

NEW MEXICO ABANDONED MINE LAND PROGRAM

COUNTY ROAD A-25 SUBSIDENCE MITIGATION PROJECT

EMNRD-MMD-2025-04

COLFAX COUNTY, NEW MEXICO

FEBRUARY 2025



Image Cite: ESRI World Street Map, Publication: 2022



CALL US AT:
800-321-2537
or 811
www.nm811.org



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CERTIFICATE OF ENGINEER

[illegible]

























I, CAMERON J. TWING HEREBY STATE TO THE BEST OF MY KNOWLEDGE AND UNDERSTANDING THAT THIS DESIGN AND ACCOMPANYING DRAWINGS HAVE BEEN PREPARED BY ME OR UNDER MY DIRECT SUPERVISION IN ACCORDANCE WITH STANDARD AND GENERALLY ACCEPTED ENGINEERING PRACTICES AND PROCEDURES IN EFFECT AT THE TIME.



| | | | | | | | | | | |
|--------|--------------------------------------|--|---|--------------------------------|------|------|-------------|---------------------------|-------|----|
| TITLE | PROJECT SITE LOCATION AND ACCESS MAP | | <div><p>Trihydro CONSULTANTS 1252 Commerce Drive Laramie, Wyoming 82070 www.trihydro.com (P) 307.745.7474 (F) 307.745.7770</p></div> | DRAWN BY: BB | | | | | | |
| | | | | CHECKED BY: CT | | | | | | |
| | | | | DATE: 01/17/2025 | | 2 | 02/19/2025 | REISSUE FOR CONSTRUCTION | MR | CT |
| | | | | SCALE: AS SHOWN | | 1 | 01/17/2025 | REISSUE FOR CLIENT REVIEW | BB | CT |
| | | | | | | 0 | 02/27/2023 | ISSUE FOR CONSTRUCTION | JD | TH |
| REV: 1 | | | | FILE: 01A-YANKEE SITE VICINITY | REV. | DATE | DESCRIPTION | BY | CHK'D | |

EXPLANATION

ABBREVIATIONS

| | | | | | | | |
|---|---|---|----------------------------------|---|-----------------------|---------|---------------------------|
|  | STATE HIGHWAY |  | PROPOSED DRILL HOLE LOCATION |  | PROBABLE EFFECT | FT. | FEET |
|  | PARCEL BOUNDARY (SHOWING OWNERSHIP) |  | EXISTING ADIT |  | DIAMETER | FT AMSL | FEET ABOVE MEAN SEA LEVEL |
|  | EXISTING A-25 ROAD CENTERLINE (APPROXIMATE) |  | EXISTING SUBSIDENCE FEATURES |  | CORRUGATED METAL PIPE | MIN. | MINIMUM |
|  | EXISTING SURFACE CONTOUR, 5 FOOT INTERVAL |  | EXISTING STORAGE TANK |  | DIMENSION | REQ'D | REQUIRED |
|  | EXISTING MASONRY WALL |  | SITE ACCESS ROUTE |  | EACH | SHT. | SHEET |
|  | EXISTING STRUCTURE |  | DENTON MINE UNDERGROUND WORKINGS |  | ELEVATION | TYP. | TYPICAL |
|  | AREA OF PROBABLE EFFECT (APE) BOUNDARY |  | INTERSTATE HIGHWAY |  | | | |
|  | PROPOSED STAGING AREA |  | PROPOSED STAGING AREA |  | | | |

NOTES:

1. GENERAL:

- A. CONTRACTOR SHALL CALL NEW MEXICO "CALL BEFORE YOU DIG" AT (800) 321-2537 OR 811 PRIOR TO INTRUSIVE ACTIVITIES TO LOCATE ON-SITE UTILITIES. CONTRACTOR IS RESPONSIBLE FOR LOCATING ALL UTILITIES. THE ENGINEER AND OWNER DO NOT MAKE ANY REPRESENTATIONS AS TO EXISTENCE OR NON-EXISTENCE OF UTILITIES WITHIN THE APE.
- B. THE CONTRACTOR'S PERSONNEL SHALL NOT BE ALLOWED TO MAINTAIN RESIDENCES ON SITE.
- C. THE CONTRACTOR SHALL NOT DISTURB AREAS OUTSIDE THE APE. THE CONTRACTOR SHALL RECLAIM OR REPAIR ALL DISTURBANCES CREATED OUTSIDE THE APE BY THE CONTRACTOR'S EMPLOYEES OR SUBCONTRACTORS AT THE CONTRACTOR'S EXPENSE. DISTURBANCE OUTSIDE OF THE APE SHOWN ON THE SITE PLANS WILL NOT BE ALLOWED.
- D. THE CONTRACTOR SHALL USE EXISTING ACCESS ROADS FOR EQUIPMENT, PERSONNEL, AND MATERIALS TRANSPORTATION. THE CONTRACTOR SHALL REPAIR ANY DAMAGE TO ACCESS ROADS AND IMPROVEMENTS CAUSED BY THE CONTRACTOR..
- E. QUANTITIES SHOWN ARE ESTIMATES FOR BIDDING PURPOSES ONLY.
- F. NO OTHER ACCESS TO THE SITE IS ALLOWED WITHOUT PERMISSION IN WRITING FROM THE ENGINEER AND/OR LANDOWNERS.
- G. ALL TRASH AND DEBRIS GENERATED BY THE CONTRACTOR SHALL BE DISPOSED OF IN A LICENSED OFF-SITE LANDFILL. TRASH INCLUDES CIGARETTE BUTTS, BOTTLES, WRAPPERS, AND OTHER MATERIALS. TRASH MAY NOT BE BURIED ON-SITE.
- H. THE CONTRACTOR SHALL DECONTAMINATE ALL EQUIPMENT AND SUPPORT VEHICLES PRIOR TO MOBILIZING TO THE SITE. EQUIPMENT AND SUPPORT VEHICLES SHALL BE FREE OF WEEDS, ORGANIC MATERIAL, AND DIRT. THE ENGINEER WILL INSPECT THE EQUIPMENT AND VEHICLES PRIOR TO ALLOWING THEM ON SITE. ANY EQUIPMENT OR VEHICLES FOUND, IN THE ENGINEER'S JUDGEMENT, TO NOT BE ADEQUATELY DECONTAMINATED SHALL NOT BE ALLOWED ON SITE.
- I. THE DRAWINGS DO NOT PURPORT TO SHOW ALL OBJECTS EXISTING ON, ABOVE, OR AROUND THE SITE.
- J. PARCEL BOUNDARIES WERE OBTAINED FROM THE COLFAX COUNTY ASSESSOR'S OFFICE. PROPERTY LINES SHOULD BE CONSIDERED APPROXIMATE. POTENTIAL RIGHT-OF-WAYS ARE NOT SHOWN ON THESE DRAWINGS. CONTRACTOR IS RESPONSIBLE FOR LOCATING RIGHT-OF-WAYS DURING UTILITY LOCATES.
- K. THE ENGINEER WILL PROVIDE LOCATIONS FOR ALL PROPOSED RECLAMATION TASKS TO THE CONTRACTOR.

2. SAFETY:

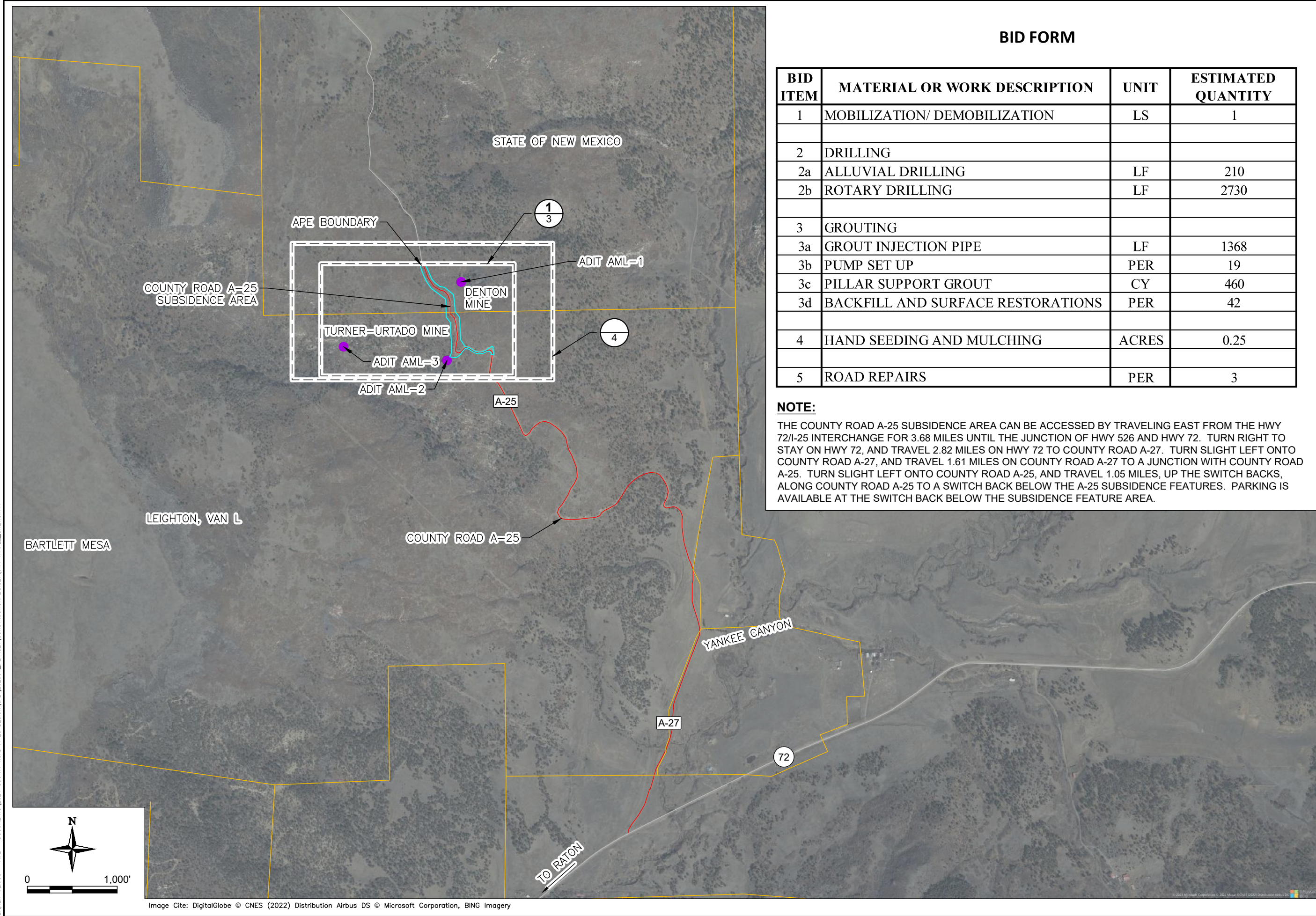
- A. THIS PROJECT REQUIRES CONSTRUCTION WORK IN THE VICINITY OF HISTORIC MINED SITES. THE CONTRACTOR SHALL BE RESPONSIBLE FOR INVESTIGATING THE SITE CONDITIONS AND SCHEDULING THEIR EQUIPMENT, OPERATIONS, PERSONNEL, AND SAFETY PROCEDURES TO PREVENT ACCIDENTS AND INJURIES. THE CONTRACTOR SHALL FOLLOW ALL APPLICABLE OSHA REGULATIONS.
- B. THE APE LIES WITHIN PRIVATE LAND OWNED BY VAN L. LEIGHTON AS WELL AS THE STATE OF NEW MEXICO. THE CONTRACTOR SHALL MARK ALL ACTIVE WORK ZONES WITH CONES, TEMPORARY FENCING, OR OTHER BARRICADES AS APPROVED BY THE ENGINEER.

3. CONSTRUCTION:

- A. TEMPORARY FENCING FOR PUBLIC ACCESS CONTROL SHALL BE INSTALLED WHERE NECESSARY.
- B. THE CONTRACTOR SHALL CONFINE CONSTRUCTION STAGING AREA AND MATERIALS LAY DOWN TO THE AREAS IDENTIFIED ON THE PLANS AND APPROVED BY THE ENGINEER. THE CONTRACTOR IS RESPONSIBLE FOR THE CONTRACTOR'S OWN WORK AREA, STORAGE AREA, AND MAINTAINING SECURITY. THE STAGING AREA MAY BE FENCED AT THE CONTRACTOR'S DISCRETION AND IT WILL BE GUARDED AND MAINTAINED BY THE CONTRACTOR TO ADEQUATELY PREVENT LOSS OR DAMAGE TO THE CONTRACTOR'S EQUIPMENT AND MATERIALS
- C. THE CONTRACTOR SHALL BE AWARE THAT HISTORIC MINING AND RECLAMATION DEBRIS SUCH AS CONCRETE, WOOD, METAL, ETC. MAY BE ENCOUNTERED. THE CONTRACTOR SHALL DISPOSE OF THESE MATERIALS AS APPROVED BY THE ENGINEER. DEBRIS SHALL NOT BE DISTURBED WITHOUT THE APPROVAL OF THE ENGINEER. DEBRIS REMOVAL AND DISPOSAL WILL BE IN ACCORDANCE WITH THE SPECIFICATIONS.
- D. THE ENGINEER WILL DETERMINE MATERIALS CLASSIFICATIONS IN THE FIELD. TOPSOIL/COVERSOIL IS ANY MATERIAL SUITABLE FOR PLANT GROWTH MEDIUM AS DETERMINED BY THE ENGINEER. THE REMAINING MATERIAL IS TERMED UNCLASSIFIED, OR ROCK DEPENDING ON MATERIAL AND SOIL CONDITIONS. THESE SOILS ARE NOT SUITABLE MEDIUM FOR PLANT GROWTH. NOTE: COVERSOIL = TOPSOIL IN ALL REFERENCES IN THESE PLANS.
- E. THE CONTRACTOR SHALL NOT REMOVE OR DESTROY ANY SURVEY MONUMENTS WITHOUT PRIOR WRITTEN PERMISSION FROM THE ENGINEER.
- F. SURFACE GRADING AREAS WILL BE FINISH GRADED, TOPSOILED, SEEDED, AND MULCHED AS DIRECTED BY THE SPECIFICATIONS AND THE ENGINEER.
- G. ALL MEASUREMENTS OF AGRICULTURAL ITEMS WILL BE BASED UPON THE ACTUAL SURFACE AREA.
- H. CONTRACTOR MAY CLEAR AND GRUB VEGETATION AS NEEDED. FULL REMOVAL OF VEGETATION IS DISCOURAGED, AND TRIMMING OF VEGETATION IS PREFERRED.

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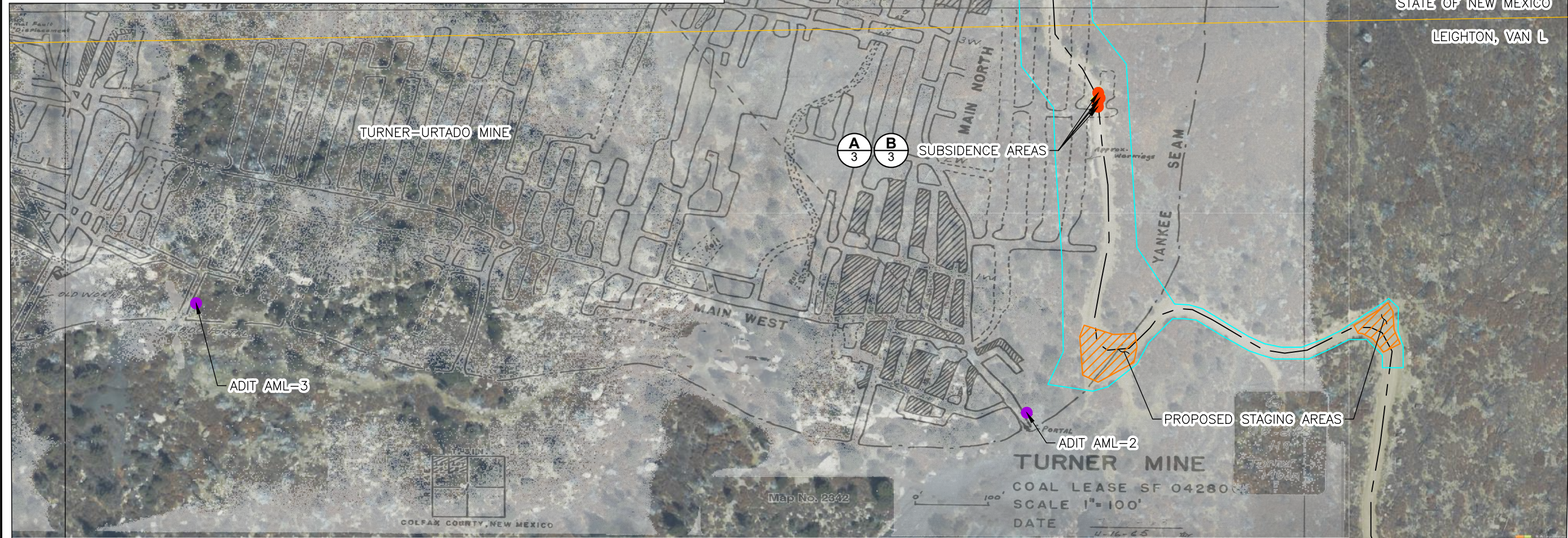
| SITE VICINITY MAP AND BID FORM | | COUNTY ROAD A-25 SUBSIDENCE MITIGATION PROJECT, EMNRD-MMD-2025-04 NEW MEXICO ABANDONED MINE LAND PROGRAM COLFAX COUNTY, NEW MEXICO | |
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| SHEET | 2 | 2 OF 6 | REV: 1 |
| DRAWN BY: BB | | CHECKED BY: CT | |
| DATE: 01/17/2025 | | SCALE: 1" = 100' | |
| FILE: 01A-YANKEE_SITEVICINITY | | REV. DATE DESCRIPTION REVISIONS | |
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| BY | | CHK'D | |



A COUNTY ROAD A-25 SUBSIDENCE FEATURE-1-1
SCALE: NONE

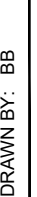


B COUNTY ROAD A-25 SUBSIDENCE FEATURE-2
SCALE: NONE



1 EXISTING SITE AREA - PLAN VIEW
SCALE: 1" = 150'



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|---------------------------------|---|---|-------------------------------|------------|--|--|--|---------------------------|----|-------|--|
| SHEET 3 3 OF 6 | EXISTING SITE AREA MAP COUNTY ROAD A-25 SUBSIDENCE MITIGATION PROJECT, EMNRD-MMD-2025-04 NEW MEXICO ABANDONED MINE LAND PROGRAM COLFAX COUNTY, NEW MEXICO |  Trihydro 1252 Commerce Drive Laramie, Wyoming 82070 www.trihydro.com (P) 307/745.7474 (F) 307/745.7729 | DRAWN BY: BB | | | | | | | | |
| | | | CHECKED BY: CT | | | | | | | | |
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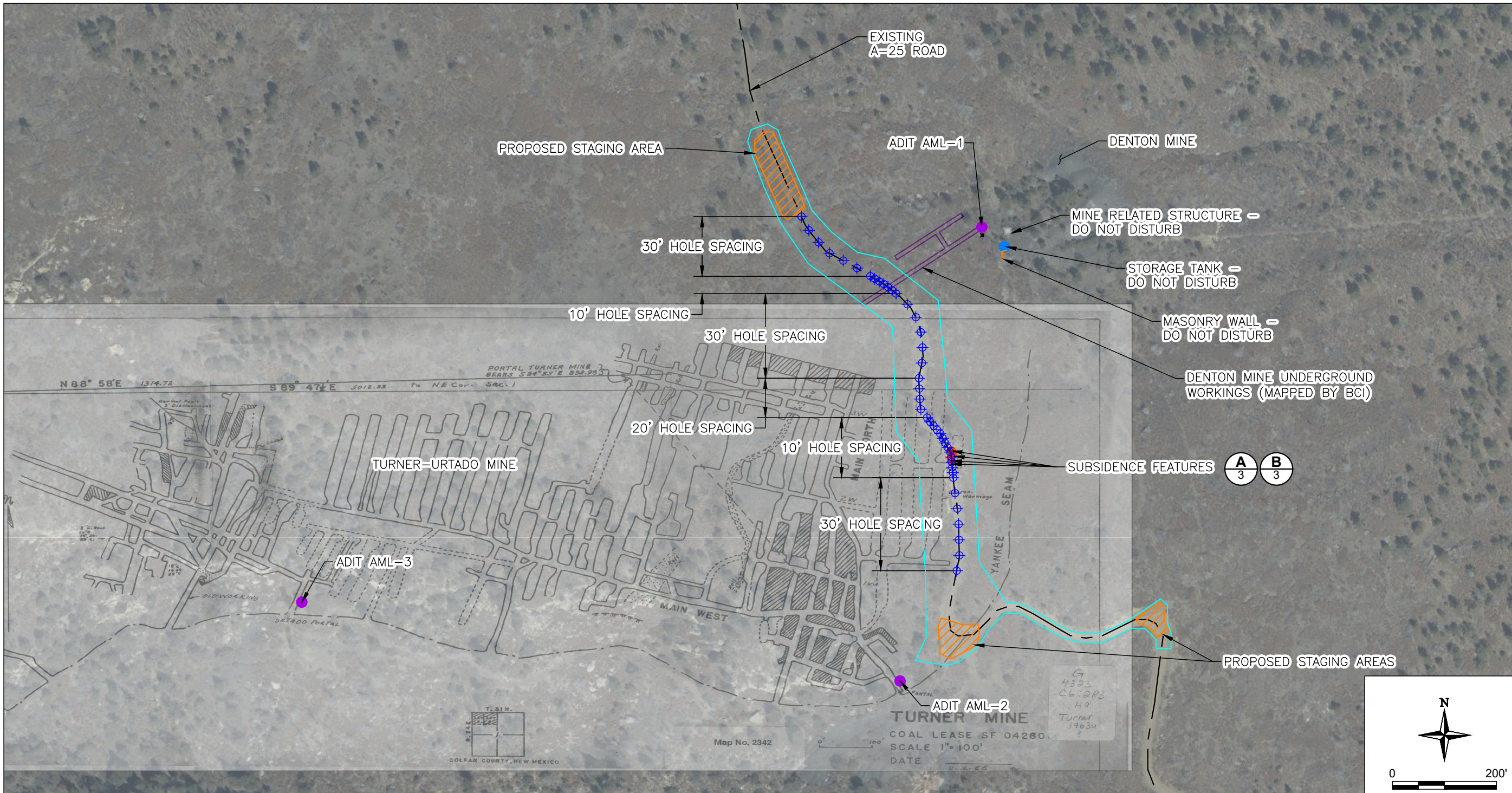



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NOTES:

1. THE PLANS INCLUDE 42 DRILLED BOREHOLES, WITH A SPACING OF 10-20 FEET APART NEAR THE SUBSIDENCE FEATURES, MINE MAP FEATURES, AND HISTORIC DENTON MINE WORKINGS AND 30 FEET APART ALONG THE REMAINING ROAD SEGMENTS. ALL DRILLING WILL HAPPEN ALONG APPROXIMATELY 810 FEET OF THE A-25 ROAD ALIGNMENT.
2. THE CONTRACTOR SHALL SURVEY ALL BOREHOLE LOCATIONS PRIOR TO DRILLING. THE DRILL HOLE SPACING SHOWN ON THE PLANS MAY BE ADJUSTED BY THE ENGINEER BASED ON THE SUBSURFACE CONDITION ENCOUNTERED. THE ENGINEER MAY ADJUST THE BORING LOCATIONS TO BETTER PREDICT VOID SPACES BASED ON HOW THE VOID FINDINGS CORRESPOND TO THE MINE MAP, AND THE ENGINEER MAY ADJUST THE BORING LOCATIONS TO ENSURE ADEQUATE PROTECTION OF THE ACTIVE SUBSIDENCE AREA. DRILL HOLE LOCATIONS MAY BE ADDED OR ELIMINATED BY THE ENGINEER.
3. THE DEPTH OF DRILLING WILL INCREASE MOVING NORTH ALONG A-25. THE PROJECTED DEPTHS TO MINE WORKINGS ARE APPROXIMATE. THE CONTRACTOR SHALL PROVIDE DRILLING EQUIPMENT THAT IS CAPABLE OF DRILLING TO A MINIMUM DEPTH OF 200 FEET.
4. THE CONTRACTOR SHALL PROVIDE CUTTINGS SAMPLES VIA AIR RETURN AT 5 FOOT INCREMENTS FROM THE GROUND SURFACE THROUGH THE FULL DEPTH OF THE HOLE, OR UNTIL CIRCULATION IS LOST. EVERY EFFORT SHOULD BE MADE TO ENSURE THAT THE CUTTINGS SAMPLES ARE REPRESENTATIVE OF THE 5 FOOT INCREMENT THEY ARE COLLECTED FOR. THE ENGINEER SHALL SHALL CREATE A SUBSURFACE PROFILE BY LOGGING THE DRILL CUTTINGS.
5. THE CONTRACTOR SHALL DRILL THROUGH THE MINE WORKINGS HORIZON AS DETERMINED BY THE ENGINEER AND A MINIMUM OF 5 FEET BELOW THE MINE FLOOR.
6. THE DOWNHOLE CONDITIONS ENCOUNTERED BY DRILL HOLES SHALL BE CATEGORIZED BY THE ENGINEER AS: ABANDONED (THE DRILL HOLE WAS NOT DRILLED TO COMPLETION), PILLAR (THE DRILL HOLE ENCOUNTERED AN INTACT SECTION OF THE TARGET COAL SEAM), OR VOID FILL (THE DRILL HOLE ENCOUNTERED RUBBLE OR OPEN VOID SPACE).
7. APPROXIMATELY 3,000 LINEAR FEET OF DRILLING IS EXPECTED.
8. FINAL LOCATION OF BOREHOLES WILL BE RECORDED BY THE CONTRACTOR WITH GPS EQUIPMENT CAPABLE OF SUB-METER ACCURACY.
9. BOREHOLES COMPLETED WITH 10-FOOT SPACING WILL BE DRILLED AND GROUTED EVERY OTHER PLANNED BOREHOLE WITH THE SKIPPED BOREHOLES COMPLETED THE FOLLOWING DAY.

| | | | | | | | | | | | |
|---|-------------------------------|---|--------------------------------|------|------------|---------------------------|--|--|----|-------|--|
| SHEET <div>4</div> <div>4 OF 6</div> | PROPOSED DRILL HOLE LOCATIONS | <div><div><div>Trihydro</div><div>1252 Commerce Drive Laramie, Wyoming 82070 www.trihydro.com</div></div><div>(P) 307/745.7474 (F) 307/745.7729</div></div> | DRAWN BY: BB | | | | | | | | |
| | | | CHECKED BY: CT | | | | | | | | |
| | | | DATE: 01/17/2025 | | | | | | | | |
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| | | | FILE: 01A-YANKEE_PROPOS-202412 | | | | | | | | |
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| | | | | | | DESCRIPTION | | | BY | CHK'D | |
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EXISTING ROAD PROFILE

ALLUVIAL SOILS OF VARIABLE THICKNESS

BEDROCK

RUBBLE

INTACT COAL

MIN. 5'

DRILLED BOREHOLE SUBSIDENCE FEATURE

The diagram illustrates a geological cross-section for a road installation. Key features include:

- EXISTING ROAD PROFILE:** Indicated by a dashed line at the top left.
- ALLUVIAL SOILS OF VARIABLE THICKNESS:** Represented by a pattern of small stars.
- VARIABLE DEPTH TO WORKINGS:** A vertical dimension line indicating the distance from the soil surface to the mine workings.
- OPEN MINE WORKINGS:** A large, irregularly shaped void in the center of the section.
- INSTALLED GROUT CASING:** A vertical structure on the right side of the section.
- STAGE DEPTH:** A vertical dimension line indicating the depth of the grout casing.
- MIN. 5':** Two vertical dimension lines indicating minimum depths of 5 feet, one for the grout casing and one for the underlying bedrock.
- BEDROCK:** A layer of rock below the alluvial soils, represented by a pattern of small crosses.
- INTACT COAL:** A layer of coal at the bottom of the section, represented by a pattern of small dots.

1. GROUT SHALL BE INJECTED AT A STAGE DEPTH UNTIL A REFUSAL CRITERIA HAS BEEN MET. IF THE MAXIMUM PRESSURE FOR THE DEPTH OF INJECTION IS MET OR IF 20 CY OF SUPPORT GROUT HAS BEEN INJECTED AT THAT STAGE DEPTH, THE GROUT STAGE IS CONSIDERED COMPLETE. WHEN A GROUT STAGE IS CONSIDERED COMPLETE, THE CASING IS LIFTED 3 FEET, AND THE NEXT GROUT STAGE BEGINS. THE FIRST GROUT STAGE BEGINS WITH THE CASING SET 3 FEET OVER THE MINE FLOOR.
2. IF THE HOLE ENCOUNTERS AN OPEN VOID SPACE WITH NO RUBBLE, THE GROUT STAGES WILL START FROM 3 FEET ABOVE THE MINE FLOOR, LIFTING 3 FEET WITH EACH COMPLETED GROUT STAGE, UNTIL A GROUT STAGE IS COMPLETED 5 FEET OR MORE OVER THE TOP OF THE VOID SPACE. WHEN A GROUT STAGE IS COMPLETED 5 FEET OR MORE OVER THE VOID SPACE, THE HOLE IS CONSIDERED COMPLETE. WHEN THE HOLE IS CONSIDERED COMPLETE PUMPING FOR THAT HOLE STOPS, AND THE CASING IS REMOVED. THE COMPLETED HOLE CAN THEN BE BACKFILLED AND RECEIVE A SURFACE RESTORATION.
3. IF THE HOLE ENCOUNTERS RUBBLE THAT DOES NOT REACH THE SURFACE, THE GROUT STAGES WILL START FROM 3 FEET ABOVE THE MINE FLOOR, LIFTING 3 FEET WITH EACH COMPLETED GROUT STAGE, UNTIL A GROUT STAGE IS COMPLETED 5 FEET OR MORE OVER THE TOP OF THE RUBBLE ZONE. WHEN A GROUT STAGE IS COMPLETED 5 FEET OR MORE OVER THE RUBBLE ZONE, THE HOLE IS CONSIDERED COMPLETE.
4. IF THE HOLE ENCOUNTERS AN OPEN VOID SPACE WITH RUBBLE EITHER BELOW OR ABOVE IT, THE SAME PROCEDURE CAN BE FOLLOWED. WHEN A GROUT STAGE IS COMPLETED 5 FEET OR MORE OVER THE TOP OF THE VOID SPACE OR RUBBLE ZONE, WHICHEVER IS HIGHER, THE HOLE IS CONSIDERED COMPLETE.
5. IF THE HOLE ENCOUNTERS RUBBLE THAT REACHES THE SURFACE, AS WITH THE SUBSIDENCE FEATURES, THE GROUT STAGES WILL START FROM 3 FEET ABOVE THE MINE FLOOR, LIFTING 3 FEET WITH EACH COMPLETED GROUT STAGE, UNTIL A GROUT STAGE IS COMPLETED WITHIN 5 FEET OF THE SURFACE. WHEN A GROUT STAGE IS COMPLETED WITHIN 5 FEET OF THE SURFACE, THE HOLE IS CONSIDERED COMPLETE.
6. IF AT ANY TIME MEASURABLE SURFACE GROUND HEAVE IS OBSERVED (I.E., DISPLACEMENT OF GROUND SURFACE OF GREATER THAN $\frac{1}{8}$ INCH DURING A GROUT STAGE OR A MAXIMUM CUMULATIVE HEAVE OF 1 INCH), THE HOLE IS CONSIDERED COMPLETE AND NO MORE SUPPORT GROUT IS REQUIRED FOR THE HOLE. IF AT ANY TIME GROUT IS RETURNED UP THE ANNULUS, THE HOLE IS CONSIDERED COMPLETE AND NO MORE SUPPORT GROUT IS REQUIRED FOR THE HOLE. BASED ON THE GROUTING CONDITIONS PRESENT, THE ENGINEER MAY CONSIDER A HOLE COMPLETE WITHOUT OBSERVING ONE OF THE LAID-OUT REFUSAL OR COMPLETION CRITERIA.
7. IF THE CONTRACTOR IS UNABLE TO COMPLETE GROUTING FOR A HOLE BEFORE THAT HOLE IS CONSIDERED COMPLETE, THE HOLE WILL BE OFFSET BY 5 TO 10 FEET AS DIRECTED BY THE ENGINEER AND RE-DRILLED. THE INCOMPLETE HOLE CAN THEN BE BACKFILLED AND RECEIVE A SURFACE RESTORATION.
8. THE GROUT MIXTURE PROPORTIONS SHALL ACHIEVE A PUMPABLE MIX WITH NOT LESS THAN 3 INCH AND NOT MORE THAN 6 INCH SLUMP WITH A 0 PERCENT BLEED, AND A STIFFENING TIME OF GREATER THAN 4 HOURS. THE REQUESTED SLUMP SHALL BE DETERMINED BY THE ENGINEER FOR EACH INDIVIDUAL GROUT BORE HOLE BASED ON THE DOWN HOLE CONDITIONS. OPEN VOID SPACE SHALL USE A LOWER SLUMP, DOWN TO 3 INCH, AND RUBBLE SHALL USE A HIGHER SLUMP, UP TO 6 INCH.
9. THE CONTRACTOR SHALL SUPPLY ALL EQUIPMENT REQUIRED TO OPERATE A GROUTING SYSTEM CAPABLE OF SUPPLYING THE SPECIFIED GROUT AT VARIABLE PRESSURES, MEASURED AT THE PUMP, UP TO 400 PSI (2758 KPA) AND AT RATES OF 0.5 TO 9 CUBIC FEET (0 TO 0.25 CUBIC METERS) PER MINUTE, AS REQUIRED TO SUIT THE APPLICATION. THE CONTRACTOR SHALL SUPPLY AND IMPLEMENT GROUND SURFACE MOVEMENT MONITORING EQUIPMENT WHENEVER GROUTING IS TAKING PLACE.
10. TO BACKFILL THE HOLES THE CONTRACTOR SHALL USE GRAVITY FED GROUT TO FILL THE HOLES UP TO 18 INCHES BELOW THE SURFACE OR TO 4 INCHES BELOW BEDROCK, WHICHEVER IS SHALLOWER. THE CONTRACTOR SHALL BACKFILL THE REMAINING DISTANCE TO THE SURFACE WITH IMPORTED ROAD BASE MATERIAL.

| PUMPING PRESSURE REFUSAL CRITERIA | |
|-----------------------------------|--|
| STAGE DEPTH (FEET) | MAXIMUM PRESSURE AT THE WELLHEAD (PSI) |
| 45 OR GREATER | 400 |
| BETWEEN 45 AND 35 | 275 |
| 35 OR LESS | 250 |