Design Report
Saline Effluent Treatment Plant (SETP) Upgrade

6526-680-132-REP-001

In Accordance with Licence 2AM-MEL1631 Part D, item 1 & 2

Prepared by:

Agnico Eagle Mines Limited – Meliadine Division

DOCUMENT CONTROL

Version	Date (YMD)	Section	Page	Revision
R0	11/06/2020			Design report
R1	27/07/2020	2.1, table 1 3.6	8 15	Limit to respect as per the MDMER and operational target Description of TDS attenuation
R2	28/08/2020	1.3 2.4 2.6 3.1 Figure 2 3.6 3.7 3.10 4.1 4.4	5 8 9 9 11 15 15 17 18 18	Update Update Update Update Update Update Update Localization of sludge disposal Update Schedule update

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1 INTRODUCTION

1.1 SITE LOCATION AND ACCESS

Agnico Eagle Mines Limited (Agnico Eagle) is operating the Meliadine gold mine located approximately 25 km north of Rankin Inlet, and 80 km southwest of Chesterfield Inlet in the Kivalliq Region of Nunavut. The site is located on the peninsula between the East, South, and West basins of Meliadine Lake (63°01'23.8"N, 92°13'6.42"W). The area is accessible from the all-weather gravel road linking the Meliadine mine site with Rankin Inlet.

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

1.2 SITE FACILITIES

The current mine plan focuses on the development of the Tiriganiaq gold deposit which will be mined using both conventional open-pit and underground mining operations. Current mining facilities to support the Mine include a plant site and accommodations, tailings storage facility, waste rock storage facilities, ore storage pads, process plant, power plant, maintenance facilities, water management treatment plants and supporting infrastructures.

Such infrastructures include water retention dikes, berms, culverts, channels, collection ponds, pumping stations, fresh water intake and water treatment plants are required to manage water during pre-production, operation, and interim mine closure. In 2019 a saline effluent treatment plant (SETP), to support saline water treatment prior to discharge to Melvin Bay, was constructed.

To support the water management plan for the 2020 discharge season and to improve the treatment plant performance and reliability, upgrades to the SETP are required. The planned upgrades will be completed within the same building as in 2019. No additional building or infrastructure will be added to the existing facilities constructed in 2019. For more details on the SETP constructed in 2019, information can be found in the Design report (6528-680-132-REP-003, AEM, 2019).

1.3 PURPOSE OF DOCUMENT

This report includes the final design and construction drawings for the SETP upgrade. The effluent from the SETP will be pumped to SP3, after which it will be transported by tanker truck to Melvin Bay where it will be discharged via an underwater pipe diffuser.

1.4 SCOPE OF WORK

WSP Canada was retained by Agnico Eagle to select new pumps and pipelines and Veolia provided the main equipment used to upgrade the SETP. This report describes the SETP, and the pumps and pipelines design. Construction drawings of the listed infrastructure are presented in Appendix A of this report.

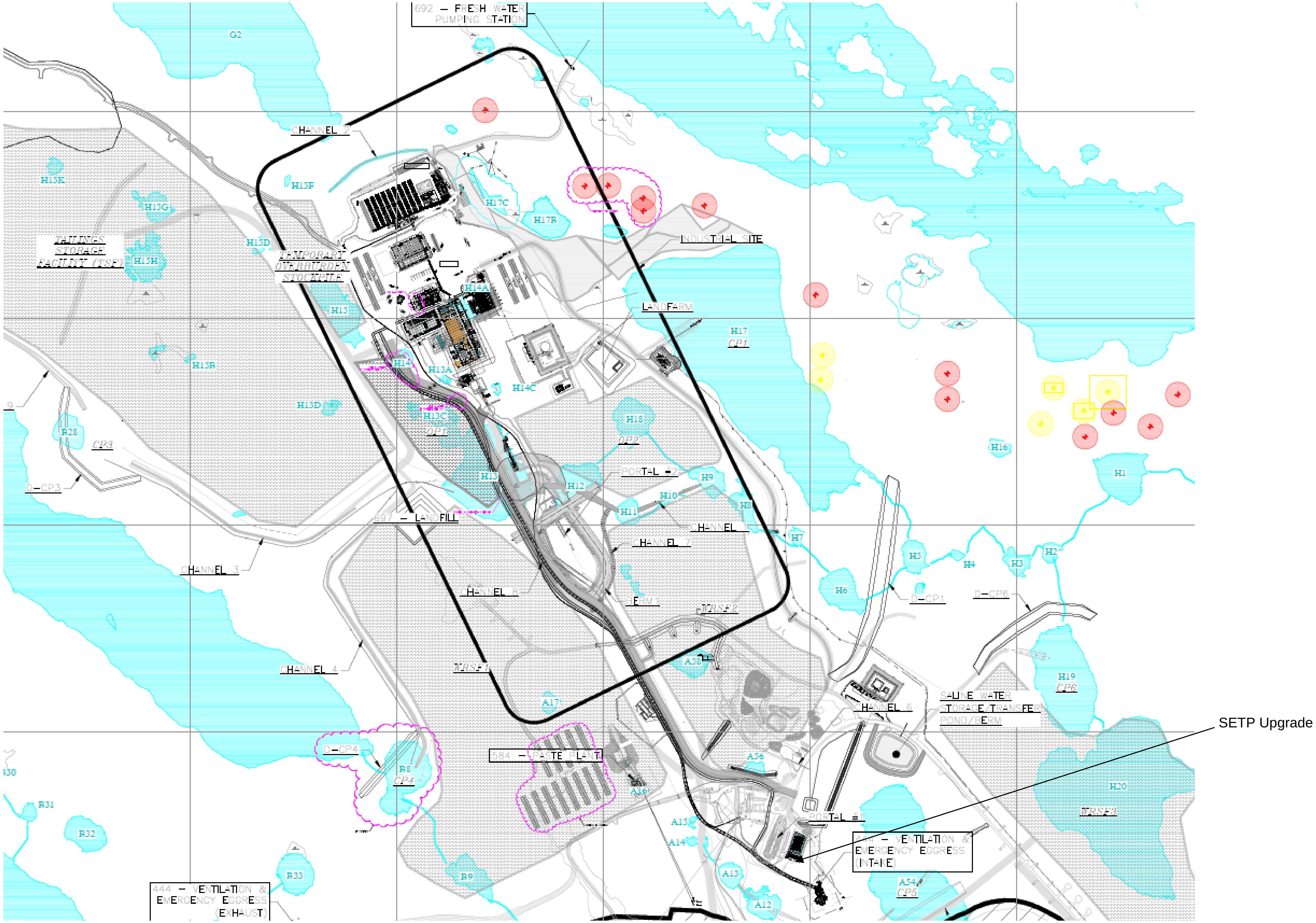

Figure 1 : General location plan

2 DESIGN METHODOLOGY

2.1 DESIGN RATIONALE, REQUIREMENTS, CRITERIA AND PARAMETERS

The design rationales are the following:

- Equipment selected should be delivered and operational for summer 2020;
- Treatment performance of the SETP should comply with regulatory requirements;
- Production of byproduct (i.e., sludge) should be minimized;
- Reuse the maximum possible number of parts and equipment from 2019 SETP version; and
- Simple to operate.

The parameters of concern identified in saline ponds are: pH, Ammonia and total suspended solids (TSS). The treatment plant is designed to meet the following effluent criteria presented in Table 1. Note that the treated water from SETP is not directly discharged to the environment. Water is discharged into SP3 pond (see design report 6528-680-132-REP-002, AEM, 2019).

Table 1 : Treatment Objectives of the SETP

Parameters	Unit	Limit average	Limit instantaneous	Type of limit
pH	-	6-9.5		As per MDMER
Acute Toxicity on marine species	-	Non-toxic		As per MDMER
TSS	mg/L	15	30	As per MDMER
Un-ionized ammonia	mg N/L	0.5	1	As per MDMER
TDS	mg/L		Max 39 600 mg/L	Operational objective

Total dissolved solid (TDS) and ammonia concentration targets will be set to be non-acutely toxic for the three-spined stickleback and other species requested as per the MDMER.

2.2 DESIGN STANDARDS ANALYSIS AND METHODS

Each component of the SETP upgrade was selected to achieve the requirement for the water quality of the SETP effluent and to achieve a maximum treatment capacity of 1600 m^3/day (two times greater than the design capacity of the SETP constructed in 2019). 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 DESIGN ASSUMPTIONS AND LIMITATIONS

The SETP is designed for a maximum treatment flow rate of 1600 m^3/d. The design of the chlorination system is flexible since the dosage of sodium hypochlorite will be directly proportional to the raw water ammonia concentration and flow; the clarification system is based on a maximum raw water TSS of 200 ppm.

2.4 SALINE WATER MANAGEMENT STRATEGY

Similar to 2019, saline water in the underground mine is first treated for TSS underground through a Mudwizard system including decanting basins. The saline water is then transferred to the surface saline ponds (SP1 and/or SP4) that have a combined storage capacity of approximately 265,808 m^3. From there, the saline water (from SP1 or SP4) as well as other contact water will be pumped to the SETP (Raw water source). Water exiting the SETP is discharged to SP3 (maximum volume of 7,867 m^3). Water is then pumped to a tanker truck and transported to Itivia for discharge through the diffuser (design report 6528-680-132-REP-001, AEM, 2019).

2.5 METHODOLOGY

The SETP equipment upgrade integrates the following components to respect operational water quality targets for effluent:

- Conversion of the lamella clarifier tank into a sand ballasted clarifier;
- Upgrade of chemical dosing skids for polymer, coagulant, sodium hypochlorite and caustic;
- Increase of chlorination tanks volume;
- Increase of dechlorination filter;
- Upgrade of pumps and piping;
- Upgrade of instrumentation; and
- Addition of an acid dosing skid to control pH.

2.6 WATER CHARACTERISTICS

The SETP equipment upgrades are designed based on water quality of underground water inflows as per the deign report emitted in 2019 (6528-680-132-REP-003, AEM, 2019) for ammonium and TSS. The TDS of raw water will be not higher than 39 600 m/L as per section 2.1

2.7 EFFLUENT FLOW RATE

The effluent flow rate will be at a maximum rate of 1600 m^3/d.

3 DESCRIPTION

3.1 SALINE EFFLUENT TREATMENT PLANT (SETP)

The Raw water feeding the SETP will be pumped to be treated, first for TSS in an Actiflo® clarifier. The treated water overflows into a chlorination reactor where ammonia is oxidized into nitrogen gas by hypochlorite solution, or alternatively bypasses the chlorination tank if necessary. The gasses generated by this treatment unit will be vented to the atmosphere outside of the plant. Excess chlorine in the water will be removed by a granular activated carbon filter (GAC). The pH of the treated water will then be adjusted before discharging to SP3. From SP3, the water will be pumped into tanker trucks, transported to Itivia, and discharged to Melvin Bay through the diffuser. If treated water quality does not meet the desired criteria, water will be recirculated in SP1 prior to entering SP3.

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

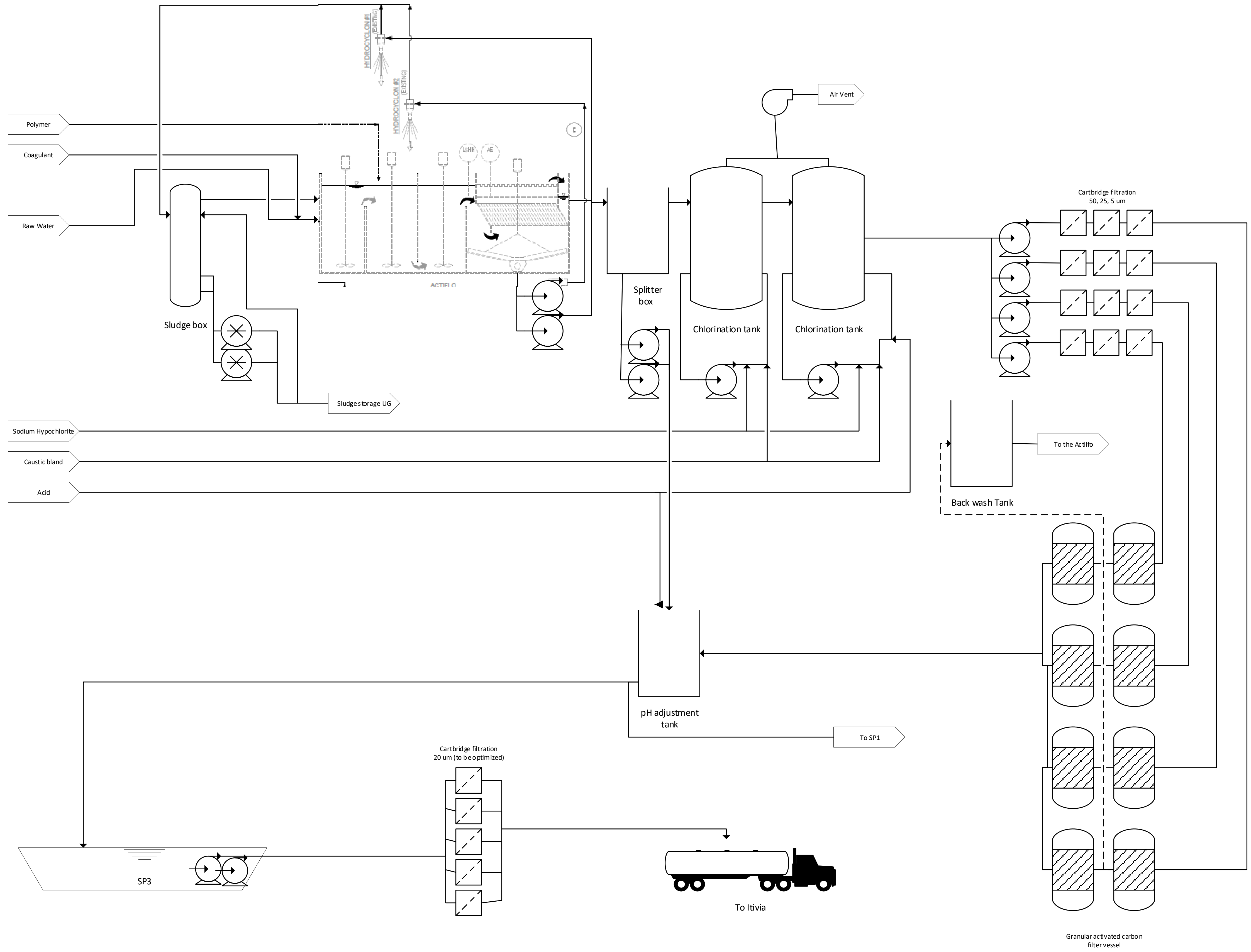

Figure 2 : SETP Overall Process Concept

3.2 ACTIFLO®

The main modification between the Multiflo® and Actiflo® units is the addition of two microsand recirculation circuits (one operating, one standby). Those circuits are designed with a recirculation pump and a hydrocyclone. A sludge recirculation tank is also added to control the sludge volume sent for disposal. Additional chemical skids are also required to meet the chemical requirement once the flow capacity is increased.

Actiflo® are sand-ballasted settling units with 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 with high overflow rates and short retention times. The use of microsand also permits the unit to perform well under dramatically changing flow rates without impacting final effluent quality.

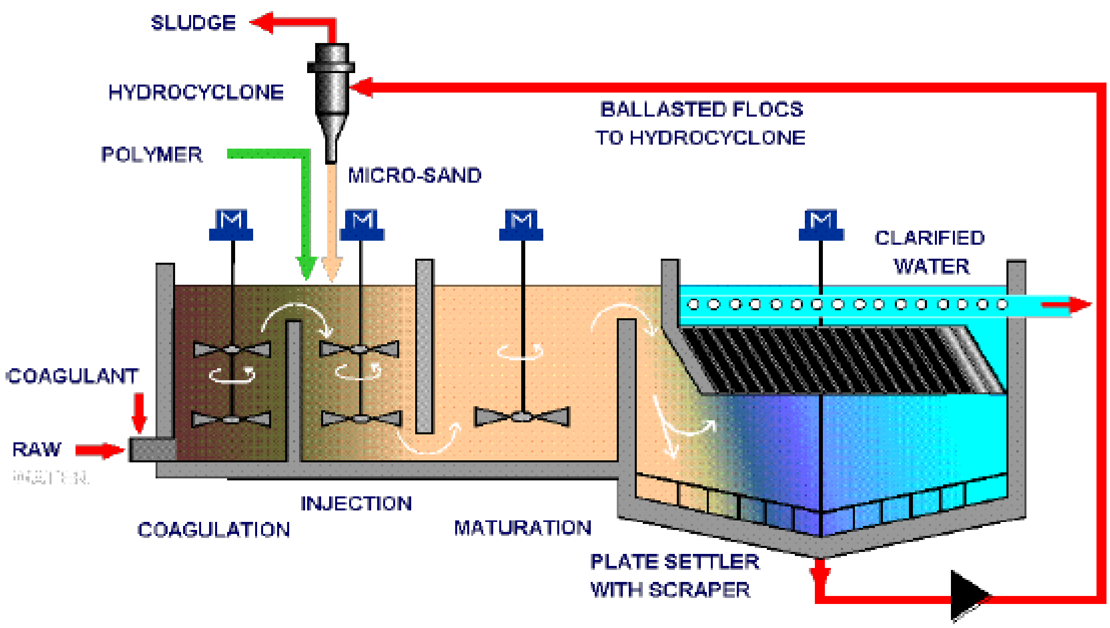

Figure 3 : Actiflo® Process

The slurry flows to the first basin, the coagulation chamber, where the reaction is optimized. The aluminum-based coagulant forms a floc of aluminum hydroxide ($Al(OH)_3$) which acts as a bridge to tie colloidal particles together. The coagulated water then overflows to a second tank section called the injection tank. There, the microsand and flocculent aid polymer are added. The microsand provides a large contact area for floc attachment and acts as ballast, thereby accelerating the settling of the flocs. The flocculent aid polymer binds the destabilized suspended solids to the microsand particles by forming polymer bridges. From the injection tank, the water underflows to a third tank section called the maturation tank. In this section, the microsand and sludge flocs agglomerate and grow into high-density flocs known as microsand ballasted flocs. From the maturation zone, the water overflows to the settling section of the tank. In the settling zone, the microsand ballasted flocs settle quickly to the bottom of the unit. In the settling zone, the settling efficiency is further increased by the use of the lamella tubes. The clarified water exits the system via a series of collection troughs or wires. The clarified water is monitored for turbidity.

The sand-sludge mixture settles to the bottom of the clarifier. Scrapers force the sludge collected at the bottom of the clarifier into a central cone from which is continuously withdrawn and pumped to a hydro cyclone where the sludge and microsand are separated by centrifugal force. After separation, the higher density microsand is discharged from the bottom of the hydro cyclone and reinjected into the process for reuse. The lighter density sludge is discharged from the top of the hydro cyclone and directed to the sludge storage tank and recirculated into the coagulation chamber or to the sludge storage location. A solid percentage of 2% is expected in the sludge tank purge.

3.3 BREAK POINT CHLORINATION

The water is then sent to two new reaction tanks in series where hypochlorite solution and an alkali (mix of NaOH/KOH) is added. The hypochlorite (ClO^-, chlorine) is a compound added to oxidize the ammonia (NH_4^+) into nitrogen (N_2) and nitrates (NO_3^-). The quantity of hypoclorite added is a function of the concentration of nitrites (NO_2^-) and ammonia concentration in the raw water. The chlorination tanks are agitated by recirculating water through eductors within each tank.

The hypochlorite solution injected in the water produces hypochlorous acid (HOCl). The hypochlorous acid is a weak acid, and part of the hypochlorous acid is decomposed in water into hypochlorite ions (ClO^-), depending on the pH of the water. The pH can be adjusted between 6 and 7 approximately to optimize the chlorine dosage. An addition of sulfuric acid is possible only in the second reactor for pH adjustment if required.

The hypochlorous acid and hypochlorite ions in solution will first be consumed by reducing agents and organic matter contained in the water. When more chlorine is added in solution and there is a presence of ammonia, the ammonia will react to form chloramines, specifically monochloramines (NH_2Cl). When the quantity of chlorine is sufficient, the monochloramines will be destroyed, and depending on the concentration, will be transformed into dichloramines ($NHCl_2$) or trichloramines (NCl_3) and then finally into nitrogen (N_2). If the quantity of chlorine injected is sufficient, a breakpoint is reached where all chloramines and ammonia are converted into nitrogen.

The overall reaction leading to the release of nitrogen and nitrate as a final product is presented below:

- $NH_4^+ + 1.5\ HOCl \rightarrow 0.5\ N_2 + 1.5\ H_2O + 2.5\ H^+ + 1.5\ Cl^-$
- $NH_4^+ + 4\ HOCl \rightarrow NO_3^- + H_2O + 6\ H^+ + 4\ Cl^-$

Figure 4 also presents a graphical view of the break point determination.

The retention time within the chlorination tank is typically around 10 to 20 minutes.

3.4 CARTRIDGE FILTRATION

Before being fed to the GAC filter, water is filtered through three cartridge filters with hole size of 50, 25 and 5 μm. This step limits the clogging risk within the GAC filter. One cartridge filter is expected to be used per day.

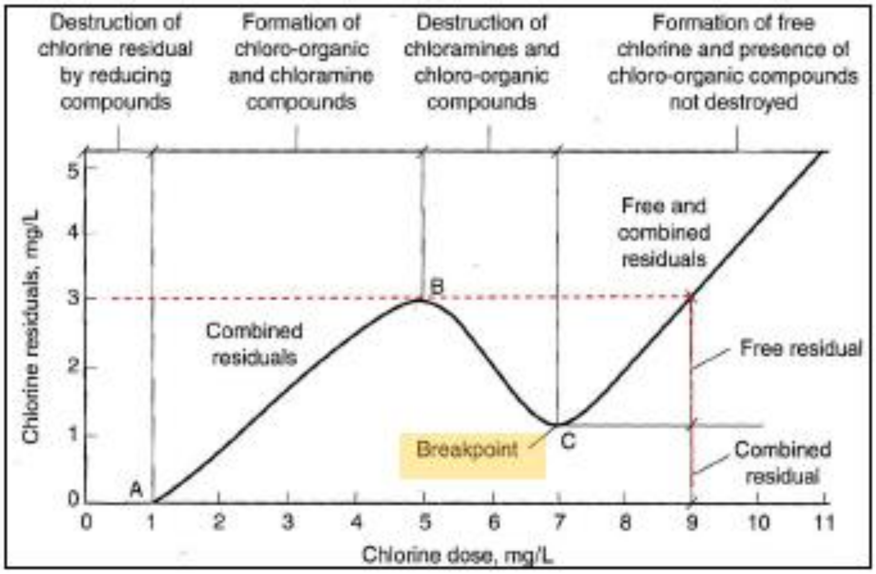

Figure 4 : Break point determination

3.5 GRANULAR ACTIVATED CARBON (GAC) FILTER

The water will then be pumped to four lines of two pressure filters filled with Granulated Activated Carbon (GAC) in series. As a result of the pressure from the pump, the water is forced to pass through the filters where it is exposed to the GAC for a period of time, removing residual chlorine and any chlorine byproducts. The treated water is then monitored for total chlorine. Backwashing of the GAC Filter is expected to occur up to one time per day to remove the buildup of TSS that may form within the filter. The duration of a backwash is expected to be 20 minutes or less, and the backwash water will be returned to the feed of the Actiflo®.

As a guideline only, the supplier estimates that the carbon will have a lifetime of 190 days or more, assuming a residual chlorine concentration of 5 mg/L, and a TOC of 3 mg/L. The chlorine residual depends on operation, variation of quality and flow of the raw water and temperature. Replacement of the media will be based on the efficiency of the dichlorination process.

The filtration and back flush rate are set at 8.3 m/h (filtration surface of approx. 2 m^2). The backwash flow will be countercurrent to the flow of filtration. Two-pressure filters will be in series to ensure a contact time of 20 minutes per 400 m^3/day of water.

The activated carbon used is 12x40 SAW (Acid washed, Continental Carbon) and possesses a capacity of chlorine removal higher than required for summer operation of the SETP. The carbon is considered as a consumable. The specifications of the GAC is presented below:

- Size: 12x40 mesh
- Surface Area: 1100 m^2/g
- Hardness: 97%
- Density: 0.48-0.53 g/cc
- pH: 6-8

3.6 PH ADJSUTMENT TANK

Treated waters (both from GAC filters and Actiflo) flow into the pH adjustment tank where pH is adjusted. Sulfuric acid will be used for pH adjustment in this reactor.

3.7 POLISHING FILTRATION

A polishing filtration will be implemented prior to fill up the tanker used for transportation of treated water to the final discharge location. To do so, five filtration vessels will be place in parallel between the pumps located in SP3 and the truck loading pad. Mesh of the filter will be optimized in the field and 10 um is expected to be used.

3.8 REAGENTS

The following reagents will be used at the SETP:

- Coagulant: Hydrex 6240 (Veolia) or equivalent
- Anionic polymer: Hydrex 6105 (Veolia) or equivalent
- Caustic blend: Hydrex 9501 (Veolia) or equivalent
- Sodium hypochlorite: (Veolia) or equivalent
- Actisand (Veolia) or equivalent
- Sulfuric Acid 93%

The expected dosages are presented in Table 2.

Table 2 : Expected treatment dosages

Chemical	Unit	Dosage
Coagulant	g/m³ of neat liquid as received	50-300
Anionic polymer	g/m³ dry basis	1.5-7
Caustic blend	g/m³ of neat liquid as received	Depend on ammonia feed concentration
Sodium hypochlorite	g/m³ of neat liquid as received	Depend on ammonia feed concentration
Actisand	g/m³ dry basis	3
Sulfuric acid	g/m³ of neat liquid as received	To be determined if required

Most of the chemicals are supplied in liquid form (and dosed using a dosing skid pump directly into the process) except for the polymer which must be prepared with a dedicated make down unit before dosing. The solutions made with these products are prepared according to the SDS provided by the suppliers. The application for each of these reagents is detailed in the Operation and Maintenance Manual (OMM).

Coagulant injection: Aluminium Chloride

The selected coagulant is Hydrex 6240, an aluminum chloride coagulant. It will be received in bulk containers of 1 m³ at 9.0% concentration as aluminum. The dosage will be performed using a mechanical diaphragm metering pump (two standby and one in duty).

Polymer makedown and injection: Anionic Polymer

The use of a flocculation agent is essential for a TSS removal process in cold temperature. The polymer is typically selected during laboratory tests but the Hydrex 6105 has shown good results on similar water. Hydrex 6105 is a solid, anionic polymer used to enhance flocculation and will be received in 25 kg bags. One automatic preparation make down system will be used to prepare a 0.2-0.25% solution. Warm water is used for the polymer preparation. The solution will be dosed using a mechanical metering pump specifically designed for high viscosity product (two standby and one in duty).

NaOH/KOH injection: Hydrex 9501

Hydrex 9501 will be received in bulk containers of 1 m^3 at 47% concentration. Hydrex 9501 (NaOH/KOH blend**)** will be used since sodium hydroxide has a freezing point of 12°C and needs to be stored in warm conditions to avoid freezing; Hydrex 9501 has a freezing point at -25°C. It is a hazardous product (class 8-corrosive) and needs to be handled accordingly. The dosage will be performed using a specifically designed mechanical diaphragm metering pump (one standby and one in duty).

Sodium hypochlorite injection: Hydrex 9560

Sodium hypochlorite (Hydrex 9560) is used to oxidize ammonia. It will be received by tote at a concentration of 12%. It will be transferred to the process by a peristaltic metering pump (one standby and two in duty). To avoid degradation of the hypochlorite solution, the tote tank has to be stored in a sea can with a dark and temperate environment.

Sulfuric Acid

Sulphuric acid is used for pH control in the second chlorination reactor. The pH will be adjusted to a pH of around 5.5 - 6.5 in the first reactor but may increase due to hypochlorous acid consumption in the second reactor. A second injection point is located in the pH and TDS attenuation tank to adjust the pH of the treated water if required.

Sulphuric acid will be received in bulk containers of 1 m^3 at 93% concentration. It has a freezing point of -30°C. It is a hazardous product (class 8-corrosive) and needs to be handled accordingly. The product can be used as is and the dosage will be performed using mechanical diaphragm metering pumps (one standby and one in duty or two in duty if needed).

Microsand

The presence of microsand allows:

- An increase in the probability of encounters between particles;
- An increase in the exchange surface and consequently in the adsorption capacity compared to conventional flocculation; and
- The formation of solid and dense ballasted flocs which will resist an energetic stirring followed by rapid settling.

These properties lead to very short residence times for flocculation as well as settling, thus optimizing the process. The microsand is recycled in the process. During the operation, it is estimated that 3 g of microsand per cubic meter of raw water will be lost in the sludge. Therefore, 3 g of microsand per cubic meter of raw water will be added. The microsand will be supplied in 22.68 kg bags and will be added manually to the Actiflo® as required, approximately once or twice a week (the dosage of sand is through batch addition).

3.9 SERVICE WATER SYSTEM

The service water system consists of two multimedia filters in parallel (one operating, one standby), one heater, one filtered water tank and one service water pump. Service water is used for polymer makeup system and for on-line polymer dilution. CP1 treated water is used to produce service water. Water will be stored in the treated water tank within the nearby SWTP building.

For polymer make down, the requirements are the following:

- Flow rate: 5.2 m^3/h (used by batch)
- Pressure > 65 PSIG
- Temperature > 10°C
- Conductivity < 10,000 µS/cm
- Chlorine < 0.5 mg Cl_2/L
- TSS < 10 ppm

3.10 SOLID WASTE MANAGEMENT

Sludge from Actiflo®

Sludge produced in the Actiflo® system will be sent back underground or into saline storage ponds. The sludge production is estimated at approximately 15 m^3/d with a solids content of approximately 2-3%.

GAC Media

Spent GAC media will be stored in the waste rock storage facility, delivered to an appropriate storage location or shipped south as a waste.

3.11 CONTROLS

The general control strategy is detailed in the P&ID in Appendix B. The SETP pump and dosing skid will be controlled by a series of sensors measuring level, flow, and water quality.

Table 3 presents a summary of on-line analysis performed for water quality control.

Table 3 : On line analysis

Parameters	Raw Water	Actiflo® Exit	Actiflo® Sludge	Chlorination tank 1	Chlorination tank 2	Each GAC filter train	Composite of 4 GAC filter trains	pH&TDS Attenuation tank	Truck loading station
pH		x		x	x		x	x	x
Conductivity								x	x
Ammonia		x					x		
Turbidity/TSS	x	x	x				x	x	x
Free chlorine				x	x				
Total chlorine				x	x	x			

4 CONSTRUCTION METHODS AND COMMISSIONING

4.1 PIPING AND PUMPING

For the operation of the SETP upgrade, the following pumps and pipes were reviewed:

- Inside the building of the SETP;
- Raw contact water sources to the SETP;
- Treated water from the SETP to SP3; and
- Treated water from the SP3 to the truck pumping station;

Pipes will be above-ground and will lie directly on the tundra. The sharp stones will be removed before the pipe installation to reduce the risks of tears and premature wear.

4.2 CONSTRUCTION METHOD AND EQUIPMENT

No building construction is expected for the SETP upgrade.

4.2 QUALITY CONTROL/ASSURANCE

A record of as-built drawings will be produced.

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 commissioning completion is planned to be early September 2020.

Appendix A: Drawings

Appendix B: Pipe & Instrumentation Diagram

Appendix A

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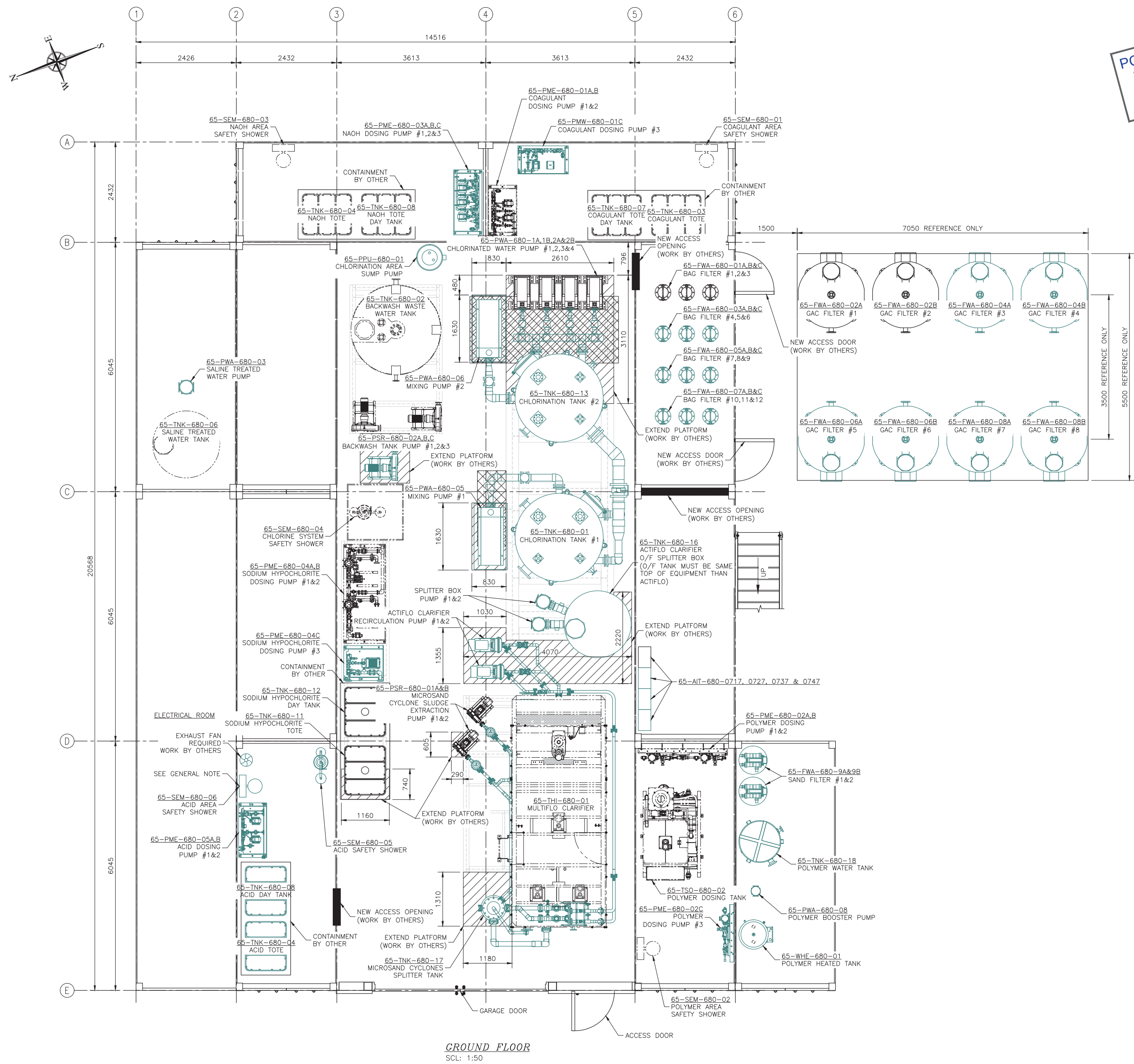

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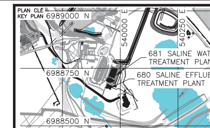
FOR CONSTRUCTION
DATE : 2020–05–15

PLAN CLÉ / KEY PLAN



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VAL-D'OR (QUEBEC) CANADA J9P 0J7
PHONE : 1-819-825-4274 | FAX : 1-819-824-1514 | WWW.WSP.COM
Ref. 201-00413-01

NOTES GÉNÉRALES / GENERAL NOTES

1. WORK SUCH AS MECHANICAL, PIPING, BUILDING MECHANICS, STRUCTURAL, CONCRETE, CIVIL, ARCHITECTURAL BY OTHERS.
2. PERFORMANCE AND USE REQUIREMENTS FOR SAFETY SHOWERS AS PER ANSI–ISEA Z358.1 EMERGENCY EYEWASH AND SHOWER EQUIPMENT.
3. ALL DIMENSIONS, ELEVATIONS AND GENERAL CONDITIONS OF THE SITE SHALL BE VERIFIED BY THE CONTRACTOR PRIOR TO THE BEGINNING OF THE WORK. HE SHALL INFORM THE ENGINEER OF ANY DISCREPANCY AND ADHERE TO HIS DIRECTIVES.
4. EXITS (QUANTITY AND LOCATION) AND MEANS OF EGRESS AS PER NATIONAL BUILDING CODE.

LEGEND

- NEW STRUCTURE
- STRUCTURE TO BE REMOVED
- EXISTING EQUIPMENT
- EQUIPMENT TO RELOCATE
- NEW EQUIPMENT

DESSINS EN RÉFÉRENCE / REFERENCE DRAWINGS

TITRE / TITLE	# DWG
INDUSTRIAL SITE – PORTAL #1	65–000–210–200–5
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–	–
–	–
–	–

AGNICO EAGLE

REVISIONS

REV.	DATE	DESCRIPTION	PAR/BY	APP.	CLIENT
1	2020–05–15	ISSUED FOR CONSTRUCTION	S.D.	S.L.	
0	2019–03–21	ISSUED FOR TENDER	C.G.	D.R.	

TITRE / TITLE
AGNICO EAGLE – MELIADINE DIVISION
680 – SALINE EFFLUENT TREATMENT PLANT
210 – GENERAL ARRANGEMENT
EQUIPMENT PLANNING
GROUND FLOOR

		DATE
DESSINÉ PAR / DRAWN BY	BRENDA FALARDEAU	2020–03–30
VÉRIFIÉ PAR / CHECKED BY	STEVE LEONARD, P.Eng.	2020–05–15
APPROUVÉ PAR / APPROVED BY	SÉBASTIEN PERRON	2020–05–01
ÉCHELLE / SCALE	INDICATED	2020–03–30

NO. DESSIN / DRAWING NO. 65–680–210–200

NO. PROJET / PROJECT NO.	REVISION	FEUILLE / SHT
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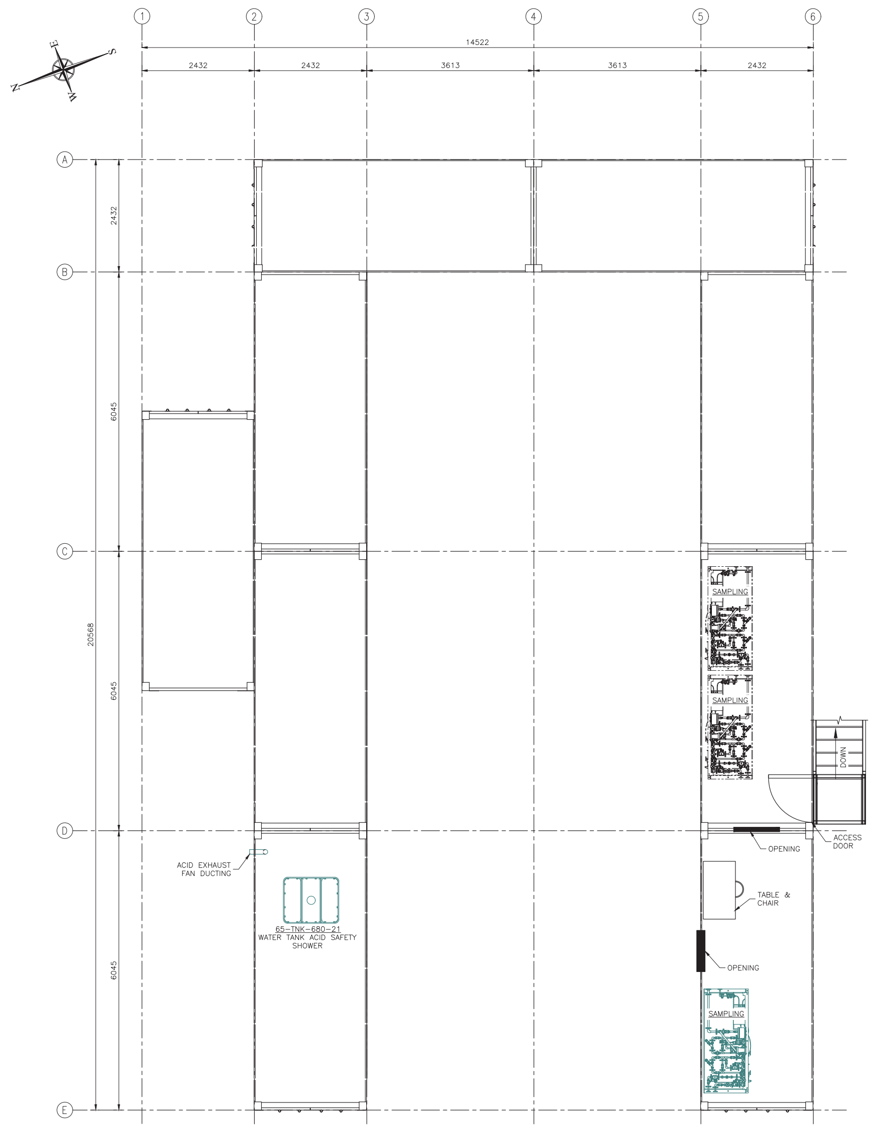

POUR CONSTRUCTION
FOR CONSTRUCTION
DATE : 2020-05-15

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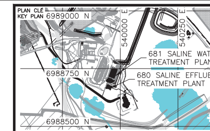
PLAN CLÉ / KEY PLAN



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- EQUIPMENT TO RELOCATE
- NEW EQUIPMENT

DESSINS EN RÉFÉRENCE / REFERENCE DRAWINGS

TITRE / TITLE	# DWG
INDUSTRIAL SITE - PORTAL #1	65-000-210-200-5
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AGNICO EAGLE

REV.	DATE	DESCRIPTION	PAR/BY	APP.	CLIENT
0	2020-05-15	ISSUED FOR CONSTRUCTION	S.D.	S.L.	

REVISIONS

TITRE / TITLE
AGNICO EAGLE - MELIADINE DIVISION
680 - SALINE EFFLUENT TREATMENT PLANT
210 - GENERAL ARRANGEMENT
EQUIPMENT PLANNING
SECOND FLOOR

		DATE
DESSINÉ PAR / DRAWN BY	BRENDA FALARDEAU	2020-03-30
VÉRIFIÉ PAR / CHECKED BY	STEVE LEONARD, P.Eng.	2020-05-15
APPROUVÉ PAR / APPROVED BY	SÉBASTIEN PERRON	2020-05-01
ÉCHELLE / SCALE	INDICATED	DATE 2020-03-30

NO. DESSIN / DRAWING NO. 65-680-210-200

NO. PROJET / PROJECT NO.	REVISION	FEUILLE / SHT
6526	0	2 / 2

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FILE NO. 65-680-210-200-2_R0.dwg

Appendix B

NO. DESSIN
DRAWING NO. 65-180-205-001_R4

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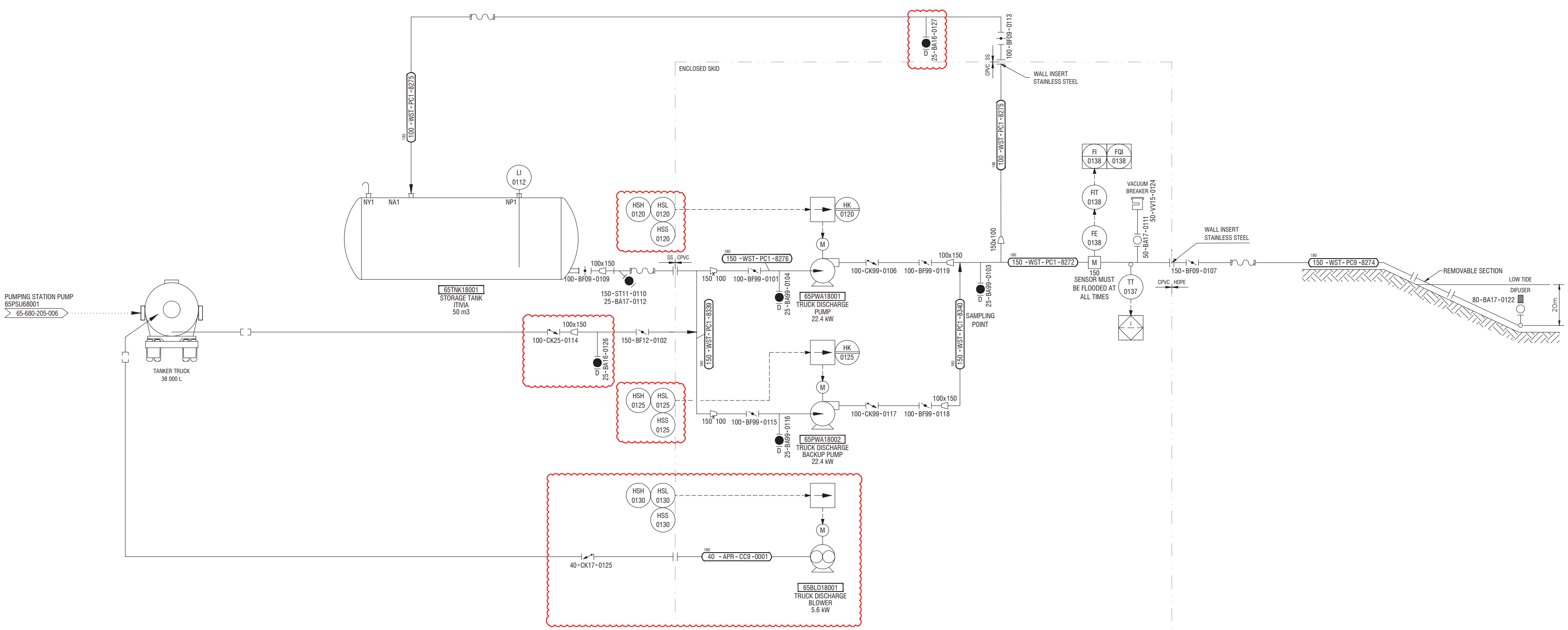

PLAN CLÉ
KEY PLAN

NOTES GÉNÉRALES / GENERAL NOTES

Process
2020-05-18

POUR CONSTRUCTION
FOR CONSTRUCTION
DATE : 2020-05-12

DESSINS EN RÉFÉRENCE / REFERENCE DRAWINGS

TITRE / TITLE	# DWG
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AGNICO EAGLE

REV.	DATE	DESCRIPTION	PAR/BY	APP.	CLIENT
4	2020-05-12	ISSUED FOR CONSTRUCTION	S.P.	T.G.	
3	2019-07-31	AS BUILT	S.P.	E.L.	
2	2019-04-11	ISSUED FOR CONSTRUCTION	S.P.	E.L.	
1	2019-03-21	GENERAL MODIFICATIONS	J.L.	S.P.	
0	2019-02-07	ISSUED FOR TENDER	S.P.	E.L.	

REVISIONS

TITRE / TITLE
AGNICO EAGLE – MELIADINE DIVISION
180 – SALINE EFFLUENT DISCHARGE SYSTEM
205 – PIPING & INSTRUMENTATION DIAGRAM
RANKIN INLET
ITIVIA

DESSINÉ PAR / DRAWN BY	JONATHAN LAVOIE	DATE	2019-01-17
VERIFIÉ PAR / CHECKED BY	SÉBASTIEN PERRON		2019-02-07
APPROUVÉ PAR / APPROVED BY	ÉRIC LAVOIE, P. Eng.		2019-04-11
ÉCHELLE / SCALE	NO SCALE	DATE	2019-01-23

NO. DESSIN / DRAWING NO. 65-180-205-001

NO. PROJET / PROJECT NO.	REVISION	FEUILLE / SHT
6526	4	1 / 1

AE-CART-ARCH D

FILE NO. 65-180-205-001_R4.dwg

NO. DESSIN DRAWING NO. 65-680-205-001_R3

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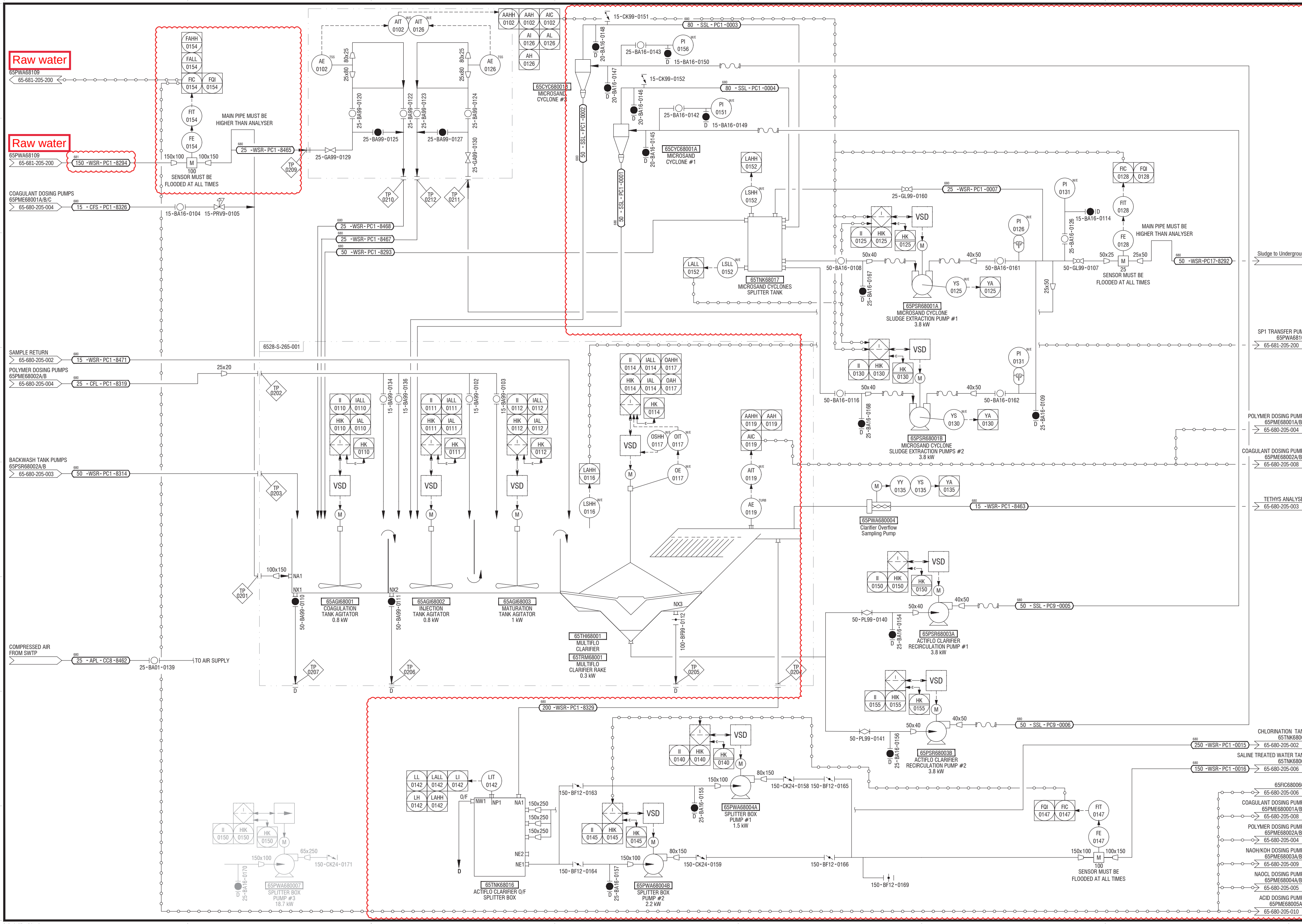

PLAN CLÉ KEY PLAN

NOTES GÉNÉRALES / GENERAL NOTES

Process
2020-05-18

POUR CONSTRUCTION
FOR CONSTRUCTION
DATE : 2020-05-12

DESSINS EN RÉFÉRENCE / REFERENCE DRAWINGS

TITRE / TITLE	# DWG

AGNICO EAGLE

REV.	DATE	DESCRIPTION	PAR/BY	APP.	CLIENT
3	2020-05-12	ISSUED FOR CONSTRUCTION	S.P.	T.G.	
2	2019-07-31	AS BUILT	S.P.	E.L.	
1	2019-04-24	ADDED MODULATING VALVE	S.P.	E.L.	
0	2019-04-11	ISSUED FOR CONSTRUCTION	S.P.	E.L.	
A	2019-03-21	PRELIMINARY	J.L.	S.P.	

REVISIONS

TITRE / TITLE
AGNICO EAGLE – MELIADINE DIVISION
680 – SALINE EFFLUENT TREATMENT PLANT
205 – PIPING & INSTRUMENTATION DIAGRAM
ACTIFLO CLARIFIER

DESSINÉ PAR DRAWN BY	JONATHAN LAVOIE	DATE	2019-03-21
VÉRIFIÉ PAR CHECKED BY	SÉBASTIEN PERRON		2019-03-21
APPROUVÉ PAR APPROVED BY	ÉRIC LAVOIE, P. Eng.		2019-04-24
ÉCHELLE SCALE	NO SCALE	DATE	2019-01-17
NO. DESSIN DRAWING NO.	65-680-205-001		
NO. PROJET PROJECT NO.	6526	REVISION 3	FEUILLE / SHT 1 / 1

AE-CART-ARCH D

FILE NO. 65-680-205-001_R3.dwg

NO. DESSIN DRAWING NO. 65-680-205-002_R2

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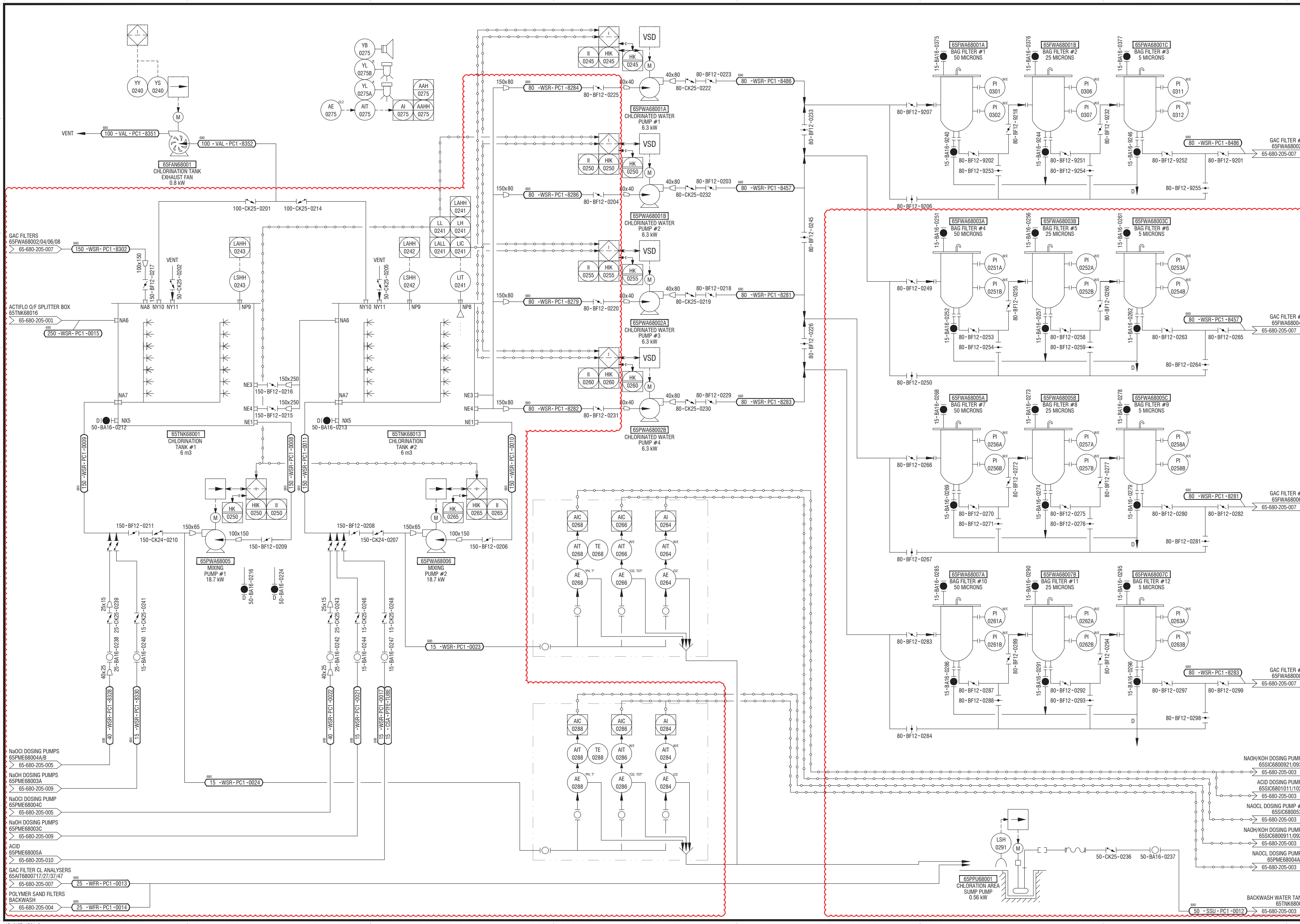

KEY PLAN

NOTES GÉNÉRALES / GENERAL NOTES

Process
2020-05-18

POUR CONSTRUCTION
FOR CONSTRUCTION
DATE : 2020-05-12

DESSINS EN RÉFÉRENCE / REFERENCE DRAWINGS

TITRE / TITLE	# DWG

AGNICO EAGLE

REV.	DATE	DESCRIPTION	PAR/BY	APP.	CLIENT
2	2020-05-12	ISSUED FOR CONSTRUCTION	S.P.	T.G.	
1	2019-07-31	AS BUILT	S.P.	E.L.	
0	2019-04-11	ISSUED FOR CONSTRUCTION	S.P.	E.L.	
A	2019-03-21	PRELIMINARY	J.L.	S.P.	

REVISIONS

TITRE / TITLE
AGNICO EAGLE – MELIADINE DIVISION
680 – SALINE EFFLUENT TREATMENT PLANT
205 – PIPING & INSTRUMENTATION DIAGRAM
CHLORINATION TANKS

DESSINÉ PAR DRAWN BY	JONATHAN LAVOIE	DATE 2019-03-21
VERIFIÉ PAR CHECKED BY	SÉBASTIEN PERRON	2019-03-21
APPROUVÉ PAR APPROVED BY	ÉRIC LAVOIE, P. Eng.	2019-04-11
ÉCHELLE SCALE	NO SCALE	DATE 2019-01-17

NO. DESSIN DRAWING NO. 65-680-205-002

NO. PROJET PROJECT NO.	REVISION	FEUILLE / SHT
6526	2	1 / 1

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FILE NO. 65-680-205-002_R2.dwg

NO. DESSIN DRAWING NO. 65-680-205-003_R2

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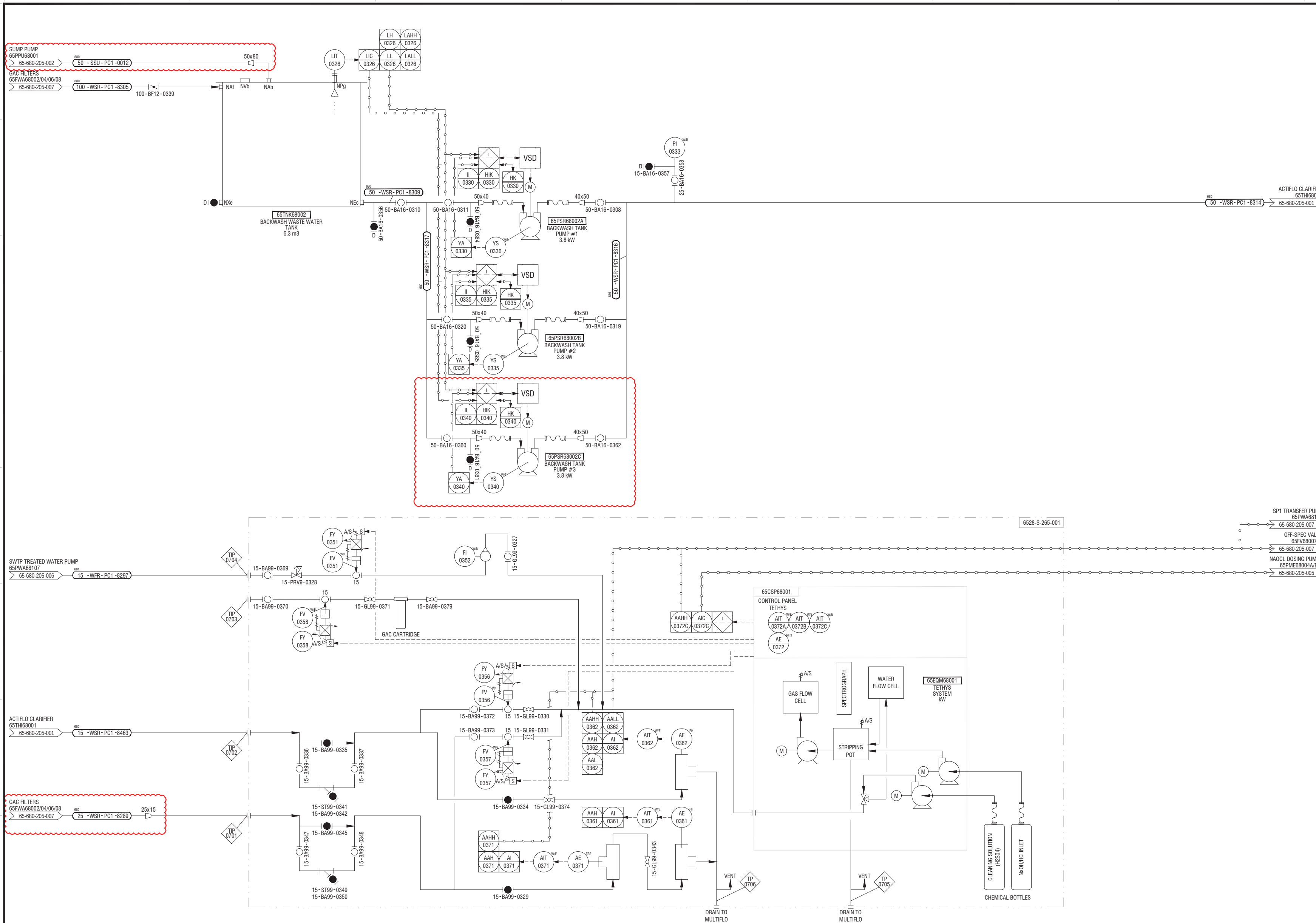

PLAN CLÉ KEY PLAN

NOTES GÉNÉRALES / GENERAL NOTES

Process
2020-05-18

POUR CONSTRUCTION
FOR CONSTRUCTION
DATE : 2020-05-12

DESSINS EN RÉFÉRENCE / REFERENCE DRAWINGS

TITRE / TITLE	# DWG
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AGNICO EAGLE

REV.	DATE	DESCRIPTION	PAR/BY	APP.	CLIENT
2	2020-05-12	ISSUED FOR CONSTRUCTION	S.P.	T.G.	
1	2019-07-31	AS BUILT	S.P.	E.L.	
0	2019-04-11	ISSUED FOR CONSTRUCTION	S.P.	E.L.	
A	2019-03-21	PRELIMINARY	J.L.	S.P.	

REVISIONS

TITRE / TITLE

AGNICO EAGLE – MELIADINE DIVISION
680 – SALINE EFFLUENT TREATMENT PLANT
205 – PIPING & INSTRUMENTATION DIAGRAM
BACKWASH TANK & TETHYS ANALYSER

DESSINÉ PAR DRAWN BY	JONATHAN LAVOIE	DATE 2019-03-21
VERIFIÉ PAR CHECKED BY	SÉBASTIEN PERRON	2019-03-21
APPROUVÉ PAR APPROVED BY	ÉRIC LAVOIE, P. Eng.	2019-04-11
ÉCHELLE SCALE	NO SCALE	DATE 2019-01-17

NO. DESSIN DRAWING NO. 65-680-205-003

NO. PROJET PROJECT NO.	REVISION	FEUILLE / SHT
6526	2	1 / 1

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FILE NO. 65-680-205-003_R2.dwg

NO. DESSIN
DRAWING NO. 65-680-205-004_R2

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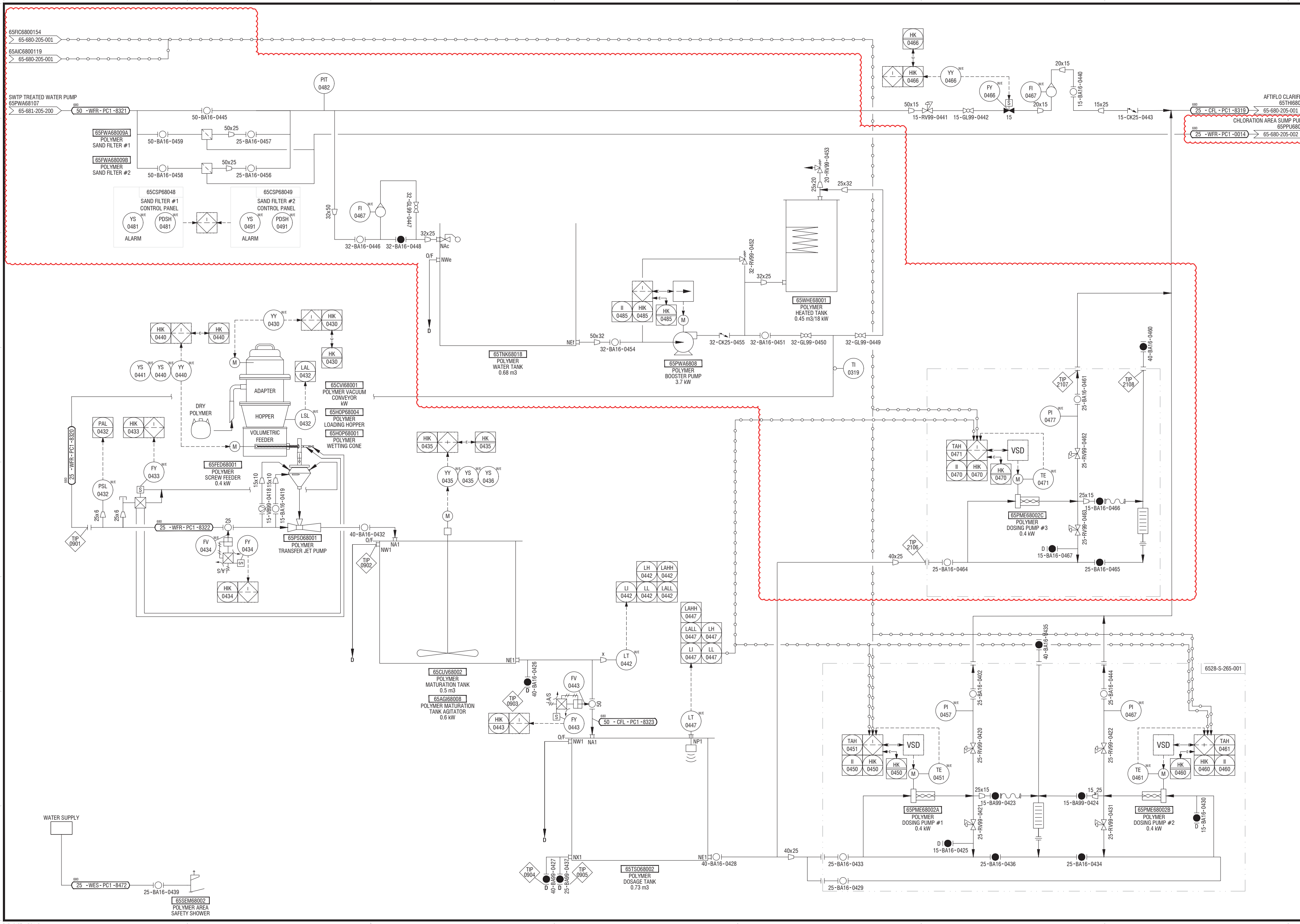

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PLAN CLÉ
KEY PLAN

NOTES GÉNÉRALES / GENERAL NOTES

Process
2020-05-18

POUR CONSTRUCTION
FOR CONSTRUCTION
DATE : 2020-05-12

DESSINS EN RÉFÉRENCE / REFERENCE DRAWINGS

TITRE / TITLE	# DWG
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AGNICO EAGLE

REV.	DATE	DESCRIPTION	PAR/BY	APP.	CLIENT
2	2020-05-12	ISSUED FOR CONSTRUCTION	S.P.	T.G.	
1	2019-07-31	AS BUILT	S.P.	E.L.	
0	2019-04-11	ISSUED FOR CONSTRUCTION	S.P.	E.L.	
A	2019-03-21	PRELIMINARY	J.L.	S.P.	

REVISIONS

TITRE / TITLE
AGNICO EAGLE – MELIADINE DIVISION
680 – SALINE EFFLUENT TREATMENT PLANT
205 – PIPING & INSTRUMENTATION DIAGRAM
POLYMER

DESSINÉ PAR / DRAWN BY	JONATHAN LAVOIE	DATE 2019-03-21
VERIFIÉ PAR / CHECKED BY	SÉBASTIEN PERRON	2019-03-21
APPROUVÉ PAR / APPROVED BY	ÉRIC LAVOIE, P. Eng.	2019-04-11
ÉCHELLE / SCALE	NO SCALE	DATE 2019-01-17

NO. DESSIN
DRAWING NO. 65-680-205-004

NO. PROJET / PROJECT NO.	REVISION	FEUILLE / SHT
6526	2	1 / 1

FILE NO. 65-680-205-004_R2.dwg

NO. DESSIN DRAWING NO. 65-680-205-005_R3

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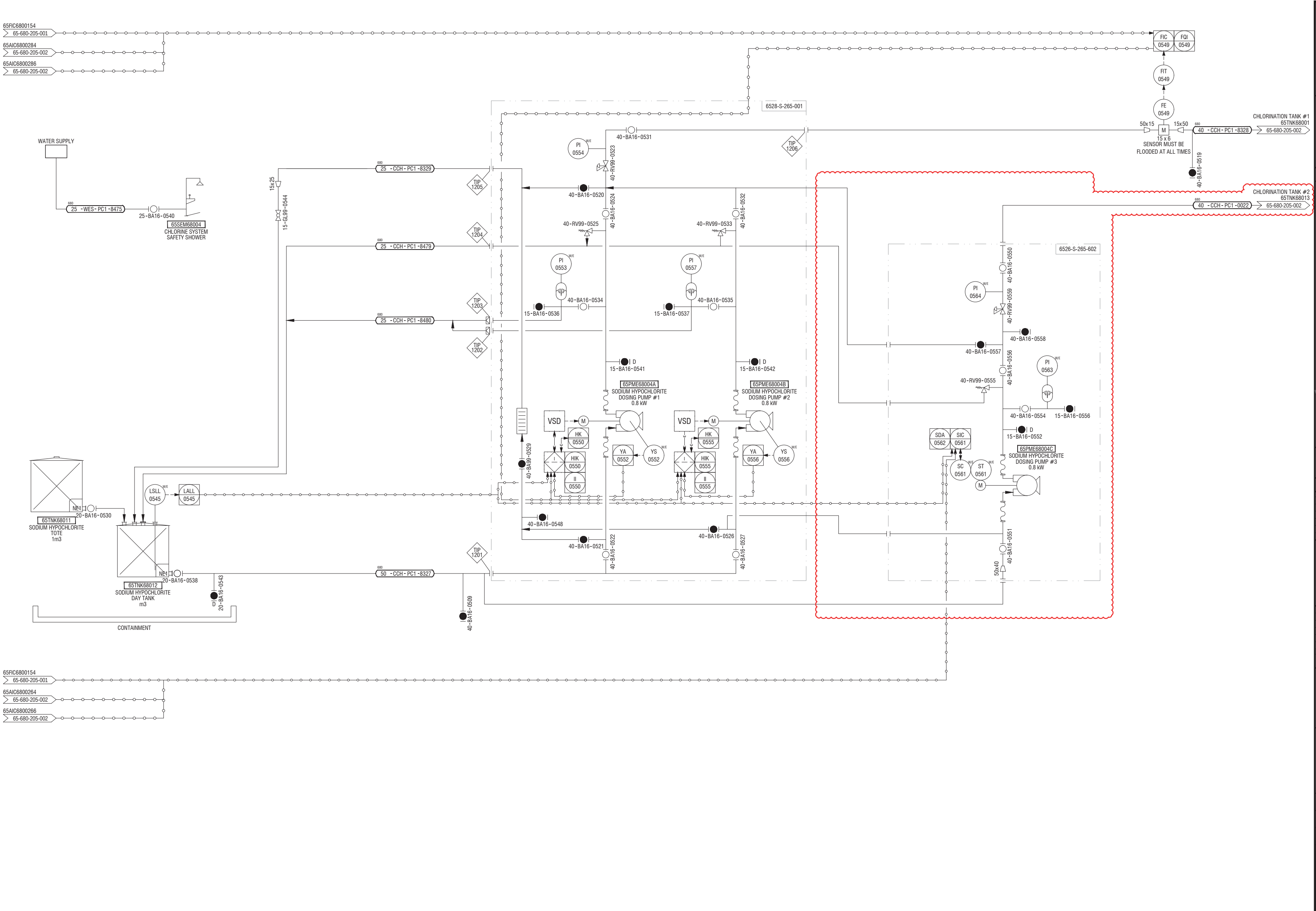

NOTES GÉNÉRALES / GENERAL NOTES

Process

20-05-2020

POUR CONSTRUCTION
FOR CONSTRUCTION
DATE : 2020-05-20

DESSINS EN RÉFÉRENCE / REFERENCE DRAWINGS

TITRE / TITLE	# DWG
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AGNICO EAGLE

REV.	DATE	DESCRIPTION	PAR/BY	APP.	CLIENT
3	2020–05–20	ISSUED FOR CONSTRUCTION	S.P.	T.G.	
2	2019–07–31	AS BUILT	S.P.	E.L.	
1	2019–04–24	CHLORINATION SYSTEM MODIF.	S.P.	E.L.	
0	2019–04–11	ISSUED FOR CONSTRUCTION	S.P.	E.L.	
A	2019–03–21	PRELIMINARY	J.L.	S.P.	

REVISIONS

TITRE / TITLE
AGNICO EAGLE – MELIADINE DIVISION
680 – SALINE EFFLUENT TREATMENT PLANT
205 – PIPING & INSTRUMENTATION DIAGRAM
SODIUM HYPOCHLORITE

DESSINÉ PAR DRAWN BY	JONATHAN LAVOIE	DATE 2019–03–21
VERIFIÉ PAR CHECKED BY	SÉBASTIEN PERRON	2019–03–21
APPROUVÉ PAR APPROVED BY	ÉRIC LAVOIE, P. Eng.	2019–04–24
ÉCHELLE SCALE	NO SCALE	DATE 2019–01–29

NO. DESSIN DRAWING NO. 65–680–205–005

NO. PROJET PROJECT NO. 6526 | REVISION 3 | FEUILLE / SHT 1 / 1

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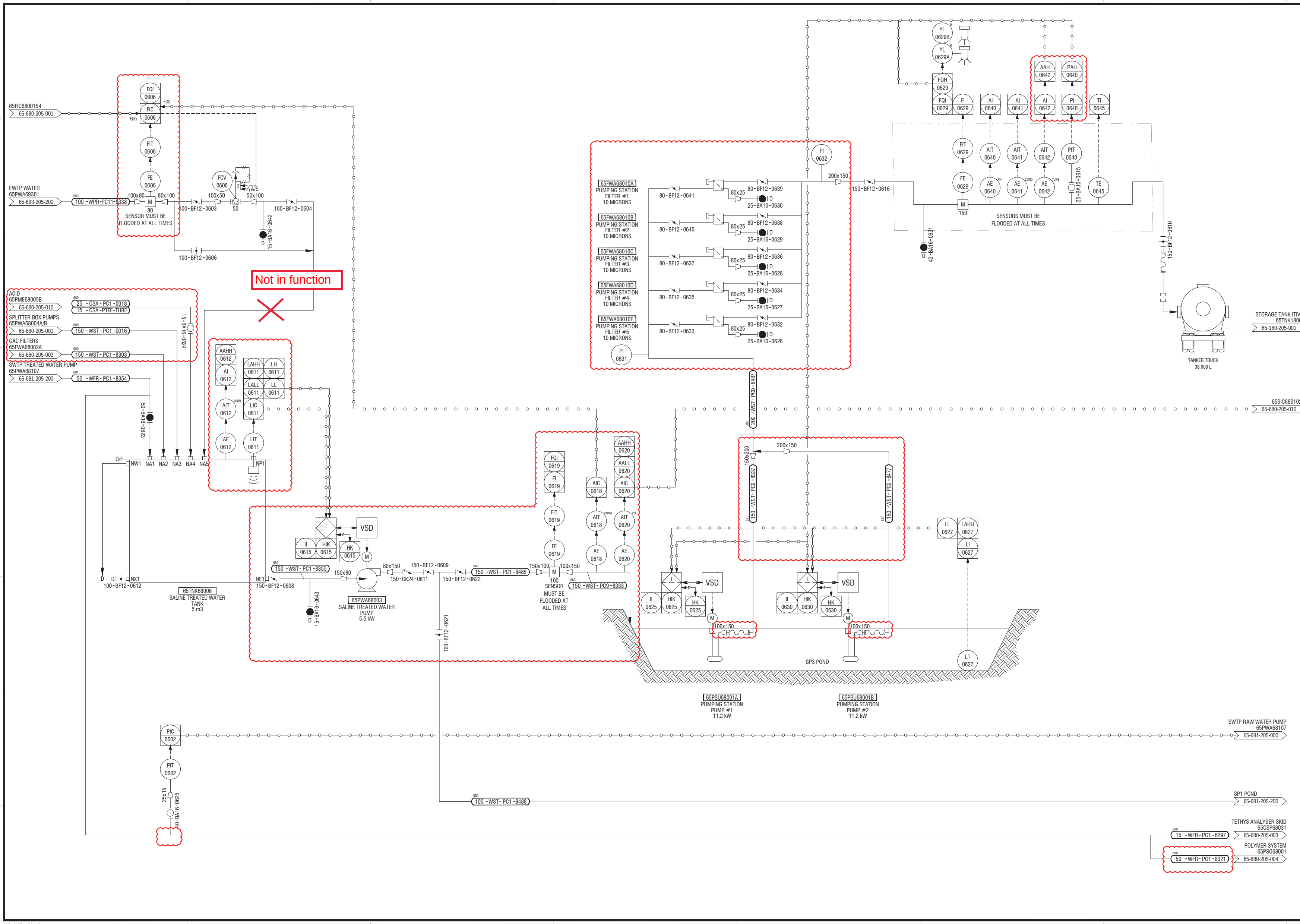
FILE NO. 65–680–205–005_R3.dwg

NO. DESSIN DRAWING NO. 65-680-205-006_R2



PLAN CLÉ KEY PLAN

NOTES GÉNÉRALES / GENERAL NOTES

Process
2020-05-18

POUR CONSTRUCTION
FOR CONSTRUCTION
DATE : 2020-05-12

DESSINS EN RÉFÉRENCE / REFERENCE DRAWINGS

TITRE / TITLE	# DWG
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AGNICO EAGLE

REV.	DATE	DESCRIPTION	PAR/BY	APP.	CLIENT
2	2020-05-12	ISSUED FOR CONSTRUCTION	S.P.	T.G.	
1	2019-07-31	AS BUILT	S.P.	E.L.	
0	2019-04-11	ISSUED FOR CONSTRUCTION	S.P.	E.L.	
A	2019-03-21	PRELIMINARY	J.L.	S.P.	

REVISIONS

TITRE / TITLE
AGNICO EAGLE – MELIADINE DIVISION
680 – SALINE EFFLUENT TREATMENT PLANT
205 – PIPING & INSTRUMENTATION DIAGRAM
SP3 POND

DESSINÉ PAR DRAWN BY	JONATHAN LAVOIE	DATE 2019-03-21
VERIFIÉ PAR CHECKED BY	SÉBASTIEN PERRON	2019-03-21
APPROUVÉ PAR APPROVED BY	ÉRIC LAVOIE, P. Eng.	2019-04-11
ÉCHELLE SCALE	NO SCALE	DATE 2019-01-17

NO. DESSIN DRAWING NO. 65-680-205-006

NO. PROJET PROJECT NO.	REVISION	FEUILLE / SHT
6526	2	1 / 1

FILE NO. 65-680-205-006_R2.dwg

NO. DESSIN / DRAWING NO. 65-680-205-007_R0

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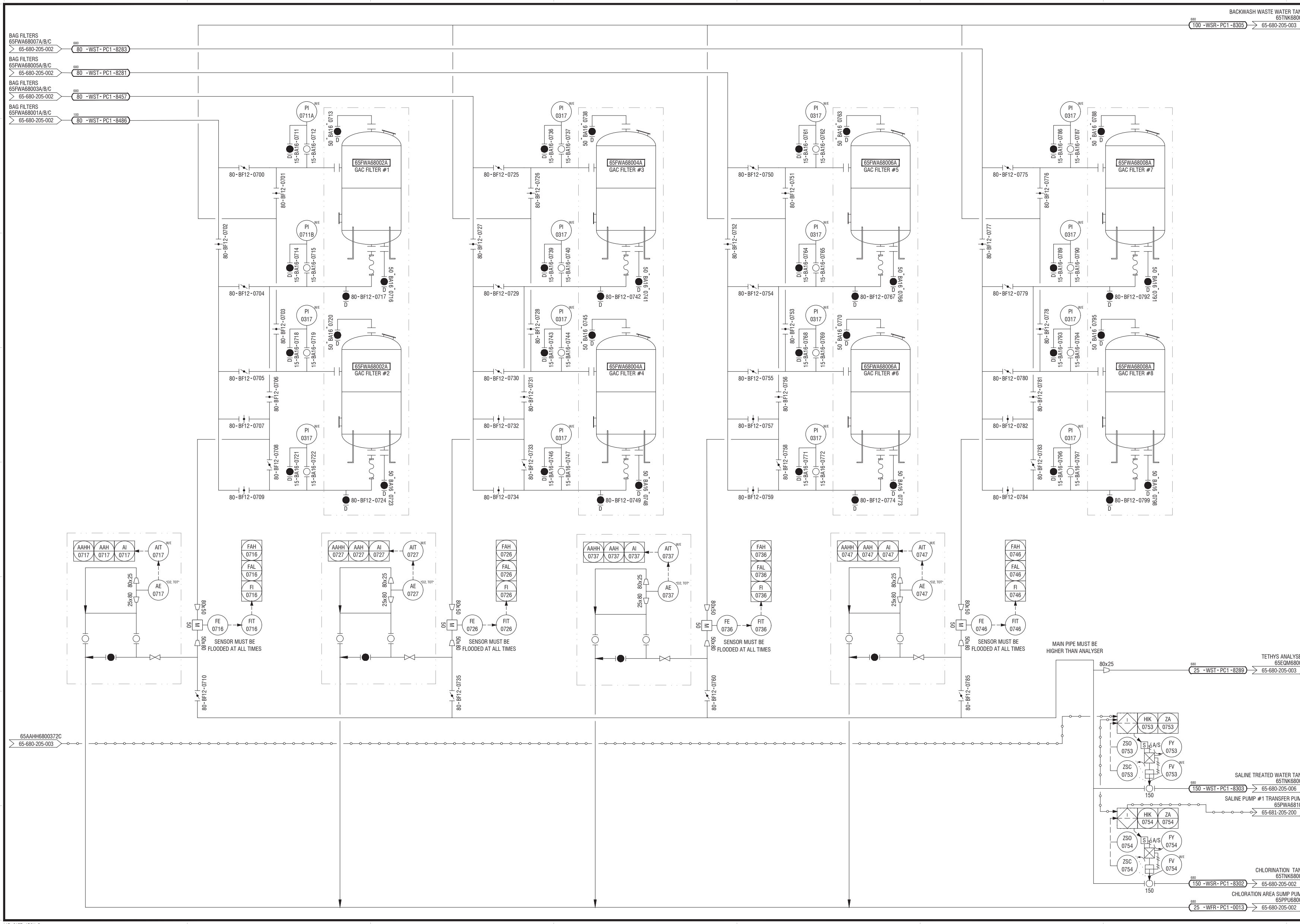

PLAN CLÉ / KEY PLAN

NOTES GÉNÉRALES / GENERAL NOTES

Process
2020-05-18

POUR CONSTRUCTION
FOR CONSTRUCTION
DATE : 2020-05-12

DESSINS EN RÉFÉRENCE / REFERENCE DRAWINGS

TITRE / TITLE	# DWG
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AGNICO EAGLE

REV.	DATE	DESCRIPTION	PAR/BY	APP.	CLIENT
0	2020-05-12	ISSUED FOR CONSTRUCTION	S.P.	T.G.	

REVISIONS

TITRE / TITLE
AGNICO EAGLE – MELIADINE DIVISION
680 – SALINE EFFLUENT TREATMENT PLANT
205 – PIPING & INSTRUMENTATION DIAGRAM
GAC FILTERS

DESSINÉ PAR / DRAWN BY	SÉBASTIEN PERRON	DATE 2020-05-12
VERIFIÉ PAR / CHECKED BY	ÉRIC LAVOIE, P.Eng.	2020-05-12
APPROUVÉ PAR / APPROVED BY	THOMAS GENTY, P.Eng.	2020-05-12
ÉCHELLE / SCALE	NO SCALE	DATE 2020-05-12

NO. DESSIN / DRAWING NO. 65-680-205-007

NO. PROJET / PROJECT NO.	REVISION	FEUILLE / SHT
6526	0	1 / 1

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FILE NO. 65-680-205-007_R0.dwg

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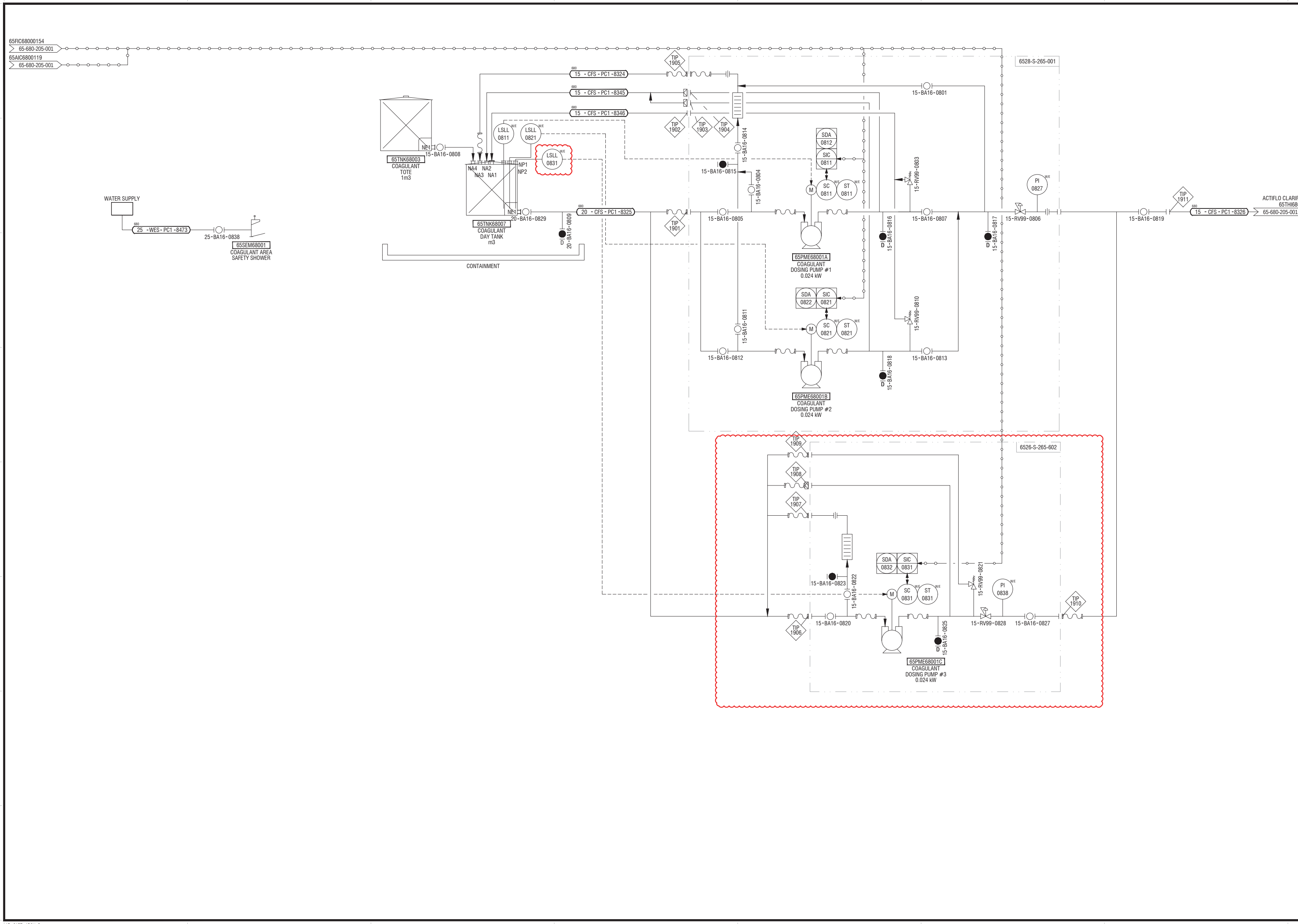

FORMAT ARCHD

PLAN CLÉ
KEY PLAN

NOTES GÉNÉRALES / GENERAL NOTES

Process
2020-05-20

POUR CONSTRUCTION
FOR CONSTRUCTION
DATE : 2020-05-12

DESSINS EN RÉFÉRENCE / REFERENCE DRAWINGS

TITRE / TITLE	# DWG
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AGNICO EAGLE

REV.	DATE	DESCRIPTION	PAR/BY	APP.	CLIENT
0	2020-05-12	ISSUED FOR CONSTRUCTION	S.P.	T.G.	

REVISIONS

TITRE / TITLE
AGNICO EAGLE – MELIADINE DIVISION
680 – SALINE EFFLUENT TREATMENT PLANT
205 – PIPING & INSTRUMENTATION DIAGRAM
COAGULANT

DESSINÉ PAR DRAWN BY	SÉBASTIEN PERRON	DATE 2020-05-12
VÉRIFIÉ PAR CHECKED BY	ÉRIC LAVOIE, P.Eng.	2020-05-12
APPROUVÉ PAR APPROVED BY	THOMAS GENTY, P.Eng.	2020-05-12
ÉCHELLE SCALE	NO SCALE	DATE 2020-05-12
NO. DESSIN DRAWING NO.	65-680-205-008	
NO. PROJET PROJECT NO. 6526	REVISION 0	FEUILLE / SHT 1 / 1

FILE NO. 65-680-205-008_R0.dwg

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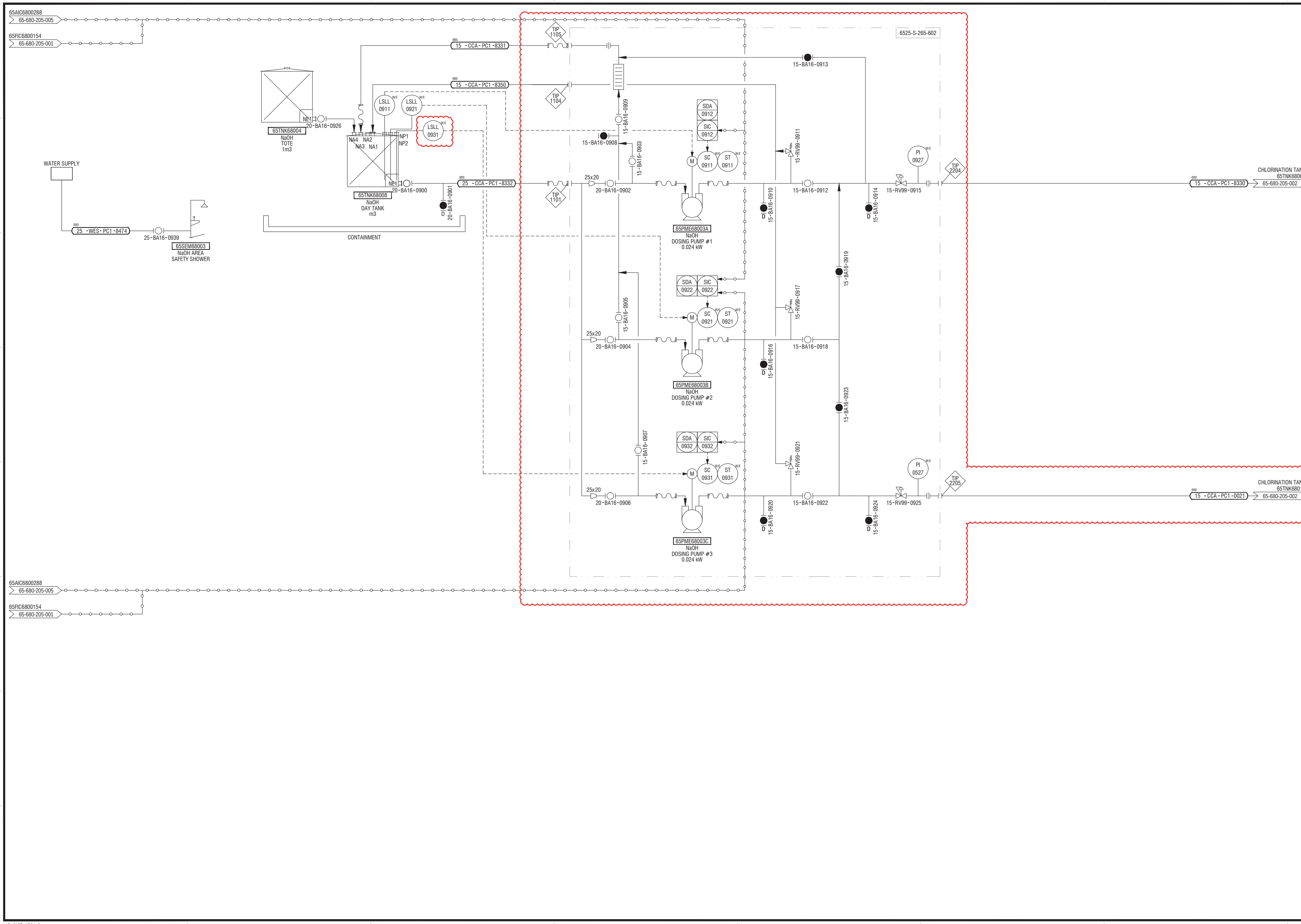
DRAWING NO. 65–680–205–009_R0

FORMAT ARCHD



PLAN CLÉ
KEY PLAN

NOTES GÉNÉRALES / GENERAL NOTES

Process
2020-05-18

POUR CONSTRUCTION
FOR CONSTRUCTION
DATE : 2020-05-12

DESSINS EN RÉFÉRENCE / REFERENCE DRAWINGS

TITRE / TITLE	# DWG
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AGNICO EAGLE

REV.	DATE	DESCRIPTION	PAR/BY	APP.	CLIENT
0	2020–05–12	ISSUED FOR CONSTRUCTION	S.P.	T.G.	

REVISIONS

TITRE / TITLE
AGNICO EAGLE – MELIADINE DIVISION
680 – SALINE EFFLUENT TREATMENT PLANT
205 – PIPING & INSTRUMENTATION DIAGRAM
NAOH/KOH

DESSINÉ PAR / DRAWN BY	SÉBASTIEN PERRON	DATE 2020–05–12
VERIFIÉ PAR / CHECKED BY	ÉRIC LAVOIE, P.Eng.	2020–05–12
APPROUVÉ PAR / APPROVED BY	THOMAS GENTY, P.Eng.	2020–05–12
ÉCHELLE / SCALE	NO SCALE	DATE 2020–05–12

NO. DESSIN
DRAWING NO. 65–680–205–009

NO. PROJET / PROJECT NO.	REVISION	FEUILLE / SHT
6526	0	1 / 1

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NO. DESSIN DRAWING NO. 65-680-205-010_R0

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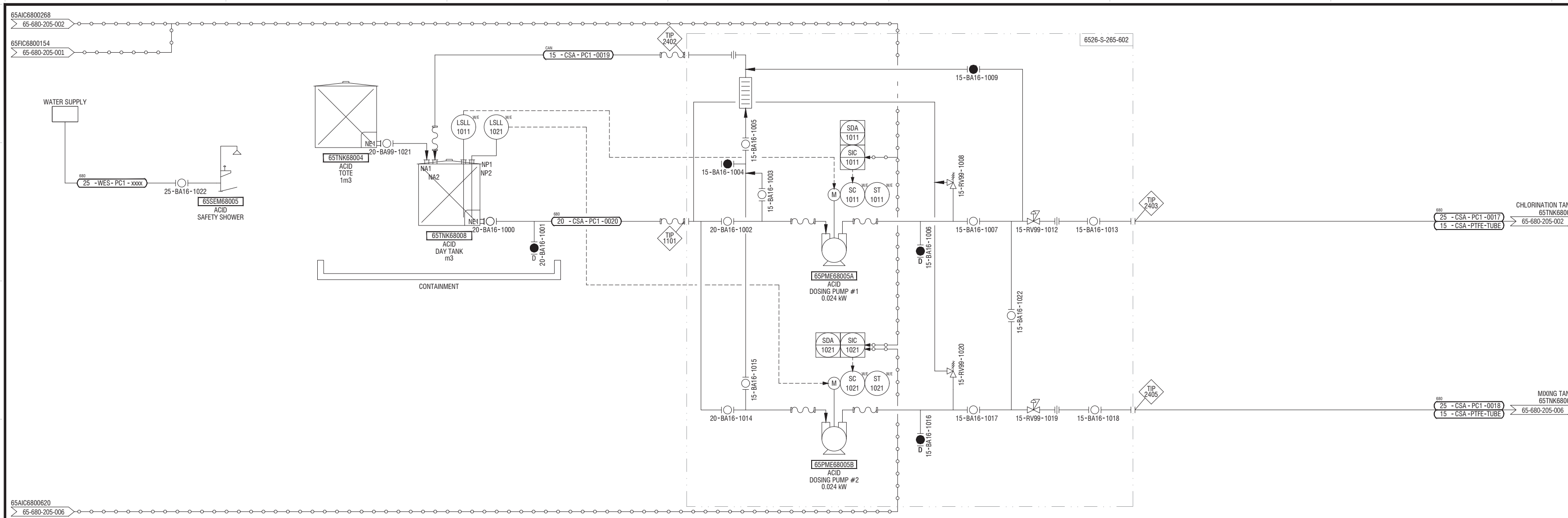

PLAN CLÉ
KEY PLAN

NOTES GÉNÉRALES / GENERAL NOTES

Process
2020-05-18

POUR CONSTRUCTION
FOR CONSTRUCTION
DATE : 2020-05-12
AGNICO EAGLE

DESSINS EN RÉFÉRENCE / REFERENCE DRAWINGS

TITRE / TITLE	# DWG
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AGNICO EAGLE

REV.	DATE	DESCRIPTION	PAR/BY	APP.	CLIENT
0	2020-05-12	ISSUED FOR CONSTRUCTION	S.P.	T.G.	

REVISIONS

TITRE / TITLE
AGNICO EAGLE – MELIADINE DIVISION
680 – SALINE EFFLUENT TREATMENT PLANT
205 – PIPING & INSTRUMENTATION DIAGRAM
ACID

DESSINÉ PAR DRAWN BY	SÉBASTIEN PERRON	DATE	2020-05-12
VÉRIFIÉ PAR CHECKED BY	ÉRIC LAVOIE, P.Eng.		2020-05-12
APPROUVÉ PAR APPROVED BY	THOMAS GENTY, P.Eng.		2020-05-12
ÉCHELLE SCALE	NO SCALE	DATE	2020-05-12

NO. DESSIN DRAWING NO. 65-680-205-010

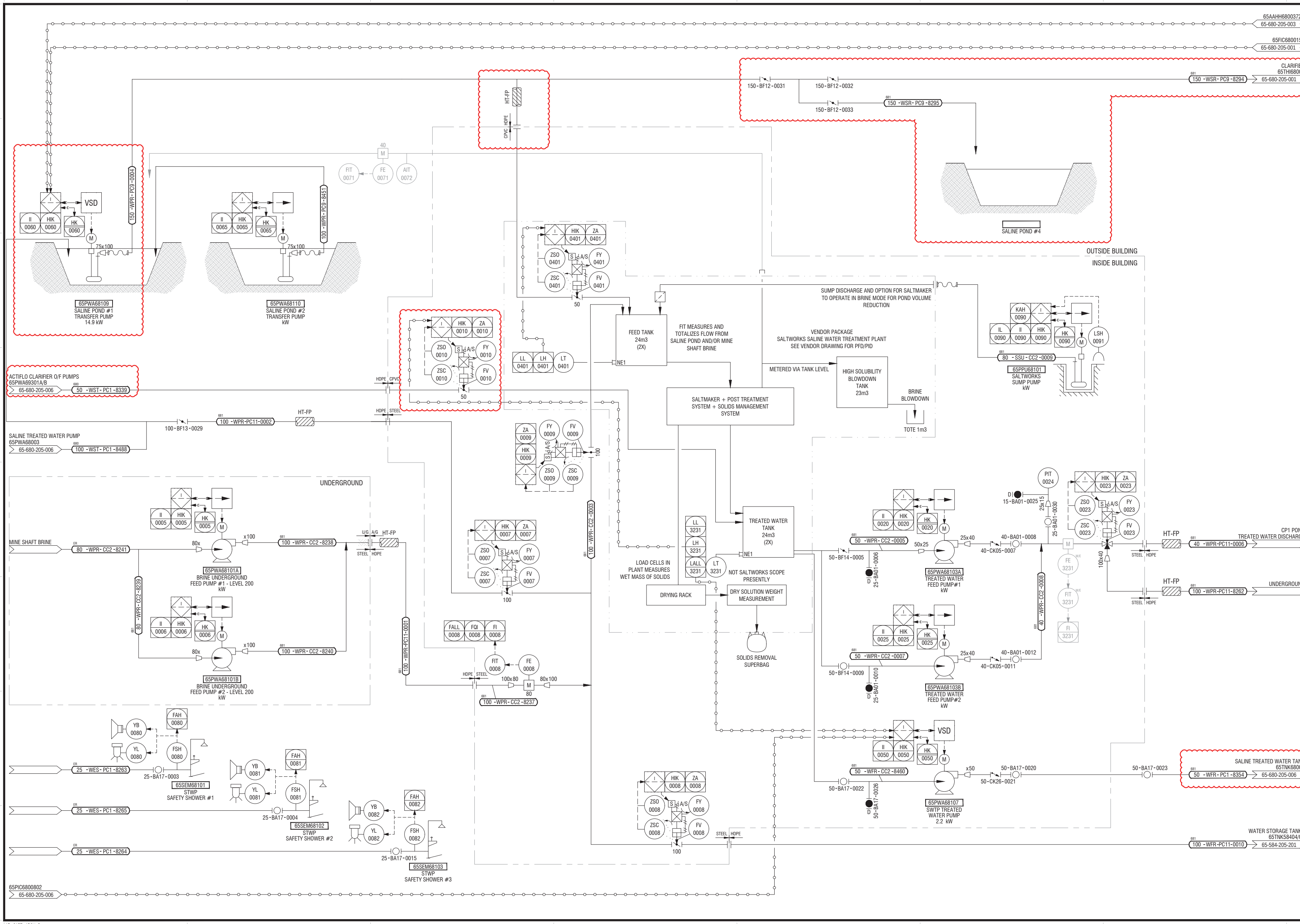
NO. PROJET PROJECT NO.	REVISION	FEUILLE / SHT
6526	0	1 / 1

AE-CART-ARCH D

FILE NO. 65-680-205-010_R0.dwg

NO. DESSIN
DRAWING NO. 65-681-205-200_R4

FORMAT ARCHD



PLAN CLÉ
KEY PLAN

NOTES GÉNÉRALES / GENERAL NOTES

Process
2020-05-18

POUR CONSTRUCTION
FOR CONSTRUCTION
DATE : 2020-05-12

DESSINS EN RÉFÉRENCE / REFERENCE DRAWINGS

TITRE / TITLE	# DWG
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AGNICO EAGLE

REV.	DATE	DESCRIPTION	PAR/BY	APP.	CLIENT
4	2020-05-12	ISSUED FOR CONSTRUCTION	S.P.	T.G	
3	2019-06-31	AS BUILT	S.P.	E.L.	
2	2019-04-11	6528 – FOR CONSTRUCTION	S.P.	E.L.	
1	2019-03-21	6528 CHANGED	J.L.	S.P.	
0	2019-01-29	AS BUILT	S.P.	EL	

REVISIONS

TITRE / TITLE
AGNICO EAGLE – MELIADINE DIVISION
681 – WATER TREATMENT SYSTEM DESALT
205 – PIPING & INSTRUMENTATION DIAGRAM
SALINE WATER TREATMENT PLANT

DESSINÉ PAR / DRAWN BY	JONATHAN LAVOIE	DATE 2018-04-12
VERIFIÉ PAR / CHECKED BY	SÉBASTIEN PERRON	2019-01-29
APPROUVÉ PAR / APPROVED BY	ÉRIC LAVOIE, P. Eng.	2019-04-11
ÉCHELLE / SCALE	NO SCALE	DATE 2018-04-12

NO. DESSIN / DRAWING NO. 65-681-205-200

NO. PROJET / PROJECT NO.	REVISION	FEUILLE / SHT
6526	4	1 / 1

AE-CART-ARCH D

FILE NO. 65-681-205-200_R4.dwg