



MINERALS PROGRAM INSPECTION REPORT
PHONE: (303) 866-3567

The Division of Reclamation, Mining and Safety has conducted an inspection of the mining operation noted below. This report documents observations concerning compliance with the terms of the permit and applicable rules and regulations of the Mined Land Reclamation Board.

MINE NAME: Goose Haven Reservoir #2- Complex Expansion	MINE/PROSPECTING ID#: M-2010-071	MINERAL: Borrow material for construction	COUNTY: Boulder
INSPECTION TYPE: Monitoring	INSPECTOR(S): Amy Eschberger	INSP. DATE: April 1, 2021	INSP. TIME: 10:00
OPERATOR: The City of Lafayette	OPERATOR REPRESENTATIVE(S): Melanie Asquith, Jon File	TYPE OF OPERATION: 112c - Construction Regular Operation	

REASON FOR INSPECTION: Normal I&E Program	BOND CALCULATION TYPE: N/A	BOND AMOUNT: No Bond Held
DATE OF COMPLAINT: N/A	POST INSP. CONTACTS: None	JOINT INSP. AGENCY: None
WEATHER: Clear	INSPECTOR'S SIGNATURE: 	SIGNATURE DATE: April 7, 2021

The following inspection topics were identified as having Problems or Possible Violations. OPERATORS SHOULD READ THE FOLLOWING PAGES CAREFULLY IN ORDER TO ASSURE COMPLIANCE WITH THE TERMS OF THE PERMIT AND APPLICABLE RULES AND REGULATIONS. If a Possible Violation is indicated, you will be notified under separate cover as to when the Mined Land Reclamation Board will consider possible enforcement action.

INSPECTION TOPIC: Hydrologic Balance

PROBLEM: The Division has no evidence the operator has a valid well permit, substitute water supply plan (SWSP), or approved water augmentation plan for the exposed groundwater at the site. Specifically, the Division does not have a copy of the current SWSP in place for the site (the most recent SWSP on file was submitted to our office on February 2, 2016 for the period of January 1, 2015 through December 31, 2016). This is a problem pursuant to C.R.S 34-32.5-116(4)(h) and Rule 3.1.6(1)(a) governing injury to existing water rights.

CORRECTIVE ACTIONS: The operator shall demonstrate the operation is in compliance with the Office of the State Engineer (SEO) by the corrective action date specified.

CORRECTIVE ACTION DUE DATE: May 19, 2021

INSPECTION TOPIC: Gen. Compliance With Mine Plan and Reclamation Plan

POSSIBLE VIOLATION: The operator has failed to comply with the conditions of an order, permit, or regulation pursuant to C.R.S. 34-32.5-124. Specifically, the operator has failed to comply with the mining and reclamation plans approved in the permit by constructing a new clay-lined reservoir within the affected lands and by failing to submit the required quarterly groundwater monitoring data on an annual basis (the most recent

groundwater level monitoring data on file was submitted to our office on September 8, 2015).

CORRECTIVE ACTIONS: This matter will be scheduled for consideration by the Mined Land Reclamation Board (MLRB) at their May 19, 2021 meeting, during which, the MLRB may issue a violation, assess a civil penalty, and/or order corrective actions. A Reason to Believe a Violation Exists and Notice of Board Hearing letter will be sent to the operator separately from this report.

CORRECTIVE ACTION DUE DATE: May 19, 2021 (MLRB Hearing)

OBSERVATIONS

This was a normal monitoring inspection of the Goose Haven Reservoir #2 – Complex Expansion (Permit No. M-2010-071) conducted by Amy Eschberger of the Division of Reclamation, Mining and Safety (Division). The operator was represented by Melanie Asquith and Jon File during the inspection. The site is located approximately two miles north of the City of Lafayette, CO in Boulder County. Access to the site is from the east off of US-287/N 107th St. The affected lands are owned by the operator. **Photos 1-36** taken during the inspection are included with this report.

This is a 112c operation permitted for 232 acres (see enclosed Google Earth image of site and Exhibit C – Pre-Mine Plan Map submitted with AM-01) to mine sand and gravel via dry mining methods. The permit area includes two existing clay-lined reservoirs (Reservoirs #1 and #3) which were mined under another permit (M-1985-158, released on December 7, 2010). The two existing reservoirs are now owned and operated by the City of Lafayette. The initial approved permit included creating a third reservoir (Reservoir #2) to the south and west of the existing reservoirs. A slurry wall was to be installed around the third pit prior to mining in order to isolate it from the surrounding alluvial aquifer. The permit Amendment (AM-01) approved on January 10, 2017 changed the method of lining the reservoir from slurry wall to compacted clay liner and also added an additional clay-lined reservoir (Reservoir #4) to the northeastern portion of the site (see enclosed Exhibit D – Mine Plan Map Sheets 1 and 2 submitted with AM-01).

The approved mining plan includes constructing dewatering trenches around the perimeter of the active excavation area, pumping water from the trenches to settling ponds located on the pit floor, then routing the water under the Lower Boulder Ditch (located north of the site) to a return flow canal that discharges to Boulder Creek. The operator holds a discharge permit from the Colorado Department of Public Health and Environment (CDPHE), Water Quality Control Division (WQCD) for this outfall. Mining highwalls will have slope gradients that vary from 1H:1V to 3H:1V. Material excavated from Reservoir #2 is transported to the material processing plant staged in the Reservoir #4 area via haul trucks and a conveyor system. Salvaged topsoil and overburden will be stored separately in the area located west of Reservoir #2 for use in reclamation.

The approved post-mining land use for the site is developed water resources. The approved reclamation plan (see enclosed Exhibit F Sheets 1 and 2 submitted with AM-01) includes creating two additional clay-lined water storage reservoirs (Reservoirs #2 and #4) with a combined water surface area of approximately 56 acres, leaving a total of four clay-lined reservoirs on site (including the two existing reservoirs). The reservoirs will be connected via pipelines that conform to SEO standards. A subsurface drain (underdrain) will be constructed along the eastern and southern edges of Reservoir #2 to prevent a rise in groundwater that may potentially impact a residential structure located within 200 feet from the southeast corner of the reservoir. This drain will free flow and empty into Reservoir #1 to the north.

Once the clay liner is completed for each reservoir, the slopes will be backfilled to a 3H:1V gradient using overburden material stored on site (see enclosed Exhibit E – Figure 1 Typical Section submitted with AM-01). After the slopes have been backfilled to the final slope configuration, a protective shell composed of processed on site rock will be placed on the slope from the ground surface above to 10 feet below the expected normal pool elevation in the reservoir. This protective shell will be placed to a thickness of 7 inches and bedded into 6 inches of Type I granular bedding. Finally, a protective soil cover will be placed to a depth of 6-8 inches on horizontal exposures of the compacted clay liner at the crest of the slope and revegetated with a grass seed mixture (comprised of Thickspike wheatgrass, Sideoats grama, Switchgrass, and Alfalfa). The Division would like to remind the operator of its commitment in AM-01 to provide the Division with the final construction report and certification for the pit liners after they have been completed. The operator also committed to notifying the Division once reservoir slopes have been reclaimed to the final grade and prior to filling the

reservoir with water, so the Division can conduct a site inspection to assess the work completed.

Disturbed areas around the reservoirs will be retopsoiled at a depth of approximately one foot and revegetated with the same seed mixture mentioned above. The topsoil/overburden storage area (approximately 70 acres in size) located west of Reservoir #2 will be ripped to reduce compaction and revegetated for reclamation. The main access road and the gravel roads constructed around the perimeter of each reservoir will remain for reclamation. Various structures related to management of the reservoirs (e.g., pipelines, maintenance buildings, monitoring wells) will also remain for reclamation. Structures related to the mine operation such as the scale, conveyor system, and processing equipment, will be removed for reclamation.

The approved groundwater monitoring plan for the site includes obtaining water levels on a quarterly basis from 7 piezometers installed upgradient and downgradient of the four reservoirs. An additional water level measurement will be obtained from each piezometer just prior to beginning the compacted clay liner and drain installation. This monitoring data is to be submitted to the Division with the annual report (due by October 18th of every year).

At the time of the inspection, the weather was clear and sunny, although a big storm event had occurred in the area a few days prior to the inspection. The operation was actively mining the Reservoir #2 pit (in the southern portion of the permit area) and the Reservoir #4 pit (in the northeastern portion of the permit area) during the inspection. The conveyor system installed from the Reservoir #2 pit to the processing plant in the Reservoir #4 pit was offline during the inspection, and according to the operator, will no longer be used by the operation. Mined material was being transported to the processing plant via haul trucks. Dewatering trenches were installed around the inside perimeter of the active pits. Water from the Reservoir #2 pit is pumped to a series of sediment ponds constructed on the floor of the Reservoir #4 pit, from which the water is ultimately discharged to Boulder Creek under a CDPHE discharge permit. The processing plant was active during the inspection. Processed material is temporarily stockpiled on the pit floor until needed off site. Several sand, gravel, and clay stockpiles were stored on the pit floors.

The eastern portion of the Reservoir #4 pit has been mostly mined out. According to the mining plan, this pit will be mined to a maximum depth of approximately 22 feet. The processing plant will soon need to be moved to the center of the pit so the western portion of the pit can be mined deeper. The operation is in the process of installing the clay liner around the inside perimeter of this pit. The Division observed where the clay liner has been partially installed along the northeastern, eastern, and southeastern edges of the pit at a 3H:1V or flatter slope gradient. In these areas, approximately 5-8 feet of near vertical highwall remains above the top of the compacted clay liner. Once the clay liner is completed, overburden material will be backfilled against the claystone as needed to achieve the final slope configuration, and a protective shell of processed rock will be placed along the top 10 feet of the lined reservoir slopes. Standing water was present in the eastern portion of the Reservoir #4 pit, which the operator indicated was melted snow/stormwater. The operator apparently holds a Substitute Water Supply Plan (SWSP) with the Division of Water Resources (DWR) which covers depletions that occur due to evaporative losses from exposed groundwater in dewatering trenches and sediment ponds, and operational losses due to water lost in mined product and dust control. However, the most recent SWSP on file was submitted to our office on February 02, 2016 for the period of January 1, 2015 through December 31, 2016. **Therefore, the Division has no evidence the operator has a valid well permit, substitute water supply plan (SWSP), or approved water augmentation plan for the exposed groundwater at the site. A problem is cited in this report (see page 1), requiring the operator to demonstrate the site is in compliance with the Office of the State Engineer (SEO)/DWR.**

The operation is also in the process of installing the clay liner around the inside perimeter of the Reservoir #2 pit. The Division observed where the clay liner has been partially installed along the northern, western, and

eastern edges of the pit at a 3H:1V or flatter slope gradient. As mentioned above, once the clay liner is completed, overburden material will be backfilled against the compacted clay to achieve the final slope configuration and a protective rock shell will be placed along the top 10 feet of the reservoir slopes. According to the mining plan, this pit will be mined to a maximum depth of approximately 30 feet. Standing water was also observed on the floor of this pit which the operator attributed to snow melt/stormwater. The operator should be advised, per DWR's requirements, if stormwater runoff is intercepted by an operation and is not diverted or captured in priority, it must be released to the stream system within 72 hours. This may require a discharge permit from CDPHE WQCD. Otherwise, the operator must make replacements for evaporation.

Salvaged topsoil and overburden are stockpiled in the area west of the Reservoir #2 pit for use in reclamation, per the approved mining plan. However, the northern portion of this area is being developed into another clay-lined reservoir, which is not part of the approved mining and reclamation plans. The operation has excavated a pit in this area approximately 35 acres in size and approximately 30 feet deep (at the eastern end). Standing water was also present on the floor of this pit, particularly at the deeper eastern end. According to aerial imagery available in Google Earth, it appears the operation began excavating the new pit in early 2018 (a year after AM-01 was approved). The operator estimates construction of the clay liner around this pit is approximately 80% complete. The operator indicated the eastern edge of the reservoir is being constructed as a dam in coordination with the DWR's Dam Safety Program. The Division has not reviewed or approved any design specifications for the construction of this dam. Additionally, the operator has not demonstrated what impacts construction of the additional clay-lined reservoir will have on the prevailing hydrologic balance of the affected land and surrounding area in accordance with Rule 3.1.6. The Ground Water Response Study prepared by CTL Thompson Inc., dated September 8, 2010, and the groundwater monitoring and mitigation plan submitted with AM-01 do not address the new reservoir.

This is cited as a possible violation in this report (see page 1) for failing to comply with the conditions of a permit pursuant to C.R.S. 34-32.5-124. Specifically, the operator has failed to comply with the mining and reclamation plans approved in the permit by constructing a new clay-lined reservoir within the affected lands. The operator has also failed to comply with the approved permit by failing to submit the required quarterly groundwater monitoring data on an annual basis (the most recent groundwater level monitoring data on file was submitted to our office on September 8, 2015). This matter will be scheduled for consideration before the Mined Land Reclamation Board (MLRB) at their May 19, 2021 meeting, during which, the MLRB may issue a violation, assess a civil penalty, and/or order corrective actions. The Division will recommend the required corrective actions include submitting an Amendment application to update the mining and reclamation plans and maps for the site to address the new reservoir construction. The Amendment application must also demonstrate that construction of the new reservoir will have a minimal disturbance on the prevailing hydrologic balance of the affected land and surrounding area in accordance with Rule 3.1.6. A Reason to Believe a Violation Exists and Notice of Board Hearing letter will be sent to the operator separately from this report, including more details on the MLRB hearing.

The Division observed the two reservoirs which existed on site prior to issuance of this permit. These reservoirs have slopes graded to 3H:1V or flatter, with a layer of riprap placed along the slopes up to approximately 5 feet above and 5 feet below the current water level. The portion of the reservoir slopes above the riprap layer has a well-established grass cover. These reservoirs will not be re-disturbed by the current operation. However, they will be part of the reservoir complex in which all the reservoirs are connected via pipelines.

No financial warranty is held for this operation since the permittee is a unit of municipal government, in accordance with Rule 4.1.2(2).

It has come to the Division's attention that the Permitting contact and Inspection contact for this permit,

currently listed as Aaron Asquith, need to be updated. The operator can change the contact information for this permit through the ePermitting system available from our website at <https://drms.colorado.gov>.

This concludes the report.

Any questions or comments regarding this inspection report should be forwarded to Amy Eschberger at the Colorado Division of Reclamation, Mining and Safety, 1313 Sherman Street, Room 215, Denver, CO 80203, via telephone at 303-866-3567, ext. 8129, or via email at amy.eschberger@state.co.us.

PHOTOGRAPHS



Photo 1. View looking east across southeastern edge of Reservoir # 4 pit, showing partially installed clay liner (indicated with arrows) with slopes of 3H:1V or flatter. Note standing water on pit floor.

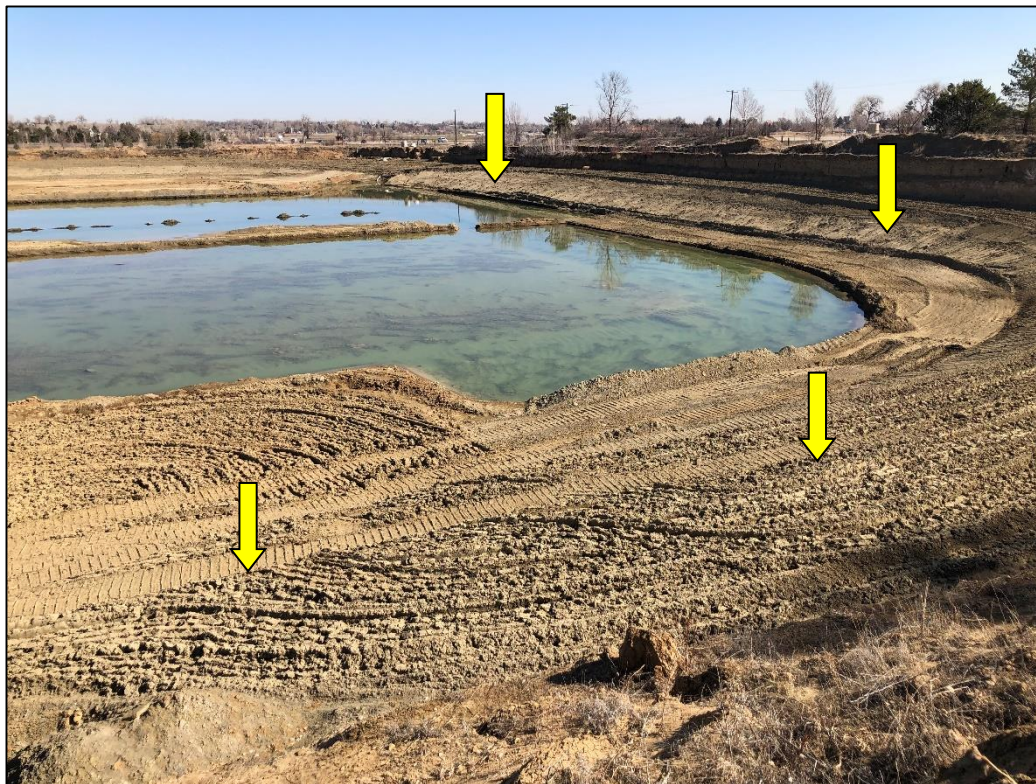


Photo 2. View looking northeast across eastern edge of Reservoir # 4 pit, showing partially installed clay liner (indicated with arrows) with slopes of 3H:1V or flatter. Note standing water on pit floor.



Photo 3. View looking north across eastern portion of Reservoir # 4 pit. Note standing water on pit floor.



Photo 4. View looking west across southern edge of Reservoir # 4 pit. Note dewatering trench present along inside perimeter of pit and clay liner not yet installed in this area.



Photo 5. View looking north across central portion of Reservoir # 4 pit. Note various material stockpiles stored on pit floor.



Photo 6. View looking northwest across western portion of Reservoir # 4 pit. Note various material stockpiles stored on pit floor and processing plant operating in background.



Photo 7. View looking northeast across northwestern portion of Reservoir #4 pit. This portion of the pit will be mined deeper. The clay liner has not yet been installed in this area.



Photo 8. View looking southeast across one of two settling ponds present in northwestern portion of Reservoir #4 pit. Water from settling ponds is routed north of site to eventually discharge into Boulder Creek.



Photo 9. View looking west across western portion of Reservoir #4 pit, showing one of two settling ponds (in foreground), and processing plant (in background).



Photo 10. View looking north across conveyor system installed between Reservoir #2 pit (to the south) and processing plant in Reservoir #4 pit (to the north). This system was offline during the inspection, and according to operator, will no longer be used by the operation.



Photo 11. View looking west across northern edge of Reservoir #2 pit. Note partially installed clay liner (indicated with arrows).



Photo 12. View looking southwest across Reservoir #2 pit. Note various material stockpiles stored on pit floor and some standing water present on pit floor.



Photo 13. View looking south across northeastern portion of Reservoir #2 pit. Note conveyor system not in use by operation. Mined material from this pit is currently transported via haul trucks to processing plant in Reservoir #4 pit.



Photo 14. View looking south across eastern edge of Reservoir #2 pit, showing partially installed clay liner (indicated with arrows). Note standing water on pit floor.



Photo 15. View looking northeast across Reservoir #2 pit. Note various material stockpiles stored on pit floor and some standing water present on pit floor.



Photo 16. View looking north across western edge of Reservoir #2 pit, showing partially installed clay liner (indicated with arrows).



Photo 17. View looking north across eastern edge of new (unauthorized) reservoir pit, showing near vertical highwalls and partially installed clay liner (indicated with arrows) forming “dam”.



Photo 18. View looking north across eastern portion of new (unauthorized) reservoir pit, showing partially installed clay liner (indicated with arrows) forming “dam” and standing water on pit floor. Note inside slopes of clay liner at 3H:1V or flatter.



Photo 19. View looking northwest across eastern portion of new (unauthorized) reservoir pit, showing partially installed clay liner (indicated with arrows) and material stockpiles on pit floor. Note standing water on pit floor.



Photo 20. View looking west across new (unauthorized) reservoir pit. Note standing water on pit floor (at right).



Photo 21. View looking west across southern edge of new (unauthorized) reservoir pit where clay liner has not been installed. Note overburden stockpiles (above pit wall) in storage area south of reservoir.



Photo 22. View looking north across central portion of new (unauthorized) reservoir pit. Note various material stockpiles on pit floor and some standing water.



Photo 23. View looking northwest across central portion of new (unauthorized) reservoir pit.



Photo 24. View looking north across western edge of new (unauthorized) reservoir pit, showing partially installed clay liner (indicated with arrows) and standing water on pit floor. Note inside slopes of clay liner at 3H:1V or flatter.



Photo 25. View looking southeast across topsoil/overburden storage area located west of Reservoir #2 pit and directly south of new (unauthorized) reservoir pit.



Photo 26. View looking south across topsoil/overburden storage area located west of Reservoir #2 pit and directly south of new (unauthorized) reservoir pit. It appears this area is also being used to process material for pit liner construction.



Photo 27. View looking southwest across topsoil/overburden storage area located west of Reservoir #2 pit and directly south of new (unauthorized) reservoir pit.



Photo 28. View looking west across topsoil/overburden storage area located west of Reservoir #2 pit and directly south of new (unauthorized) reservoir pit.



Photo 29. View looking east at large gravel stockpile stored at western edge of topsoil/overburden storage area. This material will be used to construct the protective upper shell along the upper portion of clay-lined reservoir slopes.



Photo 30. View looking west across northern edge of existing clay-lined Reservoir #1 located in northwestern portion of permit area.



Photo 31. View looking southwest across existing clay-lined Reservoir #1 located in northwestern portion of permit area.



Photo 32. View looking west across southern edge of existing clay-lined Reservoir #1 located in northwestern portion of permit area.



Photo 33. View looking southwest across northwestern edge of existing clay-lined Reservoir #3 located in southeastern portion of permit area.



Photo 34. View looking south across existing clay-lined Reservoir #3 located in southeastern portion of permit area.



Photo 35. View looking east across northeastern edge of existing clay-lined Reservoir #3 located in southeastern portion of permit area.



Photo 36. View looking east at main site entrance off US-287/N 107th Street where scale and scale house are located.

GENERAL INSPECTION TOPICS

The following list identifies the environmental and permit parameters inspected and gives a categorical evaluation of each

(AR) RECORDS-----	<u>N</u>	(FN) FINANCIAL WARRANTY-----	<u>NA</u>	(RD) ROADS-----	<u>Y</u>
(HB) HYDROLOGIC BALANCE-----	<u>PB</u>	(BG) BACKFILL & GRADING-----	<u>Y</u>	(EX) EXPLOSIVES-----	<u>NA</u>
(PW) PROCESSING WASTE/TAILING----	<u>N</u>	(SF) PROCESSING FACILITIES-----	<u>Y</u>	(TS) TOPSOIL-----	<u>Y</u>
(MP) GENL MINE PLAN/RECLAM PLAN COMPLIANCE-	<u>PV</u>	(FW) FISH & WILDLIFE-----	<u>N</u>	(RV) REVEGETATION----	<u>N</u>
(SM) SIGNS AND MARKERS-----	<u>Y</u>	(SP) STORM WATER MGT PLAN----	<u>N</u>	(ST) STIPULATIONS-----	<u>N</u>
(ES) OVERBURDEN/DEV. WASTE-----	<u>Y</u>	(SC) EROSION/SEDIMENTATION---	<u>Y</u>		
(AT) ACID OR TOXIC MATERIALS-----	<u>NA</u>	(OD) OFF-SITE DAMAGE-----	<u>Y</u>		

Y = Inspected / N = Not inspected / NA = Not applicable to this operation / PB = Problem cited / PV = Possible violation cited

Inspection Contact Address

Melanie Asquith
The City of Lafayette
1290 South Public Road
Lafayette, CO 80026

Encls: Google Earth image of site
Exhibit C – Pre-Mining Plan Map, submitted with AM-01
Exhibit D – Mine Plan Map Sheet 1, submitted with AM-01
Exhibit D – Mine Plan Map Sheet 2, submitted with AM-01
Exhibit F – Sheet 1, submitted with AM-01
Exhibit F – Sheet 2, submitted with AM-01
Exhibit E – Figure 1 Typical Section, submitted with AM-01

CC: Michael Cunningham, DRMS

M-2010-071 / Goose Haven Reservoir #2 - Complex Expansion / The City of Lafayette

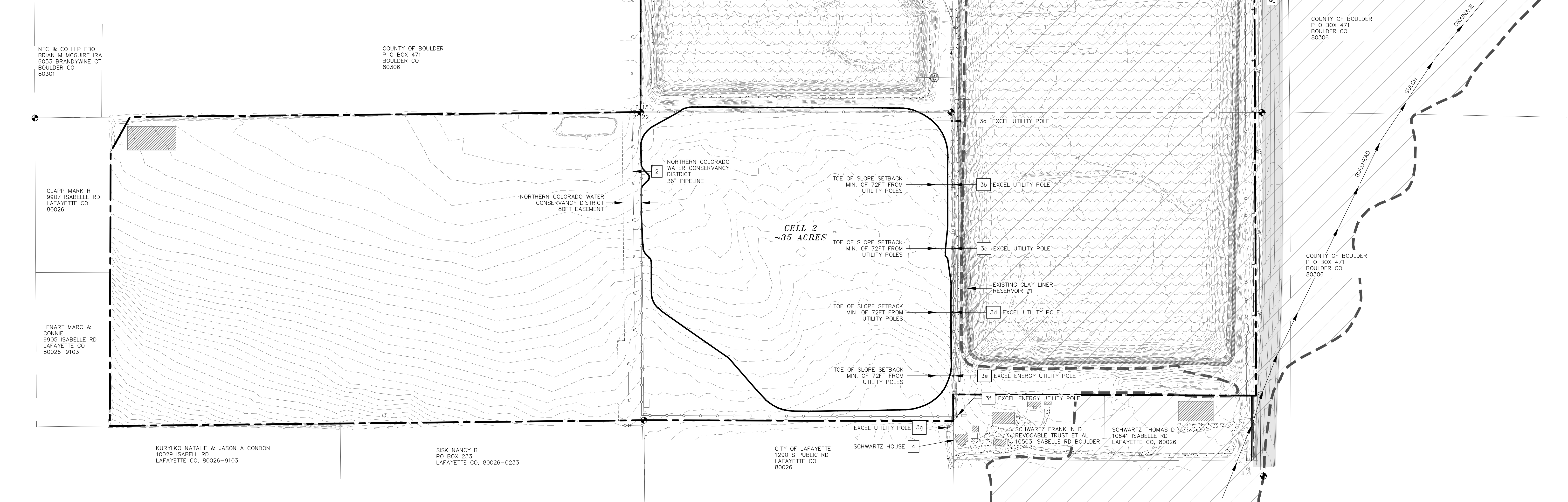
Red outline = 232 acres = Approved permit area (location approximated based on permit maps)

Yellow outline = 35 acres = New (unauthorized) clay-lined reservoir construction

(Image data from 10/15/2020)



LEGEND	
EXISTING	PROPOSED
PROPERTY/PERMIT BOUNDARY AND AFFECTED AREA BOUNDARY	MINING LIMITS OF EXCAVATION
SURROUNDING PARCEL BOUNDARY	
UNDERGROUND WATER PIPELINE	
UNDERGROUND ELECTRIC	
OVERHEAD POWER LINE	
UNDERGROUND TEL LINE	
CANAL	
CHAIN LINK FENCE	
UTILITY POLE	
ELEVATION CONTOUR LINE (5FT)	
ELEVATION CONTOUR LINE (1FT)	
GRAVEL ROAD	
BUILDING	
RESERVOIR	
100 YR FLOODPLAIN	



REVISIONS			
REV	DESCRIPTION	DATE	APPROVED



WSI Weiland, Inc.
Environmental & Engineering

PO BOX 18087
BOULDER, CO 80308
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GOOSE HAVEN RESERVOIR COMPLEX EXPANSION #2,#4

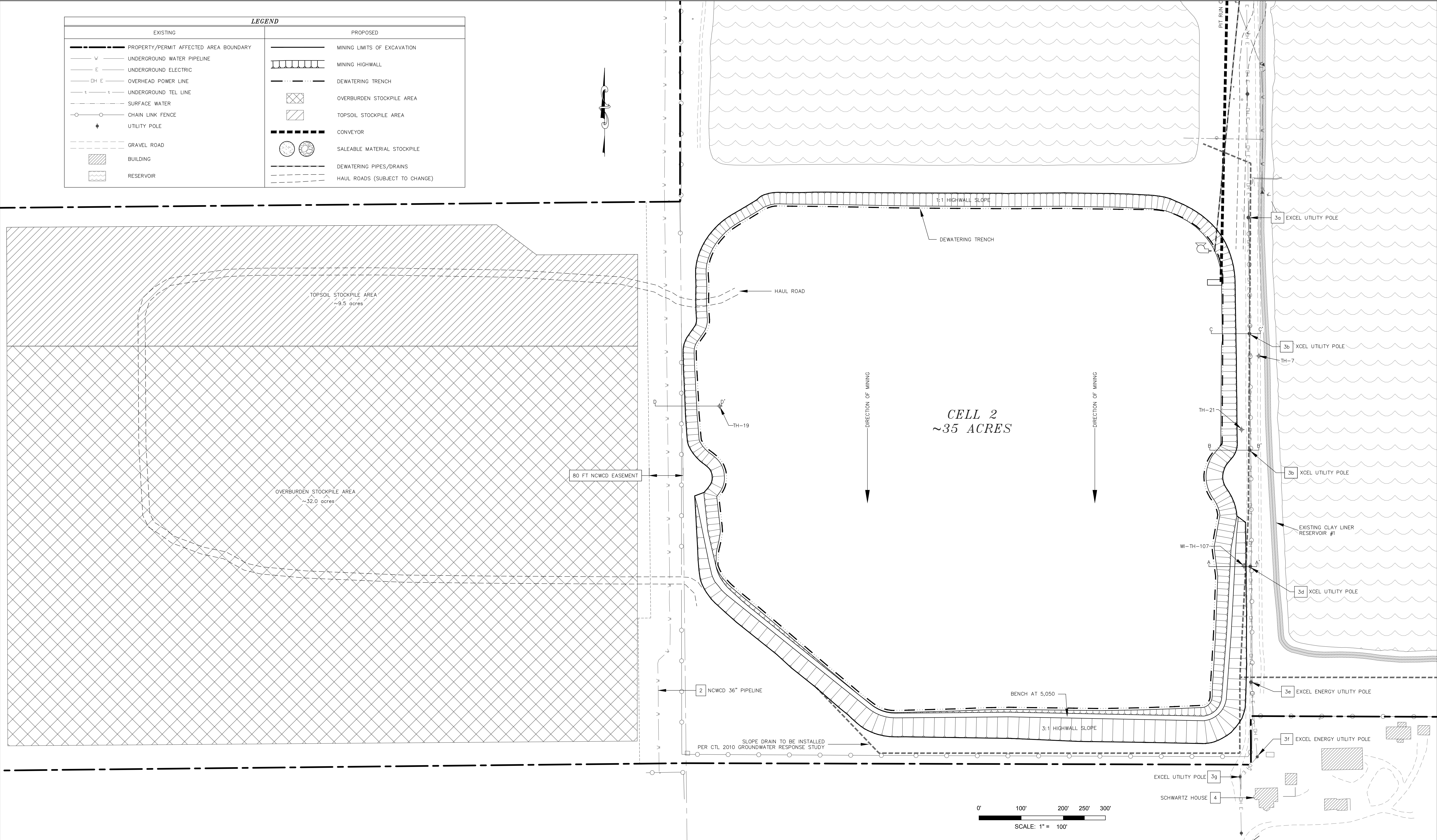
REGUALR 112 MINING PERMIT

LAFAYETTE, CO

ROCK PRODUCTS

PREPARED FOR:

EXHIBIT C - PRE-MINE PLAN MAP			
SCALE	DWG NO.	REV.	REV.
1"=200'	EXHIBIT C PRE-MINE PLAN MAP A-1.DWG		
DRAWN BY:	CHECKED BY:	DATE:	SHEET
CTW	PFW	10/31/16	SHEET 1 of 1



REVISIONS			
REV	DESCRIPTION	DATE	APPROVED



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GOOSE HAVEN RESERVOIR COMPLEX EXPANSION #2,#4

REGUALR 112 MINING PERMIT

LAFAYETTE, CO

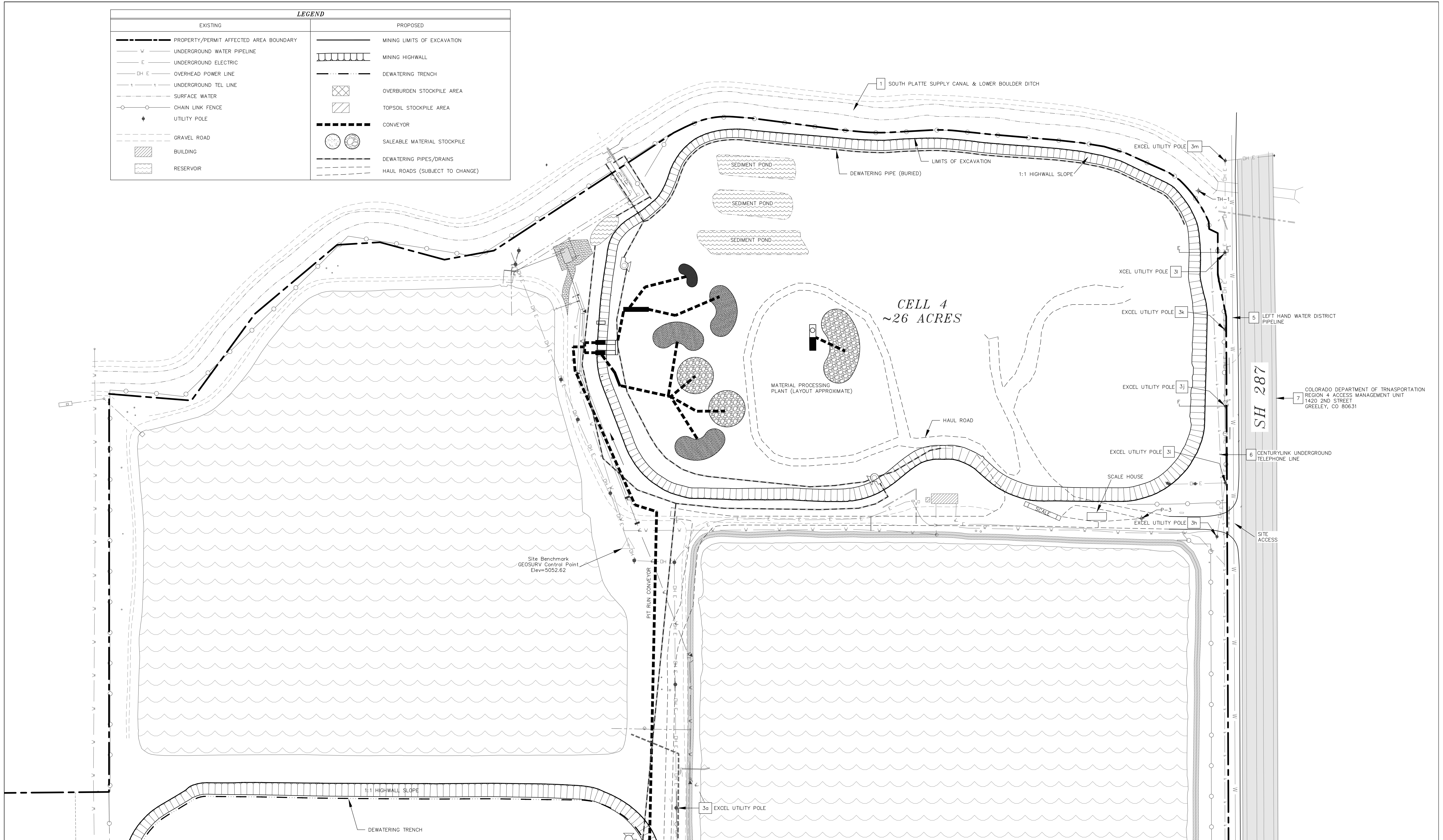
ROCK PRODUCTS

PREPARED FOR:

EXHIBIT D - MINE PLAN MAP

SHEET 1

SCALE 1"=100'	DWG NO. EXHIBIT D MINE PLAN MAP SHEETS 1-2 A-2.DWG	REV REV
DRAWN BY: CTW	CHECKED BY: PFW	DATE: 01/09/17
		SHEET SHEET 1 of 2



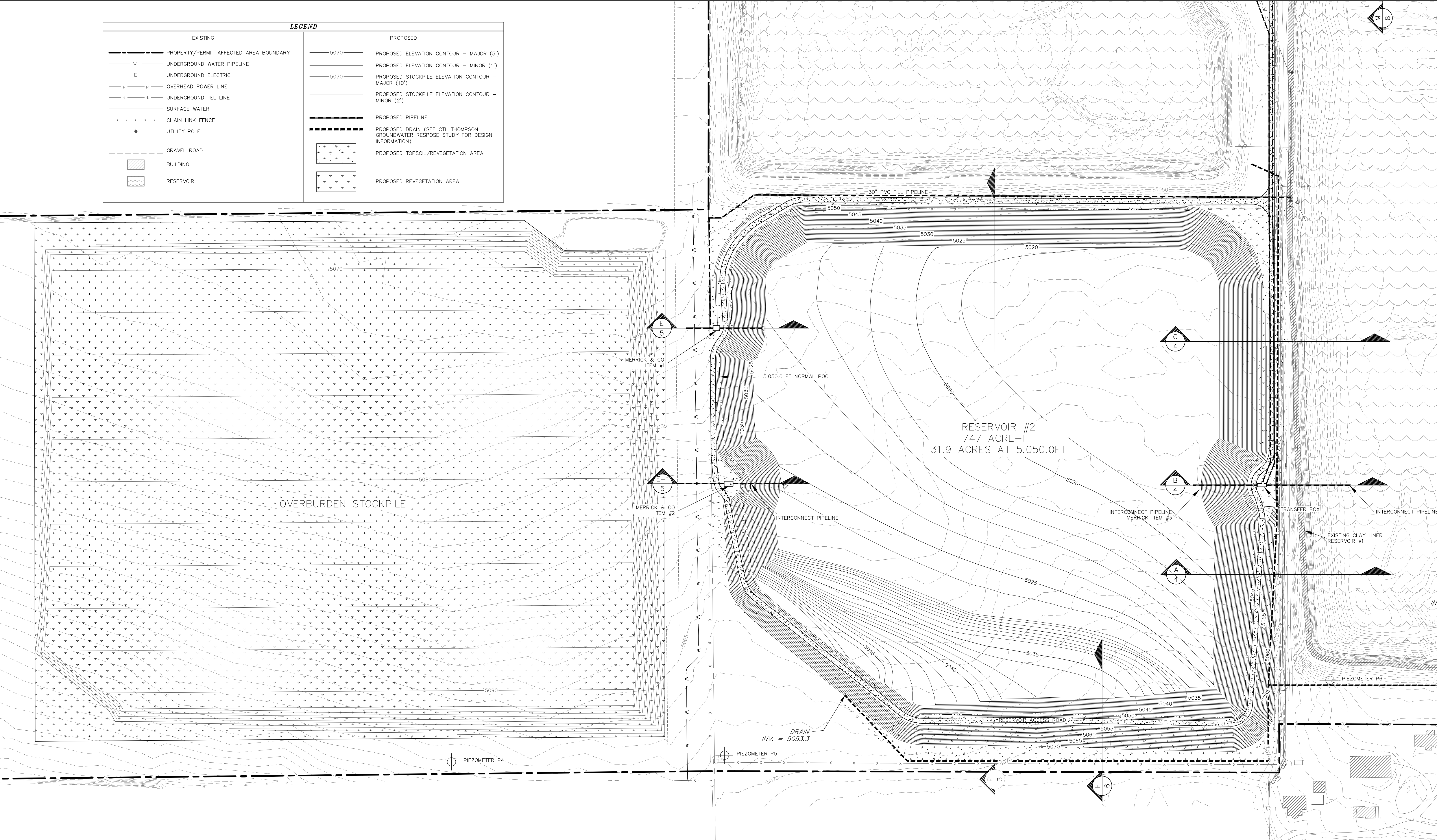
REVISIONS				GOOSE HAVEN RESERVOIR COMPLEX EXPANSION #2,#4 REGUALR 112 MINING PERMIT				EXHIBIT D - MINE PLAN MAP SHEET 2			
REV	DESCRIPTION	DATE	APPROVED								
				LAFAYETTE, CO ROCK PRODUCTS				SCALE 1"=100' DWG NO. EXHIBIT D MINE PLAN MAP SHEETS 1-2 A-1.DWG DRAWN BY: CTW CHECKED BY: PFW DATE: 01/09/17 SHEET SHEET 2 of 2			

WSI Weiland, Inc.
Environmental & Engineering

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BOULDER, CO 80308
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PREPARED FOR:

ROCK PRODUCTS



REVISIONS			
REV	DESCRIPTION	DATE	APPROVED



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GOOSE HAVEN RESERVOIR COMPLEX EXPANSION #2, #4

REGUALR 112 MINING PERMIT

LAFAYETTE, CO

ROCK PRODUCTS

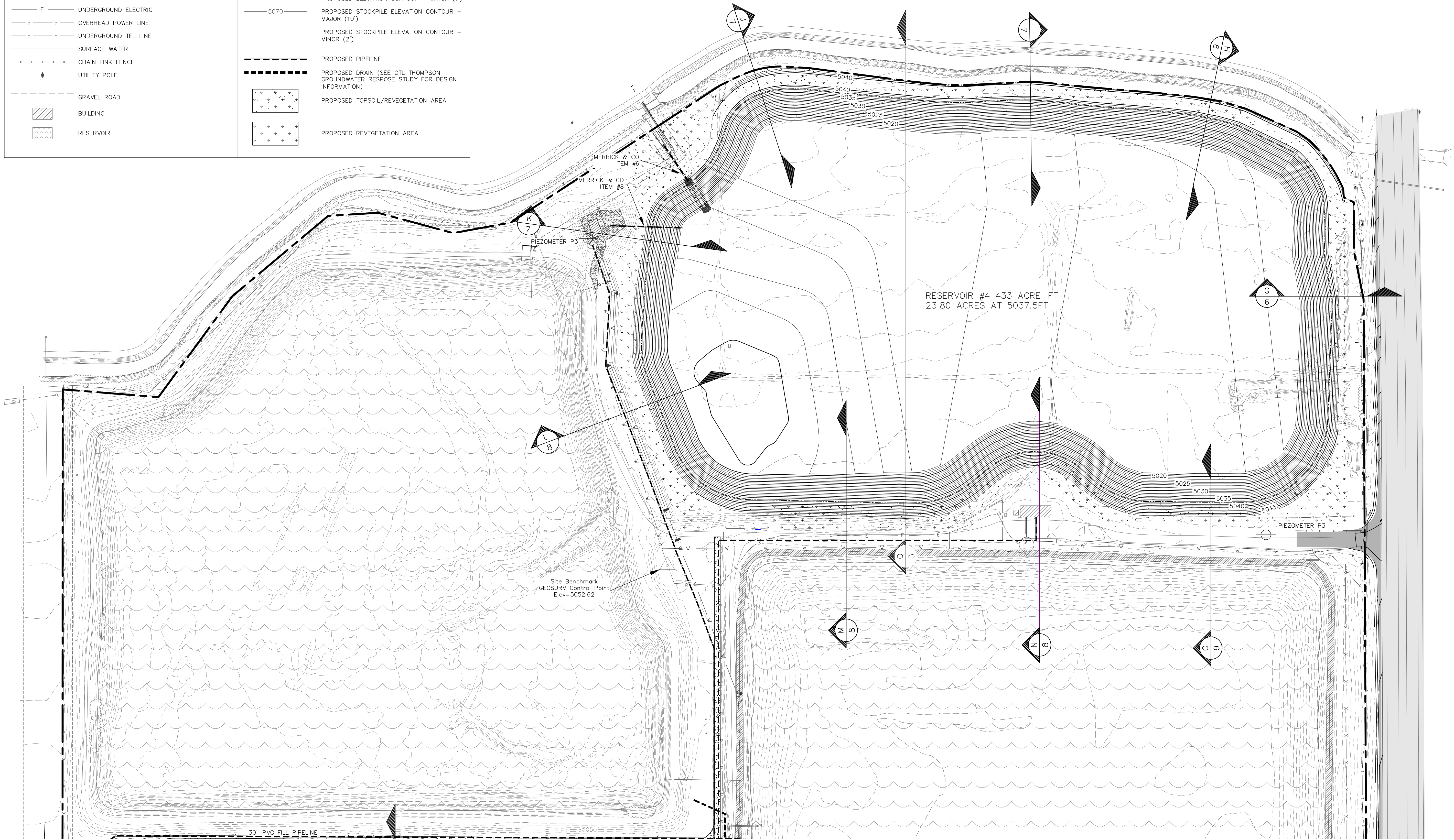
PREPARED FOR:

EXHIBIT F

SHEET 1

SCALE 1"=100'	DWG NO.	SHEETS 1-2 PLAN		REV REV
DRAWN BY: CTW	CHECKED BY: PFW	DATE: 10/31/16	SHEET SHEET 1 of 9	

LEGEND			
EXISTING		PROPOSED	
---	PROPERTY/PERMIT AFFECTED AREA BOUNDARY	---	PROPOSED ELEVATION CONTOUR - MAJOR (5')
W	UNDERGROUND WATER PIPELINE	---	PROPOSED ELEVATION CONTOUR - MINOR (1')
E	UNDERGROUND ELECTRIC	---	PROPOSED STOCKPILE ELEVATION CONTOUR - MAJOR (10')
P	OVERHEAD POWER LINE	---	PROPOSED STOCKPILE ELEVATION CONTOUR - MINOR (2')
t	UNDERGROUND TEL LINE	---	PROPOSED PIPELINE
---	SURFACE WATER	---	PROPOSED DRAIN (SEE CTL THOMPSON GROUNDWATER RESPONSE STUDY FOR DESIGN INFORMATION)
---	CHAIN LINK FENCE	---	PROPOSED TOPSOIL/REVEGETATION AREA
+	UTILITY POLE	---	PROPOSED REVEGETATION AREA
---	GRAVEL ROAD		
▨	BUILDING		
▤	RESERVOIR		



REVISIONS			
REV	DESCRIPTION	DATE	APPROVED

**WSI Weiland, Inc.**
Environmental & Engineering

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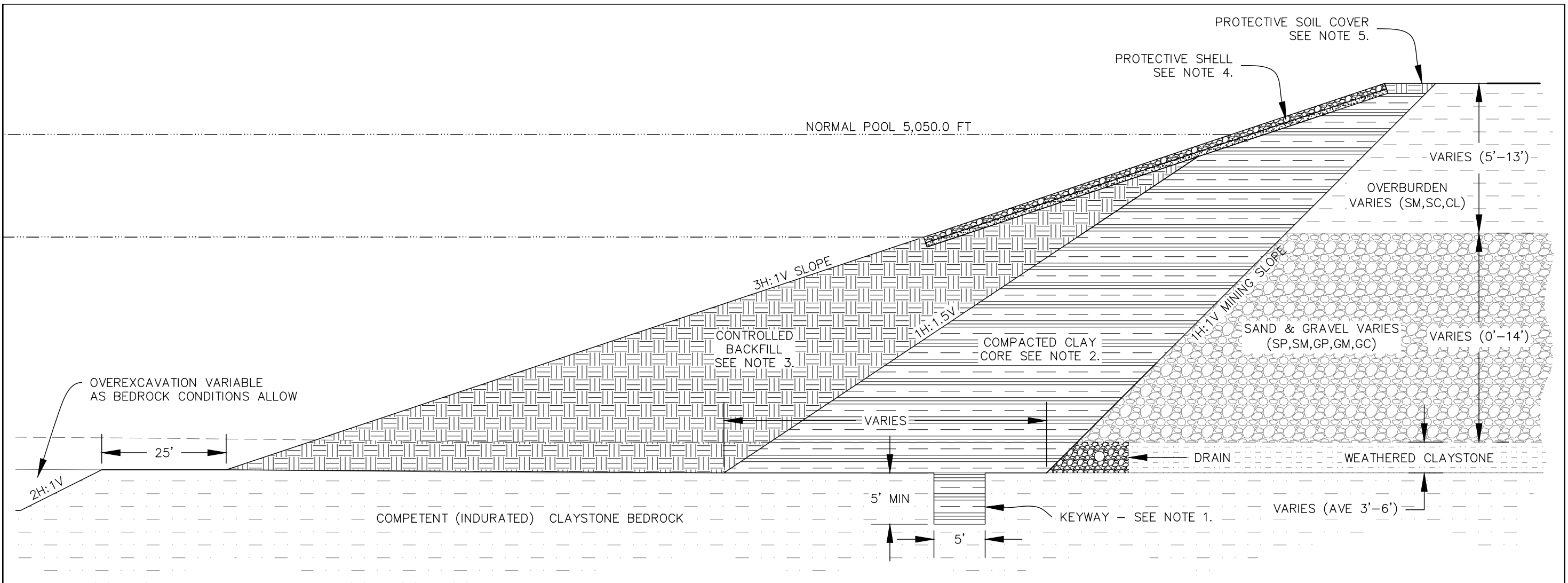
GOOSE HAVEN RESERVOIR COMPLEX EXPANSION #2, #4
REGUALR 112 MINING PERMIT

LAFAYETTE, CO
ROCK PRODUCTS

PREPARED FOR:

EXHIBIT F
SHEET 2

SCALE 1"=100'	DWG NO. SHEETS 1-2 PLAN.DWG	REV. REV
DRAWN BY: CTW	CHECKED BY: PFW	DATE: 10/31/16
SHEET SHEET 2 of 9		



NOTES:

1. KEYWAY SIDE SLOPES SHALL BE VERTICAL OR A MINIMUM OF 0.5H:1V. KEYWAY WIDTH SHALL BE A MINIMUM OF 5 FT. KEYWAY DEPTH SHALL BE A MINIMUM OF 5FT OR TO REFUSAL BY JD 400. THE KEYWAY SHALL BE FILLED WITH COMPACTED CLAY MATERIAL IN MAX 8" LIFTS TO 95% STANDARD PROCTOR DRY DENSITY AT 0 TO +3% OF THE OPTIMUM MOISTURE CONTENT.
2. THE COMPACTED CLAY CORE SHALL BE CONSTRUCTED OF PROCESSED AND MOISTURE CONDITIONED WEATHERED CLAYSTONE MATERIAL BORROWED FROM THE PIT FLOOR. THE MATERIAL SHALL BE PLACED IN 8" LIFTS TO 95% STANDARD PROCTOR DRY DENSITY AT 0 TO +3% OF THE OPTIMUM MOISTURE CONTENT. FOLLOWING PLACEMENT, EACH LIFT SHALL BE DISKED TO A DEPTH OF 2" TO ENSURE BONDING BETWEEN LIFTS.
3. CONTROLLED BACKFILL SHALL BE COMPOSED OF OVERBURDEN MATERIAL AND PLACED IN 8" LIFTS TO 95% STANDARD PROCTOR DRY DENSITY AT 0 TO +3% OF THE OPTIMUM MOISTURE CONTENT.

NOTES CONTINUED:

4. THE PROTECTIVE SHELL SHALL BE PLACED ON THE SLOPE TO BETWEEN GROUND SURFACE AND 10FT BELOW (5,053FT-5,040FT). PROTECTIVE SHELL SHALL BE CONSTRUCTED OF PROCESSED ONSITE ROCK WITH D50=3.5" AND 100% COARSER THAN 0.75". THE SHELL SHALL BE PLACED TO A THICKNESS OF 7" AND BEDDED INTO 6" OF TYPE I GRANULAR BEDDING.
5. PROTECTIVE SOIL COVER SHALL BE PLACED TO A DEPTH OF 6"=8" ABOVE COMPACTED CLAY LINER ON HORIZONTAL EXPOSURES FOLLOWED BY REVEGETATION.

REVISIONS				 PO BOX 18087 BOULDER, CO. 80308 ph 303-443-9521	GOOSE HAVEN RESERVOIR COMPLEX EXPANSION #2, #4 REGULAR 112 PERMIT		EXHIBIT E - FIGURE 1 TYPICAL SECTION							
REV	DESCRIPTION	DATE	APPROVED											
					LAFAYETTE, CO		SCALE	NTS	DWG NO.	TYPICAL SECTION A-1.DWG	REV	REV		
							DRAWN BY:	CTW	CHECKED BY:	PFW	DATE:	10/31/16	SHEET	1 OF 1
							PREPARED FOR:		ROCK PRODUCTS, LLC					