AGNICO EAGLE
HOPE BAY

July 15, 2022

Ali Shaikh
Technical Advisor
Nunavut Water Board
P.O. Box 119
Gjoa Haven, NU,
X0B 1J0

Sent via Email: ali.shaikh@nwb-oen.ca

Re: Water License 2AM-DOH1335 – Conditions Applying to Construction and Operation – Construction of Water Treatment Plant

Dear Mr. Shaikh,

This letter represents Agnico Eagle Mines (**Agnico**) written notification to the Nunavut Water Board (**NWB**) regarding the planned construction of a water treatment plant at the Hope Bay Project. This notification is being provided to the NWB prior to commencement of work, as required under the Type A Water License 2AM-DOH1335 Part D Item 1. The accompanying design report, along with final design and Issue for Construction (IFC) drawings are provided in Attachment 1.

Should you have any questions please feel free to contact me at nancy.harvey@agnicoeagle.com

Sincerely,

Nancy Duquet Harvey
Environmental Superintendent - Agnico Eagle Mines Limited - Hope Bay Mine

Cc:
Licencing (NWB)

Attachments
Design Report - Water Treatment Plant

Design Report
Water Treatment Plant (WTP)

6205-693-132-REP-002

In Accordance with Licence 2AM DOH 1335, Part D, item 1

Prepared by:

Agnico Eagle Mines Limited – Hope Bay Division

DOCUMENT CONTROL

Version	Date (YMD)	Section	Page	Revision
R0	11/07/2022			Design report

Prepared By: 2022-07-11
Thomas Genty
Water Treatment Eng.
NAPEG L4751

Prepared By:
Tony Morin
Eng. Lead

Approved by: Guy Dufour on behalf of
Nancy Duquet Harvey
Environment Superintendent

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1 INTRODUCTION

1.1 SITE LOCATION AND ACCESS

The Doris Project is a gold mining and milling undertaking of Agnico Eagle. The Project is located 705 km northeast of Yellowknife and 153 km southwest of Cambridge Bay in Nunavut Territory and is situated east of Bathurst Inlet. Agnico Eagle is currently operating the Doris Project under an existing water license.

1.2 SITE FACILITIES

The current mine plan focuses on the development of the Doris gold deposit which is mined using underground mining operations. Current mining facilities to support the mine include a camp for accommodations, tailings storage facility, rock storage facilities, ore pads, process plant, power plant, maintenance facilities, water management treatment plants and supporting water management infrastructure.

1.3 PURPOSE OF DOCUMENT

This report includes the final design and drawings for the Water Treatment Plant (WTP) aiming to treat Total suspended solids (TSS) from its effluent prior to discharge.

This report does not include the design for the Pad of water treatment plant. A design report has been submitted earlier in May (6205-693-132-REP-001) to the Nunavut Water Board for approval.

A general location plan for the project of WTP is shown in Figure 1.

1.4 SCOPE OF WORK

This report describes the WTP process. Construction drawings of the listed infrastructure are presented in appendices of this report.

Appendix A presents General arrangement and Appendix B the process P&ID.

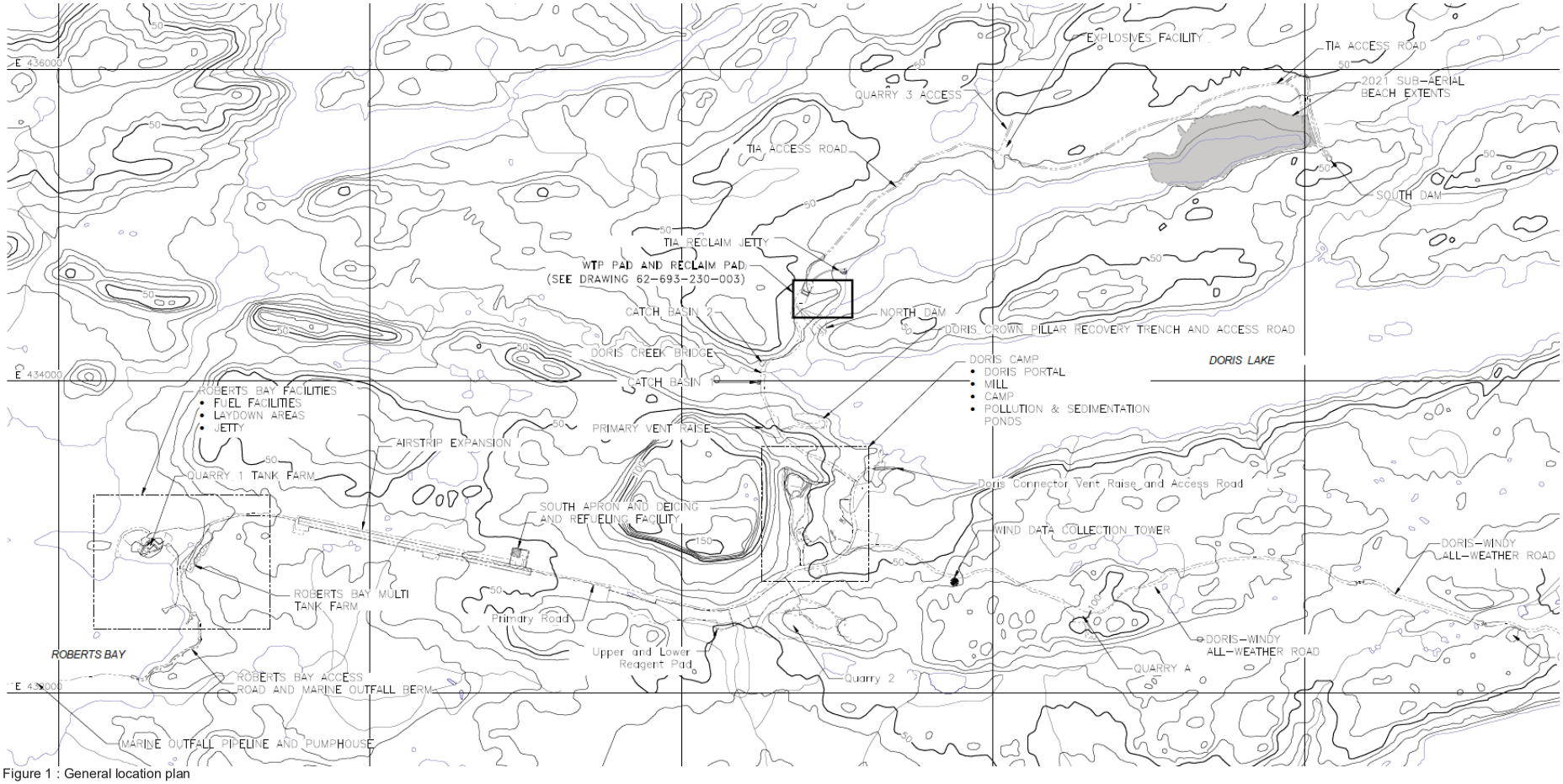


Figure 1 : General location plan

2 DESIGN METHODOLOGY

2.1 DESIGN RATIONALE

The design rationales are the following:

- WTP should treat TSS efficiently from the contact water as per Metal and Diamond Mining Effluent Regulations (MDMER) requirements;
- The WTP current equipment is designed to be able to treat metal as required by adding chemical dosing and preparation skids in a future expansion.

2.2 DESIGN METHODS, ASSUMPTIONS AND LIMITATIONS

Each component of the WTP was selected to achieve the requirement for the water quality of the effluent and to achieve a maximum treatment capacity of 500 m^3/h. The selection of each of these components was based on a typical process used in the industrial water treatment sector. The robustness and redundancy of equipment were also taken into account during equipment/supplier selection.

2.3 WATER MANAGEMENT STRATEGY

The contact water from the tailing impoundment area (TIA) will be treated for total suspended solid removal within the WTP and discharged according to the current licences/permit requirements to the Roberts Bay using the existing discharge station and diffusor. The WTP also has the capacity to treat water from underground dewatering (UG water). Treatment of both TIA and UG waters can be done by batch separately or by commingling the two sources. Details of the water management at site can be found in the Hope Bay Project Doris and Madrid Water Management Plan (June 2022).

2.4 WATER CHARACTERISTICS

The WTP purpose is to treat TSS. TSS levels in the treated water will be reduced below an average concentration of 15 mg/L for discharge as per MDMER, (maximum grab sample of 30 mg/L). pH of treated water will be between 6 and 9.5 units.

The design of the WTP plant is based on a maximum of 200 mg/L of TSS in the raw water.

2.5 EFFLUENT FLOW RATE

The WTP is designed to treat a maximum of 500 m^3/h. However, the operational flow rate is dictated by the current Roberts Bay discharge system (RBDS) maximum capacity.

3 PROCESS DESCRIPTION

3.1 WATER TREATMENT PLANT (WTP) SUMMARY

The first treatment component consists of a reactor for coagulation (RX3-75). This reactor could be used in the future to precipitate metal by addition of metal precipitator chemicals.

The second treatment component consists of one Actiflo® clarifier with two (2) recirculation lines and two (2) hydrocyclones. The Actiflo® can be operated with one (1) or two (2) lines, depending on the influent flow rate and TSS content. The hydrocyclone overflow is sent to the sludge splitter box from where sludge is both extracted to the TIA and also partially recirculated the first reactor by overflow. The final effluent is monitored for pH, turbidity and flow rate, which are monitored continuously.

The treatment concept is presented in Figure 2. The P&ID can be found in Appendix B.

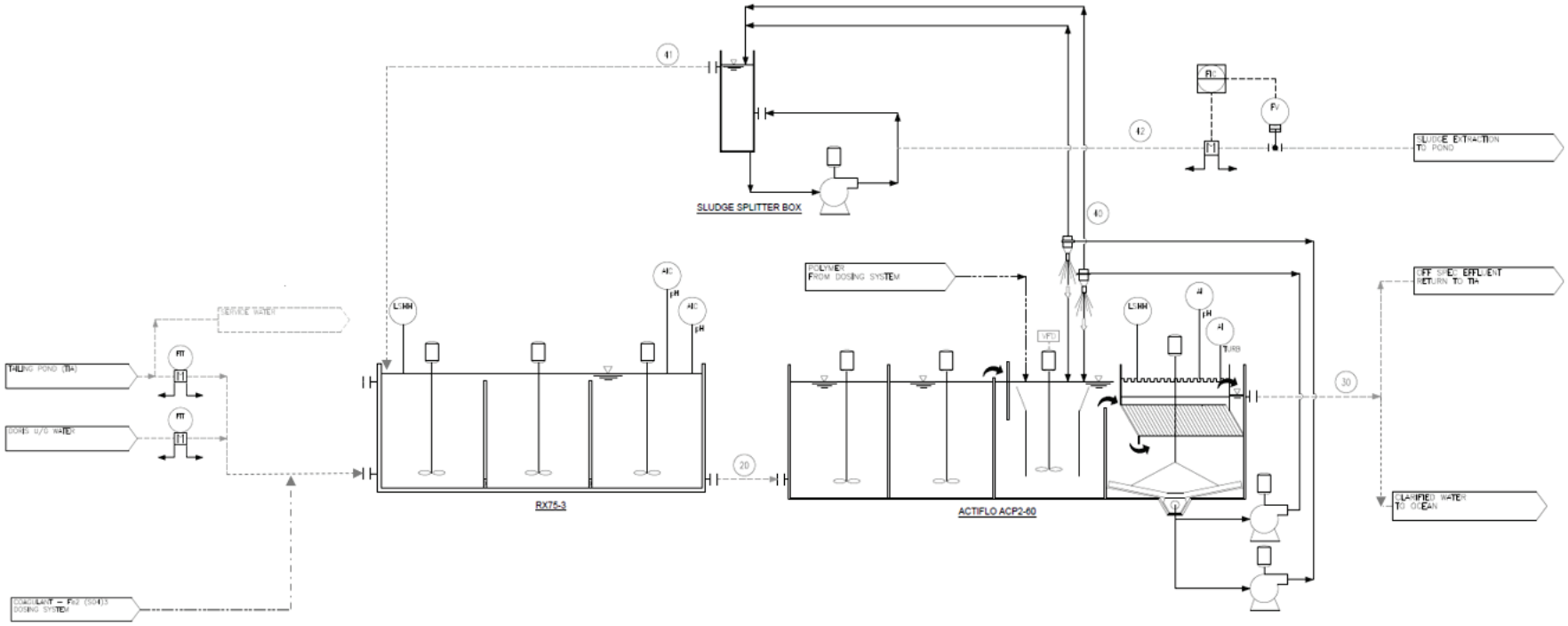


Figure 2 : WTP Overall Process Concept

3.2 REACTOR

The purpose of this step is to precipitate the dissolved metals. The influent will be sent to the Metal Removal Reactor. In this reactor, the influent water will be mixed with ferric sulfate (Coagulant) and recycled sludge. The ferric sulfate forms a floc of ferric hydroxide ($Fe(OH)_3$) which act both as a bridge to tie colloidal particles together and as an active surface which form surface complexes with many metals, such as arsenic and copper, which will be parameters of concern in the future. To promote metal precipitation in the future, an alkali and a metal precipitator could be added to ensure the optimal removal (not currently included in the current design report).

3.3 ACTIFLO®

The water from the metal precipitation reactor will then flow to the ACTIFLO clarifier (Figure 3). The proposed ACTIFLO is designed to remove suspended solids present in the water and produced in the Metal Precipitation Reactor. Sand-ballasted settling is a high-rate coagulation/flocculation/sedimentation process that utilizes microsand as a seed for floc formation. The microsand provides a surface area that enhances flocculation and acts as a ballast or weight. The resulting floc settles very fast, allowing for compact clarifier designs compared to conventional clarifiers, with high overflow rates and short detention times. The use of microsand also permits the unit to perform well under dramatically changing flow rates without impacting final effluent quality.

The ACTIFLO has four chambers. The slurry from the precipitation step flows to a pre-coagulation chamber and then to a coagulation chamber where the reaction is completed. The slurry then flows to the maturation tank, where an anionic polymeric flocculant and microsand are added to initiate floc formation. These serve as a “seed” for floc formation and development in the next process step. In this tank, a Turbomix mixer provides ideal conditions for bridging between the microsand and the destabilized suspended solids. The fully formed ballasted floc enters into the last tank, the settling tank, equipped with a lamella, which provides the rapid and effective removal of the microsand/sludge floc. The clarified water exits the system via a weir.

The sand-sludge mixture settles to the bottom of the clarifier. Scrapers force the sludge collected at the bottom of the clarifier into a centre cone from which it is continuously withdrawn and pumped in a hydrocyclone where sludge and microsand are separated by centrifugal force. After separation, the higher density microsand is discharged from the bottom of the hydrocyclone and injected into the process for reuse.

A sludge recirculation is included in the Actiflo design to maximize the sludge efficiency to capture heavy metals and to optimize the chemical product consumption. The ferric hydroxide created in the reactor will slowly transform to hydrous ferric oxide. The hydrous ferrous oxide is the molecule that can adsorb arsenic and copper and that will co-precipitate with it. By recirculating the sludge, we are promoting the hydrous ferrous oxide creation that will capture arsenic and copper in the influent water. The sludge recirculation also optimizes the chemical requirements by recirculating chemicals (like polymers) that don't have to react with water. At any time, this recirculation can be by passed.

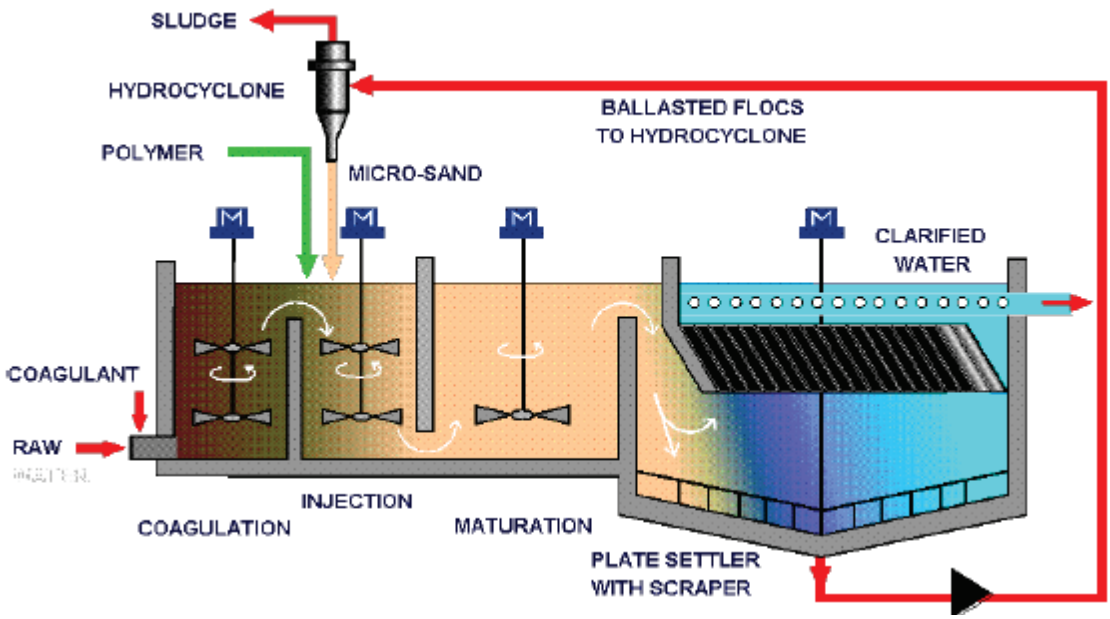


Figure 3 : Actiflo® Process

3.4 REAGENTS

The following reagents will be used at the WTP:

- Coagulant: Ferric sulfate
- Polymer: Anionic
- Sand ballast: Actisand
- pH adjustment: sulphuric acid

The MSDS sheets are provided in Appendix C.

3.5 SERVICE WATER SYSTEM

The service water system consists of multimedia filter, heater and service water pumps. Service water is used in the preparation of dry chemicals and for polymer makeup systems. Coagulant and polymer may require heated water. TIA water tank will be the source of process water.

3.6 SOLID WASTE MANAGEMENT

Sludge produced in the Actiflo system will be disposed into the TIA. The sludge production is estimated at approximately between 8 and 50 m^3/h with a solid content of approximately 0.5 to 2%.

3.7 CONTROLS

A summary of the process controls is presented if figure 4. More information can be found also in P&ID in Appendix B.

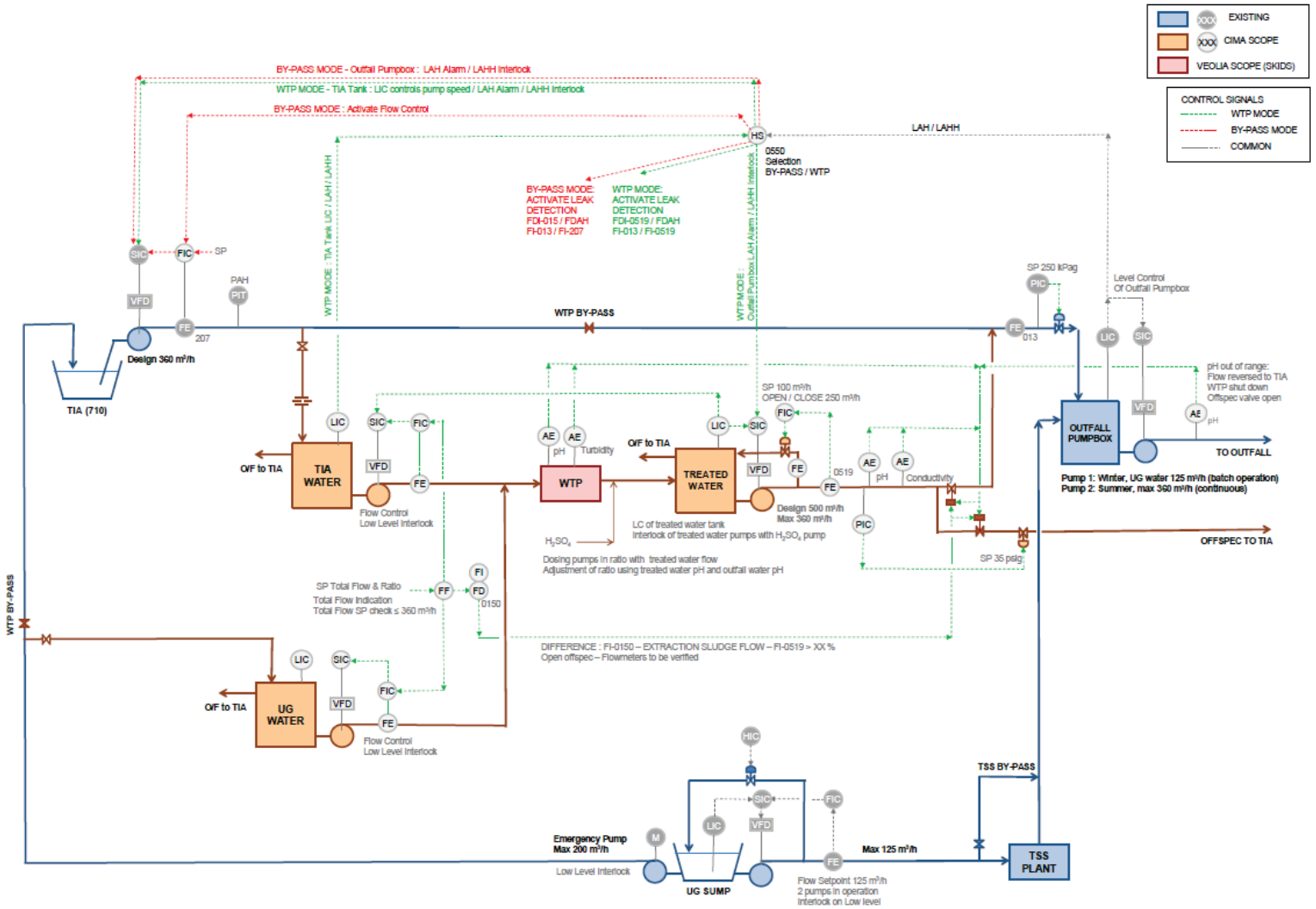


Figure 4 : Control Summary

4 CONSTRUCTION METHODS AND COMMISSIONING

4.1 PIPING AND PUMPING

For the operation of the WTP, the following Piping addition / modifications will be done:

- Pumps (pump design is presented in Appendix D)
  - TIA pumping station will be reused to feed the WTP. The seacan containing the pumps will be relocated in the new WTP Pad as presented in section 4.2.
  - Treated water pumps in the WTP will be added to convey water from the WTP to the existing pipeline from TIA to the RBDS
  - TIA tank feed water pumps and UG tank feed water pumps will be installed in the WTP to feed the Reactor.
  - Service water pumps will be used to feed the service water system from the TIA tank.
  - Sump pumps in the building to manage water in the building

- Pipes
  - The TIA line from the TIA pumping station to the RBDS will be reused to feed the WTP and to receive treated water. Valves will be added to keep also the capacity to pumps directly from TIA to the RBDS if required.
  - The TIA suction line length will be modified in TIA to connect the existing line to the pumping station at its new location. The pumping capacity will remain unchanged.
  - A pipe from UG to the WTP (emergency DCN pipe). A deviation to the WTP will be possible. The pipe from UG will keep the capacity to feed the TIA as an emergency or the WTP. The existing system to manage the water from UG through the existing water treatment plant remain unchanged.
  - A off spec pipe from the WTP to the TIA in case of process upset
  - Overflow pipe from TIA, UG and treated water tank to TIA.
  - Sludge/sumps pipe from the WTP to the TIA.

Figure 5 present the WTP pumps and pipe configuration (flowsheet).

4.2 CONSTRUCTION METHOD AND EQUIPMENT

The WTP equipment will be moved to the WTP Pad (see design report 6205-693-132-REP-001). Mobile equipment used for the modifications will operate into the footprint of existing pads (see Figure 6).

The pad for the water treatment plant will occupy 4080 m^2 (80 m x 51 m). The existing pumping stations in TIA and the reclaim station to the mill will be repositioned also on a pad (24 m x 19 m) close to the water treatment plant pad.

The WTP will be housed in a building erected on the Pad.

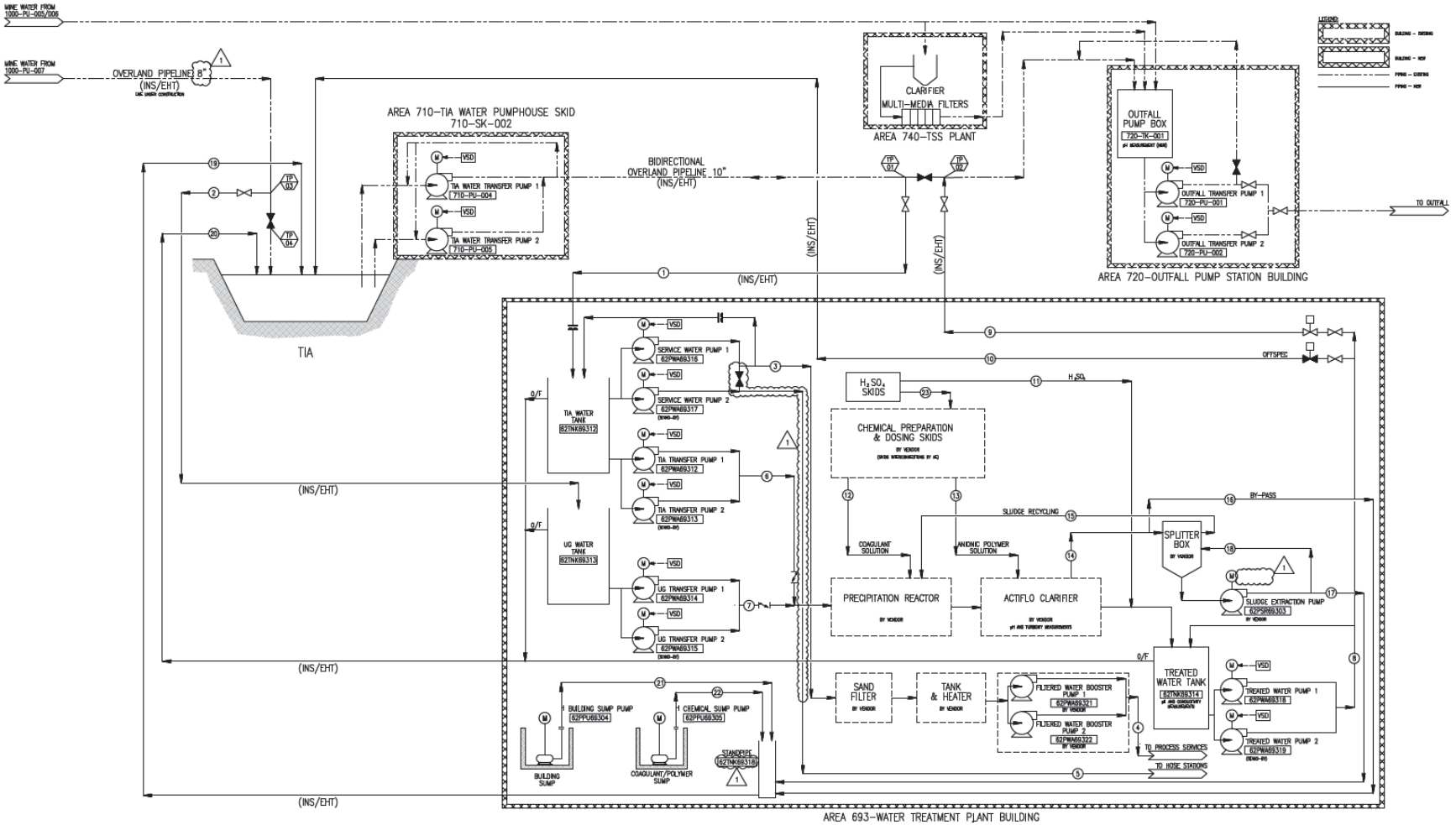


Figure 5 : Piping and Pumps

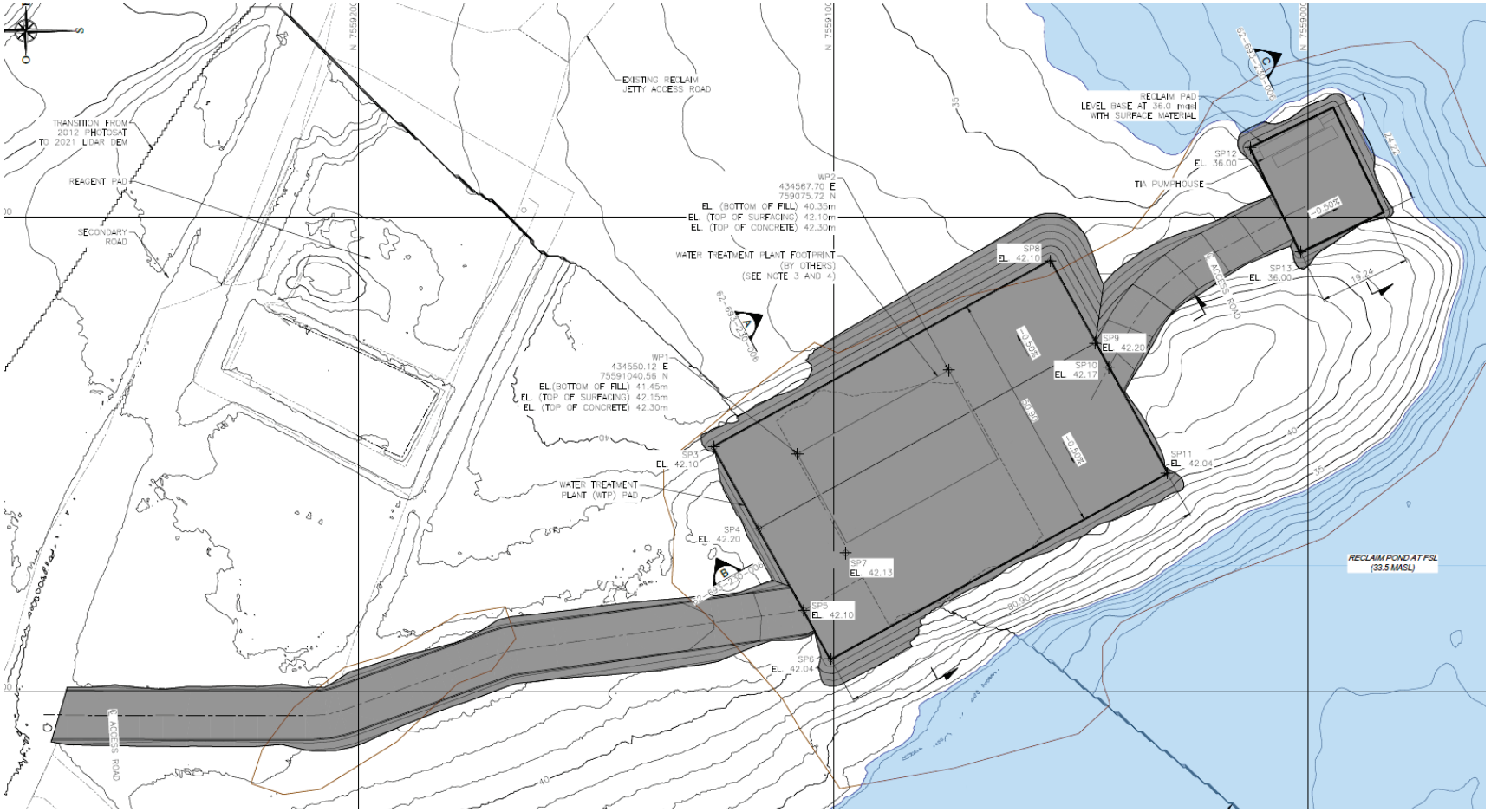


Figure 6 : WTP Pad

4.2 QUALITY CONTROL/ASSURANCE

A quality control/insurance program will be required during construction of each of the infrastructure components to ensure that construction-sensitive features of the design are achieved.

Upon the completion of the construction activities, an as-built construction report will be prepared and submitted to the regulators within 90 days after construction is completed. The construction report should provide all relevant supporting documentation.

4.3 TESTING AND INSPECTION

Prior to start up, the indoor/outdoor pipe will be tested for leaks. If leaks are found, the joint will be re-welded or re-torqued.

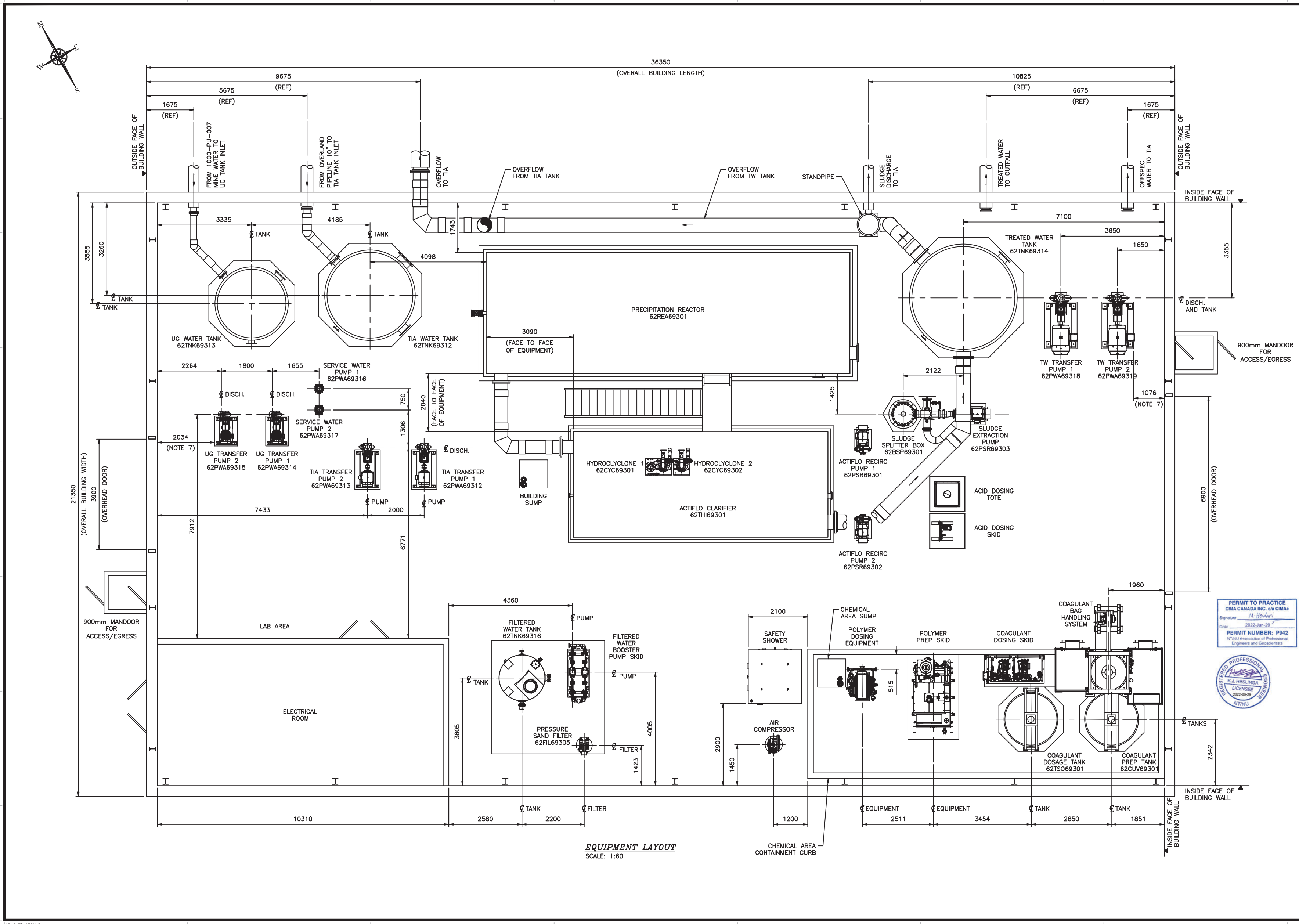
After start up, a periodic inspection, performed by Agnico Eagle personal, will be done to ensure piping integrity.

4.4 TIMELINE

The expected date of construction initiation is September 2022 and commissioning completion is planned to be June 2023 (end of construction).

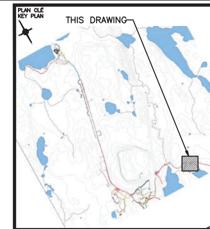
Appendix A: Drawings

NO. DESSIN / DRAWING NO. 62-693-210-001_R0



EQUIPMENT LAYOUT
SCALE: 1:60

PLAN CLÉ / KEY PLAN



NOTES GÉNÉRALES / GENERAL NOTES

1. BULK CHEMICAL ARE NOT STORED IN THE WATER TREATMENT PLANT. WAREHOUSED OFFSITE.
2. SOME PIPING NOT SHOWN FOR CLARITY.
3. 80mm (3") AND SMALLER PIPING IS FIELD RUN AND NOT SHOWN.
4. CABLETRAY ROUTING NOT SHOWN FOR CLARITY.
5. FOR CONCRETE EQUIPMENT PEDESTALS SEE STRUCTURAL DRAWING.
6. FIRE EXTINGUISHERS AND ALARM LOCATIONS BY AGNICO EAGLE.
7. CLEARANCE REQUIRED FOR EGRESS.
8. FOR BUILDING DETAILS SEE VENDOR (HONCO) DRAWINGS.

POUR CONSTRUCTION
FOR CONSTRUCTION
AGNICO EAGLE
DATE : 2022-06-29

DESSINS EN RÉFÉRENCE / REFERENCE DRAWINGS

TITRE / TITLE	# DWG
STRUCTURAL – EQUIPMENT PEDESTALS	62-693-240-001
GENERAL ARRANGMENT – KEY PLAN	62-693-210-005-1
GENERAL ARRANGMENT – KEY PLAN	62-693-210-005-2
PIPING – EXTERIOR PIPING	62-693-270-001
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AGNICO EAGLE

PERMIT TO PRACTICE
CIMA CANADA INC. o/a CIMA+
Signature M. Hadari
Date 2022-Jun-29
PERMIT NUMBER: P942
NT/NU Association of Professional Engineers and Geoscientists

REGISTERED PROFESSIONAL ENGINEER
K.J. HESLINGA
LICENSEE
2022-06-29
NT/NU

REV.	DATE	DESCRIPTION	PAR/BY	APP.	CLIENT
0	2022-06-29	FOR CONSTRUCTION	KWE	KH	
D	2022-05-03	FOR INFORMATION	NA	KH	
C	2022-04-12	FOR APPROVAL	NA	MH	
B	2022-04-08	FOR REVIEW	NA	MH	
A	2022-03-29	FOR COMMENTS	NA	MH	

REVISIONS

CIMA+

TITRE / TITLE
AGNICO EAGLE
693 – WATER TREATMENT PLANT
210 – GENERAL ARRANGEMENT
EQUIPMENT

DESSINÉ PAR / DRAWN BY	K.W. EMBURY	DATE 2022-06-24
VERIFIÉ PAR / CHECKED BY	K. HESLINGA, P.ENG	2022-06-29
APPROUVÉ PAR / APPROVED BY	K. HESLINGA, P.ENG	2022-06-29
ÉCHELLE / SCALE	AS SHOWN	DATE 2022-04-08
NO. DESSIN / DRAWING NO.	62-693-210-001	
NO. PROJET / PROJECT NO. 6205	REVISION 0	FEUILLE / SHT 1/1

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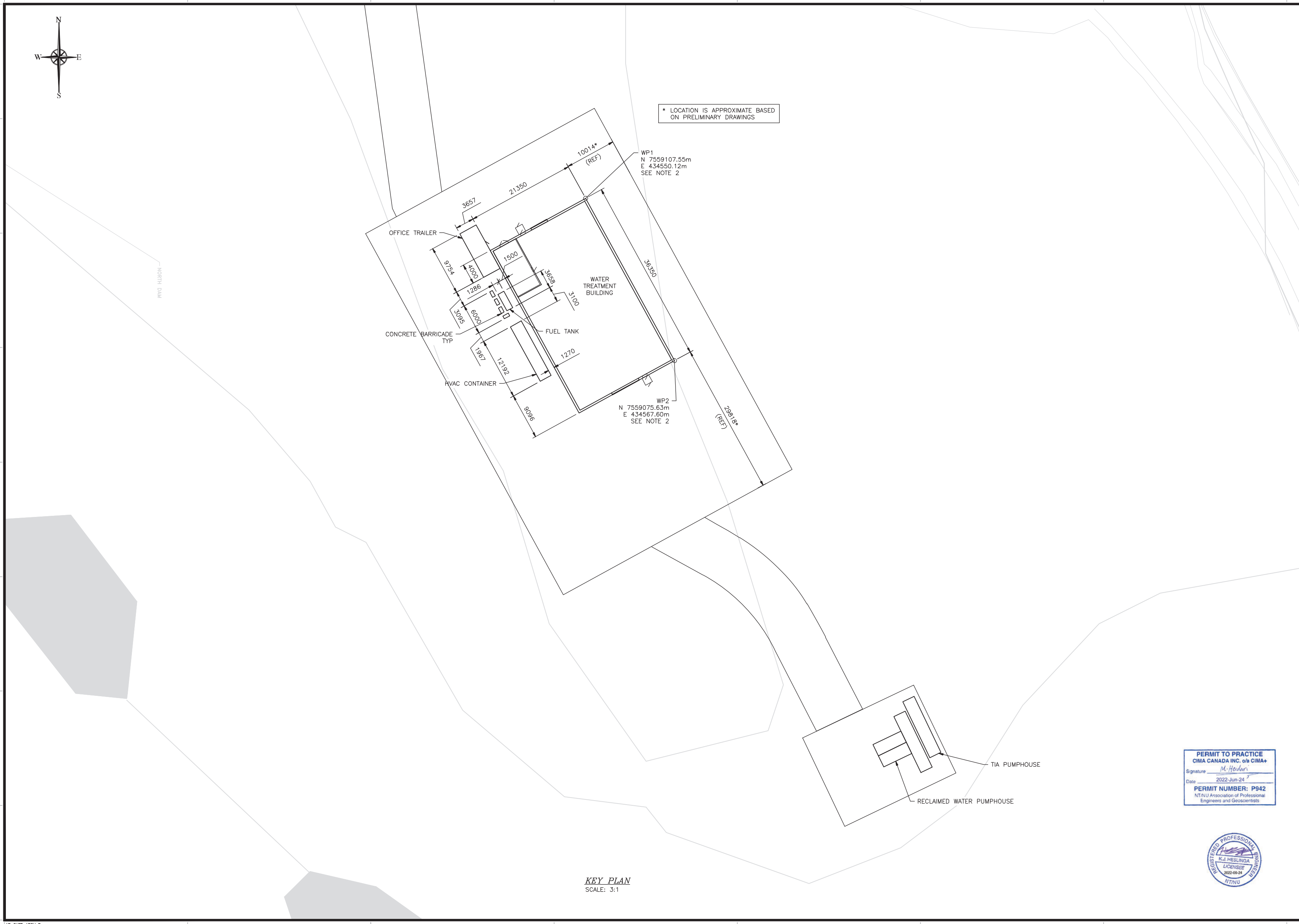

KEY PLAN
SCALE: 3:1

PLAN CLÉ
KEY PLAN

THIS DRAWING

NOTES GÉNÉRALES / GENERAL NOTES

1. SEE CAPR001862 WTP AND RECLAIM PADS PACKAGE FOR PAD LAYOUT, ELEVATION, SLOPE AND OTHER DETAILS.
2. SEE EQUIPMENT PEDESTALS DRAWING FOR BUILDING CONCRETE ELEVATIONS. SEE DWG 62-693-240-001.

POUR CONSTRUCTION
FOR CONSTRUCTION
AGNICO EAGLE
DATE : 2022-06-24

DESSINS EN RÉFÉRENCE / REFERENCE DRAWINGS

TITRE / TITLE	# DWG
EQUIPMENT PEDESTALS	62-693-240-001
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AGNICO EAGLE

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0	2022-06-03	FOR TENDER	NA	KH	

REVISIONS

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TITRE / TITLE
AGNICO EAGLE
693 – WATER TREATMENT PLANT
210 – GENERAL ARRANGEMENT
KEY PLAN

		DATE
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VERIFIÉ PAR / CHECKED BY	N. ANDERSON, E.I.T.	2022-06-03
APPROUVÉ PAR / APPROVED BY	K. HESLINGA, P.ENG	2022-06-03
ÉCHELLE / SCALE	AS SHOWN	2022-06-03

NO. DESSIN / DRAWING NO. 62-693-210-005

NO. PROJET / PROJECT NO. 6205 | REVISION 1 | FEUILLE / SHT 2 / 2

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Date 2022-Jun-24
PERMIT NUMBER: P942
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REGISTERED PROFESSIONAL ENGINEER
K.J. HESLINGA
LICENSEE
2022-06-24
NT/NU

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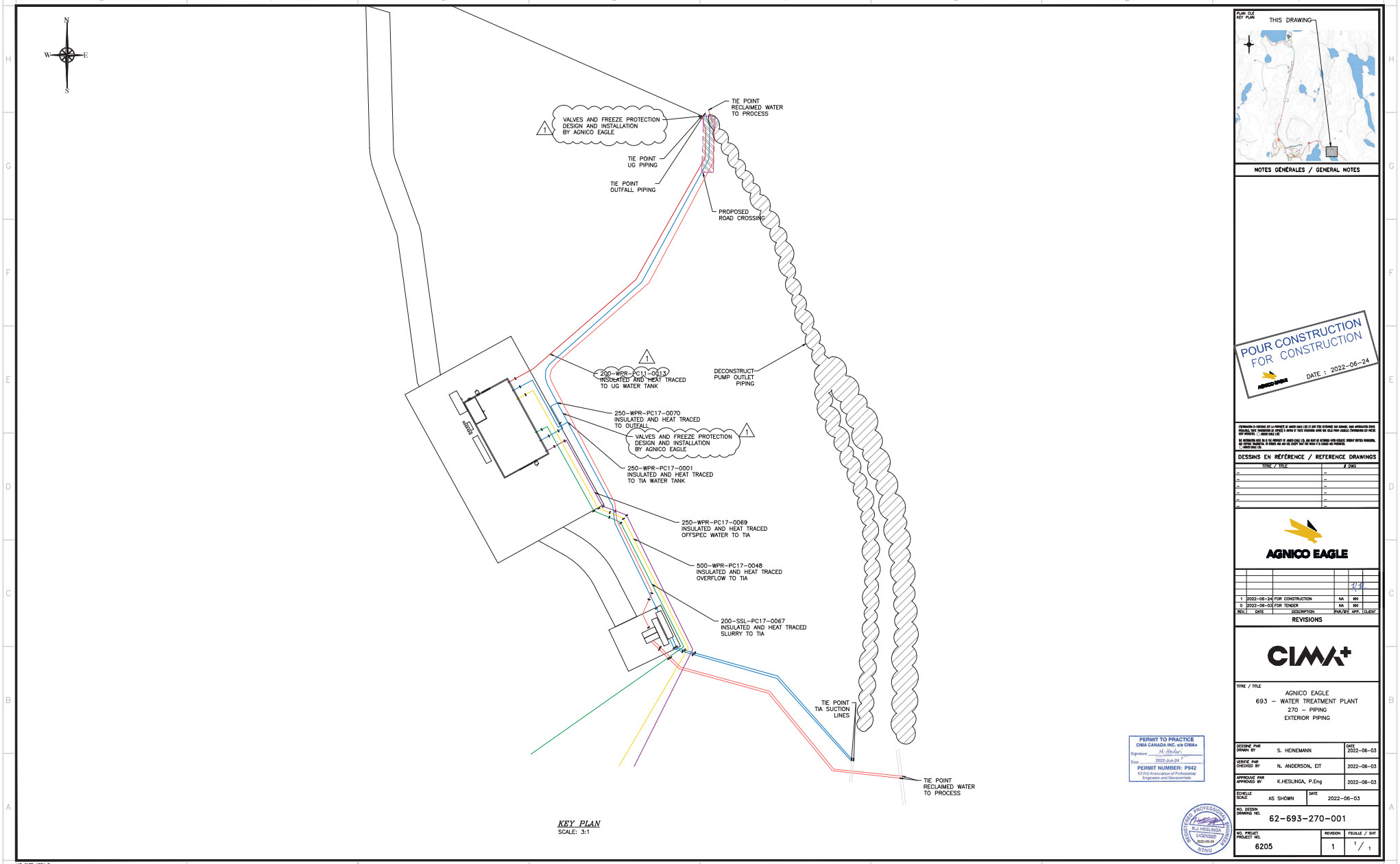

KEY PLAN
SCALE: 3:1

PLAN CLÉ
KEY PLAN

NOTES GÉNÉRALES / GENERAL NOTES

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DATE : 2022-06-24

DESSINS EN RÉFÉRENCE / REFERENCE DRAWINGS

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0	2022-06-03	FOR TENDER	NA	KH	

REVISIONS

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TITRE / TITLE
AGNICO EAGLE
693 – WATER TREATMENT PLANT
270 – PIPING
EXTERIOR PIPING

DESSINÉ PAR DRAWN BY	S. HEINEMANN	DATE 2022-06-03
VÉRIFIÉ PAR CHECKED BY	N. ANDERSON, EIT	2022-06-03
APPROUVÉ PAR APPROVED BY	K.HESLINGA, P.Eng	2022-06-03
ÉCHELLE SCALE	AS SHOWN	DATE 2022-06-03

NO. DESSIN DRAWING NO. 62-693-270-001

NO. PROJET PROJECT NO.	REVISION	FEUILLE / SHT
6205	1	1 / 1

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Signature M. Heslinga
Date 2022-Jun-24
PERMIT NUMBER: P942
NTI NU Association of Professional Engineers and Geoscientists

PROFESSIONAL ENGINEER
K.J. HESLINGA
LICENSEE
2022-06-24
NTI NU

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FILE NO. 62-693-270-001_R1.dwg

NO. DESSIN DRAWING NO. 62-693-210-005-1_R1

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PLAN CLÉ KEY PLAN

NOTES GÉNÉRALES / GENERAL NOTES

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Signature M-Hedari
Date 2022-Jun-24
PERMIT NUMBER: P942
NT/NU Association of Professional Engineers and Geoscientists

REGISTERED PROFESSIONAL ENGINEER K.J. HESLINGA LICENSEE 2022-06-24 NT/NU

POUR CONSTRUCTION
FOR CONSTRUCTION
AGNICO EAGLE
DATE : 2022-06-24

DESSINS EN RÉFÉRENCE / REFERENCE DRAWINGS

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AGNICO EAGLE

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0	2022-06-03	FOR TENDER	NA	KH	

REVISIONS

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TITRE / TITLE
AGNICO EAGLE
693 – WATER TREATMENT PLANT
210 – GENERAL ARRANGEMENT
KEY PLAN

		DATE
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VÉRIFIÉ PAR / CHECKED BY	N. ANDERSON, E.I.T.	2022-06-03
APPROUVÉ PAR / APPROVED BY	K. HESLINGA, P.ENG	2022-06-03
ÉCHELLE / SCALE	1.5:1	DATE 2022-06-03

NO. DESSIN / DRAWING NO. 62-693-210-005

NO. PROJET / PROJECT NO.	RÉVISION / REVISION	FEUILLE / SHT
6205	1	1 / 2

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Appendix B: PID

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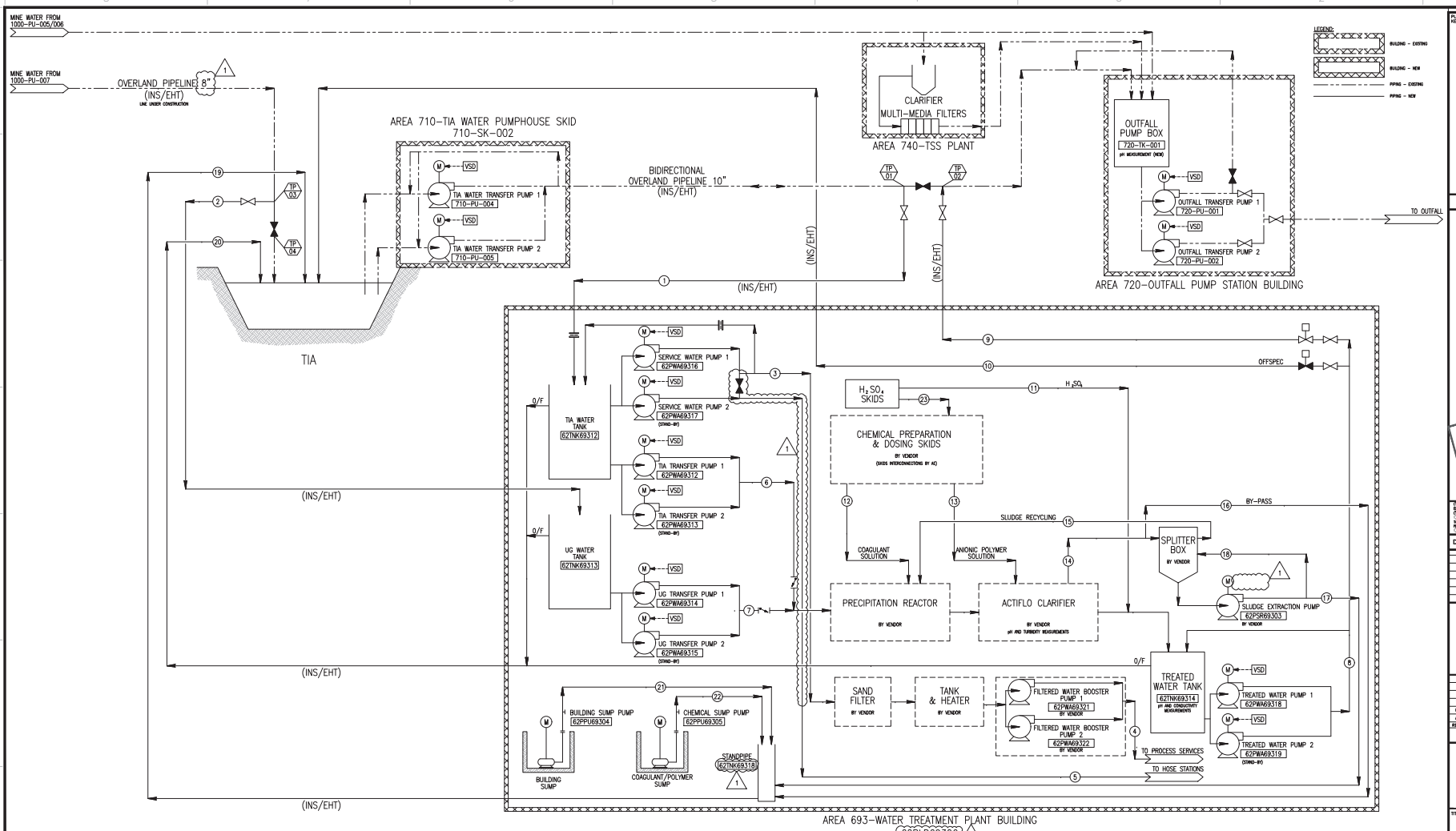

DESCRIPTION	UNIT	TIA WATER TANK INPUT	UG WATER TANK INPUT	SERVICE WATER PUMPS DISCHARGE	WATER TO PROCESS SERVICE	WATER TO HOSE STATION	TIA TRANSFER PUMPS DISCHARGE	UG TRANSFER PUMPS DISCHARGE	TREATED WATER PUMPS DISCHARGE	TREATED WATER TO OUTFALL	TREATED WATER TO TIA	H_2SO_4 TO TREATED WATER	COAGULANT SOLUTION	ANIONIC POLYMER SOLUTION	SLUDGE	SLUDGE RECYCLE	SLUDGE BYPASS	SLUDGE PUMP DISCHARGE	SLUDGE PUMP RECYCLE	TOTAL SLUDGE TO TIA	TREATED WATER TANK O/F	BUILDING SUMP PUMP DISCHARGE	CHEMICAL SUMP PUMP DISCHARGE	H_2SO_4 TO COAGULANT PREP
STREAM	–	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
NOMINAL FLOW	m^3/h	362	125	1.8	1.8	0	360	125	360	360	360	–	–	–	40	32	0	8	32	8	0	0	0	0
	L/h	–	–	–	–	–	–	–	–	–	–	0.5	38	90	–	–	–	–	–	–	–	–	–	–
DESIGN FLOW	m^3/h	508	200	8.5	8.5	15	508	200	500	500	500	–	–	–	80	80	80	80	80	100	500	27	20	1
	L/h	–	–	–	–	–	–	–	–	–	–	1	146	600	–	–	–	–	–	–	–	–	–	–
TSS CONCENTRATION	%w/w	2%	2%	2%	2%	2%	2%	2%	0.15%	0.15%	0.15%	–	–	–	20%	20%	20%	20%	20%	20%	0.15%	–	–	–
CONCENTRATION IN SOLUTION	%w/w	–	–	–	–	–	–	–	–	–	–	93%	28%	0.25%	–	–	–	–	–	–	–	–	–	93%
DENSITY	kg/m^3	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1825	1220	1000	1144	1144	1144	1144	1144	1144	1000	–	–	1825
PRESSURE	kPag	40	40	270	700	240	110	110	760	760	ATM	50	280	590	ATM	ATM	ATM	50	50	ATM	ATM	100	70	420

NOTES GÉNÉRALES / GENERAL NOTES

POUR CONSTRUCTION
FOR CONSTRUCTION
DATE : 2022-06-23

DESSINS EN RÉFÉRENCE / REFERENCE DRAWINGS

TITRE / TITLE	# DWG

REV.	DATE	DESCRIPTION	PAR/BY	APP.	CLIENT
1	2022-06-23	ISSUED FOR CONSTRUCTION	MS	SD	-
0	2022-06-06	ISSUED FOR TENDER	MS	SD	-
A	2022-03-28	FOR REVIEW	MS	SD	-

REVISIONS

PERMIT TO PRACTICE
CIMA CANADA INC. o/a CIMA+
PERMIT NUMBER: P942
NT/Nu Association of Professional Engineers and Geoscientists

TITRE / TITLE
AGNICO EAGLE – HOPE BAY
693 – WATER TREATMENT PLANT
200 – PROCESS FLOW DIAGRAM

DESSINÉ PAR DRAWN BY	JOHN OSI, Tech.	DATE 2022-03-28
VÉRIFIÉ PAR CHECKED BY	MARYAM SADEGHI, EIT	2022-03-28
APPROUVÉ PAR APPROVED BY	SYLVIE DESSUREAULT, P.Eng	2022-03-28
ÉCHELLE SCALE	N.T.S.	DATE 2022-03-28

NO. DESSIN DRAWING NO. 62-693-200-001

NO. PROJET PROJECT NO.	REVISION	FEUILLE / SHT
6205	1	1 / 1

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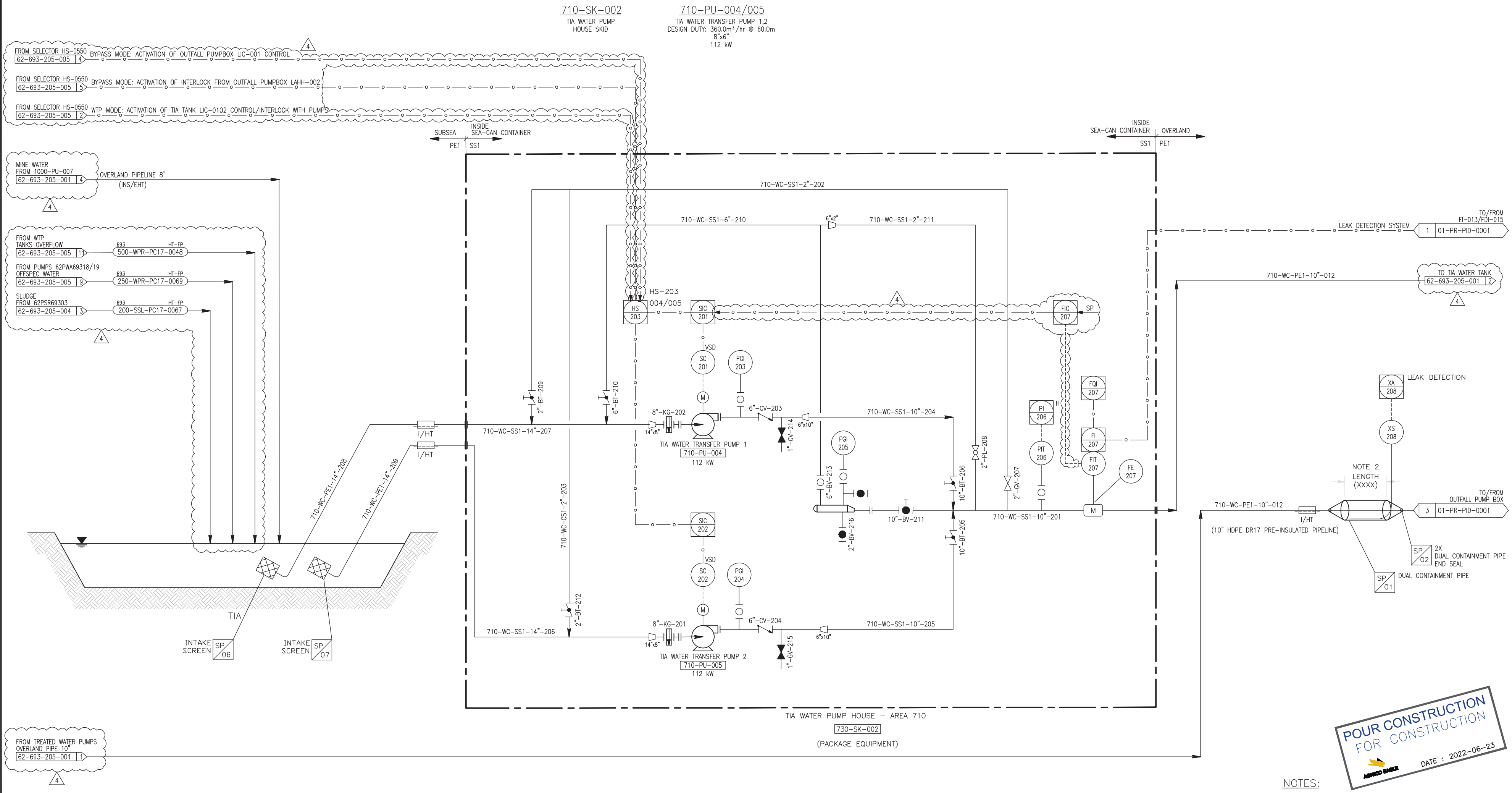
FILE NO. 62-693-200-001_R1.dwg



POUR CONSTRUCTION
FOR CONSTRUCTION
DATE : 2022-06-23

NOTES:

1. THIS DRAWING IS DEVELOPED AS PART OF DETAIL ENGINEERING PACKAGE. P&C SHALL NOT BE RESPONSIBLE FOR ANY OMISSION OR DEVIATION FROM DESIGN MADE BY FOR CONTRACTOR OR THE CLIENT.
2. THE REQUIREMENT OF DUAL CONTAINMENT AND END SEALS SHALL BE DETERMINED BY OTHERS. P&C SHALL NOT BE RESPONSIBLE FOR ANY OMISSION OR DEVIATION FROM ANY ENVIRONMENTAL REQUIREMENTS.

PERMIT TO PRACTICE
CIMA CANADA INC. o/a CIMA+
Signature
Date 2022-06-23
PERMIT NUMBER: P942
NT/NU Association of Professional Engineers and Geoscientists

Drawing No.	Description
33-0042-01-PR-PID-0005	OUTFALL DISCHARGE SYSTEM - MARINE DIFFUSER - PIPING & INSTRUMENTATION DIAGRAM
33-0042-01-PR-PID-0004	OUTFALL DISCHARGE SYSTEM - MARINE OUTFALL BERM SKID - PIPING & INSTRUMENTATION DIAGRAM
33-0042-01-PR-PID-0003	OUTFALL DISCHARGE SYSTEM - OUTFALL OVERLAND PIPELINE - PIPING & INSTRUMENTATION DIAGRAM
33-0042-01-PR-PID-0002	OUTFALL DISCHARGE SYSTEM - COMPRESSED AIR FLUSH SYSTEM - PIPING & INSTRUMENTATION DIAGRAM
33-0042-01-PR-PID-0001	OUTFALL DISCHARGE SYSTEM - OUTFALL PUMP STATION BUILDING - PIPING & INSTRUMENTATION DIAGRAM
33-0042-01-PR-PFD-0001	OUTFALL DISCHARGE SYSTEM - PUMP STATIONS AND PIPELINES - PROCESS FLOW DIAGRAM
33-0042-00-PR-PID-0001	OUTFALL DISCHARGE SYSTEM - SYMBOL AND EQUIPMENT LEGEND - PIPING & INSTRUMENTATION DIAGRAM

Reference Drawings

Rev.	Date	Description	Originator	Drawn	Checked
4	2202.06.23	ISSUED FOR CONSTRUCTION PROJECT 6205-E-132-002	MS	JO	SD
3	2022.06.06	ISSUED FOR TENDER PROJECT 6205-E-132-002	MS	JO	SD
2	2022.04.28	ISSUED FOR COMMENTS PROJECT 6205-E-132-002	MS	JO	SD
1	15.08.2018	NOTES ADDED	MJ	AZ	NB
0	16.05.2018	ISSUED FOR CONSTRUCTION	MJ	ML	NB

Revisions

Engineer's Stamp

CLIENT

TMAC RESOURCES

PATERSON & COOKE
PATERSON & COOKE CANADA INC.
306-595 HOWE STREET
VANCOUVER, BRITISH COLUMBIA, CANADA
TEL: 604-687-7704
WWW.PATERSONCOOKE.COM
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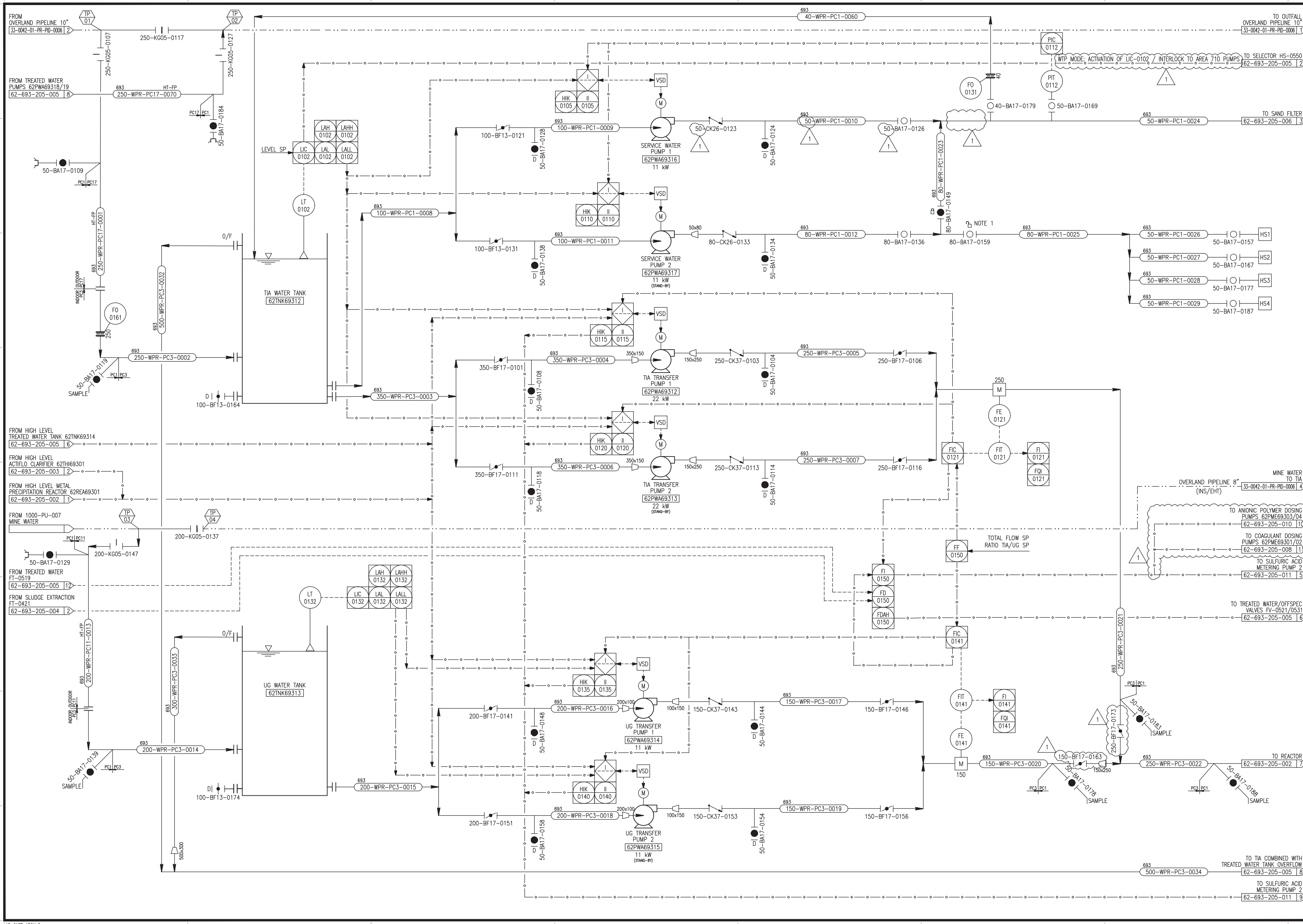
HOPE BAY
WATER DISCHARGE

OUTFALL DISCHARGE SYSTEM
TIA WATER PUMP HOUSE
PIPING & INSTRUMENTATION DIAGRAM

Scale	Off. Code	Proj. Code	Area Code	Disc. Code	Doc. Type	Unique. No	Sheet No	Rev.
N.T.S.								
ANSI D	33	0042	01	PR	PID	0006	6 OF 6	4

NO. DESSIN / DRAWING NO. 62-693-205-001_R1

FORMAT ARCHD



PLAN CLÉ / KEY PLAN

CIMA+

NOTES GÉNÉRALES / GENERAL NOTES

1. VALVE 80-BA17-0159 TO BE CLOSED AND LOCKED IF SPARE PUMP IS TO BE USED FOR PROCESS WATER.

POUR CONSTRUCTION
FOR CONSTRUCTION
DATE : 2022-06-23

DESSINS EN RÉFÉRENCE / REFERENCE DRAWINGS

TITRE / TITLE	# DWG

AGNICO EAGLE

REV.	DATE	DESCRIPTION	PAR/BY	APP.	CLIENT
1	2022-06-23	ISSUED FOR CONSTRUCTION	MS	SD	.
0	2022-06-08	ISSUED FOR TENDER	MS	SD	.
A	2022-04-28	FOR REVIEW	MS	SD	.

REVISIONS

PERMIT TO PRACTICE
CIMA CANADA INC. o/a CIMA+
PERMIT NUMBER: P942
NT/NU Association of Professional Engineers and Geoscientists

TITRE / TITLE
AGNICO EAGLE – HOPE BAY
693 – WATER TREATMENT PLANT
205 – PIPING & INSTRUMENTATION DIAGRAM
FEED TANKS

		DATE
DESSINÉ PAR / DRAWN BY	JOHN OSI, Tech.	2022-04-08
VÉRIFIÉ PAR / CHECKED BY	MARYAM SADEGHI, EIT	2022-04-08
APPROUVÉ PAR / APPROVED BY	SYLVIE DESSUREAULT, P.Eng	2022-04-08
ÉCHELLE / SCALE	N.T.S.	2022-04-08

NO. DESSIN / DRAWING NO. 62-693-205-001

NO. PROJET / PROJECT NO. 6205 — REVISION 1 — FEUILLE / SHT 1 / 1

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FILE NO. 62-693-205-001_R1.dwg

NO. DESSIN
DRAWING NO. 62-693-205-002_R1

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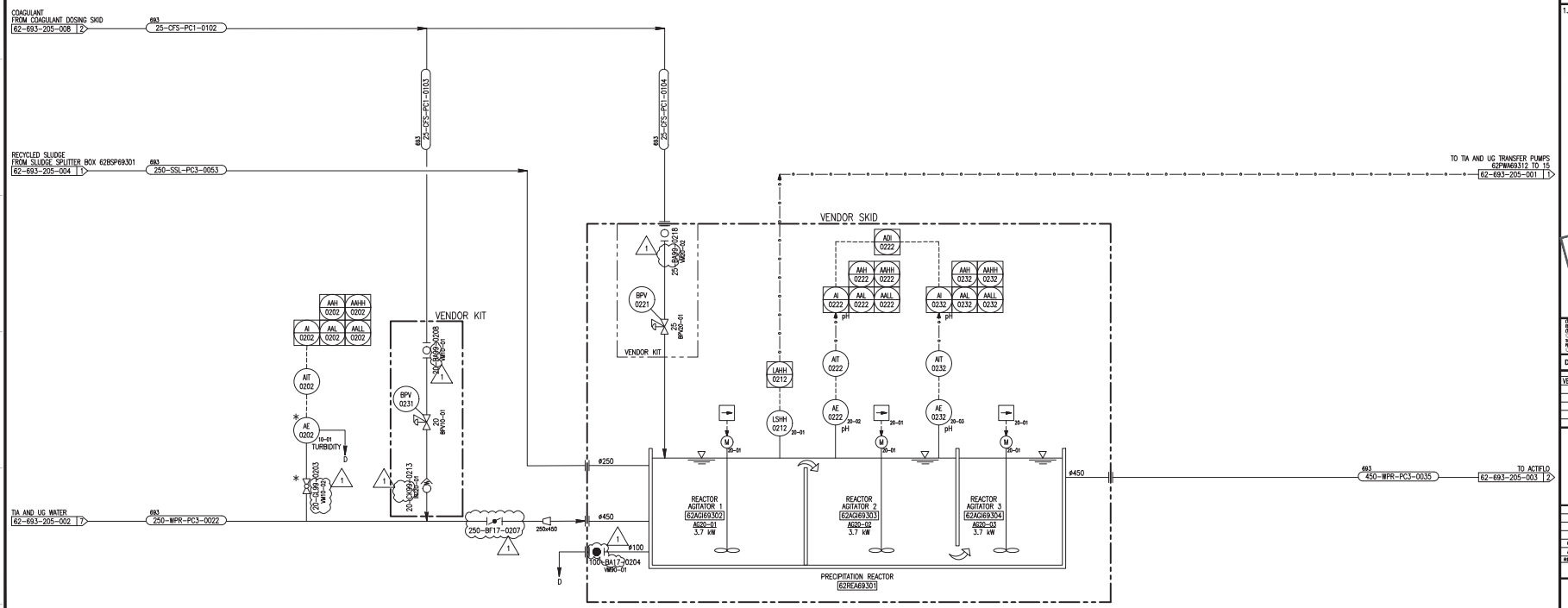

PLAN CLÉ
KEY PLAN

CIMA+

NOTES GÉNÉRALES / GENERAL NOTES

1. VENDOR SKID INFORMATION IS PROVIDED ON THIS P&ID FOR THE MAIN OBJECTIVES OF INTERCONNEXION CLARITY AND TAGGING STANDARDIZATION. FOR ANY PROCESS DESIGN DISCREPANCY BETWEEN THIS P&ID AND VENDOR P&ID, VENDOR P&ID PREVAILS FOR VENDOR SKIDS.

POUR CONSTRUCTION
FOR CONSTRUCTION
DATE : 2022-06-23

DESSINS EN RÉFÉRENCE / REFERENCE DRAWINGS

TITRE / TITLE	# DWG
VEOLIA P&ID REV. 4 (13 SHEETS)	5000220003 - PI0001

AGNICO EAGLE

REV.	DATE	DESCRIPTION	PWR/BY	APP.	CLIENT
1	2022-06-23	ISSUED FOR CONSTRUCTION	MS	SD	-
0	2022-06-08	ISSUED FOR TENDER	MS	SD	-
A	2022-04-28	FOR REVIEW	MS	SD	-

REVISIONS

PERMIT TO PRACTICE
CIMA CANADA INC. o/a CIMA+
Signature
Date 2022-06-23
PERMIT NUMBER: P942
NTMU Association of Professional Engineers and Geoscientists

TITRE / TITLE

AGNICO EAGLE – HOPE BAY
693 – WATER TREATMENT PLANT
205 – PIPING & INSTRUMENTATION DIAGRAM
METAL PRECIPITATION REACTOR

DESSINÉ PAR / DRAWN BY	JOHN OSI, Tech.	DATE 2022-04-08
VÉRIFIÉ PAR / CHECKED BY	MARYAM SADEGHI, EIT	2022-04-08
APPROUVÉ PAR / APPROVED BY	SYLVIE DESSUREAULT, P.Eng	2022-04-08
ÉCHELLE / SCALE	N.T.S.	DATE 2022-04-08

NO. DESSIN / DRAWING NO. 62-693-205-002

NO. PROJET / PROJECT NO.	REVISION	FEUILLE / SHT
6205	1	1 / 1

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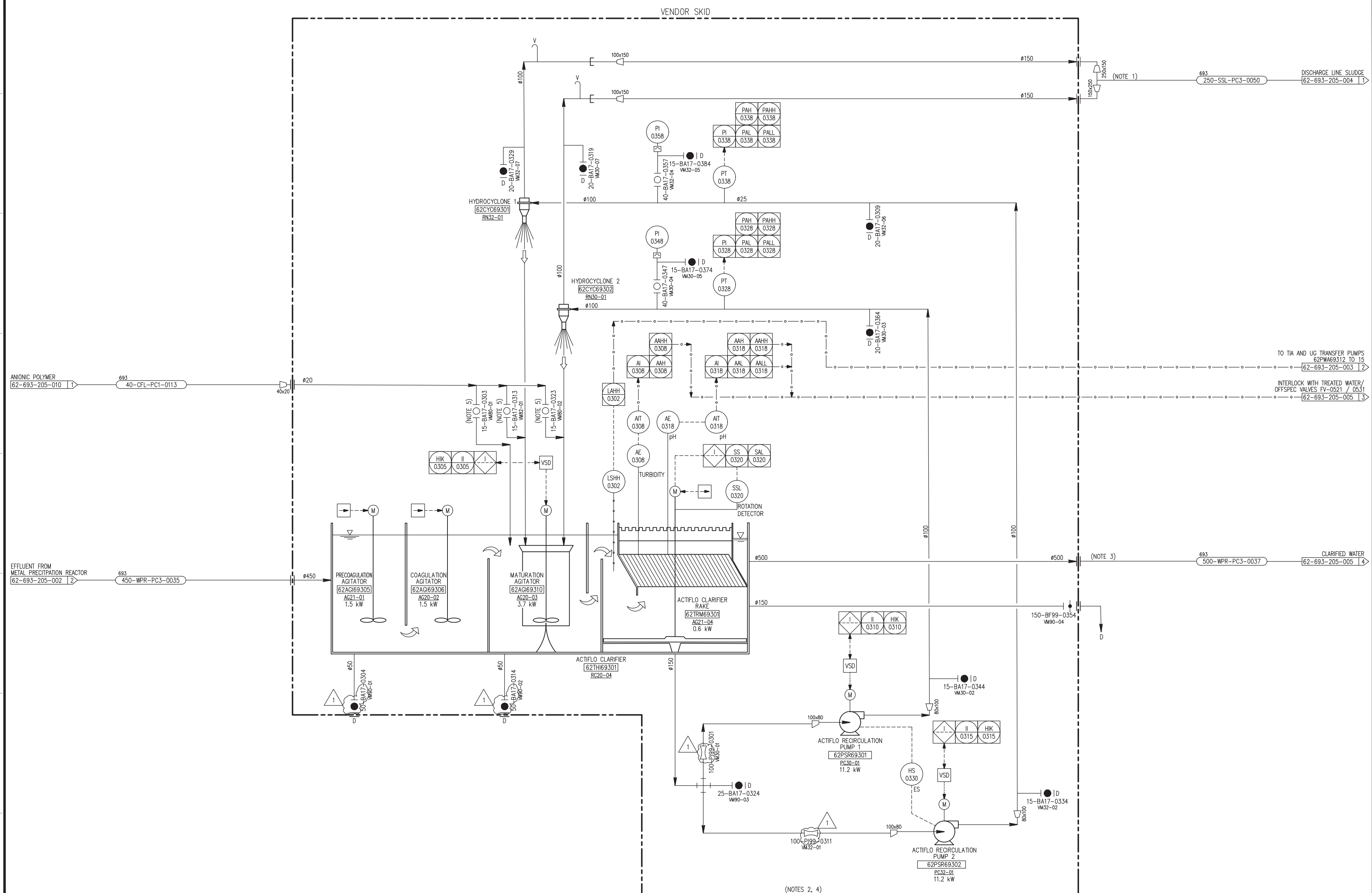
FILE NO. 62-693-205-002_R1.dwg

NO. DESSIN
DRAWING NO. 62-693-205-003_R1



NOTES GÉNÉRALES / GENERAL NOTES

1. SLUDGE DISCHARGE PIPING MUST BE DESIGNED TO PREVENT BACKPRESSURE INTO THE CYCLONES. IT IS IMPORTANT TO DROP ONE (1) METER AT THE SLUDGE OUTLET OF EACH HYDROCYCLONE. AFTER THE DROP, IF THE SLUDGE COLLECTOR IS A GRAVITY PIPE, IT MUST BE CALCULATED AS FREE FLOW WITH MAX 70–80% OF FILLING AND WITH A MAX VELOCITY OF 0.8 m/s. IF SEVERAL HYDROCYCLONES ARE IN OPERATION AT THE SAME TIME A VENT MUST BE ADDED ON EACH DROP.
2. ACTIFLO UNITS ARE PRE-ASSEMBLED. HOWEVER, FOR FREIGHT PURPOSES OR GENERAL PRACTICAL REASONS, THE INSTALLATION OF SOME ITEMS NEEDS TO BE COMPLETED ON SITE BY A CONTRACTOR.
3. A VENT MUST BE INSTALLED ON THE PIPE DISCHARGE IF ANY EQUIPMENT OR INSTRUMENT INSTALLED DOWNSTREAM COULD MALFUNCTION WITH AIR PRESENCE.
4. COMPRESSED AIR FOR CLEANING SYSTEM = 50L/min PRESSURE 22 TO 30 psig, CONNECTION 1/4" SELENOID VALVE VE92-01 BY AE.
5. ADJUSTED MANUAL VALVES WHILE IN OPERATION, SOMETIMES ONE OR TWO VALVES ARE CLOSED.
6. VENDOR SKID INFORMATION IS PROVIDED ON THIS P&ID FOR THE MAIN OBJECTIVES OF INTERCONNEXION CLARITY AND TAGGING STANDARDIZATION. FOR ANY PROCESS DESIGN DISCREPANCY BETWEEN THIS P&ID AND VENDOR P&ID, VENDOR P&ID PREVAILS FOR VENDOR SKIDS.

POUR CONSTRUCTION
FOR CONSTRUCTION
DATE : 2022-06-23

DESSINS EN RÉFÉRENCE / REFERENCE DRAWINGS

TITRE / TITLE	# DWG
VEOLIA P&ID REV. 4 (13 SHEETS)	5000220003 – PI0001

AGNICO EAGLE

REV.	DATE	DESCRIPTION	PAR/BY	APP.	CLIENT
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1	2022-06-23	ISSUED FOR CONSTRUCTION	MS	SD	.
0	2022-06-06	ISSUED FOR TENDER	MS	SD	.
A	2022-04-28	FOR REVIEW	MS	SD	.

REVISIONS

REGISTERED PROFESSIONAL ENGINEER
S.M.Y. DESSUREAULT
LICENSEE
NT/NU
2022-06-23
L5037

PERMIT TO PRACTICE
CIMA CANADA INC. o/a CIMA+
Signature
Date 2022-06-23
PERMIT NUMBER: P942
NT/NU Association of Professional Engineers and Geoscientists

TITRE / TITLE
AGNICO EAGLE – HOPE BAY
693 – WATER TREATMENT PLANT
205 – PIPING & INSTRUMENTATION DIAGRAM
HIGH RATE CLARIFIER

DESSINÉ PAR / DRAWN BY	JOHN OSI, Tech.	DATE 2022-04-08
VERIFIÉ PAR / CHECKED BY	MARYAM SADEGHI, EIT	2022-04-08
APPROUVÉ PAR / APPROVED BY	SYLVIE DESSUREAULT, P.Eng	2022-04-08
ÉCHELLE / SCALE	N.T.S.	DATE 2022-04-08

NO. DESSIN / DRAWING NO. 62-693-205-003

NO. PROJET / PROJECT NO.	REVISION	FEUILLE / SHT
6205	1	1 / 1

FILE NO. 62-693-205-003_R1.dwg

NO. DESSIN
DRAWING NO. 62-693-205-004_R1

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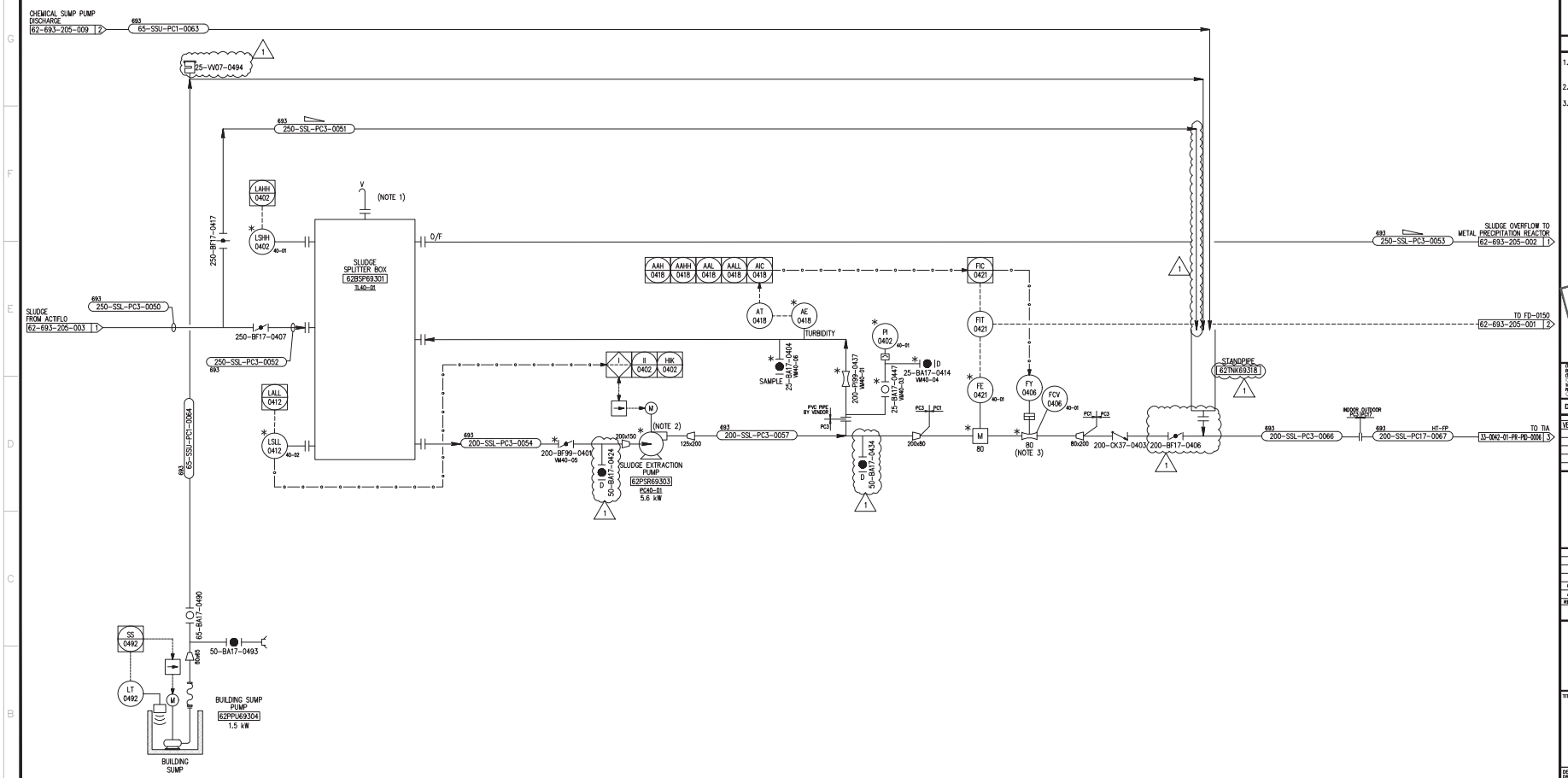

PLAN CLÉ
KEY PLAN

CIMA+

NOTES GÉNÉRALES / GENERAL NOTES

1. VENT PIPES ARE TO BE HIGHER THAN HYDROCYCLONE VENTS.
2. REDUCERS ARE IN STAINLESS STEEL.
3. FCV COMPRESSED AIR REQUIREMENT TBC AT 85 psig PER PISTON TRAVEL. FLOWRATE DEPENDS ON NUMBER OF TRAVELS. POSITIONNER BLEED FLOW < 0.00035 SCFM AT 80 psig (MAX PRESSURE 102 psig)

POUR CONSTRUCTION
FOR CONSTRUCTION
DATE : 2022-06-23
AGNICO EAGLE

DESSINS EN RÉFÉRENCE / REFERENCE DRAWINGS

TITRE / TITLE	# DWG
VEOLIA P&ID REV. 4 (13 SHEETS)	5000220003 - PI0001

AGNICO EAGLE

REV.	DATE	DESCRIPTION	PAR/BY	APP.	CLIENT
1	2022-06-23	ISSUED FOR CONSTRUCTION	MS	SD	.
0	2022-06-06	ISSUED FOR TENDER	MS	SD	.
A	2022-04-28	FOR REVIEW	MS	SD	.

REVISIONS

PERMIT TO PRACTICE
CIMA CANADA INC. o/a CIMA+
Signature
Date 2022-06-23
PERMIT NUMBER: P942
NTMU Association of Professional Engineers and Geoscientists

TITRE / TITLE

AGNICO EAGLE – HOPE BAY
693 – WATER TREATMENT PLANT
205 – PIPING & INSTRUMENTATION DIAGRAM
SLUDGE SPLITTER BOX

DESSINÉ PAR / DRAWN BY	JOHN OSI, Tech.	DATE 2022-04-08
VÉRIFIÉ PAR / CHECKED BY	MARYAM SADEGHI, EIT	2022-04-08
APPROUVÉ PAR / APPROVED BY	SYLVIE DESSUREAULT, P.Eng	2022-04-08
ÉCHELLE / SCALE	N.T.S.	DATE 2022-04-08

NO. DESSIN / DRAWING NO. 62-693-205-004

NO. PROJET / PROJECT NO.	REVISION	FEUILLE / SHT
6205	1	1 / 1

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FILE NO. 62-693-205-004_R1.dwg

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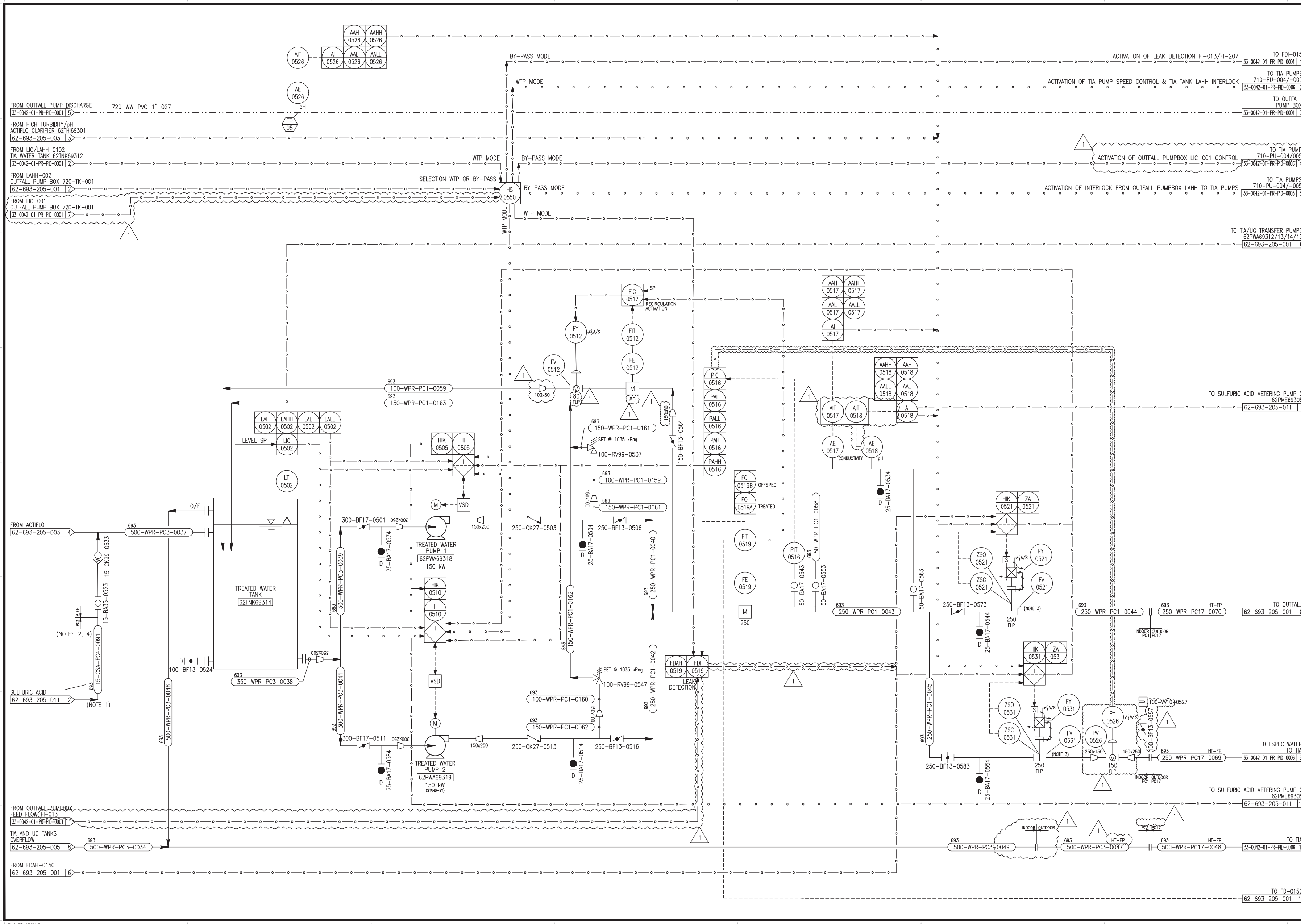


FORMAT ARCHD

PLAN CLÉ / KEY PLAN

CIMA+

NOTES GÉNÉRALES / GENERAL NOTES

1. PC4 PIPING SPECIFICATION MODIFIED AS FOLLOWS: INSIDE PIPING MATERIAL (CPVC) REPLACED WITH PTFE.
2. FROM SPEC BREAK, OUTSIDE PIPING IS NOT PRESENT.
3. ONLY ONE VALVE FV-0521 OR FV-0531 OPEN AT ANYTIME.
4. THE INDICATED PIPING DIAMETER CORRESPONDS TO THE INSIDE PIPING (TEFLON). OUTSIDE PIPING DIAMETER IS 50mm (CPVC SCH80).

POUR CONSTRUCTION
FOR CONSTRUCTION
DATE : 2022-06-23

DESSINS EN RÉFÉRENCE / REFERENCE DRAWINGS

TITRE / TITLE	# DWG

AGNICO EAGLE

REV.	DATE	DESCRIPTION	PAR/BY	APP.	CLIENT
1	2022-06-23	ISSUED FOR CONSTRUCTION	MS	SD	-
0	2022-06-08	ISSUED FOR TENDER	MS	SD	-
A	2022-04-28	FOR REVIEW	MS	SD	-

REVISIONS

PERMIT TO PRACTICE
CIMA CANADA INC. o/a CIMA+
PERMIT NUMBER: P942
NT/NU Association of Professional Engineers and Geoscientists

TITRE / TITLE
AGNICO EAGLE – HOPE BAY
693 – WATER TREATMENT PLANT
205 – PIPING & INSTRUMENTATION DIAGRAM
TREATED WATER TANK

		DATE
DESSINÉ PAR / DRAWN BY	JOHN OSI, Tech.	2022-04-08
VÉRIFIÉ PAR / CHECKED BY	MARYAM SADEGHI, EIT	2022-04-08
APPROUVÉ PAR / APPROVED BY	SYLVIE DESSUREAULT, P.Eng	2022-04-08
ÉCHELLE / SCALE	N.T.S.	2022-04-08

NO. DESSIN / DRAWING NO. 62-693-205-005

NO. PROJET / PROJECT NO. 6205 | REVISION 1 | FEUILLE / SHT 1 / 1

FILE NO. 62-693-205-005_R1.dwg

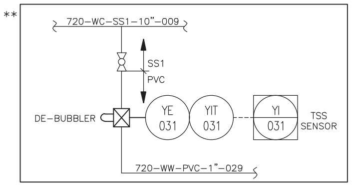
AE-CART-ARCH D

720-TK-001
OUTFALL PUMP BOX
3.40m DIA x 4.30m
$35.42m^3$ LIVE VOL
$39.04m^3$ NET VOL

720-PU-001
OUTFALL TRANSFER PUMP 1
DESIGN DUTY:
$125.0m^3/hr$ @ 30.0m
6"x4"
18.6 kW

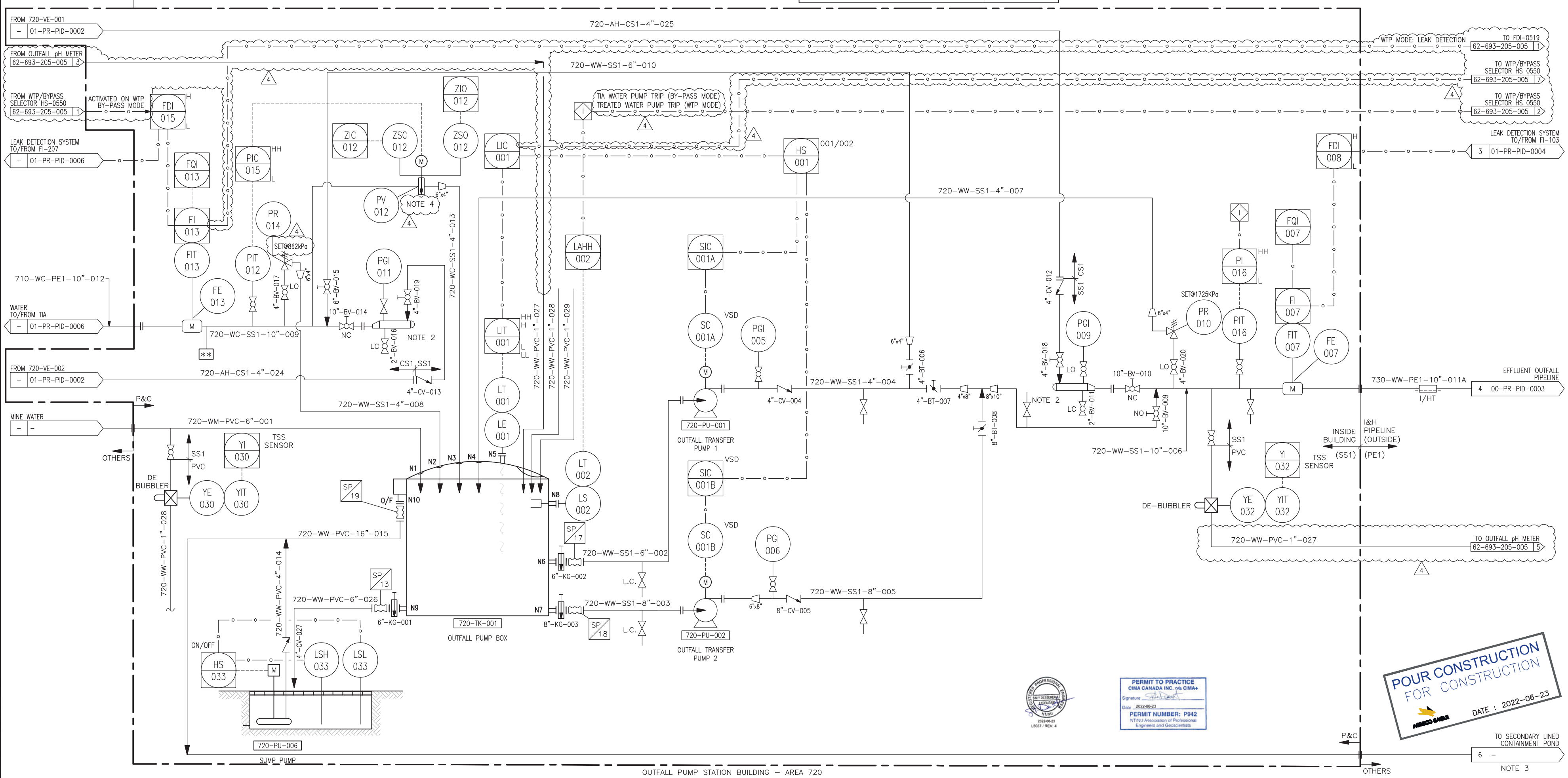
720-PU-002
OUTFALL TRANSFER PUMP 2
DESIGN DUTY:
$360.0m^3/hr$ @ 133.0m
8"x6"
268 kW

720-PU-006
SUMP PUMP
DESIGN DUTY:
$60m^3/hr$ @ 6m



NOTES:

1. THIS DRAWING IS DEVELOPED AS PART OF DETAIL ENGINEERING PACKAGE. P&C SHALL NOT BE RESPONSIBLE FOR ANY OMISSION OR DEVIATION FROM DESIGN MADE BY FOR CONTRACTOR OR THE CLIENT.
2. PIG LAUNCHER CONSTRUCTED FROM 14" PIPE.
3. OVERFLOW PIPE OUTSIDE THE BUILDING TO BE HEAT TRACED & INSULATED.
4. THE 4" PIPING IS TO BE REPLACED WITH 6" PIPING WHEN THE WTP PLANT CAPACITY WILL EXCEED $360m^3/h$.



POUR CONSTRUCTION
FOR CONSTRUCTION
DATE : 2022-06-23

PERMIT TO PRACTICE
CIMA CANADA INC. o/a CIMA+
Date: 2022-06-23
PERMIT NUMBER: P942
NT/NU Association of Professional Engineers and Geoscientists

Drawing No.	Description
33-0042-01-PR-PID-0005	OUTFALL DISCHARGE SYSTEM - MARINE DIFFUSER - PIPING & INSTRUMENTATION DIAGRAM
33-0042-01-PR-PID-0004	OUTFALL DISCHARGE SYSTEM - MARINE OUTFALL BERM SKID - PIPING & INSTRUMENTATION DIAGRAM
33-0042-01-PR-PID-0003	OUTFALL DISCHARGE SYSTEM - OUTFALL OVERLAND PIPELINE - PIPING & INSTRUMENTATION DIAGRAM
33-0042-01-PR-PID-0002	OUTFALL DISCHARGE SYSTEM - COMPRESSED AIR FLUSH SYSTEM - PIPING & INSTRUMENTATION DIAGRAM
33-0042-01-PR-PID-0001	OUTFALL DISCHARGE SYSTEM - OUTFALL PUMP STATION BUILDING - PIPING & INSTRUMENTATION DIAGRAM
33-0042-01-PR-PFD-0001	OUTFALL DISCHARGE SYSTEM - PUMP STATIONS AND PIPELINES - PROCESS FLOW DIAGRAM
33-0042-00-PR-PID-0001	OUTFALL DISCHARGE SYSTEM - SYMBOL AND EQUIPMENT LEGEND - PIPING & INSTRUMENTATION DIAGRAM

Reference Drawings

Rev.	Date	Description	Originator	Drawn	Checked
4	2022.06.23	ISSUED FOR CONSTRUCTION PROJECT 6205-E-132-002	MS	JO	SD
3	2022.06.06	ISSUED FOR TENDER PROJECT 6205-E-132-002	MS	JO	SD
2	2022.04.28	ISSUED FOR COMMENTS PROJECT 6205-E-132-002	MS	JO	SD
1	15.08.2018	NOTES ADDED	MJ	AZ	NB
0	16.05.2018	ISSUED FOR CONSTRUCTION	MJ	ML	NB

Revisions

Engineer's Stamp

CLIENT

TMAC RESOURCES

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PATERSON & COOKE CANADA INC.
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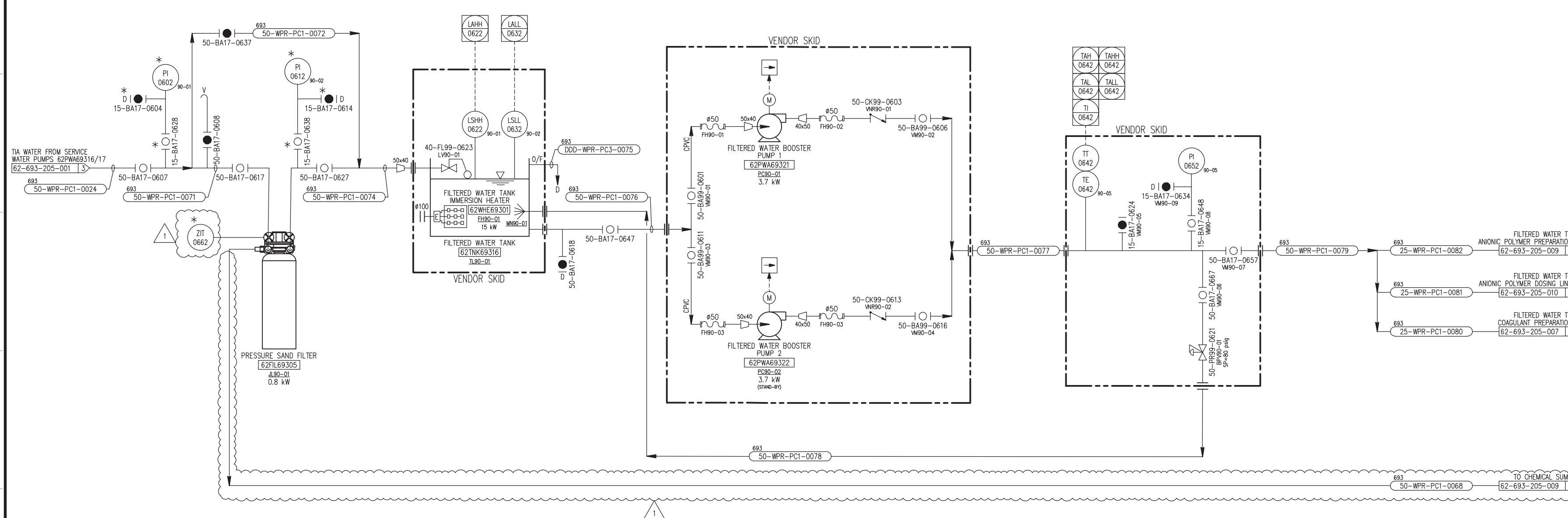
HOPE BAY
WATER DISCHARGE

OUTFALL DISCHARGE SYSTEM
TIA WATER PUMP HOUSE
PIPING & INSTRUMENTATION DIAGRAM

Scale	Off. Code	Proj. Code	Area Code	Disc. Code	Doc. Type	Unique. No	Sheet No	Rev.
N.T.S. ANSI D	33	0042	01	PR	PID	0001	1 OF 6	4

NO. DESSIN / DRAWING NO. 62-693-205-006_R1

FORMAT ARCHD



PLAN CLÉ / KEY PLAN

NOTES GÉNÉRALES / GENERAL NOTES

1. VENDOR SKID INFORMATION IS PROVIDED ON THIS P&ID FOR THE MAIN OBJECTIVES OF INTERCONNEXION CLARITY AND TAGGING STANDARDIZATION. FOR ANY PROCESS DESIGN DISCREPANCY BETWEEN THIS P&ID AND VENDOR P&ID, VENDOR P&ID PREVAILS FOR VENDOR SKIDS.

POUR CONSTRUCTION
FOR CONSTRUCTION
DATE : 2022-06-23

DESSINS EN RÉFÉRENCE / REFERENCE DRAWINGS

TITRE / TITLE	# DWG
VEOLIA P&ID REV. 4 (13 SHEETS)	5000220003 – PI0001

AGNICO EAGLE

REV.	DATE	DESCRIPTION	PAR/BY	APP.	CLIENT
1	2022-06-23	ISSUED FOR CONSTRUCTION	MS	SD	-
0	2022-06-08	ISSUED FOR TENDER	MS	SD	-
A	2022-04-28	FOR REVIEW	MS	SD	-

REVISIONS

PERMIT TO PRACTICE
CIMA CANADA INC. o/a CIMA+
Date 2022-06-23
PERMIT NUMBER: P942
NT/NU Association of Professional Engineers and Geoscientists

TITRE / TITLE
AGNICO EAGLE – HOPE BAY
693 – WATER TREATMENT PLANT
205 – PIPING & INSTRUMENTATION DIAGRAM
SERVICE WATER FILTRATION SYSTEM

DESSINÉ PAR / DRAWN BY	JOHN OSI, Tech.	2022-04-08
VÉRIFIÉ PAR / CHECKED BY	MARYAM SADEGHI, EIT	2022-04-08
APPROUVÉ PAR / APPROVED BY	SYLVIE DESSUREAULT, P.Eng	2022-04-08
ÉCHELLE / SCALE	N.T.S.	2022-04-08

NO. DESSIN / DRAWING NO. 62-693-205-006

NO. PROJET / PROJECT NO. 6205 | RÉVISION 1 | FEUILLE / SHT 1 / 1

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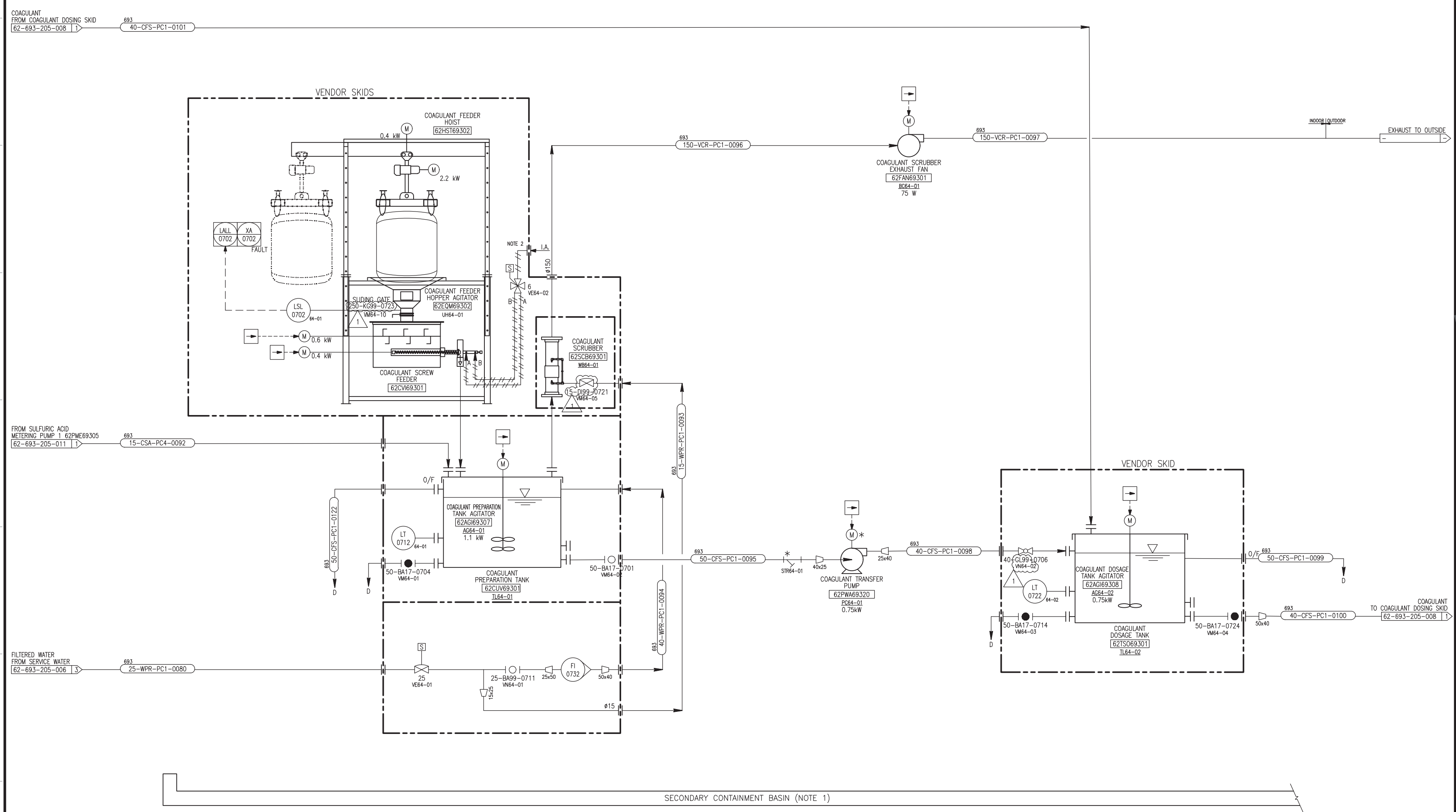
FILE NO. 62-693-205-006_R1.dwg

NO. DESSIN / DRAWING NO. 62-693-205-007_R1



NOTES GÉNÉRALES / GENERAL NOTES

1. COMMON SECONDARY CONTAINMENT FOR COAGULANT AND ANIONIC POLYMER PREPARATION/DOSAGE SYSTEMS.
2. 90-VE62-02 COMPRESSED AIR REQUIREMENT: 4 in³ AT 50 psig PER PISTON TRAVEL. THE FLOWRATE TO BE PROVIDED DEPENDS ON THE NUMBER OF TRAVELS.
3. VENDOR SKID INFORMATION IS PROVIDED ON THIS P&ID FOR THE MAIN OBJECTIVES OF INTERCONNEXION CLARITY AND TAGGING STANDARDIZATION. FOR ANY PROCESS DESIGN DISCREPANCY BETWEEN THIS P&ID AND VENDOR P&ID, VENDOR P&ID PREVAILS FOR VENDOR SKIDS.

POUR CONSTRUCTION
FOR CONSTRUCTION
DATE : 2022-06-23

DESSINS EN RÉFÉRENCE / REFERENCE DRAWINGS

TITRE / TITLE	# DWG
VEOLIA P&ID REV. 4 (13 SHEETS)	5000220003 – PI0001

AGNICO EAGLE

REV.	DATE	DESCRIPTION	PAR/BY	APP.	CLIENT
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1	2022-06-23	ISSUED FOR CONSTRUCTION	MS	SD	.
0	2022-06-06	ISSUED FOR TENDER	MS	SD	.
A	2022-04-28	FOR REVIEW	MS	SD	.

REVISIONS

REGISTERED PROFESSIONAL ENGINEER S.M.Y. DESSUREAULT LICENSEE NT/NU 2022-06-23 L5037

PERMIT TO PRACTICE
CIMA CANADA INC. o/a CIMA+
Signature
Date 2022-06-23
PERMIT NUMBER: P942
NT/NU Association of Professional Engineers and Geoscientists

TITRE / TITLE
AGNICO EAGLE – HOPE BAY
693 – WATER TREATMENT PLANT
205 – PIPING & INSTRUMENTATION DIAGRAM
COAGULANT PREPARATION SYSTEM

DESSINÉ PAR / DRAWN BY	JOHN OSI, Tech.	DATE 2022-04-08
VERIFIÉ PAR / CHECKED BY	MARYAM SADEGHI, EIT	2022-04-08
APPROUVÉ PAR / APPROVED BY	SYLVIE DESSUREAULT, P.Eng	2022-04-08
ÉCHELLE / SCALE	N.T.S.	DATE 2022-04-08
NO. DESSIN / DRAWING NO.	62-693-205-007	
NO. PROJET / PROJECT NO. 6205	REVISION 1	FEUILLE / SHT 1 / 1

FILE NO. 62-693-205-007_R1.dwg

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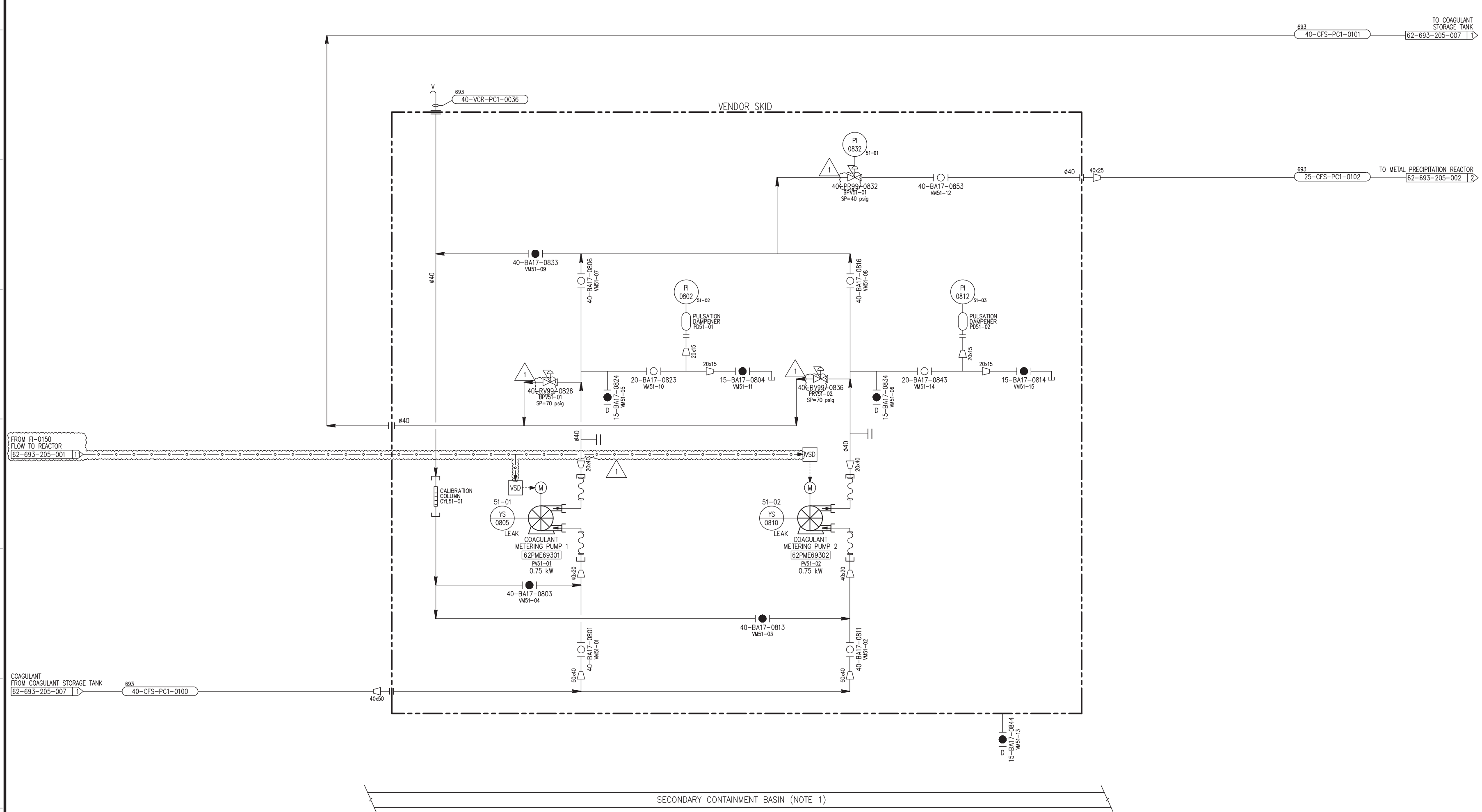
NO. DESSIN DRAWING NO. 62-693-205-008_R1

FORMAT ARCHD



PLAN CLÉ / KEY PLAN

CIMA+

NOTES GÉNÉRALES / GENERAL NOTES

1. COMMON SECONDARY CONTAINMENT FOR COAGULANT AND ANIONIC POLYMER PREPARATION/DOSAGE SYSTEMS.
2. VENDOR SKID INFORMATION IS PROVIDED ON THIS P&ID FOR THE MAIN OBJECTIVES OF INTERCONNEXION CLARITY AND TAGGING STANDARDIZATION. FOR ANY PROCESS DESIGN DISCREPANCY BETWEEN THIS P&ID AND VENDOR P&ID, VENDOR P&ID PREVAILS FOR VENDOR SKIDS.

POUR CONSTRUCTION
FOR CONSTRUCTION
DATE : 2022-06-23
AGNICO EAGLE

DESSINS EN RÉFÉRENCE / REFERENCE DRAWINGS

TITRE / TITLE	# DWG
VEOLIA P&ID REV. 4 (13 SHEETS)	5000220003 - PI0001

AGNICO EAGLE

REV.	DATE	DESCRIPTION	PAR/BY	APP.	CLIENT
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
1	2022-06-23	ISSUED FOR CONSTRUCTION	MS	SD	-
0	2022-06-08	ISSUED FOR TENDER	MS	SD	-
A	2022-04-28	FOR REVIEW	MS	SD	-

REVISIONS

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CIMA CANADA INC. o/a CIMA+
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TITRE / TITLE
AGNICO EAGLE – HOPE BAY
693 – WATER TREATMENT PLANT
205 – PIPING & INSTRUMENTATION DIAGRAM
COAGULANT DOSING SKID

		DATE
DESSINÉ PAR / DRAWN BY	JOHN OSI, Tech.	2022-04-08
VÉRIFIÉ PAR / CHECKED BY	MARYAM SADEGHI, EIT	2022-04-08
APPROUVÉ PAR / APPROVED BY	SYLVIE DESSUREAULT, P.Eng	2022-04-08
ÉCHELLE / SCALE	N.T.S.	2022-04-08

NO. DESSIN / DRAWING NO. 62-693-205-008

NO. PROJET / PROJECT NO.	REVISION	FEUILLE / SHT
6205	1	1 / 1

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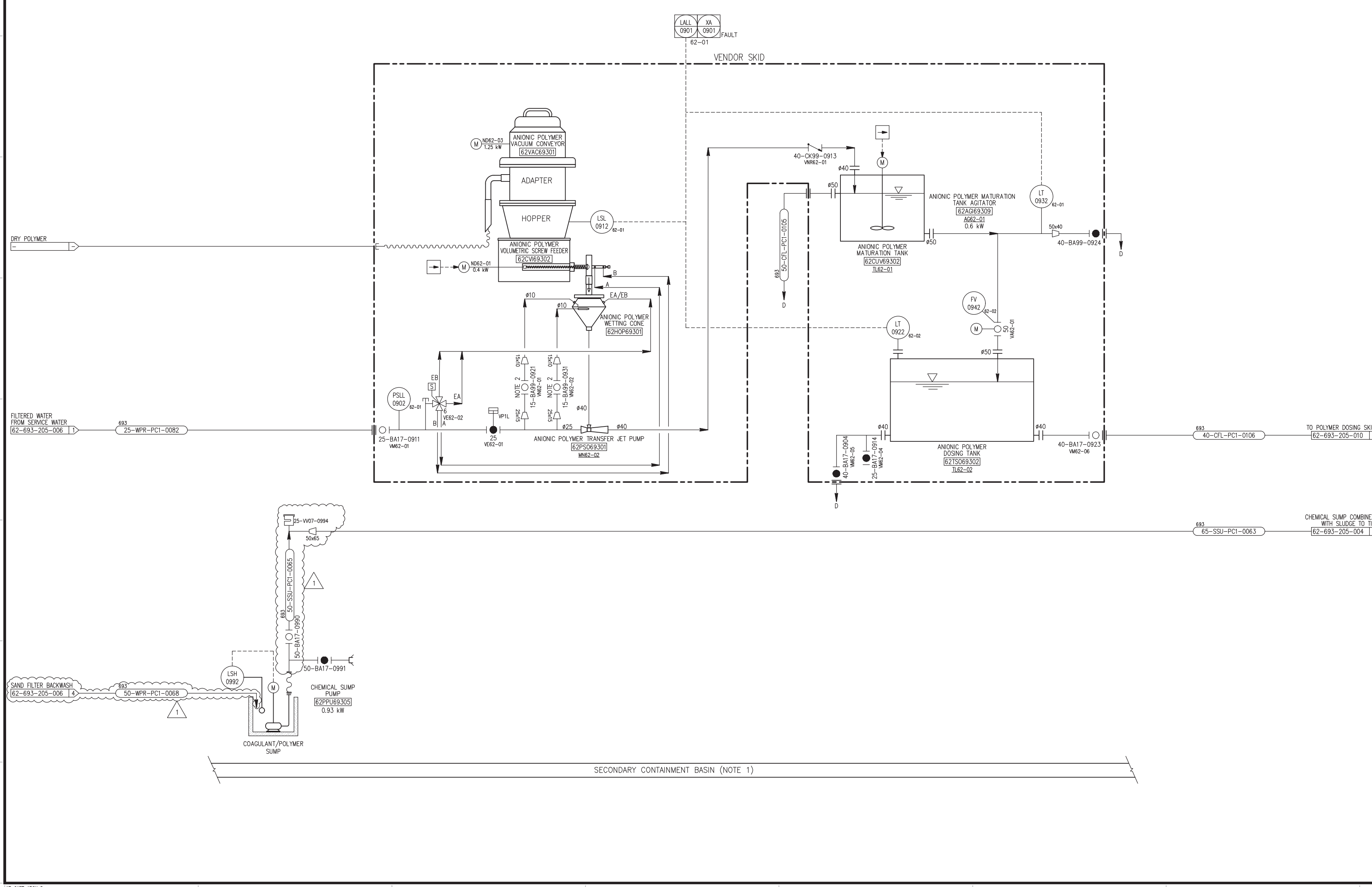
FILE NO. 62-693-205-008_R1.dwg

NO. DESSIN / DRAWING NO. 62-693-205-009_R1



FORMAT ARCHD

CIMA+

NOTES GÉNÉRALES / GENERAL NOTES

1. COMMON SECONDARY CONTAINMENT FOR COAGULANT AND ANIONIC POLYMER PREPARATION/DOSAGE SYSTEMS.
2. METERING VALVE.
3. VENDOR SKID INFORMATION IS PROVIDED ON THIS P&ID FOR THE MAIN OBJECTIVES OF INTERCONNEXION CLARITY AND TAGGING STANDARDIZATION. FOR ANY PROCESS DESIGN DISCREPANCY BETWEEN THIS P&ID AND VENDOR P&ID, VENDOR P&ID PREVAILS FOR VENDOR SKIDS.

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TITRE / TITLE
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693 – WATER TREATMENT PLANT
205 – PIPING & INSTRUMENTATION DIAGRAM
ANIONIC POLYMER PREPARATION SYSTEM

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VÉRIFIÉ PAR / CHECKED BY	MARYAM SADEGHI, EIT	2022-04-08
APPROUVÉ PAR / APPROVED BY	SYLVIE DESSUREAULT, P.Eng	2022-04-08
ÉCHELLE / SCALE	N.T.S.	2022-04-08

NO. DESSIN / DRAWING NO. 62-693-205-009

NO. PROJET / PROJECT NO. 6205 — REVISION 1 — FEUILLE / SHT 1 / 1

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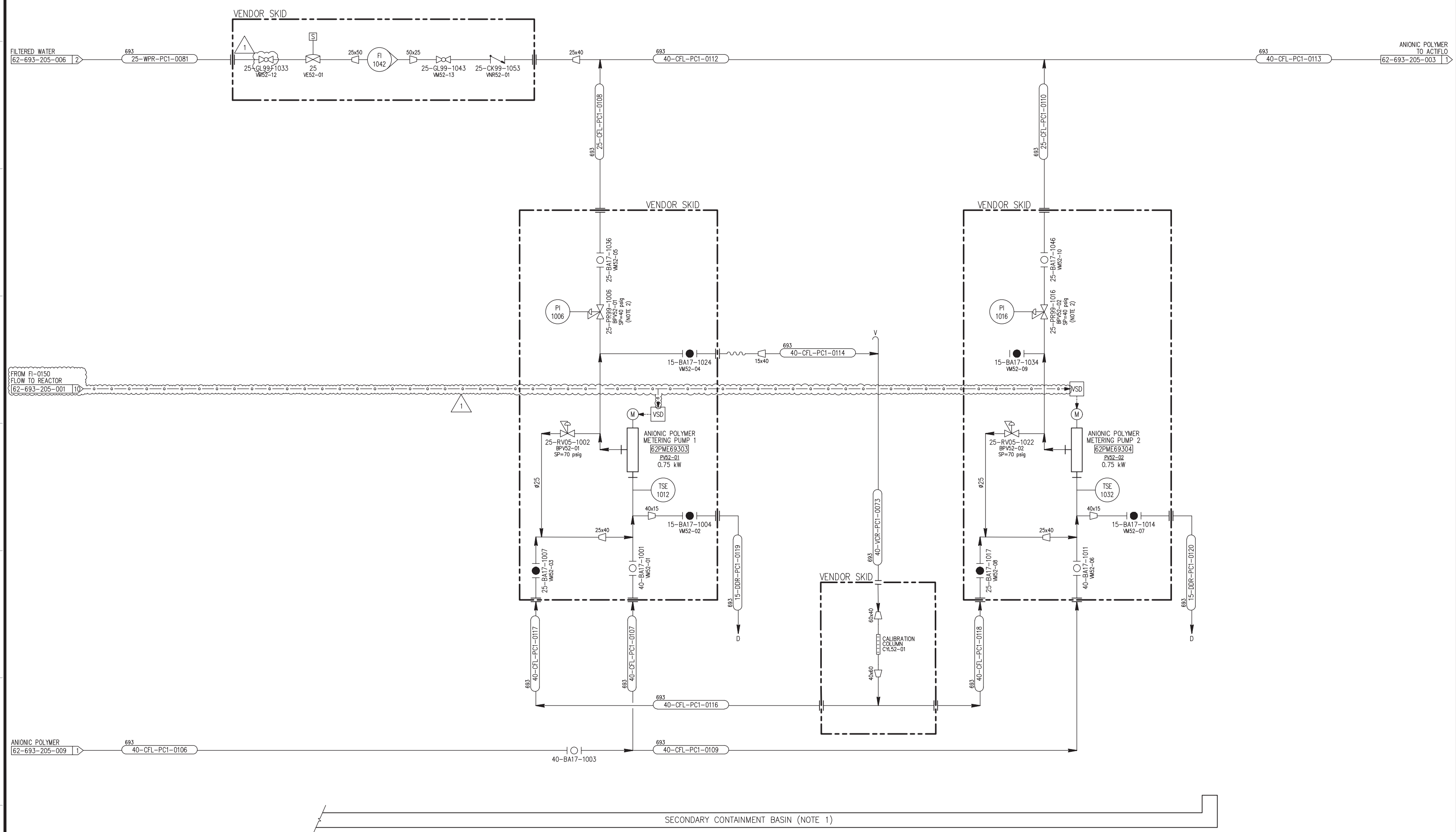
FILE NO. 62-693-205-009_R1.dwg

NO. DESSIN / DRAWING NO. 62-693-205-010_R1

FORMAT ARCHD



PLAN CLÉ / KEY PLAN

CIMA+

NOTES GÉNÉRALES / GENERAL NOTES

1. COMMON SECONDARY CONTAINMENT FOR COAGULANT AND ANIONIC POLYMER PREPARATION/DOSAGE SYSTEMS.
2. PR-99 VALVES ARE THE SAME MODELS AS RV-05 VALVES. (IN THE AGNICO STANDARDS THE BACK PRESSURE AND RELIEF VALVES OF THE CHEMLINE MANUFACTURER - MODEL SB12, HAVE THE SAME CODE OF RV05. IN THIS P&ID, THE CODE RV05 IS CONSIDERED FOR THE RELIEF VALVES, WHILE THE CODE OF PR99 WAS CONSIDERED FOR THE BACK PRESSURE VALVES.)
3. VENDOR SKID INFORMATION IS PROVIDED ON THIS P&ID FOR THE MAIN OBJECTIVES OF INTERCONNEXION CLARITY AND TAGGING STANDARDIZATION. FOR ANY PROCESS DESIGN DISCREPANCY BETWEEN THIS P&ID AND VENDOR P&ID, VENDOR P&ID PREVAILS FOR VENDOR SKIDS.

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0	2022-06-06	ISSUED FOR TENDER	MS	SD	-
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PERMIT TO PRACTICE
CIMA CANADA INC. o/a CIMA+
Date 2022-06-23
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TITRE / TITLE
AGNICO EAGLE - HOPE BAY
693 - WATER TREATMENT PLANT
205 - PIPING & INSTRUMENTATION DIAGRAM
ANIONIC POLYMER DOSING SKID

		DATE
DESSINÉ PAR / DRAWN BY	JOHN OSI, Tech.	2022-04-08
VÉRIFIÉ PAR / CHECKED BY	MARYAM SADEGHI, EIT	2022-04-08
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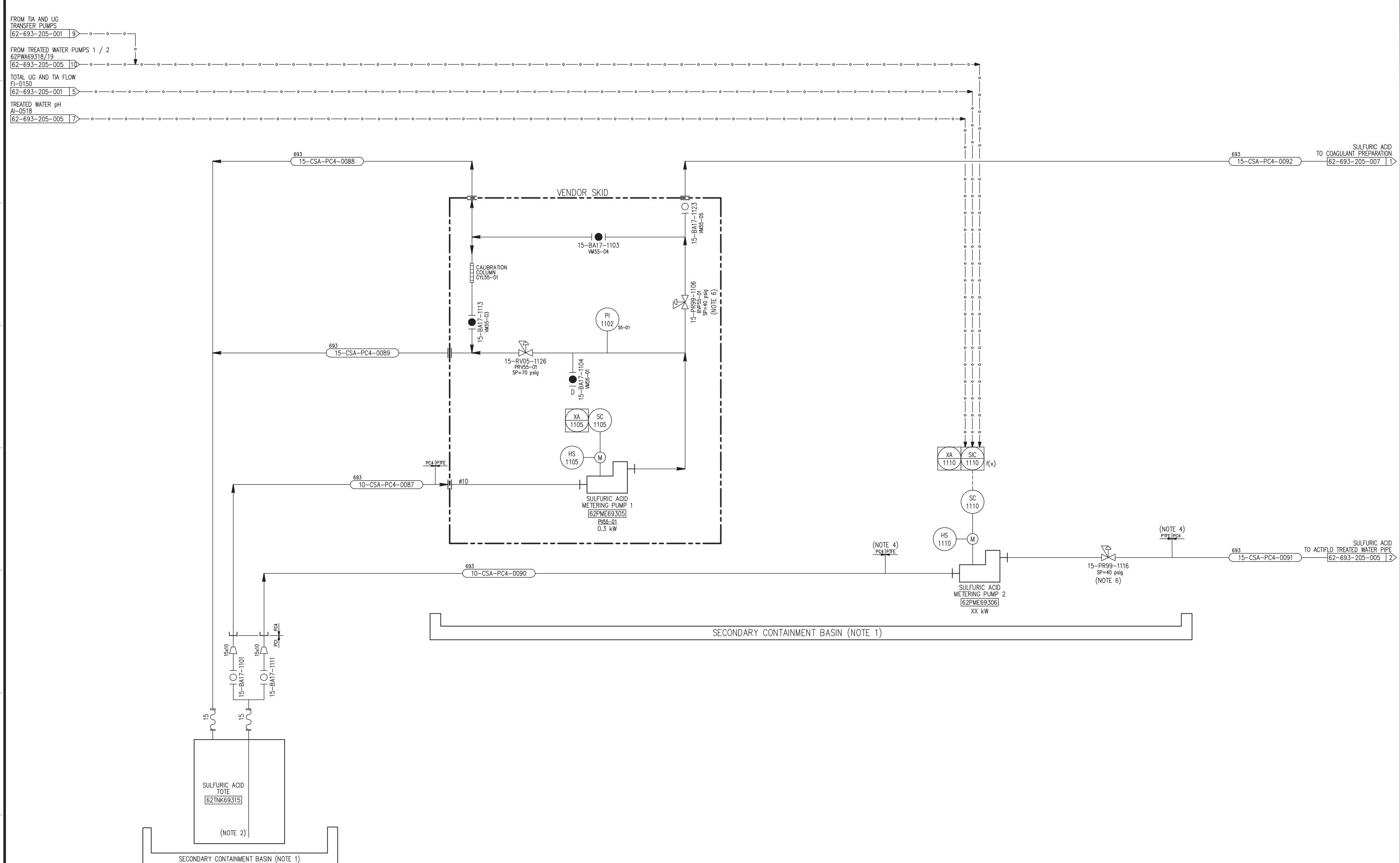
FILE NO. 62-693-205-010_R1.dwg

NO. DESSIN DRAWING NO. 62-693-205-011_R1

FORMAT ARCHD



PLAN CLÉ / KEY PLAN

POUR CONSTRUCTION
FOR CONSTRUCTION
DATE : 2022-06-23

CIMA+

NOTES GÉNÉRALES / GENERAL NOTES

1. ONE OR TWO PLASTIC CONTAINMENTS WITH DRAIN VALVE.
2. 3" TO 6" DISTANCE FROM TOTE TANK BOTTOM.
3. PC4 PIPING SPECIFICATION MODIFIED AS FOLLOWS: INSIDE PIPING MATERIAL (CPVC) IS REPLACED WITH PTFE (TEFLON).
4. FROM SPECIFICATION BREAK, OUTSIDE PIPING IS NOT PRESENT.
5. PIPING DIAMETER INDICATED IS FOR INSIDE PIPING (PTFE). OUTSIDE PIPING IS 50mm DIAMETER (CPVC SCH 80).
6. PR-99 VALVES ARE THE SAME MODELS AS RV-05 VALVES. (IN THE AGNICO STANDARDS THE BACK PRESSURE AND RELIEF VALVES OF THE CHEMLINE MANUFACTURER - MODEL SB12, HAVE THE SAME CODE OF RV05. IN THIS P&ID, THE CODE RV05 IS CONSIDERED FOR THE RELIEF VALVES, WHILE THE CODE OF PR99 IS CONSIDERED FOR THE BACK PRESSURE VALVES.)
7. VENDOR SKID INFORMATION IS PROVIDED ON THIS P&ID FOR THE MAIN OBJECTIVES OF INTERCONNEXION CLARITY AND TAGGING STANDARDIZATION. FOR ANY PROCESS DESIGN DISCREPANCY BETWEEN THIS P&ID AND VENDOR P&ID, VENDOR P&ID PREVAILS FOR VENDOR SKIDS.

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AGNICO EAGLE - HOPE BAY
693 - WATER TREATMENT PLANT
205 - PIPING & INSTRUMENTATION DIAGRAM
SULFURIC ACID DOSING SKID

		DATE
DESSINÉ PAR / DRAWN BY	JOHN OSI, Tech.	2022-04-08
VÉRIFIÉ PAR / CHECKED BY	MARYAM SADEGHI, EIT	2022-04-08
APPROUVÉ PAR / APPROVED BY	SYLVIE DESSUREAULT, P.Eng	2022-04-08
ÉCHELLE / SCALE	N.T.S.	2022-04-08

NO. DESSIN / DRAWING NO. 62-693-205-011

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6205	1	1 / 1

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FILE NO. 62-693-205-011_R1.dwg

NO. DESSIN / DRAWING NO. 62-693-205-012_RB

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EQUIPMENT IDENTIFICATION

EX. 65TNK99901 / DESCRIPTION 01 / DESCRIPTION 02 / kW

- PROJECT IDENTIFICATION
- EQUIPMENT TYPE (SEE MECHANICAL SYMBOLS)
- AREA
- SEQUENTIAL NUMBER
- EQUIPMENT DESCRIPTION (2 LINES)
- TOTAL KW FOR 4 MOTORS & HIGHER OTHERWISE EACH kW IS SEPARATED BY A "/"
- TOTAL VOLUME IN CUBIC METER

TANK NOZZLES IDENTIFICATION

NA	INLET
NE	OUTLET
NP	INSTRUMENT (PROCESS)
NS	SPARE
NV	MANHOLE
NW	OVERFLOW
NS	DRAIN
NY	VENT
EL	EARTH LUG

*NOZZLES CODE WILL HAVE A SEQUENTIAL NUMBER FOR SUFFIX

MANUAL VALVE IDENTIFICATION

DDD-CCCC-9999

- SEQUENTIAL NUMBER
- VALVE TYPE
- VALVE SIZE

AUTOMATIC VALVE ONLY SIZE WILL BE SHOWN

DDD — VALVE SIZE

VALVES TYPE

OPENED	CLOSED	TYPE	DESCRIPTION
		GL	GLOBE
		BA	BALL
		VB	V-BALL
		BF	BUTTERFLY
		ND	NEEDLE
		KG	KNIFE GATE
		DI	DIAPHRAGM
		PI	PINCH
		PG	PLUG
		VA	ANGLE
		GA	GATE VALVE
		WV	WEIR
		WD	WEIR DIAPHRAGM
		3W	3 WAY
		CK	CHECK
		PR	PRESSURE REGULATOR
		RV	RELIEF VALVE
		DP	DART PLUG
		FO	FOOT
		IPR	INLINE PRESURE RELIEF
		FC	FLOW CONTROL
		4W	4 WAY
		FL	FLOAT
		EF	EXCESS FLOW VALVE
		TH	3WAY THERMOSTAT
		CB	CIRCUIT BALANCING
		CK	INJECTION QUILL
		VV	VACUUM BREAKER

MANUAL VALVE SEQUENTIAL NUMBERING

MANUAL VALVE NUMBERING SHALL BE AS FOLLOWS:

XXX–AAA–BB99–YYYY

WHEREBY XXX CORRESPONDS TO THE LOCATED AREA

WHEREBY AAA CORRESPONDS TO THE MANUAL VALVE DIAMETER (EXPRESSED IN mm)

WHEREBY BB99 WILL BE A TWO(2) LETTER CODE DESCRIBING THE TYPE OF MANUAL VALVE (SEE VALVES TYPE) & A TWO NUMBER CODE FOR SPECIFICATION (SEE PIPING STANDARD)

WHEREBY YYYY WILL BE A SEQUENTIAL NUMBER FROM 0001 TO 9999 FOR EACH AREA. THE FIRST TWO DIGITS CORRESPOND TO THE DRAWING NUMBER, AND THE LAST TWO ARE SEQUENTIAL TO 100.

EXAMPLE:
MANUAL BALL VALVE : 693–150–BA01–0215

693	IS THE AREA OF THE MANUAL VALVE
150	IS THE MANUAL VALVE SIZE
BA01	IS THE TYPE OF VALVE
0215	IS THE SEQUENTIAL NUMBER WHERE 02 CORRESPONDS TO THE P&ID NUMBER.

PIPE IDENTIFICATION

EX. DDD–WPR–CCCC–XXXX (SECT, HT–FP)

- AREA OF ORIGIN
- INSULATION
- SEQUENTIAL NUMBER
- PIPE CLASS
- FLUID SERVICE
- PIPE DIAMETER (mm)

PIPE INSULATION CODES

AC	ACOUSTIC CONTROL
CC	COLD CONSERVATION
CP	CONDENSATION CONTROL
FP	FREEZE PROTECTION (INSULATION ONLY)
HC	HEAT CONSERVATION
HT	HEAT TRACING
NN	NONE (NOT SHOWN ON PID)
PP	PERSON PROTECTION

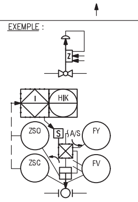
PIPE CLASS

FOR PIPING CLASS AND SPECIFICATION SEE DOCUMENT 6515–GGD–012 (PIPING, VALVES & FITTINGS GENERAL SPECIFICATIONS)

POSITION

FAILED MODE: OPEN / CLOSE / LAST

EXEMPLE :



GLOBE VALVE WITH A SINGLE ACTION TRIGGER MODULE WITH AN ELECTRO–PNEUMATIC PROVIDING OPEN FAILURE POSITION

ON & OFF BALL VALVE WITH A CLOSE FAILURE POSITION

FLUID SERVICE CODES

AIR		
AES	ENGINE STARTING AIR	CE4, SE1
AIN	INSTRUMENT TUBING	CC8
API	PLANT & INSTRUMENT AIR	SC4
APR	PROCESS AIR	CC9
APRS	PROCESS SQUEEZE	CC2
APRB	PROCESS BLOWDOWN	CC2
CHEMICALS		
CAN	HYDROCHLORIC ACID	PC1
CAS	ANTISCALANT	SC4
CCA	CAUSTIC	CC3
CCC	CALCIUM CHLORIDE	PC1
CCU	COPPER SULPHATE	SC1
CCS	SODIUM CYANIDE	CC4
CFL	FLOCULANT	CC2
CLS	LIME SOLUTION	CC2
CSM	SODIUM METABISULPHITE	SC1
DRAINAGE		
DDR	SERVICES, PROCESS FLOOR	PA1,CC2,CC12
DSA	SANITARY	PA1
DSD	STORM	PA1
GASES		
GOX	OXYGEN	CC3
GRE	REFRIGERANT	BE1
HYDRAULIC OILS		
HYH	HIGH PRESSURE	SJ1
HYO	HYDRAULIC OILS	SG1
LUBE SYSTEM		
LAP	ATMOSPHERIC PRESSURE	SC5
LBH	BREAK OIL HIGH PRESSURE	SJ1
LEL	LUBE OIL ENGINE	CC12
LGH	GREASE HIGH PRESSURE	SJ1
LLH	LUBE OIL HIGH PRESSURE	SJ1
LLL	LUBE OIL LOW PRESSURE	SC1
LTG	TRUCK GREASE DISTRIBUTION	CJ1
LTL	TRUCK LUBE OIL LOW PRESSURE	CC12
LTP	TRUCK LUBE OIL HIGH PRESSURE	CG1
PROCESS		
PBS	BARREN SOLUTION	CC3
PDI	DIESEL	CC10, CC16
PGA	GASOLINE	CC10, CC16
PPS	PREGNANT SOLUTION	CC3
SLURRIES		
SCA	CARBON SLURRY	PC21
SPB	PASTE BACKFILL	CH1
SSL	PROCESS SLURRY	CC1, CC2
SSU	SUMP	CC2, CC3, PC21, PC1, SC1
WATER		
WCO	COOLING	CC2
WCW	CHILLED WATER	CC2
WEC	ENGINE COOLING FLUID	CC11
WES	EMERGENCY SHOWERS	PC1
WER	HEAT RECOVERY FLUID	CC2, CC11, CC17,
WFG	FIRE PROTECTION DRY SYSTEM	CC6
WFI	FIRE WATER	CC7, PC9
WFR	FRESH WATER	CC2, PC11
WHR	WATER HEATING RETURN (GLYCOL)	CC2, CC3, CC18
WHS	WATER HEATING SUPPLY (GLYCOL)	CC2
WPC	POTABLE COLD WATER	BC1, PC1
WPH	POTABLE HOT WATER	BC1, PC1
WPL	POTABLE WATER	BC1, PC1
WPR	PROCESS WATER	CC2, PC17, CH1
WSL	GLAND SEAL WATER	CC2
WWH	WASH WATER HIGH PRESSURE	CG1
WWX	WASH WATER EXTRA H. PRESSURE	CJ1

PIPING NUMBERING

PIPING NUMBERING SHALL BE AS FOLLOWS:

XXX–AAA–BBB–CCC–YYYY–ZZ*–TT*

WHEREBY XXX CORRESPONDS TO THE ORIGIN AREA

WHEREBY AAA CORRESPONDS TO THE LINE'S NOMINAL DIAMETER (EXPRESSED IN mm)

WHEREBY BBB WILL BE A THREE LETTER CODE DESCRIBING THE FLUID CIRCULATING IN THE PIPE (SEE FLUID SERVICE CODES)

WHEREBY CCC WILL BE THE SPECIFICATION CODE COMPOSED OF THREE CARACTER (SEE PIPE CLASS)

WHEREBY YYYY IS A SEQUENTIAL NUMBER FROM 0001 TO 9999 BY AREA. ANY SPECIFICATION CHANGE , DIVERGENCE (BRANCHING) WILL CAUSE A CHANGE IN THE SEQUENTIAL NUMBER.

WHEREBY ZZ WILL BE THE INSULATION CODE (SEE INSULATION CODES). *OPTIONAL

WHEREBY TT WILL BE THE INSULATION THICKNESS. *OPTIONAL

EXAMPLE:
FIRE WATER LINE : 600–150–WFI–H05–0095
FIRE WATER LINE : 600–150–WFI–H05–0001–FP–25

FLOWLINES

- FLOW DIRECTION ARROW
- MAIN FLOW & PULP
- SLURRY
- WATER
- REAGENTS
- SOLUTION
- AIR
- FUEL, OIL, GAZ

INLINE – MISCELLANEOUS

- SIGHT GLASS
- ABOVE GROUND /UNDERGROUND SYMBOL HORIZONTAL LINE (UG AG)
- ABOVE GROUND /UNDERGROUND SYMBOL VERTICAL LINE (UG AG)
- BATTERY LIMIT
- CONCENTRIC REDUCER (50x75)
- ECCENTRIC REDUCER (50x75)
- SPECIFICATION BREAK (A1 A2)
- IN-LINE MIXER
- AIR DRYER

INLINE – FLOW METERS

- ORIFICE PLATE
- VENTURI TUBE OR FLUID FLOW
- FLOW METER ELECTROMAGNETIC (M)
- FLOW METER VORTEX
- FLOW METER CORIOLIS (C)
- TUBE PITOT
- SONIC FLOW ELEMENT
- FLOW METER TURBINE (8)
- POSITIVE DISPLACEMENT (∞)
- THERMAL FLOW METER (T)
- ROTAMETER

INLINE – FILTERS

- FILTER (FL)
- BASKET STRAINER
- DUPLEX STRAINER
- Y–STRAINER (ST)
- STEAM TRAP (XM)

MASS BALANCE

- MASS BALANCE LINE STREAM NUMBER (01)
- FLOW OR PRESSURE BOX TO BE ON PIPE (FLOW METRIC US)

FLANGES & CONNECTIONS

- BLIND FLANGE
- FLANGED CONNECTION
- WELDED CONNECTION
- VICTAULIC CONNECTION
- SPADE
- SPACER
- RUPTURE DISC
- NOZZLE, MAN HOLE
- SPECTACLE BLIND (OPEN)
- SPECTACLE BLIND (CLOSE)

GENERAL PIPING SYMBOLS

- CAP
- QUICK COUPLING
- BUTT WELD CAP
- CAMLOCK COUPLING
- FLEXIBLE HOSE
- EXPANSION JOINT
- DIAPHRAGM SEAL
- STEAM OR SPRAY NOZZLE
- STEAM OR SPRAY MULTI NOZZLES
- SPECIAL PIPE ITEM (SP 01)
- TIE–IN POINT (TP 01)
- CONTINUATION ARROW (ON SHEET) (EQUIPMENT DESCRIPTION / EQUIPMENT TAG / 62–693–205–003 X)
- CONTINUATION ARROW (OFF SHEET) (EQUIPMENT DESCRIPTION / EQUIPMENT TAG / 62–693–205–003 X)
- SLOPE INDICATION
- BREAK LINE
- ELECTRICAL & INSTRUMENTATION DIRECTION ARROW

VALVE ACTUATORS

- MANUAL LEVER OPERATED
- MANUAL WHEEL OPERATED
- SPRING
- ELECTRO–PNEUMATIC CONVERTER INTEGRATED IN ACTUATOR
- SOLENOID (ELECTRICAL CONTROL)
- PNEUMATIC OR HYDRAULIC CYLINDER
- SINGLE ACTION CYLINDER
- ON/OFF ACTUATOR
- PNEUMATIC RELAY
- SINGLE ACTION – MODULATING ACTUATOR
- DOUBLE ACTION – MODULATING ACTUATOR
- PRESSURE REGULATOR (EXTERNAL TAPPING)
- PRESSURE REGULATOR (SELF CONTAINED)
- 3 WAY
- 4 WAY

INSTRUMENT LINE IDENTIFICATION

- ELECTRICAL LINK
- PNEUMATIC SIGNAL & SUPPLY
- CAPILLARY TUBE
- ULTRASONIC SIGNAL
- GUIDED SIGNAL
- RADIOACTIVE SIGNAL
- INTERNAL LINK TO THE MAIN CONTROL SYSTEM
- WIRELESS LINK TO THE MAIN CONTROL SYSTEM (WL)
- HYDRAULIC LINK (L)
- COAX LINK (COAX)
- OPTIC FIBRE LINK (F)
- SINGLEMODE OPTIC FIBRE LINK (FOSM)
- MULTIMODE OPTIC FIBRE LINK (FOMM)
- ETHERNET LINK (E)
- MODBUS LINK (M)
- PROFIBUS LINK (P)
- TELEPHONIC LINK (T)
- MECHANICAL LINK

MISCELLANEOUS SYMBOLS

- PILOT LIGHT
- CAMERA
- BUZZER C/W SINGLE HORN
- BUZZER C/W DOUBLE HORN
- BEACON
- SINGLE SIDED PULL CORD
- SINGLE SIDED DOUBLE CORD
- MECHANICAL SPEED SENSOR
- STREET LIGHTS (R, G, A)
- VENT (V)
- PULSATION DAMPENER
- CALIBRATION COLUMN
- STANDPIPE

PLAN CLÉ / KEY PLAN

CIMA+

NOTES GÉNÉRALES / GENERAL NOTES

POUR INFORMATION / FOR INFORMATION — AGNICO EAGLE — DATE : 2022-06-23

DESSINS EN RÉFÉRENCE / REFERENCE DRAWINGS

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B	2022–06–23	FOR INFORMATION	MS	SD	.
A	2022–06–06	FOR INFORMATION	MS	SD	.

REVISIONS

TITRE / TITLE
AGNICO EAGLE – HOPE BAY
693 – WATER TREATMENT PLANT
205 – PIPING & INSTRUMENTATION DIAGRAM
LEGEND 1

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6205	B	1 / 1

FILE NO. 62–693–205–012_RB.dwg

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INSTRUMENTATION IDENTIFICATION NUMBER

EX. XX / XXXX — INSTRUMENT IDENTIFICATION; LOOP NUMBER

SIGNAL GENERATED FROM ANALOG VALUES

- ☐ ALARM ONLY
- ◪ INTERLOCK & ALARM
- ■ INTERLOCK ONLY

THRESHOLDS :
HH, H, M, L, LL, DL, DH

EX. XX / XXXX — HH ◪, H ■, L ■, LL ☐

INSTRUMENT CONTROL LOOP NUMBERING METHOD

INSTRUMENT CONTROL LOOP NUMBERING SHALL BE AS FOLLOWS:

62BBBXXXYYYY

WHEREBY 62 CORRESPONDS TO THE PROJECT CODE.

WHEREBY BBB CORRESPONDS TO THE TYPE OF INSTRUMENT IN ACCORDANCE WITH THE SOCIETY OF INTERNATIONAL SOCIETY OF AUTOMATION (ISA) AS EXPLAIN.

WHEREBY XXX CORRESPONDS TO THE AREA NUMBER AS DEFINED TO THE PROJECT.

WHEREBY YYYY WILL BE A SEQUENTIAL NUMBER FROM 0100 TO 9999 DETERMINED BY THE INSTRUMENTATION CONTROL LOOP AND WILL BE UNIQUE FOR THE OVERALL AREA, THE FIRST TWO(2) LOOP NUMBERS REFER TO THE LAST TWO(2) P&ID SEQUENTIAL IDENTIFICATION NUMBERS.

EXAMPLES:
THE LEVEL INDICATOR TRANSMITTER INSTRUMENT NUMBER OF THE 11TH INSTRUMENTATION CONTROL LOOP INSTALLED IN AREA 600, PRESENTED ON P&ID 62-693-205-201 WOULD BE 62LIT6930111.

SINCE A CONTROL LOOP NUMBER IS UNIQUE TO THE OVERALL AREA, PROGRAMMING TAGS WILL CORRESPOND TO THE CONTROL LOOP COMPONENT INCLUDING THE AREA NUMBER.

CABLE & WIRE IDENTIFICATION

CABLE :

CABLES WILL HAVE THE SAME NUMBER AT EACH END, AS THEIR RESPECTIVE EQUIPMENT OR INSTRUMENT TO WITCH THEY WERE CONNECTED TO THEIR DESTINATION.

CABLE SUFFIXES:

P1 WILL BE USED TO IDENTIFY POWER CABLES.
C1 WILL BE USED TO IDENTIFY CONTROL CABLES.
T1 WILL BE USED TO IDENTIFY TELECOMMUNICATION CABLES.

SHOULD THERE BE MORE THAN ONE CABLE OF THE SAME TYPE ASSOCIATED WITH THE SAME EQUIPMENT OR INSTRUMENT, SUFFIXES P1, P2, P3..., C1, C2, C3..., T1, T2, T3... WILL BE USED AS NEEDED.

EXAMPLE:
THE CONTROL CABLE IDENTIFICATION FOR INSTRUMENT 65LIT6000111 WILL BE 65LIT6000111 -C1, AND IF NEEDED, THE POWER CABLE IDENTIFICATION WILL BE 65LIT6000111-P1.

WIRE:

WIRES WILL HAVE THE SAME NUMBER AT EACH END, AS THEIR RESPECTIVE EQUIPMENT OR INSTRUMENT TO WITCH THEY WERE CONNECTED TO HEIR DESTINATION.

WIRE SUFFIXES :

L WILL BE USED TO IDENTIFY LIVE WIRES.
N WILL BE USED TO IDENTIFY NEUTRAL WIRES.

IF THERE IS NO SUFFIX, THIS WILL BE USED TO IDENTIFY SIGNAL WIRES. THE PARENTHESIS WILL SHOW THE CABLE WIRE NUMBERING.

DIGITAL SIGNAL : THE PARENTHESIS WILL SHOW A INCREMENTING NUMBER WHERE (1) WILL BE THE LIVE WIRE AND (2) WILL BE THE NEUTRAL WIRE, IF POSSIBLE.

ANALOG SIGNAL: THE PARENTHESIS WILL SHOW THE PLUS / MINUS SIGN AND AN INCREMENTING NUMBER, IF A MULTI CONDUCTOR CABLE.

EXAMPLE:
THE WIRES IDENTIFICATIONS FOR THE INSTRUMENT 6000-LIT-0111 WILL BE 62LIT6000111 (+), 62LIT6000111 (-), 62LIT6000111 L (1) & 62LIT6000111 N (2)

COLORS:
B BLACK
BL BLUE
Br BROWN
G GREEN
R RED
Y YELLOW
W WHITE
Gr GRAY
OR ORANGE

IDENTIFICATION LETTERS OF INSTRUMENTS TABLE FOLLOWING ISA STANDARDS

	FIRST LETTER		FOLLOWING LETTERS		
	MESURED VARIABLE	MODIFIER	READOUT OR PASSIVE FUNCTION	OUTPUT FUNCTION	MODIFIER
A	ANALYSIS		ALARM		
B	BURNER		BELL	USER'S CHOICE	USER'S CHOICE
C	USER'S CHOICE			CONTROL	
D	DENSITY	DIFFERENTIAL			
E	VOLTAGE		PRIMARY ELEMENT		
F	FLOW	FRACTION			
G	USER'S CHOICE		GLASS, VIEWING DEVICE		
H	HAND				HIGH
I	CURRENT		INDICATION		
J	POWER	SCANNING			
K	TIME	TIME RATE OF CHANGE		CONTROL STATION	
L	LEVEL		LIGHT		LOW
M	USER'S CHOICE	MOMENTARY			MIDDLE, INTERMEDIATE
N	USER'S CHOICE		USER'S CHOICE	USER'S CHOICE	USER'S CHOICE
O	MECHANICAL TORQUE		ORIFICE, RESTRICTION		
P	PRESSURE		SAMPLING POINT	MAIN	
Q	QUANTITY	INTEGRATER, TOTALIZER			
R	U.V. RAY				
S	SPEED, FREQUENCY	SAFETY	RECORDER	SWITCH	
T	TEMPERATURE			TRANSMITTER	
U	MULTIVARIABLE		MULTIFUNCTION	MULTIFUNCTION	MULTIFUNCTION
V	MECHANICAL VIBRATION			VALVE	
W	WEIGHT, FORCE		WELL		
X	UNCLASSIFIED	X AXIS	UNCLASSIFIED	UNCLASSIFIED	UNCLASSIFIED
Y	LOGICAL EVENT, STATE, PRESENCE	Y AXIS		RELAY, COMPUTER, CONVERTER	
Z	POSITION	Z AXIS		WATERACTUATOR, FINAL ELEMENT	

GENERAL INSTRUMENT AND FUNCTION SYMBOLS

	LOCATED IN THE PROCESS	LOCAL/PRIMARY CONTROL UNIT		CENTRAL/AUXILIARY CONTROL UNIT	
		OPERATOR ACCESS	OPERATOR NON-ACCESS	OPERATOR ACCESS	OPERATOR NON-ACCESS
DISCRETE COMPONENT	XXX XXXX	XXX XXXX	XXX XXXX	XXX XXXX	XXX XXXX
MAN-MACHINE INTERFACE	XXX XXXX	XXX XXXX	XXX XXXX	XXX XXXX	XXX XXXX
SPECIALIZED PROCESS INSTRUMENT	XXX XXXX	XXX XXXX	XXX XXXX	XXX XXXX	XXX XXXX
WIRED LOGIC	I — SEQUENTIAL LOGIC & CONTROL	I R — INTERPOSITION RELAY		S R — SAFETY RELAY	
PROCESS CONTROL SYSTEM		PROCESS CONTROL SYSTEM			

PROGRAMMING NOTES

LOW LOW, LOW, HIGH AND HIGH HIGH WILL BE PROGRAMMED AND ONLY ENABLE ALARMS WILL BE SHOWN ON THE P&ID'S.
ONLY WHAT STOP AN EQUIPMENT AND/OR CLOSE A VALVE WILL BE SHOWN BUT AUTOMATIC START AND/OR OPEN WILL BE CREATED INTO THE PROGRAM.

INSTRUMENTATION & AUTOMATION DRAWING NUMBERING

DRAWING NUMBERING IS AS FOLLOWS:

[PROJECT CODE]-[AREA]-[DISCIPLINE]-[SEQUENTIAL NUMBER]-[PAGE NUMBER (IF REQUIRED)]-[REVISION]

SEQUENTIAL NUMBER DESCRIPTION:

DISCIPLINE :

205 P&ID
280 INSTRUMENTATION

1ST, 2ND & 3RD SEQUENTIAL NUMBER - SUB-DISCIPLINE :

2xx P&ID or INTERNAL DRAWINGS
2xx NETWORK TOPOLOGY
3xx SINGLE LINE MOTOR
8xx TELECOMMUNICATION JUNCTION BOX DRAWING
9xx DIGITAL JUNCTION BOX DRAWING, HMI JUNCTION BOX DRAWING CONTROL PANEL DRAWING
1xx MAIN PLC DRAWING, 2ND SEQUENTIAL NUMBER REPRESENTS THE PANELS SEQUENTIAL NUMBER IN THAT AREA. (MAX. 9)
2xx REMOTE I/O PLC DRAWING, 2ND SEQUENTIAL NUMBER REPRESENTS THE PANELS SEQUENTIAL NUMBER IN THAT AREA.(MAX. 9)

2ND & 3RD SEQUENTIAL NUMBER DRAWING WILL BE FROM 01 to 99 EXCEPT AS FOLLOWS :

NETWORK TOPOLOGY :

200 to 209 OPTIC FIBRE LINK GENERAL LAYOUT
210 to 219 SIMPLIFIED AUTOMATION NETWORK ARCHITECTURE
220 to 299 DETAILLED AUTOMATION NETWORK ARCHITECTURE

PLC & REMOTE I/O :

3RD SEQUENTIAL NUMBER & PAGE NUMBER:

0-1 PANEL PHYSICAL LAYOUT
0-2 MATERIAL LIST
0-3 TERMINALS & CIRCUIT BREAKERS
0-4 CONTROL SUPPLY
0-5 CONTROL SUPPLY (24VDC)
0-6 CONTROL SUPPLY (UPS)
0-7 NETWORK PATCH CORD LAYOUT
0-8 PANEL BOTTOM PLATE HOLES LAYOUT
0-9 PANEL INSTALLATION LAYOUT
1-x DISCRETE INPUT
2-x RELAY OUTPUT
3-x ANALOG INPUT
4-x ANALOG OUTPUT
5-x RTD
6-x HIGH SPEED COUNTER
7-x EMERGENCY STOP
8-x & 9-x MISCELLANEOUS

FOR MORE PRECISION ON PROJECT CODE, AREA, DISCIPLINE & REVISION SEE PROJECT STANDARD

PANEL & JUNCTION BOX NUMBERING

PANEL & JUNCTION BOX NUMBERING SHALL BE AS FOLLOWS:

65BBBXXXYY

WHEREBY XXX CORRESPONDS TO THE AREA NUMBER AS DEFINED TO THE PROJECT.

WHEREBY BBBB CORRESPONDS TO THE TYPE OF EQUIPMENT :

PLC PLC PANEL
IOP RIO PANEL
CMM TELECOMMUNICATION PANEL
JBC JUNCTION BOX
HMI HMI PANEL
CPL LOCAL CONTROL PANEL

WHEREBY YYY WILL BE A SEQUENTIAL NUMBER FROM 001 TO 899 FOR GENERAL USE. SEQUENTIAL NUMBER FROM 900 TO 999 WILL BE USED FOR THE FIRE SYSTEM.

EXAMPLES:
THE FIRST PLC PANEL LOCATED IN AREA 6000 WILL BE 6000-XPLC-001.

TERMINAL BLOCK NUMBERING

TERMINAL BLOCKS NUMBERING SHALL BE AS FOLLOWS:

TBABB-YY

WHEREBY A CORRESPONDS TO THE TERMINAL BLOCK CONNECTED RACK.

WHEREBY BB CORRESPONDS TO THE TERMINAL BLOCK CONNECTED SLOT.

WHEREBY YY CORRESPONDS TO THE NUMBER OF TERMINAL BLOCK NEEDED.

THE ANALOG INPUTS TERMINAL BLOCK USED FOR THE 8 ANALOG INPUTS CARD LOCATED IN RACK 02 SLOT 00. IT WILL BE NUMBERED AS FOLLOWS TB20-01.

ABBREVIATIONS

A AMBER
AA AMBIENT AIR
A/G ABOVE GROUND
AHS AIR HOSE STATION
A/S INSTRUMENT AIR SUPPLY
CPL LOCAL CONTROL PANEL
CO CONTROLLER OUTPUT
COM COMMON EQUIPMENT DEVICE
CMM TELECOMMUNICATION JUNCTION BOX
CON CONDUCTIVITY
CSC CAR SEALED CLOSED
CSO CAR SEALED OPEN
D DRAIN
DH HIGH DIFFERENTIAL THRESHOLD
DL LOW DIFFERENTIAL THRESHOLD
D/S D.C. SUPPLY
E EXISTING
E/S CONTROL SYSTEM POWER SUPPLY FEED FROM A UTILITY PANEL
E/S PP POWER SUPPLY FEED FROM PANEL XXX/YYY V
E/S UP ELECTRICAL SUPPLY FEED FROM A NORMAL UTILITY PANEL
E/S UPU ELECTRICAL SUPPLY FROM AN EMERGENCY UTILITY PANEL
EX EXPLOSION-PROOF ENCLOSURE
FC FAIL CLOSED
FHS FIRE HOSE STATION
FO FAIL OPEN
FOT FLAT ON TOP
FOB FLAT ON BOTTOM
FLP FAIL LAST POSITION
G GREEN
G/C GROUP COMMAND
GO GEAR OPERATED
G/S GAS SUPPLY
H HIGH THRESHOLD
HH HIGH-HIGH THRESHOLD
HMI HUMAN MACHINE INTERFACE
HUM HUMIDITY
HW HAND WHEEL
IOP REMOTE I/O PANEL
IS INTRINSICALLY SAFE
JBC JUNCTION BOX
L LOW THRESHOLD
LL LOW-LOW THRESHOLD
M MEDIUM THRESHOLD
MAX MAXIMUM
MIN MINIMUM
MSC MECHANICAL STOP ON CLOSING
MSO MECHANICAL STOP ON OPENING
OA OUTSIDE AIR
O/F OVERFLOW
ORP OXYDO-REDUCTION POTENTIAL
P/A PLANT AIR SUPPLY
PLC PLC PANEL
PV PROCESS VARIABLE
R RED
REV OPPOSITE ACTION
SA INCREASED SAFETY
S/D HARD WIRED STOP
SP SET POINT
S/S STEAM SUPPLY
TUR TURBIDITY
U WHEN ADDED TO MOTOR STARTER SYMBOL IDENTIFIES FEED FROM AN EMERGENCY SUPPLY
U/G UNDERGROUND
U/S UPS ELECTRIC SUPPLY
V VENT
W/E ITEM SUPPLIED WITH EQUIPMENT
WHS WATER HOSE STATION
W/S WATER SUPPLY

COLOUR CODING FOR PANEL INTERNAL WIRING

CONTROL PANEL INTERNAL WIRING WILL BE FLEXIBLE COPPER AND WILL HAVE THE FOLLOWING MINIMUM SIZES :

DISTRIBUTION	14AWG
PLC/INSTRUMENT SIGNAL WIRING	18AWG
GROUND	14AWG
GROUND DOOR	12AWG

THE COLOUR CODING FOR CONTROL PANEL INTERNAL WIRING SHALL BE :

600VAC & 208/120VAC	POWER WIRING PHASE COLOURED (RED-BLACK-BLUE)
120VAC	RED (FERRULED 120VAC)
120VAC	WHITE (FERRULED 120VN)
DC POWER (+VE)	BLUE
DC POWER (-VE)	BLUE
CONTROL WIRING:	RED, WHITE, BLACK (3 CONDUCTORS); BLACK AND WHITE (2 CONDUCTORS) AND WHITE WITH NUMERICAL CODE (MORE THAN 3 CONDUCTORS)
INSTRUMENTATION (3-CORE)	RED / WHITE / BLACK
RTD SIGNAL	RED / RED / WHITE
INTRINSICALLY SAFE SHEALTH	BLUE
GROUND	GREEN / YELLOW

TEMPERATURE MEASUREMENT

TE XXXX	TEMPERATURE MEASURE

LEVEL MEASUREMENT

	LEVEL DETECTION
	LEVEL DETECTION CAPACITIVE
	LEVEL DETECTION VIBRATING
	LEVEL DETECTION ROTARY PADDLE
	RADAR
	ULTRASONIC MEASUREMENT
	HYDROSTATIC
	FLOAT LEVEL

STARTER & MOTOR

	LOW VOLTAGE STARTER
	MEDIUM VOLTAGE STARTER
	ISOLATION DEVICE
VSD	VARIABLE FREQUENCY DRIVE
	FULL VOLTAGE NON REVERSING
	SOFTSTART
	FULL VOLTAGE REVERSING
	DOUBLE STARTER FULL VOLTAGE NON REVERSING
	TWO SPEED FULL VOLTAGE NON REVERSING
E	MOTOR ON EMERGENCY POWER WILL BE IDENTIFIED WITH AN "E" IN THE LOWER RIGHT CORNER
	SYNCHRONOUS MOTOR
	WOUND ROTOR MOTOR RESISTORS
	MOTORIZED ACTUATOR
M	ELECTRICAL MOTOR
E	ELECTRO-MAGNET
D	DIESEL MOTOR
	HYDRAULIC MOTOR

PLAN CLÉ
KEY PLAN

CIMA+

NOTES GÉNÉRALES / GENERAL NOTES

POUR INFORMATION
FOR INFORMATION
AGNICO EAGLE
DATE : 2022-06-23

DESSINS EN RÉFÉRENCE / REFERENCE DRAWINGS

TITRE / TITLE	# DWG

AGNICO EAGLE

REV.	DATE	DESCRIPTION	PAR/BY	APP.	CLIENT
B	2022-06-23	FOR INFORMATION	MS	SD	.
A	2022-06-06	FOR INFORMATION	MS	SD	.

REVISIONS

TITRE / TITLE
AGNICO EAGLE - HOPE BAY
693 - WATER TREATMENT PLANT
205 - PIPING & INSTRUMENTATION DIAGRAM
LEGEND 2

DESSINÉ PAR DRAWN BY	JOHN OSI, Tech.	DATE 2022-04-08
VERIFIÉ PAR CHECKED BY	MARYAM SADEGHI, EIT	2022-04-08
APPROUVÉ PAR APPROVED BY	SYLVIE DESSUREAULT, P.Eng	2022-04-08
ÉCHELLE SCALE	N.T.S.	DATE 2022-04-08

NO. DESSIN DRAWING NO. 62-693-205-013

NO. PROJET PROJECT NO.	REVISION	FEUILLE / SHT
6205	B	1 / 1

FORMAT ARCHD

AE-CART-ARCH D

FILE NO. 62-693-205-013_RB.dwg

Appendix C: MSDS

SAFETY DATA SHEET

1. Identification

Product identifier	**HYDREX 3266**
Other means of identification	None.
Recommended use	Potable Water Coagulant PROFESSIONAL USE ONLY
Recommended restrictions	No other uses are advised.

Manufacturer/Importer/Supplier/Distributor information

Supplier	Veolia Water Technologies Canada Inc.
Address	2000 Argentia Road, Plaza IV, Suite 430 Mississauga, ON L5N 1W1 Canada
Contact Person	Hydrex Product Specialist
Telephone	(905) 286-4846
Fax	(905) 286-0488
e-mail	vwtcanada-hydrex@veolia.com
24-Hour Emergency telephone	24 Hour Number: +1-760-476-3962 (Code:333239)
Supplier	Not available.

2. Hazard identification

Physical hazards	Corrosive to metals	Category 1
Health hazards	Acute toxicity, oral	Category 4
	Skin corrosion/irritation	Category 2
	Serious eye damage/eye irritation	Category 1
Environmental hazards	Not classified.	

Label elements

Signal word	Danger
Hazard statement	May be corrosive to metals. Harmful if swallowed. Causes skin irritation. Causes serious eye damage.

Precautionary statement

Prevention	Keep only in original packaging. Wash thoroughly after handling. Do not eat, drink or smoke when using this product. Wear eye protection/face protection. Wear protective gloves.
Response	IF SWALLOWED: Call a POISON CENTER/doctor if you feel unwell. Rinse mouth. IF ON SKIN: Wash with plenty of water. IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER/doctor. If skin irritation occurs: Get medical advice/attention. Take off contaminated clothing and wash it before reuse. Absorb spillage to prevent material-damage.
Storage	Store in a corrosion resistant container with a resistant inner liner.
Disposal	Dispose of contents/container in accordance with local/regional/national/international regulations.

Other hazards	None known.
Supplemental information	None.

3. Composition/information on ingredients

Mixtures

Chemical name	Common name and synonyms	CAS number	%
Ferric Sulfate		10028-22-5	70 - < 90
Ferrous sulfate		7720-78-7	1 - < 5
Sulfuric acid		7664-93-9	< 1
Other components below reportable levels			20 - < 30

All concentrations are in percent by weight unless ingredient is a gas. Gas concentrations are in percent by volume.

4. First-aid measures

Inhalation
Move to fresh air. Call a physician if symptoms develop or persist.

Skin contact
Remove contaminated clothing. Wash with plenty of soap and water. If skin irritation occurs: Get medical advice/attention. Wash contaminated clothing before reuse.

Eye contact
Immediately flush eyes with plenty of water for at least 15 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Get medical attention immediately.

Ingestion
Rinse mouth. If vomiting occurs, keep head low so that stomach content doesn't get into the lungs. Get medical advice/attention if you feel unwell.

Most important symptoms/effects, acute and delayed
Nausea, vomiting. Abdominal pain. Diarrhea. Severe eye irritation. Symptoms may include stinging, tearing, redness, swelling, and blurred vision. Permanent eye damage including blindness could result. Skin irritation. May cause redness and pain.

Indication of immediate medical attention and special treatment needed
Provide general supportive measures and treat symptomatically. Keep victim warm. Keep victim under observation. Symptoms may be delayed.

General information
Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves. Show this safety data sheet to the doctor in attendance.

5. Fire-fighting measures

Suitable extinguishing media
Water fog. Foam. Dry chemical powder. Carbon dioxide (CO2).

Unsuitable extinguishing media
Not available.

Specific hazards arising from the chemical
During fire, gases hazardous to health may be formed.

Special protective equipment and precautions for firefighters
Self-contained breathing apparatus and full protective clothing must be worn in case of fire.

Fire fighting equipment/instructions
Use water spray to cool unopened containers.

Specific methods
Use standard firefighting procedures and consider the hazards of other involved materials.

6. Accidental release measures

Personal precautions, protective equipment and emergency procedures
Keep unnecessary personnel away. Keep people away from and upwind of spill/leak. Wear appropriate protective equipment and clothing during clean-up. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. Ensure adequate ventilation. Local authorities should be advised if significant spillages cannot be contained. For personal protection, see section 8 of the SDS.

Methods and materials for containment and cleaning up
Prevent entry into waterways, sewer, basements or confined areas.

Large Spills: Stop the flow of material, if this is without risk. Dike the spilled material, where this is possible. Absorb spillage to prevent material damage. Absorb in vermiculite, dry sand or earth and place into containers. Following product recovery, flush area with water.

Small Spills: Wipe up with absorbent material (e.g. cloth, fleece). Clean surface thoroughly to remove residual contamination.

Never return spills to original containers for re-use. For waste disposal, see section 13 of the SDS.

Environmental precautions
Avoid discharge into drains, water courses or onto the ground.

7. Handling and storage

Precautions for safe handling

Do not get this material in contact with eyes. Do not taste or swallow. Avoid contact with eyes, skin, and clothing. Avoid prolonged exposure. When using, do not eat, drink or smoke. Provide adequate ventilation. Wear appropriate personal protective equipment. Wash hands thoroughly after handling. Observe good industrial hygiene practices.

Conditions for safe storage, including any incompatibilities

Store in a cool, dry place out of direct sunlight. Store in corrosive resistant container with a resistant inner liner. Store in tightly closed container. Keep only in the original container. Store away from incompatible materials (see Section 10 of the SDS). Store in cool, dry place.

8. Exposure controls/personal protection

Occupational exposure limits

US. ACGIH Threshold Limit Values

Components	Type	Value	Form
FERRIC SULFATE (CAS 10028-22-5)	TWA	1 mg/m3	
FERROUS SULFATE (CAS 7720-78-7)	TWA	1 mg/m3	
Sulfuric Acid (CAS 7664-93-9)	TWA	0.2 mg/m3	Thoracic fraction.

Canada. Alberta OELs (Occupational Health & Safety Code, Schedule 1, Table 2)

Components	Type	Value
FERRIC SULFATE (CAS 10028-22-5)	TWA	1 mg/m3
FERROUS SULFATE (CAS 7720-78-7)	TWA	1 mg/m3
Sulfuric Acid (CAS 7664-93-9)	STEL	3 mg/m3
	TWA	1 mg/m3

Canada. British Columbia OELs. (Occupational Exposure Limits for Chemical Substances, Occupational Health and Safety Regulation 296/97, as amended)

Components	Type	Value	Form
FERRIC SULFATE (CAS 10028-22-5)	STEL	2 mg/m3	
	TWA	1 mg/m3	
FERROUS SULFATE (CAS 7720-78-7)	STEL	2 mg/m3	
	TWA	1 mg/m3	
Sulfuric Acid (CAS 7664-93-9)	TWA	0.2 mg/m3	Mist.

Canada. Manitoba OELs (Reg. 217/2006, The Workplace Safety And Health Act)

Components	Type	Value	Form
FERRIC SULFATE (CAS 10028-22-5)	TWA	1 mg/m3	
FERROUS SULFATE (CAS 7720-78-7)	TWA	1 mg/m3	
Sulfuric Acid (CAS 7664-93-9)	TWA	0.2 mg/m3	Thoracic fraction.

Canada. Ontario OELs. (Control of Exposure to Biological or Chemical Agents)

Components	Type	Value	Form
FERRIC SULFATE (CAS 10028-22-5)	TWA	1 mg/m3	
FERROUS SULFATE (CAS 7720-78-7)	TWA	1 mg/m3	

Canada. Ontario OELs. (Control of Exposure to Biological or Chemical Agents)

Components	Type	Value	Form
Sulfuric Acid (CAS 7664-93-9)	TWA	0.2 mg/m3	Thoracic fraction.

Canada. Quebec OELs. (Ministry of Labor - Regulation respecting occupational health and safety)

Components	Type	Value
FERRIC SULFATE (CAS 10028-22-5)	TWA	1 mg/m3
FERROUS SULFATE (CAS 7720-78-7)	TWA	1 mg/m3
Sulfuric Acid (CAS 7664-93-9)	STEL	3 mg/m3
	TWA	1 mg/m3

Canada. Saskatchewan OELs (Occupational Health and Safety Regulations, 1996, Table 21)

Components	Type	Value	Form
FERROUS SULFATE (CAS 7720-78-7)	15 minute	3 mg/m3	
	8 hour	1 mg/m3	
Sulfuric Acid (CAS 7664-93-9)	15 minute	0.6 mg/m3	Thoracic fraction.
	8 hour	0.2 mg/m3	Thoracic fraction.

Biological limit values No biological exposure limits noted for the ingredient(s).

Appropriate engineering controls Provide eyewash station and safety shower.

Individual protection measures, such as personal protective equipment

Eye/face protection Chemical goggles and face shield are recommended. Wear safety glasses with side shields (or goggles).

Skin protection

Hand protection Chemical resistant gloves.

Other Wear appropriate chemical resistant clothing. Chemical resistant gloves.

Respiratory protection In case of insufficient ventilation, wear suitable respiratory equipment.

Thermal hazards Wear appropriate thermal protective clothing, when necessary.

General hygiene considerations Keep away from food and drink. Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants.

9. Physical and chemical properties

Appearance Granular

Physical state Solid.

Form Solid.

Color Yellowish or Brown.

Odor Not significant.

Odor threshold Not available.

pH Not available.

Melting point/freezing point > 572 °F (> 300 °C)

Initial boiling point and boiling range Not available.

Flash point Non applicable

Evaporation rate Not available.

Flammability (solid, gas) Not available.

Upper/lower flammability or explosive limits

Flammability limit - lower (%)	Not available.
Flammability limit - upper (%)	Not available.
Explosive limit - lower (%)	Not available.
Explosive limit - upper (%)	Not available.
Vapor pressure	Not available.
Vapor density	Not available.
Relative density	Not available.
Solubility(ies)	
Solubility (water)	Soluble
Partition coefficient (n-octanol/water)	Not available.
Auto-ignition temperature	Not available.
Decomposition temperature	Not available.
Viscosity	Not available.
Other information	
Explosive properties	Not explosive.
Oxidizing properties	Not oxidizing.
Specific gravity	1.2 - 1.4

10. Stability and reactivity

Reactivity	May be corrosive to metals. The product is stable and non-reactive under normal conditions of use, storage and transport.
Chemical stability	Material is stable under normal conditions.
Possibility of hazardous reactions	No dangerous reaction known under conditions of normal use. Hazardous polymerization does not occur.
Conditions to avoid	Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. Contact with incompatible materials.
Incompatible materials	Strong oxidizing agents. Metals.
Hazardous decomposition products	Sulfur oxides.

11. Toxicological information

Information on likely routes of exposure

Inhalation	Prolonged inhalation may be harmful.
Skin contact	Causes skin irritation.
Eye contact	Causes serious eye damage.
Ingestion	Harmful if swallowed.
Symptoms related to the physical, chemical and toxicological characteristics	Nausea, vomiting. Abdominal pain. Diarrhea. Severe eye irritation. Symptoms may include stinging, tearing, redness, swelling, and blurred vision. Permanent eye damage including blindness could result. Skin irritation. May cause redness and pain.

Information on toxicological effects

Acute toxicity Harmful if swallowed.

Product	Species	Test Results
HYDREX 3266		
Acute		
Dermal		
Solid		
LD50	Mouse	>= 200 mg/kg Calculation

Product	Species	Test Results
LD50	Rat	5200 mg/kg estimated
Inhalation		
LC50	Rat	12000 mg/l, 1 Hours
Oral		
Solid		
LD50	Rat	>= 650 mg/kg Calculation

Skin corrosion/irritation Causes skin irritation.

Serious eye damage/eye irritation Causes serious eye damage.

Respiratory or skin sensitization

Canada - Alberta OELs: Irritant

Ferric Sulfate (CAS 10028-22-5)	Irritant
Ferrous sulfate (CAS 7720-78-7)	Irritant

Respiratory sensitization Not a respiratory sensitizer.

Skin sensitization This product is not expected to cause skin sensitization.

Germ cell mutagenicity No data available to indicate product or any components present at greater than 0.1% are mutagenic or genotoxic.

Carcinogenicity Risk of cancer cannot be excluded with prolonged exposure.

ACGIH Carcinogens

Sulfuric acid (CAS 7664-93-9)	A2 Suspected human carcinogen.

Canada - Alberta OELs: Carcinogen category

Sulfuric acid (CAS 7664-93-9)	Suspected human carcinogen.

Canada - Manitoba OELs: carcinogenicity

Sulfuric acid (CAS 7664-93-9)	Suspected human carcinogen.

IARC Monographs. Overall Evaluation of Carcinogenicity

Sulfuric acid (CAS 7664-93-9)	1 Carcinogenic to humans.

US. National Toxicology Program (NTP) Report on Carcinogens

Sulfuric acid (CAS 7664-93-9)	Known To Be Human Carcinogen.

Reproductive toxicity This product is not expected to cause reproductive or developmental effects.

Specific target organ toxicity - single exposure Not classified.

Specific target organ toxicity - repeated exposure Not classified.

Aspiration hazard Not an aspiration hazard.

Chronic effects Prolonged inhalation may be harmful. Prolonged exposure may cause chronic effects.

12. Ecological information

Ecotoxicity The product is not classified as environmentally hazardous. However, this does not exclude the possibility that large or frequent spills can have a harmful or damaging effect on the environment.

Product		Species	Test Results
HYDREX 3266			
Aquatic			
Acute			
Algae	EC50	Green algae (Scenedesmus acutus)	> 13 mg/l, 7 day
Crustacea	EC50	Daphnia	>= 100 mg/l, 48 hours calculated
Fish	LC50	Fish	>= 100 mg/l, 96 hours calculated
Chronic			
Fish	Presumed Non-Toxic	Fish	The compound is considered to have no long term effects in aquatic systems due to the rapid formation of insoluble hydroxides.

Persistence and degradability Not applicable.

Bioaccumulative potential	The product is not bioaccumulating.
Mobility in soil	This product is water soluble and may disperse in soil.
Other adverse effects	No other adverse environmental effects (e.g. ozone depletion, photochemical ozone creation potential, endocrine disruption, global warming potential) are expected from this component.

13. Disposal considerations

Disposal instructions	Collect and reclaim or dispose in sealed containers at licensed waste disposal site. Dispose of contents/container in accordance with local/regional/national/international regulations.
Local disposal regulations	Dispose in accordance with all applicable regulations.
Hazardous waste code	D002: Waste Corrosive material [pH <=2 or =>12.5, or corrosive to steel] The waste code should be assigned in discussion between the user, the producer and the waste disposal company.
Waste from residues / unused products	Dispose of in accordance with local regulations. Empty containers or liners may retain some product residues. This material and its container must be disposed of in a safe manner (see: Disposal instructions).
Contaminated packaging	Since emptied containers may retain product residue, follow label warnings even after container is emptied. Empty containers should be taken to an approved waste handling site for recycling or disposal.

14. Transport information

TDG

Not regulated as dangerous goods.

This product is regulated as a hazardous material according to the Department of Transportation only in bulk quantities (greate than 1363 lbs per package).

IATA

Not regulated as dangerous goods.

IMDG

Not regulated as dangerous goods.

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code	Not applicable.

15. Regulatory information

Canadian regulations

This product has been classified in accordance with the hazard criteria of the HPR and the SDS contains all the information required by the HPR.

Controlled Drugs and Substances Act

Not regulated.

Export Control List (CEPA 1999, Schedule 3)

Not listed.

Greenhouse Gases

Not listed.

Ontario. Toxic Substances. Toxic Reduction Act, 2009. Regulation 455/09 (July 1, 2011)

Sulfuric acid (CAS 7664-93-9)

Precursor Control Regulations

Sulfuric acid (CAS 7664-93-9)	Class B

International regulations

Stockholm Convention

Not applicable.

Rotterdam Convention

Not applicable.

Kyoto protocol

Not applicable.

Montreal Protocol

Not applicable.

Basel Convention

Not applicable.

International Inventories

Country(s) or region	Inventory name	On inventory (yes/no)*
Australia	Australian Inventory of Chemical Substances (AICS)	Yes
Canada	Domestic Substances List (DSL)	Yes
Canada	Non-Domestic Substances List (NDSL)	No
China	Inventory of Existing Chemical Substances in China (IECSC)	Yes
Europe	European Inventory of Existing Commercial Chemical Substances (EINECS)	Yes
Europe	European List of Notified Chemical Substances (ELINCS)	No
Japan	Inventory of Existing and New Chemical Substances (ENCS)	Yes
Korea	Existing Chemicals List (ECL)	Yes
New Zealand	New Zealand Inventory	Yes
Philippines	Philippine Inventory of Chemicals and Chemical Substances (PICCS)	Yes
Taiwan	Taiwan Chemical Substance Inventory (TCSI)	No
United States & Puerto Rico	Toxic Substances Control Act (TSCA) Inventory	Yes

*A "Yes" indicates that all components of this product comply with the inventory requirements administered by the governing country(s)
A "No" indicates that one or more components of the product are not listed or exempt from listing on the inventory administered by the governing country(s).

16. Other information

Issue date 01-06-2017

Revision date 05-28-2020

Version # 03

Disclaimer Veolia Water Technologies is not able to anticipate all conditions under which this information and its product, or the products of other manufacturers in combination with its product, may be used. It is the user's responsibility to ensure safe conditions for handling, storage and disposal of the product, and to assume liability for loss, injury, damage or expense due to improper use and or non respect of Veolia Water Technologies' requirement.

Revision information This document has undergone significant changes and should be reviewed in its entirety.

Hydrex

MATERIAL SAFETY DATA SHEET

1. Product and Company Identification

Product identifier	**Hydrex 6105**
Version #	01
Issue date	08-15-2014
CAS #	Mixture
Product use	Wastewater Flocculant
Manufacturer	
Supplier	VWS Canada
Address	2000 Argentia Road, Plaza IV, Suite 430 Mississauga, ON L5N 1W1 Canada
Contact Person	Hydrex Product Specialist
Telephone	(905) 286-4846
Fax	(905) 286-0488
e-mail	vwscanada.hydrex@veoliawater.com
24-Hour Emergency telephone	+1-760-476-3962 (Code:333239)

2. Hazards Identification

Potential health effects

Eyes	Health injuries are not known or expected under normal use.
Skin	Health injuries are not known or expected under normal use.
Inhalation	Health injuries are not known or expected under normal use.
Ingestion	Health injuries are not known or expected under normal use.

3. Composition / Information on Ingredients

The components are not hazardous or are below required disclosure limits.

4. First Aid Measures

First aid procedures

Eye contact	Rinse with water. Get medical attention if irritation develops and persists.
Skin contact	Rinse skin with water/shower. Get medical attention if irritation develops and persists.
Inhalation	If breathing is difficult, remove to fresh air and keep at rest in a position comfortable for breathing. Call a physician if symptoms develop or persist.
Ingestion	Rinse mouth. If ingestion of a large amount does occur, call a poison control center immediately.
General advice	If you feel unwell, seek medical advice (show the label where possible). Show this safety data sheet to the doctor in attendance.

5. Fire Fighting Measures

Flammable properties	Dust accumulation from this product may present an explosion hazard in the presence of an ignition source.
Extinguishing media	
Suitable extinguishing media	Water spray, fog, CO2, dry chemical, or alcohol resistant foam.
Protection of firefighters	
Protective equipment for firefighters	In the event of fire, wear self-contained breathing apparatus.
Fire fighting equipment/instructions	Use water spray to cool unopened containers. Dust may form an explosive mixture in the atmosphere.
Specific methods	Use water spray to cool unopened containers.

Explosion data

Sensitivity to static discharge	Not available.
Sensitivity to mechanical impact	Not available.

6. Accidental Release Measures

Personal precautions	Slippery when wet.
Environmental precautions	Prevent further leakage or spillage if safe to do so. Do not contaminate water.
Methods for cleaning up	Should not be released into the environment. Following product recovery, flush area with water. For waste disposal, see section 13 of the MSDS.

7. Handling and Storage

Handling	Avoid release to the environment. Material can be slippery when wet.
Storage	Store in a dry area. Store in closed original container at temperatures between 5°C and 30°C.

8. Exposure Controls / Personal Protection

Biological limit values	No biological exposure limits noted for the ingredient(s).

Personal protective equipment

Eye / face protection	Chemical goggles are recommended.
Skin protection	Normal work clothing (long sleeved shirts and long pants) is recommended.
Respiratory protection	No specific recommendation made, but protection against nuisance dust must be used when the general level exceeds 10 mg/m3.

9. Physical & Chemical Properties

Appearance	Not available.
Physical state	Solid.
Form	Not available.
Color	White
Odor	Not available.
pH	Not available.
Vapor pressure	0 hPa estimated
Vapor density	Not available.
Boiling point	Not available.
Melting point/Freezing point	Not available.
Solubility (water)	Not available.
Specific gravity	0.65 - 0.9
Flash point	Not available.
Auto-ignition temperature	Not available.
Ph Of 1% Solution	5 - 7

10. Chemical Stability & Reactivity Information

Chemical stability	Material is stable under normal conditions.
Conditions to avoid	None under normal conditions.
Incompatible materials	Not available.
Hazardous decomposition products	Upon decomposition, this product may yield oxides of nitrogen and ammonia, carbon dioxide, carbon monoxide and other low molecular weight hydrocarbons.

11. Toxicological Information

Toxicological data

Product	Species	Test Results
Hydrex 6105 (CAS Mixture)		
Acute		
Dermal		
LD50	Rabbit	> 10000 mg/kg
Oral		
LD50	Rat	> 5000 mg/kg

* Estimates for product may be based on additional component data not shown.

Chronic effects Not expected to be hazardous by WHMIS criteria.

12. Ecological Information

Ecotoxicological data

Product		Species	Test Results
Hydrex 6105 (CAS Mixture)			
Algae	IC50	Algae	2276 mg/l, 72 hr
Crustacea	EC50	Daphnia	> 100 mg/l, 48 hr
Other	LC50	Rainbow Trout	> 120 mg/l, 96 hr
Aquatic			
Fish	LC50	Zebra danio (Danio rerio)	> 100 mg/l, 96 hr

* Estimates for product may be based on additional component data not shown.

Ecotoxicity Contains a substance which causes risk of hazardous effects to the environment.

Environmental effects An environmental hazard cannot be excluded in the event of unprofessional handling or disposal

Persistence and degradability Not available.

13. Disposal Considerations

Disposal instructions Collect and reclaim or dispose in sealed containers at licensed waste disposal site. Do not allow this material to drain into sewers/water supplies. This product, in its present state, when discarded or disposed of, is not a hazardous waste according to Federal regulations (40 CFR 261.4 (b)(4)). Under RCRA, it is the responsibility of the user of the product to determine, at the time of disposal, whether the product meets RCRA criteria for hazardous waste. Dispose in accordance with all applicable regulations.

Contaminated packaging Empty containers should be taken to an approved waste handling site for recycling or disposal.

14. Transport Information

TDG

Not regulated as dangerous goods.

IATA

Not regulated as dangerous goods.

IMDG

Not regulated as dangerous goods.

15. Regulatory Information

Canadian regulations This product has been classified in accordance with the hazard criteria of the CPR and the MSDS contains all the information required by the CPR.

WHMIS status Non-controlled

Inventory status

Country(s) or region	Inventory name	On inventory (yes/no)*
Australia	Australian Inventory of Chemical Substances (AICS)	Yes
Canada	Domestic Substances List (DSL)	Yes

Country(s) or region	Inventory name	On inventory (yes/no)*
Canada	Non-Domestic Substances List (NDSL)	No
China	Inventory of Existing Chemical Substances in China (IECSC)	Yes
Europe	European Inventory of Existing Commercial Chemical Substances (EINECS)	No
Europe	European List of Notified Chemical Substances (ELINCS)	No
Japan	Inventory of Existing and New Chemical Substances (ENCS)	Yes
Korea	Existing Chemicals List (ECL)	Yes
New Zealand	New Zealand Inventory	Yes
Philippines	Philippine Inventory of Chemicals and Chemical Substances (PICCS)	Yes
United States & Puerto Rico	Toxic Substances Control Act (TSCA) Inventory	Yes

*A "Yes" indicates that all components of this product comply with the inventory requirements administered by the governing country(s)
A "No" indicates that one or more components of the product are not listed or exempt from listing on the inventory administered by the governing country(s).

16. Other Information

Further information
HMIS® is a registered trade and service mark of the NPCA.

HMIS® ratings
Health: 0
Flammability: 1
Physical hazard: 0

NFPA ratings
Health: 0
Flammability: 1
Instability: 0

Disclaimer
Veolia Water Solutions & Technologies is not able to anticipate all conditions under which this information and its product, or the products of other manufacturers in combination with its product, may be used. It is the user's responsibility to ensure safe conditions for handling, storage and disposal of the product, and to assume liability for loss, injury, damage or expense due to improper use and or non respect of Veolia Water Solutions & Technologies' requirement.

This data sheet contains changes from the previous version in section(s):
Product and Company Identification: Product and Company Identification

SAFETY DATA SHEET

1. Identification

Product identifier	**VEOLIA ACTISAND**
Other means of identification	None.
Recommended use	Wastewater Treatment
Recommended restrictions	Workers (and your customers or users in the case of resale) should be informed of the potential presence of respirable dust and respirable crystalline silica as well as their potential hazards. Appropriate training in the proper use and handling of this material should be provided as required under applicable regulations. PROFESSIONAL USE ONLY

Manufacturer/Importer/Supplier/Distributor information

Manufacturer	
Supplier	Veolia Water Technologies Canada Inc.
Address	2000 Argentia Road, Plaza IV, Suite 430 Mississauga, ON L5N 1W1 Canada
Contact Person	Hydrex Product Specialist
Telephone	(905) 286-4846
Fax	(905) 286-0488
e-mail	vwtcanada-hydrex@veolia.com
24-Hour Emergency telephone	+1-760-476-3962 (Code:333239)
Supplier	Not available.

2. Hazard(s) identification

Physical hazards	Not classified.	
Health hazards	Carcinogenicity	Category 1A
Environmental hazards	Not classified.	

Label elements

Signal word	Danger
Hazard statement	May cause cancer.
Precautionary statement	
Prevention	Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Wear protective gloves/protective clothing/eye protection/face protection.
Response	IF exposed or concerned: Get medical advice/attention.
Storage	Not available.
Disposal	Dispose of contents/container in accordance with local/regional/national/international regulations.
Other hazards	None known.
Supplemental information	None.

3. Composition/information on ingredients

Mixtures

Chemical name	Common name and synonyms	CAS number	%
Crystalline sillica		14808-60-7	100

All concentrations are in percent by weight unless ingredient is a gas. Gas concentrations are in percent by volume.

4. First-aid measures

Inhalation	Move to fresh air. Call a physician if symptoms develop or persist.
Skin contact	Wash off with soap and water. Get medical attention if irritation develops and persists.
Eye contact	Rinse with water. Get medical attention if irritation develops and persists.
Ingestion	Rinse mouth. Get medical attention if symptoms occur.
Most important symptoms/effects, acute and delayed	Coughing.
Indication of immediate medical attention and special treatment needed	Provide general supportive measures and treat symptomatically. Keep victim under observation. Symptoms may be delayed.
General information	IF exposed or concerned: Get medical advice/attention. Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves.

5. Fire-fighting measures

Suitable extinguishing media	Water fog. Foam. Dry chemical powder. Carbon dioxide (CO2).
Unsuitable extinguishing media	Not available.
Specific hazards arising from the chemical	During fire, gases hazardous to health may be formed.
Special protective equipment and precautions for firefighters	Self-contained breathing apparatus and full protective clothing must be worn in case of fire.
Fire fighting equipment/instructions	Use water spray to cool unopened containers.
Specific methods	Use standard firefighting procedures and consider the hazards of other involved materials.
General fire hazards	No unusual fire or explosion hazards noted.

6. Accidental release measures

Personal precautions, protective equipment and emergency procedures	Keep unnecessary personnel away. Keep people away from and upwind of spill/leak. Wear appropriate protective equipment and clothing during clean-up. Ensure adequate ventilation. Local authorities should be advised if significant spillages cannot be contained. For personal protection, see section 8 of the SDS.
Methods and materials for containment and cleaning up	The product is immiscible with water and will spread on the water surface. Stop the flow of material, if this is without risk. Following product recovery, flush area with water. For waste disposal, see section 13 of the SDS.
Environmental precautions	Avoid discharge into drains, water courses or onto the ground.

7. Handling and storage

Precautions for safe handling	Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Keep formation of airborne dusts to a minimum. Provide appropriate exhaust ventilation at places where dust is formed. Do not breathe dust. Avoid prolonged exposure. Should be handled in closed systems, if possible. Wear appropriate personal protective equipment. Observe good industrial hygiene practices.
Conditions for safe storage, including any incompatibilities	Protect from sunlight. Store in original tightly closed container. Store away from incompatible materials (see Section 10 of the SDS). Store in cool, dry place.

8. Exposure controls/personal protection

Occupational exposure limits

US. ACGIH Threshold Limit Values

Material	Type	Value	Form
VEOLIA ACTISAND	TWA	0.025 mg/m3	Respirable fraction.

Components	Type	Value	Form
Crystalline sillica (CAS 14808-60-7)	TWA	0.025 mg/m3	Respirable fraction.

Canada. Alberta OELs (Occupational Health & Safety Code, Schedule 1, Table 2)

Material	Type	Value	Form
VEOLIA ACTISAND	TWA	0.025 mg/m3	Respirable particles.

Components	Type	Value	Form
Crystalline sillica (CAS 14808-60-7)	TWA	0.025 mg/m3	Respirable particles.

Canada. British Columbia OELs. (Occupational Exposure Limits for Chemical Substances, Occupational Health and Safety Regulation 296/97, as amended)

Material	Type	Value	Form
VEOLIA ACTISAND	TWA	0.025 mg/m3	Respirable fraction.

Components	Type	Value	Form
Crystalline sillica (CAS 14808-60-7)	TWA	0.025 mg/m3	Respirable fraction.

Canada. Manitoba OELs (Reg. 217/2006, The Workplace Safety And Health Act)

Components	Type	Value	Form
Crystalline sillica (CAS 14808-60-7)	TWA	0.025 mg/m3	Respirable fraction.

Canada. Ontario OELs. (Control of Exposure to Biological or Chemical Agents)

Material	Type	Value	Form
VEOLIA ACTISAND	TWA	0.1 mg/m3	Respirable.

Components	Type	Value	Form
Crystalline sillica (CAS 14808-60-7)	TWA	0.1 mg/m3	Respirable.

Canada. Quebec OELs. (Ministry of Labor - Regulation Respecting the Quality of the Work Environment)

Material	Type	Value	Form
VEOLIA ACTISAND	TWA	0.1 mg/m3	Respirable dust.

Components	Type	Value	Form
Crystalline sillica (CAS 14808-60-7)	TWA	0.1 mg/m3	Respirable dust.

Biological limit values No biological exposure limits noted for the ingredient(s).

Exposure guidelines Occupational exposure to nuisance dust (total and respirable) and respirable crystalline silica should be monitored and controlled.

Appropriate engineering controls Good general ventilation (typically 10 air changes per hour) should be used. Ventilation rates should be matched to conditions. If applicable, use process enclosures, local exhaust ventilation, or other engineering controls to maintain airborne levels below recommended exposure limits. If exposure limits have not been established, maintain airborne levels to an acceptable level.

Individual protection measures, such as personal protective equipment

Eye/face protection Wear safety glasses with side shields (or goggles).

Skin protection

Hand protection Chemical resistant gloves. Suitable gloves can be recommended by the glove supplier.

Other Use of an impervious apron is recommended. Chemical resistant gloves.

Respiratory protection Use a particulate filter respirator for particulate concentrations exceeding the Occupational Exposure Limit.

Thermal hazards Not available.

General hygiene considerations Observe any medical surveillance requirements. Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants.

9. Physical and chemical properties

Appearance

Physical state Solid.

Form Solid.

Color Not available.

Odor	Not available.
Odor threshold	Not available.
pH	Not available.
Melting point/freezing point	Not available.
Initial boiling point and boiling range	Not available.
Flash point	Not available.
Evaporation rate	Not available.
Flammability (solid, gas)	Not available.
Upper/lower flammability or explosive limits	
Flammability limit - lower (%)	Not available.
Flammability limit - upper (%)	Not available.
Explosive limit - lower (%)	Not available.
Explosive limit - upper (%)	Not available.
Vapor pressure	< 0.0000001 kPa at 25 °C
Vapor density	Not available.
Relative density	Not available.
Solubility(ies)	
Solubility (water)	Insoluble
Partition coefficient (n-octanol/water)	Not available.
Auto-ignition temperature	Not available.
Decomposition temperature	Not available.
Viscosity	Not available.
Other information	
Explosive properties	Not explosive.
Heat of combustion (NFPA 30B)	0 kJ/g
Molecular formula	O2Si
Oxidizing properties	Not oxidizing.

10. Stability and reactivity

Reactivity	The product is stable and non-reactive under normal conditions of use, storage and transport.
Chemical stability	Material is stable under normal conditions.
Possibility of hazardous reactions	No dangerous reaction known under conditions of normal use.
Conditions to avoid	Contact with incompatible materials.
Incompatible materials	Powerful oxidizers. Chlorine.
Hazardous decomposition products	No hazardous decomposition products are known.

11. Toxicological information

Information on likely routes of exposure

Inhalation	Prolonged inhalation may be harmful.
Skin contact	No adverse effects due to skin contact are expected.
Eye contact	Direct contact with eyes may cause temporary irritation.
Ingestion	Expected to be a low ingestion hazard.

Symptoms related to the physical, chemical and toxicological characteristics Coughing.

Information on toxicological effects

Acute toxicity Not available.

Skin corrosion/irritation Prolonged skin contact may cause temporary irritation.

Serious eye damage/eye irritation Direct contact with eyes may cause temporary irritation.

Respiratory or skin sensitization

Respiratory sensitization Not a respiratory sensitizer.

Skin sensitization This product is not expected to cause skin sensitization.

Germ cell mutagenicity No data available to indicate product or any components present at greater than 0.1% are mutagenic or genotoxic.

Carcinogenicity In 1997, IARC (the International Agency for Research on Cancer) concluded that crystalline silica inhaled from occupational sources can cause lung cancer in humans. However in making the overall evaluation, IARC noted that "carcinogenicity was not detected in all industrial circumstances studied. Carcinogenicity may be dependent on inherent characteristics of the crystalline silica or on external factors affecting its biological activity or distribution of its polymorphs." (IARC Monographs on the evaluation of the carcinogenic risks of chemicals to humans, Silica, silicates dust and organic fibres, 1997, Vol. 68, IARC, Lyon, France.) In June 2003, SCOEL (the EU Scientific Committee on Occupational Exposure Limits) concluded that the main effect in humans of the inhalation of respirable crystalline silica dust is silicosis. "There is sufficient information to conclude that the relative risk of lung cancer is increased in persons with silicosis (and, apparently, not in employees without silicosis exposed to silica dust in quarries and in the ceramic industry). Therefore, preventing the onset of silicosis will also reduce the cancer risk..." (SCOEL SUM Doc 94-final, June 2003) According to the current state of the art, worker protection against silicosis can be consistently assured by respecting the existing regulatory occupational exposure limits. May cause cancer. Occupational exposure to respirable dust and respirable crystalline silica should be monitored and controlled.

ACGIH Carcinogens

Crystalline sillica (CAS 14808-60-7)	A2 Suspected human carcinogen.

Canada - Alberta OELs: Carcinogen category

Crystalline sillica (CAS 14808-60-7)	Suspected human carcinogen.

Canada - Manitoba OELs: carcinogenicity

SILICA, CRYSTALLINE-.ALPHA.-QUARTZ, RESPIRABLE FRACTION (CAS 14808-60-7)	Suspected human carcinogen.

Canada - Quebec OELs: Carcinogen category

Crystalline sillica (CAS 14808-60-7)	Suspected carcinogenic effect in humans.

IARC Monographs. Overall Evaluation of Carcinogenicity

Crystalline sillica (CAS 14808-60-7)	1 Carcinogenic to humans.

Reproductive toxicity This product is not expected to cause reproductive or developmental effects.

Specific target organ toxicity - single exposure Not classified.

Specific target organ toxicity - repeated exposure Not classified.

Aspiration hazard Not an aspiration hazard.

Chronic effects Prolonged inhalation may be harmful. Prolonged exposure may cause chronic effects.

12. Ecological information

Ecotoxicity The product is not classified as environmentally hazardous. However, this does not exclude the possibility that large or frequent spills can have a harmful or damaging effect on the environment.

Persistence and degradability No data is available on the degradability of this product.

Bioaccumulative potential No data available.

Mobility in soil No data available.

Other adverse effects No other adverse environmental effects (e.g. ozone depletion, photochemical ozone creation potential, endocrine disruption, global warming potential) are expected from this component.

13. Disposal considerations

Disposal instructions	Collect and reclaim or dispose in sealed containers at licensed waste disposal site. Dispose of contents/container in accordance with local/regional/national/international regulations.
Local disposal regulations	Dispose in accordance with all applicable regulations.
Hazardous waste code	The waste code should be assigned in discussion between the user, the producer and the waste disposal company.
Waste from residues / unused products	Dispose of in accordance with local regulations. Empty containers or liners may retain some product residues. This material and its container must be disposed of in a safe manner (see: Disposal instructions).
Contaminated packaging	Since emptied containers may retain product residue, follow label warnings even after container is emptied. Empty containers should be taken to an approved waste handling site for recycling or disposal.

14. Transport information

TDG

Not regulated as dangerous goods.

IATA

Not regulated as dangerous goods.

IMDG

Not regulated as dangerous goods.

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code Not applicable.

15. Regulatory information

Canadian regulations

Controlled Drugs and Substances Act

Not regulated.

Export Control List (CEPA 1999, Schedule 3)

Not listed.

Greenhouse Gases

Not listed.

Precursor Control Regulations

Not regulated.

International regulations

Stockholm Convention

Not applicable.

Rotterdam Convention

Not applicable.

Kyoto protocol

Not applicable.

Montreal Protocol

Not applicable.

Basel Convention

Not applicable.

International Inventories

Country(s) or region	Inventory name	On inventory (yes/no)*
Australia	Australian Inventory of Chemical Substances (AICS)	Yes
Canada	Domestic Substances List (DSL)	Yes
Canada	Non-Domestic Substances List (NDSL)	No
China	Inventory of Existing Chemical Substances in China (IECSC)	Yes
Europe	European Inventory of Existing Commercial Chemical Substances (EINECS)	Yes
Europe	European List of Notified Chemical Substances (ELINCS)	No

Country(s) or region	Inventory name	On inventory (yes/no)*
Japan	Inventory of Existing and New Chemical Substances (ENCS)	Yes
Korea	Existing Chemicals List (ECL)	Yes
New Zealand	New Zealand Inventory	Yes
Philippines	Philippine Inventory of Chemicals and Chemical Substances (PICCS)	Yes
United States & Puerto Rico	Toxic Substances Control Act (TSCA) Inventory	Yes

*A "Yes" indicates that all components of this product comply with the inventory requirements administered by the governing country(s)
A "No" indicates that one or more components of the product are not listed or exempt from listing on the inventory administered by the governing country(s).

16. Other Information

Issue date 08-16-2016

Version # 01

Disclaimer Veolia Water Technologies is not able to anticipate all conditions under which this information and its product, or the products of other manufacturers in combination with its product, may be used. It is the user's responsibility to ensure safe conditions for handling, storage and disposal of the product, and to assume liability for loss, injury, damage or expense due to improper use and or non respect of Veolia Water Technologies' requirement.

Revision information Product and Company Identification: Product Review

Safety Data Sheet
Sulfuric Acid 66 DEG BE

Version 1.5 Revision Date: 12/01/2020

SECTION 1. PRODUCT AND COMPANY IDENTIFICATION

Product name : Sulfuric Acid 66 DEG BE

Recommended use of the chemical and restrictions on use

Recommended use : Acid.
Fertilizers.
Water treatment chemical

Manufacturer or supplier's details

Company : Univar Solutions USA, Inc.
Address 3075 Highland Pkwy Suite 200
Downers Grove, IL 60515
United States of America (USA)

Emergency telephone number:
Transport North America: CHEMTREC (1-800-424-9300)
CHEMTREC INTERNATIONAL Tel # 703-527-3887

Additional Information: : Responsible Party: Product Compliance Department
E-mail: SDSNA@univarsolutions.com
SDS Requests: 1-855-429-2661
Website: www.univarsolutions.com

SECTION 2. HAZARDS IDENTIFICATION

GHS Classification

Skin corrosion : Category 1A

Serious eye damage : Category 1

GHS label elements

Hazard pictograms :

Signal word : Danger

Hazard statements : H314 Causes severe skin burns and eye damage.

Precautionary statements : **Prevention:**
P264 Wash skin thoroughly after handling.
P280 Wear protective gloves/ protective clothing/ eye protection/ face protection.
Response:
P301 + P330 + P331 IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.
P303 + P361 + P353 IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.
P304 + P340 + P310 IF INHALED: Remove person to fresh air and keep comfortable for breathing. Immediately call a POISON

CENTER/doctor.
P305 + P351 + P338 + P310 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER/doctor.
P363 Wash contaminated clothing before reuse.
Storage:
P405 Store locked up.
Disposal:
P501 Dispose of contents/ container to an approved waste disposal plant.

Other hazards
None known.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance / Mixture : Mixture

Hazardous components

CAS-No.	Chemical name	Weight percent
7664-93-9	Sulfuric acid	90 - 100

Any Concentration shown as a range is due to batch variation.

Molecular formula : H2-O4-S

Synonyms : Sulfuric Acid 66 DEG BE Baume, NC Sulf AC 66 Degree

SECTION 4. FIRST AID MEASURES

General advice : Move out of dangerous area.
Consult a physician.
Show this safety data sheet to the doctor in attendance.
Do not leave the victim unattended.

If inhaled : If unconscious, place in recovery position and seek medical advice.
If symptoms persist, call a physician.

In case of skin contact : Immediate medical treatment is necessary as untreated wounds from corrosion of the skin heal slowly and with difficulty.
If on skin, rinse well with water.
If on clothes, remove clothes.

In case of eye contact : Small amounts splashed into eyes can cause irreversible tissue damage and blindness.
In the case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
Continue rinsing eyes during transport to hospital.
Remove contact lenses.

Keep eye wide open while rinsing.
If eye irritation persists, consult a specialist.

If swallowed : Clean mouth with water and drink afterwards plenty of water.
Keep respiratory tract clear.
Do NOT induce vomiting.
Do not give milk or alcoholic beverages.
Never give anything by mouth to an unconscious person.
If symptoms persist, call a physician.
Take victim immediately to hospital.

SECTION 5. FIREFIGHTING MEASURES

Suitable extinguishing media : Dry chemical
Carbon dioxide (CO2)

Unsuitable extinguishing media : High volume water jet
Water

Specific hazards during fire-fighting : Do not allow run-off from fire fighting to enter drains or water courses.

Hazardous combustion products : sulfur oxides

Specific extinguishing methods : Use a water spray to cool fully closed containers.

Further information : Collect contaminated fire extinguishing water separately. This must not be discharged into drains.
Fire residues and contaminated fire extinguishing water must be disposed of in accordance with local regulations.

Special protective equipment for firefighters : Wear self-contained breathing apparatus for firefighting if necessary.

SECTION 6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures : Use personal protective equipment.

Environmental precautions : Prevent product from entering drains.
Prevent further leakage or spillage if safe to do so.
If the product contaminates rivers and lakes or drains inform respective authorities.

Methods and materials for containment and cleaning up : Soak up with inert absorbent material (e.g. sand, silica gel, acid binder, universal binder, sawdust).
Keep in suitable, closed containers for disposal.

SECTION 7. HANDLING AND STORAGE

Advice on protection against fire and explosion : Normal measures for preventive fire protection.

Advice on safe handling : Do not breathe vapours/dust.
Avoid contact with skin and eyes.
For personal protection see section 8.
Smoking, eating and drinking should be prohibited in the application area.
To avoid spills during handling keep bottle on a metal tray.
Dispose of rinse water in accordance with local and national regulations.

Conditions for safe storage : Keep container tightly closed in a dry and well-ventilated place.
Containers which are opened must be carefully resealed and kept upright to prevent leakage.
Observe label precautions.
Electrical installations / working materials must comply with the technological safety standards.

Materials to avoid : Do not store near acids.

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Components with workplace control parameters

CAS-No.	Components	Value type (Form of exposure)	Control parameters / Permissible concentration	Basis
7664-93-9	Sulfuric acid	TWA (Thoracic fraction)	0.2 mg/m3	ACGIH
		TWA	1 mg/m3	NIOSH REL
		TWA	1 mg/m3	OSHA Z-1
		TWA	1 mg/m3	OSHA P0

Personal protective equipment

Respiratory protection : No personal respiratory protective equipment normally required.

Hand protection

Remarks : The suitability for a specific workplace should be discussed with the producers of the protective gloves.

Eye protection : Eye wash bottle with pure water
Tightly fitting safety goggles
Wear face-shield and protective suit for abnormal processing problems.

Skin and body protection : Impervious clothing
Choose body protection according to the amount and concen-

tration of the dangerous substance at the work place.

Hygiene measures : When using do not eat or drink.
When using do not smoke.
Wash hands before breaks and at the end of workday.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	:	liquid
Colour	:	Clear, Colorless, amber
Odour	:	pungent
Odour Threshold	:	No data available
pH	:	0.3 @ 25 °C (77 °F)
Freezing Point (Melting point/range)	:	-31 - 10.56 °C (-24 - 51.01 °F)
Boiling Point (Boiling point/boiling range)	:	217 - 330 °C (423 - 626 °F)
Flash point	:	No data available
Evaporation rate	:	No data available
Flammability (solid, gas)	:	No data available
Upper explosion limit	:	No data available
Lower explosion limit	:	No data available
Vapour pressure	:	< 0.3 mmHg @ 25 °C (77 °F)
Relative vapour density	:	3.4 @ 20 °C (68 °F) (Air = 1.0)
Relative density	:	1.8347 - 1.8437 @ 25 °C (77 °F) Reference substance: (water = 1)
Density	:	Estimated 1.837 g/cm3 @ 20 °C (68 °F) 15.3 - 15.4 lb/gal @ 25 °C (77 °F)
Solubility(ies) Water solubility	:	completely miscible
Solubility in other solvents	:	No data available
Partition coefficient: n-octanol/water	:	No data available

Auto-ignition temperature	:	No data available
Thermal decomposition	:	340 °C

SECTION 10. STABILITY AND REACTIVITY

Reactivity	:	No dangerous reaction known under conditions of normal use.
Chemical stability	:	Stable under normal conditions.
Possibility of hazardous reactions	:	Acid reacts with most metals to release hydrogen gas which can form explosive mixtures with air. Reacts with organic materials and may cause ignition of finely divided materials on contact.
Conditions to avoid	:	Avoid contact with combustible material (paper, wool, oil).
Incompatible materials	:	Alkalis Metals carbide chlorates fuminates nitrates Organic materials Strong oxidizing agents strong reducing agents water Sulphur compounds
Hazardous decomposition products	:	corrosive vapors Sulphur oxides toxic fumes

SECTION 11. TOXICOLOGICAL INFORMATION

Skin corrosion/irritation

Product:

Remarks: Extremely corrosive and destructive to tissue.

Components:

7664-93-9:
Species: Rabbit
Result: Causes severe burns.

Serious eye damage/eye irritation

Product:

Remarks: May cause irreversible eye damage.

Components:

7664-93-9:

Species: Rabbit
Result: Risk of serious damage to eyes.

Germ cell mutagenicity

Components:

7664-93-9:

Genotoxicity in vitro : Test Type: Ames test
Species: Salmonella typhimurium
Metabolic activation: with and without metabolic activation
Result: negative

Carcinogenicity

IARC	Group 1: Carcinogenic to humans	
	7664-93-9	Sulfuric acid
OSHA	No component of this product present at levels greater than or equal to 0.1% is on OSHA's list of regulated carcinogens.	
NTP	Known to be human carcinogen	
	7664-93-9	Sulfuric acid

STOT - single exposure

Product:

Assessment: The substance or mixture is classified as specific target organ toxicant, single exposure, category 3 with respiratory tract irritation.

Further information

Product:

Remarks: No data available

SECTION 12. ECOLOGICAL INFORMATION

Ecotoxicity

No data available

Persistence and degradability

No data available

Bioaccumulative potential

No data available

Mobility in soil

No data available

Other adverse effects

Product:

Ozone-Depletion Potential	:	Regulation: 40 CFR Protection of Environment; Part 82 Protection of Stratospheric Ozone - CAA Section 602 Class I Substances Remarks: This product neither contains, nor was manufactured with a Class I or Class II ODS as defined by the U.S. Clean Air Act Section 602 (40 CFR 82, Subpt. A, App.A + B).
Additional ecological information	:	An environmental hazard cannot be excluded in the event of unprofessional handling or disposal. Harmful to aquatic life with long lasting effects.

SECTION 13. DISPOSAL CONSIDERATIONS

Disposal methods

Waste from residues	:	Dispose of in accordance with all applicable local, state and federal regulations. For assistance with your waste management needs - including disposal, recycling and waste stream reduction, contact Univar Solutions ChemCare: 1-800-909-4897 Dispose of in accordance with all applicable local, state and federal regulations. For assistance with your waste management needs - including disposal, recycling and waste stream reduction, contact Univar Solutions ChemCare: 1-800-909-4897
Contaminated packaging	:	Empty remaining contents. Dispose of as unused product. Do not re-use empty containers.

SECTION 14. TRANSPORT INFORMATION

DOT (Department of Transportation):
UN1830, SULFURIC ACID, 8, II

IATA (International Air Transport Association):
UN1830, SULPHURIC ACID, 8, II

IMDG (International Maritime Dangerous Goods):
UN1830, SULPHURIC ACID, 8, II

SECTION 15. REGULATORY INFORMATION

WHMIS Classification : D2A: Very Toxic Material Causing Other Toxic Effects
D2B: Toxic Material Causing Other Toxic Effects
E: Corrosive Material

EPCRA - Emergency Planning and Community Right-to-Know Act

CERCLA Reportable Quantity

Components	CAS-No.	Component RQ (lbs)	Calculated product RQ (lbs)
Sulfuric acid	7664-93-9	1000	1000

SARA 304 Extremely Hazardous Substances Reportable Quantity

Components	CAS-No.	Component RQ (lbs)	Calculated product RQ (lbs)
Sulfuric acid	7664-93-9	1000	1000

SARA 311/312 Hazards : Skin corrosion or irritation
Serious eye damage or eye irritation

SARA 302 : No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 : This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

Clean Air Act

This product does not contain any hazardous air pollutants (HAP), as defined by the U.S. Clean Air Act Section 112 (40 CFR 61).

This product does not contain any chemicals listed under the U.S. Clean Air Act Section 112(r) for Accidental Release Prevention (40 CFR 68.130, Subpart F).
This product does not contain any chemicals listed under the U.S. Clean Air Act Section 111 SOCMI Intermediate or Final VOC's (40 CFR 60.489).

Clean Water Act

The following Hazardous Substances are listed under the U.S. CleanWater Act, Section 311, Table 116.4A:
7664-93-9 Sulfuric acid
The following Hazardous Chemicals are listed under the U.S. CleanWater Act, Section 311, Table 117.3:
7664-93-9 Sulfuric acid
This product does not contain any toxic pollutants listed under the U.S. Clean Water Act Section 307

Massachusetts Right To Know

7664-93-9 Sulfuric acid

Pennsylvania Right To Know

7664-93-9 Sulfuric acid
7732-18-5 Water

California Prop 65

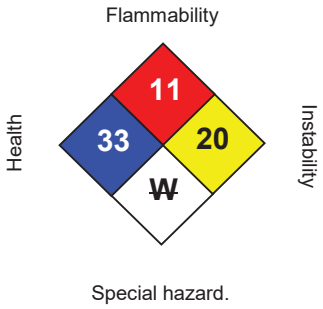
⚠ **WARNING**: This product can expose you to chemicals including Sulfuric acid, which is/are known to the State of California to cause cancer. For more information go to www.P65Warnings.ca.gov.

The components of this product are reported in the following inventories:

TSCA	:	On TSCA Inventory
DSL	:	All components of this product are on the Canadian DSL
AICS	:	On the inventory, or in compliance with the inventory
NZIoC	:	Not in compliance with the inventory
ENCS	:	On the inventory, or in compliance with the inventory
KECI	:	On the inventory, or in compliance with the inventory
PICCS	:	On the inventory, or in compliance with the inventory
IECSC	:	On the inventory, or in compliance with the inventory

SECTION16. OTHER INFORMATION

NFPA:



HMIS III:

HEALTH	3*
FLAMMABILITY	1
PHYSICAL HAZARD	2

0 = not significant, 1 =Slight,
2 = Moderate, 3 = High
4 =Extreme, * = Chronic

The information accumulated is based on the data of which we are aware and is believed to be correct as of the date hereof. Since this information may be applied under conditions beyond our control and with which we may be unfamiliar and since data made become available subsequently to the date hereof, we do not assume any responsibility for the results of its use. Recipients are advised to confirm in advance of need that the information is current, applicable, and suitable to their circumstances. This SDS has been prepared by Univar Solutions Product Compliance Department (1-855-429-2661) SDSNA@univarsolutions.com.

The information accumulated is based on the data of which we are aware and is believed to be correct as of the date hereof. Since this information may be applied under conditions

beyond our control and with which we may be unfamiliar and since data made become available subsequently to the date hereof, we do not assume any responsibility for the results of its use. Recipients are advised to confirm in advance of need that the information is current, applicable, and suitable to their circumstances. This SDS has been prepared by Univar Solutions Product Compliance Department (1-855-429-2661) SDSNA@univarsolutions.com.

Revision Date : 12/01/2020

Legacy SDS: : R0001174

Material number:
55254, 104393, 153270, 136507, 170942, 20261, 747387, 746673, 572695, 549278, 554154, 105608, 55212, 74712, 55684, 56633, 72048, 152711, 88318, 89725, 87701, 592090, 52439, 89466, 107474, 56705, 88445, 108413, 106107

Key or legend to abbreviations and acronyms used in the safety data sheet			
ACGIH	American Conference of Government Industrial Hygienists	LD50	Lethal Dose 50%
AICS	Australia, Inventory of Chemical Substances	LOAEL	Lowest Observed Adverse Effect Level
DSL	Canada, Domestic Substances List	NFPA	National Fire Protection Agency
NDSL	Canada, Non-Domestic Substances List	NIOSH	National Institute for Occupational Safety & Health
CNS	Central Nervous System	NTP	National Toxicology Program
CAS	Chemical Abstract Service	NZIoC	New Zealand Inventory of Chemicals
EC50	Effective Concentration	NOAEL	No Observable Adverse Effect Level
EC50	Effective Concentration 50%	NOEC	No Observed Effect Concentration
EGEST	EOSCA Generic Exposure Scenario Tool	OSHA	Occupational Safety & Health Administration
EOSCA	European Oilfield Specialty Chemicals Association	PEL	Permissible Exposure Limit
EINECS	European Inventory of Existing Chemical Substances	PICCS	Philippines Inventory of Commercial Chemical Substances
MAK	Germany Maximum Concentration Values	PRNT	Presumed Not Toxic
GHS	Globally Harmonized System	RCRA	Resource Conservation Recovery Act
>=	Greater Than or Equal To	STEL	Short-term Exposure Limit
IC50	Inhibition Concentration 50%	SARA	Superfund Amendments and Reauthorization Act.
IARC	International Agency for Research on Cancer	TLV	Threshold Limit Value
IECSC	Inventory of Existing Chemical Substances in China	TWA	Time Weighted Average
ENCS	Japan, Inventory of Existing and New Chemical Substances	TSCA	Toxic Substance Control Act
KECI	Korea, Existing Chemical Inventory	UVCB	Unknown or Variable Composition, Complex Reaction Products,

			and Biological Materials
<=	Less Than or Equal To	WHMIS	Workplace Hazardous Materials Information System
LC50	Lethal Concentration 50%		

Appendix D: Pumps Equipment Data Sheet

AGNICO EAGLE

EQUIPMENT DATA SHEET
Underground water transfer pump
6205-S-265-003-EDS-002
6205 - Water Treatment Plant

CIMA+

Rev	Issued for	Date	Prepared by	IOQ # / Napeg #	Approved by	IOQ # / Napeg #
A	Review	8-Apr-22	N.Anderson		K.Heslinga	
0	Quotation	11-Apr-22	N.Anderson		K.Heslinga	
1	Construction	24-Jun-22	N.Anderson		K.Heslinga	L5051

1	**GENERAL**					
2	Equipment Name / Number	-	Underground water transfer pumps			62PWA69314 / 62PWA69315
3	Expected Equipment Life	years	25			
4	Site Location	-	Near Hope Bay, Nunavut Territory, CAN			
5	Equipment Location	-	Indoor			
6	Description	Units				*See Vendor Drawing
7	**SERVICE CONDITIONS**					
8	Environment	-	Indoors			
9	Ambient Temperature	°C	10 to 36			
10	Duty	h/day	24 hrs/day			
11	Altitude Above Sea Level	m	44			
12	Quantity	-	Two (2)			
13	Purpose	-	From UG storage tank to metal precipitation reactor			
14	**PROCESS DATA**					
15	**Material Characteristics**					
16	Feed Material Description	-	underground produced water			
17	Material Temperature	°C	0.5 - 15			
18	Solids concentration	% w/w	≤ 2.0			
19	Material Density	kg/m³	1000			
20	Chloride concentration	mg/L	10 000			
21	**TECHNICAL DATA - GENERAL REQUIREMENTS**					
22	Operation	-	Continuous			
23	Expected Pump Type	-	End suction			
24	VSD Driven	-	Yes (See Note 2)			
25						
26	**Operation Parameters**		Min	Normal	Max	
27	Flowrate (see Note 1)	m³/h	60	125	200	
28	Total Dynamic Head (TDH)	m	5.7	7.4	12.7	
29	Pump Suction Pressure	psig	3.5	3.5	0.6	
30	NPSH Available	m	12.7	12.7	10.6	
31	**TECHNICAL DATA - PUMP DATA**					
32	Manufacturer	-	SAER elettropomp			*
33	Model	-	NCB-XSD 100-200 A (212)			*
34	Pump Type	-	End suction			*
35	Pump Size	-	DN 100 / 125			*
36	Pump Curve	-				*
37	Brake Power	kW				*
38	Shut-off Head	m				*
39	NPSH Required	m				*
40	Flowrate - Nominal	m³/h				*
41	Nominal Discharge Velocity	m/s				*
42	Seal Type	-	Mechanical			*
43	Gland Service Requirements (if applicable)	m³/h				*
44	Max. Allowable Casing Pressure	kPa				*
45	Operating Efficiency	%				*
46	HR-ER Ratio (ER valid if %v/v<20%)	-				*
47	Seal Arrangment	-				*
48	Noise Level	dB				*
49	**TECHNICAL DATA - IMPELLER**					
50	Impeller Type	-				*
51	Impeller Model	-				*
52	Impeller Diameter	mm				*
53	Impeller Speed	RPM				*
54	Impeller Tip Speed	m/s				*
55	Max. Stop Pressure	m				*
56	Impeller Attachment Method	-				*
57	**TECHNICAL DATA - SUCTION AND DISCHARGE**					
58	Suction Diameter	mm	125			*
59	Suction Flange	-				*
60	Discharge Diameter	mm	100			*
61	Discharge Flange	-				*
62	**TECHNICAL DATA - DRIVE**					
63	Drive Type	-	Direct Drive			*
64	**TECHNICAL DATA - MATERIAL**					
65	Casing	-	Cast Stainless Steel			*
66	Casing Liners	-				*
67	Casing Liner Thickness	mm				*
68	Casing Bolts	-				*
69	Impeller Material	-	Cast Stainless Steel			*
70	Impeller Liner Materal	-				*
71	Impeller Liner Thickness	mm				*
72	Shaft	-	Stainless steel			*
73	Shaft Sleeve	-				*
74	Packing (Seal)	-				*
75	Bearing Housing	-				*
76	Base Plate	-				*

AGNICO EAGLE

EQUIPMENT DATA SHEET
Underground water transfer pump
6205-S-265-003-EDS-002
6205 - Water Treatment Plant

CIMA+

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1	Construction	24-Jun-22	N.Anderson		K.Heslinga	L5051

77	**TECHNICAL DATA - MASS**			
78	Pump	kg		*
79	Motor	kg		*
80	Base Plate	kg		*
81	Gearbox / Coupling	kg		*
82	Total Shipping Weight	kg		*
83	Heaviest Component for Maintenance	kg		*
84	**TECHNICAL DATA - MOTOR**			
85	Manufacturer	-		*
86	Motor Type	-		*
87	Motor Horsepower	hp	15	*
88	Efficiency			*
89	Voltage, No. of Phases & Frequency	V, Hz	600V, 3Phase, 60Hz	
90	Service Factor			*
91	Synchronous Speed	RPM		*
92	Starting Method	-	VFD	
93	**Notes**			
94	1 - Vendor to provide pump MCSF.			
95	2 - Vendor to provide minimum and maximum pump speed for a continuous operation.			
96				

Prepared by : Nathan Anderson, EIT

Verified by : Keith Heslinga, P.Eng. — L5051 — 2022-06-24

Name and Title — OIQ N° — NAPEG N° — Signature — Date

PERMIT TO PRACTICE
CIMA CANADA INC. o/a CIMA+
Signature M. Heidari
Date 2022-Jun-24
PERMIT NUMBER: P942
NT/NU Association of Professional Engineers and Geoscientists

REGISTERED PROFESSIONAL ENGINEER
K.J. HESLINGA
LICENSEE
2022-06-24
NT/NU

AGNICO EAGLE

EQUIPMENT DATA SHEET
TIA transfer pump
6205-S-265-003-EDS-001
6205 - Water Treatment Plant

CIMA+

Rev	Issued for	Date	Prepared by	IOQ # / Napeg #	Approved by	IOQ # / Napeg #
A	Review	8-Apr-22	N.Anderson		K.Heslinga	
0	Quotation	11-Apr-22	N.Anderson		K.Heslinga	
1	Construction	24-Jun-22	N.Anderson		K.Heslinga	L5051

1	**GENERAL**					
2	Equipment Name / Number	-	TIA transfer pumps			62PWA69312 / 62PWA69313
3	Expected Equipment Life	years	25			
4	Site Location	-	Near Hope Bay, Nunavut Territory, CAN			
5	Equipment Location	-	Indoor			
6	Description	Units				*See Vendor Drawing
7	**SERVICE CONDITIONS**					
8	Environment	-	Indoors			
9	Ambient Temperature	°C	10 to 36			
10	Duty	h/day	24 hrs/day			
11	Altitude Above Sea Level	m	44			
12	Quantity	-	Two (2) (one running/one spare)			
13	Purpose	-	From TIA storage tank to metal precipitation reactor			
14	**PROCESS DATA**					
15	**Material Characteristics**					
16	Feed Material Description	-	Treated impound area decanted water			
17	Material Temperature	°C	0.5 - 15			
18	Solids concentration	% w/w	≤ 2.0			
19	Material Density	kg/m³	1000			
20	Chloride concentration	mg/L	2000 - 4000			
21	**TECHNICAL DATA - GENERAL REQUIREMENTS**					
22	Operation	-	Continuous			
23	Expected Pump Type	-	End suction			
24	VSD Driven	-	Yes (See Note 2)			
25						
26	**Operation Parameters**		Min	Normal	Max (Future)	
27	Flowrate (see Note 1)	m³/h	100	360	500	
28	Total Dynamic Head (TDH)	m	5.4	7.0	10.9	
29	Pump Suction Pressure	psig	3.5	3.4	0.5	
30	NPSH Available	m	12.7	12.7	10.8	
31	**TECHNICAL DATA - PUMP DATA**					
32	Manufacturer	-	SAER elettropompe			*
33	Model	-	NCB-XSD 125-250 A (266)			*
34	Pump Type	-	End suction			*
35	Pump Size	-	DN 150 / 125			*
36	Pump Curve	-				*
37	Brake Power	kW				*
38	Shut-off Head	m				*
39	NPSH Required	m				*
40	Flowrate - Nominal	m³/h				*
41	Nominal Discharge Velocity	m/s				*
42	Seal Type	-	Mechanical			*
43	Gland Service Requirements (if applicable)	m³/h				*
44	Max. Allowable Casing Pressure	kPa				*
45	Operating Efficiency	%				*
46	HR-ER Ratio (ER valid if %v/v<20%)	-				*
47	Seal Arrangment	-				*
48	Noise Level	dB				*
49	**TECHNICAL DATA - IMPELLER**					
50	Impeller Type	-				*
51	Impeller Model	-				*
52	Impeller Diameter	mm				*
53	Impeller Speed	RPM				*
54	Impeller Tip Speed	m/s				*
55	Max. Stop Pressure	m				*
56	Impeller Attachment Method	-				*
57	**TECHNICAL DATA - SUCTION AND DISCHARGE**					
58	Suction Diameter	mm				*
59	Suction Flange	-				*
60	Discharge Diameter	mm				*
61	Discharge Flange	-				*
62	**TECHNICAL DATA - DRIVE**					
63	Drive Type	-	Direct Drive			*
64	**TECHNICAL DATA - MATERIAL**					
65	Casing	-	Cast Stainless Steel			*
66	Casing Liners	-				*
67	Casing Liner Thickness	mm				*
68	Casing Bolts	-				*
69	Impeller Material	-	Cast Stainless Steel			*
70	Impeller Liner Materal	-				*
71	Impeller Liner Thickness	mm				*
72	Shaft	-	Stainless steel			*
73	Shaft Sleeve	-				*
74	Packing (Seal)	-				*
75	Bearing Housing	-				*
76	Base Plate	-				*

AGNICO EAGLE

EQUIPMENT DATA SHEET
TIA transfer pump
6205-S-265-003-EDS-001
6205 - Water Treatment Plant

CIMA+

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0	Quotation	11-Apr-22	N.Anderson		K.Heslinga	
1	Construction	24-Jun-22	N.Anderson		K.Heslinga	L5051

77	**TECHNICAL DATA - MASS**			
78	Pump	kg		*
79	Motor	kg		*
80	Base Plate	kg		*
81	Gearbox / Coupling	kg		*
82	Total Shipping Weight	kg		*
83	Heaviest Component for Maintenance	kg		*
84	**TECHNICAL DATA - MOTOR**			
85	Manufacturer	-		*
86	Motor Type	-		*
87	Motor Horsepower	hp	50	*
88	Efficiency			*
89	Voltage, No. of Phases & Frequency	V, Hz	600V, 3Phase, 60Hz	
90	Service Factor			*
91	Synchronous Speed	RPM		*
92	Starting Method	-	VFD	
93	**Notes**			
94	1 - Vendor to provide pump MCSF.			
95	2 - Vendor to provide minimum and maximum pump speed for a continuous operation.			
96				

Prepared by : Nathan Anderson, EIT

Verified by : Keith Heslinga, P.Eng.

Name and Title	OIQ N°	NAPEG N°	Signature	Date
	L5051			2022-06-24

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2022-06-24
NT/NU

AGNICO EAGLE

EQUIPMENT DATA SHEET
Treated water pump
6205-S-265-003-EDS-004
6205 - Water Treatment Plant

CIMA+

Rev	Issued for	Date	Prepared by	IOQ # / Napeg #	Approved by	IOQ # / Napeg #
A	Review	8-Apr-22	N.Anderson		K.Heslinga	
0	Quotation	11-Apr-22	N.Anderson		K.Heslinga	
1	Construction	24-Jun-22	N.Anderson		K.Heslinga	L5051

1	**GENERAL**					
2	Equipment Name / Number	-	Treated water pumps			62PWA69318 / 62PWA69319
3	Expected Equipment Life	years	25			
4	Site Location	-	Near Hope Bay, Nunavut Territory, CAN			
5	Equipment Location	-	Indoor			
6	Description	Units				*See Vendor Drawing
7	**SERVICE CONDITIONS**					
8	Environment	-	Indoors			
9	Ambient Temperature	°C	10 to 36			
10	Duty	h/day	24 hrs/day			
11	Altitude Above Sea Level	m	44			
12	Quantity	-	Two (2)(one running/one spare)			
13	Purpose	-	From treated water tank to outfall pump box			
14	**PROCESS DATA**					
15	**Material Characteristics**					
16	Feed Material Description	-	Treated tailings water			
17	Material Temperature	°C	0.5 - 15			
18	Solids concentration	% w/w	≤ 0.3			
19	Material Density	kg/m³	1000			
20	Chloride concentration	mg/L	2000 - 10000			
21	**TECHNICAL DATA - GENERAL REQUIREMENTS**					
22	Operation	-	Continuous			
23	Expected Pump Type	-	End suction			
24	VSD Driven	-	Yes (See Note 2)			
25						
26	**Operation Parameters**		Min	Normal	Max (Future)	
27	Flowrate (see Note 1)	m³/h	100	360	500	
28	Total Dynamic Head (TDH)	m	20	51	74	
29	Pump Suction Pressure	psig	3.5	3.5	0.6	
30	NPSH Available	m	12.7	12.7	10.7	
31	**TECHNICAL DATA - PUMP DATA**					
32	Manufacturer	-	SAER elettropompe			*
33	Model	-	NCBKXSD150-500D			*
34	Pump Type	-	End suction			*
35	Pump Size	-	DN 150 / 200			*
36	Pump Curve	-				*
37	Brake Power	kW				*
38	Shut-off Head	m				*
39	NPSH Required	m				*
40	Flowrate - Nominal	m³/h				*
41	Nominal Discharge Velocity	m/s				*
42	Seal Type	-	Mechanical			*
43	Gland Service Requirements (if applicable)	m³/h				*
44	Max. Allowable Casing Pressure	kPa				*
45	Operating Efficiency	%				*
46	HR-ER Ratio (ER valid if %v/v<20%)	-				*
47	Seal Arrangment	-				*
48	Noise Level	dB				*
49	**TECHNICAL DATA - IMPELLER**					
50	Impeller Type	-				*
51	Impeller Model	-				*
52	Impeller Diameter	mm				*
53	Impeller Speed	RPM				*
54	Impeller Tip Speed	m/s				*
55	Max. Stop Pressure	m				*
56	Impeller Attachment Method	-				*
57	**TECHNICAL DATA - SUCTION AND DISCHARGE**					
58	Suction Diameter	mm	200			*
59	Suction Flange	-				*
60	Discharge Diameter	mm	150			*
61	Discharge Flange	-				*
62	**TECHNICAL DATA - DRIVE**					
63	Drive Type	-	Direct Drive			*
64	**TECHNICAL DATA - MATERIAL**					
65	Casing	-	Cast Stainless Steel			*
66	Casing Liners	-				*
67	Casing Liner Thickness	mm				*
68	Casing Bolts	-				*
69	Impeller Material	-	Cast Stainless Steel			*
70	Impeller Liner Materal	-				*
71	Impeller Liner Thickness	mm				*
72	Shaft	-	Stainless steel			*
73	Shaft Sleeve	-				*
74	Packing (Seal)	-				*
75	Bearing Housing	-				*
76	Base Plate	-				*

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77	**TECHNICAL DATA - MASS**			
78	Pump	kg		*
79	Motor	kg		*
80	Base Plate	kg		*
81	Gearbox / Coupling	kg		*
82	Total Shipping Weight	kg		*
83	Heaviest Component for Maintenance	kg		*
84	**TECHNICAL DATA - MOTOR**			
85	Manufacturer	-		*
86	Motor Type	-		*
87	Motor Horsepower	hp	250	*
88	Efficiency			*
89	Voltage, No. of Phases & Frequency	V, Hz	600V, 3Phase, 60Hz	
90	Service Factor			*
91	Synchronous Speed	RPM		*
92	Starting Method	-	VFD	
93	**Notes**			
94	1 - Vendor to provide pump MCSF.			
95	2 - Vendor to provide minimum and maximum pump speed for a continuous			
96				

Prepared by : Nathan Anderson, EIT

Verified by : Keith Heslinga, P.Eng. L5051 2022-06-24

Name and Title | OIQ N° | NAPEG N° | Signature | Date

PERMIT TO PRACTICE
CIMA CANADA INC. o/a CIMA+
Signature M.Heidari
Date 2022-Jun-24
PERMIT NUMBER: P942
NT/NU Association of Professional Engineers and Geoscientists

REGISTERED PROFESSIONAL ENGINEER
K.J. HESLINGA
LICENSEE
2022-06-24
NT/NU

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6205-S-265-003-EDS-003
6205 - Water Treatment Plant

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1	**GENERAL**					
2	Equipment Name / Number	-	Service water pumps			62PWA69316 / 62PWA69317
3	Expected Equipment Life	years	25			
4	Site Location	-	Near Hope Bay, Nunavut Territory, CAN			
5	Equipment Location	-	Indoor			
6	Description	Units				*See Vendor Drawing
7	**SERVICE CONDITIONS**					
8	Environment	-	Indoors			
9	Ambient Temperature	°C	10 to 36			
10	Duty	h/day	24 hrs/day			
11	Altitude Above Sea Level	m	44			
12	Quantity	-	Two (2)(one running/one spare)			
13	Purpose	-	From TIA storage tank to sand filter and hose stations			
14	**PROCESS DATA**					
15	**Material Characteristics**					
16	Feed Material Description	-	Treated impound area decanted water			
17	Material Temperature	°C	0.5 - 15			
18	Solids concentration	% w/w	≤ 2.0			
19	Material Density	kg/m³	1000			
20	Chloride concentration	mg/L	2000 - 4000			
21	**TECHNICAL DATA - GENERAL REQUIREMENTS**					
22	Operation	-	Continuous			
23	Expected Pump Type	-	End suction			
24	VSD Driven	-	No			
25						
26	**Operation Parameters (See Note 2)**		Continuous	Intermittent	Intermittent max	
27	Flowrate (see Note 1)	m³/h	4.0	22.7	34.7	
28	Total Dynamic Head (TDH)	m	26	43	47	
29	Pump Suction Pressure	psig	3.5	3.3	0.05	
30	NPSH Available	m	12.7	12.6	10.3	
31	**TECHNICAL DATA - PUMP DATA**					
32	Manufacturer	-	Grundfos			*
33	Model	-	CRI 10-3 A-FGJ-A-E-HQQE			*
34	Pump Type	-	Vertical multistage centrifugal			*
35	Pump Size	-	DN 50 / 50 - 3 stage pump			*
36	Pump Curve	-				*
37	Brake Power	kW				*
38	Shut-off Head	m				*
39	NPSH Required	m				*
40	Flowrate - Nominal	m³/h				*
41	Nominal Discharge Velocity	m/s				*
42	Seal Type	-	Mechanical			*
43	Gland Service Requirements (if applicable)	m³/h				*
44	Max. Allowable Casing Pressure	kPa				*
45	Operating Efficiency	%				*
46	HR-ER Ratio (ER valid if %v/v<20%)	-				*
47	Seal Arrangment	-				*
48	Noise Level	dB				*
49	**TECHNICAL DATA - IMPELLER**					
50	Impeller Type	-				*
51	Impeller Model	-				*
52	Impeller Diameter	mm				*
53	Impeller Speed	RPM				*
54	Impeller Tip Speed	m/s				*
55	Max. Stop Pressure	m				*
56	Impeller Attachment Method	-				*
57	**TECHNICAL DATA - SUCTION AND DISCHARGE**					
58	Suction Diameter	mm	50			*
59	Suction Flange	-				*
60	Discharge Diameter	mm	50			*
61	Discharge Flange	-				*
62	**TECHNICAL DATA - DRIVE**					
63	Drive Type	-	Direct Drive			*
64	**TECHNICAL DATA - MATERIAL**					
65	Casing	-	AISI 316			*
66	Casing Liners	-				*
67	Casing Liner Thickness	mm				*
68	Casing Bolts	-				*
69	Impeller Material	-	AISI 304			*
70	Impeller Liner Materal	-				*
71	Impeller Liner Thickness	mm				*
72	Shaft	-				*
73	Shaft Sleeve	-				*
74	Packing (Seal)	-				*
75	Bearing Housing	-				*
76	Base Plate	-				*

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77	**TECHNICAL DATA - MASS**			
78	Pump	kg		*
79	Motor	kg		*
80	Base Plate	kg		*
81	Gearbox / Coupling	kg		*
82	Total Shipping Weight	kg		*
83	Heaviest Component for Maintenance	kg		*
84	**TECHNICAL DATA - MOTOR**			
85	Manufacturer	-		*
86	Motor Type	-		*
87	Motor Horsepower	hp	10	*
88	Efficiency			*
89	Voltage, No. of Phases & Frequency	V, Hz	600V, 3Phase, 60Hz	
90	Service Factor			*
91	Synchronous Speed	RPM		*
92	Starting Method	-	Direct On Line	
93	**Notes**			
94	1 - Vendor to provide pump MCSF.			
95	2- Intermittent flow includes continuous flow of approximately 4 m3/h			
96				

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