## Introduction

This appendix includes tabular summaries of field investigation conducted by CH2M from fiscal year (FY) 2012 to FY2016. The tables (C-1 through C-5) show the applicable geographic site area, program objectives, summary of completed fieldwork scope, and applicable data report document citations for each program.

| Table C-1. Summary of Field and Analytical Programs for FY2012-2013  Faro Mine Remediation Project | | | | |
| --- | --- | --- | --- | --- |
| Geographic Areas | Remediation Design Purpose | Characterization Objectives | Completed Fieldwork Scope | Data Report Reference |
| Site-wide | Wildlife Baseline - Winter Furbearer and Wildlife Tracking Survey | * Characterize presence, relative abundance, and habitat use by furbearers and other wildlife species during winter | * Completed 12 transects (each composed of a triangle with 1-km side length) * Identified and count wildlife tracks | Ecological Logistics & Research Ltd. (ELR). November 2012. *Faro Mine Site Winter Track Study Memo – Activity R05.09.02B.* Memo. Prepared for CH2M HILL Canada Limited (CH2M), Chuck Shewen, B.Sc., P.Biol. November 9. |
| RCTA, CVD | Construct Cross Valley Dam Interception System | * Characterize hydrostratigraphy * Evaluate GW quality * Investigate GW/SW interaction in Rose Creek | * Drilled seven borings to bedrock at toe of CVD and completed as monitoring wells * Drilled four shallow paired borings downstream adjacent to Rose Creek and completed as monitoring wells * Collected GW samples from all new wells and 56 existing locations * Completed aquifer tests at all installed wells, including the four-day aquifer test using multiple pumping wells * Installed and monitor 16 streambed piezometers | CH2M HILL Canada Limited (CH2M). March 2013m. Cross Valley Dam Interception System Investigation Data Report Faro Mine Remediation Project. Technical memorandum. Draft. Prepared for Government of Yukon. March 28. |
| Site-wide Waste Dumps, Site-wide Pits | Seep and Surface Water Monitoring | * Characterize seepage water quality * Characterize ARD evolution * Characterize WTP influent quality | * Sampled 109 seep locations and 10 SW locations in spring and fall | CH2M HILL Canada Limited (CH2M). October 2013a. *2012 Seepage, Surface Water, and Water Treatment Plant Influent Field Sampling Report, Faro Mine Remediation Project.* Final. Prepared for Government of Yukon. October 29. |
| Rose Creek, NFRC, SFRC | Fish Telemetry Survey | * Investigate seasonal movements, habitat use, critical habitat of Arctic Grayling | * Sampled, tagged, and completed telemetry monitoring of arctic grayling | Environmental Dynamics Inc. (EDI). November 2012. *Faro Mine Fish Telemetry Project – Interim Field Report No. 1*. Prepared for CH2M HILL Canada Limited (CH2M), Dawn Kelly, Project Manager. November 6. |
| Environmental Dynamics Inc. (EDI). December 2012. *Faro Mine Remediation Project Fish Telemetry Program – Interim Field Report No. 2*. Prepared for CH2M HILL Canada Limited (CH2M), Charles Shewen. December 13. |
| Main Dump, Zone II Waste Dump, Intermediate Dump, Grum Waste Dump, Vangorda Waste Dump | Waste Rock Dump Monitoring | * Characterize hydrostratigraphy * Characterize GW quality * Characterize ARD evolution * Characterize geotechnical properties of waste Rock and underlying native material | * Drilled six borings through waste dumps (NE, Zone II, Main, Intermediate, Grum, Vangorda), completed as monitoring wells, thermistor ports, gas sampling ports * Sampled groundwater wells, and monitored temperatures and pore gas in fall and winter | CH2M HILL Canada Limited (CH2M). October 2013b. Waste Rock Dump Monitoring Report. Technical memorandum. Final. Prepared for Government of Yukon. October 29. |
| Mill Building Area | Construct new Faro and Vangorda Water Treatment Plant and Piping | * Investigate geotechnical foundation conditions * Characterize WTP influent water quality | * Drilled 10 borings into bedrock. Completed borings as piezometers and developed * Monitored water levels | CH2M HILL Canada Limited (CH2M). December 2012. *Geotechnical Design Report, Water Treatment Plant, Faro Mine Remediation Project.* Technical memorandum. Draft. Prepared for Government of Yukon. December 7. |
| Zone II Pit | Replace Zone II Pit Pumping Well | * Characterize hydrostratigraphy in backfilled Zone II Pit | * Drilled, installed, and developed replacement Zone II pit pumping well | CH2M HILL Canada Limited (CH2M). November 2012g. Task Authorization 007 Summary of Zone II Drilling Activities, Faro Mine Remediation Project. Technical memorandum. Draft. Prepared for Karen Furlong/Government of Yukon (YG). November 1. |
| Site-wide | Develop and Decommission Faro and Vangorda Grum Borrow Sources | * Assess overall areal limit of potentially viable, currently undisturbed borrow source materials | * Performed geological reconnaissance * Hand-dug 20 test pits | CH2M HILL Canada Limited (CH2M). June 2013f. *Limited Borrow Material Reconnaissance, Faro Mine Remediation Project*. Technical memorandum. Final. Prepared for Government of Yukon. June 10. |
| Grum Overburden Dump | Develop Grum Overburden Dump Borrow Source | * Quantify available borrow material * Characterize geochemistry, fertility, and geotechnical properties of borrow material | * Drilled six borings * Excavated eight test pits | CH2M HILL Canada Limited (CH2M). June 2013i. *Grum Overburden Dump Fatal Flaw Evaluation Data Report, Faro Mine Remediation Project.* Technical memorandum. (Final). June 10 |
| Site-wide Surface Water | Construct New Faro and Vangorda Water Treatment Plant and Piping | * Characterize water quality from pits and water collection systems * Characterize WTP influent water quality | * Collected SW samples from eight locations three times (spring, fall, winter) | CH2M HILL Canada Limited (CH2M). October 2013a. *2012 Seepage, Surface Water, and Water Treatment Plant Influent Field Sampling Report, Faro Mine Remediation Project.* Final. Prepared for Government of Yukon. October 29. |
| CH2M HILL Canada Limited (CH2M). November 2012c. *Water Treatment Plant Design – Influent Characterization/Plant Capacity Phasing, Faro Mine Remediation Project.* Technical memorandum No. 1. Final. November 23. |
| NFRC, SFRC, Rose Creek | Aquatic Community and Habitat Baseline Field Study | * Estimate fish density * Characterize fish habitat | * Deployed and track radio tags * Collected and analyze tissue samples * Collected habitat data | Environmental Dynamics Inc. (EDI). March 2015a. *Arctic Grayling Telemetry & Fish Habitat Investigations, Faro Mine, 2012-2014.* (Final). Prepared for CH2M HILL Canada Limited (CH2M). March 25. |
| WTP | Construct New Faro and Vangorda Water Treatment Plant and Piping | * Evaluate sludge and effluent qualities produced using high-density sludge treatment | * Operated three high-density sludge pilot WTP systems * Tested effluent and sludge qualities under varying influent chemistries and system configurations | CH2M HILL Canada Limited (CH2M). November 2012a. *Water Treatment Pilot Study Report, Faro Mine Remediation Project, TA 013.* Technical Memorandum No. 4. Prepared for Government of Yukon and Aboriginal Affairs and Northern Development Canada (AANDC). November 27. |
| Notes:  AANDC = Aboriginal Affairs and Northern Development Canada  ARD = acid rock drainage  CH2M = CH2M HILL Canada Limited  CVD = Cross Valley Dam  FSP = field sampling plan  FY = fiscal year  GW = groundwater  km = kilometre  NE = northeast  NFRC = North Fork Rose Creek  RCTA = Rose Creek Tailings Area  SFRC = South Fork Rose Creek  SW = surface water  WRD = waste rock dump  WTP = water treatment plant | | | | |

| Table C-2. Summary of Field and Analytical Programs for FY2013-2014  Faro Mine Remediation Project | | | | | |
| --- | --- | --- | --- | --- | --- |
| Geographic Areas | Remediation Design Purpose | Characterization Objectives | Completed Fieldwork Scope | Data Report Reference | |
| RCD, CVD, Intermediate Impoundment, NFRC | Construct Cross Valley Dam Interception System | * Characterize hydrostratigraphy * Characterize GW Quality * Characterize GW/SW interaction in RCD and NFRC | * Completed surface geophysical transect along potential CVD SIS alignment (GPR, resistivity, seismic refraction) * Drilled one boring downstream from CVD to investigate potential fractured bedrock zone * Drilled, installed and developed six well clusters along the RCD - each consisting of paired wells and a stream stage * Drilled, installed, and developed a well cluster of three wells in the north portion of the Intermediate Impoundment * Collected GW samples * Conducted four aquifer tests at RCD well clusters * Installed and monitored 19 streambed piezometers in the NFRC upstream of the Rock Drain * Conducted a specific conductivity survey in the RCD adjacent to the Secondary Impoundment | CH2M HILL Canada Limited (CH2M). February 2014q*. 2013 Cross Valley Dam Seepage Interception System Field Investigation Data and Analysis Report, Faro Mine Remediation Project.* Final.Prepared for Government of Canada as represented by Aboriginal Affairs and Northern Development Canada and the Government of Yukon. February 7. | |
| Vangorda Creek, Granitic Rock Outcrop, Grum Waste Rock Dump Quarry | Construct Replacement Vangorda Creek Diversion | * Characterize Hydrostratigraphy * Evaluate channel hydraulics and morphology * Characterize geotechnical foundation conditions * Characterize rip rap borrow material geotechnical properties | * Drilled three borings along proposed VCD alignment (SRK, November 2010), completed as standpipe piezometers * Completed resistivity, GPR, seismic reflection and seismic refraction geophysical surveys of SRK’s proposed VCD alignment, granitic rock outcrop, and Grum Waste Rock Dump Quarry * Collected and logged surface samples from Granitic Rock Outcrop and Grum Waste Rock Dump Quarry * Drilled two diamond core drill holes in the Granitic Rock Outcrop * Completed topographic survey of SRK's proposed VCD alignment * Completed fluvial geomorphic assessment of Vangorda Creek * Inspected meteorological stations * Completed reconnaissance of SRK's proposed VCD alignment | CH2M HILL Canada Limited (CH2M). March 2014d. *2013 Vangorda Creek Diversion Field Investigation Data and Analysis Report, Faro Mine Remediation Project.* Final. Prepared for Government of Yukon and Government of Canada as represented by Aboriginal Affairs and Northern Development Canada. March 28. | |
| Ridge North of Grum Pit, Grum Overburden Dump, Haul Road Borrow, Rose Creek Borrow | Develop and Decommission Faro-Grum-Vangorda Borrow Sources | * Characterize geotechnical properties, geochemistry, and fertility of potential borrow material * Quantify available borrow material | * Logged and sampled surface bedrock exposures * Collected surface soil samples * Drilled 14 pionjar borings * Drilled six sonic borings * Excavated 40 test pits | CH2M HILL Canada Limited (CH2M). March 2014n. *Phase II Borrow Reconnaissance, Faro Mine Remediation Project.* Final. Prepared for Government of Yukon and Government of Canada as represented by Aboriginal Affairs and Northern Development Canada. March 28. | |
| CH2M HILL Canada Limited (CH2M). March 2014b. *Faro Water Treatment Plant Geotechnical Design Report Addendum, 2013 Borrow Source and Quarry Investigation*, *Faro Mine Remediation Project.* Final.Prepared for Government of Yukon and Government of Canada as represented by Aboriginal Affairs and Northern Development Canada. March 31. | |
| Faro Pit, Vangorda Pit, Grum Pit | Evaluate pit wall stability | * Investigate slope stability of pit walls | * Completed field reconnaissance/mapping * Installed survey monitoring points at Grum Pit | CH2M HILL Canada Limited (CH2M). March 2014q. *Faro Mine Complex 2013 Pit Wall Stability Inspection, Faro Mine Remediation Project.* Final. Prepared for Government of Yukon and Government of Canada as represented by Aboriginal Affairs and Northern Development Canada. March 26. | |
| NFRD, RCD, ID, NFRC, SFRC, Upper Parking Lot Waste Dump, Lower Northwest Waste Dump | Construct Down Valley Interim Hydraulic Upgrades | * Characterize hydrostratigraphy * Characterize geotechnical properties at base of Rock Drain, RCD, and ID * Characterize geochemical and geotechnical properties of potential calc silicate borrow material * Characterize flows in NFRC and RCD | * Performed geological reconnaissance of RCD * Excavated seven test pits along crest of ID * Excavated three test pits in ID spillway * Completed five geophysical transects across NFRC upstream and downstream of the NFRD * Drilled two borings at downstream toe of Rock Drain * Established continuous stream stage monitoring at SW stations R10 and X2 * Performed dye test through the NFRD * Surveyed weekly water elevations at NF1 and NF2 * Excavated 15 test pits in the Upper Parking Lot WRD and Lower Northwest WRD | CH2M HILL Canada Limited (CH2M). March 2014m. *2013 Down Valley Interim Hydraulic Upgrades Field Investigation Data and Analysis Report, Faro Mine Remediation Project.* Final. Prepared for Government of Yukon and Government of Canada as represented by Aboriginal Affairs and Northern Development Canada. March 28. | |
| Site-wide Waste Dumps, Site-wide Pits | Seep and Surface Water Monitoring | * Characterize seepage water quality * Characterize ARD evolution * Characterize WTP influent quality | * Sampled 109 seep locations and 10 surface water locations in spring and fall | CH2M HILL Canada Limited (CH2M). March 2014c. *2013* *Seep Sampling and Waste Rock Dump Monitoring Data and Analysis Report, Faro Mine Remediation Project.* Final.Prepared for Government of Yukon and Government of Canada as represented by Aboriginal Affairs and Northern Development Canada. March 31. | |
| Main Dump, Zone II Waste Dump, Grum Waste Dump, Intermediate Dump, Vangorda Waste Dump | Waste Rock Dump Monitoring | * Characterize GW quality * Characterize ARD evolution | * Monitored thermistors, pore gas and groundwater in spring, fall and winter | CH2M HILL Canada Limited (CH2M). March 2013n. *Waste Rock Dump Monitoring Data Report Faro Mine Remediation Project.* Technical memorandum. Prepared for Government of Yukon. March 28. | |
| Site-wide Surface Water Bodies | Waterfowl Study | * Characterize quality of potential waterfowl habitat * Evaluate potential for contaminant ingestion | * Performed visual survey of potential waterfowl habitat with spotting scope and binoculars * Performed waterfowl habitat surveys * Sampled vegetation and sediment | Ecological Logistics & Research Ltd (ELR). December 2013. *Faro Mine Complex 2013 Waterfowl Studies.* Prepared for CH2M HILL Canada Limited (CH2M), Chuck Shewen. December 12. | |
| Notes:  ARD = acid rock drainage  CVD = Cross Valley Dam  FY = fiscal year  GPR = ground-penetrating radar  GW = groundwater  ID = Intermediate Dam  NFRC = North Fork Rose Creek  RCD = Rose Creek Diversion  SRK = SRK Consulting Engineers and Scientists  SW = surface water  VCD = Vangorda Creek Diversion  WRD = waste rock dump | | | | |

| Table C-3. Summary of Field and Analytical Programs for FY2014-2015  Faro Mine Remediation Project | | | | |
| --- | --- | --- | --- | --- |
| Geographic Areas | Remediation Design Purpose | Characterization Objectives | Completed Fieldwork Scope | Data Report Reference |
| Faro Pit | Construct Faro Pit Safety Berm | * Observe surface conditions and hydrologic | * Performed geological reconnaissance of pit perimeter berm alignment provided in SRK Draft 4a Closure Plan (SRK, November 2010) | CH2M HILL Canada Limited (CH2M). March 2015oo. *Summary of 2014 Field Investigation – Faro Pit Safety Berm; FSP Name: Activity 101.2 – Field Reconnaissance for the Faro Pit Safety Berm.* Technical memorandum. Draft. Prepared for Government of Yukon. March 12. |
| FCD | Upgrade Faro Creek Diversion | * Characterize surface conditions at existing diversions * Characterize surface conditions along SRK proposed replacement Faro Creek Diversion alignment (SRK, November 2010) | * Performed geological reconnaissance * Performed Bed and Bank Material Characterization * Completed 20 channel cross section surveys | CH2M Canada Limited (CH2M). March 2015i. *Summary of 2014 Field Investigation – Faro Creek Diversion East Valley and Faro Creek Diversion West Valley Interceptor Ditch FSP Name: 102.1 – Faro Creek Diversion (East Valley); 102.2 – Faro Creek Diversion (West Valley Interceptor Ditch)*. Technical memorandum. Prepared for Government of Yukon. March 18. |
| NWID | Upgrade North Wall Interceptor Ditch | * Characterize channel shape and surface conditions * Characterize geotechnical properties of channel bank material | * Excavated four test pits * Performed geological reconnaissance * Completed eight channel cross section surveys | CH2M HILL Canada Limited (CH2M). March 2015j. *Summary of 2014 Field Investigation – North Wall Interceptor Ditch and Upper Guardhouse Creek FSP Name: 102.3 – Upgrade North Wall Interceptor Ditch.* Technical memorandum. Draft. Prepared for Government of Yukon. March 19. |
| Lower Guardhouse Creek | Install Lower Guardhouse Creek Interception System | * Characterize channel shape and general conditions | * Performed geological reconnaissance * Performed specific conductivity survey | CH2M HILL Canada Limited (CH2M). March 2015k. *Summary of 2014 Field Investigation – Lower Guardhouse Creek Interception FSP Name: 102.4 – Lower Guardhouse Creek Interception.* Technical memorandum. Prepared for Government of Yukon. March 19. |
| Oxide Fines Stockpile, Low Grade Ore Stockpile C | Relocate Oxide Fines to Low-grade Stockpile “C” | * Characterize geotechnical properties of oxide fines stockpile and LGSPC * Characterize geochemical properties of the oxide fines stockpile and LGSPC * Delineate extent of oxide fines stockpile | * Drilled one boring in Oxide Fines Stockpile and installed a GW monitoring well, thermistor port, and pore gas ports * Excavated four test pits * Collected two shallow hand-dug test pit samples | CH2M HILL Canada Limited (CH2M). March 2015l. *Summary of 2014 Field Investigation – Relocate Oxide Fines to Low-grade Stockpile “C” FSP Name: 104.1 – Relocate Oxide Fines to LGSPC.* Technical memorandum. Prepared for Government of Yukon. March 13. |
| ETA | Remove ETA Tailings to Rose Creek Tailings Facility | * Investigate tailings thickness and geotechnical properties * Characterize extent of contamination in tailings and underlying soils * Characterize geotechnical properties of road fill in mine access road adjacent to ETA | * Drilled three borings * Advanced six seismic CPT soundings | CH2M Canada Limited (CH2M). March 2015m. *Summary of 2014 Field Investigation – Relocate ETA Tailings to Rose Creek Tails Area FSP Name: 105.1 – Remove Tailings to Rose Creek Tailings Facility.* Technical memorandum. Prepared for Government of Yukon. March 9. |
| ETA | Design of a Surface Water Collection Structure for the Emergency Tailings Area | * Characterize bedrock conditions * Characterize overburden and bedrock conditions along the proposed alignment of the mine Access Road * Quantify surface water flow at FCS-4 and X‑23 | * Completed two seismic refraction surface geophysical survey lines * Excavated one test pit * Installed stilling wells and water level transducers at two SW locations * Performed geological reconnaissance | CH2M Canada Limited (CH2M). March 2015n. *Summary of 2014 Field Investigation – Design of a Surface Water Collection Structure for the Emergency Tailings Area* *FSP Name: 105.2 – Install Emergency Tailings Area Surface Water Collection System.* Technical memorandum. Prepared for Government of Yukon. March 9. |
| Main Dump, Intermediate Dump | Regrade and Reslope Main Dump and Intermediate Dump Sulphide Cells | * Delineate geographic extent of the Main Dump and Intermediate Dump sulphide cells * Characterize geotechnical properties of the sulphide material * Determine foundation preparation requirements for a cover * Characterize infiltration properties of the sulphide cell material | * Excavated 12 test pits * Drilled one boring in the Main WRD and installed a thermistor port and pore gas ports | CH2M HILL Canada Limited (CH2M). March 2015o. *Summary of 2014 Field Investigation – Delineate Main and Intermediate Sulphide Cells for Regrading and Capping Design FSP Name: 106.1 – Regrade and Reslope Main and Intermediate Sulphide Cells.* Technical memorandum. Prepared for Government of Yukon. March 13. |
| Faro Waste Dumps | Regrade and Reslope Faro Waste Rock Dumps | * Characterize geotechnical properties of waste rock material * Characterize geochemical kinetics and leachability of waste rock material | * Excavated seven test pits. | CH2M HILL Canada Limited (CH2M). March 2015p. *Summary of 2014 Field Investigation – Regrade and Reslope Faro Waste Rock Dumps (Upper Surface) FSP Name: 106.2 – Regrade and Reslope Faro Waste Rock Dumps (Upper Surfaces).* Technical memorandum. Prepared for Government of Yukon. March 13. |
| Faro Waste Dumps | Regrade and Reslope Faro Waste Rock Dumps | * Characterize geotechnical foundation conditions along toe of Faro WRDs * Characterize hydrostratigraphy in areas of potential WRD footprint expansion | * Performed geological reconnaissance * Excavated five test pits. | CH2M HILL Canada Limited (CH2M). March 2015q. *Summary of 2014 Field Investigation – Regrade and Reslope Faro Waste Rock Dumps (Toe of Slope) FSP Name: 106.3 – Regrade and Reslope Faro Waste Rock Dumps (Toe of Slope).* Technical memorandum. Prepared for Government of Yukon. March 13. |
| NFRC, SFRC | Upgrade North Fork Rose Creek | * Document general conditions along NFRC and SFRC | * Performed geological reconnaissance * Characterized bed and bank material * Completed 14 channel cross section surveys | CH2M Canada Limited (CH2M). March 2015i. *Summary of 2014 Field Investigation – Upgrade North Fork Rose Creek* *FSP Name: 107.1 – Upgrade North Fork Rose Creek.* Technical memorandum. Prepared for Government of Yukon. March 19. |
| Zone II Outwash | Relocate Zone II Outwash Material to Intermediate Sulphide Cell | * Delineate extent of contamination in Zone II outwash sediments | * Excavated four test pits. | CH2M Canada Limited (CH2M). March 2015j. *Summary of 2014 Field Investigation – Relocate Zone II Outwash Material to Intermediate Sulphide Cell* *FSP Name: 107.3 – Relocate Zone II Outwash Material to Intermediate Sulphide Cell).* Technical memorandum. Prepared for Government of Yukon. March 19. |
| Zone II Outwash | Install Zone II Outwash Collection System | * Characterize hydrostratigraphy in Zone II Outwash | * Drilled, installed, developed and sampled eight monitoring wells * Performed packer testing in bedrock * Completed stream stage monitoring * Completed one seismic refraction geophysics line | CH2M HILL Canada Limited (CH2M). March 2015t. *Summary of 2014 Field Investigation – Install Zone II Outwash Collection System FSP Name: 107.4 – Install Zone II Outwash Collection System.* Technical memorandum. Prepared for Government of Yukon. March 2. |
| S-Wells | Install S-Wells Groundwater Collection System | * Characterize hydrostratigraphy in S-Wells area * Investigate GW/SW interaction in the NFRC downstream of the Rock Drain | * Drilled, installed, developed and sampled six monitoring wells * Installed and monitored 16 streambed piezometers * Performed packer testing in bedrock * Completed one seismic refraction geophysics line * Completed stream stage monitoring | CH2M HILL Canada Limited (CH2M). March 2015u. *Summary of 2014 Field Investigation – Install S-Wells Groundwater Collection System FSP Name: 107.5 – Install S-Wells Groundwater Collection System.* Technical memorandum. Prepared for Government of Yukon. March 19. |
| Former Faro Lube Shack and Tank Farm | Relocate Contaminated Soil from Faro Lube Shack and Tank Farm Area and Cover | * Delineate extent of hydrocarbon contamination | * Excavated two test pits | CH2M HILL Canada Limited (CH2M). March 2015v. *Summary of 2014 Field Investigation – Relocate Contaminated Soil from Faro Lube Shack and Tank Farm Area and Cover FSP Name: 108.5 – Relocate Contaminated Soil from Faro Lube Shack and Tank Farm Area and Cover.* Technical memorandum. Prepared for Government of Yukon. March 12. |
| Intermediate Tailings Impoundment | Dewater and Cover Intermediate Tailings Area | * Delineate thickness and geotechnical properties of tailings. | * Drilled one boring and completed with thermistor port casing * Advanced three CPT soundings | CH2M Canada Limited (CH2M). March 2015m. *Summary of 2014 Field Investigation – Dewater and Cover Intermediate Tailings Area FSP Name: 201.1 – Dewater and Cover Intermediate Tailings Area.* *Technical memorandum.* Prepared for Government of Yukon. March 13. |
| Intermediate Tailings Impoundment | Construct New Side Channel and Side Channel Dike | * Delineate thickness and geotechnical properties of tailings * Evaluate seasonal frost penetration. | * Drilled 4 borings and completed with thermistor port casings * Advanced 9 CPT soundings * Monitored thermistor ports in fall and winter. | CH2M Canada Limited (CH2M). March 2015o. *Summary of 2014 Field Investigation – Construct New Side Channel and Side Channel Dike FSP Name: 201.5 – Construct New Side Channel and Side Channel Dike.* Technical memorandum.Prepared for Government of Yukon. March 13. |
| ID Spillway | Construct Intermediate Dam Spillway | * Characterize geotechnical foundation conditions along proposed ID Spillway alignment | * Drilled two borings into bedrock * Performed packer testing | CH2M Canada Limited (CH2M). March 2015p. *Summary of 2014 Field Investigation – Construct Intermediate Dam Spillway FSP Name: 201.6 – Construct Intermediate Dam Spillway.* Technical memorandum.Prepared for Government of Yukon. March 13. |
| RCD | Upgrade Rose Creek Diversion | * Characterize channel morphology | * Completed two channel cross section surveys | CH2M Canada Limited (CH2M). March 2015n. *Summary of 2014 Field Investigation – Upgrade Rose Creek Diversion FSP Name: 201.3 – Upgrade Rose Creek Diversion.* Technical memorandum.Prepared for Government of Yukon. March 13. |
| Secondary Tailings Impoundment near Fuse Plug | Construct Erosion Dissipation Structure | * Characterize local setting and foundation conditions at location of proposed erosion dissipation structure | * Performed geological reconnaissance | CH2M Canada Limited (CH2M).2015q. *Summary of 2014 Field Investigation – Erosion Dissipation Structure FSP Name: 203.2 – Erosion Dissipation Structure.* Technical memorandum.Prepared for Government of Yukon. March 13. |
| RCD near Fuse Plug | Construct New Overflow Weir | * Investigate geotechnical foundation conditions at location of proposed overflow weir | * Advanced two borings into bedrock | CH2M HILL Canada Limited (CH2M). March 2015cc. *Summary of 2014 Field Investigation – Construct New Overflow Weir FSP Name: 203.4 – Construct New Overflow Weir.* Technical memorandum. Prepared for Government of Yukon. March 13. |
| Pump House Pond | Develop and Decommission Faro Borrow Sources – Granular Soil, Pump House Borrow | * Characterize geotechnical and geochemical properties of borrow material * Delineate extent of potential borrow source | * Excavated five test pits | CH2M Canada Limited (CH2M). March 2015f. *Summary of 2014 Field Investigations – Pump House Borrow Source, Faro Mine Remediation Project.* Technical memorandum. Prepared for Government of Yukon. March 27. |
| Granitic Rock Outcrop | Develop and Decommission Grum/Vangorda Rip Rap Sources – Granitic Rock Outcrop | * Characterize geotechnical properties of borrow material * Delineate extent of potential borrow source | * Drilled two borings * Completed two seismic refraction geophysics lines | CH2M Canada Limited (CH2M). March 2015g. *Summary of 2014 Field Investigations – Granitic Rock Outcrop, Faro Mine Remediation Project.* Technical memorandum. Prepared for Government of Yukon. March 27. |
| RCD, NFRC | Site-wide Surface Water Monitoring | * Characterize surface water flows | * Installed stilling wells and water level transducers at five surface water monitoring locations | CH2M HILL Canada Limited (CH2M). March 2015dd. *Summary of 2014 Field Investigation – Site-wide Surface Water Monitoring FSP Name: SW-005 – Site-wide Surface Water Monitoring.* Technical memorandum. Prepared for Government of Yukon. March 31. |
| Site-wide Waste Dumps, RCTA | Site-wide Geochemical Monitoring | * Characterize seepage water quality * Characterize ARD evolution * Characterize GW quality in RCAA * Characterize pit Lake water quality * Characterize WTP influent quality * Characterize waste rock geotechnical and geochemical characteristics and extents * Characterize contaminant loading to Rose Creek Alluvial aquifer from ETA. | * Drilled 5 borings in Original Tailings Impoundment, Northwest Dump and Northeast Dump * Installed, and develop four monitoring wells in WRDs and Original tailings impoundment * Installed gas ports and thermistor ports in two WRD borings * Monitored WRD GW, thermistor, soil gas (spring, fall, winter) * Sampled 14 streambed piezometers upstream of Rock Drain * Sampled 85 wells in RCTA (fall) * Monitor 188 seeps (spring, fall). Complete Pit Lake Profiling. | CH2M HILL Canada Limited (CH2M). March 2015b. *Summary of 2014 Field Investigation – Site-wide Geochemical Monitoring FSP Name: SW-015 – Site-wide Geochemical Monitoring.* Technical memorandum. Prepared for Government of Yukon. March 31. |
|
| Zone II Outwash | Reclaim Zone II Outwash | * Determine terrain Classification * Characterize vegetation community * Characterize soil series * Investigate toxicology | * Conducted field survey of soil and vegetation * Collected vegetation tissue and soil samples | CH2M HILL Canada Limited (CH2M). March 2015kk. *Vegetation and Soil – 2014 Field Summary Report, Faro Mine Remediation Project Proposal.* (Final). Prepared for Government of Canada as represented by Aboriginal Affairs and Northern Development Canada and the Government of Yukon. March. |
| Site-wide Mine Disturbance Areas | Baseline Mine Vegetation Regrowth Study | * Determine terrain Classification * Characterize vegetation community * Characterize soil series * Investigate toxicology | * Conducted field survey of soil and vegetation * Collected vegetation tissue and soil samples | CH2M HILL Canada Limited (CH2M). February 2015c. *Site-wide Soil Characterization Report, Faro Mine Remediation Project.* Draft. Prepared for Government of Canada as represented by Aboriginal Affairs and Northern Development Canada and the Government of Yukon. February 9. |
| Undisturbed Portions of Local Study Area | Site-wide Soils and Vegetation Baseline Study | * Determine terrain Classification * Characterize vegetation community * Characterize soil series * Investigate toxicology | * Conducted field survey of soil and vegetation * Collected vegetation tissue and soil samples |
| LGSP A | Cover and Revegetate LGSP A | * Determine terrain Classification * Characterize vegetation community * Characterize soil series * Investigate toxicology | * Conducted field survey of soil and vegetation * Collected vegetation tissue and soil samples |
| ETA | Cover and Revegetate ETA | * Determine terrain Classification * Characterize vegetation community * Characterize soil series * Investigate toxicology | * Conducted field survey of soil and vegetation * Collected vegetation tissue and soil samples |
| Northeast WRD | Cover and Revegetate Northeast Sulphide Cell | * Determine terrain Classification * Characterize vegetation community * Characterize soil series * Investigate toxicology | * Conducted field survey of soil and vegetation * Collected vegetation tissue and soil samples |
| Main Dump and Intermediate Dump | Cover and Revegetate Main Dump and Intermediate Dump Sulphide Cells | * Determine terrain Classification * Characterize vegetation community * Characterize soil series * Investigate toxicology | * Conducted field survey of soil and vegetation * Collected vegetation tissue and soil samples |
| Mt. Mungly Waste Dump and Southwest Pit Wall Dump | Cover and Revegetate Mt Mungly (East and West) and Southwest Pit Wall Dumps | * Determine terrain Classification * Characterize vegetation community * Characterize soil series * Investigate toxicology | * Conducted field survey of soil and vegetation * Collected vegetation tissue and soil samples |
| Pipeline Alignment from CVD to WTP | Construct Cross Valley Dam SIS Pipeline | * Characterize geotechnical conditions along proposed CVD SIS pipeline alignment | * Excavated 10 test pits | CH2M HILL Canada Limited (CH2M). January 2015b. *Cross Valley Dam Seepage Interception System Test Pit Data Summary, Faro Mine Remediation Project*. Technical memorandum. Draft. Prepared for Government of Yukon. January 30. |
| Notes:  CVD = Cross Valley Dam  ETA = Emergency Tailings Area  FCD = Faro Creek Diversion  FY = fiscal year  GW = groundwater  ID = Intermediate Dam  LGSPC = low-grade ore stock pile “C”  NFRC = North Fork Rose Creek  RCD = Rose Creek Diversion  NWID = North Wall Interceptor Ditch  SFRC = South Fork Rose Creek  SIS = seepage interception system  SRK = SRK Consulting Engineers and Scientists  WRD = waste rock dump  WTP = water treatment plant  YG = Government of Yukon | | | | |

| Table C-4. Summary of Field and Analytical Programs for FY2015-2016  Faro Mine Remediation Project | | | | | | |
| --- | --- | --- | --- | --- | --- | --- |
| Geographic Areas | Remediation Design Purpose | Characterization Objectives | Completed Fieldwork Scope | | Data Report Reference | |
| Site-wide Waste Dumps and Pits, RCTA | Site-wide Geochemical Monitoring | * Characterize seepage water quality * Characterize ARD evolution * Characterize GW quality in RCAA * Characterize pit lake water quality | * Monitored WRD GW, thermistor, soil gas (spring, fall, winter) * Sampled 85 wells in RCTA (fall) * Monitored 188 seeps (spring, fall) * Completed pit lake profiling (fall, winter) | | CH2M Canada Limited (CH2M). April 2016d. Summary of 2015 Field Investigation – Site-wide Geochemical Monitoring, FSP Name: SW-015 – Site-wide Geochemical Monitoring. Technical memorandum. Draft. Prepared for Government of Yukon. April 6. | |
| FCD and Faro Valley | Upgrade Faro Creek Diversion | * Characterize hydrostratigraphy in Faro Valley * Evaluate proportion of leakage from FCD vs. quantity of GW flow beneath channel | * Drilled, installed, and developed three well clusters (three wells per cluster) | | CH2M Canada Limited (CH2M). April 2016g. Summary of 2015 Field Investigation - Faro Valley Seepage Investigation, Faro Mine Remediation Project, Field Sampling Plan Name: 106.1 – Faro Valley Seepage Investigation. Technical memorandum. Draft. Prepared for Government of Yukon. April 1. | |
| Faro Pit and FCD | Upgrade Faro Creek Diversion | * Characterize geotechnical conditions and stability of east wall of Faro Pit | * Drilled two borings into bedrock, * Performed downhole acoustic and optical televiewer surveys * Installed two slope inclinometers nested with vibrating wire piezometers * Drilled two shallow borings and completed with standpipe piezometers * Established routine monitoring schedule for piezometer and inclinometer installations | | BGC Engineering Inc. (BGC). March 2016. Faro Open Pit Stability Assessment, Site-wide Design Basis Report. Draft. Prepared for CH2M HILL Canada Limited (CH2M HILL). March 18 | |
| FCD, Upper Guardhouse Creek, NWID | Upgrade Faro Creek Diversion, Upper Guardhouse Creek and NWID | * Characterize channel shape and morphology | * Complete rapid geomorphic assessment * Survey channel cross sections at nine locations | | CH2M Canada Limited (CH2M). April 2016h. Summary of 2015 Field Investigation – West Side and East Side Diversions, Faro Mine Remediation Project. Technical memorandum. Draft. Prepared for Government of Yukon. April 1. | |
| FCD | Upgrade Faro Creek Diversion | * Characterize geotechnical conditions along proposed replacement FCD alignment * Characterize hydrostratigraphy and permafrost conditions in Faro Creek Valley * Confirm bedrock characterization at east wall of Faro Pit North Instability | * Completed 21 surface geophysical survey transects * Drilled six borings into bedrock * Installed monitoring wells and thermistor ports in five borings | | CH2M Canada Limited (CH2M). August 2016a. Summary of 2015-2016 Field Investigation – Faro Creek Diversion Proposed Realignment, Field Sampling Plan Name: Faro Creek Diversion New Alignment Drilling. Technical memorandum. Draft. Prepared for Government of Yukon. August 18. | |
| CVD Pond, ID Pond | Remediate CVD and ID Pond | * Prepare higher resolution CVD Pond stage - storage curve * Characterize thickness and volume of deposited sediment and tailings * Characterize geochemical and geotechnical properties of sediments in CVD and ID ponds | * Bathymetry and sub-bottom profiling of CVD Pond * Advanced eight CPT soundings in the ID Pond * Advanced three CPT soundings in CVD Pond * Drilled eight sonic borings in CVD Pond | | CH2M Canada Limited (CH2M). August 2016c. Summary of FY 2015 – 2016 Field Investigations – CVD and ID Pond Field Data Report, Field Sampling Plan Name: CVP and ID Pond CPT and Sonic Sampling. Technical Memorandum. Prepared for Government of Yukon. August 25. | |
| ID Spillway | Upgrade Intermediate Dam Spillway | * Characterize depth and condition of bedrock surface in the area of the proposed PMF spillway * Characterize geotechnical conditions in ID Spillway footprint * Characterize permeability of overburden at upstream and downstream end of spillway | * Complete one surface geophysical survey lines with seismic reflection and resistivity * Complete six surface geophysical survey lines with multichannel analysis of surface waves and seismic refraction * Drill five borings into bedrock, and install and develop two pumping wells and three piezometers * Complete packer testing in bedrock | | CH2M Canada Limited (CH2M). April 2016f. Summary of 2015 Field Investigation – Construct Intermediate Dam Spillway, Faro Mine Remediation Project, Field Sampling Plan Name: 201.6 Construct Intermediate Dam Spillway. Technical memorandum. Draft. Prepared for Government of Yukon. March 31. | |
| Site-wide | Water Management Inventory | * Document locations and specifications of water conveyance infrastructure | * Complete survey and inventory of water conveyance structures | | CH2M HILL Canada Limited (CH2M). February 2016b. *Water Conveyance System Mapping and Inventory, Faro Mine Remediation Project.* Technical memorandum. Prepared for Government of Yukon. February 1. | |
| Notes: | | | | | |
| ARD = acid rock drainage  BGC = BCG Engineering  CPT = cone penetration test  CVD Pond = Cross Valley Pond  FCD = Faro Creek Diversion | | | | GW = groundwater  ID = Intermediate Dam  PMF = probable maximum flood  RCAA = Rose Creek Alluvial Aquifer | |

| Table C-5. Summary of Field and Analytical Programs for FY2016-2017  Faro Mine Remediation Project | | | | | | |
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| Geographic Areas | Remediation Design Purpose | Characterization Objectives | Completed Fieldwork Scope | | Data Report Reference | |
| Site-wide Waste Dumps and Pits, RCTA | Site-wide Geochemical Monitoring | * Characterize seepage water quality * Characterize ARD evolution | * Monitored WRD GW, thermistor, soil gas (spring) * Monitored 188 seeps (spring) | | CH2M Canada Limited (CH2M). August 2016j. Summary of 2016 Field Investigation – Site-wide Geochemical Monitoring. Technical memorandum. Draft. Prepared for Government of Yukon. August 18. | |
| FCD and Faro Valley | Upgrade Faro Creek Diversion | * Characterize hydrostratigraphy in Faro Valley * Evaluate proportion of leakage from FCD vs. quantity of GW flow beneath channel * Delineate spatial extent of permafrost | * Completed aquifer testing at three well clusters * Completed surveying of 21 surface geophysical transects FCD alignment * Collected volumetric discharge measurements at four locations * Collected GW samples from one location at each well cluster | | CH2M Canada Limited (CH2M). August 2016h. Summary of 2016 Field Investigation – Faro Creek Diversion Aquifer Testing, Faro Mine Remediation Project. Technical Memorandum. Draft. Prepared for Government of Yukon. August 24. | |
| ID Pond | Remediate ID Pond | * Prepare higher resolution ID Pond stage - storage curve * Characterize thickness and volume of deposited sediment and tailings | * Bathymetry and sub-bottom profiling of ID Pond * Completed surveying of 7 surface geophysical transects for ID PMF Spillway | | CH2M Canada Limited (CH2M). August 2016c. Summary of FY 2015 – 2016 Field Investigations – CVD and ID Pond Field Data Report, Field Sampling Plan Name: CVP and ID Pond CPT and Sonic Sampling. Technical Memorandum. Prepared for Government of Yukon. August 25. | |
| Notes: | | | | | |
| ARD = acid rock drainage  CPT = cone penetration test  CVD Pond = Cross Valley Pond  FCD = Faro Creek Diversion | | | | GW = groundwater  ID = Intermediate Dam  RCTA – Rose Creek Tailings Area  WRD – Waste Rock Dump | |