Title of document: **DEWATERING PHASE PUMPING SYSTEM DESIGN REPORT**

Client: **AGNICO EAGLE MINES – MEADOWBANK DIVISION**

Project: **DETAILED ENGINEERING DESIGN OF WATER MANAGEMENT AND GEOTECHNICAL INFRASTRUCTURES DEWATERING PHASE - WHALE TAIL PROJECT EXPANSION**

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LIST OF REVISIONS

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#	Prep.	Rev.	App.	Date		
PA	DC	ALN	ALN	April 6th, 2020	All	Issued for internal review
PB	DC	ALN	ALN	April 14th, 2020	All	Issued for client review
R0	DC	ALN	ALN	May 15th, 2020	All	Issued for design
R1	DC	ALN	ALN	May 22, 2020	All	Issued for design

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1.0 Introduction

1.1 Context

Agnico Eagle Mines Limited, Meadowbank Division (AEM) is developing the Whale Tail Project, a satellite deposit located on the Amaruq property (Kivalliq Region of Nunavut, Canada). The Whale Tail Project construction is ongoing and commercial production has started in the third quarter of 2019. To continue mining and milling, AEM is proposing to expand the Whale Tail Project by expanding the Whale Tail pit, developing another open pit called the IVR pit and including underground mining operations. As part of the expansion project, new water management and geotechnical infrastructures shall be required for surface water management.

Prior to the construction of these new infrastructures, several lakes will have to be dewatered first. The following technical note presents the dewatering strategy and the design of the pumping system retained for the dewatering phase of this project. This design report of the dewatering phase pumping system is submitted as per Water License 2AM-WTP1830, Part D, Item 2.

1.2 Mandate

SNC-Lavalin was mandated to:

- Study dewatering strategy in preparation of the future phase 2 operation;
- Design pumping stations and pipelines for dewatering of each lake;
- Establish material take-off (MTO) for the dewatering phase;
- Produce appropriate documentation, including installation specifications and construction drawing to implement the retained management solution.

1.3 Reference Document

The following reference documents in Table 1-1 were developed for the dewatering detail engineering all of the pertinent drawings and documents developed for the detailed engineeringfor the water management infrastructure and can be found in Appendices 1 and 2.

Table 1-1: Reference Documents

Document number	Version	Type of document	Description
6127-648-132-DGC-001	R0	Design basis and criteria	Design basis and design criteria for pumping stations and pipelines – dewatering phase
61-648-200-202	R1	Process Flow Diagram	Lake A47 & A49 Dewatering
61-648-200-203	R1	Process Flow Diagram	Lake A50, A51, A52 & A53
61-648-200-204	R1	Process Flow Diagram	WT Attenuation Pond, WT South Lake & Mammoth Lake
61-648-270-202	R1	Pipe layout	Dewatering phase piping layout

Document number	Version	Type of document	Description
61-648-230-200	RB	Civil & Geotechnical	Lake 47-A, 47-B, 47-C and 49-B access ramps and pumping pads
61-648-230-201	RB	Civil & Geotechnical	Lake A50, A51, A52, A-P21 access ramps and pumping pads
61-695-230-202	RB	Civil & Geotechnical	IVR Attenuation Pond (Lake A53) Access Ramp and Pumping Pad
6127-S-270-004-MTO-002	R1	Material Take-off List	Phase 2 dewatering phase piping, piping hardware, valves Material Take-off list

2.0 Lake Dewatering Approach

The following lakes will have to be dewatered prior to the construction of the new infrastructures required for the Amaruq Phase 2 project:

- Lake A47, located within the footprint of the future IVR pit. It is divided into three (3) sub-sections: lake A47-A, A47-B, A-47C;
- Lake A49, located within the footprint of the future IVR pit. It is divided into two (2) sub-sections: lake A49-A and A49-B;
- Lake A53 which will become the future IVR Attenuation Pond;
- Lakes A50, A51 and A52;
- Lake A-P21 which is located on the footprint of the future IVR WRSF.

Figure 2-1 presents a plan view of the different lakes to dewater on site. Figure 2-2 presents the block flow diagram planned by AEM for dewatering of these lakes.

The construction, commission and dewatering of these lakes is expected to occur from June to September 2020 once authorization have been obtained. The dewatering sequence can be summarized as followed:

- Dewatering activity can occur concurrently and/or after fishout is completed. Fishout is required for lakes A47, A49 and A53;
- Water from lake A47-B shall be transferred to lake A49-B;
- Once the access road and jetty are built, water from lake A47-A shall be transferred to lake A49-B;
- Water from lake A47-C shall be transferred to lake A47-B, where it will then be transferred to lake A49-B;
- At lake A49-B, water shall be transferred to the Whale Tail Attenuation Pond where it can be treated by the WTP and discharged to Mammoth Lake. If the water quality permits, it can be diverted directly to Whale Tail South basin.
- Water from lake A49-A can be pumped to lake A49-B. Alternatively, a trench can be built to bridge both lakes if site condition permits.

> Water from lakes A50, A51 and A52 shall be transferred to lake A53 or Whale Tail Attenuation Pond where it can be treated by the WTP and discharge to Mammoth Lake.

> Water from lake A53 shall be pumped to the Whale Tail South Basin. If the water quality needs further treatment, it will be transferred to Whale Tail Attenuation Pond where it can be treated by the WTP and discharge to Mammoth Lake.

> Water from lake A-P21 shall be transferred to lake A52. From there, the water shall be transferred to lake A53 or Whale Tail Attenuation Pond where it can be treated by the WTP and discharge to Mammoth Lake.

The estimated total volume that will be dewatered from the lakes are presented in Table 2-1. Note that the volumes presented are estimate only based on the bathymetry data available at the time of writing of this report and does not include the spring freshet volumes. If all of the lakes are dewatered in 2020, the total volume discharged to Mammoth Lake and Whale Tail South Basin could be higher than 153,735 m^3/year.

Table 2-1: Estimated Volumes to Dewater per Lake

Lake	Total Volume to Dewater (m^3) (exclude freshet volumes)	Notes
A47-A	30,000 approx.	Based on site bathymetry
A47-B	15,000 approx.	Rough estimate
A47-C	5,000 approx.	Rough estimate
A49-A	10,500 approx.	Based on site bathymetry
A49-B	7,000 approx. A49-A and A49-B: 65,000 approx.	Based on site bathymetry Lakes A49-A and A49-B are hydraulically connected as of elev. 156.0 m approximately
A50	4,000 to 6000 approx.	Rough estimate
A51	5,000 to 8,000 approx.	Rough estimate
A52	8,000 to 10,000 approx.	Rough estimate
A53	163,000 to 165,000 approx.	Based on site bathymetry
A-P21	10,000 to 15,000 approx.	Rough estimate

The estimated total volume that will be dewatered from the lakes are presented in Table 2-1. Note that the volumes presented are estimate only based on the bathymetry data available at the time of writing of this report and does not include the spring freshet volumes.

During the dewatering phase, water discharged to Mammoth Lake or Whale Tail South Basin shall comply with the maximum monthly mean and short-term maximum concentration presented in Table 2-2.

Table 2-2: Maximum Allowable Water Quality Concentration During Dewatering

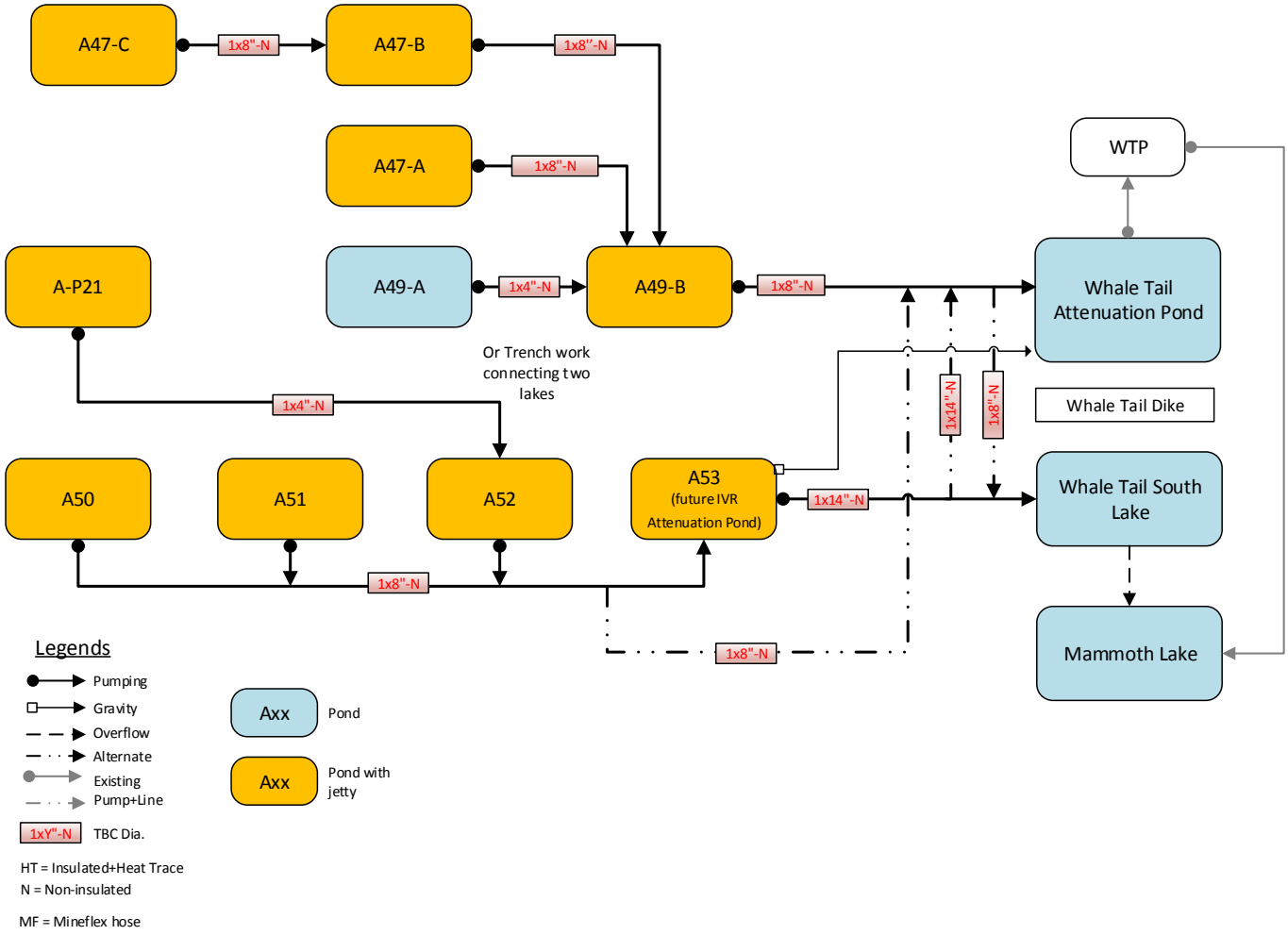
Parameters	Maximum Monthly Mean (MMM)	Short Term Maximum Composite Sample (STM)	Short Term Maximum Grab Sample
Total Suspended Solids (TSS)	15.0 mg/l	22.5 mg/L	30 mg/L

Trigger values have been developed with corresponding management action plans; should TSS concentrations in the water body exceed the trigger values during dewatering, a management action plan consisting of a series of steps to be undertaken will be initiated. The trigger value for the short-term maximum concentration is a single sample that exceeds the STM concentration. The trigger value for the maximum monthly mean is a 7-day moving average concentration that exceeds the MMM.

A description of the management action plans for dewatering can be found in AEM's document "Water Quality Monitoring and Management Plan for Dike Construction and Dewatering", version 3 (May 2020).

Figure 2-1: Plan View – Lake Dewatering for Phase II

Figure 2-2: Block Flow Diagram – Lake Dewatering for Phase II



3.0 Infrastructure Design

3.1 Summary

The following infrastructure and equipment are planned for the dewatering phase:

- An access road as well as three ramps are planned for the dewatering of lake A47-A, A47-B, A-47C;
- An access ramp is planned for the dewatering of lake A49-B;
- An access road and ramps are planned for the dewatering of lakes A50, A51 and A52, as well as lake A-P21;
- An access road and ramp are planned for the dewatering of lake A53;
- At each lake, diesel powered pump and pipelines are required to transfer water to either Whale Tail Attenuation Pond or Whale Tail South Basin, depending on the water quality.

3.2 Pump Station Design

The pump models that will be used for the various pumping stations during the dewatering, as well as the expected flow and head based on analysis of pumps' performance curves and system curves simulated by the software PipeFlo® are presented in Table 3-1. Additional information on the expected ranges in operating pressure are presented in Appendix 4. The details of the pumps, pipeline length, valves etc. are described in the dewatering phase MTO 6127-S-270-004-MTO-002 (material take-off list). All of the pumps required for the dewatering phase are mobile diesel pumps.

For the area around A47 and A49, two (2) HL250 pumps and two (2) CD103 pumps are required. The planned dewatering sequence is presented below:

- At all time, an HL250 pump is available to transfer water from A49-B to Whale Tail Attenuation Pond or Whale Tail South Basin, if water quality permits;
- Dewatering of A47-C (2 x CD103 pump) and A47-B (1 x HL250 pump) to A49-B;
- Dewatering of A47-A to A49-B (1 x HL250 pump);
- Dewatering of A49-A to A49-B (1 x CD103 pump) and emptying of A49-B (HL250 pump).

For the area around lakes A50 to A53, one (1) HL250 pumps and two (2) CD103 pumps are required. The planned dewatering sequence is presented below:

- At all time, an HL250 pump is available to transfer water from A53 to Whale Tail South Basin if water quality permits or Whale Tail Attenuation Pond;
- Dewatering of A50 (2 x CD103 pump) to A53 or Whale Tail Attenuation Pond;
- Dewatering of A51 (2 x CD103 pump) to A53 or Whale Tail Attenuation Pond;
- Dewatering of A52 (2 x CD103 pump) to A53 and emptying of A53 (HL250 pump);
- Dewatering of A-P21 to A52 (1 x CD103 pump).

It is to be noted that the order in the dewatering sequence for both areas and individual lakes can be switched as needed based on site conditions.

Since dewatering could occur concurrently with fishout of the lakes, the pumps shall be equipped with a suction cage designed for the protection of freshwater fish, per the design requirements outlined in the document “Freshwater Intake End-of-Pipe Fish Screen Guidelines” from the Department of Fisheries and Oceans (DFO), March 1995. Refer to Appendix 5 for drawings of the typical suction cages that shall be used during fishout.

3.3 Pumping Station Pad Design

The dewatering of the lakes required the construction of temporary pads for the installation of mobile pumps. A total of four (4) temporary pads were planned for A47-A, A47-B, A47-C and A49-B. Table 3-2 summarizes the design parameters of these pads and access roads. The drawing 61-648-230-200 describes the details of the pads and access roads and it is presented in *Appendix 1*.

Table 3-1: Design Parameters of the Pumping Station Pads

Parameter		Value	Unit
Pumping Pad Elevation	A47-A	El. 155.0	m
	A47-B	El. 157.0	m
	A47-C	El. 157.0	m
	A49-B	El. 155.0	m
Access Road Width		10.0	m
Pumping Pad Width		10.5	m
Safety Berm Height		Per Mine Act requirements	m
Maximum slope		6	%

An access road and pumping pads shall also be built to access lakes A50 to A52 and lake A-P21; drawing 61-648-230-201 presents details of this infrastructure. As for A53, a ramp with two (2) pads at elevation El. 163.0 m and El. 165.5 m corresponding to low and high water levels is planned for Phase 2. The detailed design of this ramp is presented in drawing 61-695-230-202, “Plan view and typical section of IVR Attenuation Pond Access Ramp and Pumping Pad”.

Table 3-2: Pump Models, Nominal & Maximum Flowrate and Expected Total Dynamic Head for Dewatering Phase

Study Line No.	From	To	Material of Construction	Nominal Diameter (in)	Approximate Total Length (1) (m)	Minimum & Maximum Water Level (2) (m)	At Nominal Flowrate			At Maximum Flowrate			Pump model	Note
							Flowrate (m^3/h)	Total Dynamic Head (m)	Motor Speed (RPM)	Flowrate (m^3/h)	Total Dynamic Head (m)	Motor Speed (RPM)		
648-200-WFR-PC11-0214 648-200-WFR-PC17-0208	49-B	Whale Tail Attenuation Pond	HDPE DR11/DR17	8	1830	Min: 152 Max: 160	300	62.4 (LL) 54.5 (HH)	1473 1384	347 (LL) 350 (HH)	83.1 (LL) 77.8 (HH)	1700 1650	HL250 (4)	Suction length 45 m (14"DR17) from pad at 155 m The discharge line is comprised of 580m 8"DR11 and 1250m 8"DR17
648-200-WFR-PC11-0214 648-200-WFR-PC17-0208 648-350-WFR-PC17-0210 648-350-WFR-PC17-0213	49-B	Whale Tail South Lake	HDPE DR17 14" HDPE DR11 8"	8 & 14	2435	Min: 152 Max: 160	300	79.4 (LL) 72.5 (HH)	1647 1579	353 (LL) 345 (HH)	105.4 (LL) 94.2 (HH)	1900 1800	HL250	Suction length 45 m from pad at 155 m The discharge line is comprised of 580m 8"DR11, 1150m 8"DR17 and 705m 14"DR17
648-200-WFR-PC11-0204	47-B	49-B	HDPE DR11	8	695	Min: 154 Max: 157	300 310	39.7 (LL) 38.9 (HH)	1200	331 (LL) 342 (HH)	46.6 (LL) 46.2 (HH)	1300	HL250	Suction length 120 m (14"DR17) from pad at 157 m The velocity in the 8" pipe is less than 4 m/s
648-200-WFR-PC11-0200	47-A	49-B	HDPE DR11	8	775	Min: 152 Max: 157	300	45.2 (LL) 40.3 (HH)	1271 1207	338 (LL) 323 (HH)	54.6 (LL) 46.7 (HH)	1400 1300	HL250	Suction length 65 m (14"DR17) from pad at 155 m The velocity in the 8" pipe is less than 4 m/s
648-200-WFR-PC11-0202	47-C	47-B	HDPE DR11	8	265	Min: 155 Max: 157	2x150=300	18.1 (LL) 16.2 (HH)	1606 1548	2x170=340 (LL) 2x176=352 (HH)	22.5 (LL) 21.8 (HH)	1800	2 x CD103 (4)	Suction length 70 m (8"DR11) The velocity in the 8" pipe is less than 4 m/s
648-100-WFR-PC17-0206	49-A	49-B	HDPE DR17	4	215	Min: 152 Max: 160	100	32.2 (LL) 24.3 (HH)	1873 1655	109 (LL) 110 (HH)	36.4 (LL) 28.6 (HH)	2000 1800	CD103	Suction length 40 m (8"DR11) The velocity in the 4" pipe can be 3-4 m/s at max. flowrate
648-200-WFR-PC11-0215	A50	A53	HDPE DR11	8	675	Min: 160 Max: 162	2x150=300	39.5 (LL) 37.6 (HH)	2160 2116	2x153=306 (LL) 2x157=314 (HH)	40.9 (LL) 40.5 (HH)	2200	2 x CD103	Suction length 50 m (8"DR11)
648-200-WFR-PC11-0217	A51	A53	HDPE DR11	8	450	Min: 162 Max: 164	2x150=300	27.5 (LL) 25.6 (HH)	1863 1811	2x163=326 (LL) 2x167=334 (HH)	31.5 (LL) 31.1 (HH)	2000	2 x CD103	Suction length 50 m (8"DR11)
648-200-WFR-PC11-0219	A52	A53	HDPE DR11	8	225	Min: 160 Max: 162	2x150=300	19 (LL) 17.1 (HH)	1630 1577	2x169=338 (LL) 2x175=350 (HH)	22.6 (LL) 21.9 (HH)	1800	2 x CD103	Suction length 50 m (8"DR11)
648-350-WFR-PC17-0211 648-350-WFR-PC17-0213	A53	Whale Tail South Lake	HDPE DR17	14	1790	Min: 159 Max: 165	800	31.8 (LL) 25.8 (HH)	1430 1385	896 (LL) 916 (HH)	39.8 (LL) 36.3 (HH)	1600	HL250	Suction length 25 m at lower pad of 163 m Suction length 55 m at higher pad of 165.5 m
648-350-WFR-PC17-0211 648-200-WFR-PC17-0208	A53	Whale Tail Attenuation Pond	HDPE DR17 14" HDPE DR17 8"	14 & 8	1185	Min: 159 Max: 165	400 (LL) 423 (HH) (3)	37.0 (LL) 36.3 (HH)	1200	400 (LL) 423 (HH)	37.0 (LL) 36.3 (HH)	1200	HL250	Suction length 25 m at lower pad of 163 m Suction length 55 m at higher pad of 165.5 m The discharge line is comprised of 300m 14"DR17 and 885m 8"DR17 The velocity in the 8"DR17 pipe can be slightly over 4 m/s at maximum flowrate (4.1 m/s at HH condition)

(1) Contingency length is not included for the calculation
(2) Assumptions based on the natural terrain topography and lake bathymetry
(3) The operational flowrate range is limited due to the system configuration and the limit of the water velocity in the pipe
(4) Details of the specification of the pumps are presented in Appendix 3

4.0 Operation Description

The dewatering phase consists of emptying lakes in order to facilitate the construction of infrastructures in Phase 2, such as IVR pit, IVR Attenuation Pond etc. The dewatering sequence of the two areas is flexible by using two HL250 and two CD103 diesel pumps. To support the dewatering, access road to the lakes, pumping station pads as well as pipelines will be constructed and installed. All water from the lakes in the dewatering phase will be transferred to either Whale Tail Attenuation Pond or Whale Tail South Basin.

The dewatering of Lakes A47, A49 and A50 to A53 is planned for the summer 2020 (June to September).

The mobile diesel pumps shall be installed on the pumping pad close to the lake to dewater based on the sequence described in Section 3.2. The flowrate shall be adjusted manually by varying the operating speed of the diesel pump. When required, in order to ensure that the operating point of the pump stay within the pump curve, the discharge valve of the pump can be manually adjusted. Since dewatering could occur concurrently during fishout, the suction cage used shall be designed for the protection of freshwater fish per DFO guidelines.

An operator will inspect each pump station at least once a day. The operator shall also manually collect water sample from the water pumped from Lake A49-B and Lake A53 to test for water turbidity and pH.

Water transferred from Lake A49 shall be directed to Whale Tail Attenuation Pond for treatment at the WTP.

At the start of the dewatering of Lake A53, it is expected that the water quality shall meet the water licence discharge criteria for total suspended solids, turbidity, pH and total aluminum, as described in table 2-2. Regular sampling shall be taken during the dewatering to confirm this. Once the water TSS or turbidity is too high, water from Lake A53 shall be transferred directly to Whale Tail Attenuation Pond for treatment. A description of the water quality monitoring program and the management action plans for dewatering can be found in AEM's document "Water Quality Monitoring and Management Plan for Dike Construction and Dewatering", version 3 (May 2020).

Dewatering of the smaller lakes shall take place one after the other and the same pumps shall be re-used. For example, once Lake A50 is dewatered, the 2 x CD-103 pumps shall be transferred to the next lake for dewatering, Lake A51.

The flow rate and cumulative volume pumped from each lake shall be assessed during the dewatering phase.

5.0 Installation Description

5.1 TSS Mitigation

To minimize TSS reporting to the lakes during the construction of the access roads and pumping pads, the section of the ramp and pumping pad that goes into the lake shall be built progressively as the water level is lowered. A turbidity curtain could be installed around where the advancing access road and pumping pad to contain and limit the dispersion of sediments into the lake. The TSS containing water can then be pumped to the Whale Tail Attenuation Pond where it will further be treated at the WTP.

To minimize TSS during dewatering phase, intake pipe(s) will be located at enough distance from the shore and, to the extent possible, in areas with highest water depth. As dewatering progresses, intakes can be moved to deeper locations in the basin. Monitoring during dewatering will primarily focusses at the water

5.2 Access Roads and Pumping Pad Material of Construction

The access road and pumping pad shall primarily be built of run-of-mine rockfill (0 to 1000 mm). The road and pad shall be covered with a 200 mm 0 to ¾" granular fill.

Only rockfill and granular fill that is Non-Potential Acid Generating (NPAG) and non-metal leaching (NML) shall be used for the construction of the access road and pumping pad outside of the footprint of the future IVR WRSF. The NPAG/NML rock shall be sourced from waste rock material from Whale Tail Pit that has been tested in laboratory. Waste material is considered NPAG/NML when:

- It contains less than 0.1 wt.% total sulphur, regardless of its Neutralizing Potential (NP) value; and/or
- It contains more than 0.1 wt.% total sulphur, and the calculated carbonate Net Potential Ratio (NPR) value is greater than 2; and
- The average total arsenic < 75 ppm.

Potential Acid Generating (PAG) and Metal Leaching (ML) waste rock material shall be used for road construction and pumping pad inside the footprint of the future IVR WRSF. For the dewatering phase, PAG/ML material shall be used to build a portion of the road access to lake A-P21. PAG/ML material are characterized as having total sulphur greater than 0.1 wt.%, NPR < 2 and average total arsenic > 75 mg/L.

The same quality assurance/quality control (QA/QC) program currently in use at Meadowbank shall be used in the sample analysis of the waste materials from Whale Tail pit, which includes the use of certified reference materials and duplicate analyses by an accredited external laboratory.

5.3 Piping Installation

All of the piping being installed at the site shall be High-Density Polyethylene (HDPE). The HDPE pipe segments shall be assembled by butt fusion joints performed by a technician quality in this field according to Plastique Pipe Institute (PPI) TN-42 guidelines.

Once completed, hydrostatic leak test on the HDPE piping is required and must comply with ASTM F 2164, ASTM F 1412 and the AWWA M55 Good Practice Manual, Chapter 9, and the PPI Polyethylene Pipeline Manual, Chapter 2 (2nd Edition). If the test section fails this test, the Contractor shall repair or replace all defective materials and/or labour at no additional cost to the Contractor.

For more details, please refer to the general HDPE Piping General Installation Specifications that can be found in Appendix 6.

5.4 QA/QC Requirements

The quality assurance and quality control (QA/QC) program that shall be put in place during the construction of the access road and pumping pads and installation of the HDPE piping and pumps to ensure the following:

- NPAG rockfill material are properly assessed and identified for use in the construction of the access roads and pumping pad.
- Ensure proper compaction of the rockfill and granular fill material.
- Track the quantity of NPAG rockfill and granular fill used in the construction.
- Provide as-built drawings for the access road and pumping pads, including final elevations of the structures.

- Identify and place the proper diameter and HDPE DR rated pipeline at its proper location on the site.
- Verify qualifications of the field technician that is assembling the piping.
- Perform hydrostatic testing of the HDPE pipe spool.
- Provide as-built drawings for the pipelines and pump location.
- Identify and ensure the proper diesel pumps are placed at the right location on site. Ensure proper diesel spill containment are in place.

The installation Contractor shall have to provide, at a minimum, the following documentations to confirm that the installation, commissioning and testing were properly completed:

- Test Plans (To be approved by AEM)
- Test Sheets (To be approved for each test perform)
- As-Built Drawings

These documents shall be submitted at the end of the project (Hand Over) by the Contractor.

During operation of the dewatering phase, the operation team shall:

- Ensure regular monitoring of the diesel pump operation. Monitor operating pressure, pump speed and operating time. Monitor for any diesel spill and water leaks along the pipeline.
- Ensure the water quality monitoring program is in place to monitor the TSS and turbidity of the water discharged directly to Whale Tail South Basin or from the WTP to Mammoth Lake.

Appendix 1: Drawings

61-648-200-202:	Phase 2 Dewatering phase – Process Flow Diagram – Lake A47 & A49 Dewatering
61-648-200-203:	Phase 2 Dewatering phase – Process Flow Diagram – Lake A50, A51, A52 & A53 Dewatering
61-648-200-204:	Phase 2 Dewatering phase – Process Flow Diagram – WT Attenuation Pond, WT South Lake & Mammoth Lake
61-648-270-202:	Phase 2 Dewatering phase – Piping Layout
61-648-230-200:	Phase 2 Dewatering phase – Lake 47-A, 47-B, 47-C & 49-B access ramps and pumping pads
61-648-230-201:	Phase 2 Dewatering phase – Lake A50, A51, A52 and A-P21 access ramps and pumping pads
61-695-230-202:	Phase 2 - IVR Attenuation Pond (Lake A53) Access Ramp and Pumping Pad

NO. DESSIN DRAWING NO. 61-648-200-202

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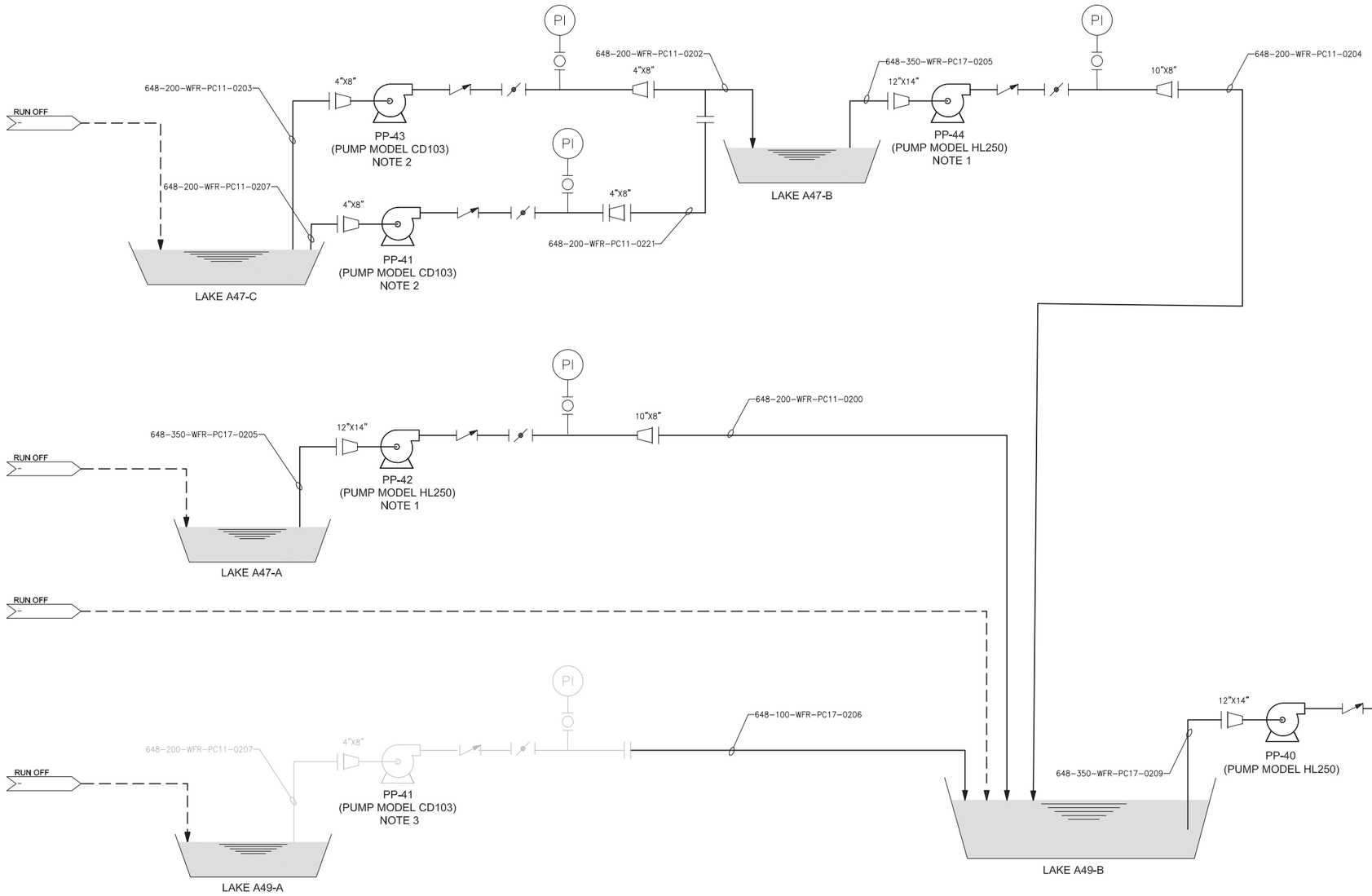

PLAN CLÉ
KEY PLAN

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PROJECT No.	SUBDIVISION	SUBJECT	SERIAL	REV.
668284	8000	49 1 D1	0001	E01

NOTES GÉNÉRALES / GENERAL NOTES

NOTES :

1. DEPENDING ON THE DEWATERING SEQUENCE, PUMP PP-44 COULD BE RE-USED FOR PUMP PP-42.
2. TO DEWATER LAKE A47-C, TWO CD103 PUMPS ARE REQUIRED TO PROVIDE A TOTAL DEWATERING FLOW RATE OF 150 M3/H APPROX. TO ENSURE THAT IT OPERATES WITHIN ITS PUMP CURVE. ALTERNATIVELY, A TRASH PUMP COULD BE USED TO DEWATER THIS LAKE IF AVAILABLE.
3. DEWATERING OF LAKE A49-A SHALL OCCUR AFTER DEWATERING OF LAKE A47-C.

LEGEND:

- PRIMARY STREAM
- INTERMITTENT STREAM
- FLANGED CONNECTION

DESSINS EN RÉFÉRENCE / REFERENCE DRAWINGS

TITRE / TITLE	# DWG

AGNICO EAGLE

REV.	DATE	DESCRIPTION	PAR/BY	APP.	CLIENT
R1	2020-05-15	ISSUED FOR DESIGN	D.C.	A.L.N.	A.L.
R0	2020-03-20	ISSUED FOR DESIGN	D.C.	A.L.N.	A.L.
RB	2020-03-16	ISSUED FOR CLIENT COMMENTS	D.C.	A.L.N.	A.L.
RA	2020-03-02	ISSUED FOR COMMENTS	D.C.	A.L.N.	A.L.

REVISIONS

PERMIT TO PRACTICE
SNC-LAVALIN INC.
Signature NAME
Date DATE 2020-05-15
PERMIT NUMBER: P 260
The Association of Professional Engineers, Geologists and Geophysicists of NWT/NU

TITRE / TITLE

AGNICO EAGLE – AMARUQ DIVISION
648 – DEWATERING

200 – PROCESS FLOWSHEET
AMARUQ DEWATERING PHASE
LAKES A47 & A49

DESSINÉ PAR / DRAWN BY	M. MOVILA	DATE 2020-03-02
VERIFIÉ PAR / CHECKED BY	D. CHEN	2020-03-02
APPROUVÉ PAR / APPROVED BY	A.L. NGUYEN	2020-03-02
ÉCHELLE / SCALE		DATE 2020-03-02

NO. DESSIN / DRAWING NO. 61-648-200-202

NO. PROJET / PROJECT NO.	REVISION	FEUILLE / SHT
6127	R1	1 / 1

DERNIÈRE SAUVEGARDE: 2020/05/15 - 10:50am
CHEMIN: I:\prod\668284 WMGI Phase 2 Detailed Engineering\40_INGÉNIERIE\40_00_Dessins\PFD - dewatering\61-648-200-202 .dwg

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FILE NO. 61-648-200-202 .dwg

NO. DESSIN
DRAWING NO. 61-648-200-203

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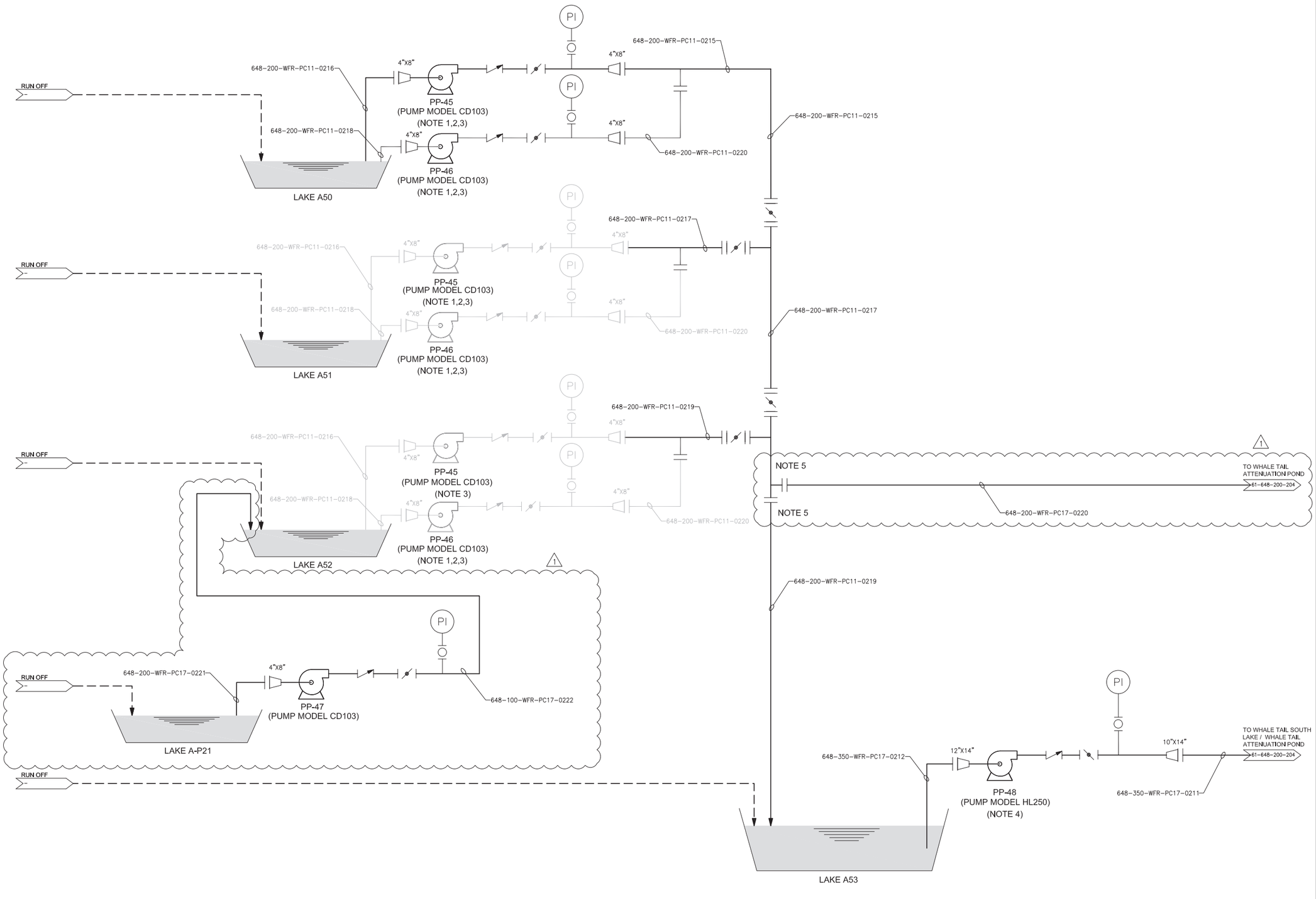

PLAN CLÉ
KEY PLAN

SNC·LAVALIN

Mining & Metallurgy
5500, des Galeries Blvd., bur. 200, Quebec (Quebec), Canada G2K 2E2
Telephone: (418) 621-5500, Fax: (418) 621-8887

PROJECT No.	SUBDIVISION	SUBJECT	SERIAL	REV.
668284	8000	49 1 D1	0002	E01

NOTES GÉNÉRALES / GENERAL NOTES

NOTES :

1. PUMP PP45 AND PP46 SHALL BE USED TO DEWATER SEQUENTIALLY LAKE A50, A51 AND A52.
2. TWO CD103 PUMPS ARE REQUIRED TO PROVIDE A TOTAL DEWATERING FLOW RATE OF 150 M3/H APPROX. TO ENSURE THAT IT OPERATES WITHIN ITS PUMP CURVE.
3. DEPENDING ON THE LAKE DEWATERING SEQUENCE, PUMPS PP41 AND PP43 COULD BE USED TO DEWATER LAKE A50, A51 AND A52.
4. DEPENDING ON THE LAKE DEWATERING SEQUENCE, PP40 OR PP44 COULD BE USED TO DEWATER LAKE A53.
5. CONNECTION TO BY-PASS LINES SHALL BE DONE BY FLANGE TO FLANGE DISCONNECTION AND RECONNECTION.

LEGEND:

- PRIMARY STREAM
- INTERMITTENT STREAM
- FLANGED CONNECTION

DESSINS EN RÉFÉRENCE / REFERENCE DRAWINGS

TITRE / TITLE	# DWG

AGNICO EAGLE

REV.	DATE	DESCRIPTION	PAR/BY	APP.	CLIENT
R1	2020-03-15	ISSUED FOR DESIGN	D.C.	A.L.N.	A.L.
R0	2020-03-20	ISSUED FOR DESIGN	D.C.	A.L.N.	A.L.
RB	2020-03-06	ISSUED FOR CLIENT COMMENTS	D.C.	A.L.N.	A.L.
RA	2020-03-02	ISSUED FOR COMMENTS	D.C.	A.L.N.	A.L.

REVISIONS

PERMIT TO PRACTICE
SNC-LAVALIN INC.
Signature NAME
Date DATE 2020-05-15
PERMIT NUMBER: P 260
The Association of Professional Engineers, Geologists and Geophysicists of NWT/NU

TITRE / TITLE

AGNICO EAGLE – AMARUQ DIVISION
648 – DEWATERING

200 – PROCESS FLOWSHEET
AMARUQ DEWATERING PHASE
LAKES A50, A51, A52 & A53

DESSINÉ PAR / DRAWN BY	M. MOVILA	DATE 2020-03-02
VERIFIÉ PAR / CHECKED BY	D. CHEN	2020-03-02
APPROUVÉ PAR / APPROVED BY	A.L. NGUYEN	2020-03-02
ÉCHELLE / SCALE		DATE 2020-03-02

NO. DESSIN / DRAWING NO. 61-648-200-203

NO. PROJET / PROJECT NO.	REVISION	FEUILLE / SHT
6127	R1	1 / 1

DERNIÈRE SAUVEGARDE: 2020/05/15 - 3:24pm
CHEMIN: T:\proj\668284 WMGI Phase 2 Detailed Engineering\40_INGÉNIERIE\40_DD_Dessins\PFD - dewatering\61-648-200-203.dwg

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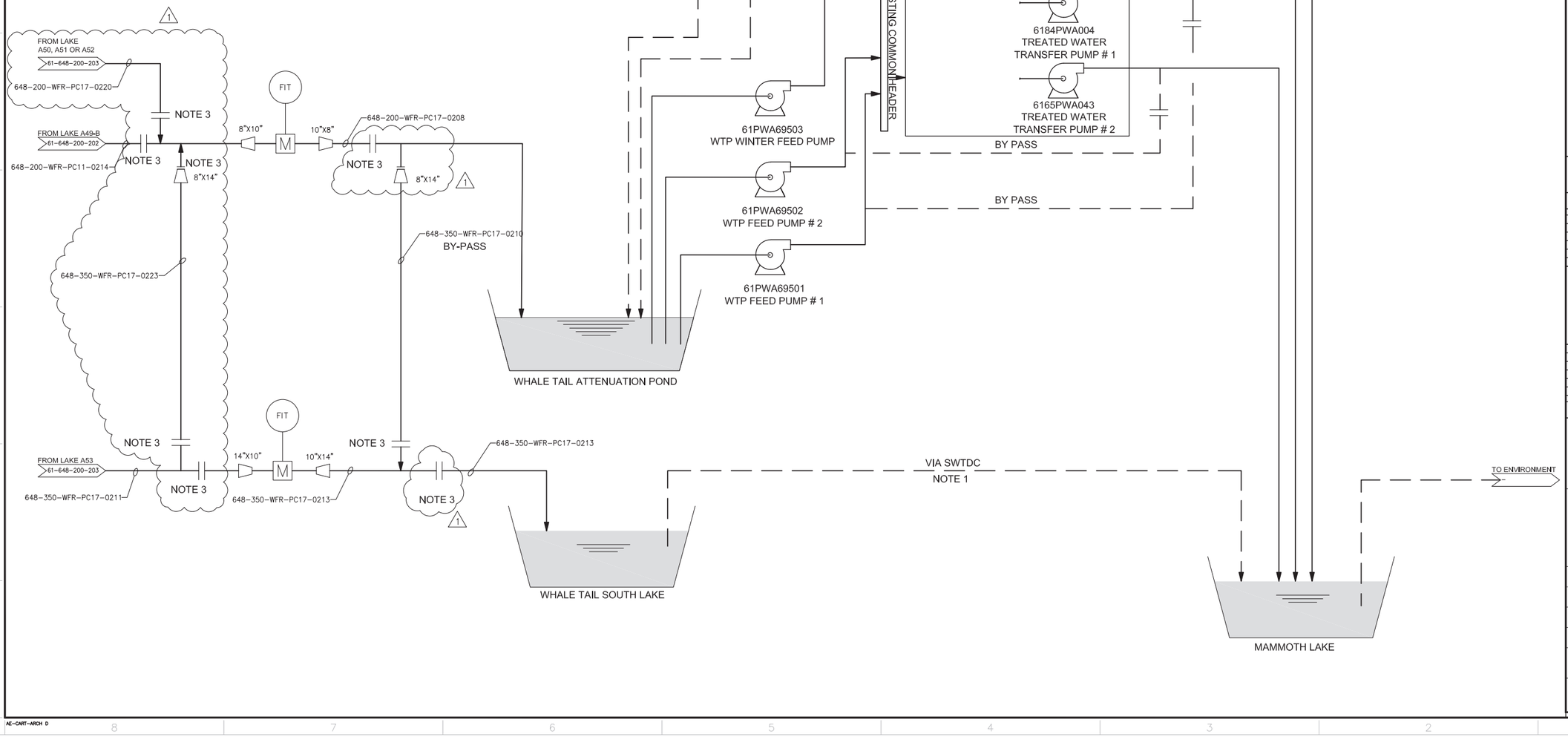
FILE NO. 61-648-200-203.dwg

NO. DESSIN DRAWING NO. 61-648-200-204

FORMAT ARCHD



PLAN CLÉ
KEY PLAN

SNC·LAVALIN

Mining & Metallurgy
5500, des Galeries Blvd., bur. 200, Quebec (Quebec), Canada G2K 2E2
Telephone: (418) 621-5500, Fax: (418) 621-8887

PROJECT No.	SUBDIVISION	SUBJECT	SERIAL	REV.
668284	8000	49 D1	0003	E01

NOTES GÉNÉRALES / GENERAL NOTES

NOTES :

1. WHALE TAIL SOUTH LAKE SHALL OVERFLOW TO MAMMOTH LAKE VIA THE SOUTH WHALE TAIL DIVERSION CHANNEL (SWTDC).
2. THIS DRAWING SHOWS ONLY THE TIE-IN POINTS OF THE AMARUQ WTP.
3. CONNECTION TO BY-PASS LINES SHALL BE DONE BY FLANGE TO FLANGE DISCONNECTION AND RECONNECTION.

LEGEND:

- PRIMARY STREAM
- INTERMITTENT STREAM
- FLANGED CONNECTION

DESSINS EN RÉFÉRENCE / REFERENCE DRAWINGS

TITRE / TITLE	# DWG

AGNICO EAGLE

REV.	DATE	DESCRIPTION	PAR/BY	APP.	CLIENT
R1	2020-05-15	ISSUED FOR DESIGN	D.C.	A.L.N.	A.L.
R0	2020-03-20	ISSUED FOR DESIGN	D.C.	A.L.N.	A.L.
RB	2020-03-06	ISSUED FOR CLIENT COMMENTS	D.C.	A.L.N.	R.B.
RA	2020-03-02	ISSUED FOR COMMENTS	D.C.	A.L.N.	A.L.

REVISIONS

PERMIT TO PRACTICE
SNC-LAVALIN INC.
Signature NAME
Date DATE 2020-05-15
PERMIT NUMBER: P 260
The Association of Professional Engineers, Geologists and Geophysicists of NWT/NU

TITRE / TITLE

AGNICO EAGLE – AMARUQ DIVISION
648 – DEWATERING

200 – PROCESS FLOWSHEET
AMARUQ DEWATERING PHASE
WT ATTENUATION POND, WT SOUTH LAKE & MAMMOTH LAKE

DESSINÉ PAR DRAWN BY	M. MOVILA	DATE 2020-03-02
VÉRIFIÉ PAR CHECKED BY	D. CHEN	2020-03-02
APPROUVÉ PAR APPROVED BY	A.L. NGUYEN	2020-03-02
ÉCHELLE SCALE	DATE 2020-03-02	

NO. DESSIN DRAWING NO. 61-648-200-204

NO. PROJET PROJECT NO.	REVISION	FEUILLE / SHT
6127	R1	1 / 1

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DERNIÈRE SAUVEGARDE: 2020/05/15 – 3:30pm
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FILE NO. 61-648-200-204.dwg

NO. DESSIN
DRAWING NO. 61-648-270-202

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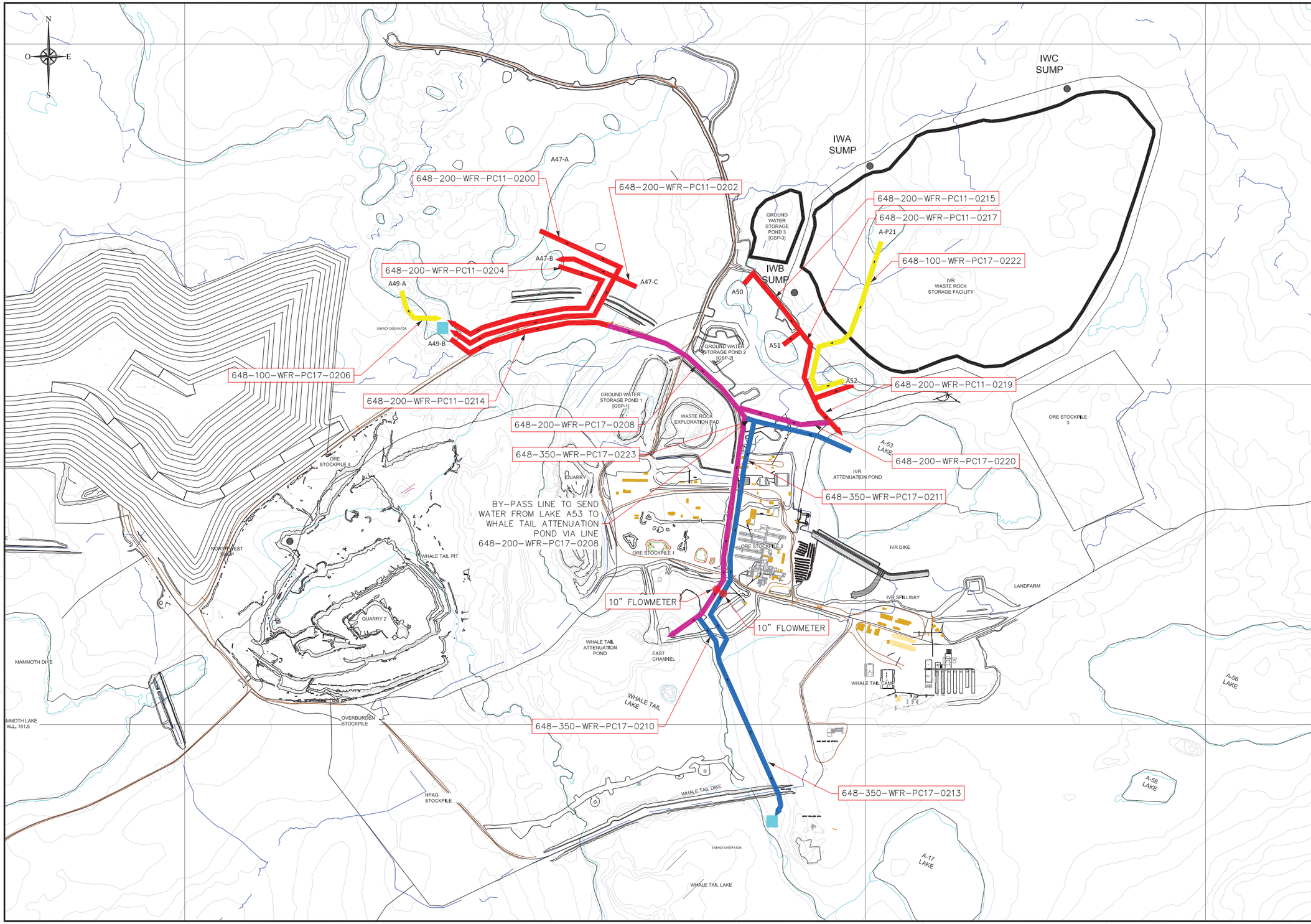

PLAN CLÉ
KEY PLAN

PROJECT No	SUBDIVISION	SUBJECT	SERIAL	REV.
668284	8000	46 | DD	0001	E01

NOTES GÉNÉRALES / GENERAL NOTES

NOTES :

1. ONLY PUMP DISCHARGE LINES ARE SHOWN. PUMP SUCTION LINES ARE NOT SHOWN.
2. DEPENDING ON THE DEWATERING SEQUENCE, PUMPS AND LINES CAN BE MOVED FROM ONE AREA TO ANOTHER.
3. PIPING ARRANGEMENT SHOWN ON THE LAYOUT CAN BE FIELD ADJUSTED BASED ON SITE CONDITIONS.
4. FLOW METER LOCATION IS APPROXIMATE AND CAN BE FIELD ADJUSTED BASED ON SITE CONDITIONS.

LEGEND:

- 4" NON-INSULATED HOSE
- 8" NOMINAL NON-INSULATED (DR11)
- 8" NOMINAL NON-INSULATED (DR17)
- 14" NOMINAL NON-INSULATED (DR17)
- ENERGY DISSIPATOR

DESSINS EN RÉFÉRENCE / REFERENCE DRAWINGS

TITRE / TITLE	# DWG

AGNICO EAGLE

REV.	DATE	DESCRIPTION	PAR/BY	APP.	CLIENT
R1	2020-05-15	ISSUED FOR DESIGN	D.C.	A.L.N.	A.L.
R0	2020-04-01	ISSUED FOR DESIGN	M.M	A.L.N.	A.L.
RB	2020-03-19	ISSUED FOR CLIENT COMMENTS	M.M.	A.L.N.	A.L.
RA	2020-03-10	ISSUED FOR INERNAL COMMENTS	M.M.	A.L.N.	A.L.

REVISIONS

PERMIT TO PRACTICE
SNC-LAVALIN INC.
Signature NAME
Date DATE 2020-05-15
PERMIT NUMBER: P 260
The Association of Professional Engineers, Geologists and Geophysicists of NWT/NU

TITRE / TITLE

AGNICO EAGLE – AMARUQ DIVISION
695 – WATER MANAGEMENT
270 – PIPING

PLAN VIEW
AMARUQ DEWATERING PHASE
PIPING LAYOUT

DESSINÉ PAR / DRAWN BY	MARIUS MOVILA	DATE 200-03-11
VÉRIFIÉ PAR / CHECKED BY	ANH-LONG NGUYEN	200-03-11
APPROUVÉ PAR / APPROVED BY	ALEXANDRE LAVALLÉE	200-03-11
ÉCHELLE / SCALE	AS SHOWN	DATE 200-03-11

NO. DESSIN / DRAWING NO. 61-648-270-202

NO. PROJET / PROJECT NO.	REVISION	FEUILLE / SHT
6127	R1	1 / 1

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FILE NO.

NO. DESSIN DRAWING NO. 61-648-230-200

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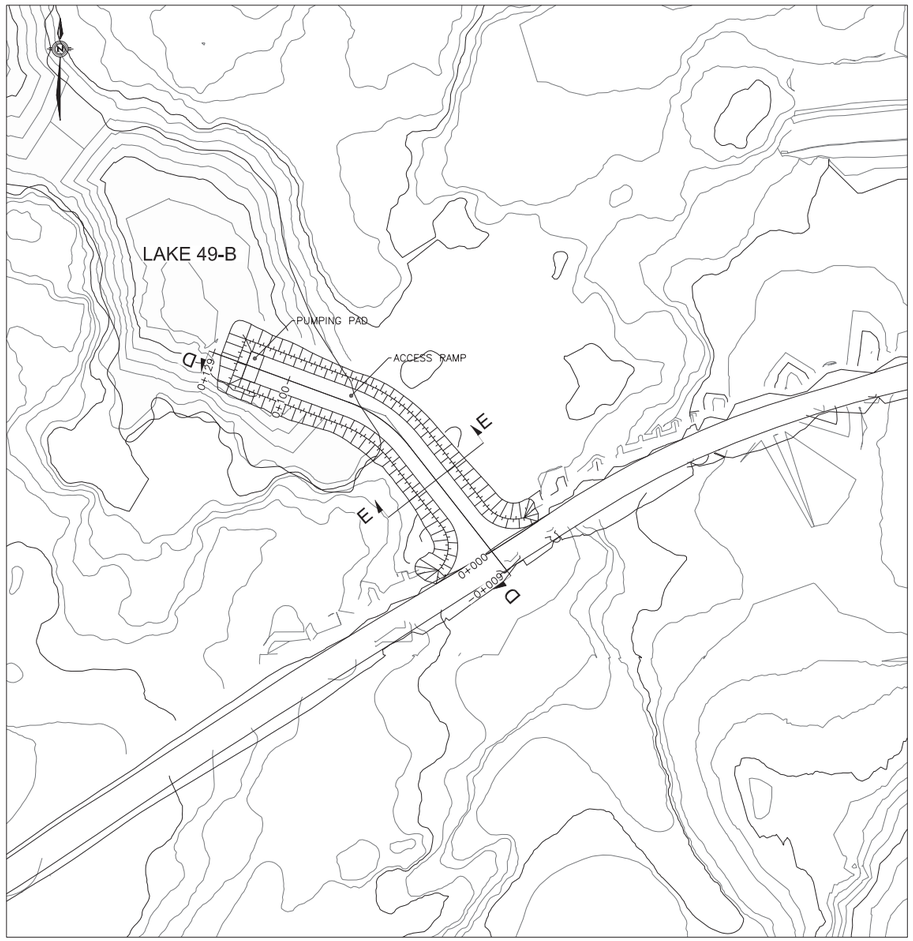
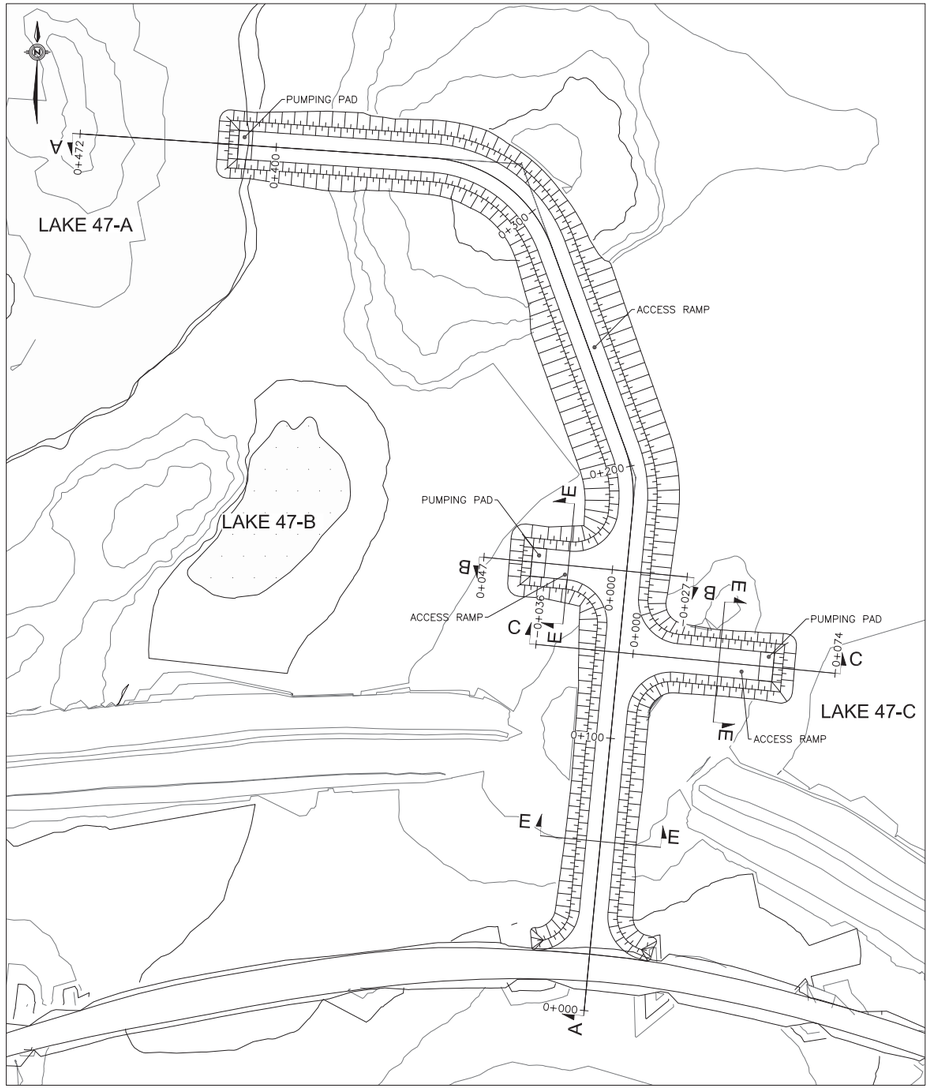
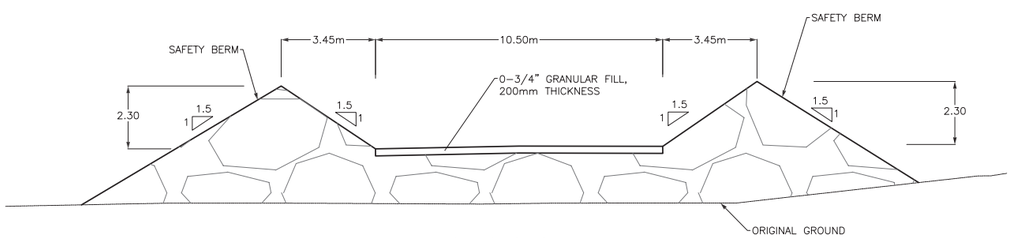


PLAN VIEW
ACCESS RAMP AND PUMPING PAD
LAKE 49-B
SCALE : 1:1000



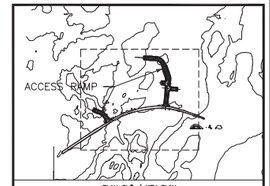
PLAN VIEW
ACCESS RAMPS AND PUMPING PADS
LAKES 47-A, 47-B, 47-C
SCALE : 1:1000



TYPICAL SECTION E-E
SCALE : 1:100

ESTIMATED IN-PLACE QUANTITIES
CONSTRUCTION – ACCESS RAMPS AND PADS

Lake (Access ramp and pad)	Granular fill, 0-3/4" (final grade, thickness 200 mm) (m^3)	Run-of-mine rockfill (0-1000 mm) (m^3)
49-B	268.4	3665.4
47-A	849.7	24410.0
47-B	84.2	1030.0
47-C	130.1	977.0



PLAN CLÉ / KEY PLAN

PROJECT No	SUBDIVISION	SUBJECT	SERIAL	REV.
668284	8000	4G DD	0001	EPB

NOTES GÉNÉRALES / GENERAL NOTES

NOTES

1. GROUND TOPOGRAPHY WAS PROVIDED BY AEM.
2. ALL UNITS ARE IN METERS.
3. THE RAMPS WILL BE BUILT PROGRESSIVELY AS THE WATER LEVEL GOES DOWN AND WILL BE LEVELED GRADUALLY.
4. STABILITY OF THE RAMPS TO BE ASSESSED ON A DAILY BASIS BY QUALIFIED GEOTECHNICAL PERSONNEL DURING CONSTRUCTION. WORK SHALL BE SUSPENDED IF SIGNS OF INSTABILITY ARE OBSERVED.

LEGEND

RUN-OF-MINE ROCKFILL 0-1000 MM

DESSINS EN RÉFÉRENCE / REFERENCE DRAWINGS

TITRE / TITLE	# DWG
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AGNICO EAGLE

REV.	DATE	DESCRIPTION	PAR/BY	APP.	CLIENT
RB	2020-03-30	ISSUED FOR CLIENT COMMENTS	M.M.	D.R./D.C.	A.L.N.
RA	2020-03-23	ISSUED FOR INTERNAL COMMENTS	M.M.	D.R./D.C.	A.L.N.

REVISIONS

TITRE / TITLE
AGNICO EAGLE – AMARUQ DIVISION
648 – DEWATERING
230 – GENERAL EARTHWORKS

PLAN VIEW, PROFILES AND TYPICAL SECTIONS
AMARUQ DEWATERING PHASE
LAKES 47-A, 47-B, 47-C AND 49-B
ACCESS RAMPS AND PUMPING PADS

DESSINÉ PAR DRAWN BY	MARIUS MOVILA	DATE 2020-03-23
VERIFIÉ PAR CHECKED BY	DARIUSH RASTGOU/ DAN CHEN	2020-03-23
APPROUVÉ PAR APPROVED BY	ANH-LONG NGUYEN	2020-03-23
ÉCHELLE SCALE	AS SHOWN	DATE 2020-03-23

NO. DESSIN DRAWING NO. 61-648-230-200

NO. PROJET PROJECT NO.	REVISION	FEUILLE / SHT
6127	RB	1 / 2

DERNIÈRE SAUVEGARDE: 2020/03/30 - 11:27am
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FILE NO.

NO. DESSIN
DRAWING NO. 61-648-230-200

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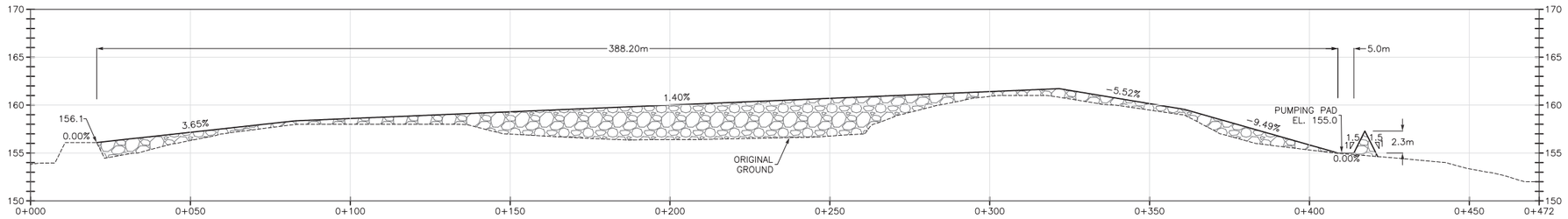
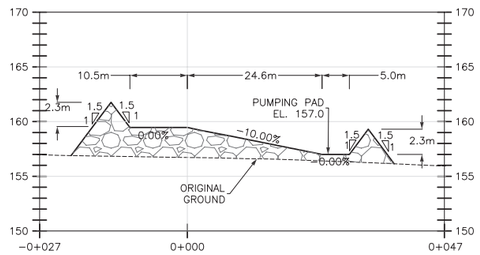


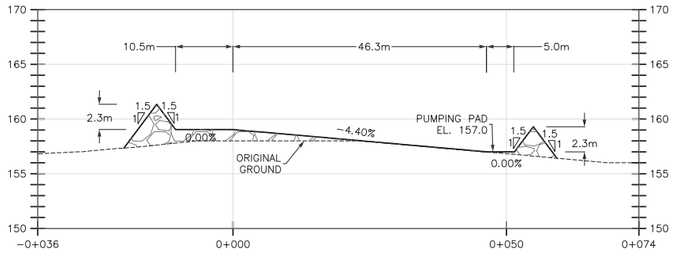
SECTION A-A
PROFILE LAKE 47-A

SCALE : H 1:750
V 1:250



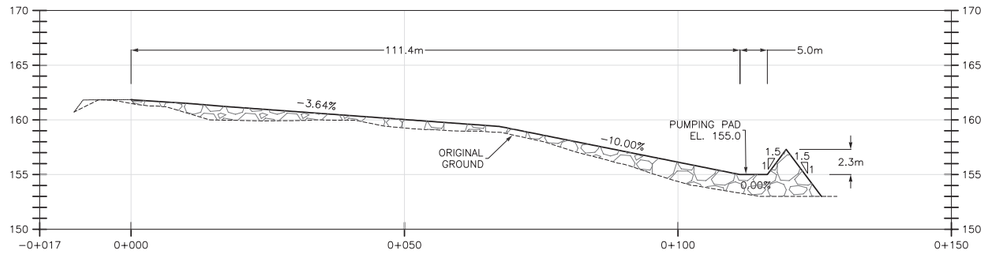
SECTION B-B
PROFILE LAKE 47-B

SCALE : H 1:500
V 1:250



SECTION C-C
PROFILE LAKE 47-C

SCALE : H 1:500
V 1:250



SECTION D-D
PROFILE LAKE 49-B

SCALE : H 1:500
V 1:250

PROJECT No	SUBDIVISION	SUBJECT	SERIAL	REV.
668284	8000	4G DD	0001	EPB

NOTES GÉNÉRALES / GENERAL NOTES

NOTES

1. GROUND TOPOGRAPHY WAS PROVIDED BY AEM.
2. ALL UNITS ARE IN METERS.
3. THE RAMPS WILL BE BUILT PROGRESSIVELY AS THE WATER LEVEL GOES DOWN AND WILL BE LEVELED GRADUALLY.
4. STABILITY OF THE RAMPS TO BE ASSESSED ON A DAILY BASIS BY QUALIFIED GEOTECHNICAL PERSONNEL DURING CONSTRUCTION. WORK SHALL BE SUSPENDED IF SIGNS OF INSTABILITY ARE OBSERVED.

LEGEND

RUN-OF-MINE
ROCKFILL 0-1000 MM

DESSINS EN RÉFÉRENCE / REFERENCE DRAWINGS

TITRE / TITLE	# DWG
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AGNICO EAGLE

REV.	DATE	DESCRIPTION	PAR/BY	APP.	CLIENT
RB	2020-03-30	ISSUED FOR CLIENT COMMENTS	M.M.	D.R./D.C.	A.L.N.
RA	2020-03-23	ISSUED FOR INTERNAL COMMENTS	M.M.	D.R./D.C.	A.L.N.

REVISIONS

TITRE / TITLE
AGNICO EAGLE – AMARUQ DIVISION
648 – DEWATERING
230 – GENERAL EARTHWORKS

PLAN VIEW, PROFILES AND TYPICAL SECTIONS
AMARUQ DEWATERING PHASE
LAKES 47-A, 47-B, 47-C AND 49-B
ACCESS RAMPS AND PUMPING PADS

DESSINÉ PAR / DRAWN BY	MARIUS MOVILA	DATE 2020-03-23
VÉRIFIÉ PAR / CHECKED BY	DARIUSH RASTGOU/ DAN CHEN	2020-03-23
APPROUVÉ PAR / APPROVED BY	ANH-LONG NGUYEN	2020-03-23
ÉCHELLE / SCALE	AS SHOWN	DATE 2020-03-23
NO. DESSIN / DRAWING NO.	61-648-230-200	
NO. PROJET / PROJECT NO.	6127	REVISION RB
		FEUILLE / SHT 2 / 2

DERNIÈRE SAUVEGARDE: 2020/03/30 - 11:27am
CHEMIN: T:\proj\668284 WMG\ Phase 2 Detailed Engineering\40_DD_DESSINS\8000\668284-8000-4GDD-0001-EPB(61-648-230-200).dwg

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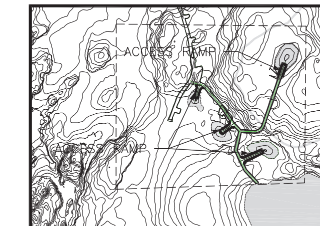
FILE NO.

NO. DESSIN
DRAWING NO. 61-648-230-201

FORMAT ARCHD

PLAN VIEW
ACCESS RAMP AND PUMPING PAD
LAKE A50, A51, A52 AND A-P21
SCALE : 1:1500



PLAN CLÉ / KEY PLAN

PROJECT No	SUBDIVISION	SUBJECT	SERIAL	REV.
668284	8000	4G DD	0002	EPB

NOTES GÉNÉRALES / GENERAL NOTES

NOTES
1. GROUND TOPOGRAPHY WAS PROVIDED BY AEM.
2. ALL UNITS ARE IN METERS.
3. SAFETY BERMS SHALL BE BASED ON THE MINE ACT REQUIREMENTS.
4. STABILITY OF THE RAMPS TO BE ASSESSED ON A DAILY BASIS BY QUALIFIED GEOTECHNICAL PERSONNEL DURING CONSTRUCTION. WORK SHALL BE SUSPENDED IF SIGNS OF INSTABILITY ARE OBSERVED.
5. ROAD ALIGNMENT IS APPROXIMATE AND SHALL BE ADJUSTED DEPENDING ON FIELD CONDITIONS AND LOCAL TOPOGRAPHY.
6. INITIAL ROCKFILL MATERIAL PLACEMENT IN WATER, AGAINST THE NATURAL SOIL OF THE LAKE, MUST BE PLACED USING A SHOVEL.
7. THE ROAD AND RAMP CONSTRUCTION MATERIAL INSIDE THE FOOTPRINT OF THE FUTURE IVR WRSF SHALL BE EITHER PAG OR NPAG MATERIAL. THE USE OF PAG MATERIAL SHALL START APPROXIMATELY 8 METERS FROM THE TOE OF THE WRSF.

LEGEND

RUN-OF-MINE
ROCKFILL 0-1000 MM

DESSINS EN RÉFÉRENCE / REFERENCE DRAWINGS

TITRE / TITLE	# DWG
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_	_
_	_
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AGNICO EAGLE

REV.	DATE	DESCRIPTION	PAR/BY	APP.	CLIENT
RB	2020-05-15	ISSUED FOR CLIENT COMMENTS	M.M.	D.R./D.C.	A.L.N.
RA	2020-05-14	ISSUED FOR INTERNAL COMMENTS	M.M.	D.R./D.C.	A.L.N.

REVISIONS

REGISTERED PROFESSIONAL ENGINEER
2020-05-15
A.-L. NGUYEN
LICENSEE
NT/NU

TITRE / TITLE
AGNICO EAGLE – AMARUQ DIVISION
648 – DEWATERING
230 – GENERAL EARTHWORKS

PLAN VIEW, PROFILES AND TYPICAL SECTIONS
AMARUQ DEWATERING PHASE
LAKES A50, A51, A52 AND A-P21
ACCESS RAMPS AND PUMPING PADS

DESSINÉ PAR / DRAWN BY	MARIUS MOVILA	DATE 2020-03-23
VERIFIÉ PAR / CHECKED BY	DAN CHEN	2020-03-23
APPROUVÉ PAR / APPROVED BY	ANH-LONG NGUYEN	2020-03-23
ÉCHELLE / SCALE	AS SHOWN	DATE 2020-03-23

NO. DESSIN / DRAWING NO. 61-648-230-201

NO. PROJET / PROJECT NO.	REVISION	FEUILLE / SHT
6127	RB	1 / 2

FILE NO.

DERNIÈRE SAUVEGARDE: 2020/05/15 – 12:12pm
CHEMIN: T:\proj\668284 WMGI Phase 2 Detailed Engineering\40_DD_DESSINS\8000\668284-8000-4GDD-0002-EPB(61-648-230-201).dwg

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NO. DESSIN
DRAWING NO. 61-648-230-201

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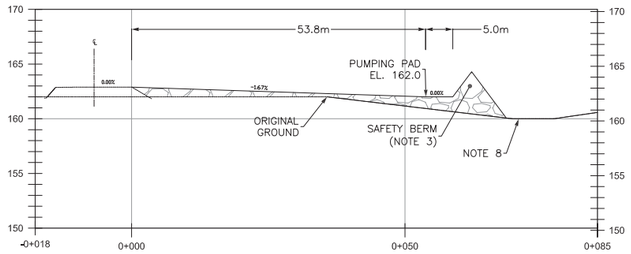
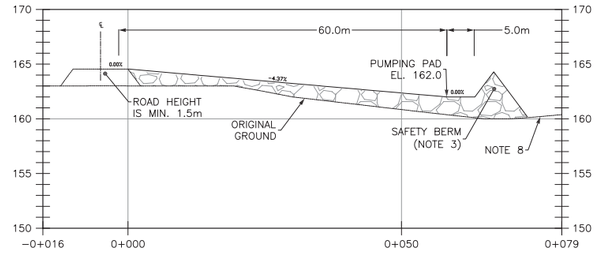
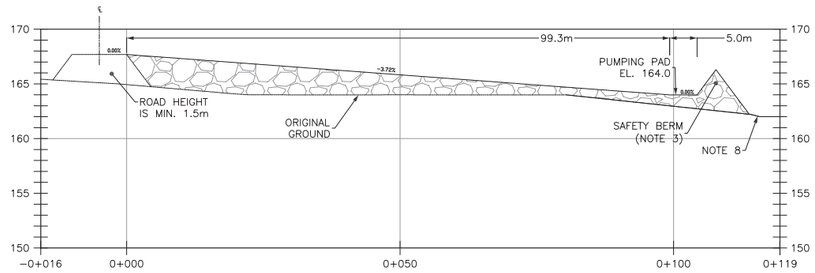


SECTION A-A
PROFILE LAKE A50 RAMP
SCALE : H 1:500
V 1:250

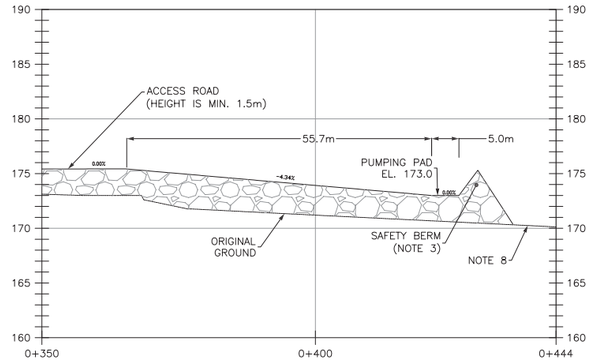


SECTION B-B
PROFILE LAKE A51 RAMP
SCALE : H 1:500
V 1:250

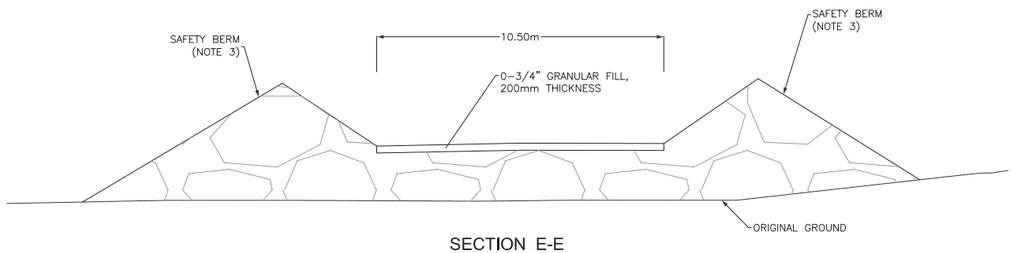
ESTIMATED IN-PLACE QUANTITIES CONSTRUCTION – ACCESS RAMPS AND PADS		
Lake (Access ramp and pad)	Granular fill, 0-3/4" (final grade, thickness 200 mm) (m^3)	Run-of-mine rockfill (0-1000 mm) (m^3)
A50	159.8	2289.7
A51	153.2	3140.6
A52	238.3	7262.9
A-P21	121.9	5536.3



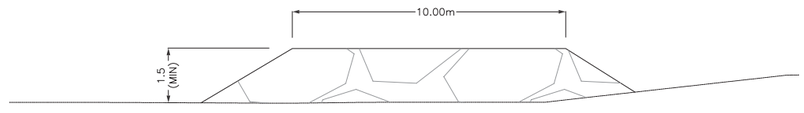
SECTION C-C
PROFILE LAKE A52 RAMP
SCALE : H 1:500
V 1:250



SECTION D-D
PROFILE LAKE A-P21 RAMP
SCALE : H 1:500
V 1:250



SECTION E-E
TYPICAL RAMP SECTION
SCALE : 1:100



SECTION F-F
TYPICAL ROAD SECTION
SCALE : N.T.S.

PROJECT No	SUBDIVISION	SUBJECT	SERIAL	REV.
668284	8000	4G DD	0002	EPB

NOTES GÉNÉRALES / GENERAL NOTES

NOTES
1. GROUND TOPOGRAPHY WAS PROVIDED BY AEM.
2. ALL UNITS ARE IN METERS.
3. SAFETY BERMS SHALL BE BASED ON THE MINE ACT REQUIREMENTS.
4. STABILITY OF THE RAMPS TO BE ASSESSED ON A DAILY BASIS BY QUALIFIED GEOTECHNICAL PERSONNEL DURING CONSTRUCTION. WORK SHALL BE SUSPENDED IF SIGNS OF INSTABILITY ARE OBSERVED.
5. ROAD ALIGNMENT IS APPROXIMATE AND SHALL BE ADJUSTED DEPENDING ON FIELD CONDITIONS AND LOCAL TOPOGRAPHY.
6. INITIAL ROCKFILL MATERIAL PLACEMENT IN WATER, AGAINST THE NATURAL SOIL OF THE LAKE, MUST BE PLACED USING A SHOVEL.
7. THE ROAD AND RAMP CONSTRUCTION MATERIAL INSIDE THE FOOTPRINT OF THE FUTURE IVR WRSF SHALL BE EITHER PAG OR NPAG MATERIAL. THE USE OF PAG MATERIAL SHALL START APPROXIMATELY 8 METERS FROM THE TOE OF THE WRSF.
8. FOR ALL ROCK FILL PLACEMENT OVER WATER, SOME FOUNDATION PREPARATION MIGHT BE NEEDED DEPENDING ON NATURE AND THICKNESS OF SEDIMENT ENCOUNTERED.

LEGEND

RUN-OF-MINE
ROCKFILL 0-1000 MM

DESSINS EN RÉFÉRENCE / REFERENCE DRAWINGS

TITRE / TITLE	# DWG
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AGNICO EAGLE

REV.	DATE	DESCRIPTION	PAR/BY	APP.	CLIENT
RB	2020-05-15	ISSUED FOR CLIENT COMMENTS	M.M.	D.R./D.C.	A.L.N.
RA	2020-05-14	ISSUED FOR INTERNAL COMMENTS	M.M.	D.R./D.C.	A.L.N.

REVISIONS

TITRE / TITLE
AGNICO EAGLE – AMARUQ DIVISION
648 – DEWATERING
230 – GENERAL EARTHWORKS

PLAN VIEW, PROFILES AND TYPICAL SECTIONS
AMARUQ DEWATERING PHASE
LAKES A50, A51, A52 AND A-P21
ACCESS RAMPS AND PUMPING PADS

DESSINÉ PAR / DRAWN BY	MARIUS MOVILA	DATE 2020-03-23
VÉRIFIÉ PAR / CHECKED BY	DAN CHEN	2020-03-23
APPROUVÉ PAR / APPROVED BY	ANH-LONG NGUYEN	2020-03-23
ÉCHELLE / SCALE	AS SHOWN	DATE 2020-03-23
NO. DESSIN / DRAWING NO.	61-648-230-201	
NO. PROJET / PROJECT NO.	6127	REVISION RB
		FEUILLE / SHT 2 / 2

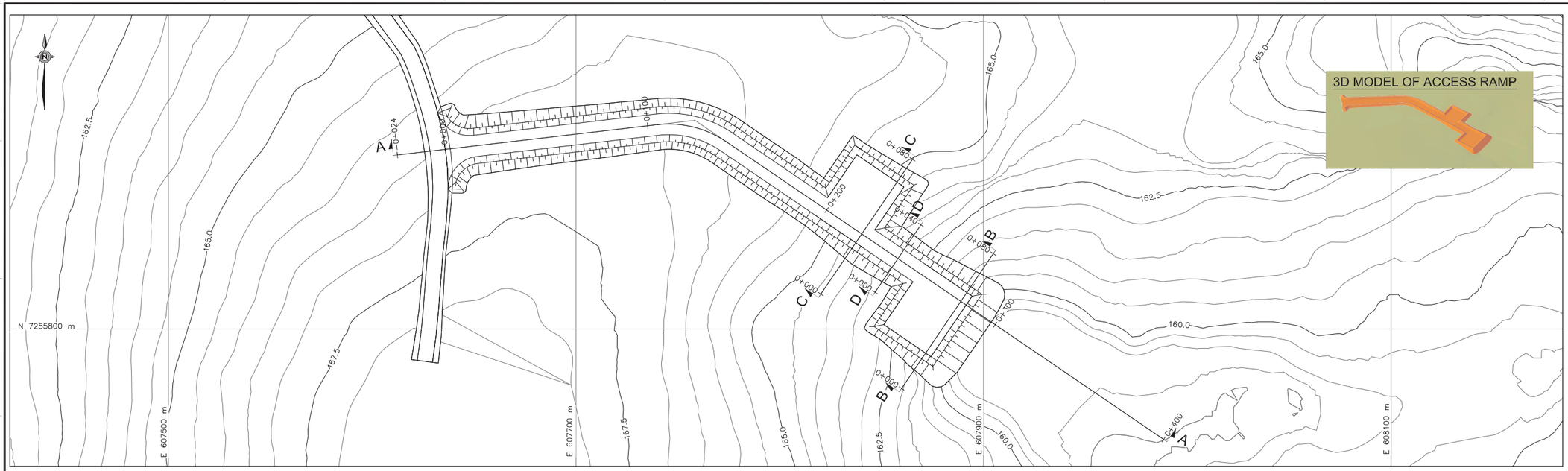
FILE NO.

DERNIÈRE SAUVEGARDE: 2020/05/15 - 2:16pm
CHEMIN: T:\pro\668284 WAGI Phase 2 Detailed Engineering\40_DD_DESSINS\8000\668284-8000-4GDD-0002-EPB(61-648-230-201).dwg

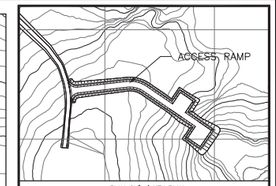
AE-CART-ARCH D

NO. DESSIN
DRAWING NO. 61-695-230-202

FORMAT ARCHD



PLAN VIEW
SCALE : 1: 1000



PLAN CLÉ / KEY PLAN

PROJECT No	SUBDIVISION	SUBJECT	SERIAL	REV.
668284	6000	4G DD	0001	EPB

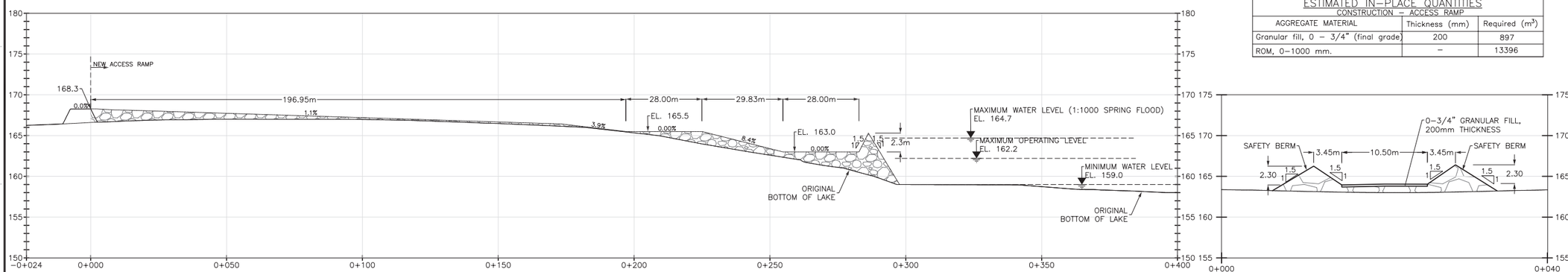
NOTES GÉNÉRALES / GENERAL NOTES

NOTES

1. GROUND TOPOGRAPHY WAS PROVIDED BY AEM
2. ALL UNITS ARE IN METERS
3. THE IVR ATTENUATION POND RAMP WILL BE BUILT PROGRESSIVELY AS THE WATER LEVEL GOES DOWN AND WILL BE LEVELED GRADUALLY
4. STABILITY OF THE RAMP TO BE ASSESSED ON A DAILY BASIS BY QUALIFIED GEOTECHNICAL PERSONNEL DURING CONSTRUCTION. WORK SHALL BE SUSPENDED IF SIGNS OF INSTABILITY ARE OBSERVED

LEGEND

RUN OFF MINE ROCKFILL 0–1000 MM

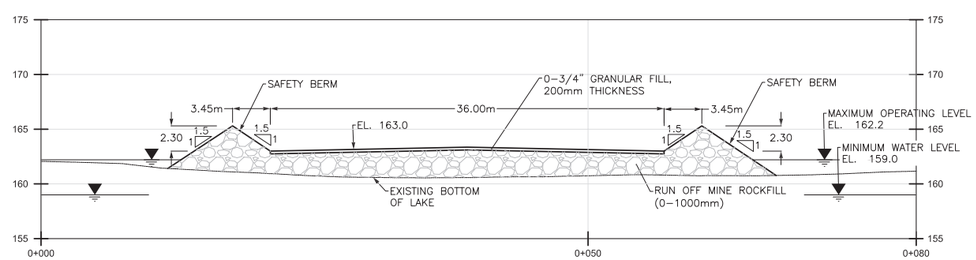


SECTION A-A
SCALE : H 1:750
V 1:250

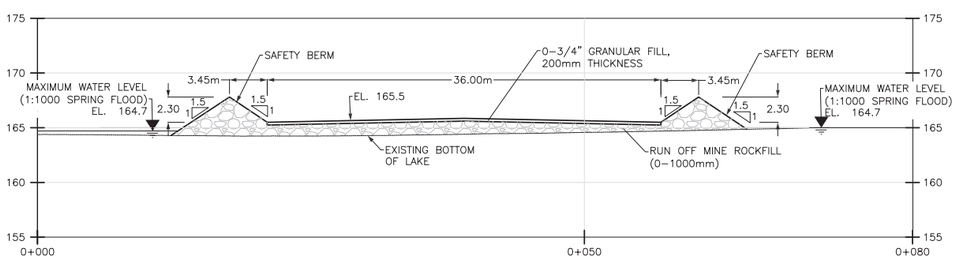
ESTIMATED IN-PLACE QUANTITIES
CONSTRUCTION – ACCESS RAMP

AGGREGATE MATERIAL	Thickness (mm)	Required (m^3)
Granular fill, 0 – 3/4" (final grade)	200	897
ROM, 0–1000 mm.	–	13396

SECTION D-D
SCALE : 1: 250



SECTION B-B
SCALE : 1: 250



SECTION C-C
SCALE : 1: 250

DESSINS EN RÉFÉRENCE / REFERENCE DRAWINGS

TITRE / TITLE	# DWG
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AGNICO EAGLE

REV.	DATE	DESCRIPTION	PAR/BY	APP.	CLIENT
RB	2020-03-16	ISSUED FOR CLIENT COMMENTS	M.M.	D.R./D.C.	A.L.N.
RA	2020-03-10	ISSUED FOR INTERNAL COMMENTS	M.M.	D.R./D.C.	A.L.N.

REVISIONS

TITRE / TITLE

AGNICO EAGLE – AMARUQ DIVISION
695 – WATER MANAGEMENT
230 – GENERAL EARTH WORKS

PLAN VIEW, PROFILE AND TYPICAL SECTION
AMARUQ PHASE 2 OPERATION
IVR ATTENUATION POND ACCESS RAMP AND PUMPING PAD

DESSINÉ PAR / DRAWN BY	MARIUS MOVILA	DATE 2020-03-11
VÉRIFIÉ PAR / CHECKED BY	DARIUSH RASTGOU / DAN CHEN	2020-03-11
APPROUVÉ PAR / APPROVED BY	ANH-LONG NGUYEN	2020-03-11
ÉCHELLE / SCALE	AS SHOWN	DATE 2020-03-11

NO. DESSIN / DRAWING NO. 61-695-230-202

NO. PROJET / PROJECT NO.	REVISION	FEUILLE / SHT
6127	RB	1 / 1

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FILE NO.

Appendix 2: Material Take-Off List

SNC·LAVALIN	MATERIAL TAKE-OFF LIST PIPING, PIPING HARDWARE, VALVES AMARUQ PHASE 2 DEWATERING PHASE SNC Document No.: 668284-8000-46ET-0001 AEM Document No.: 6127-S-270-004-MTO-002	AGNICO EAGLE	Date 15-May-20 Revision R1

Prepared By:

Process	Dan Chen, ing.	OIQ: 5008464
Civil Engineer	Pierre Carignan, ing.	

Reviewed By:

Project Manager:	Anh-Long Nguyen, ing.	2020-05-15

Revision Index:

REV.	DATE	DESCRIPTION
RA	20-Feb-20	Issued for internal coordination
RB	27-Feb-20	Issued for Client comments
RC	5-Mar-20	Issued for Client comments
R0	31-Mar-20	Issued for Construction
R1	15-May-20	Issued for Construction

SNC·LAVALIN

MATERIAL TAKE-OFF LIST
PIPING, PIPING HARDWARE, VALVES
AMARUQ PHASE 2 DEWATERING PHASE
SNC Document No.: 668284-8000-46ET-0001
AEM Document No.: 6127-S-270-004-MTO-002

AGNICO EAGLE

Date	Revision
15-May-20	R1

Values in black indicated items that are ordered
Values in red are proposed quantities to order

Rev.	Item	Dia. (in)	Dia. (mm)	Piping Tag	Description 1	Description 2	Function	Delivery Year	Year in Service	Unit	Estimated Quantity	Contigency (%)	With contingency	Qty (+contingengy) Ordered for Barge 2020	From Existing AMQ Inventory	To be Ordered for Barge 2021	Notes
	1.0				**PIPING**												
													-	-		-	
	1.1				**LINE 1: LAKE A47-A TO A49-B**								-	-		-	
	1.1.1	8	200	648-200-WFR-PC11-0200	IPS DR11 HDPE 4710	UNINSULATED, 50FT LENGHT	LAKE DEWATERING	2020		m	**775**	20%	**930**	**930**		0	
	1.1.2	14	350	648-350-WFR-PC17-0201	IPS DR17 HDPE 4710	UNINSULATED, 50FT LENGHT	PUMP SUCTION LINE FOR A47-A	2020		m	**65**	20%	**78**	**78**		0	
													-	-		-	
	1.2				**LINE 2: LAKE A47-C TO A47-B**								-	-		-	
	1.2.1	8	200	648-200-WFR-PC11-0202	IPS DR11 HDPE 4710	UNINSULATED, 50FT LENGHT	LAKE DEWATERING	2020		m	**265**	20%	**318**	**318**		0	
	1.2.2	8	200	648-200-WFR-PC11-0203	IPS DR11 HDPE 4710	UNINSULATED, 50FT LENGHT	PUMP SUCTION LINE FOR A47-C	2020		m	**70**	20%	**84**	**84**		0	
													-	-		-	
	1.3				**LINE 3: LAKE A47-B TO A49-B**								-	-		-	
	1.3.1	8	200	648-200-WFR-PC11-0204	IPS DR11 HDPE 4710	UNINSULATED, 50FT LENGHT	LAKE DEWATERING	2020		m	**695**	20%	**834**	**834**		0	
	1.3.2	14	350	648-350-WFR-PC17-0205	IPS DR17 HDPE 4710	UNINSULATED, 50FT LENGHT	PUMP SUCTION LINE FOR A47-B	2020		m	**120**	20%	**144**	**144**		0	
													-	-		-	
	1.4				**LINE 4: LAKE 49-A TO A49-N**								-	-		-	
	1.4.1	4	100	648-100-WFR-PC17-0206	LAYFLAT HOSE	TEMPORARY FLEXIBLE HOSE	LAKE DEWATERING	2020		m	**215**	20%	**258**	**258**		0	
	1.4.2	8	200	648-200-WFR-PC11-0207	IPS DR11 HDPE 4710	UNINSULATED, 50FT LENGHT	PUMP SUCTION LINE FOR A49-A	2020		m	**40**	20%	**48**	**48**		0	
													-	-		-	
	1.5				**LINE 5: A49-B TO WT ATTENUATION POND**								-	-		-	
	1.5.1	8	200	648-200-WFR-PC17-0208	IPS DR17 HDPE 4710	UNINSULATED, 50FT LENGHT	LAKE DEWATERING	2020		m	**1250**	20%	**1500**	**1500**		0	Line can be reused for Phase 2 for 695-200-WFR-PC17-0015, with additional HT (from IVR pit to IVR Attenuation Pond)
	1.5.2	14	350	648-350-WFR-PC17-0209	IPS DR17 HDPE 4710	UNINSULATED, 50FT LENGHT	PUMP SUCTION LINE FOR A49-B	2020		m	**45**	20%	**54**	**54**		0	
	1.5.3	8	200	648-200-WFR-PC11-0214	IPS DR11 HDPE 4710	UNINSULATED, 50FT LENGHT	LAKE DEWATERING	2020		m	**580**	20%	**696**	**696**		0	Line can be reused for Phase 2 for 695-200-WFR-PC17-0015, with additional HT (from IVR pit to IVR Attenuation Pond)
													-	-		-	
	1.6				**LINE 6: A49-B TO WHALE TAIL SOUTH BASIN (BY-PASS)**								-	-		-	
	1.6.1	14	350	648-350-WFR-PC17-0210	IPS DR17 HDPE 4710	UNINSULATED, 50FT LENGHT	BY-PASS	2020		m	**100**	20%	**120**	**120**		0	
													-	-		-	
	1.7				**LINE 7: IVR POND (A53) TO WT ATTENUATION POND / WTP AREA**								-	-		-	
R1	1.7.1	14	350	648-350-WFR-PC17-0211	IPS DR17 HDPE 4710	UNINSULATED, 50FT LENGHT	LAKE DEWATERING TO WT P AREA	2020		m	**1185**	20%	**1422**	**1422**		0	Line can be reused for Phase 2 for 695-350-WFR-PC17-0126 and 695-350-WFR-PC17-0131 (Line from IVR Attenuation Pond to WTP)
	1.7.2	14	350	648-350-WFR-PC17-0212	IPS DR17 HDPE 4710	UNINSULATED, 50FT LENGHT	PUMP SUCTION LINE FOR A53	2020		m	**200**	20%	**240**	**240**		0	
R1	1.7.3	14	350	648-350-WFR-PC17-0223	IPS DR17 HDPE 4710	UNINSULATED, 50FT LENGHT	BY-PASS TO WT ATTENUATION POND	2020		m	**5**	20%	**6**	**6**		0	
													-	-		-	
	1.8				**LINE 8: IVR POND (A53) TO WHALE TAIL SOUTH BASIN**								-	-		-	
	1.8.1	14	350	648-350-WFR-PC17-0213	IPS DR17 HDPE 4710	UNINSULATED, 50FT LENGHT		2020		m	**605**	20%	**726**	**726**		0	Line can be reused for Phase 2 for 695-350-WFR-PC17-0137 (Line from WTP to WTS basin)
													-	-		-	
R1	1.9				**LINE 9: A-P21 TO A52**								-	-		-	
R1	1.9.1	4	100	648-100-WFR-PC17-0222	LAYFLAT HOSE	TEMPORARY FLEXIBLE HOSE	LAKE DEWATERING	2020		m	**700**	20%	**840**	**840**		0	
R1	1.9.2	8	200	648-200-WFR-PC17-0221	IPS DR17 HDPE 4710	UNINSULATED, 50FT LENGHT	PUMP SUCTION LINE FOR A49-A	2020		m	**50**	20%	**60**	**60**		0	
													-	-		-	
	1.10				**LINE 10: LAKE A50 TO A53**								-	-		-	
	1.10.1	8	200	648-200-WFR-PC11-0215	IPS DR11 HDPE 4710	UNINSULATED, 50FT LENGHT	LAKE DEWATERING	2020		m	**225**	20%	**270**	**270**		0	
	1.10.2	8	200	648-200-WFR-PC11-0216	IPS DR11 HDPE 4710	UNINSULATED, 50FT LENGHT	PUMP SUCTION LINE FOR A50	2020		m	**50**	20%	**60**	**60**		0	
								2020					-	-		-	
	1.11				**LINE 11: LAKE A51 TO A53 - SUCTION AND DISCHARGE LINE USED FOR 2ND PUMP**			2020					-	-		-	
	1.11.1	8	200	648-200-WFR-PC11-0217	IPS DR11 HDPE 4710	UNINSULATED, 50FT LENGHT	LAKE DEWATERING	2020		m	**225**	20%	**270**	**270**		0	
	1.11.2	8	200	648-200-WFR-PC11-0218	IPS DR11 HDPE 4710	UNINSULATED, 50FT LENGHT	PUMP SUCTION LINE FOR A50	2020		m	**50**	20%	**60**	**60**		0	
	1.11.3	8	200	648-200-WFR-PC11-0220	IPS DR11 HDPE 4710	UNINSULATED, 50FT LENGHT	DISCHARGE LINE OF 2ND PUMP TO MAIN HEADER	2020		m	**50**	20%	**60**	**60**		0	Discharge line for 2nd pump used to dewater each lake individually.
								2020					-	-		-	
	1.12				**LINE 12: LAKE A52 TO A53**			2020					-	-		-	
	1.12.1	8	200	648-200-WFR-PC11-0219	IPS DR11 HDPE 4710	UNINSULATED, 50FT LENGHT	LAKE DEWATERING	2020		m	**225**	20%	**270**	**270**		0	
	1.12.2	~~8~~	~~200~~	~~648-200-WFR-PC17-0220~~	~~IPS DR17 HDPE 4710~~	~~UNINSULATED, 50FT LENGHT~~	~~PUMP SUCTION LINE FOR A50~~	~~2020~~		~~m~~	**0**	20%	-	-		-	Deleted. Pump moved to item
								2020					-	-		-	
R1	1.13				**LINE 13: A50/A51/A52 TO WHALE TAIL ATTENUATION POND (BY-PASS)**								-	-		-	
R1	1.13.1	8	200	648-200-WFR-PC17-0220	IPS DR17 HDPE 4710	UNINSULATED, 50FT LENGHT	LAKE DEWATERING	2020		m	**230**	20%	**276**	**276**		0	To send water from IVR Attn Pond to WT Attn Pond via 648-200-WFR-PC17-0208
								2020					-	-		-	
	2.0				**PIPING HARDWARE**			2020									
								2020					-	-		-	
	2.1				**LINE 1: LAKE A47-A TO A49-B**			2020					-	-		-	
	2.1.1			**648-200-WFR-PC11-0200**	**Lake dewatering**			2020					-	-		-	
	2.1.1.1	8	200	648-200-WFR-PC11-0200	IPS HDPE DR11	Number of pipe butt-fusion required (every 50 ft)		2020		u	**61**	20%	**73**	**73**		0	
	2.1.1.2	8	200	648-200-WFR-PC11-0200	IPS HDPE DR11	Flange Insulation Kit (every 250 ft)		2020		u	**0**	20%	-	-		-	
	2.1.1.3	8	200	648-200-WFR-PC11-0200	IPS HDPE DR11	Flange Adapter		2020		u	**21**	20%	**25**	**25**		0	
	2.1.1.4	8	200	648-200-WFR-PC11-0200	IPS HDPE DR11	Backing Ring		2020		u	**21**	20%	**25**	**25**		0	
	2.1.1.5	8	200	648-200-WFR-PC11-0200	IPS DR11	Red Rubber Gasket		2020		u	**12**	20%	**14**	**14**		0	
	2.1.1.6	3/4	19	648-200-WFR-PC11-0200	3/4" X 6-1/4" Bolt GR5 Full Thread	For Flange Bolt-Up - 8 in pipe	8 units per joint	2020		u	**96**	15%	**110**	**110**		0	

SNC·LAVALIN	MATERIAL TAKE-OFF LIST PIPING, PIPING HARDWARE, VALVES AMARUQ PHASE 2 DEWATERING PHASE SNC Document No.: 668284-8000-46ET-0001 AEM Document No.: 6127-S-270-004-MTO-002	AGNICO EAGLE	Date 15-May-20 Revision R1

Values in black indicated items that are ordered
Values in red are proposed quantities to order

Rev.	Item	Dia. (in)	Dia. (mm)	Piping Tag	Description 1	Description 2	Function	Delivery Year	Year in Service	Unit	Estimated Quantity	Contigency (%)	With contingency	Qty (+contingengy) Ordered for Barge 2020	From Existing AMQ Inventory	To be Ordered for Barge 2021	Notes
	2.1.1.7	3/4	19	648-200-WFR-PC11-0200	3/4" Hex Nut Gr5	For Flange Bolt-Up - 8 in pipe	8 units per joint	2020		u	**96**	15%	**110**	**110**		0	
	2.1.1.8	3/4	19	648-200-WFR-PC11-0200	3/4" Steel Washer	For Flange Bolt-Up - 8 in pipe	16 units per joint	2020		u	**192**	15%	**221**	**221**		0	
	2.1.1.9	10	250	648-200-WFR-PC11-0200	IPS DR11	Red Rubber Gasket		2020		u	**1**	15%	**1**	**1**		0	
	2.1.1.10	7/8	22	648-200-WFR-PC11-0200	7/8" X 10" Bolt GR5 Full Thread	For Flange Bolt-Up -10 in pipe	12 units per joint	2020		u	**12**	15%	**14**	**14**		0	
	2.1.1.11	7/8	22	648-200-WFR-PC11-0200	7/8" Hex Nut Gr5	For Flange Bolt-Up -10 in pipe	12 units per joint	2020		u	**12**	15%	**14**	**14**		0	
	2.1.1.12	7/8	22	648-200-WFR-PC11-0200	7/8" Steel Washer	For Flange Bolt-Up -10 in pipe	24 units per joint	2020		u	**24**	15%	**28**	**28**		0	
	2.1.1.13	8 x 10	200 x 250	648-200-WFR-PC11-0200	IPS HDPE DR11	Flanged concentric reducer		2020		u	**1**	15%	**1**	**1**		0	
								2020					-	-		-	
	2.1.2			**648-350-WFR-PC17-0201**	***Suction Line***			2020					-	-		-	
	2.1.2.1	14	350	648-350-WFR-PC17-0201	IPS HDPE DR17	Number of pipe butt-fusion required (every 50 ft)		2020		u	**10**	20%	**12**	**12**		0	
	2.1.2.2	14	350	648-350-WFR-PC17-0201	IPS HDPE DR17	Flange Insulation Kit (every 250 ft)		2020		u	**0**	20%	-	-		-	
	2.1.2.3	14	350	648-350-WFR-PC17-0201	IPS HDPE DR17	Flange Adapter		2020		u	**10**	20%	**12**	**12**		0	
	2.1.2.4	14	350	648-350-WFR-PC17-0201	IPS HDPE DR17	Backing Ring		2020		u	**10**	20%	**12**	**12**		0	
	2.1.2.5	14	350	648-350-WFR-PC17-0201	IPS DR17	Red Rubber Gasket		2020		u	**7**	20%	**8**	**8**		0	
	2.1.2.6	1	25	648-350-WFR-PC17-0201	1" X 14" Bolt GR5 Full Thread	For Flange Bolt-Up -14 in pipe	12 units per joint	2020		u	**84**	15%	**97**	**97**		0	
	2.1.2.7	1	25	648-350-WFR-PC17-0201	1" Hex Nut Gr5	For Flange Bolt-Up -14 in pipe	12 units per joint	2020		u	**84**	15%	**97**	**97**		0	
	2.1.2.8	1	25	648-350-WFR-PC17-0201	1" Steel Washer	For Flange Bolt-Up -14 in pipe	24 units per joint	2020		u	**168**	15%	**193**	**193**		0	
	2.1.2.9	12	300	648-350-WFR-PC17-0201	IPS DR17	Red Rubber Gasket		2020		u	**1**	15%	**1**	**1**		0	
	2.1.2.10	7/8	22	648-350-WFR-PC17-0201	7/8" X 10" Bolt GR5 Full Thread	For Flange Bolt-Up -12 in pipe	12 units per joint	2020		u	**12**	15%	**14**	**14**		0	
	2.1.2.11	7/8	22	648-350-WFR-PC17-0201	7/8" Hex Nut Gr5	For Flange Bolt-Up -12 in pipe	12 units per joint	2020		u	**12**	15%	**14**	**14**		0	
	2.1.2.12	7/8	22	648-350-WFR-PC17-0201	7/8" Steel Washer	For Flange Bolt-Up -12 in pipe	24 units per joint	2020		u	**24**	15%	**28**	**28**		0	
	2.1.2.13	12 x 14	300 x 350	648-350-WFR-PC17-0201	IPS HDPE DR17	Flanged concentric reducer		2020		u	**1**	15%	**1**	**1**		0	
								2020					-	-		-	
								2020					-	-		-	
	2.2				**LINE 2: LAKE A47-C TO A47-B**			2020					-	-		-	
	2.2.1			**648-200-WFR-PC11-0202**	**Lake dewatering**			2020					-	-		-	
	2.2.1.1	8	200	648-200-WFR-PC11-0202	IPS HDPE DR11	Number of pipe butt-fusion required (every 50 ft)		2020		u	**20**	20%	**24**	**24**		0	
	2.2.1.2	8	200	648-200-WFR-PC11-0202	IPS HDPE DR11	Flange Insulation Kit (every 250 ft)		2020		u	**0**	20%	-	-		-	
	2.2.1.3	8	200	648-200-WFR-PC11-0202	IPS HDPE DR11	Flange Adapter		2020		u	**7**	20%	**8**	**8**		0	
	2.2.1.4	8	200	648-200-WFR-PC11-0202	IPS HDPE DR11	Backing Ring		2020		u	**7**	20%	**8**	**8**		0	
	2.2.1.5	8	200	648-200-WFR-PC11-0202	IPS DR11	Red Rubber Gasket		2020		u	**5**	20%	**6**	**6**		0	
	2.2.1.6	3/4	19	648-200-WFR-PC11-0202	3/4" X 6-1/4" Bolt GR5 Full Thread	For Flange Bolt-Up - 8 in pipe	8 units per joint	2020		u	**40**	15%	**46**	**46**		0	
	2.2.1.7	3/4	19	648-200-WFR-PC11-0202	3/4" Hex Nut Gr5	For Flange Bolt-Up - 8 in pipe	8 units per joint	2020		u	**40**	15%	**46**	**46**		0	
	2.2.1.8	3/4	19	648-200-WFR-PC11-0202	3/4" Steel Washer	For Flange Bolt-Up - 8 in pipe	16 units per joint	2020		u	**80**	15%	**92**	**92**		0	
	2.2.1.9	4	100	648-200-WFR-PC11-0202	IPS DR11	Red Rubber Gasket		2020		u	**1**	15%	**1**	**1**		0	
	2.2.1.10	5/8	16	648-200-WFR-PC11-0202	5/8" X 5-7/8" Bolt GR5 Full Thread	For Flange Bolt-Up - 4 in pipe	8 units per joint	2020		u	**8**	15%	**9**	**9**		0	
	2.2.1.11	5/8	16	648-200-WFR-PC11-0202	5/8" Hex Nut Gr5	For Flange Bolt-Up - 4 in pipe	8 units per joint	2020		u	**8**	15%	**9**	**9**		0	
	2.2.1.12	5/8	16	648-200-WFR-PC11-0202	5/8" Steel Washer	For Flange Bolt-Up - 4 in pipe	16 units per joint	2020		u	**16**	15%	**18**	**18**		0	
	2.2.1.13	4 x 8	100 x 200	648-200-WFR-PC11-0202	IPS HDPE DR11	Flanged concentric reducer		2020		u	**1**	15%	**1**	**1**		0	
								2020					-	-		-	
	2.2.1			**648-200-WFR-PC11-0203**	**Suction line**			2020					-	-		-	
	2.2.2.1	8	200	648-200-WFR-PC11-0203	IPS HDPE DR11	Number of pipe butt-fusion required (every 50 ft)		2020		u	**10**	15%	**12**	**12**		0	
	2.2.2.2	8	200	648-200-WFR-PC11-0203	IPS HDPE DR11	Flange Insulation Kit (every 250 ft)		2020		u	**0**	15%	-	-		-	
	2.2.2.3	8	200	648-200-WFR-PC11-0203	IPS HDPE DR11	Flange Adapter		2020		u	**10**	15%	**12**	**12**		0	
	2.2.2.4	8	200	648-200-WFR-PC11-0203	IPS HDPE DR11	Backing Ring		2020		u	**10**	15%	**12**	**12**		0	
	2.2.2.5	8	200	648-200-WFR-PC11-0203	IPS DR11	Red Rubber Gasket		2020		u	**7**	15%	**8**	**8**		0	
	2.2.2.6	3/4	19	648-200-WFR-PC11-0203	3/4" X 6-1/4" Bolt GR5 Full Thread	For Flange Bolt-Up - 8 in pipe	8 units per joint	2020		u	**56**	15%	**64**	**64**		0	
	2.2.2.7	3/4	19	648-200-WFR-PC11-0203	3/4" Hex Nut Gr5	For Flange Bolt-Up - 8 in pipe	8 units per joint	2020		u	**56**	15%	**64**	**64**		0	
	2.2.2.8	3/4	19	648-200-WFR-PC11-0203	3/4" Steel Washer	For Flange Bolt-Up - 8 in pipe	16 units per joint	2020		u	**112**	15%	**129**	**129**		0	
	2.2.2.9	4	100	648-200-WFR-PC11-0203	IPS DR11	Red Rubber Gasket		2020		u	**1**	15%	**1**	**1**		0	
	2.2.2.10	5/8	16	648-200-WFR-PC11-0203	5/8" X 5-7/8" Bolt GR5 Full Thread	For Flange Bolt-Up - 4 in pipe	8 units per joint	2020		u	**8**	15%	**9**	**9**		0	
	2.2.2.11	5/8	16	648-200-WFR-PC11-0203	5/8" Hex Nut Gr5	For Flange Bolt-Up - 4 in pipe	8 units per joint	2020		u	**8**	15%	**9**	**9**		0	
	2.2.2.12	5/8	16	648-200-WFR-PC11-0203	5/8" Steel Washer	For Flange Bolt-Up - 4 in pipe	16 units per joint	2020		u	**16**	15%	**18**	**18**		0	
	2.2.2.13	4 x 8	100 x 200	648-200-WFR-PC11-0203	IPS HDPE DR11	Flanged concentric reducer		2020		u	**1**	15%	**1**	**1**		0	
								2020					-	-		-	
								2020					-	-		-	
	2.3				**LINE 3: LAKE A47-B TO A49-B**			2020					-	-		-	
	2.3.1			**648-200-WFR-PC11-0204**	**Lake dewatering**			2020					-	-		-	
	2.3.1.1	8	200	648-200-WFR-PC11-0204	IPS HDPE DR11	Number of pipe butt-fusion required (every 50 ft)		2020		u	**55**	20%	**66**	**66**		0	
	2.3.1.2	8	200	648-200-WFR-PC11-0204	IPS HDPE DR11	Flange Insulation Kit (every 250 ft)		2020		u	**0**	20%	-	-		-	
	2.3.1.3	8	200	648-200-WFR-PC11-0204	IPS HDPE DR11	Flange Adapter		2020		u	**19**	20%	**23**	**23**		0	
	2.3.1.4	8	200	648-200-WFR-PC11-0204	IPS HDPE DR11	Backing Ring		2020		u	**19**	20%	**23**	**23**		0	
	2.3.1.5	8	200	648-200-WFR-PC11-0204	IPS DR11	Red Rubber Gasket		2020		u	**11**	20%	**13**	**13**		0	
	2.3.1.6	3/4	19	648-200-WFR-PC11-0204	3/4" X 6-1/4" Bolt GR5 Full Thread	For Flange Bolt-Up - 8 in pipe	8 units per joint	2020		u	**88**	15%	**101**	**101**		0	
	2.3.1.7	3/4	19	648-200-WFR-PC11-0204	3/4" Hex Nut Gr5	For Flange Bolt-Up - 8 in pipe	8 units per joint	2020		u	**88**	15%	**101**	**101**		0	
	2.3.1.8	3/4	19	648-200-WFR-PC11-0204	3/4" Steel Washer	For Flange Bolt-Up - 8 in pipe	16 units per joint	2020		u	**176**	15%	**202**	**202**		0	
	2.3.1.9	10	250	648-200-WFR-PC11-0204	IPS DR11	Red Rubber Gasket		2020		u	**1**	15%	**1**	**1**		0	
	2.3.1.10	7/8	22	648-200-WFR-PC11-0204	7/8" X 10" Bolt GR5 Full Thread	For Flange Bolt-Up -10 in pipe	12 units per joint	2020		u	**12**	15%	**14**	**14**		0	
	2.3.1.11	7/8	22	648-200-WFR-PC11-0204	7/8" Hex Nut Gr5	For Flange Bolt-Up -10 in pipe	12 units per joint	2020		u	**12**	15%	**14**	**14**		0	
	2.3.1.12	7/8	22	648-200-WFR-PC11-0204	7/8" Steel Washer	For Flange Bolt-Up -10 in pipe	24 units per joint	2020		u	**24**	15%	**28**	**28**		0	
	2.3.1.13	8 x 10	200 x 250	648-200-WFR-PC11-0204	IPS HDPE DR11	Flanged concentric reducer		2020		u	**1**	15%	**1**	**1**		0	
								2020					-	-		-	

SNC·LAVALIN

MATERIAL TAKE-OFF LIST
PIPING, PIPING HARDWARE, VALVES
AMARUQ PHASE 2 DEWATERING PHASE
SNC Document No.: 668284-8000-46ET-0001
AEM Document No.: 6127-S-270-004-MTO-002

AGNICO EAGLE

Date	Revision
15-May-20	R1

Values in black indicated items that are ordered
Values in red are proposed quantities to order

Rev.	Item	Dia. (in)	Dia. (mm)	Piping Tag	Description 1	Description 2	Function	Delivery Year	Year in Service	Unit	Estimated Quantity	Contigency (%)	With contingency	Qty (+contingengy) Ordered for Barge 2020	From Existing AMQ Inventory	To be Ordered for Barge 2021	Notes
	2.3.2			**648-350-WFR-PC17-0205**	***Suction Line***			2020					-	-		-	
	2.3.2.1	14	350	648-350-WFR-PC17-0205	IPS HDPE DR17	Number of pipe butt-fusion required (every 50 ft)		2020		u	**16**	15%	**18**	**18**		0	
	2.3.2.2	14	350	648-350-WFR-PC17-0205	IPS HDPE DR17	Flange Insulation Kit (every 250 ft)		2020		u	**0**	15%	-	-		-	
	2.3.2.3	14	350	648-350-WFR-PC17-0205	IPS HDPE DR17	Flange Adapter		2020		u	**16**	15%	**18**	**18**		0	
	2.3.2.4	14	350	648-350-WFR-PC17-0205	IPS HDPE DR17	Backing Ring		2020		u	**16**	15%	**18**	**18**		0	
	2.3.2.5	14	350	648-350-WFR-PC17-0205	IPS DR17	Red Rubber Gasket		2020		u	**10**	15%	**12**	**12**		0	
	2.3.2.6	1	25	648-350-WFR-PC17-0205	1" X 14" Bolt GR5 Full Thread	For Flange Bolt-Up -14 in pipe	12 units per joint	2020		u	**120**	15%	**138**	**138**		0	
	2.3.2.7	1	25	648-350-WFR-PC17-0205	1" Hex Nut Gr5	For Flange Bolt-Up -14 in pipe	12 units per joint	2020		u	**120**	15%	**138**	**138**		0	
	2.3.2.8	1	25	648-350-WFR-PC17-0205	1" Steel Washer	For Flange Bolt-Up -14 in pipe	24 units per joint	2020		u	**240**	15%	**276**	**276**		0	
	2.3.2.9	12	300	648-350-WFR-PC17-0205	IPS DR17	Red Rubber Gasket		2020		u	**1**	15%	**1**	**1**		0	
	2.3.2.10	7/8	22	648-350-WFR-PC17-0205	7/8" X 10" Bolt GR5 Full Thread	For Flange Bolt-Up -12 in pipe	12 units per joint	2020		u	**12**	15%	**14**	**14**		0	
	2.3.2.11	7/8	22	648-350-WFR-PC17-0205	7/8" Hex Nut Gr5	For Flange Bolt-Up -12 in pipe	12 units per joint	2020		u	**12**	15%	**14**	**14**		0	
	2.3.2.12	7/8	22	648-350-WFR-PC17-0205	7/8" Steel Washer	For Flange Bolt-Up -12 in pipe	24 units per joint	2020		u	**24**	15%	**28**	**28**		0	
	2.3.2.13	12 x 14	300 x 350	648-350-WFR-PC17-0205	IPS HDPE DR17	Flanged concentric reducer		2020		u	**1**	15%	**1**	**1**		0	
								2020					-	-		-	
								2020					-	-		-	
	2.4				**LINE 4: LAKE 49-A TO A49-N**			2020					-	-		-	
	2.4.1			**648-100-WFR-PC17-0206**	**Lake dewatering**			2020					-	-		-	
	2.4.1.1	4	100	648-100-WFR-PC17-0206	IPS HDPE DR17	Number of pipe butt-fusion required (every 50 ft)		2020		u	**0**	20%	-	-		-	Use layflat hose with 4-in flange connection
	2.4.1.2	4	100	648-100-WFR-PC17-0206	IPS HDPE DR17	Flange Insulation Kit (every 250 ft)		2020		u	**0**	20%	-	-		-	
	2.4.1.3	4	100	648-100-WFR-PC17-0206	IPS HDPE DR17	Flange Adapter		2020		u	**0**	20%	-	-		-	Use layflat hose with 4-in flange connection
	2.4.1.4	4	100	648-100-WFR-PC17-0206	IPS HDPE DR17	Backing Ring		2020		u	**0**	20%	-	-		-	Use layflat hose with 4-in flange connection
	2.4.1.5	4	100	648-100-WFR-PC17-0206	IPS DR17	Red Rubber Gasket		2020		u	**0**	20%	-	-		-	Use layflat hose with 4-in flange connection
	2.4.1.6	3/4	19	648-100-WFR-PC17-0206	3/4" X 6-1/4" Bolt GR5 Full Thread	For Flange Bolt-Up - 8 in pipe	8 units per joint	2020		u	**0**	15%	-	-		-	Use layflat hose with 4-in flange connection
	2.4.1.7	3/4	19	648-100-WFR-PC17-0206	3/4" Hex Nut Gr5	For Flange Bolt-Up - 8 in pipe	8 units per joint	2020		u	**0**	15%	-	-		-	Use layflat hose with 4-in flange connection
	2.4.1.8	3/4	19	648-100-WFR-PC17-0206	3/4" Steel Washer	For Flange Bolt-Up - 8 in pipe	16 units per joint	2020		u	**0**	15%	-	-		-	Use layflat hose with 4-in flange connection
	2.4.1.9	4	100	648-100-WFR-PC17-0206	IPS DR17	Red Rubber Gasket		2020		u	**1**	15%	**1**	**1**		0	
	2.4.1.10	5/8	16	648-100-WFR-PC17-0206	5/8" X 5-7/8" Bolt GR5 Full Thread	For Flange Bolt-Up - 4 in pipe	8 units per joint	2020		u	**8**	15%	**9**	**9**		0	
	2.4.1.11	5/8	16	648-100-WFR-PC17-0206	5/8" Hex Nut Gr5	For Flange Bolt-Up - 4 in pipe	8 units per joint	2020		u	**8**	15%	**9**	**9**		0	
	2.4.1.12	5/8	16	648-100-WFR-PC17-0206	5/8" Steel Washer	For Flange Bolt-Up - 4 in pipe	16 units per joint	2020		u	**16**	15%	**18**	**18**		0	
	2.4.1.13	4 x 8	100 x 200	648-100-WFR-PC17-0206	IPS HDPE DR17	Flanged concentric reducer		2020		u	**0**	15%	-	-		-	Use layflat hose with 4-in flange connection
								2020					-	-		-	
	2.4.2			**648-200-WFR-PC11-0207**	**Suction line**			2020					-	-		-	
	2.4.2.1	8	200	648-200-WFR-PC11-0207	IPS HDPE DR11	Number of pipe butt-fusion required (every 50 ft)		2020		u	**6**	15%	**7**	**7**		0	
	2.4.2.2	8	200	648-200-WFR-PC11-0207	IPS HDPE DR11	Flange Insulation Kit (every 250 ft)		2020		u	**0**	15%	-	-		-	
	2.4.2.3	8	200	648-200-WFR-PC11-0207	IPS HDPE DR11	Flange Adapter		2020		u	**6**	15%	**7**	**7**		0	
	2.4.2.4	8	200	648-200-WFR-PC11-0207	IPS HDPE DR11	Backing Ring		2020		u	**6**	15%	**7**	**7**		0	
	2.4.2.5	8	200	648-200-WFR-PC11-0207	IPS DR11	Red Rubber Gasket		2020		u	**5**	15%	**6**	**6**		0	
	2.4.2.6	3/4	19	648-200-WFR-PC11-0207	3/4" X 6-1/4" Bolt GR5 Full Thread	For Flange Bolt-Up - 8 in pipe	8 units per joint	2020		u	**40**	15%	**46**	**46**		0	
	2.4.2.7	3/4	19	648-200-WFR-PC11-0207	3/4" Hex Nut Gr5	For Flange Bolt-Up - 8 in pipe	8 units per joint	2020		u	**40**	15%	**46**	**46**		0	
	2.4.2.8	3/4	19	648-200-WFR-PC11-0207	3/4" Steel Washer	For Flange Bolt-Up - 8 in pipe	16 units per joint	2020		u	**80**	15%	**92**	**92**		0	
	2.4.2.9	4	100	648-200-WFR-PC11-0207	IPS DR11	Red Rubber Gasket		2020		u	**1**	15%	**1**	**1**		0	
	2.4.2.10	5/8	16	648-200-WFR-PC11-0207	5/8" X 5-7/8" Bolt GR5 Full Thread	For Flange Bolt-Up - 4 in pipe	8 units per joint	2020		u	**8**	15%	**9**	**9**		0	
	2.4.2.11	5/8	16	648-200-WFR-PC11-0207	5/8" Hex Nut Gr5	For Flange Bolt-Up - 4 in pipe	8 units per joint	2020		u	**8**	15%	**9**	**9**		0	
	2.4.2.12	5/8	16	648-200-WFR-PC11-0207	5/8" Steel Washer	For Flange Bolt-Up - 4 in pipe	16 units per joint	2020		u	**16**	15%	**18**	**18**		0	
	2.4.2.13	4 x 8	100 x 200	648-200-WFR-PC11-0207	IPS HDPE DR11	Flanged concentric reducer		2020		u	**1**	15%	**1**	**1**		0	
								2020					-	-		-	
								2020					-	-		-	
	2.5				**LINE 5: A49-B TO WT ATTENUATION POND**			2020					-	-		-	
	2.5.1			**648-200-WFR-PC17-0208**	**Lake dewatering**			2020					-	-		-	
	2.5.1.1	8	200	648-200-WFR-PC17-0208	IPS HDPE DR17	Number of pipe butt-fusion required (every 50 ft)		2020		u	**98**	20%	**118**	**118**		0	
	2.5.1.2	8	200	648-200-WFR-PC17-0208	IPS HDPE DR17	Flange Insulation Kit (every 250 ft)		2020		u	**0**	20%	-	-		-	
	2.5.1.3	8	200	648-200-WFR-PC17-0208	IPS HDPE DR17	Flange Adapter		2020		u	**36**	20%	**43**	**43**		0	added 3 flange for molded tee 8x8x8
	2.5.1.4	8	200	648-200-WFR-PC17-0208	IPS HDPE DR17	Backing Ring		2020		u	**36**	20%	**43**	**43**		0	
	2.5.1.5	8	200	648-200-WFR-PC17-0208	IPS DR17	Red Rubber Gasket		2020		u	**22**	20%	**26**	**26**		0	
	2.5.1.6	3/4	19	648-200-WFR-PC17-0208	3/4" X 6-1/4" Bolt GR5 Full Thread	For Flange Bolt-Up - 8 in pipe	8 units per joint	2020		u	**176**	15%	**202**	**202**		0	
	2.5.1.7	3/4	19	648-200-WFR-PC17-0208	3/4" Hex Nut Gr5	For Flange Bolt-Up - 8 in pipe	8 units per joint	2020		u	**176**	15%	**202**	**202**		0	
	2.5.1.8	3/4	19	648-200-WFR-PC17-0208	3/4" Steel Washer	For Flange Bolt-Up - 8 in pipe	16 units per joint	2020		u	**352**	15%	**405**	**405**		0	
	2.5.1.9	10	250	648-200-WFR-PC17-0208	IPS DR17	Red Rubber Gasket		2020		u	**1**	15%	**1**	**1**		0	
	2.5.1.10	7/8	22	648-200-WFR-PC17-0208	7/8" X 10" Bolt GR5 Full Thread	For Flange Bolt-Up -10 in pipe	12 units per joint	2020		u	**12**	15%	**14**	**14**		0	
	2.5.1.11	7/8	22	648-200-WFR-PC17-0208	7/8" Hex Nut Gr5	For Flange Bolt-Up -10 in pipe	12 units per joint	2020		u	**12**	15%	**14**	**14**		0	
	2.5.1.12	7/8	22	648-200-WFR-PC17-0208	7/8" Steel Washer	For Flange Bolt-Up -10 in pipe	24 units per joint	2020		u	**24**	15%	**28**	**28**		0	
	2.5.1.13	8 x 10	200 x 250	648-200-WFR-PC17-0208	IPS HDPE DR17	Flanged concentric reducer		2020		u	**1**	15%	**1**	**1**		0	
	2.5.1.14	8	200	648-200-WFR-PC17-0208	IPS HDPE DR17	Blind Flange		2020		u	**2**	50%	**3**	**3**		0	
	2.5.1.15	8		648-200-WFR-PC17-0208	IPS HDPE DR17	Molded Tee (8"-8"-8")		2020		u	**1**	15%	**1**	**1**		0	To received water from IVR Attn Pond and send to WT Attn Pond via 648-200-WFR-PC17-0208
								2020					-	-		-	
								2020					-	-		-	
								2020					-	-		-	
								2020					-	-		-	
	2.5.1.15			**648-200-WFR-PC11-0214**	**Lake dewatering**			2020					-	-		-	
	2.5.1.16	8	200	648-200-WFR-PC11-0214	IPS HDPE DR11	Number of pipe butt-fusion required (every 50 ft)		2020		u	**46**	20%	**55**	**55**		0	

SNC·LAVALIN	MATERIAL TAKE-OFF LIST PIPING, PIPING HARDWARE, VALVES AMARUQ PHASE 2 DEWATERING PHASE SNC Document No.: 668284-8000-46ET-0001 AEM Document No.: 6127-S-270-004-MTO-002	AGNICO EAGLE	Date 15-May-20 Revision R1

Values in black indicated items that are ordered
Values in red are proposed quantities to order

Rev.	Item	Dia. (in)	Dia. (mm)	Piping Tag	Description 1	Description 2	Function	Delivery Year	Year in Service	Unit	Estimated Quantity	Contigency (%)	With contingency	Qty (+contingengy) Ordered for Barge 2020	Qty (+contingengy) From Existing AMQ Inventory	Qty (+contingengy) To be Ordered for Barge 2021	Notes
	2.5.1.17	8	200	648-200-WFR-PC11-0214	IPS HDPE DR11	Flange Insulation Kit (every 250 ft)		2020		u	0	20%	-	-		-	
	2.5.1.18	8	200	648-200-WFR-PC11-0214	IPS HDPE DR11	Flange Adapter		2020		u	13	20%	16	16		0	
	2.5.1.19	8	200	648-200-WFR-PC11-0214	IPS HDPE DR11	Backing Ring		2020		u	13	20%	16	16		0	
	2.5.1.20	8	200	648-200-WFR-PC11-0214	IPS DR11	Red Rubber Gasket		2020		u	10	20%	12	12		0	
	2.5.1.21	3/4	19	648-200-WFR-PC11-0214	3/4" X 6-1/4" Bolt GR5 Full Thread	For Flange Bolt-Up - 8 in pipe	8 units per joint	2020		u	80	15%	92	92		0	
	2.5.1.22	3/4	19	648-200-WFR-PC11-0214	3/4" Hex Nut Gr5	For Flange Bolt-Up - 8 in pipe	8 units per joint	2020		u	80	15%	92	92		0	
	2.5.1.23	3/4	19	648-200-WFR-PC11-0214	3/4" Steel Washer	For Flange Bolt-Up - 8 in pipe	16 units per joint	2020		u	160	15%	184	184		0	
								2020					-	-		-	
	2.5.2			**648-350-WFR-PC17-0209**	***Suction Line***			2020					-	-		-	
	2.5.2.1	14	350	648-350-WFR-PC17-0209	IPS HDPE DR17	Number of pipe butt-fusion required (every 50 ft)		2020		u	6	15%	7	7		0	
	2.5.2.2	14	350	648-350-WFR-PC17-0209	IPS HDPE DR17	Flange Insulation Kit (every 250 ft)		2020		u	0	15%	-	-		-	
	2.5.2.3	14	350	648-350-WFR-PC17-0209	IPS HDPE DR17	Flange Adapter		2020		u	6	15%	7	7		0	
	2.5.2.4	14	350	648-350-WFR-PC17-0209	IPS HDPE DR17	Backing Ring		2020		u	6	15%	7	7		0	
	2.5.2.5	14	350	648-350-WFR-PC17-0209	IPS DR17	Red Rubber Gasket		2020		u	5	15%	6	6		0	
	2.5.2.6	1	25	648-350-WFR-PC17-0209	1" X 14" Bolt GR5 Full Thread	For Flange Bolt-Up -14 in pipe	12 units per joint	2020		u	60	15%	69	69		0	
	2.5.2.7	1	25	648-350-WFR-PC17-0209	1" Hex Nut Gr5	For Flange Bolt-Up -14 in pipe	12 units per joint	2020		u	60	15%	69	69		0	
	2.5.2.8	1	25	648-350-WFR-PC17-0209	1" Steel Washer	For Flange Bolt-Up -14 in pipe	24 units per joint	2020		u	120	15%	138	138		0	
	2.5.2.9	12	300	648-350-WFR-PC17-0209	IPS DR17	Red Rubber Gasket		2020		u	1	15%	1	1		0	
	2.5.2.10	7/8	22	648-350-WFR-PC17-0209	7/8" X 10" Bolt GR5 Full Thread	For Flange Bolt-Up -12 in pipe	12 units per joint	2020		u	12	15%	14	14		0	
	2.5.2.11	7/8	22	648-350-WFR-PC17-0209	7/8" Hex Nut Gr5	For Flange Bolt-Up -12 in pipe	12 units per joint	2020		u	12	15%	14	14		0	
	2.5.2.12	7/8	22	648-350-WFR-PC17-0209	7/8" Steel Washer	For Flange Bolt-Up -12 in pipe	24 units per joint	2020		u	24	15%	28	28		0	
	2.5.2.13	12 x 14	300 x 350	648-350-WFR-PC17-0209	IPS HDPE DR17	Flanged concentric reducer		2020		u	1	15%	1	1		0	
								2020					-	-		-	
								2020					-	-		-	
	2.6			**648-350-WFR-PC17-0210**	**LINE 6: A49-B TO WHALE TAIL SOUTH BASIN (BY-PASS)**			2020					-	-		-	
	2.6.1	14	350	648-350-WFR-PC17-0210	IPS HDPE DR17	Number of pipe butt-fusion required (every 50 ft)		2020		u	11	15%	13	13		0	
	2.6.2	14	350	648-350-WFR-PC17-0210	IPS HDPE DR17	Flange Insulation Kit (every 250 ft)		2020		u	0	15%	-	-		-	
	2.6.3	14	350	648-350-WFR-PC17-0210	IPS HDPE DR17	Flange Adapter		2020		u	8	15%	9	9		0	
	2.6.4	14	350	648-350-WFR-PC17-0210	IPS HDPE DR17	Backing Ring		2020		u	8	15%	9	9		0	
	2.6.5	14	350	648-350-WFR-PC17-0210	IPS DR17	Red Rubber Gasket		2020		u	7	15%	8	8		0	
	2.6.6	1	25	648-350-WFR-PC17-0210	1" X 14" Bolt GR5 Full Thread	For Flange Bolt-Up -14 in pipe	12 units per joint	2020		u	84	15%	97	97		0	
	2.6.7	1	25	648-350-WFR-PC17-0210	1" Hex Nut Gr5	For Flange Bolt-Up -14 in pipe	12 units per joint	2020		u	84	15%	97	97		0	
	2.6.8	1	25	648-350-WFR-PC17-0210	1" Steel Washer	For Flange Bolt-Up -14 in pipe	24 units per joint	2020		u	168	15%	193	193		0	
	2.6.9	14	350	648-350-WFR-PC17-0210	IPS HDPE DR17	Blind Flange		2020		u	2	15%	2	2		0	
								2020					-	-		-	
								2020					-	-		-	
	2.7				**LINE 7: IVR POND (A53) TO WT ATTENUATION POND / WTP AREA**			2020					-	-		-	
	2.7.1			**648-350-WFR-PC17-0211**	**Dewatering line**			2020					-	-		-	
	2.7.1.1	14	350	648-350-WFR-PC17-0211	IPS HDPE DR17	Number of pipe butt-fusion required (every 50 ft)		2020		u	93	20%	112	112		0	
	2.7.1.2	14	350	648-350-WFR-PC17-0211	IPS HDPE DR17	Flange Insulation Kit (every 250 ft)		2020		u	0	20%	-	-		-	
	2.7.1.3	14	350	648-350-WFR-PC17-0211	IPS HDPE DR17	Flange Adapter		2020		u	31	20%	37	37		0	
	2.7.1.4	14	350	648-350-WFR-PC17-0211	IPS HDPE DR17	Backing Ring		2020		u	31	20%	37	37		0	
	2.7.1.5	14	350	648-350-WFR-PC17-0211	IPS DR17	Red Rubber Gasket		2020		u	18	20%	22	22		0	
	2.7.1.6	1	25	648-350-WFR-PC17-0211	1" X 14" Bolt GR5 Full Thread	For Flange Bolt-Up -14 in pipe	12 units per joint	2020		u	216	15%	248	248		0	
	2.7.1.7	1	25	648-350-WFR-PC17-0211	1" Hex Nut Gr5	For Flange Bolt-Up -14 in pipe	12 units per joint	2020		u	216	15%	248	248		0	
	2.7.1.8	1	25	648-350-WFR-PC17-0211	1" Steel Washer	For Flange Bolt-Up -14 in pipe	24 units per joint	2020		u	432	15%	497	497		0	
	2.7.1.9	10	250	648-350-WFR-PC17-0211	IPS DR17	Red Rubber Gasket		2020		u	1	15%	1	1		0	
	2.7.1.10	7/8	22	648-350-WFR-PC17-0211	7/8" X 10" Bolt GR5 Full Thread	For Flange Bolt-Up -10 in pipe	12 units per joint	2020		u	12	15%	14	14		0	
	2.7.1.11	7/8	22	648-350-WFR-PC17-0211	7/8" Hex Nut Gr5	For Flange Bolt-Up -10 in pipe	12 units per joint	2020		u	12	15%	14	14		0	
	2.7.1.12	7/8	22	648-350-WFR-PC17-0211	7/8" Steel Washer	For Flange Bolt-Up -10 in pipe	24 units per joint	2020		u	24	15%	28	28		0	
	2.7.1.13	10 x 14	250 x 350	648-350-WFR-PC17-0211	IPS HDPE DR17	Flanged concentric reducer		2020		u	1	15%	1	1		0	
	2.7.1.14	14	350	648-350-WFR-PC17-0211	IPS HDPE DR17	Blind Flange		2020		u	1	15%	1	1		0	
R1	2.7.1.15	14	350	648-350-WFR-PC17-0211	IPS HDPE DR17	Molded Tee (14"-14"-8")		2020		u	0	0%	-	-		-	
	2.7.1.16	14	350	648-350-WFR-PC17-0211	IPS HDPE DR17	Flange Adapter		2020		u	2	20%	2	2		0	
	2.7.1.17	14	350	648-350-WFR-PC17-0211	IPS HDPE DR17	Backing Ring		2020		u	2	20%	2	2		0	
	2.7.1.18	14	350	648-350-WFR-PC17-0211	IPS DR17	Red Rubber Gasket		2020		u	2	20%	2	2		0	
	2.7.1.19	1	25	648-350-WFR-PC17-0211	1" X 14" Bolt GR5 Full Thread	For Flange Bolt-Up -14 in pipe	12 units per joint	2020		u	24	15%	28	28		0	
	2.7.1.20	1	25	648-350-WFR-PC17-0211	1" Hex Nut Gr5	For Flange Bolt-Up -14 in pipe	12 units per joint	2020		u	24	15%	28	28		0	
	2.7.1.21	1	25	648-350-WFR-PC17-0211	1" Steel Washer	For Flange Bolt-Up -14 in pipe	24 units per joint	2020		u	48	15%	55	55		0	
	2.7.1.22	8	200	648-350-WFR-PC17-0211	IPS HDPE DR17	Flange Adapter		2020		u	1	20%	1	1		0	
	2.7.1.23	8	200	648-350-WFR-PC17-0211	IPS HDPE DR17	Backing Ring		2020		u	1	20%	1	1		0	
	2.7.1.24	8	200	648-350-WFR-PC17-0211	IPS DR11	Red Rubber Gasket		2020		u	1	20%	1	1		0	
	2.7.1.25	3/4	19	648-350-WFR-PC17-0211	3/4" X 6-1/4" Bolt GR5 Full Thread	For Flange Bolt-Up - 8 in pipe	8 units per joint	2020		u	8	15%	9	9		0	
	2.7.1.26	3/4	19	648-350-WFR-PC17-0211	3/4" Hex Nut Gr5	For Flange Bolt-Up - 8 in pipe	8 units per joint	2020		u	8	15%	9	9		0	
	2.7.1.27	3/4	19	648-350-WFR-PC17-0211	3/4" Steel Washer	For Flange Bolt-Up - 8 in pipe	16 units per joint	2020		u	16	15%	18	18		0	
														0			
	2.7.2			**648-350-WFR-PC17-0212**	**Suction line**			2020					-	-		-	
	2.7.2.1	14	350	648-350-WFR-PC17-0212	IPS HDPE DR17	Number of pipe butt-fusion required (every 50 ft)		2020		u	20	20%	24	24		0	
	2.7.2.2	14	350	648-350-WFR-PC17-0212	IPS HDPE DR17	Flange Insulation Kit (every 250 ft)		2020		u	0	20%	-	-		-	
	2.7.2.3	14	350	648-350-WFR-PC17-0212	IPS HDPE DR17	Flange Adapter		2020		u	14	20%	17	17		0	
	2.7.2.4	14	350	648-350-WFR-PC17-0212	IPS HDPE DR17	Backing Ring		2020		u	14	20%	17	17		0	

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MATERIAL TAKE-OFF LIST
PIPING, PIPING HARDWARE, VALVES
AMARUQ PHASE 2 DEWATERING PHASE
SNC Document No.: 668284-8000-46ET-0001
AEM Document No.: 6127-S-270-004-MTO-002

AGNICO EAGLE

Date	Revision
15-May-20	R1

Values in black indicated items that are ordered
Values in red are proposed quantities to order

Rev.	Item	Dia. (in)	Dia. (mm)	Piping Tag	Description 1	Description 2	Function	Delivery Year	Year in Service	Unit	Estimated Quantity	Contigency (%)	With contingency	Qty (+contingengy) Ordered for Barge 2020	From Existing AMQ Inventory	To be Ordered for Barge 2021	Notes
	2.7.2.5	14	350	648-350-WFR-PC17-0212	IPS DR17	Red Rubber Gasket		2020		u	9	20%	11	11		0	
	2.7.2.6	1	25	648-350-WFR-PC17-0212	1" X 14" Bolt GR5 Full Thread	For Flange Bolt-Up -14 in pipe	12 units per joint	2020		u	108	15%	124	124		0	
	2.7.2.7	1	25	648-350-WFR-PC17-0212	1" Hex Nut Gr5	For Flange Bolt-Up -14 in pipe	12 units per joint	2020		u	108	15%	124	124		0	
	2.7.2.8	1	25	648-350-WFR-PC17-0212	1" Steel Washer	For Flange Bolt-Up -14 in pipe	24 units per joint	2020		u	216	15%	248	248		0	
	2.7.2.9	12	300	648-350-WFR-PC17-0212	IPS DR17	Red Rubber Gasket		2020		u	1	15%	1	1		0	
	2.7.2.10	7/8	22	648-350-WFR-PC17-0212	7/8" X 10" Bolt GR5 Full Thread	For Flange Bolt-Up -12 in pipe	12 units per joint	2020		u	12	15%	14	14		0	
	2.7.2.11	7/8	22	648-350-WFR-PC17-0212	7/8" Hex Nut Gr5	For Flange Bolt-Up -12 in pipe	12 units per joint	2020		u	12	15%	14	14		0	
	2.7.2.12	7/8	22	648-350-WFR-PC17-0212	7/8" Steel Washer	For Flange Bolt-Up -12 in pipe	24 units per joint	2020		u	24	15%	28	28		0	
	2.7.2.13	12 x 14	300 x 350	648-350-WFR-PC17-0212	IPS HDPE DR17	Flanged concentric reducer		2020		u	1	15%	1	1		0	
														0			
R1	2.7.3			**648-350-WFR-PC17-0223**	**By-Pass to WT Attenuation Pond**			2020					-	-		-	
R1	2.7.1.1	14	350	648-350-WFR-PC17-0223	IPS HDPE DR17	Number of pipe butt-fusion required (every 50 ft)		2020		u	0	15%	-	-		-	
R1	2.7.1.2	14	350	648-350-WFR-PC17-0223	IPS HDPE DR17	Flange Insulation Kit (every 250 ft)		2020		u	0	20%	-	-		-	
R1	2.7.1.3	14	350	648-350-WFR-PC17-0223	IPS HDPE DR17	Flange Adapter		2020		u	2	15%	2	2		0	
R1	2.7.1.4	14	350	648-350-WFR-PC17-0223	IPS HDPE DR17	Backing Ring		2020		u	2	15%	2	2		0	
R1	2.7.1.5	14	350	648-350-WFR-PC17-0223	IPS DR17	Red Rubber Gasket		2020		u	2	15%	2	2		0	
R1	2.7.1.6	1	25	648-350-WFR-PC17-0223	1" X 14" Bolt GR5 Full Thread	For Flange Bolt-Up -14 in pipe	12 units per joint	2020		u	24	15%	28	28		0	
R1	2.7.1.7	1	25	648-350-WFR-PC17-0223	1" Hex Nut Gr5	For Flange Bolt-Up -14 in pipe	12 units per joint	2020		u	24	15%	28	28		0	
R1	2.7.1.8	1	25	648-350-WFR-PC17-0223	1" Steel Washer	For Flange Bolt-Up -14 in pipe	24 units per joint	2020		u	48	15%	55	55		0	
R1	2.7.1.9	8 x 14	200 x 350	648-350-WFR-PC17-0223	IPS HDPE DR17	Flanged concentric reducer		2020		u	1	15%	1	1		0	
								2020					-	-		-	
								2020					-	-		-	
	2.8			**648-350-WFR-PC17-0213**	**LINE 8: IVR POND (A53) TO WHALE TAIL SOUTH BASIN**			2020					-	-		-	
	2.8.1	14	350	648-350-WFR-PC17-0213	IPS HDPE DR17	Number of pipe butt-fusion required (every 50 ft)		2020		u	51	20%	61	61		0	
	2.8.2	14	350	648-350-WFR-PC17-0213	IPS HDPE DR17	Flange Insulation Kit (every 250 ft)		2020		u	0	20%	-	-		-	
	2.8.3	14	350	648-350-WFR-PC17-0213	IPS HDPE DR17	Flange Adapter		2020		u	23	20%	28	28		0	
	2.8.4	14	350	648-350-WFR-PC17-0213	IPS HDPE DR17	Backing Ring		2020		u	23	20%	28	28		0	
	2.8.5	14	350	648-350-WFR-PC17-0213	IPS DR17	Red Rubber Gasket		2020		u	13	20%	16	16		0	
	2.8.6	1	25	648-350-WFR-PC17-0213	1" X 14" Bolt GR5 Full Thread	For Flange Bolt-Up -14 in pipe	12 units per joint	2020		u	156	15%	179	179		0	
	2.8.7	1	25	648-350-WFR-PC17-0213	1" Hex Nut Gr5	For Flange Bolt-Up -14 in pipe	12 units per joint	2020		u	156	15%	179	179		0	
	2.8.8	1	25	648-350-WFR-PC17-0213	1" Steel Washer	For Flange Bolt-Up -14 in pipe	24 units per joint	2020		u	312	15%	359	359		0	
	2.8.9	14	350	648-350-WFR-PC17-0213	IPS HDPE DR17	Blind Flange		2020		u	1	15%	1	1		0	
								2020					-	-		-	
								2020					-	-		-	
R1	2.9				**LINE 9: A-P21 TO A52**			2020					-	-		-	Use layflat hose with 4-in flange connection
R1	2.9.1			**648-100-WFR-PC17-0222**	**Lake dewatering**			2020					-	-		-	Use layflat hose with 4-in flange connection
R1	2.4.1.9	4	100	648-100-WFR-PC17-0222	IPS DR17	Red Rubber Gasket	For hose connection to pump	2020		u	1	15%	1	1		0	Use layflat hose with 4-in flange connection
R1	2.4.1.10	1	16	648-100-WFR-PC17-0222	5/8" X 5-7/8" Bolt GR5 Full Thread	For Flange Bolt-Up - 4 in pipe	8 units per joint	2020		u	8	15%	9	9		0	Use layflat hose with 4-in flange connection
R1	2.4.1.11	1	16	648-100-WFR-PC17-0222	5/8" Hex Nut Gr5	For Flange Bolt-Up - 4 in pipe	8 units per joint	2020		u	8	15%	9	9		0	Use layflat hose with 4-in flange connection
R1	2.4.1.12	1	16	648-100-WFR-PC17-0222	5/8" Steel Washer	For Flange Bolt-Up - 4 in pipe	16 units per joint	2020		u	16	15%	18	18		0	Use layflat hose with 4-in flange connection
								2020					-	-		-	
R1	2.9.2			**648-200-WFR-PC17-0221**	**Suction line**			2020					-	-		-	
R1	2.9.2.1	8	200	648-200-WFR-PC17-0221	IPS HDPE DR17	Number of pipe butt-fusion required (every 50 ft)		2020		u	6	15%	7	7		0	
R1	2.9.2.2	8	200	648-200-WFR-PC17-0221	IPS HDPE DR17	Flange Insulation Kit (every 250 ft)		2020		u	0	15%	-	-		-	
R1	2.9.2.3	8	200	648-200-WFR-PC17-0221	IPS HDPE DR17	Flange Adapter		2020		u	6	15%	7	7		0	
R1	2.9.2.9	8	200	648-200-WFR-PC17-0221	IPS HDPE DR17	Backing Ring		2020		u	6	15%	7	7		0	
R1	2.9.2.5	8	200	648-200-WFR-PC17-0221	IPS DR17	Red Rubber Gasket		2020		u	5	15%	6	6		0	
R1	2.9.2.6	3/4	19	648-200-WFR-PC17-0221	3/4" X 6-1/4" Bolt GR5 Full Thread	For Flange Bolt-Up - 8 in pipe	8 units per joint	2020		u	40	15%	46	46		0	
R1	2.9.2.7	3/4	19	648-200-WFR-PC17-0221	3/4" Hex Nut Gr5	For Flange Bolt-Up - 8 in pipe	8 units per joint	2020		u	40	15%	46	46		0	
R1	2.9.2.8	3/4	19	648-200-WFR-PC17-0221	3/4" Steel Washer	For Flange Bolt-Up - 8 in pipe	16 units per joint	2020		u	80	15%	92	92		0	
R1	2.9.2.9	4	100	648-200-WFR-PC17-0221	IPS DR17	Red Rubber Gasket		2020		u	1	15%	1	1		0	
R1	2.9.2.10	5/8	16	648-200-WFR-PC17-0221	5/8" X 5-7/8" Bolt GR5 Full Thread	For Flange Bolt-Up - 4 in pipe	8 units per joint	2020		u	8	15%	9	9		0	
R1	2.9.2.11	5/8	16	648-200-WFR-PC17-0221	5/8" Hex Nut Gr5	For Flange Bolt-Up - 4 in pipe	8 units per joint	2020		u	8	15%	9	9		0	
R1	2.9.2.12	5/8	16	648-200-WFR-PC17-0221	5/8" Steel Washer	For Flange Bolt-Up - 4 in pipe	16 units per joint	2020		u	16	15%	18	18		0	
R1	2.9.2.13	4 x 8	100 x 200	648-200-WFR-PC17-0221	IPS HDPE DR17	Flanged concentric reducer		2020		u	1	15%	1	1		0	
								2020					-	-		-	
	2.10				**LINE 10: LAKE A50 TO A53**			2020					-	-		-	
	2.10.1			**648-200-WFR-PC11-0215**	**Lake dewatering**			2020					-	-		-	
	2.10.1.1	8	200	648-200-WFR-PC11-0215	IPS HDPE DR11	Number of pipe butt-fusion required (every 50 ft)		2020		u	18	15%	21	21		0	2 butt fuse required to fuse new "T"
	2.10.1.2	8	200	648-200-WFR-PC11-0215	IPS HDPE DR11	Flange Insulation Kit (every 250 ft)		2020		u	0	20%	-	-		-	
	2.10.1.3	8	200	648-200-WFR-PC11-0215	IPS HDPE DR11	Flange Adapter		2020		u	6	15%	7	7		0	"T" will have 1 flanged 8-in connetion for 2nd pump
	2.10.1.4	8	200	648-200-WFR-PC11-0215	IPS HDPE DR11	Backing Ring		2020		u	6	15%	7	7		0	"T" will have 1 flanged 8-in connetion for 2nd pump
	2.10.1.5	8	200	648-200-WFR-PC11-0215	IPS DR11	Red Rubber Gasket		2020		u	5	15%	6	6		0	"T" will have 1 flanged 8-in connetion for 2nd pump
	2.10.1.6	3/4	19	648-200-WFR-PC11-0215	3/4" X 6-1/4" Bolt GR5 Full Thread	For Flange Bolt-Up - 8 in pipe	8 units per joint	2020		u	40	15%	46	46		0	"T" will have 1 flanged 8-in connetion for 2nd pump
	2.10.1.7	3/4	19	648-200-WFR-PC11-0215	3/4" Hex Nut Gr5	For Flange Bolt-Up - 8 in pipe	8 units per joint	2020		u	40	15%	46	46		0	"T" will have 1 flanged 8-in connetion for 2nd pump
	2.10.1.8	3/4	19	648-200-WFR-PC11-0215	3/4" Steel Washer	For Flange Bolt-Up - 8 in pipe	16 units per joint	2020		u	80	15%	92	92		0	"T" will have 1 flanged 8-in connetion for 2nd pump
	2.10.1.9	4	100	648-200-WFR-PC11-0215	IPS DR11	Red Rubber Gasket		2020		u	1	15%	1	1		0	
	2.10.1.10	5/8	16	648-200-WFR-PC11-0215	5/8" X 5-7/8" Bolt GR5 Full Thread	For Flange Bolt-Up - 4 in pipe	8 units per joint	2020		u	8	15%	9	9		0	
	2.10.1.11	5/8	16	648-200-WFR-PC11-0215	5/8" Hex Nut Gr5	For Flange Bolt-Up - 4 in pipe	8 units per joint	2020		u	8	15%	9	9		0	
	2.10.1.12	5/8	16	648-200-WFR-PC11-0215	5/8" Steel Washer	For Flange Bolt-Up - 4 in pipe	16 units per joint	2020		u	16	15%	18	18		0	
	2.10.1.13	4 x 8	100 x 200	648-200-WFR-PC11-0215	IPS HDPE DR11	Flanged concentric reducer		2020		u	1	15%	1	1		0	
	2.10.1.14	8	200	648-200-WFR-PC11-0215	IPS HDPE DR11	Molded Tee (8"-8"-8")	For connection to 2nd pump	2020		u	1	0%	1	1		0	

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Values in black indicated items that are ordered
Values in red are proposed quantities to order

														Qty (+contingengy)			
Rev.	Item	Dia. (in)	Dia. (mm)	Piping Tag	Description 1	Description 2	Function	Delivery Year	Year in Service	Unit	Estimated Quantity	Contigency (%)	With contingency	Ordered for Barge 2020	From Existing AMQ Inventory	To be Ordered for Barge 2021	Notes
	2.10.1.15	8	200	648-200-WFR-PC11-0215	IPS HDPE DR11	Blind Flange	For connection to 2nd pump	2020		u	3	50%	5	5		0	For all three lakes
								2020					-	-		-	
	2.10.2			**648-200-WFR-PC11-0216**	**Suction line**			2020					-	-		-	
	2.10.2.1	8	200	648-200-WFR-PC11-0216	IPS HDPE DR11	Number of pipe butt-fusion required (every 50 ft)		2020		u	8	15%	9	9		0	
	2.10.2.2	8	200	648-200-WFR-PC11-0216	IPS HDPE DR11	Flange Insulation Kit (every 250 ft)		2020		u	0	15%	-	-		-	
	2.10.2.3	8	200	648-200-WFR-PC11-0216	IPS HDPE DR11	Flange Adapter		2020		u	8	15%	9	9		0	
	2.10.2.4	8	200	648-200-WFR-PC11-0216	IPS HDPE DR11	Backing Ring		2020		u	8	15%	9	9		0	
	2.10.2.5	8	200	648-200-WFR-PC11-0216	IPS DR11	Red Rubber Gasket		2020		u	6	15%	7	7		0	
	2.10.2.6	3/4	19	648-200-WFR-PC11-0216	3/4" X 6-1/4" Bolt GR5 Full Thread	For Flange Bolt-Up - 8 in pipe	8 units per joint	2020		u	48	15%	55	55		0	
	2.10.2.7	3/4	19	648-200-WFR-PC11-0216	3/4" Hex Nut Gr5	For Flange Bolt-Up - 8 in pipe	8 units per joint	2020		u	48	15%	55	55		0	
	2.10.2.8	3/4	19	648-200-WFR-PC11-0216	3/4" Steel Washer	For Flange Bolt-Up - 8 in pipe	16 units per joint	2020		u	96	15%	110	110		0	
	2.10.2.9	4	100	648-200-WFR-PC11-0216	IPS DR17	Red Rubber Gasket		2020		u	1	15%	1	1		0	
	2.10.2.10	5/8	16	648-200-WFR-PC11-0216	5/8" X 5-7/8" Bolt GR5 Full Thread	For Flange Bolt-Up - 4 in pipe	8 units per joint	2020		u	8	15%	9	9		0	
	2.10.2.11	5/8	16	648-200-WFR-PC11-0216	5/8" Hex Nut Gr5	For Flange Bolt-Up - 4 in pipe	8 units per joint	2020		u	8	15%	9	9		0	
	2.10.2.12	5/8	16	648-200-WFR-PC11-0216	5/8" Steel Washer	For Flange Bolt-Up - 4 in pipe	16 units per joint	2020		u	16	15%	18	18		0	
	2.10.2.13	4 x 8	100 x 200	648-200-WFR-PC11-0216	IPS HDPE DR11	Flanged concentric reducer		2020		u	1	15%	1	1		0	
								2020					-	-		-	
								2020					-	-		-	
	2.11				**LINE 11: LAKE A51 TO A53 - SUCTION AND DISCHARGE LINE USED FOR 2ND PUMP**			2020					-	-		-	
	2.11.1			**648-200-WFR-PC11-0217**	**Lake dewatering**			2020					-	-		-	
	2.11.1.1	8	200	648-200-WFR-PC11-0217	IPS HDPE DR11	Number of pipe butt-fusion required (every 50 ft)		2020		u	24	15%	28	28		0	2 butt fuse required to fuse new "T"
	2.11.1.2	8	200	648-200-WFR-PC11-0217	IPS HDPE DR11	Flange Insulation Kit (every 250 ft)		2020		u	0	20%	-	-		-	
	2.11.1.3	8	200	648-200-WFR-PC11-0217	IPS HDPE DR11	Flange Adapter		2020		u	15	15%	17	17		0	"T" will have 1 flanged 8-in connetion for 2nd pump
	2.11.1.4	8	200	648-200-WFR-PC11-0217	IPS HDPE DR11	Backing Ring		2020		u	15	15%	17	17		0	"T" will have 1 flanged 8-in connetion for 2nd pump
	2.11.1.5	8	200	648-200-WFR-PC11-0217	IPS DR11	Red Rubber Gasket		2020		u	11	15%	13	13		0	"T" will have 1 flanged 8-in connetion for 2nd pump
	2.11.1.6	3/4	19	648-200-WFR-PC11-0217	3/4" X 6-1/4" Bolt GR5 Full Thread	For Flange Bolt-Up - 8 in pipe	8 units per joint	2020		u	88	15%	101	101		0	"T" will have 1 flanged 8-in connetion for 2nd pump
	2.11.1.7	3/4	19	648-200-WFR-PC11-0217	3/4" Hex Nut Gr5	For Flange Bolt-Up - 8 in pipe	8 units per joint	2020		u	88	15%	101	101		0	"T" will have 1 flanged 8-in connetion for 2nd pump
	2.11.1.8	3/4	19	648-200-WFR-PC11-0217	3/4" Steel Washer	For Flange Bolt-Up - 8 in pipe	16 units per joint	2020		u	176	15%	202	202		0	"T" will have 1 flanged 8-in connetion for 2nd pump
	2.11.1.9	4	100	648-200-WFR-PC11-0217	IPS DR11	Red Rubber Gasket		2020		u	1	15%	1	1		0	
	2.11.1.10	5/8	16	648-200-WFR-PC11-0217	5/8" X 5-7/8" Bolt GR5 Full Thread	For Flange Bolt-Up - 4 in pipe	8 units per joint	2020		u	8	15%	9	9		0	
	2.11.1.11	5/8	16	648-200-WFR-PC11-0217	5/8" Hex Nut Gr5	For Flange Bolt-Up - 4 in pipe	8 units per joint	2020		u	8	15%	9	9		0	
	2.11.1.12	5/8	16	648-200-WFR-PC11-0217	5/8" Steel Washer	For Flange Bolt-Up - 4 in pipe	16 units per joint	2020		u	16	15%	18	18		0	
	2.11.1.13	4 x 8	100 x 200	648-200-WFR-PC11-0217	IPS HDPE DR11	Flanged concentric reducer		2020		u	1	15%	1	1		0	
	2.11.1.14	8	200	648-200-WFR-PC11-0217	IPS HDPE DR11	Molded Tee (8"-8"-8")		2020		u	2	0%	2	2		0	Additional tee for connection of 2nd pump
	2.11.1.15	8	200	648-200-WFR-PC11-0217	IPS	Butterfly valve	DeZurik butterfly valve, flanged, manual with handwheel or lever or equivalent	2020		u	2	0%	2	2		0	
								2020					-	-		-	
	2.11.2			**648-200-WFR-PC11-0218**	**Suction line**			2020					-	-		-	
	2.11.2.1	8	200	648-200-WFR-PC11-0218	IPS HDPE DR11	Number of pipe butt-fusion required (every 50 ft)		2020		u	8	15%	9	9		0	
	2.11.2.2	8	200	648-200-WFR-PC11-0218	IPS HDPE DR11	Flange Insulation Kit (every 250 ft)		2020		u	0	15%	-	-		-	
	2.11.2.3	8	200	648-200-WFR-PC11-0218	IPS HDPE DR11	Flange Adapter		2020		u	8	15%	9	9		0	
	2.11.2.4	8	200	648-200-WFR-PC11-0218	IPS HDPE DR11	Backing Ring		2020		u	8	15%	9	9		0	
	2.11.2.5	8	200	648-200-WFR-PC11-0218	IPS DR11	Red Rubber Gasket		2020		u	6	15%	7	7		0	
	2.11.2.6	3/4	19	648-200-WFR-PC11-0218	3/4" X 6-1/4" Bolt GR5 Full Thread	For Flange Bolt-Up - 8 in pipe	8 units per joint	2020		u	48	15%	55	55		0	
	2.11.2.7	3/4	19	648-200-WFR-PC11-0218	3/4" Hex Nut Gr5	For Flange Bolt-Up - 8 in pipe	8 units per joint	2020		u	48	15%	55	55		0	
	2.11.2.8	3/4	19	648-200-WFR-PC11-0218	3/4" Steel Washer	For Flange Bolt-Up - 8 in pipe	16 units per joint	2020		u	96	15%	110	110		0	
	2.11.2.9	4	100	648-200-WFR-PC11-0218	IPS DR17	Red Rubber Gasket		2020		u	1	15%	1	1		0	
	2.11.2.10	5/8	16	648-200-WFR-PC11-0218	5/8" X 5-7/8" Bolt GR5 Full Thread	For Flange Bolt-Up - 4 in pipe	8 units per joint	2020		u	8	15%	9	9		0	
	2.11.2.11	5/8	16	648-200-WFR-PC11-0218	5/8" Hex Nut Gr5	For Flange Bolt-Up - 4 in pipe	8 units per joint	2020		u	8	15%	9	9		0	
	2.11.2.12	5/8	16	648-200-WFR-PC11-0218	5/8" Steel Washer	For Flange Bolt-Up - 4 in pipe	16 units per joint	2020		u	16	15%	18	18		0	
	2.11.2.13	4 x 8	100 x 200	648-200-WFR-PC11-0218	IPS HDPE DR17	Flanged concentric reducer		2020		u	1	15%	1	1		0	
								2020					-	-		-	
	2.11.3			**648-200-WFR-PC11-0220**	**Discharge Line from 2nd Pump**			2020					-	-		-	
	2.11.3.1	8	200	648-200-WFR-PC11-0220	IPS HDPE DR11	Number of pipe butt-fusion required (every 50 ft)		2020		u	4	20%	5	5		0	
	2.11.3.2	8	200	648-200-WFR-PC11-0220	IPS HDPE DR11	Flange Insulation Kit (every 250 ft)		2020		u	0	20%	-	-		-	
	2.11.3.3	8	200	648-200-WFR-PC11-0220	IPS HDPE DR11	Flange Adapter		2020		u	2	20%	2	2		0	
	2.11.3.4	8	200	648-200-WFR-PC11-0220	IPS HDPE DR11	Backing Ring		2020		u	2	20%	2	2		0	
	2.11.3.5	8	200	648-200-WFR-PC11-0220	IPS DR11	Red Rubber Gasket		2020		u	2	20%	2	2		0	
	2.11.3.6	3/4	19	648-200-WFR-PC11-0220	3/4" X 6-1/4" Bolt GR5 Full Thread	For Flange Bolt-Up - 8 in pipe	8 units per joint	2020		u	16	15%	18	18		0	
	2.11.3.7	3/4	19	648-200-WFR-PC11-0220	3/4" Hex Nut Gr5	For Flange Bolt-Up - 8 in pipe	8 units per joint	2020		u	16	15%	18	18		0	
	2.11.3.8	3/4	19	648-200-WFR-PC11-0220	3/4" Steel Washer	For Flange Bolt-Up - 8 in pipe	16 units per joint	2020		u	32	15%	37	37		0	
	2.11.3.9	4	100	648-200-WFR-PC11-0220	IPS DR11	Red Rubber Gasket		2020		u	1	15%	1	1		0	
	2.11.3.10	5/8	16	648-200-WFR-PC11-0220	5/8" X 5-7/8" Bolt GR5 Full Thread	For Flange Bolt-Up - 4 in pipe	8 units per joint	2020		u	8	15%	9	9		0	
	2.11.3.11	5/8	16	648-200-WFR-PC11-0220	5/8" Hex Nut Gr5	For Flange Bolt-Up - 4 in pipe	8 units per joint	2020		u	8	15%	9	9		0	
	2.11.3.12	5/8	16	648-200-WFR-PC11-0220	5/8" Steel Washer	For Flange Bolt-Up - 4 in pipe	16 units per joint	2020		u	16	15%	18	18		0	
	2.11.3.13	4 x 8	100 x 200	648-200-WFR-PC11-0220	IPS HDPE DR11	Flanged concentric reducer		2020		u	1	15%	1	1		0	
								2020					-	-		-	
	2.12				**LINE 12: LAKE A52 TO A53**			2020					-	-		-	
	2.12.1			**648-200-WFR-PC11-0219**	**Lake dewatering**			2020					-	-		-	
	2.12.1.1	8	200	648-200-WFR-PC11-0219	IPS HDPE DR11	Number of pipe butt-fusion required (every 50 ft)		2020		u	23	20%	28	28		0	
	2.12.1.2	8	200	648-200-WFR-PC11-0219	IPS HDPE DR11	Flange Insulation Kit (every 250 ft)		2020		u	0	20%	-	-		-	
	2.12.1.3	8	200	648-200-WFR-PC11-0219	IPS HDPE DR11	Flange Adapter		2020		u	14	20%	17	17		0	
	2.12.1.4	8	200	648-200-WFR-PC11-0219	IPS HDPE DR11	Backing Ring		2020		u	14	20%	17	17		0	

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Values in black indicated items that are ordered
Values in red are proposed quantities to order

Rev.	Item	Dia. (in)	Dia. (mm)	Piping Tag	Description 1	Description 2	Function	Delivery Year	Year in Service	Unit	Estimated Quantity	Contigency (%)	With contingency	Qty (+contingengy) Ordered for Barge 2020	Qty (+contingengy) From Existing AMQ Inventory	Qty (+contingengy) To be Ordered for Barge 2021	Notes
	2.12.1.5	8	200	648-200-WFR-PC11-0219	IPS DR11	Red Rubber Gasket		2020		u	**10**	20%	**12**	**12**		0	
	2.12.1.6	3/4	19	648-200-WFR-PC11-0219	3/4" X 6-1/4" Bolt GR5 Full Thread	For Flange Bolt-Up - 8 in pipe	8 units per joint	2020		u	**80**	15%	**92**	**92**		0	
	2.12.1.7	3/4	19	648-200-WFR-PC11-0219	3/4" Hex Nut Gr5	For Flange Bolt-Up - 8 in pipe	8 units per joint	2020		u	**80**	15%	**92**	**92**		0	
	2.12.1.8	3/4	19	648-200-WFR-PC11-0219	3/4" Steel Washer	For Flange Bolt-Up - 8 in pipe	16 units per joint	2020		u	**160**	15%	**184**	**184**		0	
	2.12.1.9	4	100	648-200-WFR-PC11-0219	IPS DR11	Red Rubber Gasket		2020		u	**1**	15%	**1**	**1**		0	
	2.12.1.10	5/8	16	648-200-WFR-PC11-0219	5/8" X 5-7/8" Bolt GR5 Full Thread	For Flange Bolt-Up - 4 in pipe	8 units per joint	2020		u	**8**	15%	**9**	**9**		0	
	2.12.1.11	5/8	16	648-200-WFR-PC11-0219	5/8" Hex Nut Gr5	For Flange Bolt-Up - 4 in pipe	8 units per joint	2020		u	**8**	15%	**9**	**9**		0	
	2.12.1.12	5/8	16	648-200-WFR-PC11-0219	5/8" Steel Washer	For Flange Bolt-Up - 4 in pipe	16 units per joint	2020		u	**16**	15%	**18**	**18**		0	
	2.12.1.13	4 x 8	100 x 200	648-200-WFR-PC11-0219	IPS HDPE DR11	Flanged concentric reducer		2020		u	**1**	15%	**1**	**1**		0	
	2.12.1.14	8	200	648-200-WFR-PC11-0219	IPS HDPE DR11	Molded Tee (8"-8"-8")		2020		u	**1**	0%	**1**	**1**		0	
	2.12.1.15	8	200	648-200-WFR-PC11-0219	IPS	Butterfly valve	DeZurik butterfly valve, flanged, manual with handwheel or lever or equivalent	2020		u	**2**	0%	**2**	**2**		0	
	2.12.1.16	8	200	648-200-WFR-PC11-0219	IPS HDPE DR11	Molded Tee (8"-8"-8")	For connection to 2nd pump	2020		u	**1**	0%	**1**	**1**		0	
								2020					-	-		-	
	2.12.2			**648-200-WFR-PC17-0220**	**Suction line**			2020					-	-		-	
	2.12.2.1	8	200	648-200-WFR-PC17-0220	IPS HDPE DR17	Number of pipe butt-fusion required (every 50 ft)		2020		u	**0**	20%	-	-		-	Line used for 2nd pump discharge line. See 2.11.3
	2.12.2.2	8	200	648-200-WFR-PC17-0220	IPS HDPE DR17	Flange Insulation Kit (every 250 ft)		2020		u	**0**	20%	-	-		-	Line used for 2nd pump discharge line. See 2.11.3
	2.12.2.3	8	200	648-200-WFR-PC17-0220	IPS HDPE DR17	Flange Adapter		2020		u	**0**	20%	-	-		-	Line used for 2nd pump discharge line. See 2.11.3
	2.12.2.4	8	200	648-200-WFR-PC17-0220	IPS HDPE DR17	Backing Ring		2020		u	**0**	20%	-	-		-	Line used for 2nd pump discharge line. See 2.11.3
	2.12.2.5	8	200	648-200-WFR-PC17-0220	IPS DR17	Red Rubber Gasket		2020		u	**0**	20%	-	-		-	Line used for 2nd pump discharge line. See 2.11.3
	2.12.2.6	3/4	19	648-200-WFR-PC17-0220	3/4" X 6-1/4" Bolt GR5 Full Thread	For Flange Bolt-Up - 8 in pipe	8 units per joint	2020		u	**0**	15%	-	-		-	Line used for 2nd pump discharge line. See 2.11.3
	2.12.2.7	3/4	19	648-200-WFR-PC17-0220	3/4" Hex Nut Gr5	For Flange Bolt-Up - 8 in pipe	8 units per joint	2020		u	**0**	15%	-	-		-	Line used for 2nd pump discharge line. See 2.11.3
	2.12.2.8	3/4	19	648-200-WFR-PC17-0220	3/4" Steel Washer	For Flange Bolt-Up - 8 in pipe	16 units per joint	2020		u	**0**	15%	-	-		-	Line used for 2nd pump discharge line. See 2.11.3
	2.12.2.9	4	100	648-200-WFR-PC17-0220	IPS DR17	Red Rubber Gasket		2020		u	**0**	15%	-	-		-	Line used for 2nd pump discharge line. See 2.11.3
	2.12.2.10	5/8	16	648-200-WFR-PC17-0220	5/8" X 5-7/8" Bolt GR5 Full Thread	For Flange Bolt-Up - 4 in pipe	8 units per joint	2020		u	**0**	15%	-	-		-	Line used for 2nd pump discharge line. See 2.11.3
	2.12.2.11	5/8	16	648-200-WFR-PC17-0220	5/8" Hex Nut Gr5	For Flange Bolt-Up - 4 in pipe	8 units per joint	2020		u	**0**	15%	-	-		-	Line used for 2nd pump discharge line. See 2.11.3
	2.12.2.12	5/8	16	648-200-WFR-PC17-0220	5/8" Steel Washer	For Flange Bolt-Up - 4 in pipe	16 units per joint	2020		u	**0**	15%	-	-		-	Line used for 2nd pump discharge line. See 2.11.3
	2.12.2.13	4 x 8	100 x 200	648-200-WFR-PC17-0220	IPS HDPE DR17	Flanged concentric reducer		2020		u	**0**	15%	-	-		-	Line used for 2nd pump discharge line. See 2.11.3
								2020					-	-		-	
R1	2.13				**LINE 13: A50/A51/A52 TO WHALE TAIL ATTENUATION POND (BY-PASS)**			2020					-	-		-	
R1	2.13.1			**648-200-WFR-PC17-0220**	**Lake dewatering**			2020					-	-		-	
R1	2.13.1.1	8	200	648-200-WFR-PC17-0220	IPS HDPE DR17	Number of pipe butt-fusion required (every 50 ft)		2020		u	**18**	15%	**21**	**21**		0	
R1	2.13.1.2	8	200	648-200-WFR-PC17-0220	IPS HDPE DR17	Flange Insulation Kit (every 250 ft)		2020		u	**0**	20%	-	-		-	
R1	2.13.1.3	8	200	648-200-WFR-PC17-0220	IPS HDPE DR17	Flange Adapter		2020		u	**6**	15%	**7**	**7**		0	
R1	2.13.1.4	8	200	648-200-WFR-PC17-0220	IPS HDPE DR17	Backing Ring		2020		u	**6**	15%	**7**	**7**		0	
R1	2.13.1.5	8	200	648-200-WFR-PC17-0220	IPS DR17	Red Rubber Gasket		2020		u	**4**	15%	**5**	**5**		0	
R1	2.13.1.6	3/4	19	648-200-WFR-PC17-0220	3/4" X 6-1/4" Bolt GR5 Full Thread	For Flange Bolt-Up - 8 in pipe	8 units per joint	2020		u	**32**	15%	**37**	**37**		0	
R1	2.13.1.7	3/4	19	648-200-WFR-PC17-0220	3/4" Hex Nut Gr5	For Flange Bolt-Up - 8 in pipe	8 units per joint	2020		u	**32**	15%	**37**	**37**		0	
R1	2.13.1.8	3/4	19	648-200-WFR-PC17-0220	3/4" Steel Washer	For Flange Bolt-Up - 8 in pipe	16 units per joint	2020		u	**64**	15%	**74**	**74**		0	
								2020					-	-		-	
								2020					-	-		-	
	3.0				**VALVES**			2020									
	3.1				**COMBINATION AIR/VACUUM RELEASE VALVE FOR LINE XX**		**NOT REQUIRED FOR TEMPORARY DEWATERING**	2020				0%	-	-		-	
								2020					-	-		-	
	4.0				**PIPE ACCESSORIES FOR FLOWMETER**			2020									
	4.1				**10-in ELECTROMAGNETIC FLOW METER**		**648-350-WFR-PC17-211**	2020		u		0%	-	-		-	
	4.1.1	10	250	648-250-WFR-PC17-0211	IPS DR17 HDPE 4710	UNINSULATED	5D straight lenght downstream of flow meter	2020		m	**1.25**	25%	**1.56**	**2**		0	
	4.1.2	10	250	648-250-WFR-PC17-0211	IPS DR17 HDPE 4710	UNINSULATED	2D straight lenght downstream of flow meter	2020		m	**0.50**	25%	**0.63**	**1**		0	
	4.1.3	10	250	648-250-WFR-PC17-0211	IPS HDPE DR17	Flange Adapter	Flange connection to flow meter	2020		u	**4**	50%	**6**	**6**		0	
	4.1.4	10	250	648-250-WFR-PC17-0211	IPS HDPE DR17	Backing Ring	Flange connection to flow meter	2020		u	**4**	50%	**6**	**6**		0	
	4.1.5	10	250	648-250-WFR-PC17-0211	IPS DR17	Red Rubber Gasket	Flange connection to flow meter	2020		u	**4**	50%	**6**	**6**		0	
	4.1.6	1	25	648-250-WFR-PC17-0211	1" X 10-1/8" Bolt GR5 Full Thread	For Flange Bolt-Up -10 in pipe	12 units per joint	2020		u	**48**	15%	**55**	**55**		0	
	4.1.7	1	25	648-250-WFR-PC17-0211	1" Hex Nut Gr5	For Flange Bolt-Up -10 in pipe	12 units per joint	2020		u	**48**	15%	**55**	**55**		0	
	4.1.8	1	25	648-250-WFR-PC17-0211	1" Steel Washer	For Flange Bolt-Up -10 in pipe	24 units per joint	2020		u	**96**	15%	**110**	**110**		0	
	4.1.9	10 x 14	250 x 350	648-250-WFR-PC17-0211	IPS HDPE DR17	Flanged concentric reducer	To connect pipe to flow meter	2020		u	**2**	50%	**3**	**3**		0	
	4.1.10	14	350	648-250-WFR-PC17-0211	IPS HDPE DR17	Flange Adapter	To connect pipe to flow meter	2020		u	**2**	25%	**3**	**3**		0	
	4.1.11	14	350	648-250-WFR-PC17-0211	IPS HDPE DR17	Backing Ring	To connect pipe to flow meter	2020		u	**2**	25%	**3**	**3**		0	
	4.1.12	14	350	648-250-WFR-PC17-0211	IPS DR17	Red Rubber Gasket	To connect pipe to flow meter	2020		u	**2**	25%	**3**	**3**		0	
	4.1.13	1	25	648-250-WFR-PC17-0211	1" X 14" Bolt GR5 Full Thread	For Flange Bolt-Up -14 in pipe	12 units per joint	2020		u	**24**	15%	**28**	**28**		0	
	4.1.14	1	25	648-250-WFR-PC17-0211	1" Hex Nut Gr5	For Flange Bolt-Up -14 in pipe	12 units per joint	2020		u	**24**	15%	**28**	**28**		0	
	4.1.15	1	25	648-250-WFR-PC17-0211	1" Steel Washer	For Flange Bolt-Up -14 in pipe	24 units per joint	2020		u	**48**	15%	**55**	**55**		0	
								2020						**0**			
								2020					-	-		-	
	4.2				**10-in ELECTROMAGNETIC FLOW METER**		**648-200-WFR-PC17-214**	2020				0%	-	-		-	
	4.2.1	10	250	648-250-WFR-PC17-0214	IPS DR17 HDPE 4710	UNINSULATED	5D straight lenght downstream of flow meter	2020		m	**1.25**	25%	**1.56**	**2**		0	
	4.2.2	10	250	648-250-WFR-PC17-0214	IPS DR17 HDPE 4710	UNINSULATED	2D straight lenght downstream of flow meter	2020		m	**0.50**	25%	**0.63**	**1**		0	
	4.2.3	10	250	648-250-WFR-PC17-0214	IPS HDPE DR17	Flange Adapter	Flange connection to flow meter	2020		u	**4**	50%	**6**	**6**		0	

SNC·LAVALIN	MATERIAL TAKE-OFF LIST PIPING, PIPING HARDWARE, VALVES AMARUQ PHASE 2 DEWATERING PHASE SNC Document No.: 668284-8000-46ET-0001 AEM Document No.: 6127-S-270-004-MTO-002	AGNICO EAGLE	Date 15-May-20 Revision R1

Values in black indicated items that are ordered
Values in red are proposed quantities to order

													Qty (+contingengy)			
Rev.	Item	Dia. (in)	Dia. (mm)	Piping Tag	Description 1	Description 2	Function	Delivery Year	Year in Service	Unit	Estimated Quantity	Contigency (%)	With contingency	Ordered for Barge 2020	From Existing AMQ Inventory	To be Ordered for Barge 2021	Notes
	4.2.4	10	250	648-250-WFR-PC17-0214	IPS HDPE DR17	Backing Ring	Flange connection to flow meter	2020		u	4	50%	6	6		0	
	4.2.5	10	250	648-250-WFR-PC17-0214	IPS DR17	Red Rubber Gasket	Flange connection to flow meter	2020		u	4	50%	6	6		0	
	4.2.6	1	25	648-250-WFR-PC17-0214	1" X 10-1/8" Bolt GR5 Full Thread	For Flange Bolt-Up -10 in pipe	12 units per joint	2020		u	48	15%	55	55		0	
	4.2.7	1	25	648-250-WFR-PC17-0214	1" Hex Nut Gr5	For Flange Bolt-Up -10 in pipe	12 units per joint	2020		u	48	15%	55	55		0	
	4.2.8	1	25	648-250-WFR-PC17-0214	1" Steel Washer	For Flange Bolt-Up -10 in pipe	24 units per joint	2020		u	96	15%	110	110		0	
	4.2.9	8 x 10	200 x 250	648-250-WFR-PC17-0214	IPS HDPE DR17	Flanged concentric reducer	To connect pipe to flow meter	2020		u	2	50%	3	3		0	
	4.2.10	8	200	648-250-WFR-PC17-0214	IPS HDPE DR17	Flange Adapter	To connect pipe to flow meter	2020		u	2	25%	3	3		0	
	4.2.11	8	200	648-250-WFR-PC17-0214	IPS HDPE DR17	Backing Ring	To connect pipe to flow meter	2020		u	2	25%	3	3		0	
	4.2.12	8	200	648-250-WFR-PC17-0214	IPS DR17	Red Rubber Gasket	To connect pipe to flow meter	2020		u	2	25%	3	3		0	
	4.2.13	3/4	19	648-250-WFR-PC17-0214	3/4" X 6-1/4" Bolt GR5 Full Thread	For Flange Bolt-Up - 8 in pipe	8 units per joint	2020		u	16	15%	18	18		0	
	4.2.14	3/4	19	648-250-WFR-PC17-0214	3/4" Hex Nut Gr5	For Flange Bolt-Up - 8 in pipe	8 units per joint	2020		u	16	15%	18	18		0	
	4.2.15	3/4	19	648-250-WFR-PC17-0214	3/4" Steel Washer	For Flange Bolt-Up - 8 in pipe	16 units per joint	2020		u	32	15%	37	37		0	
														0			
													-	-		-	
													-	-		-	

END OF TABLE

SNC·LAVALIN	MATERIAL TAKE-OFF LIST PIPING, PIPING HARDWARE, VALVES AMARUQ PHASE 2 DEWATERING PHASE SNC Document No.: 668284-8000-46ET-0001 AEM Document No.: 6127-S-270-004-MTO-002	AGNICO EAGLE	Date 15-May-20 Revision R1

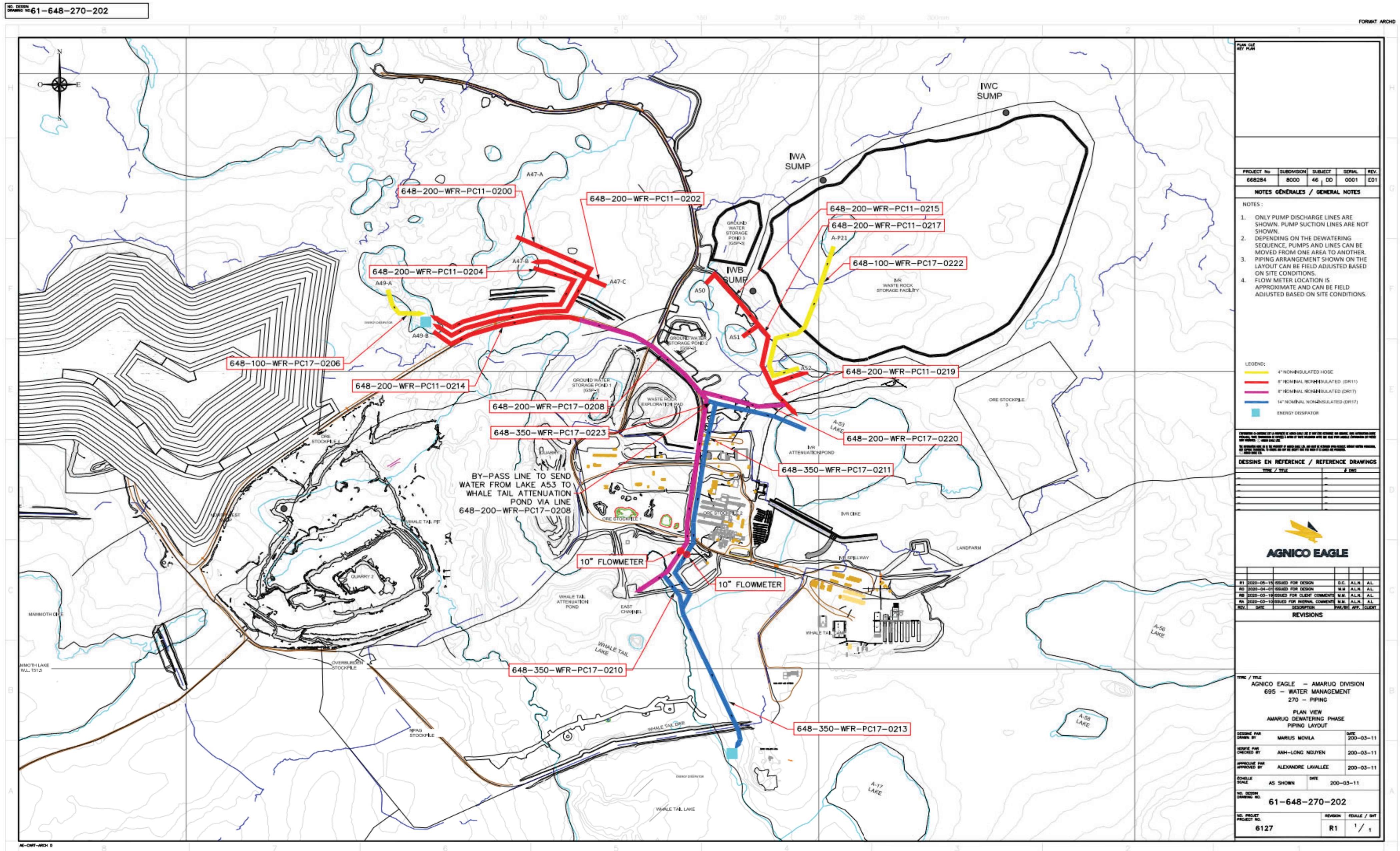
SUMMARY SHEET

PIPING LENGHT

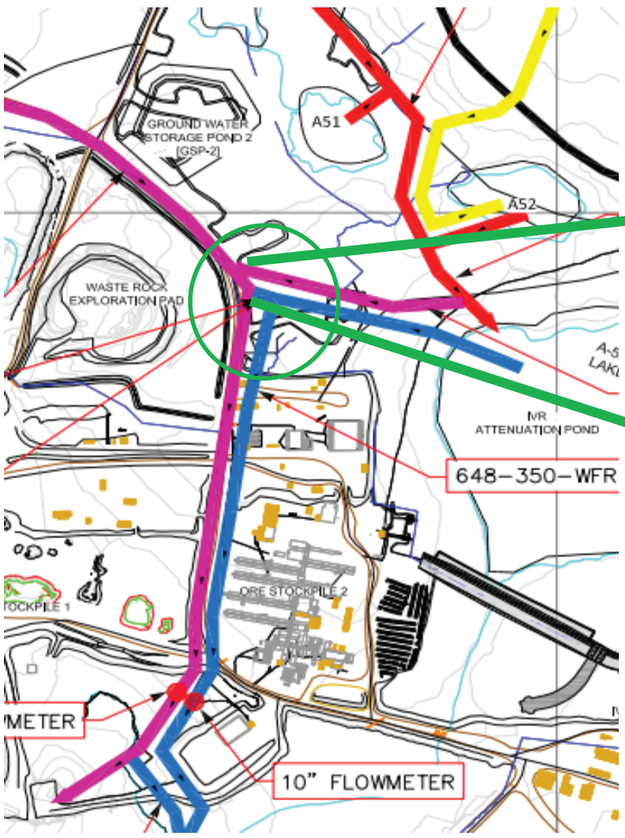
	Diameter (in)	Description 1	Description 2	Estimated Quantity	Estimated Quantity With Contingency	Ordered by AEM (ft)	Ordered by AEM (m)	Contingency available
R1	4	LAYFLAT HOSE	TEMPORARY FLEXIBLE HOSE	915	1098			
	6	IPS DR17 HDPE 4710	UNINSULATED, 50FT LENGHT	0	0			
	6	IPS DR17 HDPE 4710	INSULATED, 3 HEAT TRACED CHANNEL, 50' LENGH	0	0			
R1	8	IPS DR17 HDPE 4710	UNINSULATED, 50FT LENGHT	1530	1836	4950	1509	-1%
	8	IPS DR11 HDPE 4710	UNINSULATED, 50FT LENGHT	3250	3900	13640	4157	28%
	8	IPS DR17 HDPE 4710	INSULATED, 3 HEAT TRACED CHANNEL, 50' LENGH	0	0			
	10	IPS DR17 HDPE 4710	UNINSULATED	4	4			
R1	14	IPS DR17 HDPE 4710	UNINSULATED, 50FT LENGHT	2325	2790	9350	2850	23%
	14	IPS DR17 HDPE 4710	INSULATED, 3 HEAT TRACED CHANNEL, 50' LENGH	0	0			
	16	IPS DR17 HDPE 4710	UNINSULATED, 50FT LENGHT	0	0			
	16	IPS DR17 HDPE 4710	INSULATED, 3 HEAT TRACED CHANNEL, 50' LENGH	0	0			
	12	IPS DR17 HDPE 4710	UNINSULATED, 200 M/ROLL	0	0			

PIPING ACCESSORIES

	Diameter (in)	Description 1	Description 2	Estimated Quantity	Estimated Quantity With Contingency	Overall Contingency
	4	IPS HDPE DR17	Flange Insulation Kit (every 250 ft)	0	0	--
	6	IPS HDPE DR17	Flange Insulation Kit (every 250 ft)	0	0	--
	8	IPS HDPE DR17	Flange Insulation Kit (every 250 ft)	0	0	--
	10	IPS HDPE DR17	Flange Insulation Kit (every 250 ft)	0	0	--
	12	IPS HDPE DR17	Flange Insulation Kit (every 250 ft)	0	0	--
	14	IPS HDPE DR17	Flange Insulation Kit (every 250 ft)	0	0	--
	16	IPS HDPE DR17	Flange Insulation Kit (every 250 ft)	0	0	--
	20	IPS HDPE DR17	Flange Insulation Kit (every 250 ft)	0	0	--
	8	IPS HDPE DR11	Flange Insulation Kit (every 250 ft)	0	0	--
						--
	4	IPS HDPE DR17	Flange Adapter	0	0	--
	6	IPS HDPE DR17	Flange Adapter	0	0	--
R1	8	IPS HDPE DR17	Flange Adapter	51	61	119%
	10	IPS HDPE DR17	Flange Adapter	8	12	150%
	12	IPS HDPE DR17	Flange Adapter	0	0	--
R1	14	IPS HDPE DR17	Flange Adapter	114	135	119%
	16	IPS HDPE DR17	Flange Adapter	0	0	--
	20	IPS HDPE DR17	Flange Adapter	0	0	--
	8	IPS HDPE DR11	Flange Adapter	129	152	118%
						--
	4	IPS HDPE DR17	Backing Ring	0	0	--
	6	IPS HDPE DR17	Backing Ring	0	0	--
R1	8	IPS HDPE DR17	Backing Ring	51	61	119%
	10	IPS HDPE DR17	Backing Ring	8	12	150%
	12	IPS HDPE DR17	Backing Ring	0	0	--
R1	14	IPS HDPE DR17	Backing Ring	114	135	119%
	16	IPS HDPE DR17	Backing Ring	0	0	--
	20	IPS HDPE DR17	Backing Ring	0	0	--
	8	IPS HDPE DR11	Backing Ring	129	152	118%
						--
R1	4	IPS DR17	Red Rubber Gasket	5	6	115%
	6	IPS DR17	Red Rubber Gasket	0	0	--
R1	8	IPS DR17	Red Rubber Gasket	33	39	119%
	10	IPS DR17	Red Rubber Gasket	10	14	143%
	12	IPS DR17	Red Rubber Gasket	4	5	115%
R1	14	IPS DR17	Red Rubber Gasket	75	89	119%
	16	IPS DR17	Red Rubber Gasket	0	0	--
	20	IPS DR17	Red Rubber Gasket	0	0	--
	4	IPS DR11	Red Rubber Gasket	7	8	115%
	8	IPS DR11	Red Rubber Gasket	91	107	118%
	10	IPS DR11	Red Rubber Gasket	2	2	115%
						--
R1	5/8	5/8" X 5-7/8" Bolt GR5 Full Thread	For Flange Bolt-Up - 4 in pipe	96	110	115%
R1	5/8	5/8" Hex Nut Gr5	For Flange Bolt-Up - 4 in pipe	96	110	115%
R1	5/8	5/8" Steel Washer	For Flange Bolt-Up - 4 in pipe	192	221	115%
	3/4	3/4" X 6" Bolt GR5 Full Thread	For Flange Bolt-Up - 6 in pipe	0	0	--
	3/4	3/4" Hex Nut Gr5	For Flange Bolt-Up - 6 in pipe	0	0	--
	3/4	3/4" Steel Washer	For Flange Bolt-Up - 6 in pipe	0	0	--
R1	3/4	3/4" X 6-1/4" Bolt GR5 Full Thread	For Flange Bolt-Up - 8 in pipe	992	1141	115%
R1	3/4	3/4" Hex Nut Gr5	For Flange Bolt-Up - 8 in pipe	992	1141	115%
R1	3/4	3/4" Steel Washer	For Flange Bolt-Up - 8 in pipe	1984	2282	115%
	7/8	7/8" X 10" Bolt GR5 Full Thread	For Flange Bolt-Up -10 in pipe	48	55	115%
	7/8	7/8" Hex Nut Gr5	For Flange Bolt-Up -10 in pipe	48	55	115%
	7/8	7/8" Steel Washer	For Flange Bolt-Up -10 in pipe	96	110	115%
	7/8	7/8" X 10" Bolt GR5 Full Thread	For Flange Bolt-Up -12 in pipe	48	55	115%
	7/8	7/8" Hex Nut Gr5	For Flange Bolt-Up -12 in pipe	48	55	115%
	7/8	7/8" Steel Washer	For Flange Bolt-Up -12 in pipe	96	110	115%
R1	1	1" X 14" Bolt GR5 Full Thread	For Flange Bolt-Up -14 in pipe	900	1035	115%
R1	1	1" Hex Nut Gr5	For Flange Bolt-Up -14 in pipe	900	1035	115%
R1	1	1" Steel Washer	For Flange Bolt-Up -14 in pipe	1800	2070	115%
	1	1" X 10-1/8" Bolt GR5 Full Thread	For Flange Bolt-Up -10 in pipe	96	110	115%
	1	1" Hex Nut Gr5	For Flange Bolt-Up -10 in pipe	96	110	115%
	1	1" Steel Washer	For Flange Bolt-Up -10 in pipe	192	221	115%
						--
	6	IPS HDPE DR17	Molded Tee (6"-6"-6")	0	0	--
	8	IPS HDPE DR17	Molded Tee (8"-8"-8")	1	1	115%
	14	IPS HDPE DR17	FABRICATED Tee (14"-14"-14")	0	0	--
R1	14	IPS HDPE DR17	Molded Tee (14"-14"-8")	0	0	--
	8	IPS HDPE DR11	Molded Tee (8"-8"-8")	5	5	100%
						--
	4 x 6	IPS HDPE DR17	Flanged concentric reducer	0	0	--
R1	4 x 8	IPS HDPE DR17	Flanged concentric reducer	2	2	115%
	8 x 10	IPS HDPE DR17	Flanged concentric reducer	3	4	138%
R1	8 x 14	IPS HDPE DR17	Flanged concentric reducer	1	1	115%
	10 x 14	IPS HDPE DR17	Flanged concentric reducer	3	4	138%
	12 x 14	IPS HDPE DR17	Flanged concentric reducer	4	5	115%
	4 x 8	IPS HDPE DR11	Flanged concentric reducer	8	9	115%
	8 x 10	IPS HDPE DR11	Flanged concentric reducer	2	2	115%
						--
	4	IPS HDPE DR17	Blind flange	0	0	--
	6	IPS HDPE DR17	Blind flange	0	0	--
	8	IPS HDPE DR17	Blind flange	2	3	150%
	10	IPS HDPE DR17	Blind flange	0	0	--
	12	IPS HDPE DR17	Blind flange	0	0	--
	14	IPS HDPE DR17	Blind flange	4	5	115%
	16	IPS HDPE DR17	Blind flange	0	0	--
	20	IPS HDPE DR17	Blind flange	0	0	--
	8	IPS HDPE DR11	Blind flange	3	5	150%
						--
	4	IPS	Butterfly valve	0	0	--
	6	IPS	Butterfly valve	0	0	--
	8	IPS	Butterfly valve	4	4	100%
	10	IPS	Butterfly valve	0	0	--
	12	IPS	Butterfly valve	0	0	--
	14	IPS	Butterfly valve	0	0	--
	16	IPS	Butterfly valve	0	0	--
	20	IPS	Butterfly valve	0	0	--
						--



61-648-270-202
FORMAT ARCHD
IWC SUMP
IWA SUMP
IWB SUMP
648-200-WFR-PC11-0200
648-200-WFR-PC11-0202
648-200-WFR-PC11-0204
648-100-WFR-PC17-0206
648-200-WFR-PC11-0214
648-200-WFR-PC17-0208
648-350-WFR-PC17-0223
648-200-WFR-PC11-0215
648-200-WFR-PC11-0217
648-100-WFR-PC17-0222
648-200-WFR-PC11-0219
648-200-WFR-PC17-0220
648-350-WFR-PC17-0211
648-350-WFR-PC17-0210
648-350-WFR-PC17-0213
BY-PASS LINE TO SEND WATER FROM LAKE A53 TO WHALE TAIL ATTENUATION POND VIA LINE 648-200-WFR-PC17-0208
10" FLOWMETER
10" FLOWMETER
A47-A
A47-B
A47-C
A49-A
A49-B
A50
A51
A52
A-P23
WASTE ROCK STORAGE FACILITY
WHALE TAIL PIT
WHALE TAIL ATTENUATION POND
WHALE TAIL LAKE
LANDFARM
PROJECT No | SUBDIVISION | SUBJECT | SERIAL | REV.
668284 | 8000 | 46 DD | 0001 | E01
NOTES GÉNÉRALES / GENERAL NOTES
NOTES :
1. ONLY PUMP DISCHARGE LINES ARE SHOWN. PUMP SUCTION LINES ARE NOT SHOWN.
2. DEPENDING ON THE DEWATERING SEQUENCE, PUMPS AND LINES CAN BE MOVED FROM ONE AREA TO ANOTHER.
3. PIPING ARRANGEMENT SHOWN ON THE LAYOUT CAN BE FIELD ADJUSTED BASED ON SITE CONDITIONS.
4. FLOW METER LOCATION IS APPROXIMATE AND CAN BE FIELD ADJUSTED BASED ON SITE CONDITIONS.
LEGEND:
4" NON-INSULATED HOSE
8" NOMINAL NON-INSULATED (DR11)
8" NOMINAL NON-INSULATED (DR17)
14" NOMINAL NON-INSULATED (DR17)
ENERGY DISSIPATOR
DESSINS EN RÉFÉRENCE / REFERENCE DRAWINGS
TITRE / TITLE
DWG
AGNICO EAGLE
R1 2020-05-15 ISSUED FOR DESIGN D.C. A.L.N. A.L.
R0 2020-04-01 ISSUED FOR DESIGN M.M A.L.N. A.L.
RB 2020-03-19 ISSUED FOR CLIENT COMMENTS M.M. A.L.N. A.L.
RA 2020-03-10 ISSUED FOR INTERNAL COMMENTS M.M. A.L.N. A.L.
REV. DATE DESCRIPTION PAR/BY APP. CLIENT
REVISIONS
TITRE / TITLE
AGNICO EAGLE – AMARUQ DIVISION
695 – WATER MANAGEMENT
270 – PIPING
PLAN VIEW
AMARUQ DEWATERING PHASE
PIPING LAYOUT
DESSINÉ PAR DRAWN BY MARIUS MOVILA DATE 200-03-11
VÉRIFIÉ PAR CHECKED BY ANH-LONG NGUYEN 200-03-11
APPROUVÉ PAR APPROVED BY ALEXANDRE LAVALLÉE 200-03-11
ÉCHELLE SCALE AS SHOWN DATE 200-03-11
NO. DESSIN DRAWING NO. 61-648-270-202
NO. PROJET PROJECT NO. 6127
REVISION R1
FEUILLE / SHT 1/1
FILE NO.



From A50, A51, A52 to WT Atte. Pond
By-connection requires :
1. One flange 8-inch

From A53 to WT attenuation pond
By-connection requires :
1. One flange 8-inch
2. One reducer 14"x8"

Appendix 3: Pump Curve Data

Godwin Dri-Prime Pumps – HL250M

Godwin Dri-Prime Pumps – CD103M

CD103M Dri-Prime® Pump

The Godwin Dri-Prime CD103M pump offers flow rates to 1020 USGPM and has the capability of handling solids up to 3.0" in diameter.

The CD103M is able to automatically prime to 28' of suction lift from dry. Automatic or manual starting/stopping available through integral mounted control panel or optional wireless-remote access.

Indefinite dry-running is no problem due to the unique Godwin liquid bath mechanical seal design. Solids handling, dry-running, and portability make the CD103M the perfect choice for dewatering and bypass applications.

Features and Benefits

- Simple maintenance normally limited to checking fluid levels and filters.
- Dri-Prime (continuously operated Venturi air ejector priming device) requiring no periodic adjustment. Optional compressor clutch available.
- Extensive application flexibility handling sewage, slurries, and liquids with solids up to 3.0" in diameter.
- Dry-running high pressure liquid bath mechanical seal with high abrasion resistant solid silicon carbide faces.
- Close-coupled centrifugal pump with Dri-Prime system coupled to a diesel engine or electric motor.
- All cast iron construction (stainless steel construction option available) with cast steel impeller.
- Also available in a critically silenced unit which reduces noise levels to less than 70 dBA at 30'.
- Standard engine Caterpillar C2.2T (IT4 Flex). Also available with John Deere 4024TF281 (IT4 Flex).

Specifications

Suction connection	4" 150# ANSI B16.5
Delivery connection	4" 150# ANSI B16.5
Max capacity	1020 USGPM †
Max solids handling	3.0"
Max impeller diameter	10.1"
Max operating temp	176°F*
Max pressure	75 psi
Max suction pressure	58 psi
Max casing pressure	113 psi
Max operating speed	2200 rpm

* Please contact our office for applications in excess of 176°F.

† Larger diameter pipes may be required for maximum flows.

Please contact the factory or office for further details. A typical picture of the pump is shown. All information is approximate and for general guidance only.

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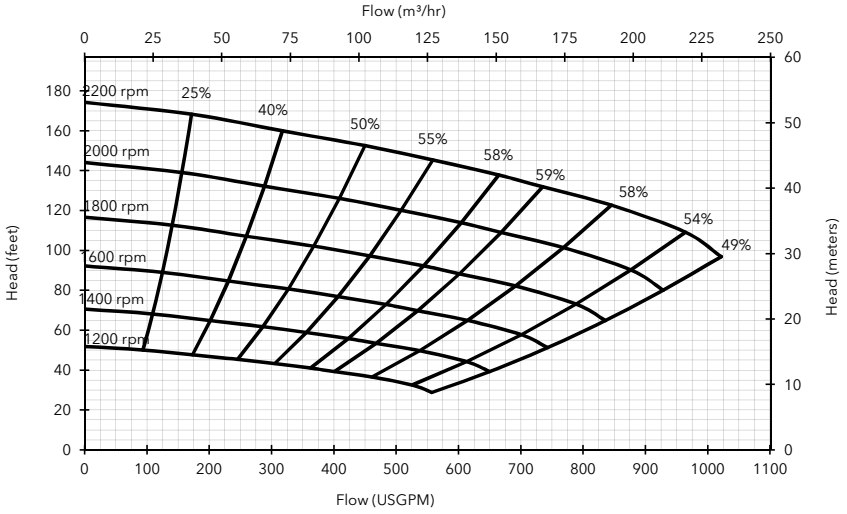
Performance Curve



Materials

Pump casing & suction cover	Cast iron BS EN 1561 - 1997
Wearplates	Cast iron BS EN 1561 - 1997
Pump Shaft	Carbon steel BS 970 - 1991 817M40T
Impeller	Cast Steel BS3100 A5 Hardness to 200 HB Brinell
Non-return valve body	Cast iron BS EN 1561 - 1997
Mechanical seal	Silicon carbide face; Viton elastomers; Stainless steel body

Engine option 1

Caterpillar C2.2T (IT4 Flex), 41 HP @ 2200 rpm

Impeller diameter 10.1"

Pump speed 2200 rpm

Suction Lift Table

Total Suction Head (feet)	Total Delivery Head (feet)				
	78	103	127	152	176
	Output (USGPM)				
10	1022	915	646	350	-
15	996	834	538	215	-
20	888	753	431	-	-
25	807	646	269	-	-

Fuel capacity: 60 US Gal

Max Fuel consumption @ 2200 rpm: 2.4 US Gal/hr

Max Fuel consumption @ 1800 rpm: 2.0 US Gal/hr

Weight (Dry): 2,240 lbs

Weight (Wet): 2,650 lbs

Dim.: (L) 119" x (W) 66" x (H) 77"

Performance data provided in tables is based on water tests at sea level and 20°C ambient. All information is approximate and for general guidance only. Please contact the factory or office for further details.

Engine option 2

John Deere 4024TF281 (IT4 Flex), 46 HP @ 2200 rpm

Impeller diameter 10.1"

Pump speed 2200 rpm

Suction Lift Table

Total Suction Head (feet)	Total Delivery Head (feet)				
	78	103	127	152	176
	Output (USGPM)				
10	1022	915	646	350	-
15	996	834	538	215	-
20	888	753	431	-	-
25	807	646	269	-	-

Fuel capacity: 60 US Gal

Max Fuel consumption @ 2200 rpm: 2.6 US Gal/hr

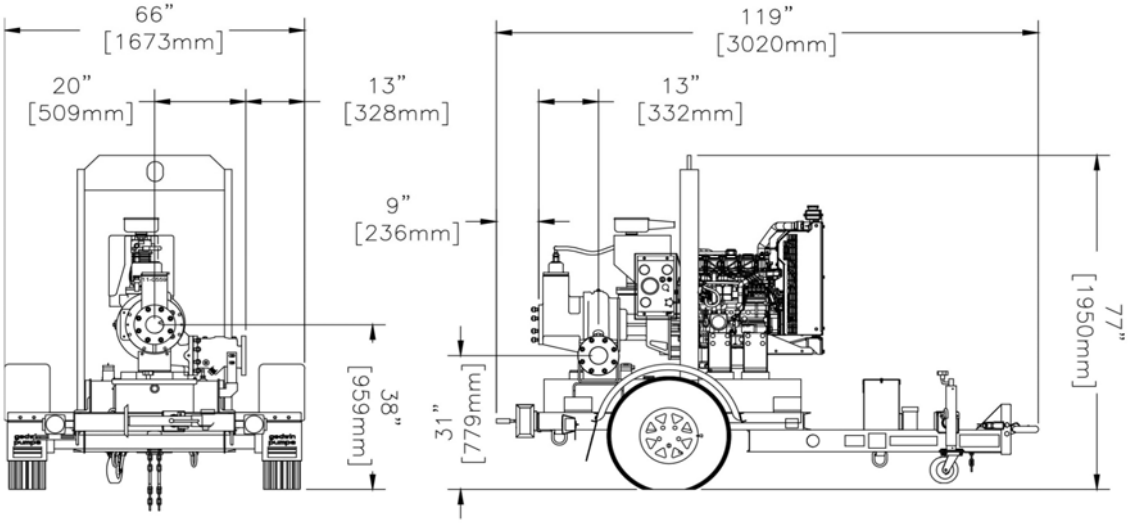
Max Fuel consumption @ 1800 rpm: 2.3 US Gal/hr

Weight (Dry): 2,400 lbs

Weight (Wet): 2,800 lbs

Dim.: (L) 119" x (W) 66" x (H) 77"

Performance data provided in tables is based on water tests at sea level and 20°C ambient. All information is approximate and for general guidance only. Please contact the factory or office for further details.



xylem
Let's Solve Water

84 Floodgate Road
Bridgeport, NJ 08014 USA
(856) 467-3636 . Fax (856) 467-4841
Email: sales@godwinpumps.com

Reference number : 95-1008-3000
Date of issue : February 26, 2014
Issue : 5

www.godwinpumps.com

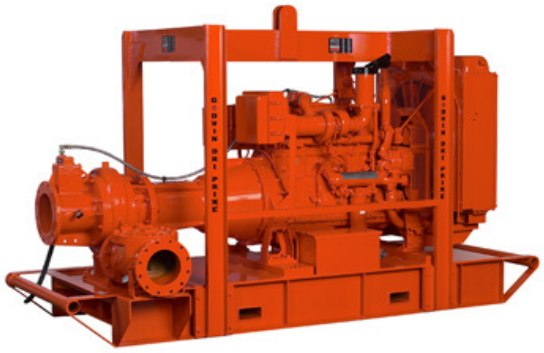
HL250M Dri-Prime Pump

HL250M

The Godwin Dri-Prime HL250M pump offers flow rates to 5,389 USGPM and discharge heads to 389' (119 m). Also it has the capability of handling solids up to 3" (65mm) in diameter.

The HL250M is able to prime to 28' (8.5 m) of suction lift from dry.

Indefinite dry-running is no problem due to the unique Godwin oil bath mechanical seal design. Solids handling, dry-running and portability make the HL250M the perfect choice for dewatering and bypass applications. The standard model is mounted on a skid, with a highway trailer option.



Features

- Simple maintenance normally limited to checking fluid levels.
- Close coupled centfrigual pump with vacuum priming compressor mounted to a diesel engine. Also available in electric drive or as a bare shaft pumpend.
- Extensive application flexibility. It will handle sewage, slurries and liquids with solids up to 3" in diameter.
- Continuously operated Godwin venturi air ejector priming device requiring no form of periodic adjustment or control.
- Dry-running heavy duty mechanical seal with abrasion resistant interfaces.
- Also availabe as a Critically Silenced unit which drastically reduces noise levels of the pump.
- Standard engine Caterpillar C15. .
- The volute & suction cover are made from cast iron bs1452:1990 grade 220 and the impeller is made from cast steel bs3100 a5 hardness to 200 hb brinell.

Specifications

Suction connection	12" 125# ANSI B16.1
Delivery connection	10" 125# ANSI B16.1
Max capacity	5389 USGPM
Max head	389' (119 m)
Max solids handling	3" (65mm)
Max Impeller diameter	17" (440mm)
Max operating temp	176°F (80°C)
Max working pressure	188.5 psi (13.0 bar)
Max suction pressure	87.0 psi (6.0 bar)
Max casing pressure	282.8 psi (19.5 bar)
Max operating speed	2000 rpm

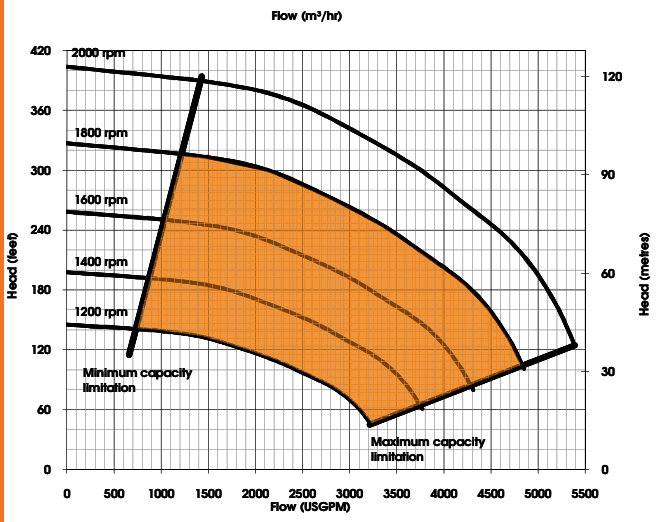
godwin
a xylem brand

Reference number : 95-1114-3000
Date of issue : Auaust 25. 2011
Issue : 1

Please contact Godwin for further details.
A typical picture of the pump is shown.
All information is approximate and for general guidance only.

HL250M

Performance Curve



Materials

Pump casing & suction cover	Cast iron BS1452:1990 Grade 220
Wearplates	Cast Iron - Chrome 1.0/1.5% Nickle 2%
Pump Shaft	Nickel Chrome Steel to BS970-1:1991 Grade 817M40T EN24T
Impeller	Cast Steel BS3100 A5 Hardness to 200 HB Brinell
Non-return valve body	Cast Iron
Mechanical seal faces	Silicon carbide vs silicon carbide

Engine option 1

Caterpillar, C15, 474.4 HP @ 1800 rpm

Impeller diameter 17" (440mm)

Suction Lift Table

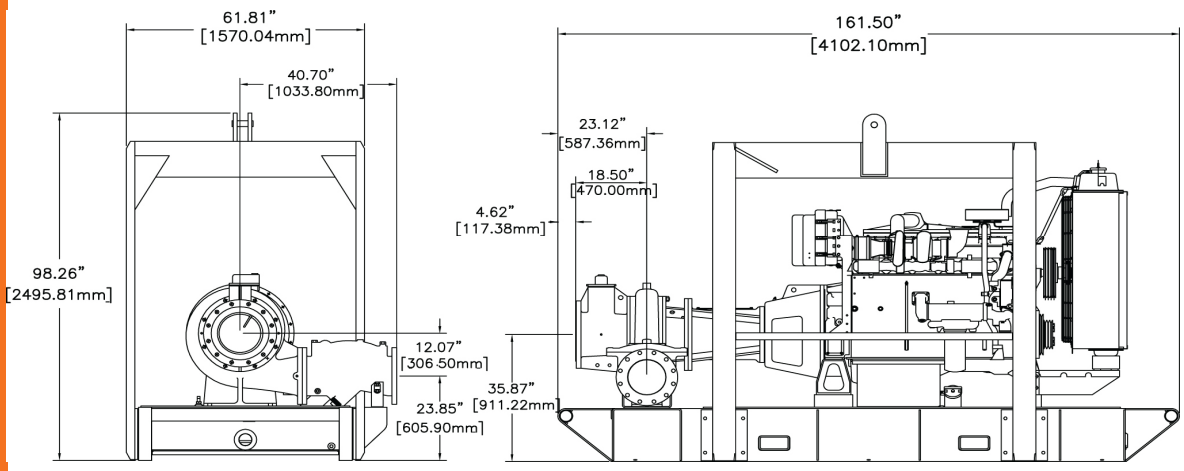
Total Suction Head (')	Total Delivery Head (')				
	93	133	194	247	295
	Output (USGPM)				
8.0	4815	4557	3864	3012	1783
12.2	4755	4526	3764	2972	1486
16.2	4359	4161	3772	2853	1308
20.2	3467	3368	3170	2708	-

Fuel capacity (Full) 215 US Gal, (Usable) 215 US Gal

Fuel consumption @ 1800 rpm BEP 17 US Gal/hr

Weight: (Dry) 11,464 lbs, (Wet) 13,250 lbs

Dimensions: (L) 161" x (W) 61" x (H) 100"



Performance data provided in tables is based on water tests at sea level and 68°F ambient.

All information is approximate and for general guidance only.

Please contact Godwin Pumps for further details.

Reference number : 95-1114-3000
Date of issue : August 25, 2011
Issue : 1

godwin a xylem brand

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sales@godwinpumps.com | godwinpumps.com

Appendix 4: Pumping Operating Range

6127-E132-003 / 668284 DETAILED ENGINEERING DESIGN OF WMGI PHASE 2 Document Number: 668284-8000-49EB-0001 By: D. Chen

Table 1: SUMMARY TABLE OF PUMPING FLOW AND TOTAL DYNAMIC HEAD REQUIREMENTS Revision: 00 Rev.: A.L. Nguyen

648 - DEWATERING PHASE Date: May 14, 2020

Study Line No.	From	To	Material of Construction and pressure rating DR	Nominal Diameter (in)	Approximate Total Length (1) (m)	Maximum Water Level (2) (m)	Minimum Water Level (2) (m)	Maximum Flowrate (m^3/h)	Total Dynamic Head (m)	Motor Speed (RPM)	Maximum Pressure (3) (psi)	Shutoff Pressure (4) (psi)	Expected operational discharge pressure (psi)	Safety factor (5) (%)	Pump model	Note
648-200-WFR-PC11-0214 648-200-WFR-PC17-0208	49-B	Whale Tail Attenuation Pond	HDPE DR11/DR17	8	1830	160	152	347 (LL) 350 (HH)	83.1 (LL) 77.8 (HH)	1700 1650	200 / 125	128	111 - 118	156%	HL250	Suction length 45 m (14"DR17) from pad at 155 m The discharge line is comprised of 580m 8"DR11 and 1250m 8"DR17
648-200-WFR-PC11-0214 648-200-WFR-PC17-0208 648-350-WFR-PC17-0210 648-350-WFR-PC17-0213	49-B	Whale Tail South Lake	HDPE DR11 8" HDPE DR17 14"	8 & 14	2435	160	152	353 (LL) 345 (HH)	105.4 (LL) 94.2 (HH)	1900 1800	200 / 125	156	134 - 150	128%	HL250	Suction length 45 m from pad at 155 m The discharge line is comprised of 580m 8"DR11, 1150m 8"DR17 and 705m 14"DR17
648-200-WFR-PC11-0204	47-B	49-B	HDPE DR11	8	695	157	154	331 (LL) 342 (HH)	46.6 (LL) 46.2 (HH)	1300	200	71	66	282%	HL250	Suction length 120 m (14"DR17) from pad at 157 m The velocity in the 8" pipe is less than 4 m/s
648-200-WFR-PC11-0200	47-A	49-B	HDPE DR11	8	775	157	152	338 (LL) 323 (HH)	54.6 (LL) 46.7 (HH)	1400 1300	200	85	66 - 78	235%	HL250	Suction length 65 m (14"DR17) from pad at 155 m The velocity in the 8" pipe is less than 4 m/s
648-200-WFR-PC11-0202	47-C	47-B	HDPE DR11	8	265	157	155	2x170=340 (LL) 2x176=352 (HH)	22.5 (LL) 21.8 (HH)	1800	200	52	31 - 32	385%	2 x CD103	Suction length 70 m (8"DR11) The velocity in the 8" pipe is less than 4 m/s
648-100-WFR-PC17-0206	49-A	49-B	Hose (6)	4	215	160	152	109 (LL) 110 (HH)	36.4 (LL) 28.6 (HH)	2000 1800	125	63	41 - 52	198%	CD103	Suction length 40 m (8"DR11) The velocity in the 4" pipecan be 3-4 m/s
648-100-WFR-PC17-0222	A-P21	A52	Hose (6)	4	500	173	170	92 (LL) 95 (HH)	38.0 (LL) 37.8 (HH)	2000	125	63	54	198%	CD103	Suction length 50 m (8"DR17)
648-200-WFR-PC11-0215 648-200-WFR-PC11-0217 648-200-WFR-PC11-0219	A50	A53	HDPE DR11	8	675	162	160	2x153=306 (LL) 2x157=314 (HH)	40.9 (LL) 40.5 (HH)	2200	200	76	58	263%	2 x CD103	Suction length 50 m (8"DR11)
648-200-WFR-PC11-0215 648-200-WFR-PC11-0217 648-200-WFR-PC11-0219 648-200-WFR-PC17-0220 648-200-WFR-PC17-0208	A50	Whale Tail Attenuation Pond	HDPE DR11 HDPE DR17	8	1570	162	160	2x142=284 (LL) 2x144=288 (HH)	42.1 (LL) 41.9 (HH)	2200	200	76	60	263%	2 x CD103	Suction length 50 m (8"DR11)
648-200-WFR-PC11-0217	A51	A53	HDPE DR11	8	450	162	160	2x158=316 (LL) 2x163=326 (HH)	32.0 (LL) 31.6 (HH)	2000	200	63	45	317%	2 x CD103	Suction length 50 m (8"DR11)
648-200-WFR-PC11-0217 648-200-WFR-PC11-0219 648-200-WFR-PC17-0220 648-200-WFR-PC17-0208	A51	Whale Tail Attenuation Pond	HDPE DR11 HDPE DR17	8	1330	162	160	2x144=288 (LL) 2x147=294 (HH)	33.3 (LL) 33.1 (HH)	2000	200	63	47	317%	2 x CD103	Suction length 50 m (8"DR11)
648-200-WFR-PC11-0219	A52	A53	HDPE DR11	8	285	164	162	2x166=332 (LL) 2x170=340 (HH)	23.2 (LL) 22.4 (HH)	1800	200	52	33	385%	2 x CD103	Suction length 50 m (8"DR11)
648-200-WFR-PC11-0219 648-200-WFR-PC17-0220 648-200-WFR-PC17-0208	A52	Whale Tail Attenuation Pond	HDPE DR11 HDPE DR17	8	1180	164	162	2x158=316 (LL) 2x161=322 (HH)	32.0 (LL) 31.8 (HH)	2000	200	63	46	317%	2 x CD103	Suction length 50 m (8"DR11)
648-350-WFR-PC17-0211 648-350-WFR-PC17-0213	A53	Whale Tail South Lake	HDPE DR17	14	1790	165	159	896 (LL) 916 (HH)	39.8 (LL) 36.3 (HH)	1600	125	113	52 - 57	111%	HL250	Suction length 25 m at lower pad of 163 m Suction length 55 m at higher pad of 165.5 m
648-350-WFR-PC17-0211 648-200-WFR-PC17-0208	A53	Whale Tail Attenuation Pond	HDPE DR17 14" HDPE DR17 8"	14 & 8	1185	165	159	400 (LL) 423 (HH)	37.0 (LL) 36.3 (HH)	1200	125	63	53	198%	HL250	Suction length 25 m at lower pad of 163 m Suction length 55 m at higher pad of 165.5 m The discharge line is comprised of 300m 14"DR17 and 885m 8"DR17 The velocity in the 8"DR17 pipecan be slightly over 4 m/s (4.1 m/s at HH condition)

(1) Contingency length is not included for the calculation

(2) Assumptions based on the natural terrain topography and lake bathymetry

(3) Maximum pressure corresponds to the pressure rating of the HDPE pipe material (resin 4710)

(4) Shutoff pressure corresponds to pressure on pump curve at zero flowrate

(5) Safety factor was calculated as the ratio of Maximum pressure divided by Shutoff pressure

(6) Assumption that the hose has an equivalent pressure rating as DR17

Appendix 5: Suction Pump Fish Cages

NO. DESSIN DRAWING NO. 61-648-270-203-R1

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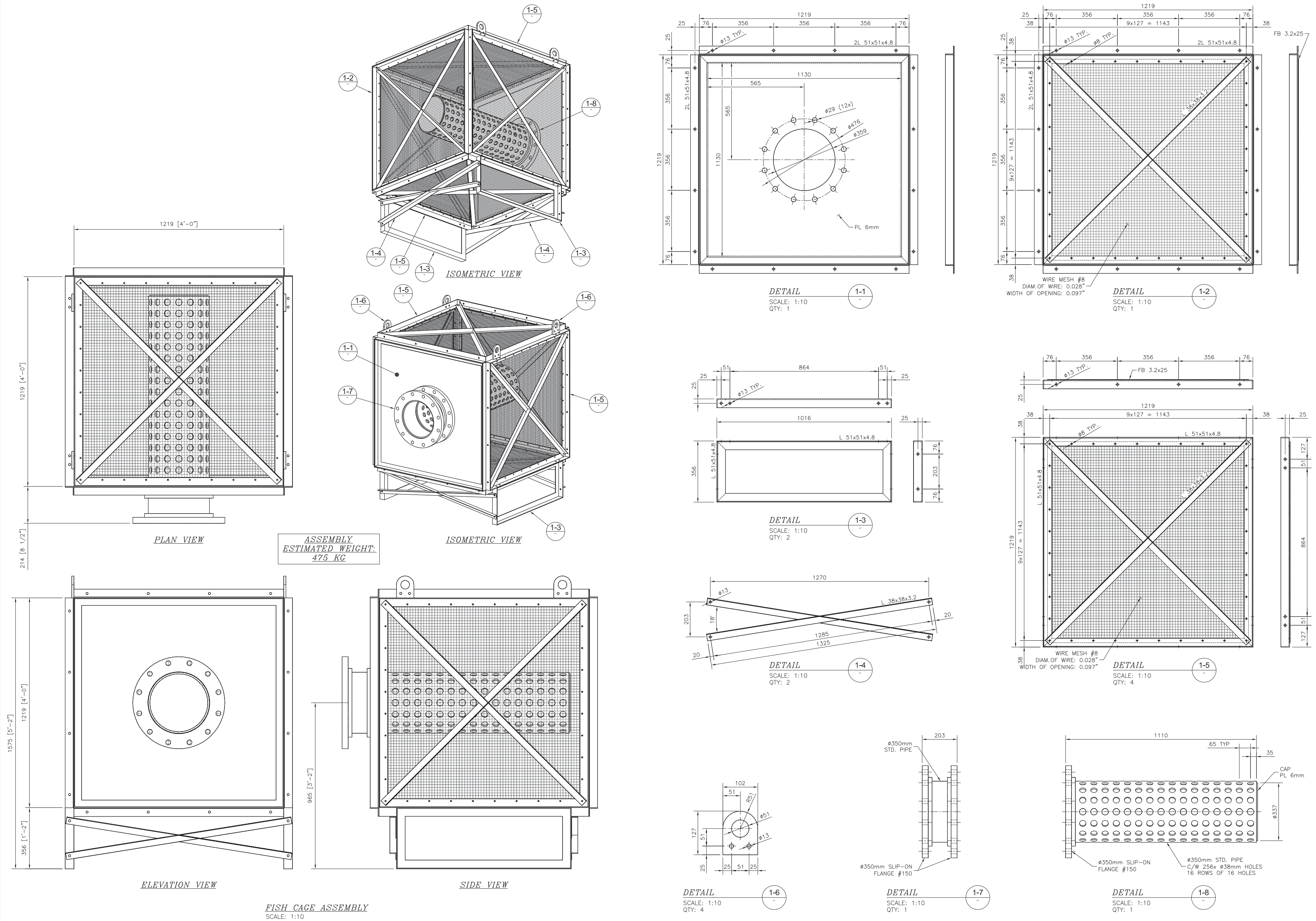

PLAN CLÉ
KEY PLAN

NOTES GÉNÉRALES / GENERAL NOTES

- STRUCTURE : PAINTED STEEL AS PER GENERAL GUIDELINE DESIGN: 6115-000-245-GGD-003.
- WIRE MESH : PREFERRED STAINLESS STEEL UNPAINTED TO LIMIT CLOGGING.

POUR SOUMISSION
FOR TENDER
DATE : 2020-03-25

DESSINS EN RÉFÉRENCE / REFERENCE DRAWINGS

TITRE / TITLE	# DWG
–	–

AGNICO EAGLE

REV.	DATE	DESCRIPTION	PAR/BY	APP.	CLIENT
1	2020/03/25	ADDENDUM #1	BL	IG	BR
0	2020/03/23	ISSUED FOR TENDER	BL	IG	BR

REVISIONS

SNC·LAVALIN
SNC-Lavalin Stavibel inc.
150, rue Gamble Ouest
Rouyn-Noranda (Québec) J9X 2R7
Tel. : 819 764-5181 Fax : 819 797-0158
www.snclavalin.com

Project # : 671087-0000

TITRE / TITLE
AGNICO EAGLE – MEADOWBANK DIVISION
648 – DEWATERING
270 – PIPING
PLAN, ELEVATION & DETAILS
FISH CAGES FOR HL250
DEWATERING PUMPS

DESSINÉ PAR DRAWN BY	BRUNO LEMIEUX	DATE 2020/03/20
VERIFIÉ PAR CHECKED BY	ISRAËL GAGNON	2020/03/20
APPROUVÉ PAR APPROVED BY	ISRAËL GAGNON	2020/03/23
ÉCHELLE SCALE	INDICATED	DATE 2020/03/20

NO. DESSIN DRAWING NO. 61-648-270-203

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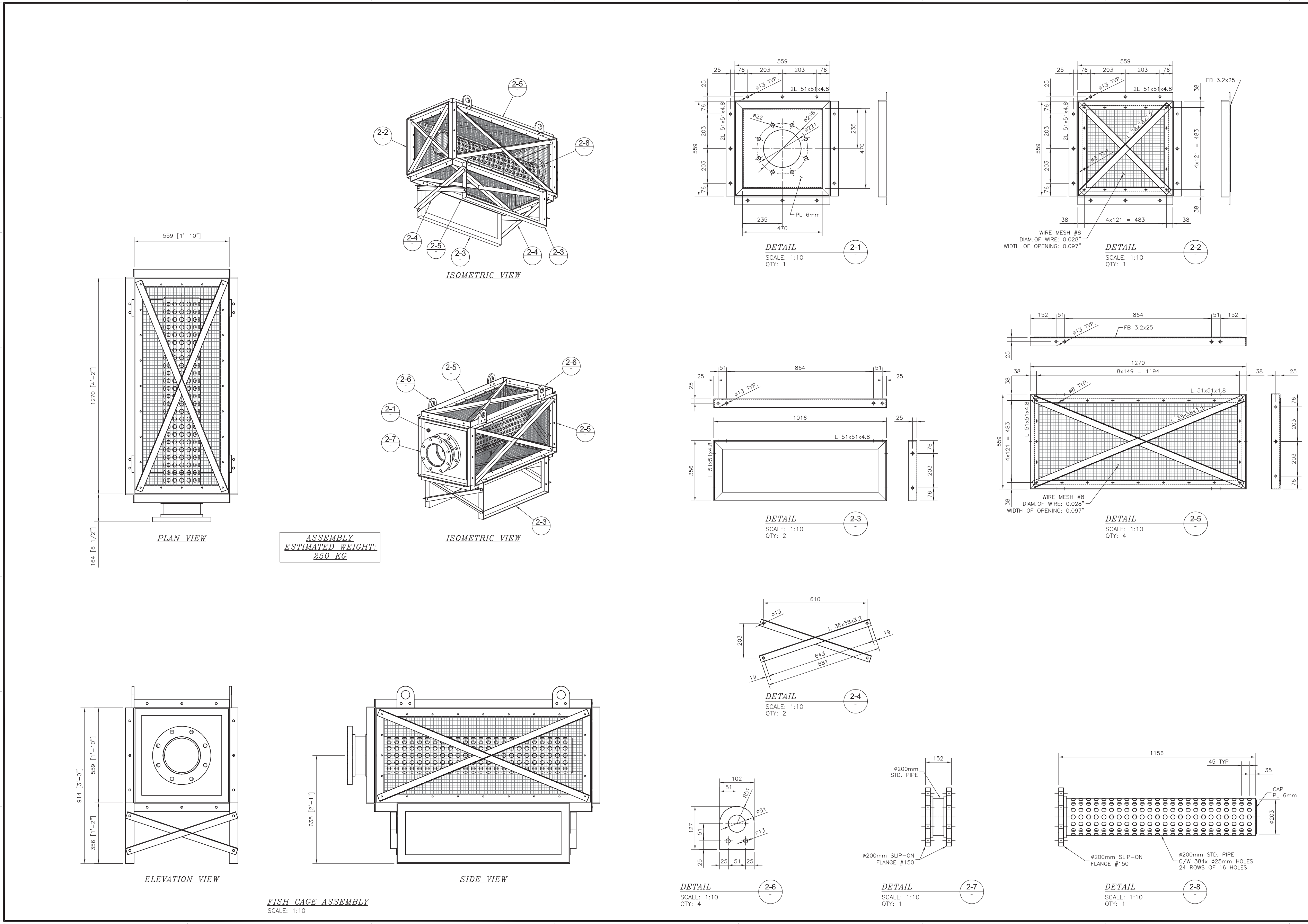

PLAN CLÉ
KEY PLAN

NOTES GÉNÉRALES / GENERAL NOTES

- STRUCTURE : PAINTED STEEL AS PER GENERAL GUIDELINE DESIGN: 6115-000-245-GGD-003.
- WIRE MESH : PREFERRED STAINLESS STEEL UNPAINTED TO LIMIT CLOGGING.

2020-03-25 2020-03-25

POUR SOUMISSION
FOR TENDER
AGNICO EAGLE
DATE : 2020-03-25

DESSINS EN RÉFÉRENCE / REFERENCE DRAWINGS

TITRE / TITLE	# DWG
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AGNICO EAGLE

REV.	DATE	DESCRIPTION	PAR/BY	APP.	CLIENT
1	2020/03/25	ADDENDUM #1	BL	IG	BR
0	2020/03/23	ISSUED FOR TENDER	BL	IG	BR

REVISIONS

SNC·LAVALIN
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Project #: 671087-0000

TITRE / TITLE
AGNICO EAGLE – MEADOWBANK DIVISION
648 – DEWATERING
270 – PIPING
PLAN, ELEVATION & DETAILS
FISH CAGES FOR DC103
DEWATERING PUMPS

		DATE
DESSINÉ PAR / DRAWN BY	BRUNO LEMIEUX	2020/03/20
VÉRIFIÉ PAR / CHECKED BY	ISRAËL GAGNON	2020/03/20
APPROUVÉ PAR / APPROVED BY	ISRAËL GAGNON	2020/03/23
ÉCHELLE / SCALE	INDICATED	2020/03/20

NO. DESSIN / DRAWING NO. 61-648-270-203

NO. PROJET / PROJECT NO.	REVISION	FEUILLE / SHT
61	1	2 / 2

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FILE NO. 61-648-270-203-R1.dwg

Appendix 6: Typical Installation Specifications for Piping

TABLE OF CONTENTS

1. MECHANICAL INSTALLATION SPECIFICATIONS

1.1 Pump and Pipeline Installation

1.1.1 General Procedures

The following section describes the general installation procedure to install the different water transfer pump station and pipeline at the Amaruq site.

There are three types of pumps that will be installed at the Amaruq site:

- Godwin HL250 containerized diesel pumps;
- Godwin CD103 wheel mounted diesel pump.

The installation procedure is similar for each of these pumps and consists of the following steps:

1. Install the pump along the ramp leading into the water collection basin. The pump will be installed closed to the water level.
2. Install the suction cage or fish cage suction cage into the lake and connect the suction hose to the suction side of the pump.
3. Install the discharge piping and accessories to the pump.

1.2 Installation Testing

Prior to placing the pipe under operation, the Contractor shall conduct a pressure test to verify for leaks.

The Contractor shall check for leaks in the piping and at each flange connection as soon as the pumps start and repair if necessary.

The Contractor shall check if the pump operate within its operating range and suction lift capacity. To do this task the contractor must take note of:

- Flowrate

- Pump discharge pressure, and
- Motor amperage.

The Contractor shall purge the discharge line at all low point if the pump is stopped for a prolonged period. Flanged joint are installed at each low point.

2. PIPING GENERAL INSTALLATION SPECIFICATIONS

2.1 HDPE Pipeline Installation

Take into consideration the expansion of the HDPE. Typically, the HDPE pipeline is installed in summer. In winter, the shrinkage of the HDPE piping is important. The expansion or shrinkage of the HDPE pipeline must not cause it to snake onto the road or risk of slipping into inside slope. Add extra length if necessary.

2.2 Standards and Reference Manuals

The most recent versions of the following standards are applicable for the project.

2.2.1 ANSI / AWWA

AWWA M55 PE Pipe – Design and Installation

2.2.2 Plastics Pipe Institute (PPI)

1. PPI Handbook of Polyethylene Pipe - 2009 (2nd Edition)
2. PPI TN-42 Recommended Minimum Training Guidelines for PE Pipe Butt Fusion Joining Operators for Municipal and Industrial Projects (March 2013)

2.2.3 ASTM

ASTM F905	Routine Practices for the Qualification of Saddle Joint Assembly in Polyethylene Conduit
ASTM F 1055	Specification Standard for Electro-fusion Polyethylene Fittings for Polyethylene Pipe and Piping of Controlled Outside Diameter

ASTM F 2164	Routine Practices for Field Leak Testing of Polyethylene (PE) Pressure Pipe Networks Using Hydrostatic Pressure
ASTM F 2620	Routine Joining Practices by Melting Polyethylene Conduit and Fittings
ASTM D 3261	Specification Standard for Butt Fusion Joining of Polyethylene (PE) Plastic Fittings for Polyethylene (PE) Plastic Pipe and Piping

2.3 Quality Assurance

In his bid, the Contractor shall provide all relative costs associated with supervision services and testing for HDPE pipe fusion.

2.4 Supply of HDPE Pipes

The supply lines to be used in this project are provided by AEM.

2.5 HDPE Piping Assembly Method

2.5.1 Butt Fusion Joints

The pipe shall be assembled using the butt fusion joining procedure described in ASTM F 2620 or PPI TR-33. All fusion assemblies must be done as recommended by the pipe or fittings manufacturer. Fusion assemblies must be performed by a technician qualified in this field according to PPI TN-42.

Fusions must be performed by experienced technicians. For contractors, the qualification of the field technician must be demonstrated by proof of training.

2.5.2 Electro Saddle Fusion

Electro saddle fusions must be performed in accordance with ASTM F 2620 or TR-4, or as recommended by the fitting manufacturer and according to PPI TR-41. Saddle fusion assemblies must be performed by experienced technicians. For contractors, the qualification of the field technician must be demonstrated by proof of training within the past year specifically tied to the equipment to be used for this project. Saddle fusion is used to assemble branch saddles, tapping tees and other HDPE constructions on the main pipe wall. (see ASTM F905).

2.5.3 Mechanical Joints

The mechanical connection of HDPE to ancillary equipment such as valves, pumps and fittings shall use adapters for mechanical connections and other equipment in accordance with the PPI Polyethylene Piping Manual, Chapter 9 and the AWWA M55 Manual of Good Practice, chapter 6.

Mechanical coupling shall be executed by experienced technicians. For contractors, the qualification of the field technician must be demonstrated by proof of training in mechanical couplings within the past year. This training must be done on the equipment and the components of the pipe that are used for this project.

2.6 Preparation

For pressure systems, HDPE pipe and fittings shall be installed in accordance with ASTM D2321 or ASTM D2774 and the AWWA M55 PE Pipe – Design and Installation, Chapter 7.

2.6.1 Regulatory Requirements

The Contractor must comply with provincial/territorial requirements for workspace safety standards and worker protection for excavation work.

The Contractor must possess the SKILLS AND ADEQUATE EQUIPMENT to ensure quality results and must be recognized by the manufacturer of HDPE piping.

2.7 Pipe Installation

2.7.1 Bedding and Backfill

Bedding – The pipe bedding material shall be Ø¾" aggregate. All materials must be compacted by heavy equipment, such as haul trucks, excavators, etc.

Backfill - The pipe backfill material shall typically be Ø¾" aggregate topped with a layer of muck. All materials must be compacted by heavy equipment, such as haul trucks, excavators, etc.

2.7.2 Bedding and Backfilling Material at Road Crossings

The following sections are for installation of piping at road crossings.

2.7.2.1 Bedding of the Berm or Trench Bottom

The material used for the base shall be the ground or muck placed in the bottom of a trench. Water must be removed from the trench to allow the bedding to be placed.

Once the pipe is placed on the bedding or on the ground, the low points along the bedding must be raised to ensure a uniform support.

2.7.2.2 Backfilling the Remainder of the Trench or the Upper Section of the Berm

Trench filling or construction of the top section of the berm to a minimum height of 500 mm above the pipe must be done with Ø¾" aggregate with a minimum of 500 mm of muck over top aggregate layer.

2.7.3 Backfilling and Cushion Materials for Roadside pipeline

The following section is for the installation of pipeline along the roadside.

2.7.3.1 Backfill

Backfill shall be placed at regular intervals along pipeline routes to mitigate elongation and shrinkage effects due to thermal dilation of HDPE pipe. This is particularly important near roadway crossings to limit "snaking" of the pipe.

2.7.3.2 Cushion

The pipes shall be installed directly on the natural ground. The pipes will be installed along the road on the ground except where fill is required in low points. If the pipe is placed on a cushion, the low points along the cushion must be raised to ensure a uniform support. The fill material used for the cushions and filling shall be muck.

2.8 Transition

The Contractor shall make transition zones between backfill material and existing soils for crossing existing roads, with a slope of 3H: 1V.

2.9 Reconditioning Work

Once the work is completed, all surplus materials and debris must be removed, slopes must be graded and all the work necessary to restore the affected areas to their original condition must be performed to the satisfaction of the Project Manager.

2.10 Testing

The hydrostatic leak test on the HDPE piping is required and must comply with ASTM F 2164, ASTM F 1412 and the AWWA M55 Good Practice Manual, Chapter 9, and the PPI Polyethylene Pipeline Manual, Chapter 2 (2nd Edition). If the test section fails this test, the Contractor shall repair or replace all defective materials and/or labour at no additional cost to the Contractor.

For safety reasons, the pneumatic (compressed air) leakage test of the HDPE pipe under pressure is prohibited.

2.11 Cleaning

Following the tests, the line must be cleaned in accordance with AWWA M55 Manual, Chapter 10.

2.12 Culvert Installation

The piping must be installed with minimal slopes of 0.4% to evacuate runoff and prevent water stagnation inside culverts.