Deloitte & Touche

Anvil Range Mine Complex
Existing Water Treatment Facilities

Anvil Range Mining Corporation
(Interim Receivership)

October 2003

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1.0 INTRODUCTION

This report presents background information compiled by EBA Engineering Consultants Ltd. (EBA) for the existing water treatment facilities at the Anvil Range mine property located in Faro, Yukon. Included herein is a description of the general water treatment process being used along with descriptions of the specific water treatment facilities present at the site. This work was authorized by Ms. Shannon Glenn of Deloitte & Touche Inc. (Interim Receiver of Anvil Range Mine Corp.) on May 15, 2003. Deloitte & Touche Inc. was appointed Interim Receiver ("Interim Receiver") of Anvil Range Mining Corporation pursuant to an order of the Ontario Court (General Division) (now the Superior Court of Justice) on April 21, 1998.

The existing water treatment facilities at the property are shown in Figures F-1, F-2 and F-3, and include the following:

- the Grum/Vangorda Water Treatment Plant,
- the Mill Water Treatment Plant, and
- the Mobile Down Valley Water Treatment Plant (currently located at the Intermediate Impoundment Spillway).

The purpose of these water treatment facilities is to remove zinc and other metals from the Vangorda and Faro pit's drainage water, as well as water collected in the Intermediate Pond ("drainage feed") so that it can be discharged to the receiving environment under terms of the site Water Licences issued by the Yukon Territory Water Board.

2.0 GENERAL WATER TREATMENT PROCESS

2.1 Treatment Objectives

The water treatment facilities must treat the drainage waters to neutralize acidity and precipitate (remove) soluble metals so that the discharge to the receiving environment from the site meets the following quality requirements:

- Zinc (Zn) 0.50 mg/L
- Copper (Cu) 0.20 mg/L
- Lead (Pb) 0.20 mg/L
- Total Suspended Solids (TSS) 15.0 mg/L
- pH >6.5

- Ammonia (as N) 1.30 mg/L
- Antimony (Sb) 0.10 mg/L
- Arsenic (As) 0.05 mg/L
- Barium (Ba) 1.00 mg/L
- Cadmium (Cd) 0.02 mg/L
- Cyanide (as CN) 0.05 mg/L
- Mercury (Hg) 0.005 mg/L
- Molybdenum (Mo) 0.50 mg/L
- Nickel (Ni) 0.50 mg/L
- Selenium (Se) 0.05 mg/L
- Silver (Ag) 0.10 mg/L

Factors that affect the water treatment facility's discharge quality are described as follows.

- **Metal Concentrations:**
  Copper (Cu), lead (Pb), and zinc (Zn) are the major contaminants of concern and must be reduced to the specified concentrations, which are in units of mg/L (milligrams per litre). Cu and Pb concentrations in the Vangorda and Faro pit's drainage water are very low and considered insignificant for the treatment process; the Zn concentrations, however, are in the range of 12 mg/L.

- **Clarity:**
  Total suspended solids (TSS) is a measure of clarity in the plant discharge. The plant discharge has a maximum TSS concentration of 15 mg/L but, in fact, it must be lower in order to meet the Zn requirement of 0.5 mg/L. The reason for this is that the solids (sludge) produced in the plant will contain about 10% Zn. Therefore, for the discharge to contain 0.5 mg/L or less Zn, the TSS concentration can not exceed 5 mg/L.

- **pH:**
  This is a measure of relative acidity with a value of 7.0 being neutral. Numbers less than 7 are acidic while those greater are alkaline. Generally, the metals are less soluble at alkaline pH values.

2.2 Treatment Process Chemistry

The three water treatment facilities use a generic treatment system involving the use of lime and flocculants to form precipitates (solid flocs) of zinc and other metals that can then be settled to remove them from the drainage water so that it can be discharged to the receiving environment under terms of the site Water Licences issued by the Yukon Territory Water Board. The following sections briefly describe the treatment system utilized at the facilities.

2.2.1 Neutralization and Metal Precipitation

The soluble and non-soluble forms of a metal are in equilibrium with another in the water, and the amount of each form is highly dependent on the pH of the water. pH has been previously defined as a relative measure of acidity, and it is an indicator of what form metals in the drainage feed will take, that is, whether they are in solution (soluble form) or are as solid particles (insoluble form). The pH of the drainage feed to the plant ranges from as low as 4 (acidic) to 7 (neutral). Within this pH range, the drainage water will contain soluble Zn and must be neutralized to eliminate the acidity and to precipitate (make insoluble and form solids) the metals content.

In the plant, lime in a slurry form is added to the drainage feed to raise the pH, and precipitate (remove) soluble metals. The two major chemical reactions that occur simultaneously in the continuous operation of the plant are:

$Ca(OH)_2$ + H_2SO_4 → H_2O + $CaSO_4*2H_2O$

(slaked lime) + (sulphuric acid) → (water) + gypsum (hydrated calcium sulphate)

$Ca(OH)_2$ + $ZnSO_4$ → $Zn(OH)_2$ + $CaSO_4*2H_2O$

(slaked lime) + (zinc sulphate (soluble)) → zinc hydroxide (insoluble) + gypsum

In both of the above reactions, it is expected that the quantities of gypsum produced will be small and will remain in solution. Zn, and possibly other metals, will be precipitated as insoluble metal hydroxides by the second reaction.

2.2.2 Clarification

The previous section outlined how lime is used to remove soluble metals from drainage water by generating insoluble metal hydroxides as solids. These metal solids may be accompanied by other forms of solids produced in treatment and by those that are carried in the drainage feed to the plant. All of these solids must be separated before a clear, treated water can be discharged.

The first stage in clarification is the addition of flocculants that serve to agglomerate or flocculate the smaller particles into larger particles termed "flocs". The metal flocs rapidly settle out of the treated water forming the sludge from the overall treatment process.

Treatment with lime may produce up to 400 mg/L TSS in the drainage water. This level of TSS must be reduced to about 5 mg/L or less, through a clarification process, for the plant discharge to meet the Water Licence limitation for Zn.

3.0 DESCRIPTION OF FACILITIES

3.1 Grum/Vangorda Water Treatment Facility

A site overview of the Vangorda Plateau mine site including significant site features overlain on a 1:50,000 topographic map is presented in Figure F-1, Appendix A.

3.1.1 Introduction

The Grum/Vangorda Water Treatment Facility is made up of the following components.

- Vangorda Pit Pumping System
- Grum/Vangorda Water Treatment Plant (GVWTP)
- Clarification Pond
- Grum Interceptor Ditch
- Sheep Pad Ponds

The GVWTP, shown in Figure F-1 of Appendix A, is a conventional lime neutralization plant that was constructed in 1991 to treat drainage water pumped from the Grum and Vangorda pits. An overland piping and pumping system was installed in 2001 to pump drainage water directly from the Vangorda Pit to the plant. The GVWTP was reactivated and successfully operated in summer 2002 to treat the Vangorda Pit drainage water exclusively.

Treatment is achieved by agitation with lime slurry, addition of flocculant and settlement of treatment sediments in an open air clarification pond. The design capacity of the plant is 7575 L/min (2,000 USgpm) based on the design influent characteristics for the Grum and Vangorda pits. Treated water, which is compliant with the Water Licence, is discharged from the clarification pond into the Grum Interceptor Ditch and subsequently enters Vangorda Creek via the Sheep Pad Ponds.

3.1.2 Vangorda Pit Pumping System

The Vangorda pit pumping system consists of a barge mounted pump in the pit, a booster pump located out of the pit on the south side, and a pipeline made up of high pressure steel pipe in the lower sections grading to plastic (Sclair) pipe to the GVWTP.

Included in Appendix A are drawings showing the location of the pipeline and booster pump with respect to the Vangorda pit and GVWTP (see Barge Pump Pipeline Overall Plan, G0-P-001) and the profile (see Barge Pump Pipeline Profile and HGL, A0-C-001). Also presented is the schematic (General Proposed Water Treatment P&I Diagram #3, A0-P-003) of the pipe and instrumentation system, utilized between the Vangorda pit and the water treatment plant and the drawing (Pump Platform and Ramp General Arrangement, Vanaquar-01) presenting the barge platform in plan and profile view.

The primary physical components of the system are the following (Gartner Lee Ltd, 2003):

- steel construction barge with fixed walkway and pivoting anchor point;
- one electric pump on the barge plus one booster pump located on land at the top of the pit that are rated at 7.6 m^3/min (2,000 USgpm);
- combination steel and Sclair plastic pipe, total approximate length of 4 km; and
- electrical transformer and switchgear located near the booster pump.

3.1.3 Grum/Vangorda Water Treatment Plant

Flow sheets, found in Appendix A, outline the overall water treatment plant process and detail the following components of the GVWTP:

- the water treatment plant (Grum/Vangorda Water Treatment Plant, P662-A-001),
- the lime feed and air system (Water Treatment Plant Lime Feed and Air P & ID, P662-A-006), and
- the water supply and flocculant feed (Water Treat. Pl. P&ID Reactor Water Supply & Flocc. Feed, P662-A-007).

The primary physical components of the Grum/Vangorda water treatment system include (Gartner Lee Ltd., 2003):

- **Lime storage and preparation system**
  The system includes the transferring and storing of the lime in the silo baghouse, lime slaking, slaked lime slurry storing, and feeding lime slurry to the plant process.

- **Plant water system**
  Water is pumped from the Groucho fresh water supply pond through distribution lines to the lime slaker, the flocculant preparation system, the flocculant dilution system, and the hose down area.

- **Lime reaction tanks**
  Vangorda pit drainage water is pumped into the plant and treated with the lime slurry from the lime slaker in two agitated reaction tanks. The 38 m^3 primary reactor and the 114 m^3 secondary reactor are placed in series and combine to provide 20 minutes of reaction time at peak treatment rates.

- **Flocculant system**
  The flocculant system consists of an automatic unit that prepares flocculants (dissolves dry flocculants) and a metering pump that supplies solution to the process. The diluted flocculant solution is mixed with secondary reactor discharge in the 7.6 m^3 flocculants mix tank which provides one minute retention time at the design flow rate of 7.6 m^3/min (2000 USgpm). Outflow from the flocculants mix tank is conveyed by an above ground pipeline to feed the distribution manifold within the clarification pond.

3.1.4 Clarification Pond

The Clarification Pond is a settlement pond for effluent from the GVWTP. Treatment solids are intended to settle in the pond such that the discharge from the pond is compliant with the terms of the Water Licence.

The pond has dimensions of approximately 120 m by 80 m by approximately 4 m deep, and was created by excavating into the surficial soil at the site. Water from the treatment plant is discharged into a manhole structure from where it is distributed via horizontal diffuser pipes into the pond. The original header pipe was replaced in 2001 with a modified design. The pond was designed to release water via either a gravel underdrain or an outlet pipe buried in the embankment fed by a horizontal exit drain. The design anticipated that the underdrain would become plugged with sediments over time and this is believed to have occurred. The discharge outlet pipe was replaced in 2002 with a 300 mm (12 in.) vertical pipe, which is used to decant off near-surface water. Solids settle out and remain on the pond bottom.

Timber booms have also been installed to form a grid over the surface area of the pond to decrease wave action thereby enhancing the settling of suspended solids.

3.1.5 Grum Interceptor Ditch

The Grum Interceptor Ditch passes runoff water and compliant effluent from the Grum/Vangorda Water Treatment Plant around the Grum Overburden Dump and into the Sheep

Pad Pond. An upgrade to the ditch was completed in 2001 that included excavation of sloughed soil, widening of the ditch, flattening of side slopes, and placement of geotextile and riprap.

3.1.6 Sheep Pad Ponds

The Sheep Pad ponds were constructed in 1995 in conjunction with upgrading of the Grum Interceptor Ditch as a means of mitigating elevated levels of suspended sediments entering Vangorda Creek. Two ponds were constructed with the intention of allowing settlement of suspended solids prior to an effluent discharge into Vangorda Creek via the Plunge Pool at the lower end of the Vangorda Creek Diversion Flume.

The first settlement pond receives the initial inflow and allows initial settling of coarse sediment. The inflow channel into this pond from the Grum Interceptor Ditch was upgraded in 2001 with a rip rap apron. Water flows to the second pond via a short half-culvert flume of approximately 15 m. The two ponds are separated by an earth dyke.

The second, larger pond is the main settlement pond and is commonly referred to as the "Sheep Pad Pond". This pond is contained on three sides by an earth dyke and on the fourth side by natural ground. Compliant effluent water flows out of this pond via a riprap-lined channel.

3.1.7 Contingencies

The Grum/Vangorda Water Treatment Facility has several contingencies to ensure all treated drainage water discharged to the receiving environment meets the terms of the site Water Licences issued by the Yukon Territory Water Board. These contingencies are as follows:

- the GVWTP is outfitted with an emergency shut down for the Vangorda Pit pumps,
- back pumping from the clarification pond to the GVWTP is available if the clarification pond water requires further treatment,
- the Vangorda pit pumping system can be utilized to return the water to the Vangorda pit,
- the water level in the pit is maintained as low as possible to maximize the freeboard,
- the ability to treat the drainage water directly in the pit is available, and
- the ability to utilize a portable lime system should the plant become non functional.

3.2 Mill Water Treatment Facility

The significant site features of the Faro mine site, overlain on a 1:50,000 topographic map, is presented in Figure F-2, Appendix B.

3.2.1 Introduction

The Faro pit treatment program was initiated in 1997 and has been established as an annual seasonal (summer) program. The program utilizes a water pumping system that was installed in 1997 to provide an estimated minimum 95% of the water required for processing while the mill was operating prior to February 1998. Since mine shut down in 1998, the system has been used exclusively to pump water from the Faro pit to the mill for treatment to maintain the in-pit water level within the pre-determined range. In 2001, the mill was converted to be used strictly as a water treatment system.

The Mill Water Treatment Plant (MWTP), shown in Figure F-2 in Appendix B, utilizes agitated flotation cells for lime conditioning and clarifier tanks for settlement of treatment solids to treat drainage water pumped from the Faro pit. Effluent water that is compliant with the Water Licence can be discharged from the effluent pipeline directly to Rose Creek via the Cross Valley Dam outflow spillway, directly into the Cross Valley Pond or into the Intermediate Impoundment spillway. The specific discharge location is determined based on operational considerations. Normal operational capacity of the plant is 19 m^3/min (5,000 USgpm); however, this can be increased to 23.5 m^3/min (6,200 USgpm).

3.2.2 Faro Pit Pumping System

The Faro pit pumping system consists of three barge mounted pumps in the pit and a plastic (Sclair) pipeline to the mill.

Included in Appendix B are drawings presenting the water treatment pipeline location (Faro Mine Site Overview, F-2), the general layout of the barge system in profile (Faro Pit Water Reclaim General Layout Elevation Sheet 1 of 2, 10-02-00) and in plan (Faro Pit Water Reclaim General Layout Plan & Details Sheet 2 of 2, 10-02-01).

In 2002, the barge anchor was modified to enable drawing the pit water level down to a lower elevation than was previously possible. This modification increased the operational flexibility to provide increased emergency storage capacity at the end of the pumping season. The pumping range for the barge system is between 3865ft and 3845ft. This system allows for two seasons of water storage should one year of pumping be missed.

The primary physical components of the system are the following:

- a steel construction barge with a fixed walkway and sliding anchor point,
- three submersible electric pumps on the barge, each rated at 19 m^3/min (5,000 USgpm),
- a 750 mm (30 in.) Sclair plastic pipe from the barge to the mill with flexible sections near the barge to prevent damage to the pipeline which might otherwise result from vertical movement of the barge, and
- an electrical transformer and control switches located near the barge.

The existing pumping system has been used to provide up to 23.5 m^3/min (6,200 USgpm) to the MWTP (only one or occasionally two pumps are utilized for pumping). However, the three-pump system provides capacity to pump water from the pit at a greater rate if circumstances required this. Feed to the mill is limited by the settling capacity in the thickener and clarifier tanks.

3.2.3 Mill Water Treatment Plant

Flow sheets, found in Appendix B, outline the overall process of the water treatment plant and detail the following components of the MWTP:

- the water treatment plant (General Water Treatment Flow Sheet, A0-F-001), and
- the piping arrangement throughout the mill building (Mill Building Piping Arrangement Plan Sheet 1, F0-P-001, Sheet 2, F0-P-002, Section-A, F0-P-003, Section-A & B, F0-P-004, and Section-C, F0-P-005).

The size of the distributor box shown in F0-P-004 and 005 was changed during installation to increase the capacity and allow greater retention time prior to open 'launder' feeding of the centre well of the 12.2 m (40 ft) diameter thickener. Revisions to these drawings are shown in Figure P-004A and P-005A found in Appendix B.

The primary physical components of this treatment system include (Gartner Lee Ltd., 2003):

- 600 mm (24 in.) steel pipeline to the distribution box, which feeds water pumped from the Faro Pit into two flotation cells;
- four "banks" of flotation each comprised of three agitated cells that are operated as two parallel lines with automated control of lime addition for lime conditioning of Faro Pit water,
- 500 mm (20 in.) steel discharge header and pipe from lime conditioning to a distribution box and open "launder" feeding the centre well of the 12.2 m (40 ft) diameter thickener,
- 500 mm (20 in.) Sclair pipe that passes overflow from the primary clarifier into the centre well of the 15.8 m (52 ft) diameter clarifier tank,
- 600 mm (24 in.) Sclair pipe effluent discharge pipe, which passes overflow approximately 3 km from the clarifier tank to the ultimate final discharge location,
- 500 mm (20 in.) steel outlet pipe, which passes overflow from the clarifier tank to the tailings pumpbox for release to the Intermediate Pond (via the existing open ditch) or pumping to the Faro pit,
- underflow pumps, which convey the treatment sediments from the thickener and clarifier to the tailings pumpbox, to be discharged via gravity to the Intermediate holding pond,
- lime mixing and distribution system including lime hopper, lime blower, lime silo, lime mixing tank, lime slurry storage tanks (2), lime distribution pumps (2), 100 mm (4 in.) plastic lime distribution pipeline; lime addition control valves (automatic and manual), and
- process monitoring and control system including, pH probes, lime valve actuators, flow meter, display and data storage panel and centralized on/off control switches (including emergency off for the Main Pit pumps).

3.2.4 Contingencies

The Mill Water Treatment Facility has several contingencies to ensure all treated drainage water discharged to the receiving environment meets the terms of the site Water Licences issued by the Yukon Territory Water Board. These contingencies are as follows:

- the MWTP is outfitted with new (2001) control instrumentation including automated lime control circuits, alarms, data recorders and centralized emergency shut down switches. The emergency switching includes an emergency shut down for the Faro Pit pumps,
- the discharge of treated water to the Intermediate Pond or back to the Faro pit via the existing tailings pump system if the water is noncompliant with the discharge requirements. The water can be returned to the Faro pit utilizing the pump located in the tailings pumphouse along with the 600 mm (24 in.) pipeline,
- the capability of diverting and liming the water through an old drop box located behind the mill in the emergency tailings area, and
- supplying power to the system using an emergency generator should Yukon Electric be unable to supply the required power.

3.3 Mobile Down Valley Water Treatment Facility

A site overview of the Mobile Down Valley Water Treatment system overlain on a 1:50,000 topographic map is presented in Figure 3, Appendix C.

3.3.1 Introduction

The Mobile Down Valley Water Treatment Plant (MDVWTP), shown in Figure 3 in Appendix C, was constructed in 2002 to treat water from the Intermediate Impoundment pond by agitation with lime slurry. Treated water is then discharged into the Intermediate Impoundment spillway and flows into the Cross Valley pond. Water that is compliant with the discharge criteria of the water licence is released from the Cross Valley Pond to Rose Creek on an intermittent basis during the summer. The operational capacity of the plant is 6.8 m^3/min (1,500 USgpm).

3.3.2 Intermediate Impoundment Pumping System

The location of the pipeline is presented in Figure 3, Appendix C.

The inflow water from the Intermediate pond is not pumped to the treatment tank but syphoned using a 300 mm (12 in.) steel pipeline. The primary physical components of the system are:

- a 300 mm (12 in.) steel pipeline from the pond to the treatment tank with a flexible section used at the intake of the pond to prevent damage.

3.3.3 Mobile Down Valley Water Treatment Plant

A drawing presenting the general layout of the treatment system in plan (Mobile Down Valley Water Treatment Plant Site Plan, Figure 4) and in profile (Mobile Down Valley Treatment Plant Profile, Figure 5) and a flow sheet (Mobile Down Valley Water Treatment Plant Flow Sheet, Figure F-6) of the treatment process is presented in Appendix C.

The Mobile Down Valley Water Treatment plant consists of the following primary physical components:

- steel construction treatment tank, 28 m^3 capacity, located in the spillway into which syphoned Intermediate pond water, Cross Valley pond water and lime slurry are added (mixing is by the force of the incoming syphoned water),

- a lime storage and preparation system, which includes the storage of lime in the hopper, slaking the lime, storing the slaked lime slurry in the 55 m^3 storage tank, and feeding the lime slurry to the treatment tank,
- a steel construction barge and one electric pump, which is located in the Cross Valley pond, to provide the treatment plant with water via a 100 mm (4 in.) Sclair plastic pipe for mixing lime slurry, and
- a 285 kW generator that provides power for the water treatment plant.

Intermediate Pond water mixed with Cross Valley pond water, which is used to regulate incoming flow, enters the base of upstream end of the treatment tank. Lime slurry from the storage tank is then added at this location causing the water and lime slurry to be mixed together by the force of the incoming water and baffles inside the tank. The treated water exits through holes in the top of the downstream end of the treatment tank and flows down the Intermediate Impoundment spillway into the Cross Valley pond.

The lime storage and preparation system is located on a bench above the spillway approximately 25 m away from the treatment tank. Lime from the hopper, which is located directly above the slaking tank, is mixed with water pumped from the Cross Valley pond in the centre mixing pipe of the slaking tank. Once the lime slurry is properly mixed, the slurry is decanted from the slaking tank into the feed line of the storage tank. To draw down the lime slurry remaining in the slaking tank and recirculate the lime slurry from the bottom of the slaking tank in between mixing sessions, a 5 hp pump is used. While the lime slurry is stored in the storage tank, it is agitated to ensure the lime stays in suspension until it is added to the treatment tank. A 5 hp pump is used to feed the lime slurring into the treatment tank and recirculate the slurry from the bottom of the storage tank. The plant operator oversees the storage and preparation system continuously to ensure the required amount of lime slurry is available for use throughout the treatment process.

The 285 kW generator along with the accompanying 4540 l (1000 gallon) fuel tank and supporting buildings are also located in the upper bench.

Treated water that is discharged from the treatment tank into the Intermediate Impoundment spillway that flows into the Cross Valley pond is retained in the Cross Valley pond to allow for treatment solids to settle out of suspension. As previously stated, water in the Cross Valley pond that meets the discharge criteria of the Water Licence is released to Rose Creek on an intermittent basis.

3.3.4 Contingencies

The Mobile Down Valley Water Treatment Facility has several contingencies to ensure all treated drainage water discharged to the receiving environment meets the terms of the site Water Licences issued by the Yukon Territory Water Board. These contingencies are as follows:

- the MDVWTP is outfitted with emergency shut down switches, which include an emergency shut down for the Intermediate pond pipeline at the treatment tank, and the Cross Valley barge pump at the plant location,
- the lime storage and preparation system can remain offline whenever it is required,
- should the lime preparation system fail, measures are available to produce the lime slurry at the mill and transported by truck to the Down Valley lime storage tank,
- the system incorporates a contingency backup that allows for three 35 hp Flyght pumps to be used if additional pumping capacity is required from the Intermediate pond or the syphon fails, and
- the maximum elevation on the Intermediate pond is to remain 1.0 m below the inlet elevation of the Intermediate spillway.

4.0 CLOSURE

Information presented in this report was obtained from a site visit completed by EBA and existing information provided to EBA by Anvil Range Mine Corporation (Interim Receiver). It is hoped that this report meets your present requirements; however, if you have any questions or concerns please contact the undersigned.

Yours truly,
EBA Engineering Consultants Ltd.

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REFERENCES

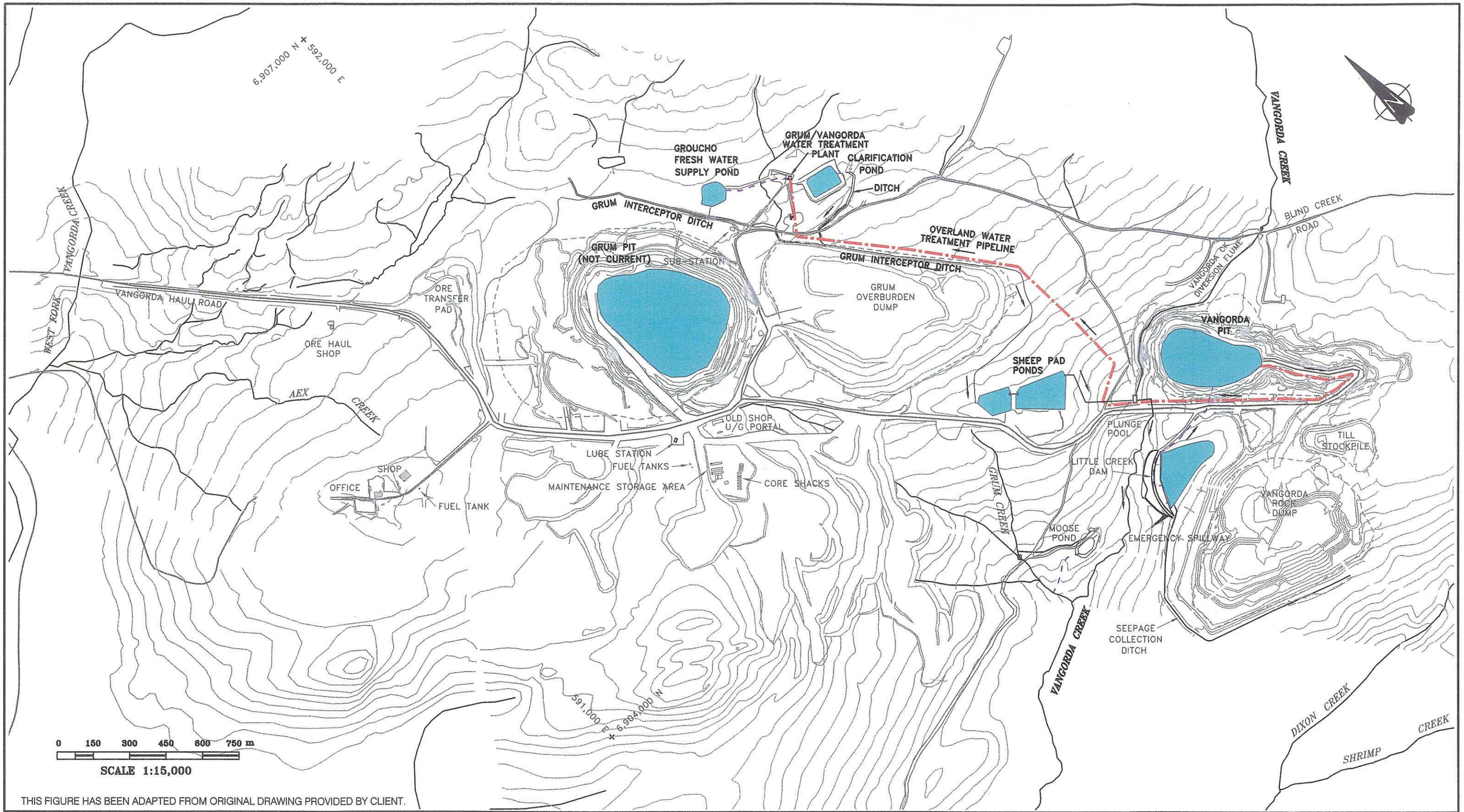
Cominco Engineering Services Ltd., February 1991, Operating Manual for the Grum/Vangorda Water Treatment Plant.

Gartner Lee Limited, April 2003, Anvil Range Mine Complex 2004-2008 Water Licence Renewal Environmental Assessment Report – Anvil Range Mining Corporation (Interim Receivership).

APPENDIX A

APPENDIX A

GRUM/VANGORDA WATER TREATMENT FACILITY



THIS FIGURE HAS BEEN ADAPTED FROM ORIGINAL DRAWING PROVIDED BY CLIENT.

LEGEND:

- ROADS
- EXISTING SURFACE DRAINAGE
- PRE-MINE DRAINAGE
- EFFLUENT PIPELINE
- PIPELINE
- WATER TREATMENT PIPELINE
- SURFACE WATER

EBA Engineering Consultants Ltd.

REVIEWED BY:	JPB/JRT
DRAWN BY:	JSB
DATE:	06/07/2003
SCALE:	AS SHOWN
PROJECT No.:	0201-1200045
ACAD FILENAME:	1200045 Fig. 1.dwg

SOURCES OF INFORMATION

1. DIGITAL COPY OF 1:50,000 TOPOGRAPHIC MAP SUPPLIED BY SRK CONSULTING.
2. MAP COORDINATES ARE UTM NAD83 ZONE 8; CONTOUR INTERVAL 100 FT.
3. FARO MINE DETAILS ADAPTED FROM DRAWINGS BY ROBERTSON GEOCONSULTANTS INC.
4. BASE DRAWING PROVIDED BY GARTNER LEE LTD.

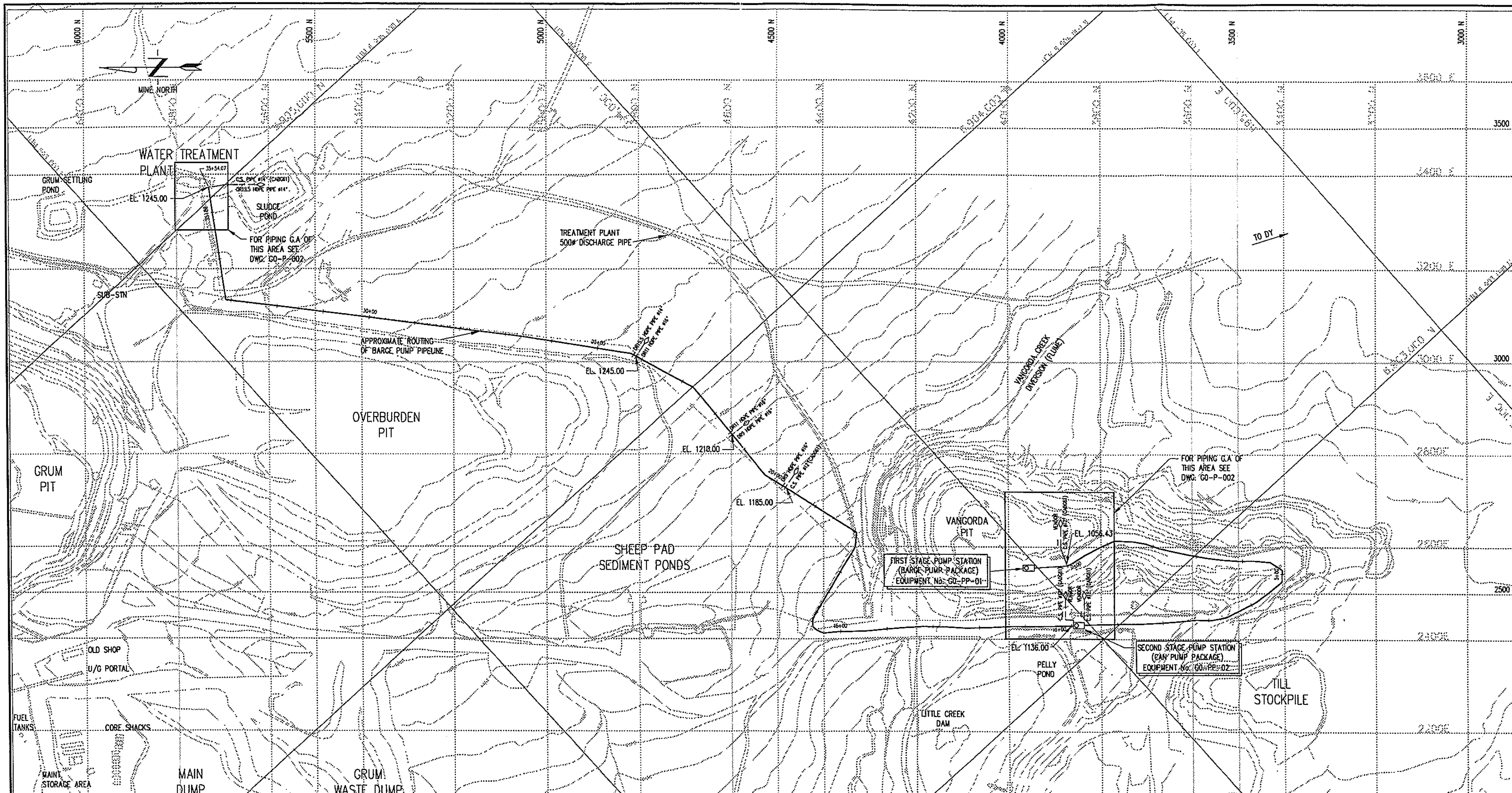
TITLE

VANGORDA PLATEAU MINE SITE REVIEW

Gartner Lee | Deloitte & Touche

REVISION ISSUE 0

DRAWING No. F-1



NOTE:

1. LOW POINTS & HIGH POINTS (2 EACH) IN CARBON STEEL LINE TO BE FITTED WITH DRAIN VALVES AND AIR RELEASE VALVES RESPECTIVELY. SEE DWG. GO-P-002 FOR GENERAL DETAIL.

FOR CONSTRUCTION

MAY 23/01

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SCALE – 1:4000

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DWG. NO.	REFERENCE DRAWINGS

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B	ISSUED FOR APPROVAL	JB	01/03/09
A	PROGRESS PRINT		

ISSUE/REVISIONS

PROJECT PROCESS CIVIL MECH. STRUCT. PIPING SERVICES ELECT. INSTR. — PW, EM

SECTION:	PIPING	
SCALE:	AS SHOWN	DATE
DESIGN. BY	BA	24/May/01
DRAWN BY:	D.L.N.	FEB. 01
CHECK. BY		May 23/01
APP. BY:		May 24/01

DELOITTE AND TOUCHE

VANGORDA PIT

HATCH

TITLE: WATER TREATMENT PLANT

BARGE PUMP PIPELINE OVERALL PLAN

FILENAME:	PROJECT NUMBER	DRAWING NUMBER	REV.
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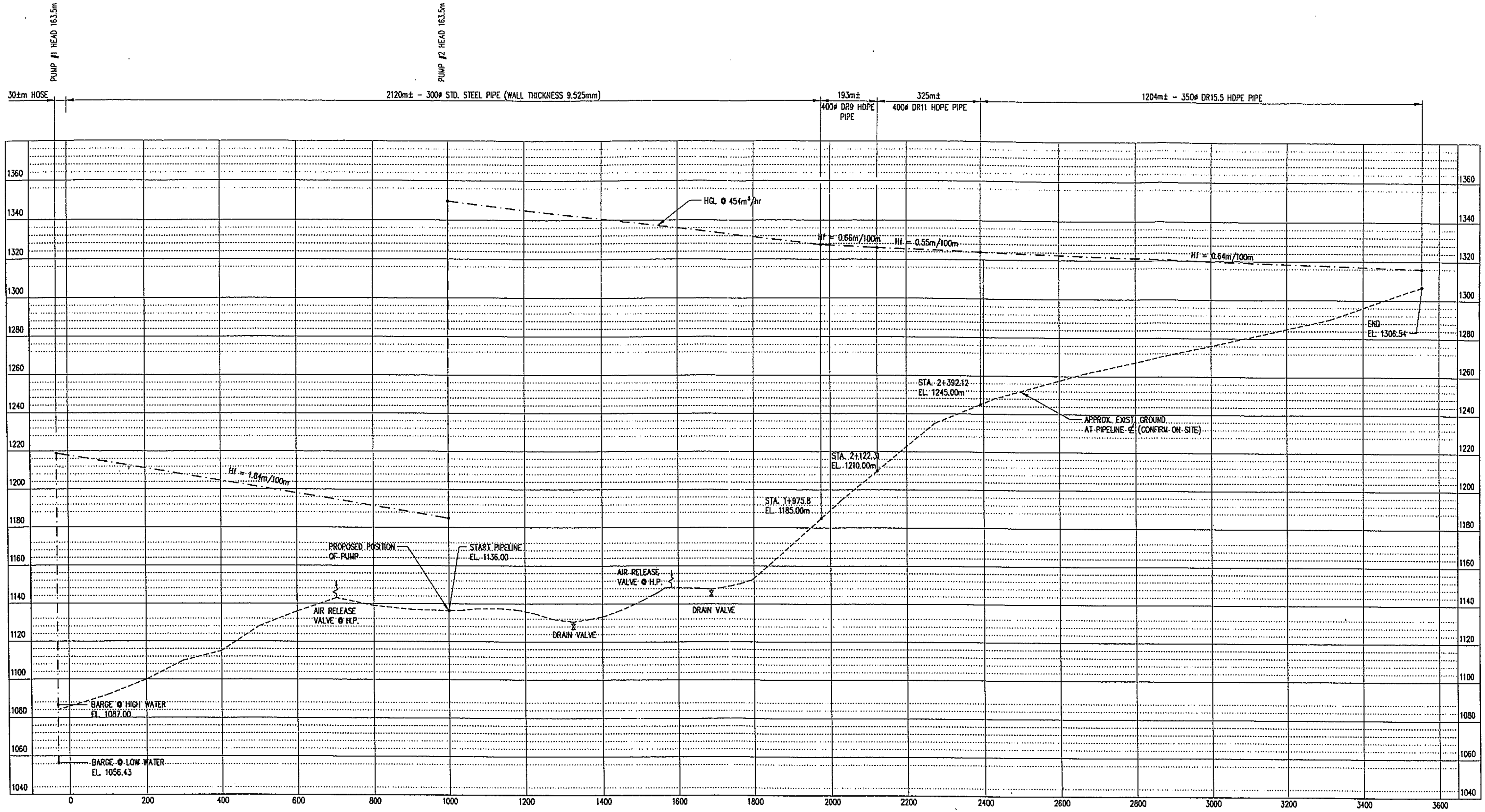


PIPELINE PROFILE

SCALE : HORIZ - 1:5000
VERT - 1:1000

NOTE: AIR RELEASE AND DRAIN VALVES REQ'D AS SHOWN OR LOW POINTS TO BE REMOVED BY THE MINE.

SCALE - 1:5000

FOR CONSTRUCTION

MAY 23, 2001

SCALE - 1:1000

THIS DRAWING HAS NOT BEEN PUBLISHED BUT RATHER HAS BEEN PREPARED BY HATCH FOR USE BY THE CLIENT NAMED IN THE TITLE BLOCK SOLELY IN RESPECT OF THE CONSTRUCTION, OPERATION AND MAINTENANCE OF THE FACILITY NAMED IN THE TITLE BLOCK AND SHALL NOT BE USED FOR ANY OTHER PURPOSE OR FURNISHED TO ANY OTHER PARTY WITHOUT THE EXPRESS CONSENT OF HATCH.

DWG. NO.	REFERENCE DRAWINGS

NO	DESCRIPTION	BY	DATE
0	ISSUED FOR CONSTRUCTION	DN	01/05/23
B	RE-ISSUED FOR APPROVAL	JB	01/03/09
A	ISSUED FOR APPROVAL	DN	01/01/25

ISSUE/REVISIONS

PROJECT / PROCESS / CIVIL / MECH. / STRUCT. / PIPING / SERVICES / ELECT. / INSTR. — PW, EM

SECTION:	CIVIL	
SCALE:	AS SHOWN	DATE
DESIGN. BY	B.A.	2? May 01
DRAWN BY:	D.L.N.	JAN. 01
CHECK. BY	[signature]	MAY ?3/01
APP. BY:	[signature]	MAY 24/01

DELOITTE AND TOUCHE

VANGORDA PIT

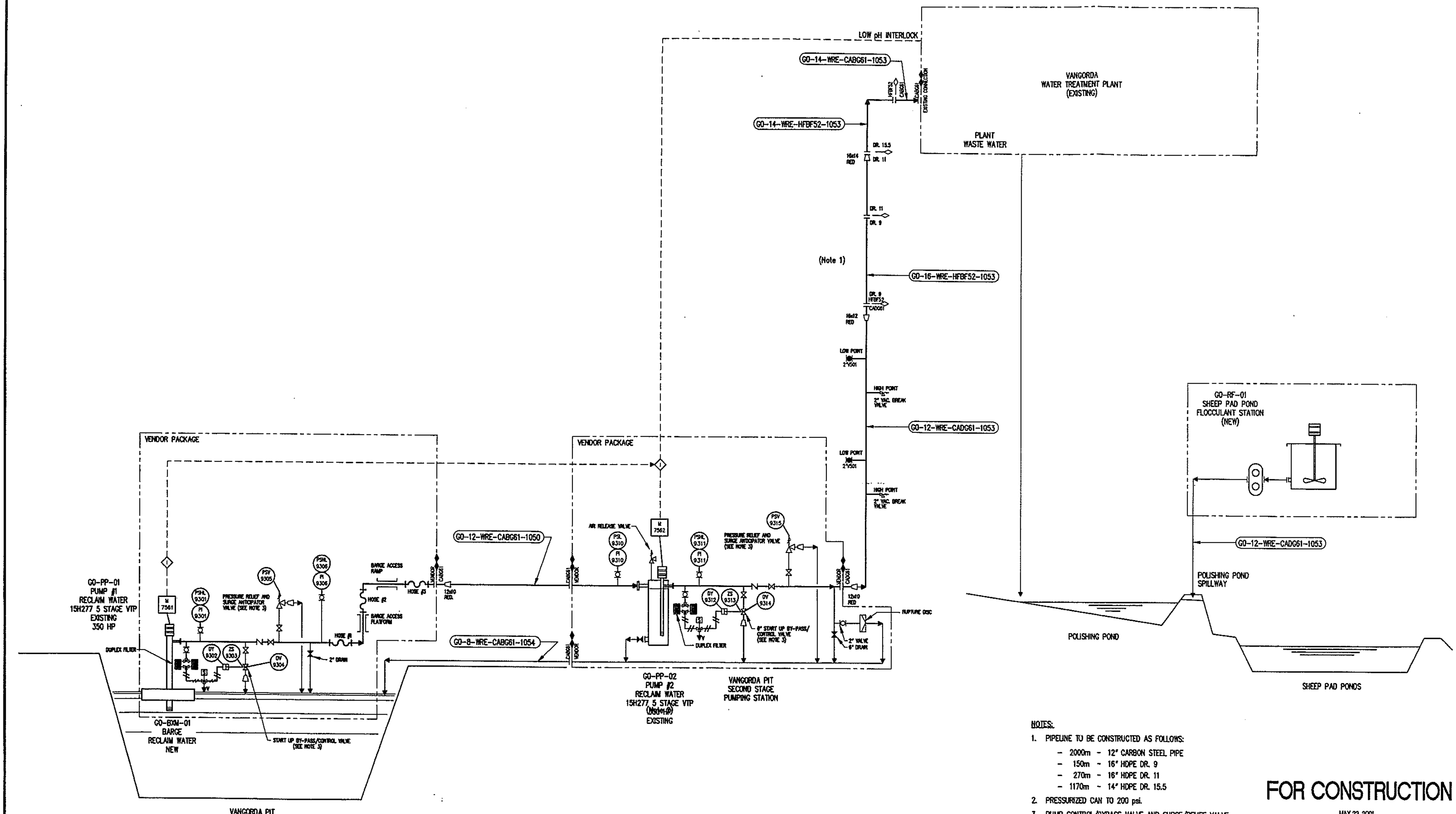
HATCH

TITLE: WATER TREATMENT PLANT

BARGE PUMP PIPELINE PROFILE AND HGL

FILENAME:	PROJECT NUMBER	DRAWING NUMBER	REV.
A0C001.DWG	32773	A0-C-001	0

32735ID__DWG 2001/05/23 13:53



NOTES:

1. PIPELINE TO BE CONSTRUCTED AS FOLLOWS:
   - 2000m - 12" CARBON STEEL PIPE
   - 150m - 16" HDPE DR. 9
   - 270m - 16" HDPE DR. 11
   - 1170m - 14" HDPE DR. 15.5
2. PRESSURIZED CAN TO 200 psi.
3. PUMP CONTROL/BYPASS VALVE AND SURGE/RELIEF VALVE AND FILTERING SYSTEM TO BE PART OF THE VENDOR PUMP PACKAGE

FOR CONSTRUCTION

MAY 22, 2001

DWG. NO.	REFERENCE DRAWINGS

NO	DESCRIPTION	BY	DATE
1	GENERALLY REVISED AND UPDATED	JB	01/05/22
0	ISSUED FOR CONSTRUCTION	EM	01/02/28
B	ISSUED FOR APPROVAL	JB	01/01/26
A	ISSUED FOR APPROVAL	JB	01/01/11

ISSUE/REVISIONS

SECTION:	GENERAL	
SCALE:	NONE	DATE
DESIGN. BY	EM	JAN.01
DRAWN BY:	JB	JAN.01
CHECK. BY	EM	01/02/28
APP. BY:	PW	01/02/28

DELOITTE AND TOUCHE

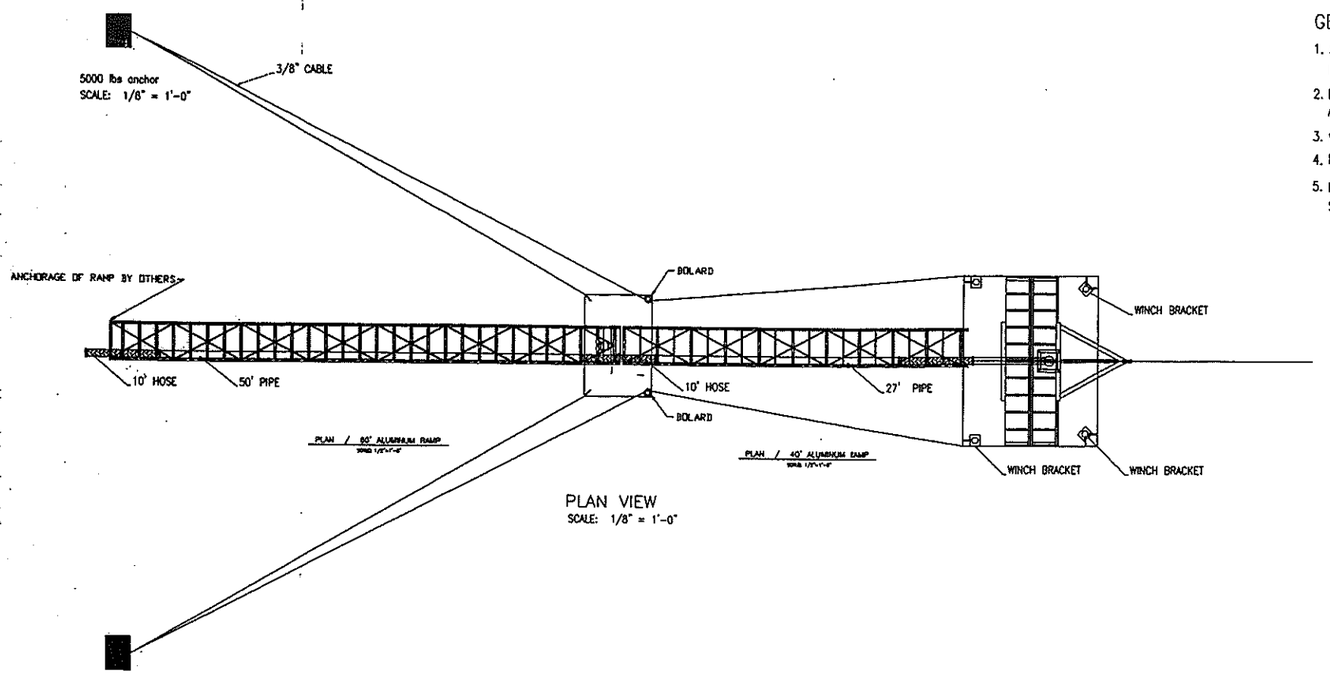
VANGORDA PIT

HATCH

TITLE: WATER TREATMENT PLANT

GENERAL
PROPOSED WATER TREATMENT
P & I DIAGRAM #3

FILENAME:	PROJECT NUMBER	DRAWING NUMBER
A0P003.dwg	32773	A0-P-003



PLAN VIEW
SCALE: 1/8" = 1'-0"

GENERAL NOTES:

1. ALL DECK PLANKS SHALL BE 38mm x 190mm AND SPAN PERPENDICULAR TO THE LONGITUDINAL AXIS OF THE RAMPS
2. BOLTS SHALL TO ASTM A307 AND FURNISHED WITH LOCK-WASHER AND NUTS.
3. WELDS WHERE NOT SHOWN TO DEVELOP FULL STRENGTH OF SECTION.
4. HAND RAIL NOT SHOWN FOR CLEARTY
5. FOR PIPING / VALVING DETAIL INCLUDING PIPE CLAMPS SEE DRAWING 225354-0024

DESIGN CRITERIA :

1. DEAD LOAD : INCLUDES ALL STRUCTURAL FRAMING AND ALL OTHER FIXED COMPONENTS TO THE STRUCTURE.
2. SNOW LOADS : NOT TO EXCEED NHBC SPECIFIED VALUES FOR SITE
3. WIND LOADS : 1: 30 YEAR RETURN PERIOD HOURLY WIND SPEED
4. WAVE LOADS: WAVES OF HEIGHT Hmax = 0.6m CONSIDERED IN DESIGN
5. FLOAT DECK LOADS :
   UNIFORM DISTRIBUTED LIVE LOAD FOR RAMP: 4.8KPa (100 PSF)
   UNIFORM DISTRIBUTED LIVE LOAD FOR PONTOON: 4.8KPa (100 PSF)
   CONCENTRATED LIVE LOAD 1.8 kN (400 lb)
   A-FRAME LIFT LOAD : 15.6 kN (3500 lbs)

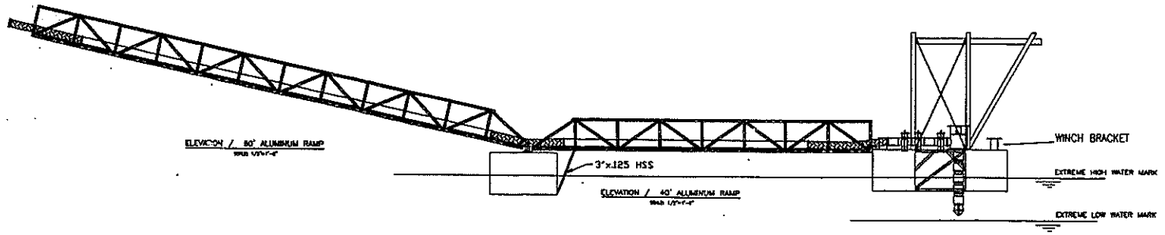
FREEBOARD AND STABILITY :

1. MIN. FREEBOARD UNDER DEAD = 900 mm
2. MINIMUM LOADED FREEBOARD = 400 mm
3. PROVIDE BALLAST TO ACHIEVE STABLE WORKING CONDITIONS

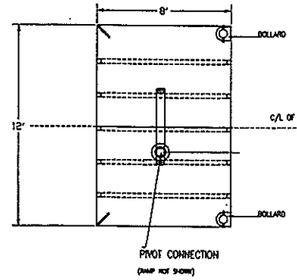
PUMP / MOTOR REMOVAL FOR MAINTENANCE

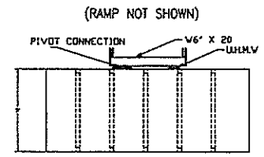
1. REMOVE MOTOR AND OFF LOAD -- MOTOR WEIGHT 2900 LBS.
2. LIFT PUMP HEAD AND BOWL ASSEMBLY APPROX. 2FT ABOVE DECK - TOTAL 3000 LBS. DO NOT ATTEMPT TO REMOVE AS ONE PIECE.
3. CLAMPS AND SUPPORT BOWL ON DECK.
4. DISCONNECT HEAD FROM BOWL ASSEMBLE AND OFF LOAD ....HEAD WT. - 900 LBS.
5. HOIST BOWL WITH SLING , TILT TO ALLOW HEAD SHAFT TO PASS HOIST - OFF LOAD PUMP BOWL WEIGHT 2100 LBS.

WARNING:----- SAFE WORKING LOAD OF GANTRY NOT TO EXCEED 3500 LBS.

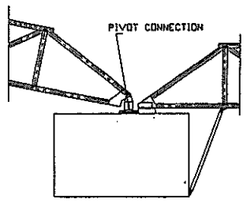


ELEVATION
SCALE: 1/8" = 1'-0"

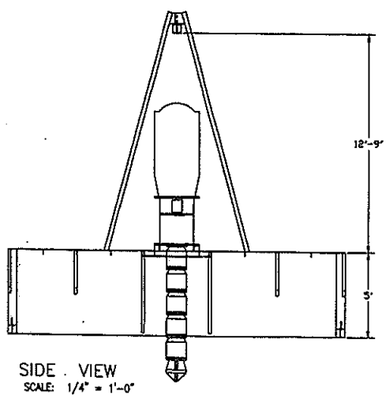




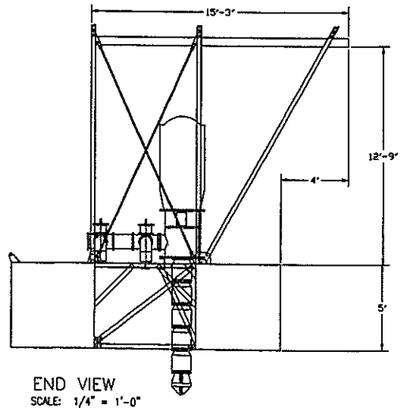
ELEVATION
SCALE: 1/8" = 1'-0"



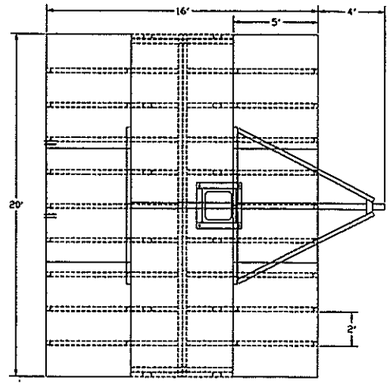
DETAIL 1

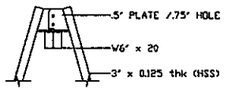


SIDE VIEW
SCALE: 1/4" = 1'-0"



END VIEW
SCALE: 1/4" = 1'-0"





DETAIL 1
SCALE 1/8" = 1'-0"

PROFESSIONAL ENGINEER
PROVINCE OF BRITISH COLUMBIA
K. S. RANGWALA

- NATIONAL PROCESS EQUIPMENT
- ANVIL RANGE MINING CORPORATION
- REF 32773
- PROJECT - VANGRODA
- LOCATION - FARO YUKON
- NPE JOB # 225354

DWG. NO.	REFERENCE	REF. NO.

DWG. NO.	REFERENCE	REF. NO.

REVISION	DESCRIPTION	DRAWN	CHECKED	DATE

REVISION	DESCRIPTION	DRAWN	CHECKED	DATE
A	ISSUED FOR CONSTRUCTION	MKR	KR	5-05-2005

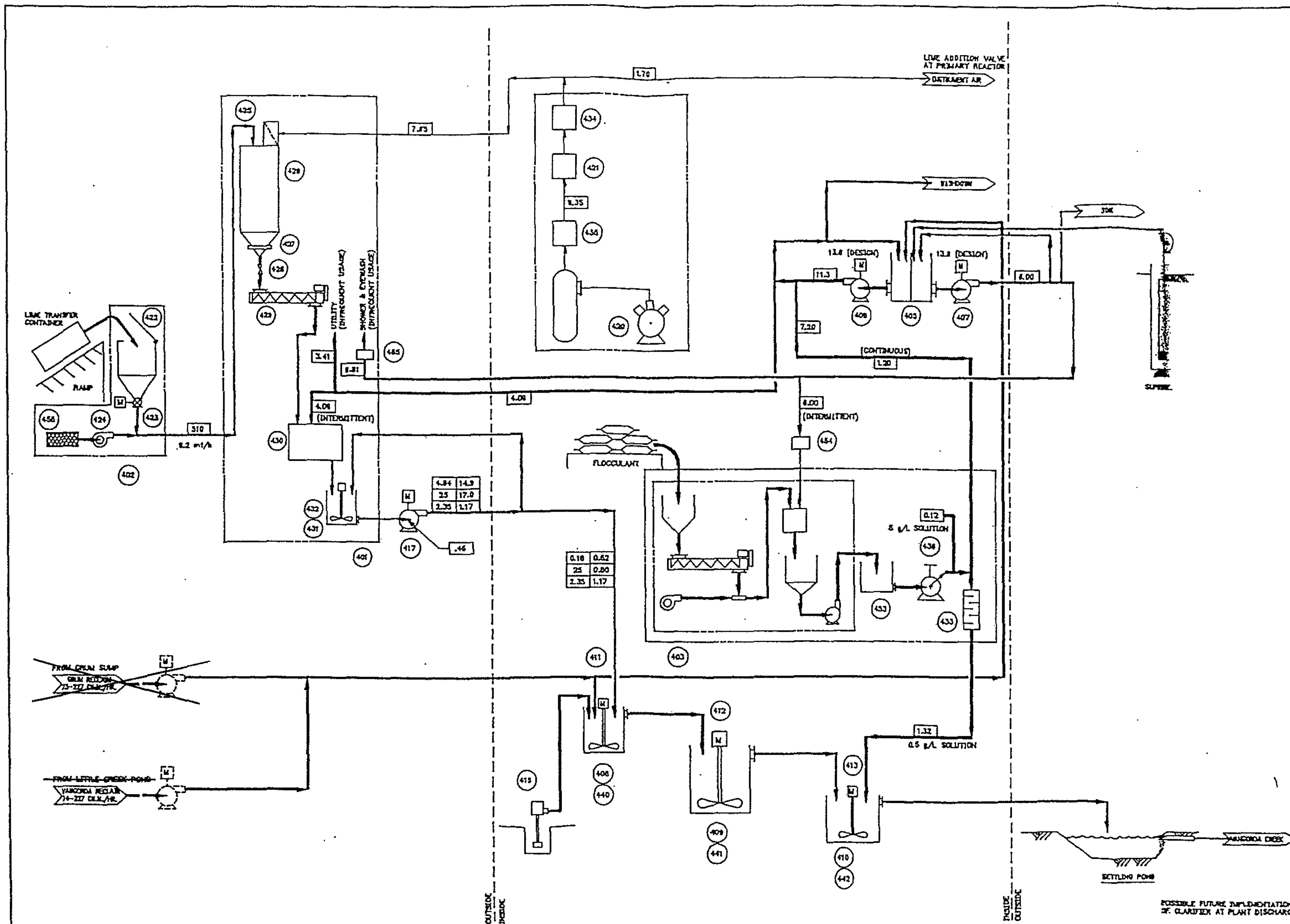
CAD FILE: DKRAMP-01

PUMP PLAT FORM
AND RAMP
GENERAL ARRANGEMENT

DATE:	14-10-00
SCALE:	AS NOTED
DRAWN:	KR
DESIGN:	KR

BLUE WATER SYSTEMS LTD
9925 RIVER RD. DELTA B.C. Canada, V4G 1B4 Fax (604) 583-9998 Tel: (604) 583-9

DWG. NO: VANAQUAR-01 REV. 0



ITEM NO.	NO. REQ'D	EQUIPMENT NO.	DESCRIPTION	MOTOR HP/UNIT	ITEM NO.	NO. REQ'D	EQUIPMENT NO.	DESCRIPTION	MOTOR HP/UNIT	ITEM NO.	NO. REQ'D	EQUIPMENT NO.	DESCRIPTION	MOTOR HP/UNIT	ITEM NO.	NO. REQ'D	EQUIPMENT NO.	DESCRIPTION	MOTOR HP/UNIT
400					415	1	P662-415	PLANT SUMP PUMP (1 1/2" CALIGHON)	3	430	1	—	LIME SLAKER (WALLACE & TIERNAN 4H lb/HR CAPACITY)	.75,.50	VOID				—
401	1	P662-401	LIME STORAGE AND PREPARATION SYSTEM ([illegible])		VOID					431	1	—	LIME SLURRY STORAGE TANK(4.32 CU M CAP)	—	VOID				
402	1	P662-402	LIME SILO FILL SYSTEM		417	2	P662-417-1,2	LIME SLURRY CIRCULATION PUMP A-C 2x2 SL	5	432	1	—	LIME SLURRY STORAGE TANK AGITATOR (PROCHEM)	3	VOID				
403	1	P662-403	FLOCCULANT PREP. UNIT (ALLIED COLLOIDS)	.2,.37,2.1	VOID					433	1	—	STATIC MIXER (KOCH TYPE SMX.B)	—	VOID				
404	1	P662-404	PLANT WATER SUPPLY PUMP		VOID					434	1	—	AFTER FILTER		VOID				
405	1	P662-405	PLANT WATER STORAGE TANK ([illegible] 4.4 CU.M.)	—	420	1	P662-420	PLANT AIR COMPRESSOR (13.0 CUM/HR@[illegible])	3	435	1	—	PREFILTER	—	VOID				
406	1	P662-406	MINE WATER CIRCULATION PUMP H/S ANSI AA-8	6	421	1	—	AIR DRYER	—	436	1	—	DOSING PUMP (BORNEMANN EH 230-2)	1 DC	VOID				
407	1	P662-407	FRESH WATER CIRCULATION PUMP H/S ANSI AA-8	5	422	1	—	LIME UNLOADING BOX(25t CAP)	—	VOID					VOID				
408	1	P662-408	PRIMARY REACTOR (3.8M x 3.3M 37.9CU.M.)	—	423	1	—	ROTARY AIR LOCK FEEDER	.33	VOID					453	1	—	HOLDING [illegible] CU.M.	—
409	1	P662-409	SECONDARY REACTOR ([illegible] 4.4M 114CU.M.)	—	424	1	—	BLOWER	20	VOID					454	1	P662-454	WATER [illegible]	—
410	1	P662-410	FLOCCULANT MIX TANK (2.2M x 2.0M 7.57CU.M.)	—	425	1	—	BIN VENT FILTER (23.2 SQ.M FLEX-KLEAN)	—	440	1	P662-440	PRIMARY AGITATOR BRIDGE	—	455	1	P662-455	WATER [illegible]	—
411	1	P662-411	PRIMARY REACTOR AGITATOR	10	426	1	—	LIME SILO 40t CAPACITY (PEABODY TECTANK)	—	441	1	P662-441	SECONDARY AGITATOR BRIDGE	—	456	1	—	FILTER/[illegible]	
412	1	P662-412	SECONDARY REACTOR AGITATOR	25	427	1	—	BIN ACTIVATOR 1.21M (METALFAB)	1.5	442	1	P662-442	FLOCCULANT TANK AGITATOR BRIDGE	—	457				
413	1	P662-413	FLOCCULANT MIX TANK AGITATOR	1.5	428	1	—	SILO DISCHARGE VALVE (203mm)	—	VOID					458				
VOID					429	1	—	VOLUMETRIC SCREW FEEDER ([illegible]mm METALFAB)	.75	VOID					459				

REVISIONS

NO.	DATE	APP'D	DESCRIPTION
A	[illegible]		PRELIMINARY
P1	[illegible]		PRELIMINARY (SCOPE CHANGES)
P2	[illegible]		FOR APPROVAL
0	[illegible]		FOR QUOTATION
1	[illegible]		FOR TENDER
2	[illegible]		FOR CONSTRUCTION
3	[illegible]		FRESH WATER PUMP ADDED
4	[illegible]		ADDED BAFFLE PLATE TO 405

REFERENCE

ISSUE

Cominco Engineering Services Ltd.

VANCOUVER–TRAIL–CALGARY–SASKATOON

DRAWN BY SES 89/04/28

CHECKED BY

DESIGNED BY

SCALE N.T.S.

TITLE
PROCESS FLOWSHEET
CURRAGH RESOURCES INC.
GRUM/VANGORDA
WATER TREATMENT PLANT

DRAWING NO. P662-A-001

REV. 4

FIRE ALARM XS 105 — XA 105

POWER FAILURE XS 108 (MCC) — XA 106

BUILDING TEMP. TSL 107 — TAL 107

AIR INTAKE

CONTRACT VENDOR

PLANT AIR COMPRESSOR PACKAGE EQ.NO. P662-420

MOISTURE TRAP

PREFILTER

AFTER FILTER

LIME ADDITION VALVE

PI 103

15 A 978-002

25 A 978-001

1581-1

TO SHOWER & EYE WASH

WATER FILTER EQ.NO. P662-455

OUTSIDE INSIDE BUILDING

SET @ 350 kPa

PSL 104

PAL 104

40 W 009-036

FRESH WATER

40 W 009-027

ET

P662-A-007 MINE WATER

INSIDE SILO SKIRT NONE

OUTSIDE ET

25 W 009-033

LIME SILO

FEEDER

XS 131

XA 131

SLAKER

50 R 230-014

50 R 216-014

P662-A-007 LIME SLURRY RETURN

PAL 119

PSL 119 SET @ 70 kPa

25DI-1

15BI-1

HS 4171

50 R 216-012

P662-A-007 LIME SLURRY TO PROM. REACTOR

LIME TRANSFER CONTAINER

LIME DILL SYS EQ.NO. P662-

FILTER/SILENCER

BLOWER

OUTSIDE INSIDE FILL SYSTEM SKIRT

INSIDE FILL SYSTEM SKIRT OUTSIDE

CONTRACT VENDOR

LSL 133

LIME STORAGE AND PREPARATION SYSTEM EQ.NO. P662-401

50 R 216-010

80x50

50DI-1 (DRAIN)

LIME SLURRY CIRCULATION PUMP EQ.NO. P662-417-1

HS 4172

50 R 216-013

60 R 216-011

80x50

50DI-1 (DRAIN)

LIME SLURRY CIRCULATION PUMP EQ.NO. P662-417-2 (STANDBY)

LAL 133

DI-1

BI-1

REVISIONS			
NO.	DATE	APP'D	DESCRIPTION
P2	98/04/06		FOR COMMENTS
0	98/08/28		FOR QUOTATION
1	98/12/21		FOR TENDER
2	99/04/15		FOR CONSTRUCTION
3	99/09/10		FRESH WATER PUMP ADDED

2	P662-A-001 PFD
1	P662-A-007 P&ID

REFERENCE

ISSUE

DN	NPS	DN	NPS
15	1/2	150	6
20	3/4	200	8
25	1	250	10
32	1 1/4	300	12
40	1 1/2	350	14
50	2	400	16
65	2 1/2	450	18
80	3	500	20
100	4	600	24
125	5	750	30

Cominco Engineering Services Ltd.

VANCOUVER-TRAIL-CALGARY-SASKATOON

DRAWN BY SES	99/04/06
CHECKED BY	
DESIGNED BY PW	

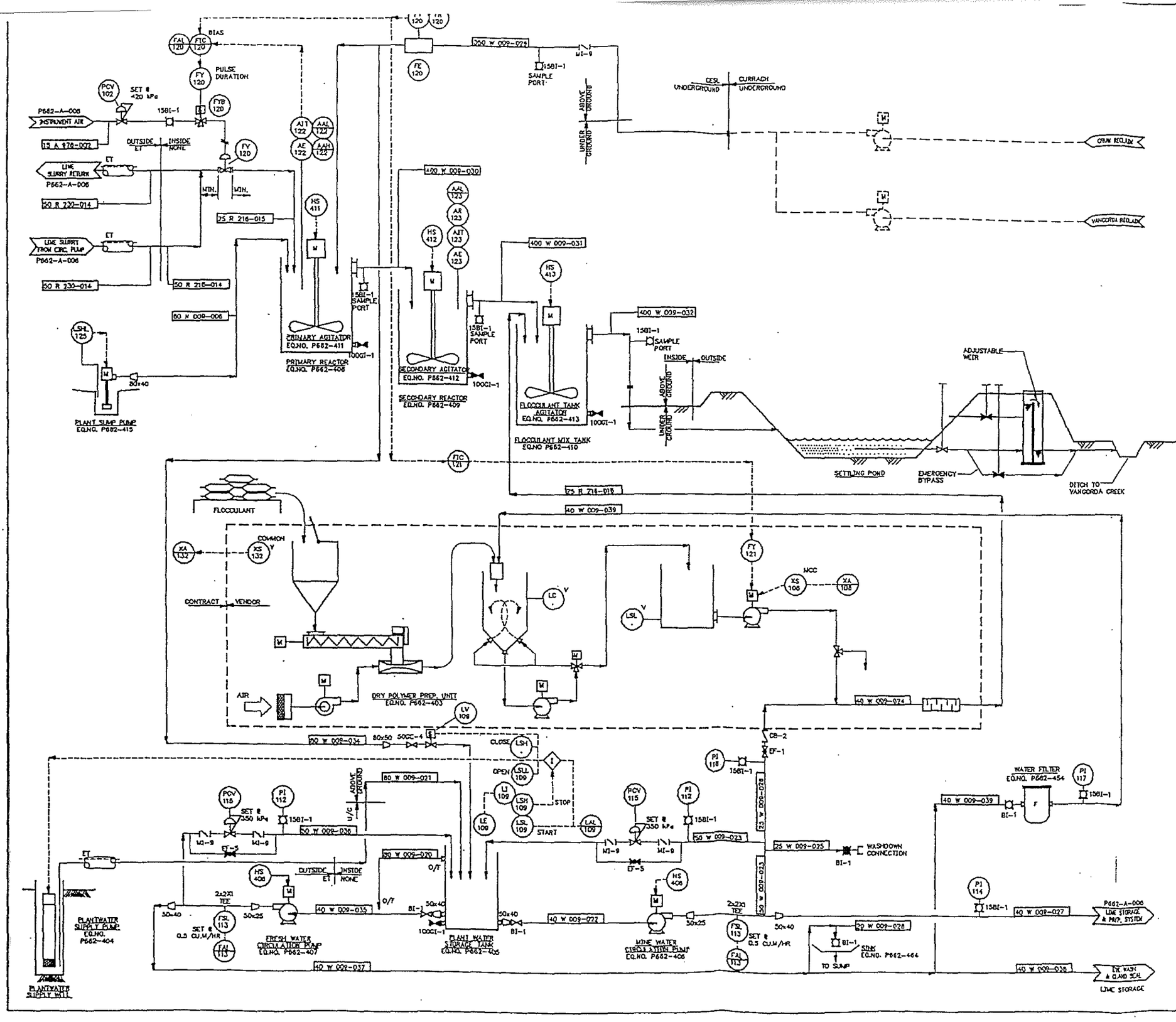
SCALE N.T.S.

TITLE

CURRAGH RESOURCES INC.
FARO, YUKON GRUM/VANGORDA
WATER TREATMENT PLANT
LIME FEED AND AIR P & ID

DRAWING NO. P662-A-006

REV. 3



REVISIONS

NO.	DATE	APP'D	DESCRIPTION
P1	89/06/23		FOR COMMENTS
0	89/08/31		FOR QUOTATION
1	89/12/28		FOR TENDER
2	90/04/25		FOR CONSTRUCTION
3	90/08/10		FRESH WATER PUMP ADDED

2	P662-A-001 PFD
1	P662-A-006 P&ID

REFERENCE ISSUE

DN	NPS	DN	NPS
15	1/2	150	6
20	3/4	200	8
25	1	250	10
32	1 1/4	300	12
40	1 1/2	350	14
50	2	400	16
65	2 1/2	450	18
80	3	500	20
100	4	600	24
125	5	750	30

Comhco Engineering Services Ltd.

VANCOUVER–TRAIL–CALGARY–SASKATOON

DRAWN BY SES	89/06/12
CHECKED BY	
DESIGNED BY PW	

SCALE N.T.S.

TITLE
CURRAGH RESOURCES INC.
FARO, YUKON GRUM/VANGORDA
WATER TREAT. PL. P&ID REACTOR
WATER SUPPLY & FLOCC. FEED

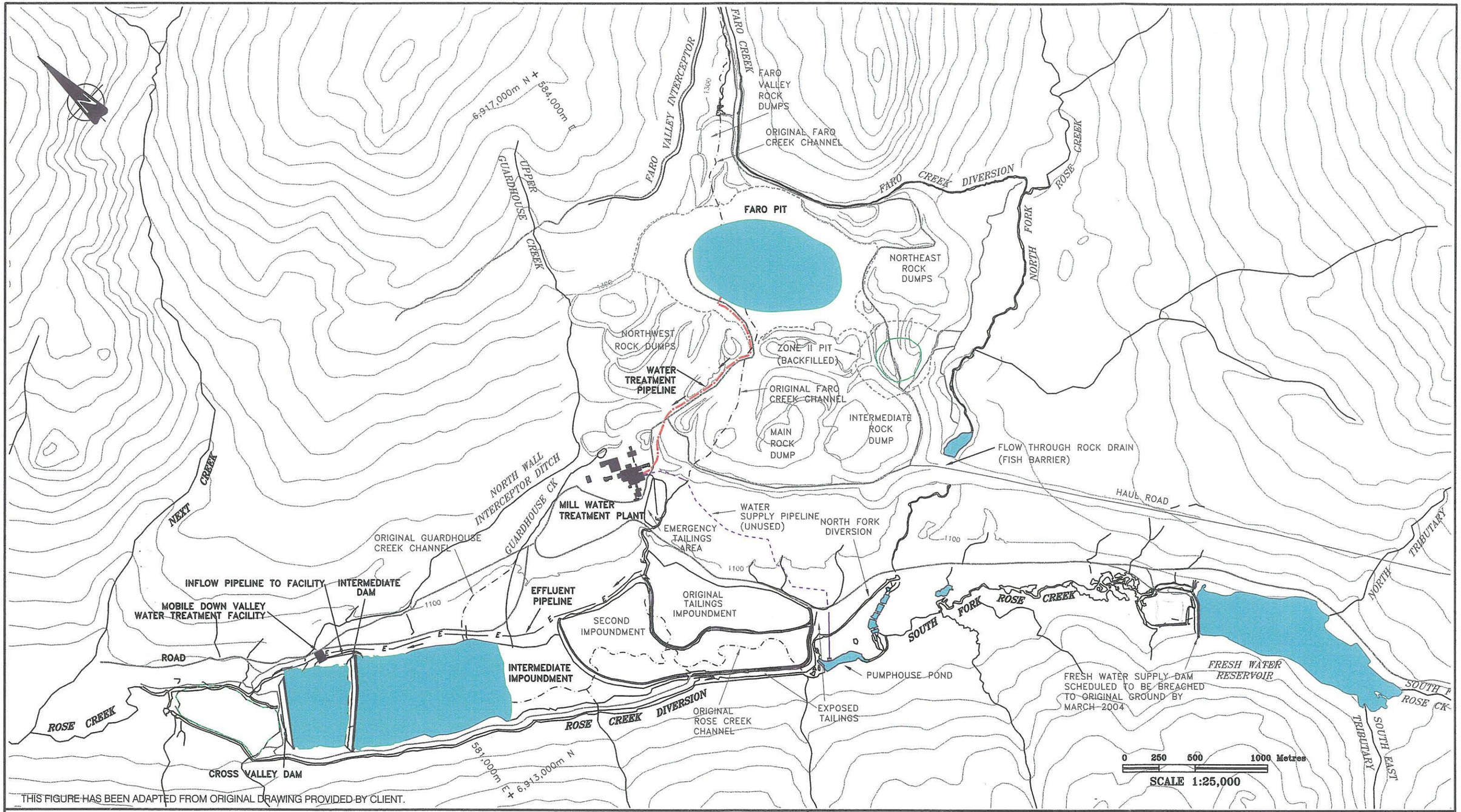
DRAWING NO. P662-A-007

REV. 3

APPENDIX B

APPENDIX B

MILL WATER TREATMENT FACILITY



THIS FIGURE HAS BEEN ADAPTED FROM ORIGINAL DRAWING PROVIDED BY CLIENT.

LEGEND:

- ROADS
- EXISTING SURFACE DRAINAGE
- PRE–MINE DRAINAGE
- E — EFFLUENT PIPELINE
- PIPELINE
- WATER TREATMENT PIPELINE
- SURFACE WATER

EBA Engineering Consultants Ltd.

REVIEWED BY:	JPB/JRT
DRAWN BY:	JSB
DATE:	06/07/2003
SCALE:	AS SHOWN
PROJECT No.:	0201–1200045
ACAD FILENAME:	1200045 Fig. 2.dwg

SOURCES OF INFORMATION

1. DIGITAL COPY OF 1:50,000 TOPOGRAPHIC MAP SUPPLIED BY SRK CONSULTING.
2. MAP COORDINATES ARE UTM NAD83 ZONE 8; CONTOUR INTERVAL 100 FT.
3. FARO MINE DETAILS ADAPTED FROM DRAWINGS BY ROBERTSON GEOCONSULTANTS INC.
4. BASE DRAWING PROVIDED BY GARTNER LEE LTD.

TITLE

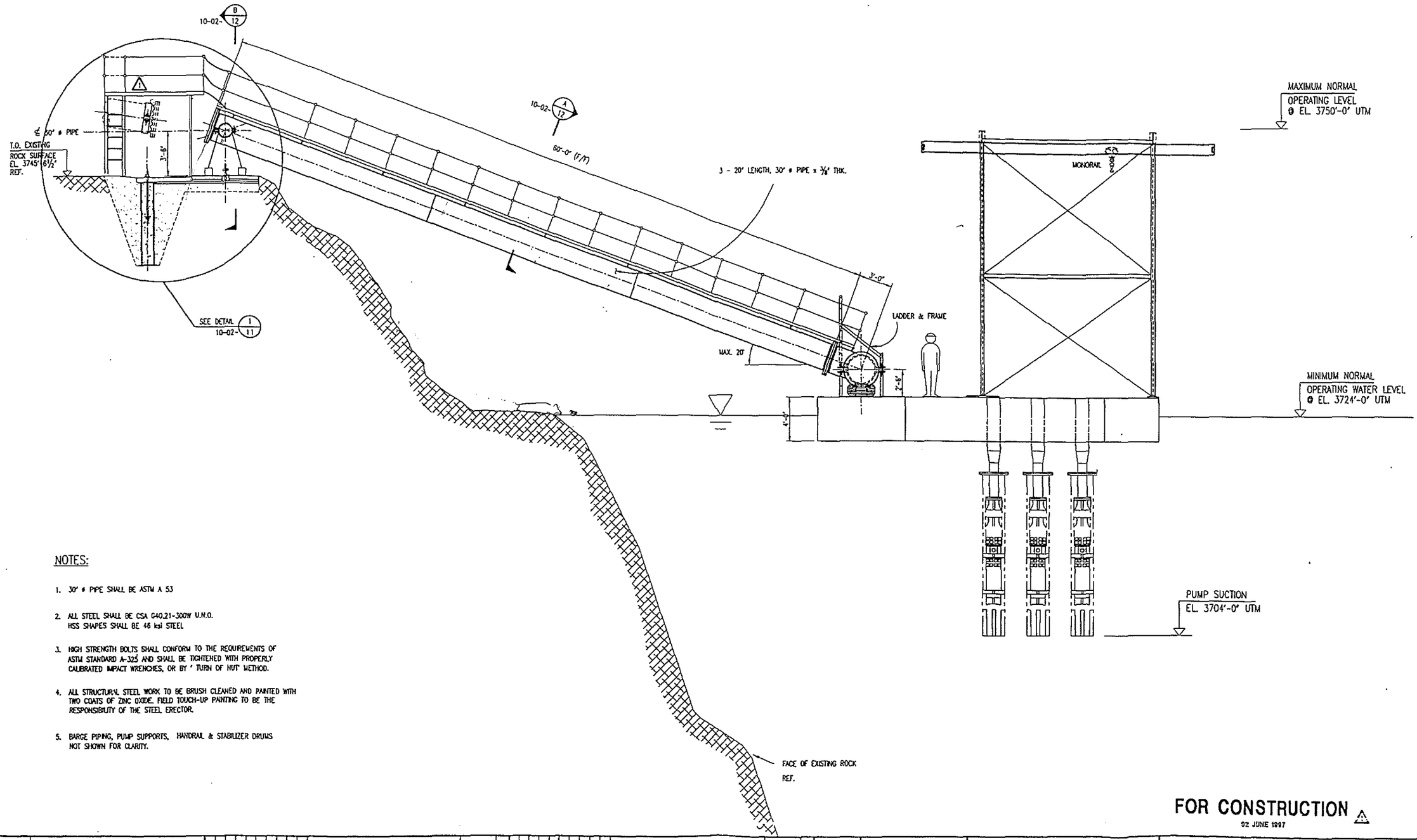
FARO MINE SITE OVERVIEW

Gartner Lee

Deloitte & Touche

REVISION ISSUE 0

DRAWING No. F–2



NOTES:

1. 30" ø PIPE SHALL BE ASTM A 53
2. ALL STEEL SHALL BE CSA G40.21-300W U.N.O. HSS SHAPES SHALL BE 46 ksi STEEL
3. HIGH STRENGTH BOLTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM STANDARD A-325 AND SHALL BE TIGHTENED WITH PROPERLY CALIBRATED IMPACT WRENCHES, OR BY ' TURN OF NUT' METHOD.
4. ALL STRUCTURAL STEEL WORK TO BE BRUSH CLEANED AND PAINTED WITH TWO COATS OF ZINC OXIDE. FIELD TOUCH-UP PAINTING TO BE THE RESPONSIBILITY OF THE STEEL ERECTOR.
5. BARGE PIPING, PUMP SUPPORTS, HANDRAIL & STABILIZER DRUMS NOT SHOWN FOR CLARITY.

FOR CONSTRUCTION ⚠
02 JUNE 1997

No.	DESCRIPTION	DATE	BY
1	GENERAL REVISION	02JUN97	SMA
0	ISSUED FOR CONSTRUCTION	21MAY97	SMA
B	REVISED FOR REVIEW	29APR97	SMA
A	ISSUED FOR REVIEW	17APR97	MB

DWG. No. | REFERENCE DRAWINGS | CLIC. MOTR. P.P. MECH. STRUCT. CIVIL SERV. PROCESS P.E.M.

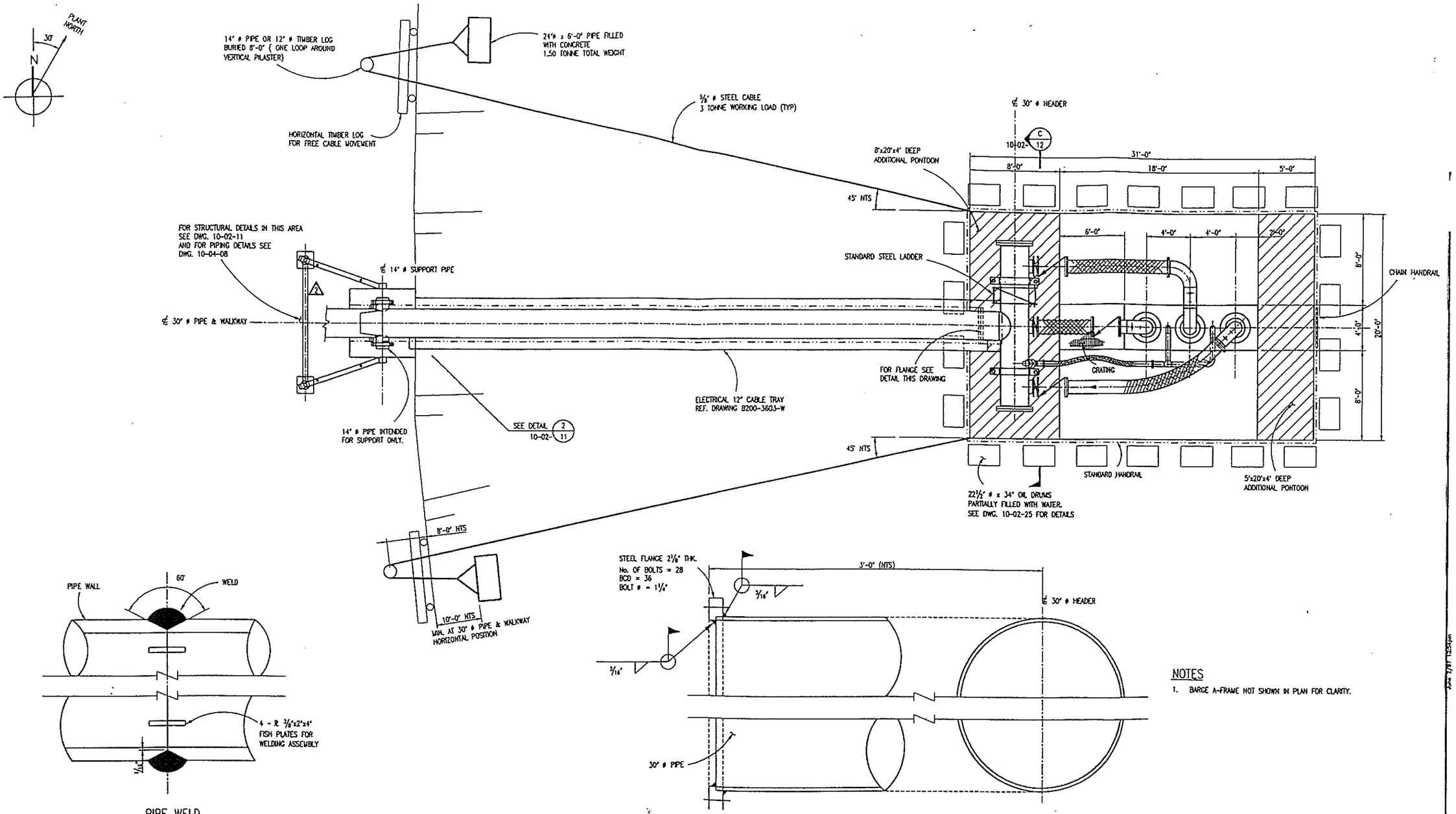
SECTION:	STRUCTURAL
SCALE:	1/4" = 1'-0"
DESIGNED BY:	AB
DRAWN BY:	PY/SMA
CHECKED BY:	
APPROVED BY:	
DATE:	OCT 96 / OCT 96 / MAY 97

PROTON INTERNATIONAL ENGINEERING CORP.
Burnaby, British Columbia

CLIENT: ANVIL RANGE MINING CORPORATION
PROJECT: PIT WATER RECLAIM
PROJECT LOCATION: FARO, YUKON

TITLE
FARO PIT WATER RECLAIM
GENERAL LAYOUT
ELEVATION
SHEET 1 OF 2

PROJECT No. 1330
DRAWING No. 10-02-00
REV. 1



PIPE WELD
SECTION THROUGH 30" ø PIPE
NTS

BOTTOM FLANGE DETAIL
CONNECTION TO 30" ø PIPE
NTS

NOTES

1. BARGE A-FRAME NOT SHOWN IN PLAN FOR CLARITY.

FOR CONSTRUCTION 2
02 JUNE 1997

No	DESCRIPTION	DATE	BY
2	GENERAL REVISION	02 JUNE 19	SMA
1	REVISED FOR CONSTRUCTION	21MAY97	SMA
0	ISSUED FOR CONSTRUCTION	21MAY97	SMA
C	ISSUED FOR INFORMATION	05MAY97	SMA
B	REVISED FOR REVIEW	29APR97	SMA
A	ISSUED FOR REVIEW	17APR97	MB

REVISIONS/ISSUES

DWG. No. REFERENCE DRAWINGS

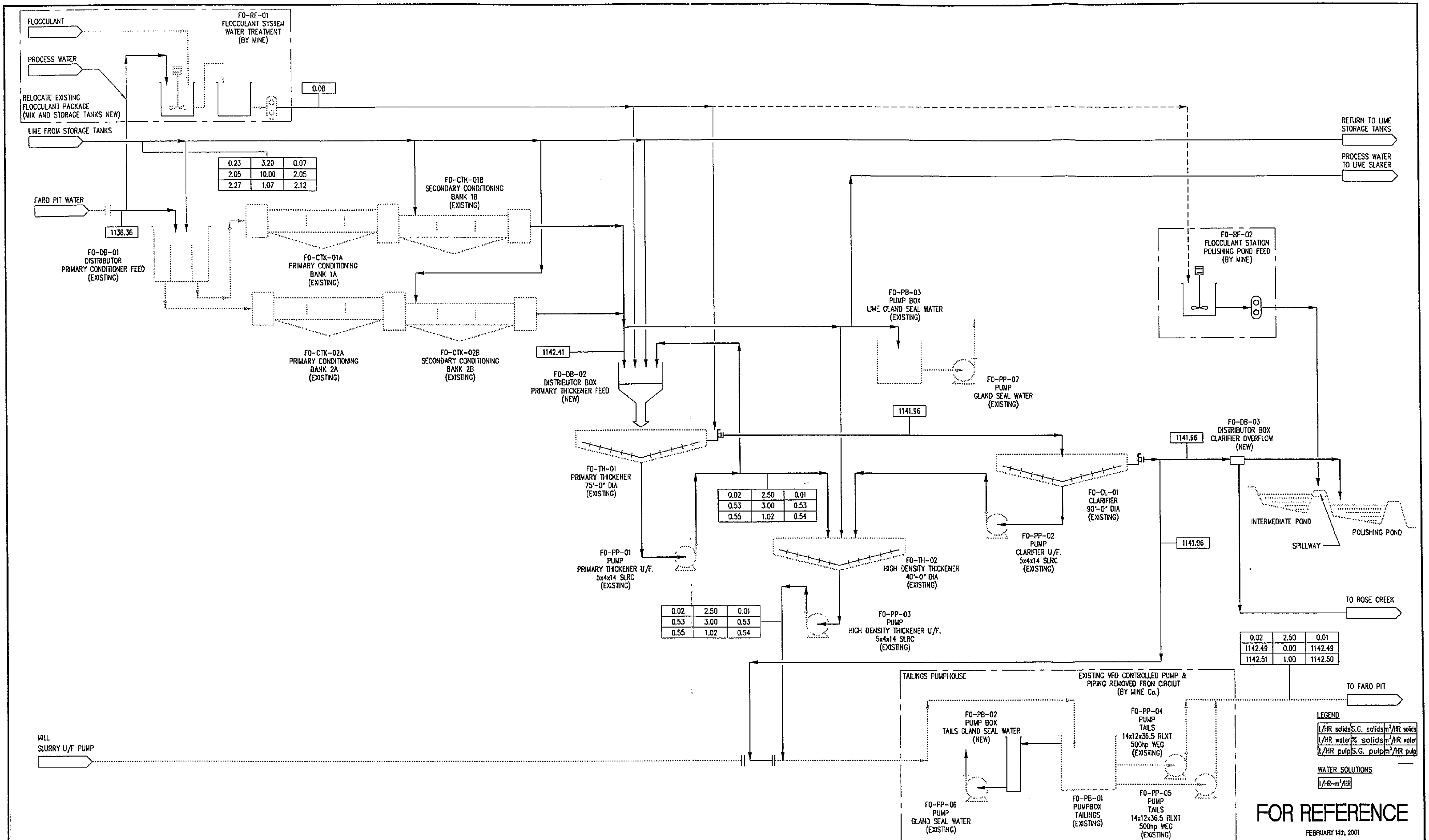
SECTION: STRUCTURAL
SCALE: 1/4"=1'-0" DATE:
DESIGNED BY: AB OCT 96
DRAWN BY: PY/SMA OCT 96
CHECKED BY: AB May 97
APPROVED BY:

PROTON INTERNATIONAL ENGINEERING CORP.
Burnaby, British Columbia

CLIENT: ANVIL RANGE MINING CORPORATION
PROJECT: PIT WATER RECLAIM
PROJECT LOCATION: FARO, YUKON

TITLE
FARO PIT WATER RECLAIM
GENERAL LAYOUT
PLAN & DETAILS
SHEET 2 OF 2

PROJECT No. 1330
DRAWING No. 10-02-01
REV. 2



FOR REFERENCE

FEBRUARY 14th, 2001

THIS DRAWING HAS NOT BEEN PUBLISHED BUT RATHER HAS BEEN PREPARED BY HATCH FOR USE BY THE CLIENT NAMED IN THE TITLE BLOCK SOLELY IN RESPECT OF THE CONSTRUCTION, OPERATION AND MAINTENANCE OF THE FACILITY NAMED IN THE TITLE BLOCK AND SHALL NOT BE USED FOR ANY OTHER PURPOSE OR FURNISHED TO ANY OTHER PARTY WITHOUT THE EXPRESS CONSENT OF HATCH.

DWG. NO.	REFERENCE DRAWINGS

NO	DESCRIPTION	BY	DATE
0	ISSUED FOR REFERENCE	EM	01/02/14
B	ISSUED FOR APPROVAL	JB	01/01/26
A	ISSUED FOR APPROVAL	EM	01/01/11

ISSUE/REVISIONS

SECTION:	GENERAL	
SCALE:	NONE	DATE
DESIGN. BY	EM	JAN.01
DRAWN BY:	JB	JAN.01
CHECK. BY	[signature]	Feb01
APP. BY:	[signature]	Feb01

DELOITTE AND TOUCHE

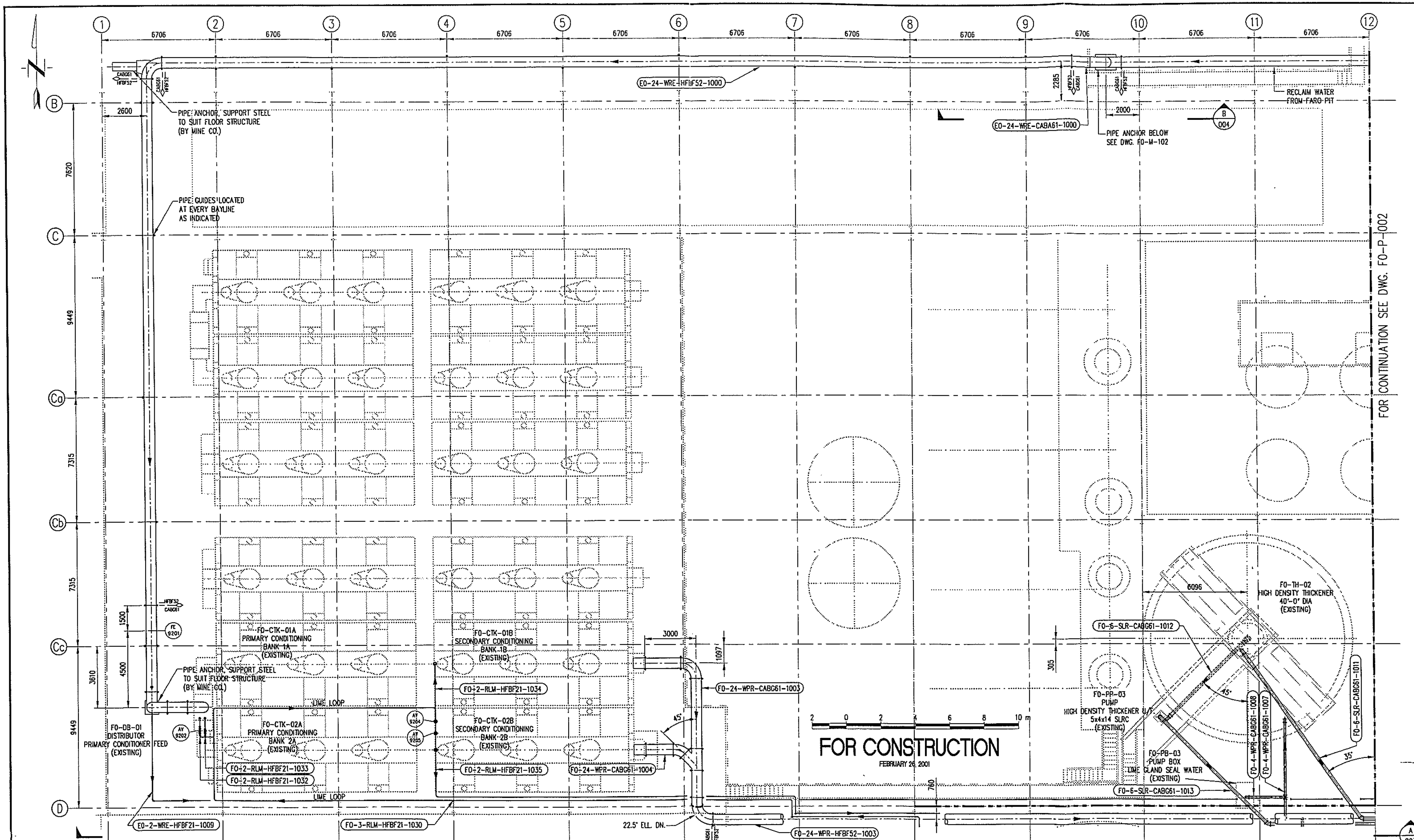
FARO MILL CONVERSION

HATCH

TITLE: WATER TREATMENT PLANT

GENERAL
WATER TREATMENT
FLOW SHEET #1

FILENAME:	PROJECT NUMBER	DRAWING NUMBER	REV
A0F001.dwg	32773	A0-F-001	0



EO-24-WRE-HFBF52-1000
EO-24-WRE-CABA61-1000
PIPE ANCHOR, SUPPORT STEEL TO SUIT FLOOR STRUCTURE (BY MINE CO.)
RECLAIM WATER FROM FARO PIT
PIPE ANCHOR BELOW SEE DWG. FO-M-102
PIPE GUIDES LOCATED AT EVERY BAYLINE AS INDICATED
FOR CONTINUATION SEE DWG. FO-P-002
FO-CTK-01A PRIMARY CONDITIONING BANK 1A (EXISTING)
FO-CTK-01B SECONDARY CONDITIONING BANK 1B (EXISTING)
FO-CTK-02A PRIMARY CONDITIONING BANK 2A (EXISTING)
FO-CTK-02B SECONDARY CONDITIONING BANK 2B (EXISTING)
FO-DB-01 DISTRIBUTOR PRIMARY CONDITIONER FEED (EXISTING)
LIME LOOP
FO-2-RLM-HFBF21-1034
FO-2-RLM-HFBF21-1033
FO-2-RLM-HFBF21-1032
FO-2-RLM-HFBF21-1035
FO-24-WPR-CABG61-1004
FO-24-WPR-CABG61-1003
FO-24-WPR-HFBF52-1003
EO-2-WRE-HFBF21-1009
FO-3-RLM-HFBF21-1030
22.5° ELL. DN.
FO-TH-02 HIGH DENSITY THICKENER 40'-0" DIA (EXISTING)
FO-6-SLR-CABG61-1012
FO-6-SLR-CABG61-1013
FO-6-SLR-CABG61-1011
FO-4-WPR-CABG61-1008
FO-4-WPR-CABG61-1007
FO-PP-03 PUMP HIGH DENSITY THICKENER U/F 5x4x14 SLRC (EXISTING)
FO-PB-03 PUMP BOX LIME GLAND SEAL WATER (EXISTING)
FOR CONSTRUCTION
FEBRUARY 26, 2001

THIS DRAWING HAS NOT BEEN PUBLISHED BUT RATHER HAS BEEN PREPARED BY HATCH FOR USE BY THE CLIENT NAMED IN THE TITLE BLOCK SOLELY IN RESPECT OF THE CONSTRUCTION, OPERATION AND MAINTENANCE OF THE FACILITY NAMED IN THE TITLE BLOCK AND SHALL NOT BE USED FOR ANY OTHER PURPOSE OR FURNISHED TO ANY OTHER PARTY WITHOUT THE EXPRESS CONSENT OF HATCH.

REFERENCE DRAWINGS

DWG. NO.	
AO-P-002	WATER TREATMENT P&ID

ISSUE/REVISIONS

NO	DESCRIPTION	BY	DATE
0	ISSUED FOR CONSTRUCTION	EM	01/02/26
A	ISSUED FOR APPROVAL	EM	01/02/23

		DATE
SECTION:	PIPING	
SCALE:	1:100	
DESIGN. BY	EM	FEB. 01
DRAWN BY:	HHT	FEB. 01
CHECK.		
APP. BY:		FEB 01

DELOITTE AND TOUCHE

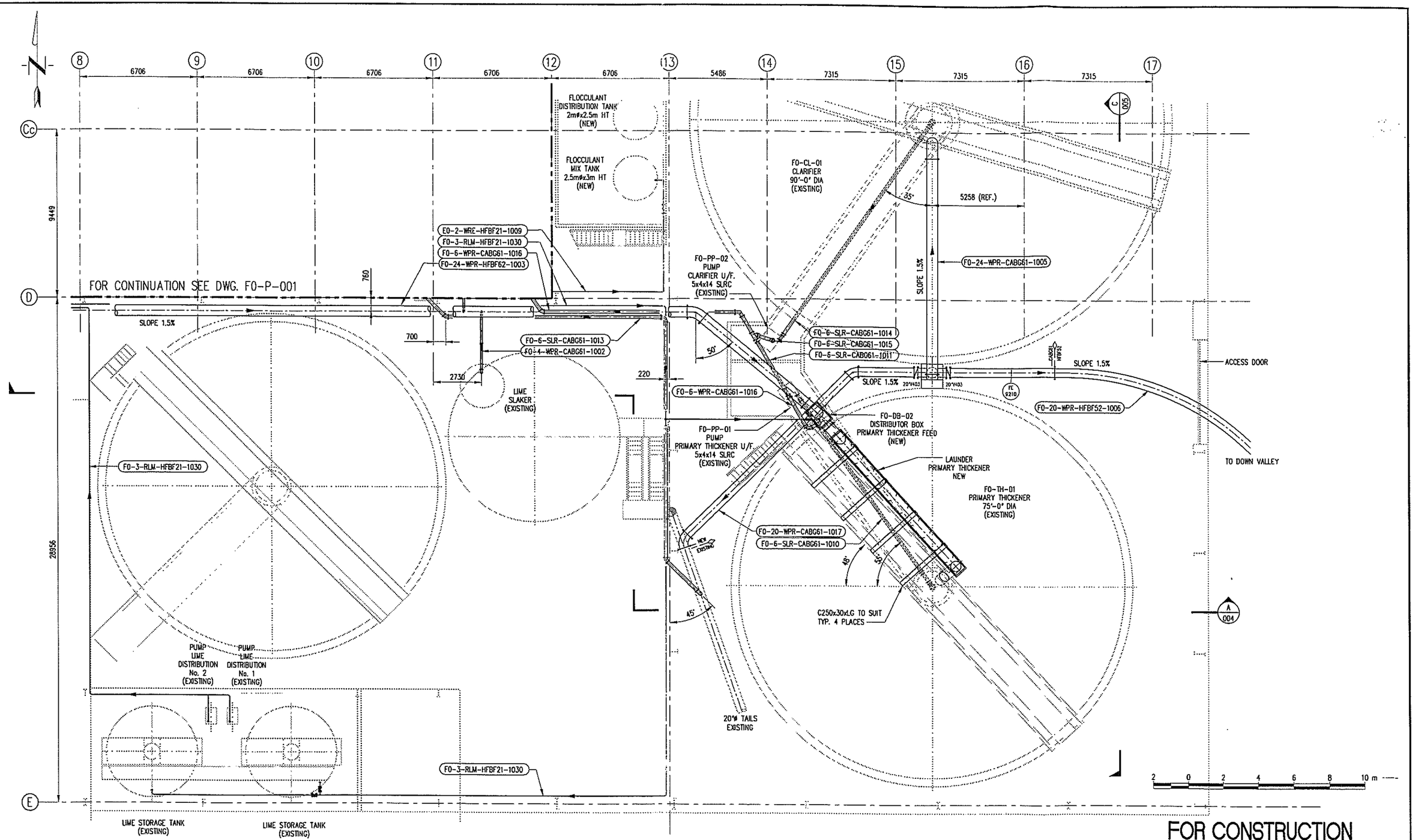
FARO MILL CONVERSION

HATCH

TITLE WATER TREATMENT PLANT

MILL BUILDING
PIPING ARRANGEMENT
PLAN SHEET 1

FILENAME:	PROJECT NUMBER	DRAWING NUMBER	REV.
FOP001.DWG	32773	FO-P-001	0



FOR CONSTRUCTION

FEBRUARY 26, 2001

2001/02/27 13:56

32773D_DWG

DWG. NO.	REFERENCE DRAWINGS
FO-P-001	PIPING ARRANGEMENT SHEET 1

NO	DESCRIPTION	BY	DATE
	ISSUE/REVISIONS		

NO	DESCRIPTION	BY	DATE
0	ISSUED FOR CONSTRUCTION	EM	01/02/26
A	ISSUED FOR APPROVAL	EM	01/02/23
	ISSUE/REVISIONS		

SECTION:	PIPING	
SCALE:	1:100	DATE
DESIGN. BY	EM	FEB. 01
DRAWN BY:	HHT	FEB. 01
CHECK.		
APP. BY:		

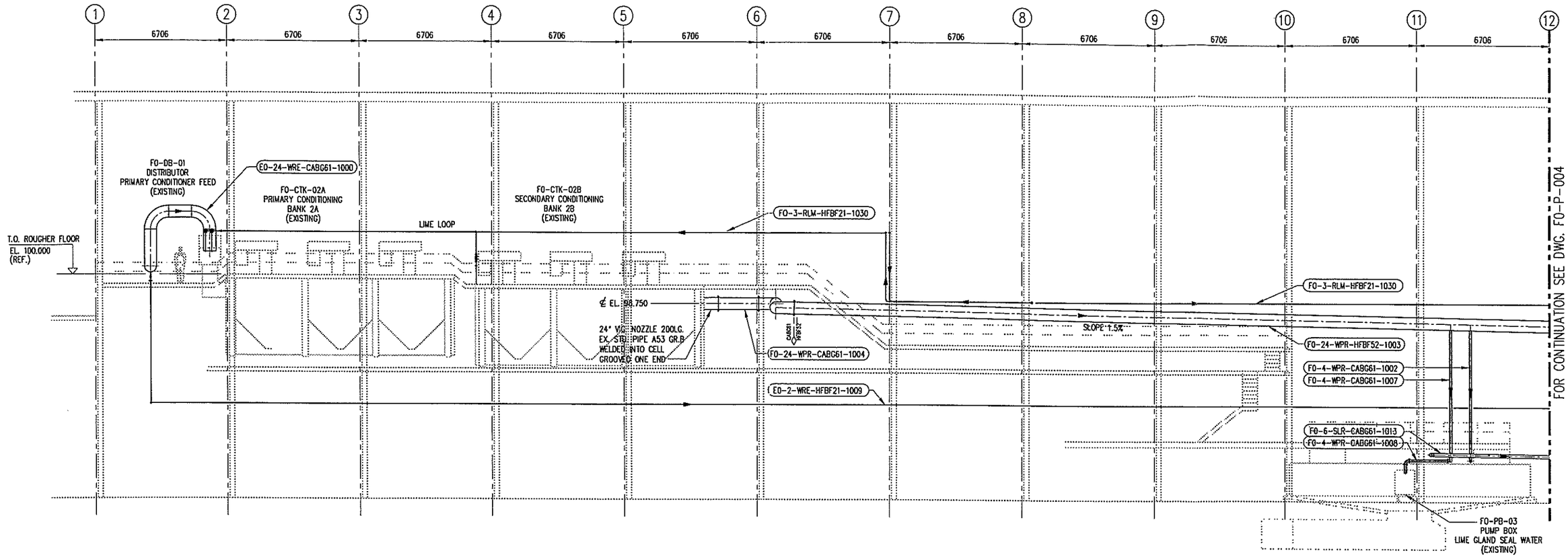
DELOITTE AND TOUCHE

FARO MILL CONVERSION

HATCH

TITLE: WATER TREATMENT PLANT
MILL BUILDING
PIPING ARRANGEMENT
PLAN SHEET 2

FILENAME:	PROJECT NUMBER	DRAWING NUMBER	REV.
FOP002.DWG	32773	FO-P-002	0



SECTION A/001

2 0 2 4 6 8 10 m

FOR CONSTRUCTION

FEBRUARY 26, 2001

FO-P-001	PIPING ARRANGEMENT SHEET 1
DWG. NO.	REFERENCE DRAWINGS

NO	DESCRIPTION	BY	DATE
	ISSUE/REVISIONS		

NO	DESCRIPTION	BY	DATE
0	ISSUED FOR CONSTRUCTION	EM	01/02/26
A	ISSUED FOR APPROVAL	EM	01/02/23
	ISSUE/REVISIONS		

SECTION:	PIPING	
SCALE:	1:100	DATE
DESIGN. BY	EM	FEB. 01
DRAWN BY:	HHT	FEB. 01
CHECK.		
APP. BY:		

DELOITTE AND TOUCHE

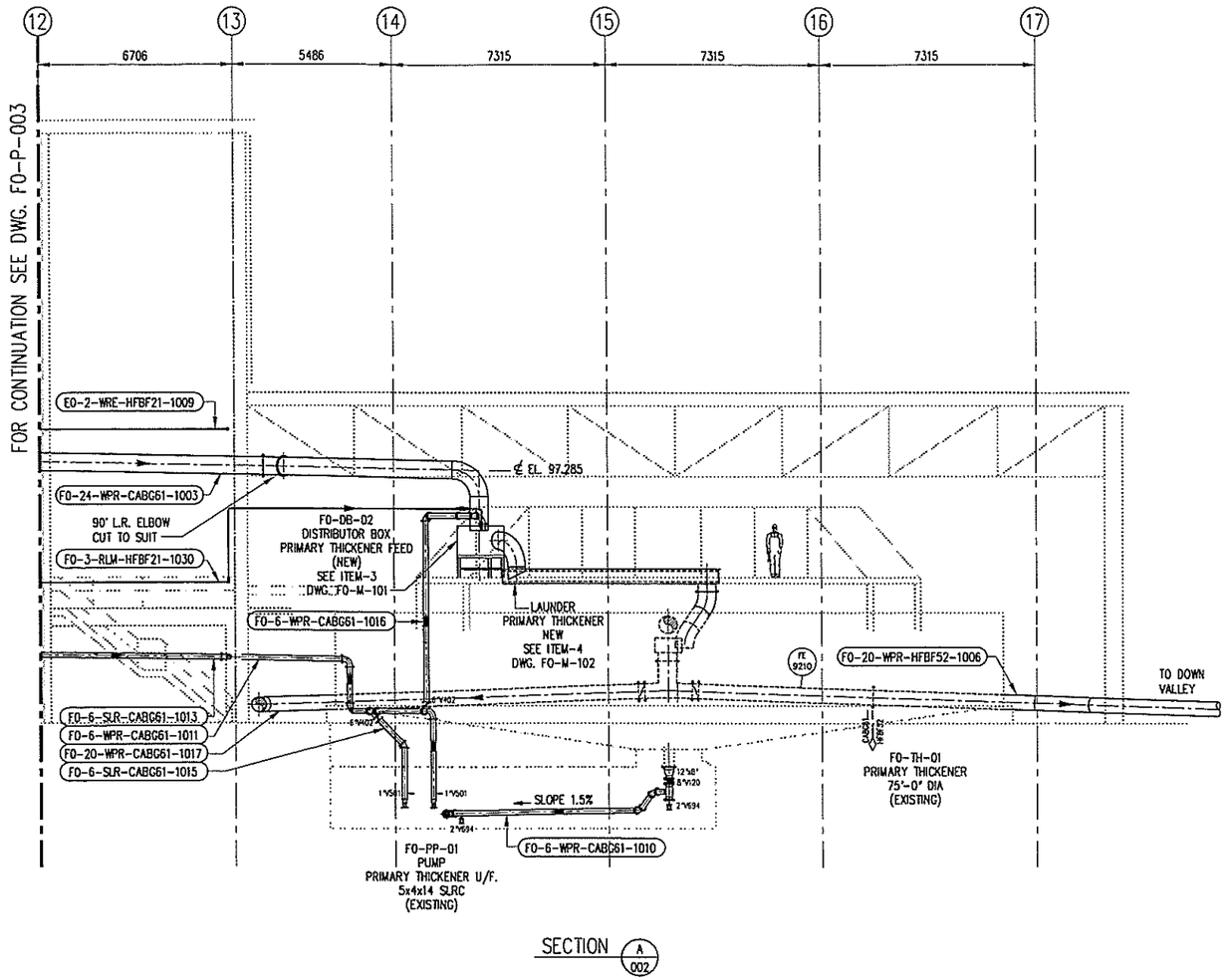
FARO MILL CONVERSION

HATCH

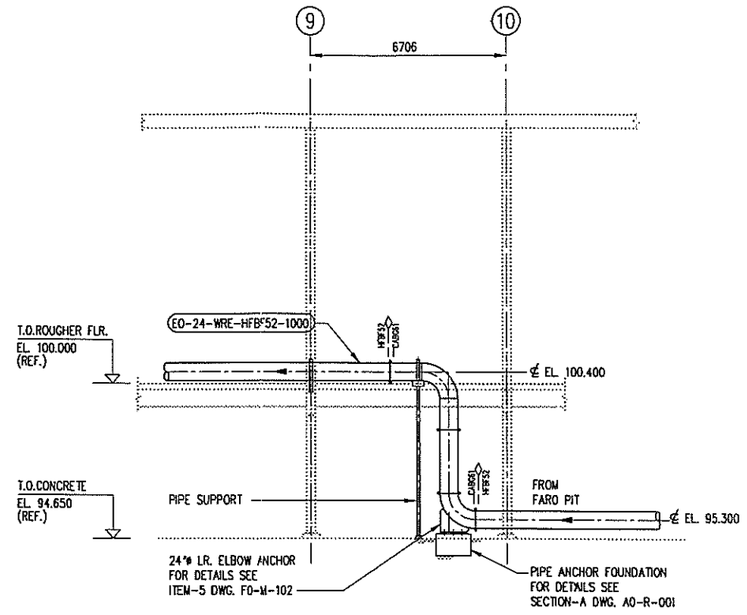
TITLE: WATER TREATMENT PLANT
MILL BUILDING
PIPING ARRANGEMENT
SECTION-A

FILENAME:	PROJECT NUMBER	DRAWING NUMBER	REV.
F0P003.DWG	32773	FO-P-003	0

32773EN_DWG 2001/02/27
REVISED AS



SECTION A 002



SECTION B 001

FOR CONSTRUCTION

FEBRUARY 26, 2001

2001/02/27 13:

DWG. NO.	REFERENCE DRAWINGS
FO-P-001	PIPING ARRANGEMENT SHEET 1

PROJECT | PROCESS | CIVIL | MECH. | STRUCT. | PIPING | SERVICES | ELECT. | INSTR.

NO	DESCRIPTION	BY	DATE
	ISSUE/REVISIONS		
0	ISSUED FOR CONSTRUCTION	EM	01/02/26
A	ISSUED FOR APPROVAL	EM	01/02/23

SECTION:	PIPING	
SCALE:	1:100	DATE
DESIGN. BY	EM	FEB. 01
DRAWN BY:	HHT	FEB. 01
CHECK. BY	EM	FEB 01
APP. BY:	WWW	FEB 01

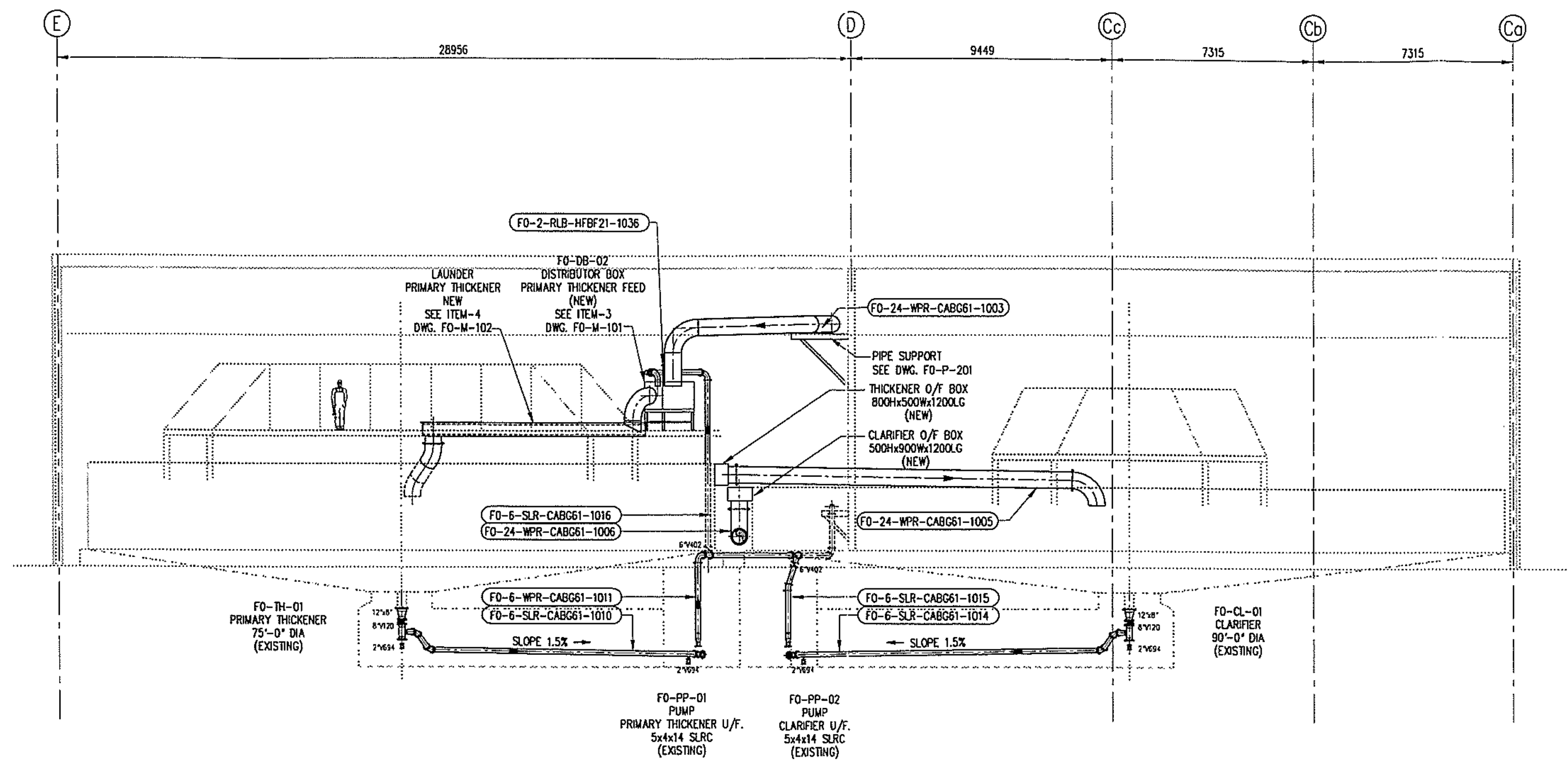
DELOITTE AND TOUCHE

FARO MILL CONVERSION

HATCH

TITLE: WATER TREATMENT PLANT
MILL BUILDING
PIPING ARRANGEMENT
SECTION-A & B

FILENAME:	PROJECT NUMBER	DRAWING NUMBER	REV.
FOP004.DWG	32773	FO-P-004	0



SECTION C/002

2 0 2 4 6 8 10 m

FOR CONSTRUCTION
FEBRUARY 26th, 2001

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DWG. NO.	REFERENCE DRAWINGS
FO-P-001	PIPING ARRANGEMENT SHEET 1

NO	DESCRIPTION	BY	DATE
0	ISSUED FOR CONSTRUCTION	EM	01/02/26
A	ISSUED FOR APPROVAL	EM	01/02/23

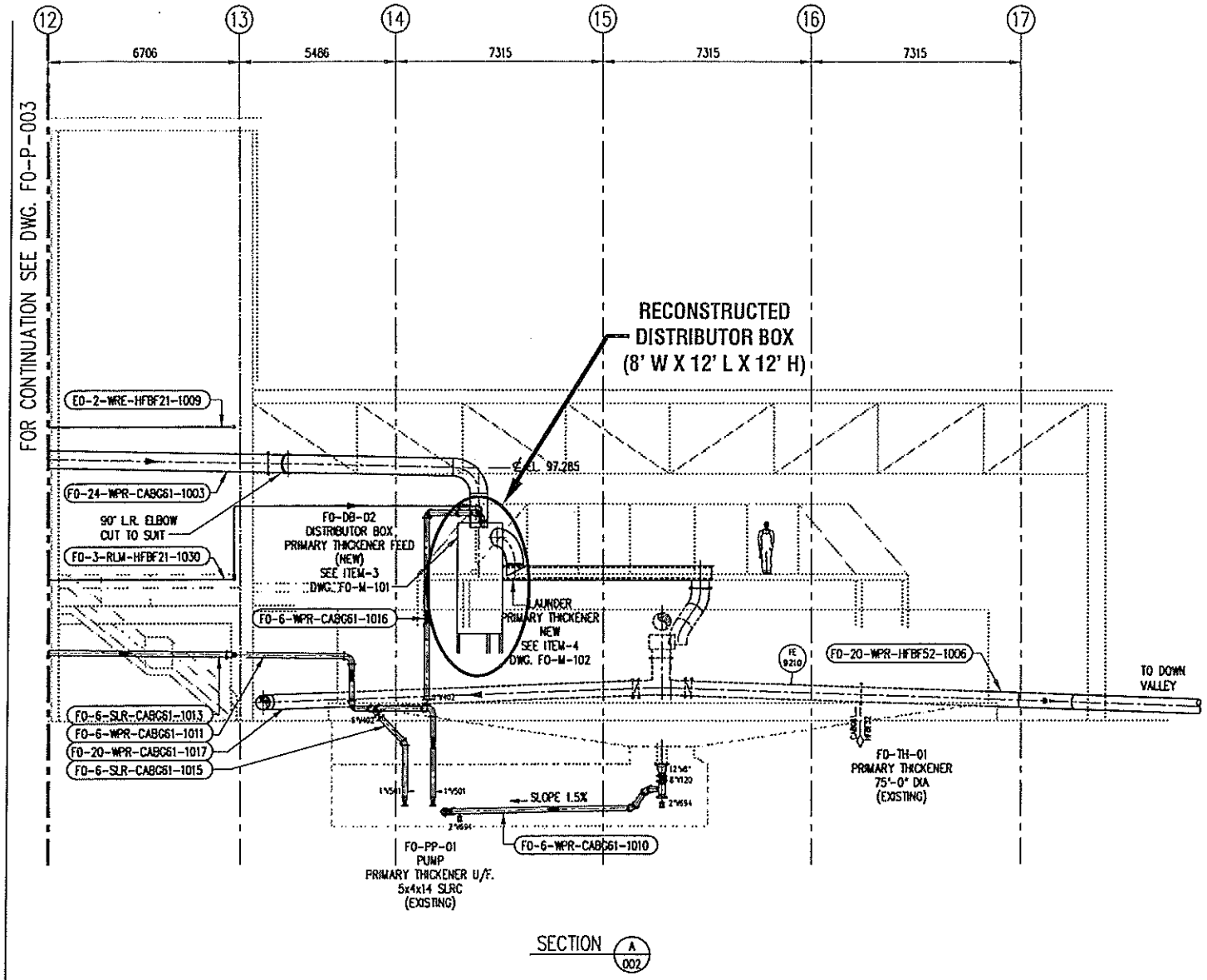
SECTION:	PIPING	
SCALE:	1:100	DATE
DESIGN. BY	EM	FEB. 01
DRAWN BY:	HHT	FEB. 01
CHECK. BY	[signature]	[signature]
APP. BY:	[signature]	FEB 01

DELOITTE AND TOUCHE
FARO MILL CONVERSION
HATCH

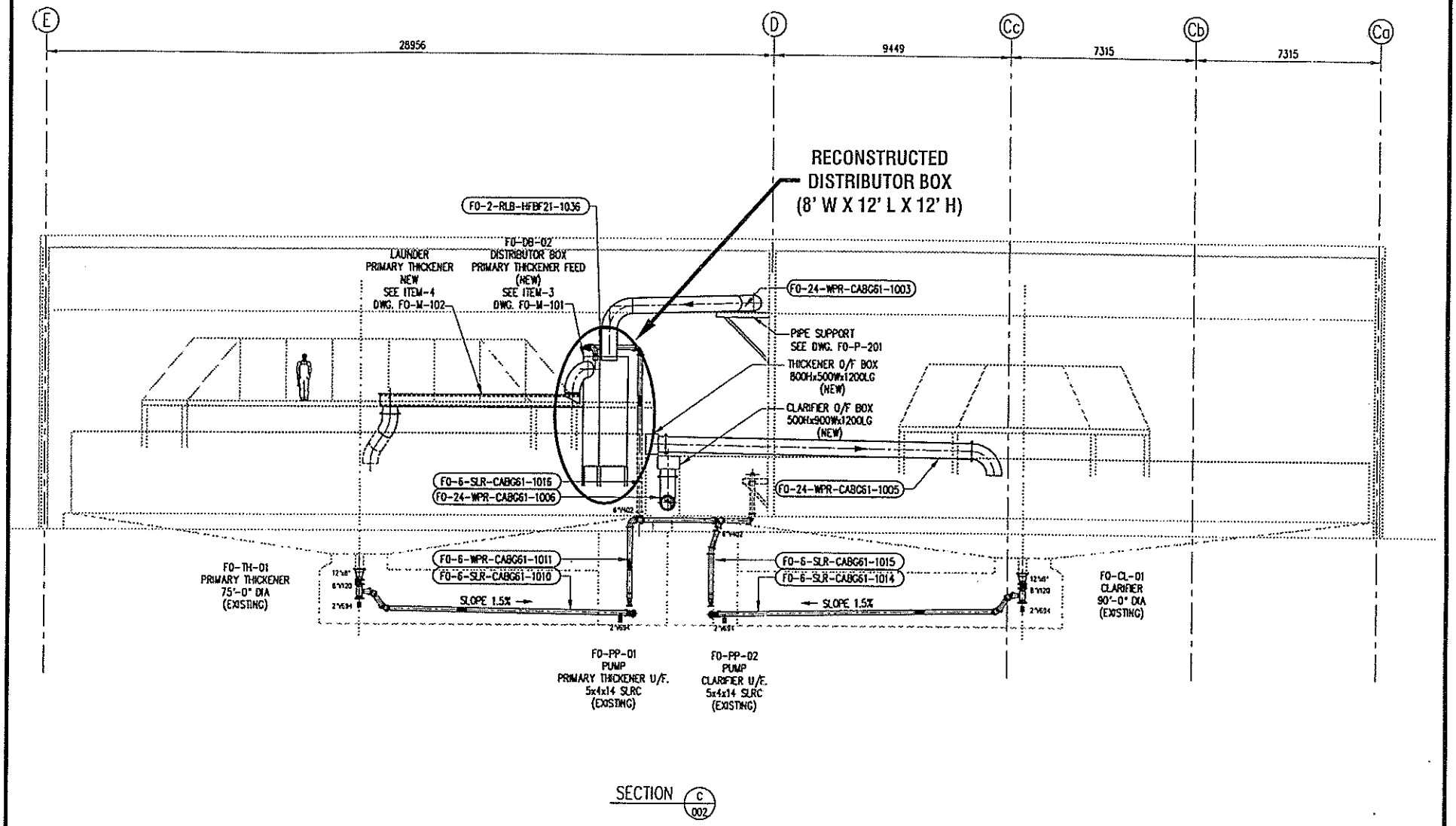
TITLE WATER TREATMENT PLANT
MILL BUILDING
PIPING ARRANGEMENT
SECTION-C

FILENAME:	PROJECT NUMBER	DRAWING NUMBER	REV.
FOP005.DWG	32773	FO-P-005	0

32773STD-_DWG 2001/02/27 14.



EBA Engineering Consultants Ltd.		PROJECT:	WATER TREATMENT FACILITIES UPDATE ANVIL RANGE MINE, FARO, YUKON
CLIENT:	ANVIL RANGE MINE CORPORATION (INTERIM RECEIVER)	TITLE:	MILL BUILDING PIPING ARRANGEMENT SECTION A
DATE: JUNE 2003	DWN: CPC	CHKD: JRT	FILE NO.: 0201-1200045 / DWNG: FIGURE P-004A / REVISION:



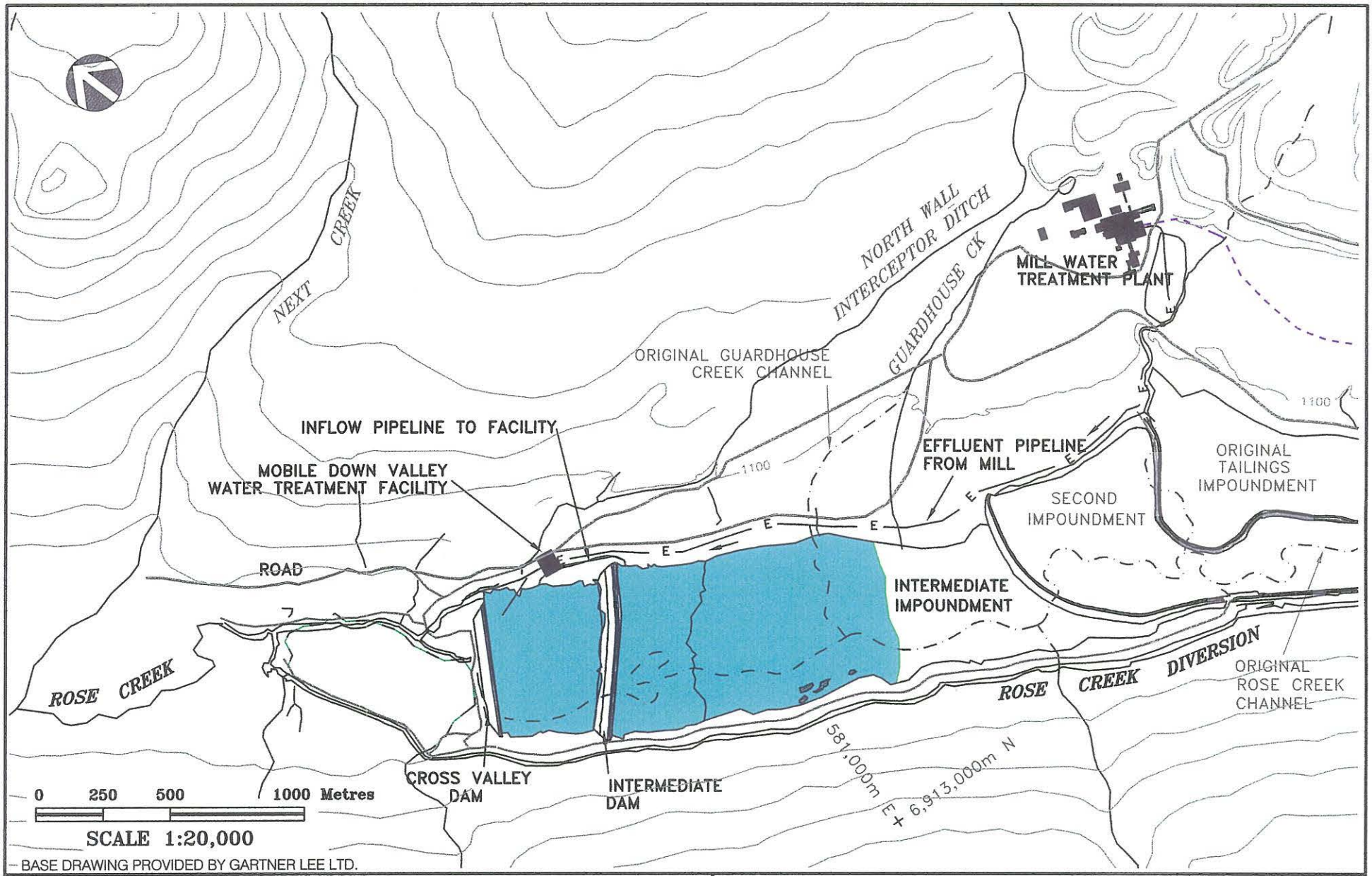
SECTION C 002

EBA Engineering Consultants Ltd.				PROJECT:	WATER TREATMENT FACILITIES UPDATE ANVIL RANGE MINE, FARO, YUKON		
CLIENT:	ANVIL RANGE MINE CORPORATION (INTERIM RECEIVER)			TITLE:	MILL BUILDING PIPING ARRANGEMENT SECTION C		
DATE:	JUNE 2003	DWN: CPC	CHKD: JRT	FILE NO.:	0201-1200045	DWNG: FIGURE P-005A	REVISION:

APPENDIX C

APPENDIX C

MOBILE DOWN VALLEY WATER TREATMENT FACILITY



BASE DRAWING PROVIDED BY GARTNER LEE LTD.

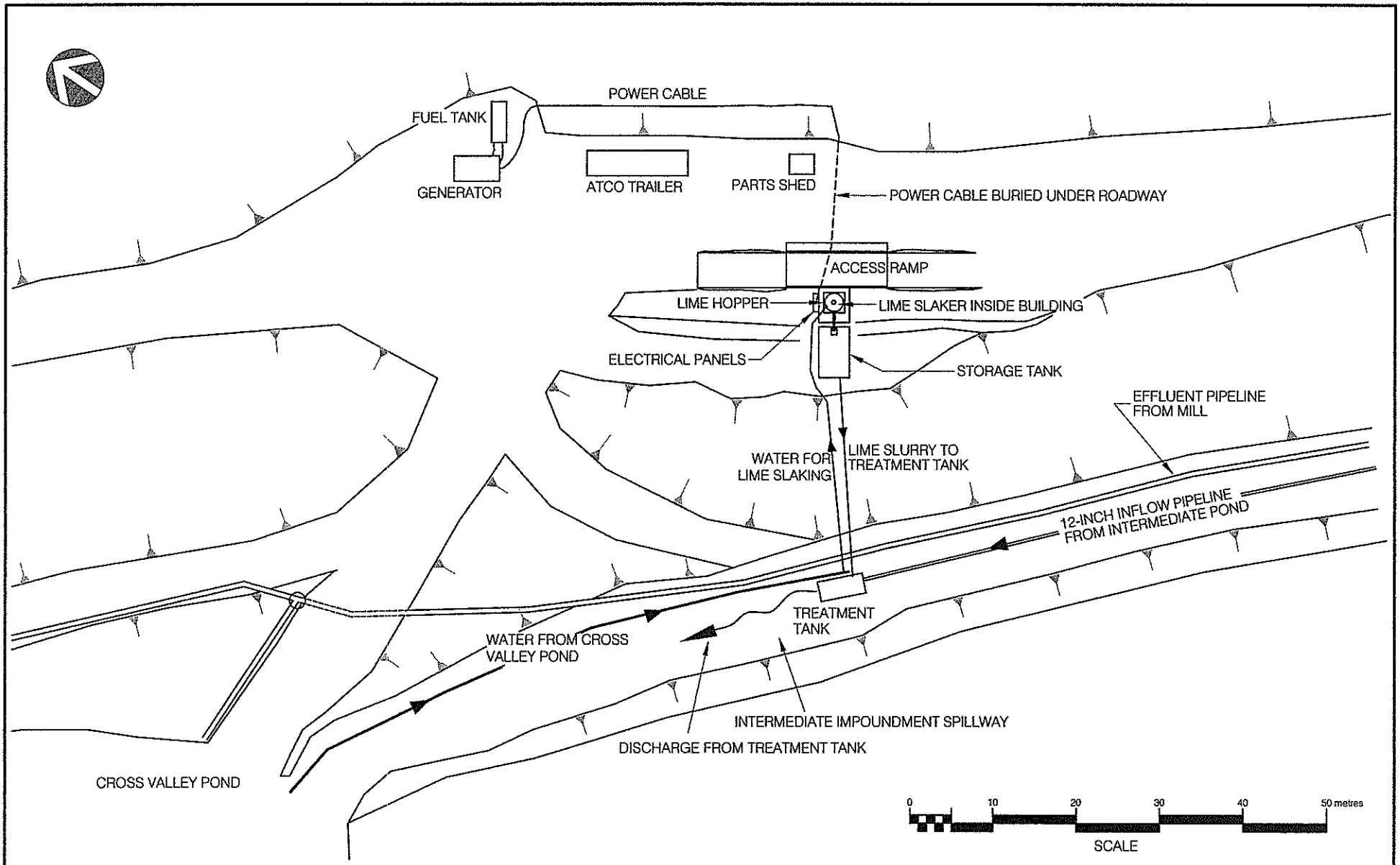
EBA Engineering Consultants Ltd.

PROJECT: EXISTING WATER TREATMENT FACILITIES
ANVIL RANGE MINE, FARO, YUKON

CLIENT: ANVIL RANGE MINE CORPORATION (INTERIM RECEIVERSHIP)

TITLE: MOBILE DOWN VALLEY WATER TREATMENT PLANT SITE OVERVIEW

DATE	DWN.	CHKD.	FILE NO.	DRWG.
JULY 2003	JSB	JPB/JRT	1200045	FIGURE 3



NOTE: CONTOUR TOPOGRAPHY ESTIMATED

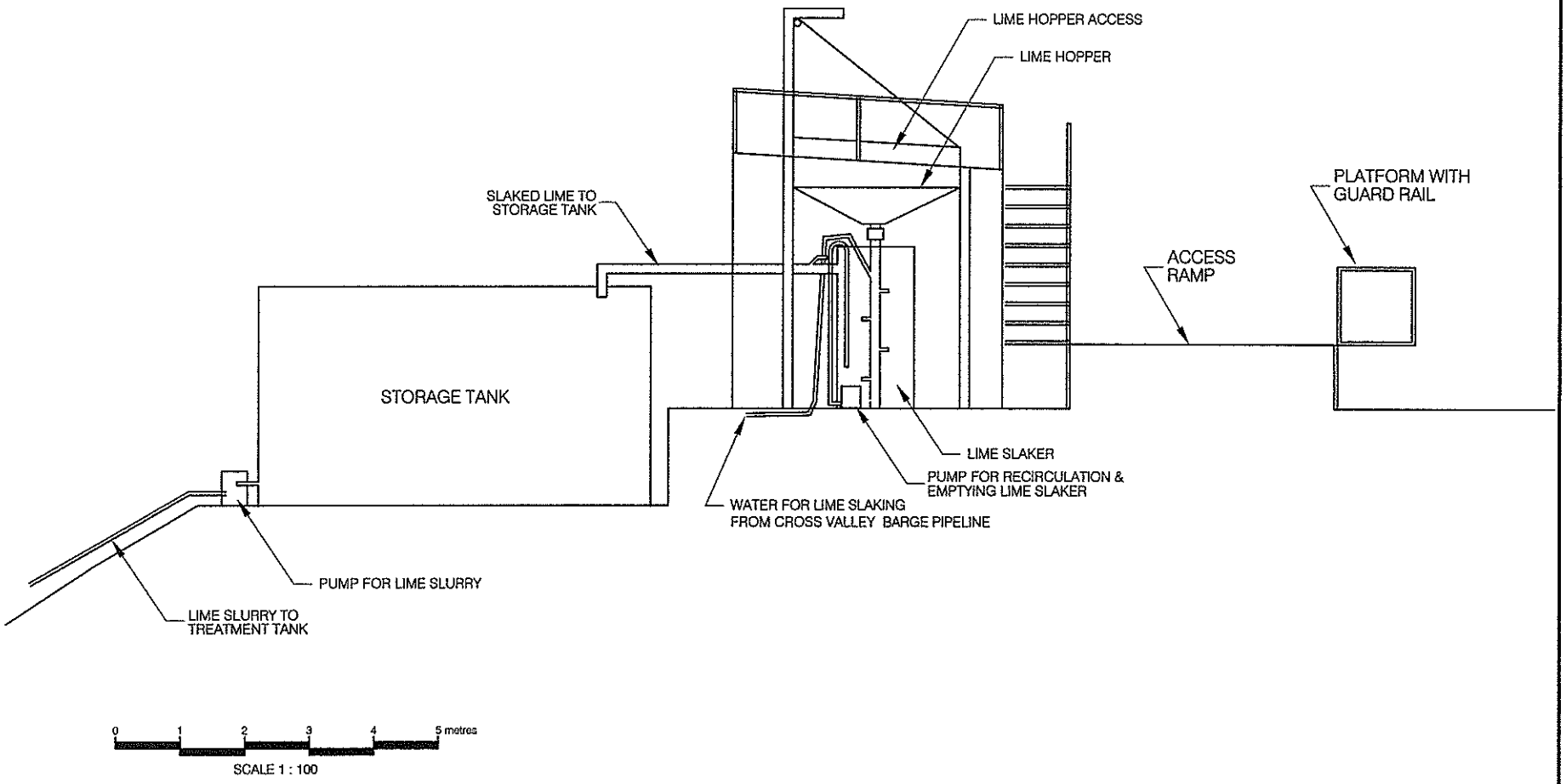
EBA Engineering Consultants Ltd.

PROJECT: EXISTING WATER TREATMENT FACILITIES
ANVIL RANGE MINE, FARO, YUKON

CLIENT: ANVIL RANGE MINE CORPORATION (INTERIM RECEIVERSHIP)

TITLE: MOBILE DOWN VALLEY WATER TREATMENT PLANT SITE PLAN

DATE	DWN.	CHKD.	FILE NO.	DRWG.
JULY 2003	JPB/JSB	JPB/JRT	1200045	FIGURE 4



EBA Engineering Consultants Ltd.

PROJECT: EXISTING WATER TREATMENT FACILITIES
ANVIL RANGE MINE, FARO, YUKON

CLIENT: ANVIL RANGE MINE CORPORATION (INTERIM RECEIVERSHIP)

TITLE: MOBILE DOWN VALLEY WATER TREATMENT PLANT PROFILE

DATE	DWN.	CHKD.	FILE NO.	DRWG.
JULY 2003	JPB/JSB	JPB/JRT	1200045	FIGURE 5

CROSS VALLEY POND

30 hp

BARGE FLYGT PUMP

CROSS VALLEY POND WATER PIPELINE

TREATED WATER OVERFLOW

TREATMENT TANK

INTERMEDIATE POND WATER

WATER SUPPLY LINE

LIME SLURRY MIXED CONTINUOUSLY IN STORAGE TANK WITH FLYGHT MIXER

STORAGE TANK FEED LINE

5 hp

LIME SLURRY RECIRCULATION

LIME STORAGE TANK

ACCESS USED TO PUMP DOWN LIME SLAKER (RECIRC. PUMP USED)

5 hp

LIME SLURRY RECIRCULATION PUMP

LIME ADDED TO HOPPER

CONTROL FOR HOPPER VIBRATOR

CONTROL FOR LIME INTAKE

LIME & WATER INTRODUCED IN CENTRE PIPE

LIME SLURRY DISCHARGED INTO SLAKER CONTAINER

LIME SLAKER

EBA Engineering Consultants Ltd.

REVIEWED BY:	JPB/JRT
DRAWN BY:	JSB
DATE:	06/07/2003
SCALE:	N.T.S.
PROJECT No.:	0201-1200045
ACAD FILENAME:	1200045 Fig. 6.dwg

SOURCES OF INFORMATION

TITLE

MOBILE DOWN VALLEY WATER TREATMENT PLANT FLOW SHEET

Gartner Lee

Deloitte & Touche

REVISION ISSUE 0

DRAWING No. F-6