Minto Mine
Waste Management Plan

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Minto Mine
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1 Introduction

Minto Explorations Ltd. (Minto), a wholly owned subsidiary of Capstone Mining Corp., operates the Minto Mine in central Yukon. The Minto Mine is located approximately 240 km northwest of Whitehorse and 41 km southwest of Pelly Crossing (Figure 1-1). The Minto Mine area consists of 164 quartz claims on the west side of the Yukon River within Selkirk First Nation (SFN) Category A Settlement Land Parcel R-6A (Survey 2000-0112LTO Plan 83638 CSR), and is comprised of several land leases with SFN. The North Klondike Highway is located on the east side of the Yukon River and the mine-site is accessed by crossing the Yukon River at Minto Landing. After crossing the Yukon River, either by summer barge or winter ice bridge, access to the mine-site is via a 27 km access road along the Yukon River and up Minto Creek drainage (Figure 1-2). Crews and supplies are transported by air during the spring thaw and fall freeze-up.

The Minto Mine is an existing and fully operational copper and gold mine. The property has been explored since initial workings began on the claims in 1971. In 2005, Sherwood Copper (the predecessor of Capstone Mining Corp.) acquired the property and has been producing copper concentrate since 2007.

This Solid Waste Management Plan (SWMP) is a requirement of Quartz Mining Licence QML-0001 (QML), which requires "*a plan that describes the mitigations and methods used to manage solid and liquid wastes and special wastes to ensure protection of the environment and human health.*" This SWMP is an update to the previous SWMP, submitted in June 2011 and approved in October 2011. The content of this SWMP is derived from the *Plan Requirement Guidance for Quartz Mining Projects* (Yukon Government, 2013).

The purpose of the SWMP is to describe the methods used to manage solid, liquid, gaseous and special wastes at the Minto Mine site, including both hazardous and non-hazardous solid wastes. All wastes will be handled, stored and disposed of according to the appropriate regulations and permits issued by Yukon Environment, including Waste Management Permit #81-005, Air Emissions Permit # 4201-60-030, and Land Treatment Facility Permit #4202-24-024. All personnel associated with waste handling, storage and disposal will be knowledgeable of the contents of this plan, the terms and conditions of the solid waste management permits, and will be trained on proper handling of materials found on site.

Figure 1-1: Minto Mine Location Map

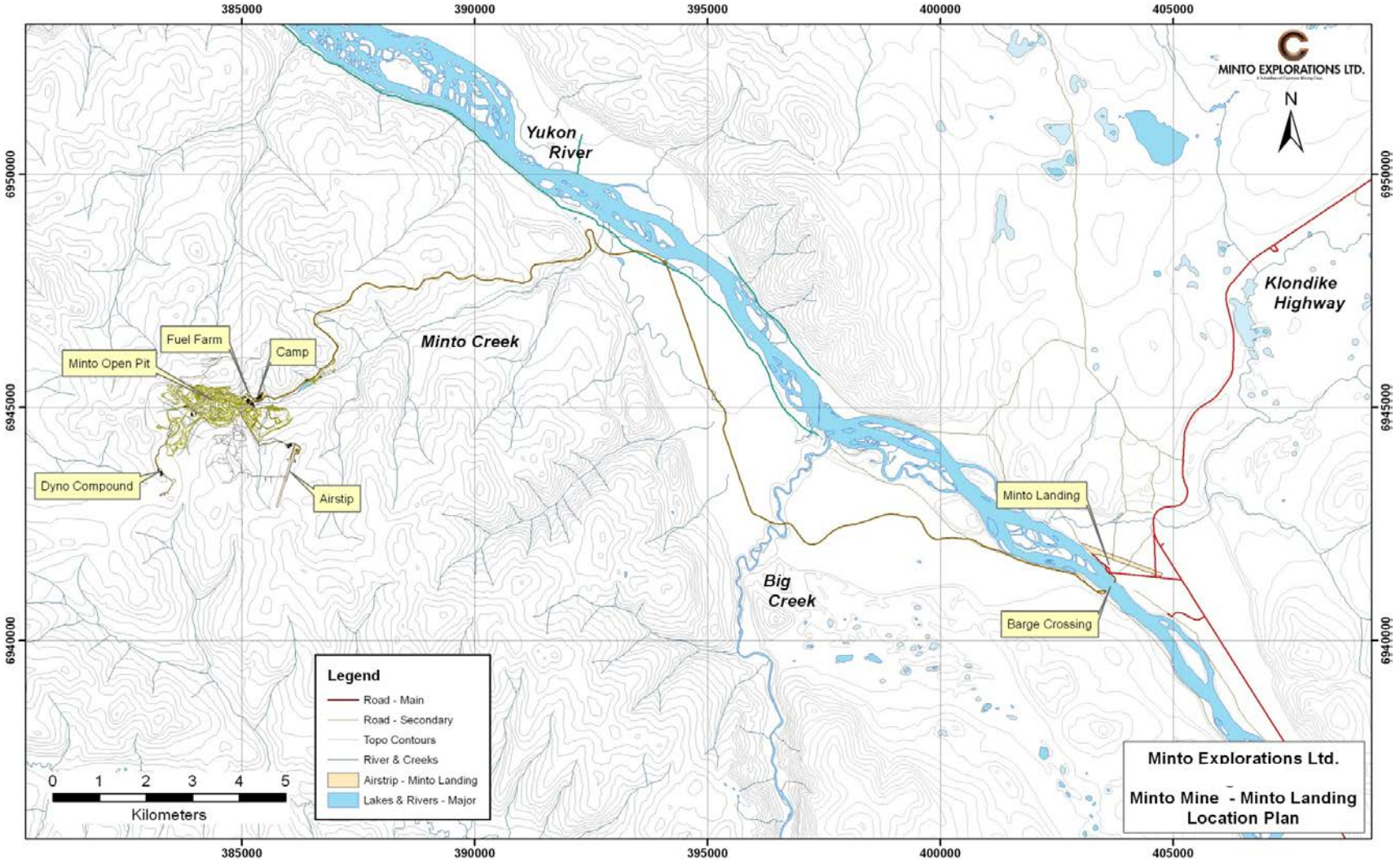


Figure 1-2: Minto Mine Access Location Plan

1.1 Definitions

For consistency in interpretation with the contents contained herein, the following terms are defined:

Waste includes Solid and Special Waste.

Solid waste includes refuse, ashes, garbage, domestic waste, compost or any other waste prescribed by regulation whether or not the waste has any commercial value or is capable of being used for a useful purpose[1].

Special Waste is a waste requiring special handling, storage, or destruction and prescribed as Special Waste by regulation whether or not the waste has any commercial value or is capable of being used for a useful purpose[1] (e.g., waste oil).

Putrescible Waste contains organic matter that is capable of being decomposed and may be capable of attracting or providing food for wildlife (e.g., kitchen waste).

Non-Putrescible Waste means any waste that contains no more than trivial amounts of putrescible materials; examples include construction waste, cardboard, demolition debris.

Class 9 Hazardous Wastes are miscellaneous products, substances or organisms considered to be dangerous to life, health, property, or the natural environment[2].

Bear-proof container is a container sealed to prevent the escape of attractant odours and strong enough to exclude a bear from the contents.

2 Waste Infrastructure

This section outlines where solid wastes are handled, stored and disposed. Table 2-1 summarizes handling storage and disposal locations for several solid waste streams and key waste disposal areas are shown on Figure 2-1. For a full list of waste streams and handling procedures please refer to the WMA waste segregation spreadsheet located in Appendix A. Non-hazardous solid waste will be segregated into two streams: putrescible and non-putrescible wastes. Non-putrescible wastes will be further segregated into three categories: recyclable, burnable and non-burnable material. Key waste management locations, including the storage and disposal areas, discussed further below. Disposal of these materials is discussed further in Section 2.2.

[1] Revised Statutes of the Yukon: Environment Act *Part 2: Definitions* (2002)
[2] Revised Statutes of the Yukon: Environment Act *Part 10 Section 118*: *Hazardous Substance and Pesticides* (2002)

Table 2-1: Handling, Storage and Disposal of Solid Waste

Type	On-site Storage Location	Disposal
Kitchen Waste	Bear-proof containers	Incinerator
Beverage Containers	Recycling Bins	Off-site disposal
Office and Dormitory Garbage	Garbage Bins/Bear-proof containers	Incinerator
Untreated Wood	Open Burn Area	Open burned[Note 1]
Treated Wood	Waste Storage Area	Incinerator
Heavy Plastics	Waste Storage Area	Incinerator
Light Plastics/Cardboard	Waste Storage Area	Open burned[Note 2]/Incinerator
Steel / Copper / Rubber	Waste Storage Area	Off-site Disposal facility
Ash from Incinerator/Open burn area	Ash Bin	Landfill[3]
Tires (rim size < 24" diameter)	Waste Storage Area	Barrier use or off-site disposal facility
Tires (rim size > 24" diameter)	Waste Storage Area	Barrier use or land filled

Note 1. Untreated wood products may be open burned without restriction
Note 2. Ash is periodically removed and disposed of the landfill

2.1 Waste and Recyclable Storage Locations

Special waste, domestic waste, recycling, and waste oil storage locations are shown in Figure 2-1 and are detailed below.

2.1.1 Special Waste Pole Barn

A 100 foot long Special Waste Storage Pole Barn is located within the waste management area (WMA) (Figure 2-1) and is used for staging special waste in a covered area prior to removal from the mine site. The floor of the pole barn is lined with 4030 Enviro Liner and is covered with 30 cm of clean construction grade crushed gravel. Materials stored within the pole barn are separated by signage to ensure that like materials are stored together away from other potential reactive materials. Typical materials that are stored in the pole barn include: aerosols, gas, diesel, oils, solvents, coolants, lead acid batteries and household alkali batteries.

2.1.2 Camp

The camp waste receptacles are located in the following areas: the kitchen, office complex, dormitories and site vehicle parking lot. In an effort to discourage wildlife from entering the camp area garbage is removed twice a day and kitchen waste is stored indoors until it is picked up by a site service employee, at which time it is brought directly to the incinerator for immediate disposal. All excess material is stored in a bear proof container adjacent to the incinerator. Recycling bins for refundable beverage containers, aerosol container bins and used alkaline battery drop bins are located throughout the camp complex.

2.1.3 Recycling Sea Can

A sea can is located at the (WMA) and is used to store recyclables until a sufficient amount of material has accumulated to warrant a removal from the mine site via empty trucks that leave the mine site after bringing in supplies.

2.1.4 Waste Oil Storage Tank

An 8000L bulk double walled waste oil storage tank and a 500L day tank are located at the water treatment plant and are used to supply the waste oil burner. There is also a waste oil tank located on the south east side of the airstrip. It is used by Pelly Construction to stage excess oil that is not used by the waste oil burner.

Figure 2-1: Location of Waste Infrastructure

3 Waste Disposal Locations

Minto Mine is licensed to operate a landfill for commercial activities, open burn solid waste, operate an incinerator and incinerate waste oil for the purpose of heating. The locations of these waste management areas are shown on Figure 2-1.

3.1 Landfill

The landfill is located on the north side of the airstrip, adjacent to the Waste Management Area (WMA). It accommodates non-putrescible and non-recyclable waste generated by the mine and is being managed in a manner that will facilitate closure at the cessation of mine operation. The landfill is located in an old borrow pit and is currently being managed by sectioning off a small designated areas for waste disposal. Once a section has acquired 50 cm of waste it is buried with a minimum of 10 cm of soil (or other suitable material) and a new lift is started. Cover material is sourced from remediated soils from the LTF (that have been approved for removal) and/or stockpiled residuum. When ash is required to be deposed of, it is buried upon arrival to prevent dispersal by wind. To ensure no food waste is deposited in the landfill all loads are checked by the WMA attendant before being dropped off. The landfill is locked outside of the WMA operating hours, which are 13:00-15:00.

3.2 Open Burn Area

A burn pit on flat ground surrounded on three sides by 3 m berms is located on the north side of the airstrip. The open burn area is used to burn cardboard and scrap wood. As per Waste Management Permit #81- 005 there is an electric fence surrounding the burn pit which is operational from May 31 to October 31. The purpose of the fence is to prevent wildlife from entering the facility. Ash from the burn pit is periodically emptied into the landfill, as required.

3.3 Incinerator

A Westland Single Chamber Cyclonator Incineration System (Model #CY-1020-FA “D”) is located on the Southeast side of the airstrip and is used to dispose of blasting caps and other blasting materials outside of the Solid Waste Management areas operating hours. The incinerator is operated by trained employees who are responsible for ensuring the volume of waste incinerated remains within the operating conditions of this incinerator. An ash bin is located adjacent to the incinerator and is used as a transfer station for ash obtained from daily incineration of waste, prior to disposal in the landfill.

A Westland CY100CA Double Chamber incinerator is located within the WMA. This is the primary incinerator for site and is operated by Minto mine employees who have received incinerator training from Westland Environmental. Physical components of the incinerator are inspected daily and any issues are reported to the Site Services supervisor. Only combustible materials are disposed of and all materials (excluding metals) are reduced to ash prior to removal. All ash is staged in an ash bin located adjacent to the incinerator prior to being disposed of in the landfill. The manufacturer’s specifications for the two incinerators are provided in Appendix B.

3.4 Waste Oil Burner

At present a CB-5000 with CB-550-S2 burner is being used to heat the Water Treatment Plant. The unit is fed by a 500L day tank and bulk waste oils are stored in an 8000L double walled storage tank located outside of the water treatment plant. The tank is filled during the summer filled on an as needed bases during winter operation. The manufacturers' specifications for the burner are provided in Appendix B. All excess waste oils that are not used by the waste oil burner are stored in an oil tanker located on the east side of the airstrip. Oil from the tanker is currently being shipped offsite by General Waste (a Whitehorse based contractor) who makes several trips a year to Minto Mine. In the future, an additional clean burn waste oil burner will be installed in Pelly Construction's mechanic shop to reduce the amount of used oil that is shipped off-site.

Waste products consumed by the burner include:

- Used crankcase oil;
- Used automatic transmission fluid;
- Used hydraulic oil; and
- Used fuel oils #2 (truck diesel and heating oil), #4 (blend of diesel, distillate or residual fuel oil) and #5 (residual fuel oils (RFO) or heavy fuel oils).

3.5 Waste Treatment

Waste treatment facilities at the Minto Mine include a land treatment facility for the treatment of hydrocarbon contaminated soil, and a sewage treatment plant, which treats camp sewage prior to disposal in the Main Pit.

3.5.1 Land Treatment Facility

A Land Treatment Facility (LTF) for the purposes of remediation for hydrocarbon and glycol contaminated soil is located south of the airstrip, (Figure 2-1), and is permitted under Land Treatment Facility Permit #4202-24-024. The LTF is composed of a staging cell and a treatment cell (Figure 2-2). Both are lined with compacted residuum with a permeability of less than 10^{-5} cm/sec. Remediation of hydrocarbon (oil, gas and diesel) and glycol contaminated soil and snow occurs within the land treatment facility. As material is remediated (i.e., once concentrations are below those outlined in the *Yukon Contaminated Sites Regulations for Industrial Sites*) and following approval from Yukon Environment it is removed from the facility for use in industrial land use activities. Minto is in the process of finalizing plans for the relocation and reconstruction of the LTF to a higher standard of environmental protection. The designs are currently subject to regulatory approval and as such have not been included in this plan. The relocated LTF is to be situated adjacent to the landfill. This centralises the management of the facilities and controls access to ensure proper tracking of contaminated soils.

Figure 2-1: Land Treatment Facility

3.5.2 Sewage disposal system

A modular sewage treatment plant has recently been installed at Minto Mine to replace previously used septic fields. The plant consists of a Pre-Settling unit (septic tank), an equalization tank, followed by EcoProcess sequencing batch reactors. It has a capacity to treat sewage from a 400 person camp (Minto is currently permitted to operate a 300 person camp). All treated effluent from the sewage treatment plant is disposed of in the main pit. The sewage disposal system process flow diagram is provided in Appendix C.

4 Waste Management

The types of waste generated at the Minto Mine site include domestic waste, non-putrescible waste, incinerator ash, and used tires. A full description of all the wastes produced at the Minto Mine and the methods of disposal are summarized in Appendix A. Wastes are defined by receptor (metals, incinerator waste, wood/cardboard, landfill/inert waste, special waste and other), and further by receptor (WMA, Incinerator, Burn Pit, Landfill, Waste Oil Tanker, Waste Oil Burner, Electrical Shop, Sewage Lagoon).

Waste storage methods, transportation requirements and receiving station storage instructions are also outlined.

4.1 Domestic Waste

Domestic wastes are generated from the kitchen, office and dormitory, and include putrescible waste, recyclable materials and office and dormitory wastes.

4.1.1 Putrescible Waste

Putrescible waste from the kitchen facilities at Minto Mine are stored inside the loading doors of the kitchen complex, then collected and transported by Site Services twice daily for incineration, in an effort to minimize attracting wildlife to site. Excess waste that cannot immediately be incinerated is temporarily stored in a latched sea container adjacent to the incinerator.

4.1.2 Recyclable Material

Recyclable materials are stored in a bear proof container until they are transported off site for recycling and/or refund. Proceeds from recyclable material are donated to a local charities. Refundable recyclable materials include:

- Aluminum and tin pop/juice cans;
- White or other plastic beverage containers;
- Plastic jugs from the assay lab;
- Tetra packs; and
- Waxed cardboard juice containers.

4.1.3 Office and Dormitory Waste

Garbage bins from offices and dormitories may contain food wastes and are emptied daily by cleaning staff and transferred to bear proof containers located adjacent to the mill and at the loader doors of the kitchen complex. The containers are emptied daily by Site Services for burning or incineration.

4.2 Non-Putrescible (Construction & Shipping) Waste

Burnable non-organic wastes such as cardboard and lumber are open burned. Metal is segregated and stored at the waste management area for periodic removal from site to a recycling facility. Non-hazardous solid wastes (inert waste) that cannot be recycled are buried in the landfill. All contractors are responsible for sorting their own materials before dropping any waste at the waste management area.

Non-putrescible materials that can be reused will be stored at the WMA until they are needed. Items include used oil and glycol drums, $1m^3$ Totes, and waste oil.

4.3 Ash from Incinerator or Open Burning

Ash generated from both the incinerator and open burning will be landfilled. Incinerator ash will be placed in the ash storage bin and then landfilled. Open burn pit ash will be landfilled as required.

4.4 Used Tires

Used tires are the responsibility of Fountain Tire. Fountain Tire currently holds the contract to service all tires on Minto Mine property; they are responsible for collecting, storing and removing used tires from site. Tires will be kept reasonably clean and not buried or burned, with the exception of tires with rim size greater than 24.5", which may be buried at the landfill. Tires not buried or used further for the purpose of protection barriers or other on-site uses will be hauled off-site and disposed of in accordance with the Yukon Used Tire Management Program[3].

5 Special Waste Management

This section outlines how Special Wastes are handled, stored and disposed. Special wastes include waste oil, oil filters, diesel, anti-freeze, solvents and lubricants (and containers in which they are contained), aerosol containers, hydraulic hoses, batteries and biomedical wastes. A full list of handling procedures is outlined in the waste segregation spreadsheet (Appendix A).

Minto will arrange for the transport of Special Waste in the following manner:

- No Special Wastes will be transported by Minto other than within the mine site.
- All Special Wastes transported off-site will be in accordance with applicable transport laws, to a facility permitted in the Yukon or other jurisdiction to receive them, by a carrier permitted in the Yukon or another jurisdiction to receive and transport Special Wastes. If the facility is in the Yukon, both the facility and the carrier must be permitted in the Yukon according to the Transportation of Dangerous Goods Regulations (SOR/2008-34).
- A movement control document (manifest) will be completed to document each shipment of Special Waste, as per Transportation of Dangerous Goods Regulations (SOR/2008-34).
- All Special Wastes will be transported and transferred in such a manner as to prevent their release into the environment.
- All vehicles carrying any Special Waste will be secured to prevent access to unauthorized personnel.

Inventory of special waste is done weekly and all materials that have been packaged and are ready for shipping are communicated to the Warehouse. Warehouse personnel are responsible for organizing proper manifests, backhauls and notifying vendors of materials that are being shipped. At present there is not a set date for backhauling special waste, the warehouse is made aware of materials and organize backhauls as soon as possible.

[3] http://www.environmentyukon.gov.yk.ca/pdf/dmrone.pdf

5.1 Waste Oil and Filters

The major sources of waste oil are from mobile equipment and power plant generators. The most common types of used oil are crank case oil, gear oil, transmission fluid, and hydraulic oil.

Waste oil will either be collected and disposed of via incineration in a waste oil burner for the purpose of space heating, or stored in the special waste oil tanker which will periodically be removed from site and brought to a licenced oil recovery facility. The volume of waste oil transported from site will be documented according to Transportation of Dangerous Goods Regulations (SOR/2008-34).

Waste oil filters will be crushed using an *OTC 1896 Oil Crusher* (or similar) and drained of oil. Crushed filters will be stored in 205L drums and backhauled to Whitehorse to be disposed of as scrap metal.

5.2 Waste Diesel

Waste diesel will either be stored at the Special Waste pole barn and periodically removed from site, or used in the waste oil burner located in the water treatment plant.

5.3 Waste Antifreeze

Used antifreeze will be stored in containers that are leak-proof and have tight fitting lids to prevent spills, stored at the Special Waste pole barn, and periodically shipped to a disposal facility.

5.4 Solvents and Lubricants

Small quantities of miscellaneous waste solvents and lubricants will be generated through routine site, equipment and vehicle maintenance and repairs. Solvents (e.g., paint thinners and strippers, varsols, degreasing fluids, mineral spirits and petroleum distillates) will be shipped to Whitehorse as special waste.

Since most of these liquids are flammable and toxic, solvents and lubricants will be collected and stored in appropriate drums for regular shipment to a licensed recycle or disposal facility. Containers will be covered and kept separate from other waste products.

5.5 Used Batteries

Alkaline batteries are placed in designated alkaline battery disposal bins, located throughout the Minto Camp complex, for collection by the Sodexo cleaning staff and Site Services department. Lead-acid batteries from vehicles will stacked on wooden pallets with a minimum of three layers of cardboard or a sheet of plywood between layers and stacked no more than three layers high. Once stacked, batteries are wrapped in cellophane to prevent movement and protect batteries during shipment. Batteries are periodically shipped to a licensed recycling or disposal facility.

5.6 Biomedical Waste

A small amount of biomedical waste (such as bandages) are generated at the first aid rooms at the Minto site. This waste will be collected in designated purpose-built containers, and then transported by Safety Coordinators to the incinerator for immediate incineration.

6 Contaminated Materials

Spills on-site may include hydrocarbons (i.e., diesel, waste oil, and hydraulic oil), antifreeze, solvents and lubricants. These items each have specific disposal methods as follows:

- Hydrocarbon contaminated soil and snow will be excavated and transported to the land treatment facility (LTF) – samples will be taken by the Environment Department to ensure compliance with LTF Permit.
- Hydrocarbon-contaminated absorbent pads will be incinerated.
- Antifreeze contaminated soil and snow will excavated and transported to the Land Treatment Facility – confirmatory samples will be taken by the Environmental department to ensure material is within acceptable limits of the LTF.
- Antifreeze contaminated absorbent pads will be incinerated.
- Solvents and lubricants have specific disposal requirements as per the MSDS sheets.

Below are the details of the assessment, treatment and confirmatory sampling for material disposed of the in LTF. Methods of assessment and treatment described below are as per the *Contaminated Sites Regulations* (Yukon Government, 2002) and the protocols established under it.

6.1 Assessment

Soils and snow contaminated with hydrocarbons and glycol may be disposed of in the LTF; however, soils with grain size greater than 15mm are not able to be treated in the LTF, and would require disposal in the Main Pit or processed through the mill. Material able to be treated in the LTF is immediately placed in the LTF to prevent further contamination and undergoes initial characterization.

Quantities less than 1 m^3 are placed on a “Small Hydrocarbon Spills” pile or a “Small Glycol Spills” pile. Quantities greater than 1 m^3 are identified with Environmental Incident Report number (EIR number) marked permanently on stakes. The maximum permissible height of piles of contaminated soil is 1.4 metres. In winter/spring, material is not placed on deep snow or ice, as this will cause contaminated water to leach from the pile in the summer and may cause subsidence. If necessary, snow or ice from the chosen spot must be removed prior to placement.

Initial characterization requires in situ sampling during the excavation of contaminated materials, of both the materials excavated and the material left behind, to ensure that all contaminated materials are excavated. Sampling is done at a rate of one composite for every 50 m^3 of material, except where there is reason to believe that Petroleum Hydrocarbons (PHC) may be at Special Waste levels (30,000ppm or

3% and above), in which case a sample must be taken for every 10 m³ of material. Note that 3% is the level at which pools of free product can be expected to form in many matrix types.

For soil sampling, a 250ml glass jar with a Teflon cap liner is filled with sample, and analyzed for BTEX group (Benzene, Toluene, Ethylbenzene and Xylene), TEPH, LEPH, HEPH (Total, Light and Heavy Extractable Petroleum Hydrocarbons), PAH (Polycyclic Aromatic Hydrocarbons), Styrene, chlorinated and non-chlorinated phenols and pH.

Analytical results are compared to *Contaminated Sites Regulations* (Yukon Government, 2002) Schedules 1 and 2.

6.2 Treatment

Contaminated soils resulting from spills are excavated and hauled to the LTF, where they are placed in a staging area. Initial characterization of these soils is undertaken by means of soil sampling, and they cannot be placed in the treatment cell until we have received analytical results for the contaminants of concern. Once under treatment, interim samples are taken annually at the end of August or in early September.

Key components of treatment in the Land Treatment Facility are water and nutrients addition and tillage. Soil must be free from debris such as piping, concrete, wiring conduit and the like, before spreading in the treatment cell. Soil can be placed in the treatment cell only when tillable (i.e. not frozen). Soil is to be spread to an approximate thickness of 15 cm. Stockpiles of contaminated material from different spills can be consolidated and treated together, provided their combined volume does not exceed 500 m³.

Water addition to the LTF is generally not required as spring, summer and fall in the Yukon tend to be generally wet, with precipitation falling in low amounts, but at frequent intervals. During the first tilling or the placement in the treatment cell, fertilizer should be applied by hand broadcast to achieve approximately the PHC: Nitrogen: Phosphorous ratio of 50:2:1. Application rates are summarized in Table 5-1 (to be used in combination with the N-P-K rating of the fertilizer you are using), and can be used to estimate fertilizer usage requirements.

Table 5-1: LTF Fertilizer Application Requirements

Petroleum Hydrocarbon Concentration	Nutrient requirement (g/m³)	
	Nitrogen (as Nitrate)	Extractable Phosphorous
1,000 ppm	44	22 – 33
1,500 ppm	66	22 – 33
2,000 ppm	88	22 – 33
2,500 ppm	110	22 – 33
3,000 ppm or greater	132	22 – 33

Remediation of ethylene glycol contaminated soils can be assisted through phosphorous addition to reduce the half-life of glycols contamination in soils. The wide variability in the results of studies of glycol degradation undertaken to date suggest a strong influence of context-specific conditions, so no single fertiliser amendment rate exists for glycol. Therefore, fertilizer application is at the same rate as for hydrocarbons.

6.3 Confirmatory Sampling

Confirmatory sampling is conducted once interim samples indicate that the soil has been remediated to below *Contaminated Sites Regulations* (Yukon Government, 2002) standards. Confirmatory sampling is conducted at a rate of one sample per 100 m³ of soil using composite sampling techniques outlined in Protocol 11 of the *Regulations*. Each composite is to be composed of soil from the deeper horizons of the treatment cell where remediation rates are lowest.

Once remediated material meets the *Contaminated Sites Regulations* standards, an application to the Yukon Government Environmental Programs Branch is sent to request permission to remove the soil from the treatment facility. Remediated materials are only used for the application under which they were approved by the Environmental Programs Branch (i.e., industrial use).

7 Inspections and Record Keeping

Inspections of the incinerator, land treatment facility and waste management area are conducted regularly with records kept in the Environment department office. Details are provided below and samples of the inspection forms are provided in Appendix D.

7.1 Incinerator Inspections and Record Keeping

Equipment checks and logs are performed in accordance with the manufacturer's specifications. Daily checks include integral physical components such as thermocouples, contact switches, refractory in primary chamber, gaskets and seals, and general housekeeping. Weekly inspections consist of checking the incinerator blowers (primary, secondary and flame port blowers) to ensure they are working properly. Monthly inspections consist of checking the external surfaces of the incinerators, more specifically checking for 'spotty' discolouration on surfaces. In 2013, a building was constructed over the incinerator to protect the incinerator and equipment from inclement weather.

7.2 Land Treatment Facility Inspection

LTF inspections are conducted biweekly bases to ensure that all signage is visible, berms are not damaged, and new material has been properly labeled and staged in the appropriate sections of the LTF. Record keeping ensures that tillage is occurring as required, that laboratory results are up to date and that all material that has been confirmed as being acceptable is moved from the staging to the treatment cell in a timely manner.

7.3 Waste Management Area Inspection

While the WMA is open the attendant organizes materials that have been dropped off. If additional resources are required the attendant will report requirements to the supervisor.

References

Yukon Government. (2002). *Contaminated Sites Regulations O.I.C. 2002/171.*

Yukon Government. (2013, August). *Plan Requirement Guidance for Quartz Mining Projects.* From http://www.yukonwaterboard.ca/forms/quartz/Plan%20Requirement%20Guideline%20for%20Quartz%20Mining%20Projects%20-%20August%202013-kh.pdf

Appendix A

Waste Segregation Spreadsheet

Waste Segregation Detail

WASTE TYPE	DESCRIPTION	WASTE GENERATION LOCATION (Pelly, Dumas, Mill (Front & Back Door), Tailings, Water Treatment Plant, Camp, Site Services, Electrical Engineering Office, Fuel Farm, Dyno, Light Duty Shop, SGS Lab, Warehouse, Exploration Laydown)	GENERATING STATION CLASS (Bin/Container: 1.**Metals,** 2.**Incinerator Waste**, 3.**Wood/Cardboard**, 4.**Landfill/Inert Waste**,5.**Special Waste**= no bin specified, 6.**Other**=no bin specified)	WASTE STORAGE METHOD/INSTRUCTIONS	TRANSPORT TO RECEIVING STATION (Site Services, Safety, Responsible Department, Responsible Contractor)	RECEIVING STATION (WMA, Incinerator, Burn Pit, Landfill, Waste Oil Tanker, Waste Oil Burner, Electrical Shop, Sewage Lagoon)	RECEIVING STATION STORAGE METHOD/INSTRUCTIONS	FINAL DISPOSAL (Receiving Station or Off Site)
Absorb all (Amorphous Silica)	Contaminated Absorb All	Dumas, Pelly, Mill	Special Waste	Contain in 20 liter pails that will be manageable for Site Services	Responsible Department, Responsible Contractor	WMA	Place in the Special Waste area of the WMA	Offsite
Acids	Used acids from the lab,	SGS lab and Enviro Lab	Other	Acids generated from both labs on site will be disposed of to the acid sump at the SGS lab.	Site Services	Sewage Lagoon	To Sewage Lagoon with Sucker Truck	Sewage lagoon
Aerosol Cans	Shaving Foam, Hair products, Deodorants, Fly Repellent, Paints, Lubricants, etc.	Engineering office, Pelly, Site Services, Warehouse, Camp	Special Waste	Place in containers at recycling stations around site labeled **"Aerosol Can Disposal"**	Site Services, Responsible Contractor	WMA	A can puncturing machine will be located at the WMA. All Aerosol cans must be punctured before placing in special waste pole barn labeled **"Aerosol Can Disposal"**	Off site
Ammonium Nitrate Bags	Empty Ammonium Nitrate (AN) bags	Dyno and Dumas	Other	No special instructions	Responsible Contractor	Old Incinerator	Only to be handled by Dyno or Dumas	Old Incinerator
Appliances (with refridgeration)	Fridge, Water Cooler, Freezer, Air Conditioners.	Camp	Other	There will be a designated area beside the scrap metal bins for storing broken appliances	Site Services, Responsible Contractor, Responsible Department	WMA	On the ground at signed location in the metal section of the WMA.	Off site
Bio-Hazardous	Contaminated bandages, Sharps (syringes), etc.	Entire site	Other	Place in appropriate containers at the **First-Aid Station** under the direction of the safety coordinator. Personnel from the safety department will bring up material and place it in the incinerator.	Safety	Incinerator	First aid attendant will bring garbage to incinerator sea can and drop material in garbage can labeled Bio Hazard	Incinerator
Blasting Caps	Used blasting caps	Dyno, Pelly and Dumas	Other	Take directly to CY-1020 incinerator(old incinerator)	Responsible Contractor	Old Incinerator	Only to be handled by Pelly blaster, Dumas blaster or Dyno	Old Incinerator
Camp Cleaning Products	Expired cleaning products	Camp	Special Waste	Depending on quantity contact environemnt department	Site Services	WMA	epending on quantity it will be back hauled as special was	Offiste
Cardboard (non-food related)	Cardboard boxes from shipping & packaging. Food related cardboard not accepted and must go to "Incinerator Waste"	Warehouse/ Kitchen	Wood/Cardboard	Cardboard will be burnt in the burn pit	Site Services	Burn Pit	Burn Pit	Burn Pit
Chemicals –(Process Facility / Water Treatment Plant)	Un-usable Chemicals (including totes and containers) used during commissioning of process facilities and water treatment plant operations (e.g. Polymers, pH adjusters, etc.)	Mill, Water Treatment Plant	Other	Ensure containers and chemicals are appropriately labeled. Contact Environment Department for Disposal	Site Services, Mill Operations	WMA	Store in proper containers for back hauling as special waste. Ask Environment Departemnt is unsure.	Offiste
Conveyor Belting and misc. Rubber	Used conveyor belting from rock crushing operations, miscellaneous rubbers	Mill (Back Door)	Landfill/Inert Waste	Place in containers labelled **"Landfill/ Inert Waste".** Large items stored and transported seperately.	Site Services, Responsible Contractor, Responsible Department	Landfill	Place in landfill	Landfill
Copper and Brass	Wire, electrical brushes and brass etc. generated during operations and construction activities	Electrical, Site Services	Other	Store seperately and deliver to WMA on as needed basis	Responsible Department, Responsible Contractor	WMA	Place all copper wire in the designated pile for backhaul	Offsite
Diesel	Waste Diesel	Dumas, Pelly, Light Duty Shop	Special Waste	Proper storage container (Drum in good condition with tight fitting lids).	Site Service	WMA	Store by Special Waste. Can be used to mix with waste oil for oil burners	Burn on site or ship offsite.
Dragosorb 400 (Lime Soda)	Dragosorb is Lime Soda used as an absorber of for carbon dioxide in respiratory equipment / devices	Safety	Other	The white pellets are extremely irritating to the eyes, skin a nd respiratory track and may cause burns. Just like lime	Safety	Landfill	Place in landfill away from metals (may cause a reaction and form hydrogen sulfide)	Landfill
Dry Cell Batteries (alkaline)	Small dry cell batteries (e.g. AA, AAA, C, D, 6V, 9V, etc.)	Entire site	Special Waste	Place in containers at recycling stations around site labeled **"Dry Cell Batteries"**.	Site Services	WMA	Place batteries in the tote or drum **"Dry Cell Batteries"** in the special waste pole barn.	Off site
Empty Paints and Coatings containers (Latex, Alkyd, and Epoxy)	Empty (or unusable) paint and/or coatings containers	Site Services, Pelly	Special Waste	Temporarily store in the Special Waste pole barn with the lids loosened to permit the curing process. Cured product and containers will be land filled. Where the curing of product is inhibited, these containers will be shipped off site for processing.	Site Services	WMA	Material should be placed in the metal cage located at the special waste pole barn. Lids should be slightly cracked to allow paints to cure then moved to landfill.	Landfill
Epoxy Resin (LokTite)	Used resin cartridges	Dumas	Special Waste	If cured then can go in landfill. Uncured resin to be shipped offsite for proper disposal.	Responsible Contractor	WMA	Tarped and covered and on pallets for offsite disposal	Off Site
Filters (Air)	Filters from heavy and light equipment, HVAC systems, etc. Small amount of rubber and metal on filters OK	Dumas, Pelly, Light Duty Shop	Landfill/Inert Waste	Place in **"Landfill/Inert Waste"** bin	Site Services, Responsible Contractor	Landfill	Place in active landfill	Landfill
Flammable Liquids (Jet B, Gasoline)	Waste Flammable Liquids generated as a result of contamination with water, dirt, etc.	Dumas, Pelly, Light Duty Shop, Exploration Laydown	Special Waste	Place in 205 L drums labeled with contents (e.g. "**Waste Diesel** or "**Waste Gasoline**", etc.) Avoid mixing any of these products.	Responsible Department, Responsible Contractor	WMA	Flammable fuels must be labeled with contents and grouped appropriately. Barrels must have both bungs screwed in.Store at the Special waste within the WMA. Ensure pails are transferred to appropriately labelled 205 L drums.	Off site
Fluorescent Light Ballasts – Used	Malfunctioned fluorescent light ballasts will be generated during construction	Site Services, Electrical, Pelly, Dumas	Other	Site Services/Electrical will collect and bring all ballasts to electrical shop for disposal. Once the storage container is full it will be	Responsible Department, Responsible Contractor	Electrical Shop	Contact electrical before dropping off any ballasts at their shop	Off site
Fluorescent Light Tubes - Used	Blown fluorescent or halogen light tubes will be generated	Site Services, Electrical, Pelly, Dumas	Other	Site Services/ Electrical will store fluorescent tubes in a designated area at the electrical shop. Site services/Electrical will bring fluorescent tubes to designated area at WMA. Bulbs will be crushed at WMA put into barrels and shipped off-site.	Responsible Department, Responsible Contractor	WMA	Place in totes near bulb breaker	Off site

WASTE TYPE	DESCRIPTION	WASTE GENERATION LOCATION (Pelly, Dumas, Mill (Front & Back Door), Tailings, Water Treatment Plant, Camp, Site Services, Electrical Engineering Office, Fuel Farm, Dyno, Light Duty Shop, SGS Lab, Warehouse, Exploration Laydown)	GENERATING STATION CLASS (Bin/Container: 1.**Metals,** 2.**Incinerator Waste**, 3.**Wood/Cardboard**, 4.**Landfill/Inert Waste**,5.**Special Waste**= no bin specified, 6.**Other**=no bin specified)	WASTE STORAGE METHOD/INSTRUCTIONS	TRANSPORT TO RECEIVING STATION (Site Services, Safety, Responsible Department, Responsible Contractor)	RECEIVING STATION (WMA, Incinerator, Burn Pit, Landfill, Waste Oil Tanker, Waste Oil Burner, Electrical Shop, Sewage Lagoon)	RECEIVING STATION STORAGE METHOD/INSTRUCTIONS	FINAL DISPOSAL (Receiving Station or Off Site)
Food Waste and Kitchen Waste	Food, coffee grinds and filters, milk containers, fruit peels, food packaging, etc.	Entire site	Incinerator	Place in containers labeled "**Incinerator**"	Site Services, Responsible Contractor	Incinerator	store food waste garbage in sea can located beside the incinerator	Incinerator
Fuel Filter	Fuel Filters	Pelly, Light Duty Shop	Other	Store in place in drum with tight fitting lid.	Site Services, Responsible Contractor, Responsible Department	WMA	Fuel filters will be stored in drums or totes	Offiste
Glass	Glass jars, beakers, etc	Kitchen/ Lab	Landfill/Inert Waste	Once Kitchen glass barrel is full, site services can bring it directly to the landfill. Others can deposit smaller buckets in **"Landfill/ Inert Waste"** bins.	Site Services	Landfill	Place in landfill	Landfill
Glycols (waste antifreeze)	Used Glycol from vehicles, heavy equipment, and facility heating systems, etc.	Dumas, Pelly, Light Duty Shop, Exploration Laydown	Special Waste	Place in 205 L drums labeled "**Glycol**". Ensure glycol is not mixed with any other products.	Responsible Department, Responsible Contractor	WMA	All waste glycol will be stored in the Special Waste Pole Barn pending off-site disposal.	Off site
Household/Office Waste	Household/Office waste, paper, old clothes and textiles, boots, misc. packaging……	Entire site	Incinerator	Place in containers labeled "**Incinerator**"	Site Services, Responsible Contractor	Incinerator	Sea can beside incinerator	Incinerator
Incinerator Ash	Ash from the incineration of waste	Incinerator	Other	Allow to cool and place in steel container labeled "**Incinerator Ash**". Waste must be completely incinerated. Acceptable ash is transported to the Landfill for disposal.	Site Services	Landfill	Once incinerator ash bin is full bring it to the landfill and cover immediately	Landfill
Ink Cartridges	Ink cartridges for printers	Entire site	Other	Add recycling label that came with cartriges. Cartridges from large, commercial printers go to IT for return to supplier. Cartridges from small printers to the incinerator.	Responsible department	Wharehouse		Offiste
Kitchen Grease	Used cooking oil / grease and grease collected from kitchen sinks / grease traps, etc.	Camp	Other	Place in 20 liter pails (max 50% full) and label "**Waste Kitchen Grease**".	Site Services	Burn Pit	Burn hot and complete	Burn Pit
Lead Acid Batteries	Vehicle and heavy equipment batteries	Dumas, Pelly, Light Duty Shop, Exploration Laydown	Special Waste	Temporary store batteries at mechanic shops.	Responsible Department, Responsible Contractor	WMA	Stack batteries on a pallet in the Special Waste Pole Barn Storage labelled **"Lead Acid Batteries"**	Off site
Light Plastics	Bags, scrap plastic, plastic bottles	Entire site	Incinerator	Place in containers labeled "**Incinerator**"	Site Services, Responsible Contractor	Incinerator	Sea can beside incinerator	Incinerator
Lime Bags	Empty Lime bags	Mill	Other	Stored in labelled containers at Mill Grinding Bay Doors with the Sodium Sulphide	Site Services	Landfill	Will be immediately burned	Landfill
Lithium Batteries	Used Lithium Batteries	Entire site	Other	Store seperately and deliver to WMA on as needed basis	Site Services	WMA	Store in tote or drum labeled Lithium Batteries Only	Offiste
Metal Drums (used 205 L)	Empty 205 liter metal drums from equipment servicing, commissioning, agents, additives, parts, etc.	Dumas, Pelly Light Duty Shop	Other	Drums need to be drained by Generating Department . Department should collect residual oils in a central labelled drum. Designated drum will also be located at the WMA.	Responsible Department	WMA	Drums can be dropped off at the bermed area at the WMA. All Drums must be laying on their side with bungs removed. Excess drums will be crushed.	Offsite
Metal Grease Pails	Empty 20 L grease pails	Dumas, Pelly, Light Duty Shop, Exploration Laydown	Special Waste	**Keep Water Out.** Need to be cleaned out as much as possible; should not have globs of grease inside the metal pail. Generator should keep the plastic liner inside the metal pail and keep the pail as clean as possible.	Responsible Department, Responsible Contractor	WMA	Store . If cleaned, the metal pails can be crushed and put into the scrap pile. Pails that are have more than just residual grease but not globs of grease **can be incinerated**. Keep one pail at WMA to collect globs of grease and send that off-site every so often.	Scrap Metal / Incinerator / Offsite depending on cleanliness
Mill Filter Cloths	Used filter cloths generated from the dry tailings filter press	Mill (Back Door)	Landfill/Inert Waste	After filter jobs, filter cloths can be brought directly to the Landfill.	Responsible Department	Landfill	Cloths should be taken directly to the landfill after a filter change.	Landfill
Misc. Hazardous Wastes and Special Wastes	**Product Specific -Check with Environment or Site Service for Disposal**	Entire Site	Special Waste	**Product Specific -Check with Environment or Site Service for Disposal**	Responsible Department, Responsible Contractor	WMA	N/A	Off Site
Misc. Inert Waste (non-recyclable / non-hazardous waste)	Windshield glass, insulation, Portland cement, construction plastics, drywall, bentonite, sand, small scrap non-recyclable metals, styrofoam, etc.	Pelly, Dumas, Mill, Water Treatment Plant, Engineering Office, Dyno	Landfill/Inert Waste	Site services will bring these bins to the landfill. **If bins contain material that is not designated to go in the landfill the responsible party will sort the material properly**	Site Services	Landfill	Place in active landfill	Landfill
Non-Ferrous Metals/ Light Metals	Aluminum, tin, etc.	Electrical, Pelly, Dumas, Mill	Metals	Place in "**Metals bins".**	Site Services, Responsible Contractor	WMA	On the ground at the metal section of the WMA.	Offsite
Non-Recycable Computers and Electronics	CRT monitors, scanners, laser printers, inject printers.	Mill, Site services, Pelly, Dumas, Tailings,Camp, Engineering Office	Other	Computers/ electronics will first go to the IT department to confirm they are no longer useful.	Site Services	Landfill	Place in active landfill	Landfill
Oil - (Motor, Diesel, Hydraulic, etc.)	Used oil from equipment	Dumas, Pelly, Light Duty Shop, Exploration Laydown	Special Waste	Store waste oil in containers that Pelly Lube truck can identify for dispatch to the waste oil burner located at the Water Treatment Plant. All other non-usable oils (contaminated with water or glycol etc.) will be stored in 205L drums or 5 gallon pails and labelled **"Contaminated Waste Oil"** .	Responsible Department, Responsible Contractor	WMA	Store drums of oil at the special waste pole barn in designated covered area. All drums must be clearly labeled with contents and bungs securely fastened.	Waste oil burner/Excess will be shipped offsite
Oil Absorbent Materials and Oil / Grease Rags	Oil Absorbent materials and oily rags used for hydrocarbon cleanup	Site Services, Mill, Dumas, Pelly	Incinerator	Place in containers labeled "**Incinerator**"	Site Services, Responsible Contractor	Incinerator	Sea can beside incinerator	Incinerator
Oil Filter	Used Oil and from equipment	Pelly, Light Duty Shop	Other	**Crushing of oil filters with a filter crusher is mandatory**. A Filter crusher is located in the Underground Shop and at Pelly Laydown. Place crushed filters in metal drums labeled "**Oil Filters**"	Site Services, Responsible Contractor, Responsible Department	WMA	Crushed oil filters will be deposited in a designated covered area located in the Pole Barn (to ship offsite as scrap metal)	Offsite
Piping – Poly / ABS / PVC	Scrap Poly, ABS, and PVC piping will be generated during construction and maintenance operations	Pelly, Mill, Dumas, Site Services, Water treatment plant	Landfill/Inert Waste	Place in containers labelled "**Landfill/ Inert Waste**".	Site Services, Responsible Contractor	Landfill	Place in active landfill	Landfill

WASTE TYPE	DESCRIPTION	WASTE GENERATION LOCATION (Pelly, Dumas, Mill (Front & Back Door), Tailings, Water Treatment Plant, Camp, Site Services, Electrical Engineering Office, Fuel Farm, Dyno, Light Duty Shop, SGS Lab, Warehouse, Exploration Laydown)	GENERATING STATION CLASS (Bin/Container: 1.**Metals,** 2.**Incinerator Waste**, 3.**Wood/Cardboard**, 4.**Landfill/Inert Waste**,5.**Special Waste**= no bin specified, 6.**Other**=no bin specified)	WASTE STORAGE METHOD/INSTRUCTIONS	TRANSPORT TO RECEIVING STATION (Site Services, Safety, Responsible Department, Responsible Contractor)	RECEIVING STATION (WMA, Incinerator, Burn Pit, Landfill, Waste Oil Tanker, Waste Oil Burner, Electrical Shop, Sewage Lagoon)	RECEIVING STATION STORAGE METHOD/INSTRUCTIONS	FINAL DISPOSAL (Receiving Station or Off Site)
Plastic Oil Pails and Oil Containers (20L)	Empty 20 L oil pails and smaller oil containers from equipment servicing	Dumas, Pelly ,Light Duty Shop, Exploration Laydown	Special Waste	**Keep Water Out**	Responsible Department, Responsible Contractor	WMA	Lids must be removed and buckets turned upside down to drain on a wire grate over drip tray located in covered area of Special Waste Pole Barn. Pails that are have more than just residual grease but not globs of grease **can be incinerated** Stack buckets neatly to be shipped	Offsite
Plastic Oil pails and Oil Containers (1L or 5L)	**Empty** 1L-5L plastic oil containers	Dumas, Pelly ,Light Duty Shop, Exploration Laydown	Incinerator	**Keep lids or caps on Water Out must be empty**	Site Services	Incinerator	Place in incinerator	Incinerator
Recyclable Computers and Electronics	LCD Screens, Laptops, Desktops, keyboards, mice, network cables, power cables, monitor cables, backup	Mill, Site services, Pelly, Dumas, Tailings,Camp, Engineering Office	Other	Computers/ electronics will first go to the IT department to confirm they are no longer useful.	Site Services	WMA	Place with the recycables in a labelled bin under the pole barn	Raven Recycling
Rubber Tires (rim size <24.5")	Used Rubber Tires from light vehicles	Light Duty Shop, Dumas, Pelly	Other	No special instructions	Responsible Department, Responsible Contractor	WMA	Store under labelled Lean-To	Off site
Rubber Tires (rim size >24.5")	Used Rubber Tires from heavy equipment	Pelly, Dumas	Other	No special instructions	Responsible Department, Responsible Contractor	Pelly Yard	Fountain tire will store all used tires at Pelly Laydown. Tires that cannot be repaired will be available to site for other uses.	On Site
Single use oil and glycol plastic drums (used 205 liter)	Empty 205 liter drums (glycol, oil)	Light Duty Shop, Dumas, Pelly	Other	Barrels need to be drained by generating department into appropriate drums. Shops should set up a draining station to handle residual amounts of liquid. Barrels can be drained into appropriate containment at the WMA.	Site Services, Responsible Contractor	WMA	Berm area at the WMA, may find a means of recycling so stored here prior to crushing and landfilling	Offsite
Single use plastic reagent drums (used 205 liter)	Empty 205 liter drums from mill production (e.g.. Nitric acid)	Tailings	Other	Single use barrels should be cleaned by Mill personnel and a hole will be punched in the top and bottom with at least one bung removed. Cleaned and drained with holes punched in bottom. barrels will be moved to the WMA where they will be temporarily	Site Services, Responsible Contractor	WMA	Berm area at the WMA, laid on their side	Raven Recycling
Sodium Sulphide Bags	Empty Sodium Sulphide bags	Mill	Other	Stored in labelled containers at Mill Grinding Bay Doors	Site Services	Landfill	Will be immediately burned	Landfill
Steel – Structural Steel	Reinforcing steel (rebar), Sag liners, Tube Steel, Sheet metal, etc.	Mill, Dumas, Pelly	Metals	Place into **"Metals" bins**,and transport large items seperately	Site Services, Responsible Contractor, Responsible Department	WMA	Separate White Iron brass and copperfor separate backhaul. On the ground at the metal section of the WMA.	Offsite

Appendix B

Incinerator and Waste Oil Burner Specifications

WESTLAND

DOUBLE CHAMBER CYCLONATOR INCINERATOR

SERIES CY-100-CA

CY-100-FA "N"

- **Built In Safety Features**
- **Surpasses Clean Air Guidelines In Most Areas**
- **Economical Operation**
- **Controlled Air Supply**
- **Stacked Secondary Chamber**

Designed to be Used in Permanent Locations for Types I, II, & III Wastes

Capacity
1.1 m^3, 100 kgs per hour type one waste
1.1 m^3, 75 kgs per hour type two waste
1.1 m^3, 55 kgs per hour type three waste

Power Requirements
115 volts 60 cycle single phase

Stack
Stainless Steel
- 14 gauge
- 38 cm diameter
- 3 m high
- c/w stainless steel spark arrester

Casing
12 gauge steel
Lining: high heat duty castable refractory
Over high temperature insulation.

Hearth
Refractory hearth over 6.35 mm steel
Base.

Doors
6.35 mm steel plate c/w heavy clamp
Type latches.
Charging: - 61 cm x 61 cm clear opening
- Refractory lined over steel Plate

Ash: - 61 cm x 30 cm clear opening
- Refractory lined over steel plate

Air Supply - Adjustable
Forced air fan c/w ducts to primary air jets
And to secondary over-fire air jets.

Timers - Adjustable
Cycle timers interconnected to air supply fan and gun type burners enclosed in Burner housings.

Burners
650,000 BTU, gun type Primary Burner. Gun burner enclosed in Protective plate steel housing.
390,000 BTU in secondary chamber,

Fuel Supply: Oil Fired Unit Only
1350 liter fuel storage tank c/w filter and Flexible hose type connection.

Transporter
Incinerator mounted on skid type frame
1.8 m wide x 4.5 m long.

Height
3.9 m tall, with stack folded.

Weight
6000 Kg.

Options
* LPG Fired burners
* Diesel Fired burners
* 2.3 m Electric power cord
* Temp. controllers in Primary and Secondary chambers.

NOTE: Some waste streams may require The use of waste gas scrubbers.

MANUFACTURED BY:
WESTLAND
INCINERATOR CO. LTD.
20204 – 110 Avenue, Edmonton, AB Canada T5S 1X8
Phone: (780) 447-5052 Fax: (780) 447-4912
E-MAIL westland@ketek.ca

DISTRIBUTED BY:
INPROHEAT
INDUSTRIES LTD.
680 Raymur Ave., Vancouver, B.C., V6A 2R1
Phone: (604) 254-0461 Fax: (604) 254-6377

WESTLAND
ENVIRONMENTAL SERVICES INC.
www.westlandenvironmental.com

SINGLE CHAMBER CYCLONATOR INCINERATOR
SERIES CY1000

- **Built In Safety Features**
- **Readily Transportable**
- **Economical Operation**
- **Clean Burning**

CY-1020-FA "N" **CY-1020-FA "D"**

Designed for Petroleum, Mining, and Lumber Industries

Capacity
0.6 m3, 64 kg per hour
Type No. 1, 2, & 3 waste.

Power Requirements
115 volts 60 cycle single phase

Stack
Stainless Steel
- 14 gauge
- 33 cm diameter
- 3 m high
- c/w stainless steel spark arrester
- a hinged base plate for moving

Casing
12 gauge steel.
Lining: high heat duty castable refractory over high temperature insulation.

Hearth
Refractory hearth over 6.35 mm steel base.

Doors
6.35-mm steel plate c/w heavy-duty blade latch.
Charging: - 46 cm x 61 cm clear opening
- Refractory lined over steel plate
Ash: - 46 cm x 30 cm clear opening
- Refractory lined over steel plate

Air Supply
Forced air fan c/w duct to primary air jets and to secondary and overfire air jets.

Timers
Cycle timer interconnected to air supply fan and gun type burner enclosed in burner housing.

Burner
500,000 BTU gun type oil burner. Gun burner enclosed in protective plate steel housing.

Fuel Supply
450-liter fuel storage tank c/w filter and flexible hose type connection.

Transporter
Incinerator and fuel storage mounted On skid type frame 365 cm long x 152 cm Wide. Height: 2.13 M tall, with stack folded. Constructed of 15 cm I Beam c/w bumper posts.

Weight
1815 kg.

Options
* Double chamber cyclonator 2000 series.
* LPG Fired burner.
* Natural gas fired burner.
* 23 m Electric power cord.
* Stack winch.
* 1.4 m3 model 1050.
* Cold climate assembly.

MANUFACTURED BY:

WESTLAND
Environmental Services Inc.

20204 – 110 Avenue, Edmonton, AB Canada T5S 1X8
Phone: (780) 447-5052 Fax: (780) 447-4912
E-MAIL info@westlandenvironmental.com

DISTRIBUTED BY:

CLEAN BURN

The #1 Waste Oil Furnace In Customer Satisfaction™

HASSLE FREE CLEAN BURN 100% SATISFACTION 10 YEAR WARRANTY (or 15,000 Hours) HEAT EXCHANGER/COMBUSTION CHAMBER

VERSATILE WASTE OIL HEATING TECHNOLOGY

Furnace system includes:

- Oil supply pump
- In-line washable oil filter
- Vacuum gauge for filter
- Check valve
- Tank filter
- Oil line fittings package
- Wall thermostat
- Barometric damper

6 ft. figure shown for scale

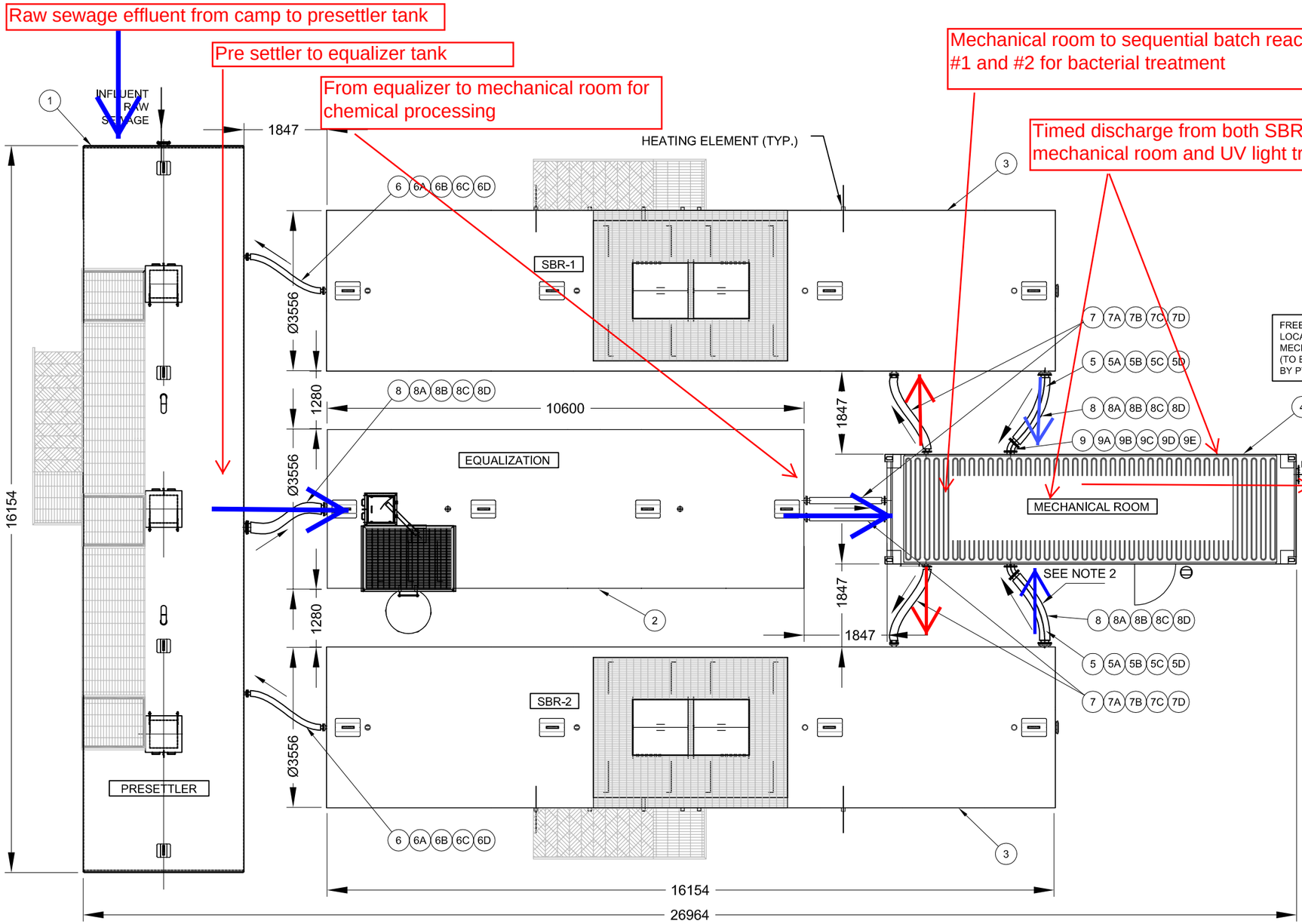
	CB-140	CB-1750	CB-2500	CB-3250	CB-3500	CB-5000
***Maximum BTU/hour**	140,000 (41 kW)	175,000 (51.25 kW)	250,000 (73 kW)	325,000 (95.3 kW)	350,000 (102 kW)	500,000 (146 kW)
***Maximum oil consumption**	1.0 GPH (3.8 L/h)	1.2 GPH (4.54 L/h)	1.7 GPH (6.4 L/h)	2.1 GPH (7.91 L/h)	2.5 GPH (9.5 L/h)	3.6 GPH (13.6 L/h)
Fuels	← **Used oils:** Crankcase, ATF, hydraulic **Fuel oils:** #2, #4, and #5 fuel oil →					
Air flow output (CFM)	Unit heater 2000 Axial fan Furnace cannot be ducted	Unit heater 1700 Central furnace (ducted) 0.25 SPWC (in.) 1500 0.30 SPWC (in.) 1400	Unit heater 2700 Central furnace (ducted) 0.25 SPWC (in.) 2500 0.40 SPWC (in.) 2400	Unit heater 3300 Central furnace (ducted) 0.25 SPWC (in.) 3150 0.40 SPWC (in.) 2900	Unit heater 4200 Central furnace (ducted) 0.25 SPWC (in.) 4000 0.40 SPWC (in.) 3900	Unit heater 5500 Central furnace (ducted) 0.25 SPWC (in.) 5200 0.40 SPWC (in.) 5100
***Air compressor req'd**	2.0 CFM @ 20 PSI (3.4 m^3/h @ 1.4 bar)	2.0 CFM @ 20 PSI (3.4 m^3/h @ 1.4 bar)	2.0 CFM @ 20 PSI (3.4 m^3/h @ 1.4 bar)	2.0 CFM @ 20 PSI (3.4 m^3/h @ 1.4 bar)	2.0 CFM @ 25 PSI (3.4 m^3/h @ 1.7 bar)	2.5 CFM @ 25 PSI (4.25 m^3/h @ 1.7 bar)
Stack size	6 inch dia. (152.4mm dia.)	8 inch dia. (203mm dia.)	8 inch dia. (203mm dia.)	8 inch dia.(203mm dia.)	8 inch dia. (203mm dia.)	10 inch dia. (254mm dia.)
Furnace dimensions, assembled L x W x H (inches) (millimeters)	45" L x 28 W x 20 H (1143 x 711.2 x 508)	83 x 29.25 x 31.5 (2190 x 743 x 787)	103.25 x 29.25 x 31.5 (2623 x 743 x 787)	121" L x 31.25 W x 35 H (3073 x 794 x 889)	74 x 35 x 61 (1880 x 889 x 1549)	78 x 38 x 73 (1981 x 965 x 1845)
Approx. weight (Uncrated furnace system)	300 pounds (136.07 kg)	406 pounds (182.7 kg)	509 pounds (229.1 kg)	641 pounds (288.7 kg)	836 pounds (376.2 kg)	1036 pounds (466.2 kg)
Electrical requirements	115 VAC 60 Hz, single phase 20 A circuit breaker	115 VAC 60 Hz, single phase 20 A circuit breaker	115 VAC 60 Hz, single phase 30 A circuit breaker	115 VAC 60 Hz,single phase 30 A circuit breaker -or- 230 VAC 60 Hz,single phase 20 A circuit breaker	230 VAC 60 Hz, single phase 30 A circuit breaker	230 VAC 60 Hz, single phase 30 A circuit breaker

* Values indicated above are nominal. Actual values will vary depending on fuel and installation.

Clean Burn, LLC. 4109 Capital Circle, Janesville, WI USA 53546 1-800-331-0183 Fax: 717-656-0952 **www.CleanBurn.com**

Appendix C

Sewage Treatment System Process Flow Diagram



ITEM PR.	ITEM SEC.	QTY	DWG ASS.	DESCRIPTION	SPECIFICATION	MAT'L
1		1	A01	PRE-SETTLER	Ø 3.56 m x 15 m (11'-8" x 53')	P.S.
2		1	A02	EQUALIZATION TANK	Ø 3.56 m x 10.6 m (11'-8" x 34.8')	P.S.
3		2	A03	BIOSEQUENCER SBR TANK	Ø 3.56 m x 16.1 m (11'-8" x 53')	P.S.
4		1	A04	MECHANICAL ROOM	2.4 m W. X 9.1 m L. X 2.86 m H. (8' W. X 30' L. X 9.5' H.)	
5		2		HOSE Ø 3/4 IN. X 80 IN. L. (HEAT TRACE)		
5	A	16		BOLT	1/2"-13 X 3 1/2"	SS304
5	B	8		NUT	1/2"-13	SS304
5	C	16		LOCK WASHER	1/2"	SS304
5	D	24		FLAT WASHER	1/2"	SS304
6		2		HOSE Ø 2 IN. X 80 IN. L. (HEAT TRACE)		
6	A	16		BOLT	5/8"-11 X 3 1/2"	SS304
6	B	8		NUT	5/8"-11	SS304
6	C	16		LOCK WASHER	5/8"	SS304
6	D	24		FLAT WASHER	5/8"	SS304
7		4		HOSE Ø 3 IN. X 80 IN. L. (HEAT TRACE)		
7	A	32		BOLT	5/8"-11 X 3 1/2"	SS304
7	B	16		NUT	5/8"-11	SS304
7	C	32		LOCK WASHER	5/8"	SS304
7	D	48		FLAT WASHER	5/8"	SS304
8		3		HOSE Ø 6 IN. X 80 IN L. (HEAT TRACE)		
8	A	48		BOLT	3/4"-10 X 4"	SS304
8	B	24		NUT	3/4"-10	SS304
8	C	48		LOCK WASHER	3/4"	SS304
8	D	72		FLAT WASHER	3/4"	SS304
9		2		ELBOW 45° (HEAT TRACE)	Ø150 (Ø6")	SS304
9	A	16		BOLT	3/4"-10 X 4"	SS304
9	B	16		NUT	3/4"-10	SS304
9	C	16		LOCK WASHER	3/4"	SS304
9	D	32		FLAT WASHER	3/4"	SS304
9	E	4		GASKET	Ø150 mm (Ø6")	NEOP

NOTES

1. SITE PREPARATION AND CIVIL ENGINEERING WORKS BY OTHERS.
2. ALL INTERCONNECTING PIPINGS IS FLEXIBLE RUBBER INSULATED, HEAT TRACED AND FLANGED

NO.	DATE	REVISION	BY
2	2013-02-27	GENERAL REVISION	L.H.M.
1	2012-10-03	General rev. staircases, except for one	L.H.M.

PREMIER TECH AQUA
TEL: (450) 471-8444
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LACHENAIE, QUE.

TITLE:
WASTEWATER TREATMENT PACKAGED PLANT
ECOPROCESS™ SBR SYSTEM
Layout View

CLIENT:
MINTO EXPLORATION, YUKON

FABRICATION TOLERANCE: METRIC

FOR INFORMATION

PREPARED BY: KHIER K. CHIBANI	DATE: 2012-09-21	REFERENCE DRAWING:		PROJECT No.: P-4163	SIZE: B
VERIFIED BY: L.-P. BUIST	DATE: 2012-09-21	VERIFIED BY:	DATE:	SCALE: 1:100	REVISION: 2
APPROVED BY: L.-P. BUIST	DATE: 2012-09-21	DRAWING BY: L. MARINIER	DATE: 2012-09-21	DRAWING NUMBER: 4163-G01	

Appendix D

LTF, WMA and Incinerator Inspection Forms

Land Treatement Facility Biweekly Physical Inspection April 1 - October 30		
PART A		
Date		
Inspector Name		
1. Is the Contaminated Material sign at the LTF entrance visible? **(Y/N)**		
2. Did you obseve signs of wildlife? **(Y/N)** If Y please describe in comments, note location in LTF.		
3. Did you obseve wildlife attractants? **(Y/N)** If Y please decribe in comments. Inform Supervisor and make a plan for removal.		
4. Did you observe signs of surface water runoff entering or leaving the LTF? **(Y/N)** If Y describe the surface runoff and location. Inform Supervisor.		
5. Did you observe damaged or degraded Berms? **(Y/N)** If Y describe in comments. Inform Supervisor.		
6. Did you observe contaminated material on berms? **(Y/N)**. If Y describe in notes where the location is and inform Supervisor.		
7. Is the new material properly labeled in staging area? **Y/N**. If N describe location in notes and inform Supervisor.		
8. Is there sufficient separation between different levels or types of contamination? **Y/N**. If N describe location in notes and inform Supervisor.		
9. Observations, comments or actions required		

Incinerator Volumes Burned

4 Hr Burns per day		Camp and Office Wasste		Buckets Burned		Rags and Spill Pads	
Mark the number of 4 hr burns each day. Mark each burn with the time started		Mark total bags burnt per day example 30/30		Mark the number of buckets burned per day example 10/ 6 Never exceed 10 buckets per burn.		Mark the number of bags of oily rags and spill pads burned per day. Mark each bag with a (1 / 2) Never exceed 2 bags per burn	
Date	**Burns**	**Date**	**Bags**	**Date**	**Buckets**	**Date**	**Bags**
1-Dec		1-Dec		1-Dec		1-Dec	
2-Dec		2-Dec		2-Dec		2-Dec	
3-Dec		3-Dec		3-Dec		3-Dec	
4-Dec		4-Dec		4-Dec		4-Dec	
5-Dec		5-Dec		5-Dec		5-Dec	
6-Dec		6-Dec		6-Dec		6-Dec	
7-Dec		7-Dec		7-Dec		7-Dec	
8-Dec		8-Dec		8-Dec		8-Dec	
9-Dec		9-Dec		9-Dec		9-Dec	
10-Dec		10-Dec		10-Dec		10-Dec	
11-Dec		11-Dec		11-Dec		11-Dec	
12-Dec		12-Dec		12-Dec		12-Dec	
13-Dec		13-Dec		13-Dec		13-Dec	
14-Dec		14-Dec		14-Dec		14-Dec	
15-Dec		15-Dec		15-Dec		15-Dec	
16-Dec		16-Dec		16-Dec		16-Dec	
17-Dec		17-Dec		17-Dec		17-Dec	
18-Dec		18-Dec		18-Dec		18-Dec	
19-Dec		19-Dec		19-Dec		19-Dec	
20-Dec		20-Dec		20-Dec		20-Dec	
21-Dec		21-Dec		21-Dec		21-Dec	
22-Dec		22-Dec		22-Dec		22-Dec	
23-Dec		23-Dec		23-Dec		23-Dec	
24-Dec		24-Dec		24-Dec		24-Dec	
25-Dec		25-Dec		25-Dec		25-Dec	
26-Dec		26-Dec		26-Dec		26-Dec	
27-Dec		27-Dec		27-Dec		27-Dec	
28-Dec		28-Dec		28-Dec		28-Dec	
29-Dec		29-Dec		29-Dec		29-Dec	
30-Dec		30-Dec		30-Dec		30-Dec	
31-Dec		31-Dec		31-Dec		31-Dec	

Incinerator Daily Checks

Thermocouples PC_T and SC_T		Contact Switches PC_D		Refactory in primary chamber PC		Gasket/seal waste feed door PC_D		General Housekeeping		Ash Bin Emptied	
Check that readings of temperature controllers are "close" to the estimated temperatures of the primary and secondary chambers		Free movement, no obstructions		No large (not expansion) cracks; pieces falling out repair if necessary		Wear and tear; proper seal		Check area for trip slip hazards and general cleanliness		Initial the date the ash bin is emptied	
Good / Repair needed		Good / Repair needed		Good / Repair needed		Good / Repair needed		Good / Repair needed		Initial the date the ash bin is	
Date	Circle one	Date	Circle one	Date	Circle one	Date	Circle one	Date	Circle one	Date	Initial
1-Dec	G / RN	1-Dec	G / RN	1-Dec	G / RN	1-Dec	G / RN	1-Dec	G / RN	1-Dec	
2-Dec	G / RN	2-Dec	G / RN	2-Dec	G / RN	2-Dec	G / RN	2-Dec	G / RN	2-Dec	
3-Dec	G / RN	3-Dec	G / RN	3-Dec	G / RN	3-Dec	G / RN	3-Dec	G / RN	3-Dec	
4-Dec	G / RN	4-Dec	G / RN	4-Dec	G / RN	4-Dec	G / RN	4-Dec	G / RN	4-Dec	
5-Dec	G / RN	5-Dec	G / RN	5-Dec	G / RN	5-Dec	G / RN	5-Dec	G / RN	5-Dec	
6-Dec	G / RN	6-Dec	G / RN	6-Dec	G / RN	6-Dec	G / RN	6-Dec	G / RN	6-Dec	
7-Dec	G / RN	7-Dec	G / RN	7-Dec	G / RN	7-Dec	G / RN	7-Dec	G / RN	7-Dec	
8-Dec	G / RN	8-Dec	G / RN	8-Dec	G / RN	8-Dec	G / RN	8-Dec	G / RN	8-Dec	
9-Dec	G / RN	9-Dec	G / RN	9-Dec	G / RN	9-Dec	G / RN	9-Dec	G / RN	9-Dec	
10-Dec	G / RN	10-Dec	G / RN	10-Dec	G / RN	10-Dec	G / RN	10-Dec	G / RN	10-Dec	
11-Dec	G / RN	11-Dec	G / RN	11-Dec	G / RN	11-Dec	G / RN	11-Dec	G / RN	11-Dec	
12-Dec	G / RN	12-Dec	G / RN	12-Dec	G / RN	12-Dec	G / RN	12-Dec	G / RN	12-Dec	
13-Dec	G / RN	13-Dec	G / RN	13-Dec	G / RN	13-Dec	G / RN	13-Dec	G / RN	13-Dec	
14-Dec	G / RN	14-Dec	G / RN	14-Dec	G / RN	14-Dec	G / RN	14-Dec	G / RN	14-Dec	
15-Dec	G / RN	15-Dec	G / RN	15-Dec	G / RN	15-Dec	G / RN	15-Dec	G / RN	15-Dec	
16-Dec	G / RN	16-Dec	G / RN	16-Dec	G / RN	16-Dec	G / RN	16-Dec	G / RN	16-Dec	
17-Dec	G / RN	17-Dec	G / RN	17-Dec	G / RN	17-Dec	G / RN	17-Dec	G / RN	17-Dec	
18-Dec	G / RN	18-Dec	G / RN	18-Dec	G / RN	18-Dec	G / RN	18-Dec	G / RN	18-Dec	
19-Dec	G / RN	19-Dec	G / RN	19-Dec	G / RN	19-Dec	G / RN	19-Dec	G / RN	19-Dec	
20-Dec	G / RN	20-Dec	G / RN	20-Dec	G / RN	20-Dec	G / RN	20-Dec	G / RN	20-Dec	
21-Dec	G / RN	21-Dec	G / RN	21-Dec	G / RN	21-Dec	G / RN	21-Dec	G / RN	21-Dec	
22-Dec	G / RN	22-Dec	G / RN	22-Dec	G / RN	22-Dec	G / RN	22-Dec	G / RN	22-Dec	
23-Dec	G / RN	23-Dec	G / RN	23-Dec	G / RN	23-Dec	G / RN	23-Dec	G / RN	23-Dec	
24-Dec	G / RN	24-Dec	G / RN	24-Dec	G / RN	24-Dec	G / RN	24-Dec	G / RN	24-Dec	
25-Dec	G / RN	25-Dec	G / RN	25-Dec	G / RN	25-Dec	G / RN	25-Dec	G / RN	25-Dec	
26-Dec	G / RN	26-Dec	G / RN	26-Dec	G / RN	26-Dec	G / RN	26-Dec	G / RN	26-Dec	
27-Dec	G / RN	27-Dec	G / RN	27-Dec	G / RN	27-Dec	G / RN	27-Dec	G / RN	27-Dec	
28-Dec	G / RN	28-Dec	G / RN	28-Dec	G / RN	28-Dec	G / RN	28-Dec	G / RN	28-Dec	
29-Dec	G / RN	29-Dec	G / RN	29-Dec	G / RN	29-Dec	G / RN	29-Dec	G / RN	29-Dec	
30-Dec	G / RN	30-Dec	G / RN	30-Dec	G / RN	30-Dec	G / RN	30-Dec	G / RN	30-Dec	
31-Dec	G / RN	31-Dec	G / RN	31-Dec	G / RN	31-Dec	G / RN	31-Dec	G / RN	31-Dec	

Incinerator Weekly Checks

Blowers PC_B*, SC_B, FP_B*****

Inspect/ Clean intakes/ Clean blowers if necessary (lockout required)

Every Sunday		Every Sunday		Every Sunday		Every Sunday		Every Sunday	
Date	Good	Date	Good	Date	Good	Date	Good	Date	Good
	Y / N		Y / N		Y / N		Y / N		Y / N
	Y / N		Y / N		Y / N		Y / N		Y / N
	Y / N		Y / N		Y / N		Y / N		Y / N
	Y / N		Y / N		Y / N		Y / N		Y / N
	Y / N		Y / N		Y / N		Y / N		Y / N
	Y / N		Y / N		Y / N		Y / N		Y / N
	Y / N		Y / N		Y / N		Y / N		Y / N
	Y / N		Y / N		Y / N		Y / N		Y / N
	Y / N		Y / N		Y / N		Y / N		Y / N
	Y / N		Y / N		Y / N		Y / N		Y / N
	Y / N		Y / N		Y / N		Y / N		Y / N

Comments

*PC_B - Primary Chamber Blower

**SC_B - Secondary Chamber Blower

***FP_B - Flame Port Blower

Incinerator Monthly Checks

External surfaces of Primary Chamber (PC) and secondary chamber (SC)

" Spotty" discoloration may indicate damage to refactory and/ or insulation

1st of Each Month		1st of Each Month		1st of Each Month		1st of Each Month		1st of Each Month		1st of Each Month	
Date	Good	Date	Good	Date	Good	Date	Good	Date	Good	Date	Good
	Y / N		Y / N		Y / N		Y / N		Y / N		Y / N
	Y / N		Y / N		Y / N		Y / N		Y / N		Y / N

Comments

Incinerator Annual Checks

Refactory in Secondary Chamber

No large (not expansion) cracks; repair if necessary

2013		2014		2015		2016		2017	
Date	Good	Date	Good	Date	Good	Date	Good	Date	Good
	Y / N		Y / N		Y / N		Y / N		Y / N