (dw)	14	7	0.01	0.062	0.22	30	10	0.01	0.11	0.56
Calcium	µg/g (dw)	11	0	505	2353	11700	22	0	666	1369	4340
Chromium	µg/g (dw)	14	6	0.025	0.082	0.2	30	9	0.025	0.21	1.1
Cobalt	µg/g (dw)	11	11	0.05	0.05	0.05	22	22	0.05	0.05	0.05
Copper	µg/g (dw)	14	0	2	3.4	5.2	30	0	2.2	5.1	10.1
Iron	µg/g (dw)	11	0	28	42.6	61	22	0	11	32.8	78
Lead	µg/g (dw)	14	13	0.05	0.082	0.2	30	13	0.05	0.74	4
Magnesium	µg/g (dw)	11	0	379	1127	4730	22	0	393	1176	4010
Manganese	µg/g (dw)	11	0	5.3	97	384	22	0	5.2	65.4	253
Mercury	µg/g (dw)	14	14	0.005	0.005	0.005	30	27	0.005	0.0062	0.02
Molybdenum	µg/g (dw)	11	5	0.05	0.94	7	22	13	0.05	0.43	2.5
Nickel	µg/g (dw)	14	4	0.05	0.39	1.4	30	2	0.05	0.94	5.2
Phosphorus	µg/g (dw)	11	0	2230	5387	10800	22	0	2330	5215	11500
Potassium	µg/g (dw)	11	0	5650	10492	18200	22	0	5900	10437	18100
Selenium	µg/g (dw)	14	12	0.1	0.46	3.5	30	30	0.1	0.21	0.5
Silicon	µg/g (dw)	11	0	238	347	488	22	0	106	224	425
Silver	µg/g (dw)	14	9	0.005	0.013	0.1	30	23	0.005	0.011	0.07
Sodium	µg/g (dw)	11	8	0.5	1.55	11	22	7	0.5	9.6	33
Strontium	µg/g (dw)	11	0	1.14	4.74	23	22	0	0.76	4.19	20.9
Tellurium	µg/g (dw)	11	11	0.05	0.05	0.05	22	22	0.05	0.05	0.05
Thallium	µg/g (dw)	11	11	0.01	0.01	0.01	22	22	0.01	0.01	0.01
Tin	µg/g (dw)	11	10	0.05	0.064	0.2	22	20	0.05	0.14	1.7
Titanium	µg/g (dw)	11	0	0.7	1.27	2.3	22	0	0.4	1.07	2.9
Uranium	µg/g (dw)	11	11	0.02	0.02	0.02	22	22	0.02	0.02	0.02
Vanadium	µg/g (dw)	11	11	0.25	0.25	0.25	22	22	0.25	0.25	0.25
Zinc	µg/g (dw)	14	0	3.1	10.8	23	30	0	5	16.2	43
Zirconium	µg/g (dw)	11	11	1.5	1.5	1.5	22	22	1.5	1.5	1.5

Note: Analytical results reported as less than method detection limit (MDL) were assumed to be equal to ½ method detection limit in the calculation of minimum, mean and maximum.

TABLE C.2.2-2
SUMMARY OF METAL CONCENTRATIONS IN FORBS

Metals	Units	Background					Affected Area				
		No. of obs.	No. of obs. <MDL	Minimum	Mean	Maximum	No. of obs.	No. of obs. <MDL	Minimum	Mean	Maximum
Aluminum	µg/g (dw)	3	0	10.4	18.5	33.1	7	0	10.2	21.2	49.6
Antimony	µg/g (dw)	3	3	0.05	0.05	0.05	7	7	0.05	0.05	0.05
Arsenic	µg/g (dw)	3	2	0.05	0.1	0.2	7	6	0.05	0.057	0.1
Barium	µg/g (dw)	3	0	55.9	81.5	123	7	0	26.4	112	269
Beryllium	µg/g (dw)	3	3	0.01	0.01	0.01	7	6	0.01	0.02	0.08
Boron	µg/g (dw)	3	0	14	19.3	29	7	0	9	18.3	31
Cadmium	µg/g (dw)	3	0	0.03	0.51	1.03	7	0	0.16	0.46	0.71
Calcium	µg/g (dw)	3	0	14600	23667	33500	7	0	15700	21743	26400
Chromium	µg/g (dw)	3	0	0.2	0.27	0.4	7	0	0.1	0.24	0.6
Cobalt	µg/g (dw)	3	1	0.05	0.38	0.8	7	0	0.1	1.31	5.4
Copper	µg/g (dw)	3	0	4	6.5	9.9	7	0	6.3	8.3	11.7
Iron	µg/g (dw)	3	0	84	87	92	7	0	78	96.7	144
Lead	µg/g (dw)	3	1	0.05	0.12	0.2	7	0	0.2	0.97	4.3
Magnesium	µg/g (dw)	3	0	4460	6240	7820	7	0	3480	6254	10300
Manganese	µg/g (dw)	3	0	90.6	272	617	7	0	111	225	312
Mercury	µg/g (dw)	3	3	0.005	0.005	0.005	7	4	0.005	0.0087	0.019
Molybdenum	µg/g (dw)	3	0	0.4	5.7	9.9	7	0	0.1	0.97	3.7
Nickel	µg/g (dw)	3	0	0.5	1.43	2.4	7	0	0.9	8.1	21.6
Phosphorus	µg/g (dw)	3	0	4600	9117	13400	7	0	4720	5959	6540
Potassium	µg/g (dw)	3	0	18000	41800	54300	7	0	16600	36943	47900
Selenium	µg/g (dw)	3	1	0.1	1.5	4.2	7	6	0.1	0.26	1.2
Silicon	µg/g (dw)	3	0	367	616	875	7	0	454	765	1160
Silver	µg/g (dw)	3	2	0.005	0.0067	0.01	7	4	0.005	0.0086	0.02
Sodium	µg/g (dw)	3	0	24	35.3	49	7	0	4	14	26
Strontium	µg/g (dw)	3	0	69.4	77.5	85.7	7	0	56.9	109	176
Tellurium	µg/g (dw)	3	3	0.05	0.05	0.05	7	7	0.05	0.05	0.05
Thallium	µg/g (dw)	3	3	0.01	0.01	0.01	7	7	0.01	0.01	0.01
Tin	µg/g (dw)	3	0	0.1	0.3	0.6	7	2	0.05	0.11	0.2
Titanium	µg/g (dw)	3	0	1.5	2.27	2.9	7	0	0.9	1.23	1.7
Uranium	µg/g (dw)	3	3	0.02	0.02	0.02	7	7	0.02	0.02	0.02
Vanadium	µg/g (dw)	3	3	0.25	0.25	0.25	7	7	0.25	0.25	0.25
Zinc	µg/g (dw)	3	0	19.7	32.7	46.8	7	0	24.3	124	648
Zirconium	µg/g (dw)	3	3	1.5	1.5	1.5	7	7	1.5	1.5	1.5

Note: Analytical results reported as less than method detection limit (MDL) were assumed to be equal to ½ of method detection limit in the calculation of minimum, mean and maximum.

TABLE C.2.2-3
SUMMARY OF METAL CONCENTRATIONS IN GRASS

Metals	Units	Background					Affected Area				
		No. of obs.	No. of obs. <MDL	Minimum	Mean	Maximum	No. of obs.	No. of obs. <MDL	Minimum	Mean	Maximum
Aluminum	µg/g (dw)	3	0	3.3	12.9	27.4	12	0	3	13	27.3
Antimony	µg/g (dw)	3	3	0.05	0.05	0.05	12	12	0.05	0.05	0.05
Arsenic	µg/g (dw)	3	2	0.05	0.1	0.2	38	33	0.05	0.45	3
Barium	µg/g (dw)	3	0	28.1	40.9	63.7	12	0	19.1	47.7	94.6
Beryllium	µg/g (dw)	3	3	0.01	0.01	0.01	12	9	0.01	0.025	0.13
Boron	µg/g (dw)	3	1	1	6	12	12	0	3	8	14
Cadmium	µg/g (dw)	3	0	0.02	0.18	0.48	38	8	0.01	0.13	0.46
Calcium	µg/g (dw)	3	0	5430	8563	14800	12	0	3260	6961	9750
Chromium	µg/g (dw)	3	0	0.4	0.43	0.5	38	0	0.01	0.35	2.11
Cobalt	µg/g (dw)	3	3	0.05	0.05	0.05	12	10	0.05	0.058	0.1
Copper	µg/g (dw)	3	0	2.1	5.2	9.9	38	0	1.99	3.54	6.4
Iron	µg/g (dw)	3	0	39	63	106	12	0	34	75.5	149
Lead	µg/g (dw)	3	1	0.05	0.15	0.3	38	4	0.05	8.5	85.5
Magnesium	µg/g (dw)	3	0	1500	2627	3860	12	0	1000	1800	4690
Manganese	µg/g (dw)	3	0	31.9	180	254	12	0	35.3	569	1820
Mercury	µg/g (dw)	3	3	0.005	0.005	0.005	38	15	0.005	0.018	0.06
Molybdenum	µg/g (dw)	3	0	0.2	13.4	26.3	12	0	0.2	0.91	2.5
Nickel	µg/g (dw)	3	0	0.3	1	1.4	38	0	0.3	1.32	3.6
Phosphorus	µg/g (dw)	3	0	3390	8730	12400	12	0	3030	4969	9230
Potassium	µg/g (dw)	3	0	20200	28767	40200	12	0	10400	18592	25900
Selenium	µg/g (dw)	3	1	0.1	1.47	4.1	38	34	0.1	0.42	1
Silicon	µg/g (dw)	3	0	847	1776	2550	12	0	966	1341	1900
Silver	µg/g (dw)	3	2	0.005	0.0067	0.01	38	20	0.005	0.031	0.34
Sodium	µg/g (dw)	3	0	28	33.3	36	12	0	2	6.5	19
Strontium	µg/g (dw)	3	0	23	28	32.5	12	0	16.6	34	54.3
Tellurium	µg/g (dw)	3	3	0.05	0.05	0.05	12	12	0.05	0.05	0.05
Thallium	µg/g (dw)	3	3	0.01	0.01	0.01	12	11	0.01	0.015	0.07
Tin	µg/g (dw)	3	1	0.05	0.52	1.3	12	7	0.05	0.11	0.4
Titanium	µg/g (dw)	3	0	0.8	2.2	3.3	12	0	0.5	0.9	2
Uranium	µg/g (dw)	3	3	0.02	0.02	0.02	12	12	0.02	0.02	0.02
Vanadium	µg/g (dw)	3	3	0.25	0.25	0.25	12	12	0.25	0.25	0.25
Zinc	µg/g (dw)	3	0	12.5	71	179	38	0	10	97.7	1040
Zirconium	µg/g (dw)	3	3	1.5	1.5	1.5	12	12	1.5	1.5	1.5

Note: Analytical results reported as less than method detection limit (MDL) were assumed to be equal to ½ of method detection limit in the calculation of minimum, mean and maximum.

TABLE C.2.2-4
SUMMARY OF METAL CONCENTRATIONS IN HORSETAIL

Metals	Units	Background					Affected Area				
		No. of obs.	No. of obs. <MDL	Minimum	Mean	Maximum	No. of obs.	No. of obs. <MDL	Minimum	Mean	Maximum
Aluminum	µg/g (dw)	1	0	7.6	7.6	7.6	9	0	4.8	8.4	13
Antimony	µg/g (dw)	1	1	0.05	0.05	0.05	9	9	0.05	0.05	0.05
Arsenic	µg/g (dw)	1	0	0.4	0.4	0.4	9	4	0.05	0.16	0.4
Barium	µg/g (dw)	1	0	103	103	103	9	0	29.6	59.7	122
Beryllium	µg/g (dw)	1	1	0.01	0.01	0.01	9	9	0.01	0.01	0.01
Boron	µg/g (dw)	1	0	34	34	34	9	0	17	23.6	37
Cadmium	µg/g (dw)	1	0	1.53	1.53	1.53	9	0	0.12	0.45	0.89
Calcium	µg/g (dw)	1	0	28200	28200	28200	9	0	24200	31044	39800
Chromium	µg/g (dw)	1	0	0.7	0.7	0.7	9	0	0.3	0.58	1.1
Cobalt	µg/g (dw)	1	0	0.1	0.1	0.1	9	0	0.1	0.36	1.3
Copper	µg/g (dw)	1	0	6.5	6.5	6.5	9	0	4.6	5.7	7.2
Iron	µg/g (dw)	1	0	70	70	70	9	0	48	91.2	156
Lead	µg/g (dw)	1	1	0.05	0.05	0.05	9	0	0.2	1.03	2.7
Magnesium	µg/g (dw)	1	0	12300	12300	12300	9	0	4560	7087	9430
Manganese	µg/g (dw)	1	0	69.7	69.7	69.7	9	0	52.7	129	286
Mercury	µg/g (dw)	1	1	0.005	0.005	0.005	9	8	0.005	0.0058	0.012
Molybdenum	µg/g (dw)	1	0	9.4	9.4	9.4	9	0	0.2	0.96	1.9
Nickel	µg/g (dw)	1	0	0.3	0.3	0.3	9	0	0.3	0.53	1.2
Phosphorus	µg/g (dw)	1	0	7610	7610	7610	9	0	3580	5577	8270
Potassium	µg/g (dw)	1	0	28400	28400	28400	9	0	19000	31878	47700
Selenium	µg/g (dw)	1	0	7.4	7.4	7.4	9	7	0.1	0.14	0.4
Silicon	µg/g (dw)	1	0	1900	1900	1900	9	0	1160	1482	1840
Silver	µg/g (dw)	1	0	0.04	0.04	0.04	9	0	0.01	0.023	0.07
Sodium	µg/g (dw)	1	0	28	28	28	9	0	32	76.2	312
Strontium	µg/g (dw)	1	0	109	109	109	9	0	75.4	124	174
Tellurium	µg/g (dw)	1	1	0.05	0.05	0.05	9	9	0.05	0.05	0.05
Thallium	µg/g (dw)	1	1	0.01	0.01	0.01	9	7	0.01	0.02	0.08
Tin	µg/g (dw)	1	0	0.2	0.2	0.2	9	2	0.05	0.17	0.4
Titanium	µg/g (dw)	1	0	1.9	1.9	1.9	9	0	0.7	1.17	1.9
Uranium	µg/g (dw)	1	1	0.02	0.02	0.02	9	9	0.02	0.02	0.02
Vanadium	µg/g (dw)	1	1	0.25	0.25	0.25	9	9	0.25	0.25	0.25
Zinc	µg/g (dw)	1	0	75.9	75.9	75.9	9	0	28.3	39.8	61.9
Zirconium	µg/g (dw)	1	1	1.5	1.5	1.5	9	9	1.5	1.5	1.5

Note: Analytical results reported as less than method detection limit (MDL) were assumed to be equal to ½ of method detection limit in the calculation of minimum, mean and maximum.

TABLE C.2.2-5
SUMMARY OF METAL CONCENTRATIONS IN LABRADOR TEA

Metals	Units	Background					Affected Area				
		No. of obs.	No. of obs. <MDL	Minimum	Mean	Maximum	No. of obs.	No. of obs. <MDL	Minimum	Mean	Maximum
Aluminum	µg/g (dw)	3	0	10.2	13.4	19.7	7	0	7.9	22	40.6
Antimony	µg/g (dw)	3	3	0.05	0.05	0.05	7	7	0.05	0.05	0.05
Arsenic	µg/g (dw)	3	3	0.05	0.05	0.05	7	7	0.05	0.05	0.05
Barium	µg/g (dw)	3	0	46.1	53.4	62.6	7	0	47.1	69.5	93.7
Beryllium	µg/g (dw)	3	3	0.01	0.01	0.01	7	7	0.01	0.01	0.01
Boron	µg/g (dw)	3	0	9	19.7	29	7	0	5	21	31
Cadmium	µg/g (dw)	3	3	0.01	0.01	0.01	7	4	0.01	0.016	0.03
Calcium	µg/g (dw)	3	0	4420	5713	6750	7	0	5000	5906	7150
Chromium	µg/g (dw)	3	1	0.05	0.083	0.1	7	5	0.05	0.079	0.2
Cobalt	µg/g (dw)	3	3	0.05	0.05	0.05	7	7	0.05	0.05	0.05
Copper	µg/g (dw)	3	0	2.4	3.63	5.2	7	0	2.6	4.37	6.5
Iron	µg/g (dw)	3	0	32	46.7	60	7	0	31	49.3	87
Lead	µg/g (dw)	3	3	0.05	0.05	0.05	7	0	0.2	0.77	2.6
Magnesium	µg/g (dw)	3	0	1660	2110	2400	7	0	1100	1314	1860
Manganese	µg/g (dw)	3	0	48.1	539	1180	7	0	126	412	678
Mercury	µg/g (dw)	3	3	0.005	0.005	0.005	7	7	0.005	0.005	0.005
Molybdenum	µg/g (dw)	3	2	0.05	0.37	1	7	6	0.05	0.13	0.6
Nickel	µg/g (dw)	3	2	0.05	0.13	0.3	7	1	0.05	0.36	1.1
Phosphorus	µg/g (dw)	3	0	3930	4440	5290	7	0	2850	4171	5310
Potassium	µg/g (dw)	3	0	4450	5310	6210	7	0	4160	5423	6360
Selenium	µg/g (dw)	3	3	0.1	0.1	0.1	7	7	0.1	0.1	0.1
Silicon	µg/g (dw)	3	0	312	345	400	7	0	222	316	458
Silver	µg/g (dw)	3	2	0.005	0.01	0.02	7	6	0.005	0.0057	0.01
Sodium	µg/g (dw)	3	1	0.5	2.5	5	7	4	0.5	1.43	3
Strontium	µg/g (dw)	3	0	5.36	8.9	15.4	7	0	5.31	9.4	12.2
Tellurium	µg/g (dw)	3	3	0.05	0.05	0.05	7	7	0.05	0.05	0.05
Thallium	µg/g (dw)	3	3	0.01	0.01	0.01	7	4	0.01	0.05	0.18
Tin	µg/g (dw)	3	3	0.05	0.05	0.05	7	6	0.05	0.071	0.2
Titanium	µg/g (dw)	3	0	1.2	1.37	1.6	7	0	0.7	1.11	1.7
Uranium	µg/g (dw)	3	3	0.02	0.02	0.02	7	7	0.02	0.02	0.02
Vanadium	µg/g (dw)	3	3	0.25	0.25	0.25	7	7	0.25	0.25	0.25
Zinc	µg/g (dw)	3	0	24.2	24.7	25.3	7	0	15.4	28.7	43
Zirconium	µg/g (dw)	3	3	1.5	1.5	1.5	7	7	1.5	1.5	1.5

Note: Analytical results reported as less than method detection limit (MDL) were assumed to be equal to ½ of method detection limit in the calculation of minimum, mean and maximum.

TABLE C.2.2-6
SUMMARY OF METAL CONCENTRATIONS IN LICHEN

Metals	Units	Background					Affected Area				
		No. of obs.	No. of obs. <MDL	Minimum	Mean	Maximum	No. of obs.	No. of obs. <MDL	Minimum	Mean	Maximum
Aluminum	µg/g (dw)	12	0	37.3	47.9	63.1	120	0	29	103	704
Antimony	µg/g (dw)	12	12	0.05	0.05	0.05	120	95	0.05	0.098	0.7
Arsenic	µg/g (dw)	18	15	0.05	0.21	0.5	152	21	0.05	1.1	24
Barium	µg/g (dw)	12	0	6.7	16.9	37.3	120	0	5.3	44.4	317
Beryllium	µg/g (dw)	12	11	0.01	0.011	0.02	120	119	0.01	0.011	0.1
Boron	µg/g (dw)	12	10	1	1.25	3	120	114	1	1.07	3
Cadmium	µg/g (dw)	18	2	0.01	0.081	0.28	152	2	0.01	0.24	2.52
Calcium	µg/g (dw)	12	0	640	1800	3560	120	0	376	1499	7490
Chromium	µg/g (dw)	18	10	0.05	0.11	0.27	152	8	0.05	0.54	4.6
Cobalt	µg/g (dw)	12	11	0.05	0.054	0.1	120	35	0.05	0.17	1
Copper	µg/g (dw)	18	0	0.6	0.97	1.3	152	0	0.7	3.56	35.4
Iron	µg/g (dw)	12	0	63	97.7	135	120	0	53	324	1950
Lead	µg/g (dw)	18	0	0.4	1.14	1.6	152	0	0.6	60.4	747.7
Magnesium	µg/g (dw)	12	0	182	375	629	120	0	123	286	613
Manganese	µg/g (dw)	12	0	13	93.5	253	120	0	16.8	81.1	417
Mercury	µg/g (dw)	18	8	0.005	0.016	0.072	152	62	0.005	0.031	0.51
Molybdenum	µg/g (dw)	12	8	0.05	0.1	0.4	120	108	0.05	0.06	0.3
Nickel	µg/g (dw)	18	4	0.05	0.22	0.5	152	0	0.2	0.62	4.6
Phosphorus	µg/g (dw)	12	0	829	1290	1880	120	0	920	1490	2280
Potassium	µg/g (dw)	12	0	855	1121	1580	120	0	797	1205	1810
Selenium	µg/g (dw)	18	18	0.1	0.23	0.5	152	142	0.1	0.29	5
Silicon	µg/g (dw)	12	0	85	217	418	120	0	103	246	881
Silver	µg/g (dw)	18	8	0.005	0.016	0.05	152	9	0.005	0.16	1.83
Sodium	µg/g (dw)	12	0	4	15.5	48	120	5	0.5	9.1	196
Strontium	µg/g (dw)	12	0	1.82	6.4	17	120	0	1.16	6.2	22.5
Tellurium	µg/g (dw)	12	11	0.05	0.054	0.1	120	119	0.05	0.05	0.1
Thallium	µg/g (dw)	12	12	0.01	0.01	0.01	120	75	0.01	0.059	1.52
Tin	µg/g (dw)	12	10	0.05	0.075	0.3	120	84	0.05	0.47	35.1
Titanium	µg/g (dw)	12	0	1.8	2.46	3	120	0	1.8	4.06	13
Uranium	µg/g (dw)	12	12	0.02	0.02	0.02	120	119	0.02	0.02	0.04
Vanadium	µg/g (dw)	12	12	0.25	0.25	0.25	120	88	0.25	0.36	1.2
Zinc	µg/g (dw)	18	0	10.7	18.2	29.7	152	0	12.3	93.7	1043
Zirconium	µg/g (dw)	12	12	1.5	1.5	1.5	120	120	1.5	1.5	1.5

Note: Analytical results reported as less than method detection limit (MDL) were assumed to be equal to ½ of method detection limit in the calculation of minimum, mean and maximum.

TABLE C.2.2-7
SUMMARY OF METAL CONCENTRATIONS IN MUSHROOM

Metals	Units	Background					Affected Area				
		No. of obs.	No. of obs. <MDL	Minimum	Mean	Maximum	No. of obs.	No. of obs. <MDL	Minimum	Mean	Maximum
Aluminum	µg/g (dw)	No background samples available					10	0	4.6	175	482
Antimony	µg/g (dw)						10	10	0.05	0.05	0.05
Arsenic	µg/g (dw)						10	0	0.2	0.97	3.9
Barium	µg/g (dw)						10	0	0.3	14.5	45.7
Beryllium	µg/g (dw)						10	10	0.01	0.01	0.01
Boron	µg/g (dw)						10	10	1	1	1
Cadmium	µg/g (dw)						10	0	0.18	1.91	5.82
Calcium	µg/g (dw)						10	0	40	296	1440
Chromium	µg/g (dw)						10	2	0.05	0.64	2.2
Cobalt	µg/g (dw)						10	3	0.05	1	7.2
Copper	µg/g (dw)						10	0	10.1	40	141
Iron	µg/g (dw)						10	0	23	376	1140
Lead	µg/g (dw)						10	0	0.4	20.7	120
Magnesium	µg/g (dw)						10	0	639	900	1810
Manganese	µg/g (dw)						10	0	6.4	29.9	120
Mercury	µg/g (dw)						10	0	0.032	0.59	4.42
Molybdenum	µg/g (dw)						10	1	0.05	0.32	0.9
Nickel	µg/g (dw)						10	0	0.2	0.83	2.2
Phosphorus	µg/g (dw)						10	0	10100	17280	52600
Potassium	µg/g (dw)						10	0	17100	21520	40300
Selenium	µg/g (dw)						10	0	0.3	1.37	3.3
Silicon	µg/g (dw)						10	0	114	246	520
Silver	µg/g (dw)						10	0	0.63	3.64	25.8
Sodium	µg/g (dw)						10	3	0.5	188	1050
Strontium	µg/g (dw)						10	0	0.13	1.7	6.07
Tellurium	µg/g (dw)						10	10	0.05	0.05	0.05
Thallium	µg/g (dw)						10	8	0.01	0.015	0.05
Tin	µg/g (dw)						10	5	0.05	0.39	1.5
Titanium	µg/g (dw)						10	0	1.8	6.5	15.5
Uranium	µg/g (dw)						10	8	0.02	0.025	0.05
Vanadium	µg/g (dw)						10	6	0.25	0.52	1.5
Zinc	µg/g (dw)						10	0	59	98	202
Zirconium	µg/g (dw)						10	10	1.5	1.5	1.5

Note: Analytical results reported as less than method detection limit (MDL) were assumed to be equal to ½ of method detection limit in the calculation of minimum, mean and maximum.

TABLE C.2.2-8
SUMMARY OF METAL CONCENTRATIONS IN ROOTS

Metals	Units	Background					Affected Area				
		No. of obs.	No. of obs. <MDL	Minimum	Mean	Maximum	No. of obs.	No. of obs. <MDL	Minimum	Mean	Maximum
Aluminum	µg/g (dw)						10	0	155	1591	3180
Antimony	µg/g (dw)						10	6	0.05	0.09	0.2
Arsenic	µg/g (dw)						10	0	0.1	1.56	3.2
Barium	µg/g (dw)						10	0	29.7	66.8	123
Beryllium	µg/g (dw)						10	1	0.01	0.09	0.19
Boron	µg/g (dw)						10	0	4	15.4	26
Cadmium	µg/g (dw)						10	0	0.04	0.18	0.32
Calcium	µg/g (dw)						10	0	3930	7492	15900
Chromium	µg/g (dw)						10	0	0.2	4.17	7.6
Cobalt	µg/g (dw)						10	0	0.1	1.6	3.3
Copper	µg/g (dw)						10	0	2.7	11	17.2
Iron	µg/g (dw)						10	0	231	2907	5260
Lead	µg/g (dw)						10	0	0.4	20.9	74.6
Magnesium	µg/g (dw)						10	0	1940	2367	2970
Manganese	µg/g (dw)						10	0	51.5	83.2	124
Mercury	µg/g (dw)						10	5	0.005	0.013	0.033
Molybdenum	µg/g (dw)	No background samples available					10	0	0.1	2.46	6.2
Nickel	µg/g (dw)						10	0	0.7	9.2	14.3
Phosphorus	µg/g (dw)						10	0	4060	6660	13500
Potassium	µg/g (dw)						10	0	5950	8002	9990
Selenium	µg/g (dw)						10	9	0.1	0.14	0.5
Silicon	µg/g (dw)						10	0	325	857	1880
Silver	µg/g (dw)						10	7	0.005	0.032	0.11
Sodium	µg/g (dw)						10	2	0.5	35.6	76
Strontium	µg/g (dw)						10	0	23.3	50.4	123
Tellurium	µg/g (dw)						10	10	0.05	0.05	0.05
Thallium	µg/g (dw)						10	5	0.01	0.034	0.09
Tin	µg/g (dw)						10	5	0.05	0.25	1
Titanium	µg/g (dw)						10	0	5.4	57.6	140
Uranium	µg/g (dw)						10	1	0.02	0.36	1.63
Vanadium	µg/g (dw)						10	0	0.5	4.06	8.2
Zinc	µg/g (dw)						10	0	18.6	42.7	130
Zirconium	µg/g (dw)						10	10	1.5	1.5	1.5

Note: Analytical results reported as less than method detection limit (MDL) were assumed to be equal to ½ of method detection limit in the calculation of minimum, mean and maximum.

TABLE C.2.2-9
SUMMARY OF METAL CONCENTRATIONS IN SAP

Metals	Units	Background					Affected Area				
		No. of obs.	No. of obs. <MDL	Minimum	Mean	Maximum	No. of obs.	No. of obs. <MDL	Minimum	Mean	Maximum
Aluminum	µg/g (dw)	3	0	1.4	3.97	5.5	7	0	1.2	13.8	29.3
Antimony	µg/g (dw)	3	3	0.01	0.01	0.01	7	6	0.01	0.017	0.06
Arsenic	µg/g (dw)	3	3	0.01	0.01	0.01	7	3	0.01	0.06	0.21
Barium	µg/g (dw)	3	0	4.22	8.2	12.8	7	0	1.05	14.5	50.8
Beryllium	µg/g (dw)	3	3	0.002	0.002	0.002	7	7	0.002	0.002	0.002
Boron	µg/g (dw)	3	0	0.4	0.77	1.1	7	2	0.2	0.61	1.1
Cadmium	µg/g (dw)	3	0	0.007	0.15	0.22	7	0	0.004	0.027	0.071
Calcium	µg/g (dw)	3	0	240	466	624	7	0	76.3	635	1480
Chromium	µg/g (dw)	3	2	0.01	0.02	0.04	7	1	0.01	0.097	0.36
Cobalt	µg/g (dw)	3	2	0.01	0.027	0.06	7	3	0.01	0.031	0.08
Copper	µg/g (dw)	3	0	0.52	0.75	0.86	7	0	0.42	1.28	2.95
Iron	µg/g (dw)	3	0	2	4	6	7	0	3	42.1	137
Lead	µg/g (dw)	3	1	0.01	0.057	0.11	7	0	0.05	6.1	24.6
Magnesium	µg/g (dw)	3	0	36.1	49	64.5	7	0	14.3	56.7	108
Manganese	µg/g (dw)	3	0	15.8	27.6	49.6	7	0	3.84	18.2	50
Mercury	µg/g (dw)	3	3	0.005	0.005	0.005	7	7	0.005	0.005	0.005
Molybdenum	µg/g (dw)	3	3	0.01	0.01	0.01	7	4	0.01	0.016	0.03
Nickel	µg/g (dw)	3	1	0.01	0.017	0.02	7	1	0.01	0.079	0.19
Phosphorus	µg/g (dw)	3	0	86.3	142	185	7	0	40.7	119	273
Potassium	µg/g (dw)	3	0	177	212	263	7	0	59	163	405
Selenium	µg/g (dw)	3	3	0.02	0.02	0.02	7	7	0.02	0.02	0.02
Silicon	µg/g (dw)	3	0	36	48.7	63	7	0	17	101	318
Silver	µg/g (dw)	3	3	0.001	0.001	0.001	7	5	0.001	0.0054	0.023
Sodium	µg/g (dw)	3	0	11.7	13.1	14.2	7	0	8.5	25	49
Strontium	µg/g (dw)	3	0	0.93	1.66	2.05	7	0	0.34	3.14	7.81
Tellurium	µg/g (dw)	3	3	0.01	0.01	0.01	7	7	0.01	0.01	0.01
Thallium	µg/g (dw)	3	3	0.002	0.002	0.002	7	3	0.002	0.0063	0.012
Tin	µg/g (dw)	3	0	0.54	0.68	0.78	7	0	0.31	1.34	3.27
Titanium	µg/g (dw)	3	1	0.03	0.083	0.14	7	1	0.03	0.25	0.51
Uranium	µg/g (dw)	3	3	0.004	0.004	0.004	7	4	0.004	0.0096	0.027
Vanadium	µg/g (dw)	3	0	0.02	0.03	0.04	7	1	0.01	0.093	0.29
Zinc	µg/g (dw)	3	0	1.6	3.53	4.8	7	0	1.1	9.3	27.7
Zirconium	µg/g (dw)	3	3	0.3	0.3	0.3	7	7	0.3	0.3	0.3

Note: Analytical results reported as less than method detection limit (MDL) were assumed to be equal to ½ of method detection limit in the calculation of minimum, mean and maximum.

TABLE C.2.2-10
SUMMARY OF METAL CONCENTRATIONS IN WILLOW

Metals	Units	Background					Affected Area				
		No. of obs.	No. of obs. <MDL	Minimum	Mean	Maximum	No. of obs.	No. of obs. <MDL	Minimum	Mean	Maximum
Aluminum	µg/g (dw)	3	0	8.3	8.9	10.1	7	0	8.2	13.4	20.5
Antimony	µg/g (dw)	3	3	0.05	0.05	0.05	7	7	0.05	0.05	0.05
Arsenic	µg/g (dw)	10	9	0.05	0.37	0.5	55	46	0.05	0.78	11
Barium	µg/g (dw)	3	0	8.2	13.9	21.5	7	0	9.8	41.2	103
Beryllium	µg/g (dw)	3	3	0.01	0.01	0.01	7	7	0.01	0.01	0.01
Boron	µg/g (dw)	3	0	5	12.3	22	7	0	5	14.3	32
Cadmium	µg/g (dw)	10	0	1.16	3.86	8.23	55	0	0.31	3.42	17.27
Calcium	µg/g (dw)	3	0	6840	10693	16300	7	0	6870	10989	20400
Chromium	µg/g (dw)	10	4	0.025	0.11	0.22	55	4	0.025	0.73	20.2
Cobalt	µg/g (dw)	3	0	0.2	0.27	0.4	7	0	0.3	0.89	1.8
Copper	µg/g (dw)	10	0	2.5	3.53	6	55	0	2.07	5.1	10.94
Iron	µg/g (dw)	3	0	45	55.3	73	7	0	48	74	141
Lead	µg/g (dw)	10	4	0.05	0.21	0.5	55	0	0.1	8.5	115
Magnesium	µg/g (dw)	3	0	2330	6537	13000	7	0	1820	3200	4730
Manganese	µg/g (dw)	3	0	63	330	804	7	0	71.8	405	908
Mercury	µg/g (dw)	10	9	0.005	0.0055	0.01	55	26	0.005	0.013	0.07
Molybdenum	µg/g (dw)	3	0	0.1	1.03	2.8	7	0	0.1	0.53	1.5
Nickel	µg/g (dw)	10	0	0.2	0.94	2.9	55	0	0.4	3.29	17.4
Phosphorus	µg/g (dw)	3	0	3430	5250	7470	7	0	3840	5646	7930
Potassium	µg/g (dw)	3	0	7070	12960	23900	7	0	5690	10824	17900
Selenium	µg/g (dw)	10	7	0.1	1	4.3	55	45	0.1	0.59	3
Silicon	µg/g (dw)	3	0	183	215	235	7	0	169	221	264
Silver	µg/g (dw)	10	8	0.005	0.008	0.03	55	14	0.005	0.041	0.22
Sodium	µg/g (dw)	3	0	2	7.7	11	7	1	0.5	11.4	30
Strontium	µg/g (dw)	3	0	19.5	39.9	70.9	7	0	27.1	49.9	86.7
Tellurium	µg/g (dw)	3	3	0.05	0.05	0.05	7	7	0.05	0.05	0.05
Thallium	µg/g (dw)	3	3	0.01	0.01	0.01	7	7	0.01	0.01	0.01
Tin	µg/g (dw)	3	3	0.05	0.05	0.05	7	5	0.05	0.11	0.3
Titanium	µg/g (dw)	3	0	1.1	1.5	2	7	0	0.7	1.03	1.3
Uranium	µg/g (dw)	3	3	0.02	0.02	0.02	7	7	0.02	0.02	0.02
Vanadium	µg/g (dw)	3	3	0.25	0.25	0.25	7	7	0.25	0.25	0.25
Zinc	µg/g (dw)	10	0	27	186	396	55	0	42.7	301	2350
Zirconium	µg/g (dw)	3	3	1.5	1.5	1.5	7	7	1.5	1.5	1.5

Note: Analytical results reported as less than method detection limit (MDL) were assumed to be equal to ½ of method detection limit in the calculation of minimum, mean and maximum.

TABLE C.2.2-11
SUMMARY OF 95 % UCL OF MEAN METAL CONCENTRATIONS IN BERRIES BY RECEPTOR LOCATIONS

Metals	Background	Faro-M	Faro-S	Faro-N	Faro-W	Van-M	Van-S	Sheep	Overall
	N=12	N=5	N=3	N=2	N=4	N=6	N=1	N=3	N=33
	N*=15	N*=8	N*=6	N*=2	N*=4	N*=8	N*=3	N*=3	N*=44
Aluminum	1.08	1.65	1.09	2.98	0.55	1.52	2.13	0.41	1.22
Antimony	0.009	0.0084	0.0078	0.0066	0.009	0.013	0.0086	0.0065	0.0092
Arsenic *	0.026	0.041	0.052	0.0066	0.009	0.033	0.065	0.0065	0.03
Barium	1.58	1.47	1.68	1.45	1.09	4.04	1.75	0.61	1.84
Beryllium	0.0018	0.0017	0.0016	0.0013	0.0018	0.0026	0.0017	0.0013	0.0018
Boron	2.02	1.79	2.25	1.14	1.67	4.61	1.55	1.08	2.25
Cadmium *	0.012	0.021	0.022	0.0099	0.049	0.0093	0.015	0.0088	0.017
Calcium	488	176	162	168	179	667	135	109	370
Chromium *	0.017	0.039	0.048	0.044	0.032	0.034	0.036	0.056	0.029
Cobalt	0.009	0.0084	0.0078	0.0066	0.009	0.013	0.0086	0.0065	0.0092
Copper *	0.62	0.86	0.96	0.86	1.12	1.16	0.93	0.67	0.83
Iron	7.5	4.84	5.7	3.37	6.1	13.3	8.6	1.71	7.1
Lead *	0.014	0.37	0.49	0.04	0.048	0.053	0.11	0.0065	0.093
Magnesium	234	118	125	110	282	507	107	89.5	246
Manganese	16.6	10.2	7.7	18.2	20.2	10.1	8.7	5	13.5
Mercury *	0.00091	0.0013	0.0015	0.00066	0.0009	0.0016	0.0018	0.00065	0.0011
Molybdenum	0.2	0.0084	0.0078	0.01	0.13	0.2	0.0086	0.025	0.13
Nickel *	0.08	0.1	0.091	0.093	0.4	0.29	0.11	0.063	0.15
Phosphorus	990	561	565	461	1206	2104	779	387	1052
Potassium	1989	1473	1500	1125	1785	3155	1398	1404	1970
Selenium *	0.099	0.045	0.054	0.013	0.018	0.043	0.067	0.013	0.06
Silicon	58.5	32.6	28.3	25	36.7	76.9	54.9	22.2	49.5
Silver *	0.0023	0.00099	0.001	0.0024	0.005	0.0025	0.0024	0.00065	0.0021
Sodium	0.27	1.86	2.87	1.21	3.36	0.29	1.03	1.36	1.09
Strontium	1	0.44	0.46	0.32	0.41	2.79	0.22	0.26	1.03
Tellurium	0.009	0.0084	0.0078	0.0066	0.009	0.013	0.0086	0.0065	0.0092
Thallium	0.0018	0.0017	0.0016	0.0013	0.0018	0.0026	0.0017	0.0013	0.0018
Tin	0.011	0.019	0.025	0.12	0.009	0.013	0.0086	0.0065	0.018
Titanium	0.23	0.11	0.11	0.14	0.18	0.51	0.21	0.064	0.23
Uranium	0.0036	0.0034	0.0031	0.0027	0.0036	0.0052	0.0034	0.0026	0.0037
Vanadium	0.045	0.042	0.039	0.033	0.045	0.065	0.043	0.032	0.046
Zinc *	1.99	3.9	4.57	1.65	4.31	3.22	2.16	1.38	2.69
Zirconium	0.27	0.25	0.24	0.2	0.27	0.39	0.26	0.19	0.28

Notes: All concentrations are in mg/kg (fresh weight) and analytical results reported as less than method detection limit (MDL) were assumed to be equal to ½ of method detection limit in the calculation of the mean.
* denotes metals analyzed in the 2002 sampling program.
N is the number of observations for metals only measured in the 2004 sampling program and N* is the number of observations for metals measured in both 2002 and 2004 sampling programs.

TABLE C.2.2-12
SUMMARY OF METAL CONCENTRATIONS IN BROWSE BY RECEPTOR LOCATIONS

Metals	Background	Faro-M	Faro-S	Faro-N	Faro-W	Van-M	Van-S	Sheep	Overall
	N=4	N=2	N=0	N=0	N=2	N=0	N=0	N=2	N=10
	N*=11	N*=37	N*=24	N*=1	N*=3	N*=4	N*=3	N*=3	N*=65
Aluminum	3.66	6.1			6			3.86	4.65
Antimony	0.019	0.019			0.02			0.02	0.019
Arsenic *	0.13	0.38	0.49	0.19	0.078	0.19	0.19	0.078	0.28
Barium	12	21.6			5.2			12.7	12.7
Beryllium	0.0038	0.0037			0.004			0.0041	0.0039
Boron	6.3	5.5			4.29			3.46	5.1
Cadmium *	1.46	1.34	1.38	0.28	1.08	1.9	0.94	0.57	1.36
Calcium	4905	3915			3673			3561	4192
Chromium *	0.69	0.17	0.12	0.043	0.047	0.16	0.13	0.041	0.24
Cobalt	0.13	0.28			0.33			0.5	0.27
Copper *	1.48	2.06	2.16	1.76	1.75	1.84	1.46	1.93	1.89
Iron	28.3	23.5			21.1			29.8	26.2
Lead *	0.077	4.53	6.7	5.5	0.26	0.62	0.66	0.12	2.82
Magnesium	2298	1322			862			1277	1611
Manganese	114	190			92.9			266	155
Mercury *	0.0021	0.006	0.0077	0.0019	0.0039	0.0039	0.0026	0.002	0.0046
Molybdenum	0.39	0.13			0.04			0.26	0.24
Nickel *	0.65	1.2	1.26	0.23	0.95	1.31	1.19	0.7	1.13
Phosphorus	2056	2374			1626			2457	2114
Potassium	4627	5384			4464			2609	4342
Selenium *	0.33	0.25	0.25	0.19	0.092	0.24	0.26	0.16	0.25
Silicon	85.6	79.4			90.4			83.7	84.9
Silver *	0.0032	0.019	0.024	0.0039	0.0083	0.019	0.018	0.0078	0.014
Sodium	3.27	1.89			5.7			5.1	3.85
Strontium	19.5	20.2			11.2			20.3	18.1
Tellurium	0.019	0.019			0.02			0.02	0.019
Thallium	0.0038	0.0037			0.004			0.0041	0.0039
Tin	0.041	0.048			0.02			0.02	0.034
Titanium	0.54	0.41			0.39			0.37	0.45
Uranium	0.0076	0.0075			0.008			0.0082	0.0078
Vanadium	0.095	0.093			0.1			0.1	0.097
Zinc *	74.5	138	177	73.5	83.1	63.6	32.7	65.7	110
Zirconium	0.57	0.56			0.6			0.61	0.58

Notes: All concentrations are in mg/kg (fresh weight) and analytical results reported as less than method detection limit (MDL) were assumed to be equal to ½ of method detection limit in the calculation of the mean.
* denotes metals analyzed in the 2002 sampling program.
N is the number of observations for metals only measured in the 2004 sampling program and N* is the number of observations for metals measured in both 2002 and 2004 sampling programs.

TABLE C.2.2-13
SUMMARY OF METAL CONCENTRATIONS IN FORAGE BY RECEPTOR LOCATIONS

Metals	Background	Faro-M	Faro-S	Faro-N	Faro-W	Van-M	Van-S	Sheep	Overall
	N=10	N=8	N=6	N=5	N=5	N=2	N=1	N=9	N=45
	N*=10	N*=23	N*=16	N*=5	N*=6	N*=8	N*=7	N*=12	N*=71
Aluminum	4.15	5.2	6	6.2	3.78	11.4	9.8	5.6	4.89
Antimony	0.015	0.015	0.015	0.018	0.012	0.024	0.023	0.016	0.016
Arsenic *	0.028	0.18	0.2	0.021	0.048	0.14	0.15	0.056	0.097
Barium	17.9	20.2	17.1	16.8	25.7	35.2	21.5	21.1	20.2
Beryllium	0.003	0.0029	0.0029	0.0082	0.0024	0.0049	0.0046	0.0091	0.0048
Boron	5	5.5	6.6	5.2	3.86	13.1	10.1	4.33	5.2
Cadmium *	0.072	0.059	0.067	0.08	0.083	0.036	0.04	0.022	0.058
Calcium	3319	4895	5777	4007	5017	2985	2285	3337	4001
Chromium *	0.078	0.13	0.12	0.11	0.081	0.12	0.13	0.074	0.1
Cobalt	0.033	0.06	0.07	0.026	0.29	0.024	0.023	0.083	0.076
Copper *	1.4	1.31	1.46	1.64	1.45	1.29	1.21	1.6	1.41
Iron	17.7	23.2	25.9	19.4	18.8	36.9	28.3	27.5	22.1
Lead *	0.025	4.71	6.6	0.17	0.33	0.69	0.77	0.086	1.7
Magnesium	1114	1130	1166	909	1479	801	631	908	1053
Manganese	110	125	63.9	124	163	141	195	107	123
Mercury *	0.0015	0.0074	0.0081	0.0023	0.0028	0.0046	0.0049	0.0027	0.0042
Molybdenum	1.57	0.22	0.11	0.19	0.37	0.17	0.023	0.25	0.52
Nickel *	0.19	0.43	0.42	0.38	1.12	0.49	0.53	0.52	0.46
Phosphorus	2038	1357	1336	1704	1852	2143	2088	1443	1686
Potassium	5779	6286	6911	5368	7027	2728	2445	6001	6043
Selenium *	0.34	0.15	0.13	0.053	0.049	0.19	0.21	0.083	0.14
Silicon	270	329	330	442	263	187	135	281	305
Silver *	0.0032	0.008	0.011	0.0077	0.022	0.0088	0.0097	0.003	0.0075
Sodium	5.6	4.97	6	3.56	7.2	0.24	0.23	10.8	6.1
Strontium	10.2	16.6	19.1	14.7	22.8	4.4	2.43	17.3	15.4
Tellurium	0.015	0.015	0.015	0.018	0.012	0.024	0.023	0.016	0.016
Thallium	0.003	0.017	0.017	0.0037	0.0024	0.0049	0.0046	0.0092	0.0072
Tin	0.063	0.02	0.018	0.045	0.051	0.024	0.023	0.044	0.041
Titanium	0.54	0.26	0.28	0.34	0.41	0.79	0.69	0.25	0.38
Uranium	0.006	0.0059	0.0059	0.0074	0.0048	0.0098	0.0091	0.0066	0.0063
Vanadium	0.076	0.074	0.073	0.092	0.06	0.12	0.11	0.082	0.079
Zinc *	11.7	33.7	41.5	19.2	16.3	54.3	60	10.2	25
Zirconium	0.45	0.44	0.44	0.55	0.36	0.73	0.69	0.49	0.48

Notes: All concentrations are in mg/kg (fresh weight) and analytical results reported as less than method detection limit (MDL) were assumed to be equal to ½ of method detection limit in the calculation of the mean.
* denotes metals analyzed in the 2002 sampling program.
N is the number of observations for metals only measured in the 2004 sampling program and N* is the number of observations for metals measured in both 2002 and 2004 sampling programs.

C.2.3 MEASURED MOOSE AND CARIBOU CONCENTRATIONS

Moose and caribou concentrations were collected annually in 2004 to 2007 and measured data were provided by Gartner Lee Limited. Data for the ten moose and ten caribous from the Anvil Range Mine site are summarized in Table C.2.3-1. One additional caribou sample (Sample 22615) was not considered in the assessment, since data for muscle was not available. The data summary statistics are provided in Table C.2.3-2.

Measured data were also available for beaver, marmot, and ruffed grouse which were provided by Gartner Lee Limited. However, only measured concentrations in moose and caribou were used in the risk assessment. The other smaller mammalian species were evaluated at different locations across the site; therefore, transfer factors were used to predict flesh concentrations. A comparison between the measured and predicted game concentrations for beaver, marmot and ruffed grouse is provided in Table C.2.3-3.

TABLE C.2.3-1
SUMMARY OF METAL CONCENTRATIONS IN MOOSE AND CARIBOU

							mg/kg (dw)															
Specimen_ID	Matrix	Species	Sex	Age	Year	% Moisture	Antimony	Arsenic	Beryllium	Boron	Cadmium	Chromium	Cobalt	Copper	Lead	Manganese	Nickel	Selenium	Silver	Strontium	Tin	Vanadium	Zinc
23127	kidney	caribou	M	1	2004	78.7	<0.01	0.04	<0.01	1.0	15.5	0.7	0.28	24.2	3.22	6.59	0.1	5.6	0.095	0.78	<0.01	0.17	83.4
22713	kidney	caribou	M	2	2004	77.5	<0.01	0.05	<0.01	0.7	5.2	0.2	0.23	19.2	2.82	6.59	0.09	1.0	0.044	0.13	<0.01	0.08	79.3
23238	kidney	caribou	M	5	2004	79.4	<0.01	0.05	<0.01	<0.5	46.1	<0.2	0.01	24.9	2.18	8.67	0.22	0.7	0.205	0.38	<0.01	0.06	131
04-503	kidney	caribou	M	4	2004	76.2	<0.01	0.06	<0.01	1.2	84	0.5	0.21	22.2	1.75	8.57	0.1	4.5	0.041	0.59	<0.01	0.19	101
22592	kidney	caribou	M	5	2005	76	<0.01	0.09	<0.01	1	53.5	<0.2	0.33	22.3	5.44	7.9	<0.05	3.4	0.076	0.61	<0.01	<0.05	111
22615	kidney	caribou	M	U	2005	76	<0.01	0.07	<0.01	1.5	87	0.2	0.4	22.3	0.97	6.8	<0.05	4.9	1.25	0.4	0.02	0.06	117
22591	kidney	caribou	M	3	2005	80	<0.01	0.08	<0.01	1.3	26	0.3	0.25	23.9	3.25	7.12	<0.05	4	0.053	0.53	0.02	0.1	115
22593	kidney	caribou	M	3	2005	79	<0.01	0.12	<0.01	1.3	36.7	0.2	0.18	21.6	4.72	6.13	<0.05	4.3	1.84	0.6	0.07	0.08	113
26293	kidney	caribou	M	U	2006	76	<0.01	0.05	<0.01	1.3	45.6	<0.2	0.21	21.5	2.54	5.98	<0.05	3.4	0.051	0.79	<0.01	<0.05	124
26531	kidney	caribou	M	U	2006	78	<0.01	0.23	<0.01	1.4	63.1	0.2	0.41	24.4	1.74	7.48	0.08	4.4	0.35	0.65	0.03	0.06	128
27589	kidney	caribou	M	U	2007	79	<0.01	0.17	<0.01	1.7	23	0.4	0.32	22.6	1.35	5.92	<0.05	3.9	0.409	0.48	0.01	0.11	105
23127	liver	caribou	M	1	2004	67.8	<0.01	<0.01	<0.01	1.0	2.55	0.2	0.24	23.1	1.82	13	0.09	1.2	0.935	0.19	<0.01	0.08	56.4
22713	liver	caribou	M	2	2004	67.7	<0.01	0.03	<0.01	0.6	0.92	<0.2	<0.01	59.5	2.38	13.5	0.09	0.8	2.21	0.23	<0.01	0.06	59.6
23238	liver	caribou	M	5	2004	68.6	<0.01	0.02	<0.01	1.0	3.33	0.7	0.20	70.2	1.44	14.6	0.16	5.1	3.21	0.55	<0.01	0.14	70.8
04-503	liver	caribou	M	4	2004	67.7	0.02	<0.01	<0.01	0.8	6.58	<0.2	0.28	27.1	1.01	9.12	0.07	1.4	2.35	0.12	<0.01	0.08	41.8
22592	liver	caribou	M	5	2005	68	<0.01	0.06	<0.01	1.3	5.88	0.2	0.39	53.6	1.57	15.5	<0.05	1	1.24	0.14	0.01	<0.05	86.2
22615	liver	caribou	M	U	2005	68	<0.01	0.04	<0.01	1.3	7.27	<0.2	0.38	19.6	0.42	11.1	<0.05	0.9	1.12	0.13	0.02	<0.05	66.7
22591	liver	caribou	M	3	2005	67	<0.01	0.06	<0.01	0.8	3.03	<0.2	0.28	79.4	1.23	12	<0.05	1	1.59	0.16	0.13	<0.05	94.4
22593	liver	caribou	M	3	2005	68	<0.01	0.04	<0.01	1.2	4.74	<0.2	0.16	107	1.18	13.8	<0.05	1.3	1.11	0.2	0.05	<0.05	74.4
26293	liver	caribou	M	U	2006	67	<0.01	0.03	<0.01	1.8	4.56	<0.2	0.26	39.1	1.27	13.6	<0.05	0.5	1.57	0.18	<0.01	<0.05	84.4
26531	liver	caribou	M	U	2006	65	<0.01	0.1	<0.01	1	9.19	0.3	0.38	38.1	0.92	12.6	<0.05	1.4	1.3	0.18	0.01	0.08	75.3
27589	liver	caribou	M	U	2007	67	<0.01	0.06	<0.01	1.1	3.04	<0.2	0.35	45.9	0.79	15.3	<0.05	1.3	1.8	0.17	0.01	<0.05	78.9
23127	muscle	caribou	M	1	2004	69.9	<0.01	<0.01	<0.01	0.8	<0.01	<0.2	<0.01	7.35	0.03	0.56	<0.05	0.6	0.149	0.30	<0.01	<0.05	245

							mg/kg (dw)															
Specimen_ID	Matrix	Species	Sex	Age	Year	% Moisture	Antimony	Arsenic	Beryllium	Boron	Cadmium	Chromium	Cobalt	Copper	Lead	Manganese	Nickel	Selenium	Silver	Strontium	Tin	Vanadium	Zinc
22713	muscle	caribou	M	2	2004	72.2	<0.01	<0.01	<0.01	1.3	<0.01	0.6	0.47	8.74	0.06	0.77	<0.05	4.3	0.108	0.51	<0.01	0.16	153
23238	muscle	caribou	M	5	2004	72.7	<0.01	0.04	<0.01	1.1	0.03	<0.2	0.39	9.18	0.1	0.77	<0.05	0.9	0.037	0.15	<0.01	<0.05	215
04-503	muscle	caribou	M	4	2004	69.4	0.02	0.02	<0.01	<0.5	0.02	0.4	0.02	8.08	0.03	2.79	0.05	0.5	0.025	0.19	0.02	0.11	138
22592	muscle	caribou	M	5	2005	73	<0.01	0.03	<0.01	1.2	0.09	<0.2	0.02	4.98	0.04	0.94	<0.05	0.3	0.109	0.16	0.03	<0.05	241
22591	muscle	caribou	M	3	2005	74	<0.01	0.05	<0.01	1.2	0.02	<0.2	0.01	6.96	0.04	0.81	<0.05	0.2	0.036	0.13	0.01	<0.05	224
22593	muscle	caribou	M	3	2005	75	<0.01	0.02	<0.01	1.7	0.07	<0.2	0.02	7.19	0.03	0.95	<0.05	0.7	0.394	0.17	0.72	0.05	276
26293	muscle	caribou	M	U	2006	73	<0.01	0.08	<0.01	1.4	0.04	<0.2	0.03	9.87	0.07	1.38	<0.05	0.4	0.148	0.14	0.06	<0.05	159
26531	muscle	caribou	M	U	2006	72	<0.01	0.17	<0.01	2.1	0.03	0.3	0.04	6.11	0.06	0.96	<0.05	0.8	0.189	0.19	0.04	0.08	189
27589	muscle	caribou	M	U	2007	73	<0.01	0.08	<0.01	1.6	0.03	0.2	0.02	11.2	0.05	2.27	<0.05	0.7	0.086	0.19	0.02	<0.05	162
22714	kidney	moose	M	6	2004	79.2	<0.01	0.03	<0.01	1.2	182	0.6	0.25	13.4	0.04	3.86	0.25	5.1	0.12	0.49	<0.01	0.19	122
22691	kidney	moose	M	4	2004	77.5	<0.01	<0.01	<0.01	1.5	148	0.4	0.26	16.5	0.13	12.2	0.88	4.9	0.068	0.61	<0.01	0.16	128
22711	kidney	moose	M	U	2004	77.4	<0.01	0.01	<0.01	1.3	166	0.5	0.30	11.8	0.08	4.78	0.23	4.7	0.08	0.48	<0.01	0.12	107
26627	kidney	moose	M	8	2006	80	<0.01	0.29	<0.01	1.5	269	0.4	0.29	16.6	0.14	7	<0.05	3.6	0.184	0.48	0.01	0.11	268
22657	kidney	moose	M	U	2005	80	<0.01	0.09	<0.01	0.9	71	1.1	0.19	16.6	0.1	19.4	<0.05	6.1	0.009	1.4	<0.01	0.22	127
24626	kidney	moose	M	2	2005	81.2	<0.01	0.1	<0.01	0.6	89.2	1.6	0.37	14.6	0.02	5.31	0.12	8.6	0.006	0.36	<0.01	0.12	130
22714	liver	moose	M	6	2004	50.7	<0.01	<0.01	<0.01	0.8	10.3	0.2	0.06	41.1	0.02	2.93	0.06	3.1	0.051	0.07	<0.01	0.06	48.5
22691	liver	moose	M	4	2004	70.8	<0.01	<0.01	<0.01	1.2	16.3	0.2	0.38	66.2	0.09	7.74	0.12	2.4	0.27	0.21	<0.01	0.10	49.3
22704	liver	moose	M	2	2004	57.7	<0.01	<0.01	<0.01	0.8	4.6	<0.2	0.15	47.7	0.07	3.98	0.09	1.6	0.128	0.11	0.02	<0.05	22.1
25660	liver	moose	M	U	2006	58	<0.01	0.02	<0.01	1.6	5.9	<0.2	0.16	95.3	0.02	3.49	<0.05	3.3	0.133	0.1	<0.01	<0.05	54.2
26627	liver	moose	M	8	2006	59	<0.01	0.13	<0.01	1.8	36.3	<0.2	0.19	124	0.15	5.4	<0.05	2.5	0.21	0.11	<0.01	<0.05	360
115	liver	moose	M	U	2005	71	<0.01	<0.01	<0.01	<0.5	45.4	0.7	0.54	177	0.07	10.2	<0.05	10.3	0.506	0.11	<0.01	<0.05	68.8
22657	liver	moose	M	U	2005	73.7	<0.01	0.03	<0.01	<0.5	14.8	<0.2	0.31	106	0.05	15.3	<0.05	13.9	1.45	0.27	<0.01	<0.05	105
23965	liver	moose	M	5	2005	73.1	<0.01	<0.01	<0.01	<0.5	68.5	0.2	0.47	169	0.03	9.88	<0.05	14.3	0.819	0.22	<0.01	<0.05	96.5
24626	liver	moose	M	2	2005	60.4	<0.01	<0.01	<0.01	<0.5	8.56	<0.2	0.14	91.1	<0.01	4.95	<0.05	23.6	0.985	0.07	<0.01	<0.05	46.8
22714	muscle	moose	M	6	2004	74.7	<0.01	<0.01	<0.01	0.6	0.08	<0.2	0.01	5.02	<0.01	0.45	<0.05	1.4	0.073	0.17	<0.01	<0.05	236
22691	muscle	moose	M	4	2004	72.8	<0.01	<0.01	<0.01	0.6	0.06	<0.2	0.01	3.8	0.02	0.44	<0.05	0.7	0.393	0.11	<0.01	<0.05	222

							mg/kg (dw)															
Specimen_ID	Matrix	Species	Sex	Age	Year	% Moisture	Antimony	Arsenic	Beryllium	Boron	Cadmium	Chromium	Cobalt	Copper	Lead	Manganese	Nickel	Selenium	Silver	Strontium	Tin	Vanadium	Zinc
22704	muscle	moose	M	2	2004	69	<0.01	<0.01	<0.01	0.9	0.02	2.3	0.01	3.72	0.05	0.8	<0.05	0.7	0.09	0.18	<0.01	0.09	257
25660	muscle	moose	M	U	2006	74	0.01	0.03	<0.01	1.5	0.14	0.2	0.05	3.52	0.07	0.56	<0.05	0.6	0.266	0.17	0.05	0.05	256
26627	muscle	moose	M	8	2006	73	0.03	0.09	<0.01	1.7	0.1	<0.2	0.04	5.63	0.61	0.63	0.22	0.3	1.17	0.14	0.51	<0.05	196
115	muscle	moose	M	U	2005	74	<0.01	<0.01	<0.01	<0.5	0.05	<0.2	0.03	2.41	<0.01	0.52	<0.05	1	0.016	0.09	<0.01	<0.05	232
22657	muscle	moose	M	U	2005	74.4	<0.01	<0.01	<0.01	<0.5	0.02	<0.2	0.01	4.92	<0.01	0.51	<0.05	2.4	0.037	0.1	<0.01	<0.05	191
22675	muscle	moose	M	U	2005	75.1	<0.01	<0.01	<0.01	<0.5	0.1	<0.2	0.03	4	0.02	0.53	<0.05	0.9	0.021	0.12	<0.01	<0.05	271
23965	muscle	moose	M	5	2005	73	<0.01	0.02	<0.01	<0.5	0.24	0.5	0.03	5.81	<0.01	0.91	<0.05	1.7	0.027	0.06	<0.01	<0.05	253
24626	muscle	moose	M	2	2005	75	<0.01	<0.01	<0.01	<0.5	0.03	<0.2	0.02	3.94	<0.01	0.63	<0.05	2.9	0.04	0.09	0.03	<0.05	207

Note: U = Unknown

TABLE C.2.3-2
SUMMARY STATISTICS FOR METAL CONCENTRATIONS MEASURED IN MOOSE AND CARIBOU

Species	Tissue	N	Units	Antimony Sb		Arsenic As		Beryllium Be		Boron B		Cadmium Cd	
				Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
Caribou	Kidney	11	mg/g dry wt	<0.01	<0.01	0.04	0.23	<0.01	<0.01	<0.5	1.7	5.2	87
	Liver	11	mg/g dry wt	<0.01	0.02	<0.01	0.10	<0.01	<0.01	0.6	1.8	0.92	9.19
	Muscle	10	mg/g dry wt	<0.01	0.02	<0.01	0.17	<0.01	<0.01	<0.5	2.1	<0.01	0.09
Moose	Kidney	6	mg/g dry wt	<0.01	<0.01	<0.01	0.29	<0.01	<0.01	0.6	1.5	71	269
	Liver	9	mg/g dry wt	<0.01	<0.01	<0.01	0.13	<0.01	<0.01	<0.5	1.8	4.6	68.5
	Muscle	10	mg/g dry wt	<0.01	0.03	<0.01	0.09	<0.01	<0.01	<0.5	1.7	0.02	0.24
Species	**Tissue**	**N**	**Units**	**Chromium Cr**		**Cobalt Co**		**Copper Cu**		**Lead Pb**		**Manganese Mn**	
				Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
Caribou	Kidney	11	mg/g dry wt	<0.2	0.7	0.01	0.41	19.2	24.9	0.97	5.44	5.92	8.67
	Liver	11	mg/g dry wt	<0.2	0.7	<0.01	0.39	19.6	107	0.42	2.38	9.12	15.5
	Muscle	10	mg/g dry wt	<0.2	0.6	<0.01	0.47	4.98	11.2	0.03	0.1	0.56	2.79
Moose	Kidney	6	mg/g dry wt	0.4	1.6	0.19	0.37	11.8	16.6	0.02	0.14	3.86	19.4
	Liver	9	mg/g dry wt	<0.2	0.7	0.06	0.54	41.1	177	<0.01	0.15	2.93	15.3
	Muscle	10	mg/g dry wt	<0.2	2.3	0.01	0.05	2.41	5.81	<0.01	0.61	0.44	0.91
Species	**Tissue**	**N**	**Units**	**Nickel Ni**		**Selenium Se**		**Silver Ag**		**Strontium Sr**		**Tin Sn**	
				Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
Caribou	Kidney	11	mg/g dry wt	<0.05	0.22	0.7	5.6	0.04	1.84	0.13	0.79	<0.01	0.07
	Liver	11	mg/g dry wt	<0.05	0.16	0.5	5.1	0.94	3.21	0.12	0.55	<0.01	0.13
	Muscle	10	mg/g dry wt	<0.05	0.05	0.2	4.3	0.03	0.39	0.13	0.51	<0.01	0.72
Moose	Kidney	6	mg/g dry wt	<0.05	0.88	3.6	8.6	0.01	0.18	0.36	1.40	<0.01	0.01
	Liver	9	mg/g dry wt	<0.05	0.12	1.6	23.6	0.05	1.45	0.07	0.27	<0.01	0.02
	Muscle	10	mg/g dry wt	<0.05	0.22	0.3	2.9	0.02	1.17	0.06	0.18	<0.01	0.51
Species	**Tissue**	**N**	**Units**	**Vanadium V**		**Zinc Zn**							
				Min	Max	Min	Max						
Caribou	Kidney	11	mg/g dry wt	<0.05	0.19	79	131						
	Liver	11	mg/g dry wt	<0.05	0.14	42	94						
	Muscle	10	mg/g dry wt	<0.05	0.16	138	276						
Moose	Kidney	6	mg/g dry wt	0.11	0.22	107	268						
	Liver	9	mg/g dry wt	<0.05	0.10	22	360						
	Muscle	10	mg/g dry wt	<0.05	0.09	191	271						

Note: N = number of samples

C.3 References

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APPENDIX D

DEVELOPMENT OF PROBABILISTIC DISTRIBUTIONS FOR TRANSFER FACTORS AND MEASURED CONCENTRATIONS

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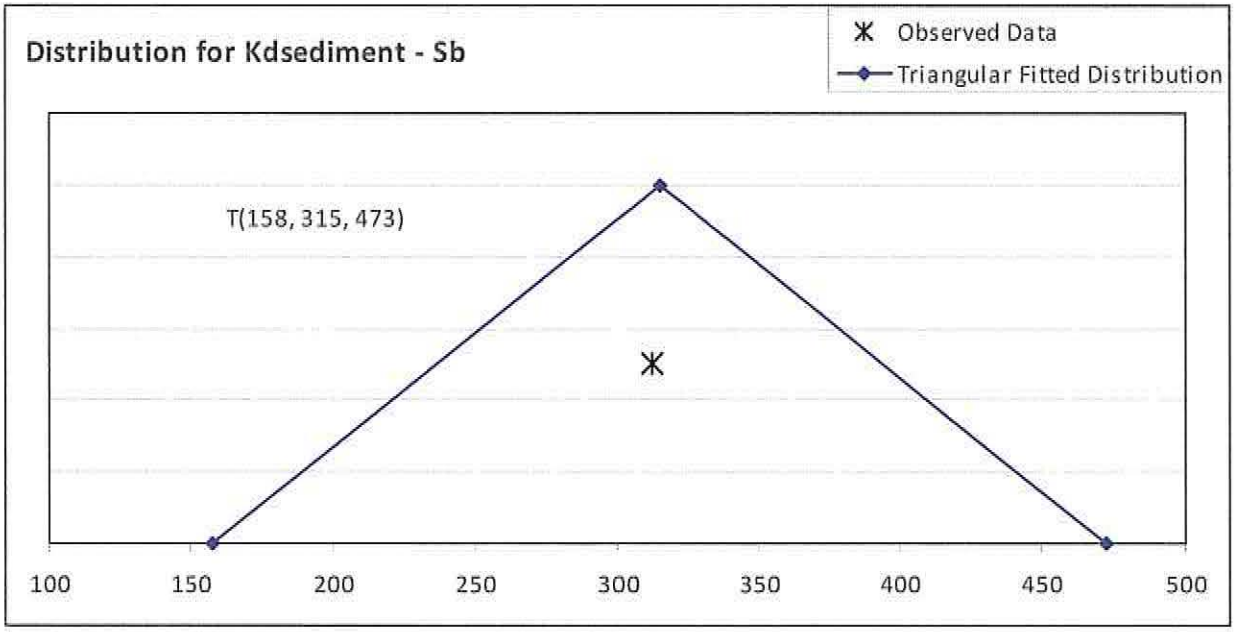
APPENDIX D: DEVELOPMENT OF PROBABILISTIC DISTRIBUTIONS FOR TRANSFER FACTORS AND MEASURED CONCENTRATIONS

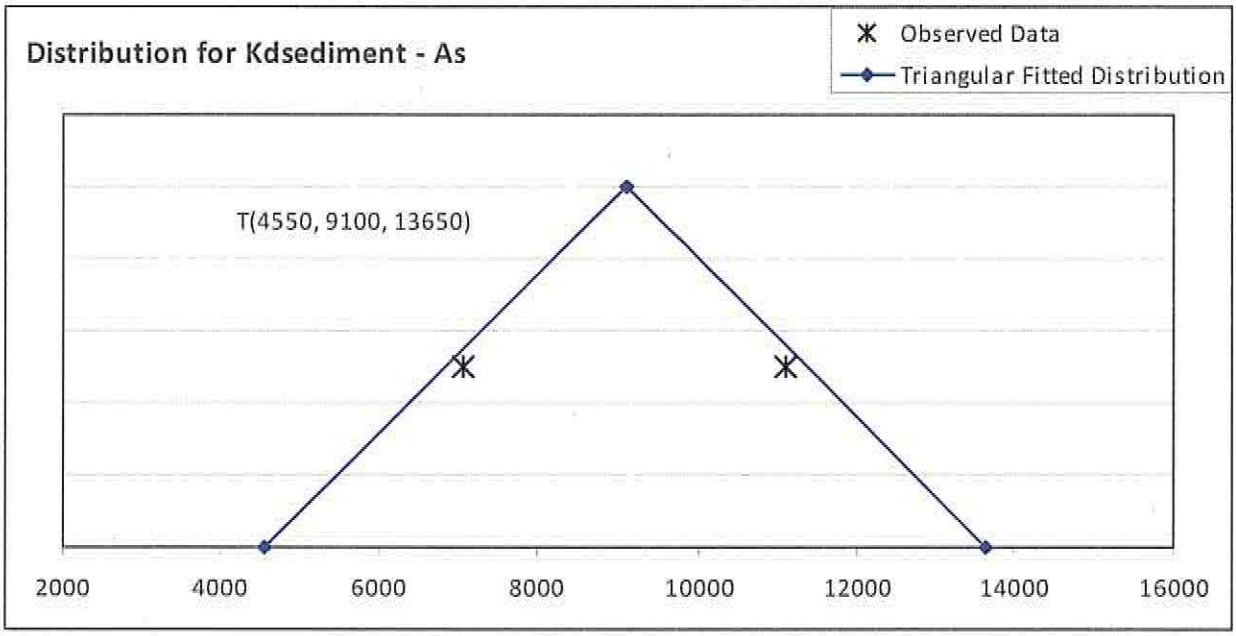
D.1 WATER – TO – SEDIMENT DISTRIBUTION COEFFICIENTS

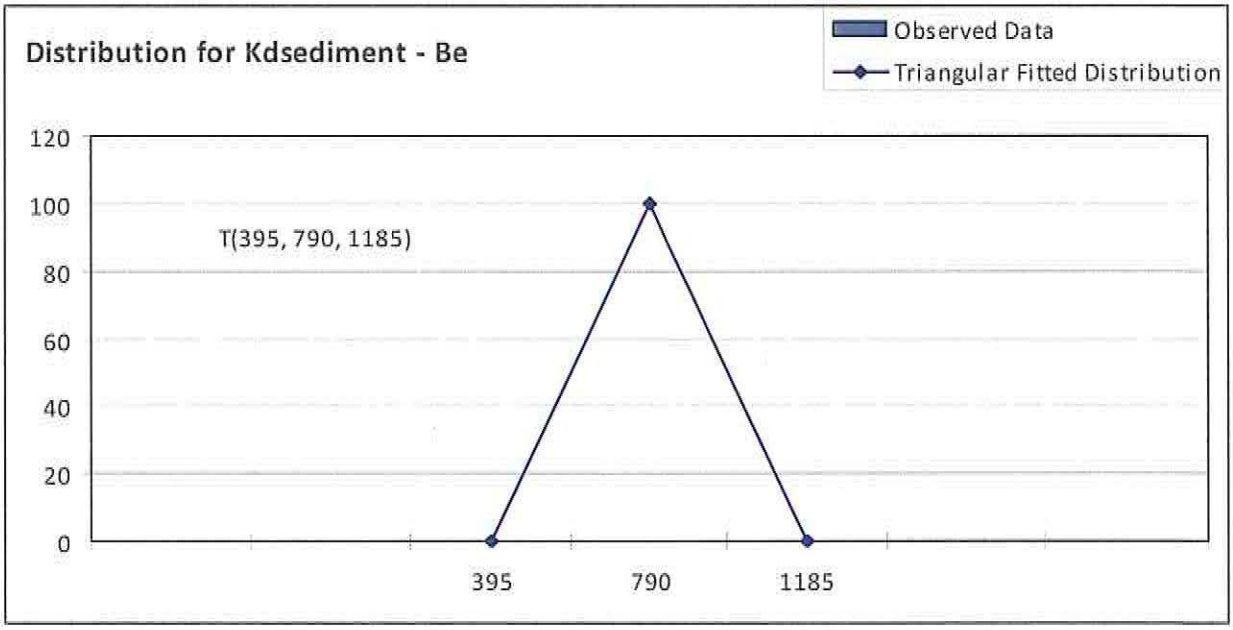
Site-specific distribution factors for sediment were developed from site-specific data for the Faro Mine Complex during the previous assessment (SENES, 2006, Section 2.2.2.1, Project No. 33798). The raw data used for the development of the mean values was analyzed to derive distributions for the data for use in the probabilistic risk assessment.

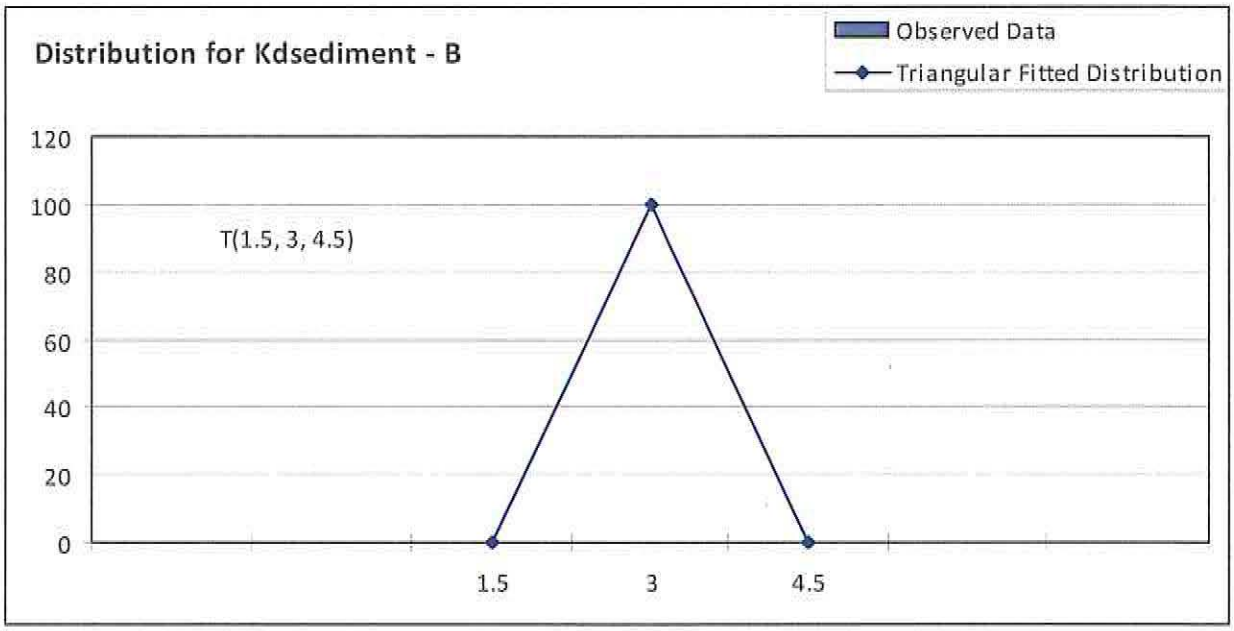
Due to the small number of values, site-specific distribution coefficients were described using triangular distributions. The triangular distributions are defined by the minimum value, the mode, and the maximum value. For the purposes of this assessment, the mean value was used to represent the mode because the triangular distribution was generally used in the case of only a few available data points and a mode value was not available. This was considered a reasonable assumption. A range was assumed on either side of the mean value to represent the minimum and maximum values and encompass the available data. For antimony and tin, an assumed range of + or – 50% was assumed on either side of the calculated value to represent the minimum and maximum values in the absence of other data. The following graphs summarize the distributions (line graph) as compared with the available data (bar graph) for each COPC.

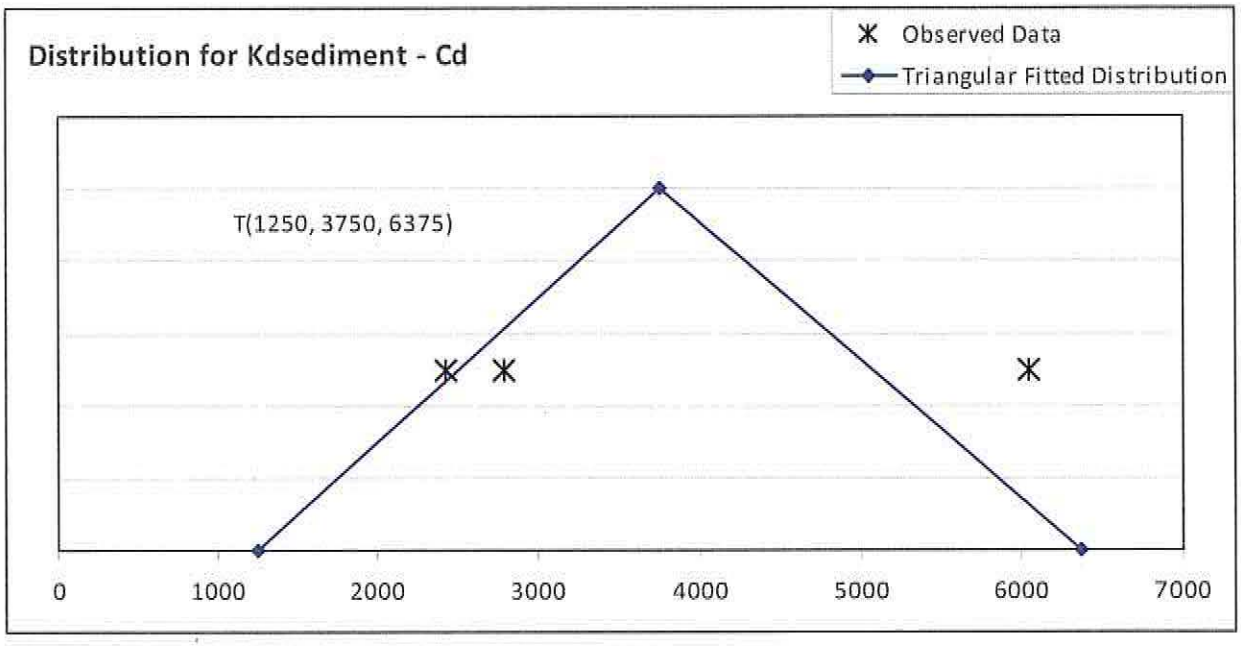
The development of distributions for site-specific water-to-sediment distribution coefficients was limited by the data available, from one to three values. In the absence of available site-specific data, literature values were used, with the literature value representing the mode of the triangular distribution and an assumed range of + or – 50% was assumed on either side of the literature value to represent the minimum and maximum values. Literature values were used for beryllium, boron, selenium, and tin (see Section 2 of the main report for the sources used to obtain these values).

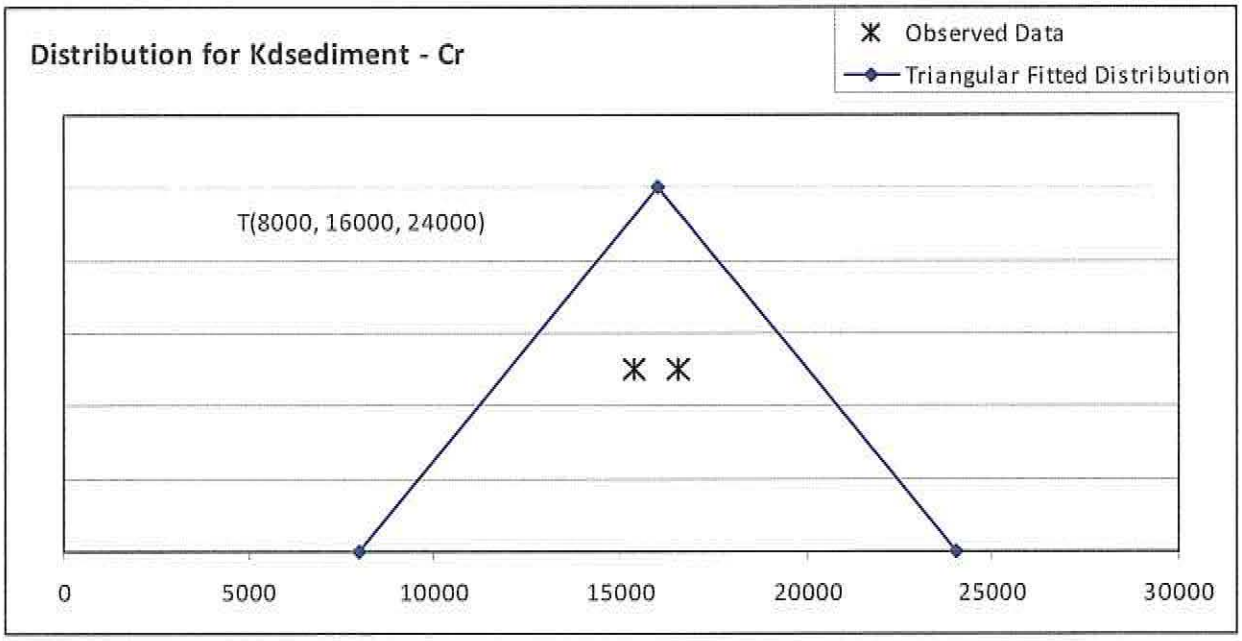

Distribution for Kdsediment - Sb
Observed Data
Triangular Fitted Distribution
T(158, 315, 473)
100
150
200
250
300
350
400
450
500

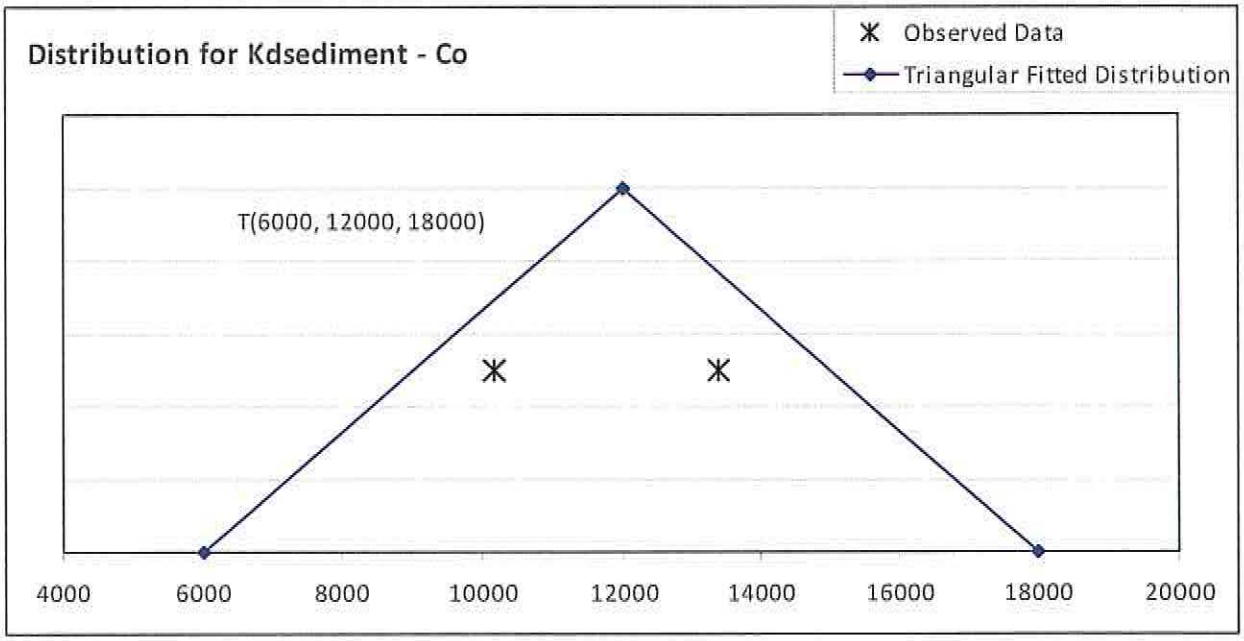

Distribution for Kdsediment - As
Observed Data
Triangular Fitted Distribution
T(4550, 9100, 13650)
2000
4000
6000
8000
10000
12000
14000
16000

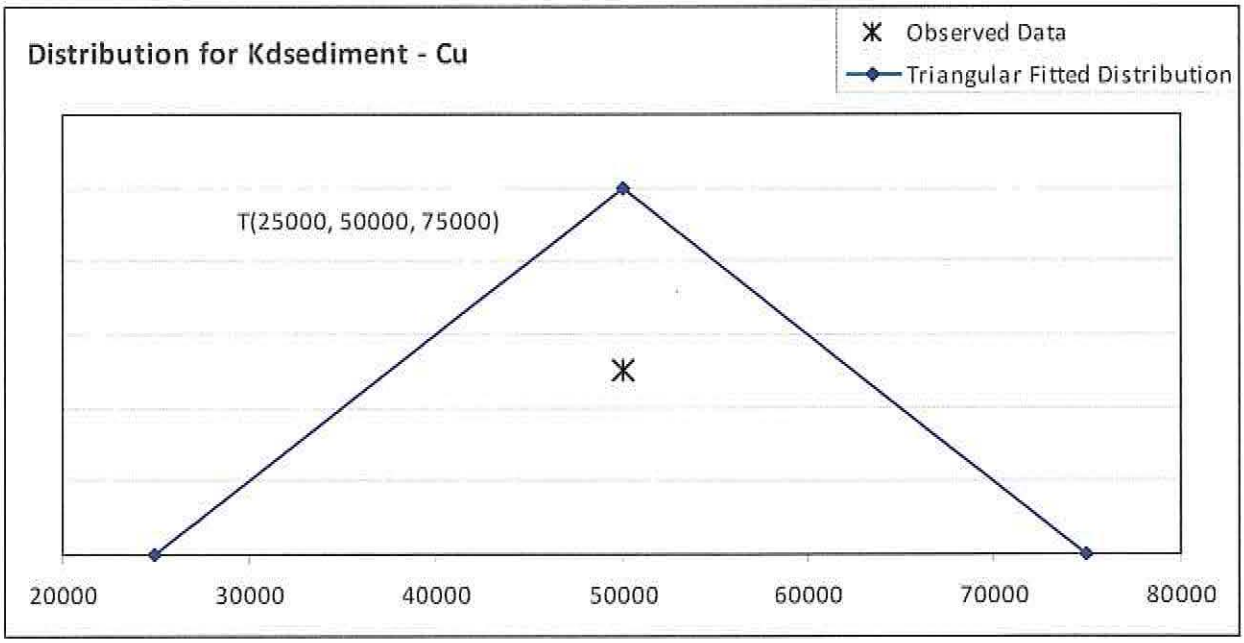

Distribution for Kdsediment - Be
Observed Data
Triangular Fitted Distribution
T(395, 790, 1185)
120
100
80
60
40
20
0
395
790
1185

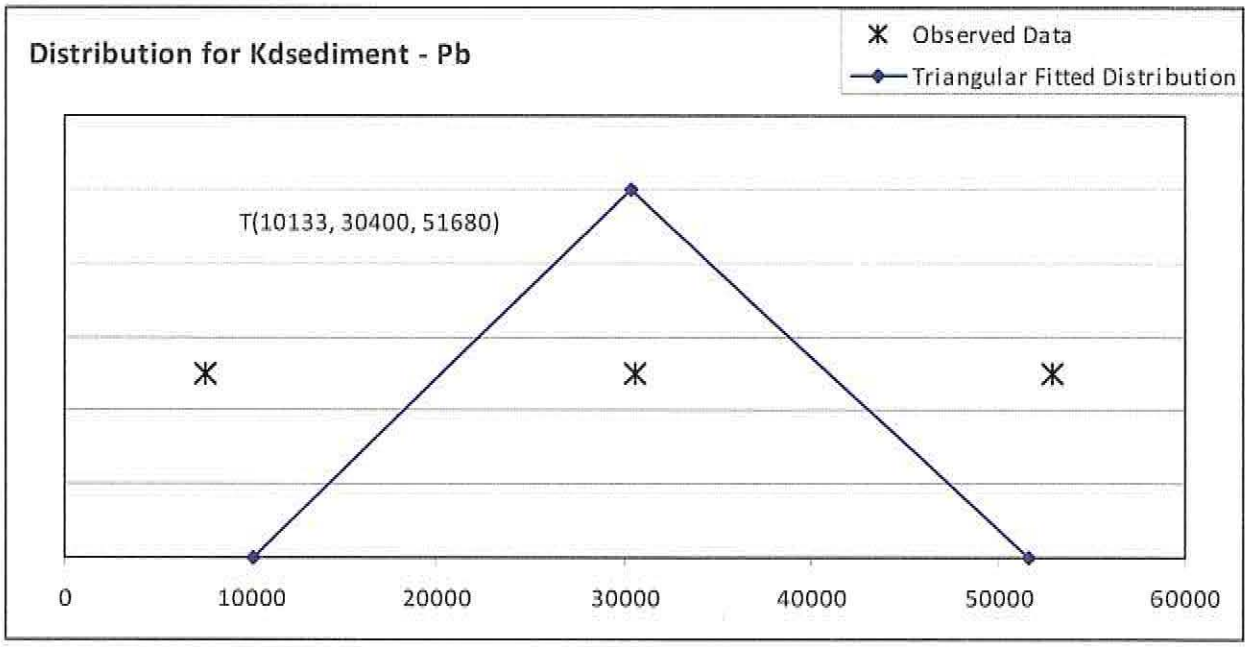

Distribution for Kdsediment - B
Observed Data
Triangular Fitted Distribution
T(1.5, 3, 4.5)
120
100
80
60
40
20
0
1.5
3
4.5

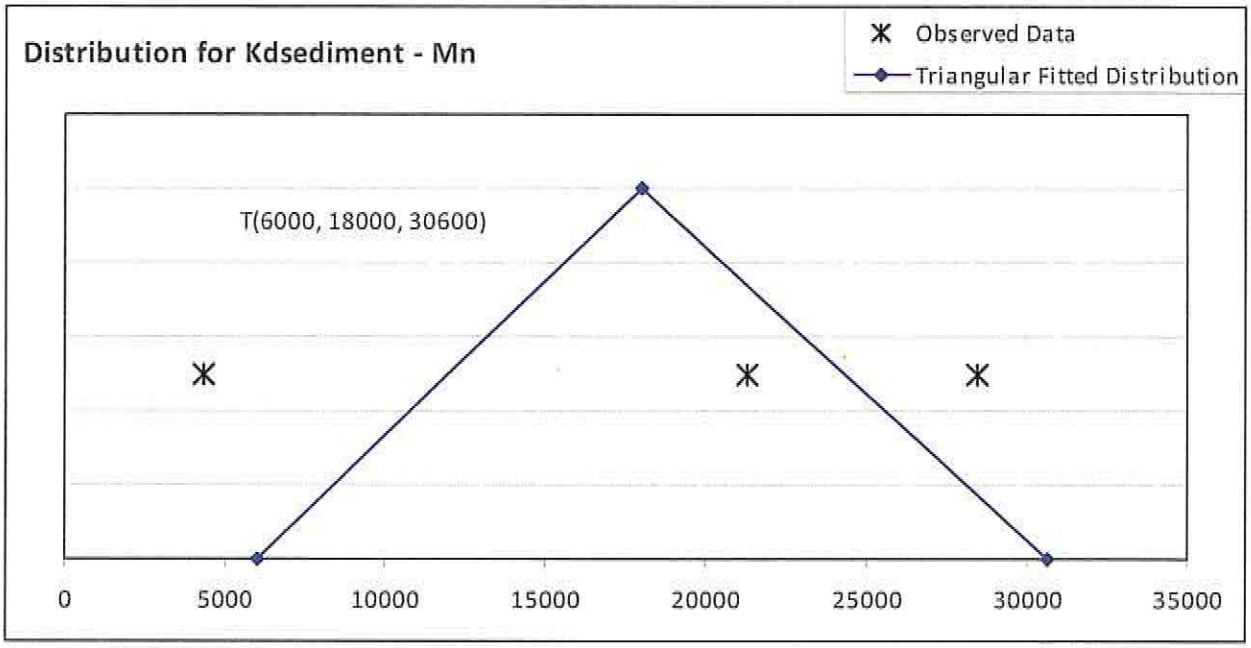

Distribution for Kdsediment - Cd
Observed Data
Triangular Fitted Distribution
T(1250, 3750, 6375)
0
1000
2000
3000
4000
5000
6000
7000

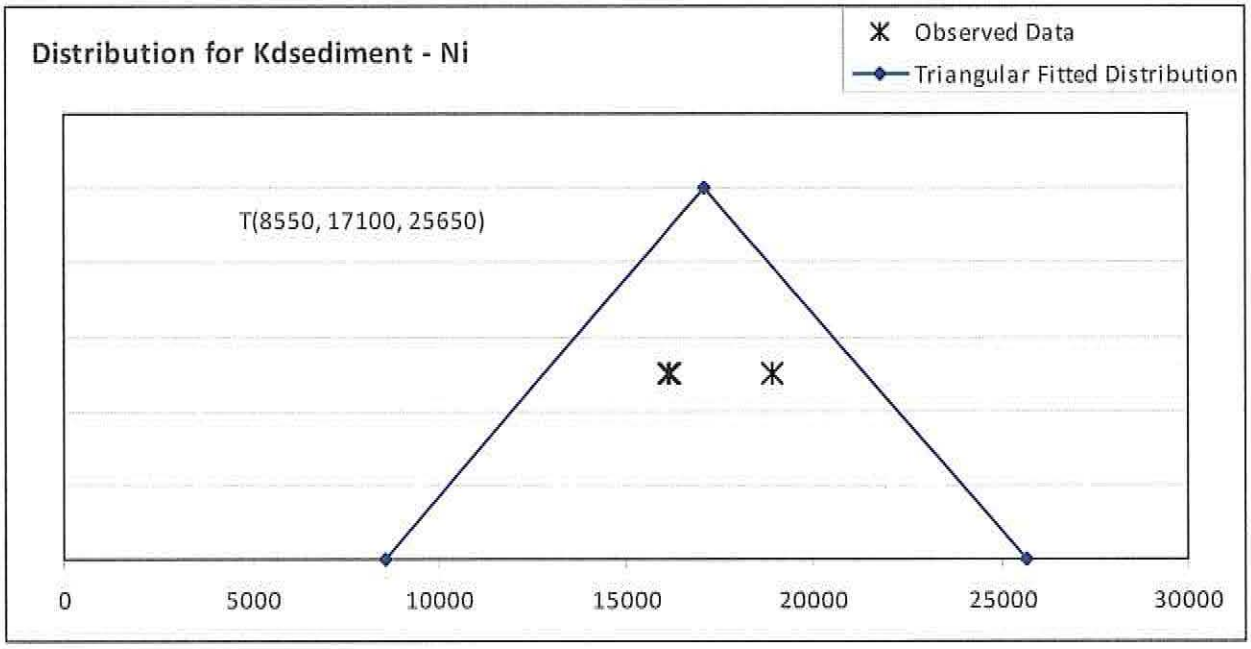

Distribution for Kdsediment - Cr
Observed Data
Triangular Fitted Distribution
T(8000, 16000, 24000)
0
5000
10000
15000
20000
25000
30000

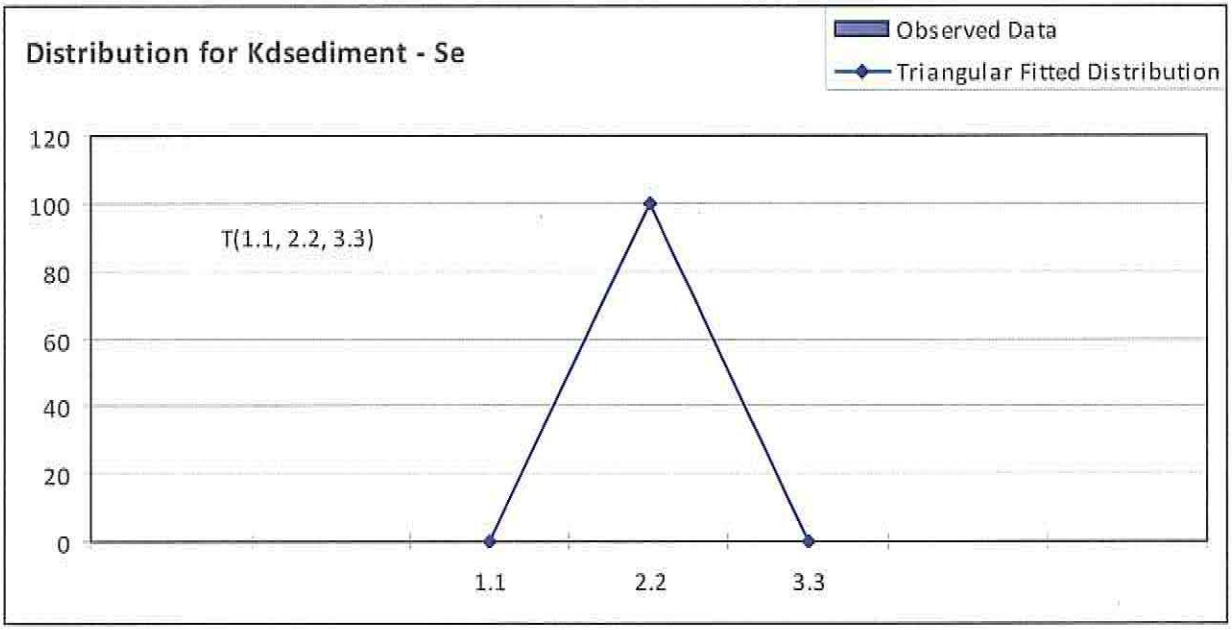

Distribution for Kdsediment - Co
Observed Data
Triangular Fitted Distribution
T(6000, 12000, 18000)
4000
6000
8000
10000
12000
14000
16000
18000
20000

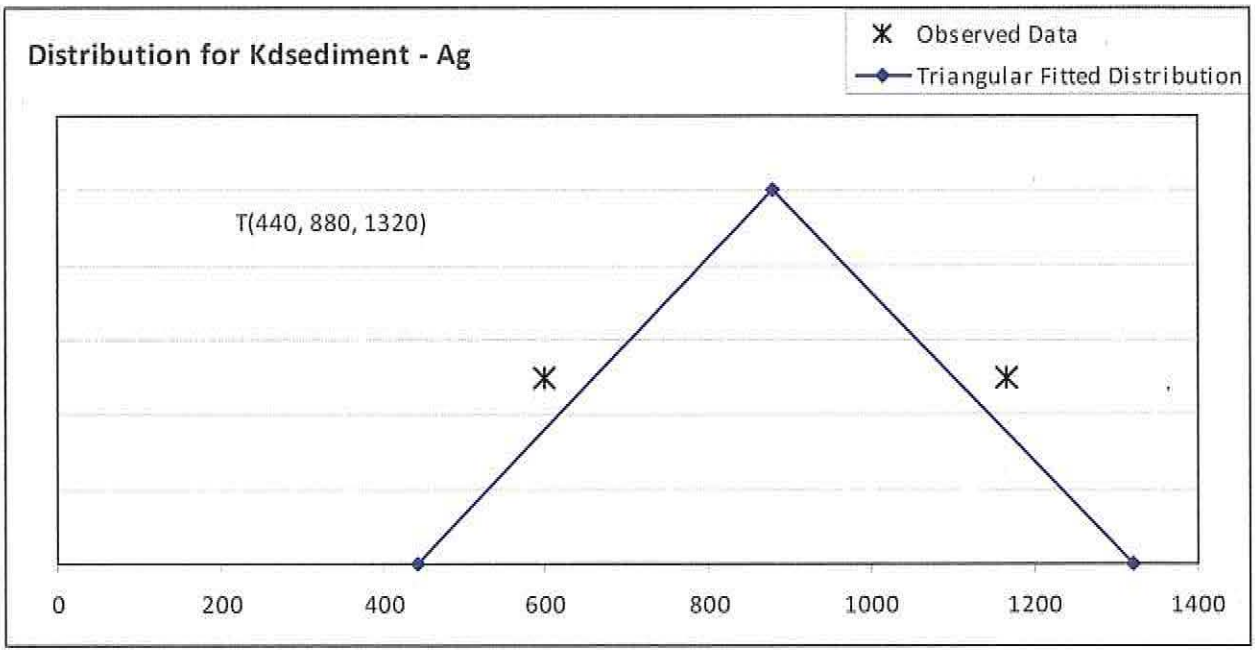

Distribution for Kdsediment - Cu
Observed Data
Triangular Fitted Distribution
T(25000, 50000, 75000)
20000
30000
40000
50000
60000
70000
80000

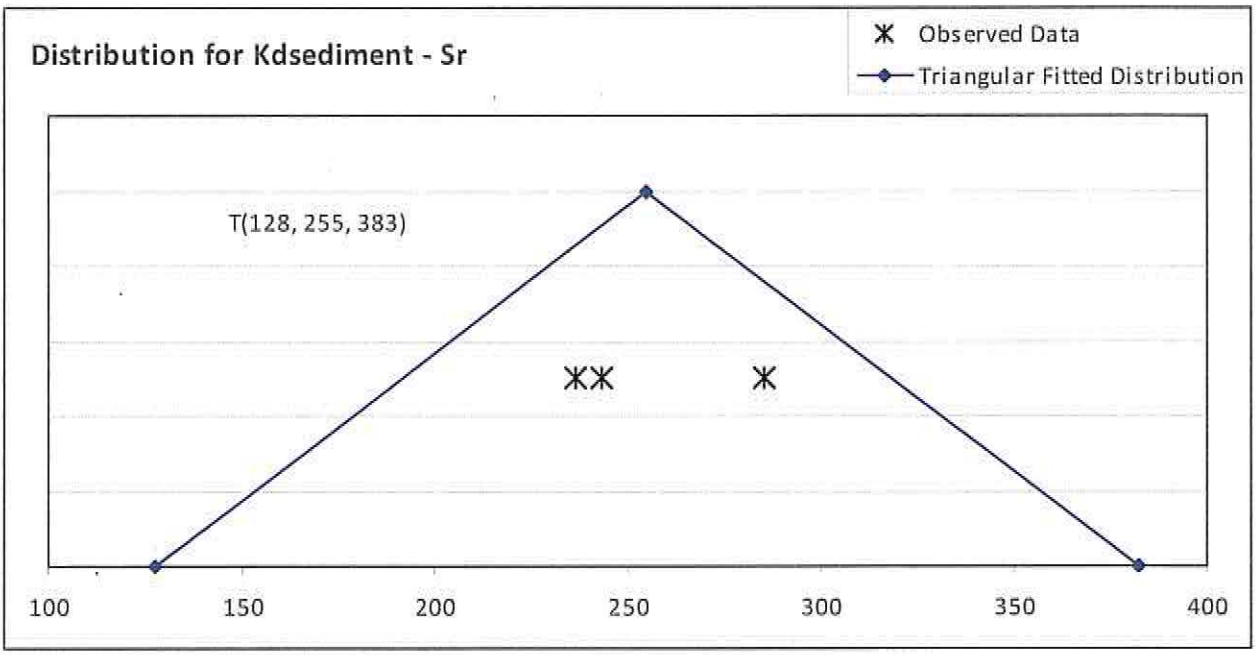

Distribution for Kdsediment - Pb
Observed Data
Triangular Fitted Distribution
T(10133, 30400, 51680)
0
10000
20000
30000
40000
50000
60000

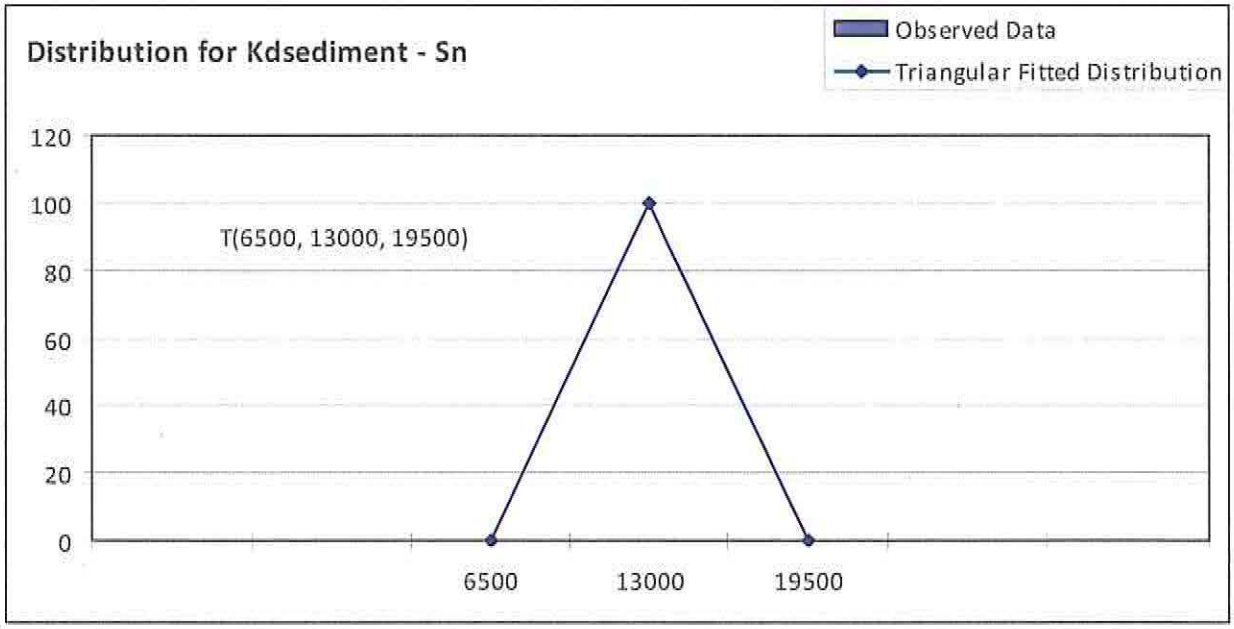

Distribution for Kdsediment - Mn
Observed Data
Triangular Fitted Distribution
T(6000, 18000, 30600)
0
5000
10000
15000
20000
25000
30000
35000

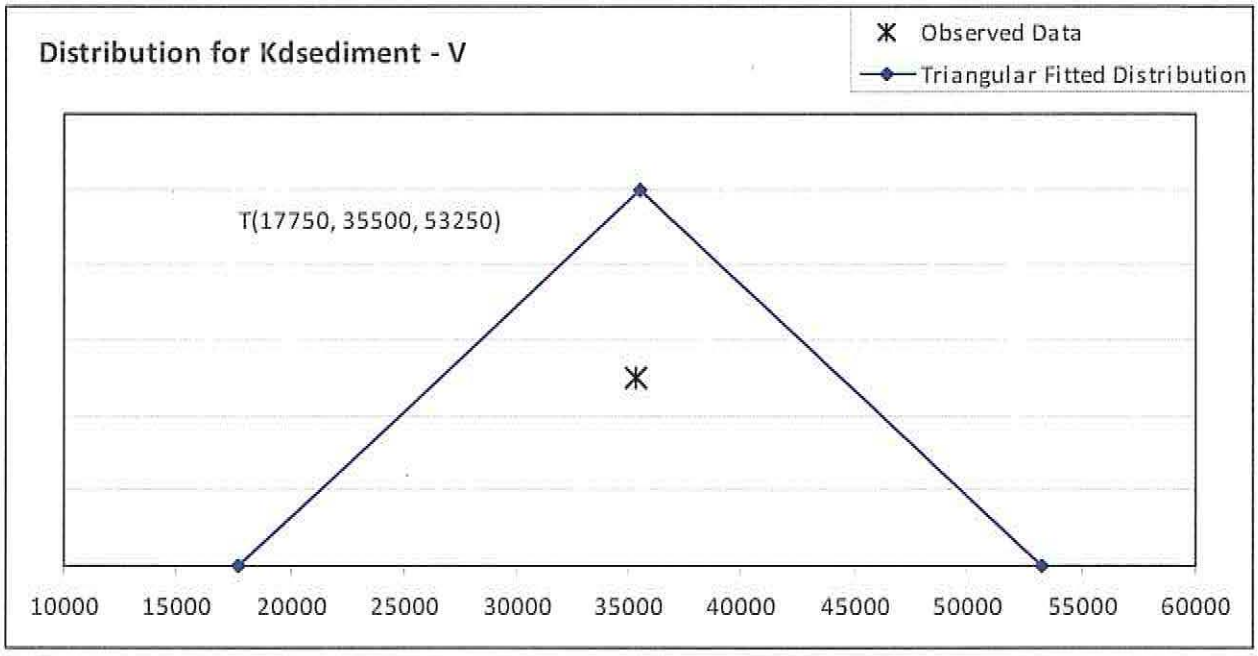

Distribution for Kdsediment - Ni
Observed Data
Triangular Fitted Distribution
T(8550, 17100, 25650)
0
5000
10000
15000
20000
25000
30000

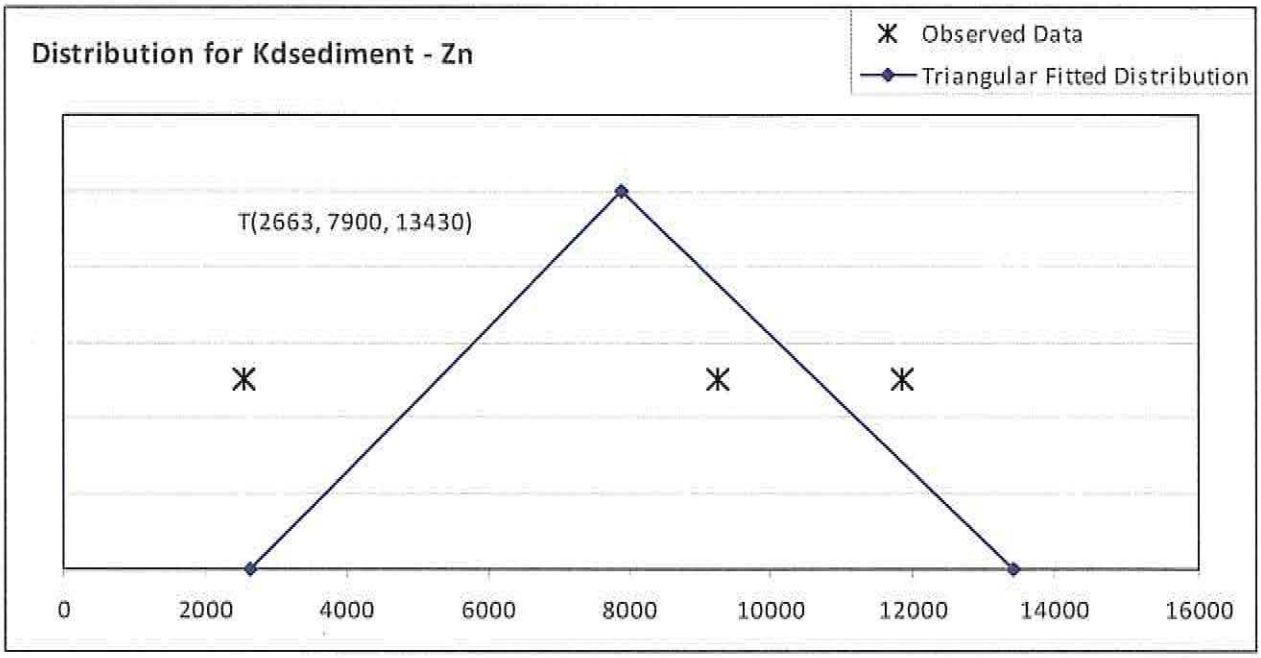

Distribution for Kdsediment - Se
Observed Data
Triangular Fitted Distribution
T(1.1, 2.2, 3.3)
120
100
80
60
40
20
0
1.1
2.2
3.3


Distribution for Kdsediment - Ag
Observed Data
Triangular Fitted Distribution
T(440, 880, 1320)
0
200
400
600
800
1000
1200
1400


Distribution for Kdsediment - Sr
Observed Data
Triangular Fitted Distribution
T(128, 255, 383)
100
150
200
250
300
350
400


Distribution for Kdsediment - Sn
Observed Data
Triangular Fitted Distribution
120
100
80
60
40
20
0
T(6500, 13000, 19500)
6500
13000
19500


Distribution for Kdsediment - V
Observed Data
Triangular Fitted Distribution
T(17750, 35500, 53250)
10000
15000
20000
25000
30000
35000
40000
45000
50000
55000
60000



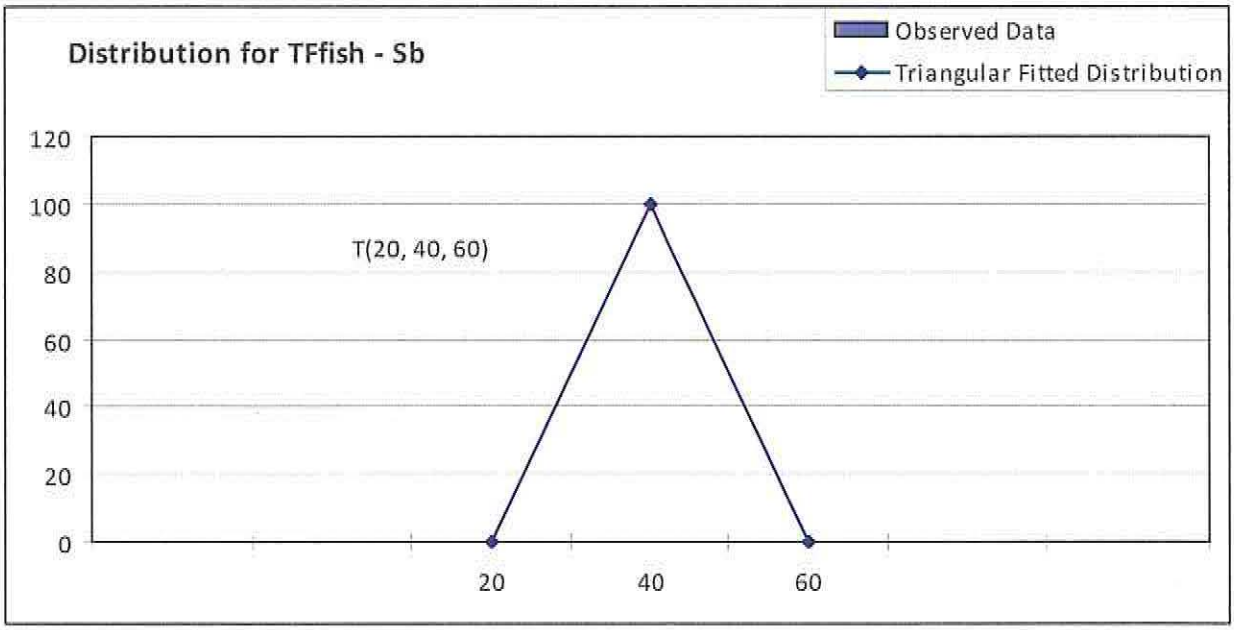
D.2 WATER – TO – FISH TRANSFER FACTORS

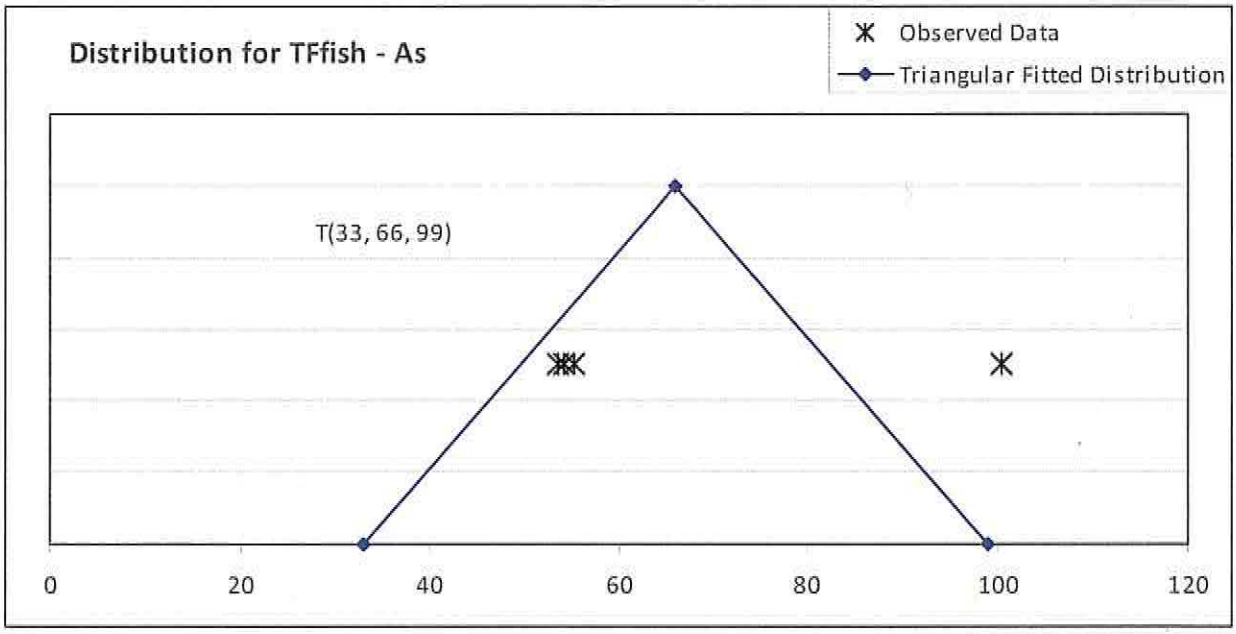
Site-specific transfer factors for fish (L/kg FW) were developed from site-specific data for the Faro Mine Complex during the previous assessment (SENES, 2006, Section 2.2.3.1, Project No. 33798). The raw data used for the development of the mean values was analyzed to derive distributions for the data for use in the probabilistic risk assessment.

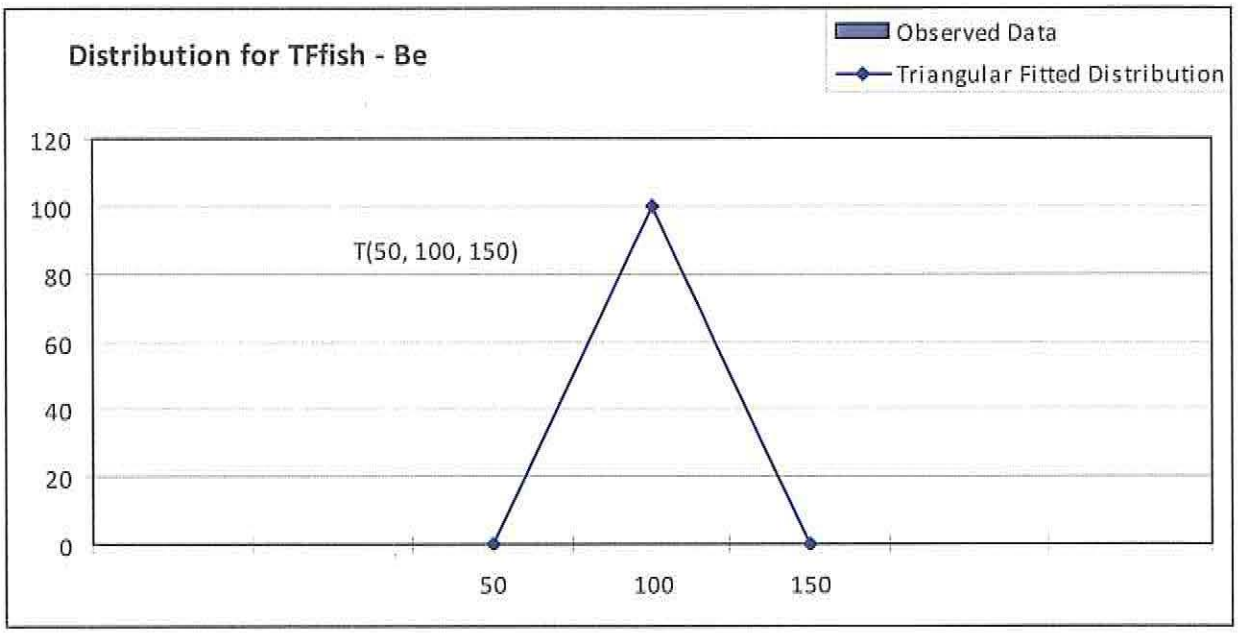
Due to the small number of values, site-specific distribution coefficients were described using triangular distributions. The triangular distributions are defined by the minimum value, the mode, and the maximum value. For the purposes of this assessment, the mean value was used to represent the mode because the triangular distribution was generally used in the case of only a few available data points and a mode value was not available. This was considered a reasonable assumption. A range (generally, +/- 50%) was assumed on either side of the mean value to represent the minimum and maximum values. The range was determined to encompass and include the available data. The following graphs summarize the distributions (line graph) as compared with the available data (bar graph) for each COPC.

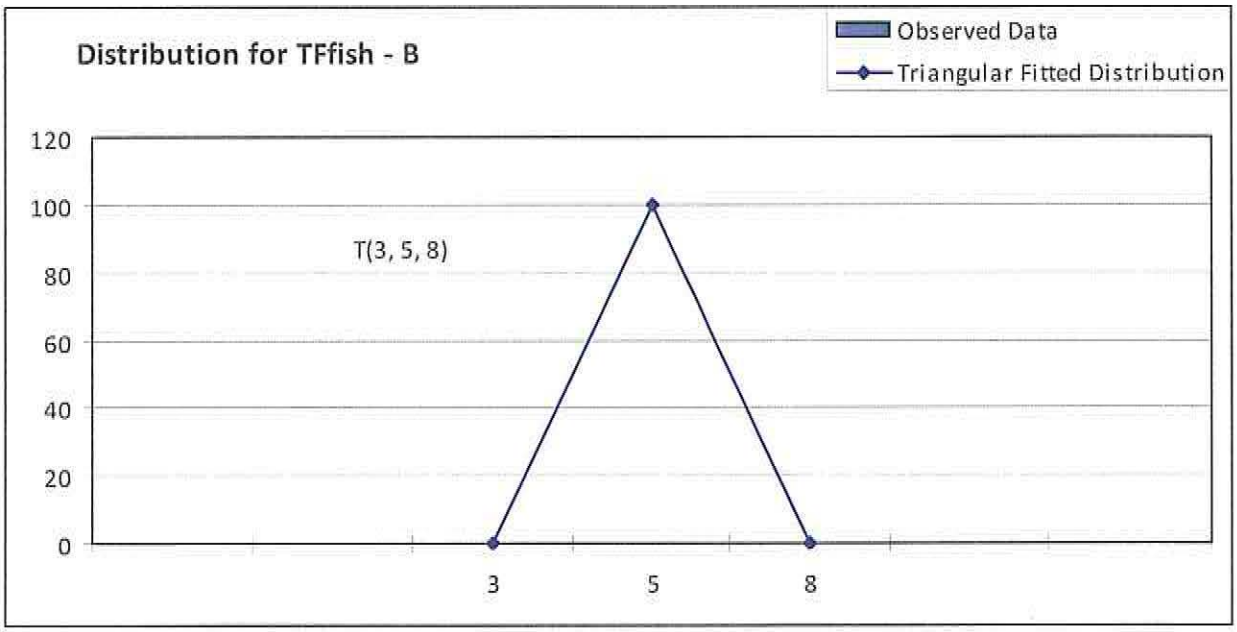
The development of distributions for site-specific water-to-fish transfer factors was limited by the data available, from three to six samples. In the absence of available site-specific data, literature values were used, with the literature value representing the mode of the triangular distribution and an assumed range of +/- 50% on either side of the literature value to represent the minimum and maximum values. Literature values were used for antimony, beryllium, boron,

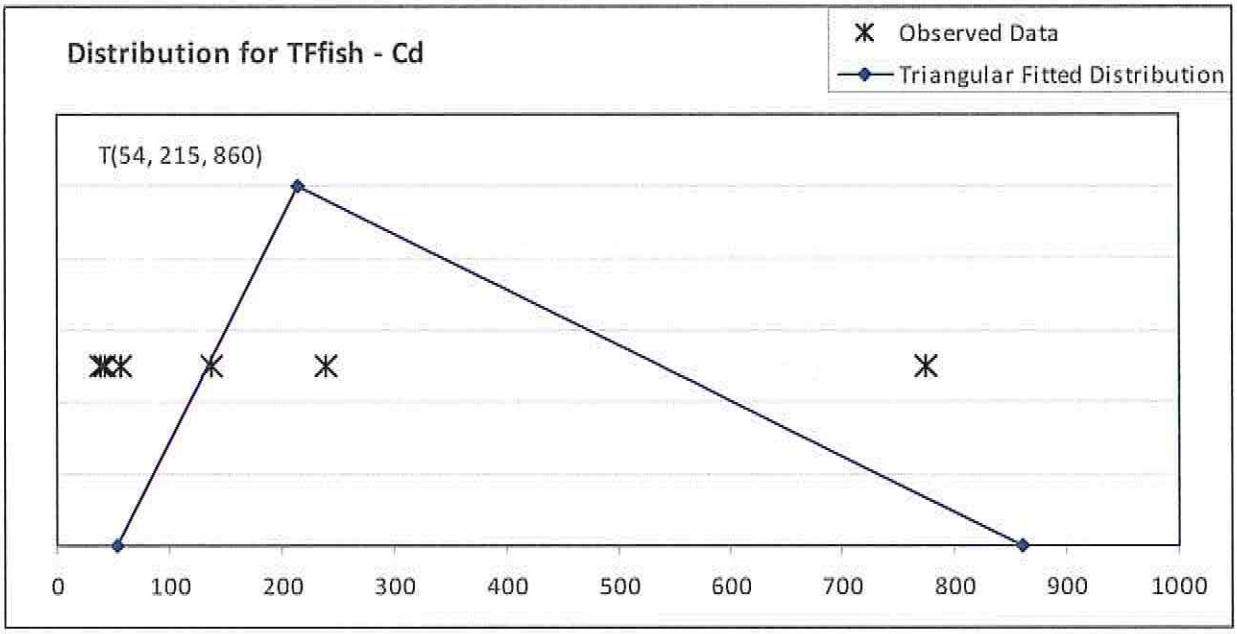
chromium, nickel and selenium (see Section 2 of the main report for the sources used to obtain these values).

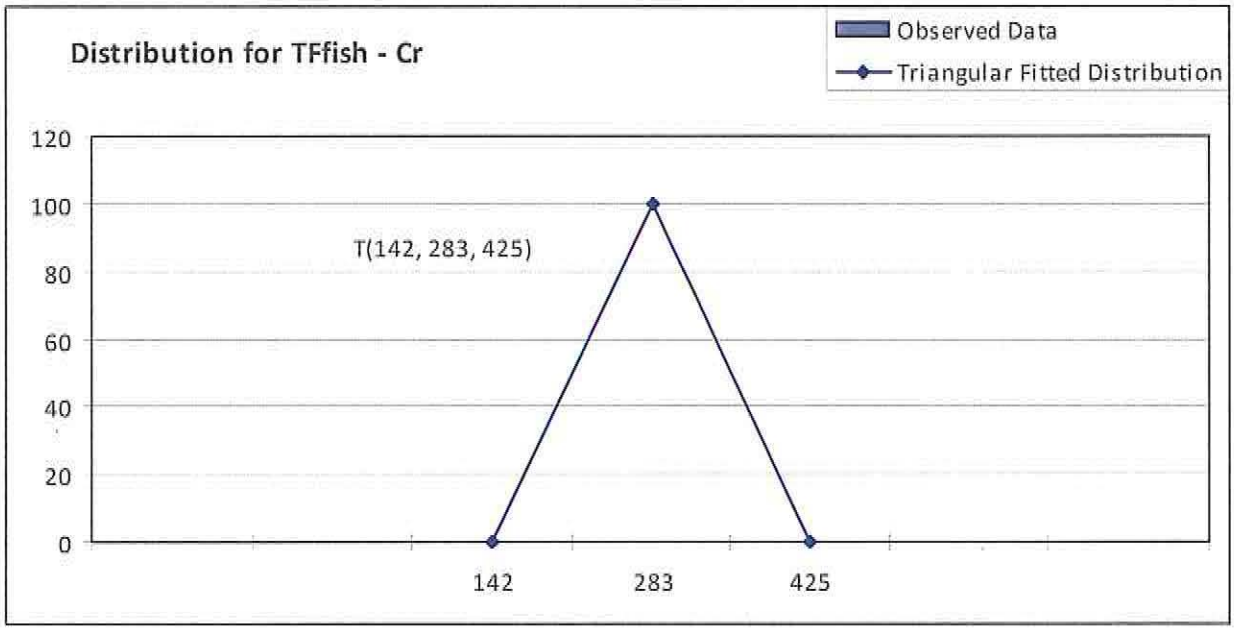


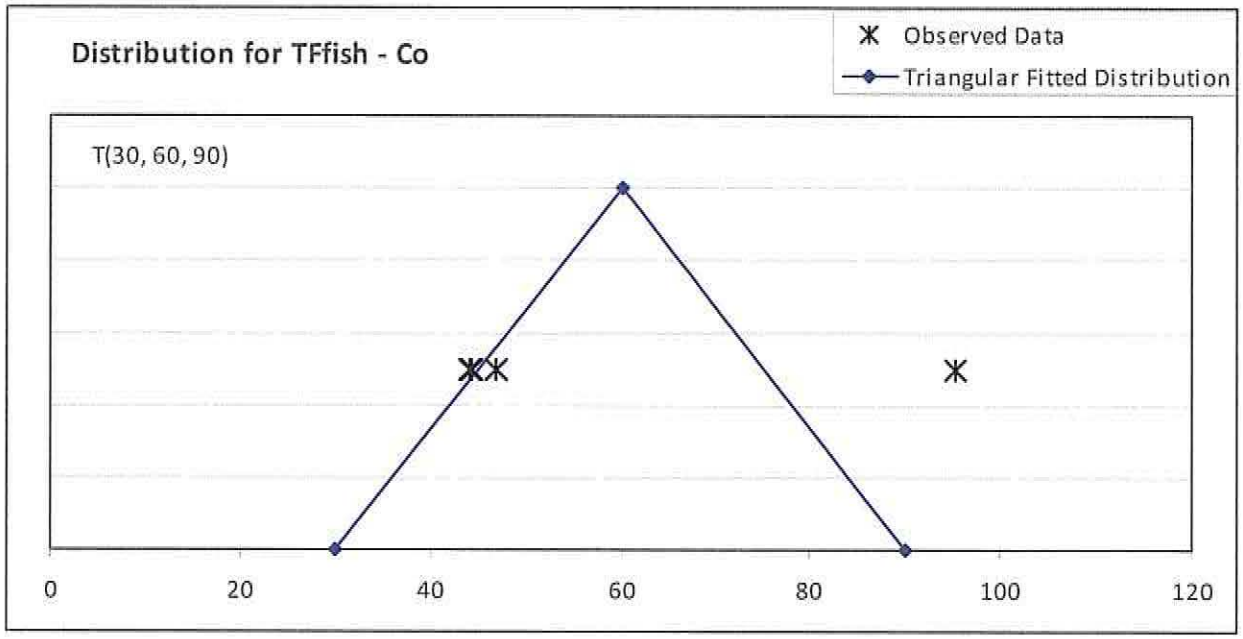


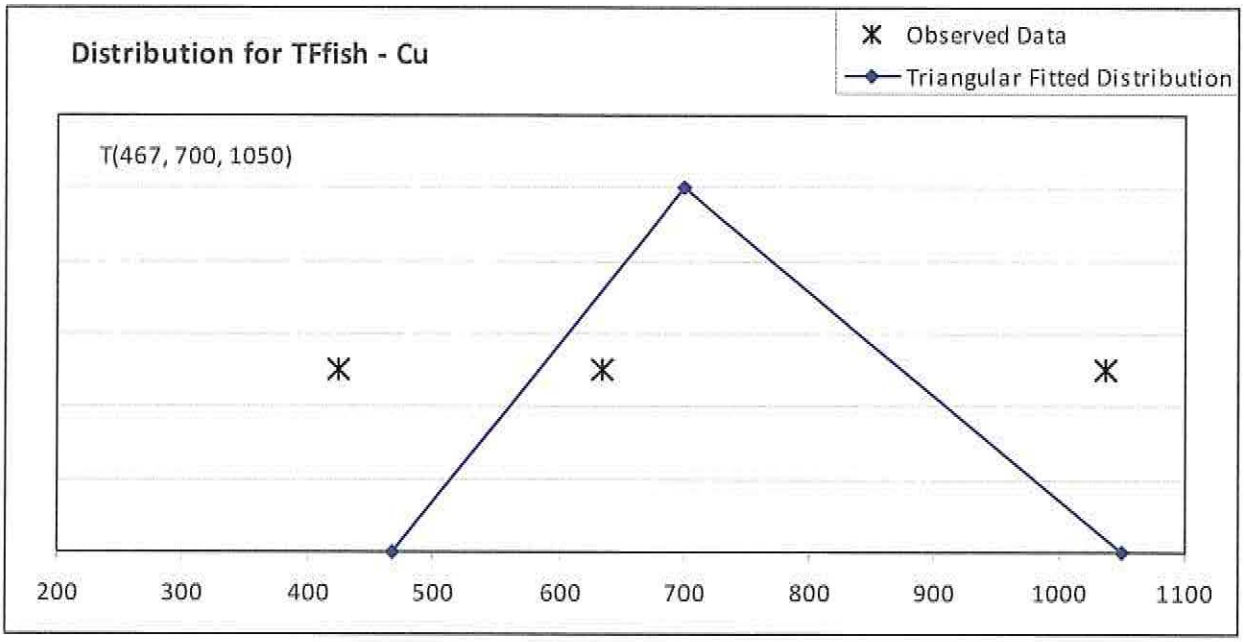

Distribution for TFfish - Be
Observed Data
Triangular Fitted Distribution
120
100
80
60
40
20
0
T(50, 100, 150)
50
100
150

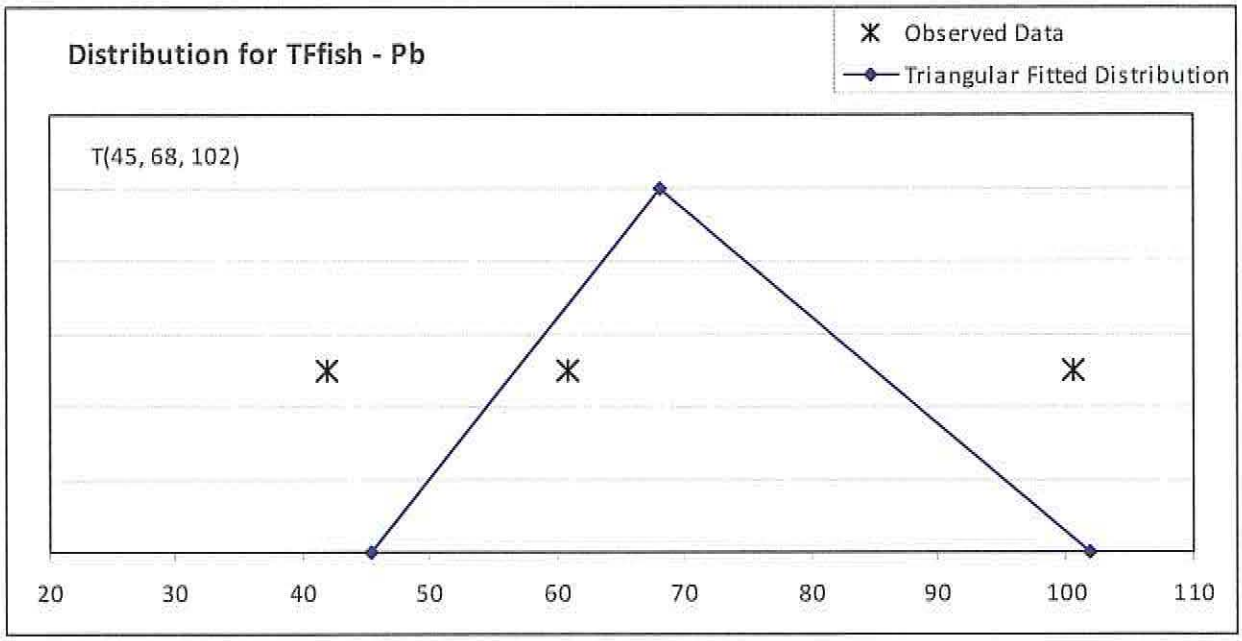

Distribution for TFfish - B
Observed Data
Triangular Fitted Distribution
120
100
80
60
40
20
0
T(3, 5, 8)
3
5
8

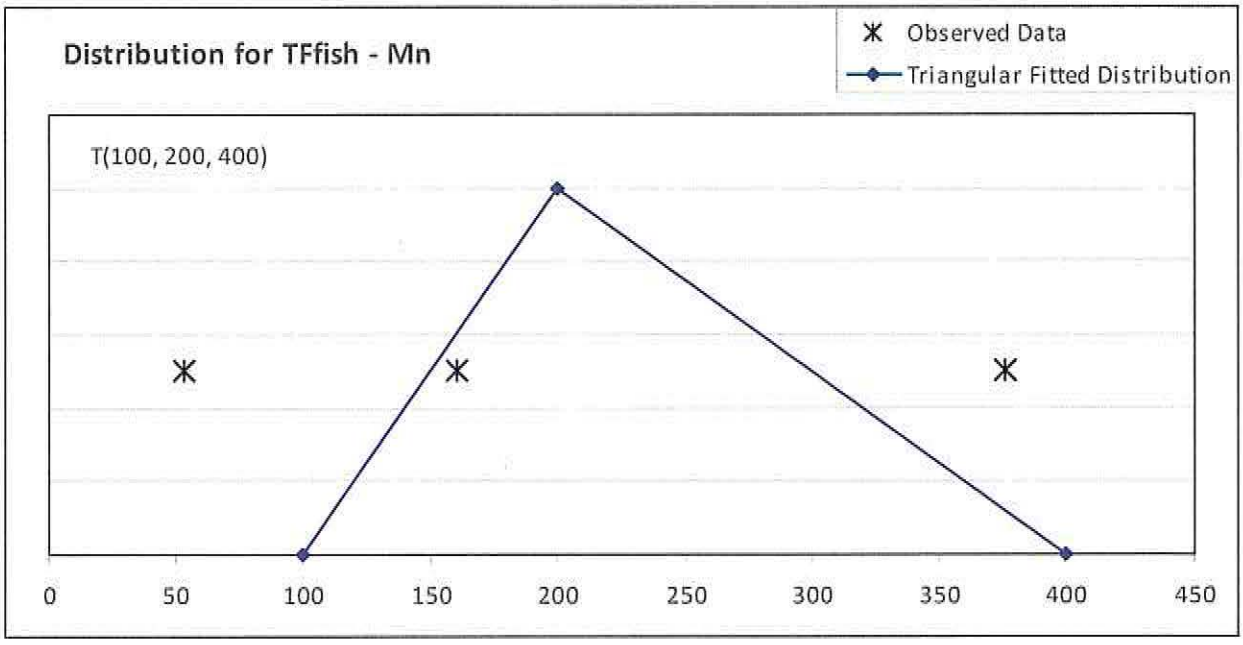

Distribution for TFfish - Cd
Observed Data
Triangular Fitted Distribution
T(54, 215, 860)
0
100
200
300
400
500
600
700
800
900
1000

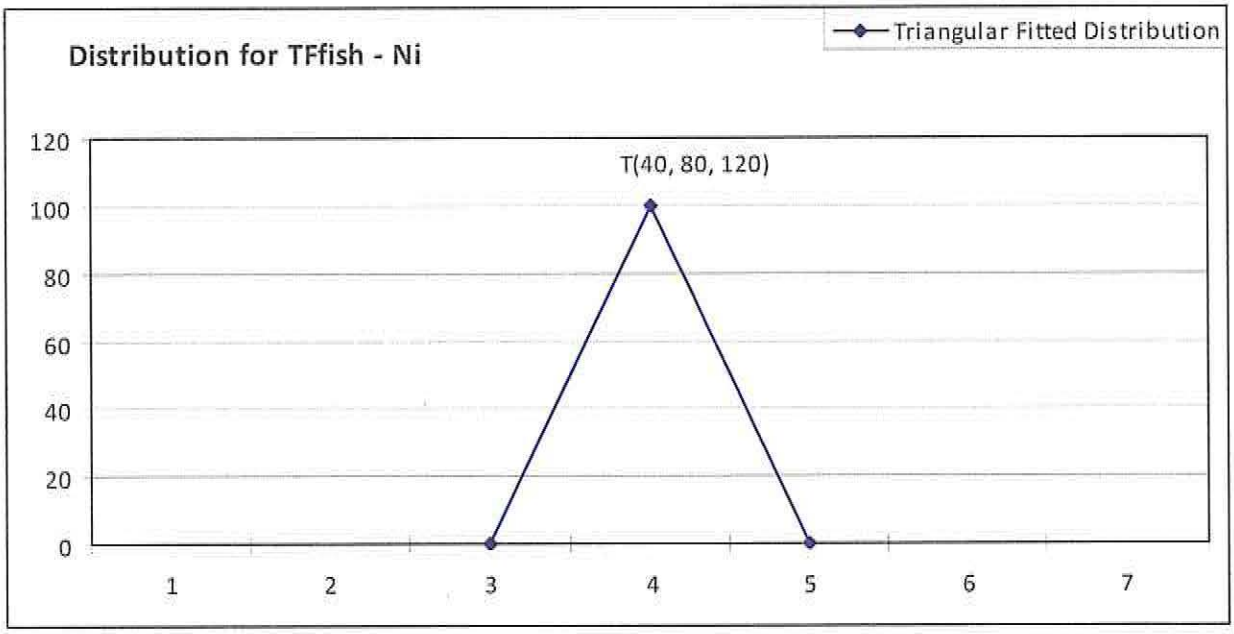

Distribution for TFfish - Cr
Observed Data
Triangular Fitted Distribution
T(142, 283, 425)
120
100
80
60
40
20
0
142
283
425

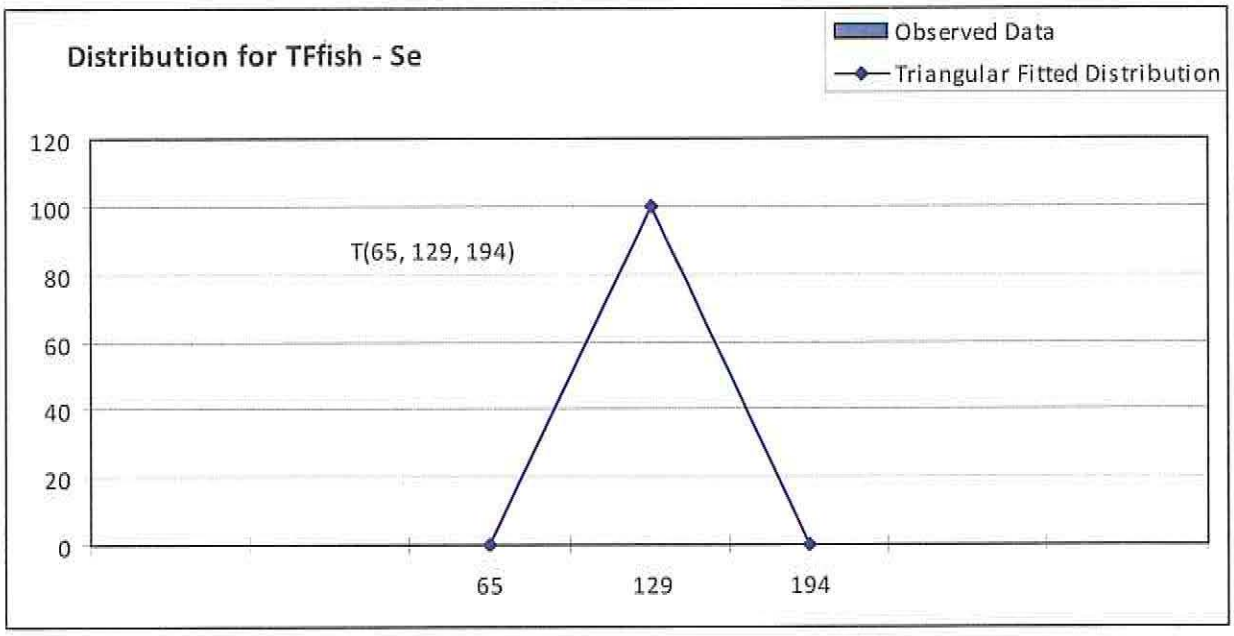

Distribution for TFfish - Co
Observed Data
Triangular Fitted Distribution
T(30, 60, 90)
0
20
40
60
80
100
120

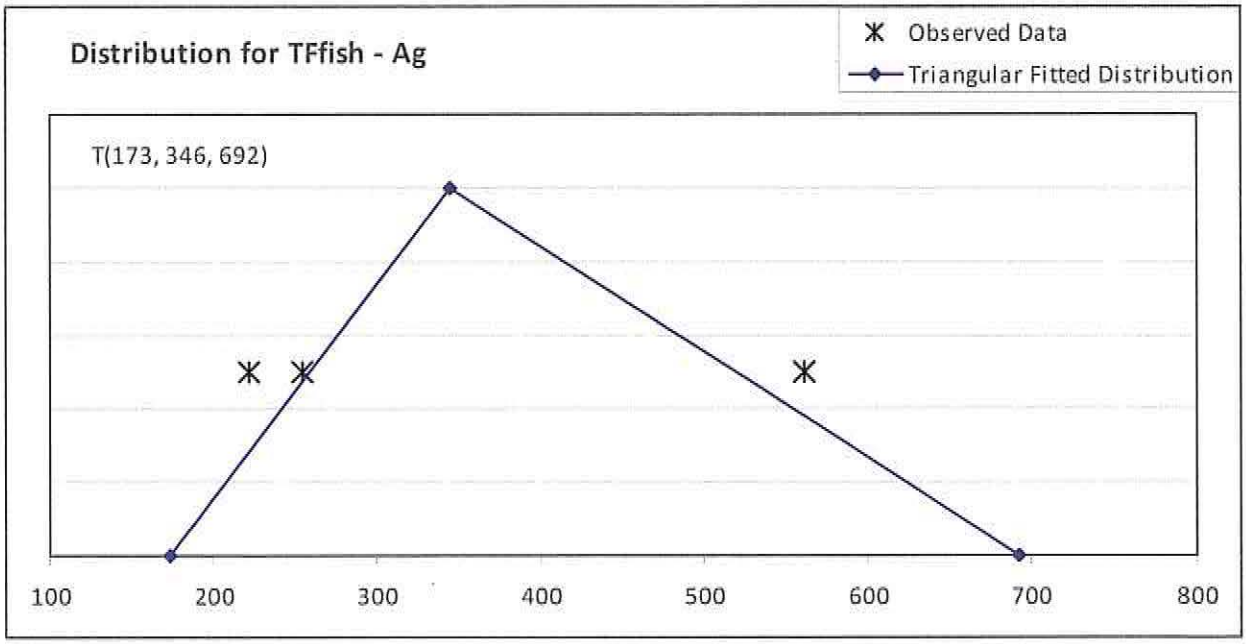

Distribution for TFfish - Cu
Observed Data
Triangular Fitted Distribution
T(467, 700, 1050)
200
300
400
500
600
700
800
900
1000
1100

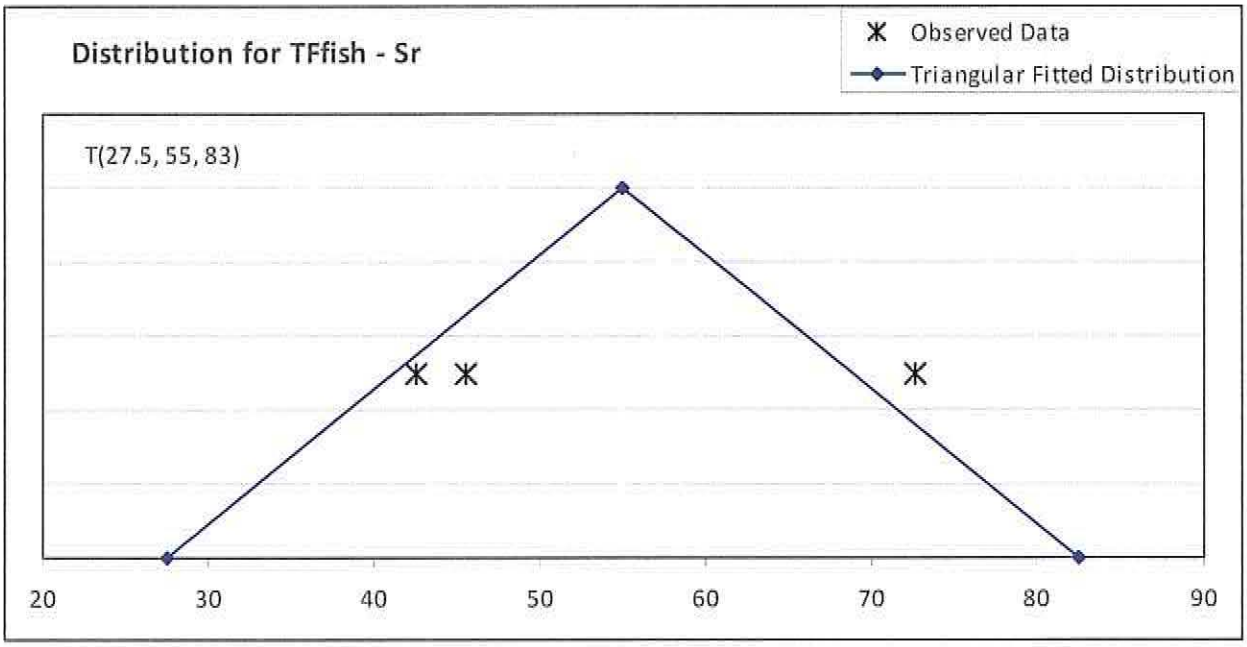

Distribution for TFfish - Pb
Observed Data
Triangular Fitted Distribution
T(45, 68, 102)
20
30
40
50
60
70
80
90
100
110

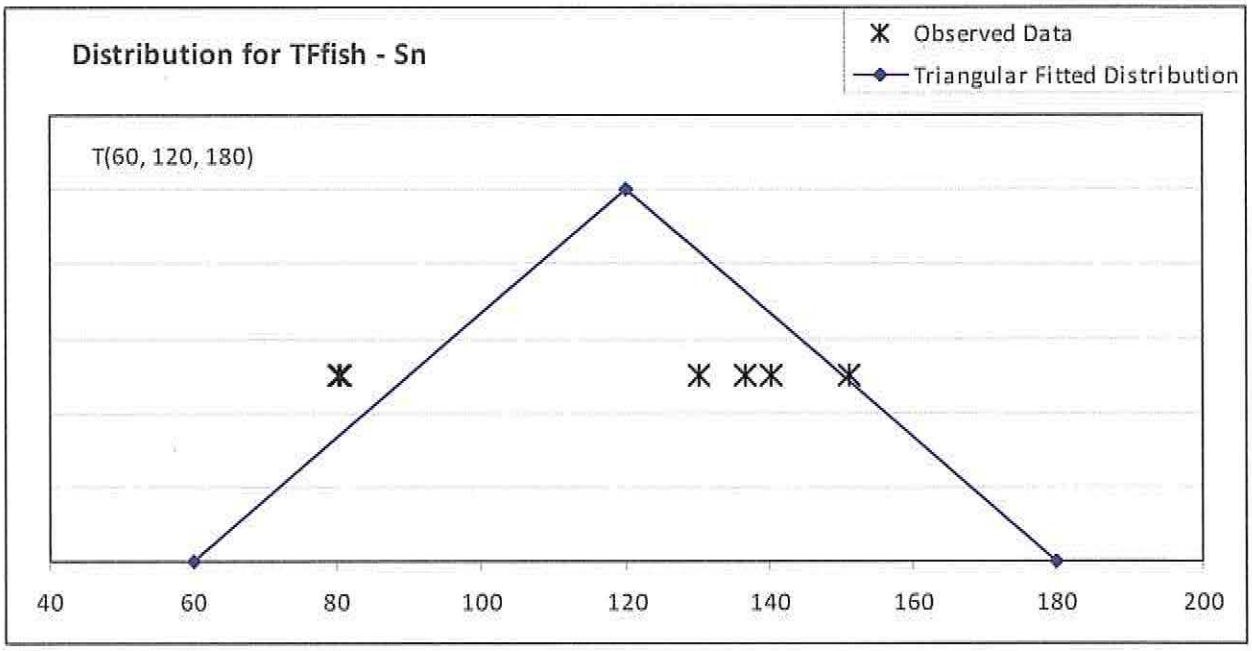

Distribution for TFfish - Mn
Observed Data
Triangular Fitted Distribution
T(100, 200, 400)
0
50
100
150
200
250
300
350
400
450

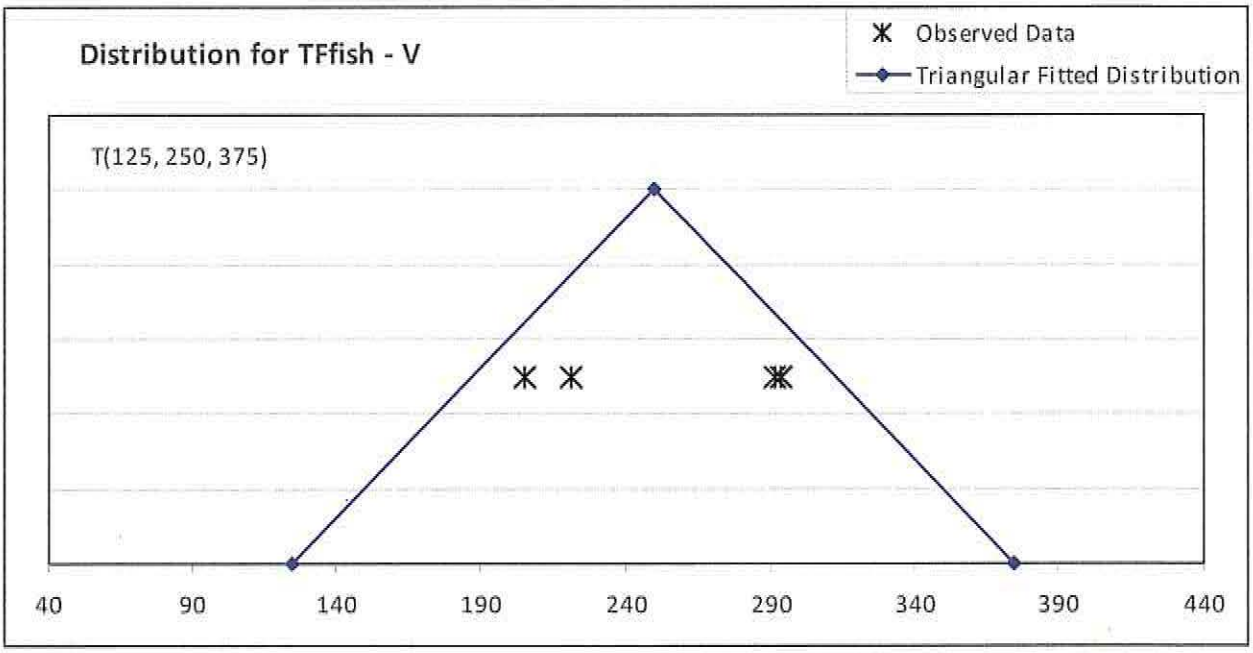

Distribution for TFfish - Ni
Triangular Fitted Distribution
T(40, 80, 120)
120
100
80
60
40
20
0
1
2
3
4
5
6
7

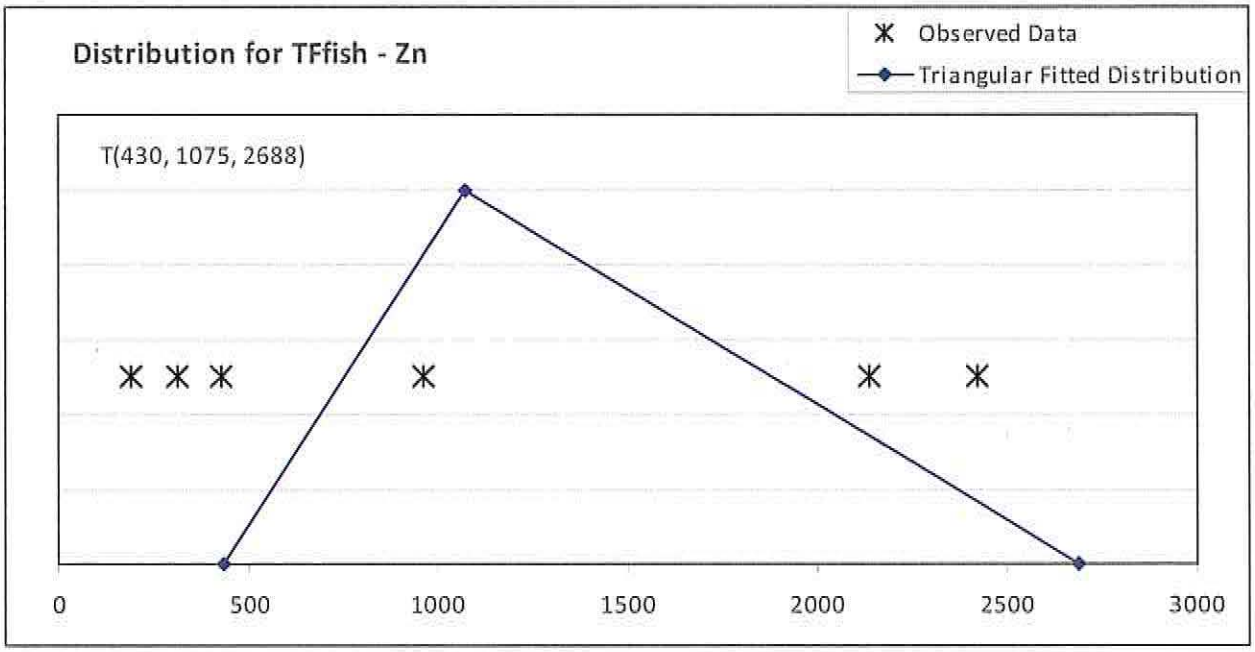

Distribution for TFfish - Se
Observed Data
Triangular Fitted Distribution
T(65, 129, 194)
120
100
80
60
40
20
0
65
129
194


Distribution for TFfish - Ag
Observed Data
Triangular Fitted Distribution
T(173, 346, 692)
100
200
300
400
500
600
700
800


Distribution for TFfish - Sr
Observed Data
Triangular Fitted Distribution
T(27.5, 55, 83)
20
30
40
50
60
70
80
90


Distribution for TFfish - Sn
Observed Data
Triangular Fitted Distribution
T(60, 120, 180)
40
60
80
100
120
140
160
180
200


Distribution for TFfish - V
Observed Data
Triangular Fitted Distribution
T(125, 250, 375)
40
90
140
190
240
290
340
390
440



D.3 MEASURED SOIL CONCENTRATIONS

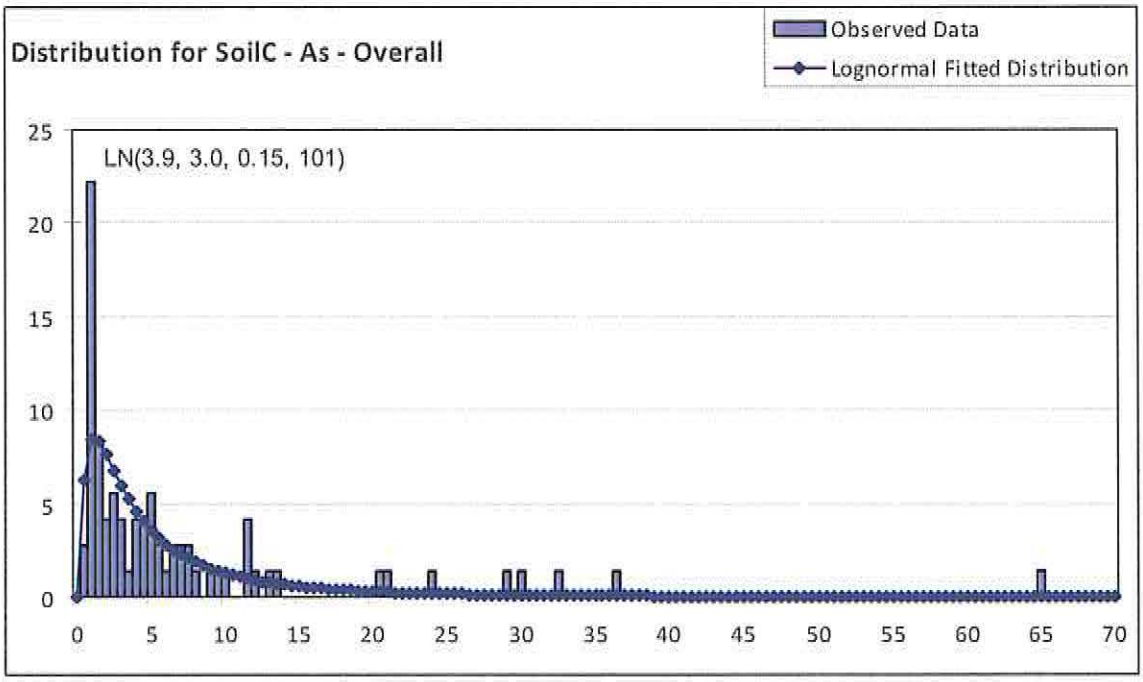
Measured soil concentrations from the Faro Mine Complex were presented in the previous assessment (SENES, 2006, Section 2.3. 1, Project No. 33798). The soil data set was used to develop distributions for the probabilistic risk assessment.

The data were fit to either lognormal, triangular or uniform distributions. Lognormal distributions are defined by the geometric mean, geometric standard deviation, minimum value, and maximum value. The triangular distributions are defined by the minimum value, the mode, and the maximum value. For the purposes of this assessment, the mean value was used to represent the mode because the triangular distribution was generally used in the case of only a few available data points and a mode value was not available. This was considered a reasonable assumption. For triangular distributions, a range was determined on either side of the mean value to represent the minimum and maximum values and encompass and include the available data. In situations where only one measured value is available, an assumed range of an order of magnitude was assumed on either side of the site data to represent the minimum and maximum values in the absence of other data. Uniform distributions were applied in the case of measured concentrations reported as less than the detection limit. The minimum and maximum values of the uniform distribution were set equal to 0 and the detection limit, respectively.

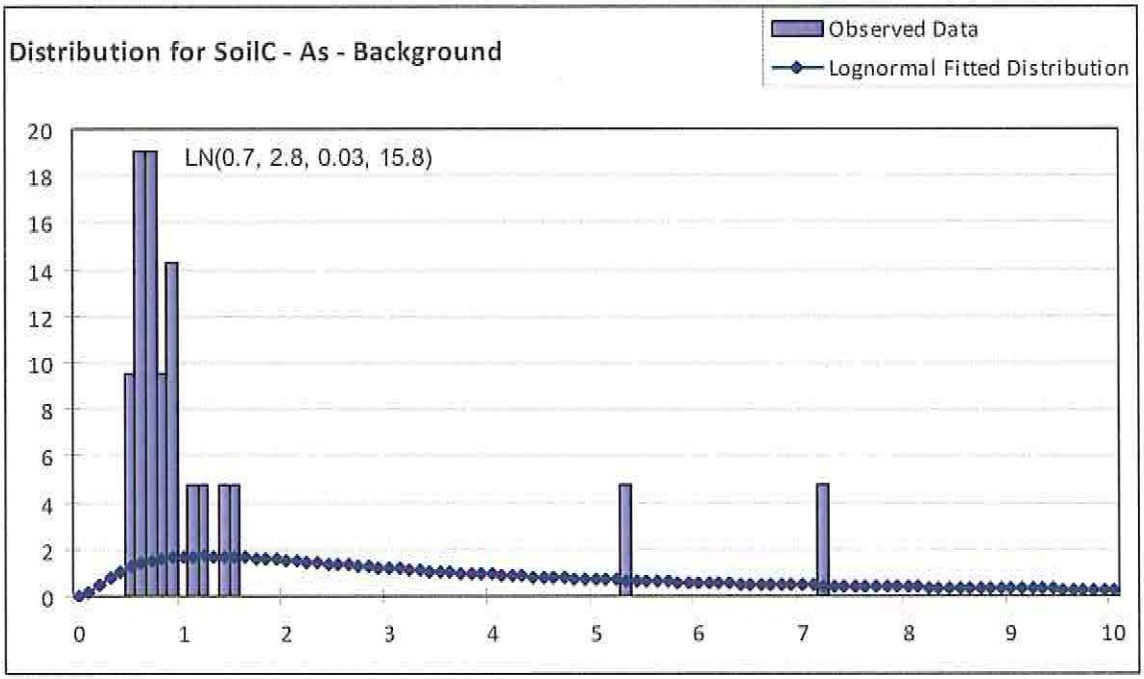
The following graphs summarize the distributions (line graph) as compared with the available data (bar graph) for each COPC and location for the lognormal and triangular distributions. The development of distributions for soil concentrations was limited by the data available. Uniform distributions are not presented.

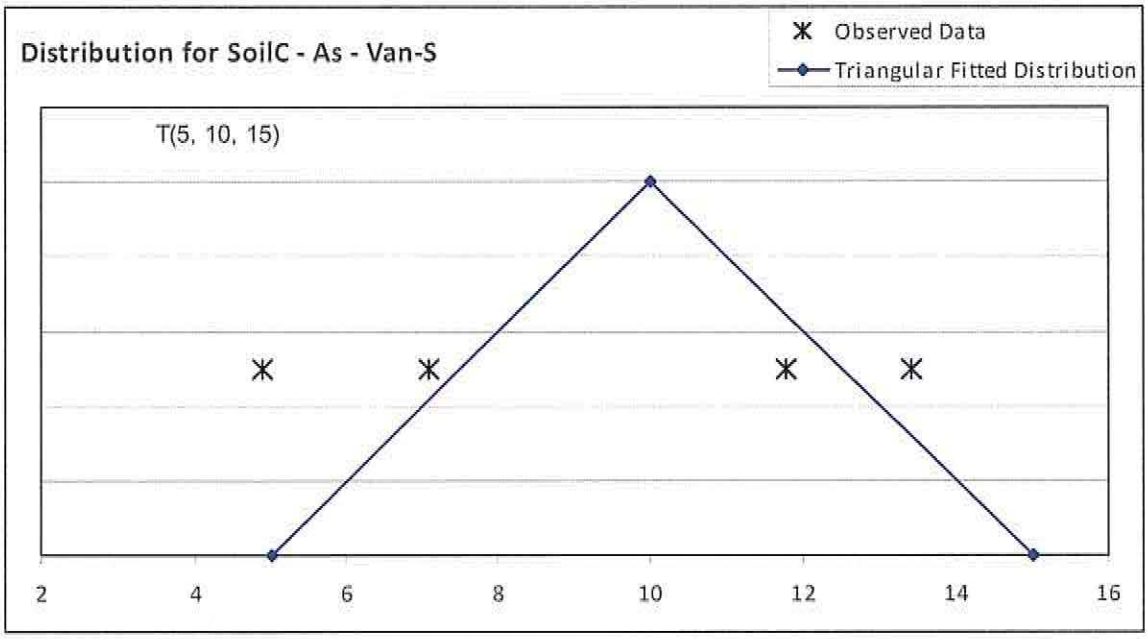
D.3.1 Antimony

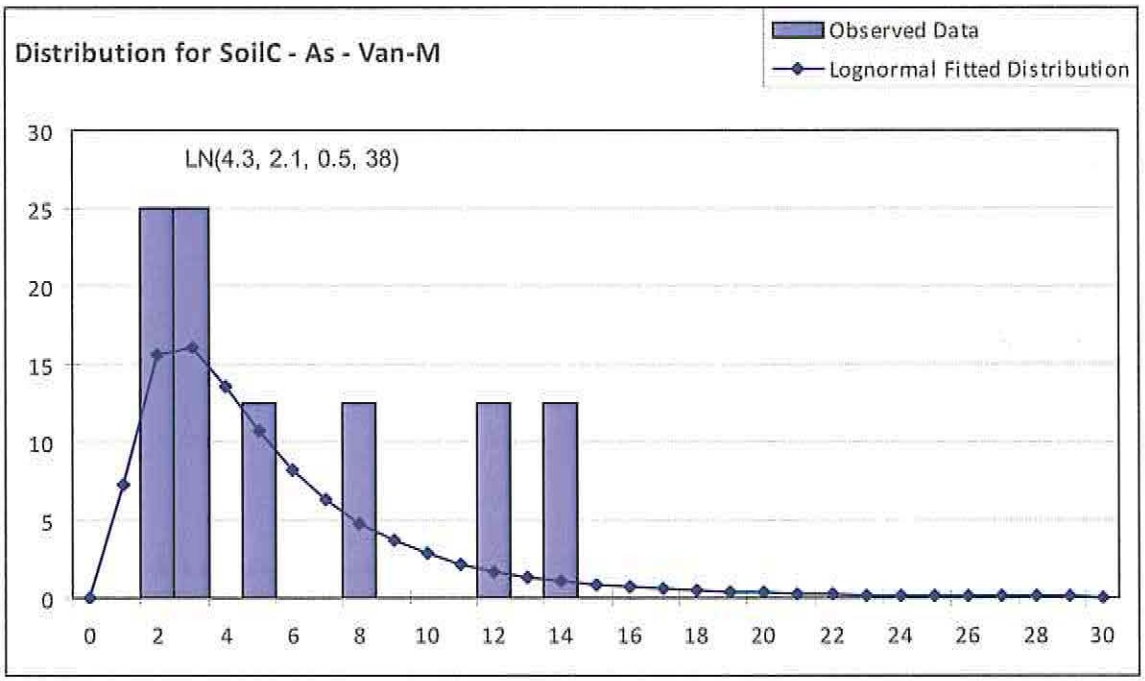
All uniform distributions – U(0,10).

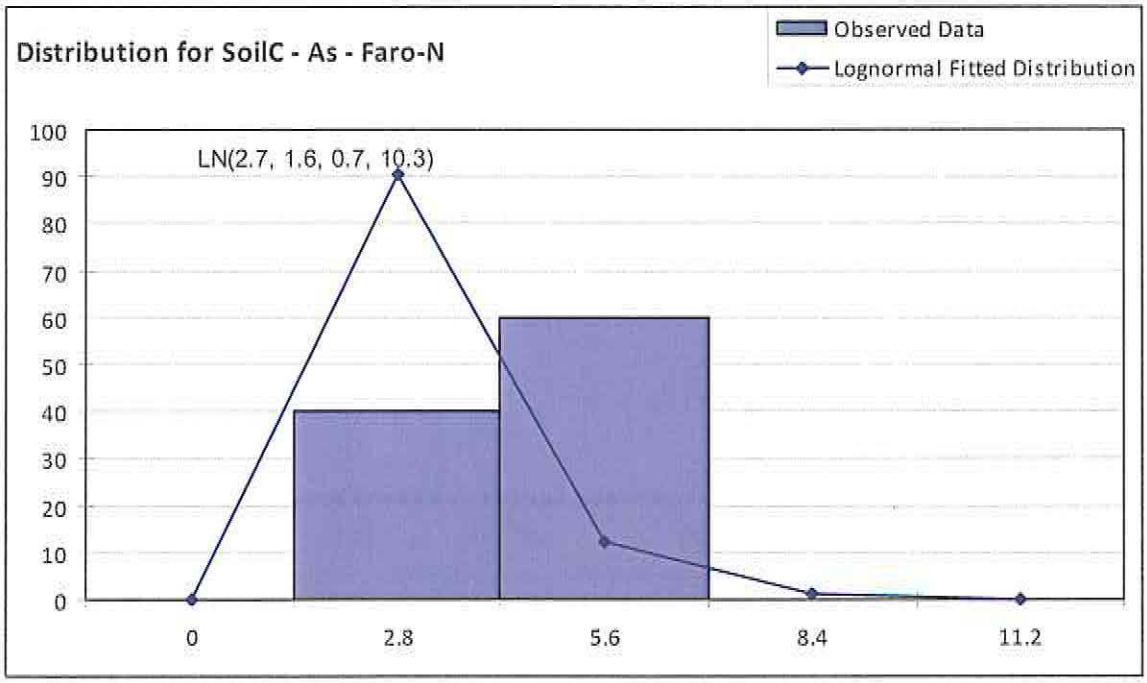


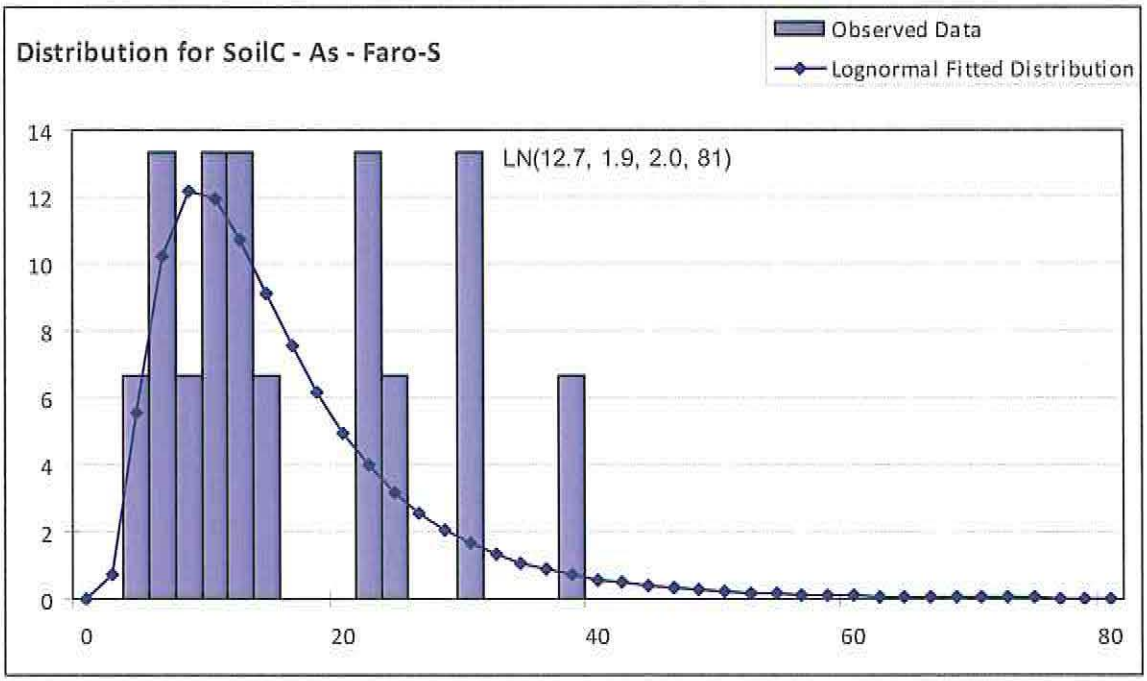
D.3.2 Arsenic

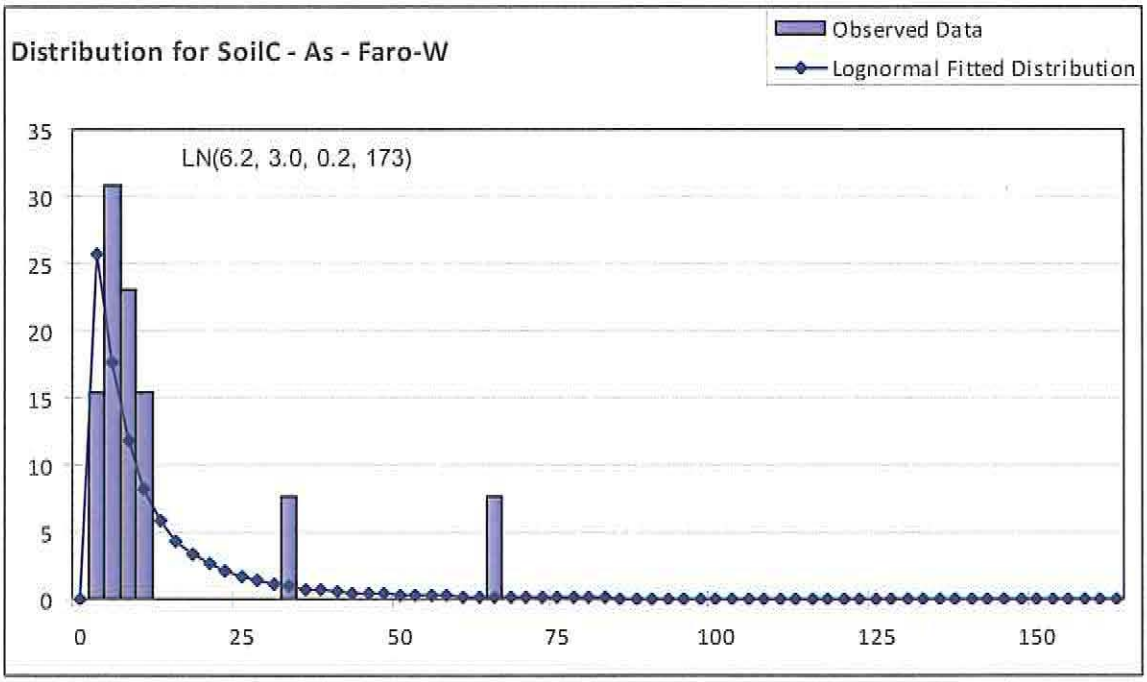

Distribution for SoilC - As - Background
Observed Data
Lognormal Fitted Distribution
LN(0.7, 2.8, 0.03, 15.8)
20
18
16
14
12
10
8
6
4
2
0
0
1
2
3
4
5
6
7
8
9
10

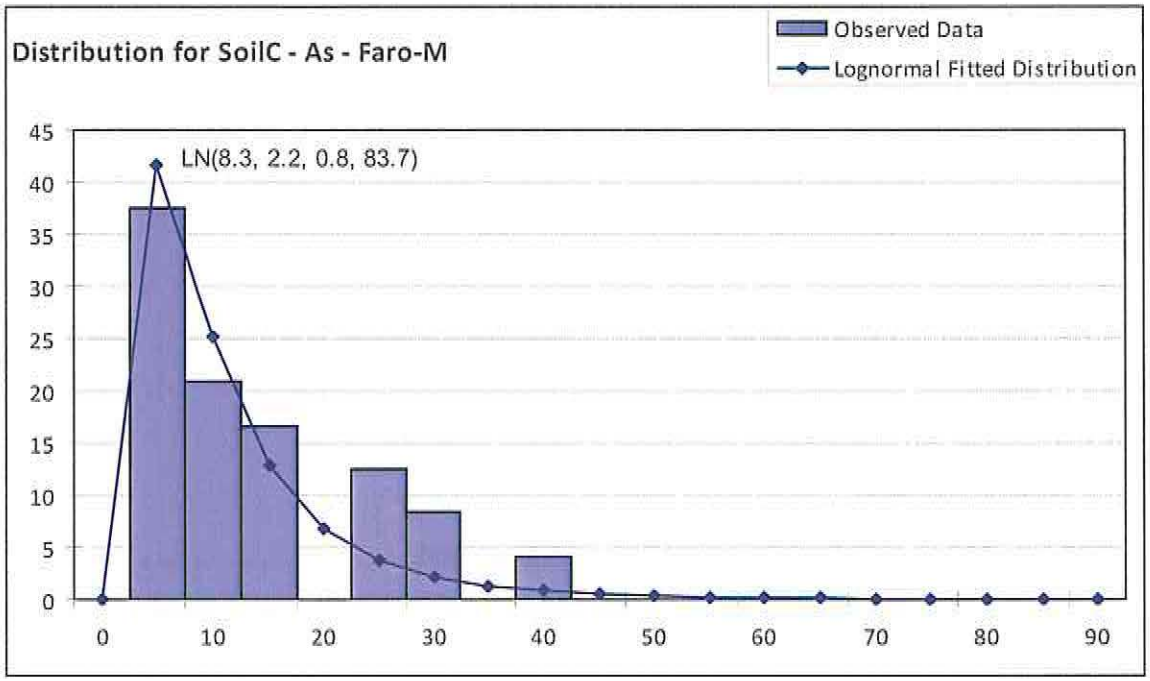

Distribution for SoilC - As - Van-S
Observed Data
Triangular Fitted Distribution
T(5, 10, 15)
2
4
6
8
10
12
14
16

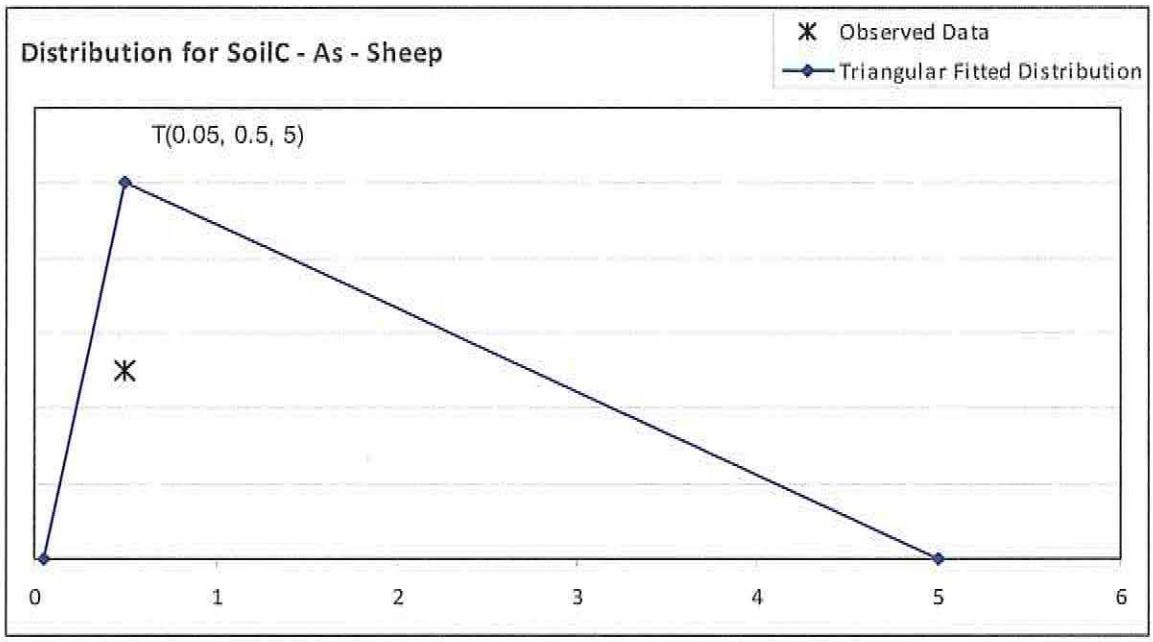

Distribution for SoilC - As - Van-M
Observed Data
Lognormal Fitted Distribution
LN(4.3, 2.1, 0.5, 38)
30
25
20
15
10
5
0
0
2
4
6
8
10
12
14
16
18
20
22
24
26
28
30


Distribution for SoilC - As - Faro-N
Observed Data
Lognormal Fitted Distribution
LN(2.7, 1.6, 0.7, 10.3)
100
90
80
70
60
50
40
30
20
10
0
0
2.8
5.6
8.4
11.2


Distribution for SoilC - As - Faro-S
Observed Data
Lognormal Fitted Distribution
LN(12.7, 1.9, 2.0, 81)
14
12
10
8
6
4
2
0
0
20
40
60
80


Distribution for SoilC - As - Faro-W
Observed Data
Lognormal Fitted Distribution
LN(6.2, 3.0, 0.2, 173)
35
30
25
20
15
10
5
0
0
25
50
75
100
125
150

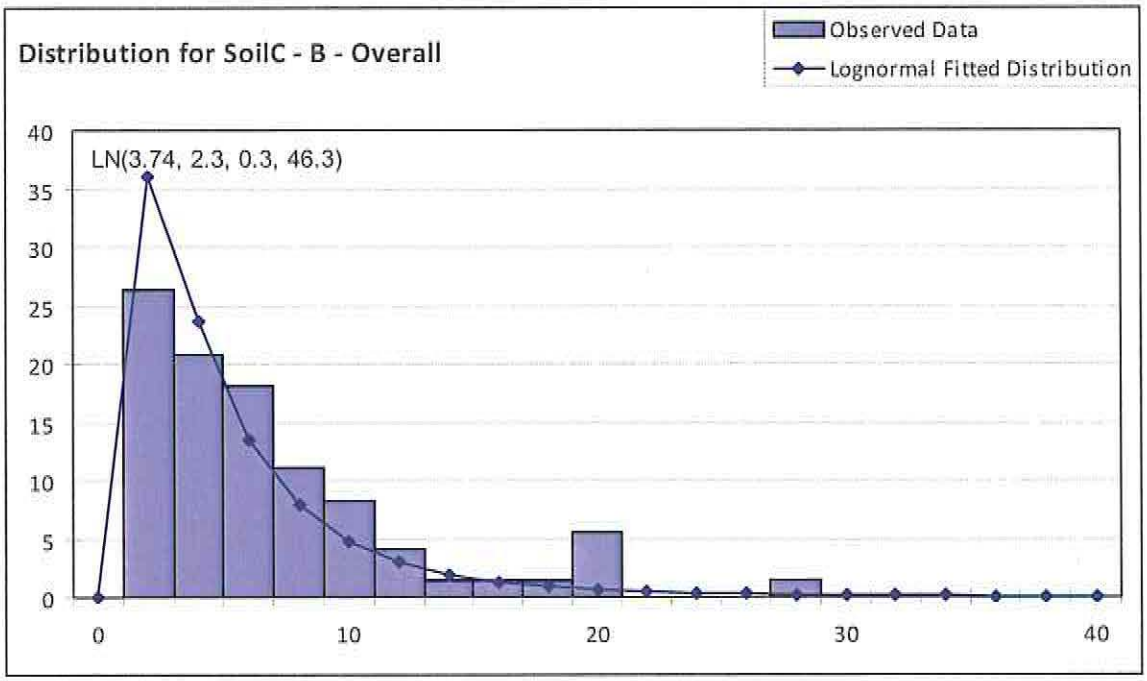


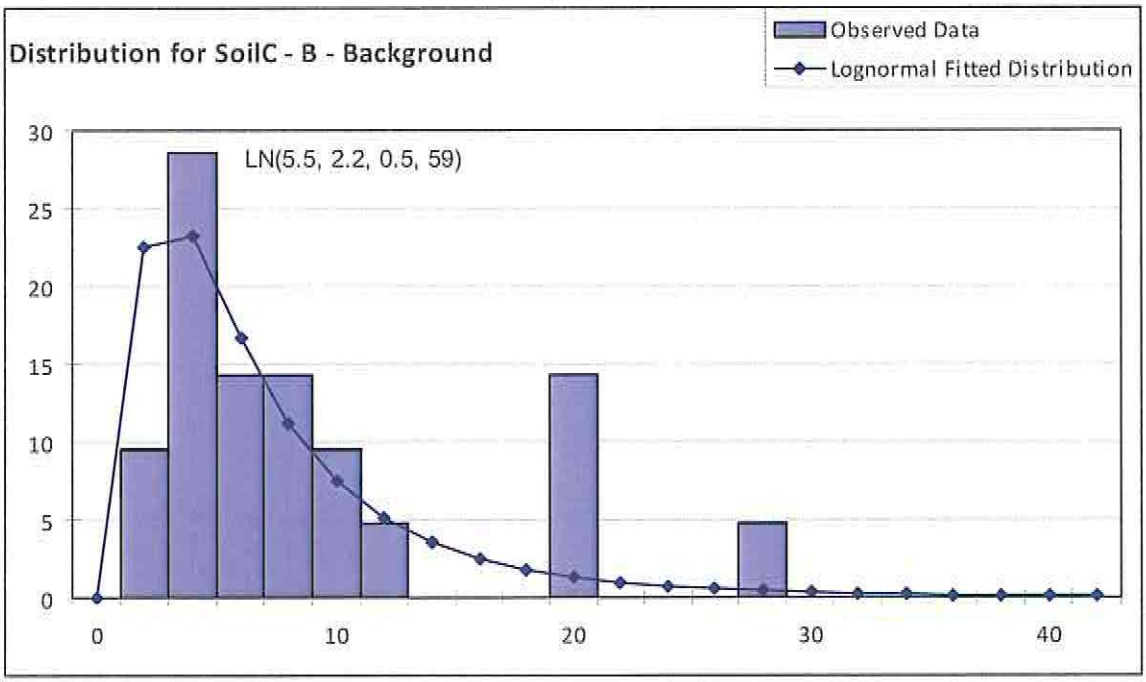


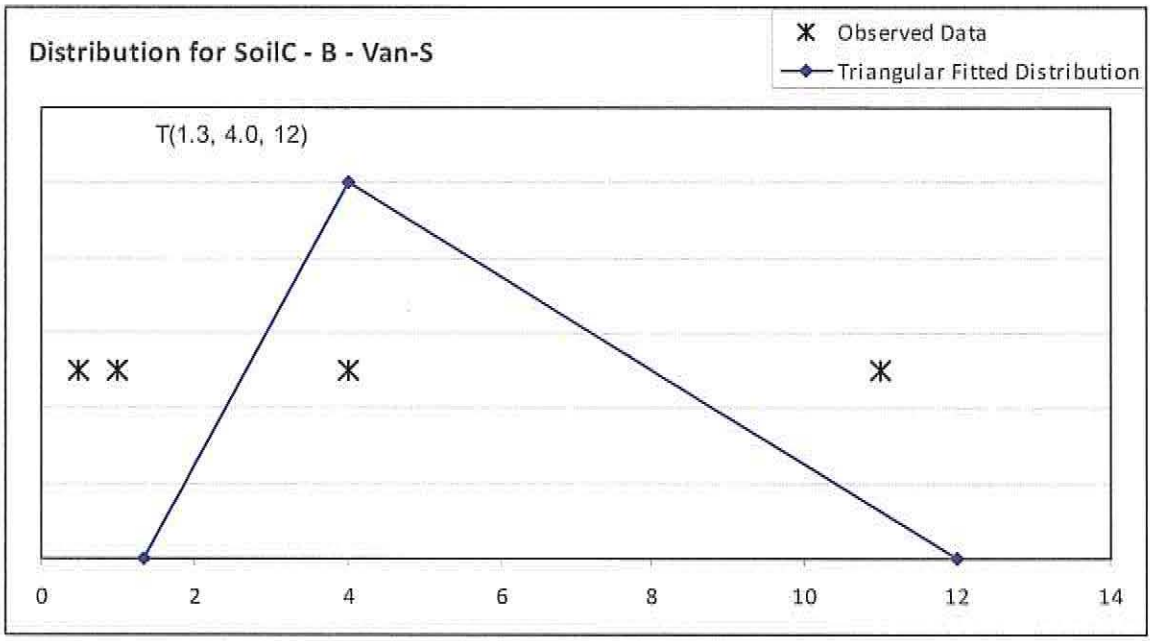
D.3.3 Beryllium

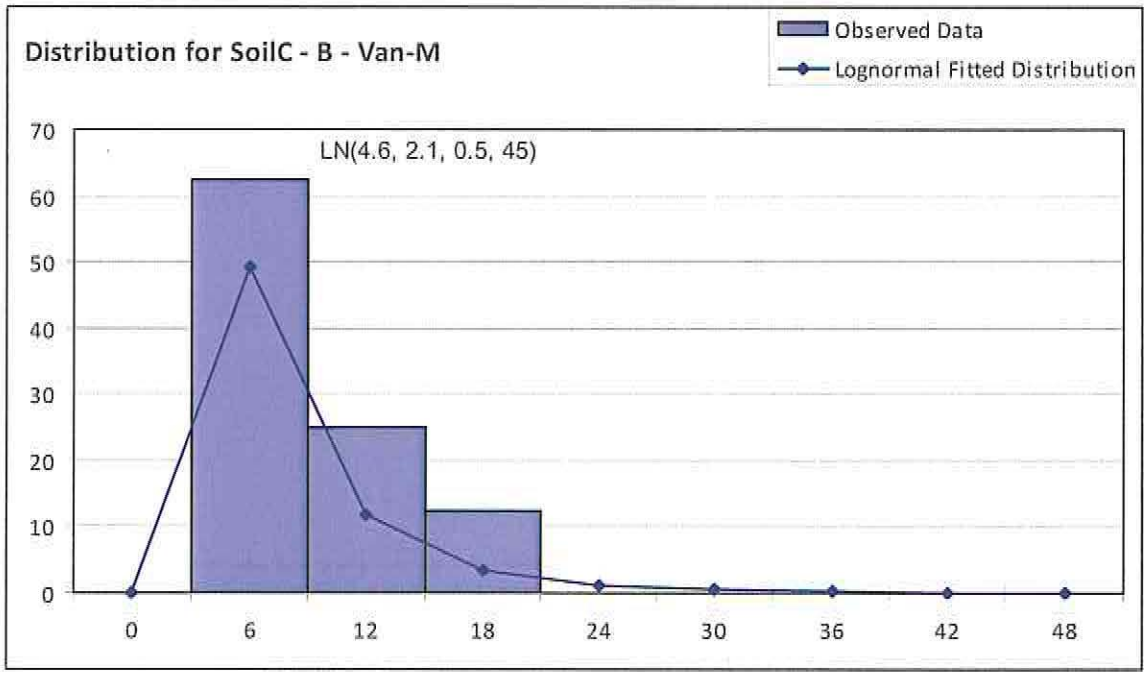
All uniform distributions – U(0,1).

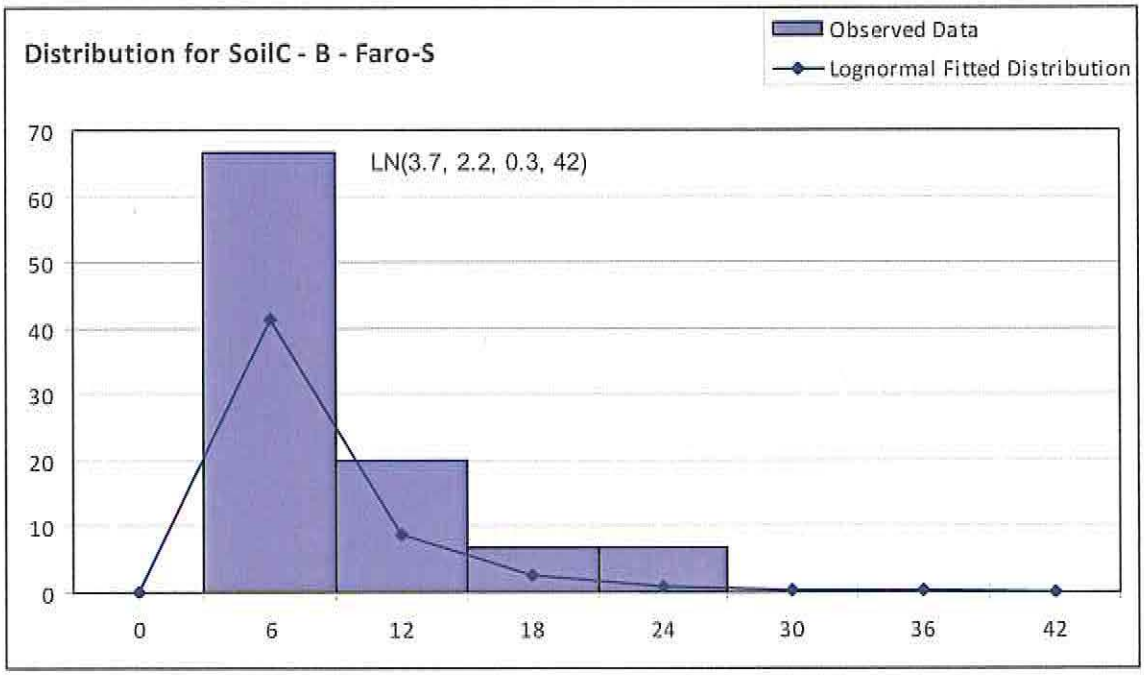
D.3.4 Boron

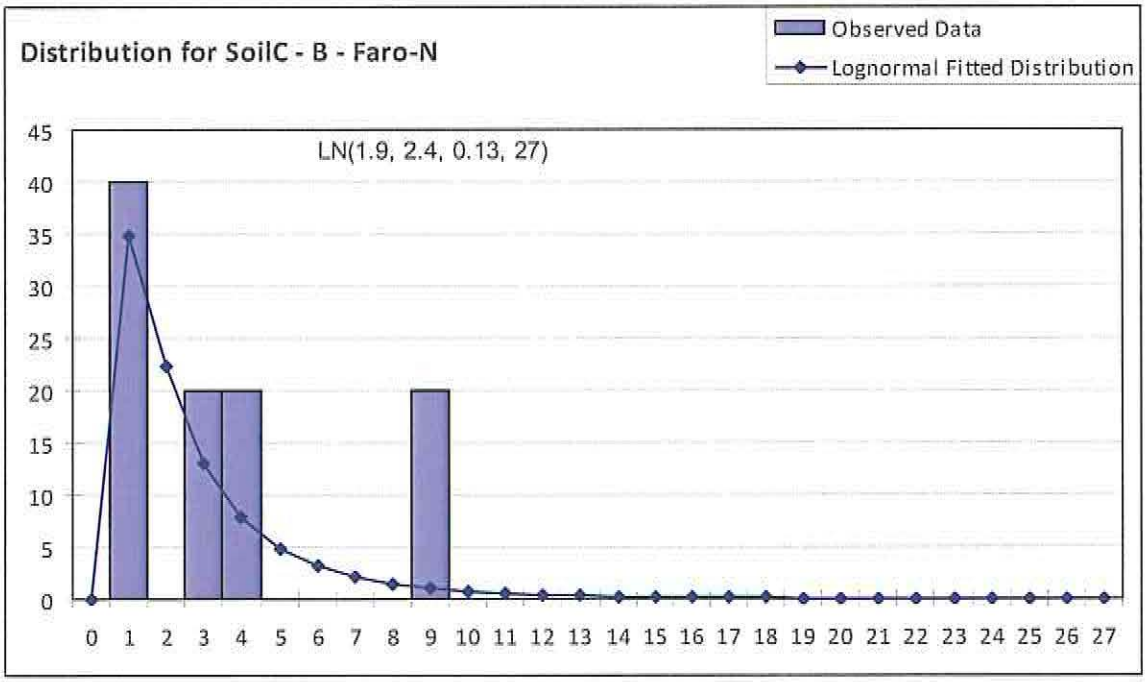

Distribution for SoilC - B - Overall
Observed Data
Lognormal Fitted Distribution
LN(3.74, 2.3, 0.3, 46.3)
40
35
30
25
20
15
10
5
0
0
10
20
30
40

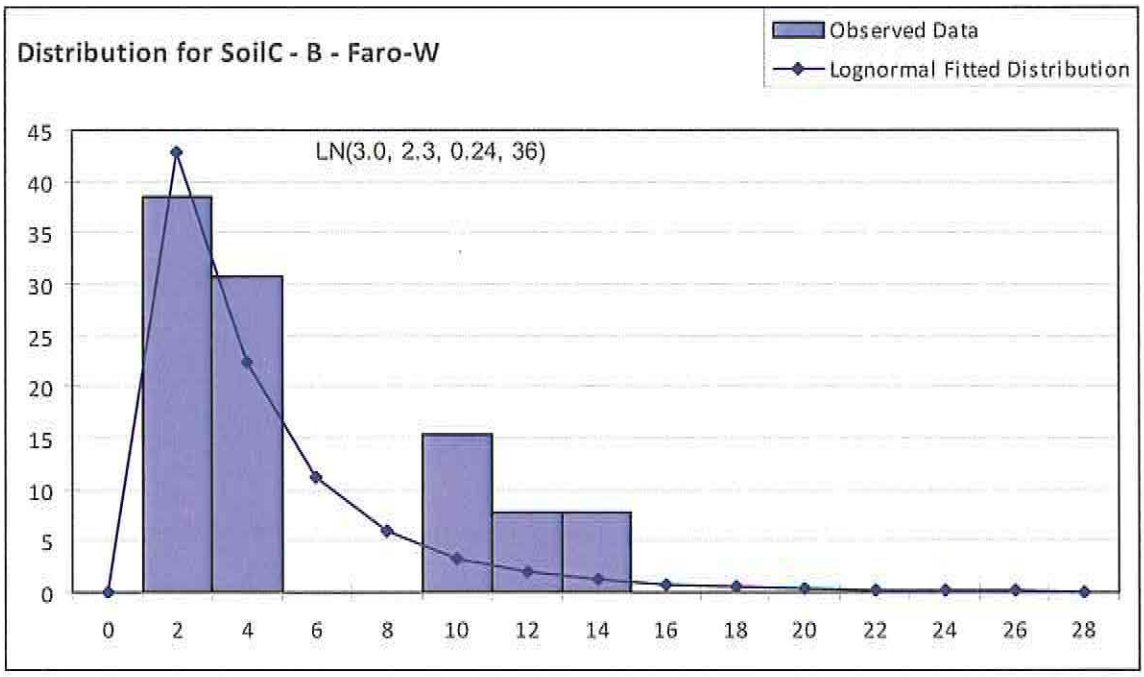

Distribution for SoilC - B - Background
Observed Data
Lognormal Fitted Distribution
LN(5.5, 2.2, 0.5, 59)
30
25
20
15
10
5
0
0
10
20
30
40

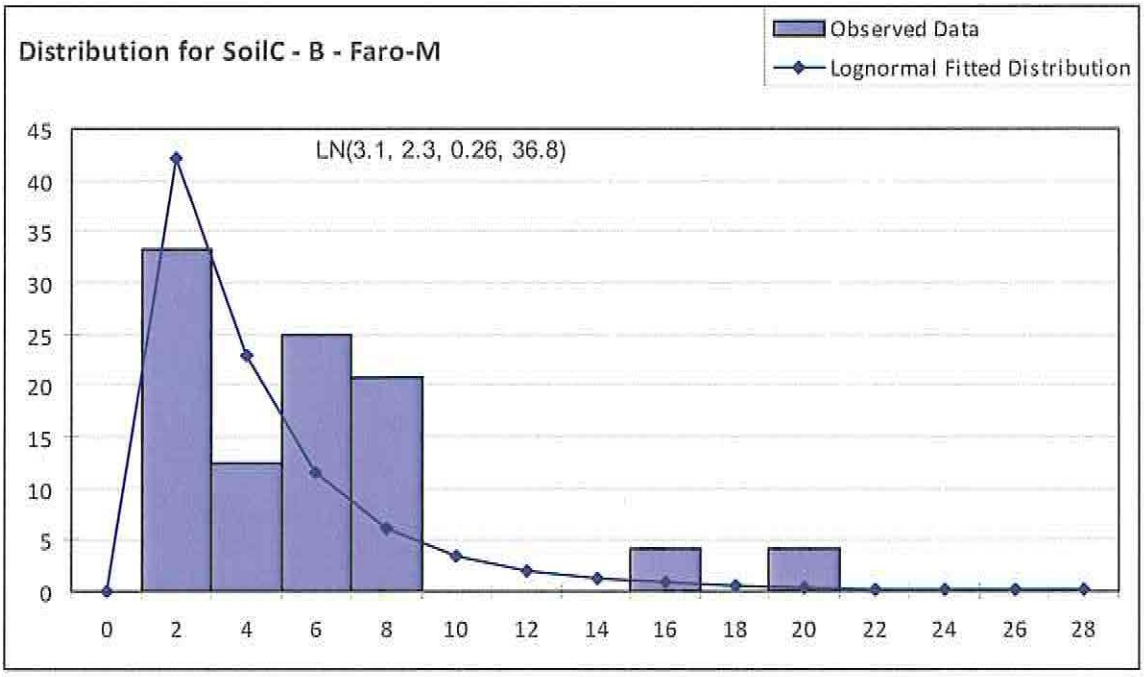

Distribution for SoilC - B - Van-S
Observed Data
Triangular Fitted Distribution
T(1.3, 4.0, 12)
0
2
4
6
8
10
12
14

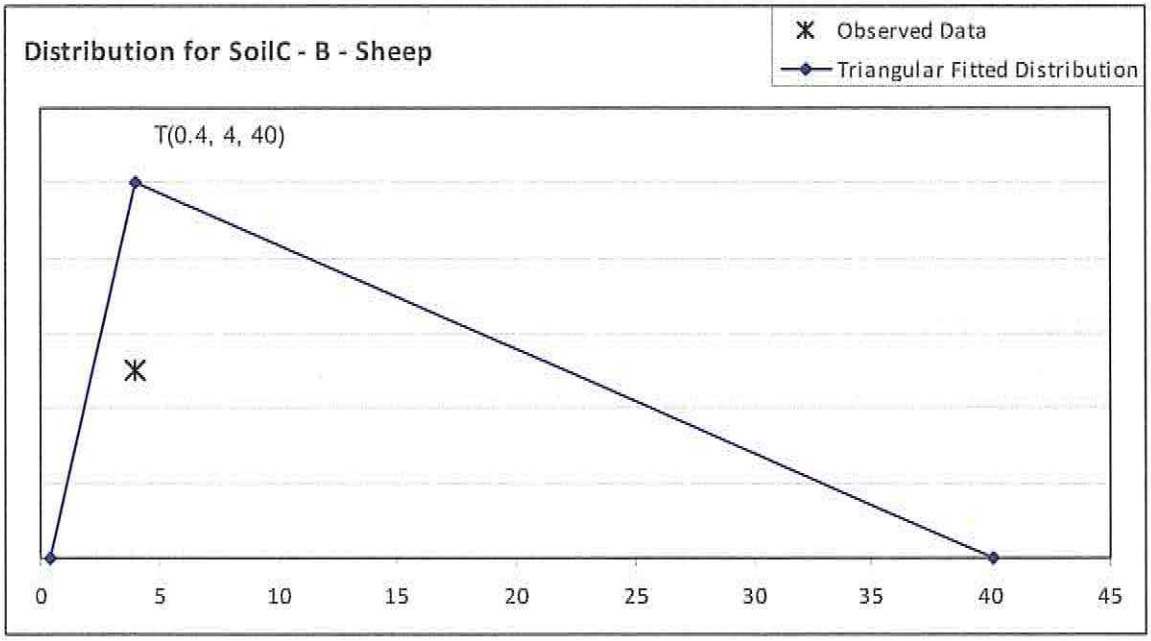

Distribution for SoilC - B - Van-M
Observed Data
Lognormal Fitted Distribution
LN(4.6, 2.1, 0.5, 45)
70
60
50
40
30
20
10
0
0
6
12
18
24
30
36
42
48


Distribution for SoilC - B - Faro-S
Observed Data
Lognormal Fitted Distribution
LN(3.7, 2.2, 0.3, 42)
70
60
50
40
30
20
10
0
0
6
12
18
24
30
36
42

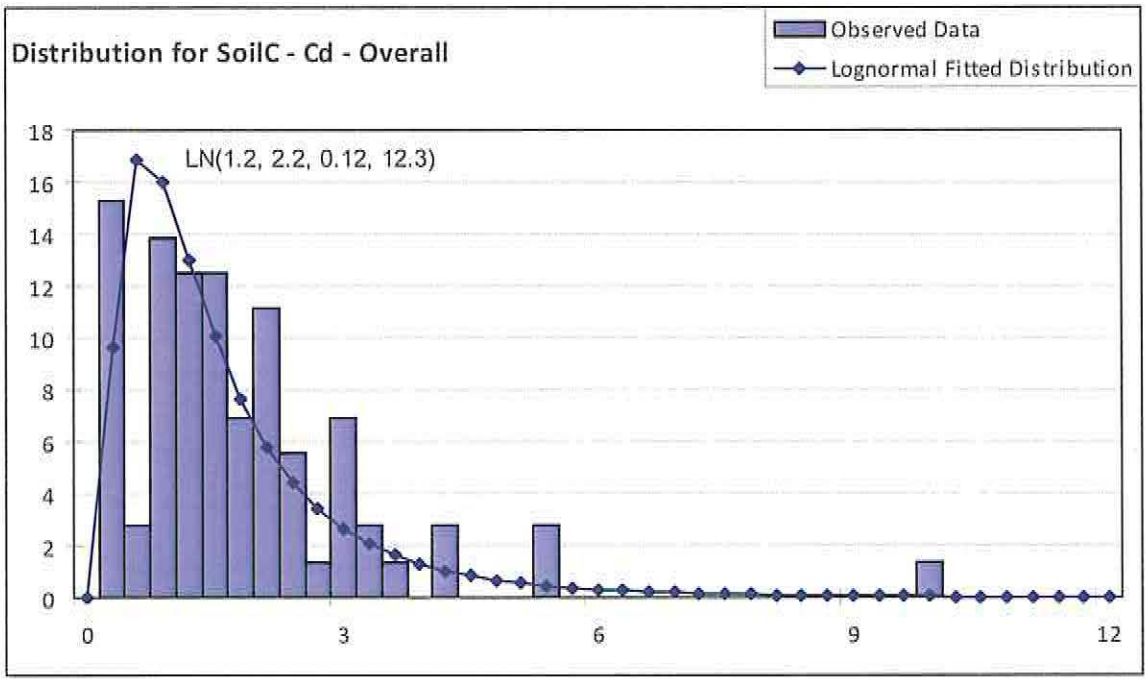

Distribution for SoilC - B - Faro-N
Observed Data
Lognormal Fitted Distribution
LN(1.9, 2.4, 0.13, 27)
45
40
35
30
25
20
15
10
5
0
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27

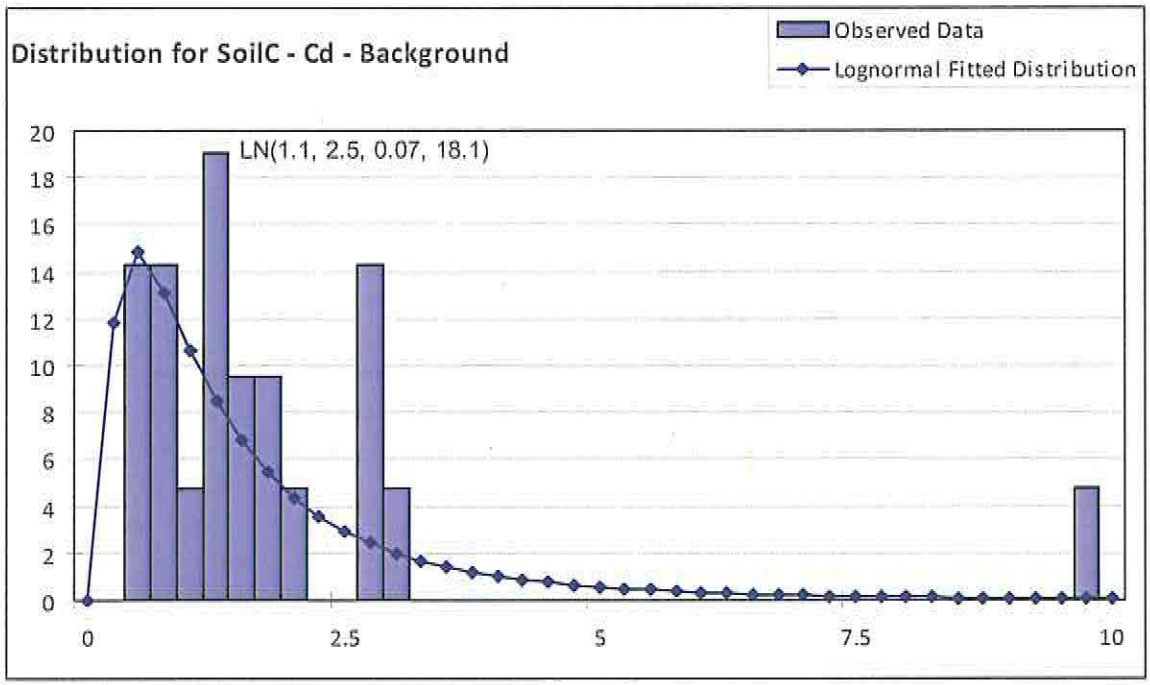

Distribution for SoilC - B - Faro-W
Observed Data
Lognormal Fitted Distribution
LN(3.0, 2.3, 0.24, 36)
45
40
35
30
25
20
15
10
5
0
0
2
4
6
8
10
12
14
16
18
20
22
24
26
28

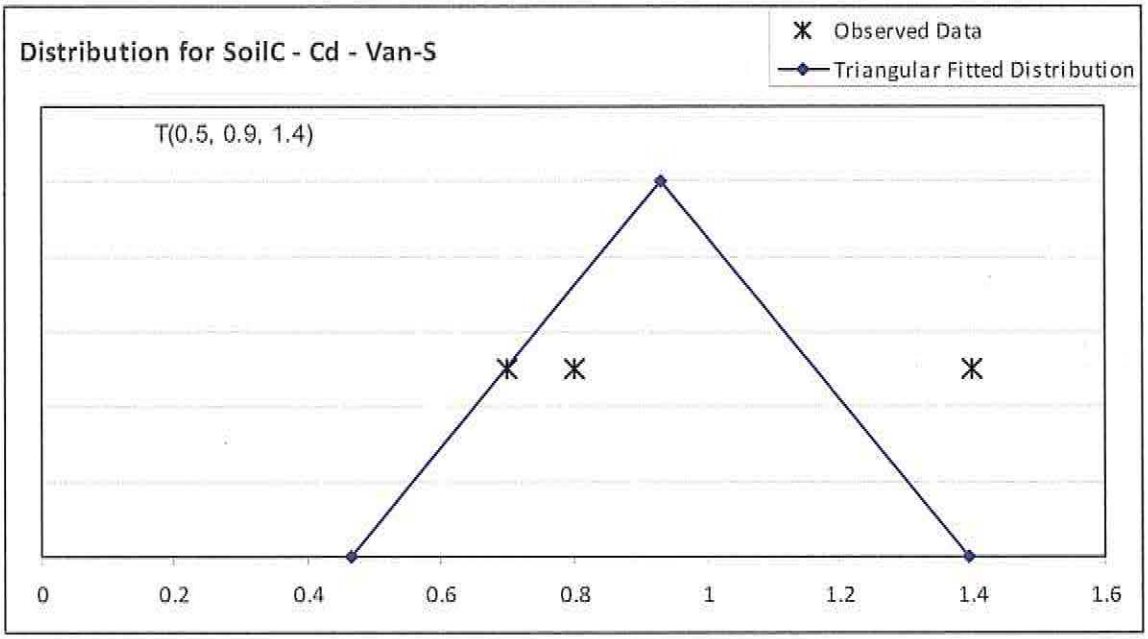

Distribution for SoilC - B - Faro-M
Observed Data
Lognormal Fitted Distribution
LN(3.1, 2.3, 0.26, 36.8)
45
40
35
30
25
20
15
10
5
0
0
2
4
6
8
10
12
14
16
18
20
22
24
26
28

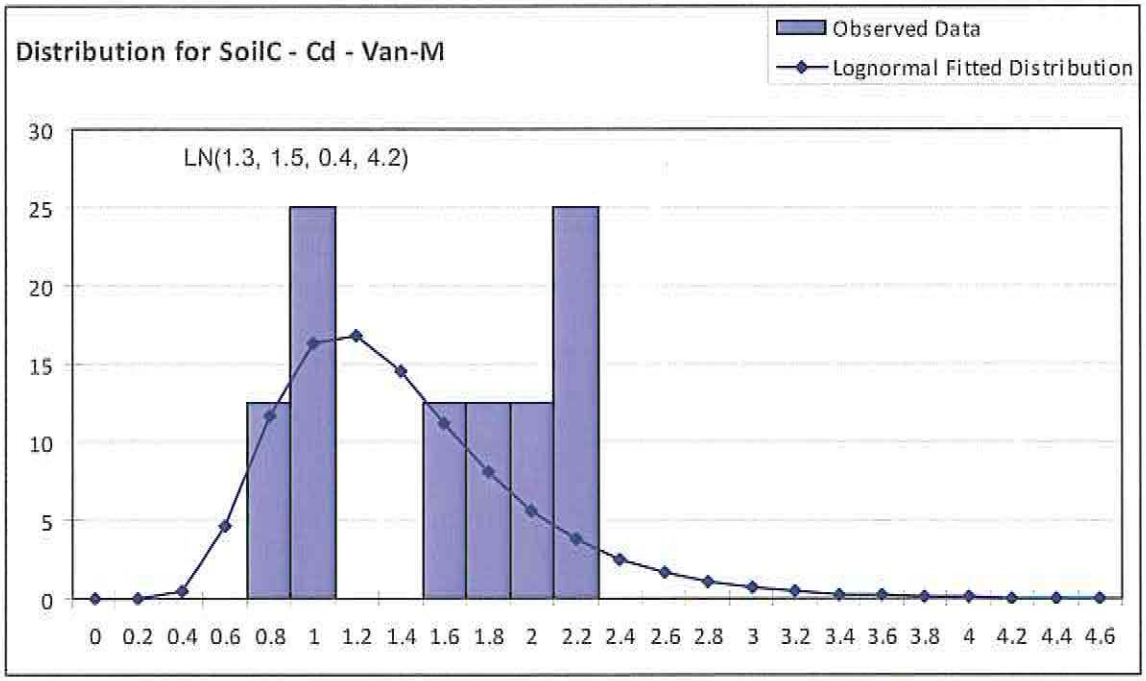

Distribution for SoilC - B - Sheep
Observed Data
Triangular Fitted Distribution
T(0.4, 4, 40)
0
5
10
15
20
25
30
35
40
45

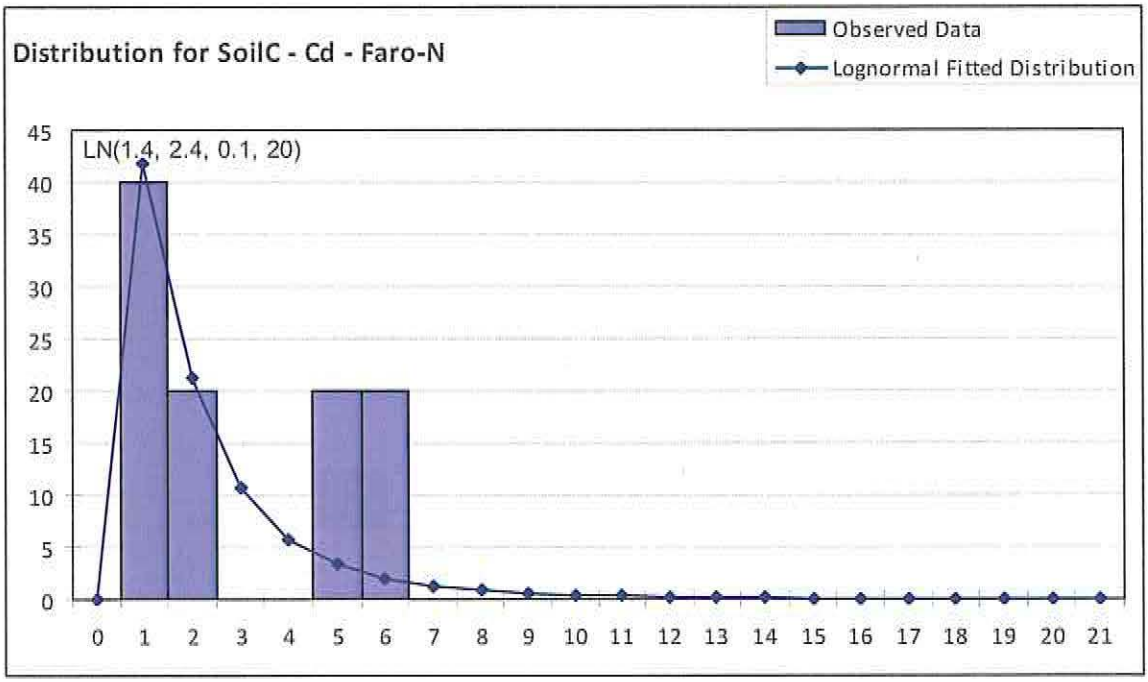
D.3.5 Cadmium

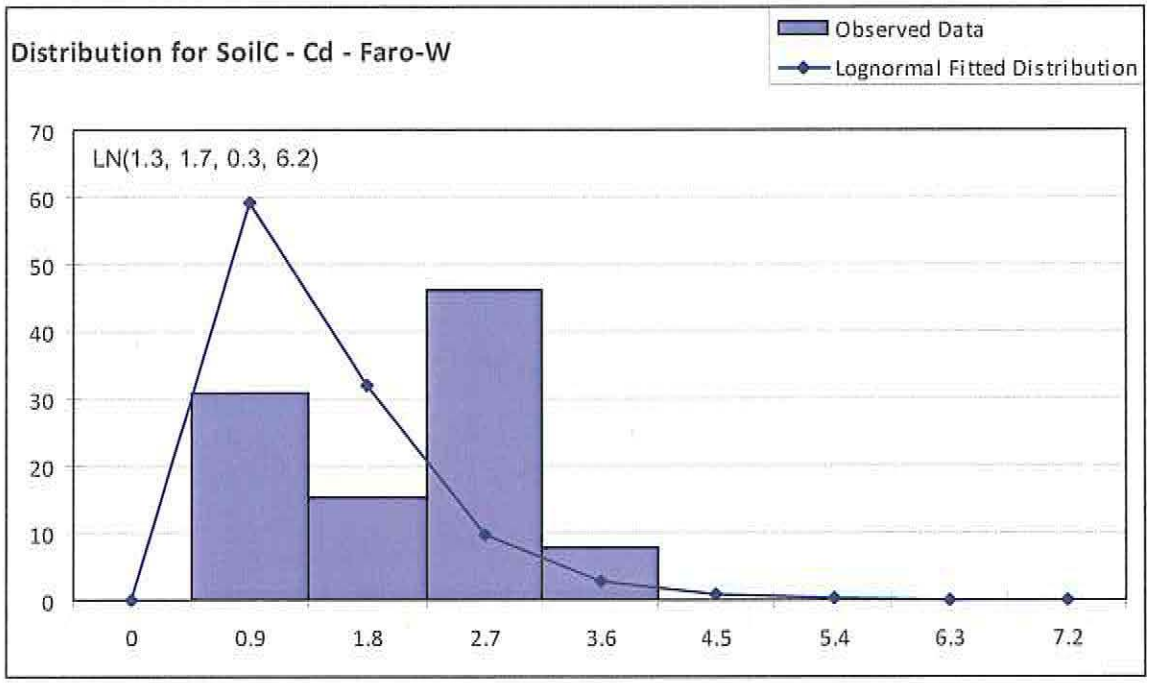

Distribution for SoilC - Cd - Overall
Observed Data
Lognormal Fitted Distribution
LN(1.2, 2.2, 0.12, 12.3)
18
16
14
12
10
8
6
4
2
0
0
3
6
9
12

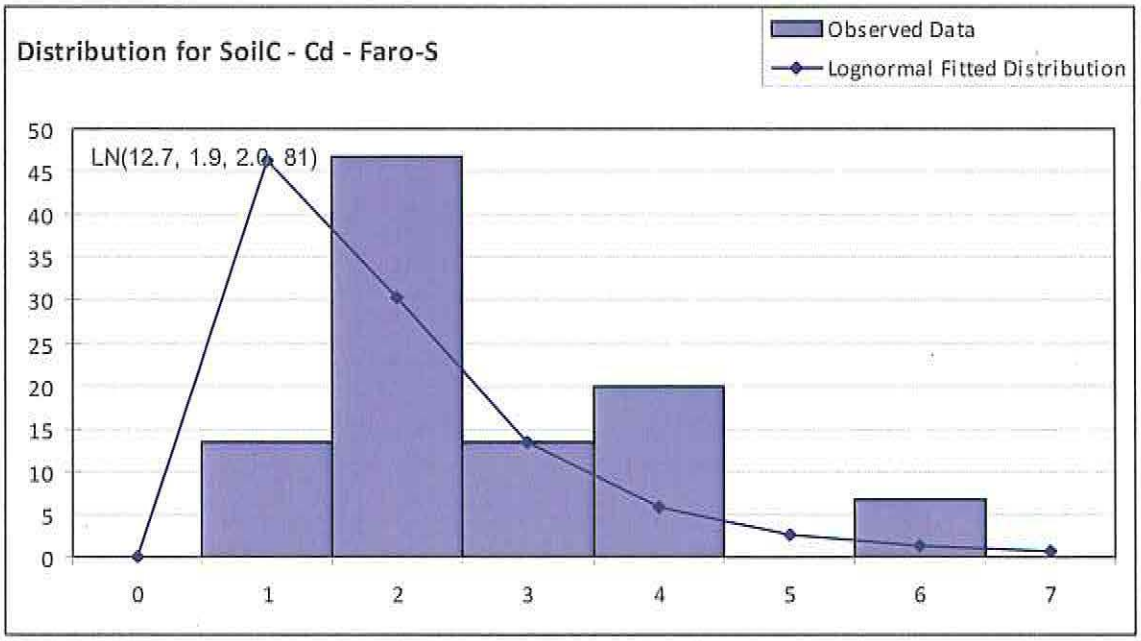

Distribution for SoilC - Cd - Background
Observed Data
Lognormal Fitted Distribution
LN(1.1, 2.5, 0.07, 18.1)
20
18
16
14
12
10
8
6
4
2
0
0
2.5
5
7.5
10

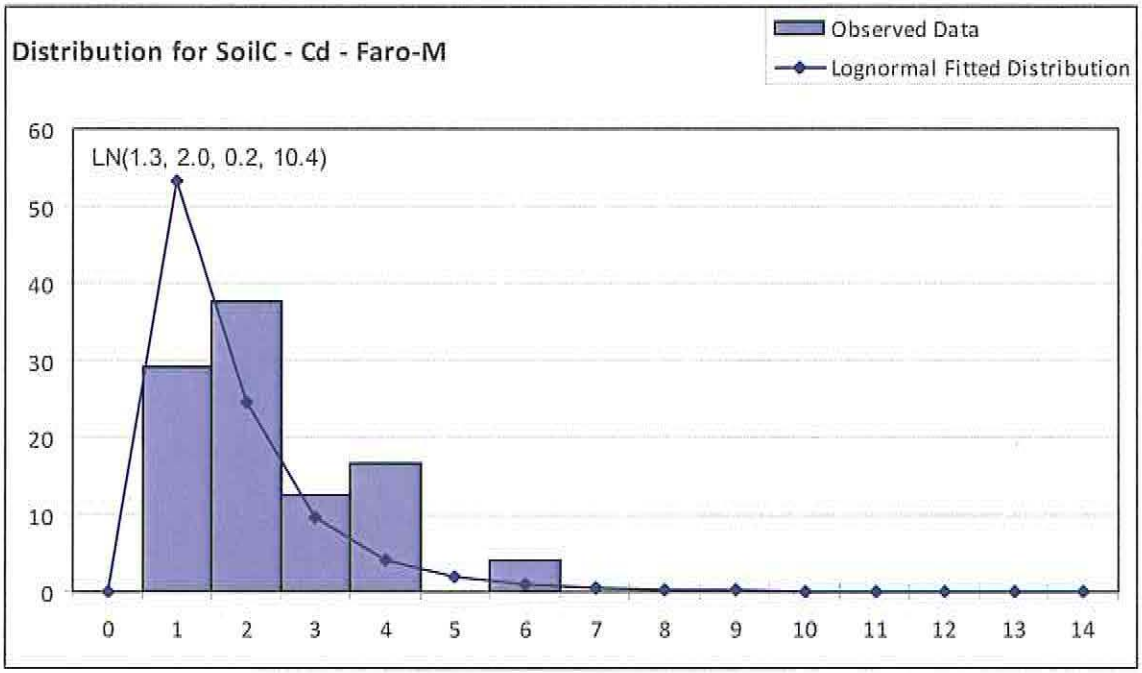

Distribution for SoilC - Cd - Van-S
Observed Data
Triangular Fitted Distribution
T(0.5, 0.9, 1.4)
0
0.2
0.4
0.6
0.8
1
1.2
1.4
1.6

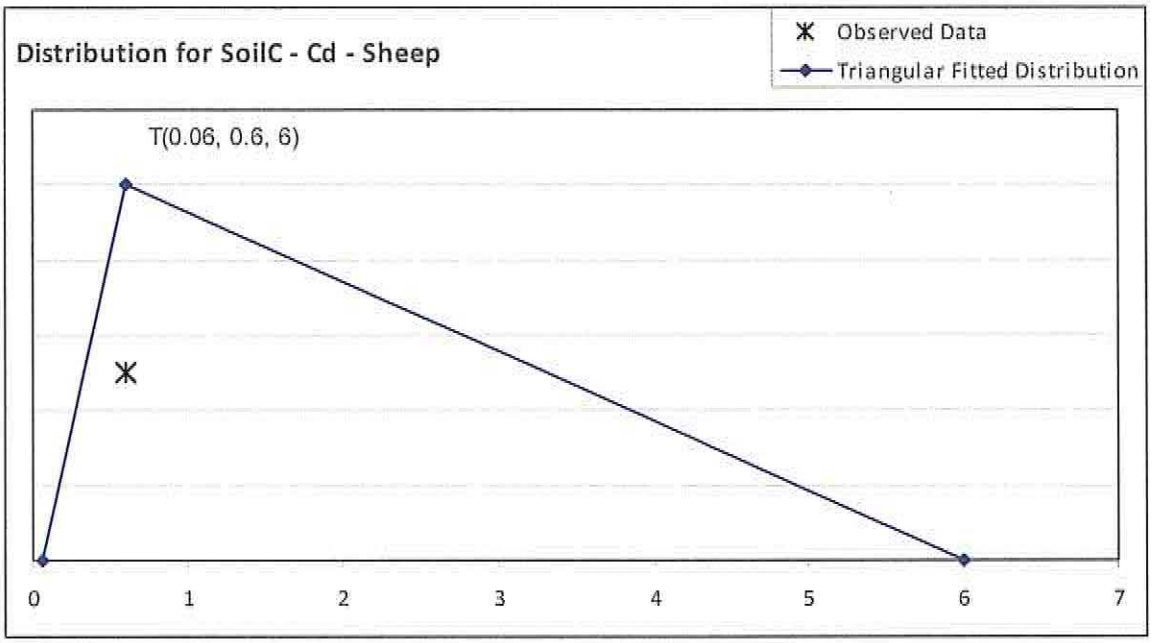

Distribution for SoilC - Cd - Van-M
Observed Data
Lognormal Fitted Distribution
LN(1.3, 1.5, 0.4, 4.2)
30
25
20
15
10
5
0
0 0.2 0.4 0.6 0.8 1 1.2 1.4 1.6 1.8 2 2.2 2.4 2.6 2.8 3 3.2 3.4 3.6 3.8 4 4.2 4.4 4.6


Distribution for SoilC - Cd - Faro-N
Observed Data
Lognormal Fitted Distribution
LN(1.4, 2.4, 0.1, 20)
45
40
35
30
25
20
15
10
5
0
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21

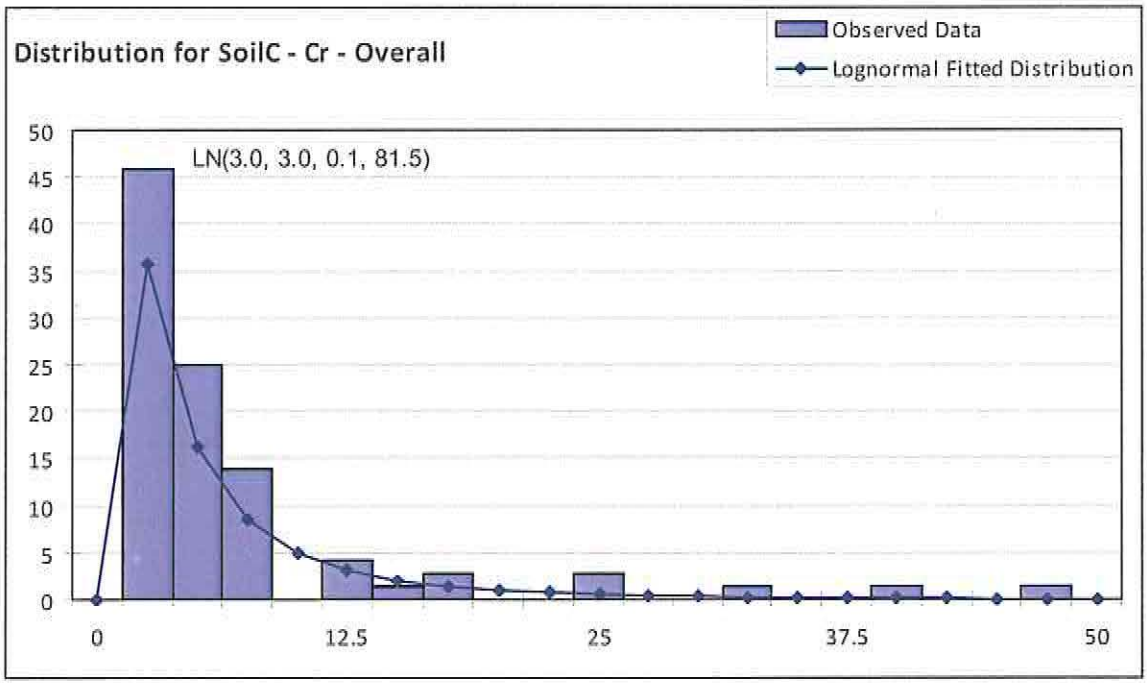

Distribution for SoilC - Cd - Faro-W
Observed Data
Lognormal Fitted Distribution
LN(1.3, 1.7, 0.3, 6.2)
70
60
50
40
30
20
10
0
0 0.9 1.8 2.7 3.6 4.5 5.4 6.3 7.2

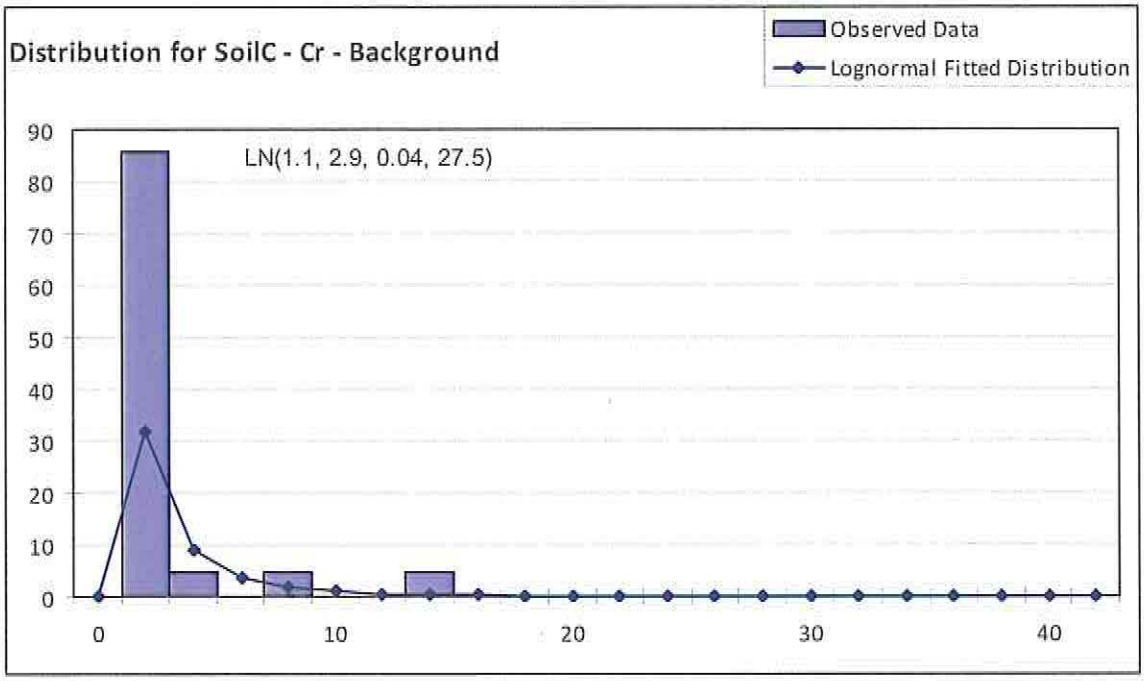

Distribution for SoilC - Cd - Faro-S
Observed Data
Lognormal Fitted Distribution
LN(12.7, 1.9, 2.0, 81)
50
45
40
35
30
25
20
15
10
5
0
0
1
2
3
4
5
6
7

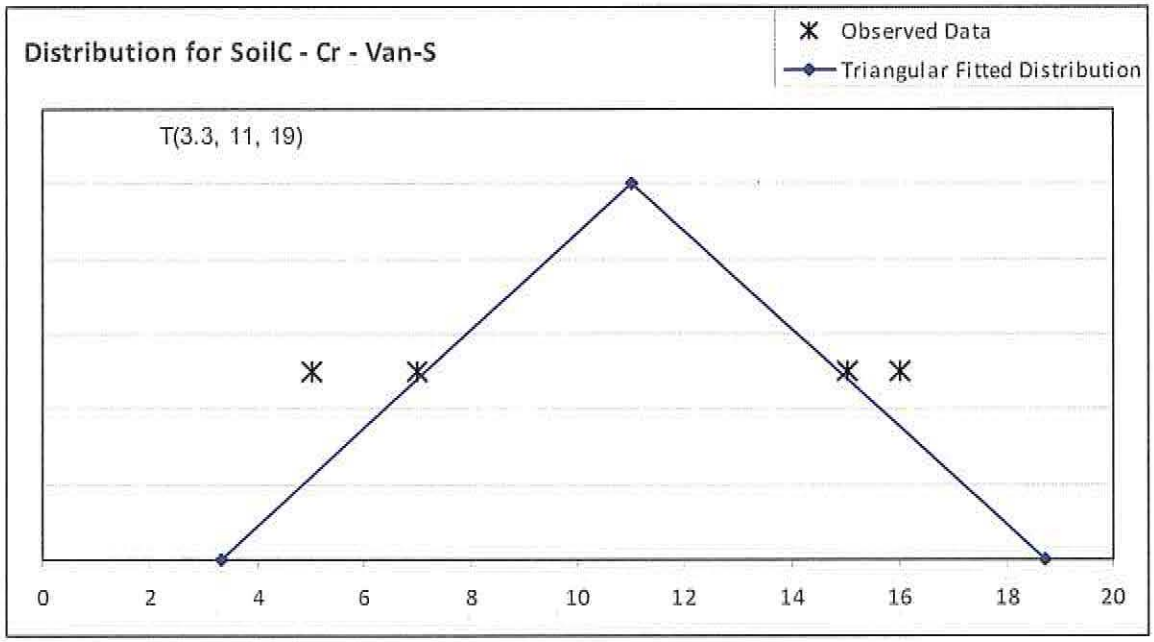

Distribution for SoilC - Cd - Faro-M
Observed Data
Lognormal Fitted Distribution
LN(1.3, 2.0, 0.2, 10.4)
60
50
40
30
20
10
0
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14

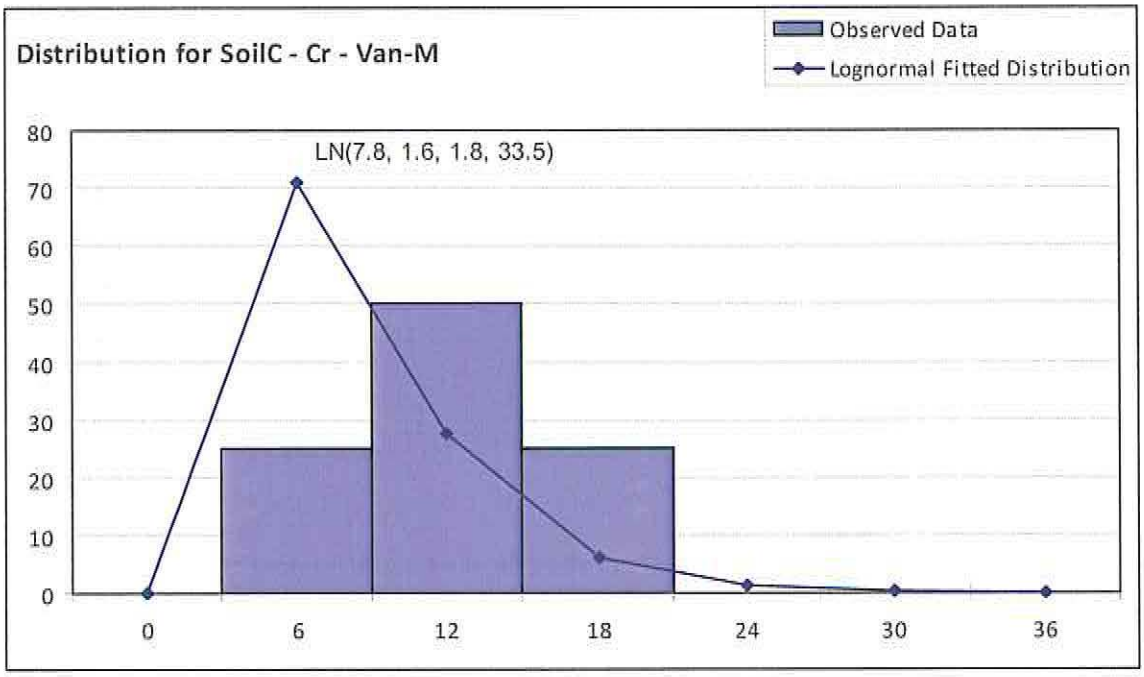


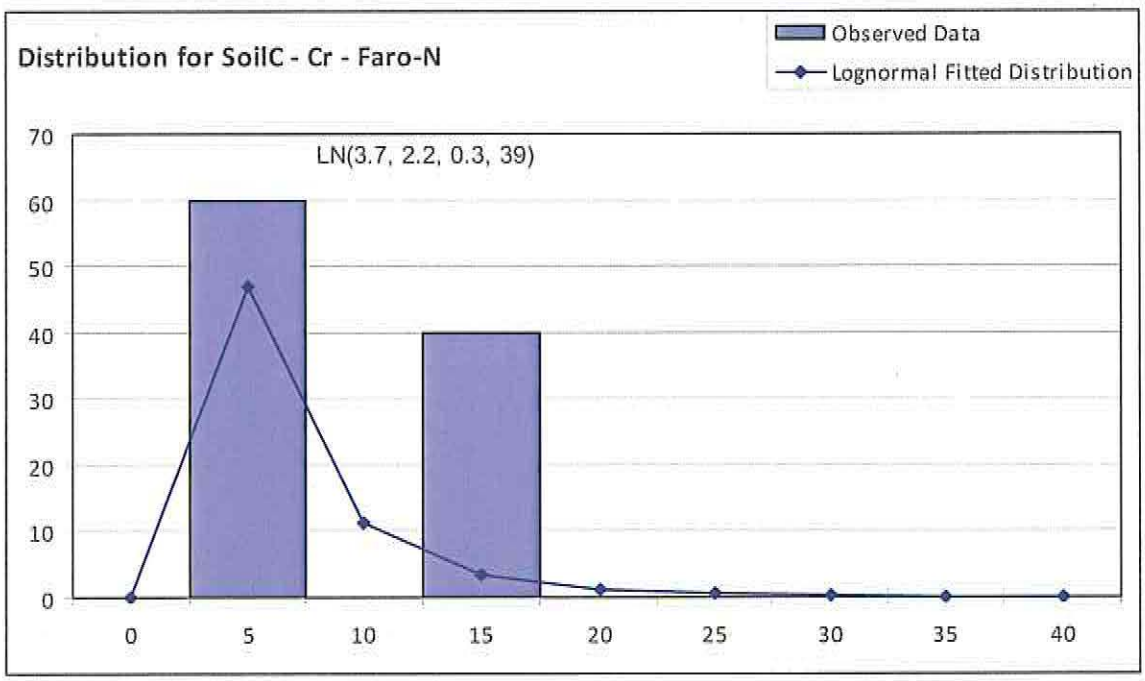
D.3.6 Chromium

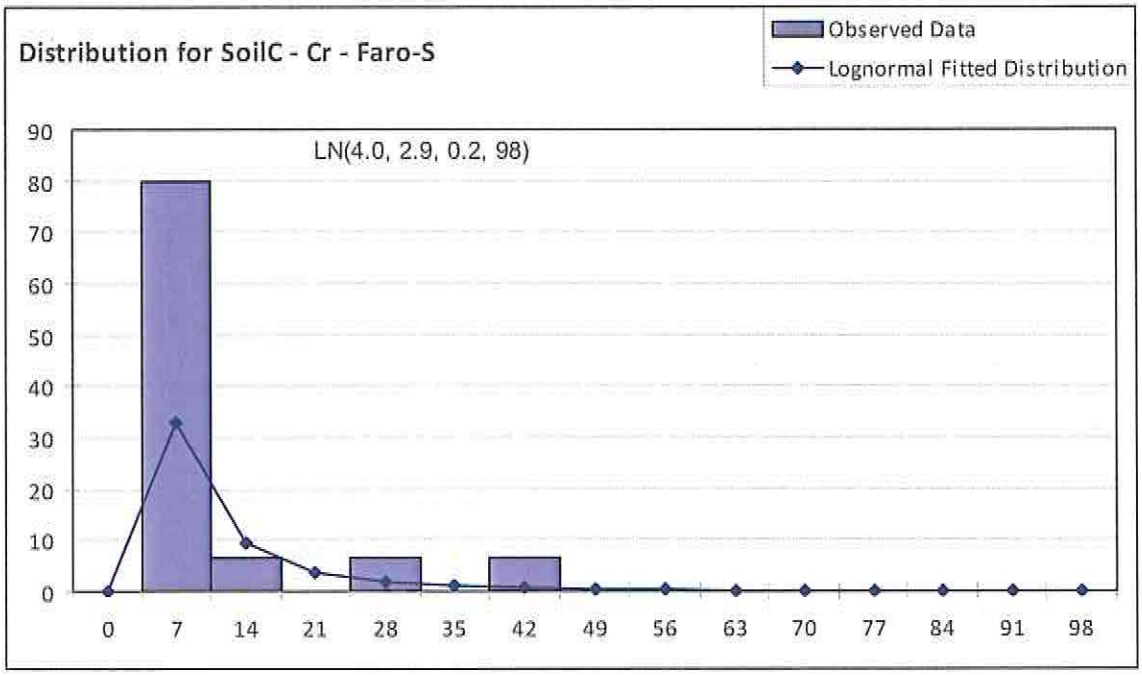


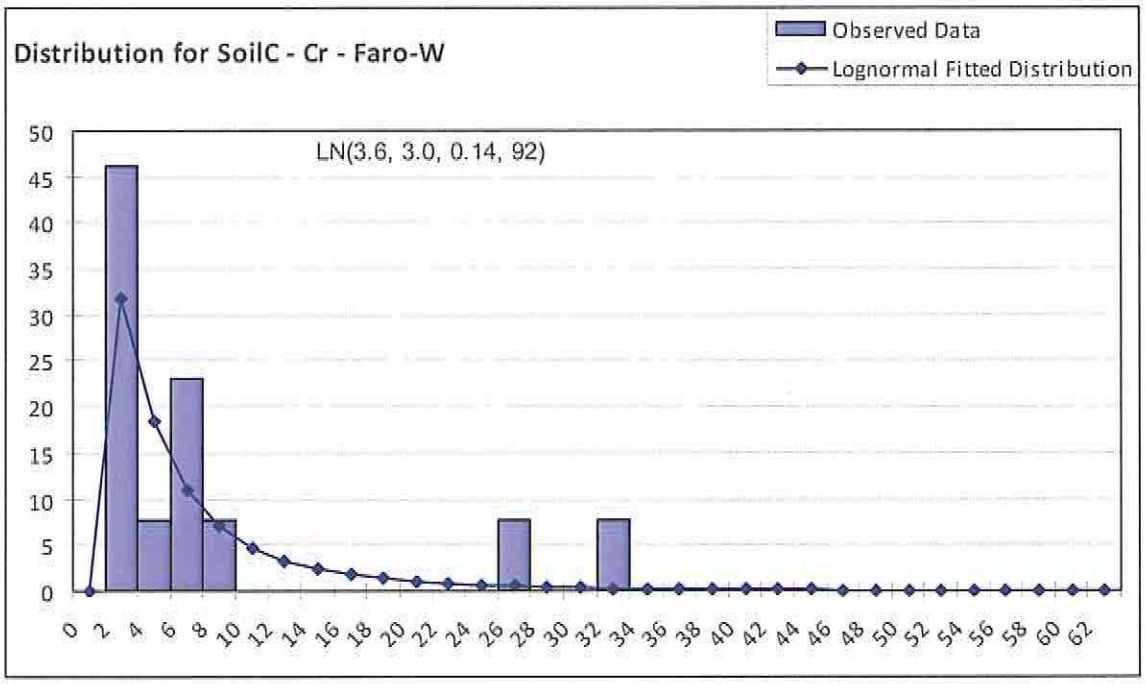

Distribution for SoilC - Cr - Background
Observed Data
Lognormal Fitted Distribution
LN(1.1, 2.9, 0.04, 27.5)
90
80
70
60
50
40
30
20
10
0
0
10
20
30
40

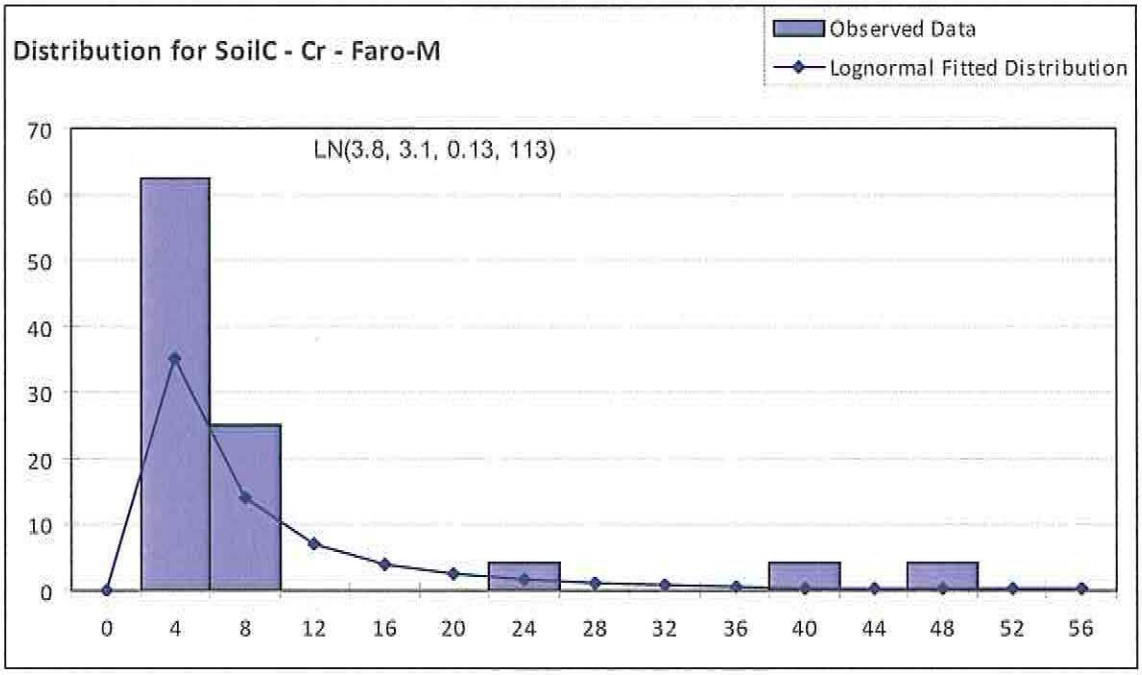

Distribution for SoilC - Cr - Van-S
Observed Data
Triangular Fitted Distribution
T(3.3, 11, 19)
0
2
4
6
8
10
12
14
16
18
20


Distribution for SoilC - Cr - Van-M
Observed Data
Lognormal Fitted Distribution
LN(7.8, 1.6, 1.8, 33.5)
80
70
60
50
40
30
20
10
0
0
6
12
18
24
30
36


Distribution for SoilC - Cr - Faro-N
Observed Data
Lognormal Fitted Distribution
LN(3.7, 2.2, 0.3, 39)
70
60
50
40
30
20
10
0
0
5
10
15
20
25
30
35
40

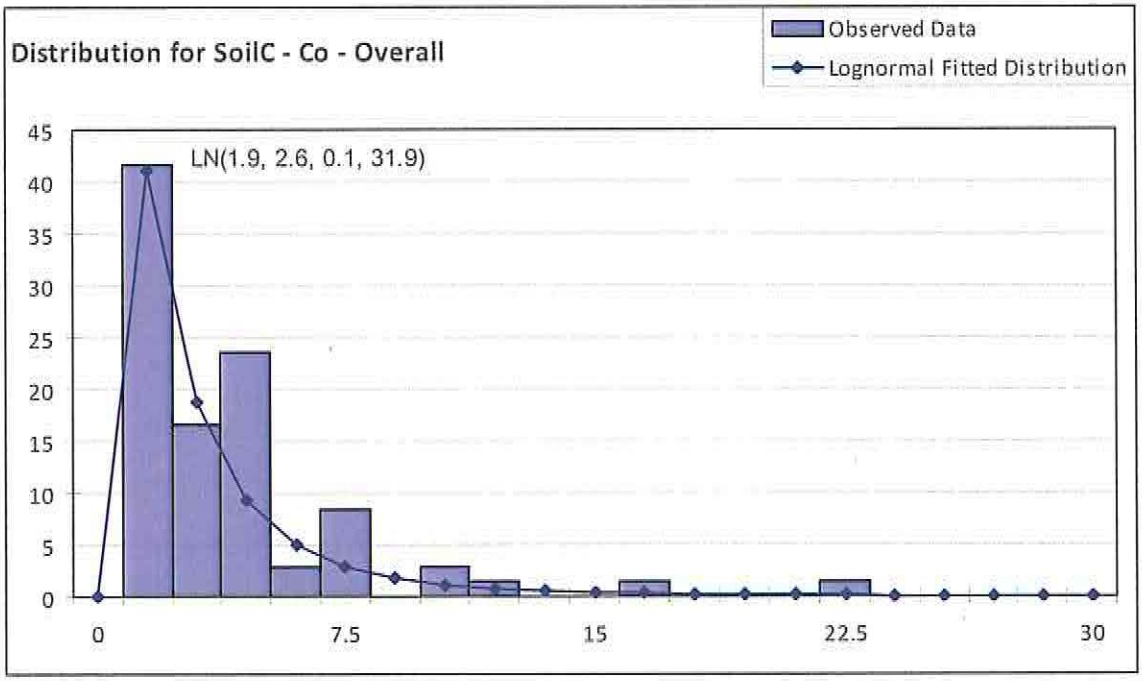

Distribution for SoilC - Cr - Faro-S
Observed Data
Lognormal Fitted Distribution
LN(4.0, 2.9, 0.2, 98)
90
80
70
60
50
40
30
20
10
0
0
7
14
21
28
35
42
49
56
63
70
77
84
91
98

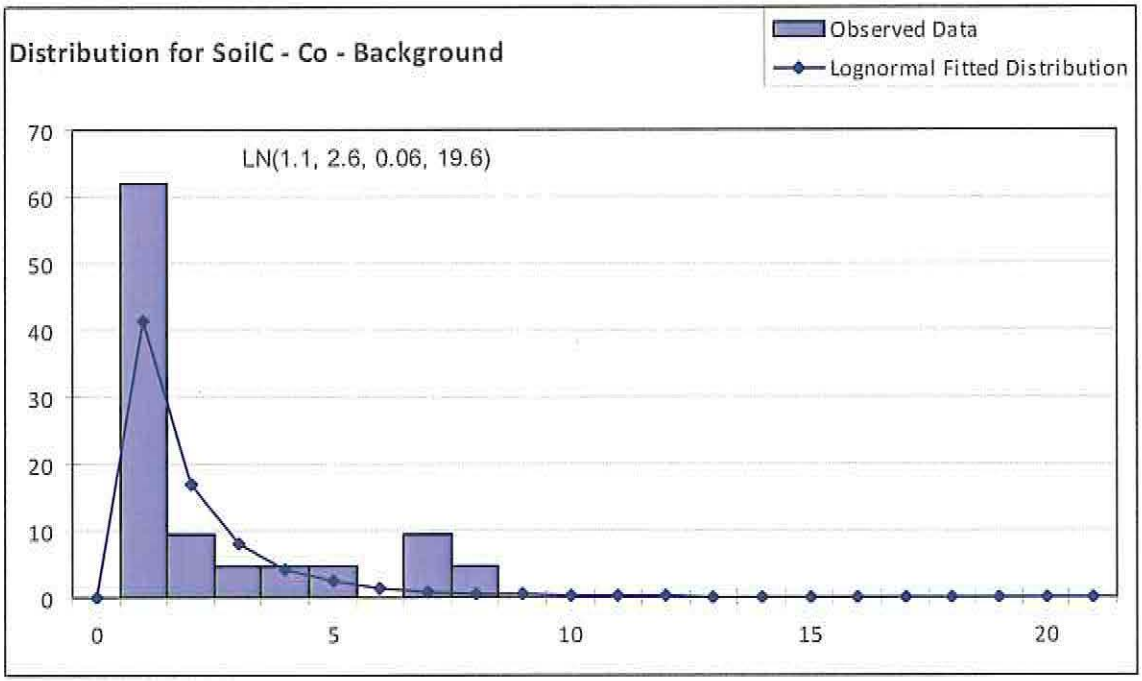

Distribution for SoilC - Cr - Faro-W
Observed Data
Lognormal Fitted Distribution
LN(3.6, 3.0, 0.14, 92)
50
45
40
35
30
25
20
15
10
5
0
0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48 50 52 54 56 58 60 62

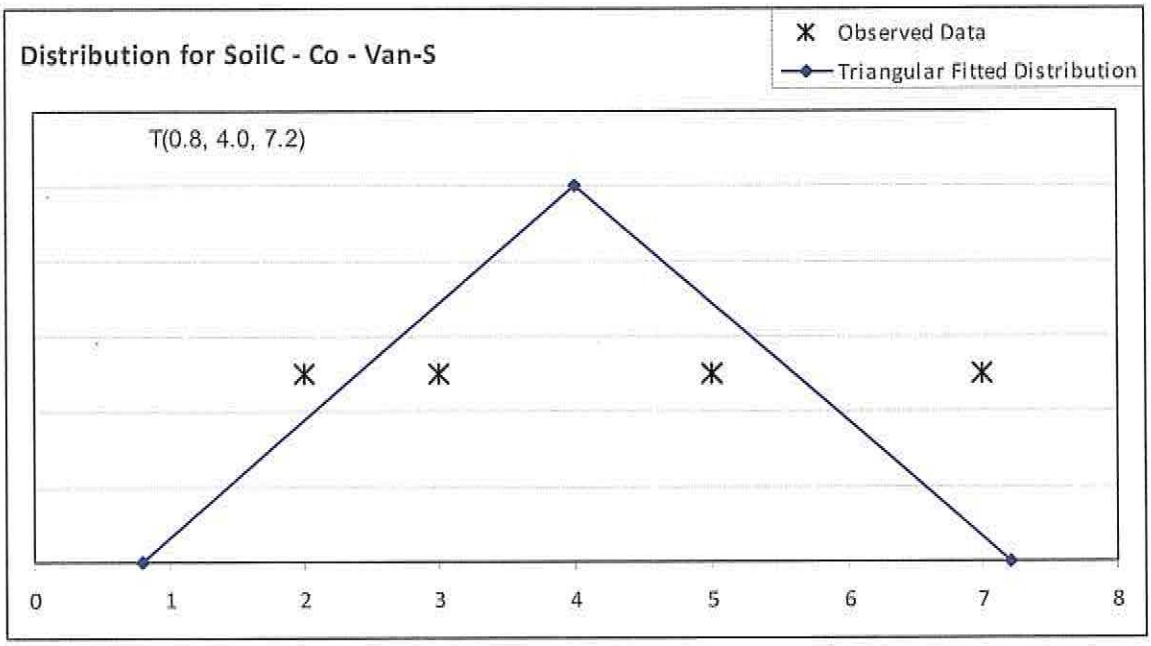

Distribution for SoilC - Cr - Faro-M
Observed Data
Lognormal Fitted Distribution
LN(3.8, 3.1, 0.13, 113)
70
60
50
40
30
20
10
0
0
4
8
12
16
20
24
28
32
36
40
44
48
52
56

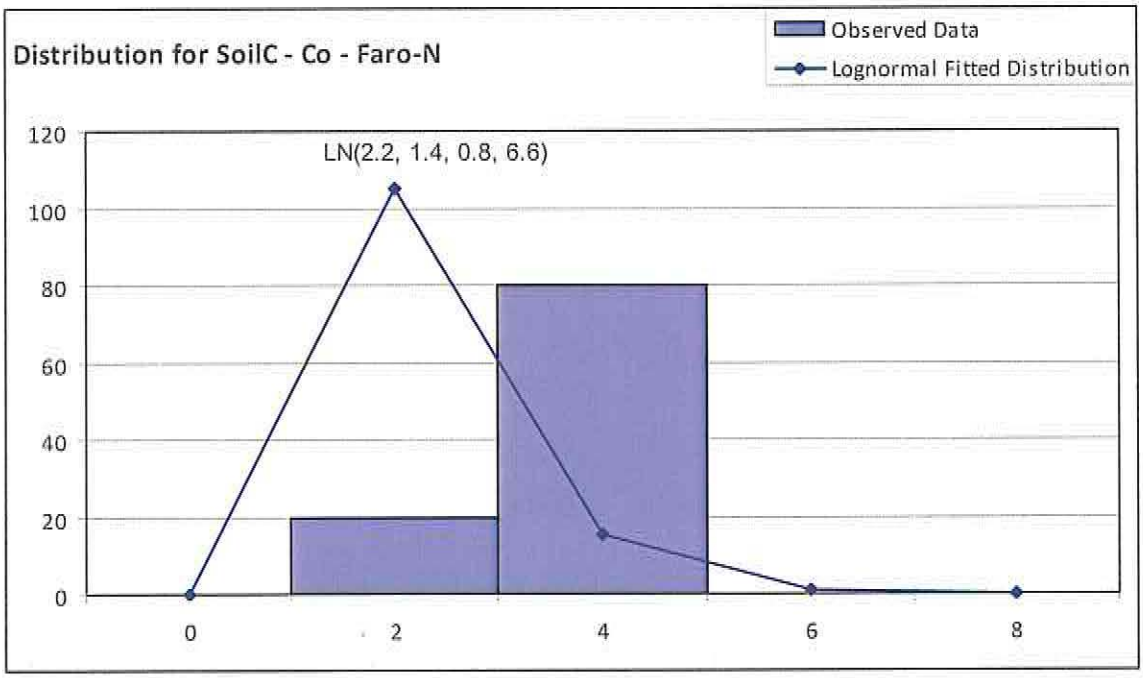

Distribution for SoilC - Cr - Sheep
Observed Data
Triangular Fitted Distribution
T(0.1, 1, 10)
0
2
4
6
8
10
12

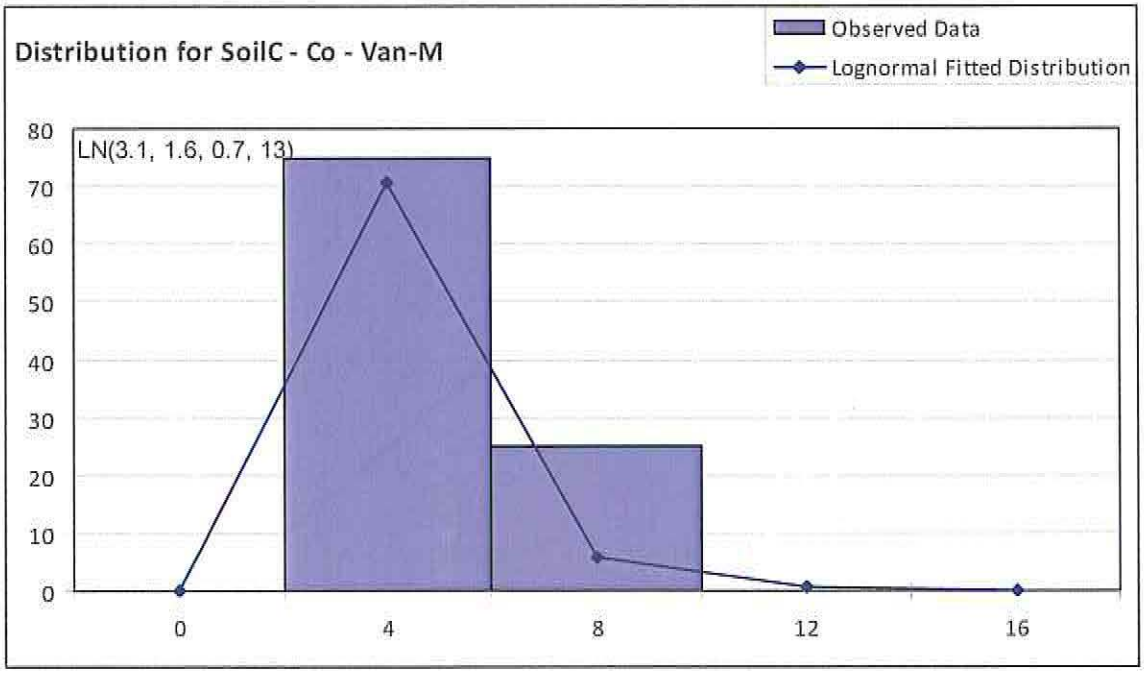
D.3.7 Cobalt

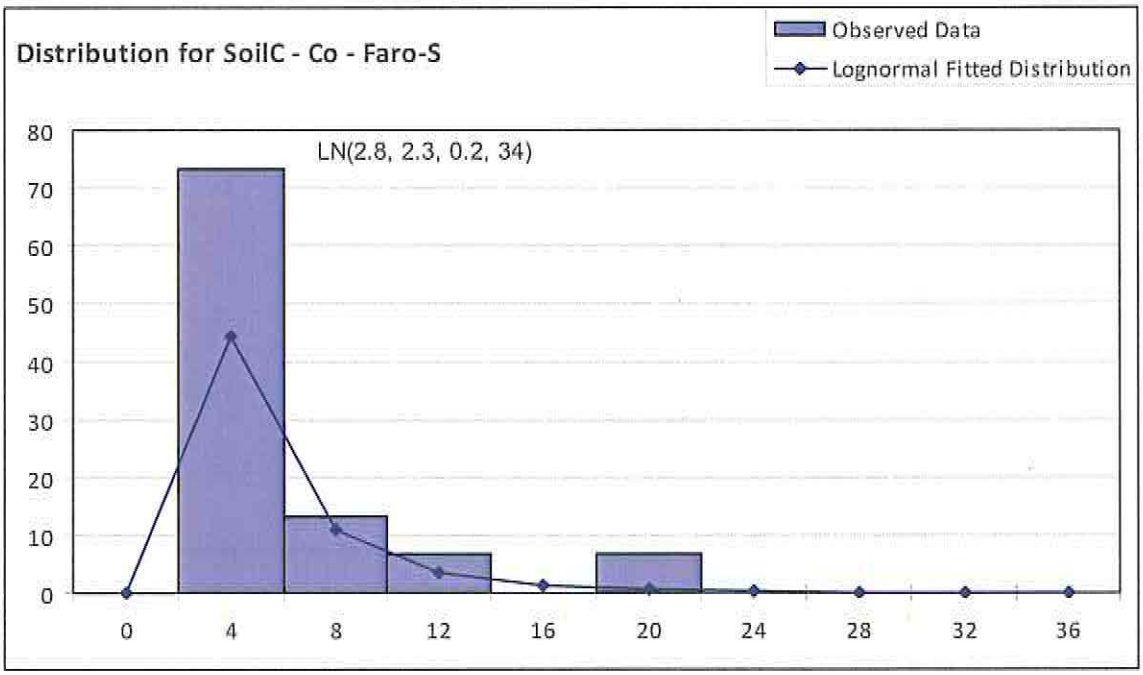

Distribution for SoilC - Co - Overall
Observed Data
Lognormal Fitted Distribution
LN(1.9, 2.6, 0.1, 31.9)
45
40
35
30
25
20
15
10
5
0
0
7.5
15
22.5
30

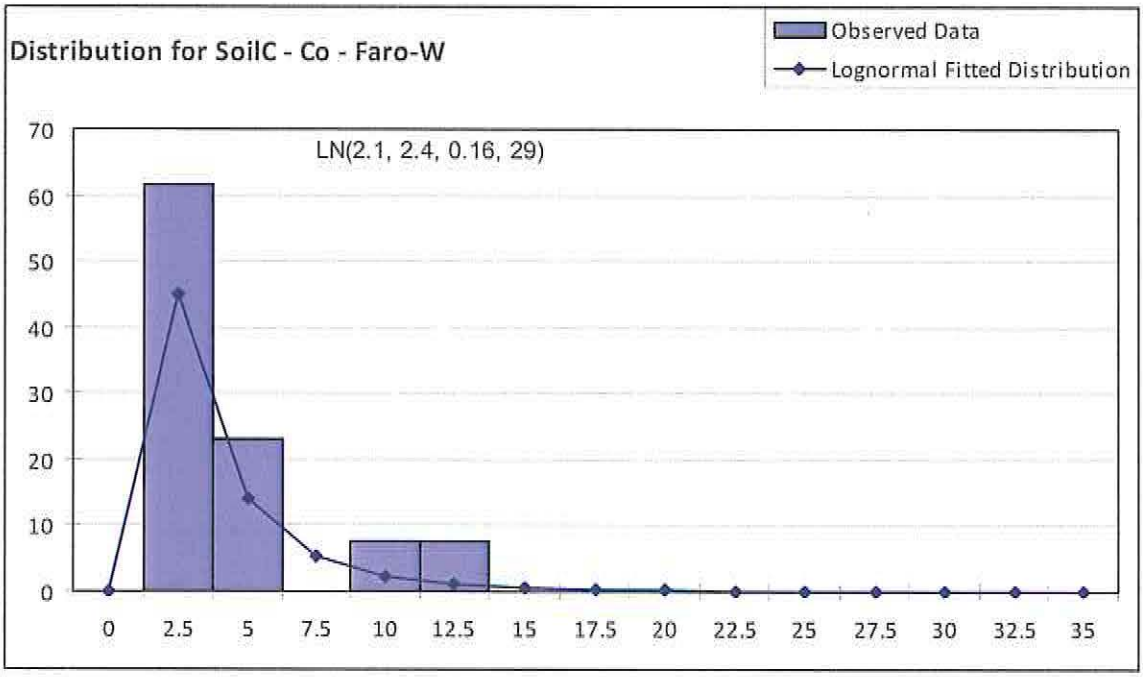

Distribution for SoilC - Co - Background
Observed Data
Lognormal Fitted Distribution
LN(1.1, 2.6, 0.06, 19.6)
70
60
50
40
30
20
10
0
0
5
10
15
20

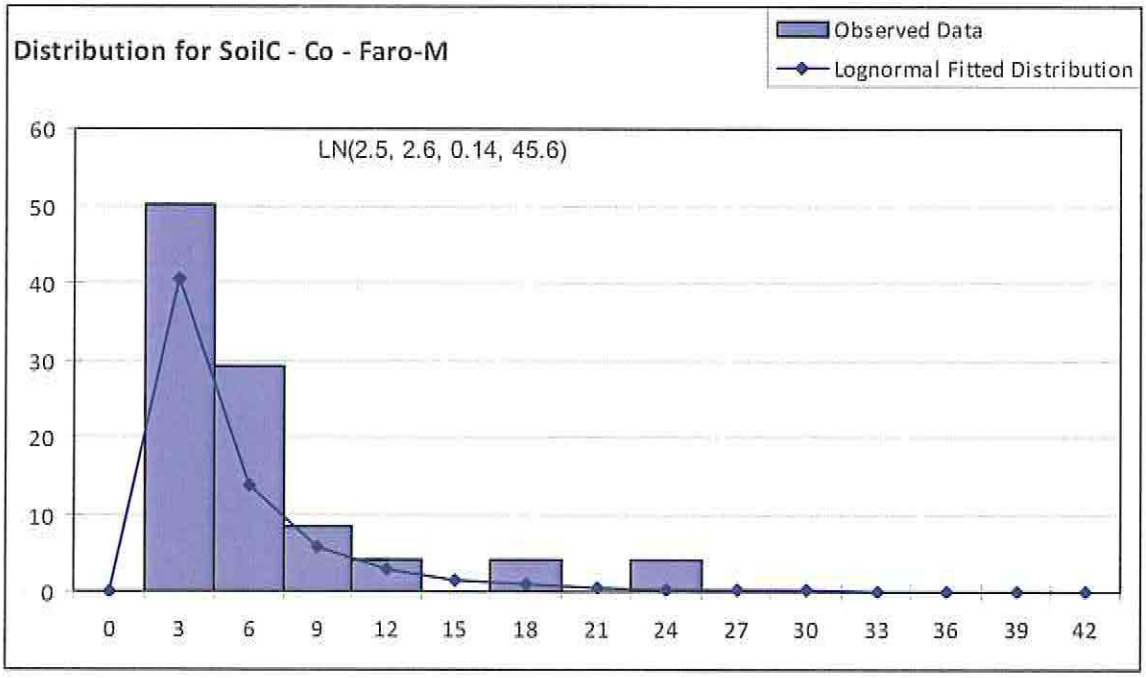

Distribution for SoilC - Co - Van-S
Observed Data
Triangular Fitted Distribution
T(0.8, 4.0, 7.2)
0
1
2
3
4
5
6
7
8

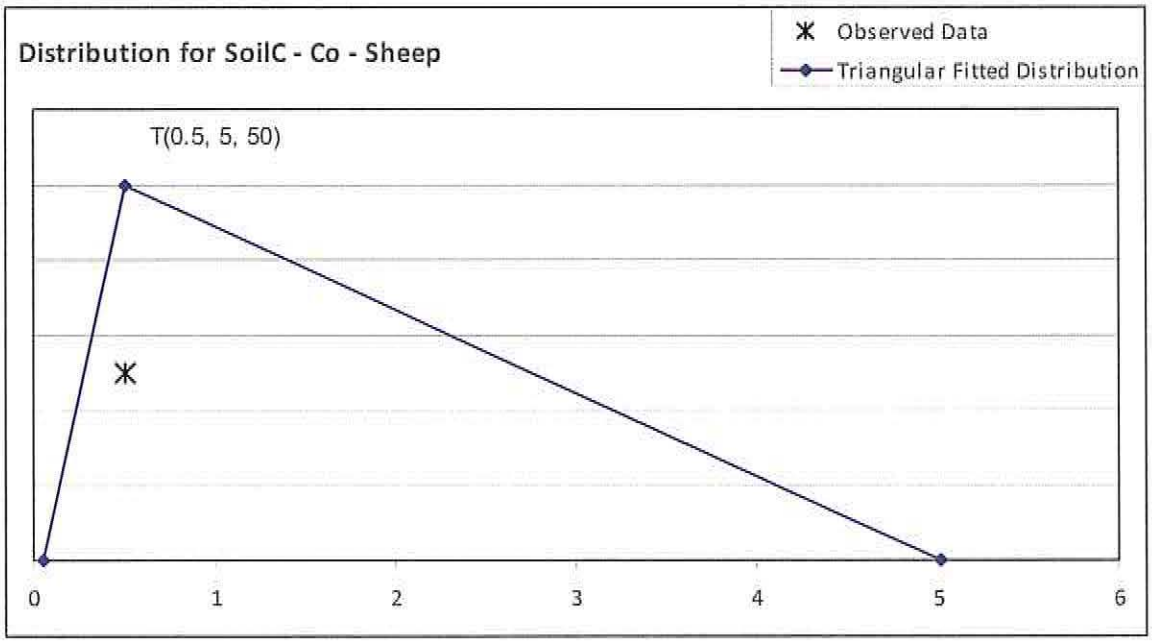

Distribution for SoilC - Co - Faro-N
Observed Data
Lognormal Fitted Distribution
LN(2.2, 1.4, 0.8, 6.6)
120
100
80
60
40
20
0
0
2
4
6
8


Distribution for SoilC - Co - Van-M
Observed Data
Lognormal Fitted Distribution
LN(3.1, 1.6, 0.7, 13)
80
70
60
50
40
30
20
10
0
0
4
8
12
16

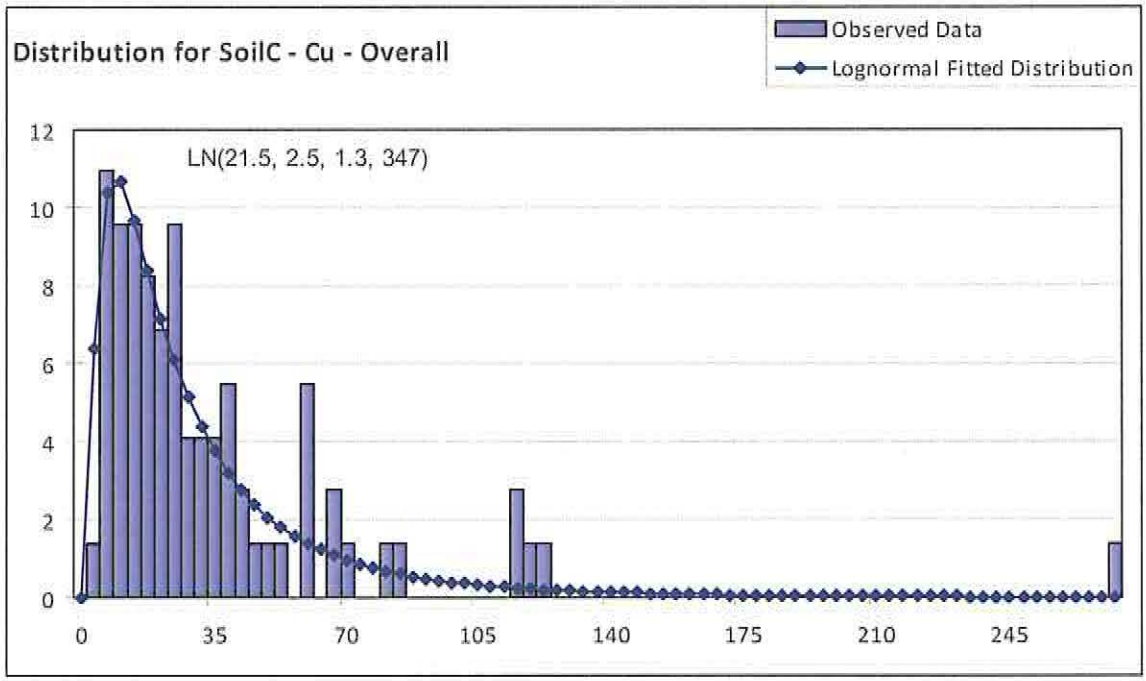

Distribution for SoilC - Co - Faro-S
Observed Data
Lognormal Fitted Distribution
LN(2.8, 2.3, 0.2, 34)
80
70
60
50
40
30
20
10
0
0
4
8
12
16
20
24
28
32
36

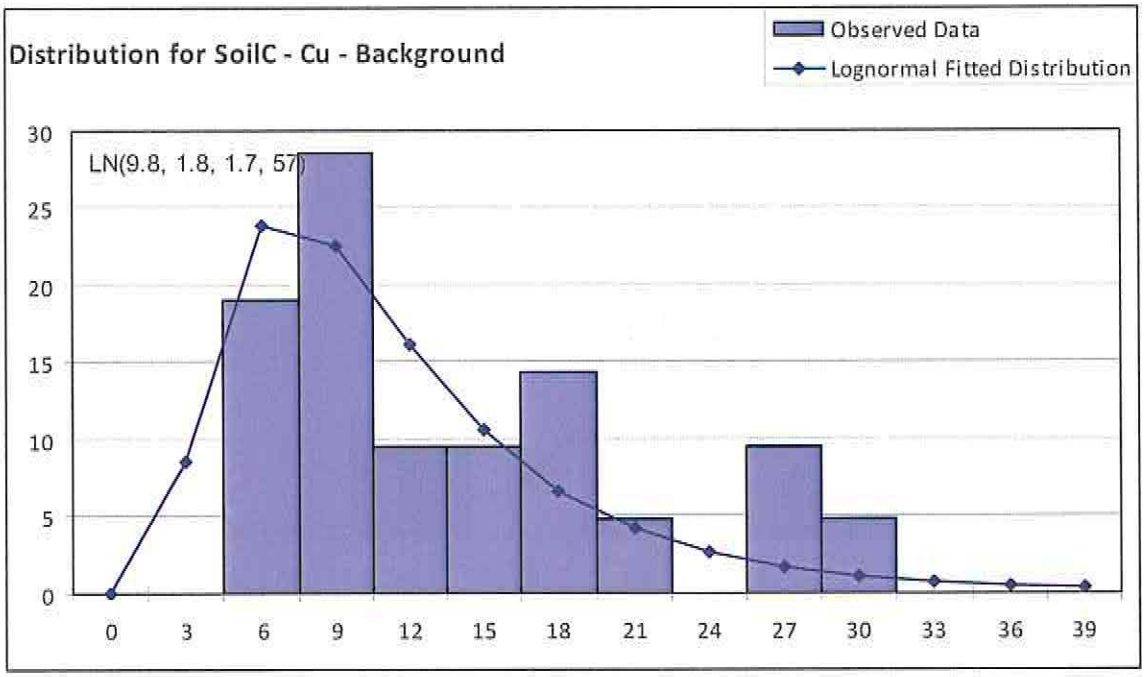

Distribution for SoilC - Co - Faro-W
Observed Data
Lognormal Fitted Distribution
LN(2.1, 2.4, 0.16, 29)
70
60
50
40
30
20
10
0
0
2.5
5
7.5
10
12.5
15
17.5
20
22.5
25
27.5
30
32.5
35

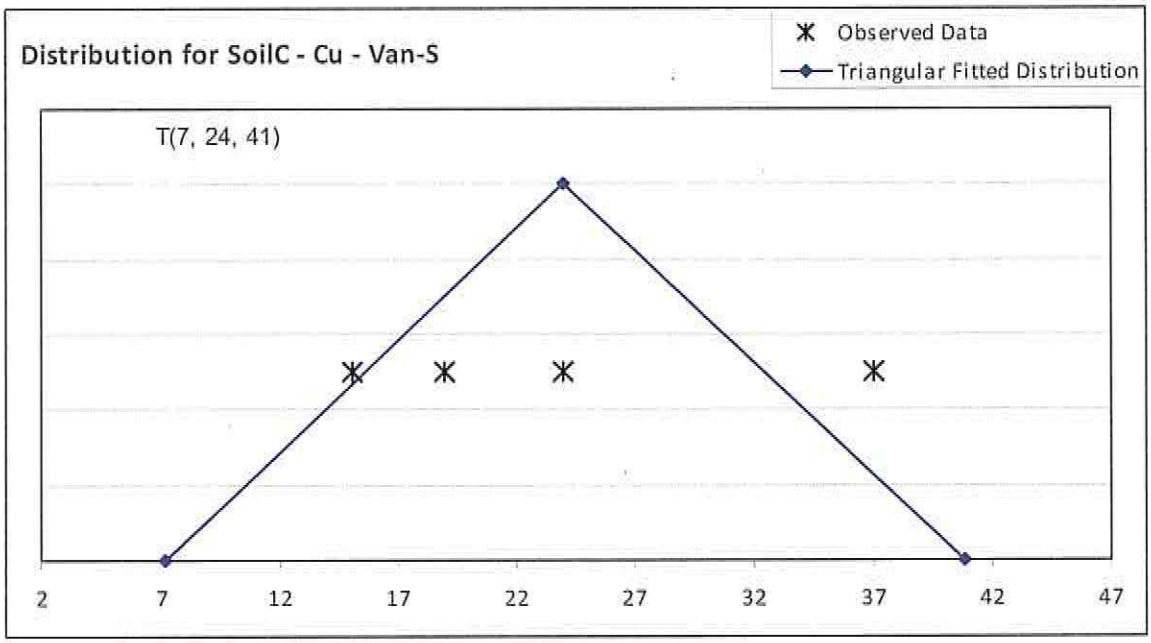

Distribution for SoilC - Co - Faro-M
Observed Data
Lognormal Fitted Distribution
LN(2.5, 2.6, 0.14, 45.6)
60
50
40
30
20
10
0
0
3
6
9
12
15
18
21
24
27
30
33
36
39
42

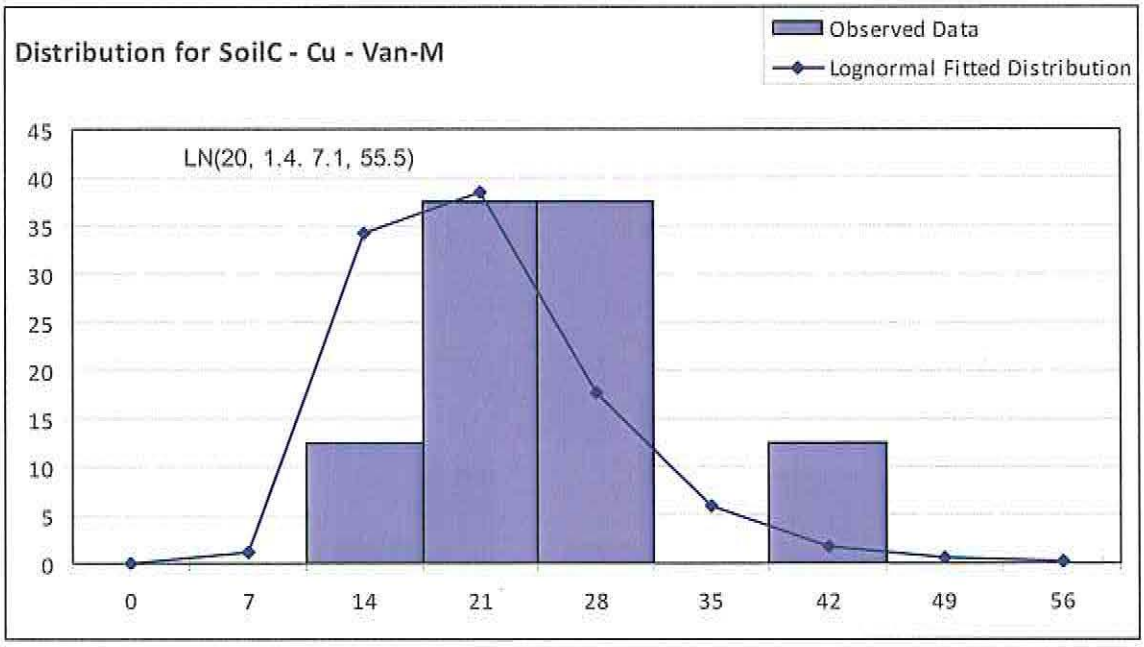

Distribution for SoilC - Co - Sheep
Observed Data
Triangular Fitted Distribution
T(0.5, 5, 50)
0
1
2
3
4
5
6

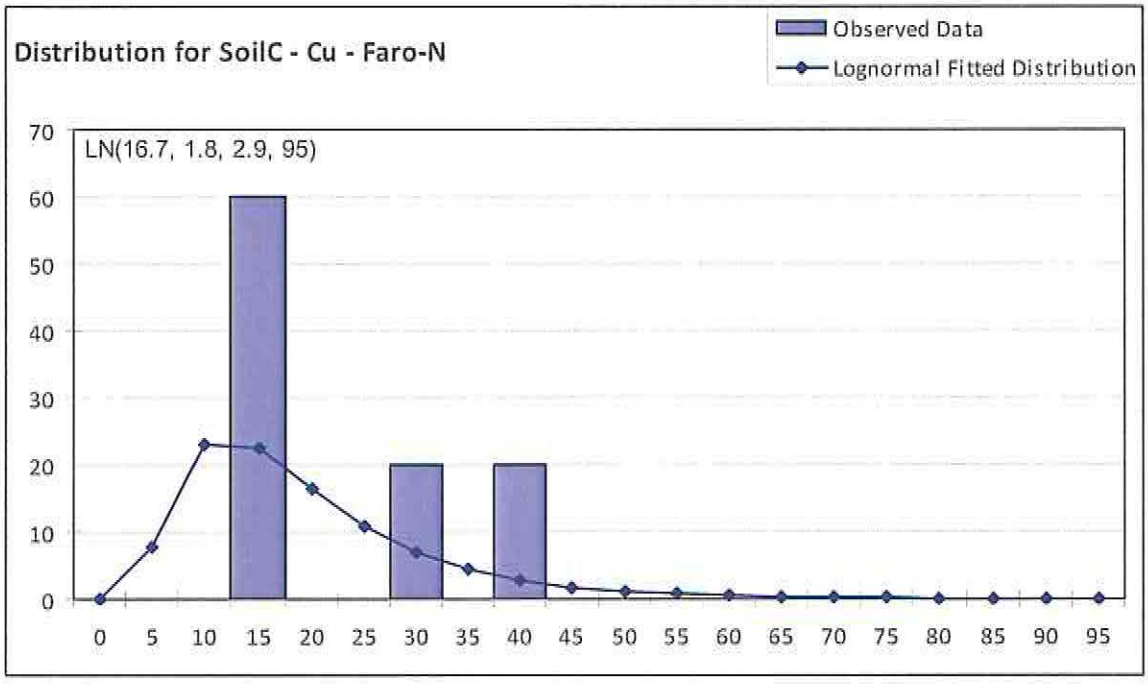
D.3.8 Copper

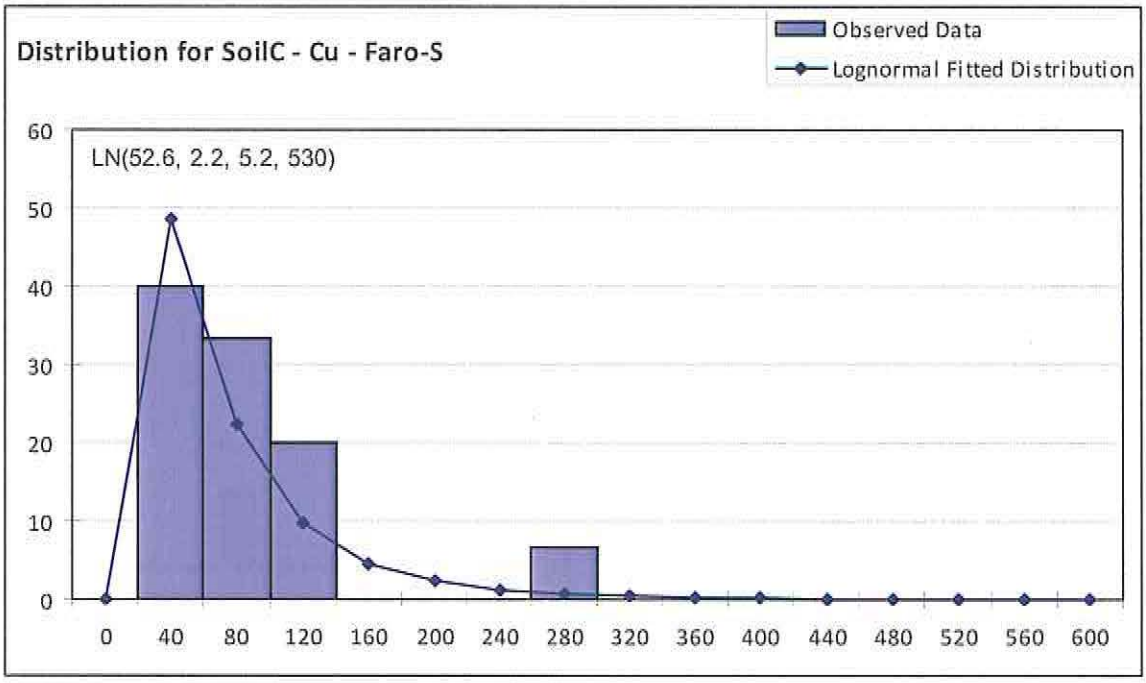

Distribution for SoilC - Cu - Overall
Observed Data
Lognormal Fitted Distribution
LN(21.5, 2.5, 1.3, 347)
12
10
8
6
4
2
0
0
35
70
105
140
175
210
245

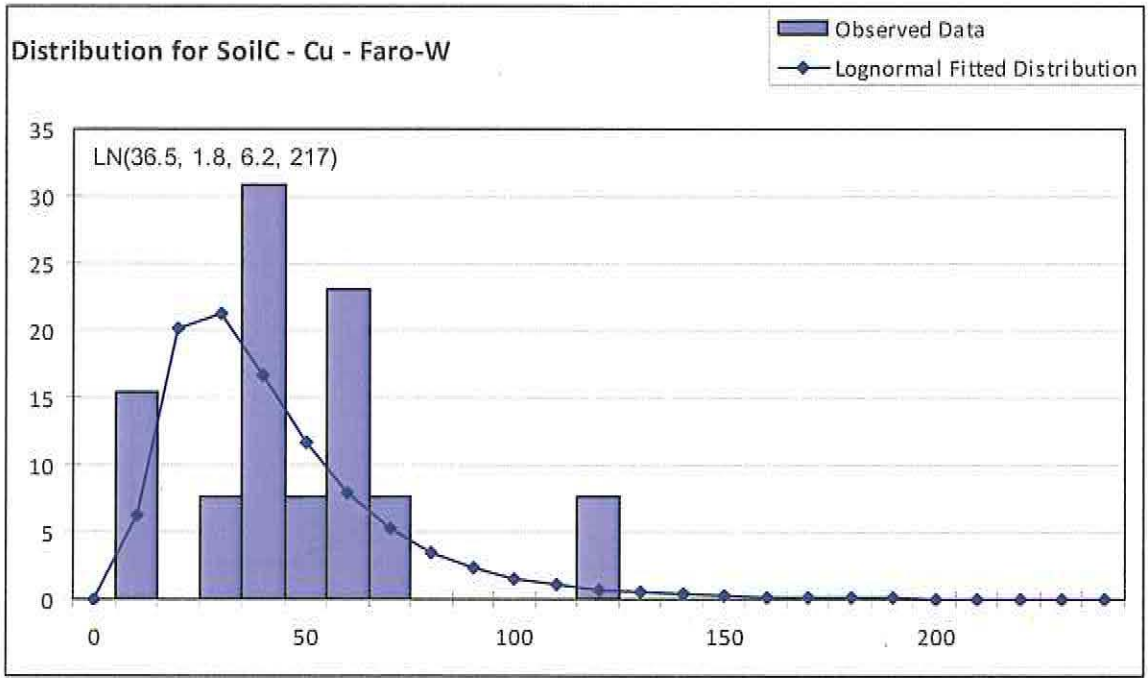

Distribution for SoilC - Cu - Background
Observed Data
Lognormal Fitted Distribution
LN(9.8, 1.8, 1.7, 57)
30
25
20
15
10
5
0
0
3
6
9
12
15
18
21
24
27
30
33
36
39

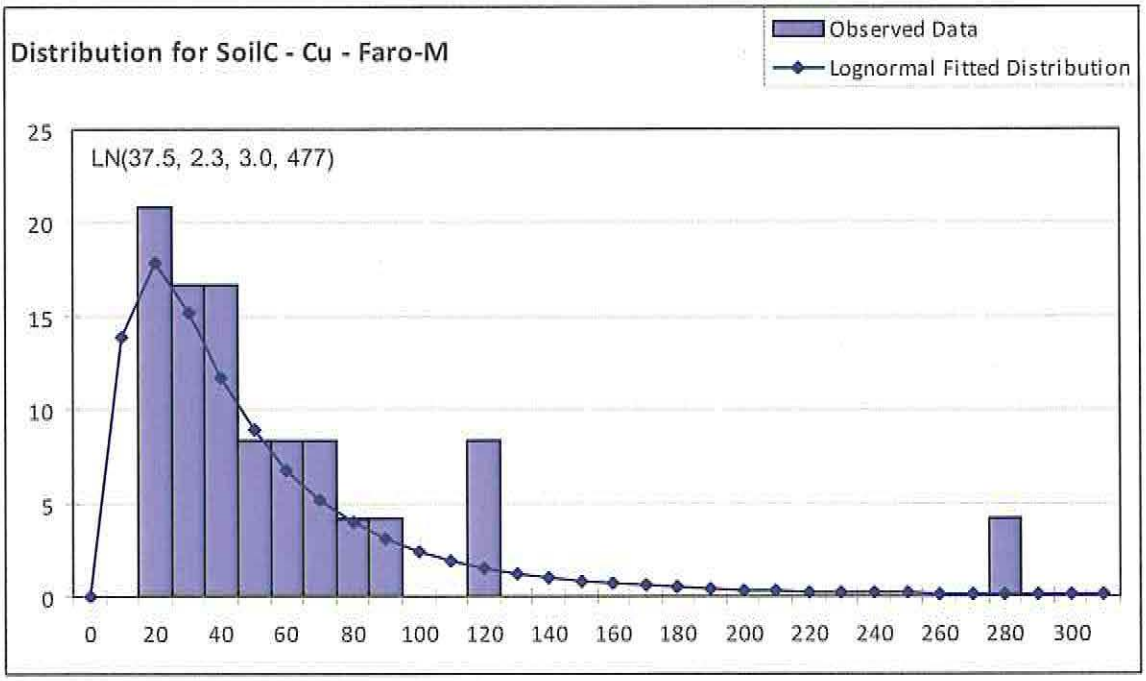

Distribution for SoilC - Cu - Van-S
Observed Data
Triangular Fitted Distribution
T(7, 24, 41)
2
7
12
17
22
27
32
37
42
47

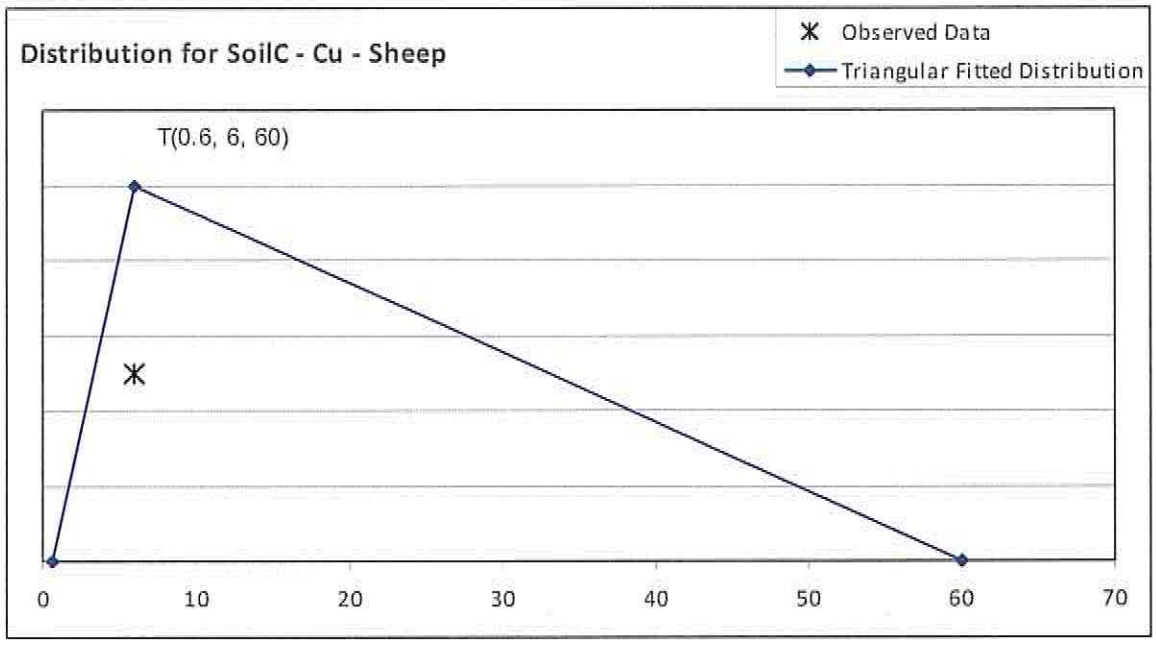

Distribution for SoilC - Cu - Van-M
Observed Data
Lognormal Fitted Distribution
LN(20, 1.4. 7.1, 55.5)
45
40
35
30
25
20
15
10
5
0
0
7
14
21
28
35
42
49
56


Distribution for SoilC - Cu - Faro-N
Observed Data
Lognormal Fitted Distribution
LN(16.7, 1.8, 2.9, 95)
70
60
50
40
30
20
10
0
0
5
10
15
20
25
30
35
40
45
50
55
60
65
70
75
80
85
90
95

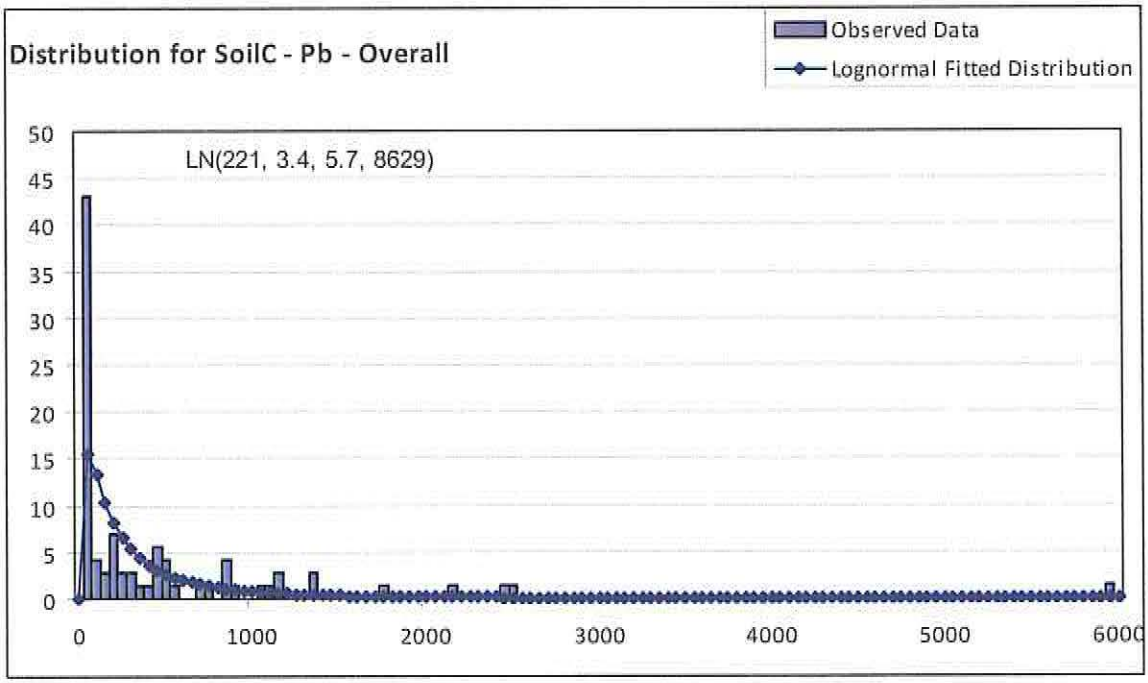

Distribution for SoilC - Cu - Faro-S
Observed Data
Lognormal Fitted Distribution
LN(52.6, 2.2, 5.2, 530)
60
50
40
30
20
10
0
0
40
80
120
160
200
240
280
320
360
400
440
480
520
560
600

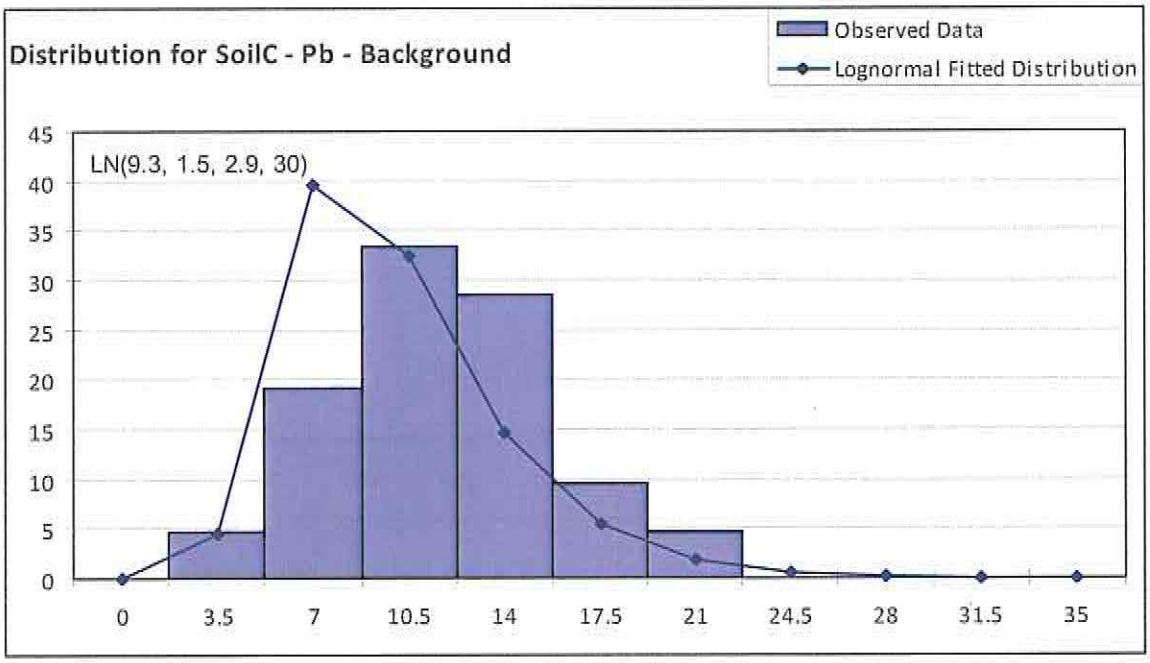

Distribution for SoilC - Cu - Faro-W
Observed Data
Lognormal Fitted Distribution
LN(36.5, 1.8, 6.2, 217)
35
30
25
20
15
10
5
0
0
50
100
150
200

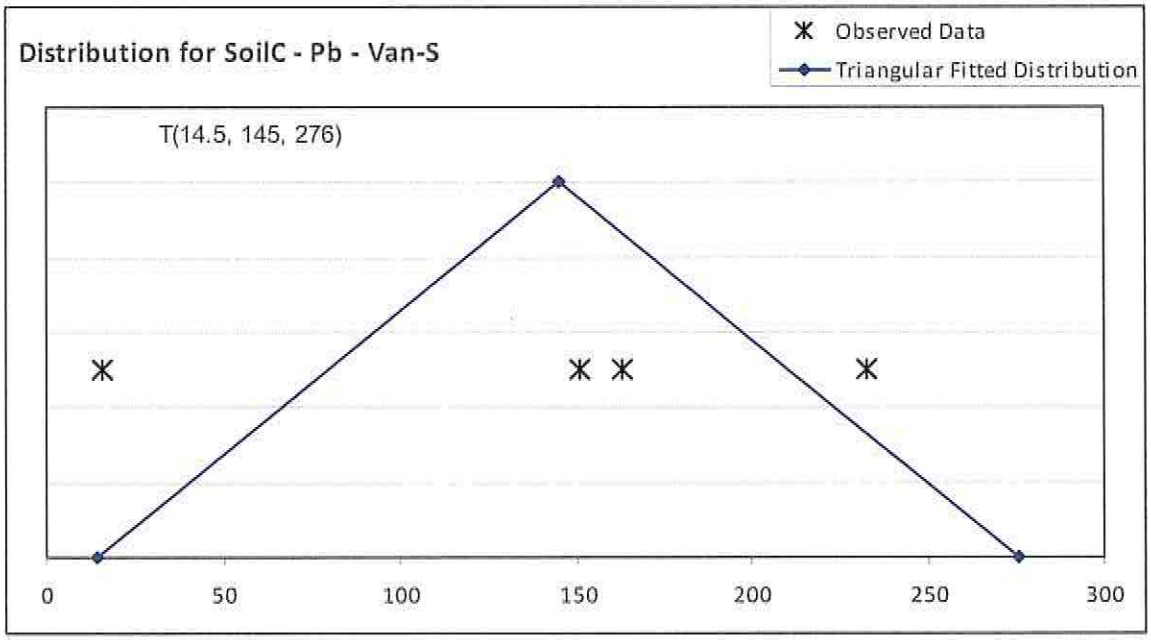

Distribution for SoilC - Cu - Faro-M
Observed Data
Lognormal Fitted Distribution
LN(37.5, 2.3, 3.0, 477)
25
20
15
10
5
0
0
20
40
60
80
100
120
140
160
180
200
220
240
260
280
300

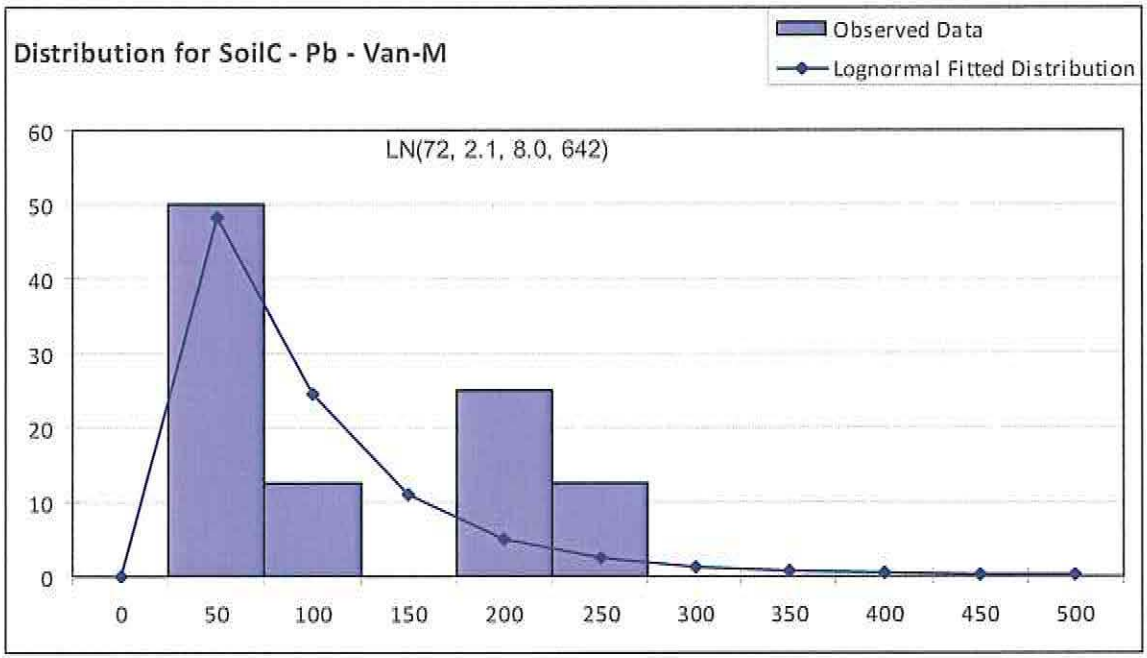

Distribution for SoilC - Cu - Sheep
Observed Data
Triangular Fitted Distribution
T(0.6, 6, 60)
0
10
20
30
40
50
60
70

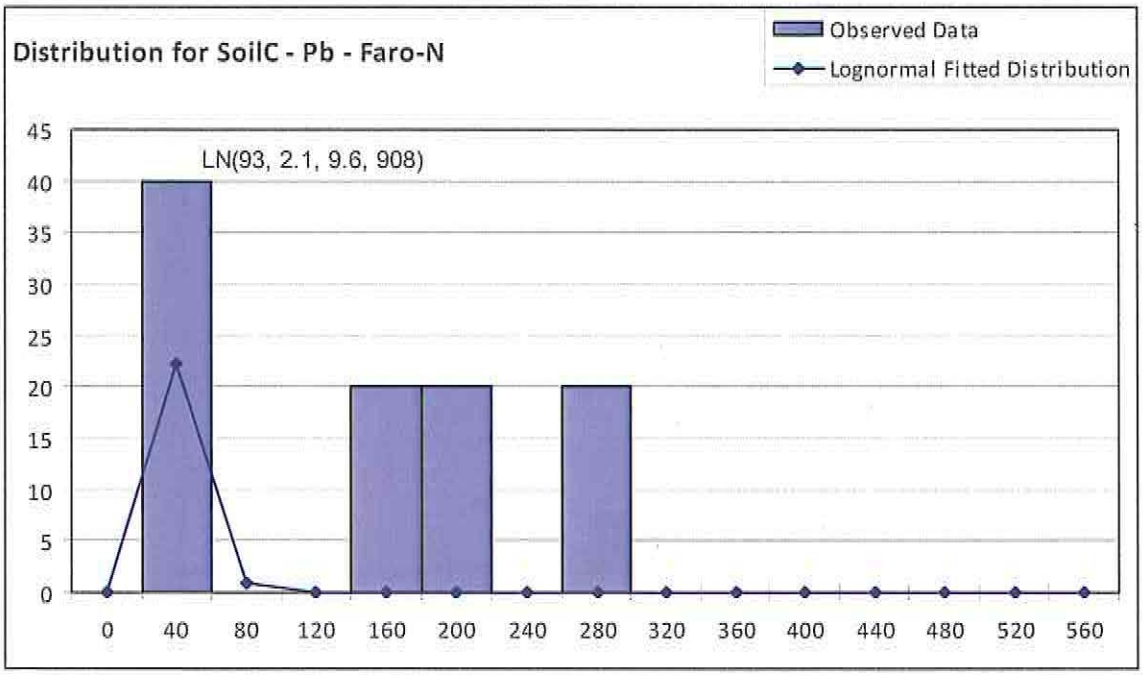
D.3.9 Lead

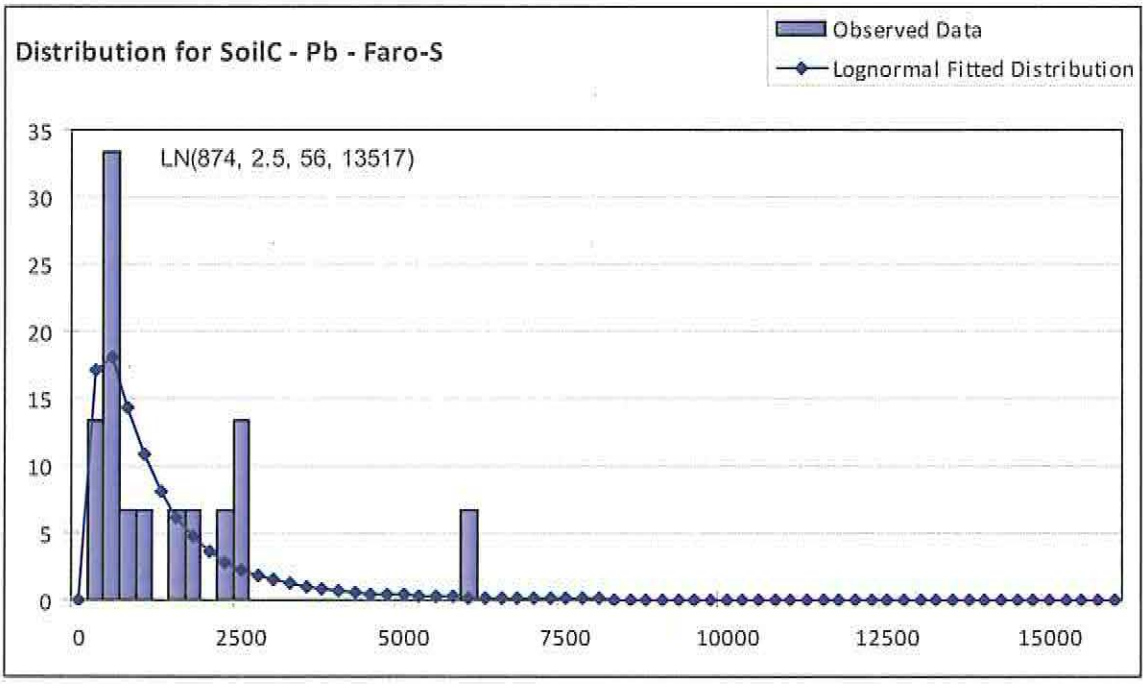

Distribution for SoilC - Pb - Overall
Observed Data
Lognormal Fitted Distribution
LN(221, 3.4, 5.7, 8629)
50
45
40
35
30
25
20
15
10
5
0
0
1000
2000
3000
4000
5000
6000

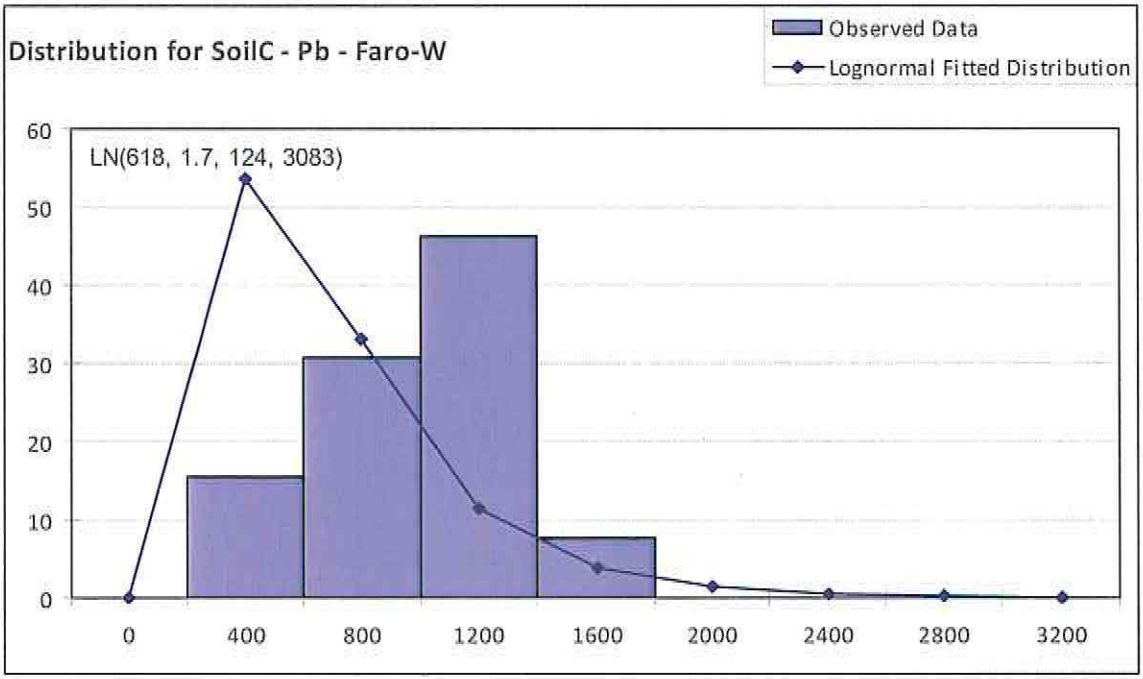

Distribution for SoilC - Pb - Background
Observed Data
Lognormal Fitted Distribution
LN(9.3, 1.5, 2.9, 30)
45
40
35
30
25
20
15
10
5
0
0
3.5
7
10.5
14
17.5
21
24.5
28
31.5
35

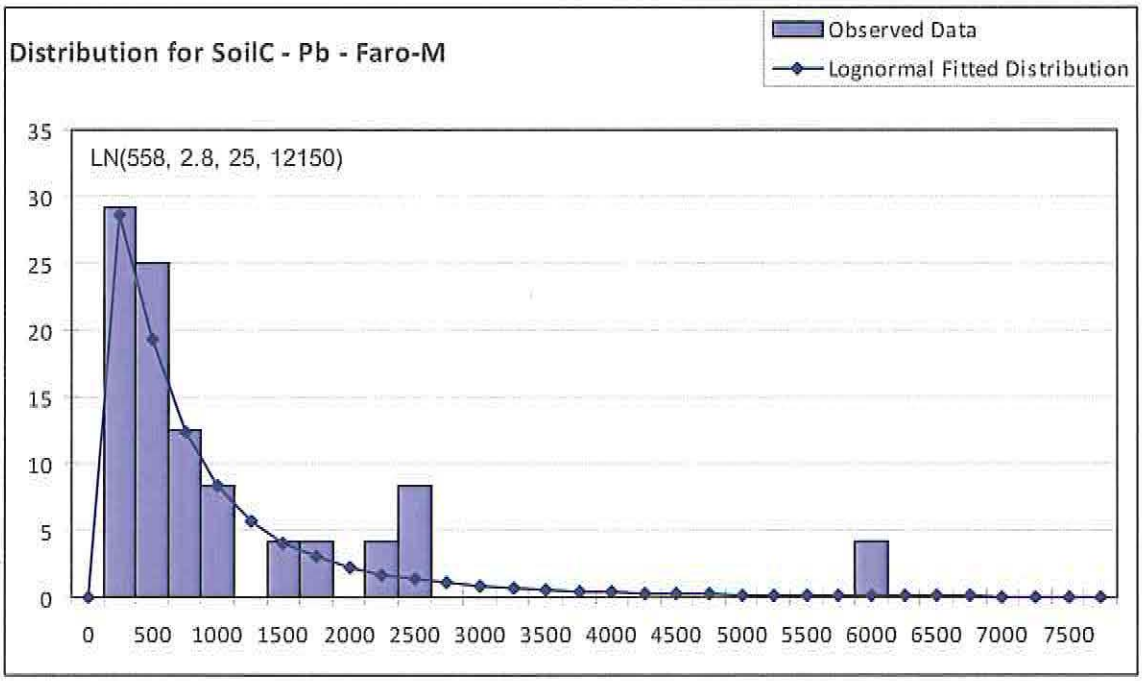

Distribution for SoilC - Pb - Van-S
Observed Data
Triangular Fitted Distribution
T(14.5, 145, 276)
0
50
100
150
200
250
300

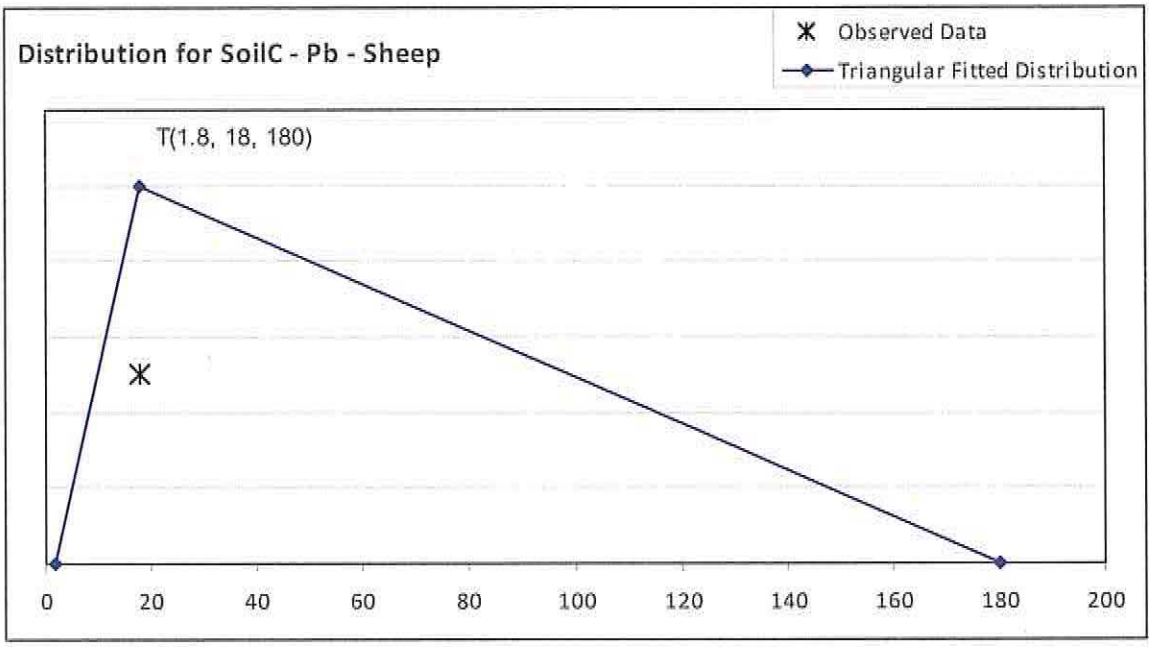

Distribution for SoilC - Pb - Van-M
Observed Data
Lognormal Fitted Distribution
LN(72, 2.1, 8.0, 642)
60
50
40
30
20
10
0
0
50
100
150
200
250
300
350
400
450
500

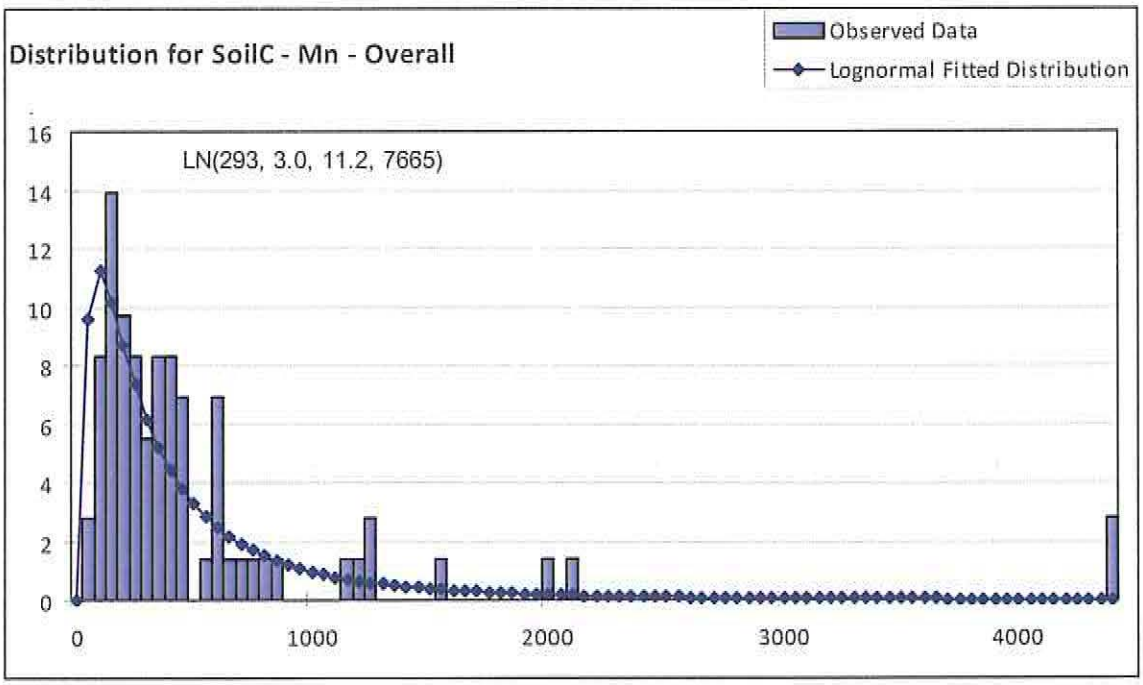

Distribution for SoilC - Pb - Faro-N
Observed Data
Lognormal Fitted Distribution
LN(93, 2.1, 9.6, 908)
45
40
35
30
25
20
15
10
5
0
0
40
80
120
160
200
240
280
320
360
400
440
480
520
560


Distribution for SoilC - Pb - Faro-S
Observed Data
Lognormal Fitted Distribution
LN(874, 2.5, 56, 13517)
35
30
25
20
15
10
5
0
0
2500
5000
7500
10000
12500
15000

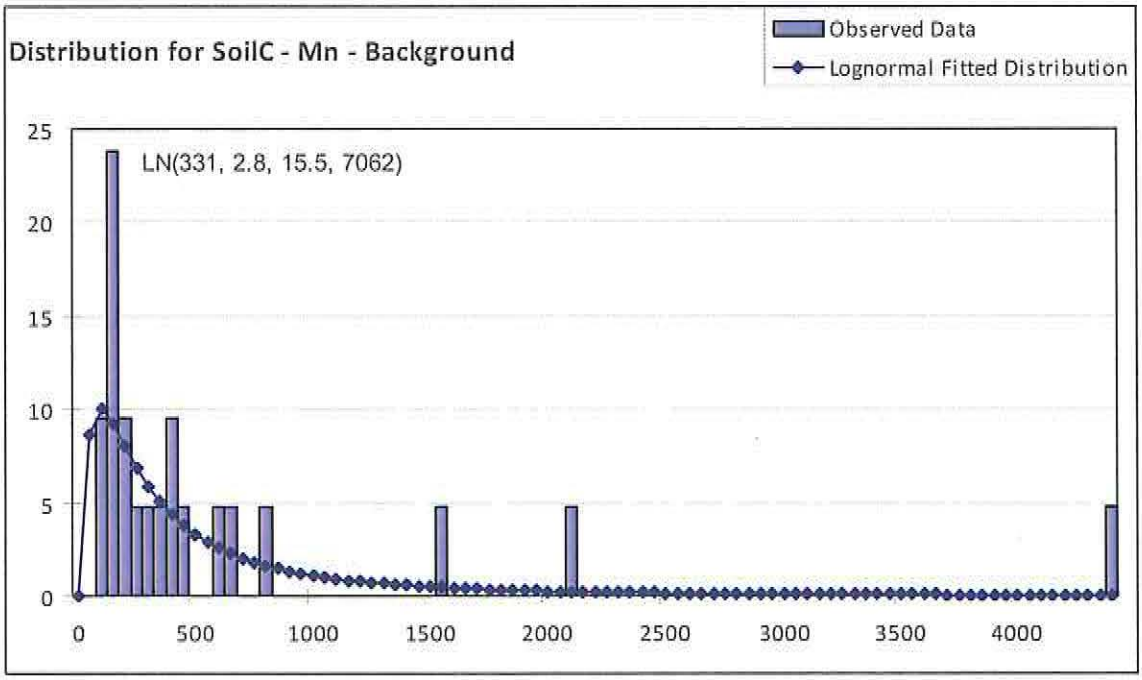

Distribution for SoilC - Pb - Faro-W
Observed Data
Lognormal Fitted Distribution
LN(618, 1.7, 124, 3083)
60
50
40
30
20
10
0
0
400
800
1200
1600
2000
2400
2800
3200

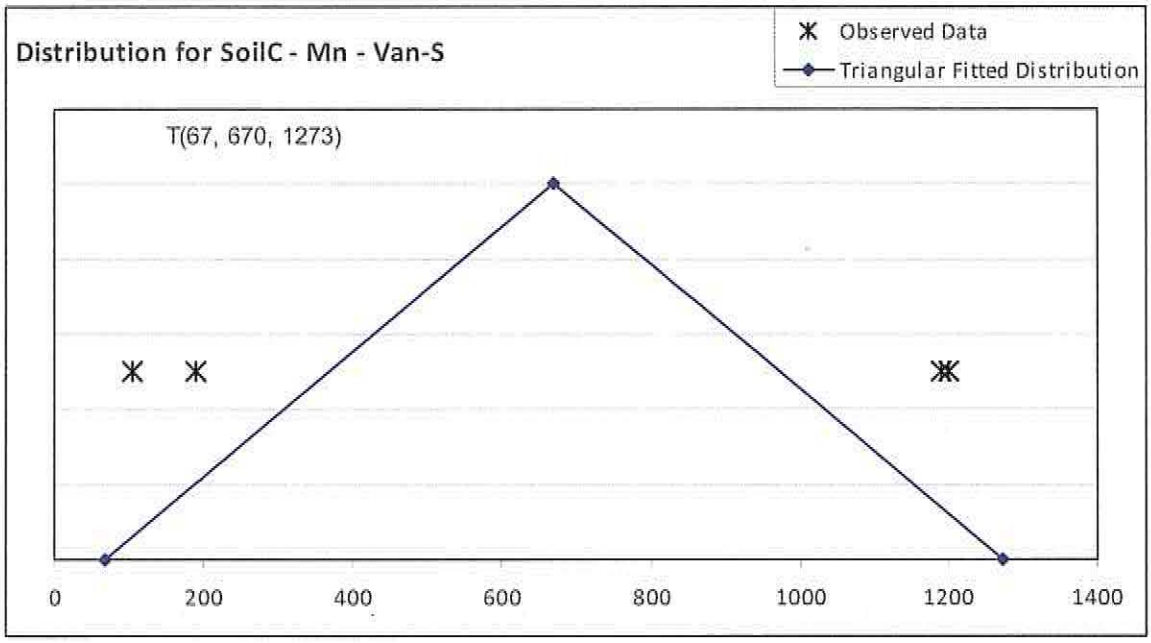

Distribution for SoilC - Pb - Faro-M
Observed Data
Lognormal Fitted Distribution
LN(558, 2.8, 25, 12150)
35
30
25
20
15
10
5
0
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
6000
6500
7000
7500

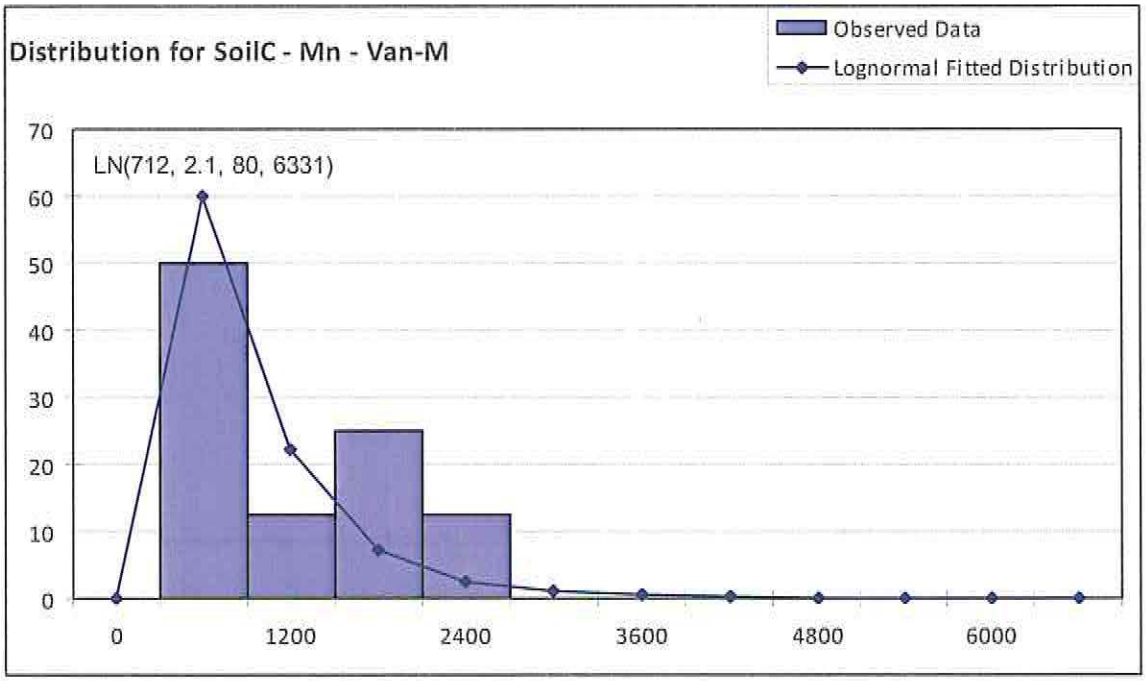


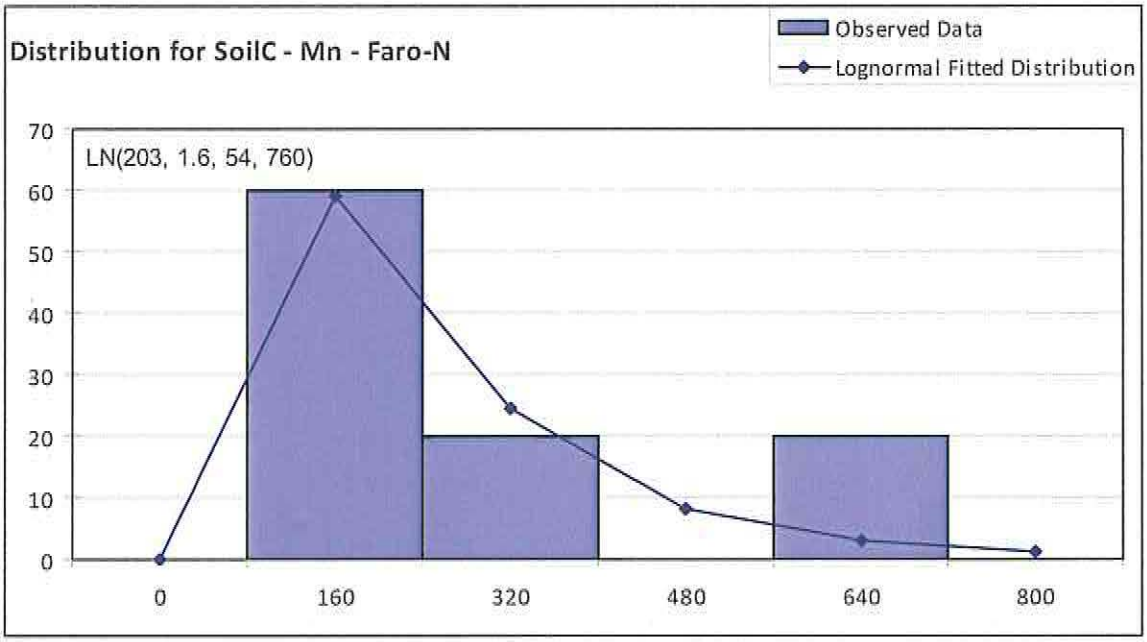


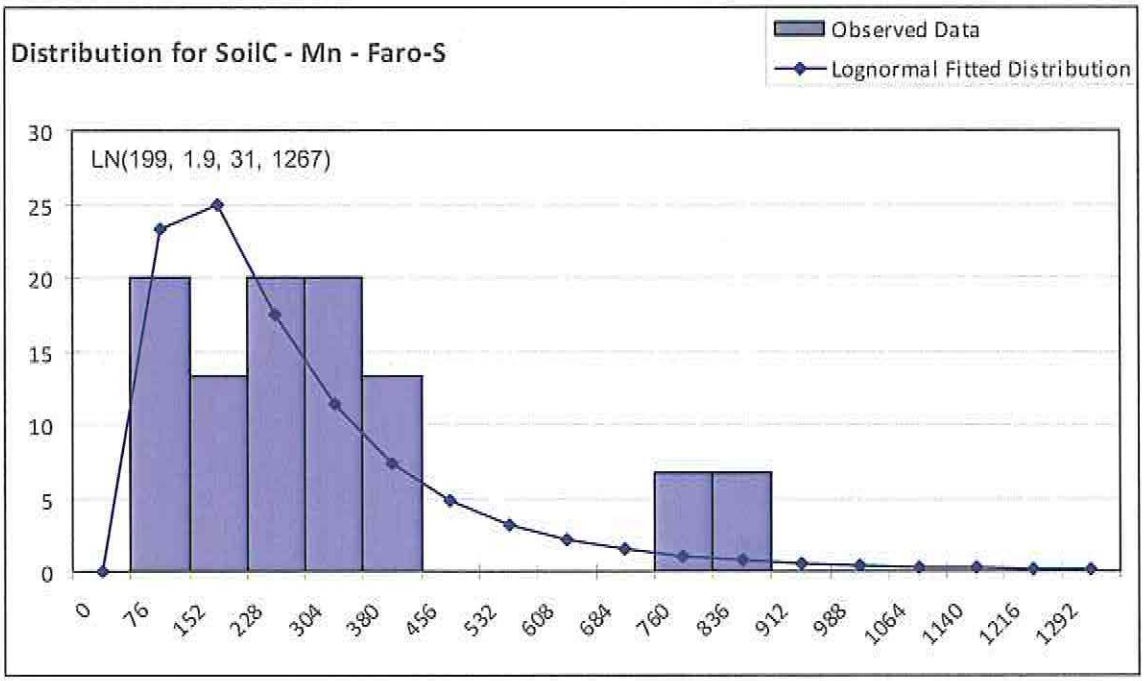
D.3.10 Manganese

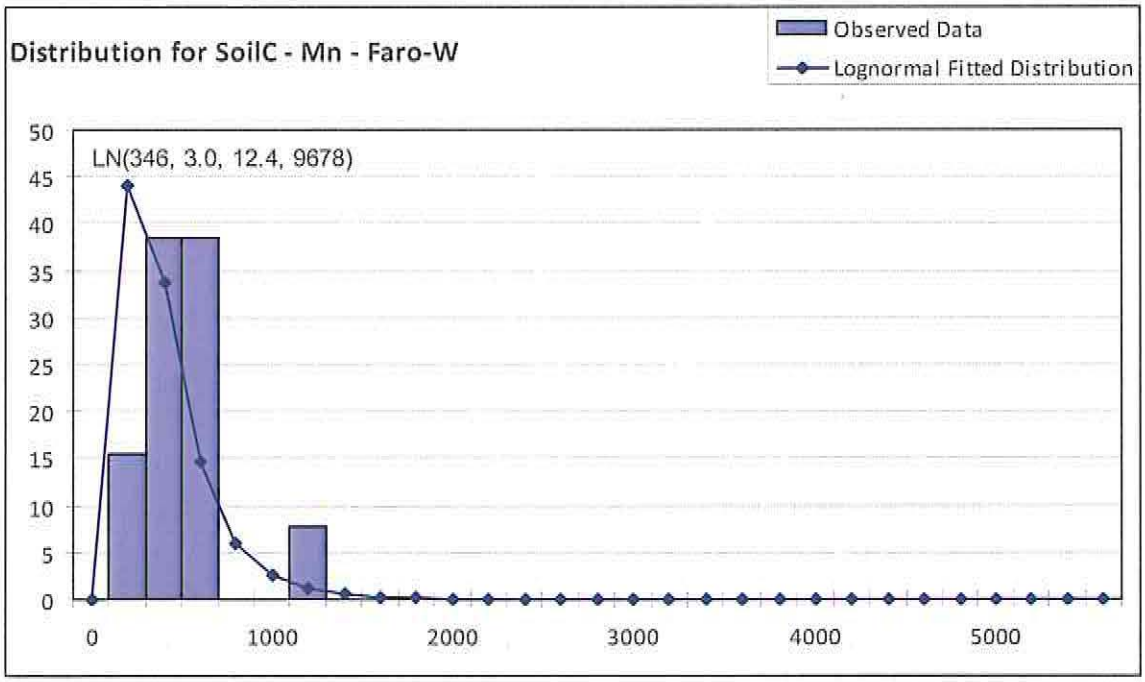

Distribution for SoilC - Mn - Background
Observed Data
Lognormal Fitted Distribution
LN(331, 2.8, 15.5, 7062)
25
20
15
10
5
0
0
500
1000
1500
2000
2500
3000
3500
4000

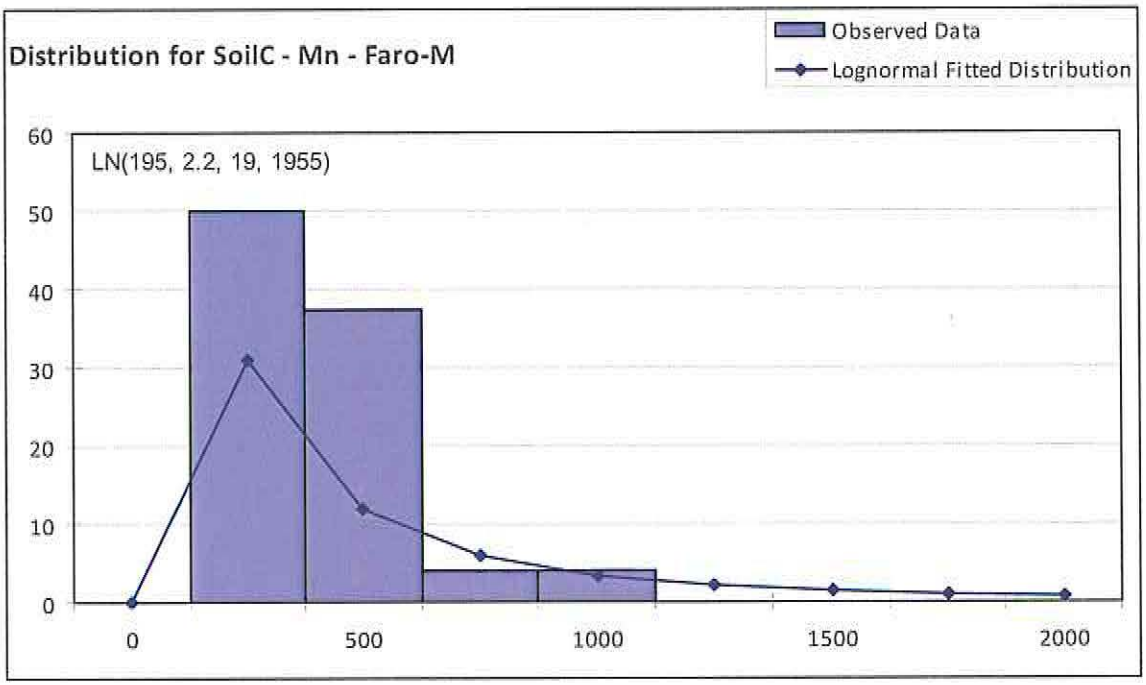

Distribution for SoilC - Mn - Van-S
Observed Data
Triangular Fitted Distribution
T(67, 670, 1273)
0
200
400
600
800
1000
1200
1400

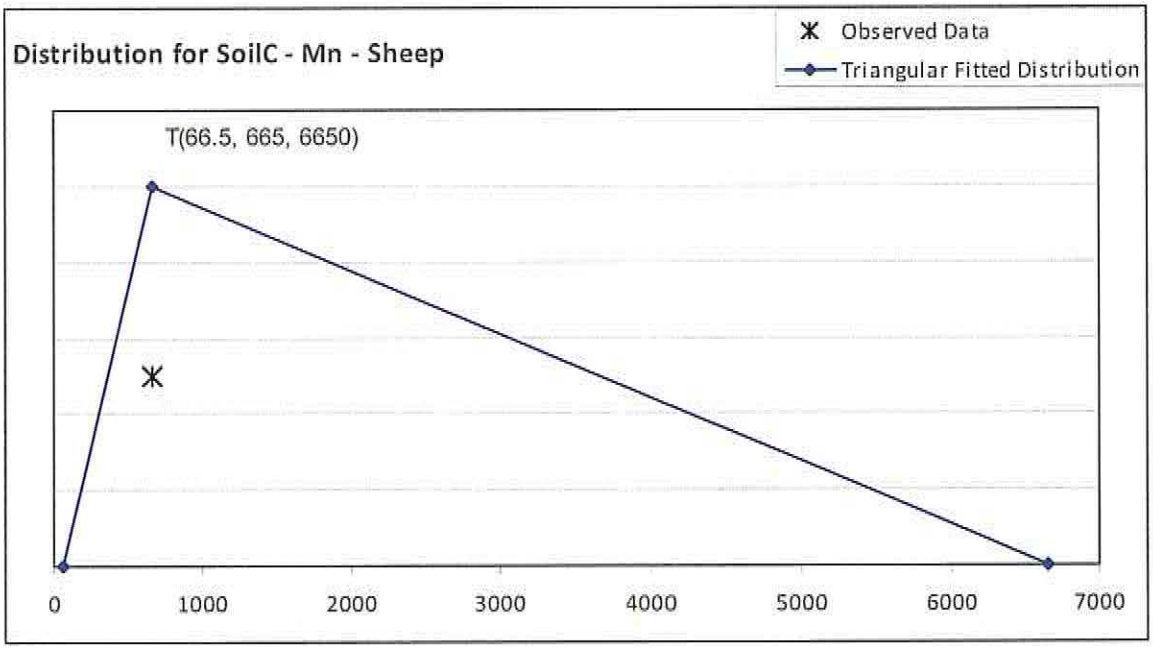

Distribution for SoilC - Mn - Van-M
Observed Data
Lognormal Fitted Distribution
LN(712, 2.1, 80, 6331)
70
60
50
40
30
20
10
0
0
1200
2400
3600
4800
6000


Distribution for SoilC - Mn - Faro-N
Observed Data
Lognormal Fitted Distribution
LN(203, 1.6, 54, 760)
70
60
50
40
30
20
10
0
0
160
320
480
640
800

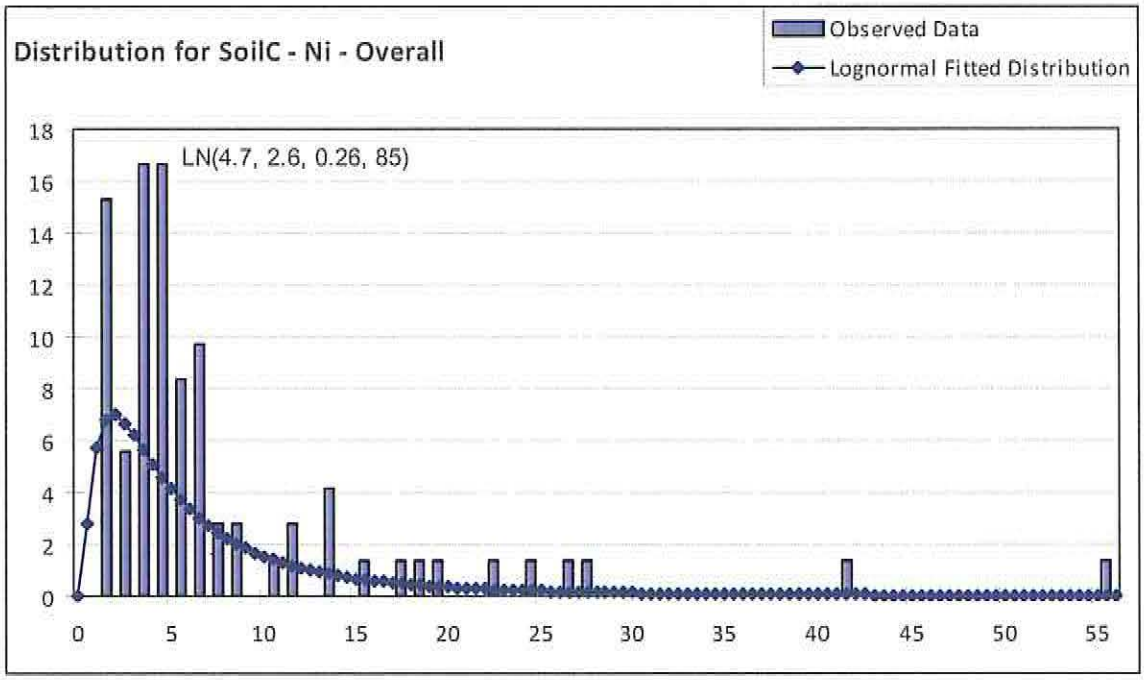

Distribution for SoilC - Mn - Faro-S
Observed Data
Lognormal Fitted Distribution
LN(199, 1.9, 31, 1267)
30
25
20
15
10
5
0
0
76
152
228
304
380
456
532
608
684
760
836
912
988
1064
1140
1216
1292

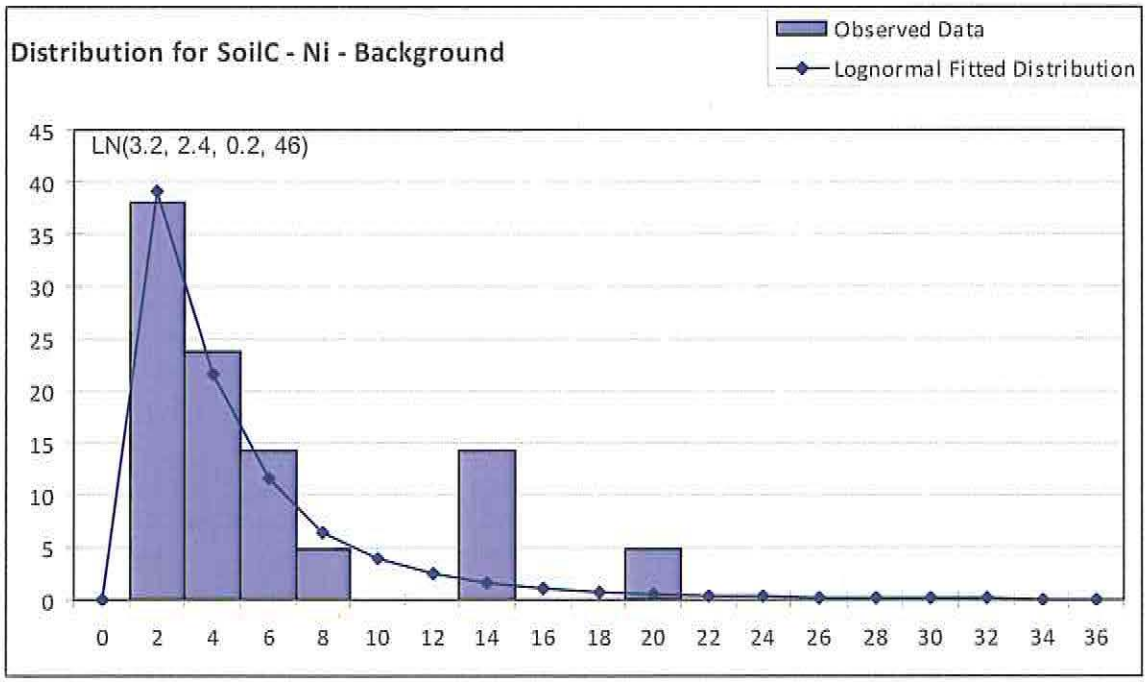

Distribution for SoilC - Mn - Faro-W
Observed Data
Lognormal Fitted Distribution
LN(346, 3.0, 12.4, 9678)
50
45
40
35
30
25
20
15
10
5
0
0
1000
2000
3000
4000
5000

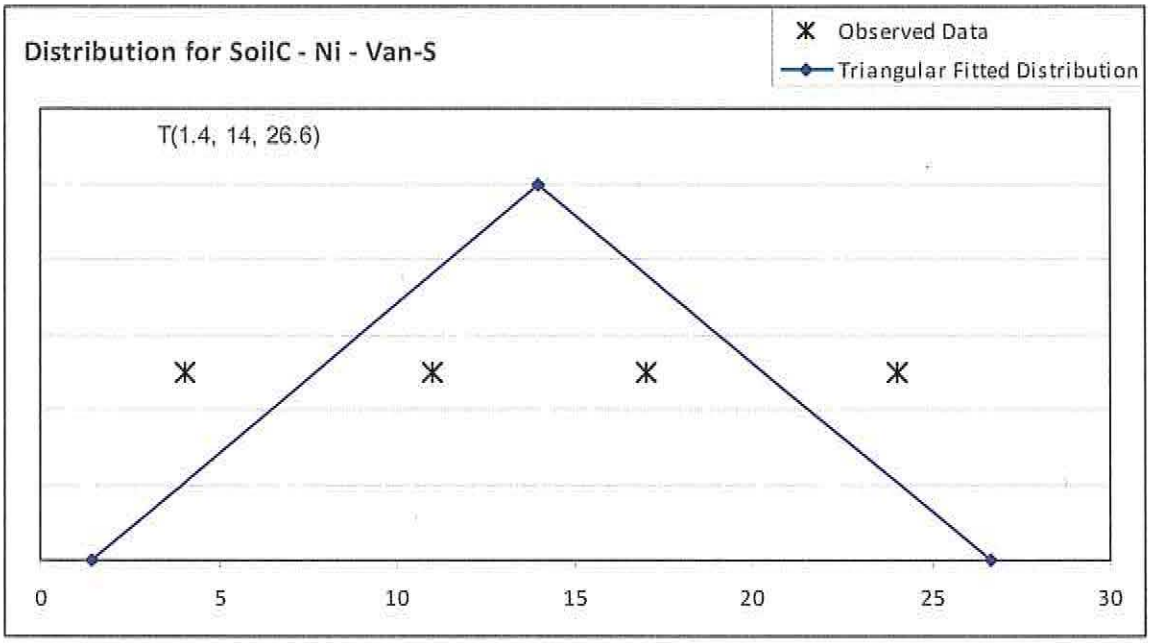

Distribution for SoilC - Mn - Faro-M
Observed Data
Lognormal Fitted Distribution
LN(195, 2.2, 19, 1955)
60
50
40
30
20
10
0
0
500
1000
1500
2000

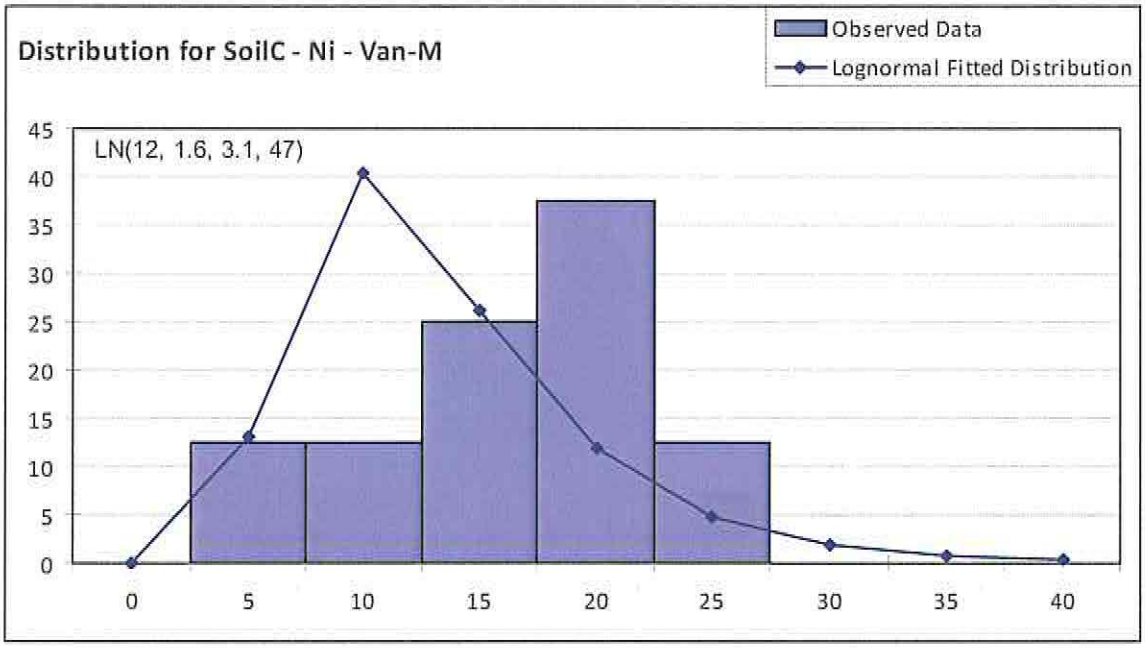

Distribution for SoilC - Mn - Sheep
Observed Data
Triangular Fitted Distribution
T(66.5, 665, 6650)
0
1000
2000
3000
4000
5000
6000
7000

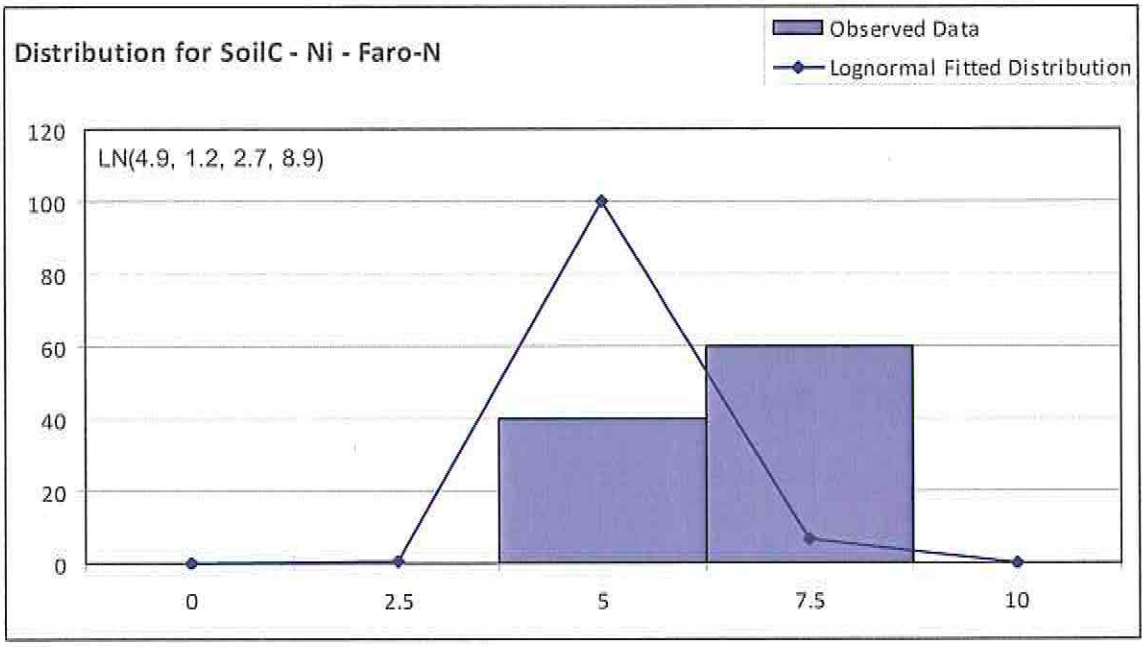
D.3.11 Nickel

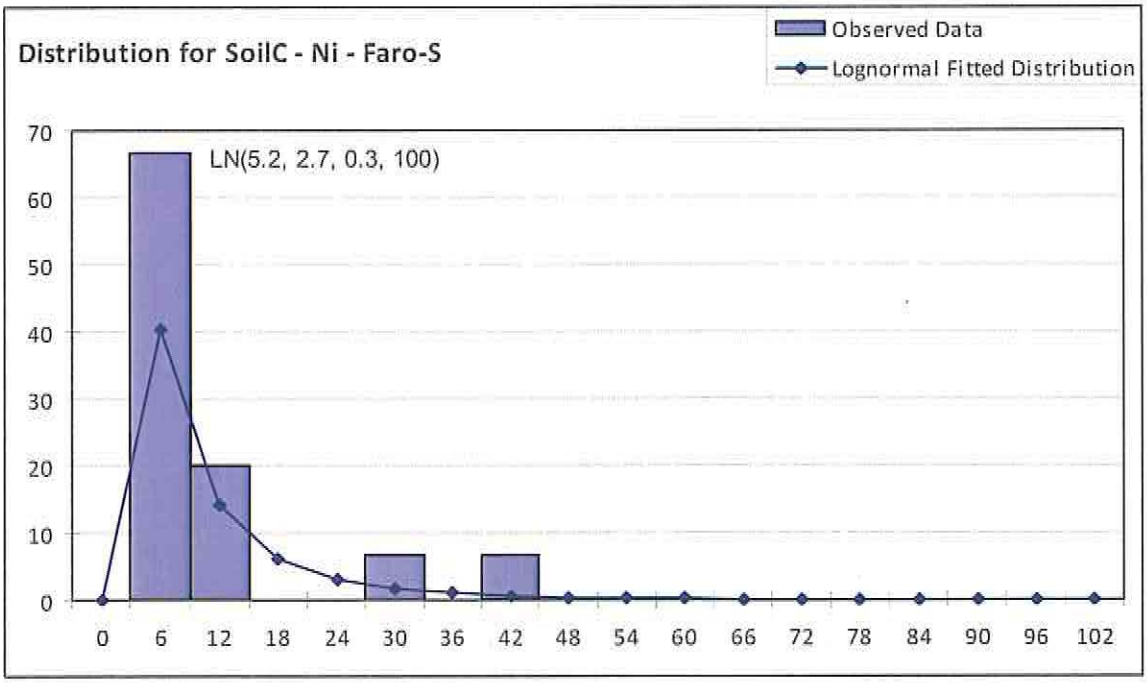

Distribution for SoilC - Ni - Overall
Observed Data
Lognormal Fitted Distribution
LN(4.7, 2.6, 0.26, 85)
0
2
4
6
8
10
12
14
16
18
0
5
10
15
20
25
30
35
40
45
50
55

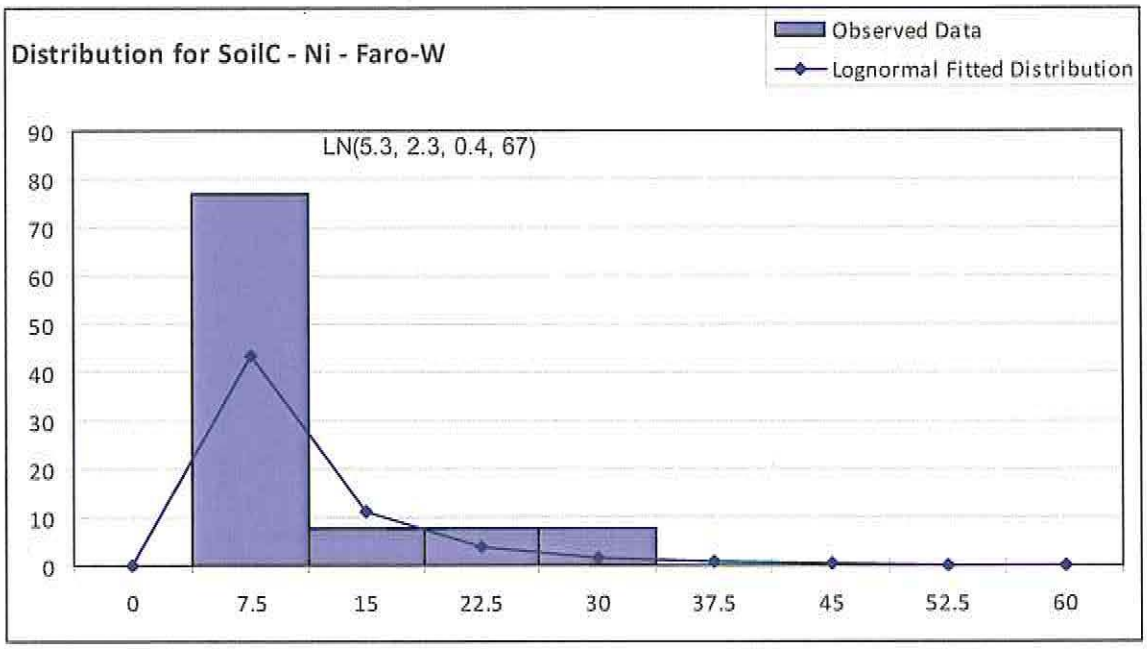

Distribution for SoilC - Ni - Background
Observed Data
Lognormal Fitted Distribution
LN(3.2, 2.4, 0.2, 46)
0
5
10
15
20
25
30
35
40
45
0
2
4
6
8
10
12
14
16
18
20
22
24
26
28
30
32
34
36

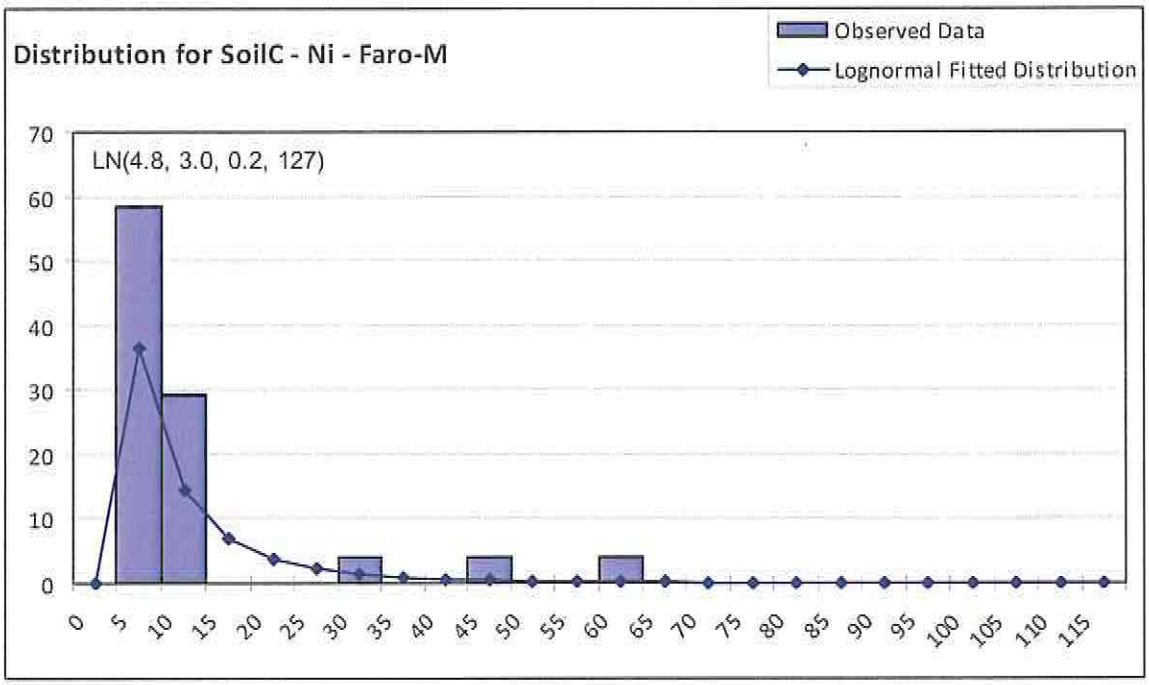

Distribution for SoilC - Ni - Van-S
Observed Data
Triangular Fitted Distribution
T(1.4, 14, 26.6)
0
5
10
15
20
25
30

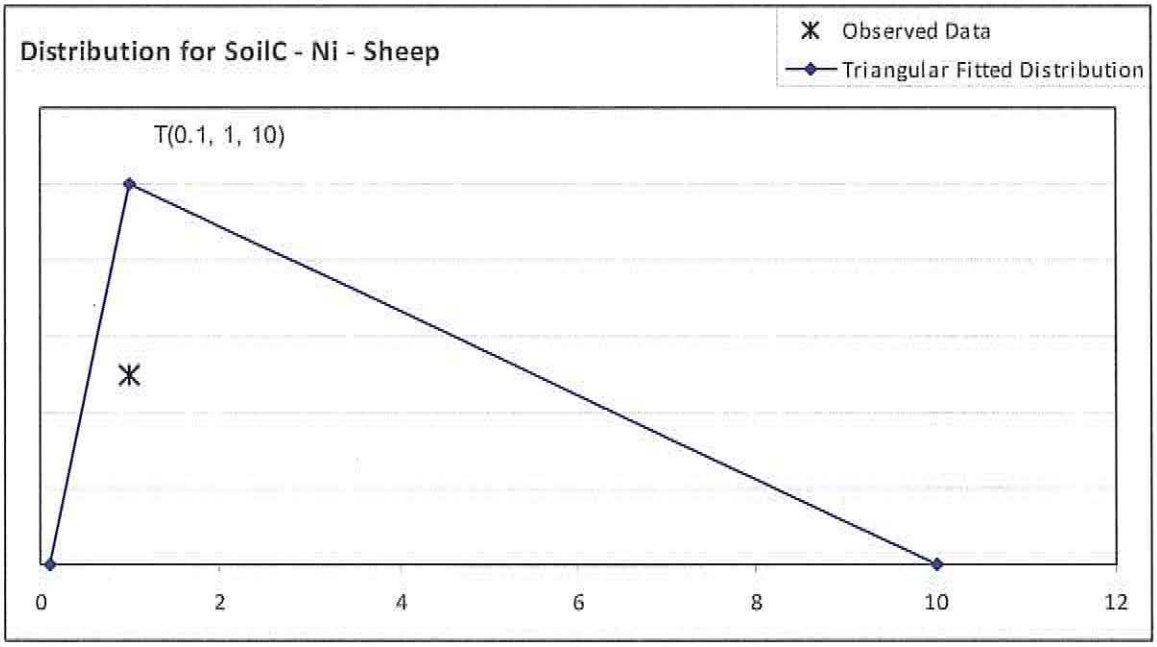

Distribution for SoilC - Ni - Van-M
Observed Data
Lognormal Fitted Distribution
LN(12, 1.6, 3.1, 47)
45
40
35
30
25
20
15
10
5
0
0
5
10
15
20
25
30
35
40


Distribution for SoilC - Ni - Faro-N
Observed Data
Lognormal Fitted Distribution
LN(4.9, 1.2, 2.7, 8.9)
120
100
80
60
40
20
0
0
2.5
5
7.5
10

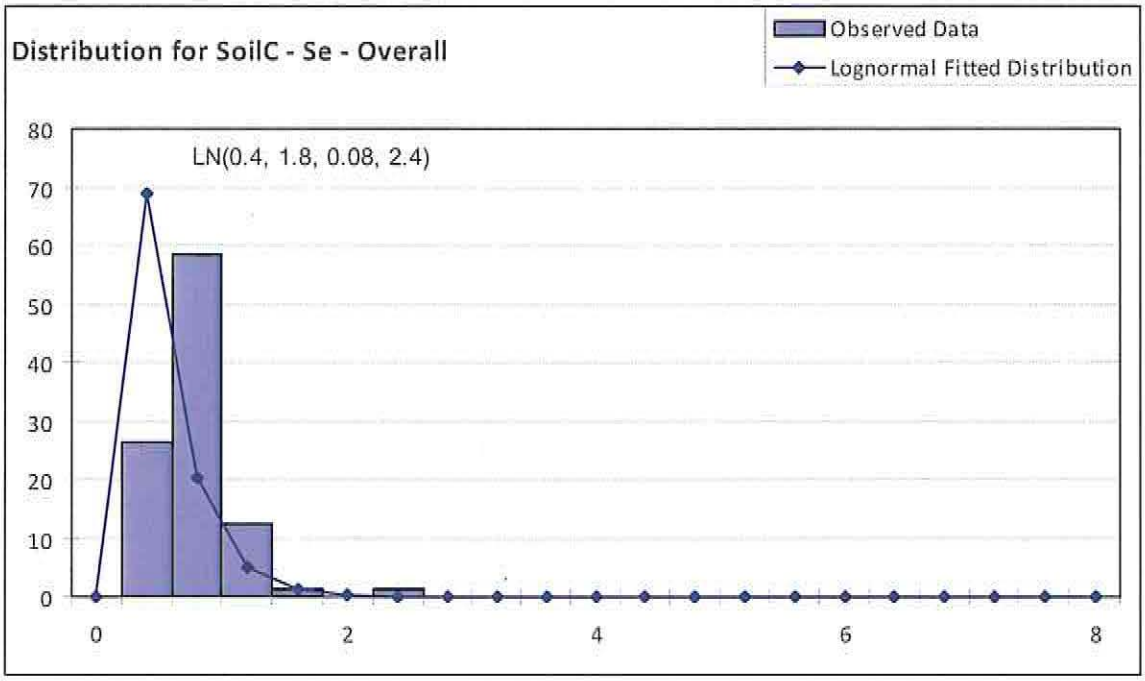

Distribution for SoilC - Ni - Faro-S
Observed Data
Lognormal Fitted Distribution
LN(5.2, 2.7, 0.3, 100)
70
60
50
40
30
20
10
0
0
6
12
18
24
30
36
42
48
54
60
66
72
78
84
90
96
102

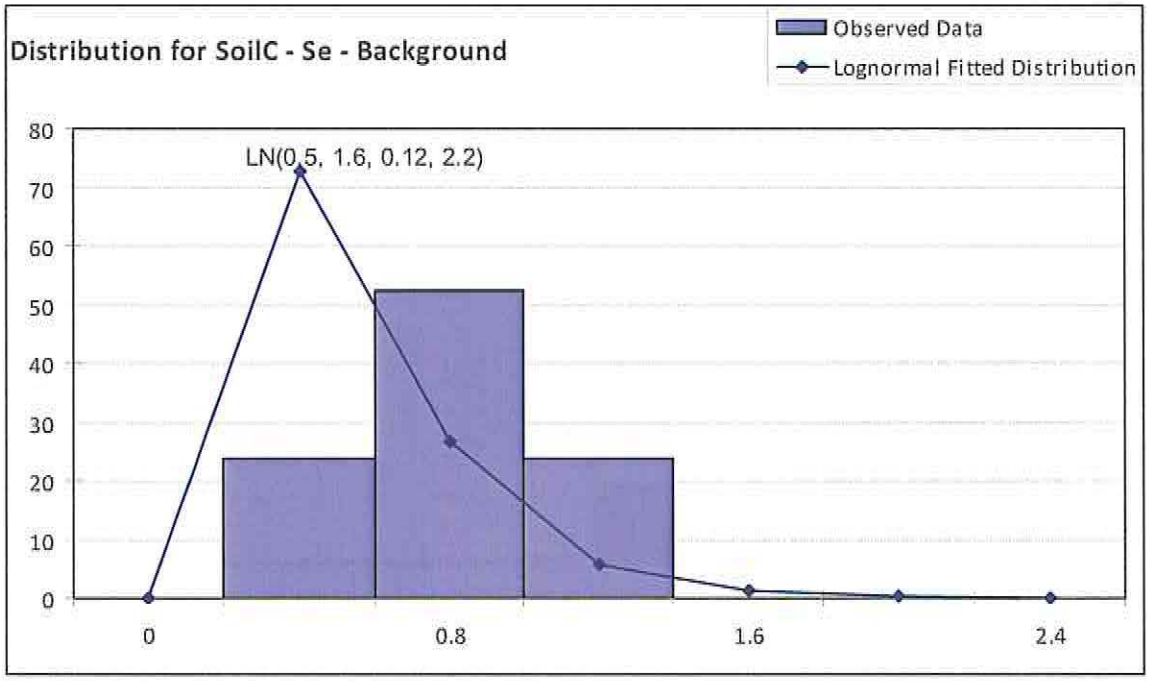

Distribution for SoilC - Ni - Faro-W
Observed Data
Lognormal Fitted Distribution
LN(5.3, 2.3, 0.4, 67)
90
80
70
60
50
40
30
20
10
0
0
7.5
15
22.5
30
37.5
45
52.5
60

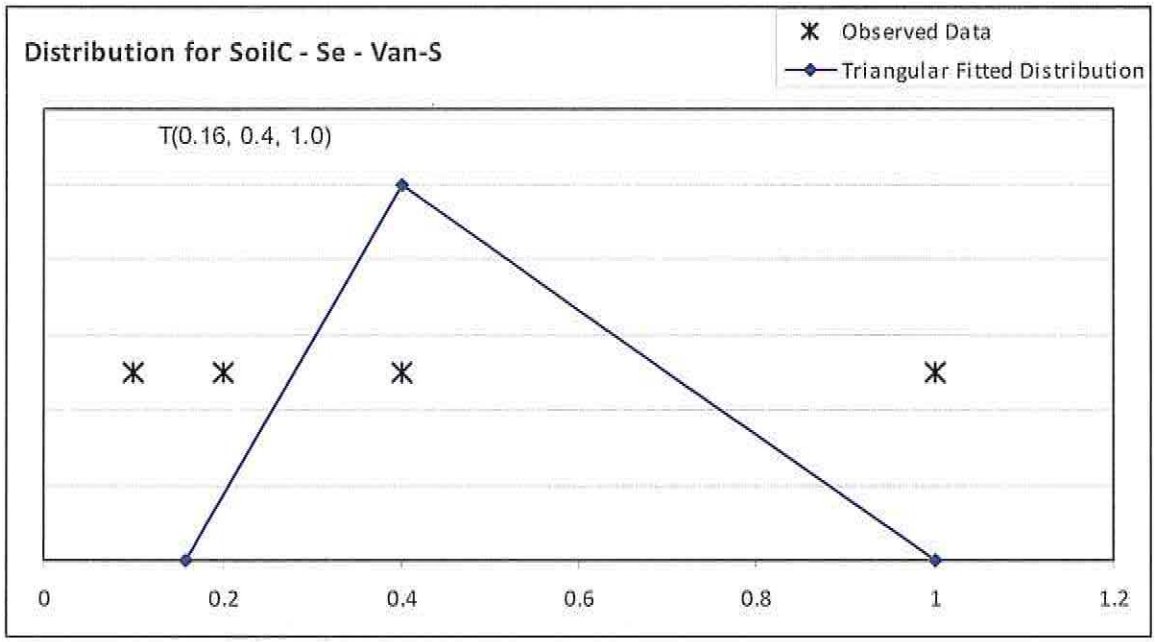

Distribution for SoilC - Ni - Faro-M
Observed Data
Lognormal Fitted Distribution
LN(4.8, 3.0, 0.2, 127)
70
60
50
40
30
20
10
0
0
5
10
15
20
25
30
35
40
45
50
55
60
65
70
75
80
85
90
95
100
105
110
115

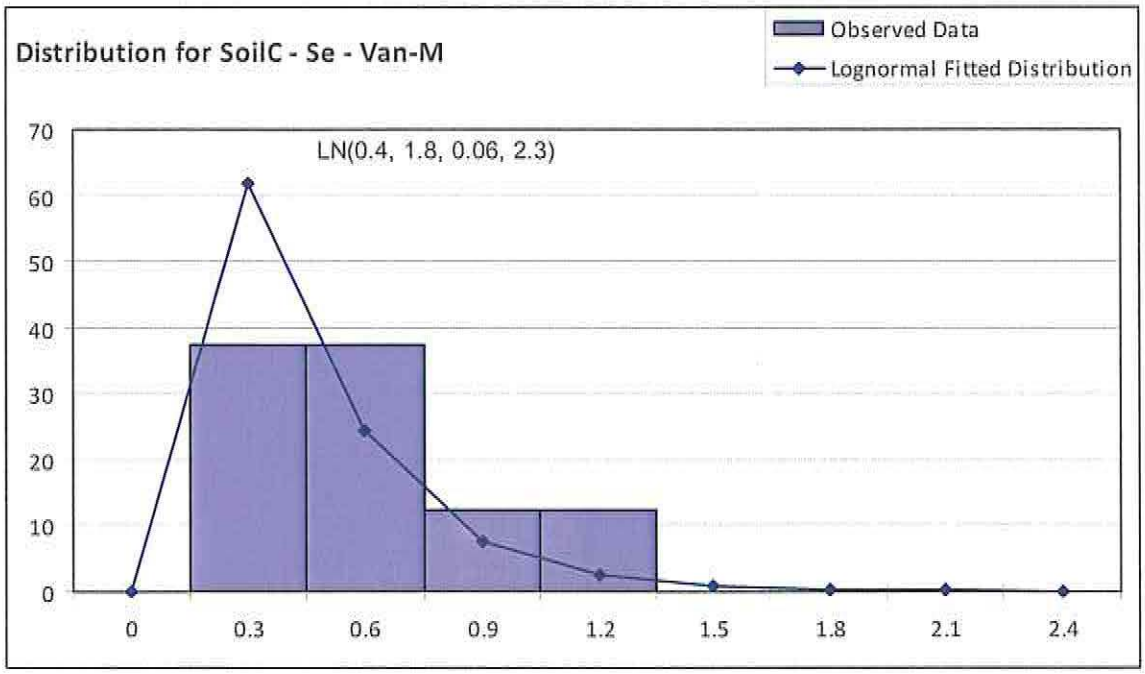


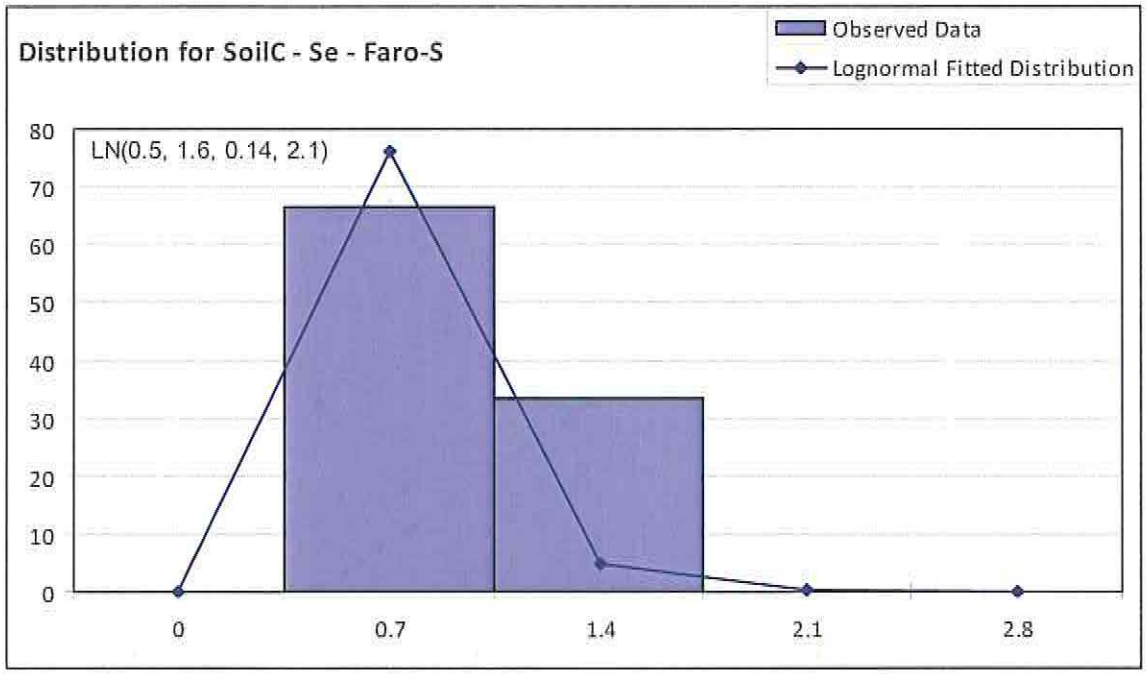
D.3.12 Selenium

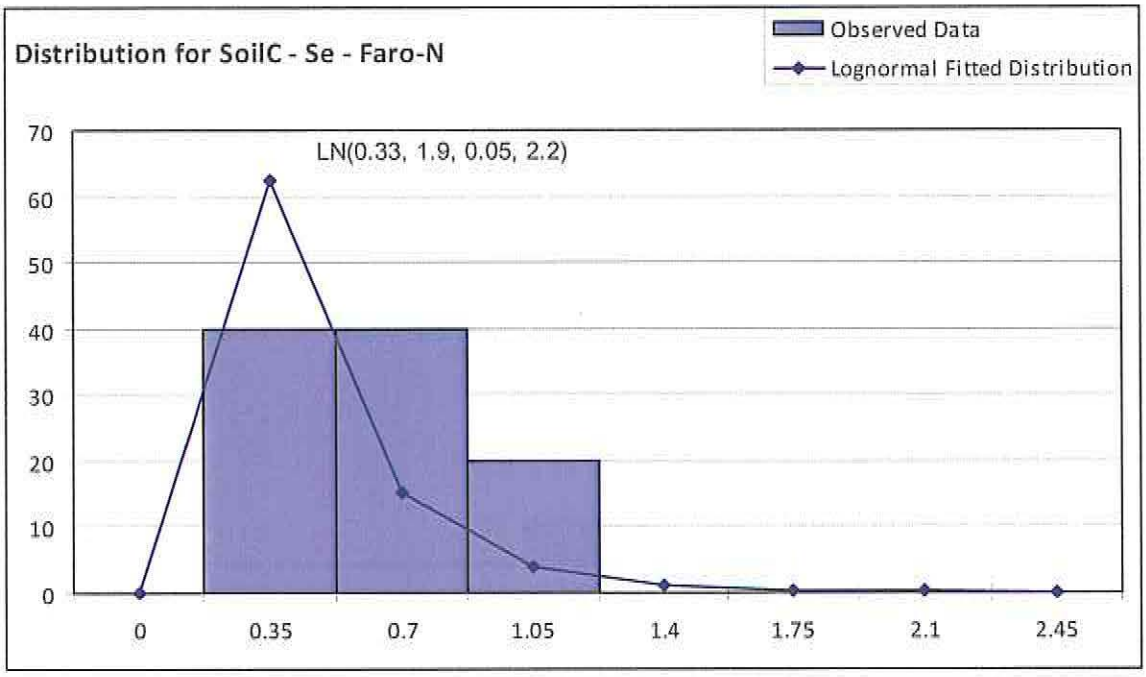


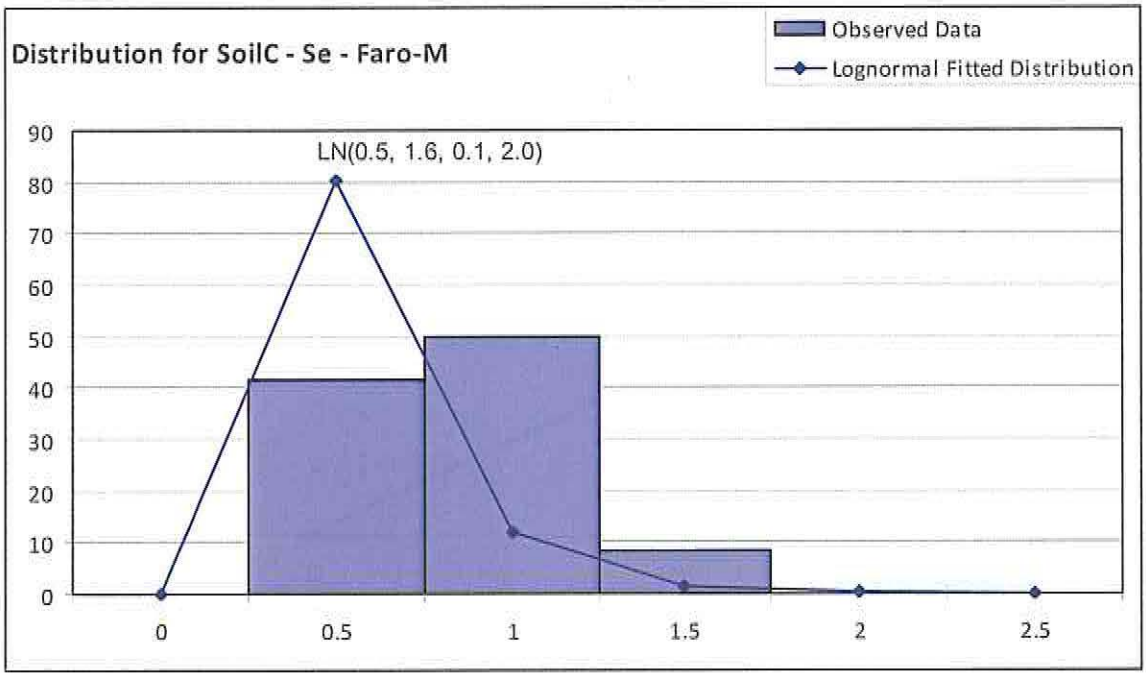

Distribution for SoilC - Se - Background
Observed Data
Lognormal Fitted Distribution
LN(0.5, 1.6, 0.12, 2.2)
80
70
60
50
40
30
20
10
0
0
0.8
1.6
2.4

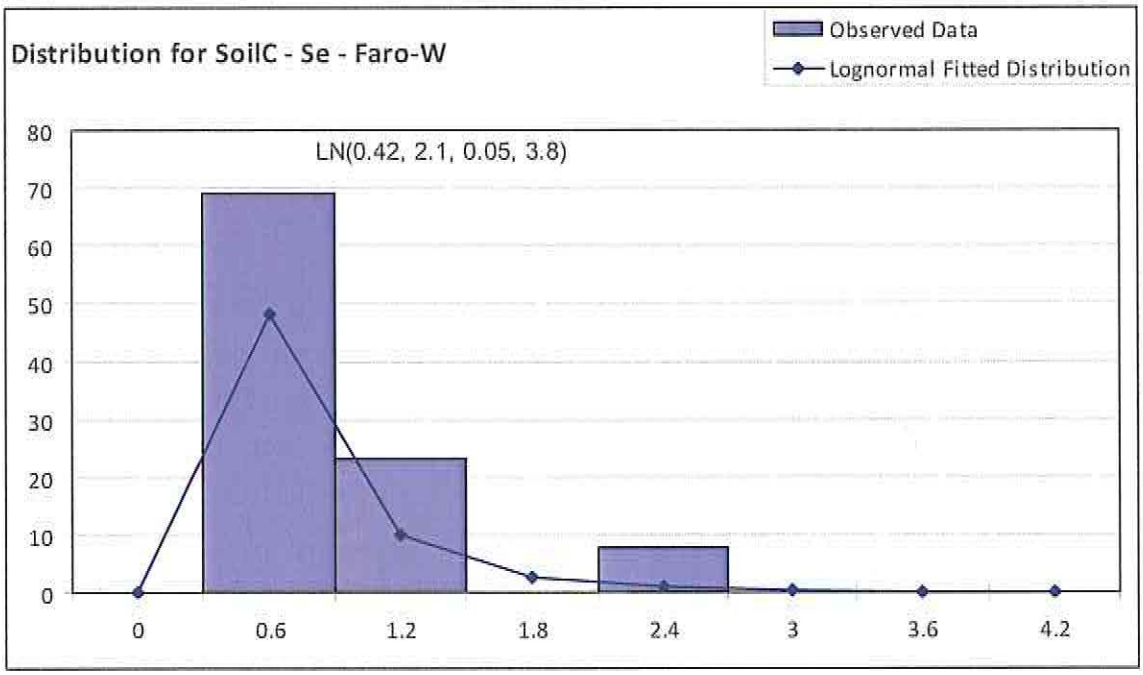

Distribution for SoilC - Se - Van-S
Observed Data
Triangular Fitted Distribution
T(0.16, 0.4, 1.0)
0
0.2
0.4
0.6
0.8
1
1.2

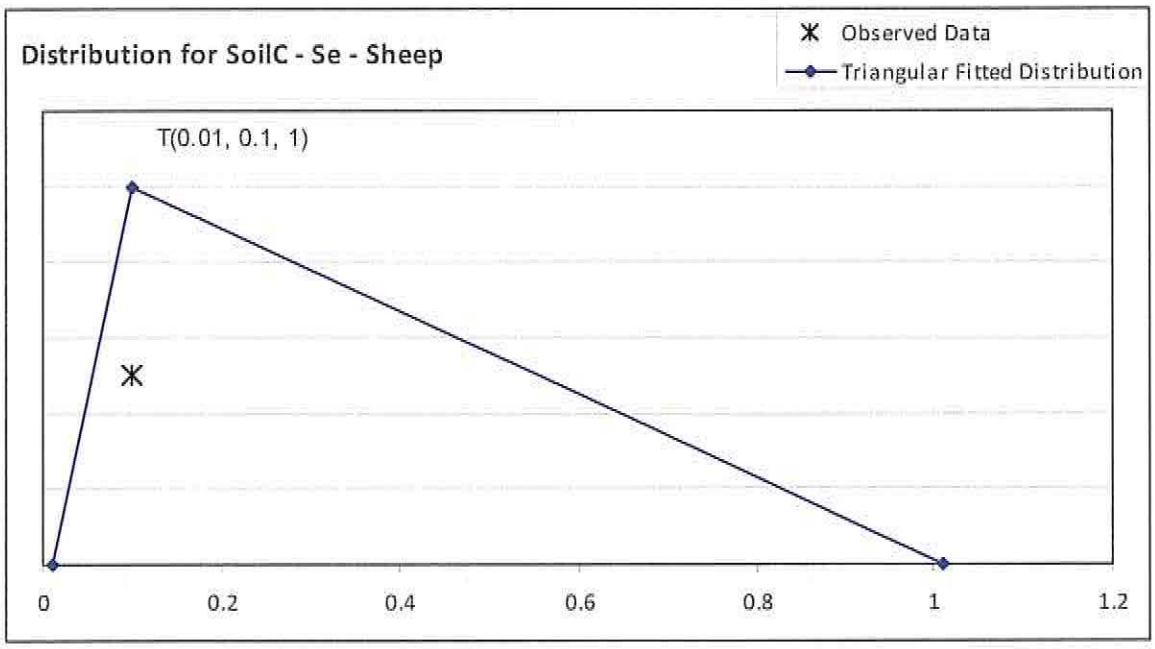

Distribution for SoilC - Se - Van-M
Observed Data
Lognormal Fitted Distribution
LN(0.4, 1.8, 0.06, 2.3)
70
60
50
40
30
20
10
0
0
0.3
0.6
0.9
1.2
1.5
1.8
2.1
2.4


Distribution for SoilC - Se - Faro-S
Observed Data
Lognormal Fitted Distribution
LN(0.5, 1.6, 0.14, 2.1)
80
70
60
50
40
30
20
10
0
0
0.7
1.4
2.1
2.8

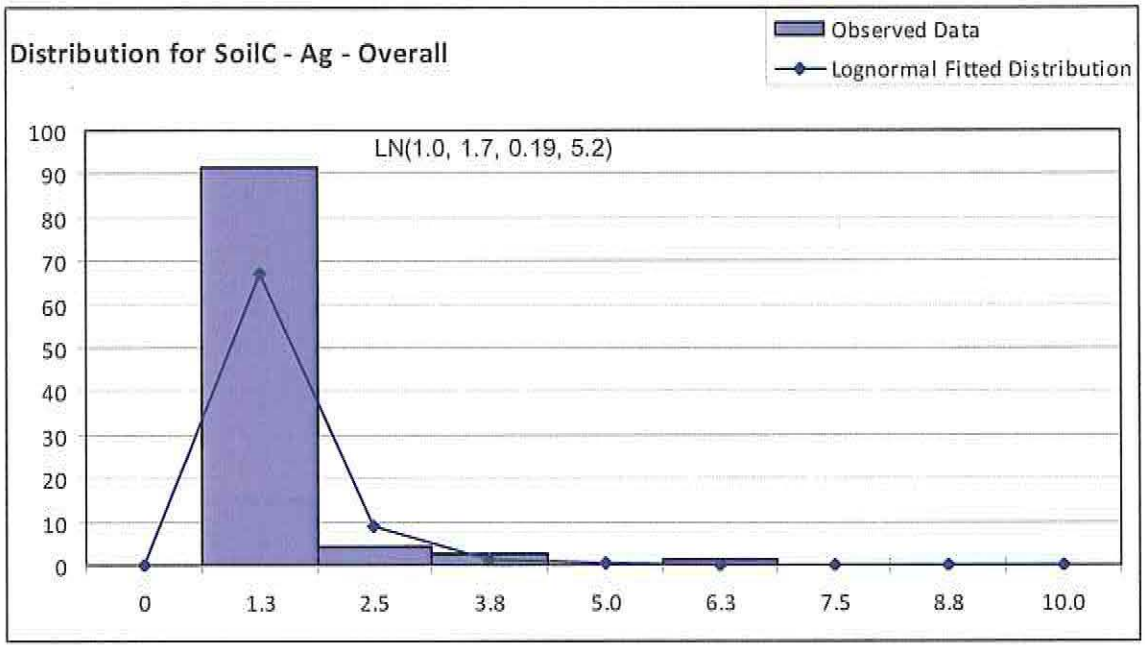

Distribution for SoilC - Se - Faro-N
Observed Data
Lognormal Fitted Distribution
LN(0.33, 1.9, 0.05, 2.2)
70
60
50
40
30
20
10
0
0
0.35
0.7
1.05
1.4
1.75
2.1
2.45

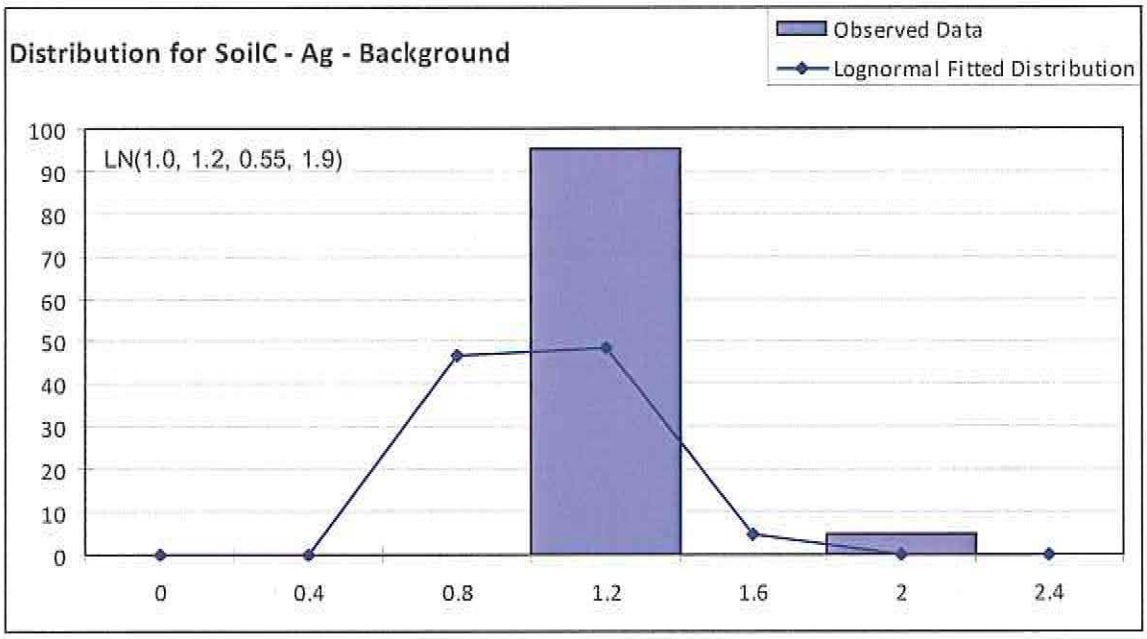

Distribution for SoilC - Se - Faro-M
Observed Data
Lognormal Fitted Distribution
LN(0.5, 1.6, 0.1, 2.0)
90
80
70
60
50
40
30
20
10
0
0
0.5
1
1.5
2
2.5

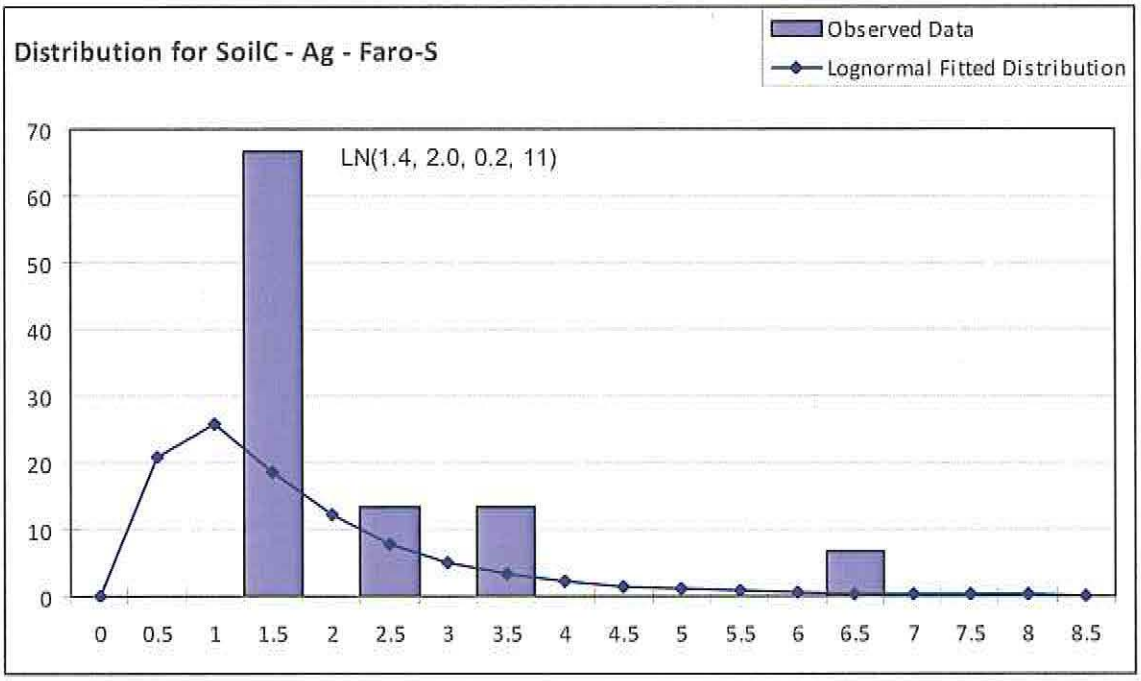

Distribution for SoilC - Se - Faro-W
Observed Data
Lognormal Fitted Distribution
LN(0.42, 2.1, 0.05, 3.8)
80
70
60
50
40
30
20
10
0
0
0.6
1.2
1.8
2.4
3
3.6
4.2

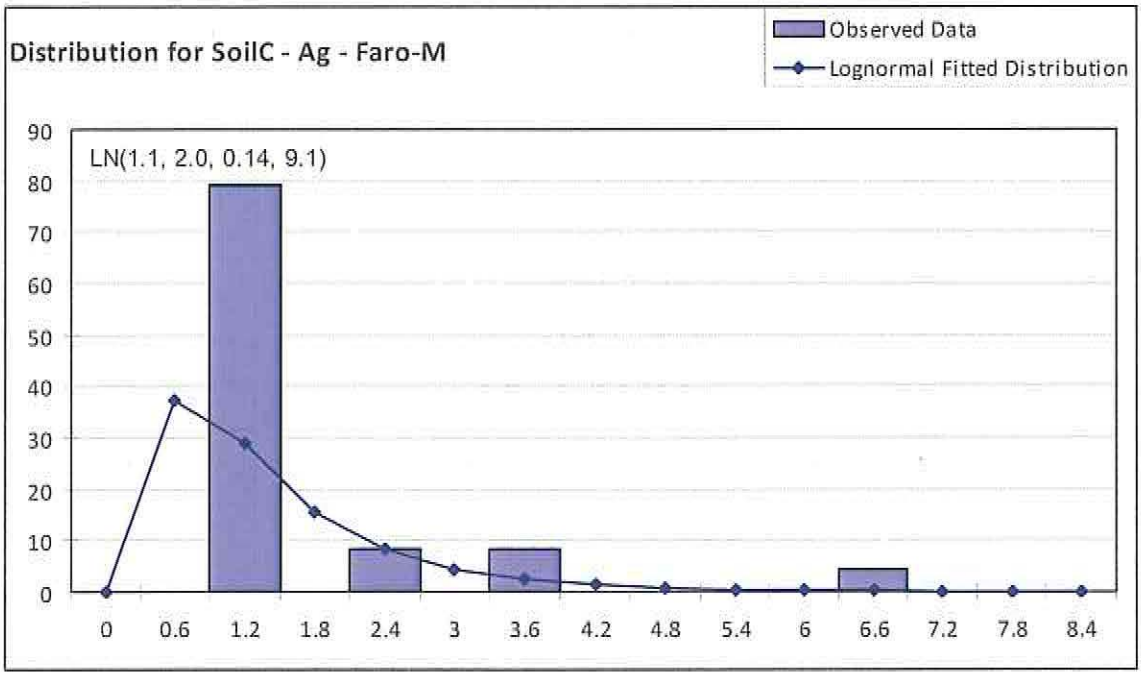

Distribution for SoilC - Se - Sheep
Observed Data
Triangular Fitted Distribution
T(0.01, 0.1, 1)
0
0.2
0.4
0.6
0.8
1
1.2

D.3.13 Silver

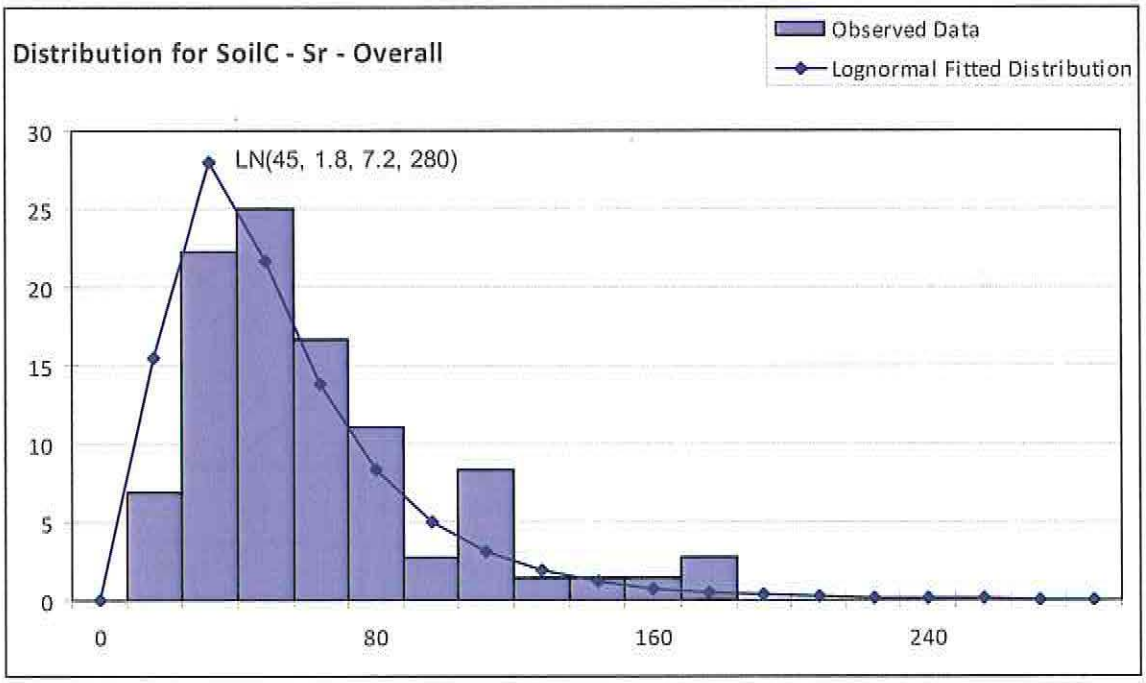

Distribution for SoilC - Ag - Overall
Observed Data
Lognormal Fitted Distribution
LN(1.0, 1.7, 0.19, 5.2)
100
90
80
70
60
50
40
30
20
10
0
0
1.3
2.5
3.8
5.0
6.3
7.5
8.8
10.0

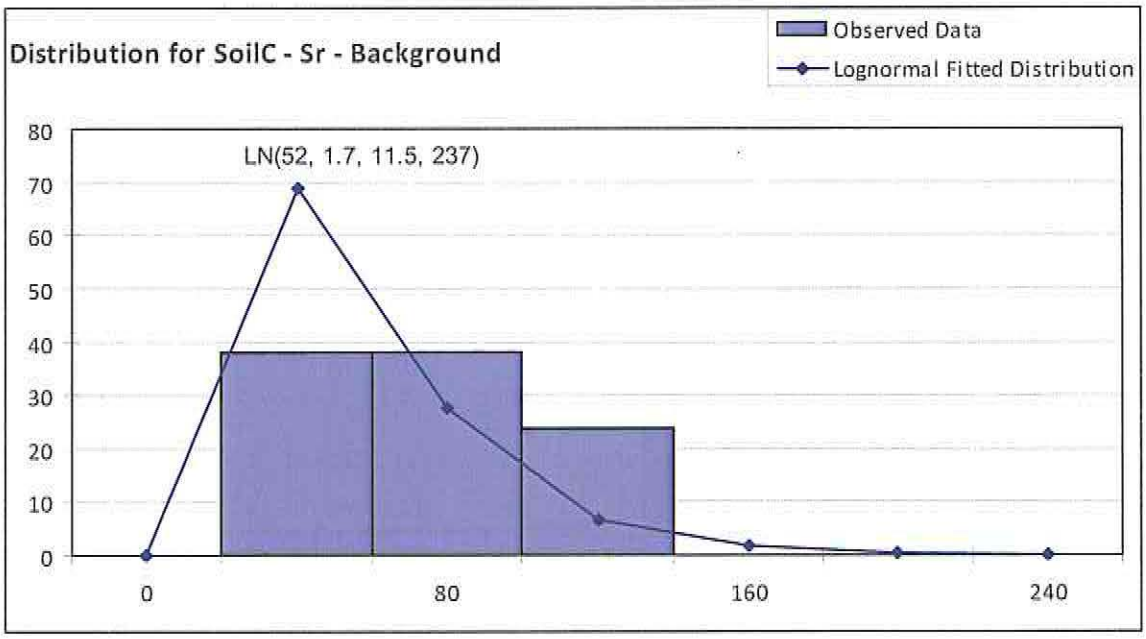

Distribution for SoilC - Ag - Background
Observed Data
Lognormal Fitted Distribution
LN(1.0, 1.2, 0.55, 1.9)
100
90
80
70
60
50
40
30
20
10
0
0
0.4
0.8
1.2
1.6
2
2.4

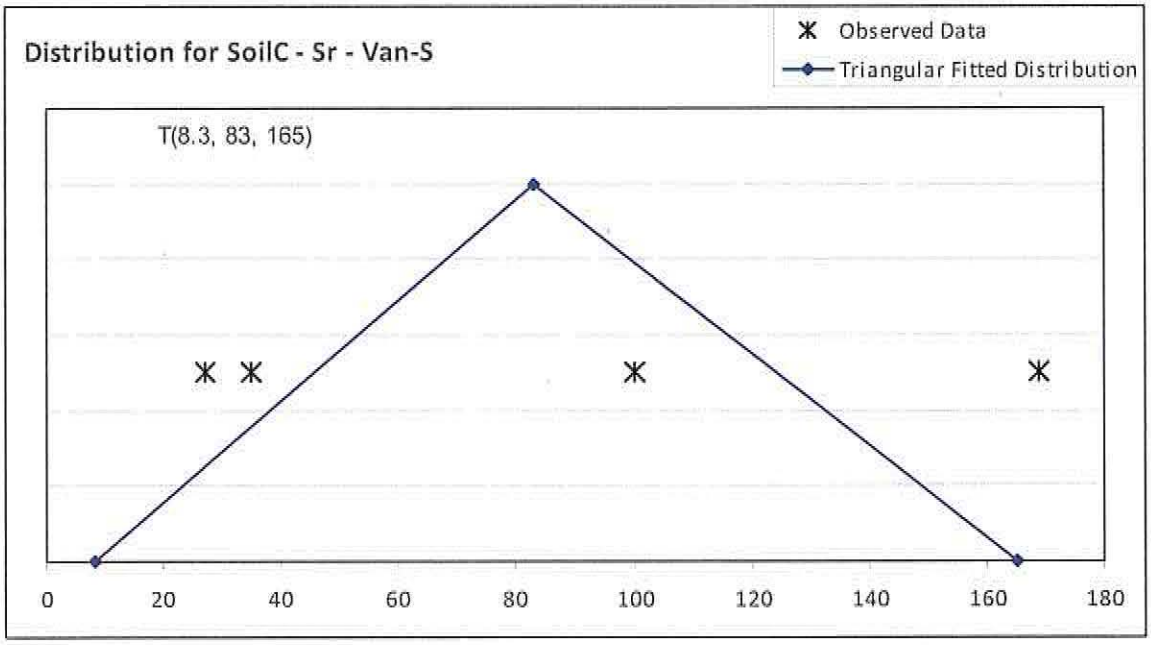

Distribution for SoilC - Ag - Faro-S
Observed Data
Lognormal Fitted Distribution
LN(1.4, 2.0, 0.2, 11)
70
60
50
40
30
20
10
0
0
0.5
1
1.5
2
2.5
3
3.5
4
4.5
5
5.5
6
6.5
7
7.5
8
8.5

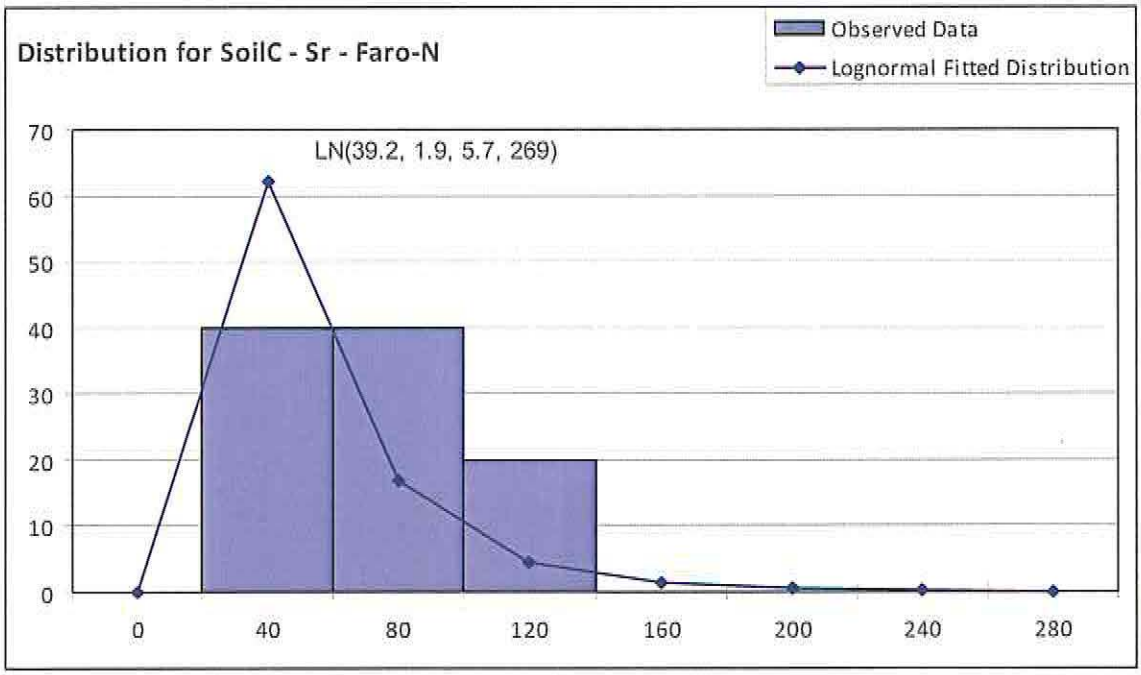

Distribution for SoilC - Ag - Faro-M
Observed Data
Lognormal Fitted Distribution
LN(1.1, 2.0, 0.14, 9.1)
90
80
70
60
50
40
30
20
10
0
0
0.6
1.2
1.8
2.4
3
3.6
4.2
4.8
5.4
6
6.6
7.2
7.8
8.4

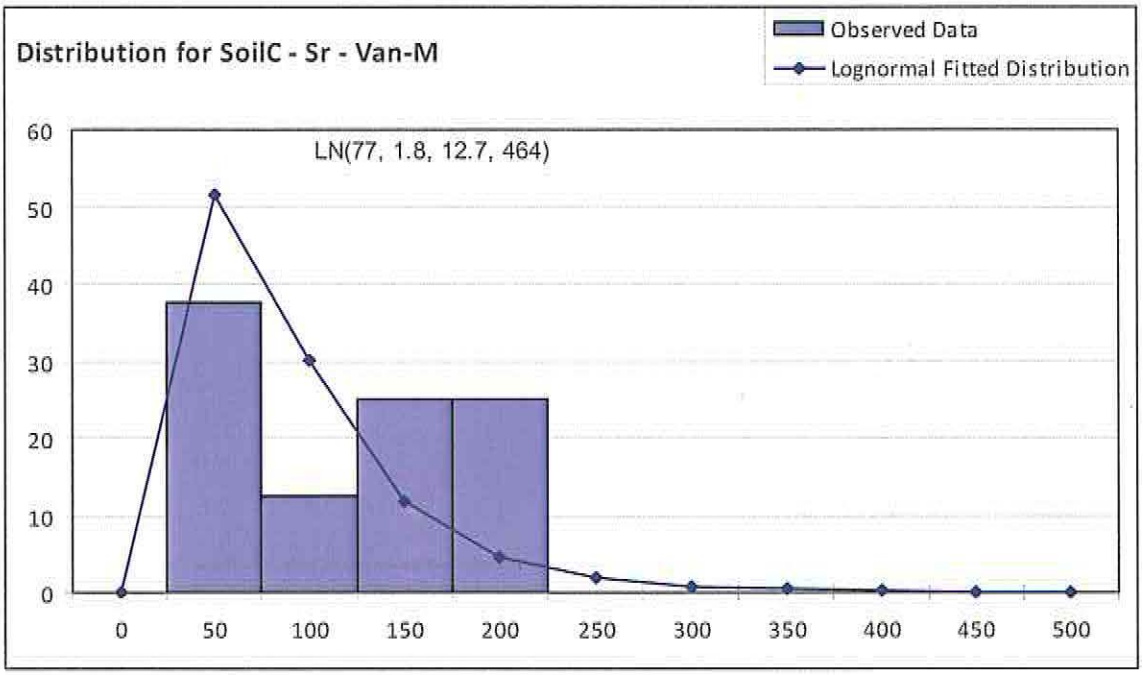
D.3.14 Strontium

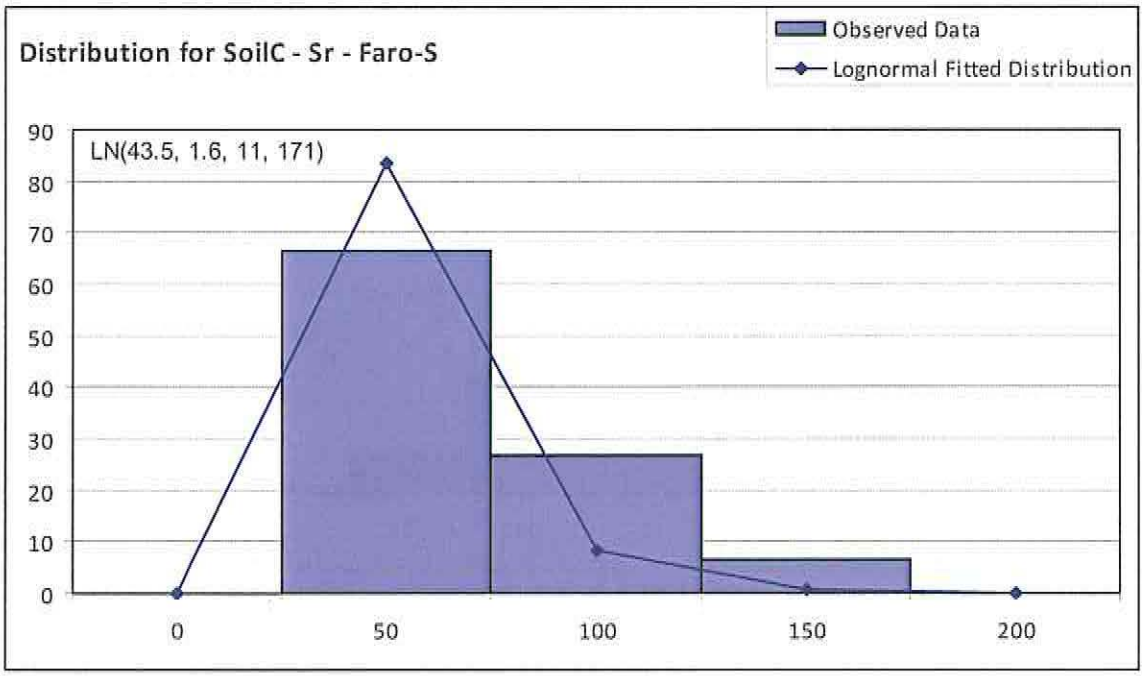


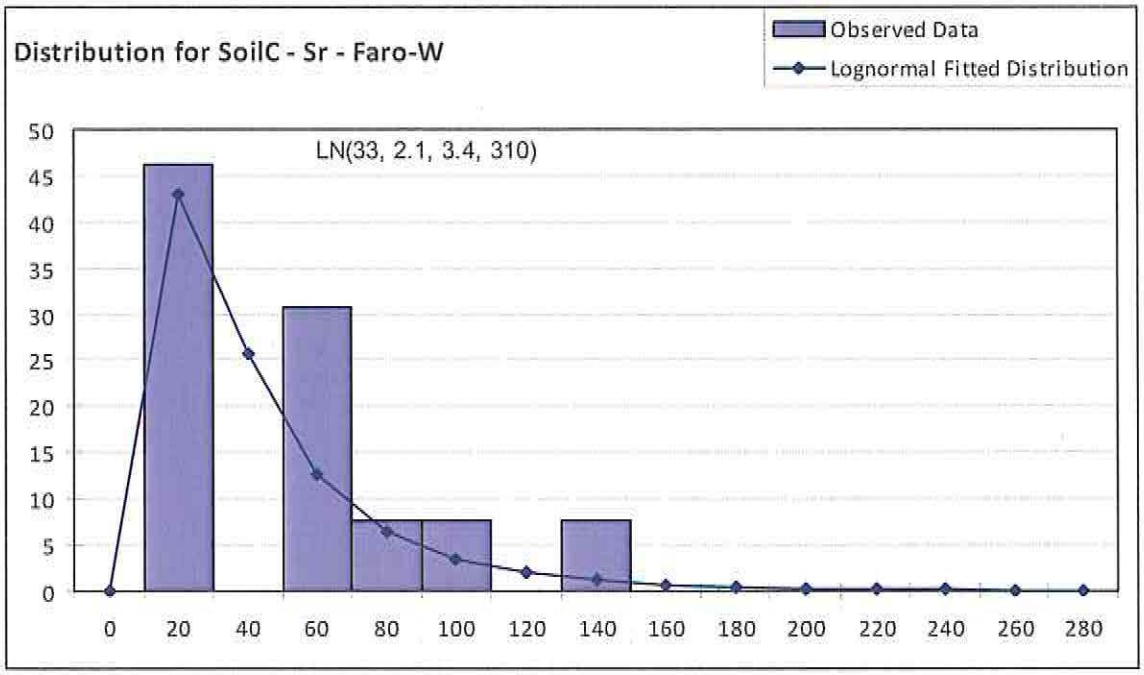


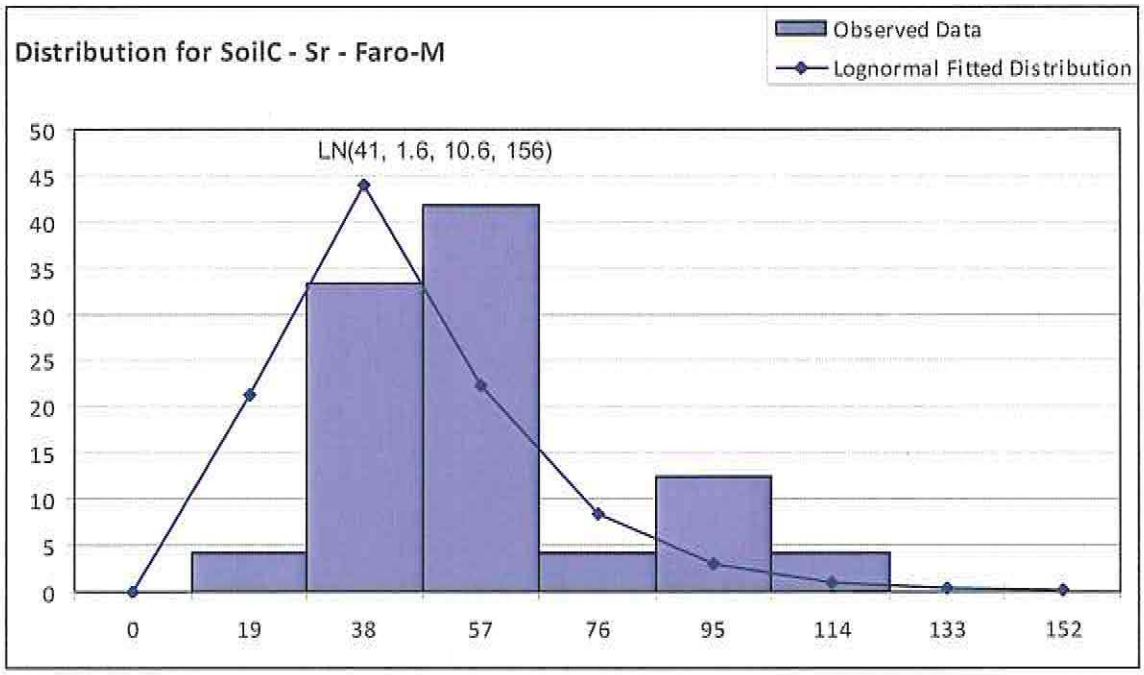

Distribution for SoilC - Sr - Van-S
Observed Data
Triangular Fitted Distribution
T(8.3, 83, 165)
0
20
40
60
80
100
120
140
160
180

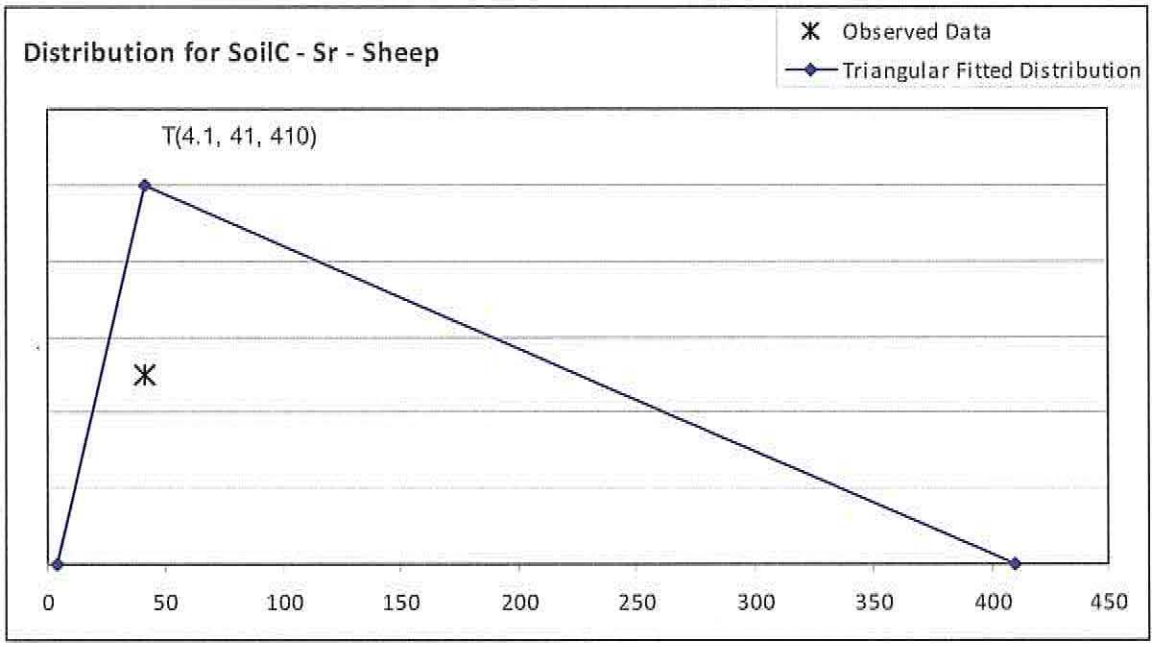

Distribution for SoilC - Sr - Faro-N
Observed Data
Lognormal Fitted Distribution
LN(39.2, 1.9, 5.7, 269)
70
60
50
40
30
20
10
0
0
40
80
120
160
200
240
280


Distribution for SoilC - Sr - Van-M
Observed Data
Lognormal Fitted Distribution
LN(77, 1.8, 12.7, 464)
60
50
40
30
20
10
0
0
50
100
150
200
250
300
350
400
450
500

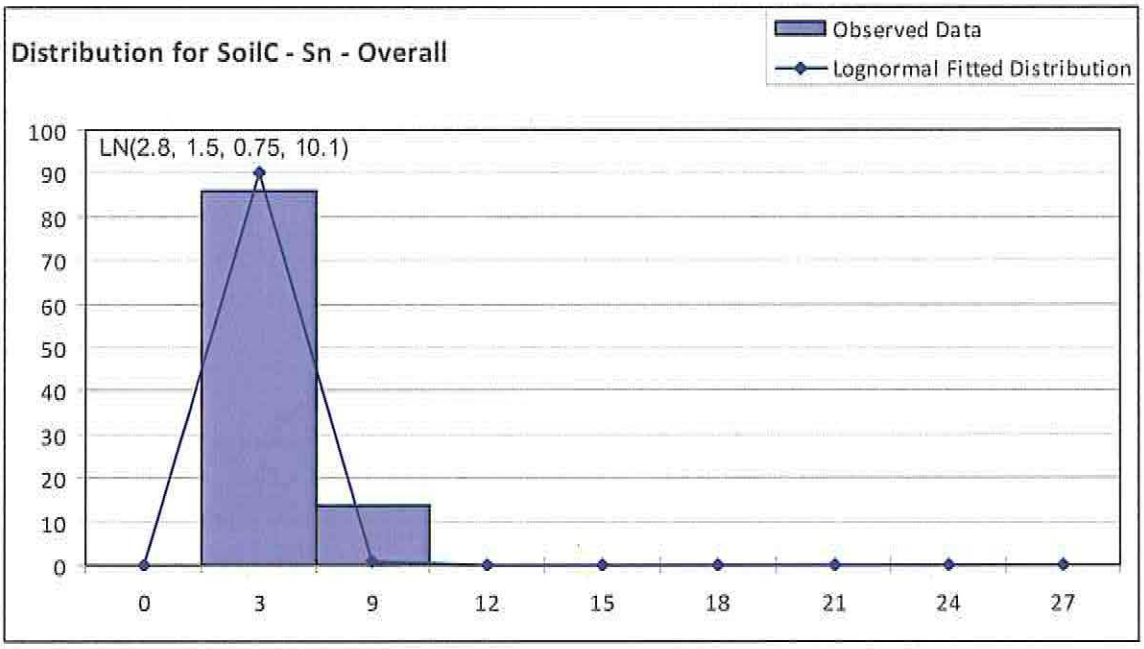

Distribution for SoilC - Sr - Faro-S
Observed Data
Lognormal Fitted Distribution
LN(43.5, 1.6, 11, 171)
90
80
70
60
50
40
30
20
10
0
0
50
100
150
200

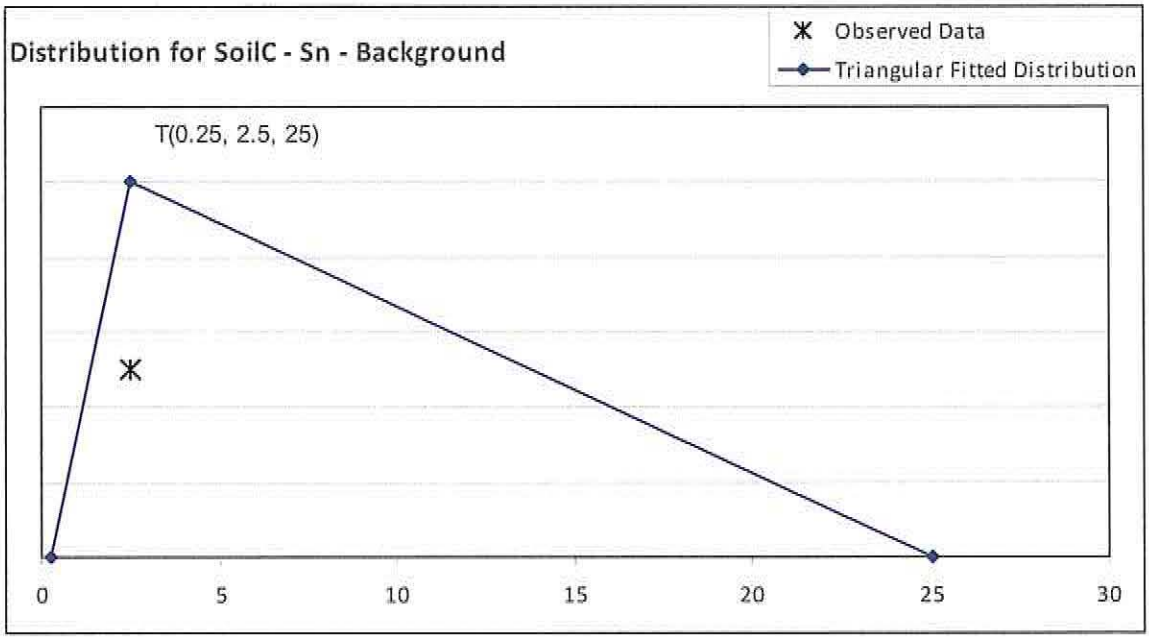

Distribution for SoilC - Sr - Faro-W
Observed Data
Lognormal Fitted Distribution
LN(33, 2.1, 3.4, 310)
50
45
40
35
30
25
20
15
10
5
0
0
20
40
60
80
100
120
140
160
180
200
220
240
260
280

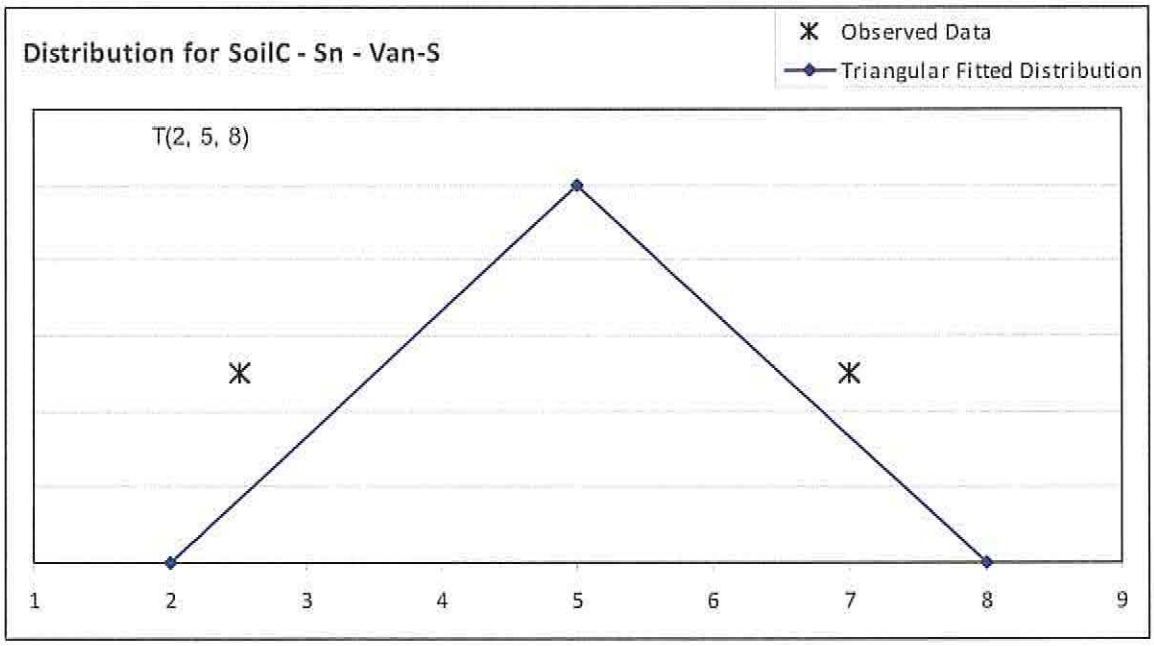

Distribution for SoilC - Sr - Faro-M
Observed Data
Lognormal Fitted Distribution
LN(41, 1.6, 10.6, 156)
50
45
40
35
30
25
20
15
10
5
0
0
19
38
57
76
95
114
133
152

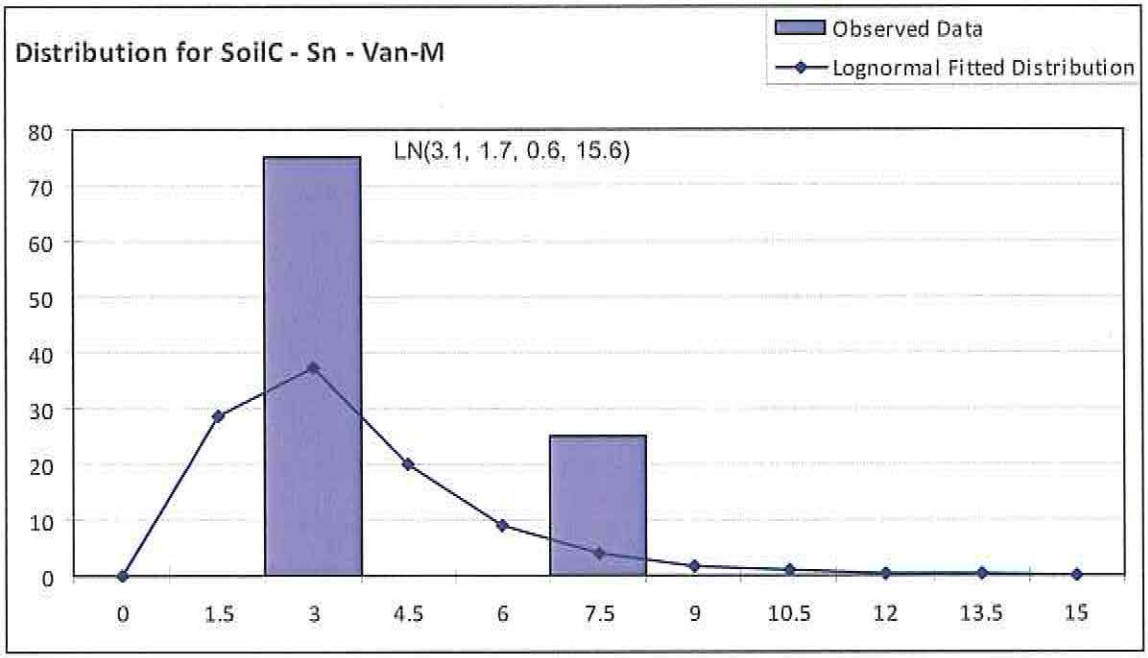

Distribution for SoilC - Sr - Sheep
Observed Data
Triangular Fitted Distribution
T(4.1, 41, 410)
0
50
100
150
200
250
300
350
400
450

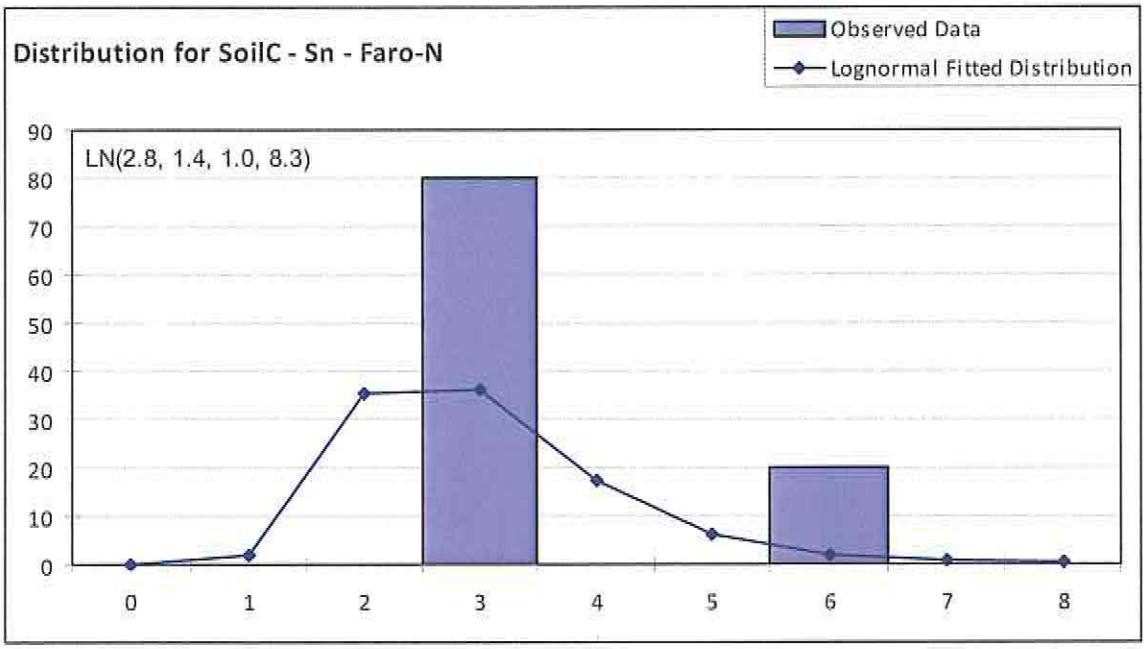
D.3.15 Tin

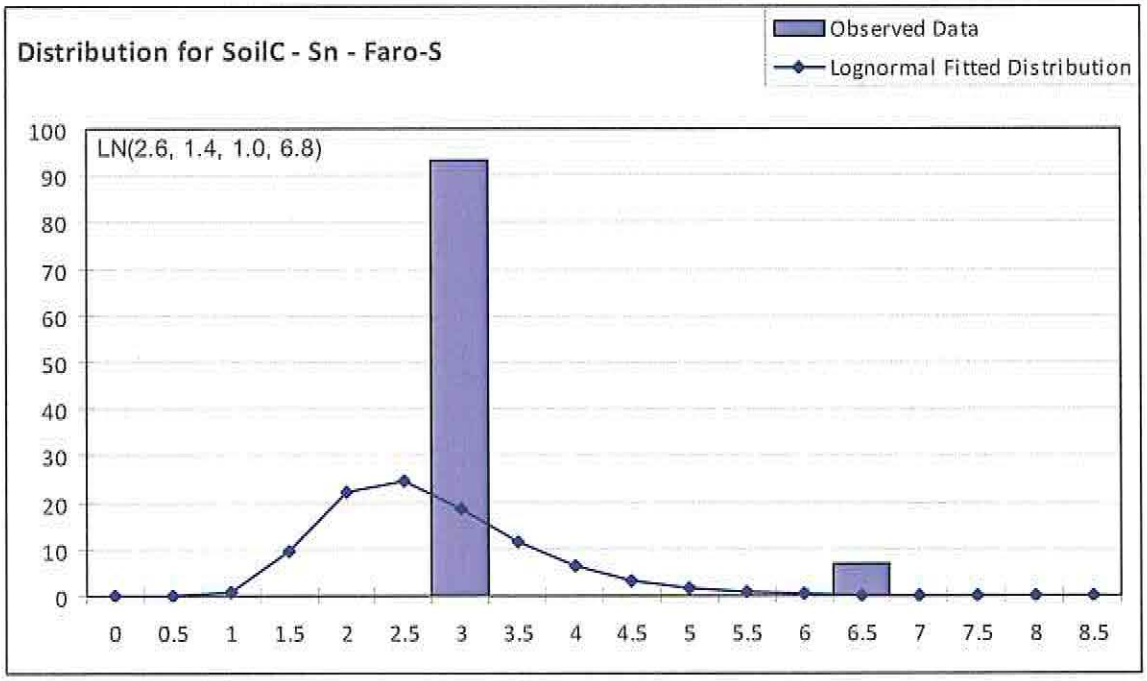

Distribution for SoilC - Sn - Overall
Observed Data
Lognormal Fitted Distribution
LN(2.8, 1.5, 0.75, 10.1)
100
90
80
70
60
50
40
30
20
10
0
0
3
9
12
15
18
21
24
27

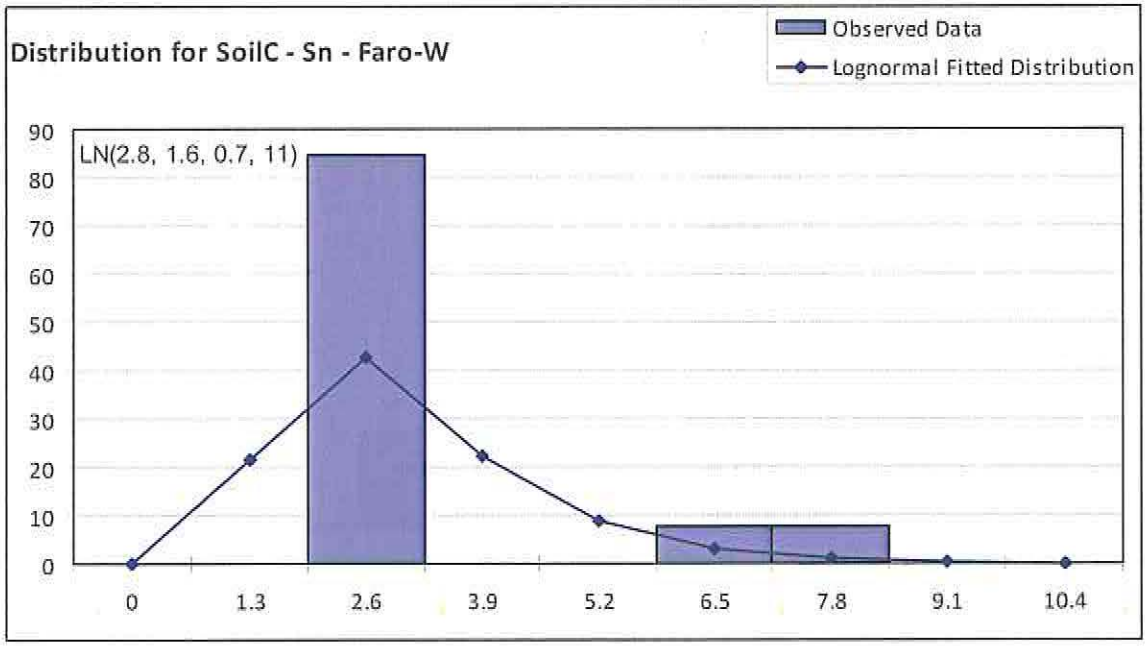

Distribution for SoilC - Sn - Background
Observed Data
Triangular Fitted Distribution
T(0.25, 2.5, 25)
0
5
10
15
20
25
30

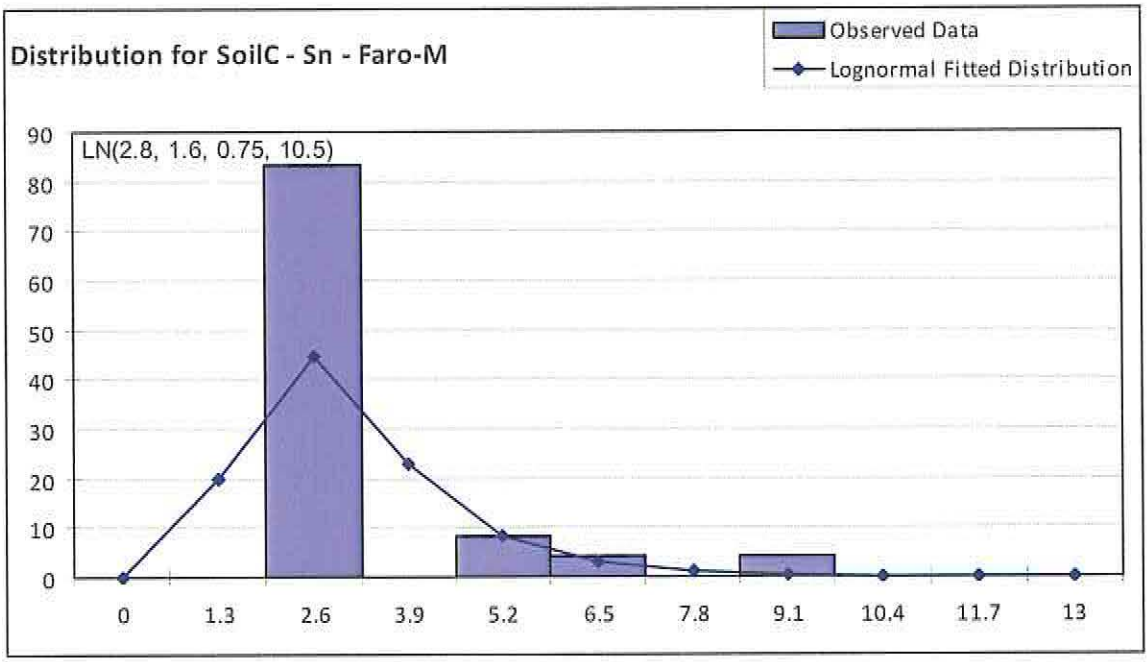

Distribution for SoilC - Sn - Van-S
Observed Data
Triangular Fitted Distribution
T(2, 5, 8)
1
2
3
4
5
6
7
8
9

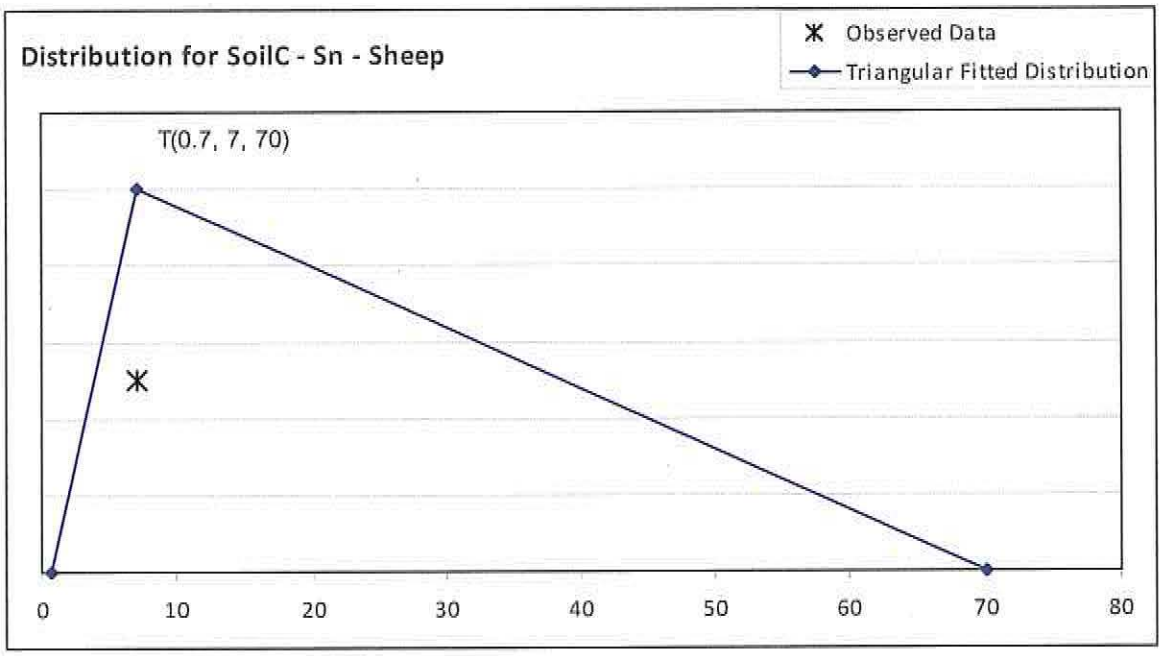

Distribution for SoilC - Sn - Van-M
Observed Data
Lognormal Fitted Distribution
LN(3.1, 1.7, 0.6, 15.6)
80
70
60
50
40
30
20
10
0
0
1.5
3
4.5
6
7.5
9
10.5
12
13.5
15


Distribution for SoilC - Sn - Faro-N
Observed Data
Lognormal Fitted Distribution
LN(2.8, 1.4, 1.0, 8.3)
90
80
70
60
50
40
30
20
10
0
0
1
2
3
4
5
6
7
8

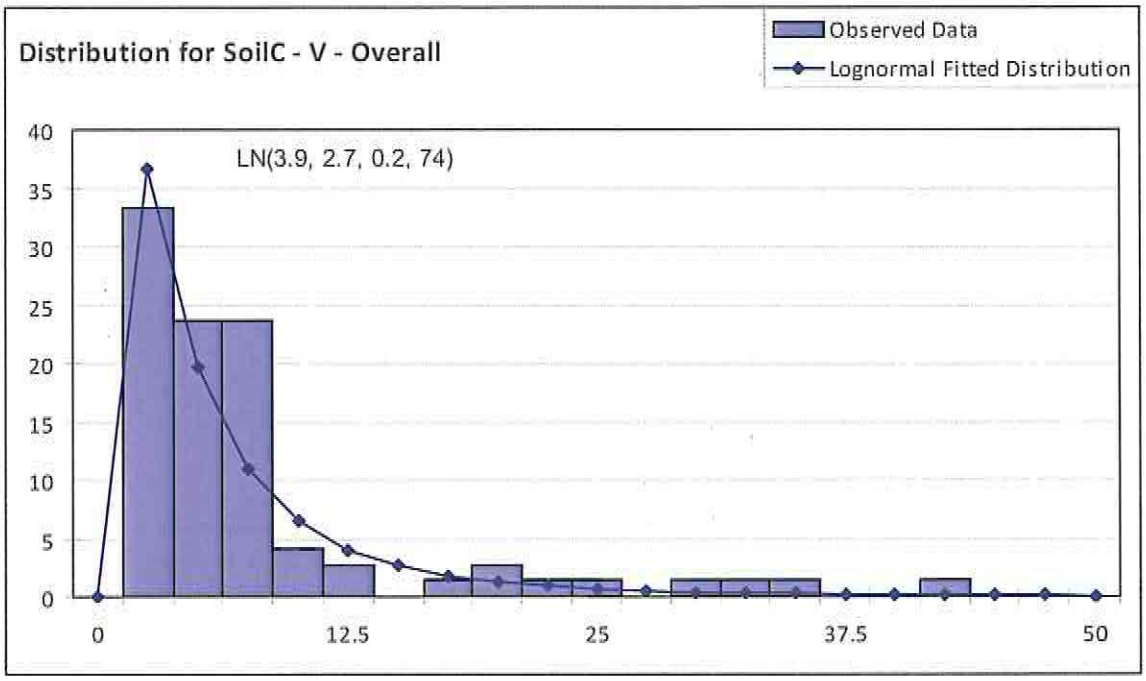

Distribution for SoilC - Sn - Faro-S
Observed Data
Lognormal Fitted Distribution
LN(2.6, 1.4, 1.0, 6.8)
100
90
80
70
60
50
40
30
20
10
0
0
0.5
1
1.5
2
2.5
3
3.5
4
4.5
5
5.5
6
6.5
7
7.5
8
8.5

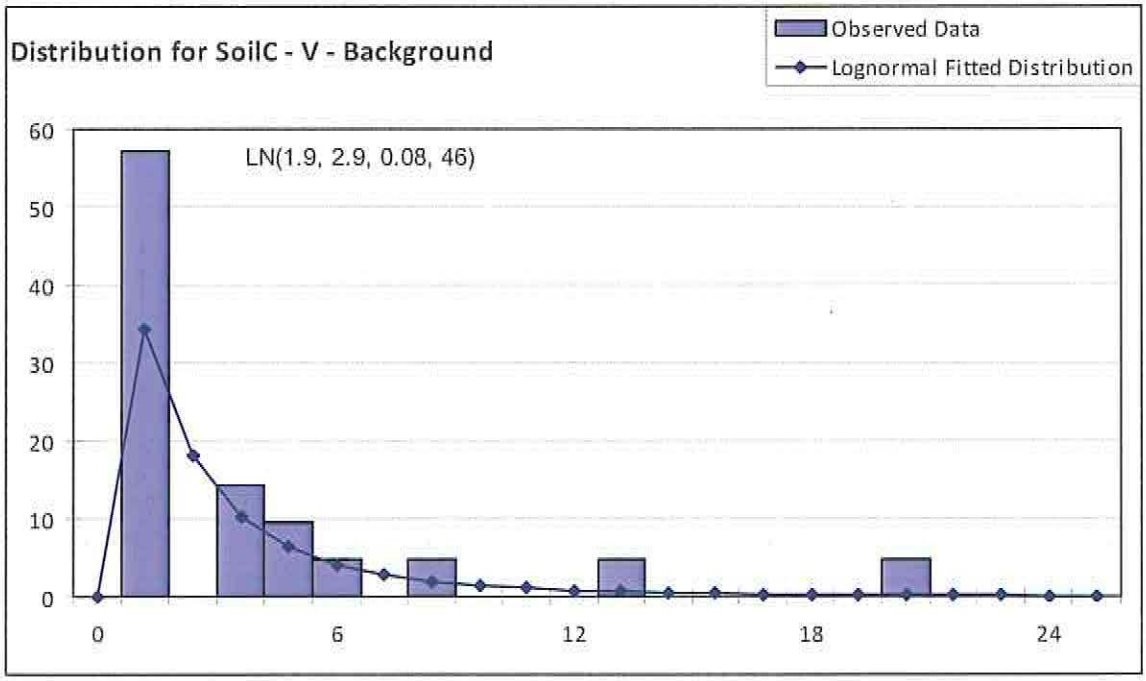

Distribution for SoilC - Sn - Faro-W
Observed Data
Lognormal Fitted Distribution
LN(2.8, 1.6, 0.7, 11)
90
80
70
60
50
40
30
20
10
0
0
1.3
2.6
3.9
5.2
6.5
7.8
9.1
10.4

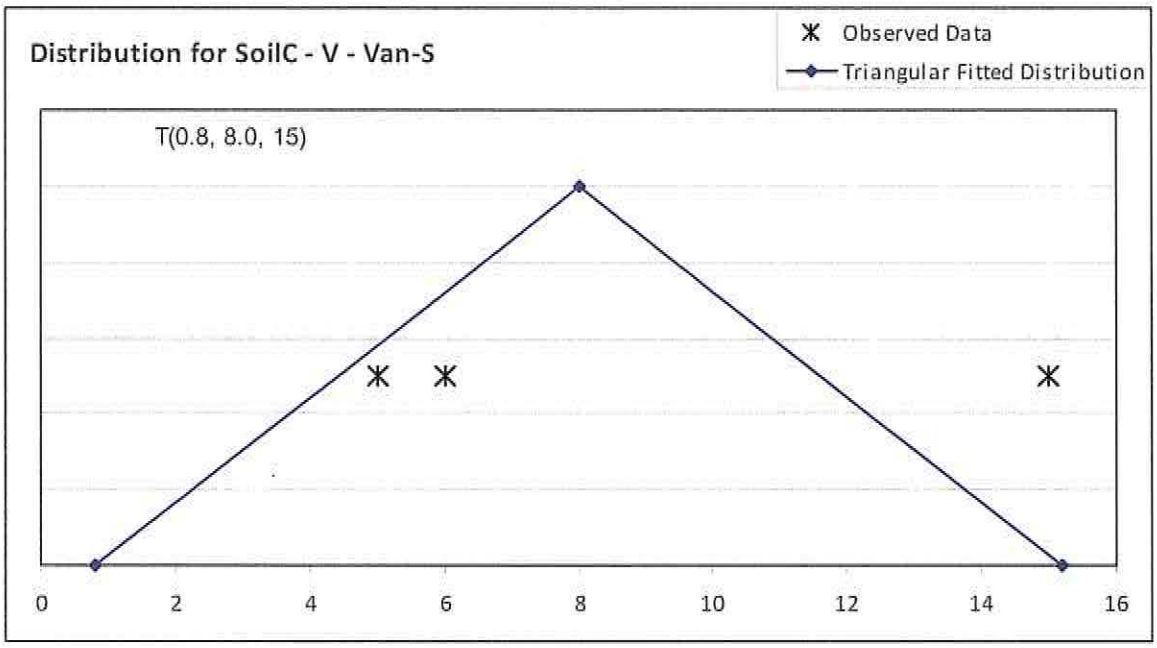

Distribution for SoilC - Sn - Faro-M
Observed Data
Lognormal Fitted Distribution
LN(2.8, 1.6, 0.75, 10.5)
90
80
70
60
50
40
30
20
10
0
0
1.3
2.6
3.9
5.2
6.5
7.8
9.1
10.4
11.7
13

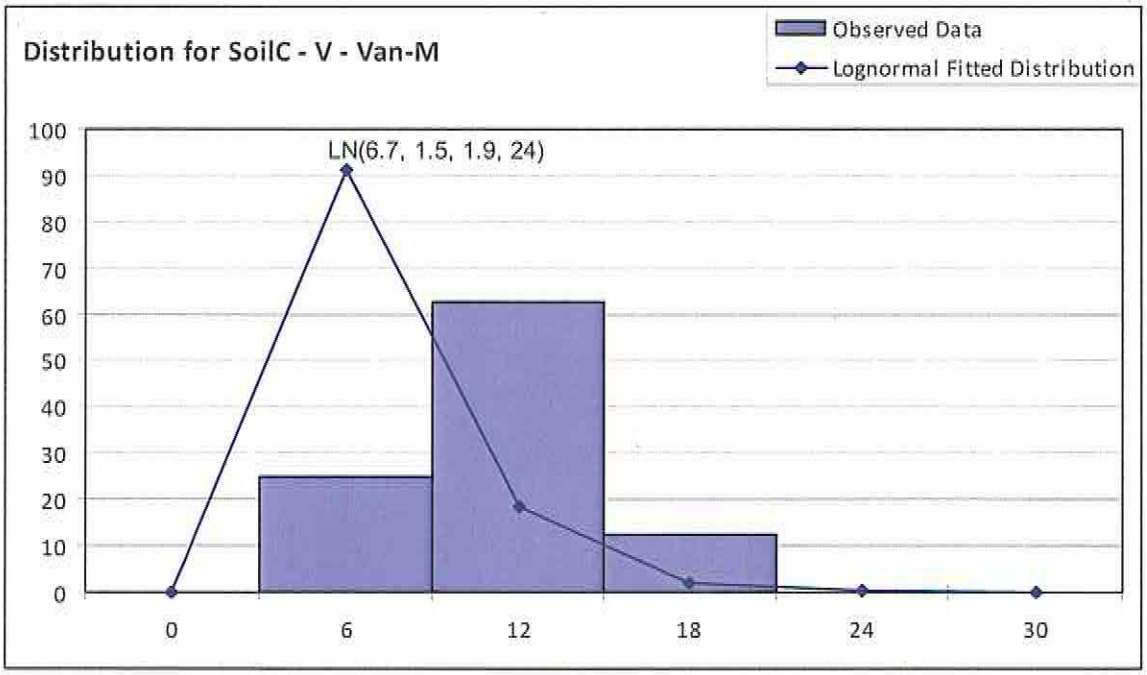

Distribution for SoilC - Sn - Sheep
Observed Data
Triangular Fitted Distribution
T(0.7, 7, 70)
0
10
20
30
40
50
60
70
80

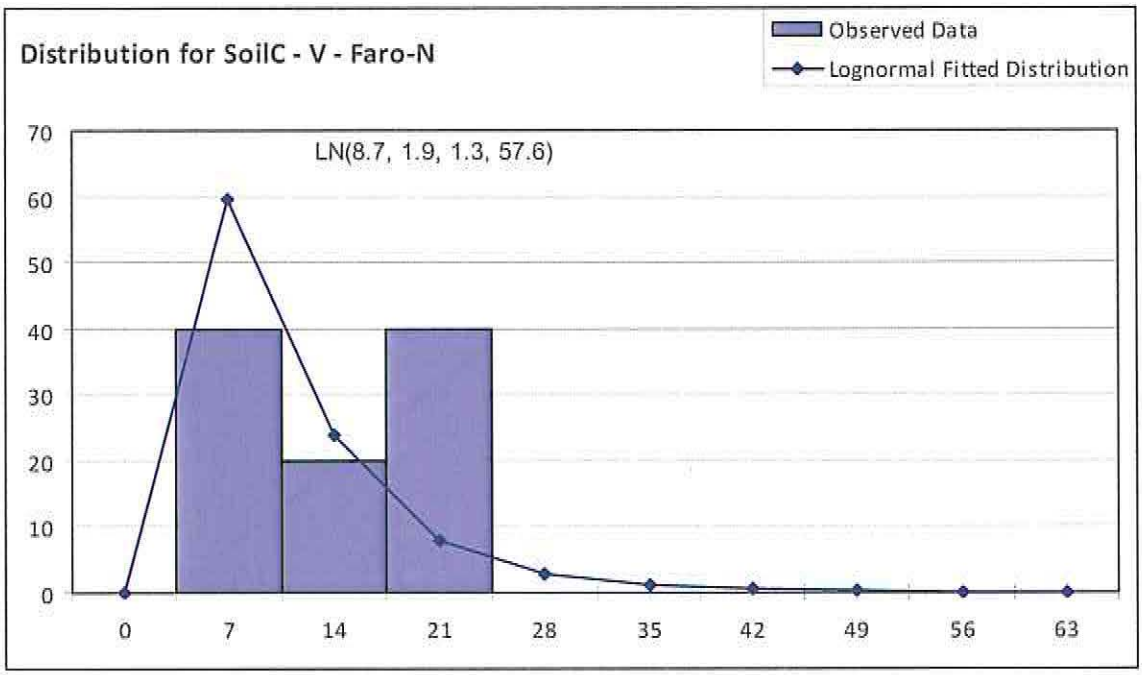
D.3.16 Vanadium

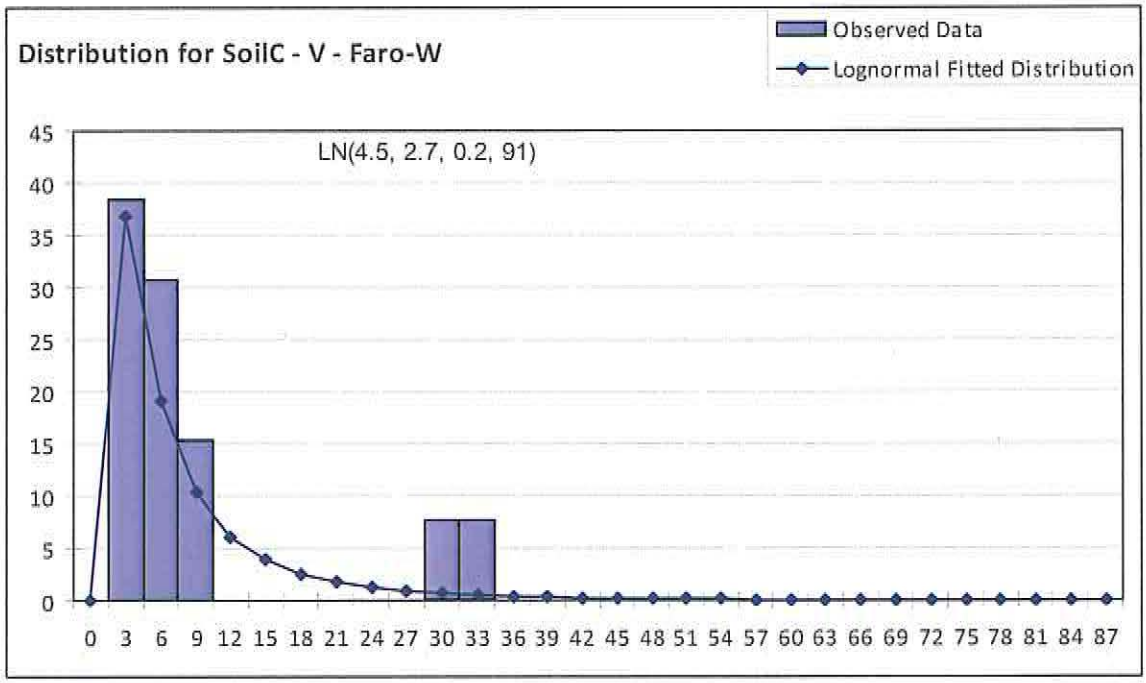


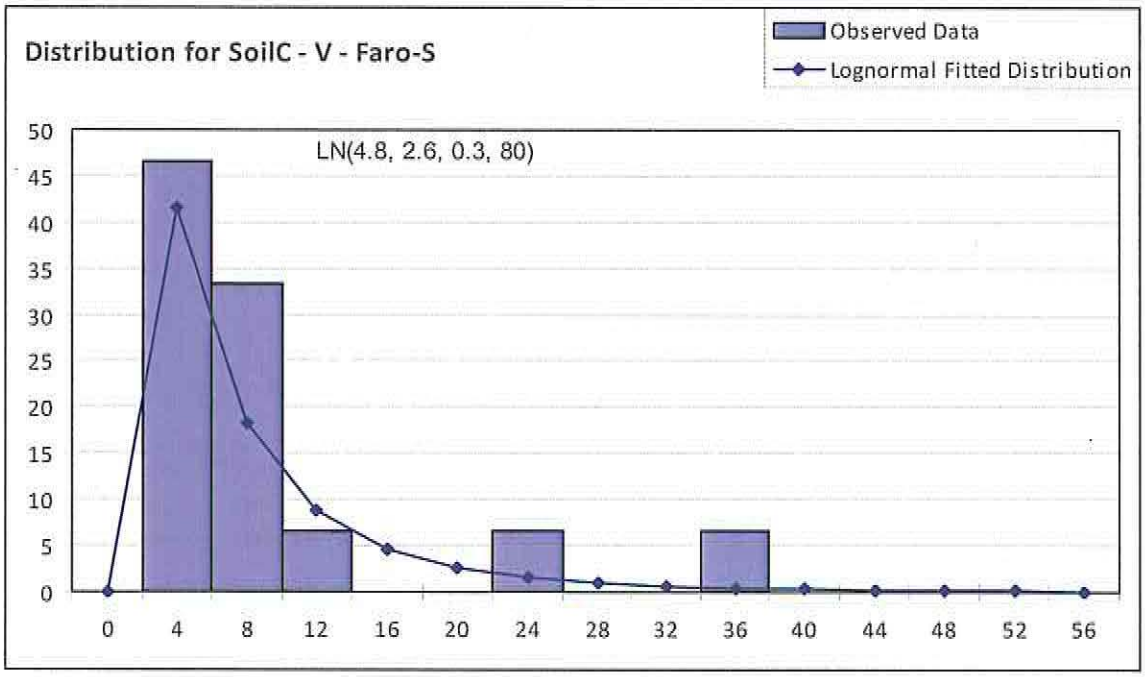


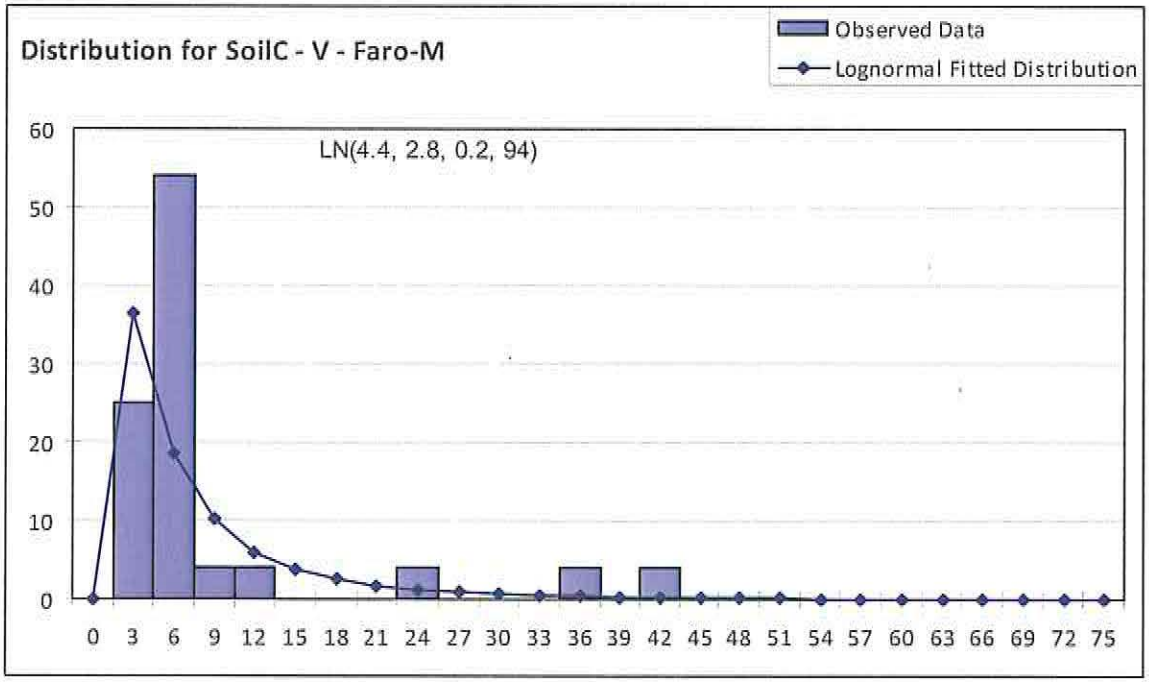

Distribution for SoilC - V - Van-S
Observed Data
Triangular Fitted Distribution
T(0.8, 8.0, 15)
0
2
4
6
8
10
12
14
16

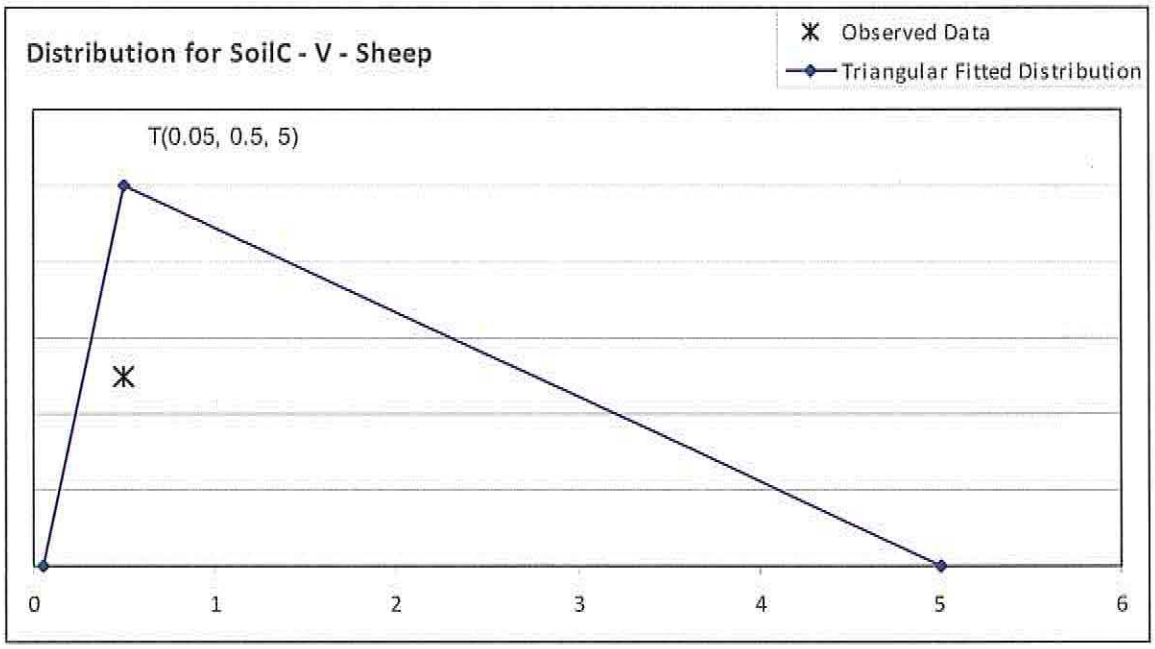

Distribution for SoilC - V - Van-M
Observed Data
Lognormal Fitted Distribution
LN(6.7, 1.5, 1.9, 24)
100
90
80
70
60
50
40
30
20
10
0
0
6
12
18
24
30


Distribution for SoilC - V - Faro-N
Observed Data
Lognormal Fitted Distribution
LN(8.7, 1.9, 1.3, 57.6)
70
60
50
40
30
20
10
0
0
7
14
21
28
35
42
49
56
63

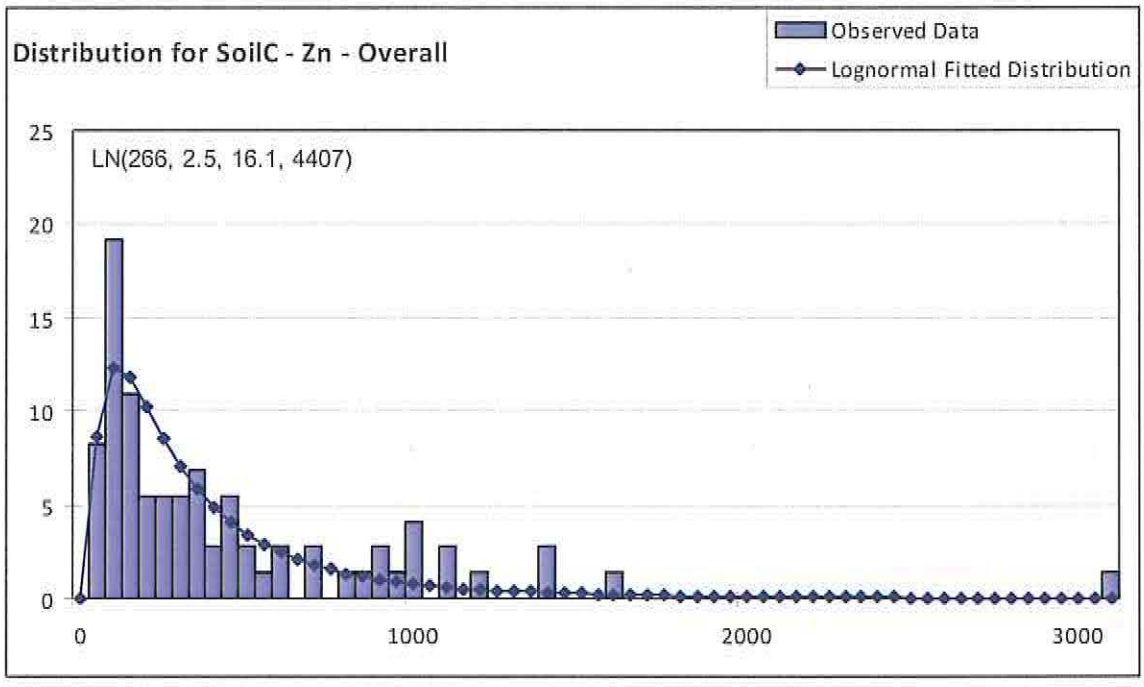

Distribution for SoilC - V - Faro-W
Observed Data
Lognormal Fitted Distribution
LN(4.5, 2.7, 0.2, 91)
45
40
35
30
25
20
15
10
5
0
0 3 6 9 12 15 18 21 24 27 30 33 36 39 42 45 48 51 54 57 60 63 66 69 72 75 78 81 84 87

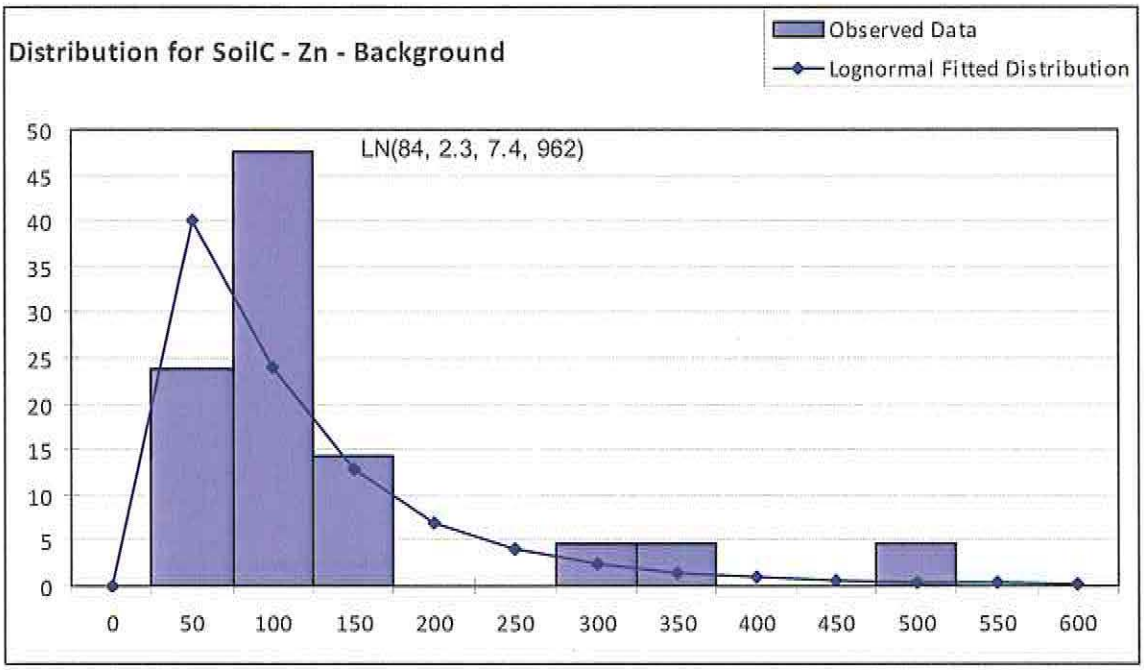

Distribution for SoilC - V - Faro-S
Observed Data
Lognormal Fitted Distribution
LN(4.8, 2.6, 0.3, 80)
50
45
40
35
30
25
20
15
10
5
0
0 4 8 12 16 20 24 28 32 36 40 44 48 52 56

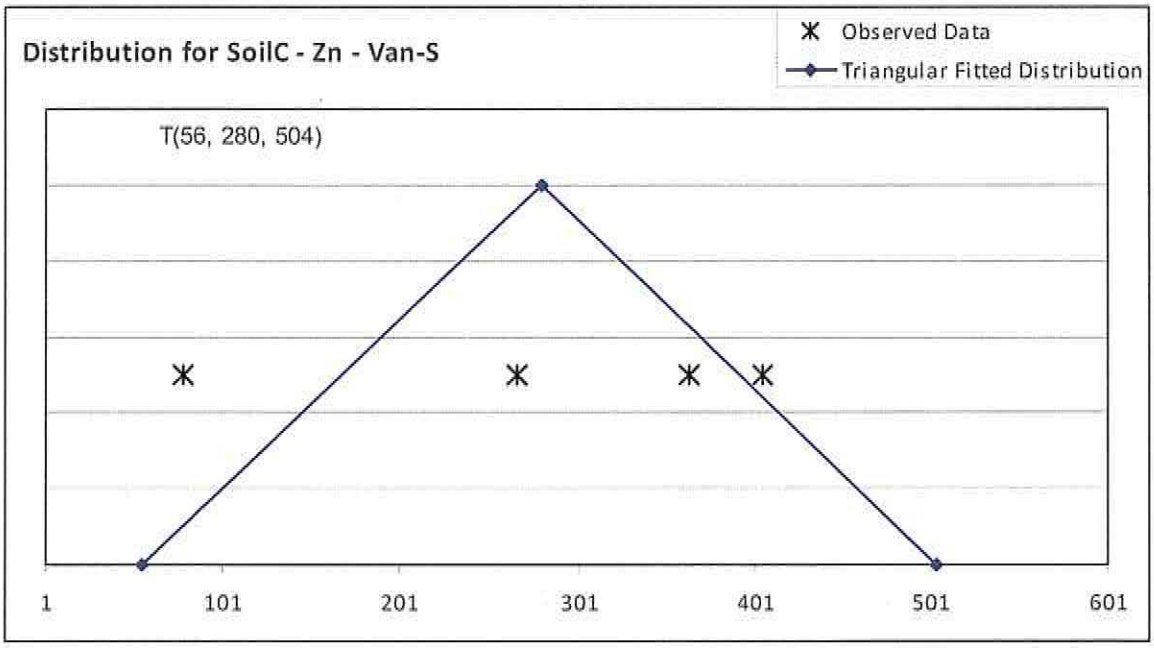

Distribution for SoilC - V - Faro-M
Observed Data
Lognormal Fitted Distribution
LN(4.4, 2.8, 0.2, 94)
60
50
40
30
20
10
0
0 3 6 9 12 15 18 21 24 27 30 33 36 39 42 45 48 51 54 57 60 63 66 69 72 75

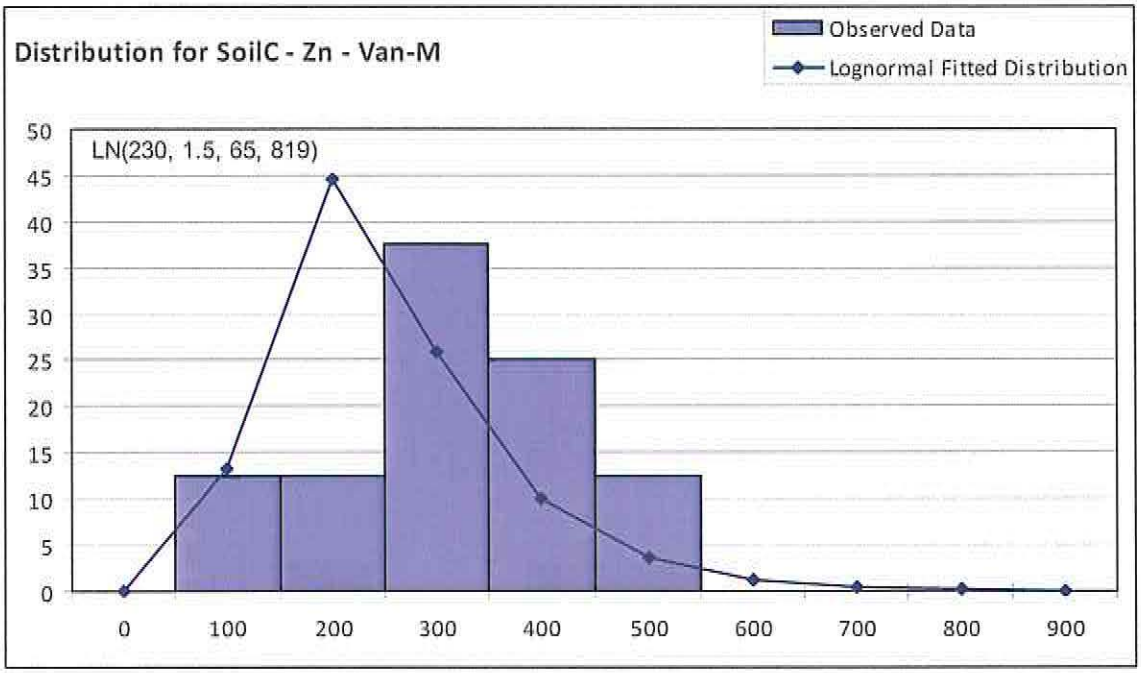

Distribution for SoilC - V - Sheep
Observed Data
Triangular Fitted Distribution
T(0.05, 0.5, 5)
0
1
2
3
4
5
6

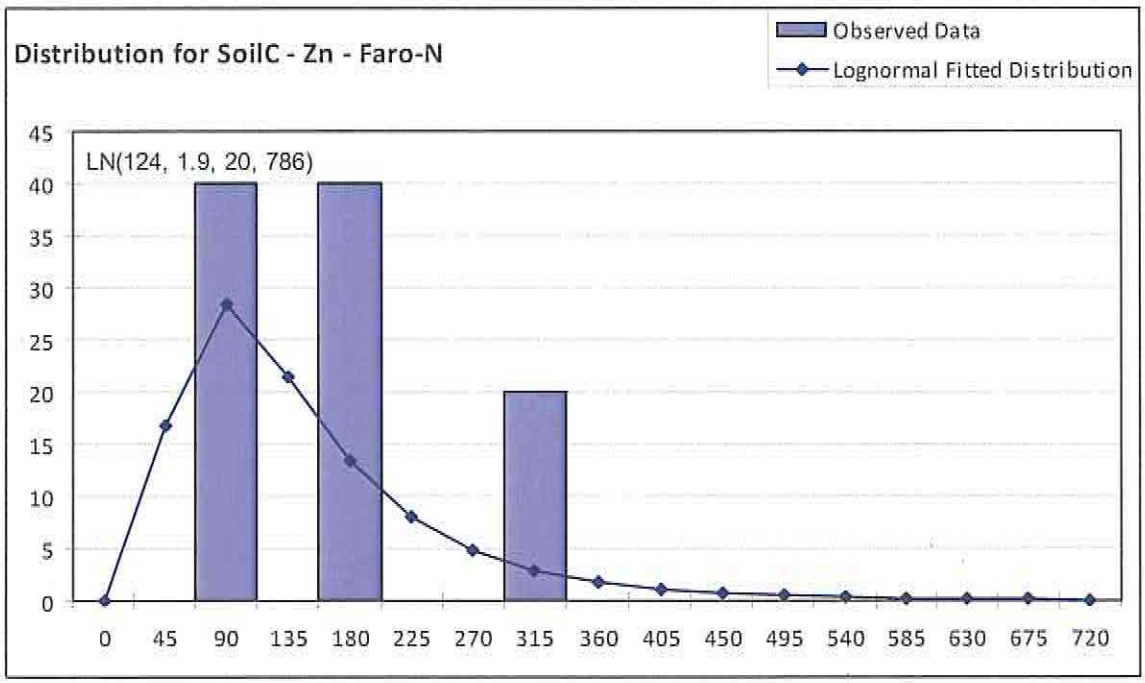
D.3.17 Zinc

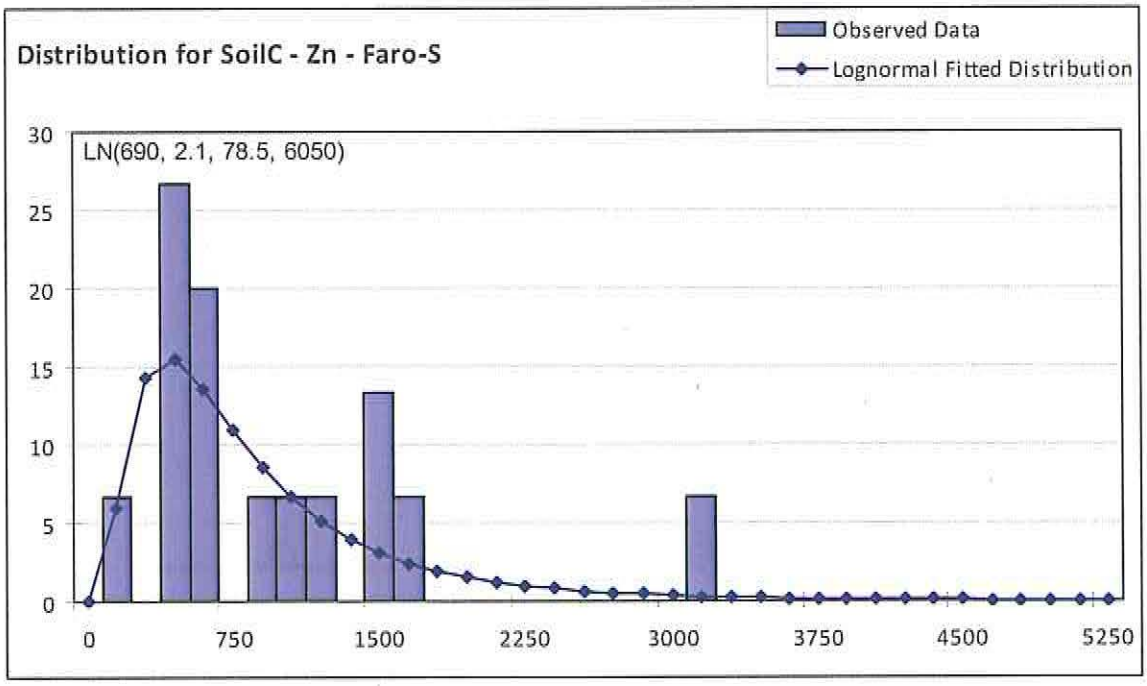

Distribution for SoilC - Zn - Overall
Observed Data
Lognormal Fitted Distribution
LN(266, 2.5, 16.1, 4407)
25
20
15
10
5
0
0
1000
2000
3000

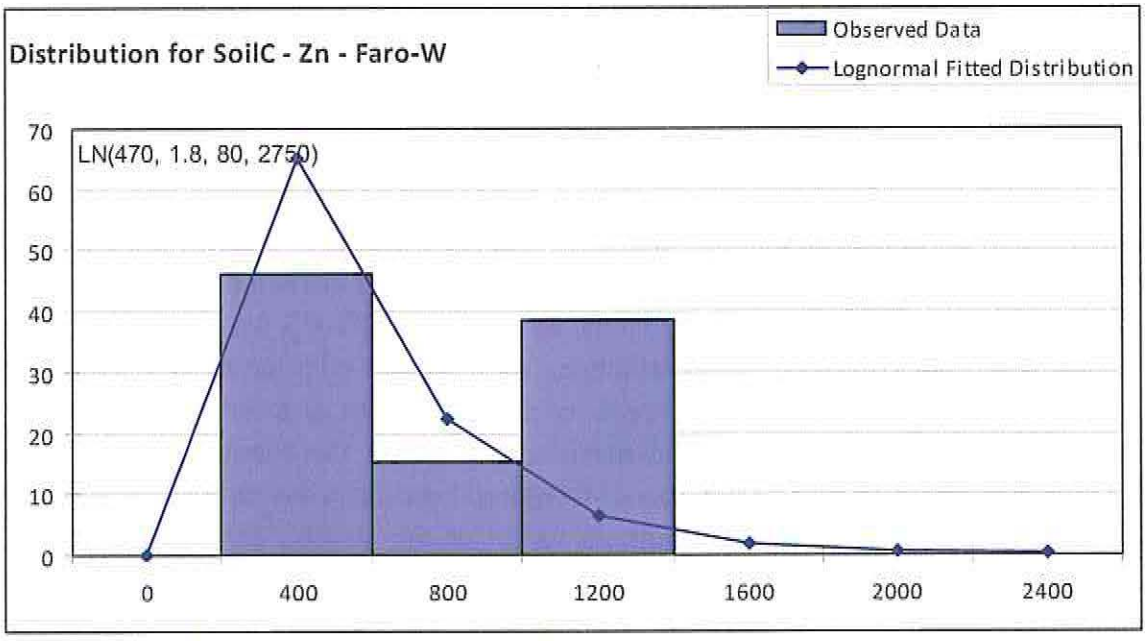

Distribution for SoilC - Zn - Background
Observed Data
Lognormal Fitted Distribution
LN(84, 2.3, 7.4, 962)
50
45
40
35
30
25
20
15
10
5
0
0
50
100
150
200
250
300
350
400
450
500
550
600

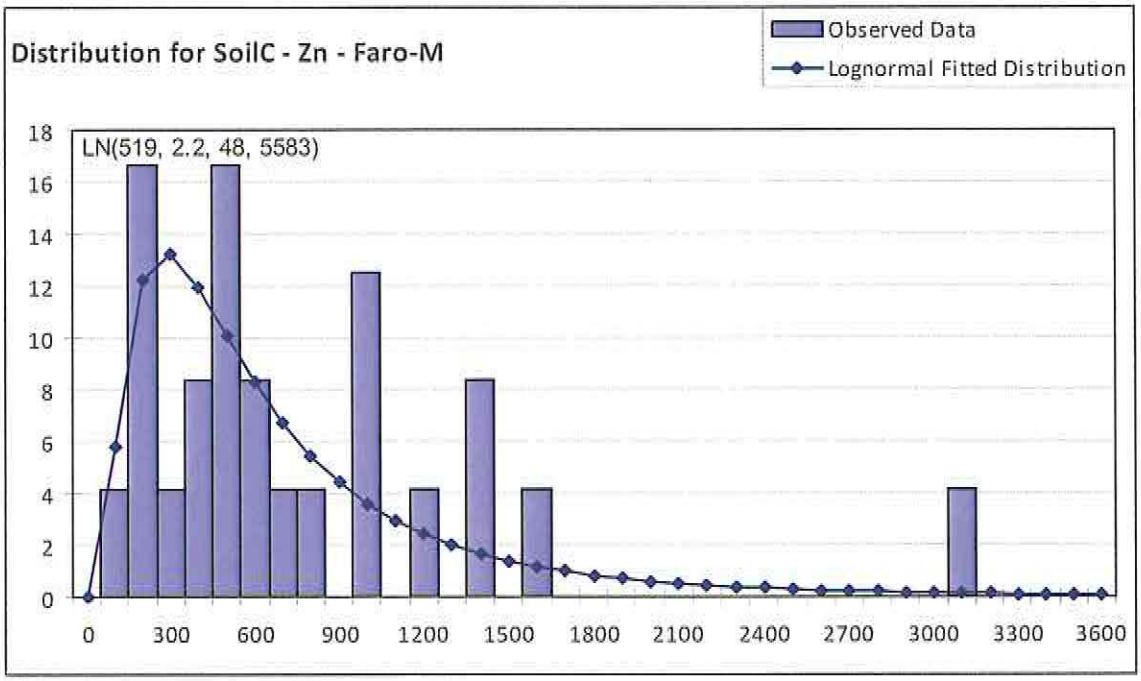

Distribution for SoilC - Zn - Van-S
Observed Data
Triangular Fitted Distribution
T(56, 280, 504)
1
101
201
301
401
501
601


Distribution for SoilC - Zn - Van-M
Observed Data
Lognormal Fitted Distribution
LN(230, 1.5, 65, 819)
50
45
40
35
30
25
20
15
10
5
0
0
100
200
300
400
500
600
700
800
900


Distribution for SoilC - Zn - Faro-N
Observed Data
Lognormal Fitted Distribution
LN(124, 1.9, 20, 786)
45
40
35
30
25
20
15
10
5
0
0
45
90
135
180
225
270
315
360
405
450
495
540
585
630
675
720


Distribution for SoilC - Zn - Faro-S
Observed Data
Lognormal Fitted Distribution
LN(690, 2.1, 78.5, 6050)
30
25
20
15
10
5
0
0
750
1500
2250
3000
3750
4500
5250


Distribution for SoilC - Zn - Faro-W
Observed Data
Lognormal Fitted Distribution
LN(470, 1.8, 80, 2750)
70
60
50
40
30
20
10
0
0
400
800
1200
1600
2000
2400



D.4 MEASURED BERRY CONCENTRATIONS

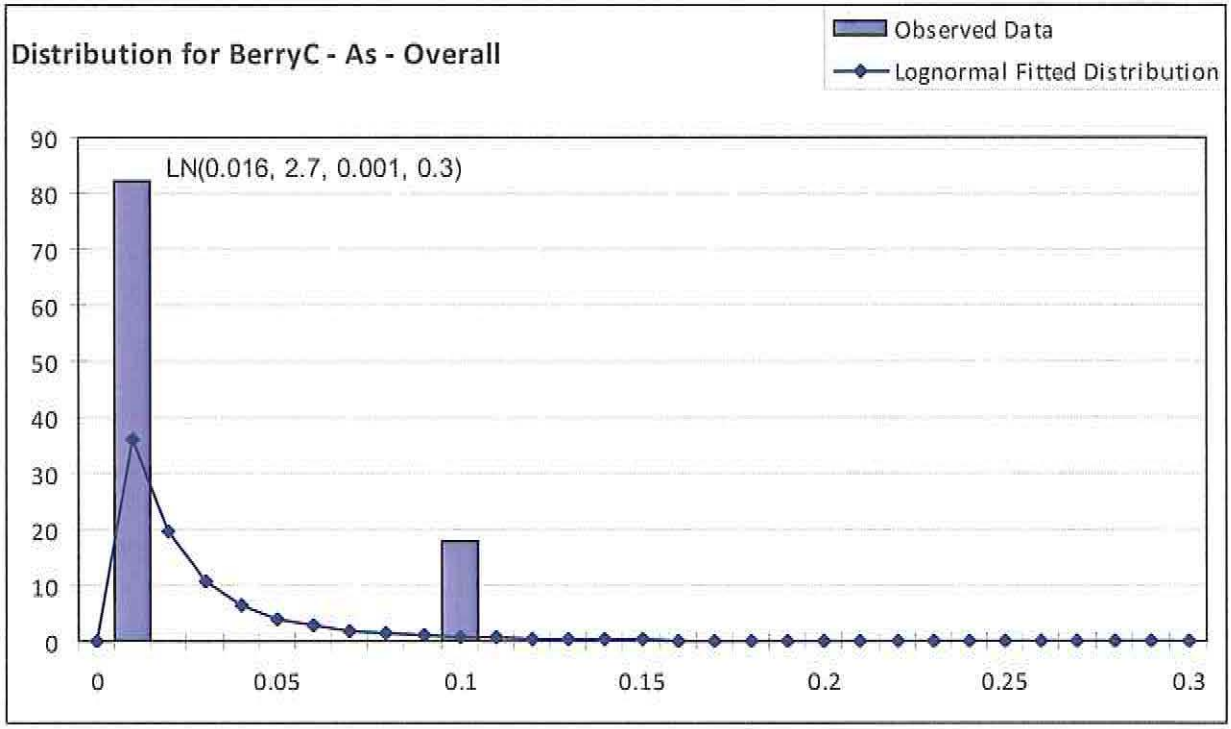
Measured concentrations (mg/kg (dw) converted to mg/kg (ww) using an average moisture content of 81.5%) in various types of vegetation from the Faro Mine Complex were presented in the previous assessment (SENES, 2006, Section 2.3. 2, Project No. 33798).

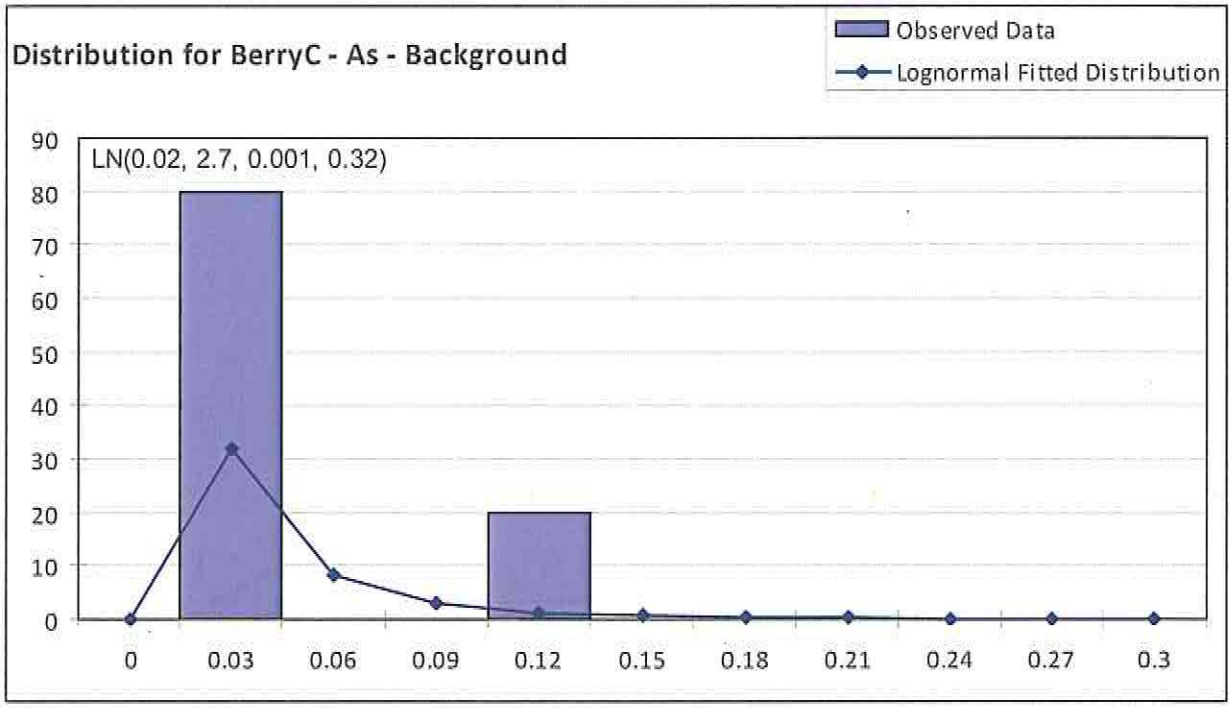
The data were fit to either lognormal, triangular, or uniform distributions. Lognormal distributions are defined by the geometric mean, geometric standard deviation, minimum value, and maximum value. In the case of only one value, an assumed GSD of 3 was used. When two to four values were available, triangular distributions were applied with the mode equal to the measured value and an assumed range of an order of magnitude was assumed on either side of the site data to represent the minimum and maximum values in the absence of other data. Uniform distributions were applied in the case of measured concentrations reported as less than the detection limit. The minimum and maximum values of the uniform distribution were set equal to 0 and the detection limit, respectively. The following graphs summarize the distributions (line graph) as compared with the available data (bar graph) for each COPC. Graphs are not provided for uniform distributions. The development of distributions for vegetation concentrations was limited by the data available.

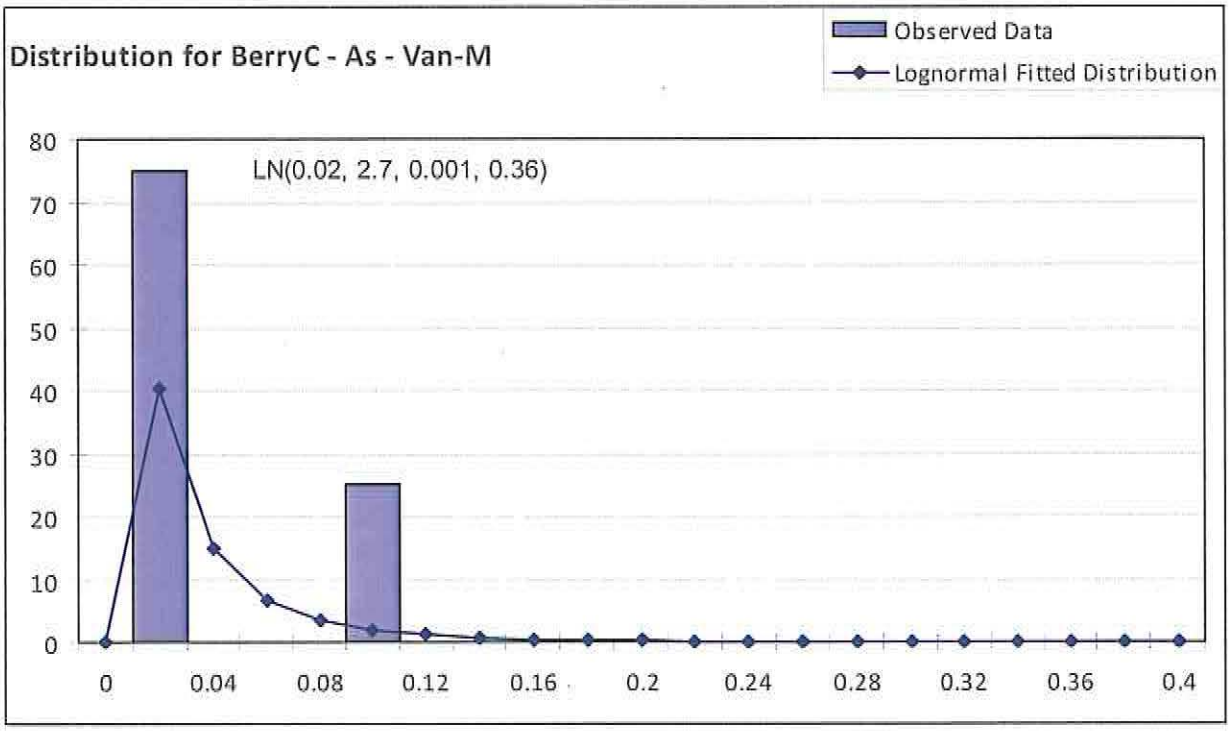
D.4.1 Antimony

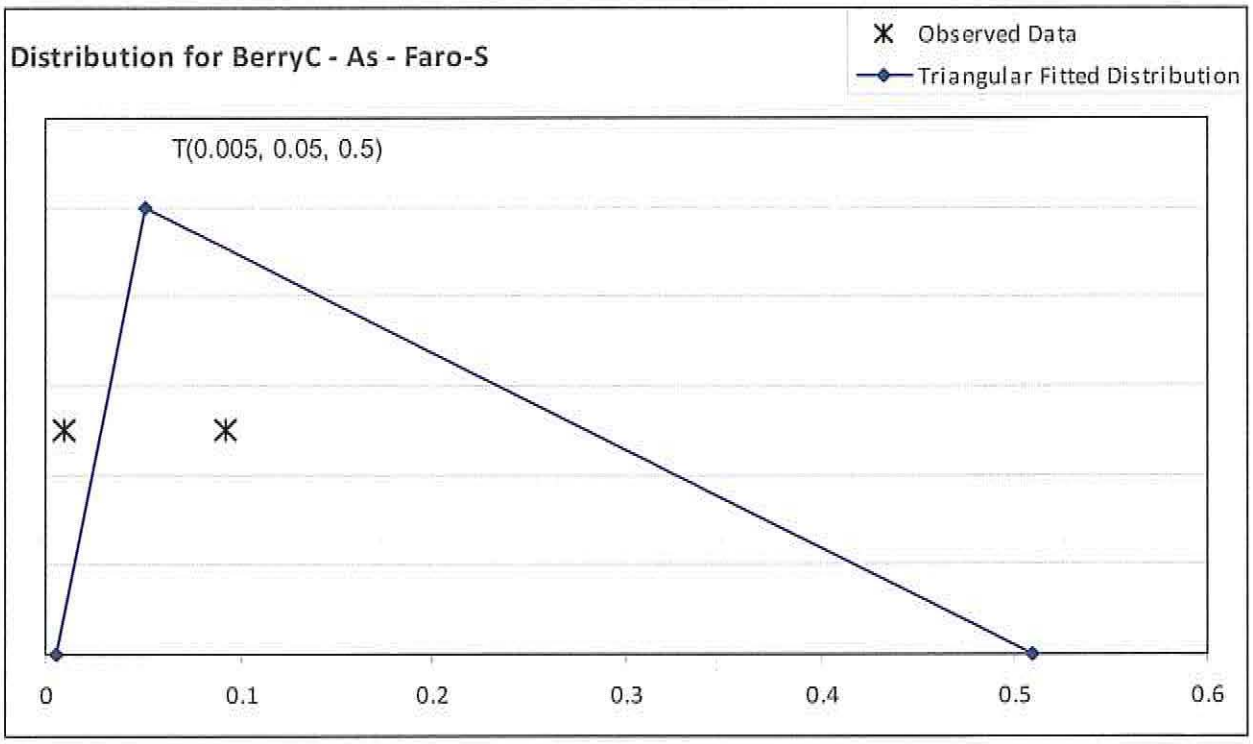
All uniform distributions – U(0, 0.02)

D.4.2 Arsenic


Distribution for BerryC - As - Overall
Observed Data
Lognormal Fitted Distribution
LN(0.016, 2.7, 0.001, 0.3)
90
80
70
60
50
40
30
20
10
0
0
0.05
0.1
0.15
0.2
0.25
0.3


Distribution for BerryC - As - Background
Observed Data
Lognormal Fitted Distribution
LN(0.02, 2.7, 0.001, 0.32)
90
80
70
60
50
40
30
20
10
0
0
0.03
0.06
0.09
0.12
0.15
0.18
0.21
0.24
0.27
0.3

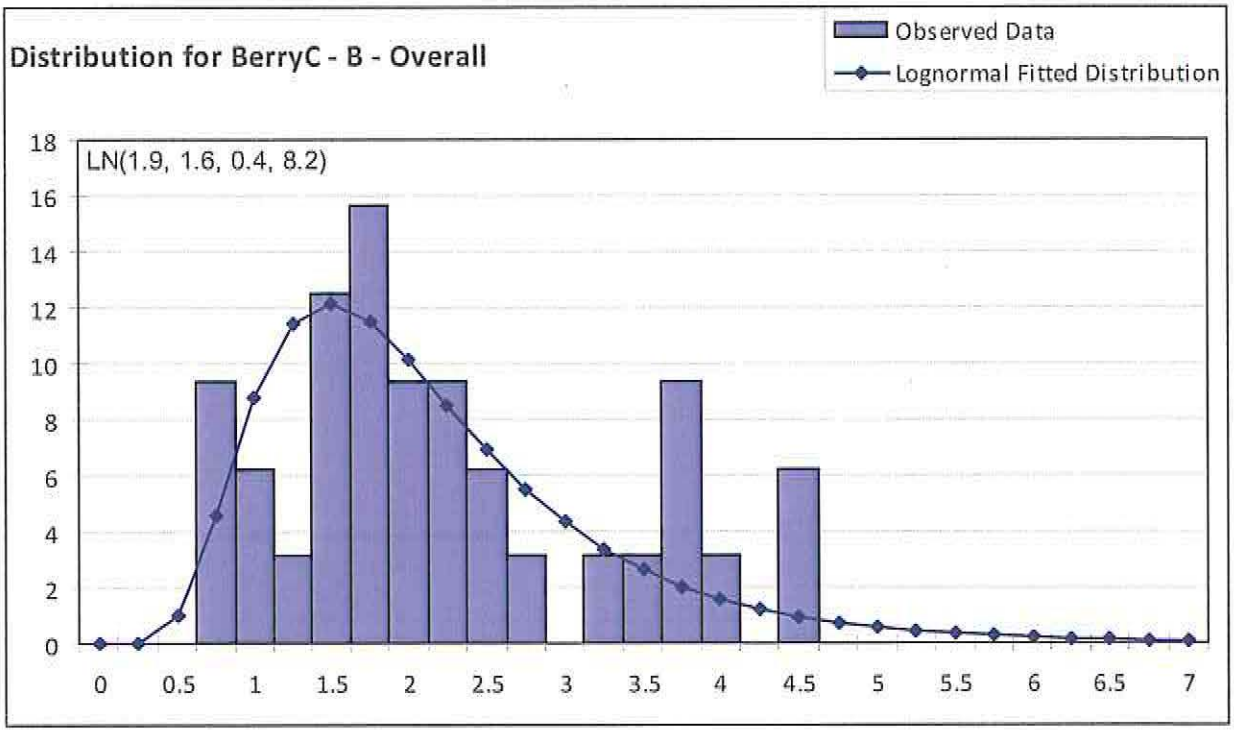


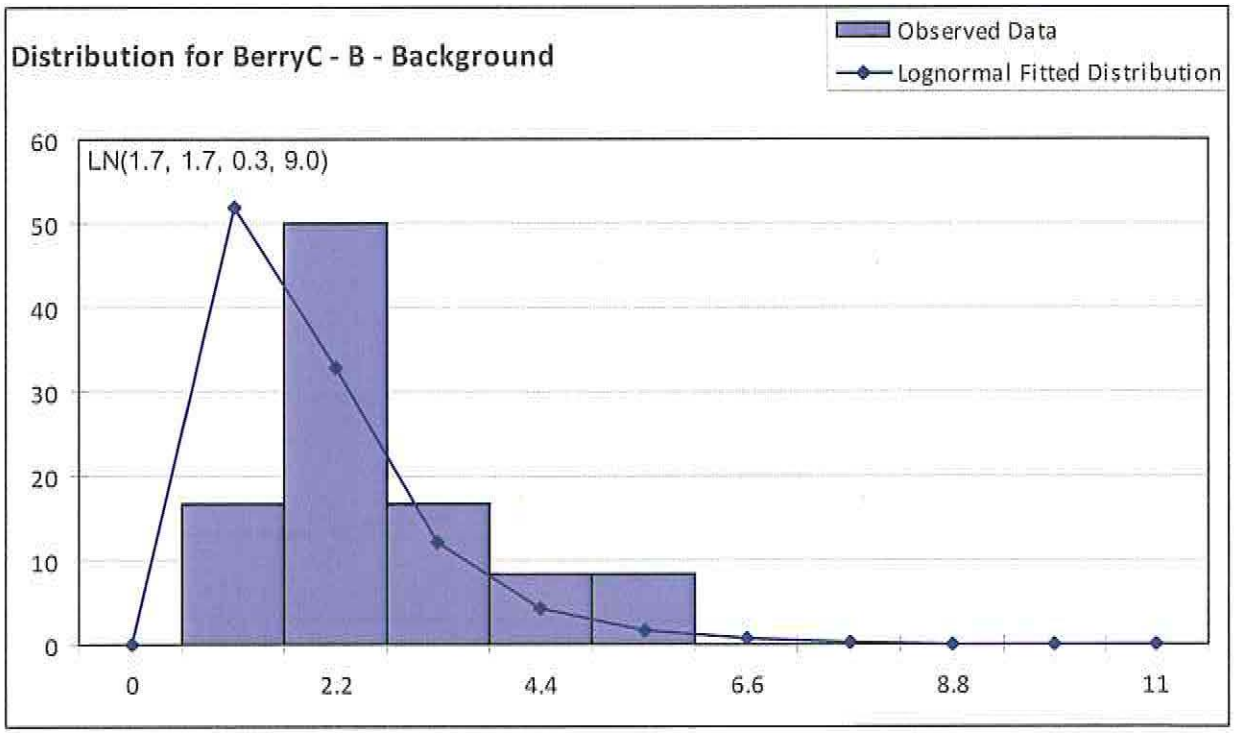


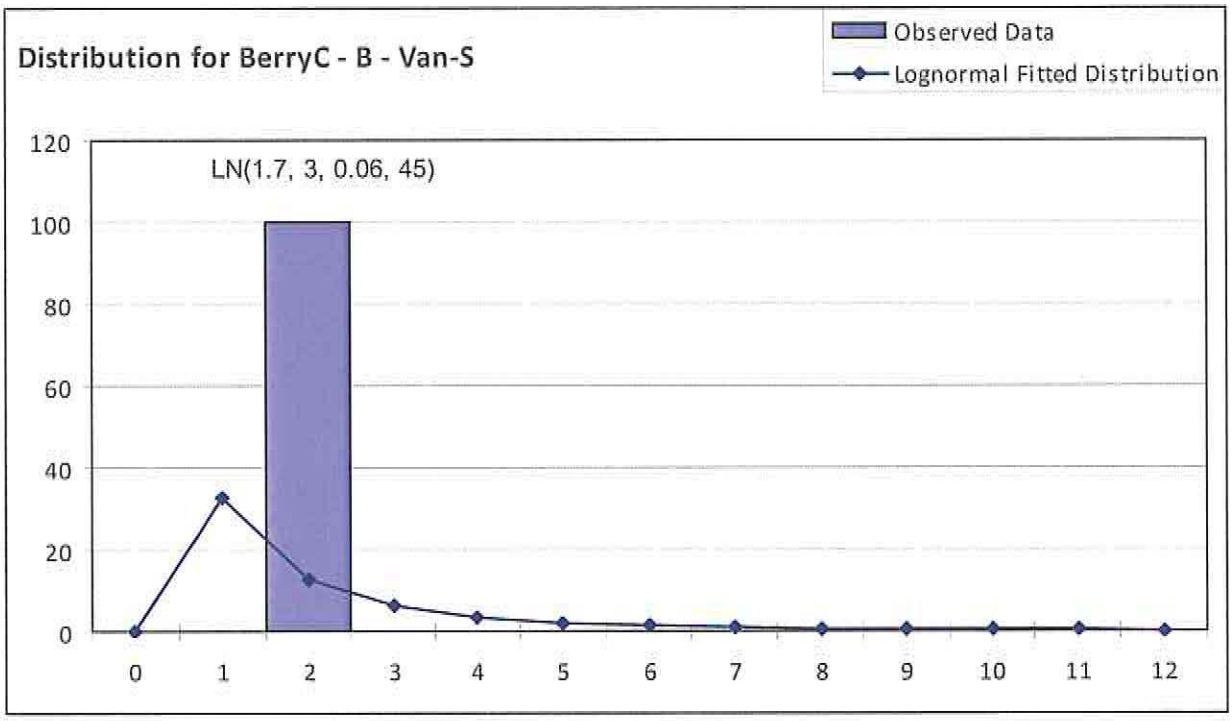
D.4.3 Beryllium

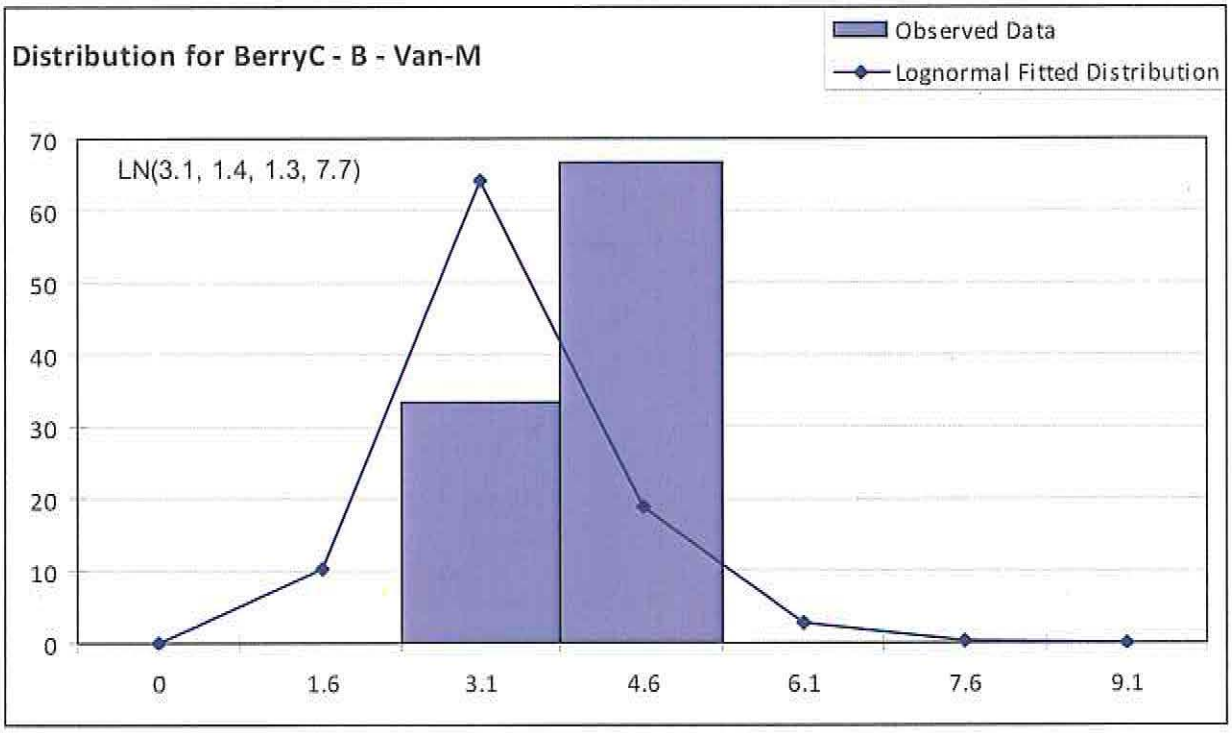
All uniform distributions – U(0, 0.004)

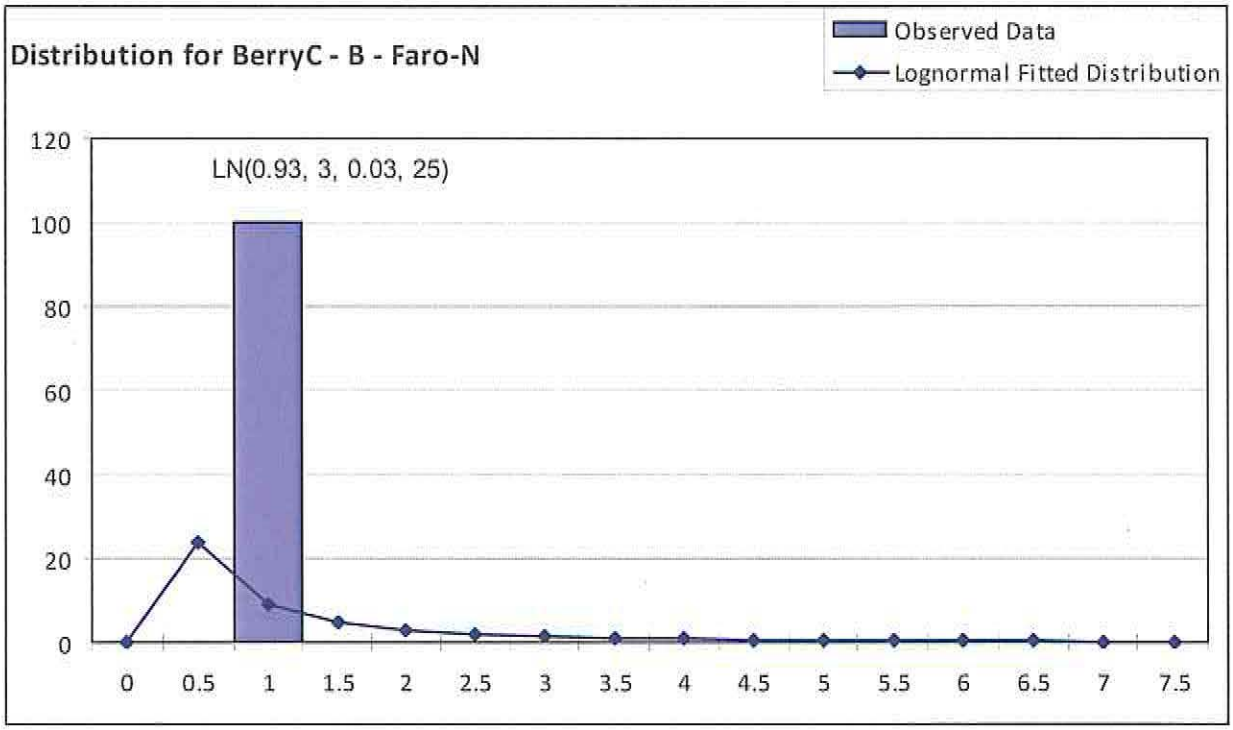
D.4.4 Boron

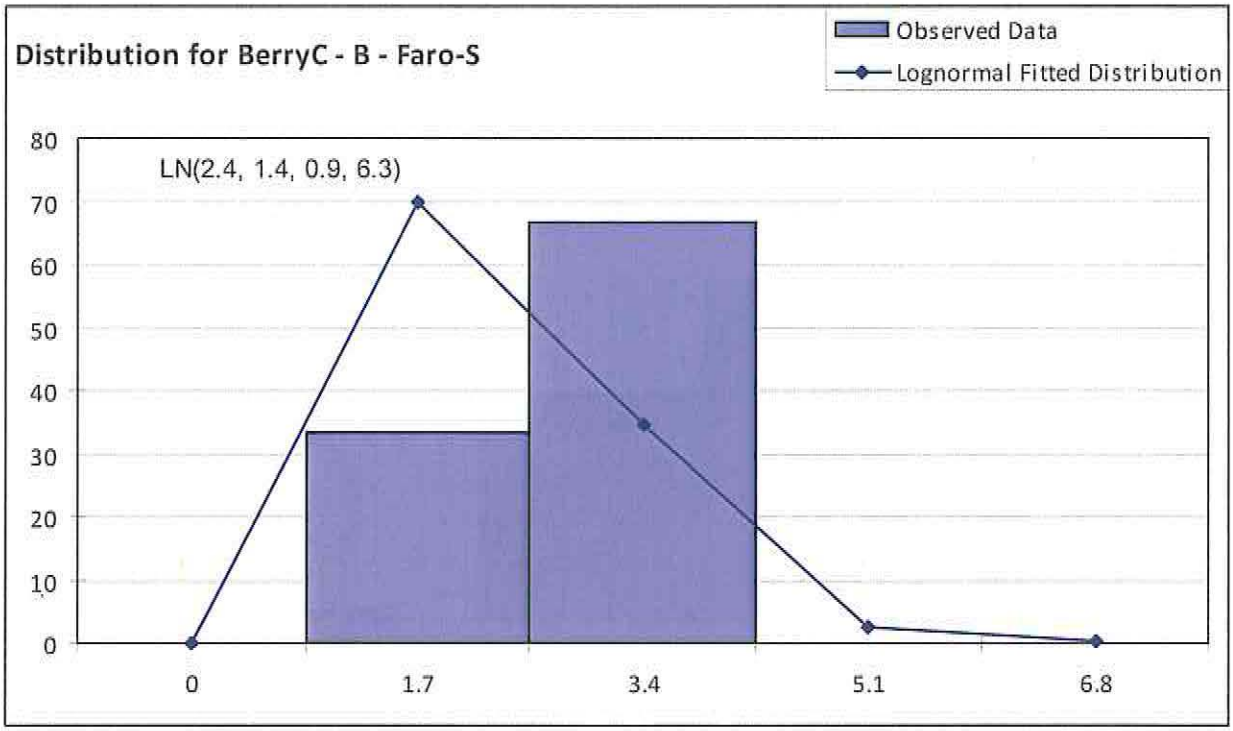

Distribution for BerryC - B - Overall
Observed Data
Lognormal Fitted Distribution
LN(1.9, 1.6, 0.4, 8.2)
18
16
14
12
10
8
6
4
2
0
0
0.5
1
1.5
2
2.5
3
3.5
4
4.5
5
5.5
6
6.5
7

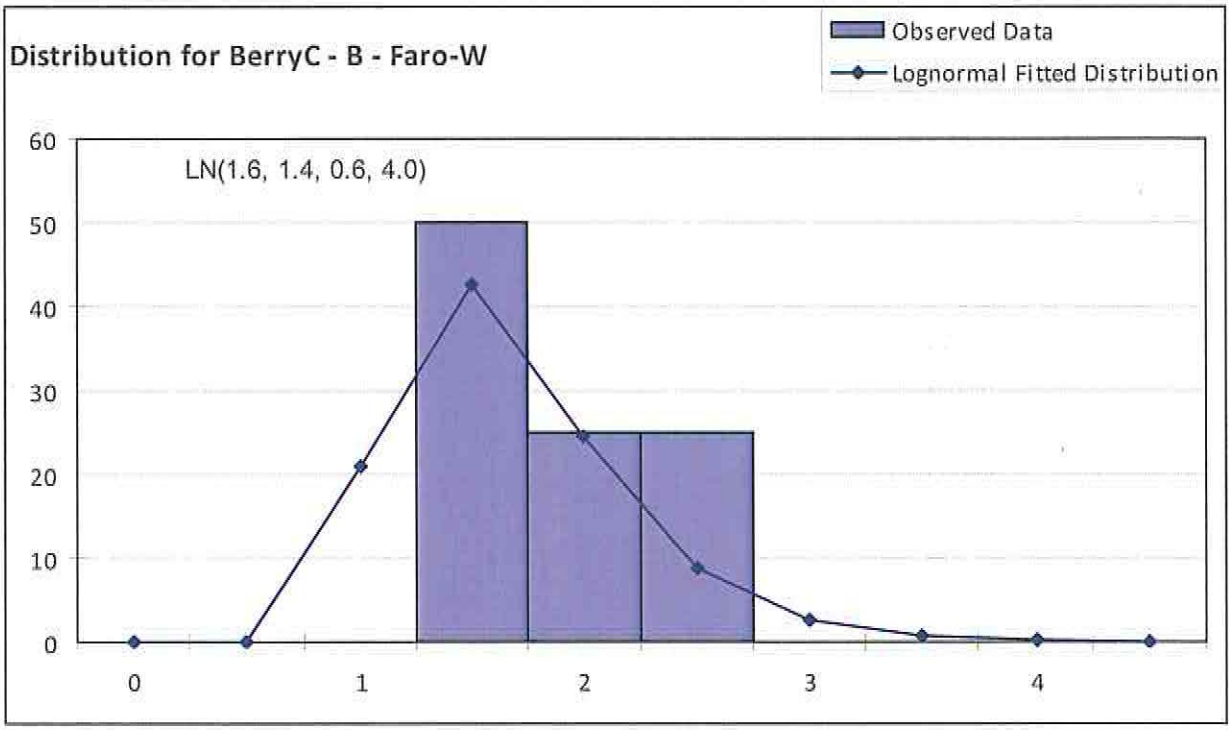

Distribution for BerryC - B - Background
Observed Data
Lognormal Fitted Distribution
LN(1.7, 1.7, 0.3, 9.0)
60
50
40
30
20
10
0
0
2.2
4.4
6.6
8.8
11

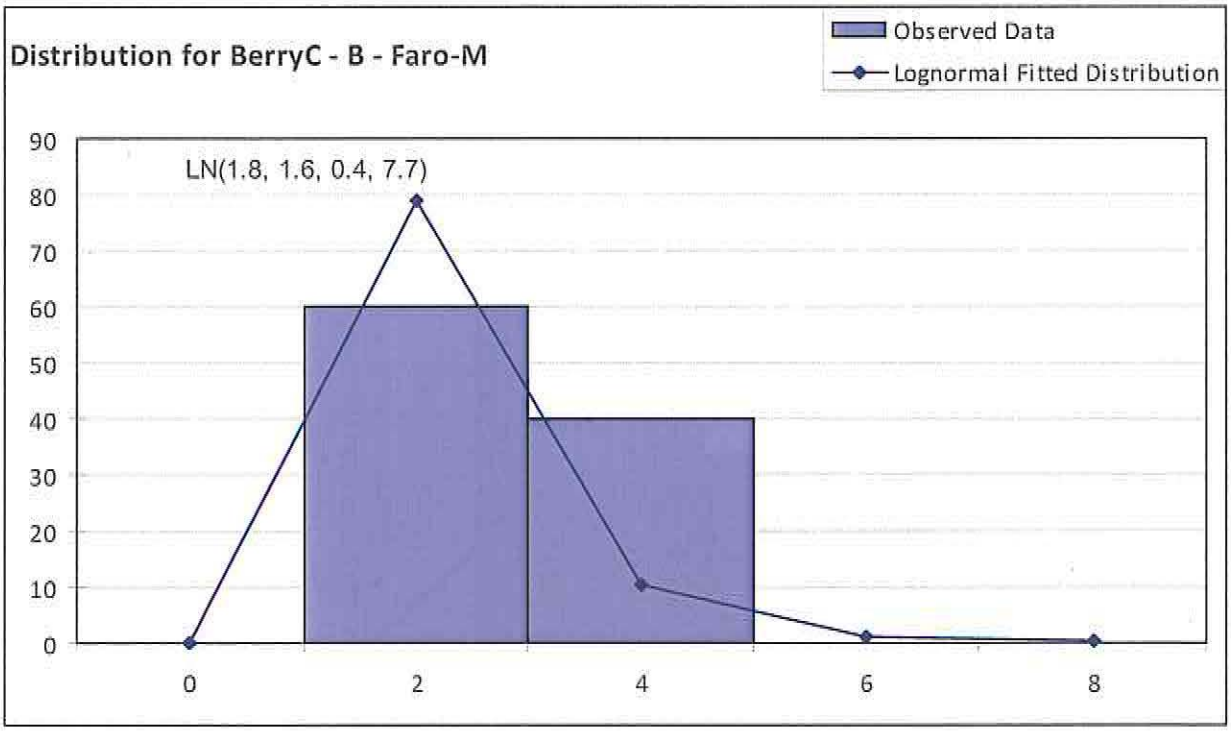

Distribution for BerryC - B - Van-S
Observed Data
Lognormal Fitted Distribution
LN(1.7, 3, 0.06, 45)
120
100
80
60
40
20
0
0
1
2
3
4
5
6
7
8
9
10
11
12

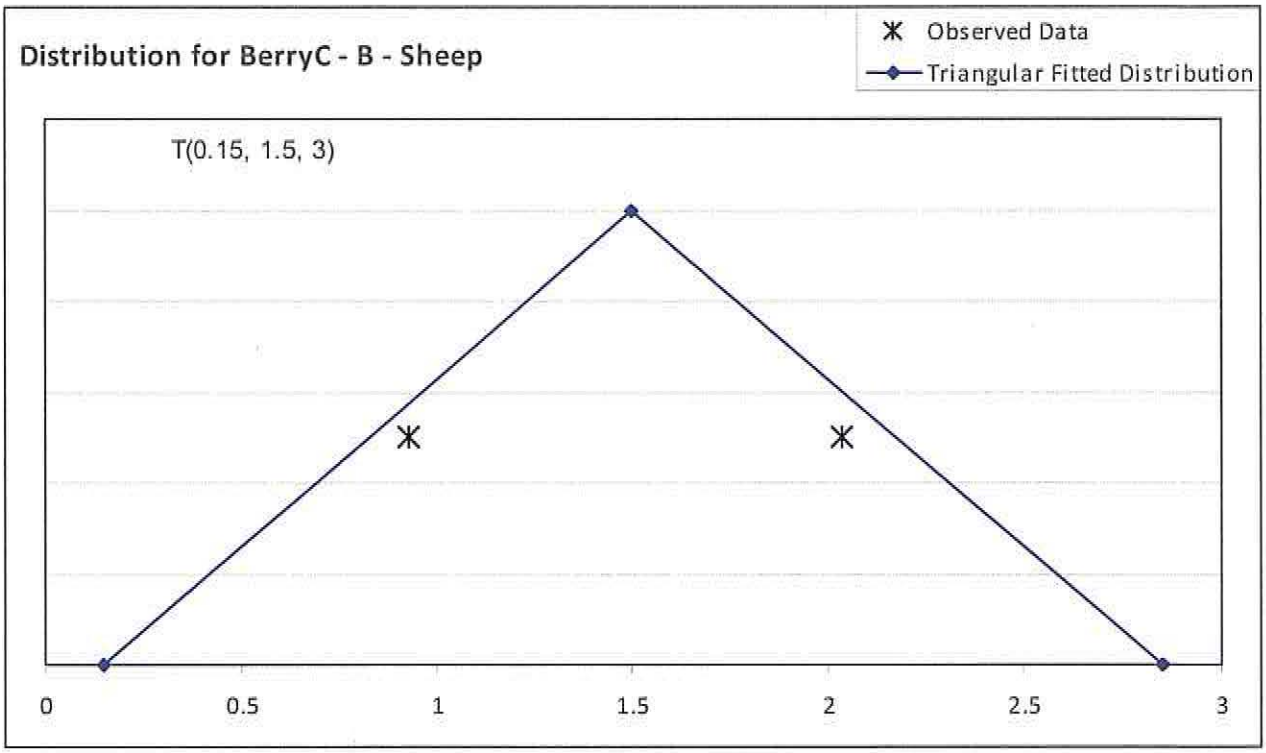

Distribution for BerryC - B - Van-M
Observed Data
Lognormal Fitted Distribution
LN(3.1, 1.4, 1.3, 7.7)
70
60
50
40
30
20
10
0
0
1.6
3.1
4.6
6.1
7.6
9.1


Distribution for BerryC - B - Faro-N
Observed Data
Lognormal Fitted Distribution
LN(0.93, 3, 0.03, 25)
120
100
80
60
40
20
0
0
0.5
1
1.5
2
2.5
3
3.5
4
4.5
5
5.5
6
6.5
7
7.5

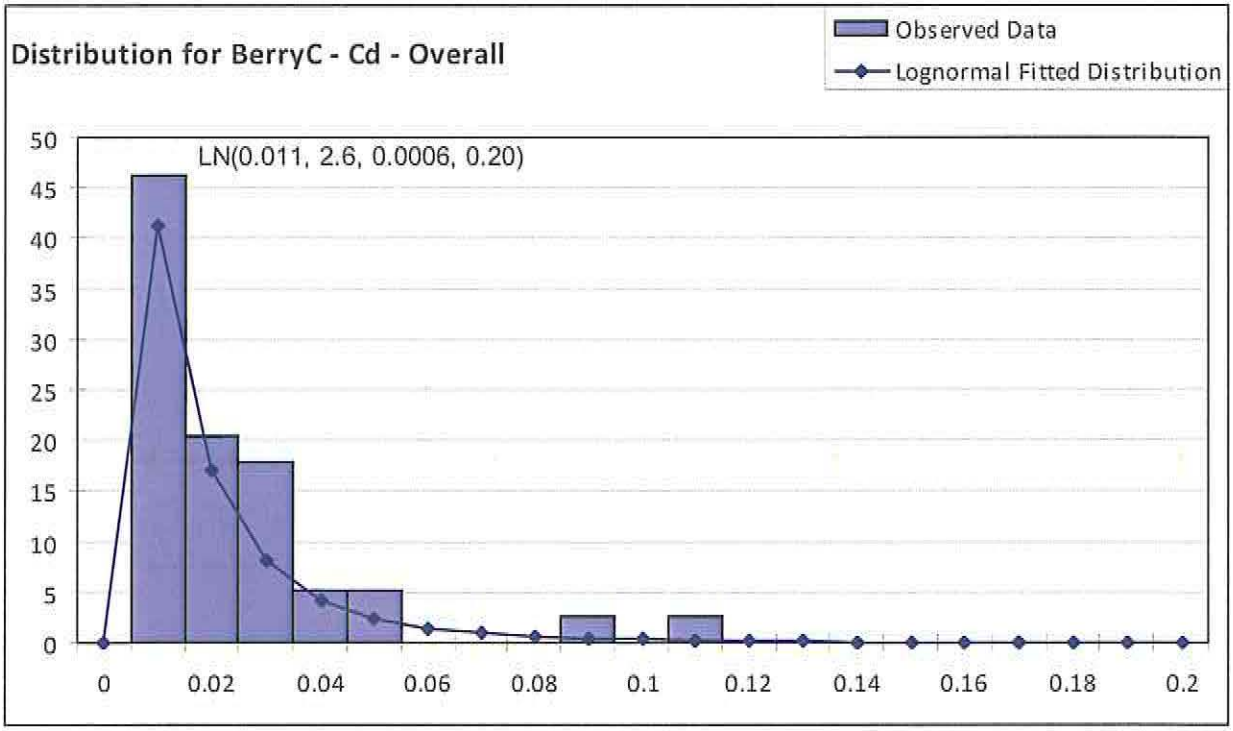

Distribution for BerryC - B - Faro-S
Observed Data
Lognormal Fitted Distribution
LN(2.4, 1.4, 0.9, 6.3)
80
70
60
50
40
30
20
10
0
0
1.7
3.4
5.1
6.8

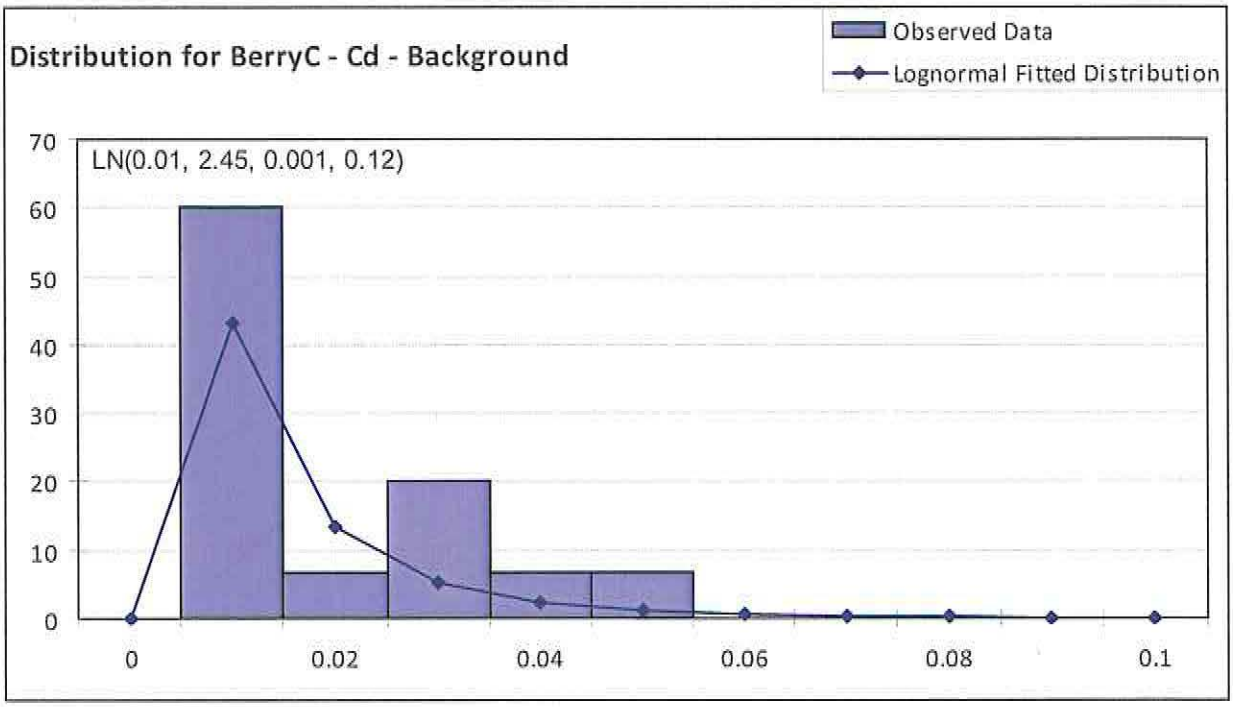

Distribution for BerryC - B - Faro-W
Observed Data
Lognormal Fitted Distribution
LN(1.6, 1.4, 0.6, 4.0)
60
50
40
30
20
10
0
0
1
2
3
4

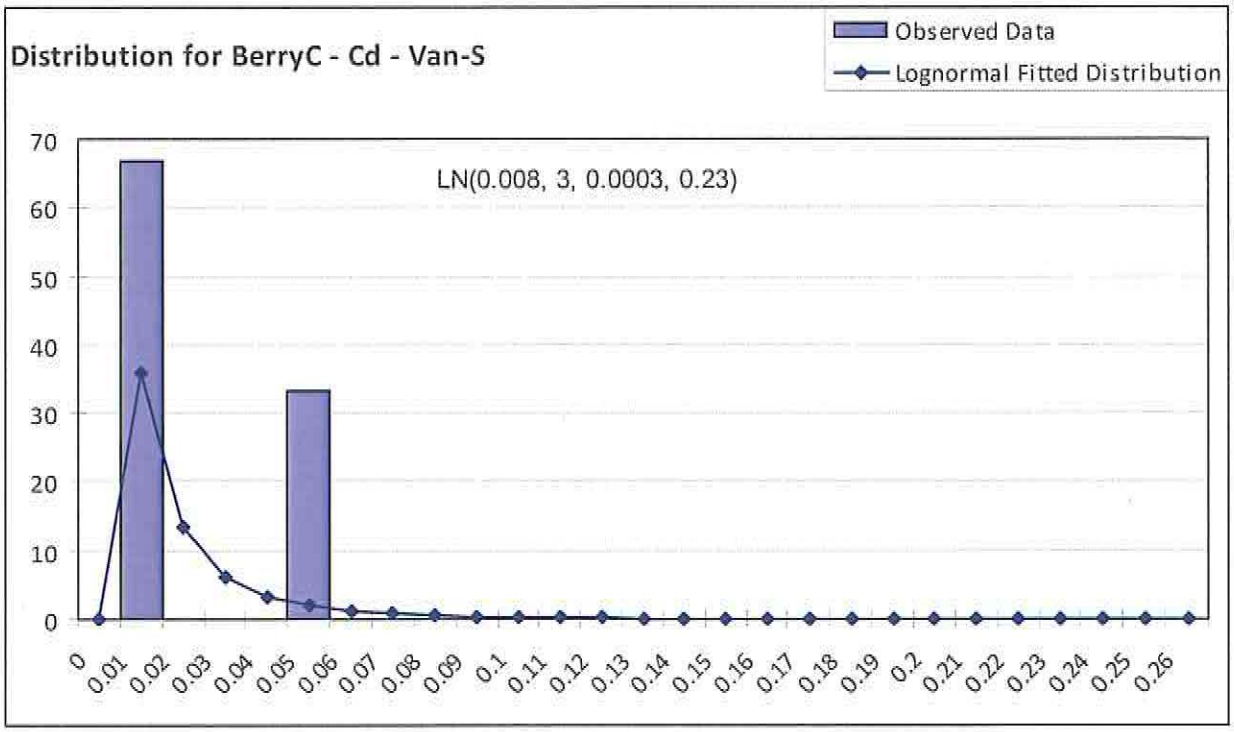

Distribution for BerryC - B - Faro-M
Observed Data
Lognormal Fitted Distribution
LN(1.8, 1.6, 0.4, 7.7)
90
80
70
60
50
40
30
20
10
0
0
2
4
6
8

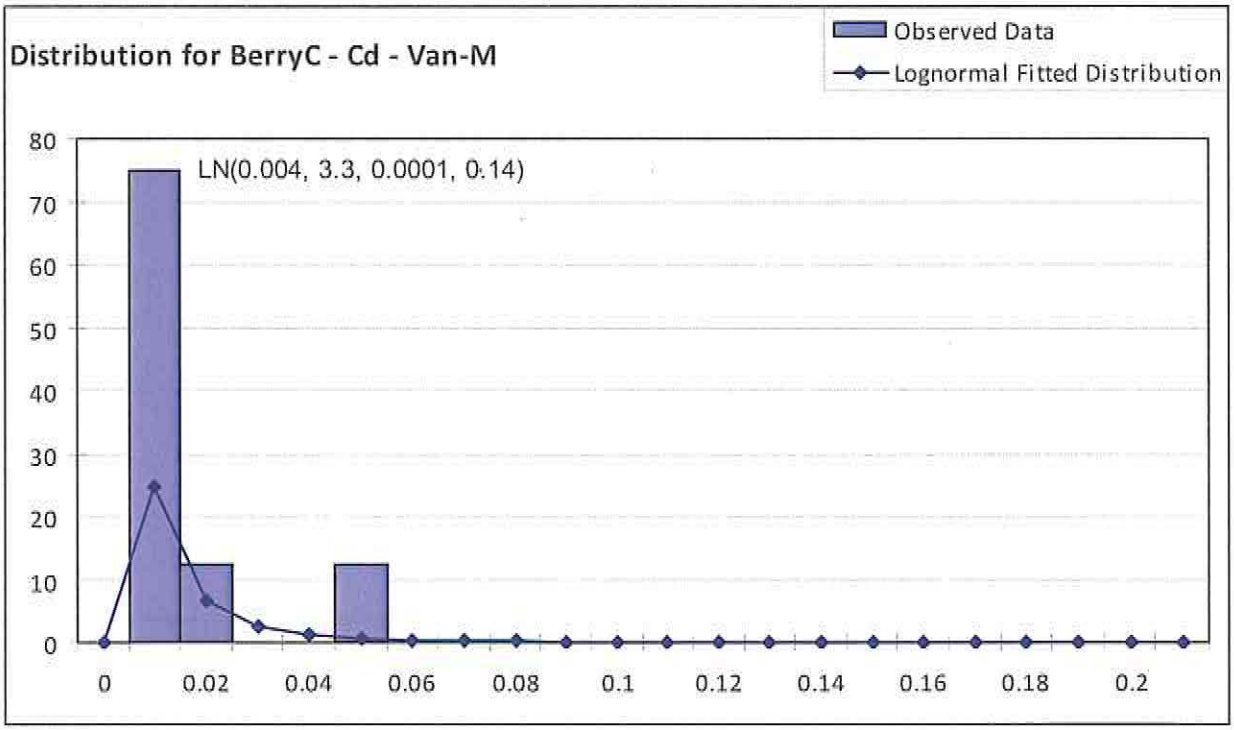

Distribution for BerryC - B - Sheep
Observed Data
Triangular Fitted Distribution
T(0.15, 1.5, 3)
0
0.5
1
1.5
2
2.5
3

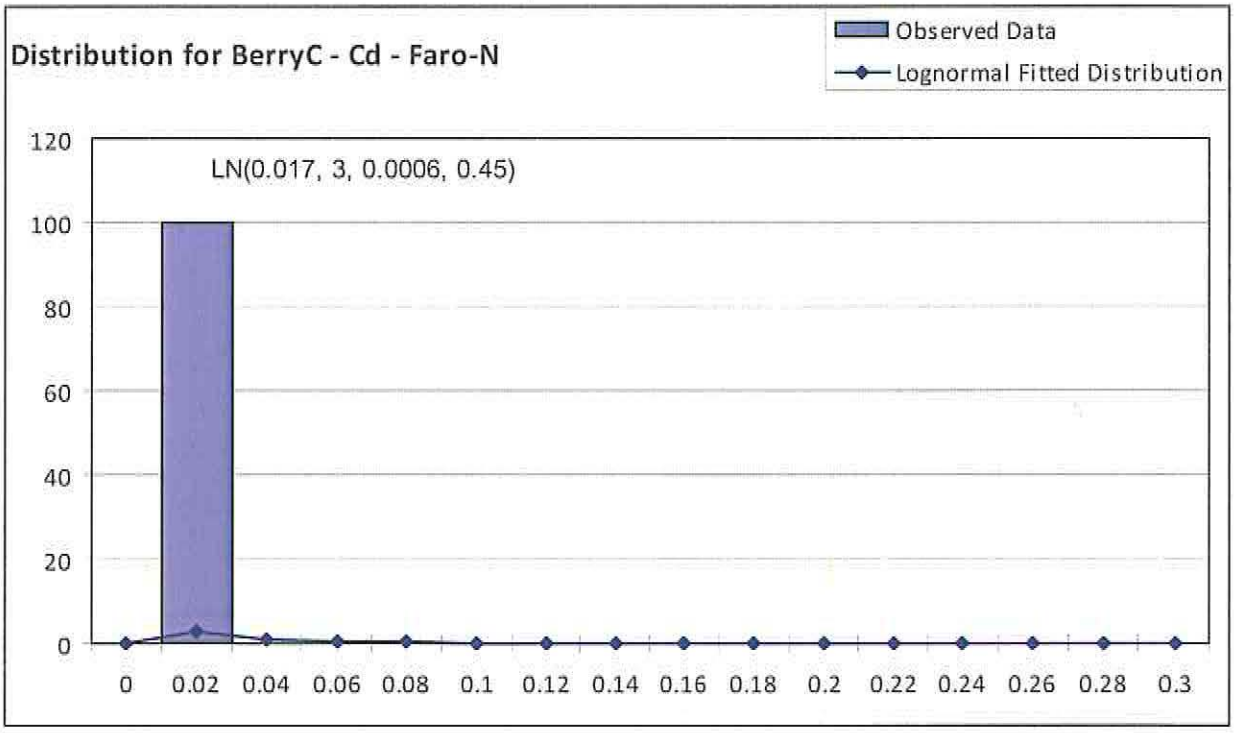
D.4.5 Cadmium

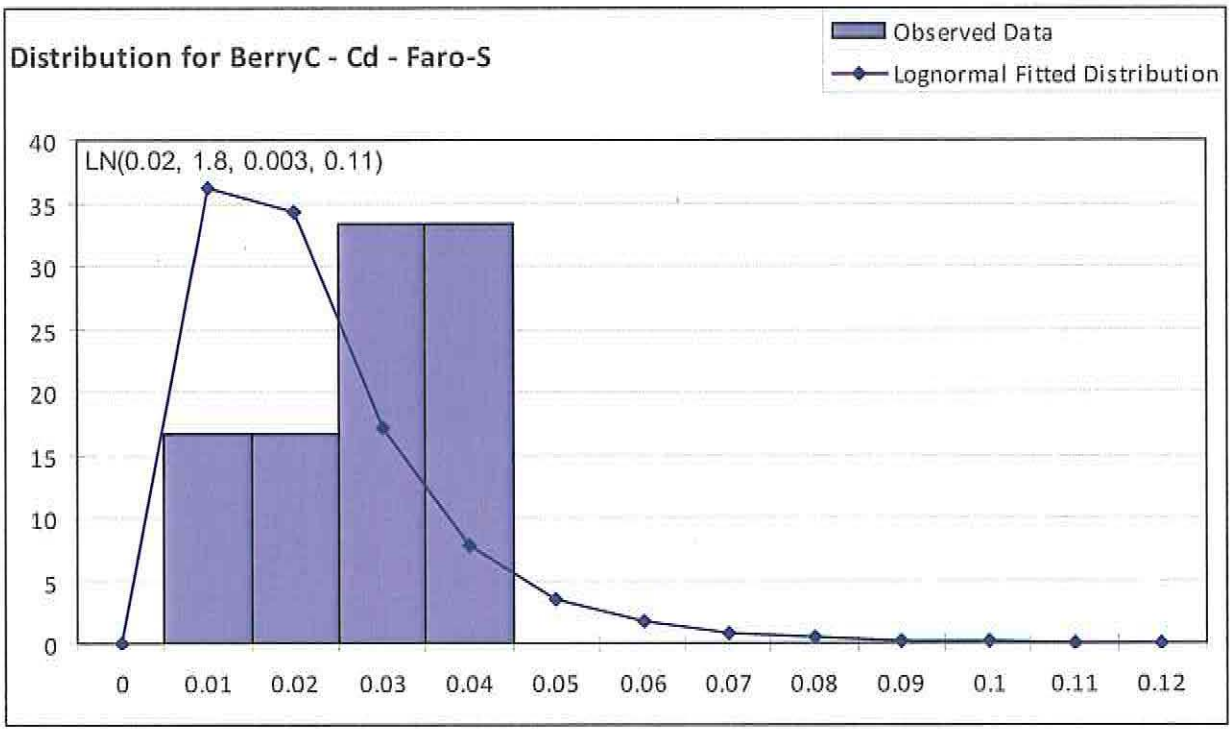

Distribution for BerryC - Cd - Overall
Observed Data
Lognormal Fitted Distribution
LN(0.011, 2.6, 0.0006, 0.20)
50
45
40
35
30
25
20
15
10
5
0
0
0.02
0.04
0.06
0.08
0.1
0.12
0.14
0.16
0.18
0.2

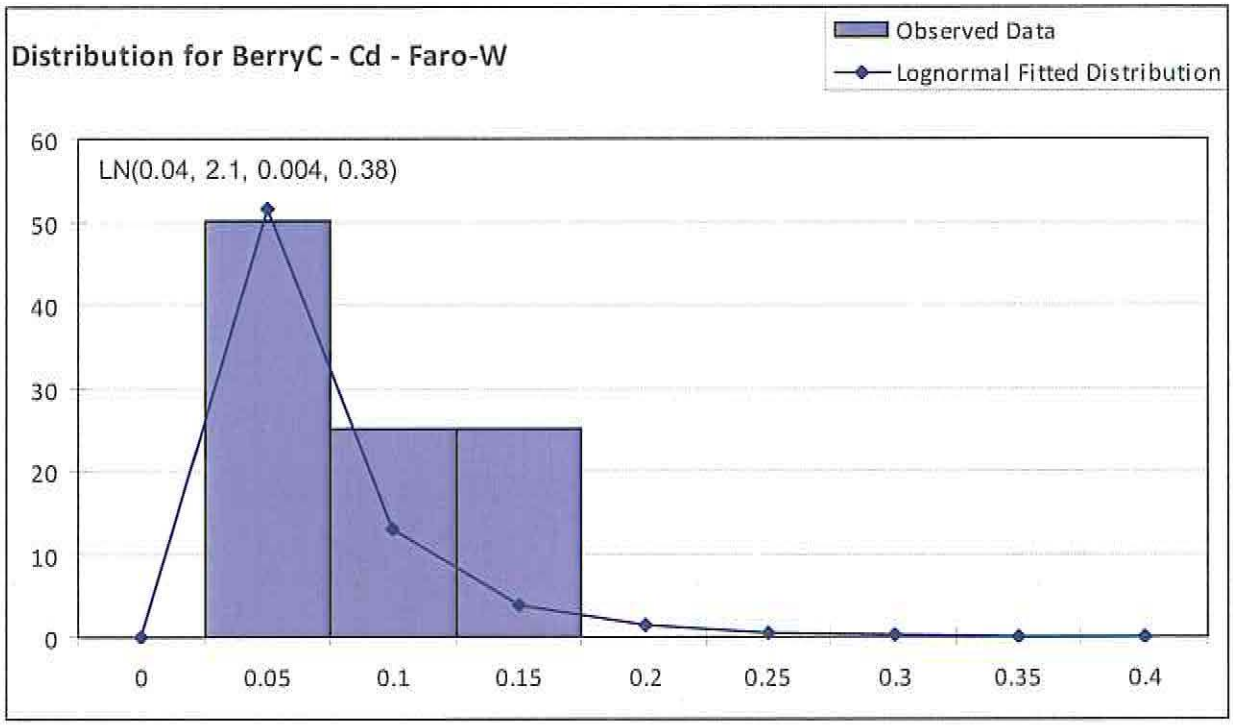

Distribution for BerryC - Cd - Background
Observed Data
Lognormal Fitted Distribution
LN(0.01, 2.45, 0.001, 0.12)
70
60
50
40
30
20
10
0
0
0.02
0.04
0.06
0.08
0.1

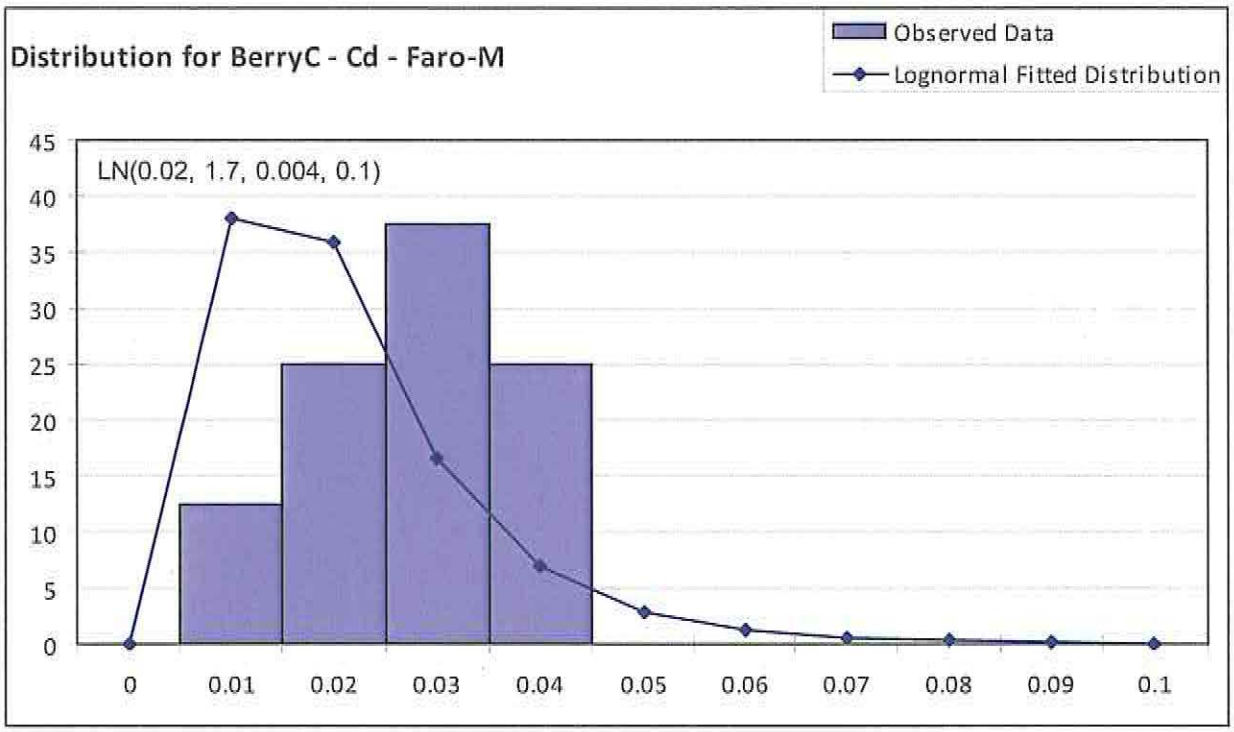

Distribution for BerryC - Cd - Van-S
Observed Data
Lognormal Fitted Distribution
LN(0.008, 3, 0.0003, 0.23)
70
60
50
40
30
20
10
0
0
0.01
0.02
0.03
0.04
0.05
0.06
0.07
0.08
0.09
0.1
0.11
0.12
0.13
0.14
0.15
0.16
0.17
0.18
0.19
0.2
0.21
0.22
0.23
0.24
0.25
0.26

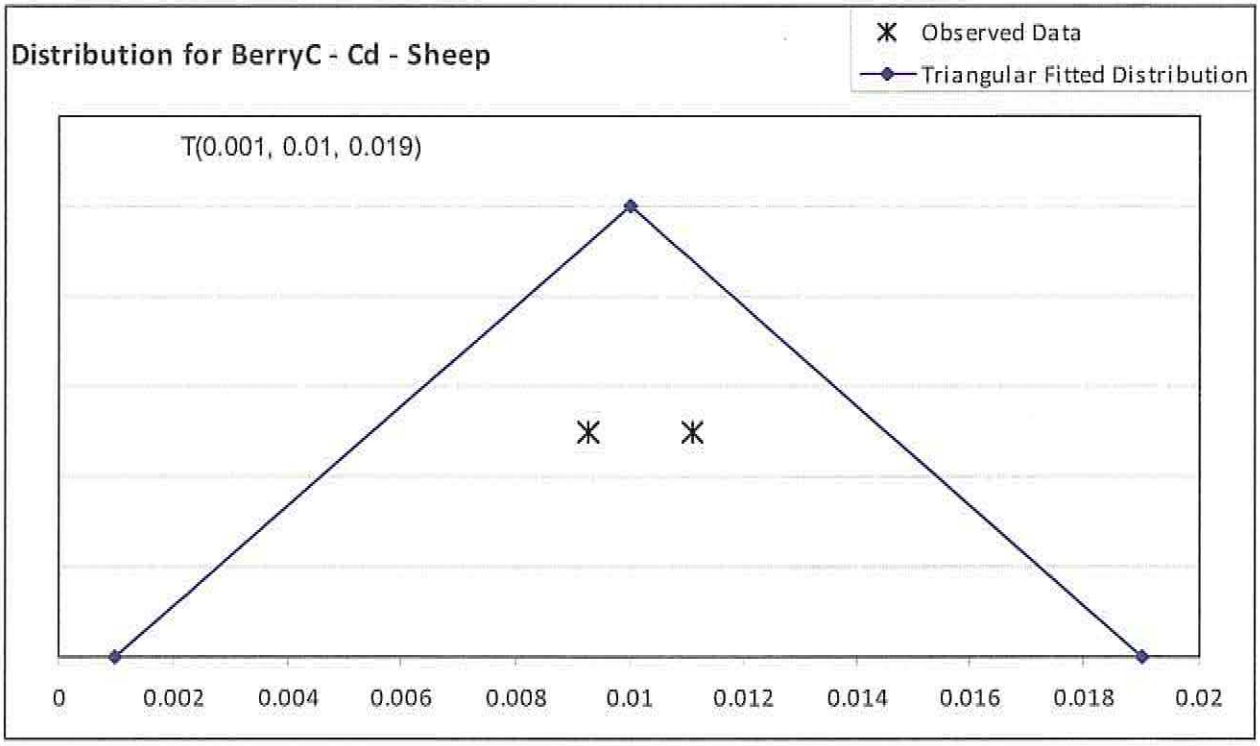

Distribution for BerryC - Cd - Van-M
Observed Data
Lognormal Fitted Distribution
LN(0.004, 3.3, 0.0001, 0.14)
80
70
60
50
40
30
20
10
0
0
0.02
0.04
0.06
0.08
0.1
0.12
0.14
0.16
0.18
0.2


Distribution for BerryC - Cd - Faro-N
Observed Data
Lognormal Fitted Distribution
LN(0.017, 3, 0.0006, 0.45)
120
100
80
60
40
20
0
0
0.02
0.04
0.06
0.08
0.1
0.12
0.14
0.16
0.18
0.2
0.22
0.24
0.26
0.28
0.3

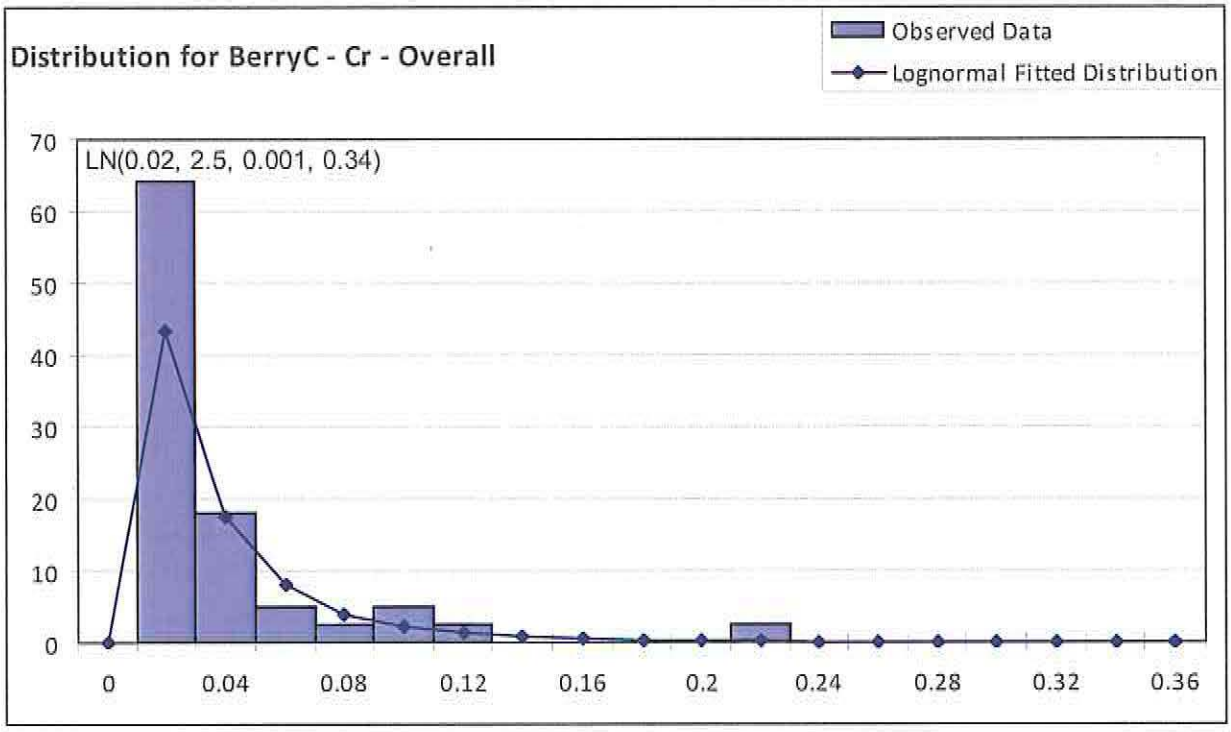

Distribution for BerryC - Cd - Faro-S
Observed Data
Lognormal Fitted Distribution
LN(0.02, 1.8, 0.003, 0.11)
40
35
30
25
20
15
10
5
0
0
0.01
0.02
0.03
0.04
0.05
0.06
0.07
0.08
0.09
0.1
0.11
0.12

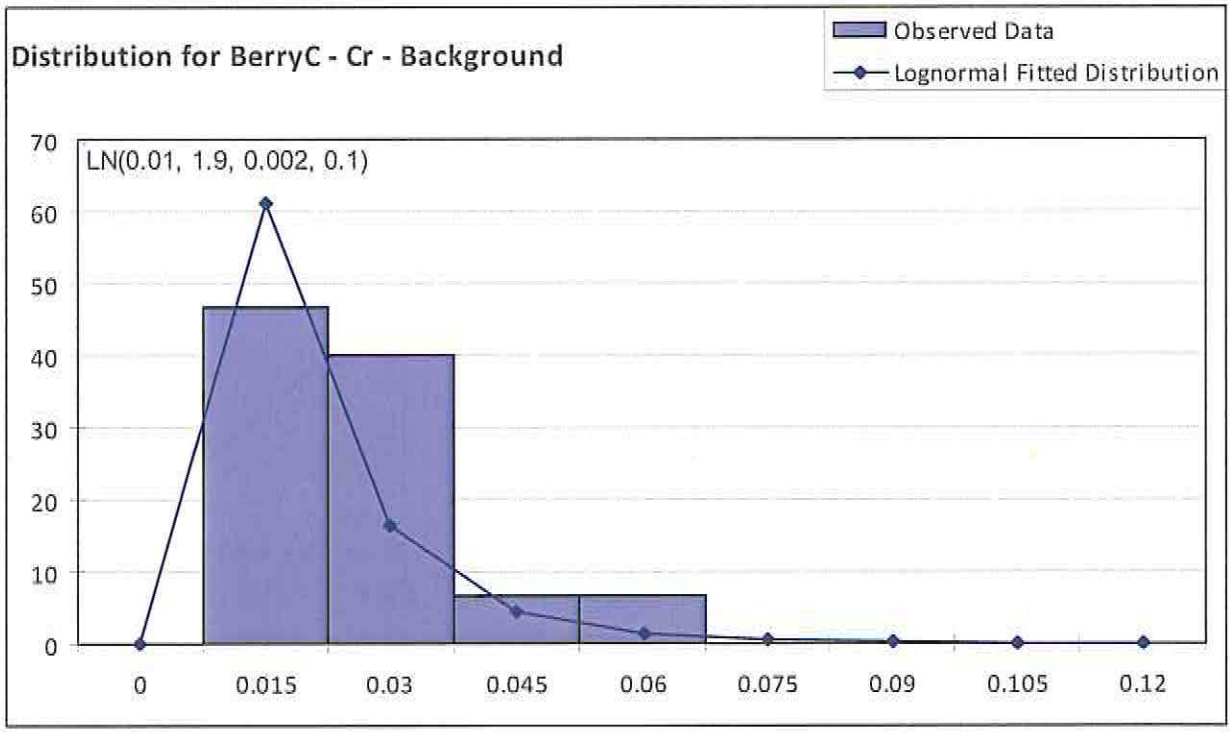

Distribution for BerryC - Cd - Faro-W
Observed Data
Lognormal Fitted Distribution
LN(0.04, 2.1, 0.004, 0.38)
60
50
40
30
20
10
0
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4

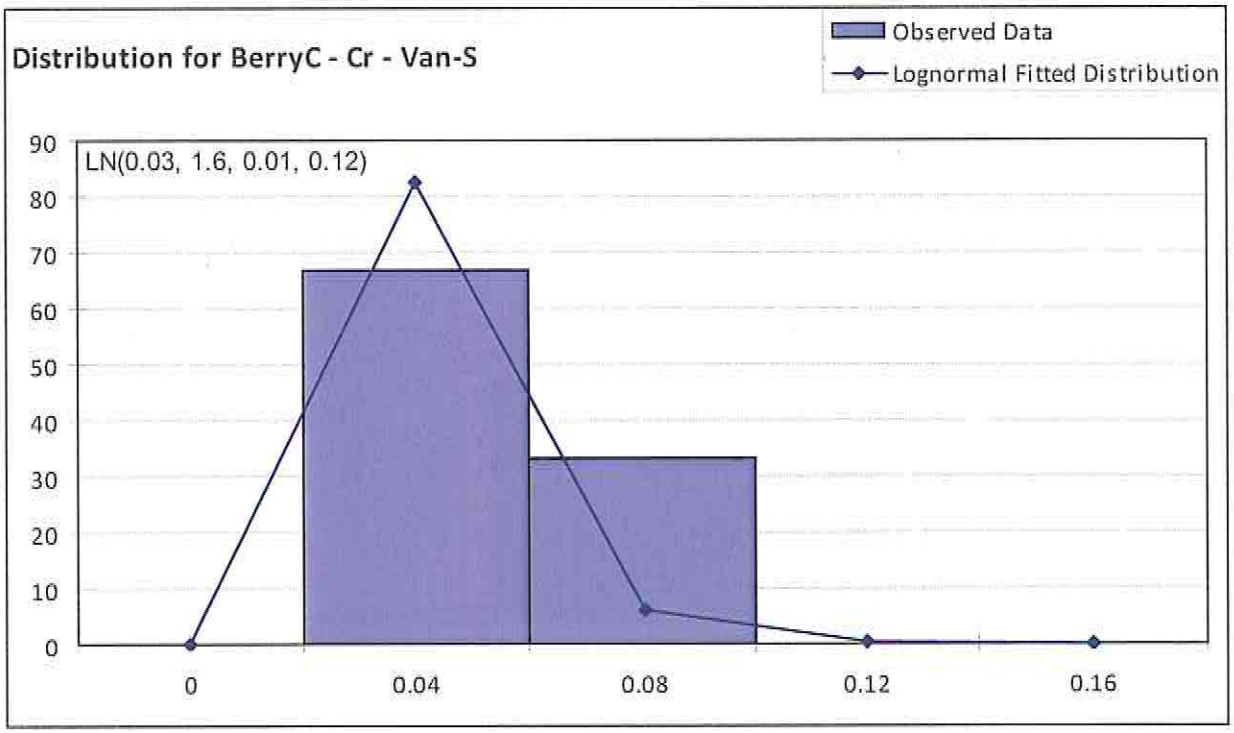

Distribution for BerryC - Cd - Faro-M
Observed Data
Lognormal Fitted Distribution
LN(0.02, 1.7, 0.004, 0.1)
45
40
35
30
25
20
15
10
5
0
0
0.01
0.02
0.03
0.04
0.05
0.06
0.07
0.08
0.09
0.1

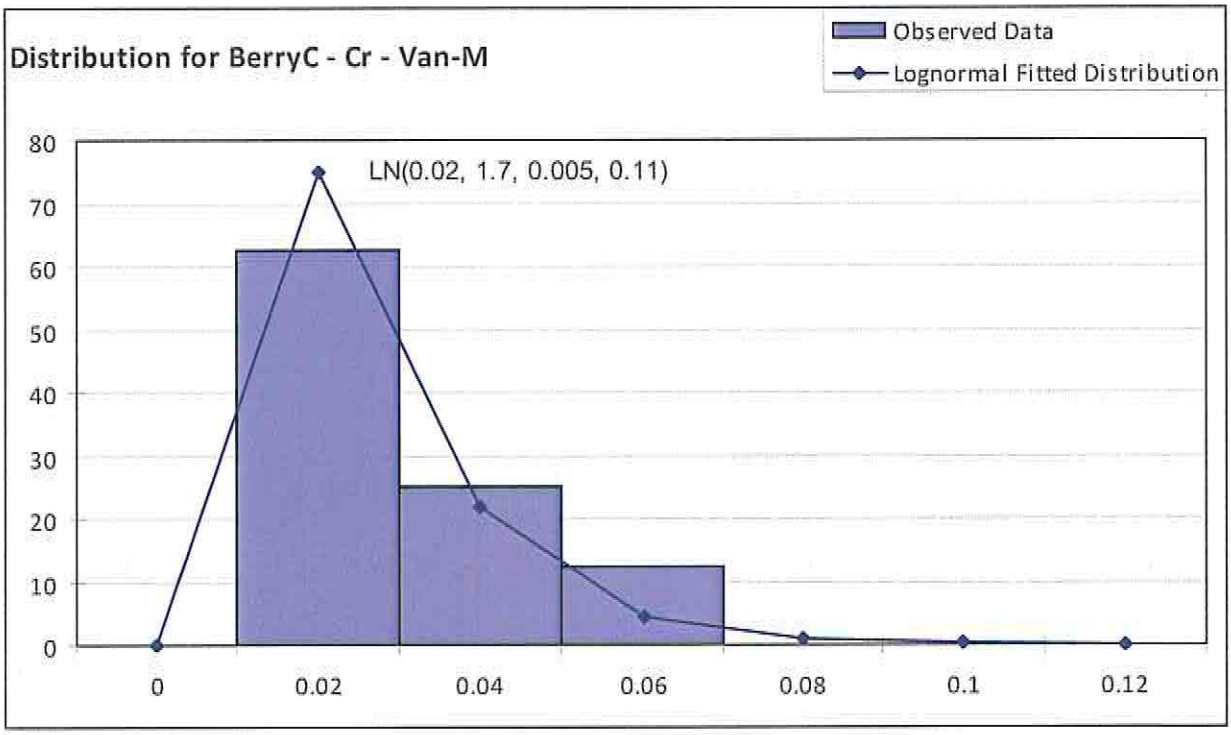

Distribution for BerryC - Cd - Sheep
Observed Data
Triangular Fitted Distribution
T(0.001, 0.01, 0.019)
0
0.002
0.004
0.006
0.008
0.01
0.012
0.014
0.016
0.018
0.02

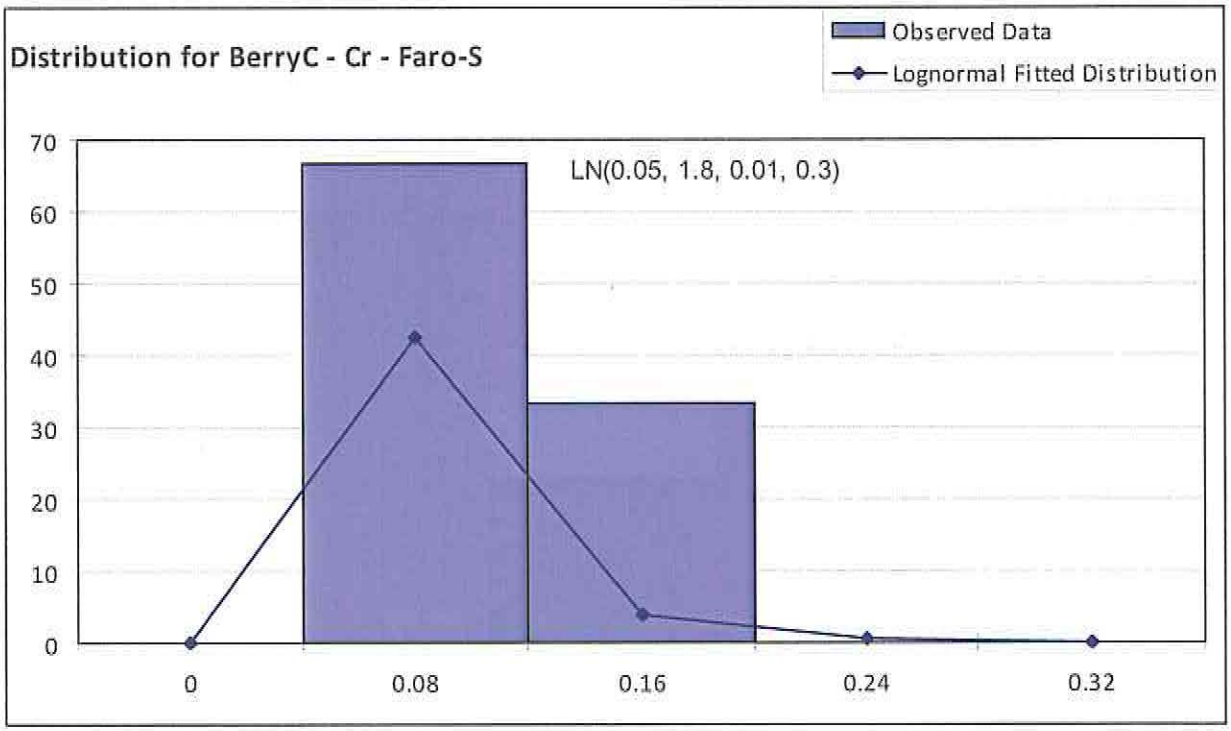
D.4.6 Chromium

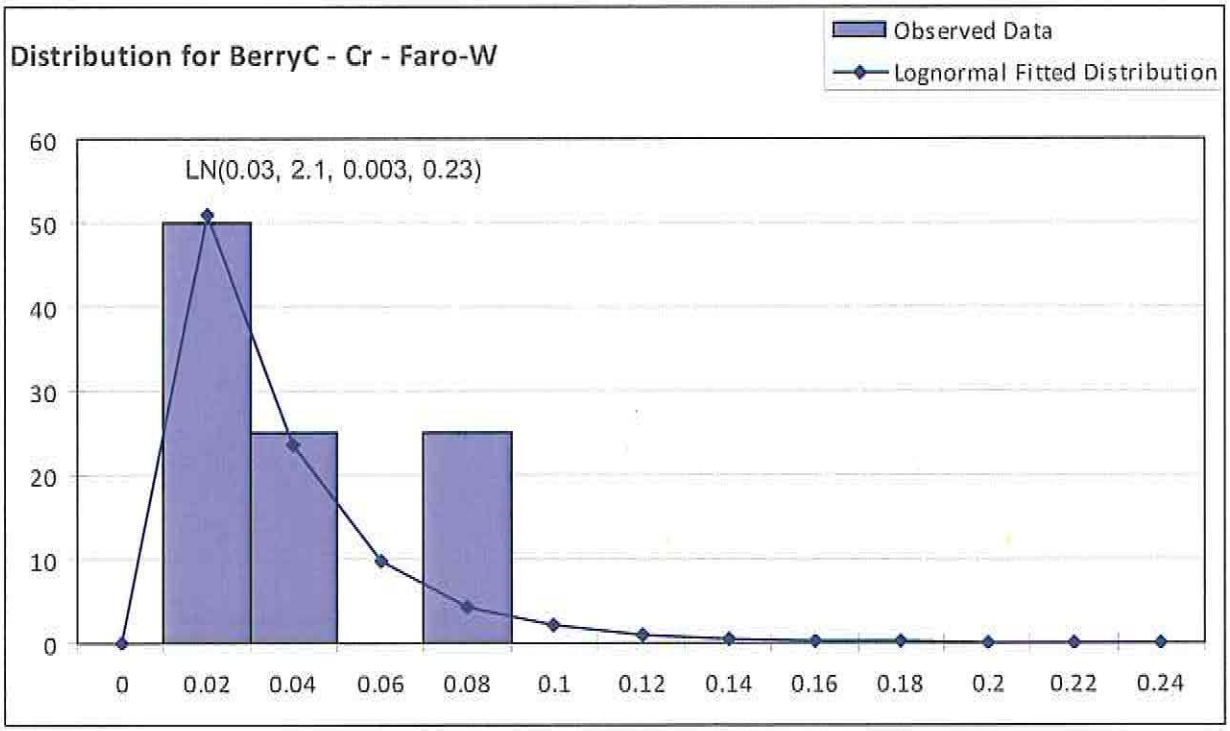


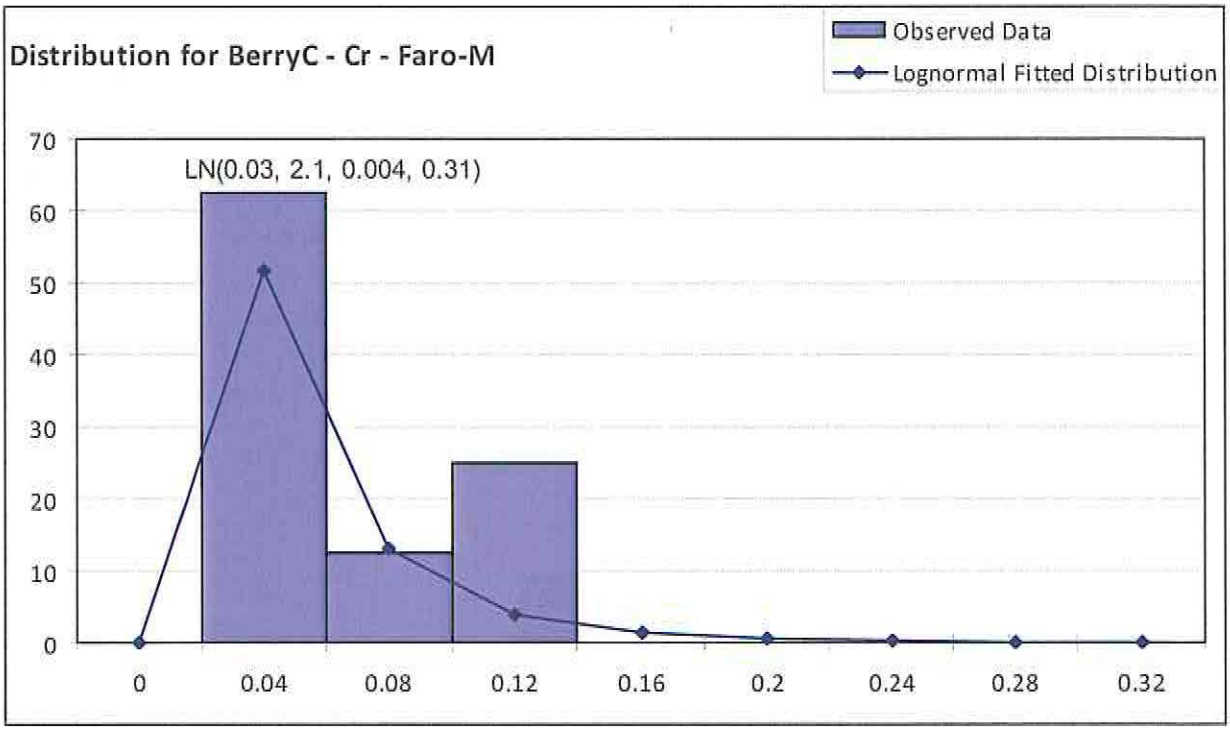


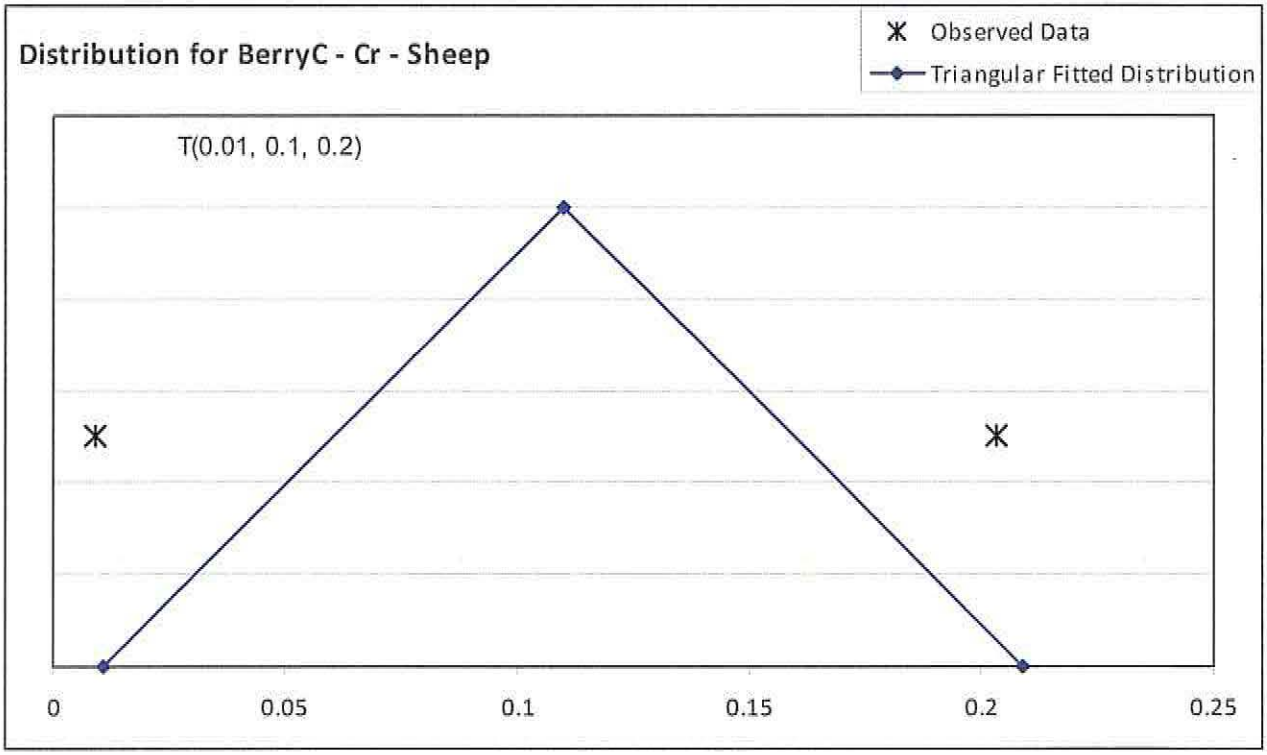

Distribution for BerryC - Cr - Van-S
Observed Data
Lognormal Fitted Distribution
LN(0.03, 1.6, 0.01, 0.12)
90
80
70
60
50
40
30
20
10
0
0
0.04
0.08
0.12
0.16


Distribution for BerryC - Cr - Van-M
Observed Data
Lognormal Fitted Distribution
LN(0.02, 1.7, 0.005, 0.11)
80
70
60
50
40
30
20
10
0
0
0.02
0.04
0.06
0.08
0.1
0.12


Distribution for BerryC - Cr - Faro-S
Observed Data
Lognormal Fitted Distribution
LN(0.05, 1.8, 0.01, 0.3)
70
60
50
40
30
20
10
0
0
0.08
0.16
0.24
0.32


Distribution for BerryC - Cr - Faro-W
Observed Data
Lognormal Fitted Distribution
LN(0.03, 2.1, 0.003, 0.23)
60
50
40
30
20
10
0
0
0.02
0.04
0.06
0.08
0.1
0.12
0.14
0.16
0.18
0.2
0.22
0.24

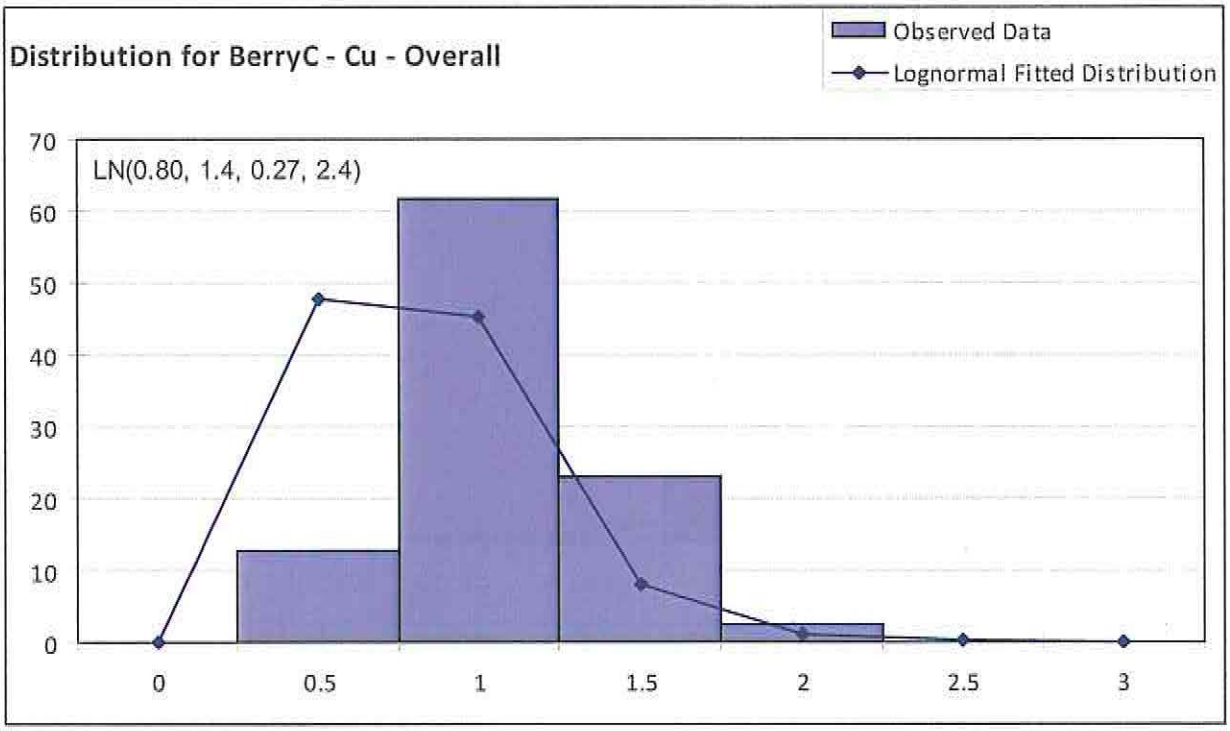


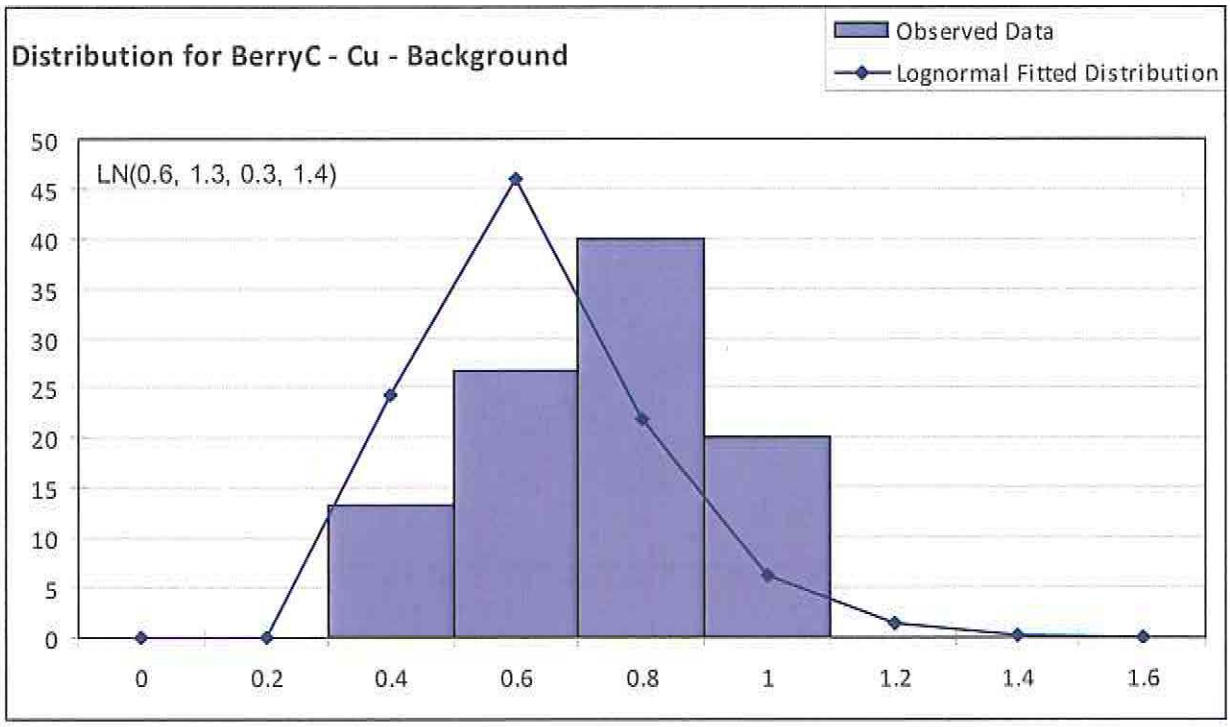


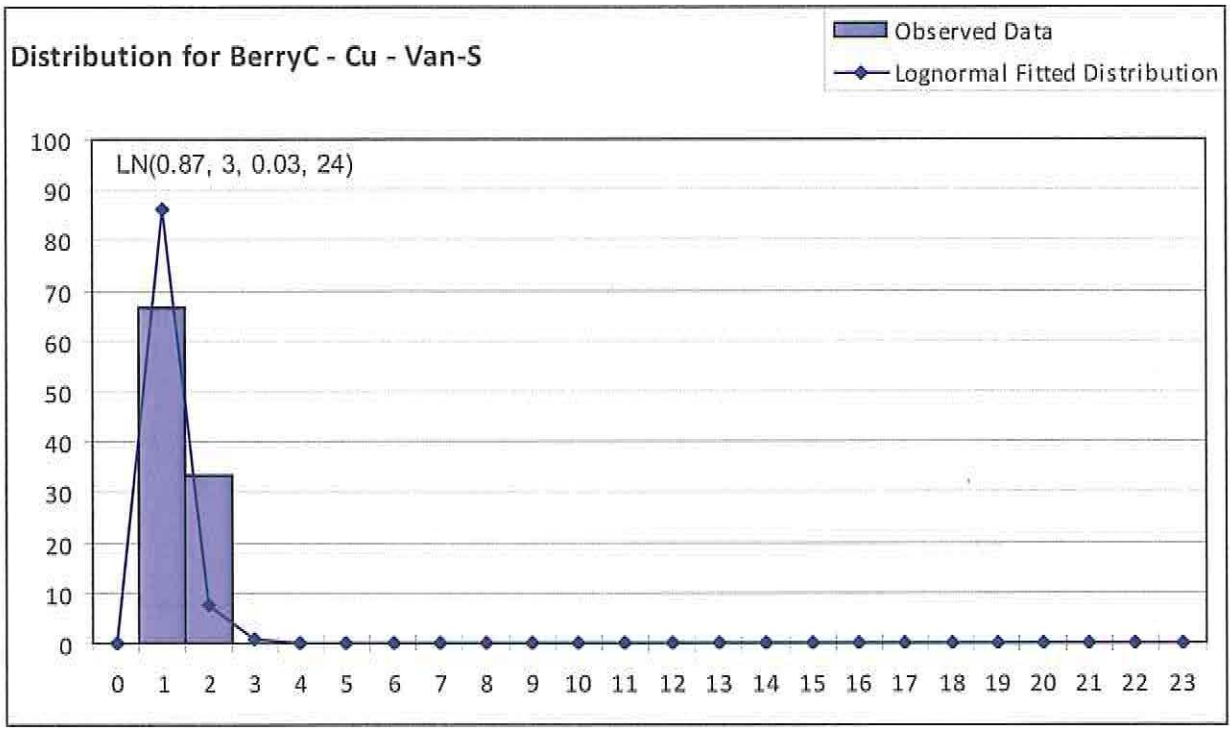
D.4.7 Cobalt

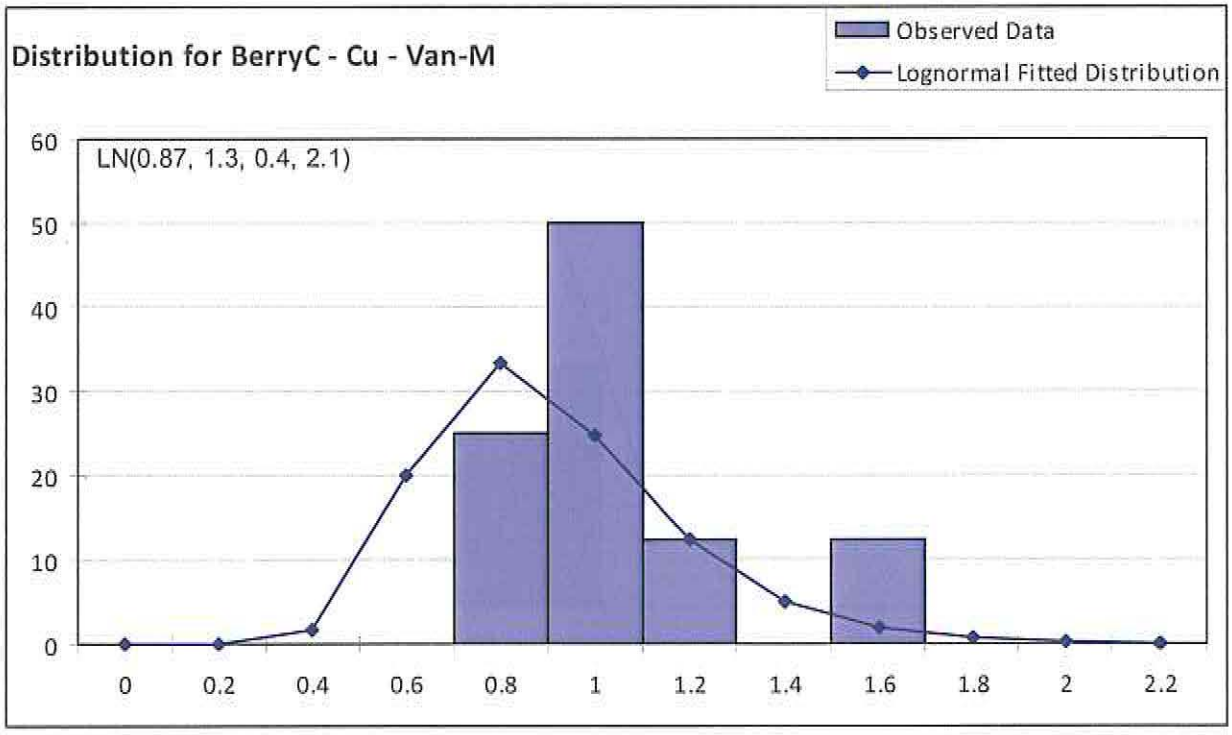
All uniform distributions – U(0, 0.02)

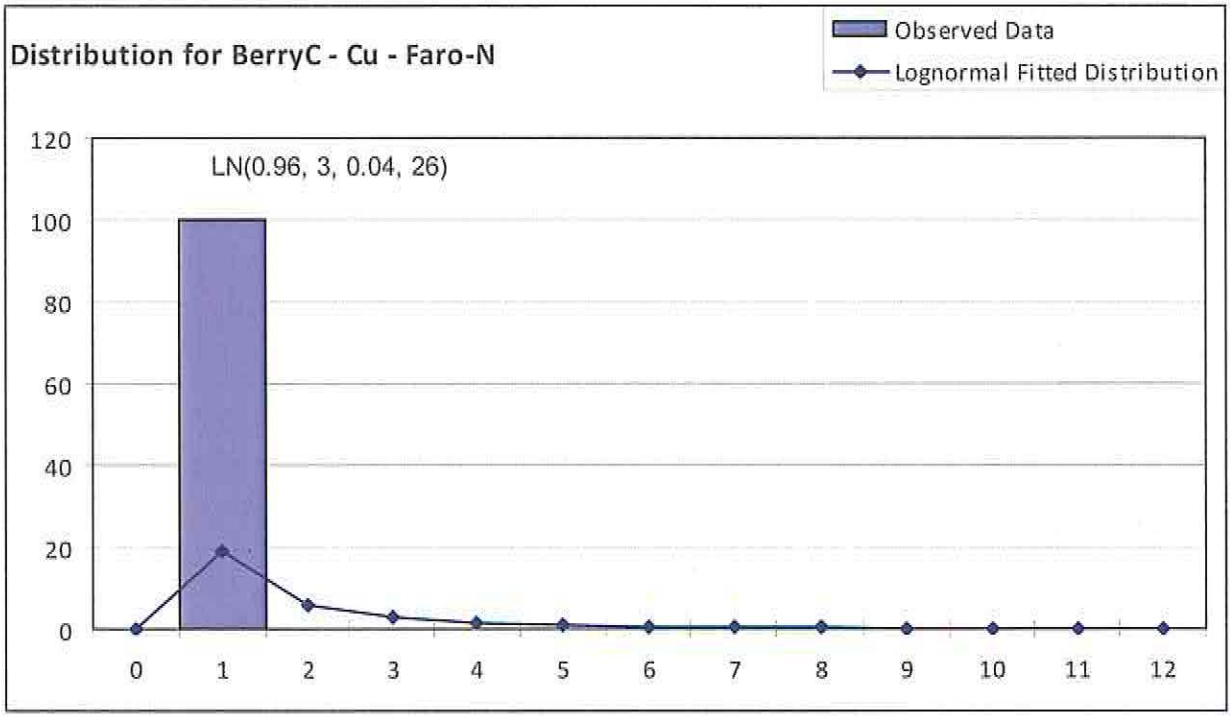
D.4.8 Copper

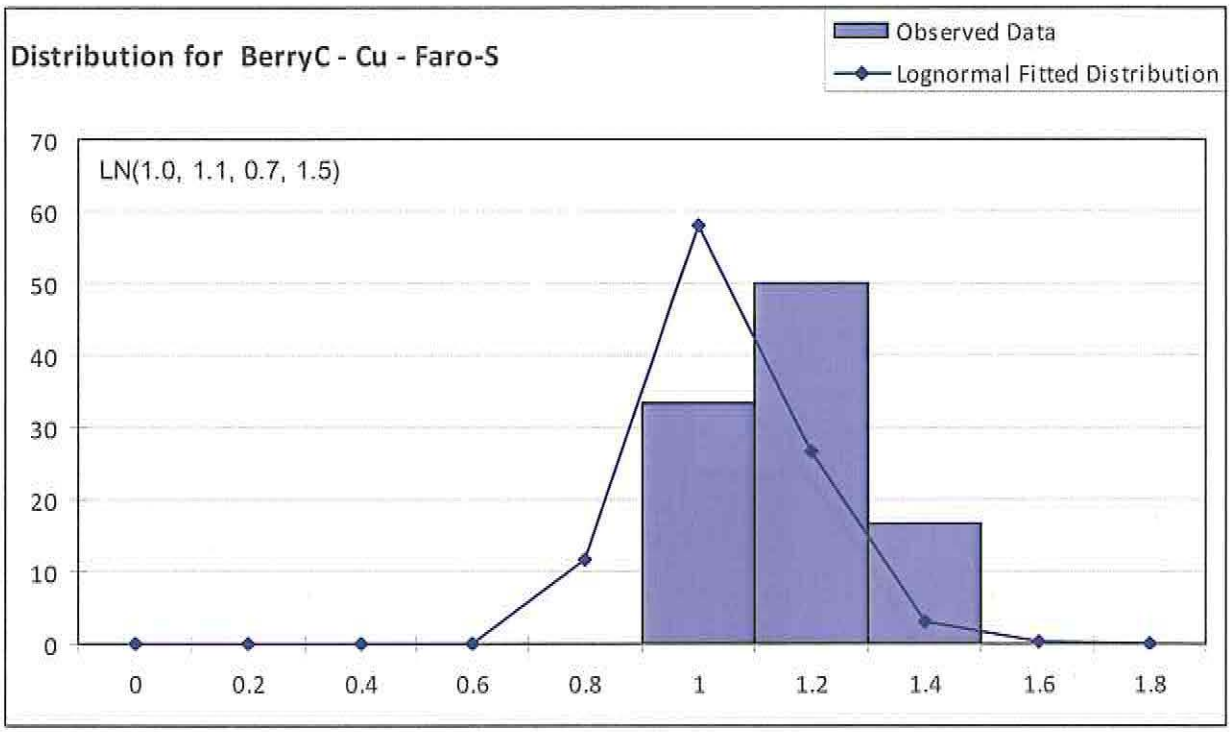

Distribution for BerryC - Cu - Overall
Observed Data
Lognormal Fitted Distribution
LN(0.80, 1.4, 0.27, 2.4)
70
60
50
40
30
20
10
0
0
0.5
1
1.5
2
2.5
3

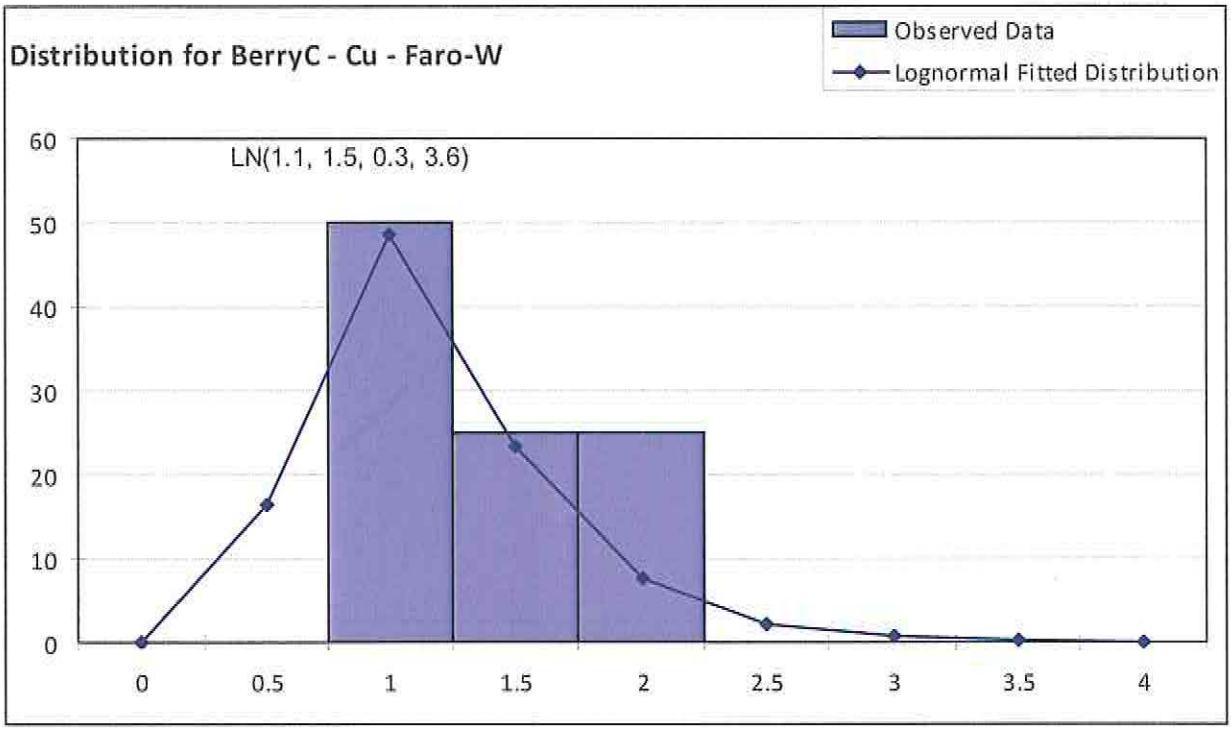

Distribution for BerryC - Cu - Background
Observed Data
Lognormal Fitted Distribution
LN(0.6, 1.3, 0.3, 1.4)
50
45
40
35
30
25
20
15
10
5
0
0
0.2
0.4
0.6
0.8
1
1.2
1.4
1.6

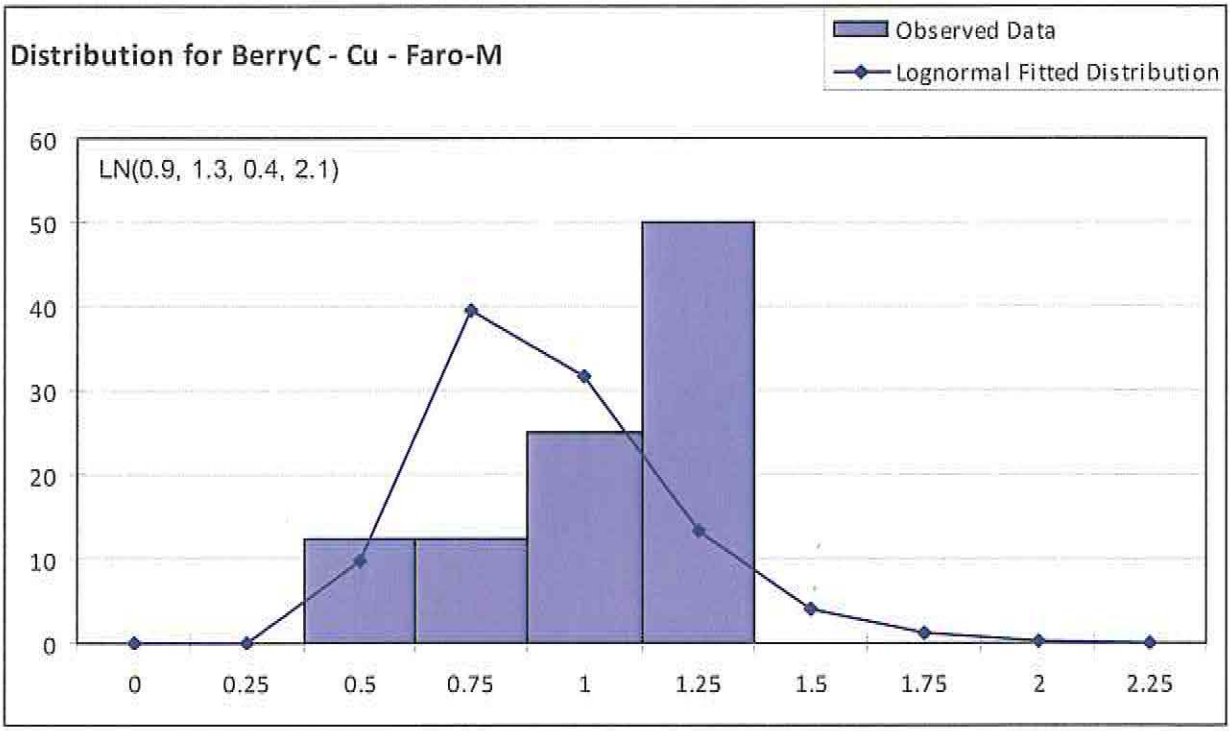

Distribution for BerryC - Cu - Van-S
Observed Data
Lognormal Fitted Distribution
LN(0.87, 3, 0.03, 24)
100
90
80
70
60
50
40
30
20
10
0
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23

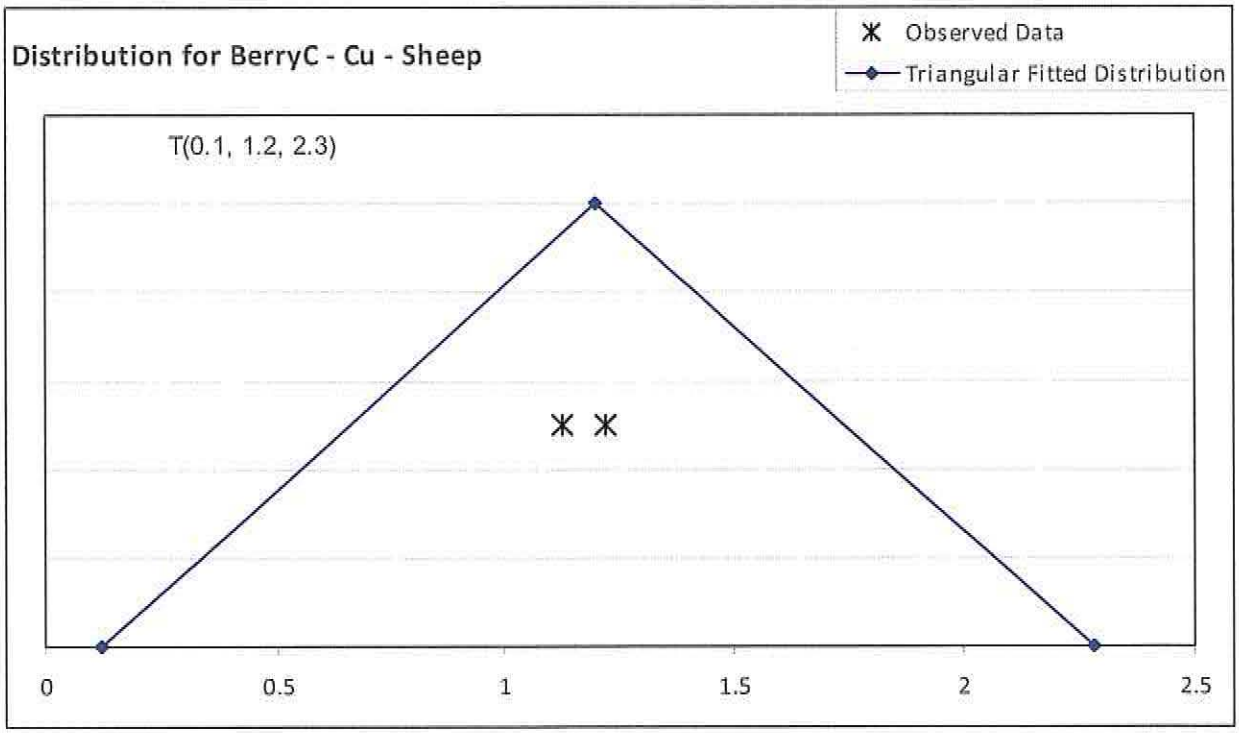

Distribution for BerryC - Cu - Van-M
Observed Data
Lognormal Fitted Distribution
LN(0.87, 1.3, 0.4, 2.1)
60
50
40
30
20
10
0
0 0.2 0.4 0.6 0.8 1 1.2 1.4 1.6 1.8 2 2.2


Distribution for BerryC - Cu - Faro-N
Observed Data
Lognormal Fitted Distribution
LN(0.96, 3, 0.04, 26)
120
100
80
60
40
20
0
0
1
2
3
4
5
6
7
8
9
10
11
12

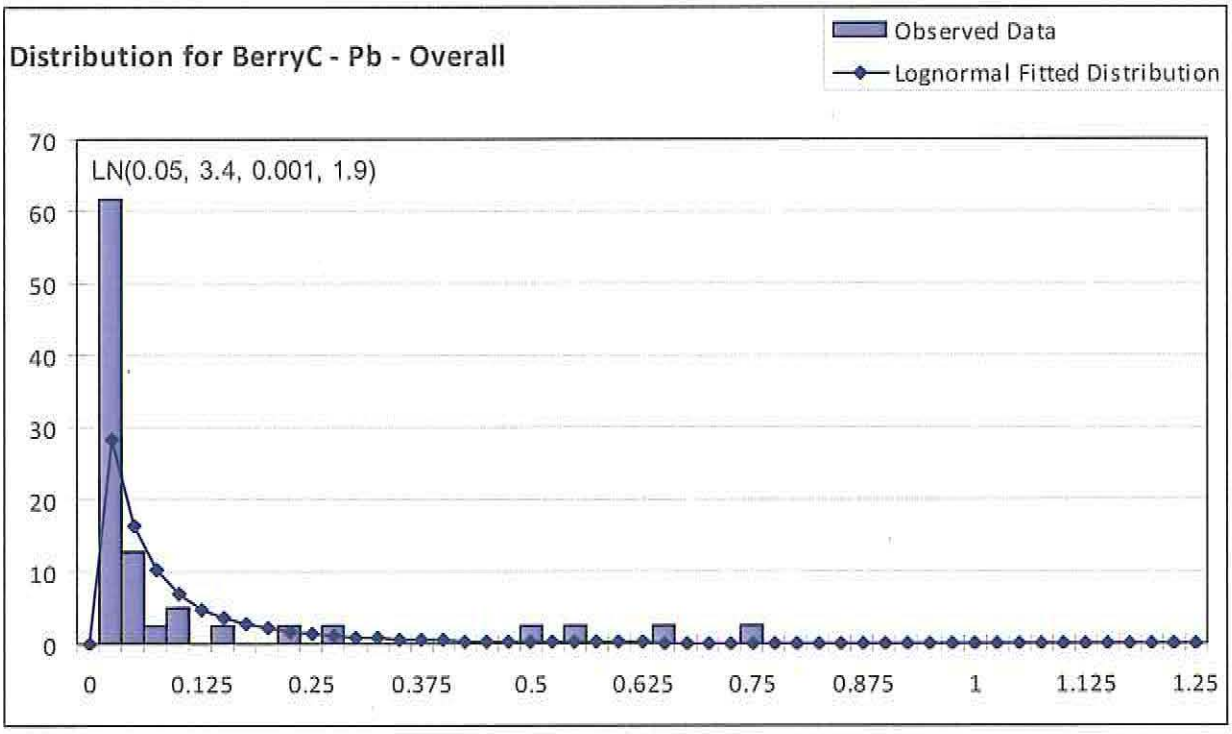

Distribution for BerryC - Cu - Faro-S
Observed Data
Lognormal Fitted Distribution
LN(1.0, 1.1, 0.7, 1.5)
70
60
50
40
30
20
10
0
0
0.2
0.4
0.6
0.8
1
1.2
1.4
1.6
1.8

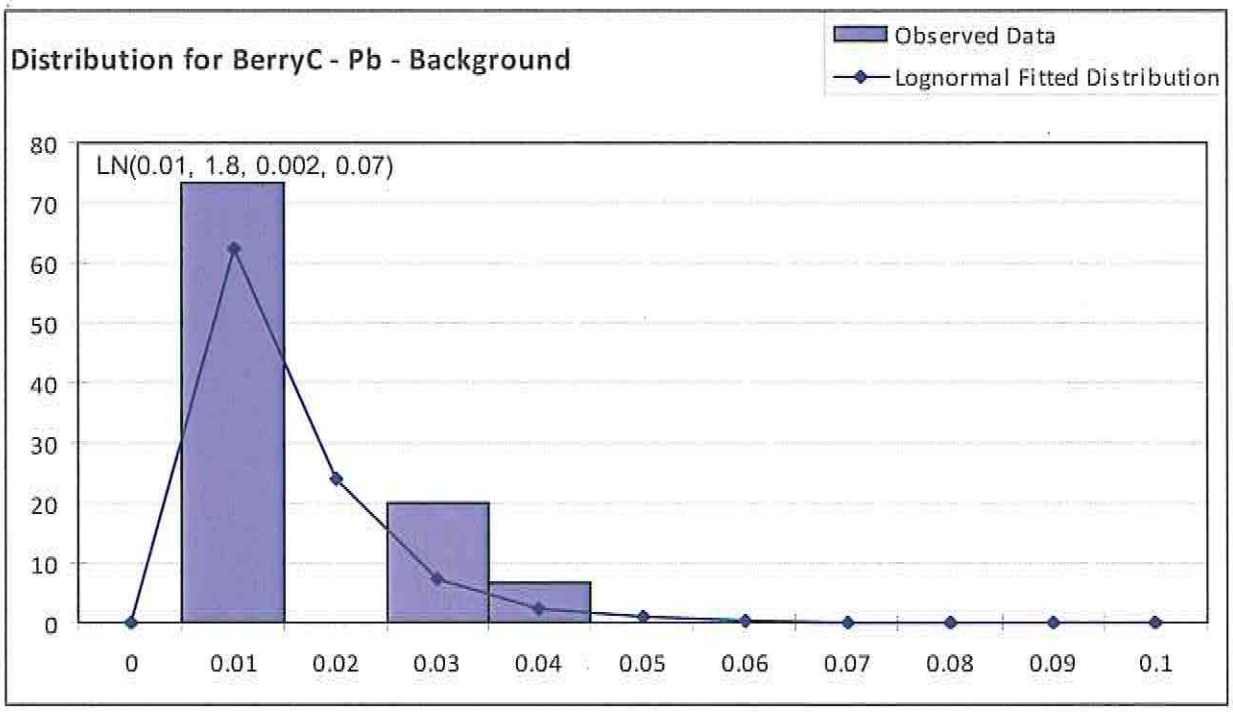

Distribution for BerryC - Cu - Faro-W
Observed Data
Lognormal Fitted Distribution
LN(1.1, 1.5, 0.3, 3.6)
60
50
40
30
20
10
0
0
0.5
1
1.5
2
2.5
3
3.5
4

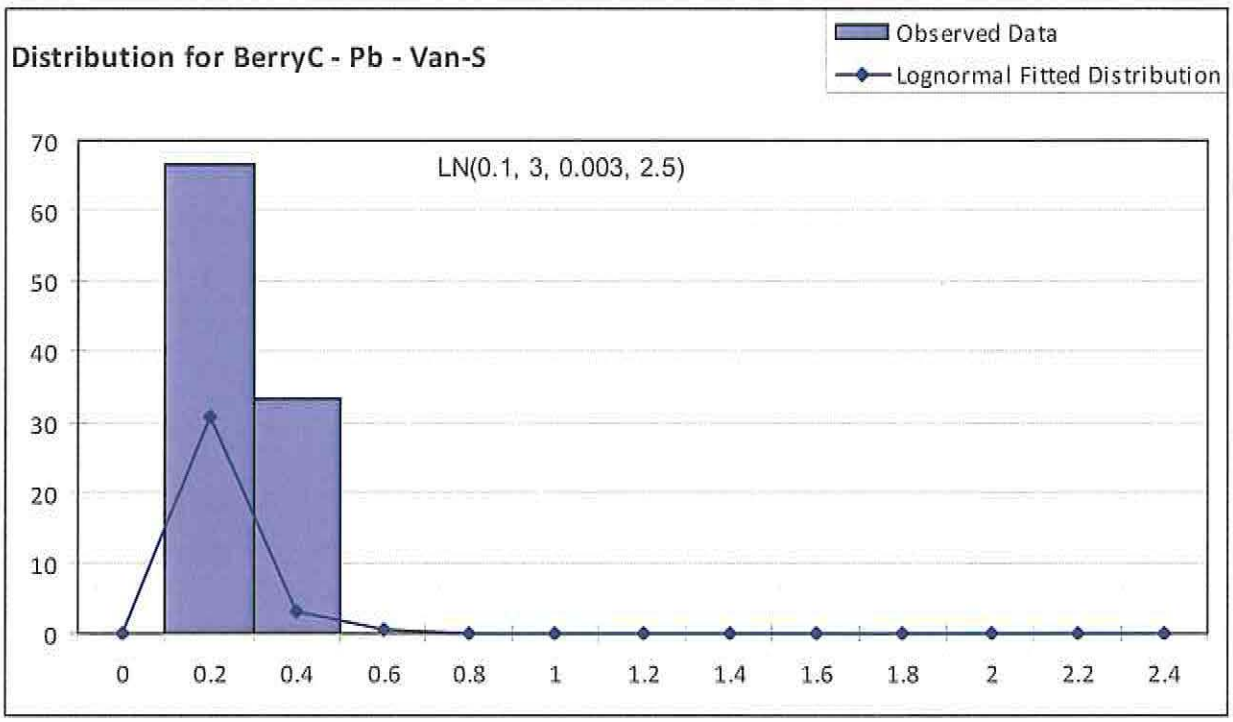

Distribution for BerryC - Cu - Faro-M
Observed Data
Lognormal Fitted Distribution
LN(0.9, 1.3, 0.4, 2.1)
60
50
40
30
20
10
0
0
0.25
0.5
0.75
1
1.25
1.5
1.75
2
2.25

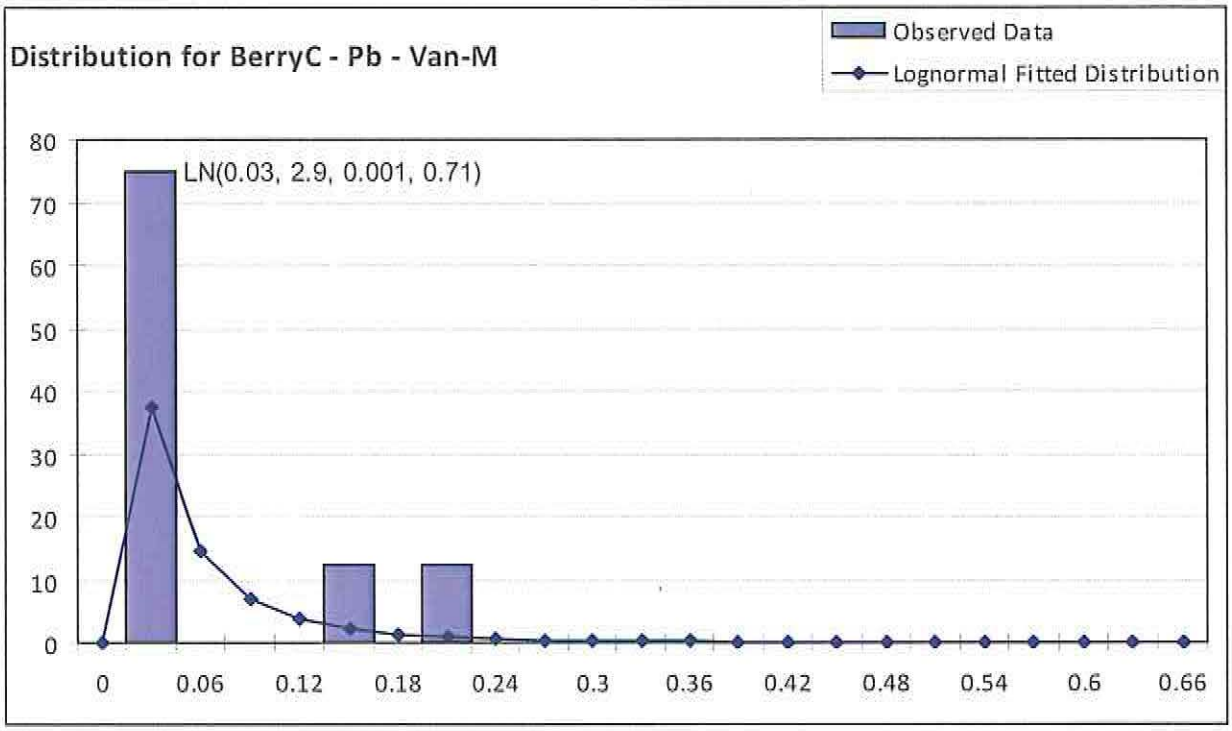

Distribution for BerryC - Cu - Sheep
Observed Data
Triangular Fitted Distribution
T(0.1, 1.2, 2.3)
0
0.5
1
1.5
2
2.5

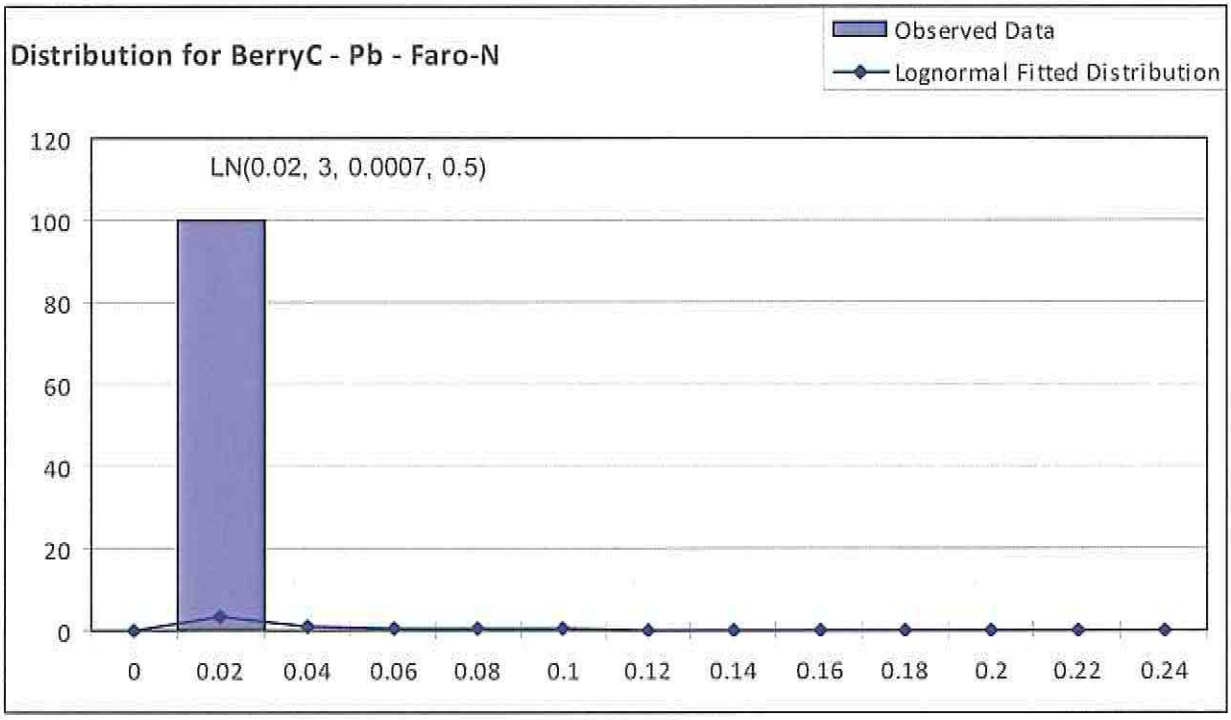
D.4.9 Lead

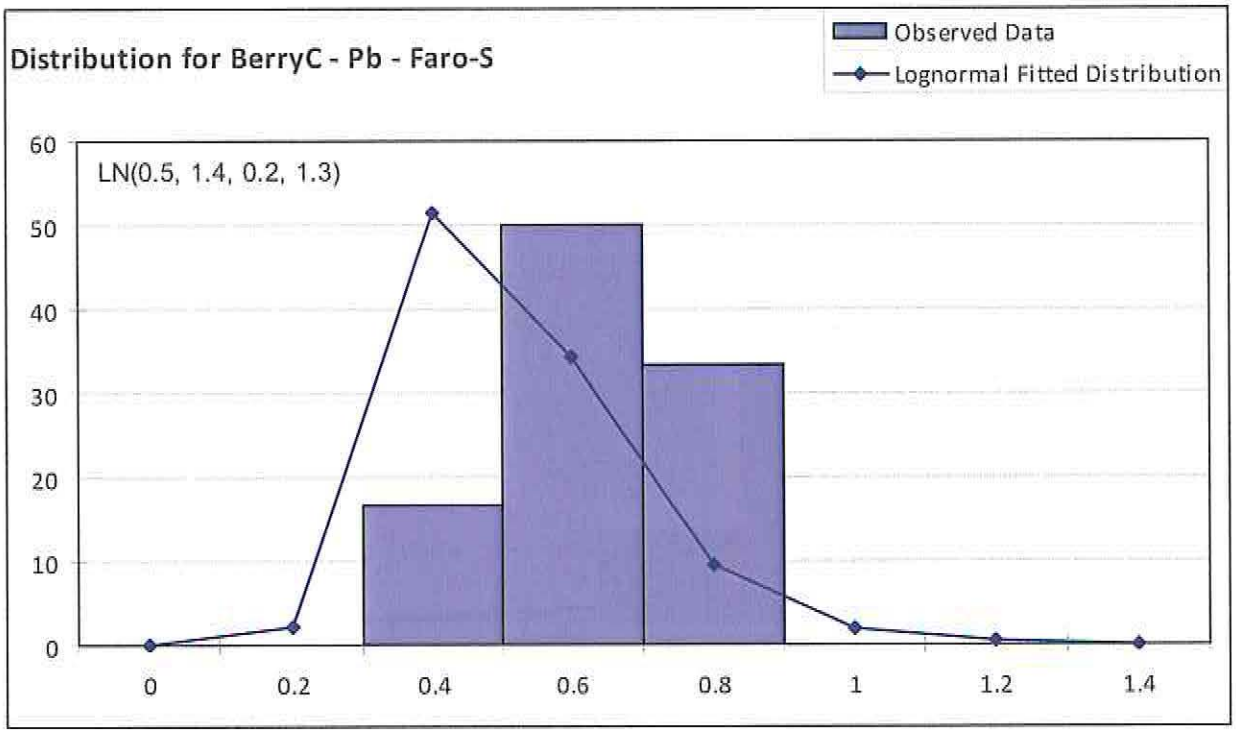

Distribution for BerryC - Pb - Overall
Observed Data
Lognormal Fitted Distribution
LN(0.05, 3.4, 0.001, 1.9)
70
60
50
40
30
20
10
0
0
0.125
0.25
0.375
0.5
0.625
0.75
0.875
1
1.125
1.25

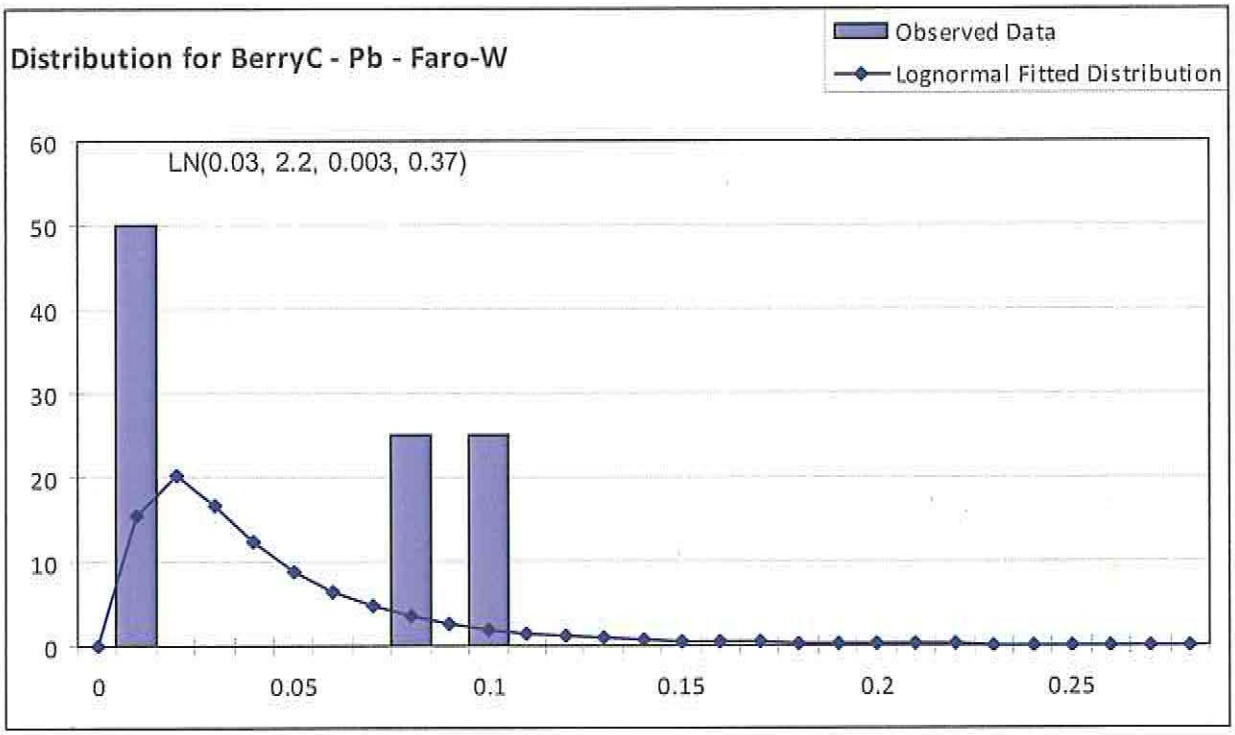

Distribution for BerryC - Pb - Background
Observed Data
Lognormal Fitted Distribution
LN(0.01, 1.8, 0.002, 0.07)
80
70
60
50
40
30
20
10
0
0
0.01
0.02
0.03
0.04
0.05
0.06
0.07
0.08
0.09
0.1

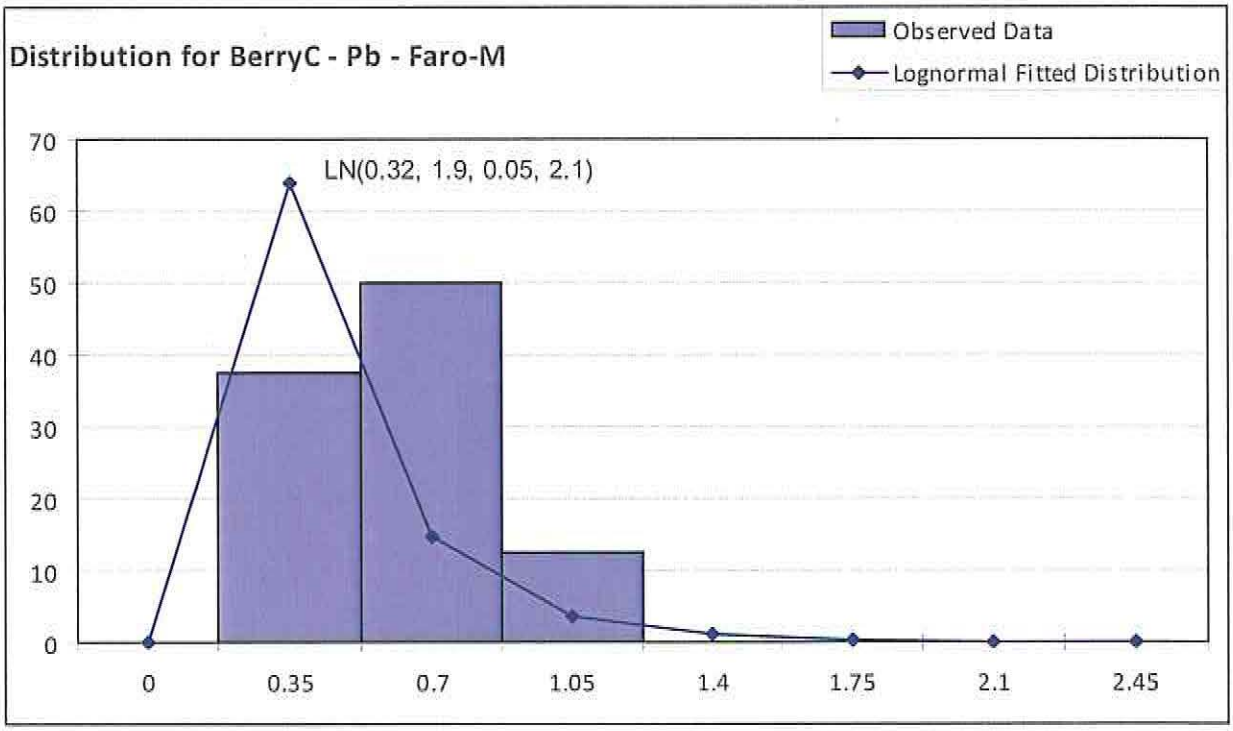

Distribution for BerryC - Pb - Van-S
Observed Data
Lognormal Fitted Distribution
LN(0.1, 3, 0.003, 2.5)
70
60
50
40
30
20
10
0
0
0.2
0.4
0.6
0.8
1
1.2
1.4
1.6
1.8
2
2.2
2.4


Distribution for BerryC - Pb - Van-M
Observed Data
Lognormal Fitted Distribution
LN(0.03, 2.9, 0.001, 0.71)
80
70
60
50
40
30
20
10
0
0
0.06
0.12
0.18
0.24
0.3
0.36
0.42
0.48
0.54
0.6
0.66

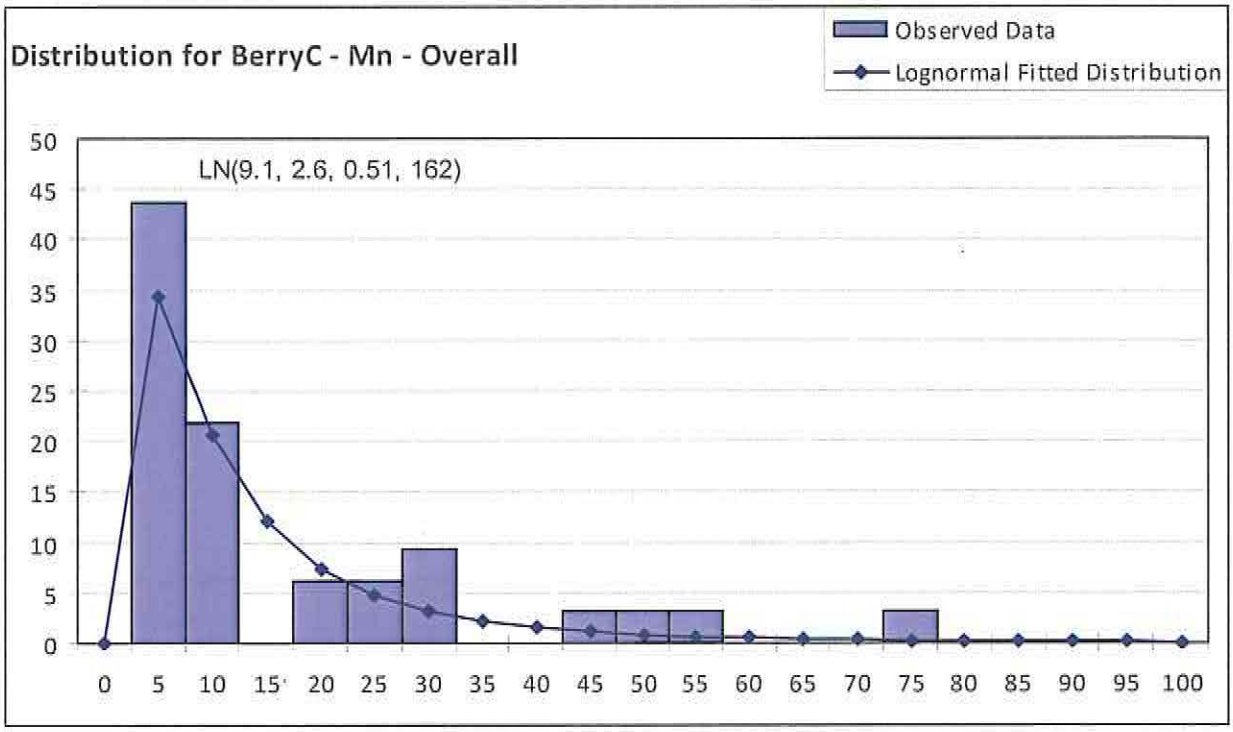

Distribution for BerryC - Pb - Faro-N
Observed Data
Lognormal Fitted Distribution
LN(0.02, 3, 0.0007, 0.5)
120
100
80
60
40
20
0
0
0.02
0.04
0.06
0.08
0.1
0.12
0.14
0.16
0.18
0.2
0.22
0.24

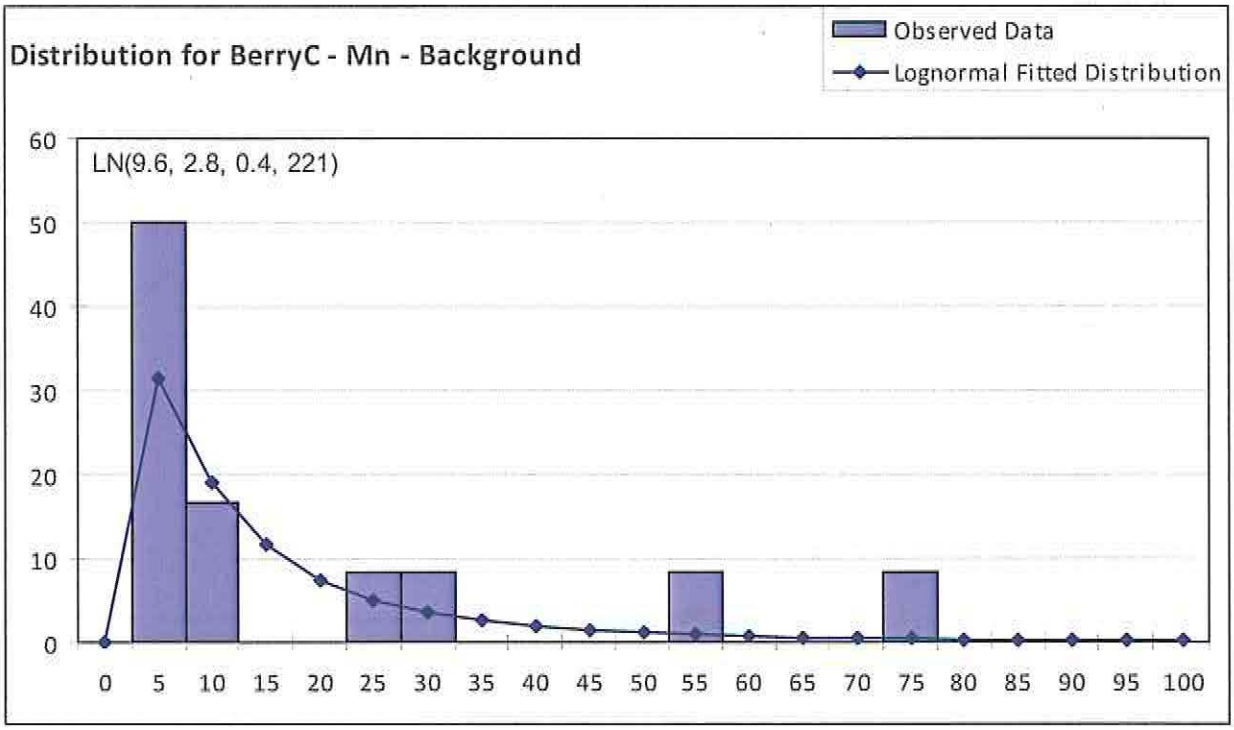

Distribution for BerryC - Pb - Faro-S
Observed Data
Lognormal Fitted Distribution
LN(0.5, 1.4, 0.2, 1.3)
60
50
40
30
20
10
0
0
0.2
0.4
0.6
0.8
1
1.2
1.4

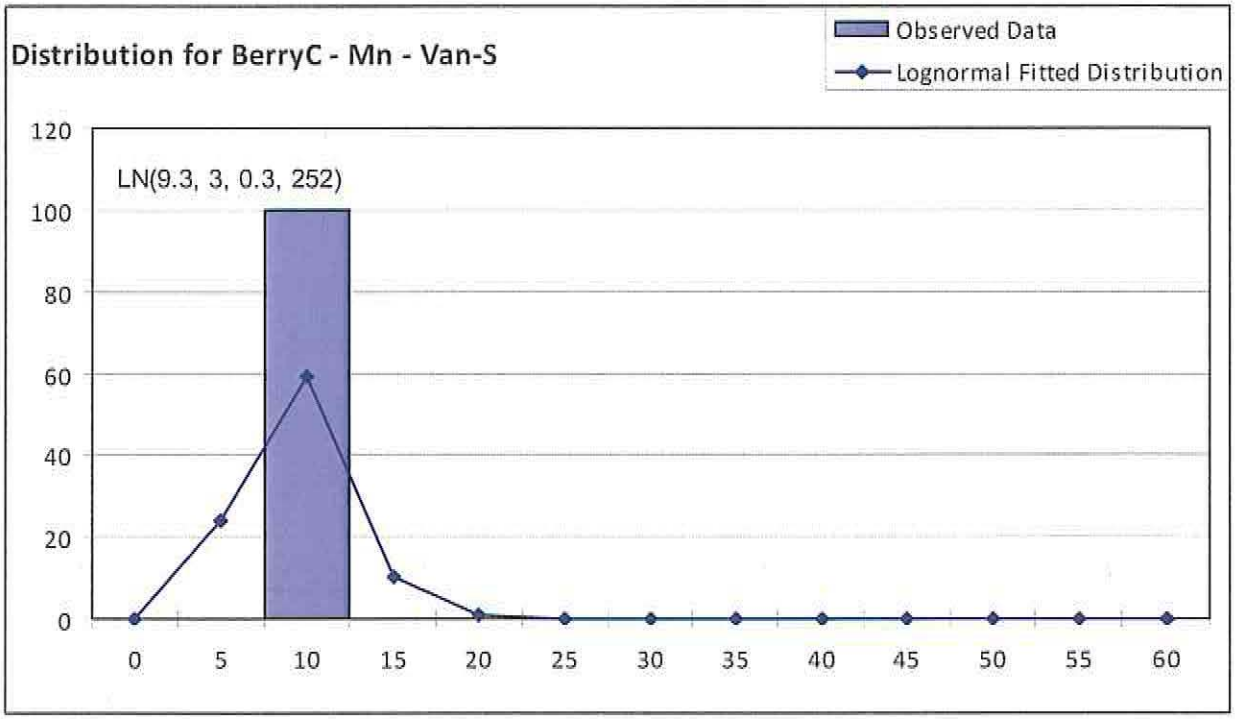

Distribution for BerryC - Pb - Faro-W
Observed Data
Lognormal Fitted Distribution
LN(0.03, 2.2, 0.003, 0.37)
60
50
40
30
20
10
0
0
0.05
0.1
0.15
0.2
0.25

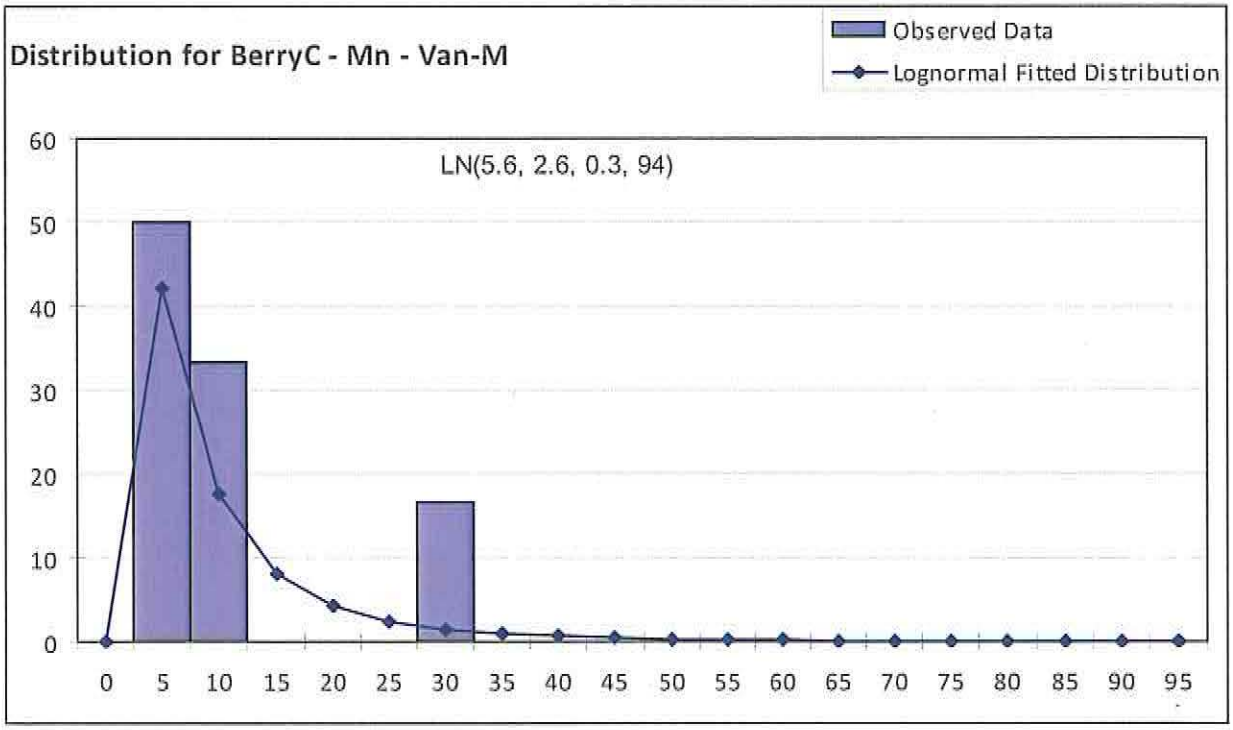


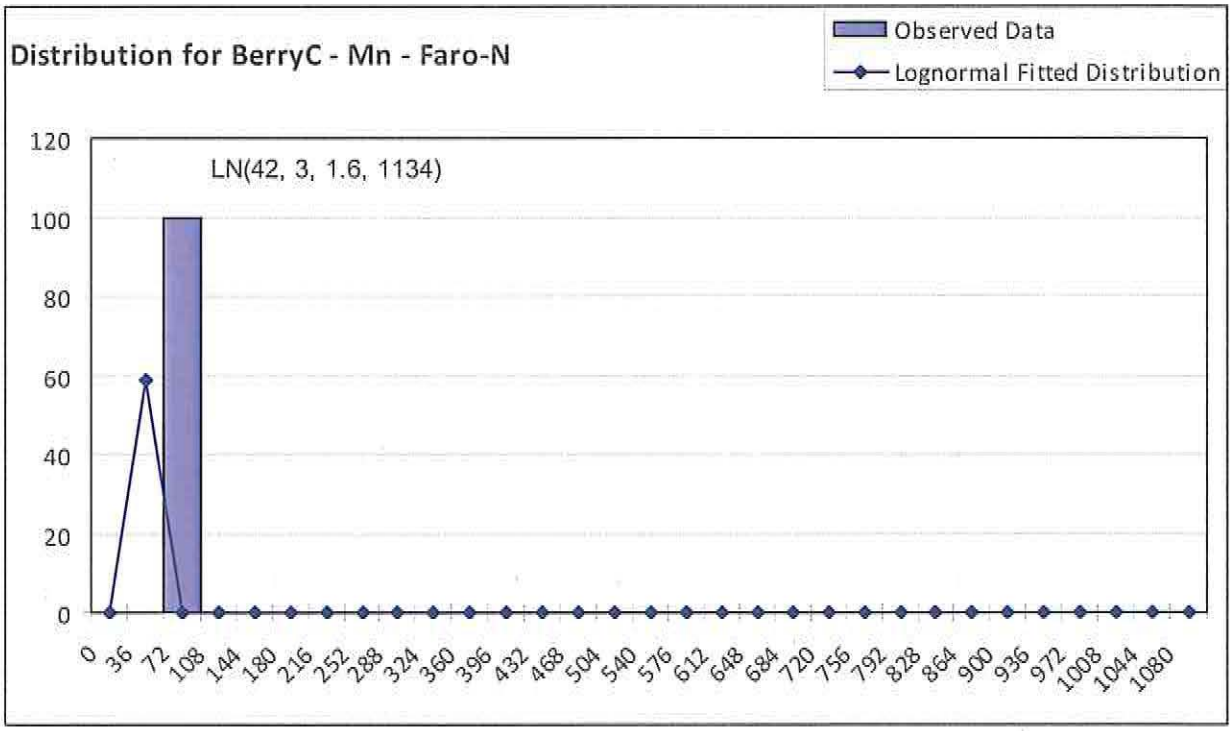
D.4.10 Manganese

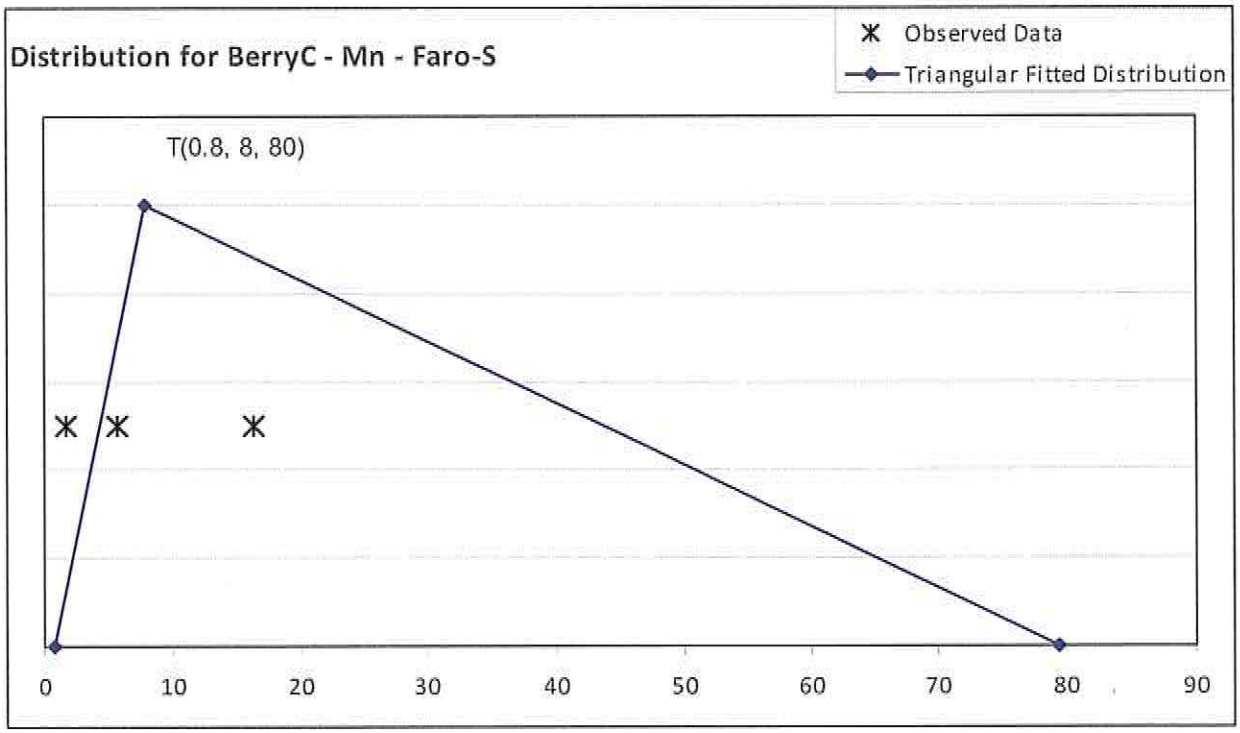


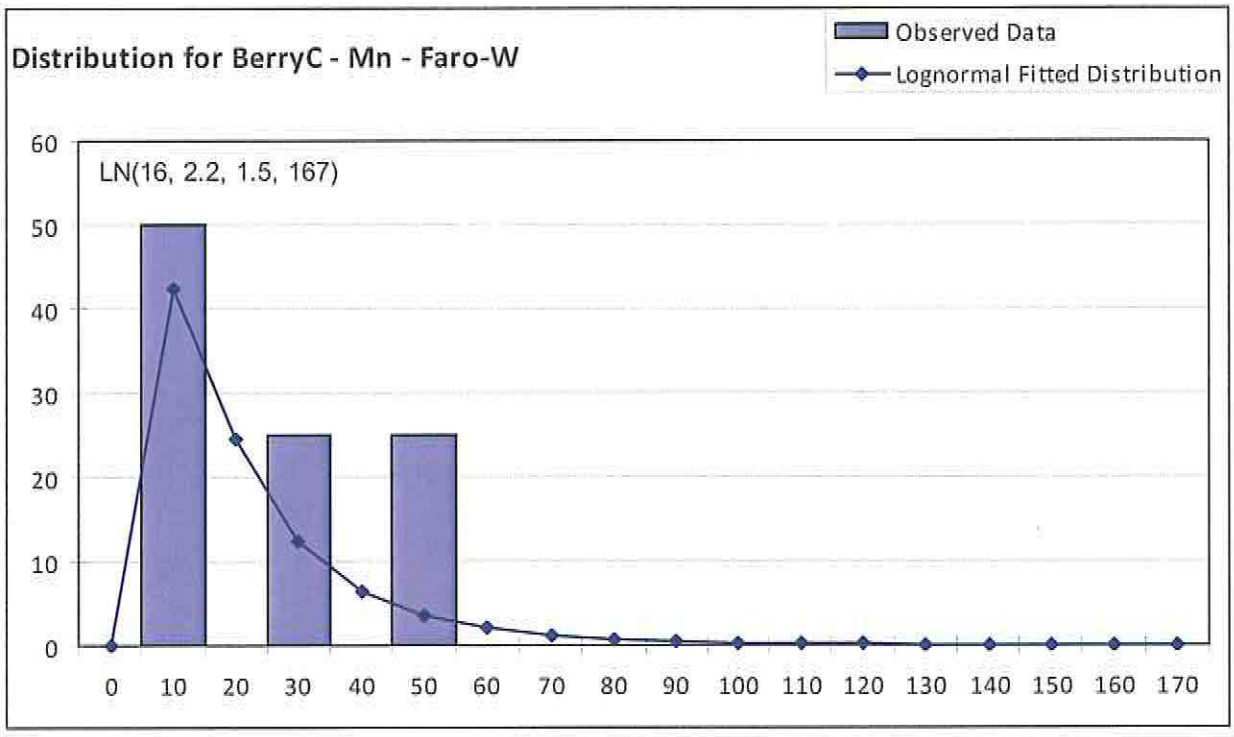

Distribution for BerryC - Mn - Background
Observed Data
Lognormal Fitted Distribution
LN(9.6, 2.8, 0.4, 221)
60
50
40
30
20
10
0
0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100

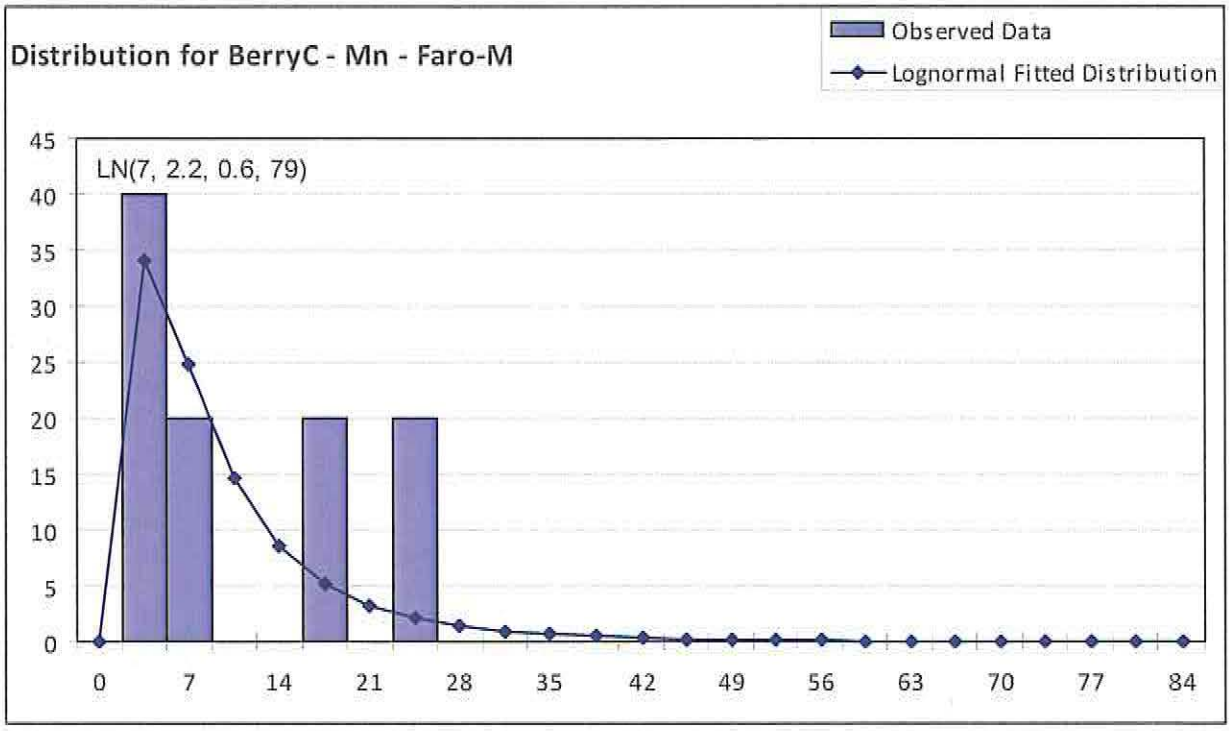

Distribution for BerryC - Mn - Van-S
Observed Data
Lognormal Fitted Distribution
LN(9.3, 3, 0.3, 252)
120
100
80
60
40
20
0
0 5 10 15 20 25 30 35 40 45 50 55 60

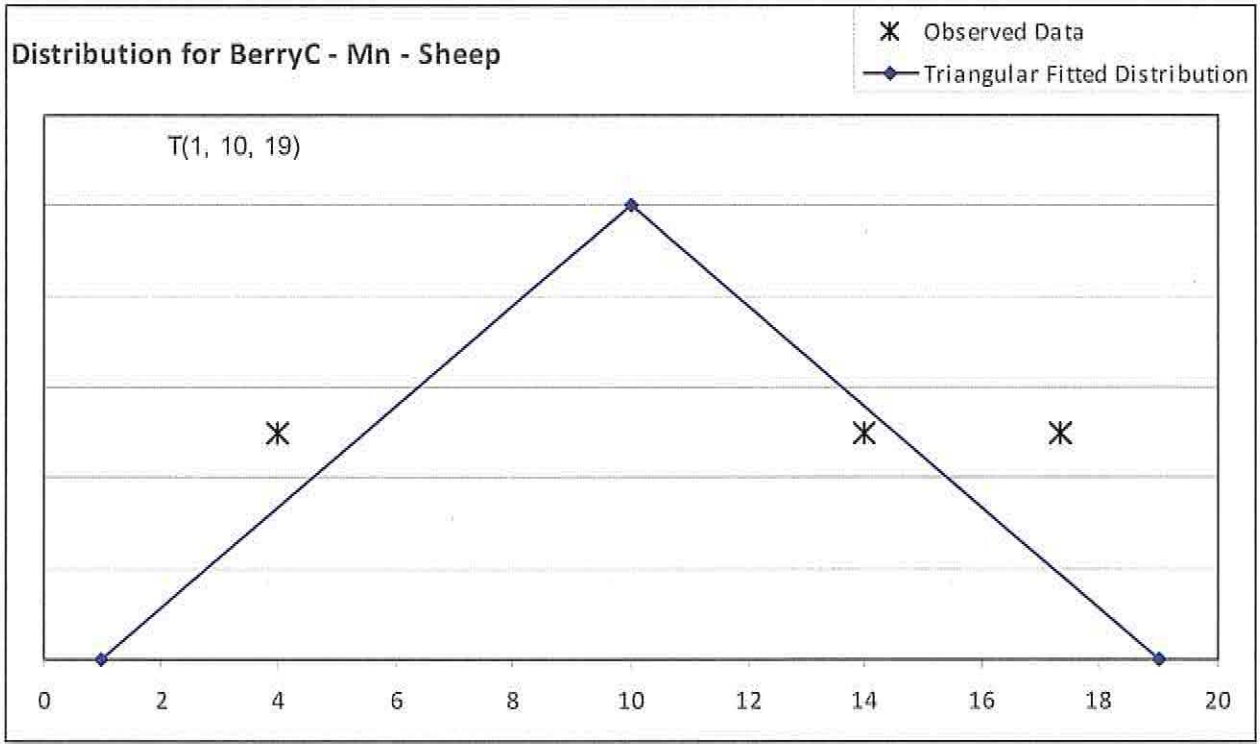

Distribution for BerryC - Mn - Van-M
Observed Data
Lognormal Fitted Distribution
LN(5.6, 2.6, 0.3, 94)
60
50
40
30
20
10
0
0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95


Distribution for BerryC - Mn - Faro-N
Observed Data
Lognormal Fitted Distribution
LN(42, 3, 1.6, 1134)
120
100
80
60
40
20
0
0 36 72 108 144 180 216 252 288 324 360 396 432 468 504 540 576 612 648 684 720 756 792 828 864 900 936 972 1008 1044 1080

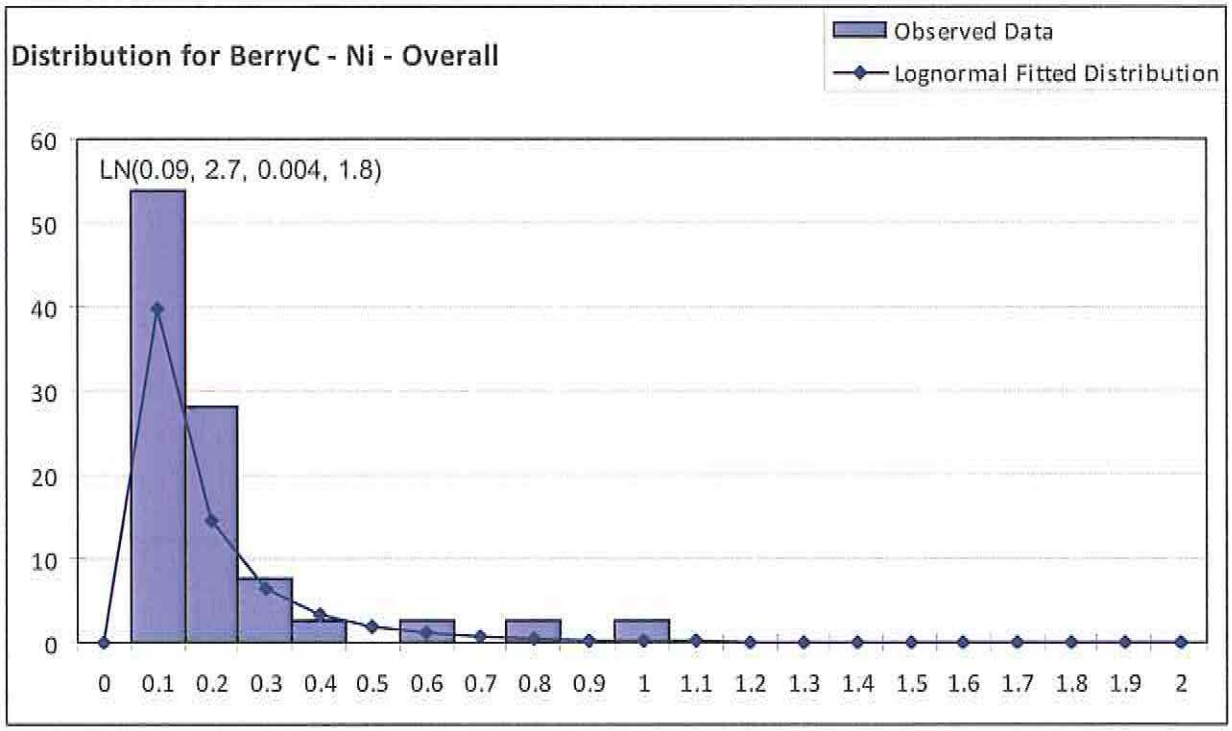

Distribution for BerryC - Mn - Faro-S
Observed Data
Triangular Fitted Distribution
T(0.8, 8, 80)
0
10
20
30
40
50
60
70
80
90

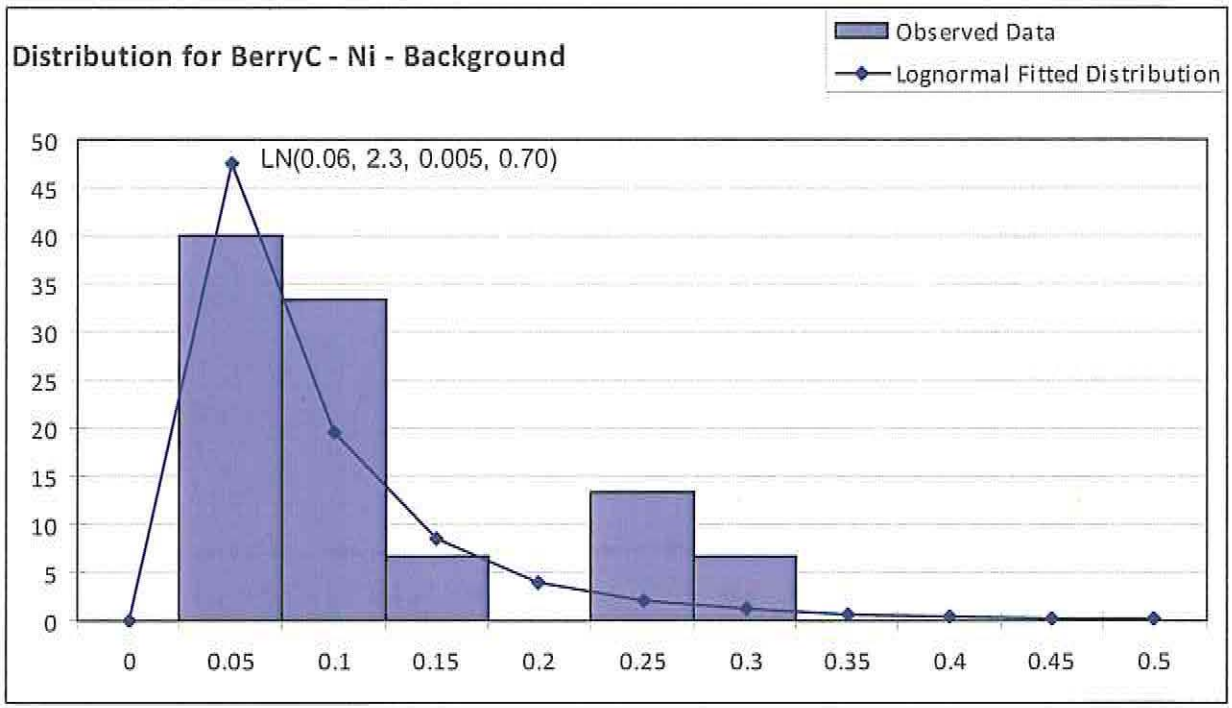

Distribution for BerryC - Mn - Faro-W
Observed Data
Lognormal Fitted Distribution
LN(16, 2.2, 1.5, 167)
60
50
40
30
20
10
0
0
10
20
30
40
50
60
70
80
90
100
110
120
130
140
150
160
170

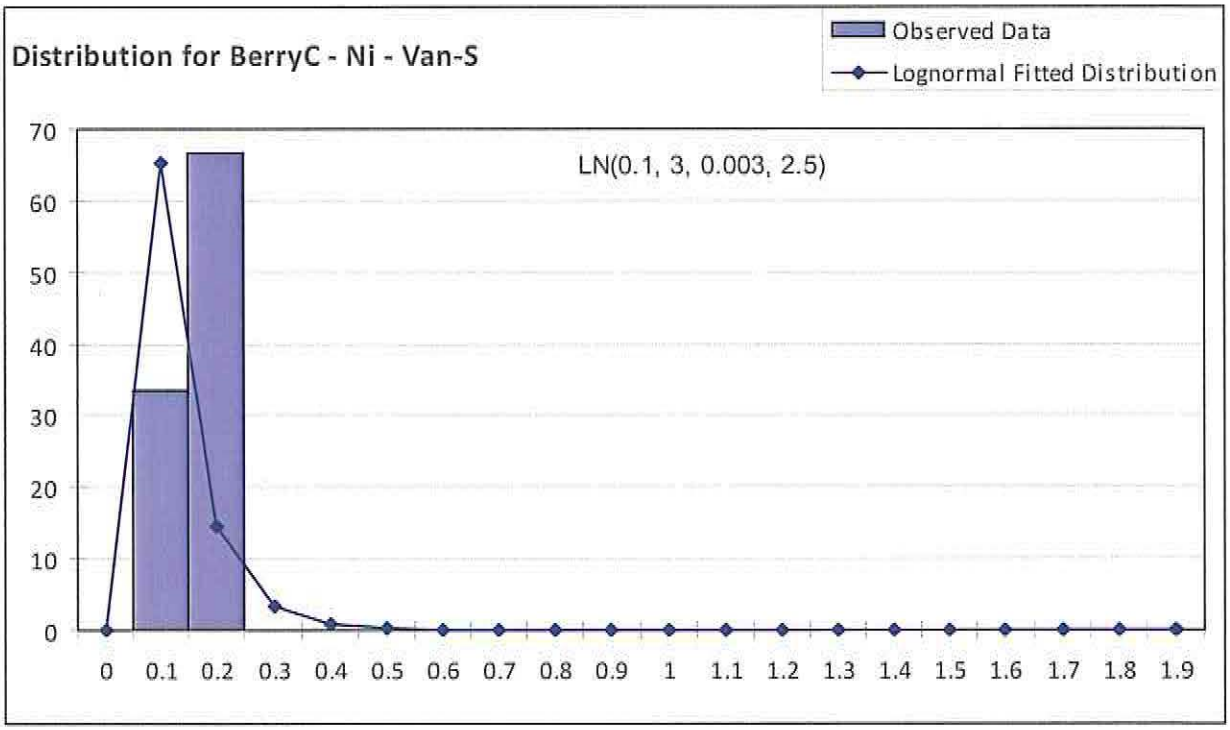

Distribution for BerryC - Mn - Faro-M
Observed Data
Lognormal Fitted Distribution
LN(7, 2.2, 0.6, 79)
45
40
35
30
25
20
15
10
5
0
0
7
14
21
28
35
42
49
56
63
70
77
84

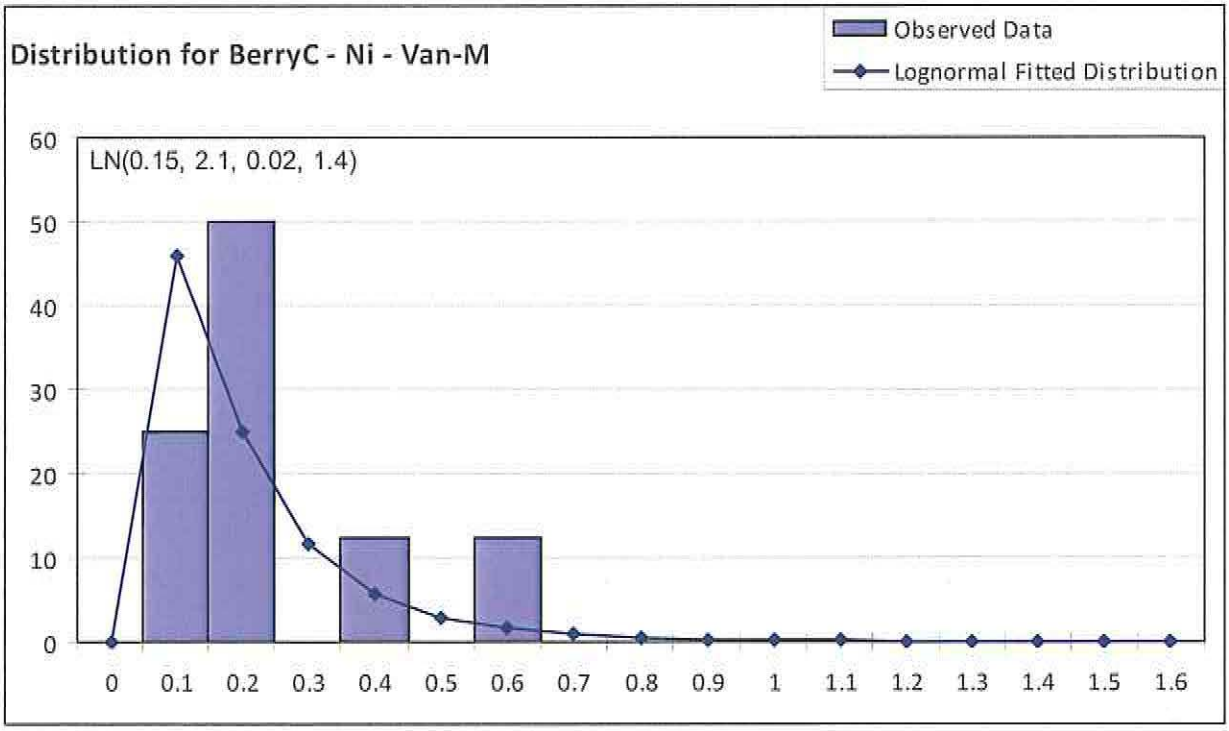

Distribution for BerryC - Mn - Sheep
Observed Data
Triangular Fitted Distribution
T(1, 10, 19)
0
2
4
6
8
10
12
14
16
18
20

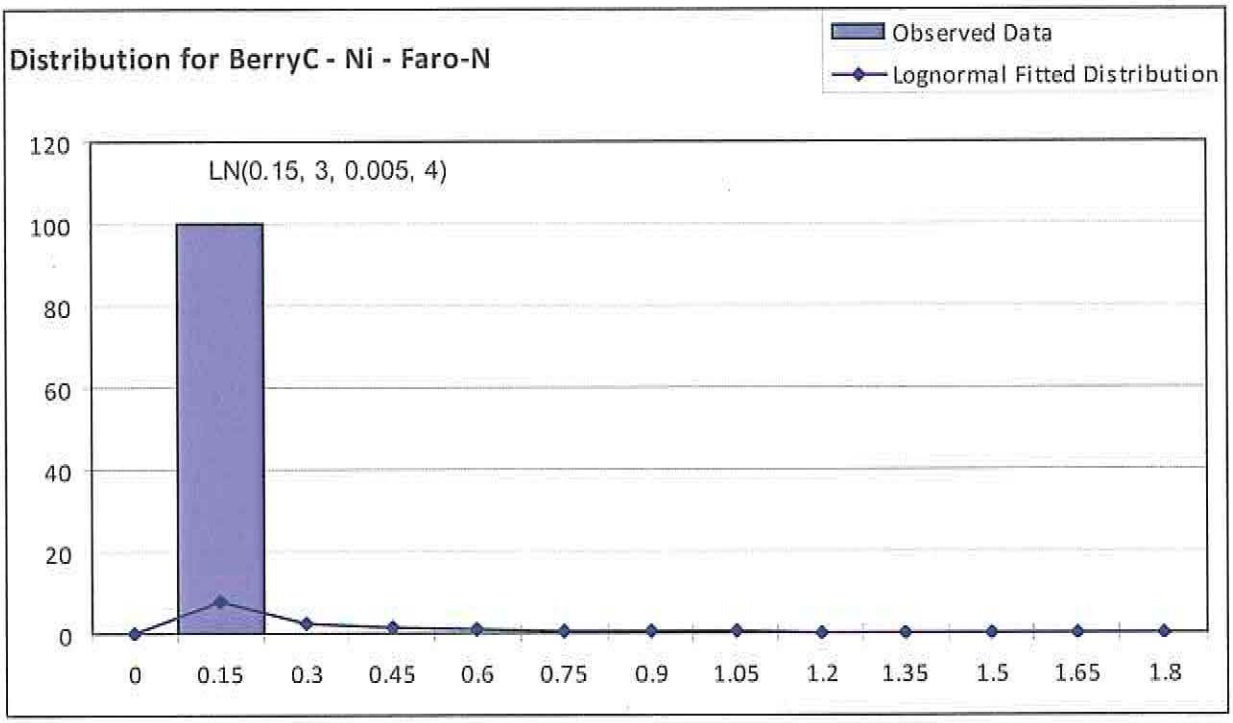
D.4.11 Nickel

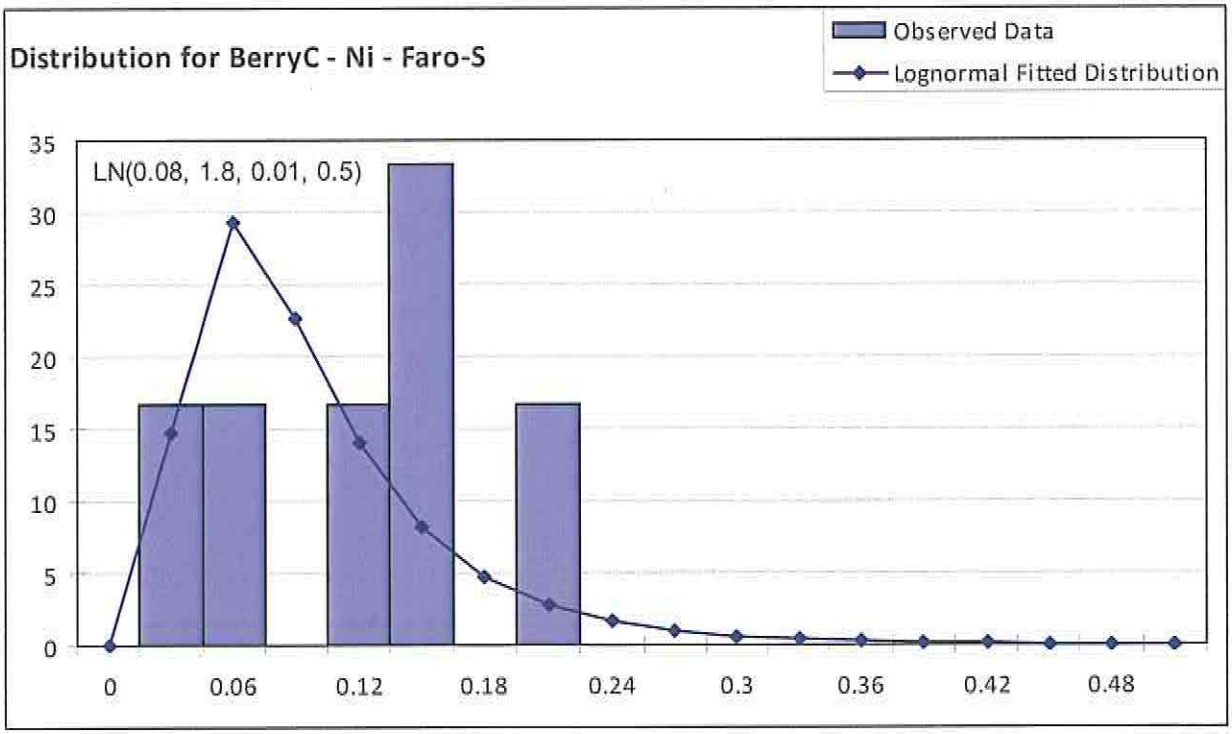

Distribution for BerryC - Ni - Overall
Observed Data
Lognormal Fitted Distribution
LN(0.09, 2.7, 0.004, 1.8)
60
50
40
30
20
10
0
0 0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 0.9 1 1.1 1.2 1.3 1.4 1.5 1.6 1.7 1.8 1.9 2

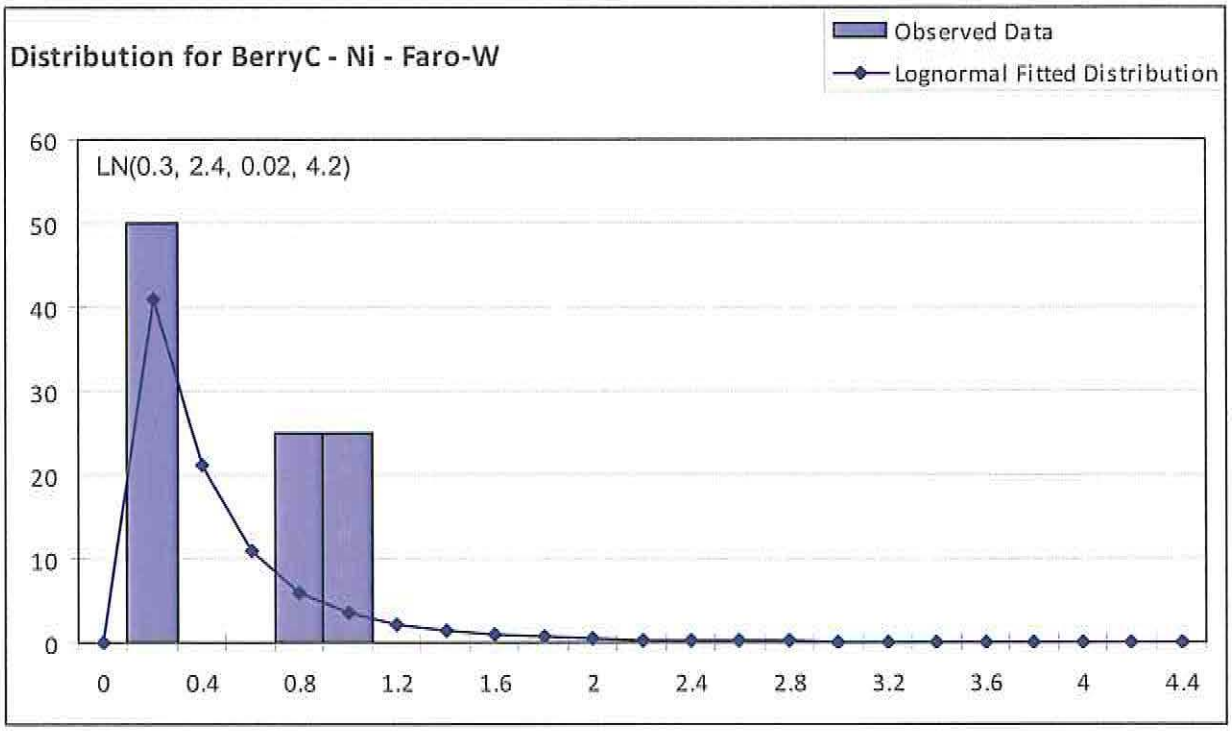

Distribution for BerryC - Ni - Background
Observed Data
Lognormal Fitted Distribution
LN(0.06, 2.3, 0.005, 0.70)
50
45
40
35
30
25
20
15
10
5
0
0 0.05 0.1 0.15 0.2 0.25 0.3 0.35 0.4 0.45 0.5

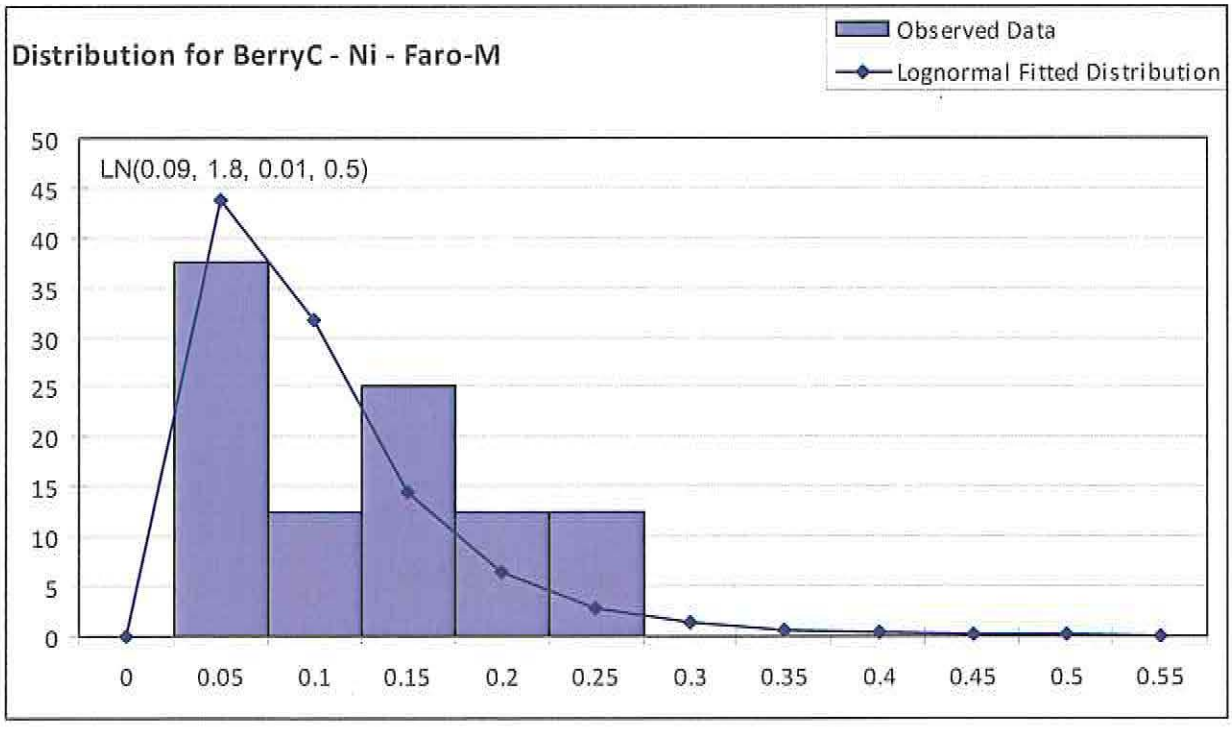

Distribution for BerryC - Ni - Van-S
Observed Data
Lognormal Fitted Distribution
LN(0.1, 3, 0.003, 2.5)
70
60
50
40
30
20
10
0
0 0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 0.9 1 1.1 1.2 1.3 1.4 1.5 1.6 1.7 1.8 1.9


Distribution for BerryC - Ni - Van-M
Observed Data
Lognormal Fitted Distribution
LN(0.15, 2.1, 0.02, 1.4)
60
50
40
30
20
10
0
0 0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 0.9 1 1.1 1.2 1.3 1.4 1.5 1.6

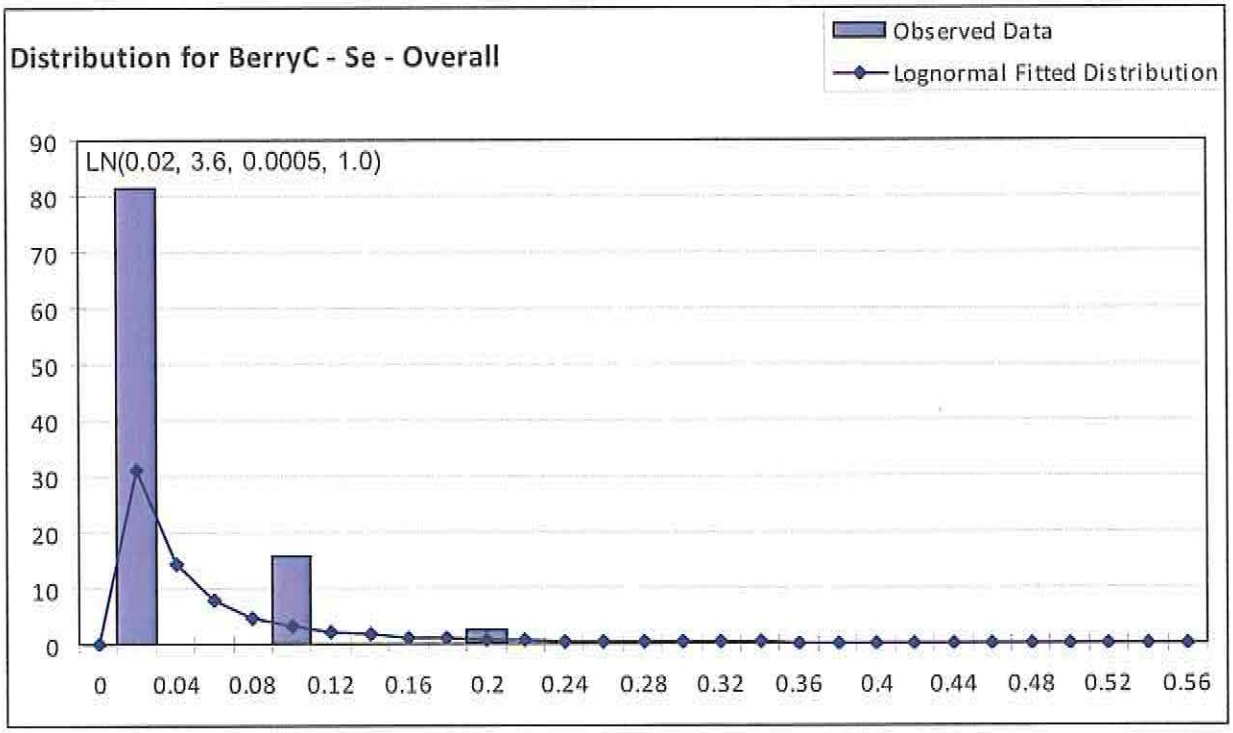

Distribution for BerryC - Ni - Faro-N
Observed Data
Lognormal Fitted Distribution
LN(0.15, 3, 0.005, 4)
120
100
80
60
40
20
0
0
0.15
0.3
0.45
0.6
0.75
0.9
1.05
1.2
1.35
1.5
1.65
1.8

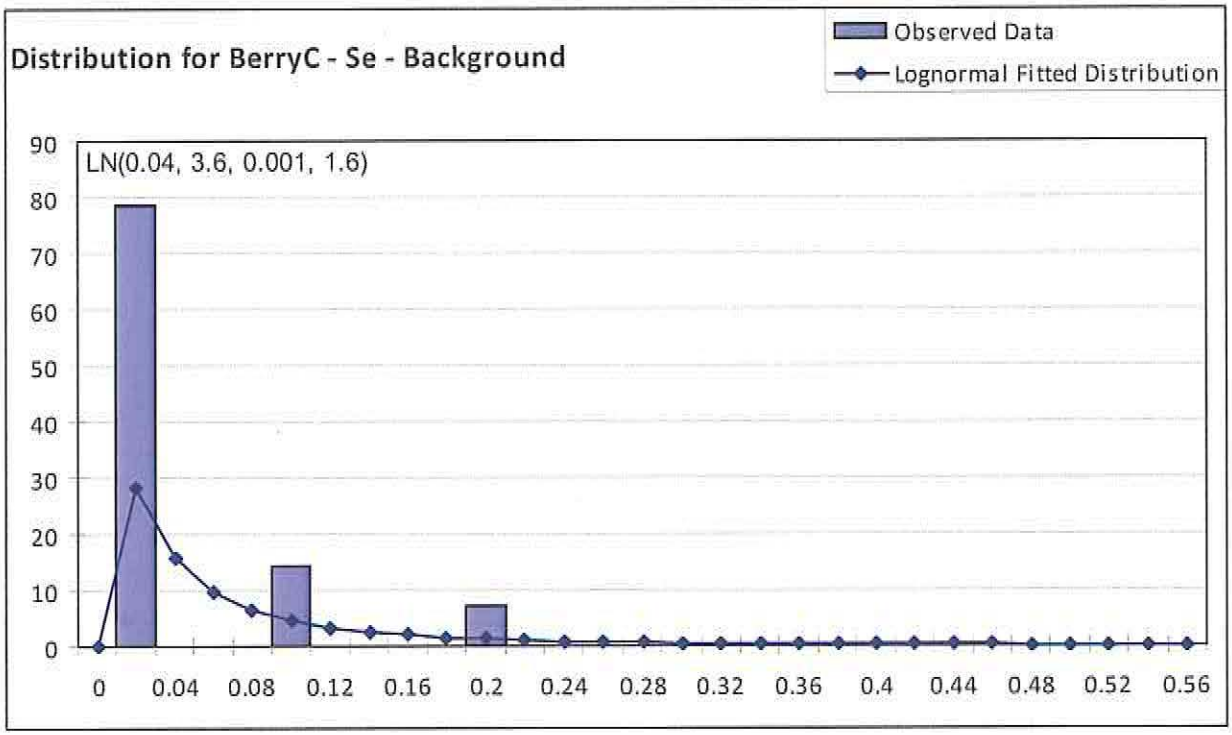

Distribution for BerryC - Ni - Faro-S
Observed Data
Lognormal Fitted Distribution
LN(0.08, 1.8, 0.01, 0.5)
35
30
25
20
15
10
5
0
0
0.06
0.12
0.18
0.24
0.3
0.36
0.42
0.48


Distribution for BerryC - Ni - Faro-W
Observed Data
Lognormal Fitted Distribution
LN(0.3, 2.4, 0.02, 4.2)
60
50
40
30
20
10
0
0
0.4
0.8
1.2
1.6
2
2.4
2.8
3.2
3.6
4
4.4

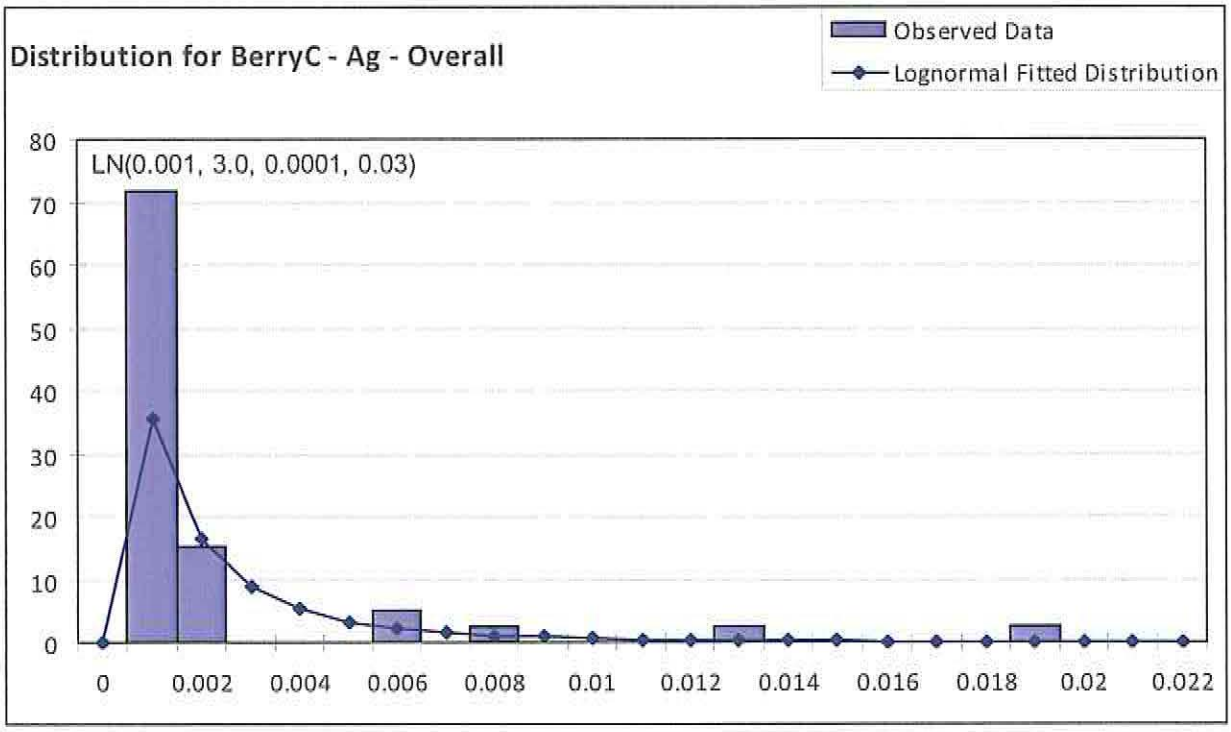

Distribution for BerryC - Ni - Faro-M
Observed Data
Lognormal Fitted Distribution
LN(0.09, 1.8, 0.01, 0.5)
50
45
40
35
30
25
20
15
10
5
0
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
0.45
0.5
0.55

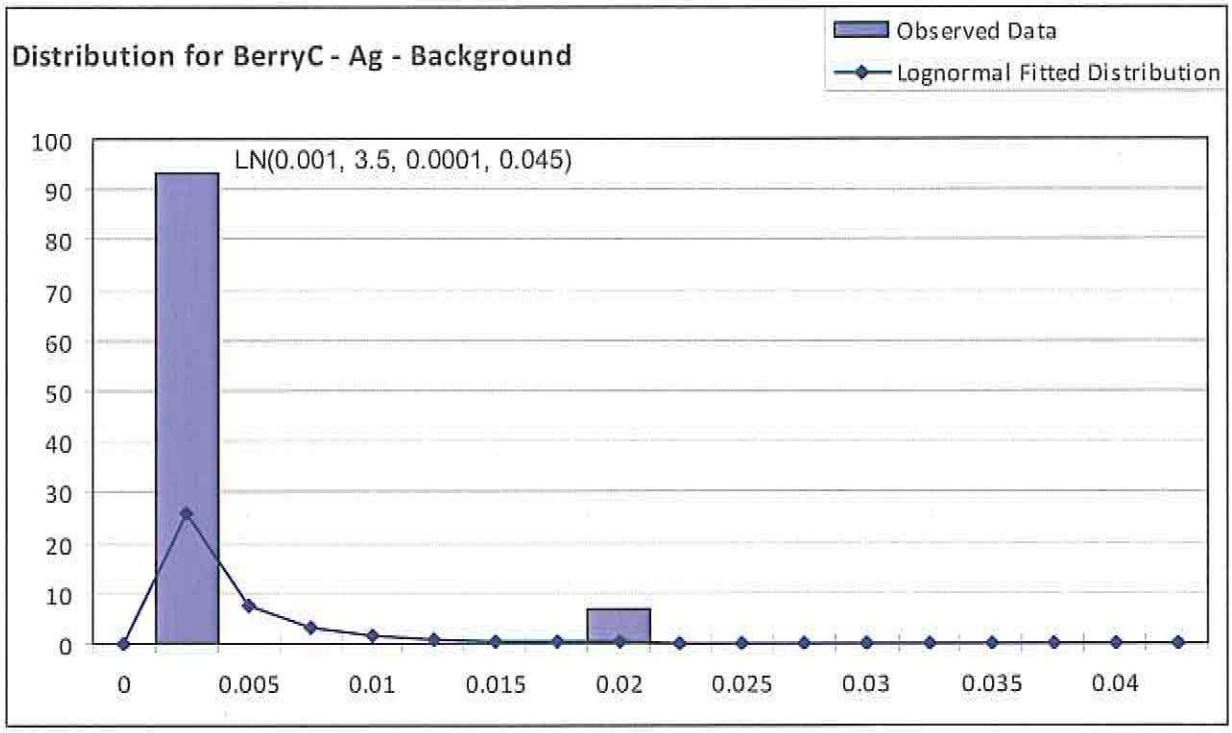
D.4.12 Selenium

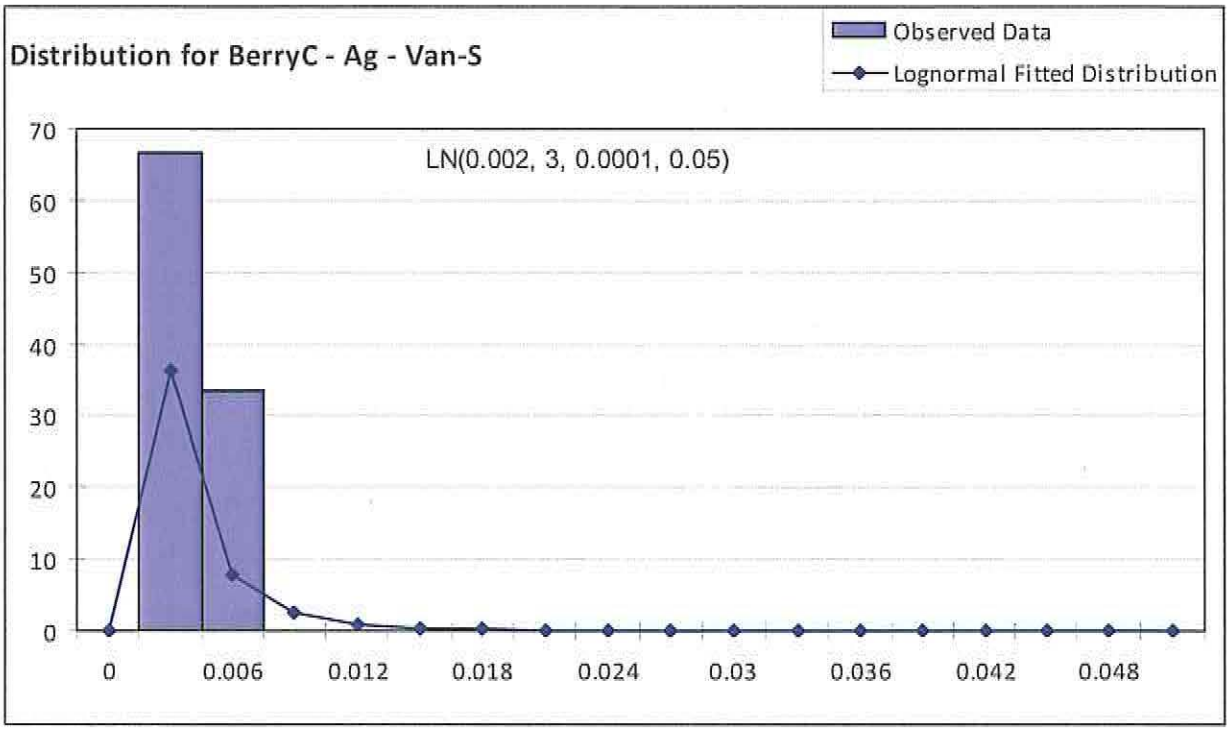


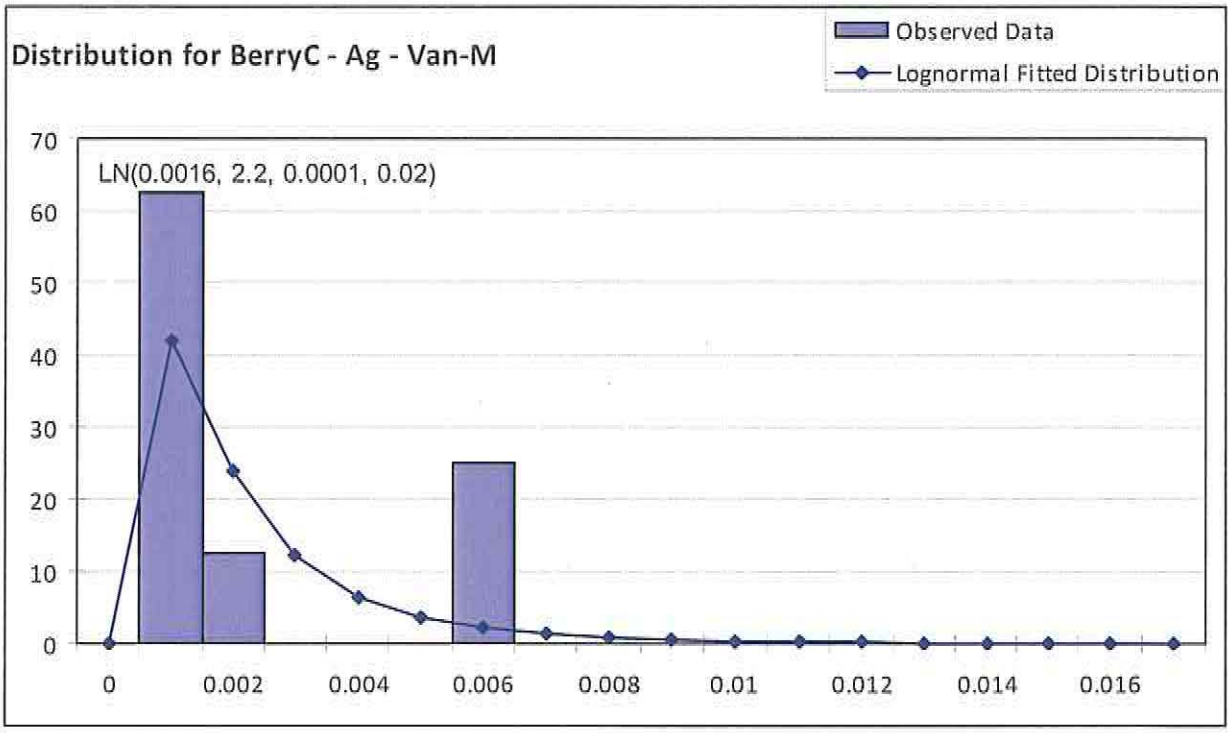


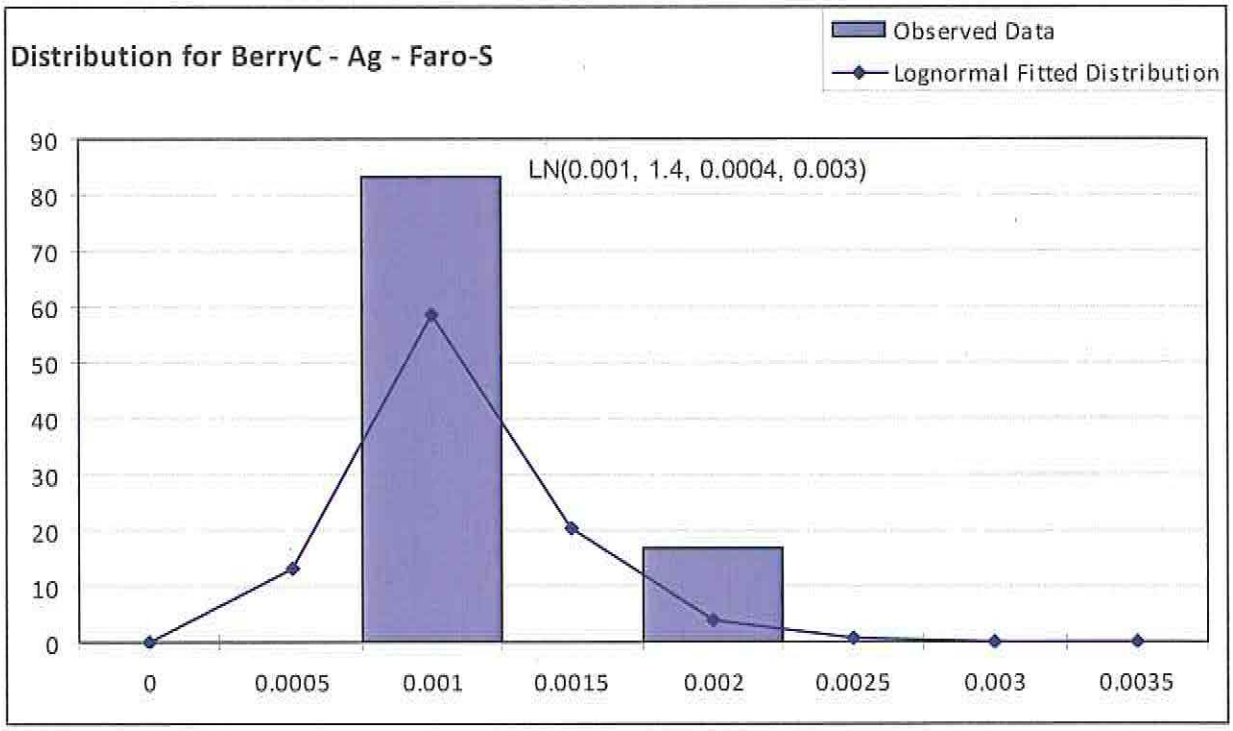
D.4.13 Silver

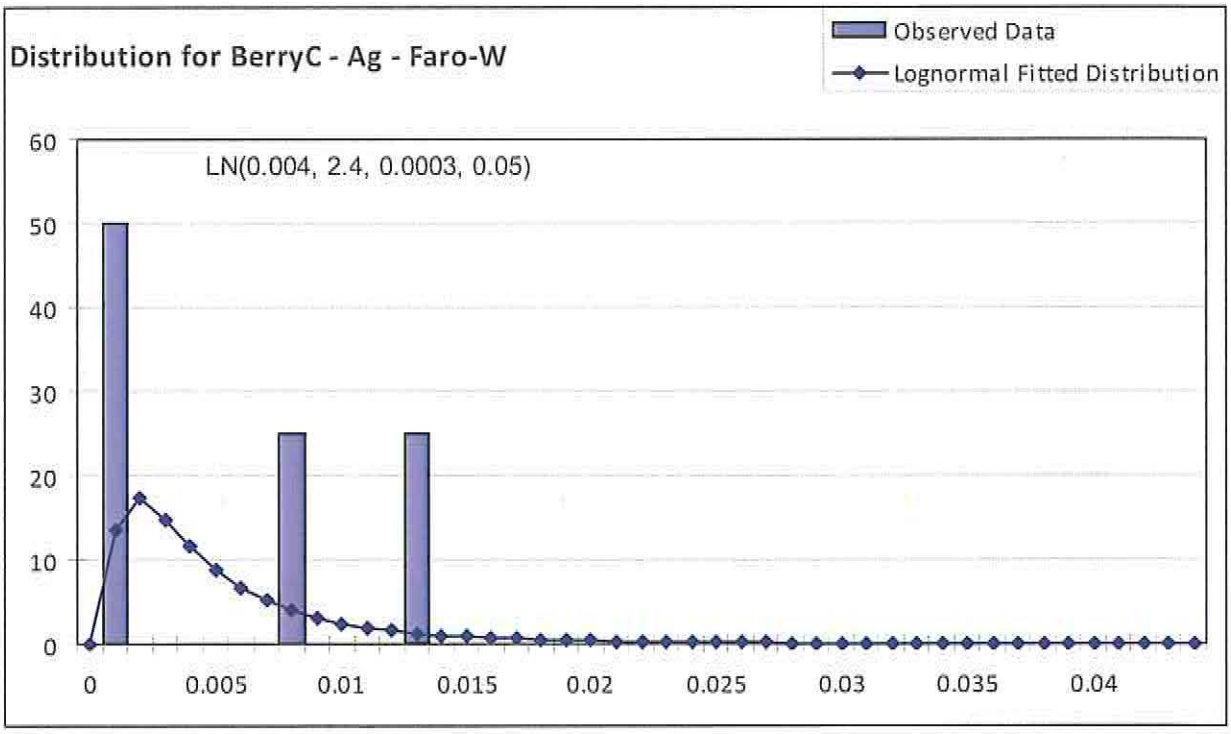

Distribution for BerryC - Ag - Overall
Observed Data
Lognormal Fitted Distribution
LN(0.001, 3.0, 0.0001, 0.03)
80
70
60
50
40
30
20
10
0
0
0.002
0.004
0.006
0.008
0.01
0.012
0.014
0.016
0.018
0.02
0.022

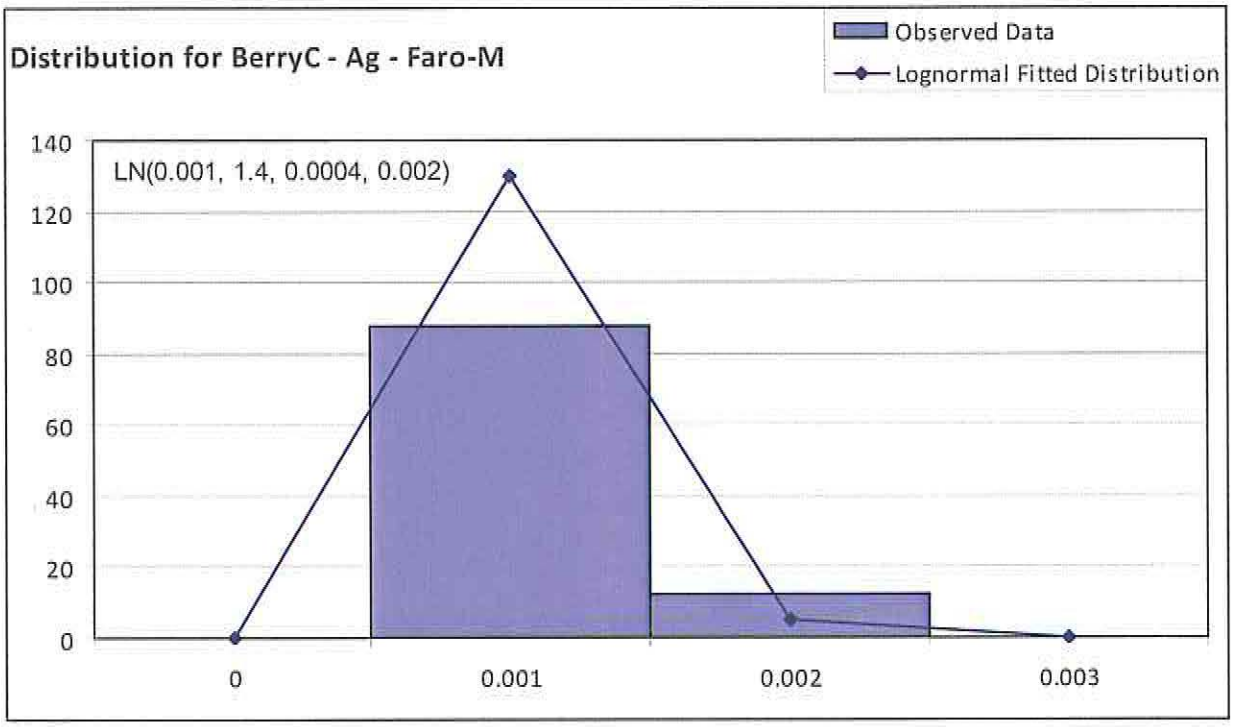

Distribution for BerryC - Ag - Background
Observed Data
Lognormal Fitted Distribution
LN(0.001, 3.5, 0.0001, 0.045)
100
90
80
70
60
50
40
30
20
10
0
0
0.005
0.01
0.015
0.02
0.025
0.03
0.035
0.04


Distribution for BerryC - Ag - Van-S
Observed Data
Lognormal Fitted Distribution
LN(0.002, 3, 0.0001, 0.05)
70
60
50
40
30
20
10
0
0
0.006
0.012
0.018
0.024
0.03
0.036
0.042
0.048

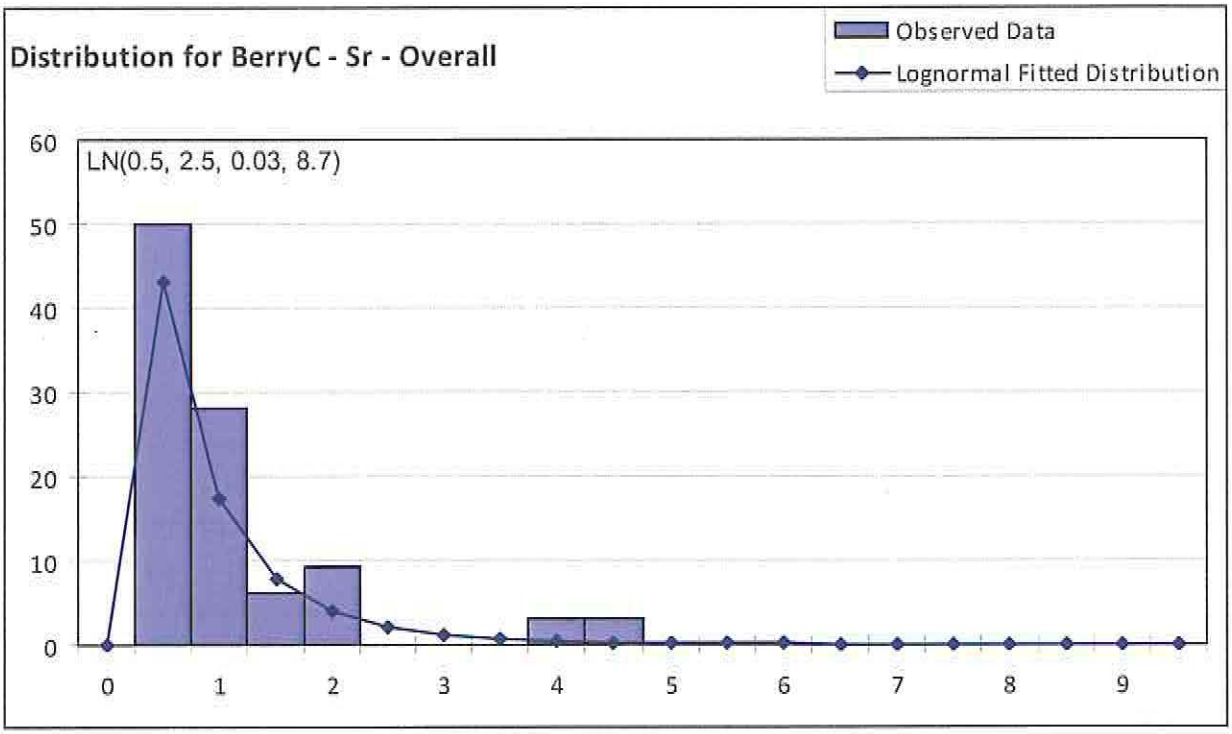

Distribution for BerryC - Ag - Van-M
Observed Data
Lognormal Fitted Distribution
LN(0.0016, 2.2, 0.0001, 0.02)
70
60
50
40
30
20
10
0
0
0.002
0.004
0.006
0.008
0.01
0.012
0.014
0.016

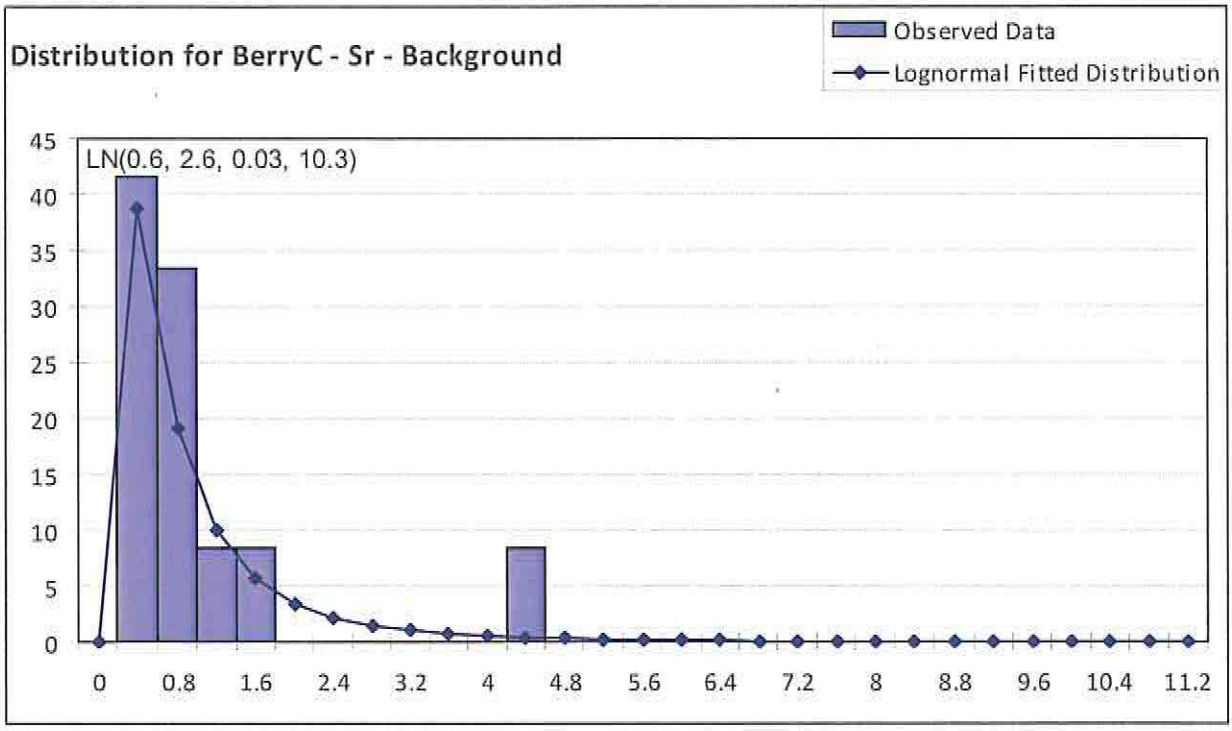

Distribution for BerryC - Ag - Faro-S
Observed Data
Lognormal Fitted Distribution
LN(0.001, 1.4, 0.0004, 0.003)
90
80
70
60
50
40
30
20
10
0
0
0.0005
0.001
0.0015
0.002
0.0025
0.003
0.0035

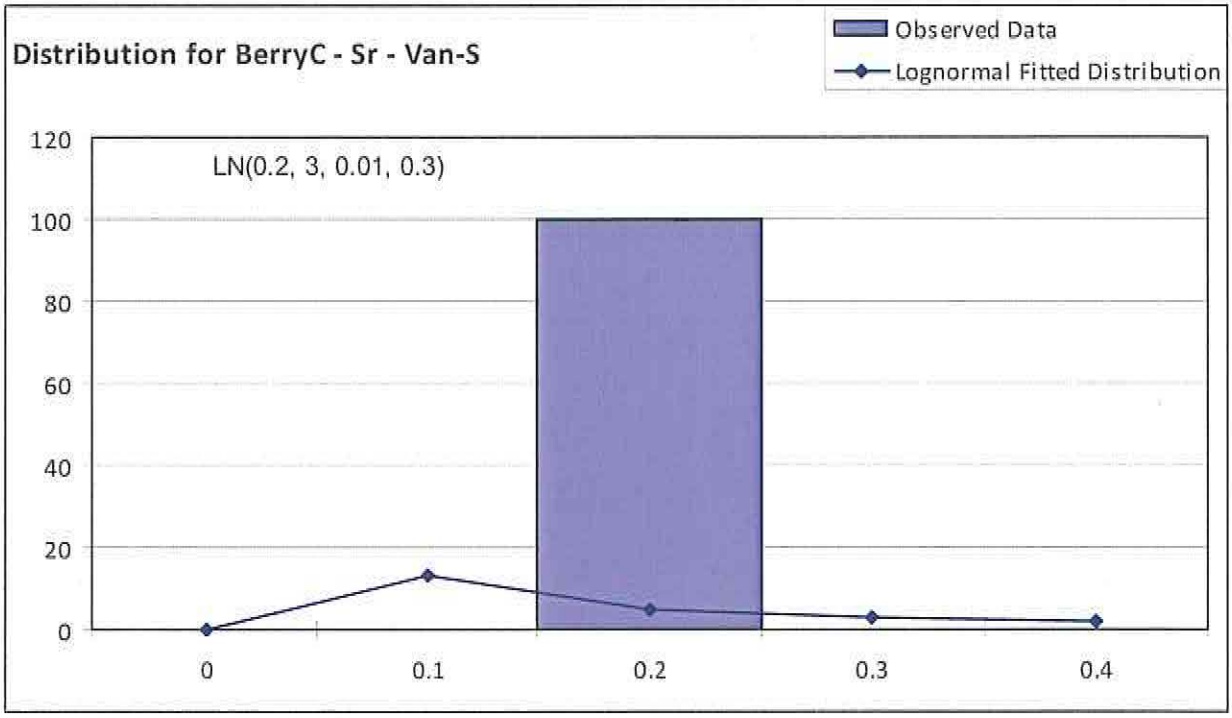

Distribution for BerryC - Ag - Faro-W
Observed Data
Lognormal Fitted Distribution
LN(0.004, 2.4, 0.0003, 0.05)
60
50
40
30
20
10
0
0
0.005
0.01
0.015
0.02
0.025
0.03
0.035
0.04

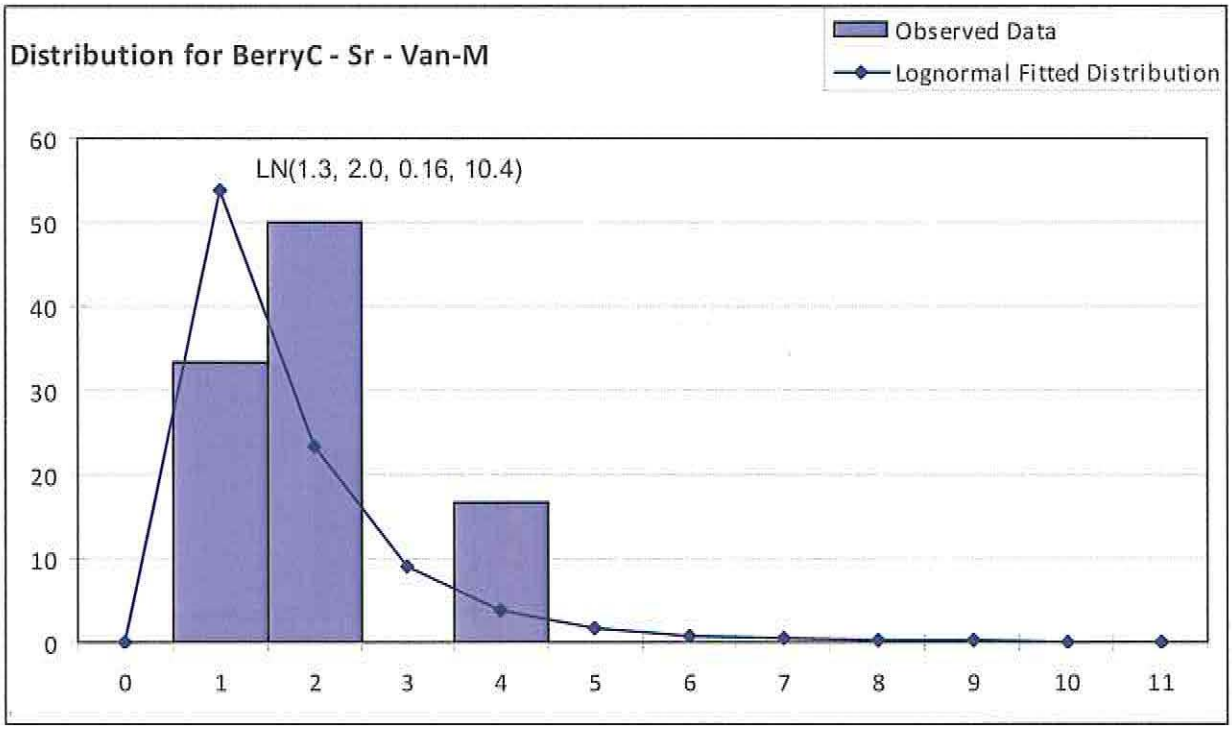


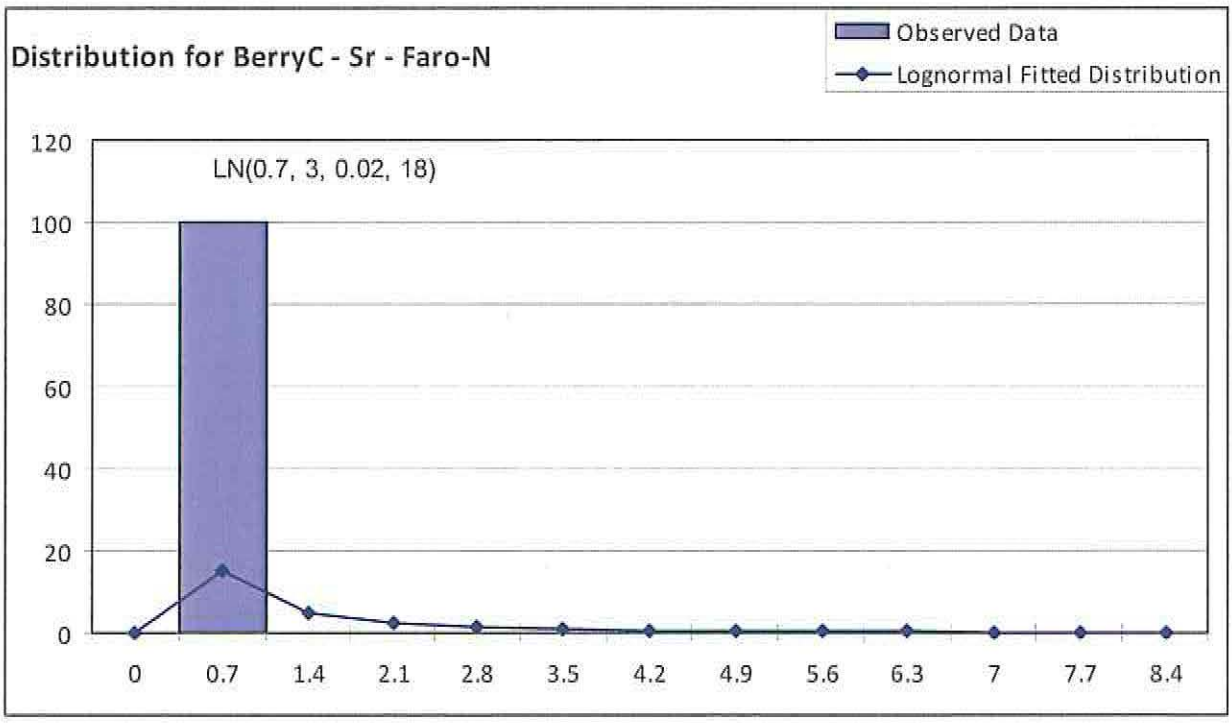
D.4.14 Strontium

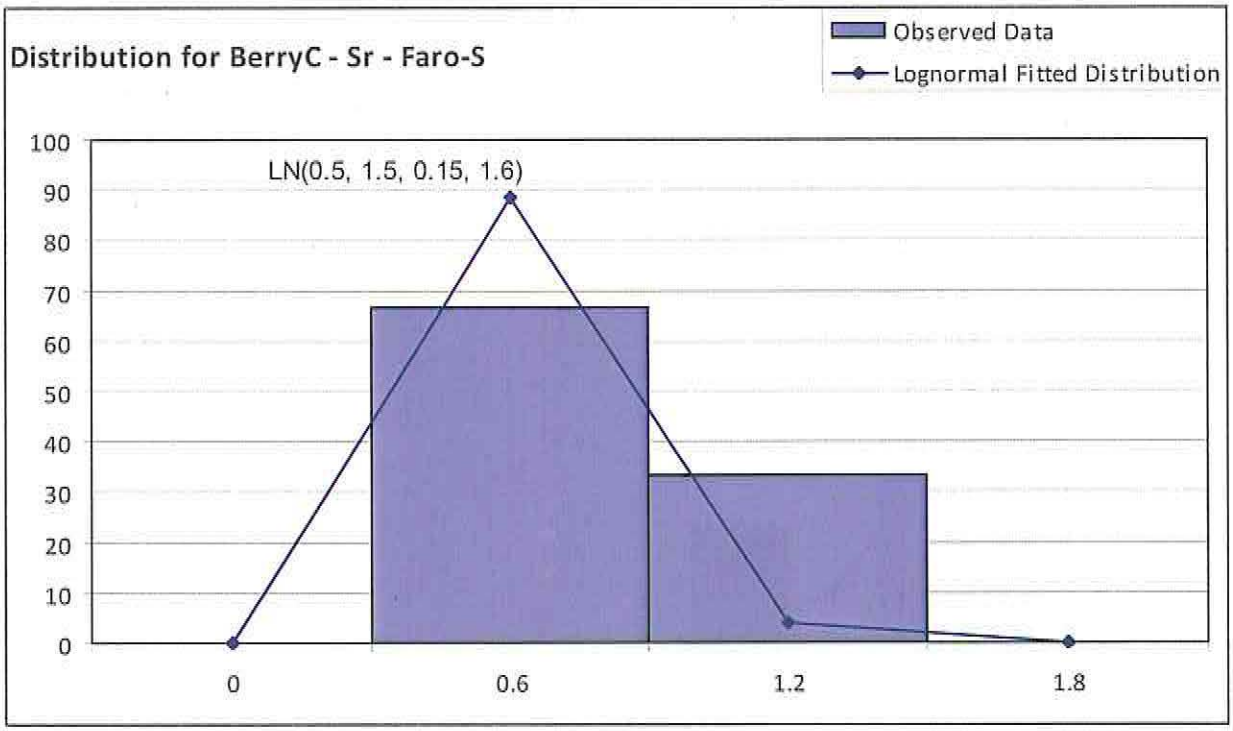


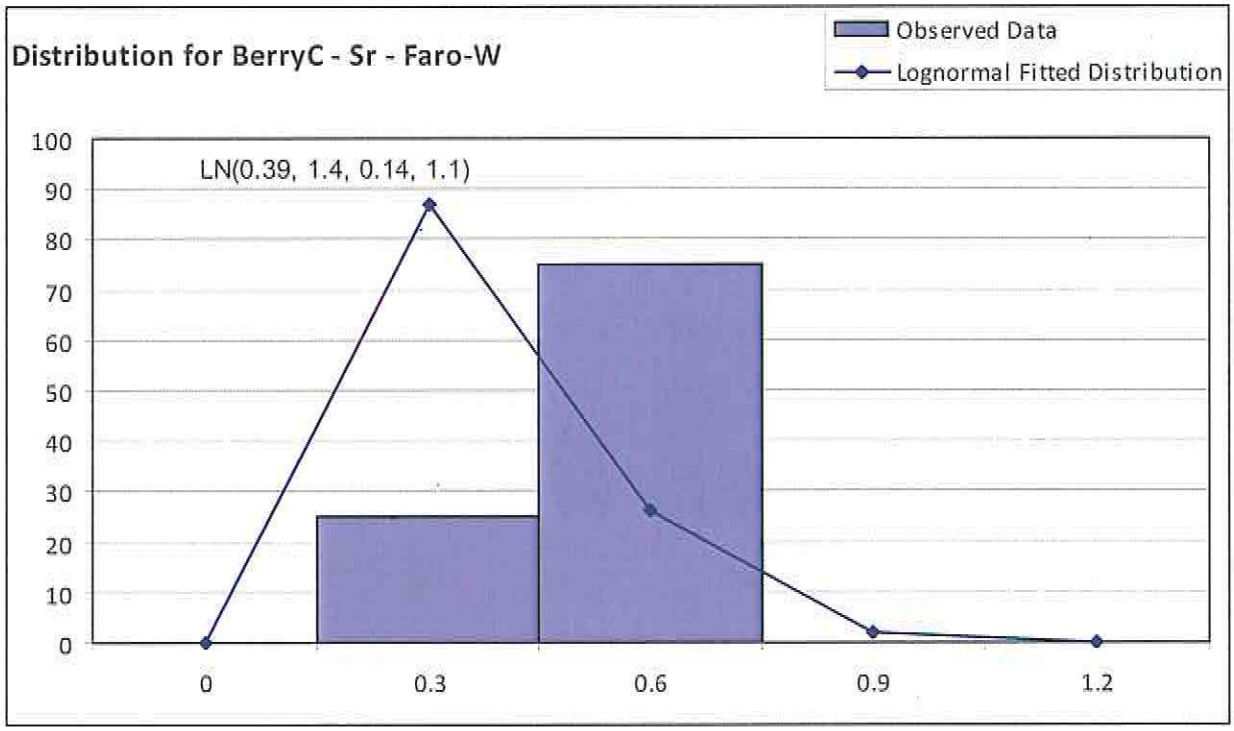

Distribution for BerryC - Sr - Background
Observed Data
Lognormal Fitted Distribution
LN(0.6, 2.6, 0.03, 10.3)
45
40
35
30
25
20
15
10
5
0
0
0.8
1.6
2.4
3.2
4
4.8
5.6
6.4
7.2
8
8.8
9.6
10.4
11.2

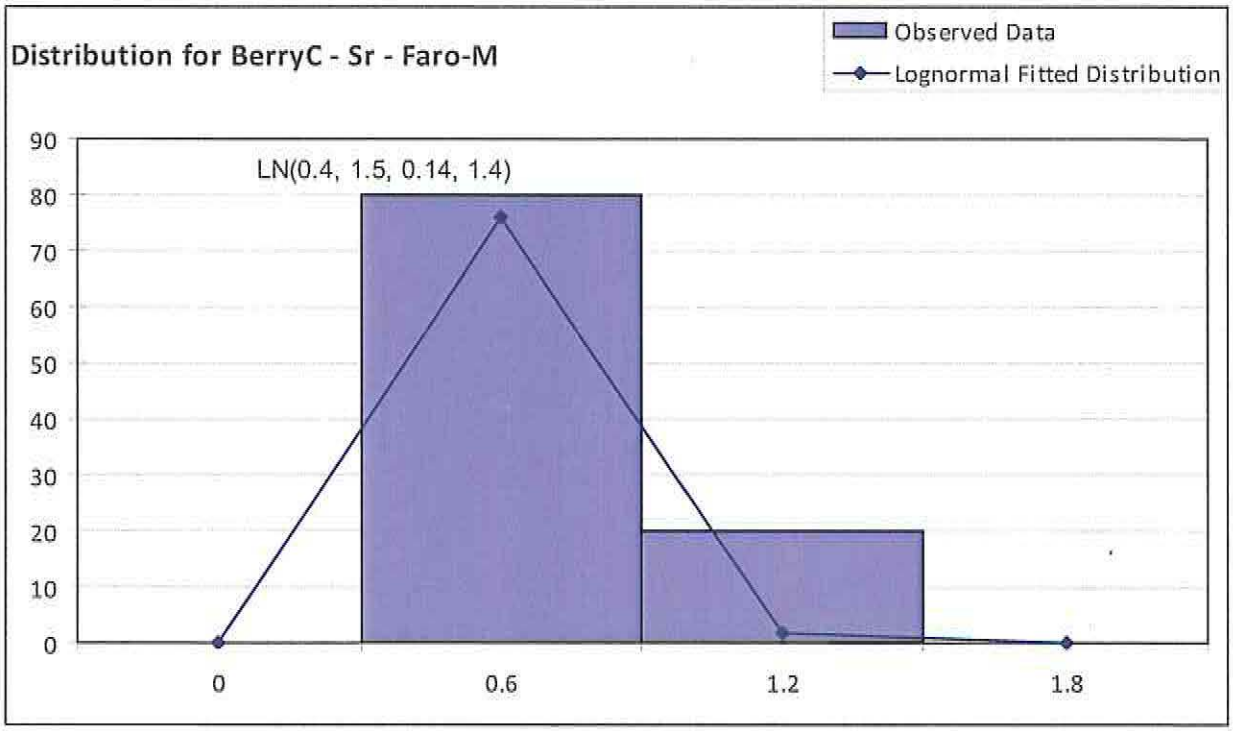

Distribution for BerryC - Sr - Van-S
Observed Data
Lognormal Fitted Distribution
LN(0.2, 3, 0.01, 0.3)
120
100
80
60
40
20
0
0
0.1
0.2
0.3
0.4

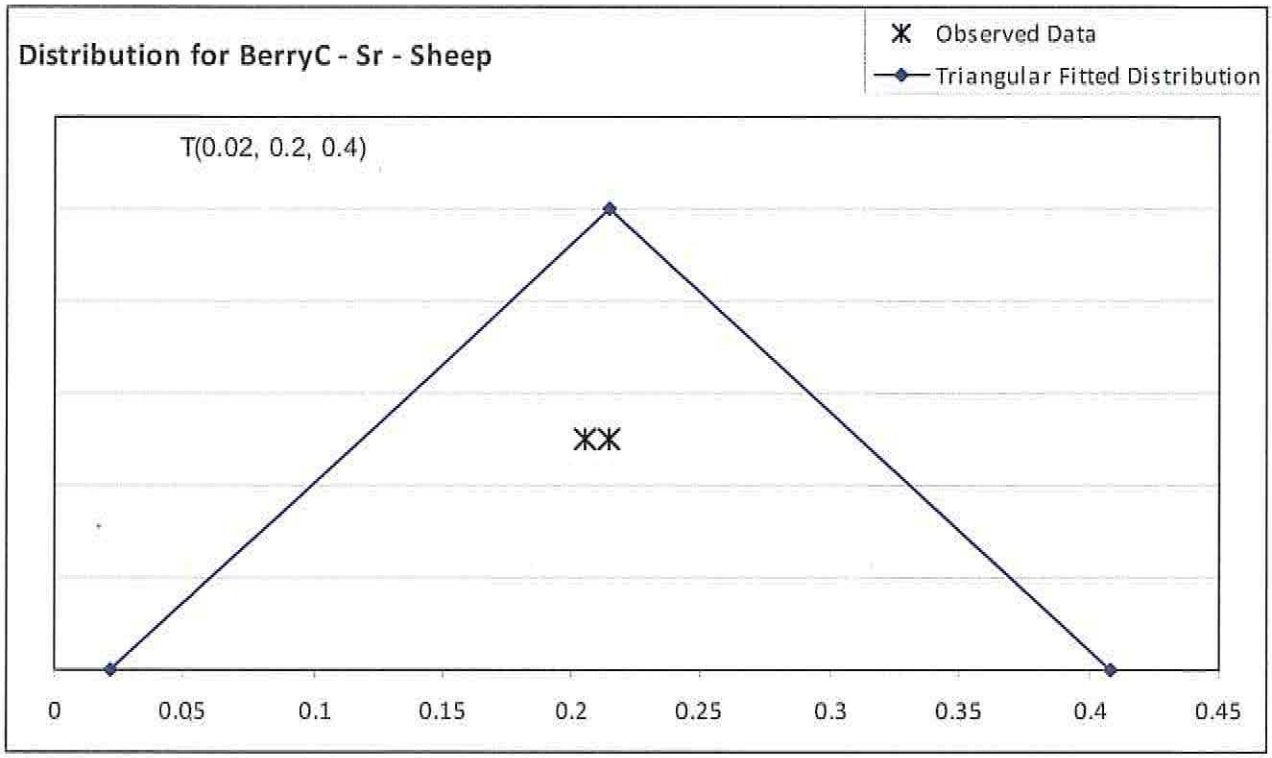

Distribution for BerryC - Sr - Van-M
Observed Data
Lognormal Fitted Distribution
LN(1.3, 2.0, 0.16, 10.4)
60
50
40
30
20
10
0
0
1
2
3
4
5
6
7
8
9
10
11


Distribution for BerryC - Sr - Faro-N
Observed Data
Lognormal Fitted Distribution
LN(0.7, 3, 0.02, 18)
120
100
80
60
40
20
0
0
0.7
1.4
2.1
2.8
3.5
4.2
4.9
5.6
6.3
7
7.7
8.4

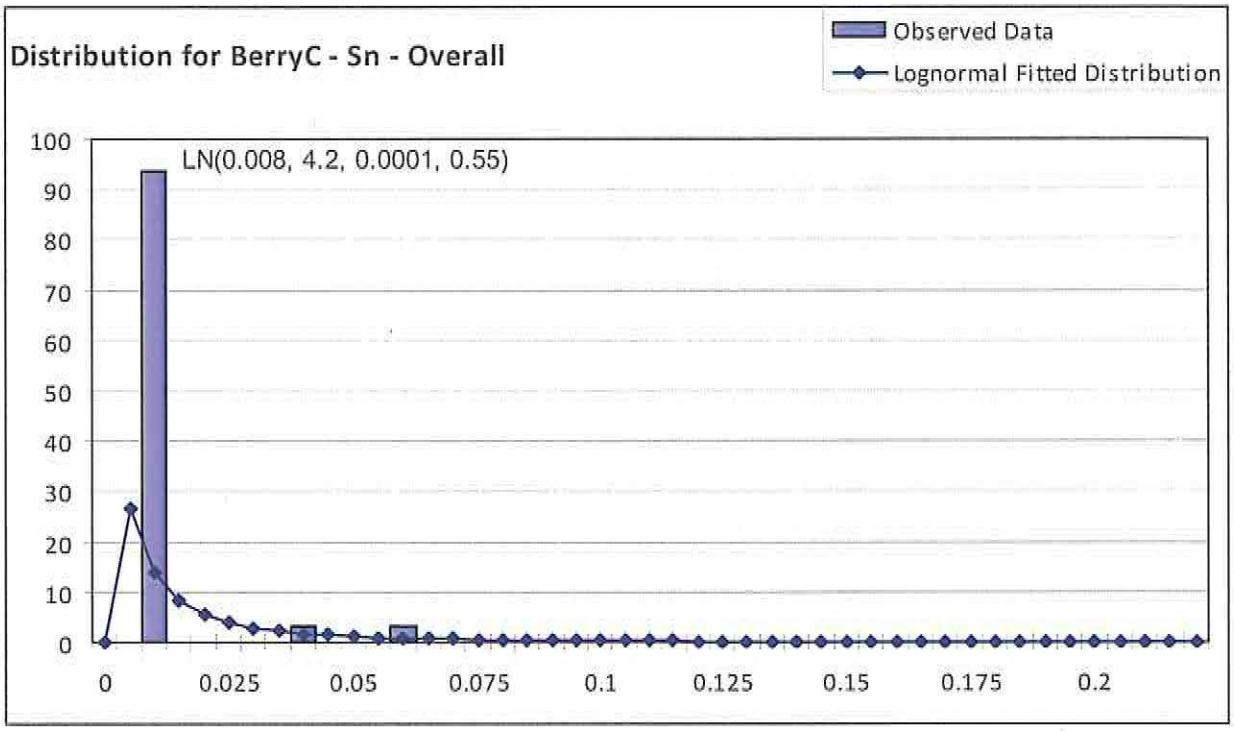

Distribution for BerryC - Sr - Faro-S
Observed Data
Lognormal Fitted Distribution
LN(0.5, 1.5, 0.15, 1.6)
100
90
80
70
60
50
40
30
20
10
0
0
0.6
1.2
1.8

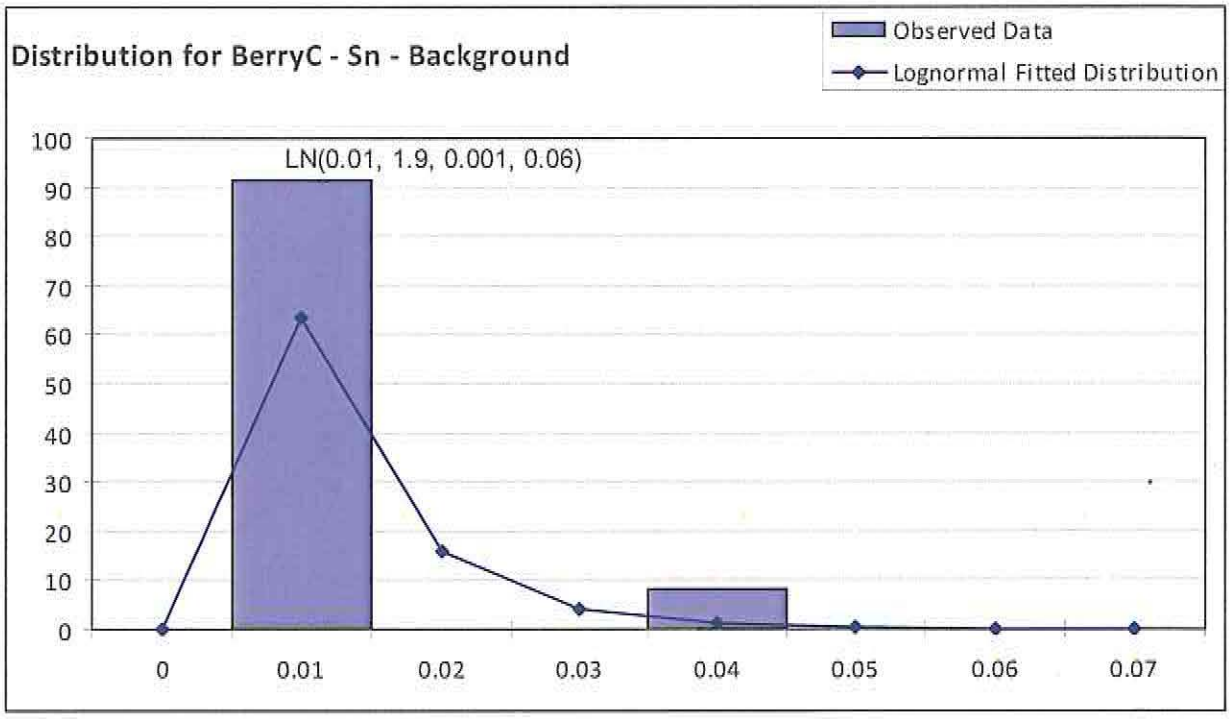

Distribution for BerryC - Sr - Faro-W
Observed Data
Lognormal Fitted Distribution
LN(0.39, 1.4, 0.14, 1.1)
100
90
80
70
60
50
40
30
20
10
0
0
0.3
0.6
0.9
1.2

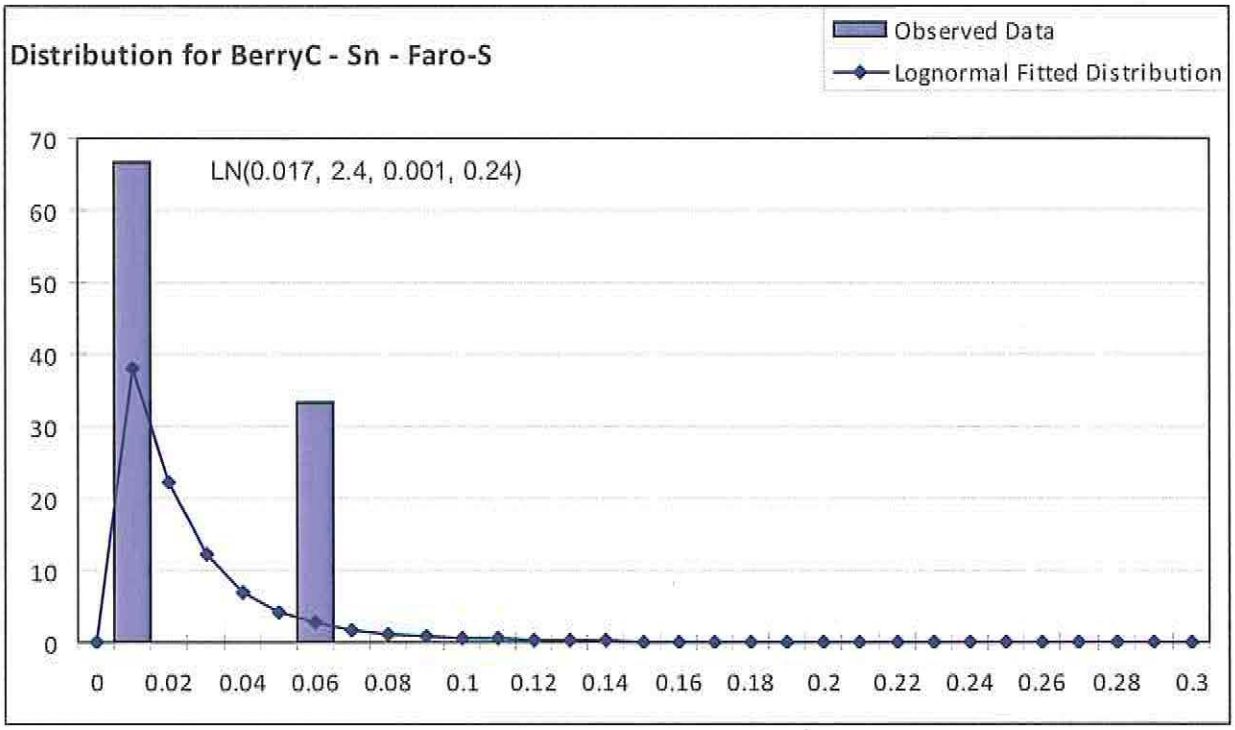

Distribution for BerryC - Sr - Faro-M
Observed Data
Lognormal Fitted Distribution
LN(0.4, 1.5, 0.14, 1.4)
90
80
70
60
50
40
30
20
10
0
0
0.6
1.2
1.8

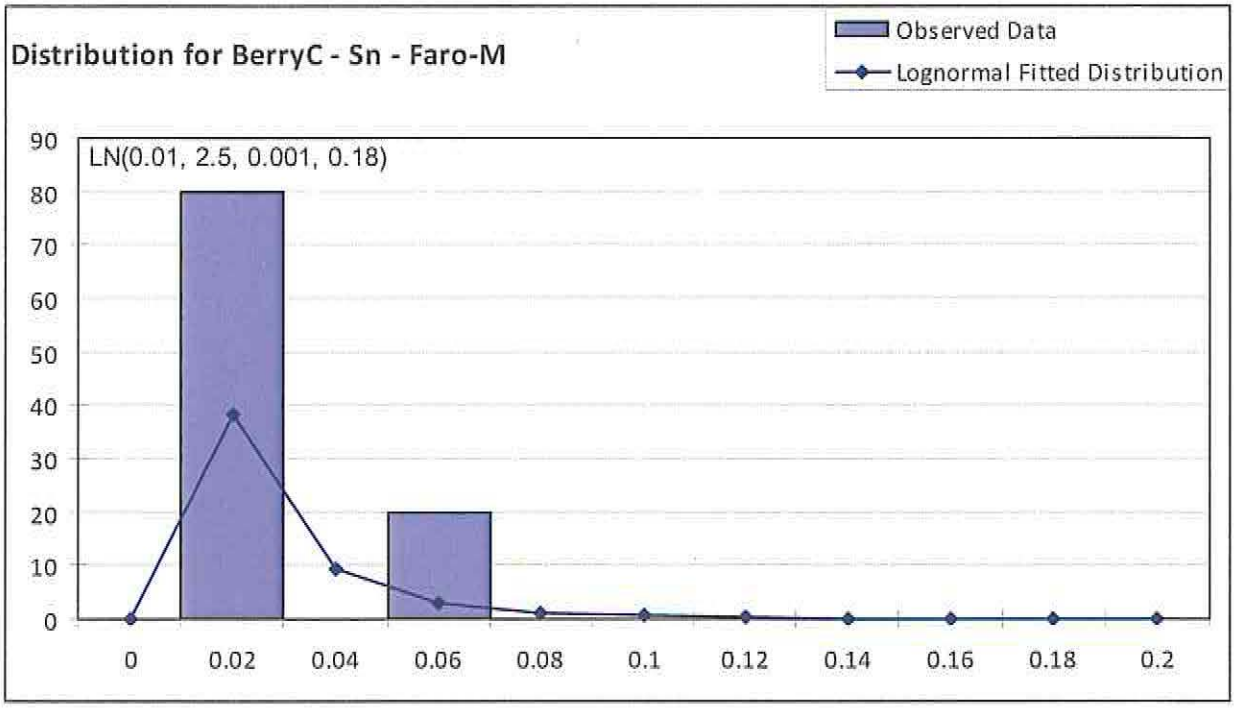

Distribution for BerryC - Sr - Sheep
Observed Data
Triangular Fitted Distribution
T(0.02, 0.2, 0.4)
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
0.45

D.4.15 Tin


Distribution for BerryC - Sn - Overall
Observed Data
Lognormal Fitted Distribution
LN(0.008, 4.2, 0.0001, 0.55)
100
90
80
70
60
50
40
30
20
10
0
0
0.025
0.05
0.075
0.1
0.125
0.15
0.175
0.2


Distribution for BerryC - Sn - Background
Observed Data
Lognormal Fitted Distribution
LN(0.01, 1.9, 0.001, 0.06)
100
90
80
70
60
50
40
30
20
10
0
0
0.01
0.02
0.03
0.04
0.05
0.06
0.07

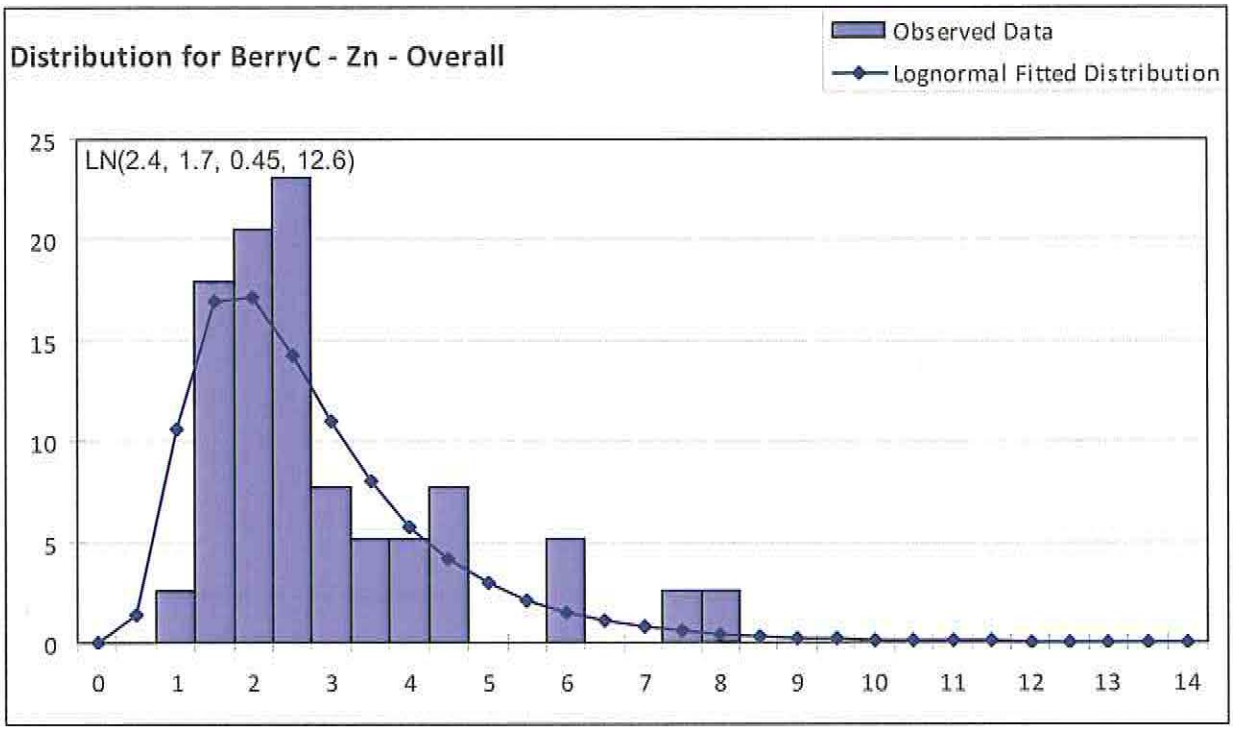


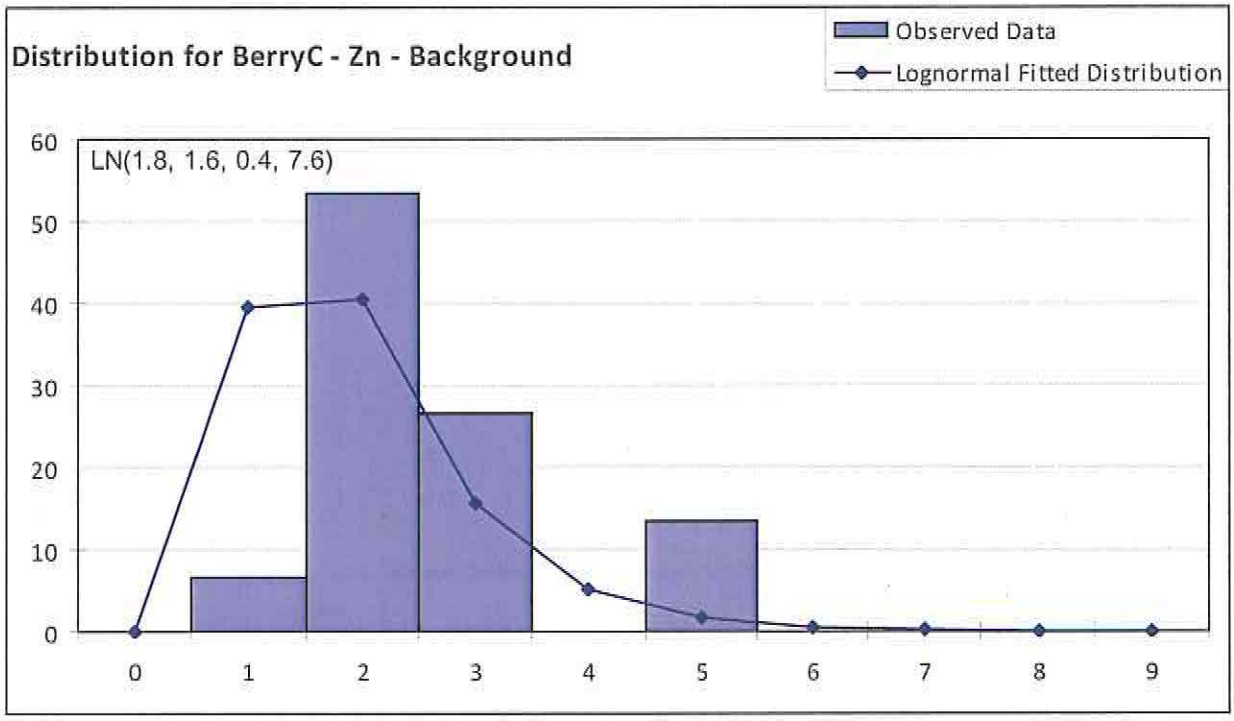


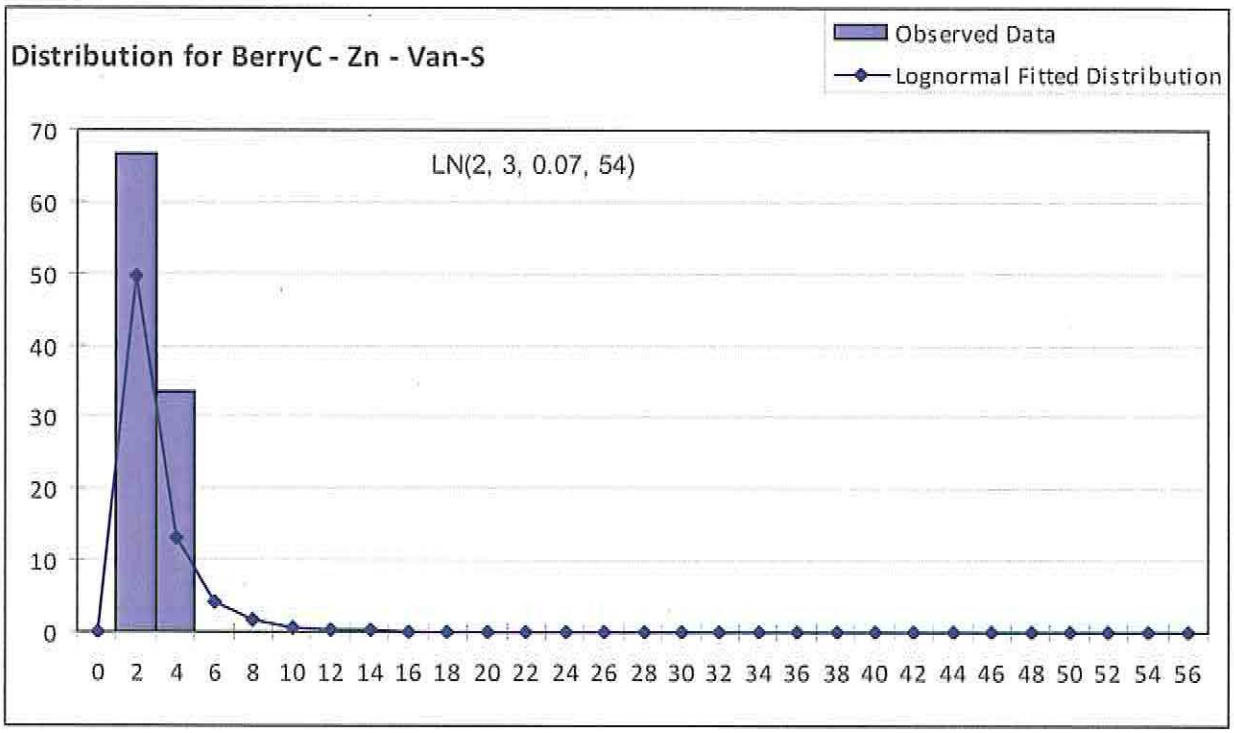
D.4.16 Vanadium

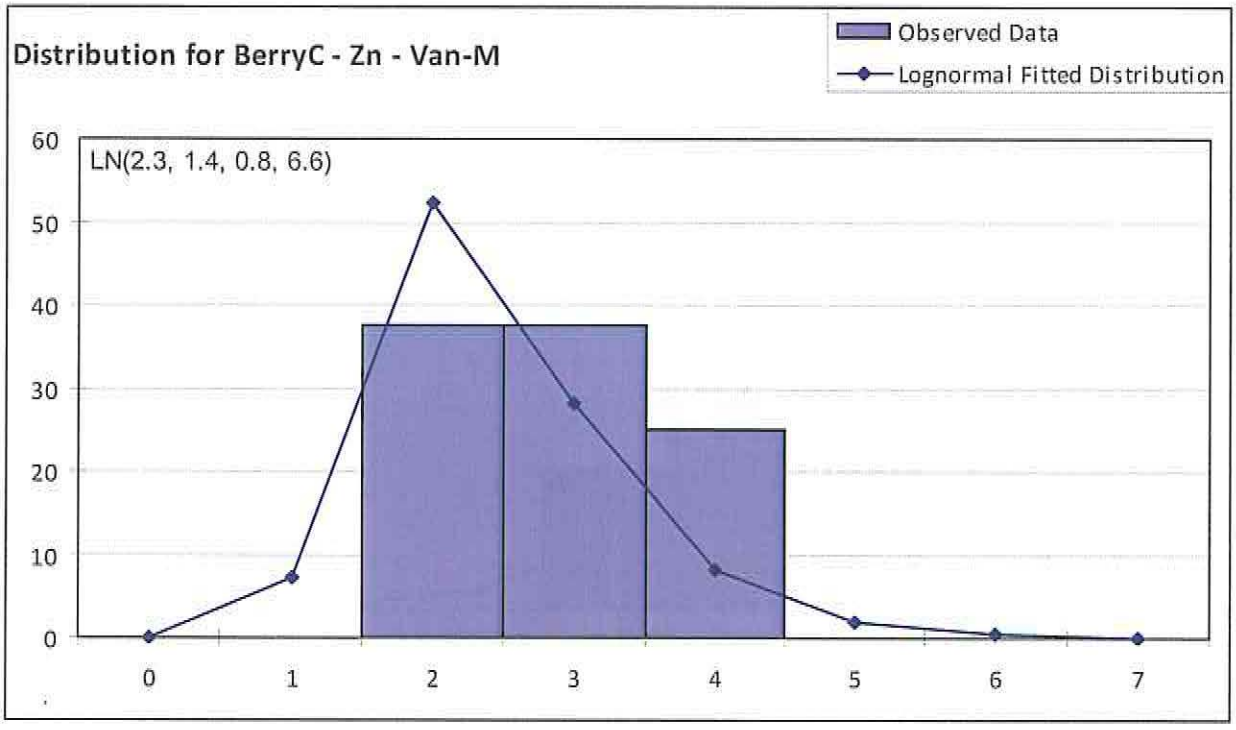
All uniform distributions – U(0, 0.1)

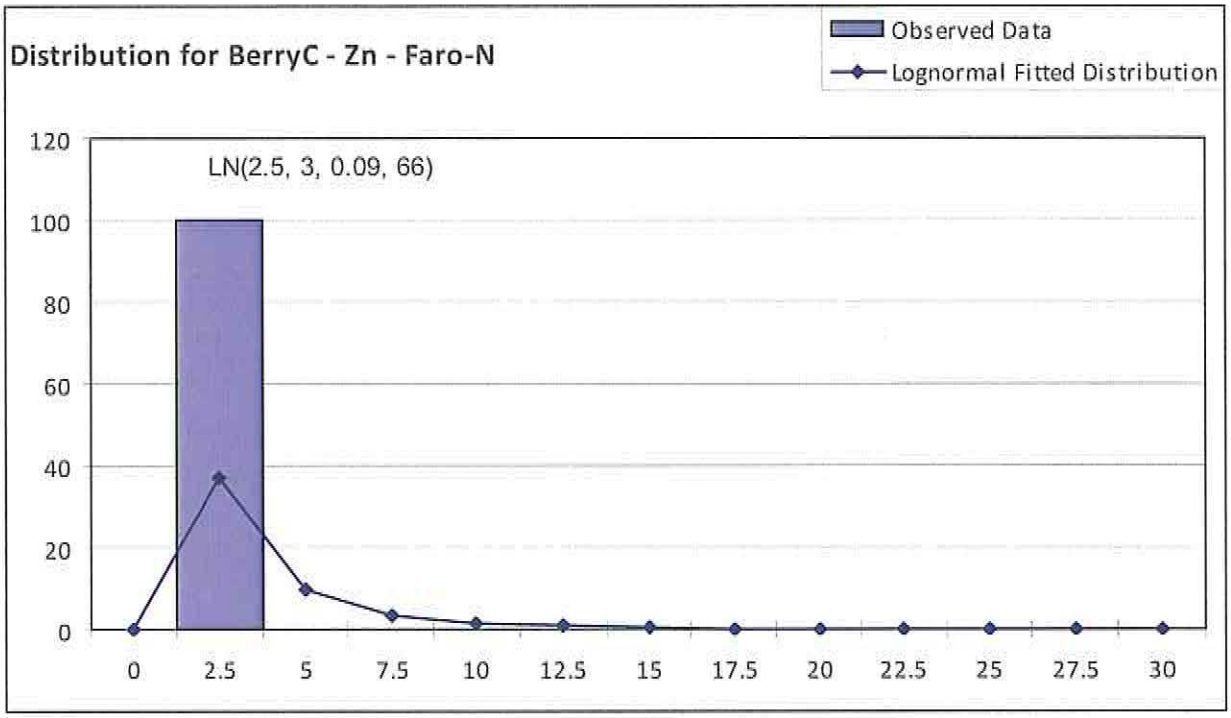
D.4.17 Zinc

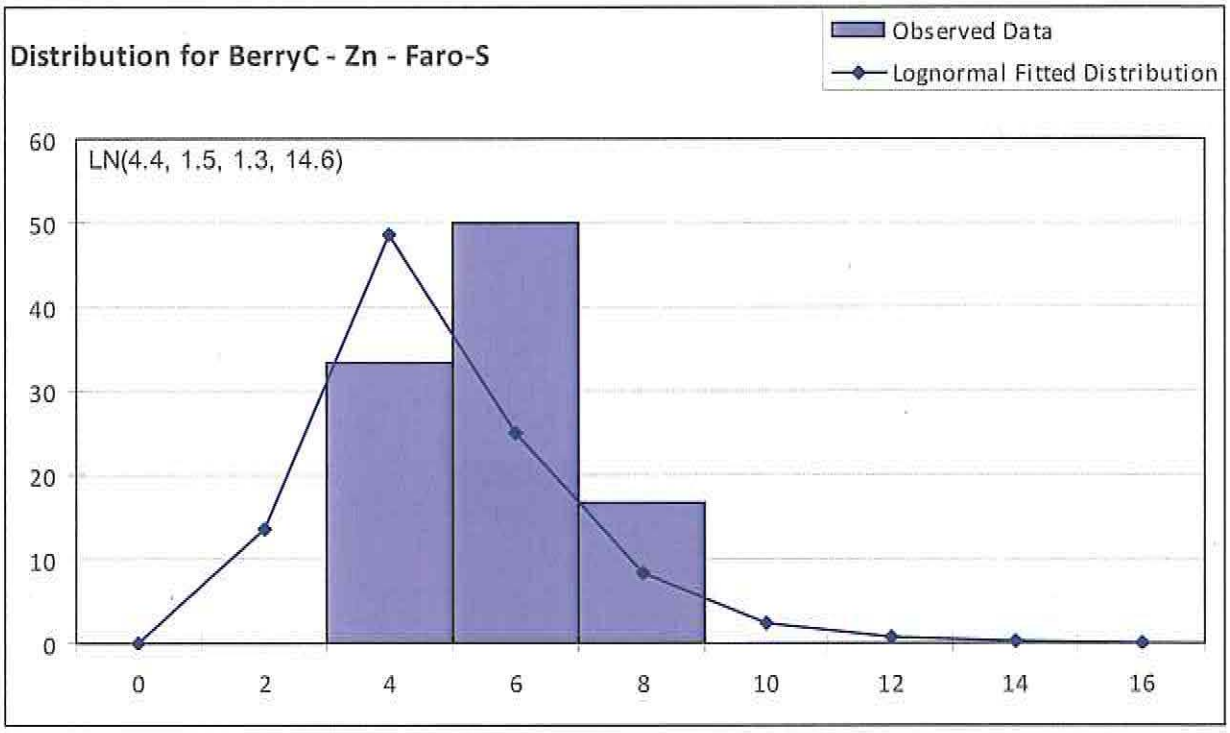

Distribution for BerryC - Zn - Overall
Observed Data
Lognormal Fitted Distribution
LN(2.4, 1.7, 0.45, 12.6)
25
20
15
10
5
0
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14

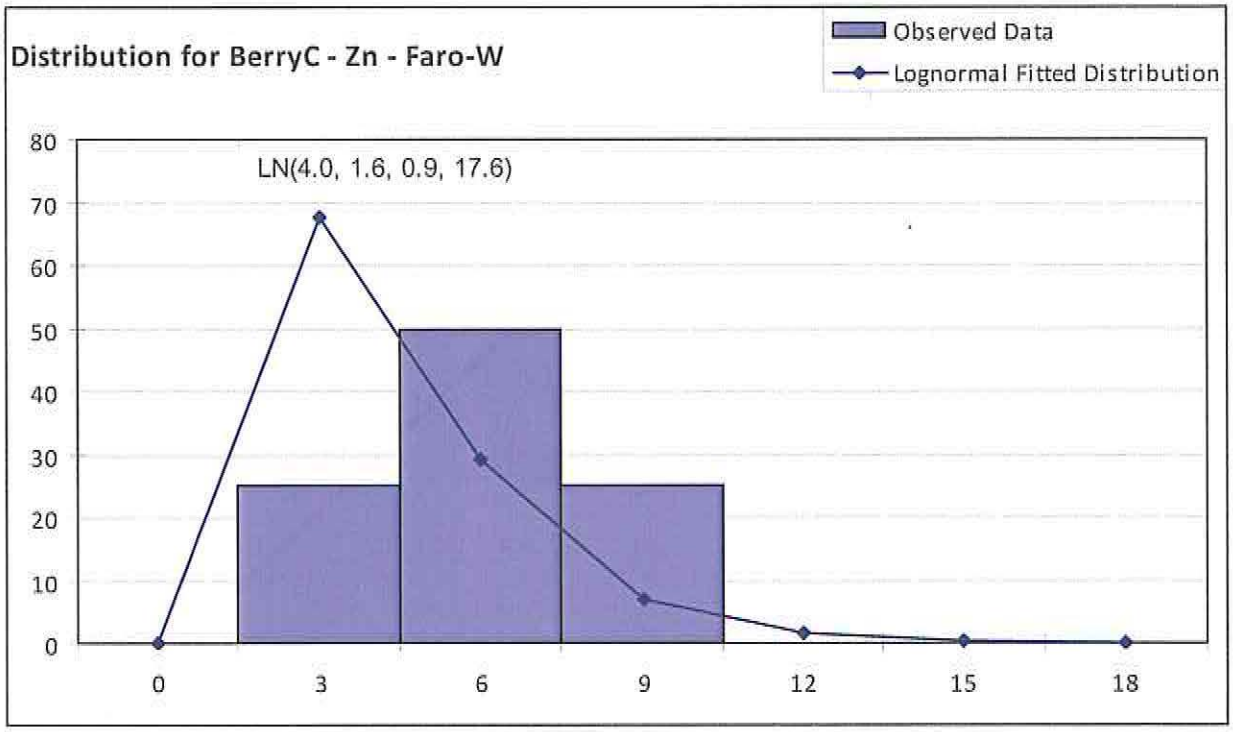

Distribution for BerryC - Zn - Background
Observed Data
Lognormal Fitted Distribution
LN(1.8, 1.6, 0.4, 7.6)
60
50
40
30
20
10
0
0 1 2 3 4 5 6 7 8 9

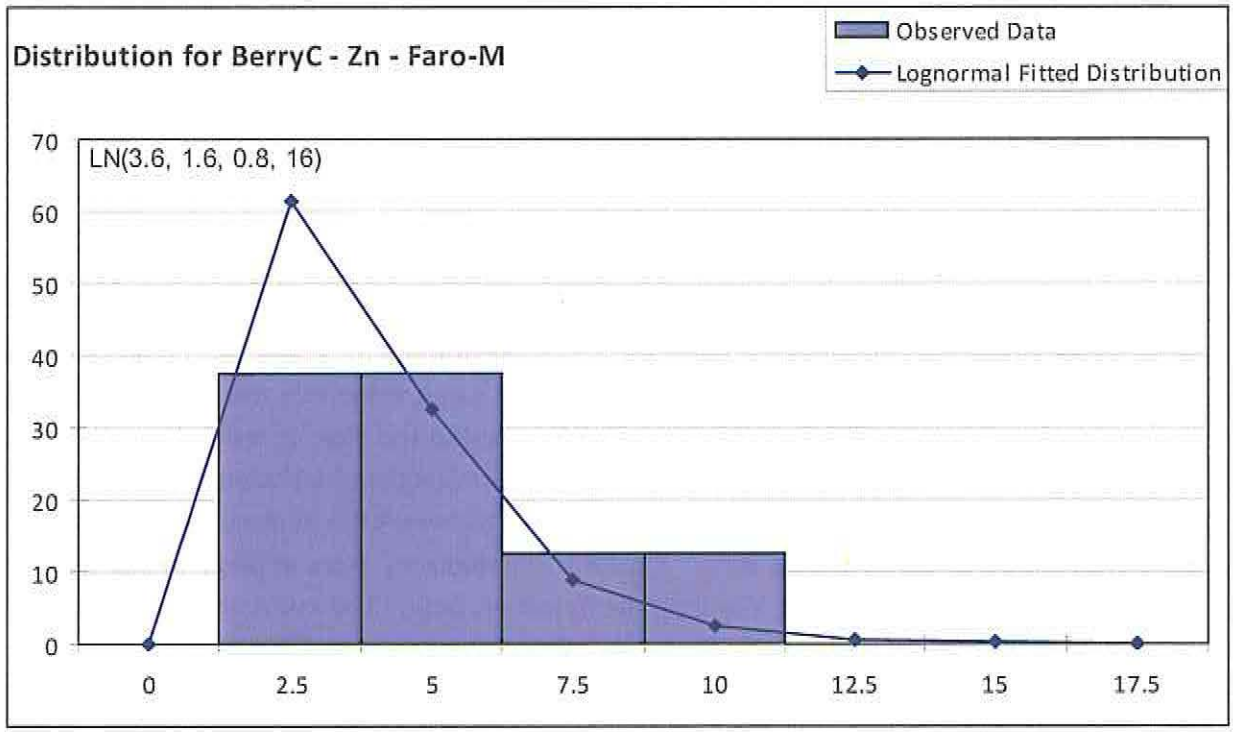

Distribution for BerryC - Zn - Van-S
Observed Data
Lognormal Fitted Distribution
LN(2, 3, 0.07, 54)
70
60
50
40
30
20
10
0
0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48 50 52 54 56

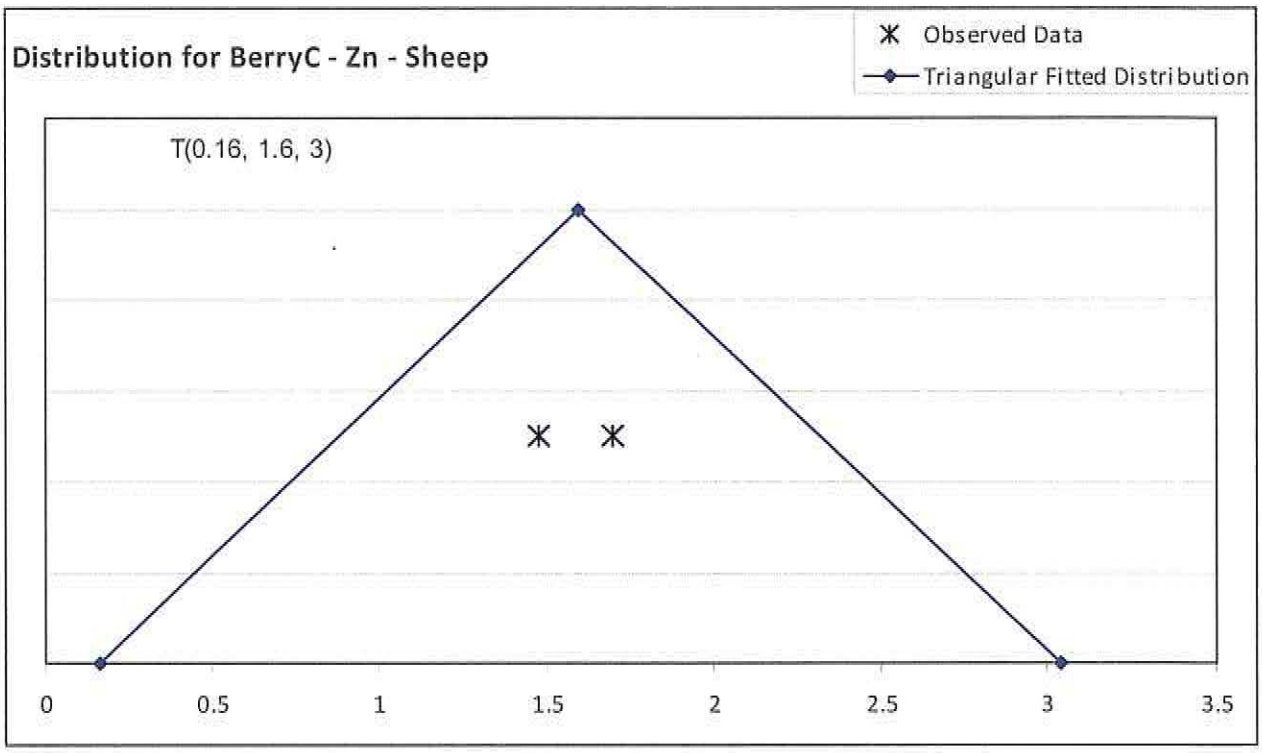

Distribution for BerryC - Zn - Van-M
Observed Data
Lognormal Fitted Distribution
LN(2.3, 1.4, 0.8, 6.6)
60
50
40
30
20
10
0
0 1 2 3 4 5 6 7


Distribution for BerryC - Zn - Faro-N
Observed Data
Lognormal Fitted Distribution
LN(2.5, 3, 0.09, 66)
120
100
80
60
40
20
0
0
2.5
5
7.5
10
12.5
15
17.5
20
22.5
25
27.5
30


Distribution for BerryC - Zn - Faro-S
Observed Data
Lognormal Fitted Distribution
LN(4.4, 1.5, 1.3, 14.6)
60
50
40
30
20
10
0
0
2
4
6
8
10
12
14
16


Distribution for BerryC - Zn - Faro-W
Observed Data
Lognormal Fitted Distribution
LN(4.0, 1.6, 0.9, 17.6)
80
70
60
50
40
30
20
10
0
0
3
6
9
12
15
18


Distribution for BerryC - Zn - Faro-M
Observed Data
Lognormal Fitted Distribution
LN(3.6, 1.6, 0.8, 16)
70
60
50
40
30
20
10
0
0
2.5
5
7.5
10
12.5
15
17.5



D.5 MEASURED BROWSE CONCENTRATIONS

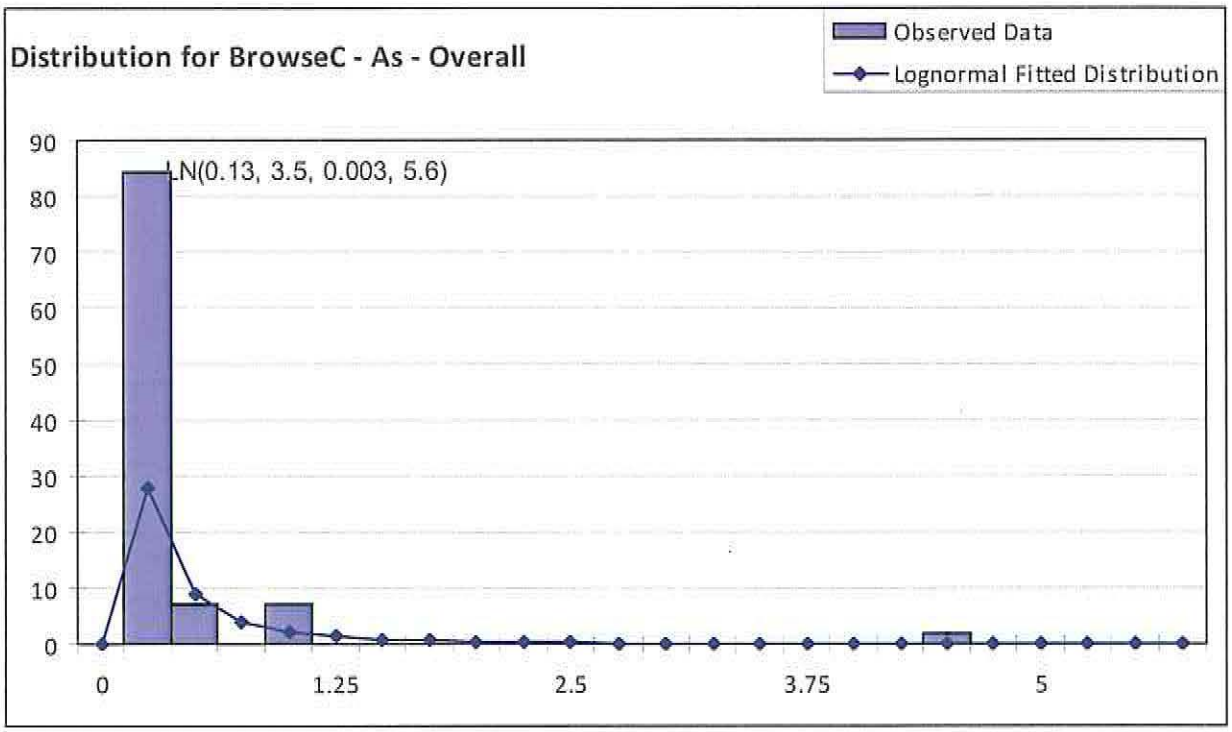
Measured concentrations (mg/kg (dw) converted to mg/kg (ww) using an average moisture content of 61.1%) in various types of vegetation from the Faro Mine Complex were presented in the previous assessment (SENES, 2006, Section 2.3. 2, Project No. 33798).

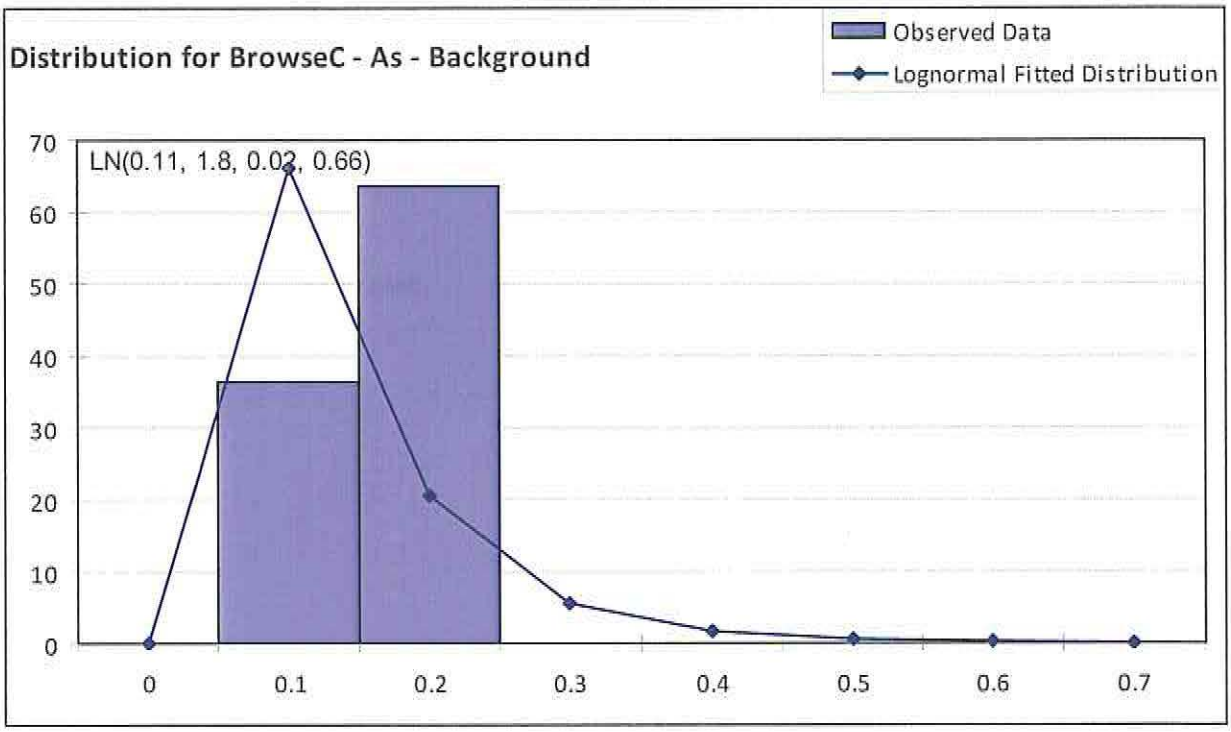
The data were fit to either lognormal, triangular or uniform distributions. Lognormal distributions are defined by the geometric mean, geometric standard deviation, minimum value, and maximum value. In the case of only one value, a geometric standard deviation of 3.0 was assumed. The triangular distributions are defined by the minimum value, the mode, and the maximum value. For the purposes of this assessment, the mean value was used to represent the mode because the triangular distribution was generally used in the case of only a few available data points and a mode value was not available. This was considered a reasonable assumption. A range was assumed on either side of the mean value to represent the minimum and maximum values and encompass the available data. Uniform distributions were applied in the case of measured concentrations reported as less than the detection limit. The minimum and maximum values of the uniform distribution were set equal to 0 and the detection limit, respectively. The following graphs summarize the distributions (line graph) as compared with the available data (bar graph) for each COPC. Graphs are not provided for uniform distributions. The development of distributions for vegetation concentrations was limited by the data available.

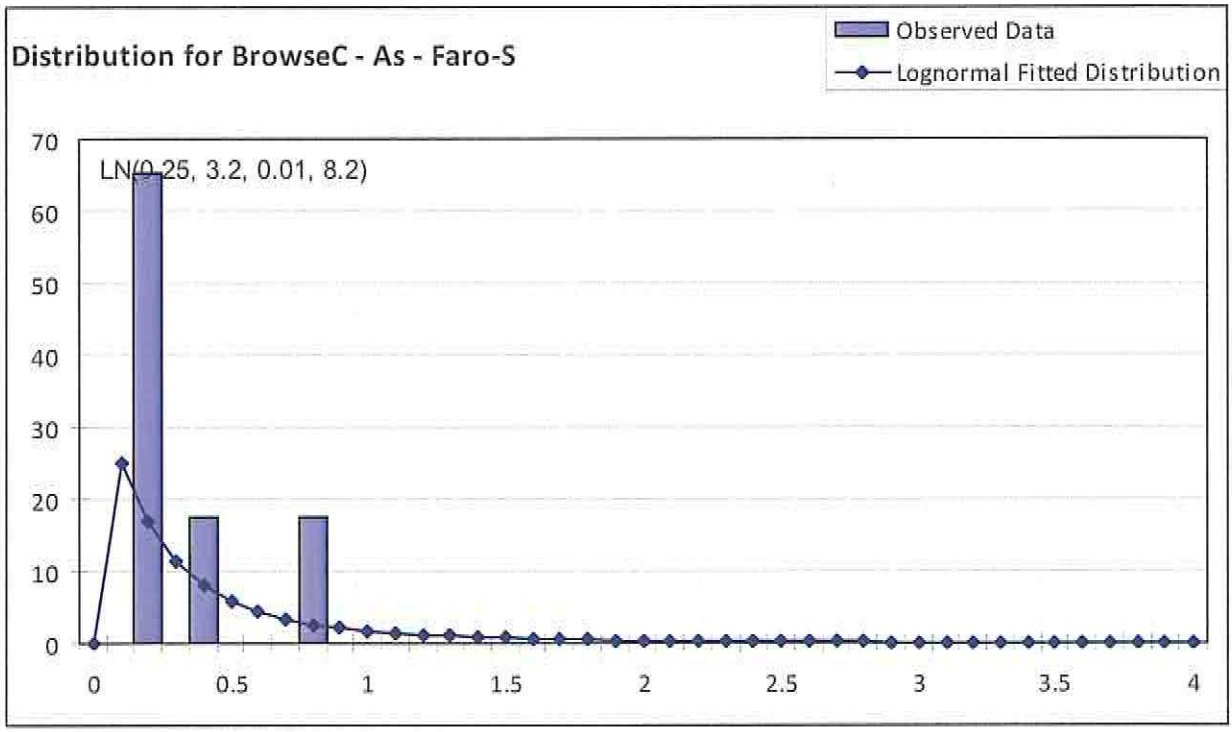
D.5.1 Antimony

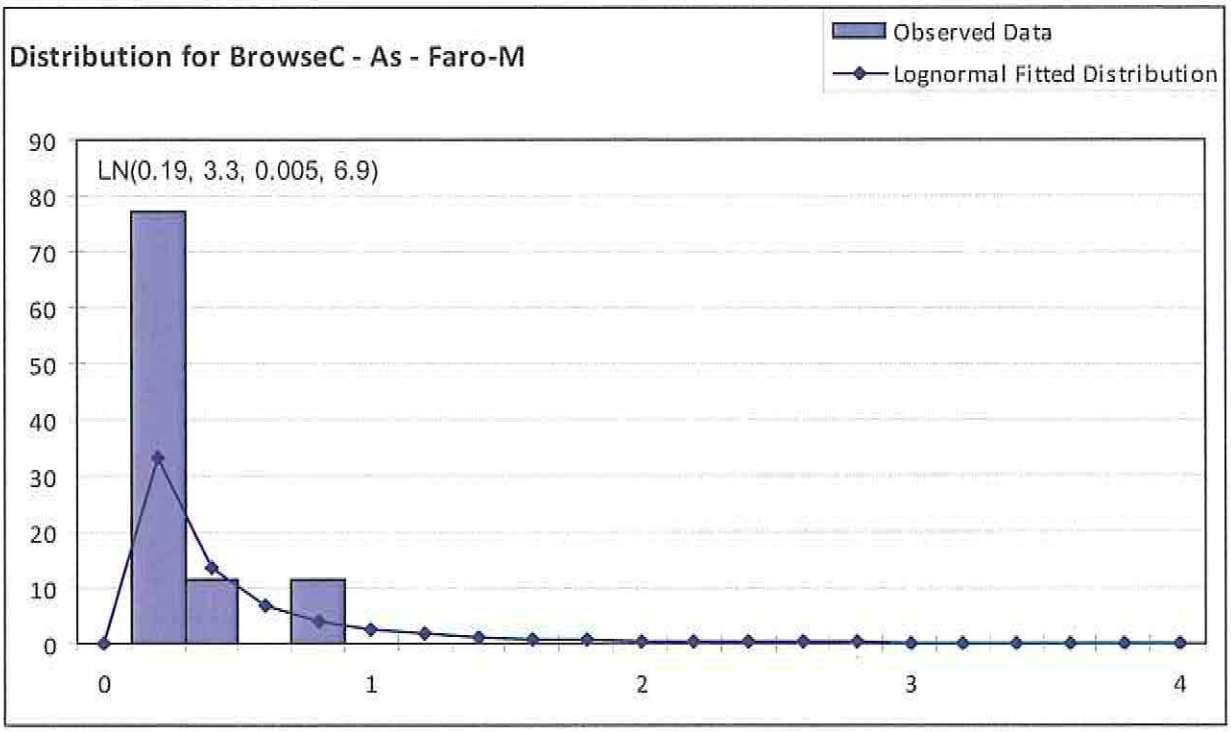
All uniform distributions – U(0, 0.04)
No Antimony data for browse at Van-S, Van-M, Faro-N, Faro-S.

D.5.2 Arsenic




Distribution for BrowseC - As - Background
Observed Data
Lognormal Fitted Distribution
LN(0.11, 1.8, 0.02, 0.66)
70
60
50
40
30
20
10
0
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7

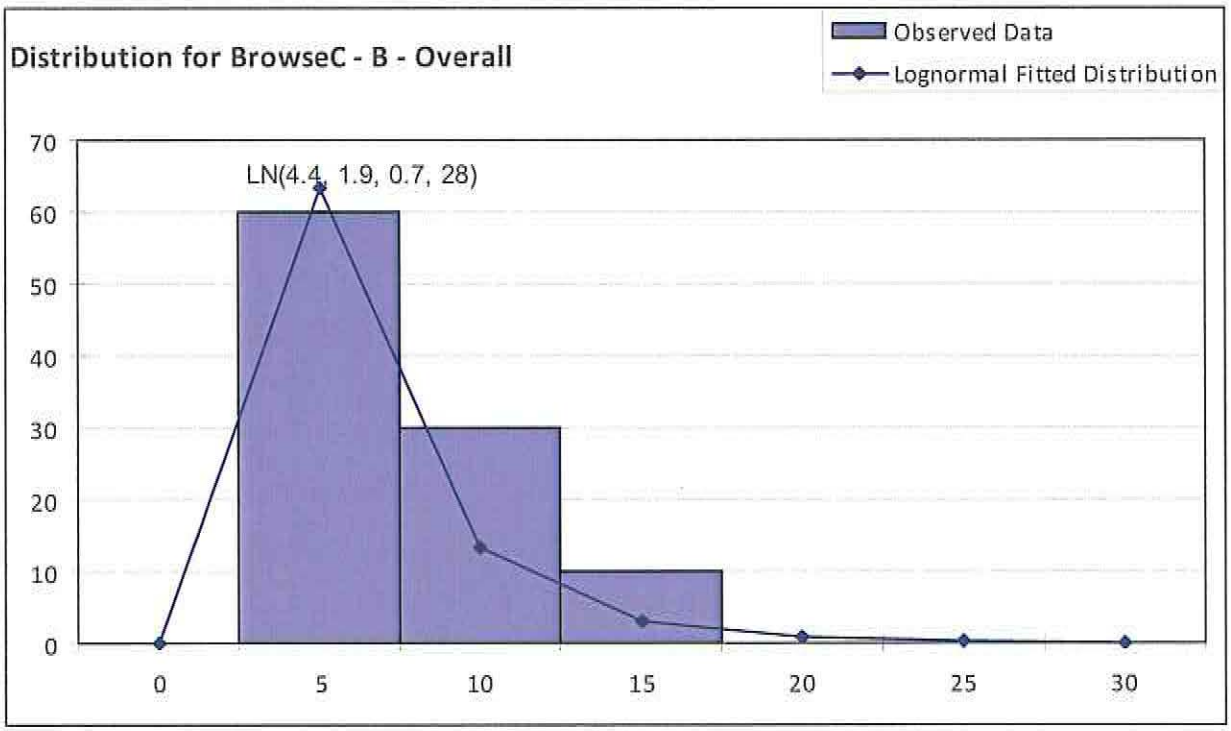

Distribution for BrowseC - As - Faro-S
Observed Data
Lognormal Fitted Distribution
LN(0.25, 3.2, 0.01, 8.2)
70
60
50
40
30
20
10
0
0
0.5
1
1.5
2
2.5
3
3.5
4

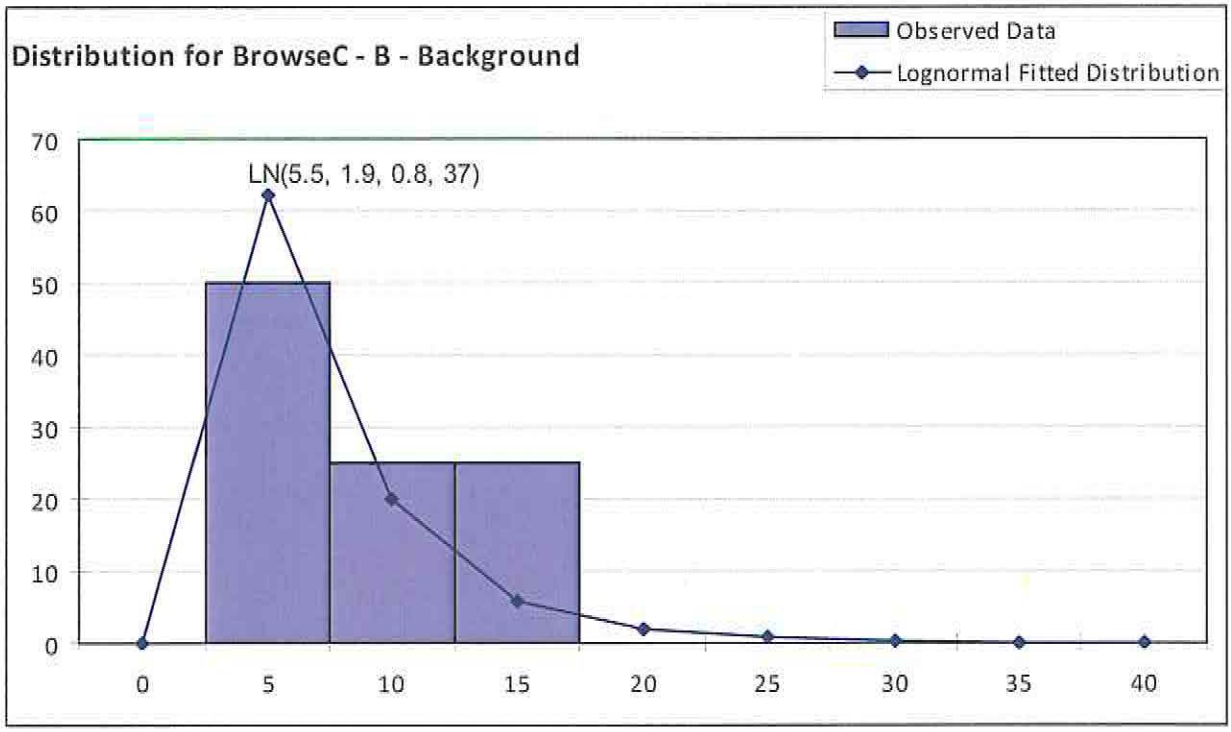


D.5.3 Beryllium

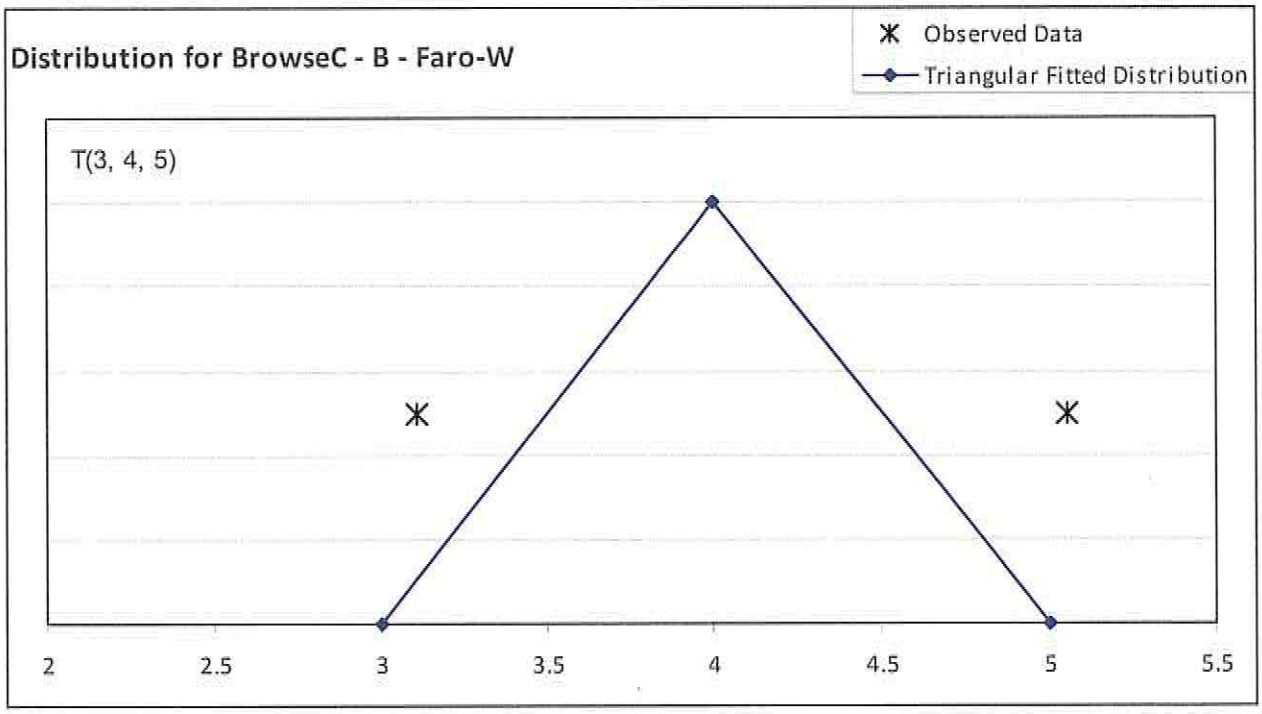
All uniform distributions – U(0, 0.008)
No Beryllium data for browse at Van-S, Van-M, Faro-N, Faro-S.

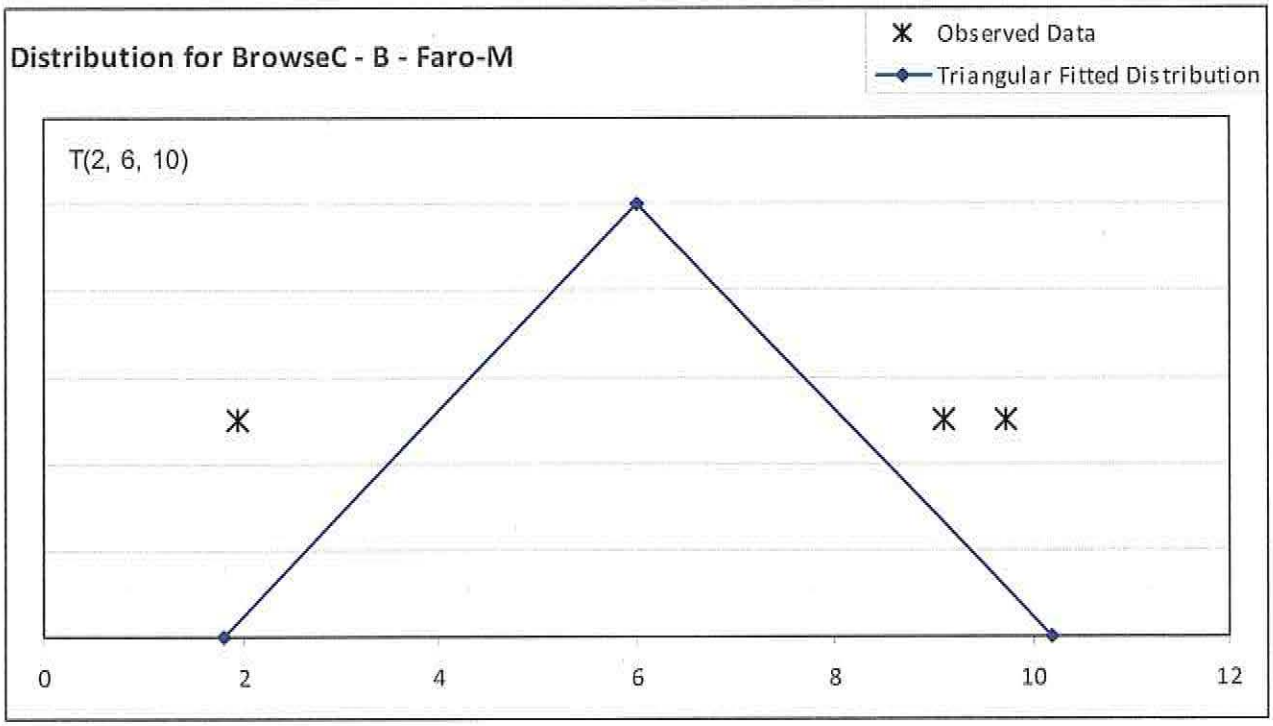
D.5.4 Boron

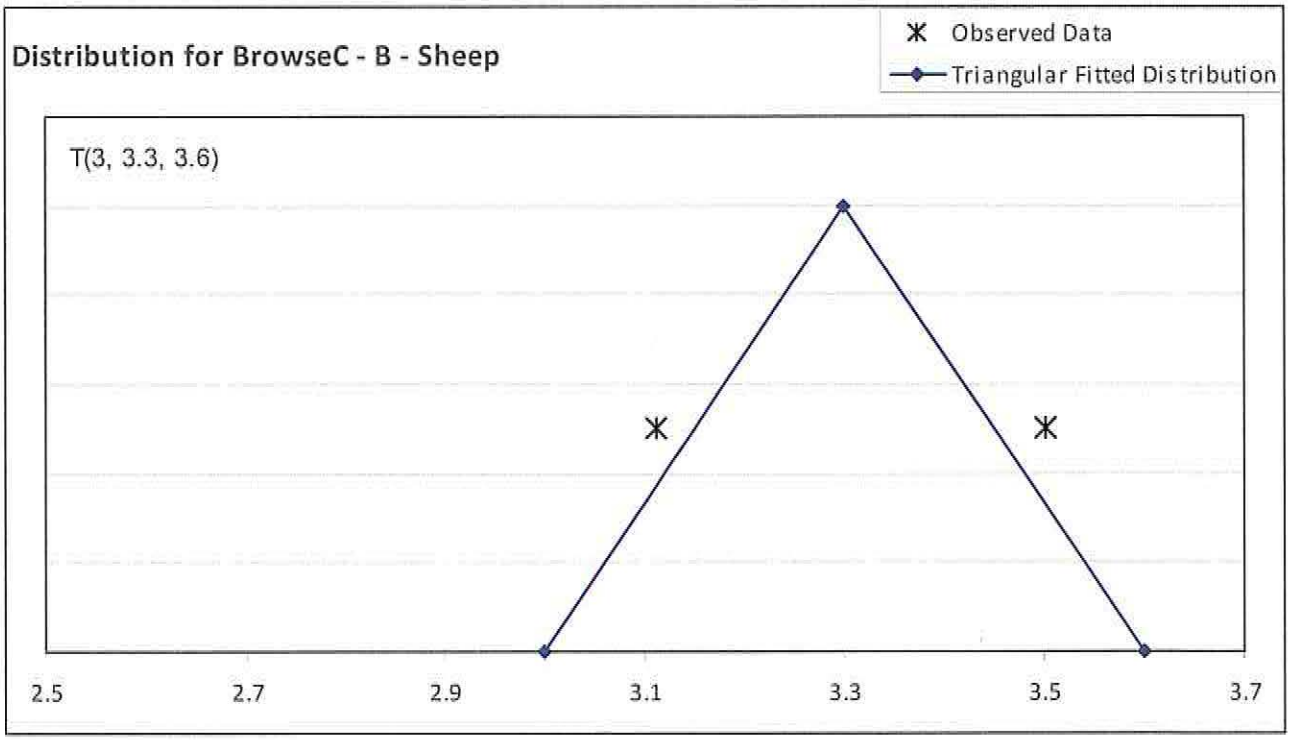




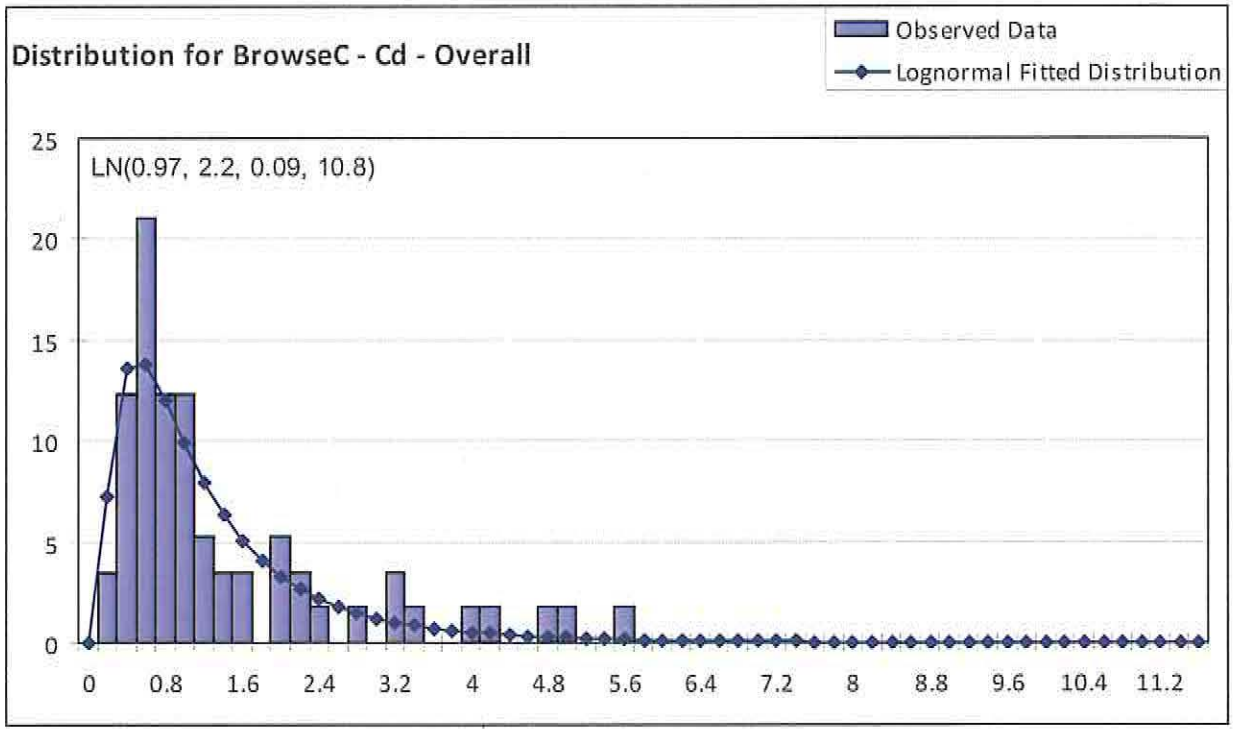
No Boron data for browse at Van-S, Van-M, Faro-N, Faro-S.

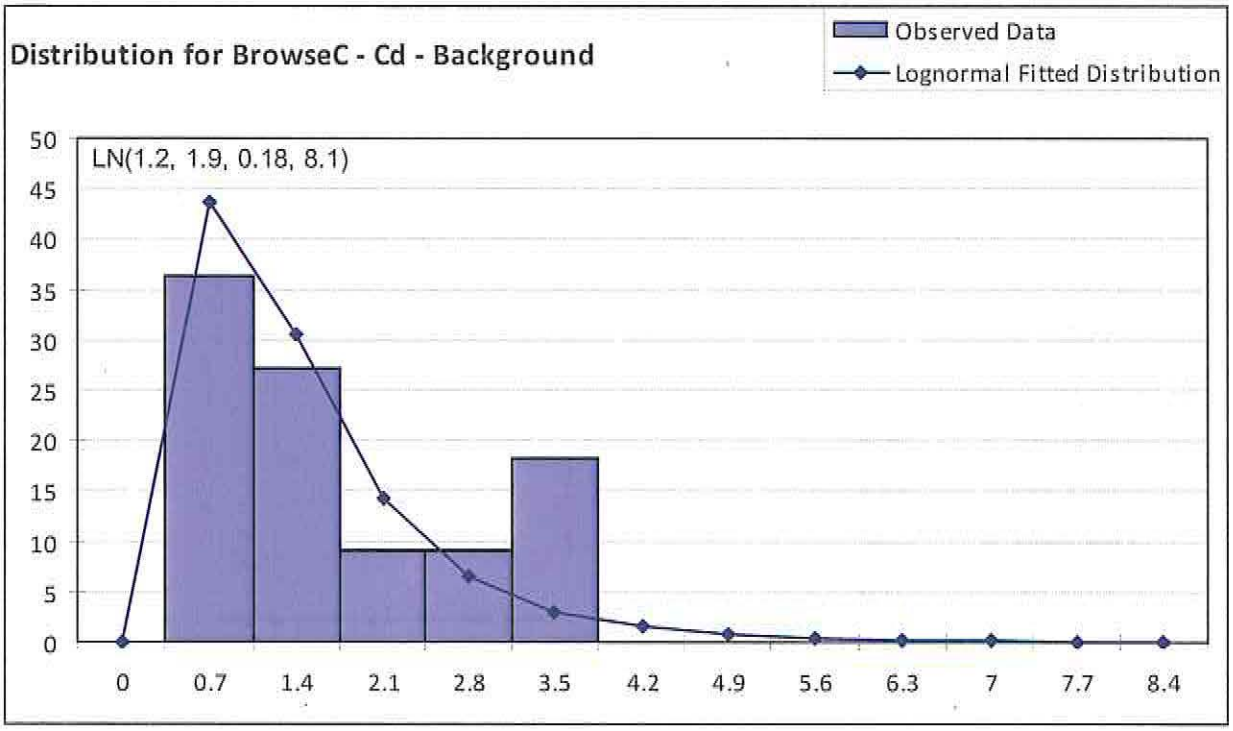

Distribution for BrowseC - B - Faro-W
Observed Data
Triangular Fitted Distribution
T(3, 4, 5)
2
2.5
3
3.5
4
4.5
5
5.5

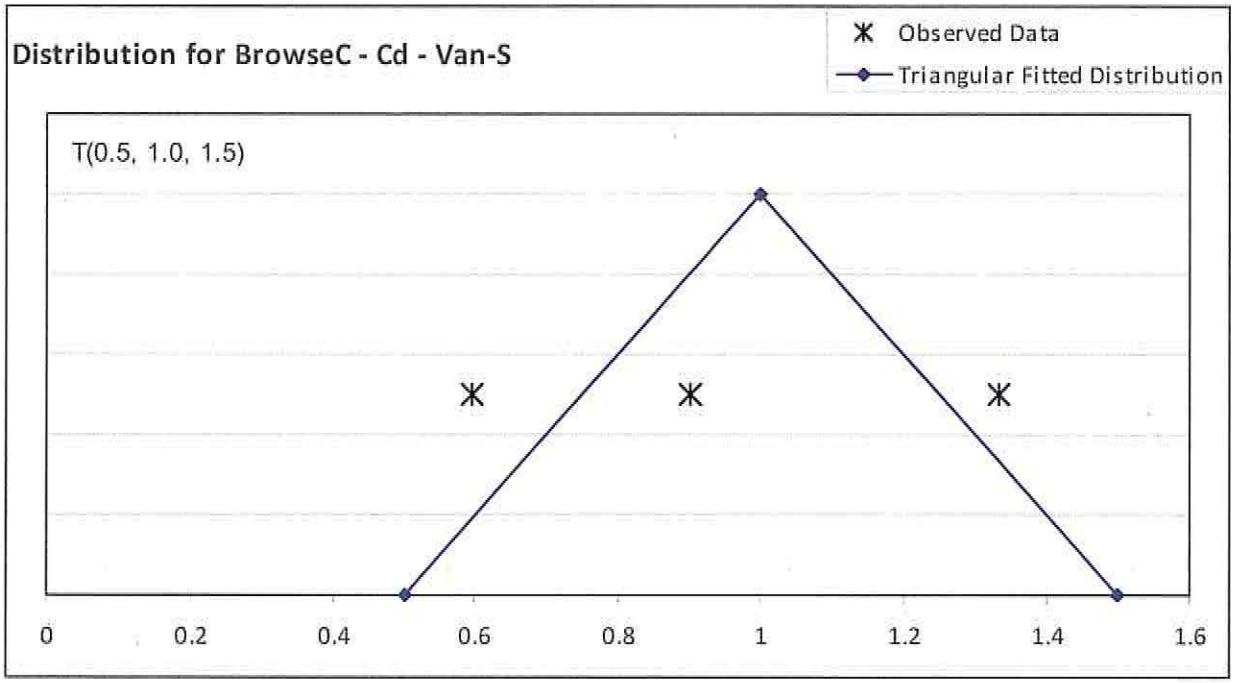

Distribution for BrowseC - B - Faro-M
Observed Data
Triangular Fitted Distribution
T(2, 6, 10)
0
2
4
6
8
10
12

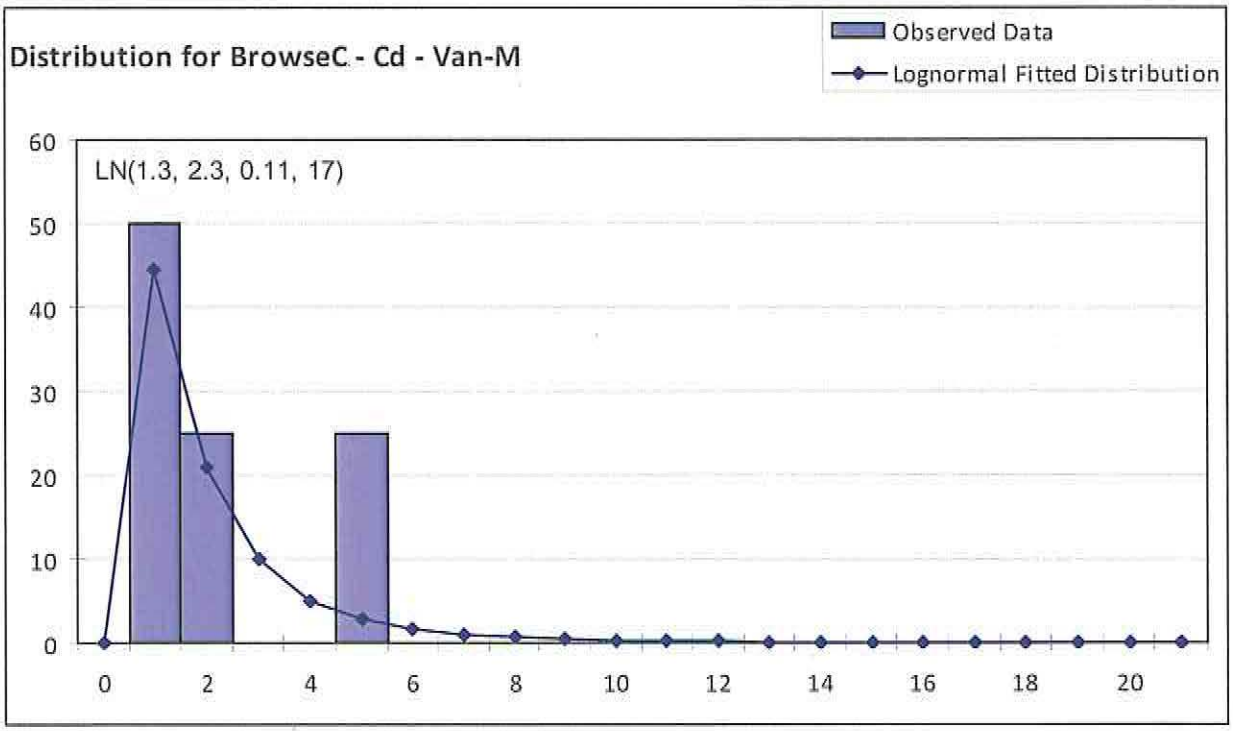

Distribution for BrowseC - B - Sheep
Observed Data
Triangular Fitted Distribution
T(3, 3.3, 3.6)
2.5
2.7
2.9
3.1
3.3
3.5
3.7

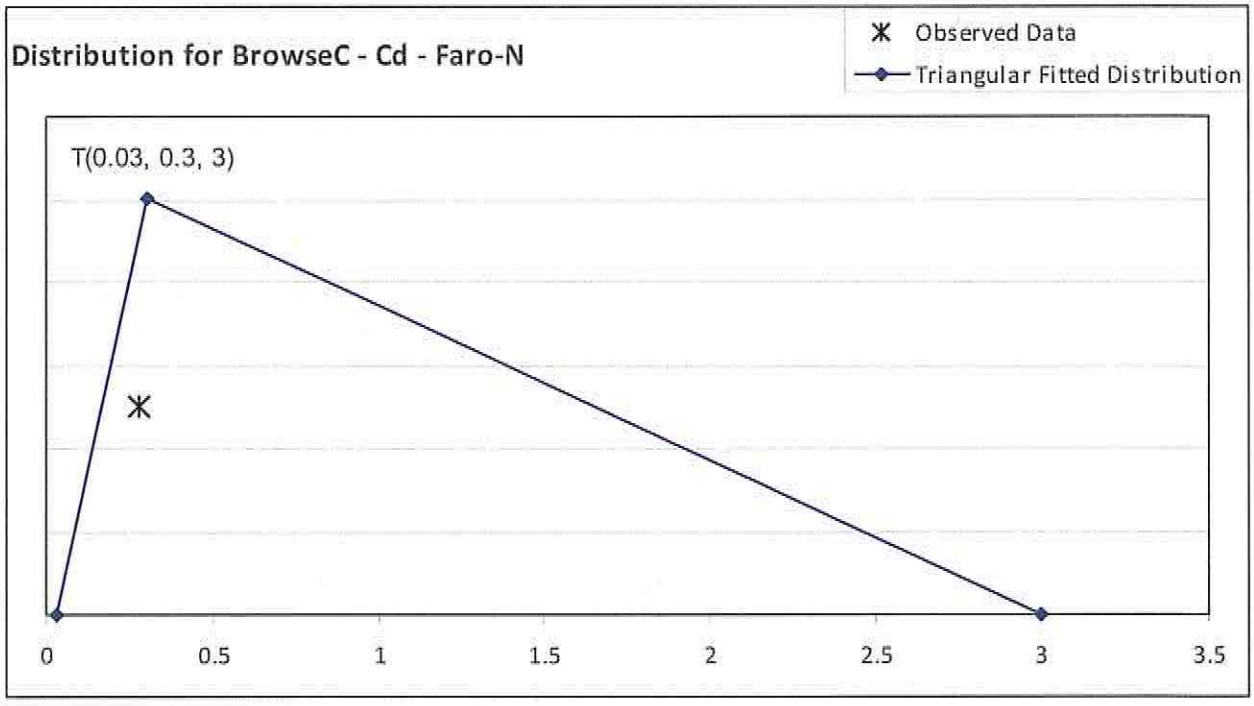
D.5.5 Cadmium

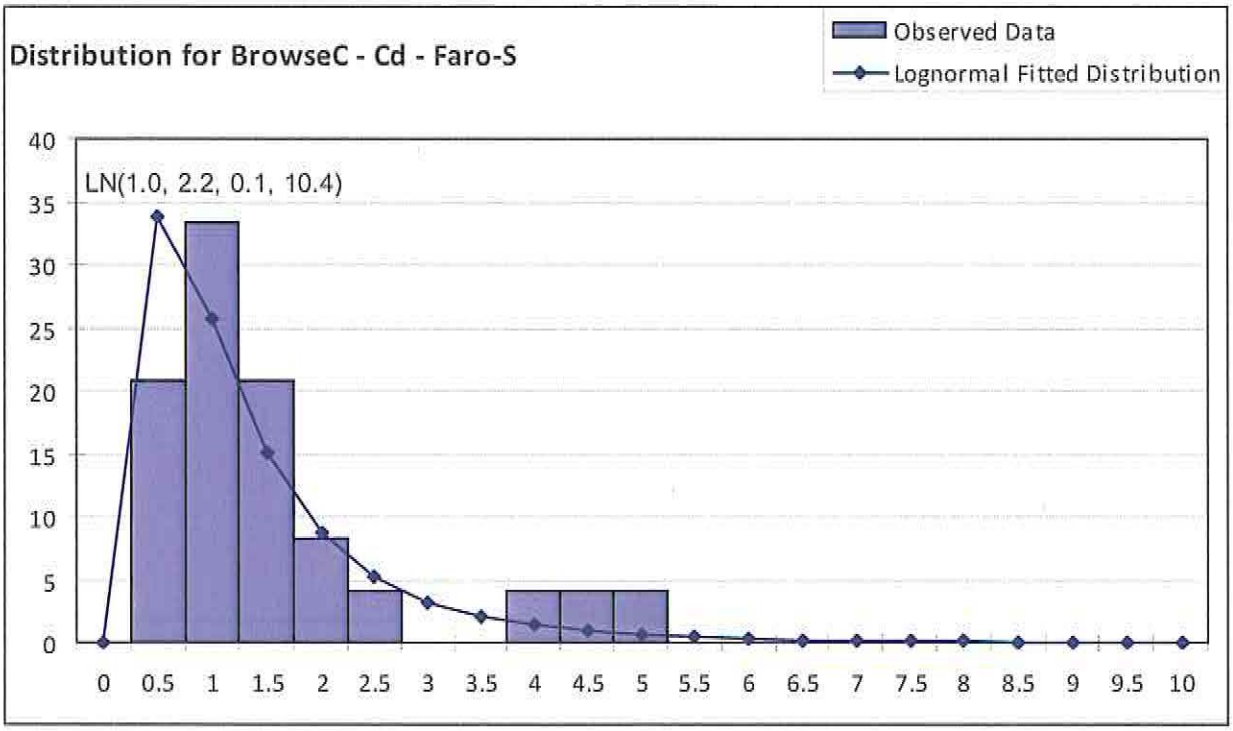

Distribution for BrowseC - Cd - Overall
Observed Data
Lognormal Fitted Distribution
LN(0.97, 2.2, 0.09, 10.8)
25
20
15
10
5
0
0
0.8
1.6
2.4
3.2
4
4.8
5.6
6.4
7.2
8
8.8
9.6
10.4
11.2

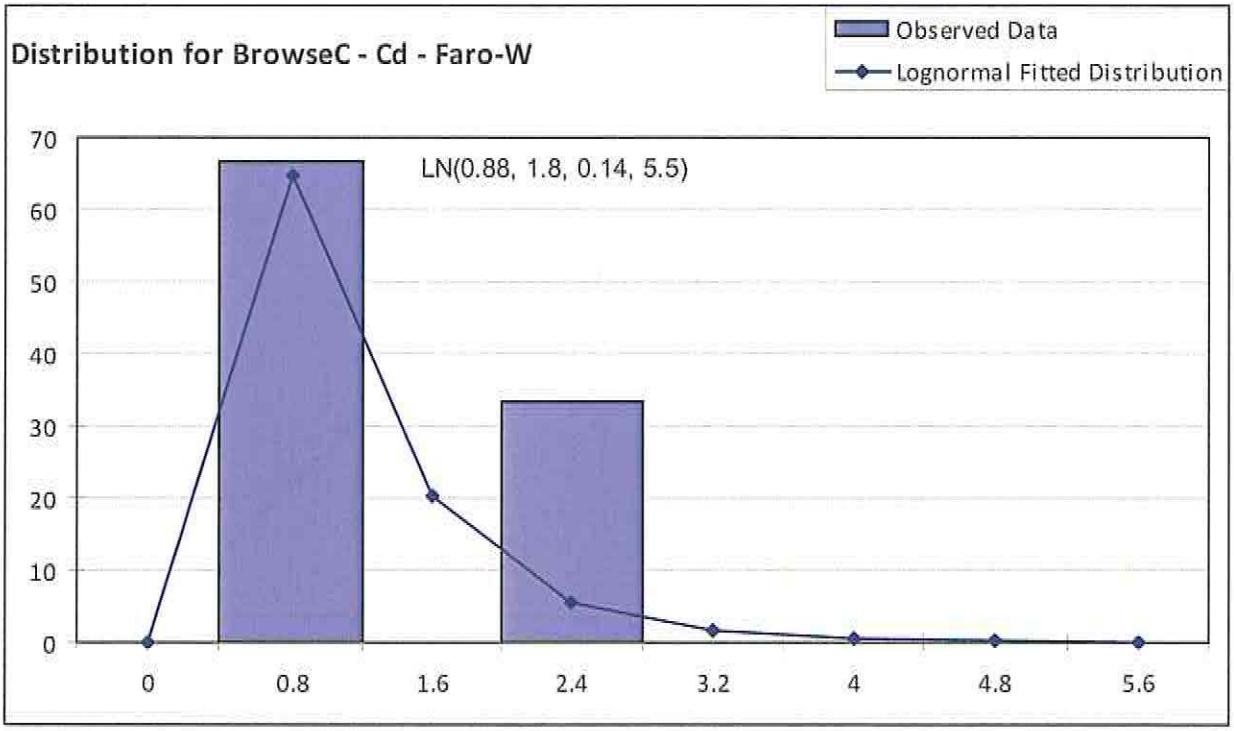

Distribution for BrowseC - Cd - Background
Observed Data
Lognormal Fitted Distribution
LN(1.2, 1.9, 0.18, 8.1)
50
45
40
35
30
25
20
15
10
5
0
0
0.7
1.4
2.1
2.8
3.5
4.2
4.9
5.6
6.3
7
7.7
8.4

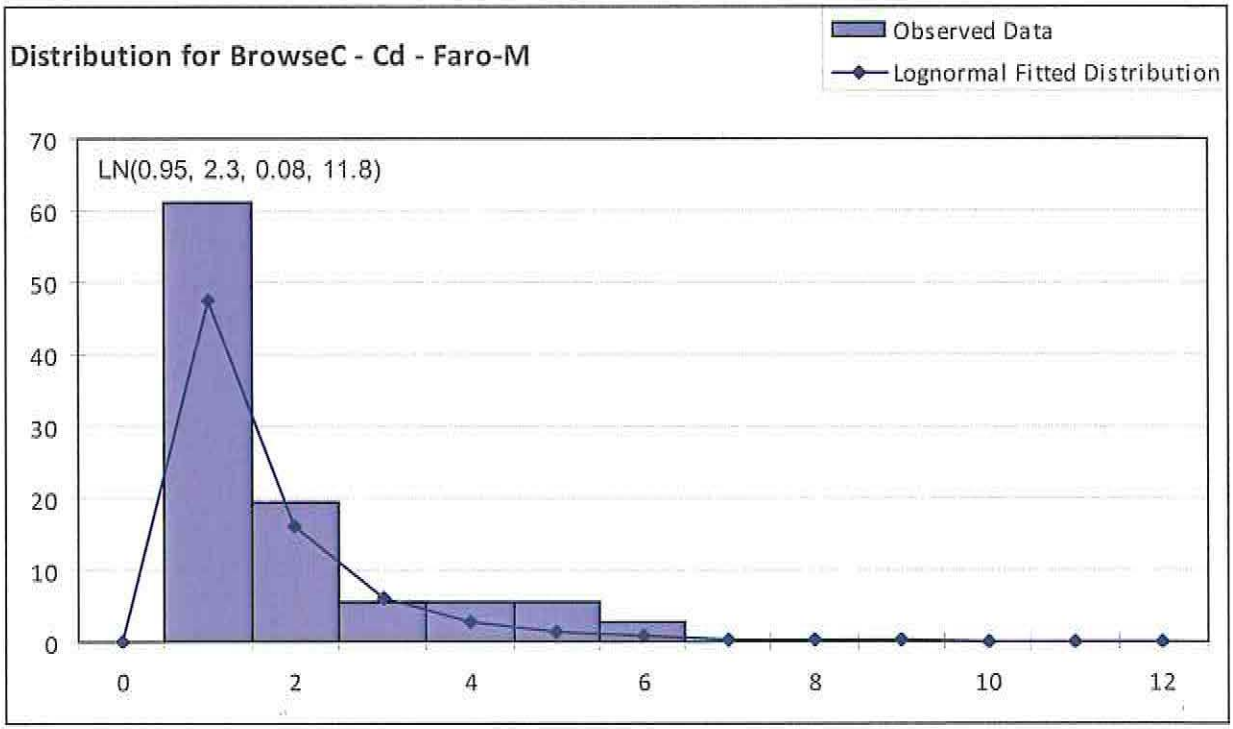

Distribution for BrowseC - Cd - Van-S
Observed Data
Triangular Fitted Distribution
T(0.5, 1.0, 1.5)
0
0.2
0.4
0.6
0.8
1
1.2
1.4
1.6

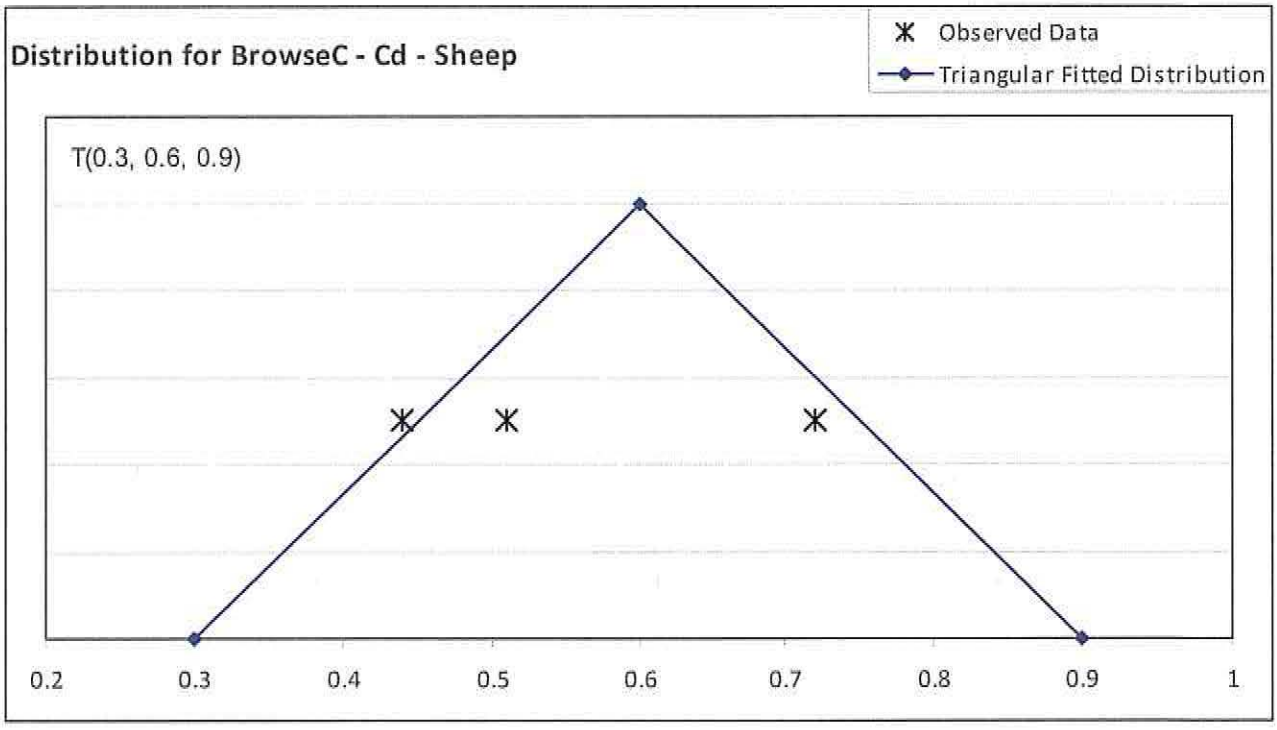

Distribution for BrowseC - Cd - Van-M
Observed Data
Lognormal Fitted Distribution
LN(1.3, 2.3, 0.11, 17)
60
50
40
30
20
10
0
0
2
4
6
8
10
12
14
16
18
20


Distribution for BrowseC - Cd - Faro-N
Observed Data
Triangular Fitted Distribution
T(0.03, 0.3, 3)
0
0.5
1
1.5
2
2.5
3
3.5

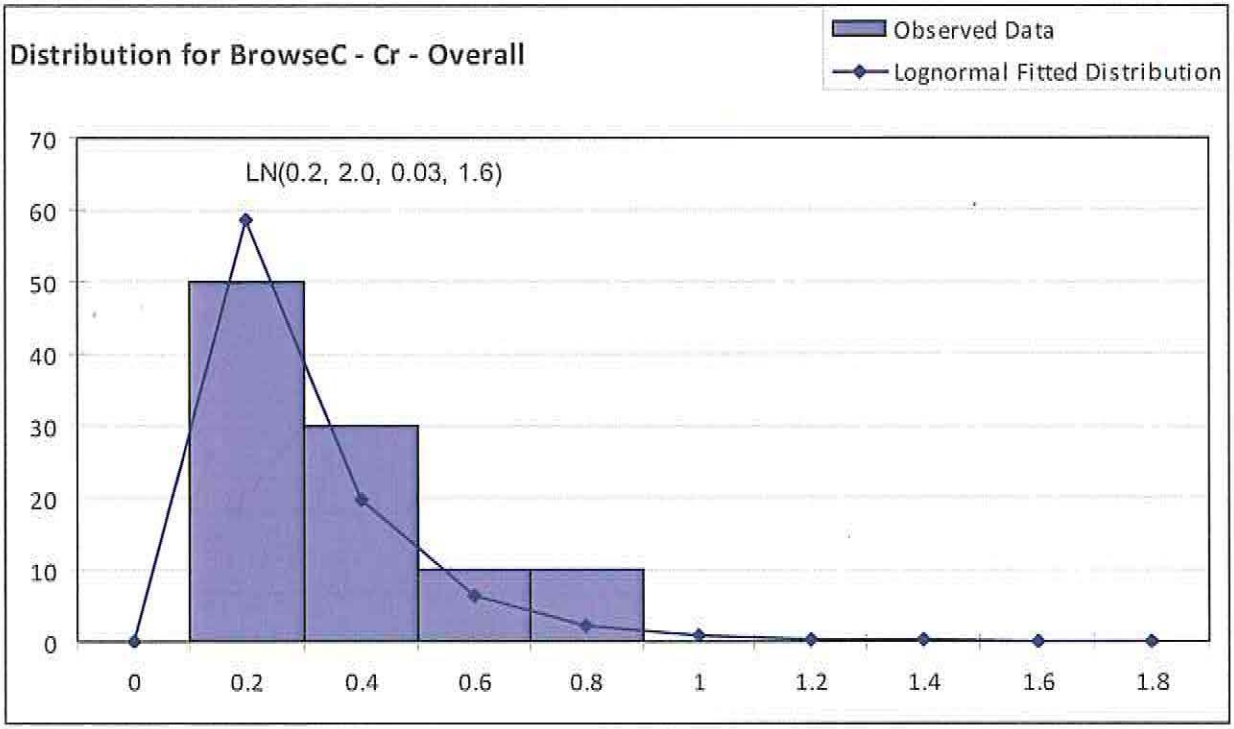

Distribution for BrowseC - Cd - Faro-S
Observed Data
Lognormal Fitted Distribution
LN(1.0, 2.2, 0.1, 10.4)
40
35
30
25
20
15
10
5
0
0 0.5 1 1.5 2 2.5 3 3.5 4 4.5 5 5.5 6 6.5 7 7.5 8 8.5 9 9.5 10

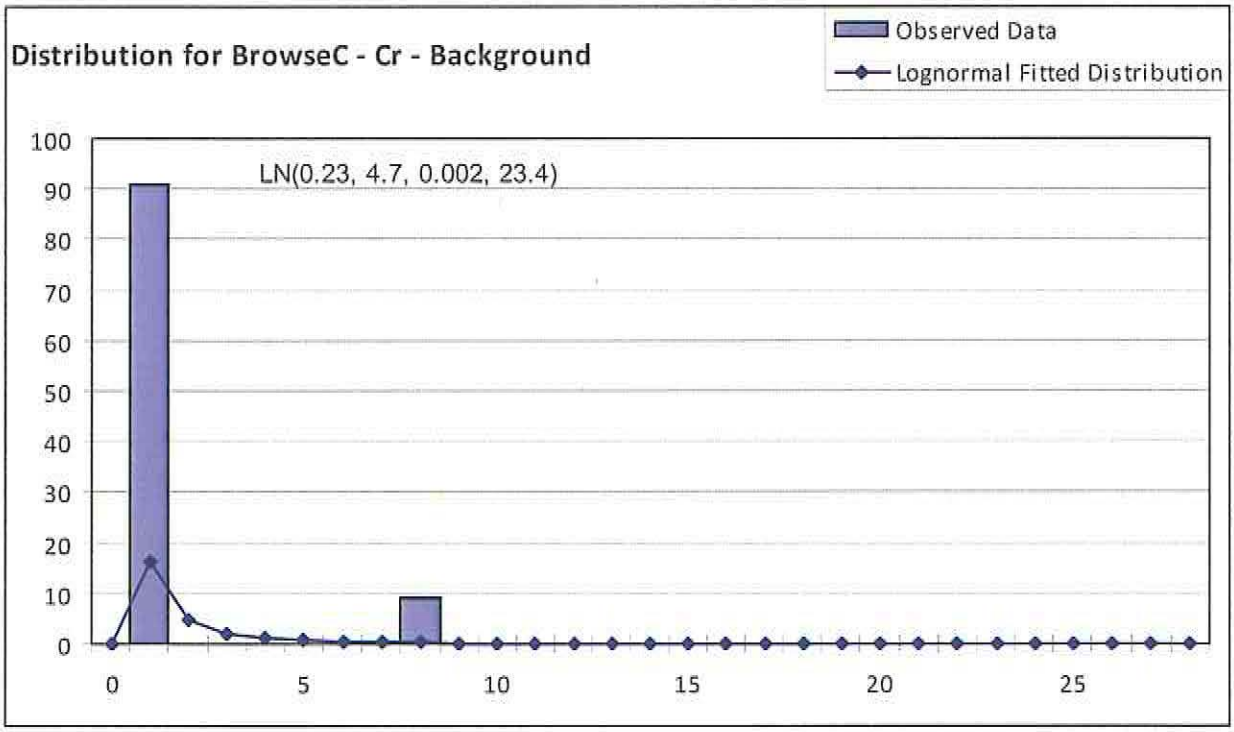

Distribution for BrowseC - Cd - Faro-W
Observed Data
Lognormal Fitted Distribution
LN(0.88, 1.8, 0.14, 5.5)
70
60
50
40
30
20
10
0
0 0.8 1.6 2.4 3.2 4 4.8 5.6

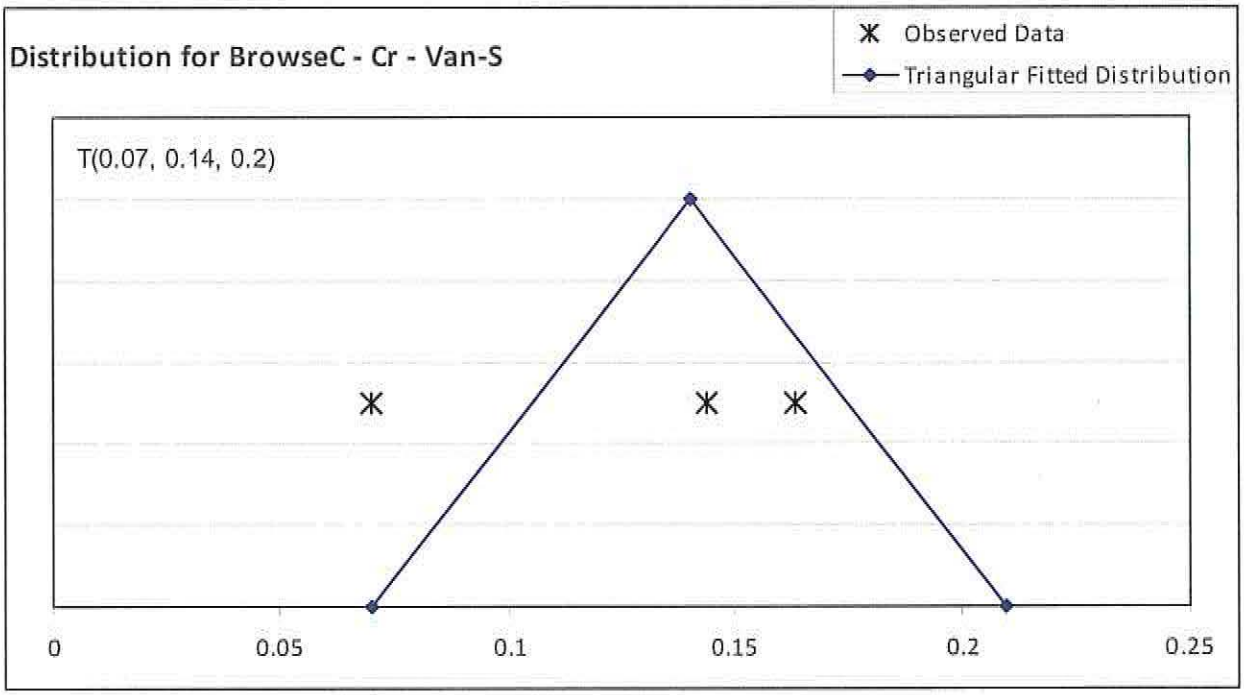

Distribution for BrowseC - Cd - Faro-M
Observed Data
Lognormal Fitted Distribution
LN(0.95, 2.3, 0.08, 11.8)
70
60
50
40
30
20
10
0
0
2
4
6
8
10
12

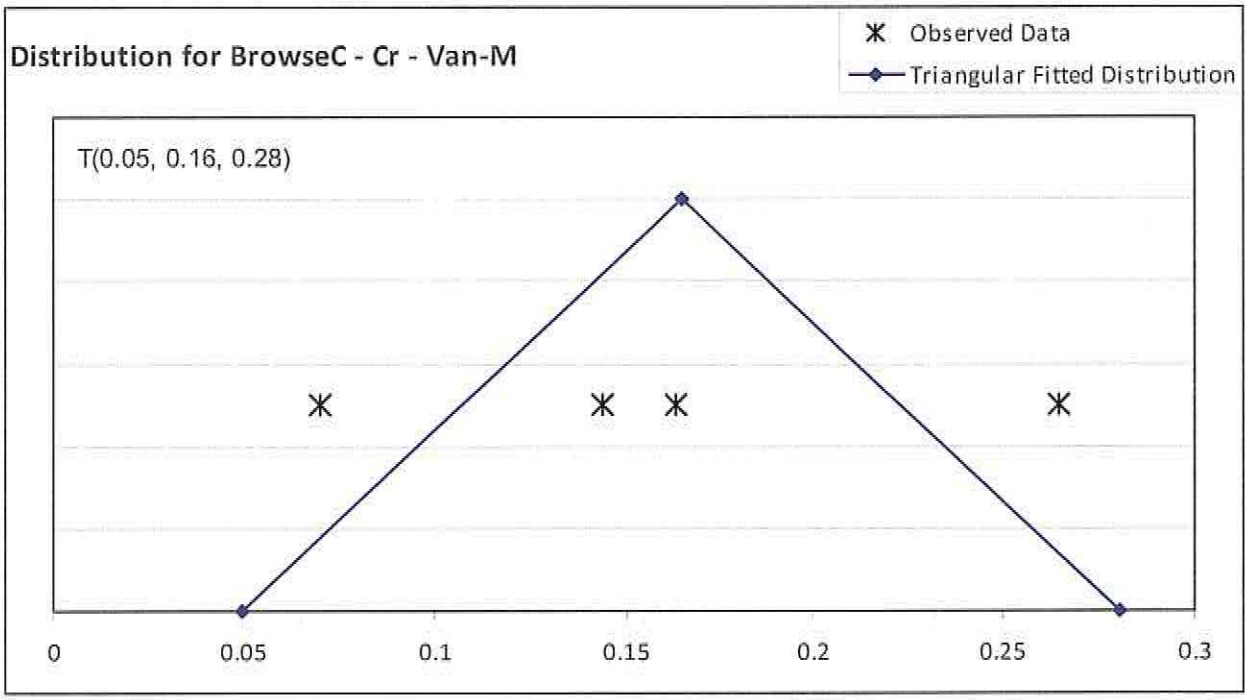

Distribution for BrowseC - Cd - Sheep
Observed Data
Triangular Fitted Distribution
T(0.3, 0.6, 0.9)
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1

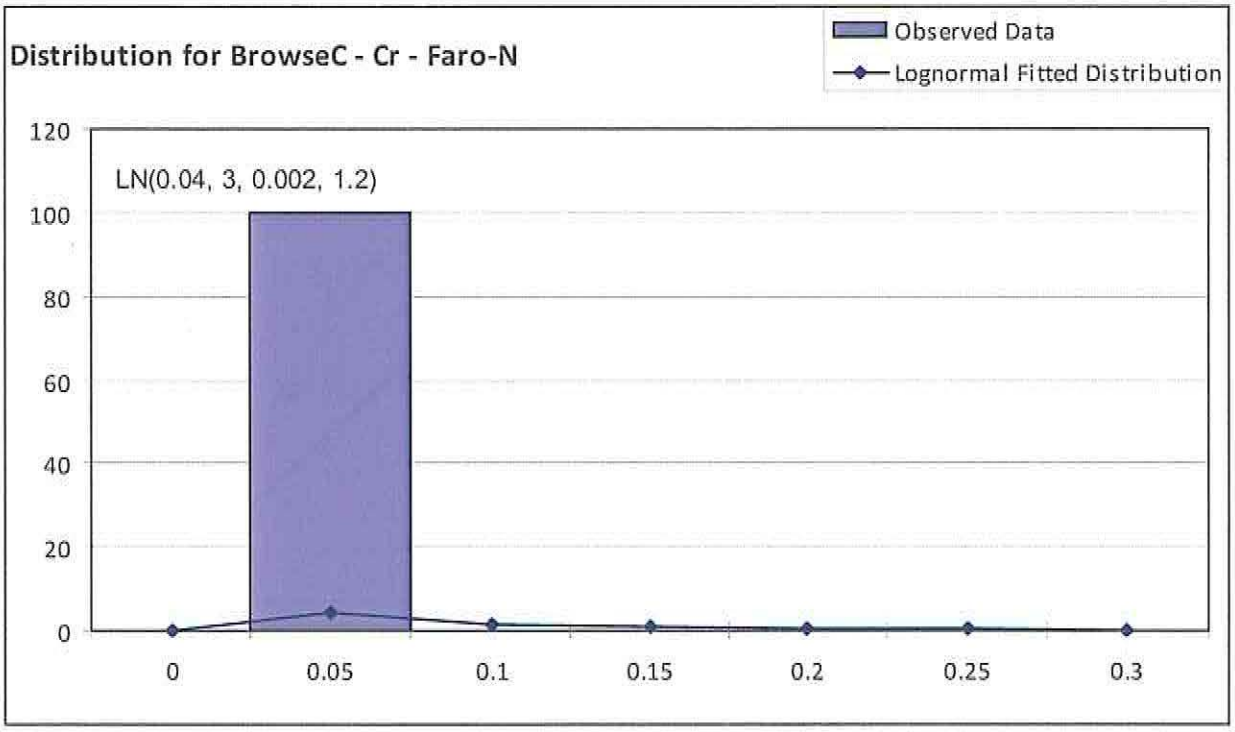
D.5.6 Chromium

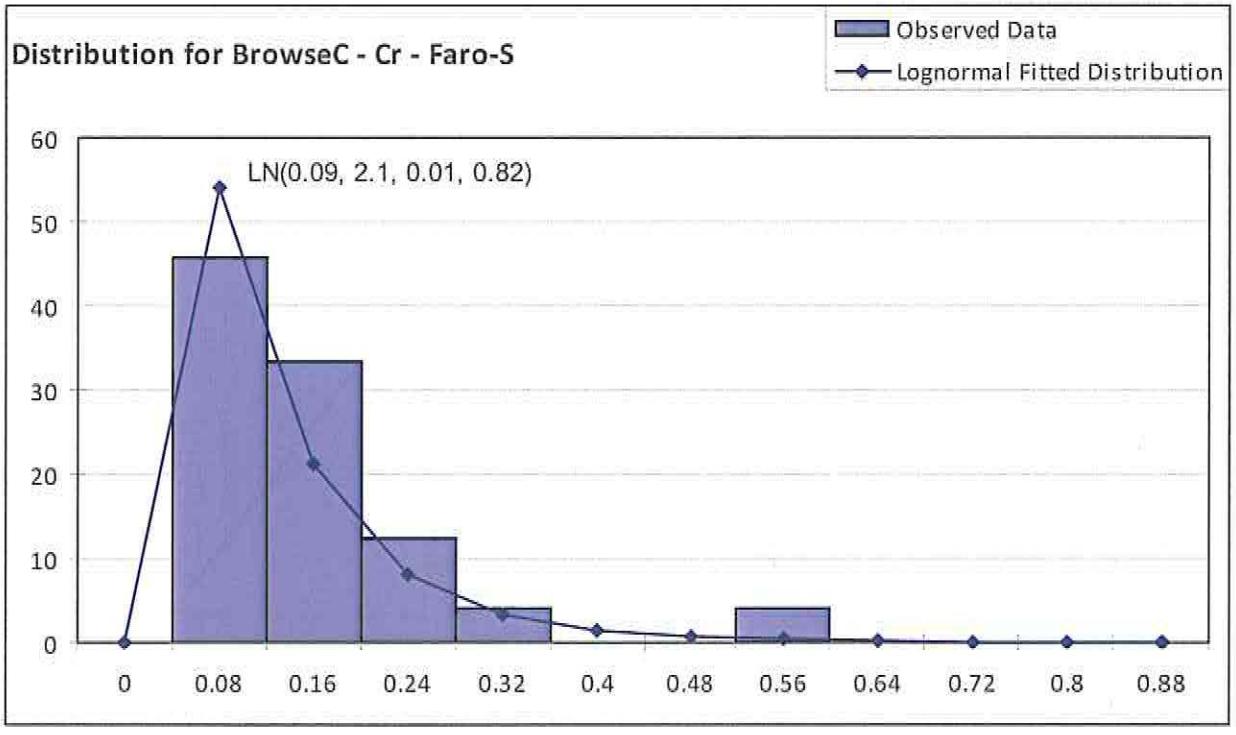


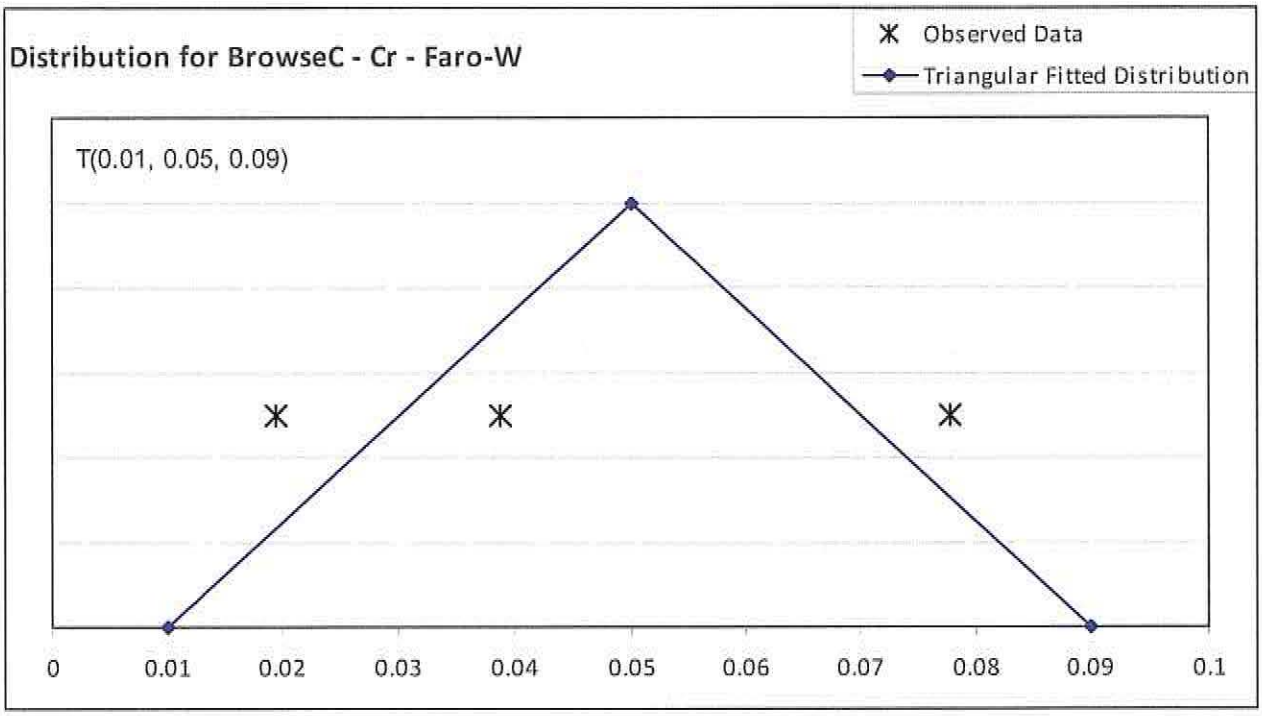


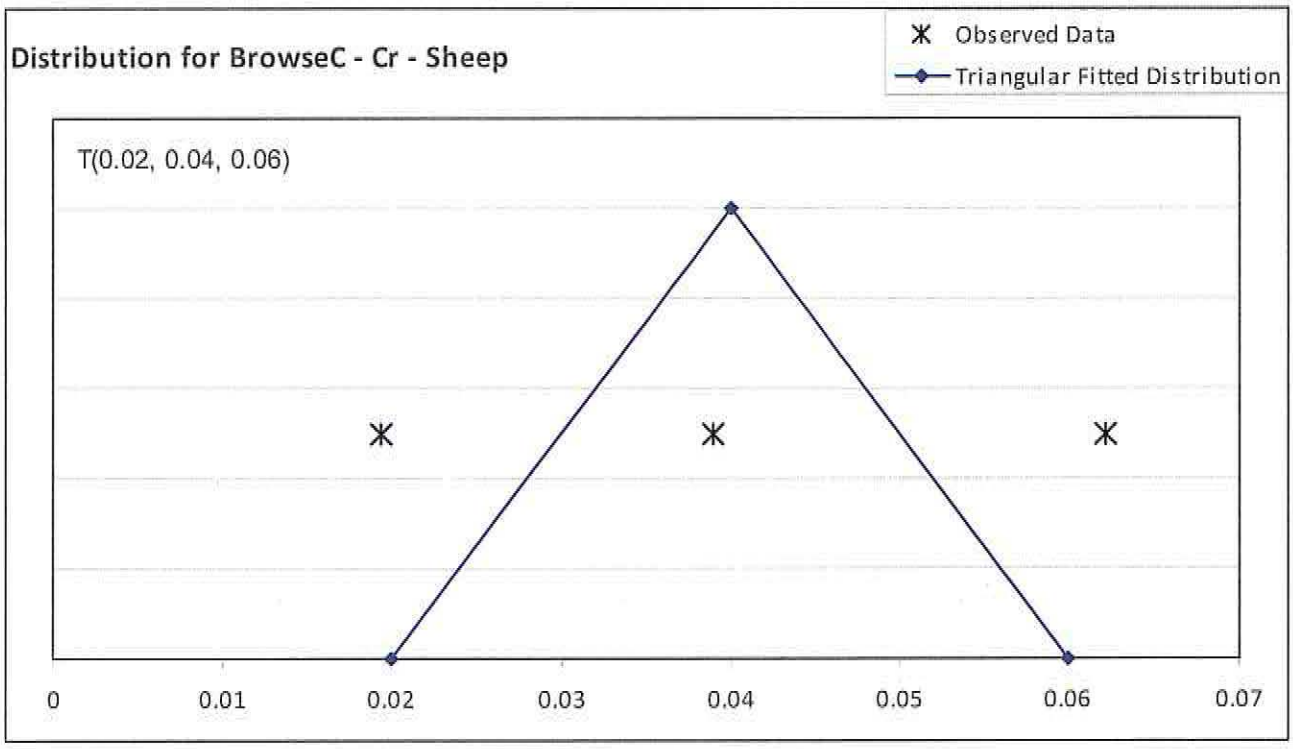

Distribution for BrowseC - Cr - Van-S
Observed Data
Triangular Fitted Distribution
T(0.07, 0.14, 0.2)
0
0.05
0.1
0.15
0.2
0.25


Distribution for BrowseC - Cr - Van-M
Observed Data
Triangular Fitted Distribution
T(0.05, 0.16, 0.28)
0
0.05
0.1
0.15
0.2
0.25
0.3

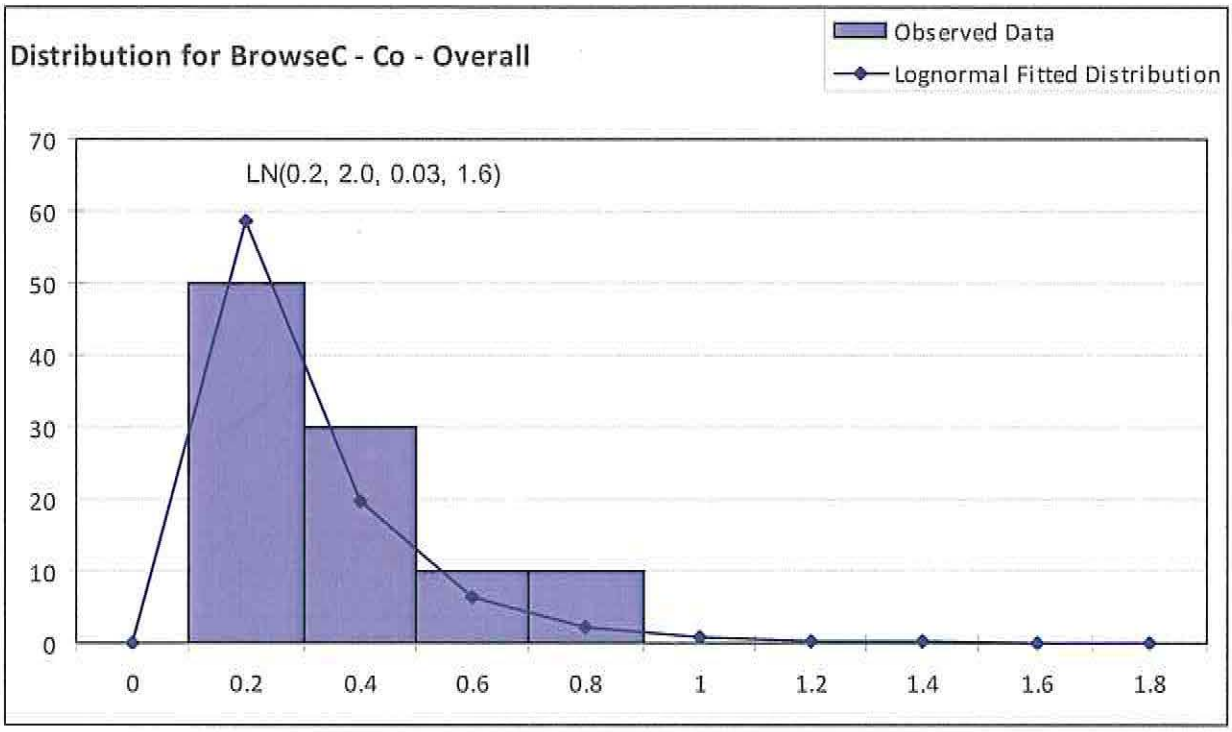

Distribution for BrowseC - Cr - Faro-N
Observed Data
Lognormal Fitted Distribution
LN(0.04, 3, 0.002, 1.2)
120
100
80
60
40
20
0
0
0.05
0.1
0.15
0.2
0.25
0.3

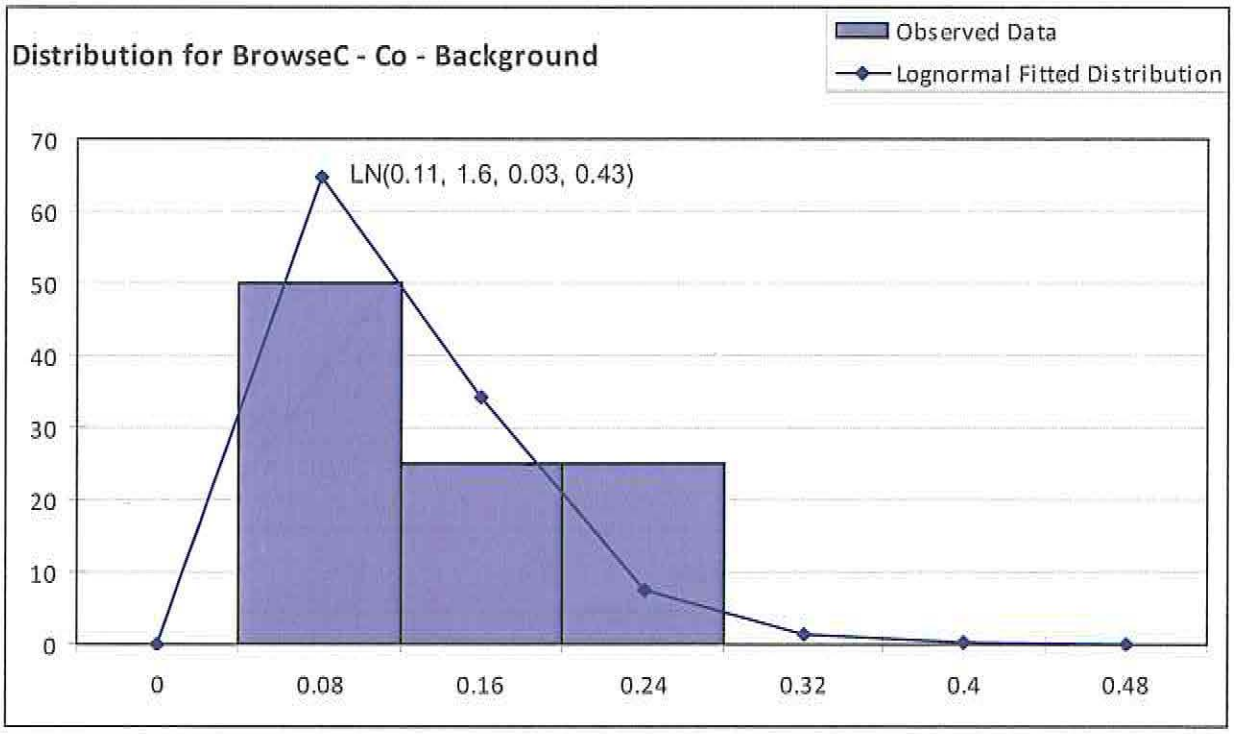

Distribution for BrowseC - Cr - Faro-S
Observed Data
Lognormal Fitted Distribution
LN(0.09, 2.1, 0.01, 0.82)
60
50
40
30
20
10
0
0
0.08
0.16
0.24
0.32
0.4
0.48
0.56
0.64
0.72
0.8
0.88


Distribution for BrowseC - Cr - Faro-W
Observed Data
Triangular Fitted Distribution
T(0.01, 0.05, 0.09)
0
0.01
0.02
0.03
0.04
0.05
0.06
0.07
0.08
0.09
0.1

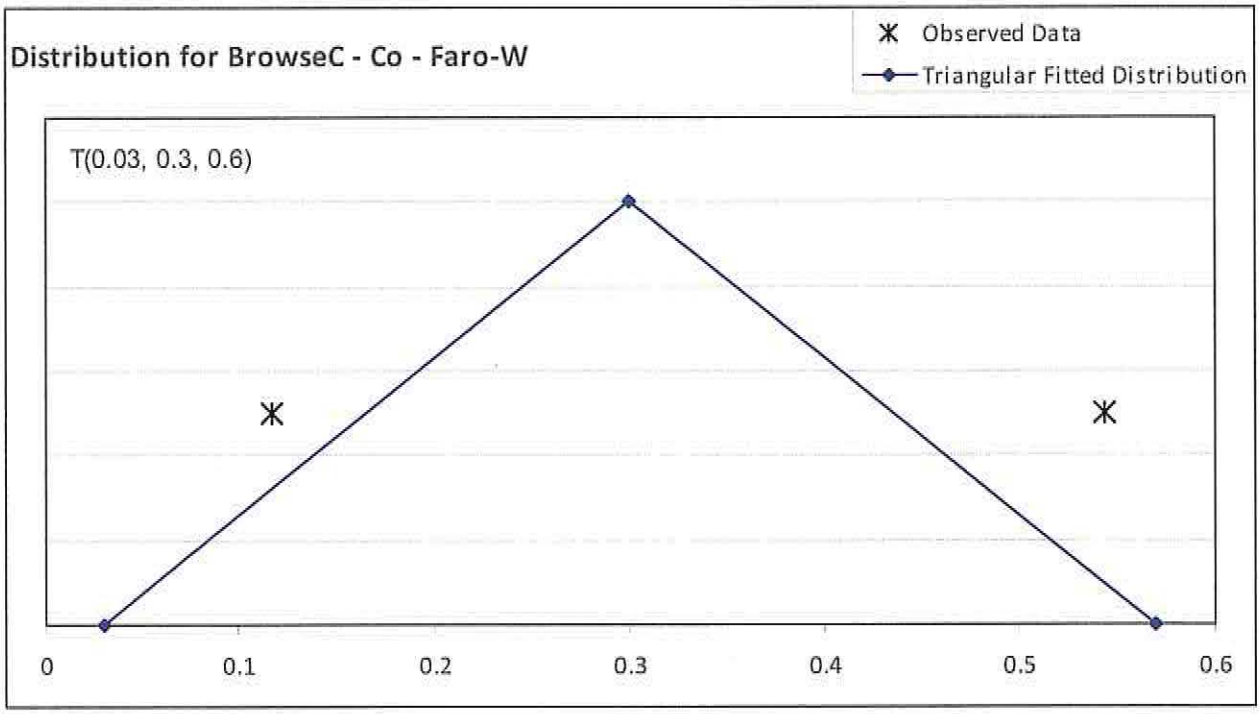

Distribution for BrowseC - Cr - Sheep
Observed Data
Triangular Fitted Distribution
T(0.02, 0.04, 0.06)
0
0.01
0.02
0.03
0.04
0.05
0.06
0.07

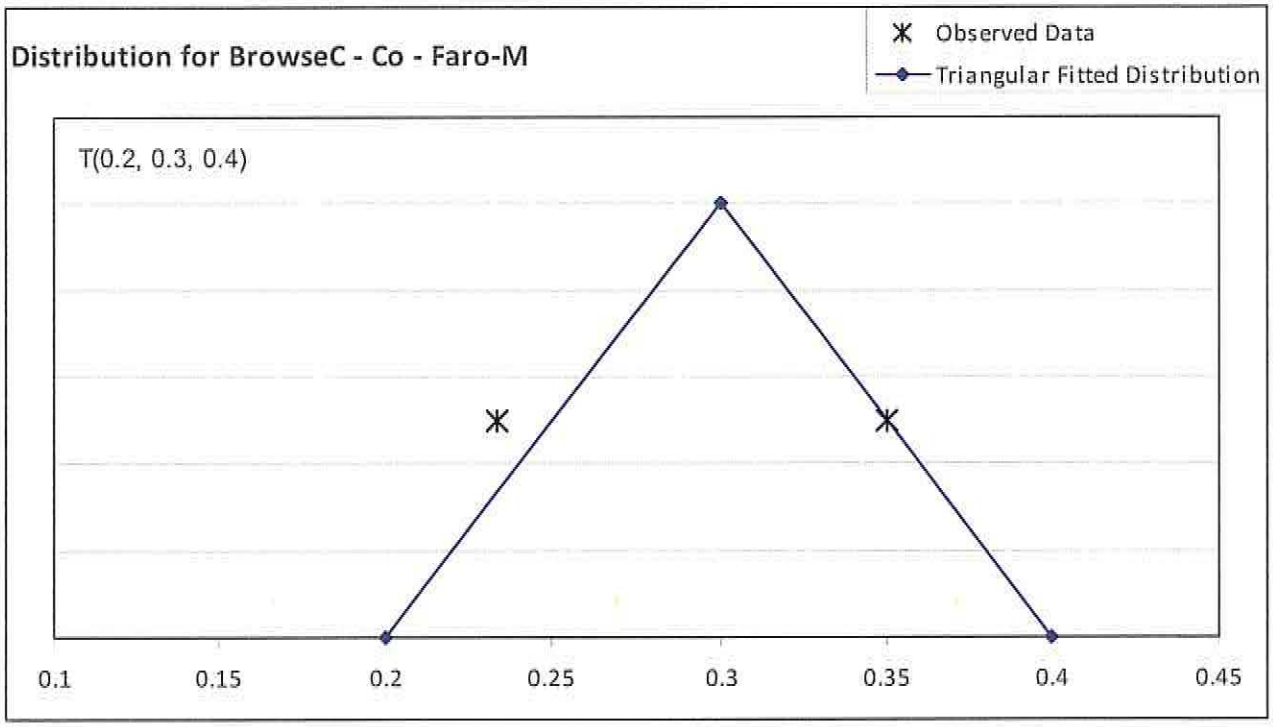
D.5.7 Cobalt

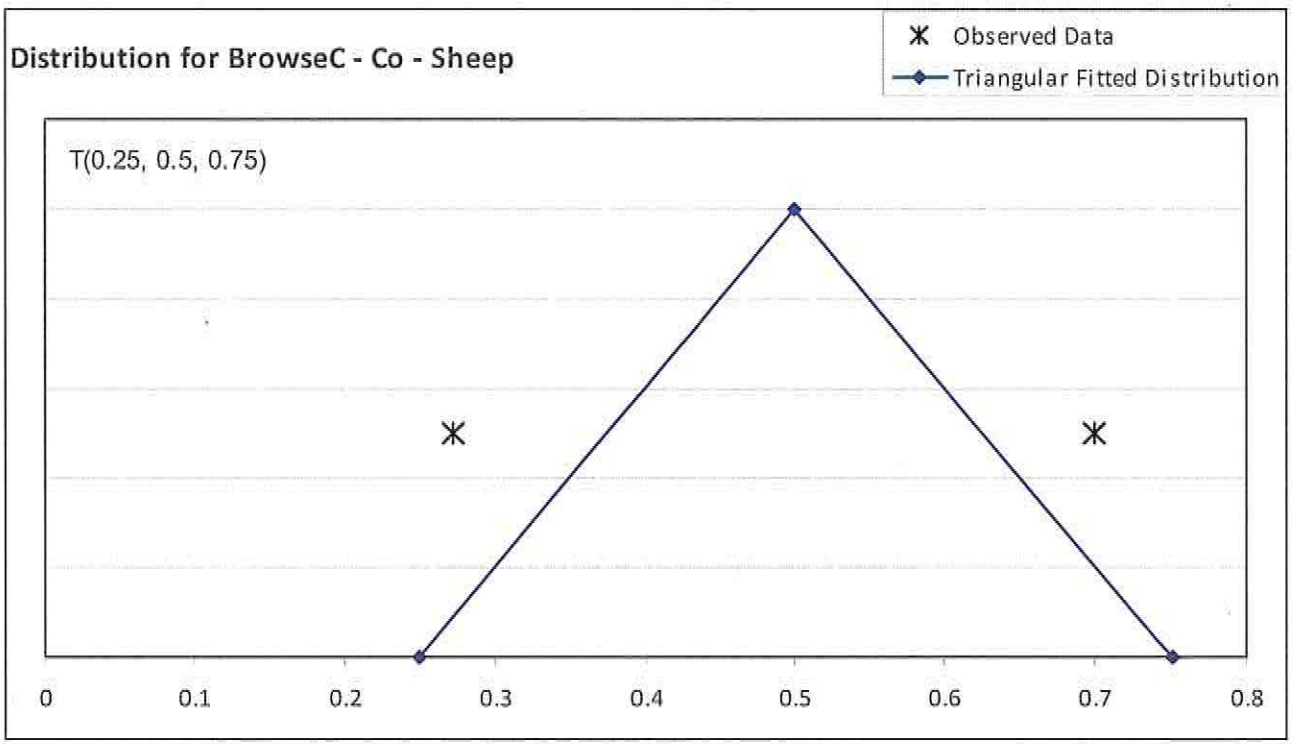




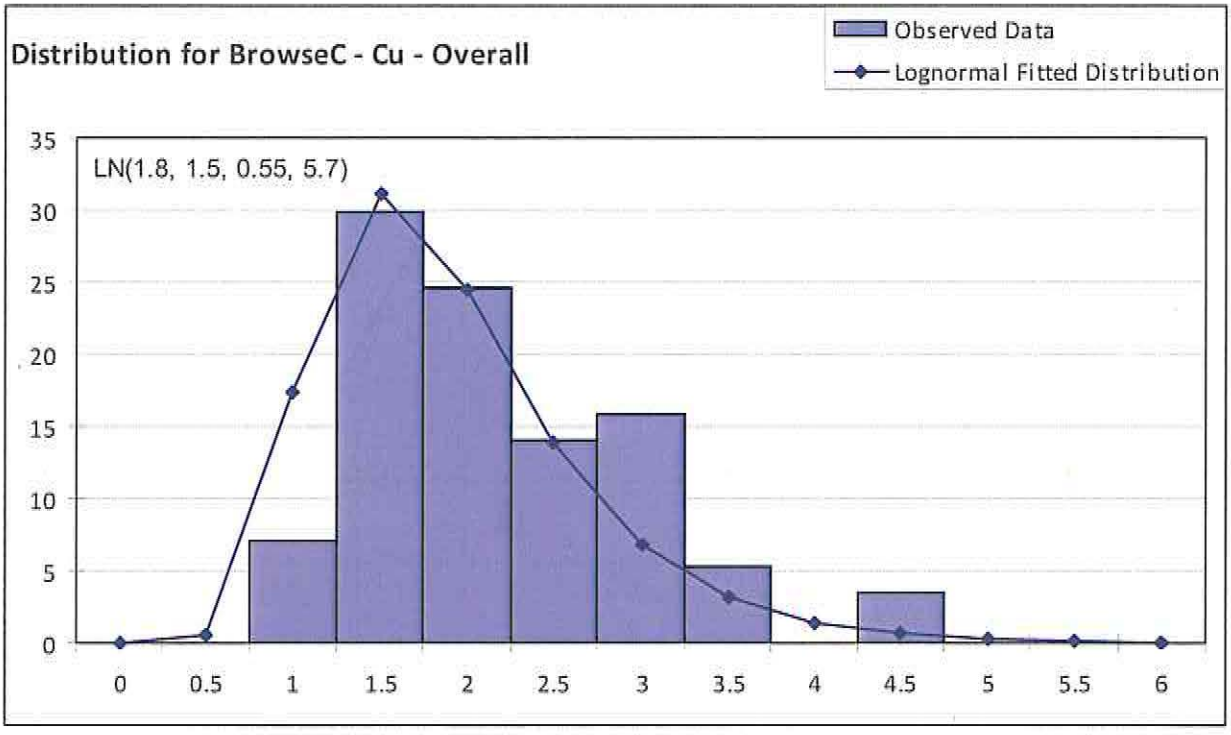
No Cobalt data for browse at Van-S, Van-M, Faro-N, Faro-S.

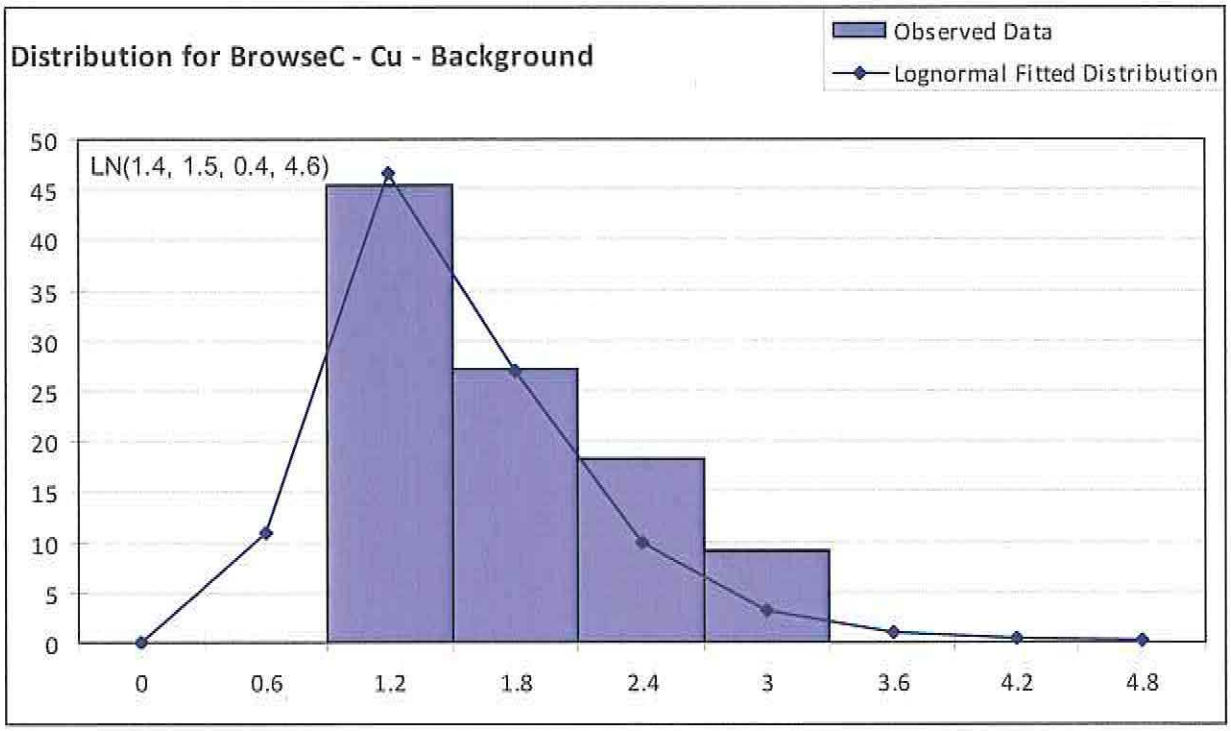

Distribution for BrowseC - Co - Faro-W
Observed Data
Triangular Fitted Distribution
T(0.03, 0.3, 0.6)
0
0.1
0.2
0.3
0.4
0.5
0.6

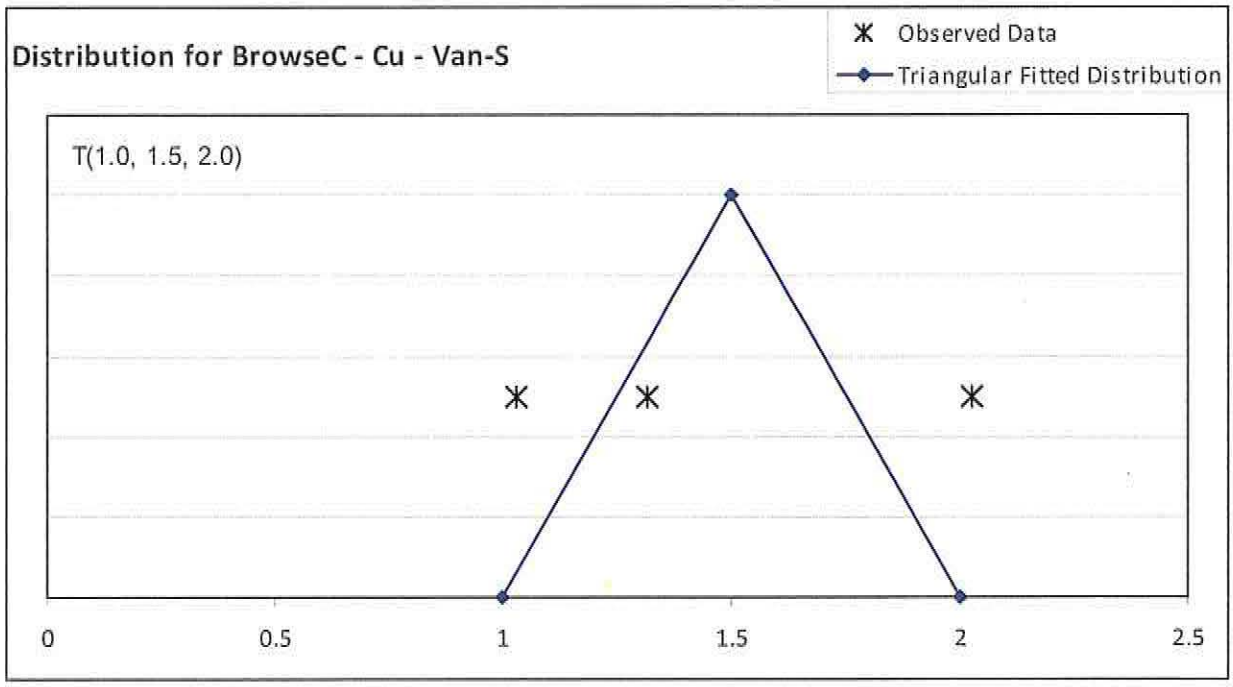

Distribution for BrowseC - Co - Faro-M
Observed Data
Triangular Fitted Distribution
T(0.2, 0.3, 0.4)
0.1
0.15
0.2
0.25
0.3
0.35
0.4
0.45

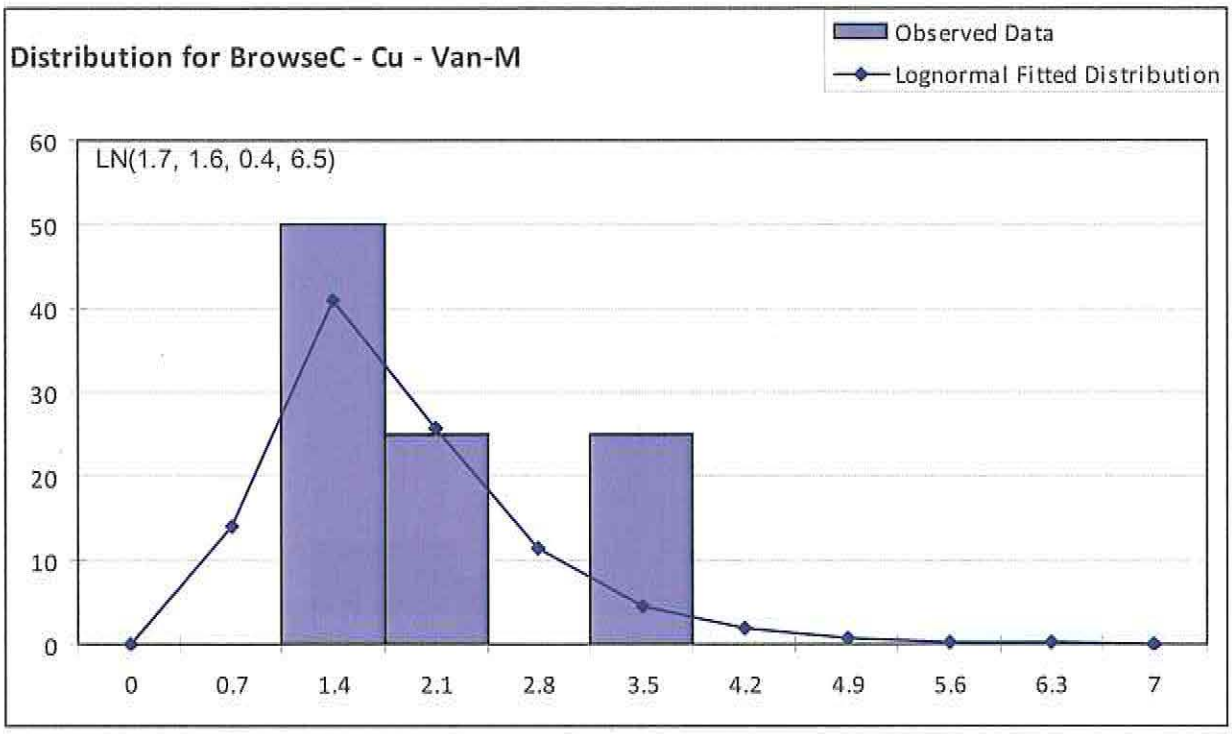

Distribution for BrowseC - Co - Sheep
Observed Data
Triangular Fitted Distribution
T(0.25, 0.5, 0.75)
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8

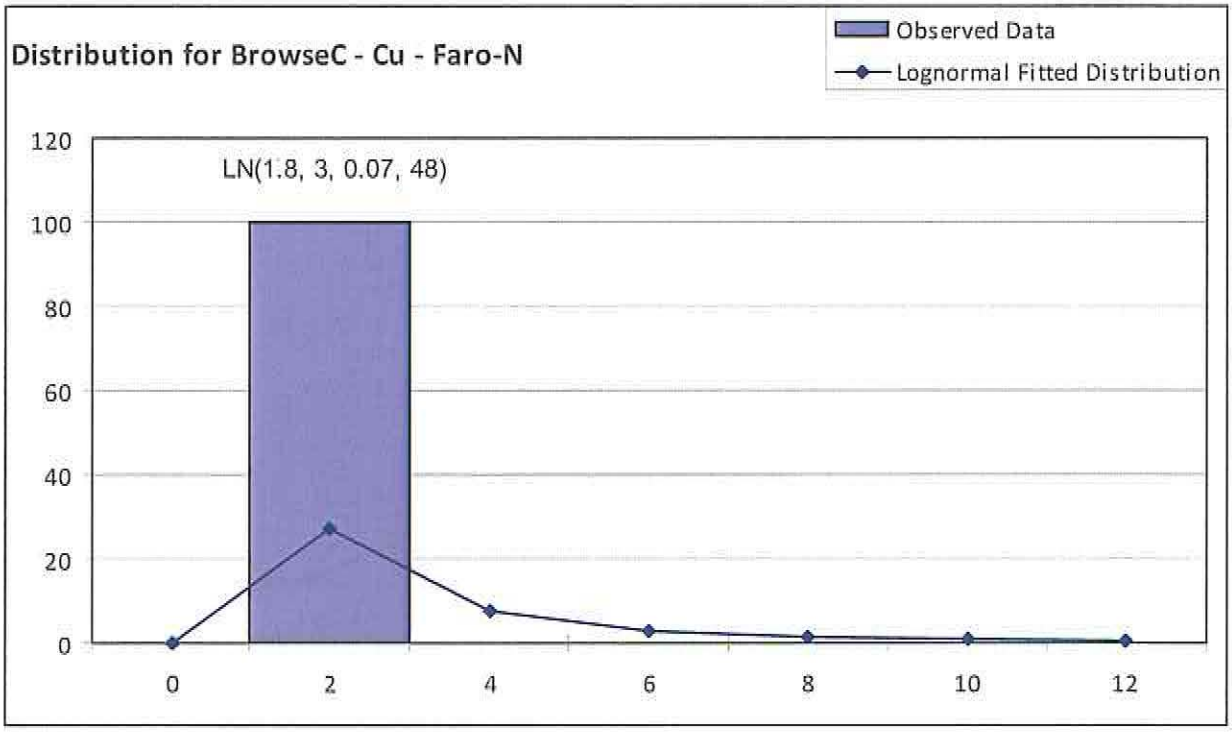
D.5.8 Copper

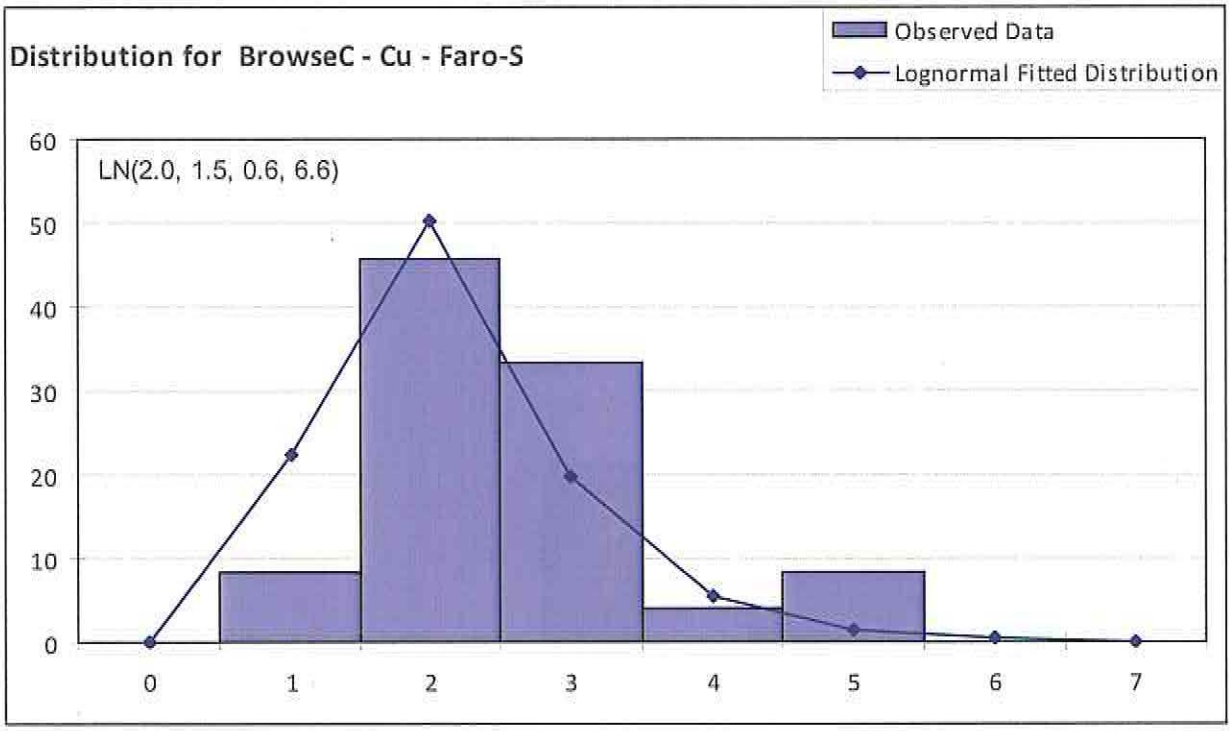

Distribution for BrowseC - Cu - Overall
Observed Data
Lognormal Fitted Distribution
LN(1.8, 1.5, 0.55, 5.7)
35
30
25
20
15
10
5
0
0
0.5
1
1.5
2
2.5
3
3.5
4
4.5
5
5.5
6

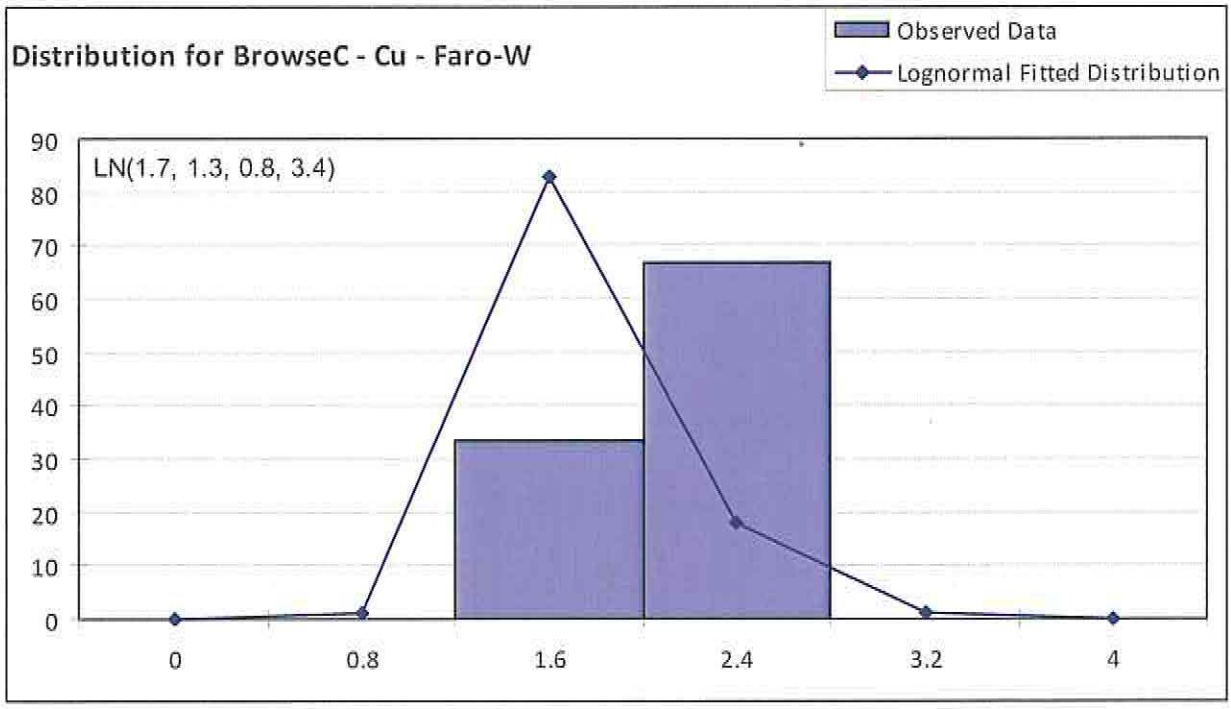

Distribution for BrowseC - Cu - Background
Observed Data
Lognormal Fitted Distribution
LN(1.4, 1.5, 0.4, 4.6)
50
45
40
35
30
25
20
15
10
5
0
0
0.6
1.2
1.8
2.4
3
3.6
4.2
4.8

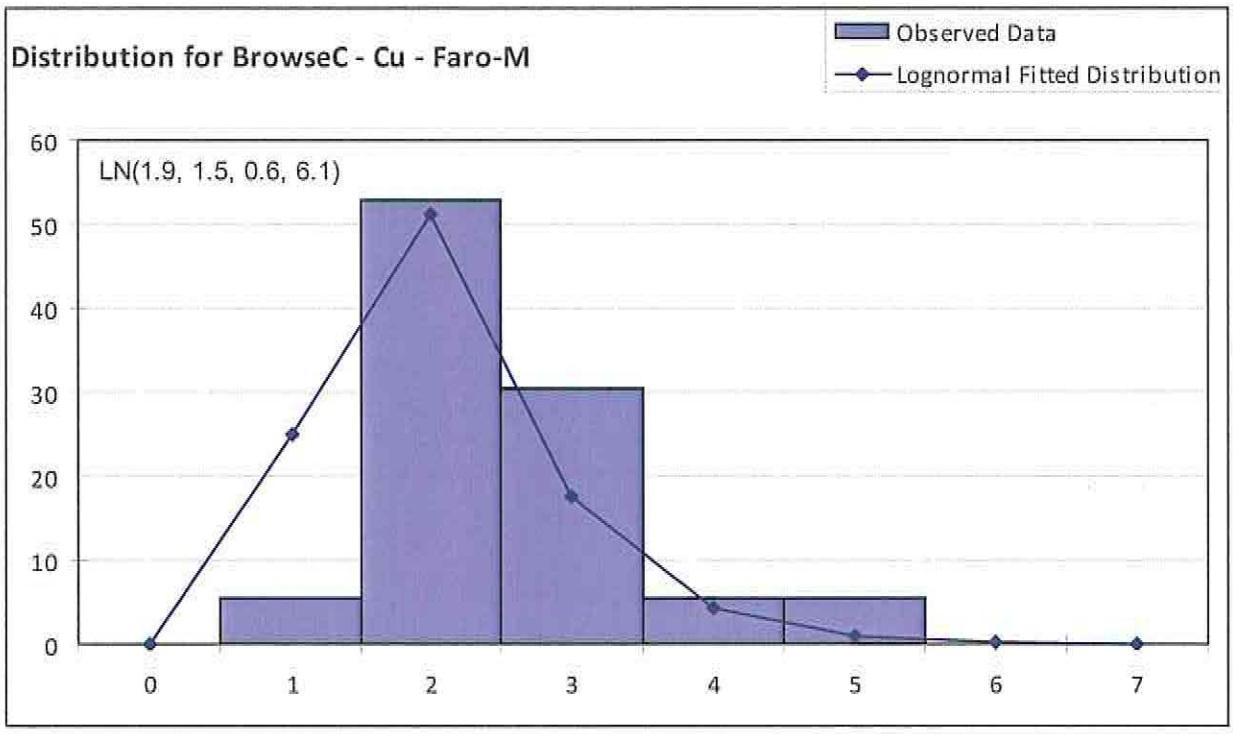

Distribution for BrowseC - Cu - Van-S
Observed Data
Triangular Fitted Distribution
T(1.0, 1.5, 2.0)
0
0.5
1
1.5
2
2.5

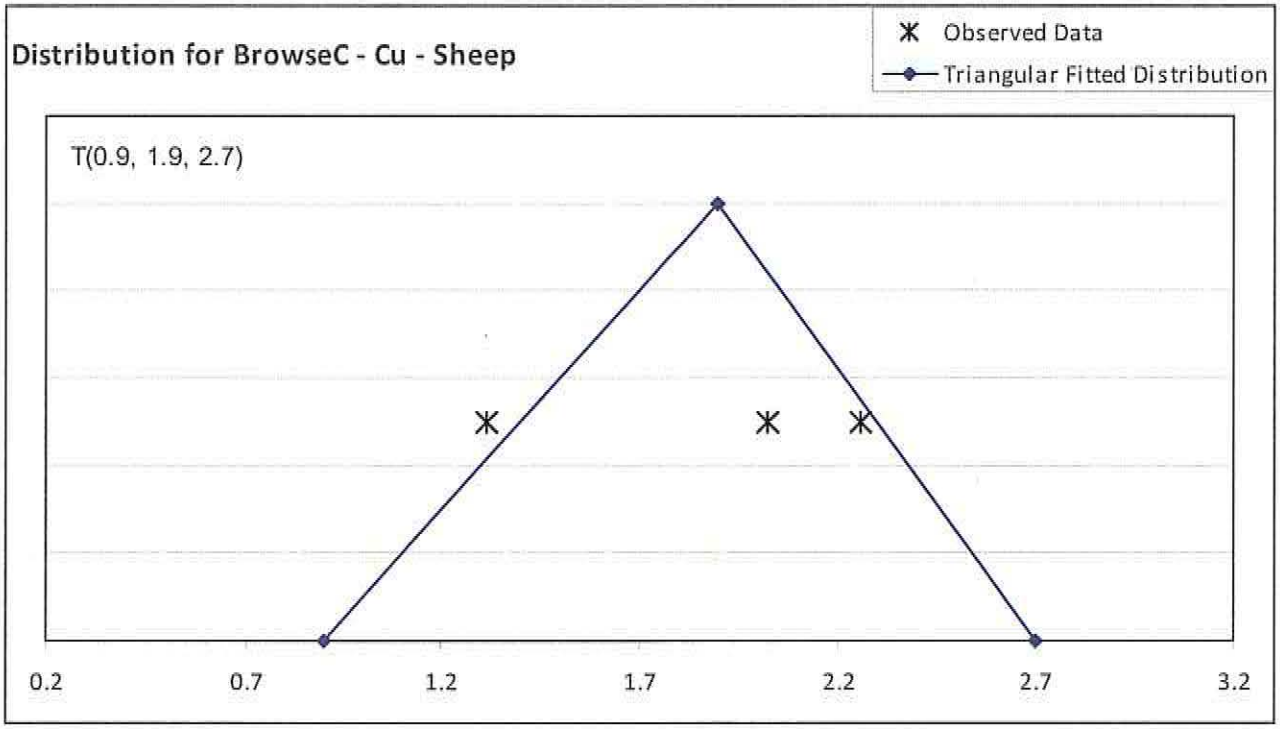

Distribution for BrowseC - Cu - Van-M
Observed Data
Lognormal Fitted Distribution
LN(1.7, 1.6, 0.4, 6.5)
60
50
40
30
20
10
0
0
0.7
1.4
2.1
2.8
3.5
4.2
4.9
5.6
6.3
7


Distribution for BrowseC - Cu - Faro-N
Observed Data
Lognormal Fitted Distribution
LN(1.8, 3, 0.07, 48)
120
100
80
60
40
20
0
0
2
4
6
8
10
12

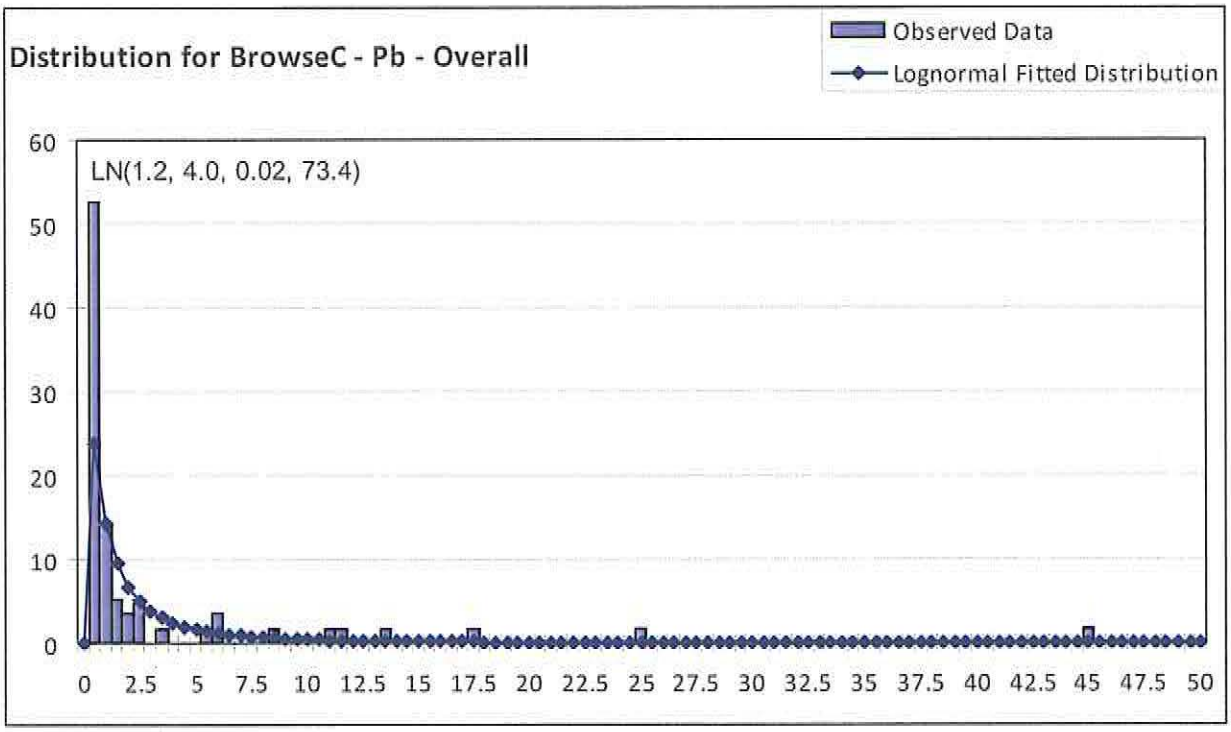

Distribution for BrowseC - Cu - Faro-S
Observed Data
Lognormal Fitted Distribution
LN(2.0, 1.5, 0.6, 6.6)
60
50
40
30
20
10
0
0
1
2
3
4
5
6
7

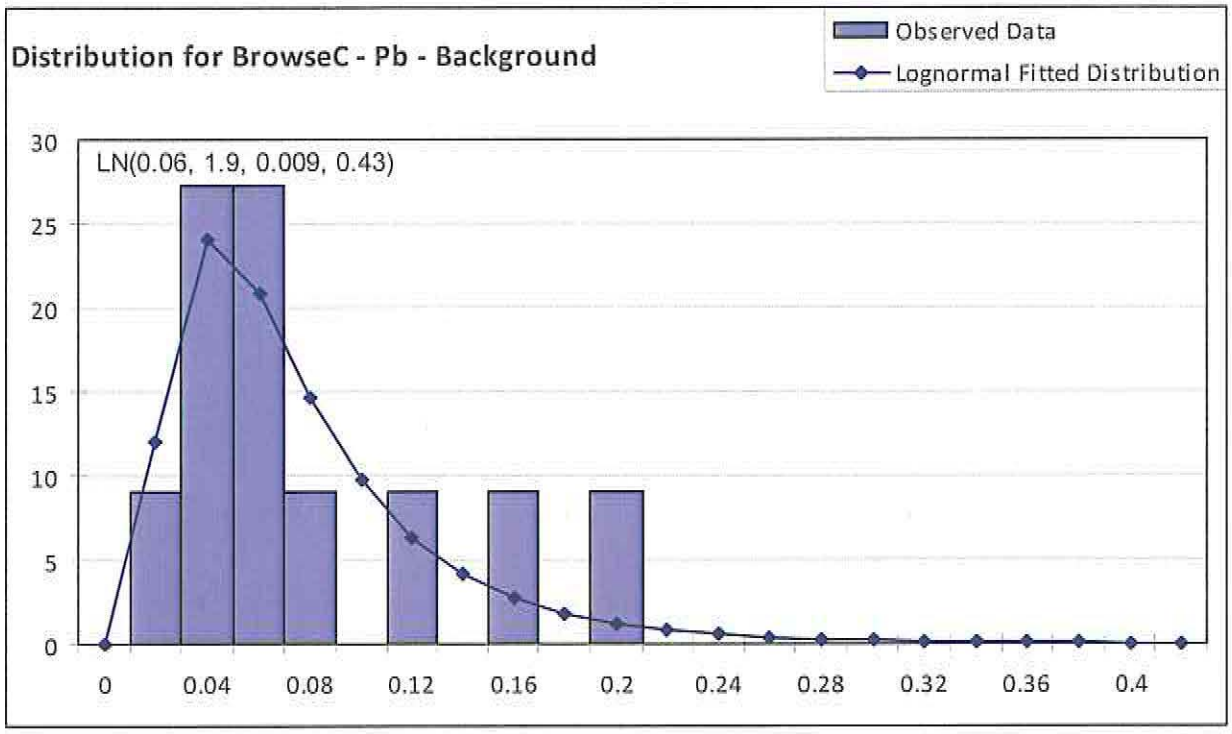

Distribution for BrowseC - Cu - Faro-W
Observed Data
Lognormal Fitted Distribution
LN(1.7, 1.3, 0.8, 3.4)
90
80
70
60
50
40
30
20
10
0
0
0.8
1.6
2.4
3.2
4

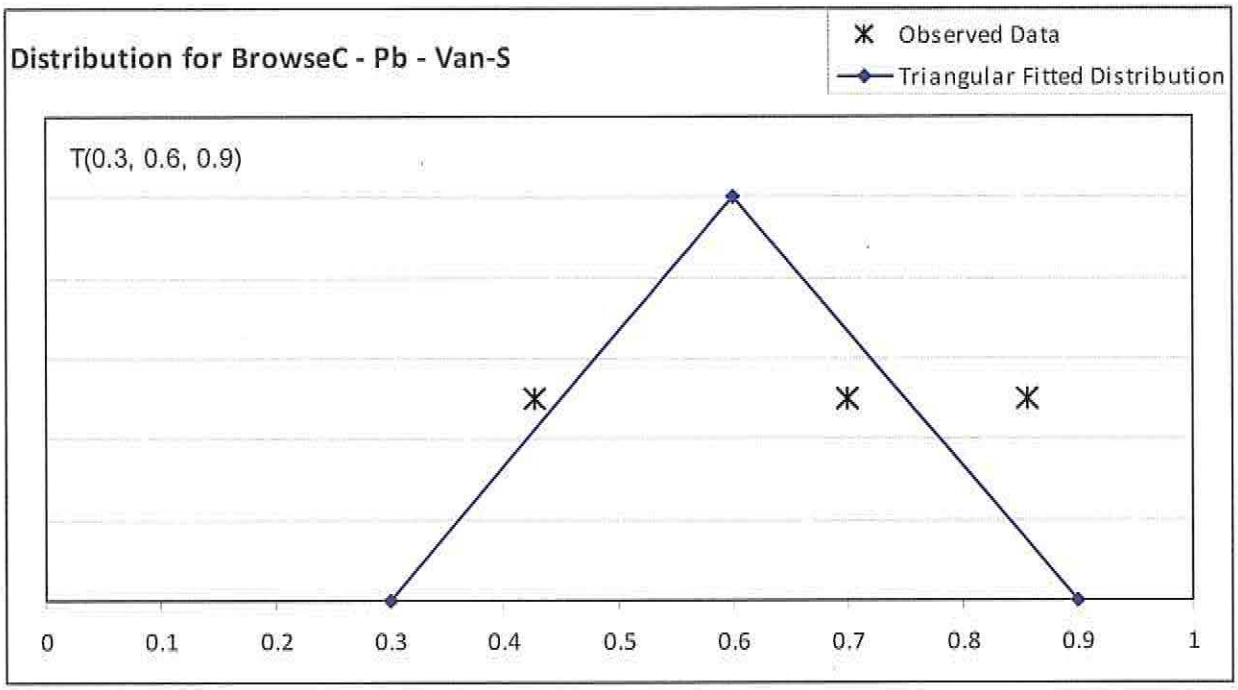

Distribution for BrowseC - Cu - Faro-M
Observed Data
Lognormal Fitted Distribution
LN(1.9, 1.5, 0.6, 6.1)
60
50
40
30
20
10
0
0
1
2
3
4
5
6
7

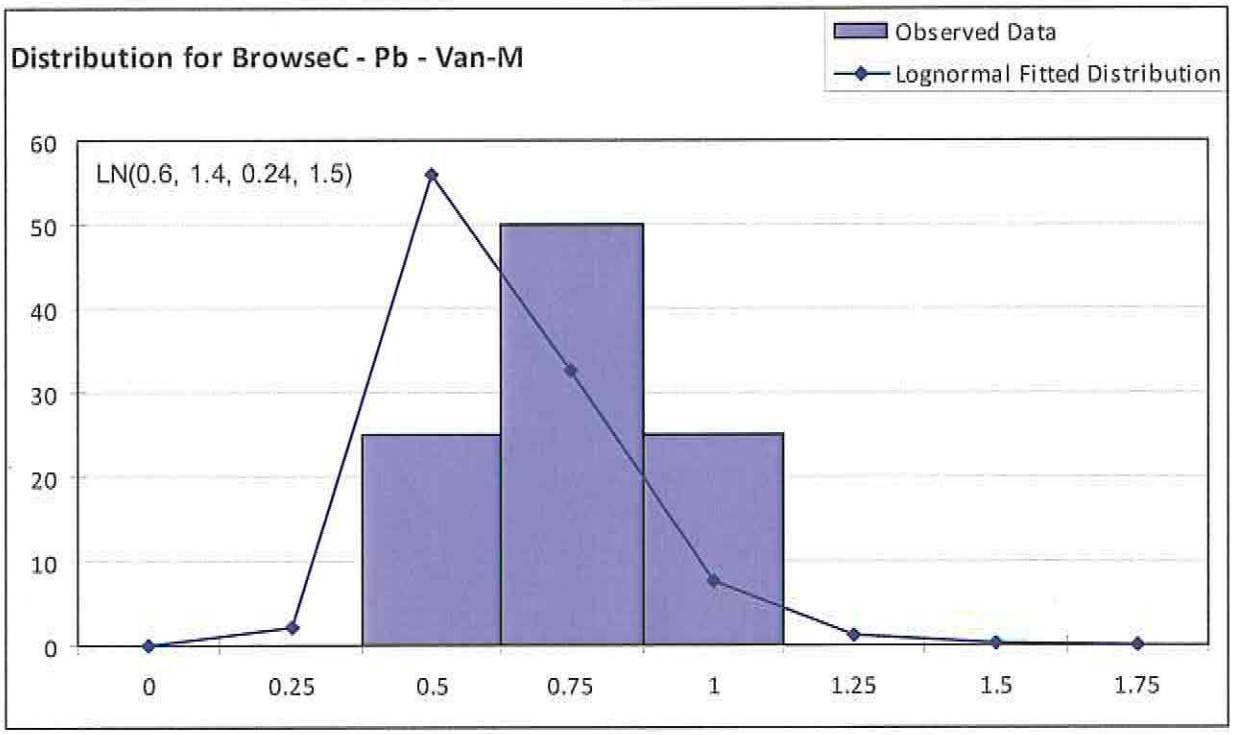

Distribution for BrowseC - Cu - Sheep
Observed Data
Triangular Fitted Distribution
T(0.9, 1.9, 2.7)
0.2
0.7
1.2
1.7
2.2
2.7
3.2

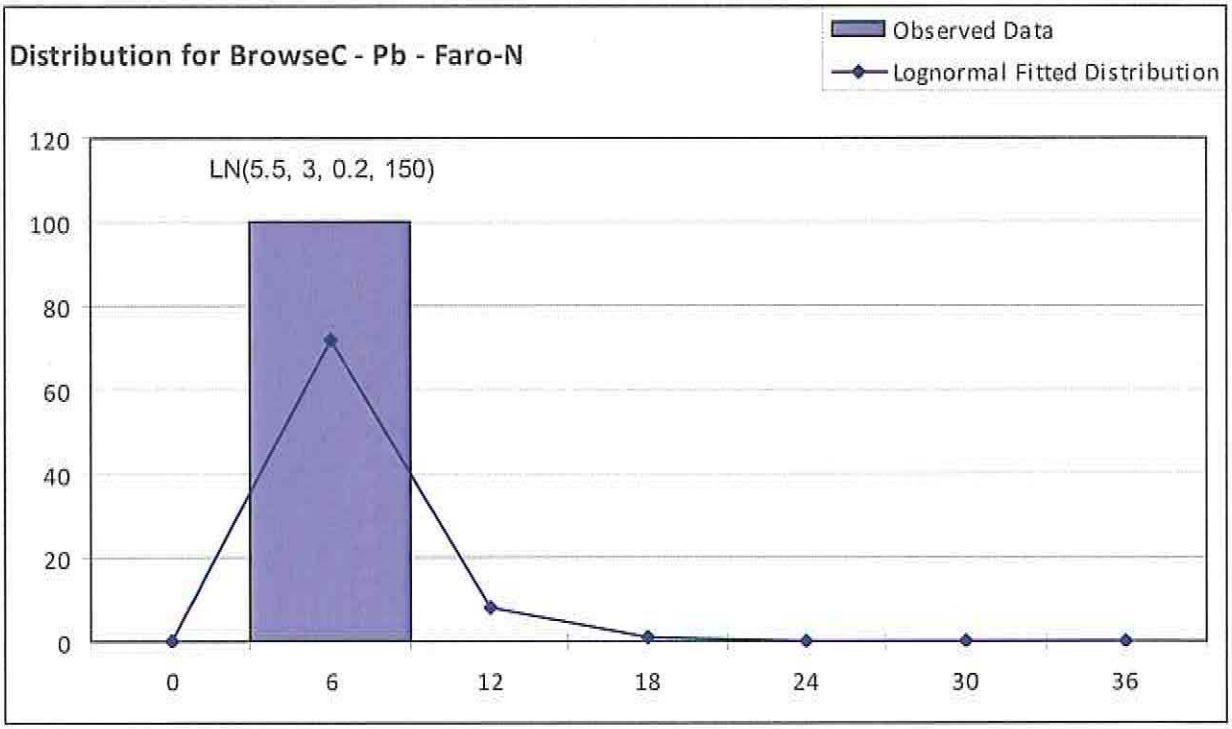
D.5.9 Lead

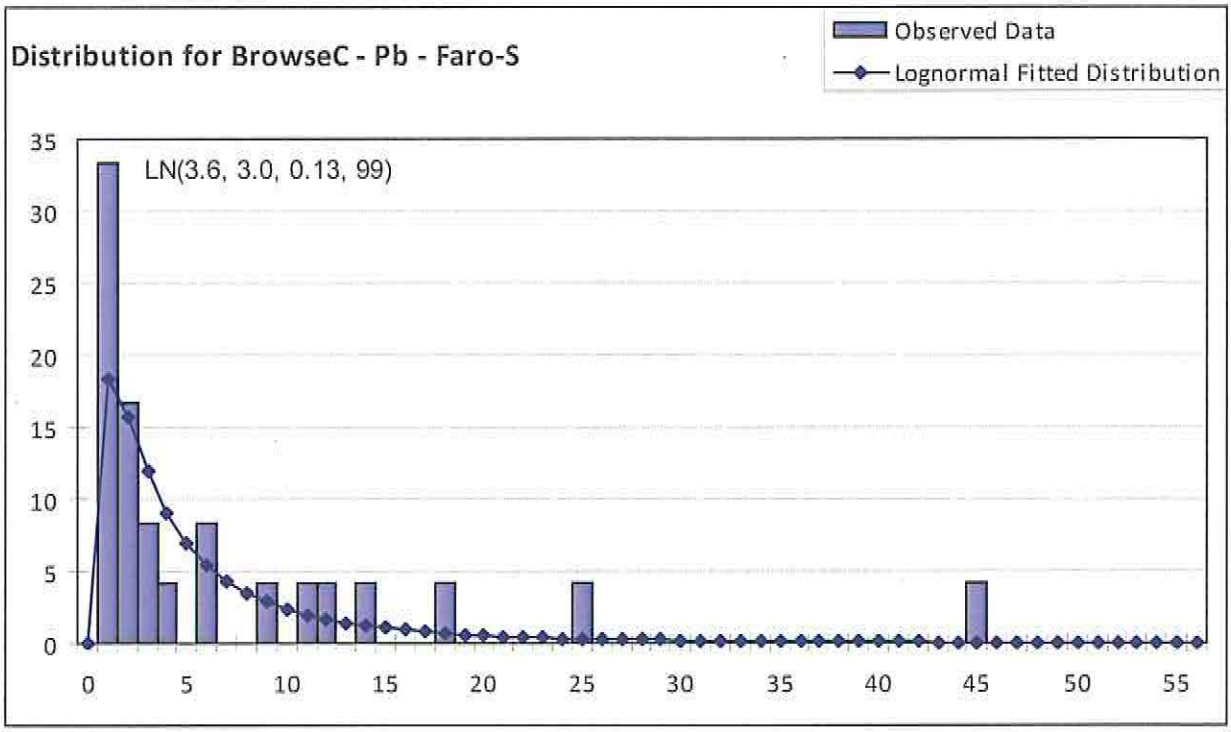

Distribution for BrowseC - Pb - Overall
Observed Data
Lognormal Fitted Distribution
LN(1.2, 4.0, 0.02, 73.4)
60
50
40
30
20
10
0
0 2.5 5 7.5 10 12.5 15 17.5 20 22.5 25 27.5 30 32.5 35 37.5 40 42.5 45 47.5 50

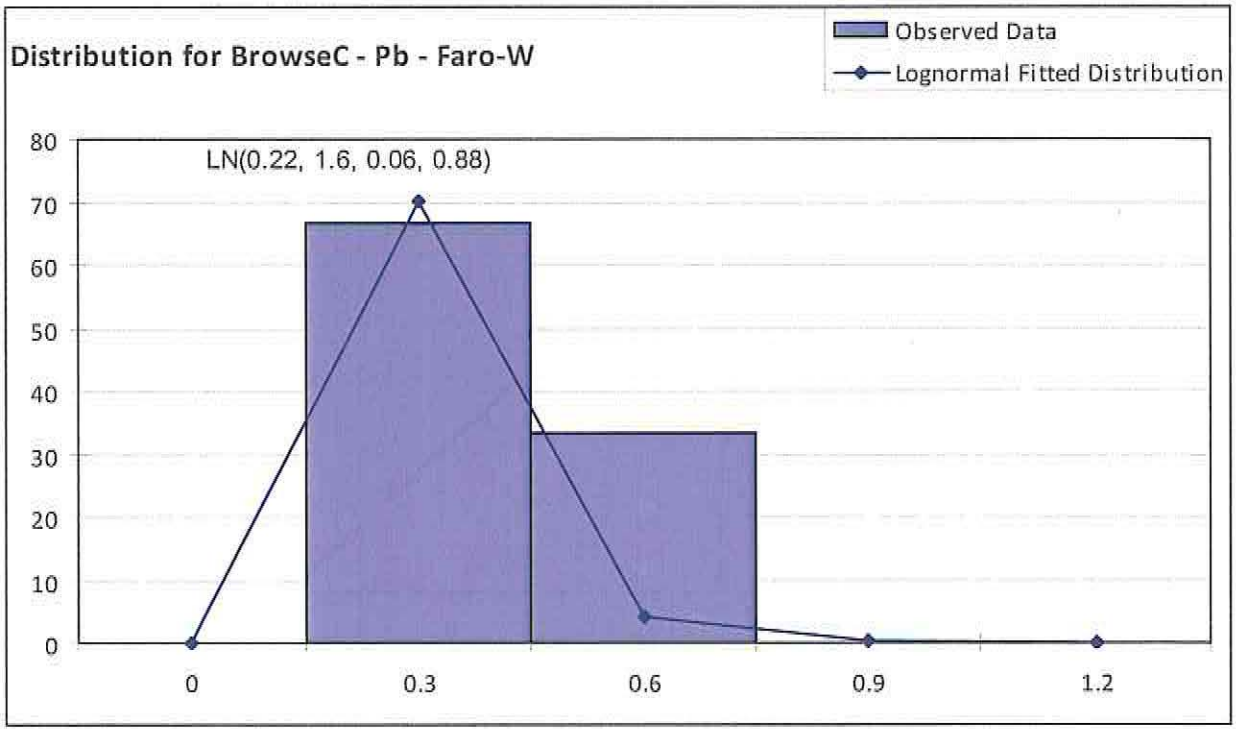

Distribution for BrowseC - Pb - Background
Observed Data
Lognormal Fitted Distribution
LN(0.06, 1.9, 0.009, 0.43)
30
25
20
15
10
5
0
0 0.04 0.08 0.12 0.16 0.2 0.24 0.28 0.32 0.36 0.4

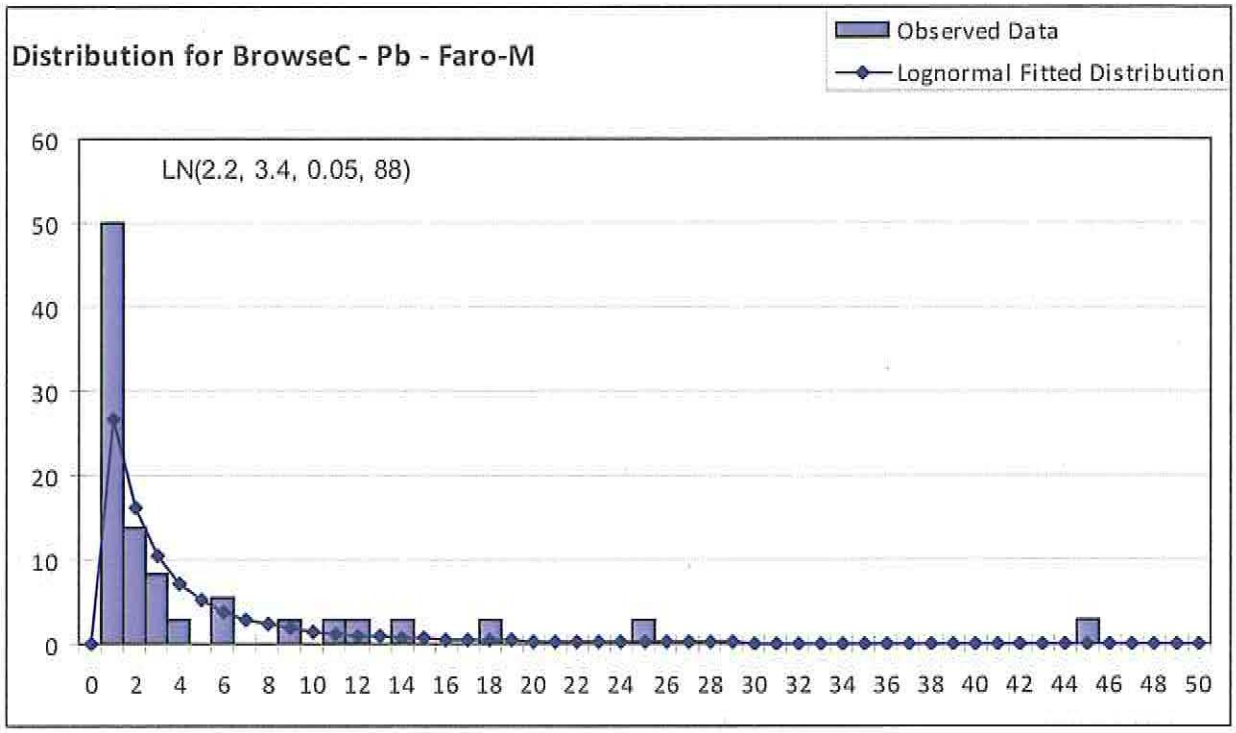

Distribution for BrowseC - Pb - Van-S
Observed Data
Triangular Fitted Distribution
T(0.3, 0.6, 0.9)
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1

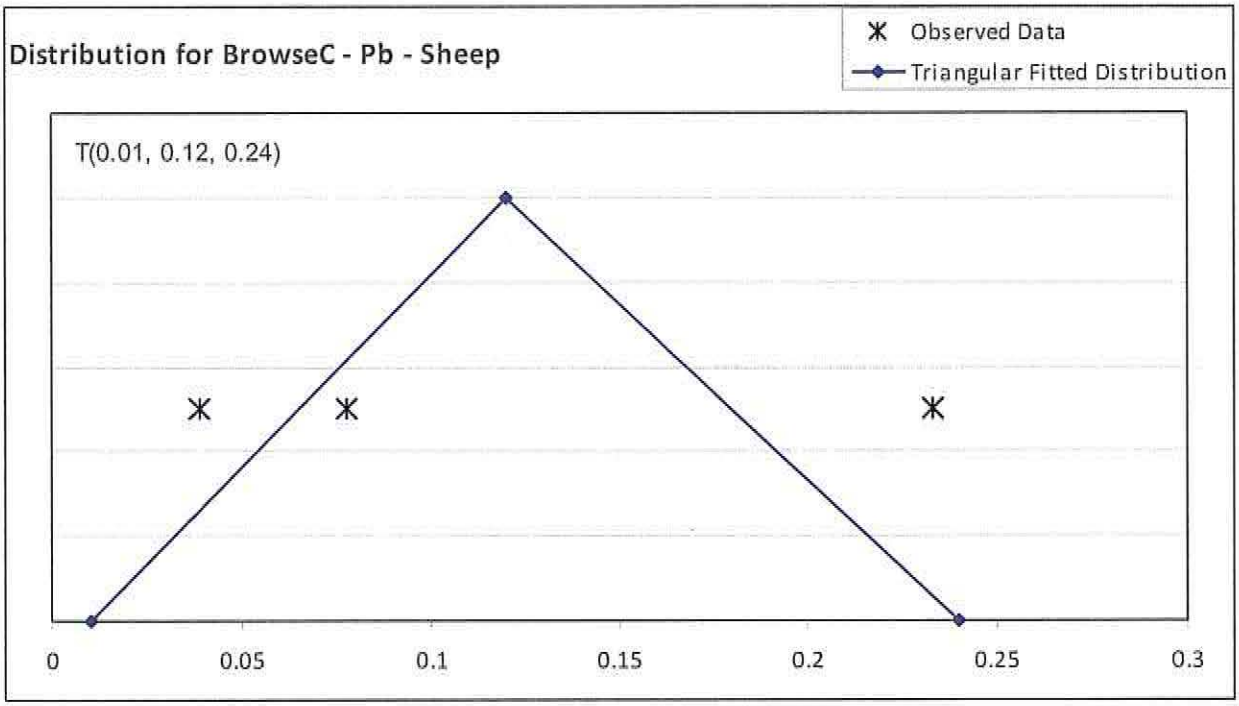

Distribution for BrowseC - Pb - Van-M
Observed Data
Lognormal Fitted Distribution
LN(0.6, 1.4, 0.24, 1.5)
60
50
40
30
20
10
0
0
0.25
0.5
0.75
1
1.25
1.5
1.75


Distribution for BrowseC - Pb - Faro-N
Observed Data
Lognormal Fitted Distribution
LN(5.5, 3, 0.2, 150)
120
100
80
60
40
20
0
0
6
12
18
24
30
36

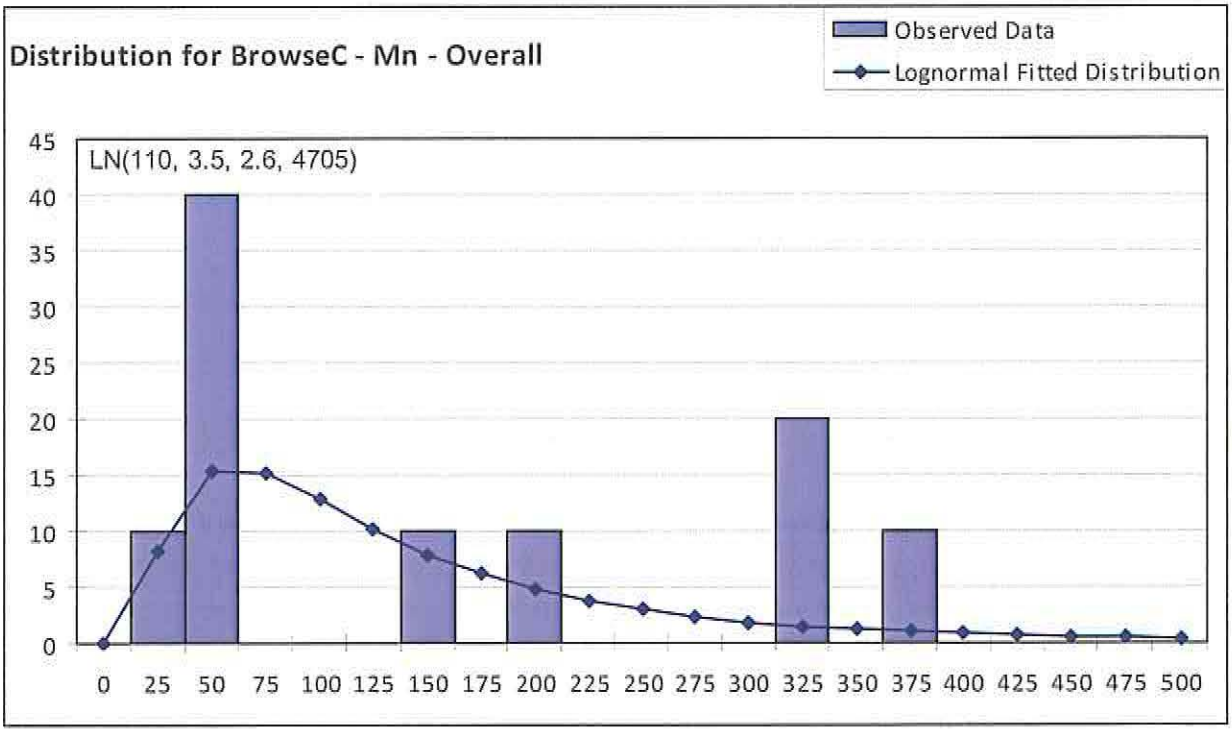

Distribution for BrowseC - Pb - Faro-S
Observed Data
Lognormal Fitted Distribution
LN(3.6, 3.0, 0.13, 99)
35
30
25
20
15
10
5
0
0
5
10
15
20
25
30
35
40
45
50
55

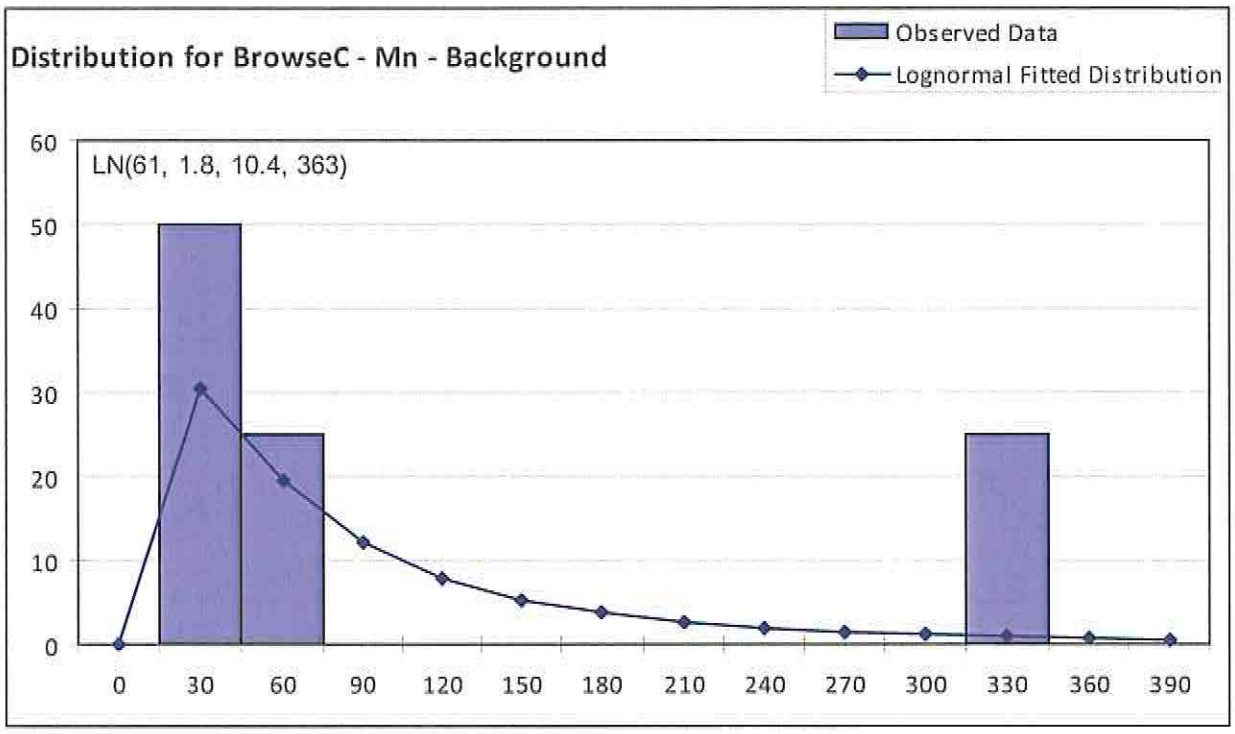

Distribution for BrowseC - Pb - Faro-W
Observed Data
Lognormal Fitted Distribution
LN(0.22, 1.6, 0.06, 0.88)
80
70
60
50
40
30
20
10
0
0
0.3
0.6
0.9
1.2


Distribution for BrowseC - Pb - Faro-M
Observed Data
Lognormal Fitted Distribution
LN(2.2, 3.4, 0.05, 88)
60
50
40
30
20
10
0
0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48 50

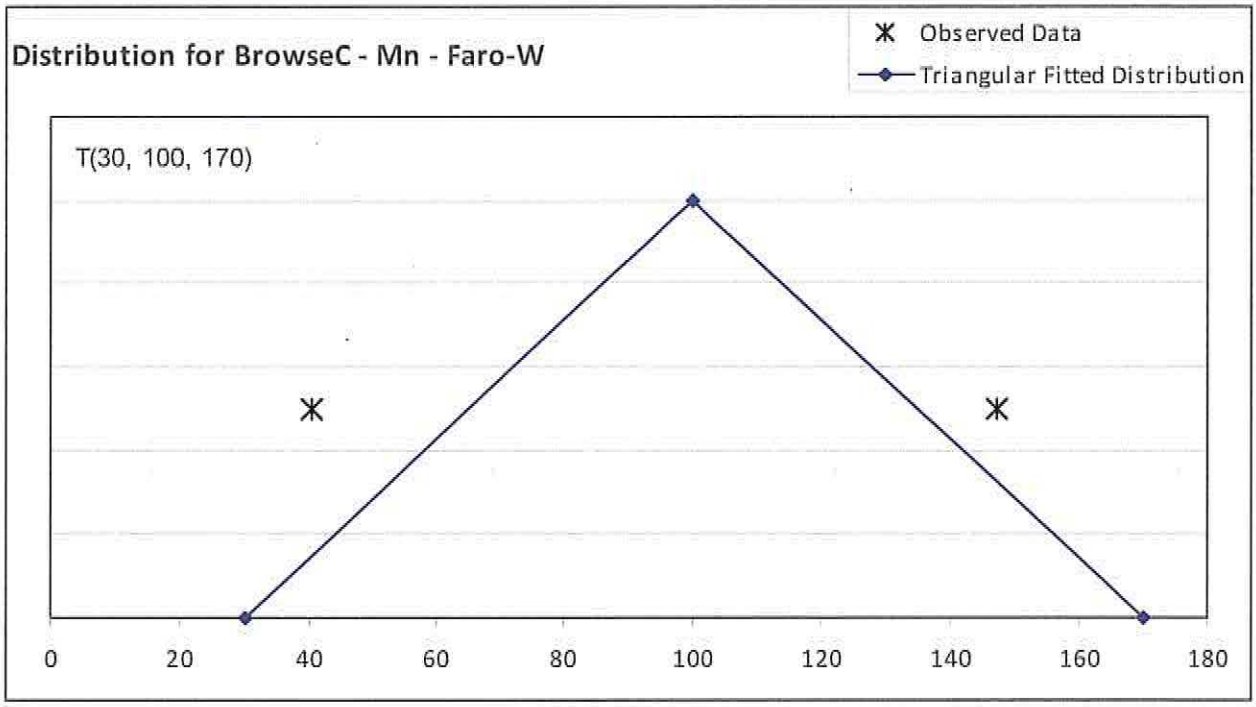


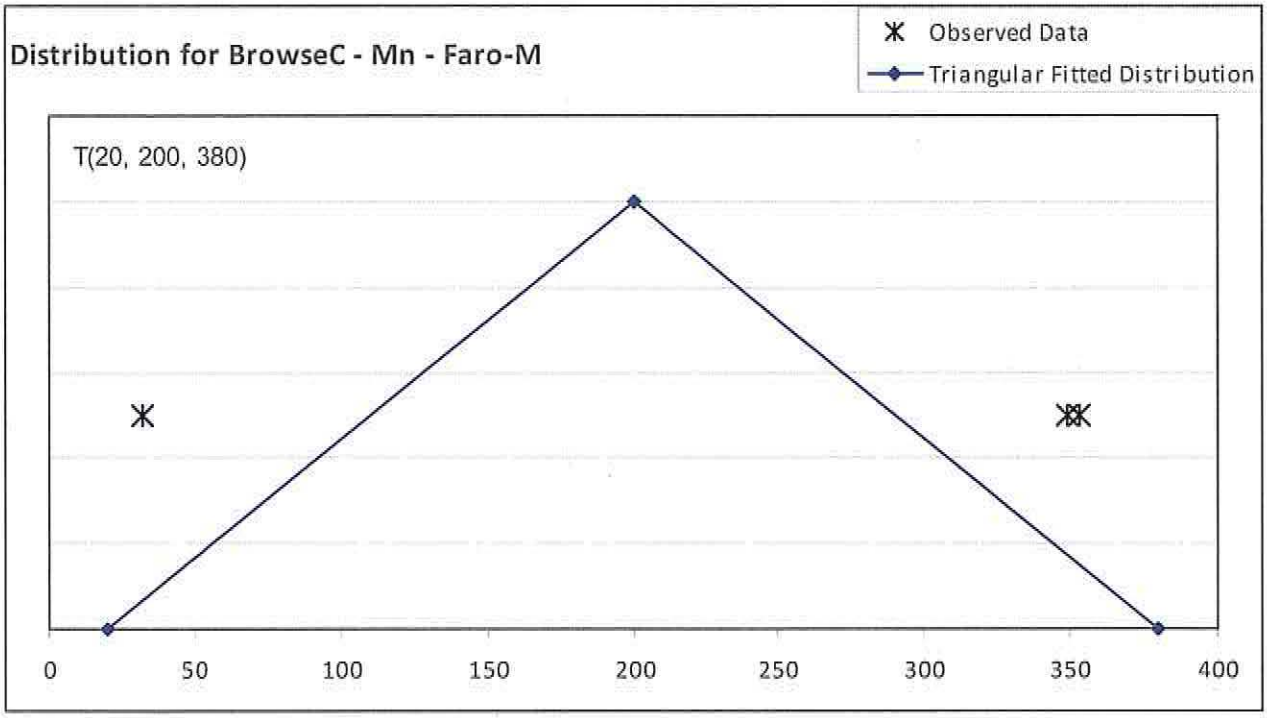
D.5.10 Manganese

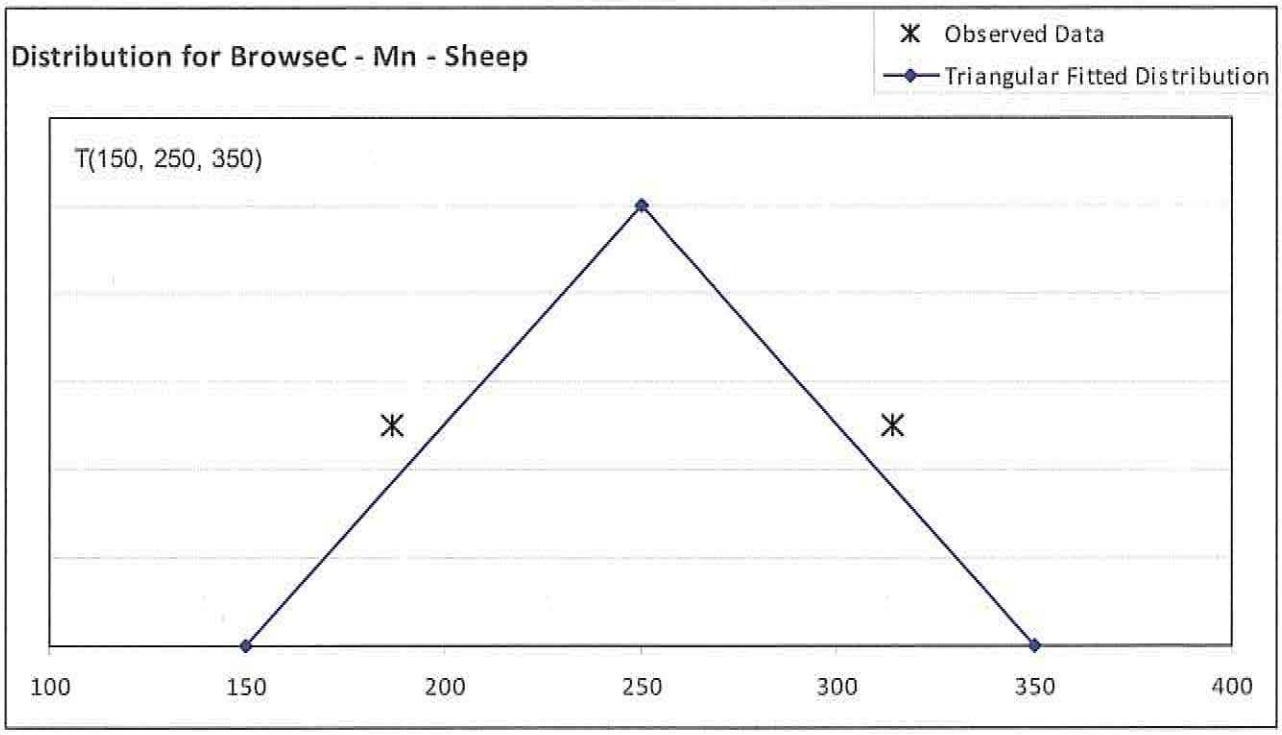




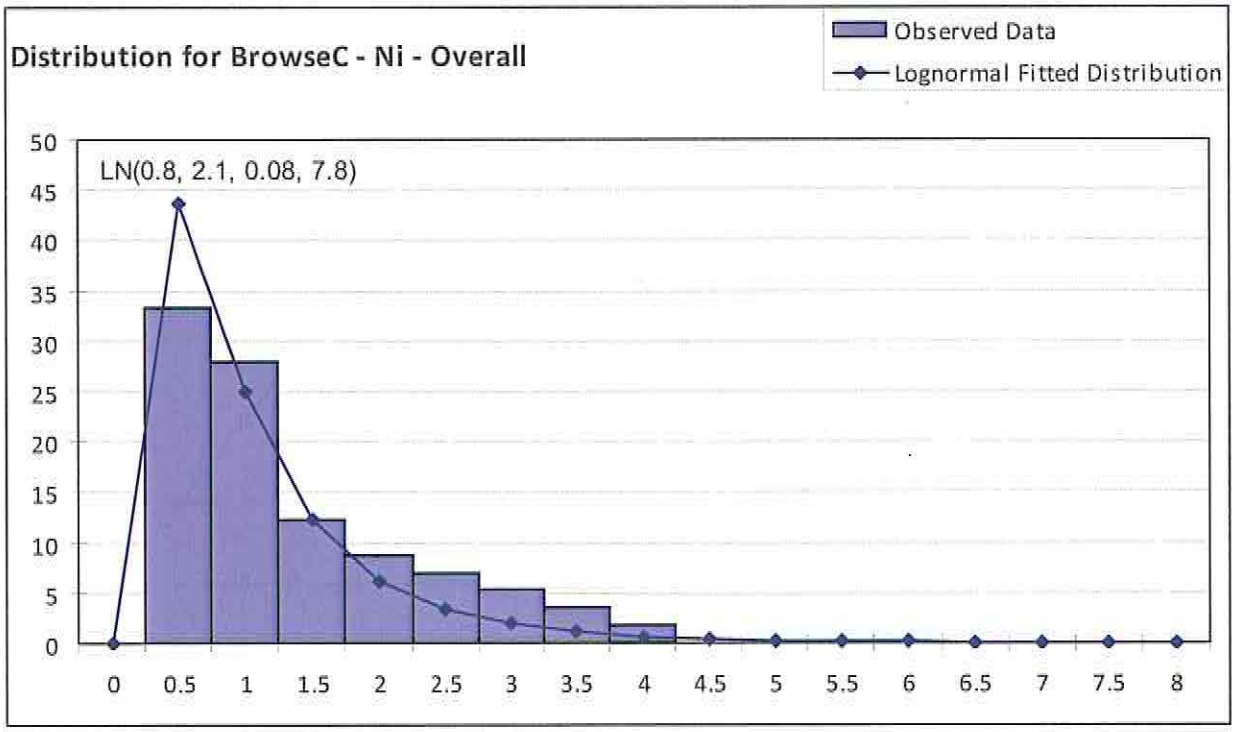
No Manganese data for browse at Van-S, Van-M, Faro-N, Faro-S.

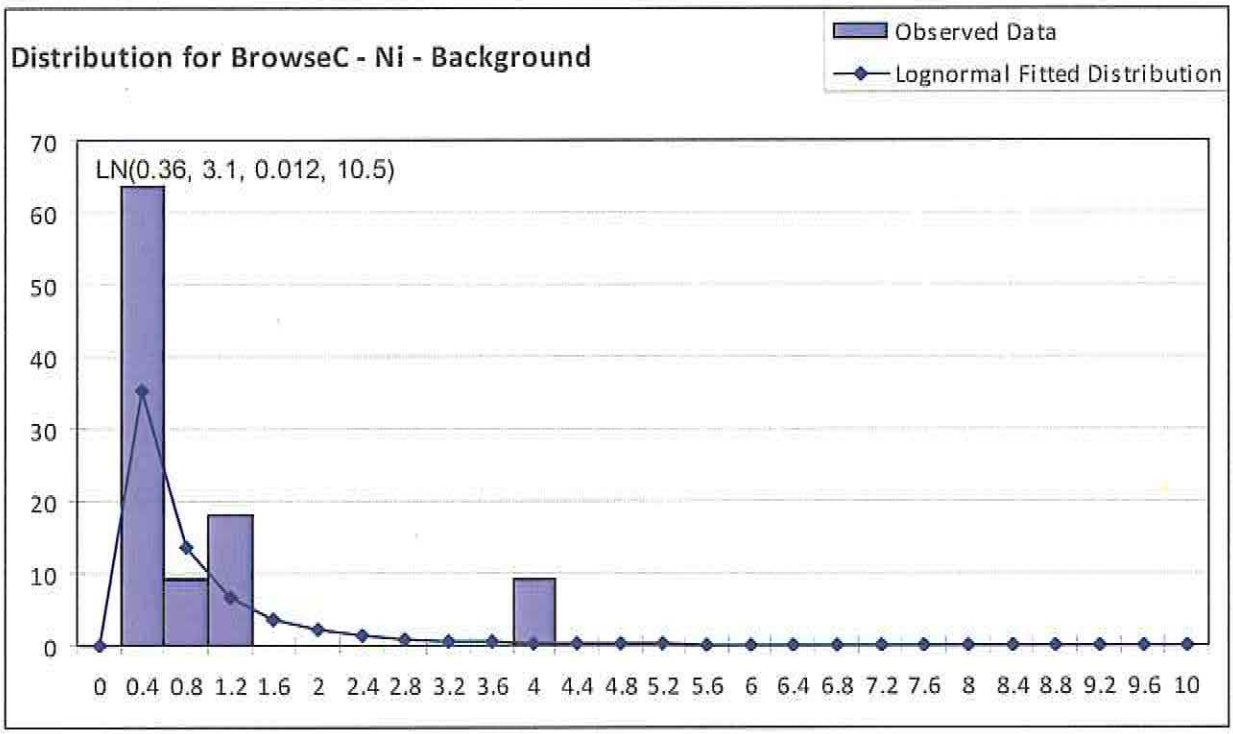


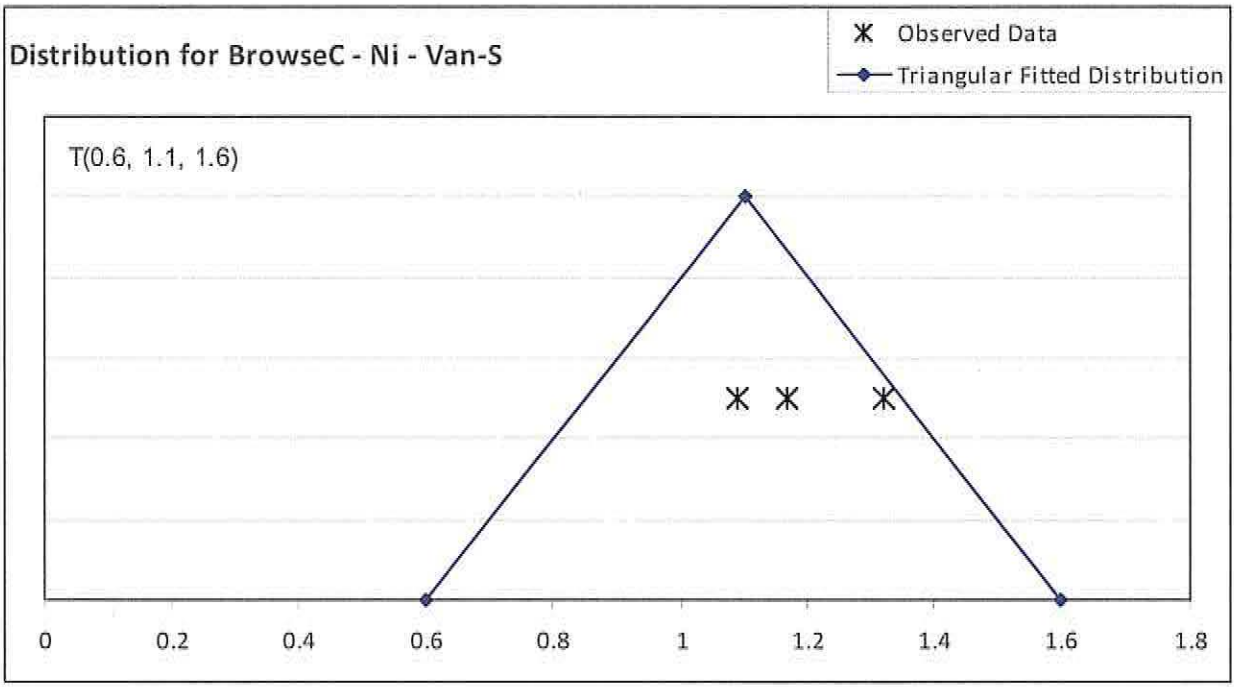

Distribution for BrowseC - Mn - Faro-M
Observed Data
Triangular Fitted Distribution
T(20, 200, 380)
0
50
100
150
200
250
300
350
400

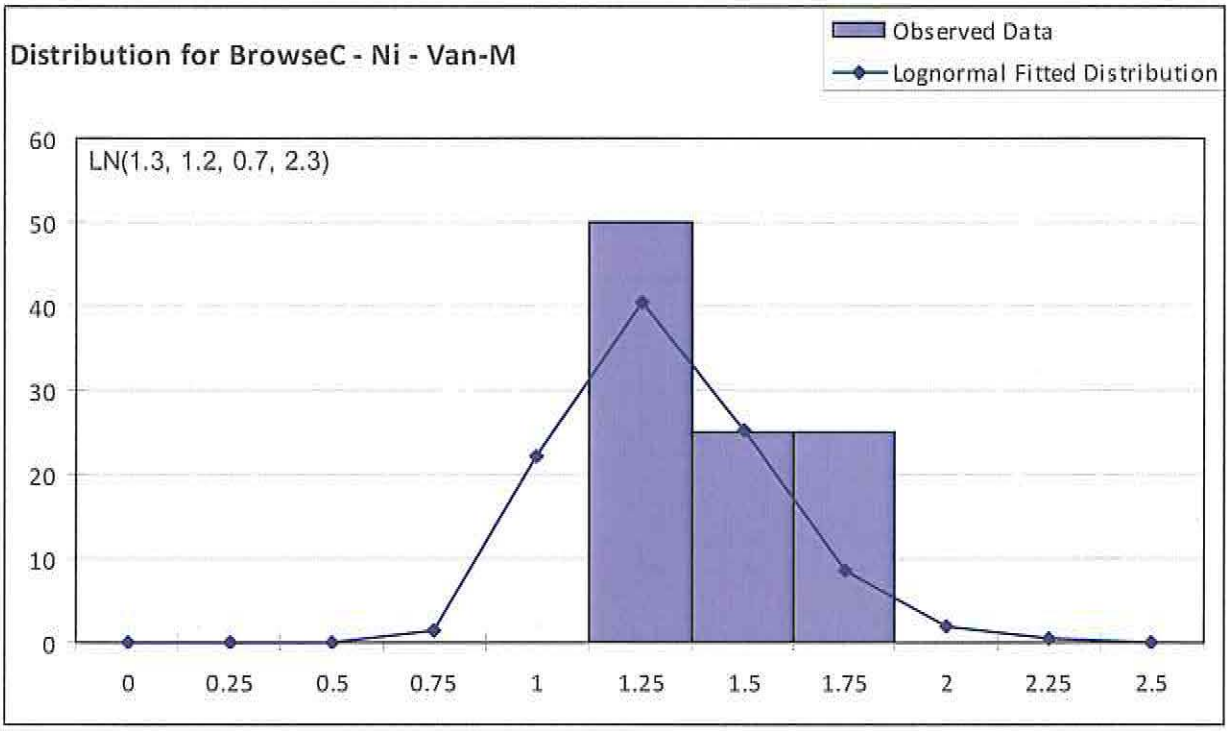

Distribution for BrowseC - Mn - Sheep
Observed Data
Triangular Fitted Distribution
T(150, 250, 350)
100
150
200
250
300
350
400

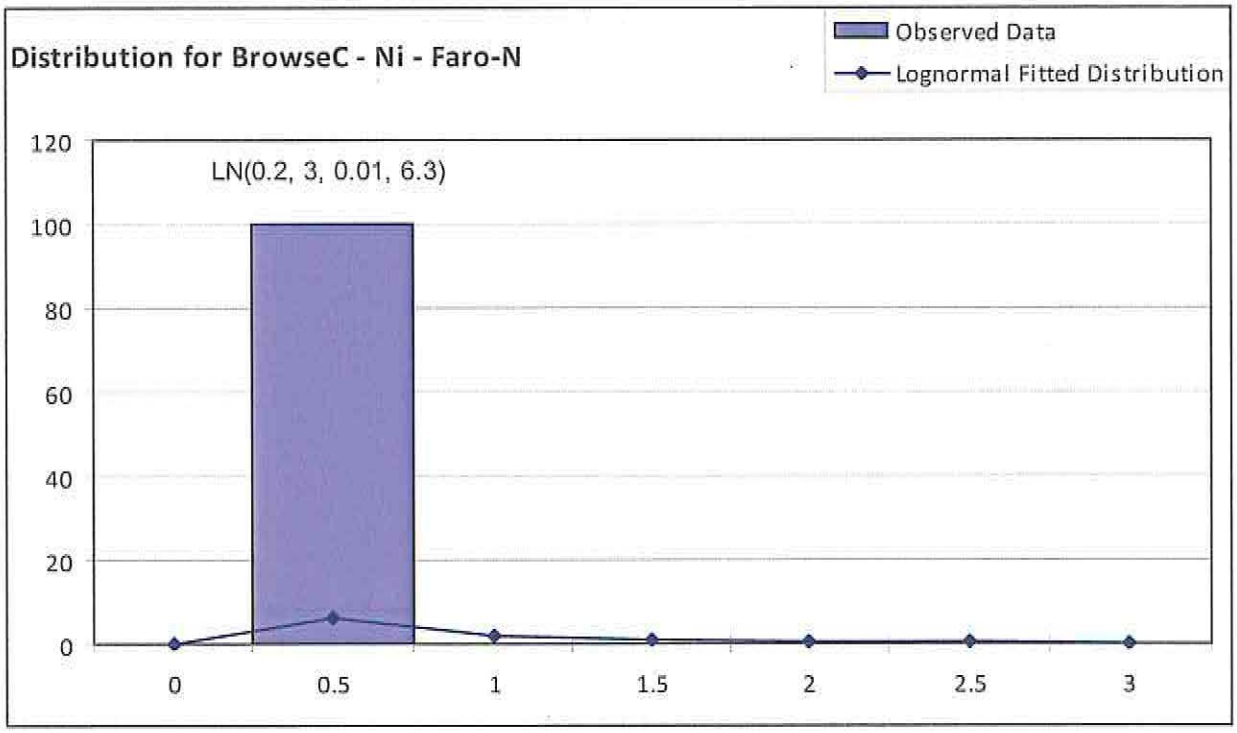
D.5.11 Nickel

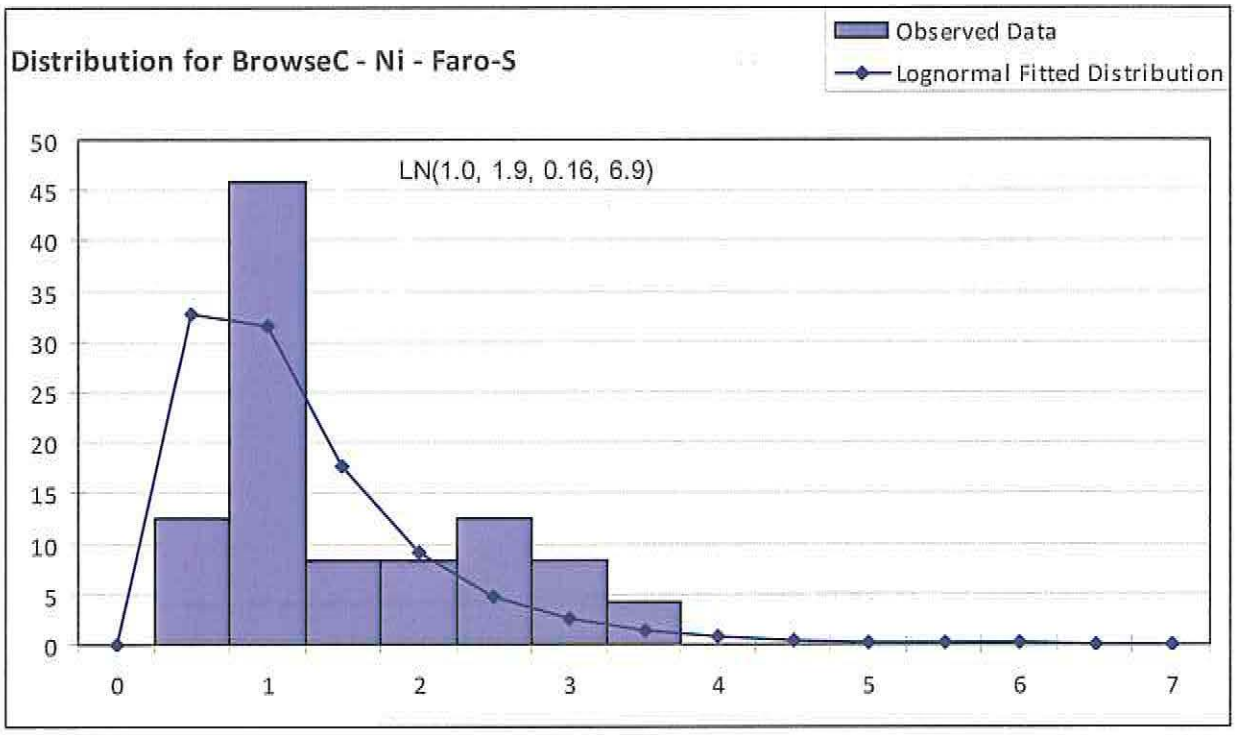

Distribution for BrowseC - Ni - Overall
Observed Data
Lognormal Fitted Distribution
LN(0.8, 2.1, 0.08, 7.8)
50
45
40
35
30
25
20
15
10
5
0
0 0.5 1 1.5 2 2.5 3 3.5 4 4.5 5 5.5 6 6.5 7 7.5 8

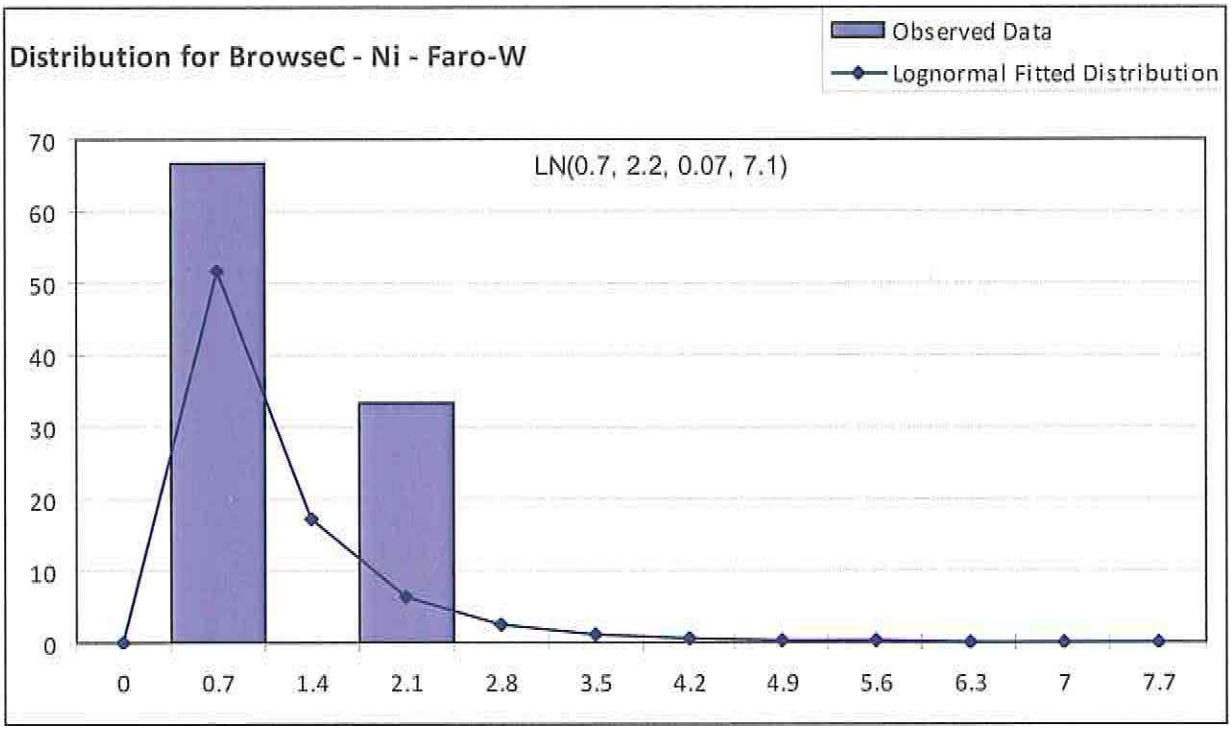

Distribution for BrowseC - Ni - Background
Observed Data
Lognormal Fitted Distribution
LN(0.36, 3.1, 0.012, 10.5)
70
60
50
40
30
20
10
0
0 0.4 0.8 1.2 1.6 2 2.4 2.8 3.2 3.6 4 4.4 4.8 5.2 5.6 6 6.4 6.8 7.2 7.6 8 8.4 8.8 9.2 9.6 10

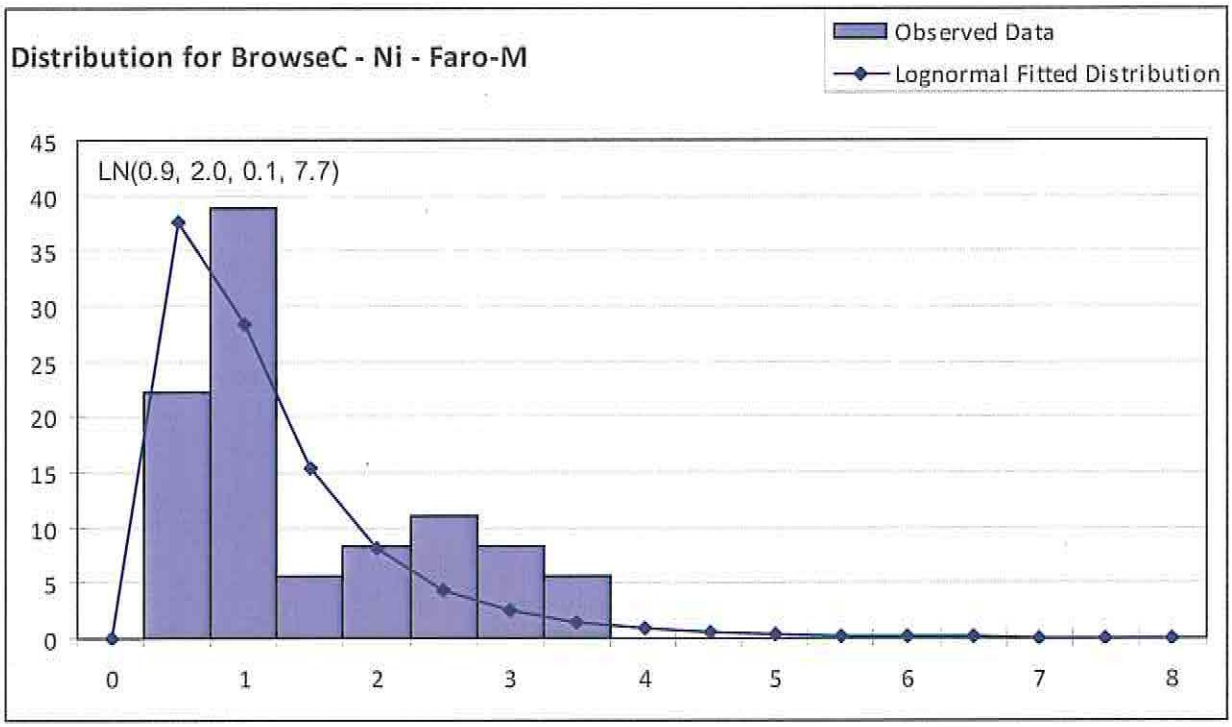

Distribution for BrowseC - Ni - Van-S
Observed Data
Triangular Fitted Distribution
T(0.6, 1.1, 1.6)
0
0.2
0.4
0.6
0.8
1
1.2
1.4
1.6
1.8

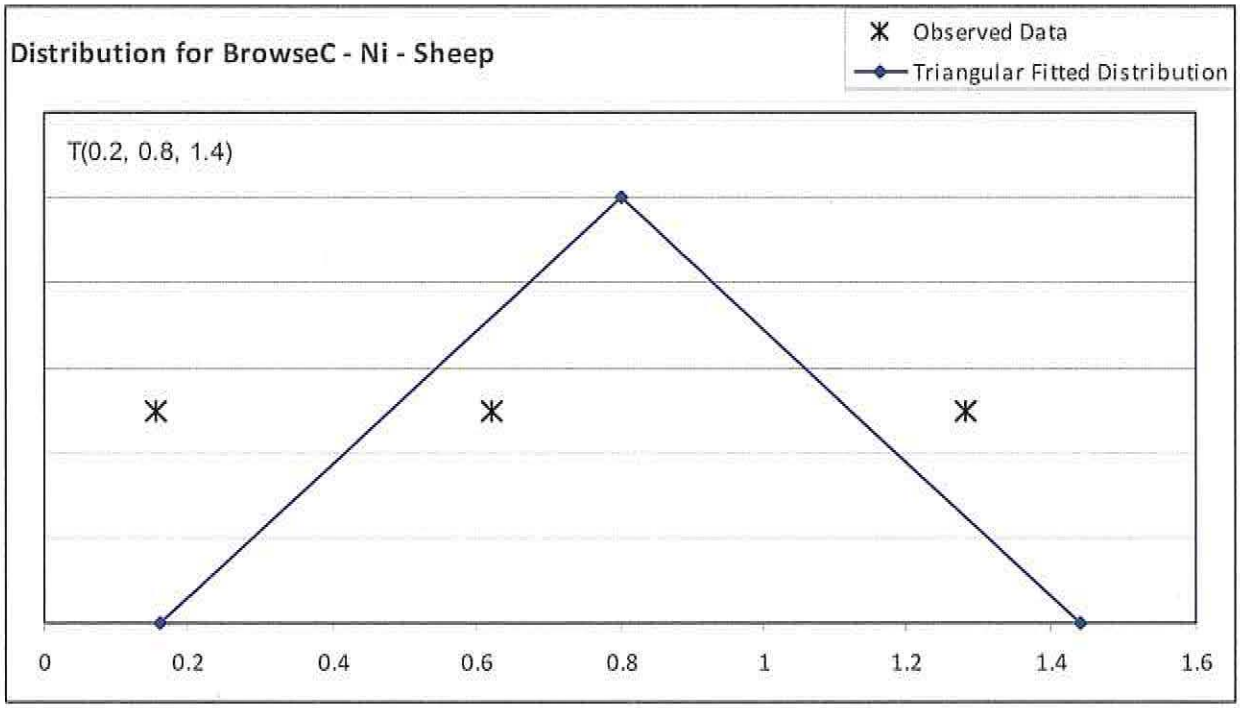

Distribution for BrowseC - Ni - Van-M
Observed Data
Lognormal Fitted Distribution
LN(1.3, 1.2, 0.7, 2.3)
60
50
40
30
20
10
0
0
0.25
0.5
0.75
1
1.25
1.5
1.75
2
2.25
2.5


Distribution for BrowseC - Ni - Faro-N
Observed Data
Lognormal Fitted Distribution
LN(0.2, 3, 0.01, 6.3)
120
100
80
60
40
20
0
0
0.5
1
1.5
2
2.5
3

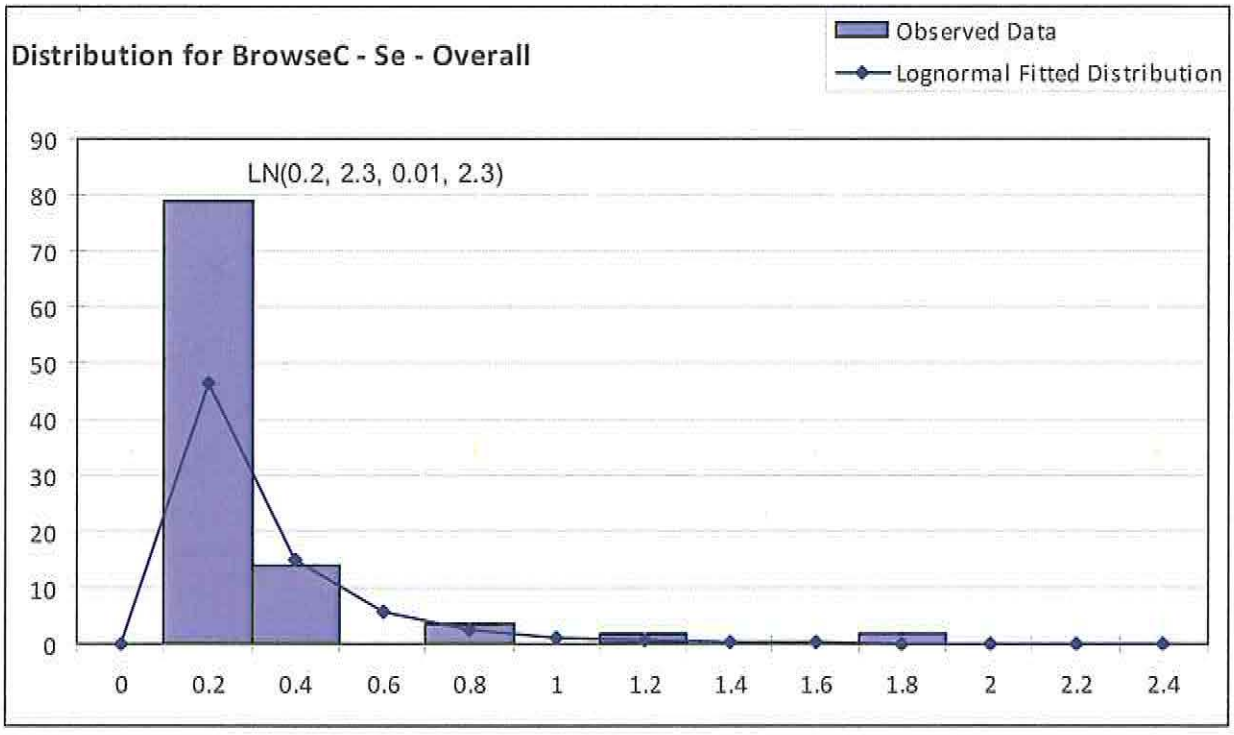

Distribution for BrowseC - Ni - Faro-S
Observed Data
Lognormal Fitted Distribution
LN(1.0, 1.9, 0.16, 6.9)
50
45
40
35
30
25
20
15
10
5
0
0
1
2
3
4
5
6
7

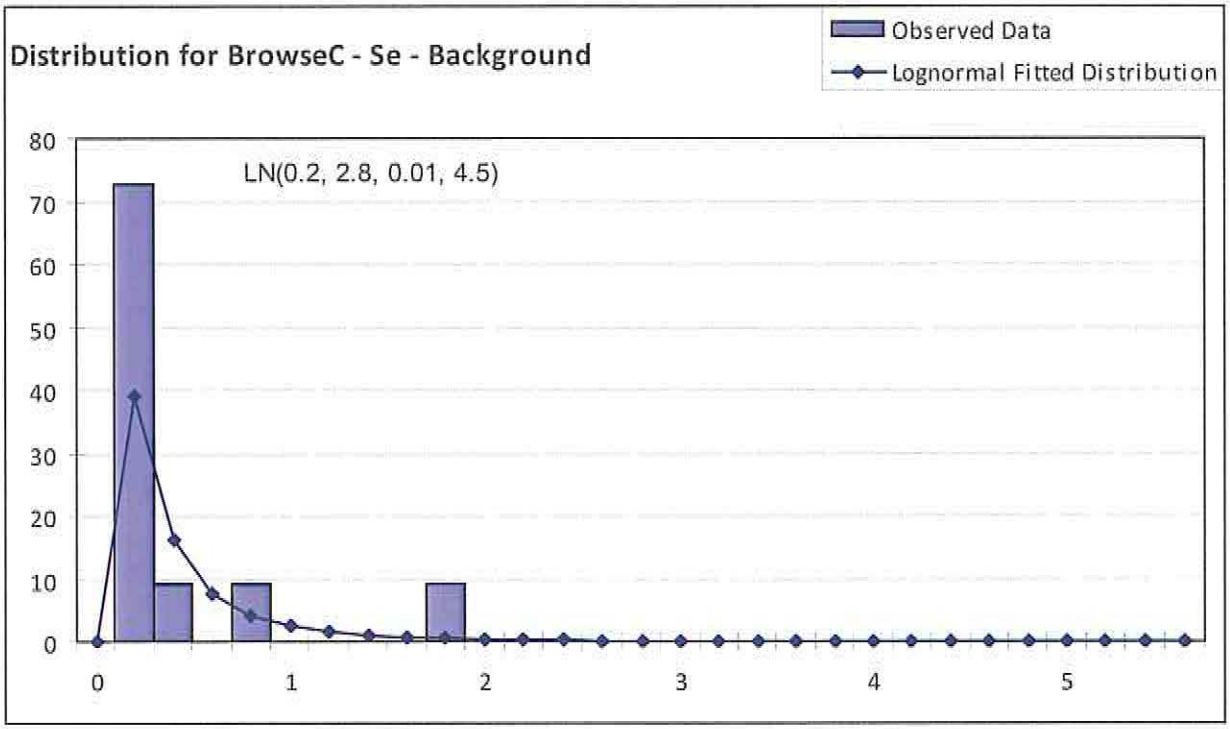

Distribution for BrowseC - Ni - Faro-W
Observed Data
Lognormal Fitted Distribution
LN(0.7, 2.2, 0.07, 7.1)
70
60
50
40
30
20
10
0
0
0.7
1.4
2.1
2.8
3.5
4.2
4.9
5.6
6.3
7
7.7

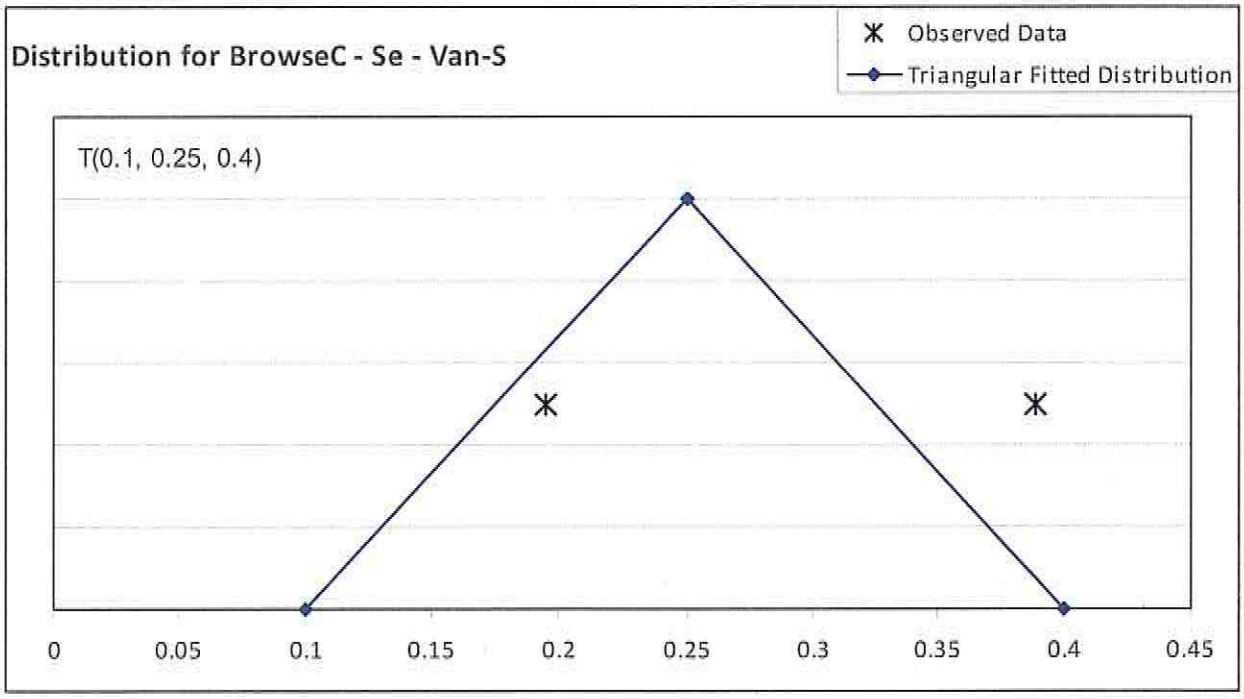

Distribution for BrowseC - Ni - Faro-M
Observed Data
Lognormal Fitted Distribution
LN(0.9, 2.0, 0.1, 7.7)
45
40
35
30
25
20
15
10
5
0
0
1
2
3
4
5
6
7
8

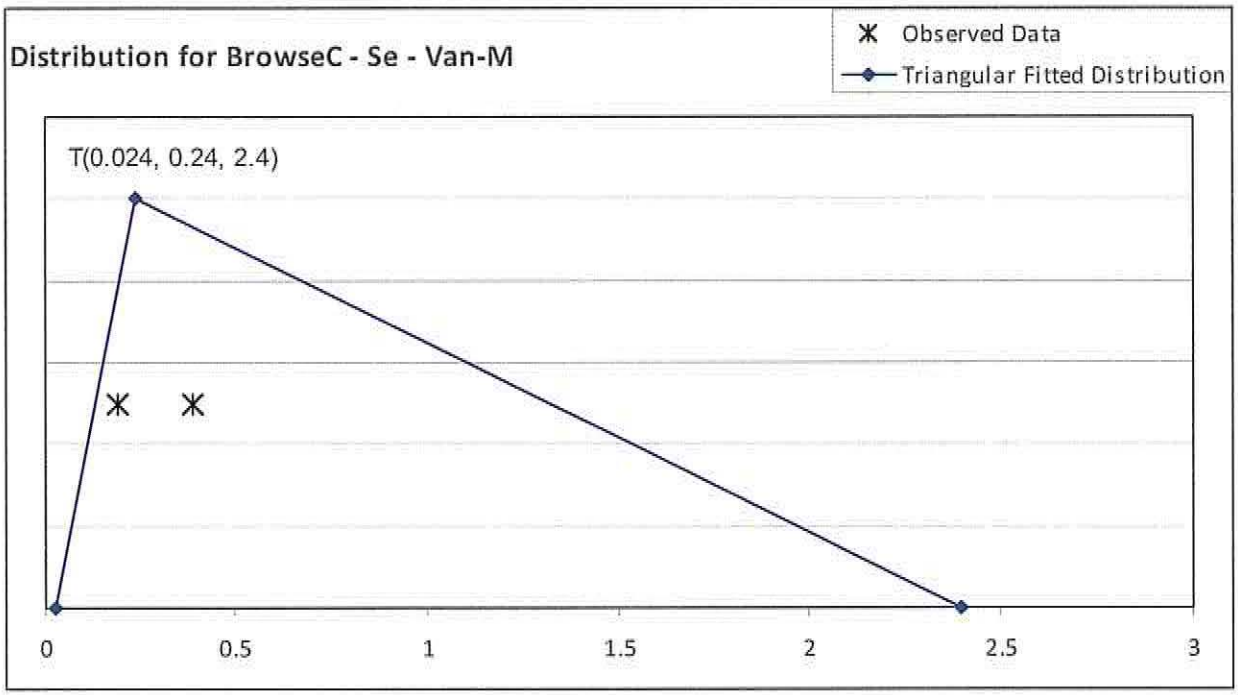


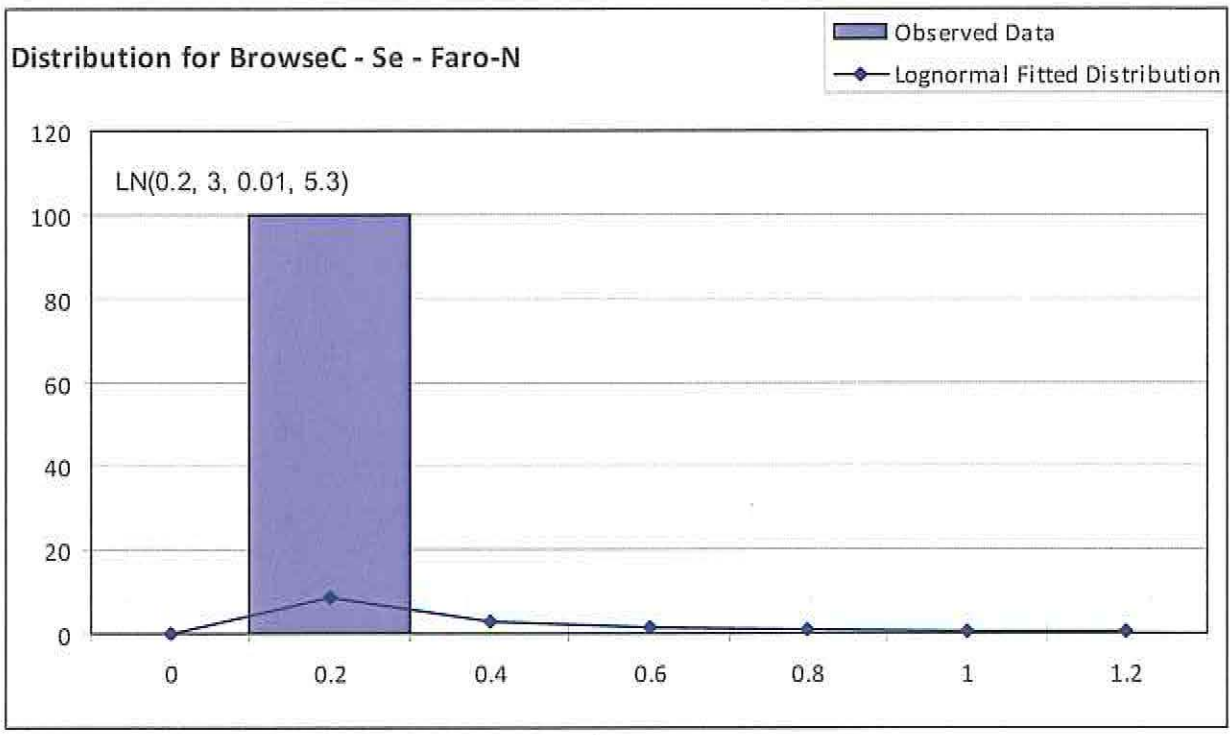
D.5.12 Selenium

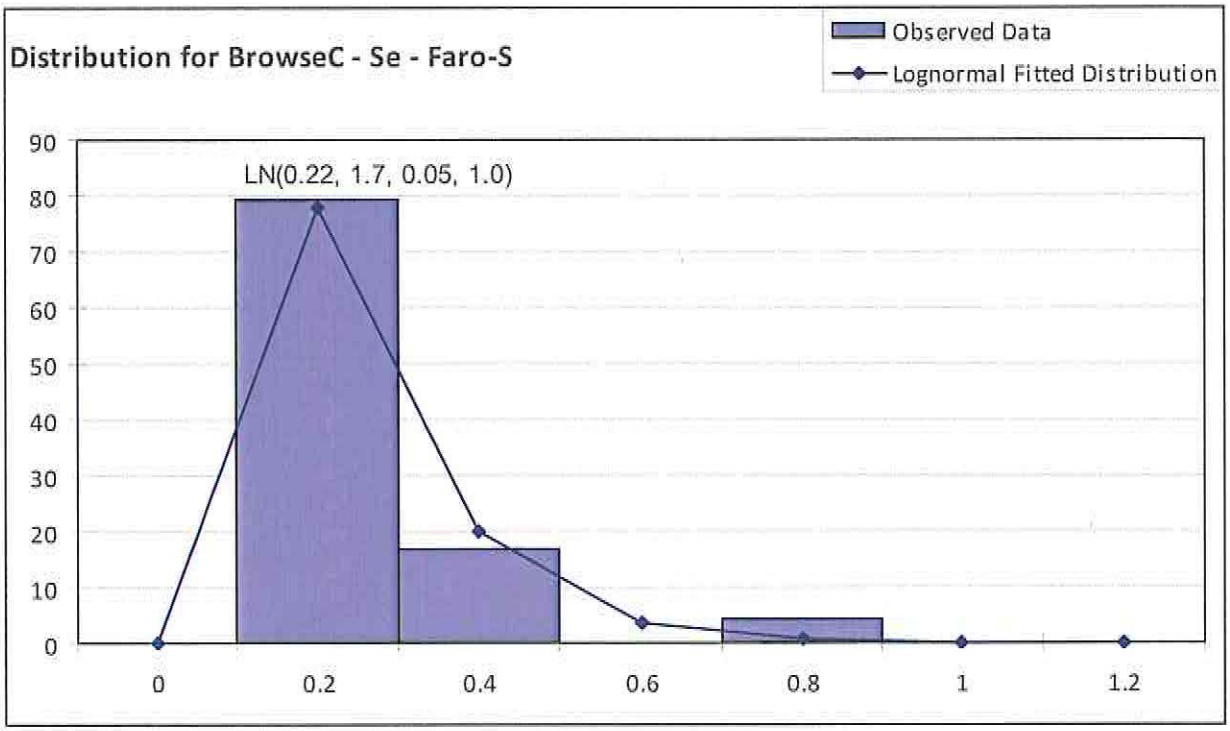


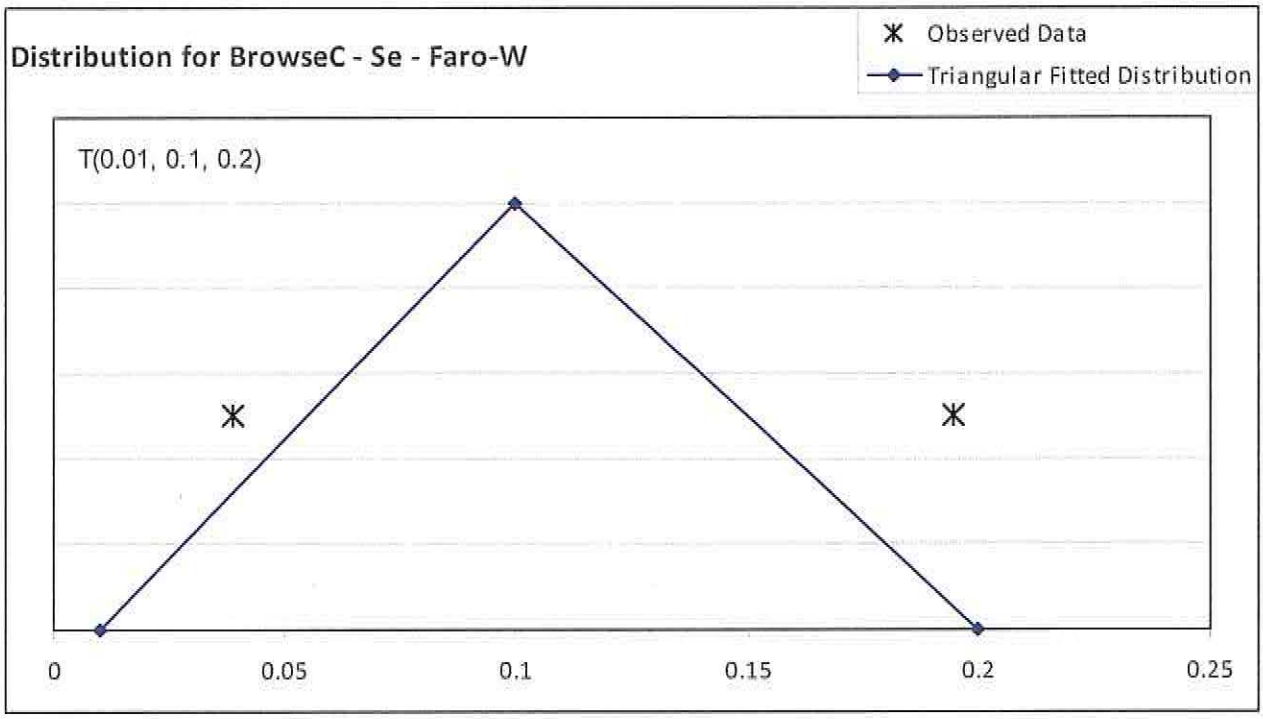

Distribution for BrowseC - Se - Background
Observed Data
Lognormal Fitted Distribution
LN(0.2, 2.8, 0.01, 4.5)
80
70
60
50
40
30
20
10
0
0
1
2
3
4
5

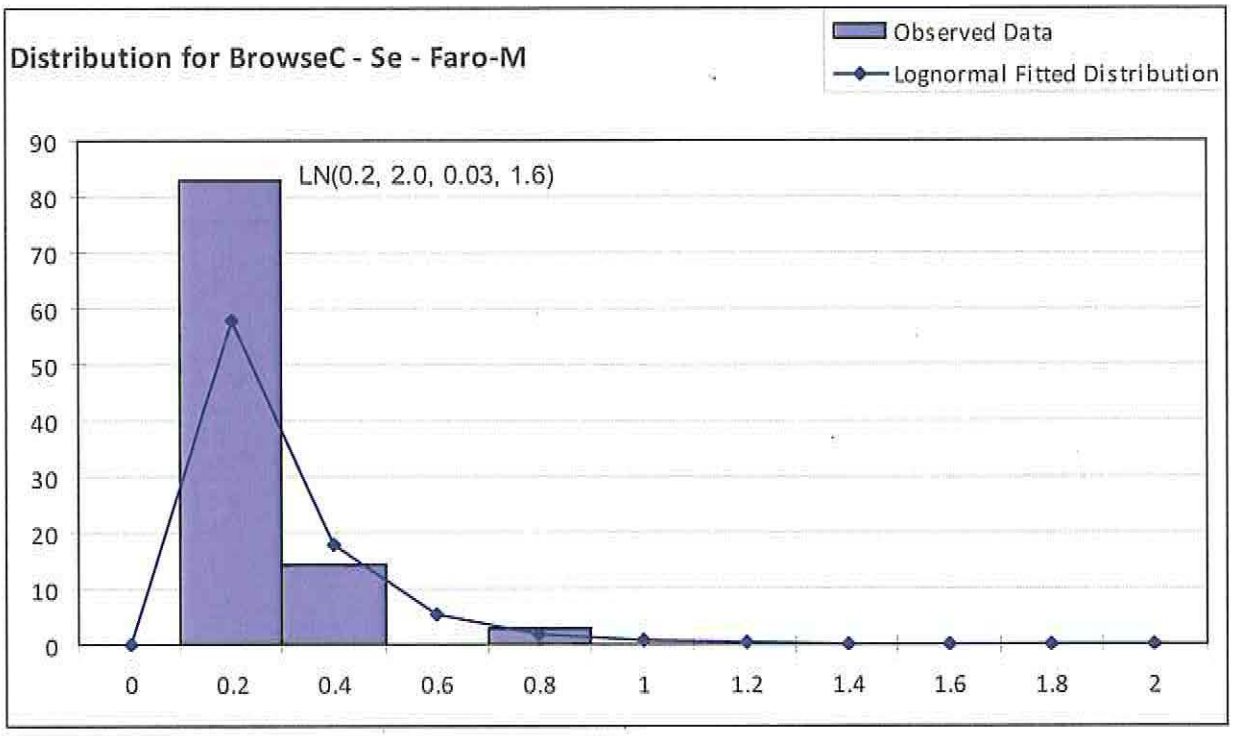

Distribution for BrowseC - Se - Van-S
Observed Data
Triangular Fitted Distribution
T(0.1, 0.25, 0.4)
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
0.45

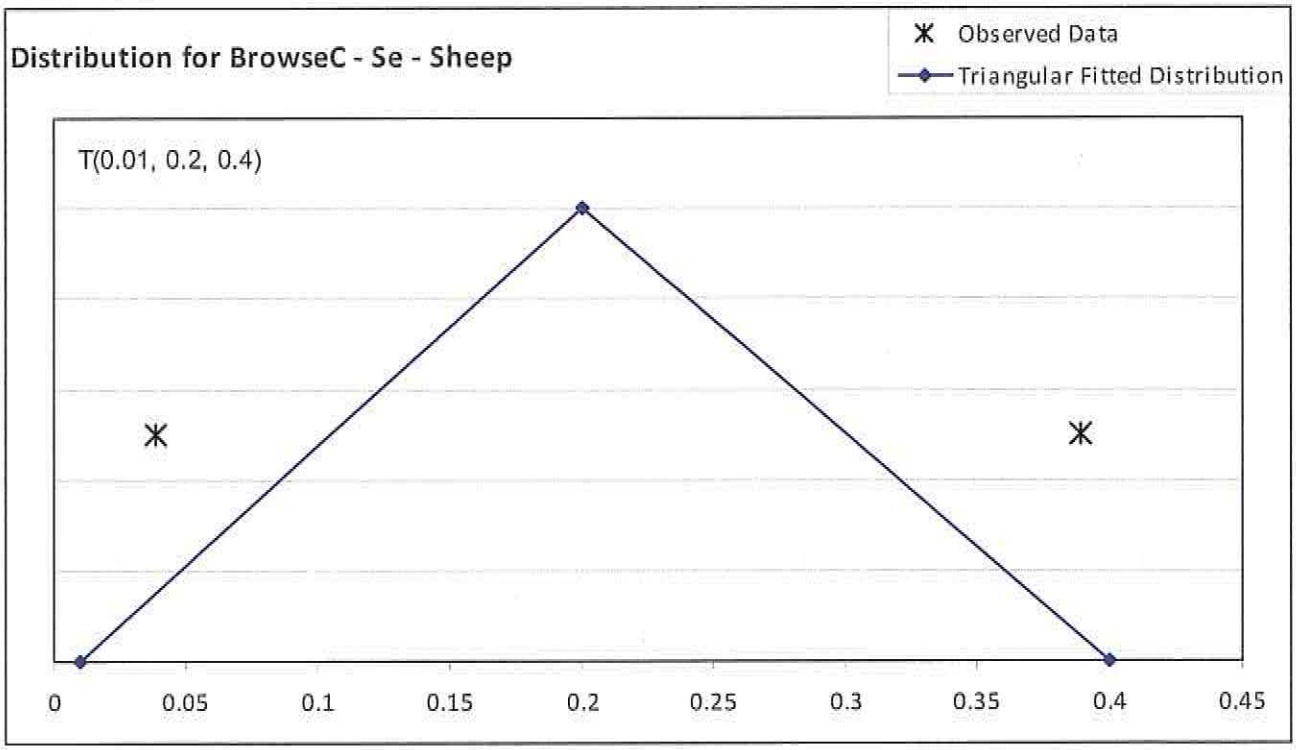

Distribution for BrowseC - Se - Van-M
Observed Data
Triangular Fitted Distribution
T(0.024, 0.24, 2.4)
0
0.5
1
1.5
2
2.5
3


Distribution for BrowseC - Se - Faro-N
Observed Data
Lognormal Fitted Distribution
LN(0.2, 3, 0.01, 5.3)
120
100
80
60
40
20
0
0
0.2
0.4
0.6
0.8
1
1.2

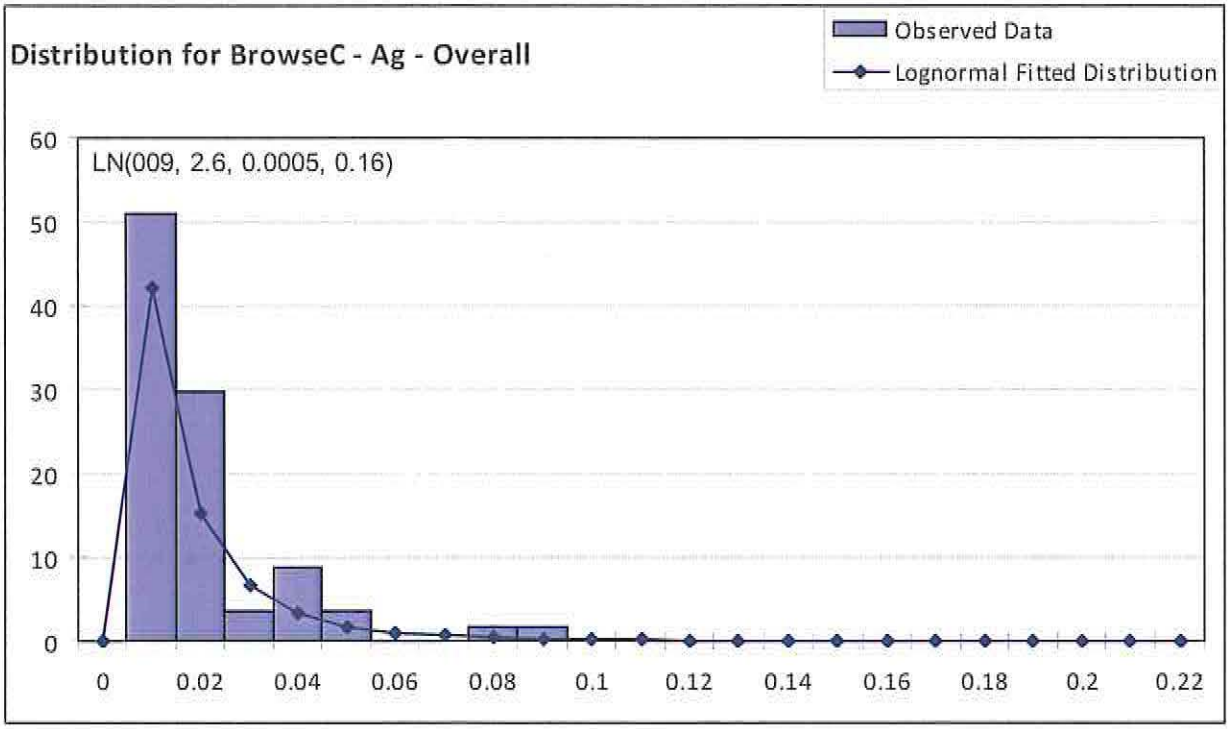

Distribution for BrowseC - Se - Faro-S
Observed Data
Lognormal Fitted Distribution
LN(0.22, 1.7, 0.05, 1.0)
90
80
70
60
50
40
30
20
10
0
0
0.2
0.4
0.6
0.8
1
1.2

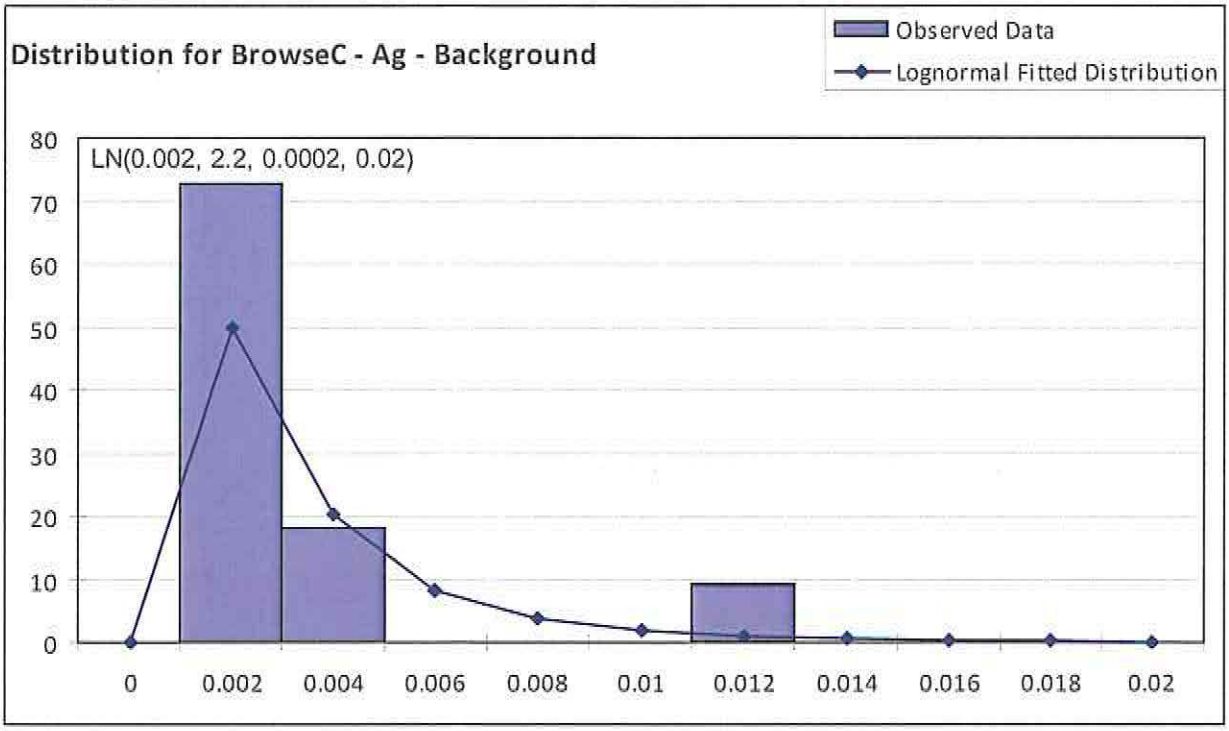

Distribution for BrowseC - Se - Faro-W
Observed Data
Triangular Fitted Distribution
T(0.01, 0.1, 0.2)
0
0.05
0.1
0.15
0.2
0.25

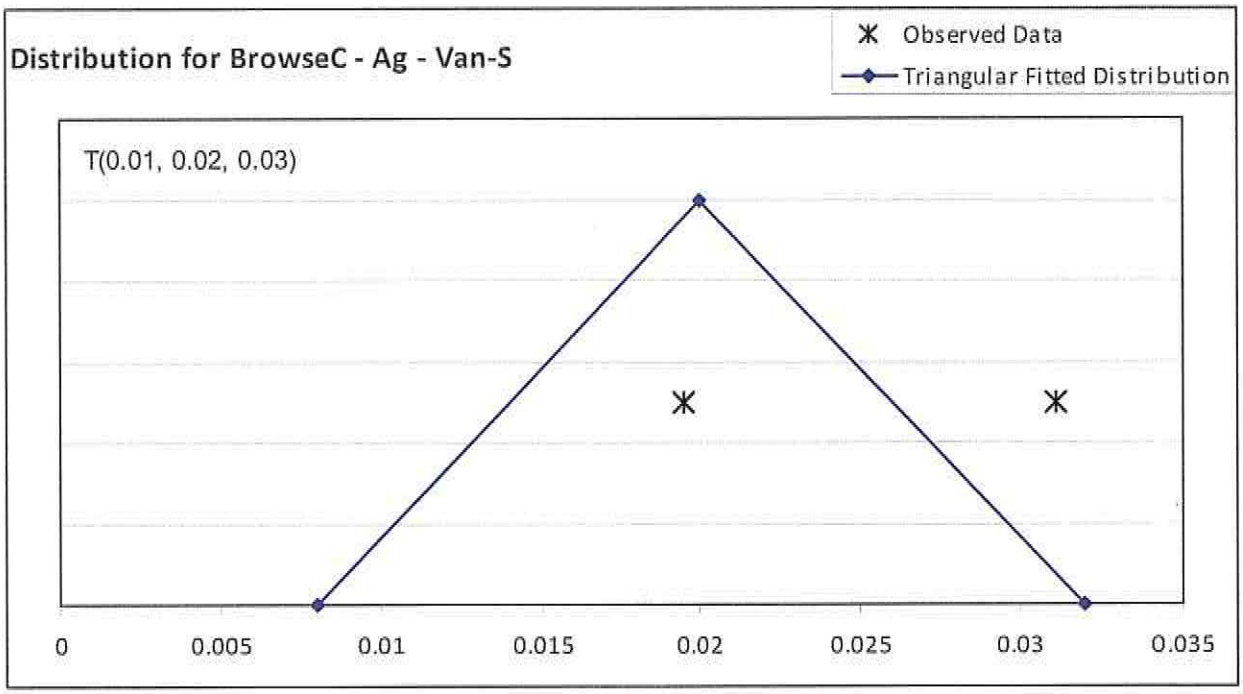

Distribution for BrowseC - Se - Faro-M
Observed Data
Lognormal Fitted Distribution
LN(0.2, 2.0, 0.03, 1.6)
90
80
70
60
50
40
30
20
10
0
0
0.2
0.4
0.6
0.8
1
1.2
1.4
1.6
1.8
2

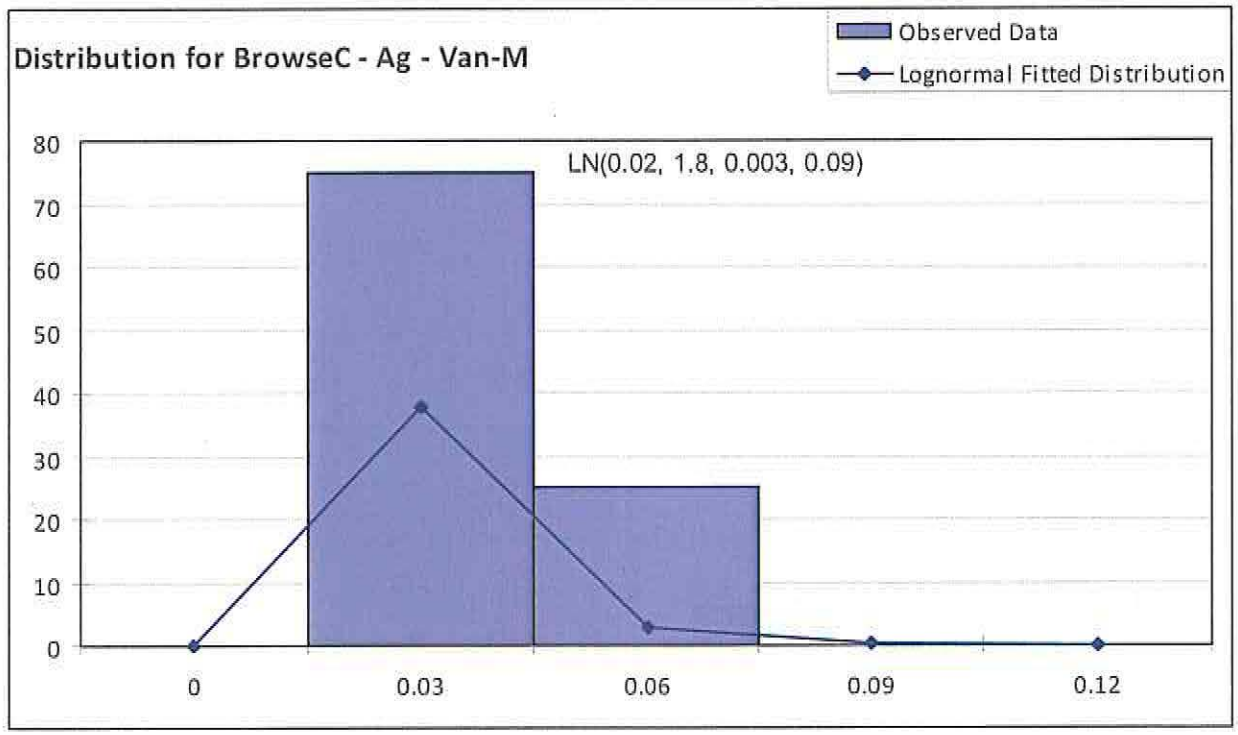

Distribution for BrowseC - Se - Sheep
Observed Data
Triangular Fitted Distribution
T(0.01, 0.2, 0.4)
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
0.45

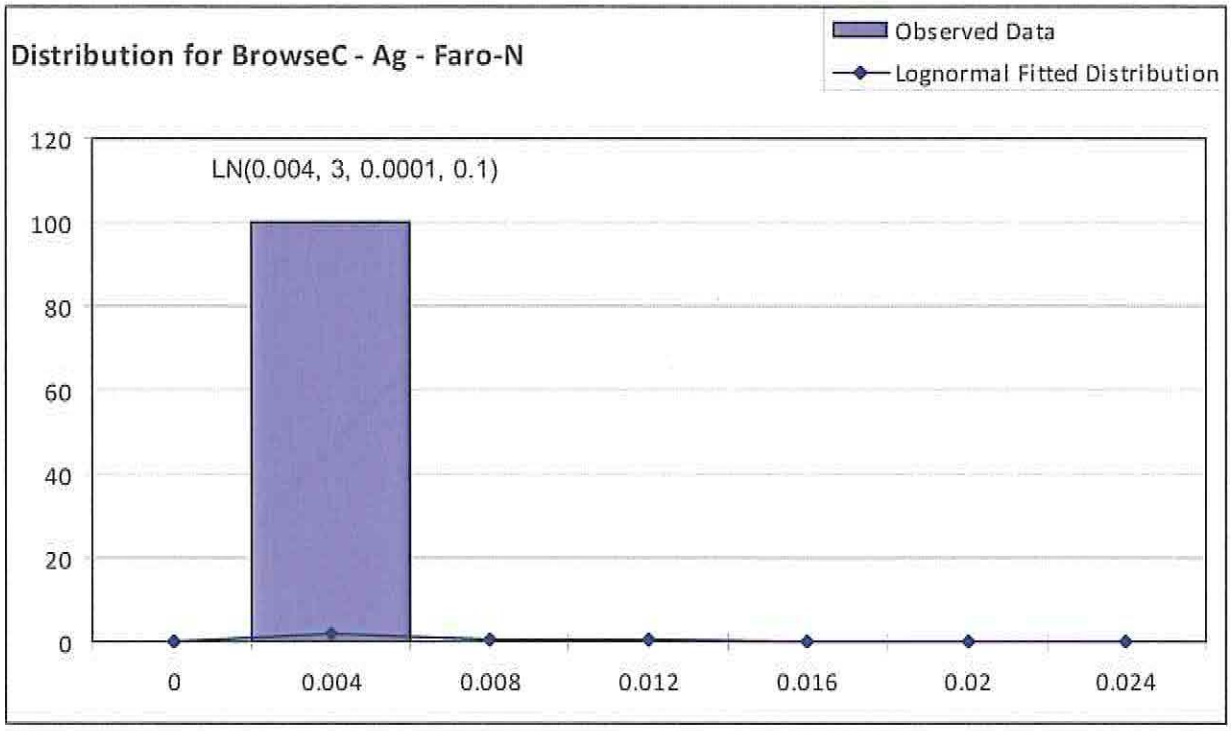
D.5.13 Silver

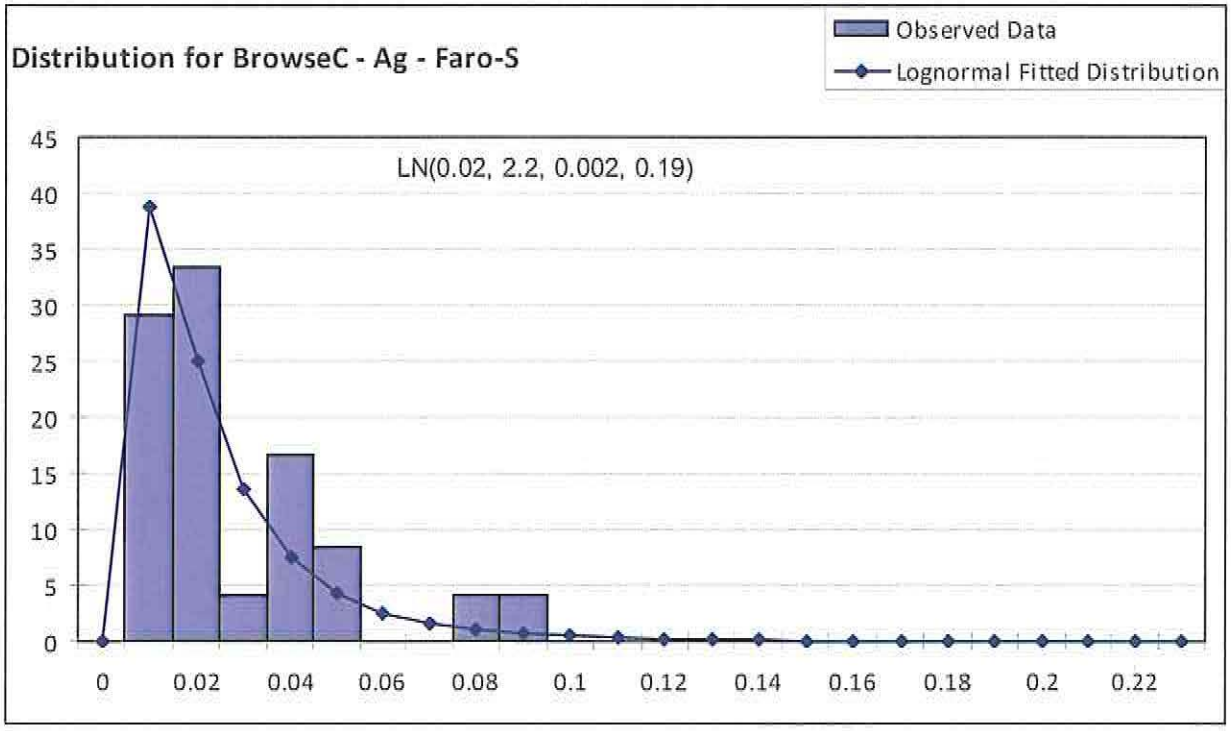

Distribution for BrowseC - Ag - Overall
Observed Data
Lognormal Fitted Distribution
LN(009, 2.6, 0.0005, 0.16)
60
50
40
30
20
10
0
0
0.02
0.04
0.06
0.08
0.1
0.12
0.14
0.16
0.18
0.2
0.22

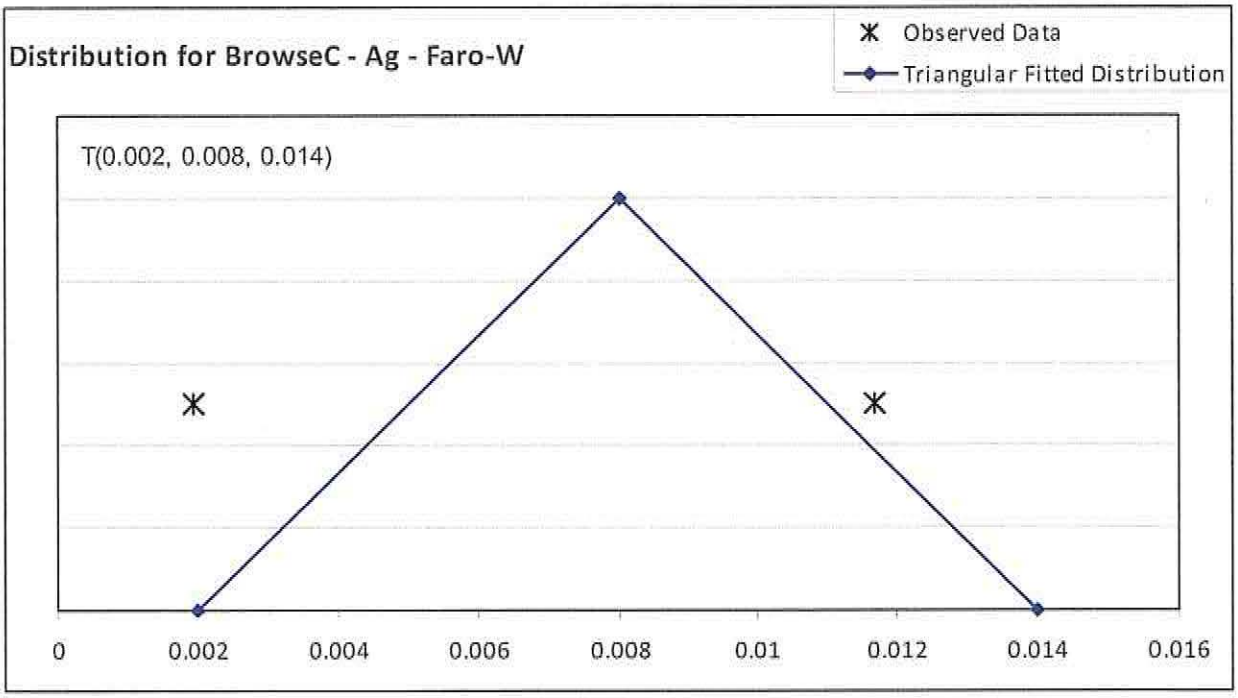

Distribution for BrowseC - Ag - Background
Observed Data
Lognormal Fitted Distribution
LN(0.002, 2.2, 0.0002, 0.02)
80
70
60
50
40
30
20
10
0
0
0.002
0.004
0.006
0.008
0.01
0.012
0.014
0.016
0.018
0.02

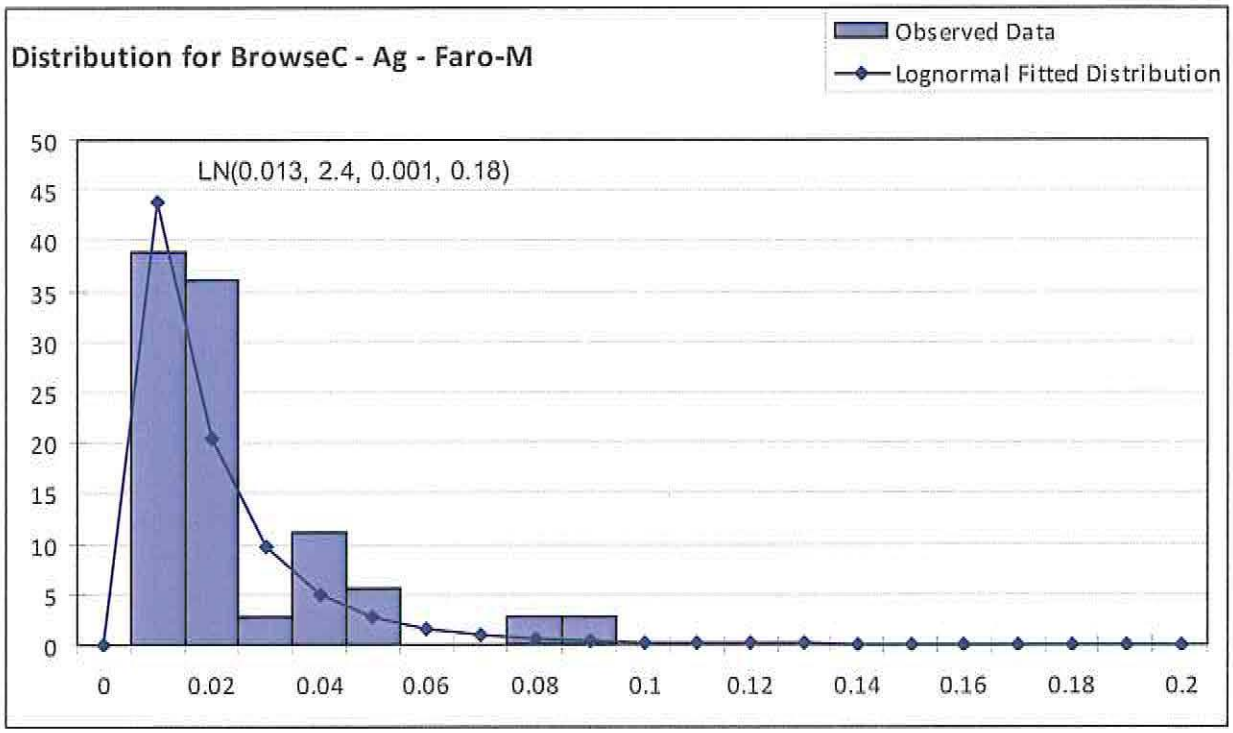

Distribution for BrowseC - Ag - Van-S
Observed Data
Triangular Fitted Distribution
T(0.01, 0.02, 0.03)
0
0.005
0.01
0.015
0.02
0.025
0.03
0.035

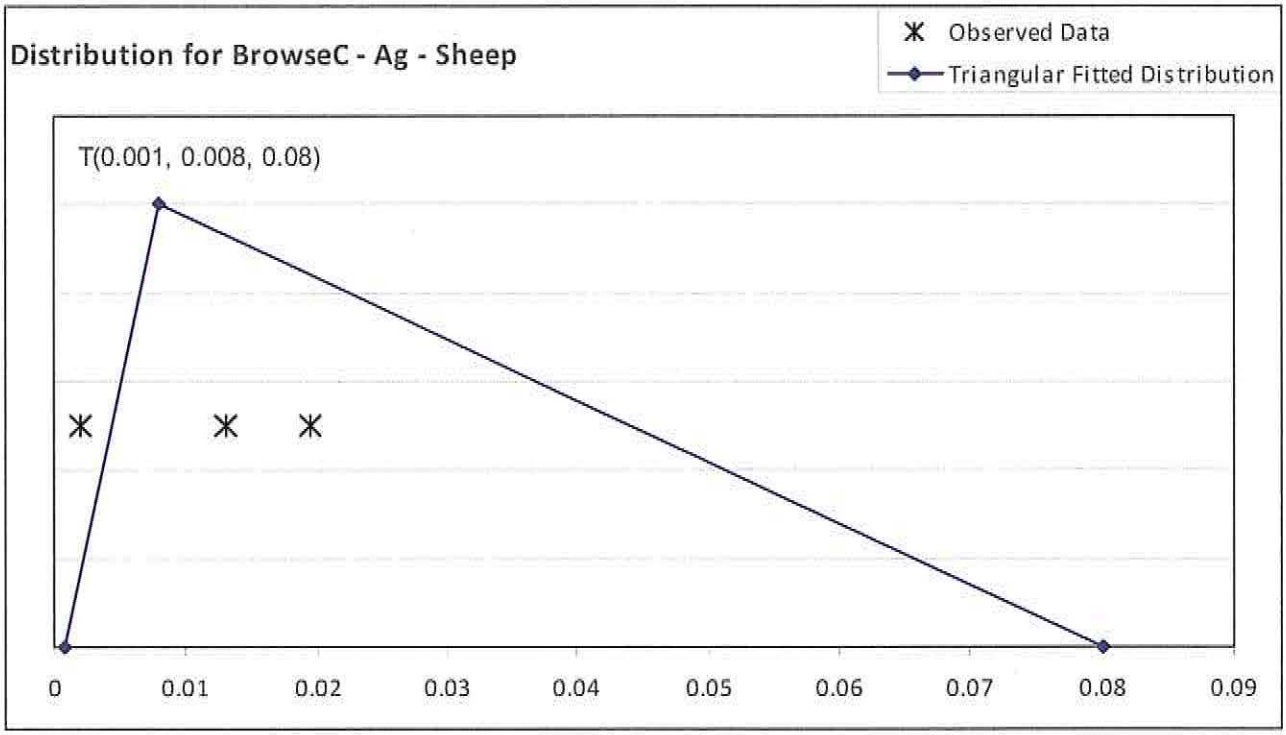

Distribution for BrowseC - Ag - Van-M
Observed Data
Lognormal Fitted Distribution
LN(0.02, 1.8, 0.003, 0.09)
80
70
60
50
40
30
20
10
0
0
0.03
0.06
0.09
0.12


Distribution for BrowseC - Ag - Faro-N
Observed Data
Lognormal Fitted Distribution
LN(0.004, 3, 0.0001, 0.1)
120
100
80
60
40
20
0
0
0.004
0.008
0.012
0.016
0.02
0.024


Distribution for BrowseC - Ag - Faro-S
Observed Data
Lognormal Fitted Distribution
LN(0.02, 2.2, 0.002, 0.19)
45
40
35
30
25
20
15
10
5
0
0
0.02
0.04
0.06
0.08
0.1
0.12
0.14
0.16
0.18
0.2
0.22


Distribution for BrowseC - Ag - Faro-W
Observed Data
Triangular Fitted Distribution
T(0.002, 0.008, 0.014)
0
0.002
0.004
0.006
0.008
0.01
0.012
0.014
0.016

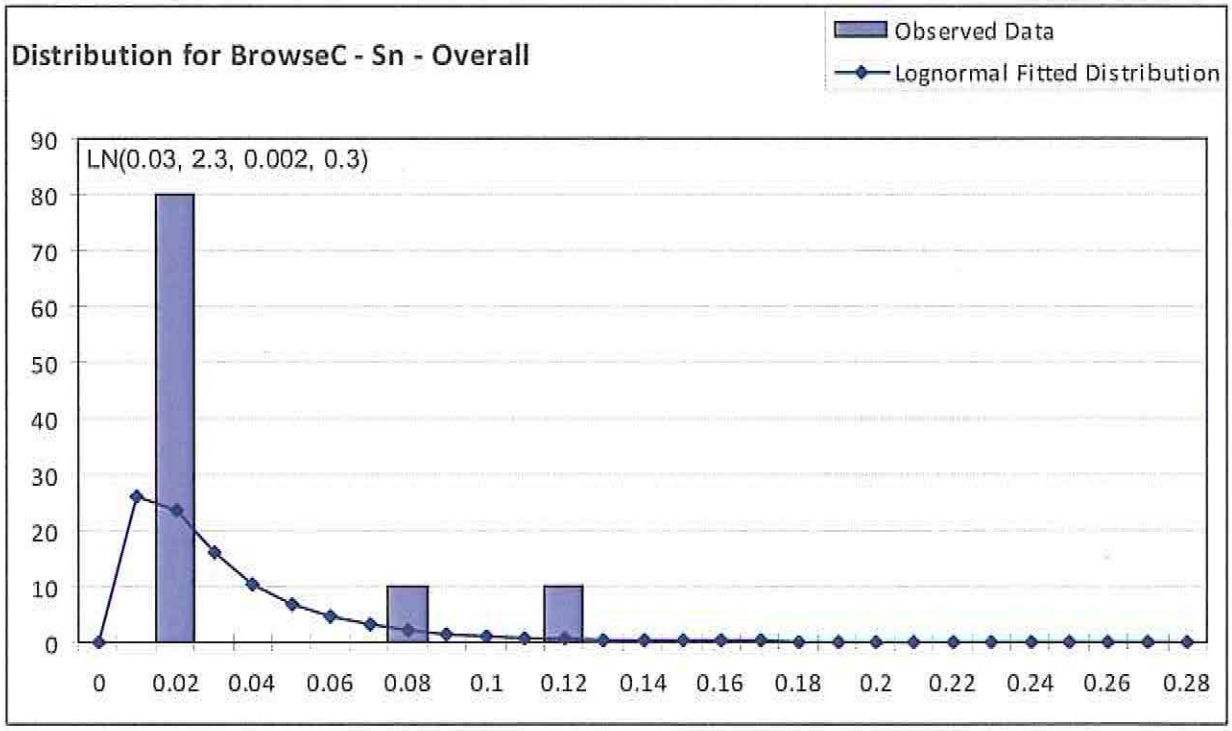

Distribution for BrowseC - Ag - Faro-M
Observed Data
Lognormal Fitted Distribution
LN(0.013, 2.4, 0.001, 0.18)
50
45
40
35
30
25
20
15
10
5
0
0
0.02
0.04
0.06
0.08
0.1
0.12
0.14
0.16
0.18
0.2

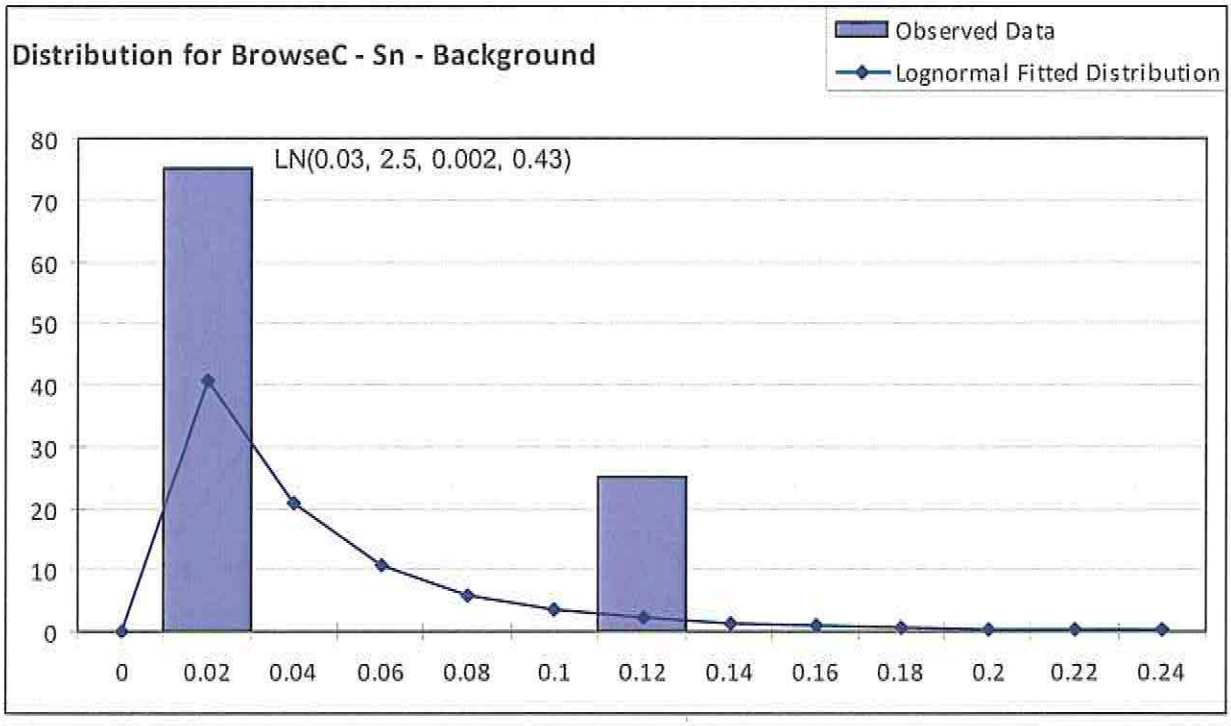


D.5.14 Strontium

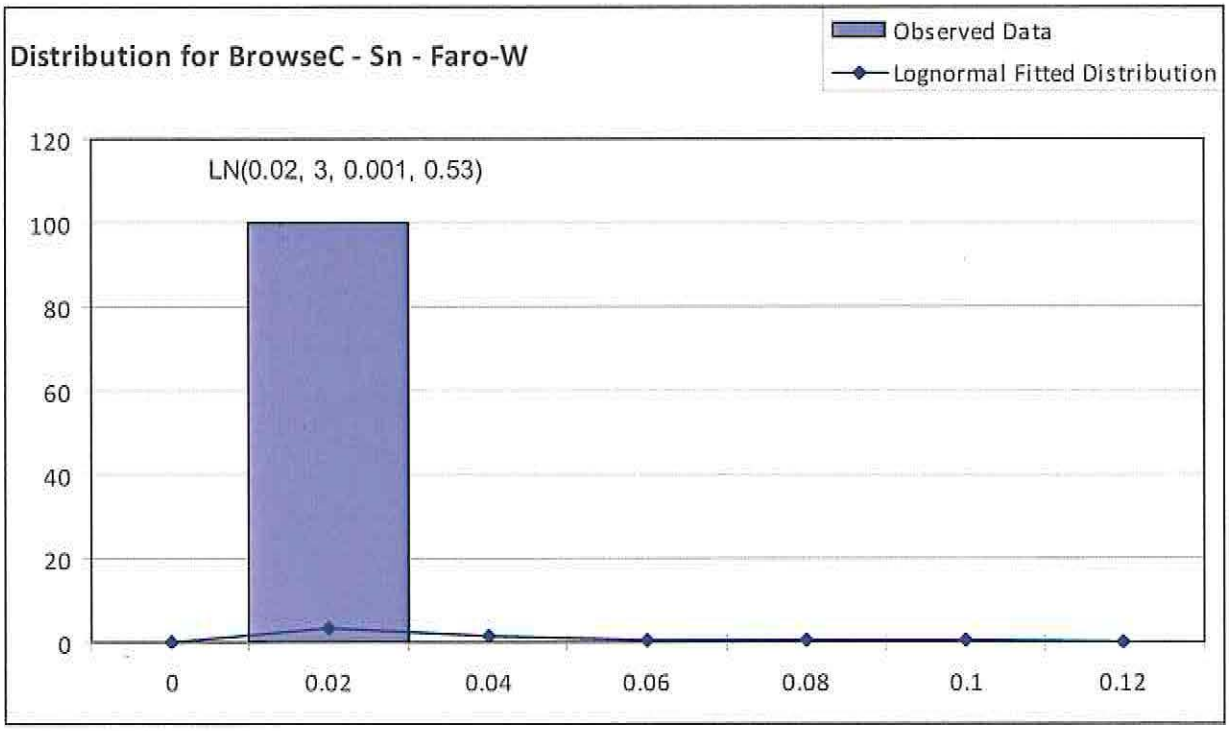
No Strontium data for browse.

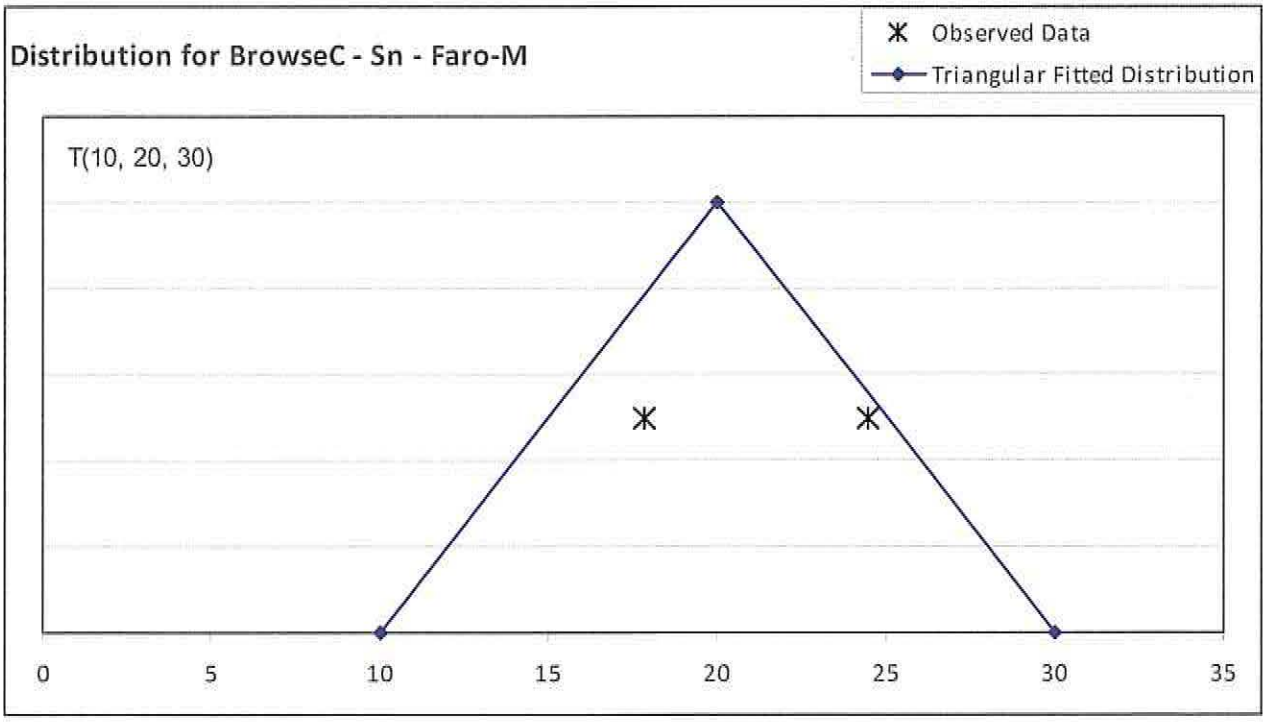
D.5.15 Tin





No Tin data for browse at Van-S, Van-M, Faro-N, Faro-S.

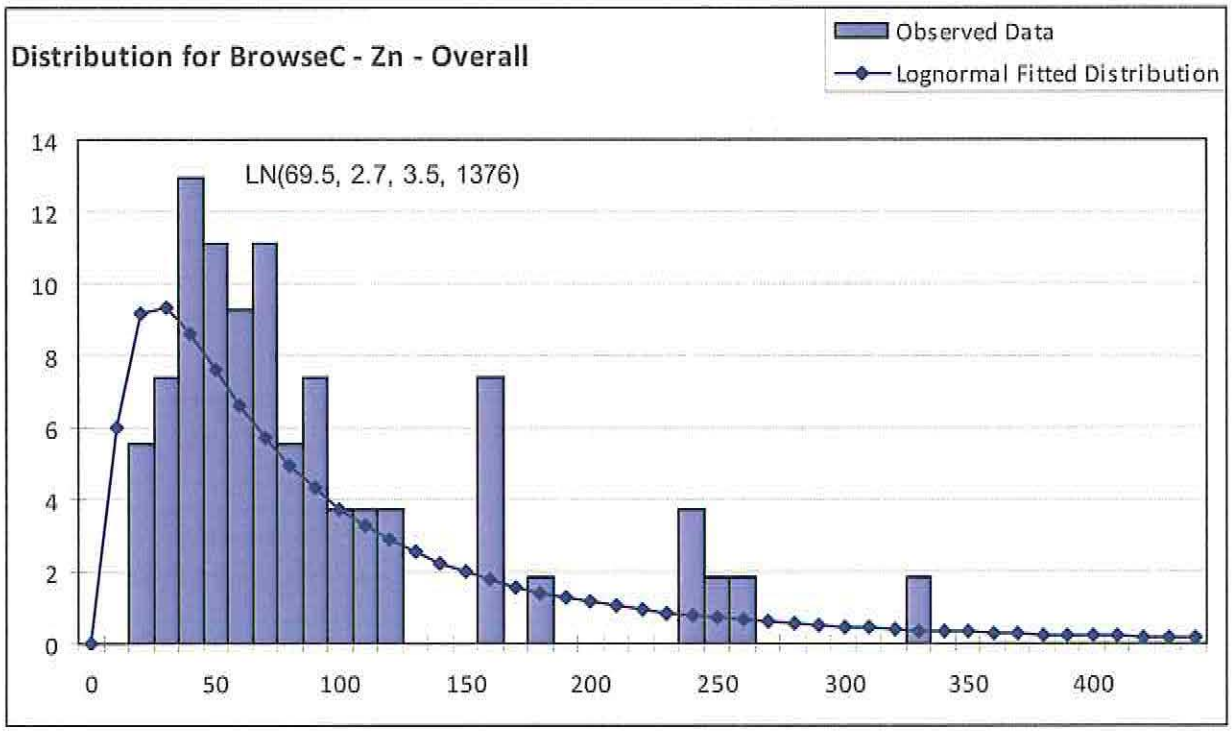


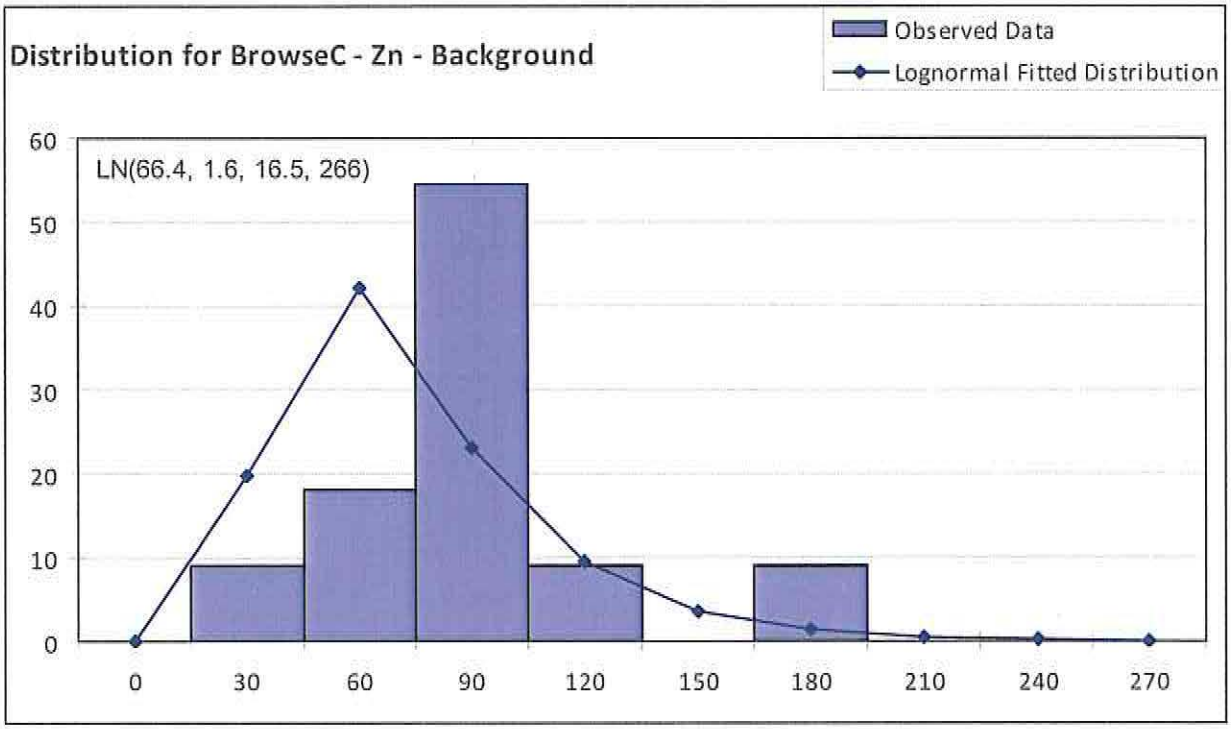


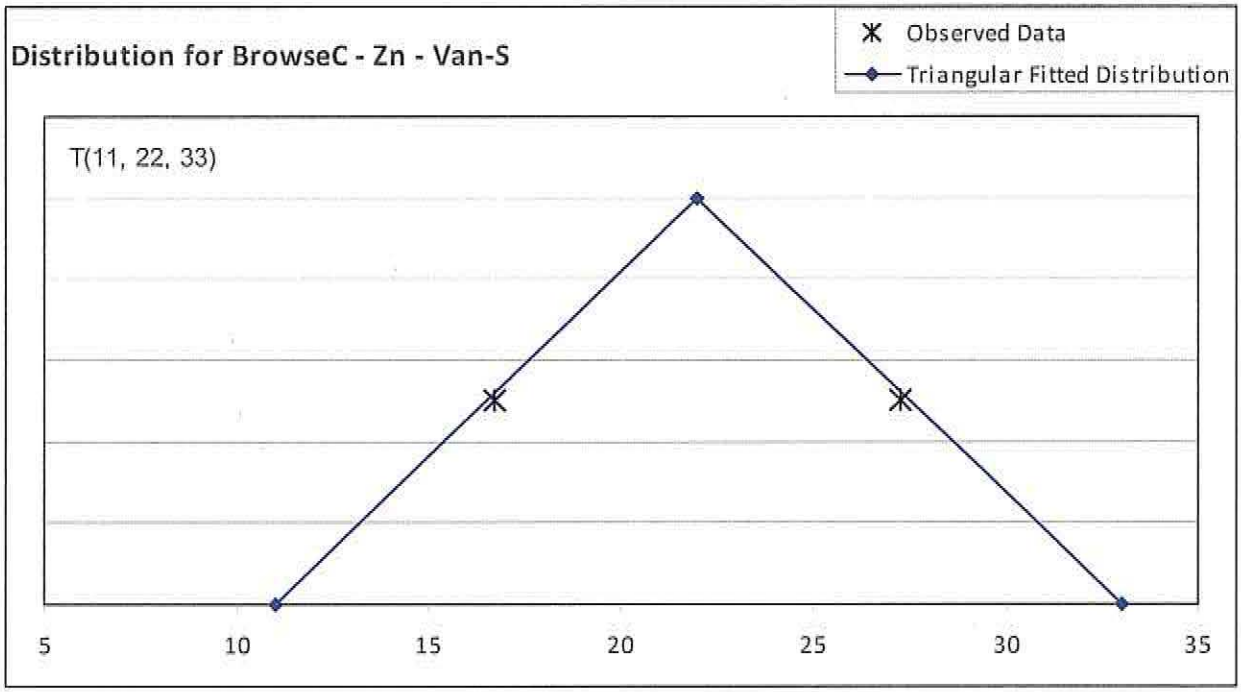
D.5.16 Vanadium

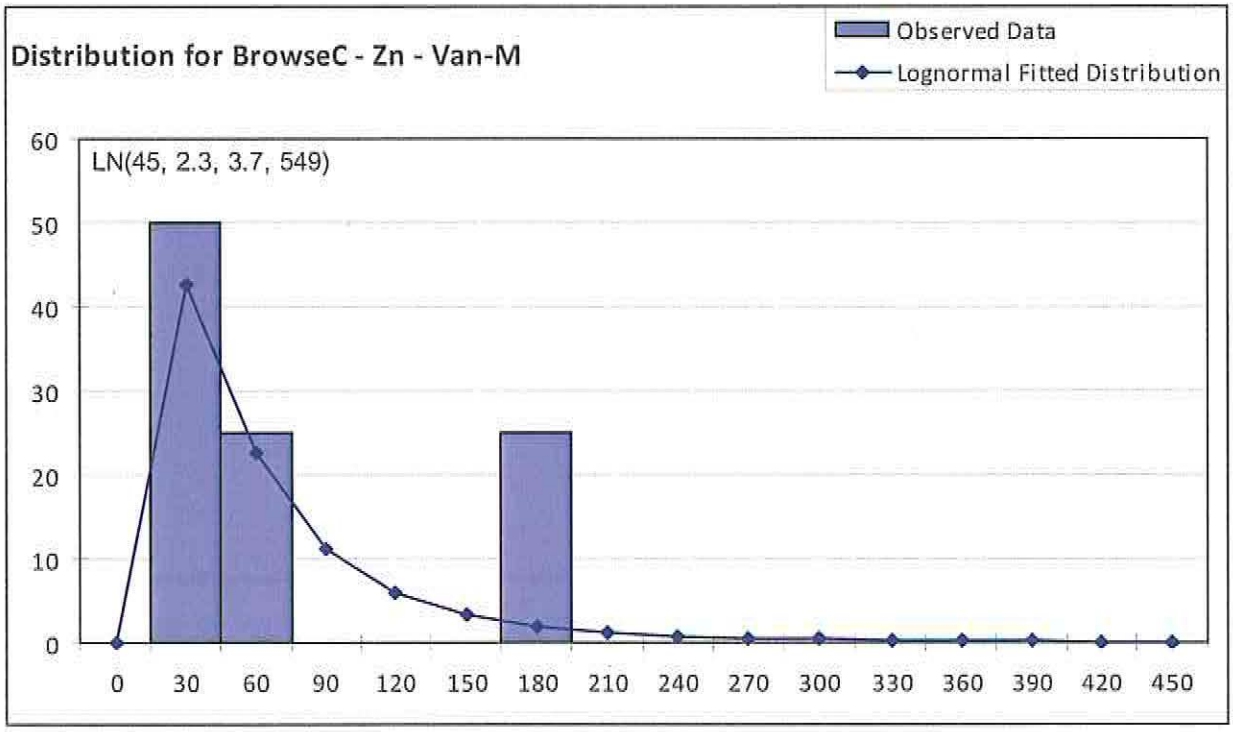
All uniform distributions – U(0, 0.2)
No Vanadium data for browse at Van-S, Van-M, Faro-N, Faro-S.

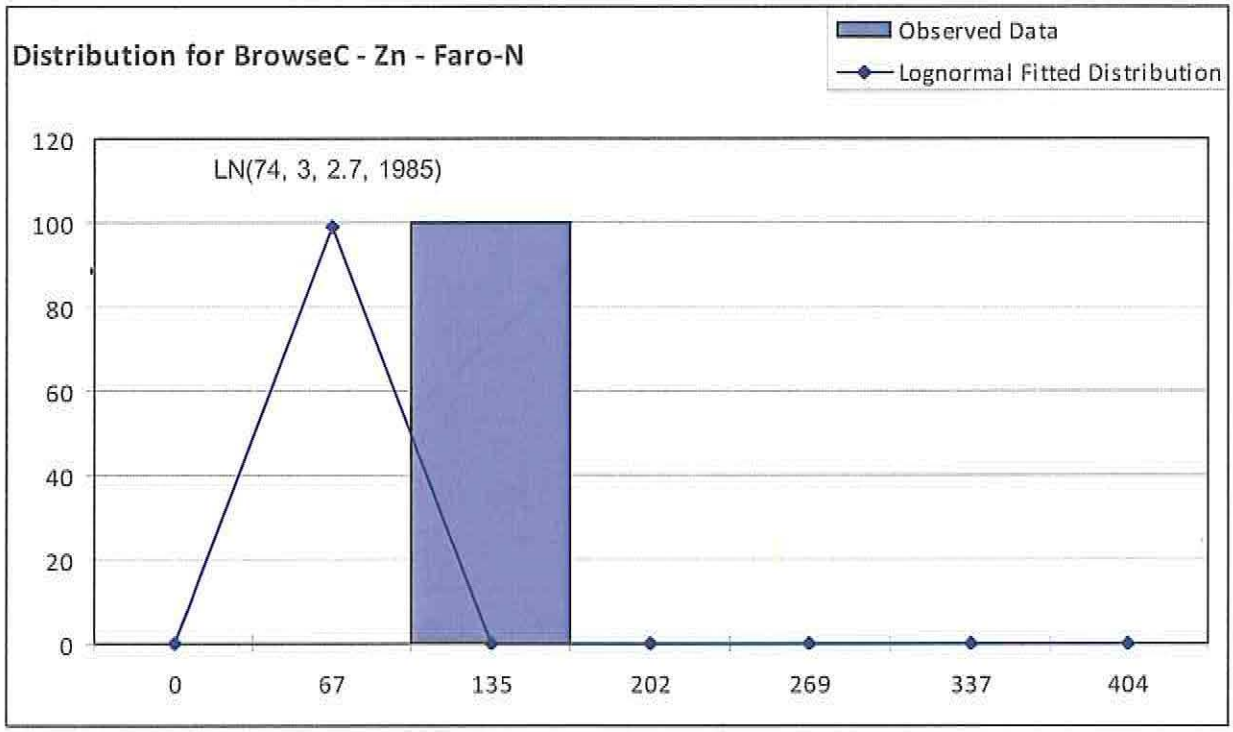
D.5.17 Zinc

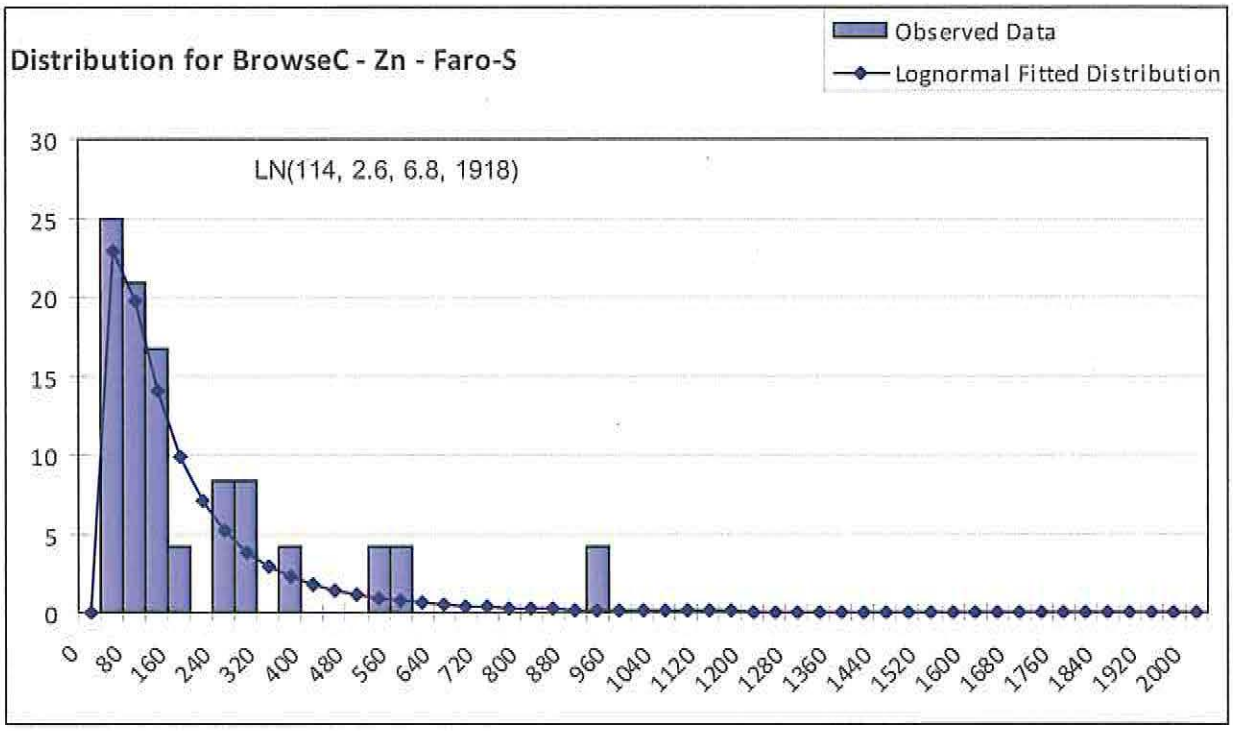


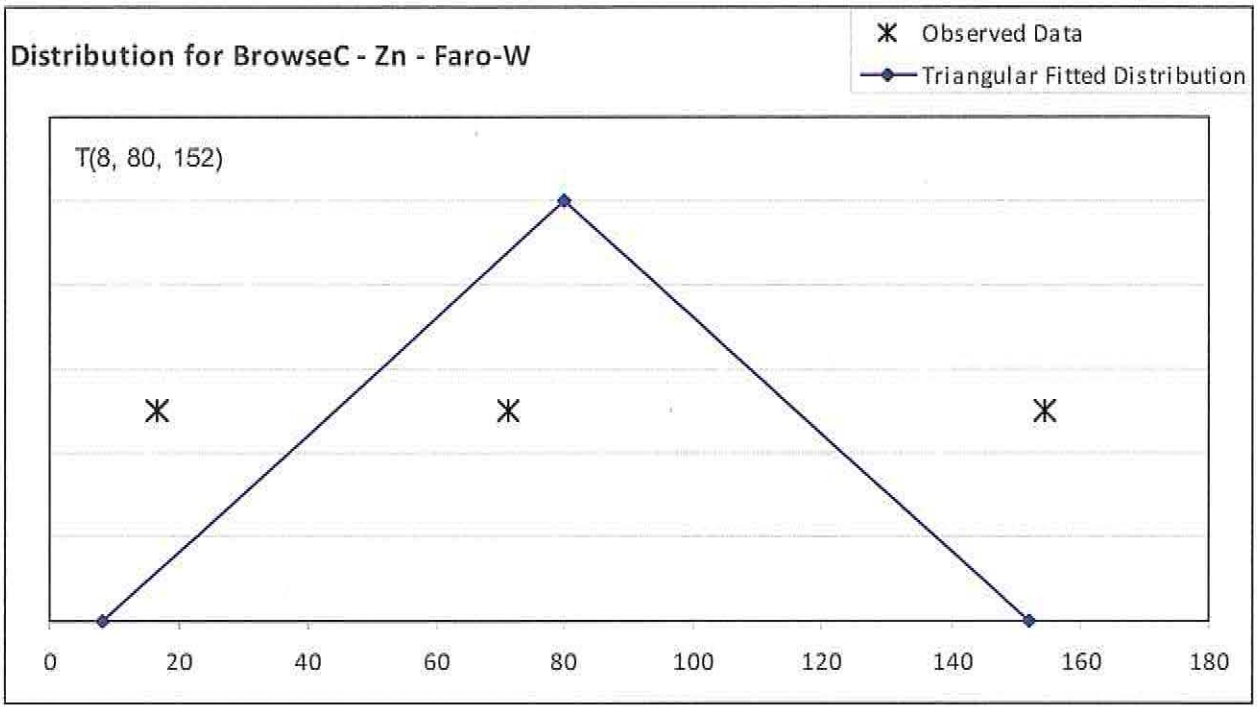

Distribution for BrowseC - Zn - Background
Observed Data
Lognormal Fitted Distribution
LN(66.4, 1.6, 16.5, 266)
60
50
40
30
20
10
0
0
30
60
90
120
150
180
210
240
270

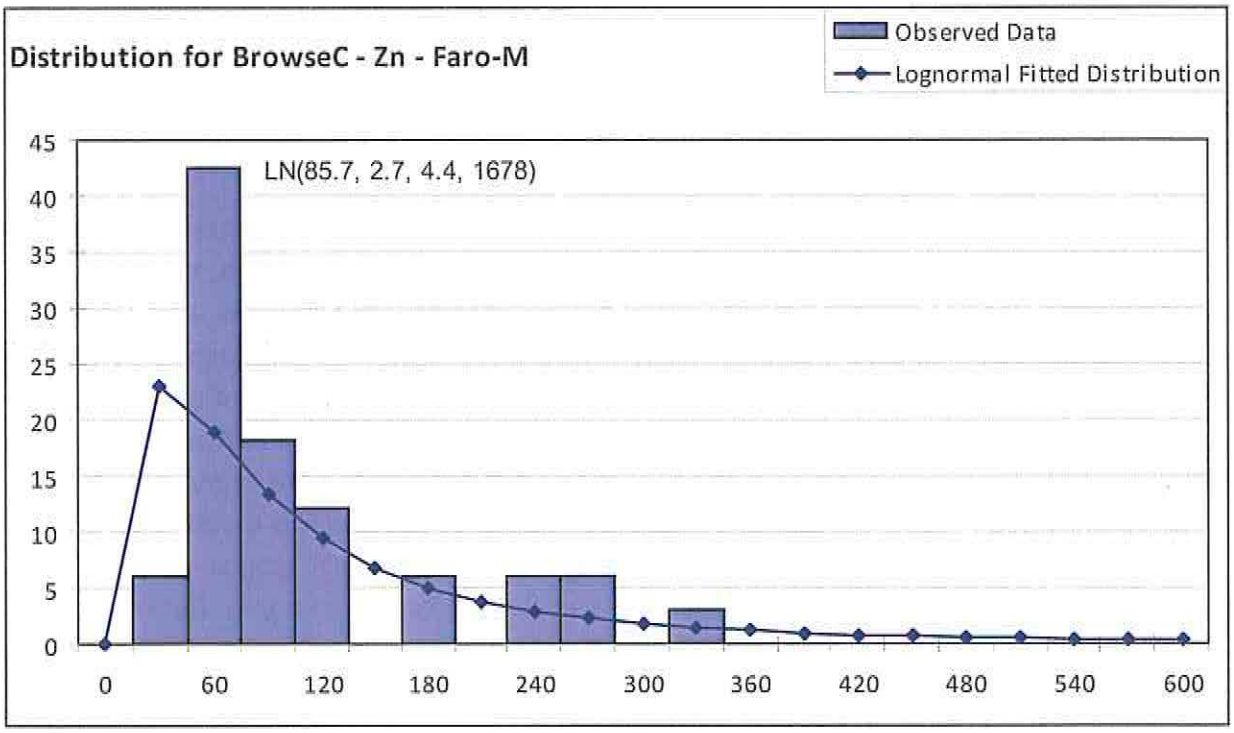

Distribution for BrowseC - Zn - Van-S
Observed Data
Triangular Fitted Distribution
T(11, 22, 33)
5
10
15
20
25
30
35

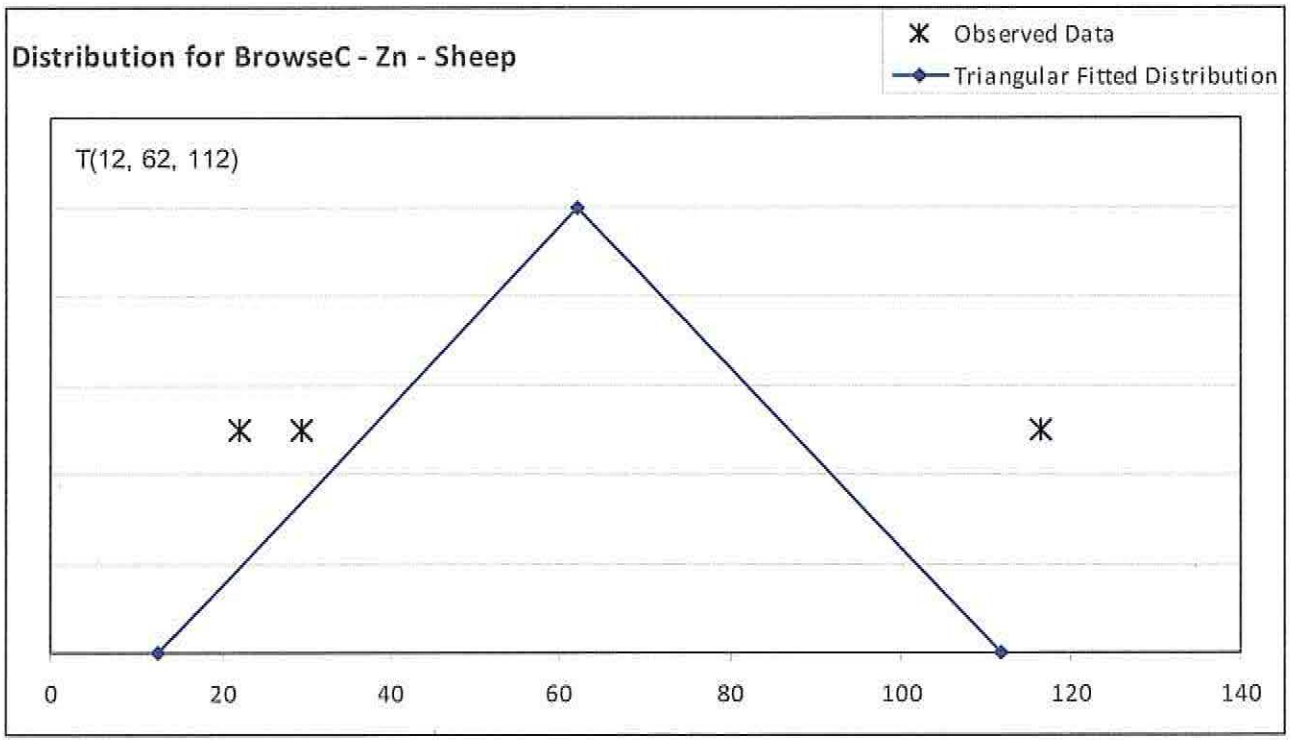

Distribution for BrowseC - Zn - Van-M
Observed Data
Lognormal Fitted Distribution
LN(45, 2.3, 3.7, 549)
60
50
40
30
20
10
0
0
30
60
90
120
150
180
210
240
270
300
330
360
390
420
450


Distribution for BrowseC - Zn - Faro-N
Observed Data
Lognormal Fitted Distribution
LN(74, 3, 2.7, 1985)
120
100
80
60
40
20
0
0
67
135
202
269
337
404


Distribution for BrowseC - Zn - Faro-S
Observed Data
Lognormal Fitted Distribution
LN(114, 2.6, 6.8, 1918)
30
25
20
15
10
5
0
0
80
160
240
320
400
480
560
640
720
800
880
960
1040
1120
1200
1280
1360
1440
1520
1600
1680
1760
1840
1920
2000


Distribution for BrowseC - Zn - Faro-W
Observed Data
Triangular Fitted Distribution
T(8, 80, 152)
0
20
40
60
80
100
120
140
160
180


Distribution for BrowseC - Zn - Faro-M
Observed Data
Lognormal Fitted Distribution
LN(85.7, 2.7, 4.4, 1678)
45
40
35
30
25
20
15
10
5
0
0
60
120
180
240
300
360
420
480
540
600


Distribution for BrowseC - Zn - Sheep
Observed Data
Triangular Fitted Distribution
T(12, 62, 112)
0
20
40
60
80
100
120
140

D.6 MEASURED FORAGE CONCENTRATIONS

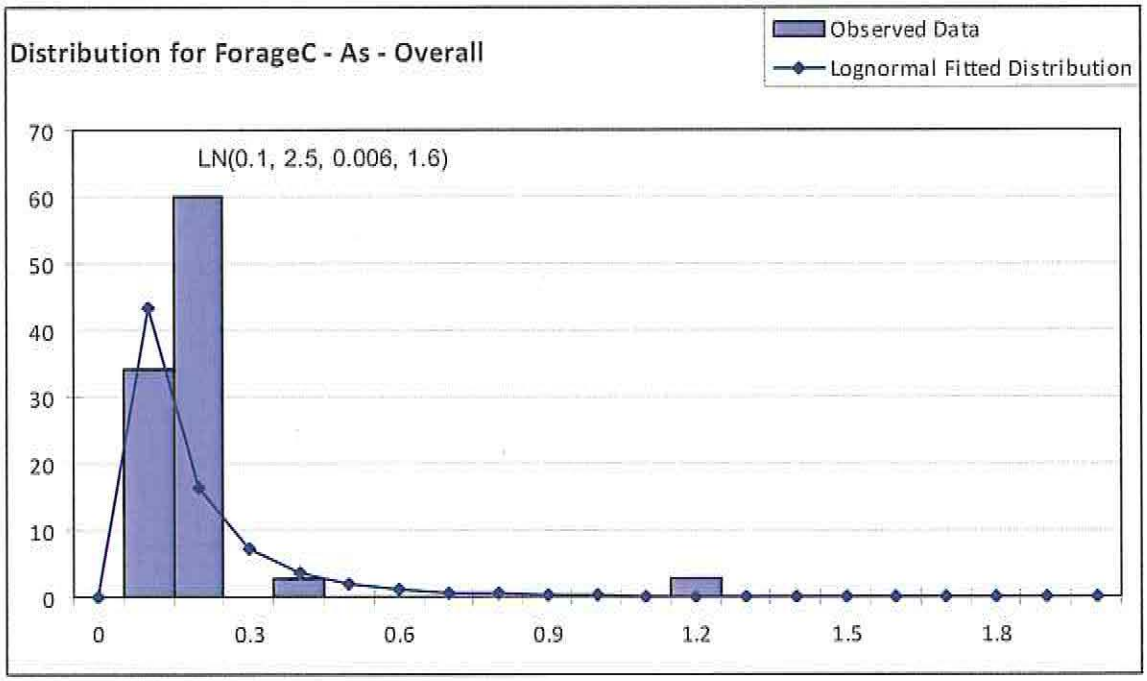
Measured concentrations (mg/kg (dw) converted to mg/kg (ww) using an average moisture content of 64.7%) in various types of vegetation from the Faro Mine Complex were presented in the previous assessment (SENES, 2006, Section 2.3. 2, Project No. 33798).

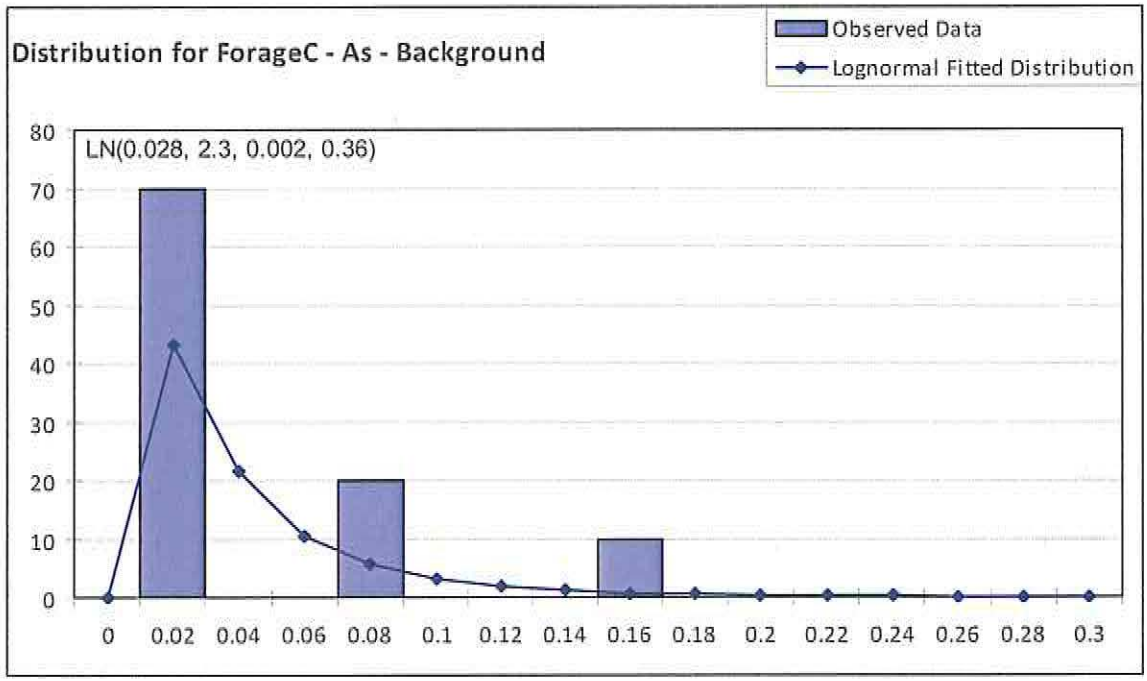
The data were fit to either lognormal, triangular or uniform distributions. Lognormal distributions are defined by the geometric mean, geometric standard deviation, minimum value, and maximum value. In the case of only one value, an assumed GSD of 3 was used. When two to four values were available, triangular distributions were applied with the mode equal to the measured value and an assumed range of an order of magnitude was assumed on either side of the site data to represent the minimum and maximum values in the absence of other data. Uniform distributions were applied in the case of measured concentrations reported as less than the detection limit. The minimum and maximum values of the uniform distribution were set equal to 0 and the detection limit, respectively. The following graphs summarize the distributions (line graph) as compared with the available data (bar graph) for each COPC. Graphs are not provided for uniform distributions. The development of distributions for vegetation concentrations was limited by the data available.

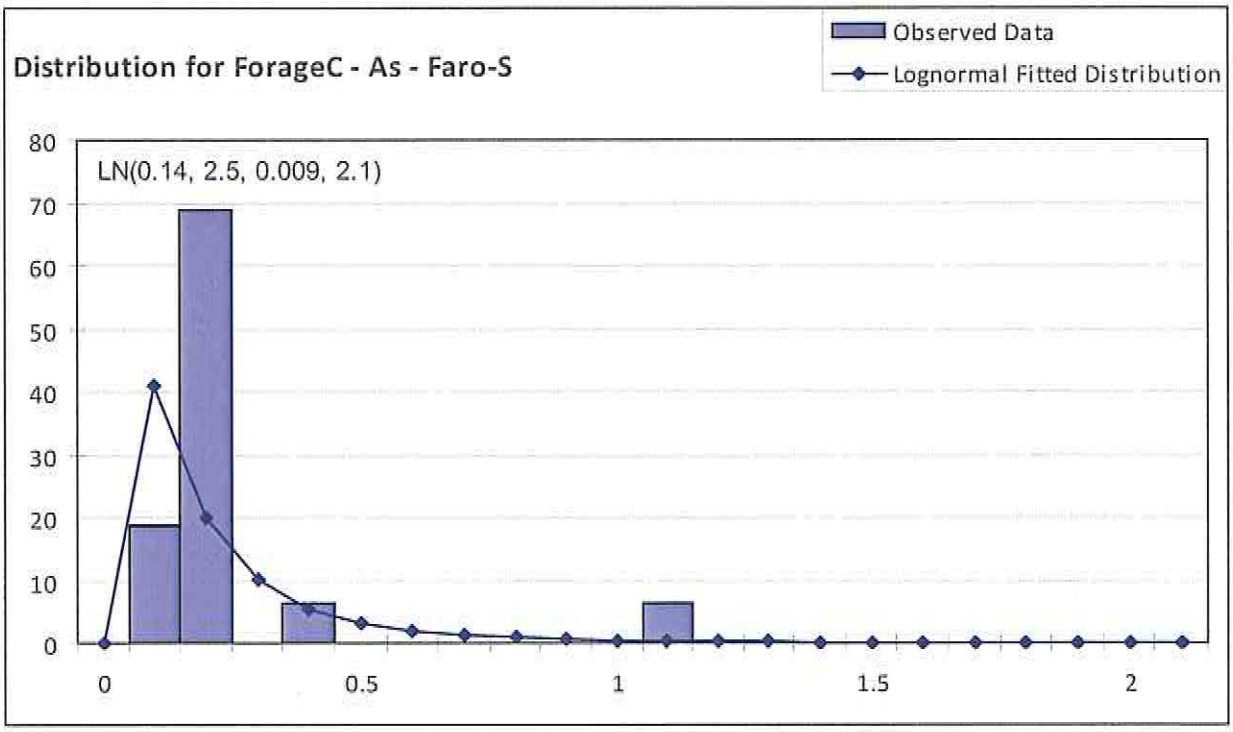
D.6.1 Antimony

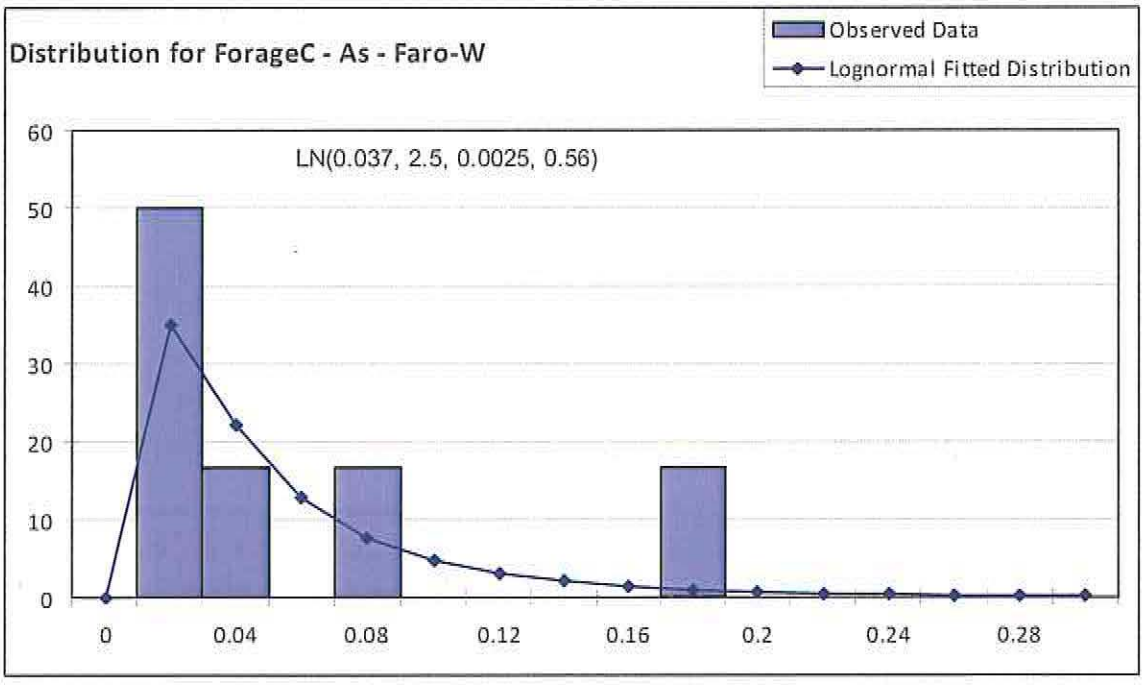
All uniform distributions – U(0, 0.04)

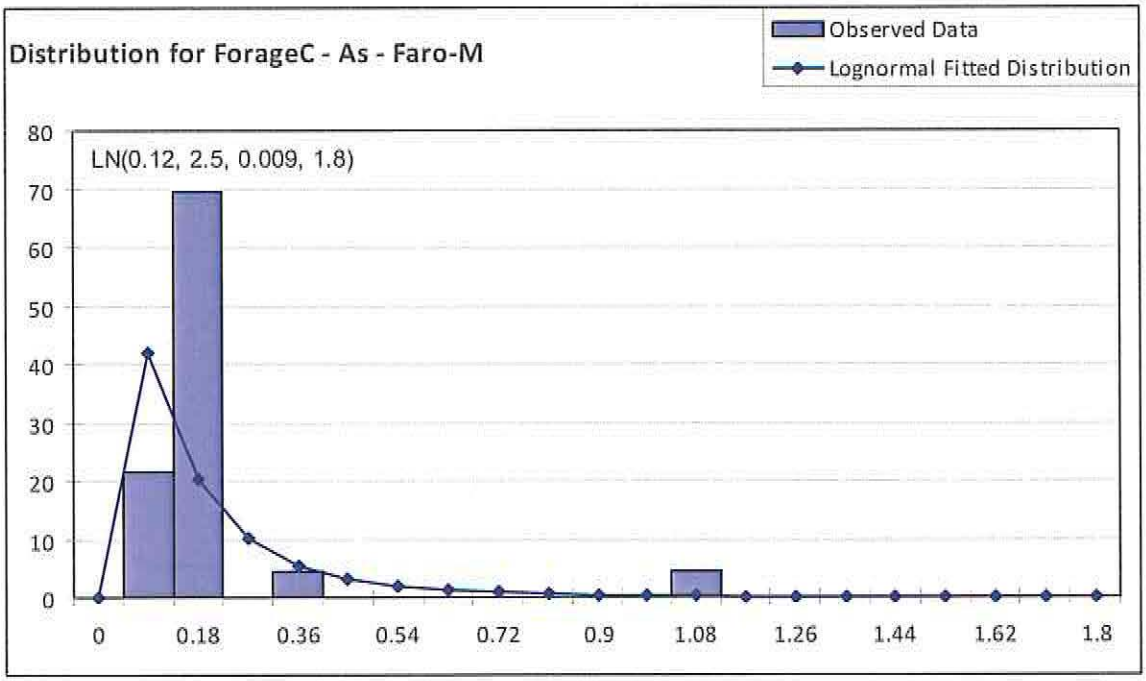
D.6.2 Arsenic


Distribution for ForageC - As - Overall
Observed Data
Lognormal Fitted Distribution
LN(0.1, 2.5, 0.006, 1.6)
70
60
50
40
30
20
10
0
0
0.3
0.6
0.9
1.2
1.5
1.8

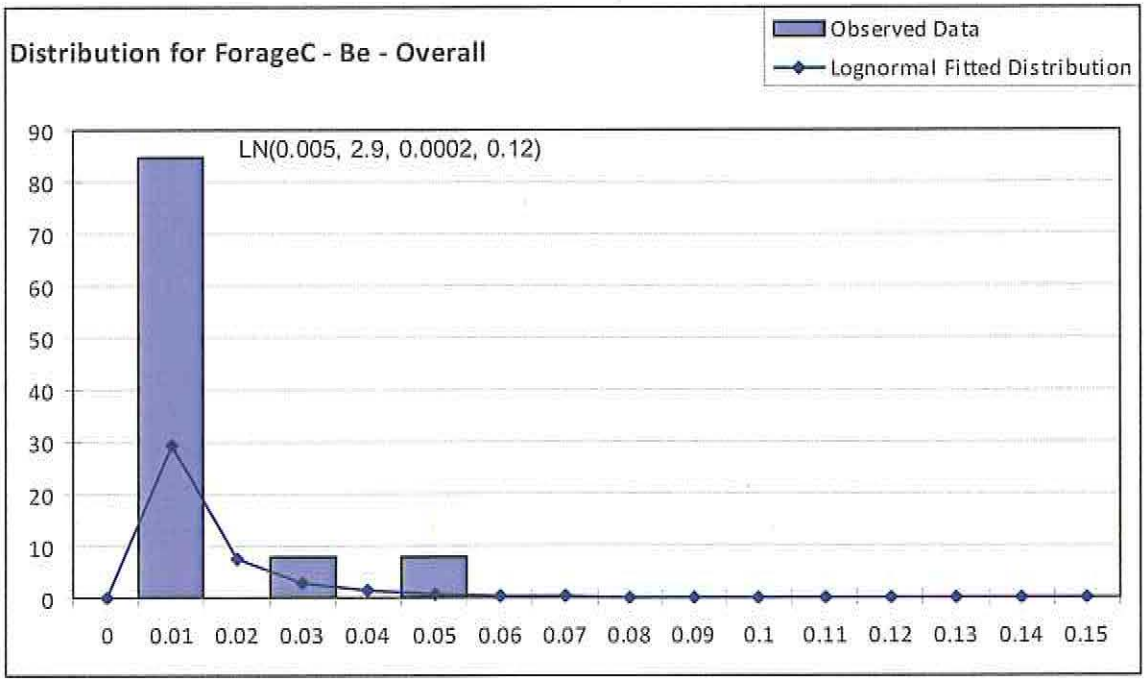

Distribution for ForageC - As - Background
Observed Data
Lognormal Fitted Distribution
LN(0.028, 2.3, 0.002, 0.36)
80
70
60
50
40
30
20
10
0
0
0.02
0.04
0.06
0.08
0.1
0.12
0.14
0.16
0.18
0.2
0.22
0.24
0.26
0.28
0.3

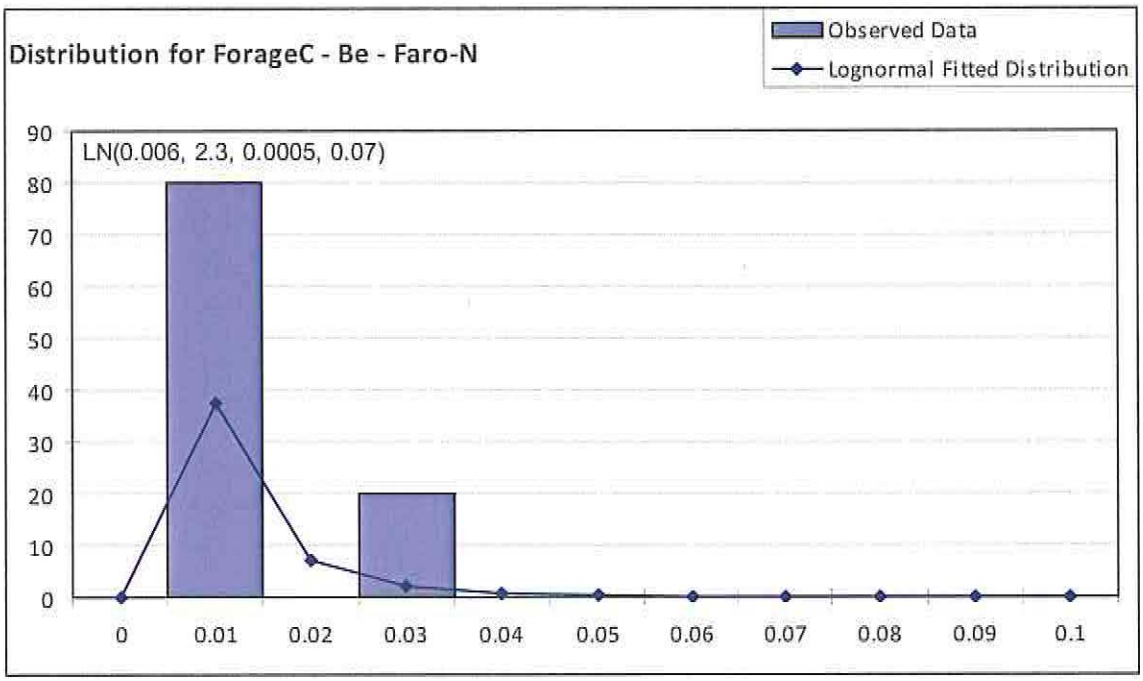

Distribution for ForageC - As - Faro-S
Observed Data
Lognormal Fitted Distribution
LN(0.14, 2.5, 0.009, 2.1)
80
70
60
50
40
30
20
10
0
0
0.5
1
1.5
2

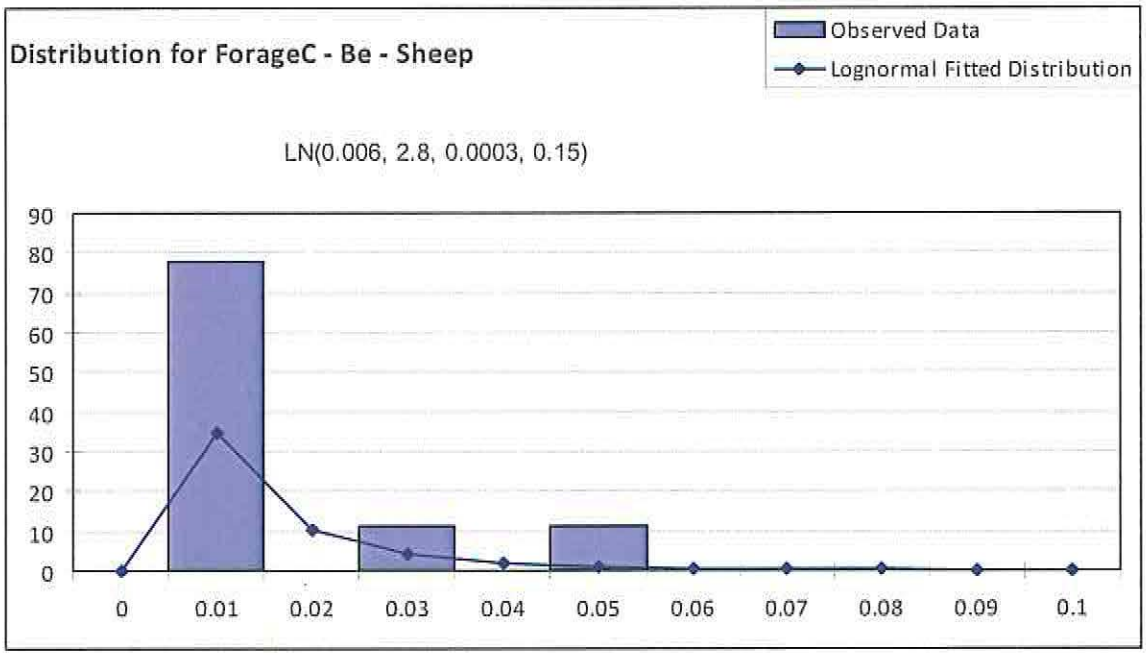

Distribution for ForageC - As - Faro-W
Observed Data
Lognormal Fitted Distribution
LN(0.037, 2.5, 0.0025, 0.56)
60
50
40
30
20
10
0
0
0.04
0.08
0.12
0.16
0.2
0.24
0.28



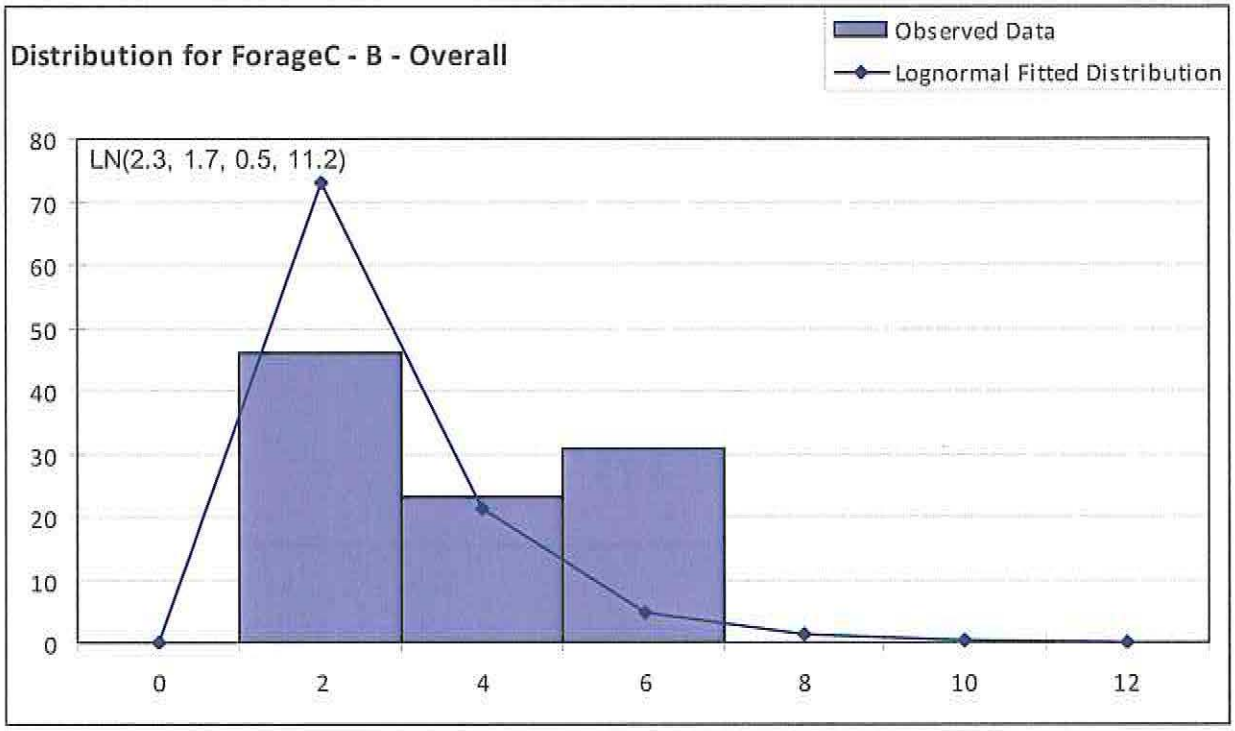
D.6.3 Beryllium

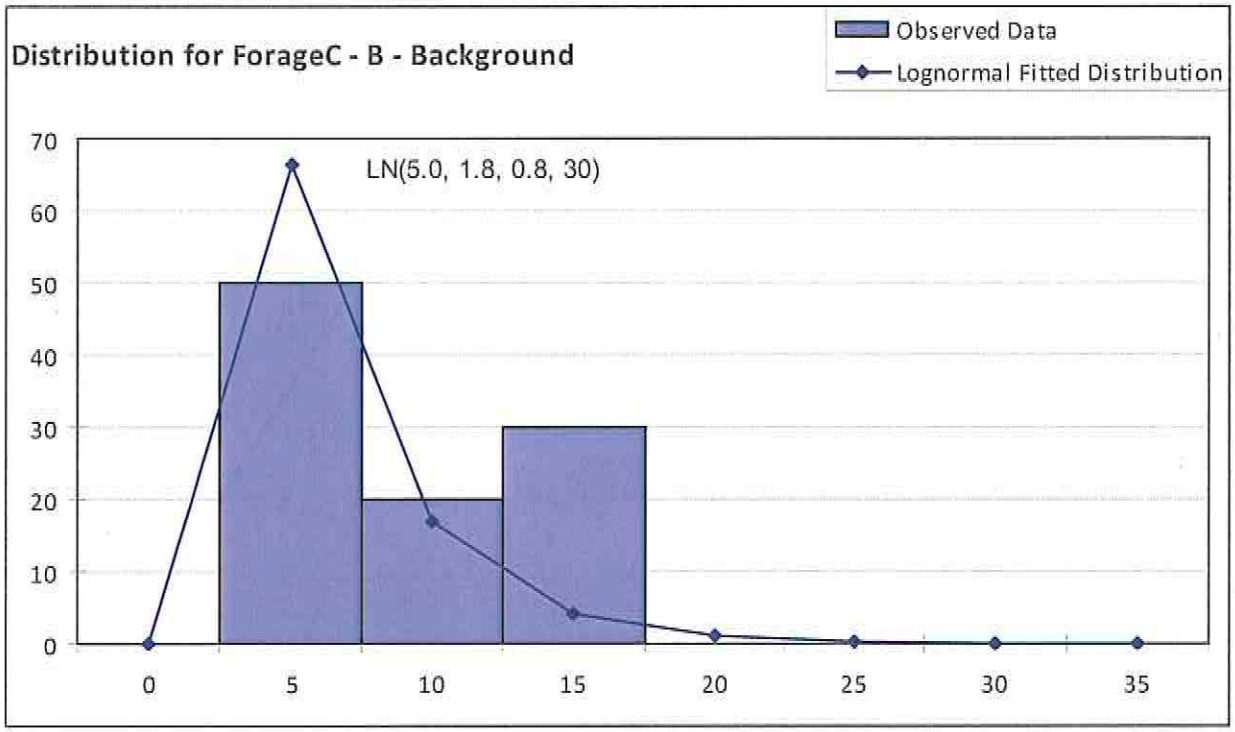


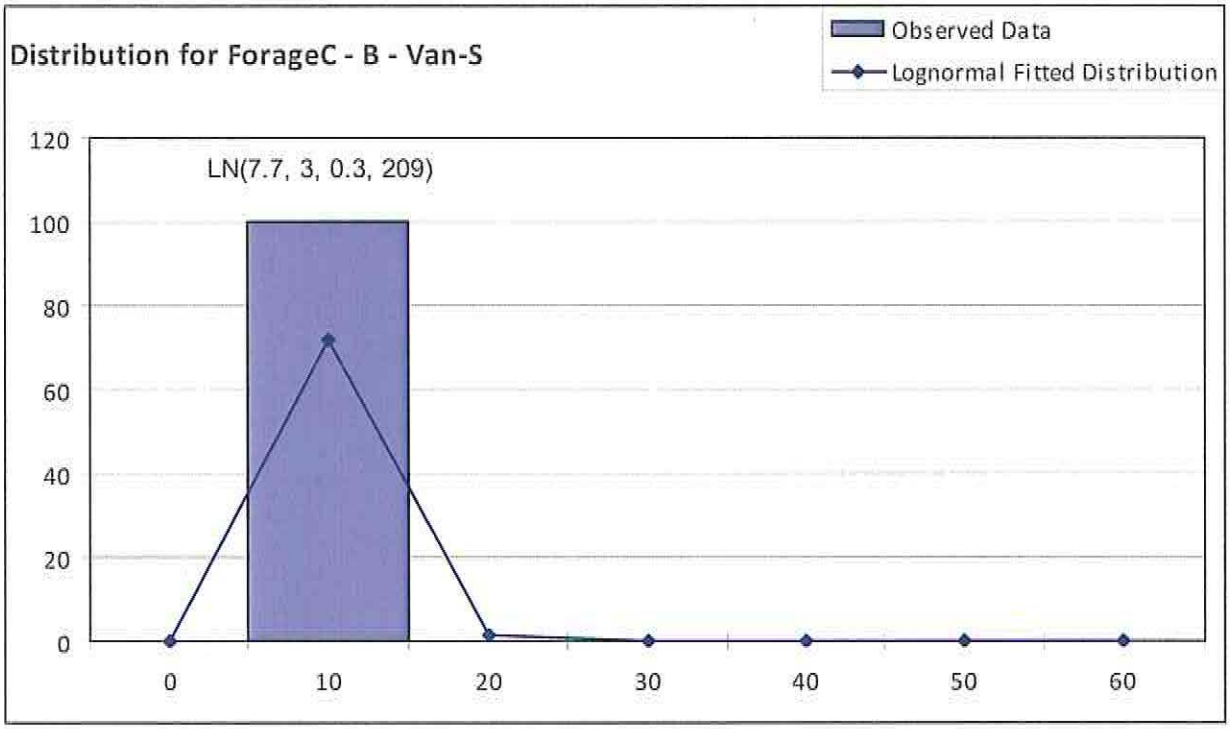

Distribution for ForageC - Be - Faro-N
Observed Data
Lognormal Fitted Distribution
LN(0.006, 2.3, 0.0005, 0.07)
90
80
70
60
50
40
30
20
10
0
0
0.01
0.02
0.03
0.04
0.05
0.06
0.07
0.08
0.09
0.1

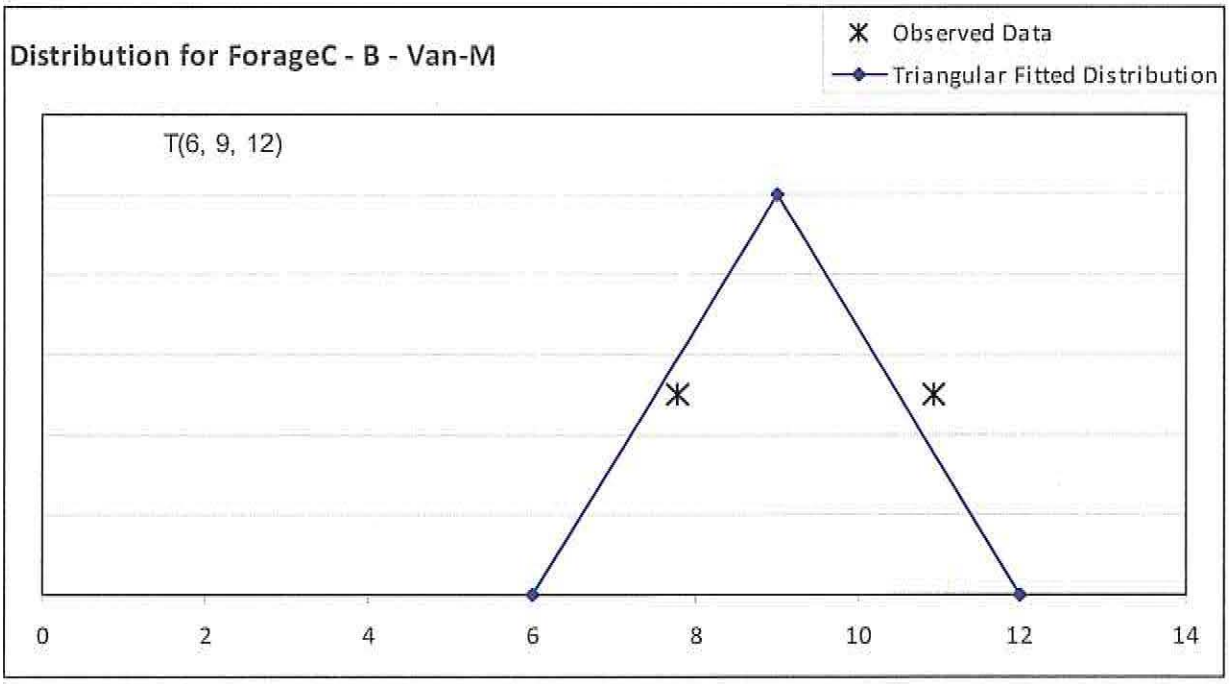

Distribution for ForageC - Be - Sheep
Observed Data
Lognormal Fitted Distribution
LN(0.006, 2.8, 0.0003, 0.15)
90
80
70
60
50
40
30
20
10
0
0
0.01
0.02
0.03
0.04
0.05
0.06
0.07
0.08
0.09
0.1

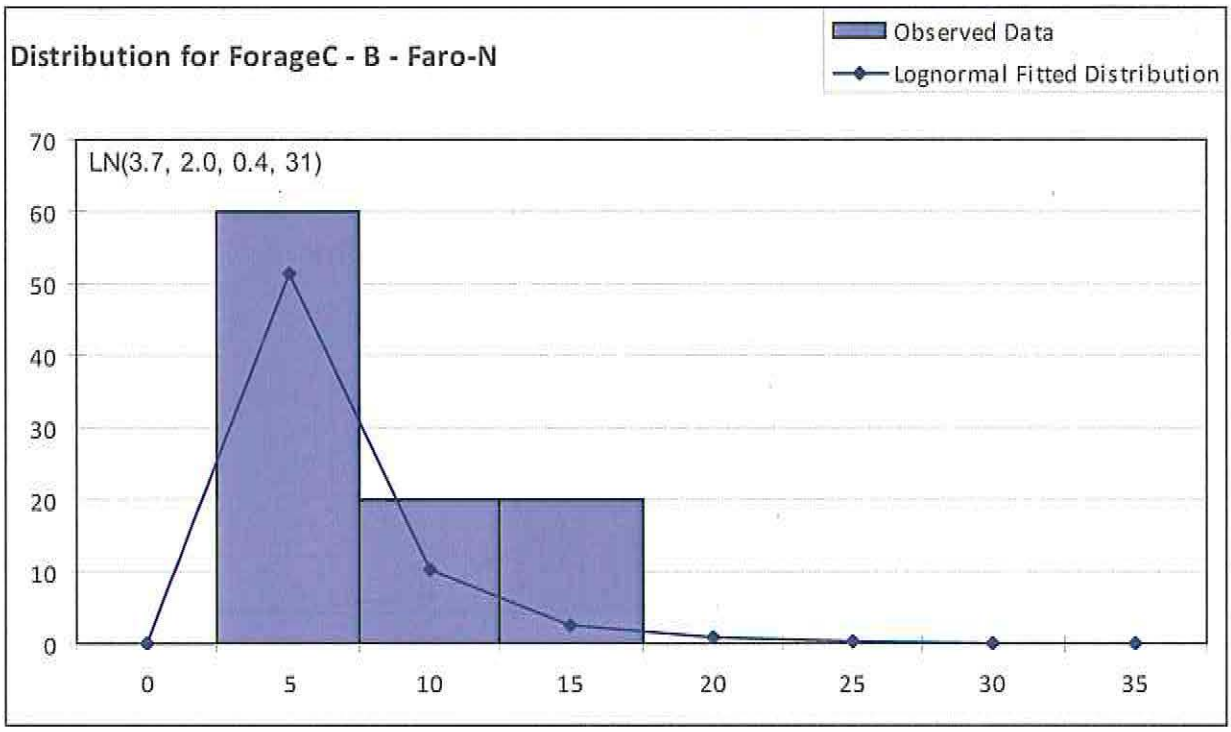
D.6.4 Boron

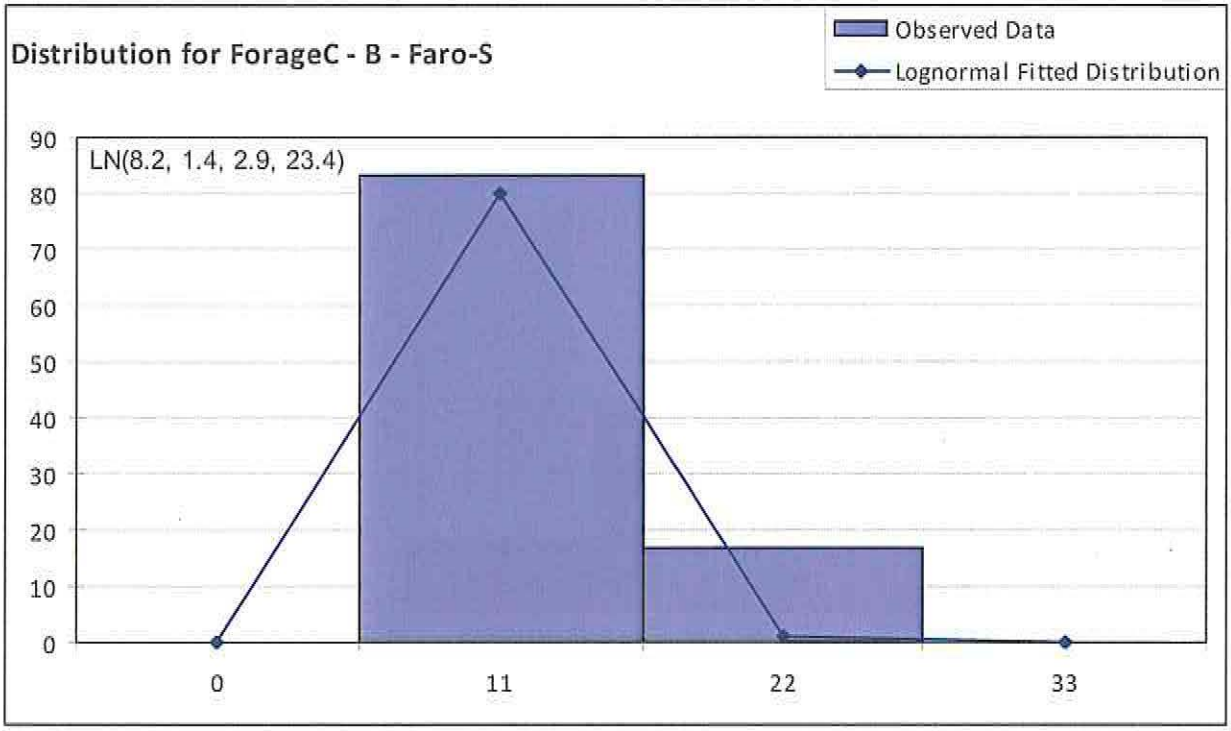

Distribution for ForageC - B - Overall
Observed Data
Lognormal Fitted Distribution
LN(2.3, 1.7, 0.5, 11.2)
80
70
60
50
40
30
20
10
0
0
2
4
6
8
10
12

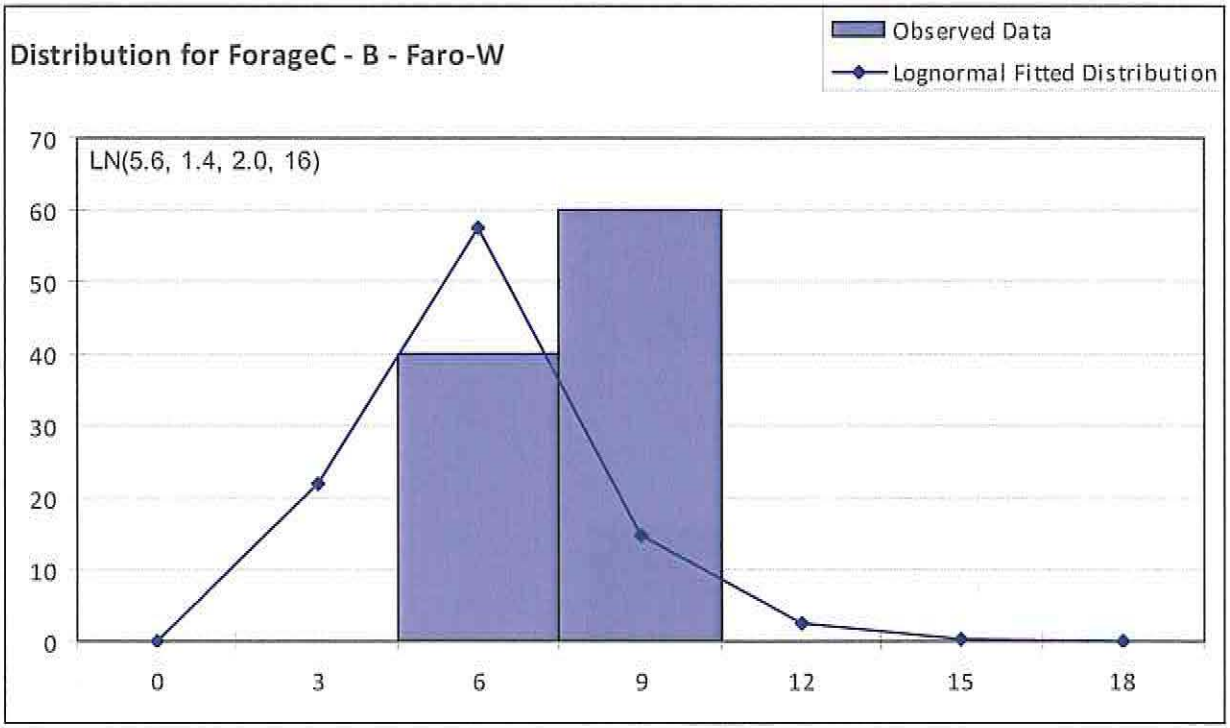

Distribution for ForageC - B - Background
Observed Data
Lognormal Fitted Distribution
LN(5.0, 1.8, 0.8, 30)
70
60
50
40
30
20
10
0
0
5
10
15
20
25
30
35

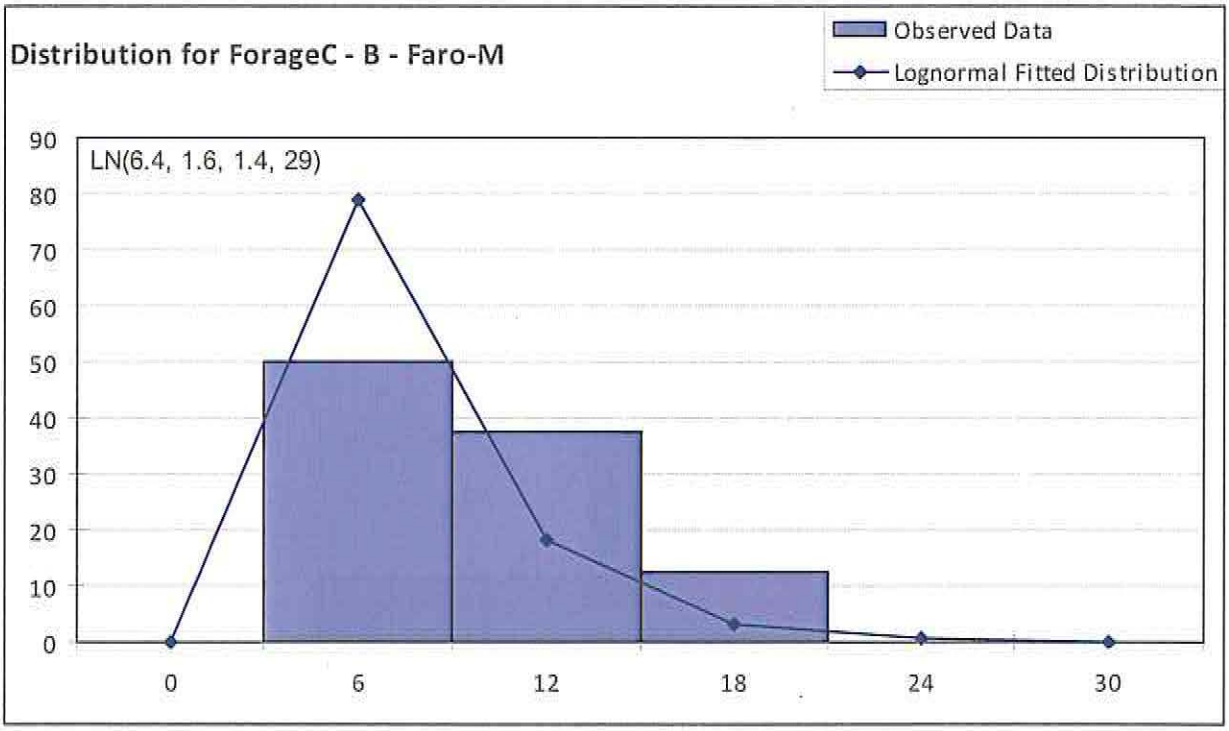

Distribution for ForageC - B - Van-S
Observed Data
Lognormal Fitted Distribution
LN(7.7, 3, 0.3, 209)
120
100
80
60
40
20
0
0
10
20
30
40
50
60

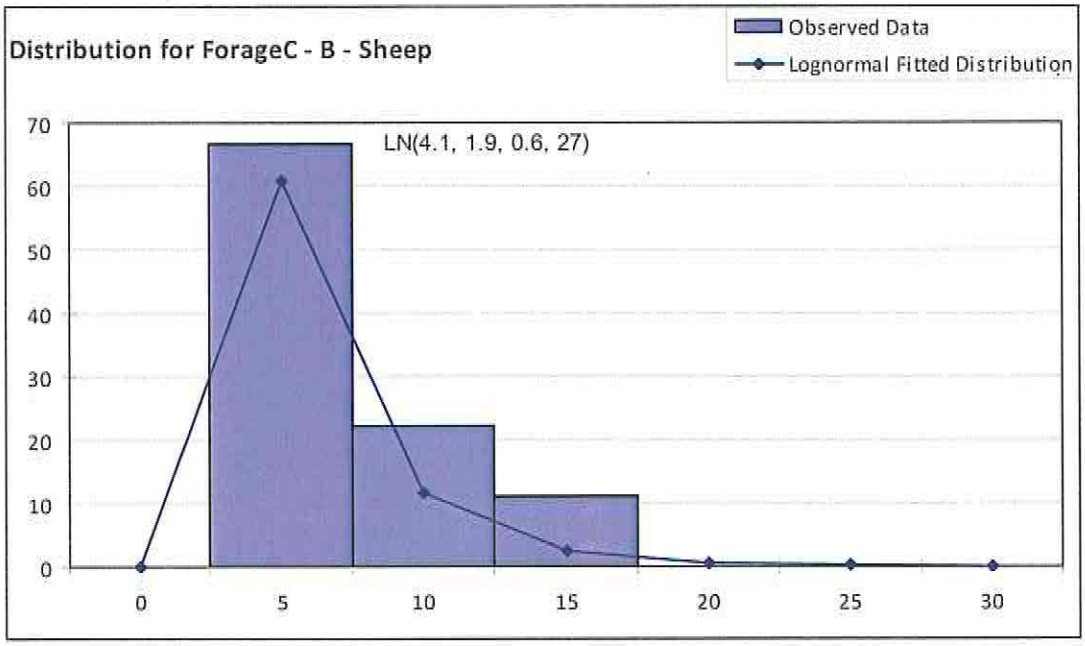

Distribution for ForageC - B - Van-M
Observed Data
Triangular Fitted Distribution
T(6, 9, 12)
0
2
4
6
8
10
12
14


Distribution for ForageC - B - Faro-N
Observed Data
Lognormal Fitted Distribution
LN(3.7, 2.0, 0.4, 31)
70
60
50
40
30
20
10
0
0
5
10
15
20
25
30
35

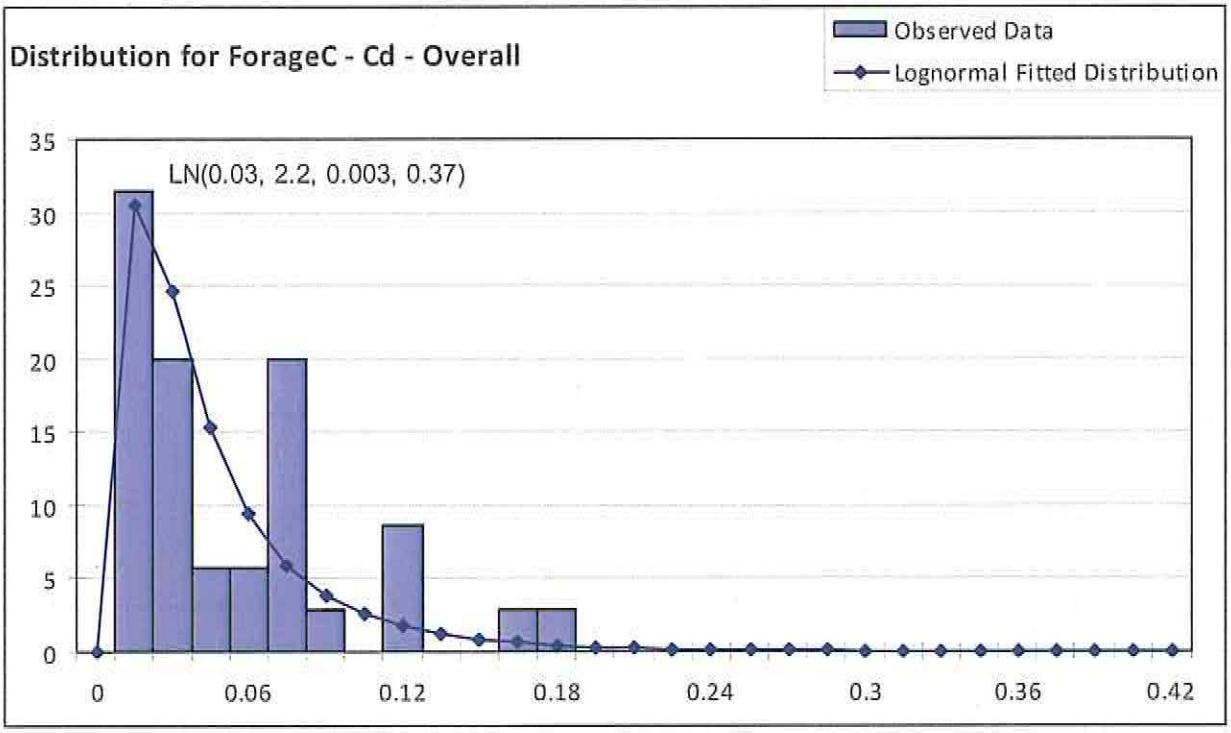

Distribution for ForageC - B - Faro-S
Observed Data
Lognormal Fitted Distribution
LN(8.2, 1.4, 2.9, 23.4)
90
80
70
60
50
40
30
20
10
0
0
11
22
33

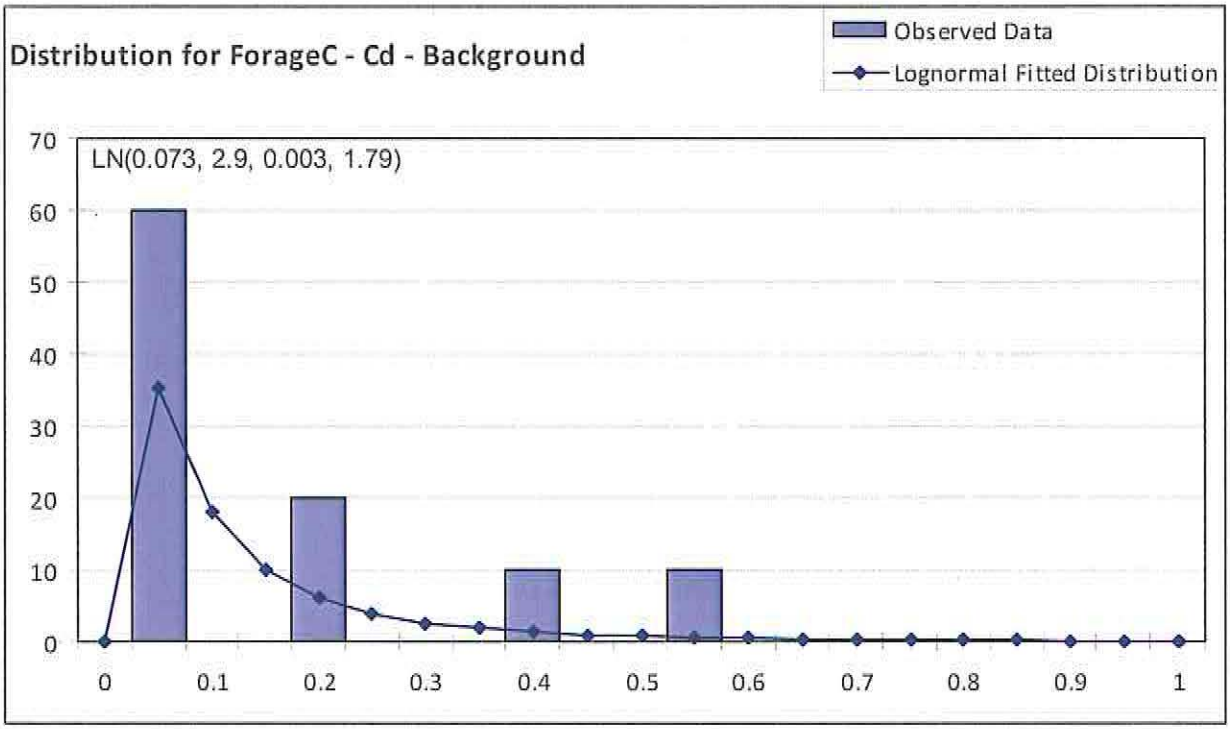

Distribution for ForageC - B - Faro-W
Observed Data
Lognormal Fitted Distribution
LN(5.6, 1.4, 2.0, 16)
70
60
50
40
30
20
10
0
0
3
6
9
12
15
18

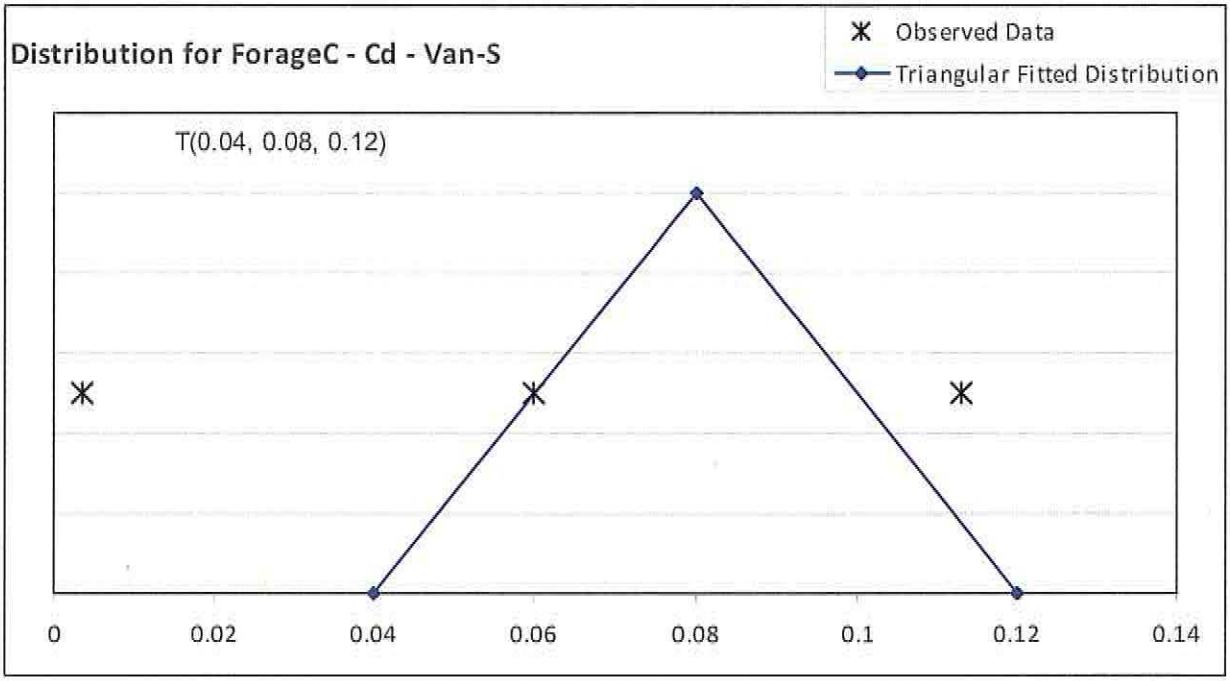

Distribution for ForageC - B - Faro-M
Observed Data
Lognormal Fitted Distribution
LN(6.4, 1.6, 1.4, 29)
90
80
70
60
50
40
30
20
10
0
0
6
12
18
24
30

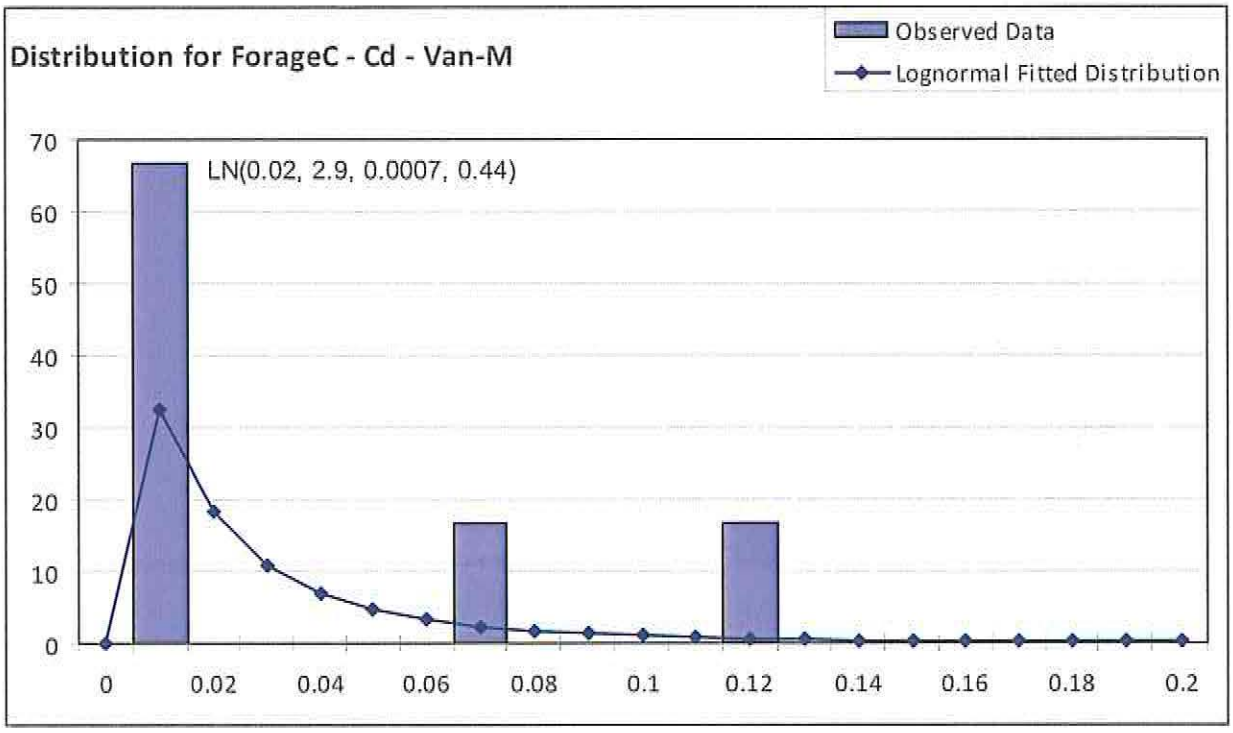

Distribution for ForageC - B - Sheep
Observed Data
Lognormal Fitted Distribution
LN(4.1, 1.9, 0.6, 27)
70
60
50
40
30
20
10
0
0
5
10
15
20
25
30

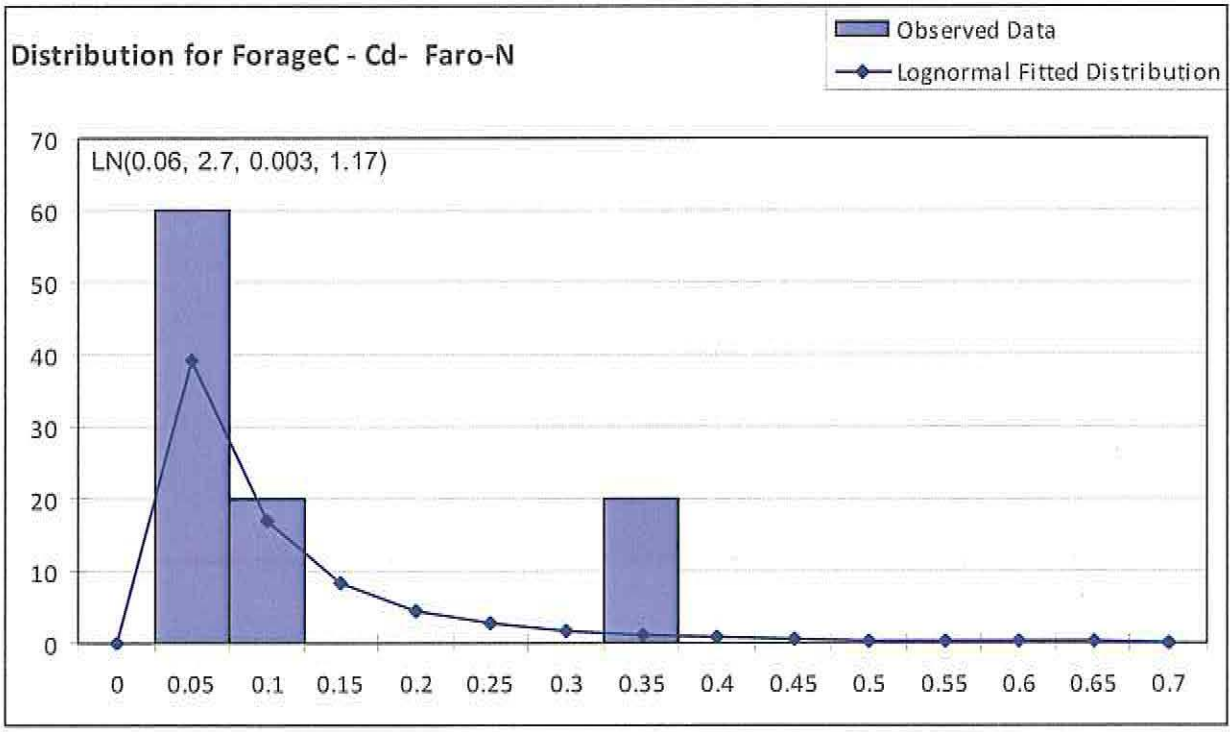
D.6.5 Cadmium

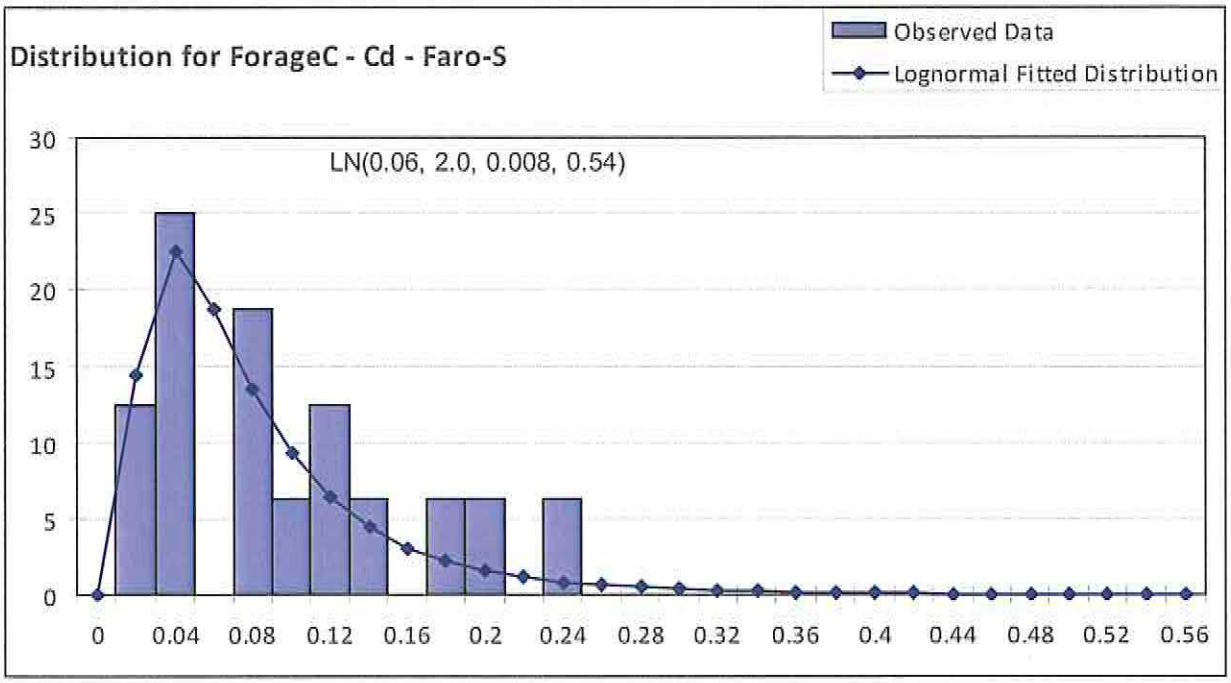

Distribution for ForageC - Cd - Overall
Observed Data
Lognormal Fitted Distribution
LN(0.03, 2.2, 0.003, 0.37)
35
30
25
20
15
10
5
0
0
0.06
0.12
0.18
0.24
0.3
0.36
0.42

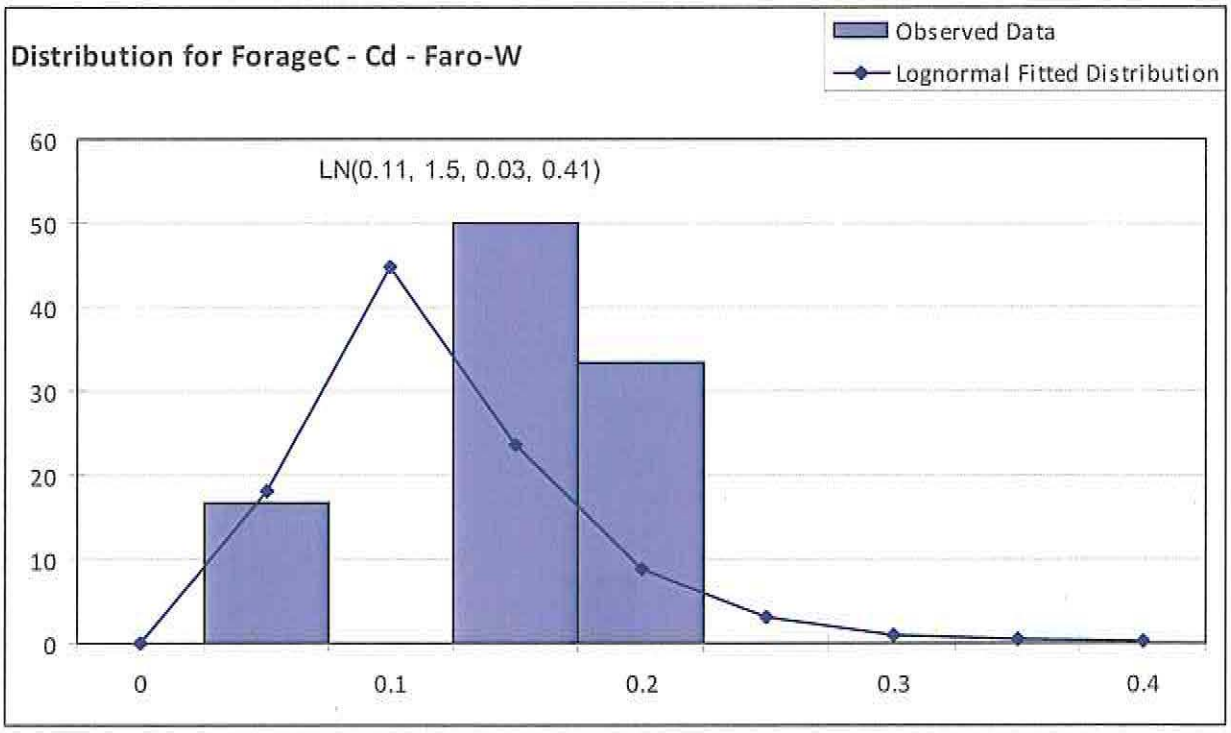

Distribution for ForageC - Cd - Background
Observed Data
Lognormal Fitted Distribution
LN(0.073, 2.9, 0.003, 1.79)
70
60
50
40
30
20
10
0
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1

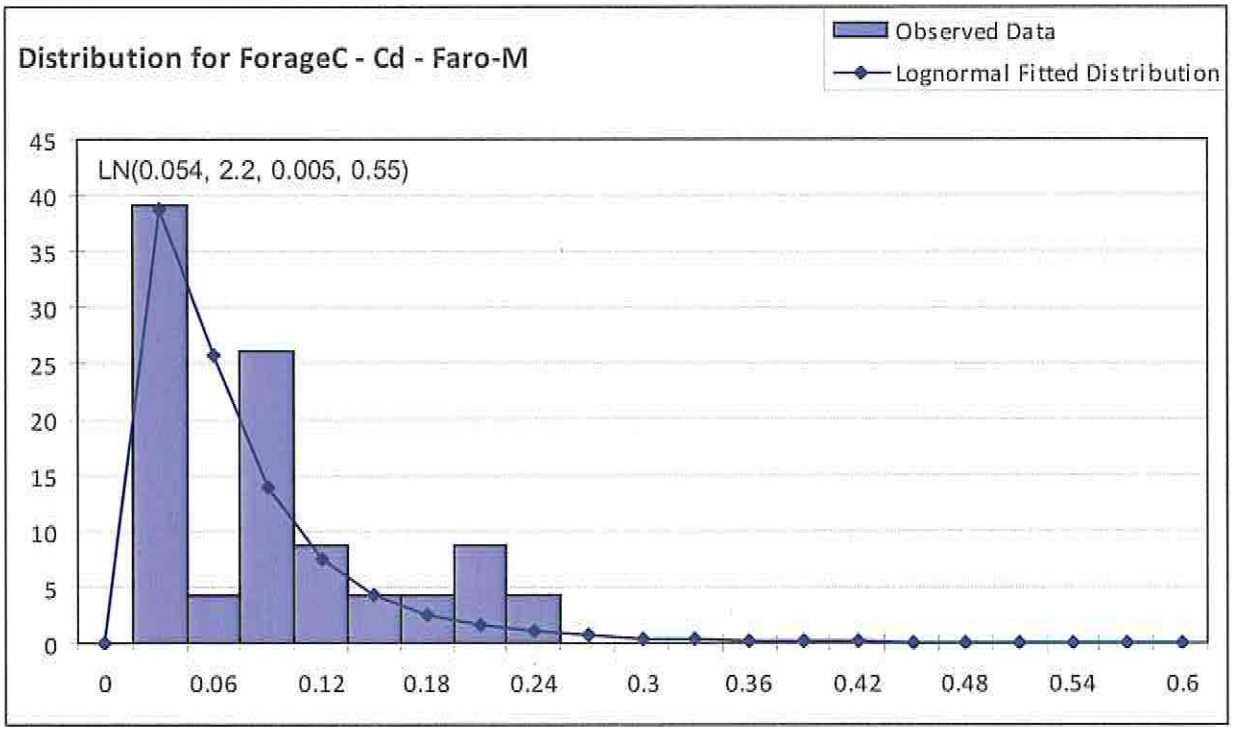

Distribution for ForageC - Cd - Van-S
Observed Data
Triangular Fitted Distribution
T(0.04, 0.08, 0.12)
0
0.02
0.04
0.06
0.08
0.1
0.12
0.14

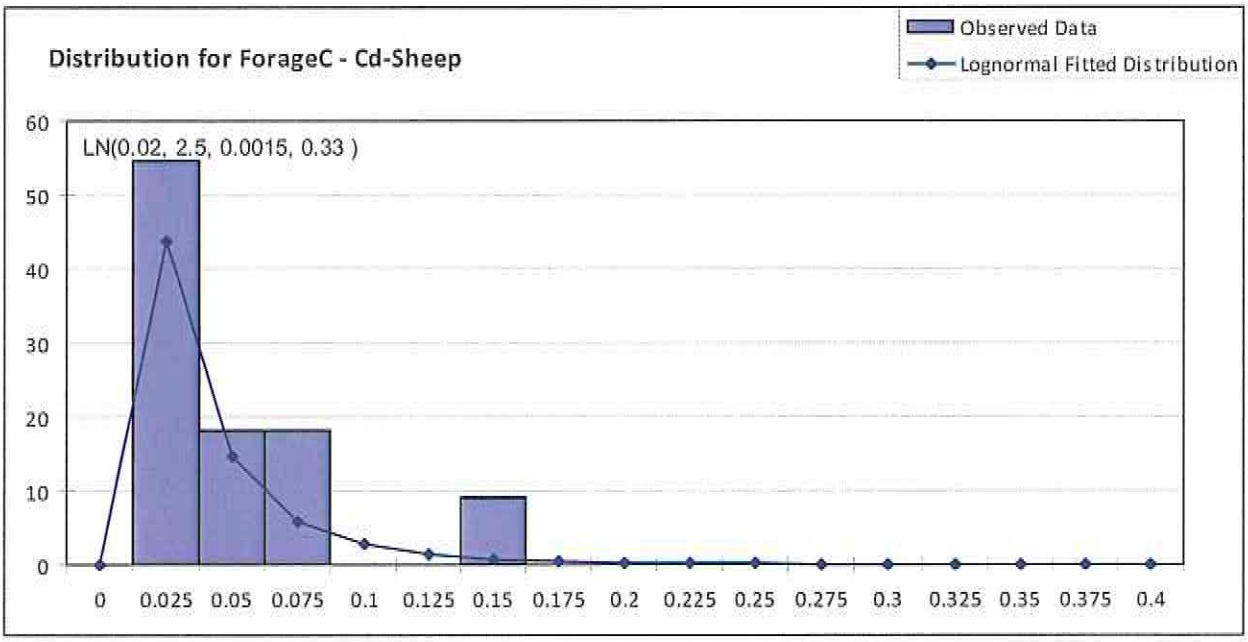

Distribution for ForageC - Cd - Van-M
Observed Data
Lognormal Fitted Distribution
LN(0.02, 2.9, 0.0007, 0.44)
70
60
50
40
30
20
10
0
0
0.02
0.04
0.06
0.08
0.1
0.12
0.14
0.16
0.18
0.2


Distribution for ForageC - Cd- Faro-N
Observed Data
Lognormal Fitted Distribution
LN(0.06, 2.7, 0.003, 1.17)
70
60
50
40
30
20
10
0
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
0.45
0.5
0.55
0.6
0.65
0.7

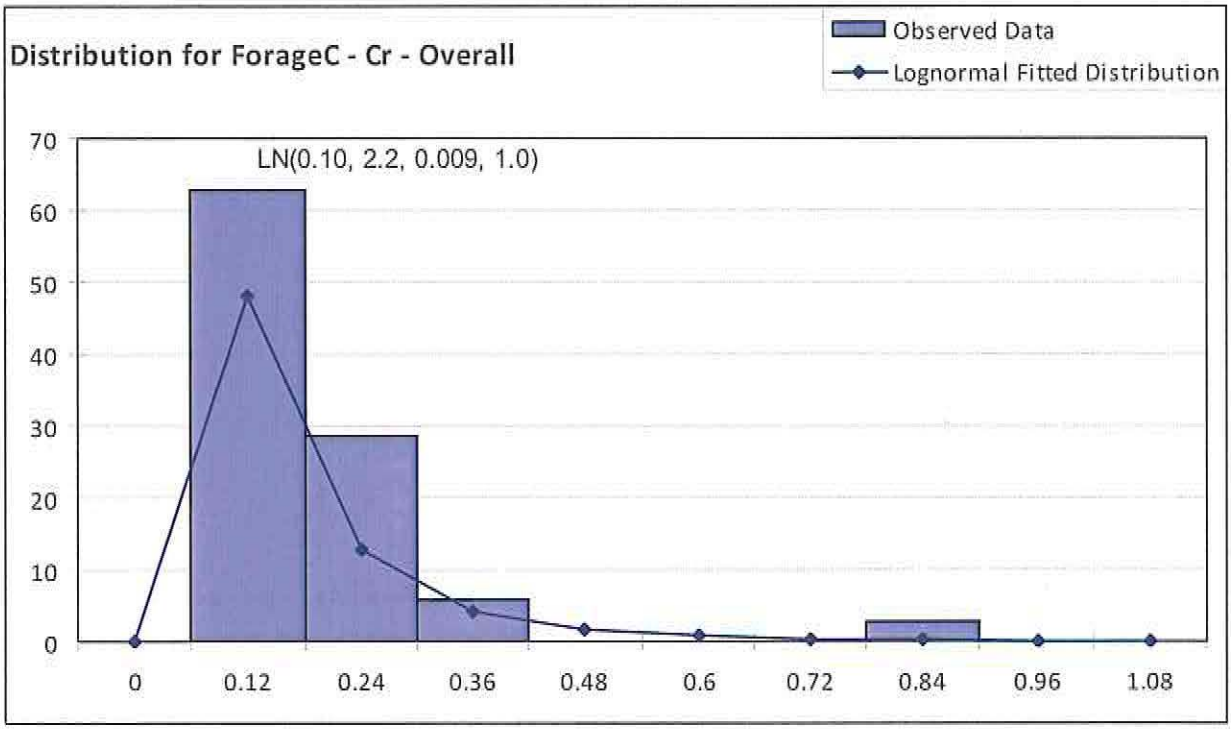

Distribution for ForageC - Cd - Faro-S
Observed Data
Lognormal Fitted Distribution
LN(0.06, 2.0, 0.008, 0.54)
30
25
20
15
10
5
0
0
0.04
0.08
0.12
0.16
0.2
0.24
0.28
0.32
0.36
0.4
0.44
0.48
0.52
0.56

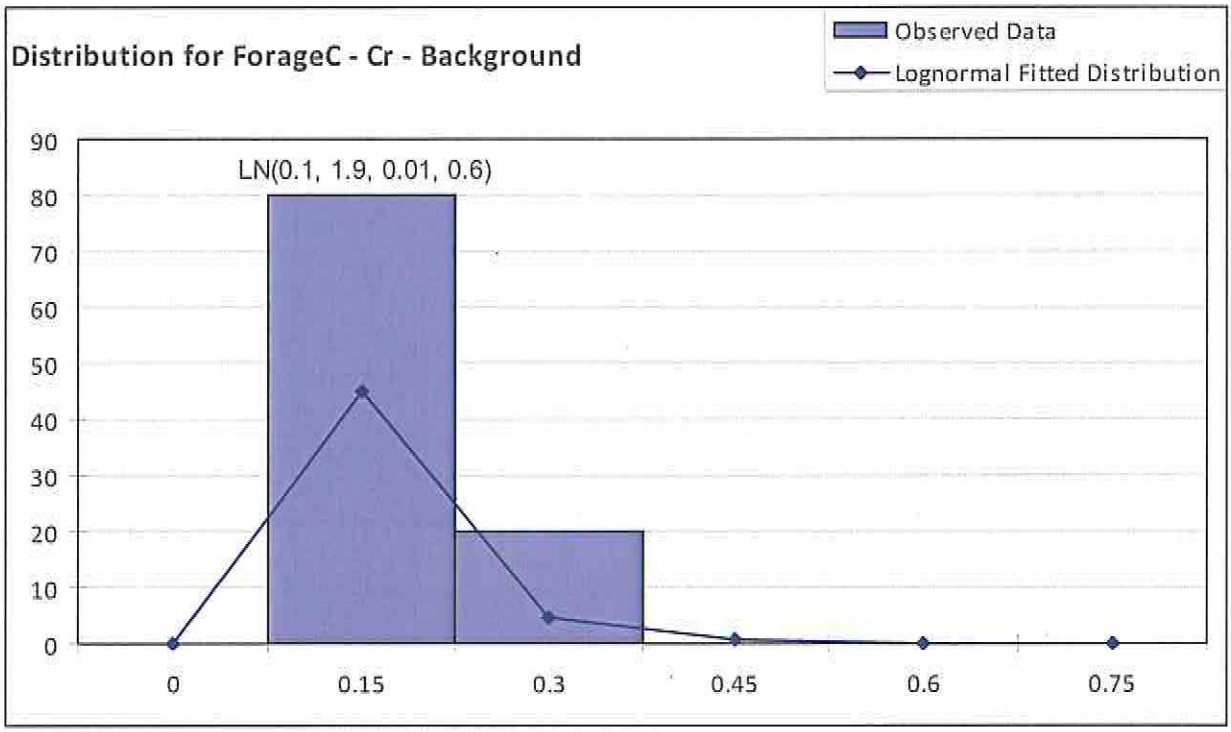

Distribution for ForageC - Cd - Faro-W
Observed Data
Lognormal Fitted Distribution
LN(0.11, 1.5, 0.03, 0.41)
60
50
40
30
20
10
0
0
0.1
0.2
0.3
0.4

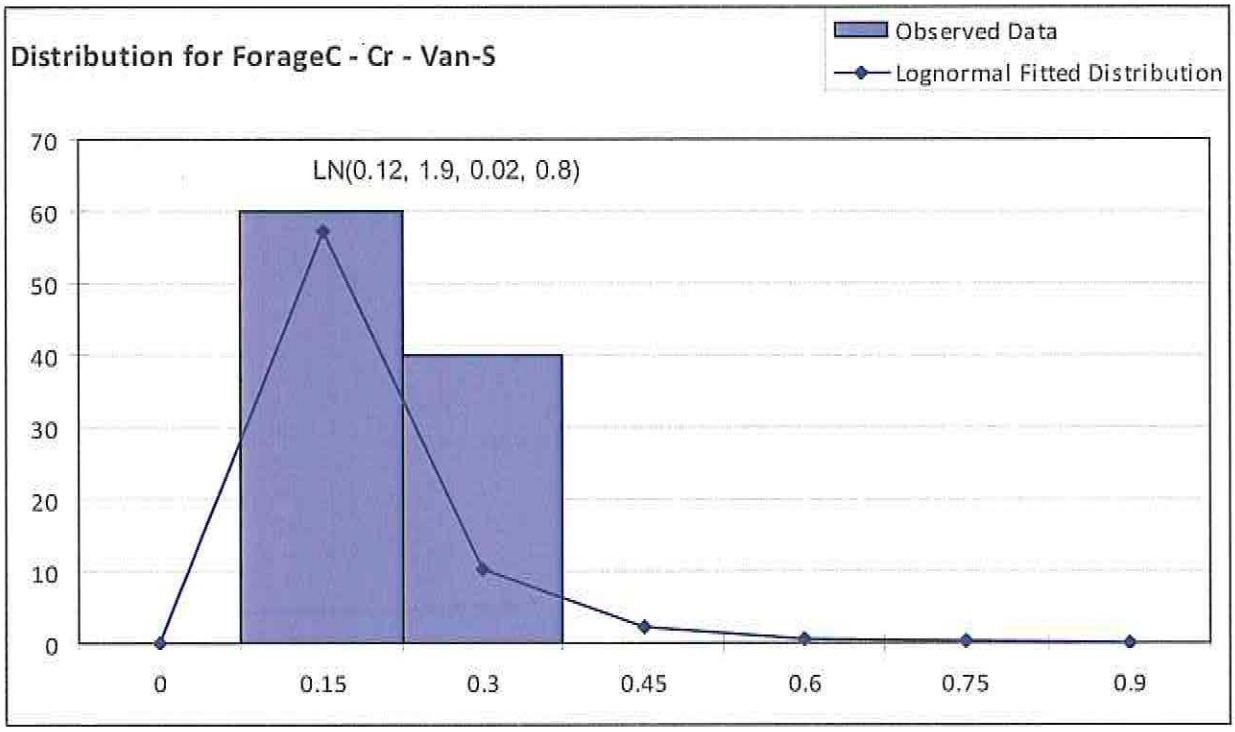

Distribution for ForageC - Cd - Faro-M
Observed Data
Lognormal Fitted Distribution
LN(0.054, 2.2, 0.005, 0.55)
45
40
35
30
25
20
15
10
5
0
0
0.06
0.12
0.18
0.24
0.3
0.36
0.42
0.48
0.54
0.6

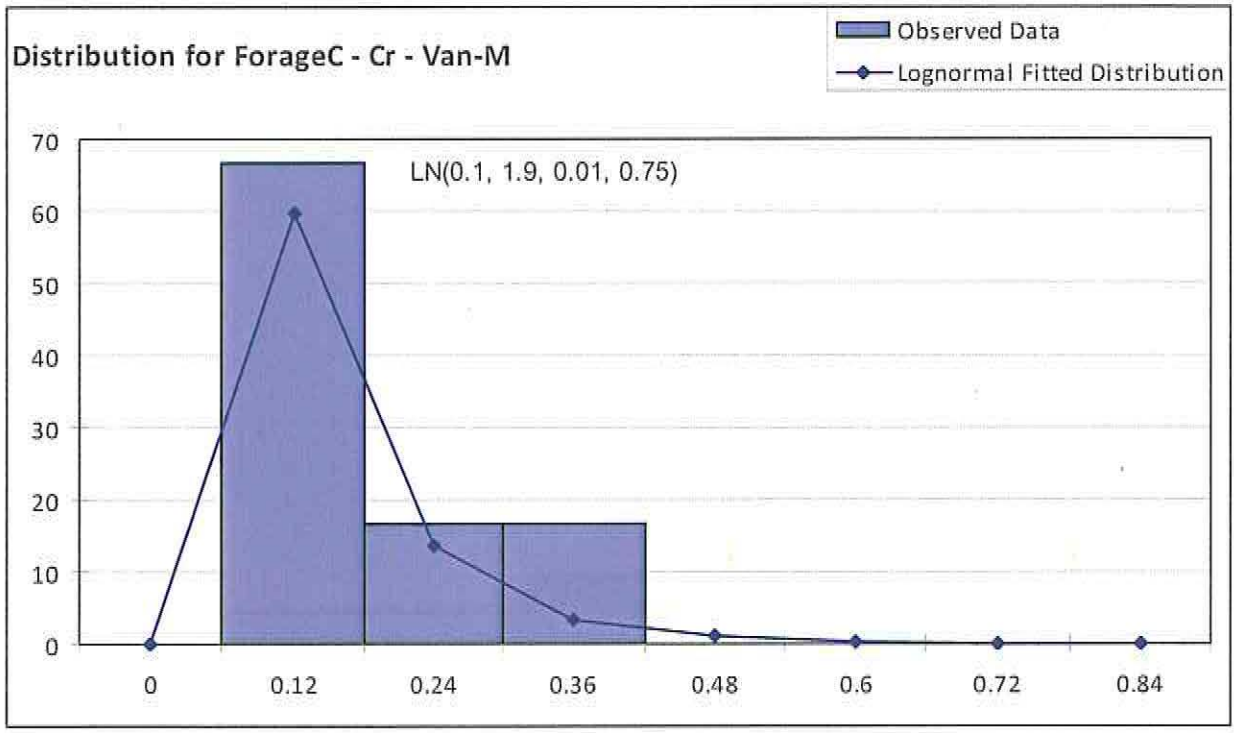

Distribution for ForageC - Cd-Sheep
Observed Data
Lognormal Fitted Distribution
LN(0.02, 2.5, 0.0015, 0.33)
60
50
40
30
20
10
0
0
0.025
0.05
0.075
0.1
0.125
0.15
0.175
0.2
0.225
0.25
0.275
0.3
0.325
0.35
0.375
0.4

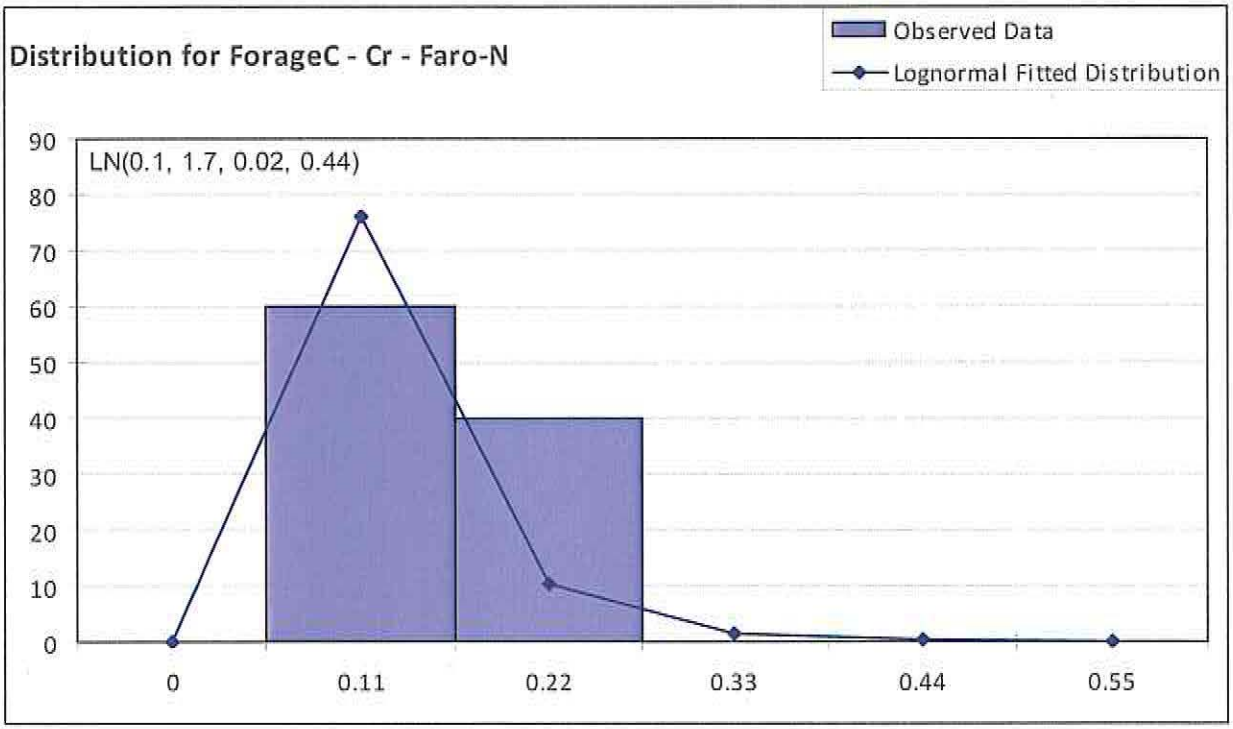
D.6.6 Chromium

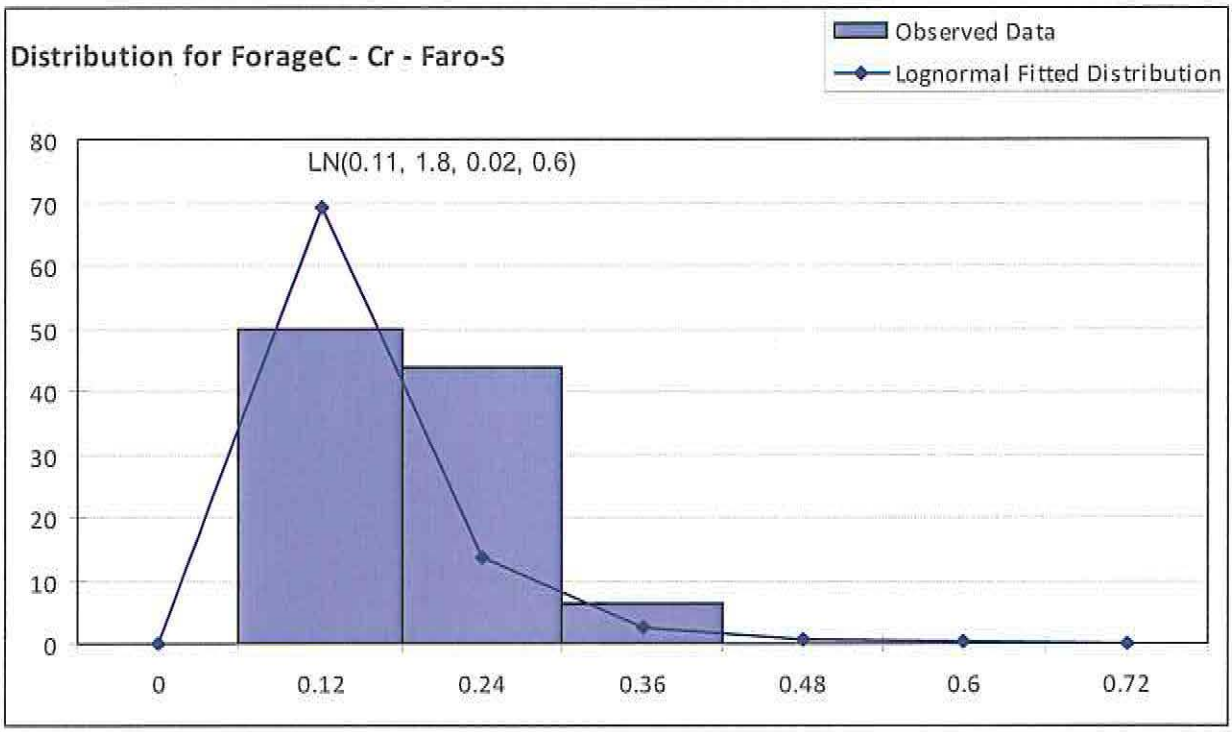


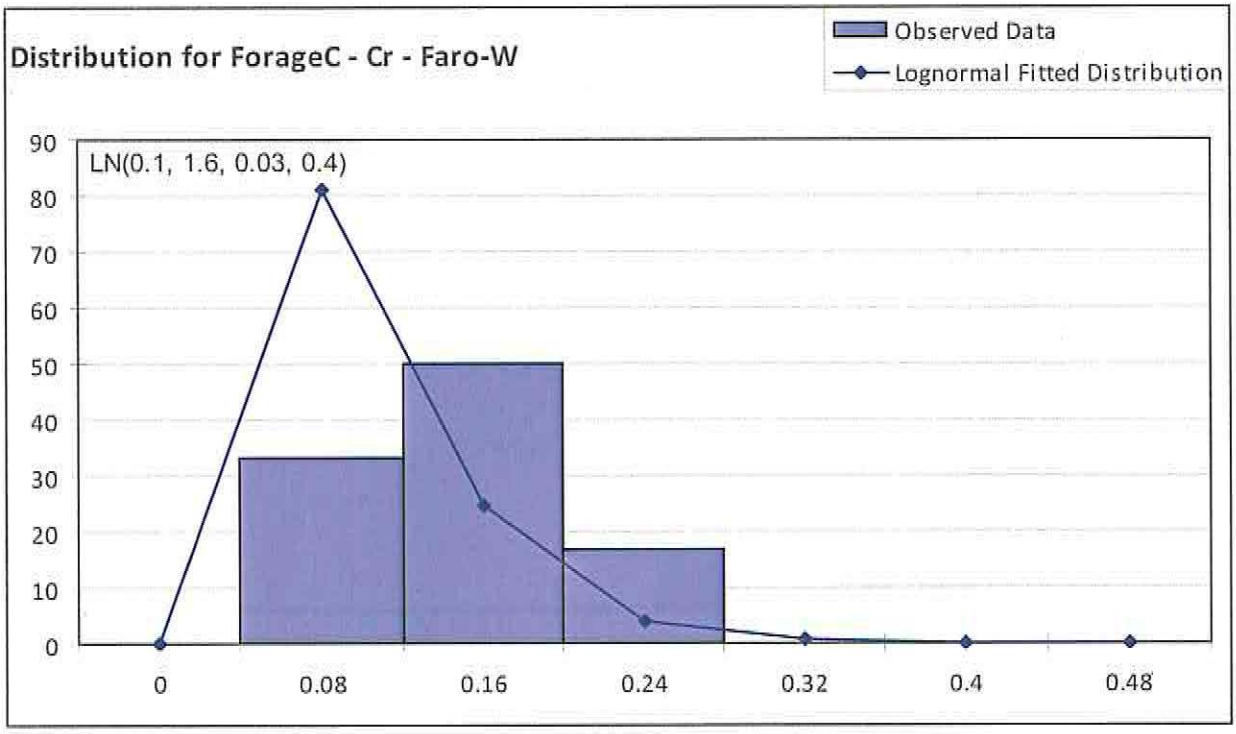


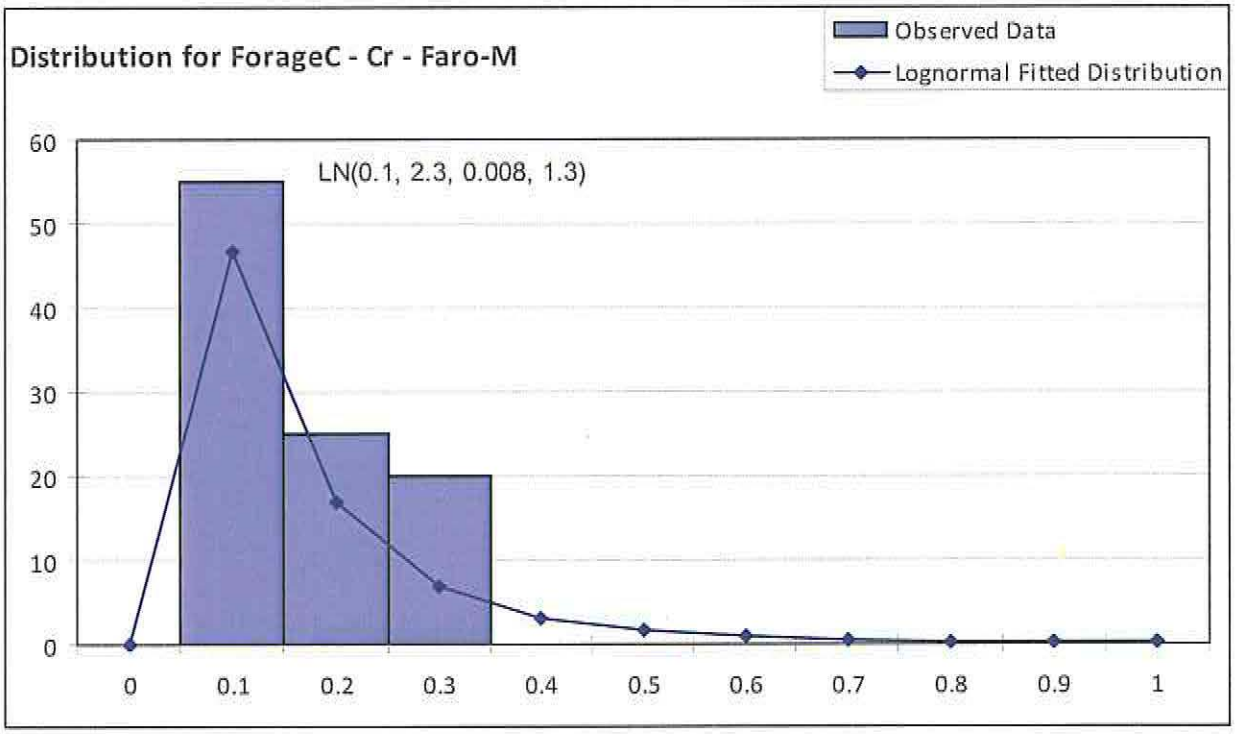

Distribution for ForageC - Cr - Van-S
Observed Data
Lognormal Fitted Distribution
LN(0.12, 1.9, 0.02, 0.8)
70
60
50
40
30
20
10
0
0
0.15
0.3
0.45
0.6
0.75
0.9

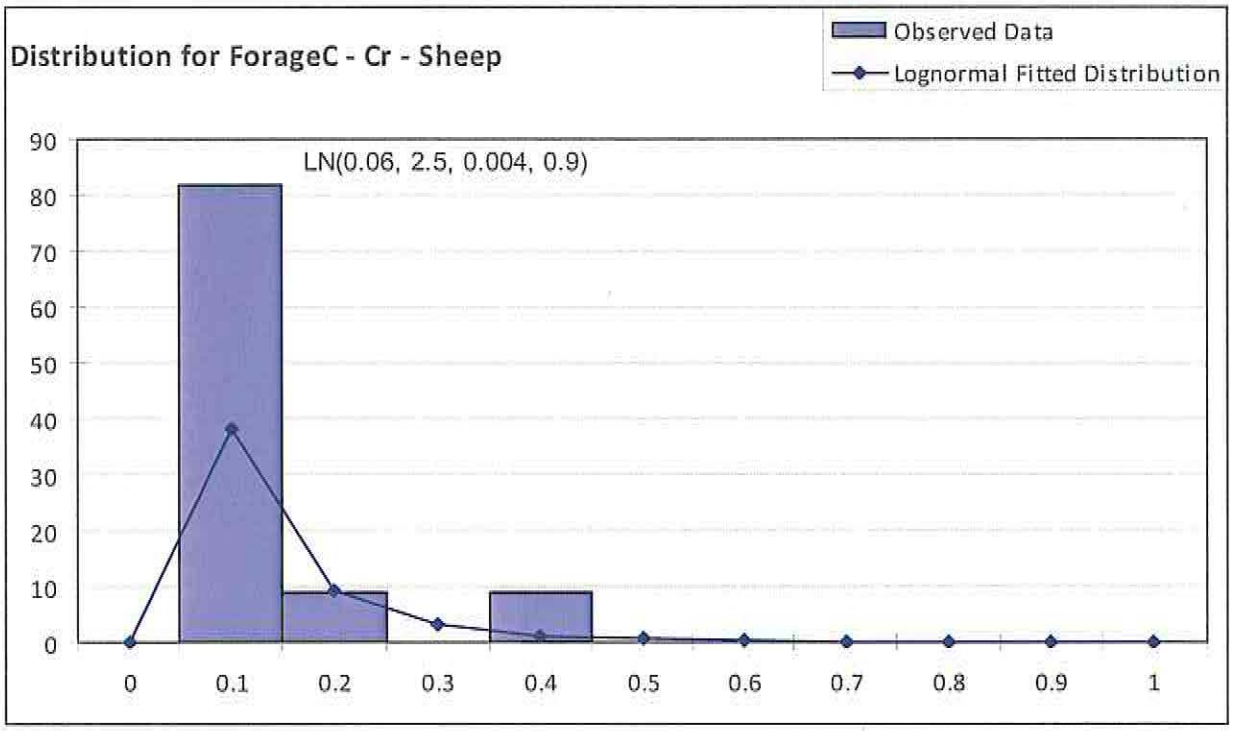

Distribution for ForageC - Cr - Van-M
Observed Data
Lognormal Fitted Distribution
LN(0.1, 1.9, 0.01, 0.75)
70
60
50
40
30
20
10
0
0
0.12
0.24
0.36
0.48
0.6
0.72
0.84


Distribution for ForageC - Cr - Faro-N
Observed Data
Lognormal Fitted Distribution
LN(0.1, 1.7, 0.02, 0.44)
90
80
70
60
50
40
30
20
10
0
0
0.11
0.22
0.33
0.44
0.55

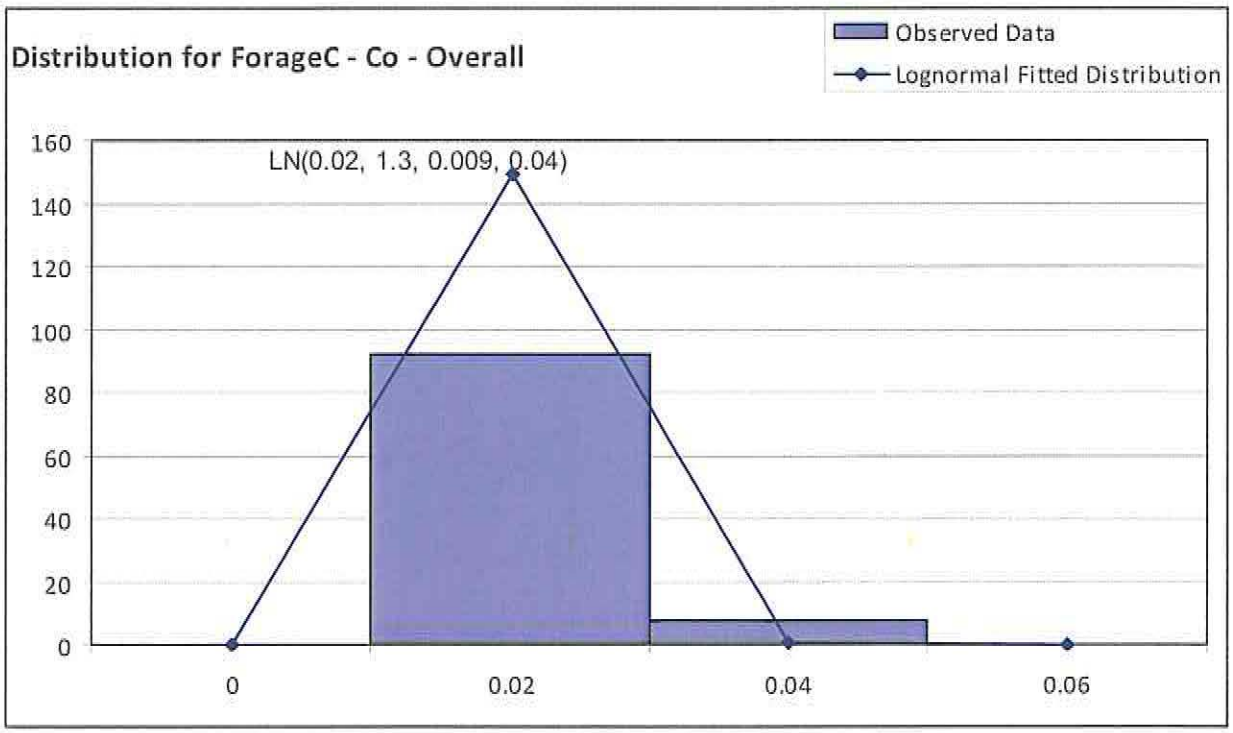

Distribution for ForageC - Cr - Faro-S
Observed Data
Lognormal Fitted Distribution
LN(0.11, 1.8, 0.02, 0.6)
80
70
60
50
40
30
20
10
0
0
0.12
0.24
0.36
0.48
0.6
0.72

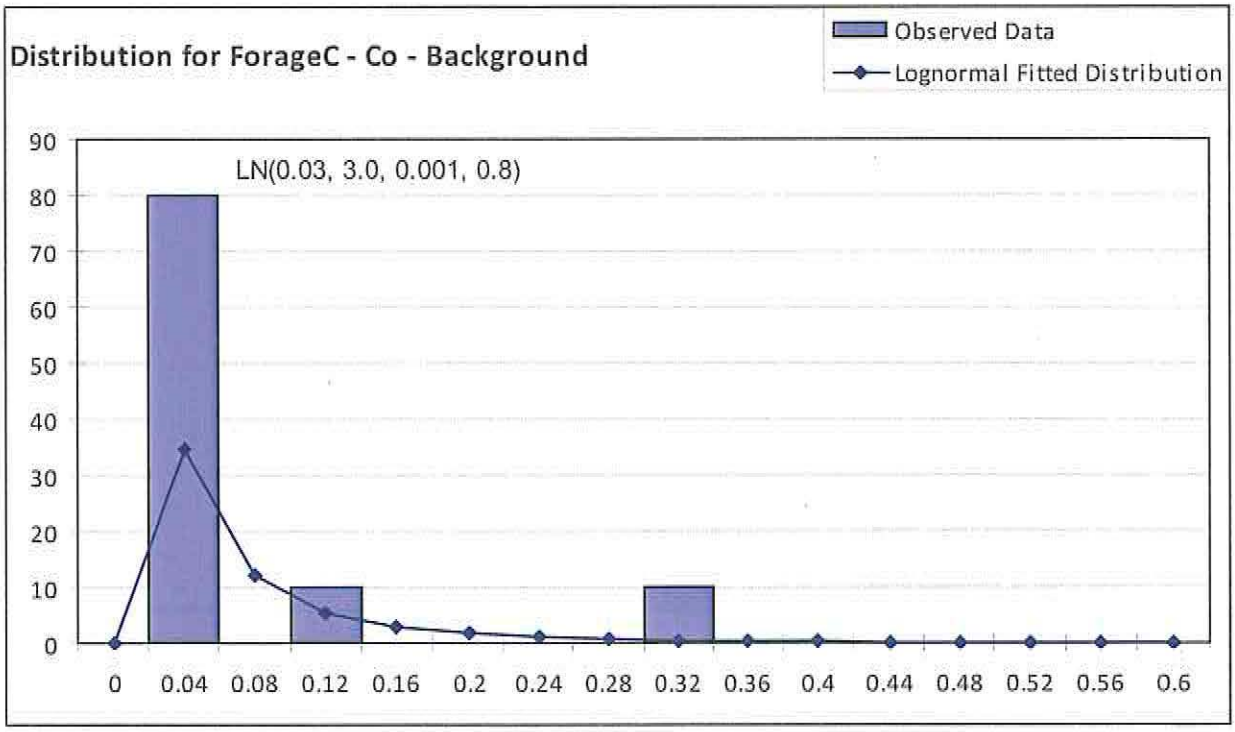

Distribution for ForageC - Cr - Faro-W
Observed Data
Lognormal Fitted Distribution
LN(0.1, 1.6, 0.03, 0.4)
90
80
70
60
50
40
30
20
10
0
0
0.08
0.16
0.24
0.32
0.4
0.48

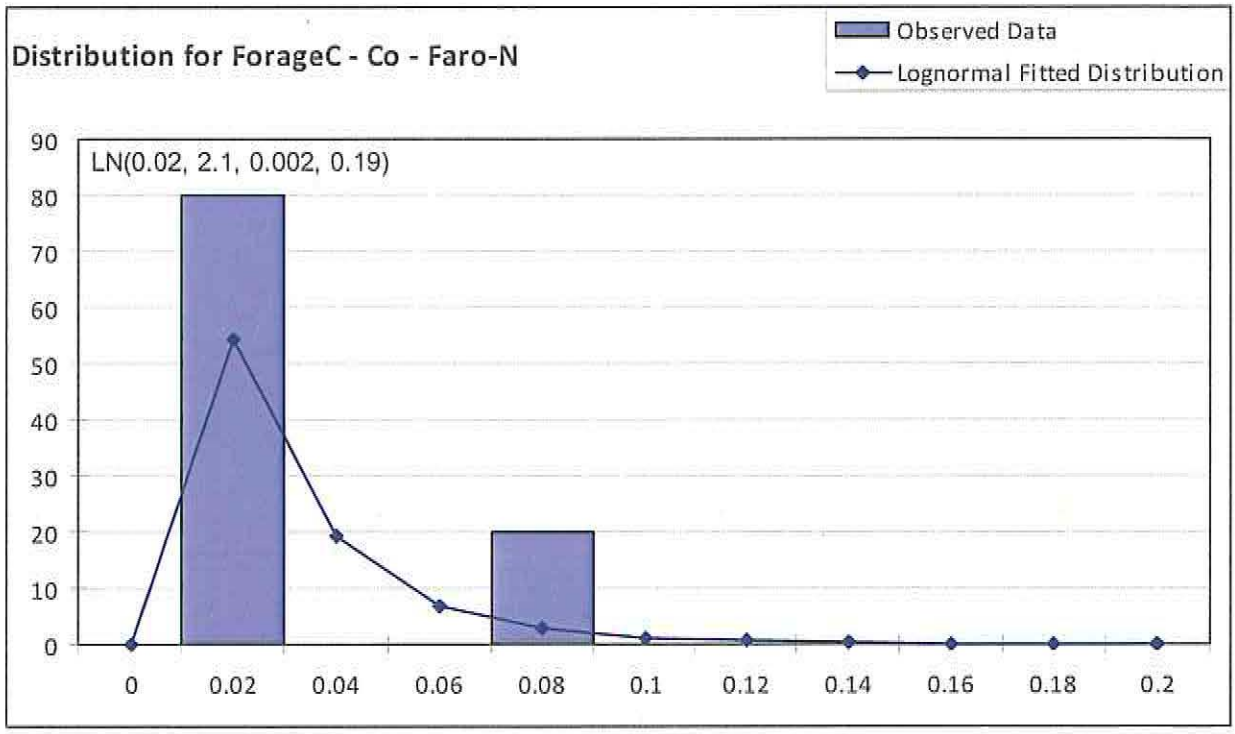

Distribution for ForageC - Cr - Faro-M
Observed Data
Lognormal Fitted Distribution
LN(0.1, 2.3, 0.008, 1.3)
60
50
40
30
20
10
0
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1

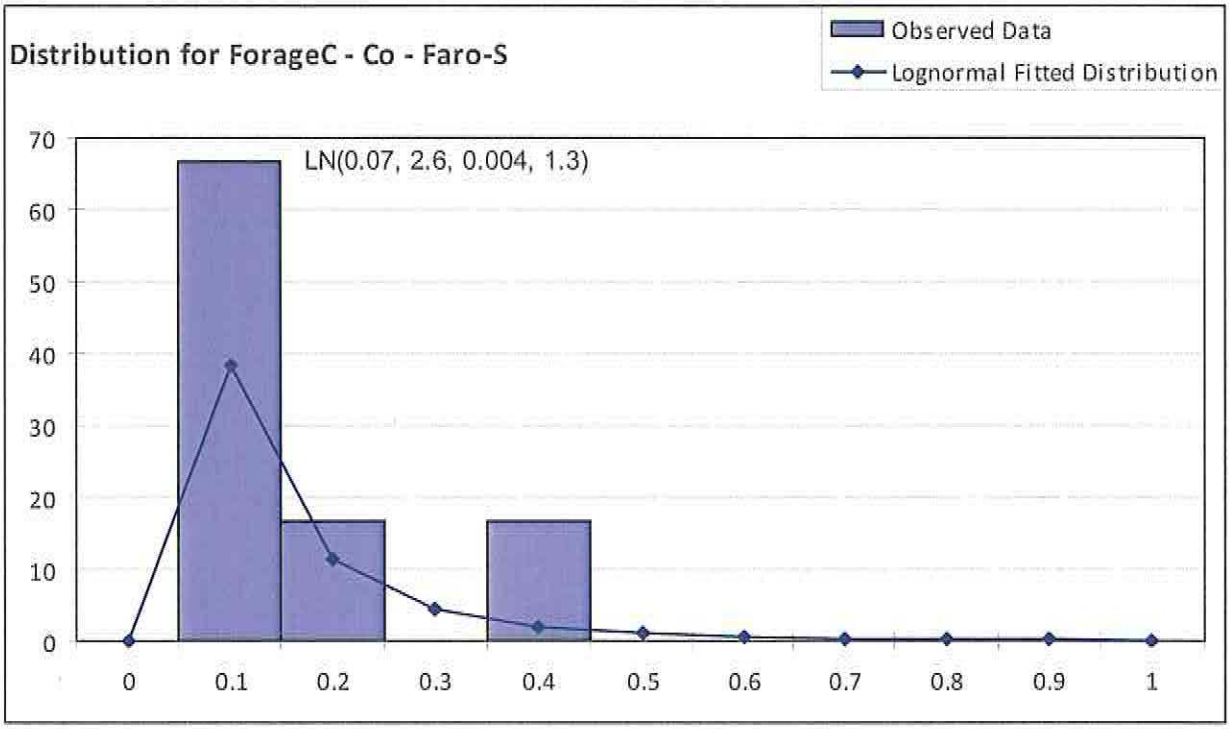

Distribution for ForageC - Cr - Sheep
Observed Data
Lognormal Fitted Distribution
LN(0.06, 2.5, 0.004, 0.9)
90
80
70
60
50
40
30
20
10
0
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1

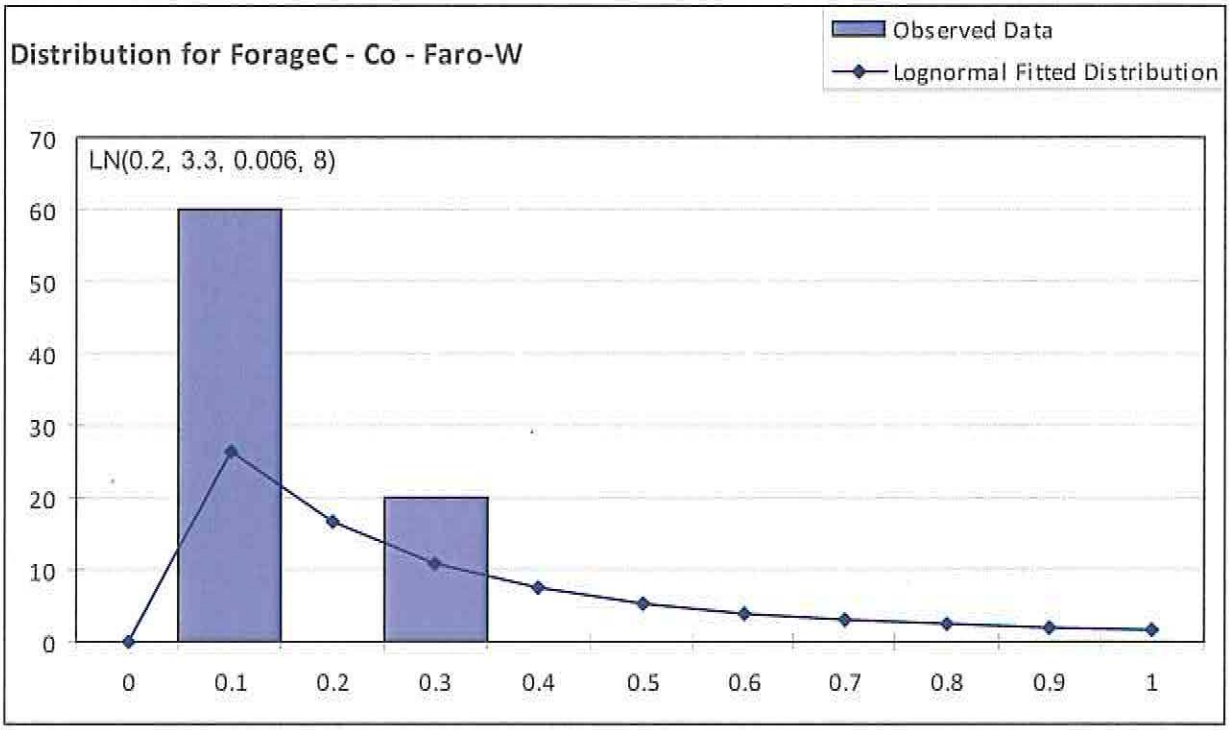
D.6.7 Cobalt

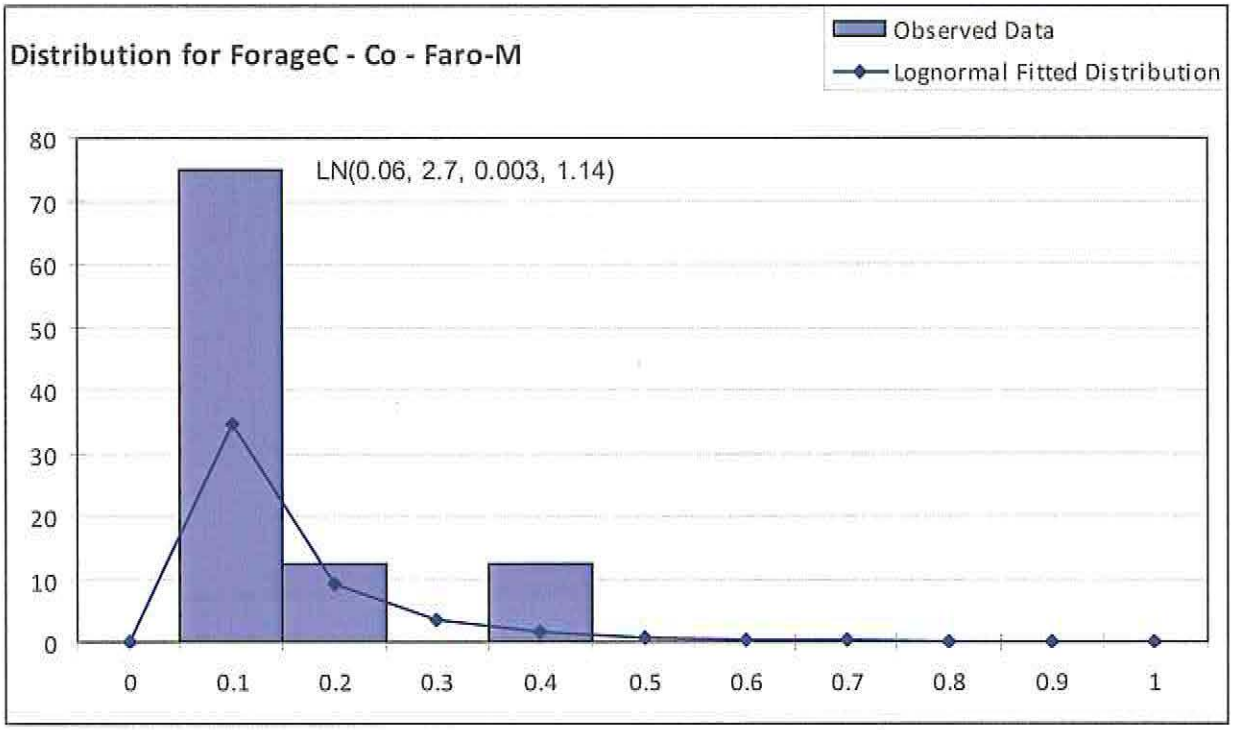

Distribution for ForageC - Co - Overall
Observed Data
Lognormal Fitted Distribution
LN(0.02, 1.3, 0.009, 0.04)
160
140
120
100
80
60
40
20
0
0
0.02
0.04
0.06

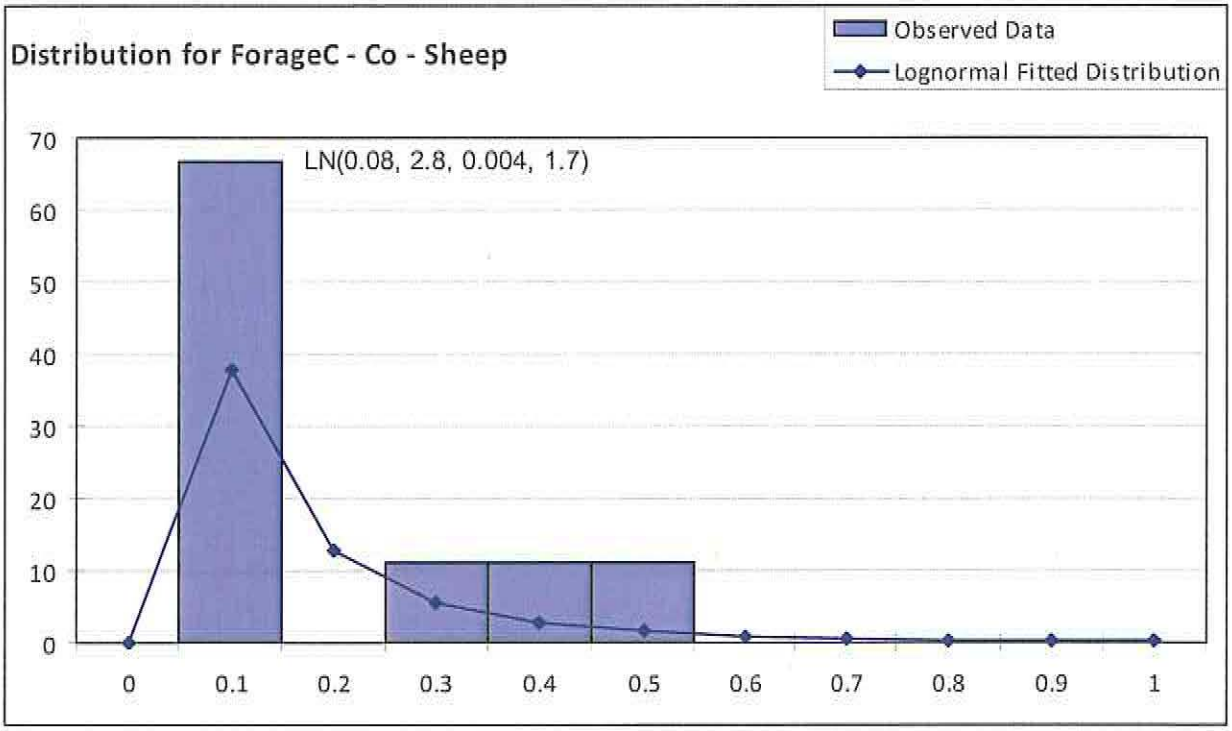

Distribution for ForageC - Co - Background
Observed Data
Lognormal Fitted Distribution
LN(0.03, 3.0, 0.001, 0.8)
90
80
70
60
50
40
30
20
10
0
0
0.04
0.08
0.12
0.16
0.2
0.24
0.28
0.32
0.36
0.4
0.44
0.48
0.52
0.56
0.6


Distribution for ForageC - Co - Faro-N
Observed Data
Lognormal Fitted Distribution
LN(0.02, 2.1, 0.002, 0.19)
90
80
70
60
50
40
30
20
10
0
0
0.02
0.04
0.06
0.08
0.1
0.12
0.14
0.16
0.18
0.2

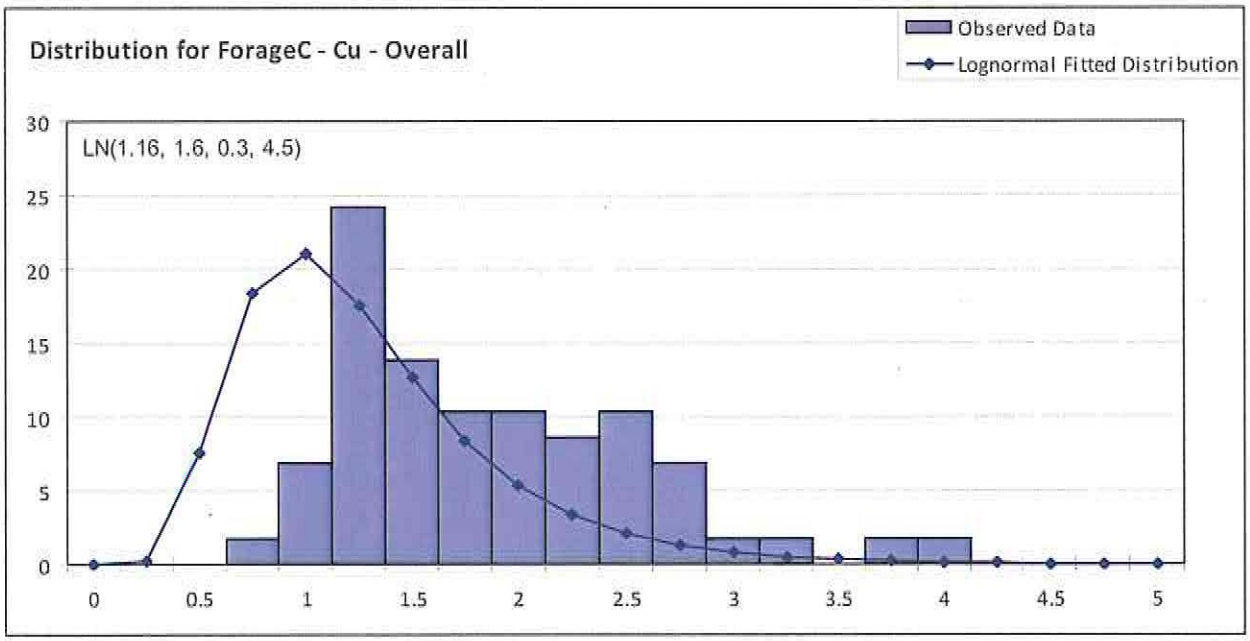

Distribution for ForageC - Co - Faro-S
Observed Data
Lognormal Fitted Distribution
LN(0.07, 2.6, 0.004, 1.3)
70
60
50
40
30
20
10
0
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1

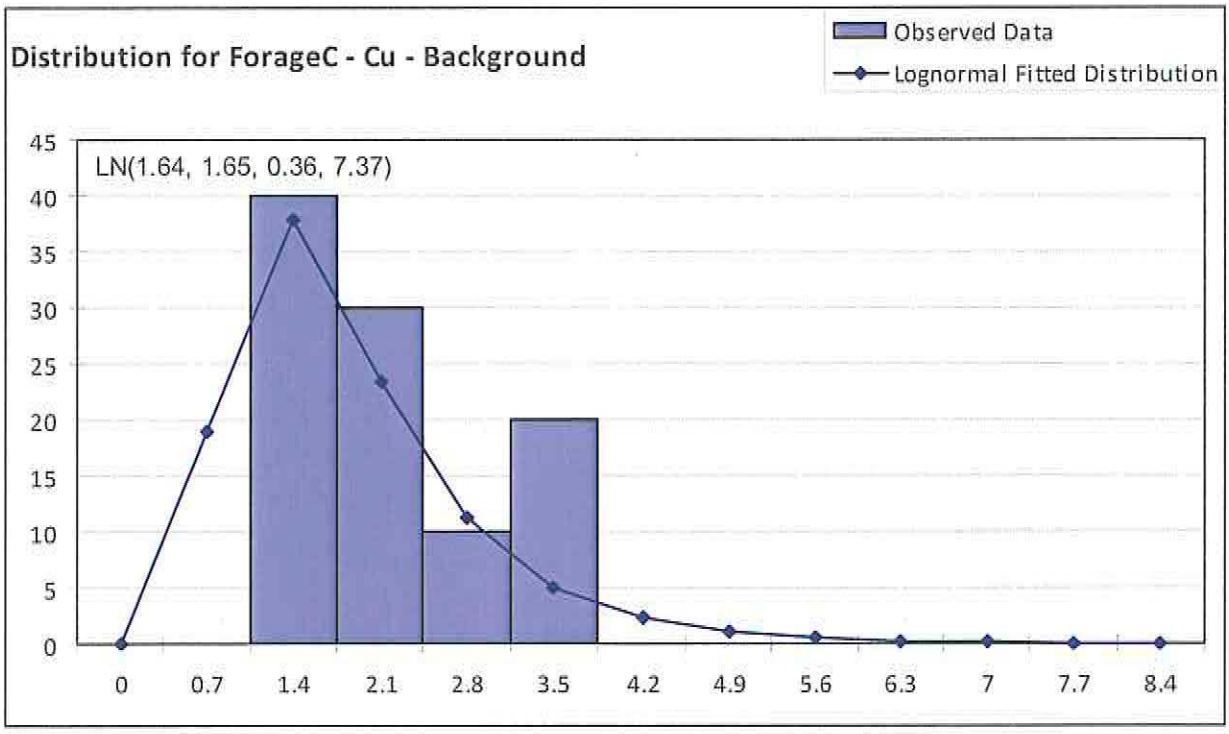

Distribution for ForageC - Co - Faro-W
Observed Data
Lognormal Fitted Distribution
LN(0.2, 3.3, 0.006, 8)
70
60
50
40
30
20
10
0
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1

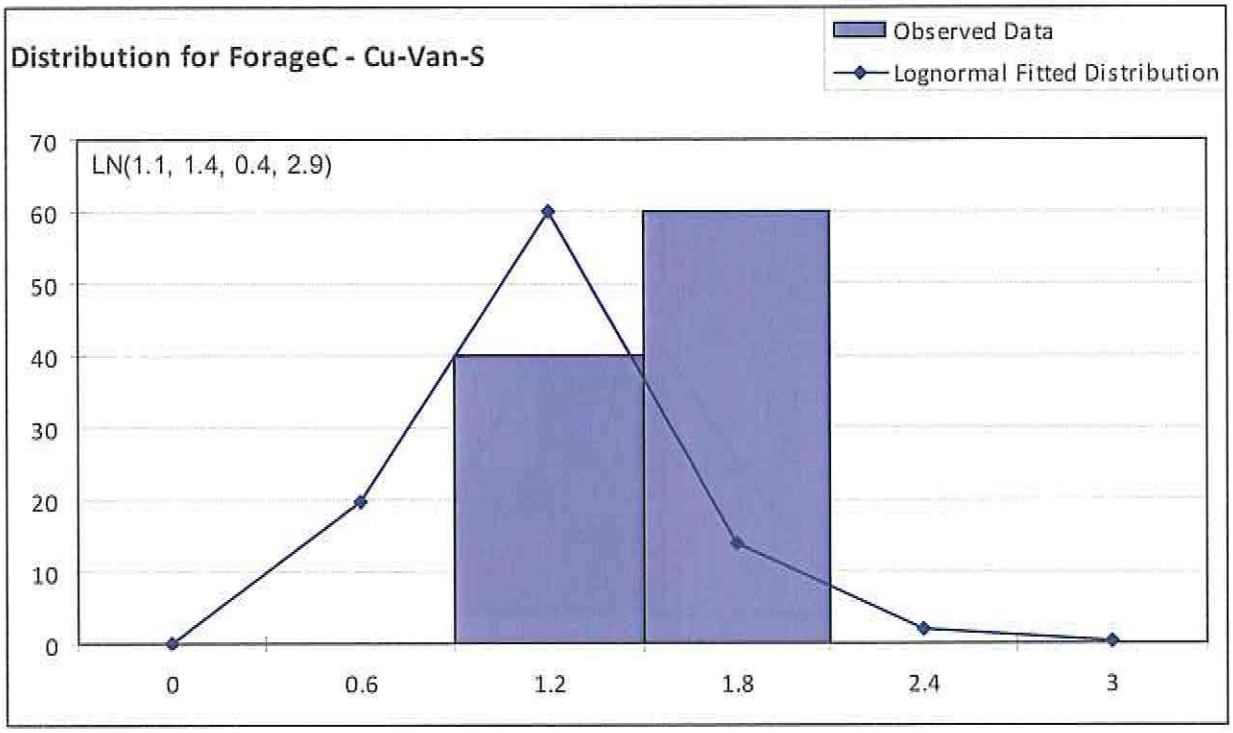

Distribution for ForageC - Co - Faro-M
Observed Data
Lognormal Fitted Distribution
LN(0.06, 2.7, 0.003, 1.14)
80
70
60
50
40
30
20
10
0
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1

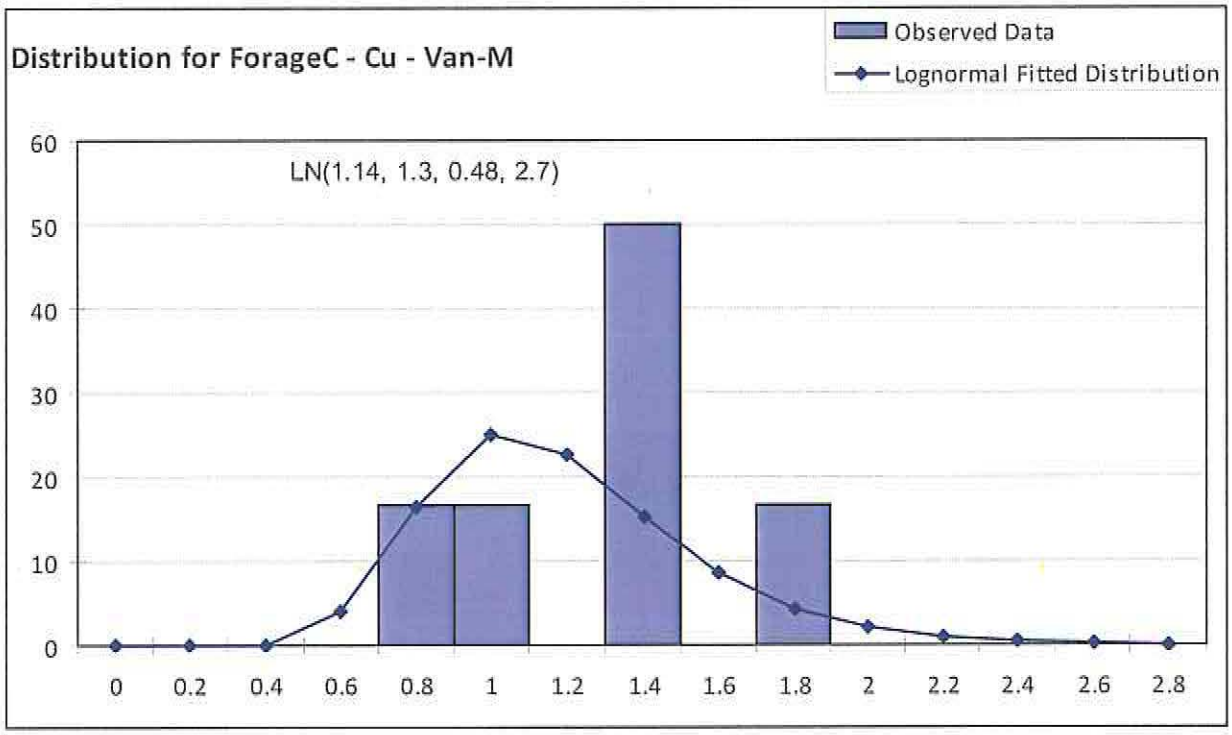

Distribution for ForageC - Co - Sheep
Observed Data
Lognormal Fitted Distribution
LN(0.08, 2.8, 0.004, 1.7)
70
60
50
40
30
20
10
0
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1

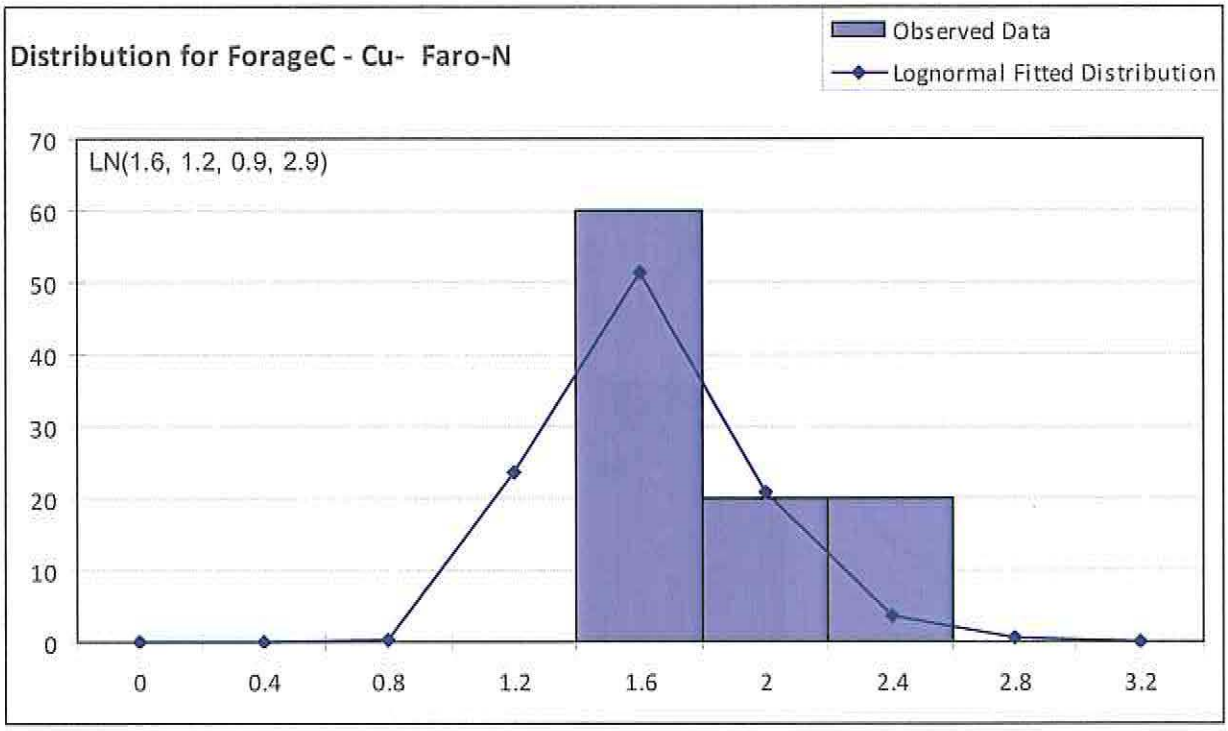
D.6.8 Copper

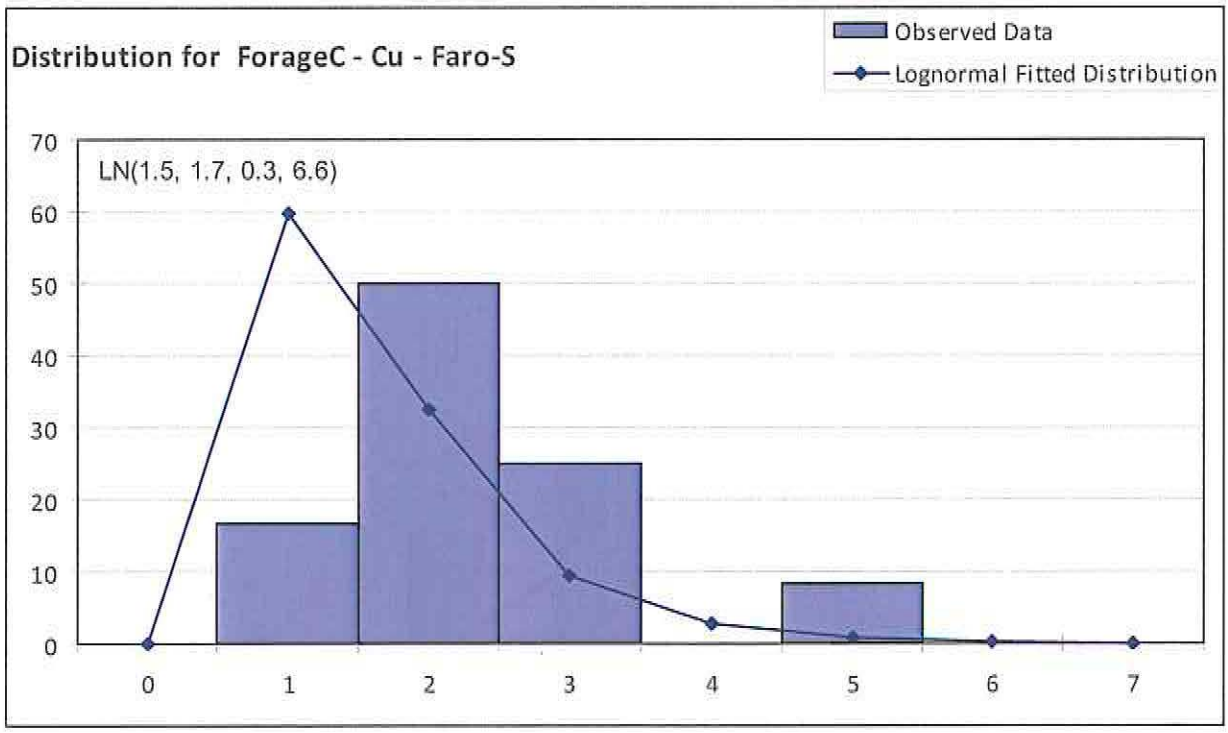

Distribution for ForageC - Cu - Overall
Observed Data
Lognormal Fitted Distribution
LN(1.16, 1.6, 0.3, 4.5)
30
25
20
15
10
5
0
0
0.5
1
1.5
2
2.5
3
3.5
4
4.5
5

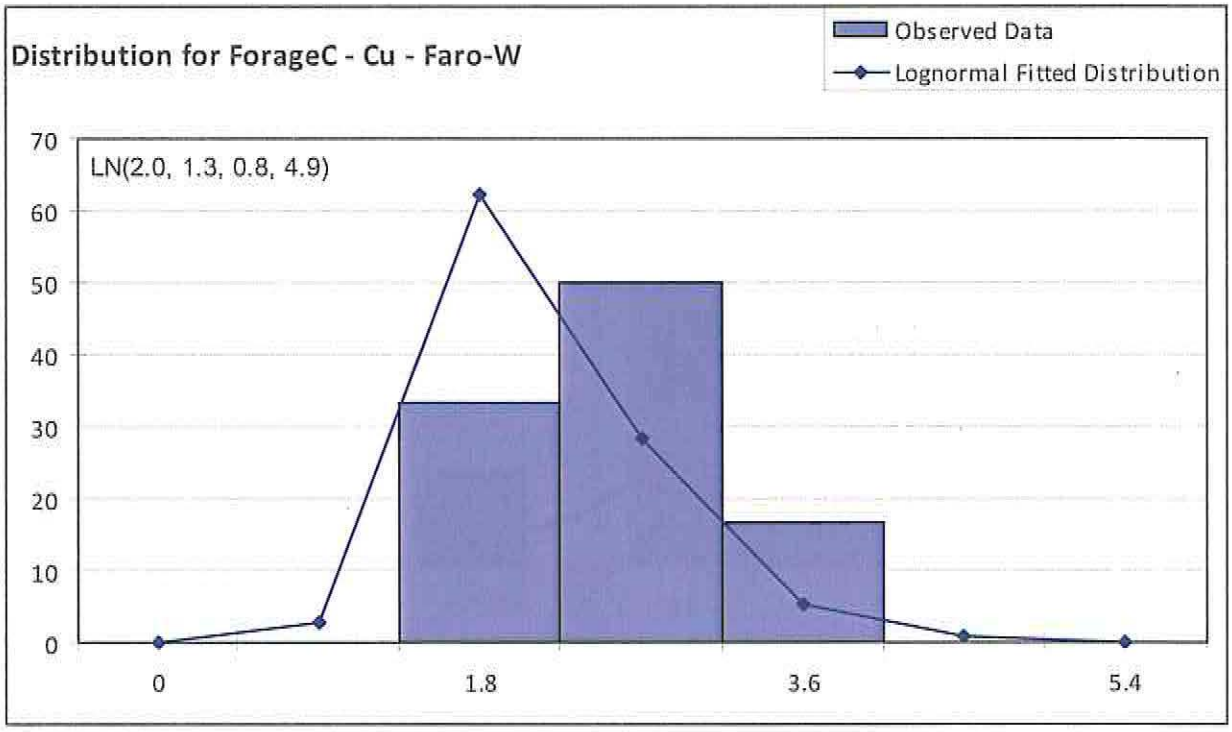

Distribution for ForageC - Cu - Background
Observed Data
Lognormal Fitted Distribution
LN(1.64, 1.65, 0.36, 7.37)
45
40
35
30
25
20
15
10
5
0
0
0.7
1.4
2.1
2.8
3.5
4.2
4.9
5.6
6.3
7
7.7
8.4

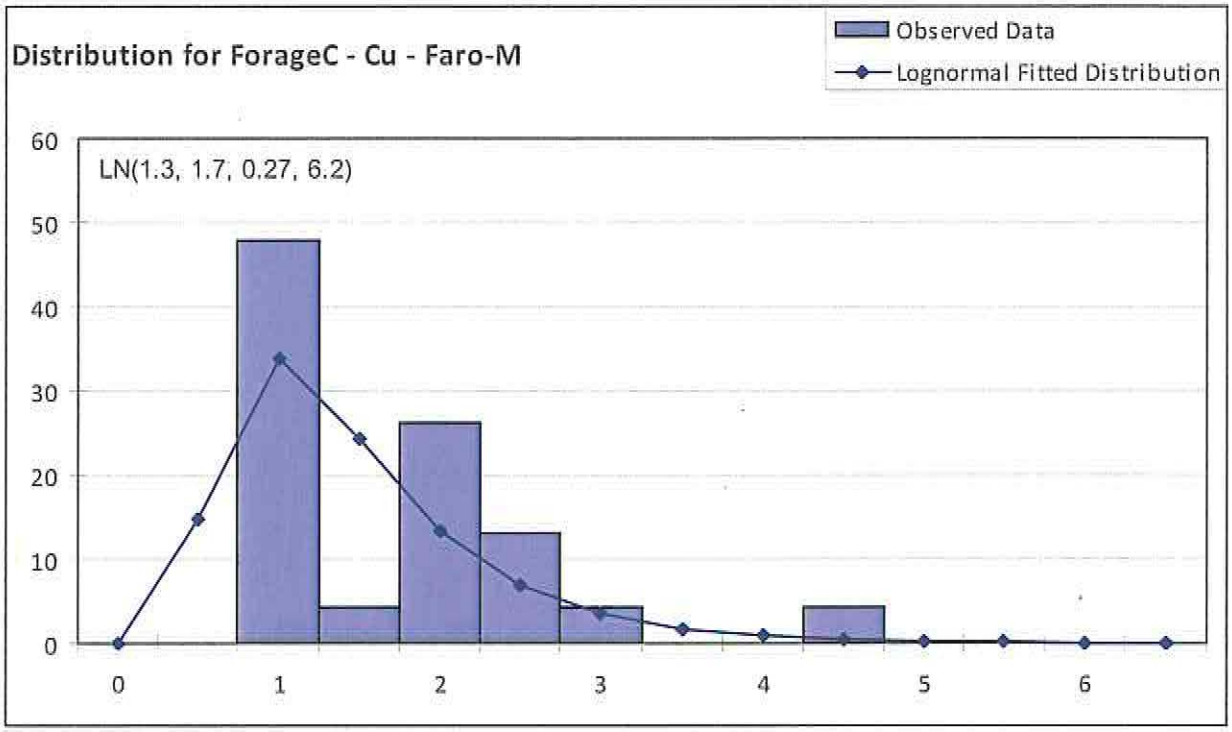

Distribution for ForageC - Cu-Van-S
Observed Data
Lognormal Fitted Distribution
LN(1.1, 1.4, 0.4, 2.9)
70
60
50
40
30
20
10
0
0
0.6
1.2
1.8
2.4
3

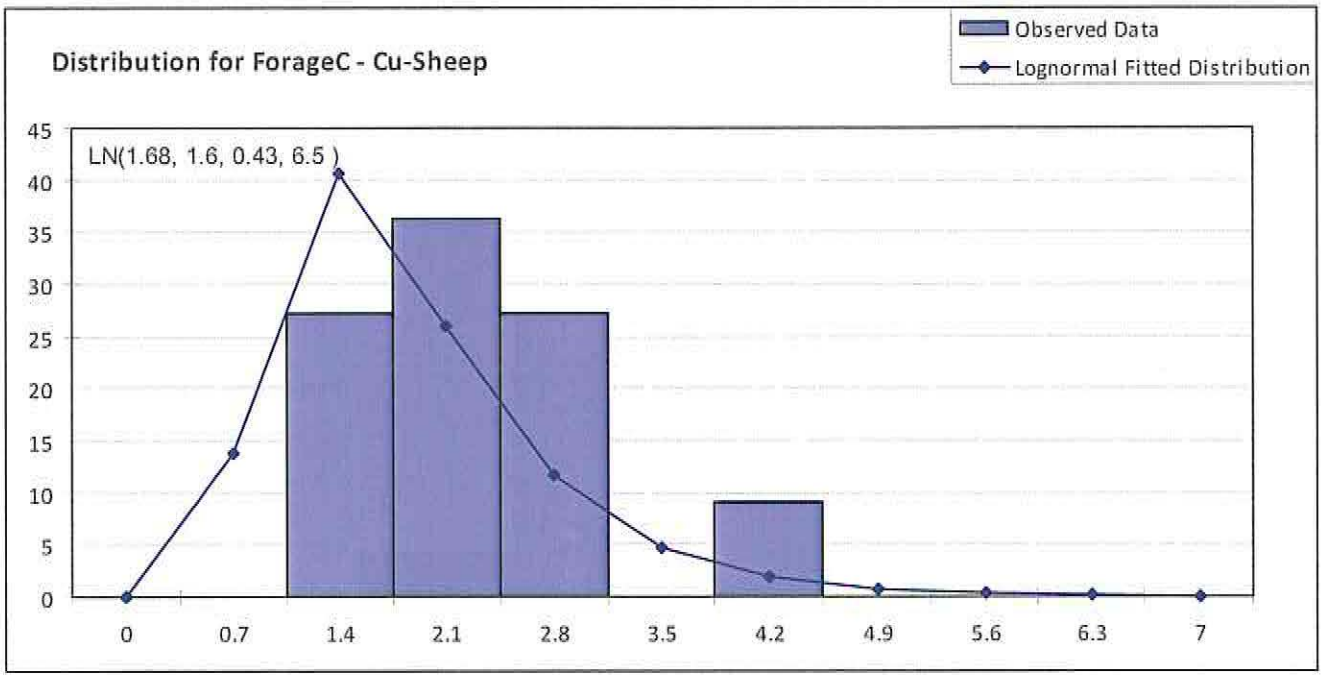

Distribution for ForageC - Cu - Van-M
Observed Data
Lognormal Fitted Distribution
LN(1.14, 1.3, 0.48, 2.7)
60
50
40
30
20
10
0
0
0.2
0.4
0.6
0.8
1
1.2
1.4
1.6
1.8
2
2.2
2.4
2.6
2.8


Distribution for ForageC - Cu- Faro-N
Observed Data
Lognormal Fitted Distribution
LN(1.6, 1.2, 0.9, 2.9)
70
60
50
40
30
20
10
0
0
0.4
0.8
1.2
1.6
2
2.4
2.8
3.2

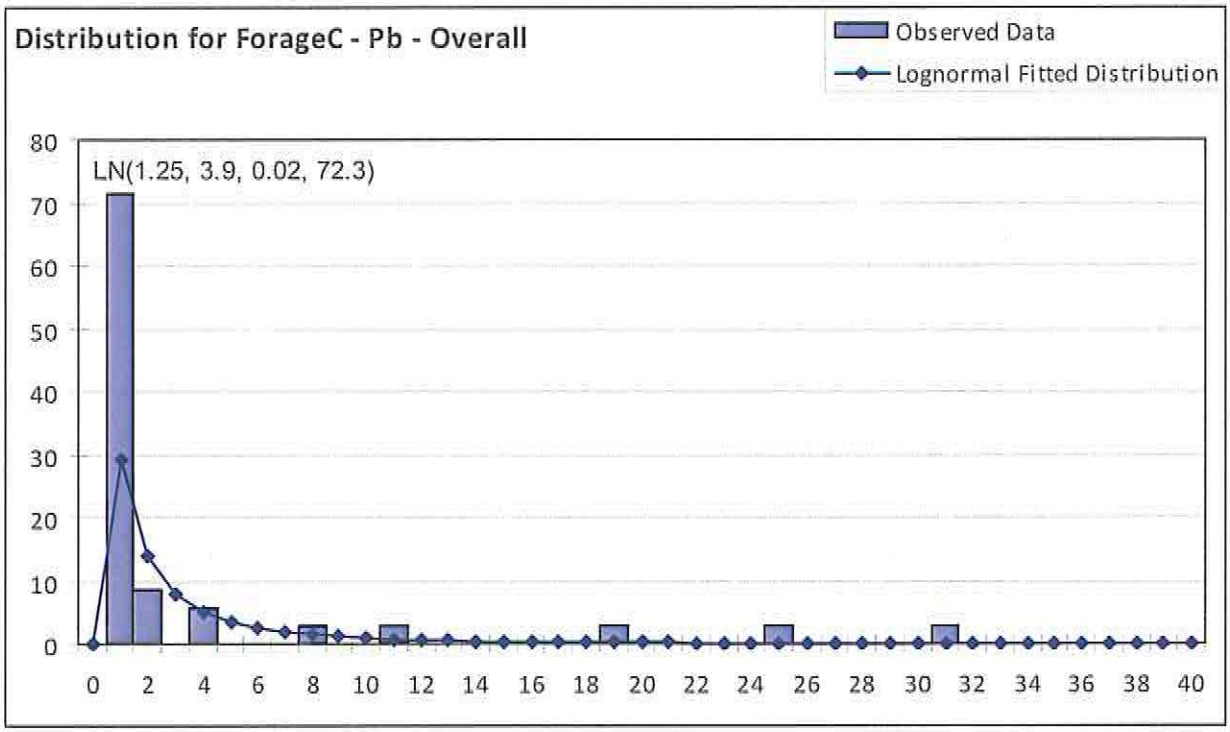

Distribution for ForageC - Cu - Faro-S
Observed Data
Lognormal Fitted Distribution
LN(1.5, 1.7, 0.3, 6.6)
70
60
50
40
30
20
10
0
0
1
2
3
4
5
6
7

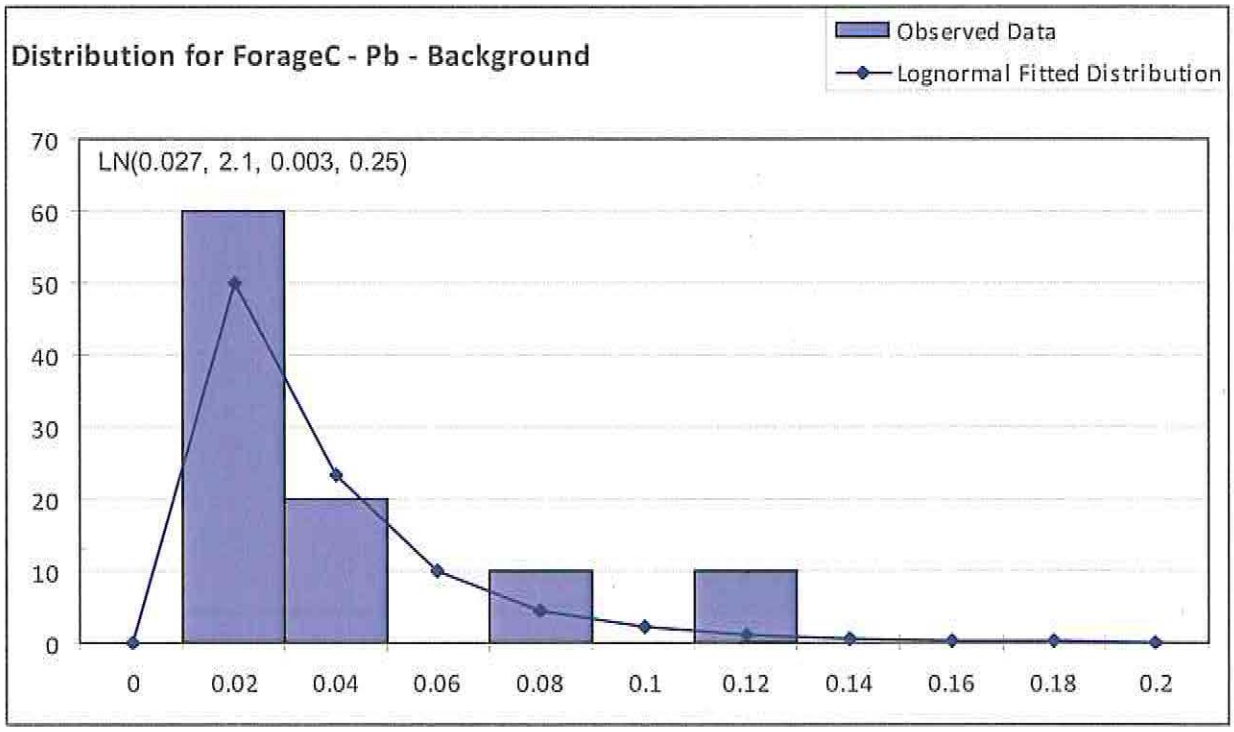

Distribution for ForageC - Cu - Faro-W
Observed Data
Lognormal Fitted Distribution
LN(2.0, 1.3, 0.8, 4.9)
70
60
50
40
30
20
10
0
0
1.8
3.6
5.4

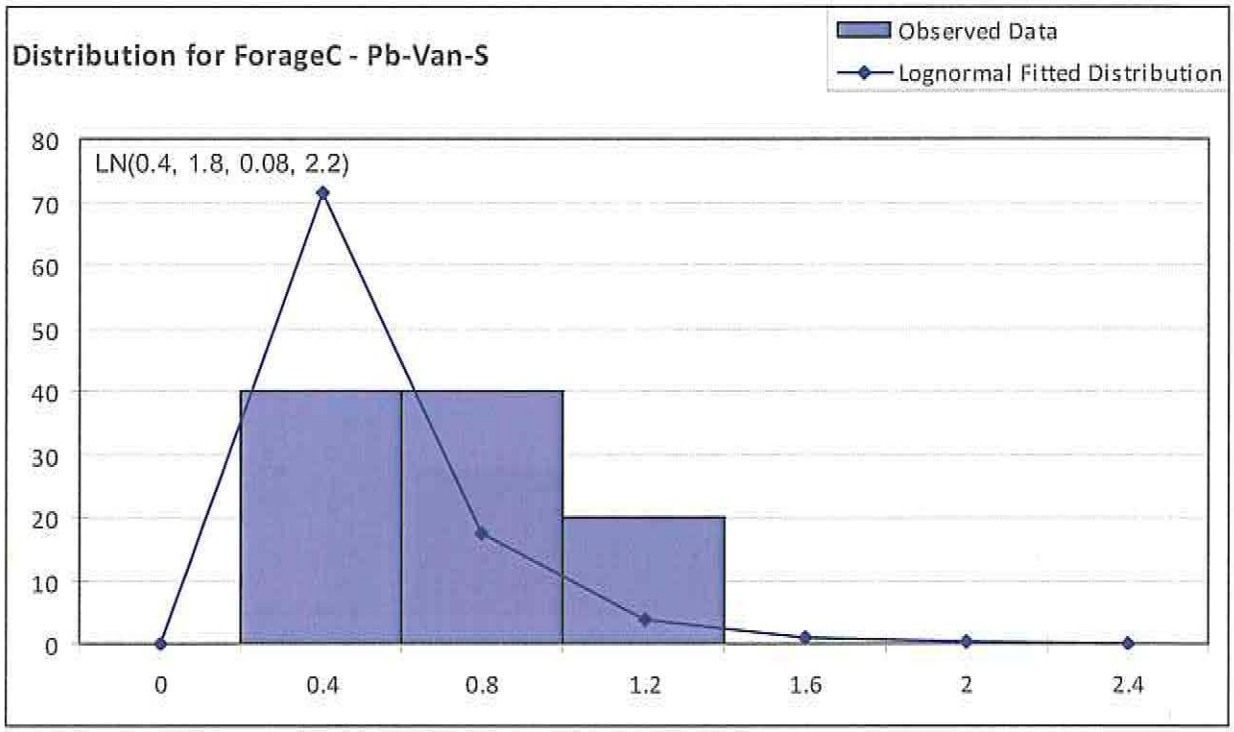

Distribution for ForageC - Cu - Faro-M
Observed Data
Lognormal Fitted Distribution
LN(1.3, 1.7, 0.27, 6.2)
60
50
40
30
20
10
0
0
1
2
3
4
5
6

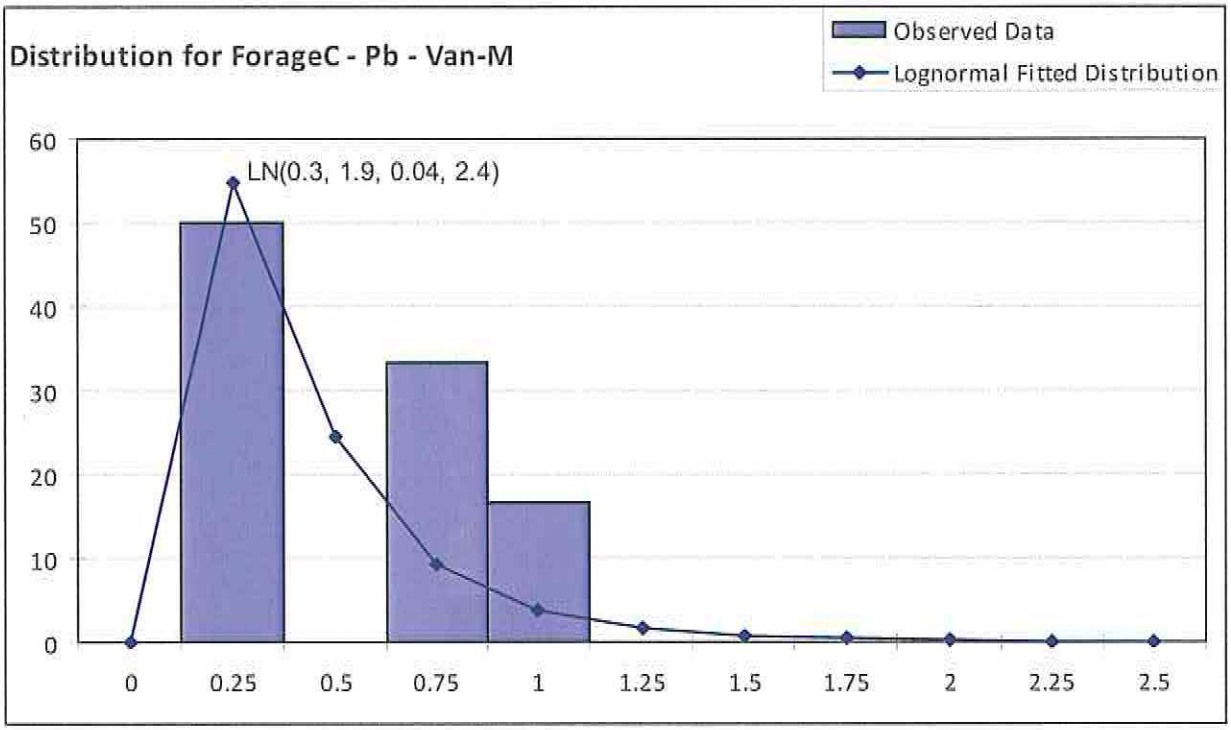

Distribution for ForageC - Cu-Sheep
Observed Data
Lognormal Fitted Distribution
LN(1.68, 1.6, 0.43, 6.5)
45
40
35
30
25
20
15
10
5
0
0
0.7
1.4
2.1
2.8
3.5
4.2
4.9
5.6
6.3
7

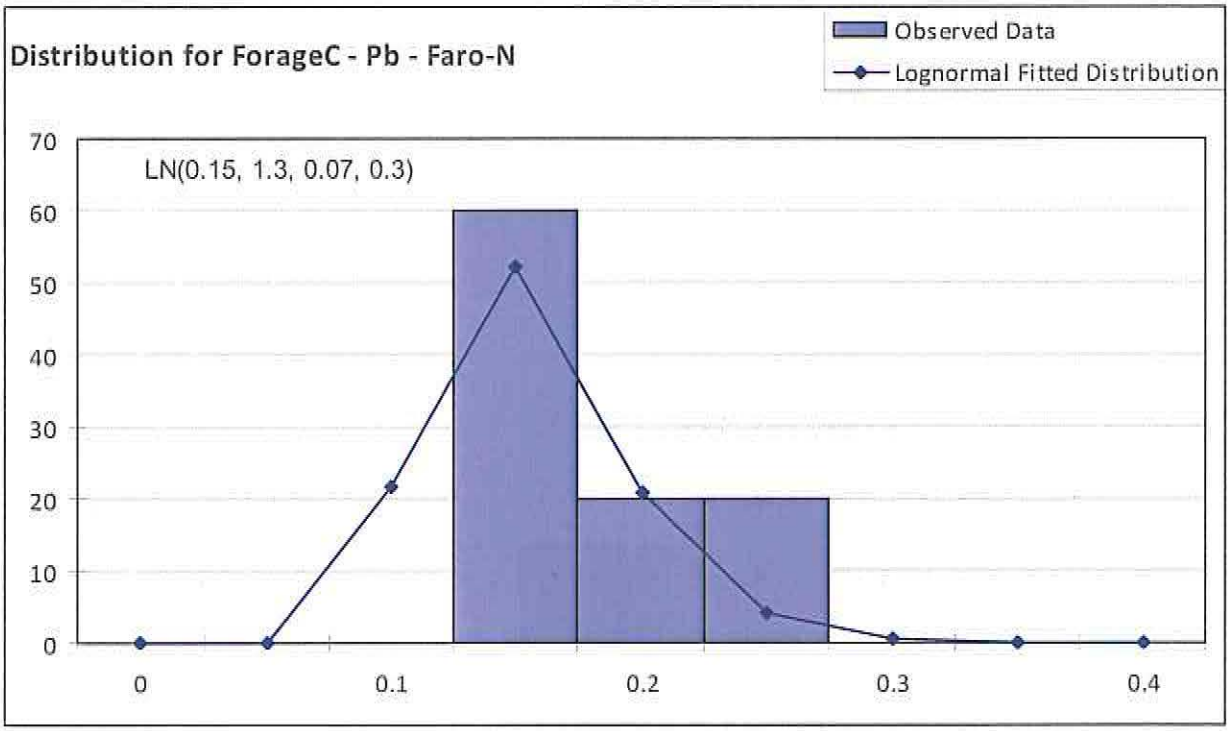
D.6.9 Lead

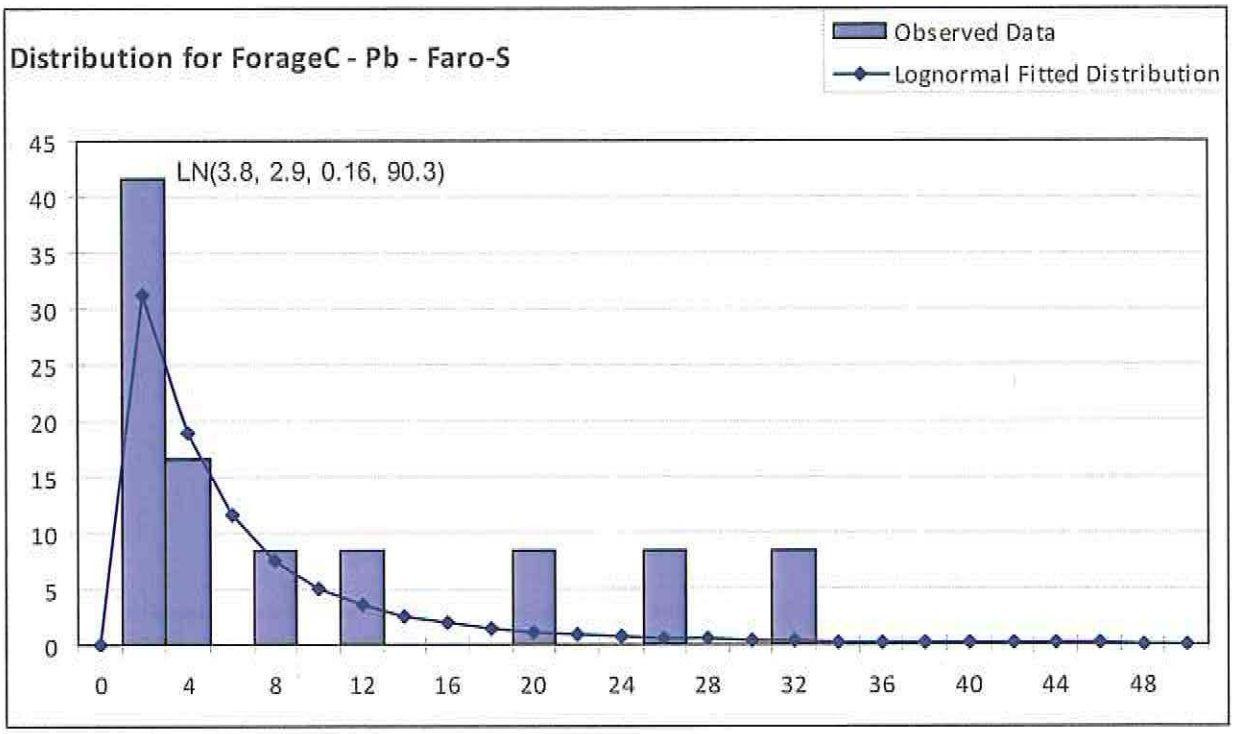

Distribution for ForageC - Pb - Overall
Observed Data
Lognormal Fitted Distribution
LN(1.25, 3.9, 0.02, 72.3)
80
70
60
50
40
30
20
10
0
0
2
4
6
8
10
12
14
16
18
20
22
24
26
28
30
32
34
36
38
40

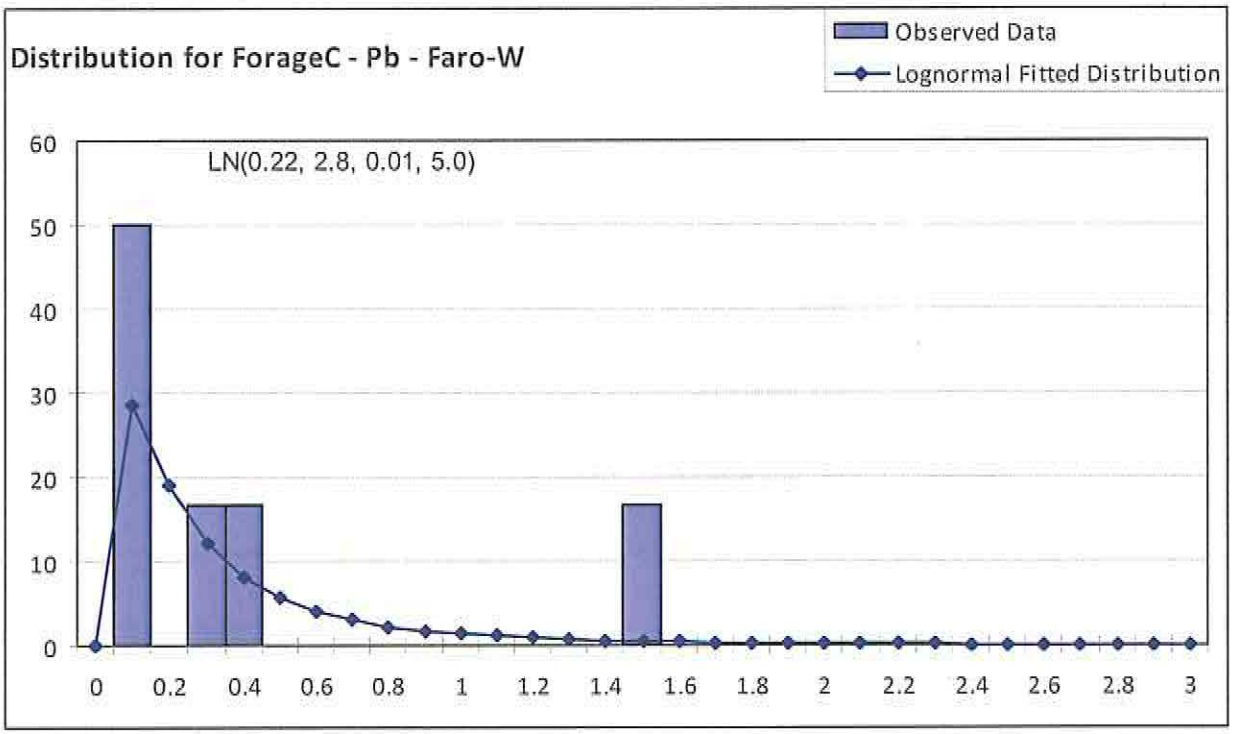

Distribution for ForageC - Pb - Background
Observed Data
Lognormal Fitted Distribution
LN(0.027, 2.1, 0.003, 0.25)
70
60
50
40
30
20
10
0
0
0.02
0.04
0.06
0.08
0.1
0.12
0.14
0.16
0.18
0.2

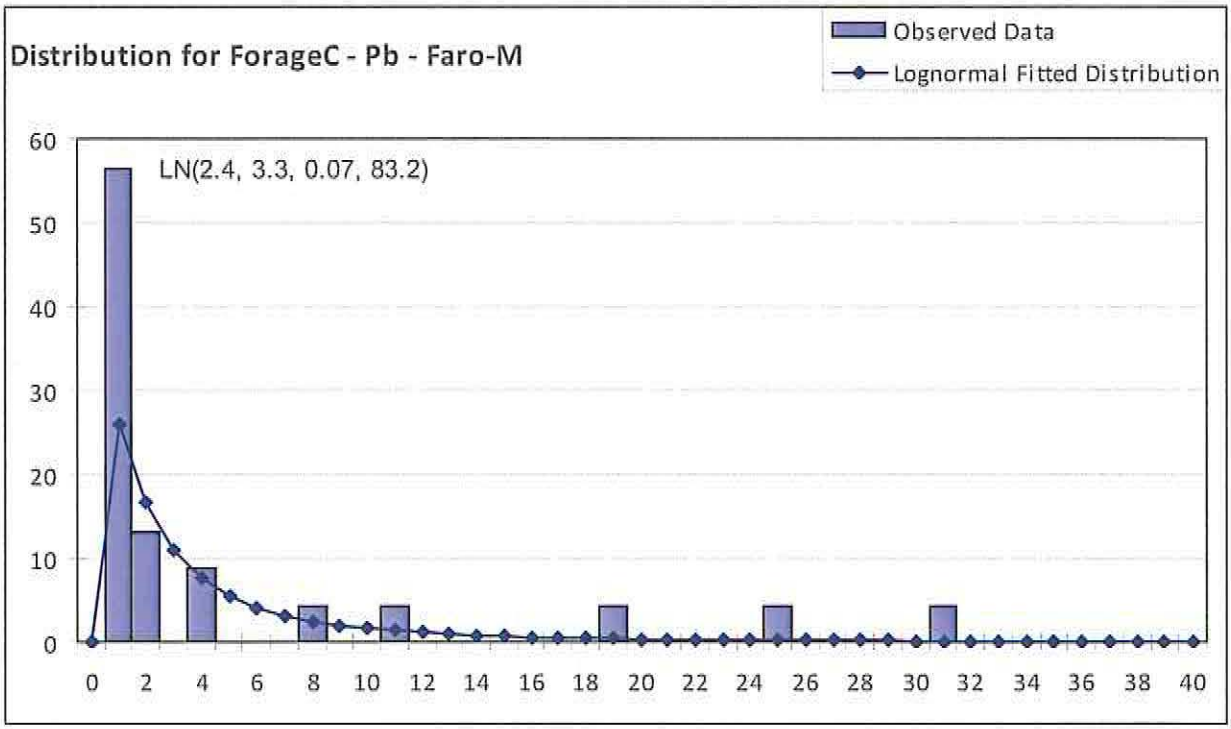

Distribution for ForageC - Pb-Van-S
Observed Data
Lognormal Fitted Distribution
LN(0.4, 1.8, 0.08, 2.2)
80
70
60
50
40
30
20
10
0
0
0.4
0.8
1.2
1.6
2
2.4

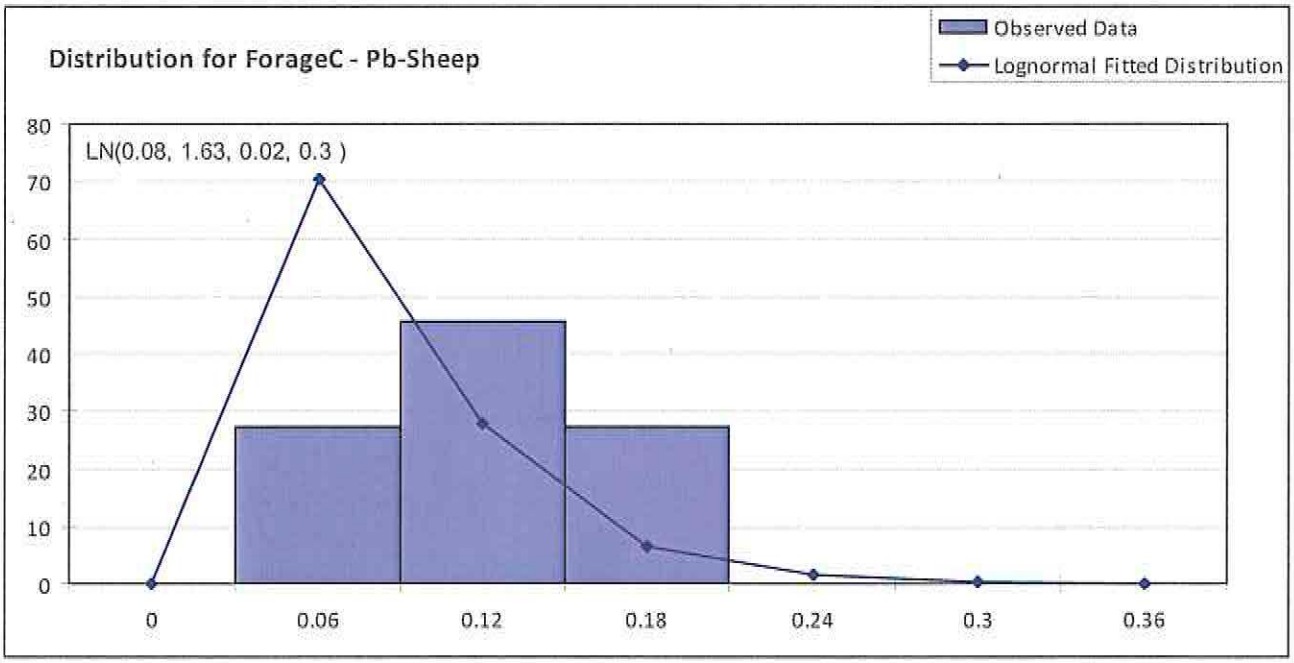

Distribution for ForageC - Pb - Van-M
Observed Data
Lognormal Fitted Distribution
LN(0.3, 1.9, 0.04, 2.4)
60
50
40
30
20
10
0
0
0.25
0.5
0.75
1
1.25
1.5
1.75
2
2.25
2.5


Distribution for ForageC - Pb - Faro-N
Observed Data
Lognormal Fitted Distribution
LN(0.15, 1.3, 0.07, 0.3)
70
60
50
40
30
20
10
0
0
0.1
0.2
0.3
0.4

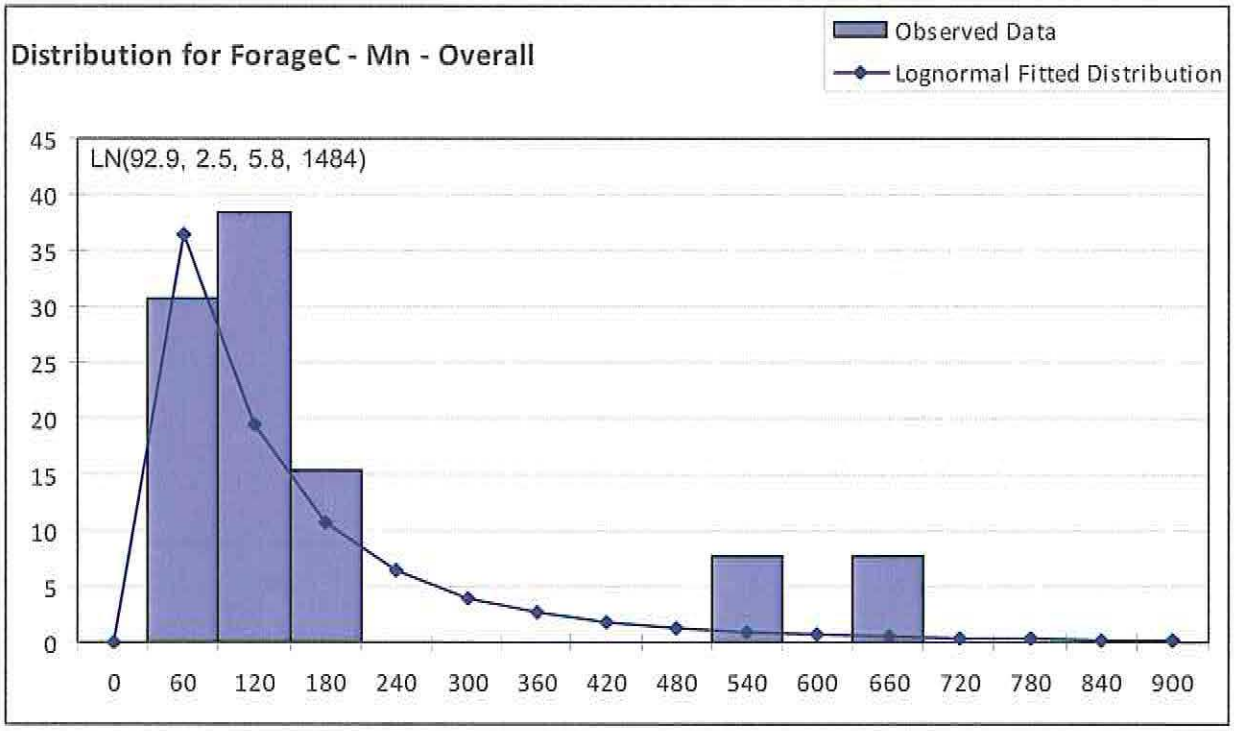

Distribution for ForageC - Pb - Faro-S
Observed Data
Lognormal Fitted Distribution
LN(3.8, 2.9, 0.16, 90.3)
45
40
35
30
25
20
15
10
5
0
0
4
8
12
16
20
24
28
32
36
40
44
48

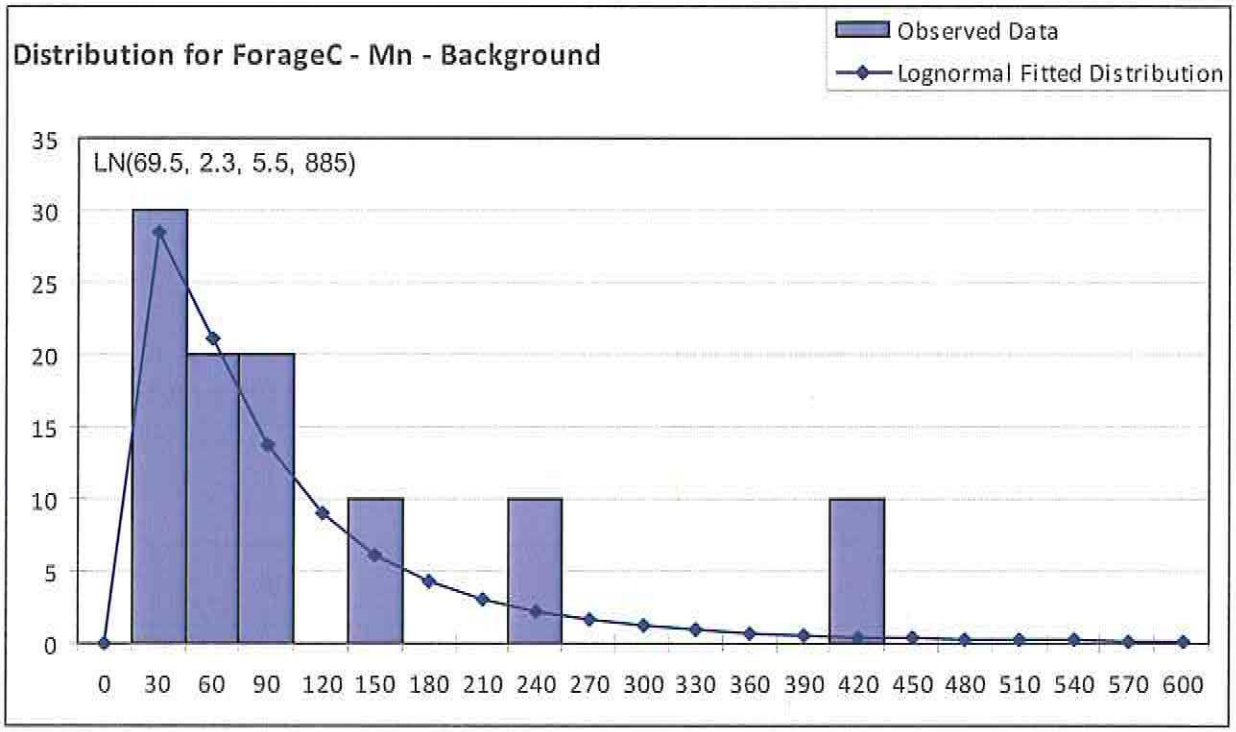

Distribution for ForageC - Pb - Faro-W
Observed Data
Lognormal Fitted Distribution
LN(0.22, 2.8, 0.01, 5.0)
60
50
40
30
20
10
0
0
0.2
0.4
0.6
0.8
1
1.2
1.4
1.6
1.8
2
2.2
2.4
2.6
2.8
3

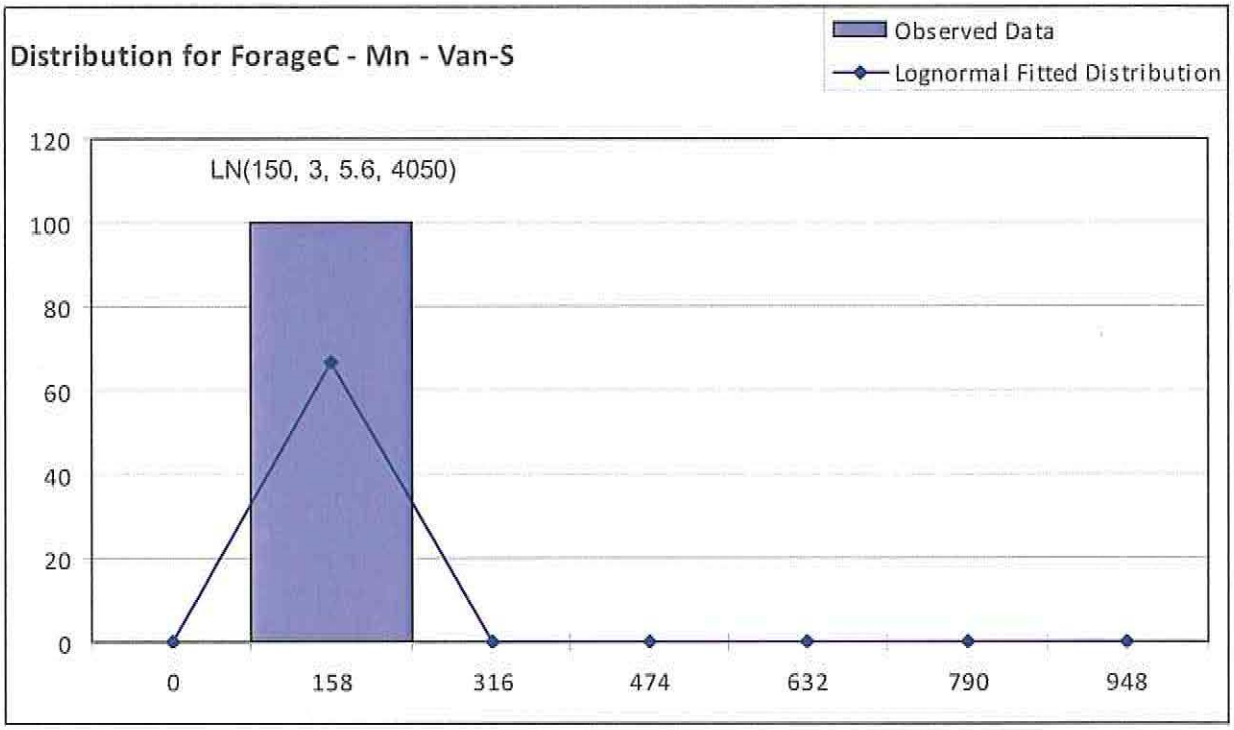

Distribution for ForageC - Pb - Faro-M
Observed Data
Lognormal Fitted Distribution
LN(2.4, 3.3, 0.07, 83.2)
60
50
40
30
20
10
0
0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40

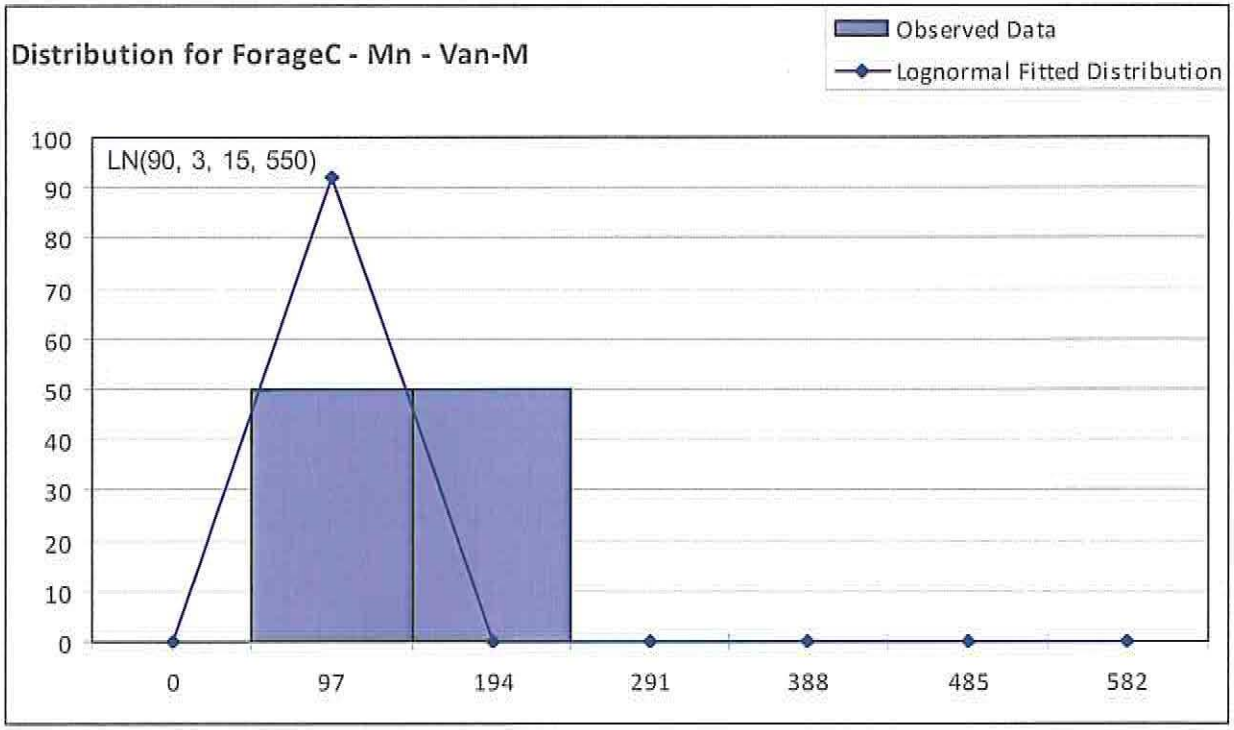

Distribution for ForageC - Pb-Sheep
Observed Data
Lognormal Fitted Distribution
LN(0.08, 1.63, 0.02, 0.3)
80
70
60
50
40
30
20
10
0
0 0.06 0.12 0.18 0.24 0.3 0.36

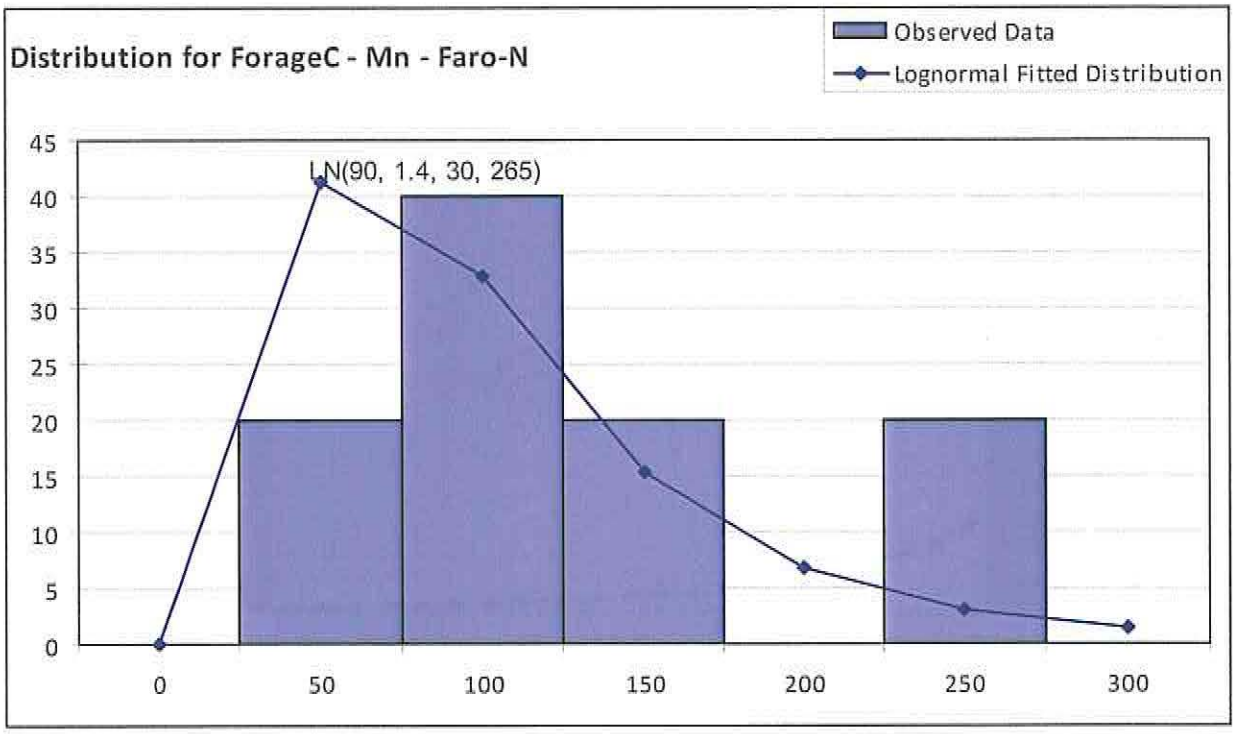
D.6.10 Manganese

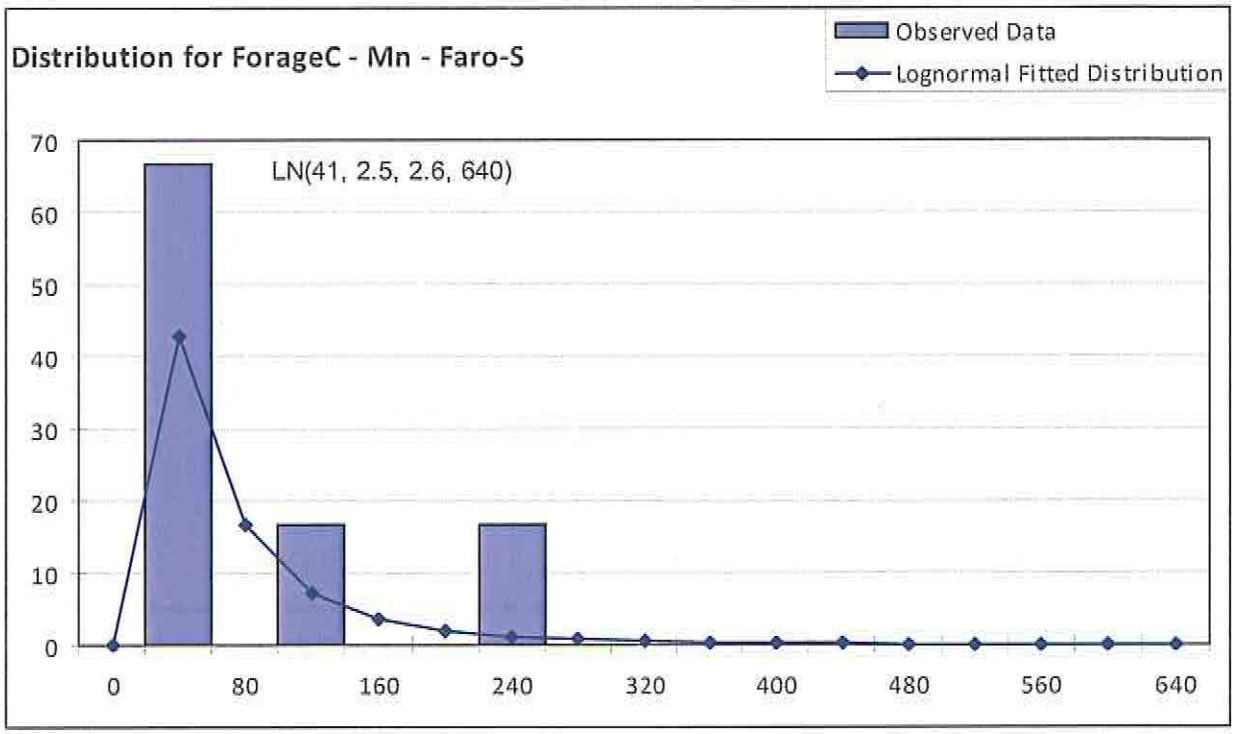


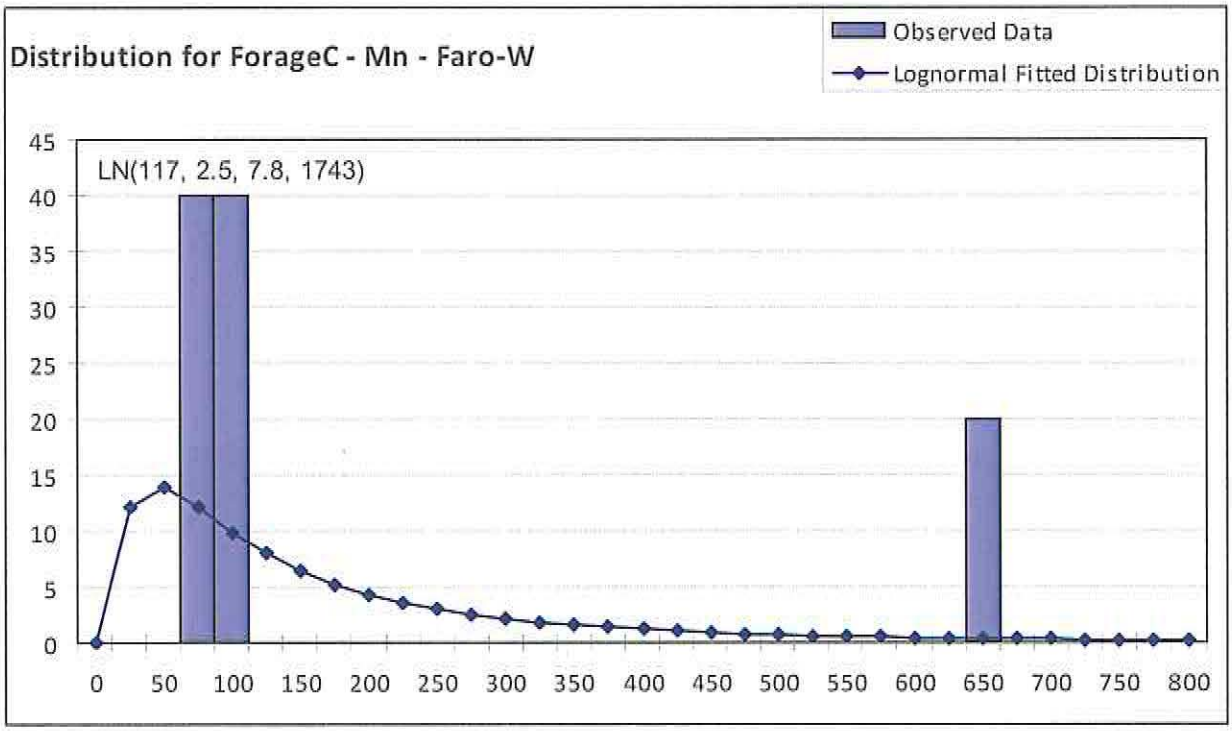


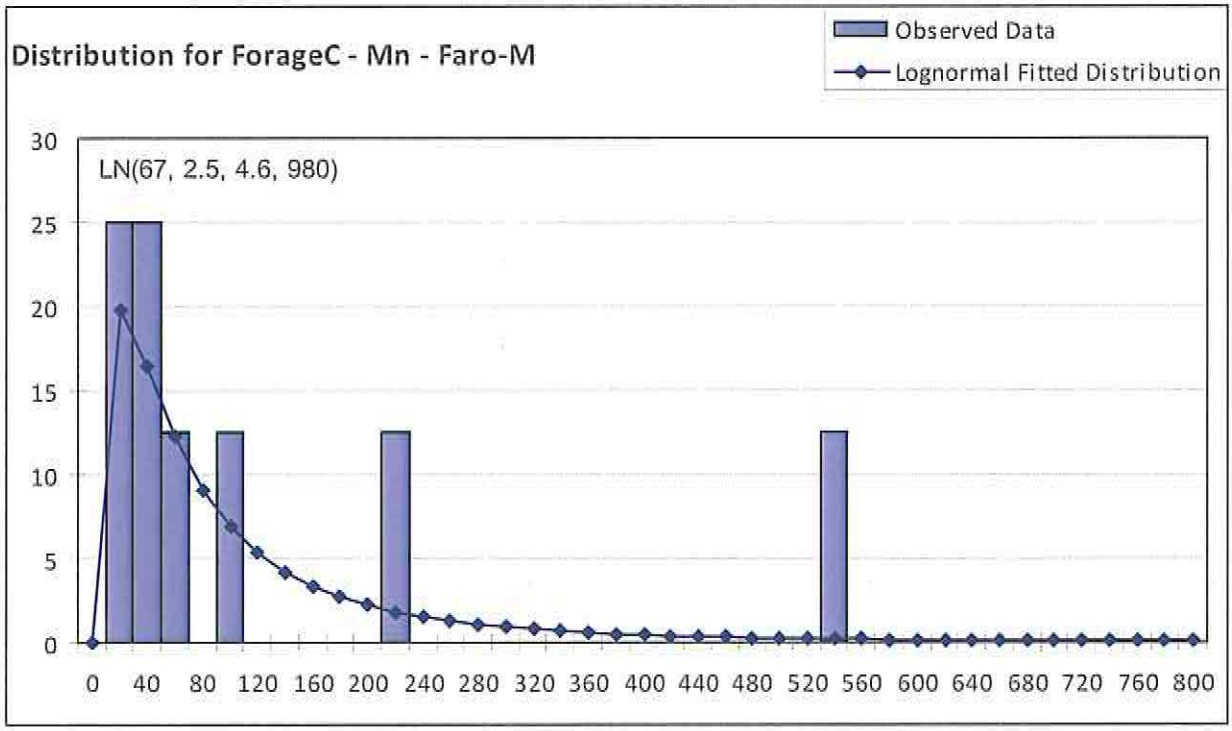

Distribution for ForageC - Mn - Van-S
Observed Data
Lognormal Fitted Distribution
LN(150, 3, 5.6, 4050)
120
100
80
60
40
20
0
0
158
316
474
632
790
948

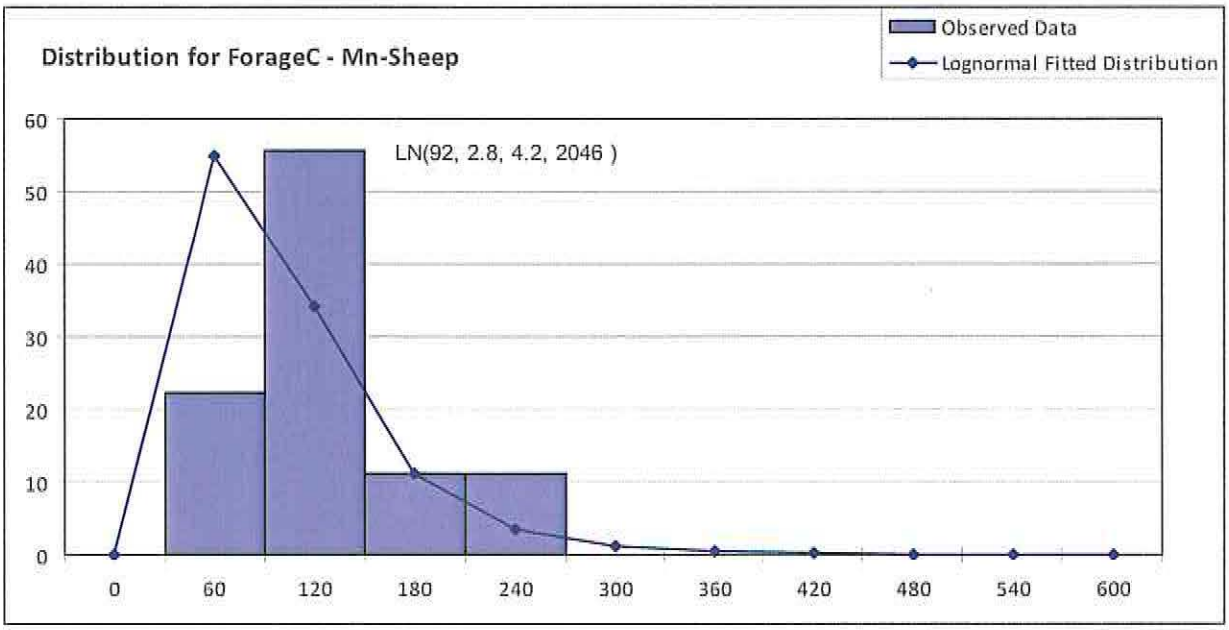

Distribution for ForageC - Mn - Van-M
Observed Data
Lognormal Fitted Distribution
LN(90, 3, 15, 550)
100
90
80
70
60
50
40
30
20
10
0
0
97
194
291
388
485
582


Distribution for ForageC - Mn - Faro-N
Observed Data
Lognormal Fitted Distribution
LN(90, 1.4, 30, 265)
45
40
35
30
25
20
15
10
5
0
0
50
100
150
200
250
300

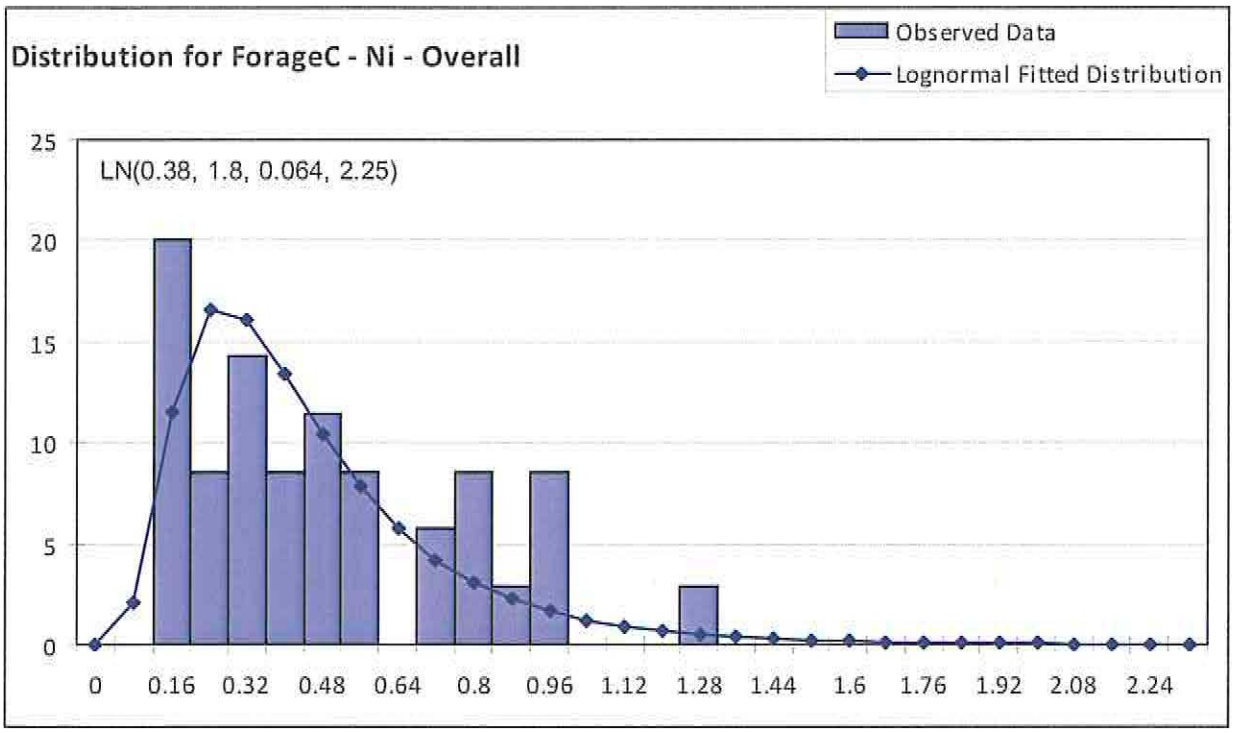

Distribution for ForageC - Mn - Faro-S
Observed Data
Lognormal Fitted Distribution
LN(41, 2.5, 2.6, 640)
70
60
50
40
30
20
10
0
0
80
160
240
320
400
480
560
640

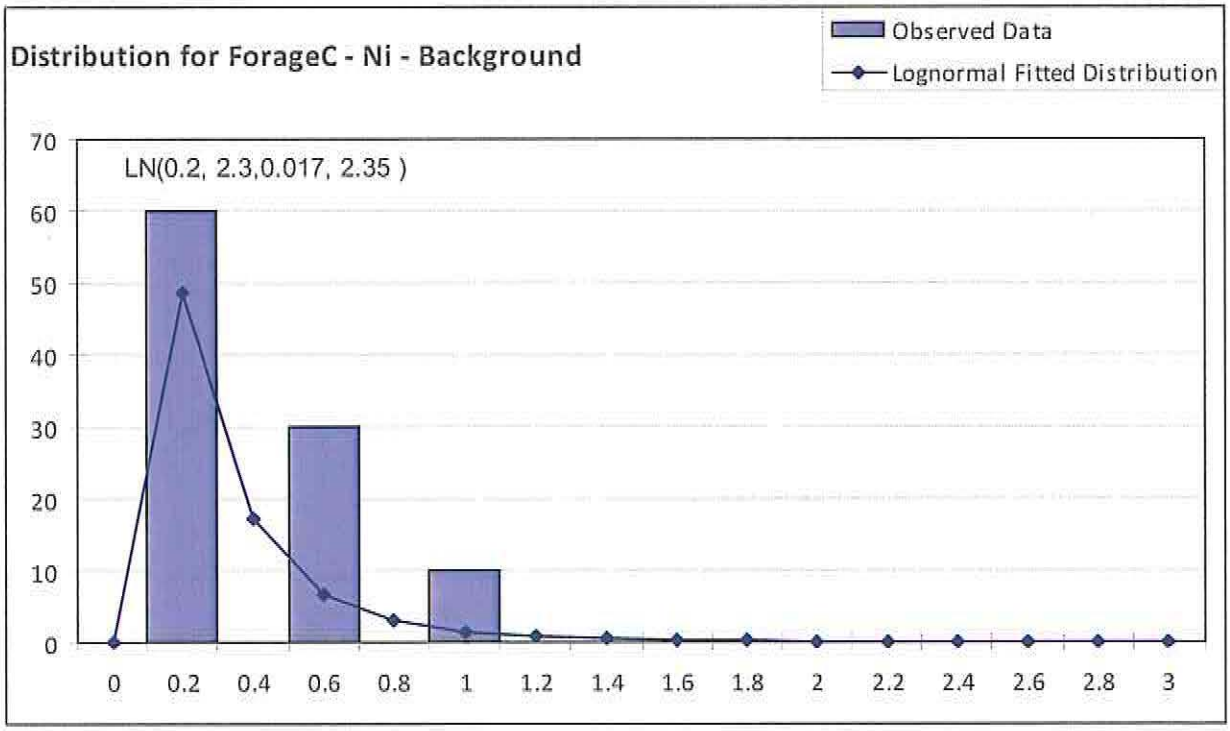

Distribution for ForageC - Mn - Faro-W
Observed Data
Lognormal Fitted Distribution
LN(117, 2.5, 7.8, 1743)
45
40
35
30
25
20
15
10
5
0
0 50 100 150 200 250 300 350 400 450 500 550 600 650 700 750 800

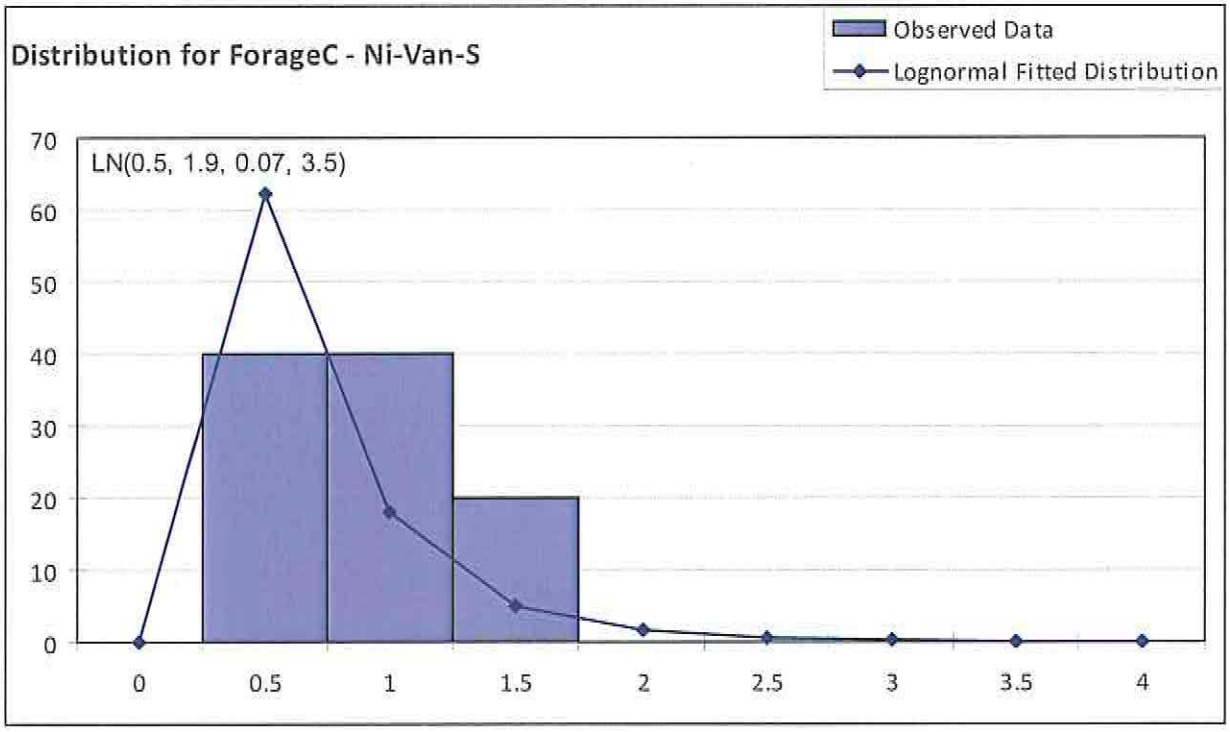

Distribution for ForageC - Mn - Faro-M
Observed Data
Lognormal Fitted Distribution
LN(67, 2.5, 4.6, 980)
30
25
20
15
10
5
0
0 40 80 120 160 200 240 280 320 360 400 440 480 520 560 600 640 680 720 760 800

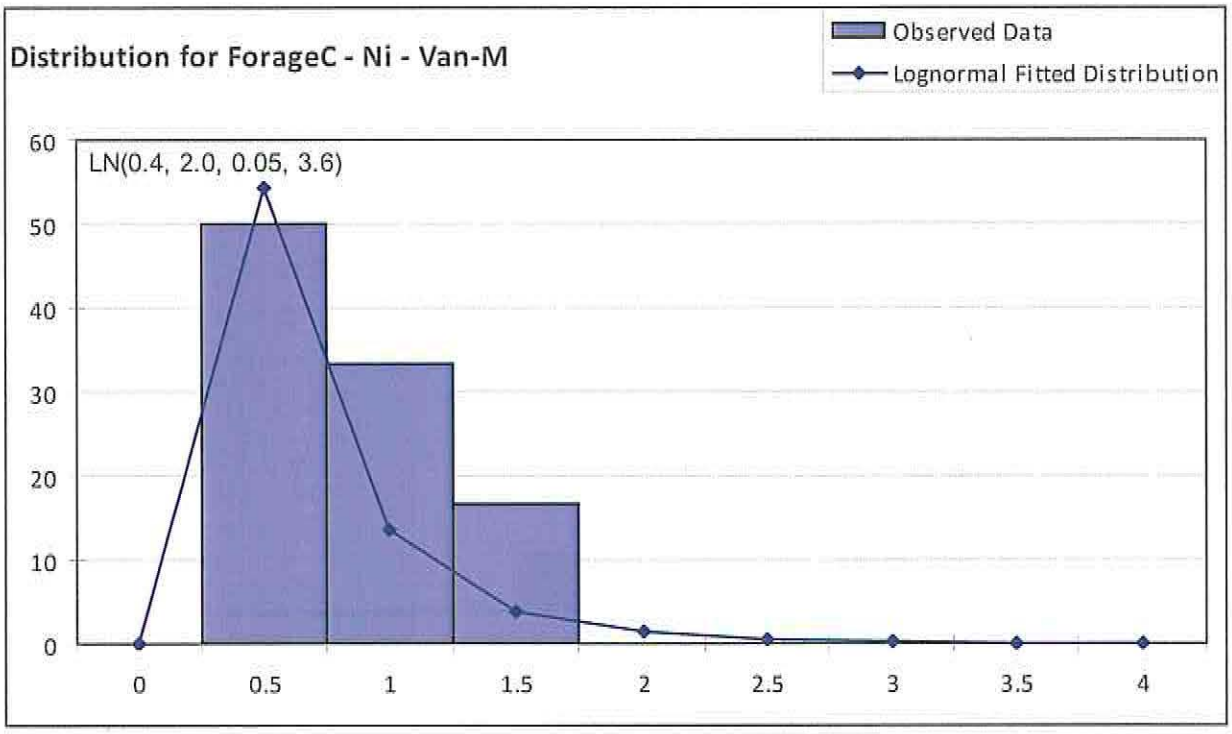

Distribution for ForageC - Mn-Sheep
Observed Data
Lognormal Fitted Distribution
LN(92, 2.8, 4.2, 2046)
60
50
40
30
20
10
0
0
60
120
180
240
300
360
420
480
540
600

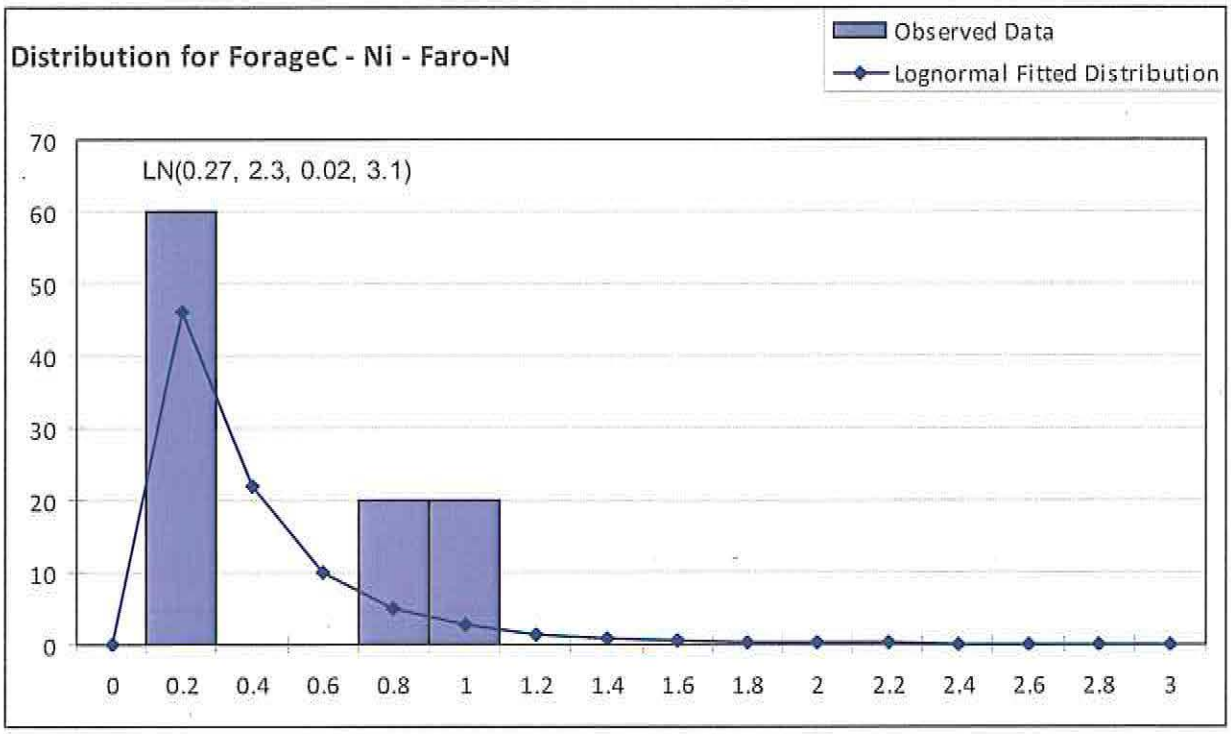
D.6.11 Nickel

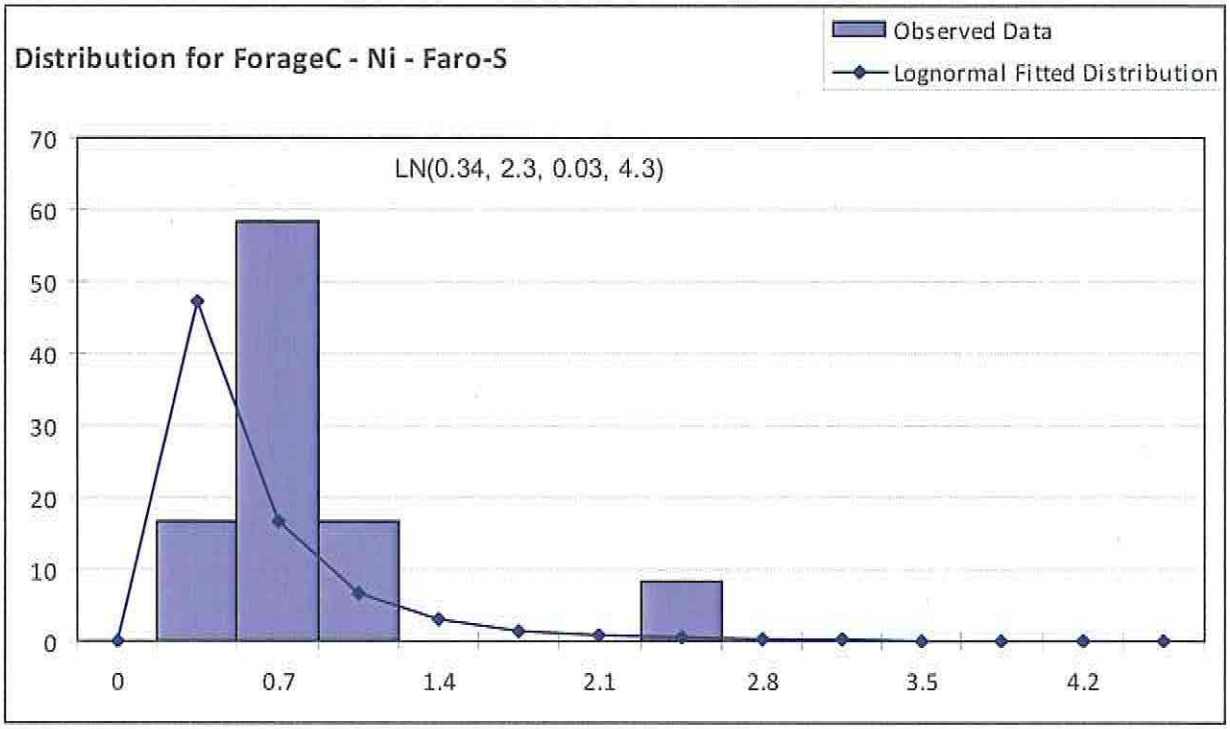

Distribution for ForageC - Ni - Overall
Observed Data
Lognormal Fitted Distribution
LN(0.38, 1.8, 0.064, 2.25)
25
20
15
10
5
0
0
0.16
0.32
0.48
0.64
0.8
0.96
1.12
1.28
1.44
1.6
1.76
1.92
2.08
2.24

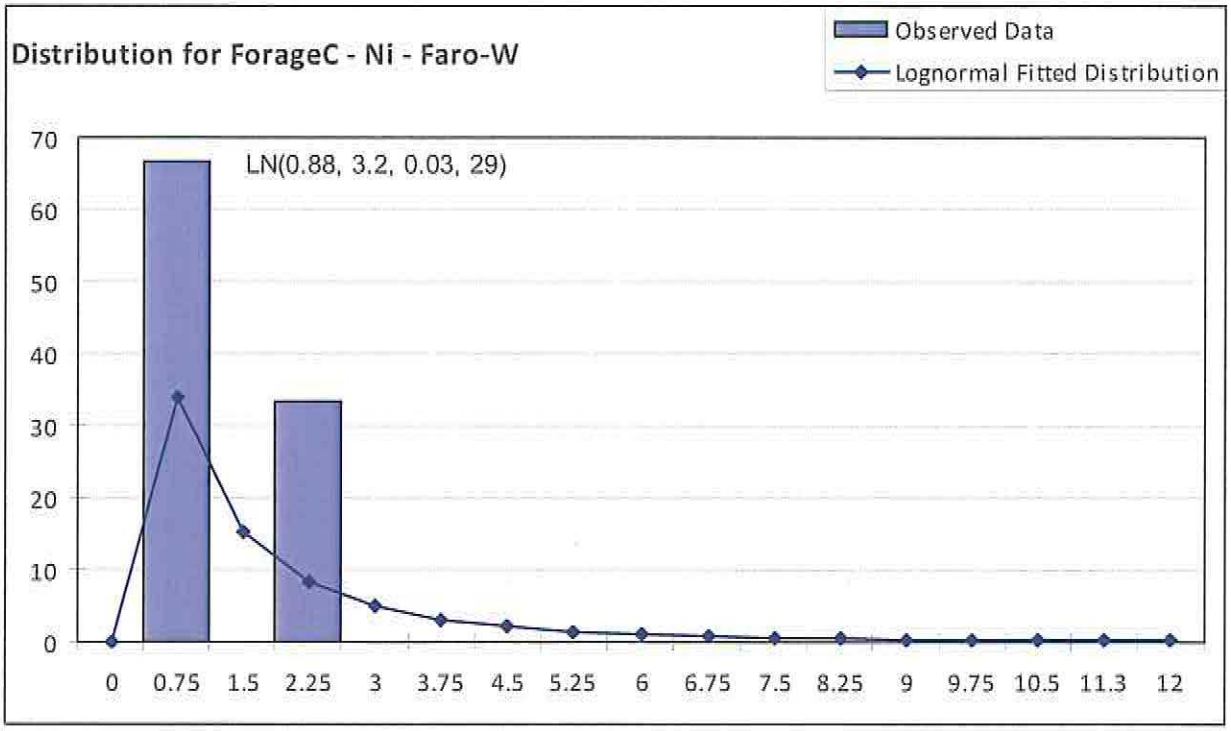

Distribution for ForageC - Ni - Background
Observed Data
Lognormal Fitted Distribution
LN(0.2, 2.3,0.017, 2.35)
70
60
50
40
30
20
10
0
0
0.2
0.4
0.6
0.8
1
1.2
1.4
1.6
1.8
2
2.2
2.4
2.6
2.8
3

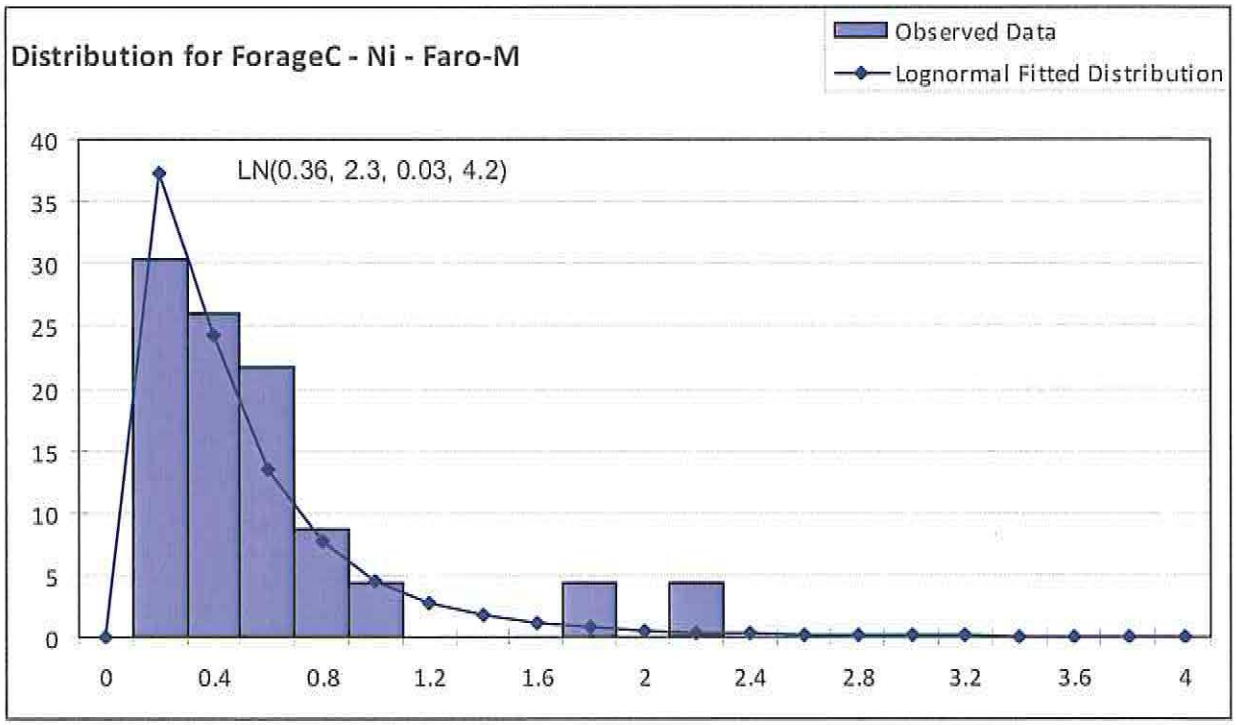

Distribution for ForageC - Ni-Van-S
Observed Data
Lognormal Fitted Distribution
LN(0.5, 1.9, 0.07, 3.5)
70
60
50
40
30
20
10
0
0
0.5
1
1.5
2
2.5
3
3.5
4

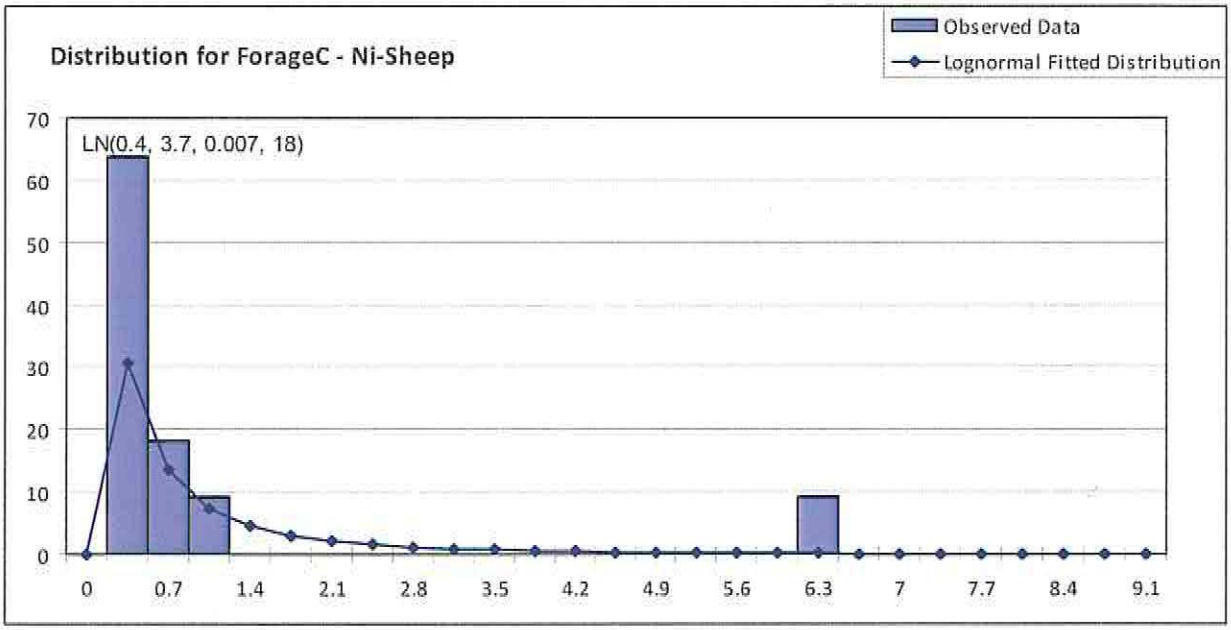

Distribution for ForageC - Ni - Van-M
Observed Data
Lognormal Fitted Distribution
LN(0.4, 2.0, 0.05, 3.6)
60
50
40
30
20
10
0
0
0.5
1
1.5
2
2.5
3
3.5
4


Distribution for ForageC - Ni - Faro-N
Observed Data
Lognormal Fitted Distribution
LN(0.27, 2.3, 0.02, 3.1)
70
60
50
40
30
20
10
0
0
0.2
0.4
0.6
0.8
1
1.2
1.4
1.6
1.8
2
2.2
2.4
2.6
2.8
3

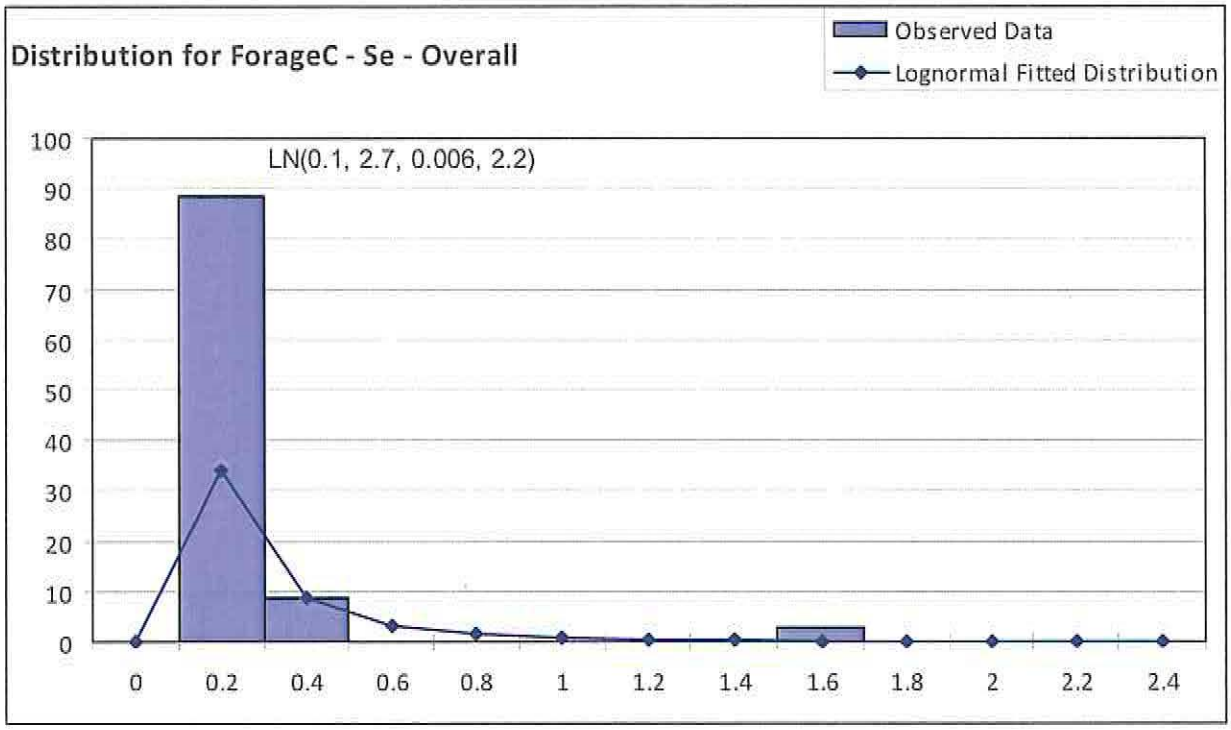

Distribution for ForageC - Ni - Faro-S
Observed Data
Lognormal Fitted Distribution
LN(0.34, 2.3, 0.03, 4.3)
70
60
50
40
30
20
10
0
0
0.7
1.4
2.1
2.8
3.5
4.2

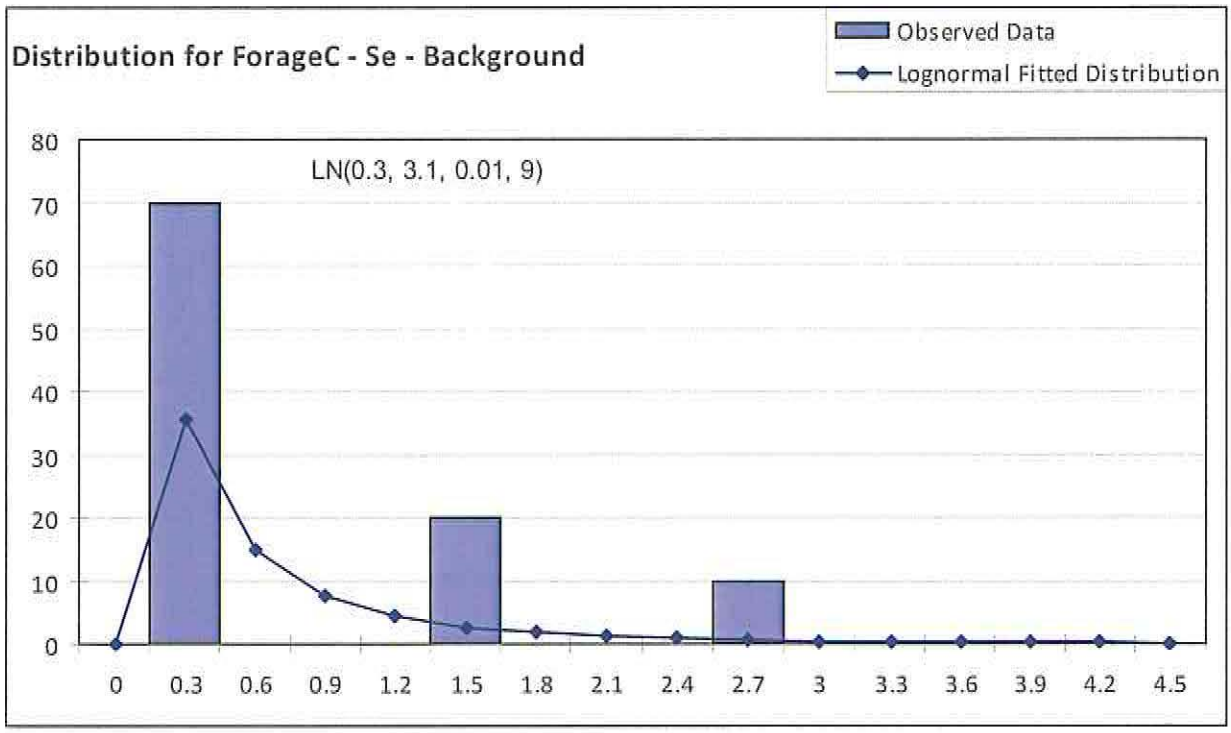

Distribution for ForageC - Ni - Faro-W
Observed Data
Lognormal Fitted Distribution
LN(0.88, 3.2, 0.03, 29)
70
60
50
40
30
20
10
0
0
0.75
1.5
2.25
3
3.75
4.5
5.25
6
6.75
7.5
8.25
9
9.75
10.5
11.3
12

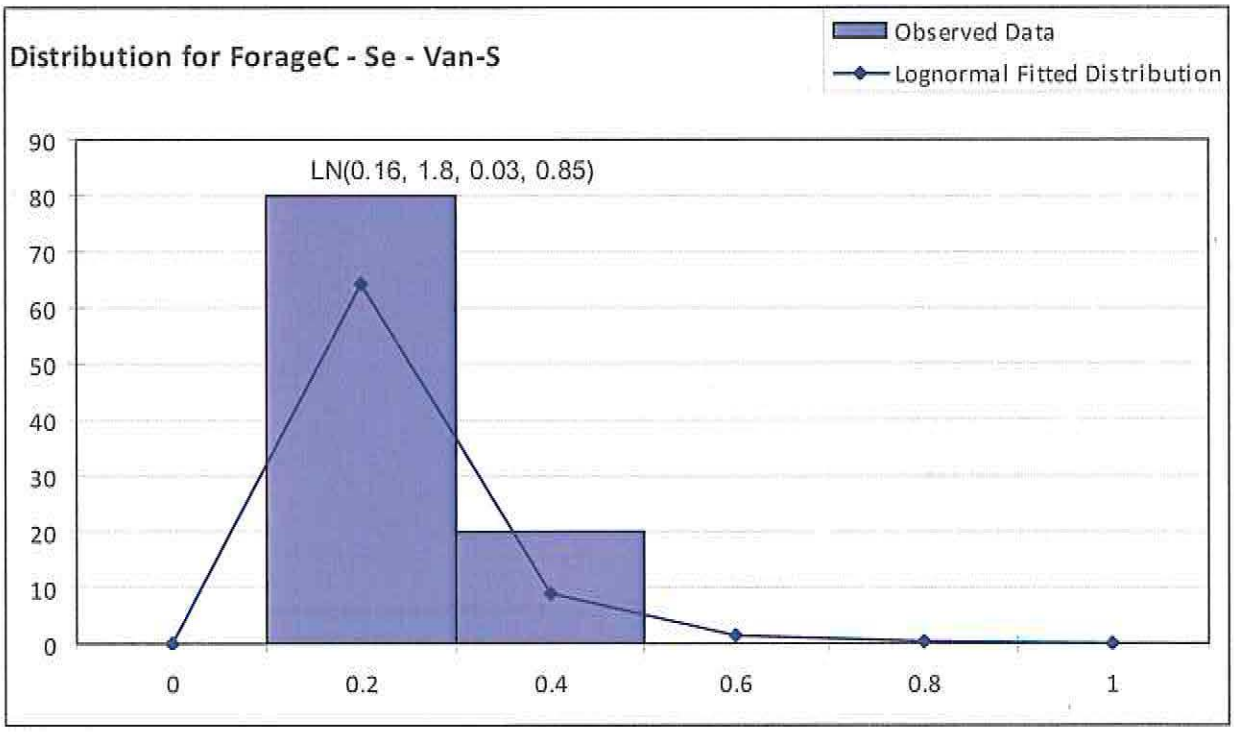

Distribution for ForageC - Ni - Faro-M
Observed Data
Lognormal Fitted Distribution
LN(0.36, 2.3, 0.03, 4.2)
40
35
30
25
20
15
10
5
0
0
0.4
0.8
1.2
1.6
2
2.4
2.8
3.2
3.6
4

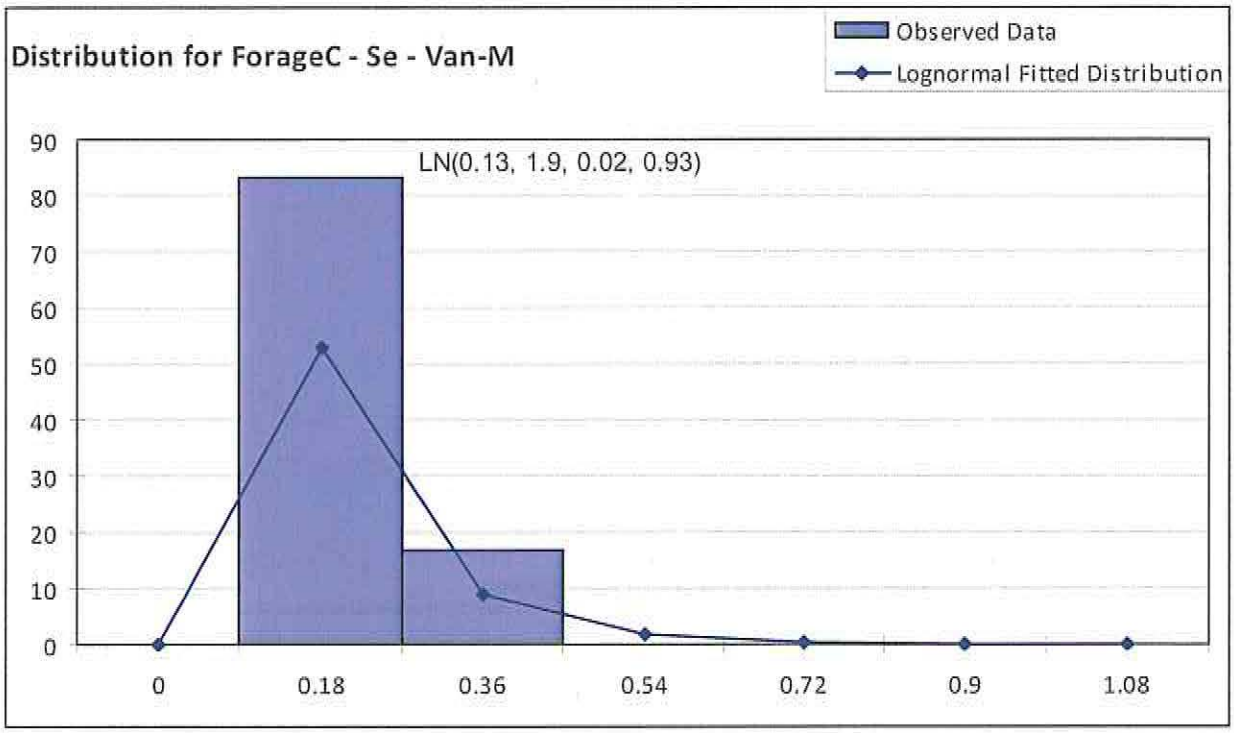

Distribution for ForageC - Ni-Sheep
Observed Data
Lognormal Fitted Distribution
LN(0.4, 3.7, 0.007, 18)
70
60
50
40
30
20
10
0
0
0.7
1.4
2.1
2.8
3.5
4.2
4.9
5.6
6.3
7
7.7
8.4
9.1

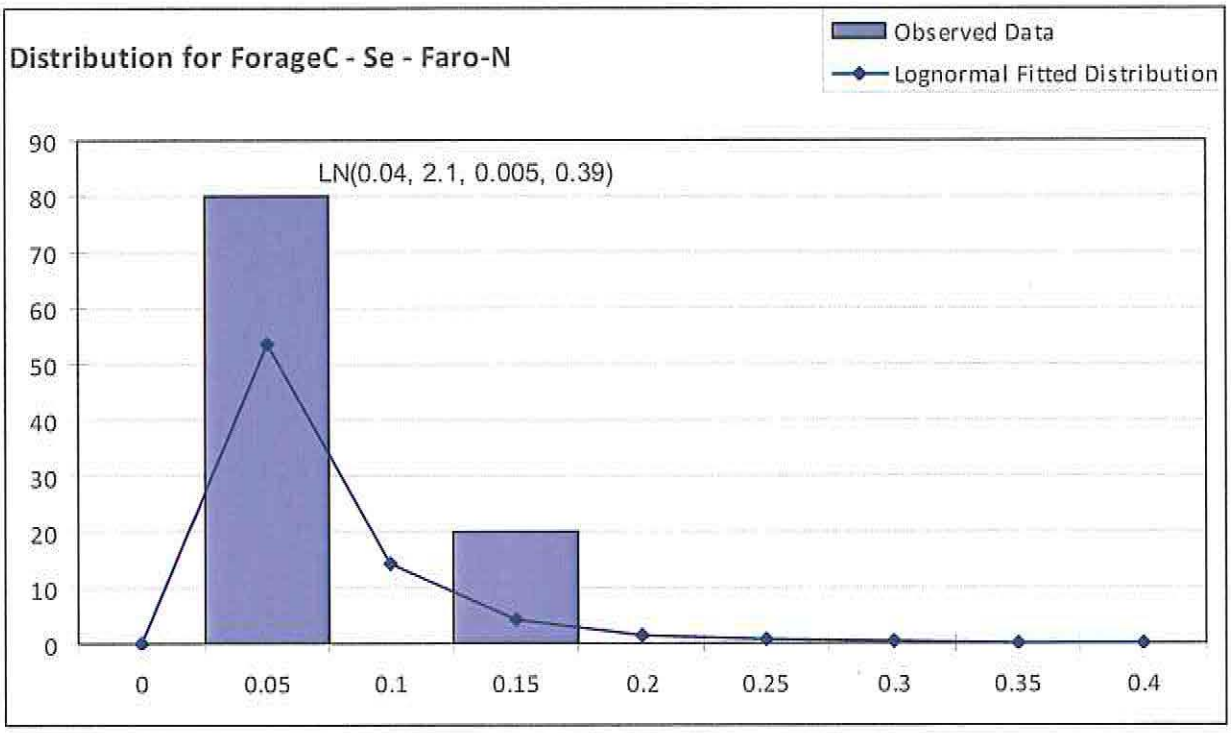
D.6.12 Selenium

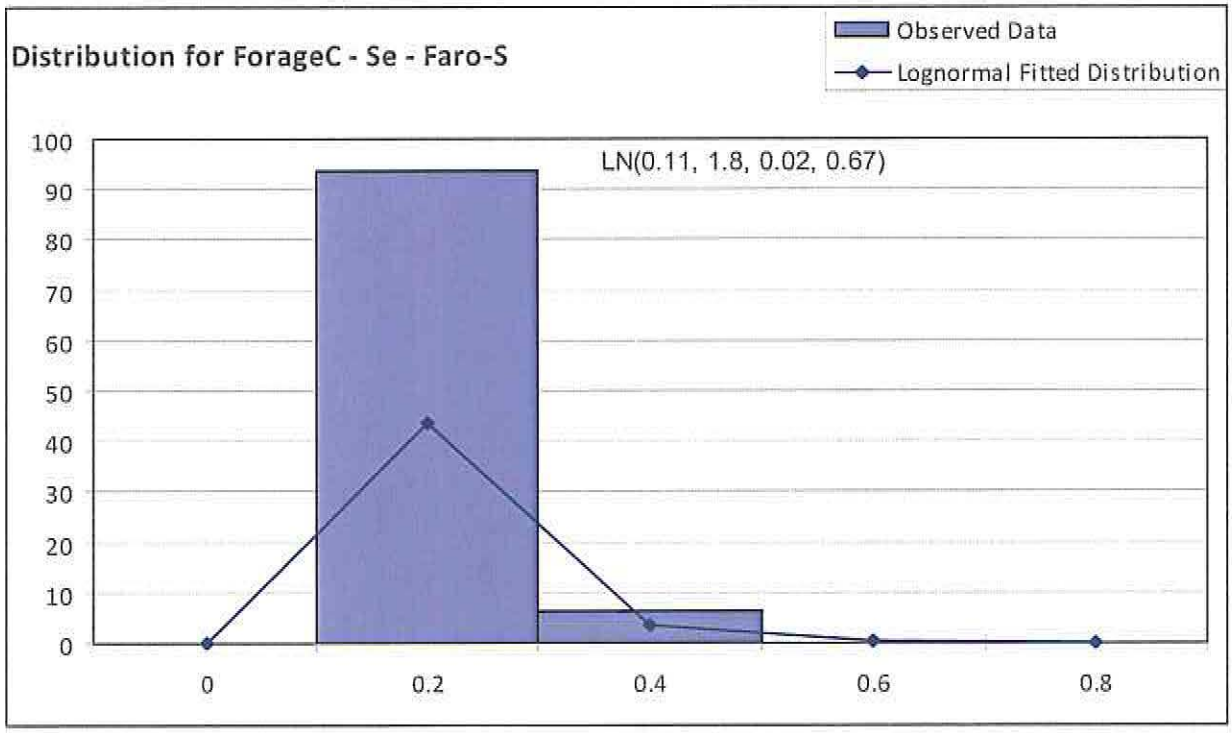


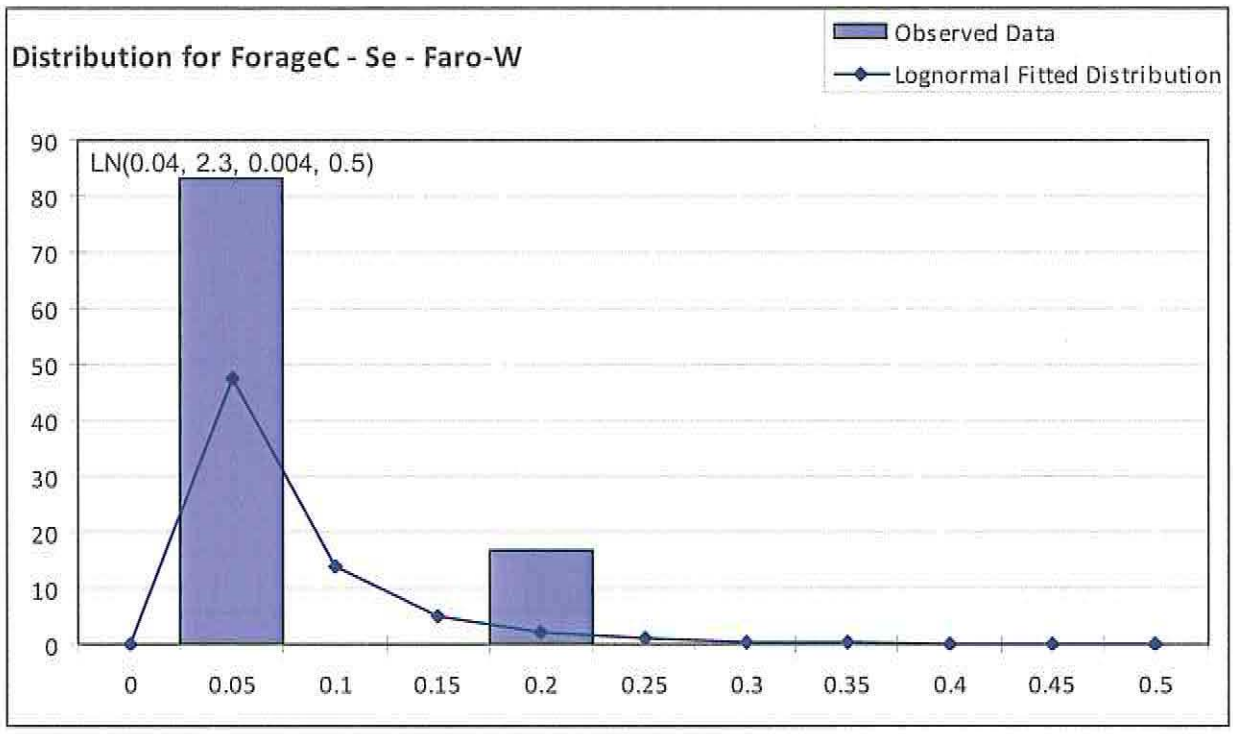


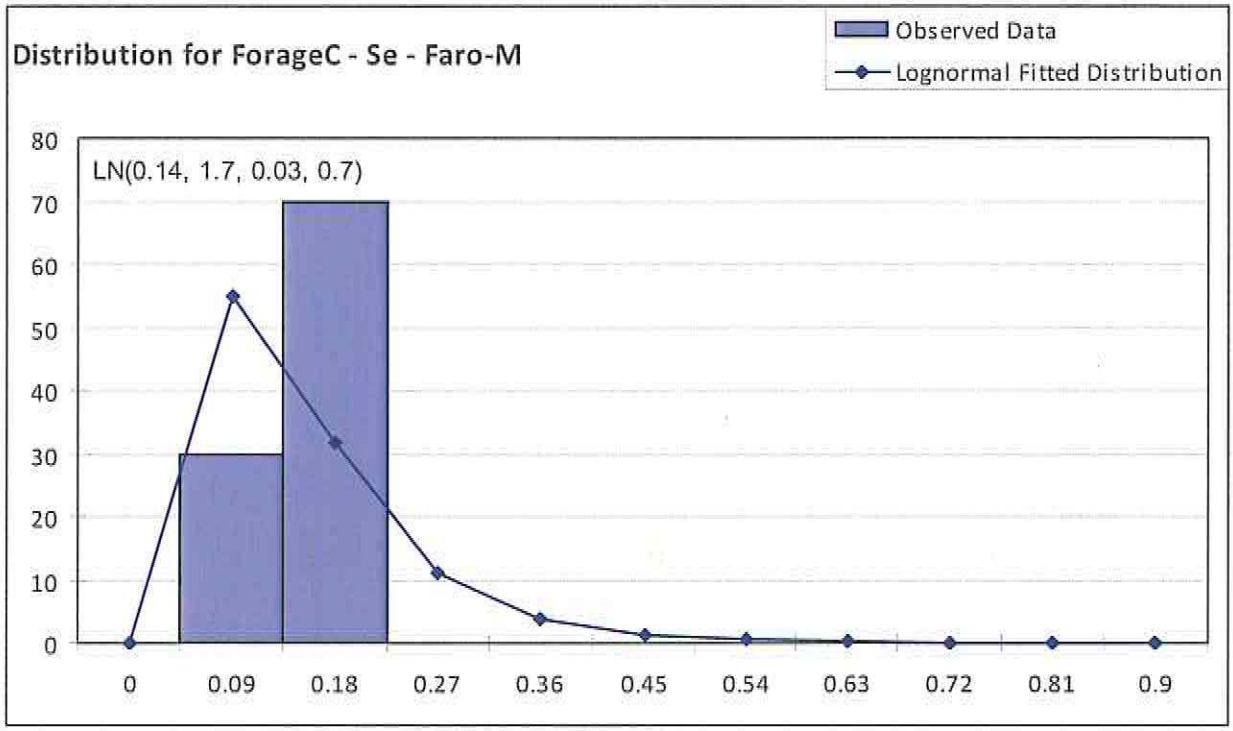

Distribution for ForageC - Se - Van-S
Observed Data
Lognormal Fitted Distribution
LN(0.16, 1.8, 0.03, 0.85)
90
80
70
60
50
40
30
20
10
0
0
0.2
0.4
0.6
0.8
1

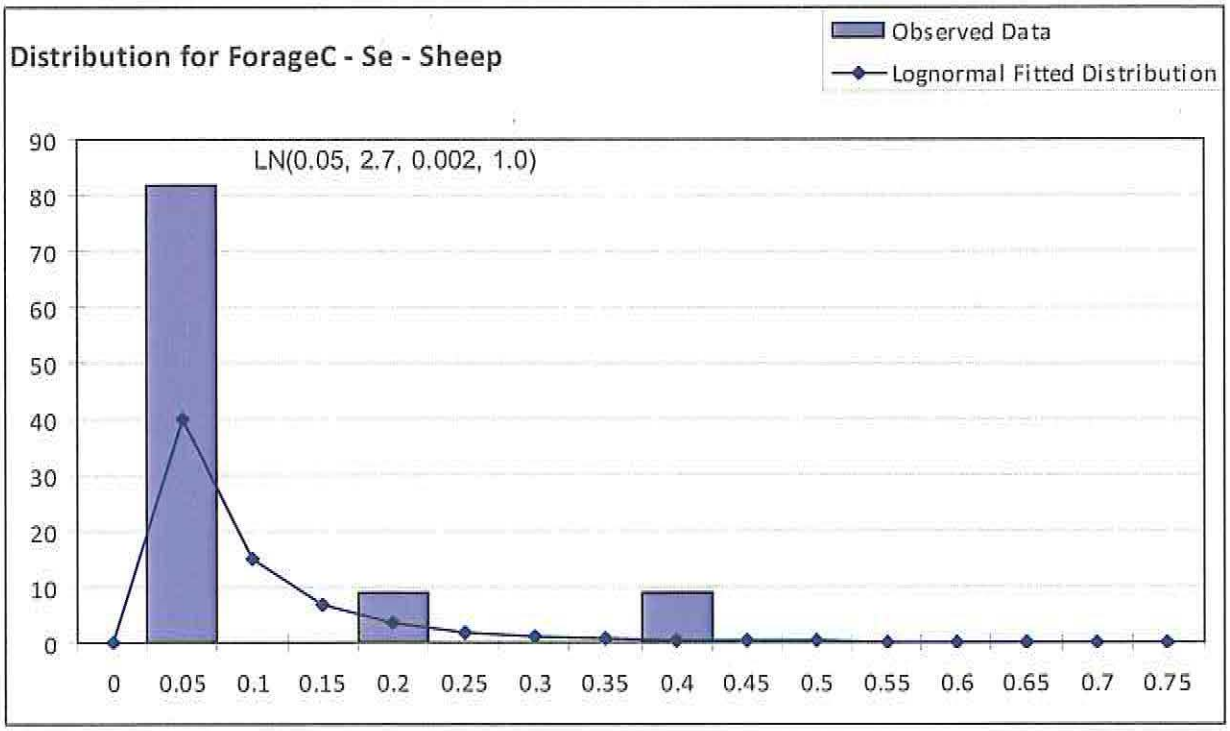

Distribution for ForageC - Se - Van-M
Observed Data
Lognormal Fitted Distribution
LN(0.13, 1.9, 0.02, 0.93)
90
80
70
60
50
40
30
20
10
0
0
0.18
0.36
0.54
0.72
0.9
1.08


Distribution for ForageC - Se - Faro-N
Observed Data
Lognormal Fitted Distribution
LN(0.04, 2.1, 0.005, 0.39)
90
80
70
60
50
40
30
20
10
0
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4

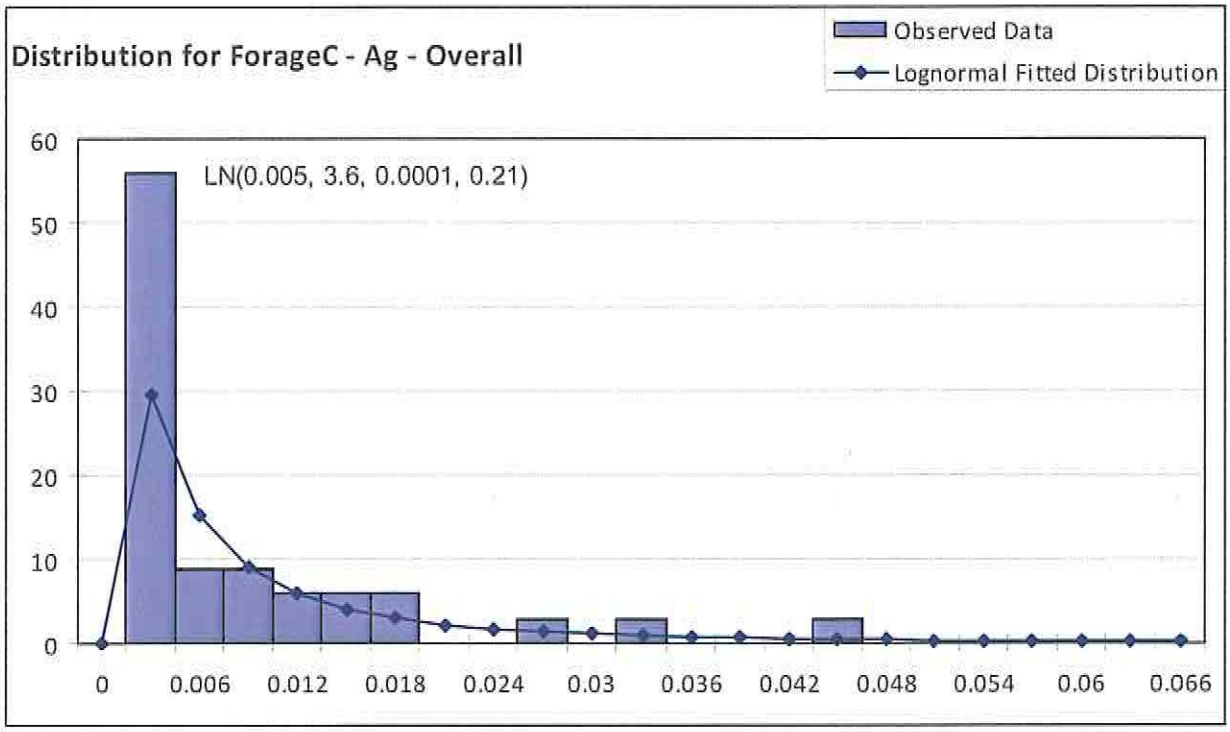

Distribution for ForageC - Se - Faro-S
Observed Data
Lognormal Fitted Distribution
LN(0.11, 1.8, 0.02, 0.67)
100
90
80
70
60
50
40
30
20
10
0
0
0.2
0.4
0.6
0.8

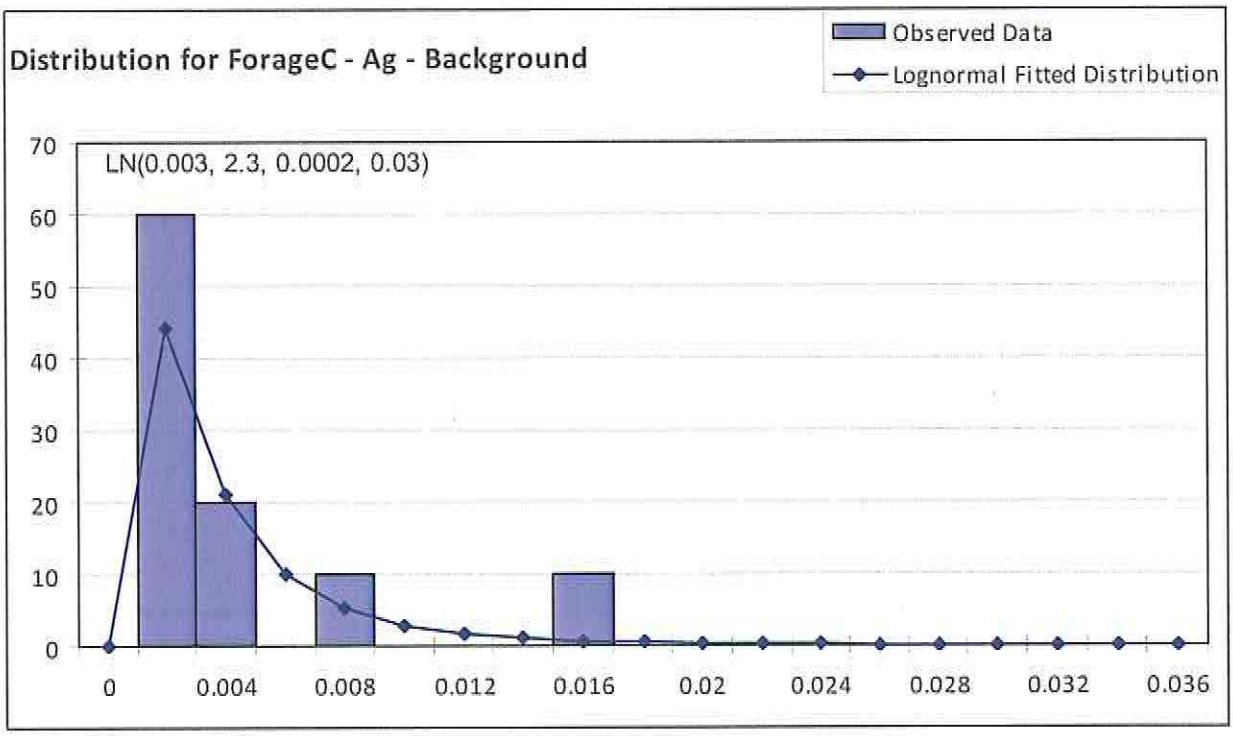

Distribution for ForageC - Se - Faro-W
Observed Data
Lognormal Fitted Distribution
LN(0.04, 2.3, 0.004, 0.5)
90
80
70
60
50
40
30
20
10
0
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
0.45
0.5

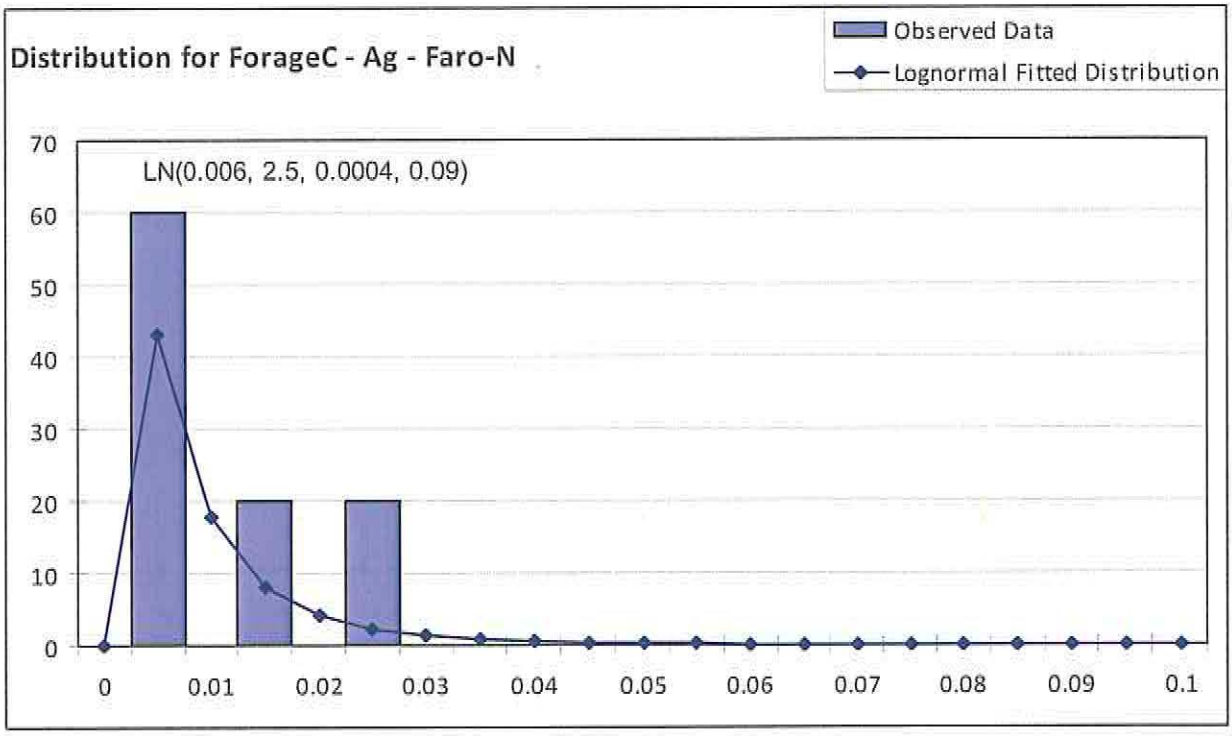

Distribution for ForageC - Se - Faro-M
Observed Data
Lognormal Fitted Distribution
LN(0.14, 1.7, 0.03, 0.7)
80
70
60
50
40
30
20
10
0
0
0.09
0.18
0.27
0.36
0.45
0.54
0.63
0.72
0.81
0.9

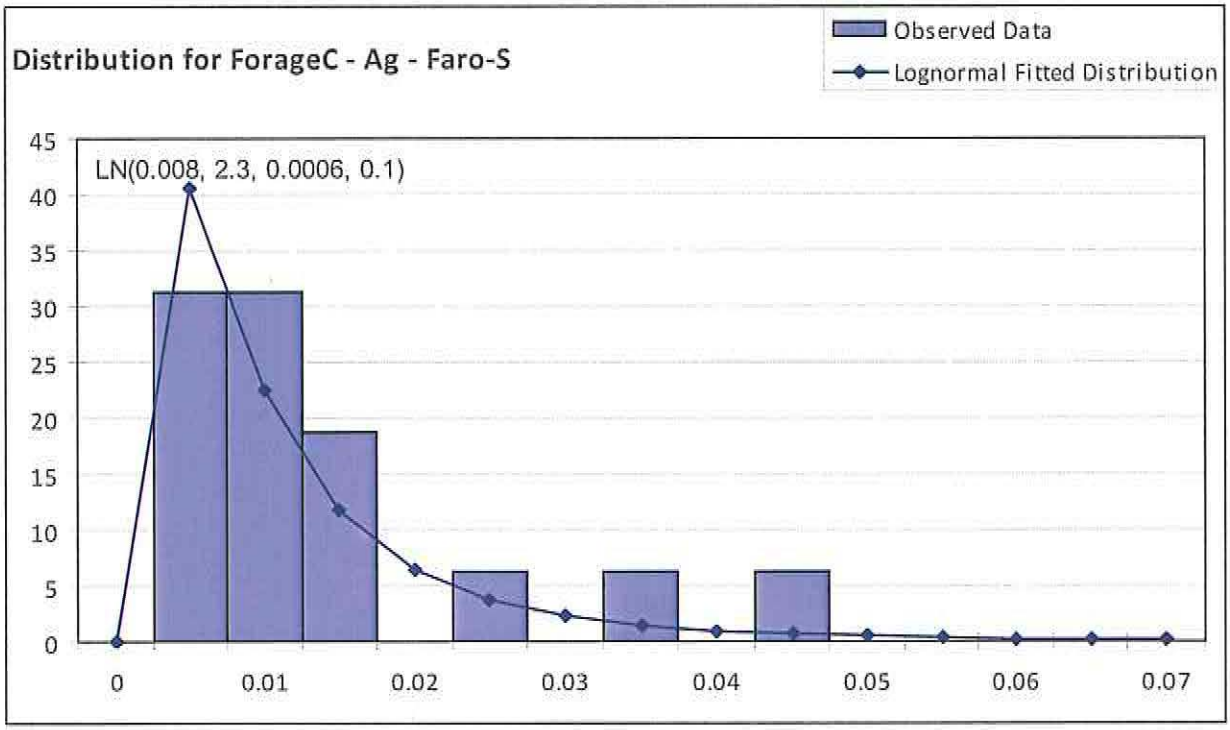

Distribution for ForageC - Se - Sheep
Observed Data
Lognormal Fitted Distribution
LN(0.05, 2.7, 0.002, 1.0)
90
80
70
60
50
40
30
20
10
0
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
0.45
0.5
0.55
0.6
0.65
0.7
0.75

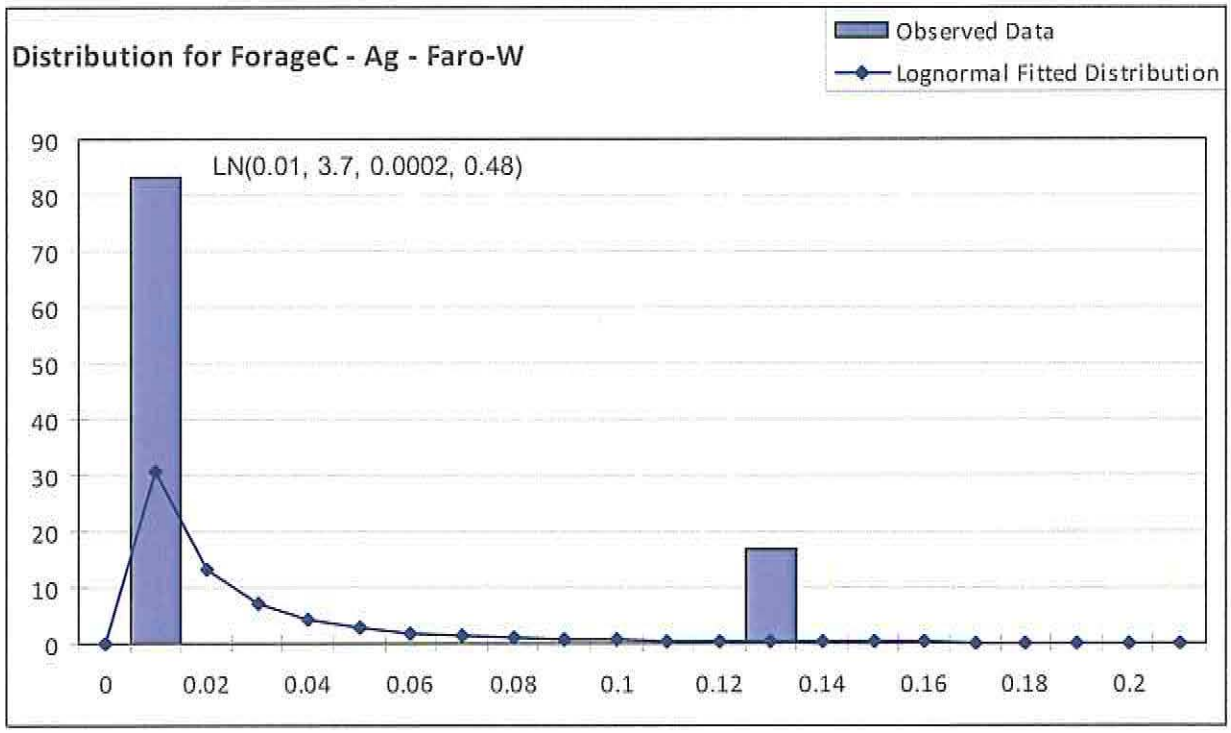
D.6.13 Silver

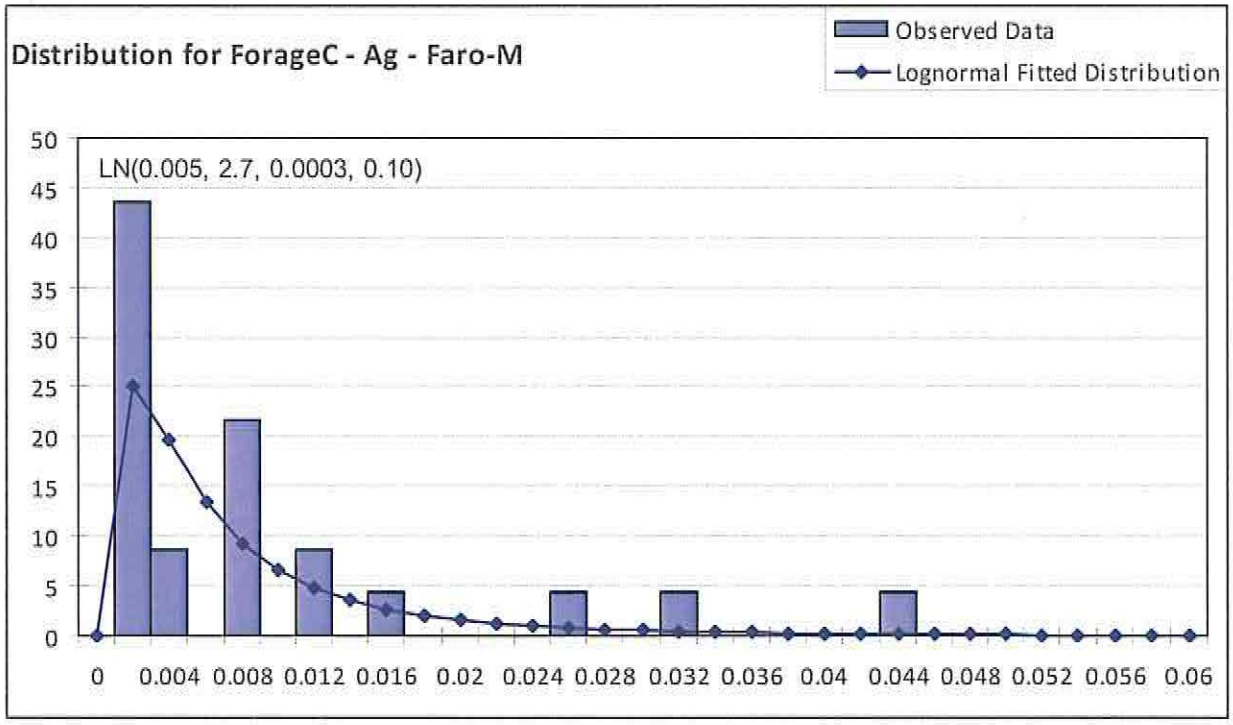

Distribution for ForageC - Ag - Overall
Observed Data
Lognormal Fitted Distribution
LN(0.005, 3.6, 0.0001, 0.21)
60
50
40
30
20
10
0
0
0.006
0.012
0.018
0.024
0.03
0.036
0.042
0.048
0.054
0.06
0.066

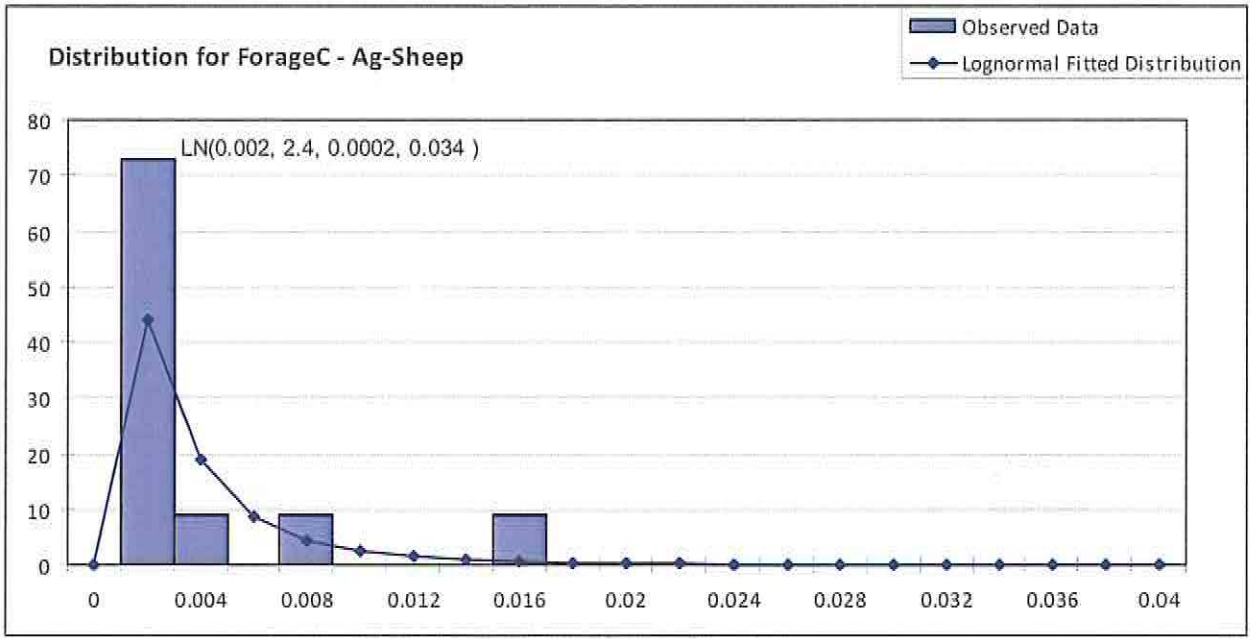

Distribution for ForageC - Ag - Background
Observed Data
Lognormal Fitted Distribution
LN(0.003, 2.3, 0.0002, 0.03)
70
60
50
40
30
20
10
0
0
0.004
0.008
0.012
0.016
0.02
0.024
0.028
0.032
0.036


Distribution for ForageC - Ag - Faro-N
Observed Data
Lognormal Fitted Distribution
LN(0.006, 2.5, 0.0004, 0.09)
70
60
50
40
30
20
10
0
0
0.01
0.02
0.03
0.04
0.05
0.06
0.07
0.08
0.09
0.1

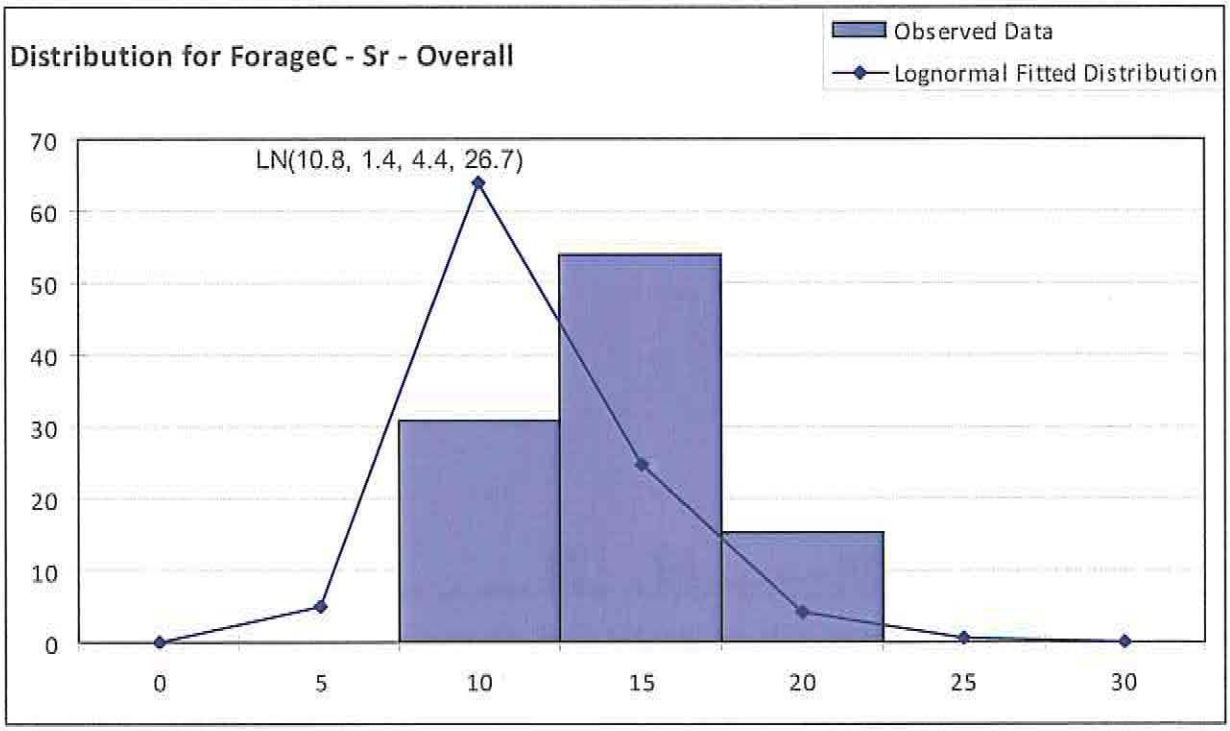

Distribution for ForageC - Ag - Faro-S
Observed Data
Lognormal Fitted Distribution
LN(0.008, 2.3, 0.0006, 0.1)
45
40
35
30
25
20
15
10
5
0
0
0.01
0.02
0.03
0.04
0.05
0.06
0.07

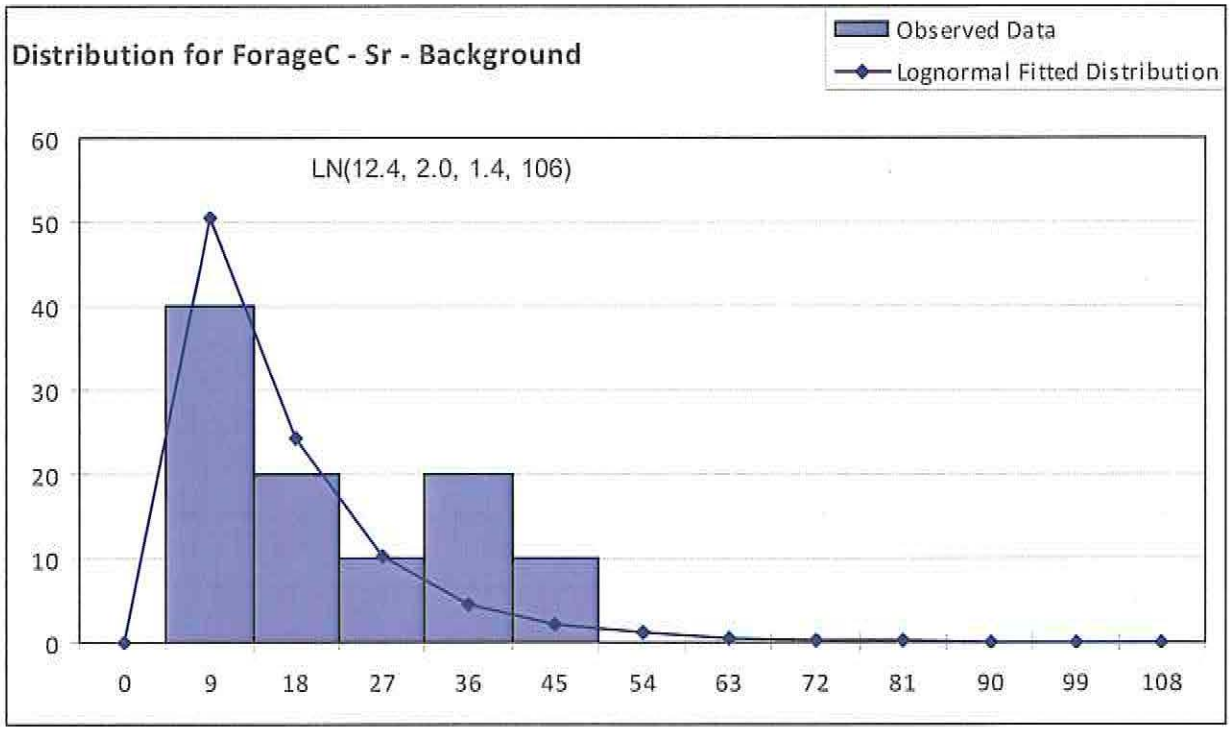

Distribution for ForageC - Ag - Faro-W
Observed Data
Lognormal Fitted Distribution
LN(0.01, 3.7, 0.0002, 0.48)
90
80
70
60
50
40
30
20
10
0
0
0.02
0.04
0.06
0.08
0.1
0.12
0.14
0.16
0.18
0.2

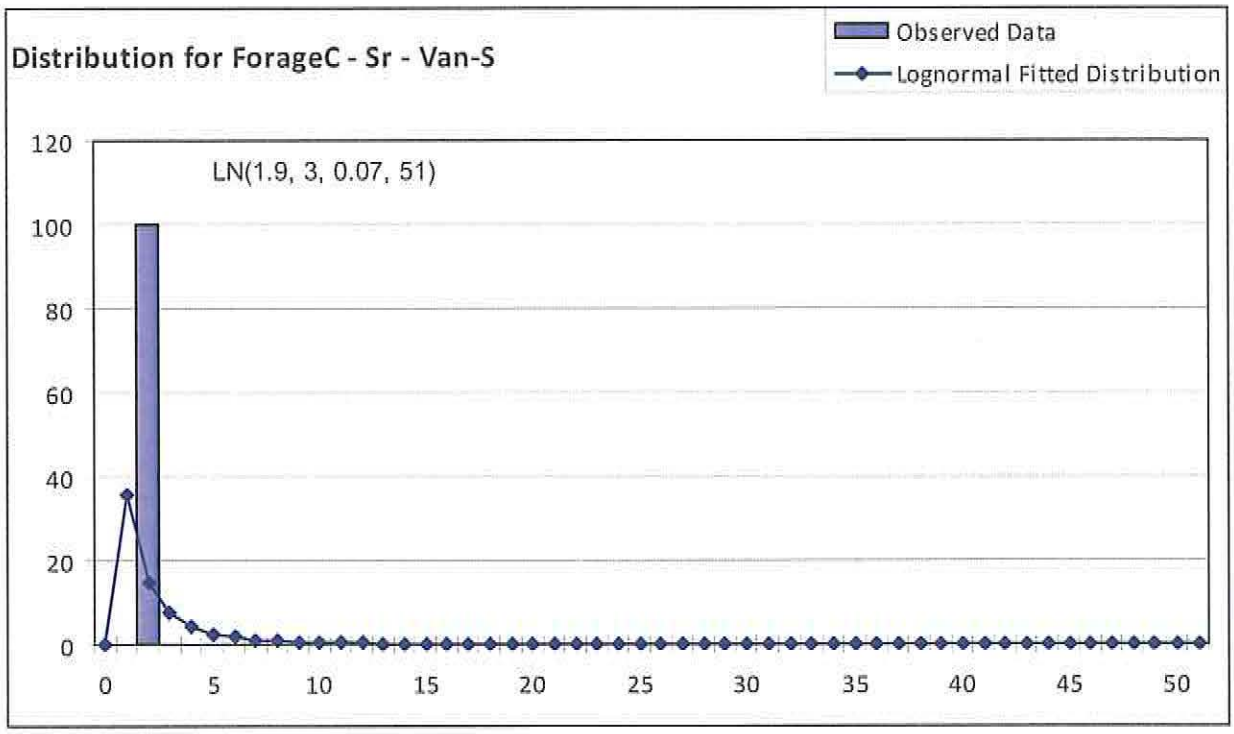

Distribution for ForageC - Ag - Faro-M
Observed Data
Lognormal Fitted Distribution
LN(0.005, 2.7, 0.0003, 0.10)
50
45
40
35
30
25
20
15
10
5
0
0 0.004 0.008 0.012 0.016 0.02 0.024 0.028 0.032 0.036 0.04 0.044 0.048 0.052 0.056 0.06

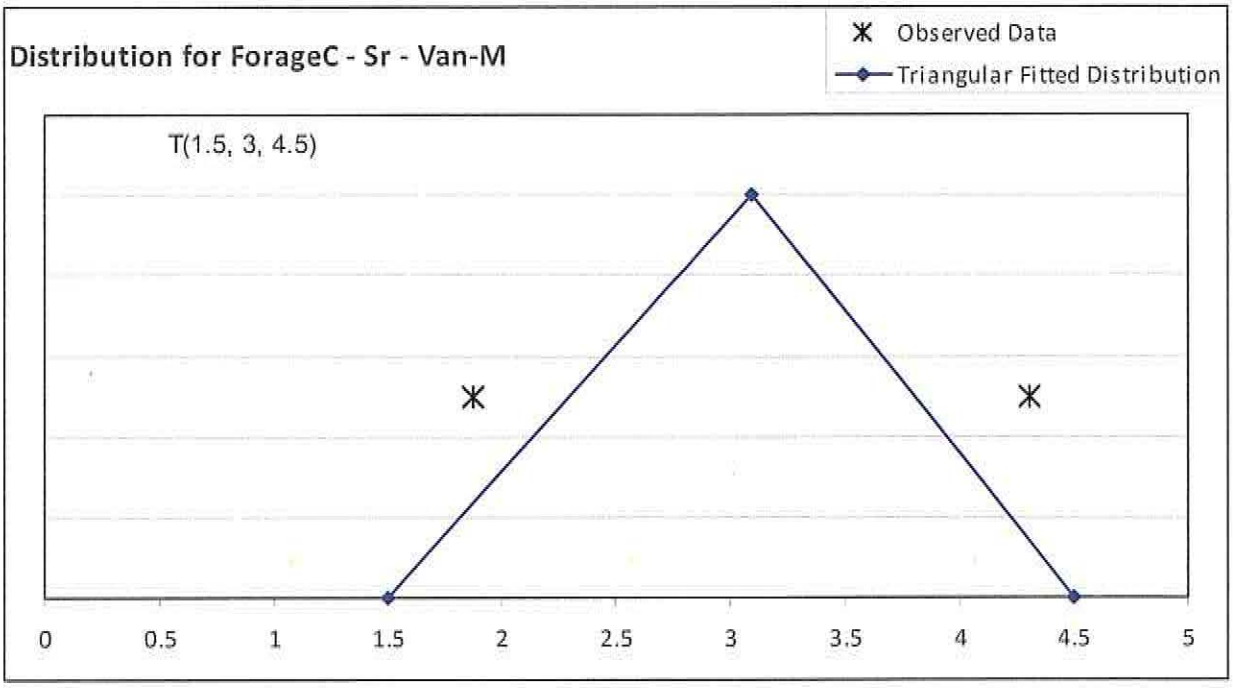

Distribution for ForageC - Ag-Sheep
Observed Data
Lognormal Fitted Distribution
LN(0.002, 2.4, 0.0002, 0.034)
80
70
60
50
40
30
20
10
0
0 0.004 0.008 0.012 0.016 0.02 0.024 0.028 0.032 0.036 0.04

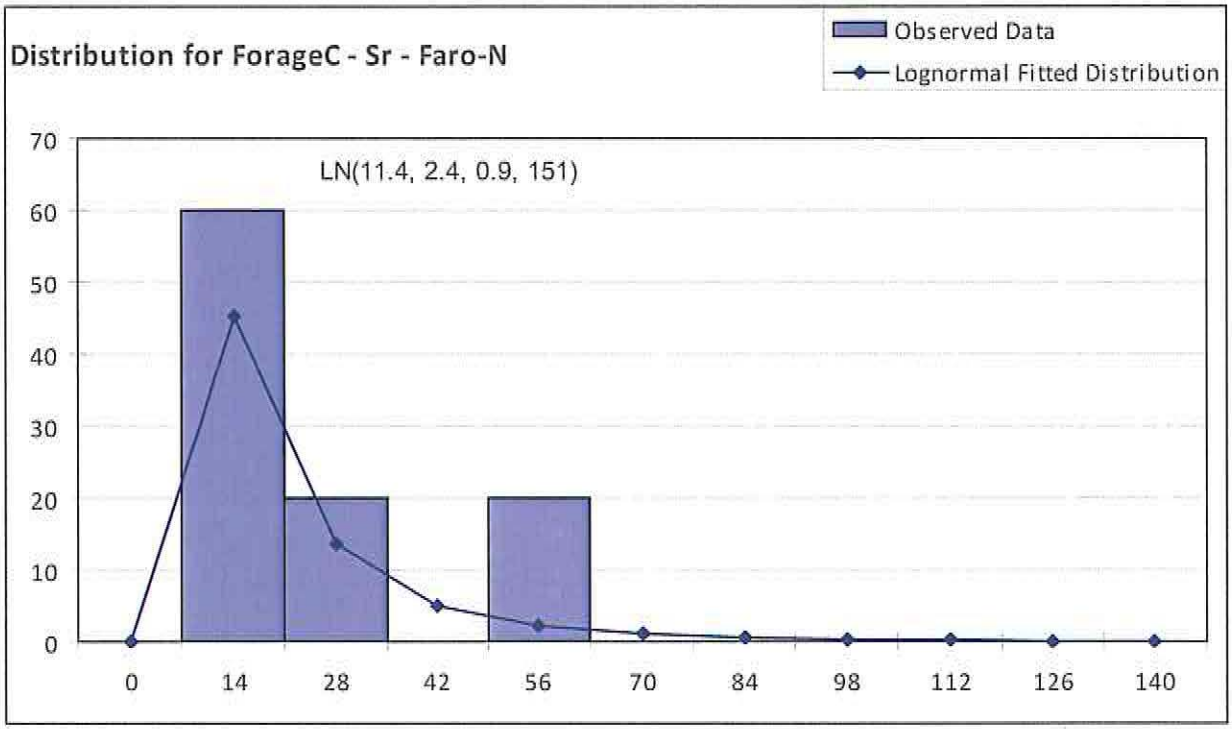
D.6.14 Strontium

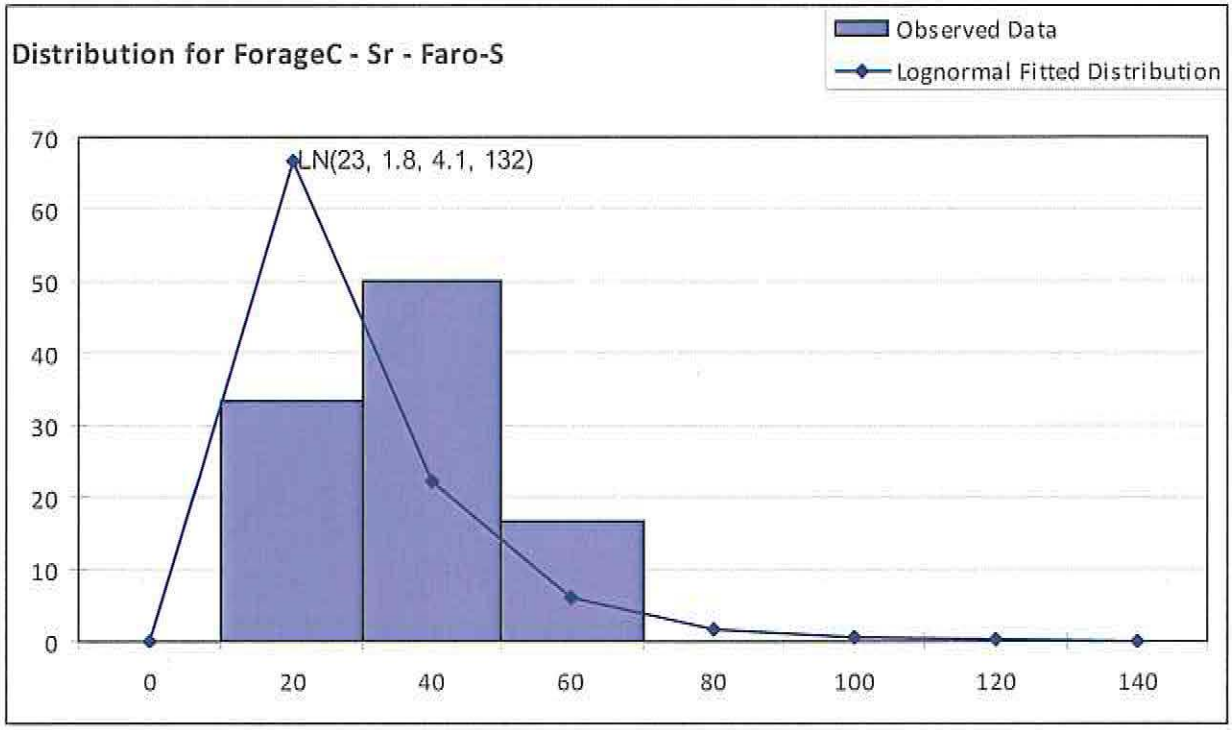


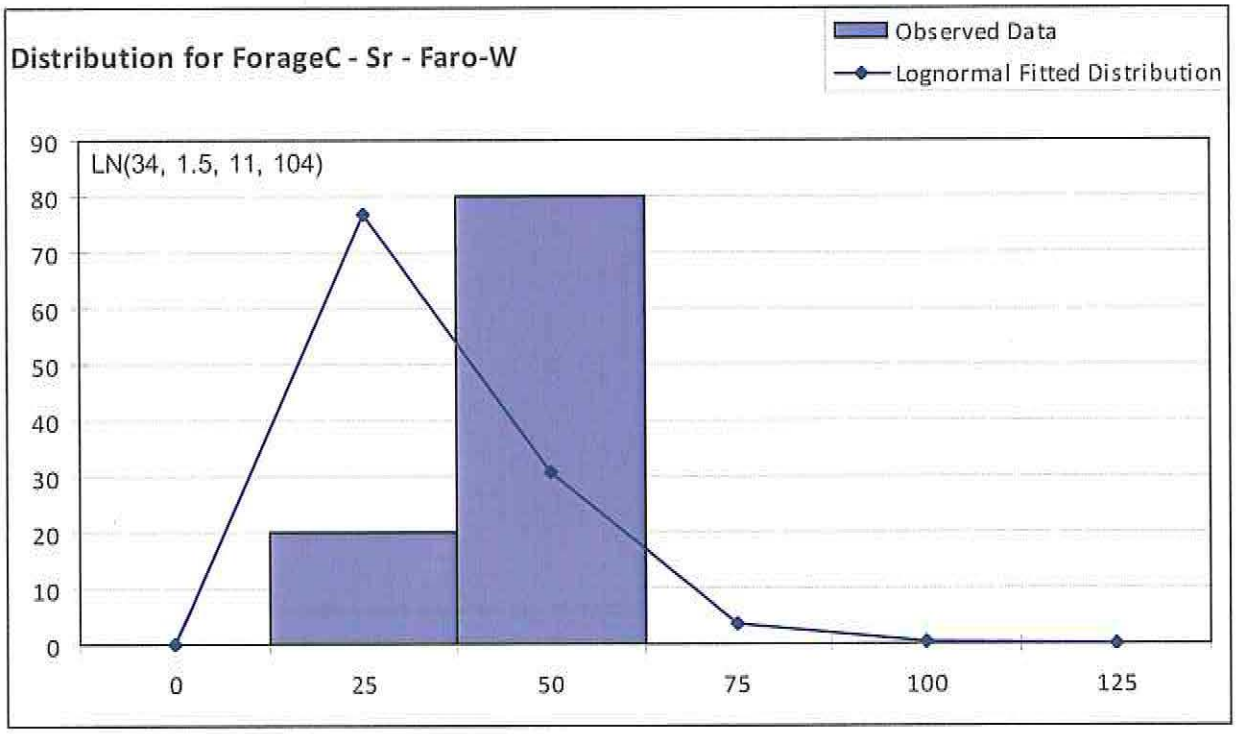


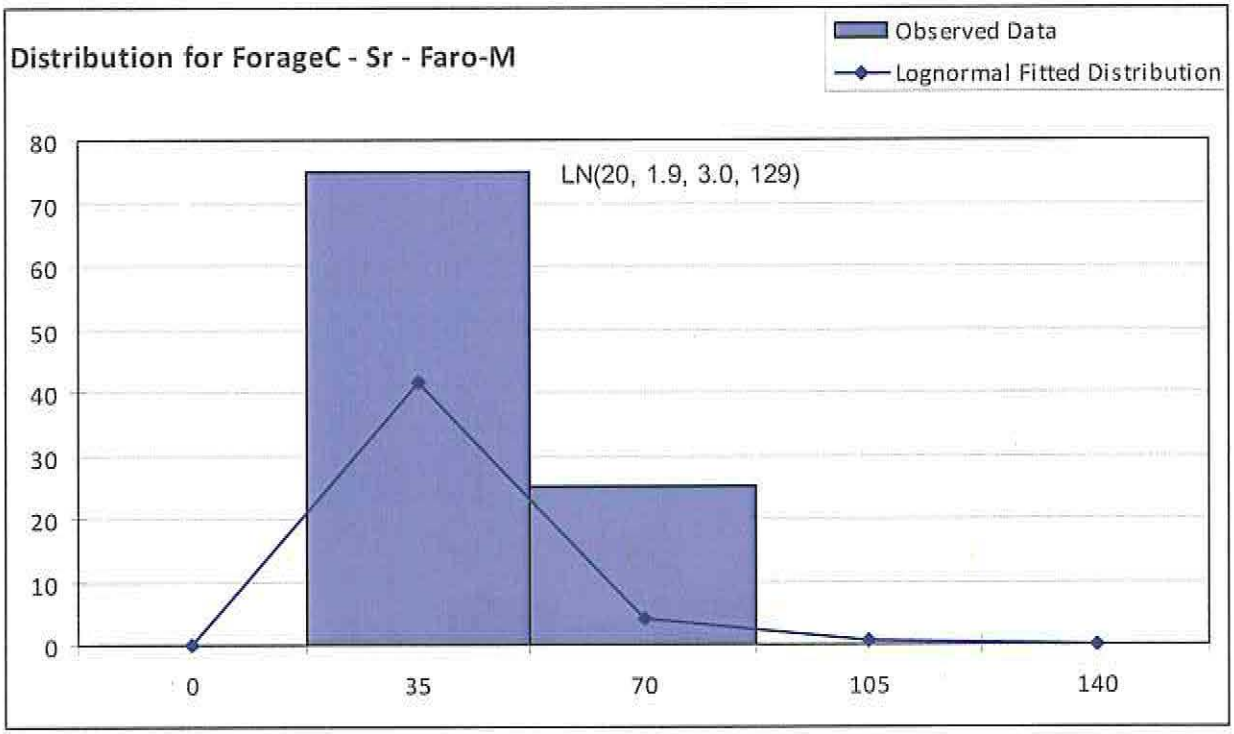

Distribution for ForageC - Sr - Van-S
Observed Data
Lognormal Fitted Distribution
LN(1.9, 3, 0.07, 51)
120
100
80
60
40
20
0
0
5
10
15
20
25
30
35
40
45
50

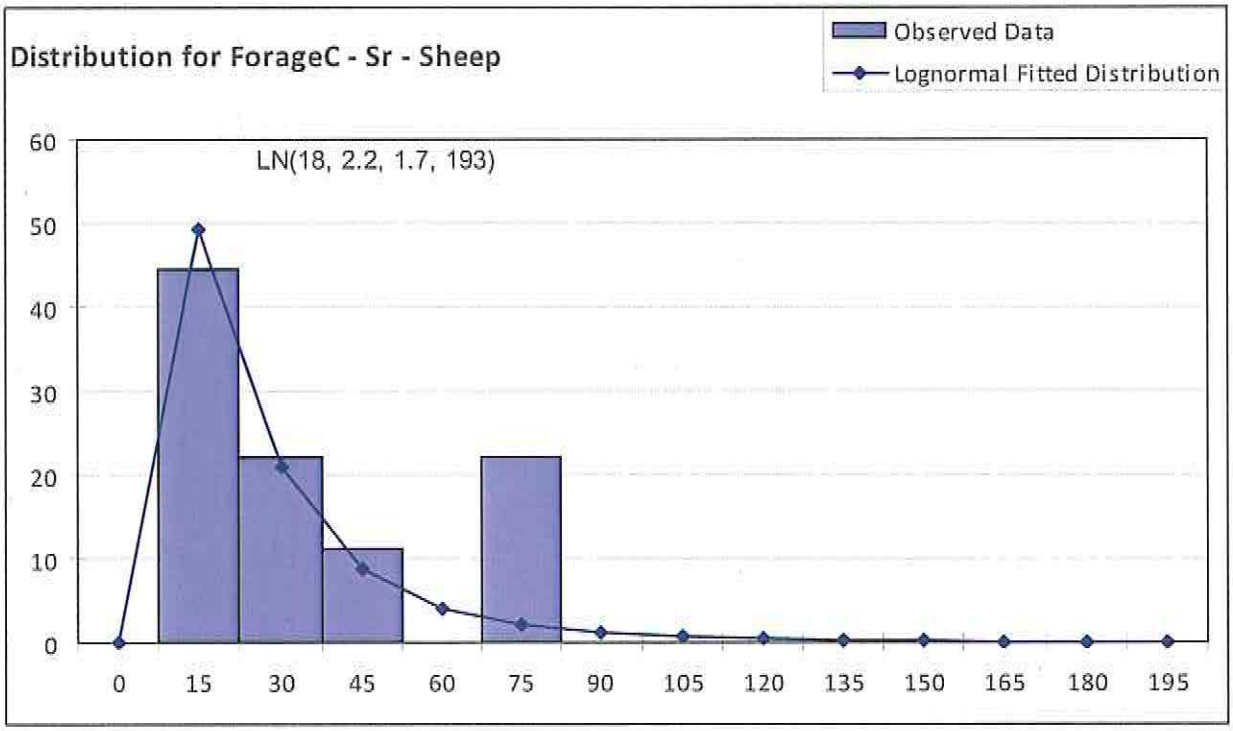

Distribution for ForageC - Sr - Van-M
Observed Data
Triangular Fitted Distribution
T(1.5, 3, 4.5)
0
0.5
1
1.5
2
2.5
3
3.5
4
4.5
5


Distribution for ForageC - Sr - Faro-N
Observed Data
Lognormal Fitted Distribution
LN(11.4, 2.4, 0.9, 151)
70
60
50
40
30
20
10
0
0
14
28
42
56
70
84
98
112
126
140

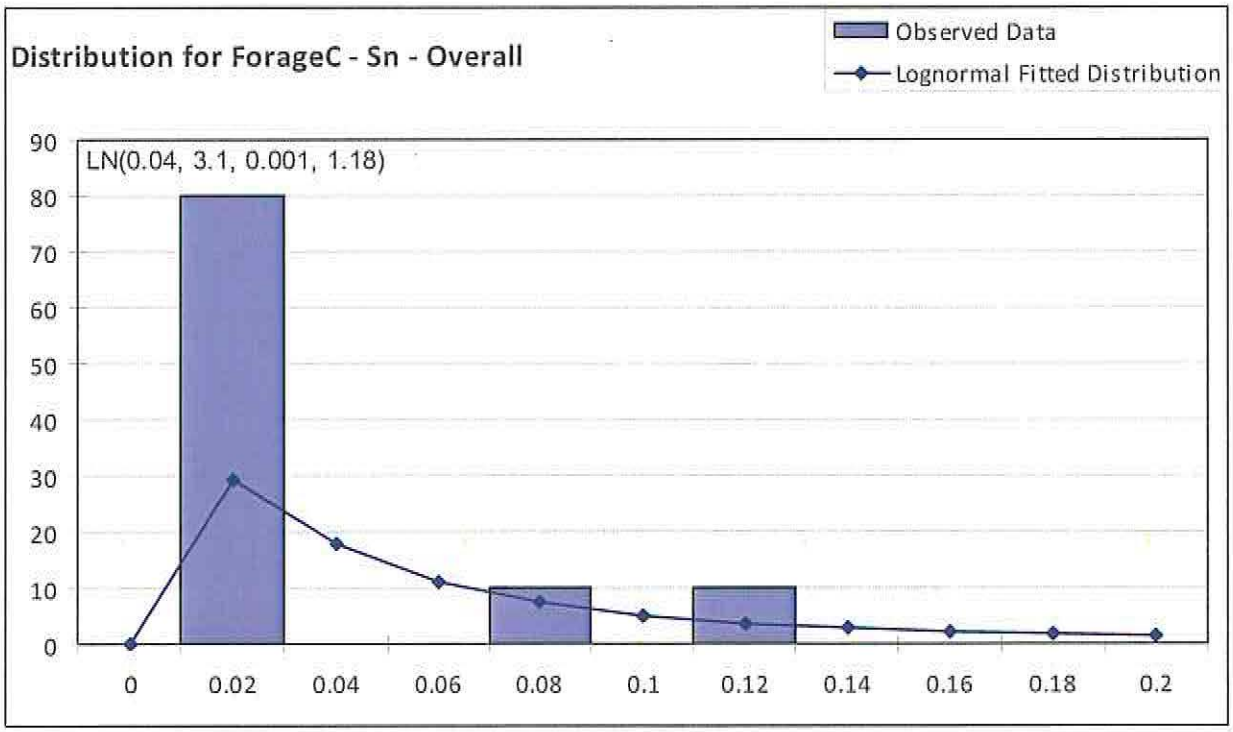

Distribution for ForageC - Sr - Faro-S
Observed Data
Lognormal Fitted Distribution
LN(23, 1.8, 4.1, 132)
70
60
50
40
30
20
10
0
0
20
40
60
80
100
120
140

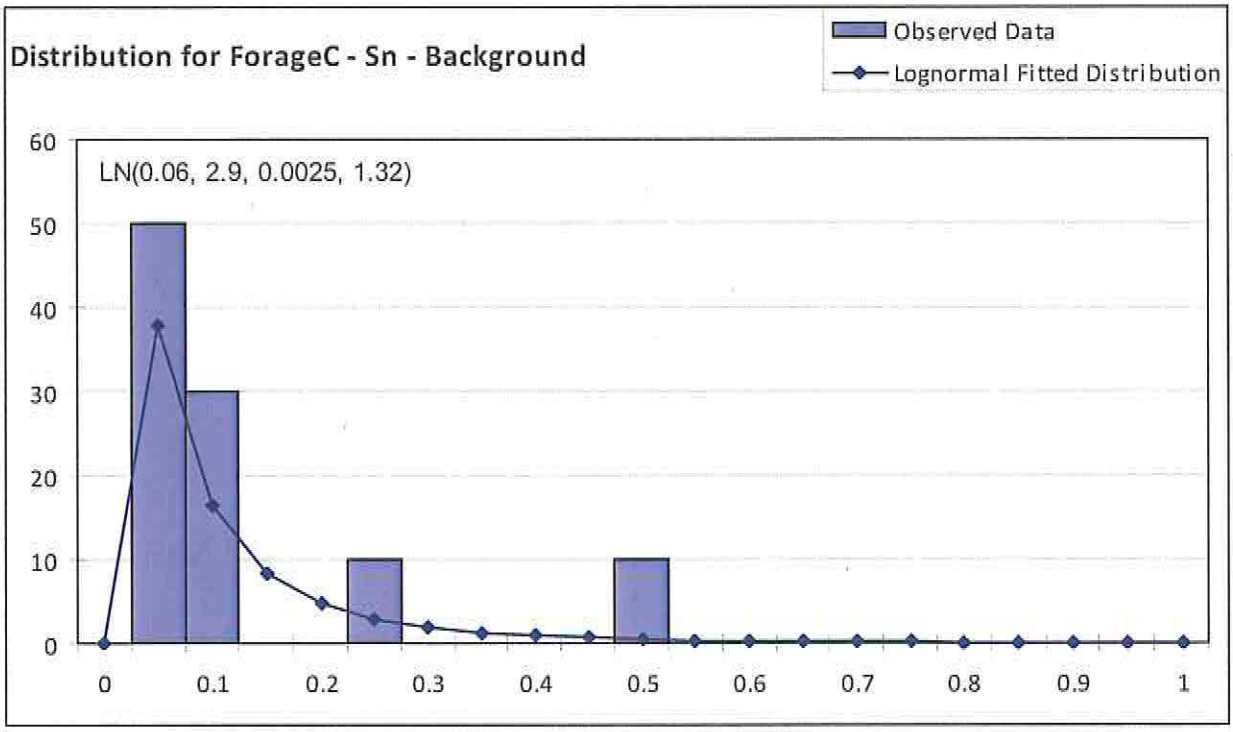

Distribution for ForageC - Sr - Faro-W
Observed Data
Lognormal Fitted Distribution
LN(34, 1.5, 11, 104)
90
80
70
60
50
40
30
20
10
0
0
25
50
75
100
125

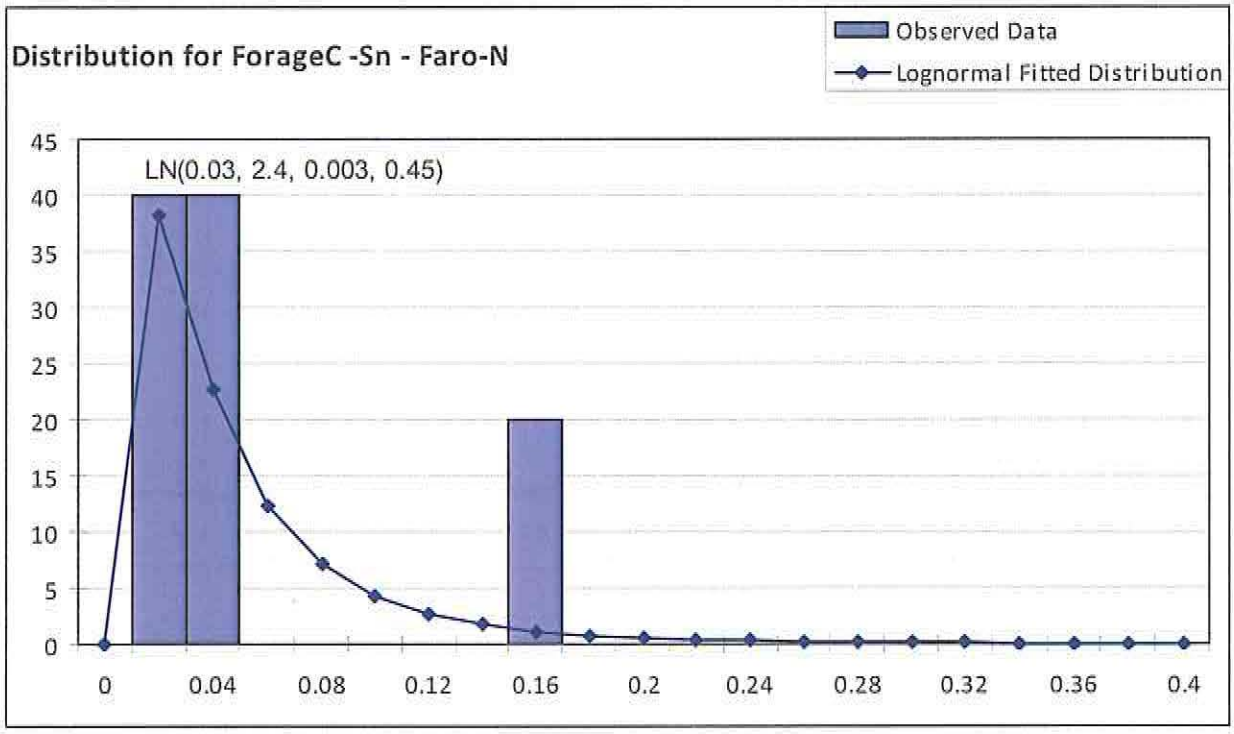

Distribution for ForageC - Sr - Faro-M
Observed Data
Lognormal Fitted Distribution
LN(20, 1.9, 3.0, 129)
80
70
60
50
40
30
20
10
0
0
35
70
105
140

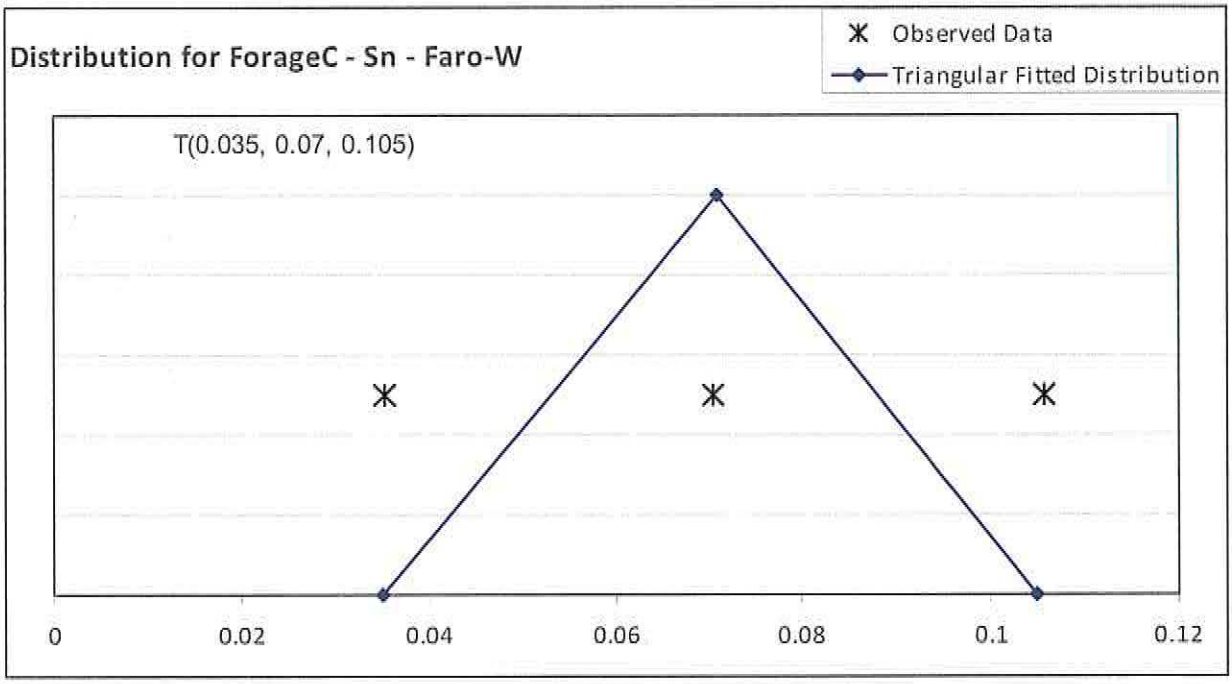

Distribution for ForageC - Sr - Sheep
Observed Data
Lognormal Fitted Distribution
LN(18, 2.2, 1.7, 193)
60
50
40
30
20
10
0
0
15
30
45
60
75
90
105
120
135
150
165
180
195

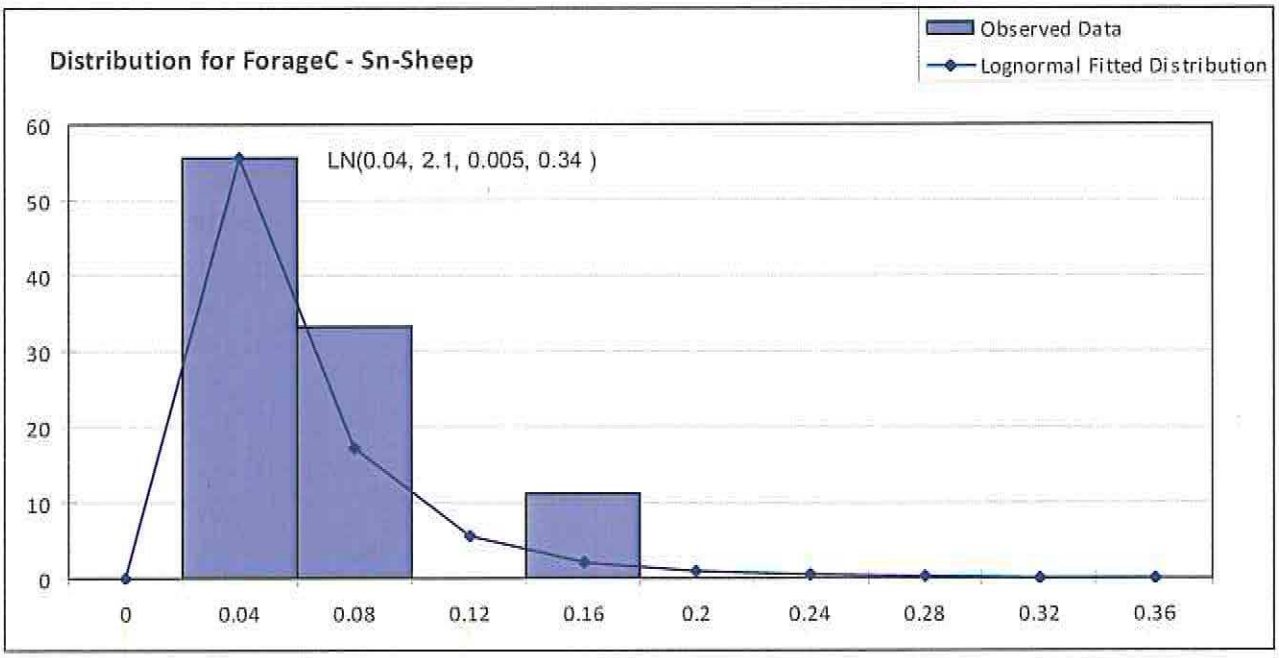
D.6.15 Tin


Distribution for ForageC - Sn - Overall
Observed Data
Lognormal Fitted Distribution
LN(0.04, 3.1, 0.001, 1.18)
90
80
70
60
50
40
30
20
10
0
0
0.02
0.04
0.06
0.08
0.1
0.12
0.14
0.16
0.18
0.2


Distribution for ForageC - Sn - Background
Observed Data
Lognormal Fitted Distribution
LN(0.06, 2.9, 0.0025, 1.32)
60
50
40
30
20
10
0
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1


Distribution for ForageC -Sn - Faro-N
Observed Data
Lognormal Fitted Distribution
LN(0.03, 2.4, 0.003, 0.45)
45
40
35
30
25
20
15
10
5
0
0
0.04
0.08
0.12
0.16
0.2
0.24
0.28
0.32
0.36
0.4

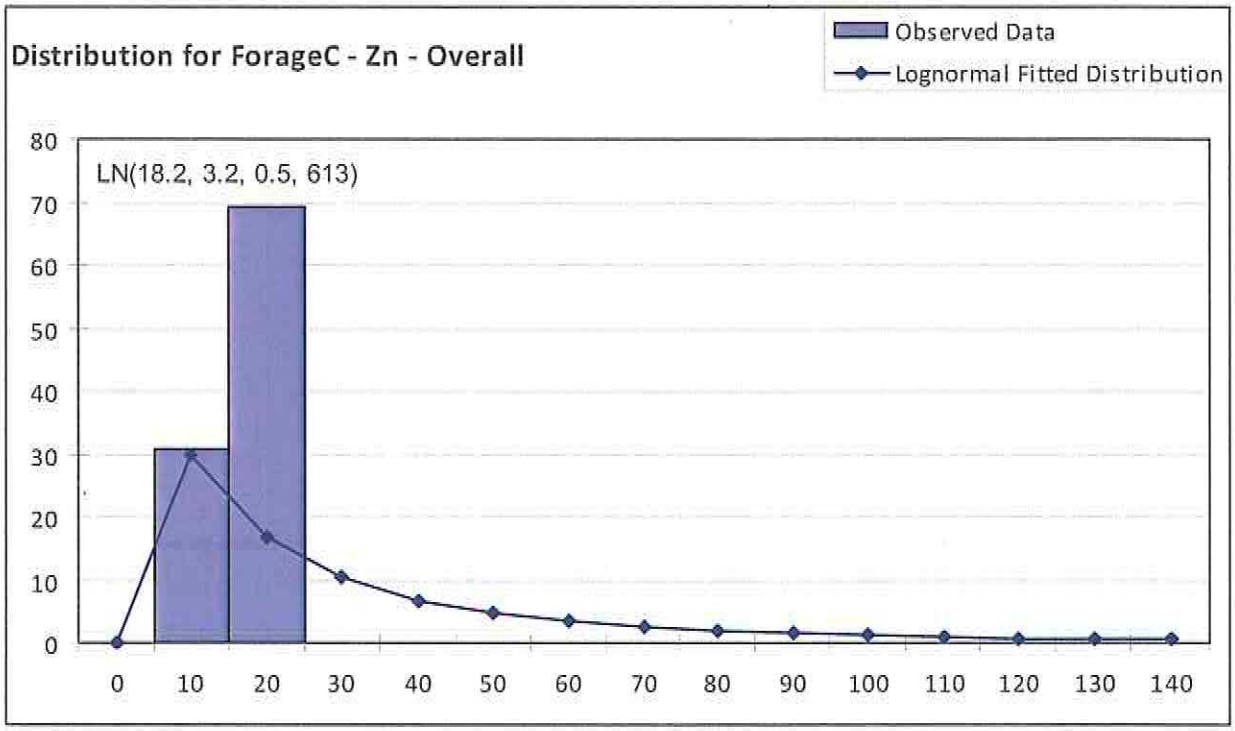


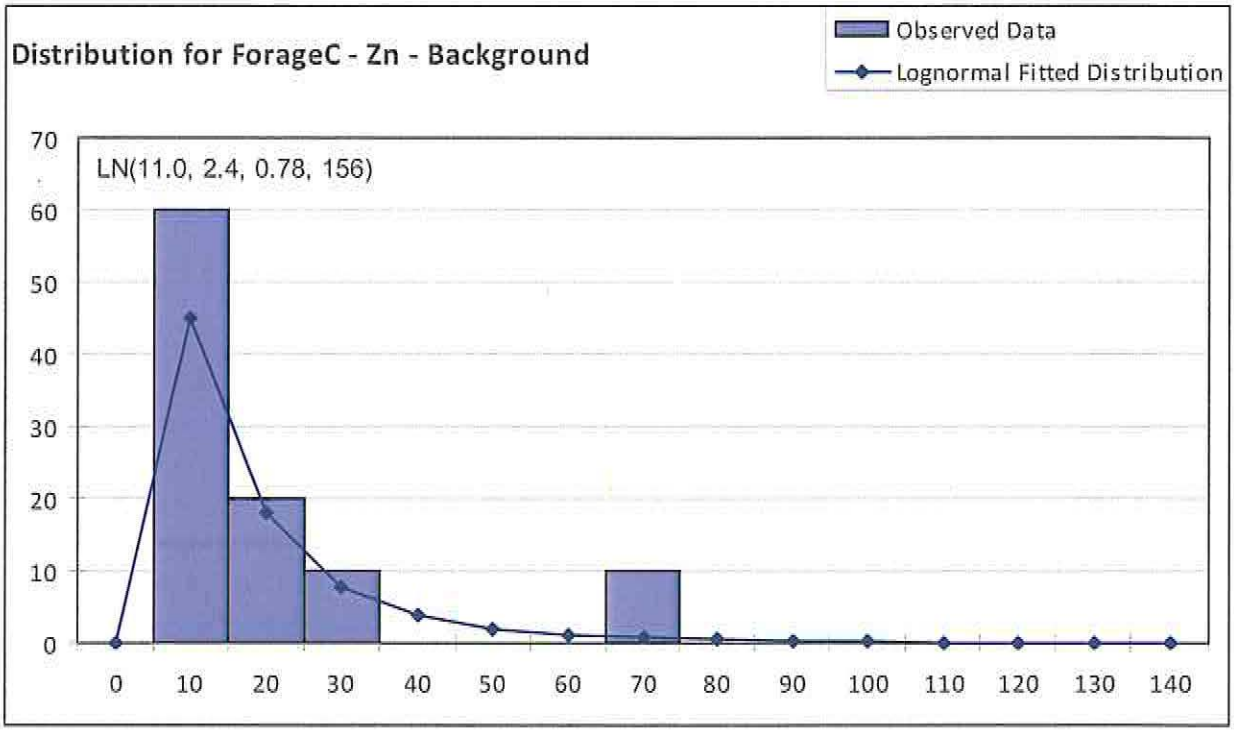


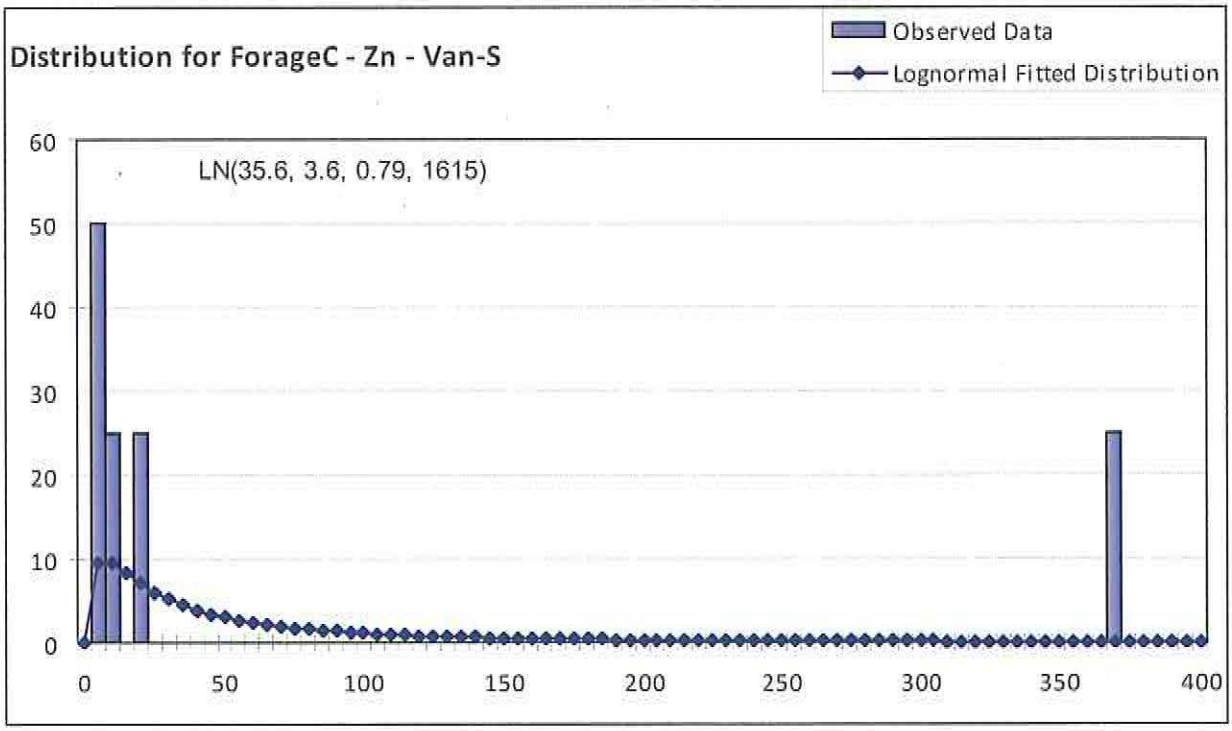
D.6.16 Vanadium

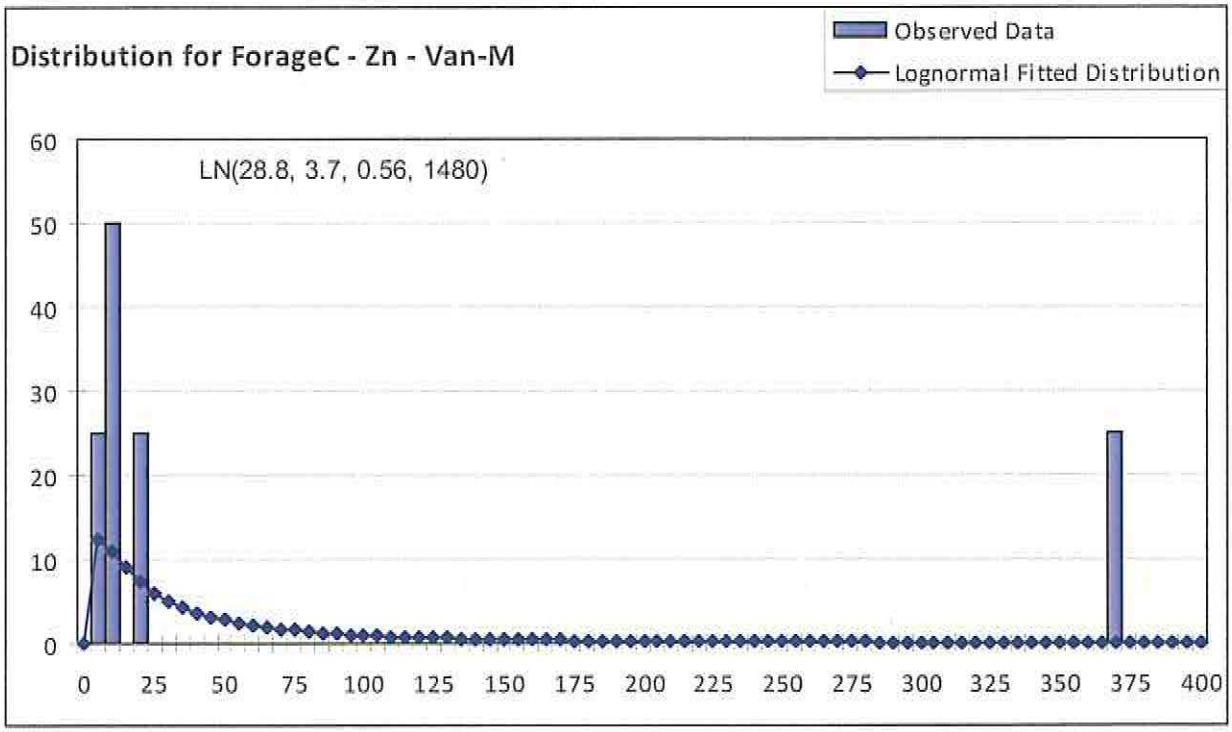
All uniform distributions – U(0, 0.2)

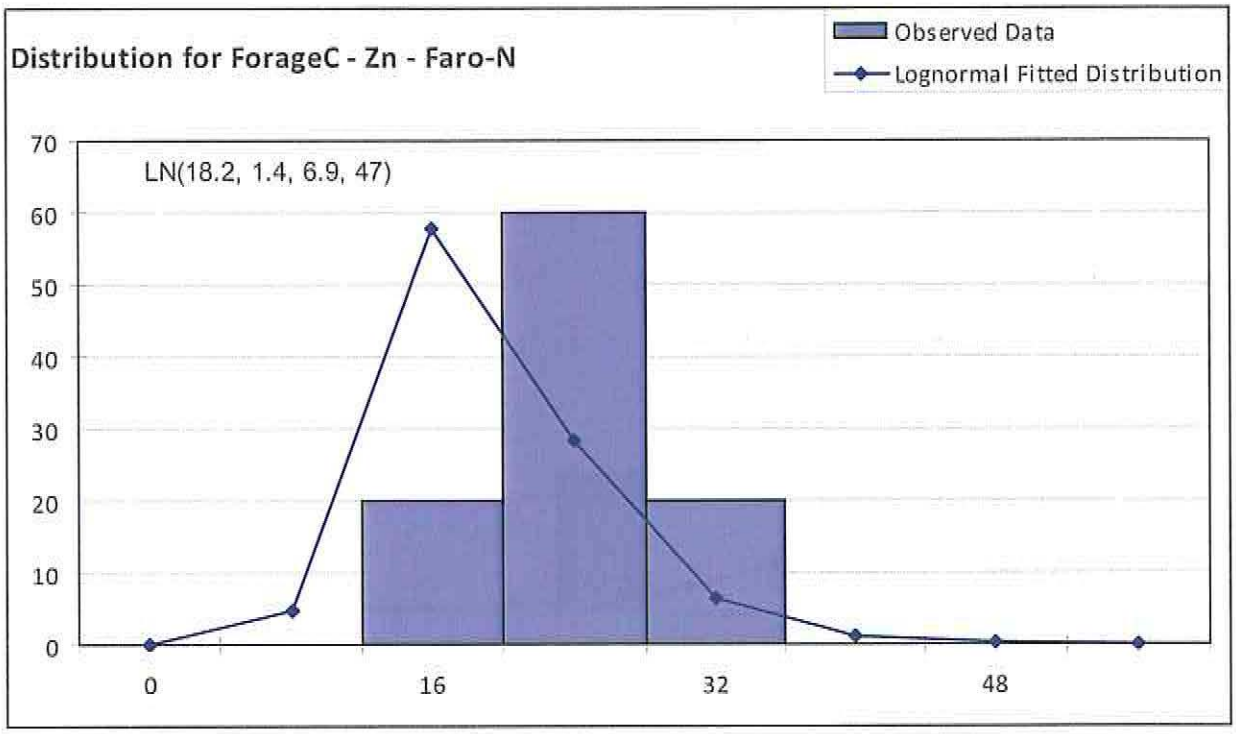
D.6.17 Zinc

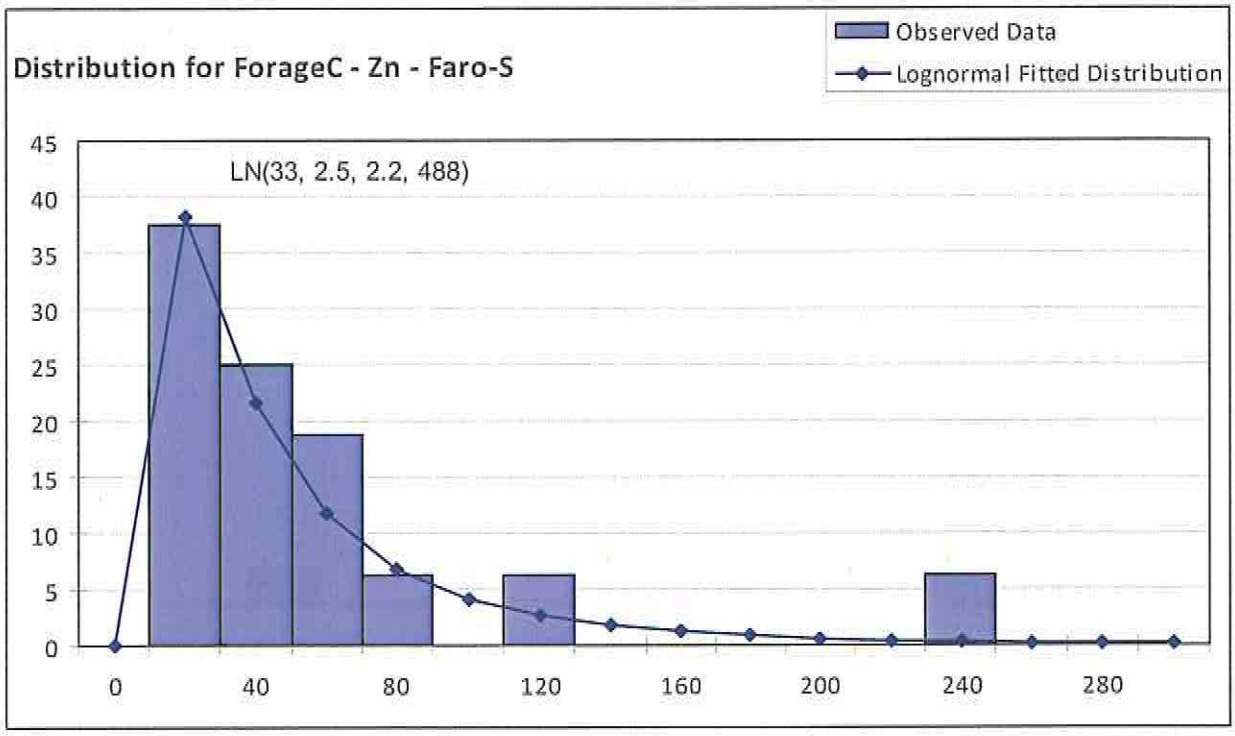

Distribution for ForageC - Zn - Overall
Observed Data
Lognormal Fitted Distribution
LN(18.2, 3.2, 0.5, 613)
80
70
60
50
40
30
20
10
0
0 10 20 30 40 50 60 70 80 90 100 110 120 130 140

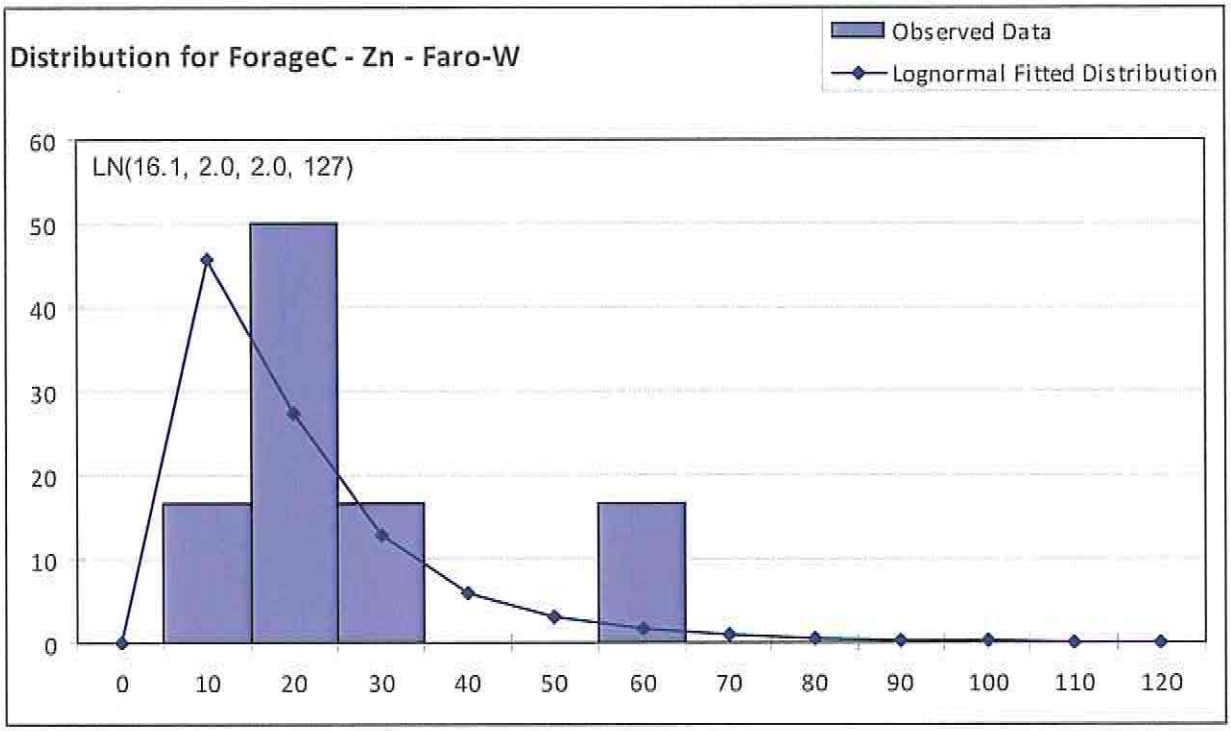

Distribution for ForageC - Zn - Background
Observed Data
Lognormal Fitted Distribution
LN(11.0, 2.4, 0.78, 156)
70
60
50
40
30
20
10
0
0 10 20 30 40 50 60 70 80 90 100 110 120 130 140

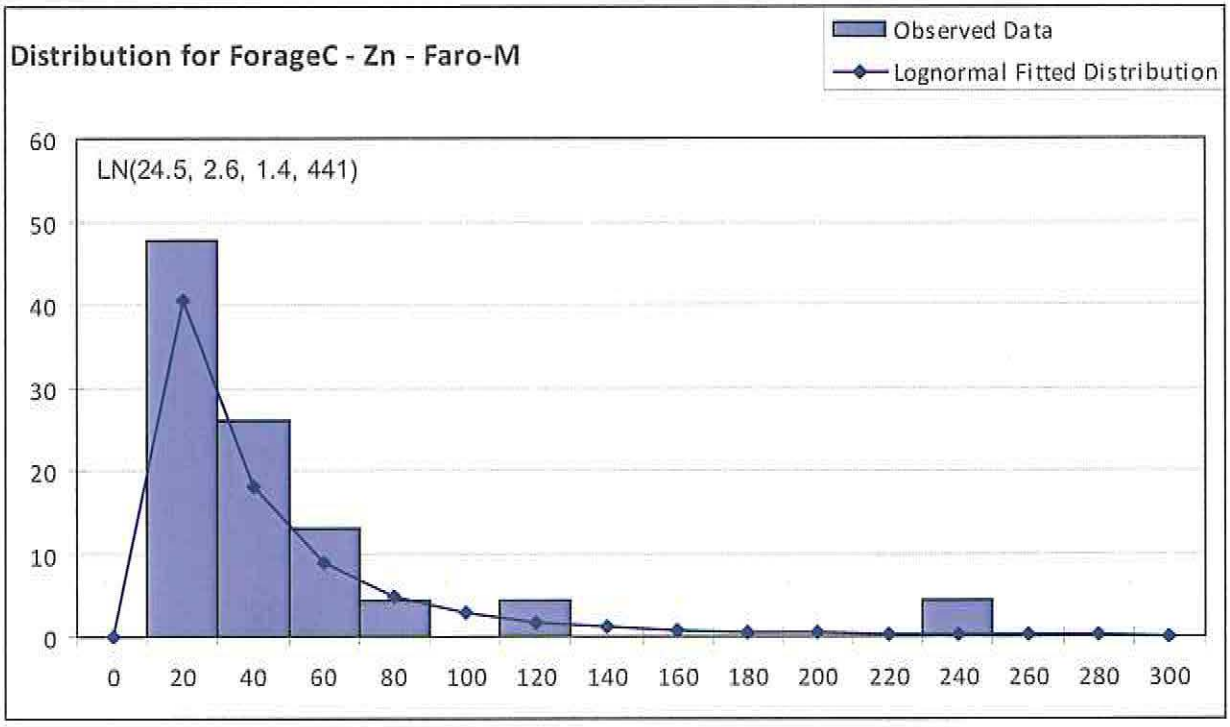

Distribution for ForageC - Zn - Van-S
Observed Data
Lognormal Fitted Distribution
LN(35.6, 3.6, 0.79, 1615)
60
50
40
30
20
10
0
0
50
100
150
200
250
300
350
400

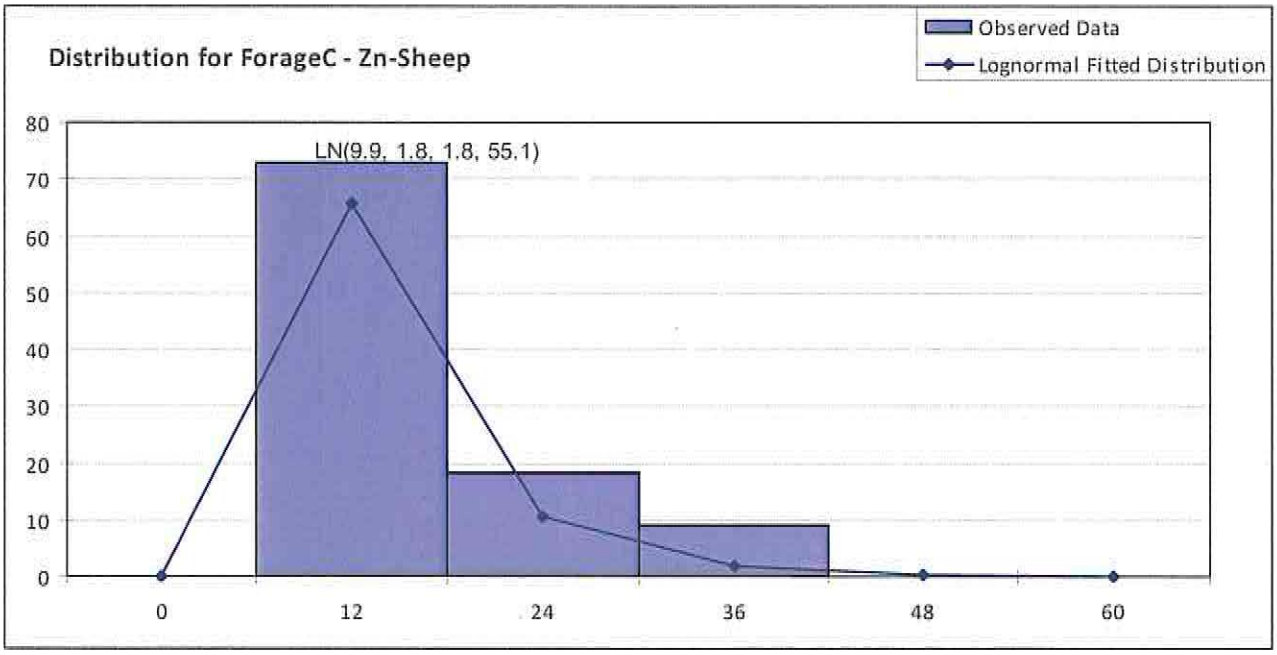

Distribution for ForageC - Zn - Van-M
Observed Data
Lognormal Fitted Distribution
LN(28.8, 3.7, 0.56, 1480)
60
50
40
30
20
10
0
0
25
50
75
100
125
150
175
200
225
250
275
300
325
350
375
400


Distribution for ForageC - Zn - Faro-N
Observed Data
Lognormal Fitted Distribution
LN(18.2, 1.4, 6.9, 47)
70
60
50
40
30
20
10
0
0
16
32
48


Distribution for ForageC - Zn - Faro-S
Observed Data
Lognormal Fitted Distribution
LN(33, 2.5, 2.2, 488)
45
40
35
30
25
20
15
10
5
0
0
40
80
120
160
200
240
280


Distribution for ForageC - Zn - Faro-W
Observed Data
Lognormal Fitted Distribution
LN(16.1, 2.0, 2.0, 127)
60
50
40
30
20
10
0
0
10
20
30
40
50
60
70
80
90
100
110
120


Distribution for ForageC - Zn - Faro-M
Observed Data
Lognormal Fitted Distribution
LN(24.5, 2.6, 1.4, 441)
60
50
40
30
20
10
0
0
20
40
60
80
100
120
140
160
180
200
220
240
260
280
300

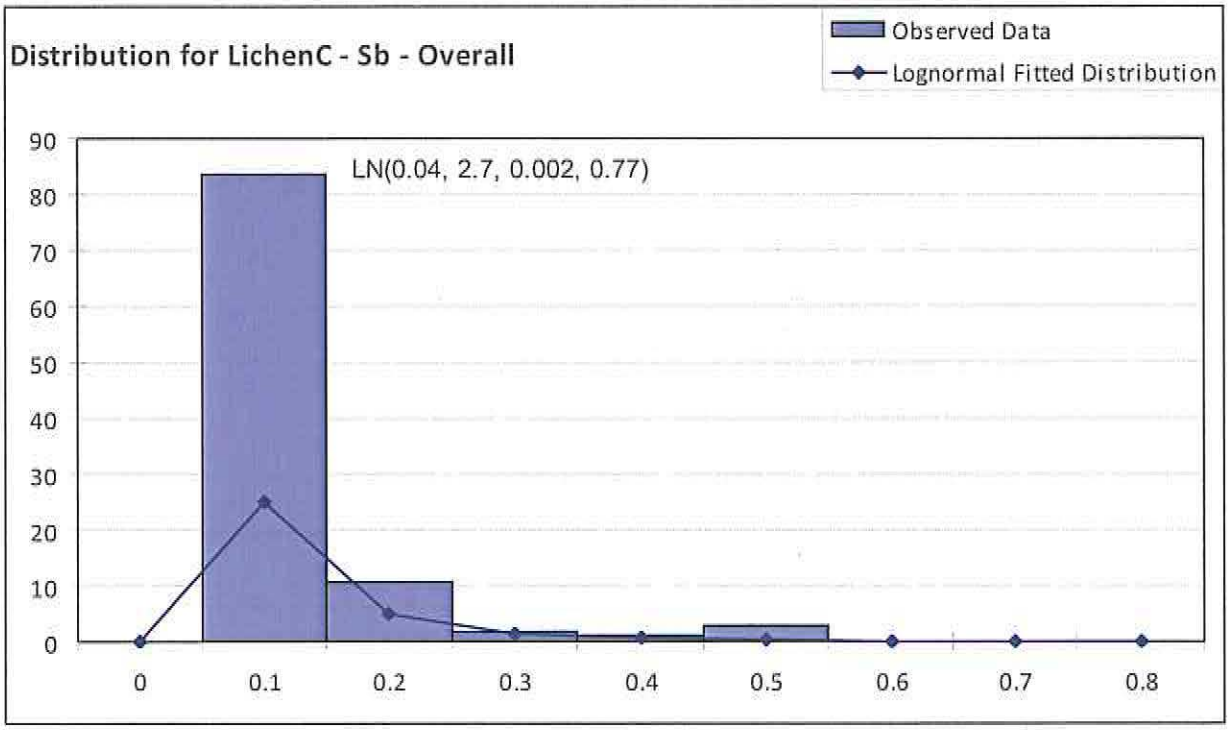


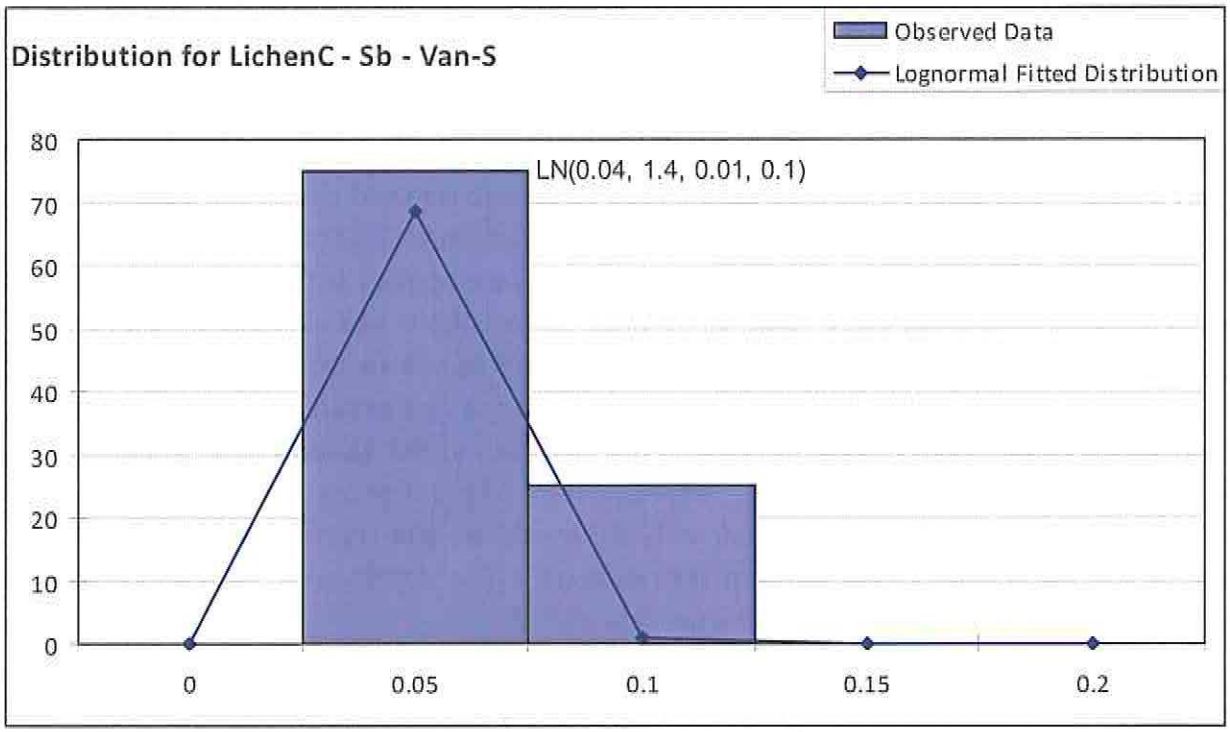
D.7 MEASURED LICHEN CONCENTRATIONS

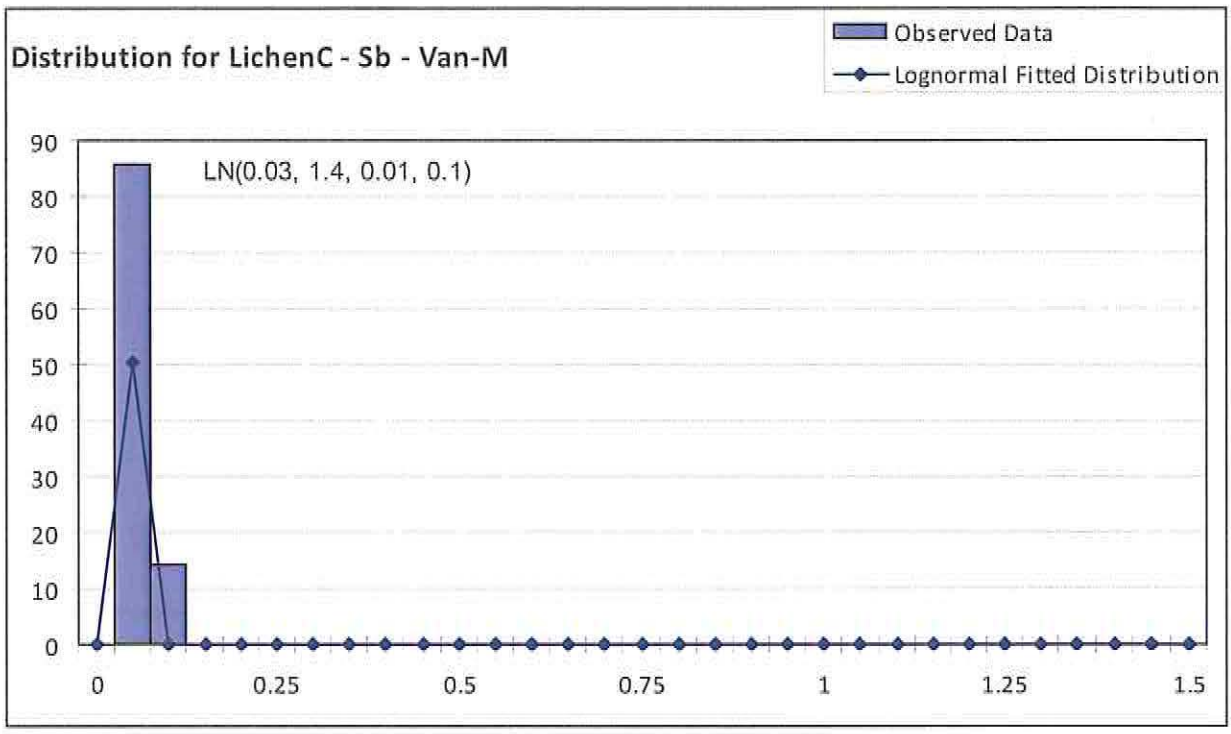
Measured concentrations (mg/kg (dw) converted to mg/kg (ww) using an average moisture content of 40%) in various types of vegetation from the Faro Mine Complex were presented in the previous assessment (SENES, 2006, Section 2.3. 2, Project No. 33798).

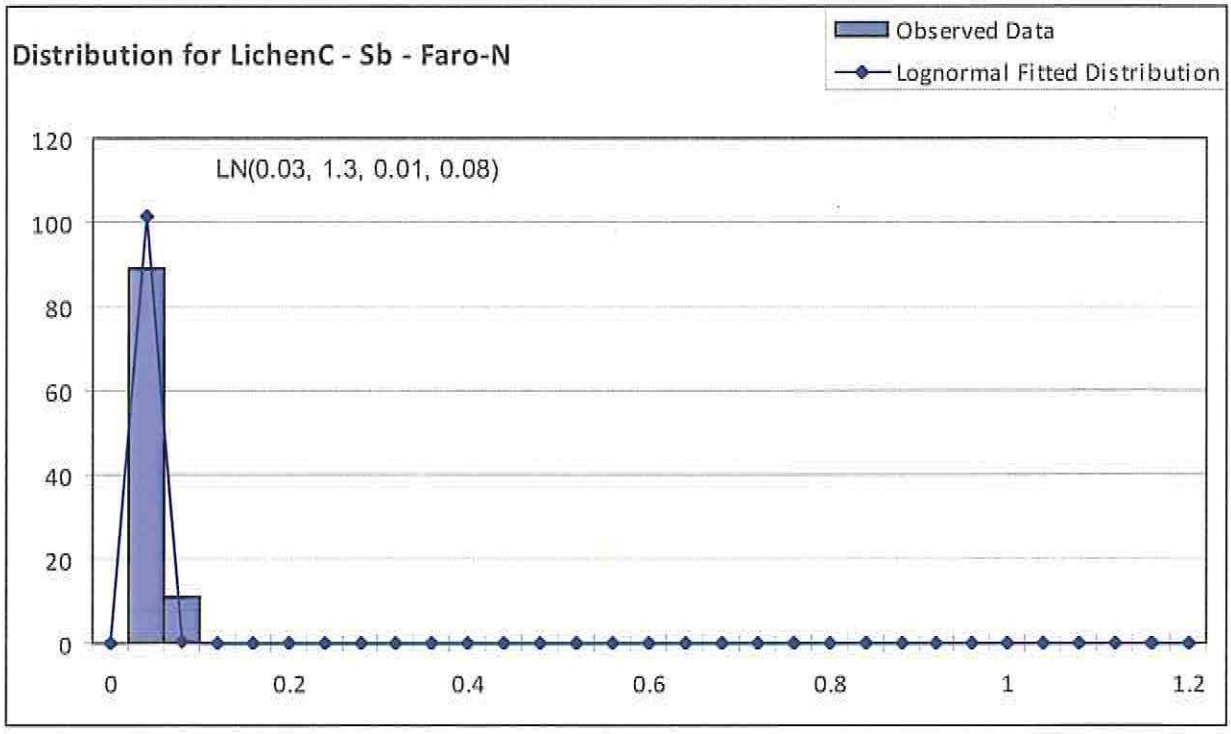
The data were fit to either lognormal, triangular or uniform distributions. Lognormal distributions are defined by the geometric mean, geometric standard deviation, minimum value, and maximum value. In the case of only one value, an assumed GSD of 3 was used. When two to four values were available, triangular distributions were applied with the mode equal to the measured value and an assumed range of an order of magnitude was assumed on either side of the site data to represent the minimum and maximum values in the absence of other data. Uniform distributions were applied in the case of measured concentrations reported as less than the detection limit. The minimum and maximum values of the uniform distribution were set equal to 0 and the detection limit, respectively. The following graphs summarize the distributions (line graph) as compared with the available data (bar graph) for each COPC. Graphs are not provided for uniform distributions. The development of distributions for vegetation concentrations was limited by the data available.

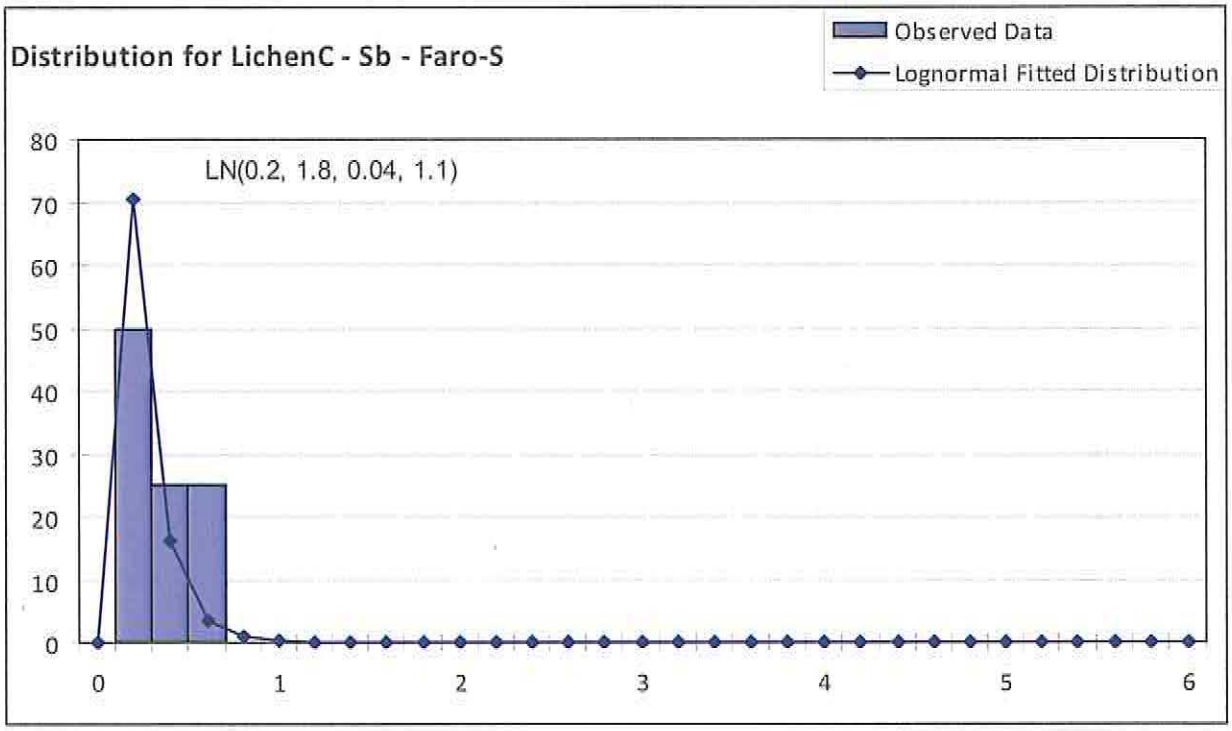
D.7.1 Antimony

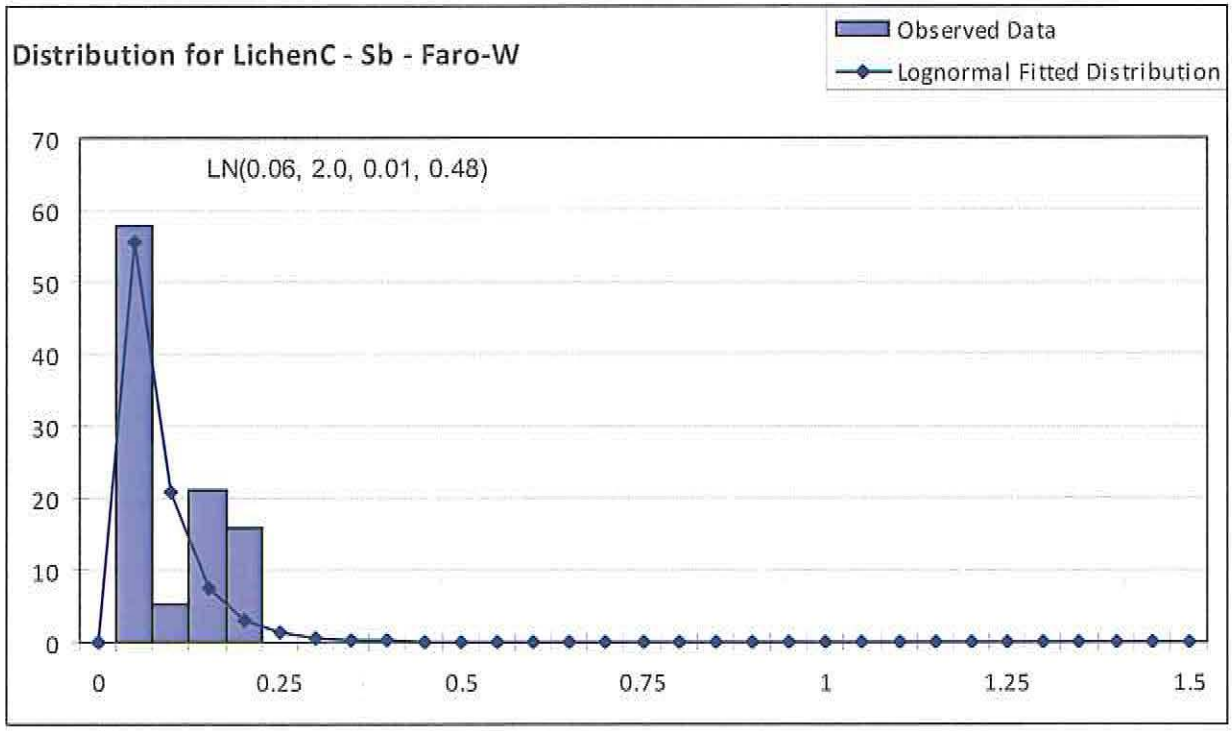


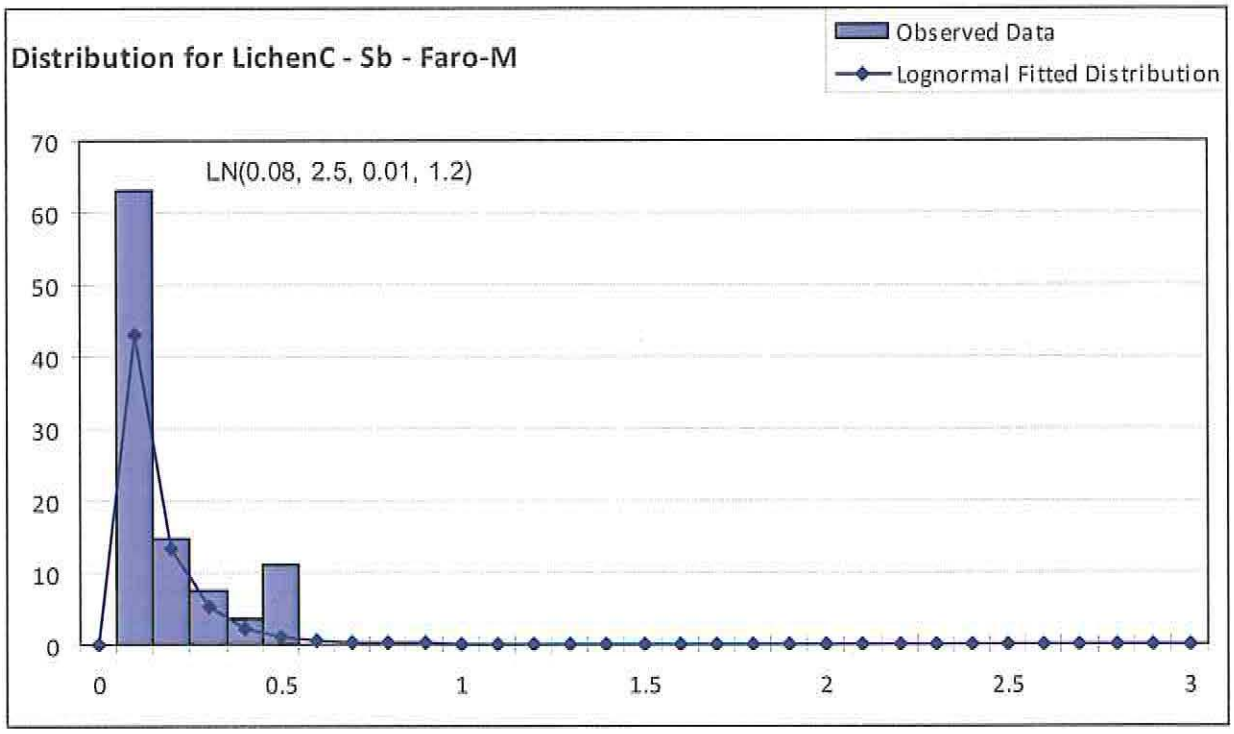



Distribution for LichenC - Sb - Van-M
Observed Data
Lognormal Fitted Distribution
LN(0.03, 1.4, 0.01, 0.1)
90
80
70
60
50
40
30
20
10
0
0
0.25
0.5
0.75
1
1.25
1.5

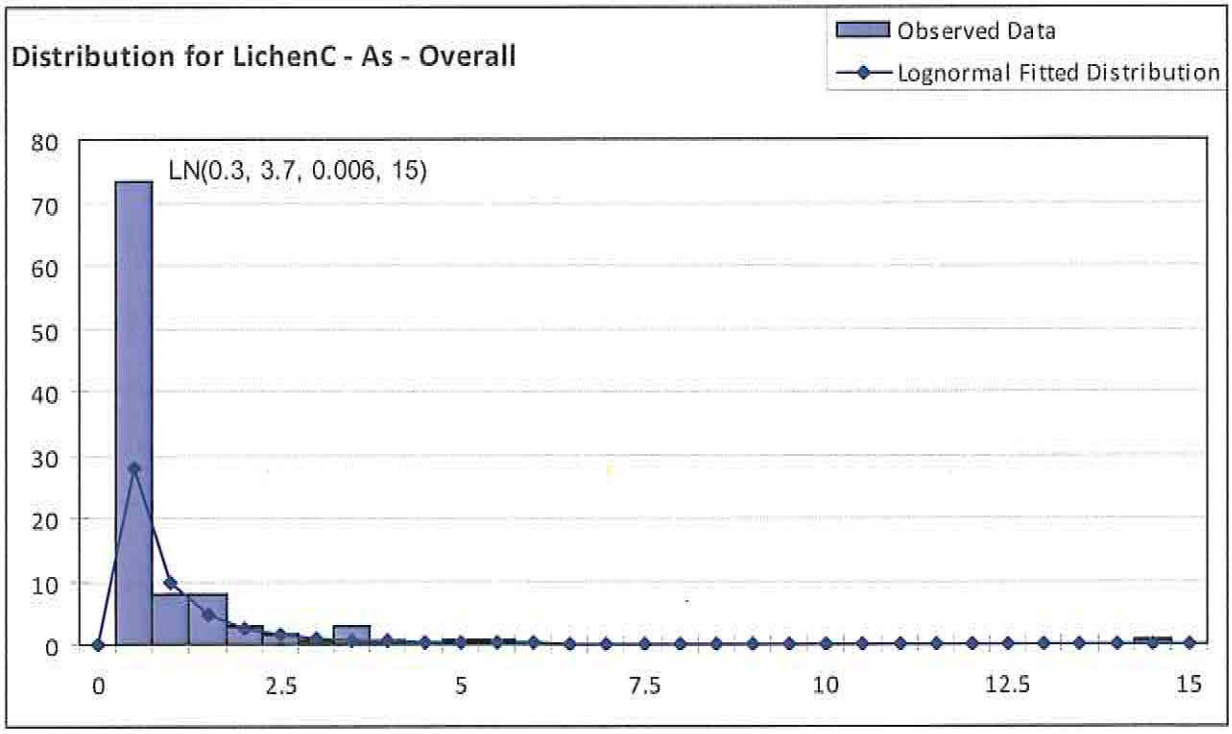

Distribution for LichenC - Sb - Faro-N
Observed Data
Lognormal Fitted Distribution
LN(0.03, 1.3, 0.01, 0.08)
120
100
80
60
40
20
0
0
0.2
0.4
0.6
0.8
1
1.2

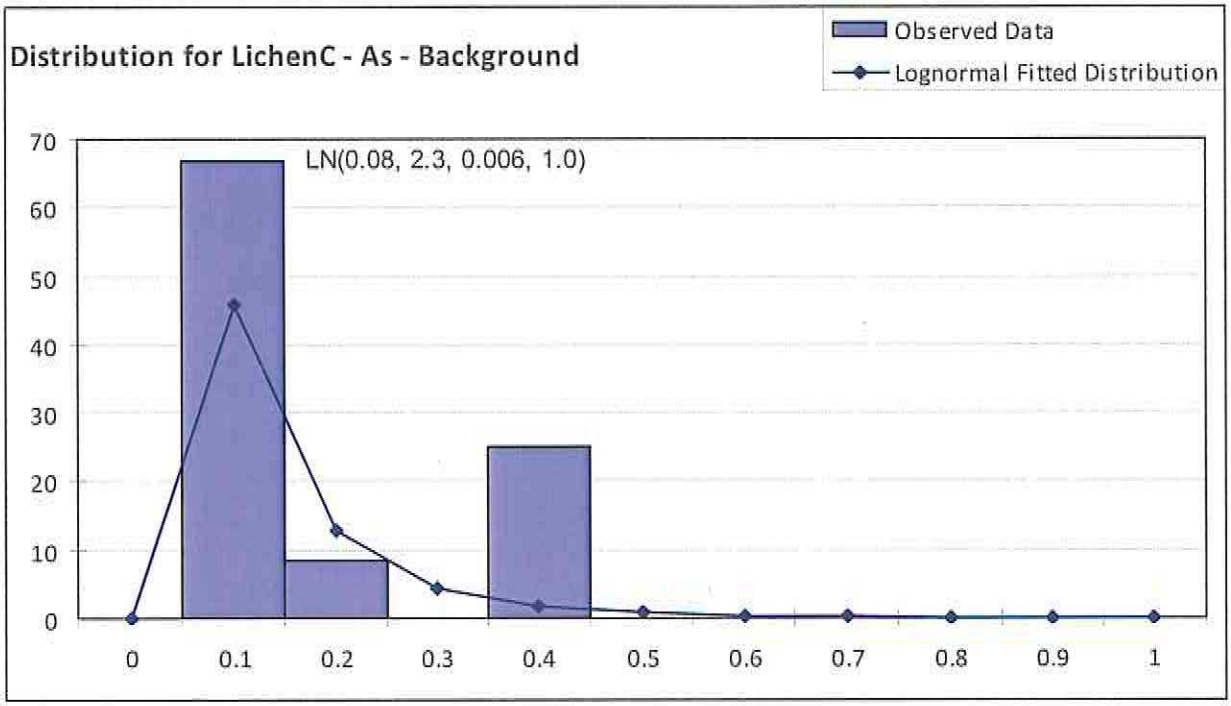

Distribution for LichenC - Sb - Faro-S
Observed Data
Lognormal Fitted Distribution
LN(0.2, 1.8, 0.04, 1.1)
80
70
60
50
40
30
20
10
0
0
1
2
3
4
5
6

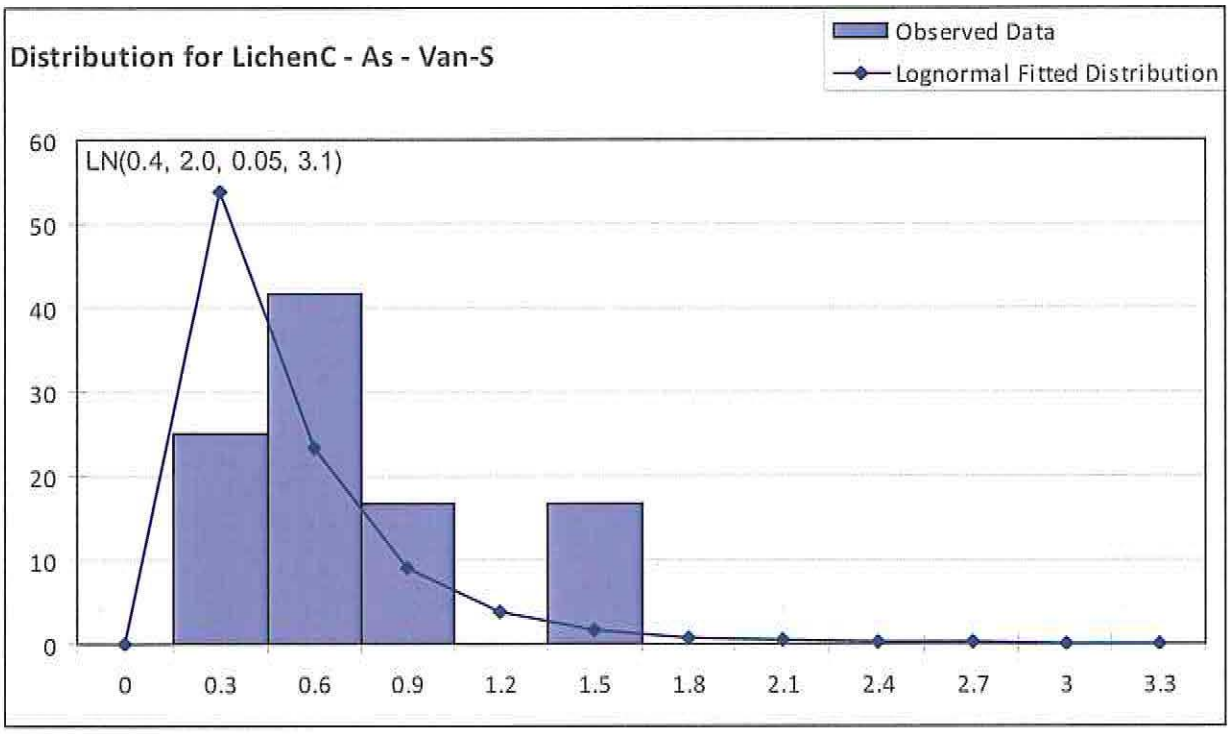

Distribution for LichenC - Sb - Faro-W
Observed Data
Lognormal Fitted Distribution
LN(0.06, 2.0, 0.01, 0.48)
70
60
50
40
30
20
10
0
0
0.25
0.5
0.75
1
1.25
1.5

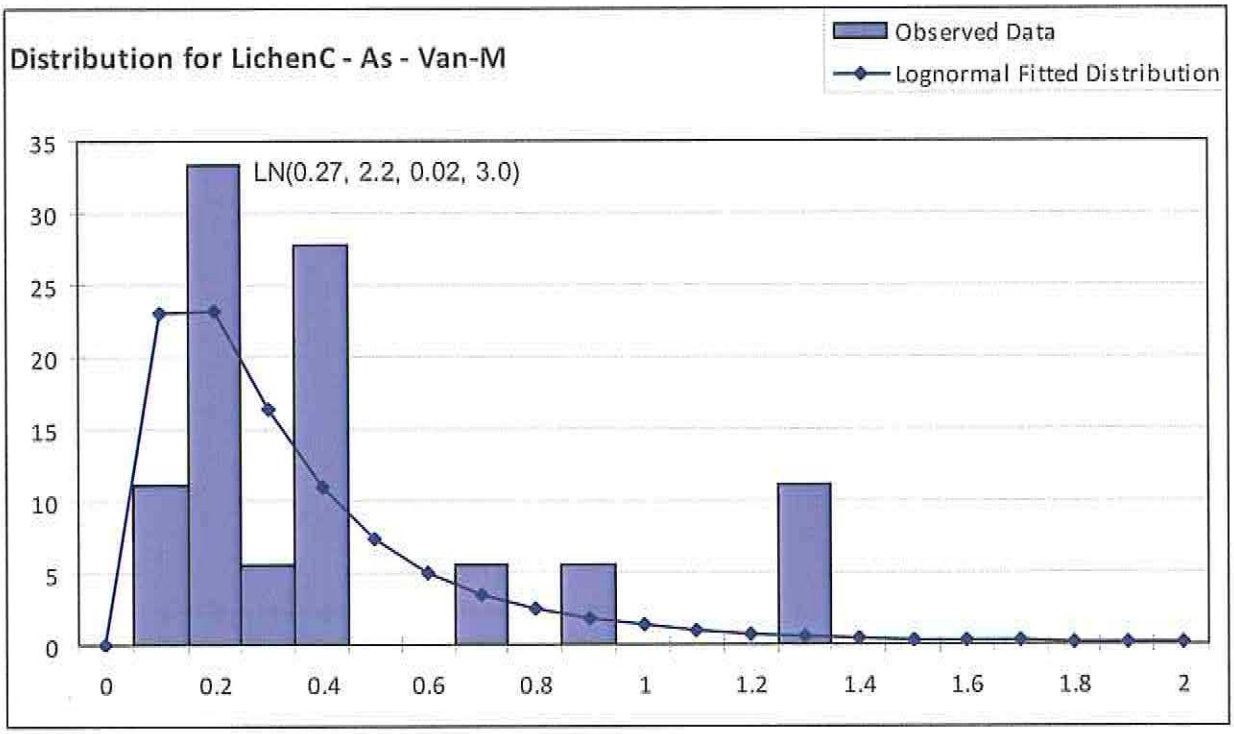

Distribution for LichenC - Sb - Faro-M
Observed Data
Lognormal Fitted Distribution
LN(0.08, 2.5, 0.01, 1.2)
70
60
50
40
30
20
10
0
0
0.5
1
1.5
2
2.5
3

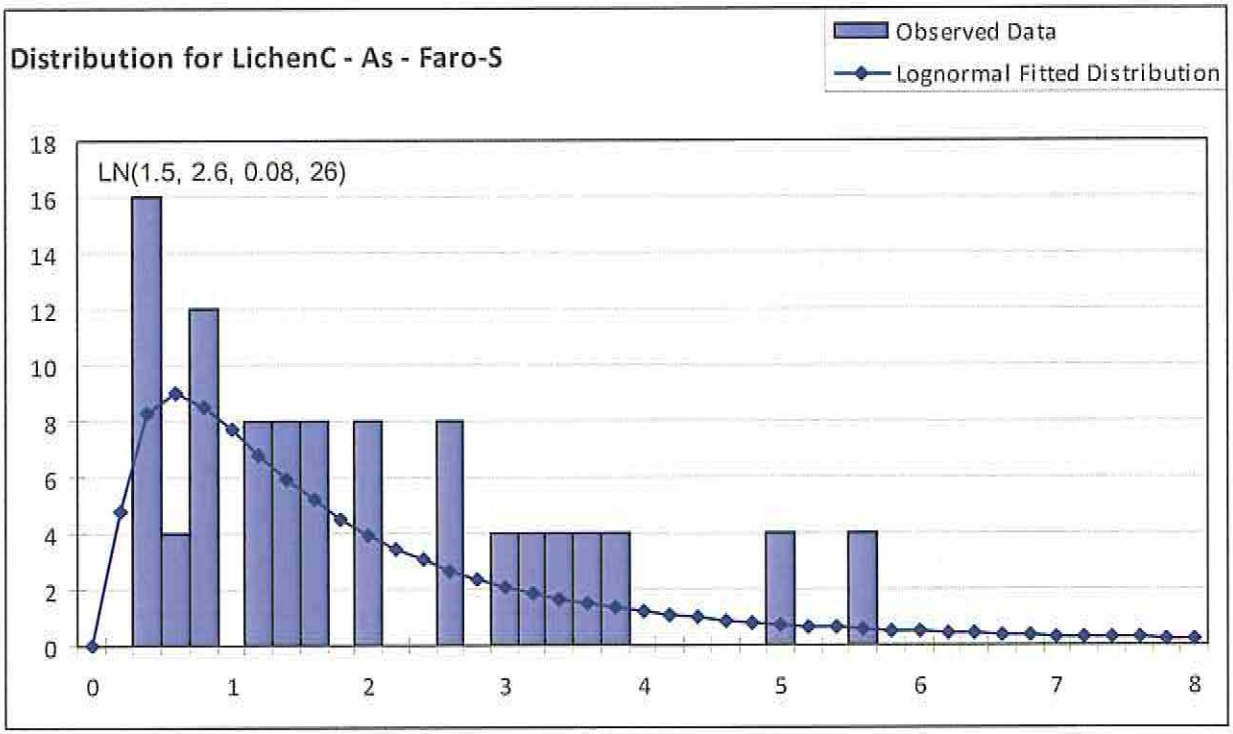
D.7.2 Arsenic

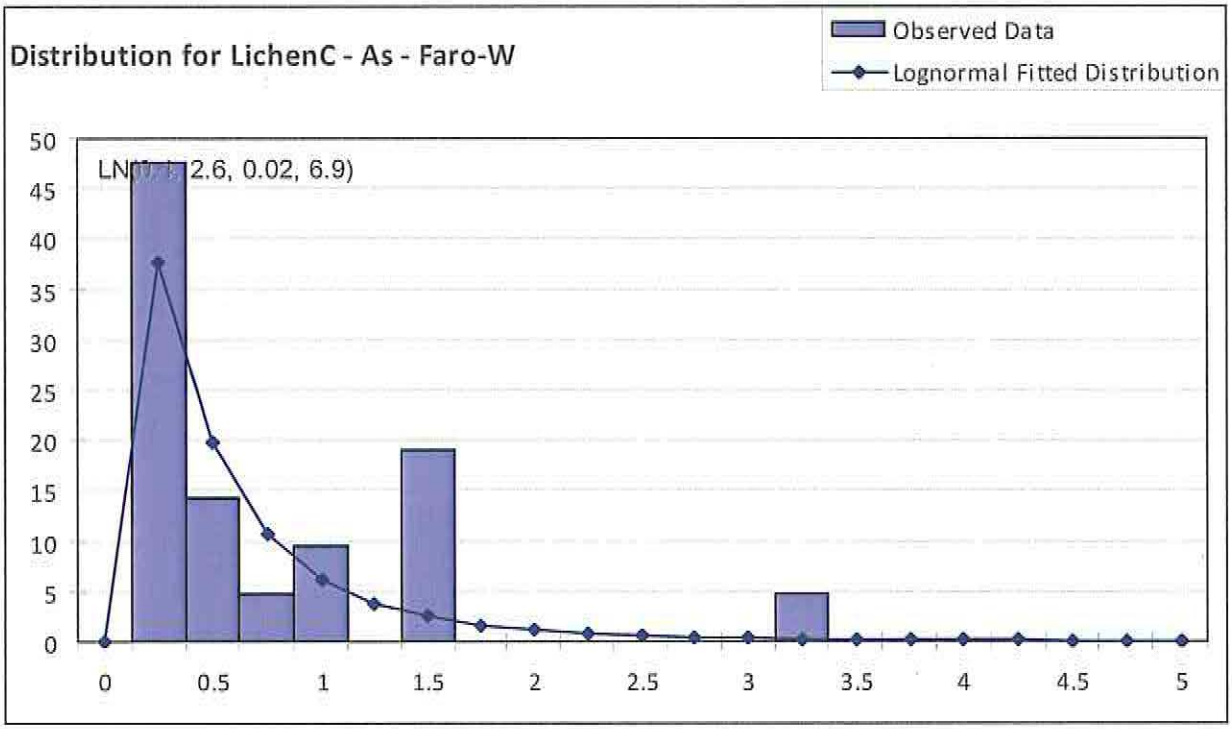

Distribution for LichenC - As - Overall
Observed Data
Lognormal Fitted Distribution
LN(0.3, 3.7, 0.006, 15)
80
70
60
50
40
30
20
10
0
0
2.5
5
7.5
10
12.5
15

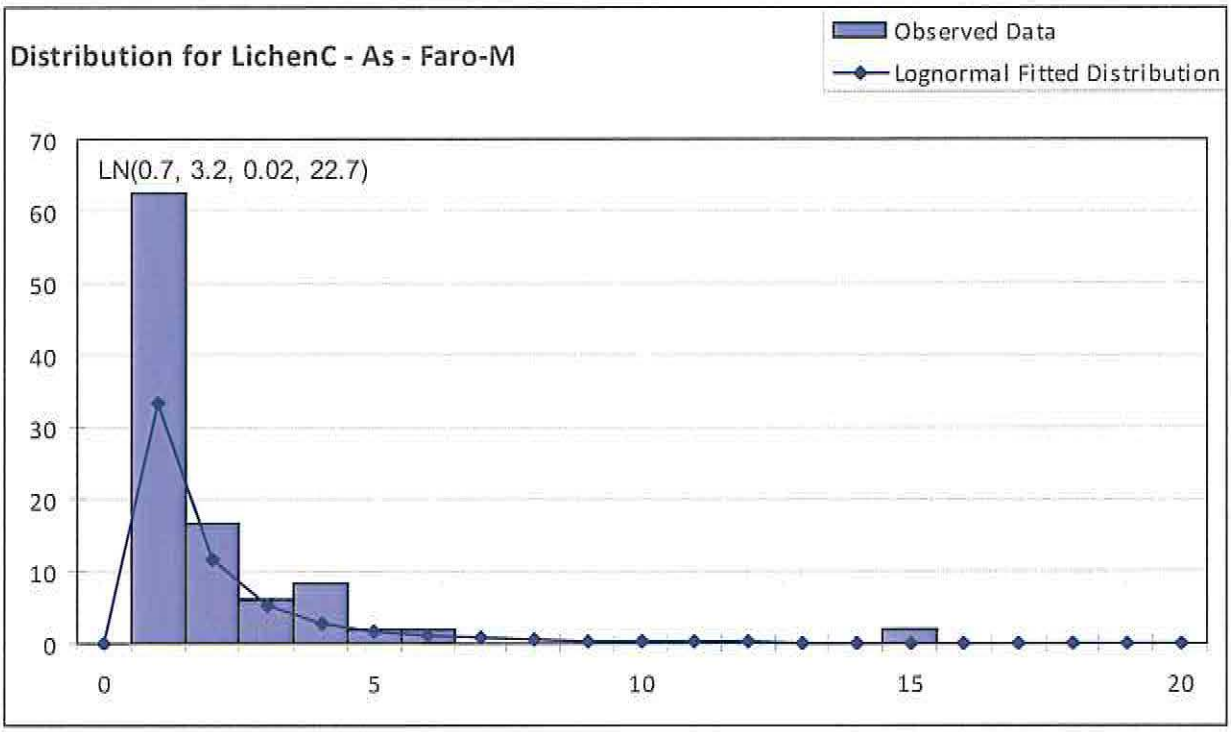

Distribution for LichenC - As - Background
Observed Data
Lognormal Fitted Distribution
LN(0.08, 2.3, 0.006, 1.0)
70
60
50
40
30
20
10
0
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1

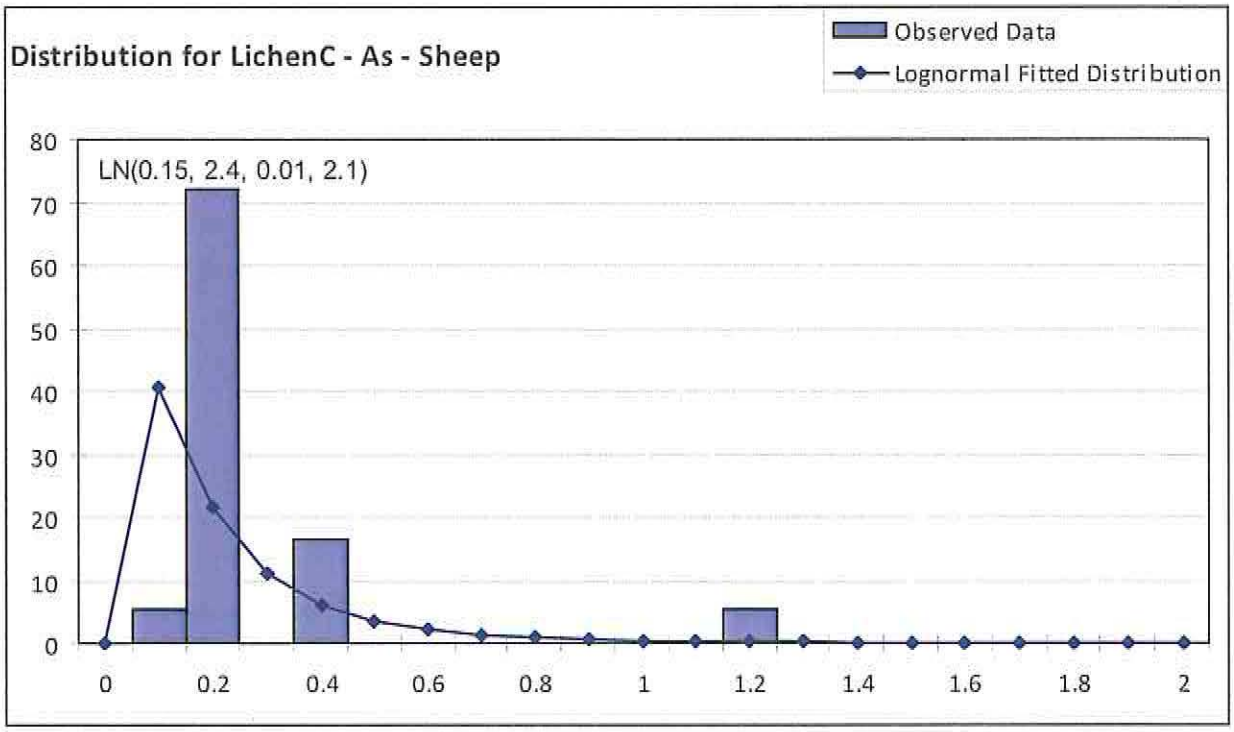

Distribution for LichenC - As - Van-S
Observed Data
Lognormal Fitted Distribution
LN(0.4, 2.0, 0.05, 3.1)
60
50
40
30
20
10
0
0
0.3
0.6
0.9
1.2
1.5
1.8
2.1
2.4
2.7
3
3.3


Distribution for LichenC - As - Van-M
Observed Data
Lognormal Fitted Distribution
LN(0.27, 2.2, 0.02, 3.0)
35
30
25
20
15
10
5
0
0
0.2
0.4
0.6
0.8
1
1.2
1.4
1.6
1.8
2

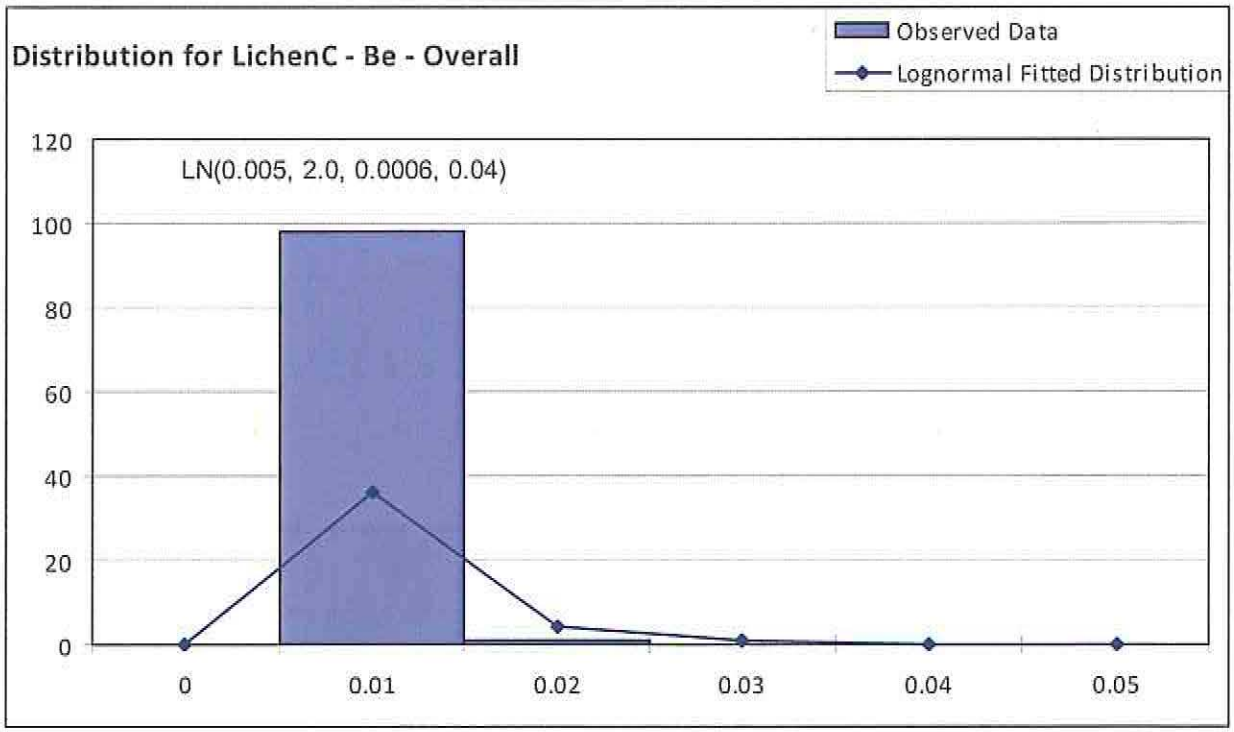

Distribution for LichenC - As - Faro-S
Observed Data
Lognormal Fitted Distribution
LN(1.5, 2.6, 0.08, 26)
18
16
14
12
10
8
6
4
2
0
0
1
2
3
4
5
6
7
8

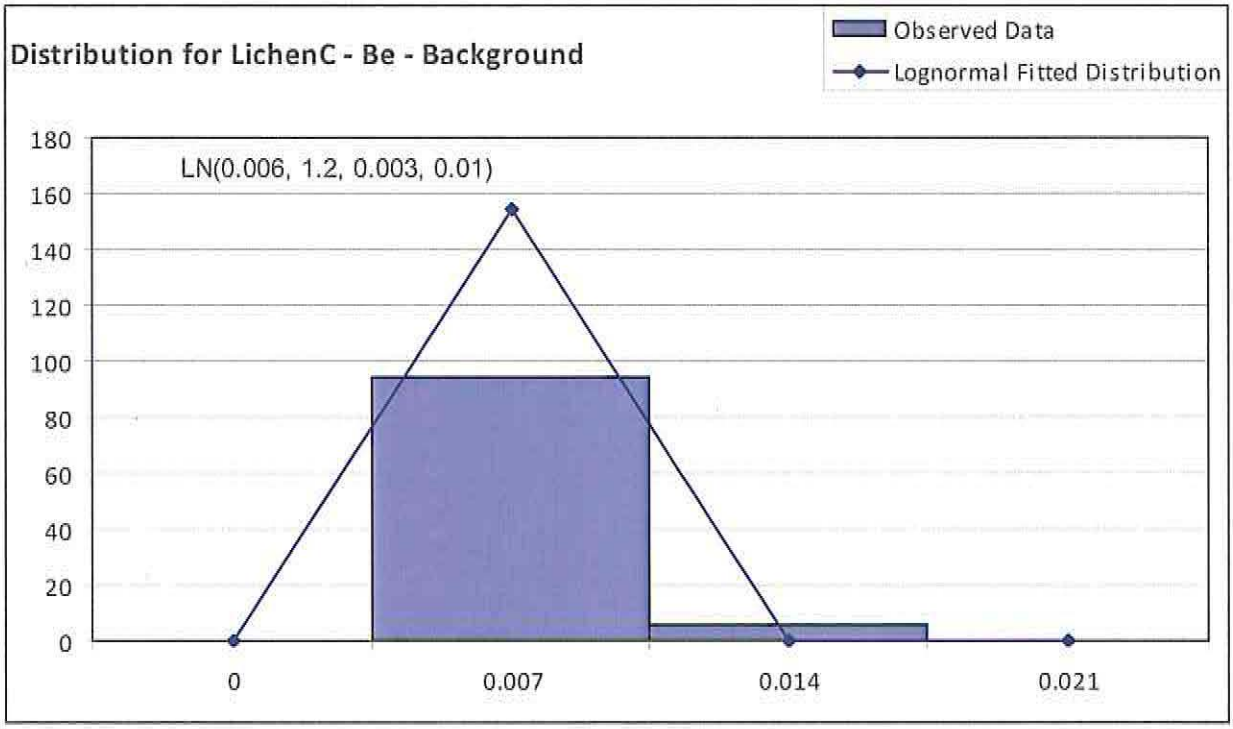

Distribution for LichenC - As - Faro-W
Observed Data
Lognormal Fitted Distribution
LN(1.1, 2.6, 0.02, 6.9)
50
45
40
35
30
25
20
15
10
5
0
0
0.5
1
1.5
2
2.5
3
3.5
4
4.5
5

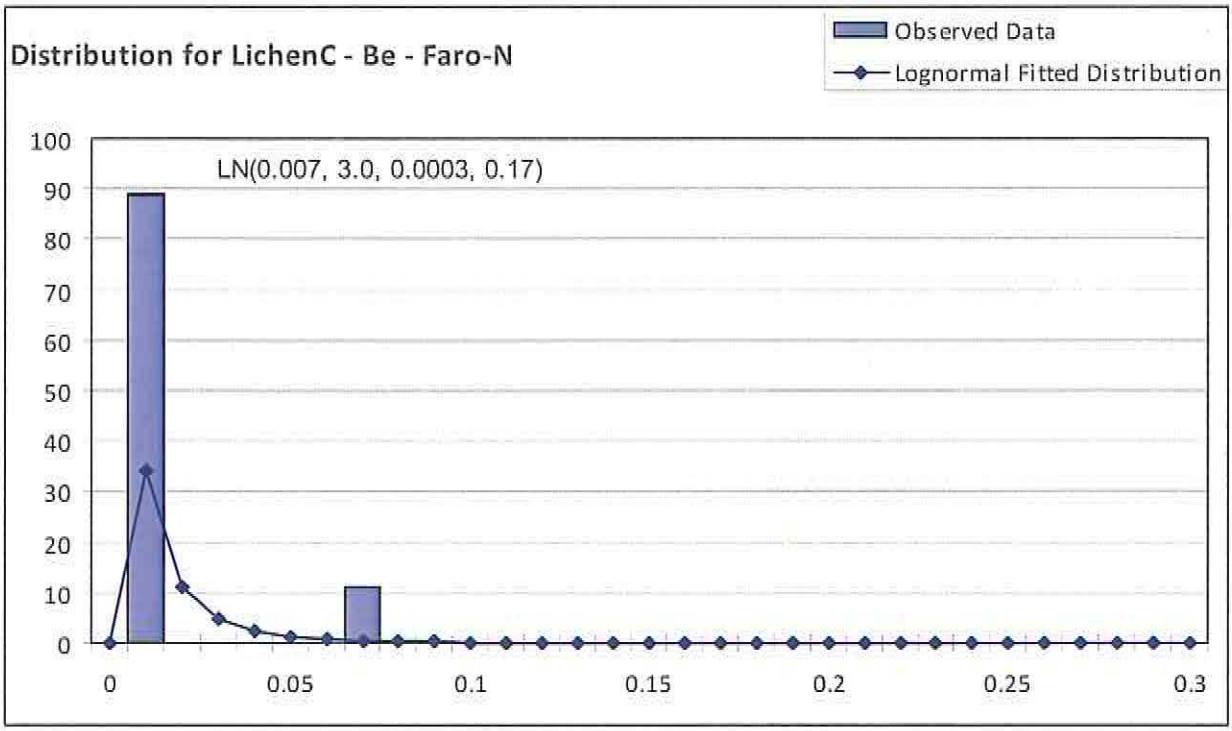

Distribution for LichenC - As - Faro-M
Observed Data
Lognormal Fitted Distribution
LN(0.7, 3.2, 0.02, 22.7)
70
60
50
40
30
20
10
0
0
5
10
15
20



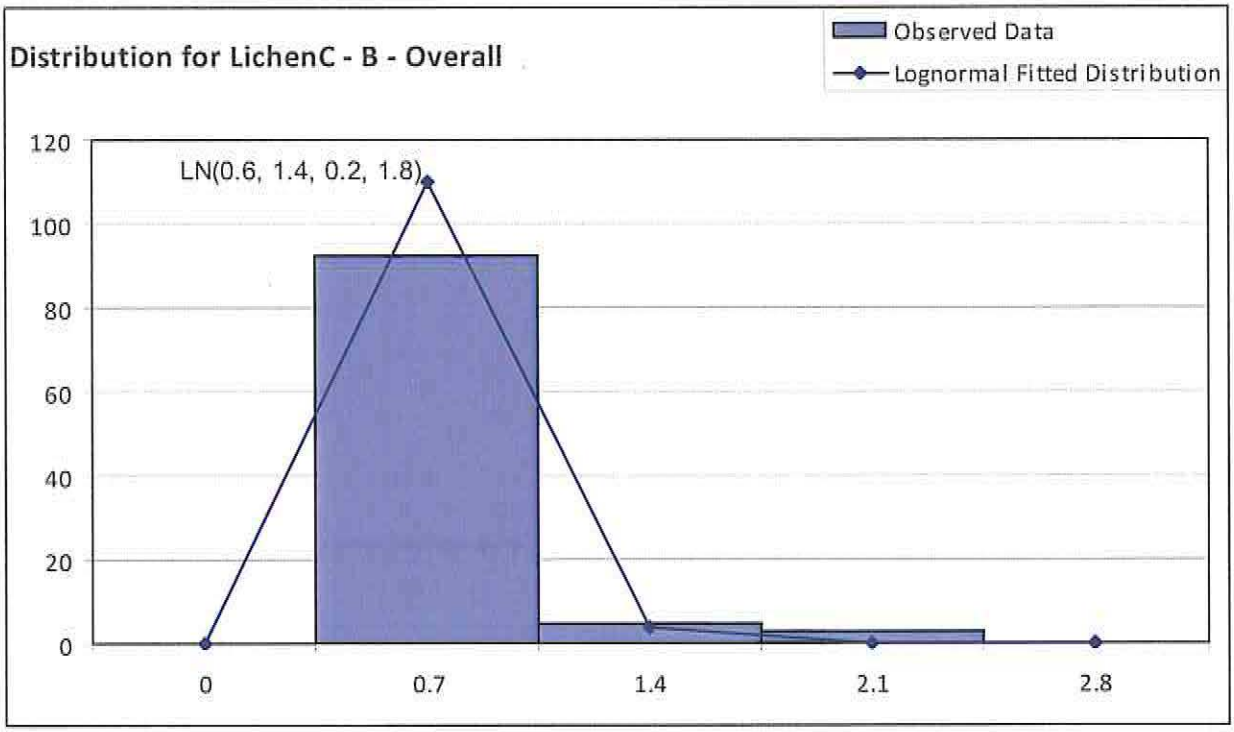
D.7.3 Beryllium

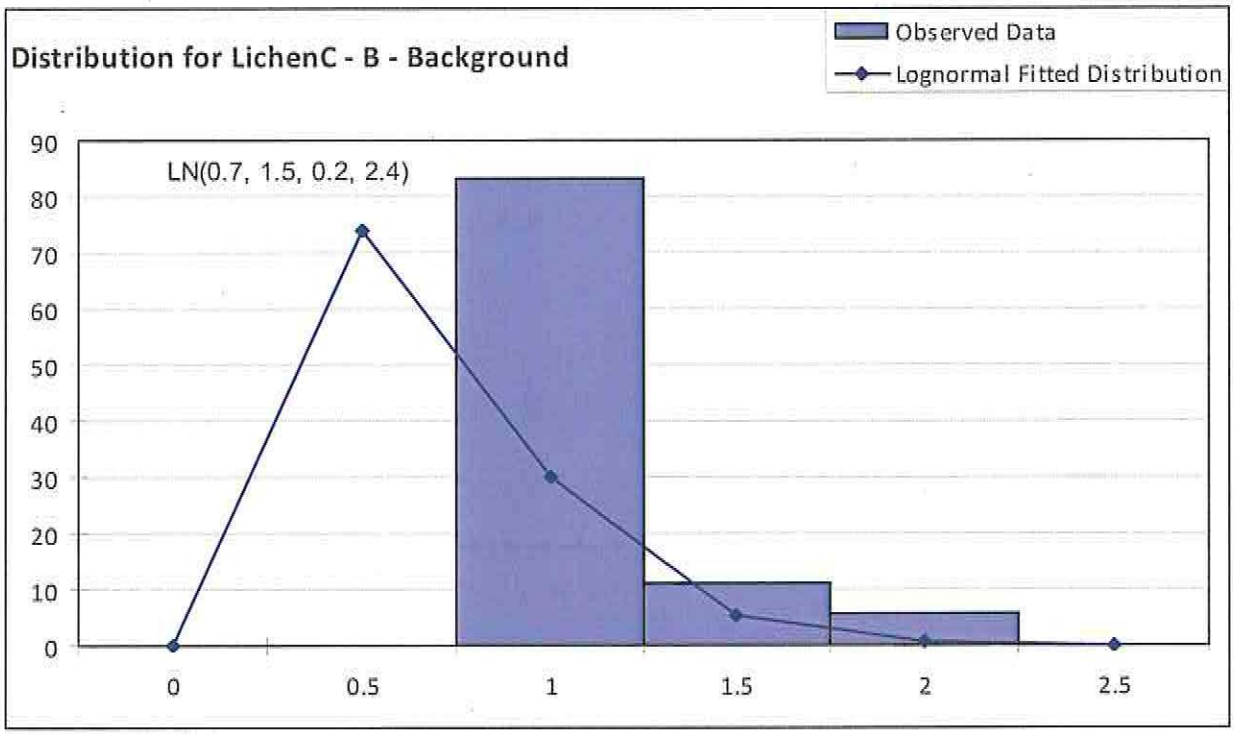


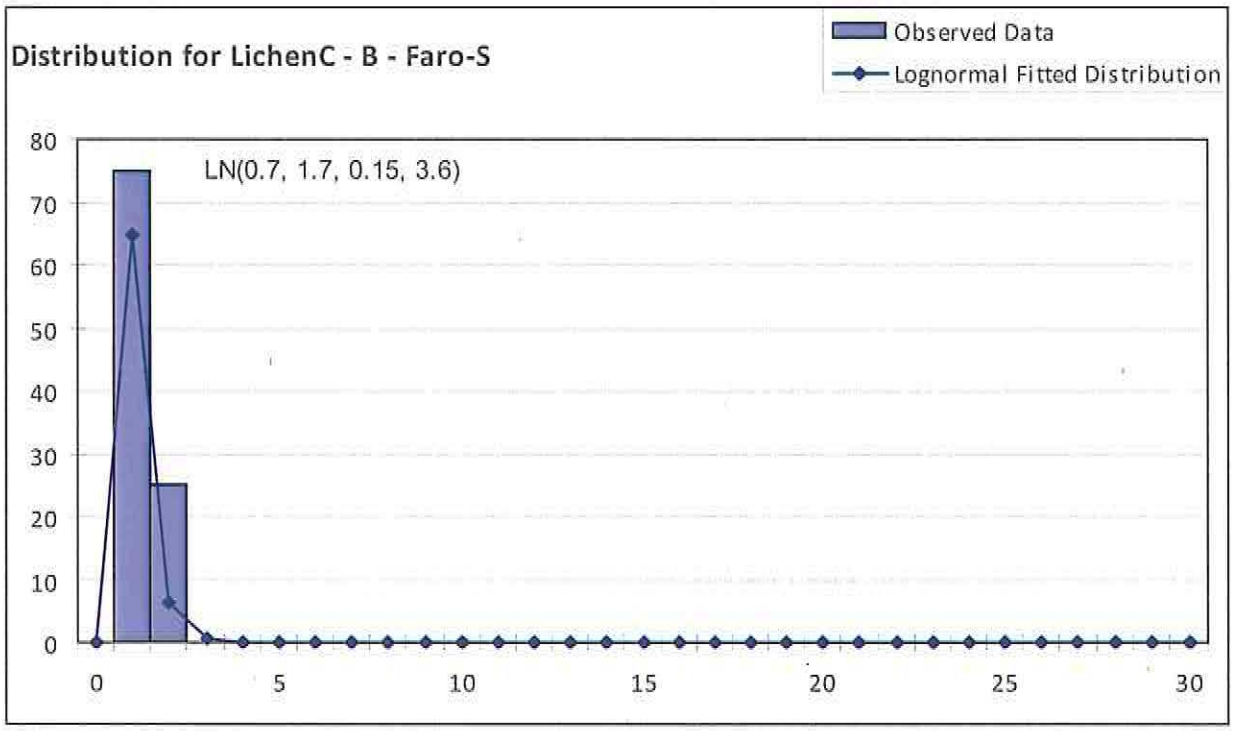

Distribution for LichenC - Be - Background
Observed Data
Lognormal Fitted Distribution
LN(0.006, 1.2, 0.003, 0.01)
180
160
140
120
100
80
60
40
20
0
0
0.007
0.014
0.021

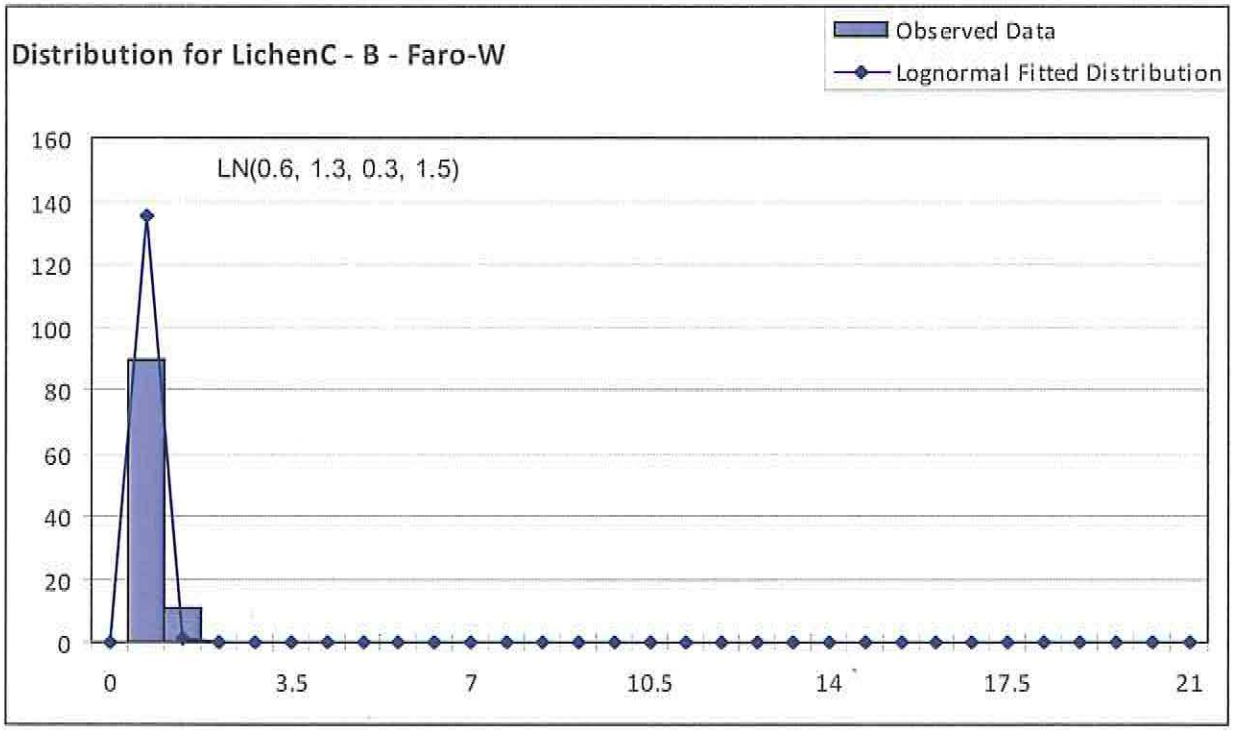

Distribution for LichenC - Be - Faro-N
Observed Data
Lognormal Fitted Distribution
LN(0.007, 3.0, 0.0003, 0.17)
100
90
80
70
60
50
40
30
20
10
0
0
0.05
0.1
0.15
0.2
0.25
0.3

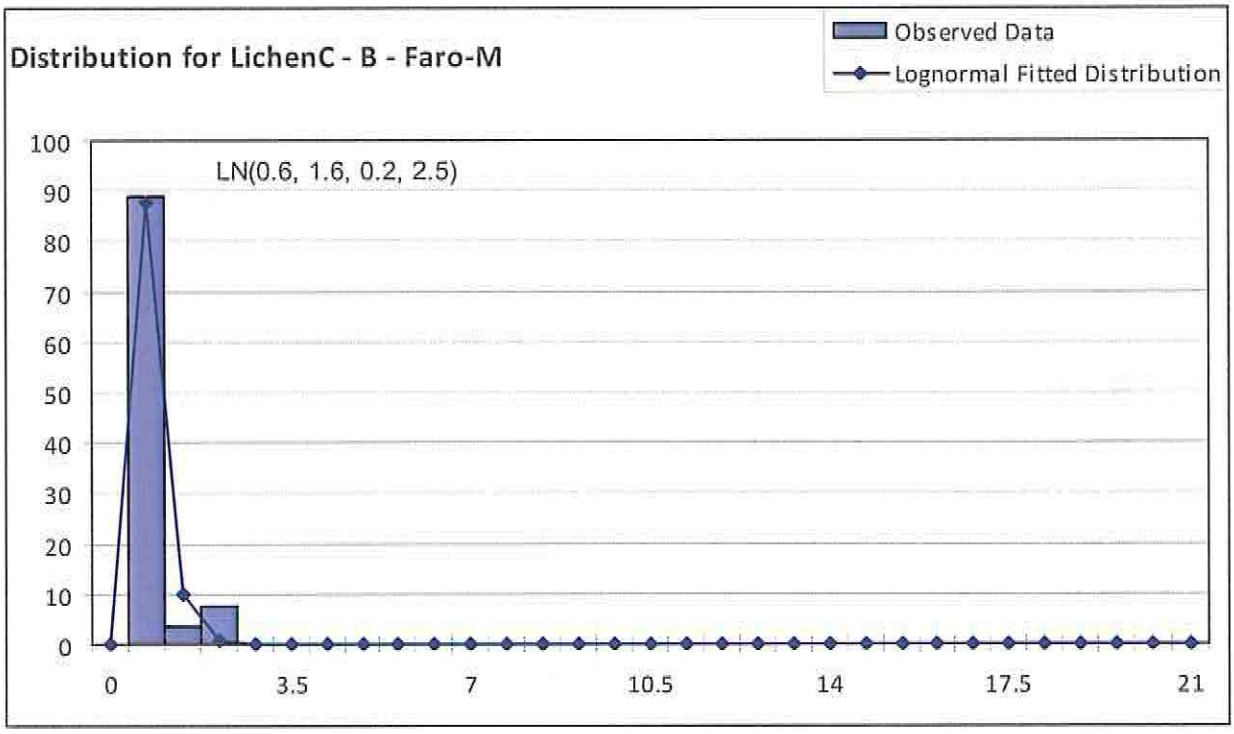
D.7.4 Boron


Distribution for LichenC - B - Overall
Observed Data
Lognormal Fitted Distribution
LN(0.6, 1.4, 0.2, 1.8)
120
100
80
60
40
20
0
0
0.7
1.4
2.1
2.8

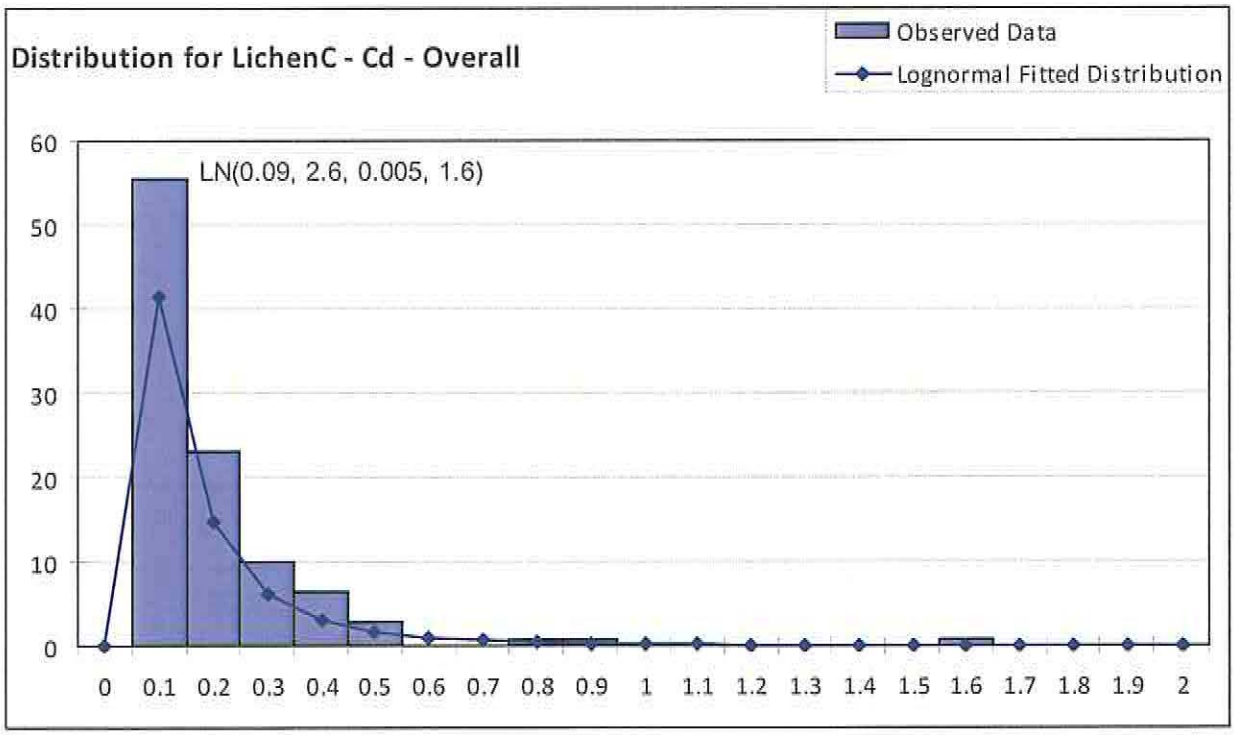

Distribution for LichenC - B - Background
Observed Data
Lognormal Fitted Distribution
LN(0.7, 1.5, 0.2, 2.4)
90
80
70
60
50
40
30
20
10
0
0
0.5
1
1.5
2
2.5

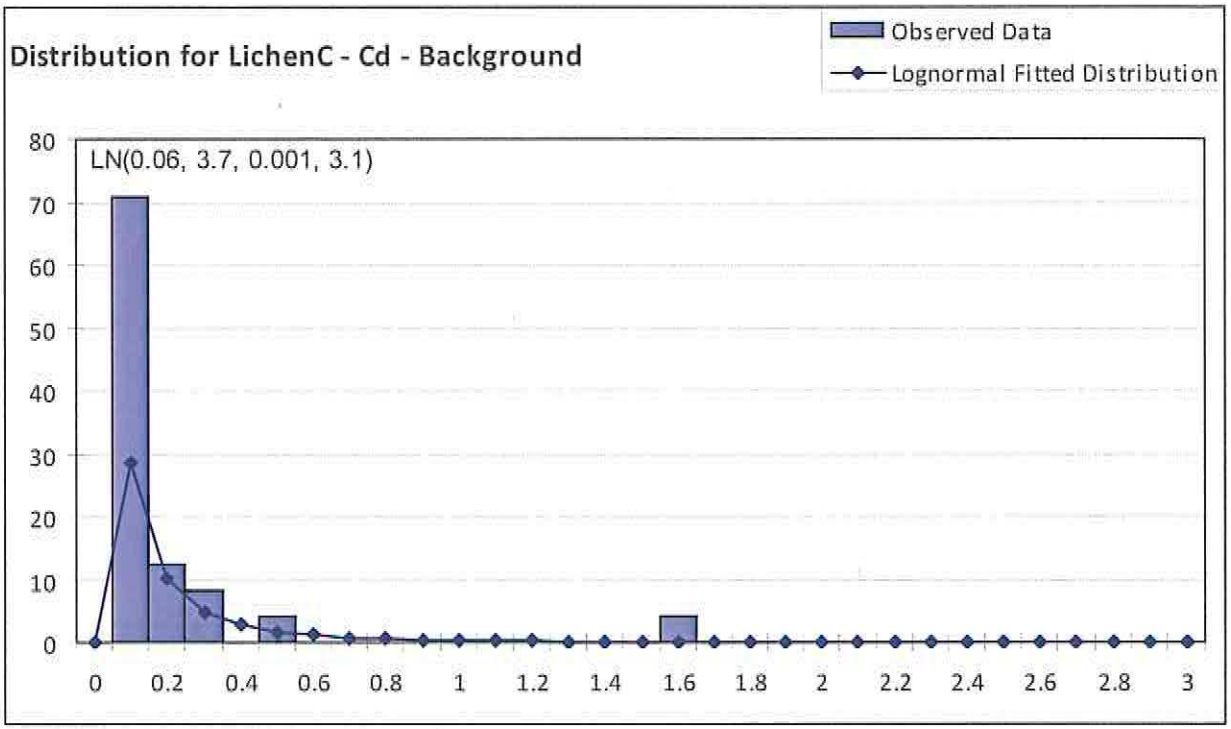

Distribution for LichenC - B - Faro-S
Observed Data
Lognormal Fitted Distribution
LN(0.7, 1.7, 0.15, 3.6)
80
70
60
50
40
30
20
10
0
0
5
10
15
20
25
30

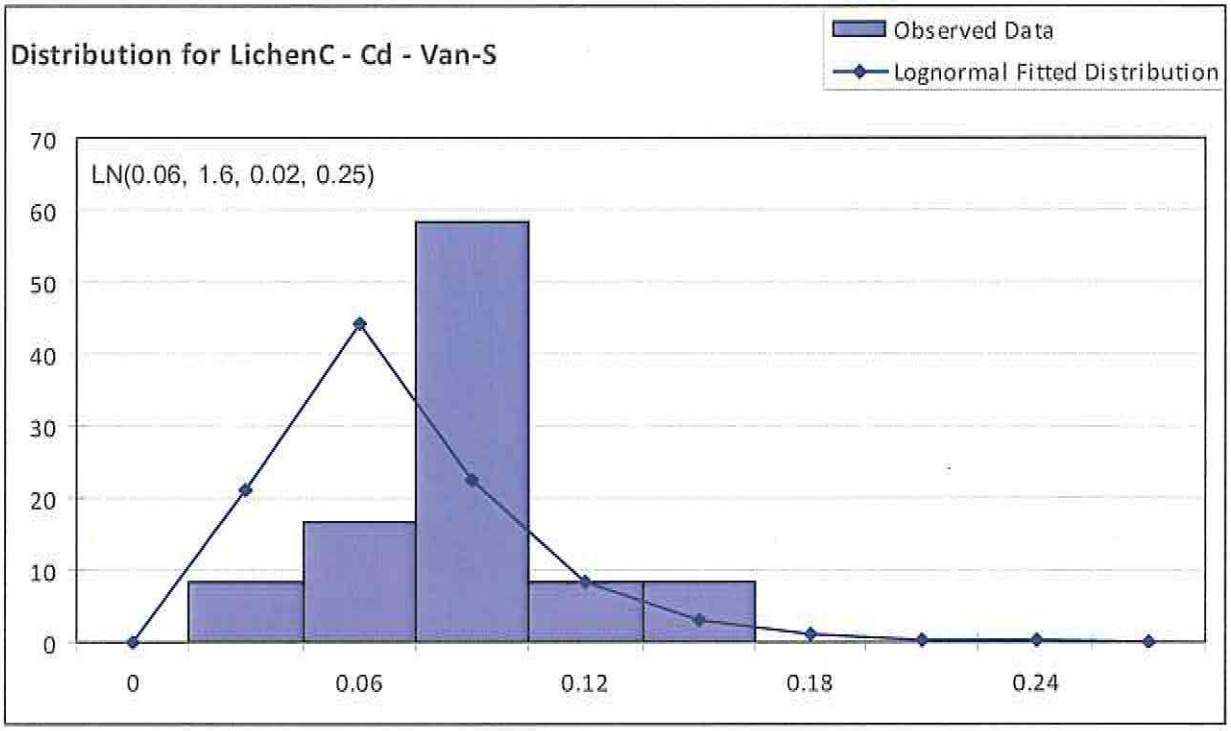

Distribution for LichenC - B - Faro-W
Observed Data
Lognormal Fitted Distribution
LN(0.6, 1.3, 0.3, 1.5)
160
140
120
100
80
60
40
20
0
0
3.5
7
10.5
14
17.5
21

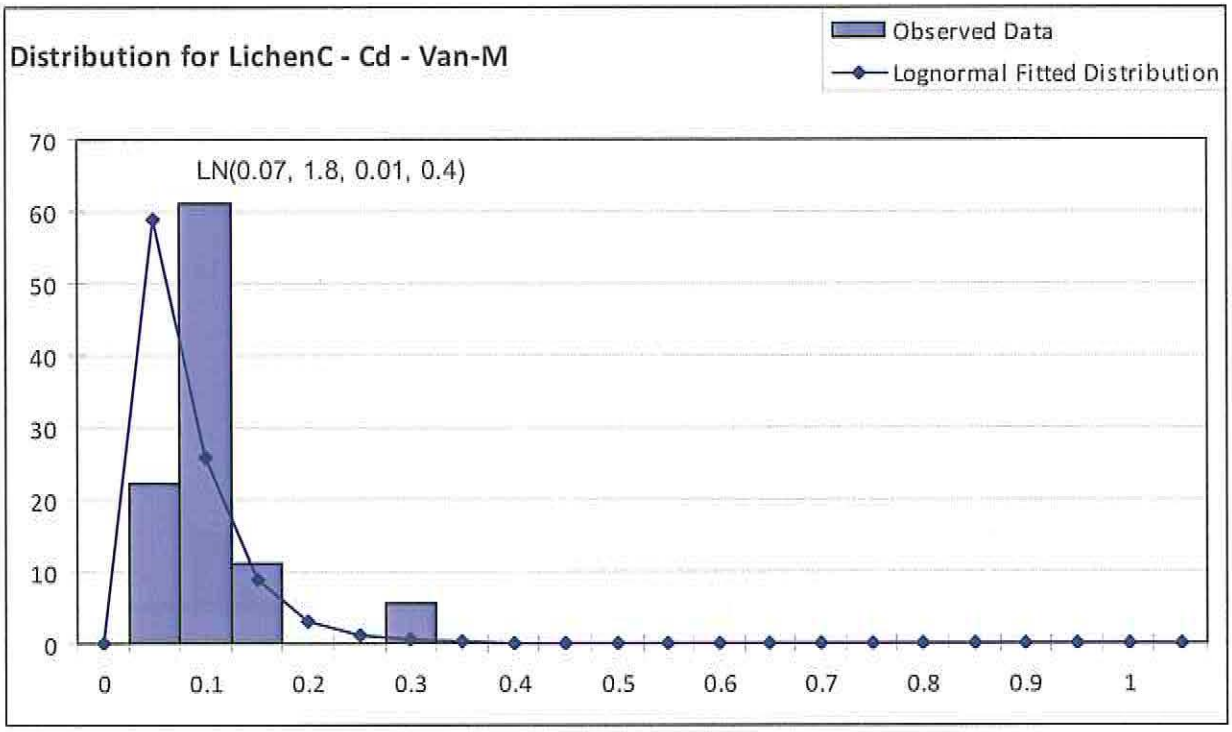

Distribution for LichenC - B - Faro-M
Observed Data
Lognormal Fitted Distribution
LN(0.6, 1.6, 0.2, 2.5)
100
90
80
70
60
50
40
30
20
10
0
0
3.5
7
10.5
14
17.5
21

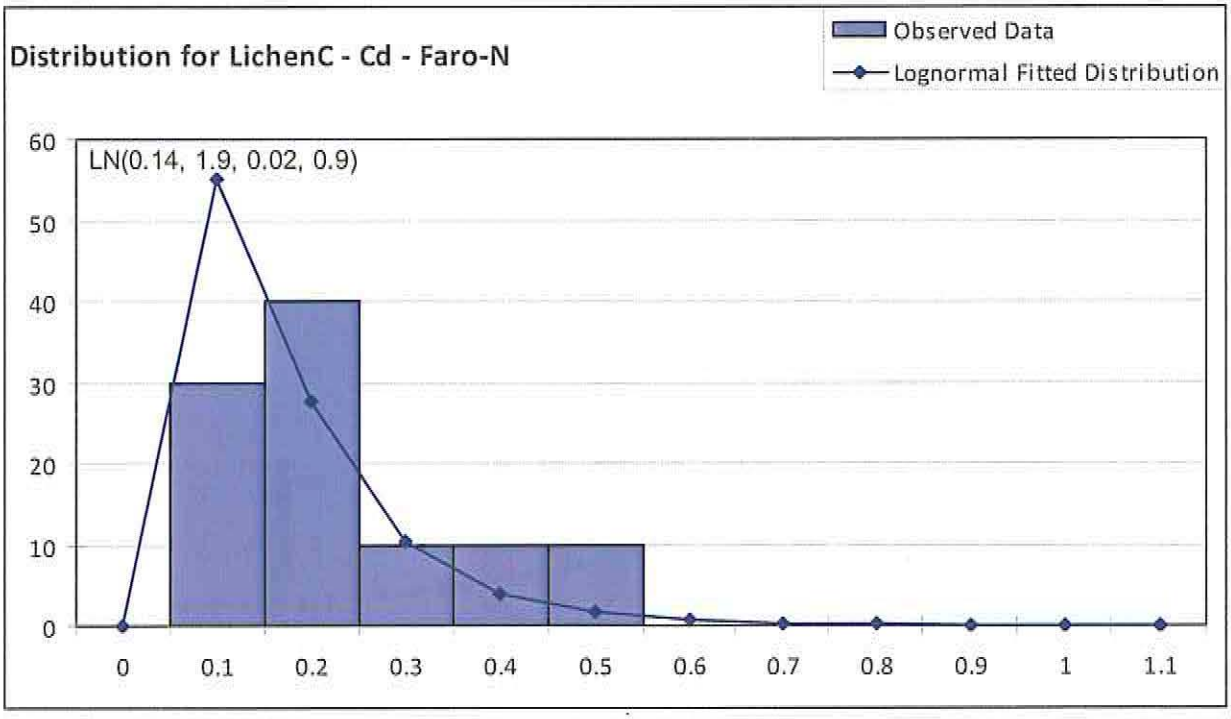
D.7.5 Cadmium

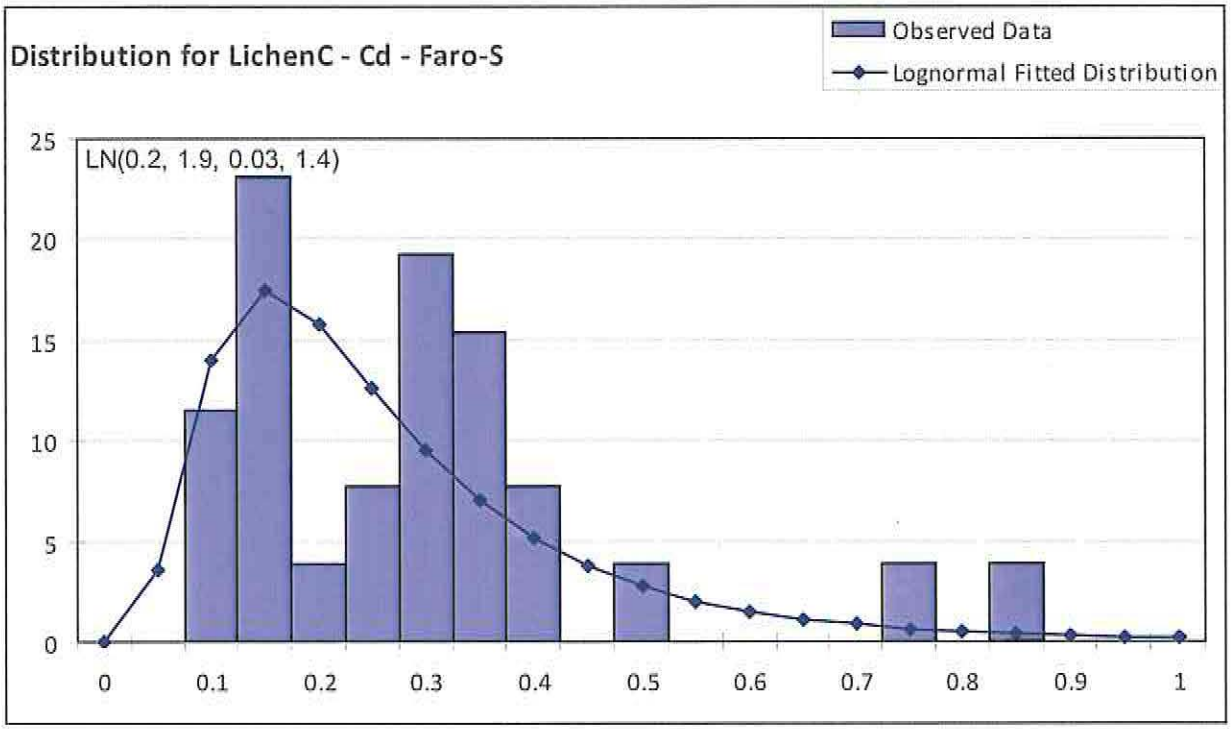

Distribution for LichenC - Cd - Overall
Observed Data
Lognormal Fitted Distribution
LN(0.09, 2.6, 0.005, 1.6)
60
50
40
30
20
10
0
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1
1.1
1.2
1.3
1.4
1.5
1.6
1.7
1.8
1.9
2

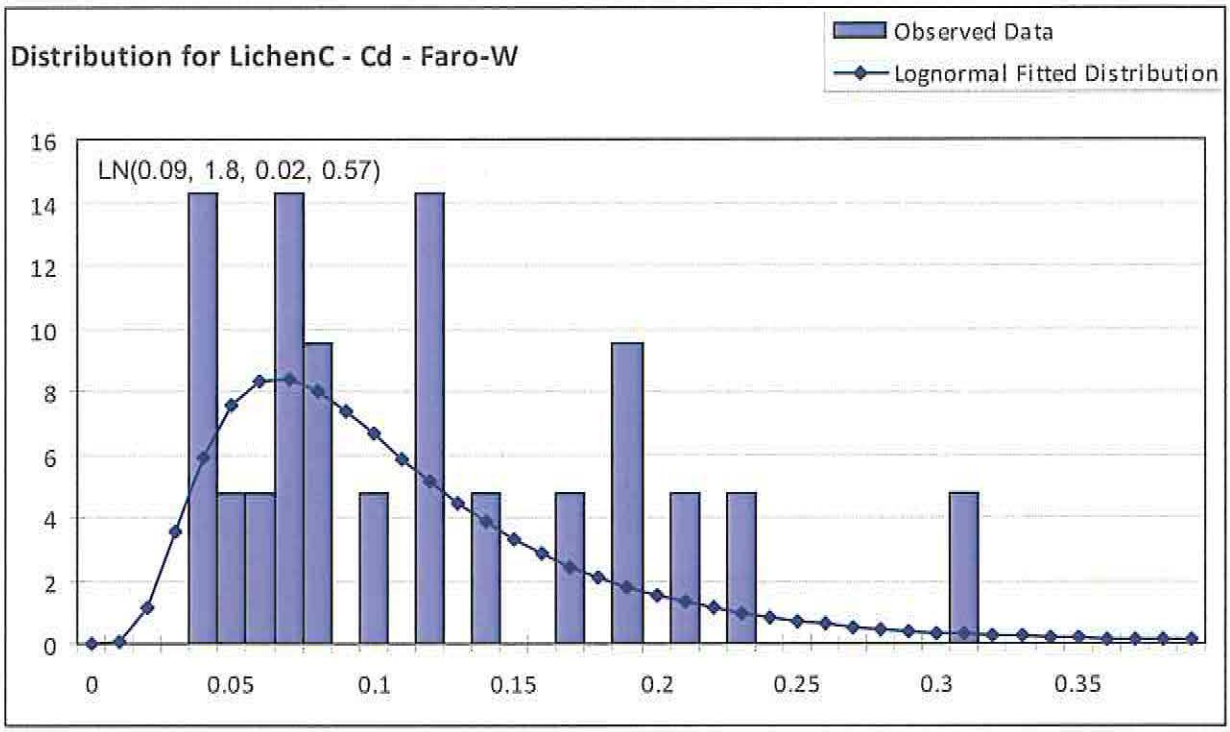

Distribution for LichenC - Cd - Background
Observed Data
Lognormal Fitted Distribution
LN(0.06, 3.7, 0.001, 3.1)
80
70
60
50
40
30
20
10
0
0
0.2
0.4
0.6
0.8
1
1.2
1.4
1.6
1.8
2
2.2
2.4
2.6
2.8
3

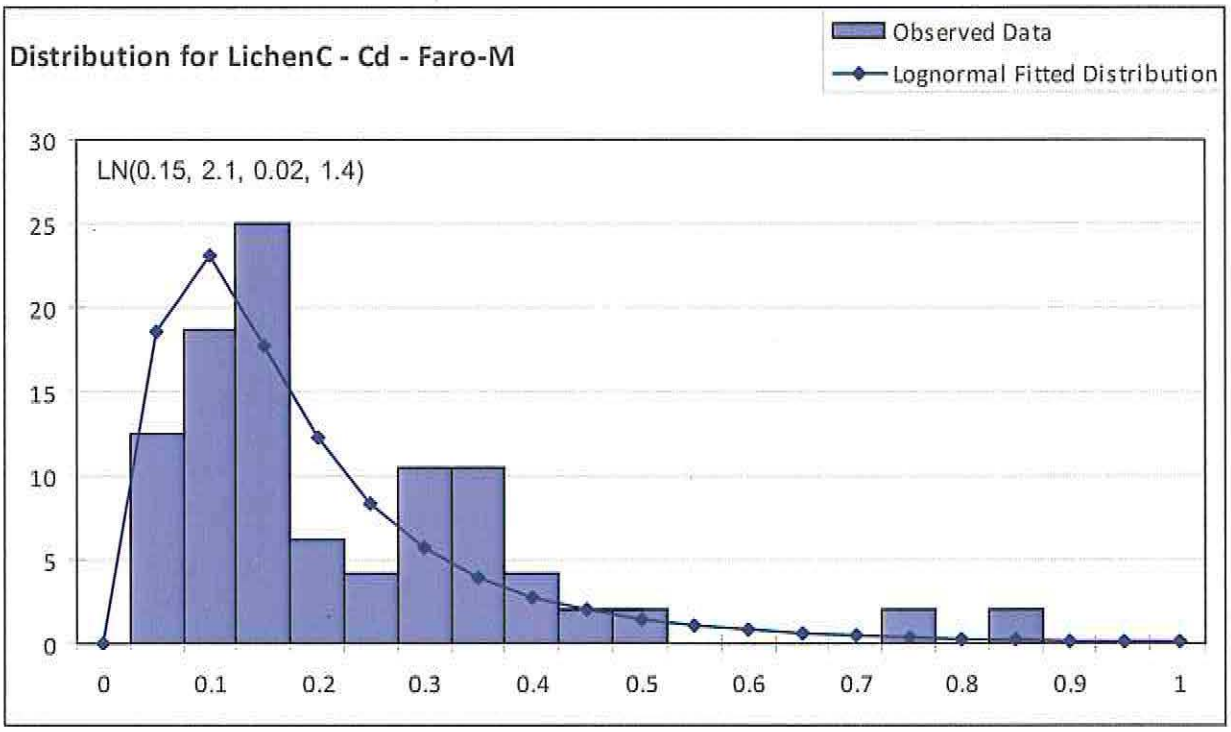

Distribution for LichenC - Cd - Van-S
Observed Data
Lognormal Fitted Distribution
LN(0.06, 1.6, 0.02, 0.25)
70
60
50
40
30
20
10
0
0
0.06
0.12
0.18
0.24

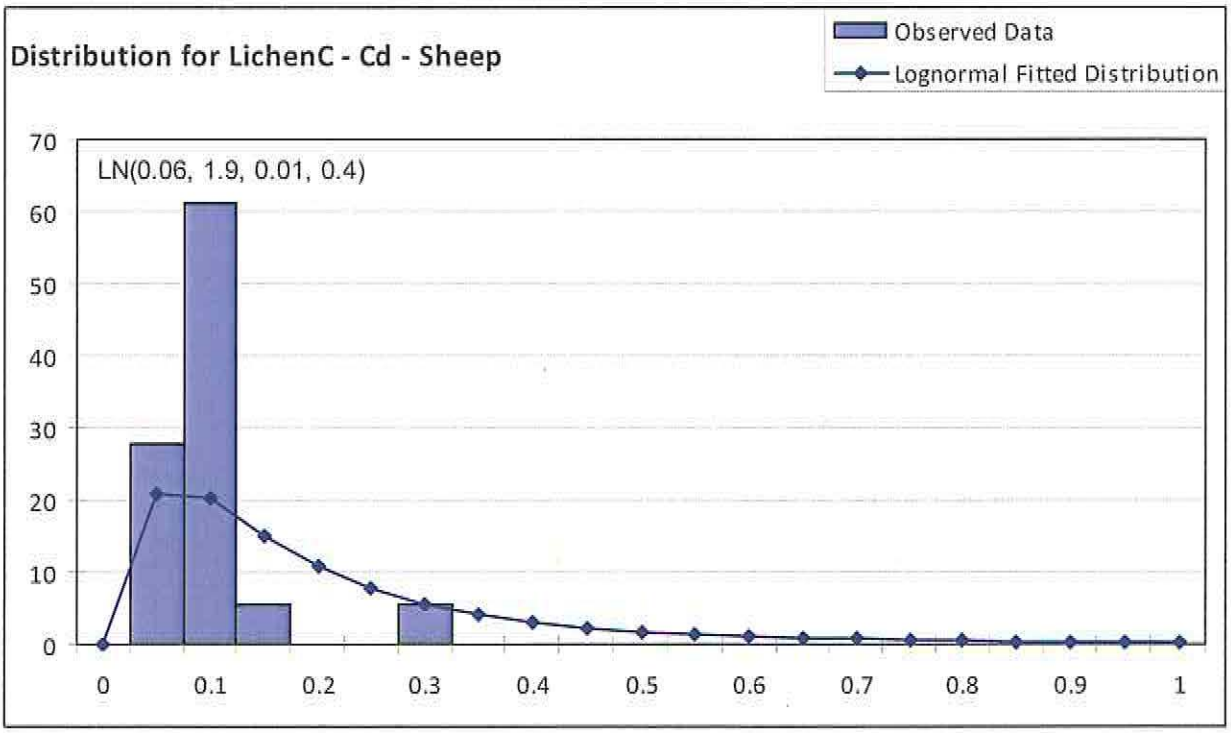

Distribution for LichenC - Cd - Van-M
Observed Data
Lognormal Fitted Distribution
LN(0.07, 1.8, 0.01, 0.4)
70
60
50
40
30
20
10
0
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1


Distribution for LichenC - Cd - Faro-N
Observed Data
Lognormal Fitted Distribution
LN(0.14, 1.9, 0.02, 0.9)
60
50
40
30
20
10
0
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1
1.1

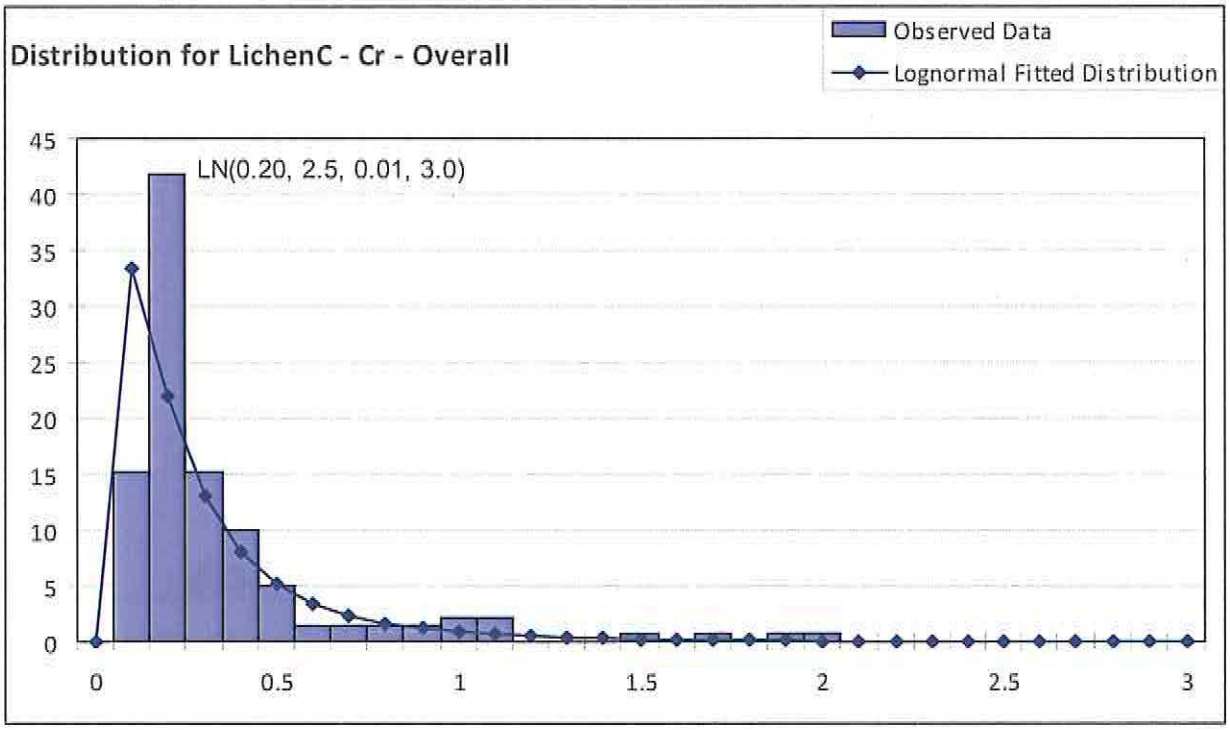

Distribution for LichenC - Cd - Faro-S
Observed Data
Lognormal Fitted Distribution
LN(0.2, 1.9, 0.03, 1.4)
25
20
15
10
5
0
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1

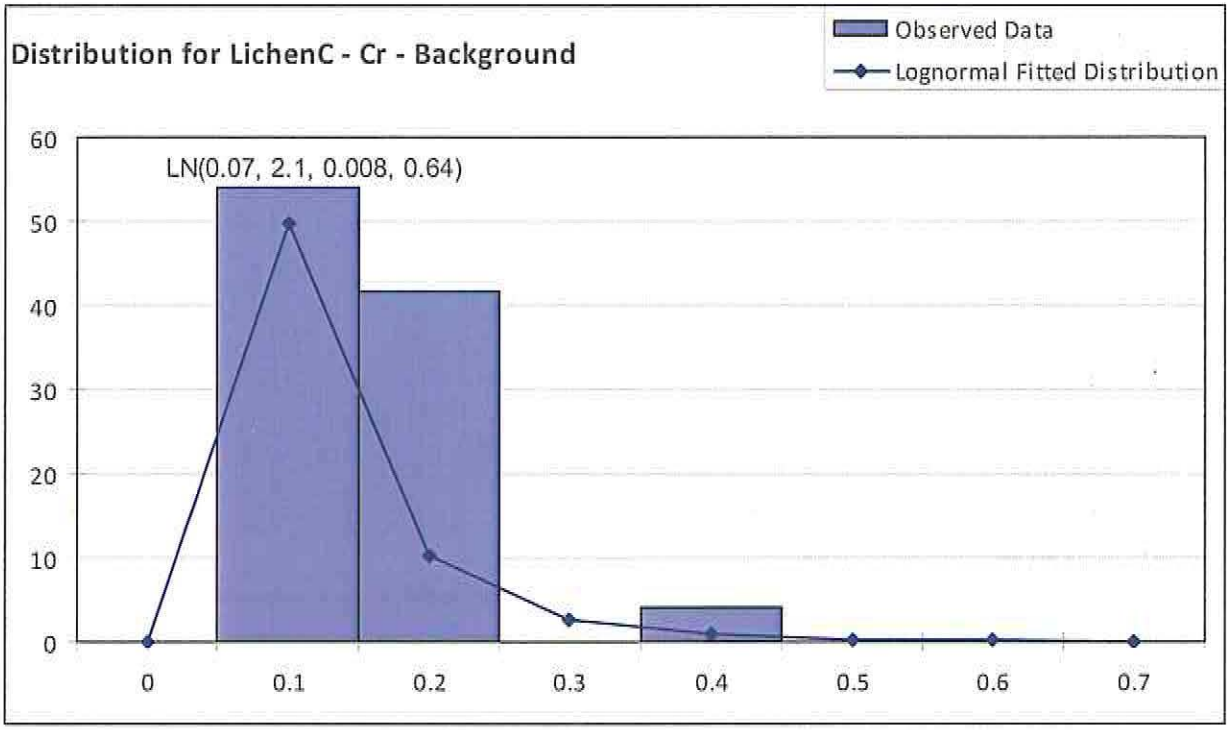

Distribution for LichenC - Cd - Faro-W
Observed Data
Lognormal Fitted Distribution
LN(0.09, 1.8, 0.02, 0.57)
16
14
12
10
8
6
4
2
0
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35

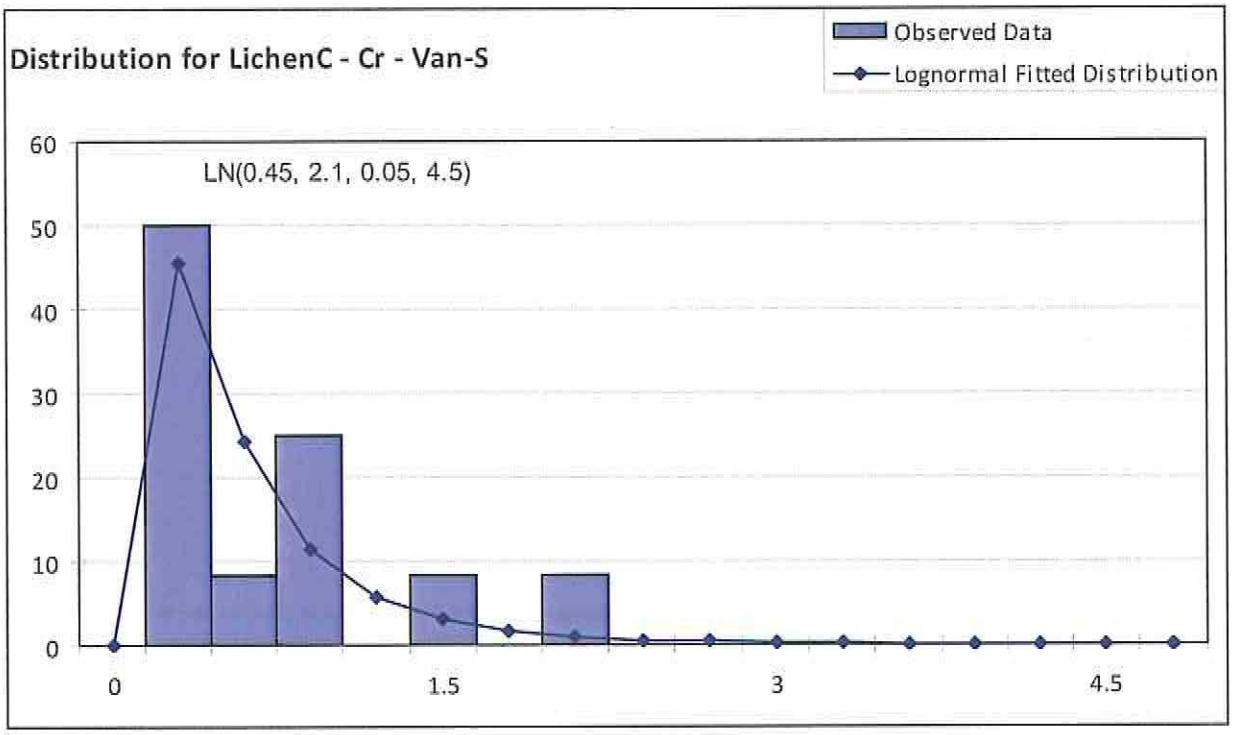

Distribution for LichenC - Cd - Faro-M
Observed Data
Lognormal Fitted Distribution
LN(0.15, 2.1, 0.02, 1.4)
30
25
20
15
10
5
0
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1

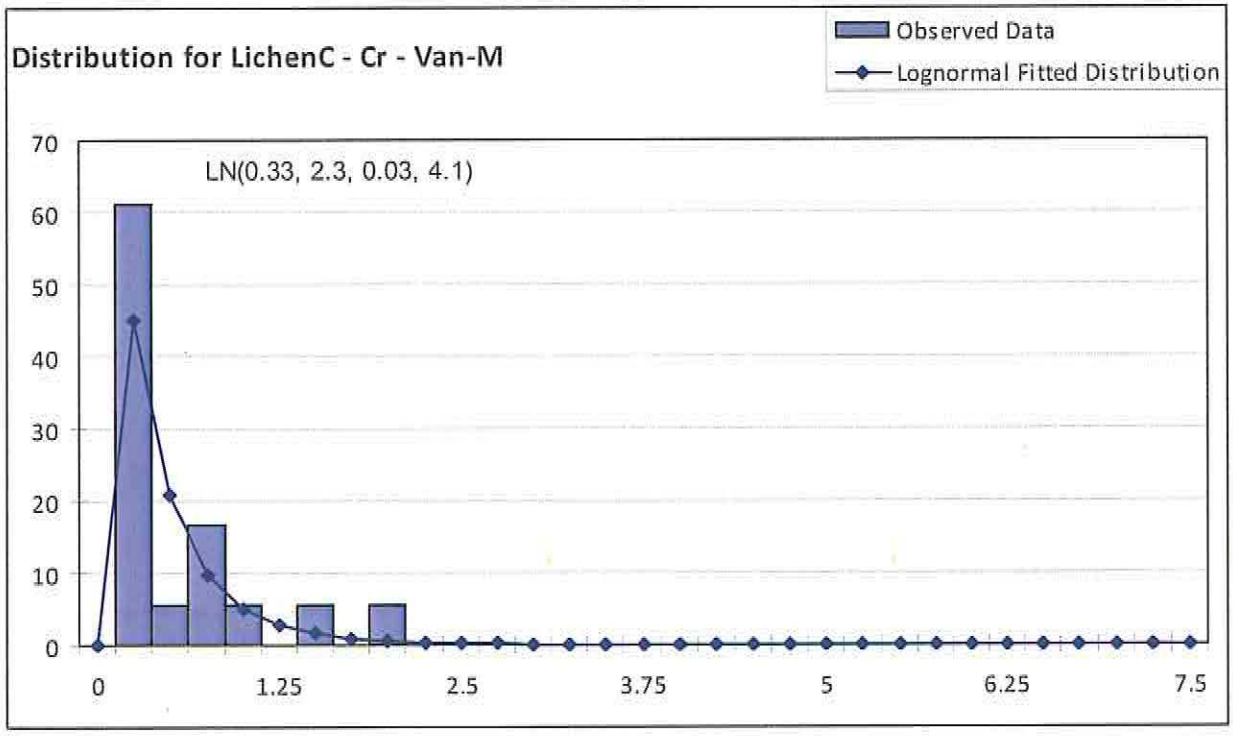

Distribution for LichenC - Cd - Sheep
Observed Data
Lognormal Fitted Distribution
LN(0.06, 1.9, 0.01, 0.4)
70
60
50
40
30
20
10
0
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1

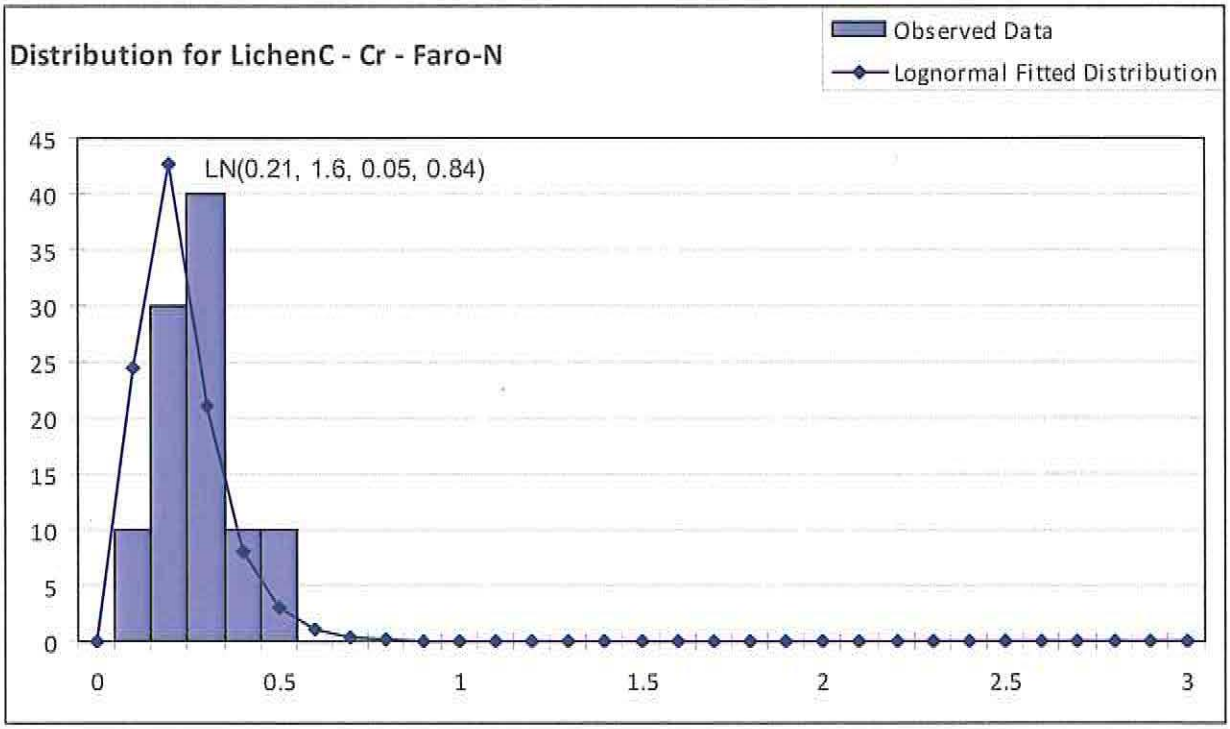
D.7.6 Chromium

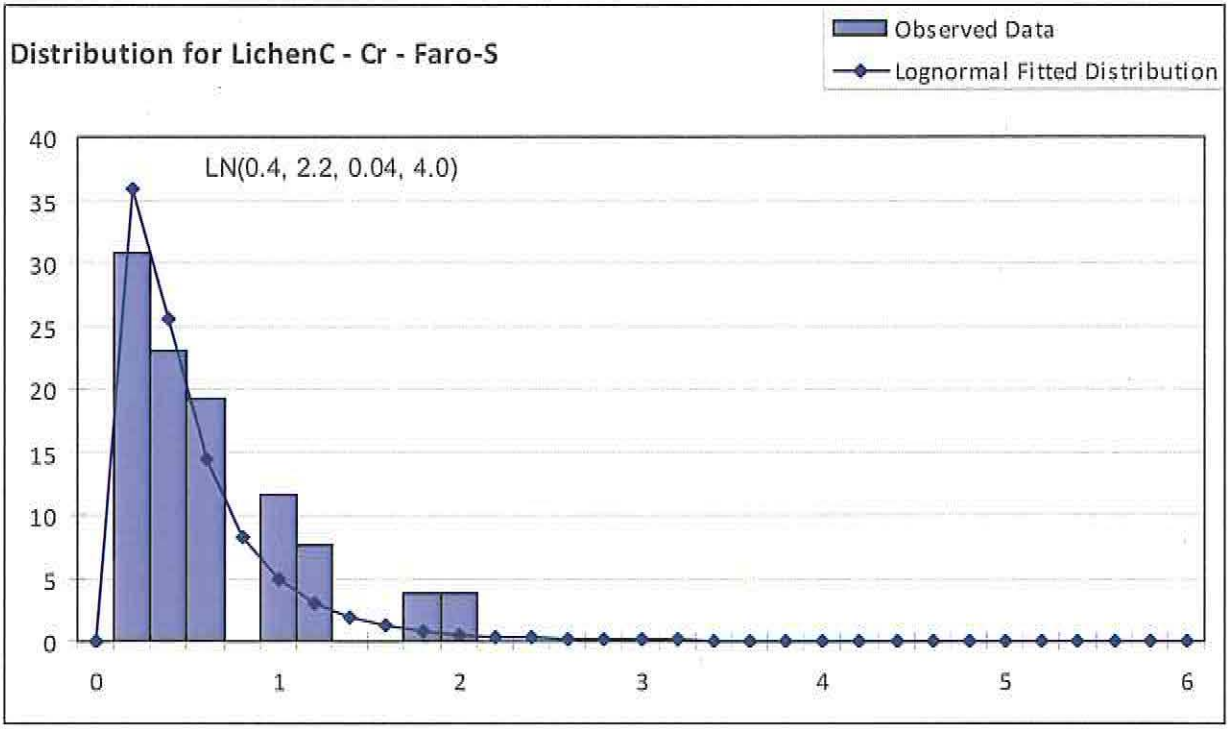


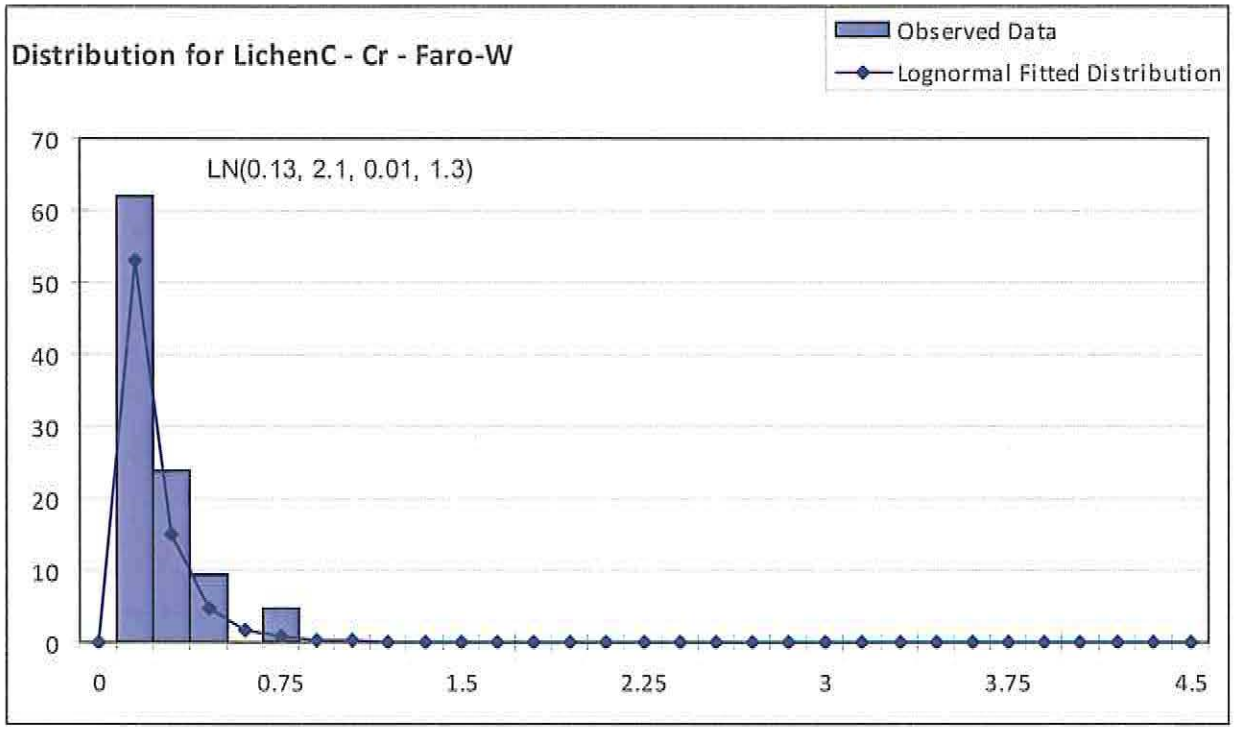


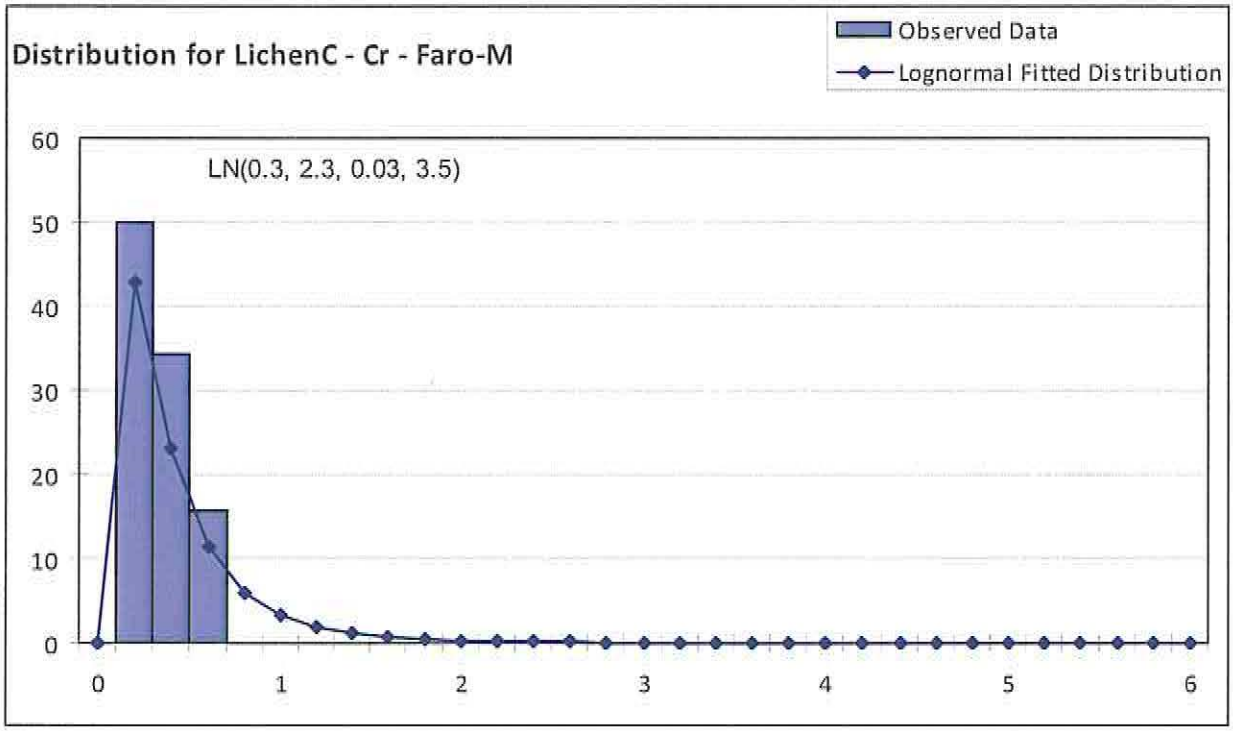

Distribution for LichenC - Cr - Van-S
Observed Data
Lognormal Fitted Distribution
LN(0.45, 2.1, 0.05, 4.5)
60
50
40
30
20
10
0
0
1.5
3
4.5

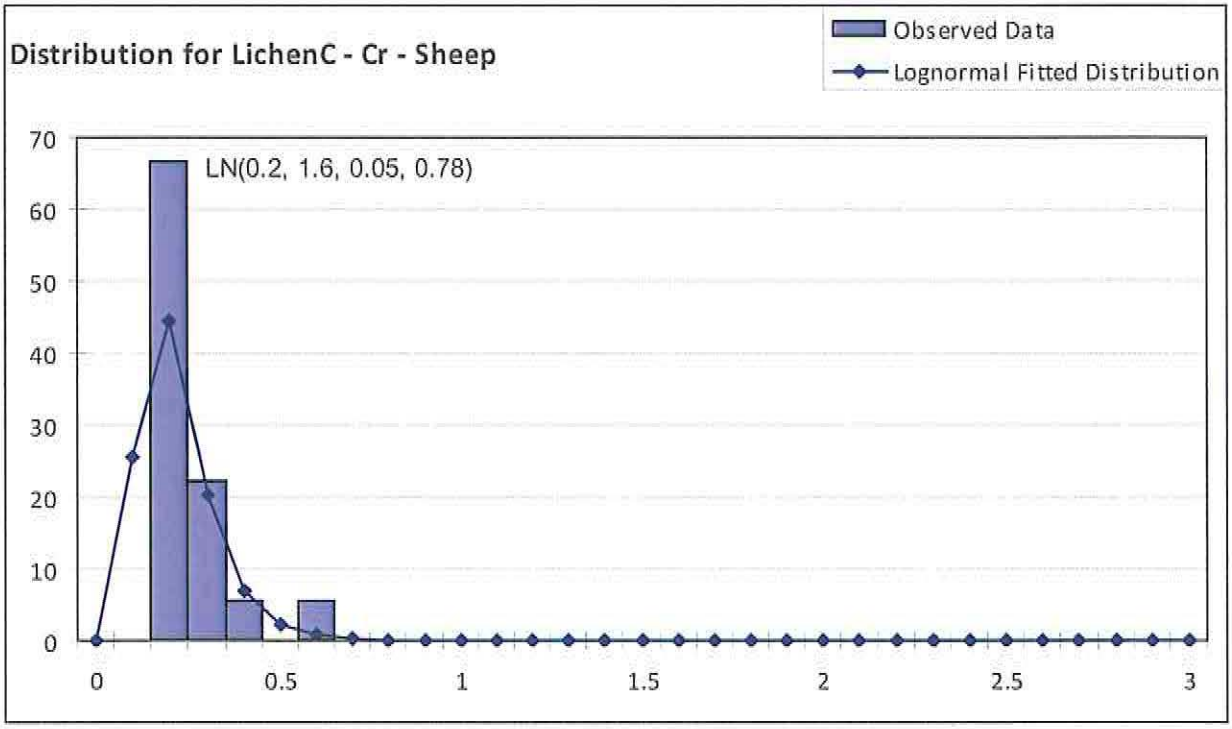

Distribution for LichenC - Cr - Van-M
Observed Data
Lognormal Fitted Distribution
LN(0.33, 2.3, 0.03, 4.1)
70
60
50
40
30
20
10
0
0
1.25
2.5
3.75
5
6.25
7.5


Distribution for LichenC - Cr - Faro-N
Observed Data
Lognormal Fitted Distribution
LN(0.21, 1.6, 0.05, 0.84)
45
40
35
30
25
20
15
10
5
0
0
0.5
1
1.5
2
2.5
3

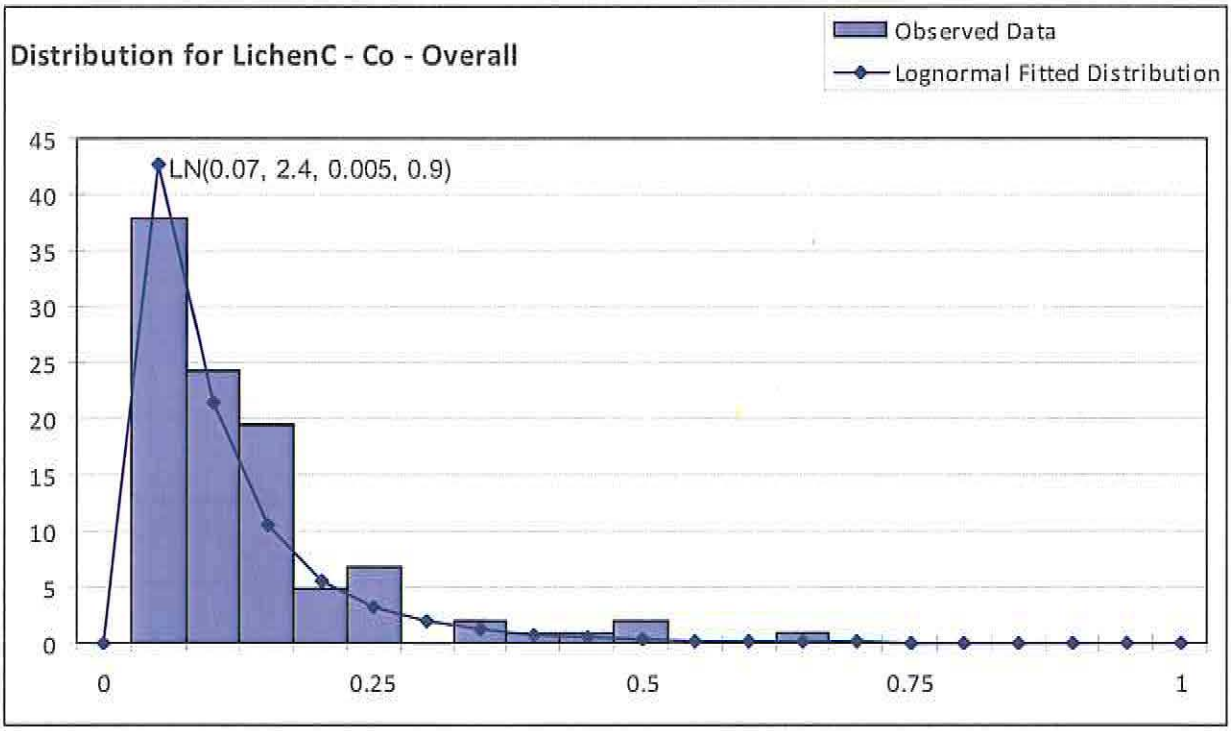

Distribution for LichenC - Cr - Faro-S
Observed Data
Lognormal Fitted Distribution
LN(0.4, 2.2, 0.04, 4.0)
40
35
30
25
20
15
10
5
0
0
1
2
3
4
5
6

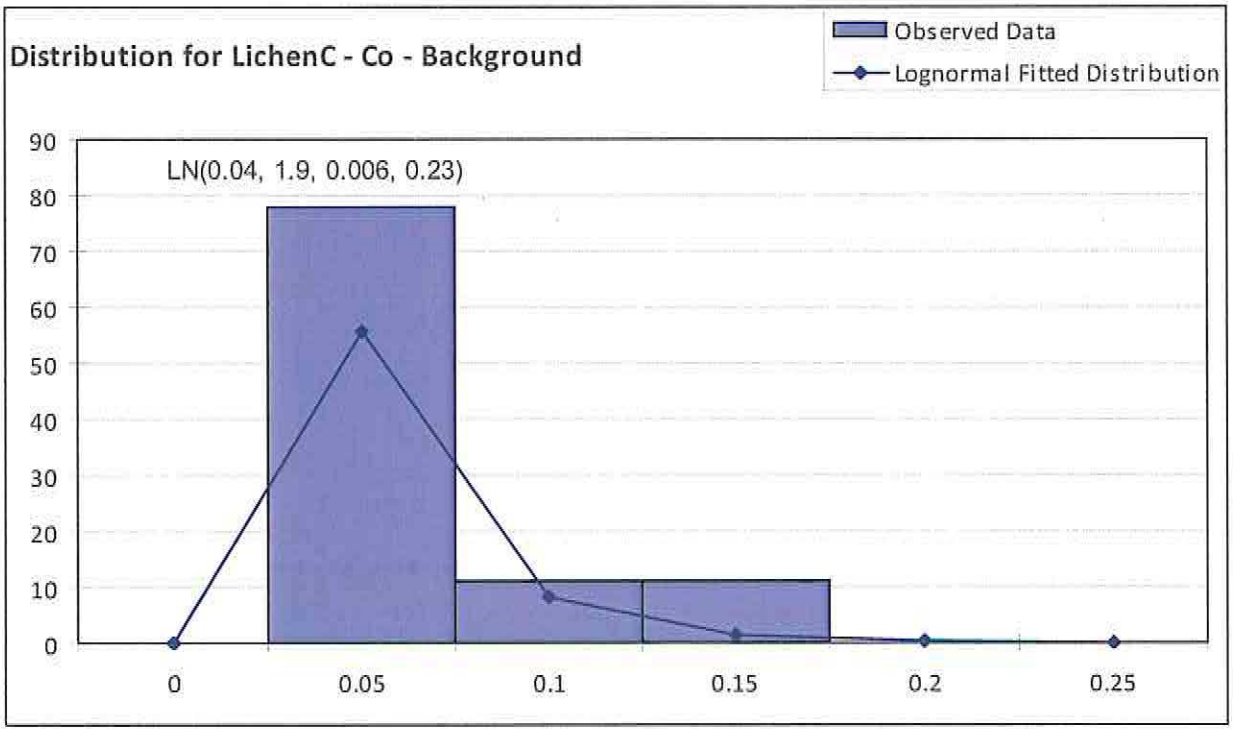

Distribution for LichenC - Cr - Faro-W
Observed Data
Lognormal Fitted Distribution
LN(0.13, 2.1, 0.01, 1.3)
70
60
50
40
30
20
10
0
0
0.75
1.5
2.25
3
3.75
4.5

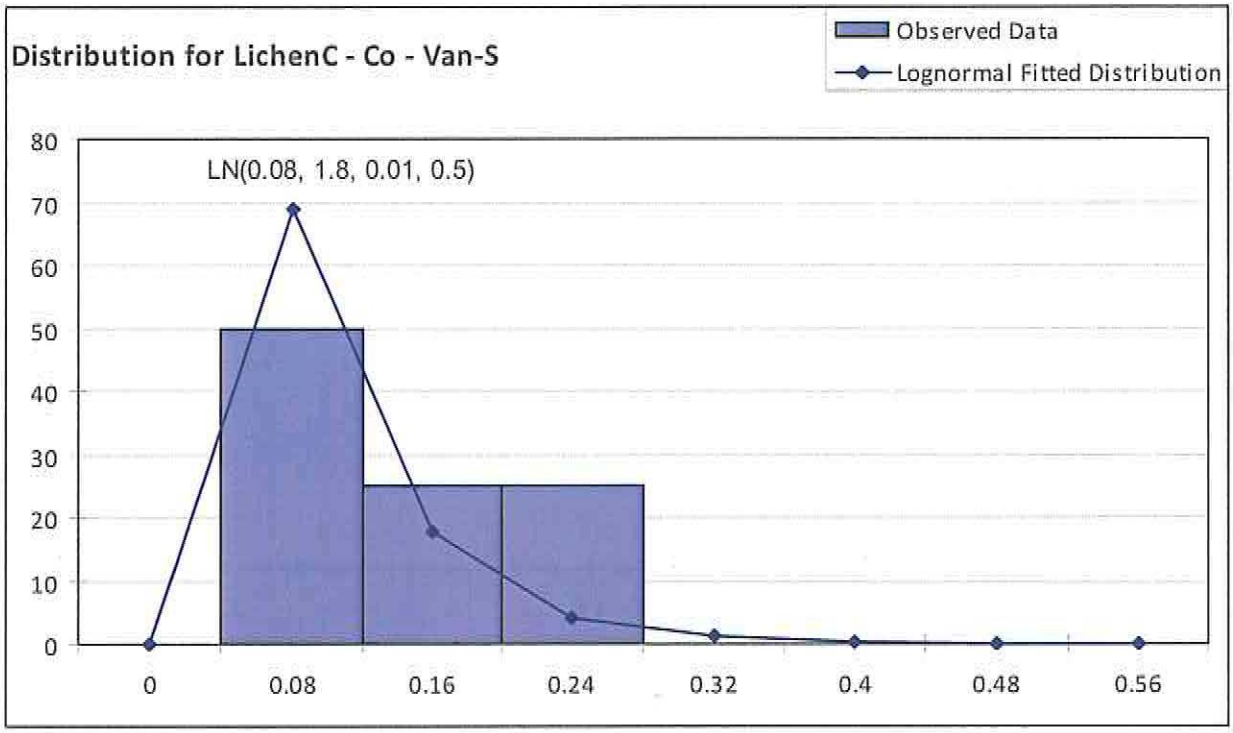

Distribution for LichenC - Cr - Faro-M
Observed Data
Lognormal Fitted Distribution
LN(0.3, 2.3, 0.03, 3.5)
60
50
40
30
20
10
0
0
1
2
3
4
5
6

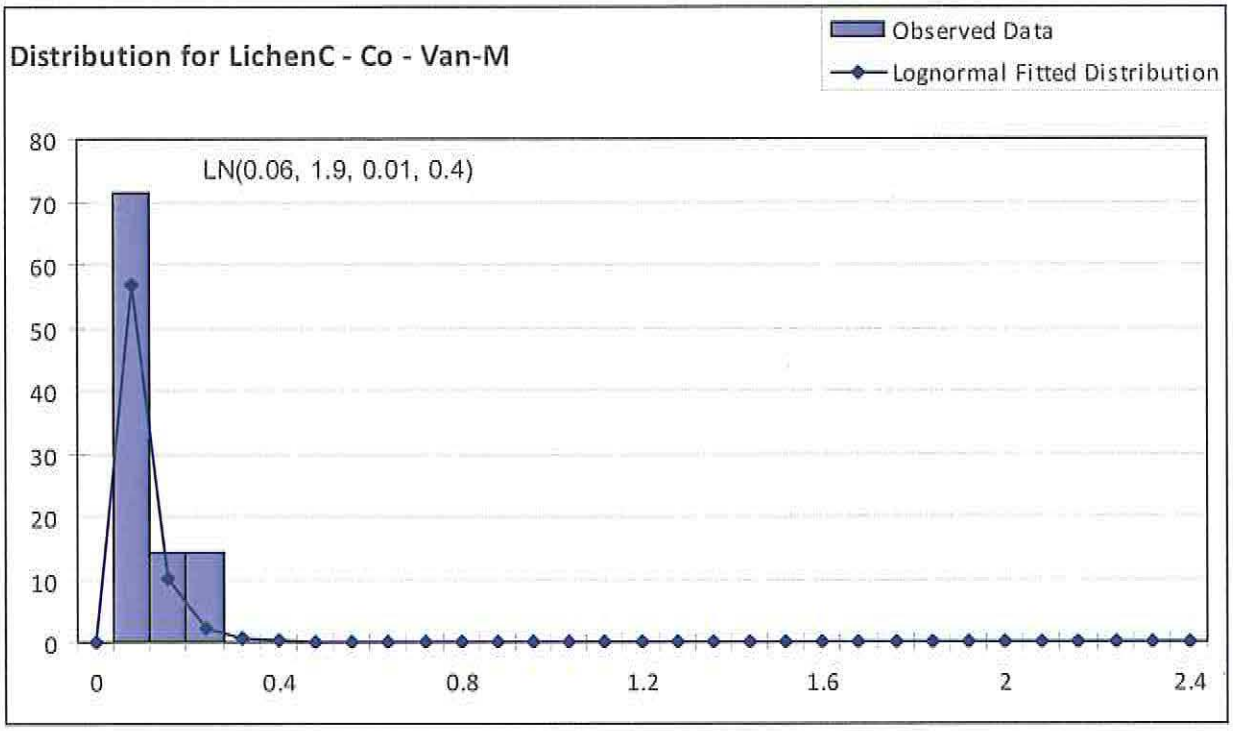

Distribution for LichenC - Cr - Sheep
Observed Data
Lognormal Fitted Distribution
LN(0.2, 1.6, 0.05, 0.78)
70
60
50
40
30
20
10
0
0
0.5
1
1.5
2
2.5
3

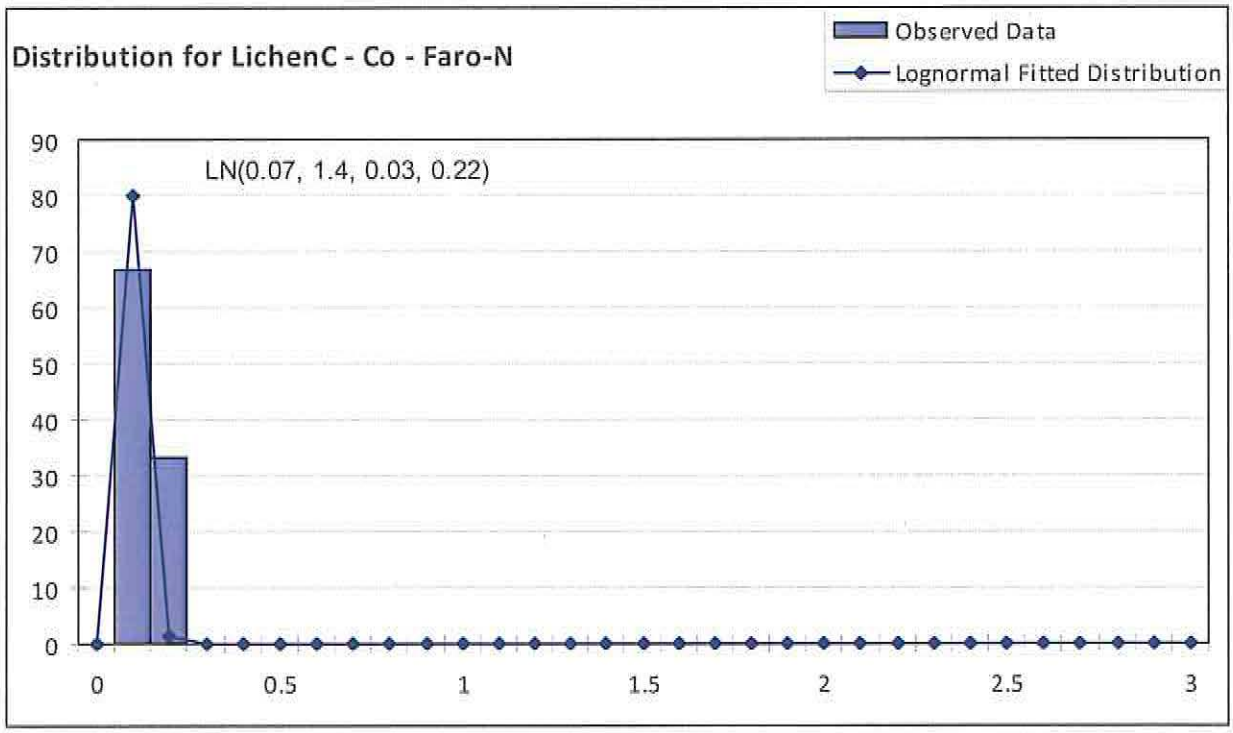
D.7.7 Cobalt

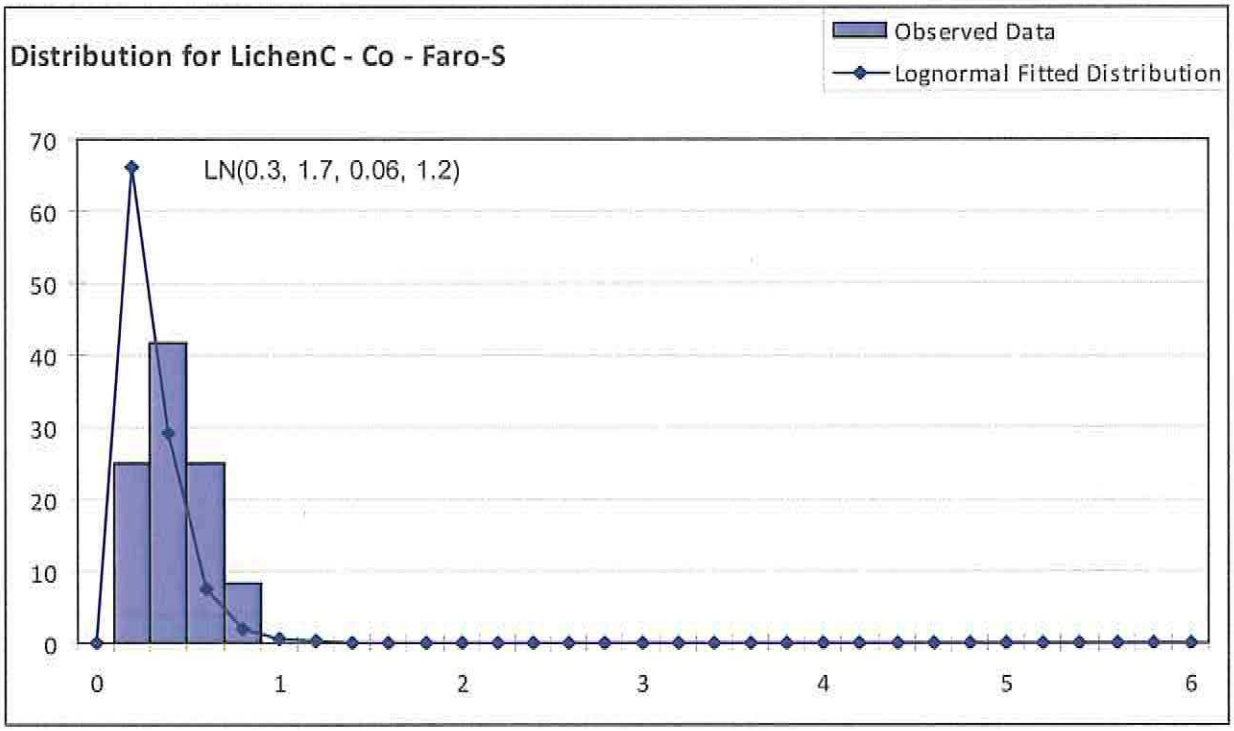

Distribution for LichenC - Co - Overall
Observed Data
Lognormal Fitted Distribution
LN(0.07, 2.4, 0.005, 0.9)
45
40
35
30
25
20
15
10
5
0
0
0.25
0.5
0.75
1

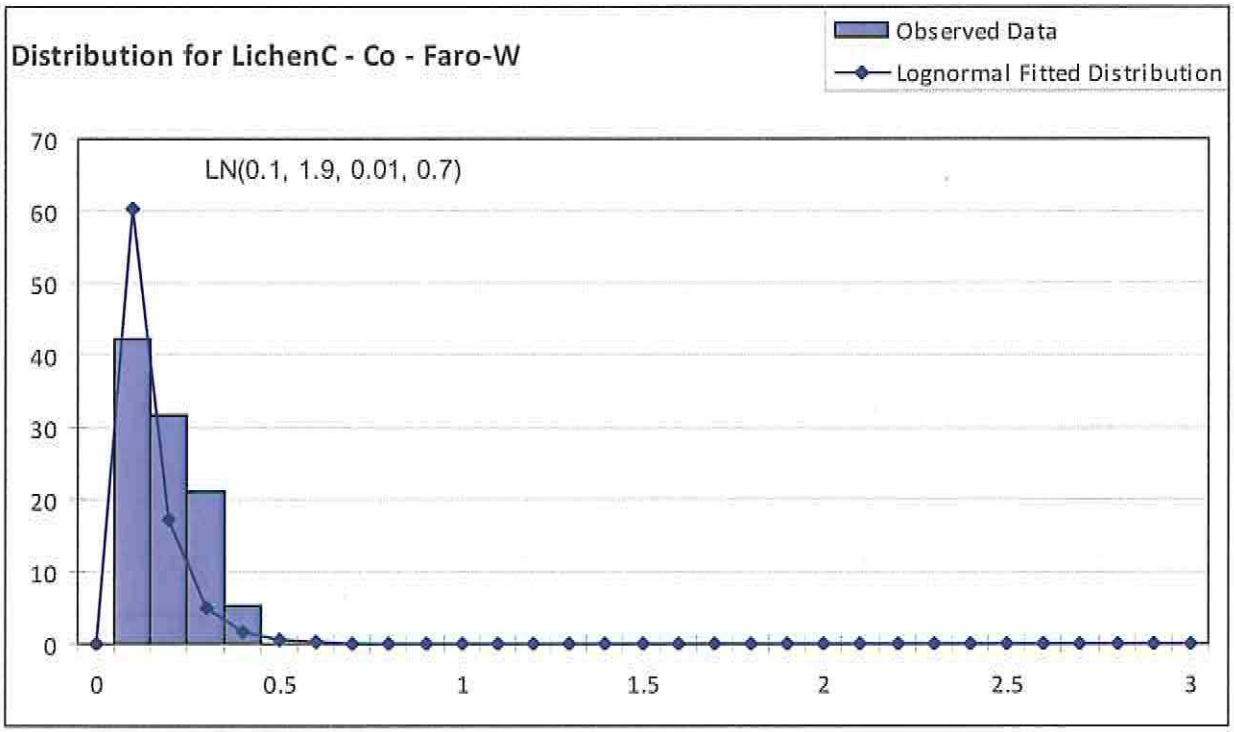

Distribution for LichenC - Co - Background
Observed Data
Lognormal Fitted Distribution
LN(0.04, 1.9, 0.006, 0.23)
90
80
70
60
50
40
30
20
10
0
0
0.05
0.1
0.15
0.2
0.25

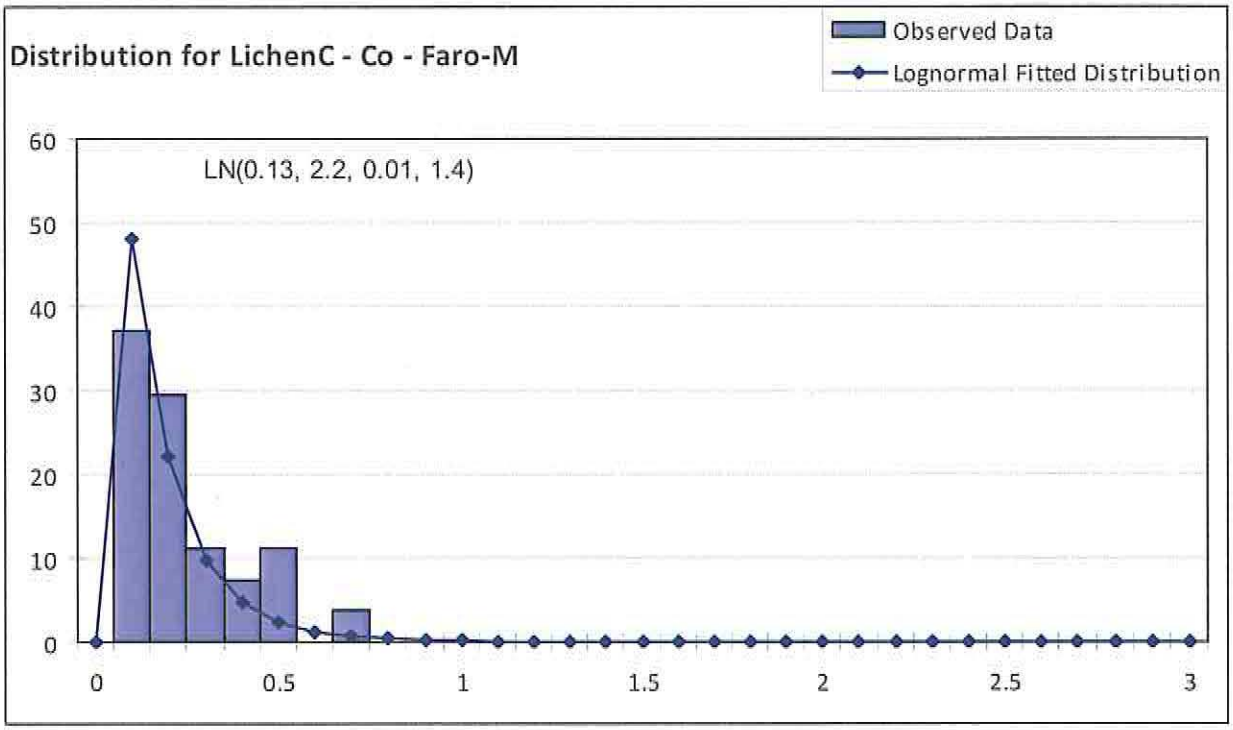

Distribution for LichenC - Co - Van-S
Observed Data
Lognormal Fitted Distribution
LN(0.08, 1.8, 0.01, 0.5)
80
70
60
50
40
30
20
10
0
0
0.08
0.16
0.24
0.32
0.4
0.48
0.56

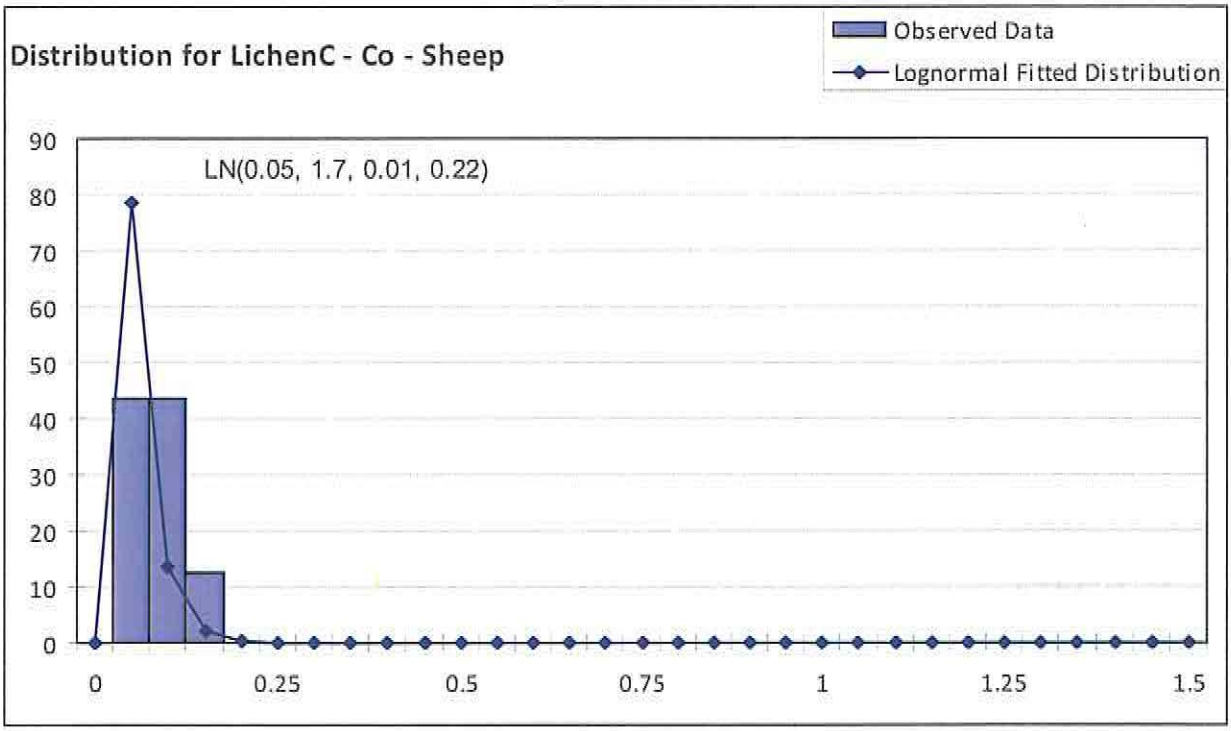

Distribution for LichenC - Co - Van-M
Observed Data
Lognormal Fitted Distribution
LN(0.06, 1.9, 0.01, 0.4)
80
70
60
50
40
30
20
10
0
0
0.4
0.8
1.2
1.6
2
2.4


Distribution for LichenC - Co - Faro-N
Observed Data
Lognormal Fitted Distribution
LN(0.07, 1.4, 0.03, 0.22)
90
80
70
60
50
40
30
20
10
0
0
0.5
1
1.5
2
2.5
3

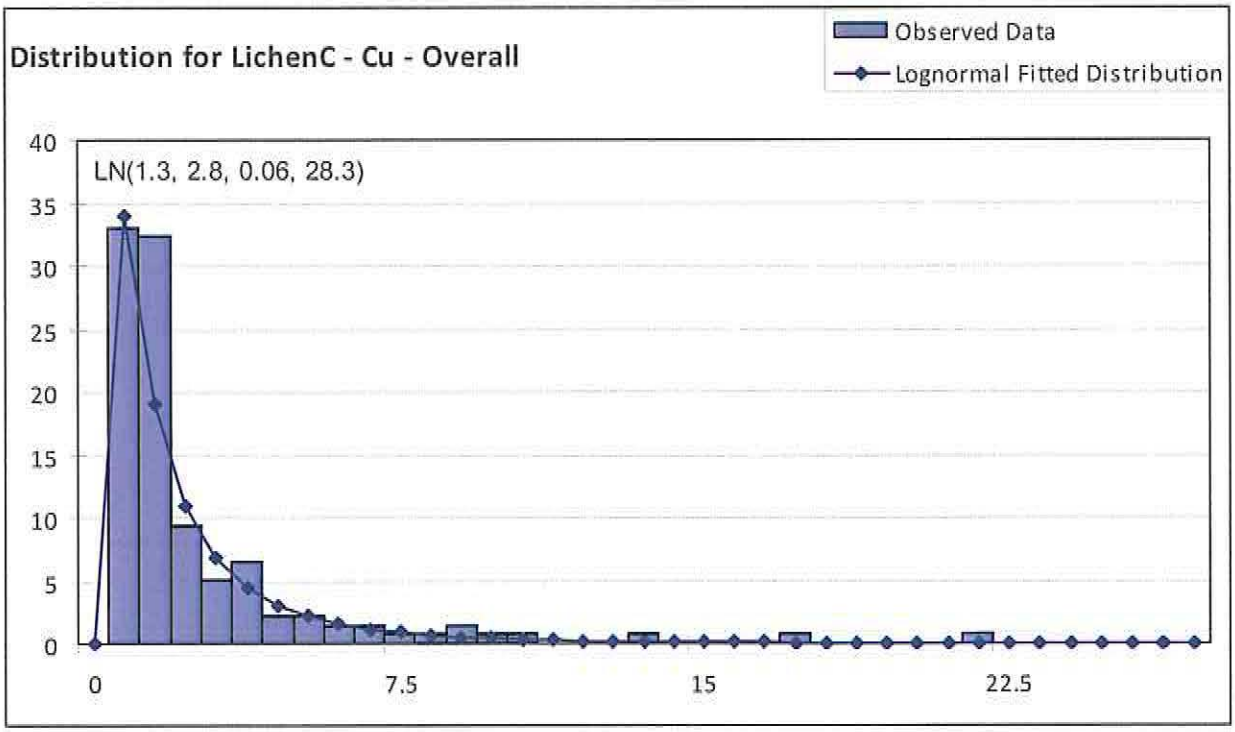

Distribution for LichenC - Co - Faro-S
Observed Data
Lognormal Fitted Distribution
LN(0.3, 1.7, 0.06, 1.2)
70
60
50
40
30
20
10
0
0
1
2
3
4
5
6

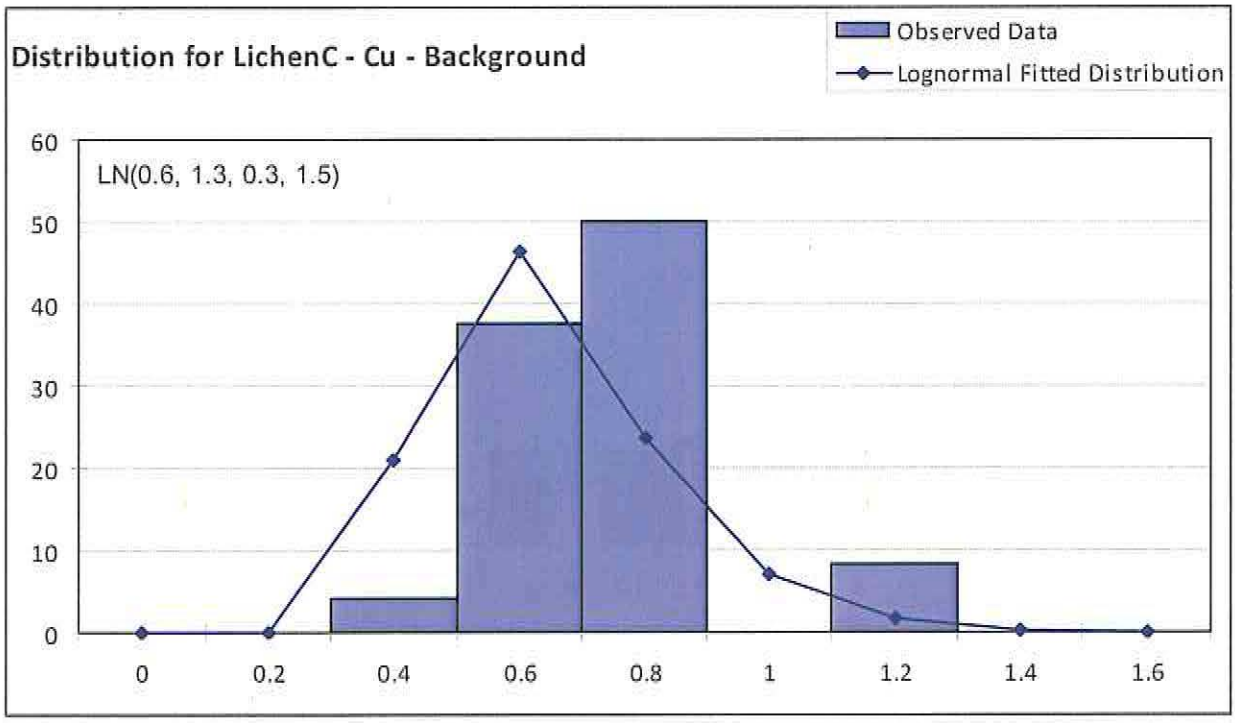

Distribution for LichenC - Co - Faro-W
Observed Data
Lognormal Fitted Distribution
LN(0.1, 1.9, 0.01, 0.7)
70
60
50
40
30
20
10
0
0
0.5
1
1.5
2
2.5
3

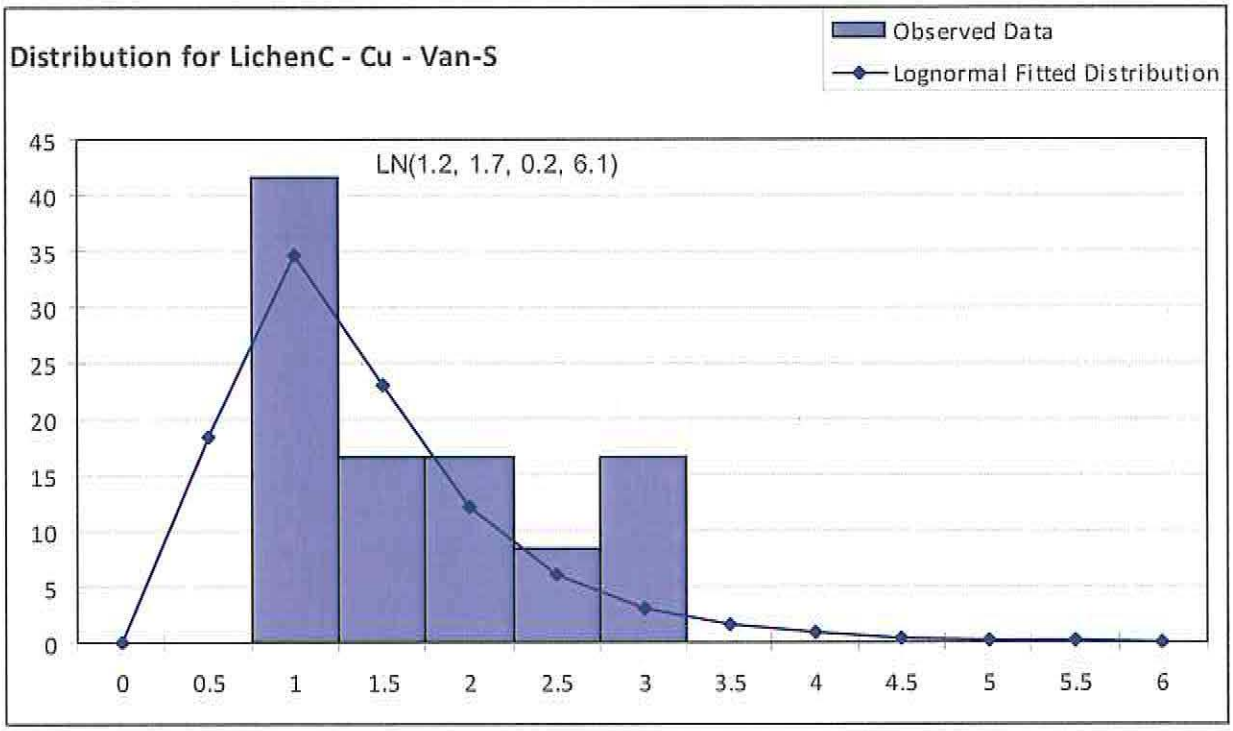

Distribution for LichenC - Co - Faro-M
Observed Data
Lognormal Fitted Distribution
LN(0.13, 2.2, 0.01, 1.4)
60
50
40
30
20
10
0
0
0.5
1
1.5
2
2.5
3

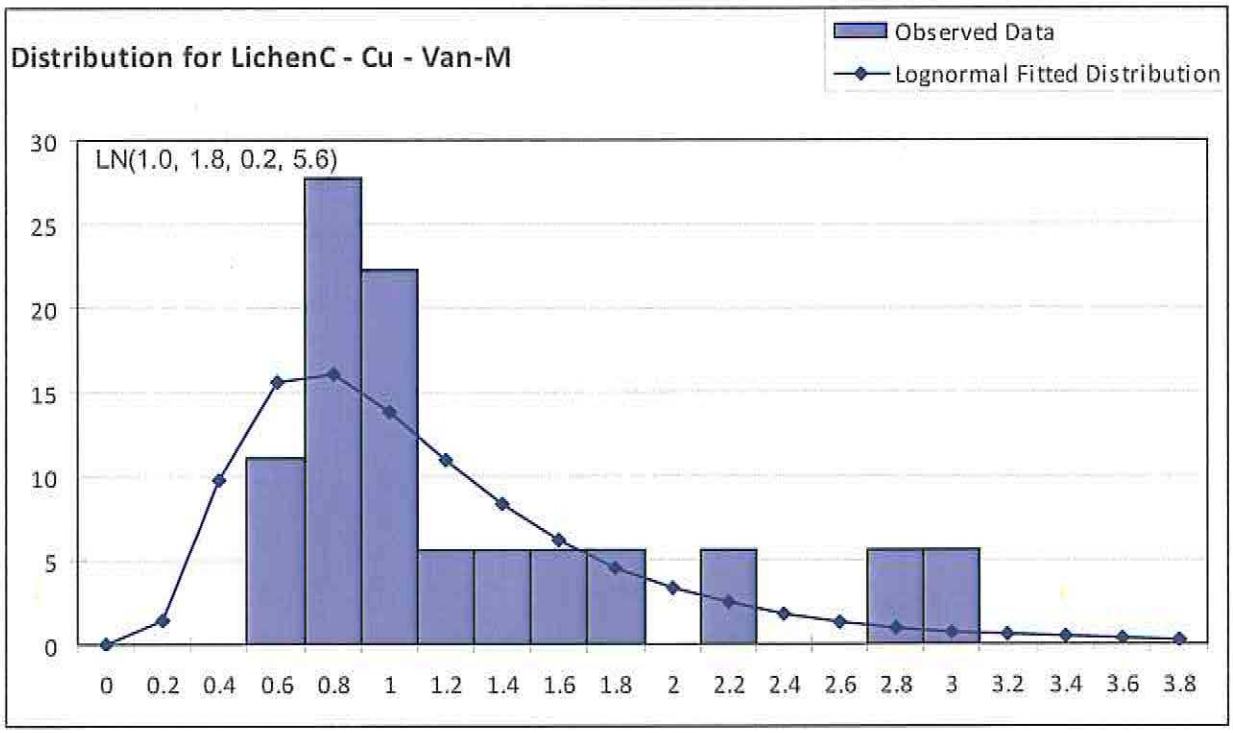

Distribution for LichenC - Co - Sheep
Observed Data
Lognormal Fitted Distribution
LN(0.05, 1.7, 0.01, 0.22)
90
80
70
60
50
40
30
20
10
0
0
0.25
0.5
0.75
1
1.25
1.5

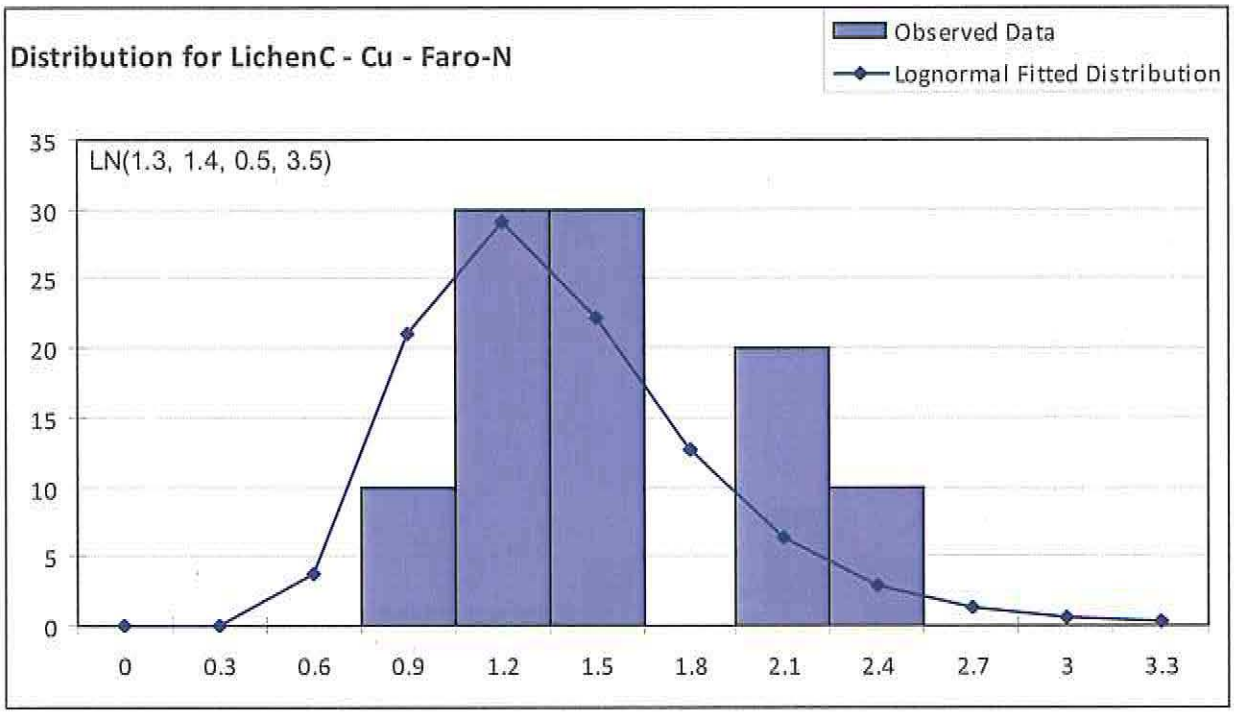
D.7.8 Copper

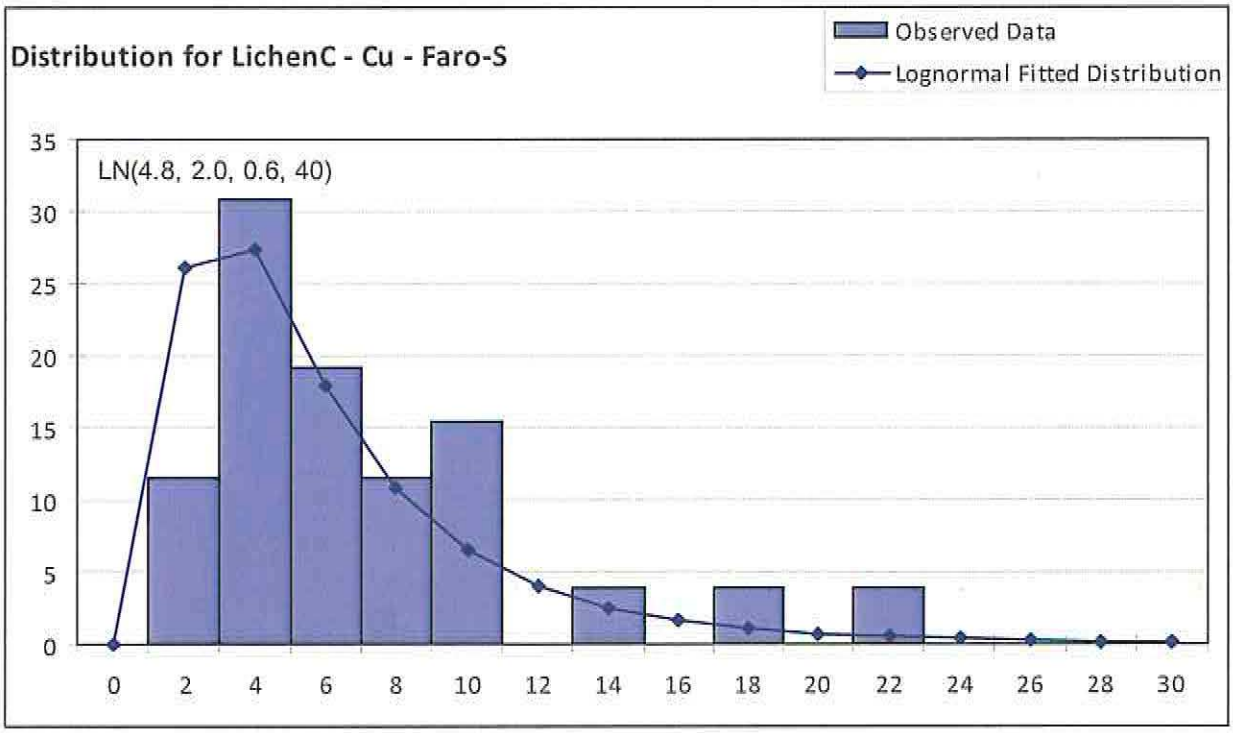

Distribution for LichenC - Cu - Overall
Observed Data
Lognormal Fitted Distribution
LN(1.3, 2.8, 0.06, 28.3)
40
35
30
25
20
15
10
5
0
0
7.5
15
22.5

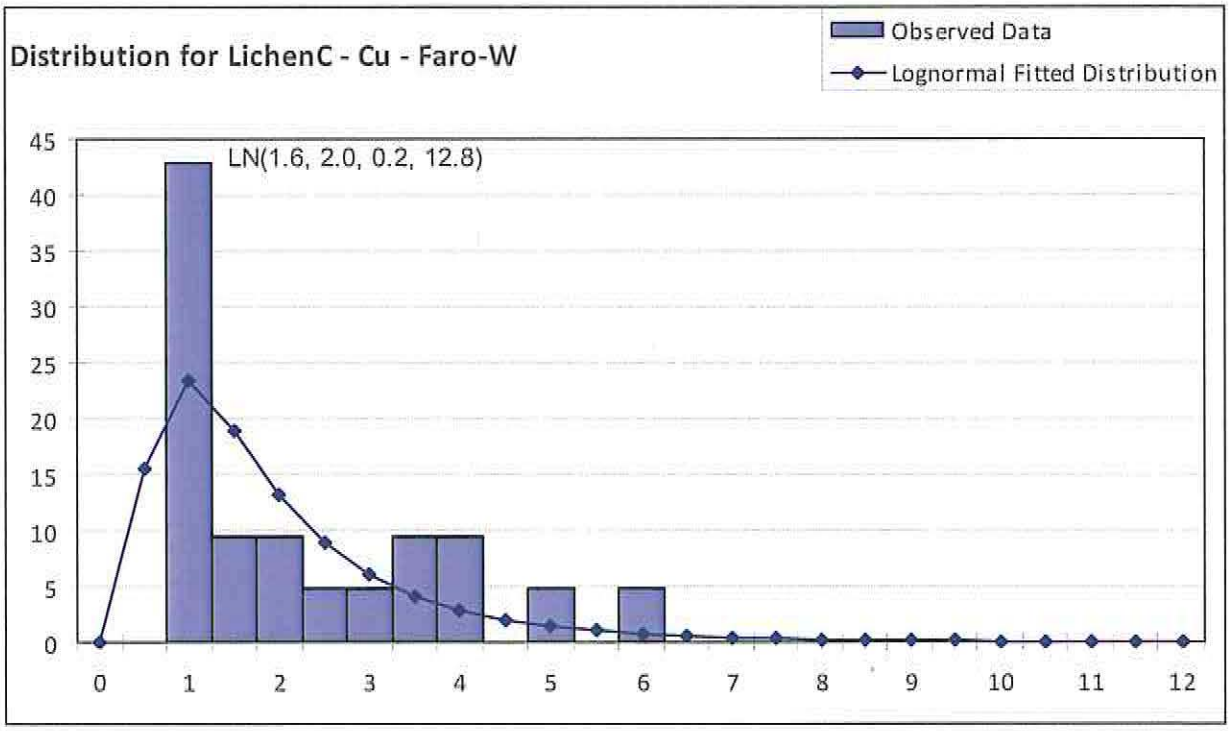

Distribution for LichenC - Cu - Background
Observed Data
Lognormal Fitted Distribution
LN(0.6, 1.3, 0.3, 1.5)
60
50
40
30
20
10
0
0
0.2
0.4
0.6
0.8
1
1.2
1.4
1.6

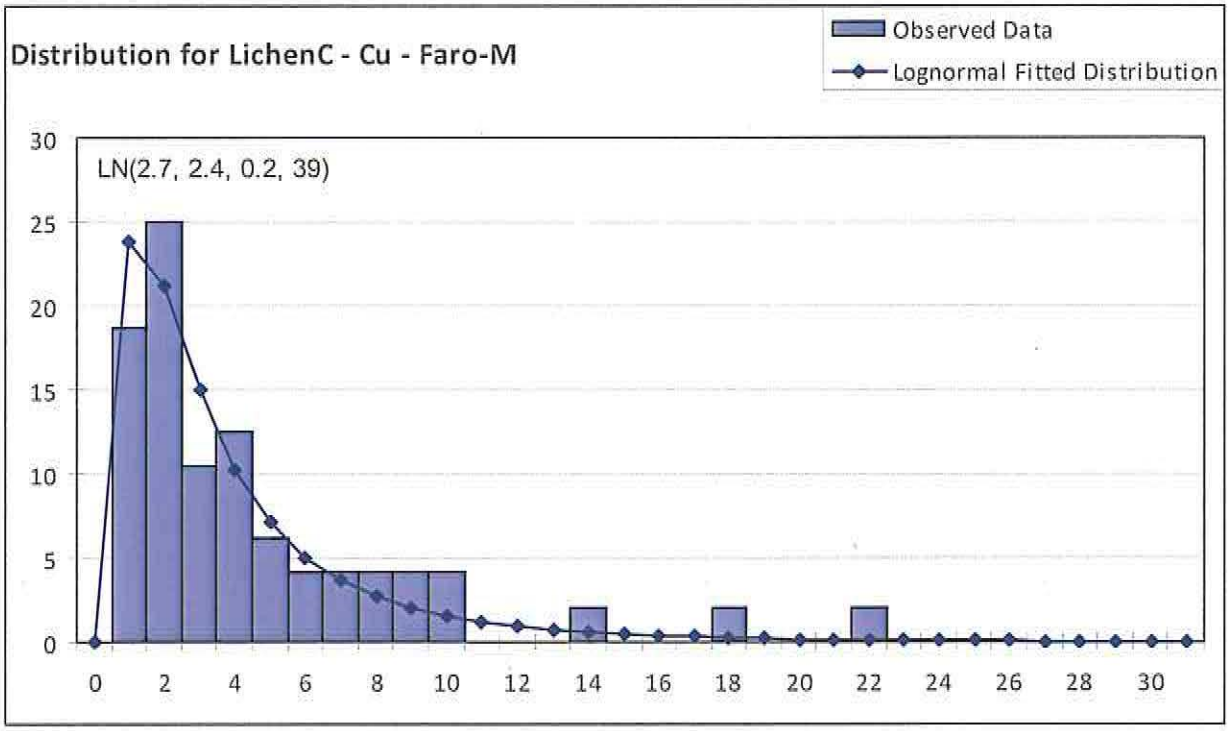

Distribution for LichenC - Cu - Van-S
Observed Data
Lognormal Fitted Distribution
LN(1.2, 1.7, 0.2, 6.1)
45
40
35
30
25
20
15
10
5
0
0
0.5
1
1.5
2
2.5
3
3.5
4
4.5
5
5.5
6

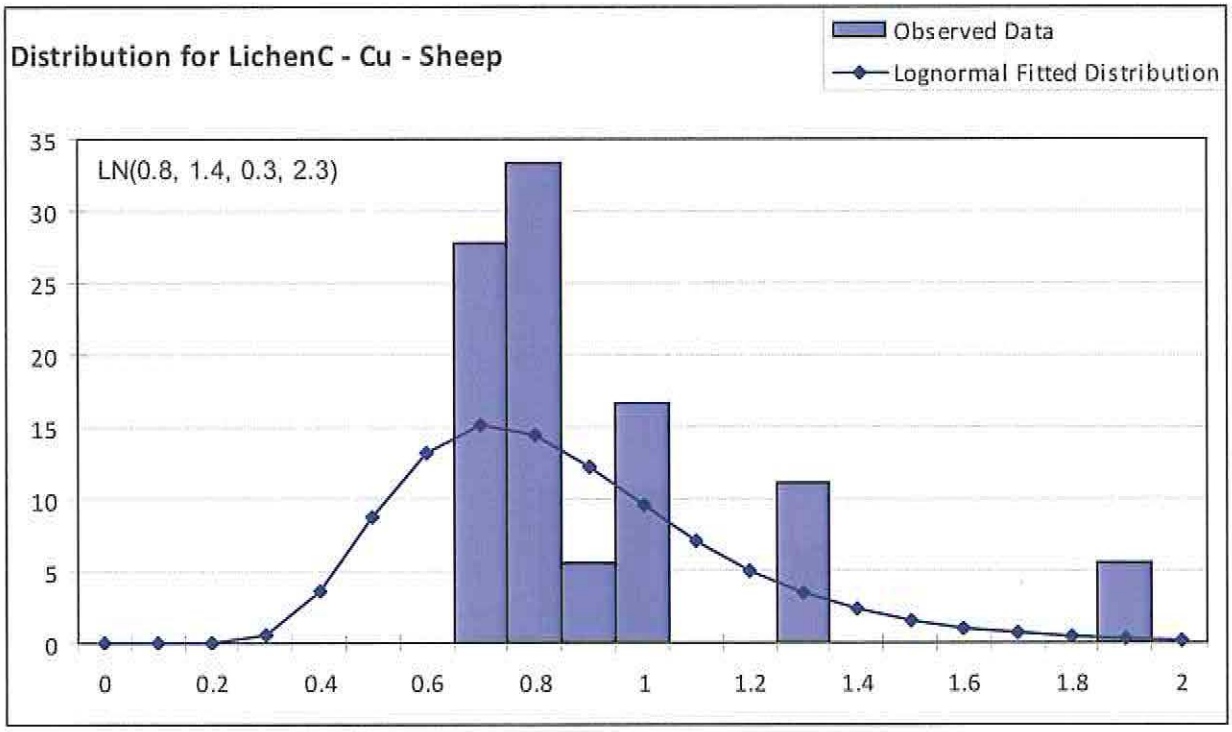

Distribution for LichenC - Cu - Van-M
Observed Data
Lognormal Fitted Distribution
LN(1.0, 1.8, 0.2, 5.6)
30
25
20
15
10
5
0
0
0.2
0.4
0.6
0.8
1
1.2
1.4
1.6
1.8
2
2.2
2.4
2.6
2.8
3
3.2
3.4
3.6
3.8


Distribution for LichenC - Cu - Faro-N
Observed Data
Lognormal Fitted Distribution
LN(1.3, 1.4, 0.5, 3.5)
35
30
25
20
15
10
5
0
0
0.3
0.6
0.9
1.2
1.5
1.8
2.1
2.4
2.7
3
3.3

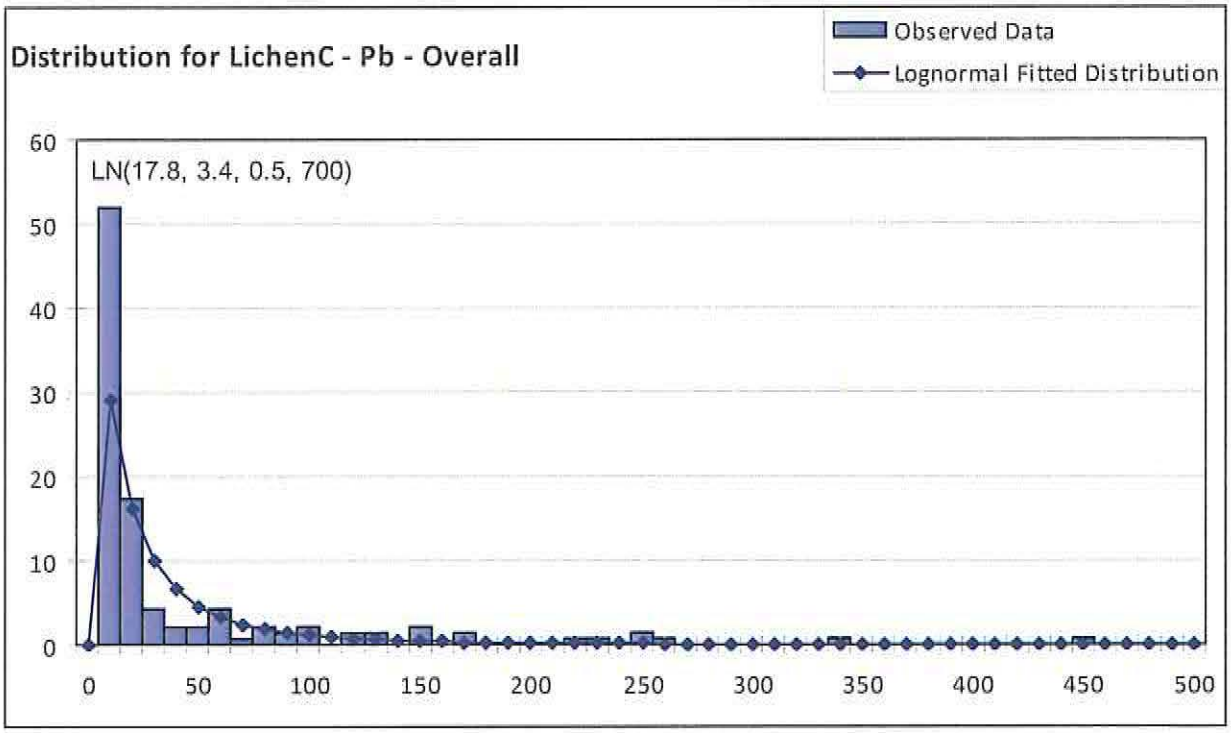

Distribution for LichenC - Cu - Faro-S
Observed Data
Lognormal Fitted Distribution
LN(4.8, 2.0, 0.6, 40)
35
30
25
20
15
10
5
0
0
2
4
6
8
10
12
14
16
18
20
22
24
26
28
30

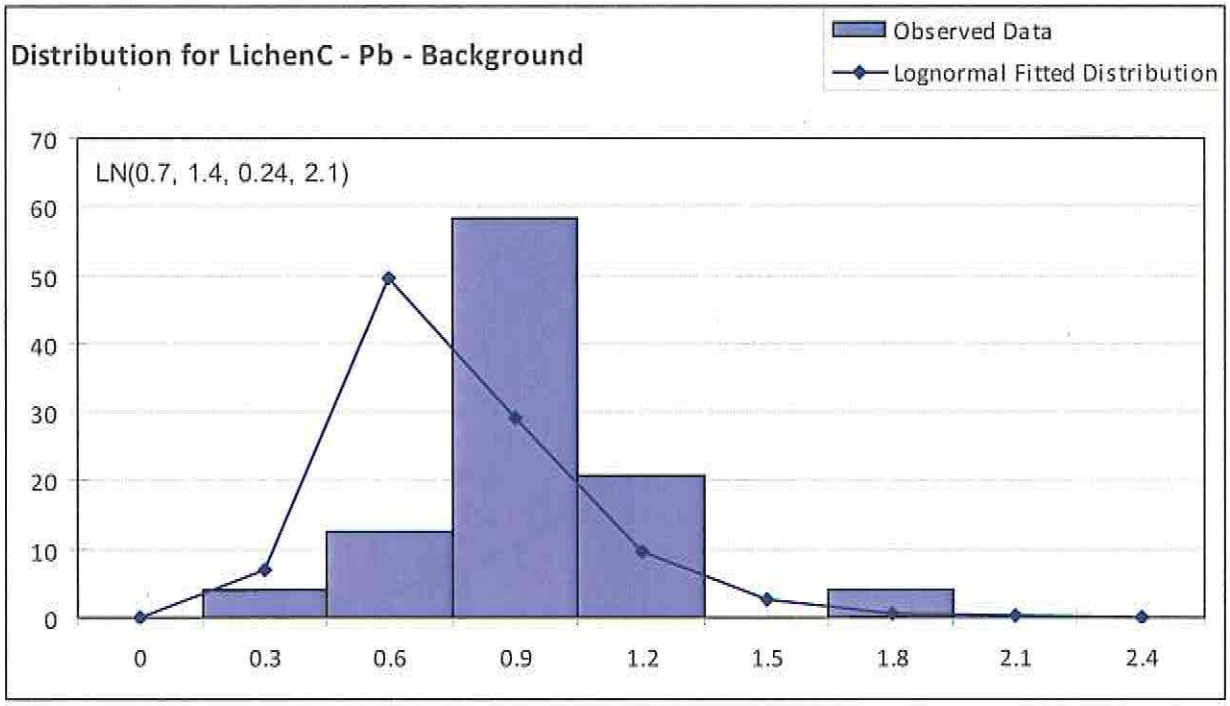

Distribution for LichenC - Cu - Faro-W
Observed Data
Lognormal Fitted Distribution
LN(1.6, 2.0, 0.2, 12.8)
45
40
35
30
25
20
15
10
5
0
0
1
2
3
4
5
6
7
8
9
10
11
12

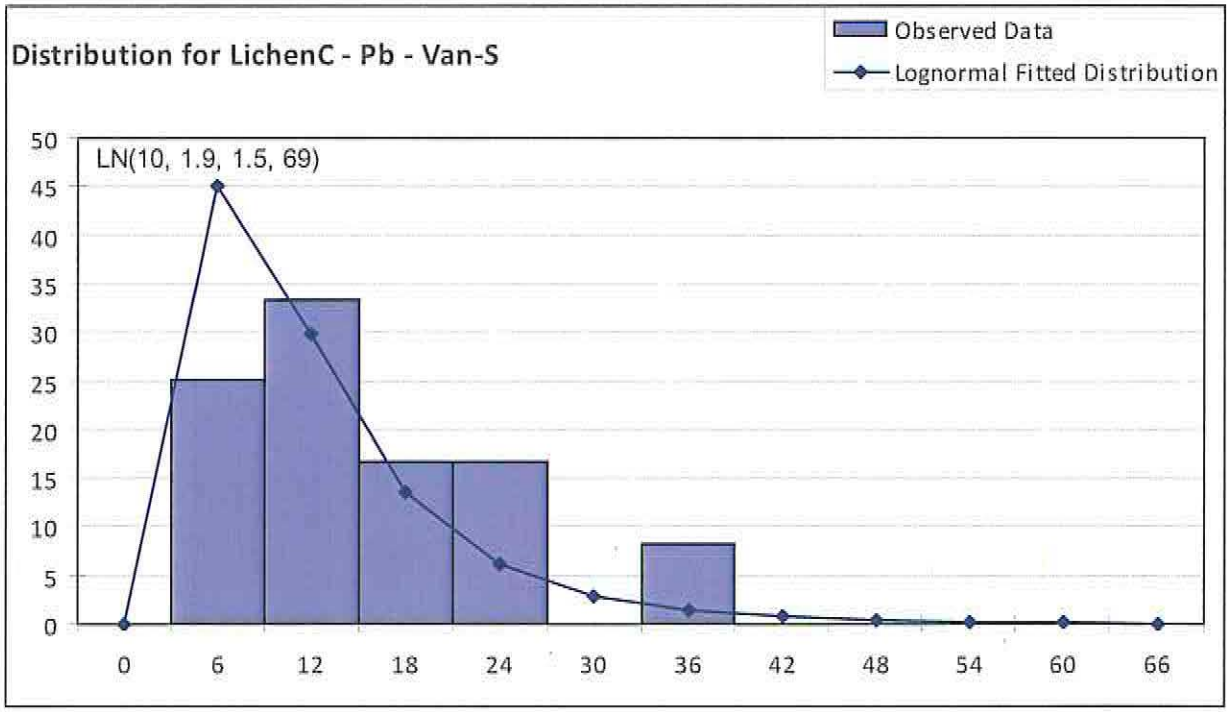

Distribution for LichenC - Cu - Faro-M
Observed Data
Lognormal Fitted Distribution
LN(2.7, 2.4, 0.2, 39)
30
25
20
15
10
5
0
0
2
4
6
8
10
12
14
16
18
20
22
24
26
28
30

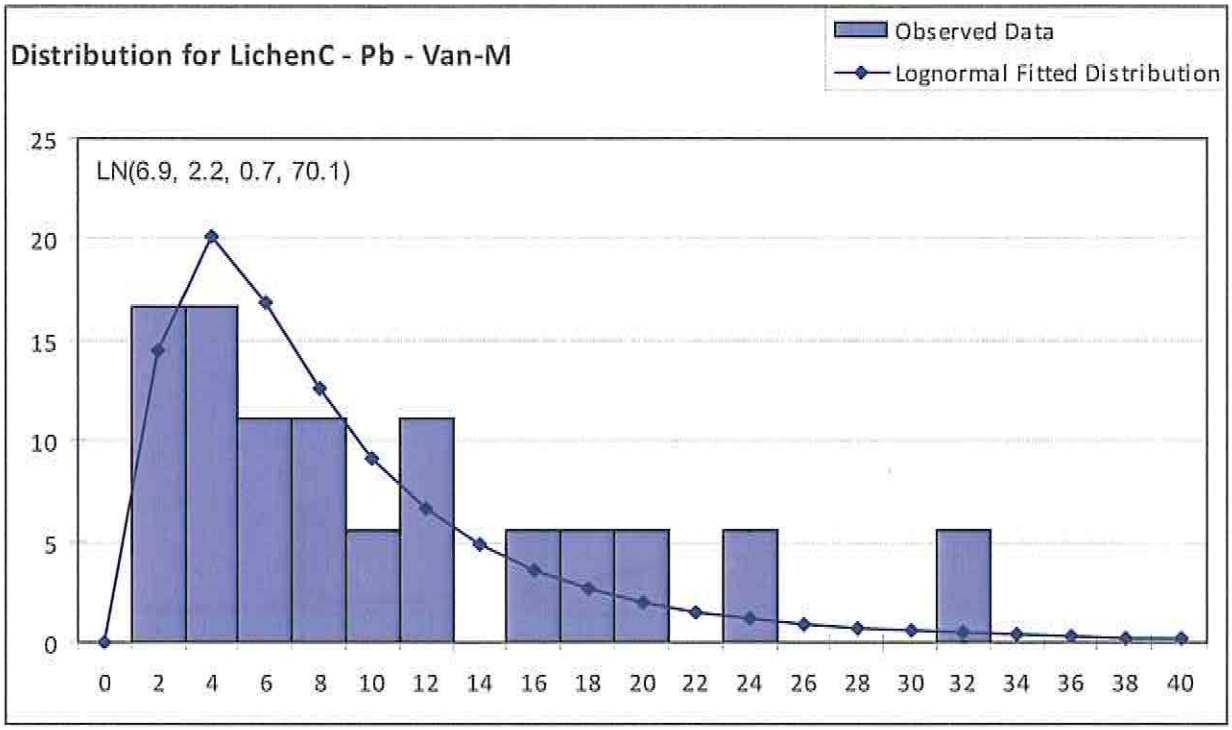

Distribution for LichenC - Cu - Sheep
Observed Data
Lognormal Fitted Distribution
LN(0.8, 1.4, 0.3, 2.3)
35
30
25
20
15
10
5
0
0
0.2
0.4
0.6
0.8
1
1.2
1.4
1.6
1.8
2

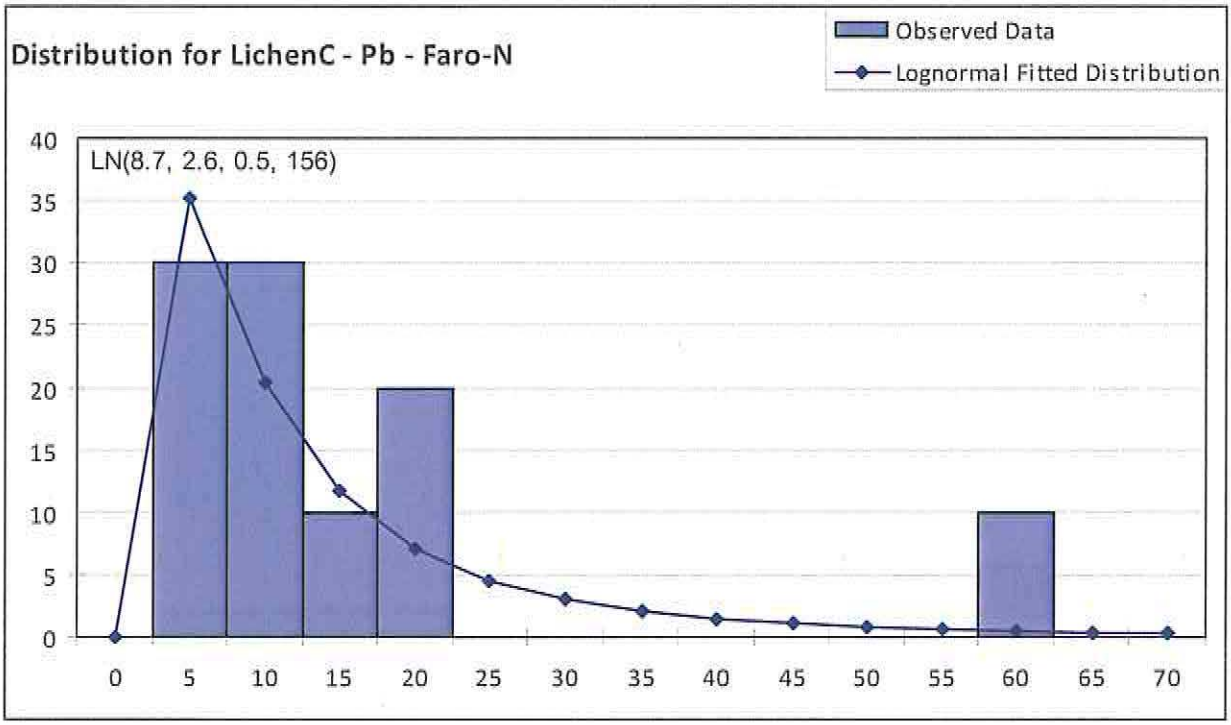
D.7.9 Lead

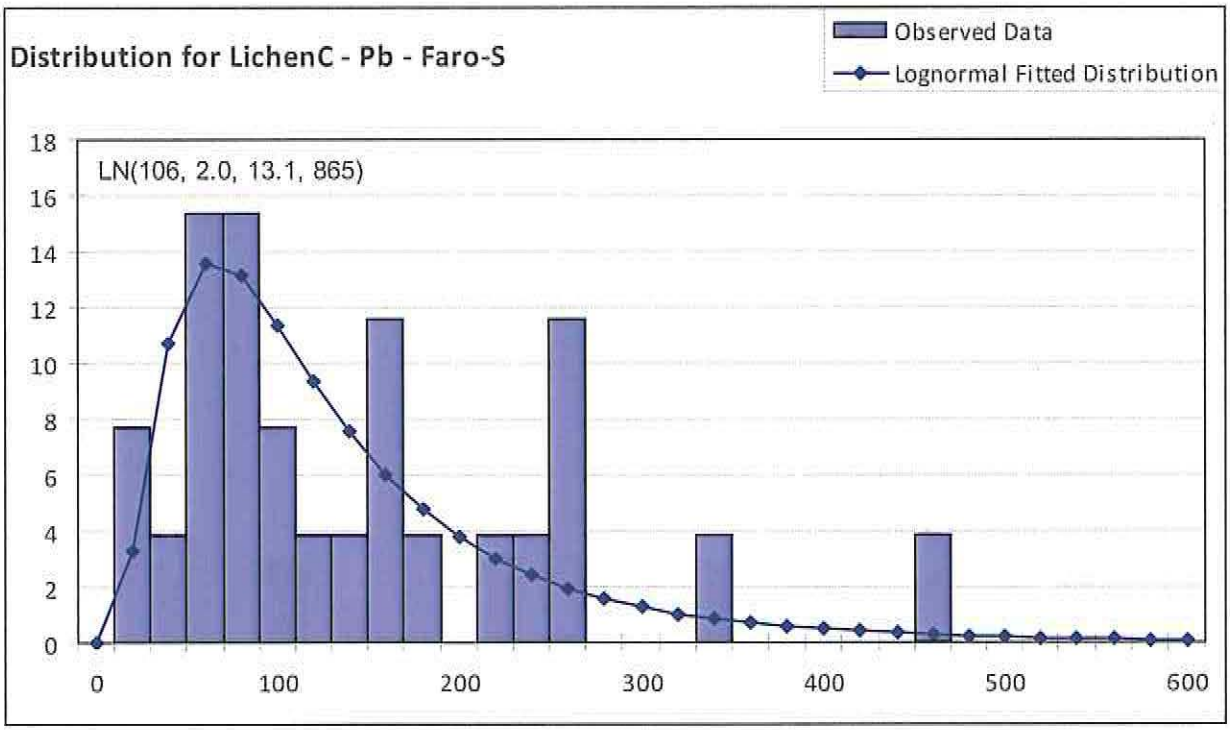

Distribution for LichenC - Pb - Overall
Observed Data
Lognormal Fitted Distribution
LN(17.8, 3.4, 0.5, 700)
60
50
40
30
20
10
0
0
50
100
150
200
250
300
350
400
450
500

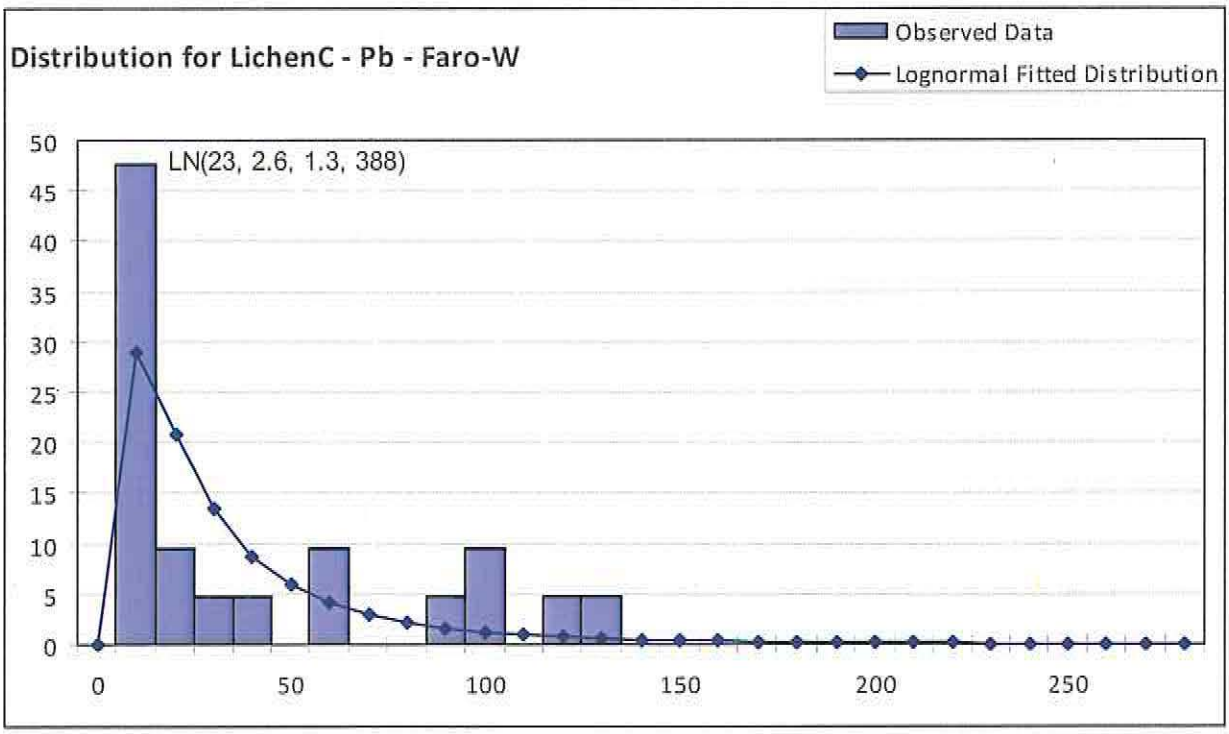

Distribution for LichenC - Pb - Background
Observed Data
Lognormal Fitted Distribution
LN(0.7, 1.4, 0.24, 2.1)
70
60
50
40
30
20
10
0
0
0.3
0.6
0.9
1.2
1.5
1.8
2.1
2.4

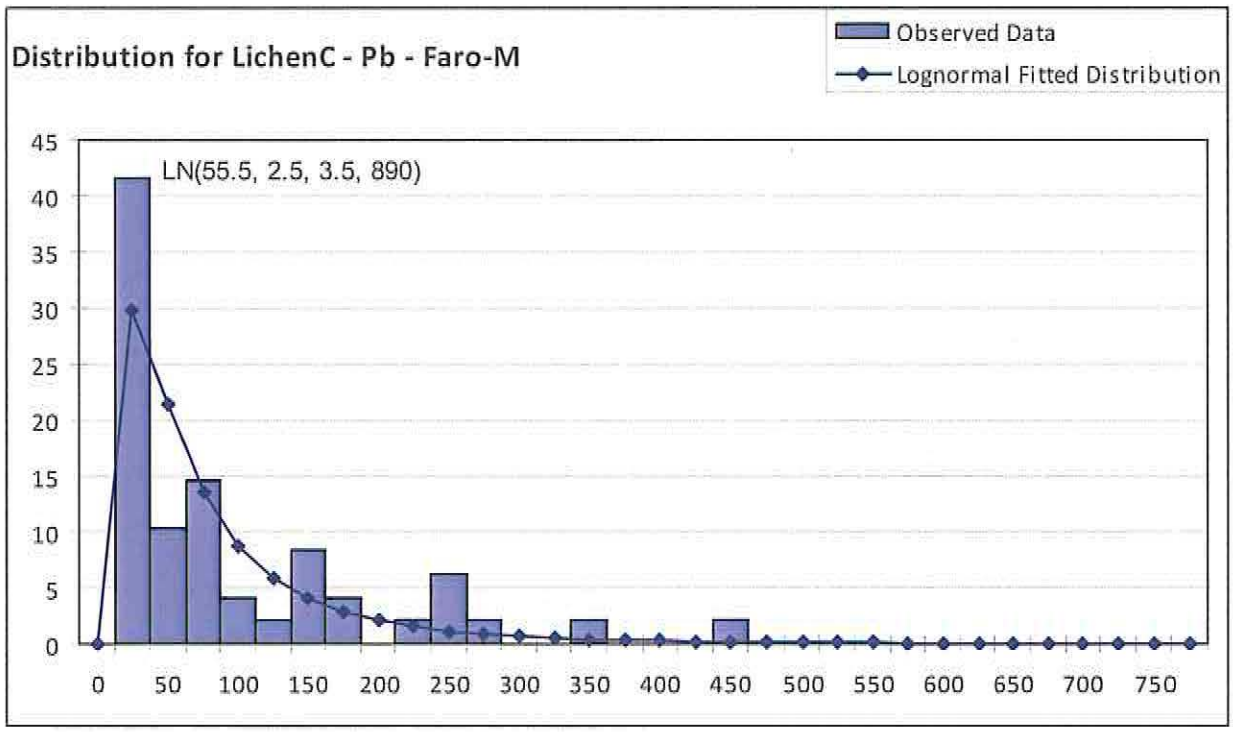

Distribution for LichenC - Pb - Van-S
Observed Data
Lognormal Fitted Distribution
LN(10, 1.9, 1.5, 69)
50
45
40
35
30
25
20
15
10
5
0
0
6
12
18
24
30
36
42
48
54
60
66

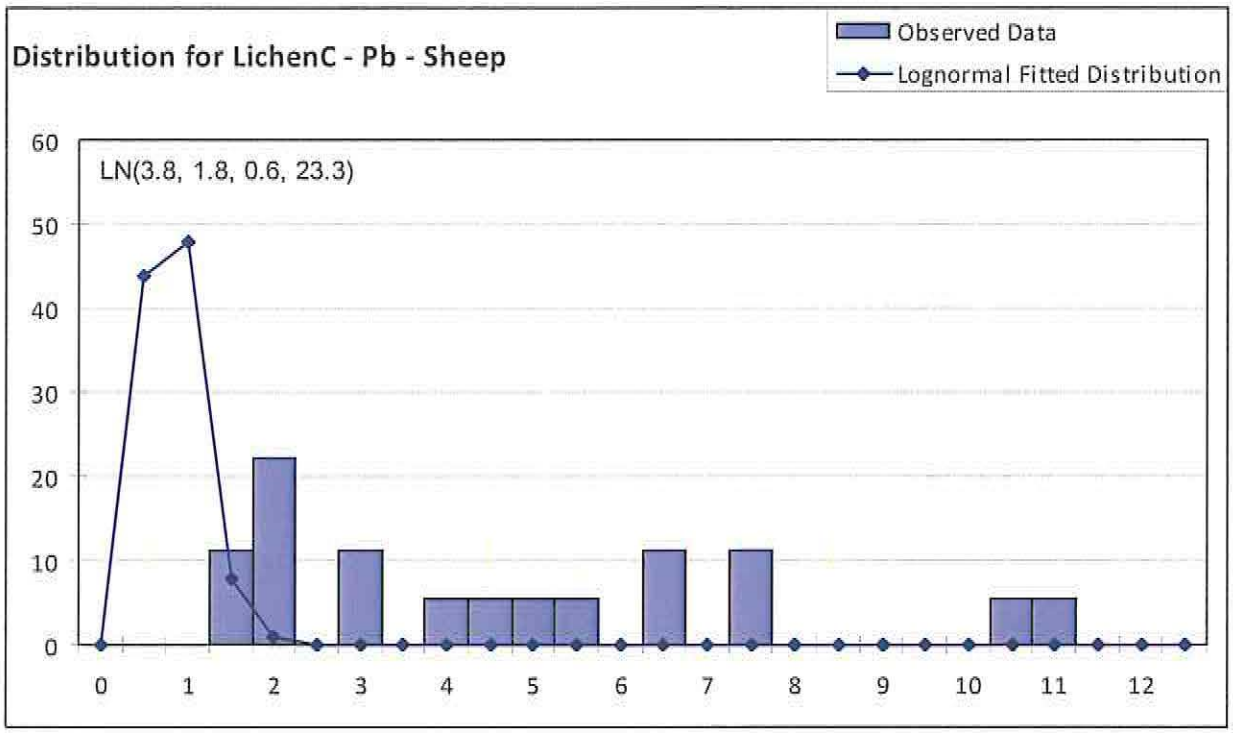

Distribution for LichenC - Pb - Van-M
Observed Data
Lognormal Fitted Distribution
LN(6.9, 2.2, 0.7, 70.1)
25
20
15
10
5
0
0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40


Distribution for LichenC - Pb - Faro-N
Observed Data
Lognormal Fitted Distribution
LN(8.7, 2.6, 0.5, 156)
40
35
30
25
20
15
10
5
0
0 5 10 15 20 25 30 35 40 45 50 55 60 65 70

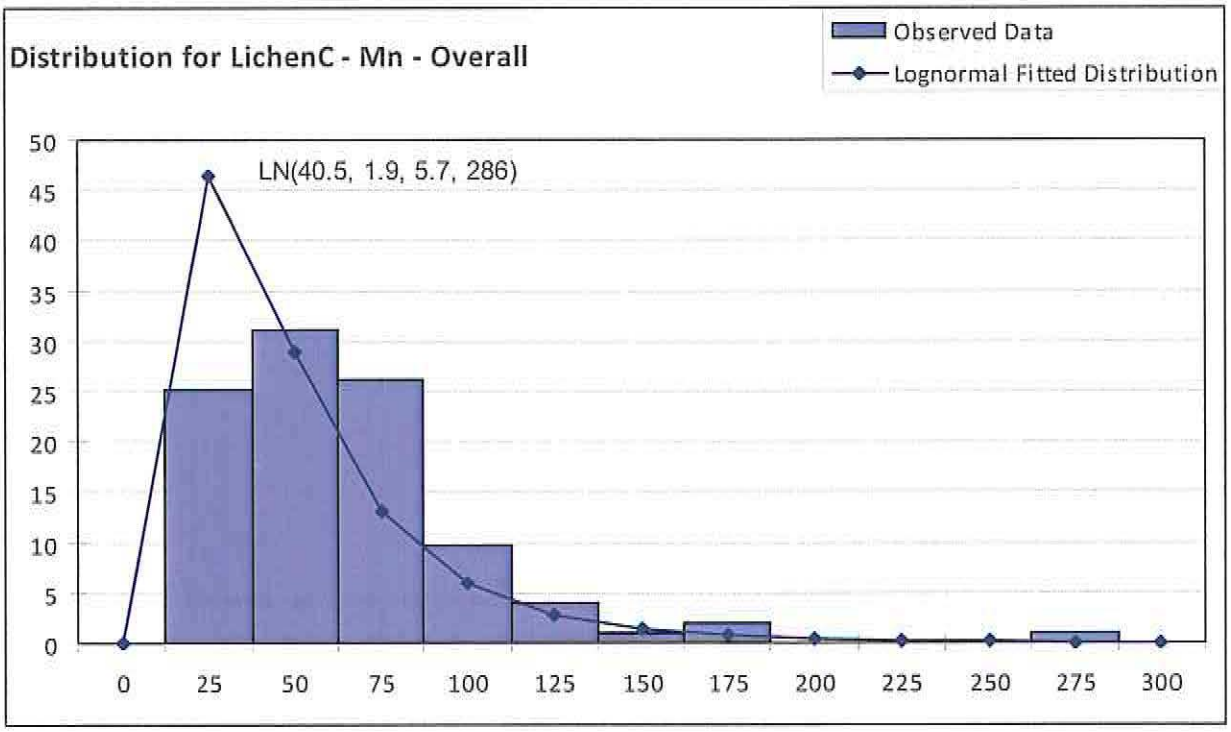

Distribution for LichenC - Pb - Faro-S
Observed Data
Lognormal Fitted Distribution
LN(106, 2.0, 13.1, 865)
18
16
14
12
10
8
6
4
2
0
0
100
200
300
400
500
600

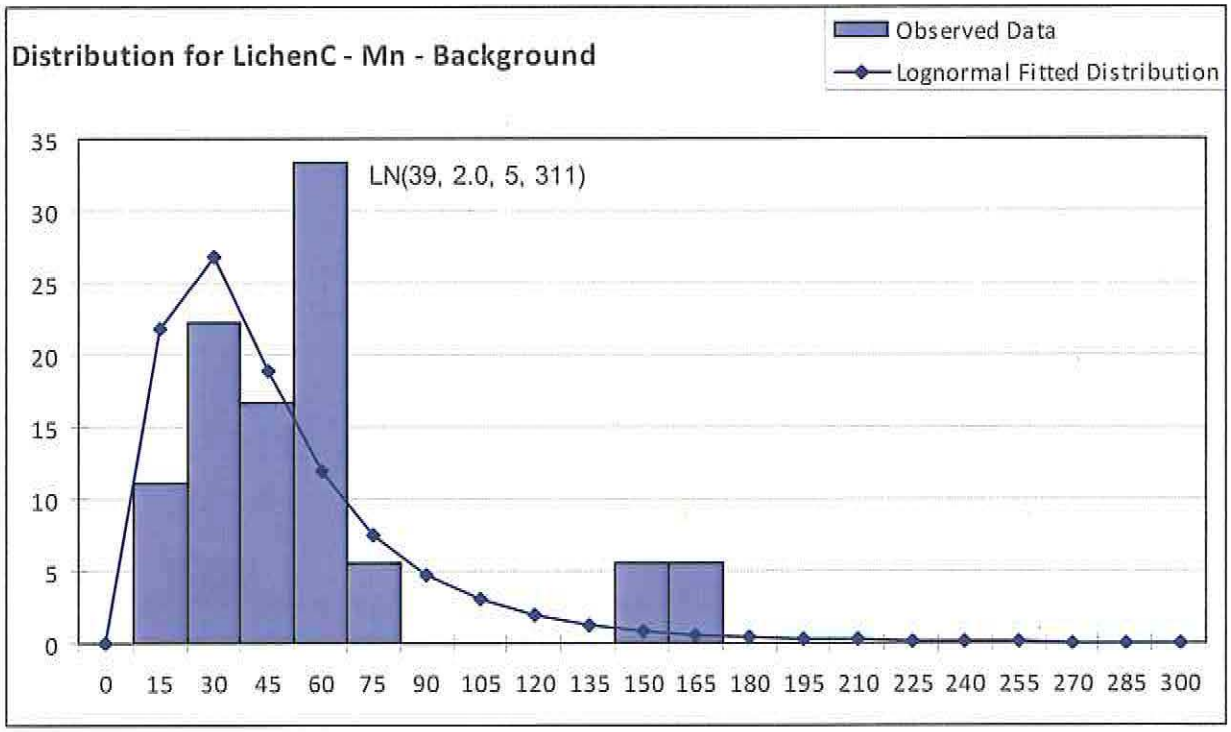

Distribution for LichenC - Pb - Faro-W
Observed Data
Lognormal Fitted Distribution
LN(23, 2.6, 1.3, 388)
50
45
40
35
30
25
20
15
10
5
0
0
50
100
150
200
250

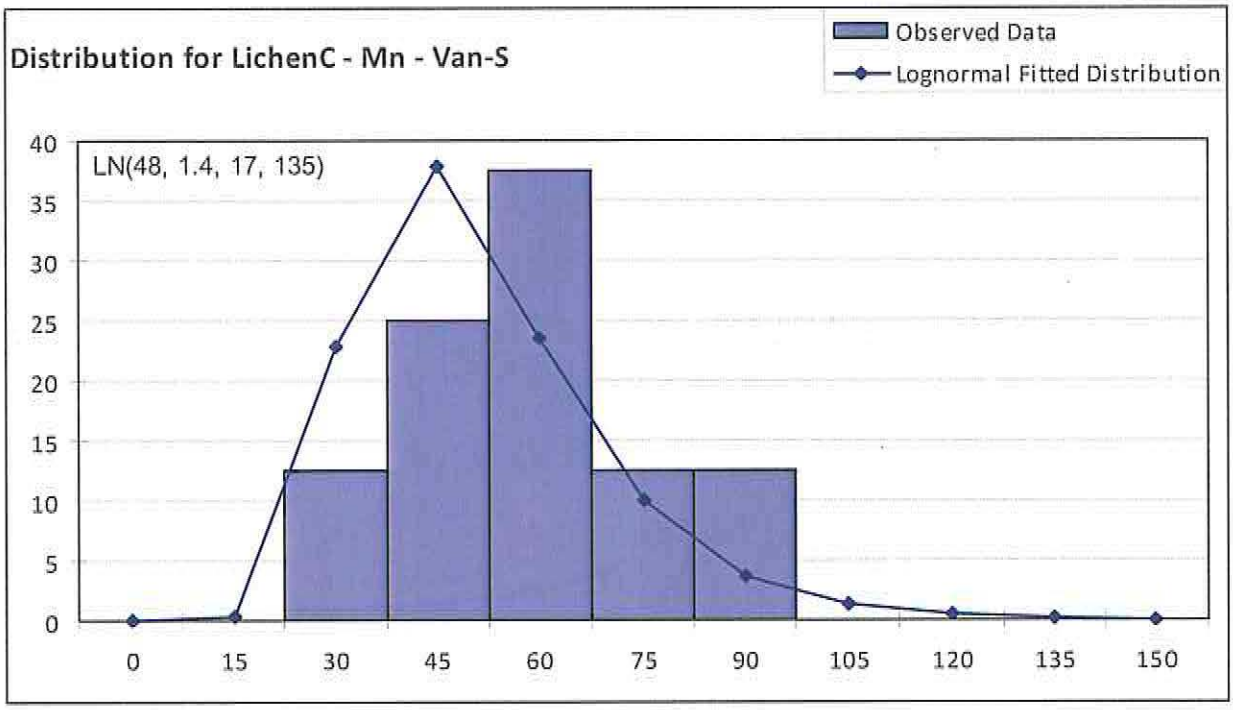

Distribution for LichenC - Pb - Faro-M
Observed Data
Lognormal Fitted Distribution
LN(55.5, 2.5, 3.5, 890)
45
40
35
30
25
20
15
10
5
0
0
50
100
150
200
250
300
350
400
450
500
550
600
650
700
750

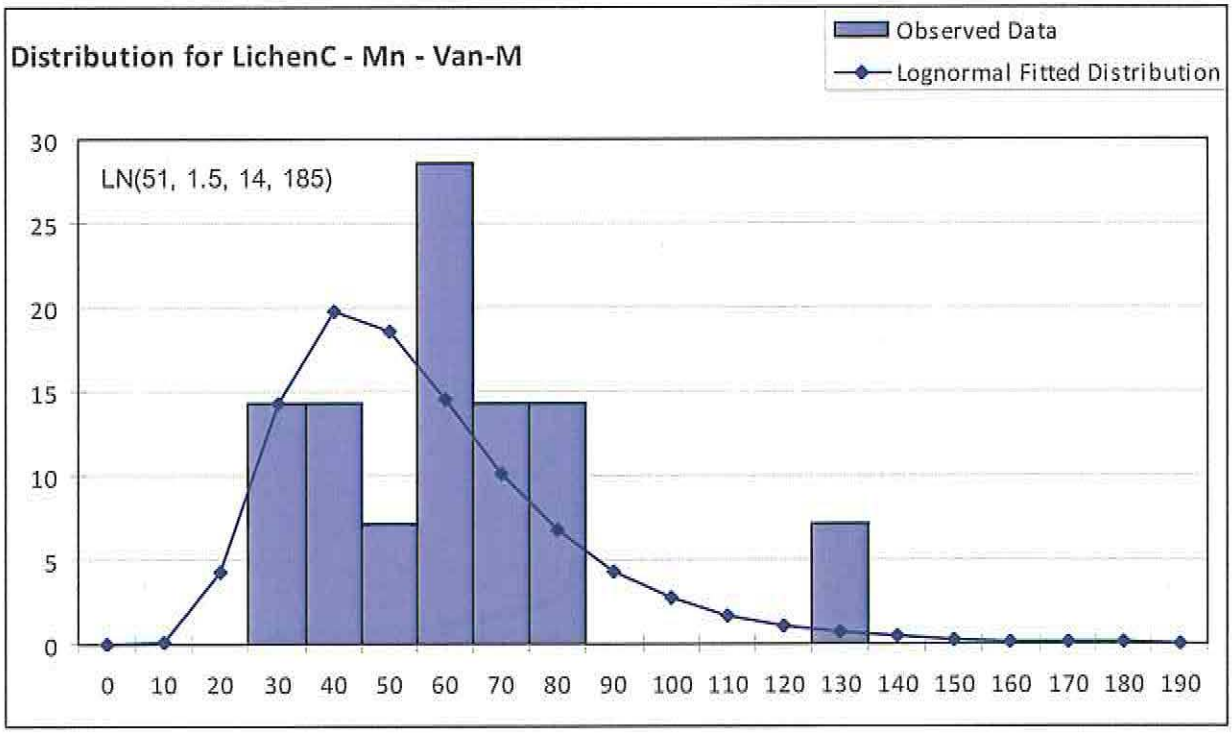

Distribution for LichenC - Pb - Sheep
Observed Data
Lognormal Fitted Distribution
LN(3.8, 1.8, 0.6, 23.3)
60
50
40
30
20
10
0
0
1
2
3
4
5
6
7
8
9
10
11
12

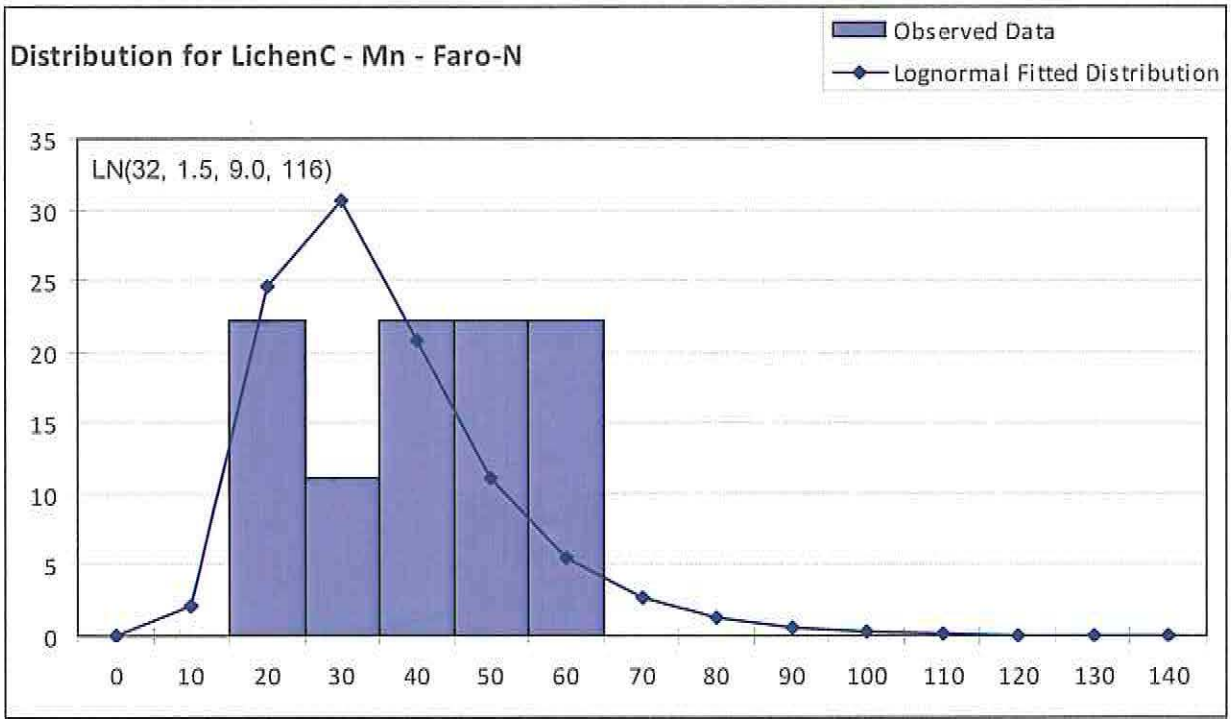
D.7.10 Manganese

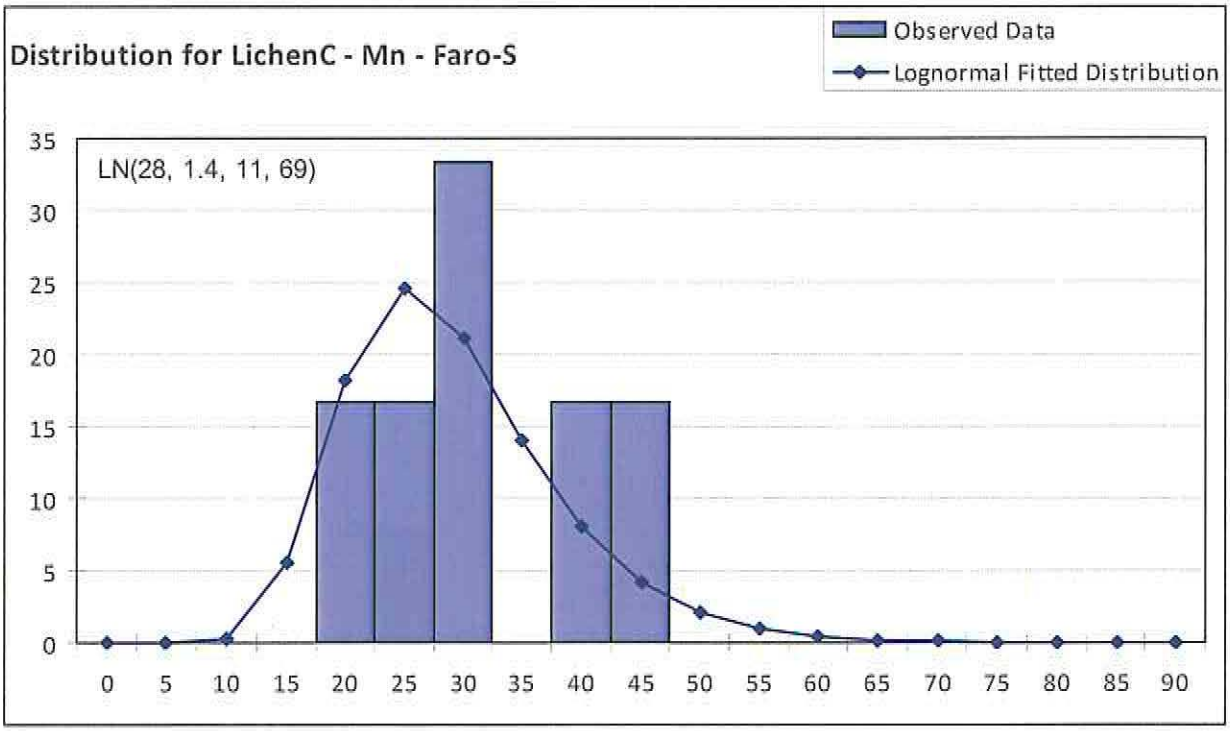


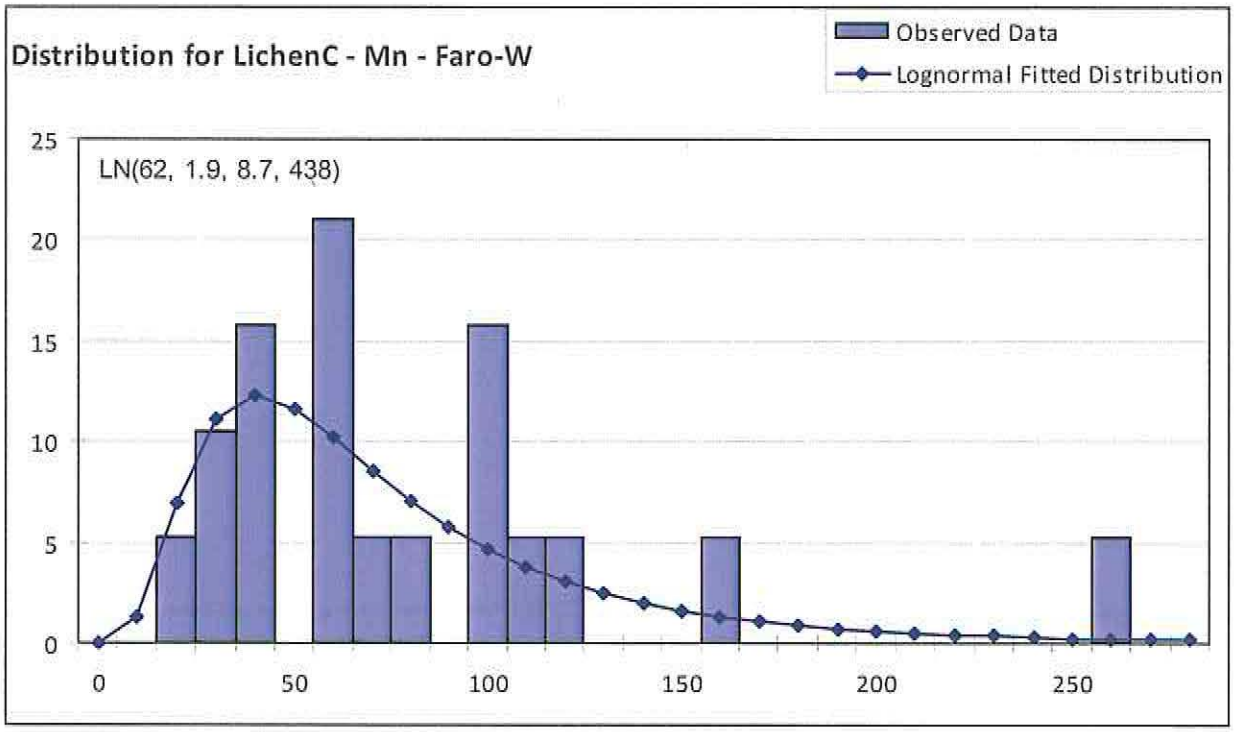


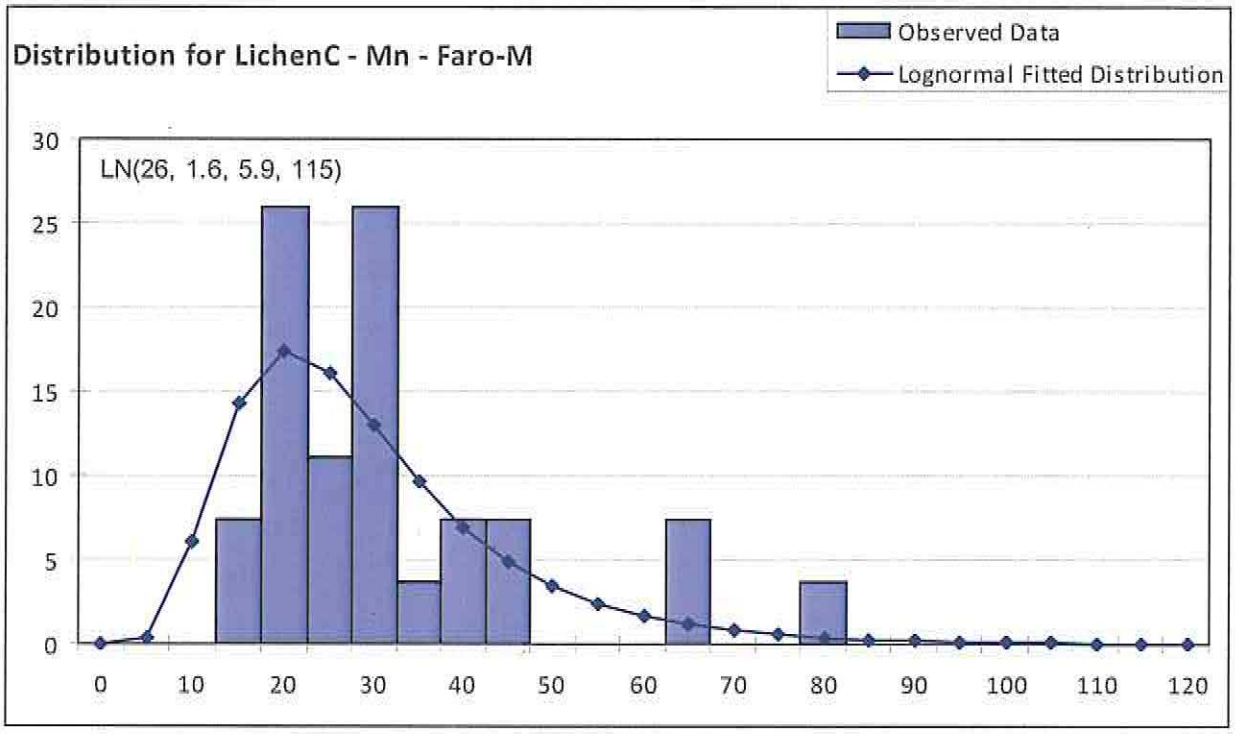

Distribution for LichenC - Mn - Van-S
Observed Data
Lognormal Fitted Distribution
LN(48, 1.4, 17, 135)
40
35
30
25
20
15
10
5
0
0
15
30
45
60
75
90
105
120
135
150

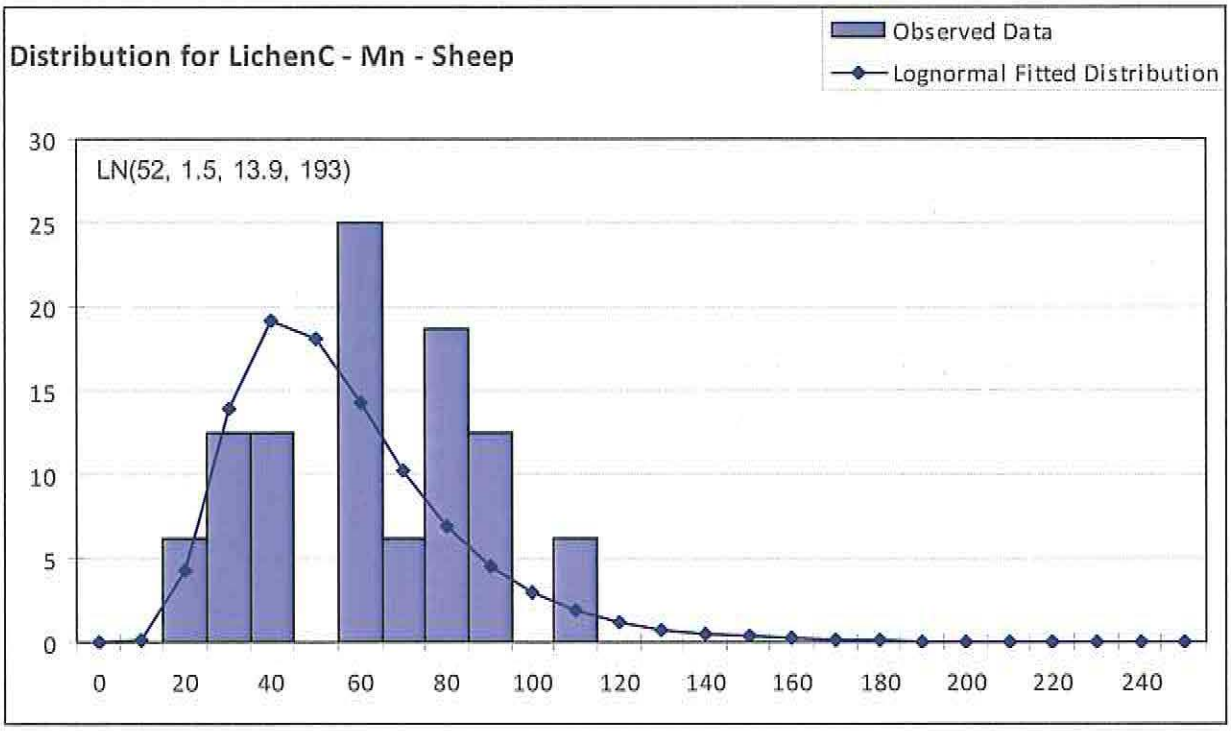

Distribution for LichenC - Mn - Van-M
Observed Data
Lognormal Fitted Distribution
LN(51, 1.5, 14, 185)
30
25
20
15
10
5
0
0
10
20
30
40
50
60
70
80
90
100
110
120
130
140
150
160
170
180
190


Distribution for LichenC - Mn - Faro-N
Observed Data
Lognormal Fitted Distribution
LN(32, 1.5, 9.0, 116)
35
30
25
20
15
10
5
0
0 10 20 30 40 50 60 70 80 90 100 110 120 130 140

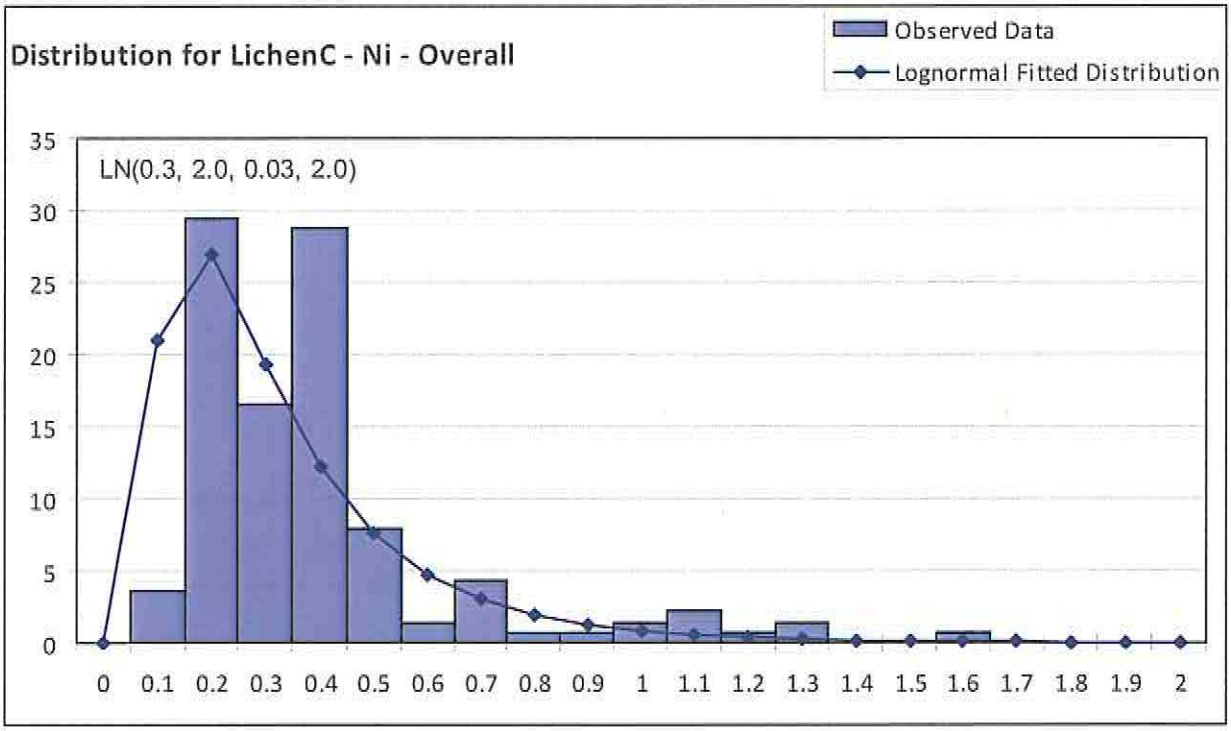

Distribution for LichenC - Mn - Faro-S
Observed Data
Lognormal Fitted Distribution
LN(28, 1.4, 11, 69)
35
30
25
20
15
10
5
0
0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90

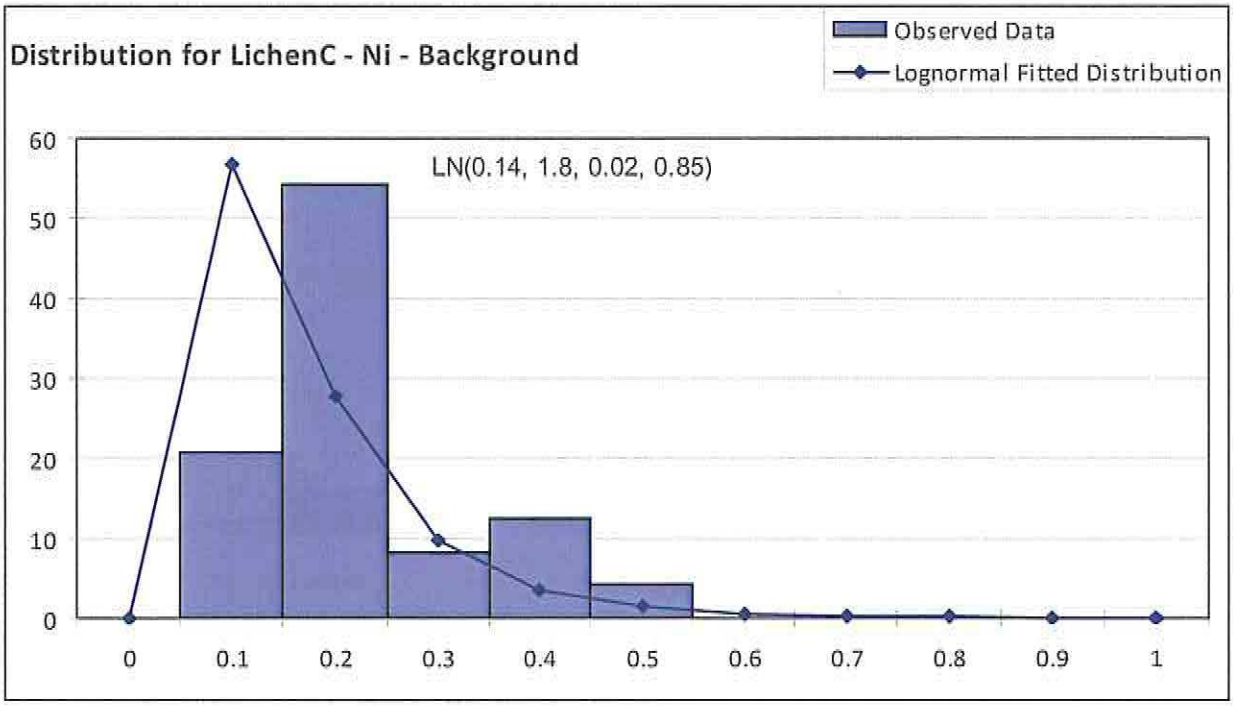

Distribution for LichenC - Mn - Faro-W
Observed Data
Lognormal Fitted Distribution
LN(62, 1.9, 8.7, 438)
25
20
15
10
5
0
0
50
100
150
200
250

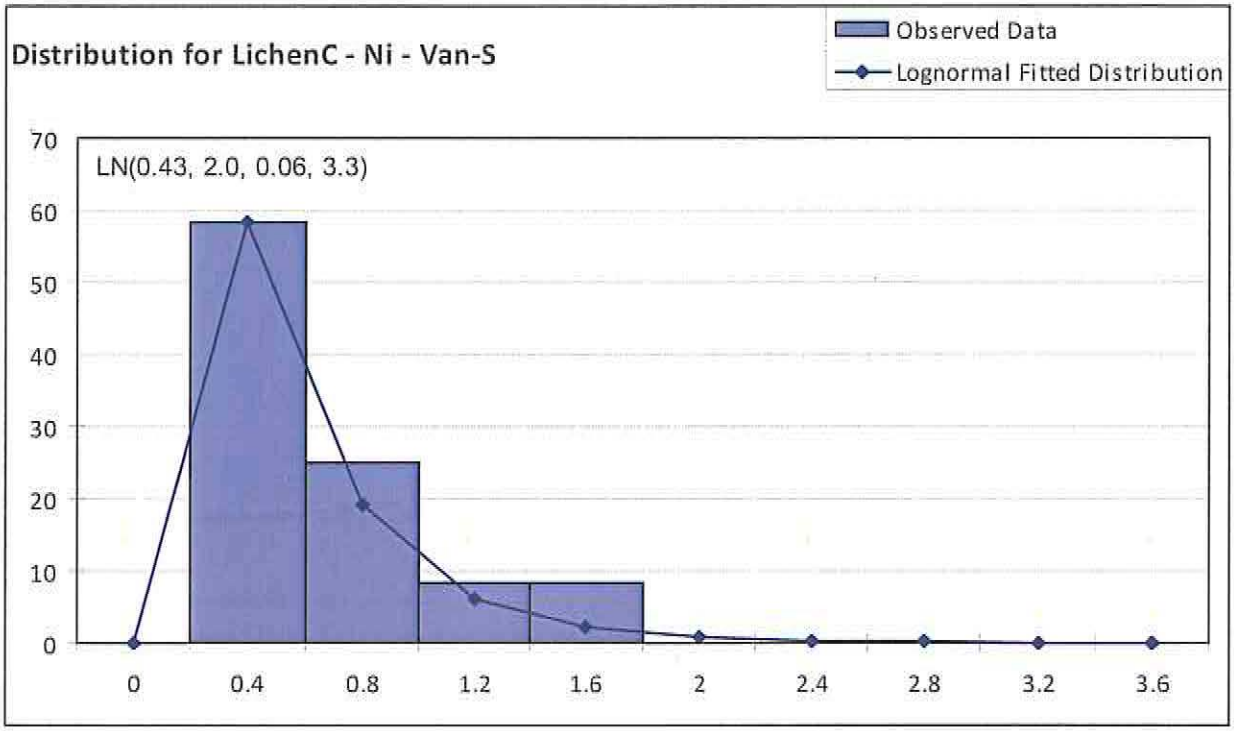

Distribution for LichenC - Mn - Faro-M
Observed Data
Lognormal Fitted Distribution
LN(26, 1.6, 5.9, 115)
30
25
20
15
10
5
0
0
10
20
30
40
50
60
70
80
90
100
110
120

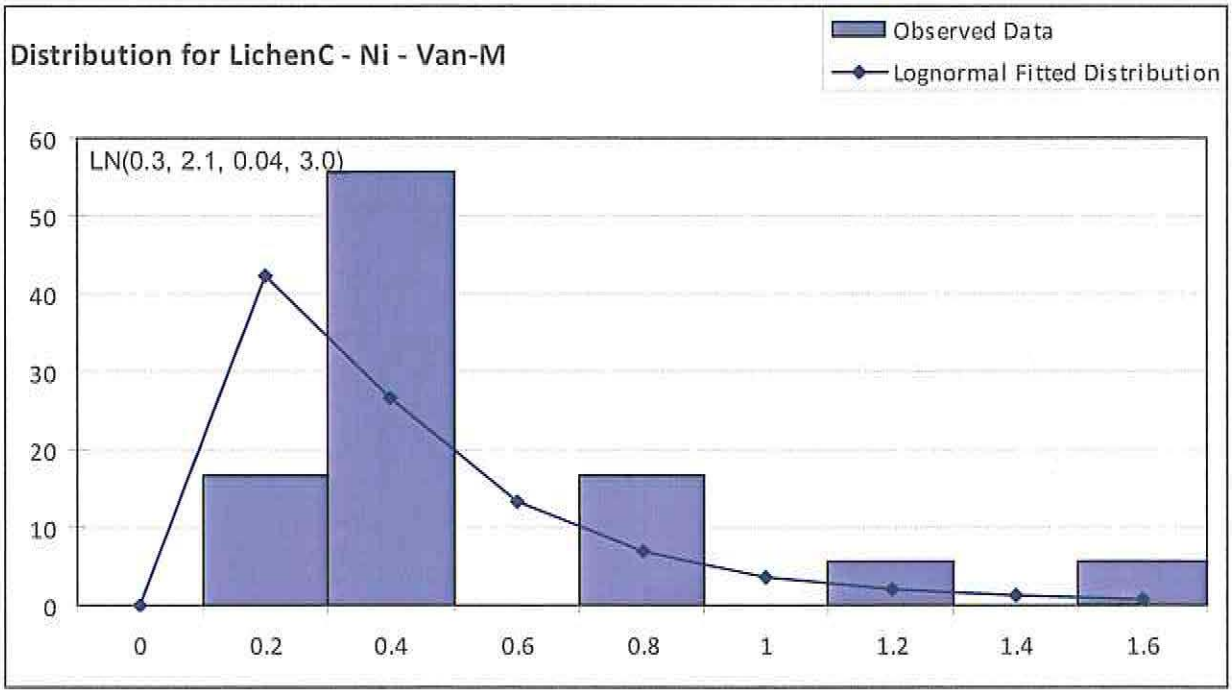

Distribution for LichenC - Mn - Sheep
Observed Data
Lognormal Fitted Distribution
LN(52, 1.5, 13.9, 193)
30
25
20
15
10
5
0
0
20
40
60
80
100
120
140
160
180
200
220
240

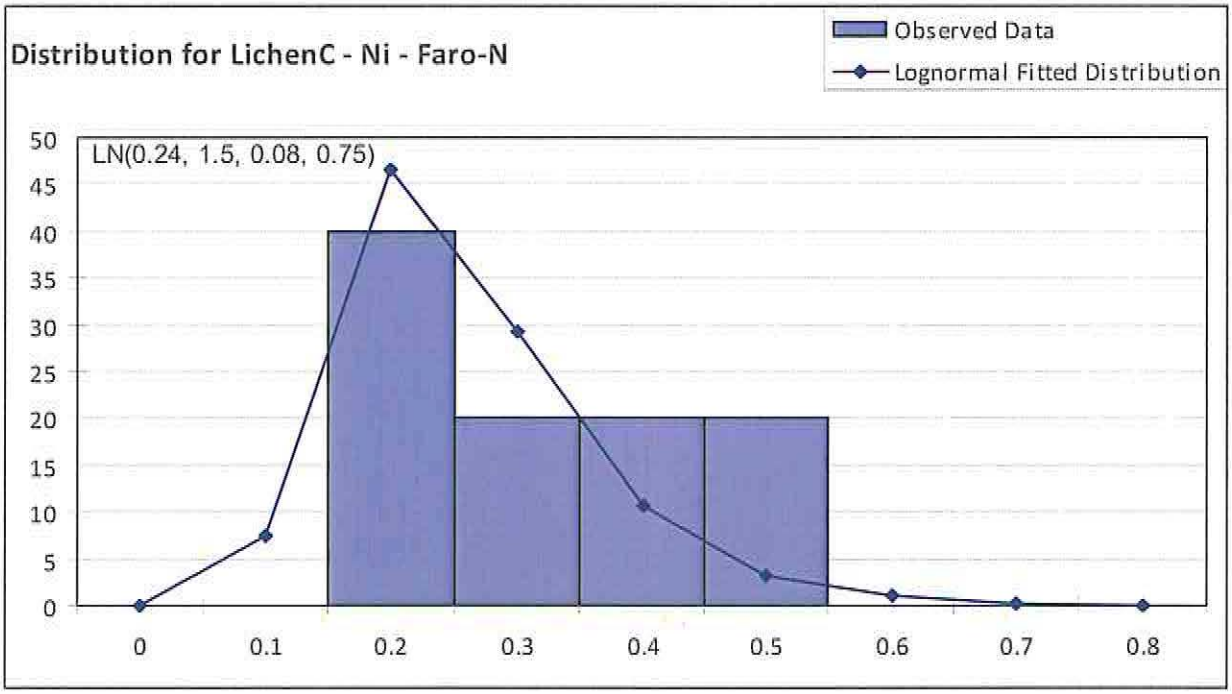
D.7.11 Nickel

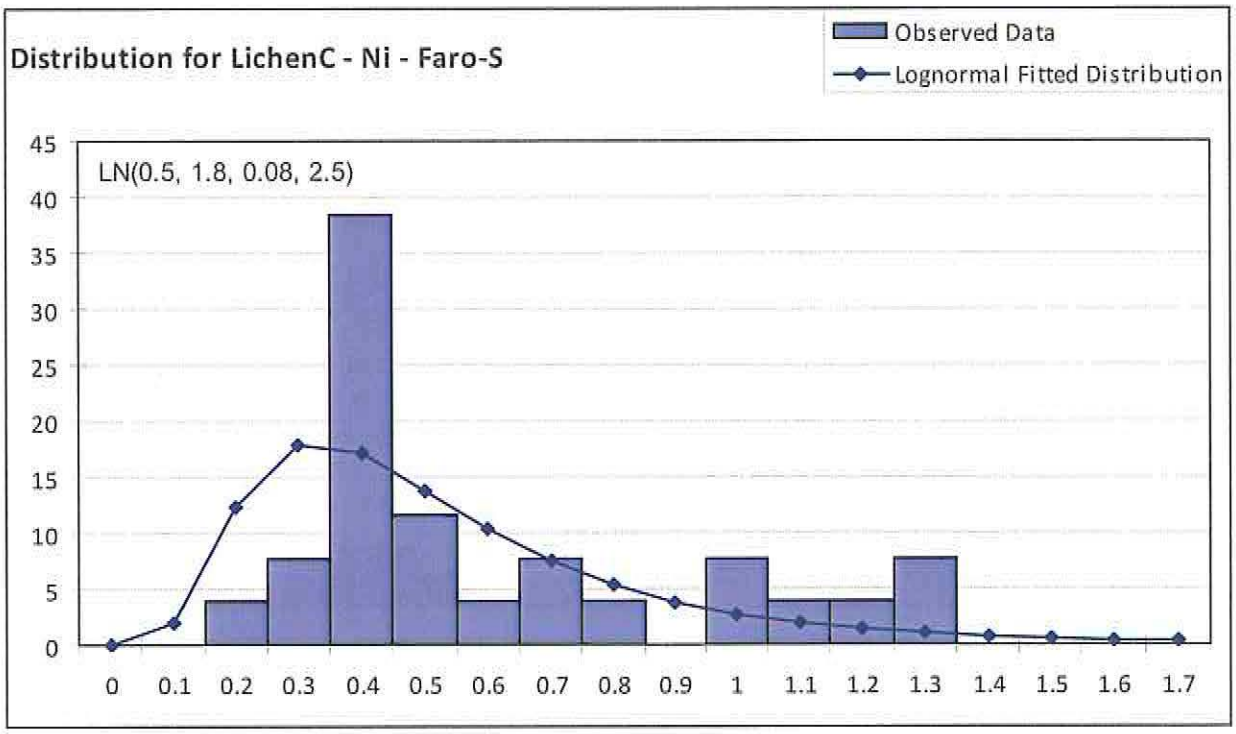

Distribution for LichenC - Ni - Overall
Observed Data
Lognormal Fitted Distribution
LN(0.3, 2.0, 0.03, 2.0)
35
30
25
20
15
10
5
0
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1
1.1
1.2
1.3
1.4
1.5
1.6
1.7
1.8
1.9
2

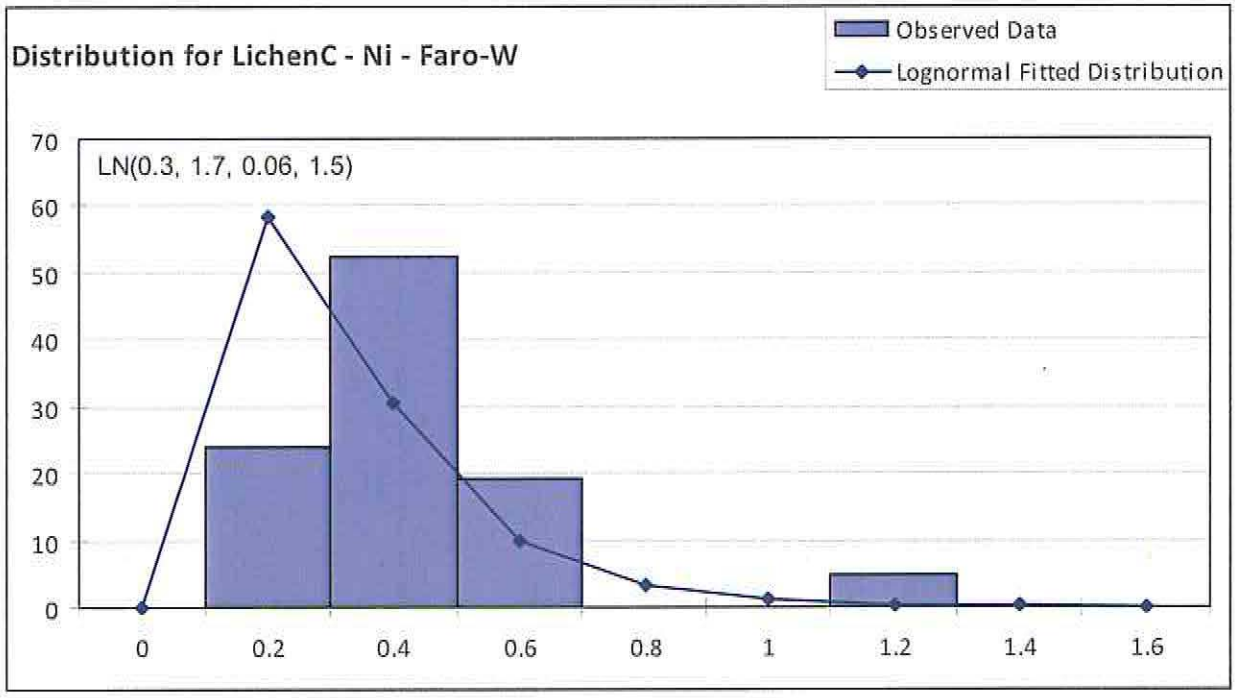

Distribution for LichenC - Ni - Background
Observed Data
Lognormal Fitted Distribution
LN(0.14, 1.8, 0.02, 0.85)
60
50
40
30
20
10
0
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1

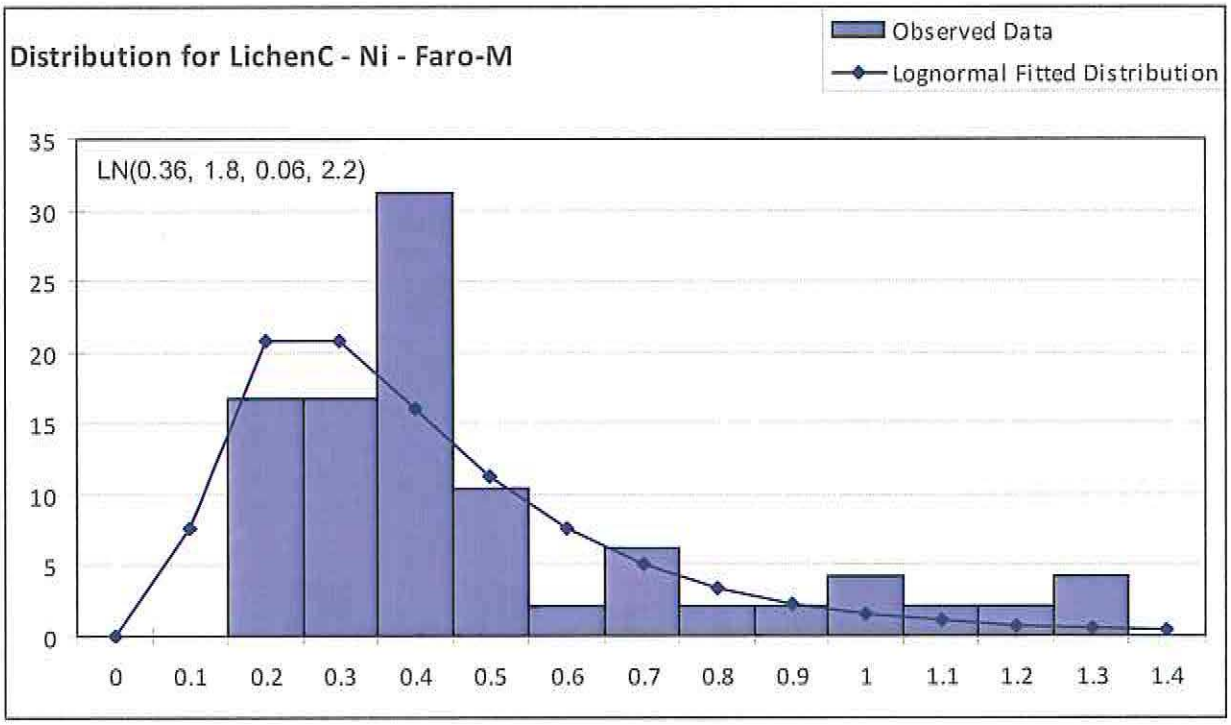

Distribution for LichenC - Ni - Van-S
Observed Data
Lognormal Fitted Distribution
LN(0.43, 2.0, 0.06, 3.3)
70
60
50
40
30
20
10
0
0
0.4
0.8
1.2
1.6
2
2.4
2.8
3.2
3.6

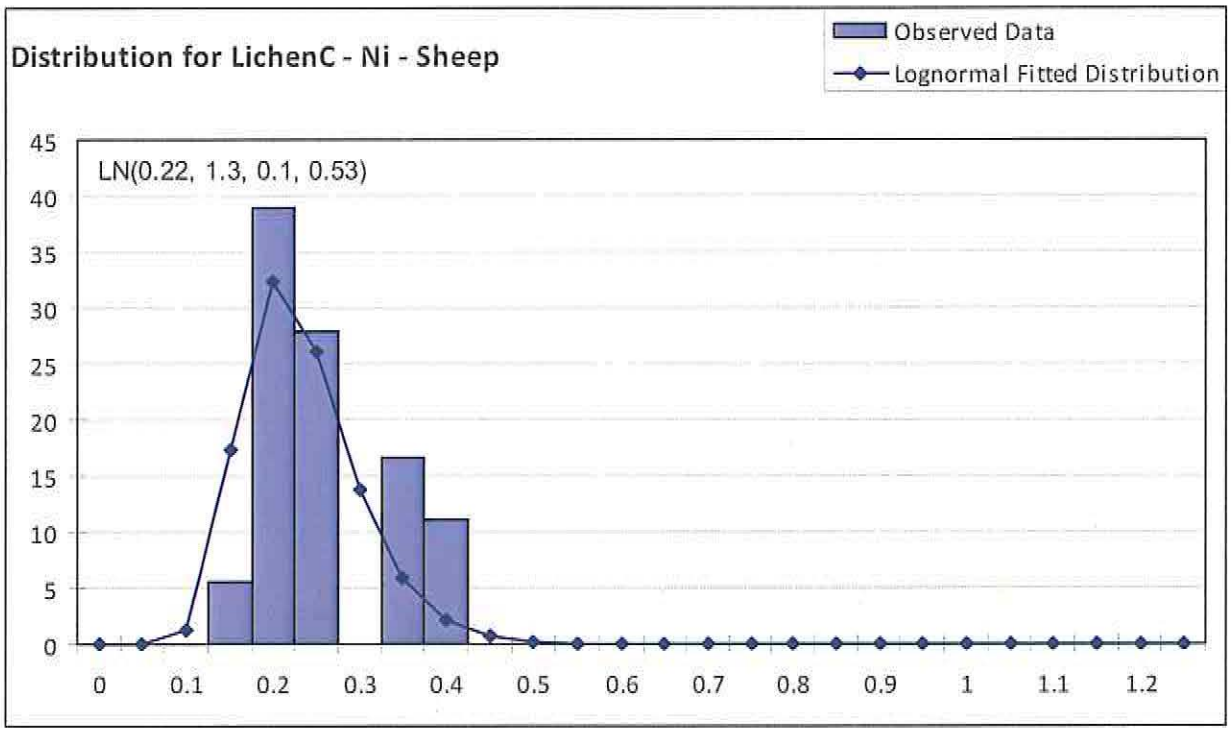

Distribution for LichenC - Ni - Van-M
Observed Data
Lognormal Fitted Distribution
LN(0.3, 2.1, 0.04, 3.0)
60
50
40
30
20
10
0
0
0.2
0.4
0.6
0.8
1
1.2
1.4
1.6


Distribution for LichenC - Ni - Faro-N
Observed Data
Lognormal Fitted Distribution
LN(0.24, 1.5, 0.08, 0.75)
50
45
40
35
30
25
20
15
10
5
0
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8

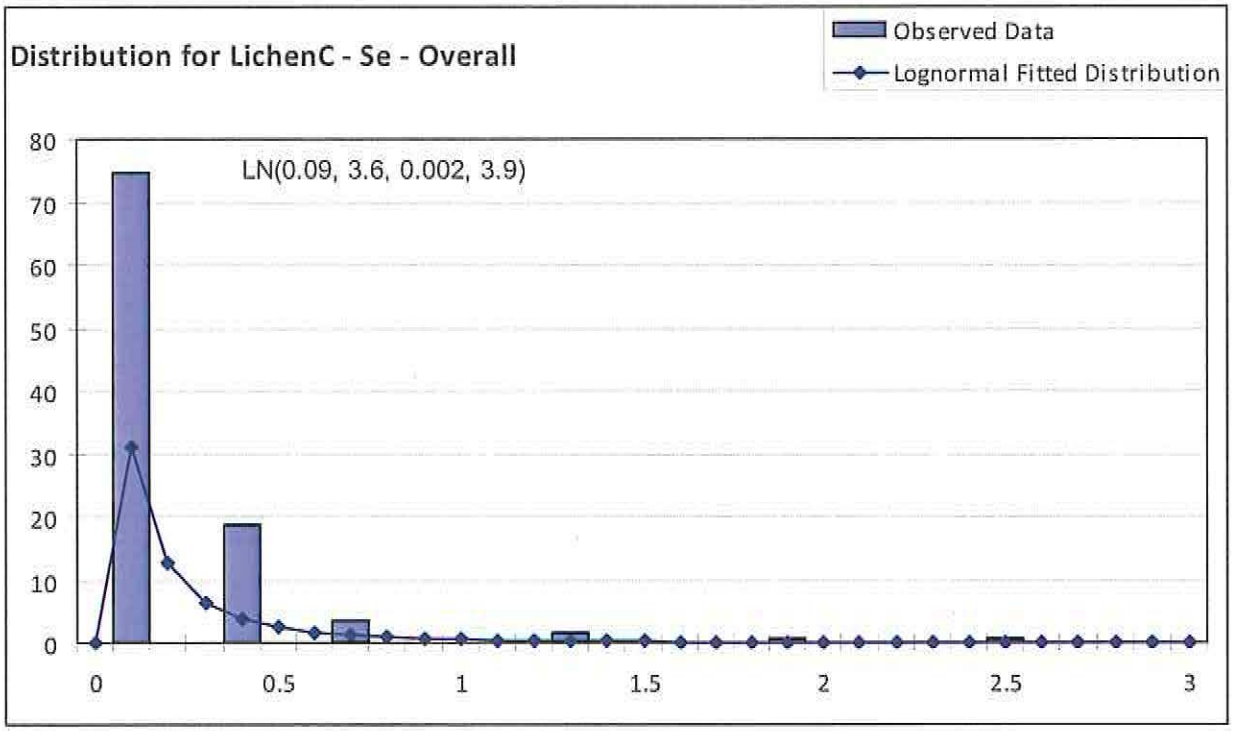

Distribution for LichenC - Ni - Faro-S
Observed Data
Lognormal Fitted Distribution
LN(0.5, 1.8, 0.08, 2.5)
45
40
35
30
25
20
15
10
5
0
0 0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 0.9 1 1.1 1.2 1.3 1.4 1.5 1.6 1.7

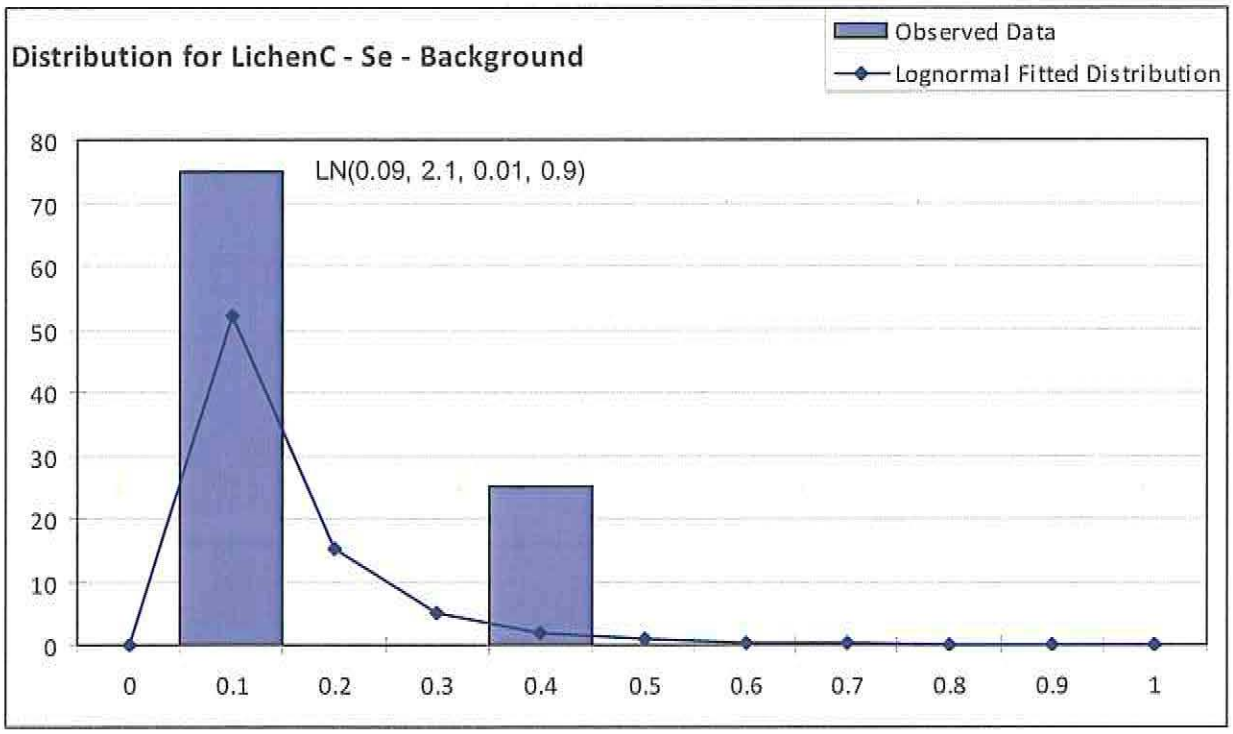

Distribution for LichenC - Ni - Faro-W
Observed Data
Lognormal Fitted Distribution
LN(0.3, 1.7, 0.06, 1.5)
70
60
50
40
30
20
10
0
0 0.2 0.4 0.6 0.8 1 1.2 1.4 1.6

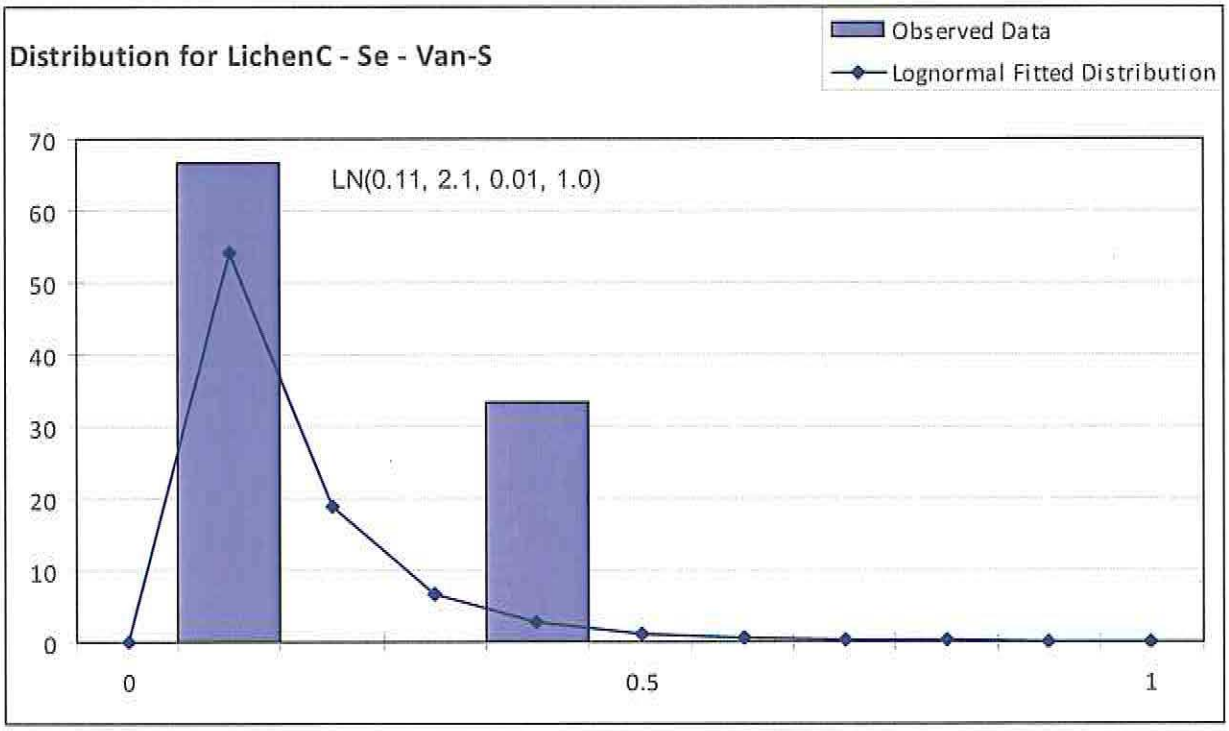

Distribution for LichenC - Ni - Faro-M
Observed Data
Lognormal Fitted Distribution
LN(0.36, 1.8, 0.06, 2.2)
35
30
25
20
15
10
5
0
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1
1.1
1.2
1.3
1.4

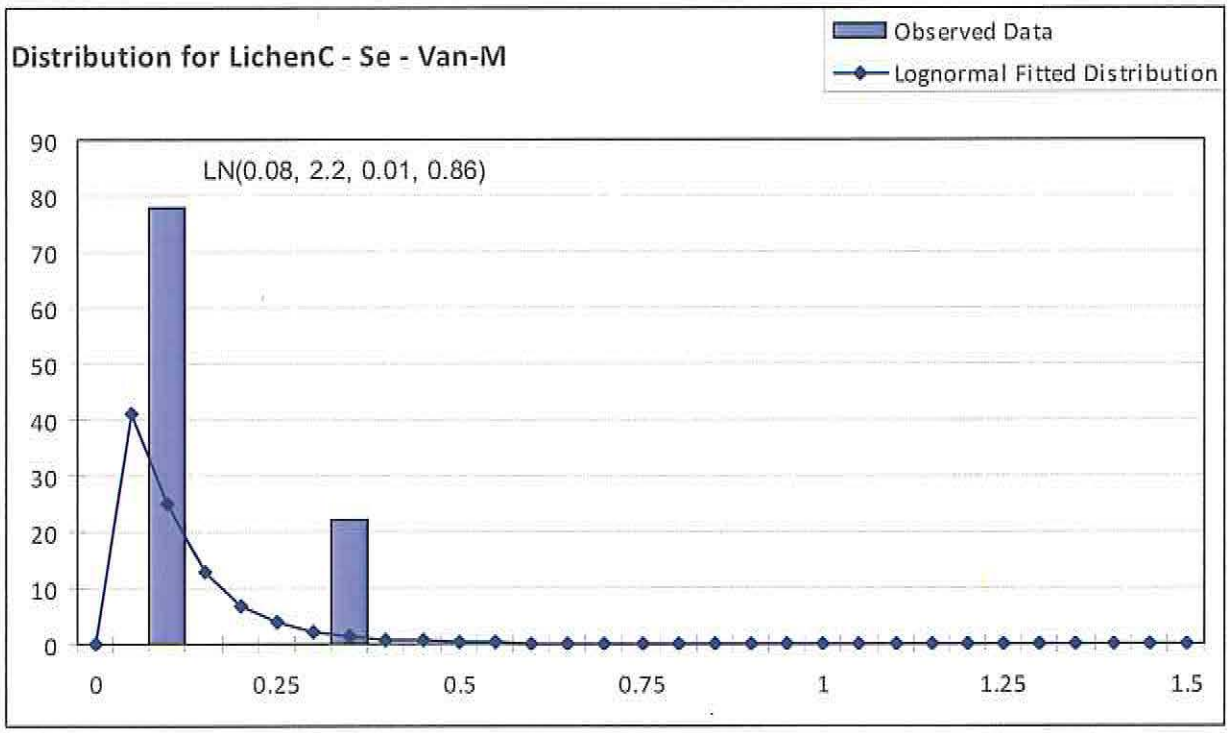

Distribution for LichenC - Ni - Sheep
Observed Data
Lognormal Fitted Distribution
LN(0.22, 1.3, 0.1, 0.53)
45
40
35
30
25
20
15
10
5
0
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1
1.1
1.2

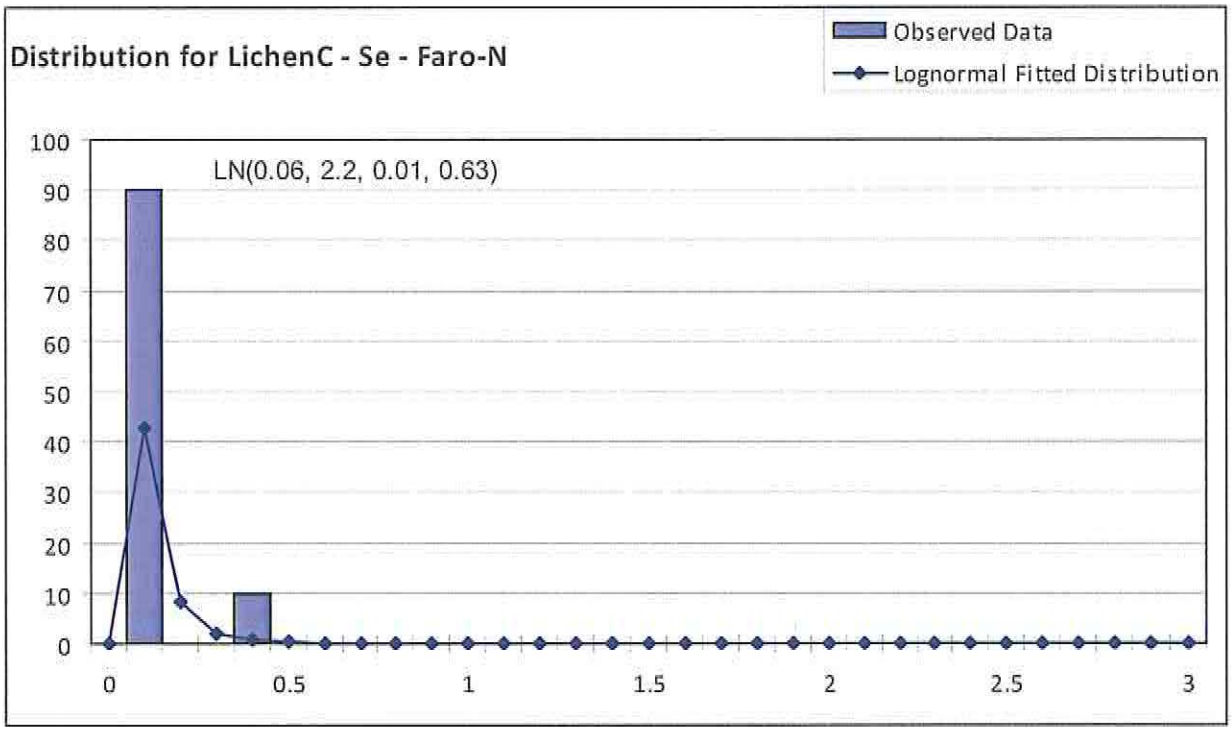
D.7.12 Selenium

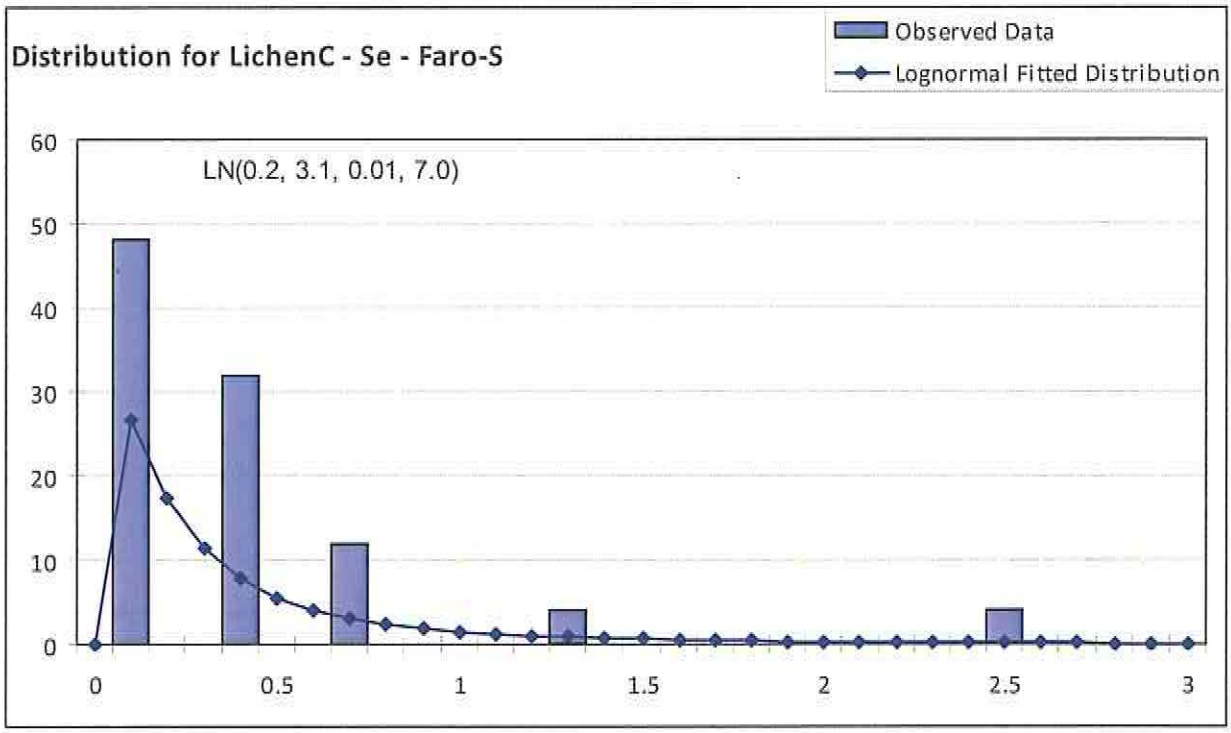


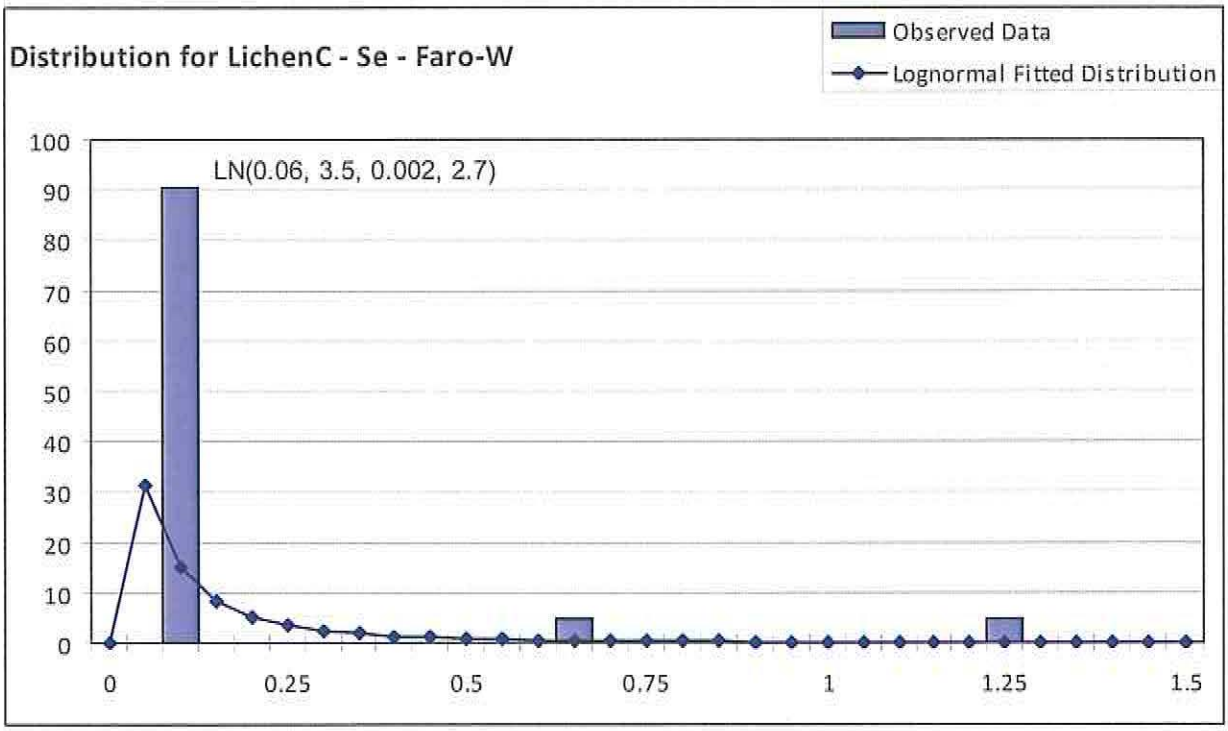


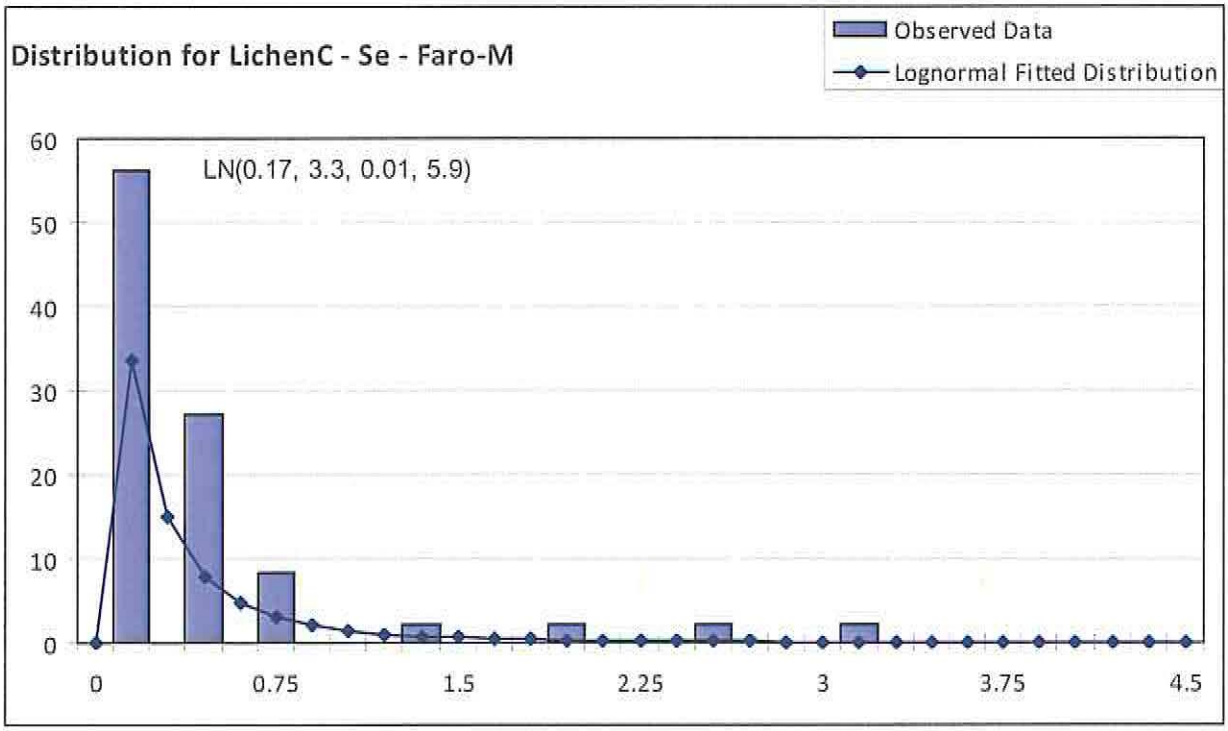

Distribution for LichenC - Se - Van-S
Observed Data
Lognormal Fitted Distribution
LN(0.11, 2.1, 0.01, 1.0)
70
60
50
40
30
20
10
0
0
0.5
1

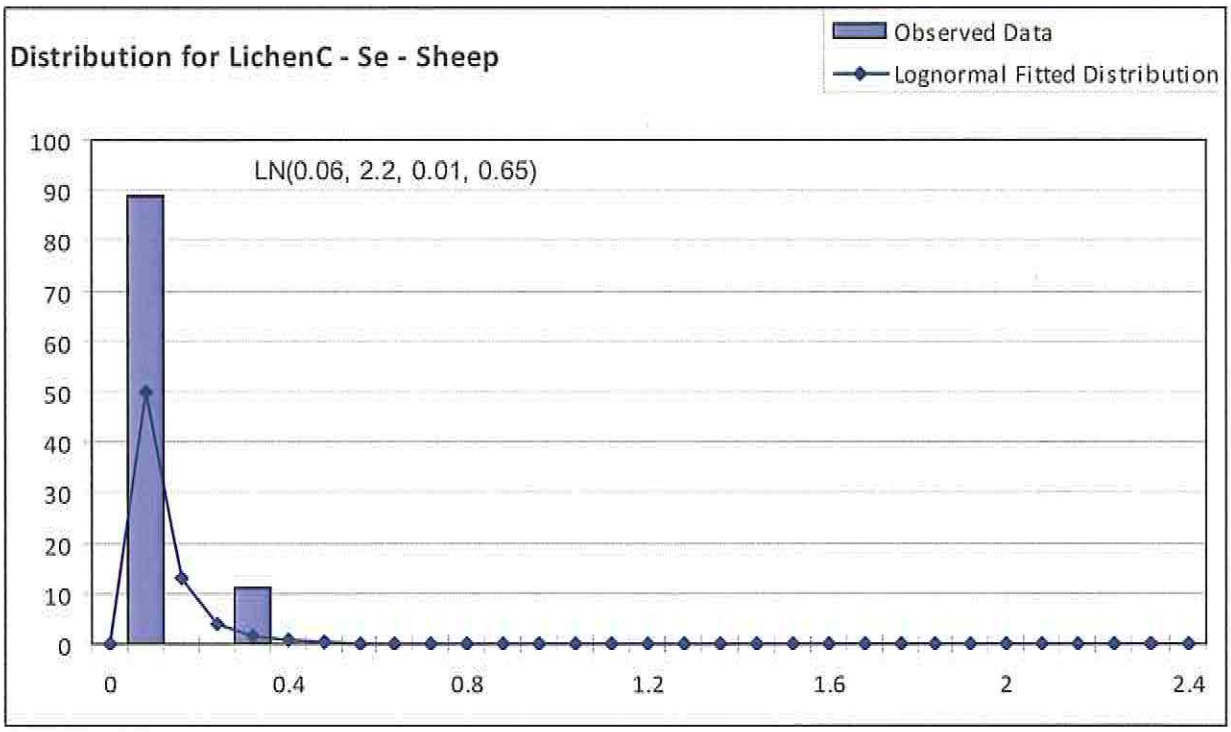

Distribution for LichenC - Se - Van-M
Observed Data
Lognormal Fitted Distribution
LN(0.08, 2.2, 0.01, 0.86)
90
80
70
60
50
40
30
20
10
0
0
0.25
0.5
0.75
1
1.25
1.5


Distribution for LichenC - Se - Faro-N
Observed Data
Lognormal Fitted Distribution
LN(0.06, 2.2, 0.01, 0.63)
100
90
80
70
60
50
40
30
20
10
0
0
0.5
1
1.5
2
2.5
3

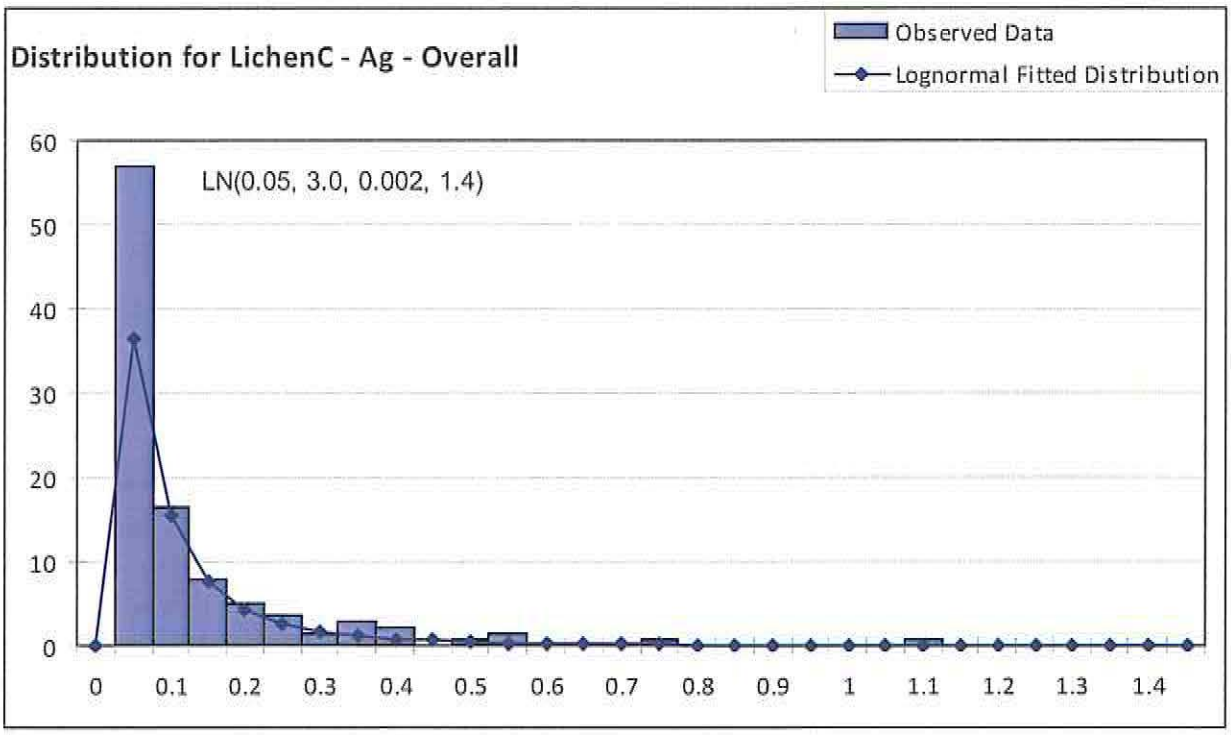

Distribution for LichenC - Se - Faro-S
Observed Data
Lognormal Fitted Distribution
LN(0.2, 3.1, 0.01, 7.0)
60
50
40
30
20
10
0
0
0.5
1
1.5
2
2.5
3

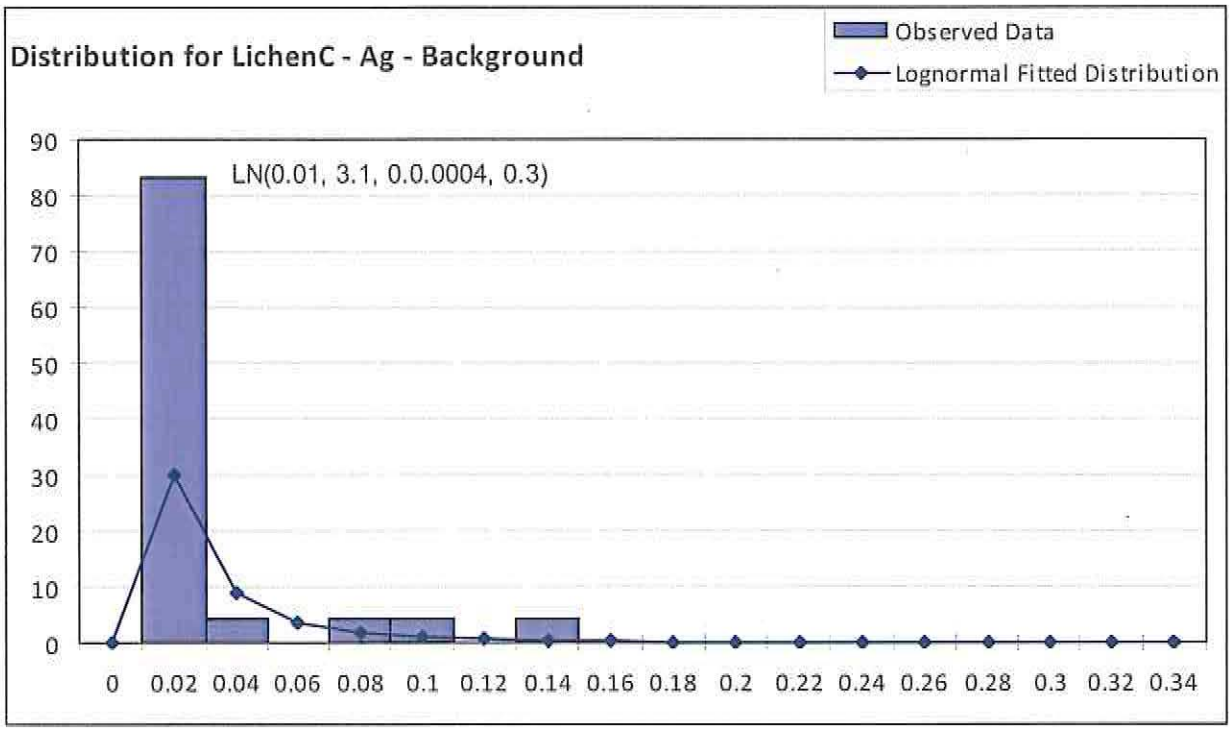

Distribution for LichenC - Se - Faro-W
Observed Data
Lognormal Fitted Distribution
LN(0.06, 3.5, 0.002, 2.7)
100
90
80
70
60
50
40
30
20
10
0
0
0.25
0.5
0.75
1
1.25
1.5

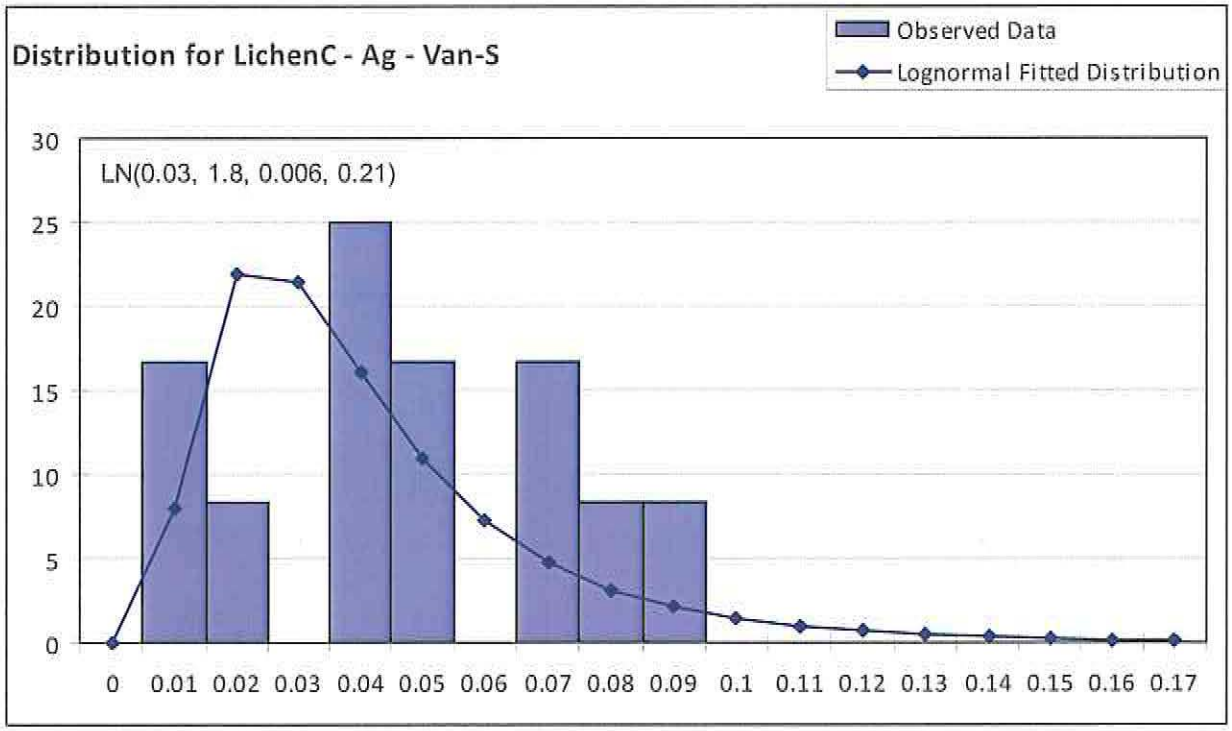

Distribution for LichenC - Se - Faro-M
Observed Data
Lognormal Fitted Distribution
LN(0.17, 3.3, 0.01, 5.9)
60
50
40
30
20
10
0
0
0.75
1.5
2.25
3
3.75
4.5

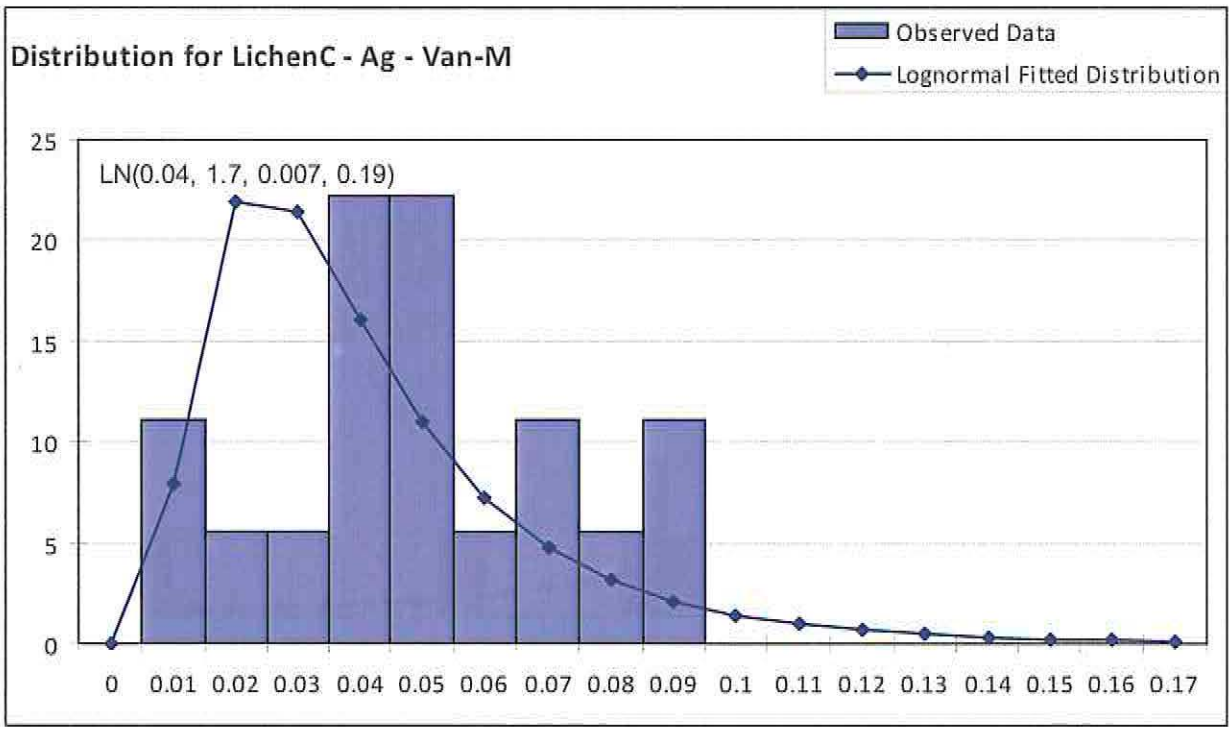

Distribution for LichenC - Se - Sheep
Observed Data
Lognormal Fitted Distribution
LN(0.06, 2.2, 0.01, 0.65)
100
90
80
70
60
50
40
30
20
10
0
0
0.4
0.8
1.2
1.6
2
2.4

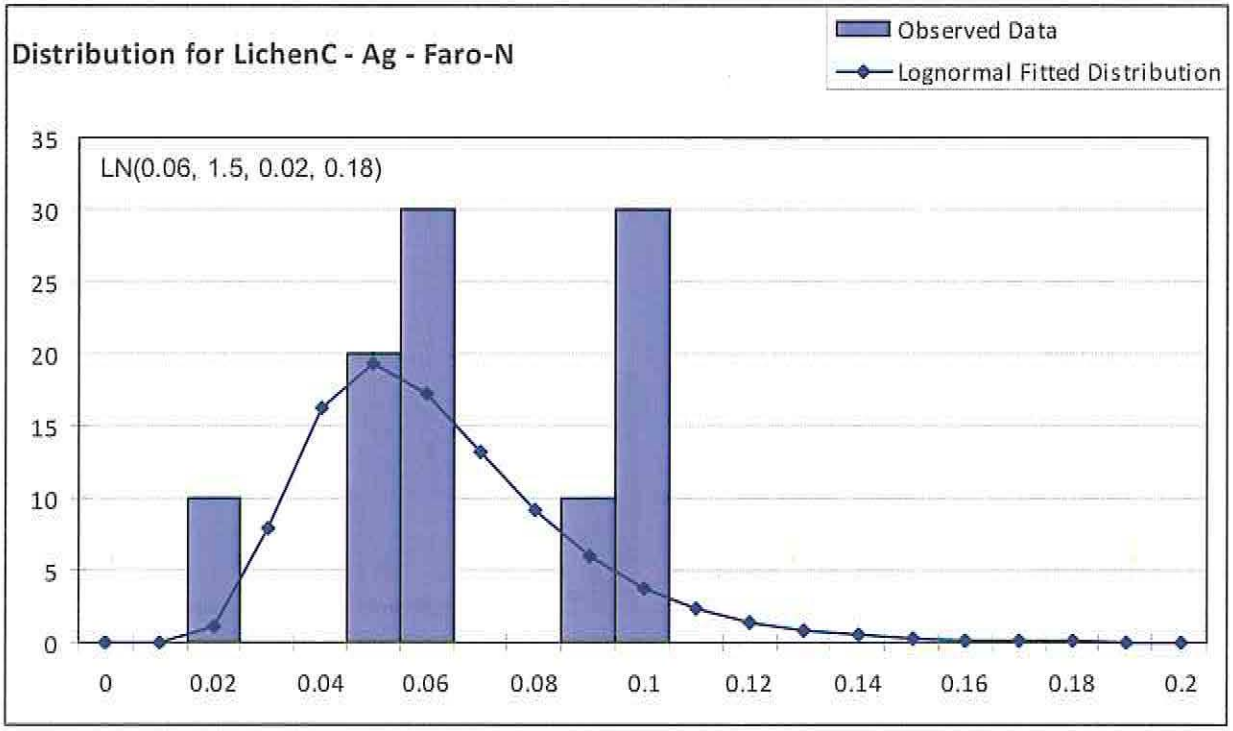
D.7.13 Silver

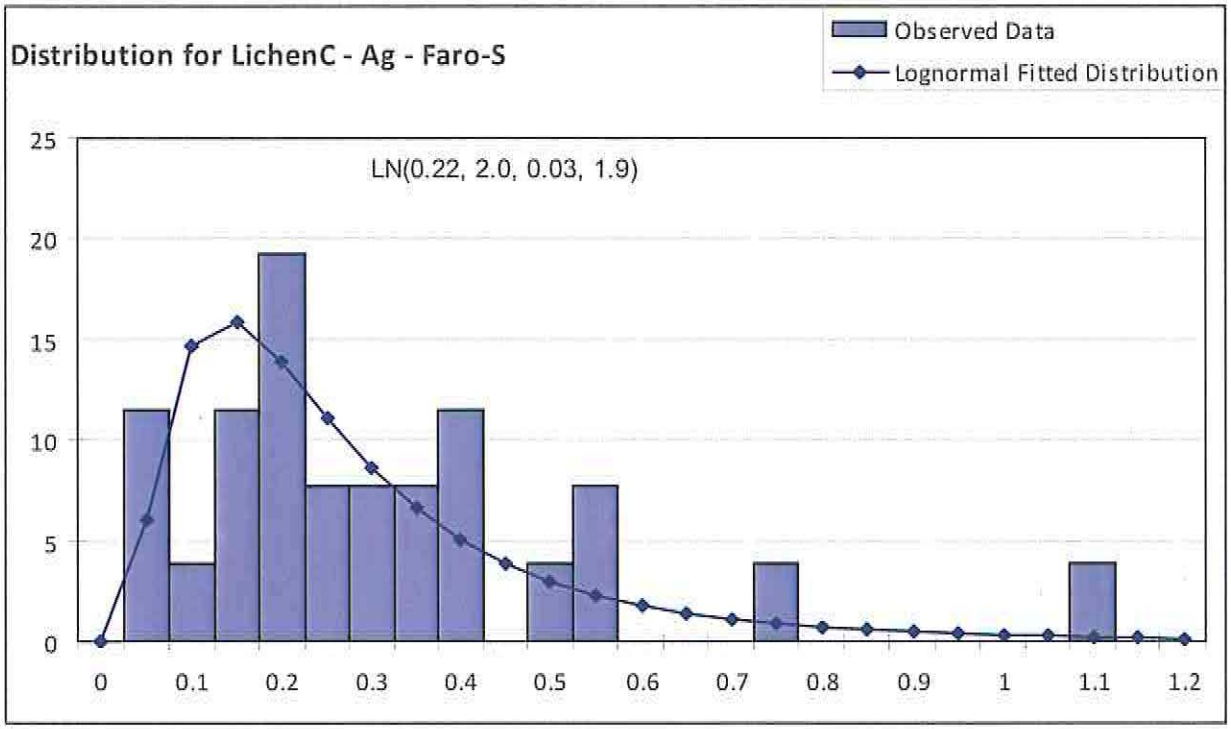

Distribution for LichenC - Ag - Overall
Observed Data
Lognormal Fitted Distribution
LN(0.05, 3.0, 0.002, 1.4)
60
50
40
30
20
10
0
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1
1.1
1.2
1.3
1.4

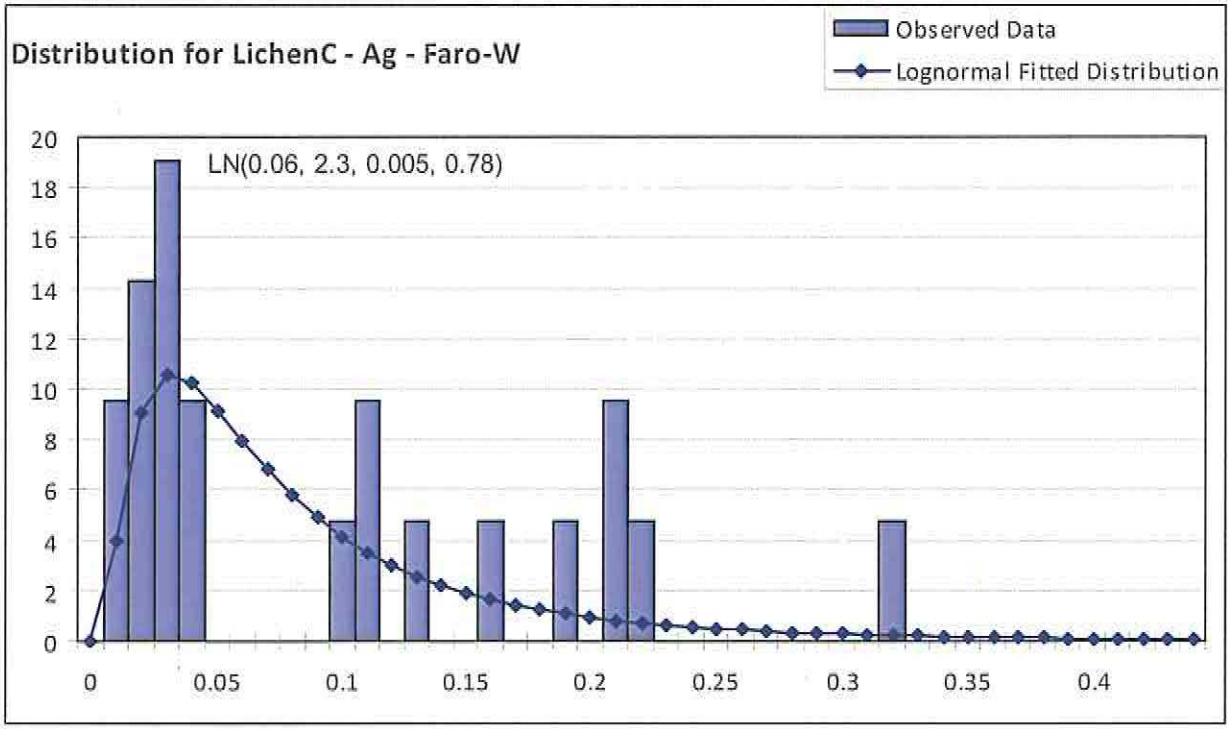

Distribution for LichenC - Ag - Background
Observed Data
Lognormal Fitted Distribution
LN(0.01, 3.1, 0.0.0004, 0.3)
90
80
70
60
50
40
30
20
10
0
0 0.02 0.04 0.06 0.08 0.1 0.12 0.14 0.16 0.18 0.2 0.22 0.24 0.26 0.28 0.3 0.32 0.34

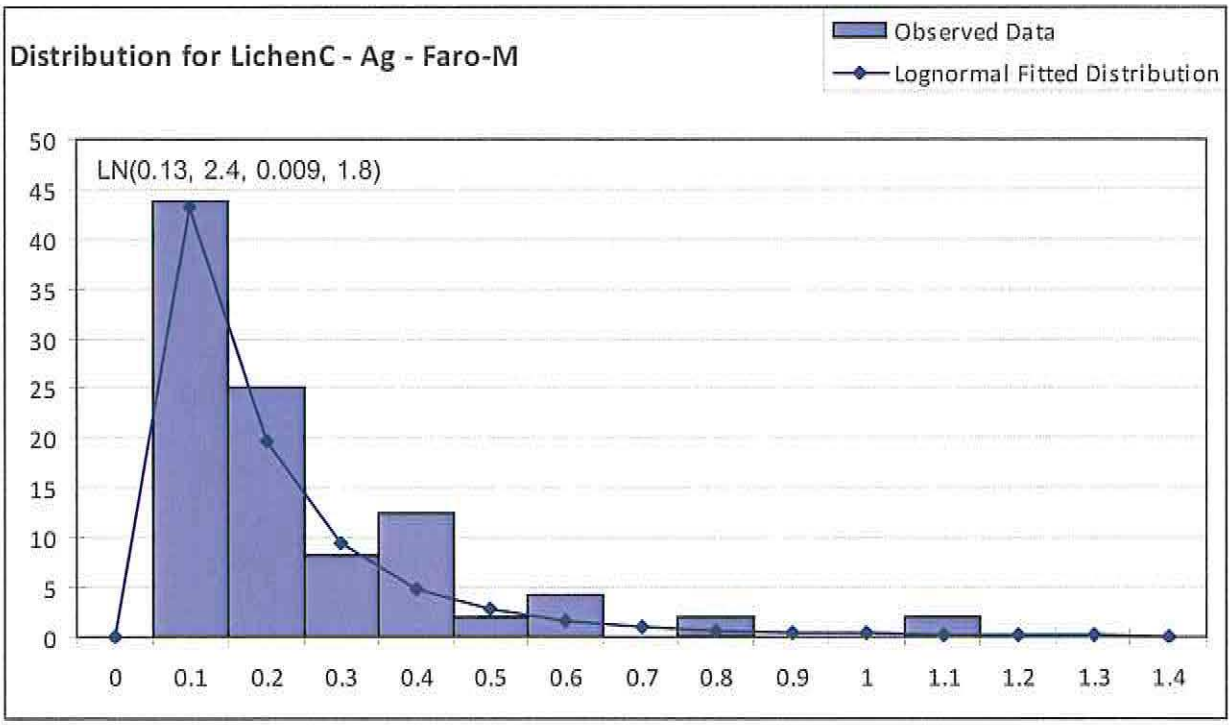

Distribution for LichenC - Ag - Van-S
Observed Data
Lognormal Fitted Distribution
LN(0.03, 1.8, 0.006, 0.21)
30
25
20
15
10
5
0
0 0.01 0.02 0.03 0.04 0.05 0.06 0.07 0.08 0.09 0.1 0.11 0.12 0.13 0.14 0.15 0.16 0.17

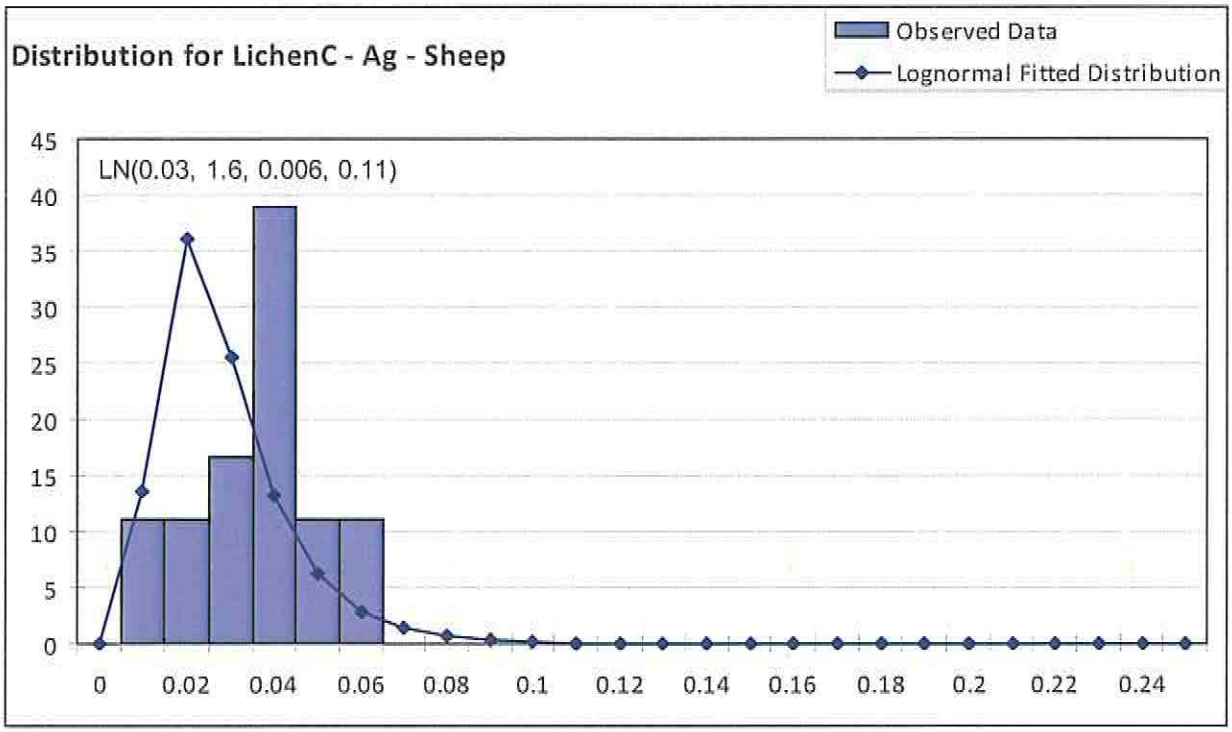

Distribution for LichenC - Ag - Van-M
Observed Data
Lognormal Fitted Distribution
LN(0.04, 1.7, 0.007, 0.19)
25
20
15
10
5
0
0 0.01 0.02 0.03 0.04 0.05 0.06 0.07 0.08 0.09 0.1 0.11 0.12 0.13 0.14 0.15 0.16 0.17


Distribution for LichenC - Ag - Faro-N
Observed Data
Lognormal Fitted Distribution
LN(0.06, 1.5, 0.02, 0.18)
35
30
25
20
15
10
5
0
0 0.02 0.04 0.06 0.08 0.1 0.12 0.14 0.16 0.18 0.2

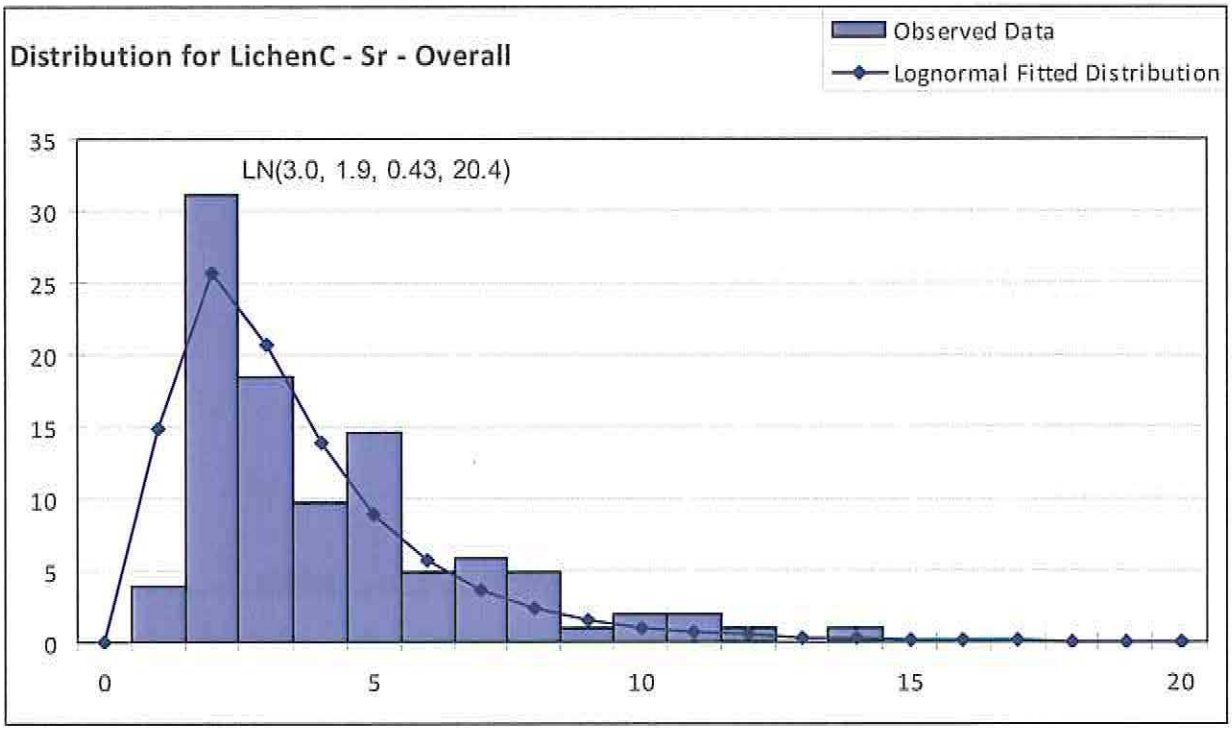

Distribution for LichenC - Ag - Faro-S
Observed Data
Lognormal Fitted Distribution
LN(0.22, 2.0, 0.03, 1.9)
25
20
15
10
5
0
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1
1.1
1.2

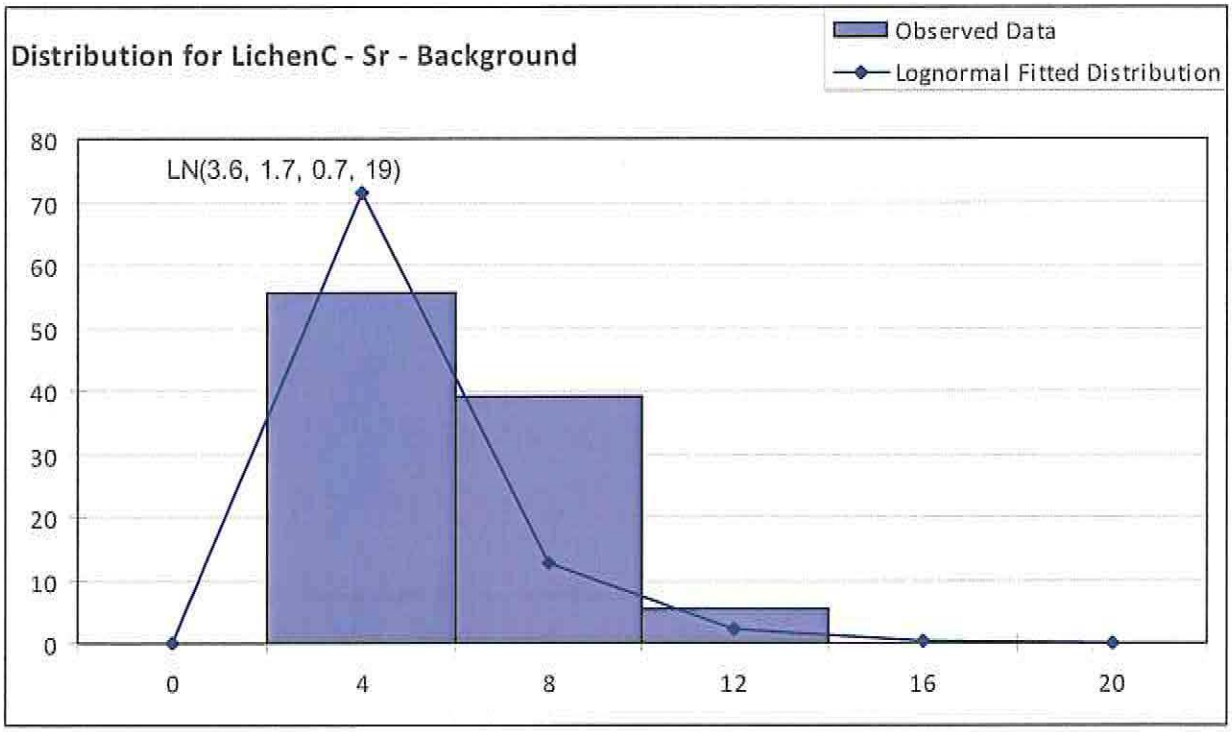

Distribution for LichenC - Ag - Faro-W
Observed Data
Lognormal Fitted Distribution
LN(0.06, 2.3, 0.005, 0.78)
20
18
16
14
12
10
8
6
4
2
0
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4

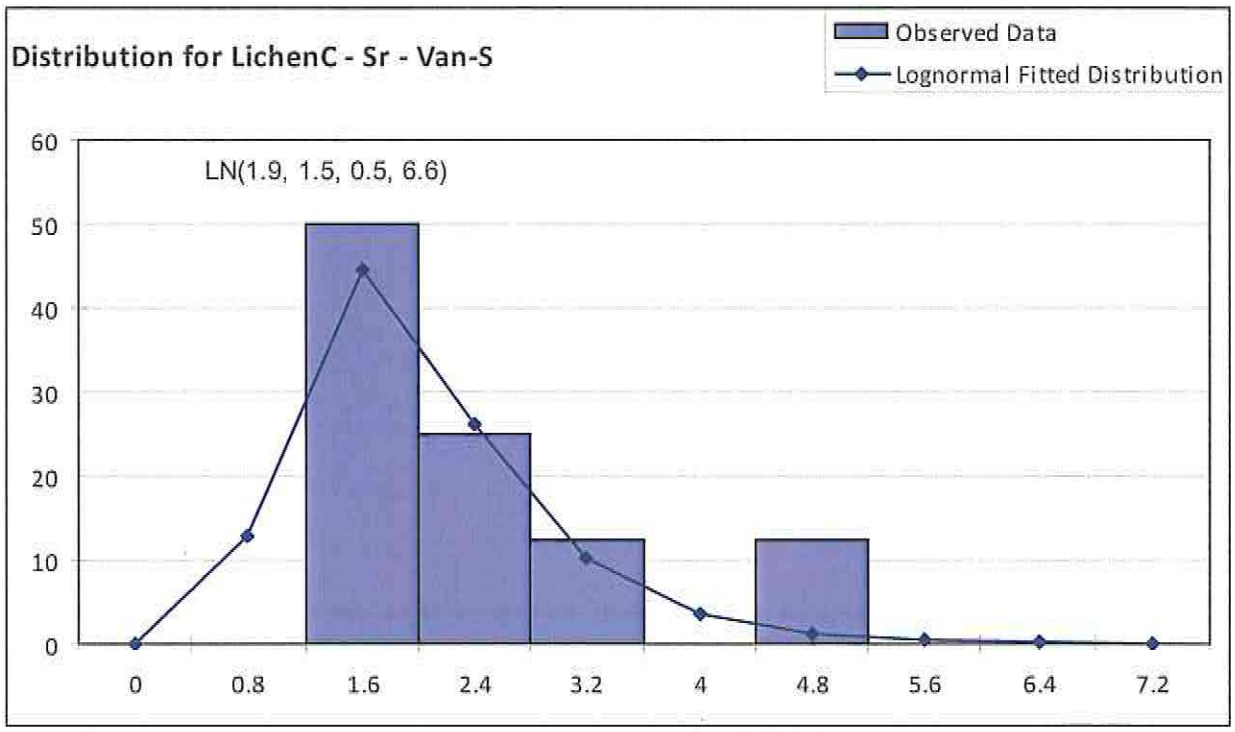

Distribution for LichenC - Ag - Faro-M
Observed Data
Lognormal Fitted Distribution
LN(0.13, 2.4, 0.009, 1.8)
50
45
40
35
30
25
20
15
10
5
0
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1
1.1
1.2
1.3
1.4

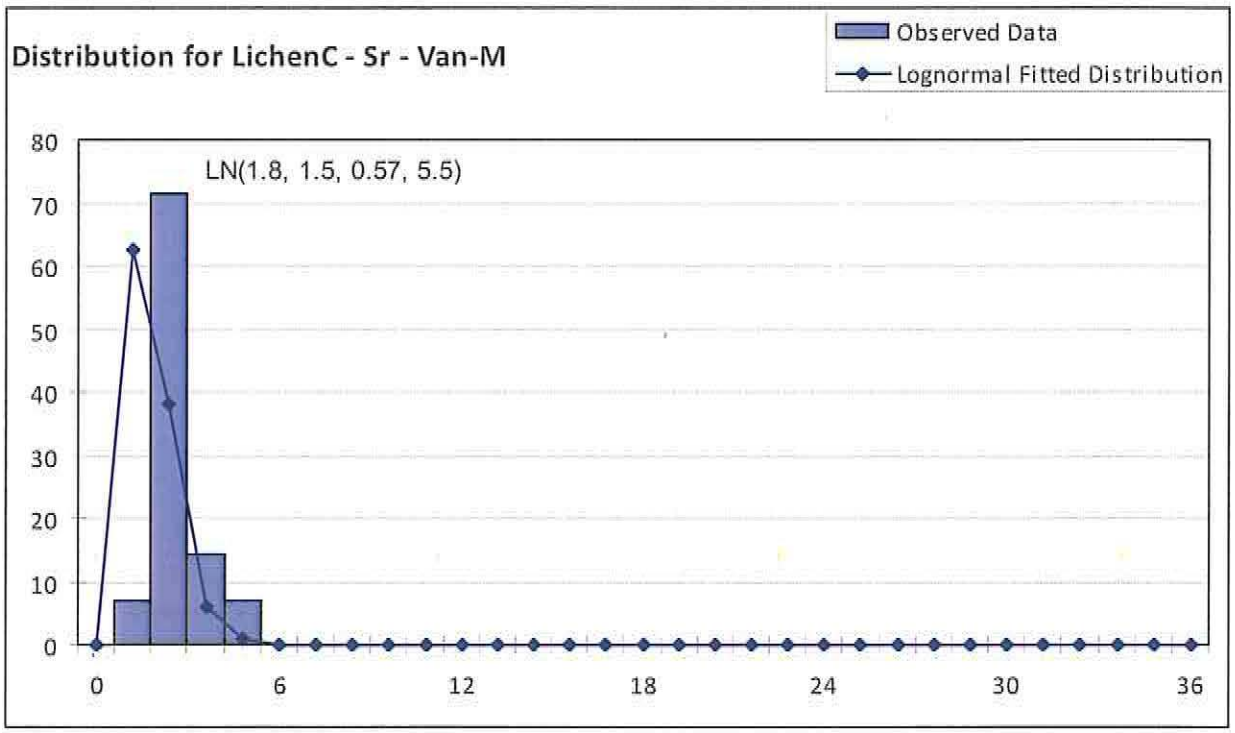

Distribution for LichenC - Ag - Sheep
Observed Data
Lognormal Fitted Distribution
LN(0.03, 1.6, 0.006, 0.11)
45
40
35
30
25
20
15
10
5
0
0
0.02
0.04
0.06
0.08
0.1
0.12
0.14
0.16
0.18
0.2
0.22
0.24

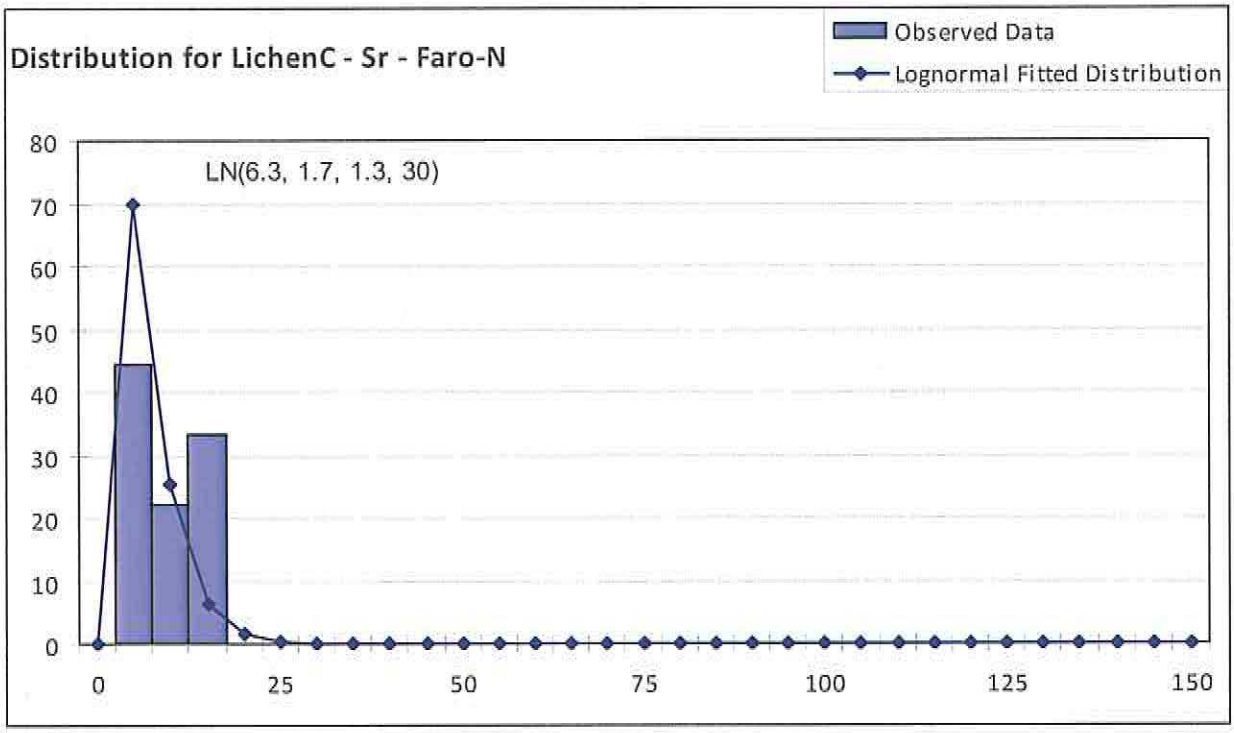
D.7.14 Strontium

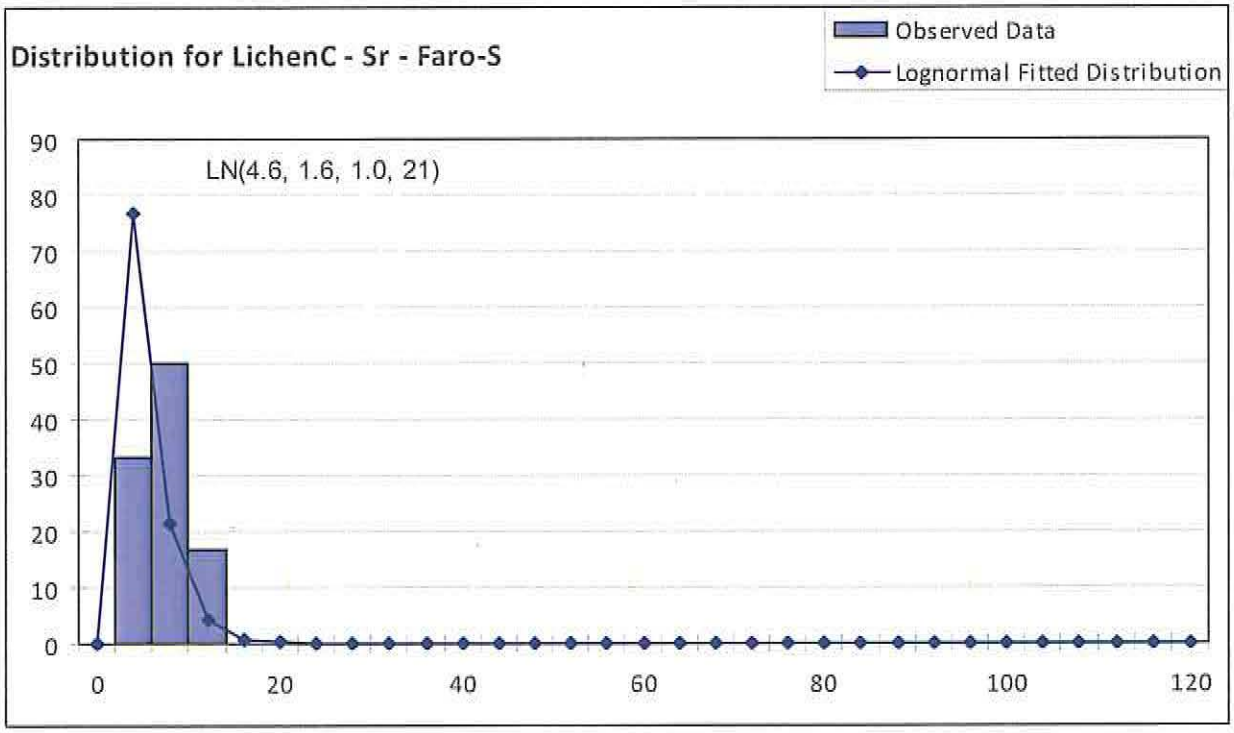


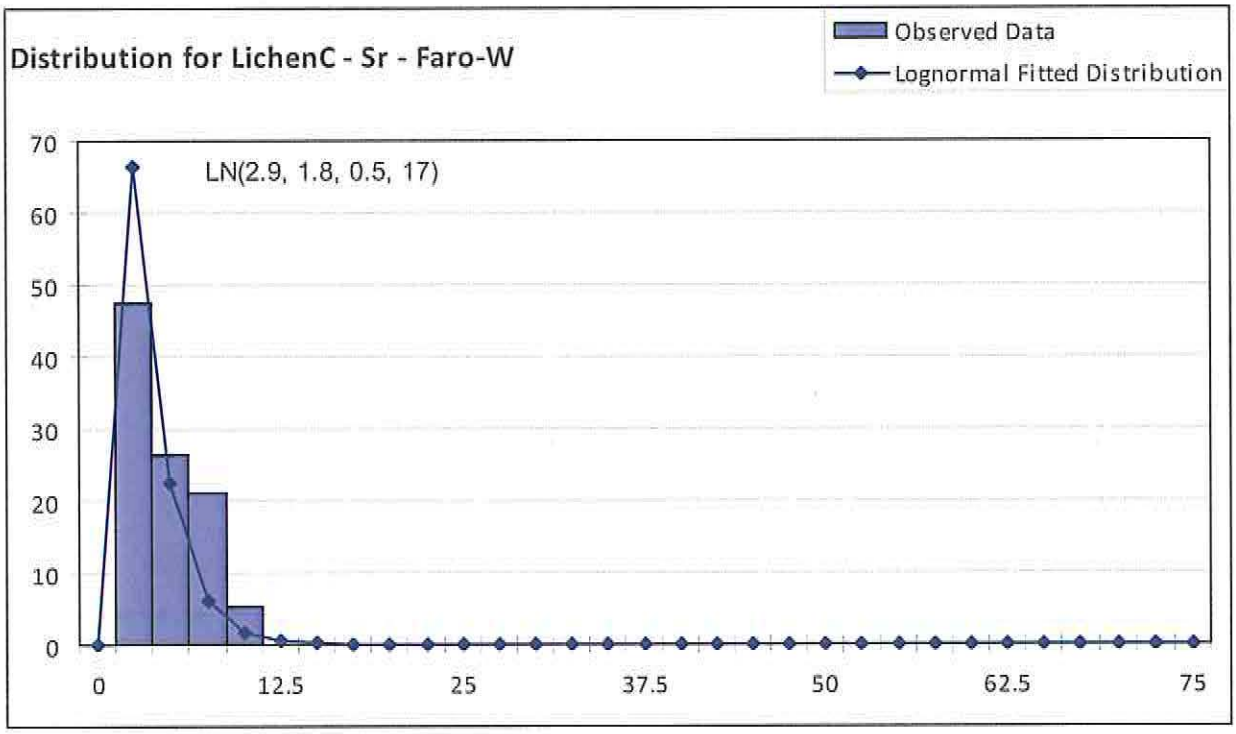


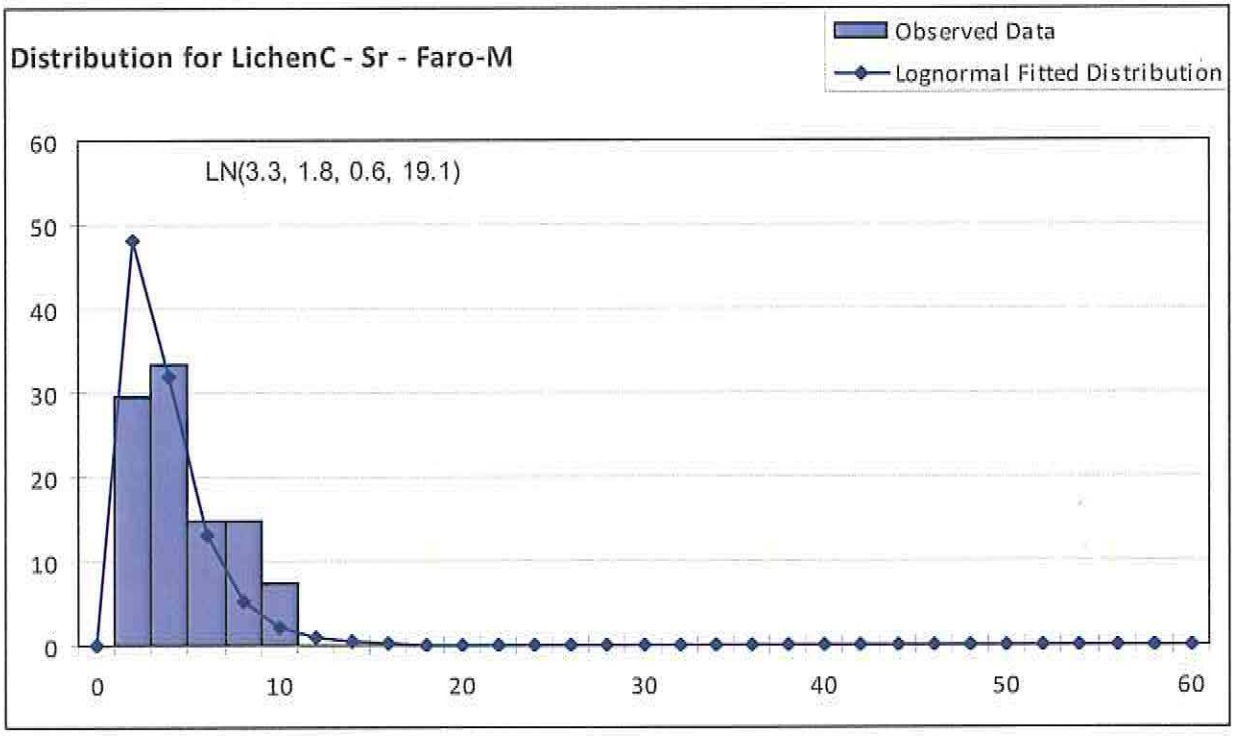

Distribution for LichenC - Sr - Van-S
Observed Data
Lognormal Fitted Distribution
LN(1.9, 1.5, 0.5, 6.6)
60
50
40
30
20
10
0
0
0.8
1.6
2.4
3.2
4
4.8
5.6
6.4
7.2

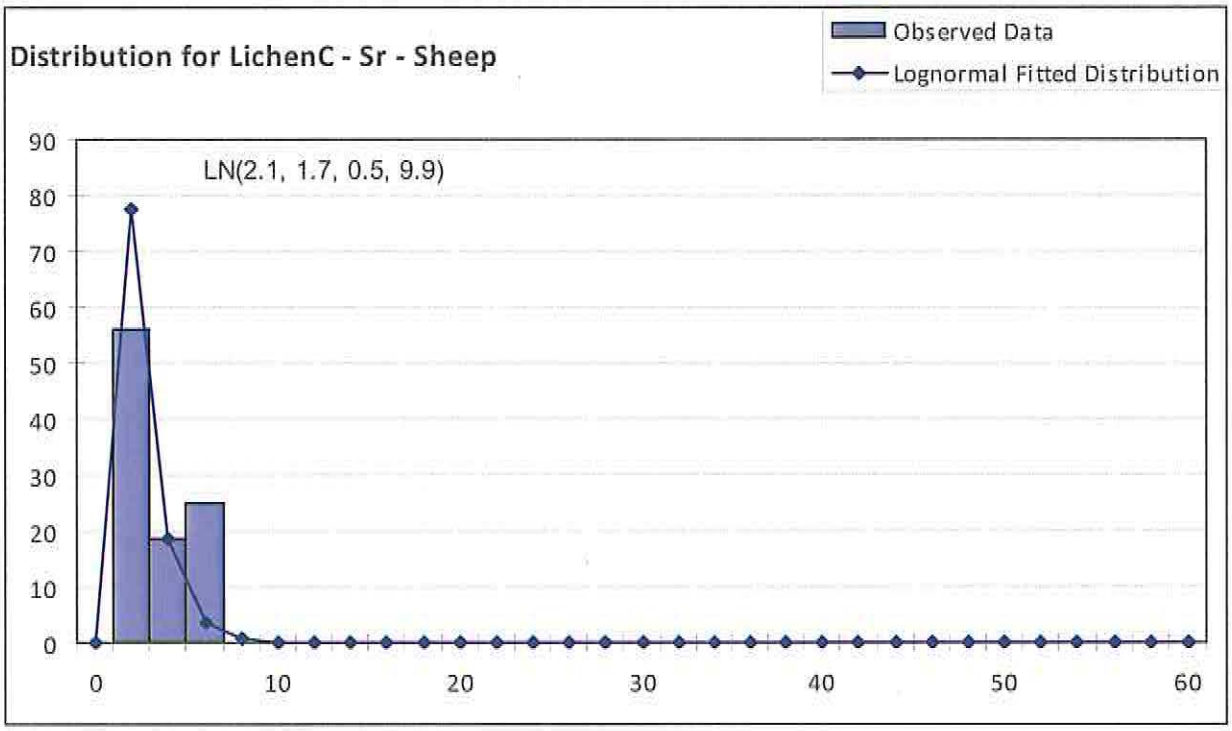

Distribution for LichenC - Sr - Van-M
Observed Data
Lognormal Fitted Distribution
LN(1.8, 1.5, 0.57, 5.5)
80
70
60
50
40
30
20
10
0
0
6
12
18
24
30
36


Distribution for LichenC - Sr - Faro-N
Observed Data
Lognormal Fitted Distribution
LN(6.3, 1.7, 1.3, 30)
80
70
60
50
40
30
20
10
0
0
25
50
75
100
125
150

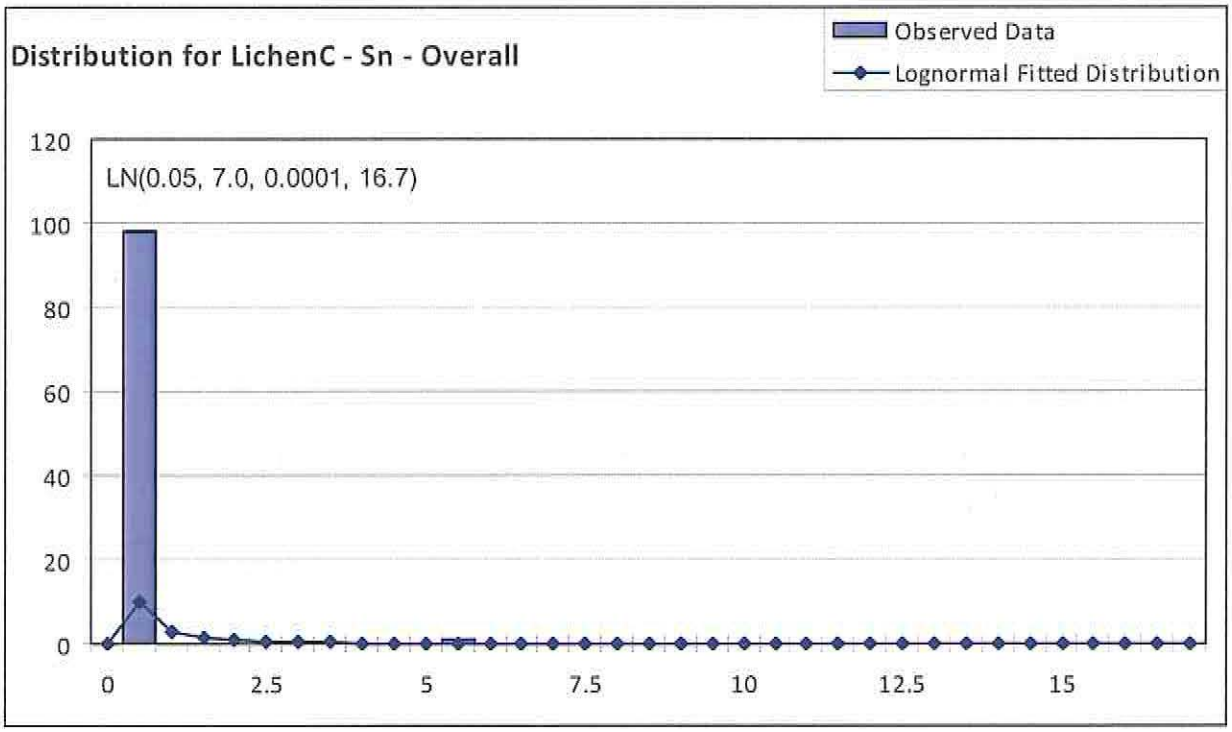

Distribution for LichenC - Sr - Faro-S
Observed Data
Lognormal Fitted Distribution
LN(4.6, 1.6, 1.0, 21)
90
80
70
60
50
40
30
20
10
0
0
20
40
60
80
100
120

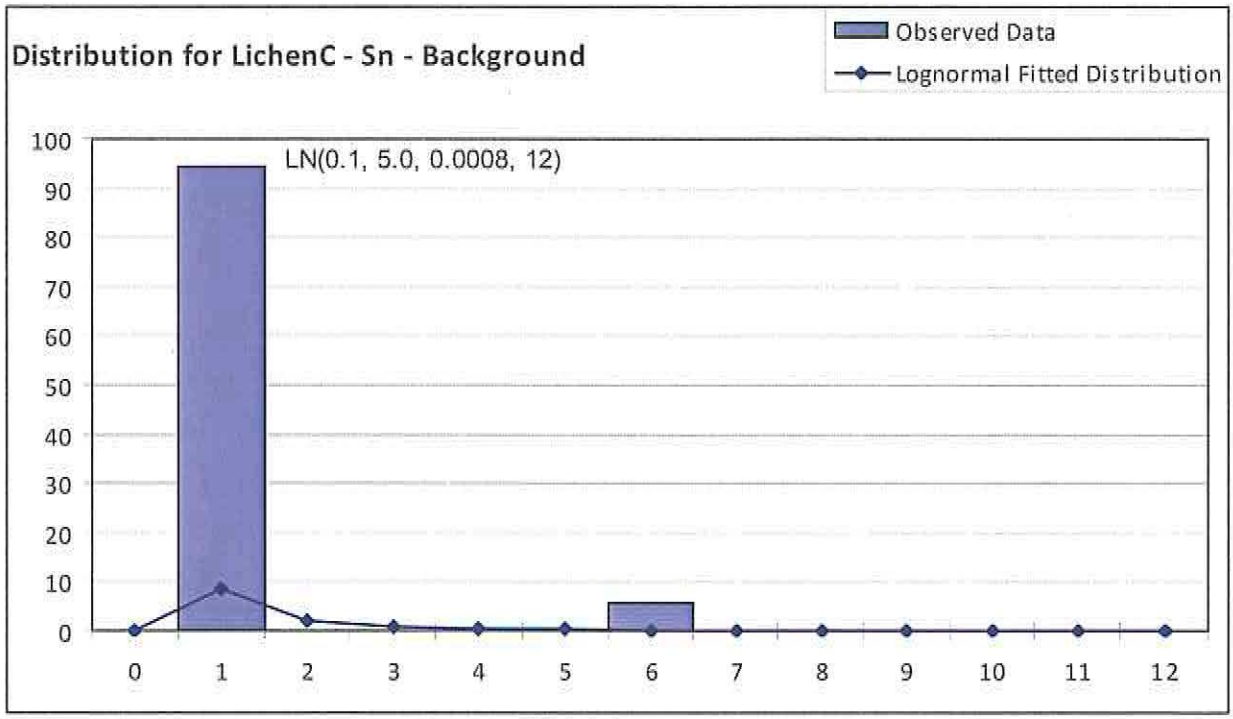

Distribution for LichenC - Sr - Faro-W
Observed Data
Lognormal Fitted Distribution
LN(2.9, 1.8, 0.5, 17)
70
60
50
40
30
20
10
0
0
12.5
25
37.5
50
62.5
75

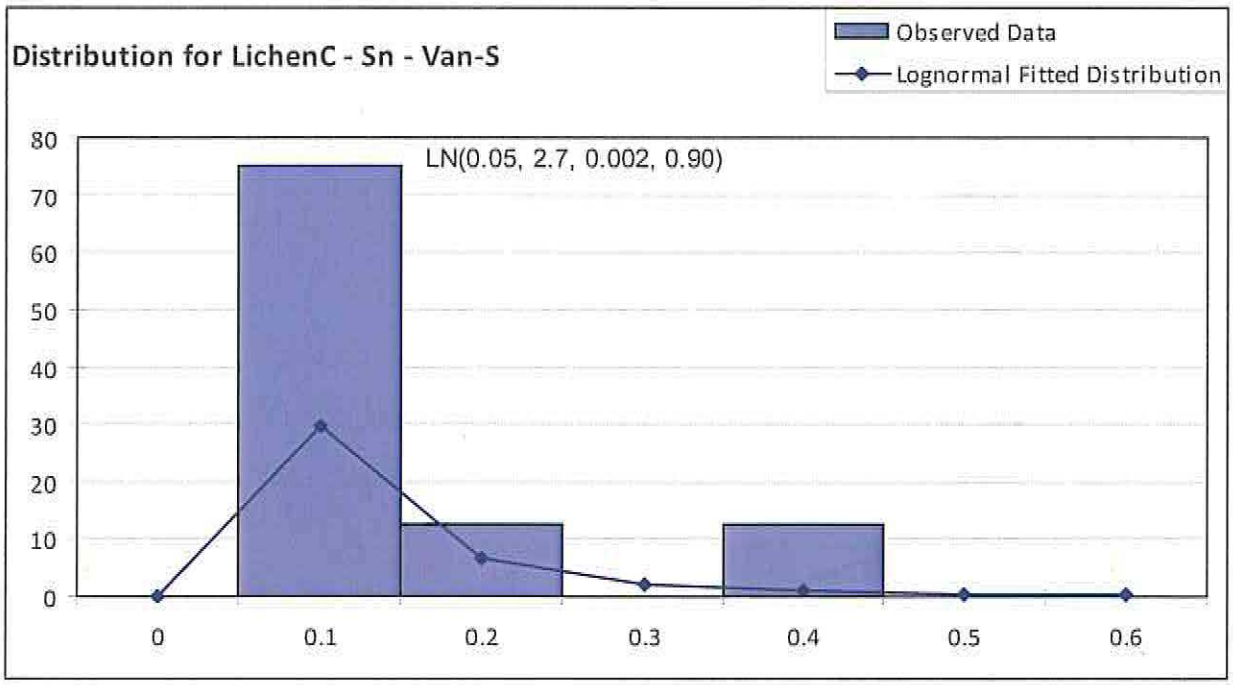

Distribution for LichenC - Sr - Faro-M
Observed Data
Lognormal Fitted Distribution
LN(3.3, 1.8, 0.6, 19.1)
60
50
40
30
20
10
0
0
10
20
30
40
50
60

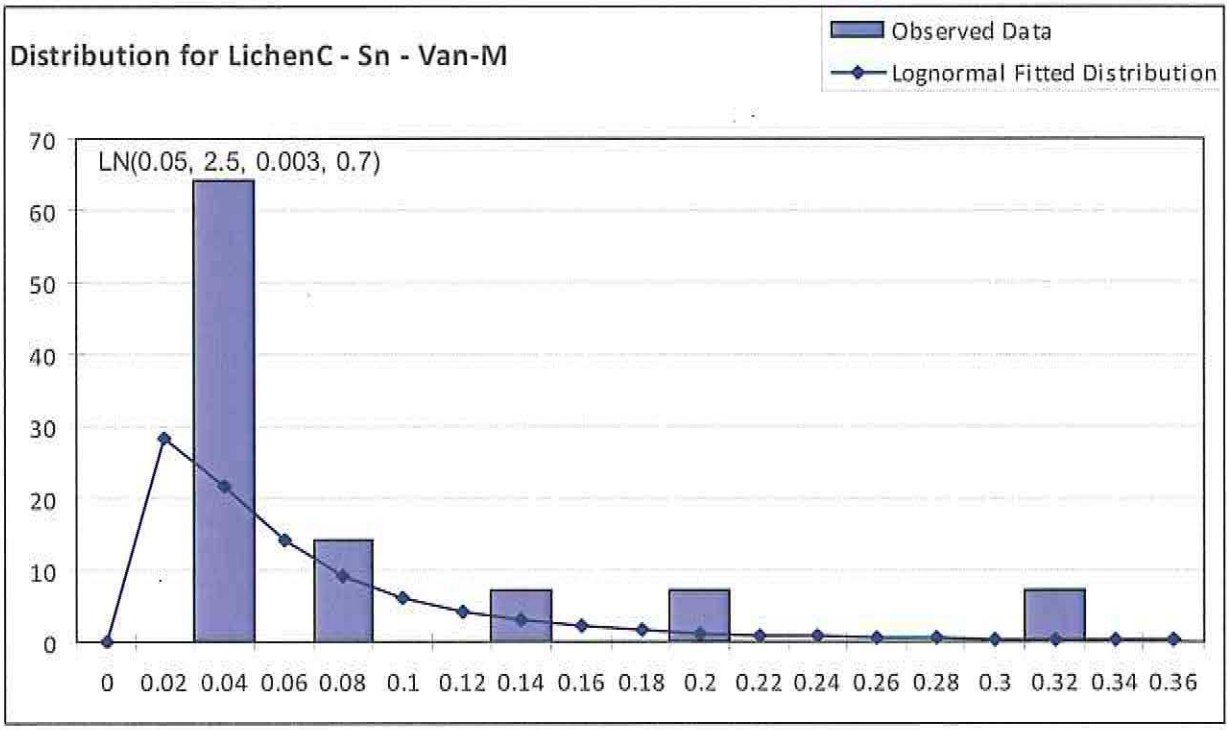

Distribution for LichenC - Sr - Sheep
Observed Data
Lognormal Fitted Distribution
LN(2.1, 1.7, 0.5, 9.9)
90
80
70
60
50
40
30
20
10
0
0
10
20
30
40
50
60

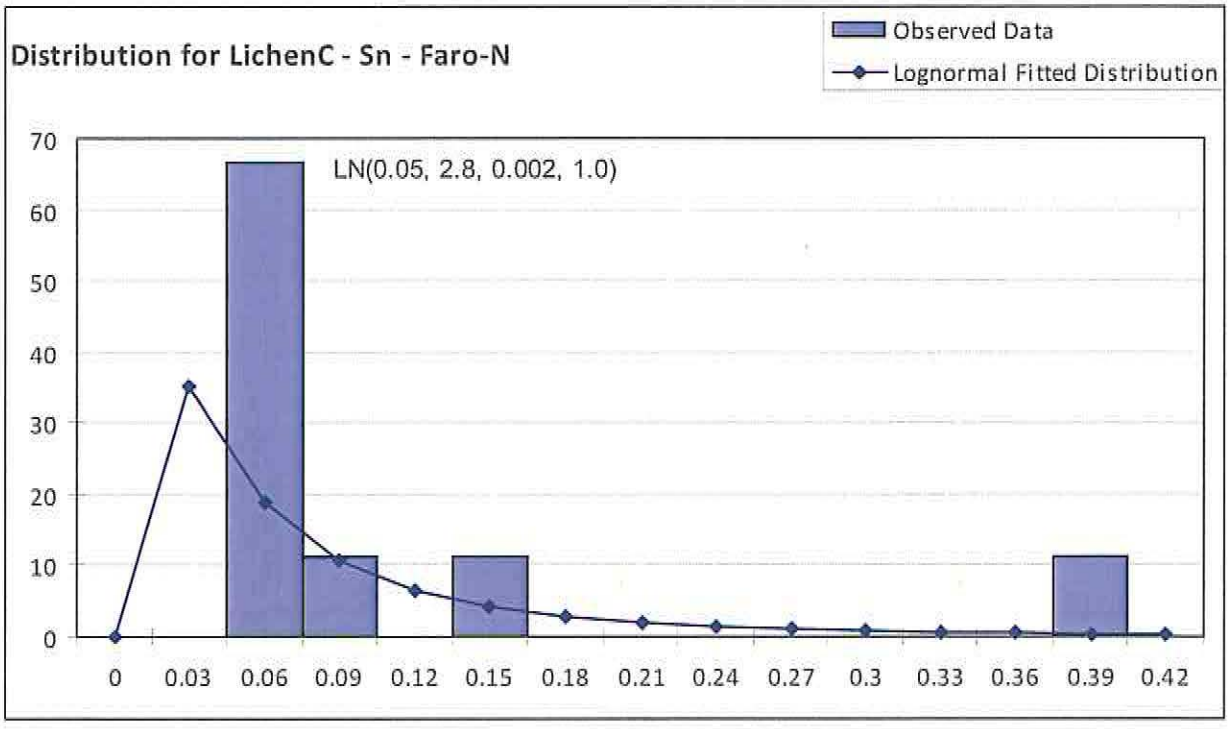
D.7.15 Tin

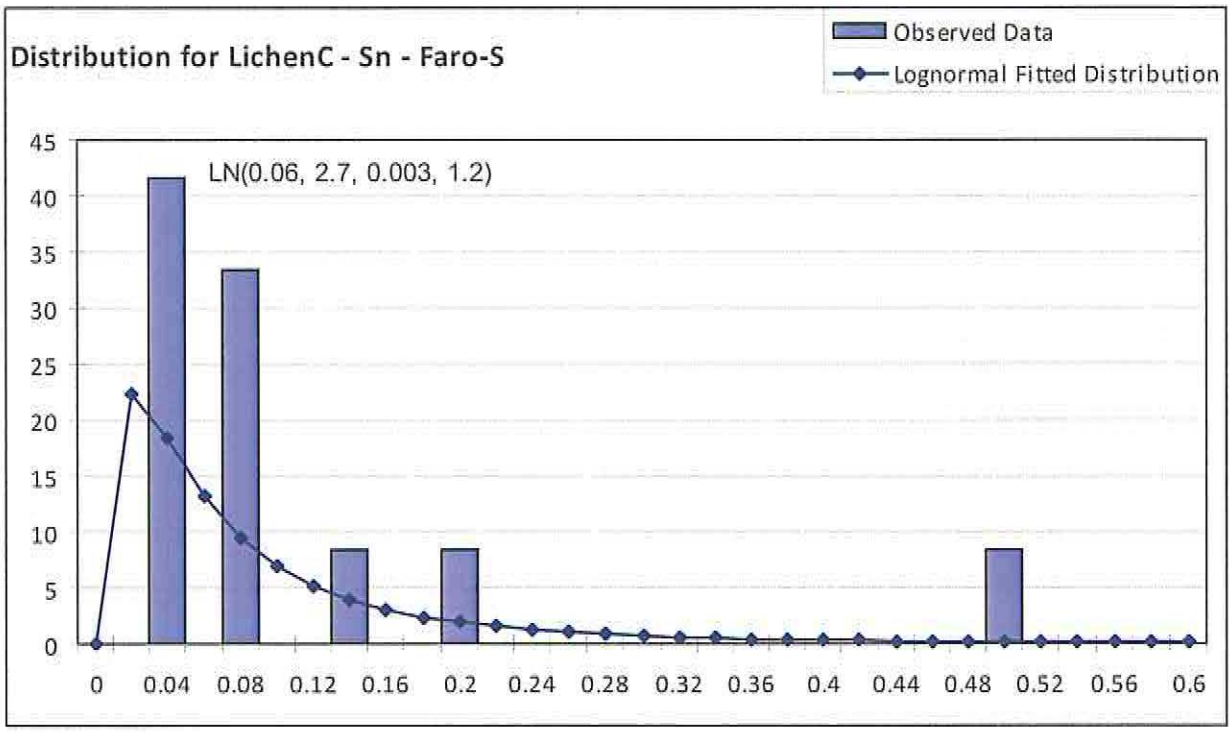

Distribution for LichenC - Sn - Overall
Observed Data
Lognormal Fitted Distribution
LN(0.05, 7.0, 0.0001, 16.7)
120
100
80
60
40
20
0
0
2.5
5
7.5
10
12.5
15

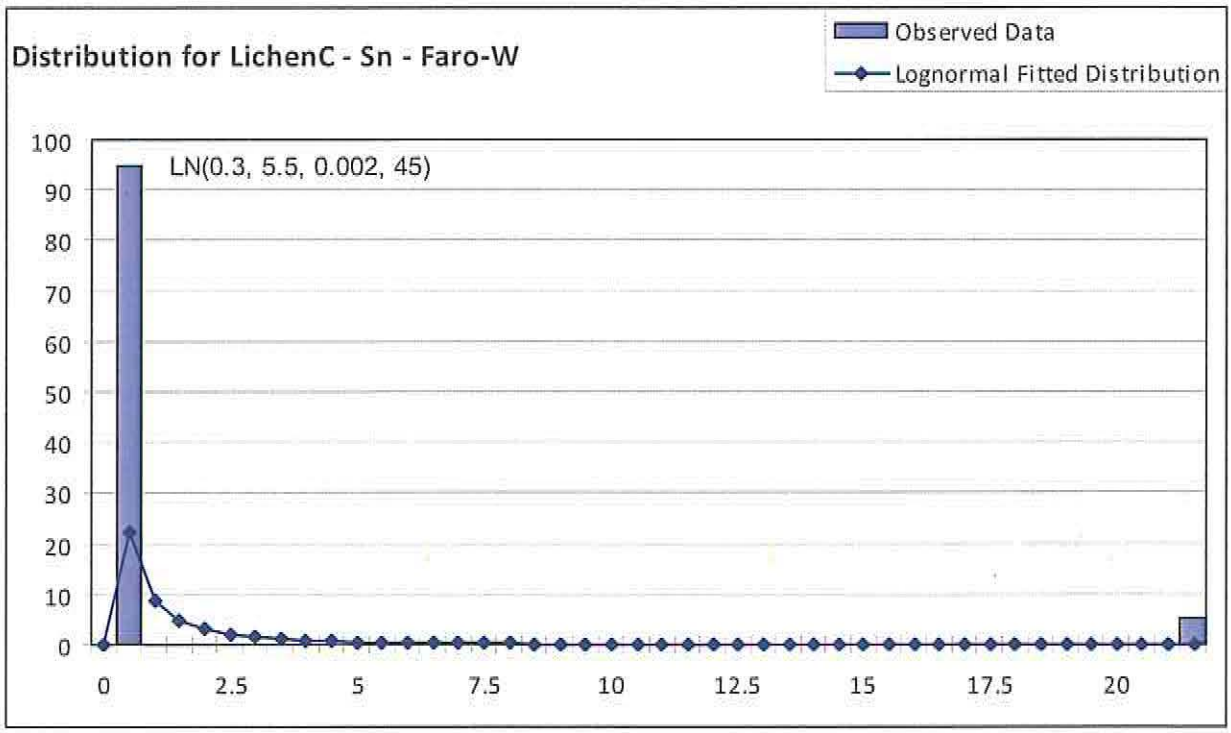

Distribution for LichenC - Sn - Background
Observed Data
Lognormal Fitted Distribution
LN(0.1, 5.0, 0.0008, 12)
100
90
80
70
60
50
40
30
20
10
0
0
1
2
3
4
5
6
7
8
9
10
11
12

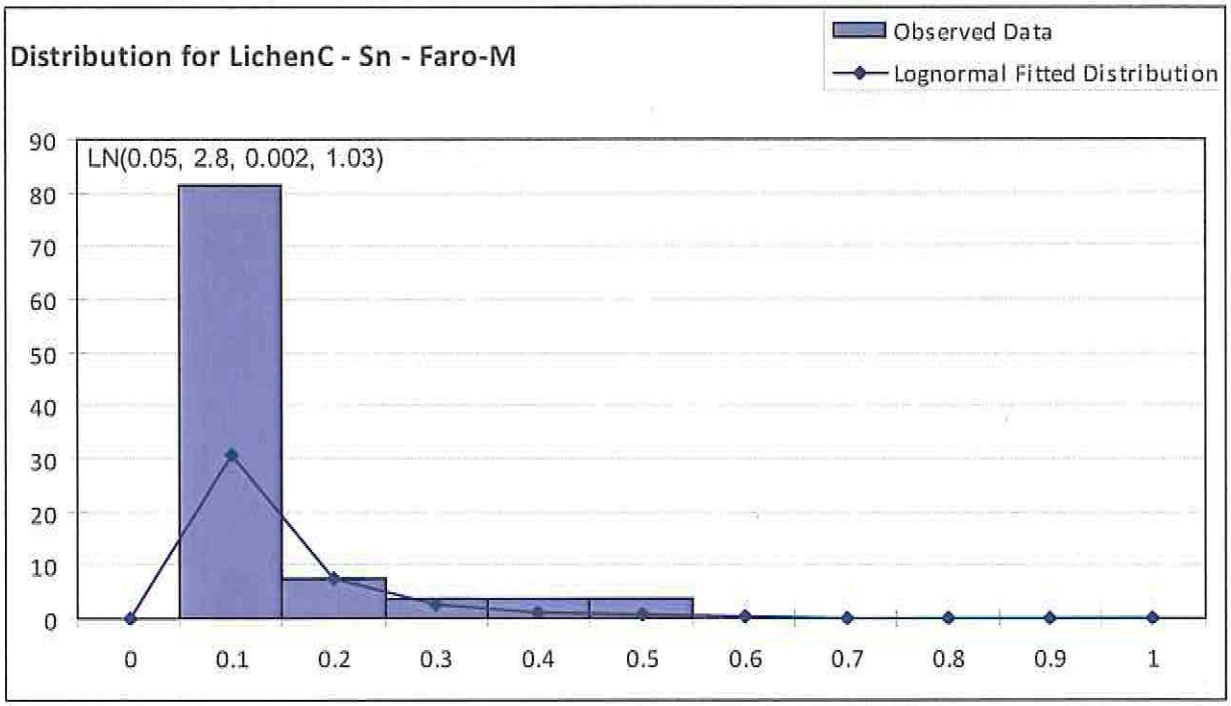

Distribution for LichenC - Sn - Van-S
Observed Data
Lognormal Fitted Distribution
LN(0.05, 2.7, 0.002, 0.90)
80
70
60
50
40
30
20
10
0
0
0.1
0.2
0.3
0.4
0.5
0.6

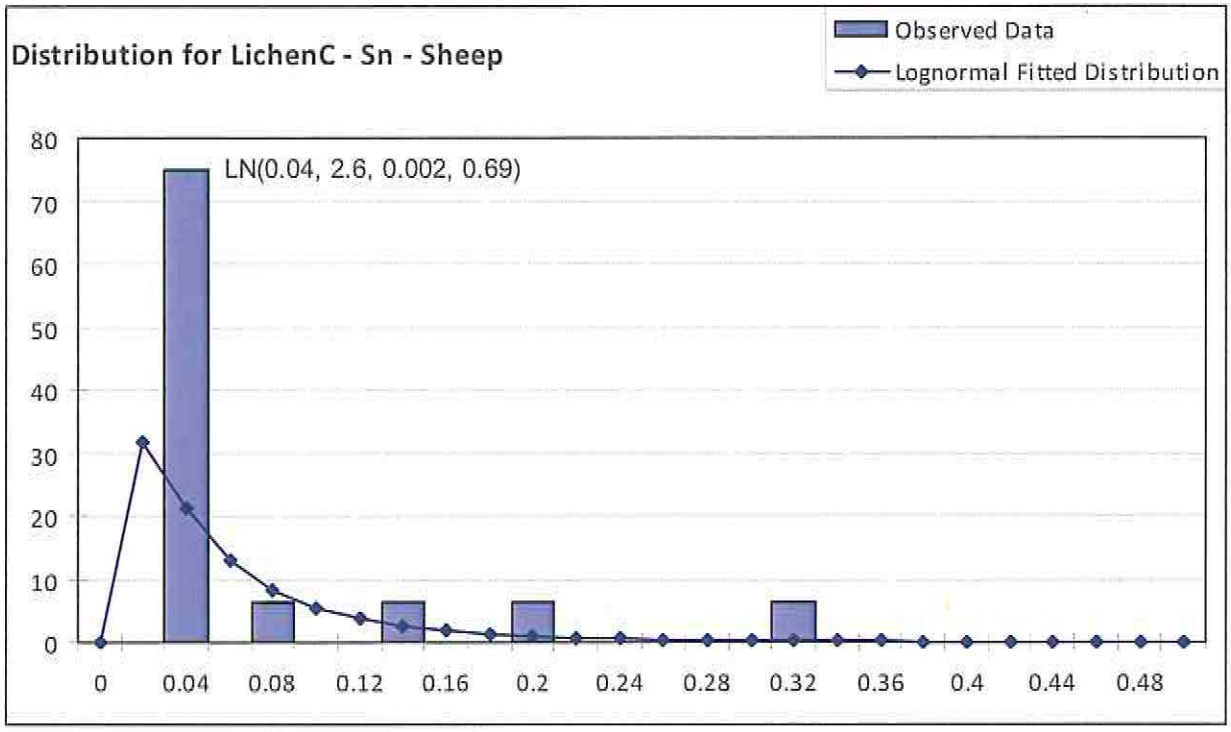

Distribution for LichenC - Sn - Van-M
Observed Data
Lognormal Fitted Distribution
LN(0.05, 2.5, 0.003, 0.7)
70
60
50
40
30
20
10
0
0 0.02 0.04 0.06 0.08 0.1 0.12 0.14 0.16 0.18 0.2 0.22 0.24 0.26 0.28 0.3 0.32 0.34 0.36


Distribution for LichenC - Sn - Faro-N
Observed Data
Lognormal Fitted Distribution
LN(0.05, 2.8, 0.002, 1.0)
70
60
50
40
30
20
10
0
0 0.03 0.06 0.09 0.12 0.15 0.18 0.21 0.24 0.27 0.3 0.33 0.36 0.39 0.42

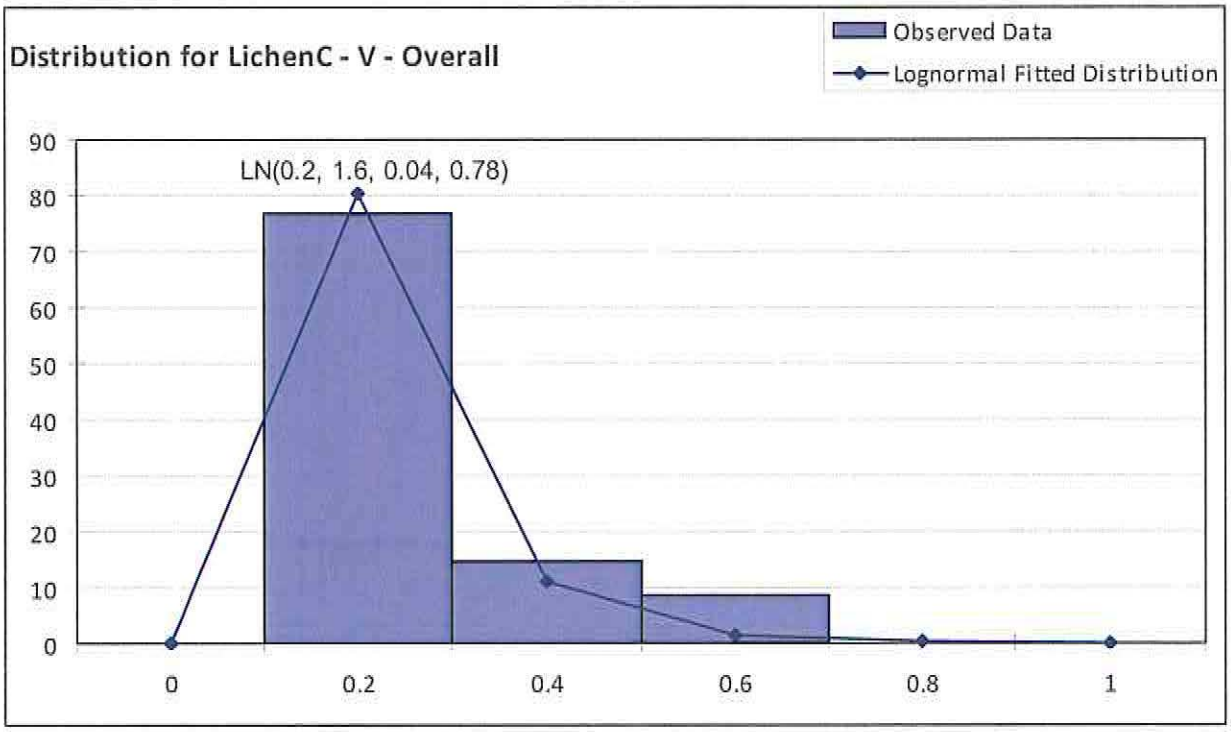

Distribution for LichenC - Sn - Faro-S
Observed Data
Lognormal Fitted Distribution
LN(0.06, 2.7, 0.003, 1.2)
45
40
35
30
25
20
15
10
5
0
0
0.04
0.08
0.12
0.16
0.2
0.24
0.28
0.32
0.36
0.4
0.44
0.48
0.52
0.56
0.6

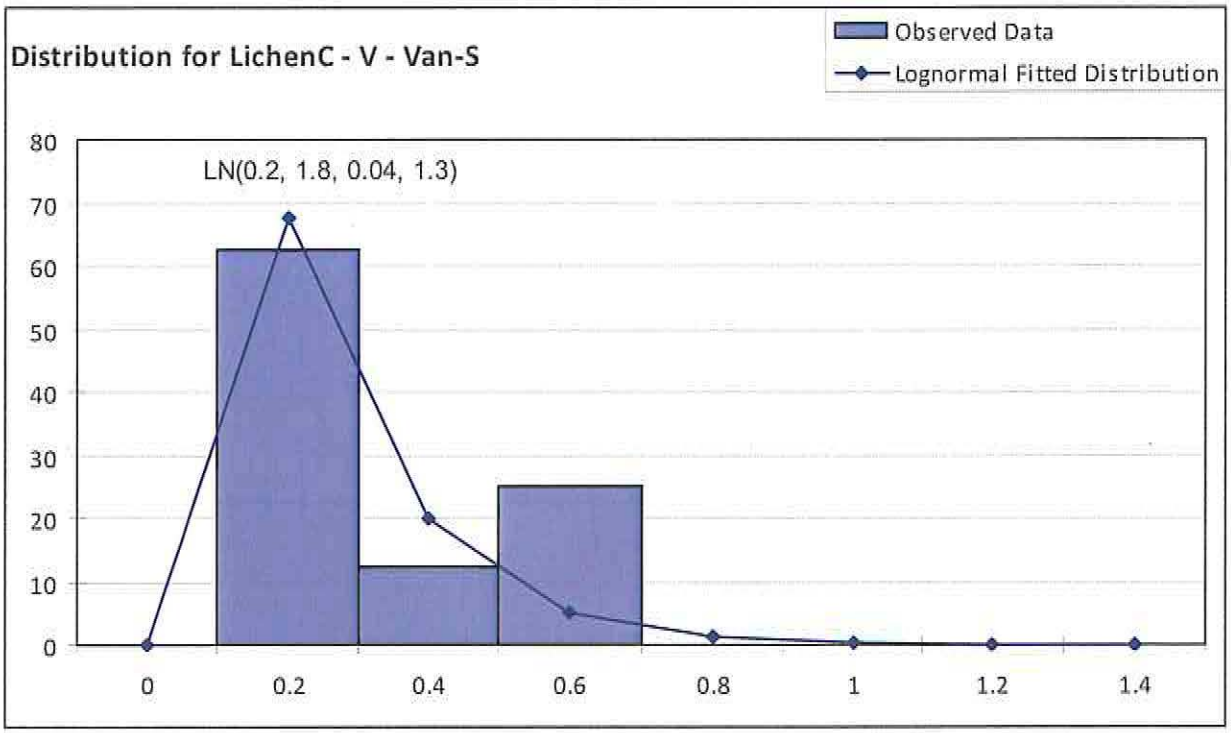

Distribution for LichenC - Sn - Faro-W
Observed Data
Lognormal Fitted Distribution
LN(0.3, 5.5, 0.002, 45)
100
90
80
70
60
50
40
30
20
10
0
0
2.5
5
7.5
10
12.5
15
17.5
20

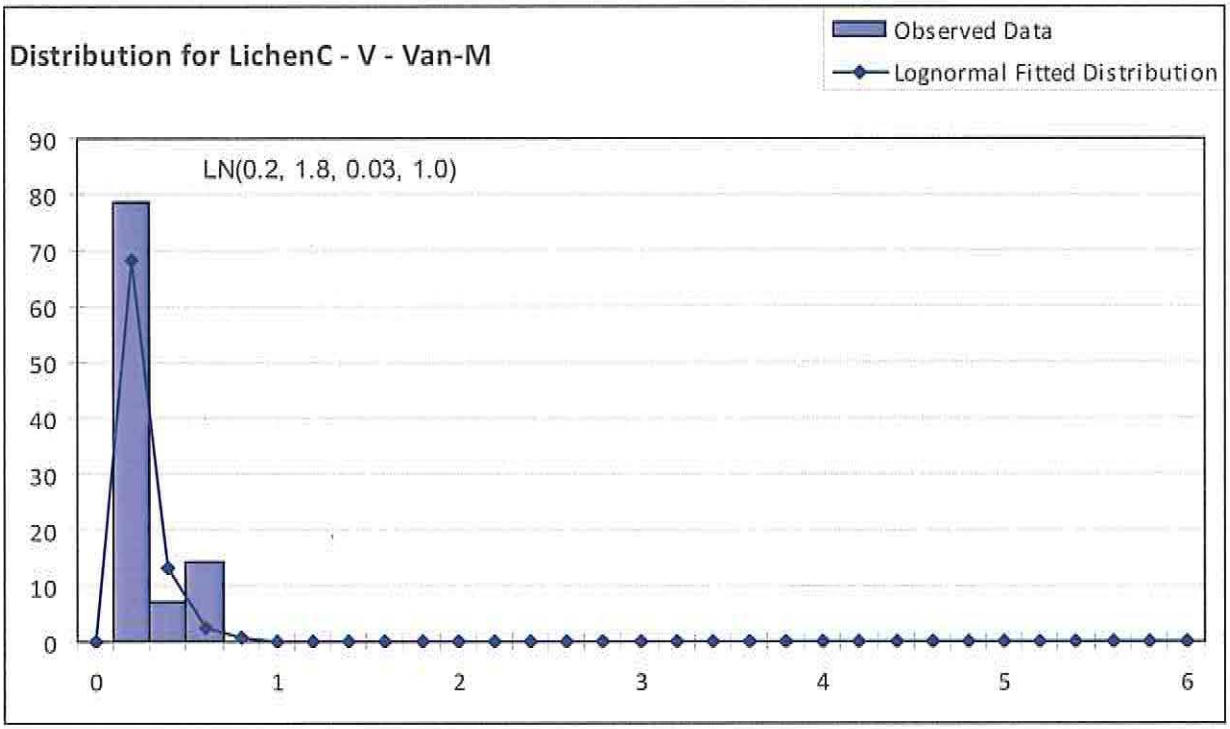

Distribution for LichenC - Sn - Faro-M
Observed Data
Lognormal Fitted Distribution
LN(0.05, 2.8, 0.002, 1.03)
90
80
70
60
50
40
30
20
10
0
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1

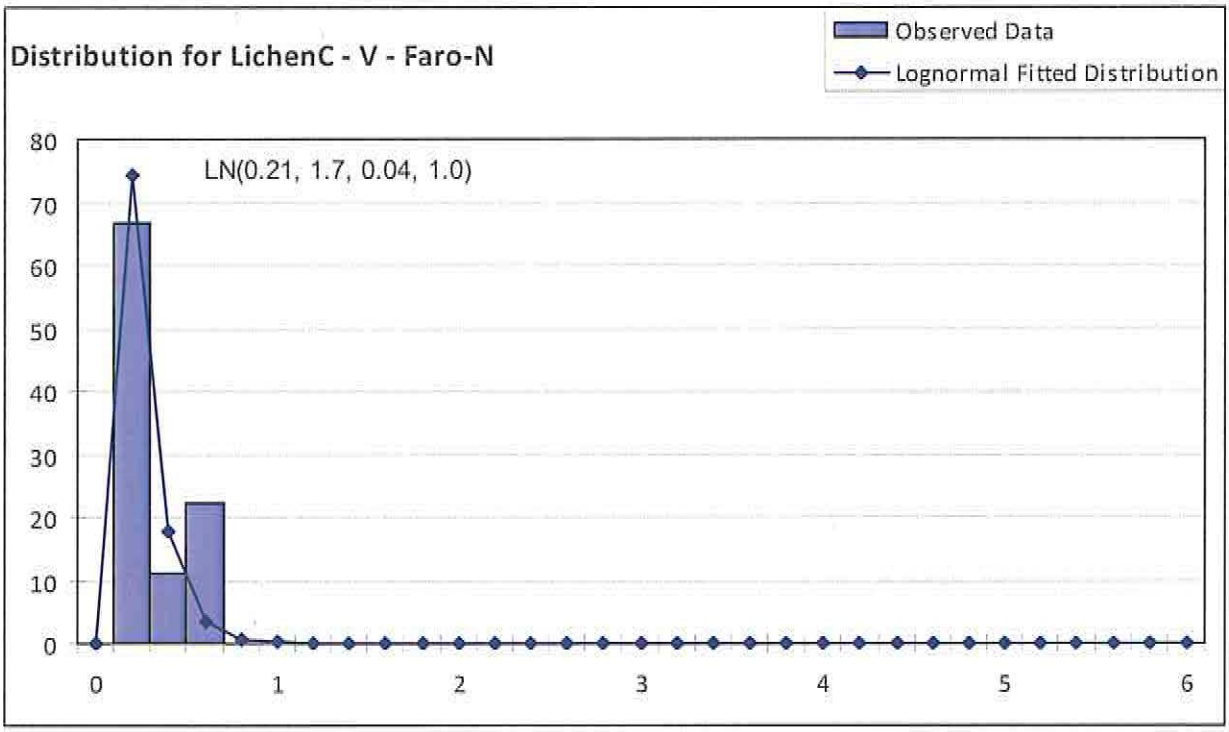

Distribution for LichenC - Sn - Sheep
Observed Data
Lognormal Fitted Distribution
LN(0.04, 2.6, 0.002, 0.69)
80
70
60
50
40
30
20
10
0
0
0.04
0.08
0.12
0.16
0.2
0.24
0.28
0.32
0.36
0.4
0.44
0.48

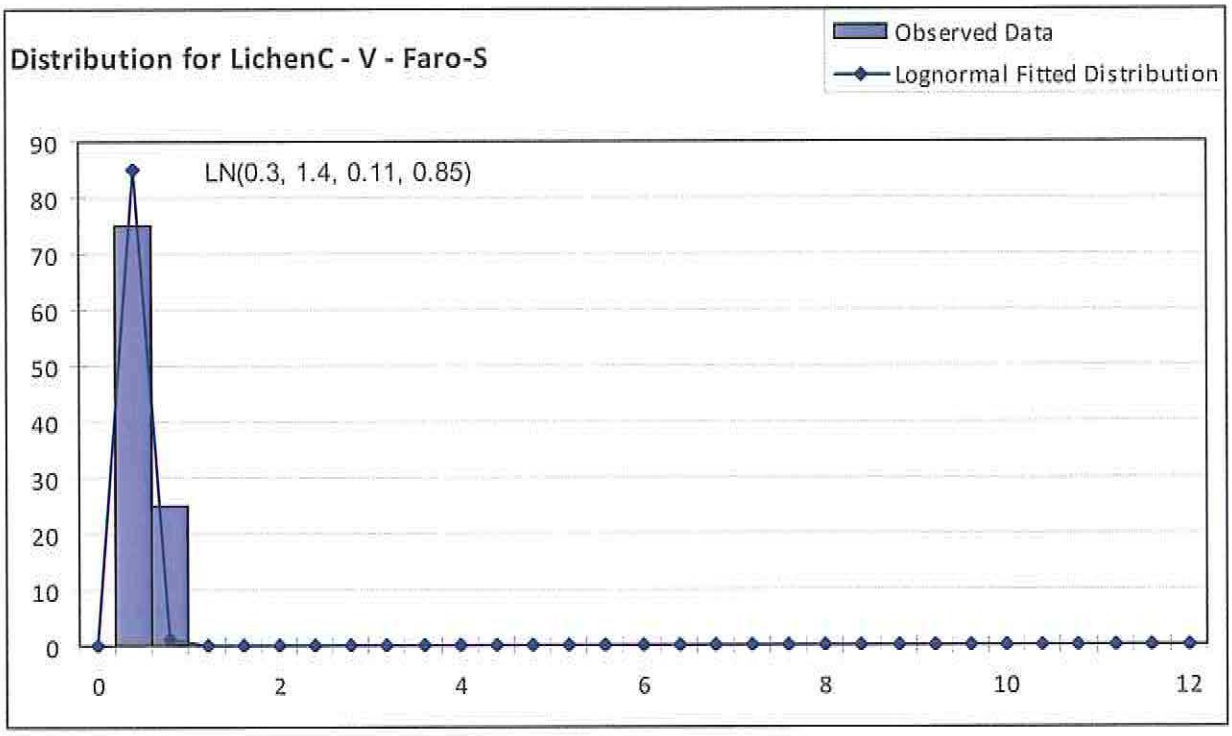
D.7.16 Vanadium

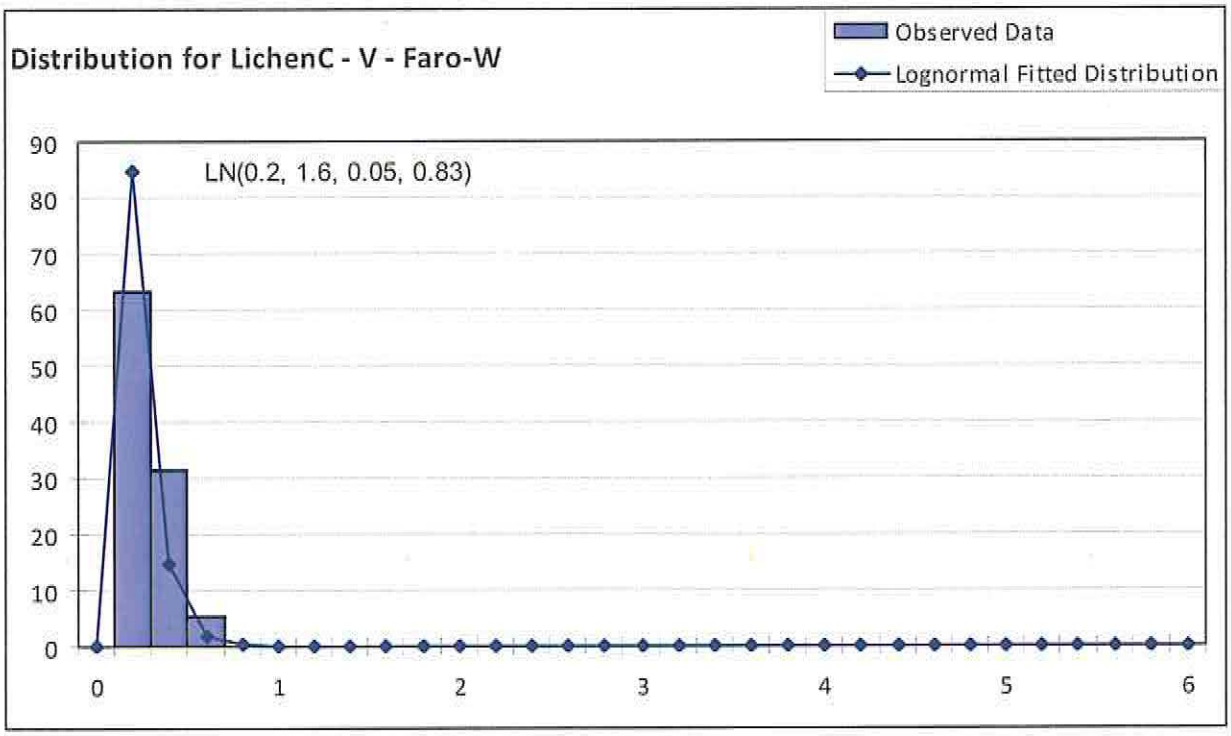


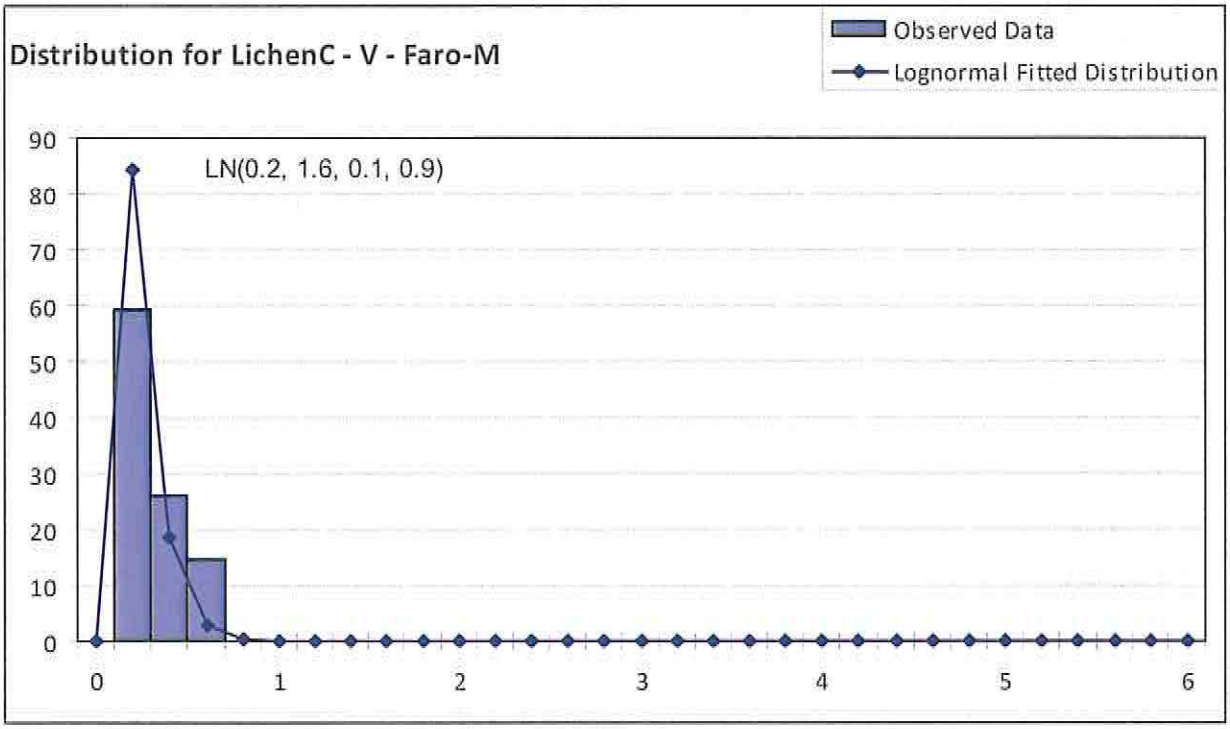



Distribution for LichenC - V - Van-M
Observed Data
Lognormal Fitted Distribution
LN(0.2, 1.8, 0.03, 1.0)
90
80
70
60
50
40
30
20
10
0
0
1
2
3
4
5
6

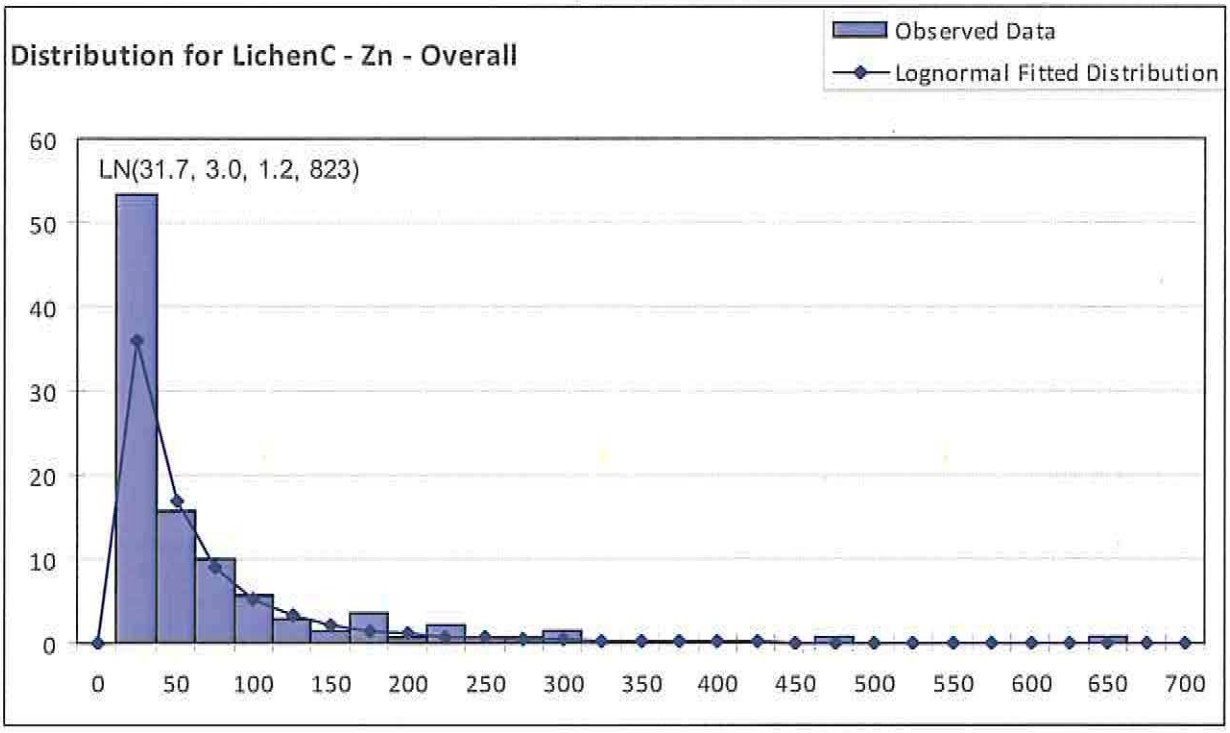

Distribution for LichenC - V - Faro-N
Observed Data
Lognormal Fitted Distribution
LN(0.21, 1.7, 0.04, 1.0)
80
70
60
50
40
30
20
10
0
0
1
2
3
4
5
6

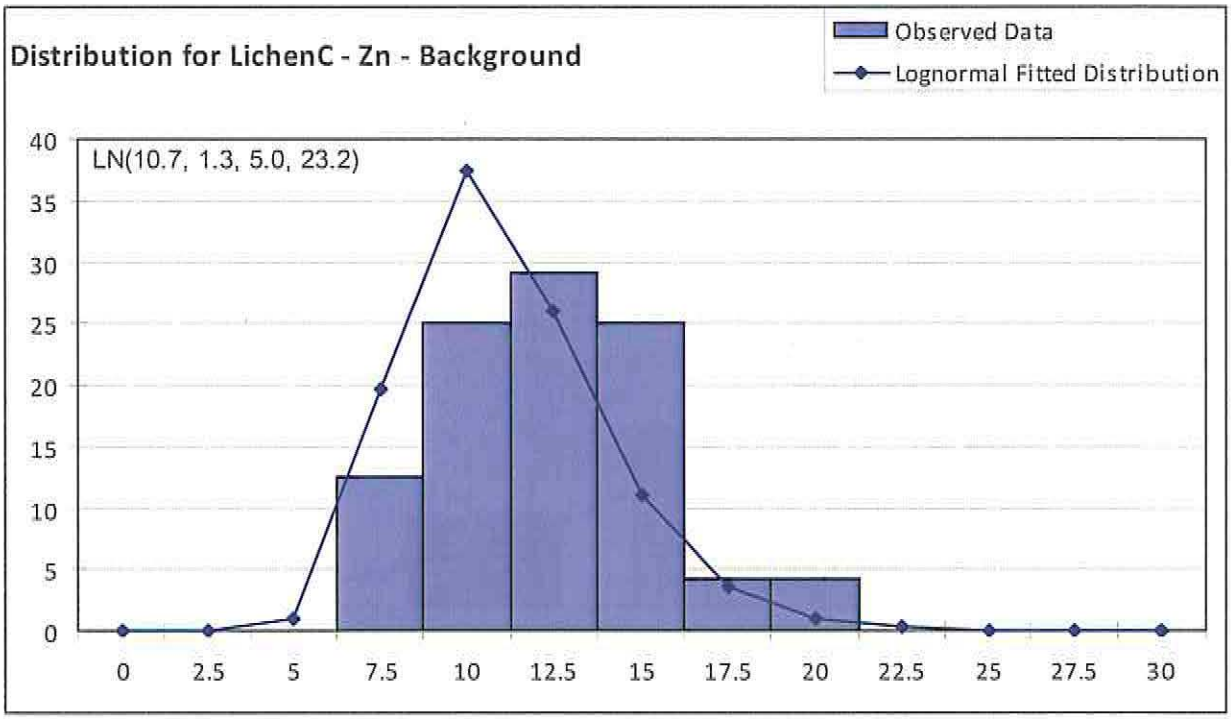

Distribution for LichenC - V - Faro-S
Observed Data
Lognormal Fitted Distribution
LN(0.3, 1.4, 0.11, 0.85)
90
80
70
60
50
40
30
20
10
0
0
2
4
6
8
10
12

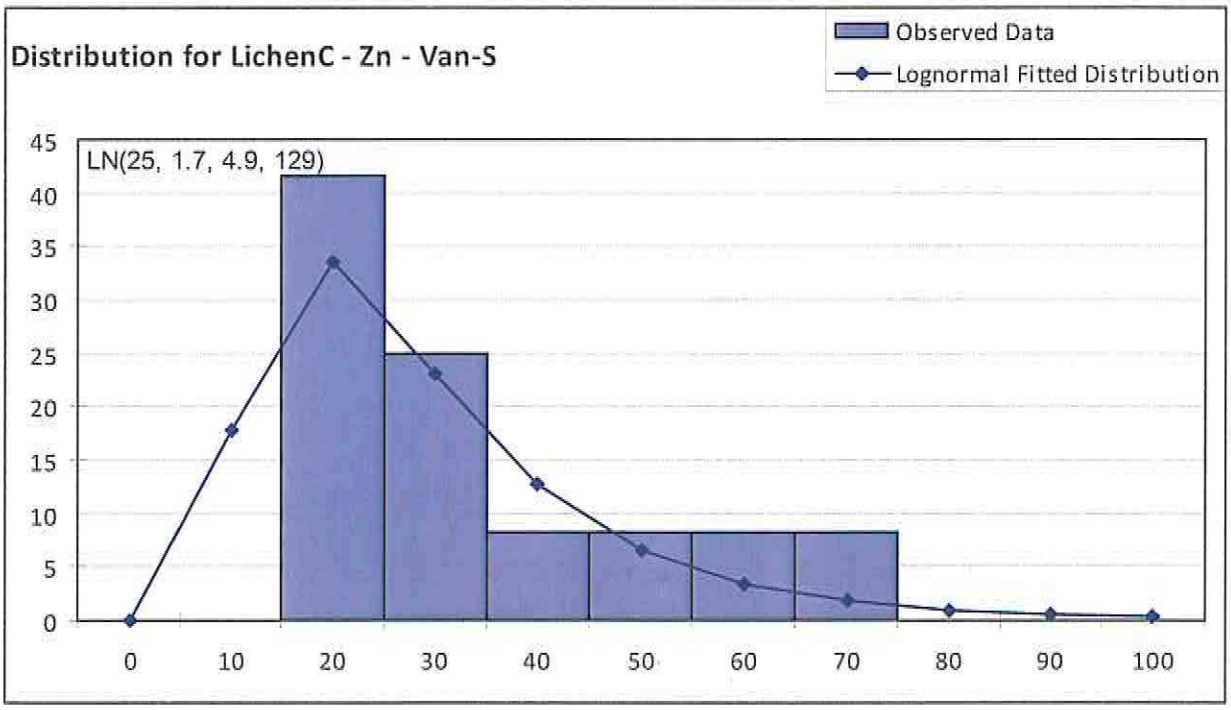

Distribution for LichenC - V - Faro-W
Observed Data
Lognormal Fitted Distribution
LN(0.2, 1.6, 0.05, 0.83)
90
80
70
60
50
40
30
20
10
0
0
1
2
3
4
5
6

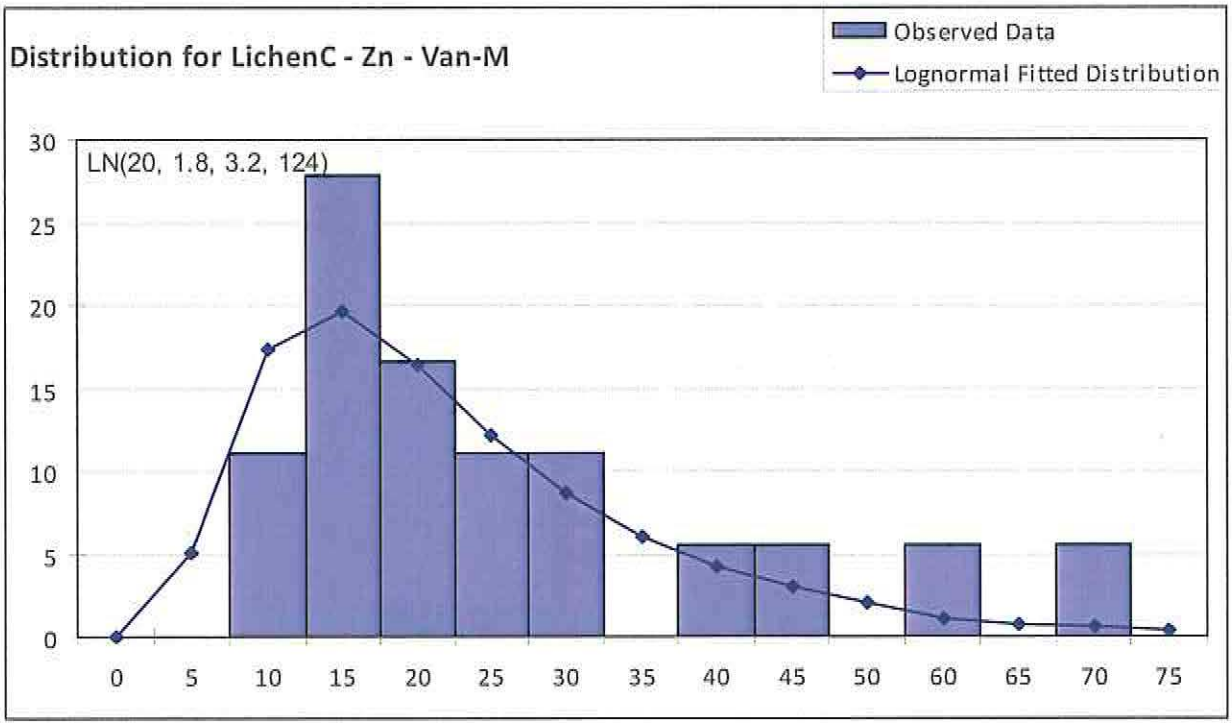

Distribution for LichenC - V - Faro-M
Observed Data
Lognormal Fitted Distribution
LN(0.2, 1.6, 0.1, 0.9)
90
80
70
60
50
40
30
20
10
0
0
1
2
3
4
5
6

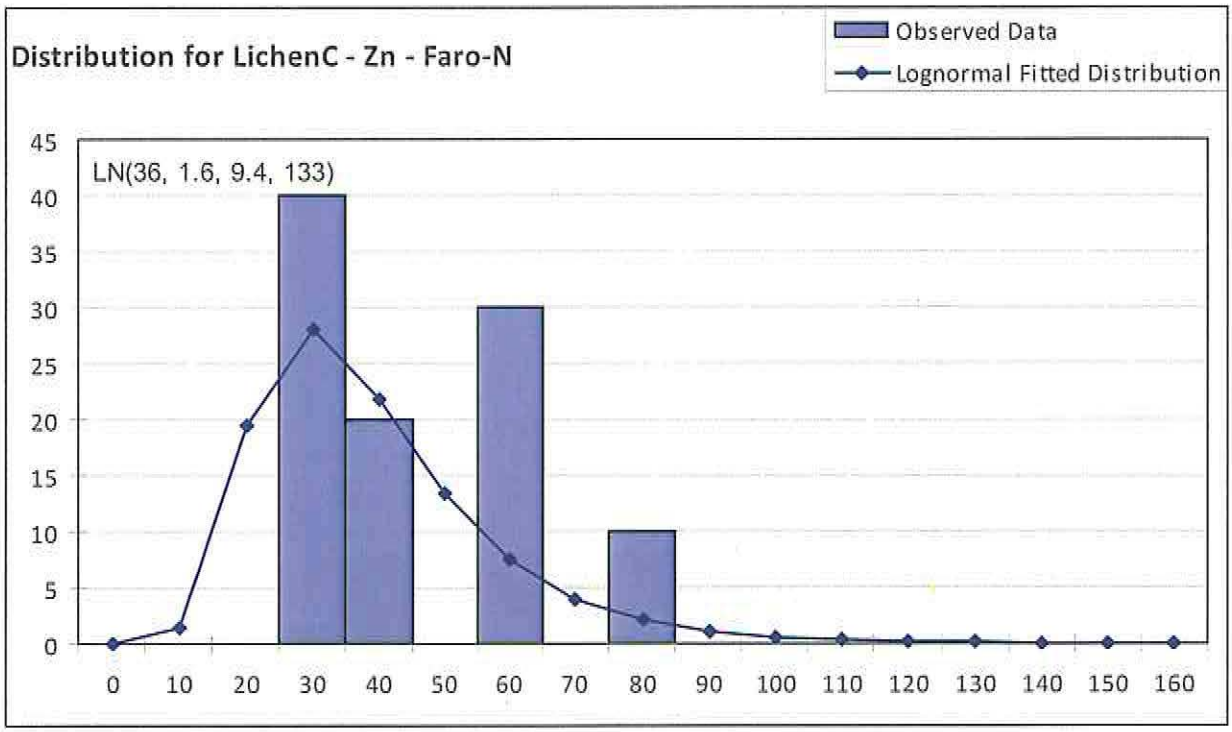
D.7.17 Zinc

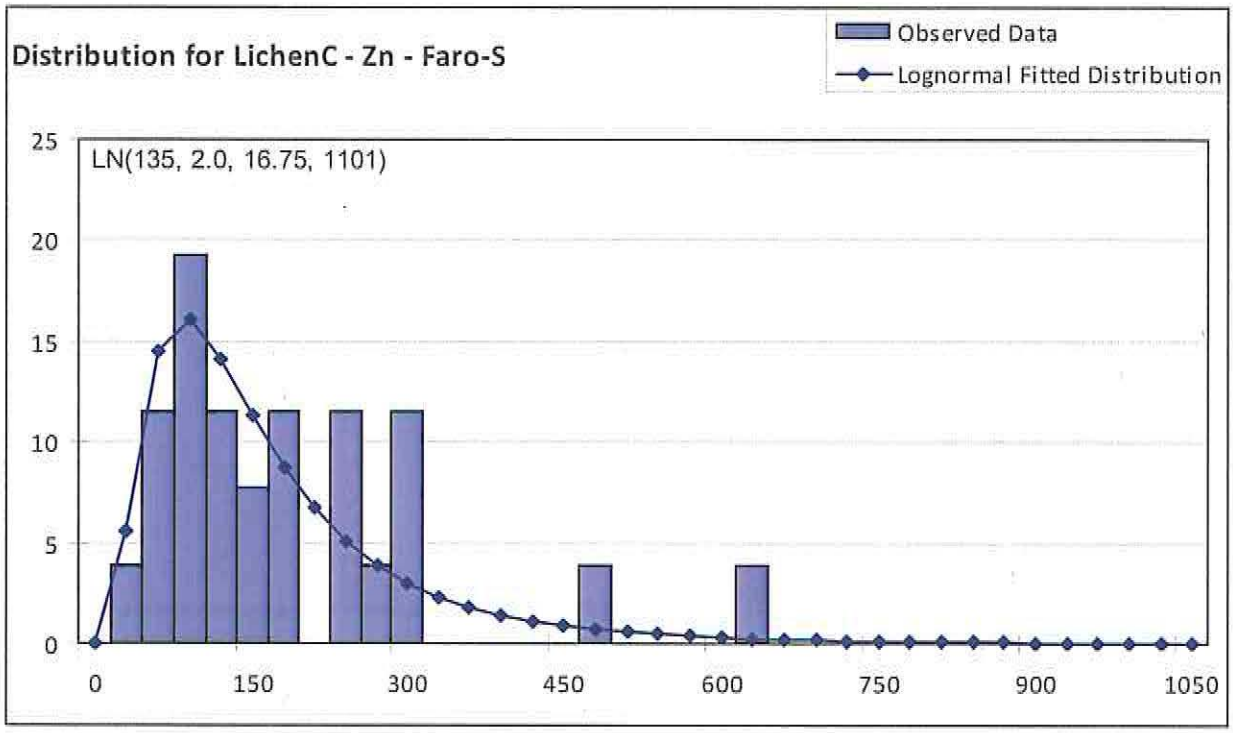

Distribution for LichenC - Zn - Overall
Observed Data
Lognormal Fitted Distribution
LN(31.7, 3.0, 1.2, 823)
60
50
40
30
20
10
0
0
50
100
150
200
250
300
350
400
450
500
550
600
650
700

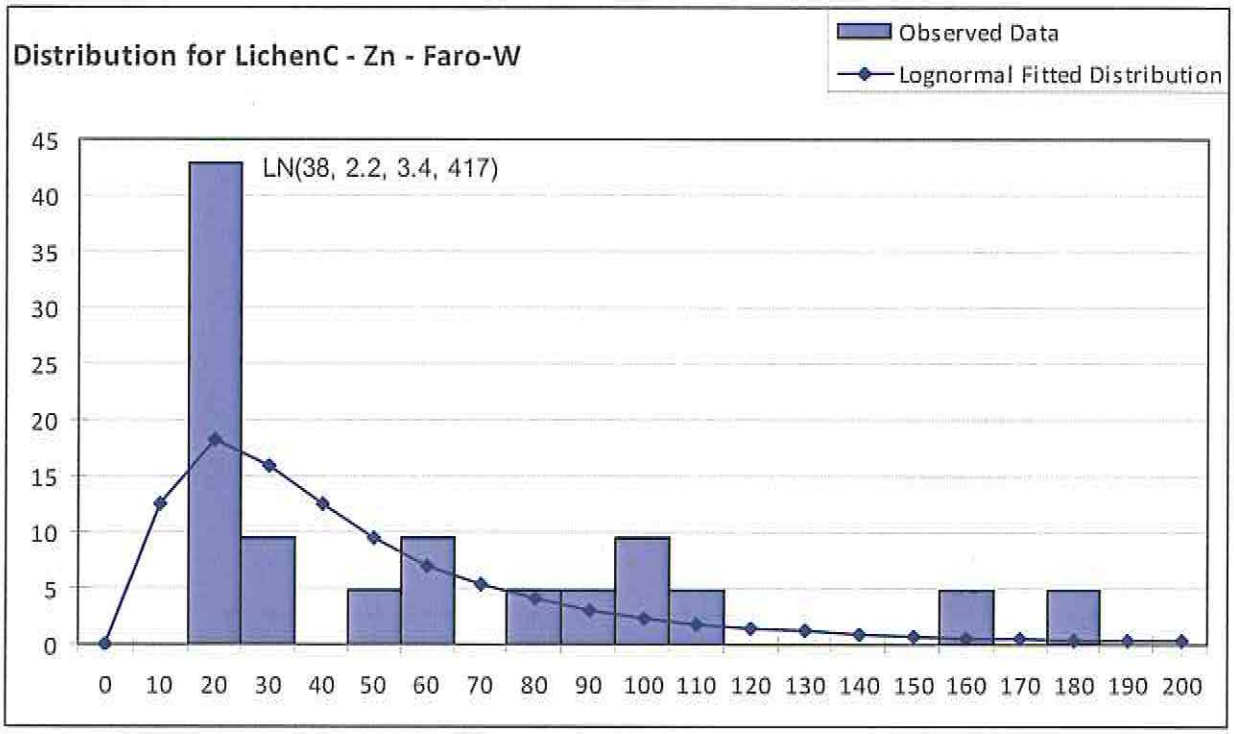

Distribution for LichenC - Zn - Background
Observed Data
Lognormal Fitted Distribution
LN(10.7, 1.3, 5.0, 23.2)
40
35
30
25
20
15
10
5
0
0
2.5
5
7.5
10
12.5
15
17.5
20
22.5
25
27.5
30

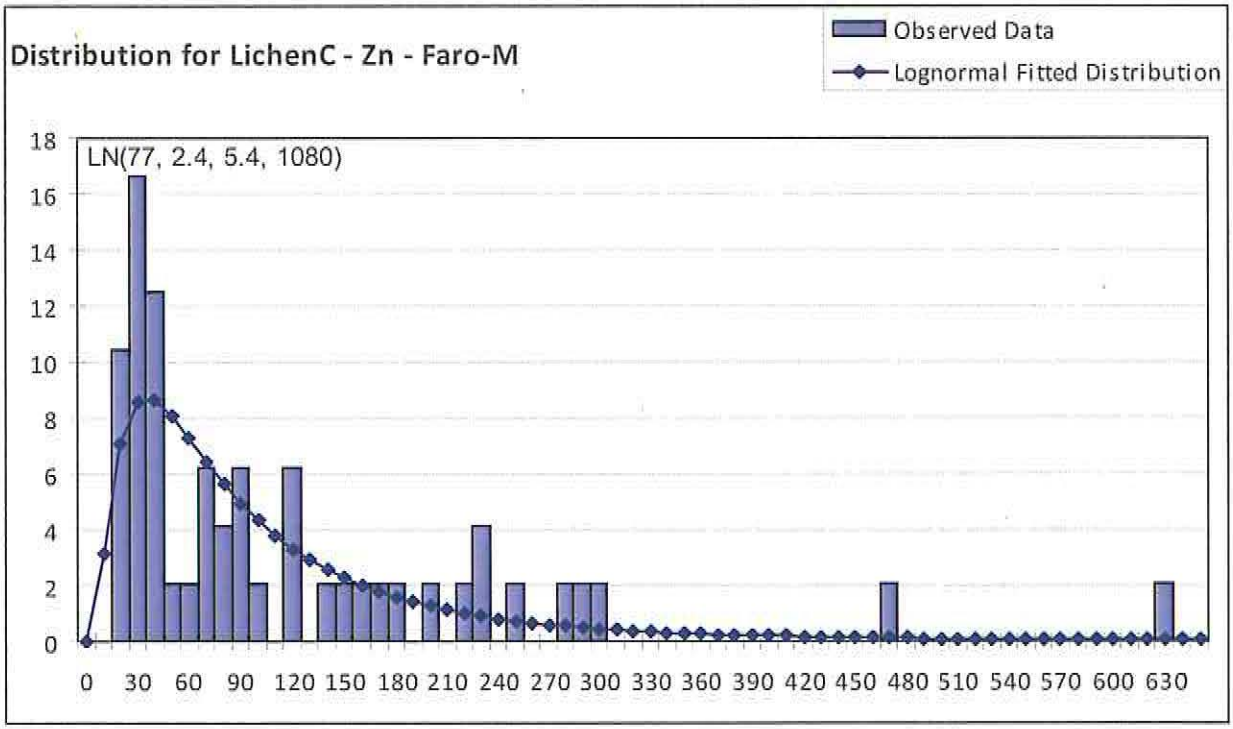

Distribution for LichenC - Zn - Van-S
Observed Data
Lognormal Fitted Distribution
LN(25, 1.7, 4.9, 129)
45
40
35
30
25
20
15
10
5
0
0
10
20
30
40
50
60
70
80
90
100

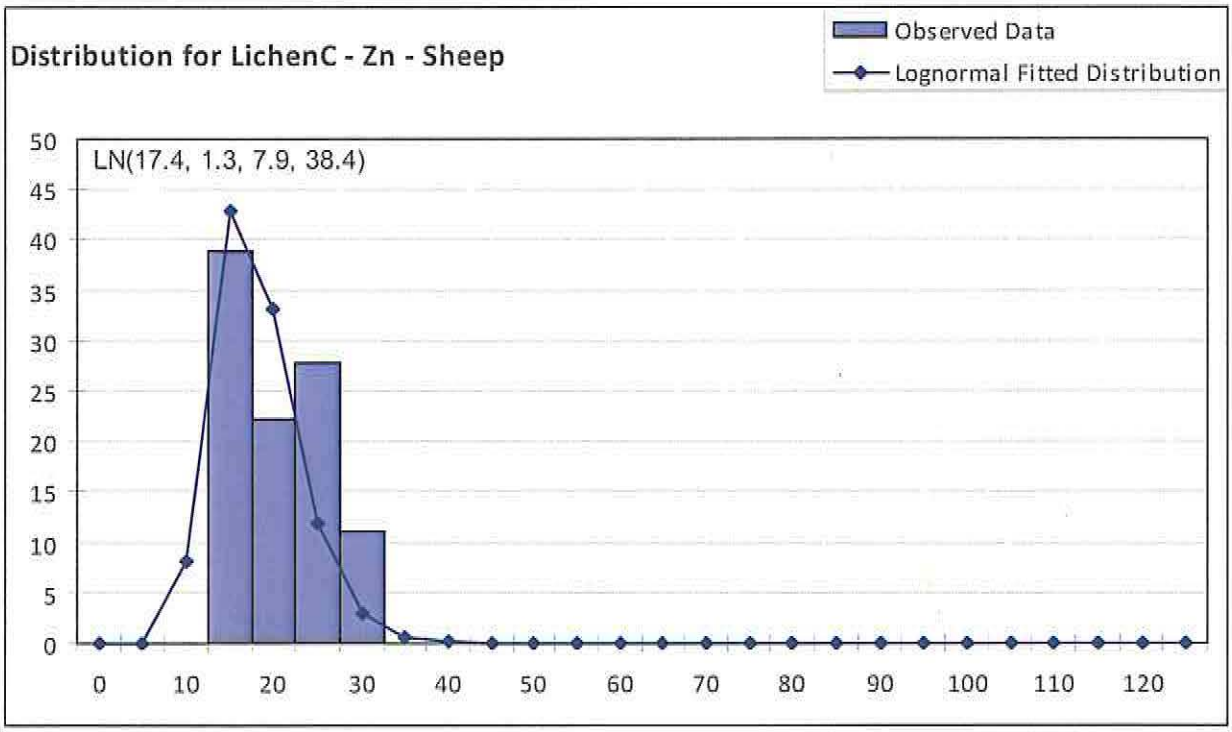

Distribution for LichenC - Zn - Van-M
Observed Data
Lognormal Fitted Distribution
LN(20, 1.8, 3.2, 124)
30
25
20
15
10
5
0
0
5
10
15
20
25
30
35
40
45
50
60
65
70
75


Distribution for LichenC - Zn - Faro-N
Observed Data
Lognormal Fitted Distribution
LN(36, 1.6, 9.4, 133)
45
40
35
30
25
20
15
10
5
0
0
10
20
30
40
50
60
70
80
90
100
110
120
130
140
150
160


Distribution for LichenC - Zn - Faro-S
Observed Data
Lognormal Fitted Distribution
LN(135, 2.0, 16.75, 1101)
25
20
15
10
5
0
0
150
300
450
600
750
900
1050


Distribution for LichenC - Zn - Faro-W
Observed Data
Lognormal Fitted Distribution
LN(38, 2.2, 3.4, 417)
45
40
35
30
25
20
15
10
5
0
0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160 170 180 190 200


Distribution for LichenC - Zn - Faro-M
Observed Data
Lognormal Fitted Distribution
LN(77, 2.4, 5.4, 1080)
18
16
14
12
10
8
6
4
2
0
0 30 60 90 120 150 180 210 240 270 300 330 360 390 420 450 480 510 540 570 600 630

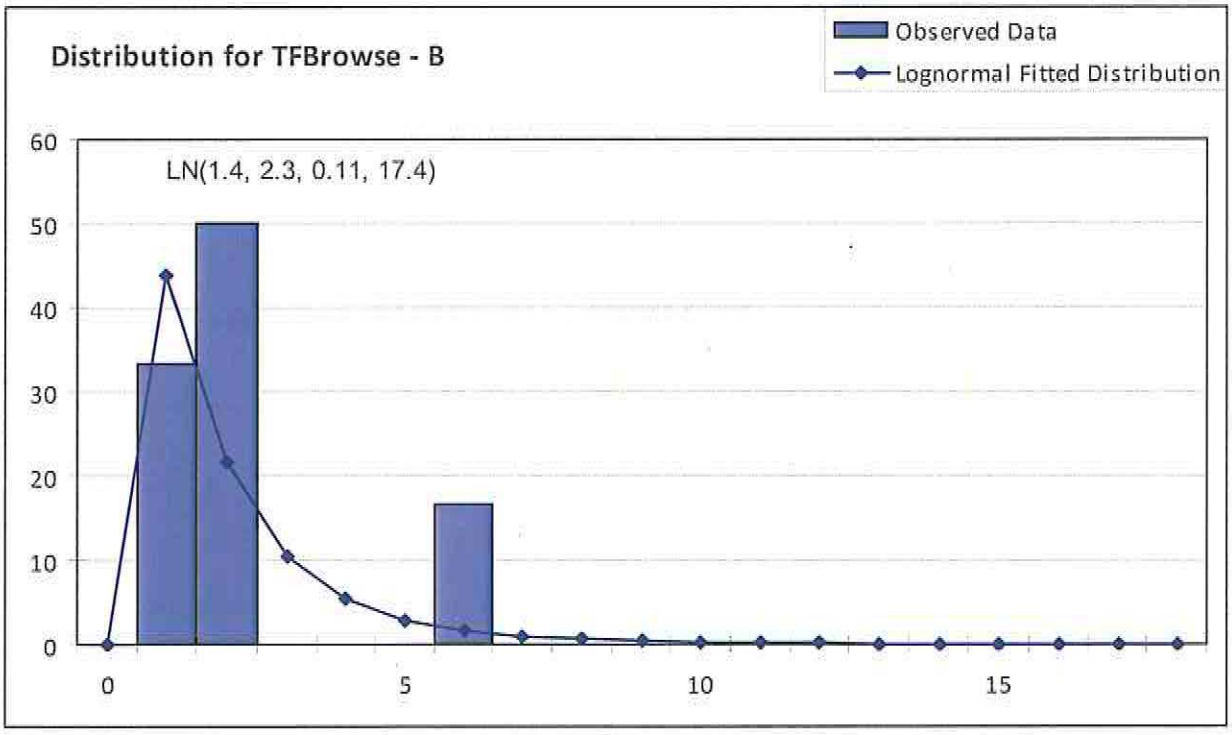

Distribution for LichenC - Zn - Sheep
Observed Data
Lognormal Fitted Distribution
LN(17.4, 1.3, 7.9, 38.4)
50
45
40
35
30
25
20
15
10
5
0
0 10 20 30 40 50 60 70 80 90 100 110 120

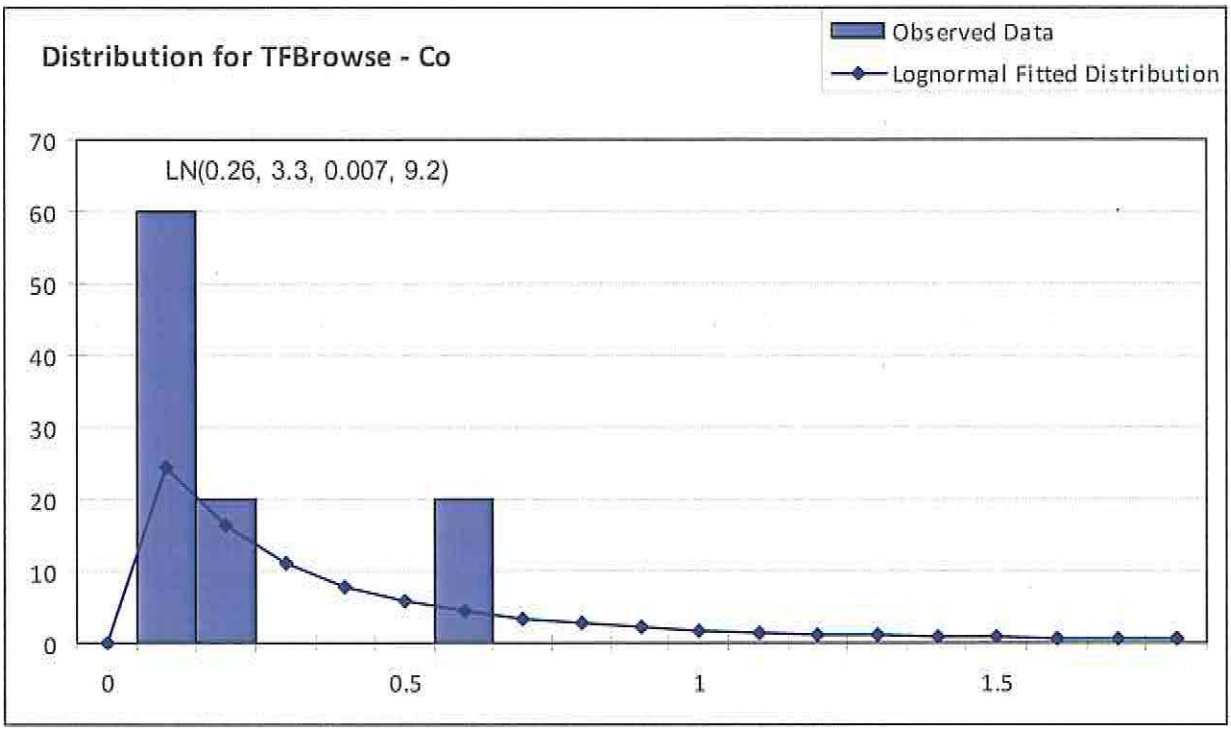
D.8 SOIL-TO-BROWSE TRANSFER FACTORS

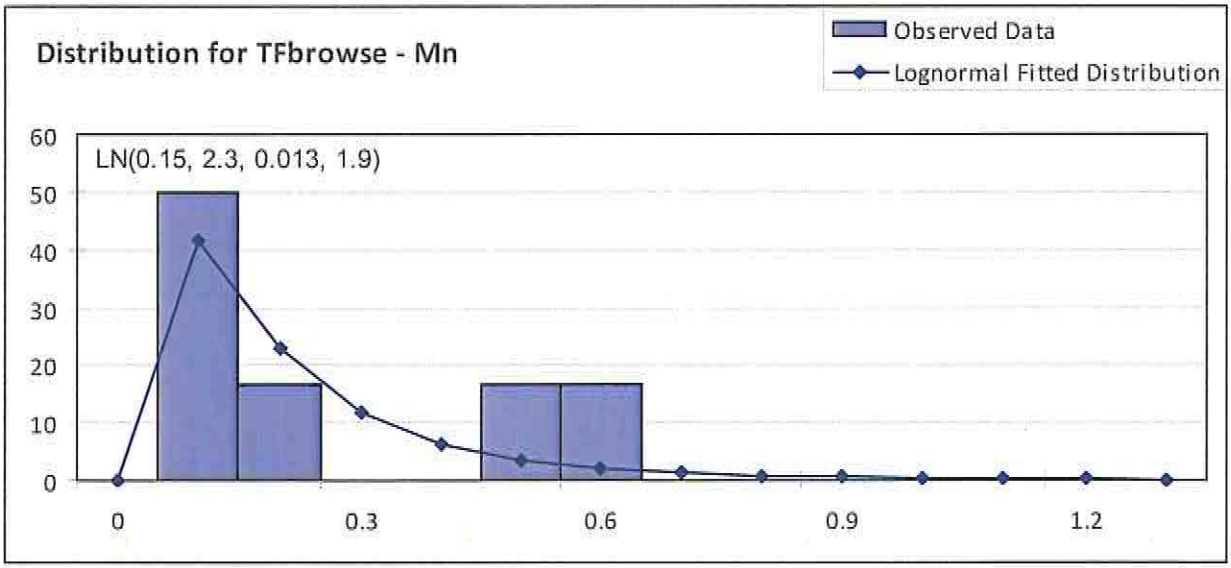
Site-specific transfer factors for soil-to-browse (kg/kg FW) were developed from site-specific data for the Faro Mine Complex during the previous assessment (SENES, 2006, Section 2.2.3.1, Project No. 33798). The raw data used for the development of the mean values was analyzed to derive distributions for the data for use in the probabilistic risk assessment.

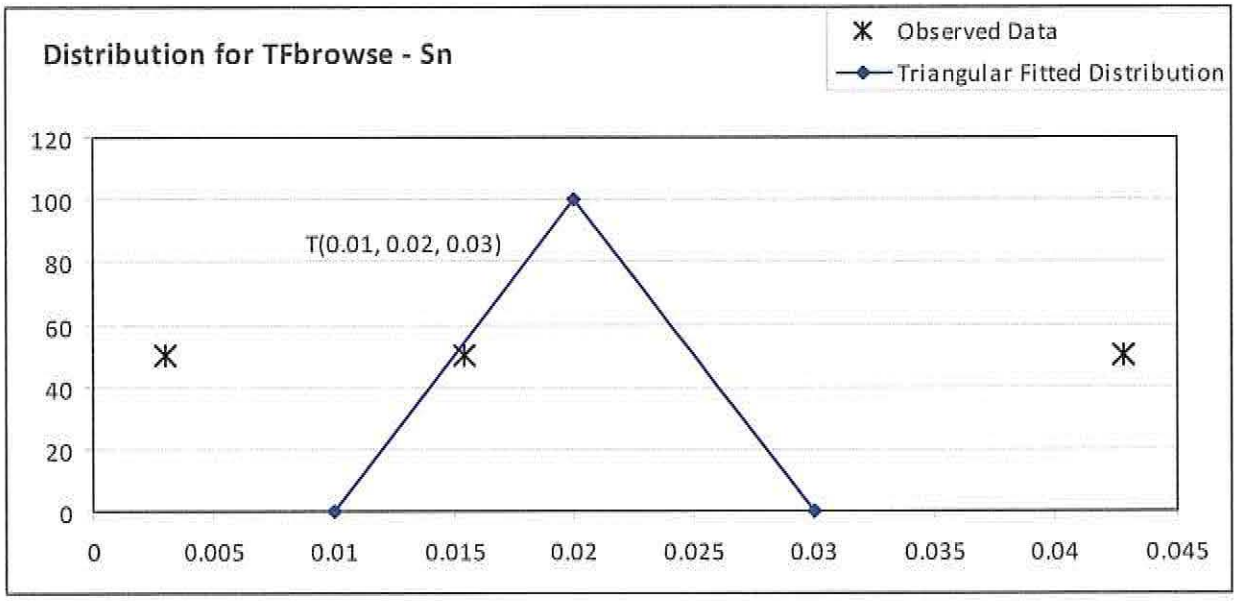
The data were fit to either lognormal or triangular distributions. Lognormal distributions are defined by the geometric mean, geometric standard deviation, minimum value, and maximum value. The triangular distributions are defined by the minimum value, the mode, and the maximum value. For the purposes of this assessment, the mean value was used to represent the mode because the triangular distribution was generally used in the case of only a few available data points and a mode value was not available. This was considered a reasonable assumption. A range was assumed on either side of the mean value to represent the minimum and maximum values to encompass the available data. The following graphs summarize the distributions (line graph) as compared with the available data (bar graph) for each COPC.

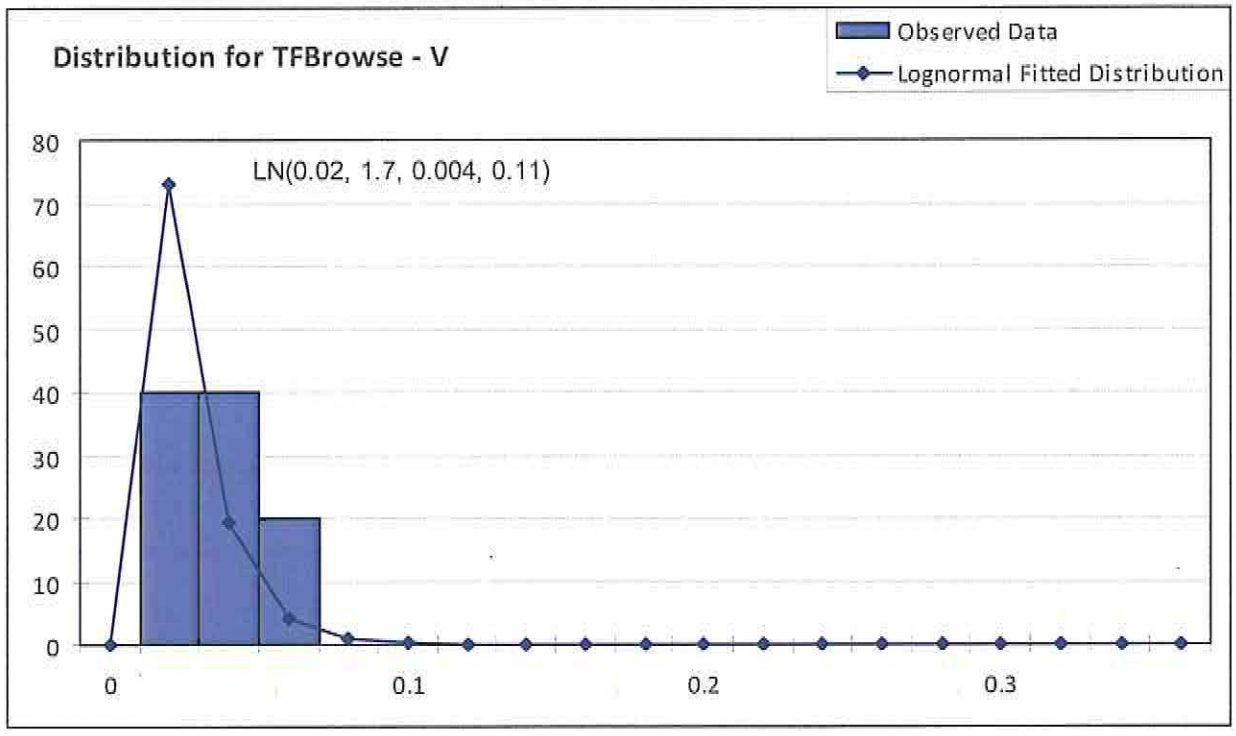
The development of distributions for the transfer from soil-to-browse was limited by the data available. In the absence of available site-specific data, literature values were used, with the literature value representing the geometric mean and an assumed geometric standard deviation of 2.5 for a lognormal distribution. Literature values were used for antimony, beryllium, and strontium. Graphs are not presented for these COPC.




Distribution for TFBrowse - Co
Observed Data
Lognormal Fitted Distribution
LN(0.26, 3.3, 0.007, 9.2)
70
60
50
40
30
20
10
0
0
0.5
1
1.5


Distribution for TFbrowse - Mn
Observed Data
Lognormal Fitted Distribution
LN(0.15, 2.3, 0.013, 1.9)
60
50
40
30
20
10
0
0
0.3
0.6
0.9
1.2

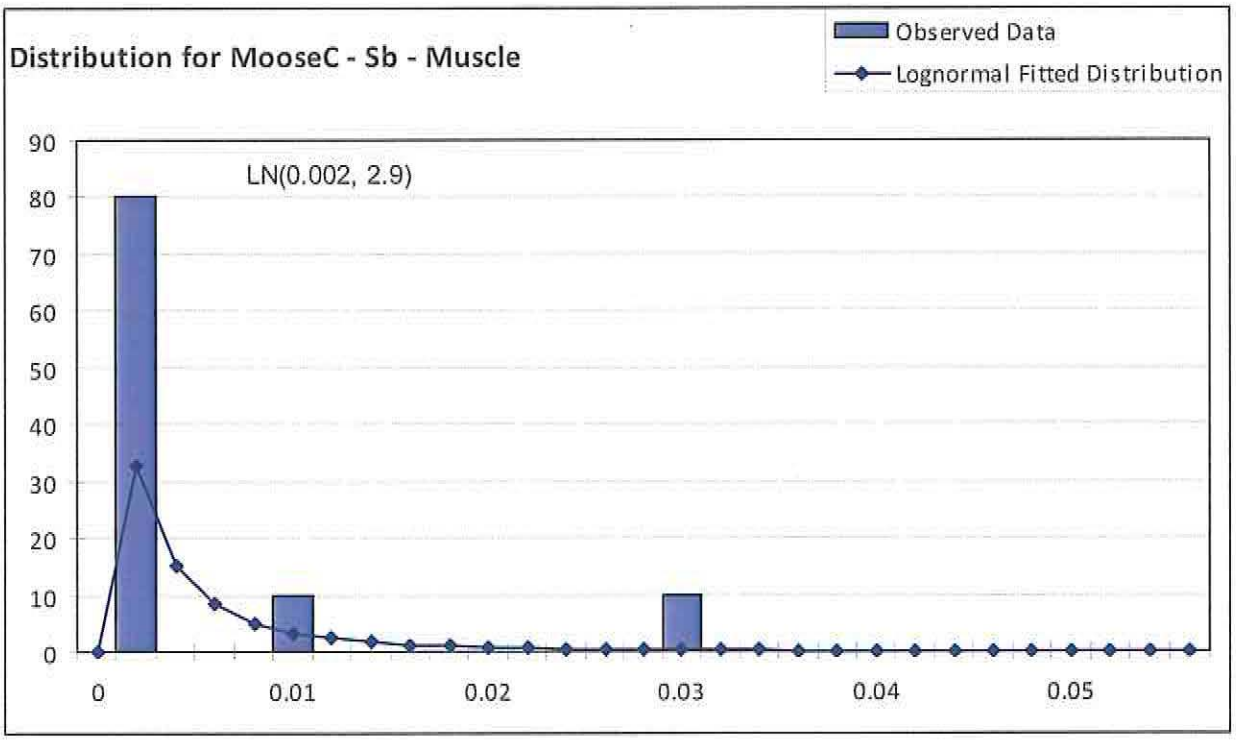

Distribution for TFbrowse - Sn
Observed Data
Triangular Fitted Distribution
T(0.01, 0.02, 0.03)
120
100
80
60
40
20
0
0
0.005
0.01
0.015
0.02
0.025
0.03
0.035
0.04
0.045

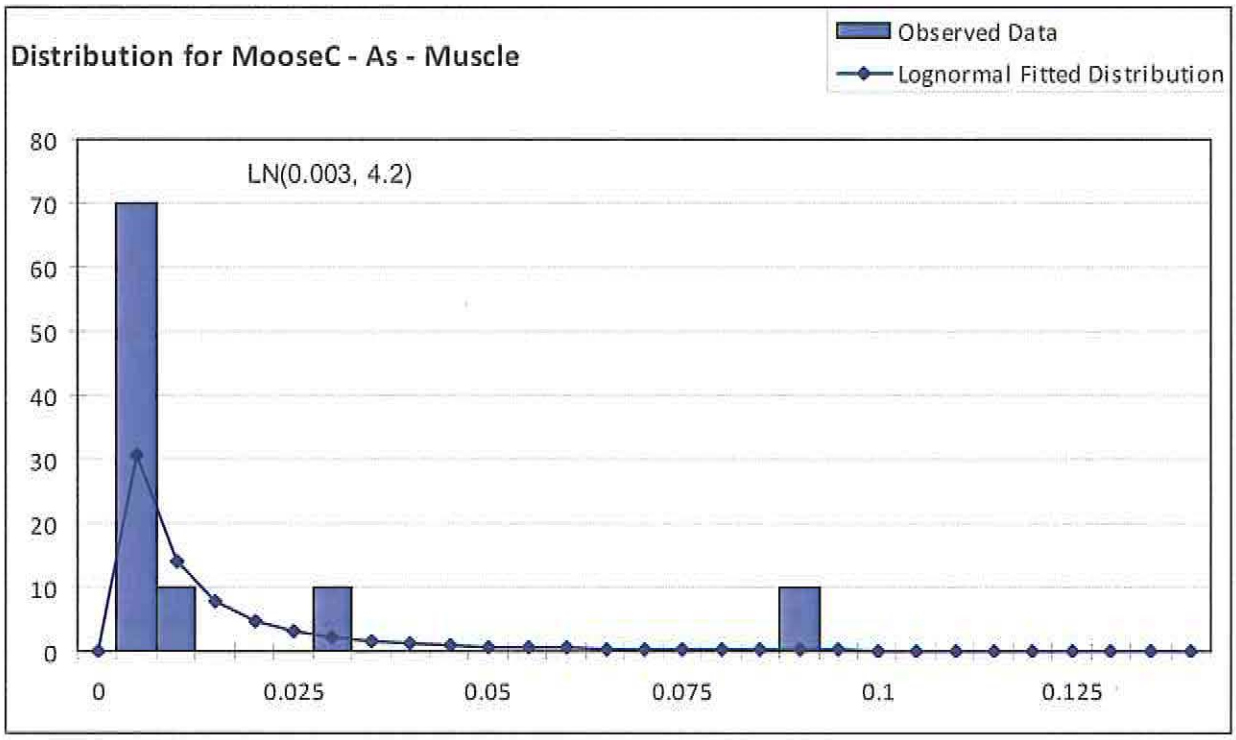

Distribution for TFBrowse - V
Observed Data
Lognormal Fitted Distribution
LN(0.02, 1.7, 0.004, 0.11)
80
70
60
50
40
30
20
10
0
0
0.1
0.2
0.3

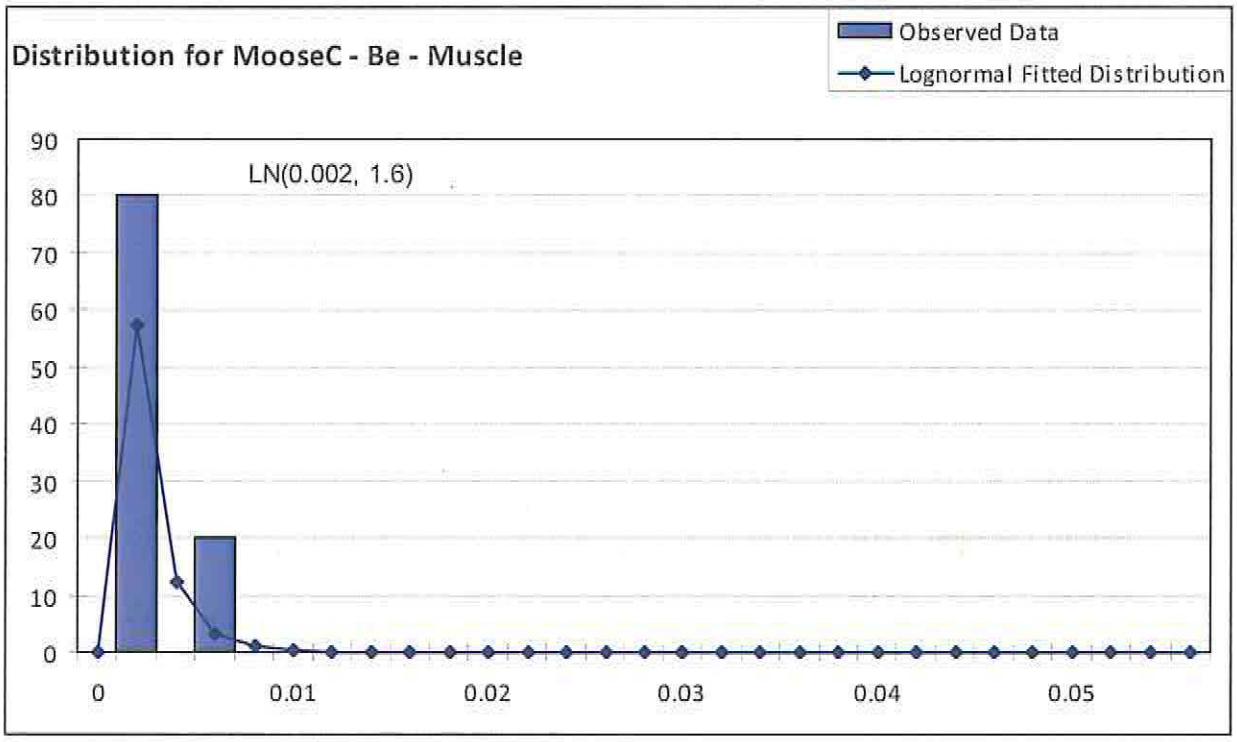
D.9 LARGE MAMMAL CONCENTRATIONS

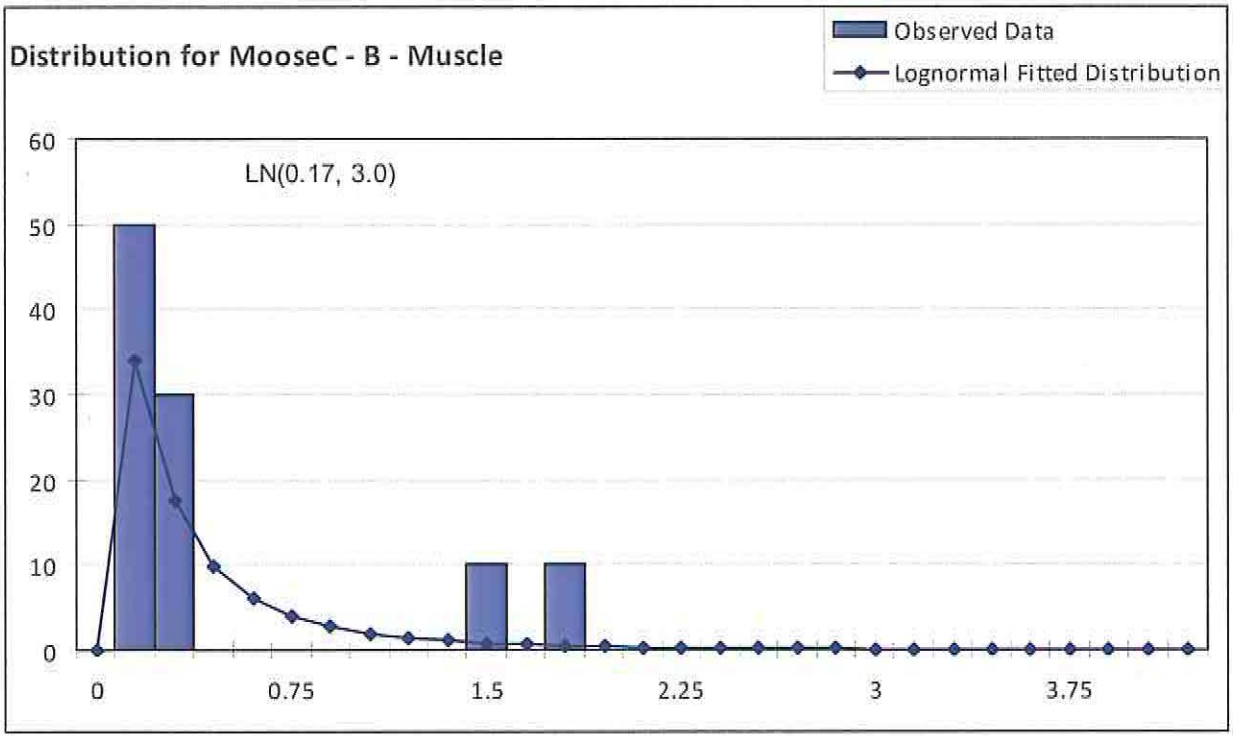
Distributions were developed for moose and caribou concentrations (mg/kg ww) from samples collected from the site. The data were fit to lognormal distributions. Lognormal distributions are defined by the geometric mean and geometric standard deviation. The following graphs summarize the distributions (line graph) as compared with the available data (bar graph) for each COPC for moose muscle and whole body concentrations and caribou muscle and whole body concentrations. The development of distributions for the transfer from soil-to-browse was limited by the data available.

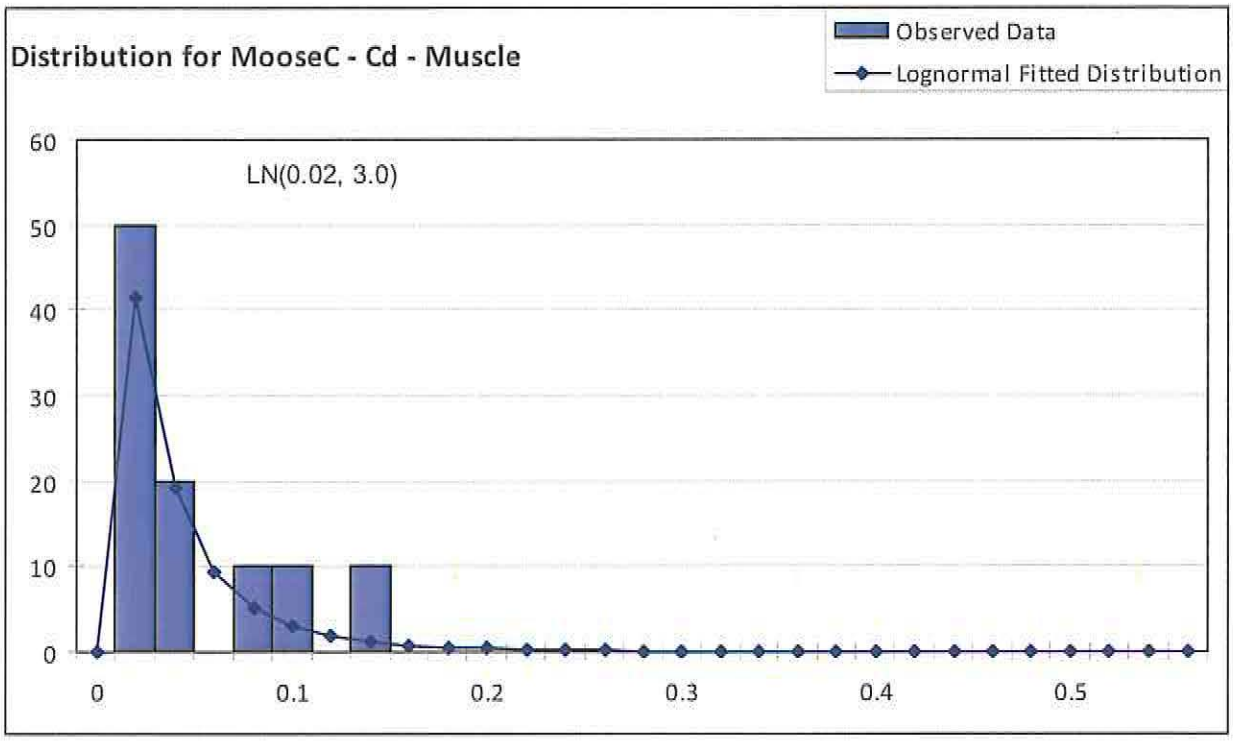
D.9.1 Moose Muscle

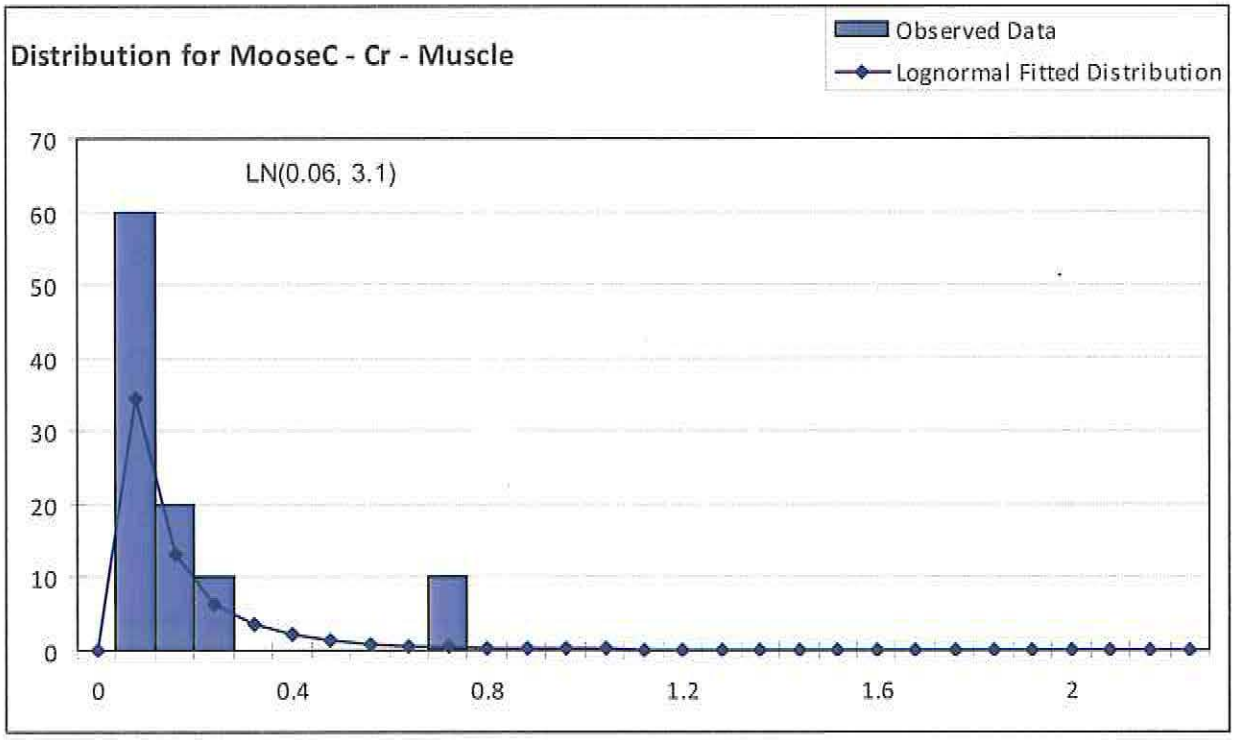


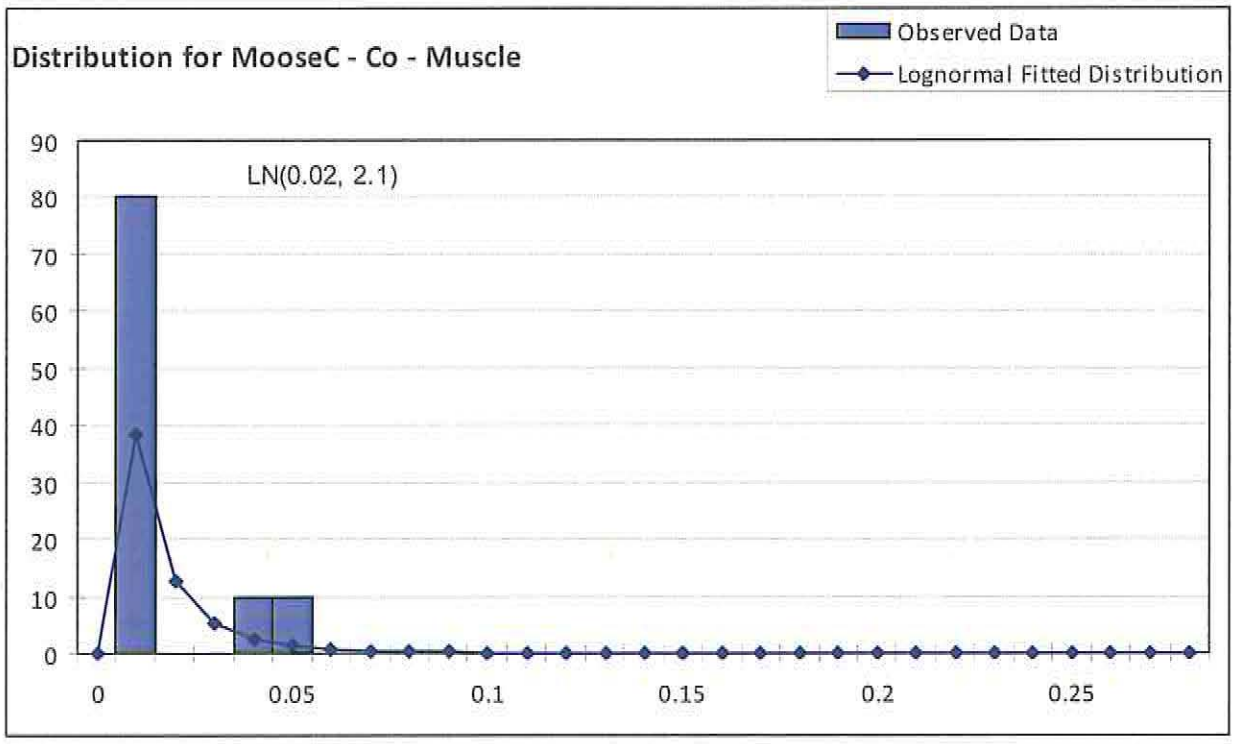

Distribution for MooseC - As - Muscle
Observed Data
Lognormal Fitted Distribution
LN(0.003, 4.2)
80
70
60
50
40
30
20
10
0
0
0.025
0.05
0.075
0.1
0.125

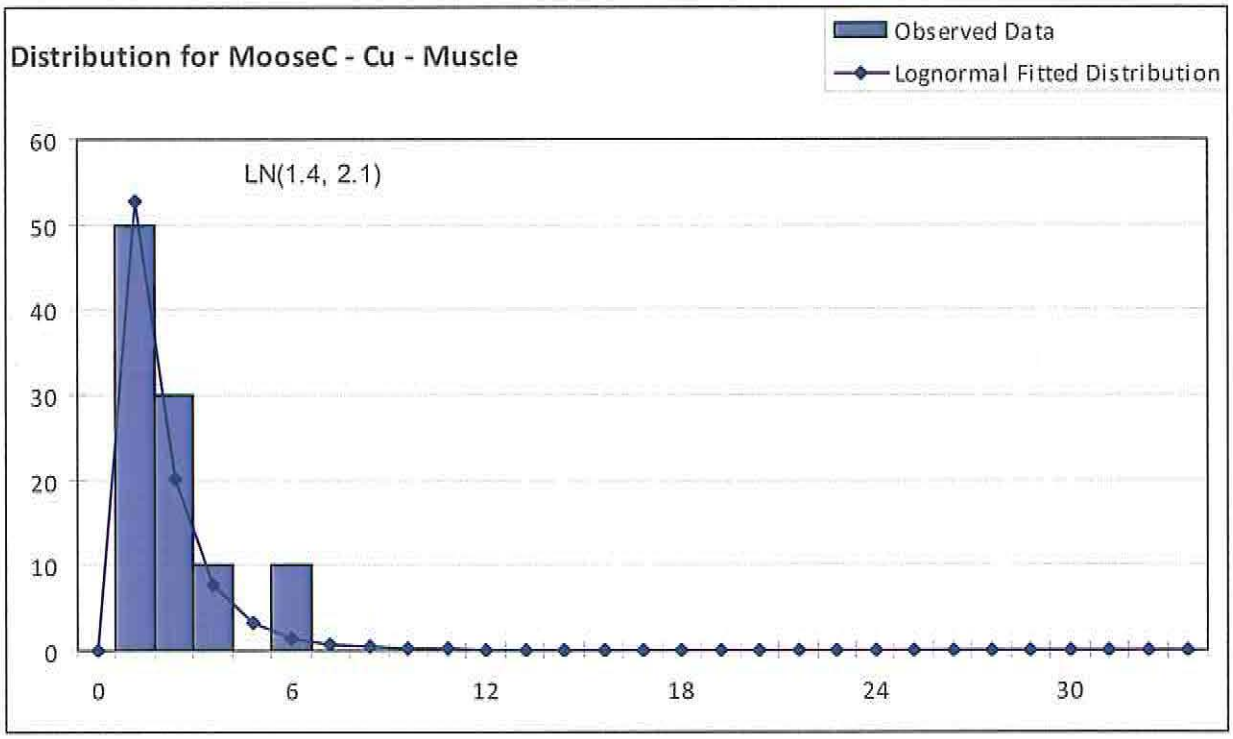

Distribution for MooseC - Be - Muscle
Observed Data
Lognormal Fitted Distribution
LN(0.002, 1.6)
90
80
70
60
50
40
30
20
10
0
0
0.01
0.02
0.03
0.04
0.05

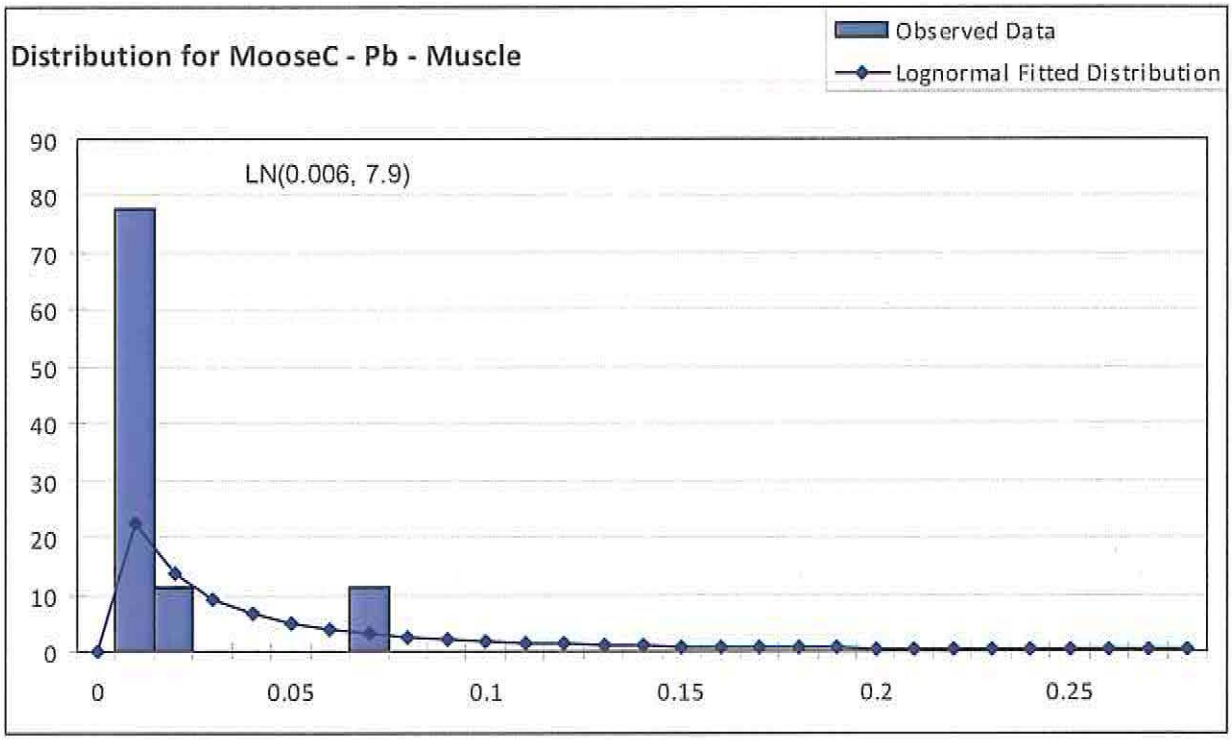

Distribution for MooseC - B - Muscle
Observed Data
Lognormal Fitted Distribution
LN(0.17, 3.0)
60
50
40
30
20
10
0
0
0.75
1.5
2.25
3
3.75

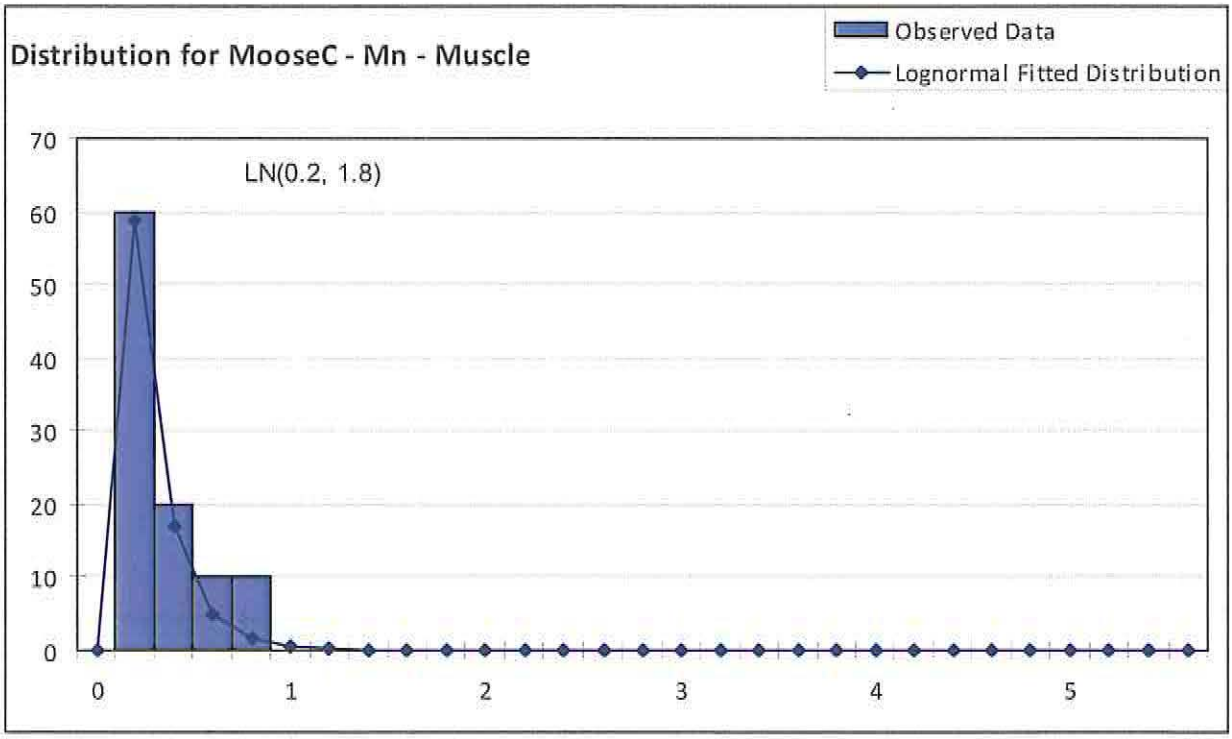

Distribution for MooseC - Cd - Muscle
Observed Data
Lognormal Fitted Distribution
LN(0.02, 3.0)
60
50
40
30
20
10
0
0
0.1
0.2
0.3
0.4
0.5

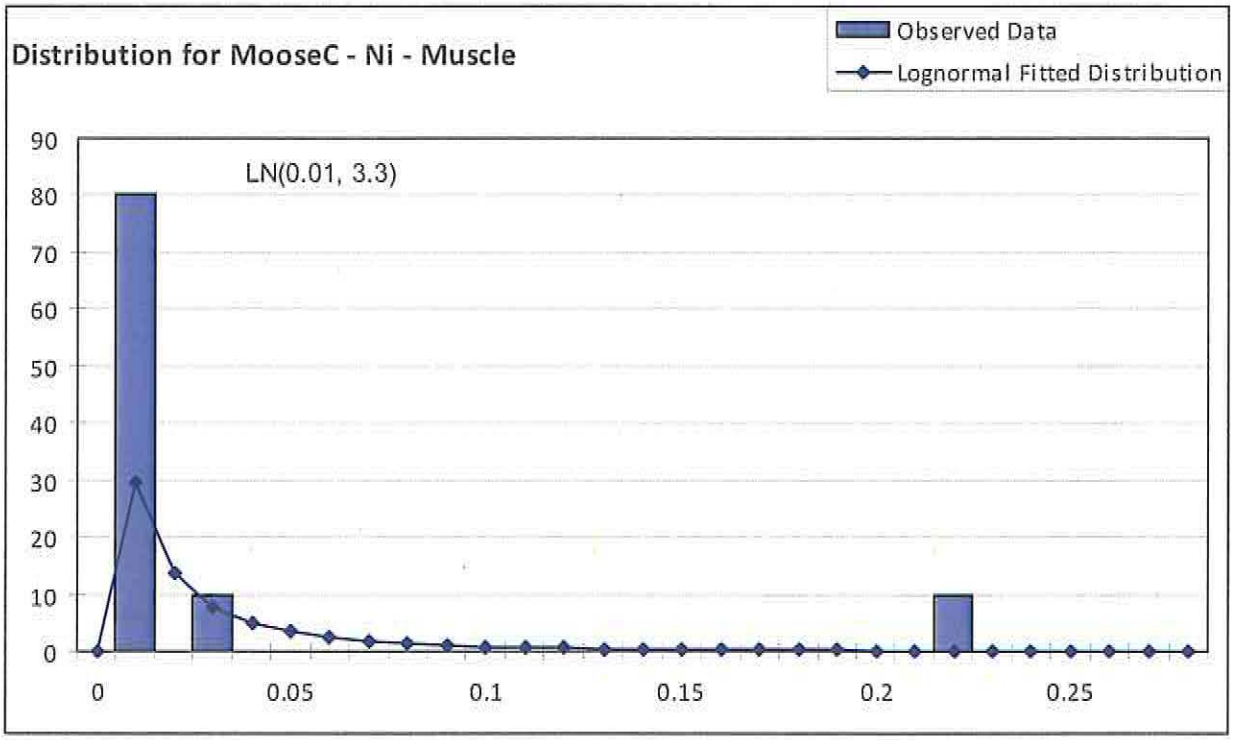

Distribution for MooseC - Cr - Muscle
Observed Data
Lognormal Fitted Distribution
LN(0.06, 3.1)
70
60
50
40
30
20
10
0
0
0.4
0.8
1.2
1.6
2

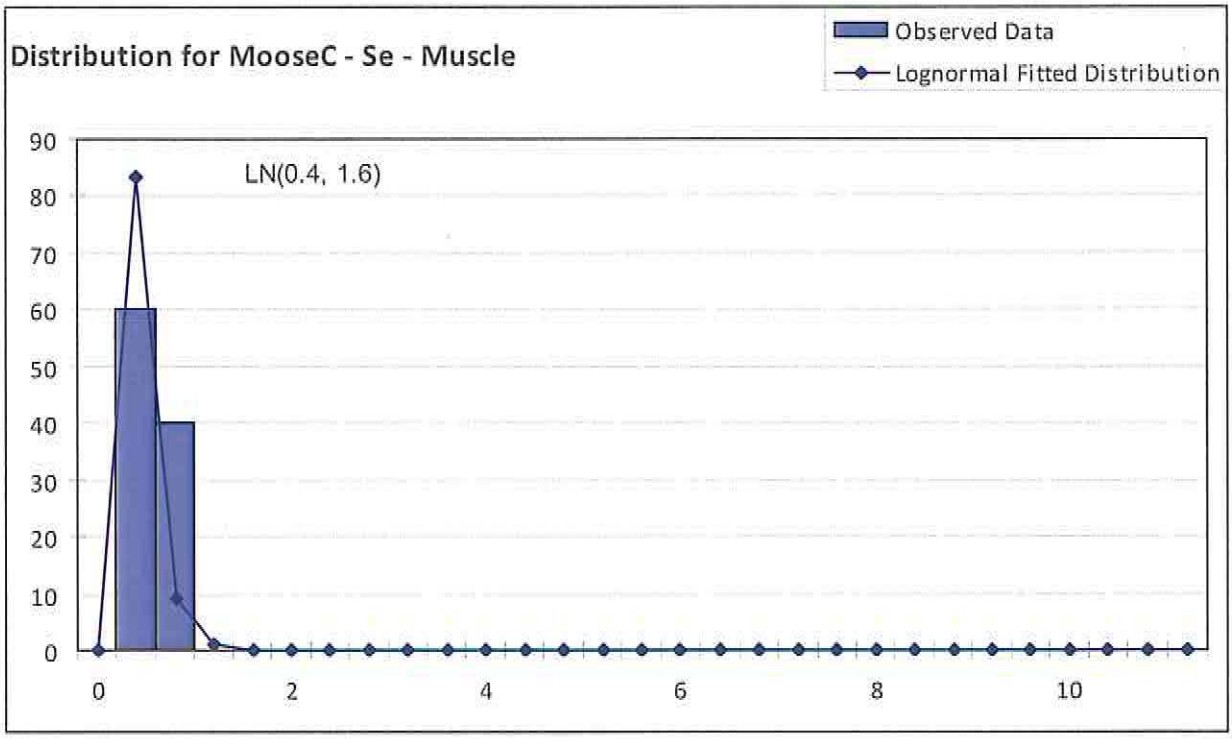

Distribution for MooseC - Co - Muscle
Observed Data
Lognormal Fitted Distribution
LN(0.02, 2.1)
90
80
70
60
50
40
30
20
10
0
0
0.05
0.1
0.15
0.2
0.25

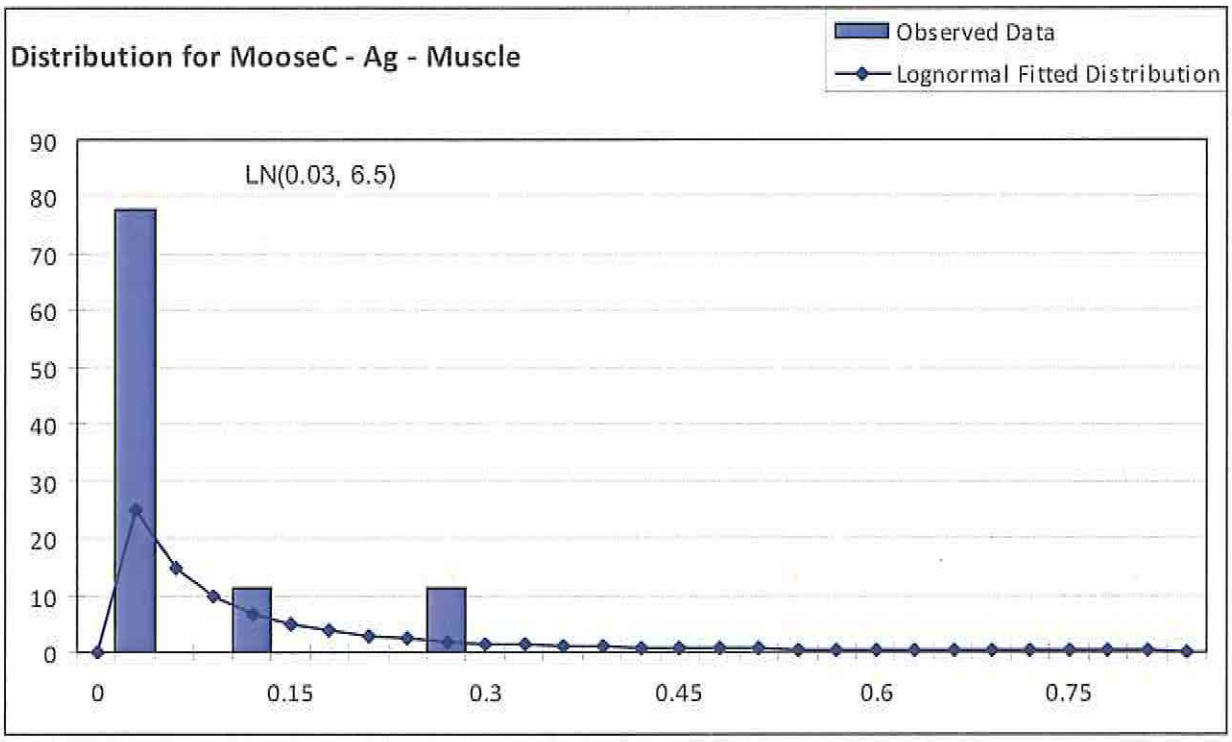

Distribution for MooseC - Cu - Muscle
Observed Data
Lognormal Fitted Distribution
LN(1.4, 2.1)
60
50
40
30
20
10
0
0
6
12
18
24
30

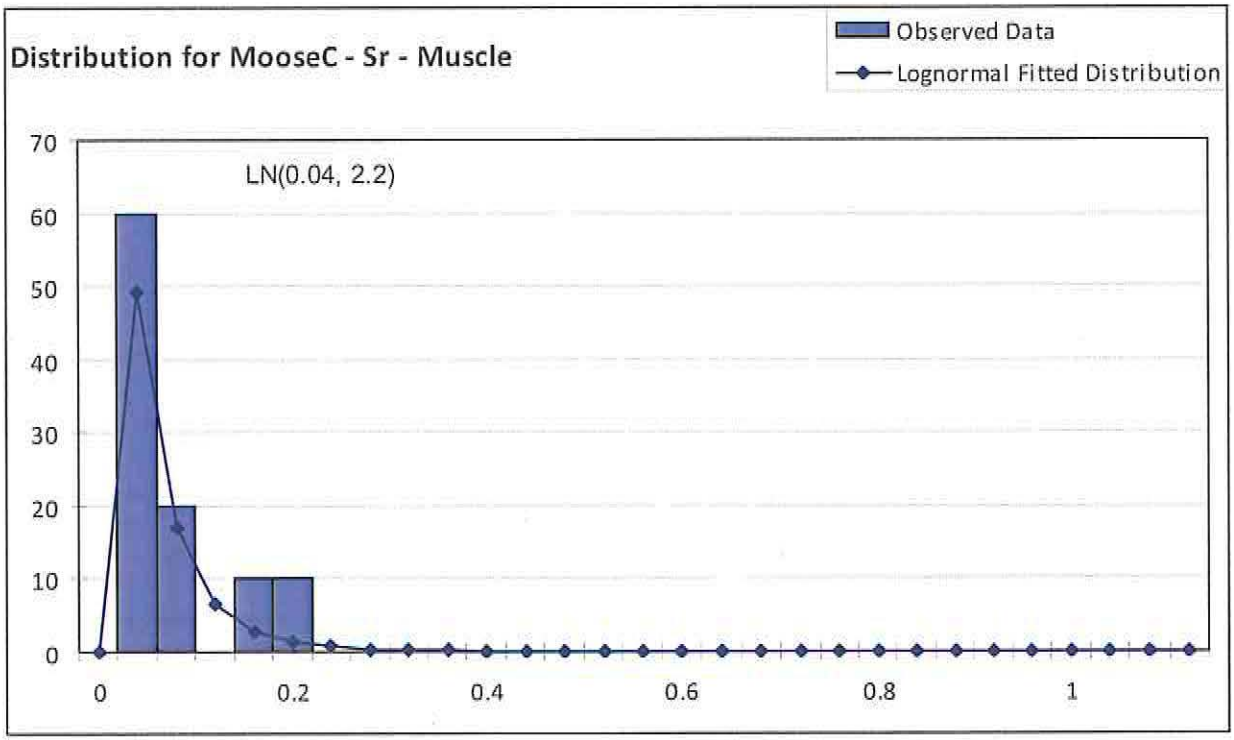

Distribution for MooseC - Pb - Muscle
Observed Data
Lognormal Fitted Distribution
LN(0.006, 7.9)
90
80
70
60
50
40
30
20
10
0
0
0.05
0.1
0.15
0.2
0.25

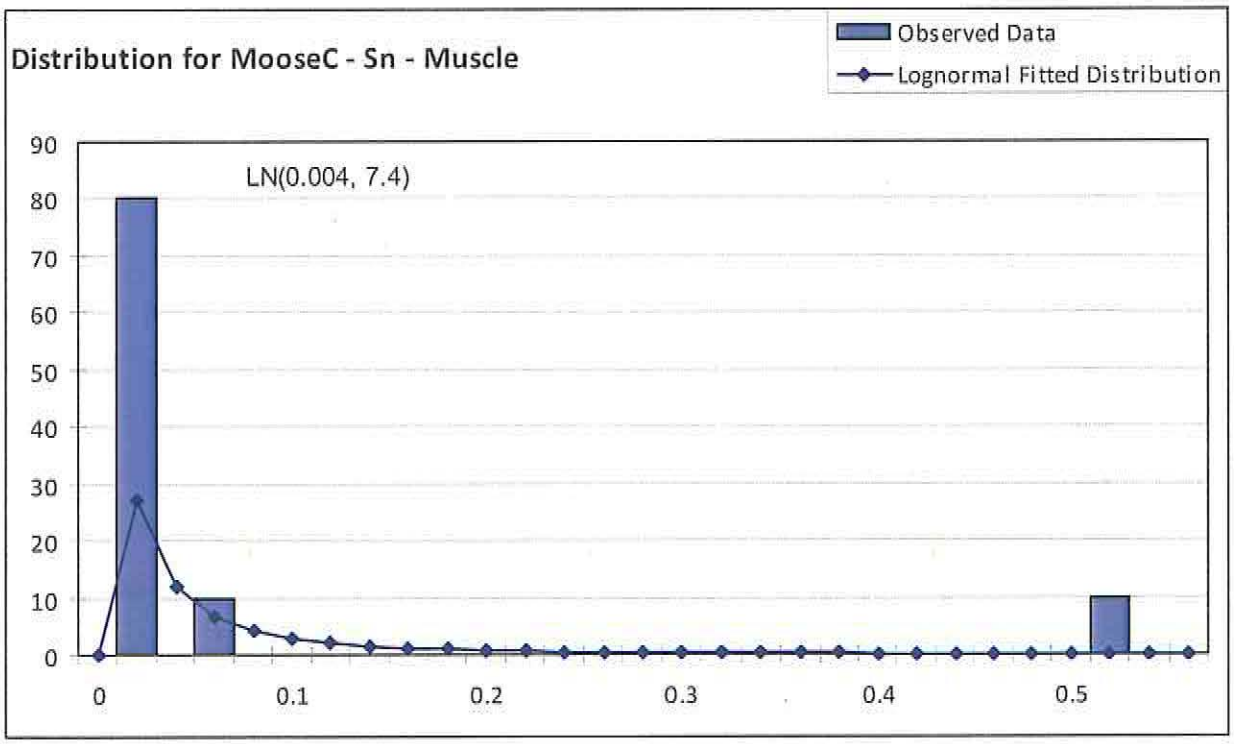

Distribution for MooseC - Mn - Muscle
Observed Data
Lognormal Fitted Distribution
LN(0.2, 1.8)
70
60
50
40
30
20
10
0
0
1
2
3
4
5

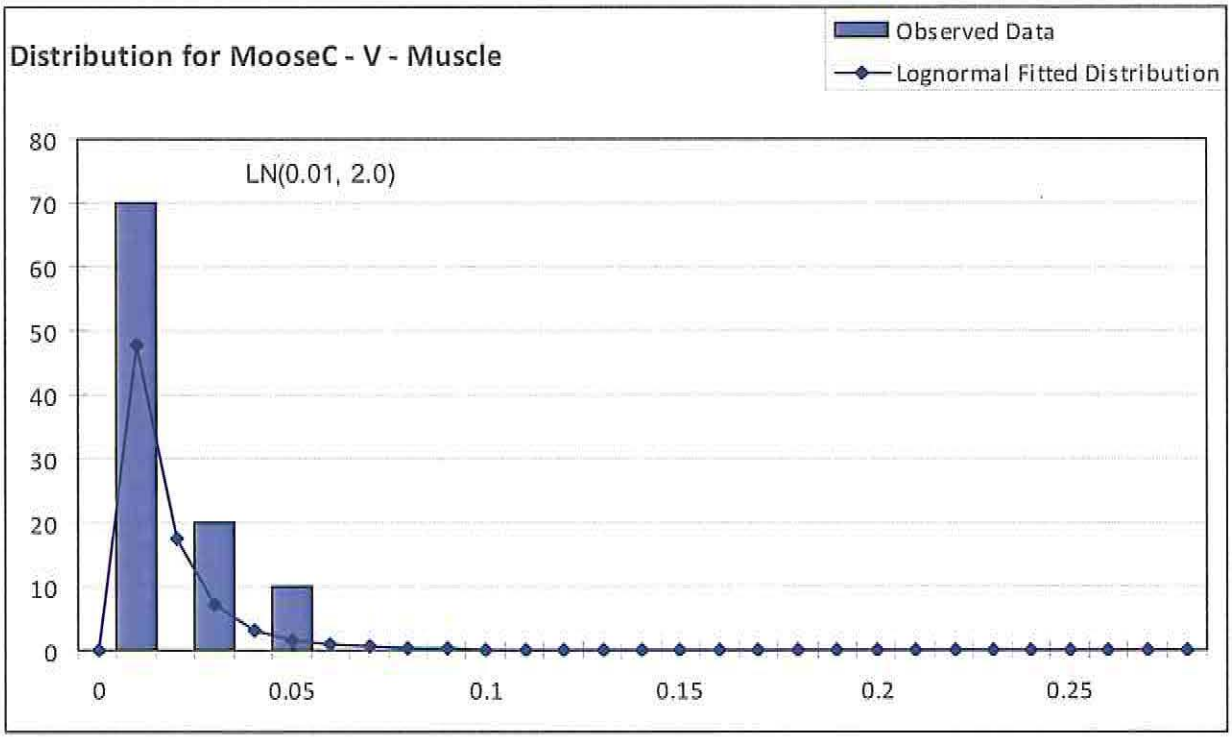

Distribution for MooseC - Ni - Muscle
Observed Data
Lognormal Fitted Distribution
LN(0.01, 3.3)
90
80
70
60
50
40
30
20
10
0
0
0.05
0.1
0.15
0.2
0.25

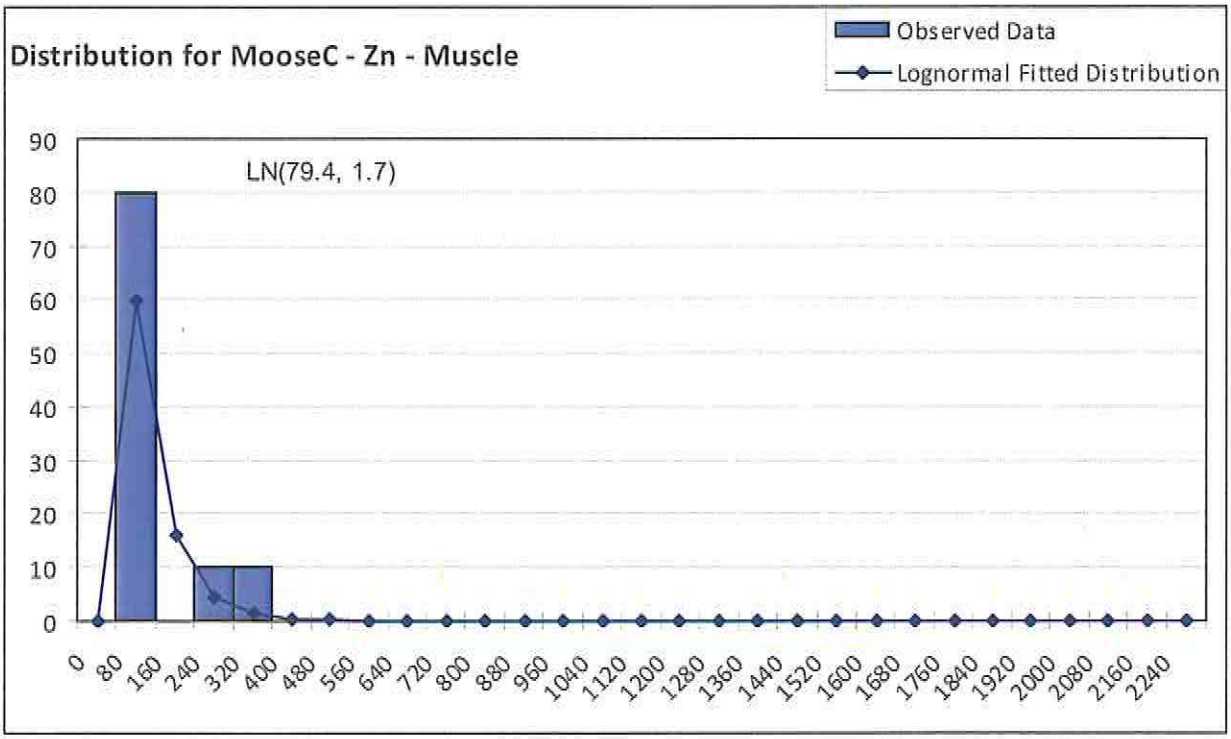

Distribution for MooseC - Se - Muscle
Observed Data
Lognormal Fitted Distribution
LN(0.4, 1.6)
90
80
70
60
50
40
30
20
10
0
0
2
4
6
8
10


Distribution for MooseC - Ag - Muscle
Observed Data
Lognormal Fitted Distribution
LN(0.03, 6.5)
90
80
70
60
50
40
30
20
10
0
0
0.15
0.3
0.45
0.6
0.75

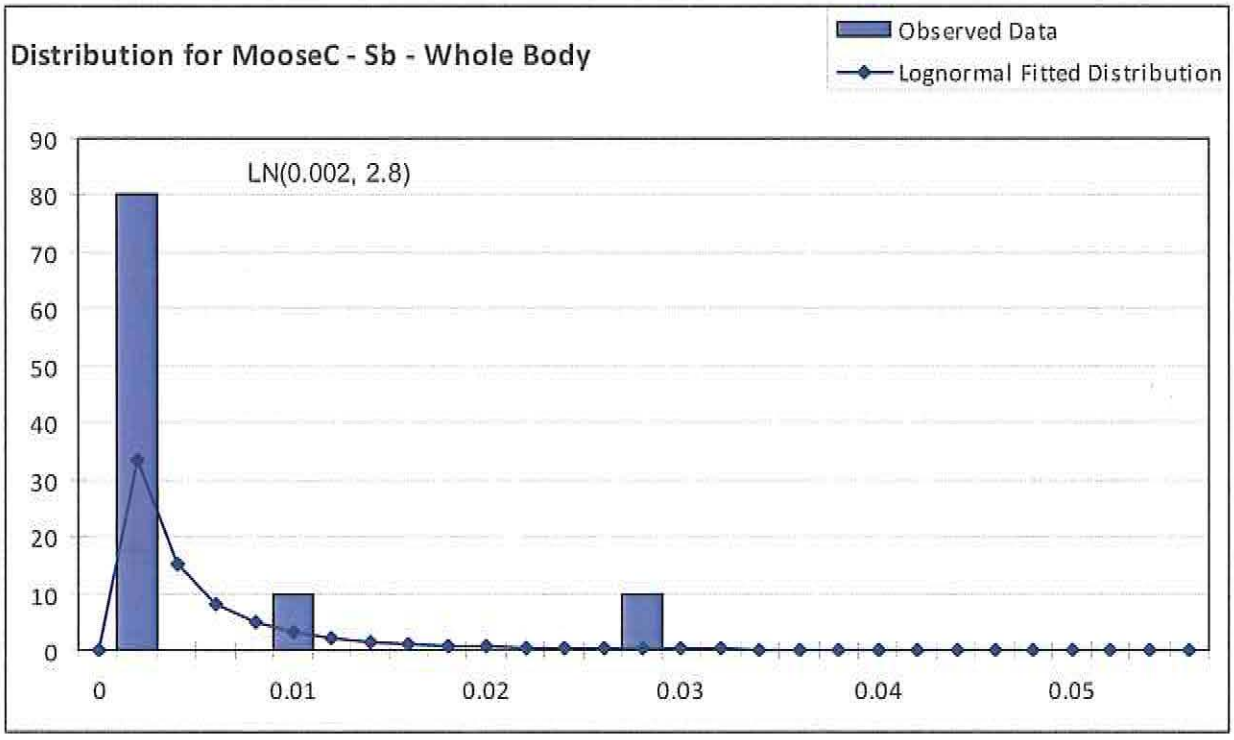

Distribution for MooseC - Sr - Muscle
Observed Data
Lognormal Fitted Distribution
LN(0.04, 2.2)
70
60
50
40
30
20
10
0
0
0.2
0.4
0.6
0.8
1

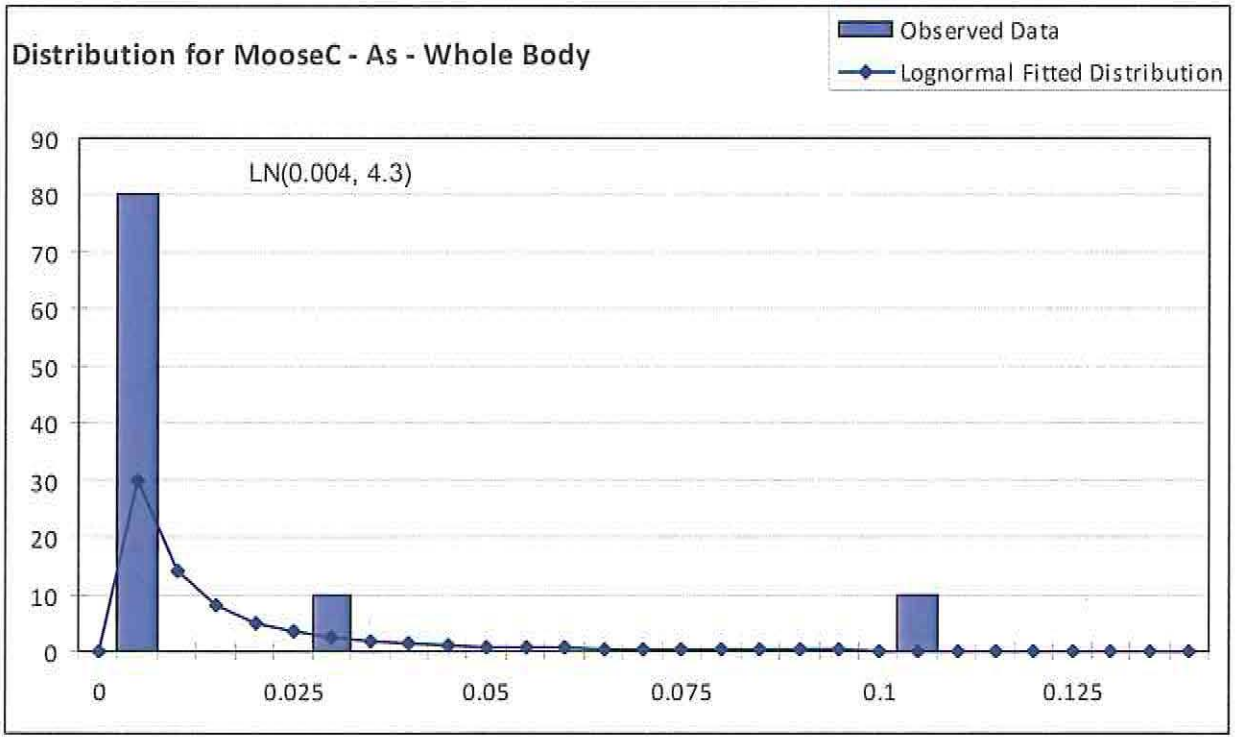

Distribution for MooseC - Sn - Muscle
Observed Data
Lognormal Fitted Distribution
LN(0.004, 7.4)
90
80
70
60
50
40
30
20
10
0
0
0.1
0.2
0.3
0.4
0.5

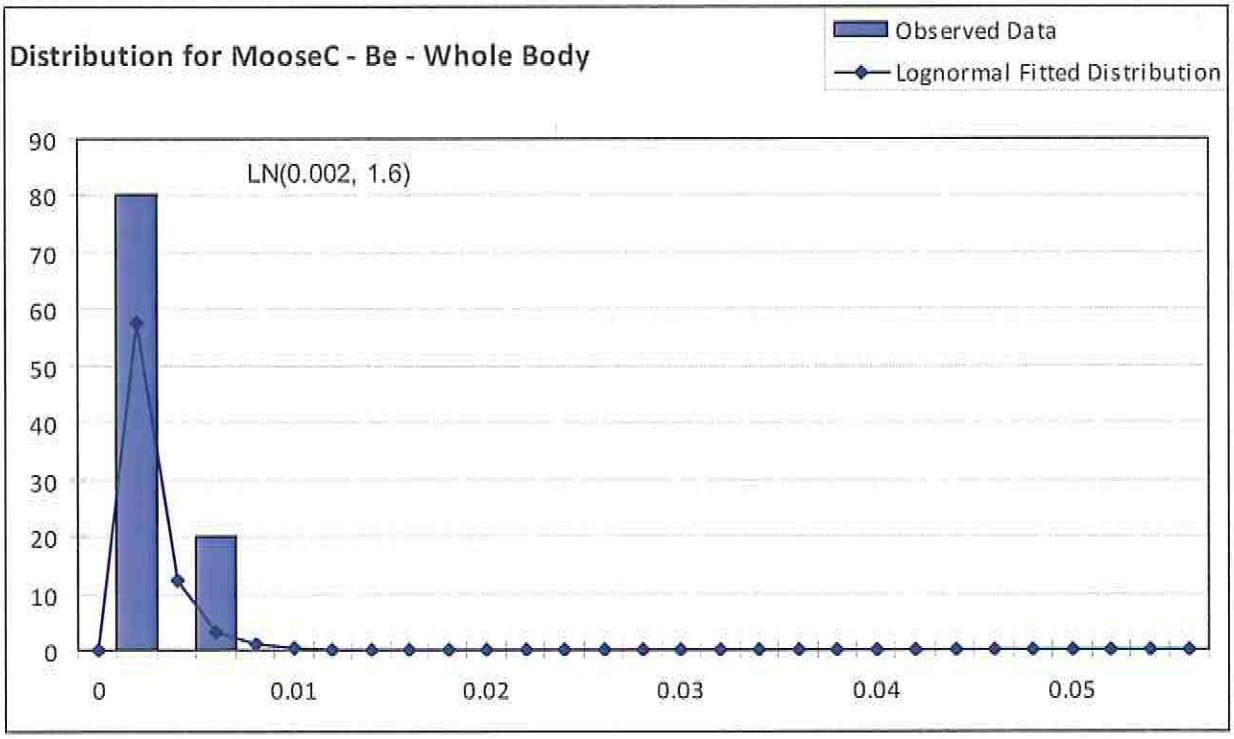

Distribution for MooseC - V - Muscle
Observed Data
Lognormal Fitted Distribution
LN(0.01, 2.0)
80
70
60
50
40
30
20
10
0
0
0.05
0.1
0.15
0.2
0.25

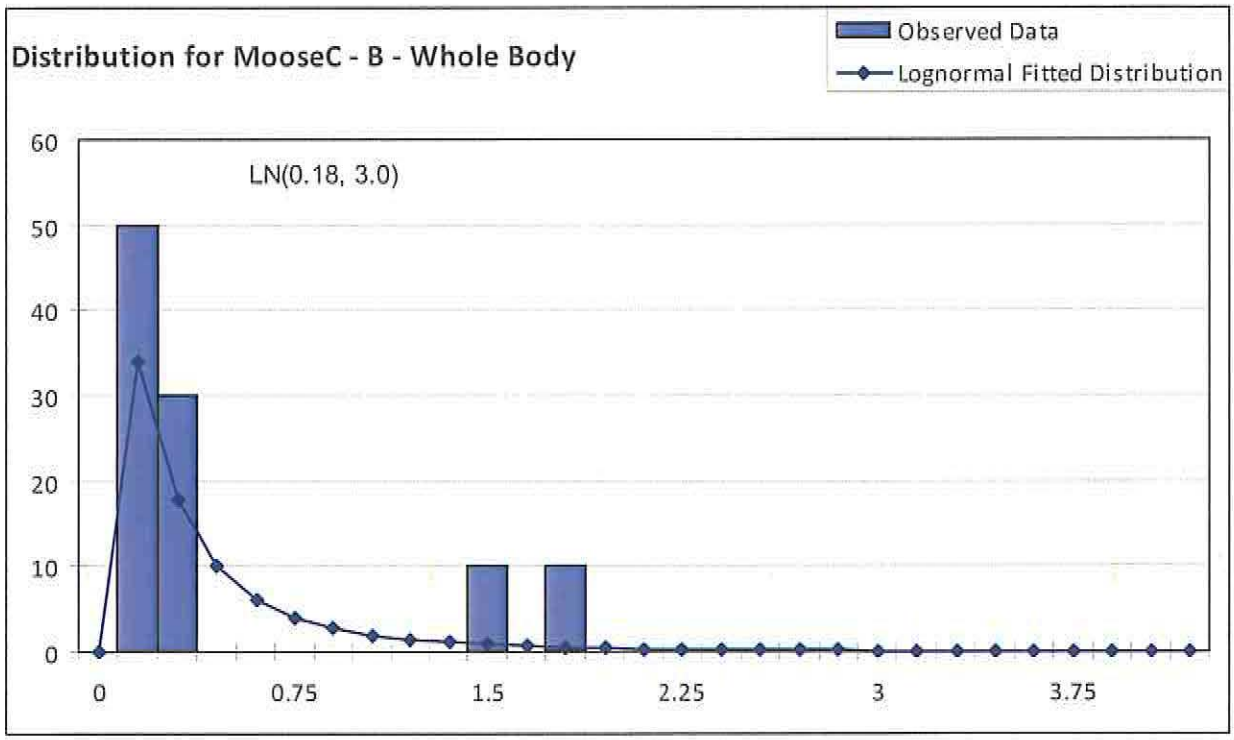

Distribution for MooseC - Zn - Muscle
Observed Data
Lognormal Fitted Distribution
LN(79.4, 1.7)
90
80
70
60
50
40
30
20
10
0
0
80
160
240
320
400
480
560
640
720
800
880
960
1040
1120
1200
1280
1360
1440
1520
1600
1680
1760
1840
1920
2000
2080
2160
2240

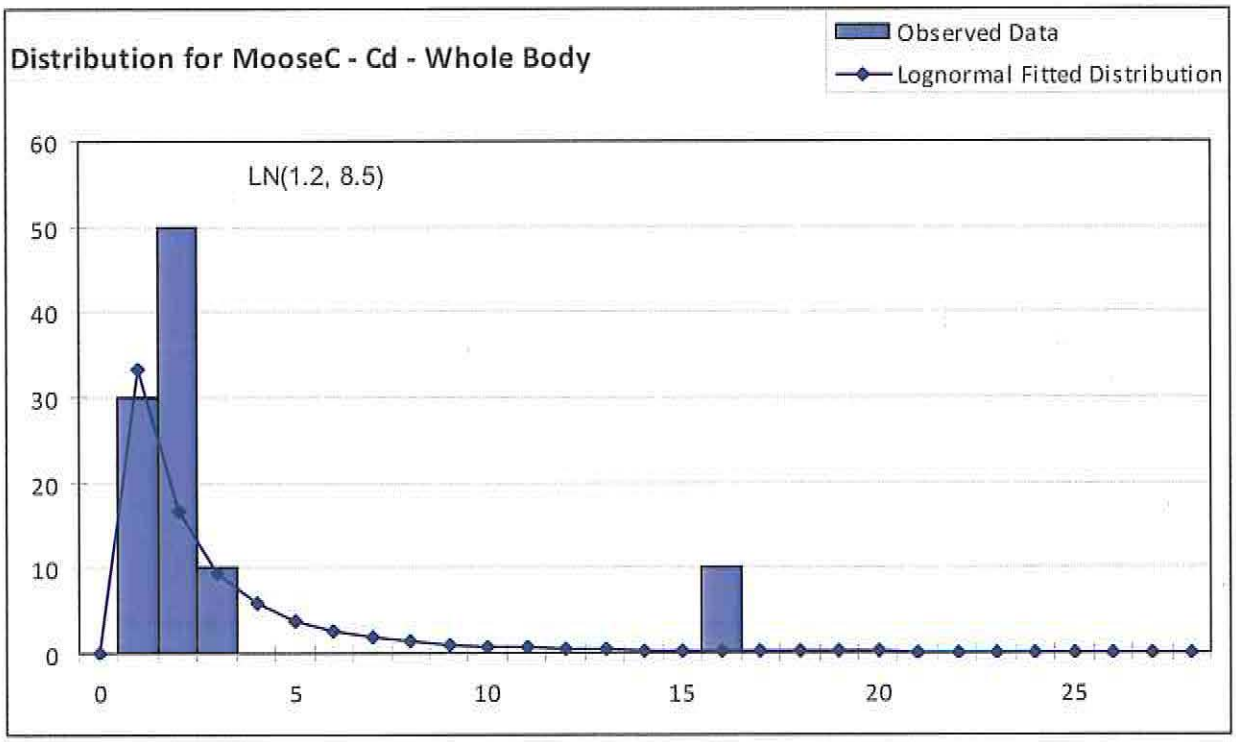
D.9.2 Moose Whole Body

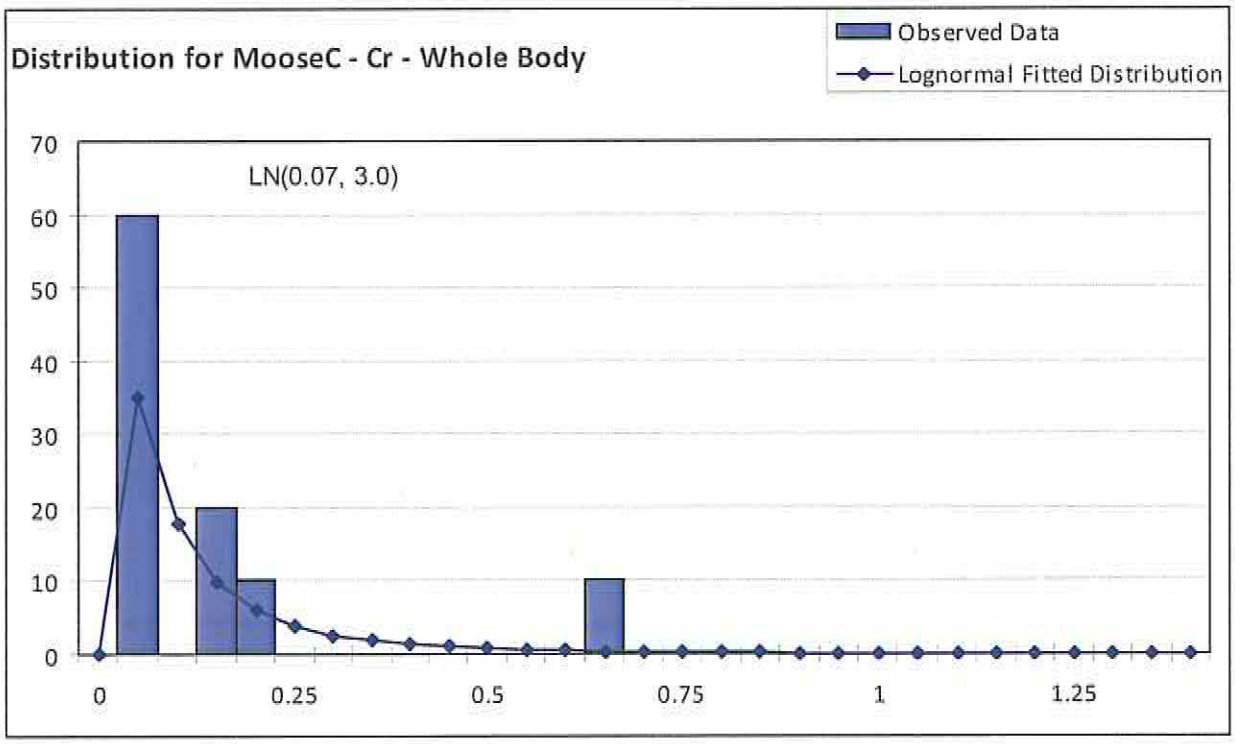


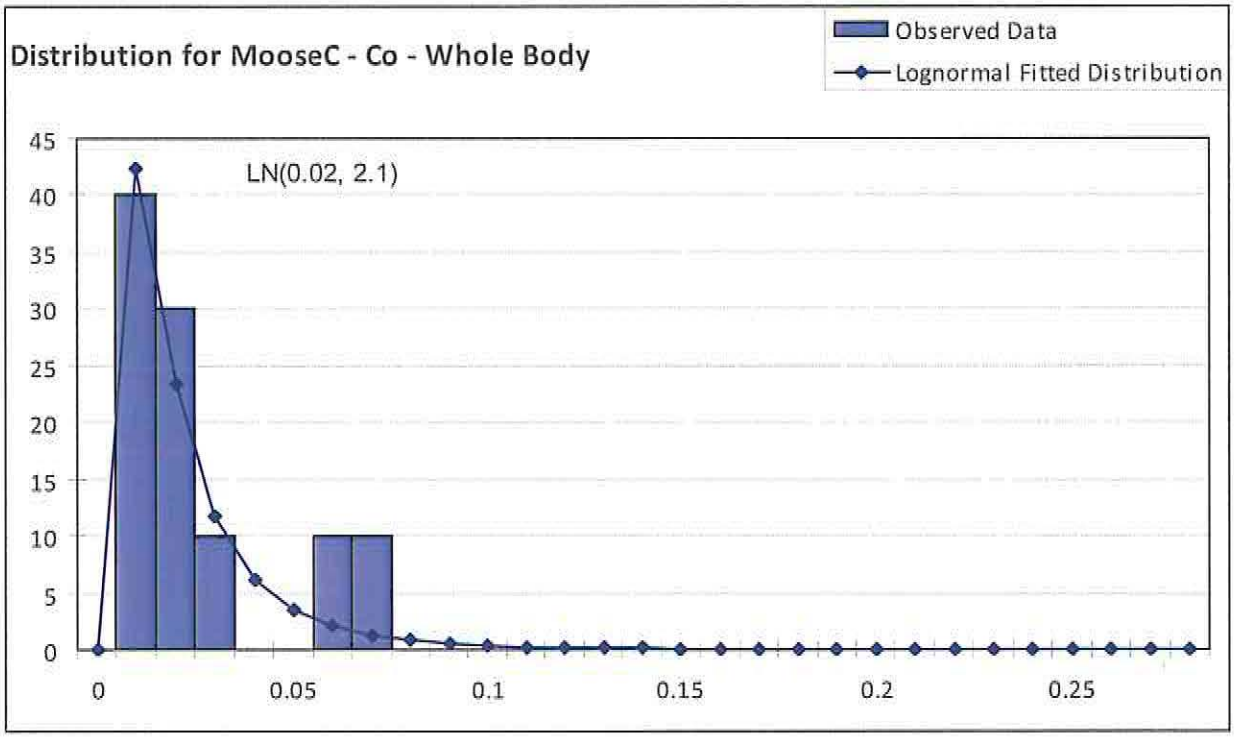


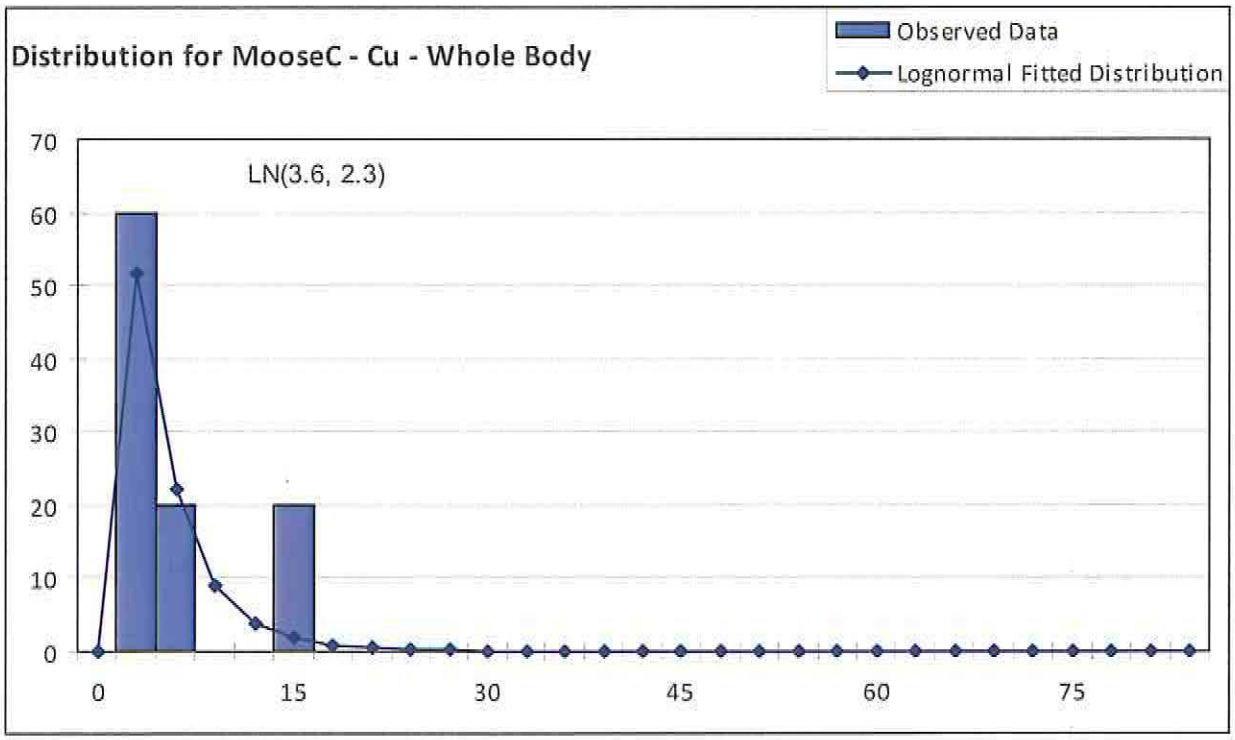

Distribution for MooseC - Be - Whole Body
Observed Data
Lognormal Fitted Distribution
LN(0.002, 1.6)
90
80
70
60
50
40
30
20
10
0
0
0.01
0.02
0.03
0.04
0.05

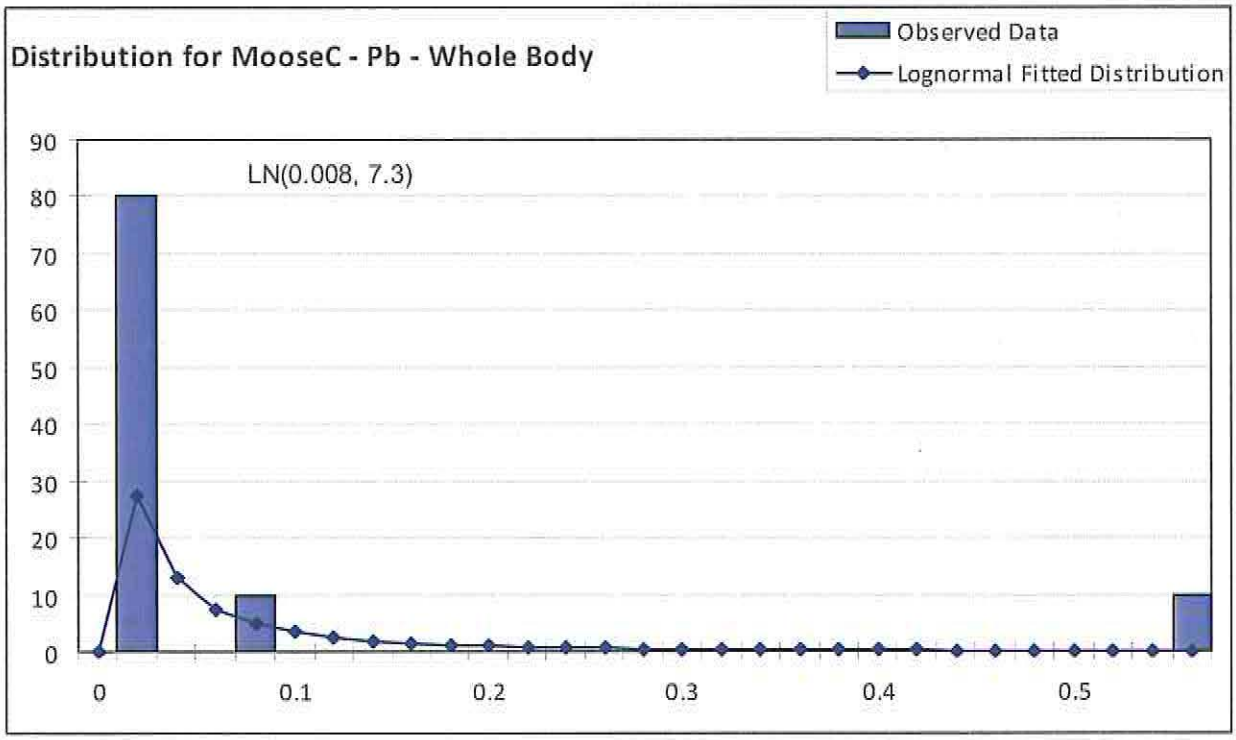

Distribution for MooseC - B - Whole Body
Observed Data
Lognormal Fitted Distribution
LN(0.18, 3.0)
60
50
40
30
20
10
0
0
0.75
1.5
2.25
3
3.75

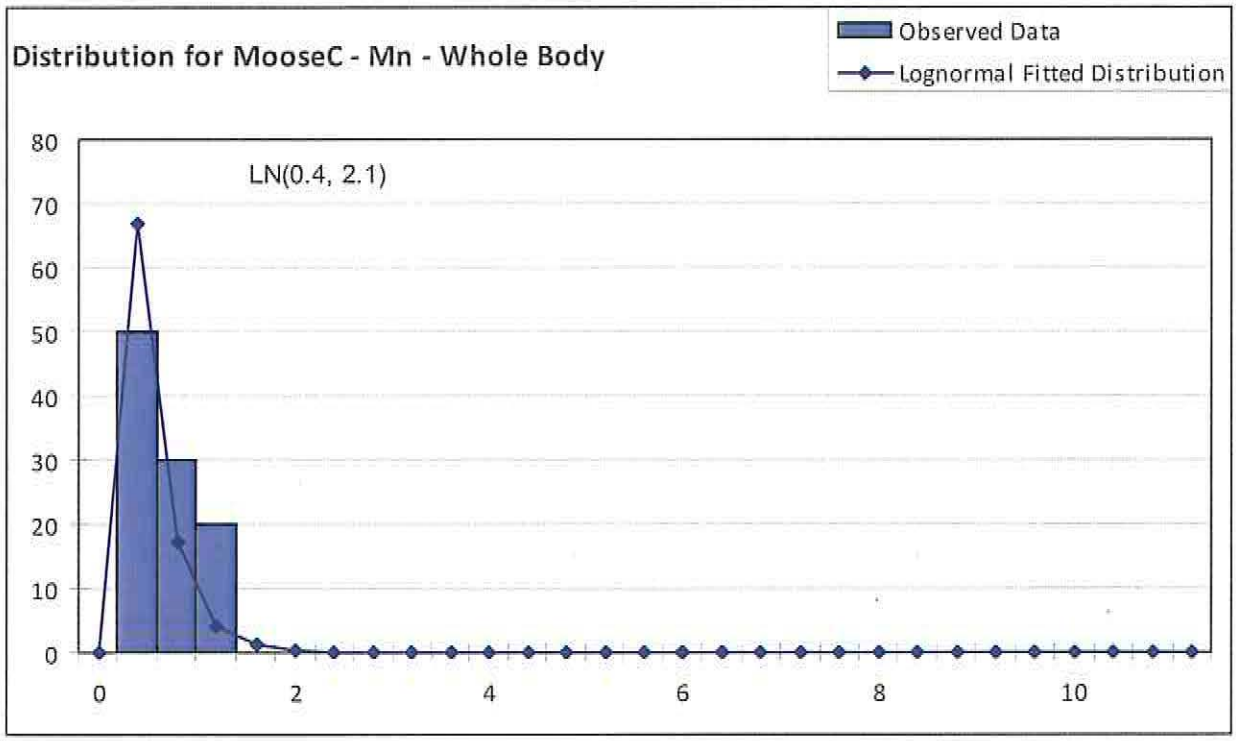

Distribution for MooseC - Cd - Whole Body
Observed Data
Lognormal Fitted Distribution
LN(1.2, 8.5)
60
50
40
30
20
10
0
0
5
10
15
20
25

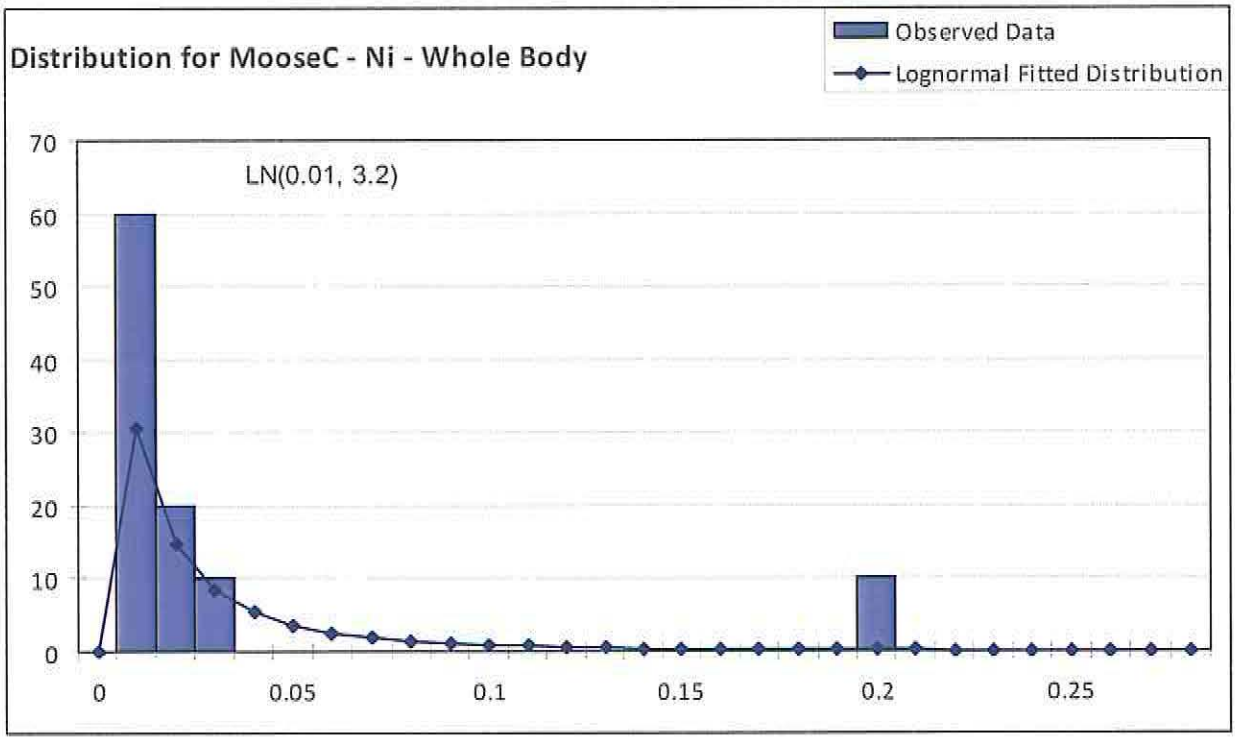

Distribution for MooseC - Cr - Whole Body
Observed Data
Lognormal Fitted Distribution
LN(0.07, 3.0)
70
60
50
40
30
20
10
0
0
0.25
0.5
0.75
1
1.25

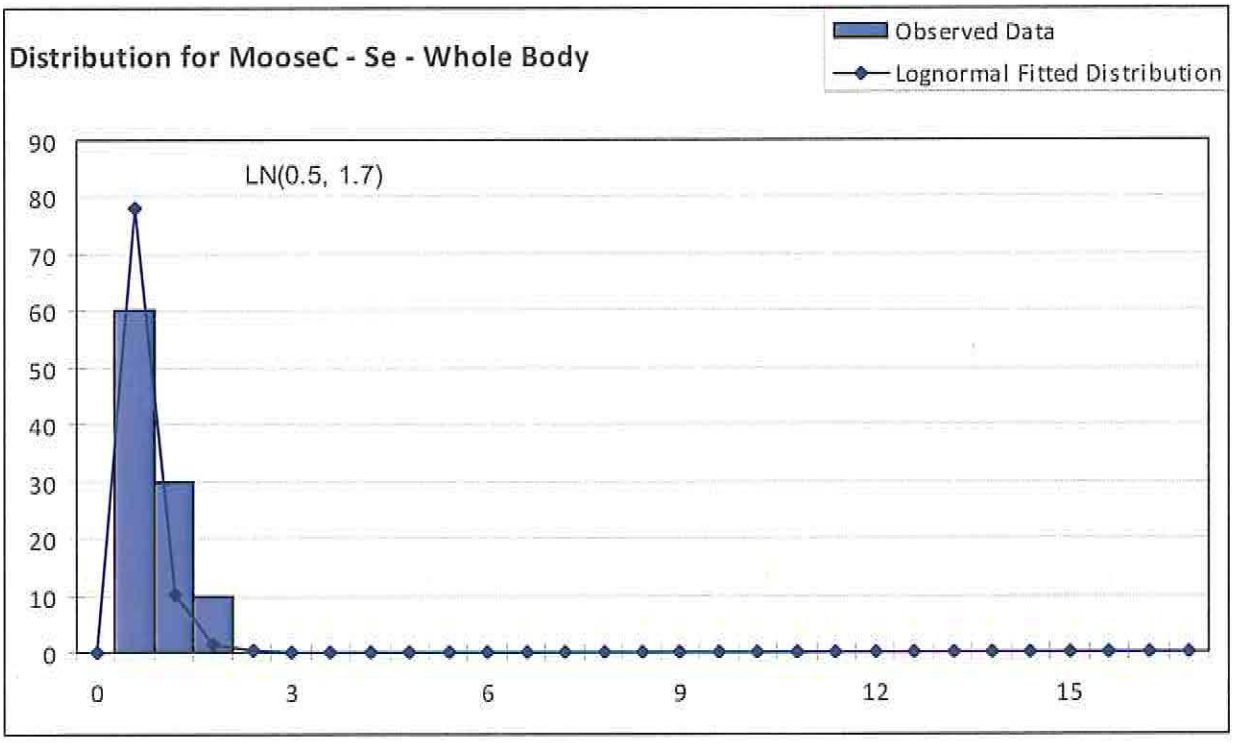

Distribution for MooseC - Co - Whole Body
Observed Data
Lognormal Fitted Distribution
LN(0.02, 2.1)
45
40
35
30
25
20
15
10
5
0
0
0.05
0.1
0.15
0.2
0.25

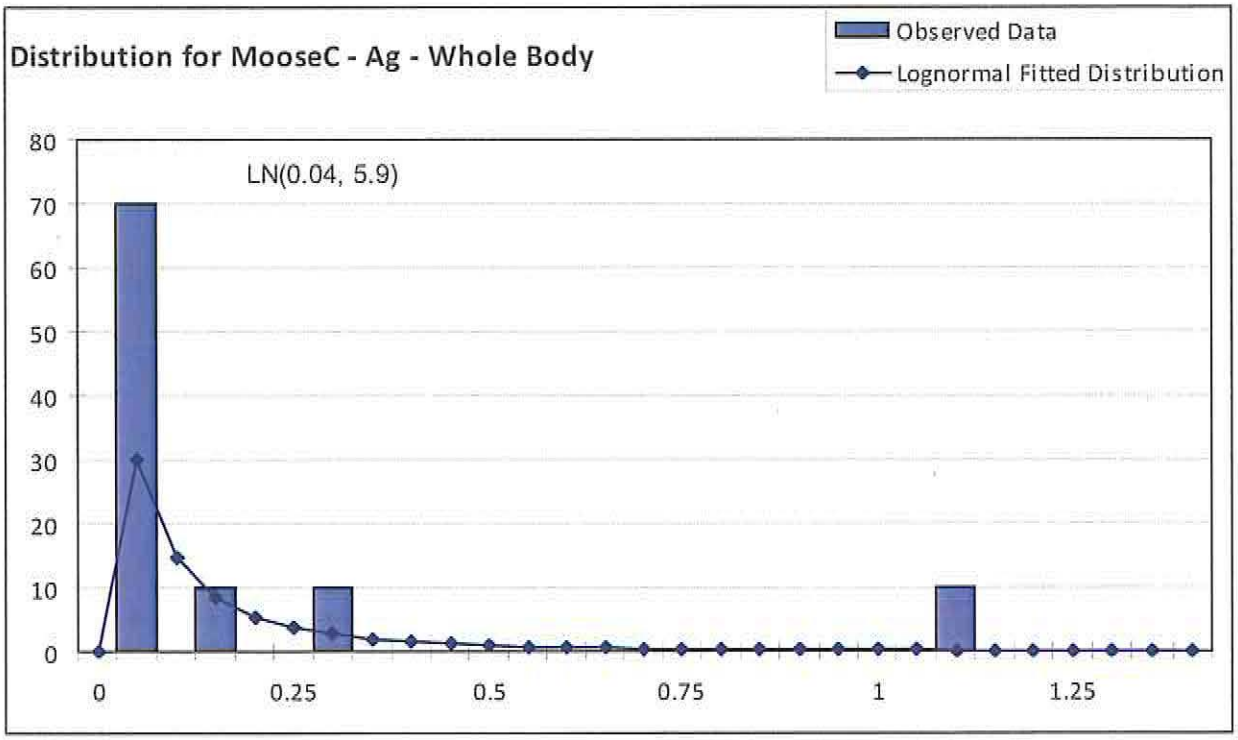

Distribution for MooseC - Cu - Whole Body
Observed Data
Lognormal Fitted Distribution
LN(3.6, 2.3)
70
60
50
40
30
20
10
0
0
15
30
45
60
75

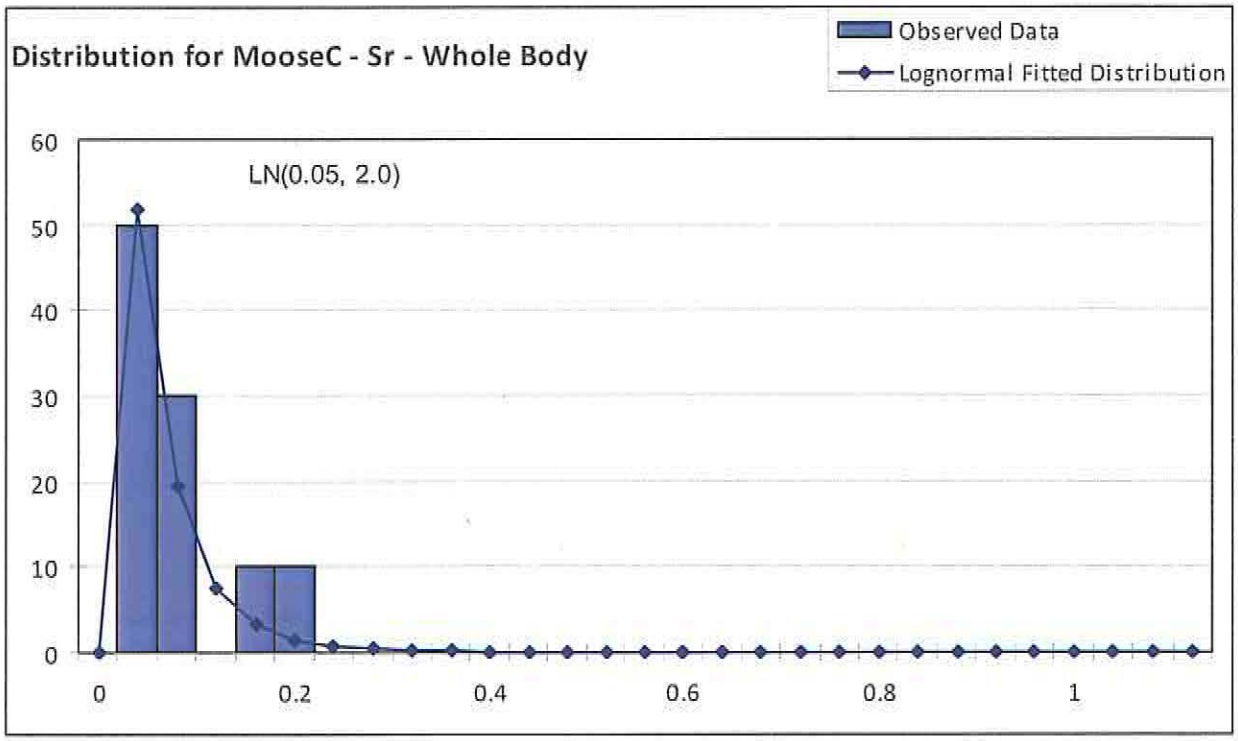

Distribution for MooseC - Pb - Whole Body
Observed Data
Lognormal Fitted Distribution
LN(0.008, 7.3)
90
80
70
60
50
40
30
20
10
0
0
0.1
0.2
0.3
0.4
0.5

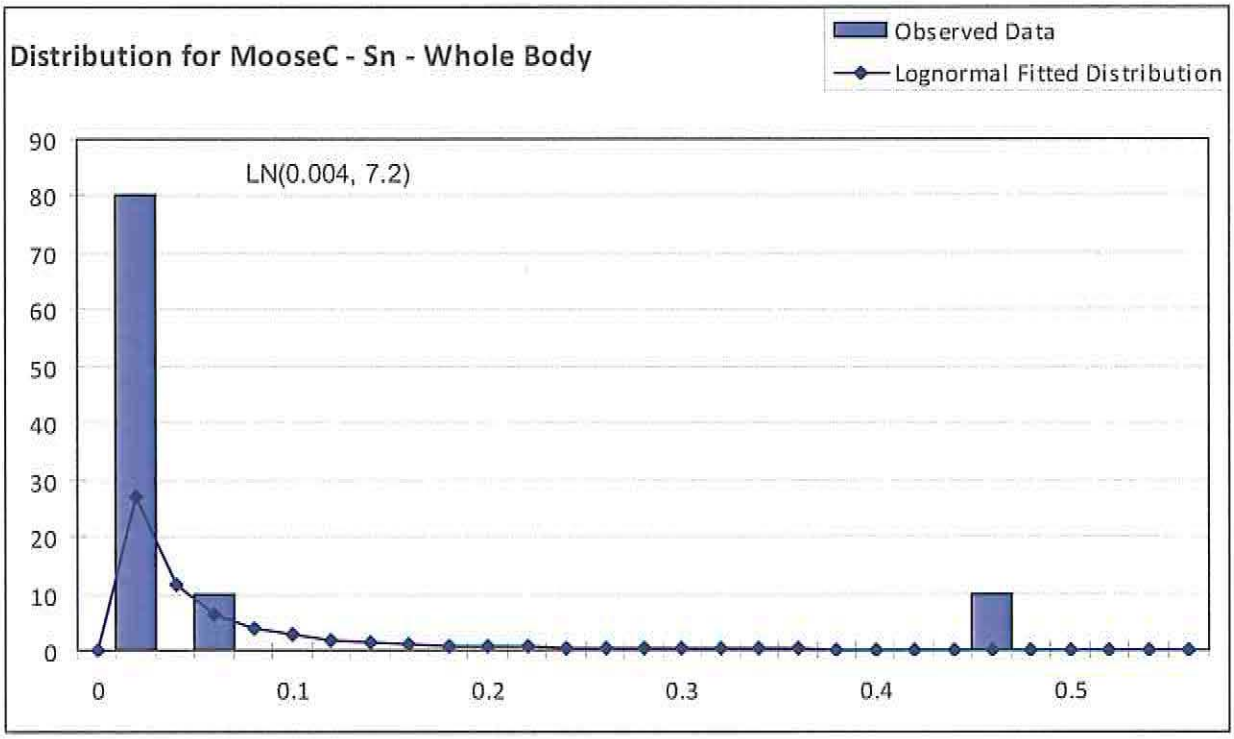

Distribution for MooseC - Mn - Whole Body
Observed Data
Lognormal Fitted Distribution
LN(0.4, 2.1)
80
70
60
50
40
30
20
10
0
0
2
4
6
8
10

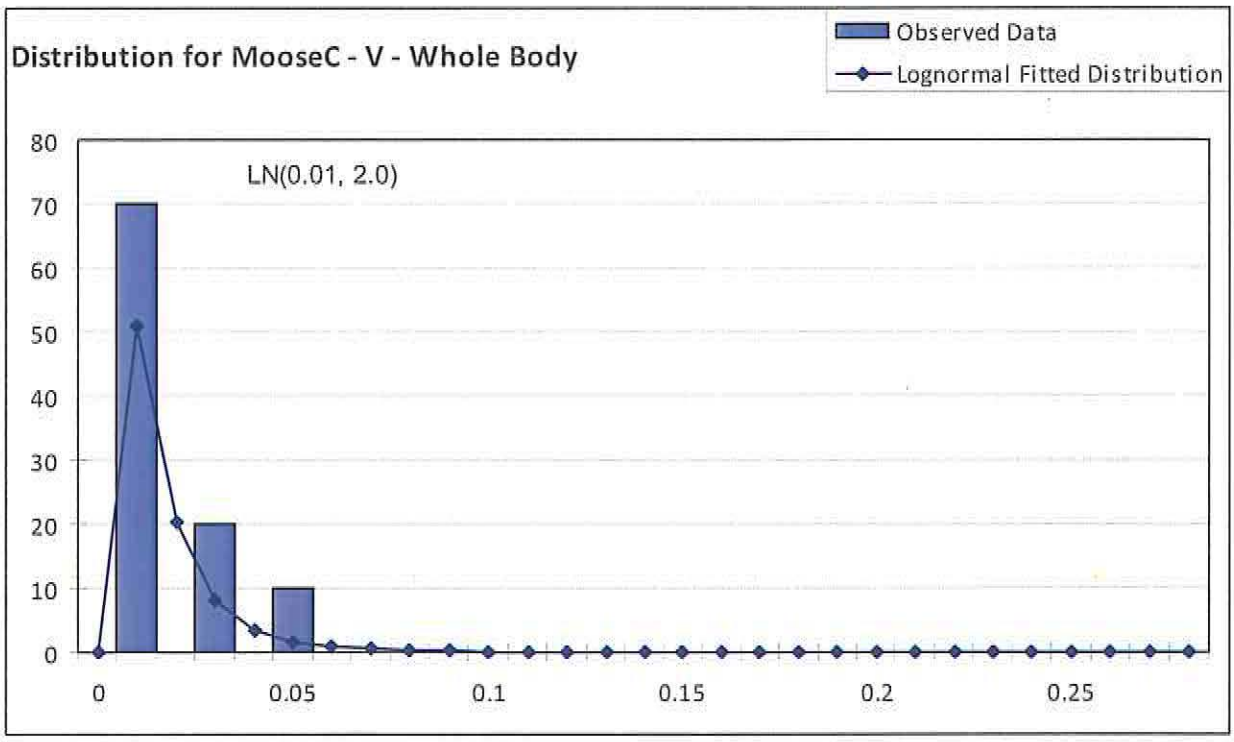

Distribution for MooseC - Ni - Whole Body
Observed Data
Lognormal Fitted Distribution
LN(0.01, 3.2)
70
60
50
40
30
20
10
0
0
0.05
0.1
0.15
0.2
0.25

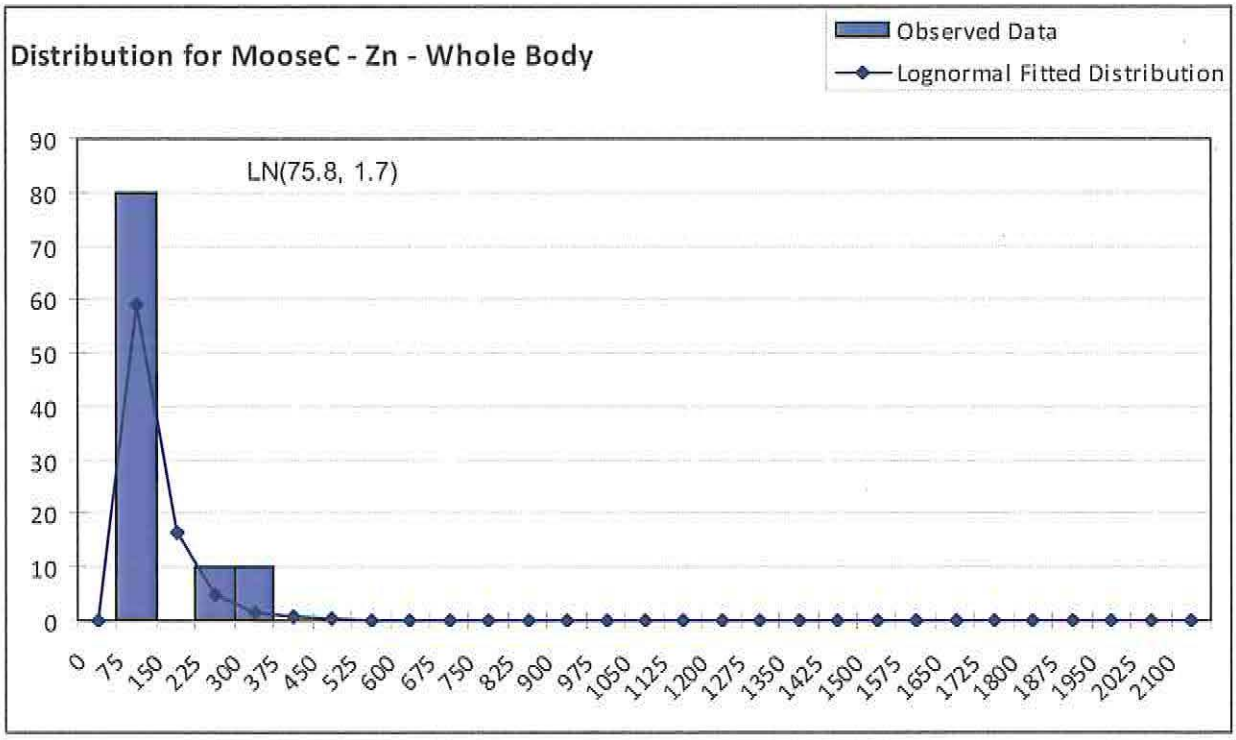

Distribution for MooseC - Se - Whole Body
Observed Data
Lognormal Fitted Distribution
LN(0.5, 1.7)
90
80
70
60
50
40
30
20
10
0
0
3
6
9
12
15


Distribution for MooseC - Ag - Whole Body
Observed Data
Lognormal Fitted Distribution
LN(0.04, 5.9)
80
70
60
50
40
30
20
10
0
0
0.25
0.5
0.75
1
1.25

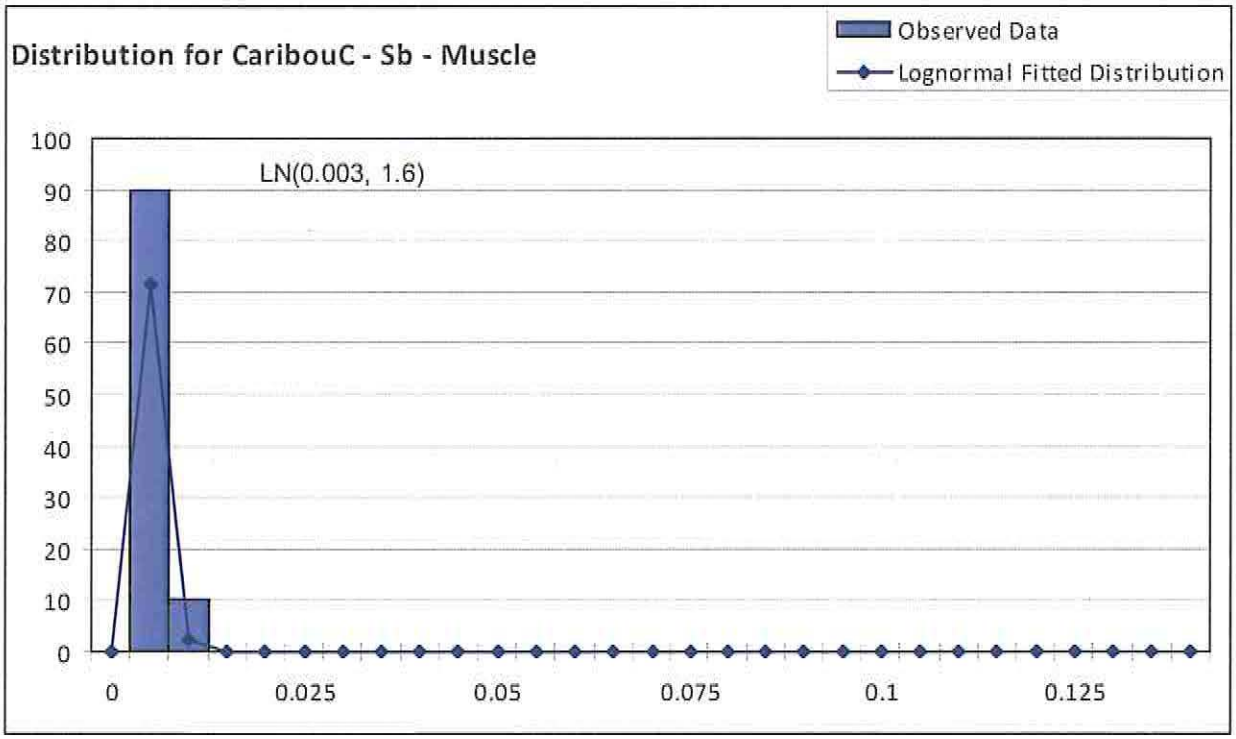

Distribution for MooseC - Sr - Whole Body
Observed Data
Lognormal Fitted Distribution
LN(0.05, 2.0)
60
50
40
30
20
10
0
0
0.2
0.4
0.6
0.8
1

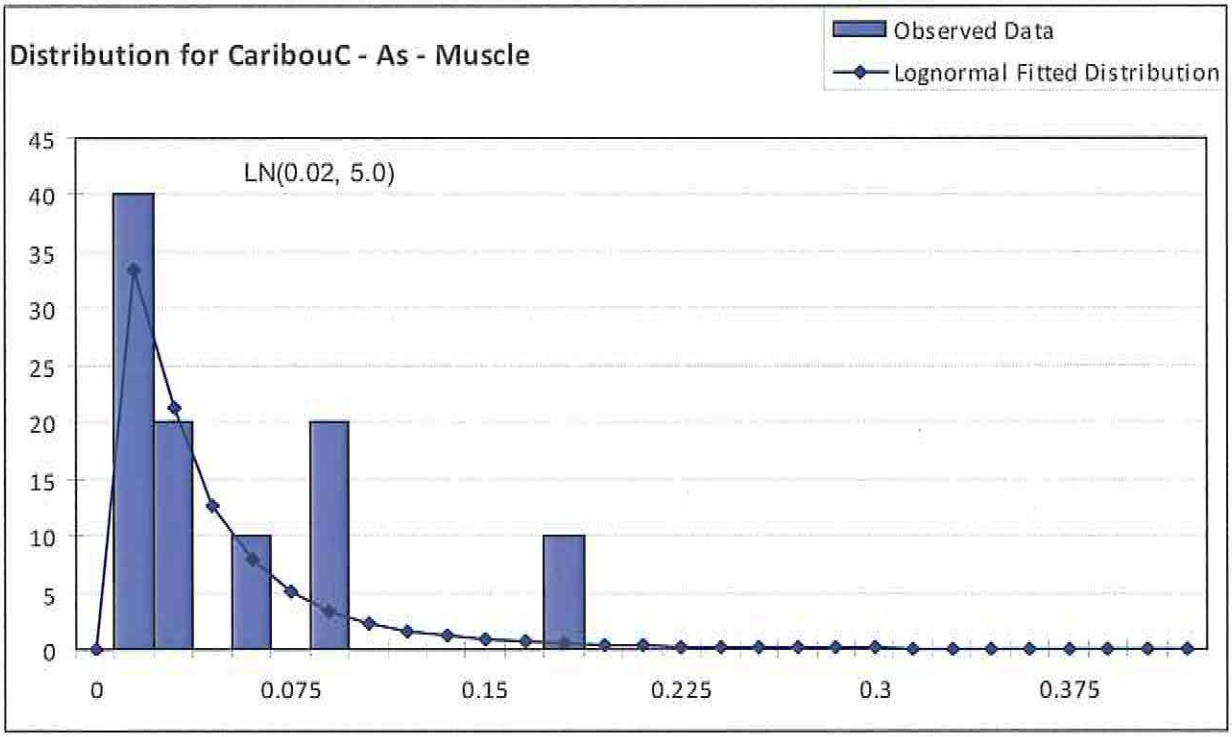

Distribution for MooseC - Sn - Whole Body
Observed Data
Lognormal Fitted Distribution
LN(0.004, 7.2)
90
80
70
60
50
40
30
20
10
0
0
0.1
0.2
0.3
0.4
0.5

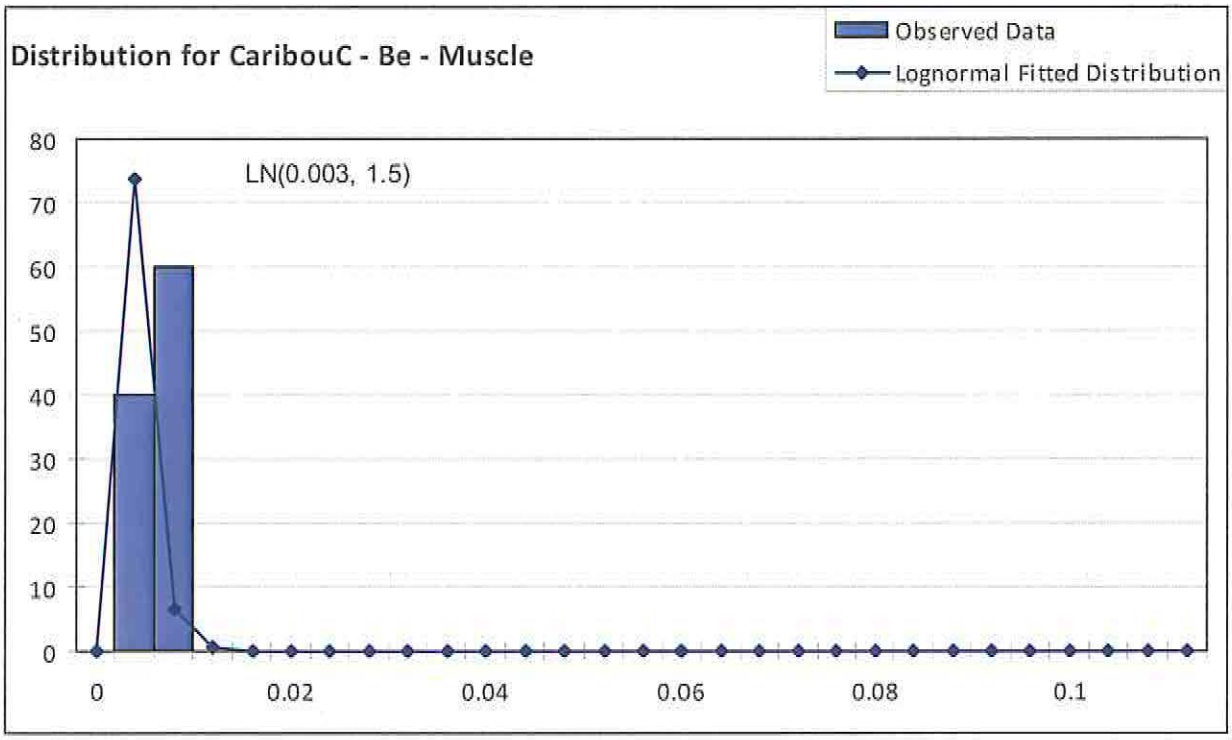

Distribution for MooseC - V - Whole Body
Observed Data
Lognormal Fitted Distribution
LN(0.01, 2.0)
80
70
60
50
40
30
20
10
0
0
0.05
0.1
0.15
0.2
0.25

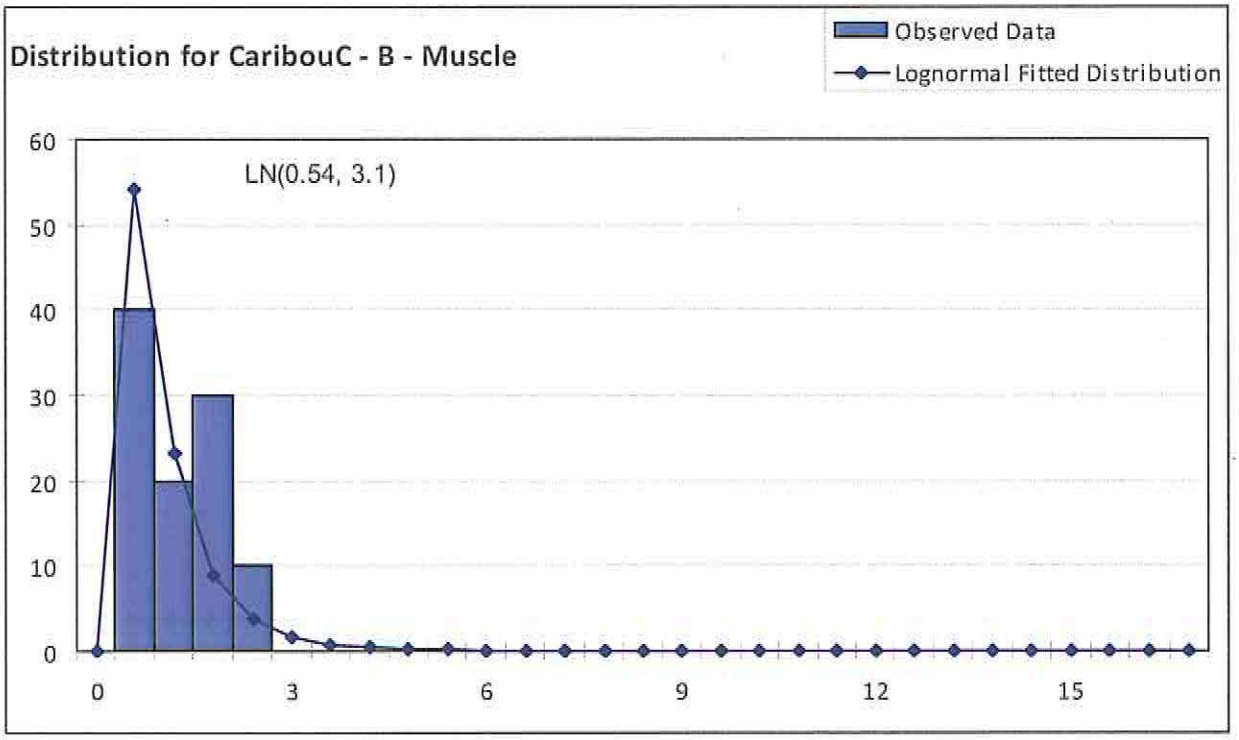


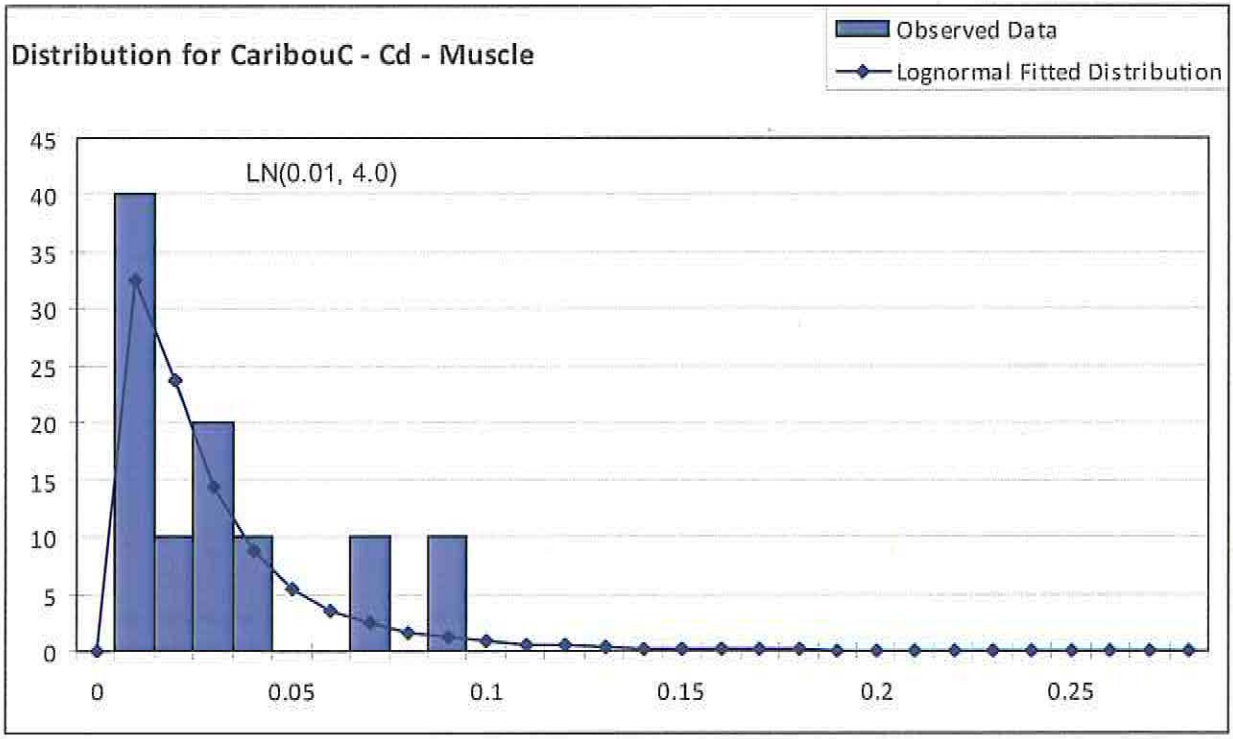
D.9.3 Caribou Muscle

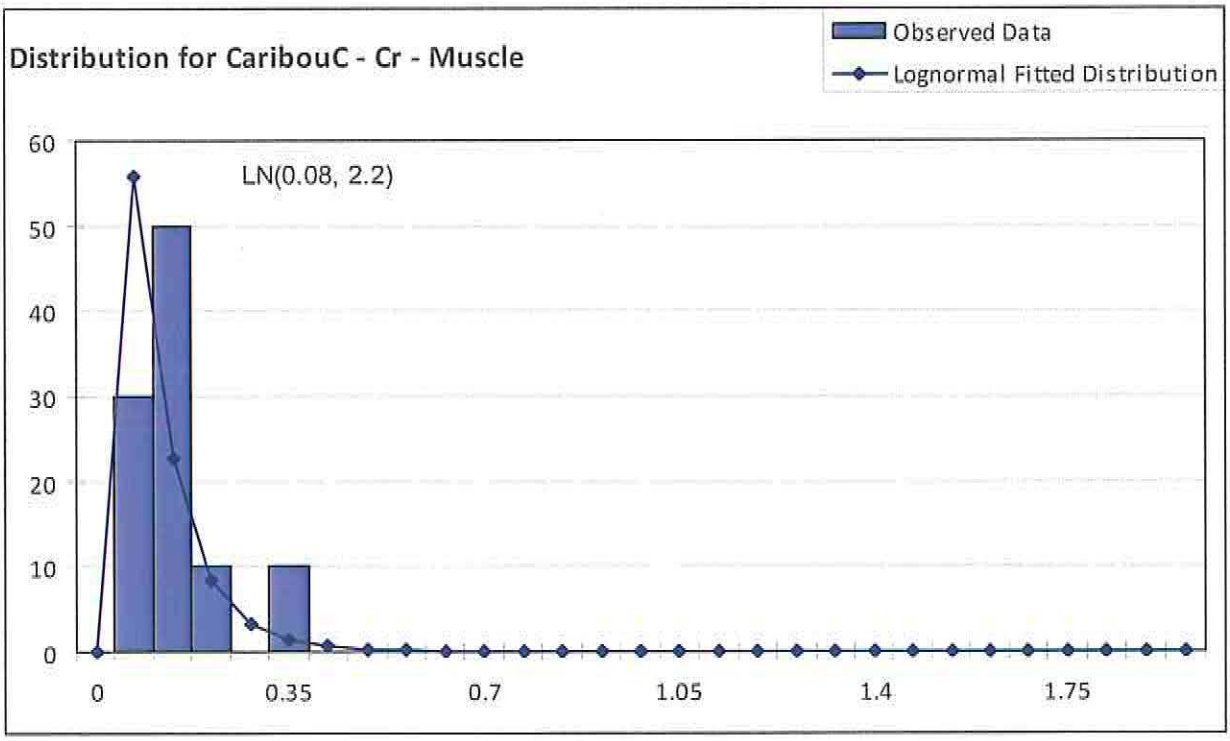


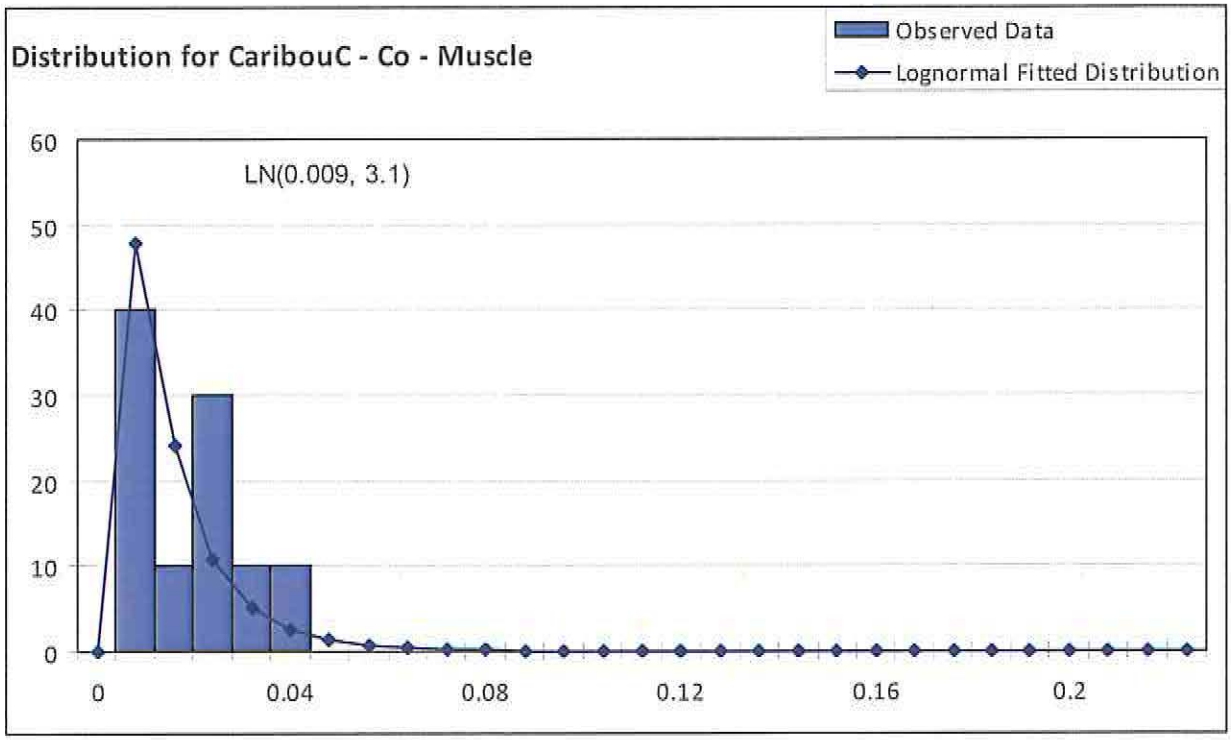

Distribution for CaribouC - As - Muscle
Observed Data
Lognormal Fitted Distribution
LN(0.02, 5.0)
45
40
35
30
25
20
15
10
5
0
0
0.075
0.15
0.225
0.3
0.375

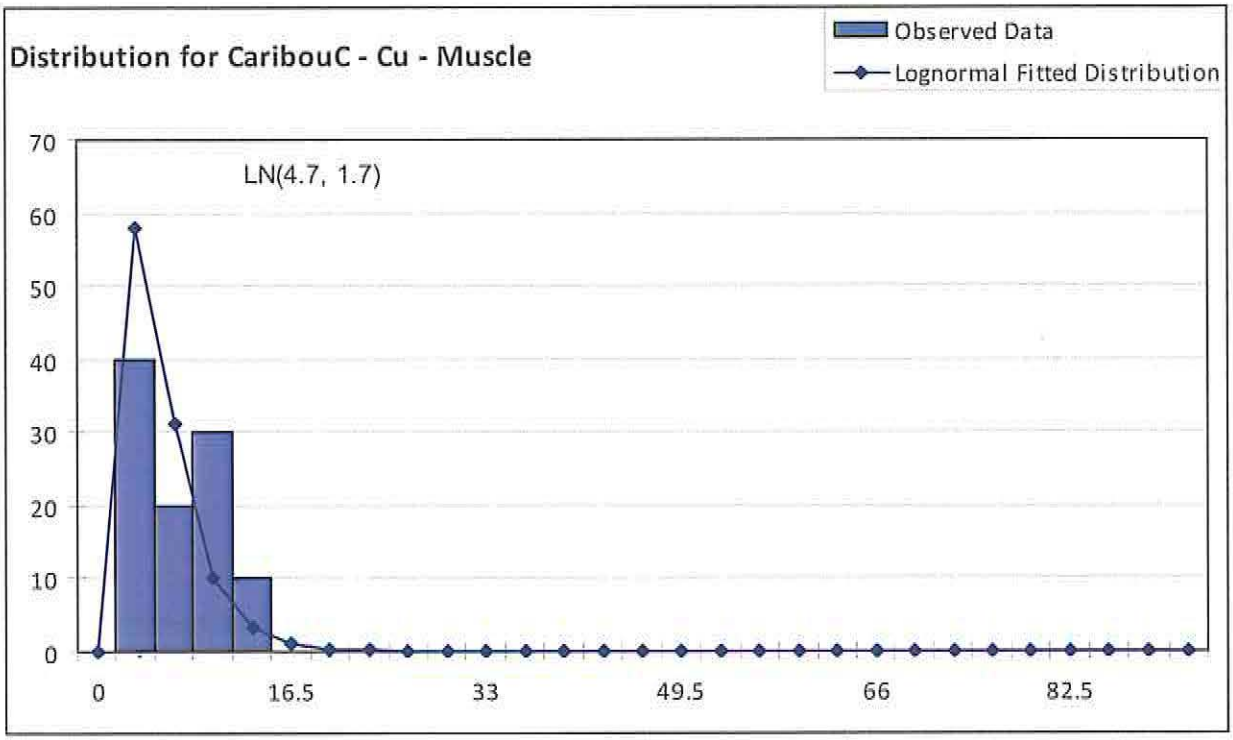

Distribution for CaribouC - Be - Muscle
Observed Data
Lognormal Fitted Distribution
LN(0.003, 1.5)
80
70
60
50
40
30
20
10
0
0
0.02
0.04
0.06
0.08
0.1

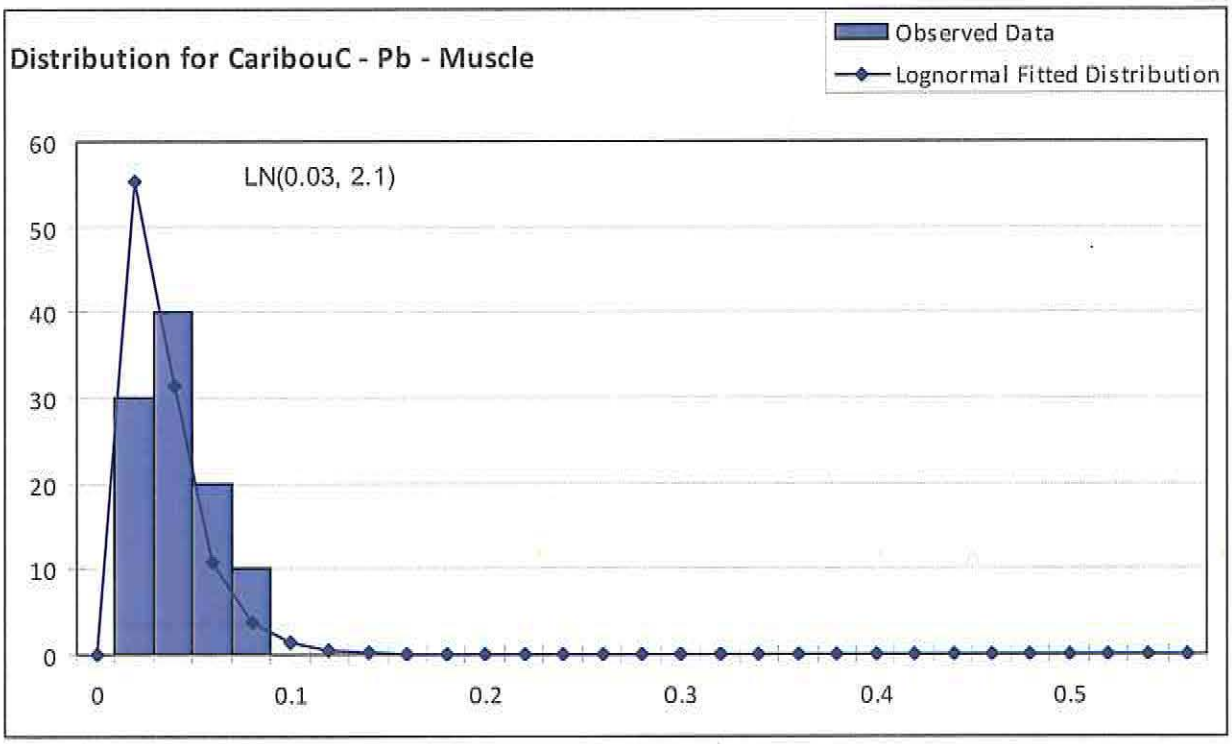

Distribution for CaribouC - B - Muscle
Observed Data
Lognormal Fitted Distribution
LN(0.54, 3.1)
60
50
40
30
20
10
0
0
3
6
9
12
15

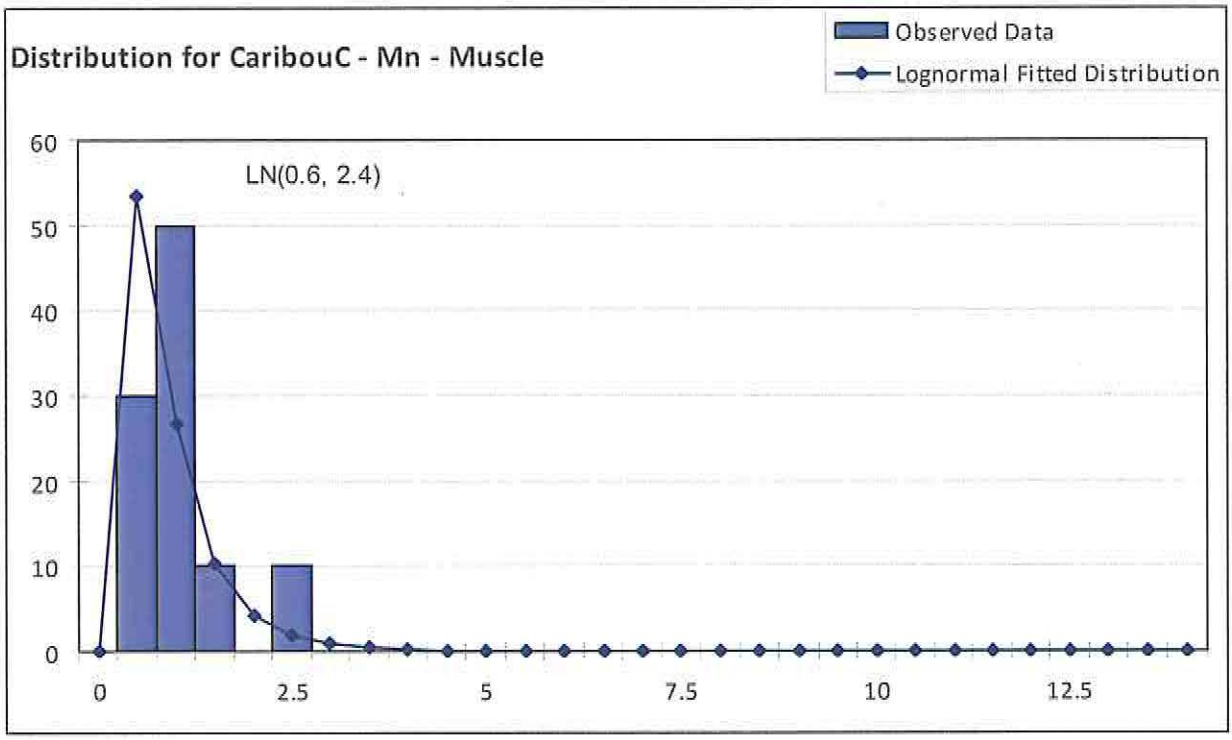

Distribution for CaribouC - Cd - Muscle
Observed Data
Lognormal Fitted Distribution
LN(0.01, 4.0)
45
40
35
30
25
20
15
10
5
0
0
0.05
0.1
0.15
0.2
0.25

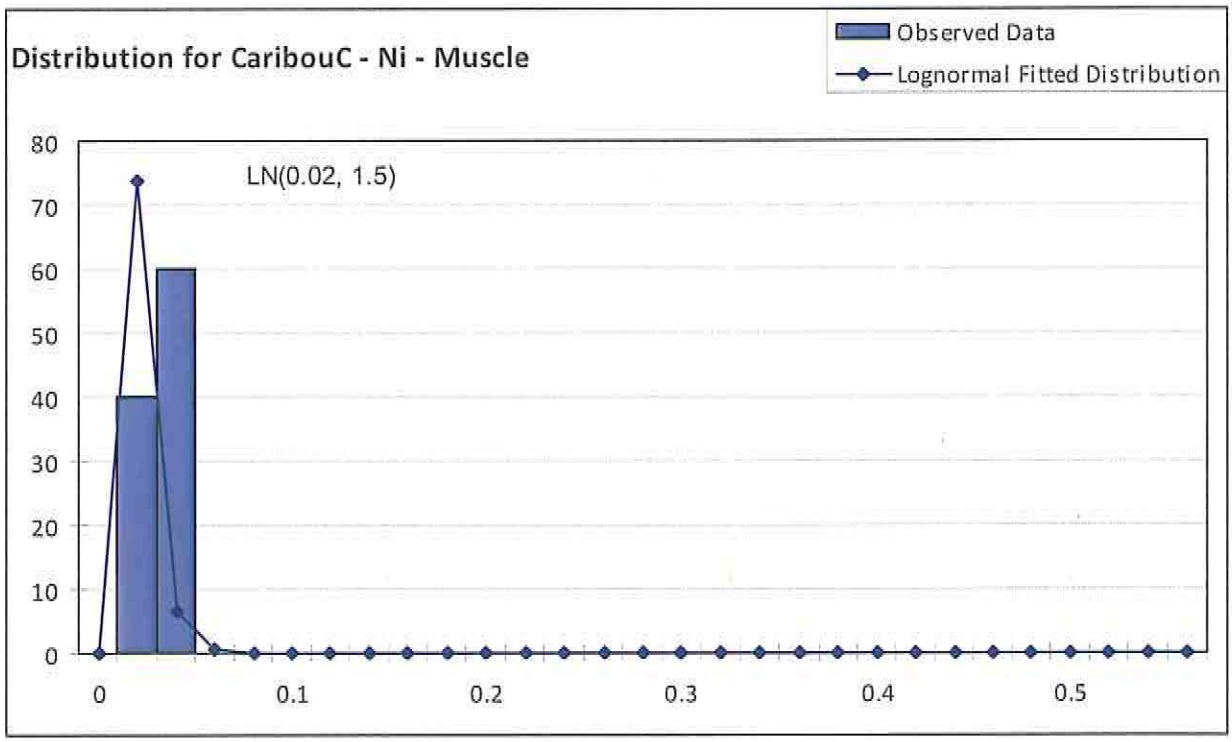

Distribution for CaribouC - Cr - Muscle
Observed Data
Lognormal Fitted Distribution
LN(0.08, 2.2)
60
50
40
30
20
10
0
0
0.35
0.7
1.05
1.4
1.75

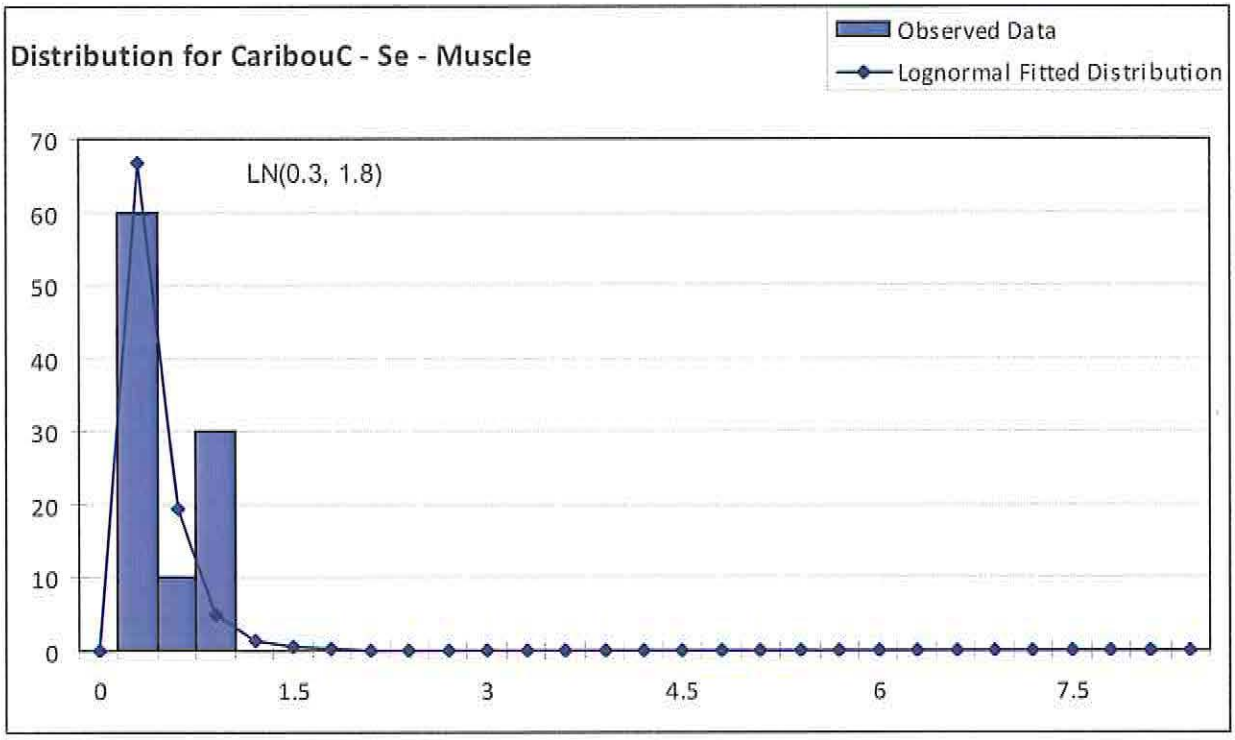

Distribution for CaribouC - Co - Muscle
Observed Data
Lognormal Fitted Distribution
LN(0.009, 3.1)
60
50
40
30
20
10
0
0
0.04
0.08
0.12
0.16
0.2

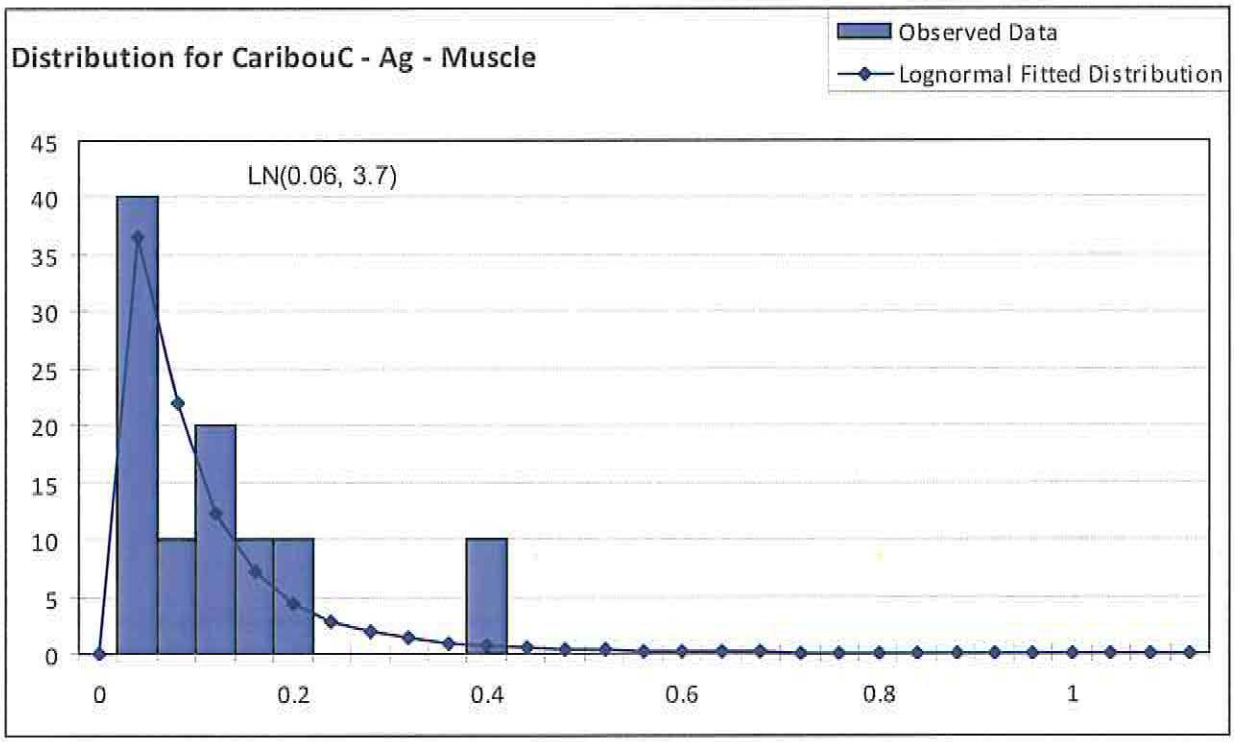

Distribution for CaribouC - Cu - Muscle
Observed Data
Lognormal Fitted Distribution
LN(4.7, 1.7)
70
60
50
40
30
20
10
0
0
16.5
33
49.5
66
82.5

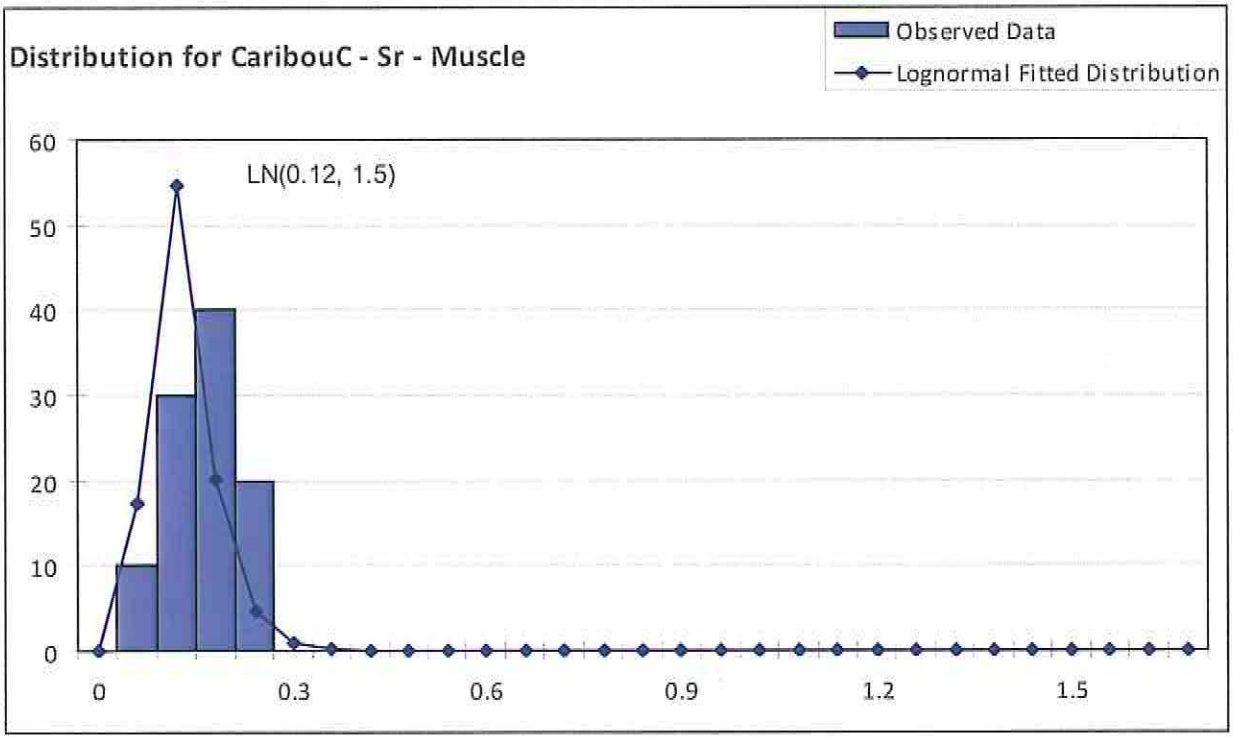

Distribution for CaribouC - Pb - Muscle
Observed Data
Lognormal Fitted Distribution
LN(0.03, 2.1)
60
50
40
30
20
10
0
0
0.1
0.2
0.3
0.4
0.5

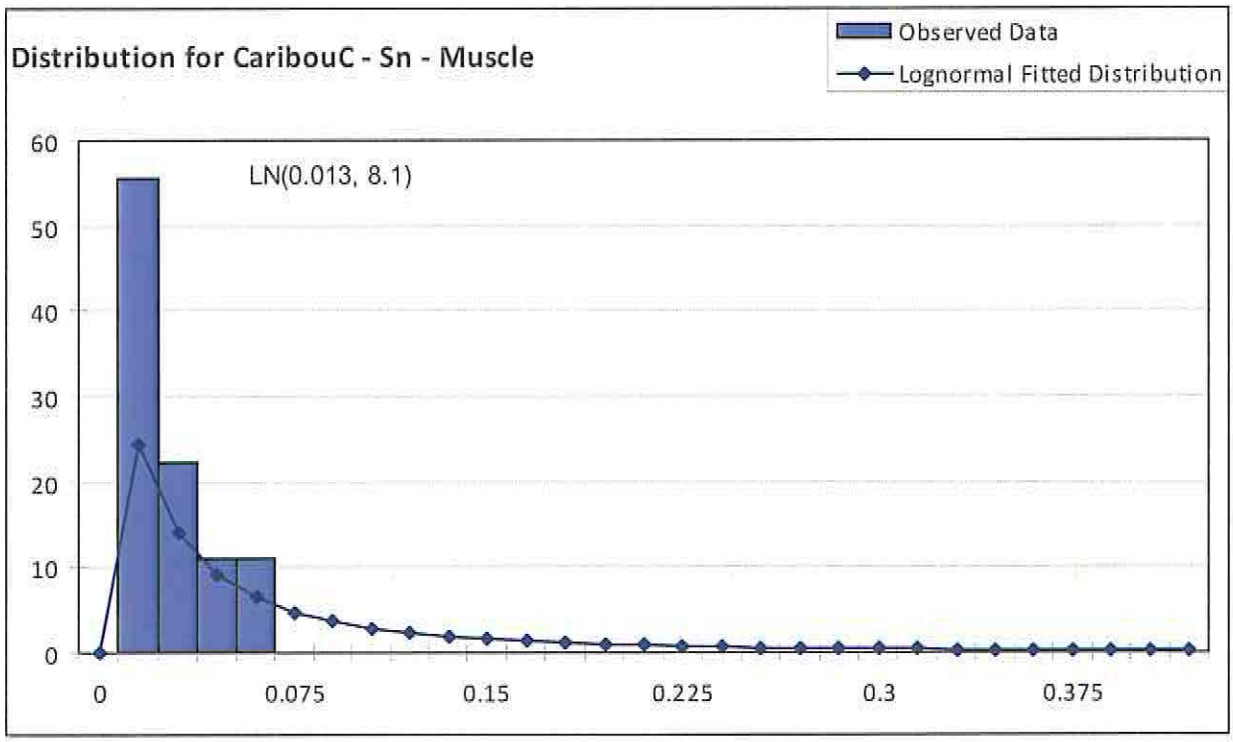

Distribution for CaribouC - Mn - Muscle
Observed Data
Lognormal Fitted Distribution
LN(0.6, 2.4)
60
50
40
30
20
10
0
0
2.5
5
7.5
10
12.5

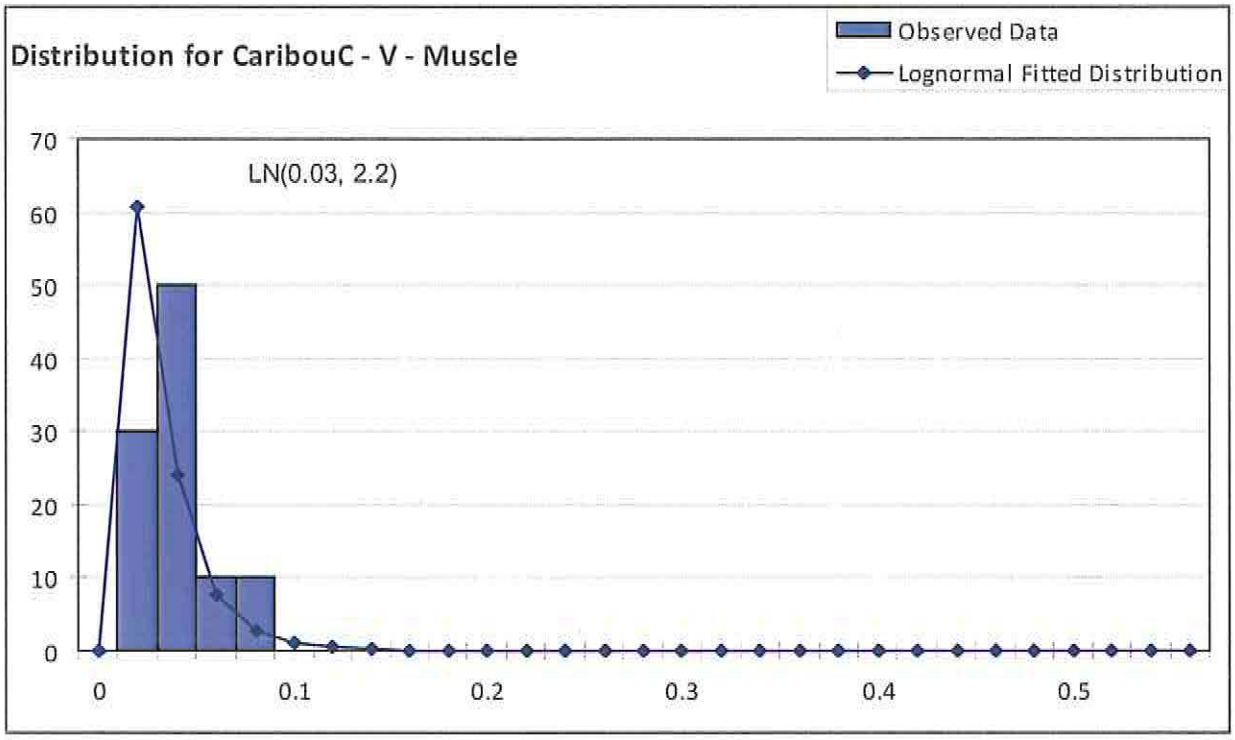

Distribution for CaribouC - Ni - Muscle
Observed Data
Lognormal Fitted Distribution
LN(0.02, 1.5)
80
70
60
50
40
30
20
10
0
0
0.1
0.2
0.3
0.4
0.5

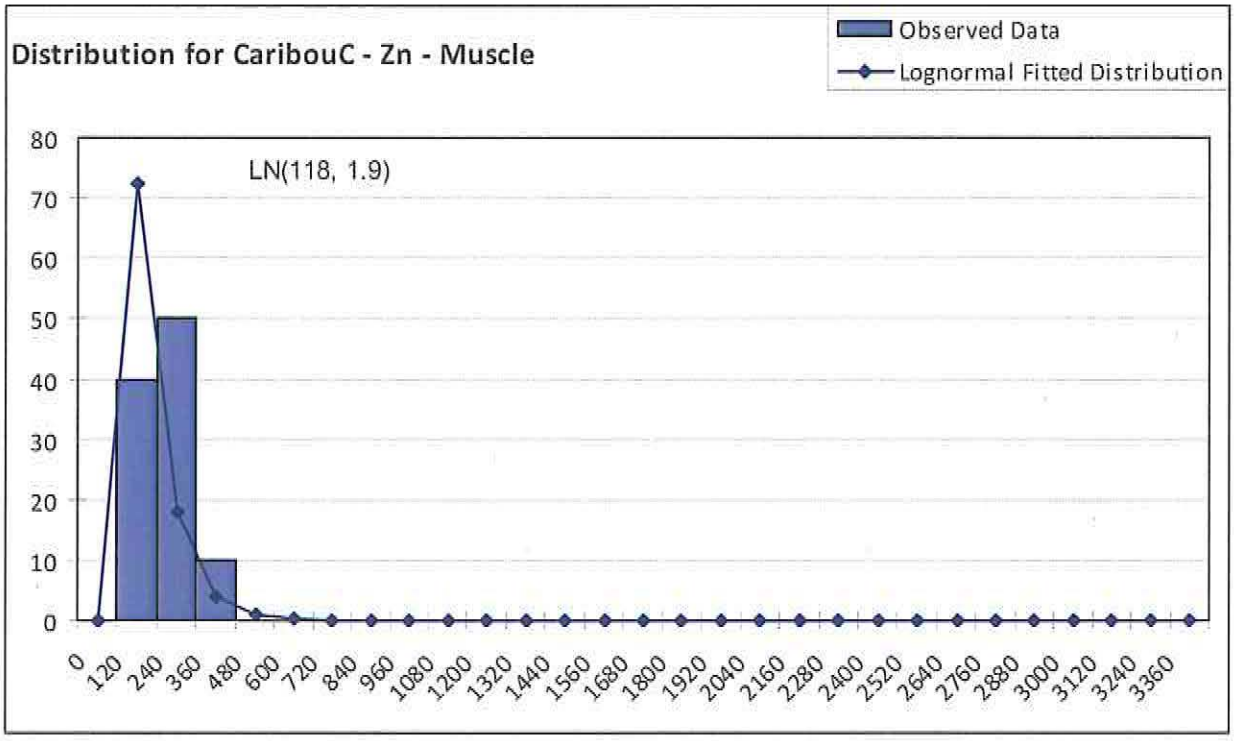

Distribution for CaribouC - Se - Muscle
Observed Data
Lognormal Fitted Distribution
LN(0.3, 1.8)
70
60
50
40
30
20
10
0
0
1.5
3
4.5
6
7.5


Distribution for CaribouC - Ag - Muscle
Observed Data
Lognormal Fitted Distribution
LN(0.06, 3.7)
45
40
35
30
25
20
15
10
5
0
0
0.2
0.4
0.6
0.8
1

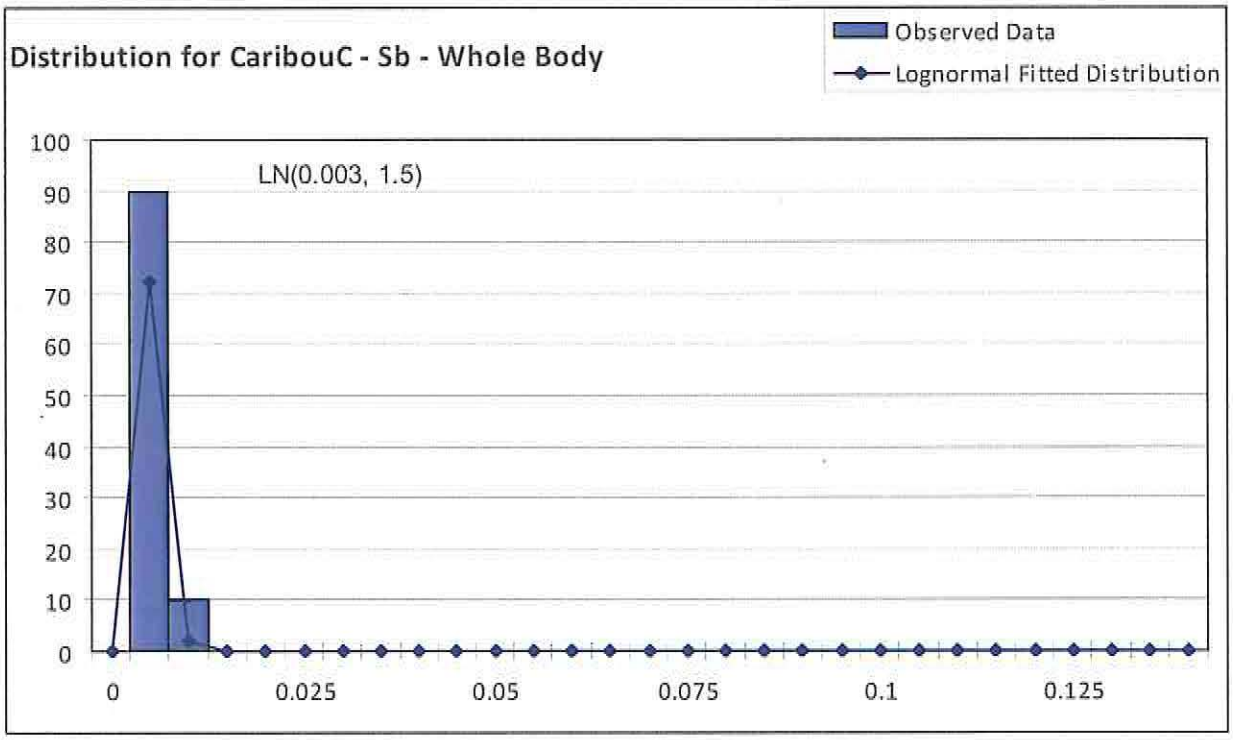

Distribution for CaribouC - Sr - Muscle
Observed Data
Lognormal Fitted Distribution
LN(0.12, 1.5)
60
50
40
30
20
10
0
0
0.3
0.6
0.9
1.2
1.5

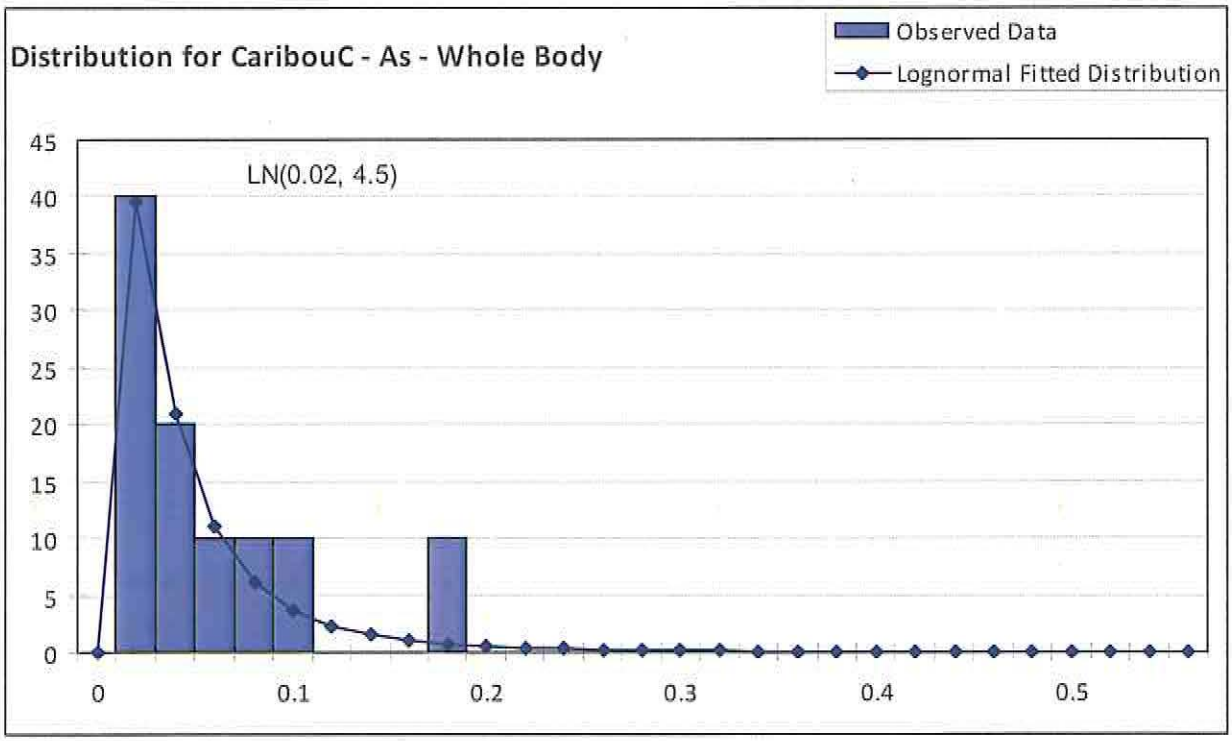

Distribution for CaribouC - Sn - Muscle
Observed Data
Lognormal Fitted Distribution
LN(0.013, 8.1)
60
50
40
30
20
10
0
0
0.075
0.15
0.225
0.3
0.375

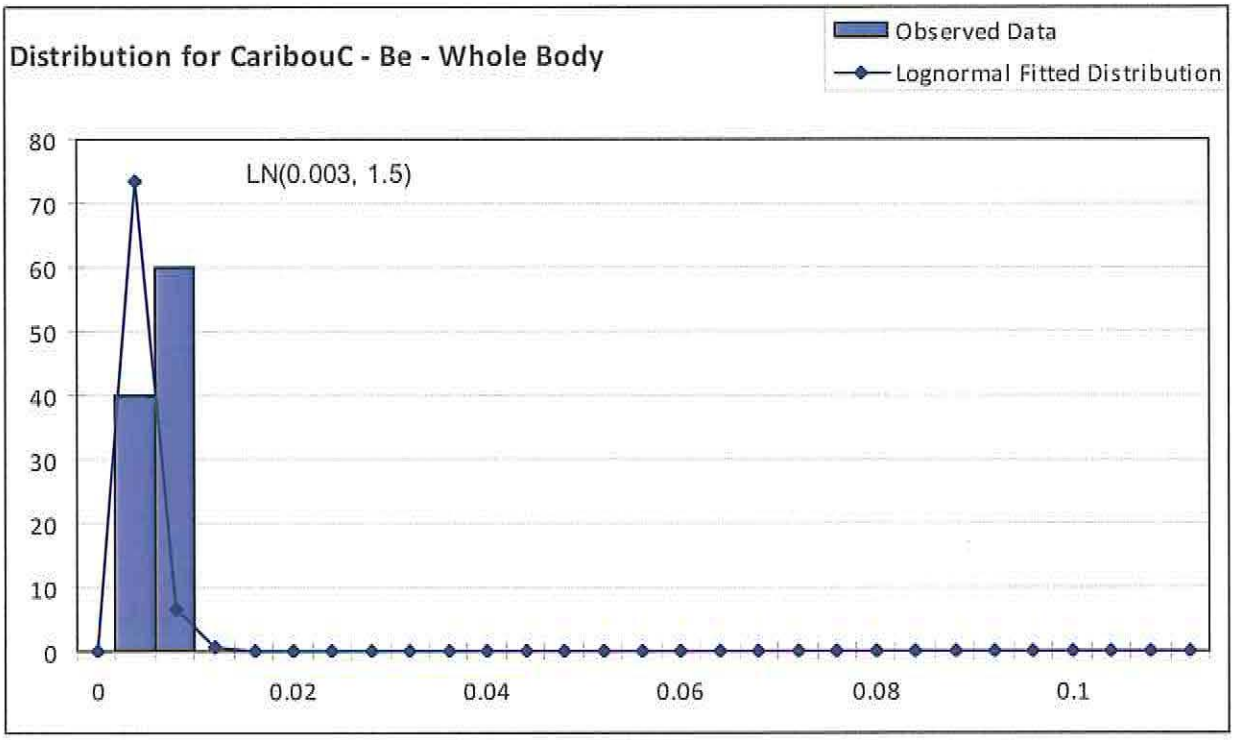

Distribution for CaribouC - V - Muscle
Observed Data
Lognormal Fitted Distribution
LN(0.03, 2.2)
70
60
50
40
30
20
10
0
0
0.1
0.2
0.3
0.4
0.5

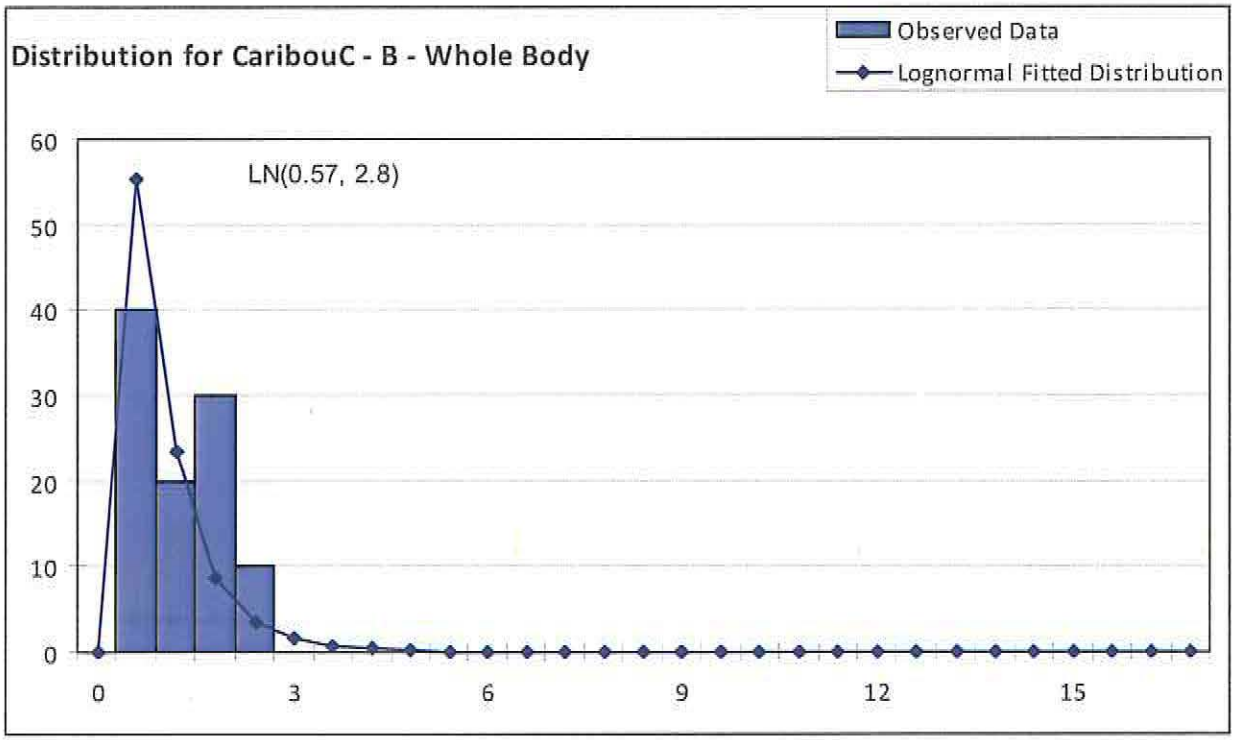

Distribution for CaribouC - Zn - Muscle
Observed Data
Lognormal Fitted Distribution
LN(118, 1.9)
80
70
60
50
40
30
20
10
0
0
120
240
360
480
600
720
840
960
1080
1200
1320
1440
1560
1680
1800
1920
2040
2160
2280
2400
2520
2640
2760
2880
3000
3120
3240
3360

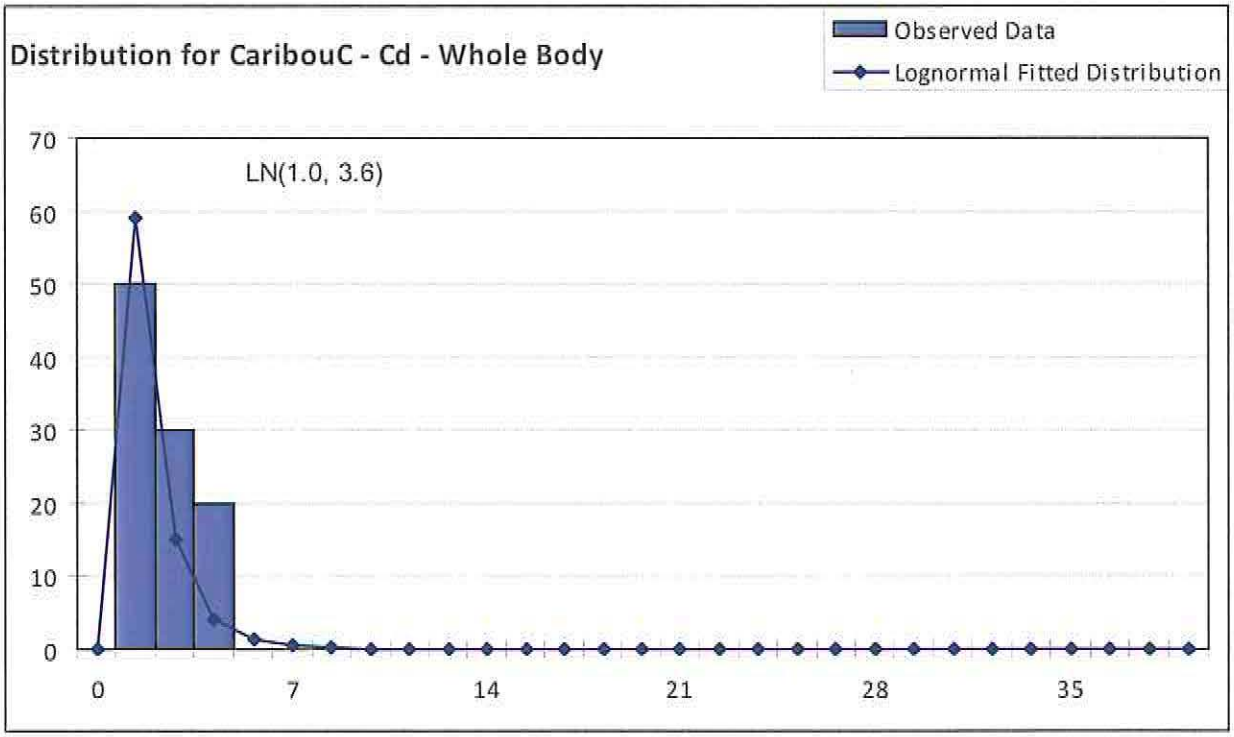
D.9.4 Caribou Whole Body

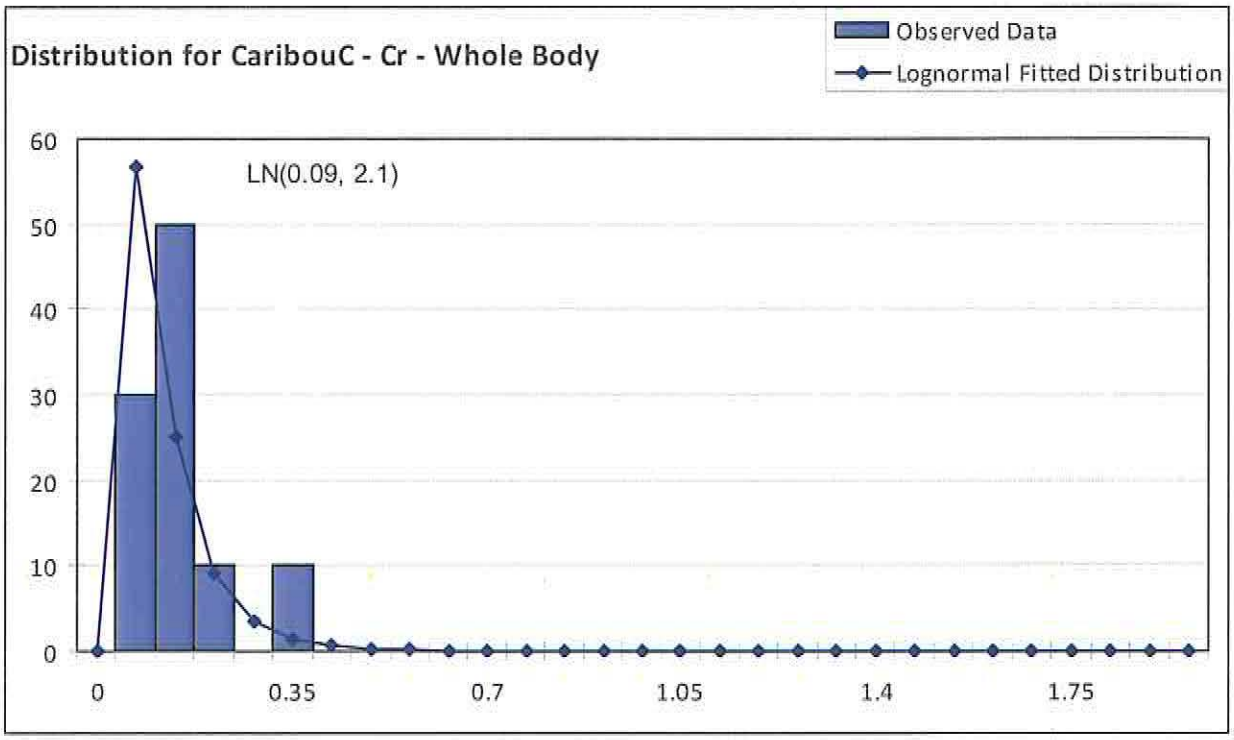


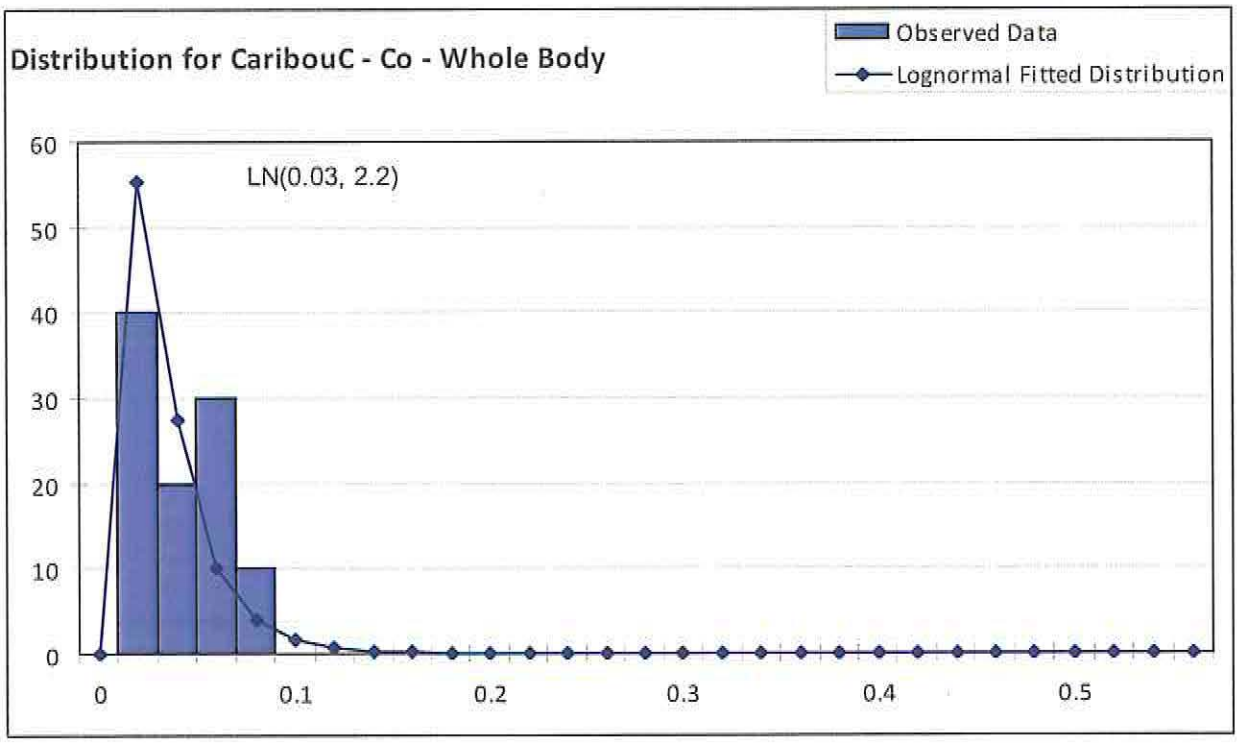


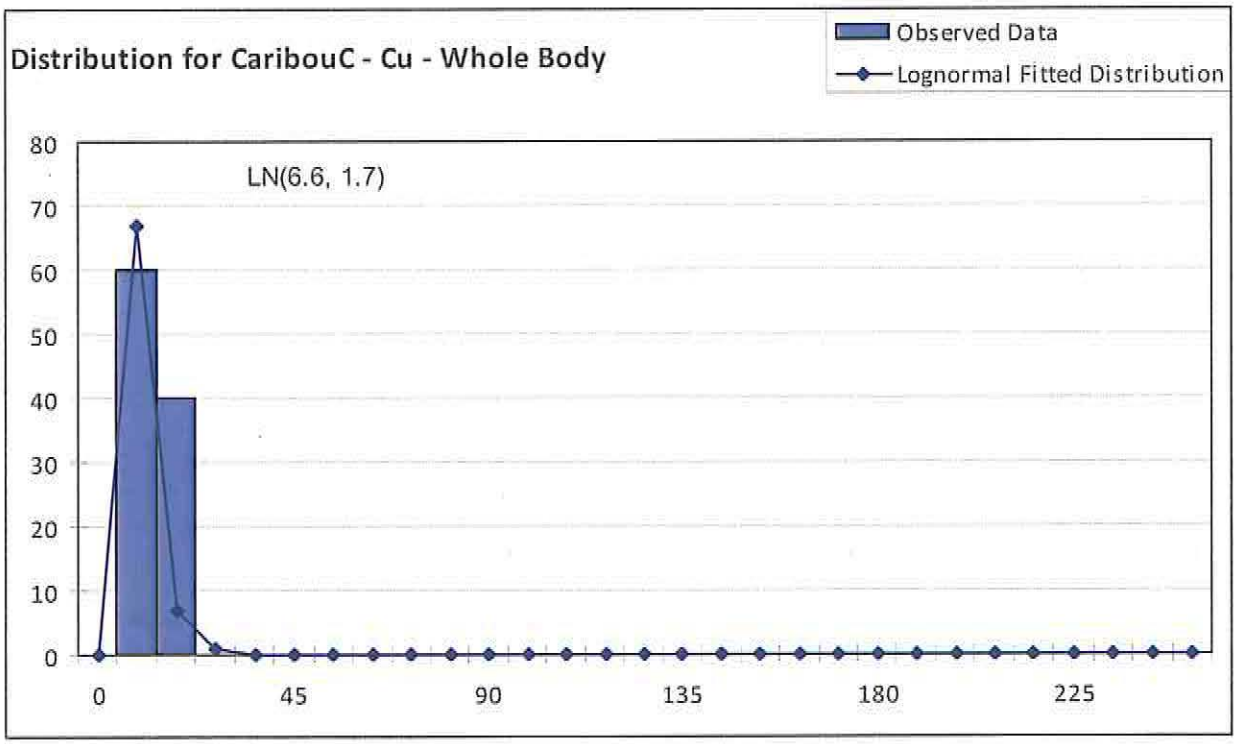

Distribution for CaribouC - Be - Whole Body
Observed Data
Lognormal Fitted Distribution
LN(0.003, 1.5)
80
70
60
50
40
30
20
10
0
0
0.02
0.04
0.06
0.08
0.1

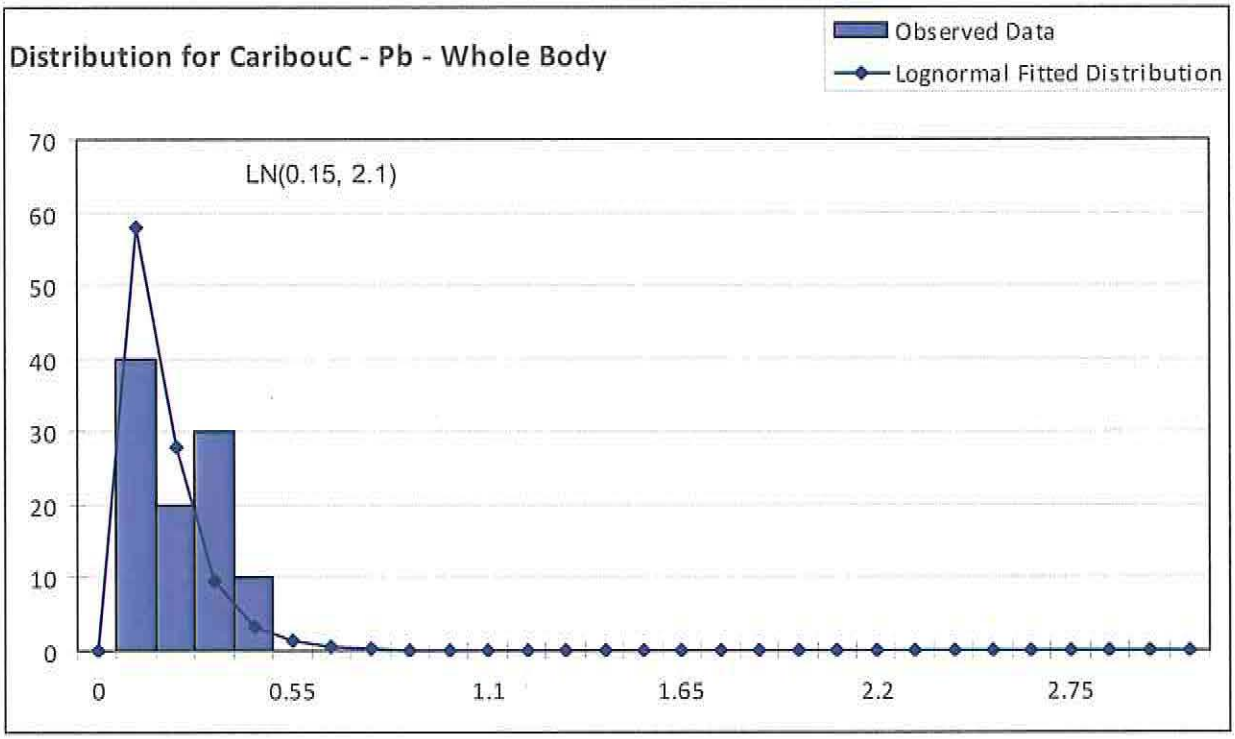

Distribution for CaribouC - B - Whole Body
Observed Data
Lognormal Fitted Distribution
LN(0.57, 2.8)
60
50
40
30
20
10
0
0
3
6
9
12
15

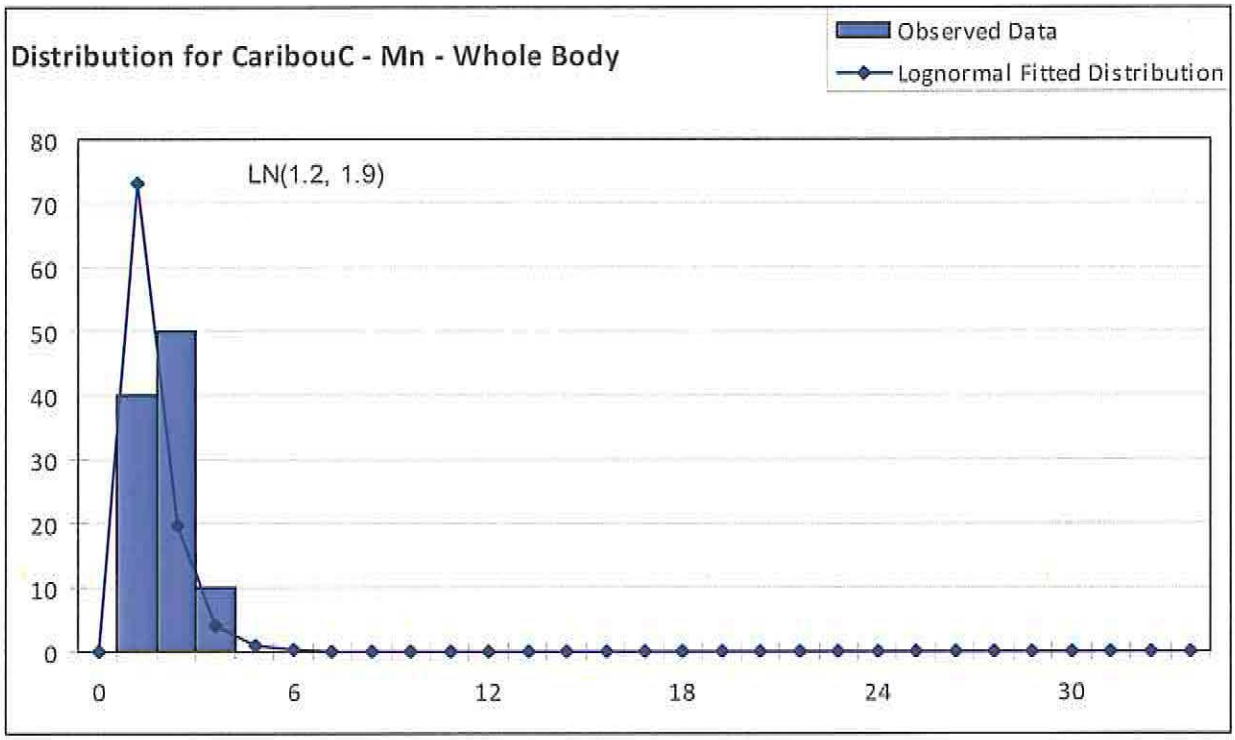

Distribution for CaribouC - Cd - Whole Body
Observed Data
Lognormal Fitted Distribution
LN(1.0, 3.6)
70
60
50
40
30
20
10
0
0
7
14
21
28
35

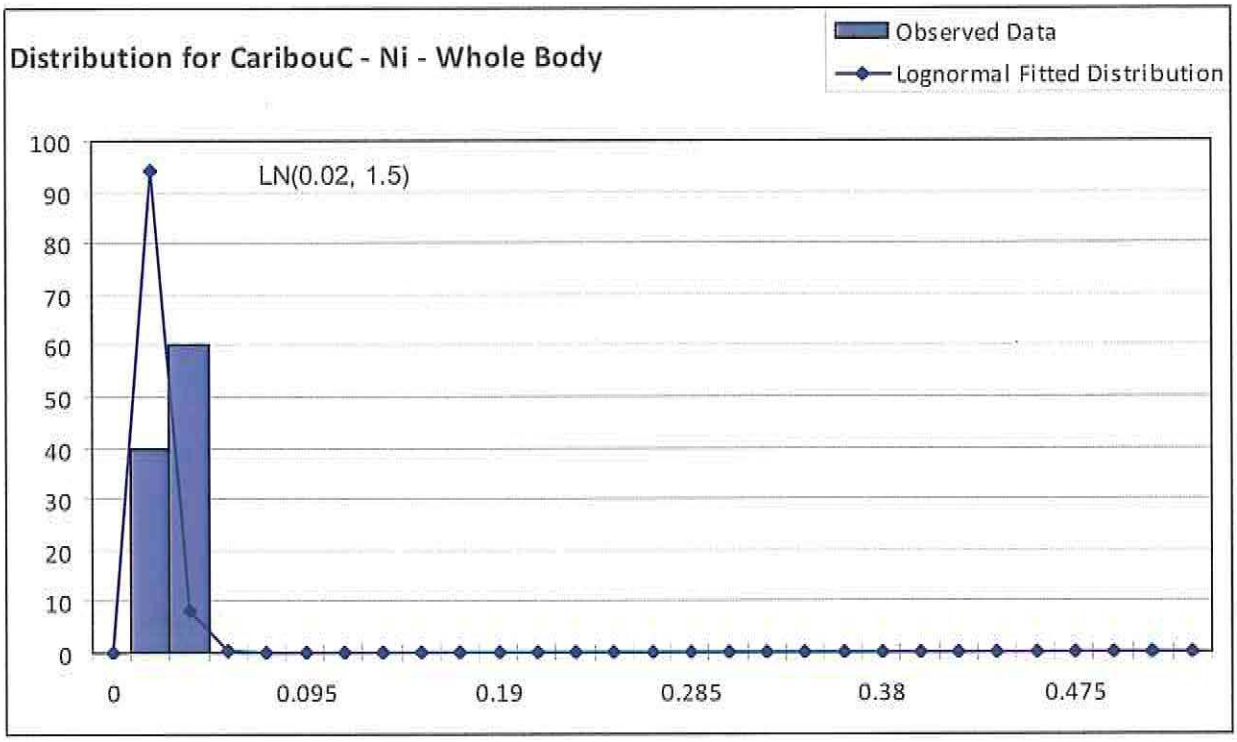

Distribution for CaribouC - Cr - Whole Body
Observed Data
Lognormal Fitted Distribution
LN(0.09, 2.1)
60
50
40
30
20
10
0
0
0.35
0.7
1.05
1.4
1.75

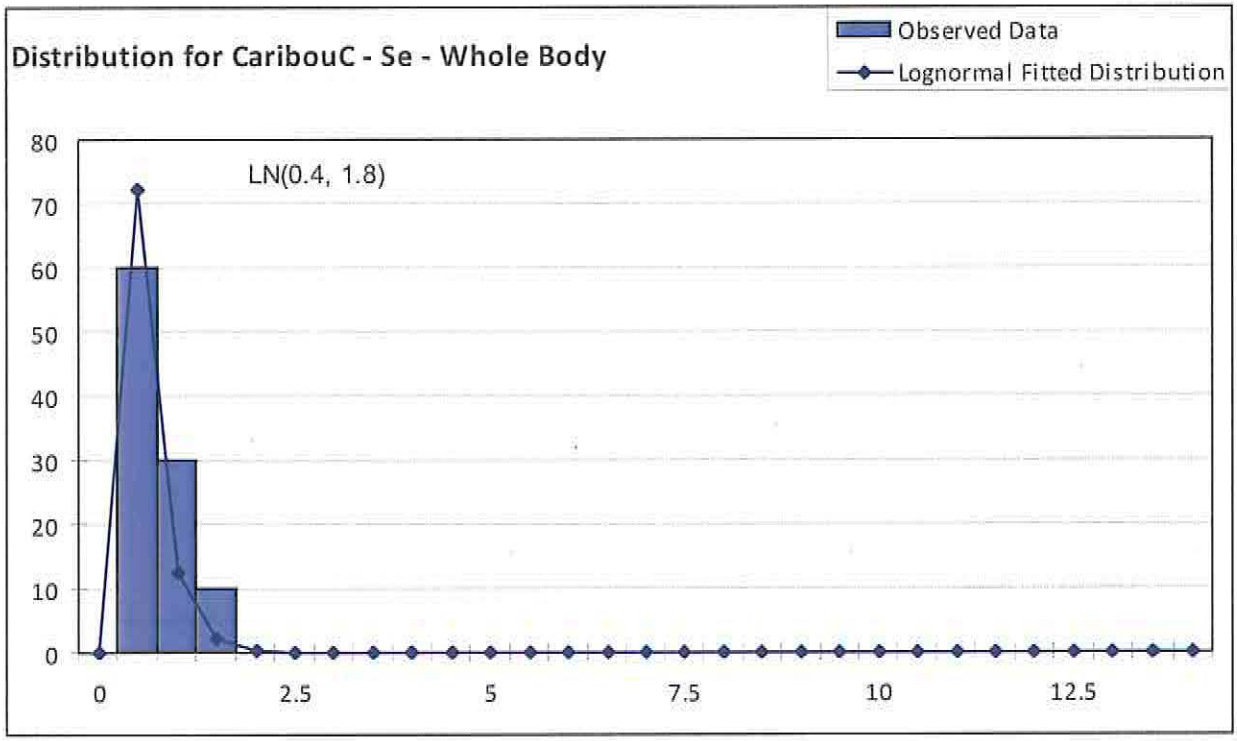

Distribution for CaribouC - Co - Whole Body
Observed Data
Lognormal Fitted Distribution
LN(0.03, 2.2)
60
50
40
30
20
10
0
0
0.1
0.2
0.3
0.4
0.5

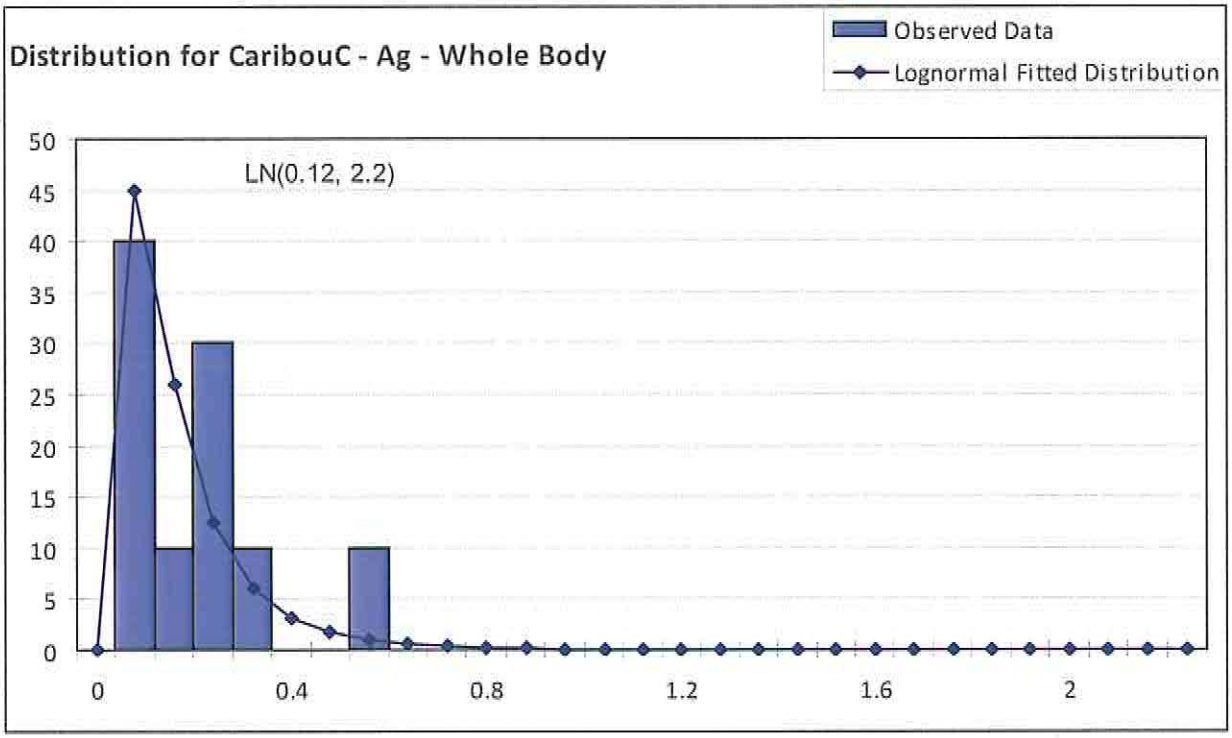

Distribution for CaribouC - Cu - Whole Body
Observed Data
Lognormal Fitted Distribution
LN(6.6, 1.7)
80
70
60
50
40
30
20
10
0
0
45
90
135
180
225

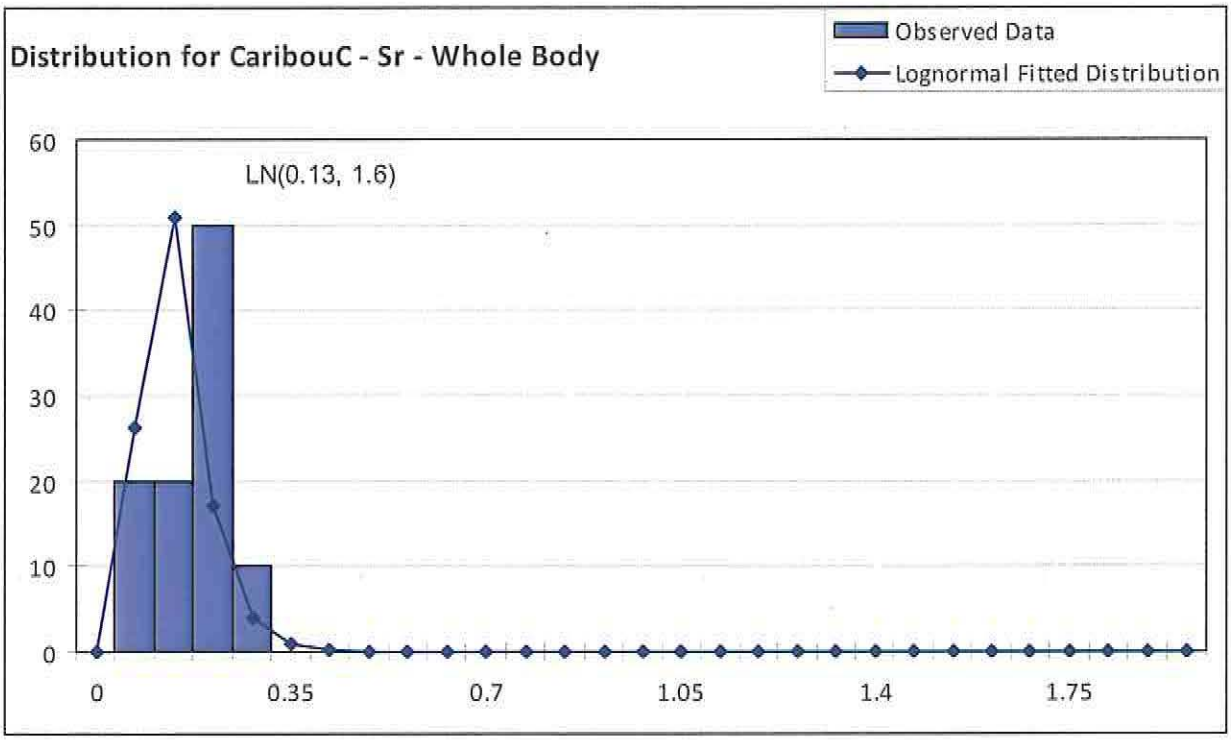

Distribution for CaribouC - Pb - Whole Body
Observed Data
Lognormal Fitted Distribution
LN(0.15, 2.1)
70
60
50
40
30
20
10
0
0
0.55
1.1
1.65
2.2
2.75

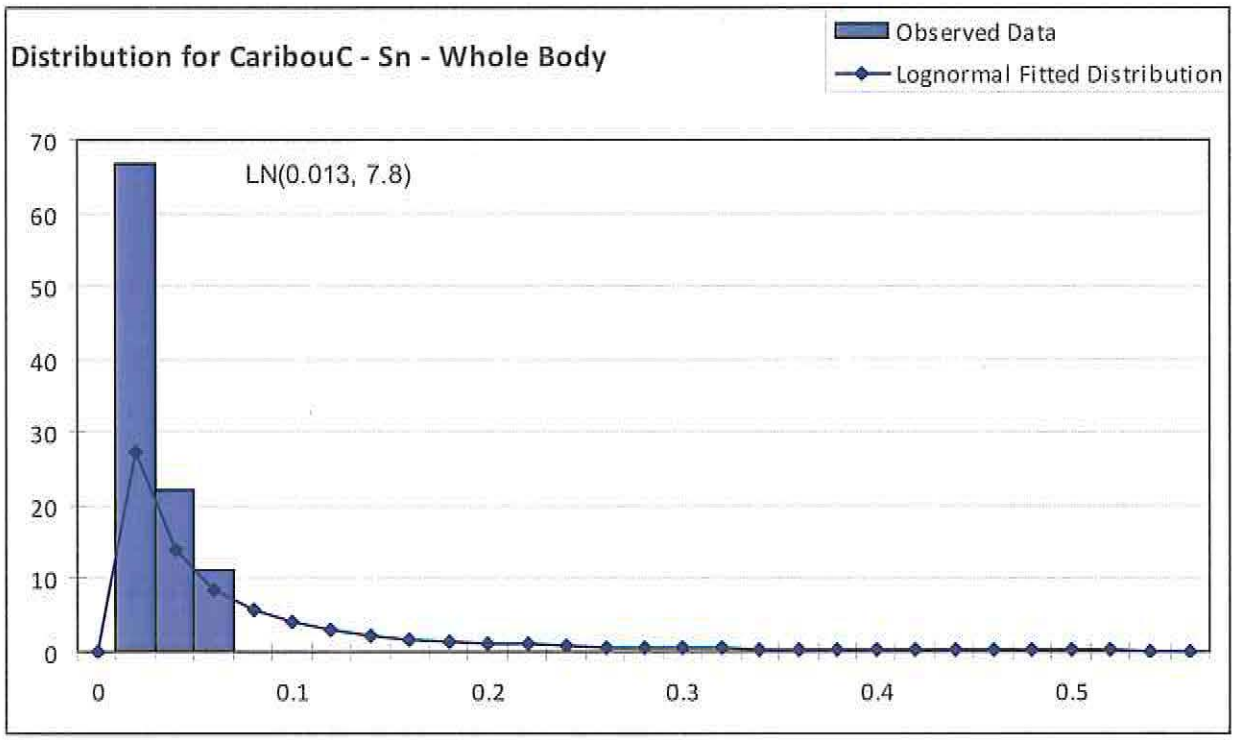

Distribution for CaribouC - Mn - Whole Body
Observed Data
Lognormal Fitted Distribution
LN(1.2, 1.9)
80
70
60
50
40
30
20
10
0
0
6
12
18
24
30

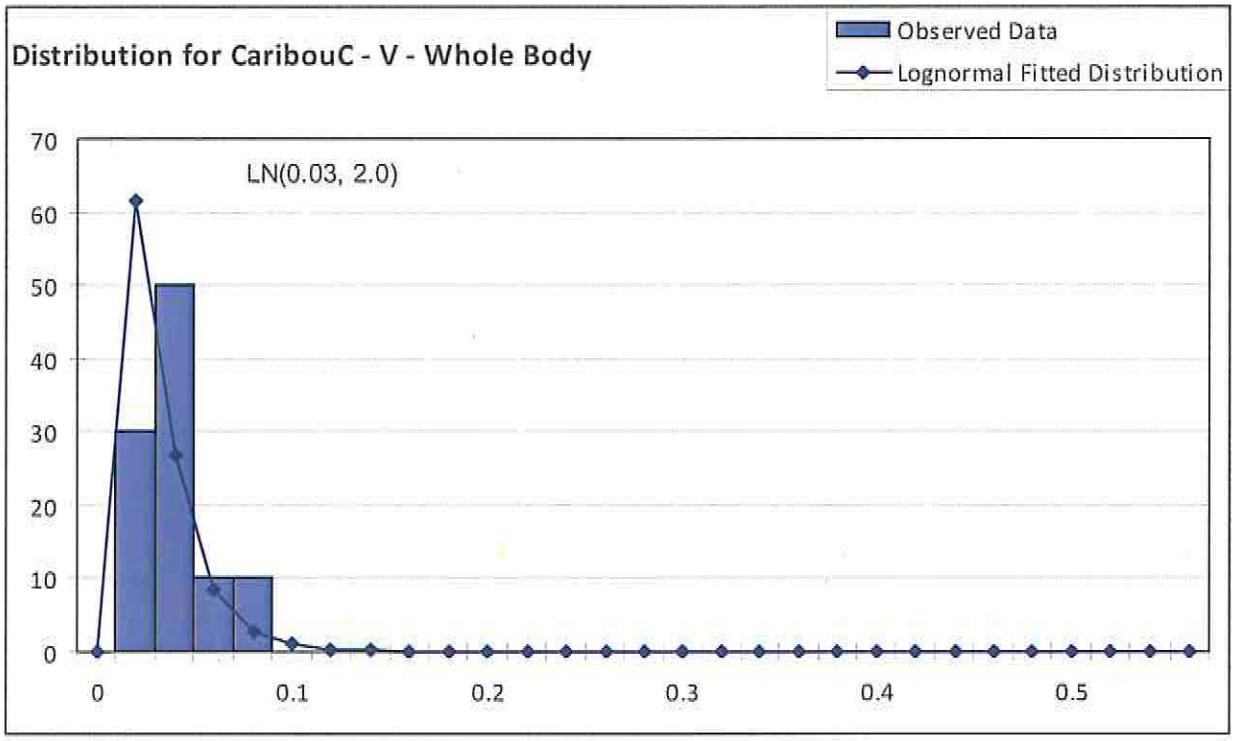

Distribution for CaribouC - Ni - Whole Body
Observed Data
Lognormal Fitted Distribution
LN(0.02, 1.5)
100
90
80
70
60
50
40
30
20
10
0
0
0.095
0.19
0.285
0.38
0.475

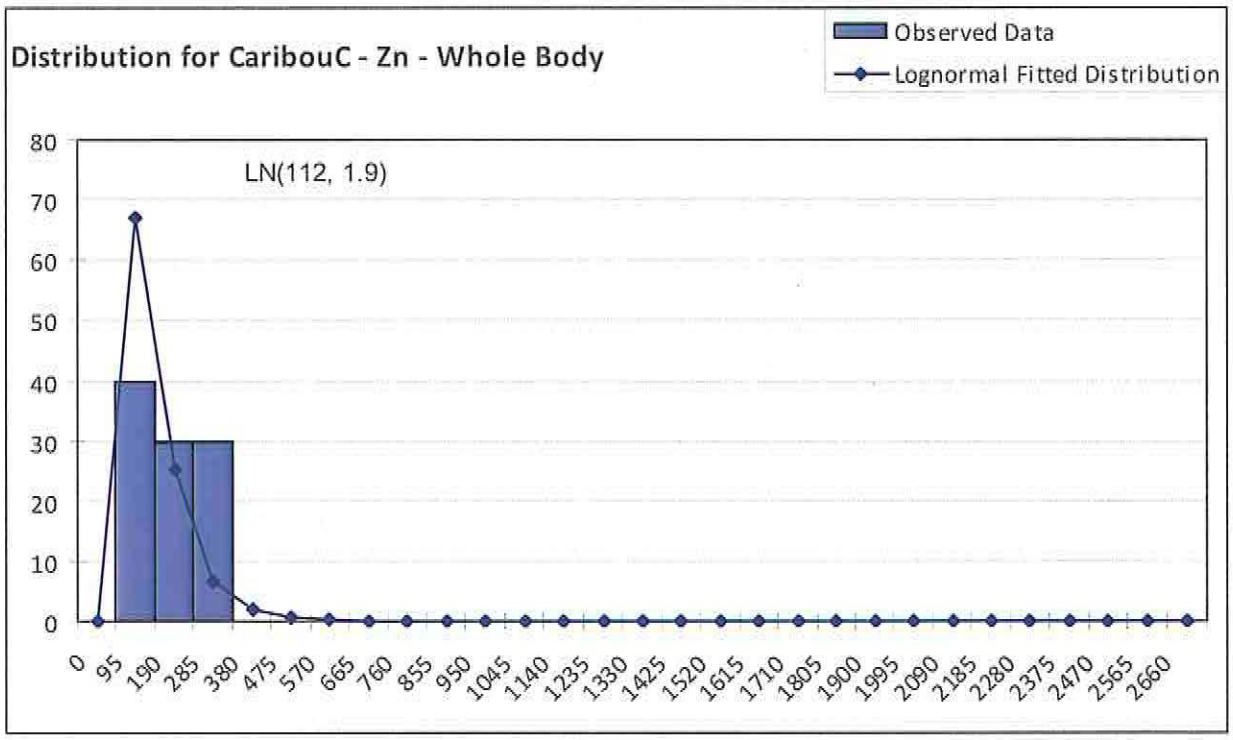

Distribution for CaribouC - Se - Whole Body
Observed Data
Lognormal Fitted Distribution
LN(0.4, 1.8)
80
70
60
50
40
30
20
10
0
0
2.5
5
7.5
10
12.5


Distribution for CaribouC - Ag - Whole Body
Observed Data
Lognormal Fitted Distribution
LN(0.12, 2.2)
50
45
40
35
30
25
20
15
10
5
0
0
0.4
0.8
1.2
1.6
2


Distribution for CaribouC - Sr - Whole Body
Observed Data
Lognormal Fitted Distribution
LN(0.13, 1.6)
60
50
40
30
20
10
0
0
0.35
0.7
1.05
1.4
1.75


Distribution for CaribouC - Sn - Whole Body
Observed Data
Lognormal Fitted Distribution
LN(0.013, 7.8)
70
60
50
40
30
20
10
0
0
0.1
0.2
0.3
0.4
0.5


Distribution for CaribouC - V - Whole Body
Observed Data
Lognormal Fitted Distribution
LN(0.03, 2.0)
70
60
50
40
30
20
10
0
0
0.1
0.2
0.3
0.4
0.5


Distribution for CaribouC - Zn - Whole Body
Observed Data
Lognormal Fitted Distribution
LN(112, 1.9)
80
70
60
50
40
30
20
10
0
0
95
190
285
380
475
570
665
760
855
950
1045
1140
1235
1330
1425
1520
1615
1710
1805
1900
1995
2090
2185
2280
2375
2470
2565
2660

APPENDIX E

CHARACTERISTICS OF TERRESTRIAL ECOLOGICAL RECEPTORS

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APPENDIX E: CHARACTERISTICS OF TERRESTRIAL ECOLOGICAL RECEPTORS

E.1 GENERAL OVERVIEW

This appendix presents the summary table of characteristics of the terrestrial ecological receptors considered in this assessment. The ecological receptors considered in this assessment included the following: woodland caribou, snowshoe hare, moose, fanning sheep, grouse, ducks (mallard, merganser, scaup), hoary marmot, black bear, wolf, mink, beaver, and fox. Information on water and food ingestion rates were obtained from literature sources, as is the typical approach for ecological risk assessments. The soil and sediment ingestion rates were obtained from Beyer *et al.* (1994). The dietary characteristics and time spent in the study area are entered into the pathways model so that estimates of exposure can be obtained.

Table E.1 Woodland Caribou Receptor Characteristics

Parameter Description	Units	Nominal Value	Distribution Used in Model[b]	Reference
water ingestion rate	g/d	9500	T (4750, 9500, 14250)	based on Kirk (1977) and Wales *et al.* (1975)
food ingestion rate	g(wet wt.)/d	8000	T (5500, 8000, 10500)	calculated from U.S. EPA 1993
fraction of food that is forage[a]	-	0.01	T (0.0, 0.01, 0.02)	based on Thomas and Barry 1991
fraction of food that is browse[a]	-	0.05	T (0.0, 0.05, 0.10)	based on Thomas and Barry 1991
fraction of food that is lichen[a]	-	0.91	Calculated as remainder of diet	based on Thomas and Barry 1991
soil ingestion rate	g(dry wt.)/d	240	T (168, 240,312)	calculated from Beyer *et al.* 1994
body weight	kg	105	C (105)	Schmidt 1978
fraction of time in study area	-	0.5	C (0.5)	assumed

Note:

a) Browse comprises shrubs and conifers and make up 5% of the diet; forage is approximately 1% of the diet and the remainder of the food is assumed to be lichen at 91% and soil at 3%.

b) T = Triangular (Minimum, Mode, Maximum); C = Constant (Value)

Table E.2 Snowshoe Hare Receptor Characteristics

Parameter Description	Units	Nominal Value	Distribution Used in Model[d]	Reference
water ingestion rate[a]	g/d	130	T (65, 130, 195)	calculated from U.S. EPA 1993
food ingestion rate[b]	g(wet wt.)/d	300	T (210, 300, 390)	Pease *et al.* 1979
fraction of food that is forage[c]	-	0.38	Calculated as remainder of diet	U.S. EPA 1993
fraction of food that is browse[c]	-	0.6	T (0.4, 0.6, 0.8)	U.S. EPA 1993
soil ingestion rate	g(dry wt.)/d	5.7	T (4, 5.7, 7.4)	calculated from Beyer *et al.* 1994
body weight	kg	1.4	C (1.4)	U.S. EPA 1993
fraction of time in study area	-	1	C (1)	assumed

Notes:

a) Based on allometric equation for water intake from U.S. EPA (1993) and using the body weight of a hare of 1.4 kg and water intake of Eastern Cottontail Rabbit from U.S. EPA (1993).

b) This value is consistent with the value obtained for an allometric equation for herbivores given in U.S. EPA (1993).

c) Based on the dietary composition of Eastern Cottontail Rabbit from U.S. EPA (1993).

d) T = Triangular (Minimum, Mode, Maximum); C = Constant (Value)

Table E.3 Moose Receptor Characteristics

Parameter Description	Units	Nominal Value	Distribution Used in Model[c]	Reference
water ingestion rate[a]	g/d	31,300	T (21300, 31300, 41300)	calculated from U.S. EPA 1993
food ingestion rate[b]	g(wet wt.)/d	23,000	T (15000, 23000, 30000)	Canadian Wildlife Service 1997
fraction of food that is browse	-	0.9	T (0.85, 0.90, 0.95)	Belovsky *et al.* 1973
fraction of food that is aquatic vegetation	-	0.09	Calculated as remainder of diet	Belovsky *et al.* 1973
sediment ingestion rate	g(dry wt.)/d	138	T (100, 138, 180)	calculated from Beyer *et al.* 1994
body weight	kg	600	C (600)	Canadian Wildlife Service 1997
fraction of time in study area	-	1	C (1)	assumed

Notes:
a) Based on the allometric equation provided in U.S. EPA 1993 and a body weight of 600 kg for moose (CWS 1997).
b) The Canadian Wildlife Service (CWS) report that moose eat 15 – 20 kg/d twigs and shrubs in the winter and 20 – 30 kg/d forage consisting of twigs, leaves, shrubs, upland and water plants in the summer.
c) T = Triangular (Minimum, Mode, Maximum); C = Constant (Value)

Table E.4 Fannin Sheep Receptor Characteristics

Parameter Description	Units	Nominal Value	Distribution Used in Model[a]	Reference
water ingestion rate	g/d	4500	T (2250, 4500, 6750)	calculated from U.S. EPA 1993
food ingestion rate	g(wet wt.)/d	7530	T (5270, 7530, 9790)	calculated from U.S. EPA 1993
fraction of food that is forage	-	0.98	C (0.98)	assumed from Canadian Wildlife Service 1997
soil ingestion rate	g(dry wt.)/d	113	T (79, 113, 147)	calculated from Beyer *et al.* 1994
body weight	kg	70	C (70)	Canadian Wildlife Service 1997
fraction of time in study area	-	1	C (1)	assumed

Notes:
a) T = Triangular (Minimum, Mode, Maximum); C = Constant (Value)

Table E.5 Grouse Receptor Characteristics

Parameter Description	Units	Nominal Value	Distribution Used in Model[d]	Reference
water ingestion rate[a]	g/d	35.8	T (17.9, 35.8, 53.7)	calculated from U.S. EPA 1993
food ingestion rate[b]	g(wet wt.)/d	119	T (83, 119, 155)	calculated from U.S. EPA 1993
fraction of food that is browse[c]	-	0.83	T (0.7, 0.83, 0.96)	U.S. EPA 1993
fraction of food that is berries[c]	-	0.15	Calculated as remainder of diet	U.S. EPA 1993
soil ingestion rate	g(dry wt.)/d	1.8	T (1.3, 1.8, 2.3)	calculated from Beyer *et al.* 1994
body weight	kg	0.475	C (0.475)	Canadian Wildlife Service 1997
fraction of time in study area	-	1	C (1)	assumed

Notes:
a) Based on allometric equation provided in U.S. EPA (1993).
b) Based on the allometric equation provided in U.S. EPA (1993) and a body weight of 475 g for a grouse (Newfoundland Government 2001).
c) Based on breakdown of food intake by a quail in U.S. EPA (1993).
d) T = Triangular (Minimum, Mode, Maximum); C = Constant (Value)

Table E.6 Duck Receptor Characteristics

Parameter Description	Units	Nominal Value	Distribution Used in Model[d]	Reference
food ingestion rate[a]				
mallard	g(wet wt.)/d	250	T (175, 250, 325)	CCME 1999
common merganser		370	T (260, 370, 480)	CCME 1999
scaup		255	T (180, 255, 330)	CCME 1999
fraction of time spent in study area[b]				
mallard	-	0.50	C (0.50)	U.S. EPA 1993
common merganser				
scaup				
fraction of food that is fish				
mallard	-	0.0	C (0.0)	U.S. EPA 1993
common merganser		0.996	C (0.996)	Andress and Parker 1995
scaup		0.0	C (0.0)	U.S. EPA 1993
fraction of food that is benthic invertebrates				
mallard	-	0.74	Calculated as remainder of diet	U.S. EPA 1993
common merganser		0.0	C (0.0)	U.S. EPA 1993
scaup		0.89	T (0.84, 0.89, 0.94)	U.S. EPA 1993
fraction of food that is aquatic vegetation				
mallard	-	0.25	T (0.15, 0.25. 0.35)	U.S. EPA 1993
common merganser		0.0	C (0.0)	
scaup		0.09	Calculated as remainder of diet	U.S. EPA 1993
Sediment ingestion rate				
mallard	g(dry wt.)/d	1.7	T (1.2, 1.7, 2.2)	Calculated from Beyer *et al.* 1994
common merganser		1.5	T (1.0, 1.5, 2.0)	
scaup		5.6	T (3.9, 5.6, 7.3)	
water ingestion rate[c]				
mallard	g/d	62	T (31, 62, 93)	Calculated from U.S. EPA 1993
common merganser		76	T (38, 76, 114)	
scaup		52	T (26, 52, 78)	
Body weight				
mallard	kg	1.08	C (1.08)	U.S. EPA 1993
common merganser		1.47	C (1.47)	U.S. EPA 1993
scaup		0.82	C (0.82)	U.S. EPA 1993

Notes:
a) Taken from CCME (1999) along with body weights of 1082g for a mallard, 820g for a scaup and 1470g for common merganser.
b) Based on information that scaup and mallards migrate and spend 4 – 8 months away from this area.
c) Based on the allometric equation published in U.S. EPA (1993).
d) T = Triangular (Minimum, Mode, Maximum); C = Constant (Value).

Table E.7 Hoary Marmot Receptor Characteristics

Parameter Description	Units	Nominal Value	Distribution Used in Model[a]	Reference
water ingestion rate	g/d	380	T (190, 380, 570)	U.S. EPA 1993
food ingestion rate	g(wet wt.)/d	790	T (550, 790, 1185)	U.S. EPA 1993
fraction of food that is forage	-	0.99	C (0.99)	Curby 1994
soil ingestion rate	g(dry wt.)/d	8.2	T (5.7, 8.2, 10.7)	calculated from Beyer *et al.* 1994
body weight	kg	4.5	C (4.5)	Curby 1994
fraction of time in study area	-	1	C (1)	assumed

Notes:
a) T = Triangular (Minimum, Mode, Maximum); C = Constant (Value)

Table E.8 Black Bear Receptor Characteristics

Parameter Description	Units	Nominal Value	Distribution Used in Model[b]	Reference
water ingestion rate[a]	g/d	9,500	T (4750, 9500, 14250)	U.S. EPA 1993
food ingestion rate[a]	g(wet wt.)/d	14,900	T (10430, 14850, 19300)	U.S. EPA 1993
fraction of food that is berries	-	0.4	T (0.35, 0.4, 0.45)	Holcroft and Herrero 1991
fraction of food that is forage	-	0.33	T (0.30, 0.33, 0.36)	Holcroft and Herrero 1991
fraction of food that is fish	-	0.15	Calculated as remainder of diet	Canadian Wildlife Service 1993
fraction of food that is moose	-	0.05	T (0.025, 0.05, 0.075)	Canadian Wildlife Service 1993
fraction of food that is caribou	-	0.05	T (0.025, 0.05, 0.075)	Canadian Wildlife Service 1993
soil ingestion rate	g(dry wt.)/d	223	T (156, 223, 290)	Calculated from Beyer *et al.* 1994
body weight	kg	160	C (160)	Kronk 2002
fraction of time in study area	-	1	C (1)	assumed

Notes:
a) Based on the allometric equation provided in U.S. EPA (1993) and a body weight of 160 kg for a black bear.
b) T = Triangular (Minimum, Mode, Maximum); C = Constant (Value)

Table E.9 Wolf Receptor Characteristics

Parameter Description	Units	Nominal Value	Distribution Used in Model[d]	Reference
water ingestion rate[a]	g/d	2,920	T (1460, 2920, 4380)	U.S. EPA 1993
food ingestion rate[b]	g(wet wt.)/d	5,500	T (4000, 5500, 7000)	Fuller and Keith 1980
fraction of food that is hare[c]	-	0.19	Calculated as remainder of diet	U.S. EPA 1993
fraction of food that is moose[c]	-	0.40	T (0.35, 0.4, 0.45)	U.S. EPA 1993
fraction of food that is caribou[c]	-	0.40	T (0.35, 0.4, 0.45)	U.S. EPA 1993
soil ingestion rate	g(dry wt.)/d	46.2	T (32, 46.2, 60)	calculated from Beyer *et al.* 1994
body weight	kg	43	C (43)	Schmidt and Gilbert 1978
fraction of time in study area	-	0.25	C (0.25)	Assumed

Notes:
a) Based on the allometric equation provided in U.S. EPA (1993) and a body weight of 43 kg for a gray wolf (Schmidt and Gilbert 1978).
b) Based on study of Fuller and Keith (1980) which estimate that gray wolf in northeastern Alberta eat 5.5 kg/d.
c) Based on the intake of foxes from U.S. EPA (1993) and wolves from the Canadian Wildlife Service (1993b).
d) T = Triangular (Minimum, Mode, Maximum); C = Constant (Value)

Table E.10 Mink Receptor Characteristics

Parameter Description	Units	Nominal Value	Distribution Used in Model[c]	Reference
water ingestion rate[a]	g/d	99	T (50, 99, 149)	
food ingestion rate[b]	g(wet wt.)/d	220	T (154, 220, 286)	U.S. EPA 1993
fraction of food that is aquatic vegetation	-	0.05	T (0.025, 0.05, 0.075)	U.S. EPA 1993
fraction of food that is fish	-	0.65	Calculated as remainder of diet	U.S. EPA 1993
fraction of food that is benthic	-	0.09	T (0.06, 0.09, 0.12)	U.S. EPA 1993
fraction of food that is ducks	-	0.05	T (0.05, 0.10, 0.15)	U.S. EPA 1993
fraction of food that is hare	-	0.05	T (0.05, 0.10, 0.15)	U.S. EPA 1993
sediment ingestion rate	g(dry wt.)/d	2.2	T (1.5, 2.2, 2.9)	calculated from Beyer *et al.* 1994
body weight	kg	1.0	C (1.0)	U.S. EPA 1993
fraction of time in study area	-	1	C (1)	assumed

Notes:
a) Based on the water intake of a mink provided in U.S. EPA (1993).
b) Based on the food intake information and a body weight of 1kg for a mink provided in U.S. EPA (1993).
c) T = Triangular (Minimum, Mode, Maximum); C = Constant (Value)

Table E.11 Beaver Receptor Characteristics

Parameter Description	Units	Nominal Value	Distribution Used in Model[a]	Reference
water ingestion rate	g/d	1730	T (865, 1730, 2600)	Beak 1995
food ingestion rate	g(wet wt.)/d	1000	T (700, 1000,1300)	Beak 1995
fraction of food that is aquatic vegetation	-	0.5	T (0.25, 0.5, 0.75)	Mirka *et al.* 1996
fraction of food that is browse	-	0.49	Calculated as remainder of diet	Mirka *et al.* 1996
sediment ingestion rate	g(dry wt.)/d	10	T (7, 10, 13)	calculated from Beyer *et al.* 1994
body weight	kg	24	C (24)	Anderson 2002
fraction of time in study area	-	1	C (1)	assumed

Notes:
a) T = Triangular (Minimum, Mode, Maximum); C = Constant (Value)

Table E.12 Fox Receptor Characteristics

Parameter Description	Units	Nominal Value	Distribution Used in Model[b]	Reference
water ingestion rate[a]	g/d	383	T (192, 383, 575)	U.S. EPA 1993
food ingestion rate[a]	g(wet wt.)/d	311	T (218, 311, 404)	U.S. EPA 1993
fraction of food that is berries	-	0.14	T (0.10, 0.14, 0.18)	U.S. EPA 1993
fraction of food that is duck	-	0.42	T (0.32, 0.42, 0.52)	U.S. EPA 1993
fraction of food that is hare	-	0.43	Calculated as remainder of diet	U.S. EPA 1993
soil ingestion rate	g(dry wt.)/d	2.6	T (1.8, 2.6, 3.4)	calculated from Beyer *et al.* 1994
body weight	kg	4.5	C (4.5)	U.S. EPA 1993
fraction of time in study area	-	1	C (1)	assumed

Notes:
a) Based on allometric equation provided in U.S. EPA (1993) and the body weight of a fox.
b) T = Triangular (Minimum, Mode, Maximum); C = Constant (Value)

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APPENDIX F

SAMPLE CALCULATION

SAMPLE CALCULATION

Zinc - Faro Mine Site and Rose Creek

Notes:
fw indicates fresh weight
dw indicates dry weight

Parameter	Units	Symbol	Mean	Reference or Equation
Water-to-aquatic vegetation transfer factor	L/kg (FW)	TFav	588.9	NTIS (1988), CSA (1987)
Water-to-benthic invertebrates transfer factor	L/kg (FW)	Tfbi	287	U.S. EPA (1979)
Water-to-sediment distribution coefficient	L/kg (DW)	Kdsed	7957	Site-specific
Water-to-fish transfer factor	L/kg (FW)	TFf	1396	Site-specific
Water concentration	mg/L	Watc	0.04	Rose Creek Downstream
Soil concentration	mg/kg dw	Soilc - FS	884	Faro-S
Soil concentration	mg/kg dw	Soilc - FM	712	Faro-M
Soil concentration	mg/kg dw	Soilc - O	412	Overall
Soil concentration	mg/kg dw	Soilc - S	619	Sheep
Berry concentration	mg/kg (FW)	Berryc - FS	4.8	Faro-S
Berry concentration	mg/kg (FW)	Berryc - FM	4.1	Faro-M
Forage concentration	mg/kg (FW)	Foragec - FS	48.3	Faro-S
Forage concentration	mg/kg (FW)	Foragec - FM	37.9	Faro-M
Forage concentration	mg/kg (FW)	Foragec - O	34.9	Overall
Forage concentration	mg/kg (FW)	Forage - S	11.6	Sheep
Browse concentration	mg/kg (FW)	Browsec - FS	176.6	Faro-S
Browse concentration	mg/kg (FW)	Browsec - FM	137.9	Faro-M
Browse concentration	mg/kg (FW)	Browsec - O	113.9	Overall
Lichen concentration	mg/kg (FW)	Lichenc - O	55.5	Overall
Aquatic Vegetation concentration	mg/kg (FW)	Aqvegc	24.29	=Watc*Tfav
Benthic invertebrate concentration	mg/kg (FW)	Benthicc	12	=Watc*Tfbi
Sediment concentration	mg/kg dw	Sedc	340	=Watc*Kdsed
Fish concentration	mg/kg (FW)	Fishc	59	=Watc*TFf
Moose concentration	mg/kg (FW)	Moosec	87	Measured at the site
Caribou concentration	mg/kg (FW)	Caribouc	135	Measured at the site
Duck concentration	mg/kg (FW)	Duckc	60	Calculated
Hare concentration	mg/kg (FW)	Harec	5	Calculated
Bear				
Body weight	kg	BWb	160	U.S. EPA, 1993
Water ingestion rate	g/d	WIRb	9.48E+03	U.S. EPA, 1993
Soil ingestion rate	g DW/d	SIRb	223	calculated from Beyer *et al*., 1994.
Berry ingestion rate	g FW/d	BIRb	5946	U.S. EPA, 1993
Forage ingestion rate	g FW/d	FIRb	4903	U.S. EPA, 1993
Moose ingestion rate	g FW/d	MIRb	744	U.S. EPA, 1993
Caribou ingestion rate	g FW/d	CIRb	743	U.S. EPA, 1993
Fish ingestion rate	g FW/d	FsIRb	2227	U.S. EPA, 1993
Toxicity Reference Value	mg/kg-d	toxb	90	U.S. EPA (2007)
Fraction of time at site	-	fb	1	assumed to be in the area all year
Intake of COC from water by body weight	mg/kg-d	Iwb	0.002	=WIRb*Watc*fb/Bwb/1000 grams per liter
Intake of COC from soil by body weight	mg/kg-d	Isb	0.99	=SIRb*Soilc*fb/Bwb/1000 grams per kilogram
Intake of COC from berries by body weight	mg/kg-d	Ibeb	0.15	=BIRb*Berryc*fb/Bwb/1000 g per kg
Intake of COC from forage by body weight	mg/kg-d	Ifrb	1.16	=FIRb*Foragec*fb/Bwb/1000 g per kg
Intake of COC from moose by body weight	mg/kg-d	Imob	0.41	=MIRb*Moosec*fb/Bwb/1000 g per kg
Intake of COC from caribou by body weight	mg/kg-d	Icb	0.63	=CIRb*Caribouc*fb/Bwb/1000 g per kg
Intake of COC from fish by body weight	mg/kg-d	Ifsb	0.82	=FsIRb*Fishc*fb/Bwb/1000 g per kg
Total intake	mg/kg-d	Itotb	4.16	=Iwb+Isb+Ibeb+Ifrb+Imob+Icb+Ifsb
Screening Index	-	SIb	0.05	=Itotb/toxb
Beaver				
Body weight	kg	BWbv	24	U.S. EPA, 1993
Water ingestion rate	g/d	WIRbv	1.73E+03	U.S. EPA, 1993
Sed ingestion rate	g DW/d	SIRbv	10	calculated from Beyer *et al*., 1994.
Aquatic vegetation ingestion rate	g FW/d	AVIRbv	499	U.S. EPA, 1993
Browse ingestion rate	g FW/d	BrIRbv	492	U.S. EPA, 1993
Toxicity Reference Value	mg/kg-d	toxbv	90	U.S. EPA (2007)
Fraction of time at site	-	fbv	1	assumed to be in the area all year
Intake of COC from water by body weight	mg/kg-d	Iwbv	0.003	=WIRbv*Watc*fbv/bwbv/1000 grams per liter
Intake of COC from sed by body weight	mg/kg-d	Isbv	0.14	=SIRbv*Sedc*fbv/bwbv/1000 grams per kilogram
Intake of COC from aq veg by body weight	mg/kg-d	Iavbv	0.50	=AVIRbv*aqvegc*fbv/bwbv/1000 g per kg
Intake of COC from browse by body weight	mg/kg-d	Ibrbv	2.8	=BrIRbv*browsec*fbv/bwbv/1000 g per kg
Total intake	mg/kg-d	Itotbv	3.5	=Iwbv+Isbv+Iavbv+Ibrbv
Screening Index	-	SIbv	0.04	=Itotbv/toxbv

Caribou					
	Body weight	kg	BWc	105	U.S. EPA, 1993
	Water ingestion rate	g/d	WIRc	9.53E+03	U.S. EPA, 1993
	Soil ingestion rate	g DW/d	SIRc	240	calculated from Beyer *et al*., 1994.
	Forage ingestion rate	g FW/d	FIRc	80	U.S. EPA, 1993
	Browse ingestion rate	g FW/d	BrIRc	402	U.S. EPA, 1993
	Lichen ingestion rate	g FW/d	LIRc	7289	U.S. EPA, 1993
	Toxicity Reference Value	mg/kg-d	toxc	90	U.S. EPA (2007)
	Fraction of time at site	-	fc	0.5	assumed to be in the area half of the year
	Intake of COC from water by body weight	mg/kg-d	Iwc	0.002	=WIRc*Watc*fc/bwc/1000 grams per liter
	Intake of COC from soil by body weight	mg/kg-d	Isc	0.47	=SIRc*Soilc*fc/bwc/1000 grams per kilogram
	Intake of COC from forage by body weight	mg/kg-d	Ifc	0.01	=FIRc*Foragec*fc/bwc/1000 g per kg
	Intake of COC from browse by body weight	mg/kg-d	Ibrc	0.2	=BrIRc*browsec*fc/bwc/1000 g per kg
	Intake of COC from lichen by body weight	mg/kg-d	Ilc	1.9	=LIRc*Lichenc*fc/bwc/1000 g per kg
	Total intake	mg/kg-d	Itotc	2.6	=Iwc+Isc+Ifc+Ibrc+Ilc
	Screening Index	-	SIc	0.03	=Itotc/toxc
Fox					
	Body weight	kg	BWf	4.5	U.S. EPA, 1993
	Water ingestion rate	g/d	WIRf	3.83E+02	U.S. EPA, 1993
	Soil ingestion rate	g DW/d	SIRf	2.6	calculated from Beyer *et al*., 1994.
	Berry ingestion rate	g FW/d	BIRf	44	U.S. EPA, 1993
	Duck ingestion rate	g FW/d	DIRf	131	U.S. EPA, 1993
	Hare ingestion rate	g FW/d	HIRf	134	U.S. EPA, 1993
	Toxicity Reference Value	mg/kg-d	toxf	90	U.S. EPA (2007)
	Fraction of time at site	-	ff	1	assumed to be in the area all year
	Intake of COC from water by body weight	mg/kg-d	Iwf	0.004	=WIRf*Watc*ff/Bwf/1000 grams per liter
	Intake of COC from soil by body weight	mg/kg-d	Isf	0.41	=SIRf*Soilc*ff/Bwf/1000 grams per kilogram
	Intake of COC from berries by body weight	mg/kg-d	Ibef	0.04	=BIRf*Berryc*ff/Bwf/1000 g per kg
	Intake of COC from duck by body weight	mg/kg-d	Idf	1.74	=DIRf*Duckc*ff/Bwf/1000 g per kg
	Intake of COC from hare by body weight	mg/kg-d	Ihf	0.13	=HIRf*Harec*ff/Bwf/1000 g per kg
	Total intake	mg/kg-d	Itotf	2.33	=Iwf+Isf+Ibef+Idf+Ihf
	Screening Index	-	SIf	0.03	=Itotf/toxf
Grouse					
	Body weight	kg	BWgro	0.475	U.S. EPA, 1993
	Water ingestion rate	g/d	WIRgro	3.57E+01	U.S. EPA, 1993
	Soil ingestion rate	g DW/d	SIRgro	2	calculated from Beyer *et al*., 1994.
	Berry ingestion rate	g FW/d	BIRgro	18	U.S. EPA, 1993
	Browse ingestion rate	g FW/d	BrIRgro	99	U.S. EPA, 1993
	Toxicity Reference Value	mg/kg-d	toxgro	123	U.S. EPA (2007)
	Fraction of time at site	-	fgro	1	assumed to be in the area all year
	Intake of COC from water by body weight	mg/kg-d	Iwgro	0.003	=WIRgro*Watc*fgro/Bwgro/1000 grams per liter
	Intake of COC from soil by body weight	mg/kg-d	Isgro	3.35	=SIRgro*Soilc*fgro/Bwgro/1000 grams per kilogram
	Intake of COC from berries by body weight	mg/kg-d	Ibegro	0.18	=BIRgro*Berryc*fgro/Bwgro/1000 g per kg
	Intake of COC from browse by body weight	mg/kg-d	Ibrgro	36.70	=BrIRgro*Browsec*fgro/Bwgro/1000 g per kg
	Total intake	mg/kg-d	Itotgro	40.24	=Iwgro+Isgro+Ibegro+Ibrgro
	Screening Index	-	SIgro	0.33	=Itotgro/toxgro
Hare					
	Body weight	kg	BWhar	1.4	U.S. EPA, 1993
	Water ingestion rate	g/d	WIRhar	1.30E+02	U.S. EPA, 1993
	Soil ingestion rate	g DW/d	SIRhar	5.694	calculated from Beyer *et al*., 1994.
	Browse ingestion rate	g FW/d	BrIRhar	180	U.S. EPA, 1993
	Forage ingestion rate	g FW/d	FIRhar	114	U.S. EPA, 1993
	Toxicity Reference Value	mg/kg-d	toxhar	90	U.S. EPA (2007)
	Fraction of time at site	-	fhar	1	assumed to be in the area all year
	Intake of COC from water by body weight	mg/kg-d	Iwhar	0.004	=WIRhar*Watc*fhar/Bwhar/1000 grams per liter
	Intake of COC from soil by body weight	mg/kg-d	Ishar	3.59	=SIRhar*Soilc*fhar/Bwhar/1000 grams per kilogram
	Intake of COC from browse by body weight	mg/kg-d	Ibrhar	22.71	=BrIRhar*Browsec*fhar/Bwhar/1000 g per kg
	Intake of COC from forage by body weight	mg/kg-d	Ifrhar	3.93	=FIRhar*Foragec*fhar/Bwhar/1000 g per kg
	Total intake	mg/kg-d	Itothar	30.24	=Iwhar+Ishar+Ibrhar+Ifrhar
	Screening Index	-	SIhar	0.34	=Itothar/toxhar

Mallard				
Body weight	kg	BWmal	1.08	U.S. EPA, 1993
Water ingestion rate	g/d	WIRmal	6.20E+01	U.S. EPA, 1993
Sediment ingestion rate	g DW/d	SIRmal	1.7	calculated from Beyer *et al*., 1994.
Aquatic vegetation ingestion rate	g FW/d	AVIRmal	62	U.S. EPA, 1993
Benthic invertebrate ingestion rate	g FW/d	BIIRmal	185	U.S. EPA, 1993
Toxicity Reference Value	mg/kg-d	toxmal	123	U.S. EPA (2007)
Fraction of time at site	-	fmal	0.5	assumed to migrate in winter
Intake of COC from water by body weight	mg/kg-d	Iwmal	0.001	=WIRmal*Watc*fmal/Bwmal/1000 grams per liter
Intake of COC from sediment by body weight	mg/kg-d	Ismal	0.27	=SIRmal*Sedc*fmal/Bwmal/1000 grams per kilogram
Intake of COC from aquatic vegetation by body weight	mg/kg-d	Iavmal	0.70	=AVIRmal*Aqvegc*fmal/Bwmal/1000 g per kg
Intake of COC from benthic invertebrate by body weight	mg/kg-d	Ibimal	0.99	=BIIRmal*Benthicc*fmal/Bwmal/1000 g per kg
Total intake	mg/kg-d	Itotmal	1.96	=Iwmal+Ismal+Iavmal+Ibimal
Screening Index	-	SImal	0.02	=Itotmal/toxmal
Hoary Marmot				
Body weight	kg	BWhm	4.50E+00	Curby 1994
Water ingestion rate	g/d	WIRhm	3.79E+02	U.S. EPA, 1993
Soil ingestion rate	g DW/d	SIRhm	8.189	calculated from Beyer *et al*., 1994.
Forage ingestion rate	g FW/d	FIRhm	833	U.S. EPA, 1993
Toxicity Reference Value	mg/kg-d	toxhm	90	U.S. EPA (2007)
Fraction of time at site	-	fhm	1	assumed to be in the area all year
Intake of COC from water by body weight	mg/kg-d	Iwhm	0.004	=WIRhm*Watc*fhm/Bwhm/1000 grams per liter
Intake of COC from soil by body weight	mg/kg-d	Ishm	1.61	=SIRhm*Soilc*fhm/Bwhm/1000 grams per kilogram
Intake of COC from forage by body weight	mg/kg-d	Ifrhm	8.95	=FIRhm*Foragec*fhm/Bwhm/1000 g per kg
Total intake	mg/kg-d	Itothm	10.56	=Iwhm+Ishm+Ifrhm
Screening Index	-	SIhm	0.12	=Itothm/toxhm
Merganser				
Body weight	kg	BWmer	1.47	U.S. EPA, 1993
Water ingestion rate	g/d	WIRmer	7.63E+01	U.S. EPA, 1993
Sediment ingestion rate	g DW/d	SIRmer	1.5	calculated from Beyer *et al*., 1994.
Fish ingestion rate	g FW/d	FIRmer	368	U.S. EPA, 1993
Toxicity Reference Value	mg/kg-d	toxmer	123	U.S. EPA (2007)
Fraction of time at site	-	fmer	0.5	assumed to migrate in winter
Intake of COC from water by body weight	mg/kg-d	Iwmer	0.001	=WIRmer*Watc*fmer/Bwmer/1000 grams per liter
Intake of COC from sediment by body weight	mg/kg-d	Ismer	0.17	=SIRmer*Sedc*fmer/Bwmer/1000 grams per kilogram
Intake of COC from fish by body weight	mg/kg-d	Ifmer	7.34	=FIRmer*Fishc*fmer/Bwmer/1000 g per kg
Total intake	mg/kg-d	Itotmer	7.52	=Iwmer+Ismer+Ifmer
Screening Index	-	SImer	0.06	=Itotmer/toxmer
Mink				
Body weight	kg	BWmin	1	U.S. EPA, 1993
Water ingestion rate	g/d	WIRmin	9.91E+01	U.S. EPA, 1993
Sed ingestion rate	g DW/d	SIRmin	2.2	calculated from Beyer *et al*., 1994.
Benthic ingestion rate	g FW/d	BenIRmin	20	U.S. EPA, 1993
Fish ingestion rate	g FW/d	FsIRmin	165	U.S. EPA, 1993
Aquatic vegetation ingestion rate	g FW/d	AvIRmin	11	U.S. EPA, 1993
Duck ingestion rate	g FW/d	DIRmin	22	U.S. EPA, 1993
Toxicity Reference Value	mg/kg-d	toxmin	90	U.S. EPA (2007)
Fraction of time at site	-	fmin	1	assumed to be in the area all year
Intake of COC from water by body weight	mg/kg-d	Iwmin	0.004	=WIRmin*Watc*fmin/Bwmin/1000 grams per liter
Intake of COC from sed by body weight	mg/kg-d	Ismin	0.75	=SIRmin*Sedc*fmin/Bwmin/1000 grams per kilogram
Intake of COC from benthic by body weight	mg/kg-d	Ibenmin	0.23	=BenIRmin*Benthicc*fmin/Bwmin/1000 g per kg
Intake of COC from fish by body weight	mg/kg-d	Ifsmin	9.68	=FsIRmin*Fishc*fmin/Bwmin/1000 g per kg
Intake of COC from aquatic vegetation by body weight	mg/kg-d	Iavmin	0.27	=AvIRmin*Aqvegc*fmin/Bwmin/1000 g per kg
Intake of COC from duck by body weight	mg/kg-d	Idkmin	1.32	=DIRmin*Duckc*fmin/Bwmin/1000 g per kg
Total intake	mg/kg-d	Itotmin	12.25	=Iwmin+Ismin+Ibenmin+Ifsmin+Iavmin+Idkmin
Screening Index	-	SImin	0.14	=Itotmin/toxmin

Moose					
	Body weight	kg	BWmoo	6.00E+02	Canadian Wildlife Service (1997)
	Water ingestion rate	g/d	WIRmoo	3.13E+04	U.S. EPA, 1993
	Sed ingestion rate	g DW/d	SIRmoo	139.2	calculated from Beyer *et al*., 1994.
	Browse ingestion rate	g FW/d	BrIRmoo	20383	U.S. EPA, 1993
	Aquatic vegetation ingestion rate	g FW/d	AvIRmoo	2035	U.S. EPA, 1993
	Toxicity Reference Value	mg/kg-d	toxmoo	90	U.S. EPA (2007)
	Fraction of time at site	-	fmoo	1	assumed to be in the area all year
	Intake of COC from water by body weight	mg/kg-d	Iwmoo	0.002	=WIRmoo*Watc*fmoo/Bwmoo/1000 grams per liter
	Intake of COC from sed by body weight	mg/kg-d	Ismoo	0.08	=SIRmoo*Sedc*fmoo/Bwmoo/1000 grams per kilogram
	Intake of COC from browse by body weight	mg/kg-d	Ibwmoo	3.87	=BwIRmoo*Browsec*fmoo/Bwmoo/1000 g per kg
	Intake of COC from aquatic vegetation by body weight	mg/kg-d	Iavmoo	0.08	=AvIRmoo*Aqvegc*fmoo/Bwmoo/1000 g per kg
	Total intake	mg/kg-d	Itotmoo	4.03	=Iwmoo+Ismoo+Ibwmoo+Iavmoo
	Screening Index	-	SImoo	0.04	=Itotmoo/toxmoo
Scaup					
	Body weight	kg	BWsca	0.82	U.S. EPA, 1993
	Water ingestion rate	g/d	WIRsca	5.18E+01	U.S. EPA, 1993
	Sediment ingestion rate	g DW/d	SIRsca	6	calculated from Beyer *et al*., 1994.
	Aquatic vegetation ingestion rate	g FW/d	AVIRsca	23	U.S. EPA, 1993
	Benthic invertebrate ingestion rate	g FW/d	BIIRsca	227	U.S. EPA, 1993
	Toxicity Reference Value	mg/kg-d	toxsca	123	U.S. EPA (2007)
	Fraction of time at site	-	fsca	0.5	assumed to migrate in winter
	Intake of COC from water by body weight	mg/kg-d	Iwsca	0.001	=WIRsca*Watc*fsca/Bwsca/1000 grams per liter
	Intake of COC from sediment by body weight	mg/kg-d	Issca	1.16	=SIRsca*Sedc*fsca/Bwsca/1000 grams per kilogram
	Intake of COC from aquatic vegetation by body weight	mg/kg-d	Iavsca	0.34	=AVIRsca*Aqvegc*fsca/Bwsca/1000 g per kg
	Intake of COC from benthic invertebrate by body weight	mg/kg-d	Ibisca	1.60	=BIIRsca*Benthicc*fsca/Bwsca/1000 g per kg
	Total intake	mg/kg-d	Itotsca	3.10	=Iwsca+Issca+Iavsca+Ibisca
	Screening Index	-	SIsca	0.03	=Itotsca/toxsca
Sheep					
	Body weight	kg	BWsh	7.00E+01	CWS (1997)
	Water ingestion rate	g/d	WIRsh	4.50E+03	U.S. EPA, 1993
	Soil ingestion rate	g DW/d	SIRsh	113.0	calculated from Beyer *et al*., 1994.
	Forage ingestion rate	g FW/d	FrIRsh	7386	U.S. EPA, 1993
	Toxicity Reference Value	mg/kg-d	toxsh	90	U.S. EPA (2007)
	Fraction of time at site	-	fsh	1	assumed to be in the area all year
	Intake of COC from water by body weight	mg/kg-d	Iwsh	0.003	=WIRsh*Watc*fsh/Bwsh/1000 grams per liter
	Intake of COC from soil by body weight	mg/kg-d	Issh	1.00	=SIRsh*Soilc*fsh/Bwsh/1000 grams per kilogram
	Intake of COC from forage by body weight	mg/kg-d	Ifrsh	1.23	=FrIRsh*Foragec*fsh/Bwsh/1000 g per kg
	Total intake	mg/kg-d	Itotsh	2.23	=Iwsh+Issh+Ibwsh+Iavsh
	Screening Index	-	SIsh	0.02	=Itotsh/toxsh
Wolf					
	Body weight	kg	BWw	4.30E+01	U.S. EPA, 1993
	Water ingestion rate	g/d	WIRw	2.92E+03	U.S. EPA, 1993
	Soil ingestion rate	g DW/d	SIRw	46.1	calculated from Beyer *et al*., 1994.
	Caribou ingestion rate	g FW/d	CIRw	2200	U.S. EPA, 1993
	Moose ingestion rate	g FW/d	MIRw	2200	U.S. EPA, 1993
	Hare ingestion rate	g FW/d	HIRw	1046	U.S. EPA, 1993
	Toxicity Reference Value	mg/kg-d	toxw	90	U.S. EPA (2007)
	Fraction of time at site	-	fw	2.50E-01	assumed to spend part of homerange at the site
	Intake of COC from water by body weight	mg/kg-d	Iww	0.001	=WIRw*Watc*fw/BWw/1000 grams per liter
	Intake of COC from soil by body weight	mg/kg-d	Isw	0.11	=SIRw*Soilc*fw/BWw/1000 grams per kilogram
	Intake of COC from caribou by body weight	mg/kg-d	Icw	1.73	=CIRw*Caribouc*fw/BWw/1000 g per kg
	Intake of COC from moose by body weight	mg/kg-d	Imw	1.11	=MIRw*Moosec*fw/BWw/1000 g per kg
	Intake of COC from hare by body weight	mg/kg-d	Ihw	0.03	=HIRw*Harec*fw/BWw/1000 g per kg
	Total intake	mg/kg-d	Itotw	2.98	=Iww+Isw+Icw+Imw+Ihw
	Screening Index	-	SIw	0.03	=Itotw/toxw

SAMPLE CALCULATION FOR HUMAN HEALTH — ZINC - CHILD (NON-CARCINOGENIC) CAMPER 1

Parameter	Units	Symbol	Mean Value	Reference or Equation
Human Receptor Characteristics (Child)				
Body Weight	kg	BW	32.9	Richardson 1997
Soil Ingestion Rate	g/d	SIRc	0.03	CCME 1996, MADEP 2002
Time at site	-	loc	0.125	assumed 1.5m/year
Skin Surface Area				
Exposed	cm^3	Sae	5140	Richardson 1997
Soil loading to exposed skin				
Child	kg/(cm2-event)	AFh	2.03E-08	Kissel et al., 1996, 1998
Soil Dermal Contact Rate	kg/d	SR	1.30E-05	=(SAe*AFh) x 1 event/d x loc
Fraction of food from the site	-	floc	0.5	assumed that 50% of annual food is taken home from the site
Water Ingestion Rate	L/d	WIRc	8.64E-01	Richardson 1997
Fish Ingestion Rate	g/d	FIRc	2.03E+01	Richardson 1997
Hare Ingestion Rate	g/d	HIRc	5.05E+00	Richardson 1997
Moose Ingestion Rate	g/d	MIRc	1.17E+02	Richardson 1997
Caribou Ingestion Rate	g/d	CIRc	9.37E+00	Richardson 1997
Hoary Marmot Ingestion Rate	g/d	HmIRc	3.34E+00	Richardson 1997
Sheep Ingestion Rate	g/d	ShIRc	7.05E-01	Richardson 1997
Grouse Ingestion Rate	g/d	GIRc	8.28E-01	Richardson 1997
Mallard Ingestion Rate	g/d	MalRc	4.16E-01	Richardson 1997
Beaver Ingestion Rate	g/d	BvIRc	5.27E+00	Richardson 1997
Berry Ingestion Rate	g/d	BIRc	3.66E+00	Richardson 1997
Labrador Tea Ingestion Rate	L/d	LTIRc	0.00E+00	assumed
Concentrations				
Soil concentration	mg/kg	Soilc	552.3	Faro-W
Water concentration	mg/L	Watc	0.022	Pelly Crossing
Fish concentration	mg/kg	Fishc	30.85	Pelly Crossing
Hare concentration	mg/kg	Harec	6.28E+00	calculated for Faro-S
Moose concentration	mg/kg	Moosec	8.71E+01	Measured at the site
Caribou concentration	mg/kg	Caribouc	1.35E+02	Measured at the site
Hoary Marmot concentration	mg/kg	Hmarc	7.19E+00	calculated for Faro-S
Sheep concentration	mg/kg	Sheepc	2.34E+01	calculated for Sheep
Grouse concentration	mg/kg	Grousec	2.40E+02	calculated for Faro-S
Mallard concentration	mg/kg	Mallc	1.40E+01	calculated for Pelly Crossing
Beaver concentration	mg/kg	Beavc	5.73E+00	calculated for Pelly Crossing
Berry concentration	mg/kg	Berryc	2.8	Faro-W
Labrador Tea concentration	mg/L	Labtc	101.4	Overall
Toxicity Data				
Reference Dose - oral	mg/kg bw-d	RfDo	5.66E-01	IIC, 2009
Reference Dose - dermal	mg/kg bw-d	RfDd	0.566	Assume equal to oral
Relative Absorption Factor for skin	-	RAFd	0.02	IIC, 2004
Camper 1				
Dose from soil ingestion	mg/kg bw-d	Dsoil	7.34E-05	=Soilc*(SIRc)*locc/BW/1000
Dose from water ingestion	mg/kg bw-d	Dwater	7.25E-05	=Watc*WIRc*locc/BW
Dose from fish ingestion	mg/kg bw-d	Dfish	9.50E-03	=Fishc*FIRc*floc/BW/1000
Dose from hare ingestion	mg/kg bw-d	Dhare	4.82E-04	=Harec*HIRc*floc/BW/1000
Dose from moose ingestion	mg/kg bw-d	Dmoose	1.55E-01	=Moosec*MIRc*floc/BW/1000
Dose from caribou ingestion	mg/kg bw-d	Dcaribou	1.93E-02	=Caribouc*CIRc*floc/BW/1000
Dose from hoary marmot ingestion	mg/kg bw-d	Dhm	3.65E-04	=Hmarc*HmIRc*floc/BW/1000
Dose from sheep ingestion	mg/kg bw-d	Dsheep	2.51E-04	=Sheepc*ShIRc*floc/BW/1000
Dose from grouse ingestion	mg/kg bw-d	Dgrouse	3.02E-03	=Grousec*GIRc*floc/BW/1000
Dose from mallard ingestion	mg/kg bw-d	Dmallard	8.87E-05	=Mallc*MalRc*floc/BW/1000
Dose from beaver ingestion	mg/kg bw-d	Dbeaver	4.59E-04	=Beavc*BvIRc*floc/BW/1000
Dose from berry ingestion	mg/kg bw-d	Dberry	3.84E-05	=Berryc*BIRc*loc/BW/1000
Dose from Labrador tea ingestion	mg/kg bw-d	Dlabt	0.00E+00	=Labtc*LTIRc*floc/BW
Total ingestion dose	mg/kg bw-d	Ding	1.88E-01	=Dsoil+Dwater+Dfish+Dhare+Dmoose+Dcaribou+Dhm+Dsheep+Dgrouse+Dmallard+Dbeaver+Dl
Dose from dermal exposure	mg/kg bw-d	Ddermal	4.38E-06	=Soilc*SR*RAFd/BW
Hazard Quotient - ingestion	-	HQing	3.33E-01	=Ding/RfDo
Hazard Quotient - dermal	-	HQderm	7.74E-06	=Ddermal/RfDd
Total Hazard Quotient	-	HQtotal	0.33	=HQing+HQderm

SAMPLE CALCULATION FOR HUMAN HEALTH — ARSENIC (CARCINOGENIC)

Parameter	Units	Symbol	Mean Value	Reference or Equation
Toxicity Data				
Slope Factor - oral	$(mg/(kg\ bw\ d))^{-1}$	SFo	1.80E+00	HC, 2009
Relative Absorption Factor for skin	-	RAFd	0.032	HC, 2009
Target Risk	-	TR	1.00E-05	HC
Concentrations				
Soil concentrations	mg/kg	Soile	11	Faro-W
Water concentration	mg/L	Wate	0.0014	Pelly Crossing
Fish concentration	mg/kg	Fishe	0.10	calculated for Pelly Crossing
Hare concentration	mg/kg	Haree	5.94E-04	calculated for Faro-S
Moose concentration	mg/kg	Moosee	9.33E-03	measured
Caribou concentration	mg/kg	Cariboue	6.59E-02	measured
Hoary Marmot concentration	mg/kg	Hmare	8.92E-04	calculated for Faro-S
Sheep concentration	mg/kg	Sheepe	1.77E-03	calculated for Sheep
Grouse concentration	mg/kg	Grousee	0.14	calculated for Faro-S
Mallard concentration	mg/kg	Malle	4.28E-01	calculated for Pelly Crossing
Beaver concentration	mg/kg	Beave	7.09E-04	calculated for Pelly Crossing
Berry concentration	mg/kg	Berrye	0.0251	Faro-W
Labrador tea concentration	mg/kg	Labte	0.18	Overall

Human Receptor Characteristics

Parameter (Units)	Symbol	Toddler (0-5 yrs)	Child (5-12 yrs)	Adult (12-75 yrs)	Reference or Equation
Body Weight (kg)	BW	16.5	32.9	70.7	Richardson 1997
Soil Ingestion Rate (kg/d)	IRs	0.10	0.03	0.03	CCME 1996, MADEP 2002
Skin Surface Area Exposed (cm^2)	SAe	3010	5140	9110	Richardson 1997
Soil loading to skin Exposed (kg/cm^2/event)	AFh	2.29E-08	2.03E-08	1.88E-08	Kissel et al., 1996, 1998
Soil Dermal Contact Rate (g/d)	SR	8.62E-06	1.30E-05	2.14E-05	=(SAh*AFh+SAo*AFo)/1000 x 1 event/d x loc
Fraction of time at the site (-)	loc	1.25E-01	1.25E-01	1.25E-01	assumed 1.5m/yr
Fraction of food from the site (-)	floc	0.5	0.5	0.5	assumed that 50% of annual food is taken home from the site
Water Ingestion Rate (L/d)	WIR	6.53E-01	8.66E-01	1.77E+00	Richardson 1997
Fish Ingestion Rate (g/d)	FIR	1.26E+01	2.04E+01	2.52E+01	Richardson 1997
Hare Ingestion Rate (g/d)	HIR	3.55E+00	5.05E+00	6.83E+00	Richardson 1997
Moose Ingestion Rate (g/d)	MIR	8.21E+01	1.17E+02	1.58E+02	Richardson 1997
Caribou Ingestion Rate (g/d)	CIR	6.59E+00	9.40E+00	1.27E+01	Richardson 1997
Hoary Marmot Ingestion Rate (g/d)	HmIR	2.35E+00	3.36E+00	4.56E+00	Richardson 1997
Sheep Ingestion Rate (g/d)	ShIR	4.84E-01	6.98E-01	9.26E-01	Richardson 1997
Grouse Ingestion Rate (g/d)	GIR	5.80E-01	8.28E-01	1.09E+00	Richardson 1997
Mallard Ingestion Rate (g/d)	MaIR	2.89E-01	4.13E-01	5.46E-01	Richardson 1997
Beaver Ingestion Rate (g/d)	BvIR	3.71E+00	5.25E+00	7.10E+00	Richardson 1997
Berry Ingestion Rate (g/d)	BIR	3.22E+00	3.68E+00	3.30E+00	Richardson 1997
Labrador Tea Ingestion Rate (g/d)	LTIR	0.00E+00	0.00E+00	5.00E-02	Richardson 1997
Exposure Duration (y)	ED	5	7	63	
Averaging Time (y)	AT	75	75	75	

Camper 1

	Symbol	Toddler (0-5 yrs)	Child (5-11 yrs)	Adult (12-70 yrs)	
Dose from soil ingestion (mg/kg bw-d)	Dsoil	8.49E-06	1.49E-06	6.93E-07	=Soile*(SIRc)*locc/BW/1000
Dose from water ingestion (mg/kg bw-d)	Dwater	7.14E-06	4.75E-06	4.52E-06	=Wate*WIRc*locc/BW
Dose from fish ingestion (mg/kg bw-d)	Dfish	3.76E-05	3.04E-05	1.75E-05	=Fishe*FIRc*floc/BW/1000
Dose from hare ingestion (mg/kg bw-d)	Dhare	6.40E-08	4.56E-08	2.87E-08	=Haree*HIRc*floc/BW/1000
Dose from moose ingestion (mg/kg bw-d)	Dmoose	2.32E-05	1.65E-05	1.04E-05	=Moosec*MIRc*floc/BW/1000
Dose from caribou ingestion (mg/kg bw-d)	Dcaribou	1.32E-05	9.40E-06	5.91E-06	=Caribouc*CIRc*floc/BW/1000
Dose from hoary marmot ingestion (mg/kg bw-d)	Dhmarm	6.36E-08	4.56E-08	2.88E-08	=Hmare*HmIRc*floc/BW/1000
Dose from sheep ingestion (mg/kg bw-d)	Dsheep	2.59E-08	1.87E-08	1.16E-08	=Sheepc*ShIRc*floc/BW/1000
Dose from grouse ingestion (mg/kg bw-d)	Dgrouse	2.46E-06	1.76E-06	1.08E-06	=Grousee*GIRc*floc/BW/1000
Dose from mallard ingestion (mg/kg bw-d)	Dmallard	3.75E-06	2.69E-06	1.65E-06	=Mallardc*MaIRc*floc/BW/1000
Dose from beaver ingestion (mg/kg bw-d)	Dbeaver	7.97E-08	5.66E-08	3.56E-08	=Beavere*BvIRc*floc/BW/1000
Dose from berry ingestion (mg/kg bw-d)	Dberry	6.14E-07	3.51E-07	1.47E-07	=Berryc*BIRc*loc/BW/1000
Dose from Labrador tea ingestion (mg/kg bw-d)	Dlabt	0.00E+00	0.00E+00	1.95E-07	=Labtc*LTIRc/BW/1000*12g/L
Total ingestion dose (mg/kg bw-d)	Ding	9.67E-05	6.76E-05	4.22E-05	=Dsoil+Dwater+Dfish+Dhare+Dmoose+Dcaribou+Dhmarm+Dsheep+Dgrouse+Dmallard+Dbeaver+L
Dose from dermal exposure (mg/kg bw-d)	Ddermal	1.87E-07	1.42E-07	1.09E-07	=Soile*SR*RAFd/BW
Overall dose (mg/kg bw-d)	Dtotal	9.69E-05	6.77E-05	4.23E-05	=Ding+Ddermal
Total Risk - Toddler	-	Rtoddler	1.2E-05		=SFo*Dtotal - toddler*ED/Att
Total Risk - Child	-	Rchild	1.1E-05		=SFo*Dtotal - child*ED/Atc
Total Risk - Adult	-	Radult	6.4E-05		=SFo*Dtotal - adult*ED/Ata
Total Risk Composite	-	Rtot	8.7E-05		=Rtoddler+Rchild+Radult
Total Risk Composite - Camper 2	-	RtotBG	4.8E-05		calculated for Camper 2
Incremental Risk Composite - Camper 1	-	IRtot	3.9E-05		calculated for Camper 1

APPENDIX G

TERRESTRIAL ECOLOGICAL RECEPTOR INTAKES – BREAKDOWN BY PATHWAY

Table G.1 Terrestrial Receptor Intakes by Pathway – Existing Conditions

Antimony	Terrestrial Receptor Intakes by Pathway – Existing Conditions																	
	Bear						Beaver											
	B		VM		FM		RC US		RC DS		VC US		VC DS		PR US		PRX	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Water	0%	0%	1%	5%	1%	5%	0%	1%	0%	2%	1%	2%	0%	1%	0%	0%	0%	0%
Sediment	0%	0%	0%	0%	0%	0%	1%	3%	1%	3%	1%	3%	0%	1%	0%	0%	0%	1%
Fish	0%	0%	12%	44%	13%	50%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Aq. Vegetation	0%	0%	0%	0%	0%	0%	88%	100%	93%	100%	95%	100%	51%	97%	0%	0%	35%	88%
Benthic Inv.	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Soil	81%	96%	71%	93%	70%	93%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Berry	7%	24%	6%	18%	6%	17%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Browse	0%	0%	0%	0%	0%	0%	10%	46%	6%	27%	4%	17%	49%	96%	100%	100%	65%	97%
Forage	12%	38%	9%	28%	9%	27%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Lichen	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Moose	0%	1%	0%	1%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Caribou	0%	1%	0%	1%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Hare	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Duck	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Total	100%		100%		100%		100%		100%		100%		100%		100%		100%	

Table G.1 Terrestrial Receptor Intakes by Pathway – Existing Conditions (Cont'd)

Antimony	Terrestrial Receptor Intakes by Pathway – Existing Conditions																	
	Caribou		Fox						Grouse									
	O		B		VM		FM		B		VS		FN		FS		FW	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Water	1%	4%	0%	0%	4%	16%	5%	18%	0%	0%	0%	1%	0%	1%	0%	1%	1%	5%
Sediment	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Fish	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Aq. Vegetation	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Benthic Inv.	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Soil	70%	95%	93%	100%	73%	97%	71%	97%	74%	96%	11%	29%	11%	29%	11%	29%	74%	96%
Berry	0%	0%	7%	26%	4%	13%	4%	12%	2%	8%	1%	2%	1%	2%	1%	2%	2%	7%
Browse	1%	2%	0%	0%	0%	0%	0%	0%	23%	66%	88%	98%	88%	98%	88%	98%	22%	63%
Forage	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Lichen	28%	76%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Moose	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Caribou	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Hare	0%	0%	0%	0%	1%	2%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Duck	0%	0%	0%	0%	19%	72%	20%	76%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Total	100%		100%		100%		100%		100%		100%		100%		100%		100%	

Table G.1 Terrestrial Receptor Intakes by Pathway – Existing Conditions (Cont'd)

Antimony	Terrestrial Receptor Intakes by Pathway – Existing Conditions																	
	Hare										Mallard							
	B		VS		FN		FS		FW		RC US		RC DS		VC US		VC DS	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Water	0%	0%	0%	1%	0%	2%	0%	2%	1%	5%	0%	0%	0%	0%	0%	0%	0%	0%
Sediment	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	4%	1%	4%	1%	4%	1%	4%
Fish	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Aq. Vegetation	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	95%	100%	95%	100%	95%	100%	95%	100%
Benthic Inv.	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	4%	18%	4%	18%	4%	18%	4%	18%
Soil	76%	95%	16%	40%	16%	40%	16%	40%	76%	94%	0%	0%	0%	0%	0%	0%	0%	0%
Berry	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Browse	15%	45%	80%	96%	80%	96%	80%	96%	14%	42%	0%	0%	0%	0%	0%	0%	0%	0%
Forage	9%	30%	3%	12%	3%	13%	3%	12%	9%	28%	0%	0%	0%	0%	0%	0%	0%	0%
Lichen	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Moose	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Caribou	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Hare	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Duck	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Total	100%		100%		100%		100%		100%		100%		100%		100%		100%	

Table G.1 Terrestrial Receptor Intakes by Pathway – Existing Conditions (Cont'd)

Antimony	Terrestrial Receptor Intakes by Pathway – Existing Conditions																	
	Mallard				Marmot										Merganser			
	PR US		PRX		B		VS		FN		FS		FW		RC US		RC DS	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Water	0%	0%	0%	0%	0%	0%	2%	6%	2%	9%	2%	9%	2%	9%	1%	1%	1%	1%
Sediment	0%	0%	1%	4%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	3%	5%	3%	5%
Fish	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	96%	98%	96%	98%
Aq. Vegetation	0%	0%	95%	100%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Benthic Inv.	0%	0%	4%	18%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Soil	0%	0%	0%	0%	67%	96%	66%	95%	65%	95%	65%	95%	66%	95%	0%	0%	0%	0%
Berry	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Browse	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Forage	0%	0%	0%	0%	33%	81%	32%	77%	33%	78%	33%	77%	32%	77%	0%	0%	0%	0%
Lichen	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Moose	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Caribou	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Hare	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Duck	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Total	0%		100%		100%		100%		100%		100%		100%		100%		100%	

Table G.1 Terrestrial Receptor Intakes by Pathway – Existing Conditions (Cont'd)

Antimony	Terrestrial Receptor Intakes by Pathway – Existing Conditions																	
	Merganser								Mink									
	VC US		VC DS		PR US		PRX		RC US		RC DS		VC US		VC DS		PR US	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Water	1%	1%	1%	1%	0%	0%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	0%	0%
Sediment	3%	5%	3%	5%	0%	0%	3%	5%	4%	9%	4%	9%	4%	9%	4%	9%	0%	0%
Fish	96%	98%	96%	98%	0%	0%	96%	98%	33%	65%	33%	65%	33%	65%	33%	64%	0%	0%
Aq. Vegetation	0%	0%	0%	0%	0%	0%	0%	0%	59%	88%	59%	88%	59%	88%	59%	88%	0%	0%
Benthic Inv.	0%	0%	0%	0%	0%	0%	0%	0%	1%	5%	1%	5%	1%	5%	1%	5%	0%	0%
Soil	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Berry	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Browse	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Forage	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Lichen	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Moose	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Caribou	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Hare	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	100%	100%
Duck	0%	0%	0%	0%	0%	0%	0%	0%	2%	7%	2%	7%	2%	7%	2%	7%	0%	0%
Total	100%		100%		0%		100%		100%		100%		100%		100%		100%	

Table G.1 Terrestrial Receptor Intakes by Pathway – Existing Conditions (Cont'd)

Antimony	Terrestrial Receptor Intakes by Pathway – Existing Conditions																			
	Mink		Moose		Scaup												Sheep		Wolf	
	PRX		O		RC US		RC DS		VC US		VC DS		PR US		PRX		S		O	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Water	1%	1%	2%	4%	0%	1%	0%	1%	0%	1%	0%	1%	0%	0%	0%	1%	2%	8%	3%	10%
Sediment	4%	9%	2%	6%	9%	24%	9%	24%	9%	24%	9%	24%	0%	0%	9%	24%	0%	0%	0%	0%
Fish	33%	64%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Aq. Vegetation	59%	88%	78%	98%	82%	98%	82%	98%	82%	98%	82%	98%	0%	0%	82%	98%	0%	0%	0%	0%
Benthic Inv.	1%	5%	0%	0%	9%	39%	9%	39%	9%	39%	9%	39%	0%	0%	9%	39%	0%	0%	0%	0%
Soil	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	72%	96%	86%	97%
Berry	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Browse	0%	0%	19%	57%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Forage	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	26%	70%	0%	0%
Lichen	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Moose	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	5%	19%
Caribou	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	6%	19%
Hare	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%
Duck	2%	7%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Total	100%		100%		100%		100%		100%		100%		0%		100%		100%		100%	

Table G.1 Terrestrial Receptor Intakes by Pathway – Existing Conditions (Cont'd)

Arsenic	Terrestrial Receptor Intakes by Pathway – Existing Conditions																	
	Bear						Beaver											
	B		VM		FM		RC US		RC DS		VC US		VC DS		PR US		PRX	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Water	1%	2%	1%	3%	0%	1%	1%	2%	1%	2%	1%	2%	1%	2%	1%	2%	1%	2%
Sediment	0%	0%	0%	0%	0%	0%	48%	79%	41%	86%	54%	91%	56%	93%	48%	73%	45%	90%
Fish	14%	28%	13%	44%	5%	17%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Aq. Vegetation	0%	0%	0%	0%	0%	0%	1%	5%	1%	5%	2%	6%	2%	6%	1%	5%	1%	5%
Benthic Inv.	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Soil	32%	71%	43%	79%	64%	91%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Berry	20%	53%	7%	22%	2%	6%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Browse	0%	0%	0%	0%	0%	0%	50%	84%	57%	95%	43%	89%	41%	87%	50%	75%	53%	93%
Forage	27%	60%	33%	65%	26%	63%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Lichen	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Moose	1%	5%	0%	1%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Caribou	6%	25%	2%	7%	2%	7%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Hare	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Duck	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Total	100%		100%		100%		100%		100%		100%		100%		100%		100%	

Table G.1 Terrestrial Receptor Intakes by Pathway – Existing Conditions (Cont'd)

Arsenic	Terrestrial Receptor Intakes by Pathway – Existing Conditions																	
	Caribou		Fox						Grouse									
	O		B		VM		FM		B		VS		FN		FS		FW	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Water	0%	2%	3%	8%	2%	7%	1%	3%	0%	0%	0%	1%	1%	2%	0%	0%	0%	1%
Sediment	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Fish	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Aq. Vegetation	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Benthic Inv.	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Soil	35%	85%	25%	71%	41%	89%	64%	97%	15%	44%	52%	89%	71%	93%	45%	83%	60%	96%
Berry	0%	0%	11%	38%	5%	18%	1%	5%	4%	12%	1%	1%	3%	7%	6%	18%	1%	4%
Browse	3%	15%	0%	0%	0%	0%	0%	0%	81%	97%	47%	71%	26%	51%	49%	88%	39%	82%
Forage	0%	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Lichen	60%	96%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Moose	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Caribou	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Hare	0%	0%	0%	1%	0%	1%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Duck	0%	0%	61%	97%	52%	97%	33%	88%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Total	100%		100%		100%		100%		100%		100%		100%		100%		100%	

Table G.1 Terrestrial Receptor Intakes by Pathway – Existing Conditions (Cont'd)

Arsenic	Terrestrial Receptor Intakes by Pathway – Existing Conditions																	
	Hare										Mallard							
	B		VS		FN		FS		FW		RC US		RC DS		VC US		VC DS	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Water	0%	1%	0%	1%	1%	2%	0%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%
Sediment	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	17%	55%	17%	55%	17%	55%	17%	55%
Fish	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Aq. Vegetation	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	2%	0%	2%	0%	2%	0%	2%
Benthic Inv.	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	82%	99%	82%	99%	82%	99%	82%	99%
Soil	19%	53%	52%	78%	72%	91%	50%	85%	63%	95%	0%	0%	0%	0%	0%	0%	0%	0%
Berry	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Browse	66%	91%	29%	53%	16%	35%	36%	79%	26%	64%	0%	0%	0%	0%	0%	0%	0%	0%
Forage	14%	39%	18%	37%	11%	24%	14%	42%	11%	35%	0%	0%	0%	0%	0%	0%	0%	0%
Lichen	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Moose	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Caribou	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Hare	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Duck	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Total	100%		100%		100%		100%		100%		100%		100%		100%		100%	

Table G.1 Terrestrial Receptor Intakes by Pathway – Existing Conditions (Cont'd)

Arsenic	Terrestrial Receptor Intakes by Pathway – Existing Conditions																	
	Mallard				Marmot										Merganser			
	PR US		PRX		B		VS		FN		FS		FW		RC US		RC DS	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Water	0%	0%	0%	0%	1%	2%	1%	2%	1%	3%	0%	1%	1%	2%	0%	0%	0%	0%
Sediment	17%	55%	17%	55%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	36%	50%	36%	50%
Fish	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	63%	76%	63%	76%
Aq. Vegetation	0%	2%	0%	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Benthic Inv.	82%	99%	82%	99%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Soil	0%	0%	0%	0%	26%	69%	41%	84%	60%	92%	48%	85%	58%	94%	0%	0%	0%	0%
Berry	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Browse	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Forage	0%	0%	0%	0%	73%	97%	58%	81%	39%	67%	51%	87%	41%	86%	0%	0%	0%	0%
Lichen	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Moose	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Caribou	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Hare	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Duck	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Total	100%		100%		100%		100%		100%		100%		100%		100%		100%	

Table G.1 Terrestrial Receptor Intakes by Pathway – Existing Conditions (Cont'd)

Arsenic	Terrestrial Receptor Intakes by Pathway – Existing Conditions																	
	Merganser								Mink									
	VC US		VC DS		PR US		PRX		RC US		RC DS		VC US		VC DS		PR US	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Water	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Sediment	36%	50%	36%	50%	36%	50%	36%	50%	41%	67%	41%	67%	41%	67%	41%	67%	41%	67%
Fish	63%	76%	63%	76%	63%	76%	63%	76%	19%	35%	19%	35%	19%	35%	19%	35%	19%	35%
Aq. Vegetation	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Benthic Inv.	0%	0%	0%	0%	0%	0%	0%	0%	34%	76%	34%	76%	34%	76%	34%	76%	34%	76%
Soil	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Berry	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Browse	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Forage	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Lichen	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Moose	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Caribou	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Hare	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Duck	0%	0%	0%	0%	0%	0%	0%	0%	6%	21%	6%	21%	6%	21%	6%	21%	6%	21%
Total	100%		100%		100%		100%		100%		100%		100%		100%		100%	

Table G.1 Terrestrial Receptor Intakes by Pathway – Existing Conditions (Cont'd)

Arsenic	Terrestrial Receptor Intakes by Pathway – Existing Conditions																			
	Mink		Moose		Scaup												Sheep		Wolf	
	PRX		O		RC US		RC DS		VC US		VC DS		PR US		PRX		S		O	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Water	0%	0%	1%	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	2%	8%	2%	6%
Sediment	41%	67%	38%	83%	31%	77%	31%	77%	31%	77%	31%	77%	31%	77%	31%	77%	0%	0%	0%	0%
Fish	19%	35%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Aq. Vegetation	0%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Benthic Inv.	34%	76%	0%	0%	69%	97%	69%	97%	69%	97%	69%	97%	69%	97%	69%	97%	0%	0%	0%	0%
Soil	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	38%	82%	64%	97%
Berry	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Browse	0%	0%	60%	95%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Forage	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	59%	89%	0%	0%
Lichen	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Moose	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	7%	31%
Caribou	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	26%	79%
Hare	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Duck	6%	21%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Total	100%		100%		100%		100%		100%		100%		100%		100%		100%		100%	

Table G.1 Terrestrial Receptor Intakes by Pathway – Existing Conditions (Cont'd)

Beryllium	Terrestrial Receptor Intakes by Pathway – Existing Conditions																	
	Bear						Beaver											
	B		VM		FM		RC US		RC DS		VC US		VC DS		PR US		PRX	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Water	0%	0%	3%	5%	1%	4%	7%	12%	5%	12%	6%	12%	6%	13%	0%	0%	2%	7%
Sediment	0%	0%	0%	0%	0%	0%	30%	54%	22%	54%	28%	52%	28%	57%	0%	0%	11%	34%
Fish	0%	0%	57%	93%	32%	89%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Aq. Vegetation	0%	0%	0%	0%	0%	0%	48%	83%	37%	81%	46%	82%	44%	83%	0%	0%	20%	64%
Benthic Inv.	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Soil	69%	92%	29%	73%	47%	85%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Berry	11%	30%	4%	12%	7%	20%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Browse	0%	0%	0%	0%	0%	0%	16%	38%	36%	95%	20%	51%	22%	79%	100%	100%	67%	98%
Forage	17%	46%	6%	19%	10%	31%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Lichen	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Moose	1%	4%	0%	1%	1%	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Caribou	2%	6%	1%	2%	1%	4%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Hare	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Duck	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Total	100%		100%		100%		100%		100%		100%		100%		100%		100%	

Table G.1 Terrestrial Receptor Intakes by Pathway – Existing Conditions (Cont'd)

Beryllium	Terrestrial Receptor Intakes by Pathway – Existing Conditions																	
	Caribou		Fox						Grouse									
	O		B		VM		FM		B		VS		FN		FS		FW	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Water	6%	21%	0%	0%	16%	44%	8%	32%	0%	0%	8%	36%	3%	18%	3%	18%	3%	18%
Sediment	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Fish	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Aq. Vegetation	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Benthic Inv.	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Soil	63%	89%	89%	99%	41%	89%	62%	96%	63%	93%	45%	76%	48%	79%	47%	79%	61%	92%
Berry	0%	0%	11%	42%	4%	12%	6%	22%	4%	11%	3%	13%	4%	14%	4%	15%	3%	10%
Browse	1%	4%	0%	0%	0%	0%	0%	0%	33%	77%	44%	78%	45%	79%	45%	79%	32%	73%
Forage	0%	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Lichen	29%	70%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Moose	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Caribou	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Hare	0%	0%	0%	1%	0%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Duck	0%	0%	0%	0%	40%	86%	23%	79%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Total	100%		100%		100%		100%		100%		100%		100%		100%		100%	

Table G.1 Terrestrial Receptor Intakes by Pathway – Existing Conditions (Cont'd)

Beryllium	Terrestrial Receptor Intakes by Pathway – Existing Conditions																	
	Hare										Mallard							
	B		VS		FN		FS		FW		RC US		RC DS		VC US		VC DS	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Water	0%	0%	9%	40%	3%	18%	4%	20%	4%	20%	2%	4%	2%	4%	2%	4%	2%	4%
Sediment	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	46%	79%	46%	79%	46%	79%	46%	79%
Fish	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Aq. Vegetation	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	52%	86%	52%	86%	52%	86%	52%	86%
Benthic Inv.	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Soil	65%	90%	49%	78%	47%	77%	51%	80%	63%	89%	0%	0%	0%	0%	0%	0%	0%	0%
Berry	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Browse	21%	55%	30%	64%	29%	64%	31%	66%	20%	53%	0%	0%	0%	0%	0%	0%	0%	0%
Forage	14%	38%	12%	41%	20%	63%	14%	48%	13%	36%	0%	0%	0%	0%	0%	0%	0%	0%
Lichen	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Moose	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Caribou	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Hare	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Duck	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Total	100%		100%		100%		100%		100%		100%		100%		100%		100%	

Table G.1 Terrestrial Receptor Intakes by Pathway – Existing Conditions (Cont'd)

Beryllium	Terrestrial Receptor Intakes by Pathway – Existing Conditions																	
	Mallard				Marmot										Merganser			
	PR US		PRX		B		VS		FN		FS		FW		RC US		RC DS	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Water	0%	0%	2%	4%	0%	0%	12%	50%	4%	23%	5%	29%	5%	28%	0%	0%	0%	0%
Sediment	0%	0%	46%	79%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	3%	5%	3%	5%
Fish	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	97%	98%	97%	98%
Aq. Vegetation	0%	0%	52%	86%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Benthic Inv.	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Soil	0%	0%	0%	0%	54%	93%	48%	86%	41%	79%	51%	89%	51%	90%	0%	0%	0%	0%
Berry	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Browse	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Forage	0%	0%	0%	0%	46%	90%	40%	81%	55%	92%	44%	86%	43%	86%	0%	0%	0%	0%
Lichen	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Moose	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Caribou	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Hare	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Duck	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Total	0%		100%		100%		100%		100%		100%		100%		100%		100%	

Table G.1 Terrestrial Receptor Intakes by Pathway – Existing Conditions (Cont'd)

Beryllium	Terrestrial Receptor Intakes by Pathway – Existing Conditions																	
	Merganser								Mink									
	VC US		VC DS		PR US		PRX		RC US		RC DS		VC US		VC DS		PR US	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Water	0%	0%	0%	0%	0%	0%	0%	0%	1%	1%	1%	1%	1%	1%	1%	1%	0%	0%
Sediment	3%	5%	3%	5%	0%	0%	3%	5%	11%	17%	11%	17%	11%	17%	11%	17%	0%	0%
Fish	97%	98%	97%	98%	0%	0%	97%	98%	84%	91%	84%	91%	84%	91%	84%	91%	0%	0%
Aq. Vegetation	0%	0%	0%	0%	0%	0%	0%	0%	3%	8%	3%	8%	3%	8%	3%	8%	0%	0%
Benthic Inv.	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Soil	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Berry	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Browse	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Forage	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Lichen	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Moose	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Caribou	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Hare	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%	100%
Duck	0%	0%	0%	0%	0%	0%	0%	0%	2%	6%	2%	6%	2%	6%	2%	6%	0%	0%
Total	100%		100%		0%		100%		100%		100%		100%		100%		100%	

Table G.1 Terrestrial Receptor Intakes by Pathway – Existing Conditions (Cont'd)

Beryllium	Terrestrial Receptor Intakes by Pathway – Existing Conditions																			
	Mink		Moose		Scaup												Sheep		Wolf	
	PRX		O		RC US		RC DS		VC US		VC DS		PR US		PRX		S		O	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Water	1%	1%	9%	18%	1%	2%	1%	2%	1%	2%	1%	2%	0%	0%	1%	2%	7%	28%	8%	26%
Sediment	11%	17%	32%	61%	84%	97%	84%	97%	84%	97%	84%	97%	0%	0%	84%	97%	0%	0%	0%	0%
Fish	84%	91%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Aq. Vegetation	3%	8%	19%	51%	15%	41%	15%	41%	15%	41%	15%	41%	0%	0%	15%	41%	0%	0%	0%	0%
Benthic Inv.	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Soil	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	46%	84%	57%	81%
Berry	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Browse	0%	0%	39%	77%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Forage	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	47%	90%	0%	0%
Lichen	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Moose	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	13%	31%
Caribou	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	23%	49%
Hare	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Duck	2%	6%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Total	100%		100%		100%		100%		100%		100%		0%		100%		100%		100%	

Table G.1 Terrestrial Receptor Intakes by Pathway – Existing Conditions (Cont'd)

Boron	Terrestrial Receptor Intakes by Pathway – Existing Conditions																	
	Bear						Beaver											
	B		VM		FM		RC US		RC DS		VC US		VC DS		PR US		PRX	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Water	0%	0%	1%	1%	1%	3%	4%	10%	3%	8%	4%	13%	4%	14%	0%	0%	1%	3%
Sediment	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Fish	0%	0%	1%	2%	1%	3%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Aq. Vegetation	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Benthic Inv.	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Soil	4%	13%	2%	5%	2%	6%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Berry	29%	57%	29%	41%	25%	48%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Browse	0%	0%	0%	0%	0%	0%	96%	99%	97%	100%	96%	99%	96%	100%	100%	100%	99%	100%
Forage	64%	86%	66%	77%	69%	87%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Lichen	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Moose	1%	2%	0%	1%	1%	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Caribou	2%	6%	1%	4%	2%	5%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Hare	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Duck	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Total	100%		100%		100%		100%		100%		100%		100%		100%		100%	

Table G.1 Terrestrial Receptor Intakes by Pathway – Existing Conditions (Cont'd)

Boron	Terrestrial Receptor Intakes by Pathway – Existing Conditions																	
	Caribou		Fox						Grouse									
	O		B		VM		FM		B		VS		FN		FS		FW	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Water	4%	8%	0%	0%	9%	21%	15%	36%	0%	0%	0%	1%	1%	3%	0%	1%	0%	1%
Sediment	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Fish	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Aq. Vegetation	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Benthic Inv.	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Soil	14%	35%	20%	48%	9%	23%	10%	28%	3%	8%	2%	5%	1%	4%	1%	4%	2%	5%
Berry	0%	0%	80%	96%	81%	93%	74%	92%	7%	19%	5%	21%	12%	48%	11%	37%	7%	13%
Browse	23%	49%	0%	0%	0%	0%	0%	0%	91%	98%	93%	99%	86%	99%	87%	99%	91%	96%
Forage	3%	6%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Lichen	56%	79%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Moose	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Caribou	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Hare	0%	0%	0%	1%	1%	2%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Duck	0%	0%	0%	0%	1%	2%	1%	3%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Total	100%		100%		100%		100%		100%		100%		100%		100%		100%	

Table G.1 Terrestrial Receptor Intakes by Pathway – Existing Conditions (Cont'd)

Boron	Terrestrial Receptor Intakes by Pathway – Existing Conditions																	
	Hare										Mallard							
	B		VS		FN		FS		FW		RC US		RC DS		VC US		VC DS	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Water	0%	0%	0%	1%	1%	2%	0%	1%	0%	1%	92%	95%	92%	95%	92%	95%	92%	95%
Sediment	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	8%	12%	8%	12%	8%	12%	8%	12%
Fish	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Aq. Vegetation	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Benthic Inv.	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Soil	3%	8%	2%	5%	1%	3%	1%	3%	2%	5%	0%	0%	0%	0%	0%	0%	0%	0%
Berry	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Browse	61%	88%	69%	97%	51%	91%	50%	88%	52%	71%	0%	0%	0%	0%	0%	0%	0%	0%
Forage	37%	71%	29%	80%	47%	89%	49%	87%	46%	65%	0%	0%	0%	0%	0%	0%	0%	0%
Lichen	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Moose	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Caribou	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Hare	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Duck	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Total	100%		100%		100%		100%		100%		100%		100%		100%		100%	

Table G.1 Terrestrial Receptor Intakes by Pathway – Existing Conditions (Cont'd)

Boron	Terrestrial Receptor Intakes by Pathway – Existing Conditions																	
	Mallard				Marmot										Merganser			
	PR US		PRX		B		VS		FN		FS		FW		RC US		RC DS	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Water	0%	0%	92%	95%	0%	0%	0%	1%	1%	2%	0%	1%	0%	1%	4%	6%	4%	6%
Sediment	0%	0%	8%	12%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Fish	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	96%	98%	96%	98%
Aq. Vegetation	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Benthic Inv.	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Soil	0%	0%	0%	0%	2%	5%	3%	11%	1%	3%	1%	2%	1%	2%	0%	0%	0%	0%
Berry	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Browse	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Forage	0%	0%	0%	0%	98%	100%	97%	100%	98%	100%	99%	100%	99%	100%	0%	0%	0%	0%
Lichen	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Moose	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Caribou	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Hare	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Duck	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Total	0%		100%		100%		100%		100%		100%		100%		100%		100%	

Table G.1 Terrestrial Receptor Intakes by Pathway – Existing Conditions (Cont'd)

Boron	Terrestrial Receptor Intakes by Pathway – Existing Conditions																	
	Merganser								Mink									
	VC US		VC DS		PR US		PRX		RC US		RC DS		VC US		VC DS		PR US	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Water	4%	6%	4%	6%	0%	0%	4%	6%	12%	18%	12%	18%	12%	18%	12%	17%	0%	0%
Sediment	0%	0%	0%	0%	0%	0%	0%	0%	1%	1%	1%	1%	1%	1%	1%	1%	0%	0%
Fish	96%	98%	96%	98%	0%	0%	96%	98%	87%	92%	87%	92%	87%	92%	86%	92%	0%	0%
Aq. Vegetation	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Benthic Inv.	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Soil	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Berry	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Browse	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Forage	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Lichen	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Moose	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Caribou	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Hare	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	1%	1%	3%	100%	100%
Duck	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	1%	0%	1%	0%	1%	0%	0%
Total	100%		100%		0%		100%		100%		100%		100%		100%		100%	

Table G.1 Terrestrial Receptor Intakes by Pathway – Existing Conditions (Cont'd)

Boron	Terrestrial Receptor Intakes by Pathway – Existing Conditions																			
	Mink		Moose		Scaup												Sheep		Wolf	
	PRX		O		RC US		RC DS		VC US		VC DS		PR US		PRX		S		O	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Water	12%	17%	1%	3%	75%	84%	75%	84%	75%	84%	75%	84%	0%	0%	75%	84%	1%	2%	5%	13%
Sediment	1%	1%	0%	0%	25%	35%	25%	35%	25%	35%	25%	35%	0%	0%	25%	35%	0%	0%	0%	0%
Fish	85%	91%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Aq. Vegetation	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Benthic Inv.	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Soil	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	6%	17%	11%	34%
Berry	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Browse	0%	0%	99%	100%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Forage	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	93%	99%	0%	0%
Lichen	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Moose	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	25%	67%
Caribou	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	59%	92%
Hare	2%	9%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%
Duck	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Total	100%		100%		100%		100%		100%		100%		0%		100%		100%		100%	

Table G.1 Terrestrial Receptor Intakes by Pathway – Existing Conditions (Cont'd)

Cadmium	Terrestrial Receptor Intakes by Pathway – Existing Conditions																	
	Bear						Beaver											
	B		VM		FM		RC US		RC DS		VC US		VC DS		PR US		PRX	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Water	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Sediment	0%	0%	0%	0%	0%	0%	0%	1%	0%	1%	0%	1%	0%	1%	0%	1%	0%	1%
Fish	12%	33%	7%	31%	4%	17%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Aq. Vegetation	0%	0%	0%	0%	0%	0%	58%	91%	61%	95%	61%	94%	59%	96%	86%	97%	67%	97%
Benthic Inv.	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Soil	10%	33%	12%	35%	12%	36%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Berry	2%	7%	2%	7%	4%	13%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Browse	0%	0%	0%	0%	0%	0%	41%	81%	39%	84%	39%	83%	40%	90%	13%	32%	33%	82%
Forage	14%	46%	6%	22%	11%	35%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Lichen	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Moose	36%	94%	41%	96%	38%	95%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Caribou	27%	76%	33%	84%	30%	81%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Hare	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Duck	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Total	100%		100%		100%		100%		100%		100%		100%		100%		100%	

Table G.1 Terrestrial Receptor Intakes by Pathway – Existing Conditions (Cont'd)

Cadmium	Terrestrial Receptor Intakes by Pathway – Existing Conditions																	
	Caribou		Fox						Grouse									
	O		B		VM		FM		B		VS		FN		FS		FW	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Water	0%	0%	1%	3%	1%	2%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Sediment	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Fish	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Aq. Vegetation	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Benthic Inv.	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Soil	24%	58%	15%	51%	37%	86%	37%	81%	3%	10%	2%	3%	5%	17%	4%	13%	3%	9%
Berry	0%	0%	2%	8%	3%	13%	10%	28%	0%	1%	0%	1%	1%	3%	1%	2%	1%	4%
Browse	29%	68%	0%	0%	0%	0%	0%	0%	97%	100%	98%	99%	94%	99%	95%	99%	95%	99%
Forage	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Lichen	47%	85%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Moose	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Caribou	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Hare	0%	0%	0%	0%	0%	1%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Duck	0%	0%	82%	99%	59%	97%	53%	95%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Total	100%		100%		100%		100%		100%		100%		100%		100%		100%	

Table G.1 Terrestrial Receptor Intakes by Pathway – Existing Conditions (Cont'd)

Cadmium	Terrestrial Receptor Intakes by Pathway – Existing Conditions																	
	Hare										Mallard							
	B		VS		FN		FS		FW		RC US		RC DS		VC US		VC DS	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Water	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Sediment	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	1%	0%	1%	0%	1%
Fish	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Aq. Vegetation	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	72%	97%	72%	97%	72%	97%	72%	97%
Benthic Inv.	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	27%	74%	27%	74%	27%	74%	27%	74%
Soil	4%	15%	3%	5%	7%	24%	7%	19%	5%	13%	0%	0%	0%	0%	0%	0%	0%	0%
Berry	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Browse	89%	98%	92%	96%	86%	98%	88%	98%	86%	96%	0%	0%	0%	0%	0%	0%	0%	0%
Forage	6%	23%	5%	9%	7%	23%	6%	17%	9%	21%	0%	0%	0%	0%	0%	0%	0%	0%
Lichen	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Moose	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Caribou	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Hare	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Duck	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Total	100%		100%		100%		100%		100%		100%		100%		100%		100%	

Table G.1 Terrestrial Receptor Intakes by Pathway – Existing Conditions (Cont'd)

Cadmium	Terrestrial Receptor Intakes by Pathway – Existing Conditions																	
	Mallard				Marmot										Merganser			
	PR US		PRX		B		VS		FN		FS		FW		RC US		RC DS	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Water	0%	0%	0%	0%	0%	1%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Sediment	0%	1%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	5%	11%	5%	11%
Fish	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	95%	98%	95%	98%
Aq. Vegetation	72%	97%	72%	97%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Benthic Inv.	27%	74%	27%	74%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Soil	0%	0%	0%	0%	20%	60%	11%	17%	26%	70%	24%	55%	12%	28%	0%	0%	0%	0%
Berry	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Browse	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Forage	0%	0%	0%	0%	80%	98%	89%	94%	74%	97%	76%	95%	88%	96%	0%	0%	0%	0%
Lichen	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Moose	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Caribou	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Hare	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Duck	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Total	100%		100%		100%		100%		100%		100%		100%		100%		100%	

Table G.1 Terrestrial Receptor Intakes by Pathway – Existing Conditions (Cont'd)

Cadmium	Terrestrial Receptor Intakes by Pathway – Existing Conditions																	
	Merganser								Mink									
	VC US		VC DS		PR US		PRX		RC US		RC DS		VC US		VC DS		PR US	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Water	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Sediment	5%	11%	5%	11%	5%	11%	5%	11%	3%	5%	3%	5%	3%	5%	3%	5%	3%	5%
Fish	95%	98%	95%	98%	95%	98%	95%	98%	16%	31%	16%	31%	16%	31%	16%	31%	16%	31%
Aq. Vegetation	0%	0%	0%	0%	0%	0%	0%	0%	61%	83%	61%	83%	61%	83%	61%	83%	61%	83%
Benthic Inv.	0%	0%	0%	0%	0%	0%	0%	0%	16%	52%	16%	52%	16%	52%	16%	52%	16%	52%
Soil	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Berry	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Browse	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Forage	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Lichen	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Moose	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Caribou	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Hare	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Duck	0%	0%	0%	0%	0%	0%	0%	0%	5%	16%	5%	16%	5%	16%	5%	16%	5%	16%
Total	100%		100%		100%		100%		100%		100%		100%		100%		100%	

Table G.1 Terrestrial Receptor Intakes by Pathway – Existing Conditions (Cont'd)

Cadmium	Terrestrial Receptor Intakes by Pathway – Existing Conditions																			
	Mink		Moose		Scaup												Sheep		Wolf	
	PRX		O		RC US		RC DS		VC US		VC DS		PR US		PRX		S		O	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Water	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%
Sediment	3%	5%	0%	1%	3%	6%	3%	6%	3%	6%	3%	6%	3%	6%	3%	6%	0%	0%	0%	0%
Fish	16%	31%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Aq. Vegetation	61%	83%	35%	72%	51%	89%	51%	89%	51%	89%	51%	89%	51%	89%	51%	89%	0%	0%	0%	0%
Benthic Inv.	16%	52%	0%	0%	47%	90%	47%	90%	47%	90%	47%	90%	47%	90%	47%	90%	0%	0%	0%	0%
Soil	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	54%	89%	2%	8%
Berry	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Browse	0%	0%	64%	91%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Forage	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	46%	85%	0%	0%
Lichen	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Moose	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	51%	98%
Caribou	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	47%	97%
Hare	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Duck	5%	16%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Total	100%		100%		100%		100%		100%		100%		100%		100%		100%		100%	

Table G.1 Terrestrial Receptor Intakes by Pathway – Existing Conditions (Cont'd)

Chromium	Terrestrial Receptor Intakes by Pathway – Existing Conditions																	
	Bear						Beaver											
	B		VM		FM		RC US		RC DS		VC US		VC DS		PR US		PRX	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Water	0%	0%	0%	1%	0%	1%	0%	1%	1%	1%	1%	1%	1%	1%	0%	0%	1%	1%
Sediment	0%	0%	0%	0%	0%	0%	41%	91%	67%	97%	53%	96%	57%	92%	0%	0%	68%	96%
Fish	0%	0%	19%	55%	23%	61%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Aq. Vegetation	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Benthic Inv.	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Soil	30%	69%	53%	79%	37%	79%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Berry	10%	25%	5%	11%	10%	27%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Browse	0%	0%	0%	0%	0%	0%	59%	98%	32%	83%	46%	96%	43%	84%	100%	100%	31%	76%
Forage	44%	76%	18%	40%	23%	57%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Lichen	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Moose	8%	27%	3%	9%	3%	13%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Caribou	8%	21%	3%	7%	3%	10%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Hare	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Duck	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Total	100%		100%		100%		100%		100%		100%		100%		100%		100%	

Table G.1 Terrestrial Receptor Intakes by Pathway – Existing Conditions (Cont'd)

Chromium	Terrestrial Receptor Intakes by Pathway – Existing Conditions																	
	Caribou		Fox						Grouse									
	O		B		VM		FM		B		VS		FN		FS		FW	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Water	1%	2%	0%	0%	1%	2%	1%	3%	0%	0%	0%	1%	0%	2%	0%	1%	0%	1%
Sediment	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Fish	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Aq. Vegetation	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Benthic Inv.	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Soil	36%	82%	73%	96%	46%	89%	33%	84%	16%	63%	57%	72%	58%	92%	43%	84%	54%	89%
Berry	0%	0%	22%	61%	3%	8%	6%	21%	2%	8%	2%	4%	2%	5%	5%	16%	5%	15%
Browse	3%	16%	0%	0%	0%	0%	0%	0%	82%	99%	41%	58%	40%	84%	52%	88%	41%	76%
Forage	0%	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Lichen	60%	93%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Moose	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Caribou	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Hare	0%	0%	4%	18%	0%	1%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Duck	0%	0%	0%	0%	51%	94%	60%	97%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Total	100%		100%		100%		100%		100%		100%		100%		100%		100%	

Table G.1 Terrestrial Receptor Intakes by Pathway – Existing Conditions (Cont'd)

Chromium	Terrestrial Receptor Intakes by Pathway – Existing Conditions																	
	Hare										Mallard							
	B		VS		FN		FS		FW		RC US		RC DS		VC US		VC DS	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Water	0%	0%	0%	1%	0%	1%	0%	1%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%
Sediment	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	90%	99%	90%	99%	90%	99%	90%	99%
Fish	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Aq. Vegetation	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Benthic Inv.	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	10%	38%	10%	38%	10%	38%	10%	38%
Soil	16%	56%	60%	76%	50%	83%	43%	83%	50%	86%	0%	0%	0%	0%	0%	0%	0%	0%
Berry	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Browse	63%	97%	25%	39%	23%	61%	33%	69%	22%	45%	0%	0%	0%	0%	0%	0%	0%	0%
Forage	21%	61%	15%	34%	27%	58%	24%	54%	28%	57%	0%	0%	0%	0%	0%	0%	0%	0%
Lichen	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Moose	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Caribou	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Hare	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Duck	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Total	100%		100%		100%		100%		100%		100%		100%		100%		100%	

Table G.1 Terrestrial Receptor Intakes by Pathway – Existing Conditions (Cont'd)

Chromium	Terrestrial Receptor Intakes by Pathway – Existing Conditions																	
	Mallard				Marmot										Merganser			
	PR US		PRX		B		VS		FN		FS		FW		RC US		RC DS	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Water	0%	0%	0%	0%	0%	0%	0%	1%	0%	2%	0%	1%	0%	1%	0%	0%	0%	0%
Sediment	0%	0%	90%	99%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	19%	29%	19%	29%
Fish	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	81%	89%	81%	89%
Aq. Vegetation	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Benthic Inv.	0%	0%	10%	38%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Soil	0%	0%	0%	0%	16%	48%	48%	75%	30%	64%	31%	72%	31%	71%	0%	0%	0%	0%
Berry	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Browse	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Forage	0%	0%	0%	0%	84%	98%	52%	79%	69%	92%	69%	95%	69%	94%	0%	0%	0%	0%
Lichen	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Moose	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Caribou	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Hare	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Duck	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Total	0%		100%		100%		100%		100%		100%		100%		100%		100%	

Table G.1 Terrestrial Receptor Intakes by Pathway – Existing Conditions (Cont'd)

Chromium	Terrestrial Receptor Intakes by Pathway – Existing Conditions																	
	Merganser								Mink									
	VC US		VC DS		PR US		PRX		RC US		RC DS		VC US		VC DS		PR US	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Water	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Sediment	19%	29%	19%	29%	0%	0%	19%	29%	42%	56%	42%	56%	42%	56%	42%	56%	0%	0%
Fish	81%	89%	81%	89%	0%	0%	81%	89%	48%	63%	48%	63%	48%	63%	48%	63%	0%	0%
Aq. Vegetation	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Benthic Inv.	0%	0%	0%	0%	0%	0%	0%	0%	0%	2%	0%	2%	0%	2%	0%	2%	0%	0%
Soil	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Berry	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Browse	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Forage	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Lichen	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Moose	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Caribou	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Hare	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	0%	0%	0%	0%	100%	100%
Duck	0%	0%	0%	0%	0%	0%	0%	0%	10%	32%	10%	32%	10%	32%	10%	32%	0%	0%
Total	100%		100%		0%		100%		100%		100%		100%		100%		100%	

Table G.1 Terrestrial Receptor Intakes by Pathway – Existing Conditions (Cont'd)

Chromium	Terrestrial Receptor Intakes by Pathway – Existing Conditions																			
	Mink		Moose		Scaup												Sheep		Wolf	
	PRX		O		RC US		RC DS		VC US		VC DS		PR US		PRX		S		O	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Water	0%	0%	1%	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	3%	1%	2%
Sediment	42%	56%	59%	96%	95%	100%	95%	100%	95%	100%	95%	100%	0%	0%	95%	100%	0%	0%	0%	0%
Fish	48%	63%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Aq. Vegetation	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Benthic Inv.	0%	2%	0%	0%	5%	19%	5%	19%	5%	19%	5%	19%	0%	0%	5%	19%	0%	0%	0%	0%
Soil	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	44%	81%	29%	72%
Berry	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Browse	0%	0%	40%	91%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Forage	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	55%	90%	0%	0%
Lichen	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Moose	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	32%	75%
Caribou	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	38%	76%
Hare	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%
Duck	10%	32%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Total	100%		100%		100%		100%		100%		100%		0%		100%		100%		100%	

Table G.1 Terrestrial Receptor Intakes by Pathway – Existing Conditions (Cont'd)

Cobalt	Terrestrial Receptor Intakes by Pathway – Existing Conditions																	
	Bear						Beaver											
	B		VM		FM		RC US		RC DS		VC US		VC DS		PR US		PRX	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Water	1%	3%	1%	5%	1%	3%	0%	1%	0%	1%	0%	1%	0%	1%	0%	1%	0%	0%
Sediment	0%	0%	0%	0%	0%	0%	20%	41%	16%	38%	20%	44%	13%	38%	23%	49%	10%	30%
Fish	19%	38%	20%	63%	12%	39%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Aq. Vegetation	0%	0%	0%	0%	0%	0%	59%	90%	51%	89%	59%	91%	42%	88%	65%	92%	33%	83%
Benthic Inv.	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Soil	39%	76%	61%	86%	49%	87%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Berry	8%	21%	5%	13%	5%	15%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Browse	0%	0%	0%	0%	0%	0%	21%	50%	32%	76%	20%	57%	44%	96%	12%	29%	57%	97%
Forage	27%	66%	9%	21%	29%	69%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Lichen	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Moose	2%	6%	1%	4%	1%	4%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Caribou	4%	10%	2%	7%	2%	7%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Hare	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Duck	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Total	100%		100%		100%		100%		100%		100%		100%		100%		100%	

Table G.1 Terrestrial Receptor Intakes by Pathway – Existing Conditions (Cont'd)

Cobalt	Terrestrial Receptor Intakes by Pathway – Existing Conditions																	
	Caribou		Fox						Grouse									
	O		B		VM		FM		B		VS		FN		FS		FW	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Water	1%	3%	2%	6%	1%	5%	1%	4%	0%	1%	0%	1%	0%	0%	0%	1%	0%	0%
Sediment	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Fish	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Aq. Vegetation	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Benthic Inv.	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Soil	43%	83%	17%	58%	32%	86%	34%	87%	19%	49%	10%	32%	10%	32%	10%	32%	15%	42%
Berry	0%	0%	2%	8%	2%	6%	2%	8%	1%	4%	0%	1%	0%	2%	0%	2%	1%	2%
Browse	9%	27%	0%	0%	0%	0%	0%	0%	80%	96%	89%	99%	89%	99%	89%	99%	84%	97%
Forage	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Lichen	46%	84%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Moose	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Caribou	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Hare	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Duck	0%	0%	79%	99%	65%	98%	62%	98%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Total	100%		100%		100%		100%		100%		100%		100%		100%		100%	

Table G.1 Terrestrial Receptor Intakes by Pathway – Existing Conditions (Cont'd)

Cobalt	Terrestrial Receptor Intakes by Pathway – Existing Conditions																	
	Hare										Mallard							
	B		VS		FN		FS		FW		RC US		RC DS		VC US		VC DS	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Water	0%	1%	0%	1%	0%	1%	0%	1%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%
Sediment	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	14%	38%	14%	38%	14%	38%	14%	38%
Fish	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Aq. Vegetation	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	36%	81%	36%	81%	36%	81%	36%	81%
Benthic Inv.	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	49%	93%	49%	93%	49%	93%	49%	93%
Soil	24%	58%	15%	44%	15%	42%	13%	36%	16%	42%	0%	0%	0%	0%	0%	0%	0%	0%
Berry	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Browse	61%	88%	83%	98%	82%	98%	77%	97%	52%	84%	0%	0%	0%	0%	0%	0%	0%	0%
Forage	15%	45%	2%	6%	4%	13%	10%	41%	32%	75%	0%	0%	0%	0%	0%	0%	0%	0%
Lichen	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Moose	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Caribou	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Hare	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Duck	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Total	100%		100%		100%		100%		100%		100%		100%		100%		100%	

Table G.1 Terrestrial Receptor Intakes by Pathway – Existing Conditions (Cont'd)

Cobalt	Terrestrial Receptor Intakes by Pathway – Existing Conditions																	
	Mallard				Marmot										Merganser			
	PR US		PRX		B		VS		FN		FS		FW		RC US		RC DS	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Water	0%	0%	0%	0%	1%	4%	2%	9%	1%	4%	1%	2%	0%	1%	0%	0%	0%	0%
Sediment	14%	38%	14%	38%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	45%	59%	45%	59%
Fish	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	55%	69%	55%	69%
Aq. Vegetation	36%	81%	36%	81%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Benthic Inv.	49%	93%	49%	93%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Soil	0%	0%	0%	0%	32%	78%	66%	93%	50%	79%	33%	77%	15%	51%	0%	0%	0%	0%
Berry	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Browse	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Forage	0%	0%	0%	0%	67%	96%	32%	58%	49%	79%	66%	95%	85%	99%	0%	0%	0%	0%
Lichen	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Moose	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Caribou	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Hare	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Duck	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Total	100%		100%		100%		100%		100%		100%		100%		100%		100%	

Table G.1 Terrestrial Receptor Intakes by Pathway – Existing Conditions (Cont'd)

Cobalt	Terrestrial Receptor Intakes by Pathway – Existing Conditions																	
	Merganser								Mink									
	VC US		VC DS		PR US		PRX		RC US		RC DS		VC US		VC DS		PR US	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Water	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Sediment	45%	59%	45%	59%	45%	59%	45%	59%	41%	65%	41%	65%	41%	65%	41%	65%	41%	65%
Fish	55%	69%	55%	69%	55%	69%	55%	69%	13%	24%	13%	24%	13%	24%	13%	24%	13%	24%
Aq. Vegetation	0%	0%	0%	0%	0%	0%	0%	0%	17%	46%	17%	46%	17%	46%	17%	46%	17%	46%
Benthic Inv.	0%	0%	0%	0%	0%	0%	0%	0%	19%	56%	19%	56%	19%	56%	19%	56%	19%	56%
Soil	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Berry	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Browse	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Forage	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Lichen	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Moose	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Caribou	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Hare	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Duck	0%	0%	0%	0%	0%	0%	0%	0%	9%	30%	9%	30%	9%	30%	9%	30%	9%	30%
Total	100%		100%		100%		100%		100%		100%		100%		100%		100%	

Table G.1 Terrestrial Receptor Intakes by Pathway – Existing Conditions (Cont'd)

Cobalt	Terrestrial Receptor Intakes by Pathway – Existing Conditions																			
	Mink		Moose		Scaup												Sheep		Wolf	
	PRX		O		RC US		RC DS		VC US		VC DS		PR US		PRX		S		O	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Water	0%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	4%	2%	5%
Sediment	41%	65%	21%	45%	37%	75%	37%	75%	37%	75%	37%	75%	37%	75%	37%	75%	0%	0%	0%	0%
Fish	13%	24%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Aq. Vegetation	17%	46%	25%	62%	13%	41%	13%	41%	13%	41%	13%	41%	13%	41%	13%	41%	0%	0%	0%	0%
Benthic Inv.	19%	56%	0%	0%	50%	92%	50%	92%	50%	92%	50%	92%	50%	92%	50%	92%	0%	0%	0%	0%
Soil	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	27%	67%	46%	83%
Berry	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Browse	0%	0%	54%	86%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Forage	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	72%	96%	0%	0%
Lichen	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Moose	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	20%	50%
Caribou	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	32%	68%
Hare	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Duck	9%	30%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Total	100%		100%		100%		100%		100%		100%		100%		100%		100%		100%	

Table G.1 Terrestrial Receptor Intakes by Pathway – Existing Conditions (Cont'd)

Copper	Terrestrial Receptor Intakes by Pathway – Existing Conditions																	
	Bear						Beaver											
	B		VM		FM		RC US		RC DS		VC US		VC DS		PR US		PRX	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Water	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Sediment	0%	0%	0%	0%	0%	0%	24%	51%	24%	50%	31%	58%	30%	53%	49%	74%	40%	71%
Fish	26%	38%	7%	16%	5%	16%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Aq. Vegetation	0%	0%	0%	0%	0%	0%	21%	56%	20%	56%	25%	62%	25%	60%	36%	74%	31%	70%
Benthic Inv.	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Soil	8%	18%	18%	30%	29%	61%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Berry	12%	19%	20%	31%	17%	29%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Browse	0%	0%	0%	0%	0%	0%	55%	88%	56%	89%	44%	80%	45%	76%	14%	29%	29%	70%
Forage	27%	46%	22%	33%	21%	40%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Lichen	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Moose	11%	29%	13%	33%	11%	29%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Caribou	17%	34%	20%	38%	17%	35%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Hare	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Duck	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Total	100%		100%		100%		100%		100%		100%		100%		100%		100%	

Table G.1 Terrestrial Receptor Intakes by Pathway – Existing Conditions (Cont'd)

Copper	Terrestrial Receptor Intakes by Pathway – Existing Conditions																	
	Caribou		Fox						Grouse									
	O		B		VM		FM		B		VS		FN		FS		FW	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Water	0%	0%	2%	3%	0%	1%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Sediment	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Fish	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Aq. Vegetation	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Benthic Inv.	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Soil	37%	80%	23%	51%	46%	68%	60%	88%	12%	28%	20%	31%	17%	46%	33%	65%	28%	50%
Berry	0%	0%	22%	47%	34%	54%	26%	54%	7%	15%	11%	35%	12%	44%	6%	12%	8%	17%
Browse	5%	15%	0%	0%	0%	0%	0%	0%	81%	92%	69%	83%	71%	96%	62%	85%	64%	82%
Forage	1%	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Lichen	57%	92%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Moose	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Caribou	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Hare	0%	0%	1%	3%	1%	3%	1%	4%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Duck	0%	0%	52%	90%	19%	57%	13%	49%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Total	100%		100%		100%		100%		100%		100%		100%		100%		100%	

Table G.1 Terrestrial Receptor Intakes by Pathway – Existing Conditions (Cont'd)

Copper	Terrestrial Receptor Intakes by Pathway – Existing Conditions																	
	Hare										Mallard							
	B		VS		FN		FS		FW		RC US		RC DS		VC US		VC DS	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Water	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Sediment	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	38%	74%	38%	74%	38%	74%	38%	74%
Fish	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Aq. Vegetation	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	23%	60%	23%	60%	23%	60%	23%	60%
Benthic Inv.	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	39%	86%	39%	86%	39%	86%	39%	86%
Soil	13%	27%	25%	37%	18%	41%	37%	69%	29%	52%	0%	0%	0%	0%	0%	0%	0%	0%
Berry	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Browse	49%	74%	50%	65%	51%	88%	42%	69%	40%	59%	0%	0%	0%	0%	0%	0%	0%	0%
Forage	38%	64%	25%	40%	31%	61%	21%	43%	31%	49%	0%	0%	0%	0%	0%	0%	0%	0%
Lichen	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Moose	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Caribou	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Hare	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Duck	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Total	100%		100%		100%		100%		100%		100%		100%		100%		100%	

Table G.1 Terrestrial Receptor Intakes by Pathway – Existing Conditions (Cont'd)

Copper	Terrestrial Receptor Intakes by Pathway – Existing Conditions																	
	Mallard				Marmot										Merganser			
	PR US		PRX		B		VS		FN		FS		FW		RC US		RC DS	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Water	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Sediment	38%	74%	38%	74%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	22%	31%	22%	31%
Fish	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	78%	86%	78%	86%
Aq. Vegetation	23%	60%	23%	60%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Benthic Inv.	39%	86%	39%	86%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Soil	0%	0%	0%	0%	7%	18%	18%	31%	11%	23%	29%	63%	17%	36%	0%	0%	0%	0%
Berry	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Browse	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Forage	0%	0%	0%	0%	93%	98%	82%	92%	89%	96%	71%	93%	83%	95%	0%	0%	0%	0%
Lichen	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Moose	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Caribou	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Hare	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Duck	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Total	100%		100%		100%		100%		100%		100%		100%		100%		100%	

Table G.1 Terrestrial Receptor Intakes by Pathway – Existing Conditions (Cont'd)

Copper	Terrestrial Receptor Intakes by Pathway – Existing Conditions																	
	Merganser								Mink									
	VC US		VC DS		PR US		PRX		RC US		RC DS		VC US		VC DS		PR US	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Water	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Sediment	22%	31%	22%	31%	22%	31%	22%	31%	44%	58%	44%	58%	44%	58%	44%	58%	44%	58%
Fish	78%	86%	78%	86%	78%	86%	78%	86%	43%	57%	43%	57%	43%	57%	43%	57%	43%	57%
Aq. Vegetation	0%	0%	0%	0%	0%	0%	0%	0%	4%	14%	4%	14%	4%	14%	4%	14%	4%	14%
Benthic Inv.	0%	0%	0%	0%	0%	0%	0%	0%	7%	27%	7%	27%	7%	27%	7%	27%	7%	27%
Soil	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Berry	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Browse	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Forage	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Lichen	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Moose	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Caribou	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Hare	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	1%	0%	0%	0%	0%	0%	0%
Duck	0%	0%	0%	0%	0%	0%	0%	0%	2%	6%	2%	6%	2%	6%	2%	6%	2%	6%
Total	100%		100%		100%		100%		100%		100%		100%		100%		100%	

Table G.1 Terrestrial Receptor Intakes by Pathway – Existing Conditions (Cont'd)

Copper	Terrestrial Receptor Intakes by Pathway – Existing Conditions																			
	Mink		Moose		Scaup												Sheep		Wolf	
	PRX		O		RC US		RC DS		VC US		VC DS		PR US		PRX		S		O	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Water	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Sediment	44%	58%	28%	48%	65%	93%	65%	93%	65%	93%	65%	93%	65%	93%	65%	93%	0%	0%	0%	0%
Fish	43%	57%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Aq. Vegetation	4%	14%	8%	24%	5%	17%	5%	17%	5%	17%	5%	17%	5%	17%	5%	17%	0%	0%	0%	0%
Benthic Inv.	7%	27%	0%	0%	30%	77%	30%	77%	30%	77%	30%	77%	30%	77%	30%	77%	0%	0%	0%	0%
Soil	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	17%	38%	6%	18%
Berry	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Browse	0%	0%	64%	83%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Forage	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	83%	97%	0%	0%
Lichen	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Moose	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	36%	72%
Caribou	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	58%	87%
Hare	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Duck	2%	6%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Total	100%		100%		100%		100%		100%		100%		100%		100%		100%		100%	

Table G.1 Terrestrial Receptor Intakes by Pathway – Existing Conditions (Cont'd)

Lead	Terrestrial Receptor Intakes by Pathway – Existing Conditions																	
	Bear						Beaver											
	B		VM		FM		RC US		RC DS		VC US		VC DS		PR US		PRX	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Water	1%	2%	0%	0%	0%	0%	0%	1%	0%	0%	0%	1%	0%	1%	0%	1%	0%	0%
Sediment	0%	0%	0%	0%	0%	0%	60%	89%	28%	77%	74%	93%	50%	81%	79%	95%	38%	76%
Fish	21%	34%	2%	8%	0%	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Aq. Vegetation	0%	0%	0%	0%	0%	0%	14%	41%	7%	27%	17%	46%	12%	36%	18%	48%	9%	31%
Benthic Inv.	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Soil	64%	80%	83%	96%	82%	99%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Berry	3%	6%	2%	6%	2%	7%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Browse	0%	0%	0%	0%	0%	0%	26%	73%	65%	99%	9%	29%	37%	77%	2%	6%	52%	91%
Forage	5%	13%	12%	32%	15%	53%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Lichen	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Moose	1%	5%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Caribou	4%	11%	1%	3%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Hare	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Duck	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Total	100%		100%		100%		100%		100%		100%		100%		100%		100%	

Table G.1 Terrestrial Receptor Intakes by Pathway – Existing Conditions (Cont'd)

Lead	Terrestrial Receptor Intakes by Pathway – Existing Conditions																	
	Caribou		Fox						Grouse									
	O		B		VM		FM		B		VS		FN		FS		FW	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Water	0%	0%	4%	8%	0%	2%	0%	0%	1%	1%	0%	0%	0%	0%	0%	0%	0%	0%
Sediment	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Fish	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Aq. Vegetation	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Benthic Inv.	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Soil	36%	87%	63%	86%	83%	98%	87%	99%	69%	89%	79%	89%	29%	73%	74%	98%	97%	99%
Berry	0%	0%	2%	4%	1%	4%	1%	5%	1%	3%	1%	3%	0%	0%	1%	2%	0%	0%
Browse	1%	3%	0%	0%	0%	0%	0%	0%	29%	56%	20%	38%	71%	97%	25%	70%	2%	6%
Forage	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Lichen	63%	97%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Moose	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Caribou	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Hare	0%	0%	5%	15%	13%	40%	11%	39%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Duck	0%	0%	25%	64%	3%	14%	1%	3%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Total	100%		100%		100%		100%		100%		100%		100%		100%		100%	

Table G.1 Terrestrial Receptor Intakes by Pathway – Existing Conditions (Cont'd)

Lead	Terrestrial Receptor Intakes by Pathway – Existing Conditions																	
	Hare										Mallard							
	B		VS		FN		FS		FW		RC US		RC DS		VC US		VC DS	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Water	1%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Sediment	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	70%	93%	70%	93%	70%	93%	70%	93%
Fish	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Aq. Vegetation	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	12%	36%	12%	36%	12%	36%	12%	36%
Benthic Inv.	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	18%	58%	18%	58%	18%	58%	18%	58%
Soil	75%	91%	82%	91%	38%	81%	73%	96%	97%	99%	0%	0%	0%	0%	0%	0%	0%	0%
Berry	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Browse	19%	41%	12%	24%	61%	94%	16%	51%	1%	3%	0%	0%	0%	0%	0%	0%	0%	0%
Forage	6%	15%	6%	15%	1%	3%	11%	37%	1%	5%	0%	0%	0%	0%	0%	0%	0%	0%
Lichen	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Moose	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Caribou	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Hare	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Duck	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Total	100%		100%		100%		100%		100%		100%		100%		100%		100%	

Table G.1 Terrestrial Receptor Intakes by Pathway – Existing Conditions (Cont'd)

Lead	Terrestrial Receptor Intakes by Pathway – Existing Conditions																	
	Mallard				Marmot										Merganser			
	PR US		PRX		B		VS		FN		FS		FW		RC US		RC DS	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Water	0%	0%	0%	0%	2%	3%	0%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%
Sediment	70%	93%	70%	93%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	62%	75%	62%	75%
Fish	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	38%	54%	38%	54%
Aq. Vegetation	12%	36%	12%	36%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Benthic Inv.	18%	58%	18%	58%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Soil	0%	0%	0%	0%	73%	92%	74%	91%	83%	96%	64%	96%	94%	99%	0%	0%	0%	0%
Berry	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Browse	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Forage	0%	0%	0%	0%	25%	53%	26%	52%	17%	38%	36%	81%	6%	20%	0%	0%	0%	0%
Lichen	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Moose	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Caribou	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Hare	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Duck	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Total	100%		100%		100%		100%		100%		100%		100%		100%		100%	

Table G.1 Terrestrial Receptor Intakes by Pathway – Existing Conditions (Cont'd)

Lead	Terrestrial Receptor Intakes by Pathway – Existing Conditions																	
	Merganser								Mink									
	VC US		VC DS		PR US		PRX		RC US		RC DS		VC US		VC DS		PR US	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Water	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Sediment	62%	75%	62%	75%	62%	75%	62%	75%	79%	89%	62%	86%	81%	90%	77%	88%	81%	90%
Fish	38%	54%	38%	54%	38%	54%	38%	54%	13%	21%	10%	18%	13%	22%	13%	21%	13%	22%
Aq. Vegetation	0%	0%	0%	0%	0%	0%	0%	0%	2%	7%	2%	6%	2%	7%	2%	7%	2%	7%
Benthic Inv.	0%	0%	0%	0%	0%	0%	0%	0%	2%	10%	2%	8%	2%	10%	2%	10%	2%	10%
Soil	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Berry	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Browse	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Forage	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Lichen	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Moose	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Caribou	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Hare	0%	0%	0%	0%	0%	0%	0%	0%	2%	10%	24%	79%	0%	2%	5%	20%	0%	0%
Duck	0%	0%	0%	0%	0%	0%	0%	0%	1%	2%	0%	2%	1%	2%	1%	2%	1%	2%
Total	100%		100%		100%		100%		100%		100%		100%		100%		100%	

Table G.1 Terrestrial Receptor Intakes by Pathway – Existing Conditions (Cont'd)

Lead	Terrestrial Receptor Intakes by Pathway – Existing Conditions																			
	Mink		Moose		Scaup												Sheep		Wolf	
	PRX		O		RC US		RC DS		VC US		VC DS		PR US		PRX		S		O	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Water	0%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%
Sediment	73%	87%	31%	76%	88%	99%	88%	99%	88%	99%	88%	99%	88%	99%	88%	99%	0%	0%	0%	0%
Fish	12%	20%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Aq. Vegetation	2%	6%	2%	9%	2%	7%	2%	7%	2%	7%	2%	7%	2%	7%	2%	7%	0%	0%	0%	0%
Benthic Inv.	2%	9%	0%	0%	10%	37%	10%	37%	10%	37%	10%	37%	10%	37%	10%	37%	0%	0%	0%	0%
Soil	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	88%	98%	85%	99%
Berry	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Browse	0%	0%	66%	97%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Forage	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	12%	32%	0%	0%
Lichen	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Moose	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	5%
Caribou	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	5%	18%
Hare	11%	43%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	8%	32%
Duck	1%	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Total	100%		100%		100%		100%		100%		100%		100%		100%		100%		100%	

Table G.1 Terrestrial Receptor Intakes by Pathway – Existing Conditions (Cont'd)

Manganese	Terrestrial Receptor Intakes by Pathway – Existing Conditions																	
	Bear						Beaver											
	B		VM		FM		RC US		RC DS		VC US		VC DS		PR US		PRX	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Water	0%	0%	0%	0%	1%	2%	0%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%	1%
Sediment	0%	0%	0%	0%	0%	0%	14%	42%	37%	74%	9%	25%	6%	22%	9%	20%	16%	52%
Fish	2%	4%	1%	3%	35%	82%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Aq. Vegetation	0%	0%	0%	0%	0%	0%	6%	25%	16%	48%	4%	15%	3%	11%	4%	14%	7%	29%
Benthic Inv.	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Soil	19%	55%	28%	64%	8%	26%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Berry	16%	48%	7%	24%	8%	25%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Browse	0%	0%	0%	0%	0%	0%	80%	98%	46%	89%	87%	98%	92%	100%	87%	97%	77%	99%
Forage	63%	93%	64%	92%	48%	89%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Lichen	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Moose	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Caribou	0%	1%	0%	1%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Hare	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Duck	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Total	100%		100%		100%		100%		100%		100%		100%		100%		100%	

Table G.1 Terrestrial Receptor Intakes by Pathway – Existing Conditions (Cont'd)

Manganese	Terrestrial Receptor Intakes by Pathway – Existing Conditions																	
	Caribou		Fox						Grouse									
	O		B		VM		FM		B		VS		FN		FS		FW	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Water	0%	1%	0%	1%	0%	1%	16%	44%	0%	0%	0%	0%	1%	3%	1%	4%	0%	1%
Sediment	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Fish	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Aq. Vegetation	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Benthic Inv.	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Soil	20%	56%	62%	95%	83%	98%	40%	79%	13%	39%	13%	30%	9%	22%	10%	23%	9%	30%
Berry	0%	0%	37%	82%	16%	48%	27%	64%	4%	15%	3%	14%	23%	67%	15%	45%	4%	11%
Browse	15%	50%	0%	0%	0%	0%	0%	0%	83%	97%	84%	97%	67%	94%	74%	95%	87%	97%
Forage	2%	9%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Lichen	62%	91%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Moose	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Caribou	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Hare	0%	0%	0%	1%	0%	1%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Duck	0%	0%	1%	3%	0%	1%	16%	55%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Total	100%		100%		100%		100%		100%		100%		100%		100%		100%	

Table G.1 Terrestrial Receptor Intakes by Pathway – Existing Conditions (Cont'd)

Manganese	Terrestrial Receptor Intakes by Pathway – Existing Conditions																	
	Hare										Mallard							
	B		VS		FN		FS		FW		RC US		RC DS		VC US		VC DS	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Water	0%	0%	0%	0%	1%	3%	1%	4%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%
Sediment	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	77%	96%	77%	96%	77%	96%	77%	96%
Fish	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Aq. Vegetation	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	23%	57%	23%	57%	23%	57%	23%	57%
Benthic Inv.	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Soil	12%	37%	9%	22%	7%	15%	10%	23%	9%	30%	0%	0%	0%	0%	0%	0%	0%	0%
Berry	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Browse	50%	83%	45%	85%	36%	74%	47%	85%	50%	82%	0%	0%	0%	0%	0%	0%	0%	0%
Forage	38%	77%	46%	88%	57%	88%	42%	85%	41%	79%	0%	0%	0%	0%	0%	0%	0%	0%
Lichen	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Moose	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Caribou	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Hare	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Duck	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Total	100%		100%		100%		100%		100%		100%		100%		100%		100%	

Table G.1 Terrestrial Receptor Intakes by Pathway – Existing Conditions (Cont'd)

Manganese	Terrestrial Receptor Intakes by Pathway – Existing Conditions																	
	Mallard				Marmot										Merganser			
	PR US		PRX		B		VS		FN		FS		FW		RC US		RC DS	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Water	0%	0%	0%	0%	0%	0%	0%	0%	1%	2%	1%	5%	0%	2%	0%	0%	0%	0%
Sediment	77%	96%	77%	96%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	25%	39%	25%	39%
Fish	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	75%	87%	75%	87%
Aq. Vegetation	23%	57%	23%	57%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Benthic Inv.	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Soil	0%	0%	0%	0%	8%	31%	7%	22%	3%	7%	7%	22%	6%	25%	0%	0%	0%	0%
Berry	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Browse	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Forage	0%	0%	0%	0%	92%	100%	93%	99%	97%	99%	92%	99%	93%	100%	0%	0%	0%	0%
Lichen	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Moose	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Caribou	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Hare	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Duck	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Total	100%		100%		100%		100%		100%		100%		100%		100%		100%	

Table G.1 Terrestrial Receptor Intakes by Pathway – Existing Conditions (Cont'd)

Manganese	Terrestrial Receptor Intakes by Pathway – Existing Conditions																	
	Merganser								Mink									
	VC US		VC DS		PR US		PRX		RC US		RC DS		VC US		VC DS		PR US	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Water	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Sediment	25%	39%	25%	39%	25%	39%	25%	39%	53%	69%	53%	69%	53%	69%	52%	69%	53%	69%
Fish	75%	87%	75%	87%	75%	87%	75%	87%	45%	63%	45%	63%	45%	63%	44%	63%	45%	63%
Aq. Vegetation	0%	0%	0%	0%	0%	0%	0%	0%	3%	8%	3%	8%	3%	8%	3%	8%	3%	8%
Benthic Inv.	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Soil	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Berry	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Browse	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Forage	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Lichen	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Moose	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Caribou	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Hare	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%
Duck	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Total	100%		100%		100%		100%		100%		100%		100%		100%		100%	

Table G.1 Terrestrial Receptor Intakes by Pathway – Existing Conditions (Cont'd)

Manganese	Terrestrial Receptor Intakes by Pathway – Existing Conditions																			
	Mink		Moose		Scaup												Sheep		Wolf	
	PRX		O		RC US		RC DS		VC US		VC DS		PR US		PRX		S		O	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Water	0%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	3%	11%
Sediment	53%	69%	17%	57%	96%	99%	96%	99%	96%	99%	96%	99%	96%	99%	96%	99%	0%	0%	0%	0%
Fish	45%	63%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Aq. Vegetation	3%	8%	2%	9%	4%	13%	4%	13%	4%	13%	4%	13%	4%	13%	4%	13%	0%	0%	0%	0%
Benthic Inv.	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Soil	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	28%	57%	70%	95%
Berry	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Browse	0%	0%	81%	99%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Forage	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	72%	94%	0%	0%
Lichen	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Moose	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	7%	22%
Caribou	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	20%	52%
Hare	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%
Duck	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Total	100%		100%		100%		100%		100%		100%		100%		100%		100%		100%	

Table G.1 Terrestrial Receptor Intakes by Pathway – Existing Conditions (Cont'd)

Nickel	Terrestrial Receptor Intakes by Pathway – Existing Conditions																	
	Bear						Beaver											
	B		VM		FM		RC US		RC DS		VC US		VC DS		PR US		PRX	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Water	0%	1%	0%	1%	1%	2%	0%	1%	0%	1%	0%	1%	0%	1%	0%	1%	0%	1%
Sediment	0%	0%	0%	0%	0%	0%	34%	81%	39%	76%	46%	86%	26%	63%	45%	79%	42%	76%
Fish	7%	15%	5%	19%	10%	33%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Aq. Vegetation	0%	0%	0%	0%	0%	0%	5%	19%	6%	20%	7%	24%	4%	15%	7%	22%	6%	21%
Benthic Inv.	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Soil	32%	69%	43%	70%	31%	72%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Berry	17%	45%	17%	39%	14%	33%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Browse	0%	0%	0%	0%	0%	0%	61%	98%	55%	91%	46%	93%	70%	96%	48%	86%	51%	87%
Forage	42%	77%	35%	65%	44%	80%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Lichen	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Moose	1%	3%	0%	1%	0%	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Caribou	1%	1%	0%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Hare	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Duck	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Total	100%		100%		100%		100%		100%		100%		100%		100%		100%	

Table G.1 Terrestrial Receptor Intakes by Pathway – Existing Conditions (Cont'd)

Nickel	Terrestrial Receptor Intakes by Pathway – Existing Conditions																	
	Caribou		Fox						Grouse									
	O		B		VM		FM		B		VS		FN		FS		FW	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Water	1%	2%	1%	3%	1%	2%	2%	5%	0%	0%	0%	0%	0%	1%	0%	0%	0%	0%
Sediment	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Fish	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Aq. Vegetation	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Benthic Inv.	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Soil	35%	75%	32%	74%	50%	85%	31%	80%	20%	59%	19%	31%	27%	60%	13%	39%	15%	43%
Berry	0%	0%	11%	35%	13%	35%	10%	31%	4%	15%	2%	7%	12%	40%	2%	5%	9%	28%
Browse	11%	31%	0%	0%	0%	0%	0%	0%	76%	98%	79%	91%	61%	92%	86%	98%	76%	96%
Forage	1%	3%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Lichen	52%	85%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Moose	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Caribou	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Hare	0%	0%	1%	3%	1%	2%	1%	3%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Duck	0%	0%	55%	92%	36%	87%	57%	95%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Total	100%		100%		100%		100%		100%		100%		100%		100%		100%	

Table G.1 Terrestrial Receptor Intakes by Pathway – Existing Conditions (Cont'd)

Nickel	Terrestrial Receptor Intakes by Pathway – Existing Conditions																	
	Hare										Mallard							
	B		VS		FN		FS		FW		RC US		RC DS		VC US		VC DS	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Water	0%	0%	0%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Sediment	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	67%	93%	67%	93%	67%	93%	67%	93%
Fish	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Aq. Vegetation	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	7%	22%	7%	22%	7%	22%	7%	22%
Benthic Inv.	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	26%	72%	26%	72%	26%	72%	26%	72%
Soil	20%	57%	23%	37%	27%	53%	15%	43%	14%	41%	0%	0%	0%	0%	0%	0%	0%	0%
Berry	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Browse	55%	92%	57%	75%	41%	82%	66%	91%	47%	85%	0%	0%	0%	0%	0%	0%	0%	0%
Forage	24%	62%	19%	40%	32%	68%	18%	49%	39%	84%	0%	0%	0%	0%	0%	0%	0%	0%
Lichen	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Moose	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Caribou	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Hare	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Duck	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Total	100%		100%		100%		100%		100%		100%		100%		100%		100%	

Table G.1 Terrestrial Receptor Intakes by Pathway – Existing Conditions (Cont'd)

Nickel	Terrestrial Receptor Intakes by Pathway – Existing Conditions																	
	Mallard				Marmot										Merganser			
	PR US		PRX		B		VS		FN		FS		FW		RC US		RC DS	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Water	0%	0%	0%	0%	0%	1%	0%	1%	0%	2%	0%	1%	0%	1%	0%	0%	0%	0%
Sediment	67%	93%	67%	93%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	47%	61%	47%	61%
Fish	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	53%	67%	53%	67%
Aq. Vegetation	7%	22%	7%	22%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Benthic Inv.	26%	72%	26%	72%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Soil	0%	0%	0%	0%	19%	53%	23%	47%	18%	42%	19%	55%	11%	40%	0%	0%	0%	0%
Berry	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Browse	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Forage	0%	0%	0%	0%	81%	98%	77%	94%	82%	96%	81%	98%	89%	99%	0%	0%	0%	0%
Lichen	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Moose	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Caribou	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Hare	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Duck	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Total	100%		100%		100%		100%		100%		100%		100%		100%		100%	

Table G.1 Terrestrial Receptor Intakes by Pathway – Existing Conditions (Cont'd)

Nickel	Terrestrial Receptor Intakes by Pathway – Existing Conditions																	
	Merganser								Mink									
	VC US		VC DS		PR US		PRX		RC US		RC DS		VC US		VC DS		PR US	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Water	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Sediment	47%	61%	47%	61%	47%	61%	47%	61%	66%	80%	67%	80%	67%	80%	66%	80%	67%	80%
Fish	53%	67%	53%	67%	53%	67%	53%	67%	21%	31%	21%	31%	21%	31%	21%	31%	21%	31%
Aq. Vegetation	0%	0%	0%	0%	0%	0%	0%	0%	1%	3%	1%	3%	1%	3%	1%	3%	1%	3%
Benthic Inv.	0%	0%	0%	0%	0%	0%	0%	0%	3%	13%	3%	13%	3%	13%	3%	13%	3%	13%
Soil	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Berry	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Browse	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Forage	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Lichen	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Moose	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Caribou	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Hare	0%	0%	0%	0%	0%	0%	0%	0%	0%	2%	0%	0%	0%	0%	0%	1%	0%	0%
Duck	0%	0%	0%	0%	0%	0%	0%	0%	8%	26%	8%	26%	8%	26%	8%	26%	8%	26%
Total	100%		100%		100%		100%		100%		100%		100%		100%		100%	

Table G.1 Terrestrial Receptor Intakes by Pathway – Existing Conditions (Cont'd)

Nickel	Terrestrial Receptor Intakes by Pathway – Existing Conditions																			
	Mink		Moose		Scaup												Sheep		Wolf	
	PRX		O		RC US		RC DS		VC US		VC DS		PR US		PRX		S		O	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Water	0%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	2%	3%	7%
Sediment	67%	80%	26%	59%	84%	98%	84%	98%	84%	98%	84%	98%	84%	98%	84%	98%	0%	0%	0%	0%
Fish	21%	31%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Aq. Vegetation	1%	3%	1%	4%	1%	4%	1%	4%	1%	4%	1%	4%	1%	4%	1%	4%	0%	0%	0%	0%
Benthic Inv.	3%	13%	0%	0%	15%	52%	15%	52%	15%	52%	15%	52%	15%	52%	15%	52%	0%	0%	0%	0%
Soil	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	17%	57%	68%	94%
Berry	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Browse	0%	0%	72%	94%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Forage	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	82%	99%	0%	0%
Lichen	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Moose	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	15%	48%
Caribou	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	14%	35%
Hare	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	3%
Duck	8%	26%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Total	100%		100%		100%		100%		100%		100%		100%		100%		100%		100%	

Table G.1 Terrestrial Receptor Intakes by Pathway – Existing Conditions (Cont'd)

Selenium	Terrestrial Receptor Intakes by Pathway – Existing Conditions																	
	Bear						Beaver											
	B		VM		FM		RC US		RC DS		VC US		VC DS		PR US		PRX	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Water	0%	0%	0%	1%	0%	1%	1%	4%	1%	4%	2%	6%	1%	2%	0%	0%	1%	1%
Sediment	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Fish	0%	0%	14%	34%	13%	31%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Aq. Vegetation	0%	0%	0%	0%	0%	0%	18%	62%	21%	64%	25%	75%	9%	36%	0%	0%	9%	32%
Benthic Inv.	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Soil	5%	12%	5%	12%	5%	11%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Berry	13%	45%	6%	13%	13%	26%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Browse	0%	0%	0%	0%	0%	0%	80%	99%	77%	98%	73%	98%	90%	100%	100%	100%	91%	99%
Forage	54%	90%	35%	62%	32%	56%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Lichen	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Moose	16%	39%	22%	44%	19%	39%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Caribou	13%	34%	18%	38%	17%	34%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Hare	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Duck	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Total	100%		100%		100%		100%		100%		100%		100%		100%		100%	

Table G.1 Terrestrial Receptor Intakes by Pathway – Existing Conditions (Cont'd)

Selenium	Terrestrial Receptor Intakes by Pathway – Existing Conditions																	
	Caribou		Fox						Grouse									
	O		B		VM		FM		B		VS		FN		FS		FW	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Water	1%	3%	0%	0%	2%	5%	1%	5%	0%	0%	0%	0%	0%	1%	0%	1%	0%	1%
Sediment	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Fish	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Aq. Vegetation	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Benthic Inv.	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Soil	16%	46%	42%	81%	7%	27%	6%	24%	6%	19%	4%	7%	5%	18%	5%	11%	9%	25%
Berry	0%	0%	49%	90%	5%	21%	10%	37%	7%	28%	7%	16%	3%	9%	5%	13%	4%	10%
Browse	12%	40%	0%	0%	0%	0%	0%	0%	87%	99%	89%	96%	92%	99%	90%	97%	87%	96%
Forage	2%	7%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Lichen	68%	96%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Moose	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Caribou	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Hare	0%	0%	10%	35%	1%	5%	1%	3%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Duck	0%	0%	0%	0%	85%	####	81%	99%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Total	100%		100%		100%		100%		100%		100%		100%		100%		100%	

Table G.1 Terrestrial Receptor Intakes by Pathway – Existing Conditions (Cont'd)

Selenium	Terrestrial Receptor Intakes by Pathway – Existing Conditions																	
	Hare										Mallard							
	B		VS		FN		FS		FW		RC US		RC DS		VC US		VC DS	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Water	0%	0%	0%	1%	0%	1%	0%	1%	1%	2%	0%	1%	0%	1%	0%	1%	0%	1%
Sediment	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Fish	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Aq. Vegetation	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	11%	47%	11%	47%	11%	47%	11%	47%
Benthic Inv.	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	88%	100%	88%	100%	88%	100%	88%	100%
Soil	4%	13%	12%	24%	6%	20%	6%	13%	12%	29%	0%	0%	0%	0%	0%	0%	0%	0%
Berry	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Browse	49%	91%	61%	81%	77%	97%	68%	89%	65%	87%	0%	0%	0%	0%	0%	0%	0%	0%
Forage	47%	90%	27%	52%	16%	50%	25%	53%	23%	53%	0%	0%	0%	0%	0%	0%	0%	0%
Lichen	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Moose	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Caribou	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Hare	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Duck	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Total	100%		100%		100%		100%		100%		100%		100%		100%		100%	

Table G.1 Terrestrial Receptor Intakes by Pathway – Existing Conditions (Cont'd)

Selenium	Terrestrial Receptor Intakes by Pathway – Existing Conditions																	
	Mallard				Marmot										Merganser			
	PR US		PRX		B		VS		FN		FS		FW		RC US		RC DS	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Water	0%	0%	0%	1%	0%	0%	0%	1%	1%	4%	0%	1%	1%	4%	0%	0%	0%	0%
Sediment	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Fish	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%	100%	100%	100%
Aq. Vegetation	0%	0%	11%	47%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Benthic Inv.	0%	0%	88%	100%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Soil	0%	0%	0%	0%	3%	11%	9%	24%	9%	26%	6%	14%	13%	37%	0%	0%	0%	0%
Berry	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Browse	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Forage	0%	0%	0%	0%	97%	100%	90%	98%	89%	98%	94%	98%	86%	98%	0%	0%	0%	0%
Lichen	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Moose	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Caribou	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Hare	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Duck	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Total	0%		100%		100%		100%		100%		100%		100%		100%		100%	

Table G.1 Terrestrial Receptor Intakes by Pathway – Existing Conditions (Cont'd)

Selenium	Terrestrial Receptor Intakes by Pathway – Existing Conditions																	
	Merganser								Mink									
	VC US		VC DS		PR US		PRX		RC US		RC DS		VC US		VC DS		PR US	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Water	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	1%	0%	1%	0%	1%	0%	0%
Sediment	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Fish	100%	100%	100%	100%	0%	0%	100%	100%	53%	88%	53%	89%	53%	88%	53%	88%	0%	0%
Aq. Vegetation	0%	0%	0%	0%	0%	0%	0%	0%	2%	7%	2%	7%	2%	7%	2%	7%	0%	0%
Benthic Inv.	0%	0%	0%	0%	0%	0%	0%	0%	19%	51%	19%	51%	19%	51%	19%	51%	0%	0%
Soil	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Berry	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Browse	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Forage	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Lichen	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Moose	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Caribou	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Hare	0%	0%	0%	0%	0%	0%	0%	0%	0%	2%	0%	0%	0%	1%	0%	1%	100%	100%
Duck	0%	0%	0%	0%	0%	0%	0%	0%	25%	66%	25%	66%	25%	66%	25%	66%	0%	0%
Total	100%		100%		0%		100%		100%		100%		100%		100%		100%	

Table G.1 Terrestrial Receptor Intakes by Pathway – Existing Conditions (Cont'd)

Selenium	Terrestrial Receptor Intakes by Pathway – Existing Conditions																			
	Mink		Moose		Scaup												Sheep		Wolf	
	PRX		O		RC US		RC DS		VC US		VC DS		PR US		PRX		S		O	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Water	0%	1%	1%	3%	0%	1%	0%	1%	0%	1%	0%	1%	0%	0%	0%	1%	2%	6%	0%	0%
Sediment	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Fish	53%	89%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Aq. Vegetation	2%	7%	4%	14%	5%	21%	5%	21%	5%	21%	5%	21%	0%	0%	5%	21%	0%	0%	0%	0%
Benthic Inv.	19%	52%	0%	0%	95%	100%	95%	100%	95%	100%	95%	100%	0%	0%	95%	100%	0%	0%	0%	0%
Soil	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	13%	40%	1%	3%
Berry	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Browse	0%	0%	95%	100%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Forage	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	85%	98%	0%	0%
Lichen	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Moose	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	53%	80%
Caribou	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	46%	75%
Hare	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Duck	25%	66%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Total	100%		100%		100%		100%		100%		100%		0%		100%		100%		100%	

Table G.1 Terrestrial Receptor Intakes by Pathway – Existing Conditions (Cont'd)

Silver	Terrestrial Receptor Intakes by Pathway – Existing Conditions																	
	Bear						Beaver											
	B		VM		FM		RC US		RC DS		VC US		VC DS		PR US		PRX	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Water	0%	0%	0%	0%	0%	1%	2%	5%	1%	4%	2%	6%	1%	3%	2%	5%	1%	3%
Sediment	0%	0%	0%	0%	0%	0%	11%	28%	7%	20%	11%	30%	6%	14%	11%	27%	6%	13%
Fish	17%	29%	20%	43%	22%	60%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Aq. Vegetation	0%	0%	0%	0%	0%	0%	68%	95%	50%	91%	69%	95%	46%	85%	69%	94%	44%	84%
Benthic Inv.	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Soil	43%	64%	36%	65%	41%	76%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Berry	2%	9%	2%	7%	1%	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Browse	0%	0%	0%	0%	0%	0%	19%	61%	41%	89%	17%	63%	47%	85%	17%	48%	49%	86%
Forage	3%	10%	6%	16%	6%	19%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Lichen	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Moose	14%	56%	14%	57%	12%	51%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Caribou	20%	48%	21%	50%	17%	45%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Hare	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Duck	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Total	100%		100%		100%		100%		100%		100%		100%		100%		100%	

Table G.1 Terrestrial Receptor Intakes by Pathway – Existing Conditions (Cont'd)

Silver	Terrestrial Receptor Intakes by Pathway – Existing Conditions																	
	Caribou		Fox						Grouse									
	O		B		VM		FM		B		VS		FN		FS		FW	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Water	0%	1%	1%	2%	1%	4%	1%	4%	0%	0%	0%	0%	0%	2%	0%	1%	0%	1%
Sediment	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Fish	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Aq. Vegetation	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Benthic Inv.	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Soil	41%	81%	67%	92%	58%	93%	63%	96%	85%	96%	43%	68%	70%	96%	56%	89%	60%	84%
Berry	0%	0%	2%	9%	3%	10%	1%	3%	2%	7%	2%	6%	1%	4%	0%	1%	4%	14%
Browse	1%	3%	0%	0%	0%	0%	0%	0%	13%	32%	55%	90%	28%	78%	43%	80%	35%	75%
Forage	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Lichen	58%	92%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Moose	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Caribou	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Hare	0%	0%	0%	0%	0%	1%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Duck	0%	0%	30%	72%	37%	87%	35%	86%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Total	100%		100%		100%		100%		100%		100%		100%		100%		100%	

Table G.1 Terrestrial Receptor Intakes by Pathway – Existing Conditions (Cont'd)

Silver	Terrestrial Receptor Intakes by Pathway – Existing Conditions																	
	Hare										Mallard							
	B		VS		FN		FS		FW		RC US		RC DS		VC US		VC DS	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Water	0%	0%	0%	0%	0%	2%	0%	1%	0%	1%	0%	1%	0%	1%	0%	1%	0%	1%
Sediment	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	7%	20%	7%	20%	7%	20%	7%	20%
Fish	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Aq. Vegetation	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	37%	85%	37%	85%	37%	85%	37%	85%
Benthic Inv.	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	56%	95%	56%	95%	56%	95%	56%	95%
Soil	85%	95%	50%	75%	68%	93%	60%	89%	58%	86%	0%	0%	0%	0%	0%	0%	0%	0%
Berry	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Browse	8%	21%	40%	74%	17%	56%	30%	65%	20%	48%	0%	0%	0%	0%	0%	0%	0%	0%
Forage	6%	18%	10%	24%	15%	46%	10%	29%	22%	67%	0%	0%	0%	0%	0%	0%	0%	0%
Lichen	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Moose	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Caribou	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Hare	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Duck	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Total	100%		100%		100%		100%		100%		100%		100%		100%		100%	

Table G.1 Terrestrial Receptor Intakes by Pathway – Existing Conditions (Cont'd)

Silver	Terrestrial Receptor Intakes by Pathway – Existing Conditions																	
	Mallard				Marmot										Merganser			
	PR US		PRX		B		VS		FN		FS		FW		RC US		RC DS	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Water	0%	1%	0%	1%	0%	1%	0%	1%	1%	3%	0%	2%	1%	2%	0%	0%	0%	0%
Sediment	7%	20%	7%	20%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	2%	1%	2%
Fish	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	99%	99%	99%	99%
Aq. Vegetation	37%	85%	37%	85%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Benthic Inv.	56%	95%	56%	95%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Soil	0%	0%	0%	0%	75%	94%	54%	92%	55%	90%	60%	91%	45%	90%	0%	0%	0%	0%
Berry	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Browse	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Forage	0%	0%	0%	0%	25%	54%	46%	89%	44%	89%	40%	79%	54%	95%	0%	0%	0%	0%
Lichen	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Moose	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Caribou	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Hare	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Duck	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Total	100%		100%		100%		100%		100%		100%		100%		100%		100%	

Table G.1 Terrestrial Receptor Intakes by Pathway – Existing Conditions (Cont'd)

Silver	Terrestrial Receptor Intakes by Pathway – Existing Conditions																	
	Merganser								Mink									
	VC US		VC DS		PR US		PRX		RC US		RC DS		VC US		VC DS		PR US	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Water	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Sediment	1%	2%	1%	2%	1%	2%	1%	2%	3%	5%	3%	5%	3%	5%	3%	5%	3%	5%
Fish	99%	99%	99%	99%	99%	99%	99%	99%	84%	95%	84%	95%	84%	95%	84%	95%	84%	95%
Aq. Vegetation	0%	0%	0%	0%	0%	0%	0%	0%	3%	11%	3%	11%	3%	11%	3%	11%	3%	11%
Benthic Inv.	0%	0%	0%	0%	0%	0%	0%	0%	5%	20%	5%	20%	5%	20%	5%	20%	5%	20%
Soil	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Berry	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Browse	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Forage	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Lichen	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Moose	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Caribou	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Hare	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Duck	0%	0%	0%	0%	0%	0%	0%	0%	4%	15%	4%	15%	4%	15%	4%	15%	4%	15%
Total	100%		100%		100%		100%		100%		100%		100%		100%		100%	

Table G.1 Terrestrial Receptor Intakes by Pathway – Existing Conditions (Cont'd)

Silver	Terrestrial Receptor Intakes by Pathway – Existing Conditions																			
	Mink		Moose		Scaup												Sheep		Wolf	
	PRX		O		RC US		RC DS		VC US		VC DS		PR US		PRX		S		O	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Water	0%	0%	2%	5%	0%	1%	0%	1%	0%	1%	0%	1%	0%	1%	0%	1%	1%	4%	0%	0%
Sediment	3%	5%	8%	21%	21%	55%	21%	55%	21%	55%	21%	55%	21%	55%	21%	55%	0%	0%	0%	0%
Fish	84%	95%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Aq. Vegetation	3%	11%	21%	61%	16%	52%	16%	52%	16%	52%	16%	52%	16%	52%	16%	52%	0%	0%	0%	0%
Benthic Inv.	5%	20%	0%	0%	62%	96%	62%	96%	62%	96%	62%	96%	62%	96%	62%	96%	0%	0%	0%	0%
Soil	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	77%	97%	12%	33%
Berry	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Browse	0%	0%	69%	95%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Forage	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	22%	67%	0%	0%
Lichen	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Moose	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	31%	86%
Caribou	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	57%	92%
Hare	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Duck	4%	15%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Total	100%		100%		100%		100%		100%		100%		100%		100%		100%		100%	

Table G.1 Terrestrial Receptor Intakes by Pathway – Existing Conditions (Cont'd)

Strontium	Terrestrial Receptor Intakes by Pathway – Existing Conditions																	
	Bear						Beaver											
	B		VM		FM		RC US		RC DS		VC US		VC DS		PR US		PRX	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Water	0%	0%	2%	3%	1%	3%	2%	4%	2%	5%	2%	4%	1%	3%	0%	0%	2%	4%
Sediment	0%	0%	0%	0%	0%	0%	2%	6%	3%	7%	2%	6%	2%	5%	0%	0%	2%	6%
Fish	0%	0%	21%	40%	17%	39%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Aq. Vegetation	0%	0%	0%	0%	0%	0%	66%	96%	74%	97%	65%	96%	57%	94%	0%	0%	67%	96%
Benthic Inv.	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Soil	18%	41%	34%	59%	8%	18%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Berry	7%	21%	16%	37%	2%	5%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Browse	0%	0%	0%	0%	0%	0%	30%	77%	21%	64%	31%	80%	40%	87%	100%	100%	30%	77%
Forage	76%	94%	27%	42%	71%	90%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Lichen	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Moose	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Caribou	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Hare	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Duck	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Total	100%		100%		100%		100%		100%		100%		100%		100%		100%	

Table G.1 Terrestrial Receptor Intakes by Pathway – Existing Conditions (Cont'd)

Strontium	Terrestrial Receptor Intakes by Pathway – Existing Conditions																	
	Caribou		Fox						Grouse									
	O		B		VM		FM		B		VS		FN		FS		FW	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Water	3%	6%	0%	0%	10%	22%	24%	44%	0%	0%	0%	1%	2%	5%	1%	4%	2%	7%
Sediment	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Fish	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Aq. Vegetation	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Benthic Inv.	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Soil	30%	57%	79%	96%	56%	83%	39%	68%	15%	37%	15%	39%	14%	35%	15%	37%	15%	36%
Berry	0%	0%	19%	51%	18%	43%	8%	16%	3%	10%	1%	3%	4%	18%	2%	6%	2%	8%
Browse	9%	29%	0%	0%	0%	0%	0%	0%	82%	97%	83%	97%	80%	96%	82%	96%	81%	96%
Forage	2%	6%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Lichen	56%	84%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Moose	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Caribou	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Hare	0%	0%	2%	8%	1%	4%	2%	6%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Duck	0%	0%	0%	0%	14%	48%	28%	71%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Total	100%		100%		100%		100%		100%		100%		100%		100%		100%	

Table G.1 Terrestrial Receptor Intakes by Pathway – Existing Conditions (Cont'd)

Strontium	Terrestrial Receptor Intakes by Pathway – Existing Conditions																	
	Hare										Mallard							
	B		VS		FN		FS		FW		RC US		RC DS		VC US		VC DS	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Water	0%	0%	1%	2%	1%	3%	1%	2%	1%	1%	0%	0%	0%	0%	0%	0%	0%	0%
Sediment	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	1%	1%	1%	1%	1%	1%	1%
Fish	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Aq. Vegetation	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	17%	49%	17%	49%	17%	49%	17%	49%
Benthic Inv.	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	82%	98%	82%	98%	82%	98%	82%	98%
Soil	10%	23%	19%	41%	9%	23%	7%	14%	4%	10%	0%	0%	0%	0%	0%	0%	0%	0%
Berry	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Browse	43%	82%	67%	93%	39%	81%	30%	70%	21%	59%	0%	0%	0%	0%	0%	0%	0%	0%
Forage	47%	85%	14%	47%	50%	89%	63%	91%	74%	95%	0%	0%	0%	0%	0%	0%	0%	0%
Lichen	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Moose	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Caribou	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Hare	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Duck	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Total	100%		100%		100%		100%		100%		100%		100%		100%		100%	

Table G.1 Terrestrial Receptor Intakes by Pathway – Existing Conditions (Cont'd)

Strontium	Terrestrial Receptor Intakes by Pathway – Existing Conditions																	
	Mallard				Marmot										Merganser			
	PR US		PRX		B		VS		FN		FS		FW		RC US		RC DS	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Water	0%	0%	0%	0%	0%	0%	2%	5%	1%	3%	0%	1%	0%	1%	0%	1%	0%	1%
Sediment	0%	0%	1%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	2%	3%	2%	3%
Fish	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	98%	99%	98%	99%
Aq. Vegetation	0%	0%	17%	49%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Benthic Inv.	0%	0%	82%	98%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Soil	0%	0%	0%	0%	6%	15%	32%	72%	5%	16%	2%	6%	1%	4%	0%	0%	0%	0%
Berry	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Browse	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Forage	0%	0%	0%	0%	94%	99%	66%	94%	94%	99%	97%	99%	98%	100%	0%	0%	0%	0%
Lichen	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Moose	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Caribou	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Hare	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Duck	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Total	0%		100%		100%		100%		100%		100%		100%		100%		100%	

Table G.1 Terrestrial Receptor Intakes by Pathway – Existing Conditions (Cont'd)

Strontium	Terrestrial Receptor Intakes by Pathway – Existing Conditions																	
	Merganser								Mink									
	VC US		VC DS		PR US		PRX		RC US		RC DS		VC US		VC DS		PR US	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Water	0%	1%	0%	1%	0%	0%	0%	1%	1%	1%	1%	1%	1%	1%	1%	1%	0%	0%
Sediment	2%	3%	2%	3%	0%	0%	2%	3%	3%	5%	3%	5%	3%	5%	3%	5%	0%	0%
Fish	98%	99%	98%	99%	0%	0%	98%	99%	39%	62%	39%	62%	39%	62%	39%	62%	0%	0%
Aq. Vegetation	0%	0%	0%	0%	0%	0%	0%	0%	13%	37%	13%	37%	13%	37%	13%	37%	0%	0%
Benthic Inv.	0%	0%	0%	0%	0%	0%	0%	0%	43%	71%	43%	71%	43%	71%	43%	71%	0%	0%
Soil	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Berry	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Browse	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Forage	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Lichen	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Moose	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Caribou	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Hare	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%	100%
Duck	0%	0%	0%	0%	0%	0%	0%	0%	1%	2%	1%	2%	1%	2%	1%	2%	0%	0%
Total	100%		100%		0%		100%		100%		100%		100%		100%		100%	

Table G.1 Terrestrial Receptor Intakes by Pathway – Existing Conditions (Cont'd)

Strontium	Terrestrial Receptor Intakes by Pathway – Existing Conditions																			
	Mink		Moose		Scaup												Sheep		Wolf	
	PRX		O		RC US		RC DS		VC US		VC DS		PR US		PRX		S		O	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Water	1%	1%	2%	7%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	13%	25%
Sediment	3%	5%	3%	8%	2%	4%	2%	4%	2%	4%	2%	4%	0%	0%	2%	4%	0%	0%	0%	0%
Fish	39%	62%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Aq. Vegetation	13%	37%	30%	76%	7%	22%	7%	22%	7%	22%	7%	22%	0%	0%	7%	22%	0%	0%	0%	0%
Benthic Inv.	43%	71%	0%	0%	92%	99%	92%	99%	92%	99%	92%	99%	0%	0%	92%	99%	0%	0%	0%	0%
Soil	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	13%	35%	70%	88%
Berry	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Browse	0%	0%	65%	95%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Forage	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	87%	98%	0%	0%
Lichen	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Moose	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	4%	12%
Caribou	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	11%	24%
Hare	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	4%
Duck	1%	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Total	100%		100%		100%		100%		100%		100%		0%		100%		100%		100%	

Table G.1 Terrestrial Receptor Intakes by Pathway – Existing Conditions (Cont'd)

Tin	Terrestrial Receptor Intakes by Pathway – Existing Conditions																	
	Bear						Beaver											
	B		VM		FM		RC US		RC DS		VC US		VC DS		PR US		PRX	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Water	0%	0%	1%	3%	1%	3%	1%	1%	0%	0%	1%	2%	1%	1%	0%	0%	1%	1%
Sediment	0%	0%	0%	0%	0%	0%	56%	88%	3%	11%	64%	90%	59%	88%	0%	0%	54%	76%
Fish	0%	0%	30%	76%	24%	72%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Aq. Vegetation	0%	0%	0%	0%	0%	0%	19%	51%	1%	5%	22%	54%	20%	52%	0%	0%	18%	48%
Benthic Inv.	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Soil	74%	95%	53%	85%	52%	82%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Berry	3%	10%	4%	12%	8%	24%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Browse	0%	0%	0%	0%	0%	0%	25%	79%	96%	100%	13%	50%	20%	65%	100%	100%	27%	51%
Forage	19%	56%	7%	17%	10%	23%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Lichen	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Moose	1%	4%	1%	6%	2%	7%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Caribou	3%	13%	4%	19%	4%	19%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Hare	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Duck	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Total	100%		100%		100%		100%		100%		100%		100%		100%		100%	

Table G.1 Terrestrial Receptor Intakes by Pathway – Existing Conditions (Cont'd)

Tin	Terrestrial Receptor Intakes by Pathway – Existing Conditions																	
	Caribou		Fox						Grouse									
	O		B		VM		FM		B		VS		FN		FS		FW	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Water	1%	5%	0%	0%	0%	1%	0%	1%	0%	0%	1%	2%	1%	3%	1%	3%	1%	4%
Sediment	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Fish	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Aq. Vegetation	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Benthic Inv.	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Soil	58%	96%	95%	99%	12%	51%	15%	61%	76%	96%	48%	59%	47%	59%	46%	58%	65%	92%
Berry	0%	0%	3%	10%	1%	3%	2%	7%	1%	4%	1%	3%	2%	5%	4%	13%	2%	7%
Browse	0%	0%	0%	0%	0%	0%	0%	0%	23%	60%	51%	62%	50%	61%	49%	60%	31%	73%
Forage	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Lichen	41%	93%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Moose	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Caribou	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Hare	0%	0%	2%	6%	0%	2%	0%	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Duck	0%	0%	0%	0%	87%	100%	82%	100%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Total	100%		100%		100%		100%		100%		100%		100%		100%		100%	

Table G.1 Terrestrial Receptor Intakes by Pathway – Existing Conditions (Cont'd)

Tin	Terrestrial Receptor Intakes by Pathway – Existing Conditions																	
	Hare										Mallard							
	B		VS		FN		FS		FW		RC US		RC DS		VC US		VC DS	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Water	0%	0%	1%	3%	1%	4%	1%	5%	1%	4%	0%	0%	0%	0%	0%	0%	0%	0%
Sediment	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	26%	66%	26%	66%	26%	66%	26%	66%
Fish	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Aq. Vegetation	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	7%	25%	7%	25%	7%	25%	7%	25%
Benthic Inv.	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	67%	97%	67%	97%	67%	97%	67%	97%
Soil	71%	94%	59%	70%	51%	65%	56%	68%	55%	77%	0%	0%	0%	0%	0%	0%	0%	0%
Berry	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Browse	13%	39%	36%	48%	32%	45%	35%	46%	17%	50%	0%	0%	0%	0%	0%	0%	0%	0%
Forage	16%	50%	4%	10%	16%	42%	9%	20%	27%	47%	0%	0%	0%	0%	0%	0%	0%	0%
Lichen	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Moose	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Caribou	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Hare	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Duck	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Total	100%		100%		100%		100%		100%		100%		100%		100%		100%	

Table G.1 Terrestrial Receptor Intakes by Pathway – Existing Conditions (Cont'd)

Tin	Terrestrial Receptor Intakes by Pathway – Existing Conditions																	
	Mallard				Marmot										Merganser			
	PR US		PRX		B		VS		FN		FS		FW		RC US		RC DS	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Water	0%	0%	0%	0%	0%	0%	2%	8%	2%	7%	2%	9%	1%	4%	0%	0%	0%	0%
Sediment	0%	0%	26%	66%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	31%	44%	31%	44%
Fish	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	69%	80%	69%	80%
Aq. Vegetation	0%	0%	7%	25%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Benthic Inv.	0%	0%	67%	97%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Soil	0%	0%	0%	0%	55%	91%	73%	95%	45%	78%	59%	91%	29%	49%	0%	0%	0%	0%
Berry	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Browse	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Forage	0%	0%	0%	0%	45%	87%	25%	47%	54%	85%	39%	66%	70%	85%	0%	0%	0%	0%
Lichen	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Moose	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Caribou	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Hare	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Duck	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Total	0%		100%		100%		100%		100%		100%		100%		100%		100%	

Table G.1 Terrestrial Receptor Intakes by Pathway – Existing Conditions (Cont'd)

Tin	Terrestrial Receptor Intakes by Pathway – Existing Conditions																	
	Merganser								Mink									
	VC US		VC DS		PR US		PRX		RC US		RC DS		VC US		VC DS		PR US	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Water	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Sediment	31%	44%	31%	44%	0%	0%	31%	44%	33%	57%	33%	57%	33%	57%	33%	57%	0%	0%
Fish	69%	80%	69%	80%	0%	0%	69%	80%	20%	37%	20%	37%	20%	37%	20%	37%	0%	0%
Aq. Vegetation	0%	0%	0%	0%	0%	0%	0%	0%	1%	4%	1%	5%	1%	5%	1%	5%	0%	0%
Benthic Inv.	0%	0%	0%	0%	0%	0%	0%	0%	13%	38%	13%	38%	13%	38%	13%	38%	0%	0%
Soil	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Berry	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Browse	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Forage	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Lichen	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Moose	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Caribou	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Hare	0%	0%	0%	0%	0%	0%	0%	0%	1%	2%	0%	1%	0%	1%	0%	0%	100%	100%
Duck	0%	0%	0%	0%	0%	0%	0%	0%	33%	75%	33%	75%	33%	75%	33%	75%	0%	0%
Total	100%		100%		0%		100%		100%		100%		100%		100%		100%	

Table G.1 Terrestrial Receptor Intakes by Pathway – Existing Conditions (Cont'd)

Tin	Terrestrial Receptor Intakes by Pathway – Existing Conditions																			
	Mink		Moose		Scaup												Sheep		Wolf	
	PRX		O		RC US		RC DS		VC US		VC DS		PR US		PRX		S		O	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Water	0%	0%	2%	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	2%	2%	7%
Sediment	33%	57%	85%	95%	45%	87%	45%	87%	45%	87%	45%	87%	0%	0%	45%	87%	0%	0%	0%	0%
Fish	20%	37%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Aq. Vegetation	1%	5%	9%	28%	1%	5%	1%	5%	1%	5%	1%	5%	0%	0%	1%	5%	0%	0%	0%	0%
Benthic Inv.	13%	38%	0%	0%	53%	93%	53%	93%	53%	93%	53%	93%	0%	0%	53%	93%	0%	0%	0%	0%
Soil	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	85%	97%	58%	93%
Berry	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Browse	0%	0%	4%	13%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Forage	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	15%	43%	0%	0%
Lichen	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Moose	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	12%	58%
Caribou	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	26%	85%
Hare	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	3%
Duck	33%	75%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Total	100%		100%		100%		100%		100%		100%		0%		100%		100%		100%	

Table G.1 Terrestrial Receptor Intakes by Pathway – Existing Conditions (Cont'd)

Vanadium	Terrestrial Receptor Intakes by Pathway – Existing Conditions																	
	Bear						Beaver											
	B		VM		FM		RC US		RC DS		VC US		VC DS		PR US		PRX	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Water	0%	0%	0%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Sediment	0%	0%	0%	0%	0%	0%	33%	65%	30%	62%	33%	64%	30%	58%	0%	0%	34%	67%
Fish	0%	0%	10%	19%	14%	48%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Aq. Vegetation	0%	0%	0%	0%	0%	0%	57%	89%	53%	87%	57%	89%	54%	87%	0%	0%	58%	89%
Benthic Inv.	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Soil	39%	80%	59%	80%	48%	86%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Berry	23%	51%	11%	24%	14%	34%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Browse	0%	0%	0%	0%	0%	0%	10%	28%	17%	61%	10%	29%	16%	41%	100%	100%	8%	32%
Forage	36%	69%	18%	36%	22%	50%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Lichen	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Moose	1%	3%	0%	1%	1%	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Caribou	2%	6%	1%	3%	1%	4%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Hare	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Duck	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Total	100%		100%		100%		100%		100%		100%		100%		100%		100%	

Table G.1 Terrestrial Receptor Intakes by Pathway – Existing Conditions (Cont'd)

Vanadium	Terrestrial Receptor Intakes by Pathway – Existing Conditions																	
	Caribou		Fox						Grouse									
	O		B		VM		FM		B		VS		FN		FS		FW	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Water	0%	1%	0%	0%	1%	1%	1%	3%	0%	0%	0%	0%	0%	0%	0%	1%	0%	1%
Sediment	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Fish	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Aq. Vegetation	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Benthic Inv.	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Soil	42%	80%	68%	97%	58%	87%	52%	92%	33%	79%	45%	66%	45%	66%	43%	64%	48%	89%
Berry	0%	0%	31%	74%	7%	18%	11%	33%	8%	23%	3%	9%	3%	9%	6%	21%	5%	16%
Browse	2%	5%	0%	0%	0%	0%	0%	0%	60%	91%	52%	73%	52%	74%	50%	73%	46%	84%
Forage	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Lichen	55%	87%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Moose	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Caribou	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Hare	0%	0%	0%	1%	0%	1%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Duck	0%	0%	0%	0%	34%	76%	36%	89%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Total	100%		100%		100%		100%		100%		100%		100%		100%		100%	

Table G.1 Terrestrial Receptor Intakes by Pathway – Existing Conditions (Cont'd)

Vanadium	Terrestrial Receptor Intakes by Pathway – Existing Conditions																	
	Hare										Mallard							
	B		VS		FN		FS		FW		RC US		RC DS		VC US		VC DS	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Water	0%	0%	0%	0%	0%	0%	0%	1%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%
Sediment	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	39%	72%	39%	72%	39%	72%	39%	72%
Fish	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Aq. Vegetation	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	52%	86%	52%	86%	52%	86%	52%	86%
Benthic Inv.	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	9%	37%	9%	37%	9%	37%	9%	37%
Soil	33%	76%	51%	70%	51%	71%	46%	69%	49%	87%	0%	0%	0%	0%	0%	0%	0%	0%
Berry	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Browse	39%	75%	35%	58%	36%	59%	32%	57%	30%	65%	0%	0%	0%	0%	0%	0%	0%	0%
Forage	27%	62%	14%	34%	13%	33%	21%	58%	20%	49%	0%	0%	0%	0%	0%	0%	0%	0%
Lichen	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Moose	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Caribou	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Hare	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Duck	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Total	100%		100%		100%		100%		100%		100%		100%		100%		100%	

Table G.1 Terrestrial Receptor Intakes by Pathway – Existing Conditions (Cont'd)

Vanadium	Terrestrial Receptor Intakes by Pathway – Existing Conditions																	
	Mallard				Marmot										Merganser			
	PR US		PRX		B		VS		FN		FS		FW		RC US		RC DS	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Water	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	1%	0%	1%	0%	0%	0%	0%
Sediment	0%	0%	39%	72%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	37%	51%	37%	51%
Fish	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	63%	76%	63%	76%
Aq. Vegetation	0%	0%	52%	86%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Benthic Inv.	0%	0%	9%	37%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Soil	0%	0%	0%	0%	26%	75%	48%	88%	52%	91%	41%	88%	40%	88%	0%	0%	0%	0%
Berry	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Browse	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Forage	0%	0%	0%	0%	74%	97%	52%	81%	48%	81%	59%	92%	60%	93%	0%	0%	0%	0%
Lichen	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Moose	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Caribou	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Hare	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Duck	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Total	0%		100%		100%		100%		100%		100%		100%		100%		100%	

Table G.1 Terrestrial Receptor Intakes by Pathway – Existing Conditions (Cont'd)

Vanadium	Terrestrial Receptor Intakes by Pathway – Existing Conditions																	
	Merganser								Mink									
	VC US		VC DS		PR US		PRX		RC US		RC DS		VC US		VC DS		PR US	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Water	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Sediment	37%	51%	37%	51%	0%	0%	37%	51%	55%	71%	55%	71%	55%	71%	55%	71%	0%	0%
Fish	63%	76%	63%	76%	0%	0%	63%	76%	26%	38%	26%	38%	26%	38%	26%	38%	0%	0%
Aq. Vegetation	0%	0%	0%	0%	0%	0%	0%	0%	14%	38%	14%	38%	14%	38%	14%	38%	0%	0%
Benthic Inv.	0%	0%	0%	0%	0%	0%	0%	0%	1%	6%	1%	6%	1%	6%	1%	6%	0%	0%
Soil	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Berry	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Browse	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Forage	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Lichen	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Moose	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Caribou	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Hare	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%	100%
Duck	0%	0%	0%	0%	0%	0%	0%	0%	4%	13%	4%	13%	4%	13%	4%	13%	0%	0%
Total	100%		100%		0%		100%		100%		100%		100%		100%		100%	

Table G.1 Terrestrial Receptor Intakes by Pathway – Existing Conditions (Cont'd)

Vanadium	Terrestrial Receptor Intakes by Pathway – Existing Conditions																			
	Mink		Moose		Scaup												Sheep		Wolf	
	PRX		O		RC US		RC DS		VC US		VC DS		PR US		PRX		S		O	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Water	0%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	1%	3%
Sediment	55%	71%	45%	75%	76%	95%	76%	95%	76%	95%	76%	95%	0%	0%	76%	95%	0%	0%	0%	0%
Fish	26%	38%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Aq. Vegetation	14%	38%	29%	66%	16%	43%	16%	43%	16%	43%	16%	43%	0%	0%	16%	43%	0%	0%	0%	0%
Benthic Inv.	1%	6%	0%	0%	8%	29%	8%	29%	8%	29%	8%	29%	0%	0%	8%	29%	0%	0%	0%	0%
Soil	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	28%	73%	62%	92%
Berry	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Browse	0%	0%	25%	56%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Forage	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	72%	95%	0%	0%
Lichen	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Moose	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	11%	31%
Caribou	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	25%	60%
Hare	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Duck	4%	13%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Total	100%		100%		100%		100%		100%		100%		0%		100%		100%		100%	

Table G.1 Terrestrial Receptor Intakes by Pathway – Existing Conditions (Cont'd)

Zinc	Terrestrial Receptor Intakes by Pathway – Existing Conditions																	
	Bear						Beaver											
	B		VM		FM		RC US		RC DS		VC US		VC DS		PR US		PRX	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Water	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	0%	0%
Sediment	0%	0%	0%	0%	0%	0%	3%	11%	7%	20%	2%	7%	10%	27%	2%	5%	6%	18%
Fish	9%	19%	24%	57%	20%	48%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Aq. Vegetation	0%	0%	0%	0%	0%	0%	8%	38%	19%	60%	8%	30%	27%	71%	7%	24%	16%	58%
Benthic Inv.	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Soil	9%	24%	11%	23%	24%	53%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Berry	4%	9%	3%	6%	4%	10%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Browse	0%	0%	0%	0%	0%	0%	89%	100%	75%	98%	90%	99%	63%	95%	91%	98%	78%	99%
Forage	24%	54%	33%	78%	25%	59%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Lichen	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Moose	22%	44%	12%	28%	11%	24%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Caribou	32%	60%	17%	41%	16%	37%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Hare	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Duck	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Total	100%		100%		100%		100%		100%		100%		100%		100%		100%	

Table G.1 Terrestrial Receptor Intakes by Pathway – Existing Conditions (Cont'd)

Zinc	Terrestrial Receptor Intakes by Pathway – Existing Conditions																	
	Caribou		Fox						Grouse									
	O		B		VM		FM		B		VS		FN		FS		FW	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Water	0%	0%	0%	1%	0%	1%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Sediment	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Fish	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Aq. Vegetation	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Benthic Inv.	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Soil	24%	65%	19%	52%	18%	52%	30%	72%	3%	10%	19%	31%	5%	19%	14%	43%	12%	29%
Berry	0%	0%	7%	18%	3%	9%	4%	10%	1%	2%	2%	8%	2%	6%	1%	3%	1%	3%
Browse	12%	41%	0%	0%	0%	0%	0%	0%	96%	99%	79%	90%	93%	99%	85%	98%	87%	96%
Forage	1%	3%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Lichen	63%	95%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Moose	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Caribou	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Hare	0%	0%	18%	54%	7%	26%	10%	35%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Duck	0%	0%	55%	92%	72%	97%	56%	94%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Total	100%		100%		100%		100%		100%		100%		100%		100%		100%	

Table G.1 Terrestrial Receptor Intakes by Pathway – Existing Conditions (Cont'd)

Zinc	Terrestrial Receptor Intakes by Pathway – Existing Conditions																	
	Hare										Mallard							
	B		VS		FN		FS		FW		RC US		RC DS		VC US		VC DS	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Water	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Sediment	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	22%	52%	22%	52%	22%	52%	22%	52%
Fish	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Aq. Vegetation	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	39%	82%	39%	82%	39%	82%	39%	82%
Benthic Inv.	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	39%	87%	39%	87%	39%	87%	39%	87%
Soil	5%	14%	16%	32%	6%	19%	17%	46%	17%	37%	0%	0%	0%	0%	0%	0%	0%	0%
Berry	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Browse	83%	96%	40%	69%	77%	97%	66%	94%	71%	89%	0%	0%	0%	0%	0%	0%	0%	0%
Forage	12%	36%	44%	86%	16%	44%	17%	50%	12%	30%	0%	0%	0%	0%	0%	0%	0%	0%
Lichen	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Moose	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Caribou	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Hare	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Duck	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Total	100%		100%		100%		100%		100%		100%		100%		100%		100%	

Table G.1 Terrestrial Receptor Intakes by Pathway – Existing Conditions (Cont'd)

Zinc	Terrestrial Receptor Intakes by Pathway – Existing Conditions																	
	Mallard				Marmot										Merganser			
	PR US		PRX		B		VS		FN		FS		FW		RC US		RC DS	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Water	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Sediment	22%	52%	22%	52%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	3%	5%	3%	5%
Fish	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	97%	99%	97%	99%
Aq. Vegetation	39%	82%	39%	82%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Benthic Inv.	39%	87%	39%	87%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Soil	0%	0%	0%	0%	11%	35%	11%	38%	8%	18%	22%	58%	26%	56%	0%	0%	0%	0%
Berry	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Browse	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Forage	0%	0%	0%	0%	89%	99%	88%	99%	92%	98%	78%	97%	74%	94%	0%	0%	0%	0%
Lichen	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Moose	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Caribou	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Hare	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Duck	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Total	100%		100%		100%		100%		100%		100%		100%		100%		100%	

Table G.1 Terrestrial Receptor Intakes by Pathway – Existing Conditions (Cont'd)

Zinc	Terrestrial Receptor Intakes by Pathway – Existing Conditions																	
	Merganser								Mink									
	VC US		VC DS		PR US		PRX		RC US		RC DS		VC US		VC DS		PR US	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Water	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Sediment	3%	5%	3%	5%	3%	5%	3%	5%	7%	13%	7%	14%	7%	14%	8%	14%	7%	14%
Fish	97%	99%	97%	99%	97%	99%	97%	99%	71%	89%	76%	90%	74%	89%	77%	90%	75%	89%
Aq. Vegetation	0%	0%	0%	0%	0%	0%	0%	0%	2%	8%	3%	8%	3%	8%	3%	9%	3%	8%
Benthic Inv.	0%	0%	0%	0%	0%	0%	0%	0%	2%	8%	2%	9%	2%	9%	2%	9%	2%	9%
Soil	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Berry	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Browse	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Forage	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Lichen	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Moose	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Caribou	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Hare	0%	0%	0%	0%	0%	0%	0%	0%	8%	36%	2%	6%	4%	17%	1%	3%	2%	8%
Duck	0%	0%	0%	0%	0%	0%	0%	0%	9%	30%	10%	32%	10%	31%	10%	32%	10%	32%
Total	100%		100%		100%		100%		100%		100%		100%		100%		100%	

Table G.1 Terrestrial Receptor Intakes by Pathway – Existing Conditions (Cont'd)

Zinc	Terrestrial Receptor Intakes by Pathway – Existing Conditions																			
	Mink		Moose		Scaup												Sheep		Wolf	
	PRX		O		RC US		RC DS		VC US		VC DS		PR US		PRX		S		O	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Water	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Sediment	7%	14%	3%	9%	49%	85%	49%	85%	49%	85%	49%	85%	49%	85%	49%	85%	0%	0%	0%	0%
Fish	75%	90%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Aq. Vegetation	3%	8%	3%	11%	13%	40%	13%	40%	13%	40%	13%	40%	13%	40%	13%	40%	0%	0%	0%	0%
Benthic Inv.	2%	9%	0%	0%	37%	84%	37%	84%	37%	84%	37%	84%	37%	84%	37%	84%	0%	0%	0%	0%
Soil	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	45%	77%	4%	13%
Berry	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Browse	0%	0%	94%	100%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Forage	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	55%	87%	0%	0%
Lichen	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Moose	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	39%	69%
Caribou	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	55%	82%
Hare	3%	10%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	3%
Duck	10%	32%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Total	100%		100%		100%		100%		100%		100%		100%		100%		100%		100%	

Table G.2 Terrestrial Receptor Intakes by Pathway – Final Closure and Remediation Plan

Antimony	Terrestrial Receptor Intakes by Pathway – Final Closure and Remediation Plan															
	Bear						Beaver									
	B		VM		FM		RC DS - X14		VC DS - V8		VC DS - V27		PR DS VC		PR DS AC	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Water	0%	1%	1%	2%	1%	1%	0%	2%	1%	2%	0%	1%	0%	1%	0%	0%
Sediment	0%	0%	0%	0%	0%	0%	1%	3%	1%	3%	0%	1%	1%	2%	0%	1%
Fish	2%	6%	7%	18%	5%	14%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Aq. Vegetation	0%	0%	0%	0%	0%	0%	93%	99%	94%	99%	48%	94%	87%	99%	30%	85%
Benthic Inv.	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Soil	79%	95%	76%	93%	77%	93%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Berry	7%	22%	6%	19%	6%	20%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Browse	0%	0%	0%	0%	0%	0%	6%	19%	5%	17%	52%	94%	12%	37%	70%	98%
Forage	11%	35%	10%	31%	10%	31%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Lichen	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Moose	0%	1%	0%	1%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Caribou	0%	1%	0%	1%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Hare	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Duck	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Total	100%		100%		100%		100%		100%		100%		100%		100%	

Table G.2 Terrestrial Receptor Intakes by Pathway – Final Closure and Remediation Plan (Cont'd)

Antimony	Terrestrial Receptor Intakes by Pathway – Final Closure and Remediation Plan															
	Caribou		Fox						Grouse							
	O		B		VM		FM		B		VS		FN		FS	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Water	0%	2%	1%	3%	3%	8%	2%	7%	0%	0%	0%	0%	0%	0%	0%	0%
Sediment	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Fish	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Aq. Vegetation	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Benthic Inv.	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Soil	70%	95%	79%	98%	78%	96%	81%	97%	75%	96%	11%	29%	11%	29%	11%	29%
Berry	0%	0%	5%	16%	4%	14%	5%	15%	2%	8%	1%	2%	1%	2%	1%	2%
Browse	1%	2%	0%	0%	0%	0%	0%	0%	23%	65%	88%	98%	88%	98%	88%	98%
Forage	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Lichen	29%	77%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Moose	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Caribou	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Hare	0%	0%	0%	0%	1%	2%	0%	2%	0%	0%	0%	0%	0%	0%	0%	0%
Duck	0%	0%	15%	68%	15%	55%	12%	48%	0%	0%	0%	0%	0%	0%	0%	0%
Total	100%		100%		100%		100%		100%		100%		100%		100%	

Table G.2 Terrestrial Receptor Intakes by Pathway – Final Closure and Remediation Plan (Cont'd)

Antimony	Terrestrial Receptor Intakes by Pathway – Final Closure and Remediation Plan															
	Grouse		Hare										Mallard			
	FW		B		VS		FN		FS		FW		RC DS - X14		VC DS - V8	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Water	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	0%	0%
Sediment	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	4%	1%	4%
Fish	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Aq. Vegetation	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	95%	100%	95%	100%
Benthic Inv.	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	4%	18%	4%	18%
Soil	75%	96%	76%	95%	16%	40%	16%	40%	16%	40%	76%	95%	0%	0%	0%	0%
Berry	2%	8%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Browse	23%	65%	14%	43%	81%	96%	81%	96%	81%	96%	14%	43%	0%	0%	0%	0%
Forage	0%	0%	9%	29%	3%	11%	3%	12%	3%	12%	9%	29%	0%	0%	0%	0%
Lichen	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Moose	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Caribou	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Hare	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Duck	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Total	100%		100%		100%		100%		100%		100%		100%		100%	

Table G.2 Terrestrial Receptor Intakes by Pathway – Final Closure and Remediation Plan (Cont'd)

Antimony	Terrestrial Receptor Intakes by Pathway – Final Closure and Remediation Plan															
	Mallard						Marmot									
	VC DS - V27		PR DS VC		PR DS AC		B		VS		FN		FS		FW	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Water	0%	0%	0%	0%	0%	0%	0%	0%	1%	2%	0%	1%	0%	1%	0%	1%
Sediment	1%	4%	1%	4%	1%	4%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Fish	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Aq. Vegetation	95%	100%	95%	100%	95%	100%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Benthic Inv.	4%	18%	4%	18%	4%	18%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Soil	0%	0%	0%	0%	0%	0%	67%	96%	67%	96%	66%	96%	67%	96%	67%	96%
Berry	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Browse	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Forage	0%	0%	0%	0%	0%	0%	33%	80%	33%	80%	33%	80%	33%	79%	33%	80%
Lichen	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Moose	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Caribou	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Hare	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Duck	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Total	100%		100%		100%		100%		100%		100%		100%		100%	

Table G.2 Terrestrial Receptor Intakes by Pathway – Final Closure and Remediation Plan (Cont'd)

Antimony	Terrestrial Receptor Intakes by Pathway – Final Closure and Remediation Plan																	
	Merganser										Mink							
	RC DS - X14		VC DS - V8		VC DS - V27		PR DS VC		PR DS AC		RC DS - X14		VC DS - V8		VC DS - V27		PR DS VC	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Water	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Sediment	3%	5%	3%	5%	3%	5%	3%	5%	3%	5%	4%	9%	4%	9%	4%	9%	4%	9%
Fish	96%	98%	96%	98%	96%	98%	96%	98%	96%	98%	33%	65%	33%	65%	33%	65%	33%	64%
Aq. Vegetation	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	58%	88%	58%	88%	58%	88%	58%	88%
Benthic Inv.	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	5%	1%	5%	1%	5%	1%	5%
Soil	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Berry	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Browse	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Forage	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Lichen	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Moose	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Caribou	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Hare	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%
Duck	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	2%	7%	2%	7%	2%	7%	2%	7%
Total	100%		100%		100%		100%		100%		100%		100%		100%		100%	

Table G.2 Terrestrial Receptor Intakes by Pathway – Final Closure and Remediation Plan (Cont'd)

Antimony	Terrestrial Receptor Intakes by Pathway – Final Closure and Remediation Plan																	
	Mink		Moose		Scaup										Sheep		Wolf	
	PR DS AC		O		RC DS - X14		VC DS - V8		VC DS - V27		PR DS VC		PR DS AC		S		O	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Water	1%	1%	1%	3%	0%	1%	0%	1%	0%	1%	0%	1%	0%	1%	2%	6%	1%	4%
Sediment	4%	9%	2%	5%	9%	25%	9%	25%	9%	25%	9%	25%	9%	25%	0%	0%	0%	0%
Fish	33%	65%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Aq. Vegetation	58%	88%	68%	96%	82%	98%	82%	98%	82%	98%	82%	98%	82%	98%	0%	0%	0%	0%
Benthic Inv.	1%	5%	0%	0%	9%	38%	9%	38%	9%	38%	9%	38%	9%	38%	0%	0%	0%	0%
Soil	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	73%	96%	87%	98%
Berry	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Browse	0%	0%	29%	70%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Forage	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	25%	70%	0%	0%
Lichen	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Moose	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	5%	20%
Caribou	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	6%	21%
Hare	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%
Duck	2%	7%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Total	100%		100%		100%		100%		100%		100%		100%		100%		100%	

Table G.2 Terrestrial Receptor Intakes by Pathway – Final Closure and Remediation Plan (Cont'd)

Arsenic	Terrestrial Receptor Intakes by Pathway – Final Closure and Remediation Plan															
	Bear						Beaver									
	B		VM		FM		RC DS - X14		VC DS - V8		VC DS - V27		PR DS VC		PR DS AC	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Water	1%	2%	0%	1%	0%	1%	1%	2%	1%	2%	1%	2%	1%	2%	1%	2%
Sediment	0%	0%	0%	0%	0%	0%	46%	85%	49%	80%	44%	86%	44%	69%	38%	80%
Fish	12%	26%	6%	16%	5%	14%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Aq. Vegetation	0%	0%	0%	0%	0%	0%	1%	5%	1%	5%	1%	5%	1%	4%	1%	4%
Benthic Inv.	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Soil	32%	73%	47%	82%	64%	91%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Berry	20%	53%	8%	24%	2%	6%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Browse	0%	0%	0%	0%	0%	0%	52%	91%	49%	82%	53%	87%	54%	78%	61%	84%
Forage	27%	61%	36%	68%	26%	63%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Lichen	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Moose	1%	5%	0%	1%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Caribou	6%	25%	2%	8%	2%	6%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Hare	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Duck	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Total	100%		100%		100%		100%		100%		100%		100%		100%	

Table G.2 Terrestrial Receptor Intakes by Pathway – Final Closure and Remediation Plan (Cont'd)

Arsenic	Terrestrial Receptor Intakes by Pathway – Final Closure and Remediation Plan															
	Caribou		Fox						Grouse							
	O		B		VM		FM		B		VS		FN		FS	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Water	0%	1%	2%	7%	1%	4%	1%	3%	0%	0%	0%	0%	1%	1%	0%	0%
Sediment	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Fish	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Aq. Vegetation	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Benthic Inv.	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Soil	36%	85%	26%	75%	52%	91%	61%	95%	15%	44%	52%	89%	71%	93%	45%	83%
Berry	0%	0%	11%	41%	6%	20%	1%	4%	4%	13%	1%	1%	3%	7%	6%	19%
Browse	4%	15%	0%	0%	0%	0%	0%	0%	81%	97%	47%	71%	26%	51%	49%	88%
Forage	0%	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Lichen	60%	96%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Moose	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Caribou	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Hare	0%	0%	0%	1%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Duck	0%	0%	60%	98%	41%	92%	37%	89%	0%	0%	0%	0%	0%	0%	0%	0%
Total	100%		100%		100%		100%		100%		100%		100%		100%	

Table G.2 Terrestrial Receptor Intakes by Pathway – Final Closure and Remediation Plan (Cont'd)

Arsenic	Terrestrial Receptor Intakes by Pathway – Final Closure and Remediation Plan															
	Grouse		Hare										Mallard			
	FW		B		VS		FN		FS		FW		RC DS - X14		VC DS - V8	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Water	0%	0%	0%	0%	1%	1%	0%	0%	0%	1%	0%	0%	0%	0%	0%	0%
Sediment	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	18%	57%	18%	57%	0%	0%
Fish	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Aq. Vegetation	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	1%	0%	0%
Benthic Inv.	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	82%	99%	82%	99%	0%	0%
Soil	19%	52%	52%	78%	72%	91%	50%	85%	63%	94%	0%	0%	0%	0%	19%	52%
Berry	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Browse	66%	92%	30%	53%	16%	35%	36%	79%	26%	64%	0%	0%	0%	0%	66%	92%
Forage	14%	40%	18%	37%	11%	24%	14%	42%	11%	36%	0%	0%	0%	0%	14%	40%
Lichen	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Moose	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Caribou	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Hare	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Duck	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Total	100%		100%		100%		100%		100%		100%		100%		100%	

Table G.2 Terrestrial Receptor Intakes by Pathway – Final Closure and Remediation Plan (Cont'd)

Arsenic	Terrestrial Receptor Intakes by Pathway – Final Closure and Remediation Plan															
	Mallard						Marmot									
	VC DS - V27		PR DS VC		PR DS AC		B		VS		FN		FS		FW	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Water	0%	0%	0%	0%	0%	0%	1%	2%	0%	0%	1%	3%	0%	0%	1%	2%
Sediment	18%	57%	18%	57%	18%	57%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Fish	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Aq. Vegetation	0%	1%	0%	1%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Benthic Inv.	82%	99%	82%	99%	82%	99%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Soil	0%	0%	0%	0%	0%	0%	26%	69%	42%	84%	61%	93%	48%	85%	59%	95%
Berry	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Browse	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Forage	0%	0%	0%	0%	0%	0%	73%	97%	58%	81%	38%	67%	52%	87%	41%	86%
Lichen	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Moose	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Caribou	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Hare	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Duck	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Total	100%		100%		100%		100%		100%		100%		100%		100%	

Table G.2 Terrestrial Receptor Intakes by Pathway – Final Closure and Remediation Plan (Cont'd)

Arsenic	Terrestrial Receptor Intakes by Pathway – Final Closure and Remediation Plan																	
	Merganser										Mink							
	RC DS - X14		VC DS - V8		VC DS - V27		PR DS VC		PR DS AC		RC DS - X14		VC DS - V8		VC DS - V27		PR DS VC	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Water	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Sediment	36%	50%	36%	50%	36%	50%	36%	50%	36%	50%	41%	67%	41%	67%	41%	67%	41%	67%
Fish	64%	76%	64%	76%	64%	76%	64%	76%	64%	76%	19%	35%	19%	35%	19%	35%	19%	35%
Aq. Vegetation	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Benthic Inv.	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	33%	76%	33%	76%	33%	76%	33%	76%
Soil	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Berry	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Browse	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Forage	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Lichen	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Moose	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Caribou	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Hare	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Duck	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	6%	22%	6%	22%	6%	22%	6%	22%
Total	100%		100%		100%		100%		100%		100%		100%		100%		100%	

Table G.2 Terrestrial Receptor Intakes by Pathway – Final Closure and Remediation Plan (Cont'd)

Arsenic	Terrestrial Receptor Intakes by Pathway – Final Closure and Remediation Plan																	
	Mink		Moose		Scaup										Sheep		Wolf	
	PR DS AC		O		RC DS - X14		VC DS - V8		VC DS - V27		PR DS VC		PR DS AC		S		O	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Water	0%	0%	1%	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	5%	1%	3%
Sediment	41%	67%	29%	70%	31%	78%	31%	78%	31%	78%	31%	78%	31%	78%	0%	0%	0%	0%
Fish	19%	35%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Aq. Vegetation	0%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Benthic Inv.	33%	76%	0%	0%	69%	97%	69%	97%	69%	97%	69%	97%	69%	97%	0%	0%	0%	0%
Soil	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	39%	84%	65%	97%
Berry	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Browse	0%	0%	70%	96%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Forage	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	60%	90%	0%	0%
Lichen	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Moose	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	7%	33%
Caribou	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	27%	80%
Hare	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Duck	6%	22%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Total	100%		100%		100%		100%		100%		100%		100%		100%		100%	

Table G.2 Terrestrial Receptor Intakes by Pathway – Final Closure and Remediation Plan (Cont'd)

Beryllium	Terrestrial Receptor Intakes by Pathway – Final Closure and Remediation Plan															
	Bear						Beaver									
	B		VM		FM		RC DS - X14		VC DS - V8		VC DS - V27		PR DS VC		PR DS AC	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Water	0%	0%	2%	4%	2%	4%	7%	13%	7%	13%	6%	12%	1%	3%	2%	6%
Sediment	0%	0%	0%	0%	0%	0%	31%	56%	30%	55%	26%	52%	5%	15%	8%	25%
Fish	1%	3%	47%	72%	48%	74%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Aq. Vegetation	0%	0%	0%	0%	0%	0%	50%	84%	49%	84%	43%	81%	10%	36%	16%	54%
Benthic Inv.	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Soil	69%	91%	38%	62%	37%	61%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Berry	10%	28%	5%	10%	4%	10%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Browse	0%	0%	0%	0%	0%	0%	13%	32%	14%	34%	26%	67%	85%	97%	75%	98%
Forage	16%	44%	7%	16%	7%	16%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Lichen	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Moose	1%	3%	1%	1%	1%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Caribou	2%	6%	1%	2%	1%	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Hare	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Duck	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Total	100%		100%		100%		100%		100%		100%		100%		100%	

Table G.2 Terrestrial Receptor Intakes by Pathway – Final Closure and Remediation Plan (Cont'd)

Beryllium	Terrestrial Receptor Intakes by Pathway – Final Closure and Remediation Plan															
	Caribou		Fox						Grouse							
	O		B		VM		FM		B		VS		FN		FS	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Water	3%	7%	0%	0%	11%	26%	11%	27%	0%	0%	2%	8%	2%	9%	3%	9%
Sediment	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Fish	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Aq. Vegetation	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Benthic Inv.	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Soil	65%	90%	60%	91%	51%	83%	50%	82%	63%	93%	47%	78%	47%	78%	47%	78%
Berry	0%	0%	6%	17%	4%	12%	4%	12%	4%	11%	4%	15%	4%	16%	4%	16%
Browse	1%	4%	0%	0%	0%	0%	0%	0%	33%	76%	46%	80%	46%	80%	46%	80%
Forage	1%	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Lichen	31%	74%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Moose	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Caribou	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Hare	0%	0%	0%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Duck	0%	0%	34%	81%	33%	76%	34%	77%	0%	0%	0%	0%	0%	0%	0%	0%
Total	100%		100%		100%		100%		100%		100%		100%		100%	

Table G.2 Terrestrial Receptor Intakes by Pathway – Final Closure and Remediation Plan (Cont'd)

Beryllium	Terrestrial Receptor Intakes by Pathway – Final Closure and Remediation Plan															
	Grouse		Hare										Mallard			
	FW		B		VS		FN		FS		FW		RC DS - X14		VC DS - V8	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Water	2%	5%	0%	0%	2%	7%	2%	7%	3%	8%	2%	6%	2%	4%	2%	4%
Sediment	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	45%	79%	45%	79%
Fish	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Aq. Vegetation	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	53%	86%	53%	86%
Benthic Inv.	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Soil	62%	91%	65%	91%	52%	80%	48%	77%	52%	79%	63%	89%	0%	0%	0%	0%
Berry	3%	10%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Browse	33%	74%	21%	54%	32%	67%	30%	66%	32%	67%	21%	53%	0%	0%	0%	0%
Forage	0%	0%	14%	39%	13%	46%	19%	61%	13%	46%	13%	36%	0%	0%	0%	0%
Lichen	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Moose	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Caribou	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Hare	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Duck	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Total	100%		100%		100%		100%		100%		100%		100%		100%	

Table G.2 Terrestrial Receptor Intakes by Pathway – Final Closure and Remediation Plan (Cont'd)

Beryllium	Terrestrial Receptor Intakes by Pathway – Final Closure and Remediation Plan															
	Mallard						Marmot									
	VC DS - V27		PR DS VC		PR DS AC		B		VS		FN		FS		FW	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Water	2%	4%	2%	4%	2%	4%	0%	0%	4%	8%	3%	7%	4%	9%	4%	9%
Sediment	45%	79%	45%	79%	45%	79%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Fish	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Aq. Vegetation	53%	86%	53%	86%	53%	86%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Benthic Inv.	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Soil	0%	0%	0%	0%	0%	0%	54%	93%	52%	89%	42%	78%	52%	88%	52%	88%
Berry	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Browse	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Forage	0%	0%	0%	0%	0%	0%	46%	89%	44%	85%	55%	91%	44%	85%	44%	85%
Lichen	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Moose	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Caribou	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Hare	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Duck	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Total	100%		100%		100%		100%		100%		100%		100%		100%	

Table G.2 Terrestrial Receptor Intakes by Pathway – Final Closure and Remediation Plan (Cont'd)

Beryllium	Terrestrial Receptor Intakes by Pathway – Final Closure and Remediation Plan																	
	Merganser										Mink							
	RC DS - X14		VC DS - V8		VC DS - V27		PR DS VC		PR DS AC		RC DS - X14		VC DS - V8		VC DS - V27		PR DS VC	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Water	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	1%	1%	1%	1%	1%	1%	1%
Sediment	3%	5%	3%	5%	3%	5%	3%	5%	3%	5%	11%	17%	11%	17%	11%	17%	11%	17%
Fish	97%	98%	97%	98%	97%	98%	97%	98%	97%	98%	84%	91%	84%	91%	84%	91%	84%	91%
Aq. Vegetation	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	3%	8%	3%	8%	3%	8%	3%	8%
Benthic Inv.	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Soil	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Berry	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Browse	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Forage	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Lichen	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Moose	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Caribou	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Hare	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%
Duck	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	2%	6%	2%	6%	2%	6%	2%	6%
Total	100%		100%		100%		100%		100%		100%		100%		100%		100%	

Table G.2 Terrestrial Receptor Intakes by Pathway – Final Closure and Remediation Plan (Cont'd)

Beryllium	Terrestrial Receptor Intakes by Pathway – Final Closure and Remediation Plan																	
	Mink		Moose		Scaup										Sheep		Wolf	
	PR DS AC		O		RC DS - X14		VC DS - V8		VC DS - V27		PR DS VC		PR DS AC		S		O	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Water	1%	1%	8%	15%	1%	2%	1%	2%	1%	2%	1%	2%	1%	2%	2%	6%	4%	8%
Sediment	11%	17%	28%	53%	84%	97%	84%	97%	84%	97%	84%	97%	84%	97%	0%	0%	0%	0%
Fish	84%	91%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Aq. Vegetation	3%	8%	17%	47%	15%	42%	15%	42%	15%	42%	15%	42%	15%	42%	0%	0%	0%	0%
Benthic Inv.	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Soil	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	48%	87%	59%	82%
Berry	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Browse	0%	0%	47%	72%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Forage	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	50%	91%	0%	0%
Lichen	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Moose	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	14%	33%
Caribou	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	24%	51%
Hare	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Duck	2%	6%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Total	100%		100%		100%		100%		100%		100%		100%		100%		100%	

Table G.2 Terrestrial Receptor Intakes by Pathway – Final Closure and Remediation Plan (Cont'd)

Boron	Terrestrial Receptor Intakes by Pathway – Final Closure and Remediation Plan															
	Bear						Beaver									
	B		VM		FM		RC DS - X14		VC DS - V8		VC DS - V27		PR DS VC		PR DS AC	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Water	0%	0%	0%	1%	1%	1%	2%	3%	2%	5%	2%	9%	0%	1%	0%	1%
Sediment	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Fish	0%	0%	0%	1%	1%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Aq. Vegetation	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Benthic Inv.	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Soil	4%	13%	2%	6%	2%	6%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Berry	29%	57%	29%	41%	25%	48%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Browse	0%	0%	0%	0%	0%	0%	98%	99%	98%	99%	97%	100%	100%	100%	100%	100%
Forage	64%	86%	67%	77%	69%	87%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Lichen	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Moose	1%	2%	0%	1%	1%	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Caribou	2%	6%	1%	4%	2%	5%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Hare	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Duck	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Total	100%		100%		100%		100%		100%		100%		100%		100%	

Table G.2 Terrestrial Receptor Intakes by Pathway – Final Closure and Remediation Plan (Cont'd)

Boron	Terrestrial Receptor Intakes by Pathway – Final Closure and Remediation Plan															
	Caribou		Fox						Grouse							
	O		B		VM		FM		B		VS		FN		FS	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Water	3%	5%	1%	2%	6%	10%	11%	20%	0%	0%	0%	0%	1%	2%	0%	1%
Sediment	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Fish	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Aq. Vegetation	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Benthic Inv.	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Soil	14%	36%	19%	47%	10%	24%	11%	29%	3%	8%	2%	5%	1%	4%	1%	4%
Berry	0%	0%	78%	95%	83%	93%	77%	91%	7%	19%	5%	21%	12%	48%	12%	39%
Browse	23%	49%	0%	0%	0%	0%	0%	0%	91%	98%	93%	99%	86%	99%	87%	98%
Forage	3%	6%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Lichen	57%	80%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Moose	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Caribou	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Hare	0%	0%	0%	1%	1%	2%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%
Duck	0%	0%	1%	5%	0%	1%	1%	2%	0%	0%	0%	0%	0%	0%	0%	0%
Total	100%		100%		100%		100%		100%		100%		100%		100%	

Table G.2 Terrestrial Receptor Intakes by Pathway – Final Closure and Remediation Plan (Cont'd)

Boron	Terrestrial Receptor Intakes by Pathway – Final Closure and Remediation Plan															
	Grouse		Hare										Mallard			
	FW		B		VS		FN		FS		FW		RC DS - X14		VC DS - V8	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Water	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	0%	0%	92%	95%	92%	95%
Sediment	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	8%	12%	8%	12%
Fish	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Aq. Vegetation	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Benthic Inv.	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Soil	2%	5%	3%	8%	2%	5%	1%	3%	1%	3%	2%	5%	0%	0%	0%	0%
Berry	7%	13%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Browse	91%	96%	60%	88%	69%	97%	51%	91%	49%	88%	52%	71%	0%	0%	0%	0%
Forage	0%	0%	37%	70%	29%	80%	47%	89%	49%	88%	46%	66%	0%	0%	0%	0%
Lichen	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Moose	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Caribou	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Hare	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Duck	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Total	100%		100%		100%		100%		100%		100%		100%		100%	

Table G.2 Terrestrial Receptor Intakes by Pathway – Final Closure and Remediation Plan (Cont'd)

Boron	Terrestrial Receptor Intakes by Pathway – Final Closure and Remediation Plan															
	Mallard						Marmot									
	VC DS - V27		PR DS VC		PR DS AC		B		VS		FN		FS		FW	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Water	92%	95%	92%	95%	92%	95%	0%	0%	0%	1%	0%	1%	0%	0%	0%	0%
Sediment	8%	12%	8%	12%	8%	12%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Fish	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Aq. Vegetation	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Benthic Inv.	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Soil	0%	0%	0%	0%	0%	0%	2%	5%	3%	11%	1%	3%	1%	2%	1%	2%
Berry	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Browse	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Forage	0%	0%	0%	0%	0%	0%	98%	100%	97%	100%	99%	100%	99%	100%	99%	100%
Lichen	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Moose	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Caribou	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Hare	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Duck	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Total	100%		100%		100%		100%		100%		100%		100%		100%	

Table G.2 Terrestrial Receptor Intakes by Pathway – Final Closure and Remediation Plan (Cont'd)

Boron	Terrestrial Receptor Intakes by Pathway – Final Closure and Remediation Plan																	
	Merganser										Mink							
	RC DS - X14		VC DS - V8		VC DS - V27		PR DS VC		PR DS AC		RC DS - X14		VC DS - V8		VC DS - V27		PR DS VC	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Water	4%	6%	4%	6%	4%	6%	4%	6%	4%	6%	12%	18%	12%	18%	12%	18%	11%	17%
Sediment	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	1%	1%	1%	1%	1%	1%	1%
Fish	96%	98%	96%	98%	96%	98%	96%	98%	96%	98%	87%	92%	86%	92%	86%	92%	82%	90%
Aq. Vegetation	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Benthic Inv.	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Soil	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Berry	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Browse	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Forage	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Lichen	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Moose	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Caribou	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Hare	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	1%	3%	1%	3%	6%	21%
Duck	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	2%	0%	2%	0%	2%	0%	1%
Total	100%		100%		100%		100%		100%		100%		100%		100%		100%	

Table G.2 Terrestrial Receptor Intakes by Pathway – Final Closure and Remediation Plan (Cont'd)

Boron	Terrestrial Receptor Intakes by Pathway – Final Closure and Remediation Plan																	
	Mink		Moose		Scaup										Sheep		Wolf	
	PR DS AC		O		RC DS - X14		VC DS - V8		VC DS - V27		PR DS VC		PR DS AC		S		O	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Water	12%	18%	1%	2%	75%	84%	75%	84%	75%	84%	75%	84%	75%	84%	1%	2%	4%	9%
Sediment	1%	1%	0%	0%	25%	36%	25%	36%	25%	36%	25%	36%	25%	36%	0%	0%	0%	0%
Fish	86%	91%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Aq. Vegetation	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Benthic Inv.	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Soil	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	6%	16%	12%	35%
Berry	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Browse	0%	0%	99%	100%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Forage	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	93%	99%	0%	0%
Lichen	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Moose	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	25%	68%
Caribou	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	60%	93%
Hare	1%	4%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%
Duck	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Total	100%		100%		100%		100%		100%		100%		100%		100%		100%	

Table G.2 Terrestrial Receptor Intakes by Pathway – Final Closure and Remediation Plan (Cont'd)

Cadmium	Terrestrial Receptor Intakes by Pathway – Final Closure and Remediation Plan															
	Bear						Beaver									
	B		VM		FM		RC DS - X14		VC DS - V8		VC DS - V27		PR DS VC		PR DS AC	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Water	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Sediment	0%	0%	0%	0%	0%	0%	0%	1%	0%	1%	0%	1%	0%	1%	0%	1%
Fish	6%	17%	8%	28%	8%	36%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Aq. Vegetation	0%	0%	0%	0%	0%	0%	71%	98%	62%	93%	68%	96%	74%	92%	71%	94%
Benthic Inv.	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Soil	11%	36%	12%	35%	11%	34%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Berry	2%	8%	2%	7%	4%	12%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Browse	0%	0%	0%	0%	0%	0%	28%	79%	38%	80%	32%	76%	25%	53%	29%	63%
Forage	15%	51%	6%	22%	10%	33%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Lichen	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Moose	37%	94%	41%	95%	37%	94%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Caribou	29%	78%	32%	82%	29%	77%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Hare	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Duck	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Total	100%		100%		100%		100%		100%		100%		100%		100%	

Table G.2 Terrestrial Receptor Intakes by Pathway – Final Closure and Remediation Plan (Cont'd)

Cadmium	Terrestrial Receptor Intakes by Pathway – Final Closure and Remediation Plan															
	Caribou		Fox						Grouse							
	O		B		VM		FM		B		VS		FN		FS	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Water	0%	0%	1%	3%	1%	2%	1%	2%	0%	0%	0%	0%	0%	0%	0%	0%
Sediment	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Fish	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Aq. Vegetation	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Benthic Inv.	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Soil	24%	58%	36%	83%	29%	75%	29%	76%	3%	10%	2%	3%	5%	17%	4%	13%
Berry	0%	0%	6%	21%	3%	10%	7%	24%	0%	1%	0%	1%	1%	3%	1%	2%
Browse	29%	68%	0%	0%	0%	0%	0%	0%	97%	100%	98%	99%	94%	99%	95%	99%
Forage	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Lichen	47%	85%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Moose	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Caribou	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Hare	0%	0%	0%	1%	0%	1%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%
Duck	0%	0%	57%	96%	67%	97%	63%	98%	0%	0%	0%	0%	0%	0%	0%	0%
Total	100%		100%		100%		100%		100%		100%		100%		100%	

Table G.2 Terrestrial Receptor Intakes by Pathway – Final Closure and Remediation Plan (Cont'd)

Cadmium	Terrestrial Receptor Intakes by Pathway – Final Closure and Remediation Plan															
	Grouse		Hare										Mallard			
	FW		B		VS		FN		FS		FW		RC DS - X14		VC DS - V8	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Water	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Sediment	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	1%	0%	0%
Fish	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Aq. Vegetation	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	72%	97%	72%	97%	0%	0%
Benthic Inv.	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	27%	74%	27%	74%	0%	0%
Soil	4%	14%	3%	5%	7%	24%	7%	19%	5%	13%	0%	0%	0%	0%	4%	14%
Berry	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Browse	89%	98%	92%	96%	86%	98%	88%	98%	86%	96%	0%	0%	0%	0%	89%	98%
Forage	6%	22%	5%	9%	6%	22%	6%	17%	8%	21%	0%	0%	0%	0%	6%	22%
Lichen	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Moose	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Caribou	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Hare	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Duck	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Total	100%		100%		100%		100%		100%		100%		100%		100%	

Table G.2 Terrestrial Receptor Intakes by Pathway – Final Closure and Remediation Plan (Cont'd)

Cadmium	Terrestrial Receptor Intakes by Pathway – Final Closure and Remediation Plan															
	Mallard						Marmot									
	VC DS - V27		PR DS VC		PR DS AC		B		VS		FN		FS		FW	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Water	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	1%	0%	1%
Sediment	0%	1%	0%	1%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Fish	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Aq. Vegetation	72%	97%	72%	97%	72%	97%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Benthic Inv.	27%	74%	27%	74%	27%	74%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Soil	0%	0%	0%	0%	0%	0%	20%	61%	11%	17%	26%	69%	24%	54%	12%	27%
Berry	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Browse	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Forage	0%	0%	0%	0%	0%	0%	80%	98%	89%	94%	74%	97%	76%	95%	88%	96%
Lichen	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Moose	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Caribou	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Hare	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Duck	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Total	100%		100%		100%		100%		100%		100%		100%		100%	

Table G.2 Terrestrial Receptor Intakes by Pathway – Final Closure and Remediation Plan (Cont'd)

Cadmium	Terrestrial Receptor Intakes by Pathway – Final Closure and Remediation Plan																	
	Merganser										Mink							
	RC DS - X14		VC DS - V8		VC DS - V27		PR DS VC		PR DS AC		RC DS - X14		VC DS - V8		VC DS - V27		PR DS VC	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Water	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Sediment	5%	11%	5%	11%	5%	11%	5%	11%	5%	11%	3%	5%	3%	5%	3%	5%	3%	5%
Fish	95%	98%	95%	98%	95%	98%	95%	98%	95%	98%	16%	31%	16%	31%	16%	31%	16%	31%
Aq. Vegetation	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	60%	83%	60%	83%	60%	83%	60%	83%
Benthic Inv.	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	16%	53%	16%	53%	16%	53%	16%	53%
Soil	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Berry	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Browse	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Forage	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Lichen	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Moose	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Caribou	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Hare	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Duck	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	5%	16%	5%	16%	5%	16%	5%	16%
Total	100%		100%		100%		100%		100%		100%		100%		100%		100%	

Table G.2 Terrestrial Receptor Intakes by Pathway – Final Closure and Remediation Plan (Cont'd)

Cadmium	Terrestrial Receptor Intakes by Pathway – Final Closure and Remediation Plan																	
	Mink		Moose		Scaup										Sheep		Wolf	
	PR DS AC		O		RC DS - X14		VC DS - V8		VC DS - V27		PR DS VC		PR DS AC		S		O	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Water	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%
Sediment	3%	5%	0%	1%	3%	6%	3%	6%	3%	6%	3%	6%	3%	6%	0%	0%	0%	0%
Fish	16%	31%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Aq. Vegetation	60%	83%	32%	67%	51%	89%	51%	89%	51%	89%	51%	89%	51%	89%	0%	0%	0%	0%
Benthic Inv.	16%	53%	0%	0%	47%	90%	47%	90%	47%	90%	47%	90%	47%	90%	0%	0%	0%	0%
Soil	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	54%	89%	2%	8%
Berry	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Browse	0%	0%	68%	92%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Forage	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	45%	85%	0%	0%
Lichen	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Moose	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	51%	98%
Caribou	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	47%	97%
Hare	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Duck	5%	16%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Total	100%		100%		100%		100%		100%		100%		100%		100%		100%	

Table G.2 Terrestrial Receptor Intakes by Pathway – Final Closure and Remediation Plan (Cont'd)

Chromium	Terrestrial Receptor Intakes by Pathway – Final Closure and Remediation Plan															
	Bear						Beaver									
	B		VM		FM		RC DS - X14		VC DS - V8		VC DS - V27		PR DS VC		PR DS AC	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Water	1%	1%	0%	0%	0%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Sediment	0%	0%	0%	0%	0%	0%	70%	96%	45%	91%	54%	76%	54%	94%	63%	80%
Fish	33%	53%	13%	25%	23%	50%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Aq. Vegetation	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Benthic Inv.	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Soil	20%	54%	57%	79%	38%	80%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Berry	6%	15%	5%	11%	9%	25%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Browse	0%	0%	0%	0%	0%	0%	29%	74%	54%	94%	46%	69%	46%	91%	36%	54%
Forage	29%	54%	19%	41%	23%	56%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Lichen	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Moose	5%	17%	3%	10%	3%	12%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Caribou	5%	14%	3%	8%	3%	10%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Hare	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Duck	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Total	100%		100%		100%		100%		100%		100%		100%		100%	

Table G.2 Terrestrial Receptor Intakes by Pathway – Final Closure and Remediation Plan (Cont'd)

Chromium	Terrestrial Receptor Intakes by Pathway – Final Closure and Remediation Plan															
	Caribou		Fox						Grouse							
	O		B		VM		FM		B		VS		FN		FS	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Water	0%	1%	2%	8%	1%	1%	1%	3%	0%	1%	0%	0%	0%	1%	0%	1%
Sediment	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Fish	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Aq. Vegetation	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Benthic Inv.	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Soil	36%	82%	24%	72%	49%	86%	31%	81%	17%	64%	57%	72%	58%	92%	43%	84%
Berry	0%	0%	5%	19%	3%	7%	5%	16%	2%	8%	2%	4%	2%	5%	5%	16%
Browse	4%	16%	0%	0%	0%	0%	0%	0%	81%	99%	41%	58%	40%	84%	51%	87%
Forage	0%	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Lichen	59%	94%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Moose	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Caribou	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Hare	0%	0%	1%	4%	0%	1%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%
Duck	0%	0%	67%	98%	47%	87%	63%	96%	0%	0%	0%	0%	0%	0%	0%	0%
Total	100%		100%		100%		100%		100%		100%		100%		100%	

Table G.2 Terrestrial Receptor Intakes by Pathway – Final Closure and Remediation Plan (Cont'd)

Chromium	Terrestrial Receptor Intakes by Pathway – Final Closure and Remediation Plan															
	Grouse		Hare										Mallard			
	FW		B		VS		FN		FS		FW		RC DS - X14		VC DS - V8	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Water	0%	1%	0%	1%	0%	0%	0%	1%	0%	1%	0%	1%	0%	0%	0%	0%
Sediment	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	89%	99%	89%	99%
Fish	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Aq. Vegetation	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Benthic Inv.	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	10%	39%	10%	39%
Soil	55%	89%	16%	55%	60%	76%	50%	83%	43%	83%	51%	87%	0%	0%	0%	0%
Berry	5%	15%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Browse	40%	76%	62%	97%	25%	39%	22%	60%	33%	69%	21%	44%	0%	0%	0%	0%
Forage	0%	0%	21%	61%	15%	33%	28%	58%	24%	54%	28%	57%	0%	0%	0%	0%
Lichen	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Moose	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Caribou	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Hare	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Duck	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Total	100%		100%		100%		100%		100%		100%		100%		100%	

Table G.2 Terrestrial Receptor Intakes by Pathway – Final Closure and Remediation Plan (Cont'd)

Chromium	Terrestrial Receptor Intakes by Pathway – Final Closure and Remediation Plan															
	Mallard						Marmot									
	VC DS - V27		PR DS VC		PR DS AC		B		VS		FN		FS		FW	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Water	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	0%	1%	0%	1%	0%	1%
Sediment	89%	99%	89%	99%	89%	99%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Fish	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Aq. Vegetation	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Benthic Inv.	10%	39%	10%	39%	10%	39%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Soil	0%	0%	0%	0%	0%	0%	16%	48%	48%	75%	30%	64%	31%	73%	31%	72%
Berry	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Browse	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Forage	0%	0%	0%	0%	0%	0%	84%	98%	52%	79%	70%	92%	68%	95%	68%	95%
Lichen	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Moose	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Caribou	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Hare	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Duck	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Total	100%		100%		100%		100%		100%		100%		100%		100%	

Table G.2 Terrestrial Receptor Intakes by Pathway – Final Closure and Remediation Plan (Cont'd)

Chromium	Terrestrial Receptor Intakes by Pathway – Final Closure and Remediation Plan																	
	Merganser										Mink							
	RC DS - X14		VC DS - V8		VC DS - V27		PR DS VC		PR DS AC		RC DS - X14		VC DS - V8		VC DS - V27		PR DS VC	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Water	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Sediment	19%	29%	19%	29%	19%	29%	19%	29%	19%	29%	42%	56%	42%	56%	42%	56%	42%	56%
Fish	81%	89%	81%	89%	81%	89%	81%	89%	81%	89%	48%	63%	48%	63%	48%	63%	48%	63%
Aq. Vegetation	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Benthic Inv.	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	2%	0%	2%	0%	2%	0%	2%
Soil	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Berry	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Browse	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Forage	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Lichen	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Moose	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Caribou	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Hare	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Duck	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	10%	32%	10%	32%	10%	32%	10%	32%
Total	100%		100%		100%		100%		100%		100%		100%		100%		100%	

Table G.2 Terrestrial Receptor Intakes by Pathway – Final Closure and Remediation Plan (Cont'd)

Chromium	Terrestrial Receptor Intakes by Pathway – Final Closure and Remediation Plan																	
	Mink		Moose		Scaup										Sheep		Wolf	
	PR DS AC		O		RC DS - X14		VC DS - V8		VC DS - V27		PR DS VC		PR DS AC		S		O	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Water	0%	0%	1%	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	3%	0%	1%
Sediment	42%	56%	53%	94%	95%	100%	95%	100%	95%	100%	95%	100%	95%	100%	0%	0%	0%	0%
Fish	48%	63%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Aq. Vegetation	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Benthic Inv.	0%	2%	0%	0%	5%	19%	5%	19%	5%	19%	5%	19%	5%	19%	0%	0%	0%	0%
Soil	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	44%	82%	30%	73%
Berry	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Browse	0%	0%	46%	93%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Forage	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	56%	90%	0%	0%
Lichen	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Moose	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	32%	75%
Caribou	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	38%	76%
Hare	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Duck	10%	32%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Total	100%		100%		100%		100%		100%		100%		100%		100%		100%	

Table G.2 Terrestrial Receptor Intakes by Pathway – Final Closure and Remediation Plan (Cont'd)

Cobalt	Terrestrial Receptor Intakes by Pathway – Final Closure and Remediation Plan															
	Bear						Beaver									
	B		VM		FM		RC DS - X14		VC DS - V8		VC DS - V27		PR DS VC		PR DS AC	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Water	0%	1%	1%	2%	1%	2%	0%	1%	0%	1%	0%	1%	0%	0%	0%	0%
Sediment	0%	0%	0%	0%	0%	0%	17%	34%	21%	46%	13%	34%	13%	25%	5%	16%
Fish	4%	8%	14%	31%	10%	24%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Aq. Vegetation	0%	0%	0%	0%	0%	0%	54%	87%	63%	92%	43%	86%	44%	82%	21%	65%
Benthic Inv.	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Soil	46%	84%	66%	85%	50%	87%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Berry	11%	28%	6%	13%	5%	15%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Browse	0%	0%	0%	0%	0%	0%	29%	59%	16%	41%	44%	90%	42%	74%	74%	98%
Forage	32%	74%	9%	21%	30%	71%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Lichen	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Moose	3%	9%	1%	4%	1%	4%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Caribou	5%	14%	2%	7%	2%	7%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Hare	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Duck	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Total	100%		100%		100%		100%		100%		100%		100%		100%	

Table G.2 Terrestrial Receptor Intakes by Pathway – Final Closure and Remediation Plan (Cont'd)

Cobalt	Terrestrial Receptor Intakes by Pathway – Final Closure and Remediation Plan															
	Caribou		Fox						Grouse							
	O		B		VM		FM		B		VS		FN		FS	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Water	1%	1%	0%	1%	1%	4%	1%	4%	0%	0%	0%	0%	0%	0%	0%	0%
Sediment	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Fish	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Aq. Vegetation	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Benthic Inv.	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Soil	43%	83%	27%	75%	31%	76%	33%	82%	19%	51%	10%	33%	10%	33%	10%	33%
Berry	0%	0%	4%	12%	2%	5%	2%	7%	1%	4%	0%	1%	0%	2%	0%	2%
Browse	9%	27%	0%	0%	0%	0%	0%	0%	79%	96%	89%	99%	89%	99%	89%	99%
Forage	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Lichen	47%	85%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Moose	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Caribou	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Hare	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Duck	0%	0%	69%	98%	66%	97%	64%	97%	0%	0%	0%	0%	0%	0%	0%	0%
Total	100%		100%		100%		100%		100%		100%		100%		100%	

Table G.2 Terrestrial Receptor Intakes by Pathway – Final Closure and Remediation Plan (Cont'd)

Cobalt	Terrestrial Receptor Intakes by Pathway – Final Closure and Remediation Plan															
	Grouse		Hare										Mallard			
	FW		B		VS		FN		FS		FW		RC DS - X14		VC DS - V8	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Water	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Sediment	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	15%	39%	15%	39%
Fish	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Aq. Vegetation	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	37%	82%	37%	82%
Benthic Inv.	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	49%	92%	49%	92%
Soil	15%	41%	24%	59%	15%	45%	15%	42%	13%	38%	16%	42%	0%	0%	0%	0%
Berry	1%	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Browse	84%	97%	61%	88%	83%	98%	81%	98%	76%	97%	53%	84%	0%	0%	0%	0%
Forage	0%	0%	15%	46%	2%	6%	4%	14%	10%	39%	32%	75%	0%	0%	0%	0%
Lichen	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Moose	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Caribou	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Hare	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Duck	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Total	100%		100%		100%		100%		100%		100%		100%		100%	

Table G.2 Terrestrial Receptor Intakes by Pathway – Final Closure and Remediation Plan (Cont'd)

Cobalt	Terrestrial Receptor Intakes by Pathway – Final Closure and Remediation Plan															
	Mallard						Marmot									
	VC DS - V27		PR DS VC		PR DS AC		B		VS		FN		FS		FW	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Water	0%	0%	0%	0%	0%	0%	0%	1%	1%	2%	1%	2%	0%	1%	0%	1%
Sediment	15%	39%	15%	39%	15%	39%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Fish	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Aq. Vegetation	37%	82%	37%	82%	37%	82%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Benthic Inv.	49%	92%	49%	92%	49%	92%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Soil	0%	0%	0%	0%	0%	0%	33%	80%	67%	94%	50%	80%	33%	76%	15%	50%
Berry	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Browse	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Forage	0%	0%	0%	0%	0%	0%	67%	97%	32%	59%	49%	79%	66%	95%	85%	99%
Lichen	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Moose	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Caribou	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Hare	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Duck	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Total	100%		100%		100%		100%		100%		100%		100%		100%	

Table G.2 Terrestrial Receptor Intakes by Pathway – Final Closure and Remediation Plan (Cont'd)

Cobalt	Terrestrial Receptor Intakes by Pathway – Final Closure and Remediation Plan																	
	Merganser										Mink							
	RC DS - X14		VC DS - V8		VC DS - V27		PR DS VC		PR DS AC		RC DS - X14		VC DS - V8		VC DS - V27		PR DS VC	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Water	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Sediment	45%	59%	45%	59%	45%	59%	45%	59%	45%	59%	41%	66%	41%	66%	41%	66%	41%	66%
Fish	55%	69%	55%	69%	55%	69%	55%	69%	55%	69%	14%	24%	14%	24%	14%	24%	14%	24%
Aq. Vegetation	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	18%	47%	18%	47%	18%	47%	18%	47%
Benthic Inv.	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	18%	55%	18%	55%	18%	55%	18%	55%
Soil	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Berry	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Browse	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Forage	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Lichen	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Moose	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Caribou	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Hare	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Duck	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	10%	32%	10%	32%	10%	32%	10%	32%
Total	100%		100%		100%		100%		100%		100%		100%		100%		100%	

Table G.2 Terrestrial Receptor Intakes by Pathway – Final Closure and Remediation Plan (Cont'd)

Cobalt	Terrestrial Receptor Intakes by Pathway – Final Closure and Remediation Plan																	
	Mink		Moose		Scaup										Sheep		Wolf	
	PR DS AC		O		RC DS - X14		VC DS - V8		VC DS - V27		PR DS VC		PR DS AC		S		O	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Water	0%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	2%	1%	2%
Sediment	41%	66%	16%	33%	37%	76%	37%	76%	37%	76%	37%	76%	37%	76%	0%	0%	0%	0%
Fish	14%	24%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Aq. Vegetation	18%	47%	19%	52%	14%	43%	14%	43%	14%	43%	14%	43%	14%	43%	0%	0%	0%	0%
Benthic Inv.	18%	55%	0%	0%	49%	91%	49%	91%	49%	91%	49%	91%	49%	91%	0%	0%	0%	0%
Soil	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	28%	68%	46%	84%
Berry	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Browse	0%	0%	65%	89%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Forage	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	72%	96%	0%	0%
Lichen	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Moose	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	20%	50%
Caribou	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	32%	68%
Hare	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Duck	10%	32%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Total	100%		100%		100%		100%		100%		100%		100%		100%		100%	

Table G.2 Terrestrial Receptor Intakes by Pathway – Final Closure and Remediation Plan (Cont'd)

Copper	Terrestrial Receptor Intakes by Pathway – Final Closure and Remediation Plan															
	Bear						Beaver									
	B		VM		FM		RC DS - X14		VC DS - V8		VC DS - V27		PR DS VC		PR DS AC	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Water	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Sediment	0%	0%	0%	0%	0%	0%	42%	70%	40%	67%	38%	66%	36%	56%	34%	56%
Fish	9%	15%	15%	35%	18%	40%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Aq. Vegetation	0%	0%	0%	0%	0%	0%	33%	69%	31%	68%	30%	67%	28%	64%	27%	63%
Benthic Inv.	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Soil	10%	21%	16%	28%	26%	57%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Berry	14%	24%	18%	29%	14%	25%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Browse	0%	0%	0%	0%	0%	0%	25%	55%	29%	63%	32%	69%	36%	60%	39%	65%
Forage	33%	54%	20%	31%	18%	35%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Lichen	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Moose	13%	34%	12%	31%	9%	26%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Caribou	21%	40%	18%	37%	14%	30%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Hare	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Duck	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Total	100%		100%		100%		100%		100%		100%		100%		100%	

Table G.2 Terrestrial Receptor Intakes by Pathway – Final Closure and Remediation Plan (Cont'd)

Copper	Terrestrial Receptor Intakes by Pathway – Final Closure and Remediation Plan															
	Caribou		Fox						Grouse							
	O		B		VM		FM		B		VS		FN		FS	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Water	0%	0%	1%	1%	1%	2%	1%	2%	0%	0%	0%	0%	0%	0%	0%	0%
Sediment	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Fish	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Aq. Vegetation	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Benthic Inv.	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Soil	37%	80%	40%	68%	40%	65%	48%	84%	12%	27%	20%	31%	17%	47%	33%	64%
Berry	0%	0%	40%	65%	29%	50%	20%	43%	7%	15%	11%	35%	12%	43%	6%	12%
Browse	5%	15%	0%	0%	0%	0%	0%	0%	81%	92%	69%	83%	70%	96%	61%	85%
Forage	1%	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Lichen	57%	92%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Moose	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Caribou	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Hare	0%	0%	2%	5%	1%	5%	1%	3%	0%	0%	0%	0%	0%	0%	0%	0%
Duck	0%	0%	18%	60%	29%	76%	30%	78%	0%	0%	0%	0%	0%	0%	0%	0%
Total	100%		100%		100%		100%		100%		100%		100%		100%	

Table G.2 Terrestrial Receptor Intakes by Pathway – Final Closure and Remediation Plan (Cont'd)

Copper	Terrestrial Receptor Intakes by Pathway – Final Closure and Remediation Plan															
	Grouse		Hare										Mallard			
	FW		B		VS		FN		FS		FW		RC DS - X14		VC DS - V8	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Water	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Sediment	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	38%	74%	38%	74%
Fish	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Aq. Vegetation	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	23%	60%	23%	60%
Benthic Inv.	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	39%	86%	39%	86%
Soil	28%	50%	13%	27%	25%	37%	18%	41%	38%	69%	29%	52%	0%	0%	0%	0%
Berry	8%	17%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Browse	64%	82%	50%	74%	50%	65%	51%	88%	42%	68%	40%	59%	0%	0%	0%	0%
Forage	0%	0%	38%	64%	25%	40%	31%	60%	21%	42%	31%	49%	0%	0%	0%	0%
Lichen	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Moose	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Caribou	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Hare	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Duck	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Total	100%		100%		100%		100%		100%		100%		100%		100%	

Table G.2 Terrestrial Receptor Intakes by Pathway – Final Closure and Remediation Plan (Cont'd)

Copper	Terrestrial Receptor Intakes by Pathway – Final Closure and Remediation Plan															
	Mallard						Marmot									
	VC DS - V27		PR DS VC		PR DS AC		B		VS		FN		FS		FW	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Water	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Sediment	38%	74%	38%	74%	38%	74%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Fish	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Aq. Vegetation	23%	60%	23%	60%	23%	60%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Benthic Inv.	39%	86%	39%	86%	39%	86%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Soil	0%	0%	0%	0%	0%	0%	7%	18%	18%	31%	11%	22%	30%	63%	17%	35%
Berry	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Browse	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Forage	0%	0%	0%	0%	0%	0%	93%	98%	82%	92%	89%	96%	70%	93%	83%	94%
Lichen	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Moose	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Caribou	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Hare	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Duck	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Total	100%		100%		100%		100%		100%		100%		100%		100%	

Table G.2 Terrestrial Receptor Intakes by Pathway – Final Closure and Remediation Plan (Cont'd)

Copper	Terrestrial Receptor Intakes by Pathway – Final Closure and Remediation Plan																	
	Merganser										Mink							
	RC DS - X14		VC DS - V8		VC DS - V27		PR DS VC		PR DS AC		RC DS - X14		VC DS - V8		VC DS - V27		PR DS VC	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Water	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Sediment	22%	31%	22%	31%	22%	31%	22%	31%	22%	31%	44%	58%	44%	58%	44%	58%	44%	58%
Fish	78%	87%	78%	87%	78%	87%	78%	87%	78%	87%	43%	57%	43%	57%	43%	57%	43%	57%
Aq. Vegetation	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	4%	14%	4%	14%	4%	14%	4%	14%
Benthic Inv.	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	7%	26%	7%	26%	7%	26%	7%	26%
Soil	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Berry	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Browse	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Forage	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Lichen	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Moose	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Caribou	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Hare	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Duck	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	2%	6%	2%	6%	2%	6%	2%	6%
Total	100%		100%		100%		100%		100%		100%		100%		100%		100%	

Table G.2 Terrestrial Receptor Intakes by Pathway – Final Closure and Remediation Plan (Cont'd)

Copper	Terrestrial Receptor Intakes by Pathway – Final Closure and Remediation Plan																	
	Mink		Moose		Scaup										Sheep		Wolf	
	PR DS AC		O		RC DS - X14		VC DS - V8		VC DS - V27		PR DS VC		PR DS AC		S		O	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Water	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Sediment	44%	59%	28%	47%	64%	93%	64%	93%	64%	93%	64%	93%	64%	93%	0%	0%	0%	0%
Fish	43%	57%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Aq. Vegetation	4%	14%	8%	23%	5%	17%	5%	17%	5%	17%	5%	17%	5%	17%	0%	0%	0%	0%
Benthic Inv.	7%	27%	0%	0%	30%	77%	30%	77%	30%	77%	30%	77%	30%	77%	0%	0%	0%	0%
Soil	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	17%	37%	10%	27%
Berry	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Browse	0%	0%	64%	83%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Forage	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	83%	97%	0%	0%
Lichen	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Moose	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	37%	47%
Caribou	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	53%	64%
Hare	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Duck	2%	6%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Total	100%		100%		100%		100%		100%		100%		100%		100%		100%	

Table G.2 Terrestrial Receptor Intakes by Pathway – Final Closure and Remediation Plan (Cont'd)

Lead	Terrestrial Receptor Intakes by Pathway – Final Closure and Remediation Plan															
	Bear						Beaver									
	B		VM		FM		RC DS - X14		VC DS - V8		VC DS - V27		PR DS VC		PR DS AC	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Water	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	0%	1%	0%	0%
Sediment	0%	0%	0%	0%	0%	0%	21%	56%	69%	88%	38%	58%	58%	81%	20%	35%
Fish	2%	3%	1%	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Aq. Vegetation	0%	0%	0%	0%	0%	0%	5%	19%	16%	42%	9%	27%	13%	37%	5%	16%
Benthic Inv.	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Soil	81%	93%	84%	97%	82%	99%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Berry	4%	9%	2%	6%	2%	7%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Browse	0%	0%	0%	0%	0%	0%	73%	97%	14%	33%	52%	73%	28%	56%	75%	88%
Forage	7%	17%	12%	32%	15%	54%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Lichen	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Moose	1%	6%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Caribou	6%	15%	1%	3%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Hare	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Duck	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Total	100%		100%		100%		100%		100%		100%		100%		100%	

Table G.2 Terrestrial Receptor Intakes by Pathway – Final Closure and Remediation Plan (Cont'd)

Lead	Terrestrial Receptor Intakes by Pathway – Final Closure and Remediation Plan															
	Caribou		Fox						Grouse							
	O		B		VM		FM		B		VS		FN		FS	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Water	0%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Sediment	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Fish	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Aq. Vegetation	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Benthic Inv.	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Soil	36%	87%	84%	96%	85%	98%	87%	99%	70%	89%	78%	89%	29%	73%	74%	98%
Berry	0%	0%	2%	6%	1%	4%	2%	5%	1%	3%	1%	4%	0%	0%	1%	2%
Browse	1%	3%	0%	0%	0%	0%	0%	0%	29%	57%	21%	38%	71%	97%	25%	70%
Forage	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Lichen	63%	97%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Moose	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Caribou	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Hare	0%	0%	7%	19%	13%	40%	11%	40%	0%	0%	0%	0%	0%	0%	0%	0%
Duck	0%	0%	6%	29%	1%	4%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%
Total	100%		100%		100%		100%		100%		100%		100%		100%	

Table G.2 Terrestrial Receptor Intakes by Pathway – Final Closure and Remediation Plan (Cont'd)

Lead	Terrestrial Receptor Intakes by Pathway – Final Closure and Remediation Plan															
	Grouse		Hare										Mallard			
	FW		B		VS		FN		FS		FW		RC DS - X14		VC DS - V8	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Water	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Sediment	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	70%	93%	70%	93%
Fish	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Aq. Vegetation	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	12%	35%	12%	35%
Benthic Inv.	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	18%	57%	18%	57%
Soil	97%	99%	75%	91%	81%	91%	38%	81%	73%	96%	97%	99%	0%	0%	0%	0%
Berry	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Browse	2%	6%	19%	41%	12%	24%	61%	94%	16%	51%	1%	4%	0%	0%	0%	0%
Forage	0%	0%	6%	15%	6%	15%	1%	4%	11%	38%	1%	4%	0%	0%	0%	0%
Lichen	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Moose	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Caribou	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Hare	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Duck	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Total	100%		100%		100%		100%		100%		100%		100%		100%	

Table G.2 Terrestrial Receptor Intakes by Pathway – Final Closure and Remediation Plan (Cont'd)

Lead	Terrestrial Receptor Intakes by Pathway – Final Closure and Remediation Plan															
	Mallard						Marmot									
	VC DS - V27		PR DS VC		PR DS AC		B		VS		FN		FS		FW	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Water	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Sediment	70%	93%	70%	93%	70%	93%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Fish	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Aq. Vegetation	12%	35%	12%	35%	12%	35%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Benthic Inv.	18%	57%	18%	57%	18%	57%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Soil	0%	0%	0%	0%	0%	0%	74%	93%	74%	91%	83%	96%	65%	96%	94%	99%
Berry	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Browse	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Forage	0%	0%	0%	0%	0%	0%	25%	53%	26%	52%	17%	39%	35%	81%	6%	19%
Lichen	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Moose	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Caribou	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Hare	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Duck	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Total	100%		100%		100%		100%		100%		100%		100%		100%	

Table G.2 Terrestrial Receptor Intakes by Pathway – Final Closure and Remediation Plan (Cont'd)

Lead	Terrestrial Receptor Intakes by Pathway – Final Closure and Remediation Plan																	
	Merganser										Mink							
	RC DS - X14		VC DS - V8		VC DS - V27		PR DS VC		PR DS AC		RC DS - X14		VC DS - V8		VC DS - V27		PR DS VC	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Water	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Sediment	63%	76%	63%	76%	63%	76%	63%	76%	63%	76%	62%	83%	75%	87%	76%	87%	68%	84%
Fish	37%	54%	37%	54%	37%	54%	37%	54%	37%	54%	10%	17%	12%	20%	12%	20%	11%	18%
Aq. Vegetation	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	2%	5%	2%	6%	2%	6%	2%	6%
Benthic Inv.	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	2%	7%	2%	9%	2%	9%	2%	8%
Soil	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Berry	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Browse	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Forage	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Lichen	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Moose	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Caribou	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Hare	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	24%	61%	8%	25%	7%	23%	17%	46%
Duck	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	2%	1%	2%	1%	2%	1%	2%
Total	100%		100%		100%		100%		100%		100%		100%		100%		100%	

Table G.2 Terrestrial Receptor Intakes by Pathway – Final Closure and Remediation Plan (Cont'd)

Lead	Terrestrial Receptor Intakes by Pathway – Final Closure and Remediation Plan																	
	Mink		Moose		Scaup										Sheep		Wolf	
	PR DS AC		O		RC DS - X14		VC DS - V8		VC DS - V27		PR DS VC		PR DS AC		S		O	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Water	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Sediment	46%	75%	14%	47%	88%	99%	88%	99%	88%	99%	88%	99%	88%	99%	0%	0%	0%	0%
Fish	7%	14%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Aq. Vegetation	1%	4%	1%	5%	2%	6%	2%	6%	2%	6%	2%	6%	2%	6%	0%	0%	0%	0%
Benthic Inv.	1%	6%	0%	0%	10%	37%	10%	37%	10%	37%	10%	37%	10%	37%	0%	0%	0%	0%
Soil	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	88%	97%	85%	99%
Berry	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Browse	0%	0%	85%	99%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Forage	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	12%	32%	0%	0%
Lichen	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Moose	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	6%
Caribou	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	5%	19%
Hare	43%	82%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	8%	33%
Duck	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Total	100%		100%		100%		100%		100%		100%		100%		100%		100%	

Table G.2 Terrestrial Receptor Intakes by Pathway – Final Closure and Remediation Plan (Cont'd)

Manganese	Terrestrial Receptor Intakes by Pathway – Final Closure and Remediation Plan															
	Bear						Beaver									
	B		VM		FM		RC DS - X14		VC DS - V8		VC DS - V27		PR DS VC		PR DS AC	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Water	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	0%	0%
Sediment	0%	0%	0%	0%	0%	0%	8%	17%	21%	49%	19%	52%	12%	26%	9%	28%
Fish	2%	6%	5%	17%	5%	15%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Aq. Vegetation	0%	0%	0%	0%	0%	0%	4%	12%	10%	32%	8%	31%	6%	19%	4%	17%
Benthic Inv.	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Soil	19%	56%	26%	60%	13%	39%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Berry	16%	48%	7%	23%	13%	37%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Browse	0%	0%	0%	0%	0%	0%	89%	97%	69%	94%	72%	97%	82%	95%	86%	99%
Forage	63%	93%	61%	90%	68%	95%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Lichen	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Moose	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Caribou	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Hare	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Duck	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Total	100%		100%		100%		100%		100%		100%		100%		100%	

Table G.2 Terrestrial Receptor Intakes by Pathway – Final Closure and Remediation Plan (Cont'd)

Manganese	Terrestrial Receptor Intakes by Pathway – Final Closure and Remediation Plan															
	Caribou		Fox						Grouse							
	O		B		VM		FM		B		VS		FN		FS	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Water	0%	0%	1%	2%	1%	4%	2%	5%	0%	0%	0%	0%	0%	0%	0%	0%
Sediment	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Fish	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Aq. Vegetation	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Benthic Inv.	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Soil	21%	58%	61%	95%	80%	97%	58%	89%	13%	39%	13%	31%	9%	22%	12%	29%
Berry	0%	0%	37%	83%	16%	47%	38%	76%	4%	15%	1%	5%	24%	68%	5%	19%
Browse	14%	49%	0%	0%	0%	0%	0%	0%	83%	97%	86%	97%	67%	94%	83%	96%
Forage	3%	9%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Lichen	62%	91%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Moose	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Caribou	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Hare	0%	0%	0%	1%	1%	3%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%
Duck	0%	0%	1%	6%	2%	7%	2%	9%	0%	0%	0%	0%	0%	0%	0%	0%
Total	100%		100%		100%		100%		100%		100%		100%		100%	

Table G.2 Terrestrial Receptor Intakes by Pathway – Final Closure and Remediation Plan (Cont'd)

Manganese	Terrestrial Receptor Intakes by Pathway – Final Closure and Remediation Plan															
	Grouse		Hare										Mallard			
	FW		B		VS		FN		FS		FW		RC DS - X14		VC DS - V8	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Water	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Sediment	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	76%	96%	76%	96%
Fish	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Aq. Vegetation	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	23%	56%	23%	56%
Benthic Inv.	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Soil	9%	29%	12%	37%	14%	31%	7%	15%	10%	23%	9%	29%	0%	0%	0%	0%
Berry	3%	10%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Browse	87%	97%	50%	84%	60%	91%	36%	75%	48%	86%	51%	82%	0%	0%	0%	0%
Forage	0%	0%	38%	77%	26%	73%	57%	88%	42%	85%	40%	79%	0%	0%	0%	0%
Lichen	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Moose	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Caribou	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Hare	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Duck	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Total	100%		100%		100%		100%		100%		100%		100%		100%	

Table G.2 Terrestrial Receptor Intakes by Pathway – Final Closure and Remediation Plan (Cont'd)

Manganese	Terrestrial Receptor Intakes by Pathway – Final Closure and Remediation Plan															
	Mallard						Marmot									
	VC DS - V27		PR DS VC		PR DS AC		B		VS		FN		FS		FW	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Water	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Sediment	76%	96%	76%	96%	76%	96%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Fish	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Aq. Vegetation	23%	56%	23%	56%	23%	56%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Benthic Inv.	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Soil	0%	0%	0%	0%	0%	0%	8%	31%	18%	54%	3%	7%	7%	23%	6%	25%
Berry	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Browse	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Forage	0%	0%	0%	0%	0%	0%	92%	100%	82%	99%	97%	99%	93%	99%	94%	100%
Lichen	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Moose	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Caribou	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Hare	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Duck	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Total	100%		100%		100%		100%		100%		100%		100%		100%	

Table G.2 Terrestrial Receptor Intakes by Pathway – Final Closure and Remediation Plan (Cont'd)

Manganese	Terrestrial Receptor Intakes by Pathway – Final Closure and Remediation Plan																	
	Merganser										Mink							
	RC DS - X14		VC DS - V8		VC DS - V27		PR DS VC		PR DS AC		RC DS - X14		VC DS - V8		VC DS - V27		PR DS VC	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Water	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Sediment	25%	40%	25%	40%	25%	40%	25%	40%	25%	40%	53%	70%	53%	70%	53%	70%	53%	69%
Fish	75%	87%	75%	87%	75%	87%	75%	87%	75%	87%	44%	62%	44%	62%	44%	62%	44%	62%
Aq. Vegetation	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	3%	8%	3%	8%	3%	8%	3%	8%
Benthic Inv.	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Soil	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Berry	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Browse	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Forage	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Lichen	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Moose	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Caribou	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Hare	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%
Duck	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Total	100%		100%		100%		100%		100%		100%		100%		100%		100%	

Table G.2 Terrestrial Receptor Intakes by Pathway – Final Closure and Remediation Plan (Cont'd)

Manganese	Terrestrial Receptor Intakes by Pathway – Final Closure and Remediation Plan																	
	Mink		Moose		Scaup										Sheep		Wolf	
	PR DS AC		O		RC DS - X14		VC DS - V8		VC DS - V27		PR DS VC		PR DS AC		S		O	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Water	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	3%
Sediment	53%	70%	8%	27%	96%	99%	96%	99%	96%	99%	96%	99%	96%	99%	0%	0%	0%	0%
Fish	44%	62%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Aq. Vegetation	3%	8%	1%	5%	4%	13%	4%	13%	4%	13%	4%	13%	4%	13%	0%	0%	0%	0%
Benthic Inv.	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Soil	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	28%	56%	80%	97%
Berry	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Browse	0%	0%	91%	99%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Forage	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	72%	94%	0%	0%
Lichen	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Moose	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	6%	15%
Caribou	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	12%	34%
Hare	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%
Duck	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Total	100%		100%		100%		100%		100%		100%		100%		100%		100%	

Table G.2 Terrestrial Receptor Intakes by Pathway – Final Closure and Remediation Plan (Cont'd)

Nickel	Terrestrial Receptor Intakes by Pathway – Final Closure and Remediation Plan															
	Bear						Beaver									
	B		VM		FM		RC DS - X14		VC DS - V8		VC DS - V27		PR DS VC		PR DS AC	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Water	1%	3%	1%	1%	0%	1%	0%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Sediment	0%	0%	0%	0%	0%	0%	34%	64%	63%	89%	56%	72%	69%	91%	51%	67%
Fish	26%	46%	15%	27%	7%	17%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Aq. Vegetation	0%	0%	0%	0%	0%	0%	5%	17%	9%	27%	8%	24%	10%	29%	8%	23%
Benthic Inv.	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Soil	25%	59%	38%	63%	32%	73%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Berry	13%	35%	15%	34%	15%	36%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Browse	0%	0%	0%	0%	0%	0%	60%	88%	27%	67%	35%	53%	20%	55%	40%	57%
Forage	33%	65%	31%	61%	46%	81%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Lichen	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Moose	1%	2%	0%	1%	0%	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Caribou	0%	1%	0%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Hare	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Duck	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Total	100%		100%		100%		100%		100%		100%		100%		100%	

Table G.2 Terrestrial Receptor Intakes by Pathway – Final Closure and Remediation Plan (Cont'd)

Nickel	Terrestrial Receptor Intakes by Pathway – Final Closure and Remediation Plan															
	Caribou		Fox						Grouse							
	O		B		VM		FM		B		VS		FN		FS	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Water	1%	2%	9%	21%	2%	5%	1%	4%	1%	1%	0%	0%	0%	0%	0%	0%
Sediment	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Fish	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Aq. Vegetation	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Benthic Inv.	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Soil	35%	74%	38%	81%	26%	62%	34%	80%	20%	59%	19%	31%	27%	59%	12%	38%
Berry	0%	0%	14%	41%	6%	20%	11%	31%	4%	15%	2%	7%	12%	41%	2%	5%
Browse	11%	31%	0%	0%	0%	0%	0%	0%	76%	98%	79%	91%	61%	92%	86%	98%
Forage	1%	3%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Lichen	52%	85%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Moose	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Caribou	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Hare	0%	0%	1%	3%	0%	1%	1%	3%	0%	0%	0%	0%	0%	0%	0%	0%
Duck	0%	0%	39%	92%	65%	94%	53%	93%	0%	0%	0%	0%	0%	0%	0%	0%
Total	100%		100%		100%		100%		100%		100%		100%		100%	

Table G.2 Terrestrial Receptor Intakes by Pathway – Final Closure and Remediation Plan (Cont'd)

Nickel	Terrestrial Receptor Intakes by Pathway – Final Closure and Remediation Plan															
	Grouse		Hare										Mallard			
	FW		B		VS		FN		FS		FW		RC DS - X14		VC DS - V8	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Water	0%	0%	1%	1%	0%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%
Sediment	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	67%	93%	67%	93%
Fish	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Aq. Vegetation	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	7%	22%	7%	22%
Benthic Inv.	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	26%	74%	26%	74%
Soil	15%	43%	20%	55%	23%	37%	27%	53%	15%	43%	14%	41%	0%	0%	0%	0%
Berry	9%	29%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Browse	76%	96%	55%	92%	57%	75%	41%	82%	67%	92%	46%	85%	0%	0%	0%	0%
Forage	0%	0%	24%	63%	19%	41%	32%	67%	18%	48%	40%	84%	0%	0%	0%	0%
Lichen	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Moose	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Caribou	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Hare	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Duck	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Total	100%		100%		100%		100%		100%		100%		100%		100%	

Table G.2 Terrestrial Receptor Intakes by Pathway – Final Closure and Remediation Plan (Cont'd)

Nickel	Terrestrial Receptor Intakes by Pathway – Final Closure and Remediation Plan															
	Mallard						Marmot									
	VC DS - V27		PR DS VC		PR DS AC		B		VS		FN		FS		FW	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Water	0%	0%	0%	0%	0%	0%	1%	3%	0%	1%	0%	1%	0%	1%	0%	0%
Sediment	67%	93%	67%	93%	67%	93%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Fish	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Aq. Vegetation	7%	22%	7%	22%	7%	22%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Benthic Inv.	26%	74%	26%	74%	26%	74%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Soil	0%	0%	0%	0%	0%	0%	18%	52%	22%	46%	18%	41%	19%	56%	11%	39%
Berry	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Browse	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Forage	0%	0%	0%	0%	0%	0%	81%	98%	77%	94%	82%	96%	81%	98%	89%	99%
Lichen	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Moose	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Caribou	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Hare	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Duck	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Total	100%		100%		100%		100%		100%		100%		100%		100%	

Table G.2 Terrestrial Receptor Intakes by Pathway – Final Closure and Remediation Plan (Cont'd)

Nickel	Terrestrial Receptor Intakes by Pathway – Final Closure and Remediation Plan																	
	Merganser										Mink							
	RC DS - X14		VC DS - V8		VC DS - V27		PR DS VC		PR DS AC		RC DS - X14		VC DS - V8		VC DS - V27		PR DS VC	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Water	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Sediment	47%	61%	47%	61%	47%	61%	47%	61%	47%	61%	67%	80%	67%	80%	67%	80%	67%	80%
Fish	53%	68%	53%	68%	53%	68%	53%	68%	53%	68%	21%	31%	21%	31%	21%	32%	21%	32%
Aq. Vegetation	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	3%	1%	3%	1%	3%	1%	3%
Benthic Inv.	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	3%	14%	3%	14%	3%	14%	3%	14%
Soil	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Berry	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Browse	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Forage	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Lichen	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Moose	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Caribou	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Hare	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Duck	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	8%	26%	8%	26%	8%	26%	8%	26%
Total	100%		100%		100%		100%		100%		100%		100%		100%		100%	

Table G.2 Terrestrial Receptor Intakes by Pathway – Final Closure and Remediation Plan (Cont'd)

Nickel	Terrestrial Receptor Intakes by Pathway – Final Closure and Remediation Plan																	
	Mink		Moose		Scaup										Sheep		Wolf	
	PR DS AC		O		RC DS - X14		VC DS - V8		VC DS - V27		PR DS VC		PR DS AC		S		O	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Water	0%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	3%	4%	9%
Sediment	67%	80%	35%	65%	84%	98%	84%	98%	84%	98%	84%	98%	84%	98%	0%	0%	0%	0%
Fish	21%	32%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Aq. Vegetation	1%	3%	2%	5%	1%	4%	1%	4%	1%	4%	1%	4%	1%	4%	0%	0%	0%	0%
Benthic Inv.	3%	14%	0%	0%	15%	53%	15%	53%	15%	53%	15%	53%	15%	53%	0%	0%	0%	0%
Soil	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	18%	57%	67%	93%
Berry	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Browse	0%	0%	63%	87%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Forage	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	81%	99%	0%	0%
Lichen	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Moose	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	14%	48%
Caribou	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	14%	34%
Hare	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	3%
Duck	8%	26%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Total	100%		100%		100%		100%		100%		100%		100%		100%		100%	

Table G.2 Terrestrial Receptor Intakes by Pathway – Final Closure and Remediation Plan (Cont'd)

Selenium	Terrestrial Receptor Intakes by Pathway – Final Closure and Remediation Plan															
	Bear						Beaver									
	B		VM		FM		RC DS - X14		VC DS - V8		VC DS - V27		PR DS VC		PR DS AC	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Water	0%	1%	0%	1%	1%	2%	2%	7%	1%	3%	0%	1%	2%	5%	1%	2%
Sediment	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Fish	11%	23%	9%	17%	22%	56%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Aq. Vegetation	0%	0%	0%	0%	0%	0%	31%	80%	16%	53%	6%	23%	26%	71%	11%	37%
Benthic Inv.	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Soil	4%	10%	5%	13%	5%	10%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Berry	11%	39%	6%	14%	11%	25%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Browse	0%	0%	0%	0%	0%	0%	67%	97%	83%	99%	93%	99%	72%	97%	88%	99%
Forage	48%	86%	36%	64%	29%	53%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Lichen	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Moose	13%	33%	23%	45%	17%	37%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Caribou	12%	29%	20%	41%	15%	33%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Hare	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Duck	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Total	100%		100%		100%		100%		100%		100%		100%		100%	

Table G.2 Terrestrial Receptor Intakes by Pathway – Final Closure and Remediation Plan (Cont'd)

Selenium	Terrestrial Receptor Intakes by Pathway – Final Closure and Remediation Plan															
	Caribou		Fox						Grouse							
	O		B		VM		FM		B		VS		FN		FS	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Water	2%	4%	3%	8%	1%	5%	2%	6%	0%	1%	0%	0%	1%	3%	0%	1%
Sediment	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Fish	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Aq. Vegetation	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Benthic Inv.	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Soil	16%	45%	8%	27%	8%	27%	5%	20%	6%	18%	4%	7%	5%	17%	5%	11%
Berry	0%	0%	13%	52%	6%	22%	7%	31%	7%	28%	7%	16%	3%	10%	5%	13%
Browse	12%	41%	0%	0%	0%	0%	0%	0%	87%	99%	89%	96%	92%	99%	90%	97%
Forage	2%	7%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Lichen	68%	96%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Moose	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Caribou	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Hare	0%	0%	2%	8%	1%	5%	1%	2%	0%	0%	0%	0%	0%	0%	0%	0%
Duck	0%	0%	75%	99%	84%	99%	86%	100%	0%	0%	0%	0%	0%	0%	0%	0%
Total	100%		100%		100%		100%		100%		100%		100%		100%	

Table G.2 Terrestrial Receptor Intakes by Pathway – Final Closure and Remediation Plan (Cont'd)

Selenium	Terrestrial Receptor Intakes by Pathway – Final Closure and Remediation Plan															
	Grouse		Hare										Mallard			
	FW		B		VS		FN		FS		FW		RC DS - X14		VC DS - V8	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Water	1%	3%	0%	1%	0%	0%	1%	4%	1%	2%	1%	4%	0%	1%	0%	1%
Sediment	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Fish	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Aq. Vegetation	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	11%	46%	11%	46%
Benthic Inv.	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	88%	100%	88%	100%
Soil	9%	24%	4%	12%	5%	9%	6%	19%	6%	13%	11%	29%	0%	0%	0%	0%
Berry	4%	9%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Browse	86%	96%	49%	91%	66%	85%	77%	97%	68%	88%	65%	87%	0%	0%	0%	0%
Forage	0%	0%	46%	90%	29%	55%	16%	47%	25%	52%	22%	54%	0%	0%	0%	0%
Lichen	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Moose	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Caribou	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Hare	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Duck	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Total	100%		100%		100%		100%		100%		100%		100%		100%	

Table G.2 Terrestrial Receptor Intakes by Pathway – Final Closure and Remediation Plan (Cont'd)

Selenium	Terrestrial Receptor Intakes by Pathway – Final Closure and Remediation Plan															
	Mallard						Marmot									
	VC DS - V27		PR DS VC		PR DS AC		B		VS		FN		FS		FW	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Water	0%	1%	0%	1%	0%	1%	0%	1%	0%	0%	3%	10%	1%	4%	3%	10%
Sediment	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Fish	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Aq. Vegetation	11%	46%	11%	46%	11%	46%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Benthic Inv.	88%	100%	88%	100%	88%	100%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Soil	0%	0%	0%	0%	0%	0%	3%	10%	4%	9%	9%	26%	6%	14%	12%	36%
Berry	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Browse	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Forage	0%	0%	0%	0%	0%	0%	97%	100%	96%	99%	88%	98%	93%	98%	85%	98%
Lichen	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Moose	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Caribou	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Hare	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Duck	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Total	100%		100%		100%		100%		100%		100%		100%		100%	

Table G.2 Terrestrial Receptor Intakes by Pathway – Final Closure and Remediation Plan (Cont'd)

Selenium	Terrestrial Receptor Intakes by Pathway – Final Closure and Remediation Plan																	
	Merganser										Mink							
	RC DS - X14		VC DS - V8		VC DS - V27		PR DS VC		PR DS AC		RC DS - X14		VC DS - V8		VC DS - V27		PR DS VC	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Water	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	1%	0%	1%	0%	1%
Sediment	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Fish	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	53%	89%	53%	88%	53%	88%	53%	89%
Aq. Vegetation	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	2%	7%	2%	7%	2%	7%	2%	7%
Benthic Inv.	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	19%	52%	19%	52%	19%	52%	19%	52%
Soil	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Berry	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Browse	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Forage	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Lichen	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Moose	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Caribou	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Hare	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	1%	0%	0%
Duck	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	25%	67%	25%	67%	25%	67%	25%	67%
Total	100%		100%		100%		100%		100%		100%		100%		100%		100%	

Table G.2 Terrestrial Receptor Intakes by Pathway – Final Closure and Remediation Plan (Cont'd)

Selenium	Terrestrial Receptor Intakes by Pathway – Final Closure and Remediation Plan																	
	Mink		Moose		Scaup										Sheep		Wolf	
	PR DS AC		O		RC DS - X14		VC DS - V8		VC DS - V27		PR DS VC		PR DS AC		S		O	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Water	0%	1%	1%	3%	0%	1%	0%	1%	0%	1%	0%	1%	0%	1%	2%	5%	0%	0%
Sediment	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Fish	53%	89%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Aq. Vegetation	2%	7%	5%	18%	5%	20%	5%	20%	5%	20%	5%	20%	5%	20%	0%	0%	0%	0%
Benthic Inv.	19%	52%	0%	0%	95%	100%	95%	100%	95%	100%	95%	100%	95%	100%	0%	0%	0%	0%
Soil	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	13%	40%	1%	3%
Berry	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Browse	0%	0%	94%	99%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Forage	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	85%	98%	0%	0%
Lichen	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Moose	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	53%	81%
Caribou	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	46%	75%
Hare	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Duck	25%	67%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Total	100%		100%		100%		100%		100%		100%		100%		100%		100%	

Table G.2 Terrestrial Receptor Intakes by Pathway – Final Closure and Remediation Plan (Cont'd)

Silver	Terrestrial Receptor Intakes by Pathway – Final Closure and Remediation Plan															
	Bear						Beaver									
	B		VM		FM		RC DS - X14		VC DS - V8		VC DS - V27		PR DS VC		PR DS AC	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Water	0%	0%	0%	0%	0%	0%	1%	2%	1%	3%	0%	1%	1%	2%	0%	0%
Sediment	0%	0%	0%	0%	0%	0%	3%	8%	7%	17%	2%	5%	4%	9%	1%	2%
Fish	1%	3%	6%	13%	5%	11%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Aq. Vegetation	0%	0%	0%	0%	0%	0%	27%	70%	53%	89%	23%	61%	31%	73%	10%	31%
Benthic Inv.	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Soil	52%	78%	43%	74%	50%	82%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Berry	3%	11%	3%	9%	1%	3%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Browse	0%	0%	0%	0%	0%	0%	69%	95%	38%	78%	74%	95%	65%	93%	89%	99%
Forage	4%	12%	8%	20%	8%	24%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Lichen	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Moose	16%	61%	16%	62%	15%	59%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Caribou	24%	53%	24%	58%	21%	53%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Hare	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Duck	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Total	100%		100%		100%		100%		100%		100%		100%		100%	

Table G.2 Terrestrial Receptor Intakes by Pathway – Final Closure and Remediation Plan (Cont'd)

Silver	Terrestrial Receptor Intakes by Pathway – Final Closure and Remediation Plan															
	Caribou		Fox						Grouse							
	O		B		VM		FM		B		VS		FN		FS	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Water	0%	0%	0%	0%	1%	2%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%
Sediment	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Fish	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Aq. Vegetation	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Benthic Inv.	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Soil	41%	81%	66%	95%	78%	97%	85%	98%	85%	96%	43%	68%	71%	96%	56%	88%
Berry	0%	0%	2%	9%	5%	16%	2%	4%	2%	7%	2%	6%	1%	4%	0%	1%
Browse	1%	3%	0%	0%	0%	0%	0%	0%	13%	32%	55%	90%	28%	78%	43%	81%
Forage	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Lichen	58%	92%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Moose	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Caribou	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Hare	0%	0%	0%	0%	0%	1%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%
Duck	0%	0%	32%	82%	16%	59%	13%	44%	0%	0%	0%	0%	0%	0%	0%	0%
Total	100%		100%		100%		100%		100%		100%		100%		100%	

Table G.2 Terrestrial Receptor Intakes by Pathway – Final Closure and Remediation Plan (Cont'd)

Silver	Terrestrial Receptor Intakes by Pathway – Final Closure and Remediation Plan															
	Grouse		Hare										Mallard			
	FW		B		VS		FN		FS		FW		RC DS - X14		VC DS - V8	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Water	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	1%
Sediment	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	7%	20%	7%	20%
Fish	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Aq. Vegetation	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	38%	86%	38%	86%
Benthic Inv.	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	55%	95%	55%	95%
Soil	61%	84%	86%	95%	51%	75%	68%	94%	60%	89%	58%	86%	0%	0%	0%	0%
Berry	4%	14%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Browse	35%	74%	8%	21%	39%	73%	17%	55%	30%	65%	20%	48%	0%	0%	0%	0%
Forage	0%	0%	6%	17%	10%	25%	14%	45%	10%	29%	22%	65%	0%	0%	0%	0%
Lichen	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Moose	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Caribou	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Hare	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Duck	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Total	100%		100%		100%		100%		100%		100%		100%		100%	

Table G.2 Terrestrial Receptor Intakes by Pathway – Final Closure and Remediation Plan (Cont'd)

Silver	Terrestrial Receptor Intakes by Pathway – Final Closure and Remediation Plan															
	Mallard						Marmot									
	VC DS - V27		PR DS VC		PR DS AC		B		VS		FN		FS		FW	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Water	0%	1%	0%	1%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Sediment	7%	20%	7%	20%	7%	20%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Fish	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Aq. Vegetation	38%	86%	38%	86%	38%	86%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Benthic Inv.	55%	95%	55%	95%	55%	95%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Soil	0%	0%	0%	0%	0%	0%	76%	94%	54%	93%	57%	90%	60%	91%	46%	90%
Berry	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Browse	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Forage	0%	0%	0%	0%	0%	0%	24%	53%	46%	90%	43%	89%	40%	78%	54%	95%
Lichen	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Moose	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Caribou	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Hare	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Duck	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Total	100%		100%		100%		100%		100%		100%		100%		100%	

Table G.2 Terrestrial Receptor Intakes by Pathway – Final Closure and Remediation Plan (Cont'd)

Silver	Terrestrial Receptor Intakes by Pathway – Final Closure and Remediation Plan																	
	Merganser										Mink							
	RC DS - X14		VC DS - V8		VC DS - V27		PR DS VC		PR DS AC		RC DS - X14		VC DS - V8		VC DS - V27		PR DS VC	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Water	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Sediment	1%	2%	1%	2%	1%	2%	1%	2%	1%	2%	3%	5%	3%	5%	3%	5%	3%	5%
Fish	99%	99%	99%	99%	99%	99%	99%	99%	99%	99%	84%	94%	84%	94%	84%	94%	84%	94%
Aq. Vegetation	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	3%	11%	3%	11%	3%	11%	3%	11%
Benthic Inv.	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	5%	21%	5%	21%	5%	21%	5%	21%
Soil	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Berry	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Browse	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Forage	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Lichen	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Moose	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Caribou	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Hare	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%
Duck	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	4%	14%	4%	14%	4%	14%	4%	14%
Total	100%		100%		100%		100%		100%		100%		100%		100%		100%	

Table G.2 Terrestrial Receptor Intakes by Pathway – Final Closure and Remediation Plan (Cont'd)

Silver	Terrestrial Receptor Intakes by Pathway – Final Closure and Remediation Plan																	
	Mink		Moose		Scaup										Sheep		Wolf	
	PR DS AC		O		RC DS - X14		VC DS - V8		VC DS - V27		PR DS VC		PR DS AC		S		O	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Water	0%	0%	1%	2%	0%	1%	0%	1%	0%	1%	0%	1%	0%	1%	1%	3%	0%	0%
Sediment	3%	5%	3%	9%	21%	55%	21%	55%	21%	55%	21%	55%	21%	55%	0%	0%	0%	0%
Fish	84%	94%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Aq. Vegetation	3%	11%	9%	33%	17%	54%	17%	54%	17%	54%	17%	54%	17%	54%	0%	0%	0%	0%
Benthic Inv.	5%	21%	0%	0%	62%	96%	62%	96%	62%	96%	62%	96%	62%	96%	0%	0%	0%	0%
Soil	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	77%	97%	12%	32%
Berry	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Browse	0%	0%	87%	99%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Forage	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	22%	66%	0%	0%
Lichen	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Moose	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	31%	86%
Caribou	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	57%	92%
Hare	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Duck	4%	14%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Total	100%		100%		100%		100%		100%		100%		100%		100%		100%	

Table G.2 Terrestrial Receptor Intakes by Pathway – Final Closure and Remediation Plan (Cont'd)

Strontium	Terrestrial Receptor Intakes by Pathway – Final Closure and Remediation Plan															
	Bear						Beaver									
	B		VM		FM		RC DS - X14		VC DS - V8		VC DS - V27		PR DS VC		PR DS AC	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Water	2%	4%	3%	5%	1%	3%	2%	5%	2%	5%	2%	4%	2%	5%	2%	4%
Sediment	0%	0%	0%	0%	0%	0%	3%	7%	3%	7%	2%	7%	3%	7%	2%	7%
Fish	25%	45%	36%	52%	17%	33%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Aq. Vegetation	0%	0%	0%	0%	0%	0%	76%	97%	73%	97%	69%	96%	75%	97%	70%	96%
Benthic Inv.	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Soil	12%	27%	27%	50%	8%	18%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Berry	5%	15%	13%	29%	2%	5%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Browse	0%	0%	0%	0%	0%	0%	20%	60%	22%	65%	27%	72%	20%	61%	26%	71%
Forage	56%	81%	21%	31%	71%	89%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Lichen	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Moose	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Caribou	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Hare	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Duck	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Total	100%		100%		100%		100%		100%		100%		100%		100%	

Table G.2 Terrestrial Receptor Intakes by Pathway – Final Closure and Remediation Plan (Cont'd)

Strontium	Terrestrial Receptor Intakes by Pathway – Final Closure and Remediation Plan															
	Caribou		Fox						Grouse							
	O		B		VM		FM		B		VS		FN		FS	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Water	5%	9%	26%	45%	18%	32%	24%	41%	1%	4%	1%	3%	1%	4%	1%	4%
Sediment	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Fish	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Aq. Vegetation	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Benthic Inv.	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Soil	30%	55%	43%	68%	45%	74%	38%	62%	14%	35%	15%	36%	14%	34%	15%	35%
Berry	0%	0%	11%	32%	14%	35%	7%	15%	3%	10%	1%	3%	4%	18%	2%	6%
Browse	9%	27%	0%	0%	0%	0%	0%	0%	82%	96%	83%	97%	80%	96%	82%	97%
Forage	2%	6%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Lichen	55%	83%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Moose	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Caribou	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Hare	0%	0%	1%	4%	1%	3%	2%	6%	0%	0%	0%	0%	0%	0%	0%	0%
Duck	0%	0%	18%	56%	22%	61%	28%	70%	0%	0%	0%	0%	0%	0%	0%	0%
Total	100%		100%		100%		100%		100%		100%		100%		100%	

Table G.2 Terrestrial Receptor Intakes by Pathway – Final Closure and Remediation Plan (Cont'd)

Strontium	Terrestrial Receptor Intakes by Pathway – Final Closure and Remediation Plan															
	Grouse		Hare										Mallard			
	FW		B		VS		FN		FS		FW		RC DS - X14		VC DS - V8	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Water	2%	6%	1%	2%	1%	3%	1%	2%	1%	1%	0%	1%	0%	0%	0%	0%
Sediment	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	1%	1%	1%
Fish	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Aq. Vegetation	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	17%	49%	17%	49%
Benthic Inv.	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	82%	98%	82%	98%
Soil	14%	34%	10%	22%	19%	42%	9%	22%	7%	14%	4%	11%	0%	0%	0%	0%
Berry	2%	8%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Browse	81%	96%	43%	82%	67%	92%	39%	81%	30%	69%	21%	59%	0%	0%	0%	0%
Forage	0%	0%	46%	84%	13%	44%	51%	89%	63%	91%	74%	95%	0%	0%	0%	0%
Lichen	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Moose	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Caribou	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Hare	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Duck	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Total	100%		100%		100%		100%		100%		100%		100%		100%	

Table G.2 Terrestrial Receptor Intakes by Pathway – Final Closure and Remediation Plan (Cont'd)

Strontium	Terrestrial Receptor Intakes by Pathway – Final Closure and Remediation Plan															
	Mallard						Marmot									
	VC DS - V27		PR DS VC		PR DS AC		B		VS		FN		FS		FW	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Water	0%	0%	0%	0%	0%	0%	1%	2%	4%	9%	1%	2%	0%	1%	0%	0%
Sediment	1%	1%	1%	1%	1%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Fish	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Aq. Vegetation	17%	49%	17%	49%	17%	49%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Benthic Inv.	82%	98%	82%	98%	82%	98%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Soil	0%	0%	0%	0%	0%	0%	5%	15%	32%	69%	5%	16%	2%	6%	1%	4%
Berry	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Browse	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Forage	0%	0%	0%	0%	0%	0%	94%	99%	65%	94%	94%	99%	97%	99%	98%	100%
Lichen	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Moose	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Caribou	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Hare	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Duck	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Total	100%		100%		100%		100%		100%		100%		100%		100%	

Table G.2 Terrestrial Receptor Intakes by Pathway – Final Closure and Remediation Plan (Cont'd)

Strontium	Terrestrial Receptor Intakes by Pathway – Final Closure and Remediation Plan																	
	Merganser										Mink							
	RC DS - X14		VC DS - V8		VC DS - V27		PR DS VC		PR DS AC		RC DS - X14		VC DS - V8		VC DS - V27		PR DS VC	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Water	0%	1%	0%	1%	0%	1%	0%	1%	0%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Sediment	2%	3%	2%	3%	2%	3%	2%	3%	2%	3%	3%	5%	3%	5%	3%	5%	3%	5%
Fish	98%	99%	98%	99%	98%	99%	98%	99%	98%	99%	39%	62%	39%	62%	39%	62%	39%	62%
Aq. Vegetation	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	14%	37%	14%	37%	14%	37%	14%	37%
Benthic Inv.	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	43%	71%	43%	71%	43%	71%	43%	71%
Soil	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Berry	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Browse	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Forage	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Lichen	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Moose	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Caribou	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Hare	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Duck	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	2%	1%	2%	1%	2%	1%	2%
Total	100%		100%		100%		100%		100%		100%		100%		100%		100%	

Table G.2 Terrestrial Receptor Intakes by Pathway – Final Closure and Remediation Plan (Cont'd)

Strontium	Terrestrial Receptor Intakes by Pathway – Final Closure and Remediation Plan																	
	Mink		Moose		Scaup										Sheep		Wolf	
	PR DS AC		O		RC DS - X14		VC DS - V8		VC DS - V27		PR DS VC		PR DS AC		S		O	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Water	1%	1%	3%	8%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	2%	19%	33%
Sediment	3%	5%	4%	9%	2%	4%	2%	4%	2%	4%	2%	4%	2%	4%	0%	0%	0%	0%
Fish	39%	62%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Aq. Vegetation	14%	37%	37%	81%	7%	22%	7%	22%	7%	22%	7%	22%	7%	22%	0%	0%	0%	0%
Benthic Inv.	43%	71%	0%	0%	92%	99%	92%	99%	92%	99%	92%	99%	92%	99%	0%	0%	0%	0%
Soil	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	13%	34%	66%	86%
Berry	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Browse	0%	0%	57%	93%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Forage	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	87%	98%	0%	0%
Lichen	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Moose	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	4%	11%
Caribou	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	10%	22%
Hare	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	4%
Duck	1%	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Total	100%		100%		100%		100%		100%		100%		100%		100%		100%	

Table G.2 Terrestrial Receptor Intakes by Pathway – Final Closure and Remediation Plan (Cont'd)

Tin	Terrestrial Receptor Intakes by Pathway – Final Closure and Remediation Plan															
	Bear						Beaver									
	B		VM		FM		RC DS - X14		VC DS - V8		VC DS - V27		PR DS VC		PR DS AC	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Water	0%	0%	1%	2%	0%	1%	0%	0%	1%	2%	1%	1%	0%	1%	0%	0%
Sediment	0%	0%	0%	0%	0%	0%	1%	1%	65%	88%	62%	85%	18%	42%	16%	32%
Fish	0%	1%	26%	55%	13%	23%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Aq. Vegetation	0%	0%	0%	0%	0%	0%	0%	1%	21%	53%	21%	52%	7%	24%	6%	20%
Benthic Inv.	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Soil	74%	95%	56%	82%	60%	81%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Berry	3%	10%	5%	11%	10%	26%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Browse	0%	0%	0%	0%	0%	0%	99%	100%	13%	39%	17%	43%	75%	95%	78%	93%
Forage	19%	55%	7%	16%	11%	24%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Lichen	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Moose	1%	4%	1%	6%	2%	7%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Caribou	3%	13%	4%	21%	5%	24%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Hare	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Duck	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Total	100%		100%		100%		100%		100%		100%		100%		100%	

Table G.2 Terrestrial Receptor Intakes by Pathway – Final Closure and Remediation Plan (Cont'd)

Tin	Terrestrial Receptor Intakes by Pathway – Final Closure and Remediation Plan															
	Caribou		Fox						Grouse							
	O		B		VM		FM		B		VS		FN		FS	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Water	1%	2%	0%	0%	0%	1%	0%	1%	0%	0%	0%	1%	0%	0%	0%	0%
Sediment	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Fish	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Aq. Vegetation	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Benthic Inv.	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Soil	58%	97%	32%	88%	10%	38%	14%	45%	76%	96%	48%	60%	47%	59%	46%	58%
Berry	0%	0%	1%	3%	0%	2%	1%	5%	1%	4%	1%	3%	2%	5%	4%	13%
Browse	0%	0%	0%	0%	0%	0%	0%	0%	23%	61%	51%	62%	51%	62%	49%	61%
Forage	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Lichen	41%	93%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Moose	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Caribou	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Hare	0%	0%	1%	2%	0%	1%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%
Duck	0%	0%	67%	99%	89%	100%	84%	99%	0%	0%	0%	0%	0%	0%	0%	0%
Total	100%		100%		100%		100%		100%		100%		100%		100%	

Table G.2 Terrestrial Receptor Intakes by Pathway – Final Closure and Remediation Plan (Cont'd)

Tin	Terrestrial Receptor Intakes by Pathway – Final Closure and Remediation Plan															
	Grouse		Hare										Mallard			
	FW		B		VS		FN		FS		FW		RC DS - X14		VC DS - V8	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Water	0%	0%	0%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Sediment	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	26%	66%	26%	66%
Fish	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Aq. Vegetation	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	7%	25%	7%	25%
Benthic Inv.	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	67%	97%	67%	97%
Soil	66%	92%	71%	94%	59%	70%	52%	66%	56%	68%	55%	78%	0%	0%	0%	0%
Berry	2%	7%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Browse	32%	72%	13%	40%	37%	48%	32%	45%	35%	47%	17%	49%	0%	0%	0%	0%
Forage	0%	0%	16%	50%	4%	10%	16%	41%	9%	20%	27%	47%	0%	0%	0%	0%
Lichen	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Moose	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Caribou	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Hare	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Duck	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Total	100%		100%		100%		100%		100%		100%		100%		100%	

Table G.2 Terrestrial Receptor Intakes by Pathway – Final Closure and Remediation Plan (Cont'd)

Tin	Terrestrial Receptor Intakes by Pathway – Final Closure and Remediation Plan															
	Mallard						Marmot									
	VC DS - V27		PR DS VC		PR DS AC		B		VS		FN		FS		FW	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Water	0%	0%	0%	0%	0%	0%	0%	0%	1%	3%	0%	1%	1%	1%	0%	0%
Sediment	26%	66%	26%	66%	26%	66%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Fish	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Aq. Vegetation	7%	25%	7%	25%	7%	25%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Benthic Inv.	67%	97%	67%	97%	67%	97%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Soil	0%	0%	0%	0%	0%	0%	55%	91%	73%	95%	46%	79%	60%	92%	30%	49%
Berry	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Browse	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Forage	0%	0%	0%	0%	0%	0%	45%	88%	26%	47%	54%	85%	40%	66%	70%	86%
Lichen	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Moose	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Caribou	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Hare	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Duck	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Total	100%		100%		100%		100%		100%		100%		100%		100%	

Table G.2 Terrestrial Receptor Intakes by Pathway – Final Closure and Remediation Plan (Cont'd)

Tin	Terrestrial Receptor Intakes by Pathway – Final Closure and Remediation Plan																	
	Merganser										Mink							
	RC DS - X14		VC DS - V8		VC DS - V27		PR DS VC		PR DS AC		RC DS - X14		VC DS - V8		VC DS - V27		PR DS VC	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Water	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Sediment	31%	44%	31%	44%	31%	44%	31%	44%	31%	44%	33%	58%	33%	58%	33%	58%	32%	56%
Fish	69%	80%	69%	80%	69%	80%	69%	80%	69%	80%	20%	37%	20%	37%	20%	37%	19%	36%
Aq. Vegetation	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	4%	1%	4%	1%	4%	1%	4%
Benthic Inv.	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	13%	39%	13%	39%	13%	39%	13%	38%
Soil	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Berry	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Browse	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Forage	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Lichen	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Moose	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Caribou	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Hare	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	2%	8%
Duck	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	33%	75%	33%	75%	33%	75%	32%	75%
Total	100%		100%		100%		100%		100%		100%		100%		100%		100%	

Table G.2 Terrestrial Receptor Intakes by Pathway – Final Closure and Remediation Plan (Cont'd)

Tin	Terrestrial Receptor Intakes by Pathway – Final Closure and Remediation Plan																	
	Mink		Moose		Scaup										Sheep		Wolf	
	PR DS AC		O		RC DS - X14		VC DS - V8		VC DS - V27		PR DS VC		PR DS AC		S		O	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Water	0%	0%	2%	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	1%	3%
Sediment	33%	57%	83%	94%	45%	87%	45%	87%	45%	87%	45%	87%	45%	87%	0%	0%	0%	0%
Fish	20%	37%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Aq. Vegetation	1%	4%	9%	27%	1%	5%	1%	5%	1%	5%	1%	5%	1%	5%	0%	0%	0%	0%
Benthic Inv.	13%	39%	0%	0%	54%	93%	54%	93%	54%	93%	54%	93%	54%	93%	0%	0%	0%	0%
Soil	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	85%	97%	59%	94%
Berry	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Browse	0%	0%	7%	17%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Forage	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	15%	42%	0%	0%
Lichen	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Moose	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	12%	57%
Caribou	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	26%	86%
Hare	1%	3%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	3%
Duck	33%	75%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Total	100%		100%		100%		100%		100%		100%		100%		100%		100%	

Table G.2 Terrestrial Receptor Intakes by Pathway – Final Closure and Remediation Plan (Cont'd)

Vanadium	Terrestrial Receptor Intakes by Pathway – Final Closure and Remediation Plan															
	Bear						Beaver									
	B		VM		FM		RC DS - X14		VC DS - V8		VC DS - V27		PR DS VC		PR DS AC	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Water	0%	1%	0%	1%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Sediment	0%	0%	0%	0%	0%	0%	33%	64%	33%	65%	31%	62%	34%	65%	32%	60%
Fish	21%	40%	16%	40%	14%	29%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Aq. Vegetation	0%	0%	0%	0%	0%	0%	58%	89%	58%	89%	55%	88%	58%	89%	56%	88%
Benthic Inv.	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Soil	31%	70%	55%	78%	48%	85%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Berry	17%	37%	10%	22%	14%	32%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Browse	0%	0%	0%	0%	0%	0%	9%	24%	9%	27%	13%	42%	8%	21%	13%	34%
Forage	27%	53%	17%	34%	22%	47%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Lichen	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Moose	1%	2%	0%	1%	1%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Caribou	2%	4%	1%	2%	1%	4%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Hare	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Duck	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Total	100%		100%		100%		100%		100%		100%		100%		100%	

Table G.2 Terrestrial Receptor Intakes by Pathway – Final Closure and Remediation Plan (Cont'd)

Vanadium	Terrestrial Receptor Intakes by Pathway – Final Closure and Remediation Plan															
	Caribou		Fox						Grouse							
	O		B		VM		FM		B		VS		FN		FS	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Water	0%	1%	1%	4%	1%	2%	1%	2%	0%	0%	0%	0%	0%	0%	0%	0%
Sediment	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Fish	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Aq. Vegetation	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Benthic Inv.	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Soil	42%	80%	33%	78%	51%	86%	48%	88%	32%	79%	44%	65%	45%	65%	43%	64%
Berry	0%	0%	12%	35%	6%	16%	9%	26%	7%	22%	3%	10%	3%	9%	6%	21%
Browse	2%	5%	0%	0%	0%	0%	0%	0%	60%	91%	52%	74%	52%	74%	51%	73%
Forage	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Lichen	56%	88%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Moose	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Caribou	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Hare	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%
Duck	0%	0%	53%	93%	42%	87%	43%	87%	0%	0%	0%	0%	0%	0%	0%	0%
Total	100%		100%		100%		100%		100%		100%		100%		100%	

Table G.2 Terrestrial Receptor Intakes by Pathway – Final Closure and Remediation Plan (Cont'd)

Vanadium	Terrestrial Receptor Intakes by Pathway – Final Closure and Remediation Plan															
	Grouse		Hare										Mallard			
	FW		B		VS		FN		FS		FW		RC DS - X14		VC DS - V8	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Water	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Sediment	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	39%	73%	39%	73%
Fish	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Aq. Vegetation	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	52%	86%	52%	86%
Benthic Inv.	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	9%	38%	9%	38%
Soil	48%	89%	33%	76%	50%	70%	51%	71%	46%	69%	50%	87%	0%	0%	0%	0%
Berry	5%	16%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Browse	46%	83%	40%	76%	36%	59%	36%	60%	33%	57%	30%	64%	0%	0%	0%	0%
Forage	0%	0%	27%	61%	14%	34%	13%	33%	21%	58%	20%	49%	0%	0%	0%	0%
Lichen	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Moose	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Caribou	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Hare	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Duck	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Total	100%		100%		100%		100%		100%		100%		100%		100%	

Table G.2 Terrestrial Receptor Intakes by Pathway – Final Closure and Remediation Plan (Cont'd)

Vanadium	Terrestrial Receptor Intakes by Pathway – Final Closure and Remediation Plan															
	Mallard						Marmot									
	VC DS - V27		PR DS VC		PR DS AC		B		VS		FN		FS		FW	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Water	0%	0%	0%	0%	0%	0%	0%	1%	0%	1%	0%	0%	0%	1%	0%	1%
Sediment	39%	73%	39%	73%	39%	73%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Fish	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Aq. Vegetation	52%	86%	52%	86%	52%	86%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Benthic Inv.	9%	38%	9%	38%	9%	38%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Soil	0%	0%	0%	0%	0%	0%	26%	77%	48%	88%	52%	92%	41%	87%	40%	88%
Berry	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Browse	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Forage	0%	0%	0%	0%	0%	0%	73%	97%	52%	81%	48%	80%	59%	92%	60%	93%
Lichen	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Moose	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Caribou	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Hare	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Duck	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Total	100%		100%		100%		100%		100%		100%		100%		100%	

Table G.2 Terrestrial Receptor Intakes by Pathway – Final Closure and Remediation Plan (Cont'd)

Vanadium	Terrestrial Receptor Intakes by Pathway – Final Closure and Remediation Plan																	
	Merganser										Mink							
	RC DS - X14		VC DS - V8		VC DS - V27		PR DS VC		PR DS AC		RC DS - X14		VC DS - V8		VC DS - V27		PR DS VC	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Water	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Sediment	37%	51%	37%	51%	37%	51%	37%	51%	37%	51%	55%	71%	55%	71%	55%	71%	55%	71%
Fish	63%	76%	63%	76%	63%	76%	63%	76%	63%	76%	26%	38%	26%	38%	26%	38%	26%	38%
Aq. Vegetation	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	14%	38%	14%	38%	14%	38%	14%	38%
Benthic Inv.	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	6%	1%	6%	1%	6%	1%	6%
Soil	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Berry	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Browse	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Forage	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Lichen	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Moose	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Caribou	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Hare	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Duck	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	4%	12%	4%	12%	4%	12%	4%	12%
Total	100%		100%		100%		100%		100%		100%		100%		100%		100%	

Table G.2 Terrestrial Receptor Intakes by Pathway – Final Closure and Remediation Plan (Cont'd)

Vanadium	Terrestrial Receptor Intakes by Pathway – Final Closure and Remediation Plan																	
	Mink		Moose		Scaup										Sheep		Wolf	
	PR DS AC		O		RC DS - X14		VC DS - V8		VC DS - V27		PR DS VC		PR DS AC		S		O	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Water	0%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	2%	1%	2%
Sediment	55%	71%	44%	73%	76%	95%	76%	95%	76%	95%	76%	95%	76%	95%	0%	0%	0%	0%
Fish	26%	38%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Aq. Vegetation	14%	38%	29%	65%	16%	43%	16%	43%	16%	43%	16%	43%	16%	43%	0%	0%	0%	0%
Benthic Inv.	1%	6%	0%	0%	8%	31%	8%	31%	8%	31%	8%	31%	8%	31%	0%	0%	0%	0%
Soil	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	27%	71%	62%	92%
Berry	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Browse	0%	0%	26%	52%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Forage	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	73%	95%	0%	0%
Lichen	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Moose	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	12%	32%
Caribou	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	25%	60%
Hare	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Duck	4%	12%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Total	100%		100%		100%		100%		100%		100%		100%		100%		100%	

Table G.2 Terrestrial Receptor Intakes by Pathway – Final Closure and Remediation Plan (Cont'd)

Zinc	Terrestrial Receptor Intakes by Pathway – Final Closure and Remediation Plan															
	Bear						Beaver									
	B		VM		FM		RC DS - X14		VC DS - V8		VC DS - V27		PR DS VC		PR DS AC	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Water	0%	0%	0%	0%	0%	0%	0%	1%	0%	1%	0%	1%	0%	0%	0%	0%
Sediment	0%	0%	0%	0%	0%	0%	14%	37%	11%	29%	16%	39%	5%	11%	8%	19%
Fish	22%	39%	41%	81%	46%	80%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Aq. Vegetation	0%	0%	0%	0%	0%	0%	34%	79%	28%	73%	38%	81%	15%	45%	21%	60%
Benthic Inv.	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Soil	8%	20%	8%	19%	16%	41%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Berry	4%	8%	2%	5%	3%	7%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Browse	0%	0%	0%	0%	0%	0%	51%	92%	61%	94%	46%	90%	79%	95%	71%	95%
Forage	20%	48%	27%	72%	18%	47%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Lichen	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Moose	19%	38%	9%	23%	7%	18%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Caribou	27%	53%	13%	34%	11%	27%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Hare	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Duck	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Total	100%		100%		100%		100%		100%		100%		100%		100%	

Table G.2 Terrestrial Receptor Intakes by Pathway – Final Closure and Remediation Plan (Cont'd)

Zinc	Terrestrial Receptor Intakes by Pathway – Final Closure and Remediation Plan															
	Caribou		Fox						Grouse							
	O		B		VM		FM		B		VS		FN		FS	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Water	0%	1%	1%	2%	1%	2%	0%	1%	0%	0%	0%	1%	0%	1%	0%	0%
Sediment	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Fish	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Aq. Vegetation	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Benthic Inv.	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Soil	24%	64%	23%	62%	11%	38%	15%	50%	3%	10%	19%	30%	5%	19%	14%	43%
Berry	0%	0%	8%	23%	2%	6%	2%	6%	1%	2%	2%	8%	2%	6%	1%	3%
Browse	12%	40%	0%	0%	0%	0%	0%	0%	96%	99%	79%	90%	93%	99%	85%	98%
Forage	1%	3%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Lichen	63%	95%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Moose	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Caribou	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Hare	0%	0%	21%	63%	4%	17%	5%	20%	0%	0%	0%	0%	0%	0%	0%	0%
Duck	0%	0%	48%	96%	83%	99%	78%	99%	0%	0%	0%	0%	0%	0%	0%	0%
Total	100%		100%		100%		100%		100%		100%		100%		100%	

Table G.2 Terrestrial Receptor Intakes by Pathway – Final Closure and Remediation Plan (Cont'd)

Zinc	Terrestrial Receptor Intakes by Pathway – Final Closure and Remediation Plan															
	Grouse		Hare										Mallard			
	FW		B		VS		FN		FS		FW		RC DS - X14		VC DS - V8	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Water	0%	0%	0%	0%	0%	1%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%
Sediment	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	22%	52%	22%	52%
Fish	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Aq. Vegetation	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	39%	80%	39%	80%
Benthic Inv.	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	39%	87%	39%	87%
Soil	12%	29%	5%	14%	16%	32%	6%	20%	17%	45%	17%	36%	0%	0%	0%	0%
Berry	1%	3%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Browse	87%	96%	83%	96%	40%	70%	77%	97%	66%	94%	71%	88%	0%	0%	0%	0%
Forage	0%	0%	12%	35%	44%	85%	16%	44%	17%	50%	12%	30%	0%	0%	0%	0%
Lichen	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Moose	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Caribou	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Hare	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Duck	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Total	100%		100%		100%		100%		100%		100%		100%		100%	

Table G.2 Terrestrial Receptor Intakes by Pathway – Final Closure and Remediation Plan (Cont'd)

Zinc	Terrestrial Receptor Intakes by Pathway – Final Closure and Remediation Plan															
	Mallard						Marmot									
	VC DS - V27		PR DS VC		PR DS AC		B		VS		FN		FS		FW	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Water	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	1%	0%	1%	0%	1%
Sediment	22%	52%	22%	52%	22%	52%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Fish	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Aq. Vegetation	39%	80%	39%	80%	39%	80%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Benthic Inv.	39%	87%	39%	87%	39%	87%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Soil	0%	0%	0%	0%	0%	0%	11%	36%	11%	37%	8%	18%	22%	59%	26%	56%
Berry	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Browse	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Forage	0%	0%	0%	0%	0%	0%	89%	99%	89%	99%	92%	98%	77%	97%	74%	94%
Lichen	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Moose	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Caribou	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Hare	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Duck	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Total	100%		100%		100%		100%		100%		100%		100%		100%	

Table G.2 Terrestrial Receptor Intakes by Pathway – Final Closure and Remediation Plan (Cont'd)

Zinc	Terrestrial Receptor Intakes by Pathway – Final Closure and Remediation Plan																	
	Merganser										Mink							
	RC DS - X14		VC DS - V8		VC DS - V27		PR DS VC		PR DS AC		RC DS - X14		VC DS - V8		VC DS - V27		PR DS VC	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Water	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Sediment	3%	5%	3%	5%	3%	5%	3%	5%	3%	5%	8%	14%	8%	14%	8%	14%	8%	14%
Fish	97%	99%	97%	99%	97%	99%	97%	99%	97%	99%	77%	90%	77%	90%	77%	90%	76%	90%
Aq. Vegetation	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	3%	8%	3%	8%	3%	8%	3%	8%
Benthic Inv.	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	2%	9%	2%	9%	2%	9%	2%	9%
Soil	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Berry	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Browse	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Forage	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Lichen	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Moose	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Caribou	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Hare	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	2%	1%	2%	0%	1%	1%	3%
Duck	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	11%	34%	11%	34%	11%	34%	10%	34%
Total	100%		100%		100%		100%		100%		100%		100%		100%		100%	

Table G.2 Terrestrial Receptor Intakes by Pathway – Final Closure and Remediation Plan (Cont'd)

Zinc	Terrestrial Receptor Intakes by Pathway – Final Closure and Remediation Plan																	
	Mink		Moose		Scaup										Sheep		Wolf	
	PR DS AC		O		RC DS - X14		VC DS - V8		VC DS - V27		PR DS VC		PR DS AC		S		O	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Water	0%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%
Sediment	7%	14%	7%	23%	50%	85%	50%	85%	50%	85%	50%	85%	50%	85%	0%	0%	0%	0%
Fish	76%	90%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Aq. Vegetation	3%	8%	7%	26%	13%	39%	13%	39%	13%	39%	13%	39%	13%	39%	0%	0%	0%	0%
Benthic Inv.	2%	9%	0%	0%	37%	85%	37%	85%	37%	85%	37%	85%	37%	85%	0%	0%	0%	0%
Soil	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	45%	77%	4%	13%
Berry	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Browse	0%	0%	86%	98%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Forage	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	55%	87%	0%	0%
Lichen	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Moose	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	40%	69%
Caribou	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	55%	82%
Hare	2%	6%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	3%
Duck	10%	33%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Total	100%		100%		100%		100%		100%		100%		100%		100%		100%	

APPENDIX H

NUMERICAL SCREENING INDEX AND HAZARD QUOTIENT VALUES

Table H.1 Sediment Screening Index Values – Existing Conditions

COPC and Type of Sediment Toxicity Benchmark	Sediment Toxicity Benchmark (mg/kg)	Sediment Screening Index Values – Existing Conditions											
		Rose Creek Upstream		Rose Creek Downstream		Vangorda Creek Upstream		Vangorda Creek Downstream		Pelly River Upstream		Pelly River @ Crossing	
		Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Arsenic													
CCME - ISQG	5.9	**1.1**	**2.7**	**1.5**	**4.7**	**3.1**	**12.0**	**4.2**	**15.3**	0.890	**1.2**	**2.3**	**8.6**
CCME - PEL	17	0.378	0.949	0.527	**1.6**	**1.1**	**4.2**	**1.5**	**5.3**	0.309	0.413	0.800	**3.0**
Thompson - LEL	10	0.642	**1.6**	0.895	**2.7**	**1.8**	**7.1**	**2.5**	**9.0**	0.525	0.702	**1.4**	**5.1**
Thompson - SEL	346	0.019	0.047	0.026	0.079	0.053	0.205	0.072	0.261	0.015	0.020	0.039	0.146
Cadmium													
CCME - ISQG	0.6	0.839	**2.4**	**1.1**	**3.7**	**1.2**	**3.8**	**1.9**	**7.5**	**3.2**	**4.6**	**2.4**	**8.9**
CCME - PEL	3.5	0.144	0.416	0.181	0.637	0.197	0.648	0.325	**1.3**	0.542	0.794	0.413	**1.5**
Chromium													
CCME - ISQG	37.3	0.308	**1.1**	0.533	**1.8**	0.865	**3.3**	0.592	**2.2**	-	-	**1.3**	**4.7**
CCME - PEL	90	0.128	0.440	0.221	0.738	0.358	**1.4**	0.246	0.892	-	-	0.528	**2.0**
Thompson - LEL	47.6	0.242	0.832	0.418	**1.4**	0.678	**2.6**	0.464	**1.7**	-	-	0.998	**3.7**
Thompson - SEL	115.4	0.100	0.343	0.172	0.576	0.280	**1.1**	0.191	0.696	-	-	0.412	**1.5**
Copper													
CCME - ISQG	35.7	**1.1**	**3.2**	**1.6**	**4.7**	**1.9**	**5.2**	**1.7**	**3.6**	**7.0**	**9.4**	**6.7**	**21.6**
CCME - PEL	197	0.201	0.580	0.281	0.849	0.340	0.947	0.310	0.656	**1.3**	**1.7**	**1.2**	**3.9**
Thompson - LEL	22	**1.8**	**5.2**	**2.5**	**7.6**	**3.0**	**8.5**	**2.8**	**5.9**	**11.3**	**15.3**	**10.8**	**35.1**
Thompson - SEL	269	0.147	0.425	0.206	0.622	0.249	0.694	0.227	0.480	0.925	**1.3**	0.886	**2.9**
Lead													
CCME - ISQG	35	0.710	**2.7**	**2.7**	**10.7**	**1.9**	**5.8**	**2.1**	**6.6**	**3.8**	**5.5**	**1.4**	**5.1**
CCME - PEL	91.3	0.272	**1.0**	**1.0**	**4.1**	0.718	**2.2**	0.794	**2.5**	**1.4**	**2.1**	0.518	**1.9**
Thompson - LEL	37	0.671	**2.5**	**2.5**	**10.1**	**1.8**	**5.4**	**2.0**	**6.3**	**3.6**	**5.2**	**1.3**	**4.8**
Thompson - SEL	412	0.060	0.228	0.229	0.908	0.159	0.489	0.176	0.564	0.320	0.466	0.115	0.431
Manganese													
CCME - ISQG	460	**1.4**	**5.0**	**34.9**	**126.8**	0.603	**1.7**	0.486	**1.4**	0.554	0.814	**2.9**	**10.5**
CCME - PEL	1100	0.599	**2.1**	**14.6**	**53.0**	0.252	0.709	0.203	0.574	0.232	0.341	**1.2**	**4.4**
Nickel													
CCME - ISQG	18	**1.1**	**4.5**	**2.8**	**9.1**	**2.2**	**8.2**	**2.0**	**7.1**	0.954	**1.3**	**4.9**	**16.6**
CCME - PEL	35.9	0.559	**2.2**	**1.4**	**4.6**	**1.1**	**4.1**	0.989	**3.6**	0.478	0.641	**2.5**	**8.3**
Thompson - LEL	23	0.872	**3.5**	**2.2**	**7.1**	**1.7**	**6.4**	**1.5**	**5.6**	0.746	1.000	**3.8**	**13.0**
Thompson - SEL	484	0.041	0.166	0.104	0.338	0.081	0.304	0.073	0.264	0.035	0.048	0.183	0.616
Selenium													
Thompson - LEL	1.9	0.001	0.002	0.001	0.003	0.002	0.005	0.001	0.003	-	-	0.001	0.002
Thompson - SEL	16.1	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	-	-	0.000	0.000
Vanadium													
Thompson - LEL	35.2	0.557	**1.1**	0.692	**2.5**	0.560	**1.2**	0.470	0.757	-	-	**3.2**	**12.0**
Thompson - SEL	160	0.123	0.242	0.152	0.557	0.123	0.270	0.103	0.166	-	-	0.709	**2.6**
Zinc													
CCME - ISQG	123	**1.1**	**4.3**	**2.7**	**7.3**	0.657	**2.1**	**3.2**	**8.9**	0.542	0.793	**1.4**	**5.2**
CCME - PEL	315	0.415	**1.7**	**1.1**	**2.9**	0.257	0.823	**1.3**	**3.5**	0.212	0.310	0.562	**2.0**

Note: - – not calculated due to a lack of water quality data

BOLD SHADE indicates the value is above a SI benchmark of 1.

Table H.2 Sediment Screening Index Values – Final Closure and Remediation Plan

COPC and Type of Sediment Toxicity Benchmark	Sediment Toxicity Benchmark (mg/kg)	Sediment Screening Index Values – Final Closure and Remediation Plan									
		Rose Creek Downstream - X14		Vangorda Creek Downstream - V8		Vangorda Creek Downstream - V27		Pelly River Downstream Vangorda Creek		Pelly River Downstream Anvil Creek	
		Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Arsenic											
CCME - ISQG	5.9	**1.5**	**3.1**	**1.2**	**2.9**	**1.5**	**3.8**	0.742	0.991	0.742	0.991
CCME - PEL	17	0.528	**1.1**	0.402	**1.0**	0.508	**1.3**	0.258	0.344	0.257	0.344
Thompson - LEL	10	0.898	**1.8**	0.684	**1.7**	0.864	**2.3**	0.438	0.585	0.438	0.585
Thompson - SEL	346	0.026	0.053	0.020	0.050	0.025	0.066	0.013	0.017	0.013	0.017
Cadmium											
CCME - ISQG	0.6	**2.7**	**10.4**	**1.2**	**3.7**	**2.1**	**6.5**	**1.3**	**1.9**	**1.3**	**1.9**
CCME - PEL	3.5	0.466	**1.8**	0.199	0.635	0.365	**1.1**	0.227	0.333	0.227	0.334
Chromium											
CCME - ISQG	37.3	0.444	**1.0**	0.238	0.379	0.271	0.513	0.375	0.504	0.375	0.504
CCME - PEL	90	0.184	0.423	0.098	0.157	0.112	0.213	0.155	0.209	0.155	0.209
Thompson - LEL	47.6	0.348	0.799	0.186	0.297	0.212	0.402	0.294	0.395	0.294	0.395
Thompson - SEL	115.4	0.143	0.330	0.077	0.122	0.087	0.166	0.121	0.163	0.121	0.163
Copper											
CCME - ISQG	35.7	**6.4**	**15.7**	**3.7**	**9.7**	**4.4**	**12.4**	**2.0**	**2.6**	**2.0**	**2.6**
CCME - PEL	197	**1.2**	**2.8**	0.677	**1.8**	0.795	**2.2**	0.356	0.479	0.356	0.480
Thompson - LEL	22	**10.3**	**25.4**	**6.1**	**15.7**	**7.1**	**20.1**	**3.2**	**4.3**	**3.2**	**4.3**
Thompson - SEL	269	0.843	**2.1**	0.496	**1.3**	0.582	**1.6**	0.261	0.351	0.261	0.351
Lead											
CCME - ISQG	35	0.680	**1.2**	0.531	0.810	0.631	**1.0**	0.203	0.298	0.203	0.297
CCME - PEL	91.3	0.261	0.453	0.204	0.311	0.242	0.389	0.078	0.114	0.078	0.114
Thompson - LEL	37	0.644	**1.1**	0.502	0.767	0.597	0.961	0.192	0.282	0.192	0.281
Thompson - SEL	412	0.058	0.100	0.045	0.069	0.054	0.086	0.017	0.025	0.017	0.025
Manganese											
CCME - ISQG	460	**1.6**	**3.2**	**2.3**	**6.6**	**3.6**	**10.3**	0.833	**1.2**	0.833	**1.2**
CCME - PEL	1100	0.671	**1.3**	0.967	**2.7**	**1.5**	**4.3**	0.348	0.510	0.348	0.511
Nickel											
CCME - ISQG	18	**1.5**	**3.1**	**3.0**	**5.0**	**5.9**	**9.5**	**4.6**	**6.2**	**4.6**	**6.2**
CCME - PEL	35.9	0.757	**1.5**	**1.5**	**2.5**	**3.0**	**4.7**	**2.3**	**3.1**	**2.3**	**3.1**
Thompson - LEL	23	**1.2**	**2.4**	**2.4**	**3.9**	**4.6**	**7.4**	**3.6**	**4.9**	**3.6**	**4.9**
Thompson - SEL	484	0.056	0.114	0.112	0.185	0.220	0.352	0.173	0.232	0.173	0.232
Selenium											
Thompson - LEL	1.9	0.003	0.010	0.001	0.001	0.001	0.001	0.001	0.002	0.001	0.002
Thompson - SEL	16.1	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Vanadium											
Thompson - LEL	35.2	0.531	0.765	0.712	**1.6**	0.939	**2.6**	0.617	0.828	0.617	0.829
Thompson - SEL	160	0.117	0.168	0.157	0.362	0.207	0.572	0.136	0.182	0.136	0.182
Zinc											
CCME - ISQG	123	**12.3**	**36.2**	**6.7**	**22.6**	**13.3**	**42.3**	**1.5**	**2.2**	**1.5**	**2.2**
CCME - PEL	315	**4.8**	**14.1**	**2.6**	**8.8**	**5.2**	**16.5**	0.587	0.864	0.587	0.864

Note: **BOLD SHADE** indicates the value is above a SI benchmark of 1.

Table H.3 Aquatic Screening Index Values – Existing Conditions

COPC and Aquatic Receptor	Aquatic Toxicity Reference Value (mg/L)	Aquatic Screening Index Values – Existing Conditions											
		Rose Creek Upstream		Rose Creek Downstream		Vangorda Creek Upstream		Vangorda Creek Downstream		Pelly River Upstream		Pelly River @ Crossing	
		Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Antimony													
Aquatic Plants	-	-	-	-	-	-	-	-	-	-	-	-	-
Phytoplankton	0.24	0.005	0.019	0.011	0.043	0.013	0.046	0.008	0.031	0.000	0.000	0.001	0.001
Benthic Invertebrates	2.6	0.000	0.002	0.001	0.004	0.001	0.004	0.001	0.003	0.000	0.000	0.000	0.000
Zooplankton	1.35	0.001	0.003	0.002	0.008	0.002	0.008	0.001	0.005	0.000	0.000	0.000	0.000
Predator Fish	4	0.000	0.001	0.001	0.003	0.001	0.003	n/a	n/a	0.000	0.000	0.000	0.000
Forage Fish	2.31	0.001	0.002	0.001	0.004	0.001	0.005	n/a	n/a	0.000	0.000	0.000	0.000
Arsenic													
Aquatic Plants	0.25	0.003	0.007	0.004	0.012	0.008	0.032	0.011	0.041	0.002	0.002	0.006	0.022
Phytoplankton	0.02	0.036	0.089	0.050	0.151	0.103	0.4	0.141	0.517	0.029	0.029	0.076	0.281
Benthic Invertebrates	0.34	0.002	0.005	0.003	0.009	0.006	0.023	0.008	0.030	0.002	0.002	0.004	0.017
Zooplankton	0.91	0.001	0.002	0.001	0.003	0.002	0.009	0.003	0.011	0.001	0.001	0.002	0.006
Predator Fish	0.14	0.005	0.013	0.007	0.022	0.015	0.057	n/a	n/a	0.004	0.004	0.011	0.040
Forage Fish	0.12	0.006	0.015	0.008	0.025	0.017	0.066	n/a	n/a	0.005	0.005	0.013	0.047
Beryllium													
Aquatic Plants	100	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Phytoplankton	0.004	0.118	0.164	0.377	**1.5**	0.095	0.193	0.873	**3.7**	0.000	0.000	0.017	0.055
Benthic Invertebrates	0.017	0.028	0.038	0.089	0.361	0.022	0.045	0.205	0.879	0.000	0.000	0.004	0.013
Zooplankton	0.0038	0.124	0.172	0.396	**1.6**	0.100	0.203	0.919	**3.9**	0.000	0.000	0.018	0.057
Predator Fish	0.095	0.005	0.007	0.016	0.065	0.004	0.008	n/a	n/a	0.000	0.000	0.001	0.002
Forage Fish	0.057	0.008	0.011	0.026	0.108	0.007	0.014	n/a	n/a	0.000	0.000	0.001	0.004
Boron													
Aquatic Plants	16	0.003	0.005	0.003	0.007	0.004	0.009	0.002	0.006	0.000	0.000	0.000	0.000
Phytoplankton	0.58	0.091	0.126	0.071	0.186	0.097	0.244	0.066	0.154	0.000	0.000	0.012	0.012
Benthic Invertebrates	137.6	0.000	0.001	0.000	0.001	0.000	0.001	0.000	0.001	0.000	0.000	0.000	0.000
Zooplankton	14.1	0.004	0.005	0.003	0.008	0.004	0.010	0.003	0.006	0.000	0.000	0.000	0.000
Predator Fish	45	0.001	0.002	0.001	0.002	0.001	0.003	n/a	n/a	0.000	0.000	0.000	0.000
Forage Fish	-	-	-	-	-	-	-	-	-	-	-	-	-
Cadmium													
Aquatic Plants	0.0043	0.031	0.089	0.037	0.121	0.042	0.138	0.068	0.254	0.116	0.116	0.088	0.310
Phytoplankton	0.02	0.007	0.019	0.008	0.026	0.009	0.030	0.015	0.055	0.025	0.025	0.019	0.067
Benthic Invertebrates	0.00036	0.367	**1.1**	0.439	**1.4**	0.507	**1.6**	0.806	**3.0**	**1.4**	**1.4**	**1.0**	**3.7**
Zooplankton	0.00032	0.413	**1.2**	0.493	**1.6**	0.571	**1.9**	0.907	**3.4**	**1.6**	**1.6**	**1.2**	**4.2**
Predator Fish	0.00029	0.456	**1.3**	0.544	**1.8**	0.630	**2.0**	n/a	n/a	**1.7**	**1.7**	**1.3**	**4.6**
Forage Fish	0.0014	0.094	0.273	0.113	0.370	0.130	0.423	n/a	n/a	0.357	0.357	0.269	0.953

Note: **BOLD SHADE** indicates the value is above a SI benchmark of 1.

Table H.3 Aquatic Screening Index Values – Existing Conditions (Cont'd)

COPC and Aquatic Receptor	Aquatic Toxicity Reference Value (mg/L)	Aquatic Screening Index Values – Existing Conditions											
		Rose Creek Upstream		Rose Creek Downstream		Vangorda Creek Upstream		Vangorda Creek Downstream		Pelly River Upstream		Pelly River @ Crossing	
		Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Chromium													
Aquatic Plants	0.002	0.358	**1.2**	0.633	**2.1**	0.984	**3.6**	0.678	**2.4**	0.000	0.000	**1.5**	**5.6**
Phytoplankton	-	-	-	-	-	-	-	-	-	-	-	-	-
Benthic Invertebrates	-	-	-	-	-	-	-	-	-	-	-	-	-
Zooplankton	0.006	0.119	0.403	0.211	0.704	0.328	**1.2**	0.226	0.792	0.000	0.000	0.499	**1.9**
Predator Fish	0.073	0.010	0.033	0.017	0.058	0.027	0.099	n/a	n/a	0.000	0.000	0.041	0.152
Forage Fish	-	-	-	-	-	-	-	-	-	-	-	-	-
Cobalt													
Aquatic Plants	-	-	-	-	-	-	-	-	-	-	-	-	-
Phytoplankton	0.22	0.002	0.005	0.006	0.019	0.004	0.011	0.014	0.055	0.005	0.005	0.004	0.014
Benthic Invertebrates	1.6	0.000	0.001	0.001	0.003	0.001	0.001	0.002	0.008	0.001	0.001	0.001	0.002
Zooplankton	0.005	0.107	0.200	0.251	0.845	0.168	0.480	0.605	**2.4**	0.200	0.200	0.179	0.634
Predator Fish	0.12	0.004	0.008	0.010	0.035	0.007	0.020	n/a	n/a	0.008	0.008	0.007	0.026
Forage Fish	0.2	0.003	0.005	0.006	0.021	0.004	0.012	n/a	n/a	0.005	0.005	0.004	0.016
Copper													
Aquatic Plants	0.0096	0.082	0.232	0.116	0.341	0.139	0.385	0.127	0.256	0.519	0.519	0.491	**1.6**
Phytoplankton	0.004	0.197	0.557	0.278	0.818	0.335	0.924	0.305	0.615	**1.2**	**1.2**	**1.2**	**3.8**
Benthic Invertebrates	0.0041	0.192	0.543	0.271	0.798	0.327	0.901	0.297	0.600	**1.2**	**1.2**	**1.1**	**3.8**
Zooplankton	0.0041	0.192	0.543	0.271	0.798	0.327	0.901	0.297	0.600	**1.2**	**1.2**	**1.1**	**3.8**
Predator Fish	0.0041	0.192	0.543	0.271	0.798	0.327	0.901	n/a	n/a	**1.2**	**1.2**	**1.1**	**3.8**
Forage Fish	0.0041	0.192	0.543	0.271	0.798	0.327	0.901	n/a	n/a	**1.2**	**1.2**	**1.1**	**3.8**
Lead													
Aquatic Plants	182	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Phytoplankton	0.63	0.001	0.005	0.005	0.019	0.003	0.010	0.004	0.011	0.007	0.007	0.002	0.009
Benthic Invertebrates	0.002	0.410	**1.6**	**1.5**	**6.1**	**1.1**	**3.2**	**1.2**	**3.6**	**2.1**	**2.1**	0.749	**2.8**
Zooplankton	0.02	0.041	0.155	0.149	0.606	0.108	0.316	0.115	0.358	0.213	0.213	0.075	0.280
Predator Fish	0.028	0.029	0.111	0.107	0.433	0.077	0.226	n/a	n/a	0.152	0.152	0.053	0.200
Forage Fish	0.42	0.002	0.007	0.007	0.029	0.005	0.015	n/a	n/a	0.010	0.010	0.004	0.013
Manganese													
Aquatic Plants	12.4	0.003	0.010	0.072	0.268	0.001	0.003	0.001	0.003	0.001	0.001	0.006	0.020
Phytoplankton	37.1	0.001	0.003	0.024	0.090	0.000	0.001	0.000	0.001	0.000	0.000	0.002	0.007
Benthic Invertebrates	46	0.001	0.003	0.019	0.072	0.000	0.001	0.000	0.001	0.000	0.000	0.002	0.005
Zooplankton	1.8	0.020	0.071	0.493	**1.8**	0.008	0.023	0.007	0.019	0.008	0.008	0.040	0.138
Predator Fish	0.73	0.050	0.174	**1.2**	**4.6**	0.021	0.056	n/a	n/a	0.019	0.019	0.098	0.341
Forage Fish	2.06	0.018	0.062	0.431	**1.6**	0.007	0.020	n/a	n/a	0.007	0.007	0.035	0.121

Note: **BOLD SHADE** indicates the value is above a SI benchmark of 1.

Table H.3 Aquatic Screening Index Values – Existing Conditions (Cont'd)

COPC and Aquatic Receptor	Aquatic Toxicity Reference Value (mg/L)	Aquatic Screening Index Values – Existing Conditions											
		Rose Creek Upstream		Rose Creek Downstream		Vangorda Creek Upstream		Vangorda Creek Downstream		Pelly River Upstream		Pelly River @ Crossing	
		Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Nickel													
Aquatic Plants	0.18	0.007	0.026	0.016	0.050	0.012	0.045	0.011	0.041	0.006	0.006	0.028	0.091
Phytoplankton	0.03	0.040	0.157	0.095	0.298	0.074	0.269	0.069	0.245	0.033	0.033	0.169	0.547
Benthic Invertebrates	0.86	0.001	0.005	0.003	0.010	0.003	0.009	0.002	0.009	0.001	0.001	0.006	0.019
Zooplankton	0.06	0.020	0.079	0.047	0.149	0.037	0.135	0.034	0.122	0.017	0.017	0.084	0.274
Predator Fish	0.06	0.020	0.079	0.047	0.149	0.037	0.135	n/a	n/a	0.017	0.017	0.084	0.274
Forage Fish	0.29	0.004	0.016	0.010	0.031	0.008	0.028	n/a	n/a	0.003	0.003	0.017	0.057
Selenium													
Aquatic Plants	0.68	0.001	0.003	0.002	0.004	0.002	0.006	0.001	0.004	0.000	0.000	0.001	0.002
Phytoplankton	0.19	0.004	0.010	0.006	0.014	0.008	0.023	0.005	0.014	0.000	0.000	0.005	0.008
Benthic Invertebrates	0.18	0.004	0.011	0.006	0.015	0.008	0.024	0.006	0.015	0.000	0.000	0.005	0.008
Zooplankton	0.025	0.031	0.079	0.042	0.106	0.060	0.176	0.040	0.106	0.000	0.000	0.035	0.059
Predator Fish	0.05	0.016	0.040	0.021	0.053	0.030	0.088	n/a	n/a	0.000	0.000	0.018	0.030
Forage Fish	0.15	0.005	0.013	0.007	0.018	0.010	0.029	n/a	n/a	0.000	0.000	0.006	0.010
Silver													
Aquatic Plants	-	-	-	-	-	-	-	-	-	-	-	-	-
Phytoplankton	-	-	-	-	-	-	-	-	-	-	-	-	-
Benthic Invertebrates	-	-	-	-	-	-	-	-	-	-	-	-	-
Zooplankton	0.00058	0.277	0.863	0.375	**1.2**	0.523	**1.9**	0.212	0.400	0.172	0.172	0.188	0.352
Predator Fish	0.00092	0.175	0.544	0.236	0.772	0.330	**1.2**	n/a	n/a	0.109	0.109	0.119	0.222
Forage Fish	0.00104	0.155	0.481	0.209	0.683	0.292	**1.1**	n/a	n/a	0.096	0.096	0.105	0.196
Strontium													
Aquatic Plants	-	-	-	-	-	-	-	-	-	-	-	-	-
Phytoplankton	150	0.001	0.001	0.001	0.003	0.001	0.002	0.001	0.001	0.000	0.000	0.001	0.002
Benthic Invertebrates	10	0.012	0.022	0.019	0.038	0.014	0.035	0.010	0.020	0.000	0.000	0.018	0.027
Zooplankton	42	0.003	0.005	0.005	0.009	0.003	0.008	0.002	0.005	0.000	0.000	0.004	0.006
Predator Fish	9.3	0.013	0.023	0.021	0.041	0.015	0.037	n/a	n/a	0.000	0.000	0.019	0.029
Forage Fish	3.4	0.036	0.064	0.056	0.113	0.041	0.102	n/a	n/a	0.000	0.000	0.052	0.080
Vanadium													
Aquatic Plants	-	-	-	-	-	-	-	-	-	-	-	-	-
Phytoplankton	0.9	0.001	0.001	0.001	0.003	0.001	0.001	0.001	0.001	0.000	0.000	0.003	0.013
Benthic Invertebrates	0.024	0.023	0.045	0.029	0.109	0.023	0.048	0.020	0.029	0.000	0.000	0.130	0.472
Zooplankton	1.9	0.000	0.001	0.000	0.001	0.000	0.001	0.000	0.000	0.000	0.000	0.002	0.006
Predator Fish	0.04	0.014	0.027	0.018	0.066	0.014	0.029	n/a	n/a	0.000	0.000	0.078	0.283
Forage Fish	0.04	0.014	0.027	0.018	0.066	0.014	0.029	n/a	n/a	0.000	0.000	0.078	0.283

Note: **BOLD SHADE** indicates the value is above a SI benchmark of 1.

Table H.3 Aquatic Screening Index Values – Existing Conditions (Cont'd)

COPC and Aquatic Receptor	Aquatic Toxicity Reference Value (mg/L)	Aquatic Screening Index Values – Existing Conditions											
		Rose Creek Upstream		Rose Creek Downstream		Vangorda Creek Upstream		Vangorda Creek Downstream		Pelly River Upstream		Pelly River @ Crossing	
		Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Zinc													
Aquatic Plants	0.73	0.022	0.090	0.057	0.146	0.014	0.043	0.069	0.189	0.011	0.011	0.030	0.102
Phytoplankton	0.0022	**7.2**	**29.9**	**19.0**	**48.4**	**4.7**	**14.3**	**22.9**	**62.6**	**3.8**	**3.8**	**9.8**	**33.9**
Benthic Invertebrates	0.044	0.360	**1.5**	0.949	**2.4**	0.234	0.713	**1.1**	**3.1**	0.190	0.190	0.491	**1.7**
Zooplankton	0.06	0.264	**1.1**	0.696	**1.8**	0.171	0.523	0.841	**2.3**	0.139	0.139	0.360	**1.2**
Predator Fish	0.2	0.079	0.329	0.209	0.532	0.051	0.157	n/a	n/a	0.042	0.042	0.108	0.373
Forage Fish	0.33	0.048	0.199	0.127	0.323	0.031	0.095	n/a	n/a	0.025	0.025	0.066	0.226

Note: n/a – fish are not assessed at Vangorda Creek Downstream due to barriers to access.
BOLD SHADE indicates the value is above a SI benchmark of 1.

Table H.4 Aquatic Screening Index Values – Final Closure and Remediation Plan

COPC and Aquatic Receptor	Aquatic Toxicity Reference Value (mg/L)	Aquatic Screening Index Values – Final Closure and Remediation Plan									
		Rose Creek Downstream - X14		Vangorda Creek Downstream - V8		Vangorda Creek Downstream - V27		Pelly River Downstream Vangorda Creek		Pelly River Downstream Anvil Creek	
		Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Antimony											
Aquatic Plants	-	-	-	-	-	-	-	-	-	-	-
Phytoplankton	0.24	0.002	0.002	0.002	0.003	0.003	0.004	0.001	0.001	0.001	0.001
Benthic Invertebrates	2.6	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Zooplankton	1.35	0.000	0.000	0.000	0.000	0.001	0.001	0.000	0.000	0.000	0.000
Predator Fish	4	0.000	0.000	0.000	0.000	n/a	n/a	0.000	0.000	0.000	0.000
Forage Fish	2.31	0.000	0.000	0.000	0.000	n/a	n/a	0.000	0.000	0.000	0.000
Arsenic											
Aquatic Plants	0.25	0.004	0.008	0.003	0.007	0.004	0.010	0.002	0.002	0.002	0.002
Phytoplankton	0.02	0.049	0.095	0.037	0.090	0.048	0.125	0.024	0.024	0.024	0.026
Benthic Invertebrates	0.34	0.003	0.006	0.002	0.005	0.003	0.007	0.001	0.001	0.001	0.002
Zooplankton	0.91	0.001	0.002	0.001	0.002	0.001	0.003	0.001	0.001	0.001	0.001
Predator Fish	0.14	0.007	0.014	0.005	0.013	n/a	n/a	0.003	0.003	0.003	0.004
Forage Fish	0.12	0.008	0.016	0.006	0.015	n/a	n/a	0.004	0.004	0.004	0.004
Beryllium											
Aquatic Plants	100	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Phytoplankton	0.004	0.147	0.181	0.131	0.141	0.137	0.158	0.002	0.002	0.007	0.009
Benthic Invertebrates	0.017	0.035	0.043	0.031	0.033	0.032	0.037	0.000	0.000	0.002	0.002
Zooplankton	0.0038	0.155	0.190	0.138	0.148	0.145	0.166	0.002	0.002	0.008	0.009
Predator Fish	0.095	0.006	0.008	0.006	0.006	n/a	n/a	0.000	0.000	0.000	0.000
Forage Fish	0.057	0.010	0.013	0.009	0.010	n/a	n/a	0.000	0.000	0.001	0.001
Boron											
Aquatic Plants	16	0.002	0.002	0.002	0.002	0.002	0.002	0.000	0.000	0.000	0.000
Phytoplankton	0.58	0.046	0.050	0.043	0.044	0.043	0.046	0.004	0.004	0.006	0.007
Benthic Invertebrates	137.6	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Zooplankton	14.1	0.002	0.002	0.002	0.002	0.002	0.002	0.000	0.000	0.000	0.000
Predator Fish	45	0.001	0.001	0.001	0.001	n/a	n/a	0.000	0.000	0.000	0.000
Forage Fish	-	-	-	-	-	-	-	-	-	-	-
Cadmium											
Aquatic Plants	0.0043	0.100	0.387	0.043	0.129	0.078	0.226	0.049	0.049	0.048	0.065
Phytoplankton	0.02	0.021	0.083	0.009	0.028	0.017	0.049	0.010	0.011	0.010	0.014
Benthic Invertebrates	0.00036	**1.2**	**4.6**	0.512	**1.5**	0.929	**2.7**	0.583	0.590	0.578	0.776
Zooplankton	0.00032	**1.3**	**5.2**	0.576	**1.7**	**1.0**	**3.0**	0.655	0.664	0.650	0.873
Predator Fish	0.00029	**1.5**	**5.7**	0.636	**1.9**	n/a	n/a	0.723	0.733	0.717	0.963
Forage Fish	0.0014	0.307	**1.2**	0.132	0.396	n/a	n/a	0.150	0.152	0.149	0.200

Note: **BOLD SHADE** indicates the value is above a SI benchmark of 1.

Table H.4 Aquatic Screening Index Values – Final Closure and Remediation Plan (Cont'd)

COPC and Aquatic Receptor	Aquatic Toxicity Reference Value (mg/L)	Aquatic Screening Index Values – Final Closure and Remediation Plan									
		Rose Creek Downstream - X14		Vangorda Creek Downstream - V8		Vangorda Creek Downstream - V27		Pelly River Downstream Vangorda Creek		Pelly River Downstream Anvil Creek	
		Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Chromium											
Aquatic Plants	0.002	0.511	**1.1**	0.276	0.399	0.314	0.550	0.434	0.435	0.430	0.441
Phytoplankton	-	-	-	-	-	-	-	-	-	-	-
Benthic Invertebrates	-	-	-	-	-	-	-	-	-	-	-
Zooplankton	0.006	0.170	0.374	0.092	0.133	0.105	0.183	0.145	0.145	0.143	0.147
Predator Fish	0.073	0.014	0.031	0.008	0.011	n/a	n/a	0.012	0.012	0.012	0.012
Forage Fish	-	-	-	-	-	-	-	-	-	-	-
Cobalt											
Aquatic Plants	-	-	-	-	-	-	-	-	-	-	-
Phytoplankton	0.22	0.004	0.006	0.004	0.009	0.006	0.012	0.001	0.001	0.001	0.001
Benthic Invertebrates	1.6	0.000	0.001	0.001	0.001	0.001	0.002	0.000	0.000	0.000	0.000
Zooplankton	0.005	0.155	0.275	0.176	0.381	0.254	0.548	0.028	0.029	0.032	0.036
Predator Fish	0.12	0.006	0.011	0.007	0.016	n/a	n/a	0.001	0.001	0.001	0.001
Forage Fish	0.2	0.004	0.007	0.004	0.010	n/a	n/a	0.001	0.001	0.001	0.001
Copper											
Aquatic Plants	0.0096	0.461	**1.1**	0.279	0.694	0.326	0.887	0.146	0.148	0.152	0.174
Phytoplankton	0.004	**1.1**	**2.6**	0.670	**1.7**	0.781	**2.1**	0.351	0.356	0.366	0.418
Benthic Invertebrates	0.0041	**1.1**	**2.5**	0.654	**1.6**	0.762	**2.1**	0.342	0.348	0.357	0.408
Zooplankton	0.0041	**1.1**	**2.5**	0.654	**1.6**	0.762	**2.1**	0.342	0.348	0.357	0.408
Predator Fish	0.0041	**1.1**	**2.5**	0.654	**1.6**	n/a	n/a	0.342	0.348	0.357	0.408
Forage Fish	0.0041	**1.1**	**2.5**	0.654	**1.6**	n/a	n/a	0.342	0.348	0.357	0.408
Lead											
Aquatic Plants	182	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Phytoplankton	0.63	0.001	0.002	0.001	0.001	0.001	0.002	0.000	0.000	0.000	0.000
Benthic Invertebrates	0.002	0.387	0.586	0.302	0.363	0.359	0.486	0.116	0.116	0.123	0.126
Zooplankton	0.02	0.039	0.059	0.030	0.036	0.036	0.049	0.012	0.012	0.012	0.013
Predator Fish	0.028	0.028	0.042	0.022	0.026	n/a	n/a	0.008	0.008	0.009	0.009
Forage Fish	0.42	0.002	0.003	0.001	0.002	n/a	n/a	0.001	0.001	0.001	0.001
Manganese											
Aquatic Plants	12.4	0.003	0.006	0.005	0.013	0.007	0.020	0.002	0.002	0.002	0.002
Phytoplankton	37.1	0.001	0.002	0.002	0.004	0.002	0.007	0.001	0.001	0.001	0.001
Benthic Invertebrates	46	0.001	0.002	0.001	0.003	0.002	0.005	0.000	0.000	0.000	0.000
Zooplankton	1.8	0.023	0.041	0.032	0.086	0.051	0.139	0.012	0.012	0.012	0.013
Predator Fish	0.73	0.056	0.102	0.079	0.213	n/a	n/a	0.029	0.030	0.029	0.031
Forage Fish	2.06	0.020	0.036	0.028	0.075	n/a	n/a	0.010	0.011	0.010	0.011

Note: **BOLD SHADE** indicates the value is above a SI benchmark of 1.

Table H.4 Aquatic Screening Index Values – Final Closure and Remediation Plan (Cont'd)

COPC and Aquatic Receptor	Aquatic Toxicity Reference Value (mg/L)	Aquatic Screening Index Values – Final Closure and Remediation Plan									
		Rose Creek Downstream - X14		Vangorda Creek Downstream - V8		Vangorda Creek Downstream - V27		Pelly River Downstream Vangorda Creek		Pelly River Downstream Anvil Creek	
		Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Nickel											
Aquatic Plants	0.18	0.009	0.017	0.018	0.027	0.035	0.051	0.027	0.027	0.026	0.026
Phytoplankton	0.03	0.052	0.100	0.106	0.160	0.209	0.304	0.163	0.163	0.157	0.158
Benthic Invertebrates	0.86	0.002	0.003	0.004	0.006	0.007	0.011	0.006	0.006	0.005	0.006
Zooplankton	0.06	0.026	0.050	0.053	0.080	0.104	0.152	0.082	0.082	0.079	0.079
Predator Fish	0.06	0.026	0.050	0.053	0.080	n/a	n/a	0.082	0.082	0.079	0.079
Forage Fish	0.29	0.005	0.010	0.011	0.017	n/a	n/a	0.017	0.017	0.016	0.016
Selenium											
Aquatic Plants	0.68	0.004	0.012	0.001	0.001	0.001	0.001	0.002	0.002	0.002	0.002
Phytoplankton	0.19	0.013	0.043	0.003	0.003	0.003	0.004	0.006	0.006	0.006	0.007
Benthic Invertebrates	0.18	0.014	0.045	0.003	0.003	0.003	0.004	0.007	0.007	0.007	0.007
Zooplankton	0.025	0.101	0.325	0.021	0.025	0.023	0.030	0.048	0.048	0.047	0.054
Predator Fish	0.05	0.051	0.163	0.011	0.012	n/a	n/a	0.024	0.024	0.024	0.027
Forage Fish	0.15	0.017	0.054	0.004	0.004	n/a	n/a	0.008	0.008	0.008	0.009
Silver											
Aquatic Plants	-	-	-	-	-	-	-	-	-	-	-
Phytoplankton	-	-	-	-	-	-	-	-	-	-	-
Benthic Invertebrates	-	-	-	-	-	-	-	-	-	-	-
Zooplankton	0.00058	0.046	0.050	0.044	0.051	0.045	0.059	0.011	0.011	0.012	0.013
Predator Fish	0.00092	0.029	0.031	0.028	0.032	n/a	n/a	0.007	0.007	0.008	0.008
Forage Fish	0.00104	0.026	0.028	0.024	0.029	n/a	n/a	0.006	0.006	0.007	0.007
Strontium											
Aquatic Plants	-	-	-	-	-	-	-	-	-	-	-
Phytoplankton	150	0.001	0.001	0.001	0.001	0.001	0.002	0.001	0.001	0.001	0.001
Benthic Invertebrates	10	0.018	0.018	0.019	0.021	0.021	0.023	0.022	0.022	0.022	0.022
Zooplankton	42	0.004	0.004	0.005	0.005	0.005	0.006	0.005	0.005	0.005	0.005
Predator Fish	9.3	0.019	0.020	0.021	0.022	n/a	n/a	0.024	0.024	0.023	0.023
Forage Fish	3.4	0.052	0.054	0.057	0.061	n/a	n/a	0.065	0.065	0.064	0.064

Note: **BOLD SHADE** indicates the value is above a SI benchmark of 1.

Table H.4 Aquatic Screening Index Values – Final Closure and Remediation Plan (Cont'd)

COPC and Aquatic Receptor	Aquatic Toxicity Reference Value (mg/L)	Aquatic Screening Index Values – Final Closure and Remediation Plan									
		Rose Creek Downstream - X14		Vangorda Creek Downstream - V8		Vangorda Creek Downstream - V27		Pelly River Downstream Vangorda Creek		Pelly River Downstream Anvil Creek	
		Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Vanadium											
Aquatic Plants	-	-	-	-	-	-	-	-	-	-	-
Phytoplankton	0.9	0.001	0.001	0.001	0.002	0.001	0.003	0.001	0.001	0.001	0.001
Benthic Invertebrates	0.024	0.022	0.027	0.030	0.067	0.039	0.103	0.025	0.026	0.025	0.025
Zooplankton	1.9	0.000	0.000	0.000	0.001	0.000	0.001	0.000	0.000	0.000	0.000
Predator Fish	0.04	0.013	0.016	0.018	0.040	n/a	n/a	0.015	0.015	0.015	0.015
Forage Fish	0.04	0.013	0.016	0.018	0.040	n/a	n/a	0.015	0.015	0.015	0.015
Zinc											
Aquatic Plants	0.73	0.257	0.708	0.146	0.473	0.286	0.882	0.032	0.035	0.035	0.052
Phytoplankton	0.0022	**85.1**	**234.9**	**48.4**	**157.0**	**94.8**	**292.6**	**10.6**	**11.5**	**11.7**	**17.1**
Benthic Invertebrates	0.044	**4.3**	**11.7**	**2.4**	**7.9**	**4.7**	**14.6**	0.528	0.573	0.587	0.855
Zooplankton	0.06	**3.1**	**8.6**	**1.8**	**5.8**	**3.5**	**10.7**	0.387	0.420	0.431	0.627
Predator Fish	0.2	0.936	**2.6**	0.532	**1.7**	n/a	n/a	0.116	0.126	0.129	0.188
Forage Fish	0.33	0.568	**1.6**	0.322	**1.0**	n/a	n/a	0.070	0.076	0.078	0.114

Note: n/a – fish are not assessed at V27 due to barriers to access.

BOLD SHADE indicates the value is above a SI benchmark of 1.

Table H.5 Terrestrial Receptor Screening Index Values – Existing Conditions

COPC	Predicted Screening Index Values for Terrestrial Receptors – Existing Conditions																	
	Bear						Beaver											
	B		VM		FM		RC US		RC DS		VC US		VC DS		PR US		PRX	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Antimony	0.006	0.012	0.007	0.013	0.008	0.014	0.031	0.123	0.066	0.282	0.082	0.317	0.073	0.237	<0.001	<0.001	0.032	0.093
Arsenic	0.004	0.008	0.014	0.026	0.018	0.041	0.004	0.009	0.009	0.026	0.009	0.027	0.012	0.036	0.004	0.007	0.008	0.020
Beryllium	0.001	0.002	0.009	0.033	0.005	0.015	<0.001	0.002	0.003	0.011	<0.001	0.002	0.007	0.026	<0.001	<0.001	<0.001	0.002
Boron	0.003	0.005	0.004	0.006	0.003	0.006	0.002	0.004	0.001	0.002	0.002	0.004	0.003	0.009	0.001	0.004	0.003	0.009
Cadmium	0.076	0.229	0.072	0.224	0.073	0.225	0.088	0.208	0.097	0.269	0.110	0.310	0.159	0.496	0.242	0.399	0.203	0.635
Chromium	0.002	0.005	0.007	0.013	0.007	0.015	0.006	0.020	0.004	0.011	0.009	0.029	0.004	0.011	0.005	0.018	0.007	0.024
Cobalt	<0.001	<0.001	<0.001	<0.001	<0.001	0.001	<0.001	0.002	0.002	0.006	0.001	0.004	0.006	0.019	0.001	0.004	0.003	0.009
Copper	0.014	0.020	0.011	0.016	0.015	0.025	0.004	0.009	0.006	0.013	0.006	0.014	0.006	0.011	0.016	0.033	0.016	0.049
Lead	<0.001	<0.001	0.002	0.004	0.018	0.056	<0.001	<0.001	0.002	0.006	<0.001	0.001	<0.001	0.002	<0.001	0.001	<0.001	0.001
Manganese	0.016	0.041	0.020	0.048	0.025	0.071	0.007	0.015	0.049	0.143	0.006	0.012	0.015	0.052	0.006	0.012	0.017	0.055
Nickel	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.001	<0.001	0.001	<0.001	0.001	<0.001	<0.001	<0.001	0.002
Selenium	0.081	0.223	0.040	0.068	0.044	0.070	0.025	0.072	0.020	0.047	0.028	0.082	0.059	0.131	0.021	0.069	0.059	0.130
Silver	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Strontium	0.002	0.005	0.001	0.002	0.004	0.007	0.004	0.010	0.005	0.015	0.004	0.012	0.004	0.010	<0.001	0.003	0.005	0.015
Tin	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.001	0.012	0.019	<0.001	0.002	<0.001	0.003	<0.001	<0.001	<0.001	<0.001
Vanadium	0.005	0.010	0.008	0.013	0.008	0.020	0.016	0.045	0.020	0.077	0.016	0.046	0.015	0.038	<0.001	0.002	0.091	0.329
Zinc	0.021	0.038	0.049	0.113	0.046	0.085	0.020	0.041	0.039	0.111	0.019	0.037	0.023	0.057	0.018	0.036	0.018	0.046
SI Benchmark	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

Table H.5 Terrestrial Receptor Screening Index Values – Existing Conditions (Cont'd)

COPC	Predicted Screening Index Values for Terrestrial Receptors – Existing Conditions																	
	Caribou		Fox						Grouse									
	O		B		VM		FM		B		VS		FN		FS		FW	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Antimony	0.006	0.012	0.002	0.005	0.004	0.007	0.004	0.009	no tox	no tox	no tox	no tox	no tox	no tox	no tox	no tox	no tox	no tox
Arsenic	0.025	0.078	0.005	0.016	0.021	0.076	0.012	0.031	0.003	0.005	0.006	0.010	0.001	0.002	0.013	0.033	0.005	0.013
Beryllium	0.001	0.002	<0.001	<0.001	0.003	0.010	0.002	0.005	no tox	no tox	no tox	no tox	no tox	no tox	no tox	no tox	no tox	no tox
Boron	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.015	0.034	0.063	0.200	0.012	0.042	0.023	0.076	0.009	0.012
Cadmium	0.009	0.021	0.015	0.051	0.009	0.034	0.006	0.019	0.071	0.164	0.048	0.069	0.055	0.118	0.067	0.182	0.052	0.118
Chromium	0.005	0.013	<0.001	0.001	0.007	0.023	0.007	0.022	0.032	0.123	0.015	0.020	0.007	0.017	0.011	0.025	0.007	0.019
Cobalt	<0.001	<0.001	<0.001	0.002	0.002	0.007	<0.001	0.003	no tox	no tox	no tox	no tox	no tox	no tox	no tox	no tox	no tox	no tox
Copper	0.007	0.020	0.003	0.008	0.002	0.003	0.003	0.007	0.006	0.010	0.007	0.010	0.013	0.037	0.012	0.022	0.009	0.014
Lead	0.022	0.068	<0.001	<0.001	<0.001	0.002	0.007	0.022	0.005	0.008	0.060	0.093	0.223	0.674	0.554	**1.458**	0.245	0.518
Manganese	0.010	0.022	0.002	0.005	0.002	0.005	0.001	0.003	0.018	0.038	0.035	0.100	0.014	0.038	0.013	0.040	0.025	0.038
Nickel	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.001	0.001	0.005	0.003	0.004	0.001	0.003	0.003	0.006	0.002	0.006
Selenium	0.023	0.075	0.004	0.010	0.093	0.364	0.098	0.367	0.076	0.235	0.058	0.084	0.076	0.246	0.056	0.110	0.024	0.040
Silver	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	no tox	no tox	no tox	no tox	no tox	no tox	no tox	no tox	no tox	no tox
Strontium	<0.001	0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	no tox	no tox	no tox	no tox	no tox	no tox	no tox	no tox	no tox	no tox
Tin	<0.001	0.001	<0.001	<0.001	0.007	0.026	0.006	0.021	0.003	0.005	0.002	0.004	0.001	0.002	0.001	0.002	0.001	0.002
Vanadium	0.007	0.015	0.001	0.003	0.004	0.008	0.005	0.015	0.003	0.006	0.006	0.012	0.008	0.020	0.006	0.018	0.004	0.010
Zinc	0.029	0.080	0.006	0.015	0.025	0.089	0.025	0.077	0.129	0.249	0.047	0.064	0.229	0.748	0.327	0.956	0.154	0.247
SI Benchmark	0.5	0.5	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

Note: **BOLD SHADE** indicates the value is above the SI benchmark.

Table H.5 Terrestrial Receptor Screening Index Values – Existing Conditions (Cont'd)

COPC	Predicted Screening Index Values for Terrestrial Receptors – Existing Conditions																	
	Hare										Mallard							
	B		VS		FN		FS		FW		RC US		RC DS		VC US		VC DS	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Antimony	0.019	0.036	0.174	0.577	0.175	0.564	0.173	0.553	0.020	0.036	no tox	no tox	no tox	no tox	no tox	no tox	no tox	no tox
Arsenic	0.020	0.039	0.064	0.092	0.013	0.022	0.112	0.253	0.048	0.138	0.009	0.035	0.011	0.047	0.025	0.093	0.033	0.141
Beryllium	0.004	0.008	0.007	0.015	0.007	0.015	0.006	0.014	0.005	0.008	no tox	no tox	no tox	no tox	no tox	no tox	no tox	no tox
Boron	0.015	0.028	0.053	0.155	0.012	0.032	0.022	0.058	0.011	0.015	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cadmium	0.208	0.476	0.141	0.206	0.162	0.338	0.196	0.512	0.155	0.344	0.029	0.093	0.034	0.120	0.040	0.136	0.061	0.234
Chromium	0.033	0.119	0.023	0.032	0.012	0.025	0.017	0.037	0.013	0.032	0.002	0.007	0.004	0.012	0.006	0.021	0.004	0.014
Cobalt	0.001	0.002	0.012	0.042	0.007	0.025	0.012	0.046	0.004	0.008	no tox	no tox	no tox	no tox	no tox	no tox	no tox	no tox
Copper	0.026	0.041	0.025	0.033	0.040	0.100	0.046	0.081	0.038	0.055	0.002	0.007	0.003	0.010	0.003	0.011	0.003	0.009
Lead	<0.001	0.001	0.009	0.014	0.022	0.062	0.082	0.214	0.037	0.079	0.003	0.011	0.010	0.039	0.007	0.022	0.008	0.026
Manganese	0.071	0.149	0.153	0.401	0.057	0.119	0.045	0.116	0.109	0.231	<0.001	0.003	0.017	0.063	<0.001	<0.001	<0.001	<0.001
Nickel	0.002	0.004	0.003	0.004	0.001	0.003	0.003	0.006	0.004	0.009	<0.001	0.001	<0.001	0.002	<0.001	0.002	<0.001	0.002
Selenium	0.283	0.797	0.149	0.223	0.155	0.474	0.139	0.251	0.062	0.100	0.046	0.187	0.063	0.259	0.091	0.388	0.062	0.255
Silver	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	no tox	no tox	no tox	no tox	no tox	no tox	no tox	no tox
Strontium	0.012	0.027	0.011	0.029	0.010	0.026	0.014	0.030	0.016	0.031	no tox	no tox	no tox	no tox	no tox	no tox	no tox	no tox
Tin	0.001	0.003	<0.001	0.001	<0.001	0.001	<0.001	<0.001	<0.001	0.001	0.008	0.029	0.014	0.052	0.016	0.063	0.017	0.067
Vanadium	0.016	0.031	0.031	0.054	0.040	0.091	0.029	0.083	0.024	0.055	0.005	0.012	0.006	0.023	0.005	0.013	0.004	0.010
Zinc	0.125	0.234	0.112	0.297	0.212	0.654	0.336	0.868	0.158	0.249	0.007	0.027	0.016	0.053	0.004	0.015	0.019	0.066
SI Benchmark	1	1	1	1	1	1	1	1	1	1	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5

Table H.5 Terrestrial Receptor Screening Index Values – Existing Conditions (Cont'd)

COPC	Predicted Screening Index Values for Terrestrial Receptors – Existing Conditions																	
	Mallard				Marmot										Merganser			
	PR US		PRX		B		VS		FN		FS		FW		RC US		RC DS	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Antimony	no tox	no tox	no tox	no tox	0.010	0.018	0.010	0.018	0.010	0.018	0.010	0.018	0.010	0.018	no tox	no tox	no tox	no tox
Arsenic	0.007	0.028	0.017	0.073	0.008	0.019	0.041	0.069	0.007	0.012	0.053	0.118	0.024	0.068	<0.001	0.002	<0.001	0.003
Beryllium	no tox	no tox	no tox	no tox	0.003	0.004	0.003	0.005	0.004	0.008	0.003	0.005	0.003	0.005	no tox	no tox	no tox	no tox
Boron	no data	no data	<0.001	<0.001	0.012	0.027	0.028	0.093	0.009	0.023	0.017	0.030	0.012	0.020	<0.001	<0.001	<0.001	<0.001
Cadmium	0.105	0.237	0.083	0.304	0.027	0.081	0.017	0.024	0.022	0.062	0.019	0.045	0.026	0.047	0.002	0.005	0.002	0.006
Chromium	no data	no data	0.009	0.032	0.007	0.015	0.014	0.026	0.009	0.017	0.011	0.023	0.010	0.020	0.006	0.021	0.011	0.037
Cobalt	no tox	no tox	no tox	no tox	<0.001	0.002	<0.001	<0.001	<0.001	<0.001	0.001	0.003	0.004	0.013	no tox	no tox	no tox	no tox
Copper	0.013	0.036	0.012	0.042	0.024	0.048	0.017	0.027	0.022	0.031	0.029	0.053	0.031	0.048	0.002	0.004	0.002	0.006
Lead	0.014	0.026	0.005	0.018	<0.001	<0.001	0.004	0.007	0.003	0.008	0.044	0.115	0.017	0.036	0.002	0.007	0.006	0.027
Manganese	<0.001	<0.001	0.001	0.005	0.072	0.215	0.179	0.594	0.072	0.164	0.043	0.127	0.127	0.393	0.001	0.005	0.034	0.128
Nickel	<0.001	<0.001	0.001	0.004	<0.001	0.002	0.002	0.004	<0.001	0.002	0.001	0.003	0.004	0.014	<0.001	<0.001	<0.001	0.002
Selenium	no data	no data	0.054	0.222	0.328	**1.154**	0.106	0.231	0.034	0.083	0.080	0.176	0.036	0.096	0.012	0.032	0.017	0.045
Silver	no tox	no tox	no tox	no tox	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	no tox	no tox	no tox	no tox
Strontium	no tox	no tox	no tox	no tox	0.012	0.029	0.003	0.009	0.012	0.033	0.020	0.043	0.026	0.046	no tox	no tox	no tox	no tox
Tin	no data	no data	0.003	0.011	<0.001	0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.002	0.007	0.003	0.012
Vanadium	no data	no data	0.027	0.100	0.012	0.022	0.016	0.026	0.018	0.033	0.015	0.030	0.015	0.031	0.002	0.005	0.003	0.011
Zinc	0.003	0.009	0.009	0.033	0.036	0.103	0.161	0.555	0.042	0.069	0.117	0.317	0.052	0.115	0.025	0.103	0.061	0.167
SI Benchmark	0.5	0.5	0.5	0.5	1	1	1	1	1	1	1	1	1	1	0.5	0.5	0.5	0.5

Note: **BOLD SHADE** indicates the value is above the SI benchmark.

Table H.5 Terrestrial Receptor Screening Index Values – Existing Conditions (Cont'd)

COPC	Predicted Screening Index Values for Terrestrial Receptors – Existing Conditions																	
	Merganser								Mink									
	VC US		VC DS		PR US		PRX		RC US		RC DS		VC US		VC DS		PR US	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Antimony	no tox	no tox	no tox	no tox	no tox	no tox	no tox	no tox	0.023	0.091	0.050	0.204	0.061	0.231	0.036	0.143	<0.001	<0.001
Arsenic	0.002	0.008	0.003	0.010	<0.001	<0.001	0.001	0.005	0.040	0.122	0.054	0.181	0.113	0.420	0.153	0.601	0.032	0.092
Beryllium	no tox	no tox	no tox	no tox	no tox	no tox	no tox	no tox	0.012	0.019	0.037	0.161	0.010	0.021	0.088	0.372	<0.001	<0.001
Boron	<0.001	0.001	<0.001	<0.001	no data	no data	<0.001	<0.001	<0.001	<0.001	<0.001	0.001	<0.001	0.001	<0.001	<0.001	<0.001	<0.001
Cadmium	0.002	0.007	0.003	0.012	0.006	0.010	0.004	0.016	0.053	0.160	0.063	0.212	0.073	0.248	0.111	0.436	0.194	0.360
Chromium	0.017	0.065	0.012	0.044	no data	no data	0.027	0.098	0.019	0.063	0.033	0.112	0.052	0.191	0.036	0.133	<0.001	<0.001
Cobalt	no tox	no tox	no tox	no tox	no tox	no tox	no tox	no tox	0.002	0.005	0.004	0.015	0.003	0.009	0.010	0.042	0.003	0.008
Copper	0.003	0.007	0.002	0.005	0.010	0.012	0.009	0.029	0.013	0.038	0.019	0.056	0.023	0.063	0.020	0.042	0.083	0.114
Lead	0.005	0.014	0.005	0.017	0.009	0.013	0.003	0.012	<0.001	0.003	0.003	0.013	0.002	0.007	0.002	0.008	0.004	0.006
Manganese	<0.001	0.002	<0.001	0.001	<0.001	<0.001	0.003	0.010	0.010	0.034	0.232	0.855	0.004	0.011	0.003	0.009	0.004	0.005
Nickel	<0.001	0.001	<0.001	0.001	<0.001	<0.001	<0.001	0.003	<0.001	0.004	0.002	0.006	0.002	0.006	0.002	0.006	<0.001	<0.001
Selenium	0.024	0.075	0.016	0.045	no data	no data	0.014	0.026	0.129	0.407	0.178	0.559	0.253	0.885	0.172	0.577	<0.001	<0.001
Silver	no tox	no tox	no tox	no tox	no tox	no tox	no tox	no tox	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Strontium	no tox	no tox	no tox	no tox	no tox	no tox	no tox	no tox	0.010	0.021	0.016	0.037	0.012	0.031	0.008	0.019	<0.001	<0.001
Tin	0.004	0.013	0.004	0.014	no data	no data	<0.001	<0.001	0.005	0.020	0.009	0.034	0.011	0.040	0.011	0.039	<0.001	<0.001
Vanadium	0.002	0.005	0.002	0.003	no data	no data	0.014	0.048	0.038	0.077	0.048	0.185	0.038	0.084	0.032	0.054	<0.001	<0.001
Zinc	0.015	0.047	0.073	0.204	0.012	0.020	0.032	0.113	0.050	0.205	0.123	0.335	0.030	0.094	0.146	0.412	0.025	0.040
SI Benchmark	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	1	1	1	1	1	1	1	1	1	1

Table H.5 Terrestrial Receptor Screening Index Values – Existing Conditions (Cont'd)

COPC	Predicted Screening Index Values for Terrestrial Receptors – Existing Conditions																			
	Mink		Moose		Scaup												Sheep		Wolf	
	PRX		O		RC US		RC DS		VC US		VC DS		PR US		PRX		S		O	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Antimony	0.006	0.016	0.007	0.024	no tox	no tox	no tox	no tox	no tox	no tox	no tox	no tox	no tox	no tox	no tox	no tox	0.008	0.015	0.001	0.002
Arsenic	0.079	0.309	0.010	0.029	0.015	0.057	0.020	0.079	0.042	0.160	0.058	0.239	0.012	0.046	0.030	0.123	0.007	0.012	0.002	0.007
Beryllium	0.002	0.006	<0.001	0.002	no tox	no tox	no tox	no tox	no tox	no tox	no tox	no tox	no tox	no tox	no tox	no tox	0.003	0.007	<0.001	<0.001
Boron	<0.001	<0.001	0.002	0.004	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	no data	no data	<0.001	<0.001	0.006	0.014	<0.001	<0.001
Cadmium	0.152	0.556	0.065	0.150	0.026	0.092	0.032	0.117	0.037	0.133	0.055	0.211	0.096	0.298	0.076	0.292	0.007	0.015	0.181	**0.606**
Chromium	0.080	0.299	0.004	0.012	0.008	0.028	0.014	0.049	0.023	0.084	0.016	0.057	no data	no data	0.035	0.130	0.005	0.011	0.001	0.003
Cobalt	0.003	0.011	<0.001	0.002	no tox	no tox	no tox	no tox	no tox	no tox	no tox	no tox	no tox	no tox	no tox	no tox	<0.001	0.002	<0.001	<0.001
Copper	0.078	0.247	0.007	0.011	0.004	0.013	0.006	0.020	0.007	0.022	0.006	0.017	0.026	0.064	0.025	0.083	0.015	0.027	0.011	0.023
Lead	0.002	0.006	0.001	0.005	0.009	0.035	0.031	0.128	0.023	0.073	0.025	0.083	0.046	0.072	0.016	0.058	0.001	0.003	0.002	0.005
Manganese	0.019	0.067	0.031	0.104	0.002	0.009	0.058	0.210	0.001	0.003	<0.001	0.002	<0.001	0.001	0.005	0.017	0.053	0.095	<0.001	0.002
Nickel	0.004	0.012	<0.001	0.001	<0.001	0.004	0.002	0.006	0.002	0.006	0.001	0.005	<0.001	0.001	0.003	0.012	0.001	0.004	<0.001	<0.001
Selenium	0.149	0.452	0.027	0.073	0.072	0.302	0.099	0.416	0.144	**0.618**	0.098	0.414	no data	no data	0.085	0.361	0.026	0.080	0.044	0.081
Silver	<0.001	<0.001	<0.001	<0.001	no tox	no tox	no tox	no tox	no tox	no tox	no tox	no tox	no tox	no tox	no tox	no tox	<0.001	<0.001	<0.001	<0.001
Strontium	0.015	0.029	0.002	0.005	no tox	no tox	no tox	no tox	no tox	no tox	no tox	no tox	no tox	no tox	no tox	no tox	0.011	0.028	<0.001	<0.001
Tin	0.002	0.005	<0.001	<0.001	0.014	0.056	0.026	0.097	0.030	0.118	0.031	0.126	no data	no data	0.005	0.019	0.001	0.003	<0.001	<0.001
Vanadium	0.220	0.774	0.008	0.020	0.008	0.017	0.010	0.038	0.008	0.018	0.007	0.012	no data	no data	0.046	0.159	0.006	0.012	0.001	0.003
Zinc	0.065	0.226	0.044	0.137	0.010	0.041	0.026	0.080	0.006	0.022	0.030	0.100	0.005	0.014	0.014	0.050	0.025	0.045	0.033	0.062
SI Benchmark	1	1	1	1	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	1	1	0.25	0.25

Note: **BOLD SHADE** indicates the value is above the SI benchmark.

Table H.6 Terrestrial Receptor Screening Index Values – Final Closure and Remediation Plan

COPC	Predicted Screening Index Values for Terrestrial Receptors – Final Closure and Remediation Plan															
	Bear						Beaver									
	B		VM		FM		RC DS - X14		VC DS - V8		VC DS - V27		PR DS VC		PR DS AC	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Antimony	0.007	0.012	0.007	0.012	0.007	0.012	0.014	0.044	0.016	0.051	0.043	0.116	0.006	0.018	0.031	0.093
Arsenic	0.004	0.008	0.012	0.023	0.018	0.041	0.009	0.026	0.004	0.009	0.006	0.011	0.004	0.007	0.005	0.009
Beryllium	0.001	0.002	0.003	0.004	0.003	0.004	0.001	0.003	0.001	0.003	0.001	0.003	<0.001	<0.001	<0.001	0.001
Boron	0.003	0.005	0.004	0.006	0.003	0.006	0.001	0.002	0.001	0.003	0.003	0.009	0.001	0.003	0.003	0.009
Cadmium	0.083	0.220	0.080	0.213	0.083	0.217	0.211	0.715	0.108	0.281	0.150	0.391	0.119	0.192	0.127	0.228
Chromium	0.003	0.006	0.006	0.010	0.006	0.014	0.003	0.007	0.005	0.018	0.002	0.004	0.006	0.019	0.003	0.004
Cobalt	<0.001	<0.001	<0.001	<0.001	<0.001	0.001	0.001	0.003	0.001	0.004	0.003	0.009	<0.001	<0.001	0.002	0.006
Copper	0.011	0.018	0.012	0.018	0.017	0.029	0.015	0.038	0.009	0.023	0.010	0.026	0.006	0.011	0.007	0.012
Lead	<0.001	<0.001	0.002	0.004	0.018	0.055	0.001	0.004	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Manganese	0.017	0.041	0.021	0.048	0.016	0.045	0.016	0.028	0.008	0.016	0.017	0.052	0.006	0.013	0.015	0.049
Nickel	<0.001	<0.001	<0.001	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.001	<0.001	0.001	<0.001	0.001
Selenium	0.085	0.211	0.038	0.064	0.052	0.091	0.027	0.068	0.024	0.073	0.058	0.127	0.027	0.077	0.060	0.130
Silver	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Strontium	0.003	0.006	0.002	0.003	0.004	0.007	0.005	0.014	0.005	0.015	0.006	0.017	0.006	0.017	0.006	0.018
Tin	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.012	0.019	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Vanadium	0.006	0.011	0.009	0.014	0.008	0.019	0.015	0.041	0.021	0.061	0.027	0.086	0.018	0.046	0.019	0.047
Zinc	0.025	0.041	0.071	0.176	0.078	0.164	0.063	0.171	0.034	0.085	0.040	0.109	0.021	0.039	0.019	0.045
SI Benchmark	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

Table H.6 Terrestrial Receptor Screening Index Values – Final Closure and Remediation Plan (Cont'd)

COPC	Predicted Screening Index Values for Terrestrial Receptors – Final Closure and Remediation Plan															
	Caribou		Fox						Grouse							
	O		B		VM		FM		B		VS		FN		FS	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Antimony	0.006	0.012	0.003	0.006	0.003	0.005	0.003	0.005	no tox	no tox	no tox	no tox	no tox	no tox	no tox	no tox
Arsenic	0.024	0.077	0.005	0.019	0.009	0.026	0.011	0.032	0.003	0.005	0.006	0.010	0.001	0.002	0.013	0.032
Beryllium	0.001	0.002	<0.001	0.002	<0.001	0.002	<0.001	0.002	no tox	no tox	no tox	no tox	no tox	no tox	no tox	no tox
Boron	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.015	0.033	0.062	0.200	0.012	0.042	0.022	0.073
Cadmium	0.009	0.021	0.005	0.015	0.008	0.031	0.013	0.050	0.071	0.164	0.048	0.070	0.054	0.117	0.066	0.175
Chromium	0.005	0.013	0.003	0.012	0.004	0.010	0.005	0.017	0.030	0.117	0.014	0.020	0.007	0.016	0.011	0.026
Cobalt	<0.001	<0.001	<0.001	0.001	<0.001	0.003	<0.001	0.002	no tox	no tox	no tox	no tox	no tox	no tox	no tox	no tox
Copper	0.008	0.020	0.001	0.002	0.002	0.005	0.004	0.011	0.006	0.011	0.008	0.010	0.012	0.038	0.012	0.021
Lead	0.022	0.067	<0.001	<0.001	<0.001	0.002	0.007	0.023	0.005	0.008	0.060	0.092	0.220	0.668	0.561	**1.481**
Manganese	0.010	0.021	0.002	0.004	0.002	0.005	<0.001	0.002	0.018	0.038	0.034	0.095	0.014	0.036	0.013	0.040
Nickel	<0.001	<0.001	<0.001	<0.001	<0.001	0.002	<0.001	<0.001	0.001	0.005	0.003	0.004	0.001	0.003	0.003	0.006
Selenium	0.022	0.072	0.076	0.267	0.055	0.210	0.235	0.895	0.078	0.239	0.058	0.084	0.076	0.255	0.057	0.111
Silver	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	no tox	no tox	no tox	no tox	no tox	no tox	no tox	no tox
Strontium	<0.001	0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	no tox	no tox	no tox	no tox	no tox	no tox	no tox	no tox
Tin	<0.001	0.001	0.004	0.013	0.004	0.014	0.001	0.005	0.003	0.005	0.002	0.004	0.001	0.003	0.001	0.002
Vanadium	0.007	0.014	0.003	0.009	0.006	0.016	0.004	0.012	0.003	0.006	0.006	0.012	0.008	0.021	0.006	0.018
Zinc	0.029	0.079	0.009	0.031	0.074	0.278	0.094	0.342	0.128	0.250	0.047	0.064	0.228	0.762	0.323	0.926
SI Benchmark	0.5	0.5	1	1	1	1	1	1	1	1	1	1	1	1	1	1

Note: **BOLD SHADE** indicates the value is above the SI benchmark.

Table H.6 Terrestrial Receptor Screening Index Values – Final Closure and Remediation Plan (Cont'd)

COPC	Predicted Screening Index Values for Terrestrial Receptors – Final Closure and Remediation Plan															
	Grouse		Hare										Mallard			
	FW		B		VS		FN		FS		FW		RC DS - X14		VC DS - V8	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Antimony	no tox	no tox	0.020	0.036	0.174	0.573	0.171	0.558	0.175	0.568	0.020	0.036	no tox	no tox	no tox	no tox
Arsenic	0.005	0.013	0.020	0.040	0.065	0.093	0.013	0.022	0.111	0.249	0.048	0.139	0.011	0.047	0.009	0.037
Beryllium	no tox	no tox	0.004	0.008	0.006	0.014	0.007	0.015	0.006	0.014	0.004	0.008	no tox	no tox	no tox	no tox
Boron	0.009	0.012	0.014	0.028	0.052	0.149	0.012	0.032	0.021	0.056	0.011	0.015	<0.001	<0.001	<0.001	<0.001
Cadmium	0.052	0.119	0.209	0.474	0.141	0.206	0.161	0.340	0.192	0.487	0.155	0.338	0.089	0.339	0.039	0.133
Chromium	0.007	0.019	0.032	0.113	0.023	0.032	0.012	0.024	0.017	0.038	0.013	0.032	0.003	0.007	0.002	0.003
Cobalt	no tox	no tox	0.001	0.002	0.012	0.042	0.007	0.025	0.012	0.042	0.004	0.008	no tox	no tox	no tox	no tox
Copper	0.009	0.014	0.026	0.041	0.026	0.033	0.040	0.102	0.046	0.081	0.038	0.055	0.011	0.036	0.007	0.021
Lead	0.242	**0.509**	<0.001	0.001	0.009	0.014	0.022	0.062	0.084	0.220	0.037	0.077	0.003	0.005	0.002	0.004
Manganese	0.025	0.038	0.072	0.150	0.153	0.394	0.056	0.120	0.045	0.115	0.108	0.230	<0.001	0.002	0.001	0.003
Nickel	0.002	0.005	0.002	0.004	0.003	0.004	0.001	0.003	0.003	0.006	0.004	0.009	<0.001	<0.001	<0.001	0.002
Selenium	0.024	0.040	0.280	0.765	0.149	0.223	0.157	0.488	0.139	0.251	0.062	0.102	0.147	**0.618**	0.032	0.134
Silver	no tox	no tox	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	no tox	no tox	no tox	no tox
Strontium	no tox	no tox	0.012	0.027	0.011	0.029	0.011	0.027	0.014	0.030	0.016	0.031	no tox	no tox	no tox	no tox
Tin	0.001	0.002	0.001	0.003	<0.001	0.001	<0.001	0.001	<0.001	<0.001	<0.001	0.001	0.003	0.011	0.006	0.021
Vanadium	0.004	0.010	0.016	0.032	0.031	0.055	0.040	0.092	0.029	0.082	0.024	0.058	0.004	0.011	0.006	0.017
Zinc	0.153	0.247	0.124	0.230	0.112	0.291	0.211	0.655	0.332	0.843	0.157	0.245	0.071	0.242	0.040	0.150
SI Benchmark	1	1	1	1	1	1	1	1	1	1	1	1	0.5	0.5	0.5	0.5

Note: **BOLD SHADE** indicates the value is above the SI benchmark.

Table H.6 Terrestrial Receptor Screening Index Values – Final Closure and Remediation Plan (Cont'd)

COPC	Predicted Screening Index Values for Terrestrial Receptors – Final Closure and Remediation Plan															
	Mallard						Marmot									
	VC DS - V27		PR DS VC		PR DS AC		B		VS		FN		FS		FW	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Antimony	no tox	no tox	no tox	no tox	no tox	no tox	0.010	0.018	0.010	0.018	0.010	0.018	0.010	0.018	0.010	0.018
Arsenic	0.010	0.040	0.006	0.023	0.006	0.024	0.008	0.019	0.041	0.069	0.007	0.012	0.053	0.122	0.024	0.068
Beryllium	no tox	no tox	no tox	no tox	no tox	no tox	0.003	0.004	0.003	0.004	0.004	0.008	0.003	0.004	0.003	0.004
Boron	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.012	0.026	0.027	0.089	0.009	0.024	0.017	0.030	0.012	0.020
Cadmium	0.056	0.175	0.044	0.099	0.044	0.101	0.027	0.082	0.017	0.024	0.022	0.061	0.019	0.044	0.025	0.046
Chromium	0.002	0.003	0.002	0.004	0.002	0.004	0.007	0.016	0.014	0.026	0.009	0.017	0.011	0.024	0.010	0.020
Cobalt	no tox	no tox	no tox	no tox	no tox	no tox	<0.001	0.002	<0.001	<0.001	<0.001	<0.001	0.001	0.003	0.004	0.013
Copper	0.007	0.024	0.004	0.010	0.004	0.011	0.024	0.048	0.017	0.027	0.022	0.031	0.029	0.054	0.031	0.049
Lead	0.002	0.004	<0.001	0.001	<0.001	0.001	<0.001	<0.001	0.004	0.007	0.003	0.008	0.045	0.118	0.017	0.035
Manganese	0.001	0.004	<0.001	<0.001	<0.001	<0.001	0.074	0.215	0.180	0.601	0.071	0.161	0.042	0.124	0.127	0.399
Nickel	0.001	0.003	0.001	0.003	0.001	0.002	<0.001	0.002	0.002	0.004	<0.001	0.002	0.001	0.003	0.004	0.014
Selenium	0.034	0.140	0.071	0.296	0.070	0.294	0.316	**1.070**	0.106	0.230	0.034	0.084	0.080	0.177	0.036	0.097
Silver	no tox	no tox	no tox	no tox	no tox	no tox	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Strontium	no tox	no tox	no tox	no tox	no tox	no tox	0.012	0.028	0.003	0.009	0.012	0.034	0.020	0.044	0.026	0.046
Tin	0.008	0.034	<0.001	<0.001	<0.001	<0.001	<0.001	0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Vanadium	0.008	0.024	0.005	0.012	0.005	0.012	0.012	0.022	0.016	0.026	0.018	0.033	0.015	0.030	0.015	0.032
Zinc	0.058	0.210	0.009	0.026	0.010	0.028	0.035	0.099	0.160	0.558	0.042	0.069	0.117	0.316	0.053	0.116
SI Benchmark	0.5	0.5	0.5	0.5	0.5	0.5	1	1	1	1	1	1	1	1	1	1

Note: **BOLD SHADE** indicates the value is above the SI benchmark.

Table H.6 Terrestrial Receptor Screening Index Values – Final Closure and Remediation Plan (Cont'd)

COPC	Predicted Screening Index Values for Terrestrial Receptors – Final Closure and Remediation Plan																	
	Merganser										Mink							
	RC DS - X14		VC DS - V8		VC DS - V27		PR DS VC		PR DS AC		RC DS - X14		VC DS - V8		VC DS - V27		PR DS VC	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Antimony	no tox	no tox	no tox	no tox	no tox	no tox	no tox	no tox	no tox	no tox	0.010	0.026	0.011	0.030	0.013	0.036	0.004	0.010
Arsenic	<0.001	0.002	<0.001	0.002	<0.001	0.002	<0.001	<0.001	<0.001	<0.001	0.053	0.157	0.042	0.131	0.047	0.149	0.026	0.076
Beryllium	no tox	no tox	no tox	no tox	no tox	no tox	no tox	no tox	no tox	no tox	0.015	0.022	0.013	0.019	0.014	0.020	<0.001	<0.001
Boron	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cadmium	0.005	0.020	0.002	0.007	0.003	0.009	0.002	0.004	0.002	0.005	0.166	0.628	0.071	0.236	0.103	0.319	0.081	0.152
Chromium	0.009	0.020	0.005	0.008	0.005	0.010	0.008	0.010	0.008	0.010	0.027	0.061	0.014	0.023	0.016	0.030	0.023	0.032
Cobalt	no tox	no tox	no tox	no tox	no tox	no tox	no tox	no tox	no tox	no tox	0.003	0.006	0.003	0.008	0.004	0.010	<0.001	0.001
Copper	0.009	0.021	0.005	0.013	0.005	0.014	0.003	0.003	0.003	0.004	0.075	0.185	0.044	0.110	0.047	0.124	0.023	0.032
Lead	0.002	0.003	0.001	0.002	0.002	0.002	<0.001	<0.001	<0.001	<0.001	0.001	0.002	<0.001	0.001	<0.001	0.001	<0.001	<0.001
Manganese	0.002	0.003	0.002	0.006	0.003	0.008	<0.001	0.001	<0.001	0.001	0.011	0.021	0.016	0.043	0.020	0.053	0.006	0.008
Nickel	<0.001	<0.001	<0.001	<0.001	0.001	0.002	<0.001	0.001	<0.001	0.001	0.001	0.002	0.002	0.004	0.004	0.007	0.003	0.005
Selenium	0.040	0.130	0.009	0.013	0.009	0.014	0.019	0.028	0.019	0.028	0.421	**1.415**	0.090	0.266	0.096	0.282	0.204	0.597
Silver	no tox	no tox	no tox	no tox	no tox	no tox	no tox	no tox	no tox	no tox	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Strontium	no tox	no tox	no tox	no tox	no tox	no tox	no tox	no tox	no tox	no tox	0.015	0.026	0.016	0.028	0.017	0.031	0.018	0.032
Tin	<0.001	<0.001	0.001	0.003	0.002	0.005	<0.001	<0.001	<0.001	<0.001	0.002	0.005	0.004	0.011	0.005	0.017	<0.001	<0.001
Vanadium	0.002	0.003	0.003	0.007	0.004	0.011	0.003	0.003	0.003	0.003	0.036	0.055	0.049	0.115	0.063	0.171	0.042	0.061
Zinc	0.274	**0.793**	0.154	**0.521**	0.215	**0.694**	0.034	0.056	0.038	0.069	0.546	**1.592**	0.307	**1.041**	0.429	**1.363**	0.068	0.113
SI Benchmark	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	1	1	1	1	1	1	1	1

Note: - **BOLD SHADE** indicates the value is above SI benchmark.

Table H.6 Terrestrial Receptor Screening Index Values – Final Closure and Remediation Plan (Cont'd)

COPC	Predicted Screening Index Values for Terrestrial Receptors – Final Closure and Remediation Plan																	
	Mink		Moose		Scaup										Sheep		Wolf	
	PR DS AC		O		RC DS - X14		VC DS - V8		VC DS - V27		PR DS VC		PR DS AC		S		O	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Antimony	0.004	0.011	0.003	0.009	no tox	no tox	no tox	no tox	no tox	no tox	no tox	no tox	no tox	no tox	0.008	0.015	0.001	0.002
Arsenic	0.027	0.077	0.009	0.029	0.020	0.077	0.016	0.062	0.018	0.069	0.010	0.039	0.010	0.039	0.007	0.012	0.002	0.007
Beryllium	<0.001	0.001	<0.001	<0.001	no tox	no tox	no tox	no tox	no tox	no tox	no tox	no tox	no tox	no tox	0.003	0.007	<0.001	<0.001
Boron	<0.001	<0.001	0.002	0.004	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.006	0.013	<0.001	<0.001
Cadmium	0.080	0.156	0.063	0.146	0.081	0.317	0.035	0.132	0.052	0.177	0.041	0.126	0.040	0.129	0.007	0.015	0.207	**0.569**
Chromium	0.023	0.031	0.003	0.011	0.012	0.026	0.006	0.010	0.007	0.013	0.010	0.014	0.010	0.014	0.005	0.011	0.001	0.003
Cobalt	<0.001	0.001	<0.001	0.001	no tox	no tox	no tox	no tox	no tox	no tox	no tox	no tox	no tox	no tox	<0.001	0.002	<0.001	<0.001
Copper	0.024	0.034	0.007	0.011	0.024	0.069	0.014	0.041	0.015	0.045	0.007	0.018	0.008	0.019	0.015	0.027	0.011	0.022
Lead	<0.001	0.001	0.001	0.005	0.008	0.015	0.006	0.010	0.008	0.013	0.002	0.004	0.003	0.004	0.001	0.003	0.002	0.006
Manganese	0.006	0.008	0.029	0.104	0.003	0.005	0.004	0.011	0.005	0.014	0.001	0.002	0.001	0.002	0.053	0.096	<0.001	0.002
Nickel	0.003	0.005	<0.001	0.001	0.001	0.002	0.002	0.004	0.004	0.008	0.003	0.006	0.003	0.006	0.001	0.004	<0.001	<0.001
Selenium	0.201	0.595	0.027	0.076	0.232	**0.998**	0.050	0.213	0.053	0.227	0.111	0.482	0.110	0.470	0.026	0.081	0.044	0.082
Silver	<0.001	<0.001	<0.001	<0.001	no tox	no tox	no tox	no tox	no tox	no tox	no tox	no tox	no tox	no tox	<0.001	<0.001	<0.001	<0.001
Strontium	0.018	0.032	0.002	0.006	no tox	no tox	no tox	no tox	no tox	no tox	no tox	no tox	no tox	no tox	0.011	0.027	<0.001	<0.001
Tin	<0.001	<0.001	<0.001	<0.001	0.005	0.018	0.010	0.036	0.016	0.059	<0.001	<0.001	<0.001	0.002	0.001	0.003	<0.001	<0.001
Vanadium	0.042	0.060	0.006	0.012	0.008	0.012	0.010	0.025	0.013	0.037	0.009	0.014	0.009	0.013	0.006	0.012	0.001	0.003
Zinc	0.076	0.139	0.046	0.137	0.113	0.366	0.064	0.238	0.092	0.324	0.014	0.039	0.016	0.044	0.025	0.045	0.033	0.063
SI Benchmark	1	1	1	1	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	1	1	0.25	0.25

Note: **BOLD SHADE** indicates the value is above the SI benchmark.

Table H.7 Human Receptor Hazard Quotient Values – Existing Conditions

COPC	Predicted Hazard Quotients – Existing Conditions											
	Camper 1						Camper 2					
	Adult		Child		Toddler		Adult		Child		Toddler	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Antimony	0.02	0.05	0.04	0.09	0.06	0.12	0.01	0.01	0.01	0.02	0.02	0.04
Beryllium	2.0×10^{-3}	4.1×10^{-3}	3.3×10^{-3}	0.01	4.6×10^{-3}	0.01	3.2×10^{-4}	7.8×10^{-4}	5.1×10^{-4}	1.2×10^{-3}	8.8×10^{-4}	1.9×10^{-3}
Boron	0.03	0.09	0.05	0.13	0.07	0.18	0.02	0.02	0.02	0.03	0.03	0.04
Cadmium	0.08	0.23	0.13	0.37	0.18	0.51	0.05	0.09	0.09	0.16	0.11	0.21
Chromium	0.31	**0.94**	0.51	**1.51**	0.68	**2.02**	0.07	0.16	0.11	0.26	0.16	0.36
Cobalt	3.5×10^{-3}	0.01	0.01	0.02	0.01	0.02	2.1×10^{-3}	3.2×10^{-3}	3.4×10^{-3}	5.2×10^{-3}	4.6×10^{-3}	7.0×10^{-3}
Copper	0.33	0.71	0.52	**1.14**	0.72	**1.58**	0.19	0.28	0.31	0.46	0.43	0.63
Lead	0.10	0.28	0.16	0.44	0.34	0.76	0.05	0.08	0.08	0.14	0.23	0.42
Manganese	0.04	0.11	0.05	0.16	0.07	0.21	0.02	0.04	0.02	0.04	0.03	0.06
Nickel	0.01	0.03	0.02	0.06	0.03	0.08	4.6×10^{-3}	7.7×10^{-3}	7.9×10^{-3}	1.4×10^{-2}	1.2×10^{-2}	0.02
Selenium	0.10	0.19	0.16	0.30	0.22	0.43	0.02	0.04	0.03	0.06	0.05	0.09
Silver	0.04	0.14	0.06	0.22	0.09	0.30	4.1×10^{-3}	6.2×10^{-3}	6.7×10^{-3}	1.0×10^{-2}	9.2×10^{-3}	1.4×10^{-2}
Strontium	4.1×10^{-3}	0.01	0.01	0.01	0.01	0.02	1.7×10^{-4}	2.7×10^{-4}	1.8×10^{-4}	3.0×10^{-4}	3.1×10^{-4}	5.1×10^{-4}
Tin	1.1×10^{-4}	3.2×10^{-4}	1.8×10^{-4}	5.1×10^{-4}	2.5×10^{-4}	7.2×10^{-4}	5.8×10^{-5}	8.5×10^{-5}	9.2×10^{-5}	1.4×10^{-4}	1.3×10^{-4}	2.0×10^{-4}
Vanadium	0.03	0.11	0.06	0.20	0.08	0.25	1.8×10^{-5}	2.5×10^{-5}	2.7×10^{-5}	4.0×10^{-5}	4.8×10^{-5}	8.0×10^{-5}
Zinc	0.22	0.45	0.35	0.73	0.49	**1.02**	0.10	0.15	0.17	0.24	0.23	0.33

Note: -

BOLD SHADE indicates the value is above hazard quotient benchmark of 0.8.

Table H.8 Human Receptor Hazard Quotient Values – Final Closure and Remediation Plan

COPC	Predicted Hazard Quotients – Final Closure and Remediation Plan											
	Camper 1						Camper 2					
	Adult		Child		Toddler		Adult		Child		Toddler	
	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th	Mean	95th
Antimony	0.03	0.06	0.05	0.09	0.07	0.14	0.03	0.06	0.05	0.10	0.07	0.14
Beryllium	0.01	0.01	0.01	0.02	0.02	0.02	0.01	0.01	0.01	0.02	0.01	0.02
Boron	0.04	0.09	0.05	0.14	0.08	0.19	0.04	0.09	0.06	0.14	0.09	0.20
Cadmium	0.08	0.22	0.12	0.36	0.17	0.48	0.06	0.17	0.10	0.28	0.14	0.39
Chromium	0.19	0.49	0.31	0.80	0.42	**1.10**	0.17	0.47	0.28	0.76	0.38	**1.06**
Cobalt	0.00	0.01	0.01	0.01	0.01	0.02	0.00	0.01	0.01	0.01	0.01	0.02
Copper	0.31	0.66	0.50	**1.05**	0.70	**1.49**	0.29	0.64	0.47	**1.01**	0.66	**1.43**
Lead	0.10	0.29	0.17	0.47	0.35	0.80	0.03	0.08	0.05	0.12	0.08	0.19
Manganese	0.03	0.05	0.03	0.06	0.05	0.10	0.04	0.07	0.04	0.10	0.06	0.14
Nickel	0.01	0.01	0.01	0.02	0.02	0.03	0.01	0.02	0.01	0.03	0.02	0.04
Selenium	0.11	0.20	0.17	0.32	0.25	0.46	0.10	0.19	0.16	0.30	0.22	0.43
Silver	0.04	0.14	0.06	0.23	0.09	0.33	0.04	0.14	0.06	0.23	0.09	0.33
Strontium	0.00	0.01	0.01	0.01	0.01	0.01	0.00	0.01	0.01	0.01	0.01	0.01
Tin	1.4×10^{-4}	3.8×10^{-4}	2.3×10^{-4}	6.2×10^{-4}	3.2×10^{-4}	8.3×10^{-4}	1.4×10^{-4}	3.8×10^{-4}	2.2×10^{-4}	6.1×10^{-4}	3.1×10^{-4}	8.6×10^{-4}
Vanadium	0.01	0.02	0.02	0.03	0.02	0.04	0.01	0.02	0.02	0.04	0.03	0.05
Zinc	0.28	0.56	0.46	**0.90**	0.62	**1.22**	0.25	0.52	0.41	**0.85**	0.56	**1.16**

Note: -

BOLD SHADE indicates the value is above hazard quotient benchmark of 0.8.

Table H.9 Incremental Lifetime Risks of Carcinogenic Effects for Arsenic Exposure for All Scenarios Considered in the Assessment

Arsenic Risk	Incremental Lifetime Risk – Adult Receptor		Incremental Lifetime Risk – Composite Receptor	
	Mean	95th Percentile	Mean	95th Percentile
Existing Conditions				
Camper 1	**3.2×10^{-5}**	**1.5×10^{-4}**	**4.3×10^{-5}**	**2.0×10^{-4}**
Camper 2	0	0	0	0
Final Closure and Remediation Plan				
Camper 3	**1.9×10^{-5}**	**7.7×10^{-5}**	**2.4×10^{-5}**	**1.0×10^{-4}**
Camper 4	**1.7×10^{-5}**	**7.9×10^{-5}**	**2.2×10^{-5}**	**1.0×10^{-4}**

Note: -
BOLD SHADE indicates the value is above the Health Canada "essentially negligible" risk level of 1.0×10^{-5}