STATE OF COLORADO

West - DNR, Lucas <lucas.west@state.co.us>

Climax TR-36 extension request

Ungers, Alex <aungers@fmi.com> Thu, Sep 21, 2023 at 1:16 PM
To: "West - DNR, Lucas" <lucas.west@state.co.us>, "Detmer, Eric" <edetmer@fmi.com>
Cc: "Yeldell - DNR, Amy" <amy.yeldell@state.co.us>, Dustin Czapla <dustin.czapla@state.co.us>

Lucas,

Here is the full TR-36 Adequacy Review Response, including the missing pages.

Thanks,

Alex Ungers

Sr. Environmental Scientist

Climax Mine

(720) 285-0985

From: West - DNR, Lucas <lucas.west@state.co.us>
Sent: Thursday, September 21, 2023 12:19 PM
To: Detmer, Eric <edetmer@fmi.com>
Cc: Yeldell - DNR, Amy <amy.yeldell@state.co.us>; Dustin Czapla <dustin.czapla@state.co.us>; Ungers, Alex <aungers@fmi.com>
Subject: Re: Climax TR-36 extension request

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TR-36 submittal 091323.pdf
12012K

Climax Molybdenum
A Freeport-McMoRan Company

Climax Mine
Highway 91 - Fremont Pass
Climax, CO 80429
Phone (719) 486-7718
Fax (719) 486-2251

September 13, 2023

Mr. Dustin Czapla, Environmental Protection Specialist
Colorado Division of Reclamation, Mining and Safety
1313 Sherman St., Rm. 215
Denver, CO 80203

Re: TR-36 Adequacy Review Response – Climax Mine Permit No. M-1977-493

Dear Mr. Czapla:

The purpose of this letter is to provide additional information requested in DRMS's August 3, 2023, TR-36 Adequacy Review. The Division's comments are in italics with Climax's response following.

1. *As indicated by Climax, the Environmental Protection Plan (EPP) will be inadequate and will need to be revised. Pursuant to Rule 7.2.8, a revised EPP shall be submitted in the form of a Technical Revision with the Required Revision Fee by December 15, 2023.*

   Climax commits to updating the EPP in the form of a Technical Revision and will contain the required information for an Environmental Protection Facility. The submittal will include the required fee and be submitted by December 15, 2023.

2. *In conjunction with the updated EPP to be submitted by December 15, 2023, please submit updated/revised Reclamation Plan and Maps as it pertains to this Environmental Protection Facility (EPF). As well as any other features that have been modified to ensure the Plan and Map(s) accurately reflect site conditions pursuant to C.R.S. 34-32-112(3).*

   Climax commits to submitting updated/revised Reclamation Plan and Maps in conjunction with the EPP update.

3. *The originally submitted narrative including the bullet point key project elements list does not provide enough detail to accurately characterize the scope, purpose, and function of the proposed EPF. Please provide a more detailed narrative, supported by additional and revised drawings, discussing all aspects of the proposed EPF, pursuant to Rule 6.4.21(7). Please also include directional flow arrows on all revised figures.*

   The attached narrative has been revised to include additional detail on the scope, purpose, and function of the proposed EPF. Revised drawings are also included with directional flow arrows where appropriate.

4. *Please state where the three spoil piles and one topsoil pile which need to be relocated will be placed. (Per drawing #6-807-00102 and #6-807-00106) What is the estimated volume of the three spoil piles needing to be removed?*

   The three spoil piles depicted on Drawing Nos. 6-807-00102 and 6-807-00106 are artifacts from when the topography was last flown and have been previously removed. The topsoil pile has also been relocated to adjacent to 5-Dam in preparation for spreading onto an un-reclaimed area of the dam face in 2024.

5. *What is the capacity of the Mayflower Secondary Seepage Collection Area (Sump) depicted in drawing 6-807-00109?*

   The cutoff wall crest elevation will be set at 10,364.5 feet above mean sea level (ft amsl). The sump detention storage capacity at this elevation is about 250,000 gallons (0.78 acre-feet). A target total pumping capacity of at least 250 gallons per minute (gpm) (or about 0.56 cubic feet per second [cfs]) will be employed through a two-pump installation:

   a. The first pump will have a capacity of at least 50 gpm and use a variable frequency drive (VFD) to manage baseflows and reduce stress on the pump. This pump is expected to be in near-continuous use.
   b. The second pump will have a capacity of at least 200 gpm. The pump will activate at elevation 10,359.5 ft amsl to intermittently manage heavy rainfall and periods of large snowmelt.
   c. The combined pumping capacity with both pumps running will be at over 250 gpm.

6. *Pursuant to Rule 6.4.12, commit to including all pertinent bonding information for this EPF in the 2024 cost update (due April 1, 2024). This includes but is not limited to building and foundation dimensions, material types, piping and dirt work associated with the removal of the 5 Dam Seepwater Collection Area, Secondary Containment System. Please also identify if any features previously accounted for (and how much) have been removed in support of this project.*

   Climax commits to include this EPF in bond calculations in the 2024 cost update, to be submitted prior to April 1, 2024.

7. *Provide a construction schedule per Rule 6.4.21(15). *This does not have to be identical to phased inspections*

   A detailed construction schedule is attached.

8. *Please identify the construction phases in which incremental (certifiable) inspections will be conducted pursuant to Rule 7.3.1(1). The minimum general inspection phases are listed under Rule 7.4.2(2).*

   The construction phases in which inspections shall be conducted are:
   - Cutoff trench and slope excavation at new concrete cutoff structure location
   - Placement of compacted structural backfill
   - Install reinforced concrete for the seepage cutoff structure
   - Wet well manhole excavation and gravel bedding under manhole
   - Compacted backfill around manhole
   - 18-inch diameter corrugated intake pipe excavation and backfill bedding from wet well to cutoff wall/pond
   - Wet well pump station floor slab (foundation gravel, concrete placement)
   - Wet well pump and piping install, leak test
   - 8-inch diameter HDPE discharge line from wet well to Clear Pond, excavation and backfill, leak test

9. *Quality Assurance and Quality Control (QA/QC)*
   a. Describe the QA/QC program to be employed while constructing this EPF, Rule 6.4.21(16) and Rule 7.3.1(4).
   b. Who will conduct the facility certification and phased inspection(s) (QA/QC)?

The facility certification and phased inspections (QA/QC) will be performed by W.W. Wheeler Engineers or their designee. In the specifications (see Drawing No. 6-807-00112) are the QA/QC requirements and standards; key verifications and inspections are summarized as follows:

Required Verification and Inspection of Soils:

- Verify materials below shallow foundations are adequate to achieve the design bearing capacity (periodic inspections)
- Verify excavations are extended to proper depth and have reached proper material (periodic inspections)
- Perform classification and testing of compacted fill materials (periodic inspections)
- Verify use of proper materials, densities, and lift thicknesses during placement and compaction of compacted fill (continuous inspections)
- Prior to placement of compacted fill, observe subgrade and verify that site has been prepared properly (periodic inspections)

Required Verification and Inspection of Concrete Construction

- Inspection of reinforcing steel and placement (periodic inspection)
- Inspection of reinforcing steel welding
- Inspection of anchors cast in concrete where allowable loads have been increased or where strength design is used (periodic inspection)
- Inspection of anchors post-installed in hardened concrete members (periodic inspection)
- Verifying use of required design mix (periodic inspection)
- At the time fresh concrete in sampled to fabricate specimens for strength tests, perform slump and air content tests, and determine the temperature of the concrete (continuous inspection)
- Inspection of concrete and shotcrete placement for proper application techniques (continuous inspection)
- Inspection of maintenance of specified curing temperature and techniques (periodic inspection)
- Verification of in-situ concrete strength prior to removal of shores and forms from beams and structural slabs (periodic inspection)
- Inspect formwork for shape, location, and dimensions of the concrete member being formed (periodic inspection)

10. *During the Division's meeting with Climax on August 2, 2023, Climax stated that the headwaters of Tenmile Creek start at their Outfall 001, not immediately adjacent to the 5 Dam Clear Water Pond Spillway. Please provide documentation that the headwaters of Tenmile Creek begin at Outfall 001.*

    In Regulation 33 (5 Code of Colorado Regulations [CCR] 1002-33), Tenmile Creek is described in the following places (note that "Parshall Flume" is synonymous with Outfall 001A):

    - Segment is described in Appx 33-1 (page 184 of current version): 13. Mainstem of Tenmile Creek from the Climax Parshall Flume (39.447556, -106.157003) to a point immediately above the confluence of West Tenmile Creek and all tributaries and wetlands from the source of Tenmile Creek to a point immediately above the confluence with West Tenmile Creek, except for the specific listing in Segment 15.
    - Section 33.11, page 26: Segmentation: The evidence in these proceedings on Ten Mile Creek have shown that Ten Mile Creek for all intents and purposes begins at Climax property boundary at a place designated as the "Parshall Flume". It is at this point that the natural flows that are intercepted by Climax in the Ten Mile Creek Basin are channeled together and form the source of Ten Mile Creek. Hence, the Commission believes Parshall Flume to be the source of the mainstem of Ten Mile Creek. Also, included in this segment are all tributaries to Ten Mile Creek including those natural tributaries intercepted by Climax.

- Section 33.16, page 35: Segmentation: The evidence in these proceedings on Ten Mile Creek have shown that Ten Mile Creek for all intents and purposes begins at Climax property boundary at a place designated as the "Parshall Flume". It is at this point that the natural flows that are intercepted by Climax in the Ten Mile Creek Basin are channelled together and form the source of Ten Mile Creek. Hence, the Commission believes Parshall Flume to be the source of the mainstem of Ten Mile Creek. Also, included in this segment are all tributaries to Ten Mile Creek including those natural tributaries intercepted by Climax.

11. *The drawings depict a collection pond/channel however no design specifications or volumetrics have been provided. Please sufficiently describe the new collection pond that will be constructed in conjunction with the 5 Dam Seepage Collection System. This information should include more details regarding the average and maximum containment volume and emergency spillway of the collection pond.*

    Additional details on the hydrologic analysis have been added to the narrative, including the below details.

    In accordance with FMI guidelines, the pumping system design criteria is to contain/convey the runoff from 100-year Average Recurrent Interval (ARI) storms. The hydrologic analysis was conducted to evaluate the runoff volume from the basin and determine a corresponding pumping rate and detention storage capacity to contain the 100-year flows. Basin hydrology was evaluated using two different 100-year storm models: the 2-hour and 6-hour, 100-year storm events. The following resulted from the basin hydrologic modeling (and conservatively assumed using a 6-inch diameter outlet pipe from the basin to the wet well, draining the basin during the storm event):

Storm	Peak Inflow (cfs)	Direct Runoff Volume (acre-feet)	Containment * Pool Peak WSEL (ft)	Time to Peak Inflow/Discharge* (HH:MM)
100-yr ARI, 2-hr LS	7.49	0.39	10361.6	00:26
100-yr ARI, 6-hr MEC	6.58	0.44	10361.4	01:01

    The table shows that the governing storm for this design is the 100-year ARI, 2-hour Local Storm, as it results in a higher peak water surface elevation in the Containment Pool. While the 100-year ARI, 6-hour MEC Storm has a higher total storm volume, the average discharge over the storm is much lower than the 2-hour storm and is not as limiting when routing flow out of the Containment Pool. A 40-foot-long conduit will route water from the Containment Pool to the wet well. This conduit must convey flow while neither limiting the flow rate into the wet well, nor overtopping the cutoff wall. The analysis shows that 6-inch diameter and larger conduits can meet both objectives at cutoff wall crest elevation of 10364.5. Wheeler recommends an 18-inch conduit due to concerns with clogging at the inlet and scale buildup in the pipeline.

12. *In addition to the volumetric demonstration of the capacity of the collection pond, please include in the narrative any information regarding necessary improvements to the drainage way such as vegetation clearing, concrete or liner installation. If no improvements are proposed please clarify that.*

    No changes to the contributing channel geometry or invert are planned, except for the areas immediately adjacent and under where the cutoff wall is planned. An explanation is included in the revised narrative.

13. *In the Division's August 2, 2023 meeting it was described that the proposed 24" corrugated HDPE culvert on the south side of the collection channel and pond is no longer necessary. Please revise all applicable drawings removing that feature from the design. Please also explain how the modification better manages stormwater within the updated narrative.*

Please see Drawing No. 6-807-00107, which depicts the three 24-inch diameter corrugated metal pipe (CMP) culverts under Old Hwy 91 that will be plugged. This will ensure surface water runoff from the south side of Old Hwy 91 stays on the south side of this road. This water will be conveyed in an existing road ditch/channel until it enters the main channel below (or downgradient) of the 120-inch diameter CMP outlet. This will reduce the amount of natural (unimpacted) flow from entering the seepage capture system.

This improvement description is included in the updated project narrative. The revision has been reflected in the design drawings, too.

Please feel free to contact me at (719) 486-7633 or edetmer@fmi.com if you have any questions.

Sincerely,

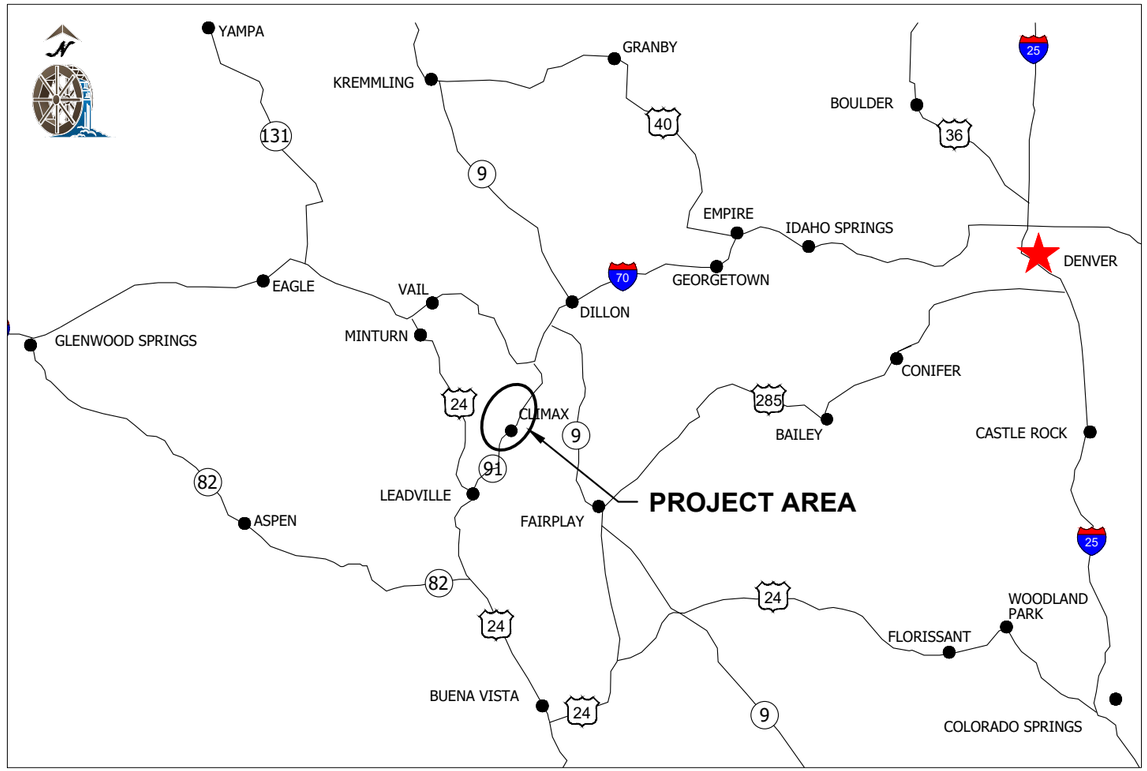
Eric Detmer
Manager, Environmental

Attachments
1) Issued for Construction (IFC) Drawings
2) Updated Project Narrative

CLIMAX MINE

5 DAM SEEPWATER COLLECTION AREA
SECONDARY CONTAINMENT SYSTEM

DRAWING INDEX	
DRAWING NO.	DRAWING TITLE
Drawings: General	
6-807-00101	COVER SHEET - DRAWING INDEX AND LOCATION MAP
6-807-00102	GENERAL ARRANGEMENT - SITE PLAN
Drawings: Instrumentation and Control	
6-807-00103	PIPING AND INSTRUMENTATION DIAGRAM
Drawings: Civil	
6-807-00104	SEEPAGE CUTOFF AND PUMP STATION - PLAN AND PROFILE
6-807-00105	GENERAL ARRANGEMENT - CULVERT INLET CUTOFF
6-807-00106	DISCHARGE PIPELINE - PLAN AND PROFILE
6-807-00107	OLD HIGHWAY DRAINAGE MODIFICATIONS - PLAN AND DETAILS
6-807-00108	MISCELLANEOUS CIVIL DETAILS - SECTIONS
Drawings: Mechanical	
6-807-00109	PUMP BUILDING - PLAN, SECTIONS AND DETAILS
6-807-00110	MISCELLANEOUS DETAILS
6-807-00111	MATERIAL LIST
Drawings: Structural	
6-807-00112	STRUCTURAL NOTES
6-807-00113	ISOMETRICS AT CULVERT
6-807-00114	PLANS AT CULVERT
6-807-00115	SECTIONS AT CULVERT
6-807-00116	FOUNDATION DETAILS
6-807-00117	FOUNDATION DETAILS



PROJECT LOCATION MAP

0 5 10 20 30
Scale in Miles

PROJECT VICINITY MAP

0 500 1000 2000 3000
Scale in Feet

REVISIONS					
	NO.	DATE	MADE BY	CKD. BY	REMARKS
	1	06/23	SAA	SMM	ISSUE FOR BIDDING
	2	08/23	SAA	SMM	ISSUE FOR CONSTRUCTION

REFERENCE DWGS	DRAWING NO.	REFERENCE

Climax Molybdenum
A Freeport-McMoRan Company

W. W. WHEELER & ASSOCIATES, INC
Water Resources Engineers
3700 S. Inca Street
Englewood, CO 80110-3405
303-761-4130

5 DAM SEEPWATER COLLECTION AREA	Climax Molybdenum Climax Mine Climax, CO		
SECONDARY CONTAINMENT SYSTEM	MADE BY: SAA	01/23	PROJECT NUMBER: 1051.19.17
COVER SHEET	CHECKED BY: SMM	01/23	DRAWING NO.
DRAWING INDEX AND LOCATION MAP	ACCEPTED BY: ...		6-807-00101 1

NOTES:
1. PROJECT LAYOUT IS BASED ON THE CLIMAX SITE SPECIFIC COORDINATE SYSTEM.
2. BASE TOPOGRAPHIC MAPPING FROM 2016 AERIAL SURVEY.
3. THE LOCATION OF THE EXISTING UTILITIES SHOWN ON THESE DRAWINGS IS APPROXIMATE. FOLLOW CLIMAX BLUESTAKE PROCEDURES PRIOR TO EXCAVATION.

MAYFLOWER TUNNEL PORTAL
POWER POLE (TYP.)
5 DAM CLEAR WATER POND
MAYFLOWER SEEPWATER PUMP STATION
EXISTING SUBSTATION
SPOIL PILE (REMOVED)
SPOIL PILE (REMOVED)
SPOIL PILE (REMOVED)
TOPSOIL STOCKPILE TO BE REMOVED BY OTHERS PRIOR TO CONSTRUCTIONS
EXISTING UTILITIES
ACCESS ROAD
EXISTING 24" CMP DRAIN POSSIBLE SEEPAGE SOURCE
EXISTING 18" CMP DRAIN PRIMARY SEEPAGE SOURCE
NEW 8" DIA. HDPE DISCHARGE PIPELINE (REF. DWG. 106)
MAYFLOWER SECONDARY SEEPAGE PUMP STATION (REF. DWG. 109)
WATER LINE @ NORMAL LEVEL EL. 10359.0
10' WEIR
EXISTING COLLECTION CHANNEL
COLLECTION POND
CULVERT INLET CUTOFF (REF. DWG. 112)
WATER LINE @ HIGH LEVEL EL. 10364.5
EXISTING 120" DIA. CMP CULVERT
APPROX. DRAINAGE BASIN
OLD HIGHWAY
OLD HIGHWAY DRAINAGE CHANNEL, CLEAN/GRADE (REF. DWG. 107)
EXISTING 24" CMP CULVERT (3 EA) PLUG ALL W/ CONCRETE (REF. DWG. 107)

0 10 30 60 90
Scale in Feet

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REVISIONS	NO.	DATE	MADE BY	CKD. BY	REMARKS
	1	06/23	SAA	SMM	ISSUE FOR BIDDING
	2	08/23	SAA	SMM	ISSUE FOR CONSTRUCTION

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Climax Molybdenum
A Freeport-McMoRan Company
W. W. WHEELER & ASSOCIATES, INC
Water Resources Engineers
3700 S. Inca Street
Englewood, CO 80110-3405
303-761-4130

5 DAM SEEPWATER COLLECTION AREA	Climax Molybdenum Climax Mine, Climax, CO		
SECONDARY CONTAINMENT SYSTEM	MADE BY SAA	01/23	PROJECT NUMBER 1051.19.17
GENERAL ARRANGEMENT	CHECKED BY SMM	01/23	DRAWING NO.
SITE PLAN	ACCEPTED BY ...		6-807-00102 1

807-PU-1001

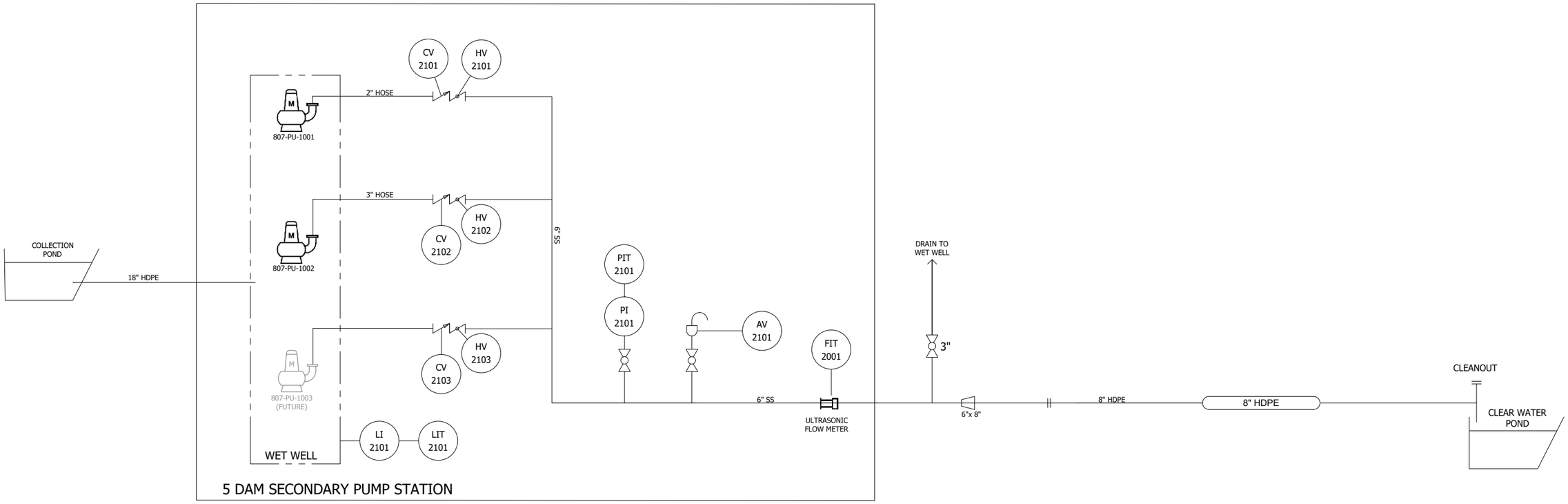
SERVICE:	SEEPAGE PUMP
MAKE:	TSURUMI
MODEL:	50SFQ2.75
CAPACITY:	75 GPM
DISCHARGE:	21 FT HEAD
RPM:	3600
HP:	1

807-PU-1002

SERVICE:	SEEPAGE PUMP
MAKE:	TSURUMI
MODEL:	80SFQ23.7
CAPACITY:	250 GPM
DISCHARGE:	31 FT HEAD
RPM:	3600
HP:	5

807-PU-1003

SERVICE:	FUTURE
MAKE:	TBD
MODEL:	TBD
CAPACITY:	TBD
DISCHARGE:	TBD
RPM:	TBD
HP:	TBD



NOTES:
1. ADD 807 PREFIX TO ALL VALVE AND INSTRUMENT IDENTIFICATION NUMBERS.

REVISIONS

NO.	DATE	MADE BY	CKD. BY	REMARKS
1	06/23	SAA	SMM	ISSUE FOR BIDDING
2	08/23	SAA	SMM	ISSUE FOR CONSTRUCTION

REFERENCE DWGS

DRAWING NO.	REFERENCE

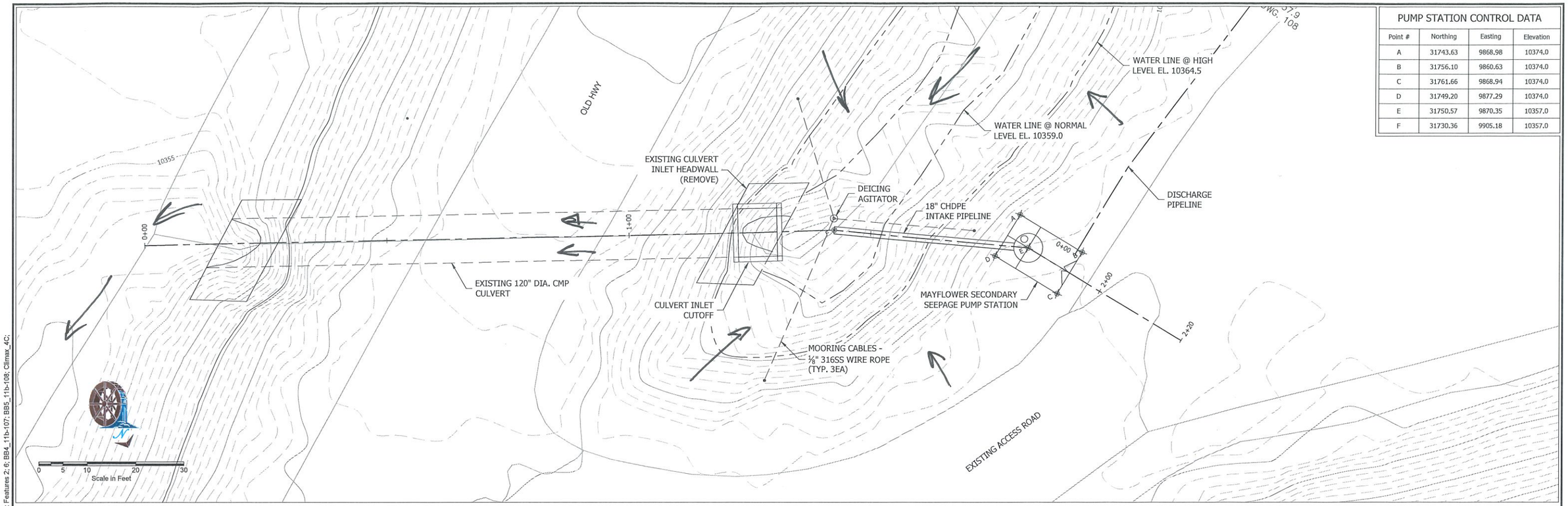
Climax Molybdenum
A Freeport-McMoRan Company

W. W. WHEELER & ASSOCIATES, INC
Water Resources Engineers
3700 S. Inca Street
Englewood, CO 80110-3405
303-761-4130

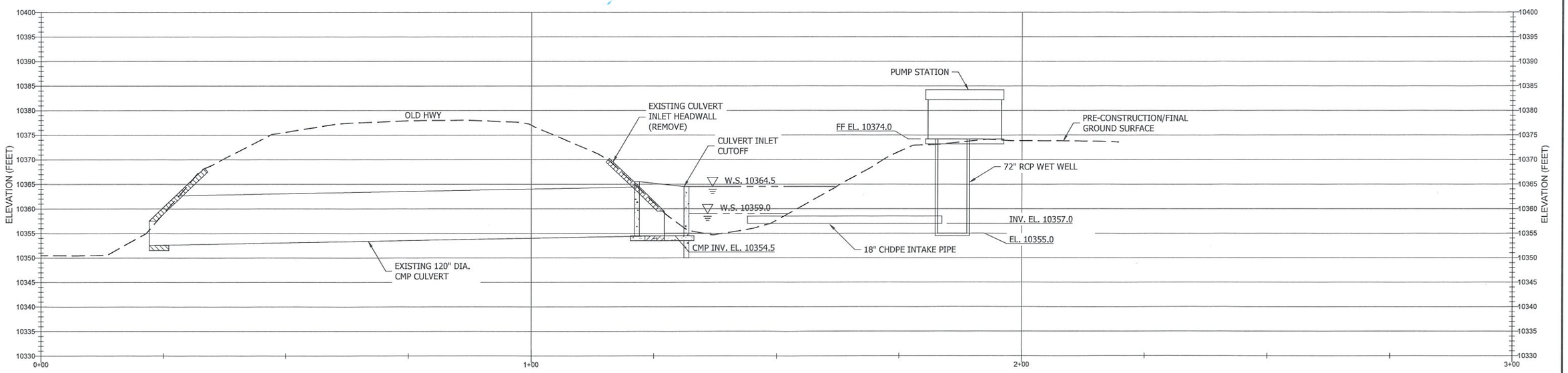
5 DAM SEEPWATER COLLECTION AREA
SECONDARY CONTAINMENT SYSTEM
PIPING AND INSTRUMENTATION DIAGRAM

Climax Molybdenum Climax Mine
Climax, CO

MADE BY: SAA	01/23	PROJECT NUMBER: 1051.19.17
CHECKED BY: SMM	01/23	DRAWING NO.: 6-807-00103
ACCEPTED BY: ...		1



PUMP STATION CONTROL DATA			
Point #	Northing	Easting	Elevation
A	31743.63	9868.98	10374.0
B	31756.10	9860.63	10374.0
C	31761.66	9868.94	10374.0
D	31749.20	9877.29	10374.0
E	31750.57	9870.35	10357.0
F	31730.36	9905.18	10357.0



Profile View of PUMPING SYSTEM

REVISIONS	NO.	DATE	MADE BY	CKD. BY	REMARKS
	2	06/23	SAA	SMM	ISSUE FOR BIDDING
	1	08/23	SAA	SMM	ISSUE FOR CONSTRUCTION

REFERENCE DWGS	DRAWING NO.	REFERENCE

Climax Molybdenum
A Freeport-McMoRan Company
W. W. WHEELER & ASSOCIATES, INC
Water Resources Engineers
3700 S. Inca Street
Englewood, CO 80110-3405
303-761-4130

5 DAM SEEPWATER COLLECTION AREA	Climax Molybdenum Climax Mine, Climax, CO		
SECONDARY CONTAINMENT SYSTEM	MADE BY: SAA	01/23	PROJECT NUMBER: 1051.19.17
SEEPAGE CUTOFF AND PUMP STATION	CHECKED BY: SMM	01/23	DRAWING NO.
PLAN AND PLOT	ACCEPTED BY: ...		6-807-00104 ⚠1

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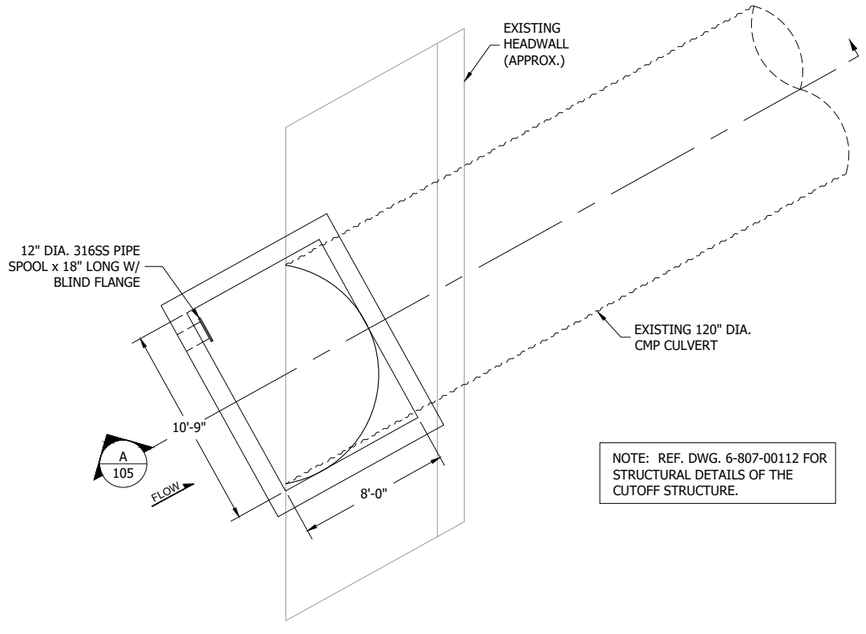
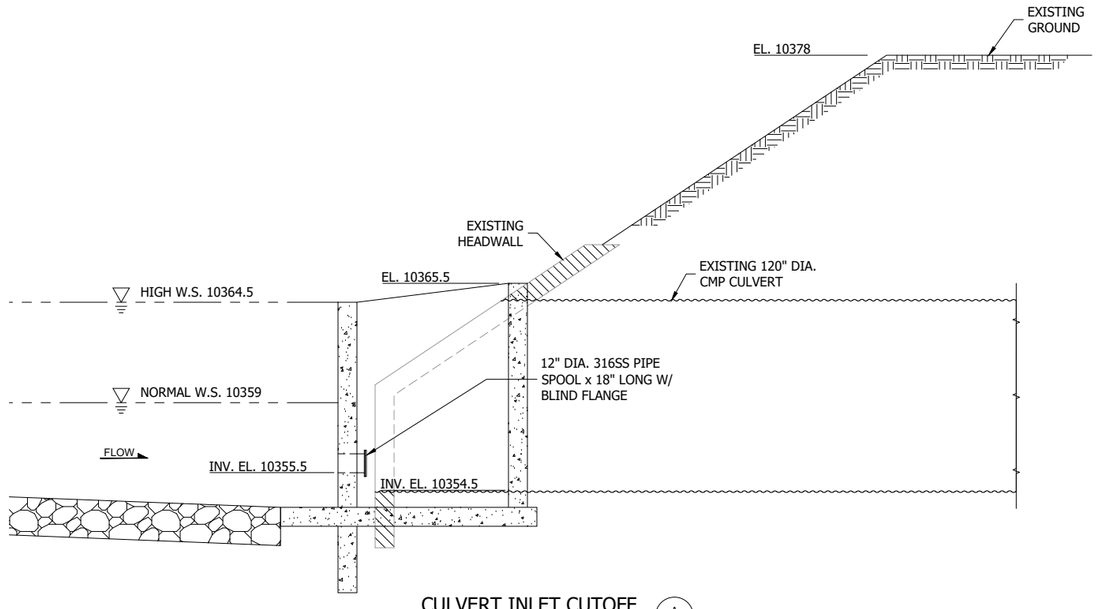
EXISTING CULVERT INLET - 1

EXISTING CULVERT INLET - 2



NOTE: REF. DWG. 6-807-00112 FOR STRUCTURAL DETAILS OF THE CUTOFF STRUCTURE.

1 CULVERT INLET CUTOFF
PLAN VIEW
0 2 4 8 12
Scale in Feet



CULVERT INLET CUTOFF
A
105
SECTION
0 2 4 8 12
Scale in Feet

REVISIONS	NO.	DATE	MADE BY	CKD. BY	REMARKS
	1	06/23	SAA	SMM	ISSUE FOR BIDDING
	2	08/23	SAA	SMM	ISSUE FOR CONSTRUCTION

REFERENCE DWGS	DRAWING NO.	REFERENCE

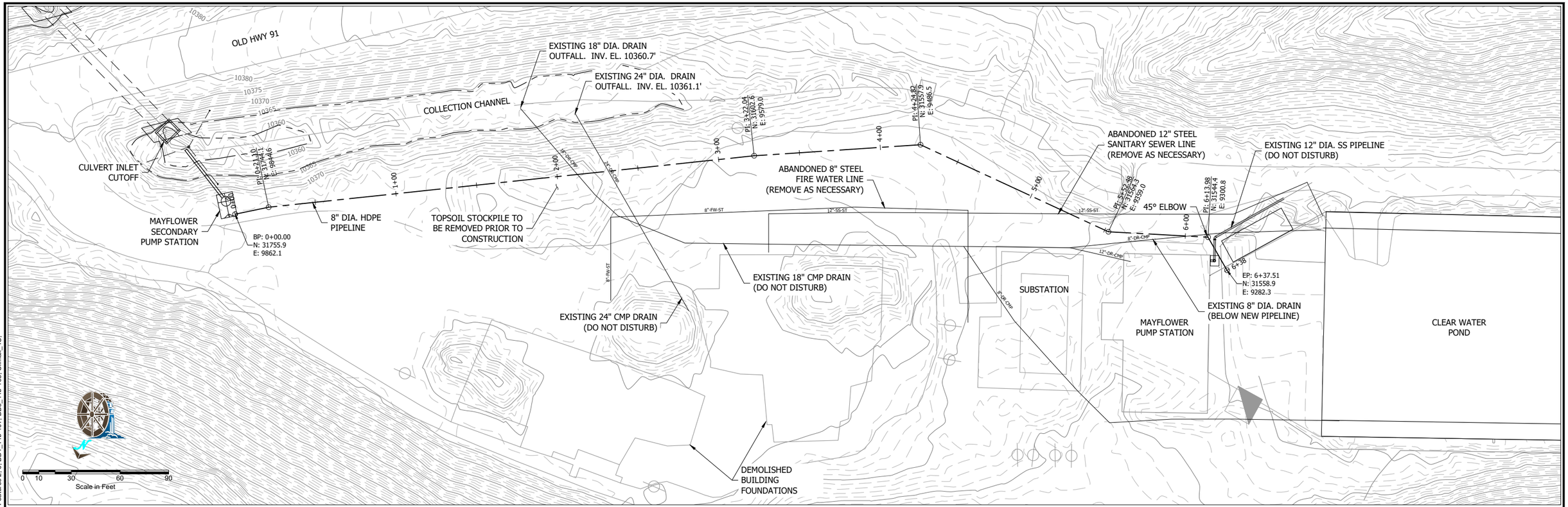
Climax Molybdenum
A Freeport-McMoRan Company

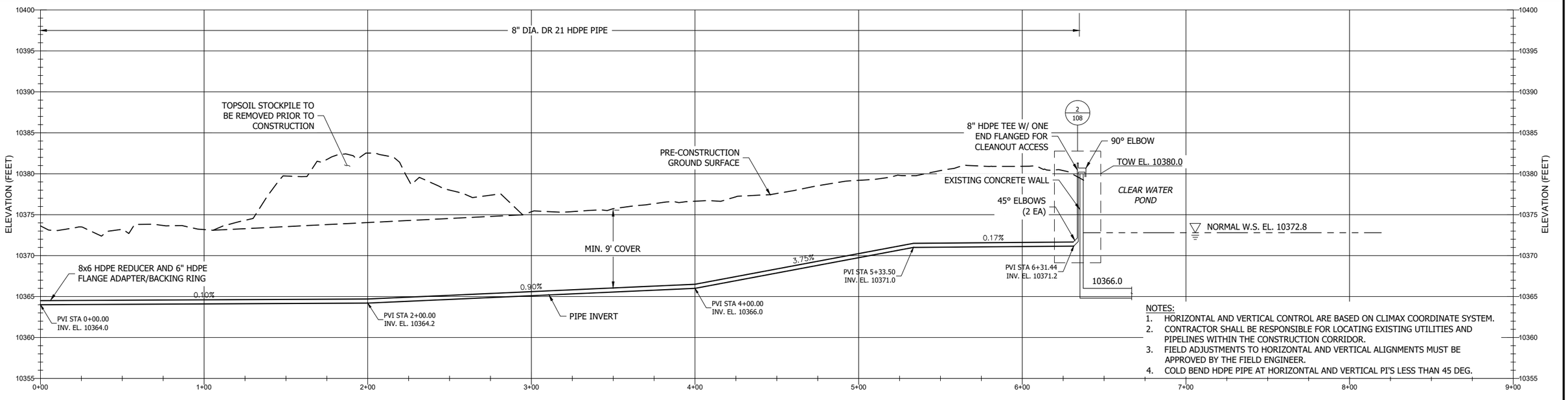
W. W. WHEELER & ASSOCIATES, INC
Water Resources Engineers
3700 S. Inca Street
Englewood, CO 80110-3405
303-761-4130

5 DAM SEEPWATER COLLECTION AREA
SECONDARY CONTAINMENT SYSTEM
GENERAL ARRAGEMENT
CULVERT INLET CUTOFF

Climax Molybdenum Climax Mine
Climax, CO

MADE BY		PROJECT NUMBER
SAA	01/23	1051.19.17
CHECKED BY		DRAWING NO.
SMM	01/23	6-807-00105 1
ACCEPTED BY		
...		





Profile View of Discharge Pipeline

NOTES:
1. HORIZONTAL AND VERTICAL CONTROL ARE BASED ON CLIMAX COORDINATE SYSTEM.
2. CONTRACTOR SHALL BE RESPONSIBLE FOR LOCATING EXISTING UTILITIES AND PIPELINES WITHIN THE CONSTRUCTION CORRIDOR.
3. FIELD ADJUSTMENTS TO HORIZONTAL AND VERTICAL ALIGNMENTS MUST BE APPROVED BY THE FIELD ENGINEER.
4. COLD BEND HDPE PIPE AT HORIZONTAL AND VERTICAL PI'S LESS THAN 45 DEG.

REVISIONS NO.	DATE	MADE BY	CKD. BY	REMARKS
1	06/23	SAA	SMM	ISSUE FOR BIDDING
2	08/23	SAA	SMM	ISSUE FOR CONSTRUCTION

REFERENCE DWGS DRAWING NO.	REFERENCE

Climax Molybdenum
A Freeport-McMoRan Company

W. W. WHEELER & ASSOCIATES, INC
Water Resources Engineers
3700 S. Inca Street
Englewood, CO 80110-3405
303-761-4130

5 DAM SEEPWATER COLLECTION AREA
SECONDARY CONTAINMENT SYSTEM
DISCHARGE PIPELINE
PLAN AND PROFILE

Climax Molybdenum Climax Mine
Climax, CO

MADE BY		PROJECT NUMBER
SAA	01/23	1051.19.17
CHECKED BY		DRAWING NO.
SMM	01/23	6-807-00106
ACCEPTED BY		1
...		

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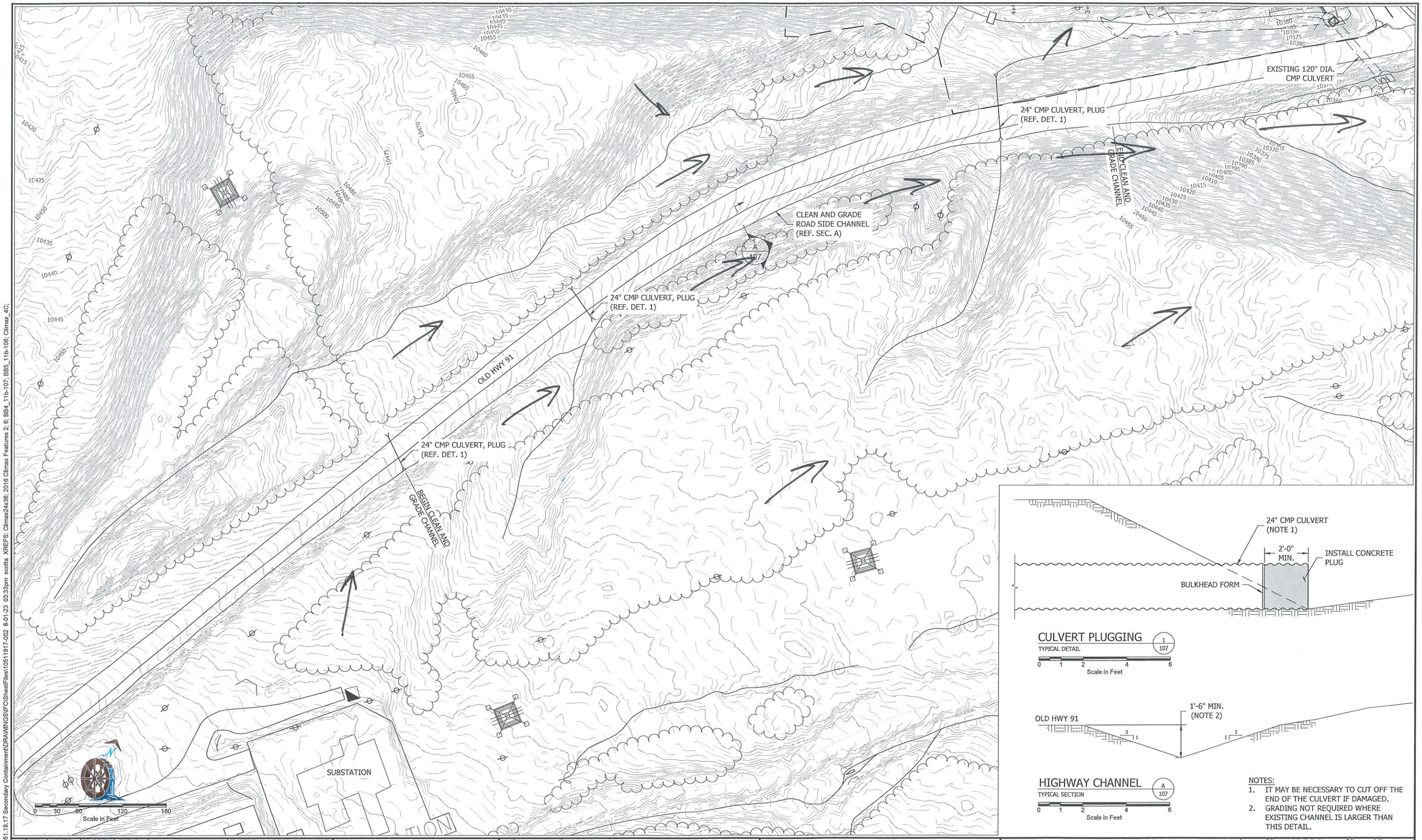


CULVERT PLUGGING (1 / 107)
TYPICAL DETAIL
0 1 2 4 6
Scale in Feet

HIGHWAY CHANNEL (A / 107)
TYPICAL SECTION
0 1 2 4 6
Scale in Feet

NOTES:
1. IT MAY BE NECESSARY TO CUT OFF THE END OF THE CULVERT IF DAMAGED.
2. GRADING NOT REQUIRED WHERE EXISTING CHANNEL IS LARGER THAN THIS DETAIL.

REVISIONS

NO.	DATE	MADE BY	CKD. BY	REMARKS
2	06/23	SAA	SMM	ISSUE FOR BIDDING
1	08/23	SAA	SMM	ISSUE FOR CONSTRUCTION

REFERENCE DWGS

DRAWING NO.	REFERENCE

Climax Molybdenum
A Freeport-McMoRan Company

W. W. WHEELER & ASSOCIATES, INC
Water Resources Engineers
3700 S. Inca Street
Englewood, CO 80110-3405
303-761-4130

5 DAM SEEPWATER COLLECTION AREA

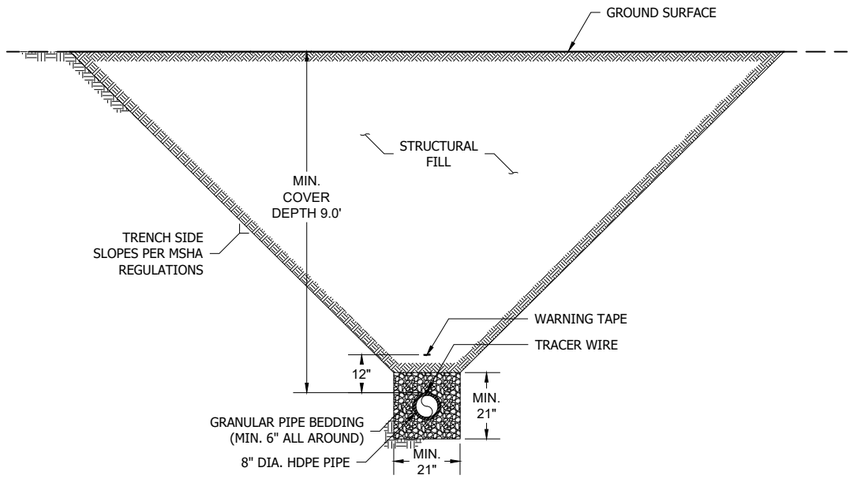
SECONDARY CONTAINMENT SYSTEM

OLD HIGHWAY DRAINAGE MODIFICATIONS

PLAN AND DETAILS

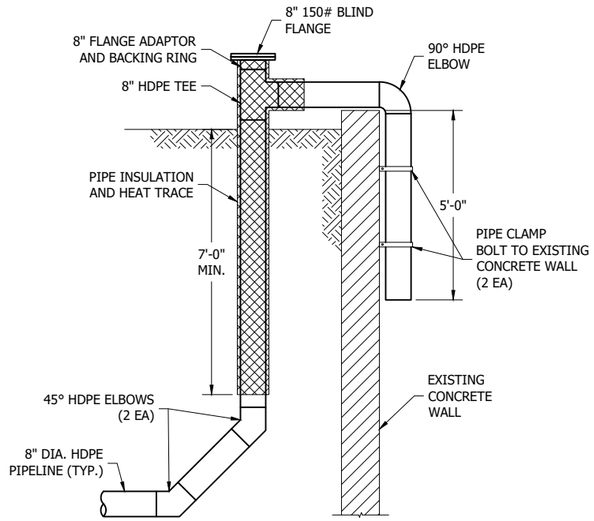
Climax Molybdenum Climax Mine
Climax, CO

MADE BY		PROJECT NUMBER
SAA	01/23	1051.19.17
CHECKED BY		DRAWING NO.
SMM	01/23	6-807-00107 2
ACCEPTED BY		
...		



BURIED PIPELINE TRENCH (1)
TYPICAL SECTION

0 1 2 4 6
Scale in Feet



PIPELINE DISCHARGE (2)
DETAIL (N.T.S.) 106

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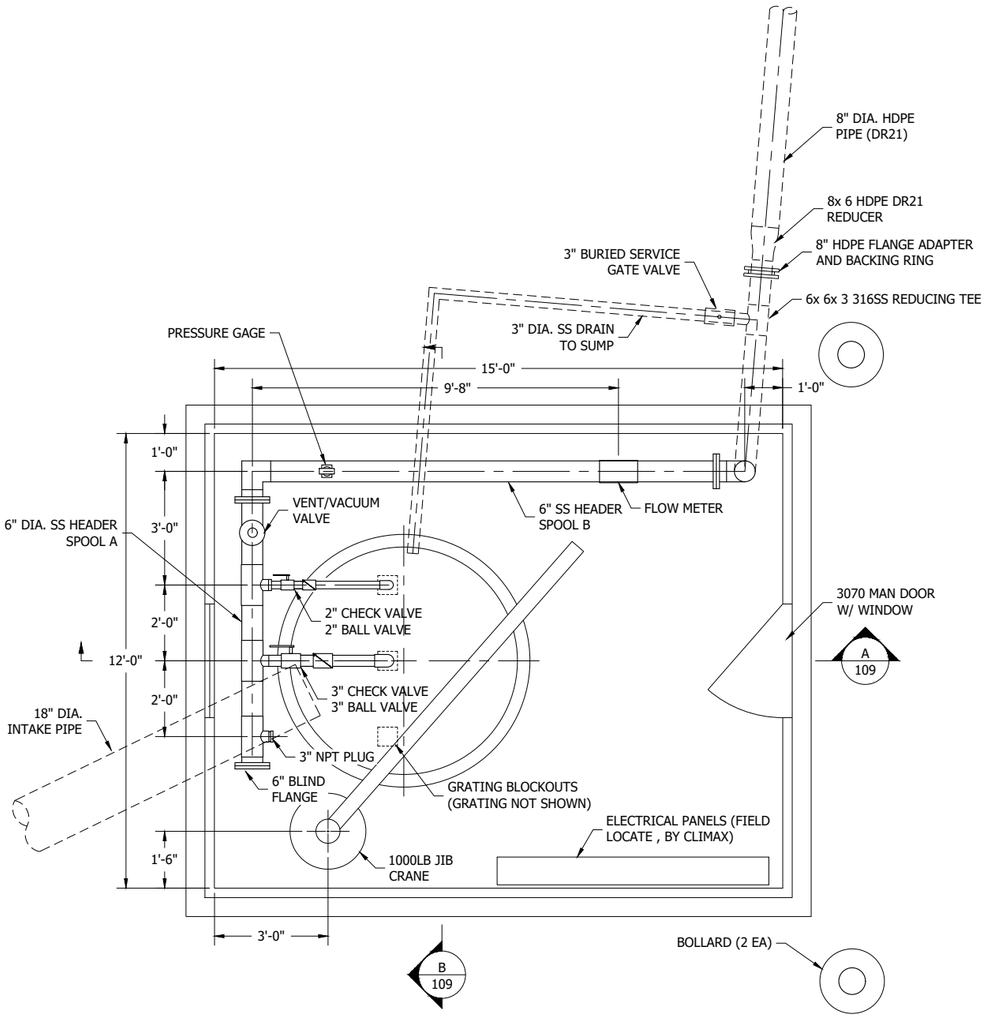
REVISIONS	NO.	DATE	MADE BY	CKD. BY	REMARKS
	1	06/23	SAA	SMM	ISSUE FOR BIDDING
	2	08/23	SAA	SMM	ISSUE FOR CONSTRUCTION

REFERENCE DWGS	DRAWING NO.	REFERENCE

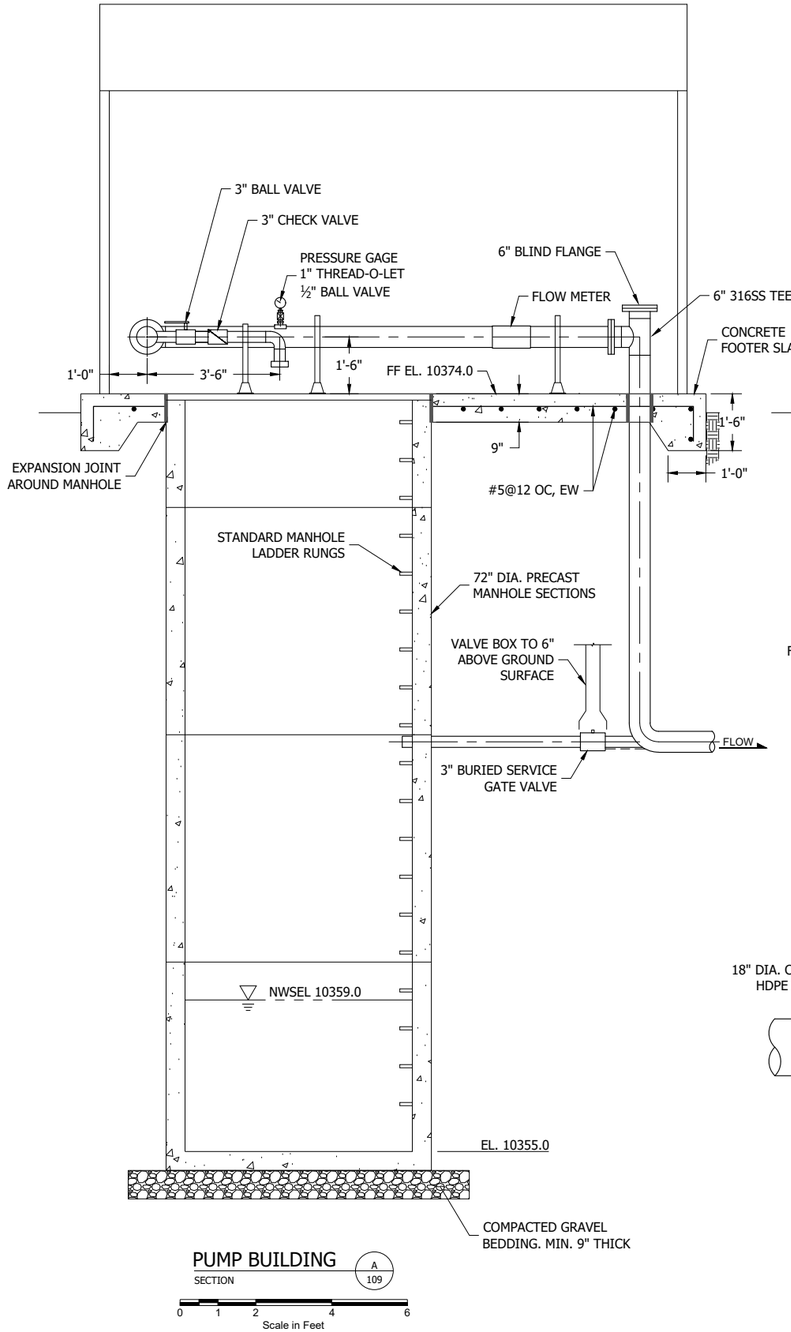
Climax Molybdenum
A Freeport-McMoRan Company

W. W. WHEELER & ASSOCIATES, INC
Water Resources Engineers
3700 S. Inca Street
Englewood, CO 80110-3405
303-761-4130

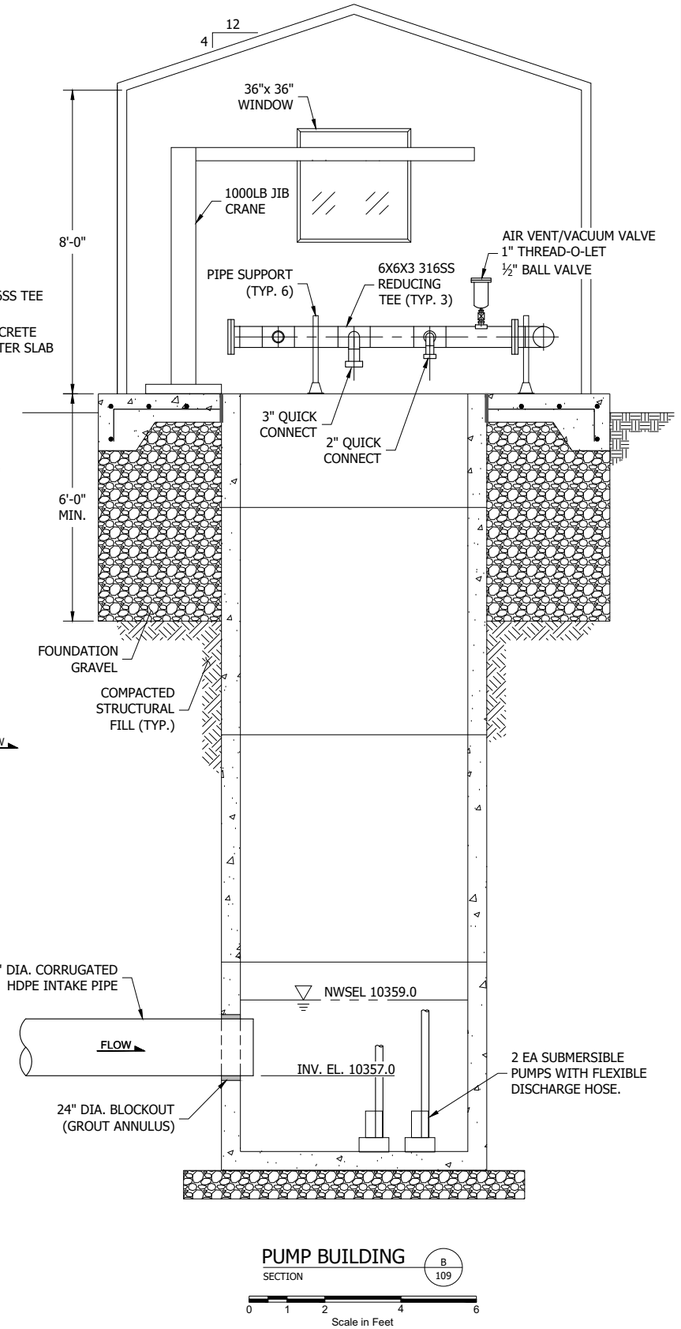
5 DAM SEEPWATER COLLECTION AREA	Climax Molybdenum Climax Mine, Climax, CO		
SECONDARY CONTAINMENT SYSTEM	MADE BY: SAA	01/23	PROJECT NUMBER: 1051.19.17
MISCELLANEOUS CIVIL DETAILS	CHECKED BY: SMM	01/23	DRAWING NO.
SECTIONS	ACCEPTED BY: ...		6-807-00108 (1)



1 PUMP BUILDING
PLAN VIEW
0 1 2 4 6
Scale in Feet



PUMP BUILDING
SECTION
A
109
0 1 2 4 6
Scale in Feet



PUMP BUILDING
SECTION
B
109
0 1 2 4 6
Scale in Feet

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REVISIONS

NO.	DATE	MADE BY	CKD. BY	REMARKS
1	06/23	SAA	SMM	ISSUE FOR BIDDING
2	08/23	SAA	SMM	ISSUE FOR CONSTRUCTION

REFERENCE DWGS

DRAWING NO.	REFERENCE

Climax Molybdenum
A Freeport-McMoRan Company

W. W. WHEELER & ASSOCIATES, INC
Water Resources Engineers
3700 S. Inca Street
Englewood, CO 80110-3405
303-761-4130

5 DAM SEEPWATER COLLECTION AREA

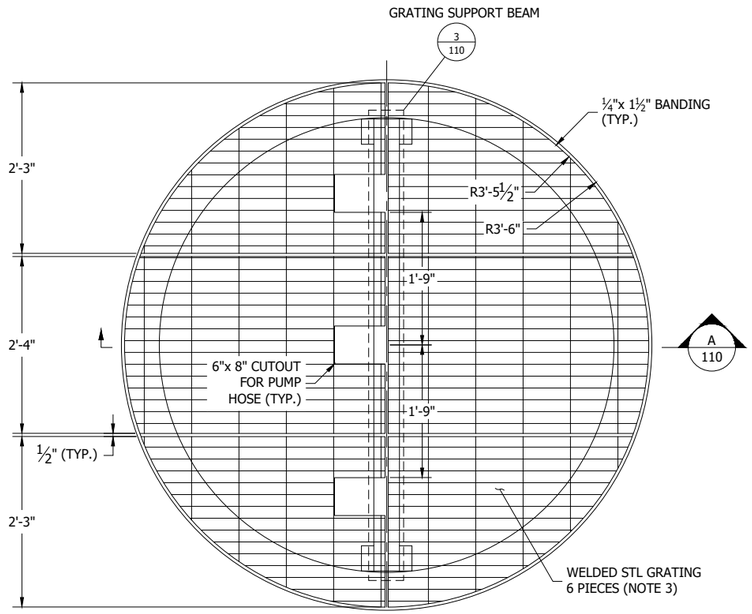
SECONDARY CONTAINMENT SYSTEM

PUMP BUILDING

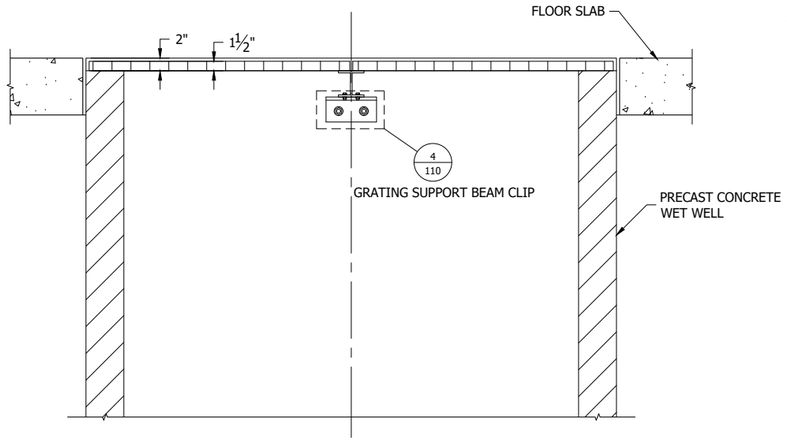
PLAN, SECTIONS AND DETAILS

Climax Molybdenum Climax Mine
Climax, CO

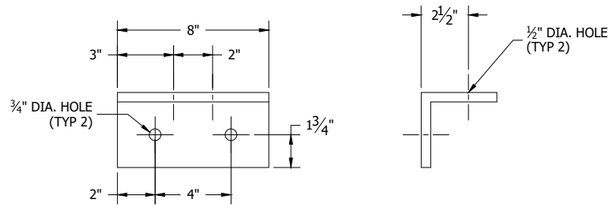
MADE BY	01/23	SCALE
SAA		1051.19.17
CHECKED BY	01/23	DRAWING NO.
SMM		6-807-00109 1
ACCEPTED BY		
...		



1 WET WELL GRATING
PLAN VIEW
0 ½ 1 2 3
Scale in Feet

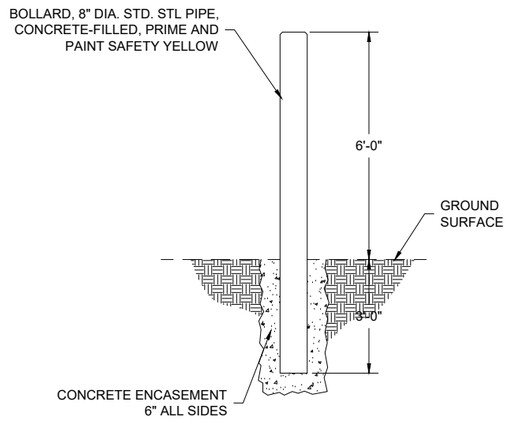


WET WELL GRATING
SECTION
A
110
0 ½ 1 2 3
Scale in Feet

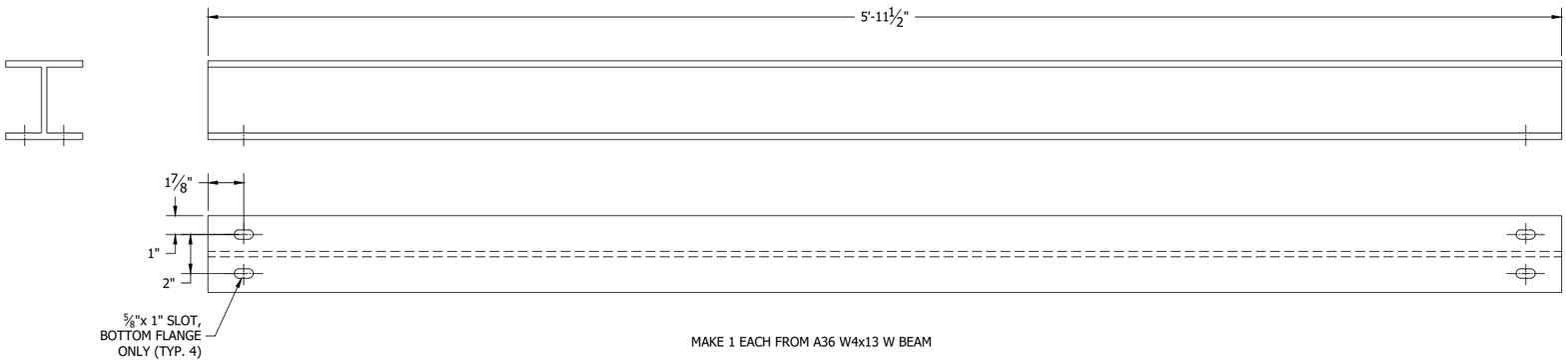


MAKE 2 EACH FROM A36 4"x 4"x ½" ANGLE

GRATING SUPPORT BEAM CLIP
TYPICAL DETAIL
4
110
0 2 4 8 12
Scale in Inches



SAFETY BOLLARD
TYPICAL DETAIL
5
110
0 1 2 4 6
Scale in Feet



MAKE 1 EACH FROM A36 W4x13 W BEAM

GRATING SUPPORT BEAM
DETAIL
3
110
0 2 4 8 12
Scale in Inches

METALWORK NOTES:
1. PRIME AND PAINT GRATING SUPPORT BEAM AND CLIPS AFTER FABRICATION.
2. USE SHERWIN-WILLIAMS MACROPOXY 649, 6 MILS DFT MIN., COLOR: WHITE.
3. ASTM A1011 19-4-W (1 ½"x 3⁄16" BARS), NOTE BEARING BAR DIRECTION.
4. HOT-DIP GALVANIZE GRATING SECTIONS AFTER FABRICATION.
5. SUBMIT SHOP DRAWINGS TO ENGINEER FOR APPROVAL BEFORE PURCHASING.

REVISIONS

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1	06/23	SAA	SMM	ISSUE FOR BIDDING
2	08/23	SAA	SMM	ISSUE FOR CONSTRUCTION

REFERENCE DWGS

DRAWING NO.	REFERENCE

Climax Molybdenum
A Freeport-McMoRan Company

W. W. WHEELER & ASSOCIATES, INC
Water Resources Engineers
3700 S. Inca Street
Englewood, CO 80110-3405
303-761-4130

5 DAM SEEPWATER COLLECTION AREA
SECONDARY CONTAINMENT SYSTEM
MISCELLANEOUS DETAILS

Climax Molybdenum Climax Mine
Climax, CO

MADE BY		PROJECT NUMBER
SAA	01/23	1051.19.17
CHECKED BY		DRAWING NO.
SMM	01/23	6-807-00110 1
ACCEPTED BY		
...		

MATERIAL LIST

ITEM NO.	UNIT	QTY	DESCRIPTION	PURCHASER	NOTES / LOCATION
HDPE PIPE AND FITTINGS					
100	LF	650	8" IPS DR 21 HDPE PIPE, PE4710, 50' LENGTHS, IN ACCORDANCE WITH SPECIFICATION 02530: HDPE PIPE.	OWNER	STATION 0+00 TO 6+32. APPROX. 10 EXTRA.
101	EA	1	8" X 6" IPS DR 21 HDPE MOLDED REDUCER, PE4710, IN ACCORDANCE WITH SPECIFICATION 02530: HDPE PIPE.	OWNER	STATION 0+05
102	EA	1	6" IPS DR 21 HDPE FLANGE ADAPTER, PE 4710, IN ACCORDANCE WITH SPECIFICATION 02530: HDPE PIPE.	OWNER	STATION 0+05
103	EA	1	6" IPS BACKING RING, EPOXY COATED DUCTILE IRON, PRESSURE RATED MIN. 100 PSI, IPP DELTAFLEX BUP-SDR21, IN ACCORDANCE WITH SPECIFICATION 02530: HDPE PIPE.	OWNER	STATION 0+05
104	EA	1	8" IPS DR 21 HDPE 90 DEG. MOLDED ELBOW, PE4710, IN ACCORDANCE WITH SPECIFICATION 02530: HDPE PIPE.	OWNER	STATION 6+32
105	EA	2	8" IPS DR 21 HDPE 45 DEG. MOLDED ELBOW, PE4710, IN ACCORDANCE WITH SPECIFICATION 02530: HDPE PIPE.	OWNER	STATION 6+32
106	EA	1	8" IPS DR 21 HDPE MOLDED TEE, PE4710, IN ACCORDANCE WITH SPECIFICATION 02530: HDPE PIPE.	OWNER	STATION 6+32
107	EA	1	8" IPS DR 21 HDPE FLANGE ADAPTER, PE 4710, IN ACCORDANCE WITH SPECIFICATION 02530: HDPE PIPE.	OWNER	STATION 6+32
108	EA	1	8" IPS BACKING RING, EPOXY COATED DUCTILE IRON, PRESSURE RATED MIN. 100 PSI, IPP DELTAFLEX BUP-SDR21, IN ACCORDANCE WITH SPECIFICATION 02530: HDPE PIPE.	OWNER	STATION 6+32
109					
110					
111					
112	LF	40	18" DUAL-WALL CORRUGATED HDPE PIPE, GASKETED WATERTIGHT JOINTS	CONTRACTOR	PUMP STATION INTAKE LINE
STEEL/PVC/RUBBER PIPE AND FITTINGS					
200	EA	1	8" PVC BLIND FLANGE, MIN. 25 PSI, 150# DRILLING	CONTRACTOR	STATION 6+32
201	LF	16	6" DIA. SCH 10 316SS PIPE, ASTM A312	CONTRACTOR	PUMP STATION AREA
202	LF	16	3" DIA. SCH 10 316SS PIPE, ASTM A312	CONTRACTOR	PIPELINE DRAIN
203	EA	1	6" SCH 10 316SS HEADER SPOOL A, ASTM A312. REF. DWG. 6-807-00109. SUBMIT SHOP DWG. FOR APPROVAL.	CONTRACTOR	PUMP STATION
204	EA	1	6" SCH 10 316SS HEADER SPOOL B, ASTM A312. REF. DWG. 6-807-00109. SUBMIT SHOP DWG. FOR APPROVAL.	CONTRACTOR	PUMP STATION
205	EA	2	6" DIA. SCH 10 316SS TEE, WELD FITTING, ASTM A182	CONTRACTOR	PUMP STATION
206	EA	2	6" DIA. SCH 10 316SS 90-DEG. ELBOW, WELD FITTING, ASTM A182	CONTRACTOR	PUMP STATION
207	EA	1	3" DIA. SCH 10 316SS 90-DEG. ELBOW, WELD FITTING, ASTM A182	CONTRACTOR	PUMP STATION
208	EA	2	6" 150 LB. BLIND FLANGE, 316 STAINLESS STEEL, RAISED FACE, ANSI B16.5	CONTRACTOR	PUMP STATION
209	EA	2	6" 150 LB. SLIP-ON FLANGE, 316 STAINLESS STEEL, RAISED FACE, ANSI B16.5	CONTRACTOR	PUMP STATION
210	EA	1	6" 150 LB. WELDNECK FLANGE, 316 STAINLESS STEEL, RAISED FACE, ANSI B16.5	CONTRACTOR	PUMP STATION
211	EA	2	3" 150 LB. SLIP-ON FLANGE, 316 STAINLESS STEEL, RAISED FACE, ANSI B16.5	CONTRACTOR	PIPELINE DRAIN
212	EA	1	6" X 6" X 3" SCH 10 316SS REDUCING TEE, WELD FITTING, ASTM A182	CONTRACTOR	PIPELINE DRAIN
213	EA	1	12" DIA. SCH 10 316SS PIPE SPOOL, ASTM A312, 1'6" LONG, 150 LB. FLANGE ON ONE END.	CONTRACTOR	CULVERT CUTOFF WALL DRAIN
214	EA	1	12" 150 LB. BLIND FLANGE, 316 STAINLESS STEEL, RAISED FACE, ANSI B16.5	CONTRACTOR	CULVERT CUTOFF WALL DRAIN
215	LF	20	2" DIA. PUMP DISCHARGE HOSE. QUICK CONNECT ENDS. 50 PSI MIN. RATING. VERIFY LENGTH.	OWNER	PUMP STATION
216	LF	20	3" DIA. PUMP DISCHARGE HOSE. QUICK CONNECT ENDS. 50 PSI MIN. RATING. VERIFY LENGTH.	OWNER	PUMP STATION
217	EA	1	2" NPT X QUICK CONNECT TRANSITION FITTING.	CONTRACTOR	PUMP STATION
218	EA	1	3" NPT X QUICK CONNECT TRANSITION FITTING.	CONTRACTOR	PUMP STATION
219	EA	4	6" PIPE BOLLARD, 9 FEET LONG, SCH 40.	CONTRACTOR	PUMP STATION, PIPELINE DISCHARGE
VALVES					
300	EA	1	1/2" NPT COMBINATION AIR VALVE, 1" DEZURIK/APCO ASU COMBINATION AIR VALVE W/ 1" TO 1/2" NPT BUSHING, ALL 316 SS CONSTRUCTION.	CONTRACTOR	PUMP STATION
301	EA	1	3" BURIED SERVICE GATE VALVE, MUELLER MODEL A-2362, FLANGED ENDS, 2" NUT, RIGHT OPEN	CONTRACTOR	PIPELINE DRAIN
302	EA	2	1/2" NPT BALL VALVE, 316 SS, LEVER HANDLE, APOLLO MODEL 76F OR EQUAL.	CONTRACTOR	PUMP STATION
303	EA	1	3" NPT BALL VALVE, 316 SS, LEVER HANDLE, APOLLO MODEL 76F OR EQUAL.	CONTRACTOR	PUMP STATION
304	EA	1	2" NPT BALL VALVE, 316 SS, LEVER HANDLE, APOLLO MODEL 76F OR EQUAL.	CONTRACTOR	PUMP STATION
305	EA	1	3" NPT Check Valve, In-line Spring Assisted, Durachoice Model VCSL1-200, 316 SS	CONTRACTOR	PUMP STATION
306	EA	1	2" NPT Check Valve, In-line Spring Assisted, Durachoice Model VCSL1-300, 316 SS	CONTRACTOR	PUMP STATION
PUMP STATION EQUIPMENT AND INSTRUMENTS					

MATERIAL LIST

ITEM NO.	UNIT	QTY	DESCRIPTION	PURCHASER	NOTES / LOCATION
400	EA	1	SUBMERSIBLE PUMP, TSURUMI MODEL 50SFQ2.75, 1 HP, 316SS, 75 GPM AT 21-FT TDH.	OWNER	PUMP STATION
401	EA	1	SUBMERSIBLE PUMP, TSURUMI MODEL 80SFQ23.7, 5 HP, 316SS, 250 GPM AT 31-FT TDH.	OWNER	PUMP STATION
402	EA	1	7.5 KW ELECTRIC UNIT HEATER	OWNER	PUMP STATION
403	EA	1	JIB CRANE BY HARRINGTON WITH 10 FT REACH, 360-DEGREE SWIVEL, CHAIN OPERATED HOIST, 1000 LB. CAPACITY, STANDARD FINISH.	CONTRACTOR	PUMP STATION
404	EA	1	ICE-AWAY BY AIR-O-LATOR CORP., MODEL #IA-5, 1/2 HP, 115-V, 100' CORD. WITH PE FLOAT AND PROPELLER GUARD.	OWNER	PUMP STATION
405	EA	1	FLOW METER FOR 6" DIA. 316SS PIPE. ENDRESS & HAUSER PROSONIC 91W W/ LOCAL DISPLAY. 4-20 MA.	OWNER	PUMP STATION
406	EA	1	SUMP LEVEL INDICATOR - VEGA VEGAPULS 31, ON-SITE DISPLAY, 4-20 MA, MIN. 20 FEET RANGE.	OWNER	PUMP STATION
407	EA	1	HEADER PRESSURE INDICATOR - VEGA VEGABAR 28 PRESSURE SENSOR WITH VEGADIS EXTERNAL DISPLAY, 4-20 MA	OWNER	PUMP STATION
STRUCTURAL					
500	EA	1	PUMP STATION BUILDING, 12' W X 15' L X 8' H, ALL METAL CONSTRUCTION, PER SPECIFICATIONS 13300 AND DRAWING 6-807-00109.	OWNER	PUMP STATION
501	EA	1	72" ID PRECAST CONCRETE MANHOLE: BASE RISER W/ INTEGRAL BASE SLAB (5' TALL), 2 EA. RISER SECTIONS (6' TALL), RISER SECTION (2'-10" TALL) WITH SQUARE TOP, ALL WITH STD. MANHOLE LADDER RUNGS (SIZE AND SPACE PER MANUFACTURERS RECOMMENDATIONS), T&G JOINT, PIPE CUTOUT SIZE AND LOCATION PER DWG. 6-807-00109.	OWNER	PUMP STATION WET WELL
502	Lot	1	PUMP STATION BASE SLAB REINFORCED CONCRETE,IN ACCORDANCE WITH SPECIFICATION 03300: CAST-IN-PLACE CONCRETE	CONTRACTOR	PUMP STATION
503	Lot	1	CULVERT INLET CUTOFF WALL REINFORCED CONCRETE, IN ACCORDANCE WITH SPECIFICATION 03300: CAST-IN-PLACE CONCRETE	CONTRACTOR	CULVERT INLET CUTOFF WALL
504	EA	4	STEEL PIPE SUPPORT FOR 6" CS PIPE W/ STANCHION BASE PLATE. ANVIL 63T OR APPROVED EQUIVALENT. PLAIN FINISH	CONTRACTOR	PUMP STATION PIPE SUPPORTS
505	EA	1	STEEL PIPE SUPPORT FOR 3" CS PIPE W/ STANCHION BASE PLATE. ANVIL 63T OR APPROVED EQUIVALENT. PLAIN FINISH	CONTRACTOR	PUMP STATION PIPE SUPPORTS
506	EA	1	STEEL PIPE SUPPORT FOR 2" CS PIPE W/ STANCHION BASE PLATE. ANVIL 63T OR APPROVED EQUIVALENT. PLAIN FINISH	CONTRACTOR	PUMP STATION PIPE SUPPORTS
507	Lot	1	WET WELL GRATING, IN ACCORDANCE WITH DRAWING 6-807-00110.	CONTRACTOR	PUMP STATION
508	EA	1	GRATING SUPPORT BEAM ASSEMBLY, IN ACCORDANCE WITH DRAWING 6-807-00110.	CONTRACTOR	PUMP STATION
509	EA	1	U CLAMP FOR BOLTING 8.625" OD HDPE PIPE TO CONCRETE WALL, 316 SS	CONTRACTOR	PIPELINE DISCHARGE
MISCELLANEOUS					
600	LF	650	PIPE TRACER WIRE, PER DRAWINGS AND SPECIFICATION 02530: HDPE PIPE	CONTRACTOR	8" PIPELINE
601	LF	650	PIPE WARNING TAPE, PER DRAWINGS AND SPECIFICATION 02530: HDPE PIPE	CONTRACTOR	8" PIPELINE
602	CY	75	GRANULAR PIPE BEDDING, IN ACCORDANCE WITH SPECIFICATION 02330: EARTHWORK	CONTRACTOR	8" PIPELINE BEDDING
603	CY	150	GRANULAR PIPE BEDDING, IN ACCORDANCE WITH SPECIFICATION 02330: EARTHWORK	CONTRACTOR	24" CULVERT BEDDING
604	CY	50	STRUCTURAL SUBGRADE GRAVEL, IN ACCORDANCE WITH SPECIFICATION 02330: EARTHWORK	CONTRACTOR	PUMP STATION, CUTOFF WALL
605	Lot	1	PIPE INSULATION. REF. DWG. 108.	CONTRACTOR	PIPELINE DISCHARGE
606	EA	1	VALVE CURB BOX. CONTRACTOR TO DETERMINE MODEL, PART NUMBER, AND LENGTH	CONTRACTOR	PIPELINE DRAIN

NOTES:
1. NOT ALL MATERIALS FOR CONSTRUCTION ARE LISTED. SMALL ITEMS SUCH AS GROUT, CONCRETE, REBAR, BOLTS, BUSHINGS, SEALANT, ETC. ARE NOT LISTED. IT IS THE CONTRACTOR'S RESPONSIBILITY TO PROVIDE ALL MATERIALS REQUIRED TO COMPLETE THE PROJECT.
2. NO ELECTRICAL MATERIALS ARE LISTED.
3. SUBMIT SHOP DRAWINGS TO ENGINEER FOR APPROVAL BEFORE PURCHASE.
4. SUBMIT PRODUCT DATA TO ENGINEER FOR APPROVAL IN ACCORDANCE WITH THE SPECIFICATIONS.
5. CONTRACTOR IS RESPONSIBLE FOR VERIFYING ITEMS AND QUANTITIES IN MATERIAL LIST ABOVE.

REVISIONS

NO.	DATE	MADE BY	CKD. BY	REMARKS
1	06/23	SAA	SMM	ISSUE FOR BIDDING
2	08/23	SAA	SMM	ISSUE FOR CONSTRUCTION

REFERENCE DWGS

DRAWING NO.	REFERENCE

Climax Molybdenum
A Freeport-McMoRan Company

W. W. WHEELER & ASSOCIATES, INC
Water Resources Engineers
3700 S. Inca Street
Englewood, CO 80110-3405
303-761-4130

5 DAM SEEPWATER COLLECTION AREA
SECONDARY CONTAINMENT SYSTEM
MATERIAL LIST

Climax Molybdenum Climax Mine
Climax, CO

MADE BY		PROJECT NUMBER
SAA	01/23	1051.19.17
CHECKED BY		DRAWING NO.
SMM	01/23	6-807-00111 1
ACCEPTED BY		
...		

GENERAL NOTES

DESIGN CRITERIA

Code:	International Building Code (IBC), 2018 Edition	
Soil:	Density, assumed	120 pcf, wet gravel/sand
	EFP, culvert / hill side	90 pcf wet gravel/sand sloping upward
	EFP, side walls	45 pcf wet gravel/sand sloping down
	EFP, front wall	62.4 pcf water
	Allowable soil bearing	4,000 psf
Wind:	Velocity (ultimate)	115 mph
	Exposure	C
Seismic:	Seismic Design Category	B

GENERAL CONDITIONS AND REQUIREMENTS

1. The use of these drawings constitutes a contractual agreement between the Contractor and the Owner. Thus, these Contract Documents take precedence over trade practices and third party specifications.
2. The term "Engineer" shall be taken to mean the Structural Engineer of Record. Third party entries are specifically noted as "Professional Engineer," "Contractor's Engineer," "Designer," etc.
3. Contractor is responsible for obtaining access to all codes, standards, specifications, reports, third party literature, etc. referenced in these documents.
4. Contractor shall field measure and verify all existing conditions and dimensions at job site. In the event that existing conditions or dimensions vary from those shown on the drawings, Contractor shall notify the Engineer so proper adjustments can be made.
5. Contractor shall check and verify all dimension and other information shown on structural drawings with those shown and non-structural, including architectural and other disciplines. Contractor shall notify the Engineer of any discrepancies between structural and non-strcural drawings, or with structural drawings. When such discrepancies occur, the most stringent requirements shall govern unless written clarification is obtained from the Engineer.
6. All Contractors, Subcontractors, Fabricators, Suppliers, and other jobsite personnel shall at all times comply with the Occupational Safety and Health Administration (OSHA) Standards - 29 CFR, Parts 1910 ("Occupational Safety and Health Standards") and 1926 ("Safety and Health Regulations for Construction").
7. Drawings represent a finished product, and do not address the means and methods necessary to complete the construction. During the erection of the structure, the Contractor shall be responsible for temporary bracing to withstand all loads to which the structure may be subjected, including lateral loads, stockpiles of material and equipment. Such bracing shall be left in place as long as required for safety, and until all structural framing and diaphragms are in place with connections complete.
8. The term "provide' as used herein shall mean that Contractor shall furnish and install said item, including all construction, equipment, materials, etc., for a complete, finished installation.
9. Installation of proprietary products shall comply with all manufacturer's specifications and recommendations, unless otherwise noted. Product substitutions shall be subject to Engineer's review.
10. Details noted "typical" apply to all comparable conditions. Where no specific details are shown, constructions shall conform to the comparable work defined elsewhere on the project.
11. Deviations from these Contract Documents are not permitted, unless coordinated with the Architect or Engineer.
12. Third Party Quality Control: Contractor shall provide Engineer with copies of all third party structural field observation reports and test results immediately upon receipt.
13. Third Party Engineered Systems: All references to "Professional Engineer" or "P.E." shall be taken to mean a Professional Engineer currently registered in the project's jurisdiction with experience in the specific discipline of the engineered system.
14. Construction documents are copyrighted and shall not be reproduced without written authorization from the Engineer. authorization from the Engineer.
15. Items requiring review by the Engineer, such as shop drawings, product substitutions, requests for field observations, etc., shall be brought to the Engineer's attention with sufficient notice to allow the Engineer a reasonable review period.
16. The Engineer's scope of services does not include design and/or analysis of conditions resulting from Contractor errors or changes, nor does it include review of reissued submittals that were originally rejected. In these cases, the Contractor shall be subject to reimbursing the Owner for additional services incurred by the Engineer.
17. Structural Drawings are not stand-alone documents, and are intended to be used in conjunction with Civil, Architectural, Mechanical and Electrical drawings, plus all drawing from other disciplines. Structural material that are used in a non-structural applications are subject to the Structural General Notes. The Contractor shall coordinate all requirements of the Contract Documents into the Work.
18. Coordinate size and location of all openings, blockouts, floor depressions, curbs, etc. with Civil, Architectural, Mechanical, Electrical drawings, etc. as applicable, and reinforce notches, blockouts, etc. are prohibited in structural members unless specifically shown on the drawings or coordinated with the Engineer.
19. Do not scale drawings.
20. Where discrepancies exist among Drawings and General Notes, the most stringent requirements shall govern.

SUBMISSIONS

1. General Contractor shall check and stamp all shop drawing before submitting to Engineer. Unchecked submittals and /or submittals that substantially deviate from the Contract Documents will be returned without review.
2. As a minimum, shop drawings shall include comprehensive layouts, member sizes, fabrication requirements and connections as required to demonstrate complete understanding of the structural system to be constructed. Refer to individual material general notes for additional requirements.
3. Product catalog pages and reproductions of Contract Documents do not demonstrate the required understanding of the structural intent, and will be returned without review.
4. General Contractor shall submit shop drawings and proprietary documentation in a timely manner to permit minimum ten working days for review by Engineer. Contractor shall coordinate construction schedule to account for correction of errors and resubmittals, if required.
5. Engineer's review of shop drawings does not receive Contractor of responsibility to follow all requirements of the Contract Documents.
6. General Contractor shall submit in writing any requests to modify the Contract Documents. Such requests shall not be considered accepted until they have been specifically address by the Engineer. Shop drawing alone do not constitute "in writing", unless specific proposed changes are clearly identified. Proposed changes shall be coordinated by the individual initiating the change.
7. Deferred submittals are required for the following items. The Contractor shall submit these items to the Building Department after review by the Architect and /or Engineer.
   a. Non-structural component attachment to structure.

NON-STRUCTURAL BUILDING COMPONENTS

Wind and seismic design of non-structural building components not otherwise defined in the structural drawings, including but not limited to partitions, suspended ceilings, mechanical and electrical equipment, piping, signage, lighting, etc. is outside the scope of the structural work. G.C. shall employ engineering services for the design and detailing of non-structural building components, including attachments to the primary building of the structure. Wind and seismic design of components and their attachment to structure shall be in accordance with Sections 1609.1 and 1613.1 of the IBC, and shall be supervised by a P.E. registered in the jurisdiction of the project. G.C. shall submit stamped designs to the Engineer and, if required by the governing jurisdiction, the Building Official.

DISCLAIMER

All design, documents and data prepared shall remain the property of J.C. Baur & Associates, Inc., and shall not be copied, changed, or disclosed in any form without written consent. J.C. Baur & Associates, Inc. shall not be responsible for any alterations or revisions made by anyone other than employees of J.C. Baur & Associates, Inc. J.C. Baur & Associates, Inc. produced the information presented on this drawing through the use of technical information and practical experience specific to its efforts. Receiving this drawings does not guarantee any rights to such technical information and practical experience. Any alteration or adaptation of the data or contents of this drawing shall be at user's sole risk and without any liability or legal responsibility to J.C. Baur & Associates, Inc.

FOUNDATION

1. Foundations are designed using presumed bearing values noted below. Contractor shall provide written open excavation inspection report by a Geotechnical Professional Engineer prior to forming or placing foundation concrete. Foundation system is subject to change based on report findings. Contractor shall follow all recommendations of report including modifying the foundation system in accordance with revised design.
2. All footings shall rest on solid undisturbed soil or approved compacted fill. Assumed maximum design bearing capacity is 4000 psf.
3. All footings shall be the exact size and shape as shown in the structural drawings; no larger, no smaller.
4. No footings or foundation walls shall be poured before observation by the Engineer.
5. No concrete shall be poured in excavation containing wall or on frozen ground.
6. Backfill shall be placed against both sides of walls and piers simultaneously. Use only hand operated tools for compaction adjacent to foundation walls. Do not backfill until building walls have cured a minimum of 7 days, and cantilevered retaining wall have cured a minimum of 28 days.
7. Refer to Geotechnical Report, architectural drawings and/or civil drawings for complete site grading, drainage, subgrade preparation and engineered fill requirements. Slope exterior grades away from foundation in all directions. All roof downspouts and drains shall discharge well beyond the limits of all backfill, and water shall not be allowed to pond adjacent to the building.
8. Assumed equivalent fluid pressure of saturated soil against retaining walls = 90 pcf.

CONCRETE

CONCRETE MIX DESIGN MATRIX

Intended Use	Min. f'c at 28 days	Unit Weight	Cement Type	Max. w/cm	% Air Content	Durability Exposure Class: Frz./Thaw	Sulfate	Water	Corrosion
Footings/Walls	4.5 ksi	145 pcf	II	0.45	4-6	F2	S2	W2	C2
Exterior Slab-on-Grade	4.5 ksi	145 pcf	II	0.45	4-6	F2	S2	W2	C2
Interior Slabs-on-Grade	4.5 ksi	145 pcf	II	0.45	2	F0	S1	W0	C2

1. Concrete mixes shall conform to the above table, unless noted otherwise. Mixes shall comply with all durability requirements specified in Chapter 19 of ACI-318, based on the specified exposure class. If discrepancies exist between Chapter 19 and the above table, the most stringent requirements shall govern.
2. Material and workmanship shall be in accordance with the requirements of the American Concrete Institute "Building Code Requirements for Reinforced Concrete" (ACI 318, latest edition), and "Specifications for Structural Concrete" (ACI 301, latest edition).
3. All Cement shall conform to ASTM C 150. All fly ash and natural pozzolans shall conform to ASTM C 618. All aggregates shall conform to C 33 (NW) and/or C 330 (LW), as applicable. Water shall conform to ASTM C 1602.
4. All concrete shall have a minimum cement content of 540 lbs. per cubic yard, unless noted otherwise. Fly ash shall be used, and shall comprise no less than 15% and not more than 25% of cementitious material. Maximum aggregate size is 3/4", unless noted otherwise.
5. Calcium Chloride shall not be added to concrete.
6. Reinforcing bars shall be deformed bars and shall conform to ASTM A 615, Grade 60, unless noted otherwise. All stirrups and column ties shall conform to ASTM A 615, Grade 40. Weldable reinforcement shall conform to ASTM A 706, Grade 60.
7. Reinforcing bars shall be detailed on the shop drawing in accordance with the American Concrete Institute "ACI Detailing Manual" (ACI SP-66, latest edition), unless noted otherwise.
8. Cast-in-place steel anchor bolts shall conform to ASTM F1554, Grade 36, unless noted otherwise.
9. Bar bending details and placing drawings shall be in accordance with the "Manual of Standard Practice for Detailing Reinforced Concrete Structures" (ACI 315, latest edition).
10. Bar supports, chairs, spacers and rebar positioners shall be used to place all bars in the exact location specified on the drawings. Wire adequately at intersections to hold bars firmly in position while concrete is placed.
11. Bar supports, chairs and spacers which rest on or against an exposed surface shall be hot-dipped galvanized.
12. Continuous bars shall lap and dowels shall project adequately to provide a Class B splice, but not less than 12 inches, unless noted otherwise.
13. Stirrups, ties, footing dowels and cantilevered reinforcement shall terminate in a standard hook at the free end(s) of the bar, unless noted otherwise.
14. Where lap splice locations of horizontal bars are not specifically noted on the drawings, lap splices are to be staggered.
15. Concrete cover for reinforcement shall be as follows, subject to the tolerances of ACI 117, unless noted otherwise:
    A. Concrete poured against earth ..... 3"
    B. Concrete poured in forms but exposed to weather or earth, or concrete cast over controlled fill
       (1.) #5 bars or smaller ..... 1 1/2"
       (2.) Bars larger than #5 ..... 2"
    C. Columns, girders and beams (principle reinforcement, ties and stirrups) .... 1 1/2"
    D. Slabs and Walls ..... 3/4"
16. See mechanical and electrical drawing for additional openings, depressions, curbs, floor finishes, inserts and other embedded items.
17. Where other reinforcing is not required by the drawings, (2) #5 bars shall be located at all sides of, and adjacent to, every opening that exceeds 24" in either direction. Extend bars 24" beyond each side of opening

SPECIAL INSPECTION AND TESTS

STATEMENT OF SPECIAL INSPECTION

1. All inspection shall conform to the requirements of Section 109 of the International Building Code. All Special Inspection shall conform to the requirements of Chapter 17 of the International Building Code.
2. The owner is required to employ inspectors and special inspectors, who shall submit copies of all reports to the owner, architect, structural engineer, and the Building Department. Upon completion of their work, the inspectors and special inspectors shall submit a final signed report stating whether the work was, to the best of their knowledge, in conformance with the approved set of Contract Documents and the applicable workmanship provisions of the Building Code.
3. Inspectors and special inspector shall be qualified person(s) who demonstrate competence in their respective type of construction to the satisfaction of the Building Official.
4. The General Contractor shall coordinate with inspectors and special inspectors to incorporate the inspection schedule into the overall project construction schedule.
5. Special Inspection is required for all activities defined herein that occur for this project.
6. The Engineer of Record shall not be considered a Special Inspector.
7. The Engineer of Record shall be provided jobsite access to conduct quality assurance.

REQUIRED VERIFICATION AND INSPECTION OF SOILS

	VERIFICATION AND INSPECTION	CONTINUOUS	PERIODIC
1.	Verify materials below shallow foundations are adequate to achieve the design bearing capacity	-	X
2.	Verify excavations are extended to proper depth and have reached proper material	-	X
3.	Perform classification and testing of compacted fill materials	-	X
4.	Verify use of proper materials, densities, and lift thicknesses during placement and compaction of compacted fill	X	-
5.	Prior to placement of compacted fill, observe subgrade and verify that site has been prepared properly	-	X

REQUIRED VERIFICATION AND INSPECTION OF CONCRETE CONSTRUCTION

Verification of slump, density, temperature and air content as delivered to the project site in accordance with Chapter 3 of ACI 318 and its referenced ASTM standards
Verification of *f'c* in accordance with ACI 363.2R and its referenced ASTM standards

	VERIFICATION AND INSPECTION	CONTINUOUS	PERIODIC	REFERENCE STANDARD	IBC REFERENCE
1.	Inspection of reinforcing steel and placement	-	X	ACI 318: 3.5, 7.1-7.7	1910.4
2.	Inspection of reinforcing steel welding in accordance with IBC 2012 Table 1705.2.2, Item 2b	-	-	AWS D1.4 ACI318: 3.5.2	
3.	Inspection of anchors cast in concrete where allowable loads have been increased or where strength design is used	-	X	ACI 318: 8.1.3, 21.2.8	1908.5, 1909.1
4.	Inspection of anchors post-installed in hardened concrete members	-	X	ACI 318: 3.8.6, 8.1.3, 21.2.8	1909.1
5.	Verifying use of required design mix	-	X	ACI 318: Ch. 4, 5.2-5.4	1904.2, 1910.2,
6.	At the time fresh concrete in sampled to fabricate specimens for strength tests, perform slump and air content tests, and determine the temperature of the concrete	X	-	ASTM C 172 ASTM C 31 ACI 318: 5.6, 5.8	1910.3 1910.10
7.	Inspection of concrete and shotcrete placement for proper application techniques	X	-	ACI 318: 5.9, 5.10	
8.	Inspection of maintenance of specified curing temperature and techniques	-	X	ACI 318: 5.11-5.13	1910.6, 1910.7,
9.	Verification of in-situ concrete strength prior to removal of shores and forms from beams and structural slabs	-	X	ACI 318: 6.2	1910.8 1910.9
10.	Inspect formwork for shape, location, and dimensions of the concrete member being formed	-	X	ACI 318: 6.1.1	

Sheet List

Sheet Number	Sheet Name
112	COVER SHEET
113	ISOMETRICS AT CULVERT
114	PLANS AT CULVERT
115	SECTIONS AT CULVERT
116	FOUNDATION DETAILS
117	FOUNDATION DETAILS

BAUR & ASSOCIATES
CONSULTING ENGINEERS
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Boulder, CO 80301
303-444-9121(v), 303-415-1070(f)
jcbaur.com Project No. 23018

REVISIONS

NO.	DATE	MADE BY	CKD. BY	REMARKS
0	06/27/23	DAN	JLK	ISSUED FOR BID
1	08/03/23	DAN	JLK	CONSTRUCTION
2	-	-	-	-

REFERENCE DWGS

DRAWING NO.	REFERENCE

Climax Molybdenum
A Freeport-McMoRan Company

W. W. WHEELER & ASSOCIATES, INC
Water Resources Engineers
3700 S. Inca Street
Englewood, CO 80110-3405
303-761-4130
FAX 303-761-2802

5 DAM SEEPWATER COLLECTION AREA

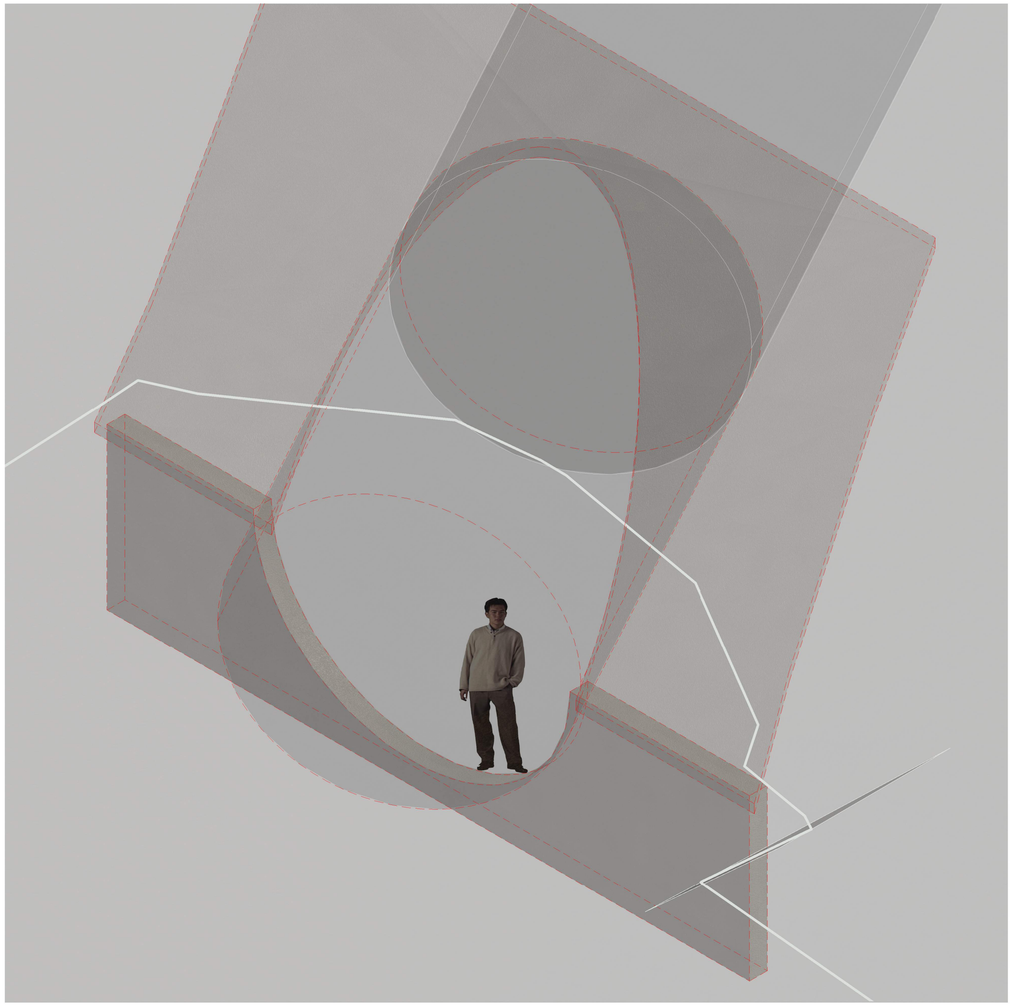
CLIMAX MOLYBDENUM CLIMAX MINE
CLIMAX, CO

SECONDARY CONTAINMENT SYSTEM

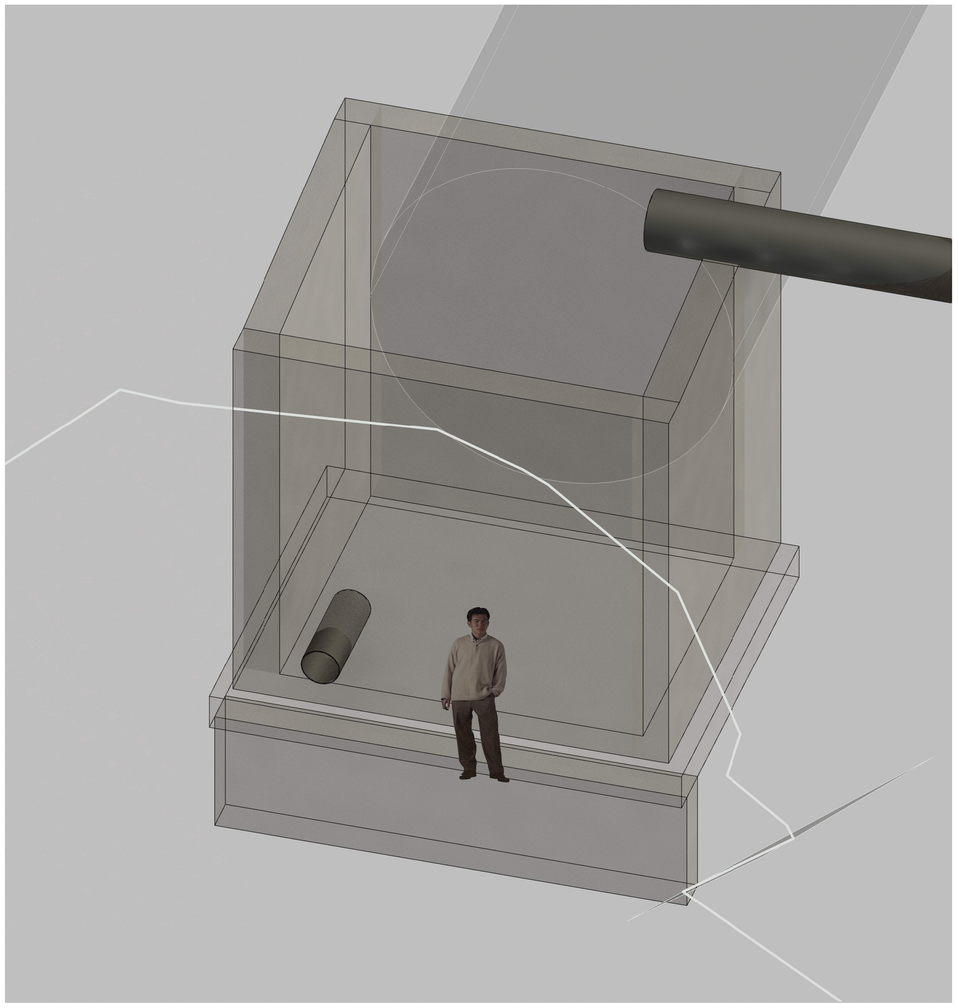
COVER SHEET

CULVERT INLET CUTOFF

MADE BY	05/30/23	PROJECT NUMBER
DAN		1051.191.17
CHECKED BY	08/03/23	DRAWING NO.
JLK		6-807-00112
ACCEPTED BY		
...		



1 113 EXISTING CULVERT ISOMETRIC



2 113 CULVERT CUTOFF ISOMETRIC

BAUR & ASSOCIATES
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Boulder, CO 80301
303-444-9121(v), 303-415-1070(f)
jcbaur.com Project No. 23018

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0	06/27/23	DAN	JLK	ISSUED FOR BID
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2	.	.	.	.

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A Freeport-McMoRan Company

W. W. WHEELER & ASSOCIATES, INC
Water Resources Engineers
3700 S. Inca Street
Englewood, CO 80110-3405
303-761-4130
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5 DAM SEEPWATER COLLECTION AREA

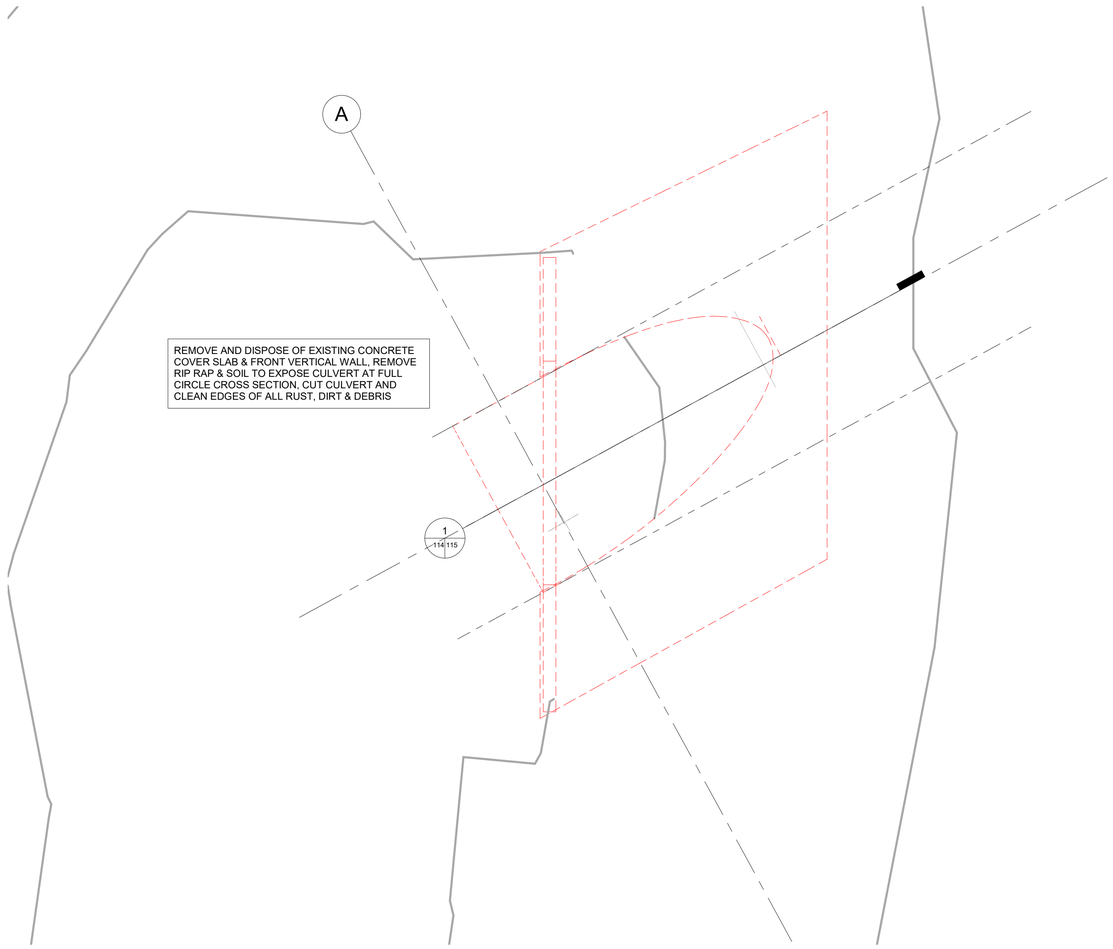
SECONDARY CONTAINMENT SYSTEM

ISOMETRICS AT CULVERT

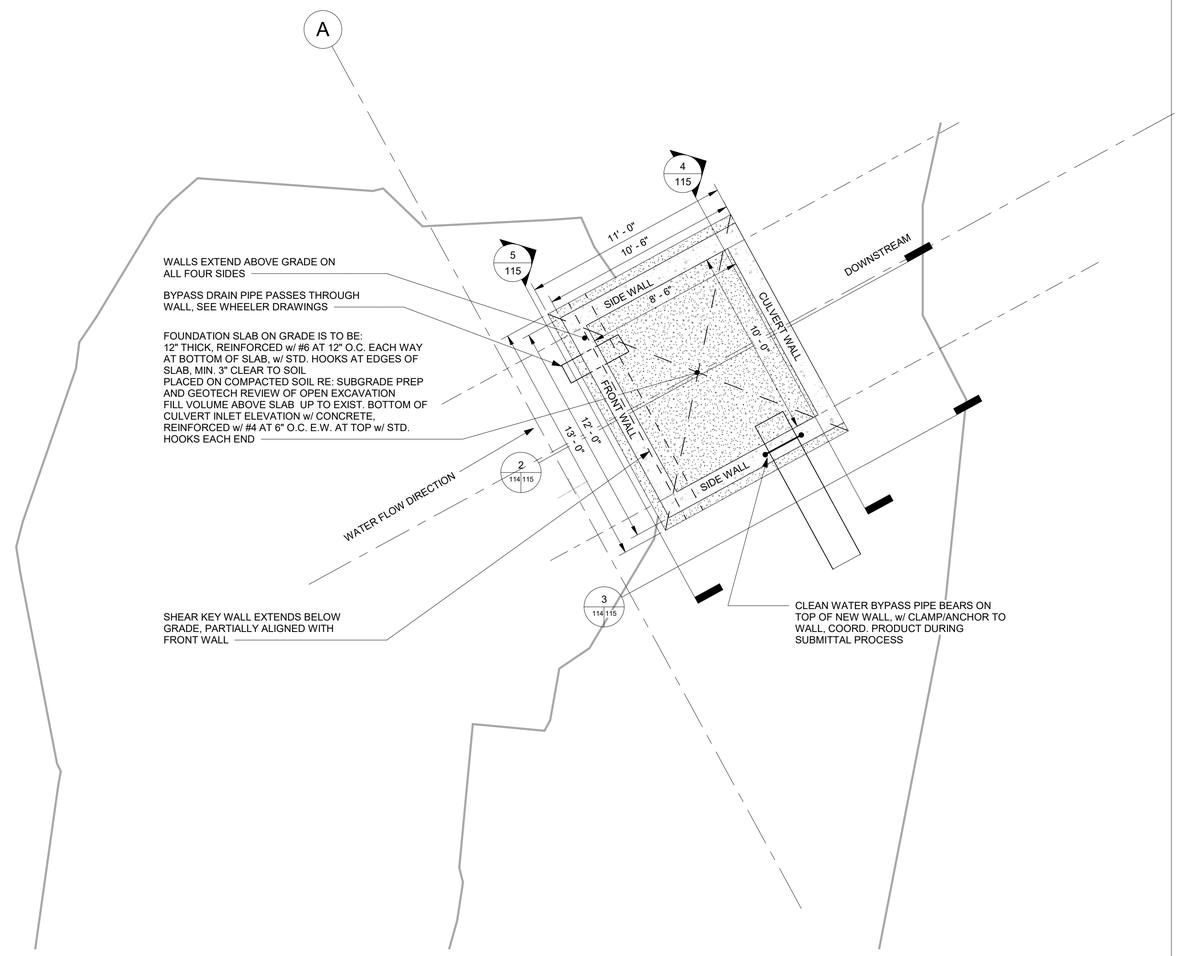
CULVERT INLET CUTOFF

CLIMAX MOLYBDENUM CLIMAX MINE
CLIMAX, CO

MADE BY	05/30/23	PROJECT NUMBER
DAN		1051.191.17
CHECKED BY	08/03/23	DRAWING NO.
JLK		6-807-00113
ACCEPTED BY		
...		



1 EXISTING CULVERT PLAN
115/114
1/4" = 1'-0"



2 RETAINING BOX PLAN
115/114
1/4" = 1'-0"

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DRAWING NO.	REFERENCE

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A Freeport-McMoRan Company

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5 DAM SEEPWATER COLLECTION AREA

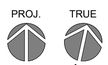
SECONDARY CONTAINMENT SYSTEM

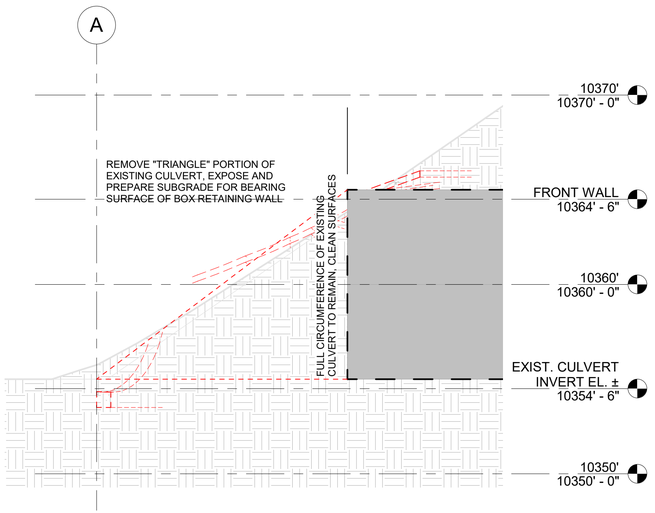
PLANS AT CULVERT

CULVERT INLET CUTOFF

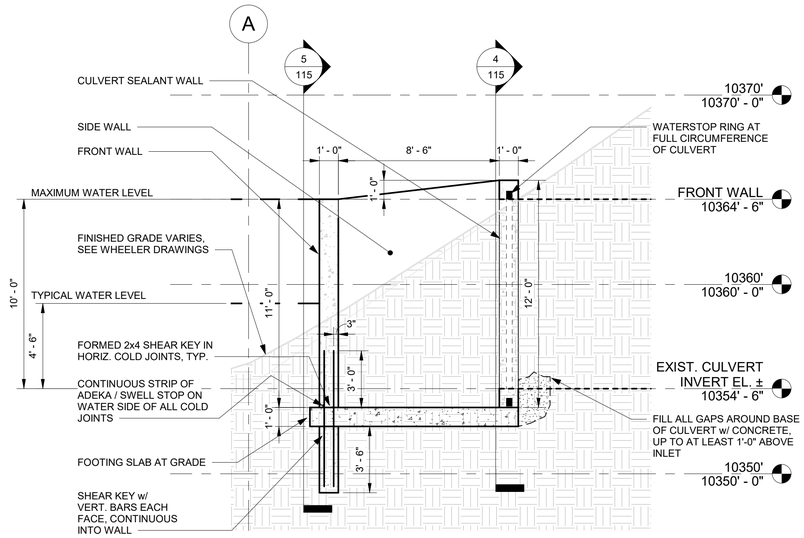
CLIMAX MOLYBDENUM CLIMAX MINE
CLIMAX, CO

MADE BY	05/30/23	PROJECT NUMBER
DAN		1051.191.17
CHECKED BY	08/03/23	DRAWING NO.
JLK		6-807-00114 △
ACCEPTED BY		
...		

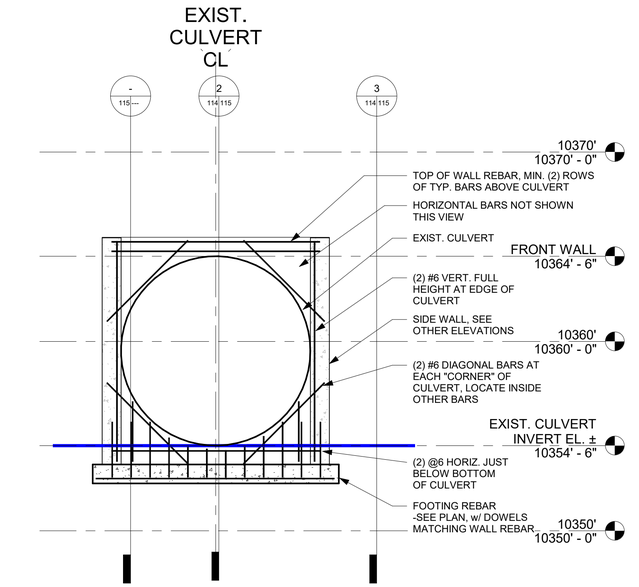




1 114|115 SECTION AT EXISTING
1/4" = 1'-0"



2 114|115 SECTION AT CENTER OF RETAINING BOX
1/4" = 1'-0"



4 114|115 SECTION AT CULVERT WALL
1/4" = 1'-0"

3 114|115 SECTION AT SOUTH SIDE WALL OF RETAINING BOX
1/4" = 1'-0"

5 114|115 SECTION AT FRONT WALL
1/4" = 1'-0"

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1	08/03/23	DAN	JLK	CONSTRUCTION
2	-	-	-	-

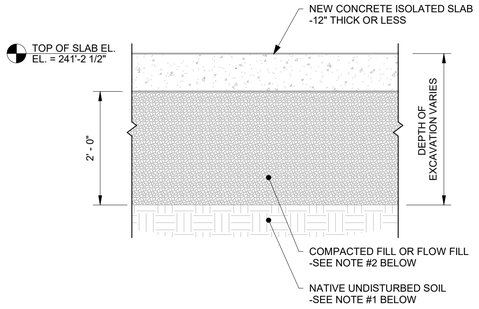
REFERENCE DWGS

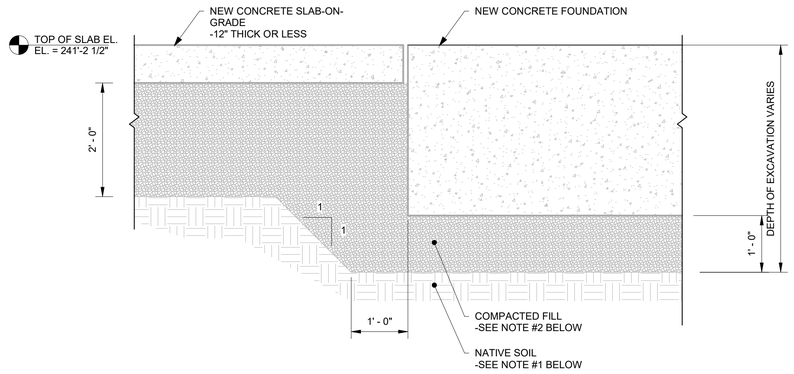
DRAWING NO.	REFERENCE

Climax Molybdenum
A Freeport-McMoRan Company

W. W. WHEELER & ASSOCIATES, INC
Water Resources Engineers
3700 S. Inca Street
Englewood, CO 80110-3405
303-761-4130
FAX 303-761-2802

5 DAM SEEPWATER COLLECTION AREA	CLIMAX MOLYBDENUM CLIMAX MINE CLIMAX, CO		
SECONDARY CONTAINMENT SYSTEM	MADE BY DAN	05/30/23	PROJECT NUMBER 1051.191.17
SECTIONS AT CULVERT	CHECKED BY JLK	08/03/23	DRAWING NO. 6-807-00115 △
CULVERT INLET CUTOFF	ACCEPTED BY ...		



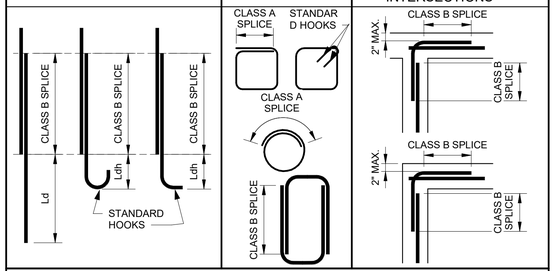


NOTES:
1. NATIVE SOIL SHALL BE COMPACTED TO 95% STANDARD PROCTOR DENSITY PRIOR TO PLACING ANY FILL. ANY WEAK, YIELDING OR UNSTABLE AREAS OF EXPOSED SOIL SHALL BE REMOVED AND REPLACED W/ STRUCTURAL FILL MATERIAL.
2. COMPACTED FILL MATERIAL SHALL CONSIST OF ONE OF THE FOLLOWING CATEGORIES
   a. NATIVE MATERIAL MEETING CRITERIA FOR COMPACTED AGGREGATE FILL, RE: GEOTECH.
      - FILL SHALL BE PLACED IN LOOSE LIFTS NOT TO EXCEED 8", AND COMPACTED TO w/ ± 2% OF OPTIMUM MOISTURE CONTENT, TO 95% OF MODIFIED PROCTOR ASTM D 1557.
   b. CEMENTITIOUS FLOWABLE FILL.
3. G.C. SHALL COORDINATE QUALITY ASSURANCE FOR SUBGRADE PREPARATION w/ A GEOTECHNICAL ENGINEER IN ACCORDANCE W/ THE GEOTECHNICAL REPORT.
4. REFER TO GEOTECHNICAL REPORT FOR ADDITIONAL INFORMATION AND REQUIREMENTS.

1 SUBGRADE PREPARATION
116
3/4" = 1'-0"

CONCRETE DEVELOPMENT LENGTH AND LAP SPLICE SCHEDULE [3,4,5]

PRIMARY REINFORCEMENT | CLOSED TIES | CORNERS AND INTERSECTIONS

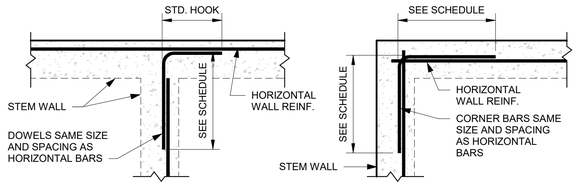


CONCRETE STRENGTH f'c = 4500 psi, BAR YIELD STRENGTH fy = 60,000 psi

BAR SIZE	Ld AND CLASS A SPLICE (in.) TOP REINF. [2]	Ld AND CLASS A SPLICE (in.) OTHER REINF.	CLASS B SPLICE (in.) TOP REINF. [2]	CLASS B SPLICE (in.) OTHER REINF.	Ldh (in.)
3	12	12	14	11	7
4	14	12	19	14	9
5	18	14	23	18	12
6	21	17	28	21	14

NOTES:
1. TABULATED DEVELOPMENT LENGTHS AND BAR SPLICES SHALL BE CONSIDERED THE MINIMUM REQUIREMENT UNLESS NOTED OTHERWISE.
2. TOP BARS ARE ANY HORIZONTAL BARS WITH MORE THAN 12" OF CONCRETE CAST BELOW THE REINFORCEMENT.
3. TABULATED LENGTHS/SPLICES ASSUME THE FOLLOWING: CLEAR COVER OF BARS NOT LESS THAN 1 1/2"; CLEAR SPACING BETWEEN BARS NOT LESS THAN ONE DIAMETER OR 1", WHICHEVER IS GREATER; 1 OR 2-BAR BUNDLES ONLY; NORMAL WEIGHT CONCRETE; GRADE 60 REBAR (fy = 60,000 PSI), AND UNCOATED REINFORCEMENT. IF THESE CONDITIONS VARY, THEN THE TABULATED LENGTHS/SPLICES SHALL BE MULTIPLIED BY THE FOLLOWING FACTORS, AS APPLICABLE. IF MORE THAN ONE CONDITION APPLIES, THEN MULTIPLIERS SHALL BE CUMULATIVE.
   CLEAR COVER LESS THAN 1 1/2"....1.60
   LIGHTWEIGHT CONCRETE.....1.33
   GRADE 40 REBAR.....0.67 (CONTRACTOR OPTION)
   EPOXY-COATED REBAR.....1.30 FOR "TOP REINF."
   1.50 FOR "OTHER REINF."
   1.20 FOR Ldh
   THE FINAL LENGTH/SPLICE SHALL NOT BE LESS THAN 6" FOR Ldh AND 12" FOR ALL OTHER CASES. FOR CONDITIONS NOT DEFINED IN THIS TABLE OR NOTES, COORDINATE LENGTHS/SPLICES WITH THE ENGINEER.
4. MECHANICAL AND WELDED SPLICES SHALL DEVELOP 125% OF THE BAR YIELD STRENGTH fy.
5. IF BARS OF VARYING SIZE AND/OR STRENGTH ARE SPLICED, THEN THE LONGER SPLICE LENGTH SHALL BE USED.

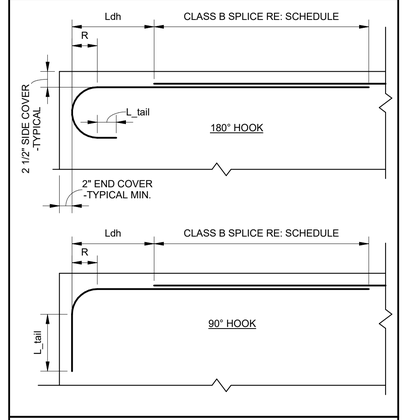
2 CONCRETE DEVELOPMENT LENGTH AND LAP SPLICE SCHEDULE
116
1" = 1'-0"



THIS DETAIL TO BE USED IN CONJUNCTION W/ ACI REBAR LAP SCHEDULE

4 WALL INTERSECTION REINFORCING
116
3/4" = 1'-0"

STANDARD HOOK GEOMETRY
FOR PRIMARY REINFORCING IN TENSION



TOP BAR SIZE	BEND RADIUS "R" (in.)	L_tail (in.) 180° HOOK	L_tail (in.) 90° HOOK
3	1.3125	2.50	4.50
4	1.75	2.50	6.00
5	2.1875	2.50	7.50
6	2.625	3.00	9.00
7	3.0625	3.50	10.5
8	3.50	4.00	12.0
9	4.50	4.50	13.5

3 STANDARD HOOK GEOMETRY
116
1" = 1'-0"

REVISIONS

NO.	DATE	MADE BY	CKD. BY	REMARKS
0	06/27/23	DAN	JLK	ISSUED FOR BID
1	08/03/23	DAN	JLK	CONSTRUCTION
2	.	.	.	.
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REFERENCE DWGS

DRAWING NO.	REFERENCE

Climax Molybdenum
A Freeport-McMoRan Company

W. W. WHEELER & ASSOCIATES, INC
Water Resources Engineers
3700 S. Inca Street
Englewood, CO 80110-3405
303-761-4130
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BAUR & ASSOCIATES
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5485 Conestoga Ct. Suite 200,
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jcbaur.com Project No. 23018

5 DAM SEEPWATER COLLECTION AREA

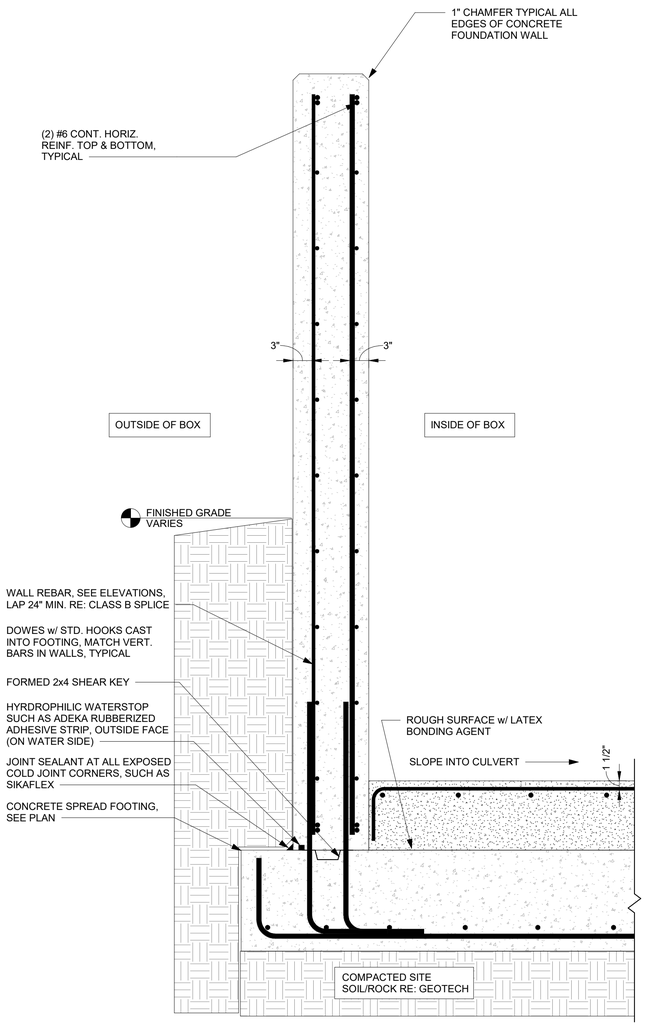
SECONDARY CONTAINMENT SYSTEM

FOUNDATION DETAILS

CULVERT INLET CUTOFF

CLIMAX MOLYBDENUM CLIMAX MINE
CLIMAX, CO

MADE BY		PROJECT NUMBER
DAN	05/30/23	1051.191.17
CHECKED BY		DRAWING NO.
JLK	08/03/23	6-807-00116 △
ACCEPTED BY		
...		



1 / 117 TYP. WALL SECTION
1" = 1'-0"

REVISIONS	NO.	DATE	MADE BY	CKD. BY	REMARKS
	0	06/27/23	DAN	JLK	ISSUED FOR BID
	1	08/03/23	DAN	JLK	CONSTRUCTION
	2	.	.	.	.
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REFERENCE DWGS	DRAWING NO.	REFERENCE

Climax Molybdenum
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5 DAM SEEPWATER COLLECTION AREA

SECONDARY CONTAINMENT SYSTEM

FOUNDATION DETAILS

CULVERT INLET CUTOFF

CLIMAX MOLYBDENUM CLIMAX MINE
CLIMAX, CO

MADE BY		PROJECT NUMBER
DAN	05/30/23	1051.191.17
CHECKED BY		DRAWING NO.
JLK	08/03/23	6-807-00117 △
ACCEPTED BY		
...		

5-Dam Seep-water Collection Area, Secondary Containment System
Submitted with TR-36

The following narrative describes the purpose and need for the project, including technical details such as basin, pump and pipe sizing, and the proposed construction sequence and QA/QC process.

Purpose and Need

- The project involves addition of an Environmental Protection Facility (EPF) and is entirely within the currently permitted affected lands boundary.
- The project is intended to prevent events similar to that which occurred on August 5, 2022 at Climax, when a fitting on a primary seepage conveyance pipe failed and a small amount of process water ultimately flowed outside of containment. The system will also capture potential shallow process water seepage from the Mayflower Tailings Storage Facility (TSF) and nearby seepage collection ponds and infrastructure. Ultimately, the project will help protect water quality in Tenmile Creek (which begins about 0.5 miles north/downgradient of the project site).
- The project involves constructing a seepage collection and pump-back system to collect potential impacted seepage and direct this water back into the Mayflower seepage water management system.

Major Project Components

- The project involves relocating a small ~2,500 cy topsoil stockpile from the future pipeline route to another location adjacent to 5-Dam (to be used for dam reclamation in 2024).
- Project involves removing an existing concrete headwall at the inlet of the 120-inch diameter corrugated metal pipe (CMP) that currently conveys water under Old Hwy 91 (downstream of the Mayflower Clear Pond). This will make room for construction of the new cutoff wall and collection sump.
- The project involves constructing a cutoff wall, collection pond, and pumping infrastructure downstream of the Mayflower Clear Pond. Any water collected in the sump would be conveyed back to the Mayflower Clear Pond. This system is similar to another seep-water collection/secondary containment EPF below Robinson Lake.
- Pumping infrastructure would consist of an 18-inch diameter corrugated HDPE (CHDPE) intake pipe from the sump to a wet well, a wet well, submersible pumps, and an 8-inch diameter pipeline consisting of Steel (inside the building footprint) and HDPE piping from the pumps to the Mayflower Clear Pond. The wet well and pumps would be contained/covered inside a small 12’ x 15’ building.
- Detailed plan and design drawings are attached to this submittal.

Project Location and Background

- The project’s general location is depicted on Drawing No. 6-807-00101. The site is located downgradient of the Mayflower Tailings Storage Facility (TSF) and below the Mayflower TSF seepage collection facilities. The site is fully within Climax’s affected lands boundary.
- Currently, seepage emanating from the toe of Mayflower TSF (known as 5-Dam) is captured using an engineered drainage collection network of pipes. This captured seepage water is initially routed into two parallel concrete-lined seepage collection ponds. This water then flows

into another concrete-lined pond called the Mayflower Clear Pond. It is here where this water is routed into a pumping system and sent back to the Mayflower TSF pool. This system comprises the '5 Dam Seep-water Collection and Return System' EPF contained in the Climax Mine EPP (Appendix T, Section 5.3.2).

- The EPF proposed in this TR will be located downgradient of the 5 Dam Seep-water Collection and Return System EPF, to serve as secondary containment for potential upsets and collection of potential impacted seepage. The purpose of the project is to protect water quality in Tenmile Creek, which begins about 0.5 miles downgradient of the project site.
- The site is located about 0.5 miles upgradient of the beginning/headwaters of Tenmile Creek. Note that Tenmile Creek begins at the 'Parshall Flume', or Outfall 001A as defined in Regulation 33, 5 Code of Colorado Regulations (CCR) 1002-33. All construction work is planned to occur on previously disturbed channel and surface that was previously used for historic water treatment operations.
- The General Arrangement (GA) of the site is depicted on Drawing No. 6-807-00102. Water flow direction is generally west to east and is depicted with flow direction arrows. Note that there are three 'spoil piles' depicted within the project area, but those are topography map artifacts and have been previously removed from the site. The topsoil stockpile on the GA drawing has also been relocated to a site adjacent to 5 Dam for near-term reclamation on the dam face.

Contributing Drainage Modification

- The 'Existing Collection Channel' depicted on Drawing No. 6-807-00102 will feed the collection pond and pump-back system EPF. A hydrologic analysis was performed (see below section) to determine how much water could potentially report to the new EPF via this channel.
- To reduce the amount of unimpacted water reporting to the EPF, an evaluation was conducted to identify opportunities for diverting or otherwise modifying how natural runoff reports to the local drainage systems. Drawing No. 6-807-00107 depicts three culverts that will be plugged. These culverts, if left unplugged, would otherwise convey unimpacted runoff (from undisturbed surface) under Old Highway 91 and eventually to the 'Existing Collection Channel' shown in Drawing No. 6-807-00102. By plugging these three culverts, unimpacted runoff water will stay on the south side of Old Highway 91 in an existing road ditch and stay out of the EPF system. Culverts will be plugged with concrete and the road channel will be graded as depicted on Drawing No. 6-807-00107.

Hydrologic Analysis

- Design basis. The EPF system was sized to be capable of containing and pumping the runoff from a 100-year Average Recurrent Interval (ARI) storm event. A hydrologic analysis was completed to evaluate the runoff volume from the contributing basin and determine a corresponding pumping rate and detention storage capacity to contain the 100-year flow.
- Inflow hydrology. A hydrologic model for the Secondary Containment Basin using U.S. Army Corps of Engineers Hydrologic Engineering Center, Hydrologic Modeling Systems (HEC-HMS) software, Version 4.11 Beta 13 (USACE, 2023) was developed. General guidelines for model construction and parameter derivation are from Hydrologic Basin Response Parameter Guidelines (Sabol, 2008). The hydrologic analysis was used as a basis to size pumps to route flow from the Secondary Containment Pool (a.k.a. collection pond).

- Basin characteristics. The contributing drainage basin was delineated using ArcMap 10.7 software (ESRI, 2019) on 2016 digital elevation model (DEM) tiles. This basin includes modifications to the area based on proposed project changes (i.e., the culvert modifications under Old Hwy 91), resulting in a 4.4-acre basin. The current outflow point to the basin is a 10-foot diameter CMP culvert that runs underneath Old Highway 91 and into the local drainage channel. Climax proposes to construct a seepage cutoff wall around the culvert intake, retaining the containment pond behind the wall. Below is the stage-capacity table for the containment pond.

Interpolated to integer elevation values:

Elevation-Area-Capacity Table			
Water Elevation	Surface Area*		Storage Capacity
(feet)	(sq. ft.)	(acres)	(ac-ft)
10,354.2	0	0.00	0.000
10,355.0	61	0.00	0.002
10,356.0	259	0.01	0.005
10,357.0	696	0.02	0.018
10,358.0	1,436	0.03	0.041
10,359.0	2,299	0.05	0.080
10,360.0	3,182	0.07	0.147
10,361.0	4,148	0.10	0.231
10,362.0	5,084	0.12	0.338
10,363.0	7,256	0.17	0.468
10,364.0	9,413	0.22	0.662
10,365.0	11,012	0.25	0.894
10,366.0	12,537	0.29	1.150
All other values are interpolated from this table.			
**Values above 10365.0 are extrapolated			

*From GIS contour shapefile

- Precipitation. Precipitation estimates for this study were developed using MetPortal 2.2.0 (MetPortal, 2019). MetPortal guidance recommends a point precipitation frequency estimate for basins smaller than 50 square miles. Only two storm types to govern peak runoff behavior were considered due to the small size of the basin:
    1. 100-year Local Storm, 2-hour duration, 1.41-inches precipitation with a "Synthetic West" temporal distribution; and
    2. 100-year Mesoscale with Embedded Convection (MEC) Storm, 6-hour duration, 1.69-inches precipitation with a "Synthetic West" temporal distribution.

  Longer duration storms were not considered for this study as they result in smaller peak inflows into the basin. The seasonality of the storm was considered to determine if the precipitation would fall as rain or snow. From the MetPortal guidance, both the 2-hour and 6-hour storms are most likely to occur in July or August (MetPortal, 2019). It was conservatively assumed the precipitation would fall as rainfall since summer temperatures at Climax are typically above freezing.

- Vegetation, Soil, and Infiltration. A key consideration in the hydrologic model of this basin is the volume of water lost to interception and infiltration. The (Sabol, 2008) guidelines recommend the Green/Ampt Loss Rate (G/A) method for storms having ARI equal to or less than 100 years. This method accounts for ponding at the soil surface and for infiltrated water. Mine Permit Amendment 06 (AM-06) Figure AM-06-J-01 provided vegetation coverage information for the Secondary Containment Basin (Habitat, 2010). Adjustments were made to the coverage percentages using aerial photos and field observations. Minor adjustments were also made to the unit delineation to increase the accuracy to the scale of the basin. The "Holy Cross Soil Survey: Copper Mountain and Climax Quadrangles" (USDA, 2003) and associated report provided soil unit information over the basin. The USDA data includes soil texture information recorded at multiple depths. The (Sabol, 2008) provides saturated hydraulic conductivity values based on the most restrictive soil texture in each soil map unit (SMU). The soil data were supplemented with knowledge of impervious asphalt/concrete pads in the basin. Minor adjustments were made to the SMU delineations to increase the accuracy to the scale of the basin and to add the containment pool. The saturated hydraulic conductivities for each unit were used to compute an areal-weighted average of "bare soil surface" saturated hydraulic conductivity. In lieu of an estimated hydraulic conductivity for the "Made Lands" soil unit, it was assumed impervious conditions over the unit due to the lack of information over the soil texture. This assumption would account for any unknown buried asphalt or concrete within the unit. Other G/A loss parameters were estimated from satellite imagery and knowledge of the basin. The parameters were adjusted for effective slope, vegetal cover, and antecedent moisture condition following the recommendations in the (Sabol, 2008) document. The spoil piles captured in the 2016 Climax mapping were not included in any slope calculations.

- Baseflow. The baseflow in the Secondary Containment basin is difficult to estimate due to the lack of a measurement gage or a comparable gaged basin in the region. When a basin lacks a gaged measurement point, it is typical to make a comparison to a similar basin and scale the baseflow based on certain basin characteristics. The typical approach is not applicable in this case due to the very small size, relatively shallow slope and mostly unvegetated lands. Most comparable gaged basins in the area are large, with significant vegetation cover, and steep slopes. Additionally, this basin experiences significant upstream regulation in the form of snow removal/relocation over the mine roadway that passes through the center. Using field estimations and site knowledge, it was conservatively estimated the peak baseflow to be 50 gpm (16.2 cfs/mi^2). This baseflow is comparable to the previously estimated 10-year ARI peak day annual baseflow of 17.5 cfs/mi^2, as obtained from the 2019 Clinton & Mayflower Canal Flood Assessment Report (Wheeler, 2019).

- Modeling storm and containment/pump sizes. Two models were constructed using the inputs and assumptions described above. These models evaluate basin hydrology, a governing storm event, and multiple design components for the Secondary Containment civil design.

  The first model was to determine the governing storm in the Secondary Containment Basin. The required size of conduit was also evaluated with the first model to route flows into the wet well. The governing storm is the storm which results in a higher peak water surface elevation (WSEL).

The following table summarizes the basin hydrology results used to determine the governing storm.

Storm	Peak Discharge (cfs)	Direct Runoff Volume (acre-feet)	Containment * Pool Peak WSEL (ft)	Time to Peak Inflow/Discharge* (HH:MM)
100-yr ARI, 2-hr LS	5.73	0.33	10361.7	00:28
100-yr ARI, 6-hr MEC	5.31	0.38	10361.5	01:03

* Modeled with 6-inch outlet conduit outflow (see Attachment 5 for other configurations)

The above table shows that the governing storm for this design is the 100-year ARI, 2-hour Local Storm, as it results in a higher peak water surface elevation in the Containment Pool. While the 100-year ARI, 6-hour MEC Storm has a higher total storm volume, the average discharge over the storm is much lower than the 2-hour storm and is not as limiting when routing flow out of the Containment Pool. A 40-foot-long conduit will route water from the Containment Pool to the wet well. This conduit must convey flow while neither limiting the flow rate into the wet well, nor overtopping the cutoff wall. The analysis shows that 6-inch diameter and larger conduits can meet both objectives at cutoff wall crest elevation of 10363.5. Increases to the cutoff wall height does allow for a smaller conduit, but an 18-inch conduit is included in the design due to concerns with clogging at the inlet.

The second model used the governing storm determined from the first model (2-hour 100-year storm). The second model was iterated at specified cutoff wall crest elevations to determine the minimum pumping rate required to prevent a loss of containment. The required pumping rate is a function of three items: the peak inflow rate, the volume into the Containment Pool, and the pump activation elevation. A lower cutoff wall requires a larger pumping rate to convey inflow without a loss of containment, and the converse for a taller cutoff wall. Peak discharge from a 100-year ARI, 2-hour Local Storm occurs very quickly, requiring the pump to manage most of the storm volume immediately at smaller cutoff wall heights. A taller cutoff wall reduces the pump size by providing more detention storage to mitigate the impact of the peak discharge.

Additionally, the pump activation elevation factors into how much time and/or elevation the pump has before it must route inflows out of the Secondary Containment Pool. At lower wall elevations, the activation elevation must also decrease, to provide enough time for the pump to respond to the rapid peak inflow. It was concluded that a reasonable option would be to incorporate two pumps in the design: one to manage baseflow into the Secondary Containment Pool, and another to route larger inflows from rainstorms or periods of large snowmelt. The small pump would use a variable frequency drive (VFD) to reduce the stress on the pump. The large pump would activate at a certain elevation above the normal pool. This two-pump system resolves issues with balancing the pump activation elevation for a single large pump, while reducing stress through the use of a VFD. The selected pump activation trigger elevation for Model 2 (for the larger pump) is 10359.5, a half-foot above the normal pool. This provides enough elevation so the large pump will not activate at baseflow-scale flows, but will activate soon enough to capture larger storm events. The below table presents the modeled pumping rates at various cutoff wall crest elevations.

Cutoff Wall Crest Elevation (ft)	Pumping Rate*		Containment Pool Peak WSEL (ft)	Residual Freeboard (ft)
	(gpm)	(cfs)		
10362.5	250	0.56	10362.1	0.4
10363.5	250	0.56	10362.1	1.4
10362.5	500	1.1	10361.6	1.9

The model results support multiple configurations of the pumping system, but it is recommended a Cutoff Wall crest elevation of 10363.5 with a total pumping rate of 250 gpm (this assumes a large pump capacity of at least 200 gpm and small pump capacity of at least 50 gpm). A "worst-case scenario" model was also evaluated, with 100% impervious soil and no initial surface storage, and the cutoff wall crest of 10363.5 provides more storage to contain the additional runoff volume, whereas 10362.5 does not (results in overtopping at crest 10362.5). While this scenario is very unlikely, it does suggest that the extra foot of concrete provides significant contingency for the containment system which is why this configuration is recommended. In the event that flows result in the overtopping of the cutoff wall crest, this water will safely spill over the rear concrete wall into the adjacent/existing 120-inch diameter CMP that conveys water under Old Highway 91 (as it did prior to construction and operation of this EPF).

- Hydrology study and modeling conclusions. This section of the narrative detailed the hydrologic analysis used to size pumps and detention storage for the Secondary Containment System. Based on the pump sizing results and discussion, the following are conclusions from the evaluation:
    1. The cutoff wall crest elevation should be set at 10363.5.
    2. A target total pumping capacity of at least 250 gpm (~0.56 cfs) should be employed through a two-pump installation.
        a. The first pump should have a capacity of at least 50 gpm and use a VFD to manage baseflows and reduce stress on the pump. Wheeler intends this pump to be in near-continuous use.
        b. The second pump should have a capacity of at least 200 gpm. The pump should activate at elevation 10359.5 to intermittently manage heavy rainfall and periods of large snowmelt.
    3. Construct an 18-inch diameter connection conduit between the Secondary Containment Pool and wet well.

Secondary Containment Concrete Cutoff Construction

- Drawing No. 6-807-00104 depicts a plan and section view of the secondary containment system.
- Some minor vegetation clearing is expected where the cutoff structure and 18-inch diameter CHDPE intake pipe will be constructed. Limited grading and vegetation removal work in the existing drainage channel is anticipated.
- Dewatering will occur during construction and is expected to involve a temporary sump (just upstream of the project work) and pumping system to pump run-on water to the Mayflower Clear Pond.

- The existing inlet concrete headwall at the 120-inch diameter CMP will be modified to allow for installation of the culvert inlet cutoff structure. The inlet concrete headwall will be modified by removing the headwall portions as depicted on Drawing No. 6-807-1005, including any surrounding vegetation to perform the work.
- Drawings depicting the Secondary Containment Concrete Cutoff Structure layout, foundation details, concrete specifications, dimensions, reinforcement plan, and tests/inspection requirements are contained in Drawing Nos. 6-807-00112 through 6-807-00117.
- Note that the design and construction plans specify a 12-inch diameter pipe penetration (18-inches long, with a blind flange on the interior of the cutoff structure) through the front of the containment cutoff wall. The purpose of this pipe is to allow for potential pumping of the collection pool for sediment removal or other maintenance activities.

Pump Station

- An 18-inch diameter corrugated HDPE (CHDPE) intake pipe will run from the collection pool (at elevation 10,357 ft amsl) to the wet well. This pipe will supply the wet well and is depicted in detail in plan and cross-section on Drawing No. 6-807-00104.
- A deicing agitator will be installed in the center of the containment pool with mooring cables and be electrically powered. The agitator is depicted on the plan view on Drawing No. 6-807-00104.
- The pump station will generally consist of a wet well (fed by the 18-inch diameter CHDPE pipe), a set of submersible pumps (described more fully in the Hydrology Analysis above), an outlet piping system and a pump building. The pump station location Is depicted on Drawing No. 6-807-00104. Dimensions, materials and detailed plan and cross-section views are depicted on Drawing No. 6-807-00109.
- The 2-inch (~50 gpm with VFD) and 3-inch (~200 gpm) submersible pumps will feed into a manifold on a 6-inch diameter pipe inside the pump building. This will transition to an 8-inch diameter HDPE buried pipeline just outside the pump building. The pump lines within the wet well will be fitted with check valves to prevent the system from unintentionally 'backdraining' from the discharge end (at the Mayflower Clear Pond) back into the wet well. The discharge system will be fitted with a separate 3-inch diameter drain back to the wet well to allow for manual pipeline draining when the 3-inch diameter gate valve is opened.
- The system will be fitted with a pressure gage and flow meter to track how much water is pumped back to the Mayflower Clear Pond. The pump building will also be fitted with a jib crane for pump maintenance. Miscellaneous details such as wet well grating and pump building safety bollards are depicted on Drawing No. 6-807-00110.
- The normal water level in the containment pool and wet well will be maintained at approximately 10,359 ft amsl.
- The 8-inch diameter HDPE discharge pipe will convey water from the wet well to the Mayflower Clear Pond. The plan and profile of this line is depicted on Drawing No. 6-807-00106. Details of the pipeline trench and the discharge point are depicted on Drawing No. 6-807-00108.

Construction Schedule

- A construction schedule is attached in accordance with Rule 6.4.21(15). The schedule is based on task lengths (in case start date gets delayed and renders subsequent dates inaccurate). Upon TR

approval, Climax commits to providing an updated schedule to the Division with start date and expected milestones.

Construction Phases

- Pursuant to Rule 7.3.1(1), the below construction phases have been identified.
- The construction phases in which inspections shall be conducted are:
    - Cutoff trench and slope excavation at new concrete cutoff structure location
    - Placement of compacted structural backfill
    - Install reinforced concrete for the seepage cutoff structure
    - Wet well manhole excavation and gravel bedding under manhole
    - Compacted backfill placement around manhole
    - 18-inch diameter corrugated intake pipe excavation and backfill bedding from wet well to containment pond
    - Wet well pump station floor slab (foundation gravel, concrete placement)
    - Wet well pump and piping install, leak test
    - 8-inch diameter HDPE discharge line from wet well to Clear Pond, excavation and backfill, leak test

Quality Assurance and Quality Control

- The facility certification and phased inspections (QA/QC) will be performed by W.W. Wheeler Engineers or their designee. In the specifications (see Drawing No. 6-807-00112) are the QA/QC requirements and standards; key verifications and inspections are summarized as follows:

    Required Verification and Inspection of Soils:

    - Verify materials below shallow foundations are adequate to achieve the design bearing capacity (periodic inspections)
    - Verify excavations are extended to proper depth and have reached proper material (periodic inspections)
    - Perform classification and testing of compacted fill materials (periodic inspections)
    - Verify use of proper materials, densities, and lift thicknesses during placement and compaction of compacted fill (continuous inspections)
    - Prior to placement of compacted fill, observe subgrade and verify that site has been prepared properly (periodic inspections)

    Required Verification and Inspection of Concrete Construction

    - Inspection of reinforcing steel and placement (periodic inspection)
    - Inspection of reinforcing steel welding
    - Inspection of anchors cast in concrete where allowable loads have been increased or where strength design is used (periodic inspection)
    - Inspection of anchors post-installed in hardened concrete members (periodic inspection)
    - Verifying use of required design mix (periodic inspection)

- At the time fresh concrete in sampled to fabricate specimens for strength tests, perform slump and air content tests, and determine the temperature of the concrete (continuous inspection)
- Inspection of concrete and shotcrete placement for proper application techniques (continuous inspection)
- Inspection of maintenance of specified curing temperature and techniques (periodic inspection)
- Verification of in-situ concrete strength prior to removal of shores and forms from beams and structural slabs (periodic inspection)
- Inspect formwork for shape, location, and dimensions of the concrete member being formed (periodic inspection)

Permitting and Associated Documentation

- Per Rule 7.2.8, Climax commits to updating the Environmental Protection Plan (EPP) in the form of a Technical Revision (TR) with the required information from this TR, for an Environmental Protection Facility (EPF). This will be submitted to the Division by December 15, 2023.
- Because this TR involves addition of fixed site infrastructure, Climax commits to including the facility in forthcoming updates to the Reclamation Plan, Maps and Cost Model submittal, to be provided to the Division by April 1, 2024, pursuant to Rule 6.4.12.
- PE-stamped as-built drawings certifying construction is/was completed in accordance with the plans will be submitted to DRMS upon completion.

Construction Schedule

- Expected start date 10/2/2023 (subject to change based on TR approval).
- Some tasks overlap.
- Note that electrical work will be self-performed by Climax and due to supply chain issues, certain long-lead components may not be available until after the civil construction work is complete. Leak testing and other activities that require electricity will be powered with a mobile generator.

Task	Estimated Start date	Estimated Task Length
Survey	10/2/2023	5 days
Mobilization	10/7/2023	1 day
Dewatering, set-up, and maintenance	10/8/2023	9 days
Demolition of inlet headwall on 120-inch dia. culvert	10/12/2023	1 day
Install cutoff structure	10/13/2023	9 days
Install wet well	10/23/2023	2.5 days
Install grating and beam, discharge pipe, 18-inch diameter pipe, submersible pumps and valves in pump house	10/26/2023	4.5 days
Perform leak test on pump station discharge pipes	11/1/2023	0.5 days
Install pump house concrete slab	11/2/2023	2.5 days
Install pump house	11/7/2023	8 days
Install 8-inch diameter HDPE discharge pipe	11/9/2023	12.5 days
Perform leak test on 8-inch HDPE pipe	11/22/2023	0.5 days
Plug culverts	11/27/2023	1 day
Punch list items	11/28/2023	2 days
Electrical (by Climax)	TBD based on availability of electrical components	2 weeks
Clean-up and demobilization of civil contractor	12/1/2023	1 day