

UNITED STATES DEPARTMENT OF ENERGY
Albuquerque, New Mexico

Uranium Mill Tailings Remedial Action Project (UMTRAP)

Slick Rock, Colorado

SRK

Subcontract Documents

Preliminary Design for Review

Bid Schedule

Special Conditions

Specifications

Subcontract Drawings

MARCH 1988



MORRISON-KNUDSEN ENGINEERS, INC.
A MORRISON-KNUDSEN COMPANY

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UMTRA PROJECT - SLICK ROCK, COLORADO
SUBCONTRACT DOCUMENTS SRK
PRELIMINARY DESIGN FOR REVIEW
MARCH 1988

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Bid Schedule

SECTION 00310

BID SCHEDULE

Name of Bidder _____ Date: _____

Following are the prices bid for completion of the Work as required by the Subcontract Documents:

Item No.	Spec. Section	Description*	Unit	Approx. Quantity	Unit Price	Amount
<u>000 - MOBILIZATION</u>						
001	01019	Mobilization	L.S.	100%	N/A	_____
002	SC-20	Payment for Bond Premium	L.S.	100%	N/A	_____
<u>100 - RELOCATIONS</u>						
101	02125	Relocation of Firehouse	L.S.	100%	N/A	_____
102	02125	Relocation of Electric Service to Slick Rock Village	L.S.	100%	N/A	_____
103	02125	Relocation of Electric Service to Water Supply Well	L.S.	100%	N/A	_____
104	02125	Relocation of Water Service	L.S.	100%	N/A	_____
105	02125	Detour of County Road CR-S8	L.S.	100%	N/A	_____
106	02125	Furnish and Install Sanitary Sewage System	L.S.	100%	N/A	_____
107	02125	Relocation of Housing Trailers	Each	2	_____	_____

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Item No.	Spec. Section	Description*	Unit	Approx. Quantity	Unit Price	Amount
<u>200 - SITE PREPARATION</u>						
201	01500	Temporary Offices	L.S.	100%	N/A	_____
202	01500	Temporary Roads and Parking Areas	L.S.	100%	N/A	_____
203	01500	Janitorial and Snow Removal Services	L.S.	100%	N/A	_____
204	01500	Temporary Sanitary Facilities	L.S.	100%	N/A	_____
205	01500	Temporary Electric Power	L.S.	100%	N/A	_____
206	01500	Temporary Water	L.S.	100%	N/A	_____
207	01560	Furnish and Install Silt Fence	L.F.	3,930	_____	_____
208	02050	Demolition and Disposal of Existing Structures and Facilities	L.S.	100%	N/A	_____
209	02081	Removal and Disposal of Asbestos and Non-Hazardous Waste Materials	L.S.	100%	N/A	_____
210	02090	Sealing of Monitor Wells	L.F.	460	_____	_____
211	02200	Excavation for Access Control, Temporary Drainage Ditches and Wastewater Retention Basin in UC Area	C.Y.	18,200	_____	_____
212	02200	Fill for Access Control, Temporary Drainage Ditches and Wastewater Retention Basin in UC Area	C.Y.	20,700	_____	_____

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Item No.	Spec. Section	Description*	Unit	Approx. Quantity	Unit Price	Amount
213	02200	Excavation for Temporary Drainage Ditches and Wastewater Retention Basin in NC Area	C.Y.	20,400	_____	_____
214	02200	Fill for Temporary Drainage Ditches and Wastewater Retention Basin in NC Area	C.Y.	700	_____	_____
215	02230	Furnish and Place Aggregate Base Course Materials for Access Control Area	C.Y.	1,200	_____	_____
216	02613	Furnish and Install 12-Inch Inside Diameter CSP	L.F.	40	_____	_____
217	02613	Furnish and Install 18-Inch Inside Diameter CSP	L.F.	50	_____	_____
218	02613	Furnish and Install 36-Inch Inside Diameter CSP	L.F.	80	_____	_____
219	02771	Furnish and Install Membrane Liner	S.Y.	19,200	_____	_____
<u>400 - TAILINGS PILE</u>						
401	02200	Excavation of Uncontaminated Materials from UC Area	C.Y.	781,800	_____	_____
402	02200	Excavation of Tailings and Contaminated Materials from NC Area and Placement in Tailings Embankment	C.Y.	84,800	_____	_____

Item No.	Spec. Section	Description*	Unit	Approx. Quantity	Unit Price	Amount
403	02200	Excavation of Tailings from UC Area and Placement in Tailings Embankment	C.Y.	341,800	_____	_____
404	02200	Excavation of Contaminated Materials from UC Area and Placement in Tailings Embankment	C.Y.	191,600	_____	_____
405	02200	Uncontaminated Rock Excavation from Tailings Embankment Area	C.Y.	920	_____	_____
<u>500 - COVER</u>						
501	02200	Furnish and Place Radon Barrier Material	C.Y.	89,900	_____	_____
<u>600 - EROSION PROTECTION</u>						
601	02278	Furnish and Place Riprap Material, Type A	C.Y.	8,900	_____	_____
602	02278	Furnish and Place Riprap Material, Type B	C.Y.	11,900	_____	_____
603	02278	Furnish and Place Riprap Material, Type C	C.Y.	11,400	_____	_____
604	02278	Furnish and Place Riprap Material, Type D	C.Y.	3,000	_____	_____
605	02278	Furnish and Place Bedding Material	C.Y.	12,900	_____	_____
<u>700 - DECONTAMINATION</u>						
701	01500	Decontamination Wash-water Recycling System at UC Area	L.S.	100%	N/A	_____

Item No.	Spec. Section	Description*	Unit	Approx. Quantity	Unit Price	Amount
702	01500	Washwater Collection System at CR-S8 Road Crossing	L.S.	100%	N/A	_____
<u>800 - SITE RESTORATION</u>						
801	02200	Common Fill for Finish Grading of UC Area	C.Y.	24,600	_____	_____
802	02200	Gravel/Cobble Fill for Finish Grading of UC Area	C.Y.	37,500	_____	_____
803	02200	Fill for Finish Grading of NC Area	C.Y.	19,300	_____	_____
804	02935	Seeding	Acres	162	_____	_____
<u>900 - FENCING</u>						
901	02832	Furnish and Install Chain Link Fence	L.F.	1,120	_____	_____
902	02832	Furnish and Install Chain Link Gates Size: 15 Feet	Each	8	_____	_____
903	02832	Furnish and Install Chain Link Gates Size: 20 Feet	Each	2	_____	_____
904	02834	Furnish and Install Barb Wire Fence	L.F.	8,670	_____	_____
TOTAL (SUBCONTRACT PRICE)					\$	_____

* For complete description of a Bid Item and for measurement and payment provisions, see Part 4 of the Specification Section cited.

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Special Conditions

SECTION 00800
SPECIAL CONDITIONS

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STATE OF COLORADO, APPLICATION FOR EXEMPTION
CERTIFICATE (BLANK FORM)

SC-1 DEFINITIONS

A. Wherever used in the Subcontract Documents the following terms have the meanings indicated which are applicable to both the singular and plural thereof:

1. Access Control Area - Access control area shall include the areas occupied by and in the immediate vicinity of administration facilities including, but not limited to, Contractor's and Subcontractor's office trailers, access control trailer, sanitary facilities, decontamination pad and its contaminated water collection sump, equipment and materials lay-down and storage area, employee and service vehicle parking area, roadway connecting vehicular gate to decontamination pad.
2. Addenda - Written and/or graphic instruments issued prior to opening of Bids which clarify, correct or change the bidding documents.
3. Asbestos - All the asbestiform varieties of serpentine (chrysotile), riebeckite (crocidolite), cummingtonite-grunerite, anthophyllite, and actinolite-tremolite.
4. Asbestos Contaminated Area - The asbestos contaminated work area or any other area with either an airborne asbestos level equal to or above 0.1 fibers/cc air or visible uncontained deposits of asbestos contaminated material.
5. Asbestos Contaminated Materials - Materials consisting of friable or non-friable asbestos, or materials contaminated with asbestos to a degree that handling the materials may reasonably be expected to give rise to exposure to airborne asbestos fibers.
6. Bid - The offer or proposal of the bidder submitted on the prescribed form setting forth the prices for the Work to be performed.
7. Bonds - Bid, performance and payment bonds.
8. Clearance Air Samples - Air samples taken following asbestos removal and visual inspection by the Site Manager or his authorized representative to verify completion of work specified under this Subcontract.

9. Construction Facilities - Construction facilities shall include temporary facilities required during construction phase of the permanent facilities. These facilities are specified in Section 01500.
10. Contaminated Materials - Tailings and other materials having radioactive contamination levels greater than specified in the applicable US Environmental Protection Agency Standards. Contamination levels shall be as determined by the Contractor. These standards are presented in the Federal Register, January 5, 1983, Section 192.12: "Standards for Remedial Actions at Inactive Uranium Processing Sites". All demolished materials and debris shall be considered as contaminated materials for disposal purposes.
11. Controlled Area - Some areas on the construction site have localized health physics restrictions. Such areas are marked by ribbons, signs, and tags.
12. Day - Day shall mean a calendar day of 24 hours.
13. General Requirements - Division 1 of the Specifications.
14. Hazardous Waste - Any material, alone or mixed with other materials, which has no commercial use or value, or which is discarded or is to be discarded by the possessor thereof, either of which because of its quantity, concentration, or physical, chemical, or infectious characteristics may cause or significantly contribute to an increase in mortality or an increase in serious irreversible or incapacitating reversible illness; or pose a substantial present or potential hazard to human health or to the environment when improperly treated, stored, transported, disposed of, or otherwise managed. The term does not include: discharges which are point sources subject to permits under Section 402 of the "Federal Water Pollution Control Act", as amended; source, special nuclear, or byproduct material as defined by the Federal "Atomic Energy Act of 1954", as amended; agricultural waste from the raising of crops or animals, including animal manures, which are returned to the soils as fertilizers or soil conditioners; domestic sewage; irrigation return flows; inert materials deposited for construction for fill or topsoil placement in connection with actual or contemplated construction at such location or for changes in land contour for agricultural and mining purposes; or any waste or

other materials exempted or otherwise not regulated as a hazardous waste under the federal act.

15. Lower-Tier Subcontractor/Other Subcontractor:

- a. Lower-tier Subcontractor - An individual firm or corporation having a direct contract with the Subcontractor.
- b. Other Subcontractor - An individual firm or corporation (other than the Subcontractor) having a direct contract with the Contractor for other work on the Project.

16. Notice of Award - The written notice by Contractor to the apparent successful bidder stating that upon compliance by the apparent successful bidder with the conditions precedent enumerated therein, within the time specified, Contractor will sign and deliver the Agreement.

17. Notice to Proceed - A written notice given by Contractor to Subcontractor fixing the date on which the Subcontract Time will commence to run and on which Subcontractor shall start to perform Subcontractor's obligations under the Subcontract Documents.

18. Permanent Facilities - Permanent facilities shall include permanent features of the Project including, but not limited to, the following: Tailings embankment, permanent drainage ditches, finish grading and seeding.

19. Project - The total construction of which the Work to be provided under these Subcontract Documents is a part as indicated elsewhere in the Subcontract Documents.

20. Shop Drawings - All drawings, diagrams, illustrations, schedules and other data which are specifically prepared by or for Subcontractor to illustrate some portion of the Work and all illustrations, brochures, standard schedules, performance charts, instructions, diagrams and other information prepared by a Supplier and submitted by Subcontractor to illustrate material or equipment for some portion of the Work.

21. Site Manager - The authorized representative of the Contractor who is assigned to the site or any part thereof.

22. Specifications - Those portions of the Subcontract Documents consisting of written technical descriptions of materials, equipment, construction systems, standards and workmanship as applied to the Work and certain administrative details applicable thereto.
23. Subcontract Change Notice/Change Order - A document signed by Subcontractor and Contractor authorizing an addition, deletion, revision, or clarification of the Work, modified in writing and issued on or after the Effective Date of the Agreement.
24. Subcontract Drawings - The drawings which show the character and scope of the Work to be performed and which are referred to in the Subcontract Documents.
25. Subcontract Modification - A document issued to incorporate Subcontract Change Notices/Change Orders and adjustments in the Subcontract Price or Subcontract Time or to modify Subcontract.
26. Subcontract Price - The moneys payable by Contractor to Subcontractor under the Subcontract Documents as stated in the Agreement.
27. Subcontract Time - Duration of time specified in the Subcontract Agreement Form for the completion of the Work under the Subcontract. The time commences from the date or the day specified in the Notice to Proceed, and may be specified in terms of number of calendar days available to complete the Work, or in terms of the date on or before which to complete the Work.
28. Tailings Embankment - See Section 02200.
29. Temporary Facilities - See Construction Facilities in Paragraph 5 above.
30. Temporary Roads - Improvements to existing roads, and construction of new roads if any, carried out by the Subcontractor for his convenience in the performance of the Subcontract. These improvements or new constructions are not designated on the Subcontract Drawings.
31. Uncontaminated Materials - All materials having radioactive contamination levels less than specified in the applicable US Environmental Protection Agency Standards. These standards are presented in the

Federal Register, January 5, 1983, Section 192.12:
"Standards for Remedial Actions at Inactive Uranium
Processing Sites".

32. Work - The entire completed construction required under the Subcontract Documents. Work is the result of performance of services, furnishing labor and furnishing and incorporating materials and equipment into the construction, all as required by the Subcontract Documents.

- B. The other terms such as Contractor, Subcontractor, Government, DOE, Subcontract Administrator, Subcontract Documents, MK-F and Site of Work are defined in Article GP-2 of General Provisions.

SC-2 HOLIDAYS

- A. The following days will be observed as holidays by MK-Ferguson Company, the Contractor:

New Year's Day
President's Day
Memorial Day
Independence Day
Labor Day
Thanksgiving Day
Day After Thanksgiving Day
Christmas Day

- B. Holidays occurring on Saturday or Sunday will be observed on Friday or Monday.

SC-3 CONSTRUCTION RESTRAINTS

- A. Concurrent Work: MK-Ferguson Company (Contractor) and other subcontractors may be engaged in work in the general areas covered by the Work under this Subcontract. Such personnel will have access to the areas and to the utilities. The Subcontractor shall cooperate to best utilize the available areas, roadways and facilities. Coordination shall be through the Contractor.
- B. During the course of this Subcontract, the Contractor will perform radiological surveys, and will conduct tests on excavated areas to determine whether additional contaminated material remains to be excavated. Results of such tests of contaminated material are generally

available within four hours during normal work hours; however, test equipment constraints may increase the testing time.

- C. Upon apparent completion of contaminated material excavation in a distinct area, the Contractor will conduct a radiological verification survey to confirm removal of contamination to EPA standards. This survey may take up to seven work days. The Subcontractor shall plan his work accordingly.
- D. Stop Work in Case of Excessive Radionuclide or Other Toxic Concentrations: The Site Manager will monitor construction activities and may shut down the Work or require modification of Subcontractor activities in the event that gaseous or particulate radionuclide or other toxic concentrations associated with construction activities exceed allowable limits. Any shut down shall be a last resort response to such conditions; other responses including watering, vehicle speed reduction, covering of material emitting radon gas, etc., shall first be implemented by the Subcontractor.
- E. The Subcontractor shall not be permitted to bring explosives to the site under any circumstances.
- F. No surface-disturbing activities shall be permitted at the Petroglyph site shown on the Subcontract Drawings and described in UMTRA Archaeological Report No. 24, Information to Bidders. The site has been declared eligible for the National Register of Historic Places. The Subcontractor shall protect this site from damage at all times during the term of the Subcontract.
- G. The Subcontractor shall maintain the exhaust systems of all vehicles and equipment to protect against excessive noise and air pollution in compliance with the applicable local, state and federal requirements. The trucks shall be equipped with sound-dampening features. Tailgate chains shall be rubber-insulated and latches shall be adequately secured. Noise surveys will be conducted by Contractor's representative on all equipment.
- H. The public will have access to County Road CR-S8.
- I. If the Subcontractor uncovers any archaeological artifacts or human remains during the term of the Subcontract, he shall immediately halt operations in the immediate vicinity of such a discovery and notify the Site Manager. Further work in these areas shall not

resume until a qualified archaeologist has inspected the site and completed all resource recovery work.

SC-4 SITE LOCATION AND ACCESS

- A. The Work under the Subcontract involves operations at two different sites approximately 1.2 road miles apart:
 - 1. Union Carbide Processing Site (also referred to in the Subcontract Documents as UC Site).
 - 2. North Continent Processing Site (also referred to in the Subcontract Documents as NC Site).
- B. The locations of the sites are specified in Specification Section 01010.
- C. Access: See Section 01560.

SC-5 COORDINATION OF WORK

The Subcontractor shall carefully coordinate all construction activities with the Site Manager to avoid conflicts and unnecessary delays in construction.

SC-6 CONSTRUCTION FACILITIES AND TEMPORARY CONTROLS

- A. Unless otherwise specified elsewhere in the Subcontract Documents, the Subcontractor shall furnish and assume full responsibility for the following facilities and incidentals which are necessary for the furnishing, performance, testing, start-up and completion of the Work as shown on the Subcontract Drawings and as specified in the Specifications:
 - 1. Furnishing all materials, equipment, plant, labor, transportation, construction equipment and machinery, tools, appliances, fuel, power, light, heat, telephone, water, sanitary facilities, decontamination facilities and all other facilities and incidentals as specified in Section 01500.
 - 2. Furnishing temporary controls including, but not limited to, dust control, erosion control, noise control, pollution control, surface water control and access and traffic control as specified in Section 01560.

- B. Subcontractor shall be responsible for installing, constructing, maintaining, operating, removing and disposing of the construction facilities and temporary controls through the term of the Subcontract.

SC-7 CONSTRUCTION HEALTH AND SAFETY

A. Contractor Safety Program:

1. The Subcontractor shall comply with the Construction Safety and Health Management Program (Document No. MK-UMTRA-4). This document is available upon request from the Contractor's office in Albuquerque, New Mexico.
2. The successful bidder will be issued a copy of the Construction Safety and Health Management Program Document with the Notice of Award by the Contractor's Subcontract Administrator.
3. A table of contents for the Construction Safety and Health Management Program is listed below:

SAFETY AND HEALTH MANAGEMENT PROGRAM

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B. Construction Safety and Health Initial Indoctrination and Training:

1. All construction personnel working on the site shall receive the basic Construction Safety and Health Initial Indoctrination and Training. The Indoctrination and Training will cover such matters as first aid and medical responsibilities, emergency actions, etc. The indoctrination will be oral or written (approximately 30 minutes). It will be presented to construction personnel either individually or on a group basis and at the Subcontractor's convenience. The indoctrination will be presented to all personnel upon request, between the hours of 8:00 a.m. and 4:00 p.m., Monday through Friday (holidays excluded). No construction personnel will be permitted to work without having received this basic indoctrination.
2. The use of respirators may be necessary on this Project. If respirator use becomes necessary, the respirators will be provided by the Contractor and training in the proper use of respirators in the performance of specific tasks will be provided by the Contractor. This instruction is approximately two hours long and will be provided to the Subcontractor at no extra cost. The Subcontractor shall notify the Contractor's Representative at least one (1) week in advance of the time that the training is desired. Note, that individuals with beards or facial hair that interferes with a proper respirator seal will not be accepted for respirator training.
3. No payment will be made to the Subcontractor for his employees' attendance at Safety and Health Initial Indoctrination and Training Program or respirator training provided by the Contractor. Full compensation for such costs will be considered incidental to the Work of this Subcontract.
4. Based upon the criteria established by the MK-Ferguson Corporate Medical Director and upon the recommendations listed in the American National Standard, ANSI Z88.2-1980, "Practices for Respiratory Protection", all employees who will or may be required to wear respirators on this Project shall complete a medical questionnaire. There may be a need for further medical evaluation based on answers in the questionnaire. The Respirator Program Administrator or his designee will make this determination.

C. Electrical Precautions:

1. Personnel Ground Fault Protection: All electrical conductors used in construction, operating on single phase, 120V AC, 15 or 20 amperes circuits, shall be equipped with UL listed Ground Fault Circuit Interrupters set at five (5) milliamperes plus (+) or minus (-) one (1) milliampere. All portable electric tools and their usage shall be in compliance with applicable OSHA (29 CFR 1926) standards.
2. Electrical Clearance Requirement: All electrical circuit connections shall be made on de-energized systems. Working clearance for energized systems shall be 3 feet for 0 to 150 volts and 4 feet for 151 to 600 volts. The work shall be performed by a qualified journeyman electrician or by an apprentice electrician under the direct supervision of a qualified journeyman electrician.

D. Smoking, Drinking, Eating and Chewing Restrictions: No smoking will be permitted in the immediate vicinity of any flammable liquids, gases or highly combustible material, or in any area posted as a non-smoking area. No smoking, drinking, eating or chewing will be permitted in any controlled area.

E. Ladders, Scaffolds, and Man Lifts: All man-lift equipment, ladders, and scaffolding shall be in compliance with applicable OSHA (29 CFR 1926) standards and be subject to inspection by the Contractor prior to and during its use.

F. Trench/Excavation Barricades:

1. Trenching, excavation, shoring bracing, and barricading requirements shall be in accordance with OSHA, 29 CFR 1926, Subpart P.
2. The following forms of protection shall be required for open trenches/excavations adjacent to occupied buildings, crossing pedestrian crosswalks and paths, at street intersections, and crossing or adjacent to sidewalks and driveways:
 - a. Barricades shall be positioned on each side of the trench and stationed at a maximum of ten (10) foot intervals. Spacing on each side of the trench shall alternate to show that a front view depicts barricades at five (5) foot intervals.

- b. Whenever possible, each barricade shall be positioned at least two (2) feet away from the open trench or excavation.
 - c. Each barricade shall be equipped with a yellow flasher of at least eight (8) inches in diameter. (NOTE: Temporary barricades used during daylight operations do not require flashers.) Street side flashers shall be directed parallel with the street, curb side flashers and flashers along pedestrian routes shall be facing in the direction of pedestrian traffic.
 - d. When continuous solid barricades are not provided, interconnecting ropes or tape shall be attached to all barricades. When rope is used, streamers shall be attached at 2-3 foot intervals.
 - e. Walkways and/or bridges with standard guard rails, shall be provided at all pedestrian crossing points except for trench width 2'-0" and less where a barricade straddling the trench on either side of the walkway may be used.
 - f. Where vehicle traffic must cross trenching operations, metal plate covers shall be provided to support all motor vehicles.
 - g. Where trenches or excavations interrupt a doorway, ramp, or other exits/entrances to buildings, the doors shall be locked or blocked and a sign displayed to indicate the condition that exists.
- G. Notification of Occurrences: Subcontractors shall advise the Contractor immediately upon occurrence of any non-routine events, occurrences, incidents, or accidents, etc., particularly in situations such as lost time accidents and ambulance calls.
- H. Responsibility:
- 1. Subcontractor Safety Responsibility:
 - a. Each Subcontractor shall designate a qualified person to implement the Construction Safety and Health Management Program at the work site. The designated person shall have authority for actions and for control of work activity to prevent accidents.

- b. Daily work area safety and health inspections are required and appropriate action shall be taken to correct noncompliance conditions.

2. Contractor Safety Responsibility:

- a. Contractor Safety Department personnel or designated representatives will make regular continuing inspections of all facilities and operations within the scope of the Subcontract. These inspections will include the facilities and operations of all Subcontractors, but do not in any way relieve Subcontractors of their responsibility for compliance with the provisions of the Construction Safety and Health Management Program.
 - b. Daily work area safety and health inspections will be made by Contractor personnel.
- I. Galvanized Fence Materials: Personal respiratory protection or ventilation is required if a heat process takes place with galvanized fencing materials.
- J. Back Up Alarms: All heavy equipment shall have functioning audible back up alarms while in use on an UMTRA project.
- K. Asbestos: The Subcontractor shall submit the following to the Contractor for review before work start up:
- 1. A Certificate of Insurance Coverage, including, but not limited to, the following. These insurance coverage requirements are supplemental to other requirements specified in Section GC-8 of the General Conditions.
 - a. Asbestos Exclusions on Workmen's Compensation or Liability policies will not be accepted. However, separate policies will be satisfactory.
 - b. Whether coverage is on an occurrence or claims made basis, it is required that the coverage or policy be extended or kept in force for at least twenty-four (24) months after completion of the Subcontract.
 - c. The Subcontractor shall provide evidence of coverage by submitting a Certificate of Insurance stating that such exclusions or coverage are in effect.

2. An Asbestos Removal Plan.

3. Asbestos Removal Permit: See Article SC-11.B.

L. Unidentified Waste Materials: Unidentified wastes will be identified by the Contractor through laboratory analysis. If the materials are identified as hazardous, the Subcontractor shall comply with the applicable standards for personnel safety and health protection.

M. Industrial Hygiene:

1. Noise: Hearing protection shall be provided by the Subcontractor for personnel exposed to noise levels exceeding 85 decibels per 8-hour duration. Noise surveys conducted periodically by the Contractor's Safety and Health Department Personnel will be used to measure noise levels in the area. Noise dosimeters will be periodically placed on site workers by the Contractor's Personnel to measure actual, time-weighted noise exposure.

2. Dust: Subcontractor's dust control provisions shall be adequate to prevent personnel from potential inhalation exposure to Silica or Nuisance particulates. Contractor's Safety Department will conduct ongoing dust monitoring and will keep the Subcontractor informed about the need for respiratory protection.

SC-8 HEALTH PHYSICS

Portions of the Subcontract work area is a radiologically controlled area. All work shall be governed by the essential requirements given in the following paragraphs:

A. Work Conditions:

1. Radiation/Contamination Areas: Radiation/contamination controlled areas shall be established on a case-by-case basis at the discretion of the Site Manager. Protective clothing for contamination control is provided to the Subcontractor at no charge on a loan basis. Clothing will be issued by Contractor personnel when required at the access control gate.

2. Radiation Dressing Requirements:

a. All controlled area protective clothing, when required, shall be put on and removed at the con-

trolled area boundary. The Subcontractor shall ensure that removed items are properly stored and areas are maintained in proper order.

- b. When required, protective clothing for contamination control could consist of coveralls, gloves, and rubber boots, shoecovers or any combination of the above. Personnel will be required to change out of the protective clothing prior to leaving the controlled area.
3. Personnel Monitoring: All personnel will be required to self-monitor for radioactive contamination upon leaving the controlled area. Personnel will be instructed in self-monitoring procedures in accordance with paragraph 5 below defining Training Requirements.
4. Vehicles and Other Monitoring: Vehicles, equipment and tools from the controlled area will be monitored for radioactive contamination by the Contractor before leaving the area.
5. Training Requirements: In order to work in the controlled area, personnel shall be trained as Radiation Workers by the Contractor. The training course is approximately four hours long and is available to Subcontractor personnel at no cost for the instruction. Training in the proper use of respirators for performing specific tasks may be required. A test will be given to all personnel at the conclusion of training to establish qualifications as a Radiation Worker. Personnel must pass this test to work within the radiation control area. For respirator training and medical requirements, see Articles SC-7.B.2 and SC-7.B.4.
6. Radiation Exposure Limits and Restrictions:
 - a. Radiation exposure on this Project is expected to be well within allowable radiation exposures. Whole body radiation exposure in rem shall be determined by Personal Thermoluminescent Dosimeters (TLD) issued to each radiation worker.
 - b. Prior to working at the construction site each employee shall provide prior radiation exposure records as applicable.
 - c. While working at the construction site each employee is required to wear TLD badges issued and collected daily.

- d. No one under the age of 18 shall be permitted to enter or work in the controlled area.
7. Controlled area restrictions shall be observed by the Subcontractor and applicable precautions taken.

B. Special Examinations:

1. Employees working in radiation control areas may be required to submit a bioassay sample prior to starting work in the radiation control areas and also upon termination or completion of the subcontract. Certain Subcontractor employees, identified by the Contractor based on potential exposure to airborne radionuclides, will be required to submit quarterly bioassay samples. Employees may be required to submit additional bioassay samples on an occasional basis, to ensure that applicable radionuclide exposure standards are being met. It is the Subcontractor's responsibility to ensure that each employee submits bioassay samples as required by the Subcontract.
 2. The Subcontractor shall notify the Contractor of any personnel terminations or transfer within 8 working hours of such terminations or transfers. The Subcontractor shall also provide the Contractor with weekly lists of all Subcontractor or subtier employees employed by, or for, the Subcontractor who have been issued TLD radiation exposure badges. These weekly listings shall include full name, social security number, hire date, and termination/transfer date (if applicable), of all such employees.
- C. Health Physics (HP) Personnel: The Site Manager will monitor the construction work through HP personnel employed by him. The HP personnel will provide radiological surveillance over construction activities and advise supervision on matters concerning radiation safety as related to activities or conditions affecting the construction work.
- D. Warning Signals: The Subcontractor may depend on direct verbal information from the Contractor's personnel for warning signals. This verbal information will be communicated directly to the Subcontractor's personnel by the Site Manager or his designee. These warning signals may be required due to the Contractor's identification of unusual or unanticipated radiation levels, presence of toxic substances, or unsafe working conditions. The Sub-

contractor's employees shall take action as directed. The Subcontractor shall obtain the name and position of the Contractor's representative providing such direction.

E. Disposition of Contaminated Equipment, Tools and Material:

1. The Subcontractor shall use his own or rental equipment in performing the required work under this Subcontract. All tools, vehicles, equipment and material will be inspected for radioactive contamination by the Contractor or his designee prior to removal from the construction area.
2. Should the Subcontractor's tools, material, or equipment become contaminated, they will have to be decontaminated before removal from the area. If decontamination becomes necessary, the Site Manager will provide instructions for decontamination by the Subcontractor's employees. Decontamination may consist of steam cleaning, dry brushing, or washing with appropriate liquids. Decontamination required beyond these described will be handled under Article 4, "CHANGES" of the General Provisions.
3. If decontamination proves impracticable or impossible, the tools, material, or equipment in question will be retained by the Contractor and an equitable adjustment for same will be negotiated with the Subcontractor provided that:
 - a. There is no fault or negligence of the Subcontractor contributing to the contamination;
 - b. The Subcontractor has followed all the specific instructions of the authorized HP personnel who have surveillance over the work;
 - c. Items or equipment confiscated from the Subcontractor will be documented by a Confiscation Notice furnished to the Subcontract Administrator by the Contractor and signed by HP personnel and the Site Manager;
 - d. The Subcontractor allows reasonable time (a minimum of ten (10) working days, excluding weekends and holidays) in which to attempt decontamination of the item(s) in question. The reimbursement schedule will be as follows:
 - 1) Tools valued less than \$300.00 at 95% of replacement cost.

- 2) Tools/Equipment \$300.00 and up: If less than one (1) year old or at top of depreciation schedule, at 75% of replacement cost; if at bottom of or off the depreciation schedule, at 50% of replacement cost.
- e. Failure to agree upon an equitable adjustment shall constitute a dispute per Article GP-7 of the General Provisions.
- f. In view of the foregoing, the Subcontractor is encouraged to plan his work to minimize the transfer of equipment into and out of the construction area.

SC-9 SUBMITTALS

Pursuant to the provisions of the General Conditions Section GC-4 - Accomplishment of Work - Administration, and Specification Section 01300 - Submittals, the Subcontractor shall submit samples of materials, schedules and reports, shop drawings, product data, manufacturer's instructions, and design calculations and design drawings to the Contractor.

SC-10 QUALITY ASSURANCE

All work shall be performed to the requirements of the Contractor's Quality Assurance Program. This program meets the requirements of 10 CFR 50 Appendix B and ANSI/ASME NQA-1-79. The program will be wholly administered by the Contractor. All Quality Records will be generated by and maintained by Contractor's personnel.

SC-11 PERMITS

- A. The Contractor will provide the following permits and notifications, as required, for the facilities and activities depicted on the Subcontract drawings, except as noted below in Article SC-11.B:
 1. Dredge and Fill Permit - for
(U.S. Army Corps of Engineers)
 2. Endangered Species Consultation
(U.S. Fish and Wildlife Service)

3. Cultural Resource Clearance
(Colorado Historic Preservation Office and Advisory Council in Historic Preservation)
 4. Air Pollution Emission Permit - for earthmoving activities at the project site.
(Colorado Department of Health, Air Pollution Control Division)
 5. Colorado Pollutant Discharge System Permit (Waste-water)
(Colorado Department of Health, Water Quality Control Division)
 6. Free Use Permit - for
(Bureau of Land Management)
 7. Certificate of Designation for Solid Waste Disposal Site - for tailings embankment.
(San Miguel County Board of Commissioners and Colorado Department of Health)
 8. Mining and Reclamation Permit - for
(Colorado Mined Land Reclamation Division)
 9. Water Service Contract
(U.S. Bureau of Reclamation)
 10. Conditional Water Rights
(Colorado District Water Court)
 11. Conditional Use Permit
(San Miguel County Board of Commissioners)
 12. Approval of Road Construction
(San Miguel County and Colorado Department of Highways)
 13. Permit to Construct a Well (Water Supply and/or Monitor Wells)
(Colorado Division of Water Resources)
 14. Road Access Permit
(San Miguel County Roads Department)
- B. All other permits and notifications, including but not limited to the following, as required, shall be the responsibility of the Subcontractor in accordance with Article GP-13 of the General Provisions:

1. Special Transport Permit
(Colorado Department of Highways)
 2. Well Abandonment Affidavit
(Colorado Division of Water Resources)
 3. Demolition Permit and Notice of Intent to Perform
Asbestos Abatement
(Colorado Department of Health, Pollution Control
Division)
 4. Notice and Approval of Asbestos Emission Control
Procedures
(U.S. Environmental Protection Agency and Colorado
Department of Health)
 5. Spill Prevention Control and Countermeasures Plan -
for on-site fuel/oil storage.
(U.S. Environmental Protection Agency)
 6. Emission Permit for Gasoline Storage Tanks
(Colorado Department of Health, Air Pollution Control
Division)
 7. Open Burning Permit (for Uncontaminated Materials)
(Colorado Department of Health, Air Pollution Control
Division)
 8. Right of Entry to State Highway
(Colorado Department of Highways)
 9. Building Permit (for Trailer Pads)
(San Miguel County Planning Department)
 10. Mobile Home Siting Permit
(San Miguel County Planning Department)
 11. Approval of Disposal of Nonhazardous Wastes
(Colorado Department of Health, Air Pollution Control
Division)
 12. Approval of Sewage Disposal System Installation
(San Miguel County Department of Health)
- C. The Subcontractor shall comply with the provisions of the permits at all times during the execution of the Subcontract.
- D. The Subcontractor shall be responsible for providing necessary bonding required by the applicable city, county and state highway departments.

- E. Separate measurement or payment will not be made for work required of the Subcontractor for obtaining additional permits and for compliance with the provisions of all permits, unless specifically provided for in this Subcontract. All costs in connection with obtaining such permits and for compliance with such permits will be considered incidental to the Subcontract.

SC-12 SUBCONTRACTOR LABOR AND EQUIPMENT RATES

- A. Within 15 days after receipt of Notice to Proceed, the Subcontractor shall furnish to the Contractor a list of all equipment to be used on the Project. The list, as a minimum, shall include the following for each piece of equipment:
1. Equipment number, make, model, type, year of manufacture, capacity and/or horsepower.
 2. Rental rates for hourly, daily, weekly and monthly time periods. These rates shall include overhead and profit, but shall not exceed 60% of the current edition of the Rental Rate Blue Book for Construction Equipment.
 3. An hourly operating rate for fuel, oil, parts, maintenance and repairs, etc. for actual hours of operation only. Each rate shall be listed separately, and shall include appropriate overhead and profit but shall not include the equipment operator.
 4. The above information shall also be provided for any subsequent equipment brought onto the site during the term of the Subcontract in addition to the initial list, and shall be provided within five days of the date the equipment arrives.
 5. The initial equipment rate list submittal above shall be valid for all pieces of equipment from its receipt until January 1 of the following year.
 6. The equipment rate list shall be revised on January 1 of each year with the current Blue Book rates. These rates shall be used until the equipment rate list is revised on January 1 of the following year.
- B. Within 15 days after receipt of Notice to Proceed, the Subcontractor shall furnish to the Contractor labor rates for all craft designations to be used on the Project as follows:

1. List craft category and classification (i.e., loader operator, 6 cy; truck driver, 3 axle; etc.).
 2. Labor cost rate including fringe benefits, payroll, taxes, insurance, overhead and profit.
 3. Each item in 2 above shall be listed separately.
- C. The rates provided in Paragraphs A and B above shall be used for changes to the Subcontract where unit prices or other methods of pricing do not apply and shall be used solely at the discretion of the Contractor. These rates will be utilized to compensate the Subcontractor for little risks occurring from minor changes to the Subcontract. For larger changes, unit pricing or other appropriate methods will be used which will allow more appropriate profit margins.
- D. In the event the Contractor directs the Subcontractor to work overtime in addition to the Subcontractor's original intended schedule, the Contractor will pay (except in states where such a requirement is prohibited by law) only the actual labor cost over the rate of regular time plus actual payroll burdens (applicable taxes, fringes, benefits, etc.).

SC-13 MODIFICATION PROPOSALS PRICE BREAKDOWN

The Subcontractor, in connection with any proposal he makes for a Subcontract modification, shall furnish a price breakdown, itemized as required by the Subcontract Administrator. Unless otherwise directed, the breakdown shall be in sufficient detail to permit an analysis of all material, labor, equipment, subcontract, and overhead costs, as well as profit, and shall cover all work involved in the modification, whether such work was deleted, added or changed. Any amount claimed for subcontracts shall be supported by a similar price breakdown and/or quotes from the Subcontractors. In addition, if the proposal includes a time extension, a justification therefore shall be furnished. The proposal, together with the price breakdown and time extension justification, shall be furnished by the date specified by the Subcontract Administrator.

SC-14 VARIATIONS IN QUANTITIES

In all cases, except cancellation of one or more line items, where the quantity of a unit priced line item in

the Subcontract is an estimated quantity, and where the actual quantity of such line item varies by more than 10% above or 10% below the originally estimated quantity stated in the Subcontract, an adjustment in unit price shall be negotiated upon demand of either party for the quantities above or below the stated variation.

SC-15 LAWS AND REGULATIONS

Subcontractor shall give all notices and comply with all laws, ordinances, rules and regulations applicable to the Work. If Subcontractor observes that the Specifications or Subcontract Drawings are at variance therewith, Subcontractor shall give Contractor prompt written notice thereof, and any necessary changes shall be adjusted by an appropriate Modification. If Subcontractor performs any Work knowing or having reason to know that it is contrary to such laws, ordinances, rules and regulations, and without such notice to Contractor, Subcontractor shall bear all costs arising therefrom; however, it shall not be Subcontractor's primary responsibility to make certain that the Specifications and Subcontract Drawings are in accordance with such laws, ordinances, rules and regulations.

SC-16 FUNDING LIMITATIONS

- A. Of the total Subcontract Price, the sum of \$ _____ is presently available for payment to the Subcontractor under this Subcontract during fiscal year _____. It is anticipated that additional funds will be allotted from time to time to this Subcontract subject to Government appropriations available in this fiscal year or succeeding fiscal years. The responsibilities of Contractor are limited by this clause notwithstanding any contrary provision of the "Payments to Subcontractors" clause or any other clause of this Subcontract.
- B. The Subcontractor agrees to perform or have performed work up to the point at which, in the event of termination of this Subcontract pursuant to the clause hereof entitled "Termination for Convenience", the total amount payable by the Contractor (including amounts payable in respect of lower-tier subcontracts and settlement costs), pursuant to paragraph E. thereof, would in the exercise of reasonable judgment by the Subcontractor approximate the total amount at the time allotted to this Subcontract. The Contractor shall not be obligated in any

event to pay or reimburse the Subcontractor in excess of the amount from time to time allotted to this Subcontract, anything to the contrary in this clause or the clauses hereof entitled "Termination for Convenience" as specified in Article GP-18 and "Payments to Subcontractors" as specified in Article GP-8 of the General Provisions notwithstanding.

- C. It is contemplated that funds presently allotted to this Subcontract will cover the work to be performed until _____. In the event funds allotted are considered by the Subcontractor to be inadequate to cover the work to be performed until the above date, the Subcontractor shall notify the Subcontract Administrator when the work will reach a point at which, in the event of termination of this Subcontract pursuant to the clause hereof entitled "Termination for Convenience", the total amount payable by the Contractor (including amounts payable in respect of lower-tier subcontracts and settlement costs) pursuant to paragraph E. thereof, will approximate 85% of the total amount then allotted to this Subcontract. Such notice shall be in writing and shall be given not less than 45 days nor more than 60 days prior to the estimated date when such point will be reached. Such notice shall also state the estimated amount of additional funds required to continue performance to the above stated date. The Subcontractor shall, 30 days prior to the date above stated, advise the Subcontract Administrator in writing as to the estimated amount of additional funds which will be required for the timely performance of this Subcontract for the balance of the current fiscal year and the succeeding fiscal year. If after such latter notification, additional funds are not allotted by the date above written or by an agreed date in substitution thereof, the Subcontractor, by written notice delivered to the Subcontract Administrator at any time before such additional funds are allotted, may elect to treat its responsibility to proceed with the work under this Subcontract as having been terminated. Such a termination shall be considered a termination pursuant to the clause hereof entitled "Termination for Convenience".
- D. The Contractor may at any time prior to the Subcontractor's election to terminate as provided in Paragraph C. above, and with the written consent of the Subcontractor after such election to terminate, allot additional funds for continued performance of this Subcontract. The Subcontract Administrator will promptly notify the Subcontractor in writing, of any such allotment and the parties shall: (a) agree on the applicable period of Subcontract

performance which shall be covered by such funding; (b) modify the date stated in Paragraph C. above in order to reflect such extended period of coverage; and (c) modify the amount stated in Paragraph A. above. The provisions of Paragraphs B. and C., above, shall apply to such additional allotted funds and modified date.

- E. In the event the Subcontractor incurs additional costs, or is delayed in the performance of the work under this Subcontract, solely by reason of the failure of the Contractor to allot additional funds pursuant to Paragraph D. above in amounts sufficient for the timely performance of this Subcontract, and if additional funds are allotted by the Contractor pursuant to Paragraph D. for continued performance of this Subcontract, then an equitable adjustment may be made in the Subcontract Price (including appropriate target, billing and ceiling prices where applicable) or in the time required for the performance of the work, or both, and this Subcontract may be modified in writing accordingly; provided, that the Subcontractor provides to the Subcontract Administrator written notice of its claim of entitlement to an equitable adjustment prior to the date then stated in Paragraph C.
- F. Nothing in this clause shall affect the right of the Contractor to terminate this Subcontract pursuant to the clause of this Subcontract entitled "Termination for Convenience".

SC-17 CERTIFIED PAYROLLS

In addition to the copies of certified payrolls that are to be submitted each week to the Subcontract Administrator, one copy will also be submitted to the Site Manager.

SC-18 SUBCONTRACTOR'S LIABILITY

The Subcontractor has total liability for all of his own equipment, supplies, tools, etc., brought on the job site or used in the performance of his Subcontract.

SC-19 COLORADO SALES AND USE TAX

- A. Upon obtaining a certificate from the Colorado Department of Revenue, the Subcontractor shall be exempt from state and local sales and use tax on the purchase of construc-

tion materials for use in the building, erection, alteration, or repair of structures, highways, roads, streets, and other public works owned and used by the United States Government, the State of Colorado, its departments and institutions, and its political subdivisions in their governmental capacities only.

- B. The City of Denver does not exempt materials purchased by a Subcontractor for use in a job for an exempt institution.
- C. Consumable supplies used in the performance of the Subcontract and not becoming part of the permanent construction project would be taxable to the Subcontractor.
- D. Enclosed is Colorado Application for Exemption Certificate, Form DR172, which may be reproduced as necessary. For the purposes of this Subcontract, all references to "Contractor" shall mean the "Subcontractor", and all references to "Subcontractor" shall mean "lower-tier subcontractor". One certificate should cover the entire Subcontract if all Colorado locations are listed in Item 6. Item 10 must be "no" and Item 12 should be as late a date as anticipated to avoid requesting extensions.
- E. Lower-tier subcontractors who furnish and install permanent materials shall obtain their own exemption certificates for the purchase of materials.

SC-20 MEASUREMENT AND PAYMENT

- A. Unless otherwise provided in the Subcontract Documents, no separate measurement or payment will be made for compliance with the provisions of the General Provisions, General Conditions and Special Conditions. Full compensation for such work will be considered to be included in the related items of Bid Schedule or incidental to the Subcontract.
- B. Payment for the cost of premiums paid by the Subcontractor to obtain performance and payment bonds will be as specified in Article GP-8.E of the General Provisions. The Subcontractor shall quote the price for the premiums by the lump sum in the Bid Schedule. (Bid Schedule Item 002)

END OF SECTION 00800

Document No. 5057-SRK-S-01-00360-00

Issued for Review-Revision A

Special Conditions

SRK

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(STATE OF COLORADO LETTERHEAD)

(APPLICATION FOR EXEMPTION CERTIFICATE)

FORM IS PROVIDED AT THE END OF THIS SECTION

STATE OF COLORADO

DEPARTMENT OF REVENUE

440 West Fifth Avenue
Denver, Colorado 80204

Telephone: 303-839-3767

1-800-332-2085 (within Colo. only)



APPLICATION FOR EXEMPTION CERTIFICATE

The following information is required for an exemption certificate on an exempt construction project as defined in 39-26-114 (1)(a)(XIX, CRS 1973, as amended.

This exemption does not include or apply to the purchase or rental of equipment, supplies, and materials which are purchased, rented, or consumed by the contractor and which do not become a part of the structure, highway, road, street, or other public works owned and used by the exempt organization.

1. Exempt Agency's Sales Tax Exemption Number _____
2. Exempt Agency with which Contract Was Made _____
3. Present Owner of the Project _____
4. Contract Number _____
5. Describe Type of Construction _____
6. Location of Job _____
7. Prime Contractor _____
8. Total Amount of Your Contract \$ _____
9. Amount of Material (Dollar Value) \$ _____
10. Was Colorado Sales Tax Included in Your Bid? _____
11. Date You Will Start Work _____
12. Expected Completion Date (Month/Day/Year) _____

NOTE: A separate certificate is required for the prime contractor and all sub-contractors. Sub-contractors may not claim exemption under the prime contractor's certificate.

DBA or TRADE NAME _____

ADDRESS: Location _____

Mailing _____

By: _____ Date: _____

Specifications

Division 1
General Requirements

SECTION 01010

SUMMARY OF WORK

PART 1 - GENERAL

1.1 DESCRIPTION OF THE PROJECT

A. General:

1. The Work under this Subcontract covers two areas, known as the Union Carbide (UC) mill area and the North Continent (NC) mill area. Both areas are in the western portion of San Miguel County, Colorado. The 24.5-acre NC area is in Section 30, Township 44 North, Range 18 West, New Mexico Principal Meridian. The 81.5-acre UC area is in Section 25, Township 44 North, Range 19 West, New Mexico Principal Meridian.
 2. Site access is via Colorado Highway 141 and San Miguel County Road CR-S8.
 3. Each area contains a tailings pile area, some abandoned mill structures, abandoned utilities and wind-blown contaminated areas. In order to stabilize the tailings and meet EPA standards, the tailings and other contaminated materials from the NC area will be consolidated with the contaminated materials at the UC area in a tailings embankment to be constructed at the designated UC area.
 4. Access from the NC area to the UC area will be by San Miguel County Road CR-S9. This road will be used exclusively by the Subcontractor. During the term of this Subcontract, the public will be denied access on this road.
 5. During construction, County Road CR-S8 will be detoured on a temporary roadway to be constructed under this Subcontract. A permanent relocation for the road will be constructed by others after the end of this Subcontract.
 6. Certain utilities and structures associated with the Slick Rock Village will be relocated.
- B. Certain facilities specified in this Subcontract are required in greater than one number as shown on the Subcon-

tract Drawings. References made in singular shall be considered to apply to facilities to be provided at both sites. The sizes and shapes of these facilities may be different at each site.

1.2 SCOPE OF WORK

A. General:

1. The work is generally described as site work related to the excavation of contaminated radioactive materials from both the NC and UC mill areas and placement in tailings embankment to be located at the UC area. A cover consisting of radon barrier and erosion protection material will be placed over the embankment.
2. The Work includes furnishing all plant, labor, tools, equipment, materials, transportation, and services, and performing all operations necessary for and properly incidental to the construction as shown and noted on the Subcontract Drawings and as specified in these Specifications.

B. The Work Includes:

1. Mobilization: Mobilization, as specified in Section 01019.
2. Construction of a detour for County Road CR-S8.
3. Relocation of certain utilities and structures, as specified in Section 02125.
4. Construction Facilities: Construction of certain construction facilities, as specified in Section 01500.
5. Dust Control: Dust generated by vehicle use, demolished materials stockpiling, contaminated materials excavation and stockpiling, placement of fills or embankments, and other activities shall be controlled and minimized by the use of water and water-based surfactants sprayed from hoses or trucks, as specified in Section 01500.
6. Demolition: All foundations, structures, vehicles, existing fences, and piping from the areas to be demolished as specified in Section 02050, for placement in the tailings embankment.

7. Removal, plugging and abandoning, and demolition of existing utilities as specified in Section 02050 for placement in the tailings embankment.
 8. Removal and stockpiling of asbestos containing materials and identified non-hazardous waste materials, as specified in Section 02081.
 9. Sealing of existing monitor wells as specified in Section 02090.
 10. Excavation of uncontaminated materials from tailings embankment area and stockpiling for later use as backfill or for final site grading.
 11. Excavation of tailings and contaminated materials from the tailings piles and other areas of the sites.
 12. Construction of Tailings Embankment: Construction of tailings embankment at the UC area using tailings from both the UC and NC areas and other contaminated materials resulting from excavations, debris resulting from the demolition, and sediments from the retention basins.
 13. Cover Construction: Construction of a protective cover over the tailings embankment consisting of a compacted layer of radon barrier material and layers of rock bedding and riprap from borrow areas or required excavations.
 14. Removal of construction facilities.
 15. Restoration of Sites: After removal of contaminated material, the areas of excavation on and around the UC and the NC areas and borrow areas shall be graded and seeded as shown on the Subcontract Drawings.
- C. The above description of the Work is for general information only, and in no way limits the responsibility of the Subcontractor for constructing the Work in strict accordance with the Subcontract Drawings and Specifications listed in the Table of Contents.
- D. Environmental Observations: The Work shall be performed in strict accordance with the applicable requirements of EPA, San Miguel County, the Colorado Department of Health, and other involved state and federal agencies (see Article SC-11 of Special Conditions for list of permits) having jurisdiction, and in accordance with the requirements of

General Provisions, General Conditions and Special Conditions of this Subcontract.

1.3 CONSTRUCTION SEQUENCE

- A. Unless otherwise specified or directed, the Subcontractor shall follow the sequence of operations as set forth below. Full compensation for conforming to such requirements will be considered as included in the Bid Schedule items of Work and no additional compensation will be allowed therefor:
- B. Meetings will be conducted between the Contractor and Subcontractor prior to starting each sequence of construction listed below. The intent of these meetings is to review and discuss specification requirements for that particular sequence of construction. During these meetings, the Subcontractor shall present a construction plan that will outline and detail the equipment, personnel, schedule, and source, transportation, excavation, placement and compaction of materials proposed for each construction sequence as applicable.
- C. The sequence of operations:
 - 1. Mobilize.
 - 2. Perform Stage 1 excavation in tailings embankment area for road detour and gas pipeline relocation.
 - 3. Construct detour for County Road CR-S8.
 - 4. Relocate utilities, firehouse and housing trailers.
 - 5. Erect site perimeter fences and remove existing fences.
 - 6. Seal existing monitor wells.
 - 7. Excavate and stockpile contaminated materials from access control and decontamination pad areas.
 - 8. Construct access control area and decontamination pads.
 - 9. Demolish abandoned structures and utilities encountered and stockpile the debris.
 - 10. Construct retention basin including dikes, spillways and temporary drainage ditches. Stockpile contaminated materials excavated in this process for later

disposal in the tailings embankment; stockpile uncontaminated materials excavated for later use as fills. Perform grading required for site drainage.

11. Open borrow sites.
12. Perform Stage 2 excavation in tailings embankment area and stockpile contaminated materials.
13. Complete preparation of the tailings embankment foundation.
14. Excavate and transport the NC contaminated materials to the tailings embankment.
15. Perform final site grading of the NC area excluding retention basin.
16. Excavate and transport the UC contaminated materials to the tailings embankment.
17. Demolish decontamination facilities, including decontamination pad and recirculation sump, and dispose of the debris in the tailings embankment.
18. Dispose of contaminated sediments from the temporary drainage ditches and the wastewater retention basins of the UC and NC areas in the tailings embankment, as required, and dispose of synthetic membrane liner.
19. Construct radon barrier cover over the contaminated material in the tailings embankment. The cover shall consist of selected uncontaminated material obtained from designated borrow areas.
20. Place erosion protection materials over the radon barrier materials. The erosion protection materials shall consist of a layer of bedding material topped by a layer of rock riprap.
21. Site Cleanup: Remove and dispose of Subcontractor's stockpiled materials, close the borrow areas and remove site perimeter fencing.
22. Site Restoration: Grade the UC area, the borrow areas and the stockpile areas to provide drainage including placement of uncontaminated fill and seeding.

1.5 BORROW AREA LOCATION

- A. The following potential borrow areas are identified and shown on the Subcontract Drawings:
 - 1. Barlow Creek Borrow Area is located approximately 60 miles east of the UC area and 10 miles north of Rico, Colorado.
 - 2. Dolores River Borrow Area is located at N57,500, E61,000.
 - 3. Disappointment Valley Borrow Area is located at N53,000, E86,000.
 - 4. Materials from required excavations at the UC and NC areas which meet the Specifications may also be used.
- B. The Subcontractor shall be responsible for processing and selective quarrying to provide materials conforming to the Specifications.

1.6 SUBCONTRACT DRAWINGS

- A. A list of Subcontract Drawings and Titles is provided in the Table of Contents of these Subcontract Documents under "Subcontract Drawings".
- B. Where "as shown," "as detailed," "as noted," or words of like meaning are used in the Subcontract Documents, it shall be understood that reference is being made to the Subcontract Drawings unless otherwise specified.

1.7 TIME OF COMPLETION

- A. The Subcontractor shall commence Work under this Subcontract according to a written Notice to Proceed issued by the Contractor not later than _____, and shall complete the Work within _____ calendar days from the date of starting the Work.
- B. Termination for default, damages for delay and time extensions are specified in Article GP-6 of General Provisions.

1.8 CODES AND STANDARDS

- A. Pursuant to Section GC-3 of the General Conditions, any material, method, or procedure specified by reference to

the number, symbol, or title of a specific specification or standard, such as a Commercial Standard, American National Standard, Federal or State Specification, Industry or Government Code, a trade association code or standard, or other similar standard, shall comply with the requirements in the latest revision thereof and any amendments or supplements thereto in effect on the date of these Subcontract Documents, except as limited to type, class or grade, or modified in such reference.

- B. The code, specification or standard referred to, except as modified in these Specifications, shall have full force and effect as though printed in these Specifications. These Specifications and standards are not furnished to bidders because manufacturers and trades involved are assumed to be familiar with their requirements. The Contractor will furnish, upon request, information as to how copies of the specifications and standards referred to may be obtained.

1.9 MANUFACTURERS' SPECIFICATIONS AND INSTRUCTIONS

- A. Pursuant to Section GC-4 of the General Conditions, and unless otherwise indicated or specified, all manufactured materials, products, processes, equipment, or the like shall be installed or applied in accordance with the manufacturers' instructions, directions, or specifications. Said installation or application shall be in accordance with printed instructions furnished by the manufacturer of the material or equipment concerned for use under conditions similar to those at the jobsite. Two copies of such instructions shall be furnished to the Contractor and his acceptance thereof obtained before work is begun.
- B. Any deviation from the manufacturers' printed recommendations shall be explained and acknowledged as correct for the circumstances, in writing by the particular manufacturer. Subcontractor will be held responsible for all installations contrary to the manufacturers' recommendations. If any item of material or equipment is found to be installed not in accordance with the manufacturer's recommendations, Subcontractor shall make all changes necessary to achieve such compliance.

1.10 WORK QUALITY

- A. Shop and field work shall be performed by mechanics and workers skilled and experienced in the fabrication and

installation of the work involved. All work on this Project shall be performed in accordance with the best practices of the various trades involved and in accordance with the Subcontract Drawings and these Specifications.

- B. All Work shall be erected and installed plumb, level, square and true, or true to indicated angle, and in proper alignment and relationship to the work of other trades. All finished work shall be free from defects and damage.
- C. The Contractor reserves the right to reject any materials and work which are not considered to be up to the highest standards of the various trades involved. Such inferior material or work shall be repaired or replaced, as directed, at no additional cost to the Contractor or extension of Subcontract time.

1.11 FIELD MEASUREMENT AND TEMPLATES

Subcontractor shall secure all field measurements required for proper and accurate fabrication and installation of the work included in this Subcontract. Exact measurements are the Subcontractor's responsibility. Subcontractor shall also furnish or obtain all templates, patterns, and setting instructions required for the installation of all work. All dimensions shall be verified by the Subcontractor in the field.

1.12 ACCESS TO WORK

- A. Pursuant to the provisions of Article GP-11 of the General Provisions, the authorized agents of the following agencies will also have the right of access to inspect the Work covered by these Subcontract Documents during the performance of this Subcontract:
 - 1. United States Department of Energy (DOE)
 - 2. United States Nuclear Regulatory Commission (NRC)
 - 3. Colorado Department of Health, Radiation Control Division
 - 4. Various Agencies Listed in Article SC-11 of the Special Conditions
 - 5. Other Local, State and Federal Agencies

- B. The inspections will be performed in conjunction with an inspection by the Contractor. Reasonable facilities for the proper handling and inspection of the materials and the Work shall be furnished by the Subcontractor.

PART 2 - PRODUCTS

(Not Used)

PART 3 - EXECUTION

(Not Used)

PART 4 - MEASUREMENT AND PAYMENT

(Not Used)

END OF SECTION 01010

SECTION 01019

MOBILIZATION

PART 1 - GENERAL

1.1 SCOPE

A. This Specification Section covers the following:

1. Organization and mobilization of Subcontractor's forces and equipment;
2. Transporting construction plant and equipment to the site and setting up of same;
3. Transporting tools, materials, and equipment to the site; and
4. Furnishing, installation, construction, maintaining, operation, removal and disposal of construction facilities and temporary controls specified in Sections 01500 and 01560 but not covered for payment under those Sections.
5. Furnishing, installing, operation, maintenance and subsequent removal of construction plant, equipment, materials and supplies; decontamination of construction facilities; cleaning of equipment for salvage; cleaning of the site; and restoration and reseedling.

1.2 RELATED WORK

- A. Section 00800 - Special Conditions: Definitions
- B. Section 01500 - Construction Facilities
- C. Section 01560 - Temporary Controls
- D. Section 01561 - Construction Cleaning

1.3 DESCRIPTION

A. Mobilization shall include:

1. Furnishing, installation, construction, maintenance, operation, removal and disposal of construction facil-

ities and temporary controls identified in Article 1.1.A.4 above; mobilization of all construction equipment, materials, supplies, appurtenances, and the like; manned and ready for commencing and performing the Work.

2. Assembly and delivery to the site of plant, equipment, materials, and supplies necessary for the performance of the Work but which are not intended to be incorporated in the work; the preparation of the Subcontractor's work area; the complete assembly, in working order, of equipment necessary to perform the required work; personnel services preparatory to commencing actual work; and all other preparatory work required to permit commencement of the actual work on construction items for which payment is provided under the Subcontract.
3. Decontamination of construction facilities, equipment, materials, supplies, appurtenances; and cleaning of equipment for salvage.
4. Subsequent removal from the site of all construction equipment, materials, supplies, appurtenances, and the like upon completion of the work.
5. Cleaning of the site.

PART 2 - PRODUCTS

(Not Used)

PART 3 - EXECUTION

(Not Used)

PART 4 - MEASUREMENT AND PAYMENT

4.1 MEASUREMENT

Measurement for payment for mobilization will be by the lump sum basis.

4.2 PAYMENT

- A. Payment for mobilization will be by the lump sum price quoted therefor in the Bid Schedule, and shall include all items except as specified herein. Payment for mobilization will be made as follows:
1. Payment of 50 percent of the lump sum price will be made upon completion of "move-in". Move-in is defined as organization of the Subcontractor's manpower and equipment, transporting equipment to the site, and installation of Subcontractor's field office and other supporting structures.
 2. Payment of the remaining 50 percent of the lump sum price will be made upon completion of work corresponding to 10 percent of the total price quoted in the Bid Schedule exclusive of the price quoted for mobilization.
- B. Payment for furnishing, installing, operating, maintaining, decontaminating, and removing and disposal if required, of construction facilities and temporary controls not covered for payment under any other Bid Items will be considered to be included in the Bid Schedule item for Mobilization.

END OF SECTION 01019

SECTION 01025

MEASUREMENT AND PAYMENT

PART 1 - GENERAL

1.1 SCOPE

- A. This Specification Section covers descriptions of measurement and payment as they apply to this Subcontract. The provisions of this Section shall be supplemental to the requirements specified in General Provisions, General Conditions and Special Conditions.
- B. Measurement methods specified in the individual Sections of these Specifications shall govern if they differ from methods specified in this Section.
- C. The Subcontractor will compute all quantities. Where necessary, such computations will be based upon surveys performed by the Subcontractor.

1.2 RELATED WORK

- A. General Provisions - Article GP-8: Payments to Subcontractor.
- B. General Conditions - Section GC-4B: Reports and Progress Payments.
- C. Section 00800 - Special Conditions: Article SC-14, Variations in Quantities.
- D. Section 01052 - Layout of Work and Surveys.
- E. Section 01300 - Submittals: Schedule of Values and Progress Payment Schedule.

1.3 MEASUREMENT OF QUANTITIES

- A. Measurement Standards: All work to be paid for at a Contract price per unit of measurement will be measured in accordance with United States Standard Measures. A ton shall consist of 2,000 pounds avoirdupois.

B. Measurement by Weight:

1. Reinforcing steel, steel shapes, castings, miscellaneous metal, metal fabrications, and similar items, to be paid for by weight, shall be measured by scale or by handbook weights for the type and quantity of material actually furnished and used.
2. Material to be measured and paid for by scale weight shall be weighed on accurate, Contractor-approved scales, furnished by and at the expense of the Subcontractor. Use platform scales of sufficient size and capacity to permit the entire vehicle or combination of vehicles to rest on the scale platform while being weighed. Combination vehicles may be weighed as separate units provided they are disconnected while being weighed. All scales shall be inspected and certified as often as the Contractor may deem necessary to ascertain accuracy. Costs incurred, as a result of regulating, adjusting, testing, inspecting, and certifying scales, shall be borne by the Subcontractor.
3. The Contractor may be present to witness the weighing and to check and compile the daily record of such scale weights; however, in any case, the Contractor will require that the Subcontractor furnish weigh slips and daily summary weigh sheets. A duplicate weigh slip or a load slip for each vehicle weighed shall be delivered to the Contractor at the point of delivery of the material.
4. If the material is shipped by rail, the certified car weights will be accepted, provided that only actual weight of material will be paid for and not minimum car used for assessing freight tariff. Car weights will not be acceptable for material to be passed through mixing plants.
5. Trucks used to haul material being paid for by weight, shall be weighed empty daily and at such additional times as the Contractor may require. Each truck shall bear a plainly legible identification mark. The Contractor may require the weight of the material verified by weighing empty and loaded trucks on such other scales as the Contractor may designate.

C. Measurement By Volume:

1. Measurement by volume will be by the cubic dimension listed or indicated in the Bid Schedule. Method of

volume measurement will be as determined or directed by the Contractor.

2. When material is to be measured and paid for on a volume basis and it is impractical to determine the volume by the specified method of measurement, or when requested by the Subcontractor in writing and accepted by the Contractor in writing, the material will be weighed in accordance with the requirements specified for weight measurement. Such weights will be converted to volume measurement for payment purposes. Factors for conversion from weight measurement to volume measurement will be determined by the Contractor and shall be agreed to by the Subcontractor before such method of measurement of pay quantities will be accepted.

D. Measurement by Area: Measurement by area will be by the square dimension listed or indicated in the Bid Schedule. Method of square measurement will be as determined or directed by the Contractor.

E. Linear Measurement: Linear measurement will be by the linear dimension listed or indicated in the Bid Schedule. Method of linear measurement will be as determined or directed by the Contractor. Generally, items, components, or work to be measured will be measured at the centerline of the item in place.

F. Lump-Sum Measurement:

1. Lump-sum measurement will be for the entire item, unit of work, structure, or combination thereof, as listed or indicated in the Bid Schedule.
2. If the Subcontractor requests progress payments for lump-sum items or amounts in the Bid Schedule, such progress payments will be made in accordance with a Schedule of Values for that item as specified in Section GC-4B of the General Conditions and Article SC-12 of the Special Conditions.

1.4 FIELD MEASUREMENT FOR PAYMENT

- A. The Subcontractor shall compute all quantities of Work performed or of materials and equipment delivered to the site, for payment purposes.

- B. The Subcontractor shall assist the Contractor in the taking of measurements by providing all equipment, workers, and survey crews, as required, for verification of quantities by the Contractor in accordance with the provisions of Section 01052 of these Specifications.
- C. All such assistance in measurement services required of the Subcontractor, as specified, shall be performed under the direction and supervision of the Contractor.

1.5 PAYMENT

- A. Payment will be full compensation for furnishing all labor, materials, tools, equipment, transportation, services, and incidentals, as specified, in Article GP-8 of the General Provisions and Section GC-4B of the General Conditions, and for performing all work necessary for completing the erection or installation of the item or work classification, including all adjusting and balancing, testing, cleaning, and all other incidental work.
- B. Full compensation for all expense involved in conforming to the requirements for measuring materials or work shall be considered as included in the unit or lump-sum prices paid for the materials or work being measured, and no additional compensation will be permitted therefor.

1.6 VALUES OF UNIT PRICES

- A. The number of units and quantities contained in the Bid Schedule are approximate only, and final payment will be made for the actual number of units and quantities which are incorporated in or made necessary by the Work included in this Subcontract.
- B. In the event that work and/or materials or equipment are required to be furnished to a greater or lesser extent than is indicated by the Subcontract Drawings and Specifications, such work and/or materials or equipment shall be furnished in greater or lesser quantities, and the adjustment in unit price shall be made as specified in Article SC-14 of the Special Conditions.

1.7 REJECTED MATERIALS

Quantities of material wasted or disposed of in a manner not called for under the Subcontract; rejected loads of material, including material rejected after it has been placed by reasons of the failure of the Subcontractor to conform to the provisions of the Subcontract; material not unloaded from the transporting vehicle; material placed outside the limits indicated on the Subcontract Drawings or established by the Contractor; or material remaining on hand after completion of the Work, will not be paid for, and such quantities shall not be included in the final total quantities. No compensation will be permitted for loading, hauling, and disposing of rejected material.

PART 2 - PRODUCTS

(Not Used)

PART 3 - EXECUTION

(Not Used)

PART 4 - MEASUREMENT AND PAYMENT

4.1 MEASUREMENT

Separate measurement for payment will not be made for work required under this Section.

4.2 PAYMENT

Separate payment will not be made for work required under this Section. All costs in connection with the work specified herein will be considered to be included in the related item of work in the Bid Schedule, or incidental to the Subcontract.

END OF SECTION 01025

SECTION 01052

LAYOUT OF WORK AND SURVEYS

PART 1 - GENERAL

1.1 SCOPE

- A. This Specification Section covers the procedures and accuracy requirements for survey services for layout of work and field measurement of work quantities to be determined by surveys.
- B. Before commencing any layout of work and surveys, the Subcontractor shall give the Contractor five working days written notice in advance so that the Contractor may witness such work.
- C. The requirements specified herein are in addition to the requirements specified in Section GC-3 of General Conditions.

1.2 DESCRIPTION

- A. Reference Points: The reference points to be provided by the Contractor pursuant to Section GC-3A of General Conditions Paragraph 4.4 will include referenced monuments and elevation bench marks in the vicinity of the project. Initial reference points will be furnished by the Contractor. Replacement of Contractor-furnished reference points by the Contractor will be charged to the Subcontractor at a rate of \$150 per hour. All other necessary reference points shall be established by the Subcontractor.
- B. The Subcontractor shall furnish all necessary detail surveys including all lines, grades, and appropriate surveys as specified.
- C. The Contractor reserves the right to perform any desired checking and/or correction of the Subcontractor's surveys but this shall not relieve the Subcontractor of the responsibility for adequate performance of the work.
- D. Equipment and Personnel: The Subcontractor's instruments and other survey equipment shall be accurate, suitable for the surveys required in accordance with recognized professional standards, and in proper condition and adjustment at all times.

- E. Field Notes and Records: The Subcontractor shall record surveys in duplicate page field notebooks. The original pages of such records shall be furnished to the Contractor at intervals required by the Contractor. A duplicate of each field notebook shall be furnished to the Contractor when filled or completed.
- F. Use by the Contractor: The Contractor may at any time use line and grade points and markers established by the Subcontractor. The Subcontractor's surveys are a part of the Work and may be checked by the Contractor or representatives of the Contractor at any time. The Subcontractor shall be responsible for any lines, grades, or measurements which do not comply with specified or proper tolerances, or which are otherwise defective, and for any resultant defects in the Work. The Subcontractor will be required to conduct re-surveys or check surveys to correct errors indicated by review of the field notebooks or otherwise detected.

1.3 SURVEYS FOR LAYOUT AND PERFORMANCE

The Subcontractor shall perform all surveys for layout and performance of the Work, and shall reduce the field notes and make all necessary calculations and drawings necessary to carry out such work.

1.4 SURVEYS FOR MEASUREMENT FOR PAYMENT

When the Specifications or the Contractor require Bid Schedule items of work to be measured by surveying methods, the Subcontractor shall perform the surveys. All such surveys, including control surveys run for establishing the measurement reference lines, shall be performed in the presence of the Contractor (or a representative of the Contractor) who will witness the surveying operation by signing the field notes or keeping duplicate field notes, at the Contractor's option. The Subcontractor shall reduce the field notes and calculate final quantities for payment purposes. A duplicate of the note reductions and calculations will be given to the Contractor.

1.5 SURVEYING ACCURACY AND TOLERANCES IN LAYOUT OF SURVEY STAKES

- A. Tolerances in layout of Work shall not exceed the following:

<u>Type of Line or Mark</u>	<u>Horizontal Position</u>	<u>Elevation</u>
Permanent reference points	1 in 10,000	\pm .01 ft.
General Excavation and earthwork	1 in 2,000	\pm .10 ft.

- B. Tolerances for designed thicknesses shown on Subcontract Drawings and for elevations shown on the Subcontract Drawings shall be \pm 0.10 foot.
- C. These tolerances shall not supersede stricter tolerances required by the Drawings or Specifications, or by the governing authorities, and shall not otherwise relieve the Subcontractor of responsibility for measurement in compliance therewith.

PART 2 - PRODUCTS

(Not Used)

PART 3 - EXECUTION

(Not Used)

PART 4 - MEASUREMENT AND PAYMENT

4.1 MEASUREMENT

Separate measurement for payment will not be made for work required under this Section.

4.2 PAYMENT

Separate payment will not be made for work required under this Section. All costs in connection with the work specified herein will be considered to be included in the related item of work in the Bid Schedule, or incidental to the Subcontract.

END OF SECTION 01052

SECTION 01300

SUBMITTALS

PART 1 - GENERAL

1.1 DESCRIPTION

- A. This Specification Section describes the requirements for the following submittals:

1. Technical Submittals:

- a. Schedule of Technical Submittals
- b. Shop Drawings
- c. Samples
- d. Product Data
- e. Manufacturer's Instructions
- f. Design Calculations and Design Drawings
- g. Winter Shutdown Plan

2. General Submittals:

- a. Schedule of General Submittals
- b. Site Mobilization Schedule
- c. Project Construction Schedule
- d. Schedule of Values/Cost Profile
- e. Labor and Equipment Rates

3. Submittals Not Requiring Approval:

- a. Weekly Status Reports
- b. Weekly Manhour Reports/Employee Roster
- c. Certified Payroll
- d. Monthly Schedule Updates

- B. The requirements specified in this Section shall be supplemental to the requirements specified in General Provisions, General Conditions, Special Conditions and any other requirements specified in individual sections.

- C. All submittals shall be in the English language.

- D. The Subcontractor shall submit all submittals to the Site Manager. A copy of the submittal, marked "Information Only," shall be sent to the Subcontract Administrator by the Subcontractor.

- E. Technical and General Submittals shall be numerically serialized by type, Technical Submittal with a "T" prefix (T-1, T-2, T-3, etc.) and General Submittals with a "G" prefix (G-1, G-2, G-3, etc.).
- F. The Site Manager will clearly label the submittals as follows and return to the Subcontractor:
1. Approved
 2. Approved as Noted
 3. Revise and Resubmit
 4. Rejected
 5. Information Only
- G. When submittals are returned marked with either "Revise and Resubmit" or "Rejected" the Subcontractor shall make such revisions and corrections as required and resubmit the submittal with the same submittal number followed by R1 (Revision One). Example: T-5 - R1.

1.2 TECHNICAL SUBMITTALS

A. Schedule of Technical Submittals:

1. The Subcontractor shall complete the attached Technical Submittals Schedule (01300-A) provided with this Section, listing all technical submittals required per this section.
2. The Technical Submittals Schedule shall separate submittals by major specification section. This schedule shall include submittal delivery dates, required return dates, material delivery dates, and other pertinent data which may be required to ensure that the project schedule is met by the Subcontractor.
3. This Schedule shall be continually updated to reflect progress and any additions or deletions to the submittal schedule. Copies of the updated schedule shall be furnished to the Contractor during the first week of each calendar month.

B. Shop Drawings:

1. The procedure for submittal of shop drawings is set forth below and is supplemental to the requirements of Section GC-4 of the General Conditions.
2. Shop drawings shall establish the actual detail of all manufactured or fabricated items, indicate proper

relation of adjoining work, and incorporate minor changes of design or construction to suit actual conditions. Shop drawings shall be drawn to scale and shall be completely dimensioned.

3. Sheet sizes of shop drawings shall be 8 1/2 inches x 11 inches, 11 inches x 17 inches, or 22 inches x 34 inches.
4. A clear space of 3 inch by 3 inch shall be provided on each drawing for the Contractor's review stamp and comments.
5. Shop drawings shall be submitted to the Contractor in the form of a reproducible transparency, together with three blackline or blue-line prints.
6. After the Contractor has completed his review of shop drawings, he will return one print to the Subcontractor indicating the approval status as described in Article 1.1.D.
7. The Contractor will review and generally return shop drawings within ten days of receipt by the Subcontract Administrator but in no case will this process take longer than thirty days.

C. Samples:

1. The procedure for submittal of samples is set forth below and is supplemental to the requirements of Section GC-4A (3) of the General Conditions.
2. The Subcontractor shall furnish the Contractor at least three samples of each of the various materials, together with the finish thereon, as specified for and intended to be used on or in the work. Samples shall be sent to the Contractor.
3. The Subcontractor shall submit all samples to the Contractor at least 21 days before purchasing, fabricating, applying, or installing such materials and finishes, unless otherwise stated. The Contractor will review the samples for visual aspects such as kind, color, pattern, and texture, and will approve or ask for resubmission of samples generally within 10 days but in no case longer than thirty days of the Subcontractor's submission. All approvals of samples will be given by the Contractor in writing.

4. Unless otherwise specified in the various sections of these specifications, the Subcontractor shall submit all samples, other than field samples, in triplicate. A cover letter shall accompany the sample and shall list all items being transmitted, designating their particular usage and location in the project.
5. After the Contractor has performed his review and analysis of samples, two samples will be retained and the remaining sample will be returned to the Subcontractor, with the Contractor's comments.
6. Samples shall be submitted and resubmitted until approved as satisfactory. Approval of a sample shall not be taken in itself to change or modify any Subcontract requirement.

All materials, color, pattern and texture in the completed building or structure shall be equal in every respect to that of the approved samples.

7. Each sample shall be identified completely as to product, color, manufacturer, trade name, lot, style, model, location of use, and Subcontract Document reference, as well as the names of the Subcontractor, Supplier, Project and Contractor.
8. Test samples, as designated by the Contractor, may also be selected from the materials or equipment delivered by the Subcontractor to the site for use in the work. If any test sample fails to meet the specification requirements, such materials or equipment which fail the testing, shall be removed and replaced by the Subcontractor with materials or equipment meeting the Specification requirements.
9. Field samples shall be prepared at the site by the Subcontractor in the manner and number as specified in these specifications. Affected finish work shall not be commenced until the Contractor has approved the field samples, in writing.

D. Product Data:

1. Each copy shall be marked to identify applicable products, models, options, and other data; manufacturers' standard data shall be supplemented to provide information unique to the work.

2. The Subcontractor shall submit the number of copies which the Subcontractor requires to be returned, plus two copies which will be retained by the Contractor.
- E. Manufacturer's Instructions: When required by the manufacturer's warranty requirements, the Subcontractor shall submit manufacturer's printed instructions for delivery, storage, shelf life, assembly, installation, adjusting, and finishing.
- F. Design Calculations and Design Drawings:
1. Design Calculations: When requested by the Contractor, design calculations shall be submitted to the Contractor for review with all pertinent data, assumptions, objective, criteria, applicable codes, standards and references. The calculations shall be on 8-1/2 by 11-inch or 11 by 17-inch sheets. Each design calculation set shall bear page numbers, titles, revision numbers, date and calculation number. Where multiple number of items are designed in a particular system, the calculations shall be preceded by a table of contents.
 2. Design Drawings:
 - a. When requested by the Contractor, design drawings shall be submitted to the Contractor for review.
 - b. Pertinent requirements of Article 1.2.B of this Section shall be applicable for submittal of design drawings.
- G. Winter Shutdown Plan: A winter shutdown plan will be required for sites which will shutdown or limit operations for the winter season. This plan shall include grading modification drawings, product data and a narrative of the steps the subcontractor will take to address the following subjects:
1. Erosion from wind and water runoff of both contaminated and uncontaminated areas.
 2. Slope protection.
 3. Temporary ditching.
 4. Grading of excavations and embankments to drain.
 5. Segregation of contaminated and non-contaminated runoff.

6. Reduction of water in the retention ponds to allow for spring snow melt.
7. Protection of all equipment and piping from damage due to freezing.
8. Other items which may be required by the Contractor.

1.3 GENERAL SUBMITTALS

A. Schedules and Reports:

1. The Subcontractor shall prepare and submit (a) General Submittals Schedule (01300-B) provided with this Section and (b) Reports in accordance with the requirements of Section GC-4B of General Conditions and the requirements of this section.
2. The schedules and reports shall describe the Subcontractor's work plan in sufficient detail as delineated below to provide:
 - a. Assurance to the Contractor that the finished work complies accurately with the Subcontract Documents, and the requirements of Section GC-4 of General Conditions are satisfied,
 - b. A basis for determining the progress of the work, and
 - c. A basis for the Contractor's internal planning activities.
3. Within fifteen calendar days after Notice to Proceed, the Subcontractor shall provide the Contractor with initial copies of the General Submittals specified in this section. The cost profile shall be submitted within 30 calendar days.
4. The schedules shall be in a reproducible form and all of the same scale or may be combined at the option of the Subcontractor.
5. Unless otherwise specified, the schedules shall be presented in graphic format and shall be updated for each construction meeting, or at least monthly, and transmitted to the Contractor.

6. The Subcontractor shall obtain approval of the various schedules specified in this section before submitting the first application for payment. Schedule revisions also require Contractor approval.

B. Schedule of General Submittals: The Subcontractor shall complete the attached General Submittals Schedule, listing all General Submittals required per this section.

C. Site Mobilization Schedule:

1. Format: The Subcontractor shall present, at the pre-construction meeting, the schedule for site mobilization in bar chart format. The schedule shall delineate the establishment of the temporary facilities identified in Section 01500 and the Subcontractor's plan for starting the work.

2. Written Narrative: The Site Mobilization Schedule shall be accompanied by a written narrative discussion of the schedule. The narrative shall provide a man-power level by month for the first three months of the job, transportation routes proposed for delivery of major construction equipment to be used on the project, identification of special permits required and when they are needed, and a description of the temporary facilities to be provided.

3. Status and Progress: The status of mobilization schedule items will be reported in the Weekly Status Report discussed below.

D. Project Construction Schedule:

1. Scheduling: A preliminary issue of the Project Construction Schedule shall be prepared for review at the preconstruction meeting. Fifteen days after receipt of Notice to Proceed the Subcontractor shall issue the Project Construction Schedule for approval and issue the approved Project Construction Schedule ten days after receipt of approval and comments from the Contractor.

2. Format: The Project Construction Schedule shall consist of the following items, each compatible with the other and developed from the same basis:

a. Method of Construction Narrative

b. CPM Schedule: A time scaled Critical Path Method (CPM) Schedule which depicts proper restraints, activity durations, total float and free float for each schedule activity.

c. Critical Milestone Dates as listed below.

- 1) Start/complete mobilization.
- 2) Start/complete County Road CR-S8 detour.
- 3) Start/complete utilities and structures relocation.
- 4) Start/complete contaminated water collection and disposal system.
- 5) Start/complete drainage and water diversion across site.
- 6) Start/complete water supply facilities.
- 7) Start/complete demolition of structures and utilities.
- 8) Start/complete sealing of monitor wells.
- 9) Start/complete excavation for embankment, including Stage 1 and Stage 2.
- 10) Start/complete tailings excavation from NC area.
- 11) Start/complete tailings excavation from UC area.
- 12) Start/complete radon barrier.
- 13) Start/complete erosion protection including bedding layer.
- 14) Start/complete site restoration.
- 15) Demobilization.

d. Schedule of Values

3. Method of Construction: Method of construction submitted at the preconstruction meeting with the preliminary schedule shall be a written discussion of the

Subcontractor's methods for completing the work. The Subcontractor shall briefly describe his approach to the Subcontract.

4. The Use of Schedule Float: In as much as the Subcontractor's Schedule represents the Project Construction Schedule, the calculated float for an activity is shared by the Subcontractor and Contractor. Adjustments to the schedule float will be equitably resolved by the Contractor.
5. Computer Generated Schedule: The Subcontractor may generate the CPM Schedule manually or by using a computer. The CPM Schedule shall include all significant items of work.
6. Comments Incorporated: The Subcontractor shall incorporate the Contractor's comments into revisions of the Project Construction Schedule, adjust the manpower loading as required and resubmit the schedule to the Contractor for approval along with a summary of the changes.
7. Revisions made to the schedule will be given a new revision number and submitted to the Contractor for approval. A written narrative shall accompany any changes to the logic and/or durations of the Construction Schedule. This narrative shall explain in detail what the change involves, the reason for the change, and any effect to the critical path of the schedule.

E. Schedule of Values/Cost Profile:

1. Each time a construction schedule is submitted, it shall be accompanied by a Schedule of Values for the entire Scope of Work. The Schedule of Values shall conform to the format sample (01300-C) provided with this Section. The Schedule of Values shall be based upon that specific revision of the Construction Schedule, and presented in such a format to clearly provide total period and cumulative cost information for each month for the entire duration of the Subcontract. This Schedule of Values shall be in a form which will provide a correlation between the subcontract bid items and the Subcontractor's schedule activities. The Subcontractor may, at his own risk, plan work in excess of the funding limitations outlined in the Special Conditions.
2. The format and the substance of the finalized Schedule of Values shall be as approved by the Contractor.

- F. Labor and Equipment Rates: The Subcontractor shall submit labor and equipment rates as stipulated in Subcontractor Labor and Equipment Rates of the Special Conditions.

1.4 SUBMITTALS NOT REQUIRING APPROVAL

- A. The Subcontractor shall furnish the following submittals for information only. These submittals will not be approved and returned to the Subcontractor.

1. Weekly Status Reports: The Subcontractor shall submit a Weekly Status Report to the Contractor by Friday noon. The report shall be on a form satisfactory to the Contractor, and shall include items such as a Summary of Work completed and a Two-Week Look Ahead Bar Chart.
2. Weekly Manhour Reports/Employee Roster: The Subcontractor shall provide a weekly employee roster listing all Subcontractor and lower-tier subcontractor employees. The Subcontractor shall also tabulate total manhours worked each week including manhours spent by lower-tier subcontractor's personnel, craft, supervision, management and submit this information to the Contractor. The manhour report shall include separate totals for each craft and administrative classification.
3. Certified Payrolls: Certified Payrolls are to be submitted in strict compliance with Section 10 of MK-Ferguson Company Standard Documents Package for proposed construction subcontracts.
4. Monthly Schedule Updates: The Subcontractor shall submit an updated schedule, with the Critical Milestones clearly identified, by the first of each month. The status of the CPM Schedule shall indicate percent complete by activity, remaining duration of in-progress activities, total float and free float for each schedule activity.

PART 2 - PRODUCTS

(Not Used)

PART 3 - EXECUTION

(Not Used)

PART 4 - MEASUREMENT AND PAYMENT

4.1 MEASUREMENT

Separate measurement for payment will not be made for work required under this section.

4.2 PAYMENT

Separate payment will not be made for work required under this section. All costs in connection therewith shall be considered to be incidental to the applicable items of work to which they pertain.

END OF SECTION 01300



TECHNICAL

SUBMITTALS SCHEDULE

UNTRA SITE _____

SUBCONTRACTOR _____

SUBCONTRACT NO. _____

STATUS:

A = Approved

AAN = Approved As Noted

RJR = Revise & Resubmit

R = Rejected

[illegible]



GENERAL SUBMITTALS SCHEDULE

UMTRA SITE _____
SUBCONTRACTOR _____
SUBCONTRACT NO. _____

A = Approved
AAN = Approved As Noted
RIR = Revise & Resubmit
R = Rejected

[illegible]

01300-B

UMTRA PROJECT
 SUBCONTRACT DOCUMENTS _____
 SCHEDULE OF VALUES

SAMPLE

DESCRIPTION	SCHEDULE ACTIVITY NUMBER	BID ITEM		1987						TOTAL DOLLARS
		NUMBER	PERCENT	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	
MOBILIZA- TION	1	001	50%	-----						\$32,000
INSTALL FENCE AT CONTRACT- OR'S OFFICE	2	901	25%		-----					\$57,000
		902	100%							
EXCAVATION (TAILINGS)	3	204	100%			-----				\$320,000
INSTALL REMAINING FENCE	4	901	75%				-----			\$21,000
DEMOBILIZA- TION	5	001	50%					-----		\$32,000
TOTAL:		PERIOD		\$31,000	\$40,000	\$152,000	\$207,000	\$30,000	\$2,000	\$462,000
		CUMULATIVE		\$31,000	\$71,000	\$223,000	\$430,000	\$460,000	\$462,000	

CONSTRUCTION START DATE: 3/10/87
 CONSTRUCTION COMPLETION DATE: 8/07/87

SECTION 01500

CONSTRUCTION FACILITIES

PART 1 - GENERAL

1.1 SCOPE

- A. This Specification Section covers the requirements for the construction facilities.
- B. Construction facilities shall include, but not be limited to, the following temporary offices, utilities, equipment, materials and services:
 - 1. Subcontractor's Office
 - 2. Contractor's Office
 - 3. Parking Areas
 - 4. Janitorial and Snow Removal Services
 - 5. Temporary Roads
 - 6. Storage of Materials and Equipment
 - 7. Construction Equipment
 - 8. Temporary Sanitary Facilities
 - 9. Temporary Electric Power
 - 10. Temporary Water
 - 11. Decontamination Washwater Recycling Systems
 - 12. Temporary Heat
 - 13. Temporary Telephone Service
 - 14. Temporary Fences
- C. The Subcontractor shall be responsible for furnishing, installing, constructing, operating, maintaining, removing and disposing of the facilities as shown on the Subcontract Drawings, as specified in this Specification, and as required by the Contractor for the completion of the Work under the Subcontract.
- D. All such temporary facilities shall be located as shown on the Subcontract Drawings, or as directed, and maintained in a clean, safe and sanitary condition at all times until completion of the Subcontract.
- E. Upon completion of the Subcontract, the temporary facilities shall be left in the status specified in Article 1.21 of this Section.
- F. The requirements specified herein are in addition to any requirements specified elsewhere in the Subcontract Documents. Temporary facilities shall meet the requirements for all-weather service.

- G. All Contractor's trailers shall be provided with adequate stairs, stoops, and hand railings. They shall be connected by a covered deck provided at the door sill level. Utilities shall be designed and constructed to provide service without interruption during extreme weather conditions.
- H. Certain facilities specified in this Section, although referred to in singular, may be required in greater numbers. The number of facilities required shall be as shown on the Subcontract Drawings.
- I. All land disturbances related to the temporary facilities shall be minimized to the greatest extent possible and the land restored to the extent reasonable and practical, to its original contours by grading to provide positive drainage and by seeding the area to match with existing vegetation.

1.2 RELATED WORK

- A. Section 00800 - Special Conditions: Definitions
- B. Section 01019 - Mobilization: Payment
- C. Section 01560 - Temporary Controls
- D. Section 02200 - Earthwork
- E. Section 02230 - Aggregate Base
- F. Section 02832 - Chain Link Fence and Gates
- G. Section 02834 - Barbed Wire Fence
- H. Section 02935 - Seeding

1.3 APPLICABLE PUBLICATIONS

- A. The Publications listed below form a part of this Specification to the extent referenced. The Publications are referred to in the text by the basic designation only:
 - 1. UMTRA Project Construction Safety and Health Management Program (MK-UMTRA-4)
 - 2. Colorado Highway Department:
"Standard Specifications", as applicable.
 - 3. Uniform Building Code (UBC):
1985 Edition, applicable Chapters and Sections.

4. National Fire Protection Association (NFPA), as applicable.

5. American Society for Testing and Materials (ASTM):

D751-79 Methods for Testing Coated Fabrics

D1682-64 Standard Test Methods for Breaking Load
and Elongation of Textile Fabrics

B. All required facilities, equipment and utilities shall also be constructed/installed, maintained and operated in accordance with applicable Federal, State, County, and Utility laws, rules, and regulations. Notwithstanding contrary provisions of General Provisions, General Conditions and Special Conditions, nothing in the Subcontract Drawings and Specifications shall be construed to permit work not conforming to the above.

1.4 SUBCONTRACTOR'S TEMPORARY OFFICE TRAILER

A. Subcontractor may furnish and install, in good condition, on the UC area, one or more temporary office trailer(s) of suitable sizes for himself and his office staff.

B. The location of the trailers shall be approved by the Contractor prior to setting in place.

1.5 CONTRACTOR'S TRAILERS

A. Subcontractor-Furnished Trailers:

1. The Subcontractor shall furnish and install the following trailers for the Contractor's staff at locations as shown on the Subcontract Drawings. The location of the trailers shall be approved by the Contractor prior to setting in place:

- a. Contractor's Office Trailer (UC Area)
- b. Two Access Control Trailers (UC Area)
- c. Laboratory Trailer (UC Area)
- d. Radiological Control Trailer (UC Area)

2. Each trailer shall be not less than 720 (12 ft. x 60 ft.) square feet.

- B. Each trailer shall be provided with running water and power, and shall be properly lighted and temperature conditioned for summer and winter uses. Wash basins and toilets shall be connected to sanitary facilities specified in Article 1.11.
- C. All trailers shall be equipped with skirting all around.

1.6 PARKING AREAS

- A. No personal vehicles will be permitted inside the construction controlled work area. Vehicles used for construction purposes will be allowed inside the work area, but will be monitored for radioactive contamination at the access gate or control point before leaving the area.
- B. Subcontractor shall provide aggregate surfaced parking area for maintenance and delivery vehicles, the Contractor's and Subcontractor's representatives, and for other authorized visitors, as indicated on the Subcontract Drawings. Parking for personal cars shall be limited to the Contractor's and Subcontractor's office areas.

1.7 JANITORIAL AND SNOW REMOVAL SERVICES

- A. The Subcontractor shall provide daily janitorial, and snow removal when required, services including, but not limited to, the following for all Contractor's trailers, toilet facilities and the access control area:
 - 1. Sweep, vacuum, mop, and, if required, polish floors.
 - 2. Clean toilets, doors and windows, office furniture.
 - 3. Collect and dispose of office and yard solid waste.
 - 4. Furnish paper, soap, cups, napkins, light bulbs, etc.
 - 5. Operate and maintain trailer services including, but not limited to, the water supply and wastewater collection systems; heating, ventilating and air-conditioning system; and lighting and security systems.
 - 6. Remove snow from the walkways to the office trailers and from the parking areas.
- B. Janitorial services shall be provided throughout the period of the Subcontract.

1.8 TEMPORARY ROADS

- A. Temporary roads as defined in Article SC-1 of the Special Conditions shall meet the following requirements:
1. Construction shall be coordinated with and shall be as approved by the Contractor.
 2. Thirty days prior to the start of any roadway work, the Subcontractor shall submit, for review and approval, improvement drawings to the Contractor. The drawings shall indicate approval by the agency having jurisdiction over such roads.
 3. The Subcontractor shall coordinate all road construction activities with local utilities, fire and police departments.
 4. Erosion shall be kept to a minimum and suitable grades and radii of curves shall be maintained to facilitate ease of movement of vehicles and equipment.
 5. Longitudinal and cross drainage facilities including, but not limited to, the ditches, structures, pipes and the like shall be furnished and installed by the Subcontractor.
 6. Existing or temporary roads may also require decontamination after the construction activities are completed. All costs in connection therewith shall be considered to be incidental to the applicable items of work to which they pertain.

1.9 STORAGE OF MATERIALS AND EQUIPMENT

- A. Subcontractor shall make arrangements for exterior storage areas for materials, equipment, and debris. Locations and perimeters of such facilities shall be subject to the approval of the Contractor.
- B. All operations of the Subcontractor, including storage of materials, shall be confined to areas approved. Subcontractor shall be liable for any and all damage caused by him during such use by him of property of the Contractor or other parties. Materials shall be stored in accordance with the manufacturer's instructions, as applicable.
- C. Subcontractor shall store construction materials and equipment within boundaries of designated areas. Storage of gasoline or similar fuels shall conform to the requirements specified in Article SC-13 of the Special Conditions.

1.10 CONSTRUCTION EQUIPMENT

- A. Subcontractor shall erect, equip, and maintain all construction equipment in accordance with all applicable statutes, laws, ordinances, rules and regulations of the Contractor or other authority having jurisdiction.
- B. Scaffolding, staging, runways, hoists, barricades, and similar equipment required for performance of the Subcontract shall be provided and maintained by the Subcontractor. Hoists or similar equipment shall be provided with operators and signals, as required.
- C. Subcontractor shall provide, maintain, and remove upon completion of the work, all temporary rigging, scaffolding, hoisting equipment, debris boxes, barricades around openings and excavations, fences, ladders, and all other temporary work, as required for all work hereunder unless otherwise directed by the Site Manager.
- D. Construction equipment and temporary work shall conform to all the requirements of State, County, and local authorities, OSHA, and underwriters which pertain to operation, safety, and fire hazard. Subcontractor shall furnish and install all items necessary for conformity with such requirements, whether or not called for under the separate sections of these Specifications.

1.11 TEMPORARY SANITARY FACILITIES

- A. Subcontractor shall provide temporary sanitary facilities for use by all employees and persons engaged in the Work, including lower-tier subcontractors, Contractor, DOE, their employees and authorized visitors.
- B. Sanitary facilities include enclosed chemical toilets, washing sinks, pipes, tanks and pumping equipment. These facilities shall meet the requirements of local public health standards. Open pit or trench latrines will not be permitted.
- C. Chemical toilets and washing sinks shall be provided for use by the Subcontractor, his employees and all other workers and suppliers. The number required shall conform to the requirements specified in Section GC-6 of the General Conditions.
- D. Contaminated water from the Access Control and Laboratory trailers wash sinks and from the emergency shower shall be collected into an underground holding tank by a separate piping system. The contents of the underground holding

tank shall be pumped into the wastewater retention basin or to decontamination washwater recycling system.

- E. Sanitary waste from wash sinks and toilets provided in the Contractor's trailers shall be drained to an underground septic tank by a separate piping system, or at the Subcontractor's option to existing sanitary sewer system where available. The contents of the underground septic tank, if provided, shall be disposed of offsite as Subcontractor's property.
- F. During the term of the Subcontract, both tanks shall be kept pumped out at regular intervals to prevent overflow and contamination of the ground, flowing streams or surface drainage.
- G. Sanitary facilities shall be located as shown on the Subcontract Drawings and as approved by the Contractor, and shall be maintained in a sanitary condition during the entire course of the Work. Subcontractor shall keep such facilities adequately supplied with toilet paper, paper toweling, paper cups, etc., as required.
- H. At completion of the Work, sanitary facilities shall be properly disinfected and the tank and the contents disposed of as required by the Contractor.

1.12 TEMPORARY ELECTRIC POWER

- A. The Subcontractor shall provide and maintain during the course and progress of the Work all electrical power and wiring requirements to facilitate the work of all trades and services associated with the Work. The sites can be served by the San Miguel Power Co. The Subcontractor shall make arrangements with the serving utility and shall pay all charges for providing and maintaining electrical service including usage costs at the site. All temporary wiring, feeders, and connections shall be furnished by the Subcontractor.
- B. Routing of temporary conductors, including welding leads shall not create a safety hazard nor interfere with operation and maintenance of existing facilities. Approval from Site Manager shall be obtained prior to making connections to existing power panels.
- C. All temporary wiring installed by the Subcontractor shall be accomplished in accordance with the requirements of the National Fire Protection Association (NFPA) Codes 70 and 70E (latest edition), using acceptable code materials and equipment.

D. There may be times during the period of the subcontract when the Contractor will schedule power outages which will make temporary electrical power unavailable over any of the electrical transmission and distribution systems. Normally, these outages will be scheduled sufficiently in advance to give the Subcontractor prior notification; however, due to operational requirements, it may be necessary to "kill" the lines without prior notification. The Contractor assumes no liability for interruptions, delays, or inconveniences caused to the Subcontractor as a result of such electrical power outages or power failure, scheduled or unscheduled, except that any delay in completion of the work resulting directly from such power outages shall be deemed a delay due to unforeseeable causes beyond the control and without the fault or negligence of the Subcontractor within the meaning of the Article 6, "TERMINATION FOR DEFAULT-DAMAGES FOR DELAY TIME EXTENSIONS," of the General Provisions, and the Subcontractor shall be entitled to relief in accordance with the provisions of said Article 6, provided he gives written notice of such delay in accordance with the requirements thereof. There will be no adjustment in the Subcontract Price due to any such electrical power outage or power failure.

E. Subcontractor shall provide power and lighting to all trailers, and for all Work as required, at no extra cost to the Contractor, and as follows:

1. A minimum of 200A electric service to all Contractor's trailers.
2. Adequate temporary lighting to all trailers, and for all Work, as required.

1.13 TEMPORARY WATER

A. General:

1. Temporary water for potable and construction use shall be provided at no additional cost to the Contractor.
2. Subcontractor shall furnish, install, operate and maintain all equipment, including necessary tanks, piping, hoses, meters, valves, fixtures, and the like, to distribute water to various points of usage throughout the site.

B. Potable Water:

1. Subcontractor shall provide chilled drinking water in bottles from an approved source.
2. Potable water for sanitary uses shall be provided to all Contractor's trailers.

C. Construction Water: The Subcontractor shall make his own arrangements for construction water. Water rights from the Dolores River will be available from the U.S. Bureau of Reclamation.

D. All plumbing fixtures including wash sinks, emergency shower, and toilets provided in the Contractor's trailers shall be connected to a source of water supply.

1.14 UC AREA DECONTAMINATION WASHWATER RECYCLING SYSTEM

A. The Subcontractor shall furnish, install, operate and maintain a decontamination washwater recycling system at the UC area for:

1. Washing contaminations from vehicles, equipment, tools and materials that become contaminated during use in Work.
2. Recycling washwater from recirculation pond for reuse as washwater for decontamination.
3. Furnishing make-up water and emptying the surplus water, when required, to maintain the recirculation pond capacity at 3/4 full.
4. Emptying the solids from the sump, as required.

B. The decontamination washwater recycling system shall, as a minimum, consist of the following:

1. High-pressure, low-flow wash system capable of decontaminating vehicles, tools and equipment, as required, for Work under the Subcontract, consisting of pumps, motors, tanks with suction and discharge piping, valves, meters, gages, nozzles, etc.
2. A lined recirculation pond and a lined sump.
3. Overflow pipe.
4. Decontamination pad.

- C. Contaminated washwater and sediments shall be collected from the decontamination pad by gravity through a buried pipe into the lined sump. Overflow from the sump shall be collected in the recirculation pond. The water from the recirculation pond shall be recycled for reuse as washwater by a pumping system. The water level in the pond shall be maintained to not exceed 3/4 full. Excess water shall be used to the extent feasible for dust control of contaminated areas and in moisture-conditioning of soils during construction of fills in contaminated areas, and the remainder pumped out to the wastewater retention basin. Sediments from the sump and ponds shall be removed and placed in contaminated areas as approved by the Contractor.
- D. The Subcontractor shall submit his proposed decontamination washwater recycling system designs, including calculations, drawings, and equipment list with capacities, to the Contractor for review at least 45 days prior to commencement of installation.
- E. Construction of decontamination pad at the UC area shall conform to the following:
1. The pad shall be of Portland cement concrete and may be of reinforced or unreinforced design.
 2. The pad shall be designed by the Subcontractor, and the design shall be submitted to the Contractor for review and approval. The pad shall be designed and constructed to handle the largest and heaviest vehicle to be used by the Subcontractor, and the pavement section shall be designed, considering site subgrade conditions, to support the heaviest loading anticipated during project construction. The minimum size shall be 30 ft. x 100 ft., and minimum pavement thickness for reinforced concrete shall be 6 inches.
 3. The pad shall be designed to drain to the sump so that all washwater is collected, without spillage outside of sump facilities.
 4. All joints shall be sealed and the pad shall be maintained in a waterproof condition to eliminate the possibility of washwater drainage into the subgrade.
- F. Demolition and disposal of the decontamination system shall conform to Section 02050.

1.15 WASTEWATER COLLECTION SYSTEM AT COUNTY ROAD CR-S8

- A. The Subcontractor shall also furnish, install, operate and maintain wastewater collection system at County Road CR-S8 at the intersection with haul road from NC area.
- B. The system shall, as a minimum, consist of the following:
 - 1. High pressure, low flow wash system consisting of pumps, motors, tanks with suction and discharge piping, valves, meters, gages, nozzles, etc., as required.
 - 2. Concrete pad.
 - 3. Transverse drainage channel Q200 as manufactured by ACO Polymer Products, or equal.
 - 4. PVC piping.
 - 5. A lined sump.
- C. The system shall be capable of washing the spilled contaminated debris from the transport trucks into the sump via drainage channel and piping.
- D. The Subcontractor shall be responsible for pumping out the sediments and the contaminated water from the sump as often as required to prevent it from overflowing.
- E. Contaminated sediments and water shall be disposed of by pumping into the wastewater retention basin or may be used in moisture and dust control work in contaminated areas.
- F. The pad shall be constructed to conform with the provisions of Article 1.14.E with the following exceptions:
 - 1. The size of the pad shall be as shown on the Subcontract Drawings.
 - 2. The pad shall be designed to drain in the sump via the slotted drain.
- G. When no longer required, the Subcontractor shall remove the wastewater collection system; demolish the pad, piping, sump; decontaminate pumping equipment and accessories; dispose of the debris into the tailings embankment and the equipment and accessories as his own equipment; and regrade the roadway.
- H. Demolition and disposal of the system shall conform to Section 02050.

1.16 TEMPORARY HEAT

Subcontractor shall provide, at his own expense, all temporary heat as necessary for the trailers, for proper installation of all work, equipment, and materials, and for the protection of all work and materials, against injury from dampness, cold, and freezing.

1.17 TEMPORARY TELEPHONE SERVICE

The sites can be served by the Eagle Telecommunication Company. The Subcontractor shall make arrangements for telephone service for his own use. The Contractor will make his own arrangements for telephone service to his offices.

1.18 TEMPORARY FENCES

See Sections 02832 and 02834.

1.19 SHUT-DOWN TIME OF SERVICES

The Subcontractor shall not disconnect or shut down any part of the existing utilities and services, except by express permission of the Contractor. The Subcontractor shall submit schedule of estimated shut-down time in order to obtain such permission, and shall notify all interested parties, utilities, County authorities, etc., as required.

1.20 MAINTENANCE

- A. Subcontractor shall maintain all construction facilities and utilities in good working condition as required by the Contractor during the term of the Subcontract.
- B. Subcontractor's maintenance shall include, but not be limited to, all temporary roads including access control areas and fencing during the term of the Subcontract for the safe and efficient transport of equipment, supplies and personnel.
- C. The Subcontractor shall remove from the access and the haul roads any contaminated material deposited there by his operations. Such removal and cleanup shall be at no additional cost to the Contractor.

1.21 STATUS AT COMPLETION

- A. Upon completion of the Work, or prior thereto, when so required by the Contractor, Subcontractor shall:
1. Repair all existing roads improved by the Subcontractor for his convenience (used as temporary roads) including recompacting and resurfacing to at least equal or better conditions existing prior to the start of the Subcontract, at no additional cost. This shall include County Road CR-S8.
 2. Except for the County Road CR-S8 detour, obliterate new roads constructed as temporary roads and restore the areas to their near original contours by grading to provide positive drainage. County Road CR-S8 detour shall be removed by others.
 3. Remove all other facilities including, but not limited to, all Subcontractor-furnished trailers.
 4. Restore and seed disturbed areas as specified in Sections 02200 and 02935.

PART 2 - PRODUCTS

(Not Used)

PART 3 - EXECUTION

(Not Used)

PART 4 - MEASUREMENT AND PAYMENT

4.1 MEASUREMENT

- A. With the exception of the items mentioned in Paragraph B below, separate measurement for payment will not be made for work specified in this Section.
- B. Measurement for payment for the following items will be by the lump sum. Separate measurement for payment will be made for construction and demolition of concrete pads:
1. Temporary Offices

2. Temporary Roads and Parking Areas
3. Janitorial and Snow Removal Services
4. Temporary Sanitary Facilities
5. Temporary Electric Power
6. Temporary Water
7. Decontamination Washwater Recycling System at UC Area
8. Wastewater Collection System at CR-S8 Road Crossing

4.2 PAYMENT

- A. With the exception of the items mentioned in Paragraph B below, separate payment will not be made for work specified in this Section. Payment for such other work will be considered to be included in the applicable related items of Work specified elsewhere in the Subcontract Documents or in the Bid Schedule item for Mobilization.
- B. Payment for items 1 through 8 of Article 4.1.B above will be by their applicable lump sum prices quoted therefor in the Bid Schedule. The prices quoted shall include full compensation for furnishing all labor, materials, tools, equipment, incidentals and accessories and for performing all work as specified for designing, furnishing, installing, operating, maintaining, removing and disposal of the facilities through the term of the Subcontract.

END OF SECTION 01500

SECTION 01560

TEMPORARY CONTROLS

PART 1 - GENERAL

1.1 SCOPE

- A. This Specification Section covers the requirements for temporary controls required during the construction of the permanent works. Temporary controls shall include related equipment, facilities, and incidentals.
- B. Temporary controls shall include, but not be limited to, the following:
 - 1. Dust Control
 - 2. Silt Control
 - 3. Noise Control
 - 4. Pollution Control
 - 5. Water Control
 - 6. Access, Traffic and Safety Controls
- C. The Subcontractor shall be responsible for furnishing, installing, constructing, operating, maintaining, removing and disposing of the controls as shown on the Subcontract Drawings, as specified in this Specification, and as required by the Contractor for the completion of the Work under the Subcontract.
- D. All such temporary controls shall be located as shown on the Subcontract Drawings and as directed, and maintained in clean, safe and sanitary condition at all times until completion of the Subcontract.
- E. Upon completion of the Subcontract, the temporary controls shall be left in the status specified in Article 1.11 of this Section.
- F. The requirements specified herein are in addition to any requirements specified elsewhere in the Subcontract Documents. Temporary controls shall meet the requirements for all-weather service.
- G. All land disturbances related to the temporary controls shall be minimized to the greatest extent possible and the land restored to the extent reasonable and practical, to its original contours by grading to provide positive drainage and by seeding the area as specified in Section 02935.

1.2 RELATED WORK

- A. Section 00800 - Special Conditions: Noise Control
- B. Section 01019 - Mobilization: Payment
- C. Section 01500 - Construction Facilities
- D. Section 02141 - Dewatering and Drainage
- E. Section 02200 - Earthwork: Site Restoration
- F. Section 02935 - Seeding

1.3 APPLICABLE PUBLICATIONS

- A. The Publications listed below form a part of this Specification to the extent referenced. The Publications are referred to in the text by the basic designation only:
 - 1. UMTRA Project Construction Safety and Health Management Program (MK-UMTRA-4)
 - 2. Colorado Highway Department:
"Standard Specifications", as applicable.
 - 3. Uniform Building Code (UBC):
1985 Edition, applicable Chapters and Sections.
 - 4. National Fire Protection Association (NFPA), as applicable.
 - 5. American Society for Testing and Materials (ASTM):
 - D751-79 Methods for Testing Coated Fabrics
 - D1682-64 Standard Test Methods for Breaking Load and Elongation of Textile Fabrics
- B. All required facilities, equipment and utilities shall also be constructed/installed, maintained and operated in accordance with applicable Federal, State, County, and Utility laws, rules, and regulations. Notwithstanding contrary provisions of General Provisions, General Conditions and Special Conditions, nothing in the Subcontract Drawings and Specifications shall be construed to permit work not conforming to such laws, rules and regulations.

1.4 DUST CONTROL

- A. The Subcontractor shall be responsible for providing adequate dust control measures during the term of the Subcontract.
- B. Dust control shall consist of furnishing water supply, required equipment, additives, accessories and incidentals, and carrying out proper and efficient measures wherever and as often as necessary to reduce dust nuisance, and to prevent dust originating from construction operations and causing damage to crops, orchards, cultivated fields, and dwellings, or causing a nuisance to persons during the completion of the Subcontract, as required by the Contractor.
- C. Water shall be applied by means of pressure-type distributors or pipe lines equipped with a spray system or hoses with nozzles that will insure a uniform application of water.
- D. All equipment used for the application of water shall be equipped with a positive means of shut-off.
- E. Unless otherwise permitted by the Contractor or unless all the water is applied by means of pipelines, at least one mobile unit with a minimum capacity of 5,000 gallons shall be available at each site in operating condition for applying water on the project at all times.
- F. To conserve water, the Subcontractor may use chemical additives in dust control water. If such additives are used, furnishing and applying the additives shall be at no additional expense to the Contractor.
- G. The use, location of application, and the amount and type of additives proposed for use by the Subcontractor shall be subject to approval by the Contractor.
- H. The primary sources of water for dust control in contaminated areas at the sites will be recycled water from the wastewater retention basin, or water from tailings and subsoil dewatering to the extent feasible. When these sources are judged inadequate or unacceptable the Subcontractor may, with the Contractor's approval, use water from an alternate source.
- I. The source of water for dust control in uncontaminated areas shall be free of radioactive contamination.

1.5 SILT CONTROL

- A. Silt fences shall be furnished and installed to conform with the following requirements:
1. Structure: woven
 2. Width: 36 inches
 3. Grab Tensile Strength (ASTM D1682): 175 lbs. (WARP)
 4. Mullen Burst Strength (ASTM D751): 300 psi
 5. Puncture Strength (ASTM D751): 60 psi
 6. Equivalent Opening Size: U.S. Sieve No. 30/70
- B. Posts shall be made of wood minimum 2 inches square, or 1.25-inch x 1.00-inch steel T-section or equivalent, or acceptable plastic with an equivalent section. Post length shall be sufficient for 18-inch embedment in firm ground.
- C. Preassembled silt barrier fences may be used, subject to the Contractor's approval.
- D. Silt fences shall be installed to conform with the details shown on the Subcontract Drawings and in accordance with the manufacturer's written recommendations.

1.6 NOISE CONTROL

See Section 00800, Article SC-7, Paragraph M.

1.7 POLLUTION CONTROL

- A. Pollution of Waterways: The Subcontractor's construction and related activities shall be performed by methods that prevent entrance or accidental spillage of solid or liquid matter, contaminants, debris and other objectionable pollutants and wastes into streams, watercourses, flowing or dry, and underground water sources. Such pollutants and wastes will include, but will not be restricted to refuse, earth and earth products, garbage, cement, concrete, sewage effluent, industrial waste, radioactive substances, hazardous chemicals, oil and other petroleum products, aggregate processing tailings, and mineral salts. Pollutants and wastes shall be disposed of in accordance with applicable permit provisions or in a manner acceptable to and approved by the Contractor.

B. Storage and Disposal of Petroleum Products:

1. Petroleum products covered by this Section include gasoline, diesel fuel, lubricants, heating oils, and refined and used oil. During project construction, all petroleum products shall be stored in such a way as to prevent contamination of all ground and surface waters.
2. Storage facilities shall conform to the requirements of Construction Safety and Health Management Program specified in Article SC-7 of the Special Conditions.
3. Lubricating Oil: Lubricating oil may be brought into the project area in steel drums or other means, as the Subcontractor elects. If the total volume of stored oil is greater than 1320 gallons, then the Subcontractor shall provide secondary containment facilities. Used lubricating oil shall be stored in steel drums, or other approved means, and shall be returned to the supplier for disposal. It shall not be burned or otherwise disposed of at the project area.
4. If the total volume of stored petroleum products is greater than 1320 gallons and these products are stored above ground, the Subcontractor shall prepare a spill prevention control and countermeasure plan in accordance with applicable EPA and other state regulations.

C. The following environmental pollution control measures shall be adopted by the Subcontractor for the trucks hauling contaminated materials on public roads to prevent the spread of radioactive contamination in uncontaminated areas:

1. Trucks shall be equipped with leakproof seals and dump gates or other means to prevent leakage of contaminated material onto roadways.
2. In addition to the above mentioned provisions, the Subcontractor shall take the following additional measures:
 - a. Trucks shall be covered by tarpaulin and/or spread by chemical crusting agents. The use of chemical crusting agents shall conform to the applicable local, state and federal agency (including permit) requirements. Chemical crusting agents shall be used only after demonstrating to the Contractor

the performance of such agents and receiving an approval from the Contractor for use of such agents.

- b. Prior to travel on offsite roadways or beyond the contaminated site area, trucks shall be decontaminated by washing with water all visible contamination from truck tires and from under the trucks.

- 3. Health Physics personnel employed by the Contractor will routinely check trucks for residual contamination prior to release from contaminated areas. Proper attention to decontamination of trucks and other equipment may cause reduction in the frequency of health physics truck contamination monitoring.

1.8 WATER CONTROL

See Section 02141 - Dewatering and Drainage.

1.9 ACCESS, TRAFFIC AND SAFETY CONTROLS

A. Access Control:

- 1. Private, personal or agency vehicles not used for authorized construction purposes will not be allowed in the controlled site areas.
- 2. Parking of private, personal or agency vehicles shall be in a restricted area outside of the controlled site areas as designated by the Site Manager or his representative.

B. Traffic and Safety Controls:

- 1. The Subcontractor shall post construction areas and roads with traffic control signs or devices used for protection of workmen, the public and equipment. The signs or devices shall conform to the American National Standards Institute D6.1-1978, Manual on Uniform Traffic Control Devices for Streets and Highways.
- 2. Signs or traffic control devices shall be removed or covered as soon as they have served their purpose. It is particularly important to remove any markings on road surfaces which under conditions of poor visibility could cause a driver to turn off the road or into traffic moving in the opposite direction.

3. Barricades for protection of employees shall conform to the portions of the American National Standards Institute D6.1-1978, Manual on Uniform Traffic Control Devices for Streets and Highways, relating to barricades.
4. Flag persons, properly equipped with International Orange protective clothing and flags, shall be provided at all such times, as necessary, to direct or divert pedestrian or vehicular traffic.
5. Pursuant to Article GP-34 of General Provisions, Section GC-3D of General Conditions, the Subcontractor shall construct and maintain fences, planking, barricades, lights, shoring, and warning signs as required by local authorities and Federal and State safety ordinances, and as required, to protect the Contractor's property from injury or loss and as necessary for the protection of the public, and provide walks around any obstructions made in a public place for carrying on the Work covered in this Subcontract. All such protection shall be left in place and maintained until removal is authorized.
6. In addition, the Subcontractor shall guard and protect all workers, pedestrians, and the public from excavations, blasting operations, construction equipment, all obstructions, and other dangerous items or areas by means of adequate railings, guard rails, temporary walks, barricades, warning signs, sirens, directional signs, overhead protection, planking, decking, danger lights, etc.

1.10 MAINTENANCE

Subcontractor shall maintain all temporary controls in good working conditions during the term of the Subcontract for the safe and efficient transport of equipment and supplies, and construction of permanent works, as required by the Contractor.

1.11 STATUS AT COMPLETION

- A. Upon completion of the Work, or prior thereto, when so required by the Contractor, Subcontractor shall:
 1. Remove all temporary controls as required by the Contractor.

2. Restore and seed disturbed areas as specified in Sections 02200 and 02935.

PART 2 - PRODUCTS

(Not Used)

PART 3 - EXECUTION

(Not Used)

PART 4 - MEASUREMENT AND PAYMENT

4.1 MEASUREMENT

- A. With the exception of furnishing and installing silt fence, separate measurement for payment will not be made for work specified in this Section.
- B. Measurement for payment for furnishing and installing silt fence will be by the linear feet of fence furnished and installed.

4.2 PAYMENT

- A. With the exception of furnishing and installing silt fence, separate payment will not be made for work specified in this Section. Payment for such other work will be considered to be included in the applicable related items of Work specified elsewhere in the Subcontract Documents or incidental to the Subcontract.
- B. Payment for furnishing and installing silt fence will be by the unit price per linear foot quoted therefor in the Bid Schedule. The price quoted shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for performing all work involved in constructing, maintaining, and removing fences, including any clearing, stripping, tree removal, excavation, concrete work, if any, complete, as shown on the Subcontract Drawings and as accepted by the Contractor.

END OF SECTION 01560

SECTION 01561

CONSTRUCTION CLEANING

1.1 SCOPE

- A. This Specification Section covers furnishing of all labor, materials, equipment, and services, and performing all operations necessary for, and properly incidental to, cleanup during construction and final cleaning of the site, prior to acceptance of the Project by the Contractor as specified herein and in other sections when specified.
- B. The requirements specified in this Section are supplemental to the requirements specified elsewhere in the Subcontract Documents.

1.2 WORK NOT INCLUDED

Chemical, Toxic or Hazardous Waste

1.3 RELATED WORK

- A. Section GC-1D - General Conditions
- B. Section 00800 - Special Conditions: Definitions
- C. Section 02081 - Asbestos and Non-Hazardous Waste
- D. Section 02110 - Site Clearing
- E. Section 02200 - Earthwork

1.4 GENERAL

- A. It is required that the entire site be kept in a neat and orderly condition, and the Contractor or his representative may, at any time during construction, order a general cleanup of the site as a part of the work under this Section.
- B. Subcontractor shall dispose of waste, trash, and debris in a safe, acceptable manner, in accordance with applicable laws and ordinances and as prescribed by authorities having jurisdiction. No waste material and debris shall

be buried on the site. Burning of trash and debris on the site will not be permitted.

- C. Location of dump for trash and debris and length of haul are the Subcontractor's responsibility.

1.5 CLEANUP DURING CONSTRUCTION

- A. Cleanup: The Subcontractor will be required to clean up construction work areas including all trailers and dispose of waste material. Cleanup of construction work areas will be required on a daily basis. At the close of each day's work all small quantities of waste and debris resulting from construction activities shall be gathered up and disposed of as designated in paragraph B below. Waste and debris shall not be allowed to accumulate in such quantities as to create an unsightly appearance, or safety or fire hazard, nor shall it interfere in any way with free access to, and operation of existing facilities.

- B. Waste Disposal:

- 1. General: Material determined to be waste will be tested for radioactive contamination prior to removal from the construction site. Testing will be performed by the Contractor at no cost to the Subcontractor to classify the waste into the following two categories for disposal purposes:
 - a. Uncontaminated Waste: The Subcontractor shall provide suitable receptacles for all construction office waste material such as wrapping paper, discarded containers, scrap lumber, scrap metals, etc. Other uncontaminated waste including construction office waste shall be disposed of off-site as Subcontractor's property in a safe, acceptable manner, in accordance with the applicable laws and ordinances and as prescribed by authorities having jurisdiction. No waste material and debris shall be buried on the site. The Subcontractor shall be responsible for the location of dump for trash and debris, length of haul, and disposal costs.
 - b. Contaminated Waste: Waste materials identified as contaminated materials defined in Article SC-1 and materials resulting from demolition operations and demolished materials stockpiled on site by others shall be disposed of in the construction of the tailings embankment as specified in Section 02200.

1.6 FINAL SITE CLEANUP

- A. Prior to final inspection, the entire site shall be thoroughly cleaned and shall be put into a neat, acceptable condition. All construction waste and unused materials, dunnage, loose rock and stones, excess earth, and debris of any description resulting from the work shall be removed from the entire site.
- B. All pavements and paved walks shall be hosed down and scrubbed clean where necessary.
- C. Mortar droppings shall be thoroughly removed from concrete slabs and pavements. All concrete flatwork and exposed vertical surfaces of concrete and masonry shall be hosed down and scrubbed clean.
- D. All construction areas shall be thoroughly cleaned to the satisfaction of the Contractor prior to final acceptance of the completed Subcontract.

PART 2 - PRODUCTS

(Not Used)

PART 3 - EXECUTION

(Not Used)

PART 4 - MEASUREMENT AND PAYMENT

4.1 MEASUREMENT AND PAYMENT

Separate measurement or payment will not be made for work required under this Section. All costs in connection with the work specified herein will be considered incidental to the Subcontract.

END OF SECTION 01561

Division 2

Sitework

SECTION 02050

DEMOLITION

PART 1 - GENERAL

1.1 SCOPE

- A. This Specification Section describes the requirements for the demolition of the following structures and facilities (including plugging and abandoning of utilities), and disposal of debris as shown on the Subcontract Drawings and as specified in this Section.

1. Existing structures and facilities.
2. New structures and facilities constructed under this Subcontract.

1.2 RELATED WORK

- A. Section 02125 - Detour for Road, Relocation of Structures and Utilities
- B. Section 02081 - Asbestos and Non-hazardous Waste
- C. Section 02200 - Earthwork: Disposal of Demolished Materials and Debris

1.3 DESCRIPTIONS OF STRUCTURES AND FACILITIES

- A. Descriptions of existing structures and facilities to be demolished are contained in a separate document entitled "Information for Bidders" available from the Contractor's office.
- B. Following structures and facilities constructed under this Subcontract shall also be demolished by the Subcontractor:
1. UC Area:
 - a. Decontamination pad.
 - b. Membrane liner.
 - c. CR-S8 road crossing pad and drain.

2. NC Area: Membrane liner.

PART 2 - PRODUCTS

(Not Used)

PART 3 - EXECUTION

3.1 DEMOLITION

- A. During the execution of this Subcontract, if chemically hazardous or toxic waste material is suspected or encountered, the Site Manager shall be immediately notified for identification and subsequent disposition by others.
- B. Asbestos and other non-hazardous materials removal and disposal shall comply with the standards listed in Section 02081 of these Specifications.
- C. Pollution Controls:
 - 1. Water sprinkling, temporary enclosures, and other Contractor approved methods shall be used to limit the amount of airborne dust and dirt to the lowest practical level. Demolition work shall comply with governing regulations pertaining to environmental protection.
 - 2. Water shall not be used if it is likely to create hazardous or objectionable conditions such as ice, flooding, or pollution. An approved water-based biodegradable wetting agent (surfactant) such as Dupont "Duponol WAQ" or equal may be used to reduce the quantity of water required.
- D. Demolition work shall be carried out using equipment compatible to the structures to be demolished and by methods required to complete the Work in accordance with governing regulations. The structures shall be demolished and the materials and debris disposed of as specified in Section 02200.
- E. Removal or plugging of the utility shall not be undertaken until written approval for such work has been obtained from the Contractor.

- F. Unless otherwise specifically indicated on the Subcontract Drawings or in this Specification or otherwise authorized in writing by the Contractor:
1. All aboveground utilities shall be removed, broken up and stockpiled for disposal.
 2. All underground utilities within the tailings pile and underground utilities from the contaminated areas shall be removed, broken up and stockpiled for disposal.
 3. The ends of the utilities left in place shall be capped or plugged with concrete grout.
 4. All utilities not utilized during the Subcontract shall be demolished by the Subcontractor.
- G. When the abandoned line is connected to a line that will continue to be used, the abandoned line shall be disconnected first and the in-use line shall be sealed before plugging the abandoned line. Subsurface lines to be plugged or removed shall include mains shown on the Subcontract Drawings and all sub-mains and laterals connecting the buildings to the mains even though not specifically shown on the Subcontract Drawings.
- H. The Contractor will obtain approval from the affected utility companies including, but not limited to, San Miguel Electric Company, UMETCO, and Eagle Telecommunications before disturbing utilities. Utilities shall be protected from damage by demolition operations until they are removed from service.
- I. All pipes and ducts shall be cut to sizes no greater than 10 feet in length, and stockpiled onsite for disposal. All pipes and ducts 6 inches and larger in diameter shall be longitudinally cut in halves, or crushed flat.
- J. Tanks and Vessels: Tanks and vessels shall be emptied of contents prior to removal and demolition. Tanks and vessels shall be cut to pieces no greater than 10 feet long by 8 feet wide.
- K. Solid metals, concrete, masonry and wooden members shall be cut in pieces to be no greater than 10 feet and no more than 27 cubic feet in volume.

- L. Metal objects with voids shall be crushed to sizes no greater than 27 cubic feet in volume with least dimension not exceeding 6 inches.
- M. Grading shall be performed, as required by the Contractor, to match existing contours in the vicinity and to facilitate drainage.

3.2 DISPOSAL OF DEMOLISHED MATERIALS AND DEBRIS

- A. Demolished materials and debris shall be disposed of in the tailings embankment as shown on the Subcontract Drawings and as specified in Section 02200.
- B. Burning of materials removed from demolished structures will not be permitted.

PART 4 - MEASUREMENT AND PAYMENT

4.1 MEASUREMENT

- A. Measurement for payment for demolition and disposal of existing structures and facilities (including abandoned utilities) specified in this Section will be on a lump sum basis.
- B. Separate measurement for payment will not be made for demolition and disposal of structures and facilities (including utilities) constructed under this Subcontract. Such work will be considered incidental to applicable related item(s) of Work under the Subcontract.

4.2 PAYMENT

- A. Payment for demolition and disposal of existing structures and facilities (including abandoned utilities) specified in this Section will be by the lump sum price quoted therefor in the Bid Schedule. The price quoted shall include full compensation for furnishing all labor, materials, equipment, incidentals, and for performing all work specified, including, but not limited to, temporary stockpiling, transportation, and placement of demolished materials and debris in the tailings embankment.

- B. Separate payment will not be made for demolition and disposal of structures and facilities (including utilities) constructed under this Subcontract. Full compensation for such work will be considered to be included in the applicable related item(s) of Work under the Subcontract.

END OF SECTION 02050

SECTION 02081

ASBESTOS AND NON-HAZARDOUS WASTE

PART 1 - GENERAL

1.1 SCOPE

- A. This Specification Section describes the requirements for removal and disposal of:
 - 1. All friable and nonfriable asbestos-containing materials, and
 - 2. Identified non-hazardous materials.
- B. The Subcontractor shall furnish all labor, materials, services, insurance, and equipment necessary to carry out the removal and disposal work in accordance with the EPA and OSHA regulations, applicable State and local government regulations, and as specified in this Section and as shown on the Subcontract Drawings.
- C. The requirements specified in this Section are supplemental to the requirements specified in General Provisions, General Conditions and Special Conditions.

1.2 WORK NOT INCLUDED

- A. Unidentified Waste:
 - 1. The Site Manager shall be notified immediately if unidentified wastes are suspected or encountered. Such wastes will be fully characterized and identified through laboratory analysis by the Contractor.
 - 2. If the wastes are identified as radiologically contaminated and suitable for disposal in the tailings embankment (Non-hazardous), the Subcontractor may be directed by Subcontract Change Notice to remove and dispose of these wastes in the tailings embankment.
 - 3. If the wastes are identified as non-radiologically contaminated (chemical, toxic or hazardous) and not suitable for disposal in the tailings embankment, the Subcontractor may be directed by Subcontract Change Notice to obtain qualified services for removal and disposal of these wastes.

4. Disposal of such wastes, if required, shall conform to the applicable provisions of the following standards of the Colorado Department of Health:
 - a. Non-Hazardous Wastes: Solid Waste Disposal Sites and Facilities Act.
 - b. Hazardous Wastes: C.R.S. 25-15-101, for offsite disposal to an approved hazardous waste site.
 - c. Applicable provisions of these Subcontract Documents.

1.3 RELATED WORK

- A. Section 00800 - Special Conditions: Articles SC-7 and SC-11.
- B. Section 02200 - Earthwork: Placement of Asbestos and Non-Hazardous Materials.

1.4 DEFINITIONS

See Section 00800, Article SC-1.

1.5 CODES AND REGULATIONS

- A. The Subcontractor shall comply with the applicable codes and regulations including, but not limited to, the following:
 1. U.S. Department of Labor, Occupational Safety and Health Administration ("OSHA"):
29 CFR 1926.58, which includes control by a "competent person."
 2. Environmental Protection Agency ("EPA"):
National Emissions Standard for Hazardous Air Pollutants (NESHAPS) 40 CFR 61, Subparts A and M
 3. State of Colorado Department of Health ("DOH"):
 - a. Section 8 of the Solid Waste Regulations for Asbestos Removal.

- b. Other Provisions of the Solid Waste Regulations for non-asbestos non-hazardous waste.

- B. Posting Regulations: Copies of applicable OSHA, EPA and Colorado DOH regulations shall be obtained by the Subcontractor and one copy of each shall be posted on the job site for compliance by his employees. The EPA notification of asbestos removal, including the "Plan of procedures to be employed for compliance with EPA regulations" shall also be posted at the job site.

1.6 NOTIFICATION AND APPROVAL REQUIREMENTS

- A. Ten days prior to the removal and disposal of asbestos and other non-hazardous waste materials, the Subcontractor shall submit a written notice to the Colorado Department of Health, Air Pollution Control Division. A copy of the notice shall also be submitted to the Contractor.
- B. Upon completion of asbestos and other non-hazardous waste removal and disposal work, the Subcontractor shall submit a written report to the Colorado Department of Health, Air Pollution Control Division with a copy to the Contractor.

1.7 EXPOSURE MONITORING

- A. The airborne asbestos exposure limit outside of asbestos controlled areas is 0.1 fibers/cc air which is the action level before reaching 0.2 fibers/cc air, the permissible exposure limit.
- B. All air monitoring shall be performed under the supervision of a "competent person" as defined in 29 CFR 1926.56(b), (e) and Appendix F.
- C. Documentation of each air sample shall be as specified by the Site Manager and shall include at least the date and time, sample number, exact sampling location, name of individual performing sampling, sampling rate, sampling volume, analytical method, analytical results and limits of quantification and detection as per NIOSH analytical methods.
- D. Analysis of air samples shall be by NIOSH 7400 method. Samples shall be analyzed by a "certified" Industrial Hygiene Laboratory. Results are to be reported to the Site Manager and Albuquerque Project Office Safety and Health Department.

- E. Preliminary air sampling shall be sufficient to establish the perimeters of asbestos control areas to the satisfaction of the Site Manager. During asbestos removal work, samples shall be taken continuously outside each asbestos control area within 10 feet of each decontamination enclosure system exit and within 10 feet of each HEPA exhaust.
- F. Air samples shall be taken in the breathing zones of workers removing asbestos in sufficient numbers to permit estimation of peak and Time Weighted Average (TWA) Exposures. At a minimum, for TWA exposures, one personal sample on the worker with the highest probable exposure is required in each asbestos control area, per work shift.

1.8 SUBMITTALS

- A. The Subcontractor shall, within fifteen days after receipt of Notice to Proceed, prepare and submit the following, as specified in this Section:
 - 1. Asbestos Removal Plan
 - 2. Subcontractor Qualifications
 - 3. Qualifications of Health and Safety Person
 - 4. Training Certifications of All Workers as Asbestos Abatement Workers According to Federal Occupational Safety and Health Administration
 - 5. Training Certificate of One Supervisor Certified by U.S. EPA, National Asbestos Training Center, or Satellite Center, or equivalent.
- B. General submittals requirements are specified in Section 01300.
- C. Asbestos Removal: The Subcontractor shall submit a detailed plan of the work procedures to be used in the removal and disposal of materials containing asbestos. Such plan shall include construction details of asbestos control barrier and decontamination enclosure system, air monitoring plan, an equipment decontamination plan, location of asbestos control areas, layout of change rooms, disposal plan, type of wetting agent and asbestos sealer to be used. This plan shall be approved by the Contractor and by the Colorado Department of Health, Air Pollution Control Division prior to the start of any asbestos work. The Subcontractor and his assigned person competent in asbestos abatement shall meet with the

Contractor prior to beginning work to discuss in detail the asbestos plan, including work procedures and safety precautions.

C. Subcontractor Qualifications:

1. A statement demonstrating Subcontractor's understanding of asbestos abatement shall include the following as a minimum:
 - a. Knowledge of asbestos abatement techniques and state-of-the-art abatement practices and equipment.
 - b. Knowledge of OSHA, EPA, NIOSH, CDH, and any other applicable regulations and requirements regarding asbestos abatement practices and equipment.
 - c. Knowledge of the special safety hazards and requirements associated with asbestos abatement work.
 - d. Knowledge of the health hazards of asbestos.
2. A statement demonstrating Subcontractor's qualifications and experience shall include the following as a minimum:
 - a. Years firm has been engaged in asbestos abatement, including years engaged in asbestos removal.
 - b. List of projects completed in the last five years that are similar in scope to this Project. Include name, address and telephone numbers of the purchaser(s) of services; the industrial hygienist, if any, overseeing the work; location; and type of work.
 - c. List all equipment, tools and materials available for use on this Project. Include certification by manufacturer that all HEPA equipment meets ANSI Z9.2.
 - d. A description of the qualifications and experience of all supervisors proposed for this Project. Include evidence of successful completion of an EPA-approved training course in asbestos removal (including subject matter and duration of course). Also include evidence of previous supervision of at least two asbestos abatement projects similar in scope and nature to the present project, pro-

viding the name, address and telephone number of each of the purchasers of services.

- e. Describe the asbestos training program for the workforce, including duration of course, subject matter and qualifications of the instructor. Minimal qualification for training for each employee is 8 hours of instruction on the hazards of asbestos exposure, on the use, fitting and limitations of respirators and protective clothing, on all aspects of asbestos abatement work procedures, protective measures, and safety precautions. Describe any special expertise of any of the workers.
- f. Give a breakdown of the composition of the workforce proposed for this Project including: percent of personnel trained, experienced, fulltime with company; percent of personnel trained, experienced, parttime with company; and percent of "pick-up" labor.
- g. A copy of the Subcontractor's Personal Protective Equipment Program including the Respiratory Protection Program. Minimal qualifications are as specified in 29 CFR 1926.58, Asbestos.
- h. A description of the Subcontractor's medical surveillance for the employees. Minimal qualifications shall be as specified in 29 CFR 1926.58 or where applicable, state regulations.
- i. A statement regarding the Subcontractor's insurance status.

D. Qualifications of Person Responsible for Health and Safety:

1. A statement demonstrating the qualifications and experience of the person responsible for Health and Safety and air monitoring technicians that the Subcontractor intends to employ on this Project shall include the following as a minimum:
 - a. A record of experience qualifying the Health and Safety Person as a professional and specialist in asbestos abatement. As a minimum this shall include a review of previous experience in asbestos abatement projects including the name and address of the purchaser of the service, location of the work performed, and a review of the industrial hygiene activities performed for each job.

- b. If air monitoring technicians will participate in this Project, submit, for each technician, a description of his or her training in asbestos air monitoring and a review of previous air monitoring experience in asbestos removal projects, including the name and address of the purchaser of the service, location of the work performed and a review of all air monitoring and other inspection activities performed for each job.
- c. Submit a statement for each person who may be doing asbestos air sample analysis indicating the qualifications, training program and experience in asbestos air sample analysis, analytical methods used, dates of training, and average number of asbestos samples analyzed per month in the last year.
- d. A statement indicating the Health and Safety Person's degree of authority on this Project for effecting corrective actions deemed necessary in his or her judgement.

1.9 COLORADO DEPARTMENT OF HEALTH, AIR QUALITY CONTROL DIVISION REQUIREMENTS

A. The Subcontractor shall comply with the following provisions of Colorado Air Quality Control Commission Regulation No. 8 of the State Solid Waste Regulations:

- 1. As of July 1, 1987, all persons who wish to conduct asbestos abatement work in Colorado are deemed certified according to the requirements contained in 25-7-505 providing that 1) all the applicant's employees have been trained according to Federal Occupational Safety and Health Administration worker training requirements for asbestos abatement workers, and 2) the applicant employs at least one trained supervisor who must be on-site at all times when abatement work is proceeding.
- 2. As of July 1, 1987, all abatement project supervisors shall be deemed certified as trained supervisors according to the requirements contained in 25-7-506 providing an applicant has completed a three-day or longer asbestos abatement supervisory course given by any U.S. Environmental Protection Agency National Asbestos Training Center or Satellite Center, or equivalent, within the preceding 12 months from enactment of this regulation.

PART 2 - PRODUCTS

2.1 EQUIPMENT

- A. The Subcontractor shall include in the procedures plan, specified in Article 1.6 above, the construction aids he intends to provide.
- B. Construction aids shall be cleaned and free of asbestos fibers (and radioactive contamination as specified in Article SC-7 of the Special Conditions) before removal from site-controlled work areas.
- C. The Subcontractor shall provide all necessary transport vehicles for hauling the asbestos-containing and non-hazardous waste materials to the disposal area and shall provide excavating and compacting equipment for encapsulation of the asbestos-containing materials in the disposal area.

PART 3 - EXECUTION

3.1 GENERAL

- A. Asbestos wastes removal and disposal shall conform to Section 8 of the Colorado Department of Health's Regulations Pertaining to Solid Waste Disposal Sites and Facilities and the requirements of this Section. In case of any conflicts, the Contractor will determine the applicability of a particular code and standard.
- B. Removal and Disposal of other non-hazardous waste materials shall conform to the applicable requirements of Colorado Department of Health's Regulations Pertaining to Solid Waste Disposal Sites and Facilities.
- C. All asbestos and non-hazardous waste materials shall be disposed of in the tailings embankment as specified in Section 02200.

3.2 ESTIMATED AMOUNTS OF ASBESTOS-CONTAINING AND NON-HAZARDOUS WASTE MATERIALS

A. Asbestos-Containing Material:

1. There are approximately 1300 square feet of siding materials containing 20 to 25 percent chrysotile asbestos on the outside of the recreation building.
2. The transite materials on a pile, shown in Picture No. 10 and identified as No. UC11 on the Subcontract Drawings, are 10 percent chrysotile asbestos. Similar materials are also scattered on the ground in several locations making it difficult to estimate quantity.

- B. A buried gasoline tank or tanks are inferred at the old gasoline station area.

3.3 DISPOSAL LOCATION, TRANSPORT AND BURIAL

- A. All friable and non-friable asbestos shall be disposed of in the tailings embankment in accordance with the requirements of Section 02200.
- B. Asbestos-containing materials shall be adequately wetted pursuant to 40 CFR 61.147 and contained for transport to the disposal area. The methods of containment may include sealing, wrapping and bagging. The Subcontractor shall arrange for water supply needed to wet the asbestos materials.
- C. Transport and disposal shall conform to 40 CFR 61.153 and 40 CFR 61.152.
- D. The materials and containers shall be transported to the disposal area and disposed of as specified in 30 CRS, and as specified in Section 02200.

3.4 CLEANING WORK AREAS AFTER ASBESTOS REMOVAL

- A. After asbestos-containing materials have been removed, contained and transported, work areas shall be cleaned with significant assurance that there are no asbestos fibers to become airborne when other work such as structural demolition takes place.
- B. The Subcontractor shall notify the Contractor's Site Manager when work is complete for a final visual inspection.

- C. The Subcontractor shall spray all surfaces from which asbestos has been transported with an encapsulating material approved by the Contractor.
- D. Clearance Air Sampling - Aggressive air sampling (as per EPA) shall be conducted to the satisfaction of the Site Manager at each asbestos controlled work area. Asbestos contamination levels must be below 0.1 fibers/cc air.

PART 4 - MEASUREMENT AND PAYMENT

4.1 MEASUREMENT

Measurement for payment for removal and disposal of asbestos and non-hazardous waste materials will be by the lump sum.

4.2 PAYMENT

Measurement for payment for removal and disposal of asbestos and non-hazardous waste materials will be by the lump sum price quoted therefor in the Bid Schedule. The price quoted shall include full compensation for furnishing all labor, materials, equipment, tools, accessories and incidentals and for performing all work as specified including, but not limited to, all fees and permits and compliance with the codes and standards, and all earthwork activities.

END OF SECTION 02081

SECTION 02090
SEALING MONITOR WELLS

PART 1 - GENERAL

1.1 SCOPE

- A. This Specification Section describes the requirements for sealing of existing monitor wells. The approximate locations of the known wells to be sealed are shown on the Subcontract Drawings.
- B. Table 02090-1 lists all known wells that are to be sealed. Table 02090-2 lists all known wells that are to be saved.

1.2 APPLICABLE PUBLICATIONS

- A. The Publications listed below form a part of this Specification to the extent referenced. The publications are referred to in the text by the basic designation only:
 - 1. Manual of Water Well Construction Practices, Environmental Protection Agency, EPA-570/9-75-001.
 - 2. American Society for Testing and Materials (ASTM): C150-86 Standard Specification for Portland Cement (Rev. A).
 - 3. State of Colorado, Revised and Amended Rules and Regulations for Pump Installation Contractors, Abandonment and Appeals Sections, Effective Date December 15, 1972.

1.3 SITE CONDITIONS

Subcontract Drawings show all known wells on and in the vicinity of the site. Wells not designated to be sealed shall be protected to prevent damage during construction. Such wells, if damaged, shall be reconstructed by the Subcontractor at no cost to the Contractor.

TABLE 02090-1
WELLS TO BE SEALED

Well No.	Coordinates		Ground Surface Elev. (Feet above MSL)	Casing Dia. (In.)	Screened Interval Elev. (Feet)	Depth of Bore- hole (Feet)	Length to be Sealed with Concrete (Feet)
	North	East					

UC AREA

Wells Completed in Sandstone

668	58,671.12	58,712.07	5524.9	2	5410-5370	155	113
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NC AREA

Wells Completed in Alluvium

501	58,537.69	63,677.8	5454.0	4	5438-5429	22	19
503	58,246.66	63,269.25	5457.8	4	5438-5432	27	14
504	58,094.93	63,088.4	5448.4	4	5434-5430	19	15.5
512	58,394.23	63,267.23	5450.5	4	5438-5431	20	14.5
686	58,619.85	63,769.62	5455.1	2	5440-5435	22	19

Wells Completed in Sandstone

687	57,223.24	62,932.86	5492.8	2	5320-5300	195	193
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TABLE 02090-2
WELLS TO BE SAVED

<u>Well No.</u>	<u>Coordinates</u>		<u>Ground Surface Elevation</u> (Feet above MSL)
	<u>North</u>	<u>East</u>	
<u>UC AREA</u>			
505	58,621.32	60,065.89	5440.4
506	59,877.73	58,895.73	5430.1
507	60,019.87	58,704.15	5431.3
508	59,547.64	59,575.23	5437.2
509	59,201.69	60,131.02	5434.6
510	59,726.14	59,227.96	5436.2
669	59,553.197	59,550.486	5440.5
670	59,797.44	59,171.81	5437.8

NC AREA

All wells in NC Area will be sealed.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Approved sealing materials are as follows:

1. Cement used for sealing mixtures shall meet the requirements of ASTM C150 "Standard Specification for Portland Cement," Type V (high sulfate resistance).
2. Cement grout shall be composed of one sack of Portland Cement (94 pounds), with 3 to 5 percent, by weight, of commercially processed sodium bentonite, to not more than 6 gallons of potable water in order to achieve a weight of not less than 15 pounds per gallon. The weight of the grout shall be sufficient to prevent flow of water into the well from any aquifer penetrated. Calcium chloride may be added to the grout to accelerate the set, but it shall not exceed two (2) pounds per sack of dry cement.

PART 3 - EXECUTION

3.1 GENERAL

A. The State of Colorado well abandonment regulations specified in Article 1.2.A.3 require that wells be sealed in a manner that is compatible with the well design and so as not to act as a conduit for future contamination of groundwater. Detailed well sealing criteria are outlined in the Environmental Protection Agency (EPA) Manual of Water Well Construction Practices, EPA-570/9-75-001, Article 56, pages 133-142. The basic premise of the EPA criterion is to seal abandoned wells and to restore, as much as possible, the geohydrologic regime in existence before the well was constructed. The following criteria shall apply to all wells to be sealed on and in the vicinity of the processing and disposal sites:

1. Well sealing operations shall be performed by a State-licensed (Colorado) drilling contractor.
2. All wells shall be sealed in such a manner that they will not act as a conduit for fluids to flow from the specific strata in which they were originally encountered.

3. All wells shall be located in the field and sealed by the Subcontractor prior to the beginning of stripping, grading or other surface-disturbing activities that will hinder the detection and sealing of wells. If any well cannot be located after a reasonable search, the Subcontractor shall, prior to the commencement of the well sealing operations, submit to the Contractor a written report documenting the well number, the areas covered and the effort spent in the search.
4. Upon discovery of any unknown wells during the earth-work operations, the Subcontractor shall give the Site Manager immediate verbal notice followed by written confirmation within 24 hours.
5. Wells shall be sealed according to the following procedures:
 - a. The Subcontractor shall check each well to be sealed for obstructions that may interfere with the sealing operation and shall remove any such obstructions prior to starting filling operations.
 - b. In order to seal the well properly it is preferable to remove the well casings by methods approved by the Contractor as outlined in Article 56 of the EPA Manual of Water Well Construction Practices. Upon removal, if the casings and the materials are found to be contaminated, they shall be decontaminated as required by the Contractor, or stockpiled with demolition debris after breaking into lengths not greater than 10 feet. If casing removal is not feasible, the casing shall be perforated, ripped or otherwise disintegrated by methods outlined in Article 56, to ensure grouting of the entire annular space between the casing and the borehole.
 - c. The approved methods for the placement of a grout seal shall be as follows:
 - 1) In wells where casing is removed, the cement grout shall be introduced at the bottom of the well or interval to be sealed (or filled) and placed progressively upward to the top of the well. The grout shall be placed by the use of grout pipe, drop pipe, tremie, cement bucket or dump bailer, in such a way as to avoid segregation or dilution of the sealing materials. Dumping grout material from the top of the well shall not be permitted.

- 2) In wells where casing is not removed, the calculated amount of grout required to fill the well interval plus the annular space outside the lining shall be placed within the space to be grouted, running the grout through a special grouting packer manufactured for this purpose and installed immediately above the perforated or ripped zone. The grout shall be injected at a pressure calculated to be at least 50 psi greater than the normal hydrostatic pressure within the well at the point of injection.
- d. For all wells located in areas where the construction grade elevation will be greater than or equal to the existing grade surface, existing casings and cement grout seals shall be removed to a minimum depth of 2 feet below the existing grade surface, and as otherwise required for construction. Grouting shall extend to 2 feet below the existing grade. The interval from the top of the grout to the existing grade surface shall be filled with a mixture of uncontaminated soil (ML or CL) and a minimum of 25 percent by weight of commercially processed sodium bentonite. The mixture of uncontaminated soil shall be hand-tamped, as required.
- e. For all wells located in areas where the construction grade surface will be less than the existing grade surface (i.e. in areas of proposed cut), the existing casings and cement grout seals shall be removed to a minimum of 2 feet below the grade cut elevation and as otherwise required for construction. Grouting shall extend to 2 feet below the grade cut elevation. The interval from the top of the grout to the top surface elevation shall be filled with a mixture of uncontaminated soil (ML or CL) and a minimum of 25 percent by weight of commercially processed sodium bentonite. The uncontaminated soil mixture shall be hand-tamped, as required.
6. Within 30 days of the completion of well sealings, the Subcontractor shall submit a Well Abandonment Affidavit to the Colorado Division of Water Resources. A copy of the affidavit shall be submitted to the Contractor.

PART 4 - MEASUREMENT AND PAYMENT

4.1 MEASUREMENT

Measurement for payment for sealing of monitor wells will be by the linear feet of wells sealed, as measured from the bottom of well to the top of the complete seal.

4.2 PAYMENT

Payment for sealing of monitor wells will be by the unit price per linear foot quoted therefor in the Bid Schedule. The price quoted shall include full compensation for furnishing all materials, equipment, tools, accessories, incidentals, labor, and for performing the work specified in this Section including decontamination and disposal of materials and equipment.

END OF SECTION 02090

SECTION 02110

SITE CLEARING

PART 1 - GENERAL

1.1 SCOPE

This Specification Section describes the requirements for clearing of vegetation, stripping of topsoil, and disposal of cleared and stripped materials.

1.2 DEFINITIONS

- A. Clearing: Clearing is defined as removing brush, other vegetation and immature trees. All such vegetation and immature trees shall be cleared down to the natural ground surface.
- B. Topsoil: Topsoil shall consist of natural, friable soil representative of productive soils in the vicinity, and includes roots, organic materials, vegetation, and other materials unsuitable for structural fill.
- C. Stripping of Topsoil: This shall consist of the removal of topsoil by blading with a bulldozer or other equivalent means. Depth of stripping shall be 6 inches unless otherwise indicated elsewhere in the Subcontract Documents.

1.3 RELATED WORK

- A. Section 02200 - Earthwork
- B. Section 02935 - Seeding

PART 2 - PRODUCTS

(Not Used)

PART 3 - EXECUTION

3.1 PRESERVATION OF PROPERTY

Existing improvements, adjacent property, utility and other facilities, and trees and plants that are not to be removed shall be protected from injury or damage.

3.2 CLEARING

- A. Clearing shall be performed on all areas of construction activities. Contaminated cleared materials shall be kept separate from uncontaminated cleared materials. Cleared materials shall be disposed of by the Subcontractor.
- B. Uncontaminated cleared materials shall be disposed of as Subcontractor's property. Disposal may be by burning at the disposal area. The Subcontractor shall be responsible for obtaining required permits for burning such wastes from Colorado Department of Health, Air Pollution Control Division.
- C. Contaminated cleared material shall be reduced in size as required by the Contractor and disposed of as contaminated materials in the tailings embankment as specified in Section 02200.

3.3 STRIPPING

A. Uncontaminated Areas:

1. Stripping will be required in the following areas:

- a. Beneath all fills in areas where excavation is not otherwise required;
- b. Beneath areas of riprap protection where excavation is not otherwise required.
- c. In areas of excavation where excavated materials are to be used as fill.

2. Stripped material shall be disposed of as specified in Article 3.4.

- #### B. Contaminated Areas:
- In areas of excavation where the contaminated surfaces are covered by vegetation, the

removal of topsoil may be carried out together with the excavation in one operation.

3.4 STOCKPILING OF UNCONTAMINATED TOPSOIL

Stockpiling of uncontaminated topsoil shall be performed only when required by the Contractor upon his determination that there is sufficient uncontaminated organic topsoil in the area to justify the operation; otherwise the materials shall be disposed of in an approved spoil area shown on the Subcontract Drawings, or as Subcontractor's property. The topsoil from the stockpile shall be used in finish grading of the site and as seedbed as specified in Section 02935.

3.5 BURNING OF CONTAMINATED CLEARED AND STRIPPED MATERIAL

Burning of cleared and stripped materials from contaminated areas will not be permitted.

PART 4 - MEASUREMENT AND PAYMENT

4.1 MEASUREMENT

Separate measurement for payment will not be made for work specified in this Section. All such work will be considered incidental to the applicable related items of work.

4.2 PAYMENT

Separate payment will not be made for work specified in this Section. Full compensation for such work will be considered incidental to the applicable related items of work.

END OF SECTION 02110

SECTION 02125

DETOUR FOR ROAD AND RELOCATION OF STRUCTURES AND UTILITIES

PART 1 - GENERAL

1.1 SCOPE

- A. This Specification Section describes the requirements for the relocations of the following:
 - 1. Existing mobile homes, 2 in number, and a fire house.
 - 2. Existing utilities including UMETCO Powerline and Electrical System, Sanitary Sewage System, and Water and Gas Lines.
 - 3. Detouring existing County Road CR-S8.
- B. The work shall conform to the details indicated on the Subcontract Drawings and the requirements of the applicable agencies having jurisdiction.

1.2 DEFINITIONS

Relocation work shall include obtaining all permits and approvals, preparation of detail drawings for the relocations (removal and reconstruction), furnishing of all labor, materials, equipment, accessories, incidentals and services, performance of all work including earthwork, for complete relocations, maintenance and, if required, removal of the relocated structures, utilities and roadways and restoration of the areas.

1.3 RELATED WORK

- A. Section 01300 - Submittals
- B. Section 02050 - Demolition

1.4 SUBMITTALS

- A. General submittal requirements shall conform to Section 01300.

- B. Thirty days prior to the initiation of any relocation work, the Subcontractor shall submit, for review and approval, relocation drawings to the Contractor. The drawings shall indicate approval by the applicable agencies and utility companies.

1.5 APPLICABLE PUBLICATIONS

- A. The Publications listed below form a part of this Specification to the extent referenced. The Publications are referred to in the text by the basic designation only:
1. Firehouse Plans and Drawings
 2. Colorado Department of Health Standards
 3. San Miguel County Subdivision Regulations
 4. Uniform Building Code (UBC): 1985 Edition, as applicable.
 5. National Fire Protection Association (NFPA), as applicable
 6. UMTRA Project Construction Safety and Health Management Program (MK-UMTRA-4)
- B. All relocation works shall be constructed/installed, maintained and operated in accordance with the applicable Federal, State, County, City, and Utility laws, rules, and regulations. Notwithstanding contrary provisions of General Provisions, General Conditions and Special Conditions, nothing in the Subcontract Drawings and Specifications shall be construed to permit work not conforming to the above.

1.6 COORDINATION

The Subcontractor shall coordinate all relocation activities with the Rocky Mountain Natural Gas Company, the Eagle Telecommunications Company, and local utilities, fire and police departments through the Contractor.

1.7 FIREHOUSE RELOCATION

- A. The Subcontractor shall relocate the firehouse to a new slab at the location shown on the Subcontract Drawings.

- B. The Subcontractor shall design a new floor slab for a H20-44 wheel loading.
- C. The Subcontractor shall provide new materials as recommended by the manufacturer, Star Manufacturing Co., Oklahoma City, Oklahoma. All damaged materials and installation shall be repaired or replaced as directed by the Contractor. Such materials shall include, but not be limited to, the following:
1. High Strength Bolts
 2. Tape Sealants
 3. Anchor Bolts
 4. Weatherstripping
 5. Caulking
- D. The Subcontractor shall follow manufacturer's recommendations for removing tape sealants and other adhesive materials.
- E. The Subcontractor shall relocate all utility services currently servicing the firehouse.

PART 2 - PRODUCTS

(Not Used)

PART 3 - EXECUTION

(Not Used)

PART 4 - MEASUREMENT AND PAYMENT

4.1 MEASUREMENT

- A. Measurement for payment for the following will be by the lump sum:
1. Relocation of firehouse.
 2. Relocation of electric service to Slick Rock Village.
 3. Relocation of electric service to water supply well.

4. Relocation of water service.
 5. Detour of County Road CR-S8.
 6. Furnish and install sanitary sewage system.
- B. Measurement for payment for relocation of housing trailers will be by the number of housing trailers relocated, including utility hookups not provided by others.
- C. Separate measurement for payment will not be made for any other item(s) of work incidental to or related to relocations specified in this Section.

4.2 PAYMENT

- A. Payment for the items of Article 4.1.A above will be by their applicable lump sum prices quoted therefor in the Bid Schedule. The prices quoted shall include full compensation for furnishing all materials, equipment including, but not limited to, septic tank, pipes, manholes, cleanouts, etc., tools, labor, accessories, incidentals and for performing all work including design, installation, earthwork, and related and incidental works of removal and relocations. The lump sum price quoted for relocation of firehouse shall also include full compensation for providing all utility services.
- B. Payment for relocation of housing trailers will be by their applicable unit prices per each quoted therefor in the Bid Schedule. Prices quoted shall include full compensation for furnishing all labor, materials, equipment, hardware and incidentals and for performing all work of installing, maintaining, removal and disposal as specified in this Section.
- C. Separate payment will not be made for any other item(s) of work incidental to or related to relocations specified in this Section. Full compensation for such work will be considered to be included in the applicable related item(s) of work under the Subcontract.

END OF SECTION 02125

SECTION 02141

DEWATERING AND DRAINAGE

PART 1 - GENERAL

1.1 SCOPE

- A. This Specification Section describes the requirements for the disposal of surface and subsurface water from the work areas, and for the design, construction and maintenance of dewatering and drainage facilities.
- B. If the groundwater level is higher than the bottom of excavation, the Subcontractor shall dewater the excavation, as required, for performance of work in the dry. Stormwater shall be removed from the excavation to maintain dry conditions.
- C. A dewatering scheme for work in uncontaminated areas is not shown on the Subcontract Drawings. The Subcontractor shall, as required, design and construct additional gravity or pump systems or a combination of both systems for dewatering of water from uncontaminated work areas.
- D. A gravity dewatering scheme for work in contaminated areas is limited to the temporary drainage ditches as shown on the Subcontract Drawings. The Subcontractor shall, as required, design and provide additional gravity or pump system or a combination of both systems for dewatering contaminated work areas.
- E. Contaminated material excavation done prior to the construction of the temporary ditches and retention basins will be diked to prevent runoff from the processing sites.

1.2 DESCRIPTION

- A. The work of this Section includes, but is not limited to: dewatering the excavations by installing sump pumps in the excavations and disposal of water by excavating drainage ditches. Water from uncontaminated areas shall be pumped, or allowed to flow by gravity, to drainage ditches leading to the existing drainage courses that flow offsite. Water from contaminated areas shall be pumped, or allowed to flow by gravity, to drainage ditches leading to the wastewater retention basins.

- B. The Subcontractor shall be responsible for designing, scheduling, utilizing, providing, and maintaining any dikes, ditches, channels, flumes, drains, culverts, sumps, pumping equipment, monitoring wells, other subsurface dewatering devices, and other temporary diversion and protective work necessary to ensure that construction shall be performed in areas free from water.

1.3 WORK NOT INCLUDED

Drainage work related to the construction of temporary facilities specified in Section 01500 is not included in the scope of work of this Section.

1.4 RELATED WORK

- A. Section 01500 - Construction Facilities
- B. Section 02200 - Earthwork
- C. Section 02771 - Membrane Liner

PART 2 - PRODUCTS

2.1 MATERIALS AND EQUIPMENT

The Subcontractor shall furnish all materials, equipment and appurtenances required for furnishing, installing and removing dewatering facilities, and shall also supply sufficient standby pumping and auxiliary equipment to preclude any interference to pumping operations during periods of breakdown and maintenance.

PART 3 - EXECUTION

3.1 DEWATERING PROCEDURES

- A. Water from uncontaminated areas shall be pumped, or allowed to flow by gravity to natural drainage courses. Silt fences shall be installed if necessary.
- B. All water from contaminated areas including storm runoff will be considered contaminated and shall be either pumped or allowed to flow by gravity to nearby drainage ditches

leading to wastewater retention basins. Water from the wastewater retention basins shall not be used for dust and moisture control in uncontaminated fills or in uncontaminated roads. Silt fences may also be required in some areas during excavation. Silt fences shall conform to Section 01500.

- C. The water level in excavation shall be maintained below the lowest point in the excavation until the backfilling of the excavation has been completed, unless otherwise approved by the Contractor.

3.2 WASTEWATER RETENTION BASINS AND DRAINAGE DITCHES

- A. Wastewater retention basins and drainage ditches shown on the Subcontract Drawings shall be constructed as specified in Section 02200.
- B. Additional drainage ditches, if required, shall be constructed by the Subcontractor for collection of wastewater into the retention basins.

3.3 MAINTENANCE

The Subcontractor shall be responsible for the maintenance of drainage facilities during the term of the Subcontract. Drainage ditches and pipes may require periodic cleaning. Pipes and ditches shall be kept free of sediment deposits, debris and other materials that may restrict or prevent drainage. The Subcontractor, when directed by the Contractor, shall remove and replace all items not functioning properly because of clogging, damage, or deterioration.

3.4 REMOVAL

- A. When no longer required for water and sediment control:

1. Dewatering equipment and silt fences shall be removed and disposed of as Subcontractor's property.
2. Contaminated sediments deposited in ditches and the wastewater retention basins shall be removed and disposed of in the tailings embankment as specified in Section 02200 and as required by the Contractor.
3. Areas occupied by the wastewater retention basins, dikes, spillways, and temporary drainage ditches shall be restored and graded as specified in Section 02200.

PART 4 - MEASUREMENT AND PAYMENT

4.1 MEASUREMENT

Separate measurement for payment will not be made for dewatering and drainage.

4.2 PAYMENT

Separate payment will not be made for dewatering and drainage. Full compensation for such work will be considered to be included in the applicable related items of Work specified in this Subcontract.

END OF SECTION 02141

SECTION 02200

EARTHWORK

PART 1 - GENERAL

1.1 SCOPE

A. This Specification Section describes the requirements for earthwork related to the following:

1. Construction of drainage ditches.
2. Construction of access control area.
3. Construction of wastewater retention basins.
4. Construction of the Tailings Embankment:
 - a. Excavation of uncontaminated materials from the tailings embankment area,
 - b. Excavation of contaminated materials from the NC and UC areas, and
 - c. Placement of excavated contaminated materials in the tailings embankment.
5. Disposal of demolished materials and debris (resulting from work specified in Section 02050) in the construction of the tailings embankment.
6. Disposal of asbestos and non-hazardous waste materials (resulting from work specified in Section 02081) in the construction of tailings embankment.
7. Finish grading of the sites, including restoration and regrading of drainage ditches, wastewater retention basins and access control area.

B. Construction restraints are specified in Article SC-3 of the Special Conditions.

1.2 WORK NOT INCLUDED

- A. Earthwork related to the construction facilities except those specified in Article 1.1.A above is not included in this Section.
- B. Detouring of County Road CR-S8.

1.3 RELATED WORK

- A. Section 00800 - Special Conditions, Article SC-1: Definitions
- B. Section 01300 - Submittals
- C. Section 01500 - Construction Facilities
- D. Section 01550 - Temporary Controls: Dust Control
- E. Section 01561 - Construction Cleaning
- F. Section 02050 - Demolition
- G. Section 02081 - Asbestos and Non-Hazardous Waste
- H. Section 02110 - Site Clearing
- I. Section 02141 - Dewatering and Drainage
- J. Section 02230 - Aggregate Base
- K. Section 02278 - Erosion Protection

1.4 DEFINITIONS

- A. Contaminated materials and uncontaminated materials are defined in Article SC-1 of the Special Conditions.
- B. Contaminated Materials Excavation: This excavation shall include removal of all materials encountered regardless of the nature of the materials encountered including rocks up to the size of 4 cubic yards. Soil investigations do not indicate presence of large rocks in the area. Should individual rock size larger than 4 cubic yards be encountered, the compensation to Subcontractor will be by a Change Order. Contaminated materials excavation shall include excavation of contaminated materials from tailings piles, slime pits, Area "A", access control area, temporary drainage ditches, the windblown areas and the wastewater retention basins.
- C. Uncontaminated Materials Excavation: Uncontaminated materials excavation shall include excavations of contaminated materials from the various areas of the site including, but not limited to, excavations for embankment, drainage ditches, retention basins, trenches, access control area, and finish grading. Uncontaminated materials excavation shall further be classified into the following categories for payment purposes:

1. Uncontaminated Common Materials
 2. Uncontaminated Rock Materials: Rock is intact sandstone, moderately to well cemented. Blasting will not be done unless approved by the Contractor.
- D. Overexcavation: Overexcavation is defined as:
1. Excavation carried out beyond the lines and grades indicated on the Subcontract Drawings.
 2. Excavation carried out beyond the limits authorized by the Contractor's HP personnel.
- E. Slimes: Slimes are the fraction of the tailings consisting of silty clay, clay and clayey silt generally defined as containing 70 percent or more of minus No. 200 Sieve material.
- F. Percent Maximum Density: Percent maximum density is the field dry density expressed as a percentage of the maximum density obtained by the test procedure presented in ASTM D698 and ASTM D1557, as applicable.
- G. Topsoil: Topsoil for use as seed bed shall be free of any admixture of subsoil, foreign matter, toxic substances, and any material or substance that may be harmful to plant growth.
- H. Tailings Embankment: Relocated tailings embankment shall consist of relocated contaminated materials, demolished materials and debris, and the protective cover materials.
- I. Temporary Drainage Ditches: Temporary drainage ditches shall be all drainage ditches of temporary nature and shall include diversion, collection and interceptor ditches.
- J. Subgrade Preparation: Subgrade preparation includes fine grading and compaction of excavations including drainage ditches, backfills, and embankments upon which bedding materials, riprap, or other features are to be constructed.
- K. Cover: Cover shall consist of the layers of following fill materials placed over the relocated contaminated materials in the tailings embankment as shown on the Subcontract Drawings:

1. Bedding material and riprap material.
 2. Radon barrier materials.
- L. Demolished Materials and Debris: Demolished materials and debris resulting from the demolition work are specified under Section 02050.
- M. Finish grading of the site shall include excavation, fill and backfill of the various areas of the sites, retention basin, spillway, and temporary drainage ditches.
- N. Soil-like materials have a maximum particle size of 6 inches and more than 40 percent passing the number 4 sieve.
- O. Rock-like materials have a maximum particle size of 12 inches and less than 40 percent passing the number 4 sieve.
- P. Gravel-Cobble material is unprocessed material from required excavation within the embankment area west of coordinate E59400 with less than 40 percent passing the number 4 sieve.

1.5 APPLICABLE PUBLICATIONS

- A. The Publications listed below form a part of this Specification to the extent referenced. The Publications are referred to in the text by the basic designation only:

1. American Society for Testing and Materials (ASTM):

D698-78	Test Methods for Moisture Density Relations of Soils and Soil-Aggregate Mixtures Using 5.5 lb. (2.49-kg) Rammer and 12-in. (305-mm) Drop
D1140-54	Test Method for Amount of Material in Soils Finer than the No. 200 (75-mm) Sieve.
D1556-82	Test Method for Density of Soil in Place by the Sand-Cone Method
D1557-78	Test Methods for Moisture Density Relations of Soils and Soil-Aggregate Mixtures Using 10-lb. (4.54-kg) Rammer and 18-in. (457-mm) Drop.
D2167-84	Test Method for Density and Unit Weight of Soil In-Place by the Rubber-Balloon Method

- D2216-80 Test Method for Laboratory Determination of Water (Moisture) Content of Soil, Rock, and Soil-Aggregate Mixtures
- D2487-83 Test Method for Classification of Soils for Engineering Purposes
- D2922-81 Test Methods for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth)

1.6 QUALITY ASSURANCE

- A. The Contractor will take soil samples and perform moisture, density, gradation and other tests to ascertain that the work is being performed in compliance with these Specifications. Samples may be taken at the place of excavation, stockpiles, or on the fill itself. The Contractor will conduct the density and other tests on the fill and related laboratory testing as frequently as the Contractor considers necessary. The Subcontractor shall remove surface material and render assistance as necessary to enable sampling and testing.
- B. Methods of Sampling and Testing:
 - 1. In-Place Density: ASTM D1556, D2167, or D2922
 - 2. Percent Passing No. 200 Sieve: ASTM D1140
 - 3. Moisture Content: ASTM D2216
 - 4. Laboratory Moisture-Density Relations: ASTM D698, ASTM D1557
- C. Suitability of Materials: The suitability of all materials for foundations and backfill will be determined by the Contractor. Fill material shall be approved material from borrow areas or required excavations.
- D. The Contractor may direct that inspection trenches or test pits be cut into fills and backfills to determine that the Specifications have been met. Such trenches or pits will be of limited depth and size, and shall be backfilled with the material excavated therefrom, or other fill material meeting the requirements for the zones cut into. Backfill shall be compacted to a density at least equal to that of the contiguous fill.

E. When the Contractor directs inspection trenches or test pits to be excavated into fills and backfills and materials are found to meet all Specification requirements, the excavation and refilling shall be paid for as additional work pursuant to the applicable provisions of the General Conditions. Inspection trenches or test pits, and the refilling of the same, shall be at the Subcontractor's expense when it is found that the materials do not meet the Specification requirements.

F. Tolerances: See Specification Section 01052, Article 1.5.

1.7 PROTECTION

A. The Subcontractor shall protect the following:

1. Trees, shrubs and other features outside the areas of construction.
2. Benchmarks and monuments, existing structures, fences, walks, pavings, curbs, etc. from equipment and vehicular traffic.
3. Above and below ground utilities not specified for removal.
4. Excavations from cave-in by shoring, bracing, sheet-piling, underpinning or by other methods.
5. Perimeter of excavation top to prevent surface water runoff into excavation.
6. Monitor wells not to be abandoned.
7. Petroglyphs.

PART 2 - PRODUCTS

2.1 FILL MATERIALS

A. General:

1. Fill materials shall be obtained from the required excavations to the extent available. Where the

excavated materials do not meet the requirements of the Specifications or they are not available, the materials shall be furnished from uncontaminated areas at the UC area or from Subcontractor's borrow areas.

2. The Subcontractor shall make his own determination of any processing that may be required, and shall perform testing as required to meet the Specifications for the various construction materials.

B. Uncontaminated Fill Materials:

1. General Fill: Uncontaminated fill materials for common or general fill and imported fill shall conform to the following requirements:
 - a. Uncontaminated fill materials shall not contain more than 5 percent organic material, by volume, or other deleterious substances.
 - b. Maximum particle size shall not be greater than the compacted lift thickness in any dimension, except that for fill areas under pavement locations, maximum stone dimension allowed in the upper 18 inches of the fill shall be 4 inches. Individual large stones shall be distributed within the fill materials to provide visual void-free mass, and be able to meet the requirements of Article 3.8.A. Larger stones may be utilized in initial backfill in the lower layers of finish grading of the site.
2. Radon Barrier Materials: Radon barrier materials shall conform to the following requirements:
 - a. Radon barrier materials shall be uncontaminated soils obtained from the designated borrow area.
 - b. Radon barrier materials shall consist predominantly of soils with classification of SC or CL, when classified in accordance with the requirements of ASTM D2487, and graded with maximum particle size of 2 inches and minimum of 20 percent passing No. 200 Sieve. Percent passing No. 200 Sieve shall be determined in accordance with the requirements of ASTM D1140. Compliance with these Specifications will be determined by the Contractor.

- c. Radon barrier material shall not contain more than five percent organic matter, by volume, or other deleterious substances.
- C. Contaminated Fill Materials: Contaminated materials defined in Article SC-1 of the Special Conditions resulting from the clearing, stripping and excavation operations in contaminated areas.
- D. Demolished Materials and Debris: Demolished materials and debris resulting from work specified in Section 02050 shall be considered as contaminated materials for disposal purposes.
- E. Asbestos and Non-Hazardous Waste Materials: Asbestos and non-hazardous waste materials resulting from work specified in Section 02081.

PART 3 - EXECUTION

3.1 PROTECTION OF EXPOSED SURFACES

- A. During seasonal shutdowns and during other periods of prolonged exposure of excavated or filled areas, the Sub-contractor shall provide labor, materials and equipment as required by the Contractor to maintain and protect exposed surfaces of uncontaminated and contaminated materials against wind erosion and excessive stormwater erosion. Prior to the application of protective erosion control measures, the exposed surfaces shall be sloped to drain and compacted with a smooth drum roller to eliminate ruts and ridges formed by construction equipment. Unless otherwise approved by the Contractor, acceptable methods of erosion protection are as follows:
 - 1. Spraying with Water containing Chemical Additives: Acceptable chemical additive is "Soil Seal Concentrate" as manufactured by Soil Stabilization Products Company of Merced, California, or approved equal. Mixing and application shall be in accordance with the manufacturer's recommendations, or
 - 2. Covering exposed surfaces with geotextile fabric such as "Supac" as manufactured by Phillips Fibers Corporation of San Jose, California, or approved equal. Handling and installation shall be as recommended by the manufacturer of the product.

3.2 EARTHWORK - GENERAL

A. Preparation:

1. Required lines, levels, contours and datum shall be identified before the start of earthwork operations.
2. The Subcontractor shall verify the existing above ground and underground utilities, identify them, and notify the Contractor immediately of his finding, if any, for appropriate action by the Contractor.
3. Clearing and stripping shall be as specified in Section 02110.

B. Dewatering and Drainage: Prior to commencement of earthwork operations, the Subcontractor shall verify that the dewatering and drainage facilities are constructed and operational in accordance with the requirements of Section 02141.

C. In order to avoid cross-contamination of uncontaminated material, the contaminated and uncontaminated materials shall be kept separated during earthwork operations. Stockpiles of contaminated materials shall be placed on contaminated areas only and the drainage collected in the wastewater retention basin.

D. Earthwork shall conform to the lines and grades indicated on the Subcontract Drawings or specified in this Section.

E. The excavated uncontaminated materials, where practicable, shall be used as fill in various areas of the sites including the construction of retention basin dikes, lined ditch fills, backfill, and fill for the final grading of the sites, as required. Uncontaminated excavated material not utilized in fills may be stockpiled.

3.3 EXCAVATION

A. General:

1. Excavation shall be carried out to reach the lines and grades indicated on the Subcontract Drawings or specified herein, or, in the case of contaminated materials, as required by the Contractor's Health Physics Personnel.

2. At all times, the Subcontractor shall conduct his operations in such a manner as to prevent free standing water and contamination of uncontaminated materials. The Subcontractor shall, as a minimum, take the following measures to safeguard against such problems:
 - a. Water leaving contaminated excavation area or contaminated area otherwise disturbed by construction activities shall be routed into the retention basin as specified in Section 02141.
 - b. Exposed surfaces of contaminated and uncontaminated materials excavations shall be protected from erosion as specified in Article 3.1 above.
3. Unless otherwise indicated on the Subcontract Drawings, the Subcontractor shall remove all excavated material from the excavation site and dispose of it in fills or stockpiles.
4. Unsuitable or low density subgrade material not readily capable of in-place compaction as determined by the Contractor shall be excavated as directed by the Contractor and disposed of as specified in Article 3.4.
5. Adequate working space for safety of personnel shall be provided within the limits of the excavation.
6. Except as otherwise noted, care shall be exercised to preserve the material below and beyond the lines of all excavation. Where excavation is carried below grade, the Subcontractor shall backfill to the required grade or to indicated invert grade, as specified, and recompact the backfill to meet existing conditions.
7. Excavation for the convenience of the Subcontractor shall conform to the limits approved by the Contractor and shall be at no additional expense to the Contractor.
8. Excavated material shall be placed at sufficient distance from the edge of excavations to prevent cave-ins or bank slides.

B. Contaminated Materials Excavation:

1. The Subcontractor shall minimize the open excavation area of contaminated materials at any time during

excavation work. The Subcontractor shall operate from one or two sides at one time, progressing uniformly to opposite sides for completion, unless directed otherwise by the Site Manager. Contaminated materials shall be excavated to the depths indicated on the Subcontract Drawings, and as required by the Contractor, and placed in the proper part of the tailings embankment. The contaminated material will be excavated generally in priority of its placement in the embankment to minimize rehandling and stockpiling.

2. During the excavation operation, tests will be performed by the Contractor to determine the level of radioactive contamination of the material to be excavated.

C. Uncontaminated Materials Excavation:

1. Temporary Drainage Ditches:

- a. Drainage ditches shall be cut accurately to the cross sections and grades where indicated. All roots, stumps, rock, and foreign matter in the sides and bottom of ditches shall be trimmed and dressed or removed to conform to the slope, grade, and shape of section indicated. Care shall be taken not to excavate ditches below the grades indicated. Excessive ditch excavation shall be backfilled to grade with compacted material.
- b. Ditches shall be located as shown on the Subcontract Drawings to collect and transport storm runoff, wastewater and water-borne contaminated material to the retention basins during construction, and to divert uncontaminated water from the site.
- c. Ditches shall be fine graded, compacted, and maintained to provide drainage during construction.

2. Borrow Area Excavation:

- a. Where materials are not available in sufficient quantity from the required excavations, such materials shall be obtained from borrow areas of approved sources offsite.
- b. The Subcontractor shall notify the Contractor at least 30 days in advance of opening any borrow area so that adequate time will be allowed for testing the material.

- c. Borrow areas shall meet all permit and negotiated requirements as required by the Contractor.
- d. Necessary clearing, grubbing, and disposal of debris shall be performed by the Subcontractor as incidental operations to the borrow excavation.
- e. After borrow excavations are completed, borrow areas shall be graded to drain.

3. Wastewater Retention Basin Excavation:

- a. The wastewater retention basin shall be constructed to the lines and grades shown on the Subcontract Drawings. Contaminated materials shall first be excavated and stockpiled within the area as shown on the Subcontract Drawings, then the excavation and fill for the retention basin shall be accomplished.
- b. The retention basin shall be demolished when no longer required and the area graded as shown on the Subcontract Drawings and as specified in this Section.
- c. Construction of the retention basin shall also conform to the requirements specified in Section 02141.

4. Radon Barrier Borrow Area Excavation:

- a. Borrow area shall meet all permit and negotiated requirements as required by the Contractor.
- b. Necessary clearing, grubbing, and disposal of debris shall be performed by the Subcontractor as incidental operations to the borrow excavation.
- c. The material shall be excavated after stripping the topsoil.
- d. Excavations for radon barrier materials shall be carried out in the presence of a qualified technician employed by the Contractor.

3.4 DISPOSAL OF EXCAVATED MATERIALS

- A. Contaminated Materials: All excavated contaminated materials shall be used as contaminated material fill or

stockpiled in the designated areas shown on the Subcontract Drawings until placed in the tailings embankment.

B. Uncontaminated Materials:

1. Uncontaminated materials excavated from the site, including excavations for trenches, drainage ditches, retention basins, decontamination pads, and the like, shall be used as uncontaminated material fill for the construction of various features, or stockpiled for later use.
2. Where used in fills, such material shall be transported directly from the excavation and placed in its final position in such fills whenever possible. If required by the Subcontractor's schedule, the material may be placed temporarily in stockpiles at approved locations. Material in stockpile shall be protected from contamination of any kind that would render it unsuitable for use in fills.
3. Excess excavated uncontaminated materials generated during the Work shall be temporarily stockpiled on site for later use or in the designated permanent stockpile areas as required by the Contractor.
4. All operations in the stockpile areas throughout the Work shall be in strict conformity with the requirements of this Section. The Subcontractor shall ensure that silty water from the stockpile areas does not enter nearby waterways. If required, temporary berms and detention ponds shall be constructed by the Subcontractor.

- C. Garbage, refuse, debris, oil, and any waste material which is harmful to the environment or offensive to the area shall be removed from the job site and disposed of offsite in a manner approved by the Contractor's representative.

3.5 FILL CONSTRUCTION

A. General Requirements:

1. Fill materials shall be placed and compacted to the lines and grades shown on the Subcontract Drawings or as required by the Contractor.

2. Prior to placing uncontaminated fill materials, the subgrade will be radiologically surveyed by the Contractor to confirm that EPA standards have been met. These radiological surveys may cause delays to backfill operations of up to seven working days. The Subcontractor shall plan his work accordingly.
3. If any portion of the materials placed as fill does not meet the specified requirements, the Subcontractor shall remove such material and replace it with fill materials meeting the specification at no additional cost to the Contractor.
4. Constructed fills shall be maintained to meet the requirements of this Specification until final completion and acceptance of the Work. This shall include all measures to prevent erosion or contamination during construction, including contamination by radioactive material. During seasonal or other extended shutdowns, all exposed surfaces shall be protected with special treatments specified in Article 3.1 above.

B. Placing Requirements:

1. Prior to placement of materials, the in-place density of the Subgrade shall be as specified in Article 3.8. Subgrade preparation, where required, shall be as specified in Article 3.7.
2. No materials shall be placed on any portion of the subgrade or against or upon any structure until consent to place such fill has been obtained from the Contractor.
3. Subgrade and fill materials may require moisture conditioning (wetting or drying) prior to compaction.
4. Fill materials shall be placed in continuous and approximately horizontal layers for their full length and width unless otherwise specified or specifically permitted by the Contractor.
5. The method of dumping and spreading the materials shall ensure uniform distribution of the material.
6. Loose thickness of each lift of materials shall not be greater than that required to achieve the specified compaction for the entire lift, and in no case shall exceed 12 inches.

7. Unless otherwise indicated, fill materials shall be placed to a grade no flatter than 2 percent to facilitate drainage of water. In areas where ponding cannot be prevented or ponding has occurred and fill is required to be placed, placing shall begin only after the area is dewatered and permission to place is obtained from the Contractor.
8. Materials shall not be placed on frozen subgrade nor shall frozen material be used as fill.
9. Disposing of bulky materials shall be done with care to minimize the volume of voids created in the disposal embankment fill. Pieces of wood, concrete, and steel members shall be cut or broken up as specified in Section 02050, and placed to avoid nesting. Such bulky materials shall be placed in the lower lifts of the tailings embankment as determined by the Contractor. Bulky materials from vicinity properties materials stockpile and from the demolition of temporary facilities at the end of construction shall be placed as low as practicable within the embankment.
10. When no longer needed for control of contamination, as determined by the Contractor, the temporary drainage ditches, retention basin, sumps, and the like shall be removed and the area restored and finish graded as shown on the Subcontract Drawings.

C. Compaction Requirements:

1. Each lift of fill materials shall be compacted to at least the minimum density specified in Article 3.8.
2. During compaction, the moisture content of material shall be maintained within the range specified in Article 3.8.D to achieve specified density. Uniform moisture distribution shall be obtained by disking, blading, or other methods approved by the Contractor prior to compaction of a layer.
3. If the surface of the prepared foundation or the rolled surface of any lift of fill is too wet for proper compaction of the lift of fill material to be placed thereon, it shall be removed, allowed to dry, mixed with dry material, or worked with harrow, scarifier, or other suitable equipment to reduce the water content to the required amount, and then re-compacted before the next succeeding layer of fill is placed.

4. Fill compacted to densities lower than the specified minimum density or at moisture contents outside the specified acceptable range of moisture content shall be reworked to meet the density and moisture requirements or removed and replaced by acceptable fill compacted to meet these requirements.
5. Compaction of radon barrier shall be accomplished by the use of tamping-foot rollers. The final lift of each of the contaminated materials, radon barrier material and bedding material shall be compacted by the use of a smooth roller.
6. Uncontaminated fill material in the stockpile areas shall be placed by spreading with a bulldozer and track walking. Lift thickness before compaction shall not exceed one foot. Compaction shall be accomplished by routing of hauling and spreading equipment units.

3.6 FIELD QUALITY CONTROL

- A. General: The Contractor will take samples and perform tests throughout the construction period, and the Sub-contractor shall cooperate in providing access for the Contractor to areas where testing is to be performed and shall schedule his placing to avoid interference with the testing operations.
- B. Tests: The Contractor will perform the following tests on a regular basis.
 1. In-place density and moisture content tests for compacted materials where density is specified will be as follows:
 - a. One test per 1000 cubic yards of contaminated materials.
 - b. One test per 500 cubic yards of radon barrier materials.
 - c. One test per 3000 cubic yards of common fill materials.
 - d. At least two tests for each day of material placement in excess of 150 cubic yards for each material.
 2. Percentage by weight passing the No. 200 sieve on radon barrier materials at a minimum of one test per

1000 cubic yards of material placed with an absolute minimum of one gradation performed per day of placement.

3.7 SUBGRADE PREPARATION

- A. Subgrade Preparation: Subgrade preparation includes fine grading and compaction of excavations, backfills, embankments (including stockpiles) upon which pavement, surfacing, base, subbase, bedding materials, and riprap or other structures are constructed. Areas excavated to bedrock or to cobbles/gravels do not require subgrade preparation.
- B. Where required for compaction, the entire surface of the subgrade shall be plowed, harrowed, and mixed to a depth of at least 6 inches. Compaction shall be carried out for the full area below finished subgrade to at least the density specified in Article 3.8 below. Soft spots developed during working shall be corrected.
- C. Subgrade for the tailings embankment shall be on bedrock or excavated to the lines indicated on the Subcontract Drawings. Loose material shall be removed to the extent practicable. Subgrade shall not be compacted prior to tailings placement. The Contractor will inspect and approve the tailings embankment subgrade prior to placement of contaminated materials. The Subcontractor shall minimize disturbance to the subgrade once Contractor's approval has been obtained.

3.8 COMPACTION DENSITIES AND MOISTURE CONTENTS

- A. Soil-like materials in subgrades of roads, decontamination pads and embankments, and each layer of embankment and backfill shall be compacted to at least the following percentage of maximum dry density, as determined by the specified ASTM test method:
 - 1. For roads and decontamination pads: ASTM D1557
 - a. Subgrade preparation: 90 percent
 - b. Embankment: 95 percent

2. For all other areas: ASTM D698

- a. Subgrade preparation: 90 percent
- b. Embankment: 90 percent
- c. Radon barrier: 95 percent

B. Rock-like materials and gravel/cobble backfill shall be compacted with four passes of a 2- to 3-ton working weight vibratory smooth drum roller over the entire area of placement.

C. Embankment erosion protection shall be compacted as specified in Part 3 of Section 02278.

D. Moisture Control:

- 1. During compaction, the moisture content of soil-like materials, excluding radon barrier material, shall be maintained as required to achieve specified density.
- 2. Radon barrier material shall be compacted at moisture contents within zero to plus three percent of the optimum moisture content.
- 3. There are no moisture requirements for rock-like materials.

3.9 DISPOSAL OF DEMOLISHED MATERIALS AND DEBRIS

- A. All demolished materials and debris including contaminated cleared materials shall be disposed of in the tailings embankment conforming to the applicable provisions of this Section and as required by the Contractor.
- B. During construction of the tailings embankment, provision shall be made to leave required space at proper location in the embankment for the placement of the demolished materials and debris.

3.10 DISPOSAL OF ASBESTOS AND NON-HAZARDOUS WASTE MATERIALS

Disposal of asbestos and non-hazardous waste materials in the tailings embankment shall conform to the applicable provisions of this Section and the provisions of the Solid Waste Regulations of Colorado Department of Health.

PART 4 - MEASUREMENT AND PAYMENT

4.1 MEASUREMENT

- A. Measurement for payment for the following items of excavation will be by the cubic yards of materials excavated. The quantities for payment will be computed by average end area method from surveys conducted before and after excavation operations, or from lines and dimensions shown on the Subcontract Drawings. Separate measurement for payment will not be made for placement of the materials in their final locations.
1. Excavation of Tailings and Contaminated Materials from NC Area and Placement in Tailings Embankment
(Bid Schedule Item 402)
 2. Excavation of Tailings from UC Area and Placement in Tailings Embankment
(Bid Schedule Item 403)
 3. Excavation of Contaminated Materials from UC Area and Placement in Tailings Embankment
(Bid Schedule Item 404)
- B. Measurement for payment for the following items of excavation will be by the cubic yards of materials excavated. Quantities for payment will be computed by average end area method from surveys conducted before and after excavation operations, or from lines and dimensions as shown on the Subcontract Drawings.
1. Excavation for Access Control, Temporary Drainage Ditches and Wastewater Retention Basin in UC Area
(Bid Schedule Item 211)
 2. Excavation for Temporary Drainage Ditches and Wastewater Retention Basin in NC Area
(Bid Schedule Item 213)
 3. Excavation of Uncontaminated Materials from UC Area
(Bid Schedule Item 401)
 4. Uncontaminated Rock Excavation from Tailings Embankment Area
(Bid Schedule Item 405)
- C. Measurement for payment for the following items of fills will be by the cubic yards of material placed in fills.

The quantities for payment will be computed by average end area method from surveys conducted before and after placement, or from lines and dimensions as shown on the Subcontract Drawings.

1. Fill for Access Control, Temporary Drainage Ditches and Wastewater Retention Basin in UC Area
(Bid Schedule Item 212)
 2. Fill for Temporary Drainage Ditches and Wastewater Retention Basin in NC Area
(Bid Schedule Item 214)
 3. Furnish and Place Radon Barrier Material
(Bid Schedule Item 501)
 4. Common Fill for Finish Grading of UC Area
(Bid Schedule Item 801)
 5. Gravel/Cobble Fill for Finish Grading of UC Area
(Bid Schedule Item 802)
 6. Fill for Finish Grading of NC Area
(Bid Schedule Item 803)
- D. Separate measurement for payment will not be made for the following items, and such work will be considered incidental to the related items of work:
1. Subgrade preparation.
 2. Disposal in spoil of excess uncontaminated material including incidental activities.
 3. Required rehandling of materials.
 4. Temporary/permanent stockpiling of excavated materials.
- E. Overexcavation: Overexcavation for the Subcontractor's convenience or due to error or lack of control by the Subcontractor will not be measured for payment. At the discretion of the Contractor, overexcavation shall be backfilled with compacted contaminated or uncontaminated fill, as required, at the Subcontractor's expense.
- F. When it is impossible or impractical to use any of the methods of measurement specified above, the Contractor will stipulate a method of computation.
- G. Measurement for payment for disposal of demolished materials and debris will be made under Section 02050.

- H. Measurement for payment for disposal of asbestos and non-hazardous waste materials will be made under Section 02081.

4.2 PAYMENT

- A. Payment for the items of Article 4.1.A above will be by their applicable unit prices per cubic yard quoted therefor in the Bid Schedule. The prices quoted shall include full compensation for excavating, hauling, and placing the excavated materials in their final locations, including all clearing, stripping, grading, shaping, preparing subgrade, compacting, temporary stockpiling and required rehandling.
- B. Payment for the items of Article 4.1.B above will be by their applicable unit prices per cubic yard quoted therefor in the Bid Schedule. The prices quoted shall include full compensation for excavating, hauling, and placing the excavated materials in temporary stockpiles, or in spoil areas if excess or unsuitable for use as fill, as required, including all clearing, stripping, shaping, and compacting such stockpiles or areas as specified.
- C. Payment for the items of Article 4.1.C above will be by their applicable unit prices per cubic yard quoted therefor in the Bid Schedule. The prices quoted shall include full compensation for hauling the materials from excavated areas or retrieving the materials from temporary stockpiles, and placing the excavated materials in their final locations including all clearing, stripping, grading, shaping, preparing subgrade, and compacting. The prices quoted shall also include full compensation for furnishing imported uncontaminated/erosion protection materials from the Subcontractor's own sources.
- D. Separate payment will not be made for the items mentioned in Article 4.1.D above. All costs for such work will be considered to be included in the prices quoted for the applicable related items of work.
- E. Payment for disposal of demolished materials and debris will be made under Section 02050.
- F. Payment for disposal of asbestos and non-hazardous waste materials will be made under Section 02081.

END OF SECTION 02200

SECTION 02230

AGGREGATE BASE

PART 1 - GENERAL

1.1 SCOPE

This Specification Section describes the requirements for furnishing and placing aggregate base course materials for access control area.

1.2 WORK NOT INCLUDED

- A. Temporary roads as defined in Article SC-1 of the Special Conditions.
- B. Detour of County Road CR-S8.

1.3 RELATED WORK

- A. Section 01300 - Submittals
- B. Section 02200 - Earthwork

1.4 APPLICABLE PUBLICATIONS

- A. The Publications listed below form a part of this Specification to the extent referenced. The publications are referred to in the text by the basic designation only:

1. American Society for Testing and Materials (ASTM):

D1557-78 Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures Using 10-Lb (4.54-kg) Rammer and 18-in (457-mm) Drop

- 2. Standard Specifications for Road and Bridge Construction, State of Colorado, Department of Highways, Highway Division, 1981. All references to "Engineer" shall mean "Site Manager"; all references to "Division" shall mean "Contractor"; and all references to "Con-

tractor" shall mean "Subcontractor". The provisions for sampling of paving for measurement and payment shall not be applicable. All references to "special provisions" shall not be applicable. Measurement and payment provisions shall be as specified in this Section.

1.5 QUALITY ASSURANCE

A. Aggregate Base:

1. Aggregate base course materials and operations may be subject to inspection, sampling and testing by a soil testing laboratory employed by the Contractor. Laboratory personnel shall have unrestricted access to the work.
2. The soil testing laboratory will analyze and test materials in the laboratory as directed by the Site Manager to determine conformance with these Specifications.

1.6 SUBMITTALS

The Subcontractor shall submit a certificate from the manufacturer stating that the material meets the Specifications in all respects.

PART 2 - PRODUCTS

2.1 EQUIPMENT

The Subcontractor shall provide all equipment and facilities required to perform the work of this Specification. The equipment and facilities shall be subject to approval by the Contractor.

2.2 MATERIALS

Base Course Materials: Materials for base course shall conform to the requirements of Section 703 of the Colorado Standard Specifications. The materials shall be Class 6.

PART 3 - EXECUTION

3.1 EARTHWORK AND SUBGRADE PREPARATION

- A. Earthwork and subgrade preparation shall be as specified in Section 02200.
- B. Before placing and spreading base course materials, the subgrade shall be cleaned of all foreign substances and shall not contain frozen material. It will be inspected by the Contractor for adequate compaction and surface tolerances.

3.2 CONSTRUCTION OF BASE COURSE

- A. Construction of base course shall follow the requirements of Section 304 of the Colorado Highway Division Specifications, except as modified herein and as approved by the Contractor.
- B. Placement: Base course shall have water added and shall be mixed and processed so as to produce a uniform blend of material before final placement. After processing, the material shall be placed and spread on the prepared subgrade, in a uniform layer or layers not exceeding 6 inches in compacted depth, unless otherwise approved in writing by the Contractor. The spread material shall be free from segregation.
- C. Compaction: Each layer of aggregate base course shall be compacted to a density of not less than 95 percent of the maximum density determined in accordance with the requirements of ASTM D1557.
- D. Finishing:
 - 1. The final layer of base course shall be finished with equipment capable of shaping and grading the finish surface within the tolerances specified herein.
 - 2. The finished surface of aggregate base course shall not vary from the grades established by the Contractor by more than 0.05 of a foot.
 - 3. The compacted layers of aggregate base course shall be maintained in a condition satisfactory to receive the surface or pavement material when so required.

4. Areas not within the allowable tolerance shall be corrected by scarifying, placing additional material, remixing, reshaping and recompacting to the specified density and surface tolerance.

3.3 MAINTENANCE

The roadway surfaces shall be maintained by the Subcontractor in good conditions, free of pot holes, ruts and ravel.

PART 4 - MEASUREMENT AND PAYMENT

4.1 MEASUREMENT

- A. Measurement for payment for furnishing and placing aggregate base course materials for access control area will be by the cubic yards of the materials furnished and placed. The quantities will be calculated from the lines and dimensions shown on the Subcontract Drawings and accepted by the Contractor.
- B. Measurement for payment for earthwork and subgrade preparation is specified in Section 02200.

4.2 PAYMENT

- A. Payment for furnishing and placing aggregate base course materials for access control area will be by the unit price per cubic yard quoted therefor in the Bid Schedule. The price quoted shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals for doing all work involved in constructing aggregate base course; protection and maintenance of completed work; setting up temporary signs, detours, land shutdowns, and the like; as shown on the Subcontract Drawings, as specified in these Specifications and as required by the Site Manager.
- B. Payment for earthwork and subgrade preparation is specified in Section 02200.

END OF SECTION 02230

SECTION 02278

EROSION PROTECTION

PART 1 - GENERAL

1.1 SCOPE

This Specification Section describes the requirements for furnishing and placing erosion protection materials (riprap and bedding) for tailings embankment cover and aprons.

1.2 WORK NOT INCLUDED

Erosion protection related to the Construction Facilities and Temporary Controls specified in Sections 01500 and 01560 is not included in the scope of work of this Specification.

1.3 RELATED WORK

- A. Section 01300 - Submittals
- B. Section 02200 - Earthwork: Subgrade Preparation

1.4 APPLICABLE PUBLICATIONS

- A. The publications listed below form a part of this Specification to the extent referenced. The publications are referred to in the text by the basic designation only:

- 1. American Society for Testing and Materials (ASTM):

- | | |
|---------|---|
| C88-83 | Test Method for Soundness of Aggregates by Use of Sodium Sulfate or Magnesium Sulfate |
| C117-87 | Test Method for Materials Finer Than 75-um (No. 200) Sieve in Mineral Aggregates by Washing |
| C127-84 | Test Method for Specific Gravity and Absorption of Coarse Aggregate |

- C131-81 Test Method for Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine.
- C136-84 Test Method for Sieve Analysis of Fine and Coarse Aggregates
- C295-85 Practice for Petrographic Examination of Aggregates for concrete.

2. International Society for Rock Mechanics (ISRM), 1981, Rock Characterization Testing and Monitoring, ISRM Suggested Methods, E. T. Brown, Editor, Pergamon Press, New York:

Suggested Method for Determining Indirect Tensile Strength by the Brazil Test, pp. 120-121

Suggested Method for Determination of the Schmidt Rebound Hardness, pp. 101-102

1.5 PERMITS

The Contractor will provide permits for the use of borrow areas shown on the Subcontract Drawings as specified in Article SC-11 of Special Conditions. If the Subcontractor uses other sources for erosion protection materials, he shall be responsible for obtaining all required permits.

1.6 SUBMITTALS

- A. If the Subcontractor determines to use other sources for erosion protection materials, a site inspection report containing the information specified in Article 2.3 below shall be submitted, in triplicate, to the Contractor for review and approval of the source, in accordance with the requirements of Section 01300.
- B. During production of riprap and bedding materials, the Subcontractor shall submit test results, in triplicate, including, as a minimum, the tests specified in Article 2.1.E for a minimum of three representative samples of each type of material produced.

PART 2 - PRODUCTS

2.1 GENERAL

- A. Material Sources: Erosion protection materials shall be obtained from sources approved by the Contractor. The approved sources for Types A and B riprap and bedding material are the Dolores River borrow site and terrace cobbles and gravels from the disposal area excavations west of coordinate E59,400. The approved source for Types C and D riprap is the Barlow Creek borrow site. The basis for approval of other sources is specified in Article 2.3 below.
- B. Approval of a source as a borrow area does not mean that all materials excavated will meet the requirements of this Specification. Processing or selective quarrying may be necessary to meet these requirements.
- C. The materials shall be free from radioactive or other contamination.
- D. Material shall be dense, sound, resistant to abrasion, and shall be free from cracks, seams, and other defects as shown in the petrographic examination and during field inspection as per Article 3.3 below.
- E. Quality and Gradation Tests: For record purposes the following tests shall be performed and the results shall be provided to the Contractor in accordance with Article 1.6.B:

<u>Test</u>	<u>Designation</u>
Gradation	ASTM C117 ASTM C136
Specific Gravity (Saturated Surface Dry Basis)	ASTM C127
Absorption	ASTM C127
Soundness	ASTM C88
Abrasion	ASTM C131
Schmidt Hammer	ISRM Method
Splitting Tensile Strength (Modified-Loading Rate Shall Cause Failure in 1 to 3 minutes)	ISRM Method
Petrographic Examination	ASTM C295

2.2 QUALITY REQUIREMENTS

A. All riprap and bedding materials used shall meet the following requirements:

1. The Subcontractor shall have a qualified laboratory perform the six (6) types of tests listed in Table A on each sample (minimum of 3 samples) obtained from the proposed source. Special attention shall be given to ensure that the samples are representative of the proposed rock materials. Test samples shall be obtained from within the precise locations of rock deposits from which materials will be produced.
2. Results of the tests specified in Table A on a minimum of three samples of each material shall be used to obtain rock quality scores using the criteria given in the table. The score for each test is determined by multiplying the appropriate weighting factor by the score (0 to 10) based on the specific test result. The final score for each sample is the ratio of the sum of the individual test scores (six tests) to the maximum possible score, expressed as a percentage. To be acceptable, the final score must be no less than 65 percent for Riprap Types A and B and bedding material, and no less than 80 percent for Riprap Types C and D.

2.3 SUBCONTRACTOR-PROPOSED SOURCES

A. The basis for approval of sources proposed by the Subcontractor shall be as follows:

1. A site inspection report by an engineering geologist which will include, as a minimum, an evaluation of soundness, hardness, and durability for three samples representative of the proposed source. The evaluation of durability shall be based in part on petrographic examination of rock types available from the source. In addition, the material shall meet the quality requirements of Article 2.2 above. Representativeness of samples shall be determined by the Contractor, based on precise location and source of sample taken in relation to the whole borrow area. The site inspection report shall include locations of all samples and methods of sampling.
2. If available, examples of successful uses of the material including riprap that has been in place on other project sites for more than 20 years, rock that has functioned satisfactorily as foundation stone or building facing for 50 years or more, and abandoned quarry faces which have maintained their integrity

after not being worked for approximately 50 years or more. Durability shall be indicated by lack of significant weathering or loss of volume strength over decades of exposure to natural weathering elements.

2.4 GRADATION REQUIREMENTS

A. Materials shall be reasonably well graded within the following limits:

1. Riprap:

a. Gradation:

<u>U.S. Standard Sieve Size/Nominal Size (Square Openings)</u>	<u>Percent Passing (by weight)</u>
--	--

Type A

3-inch	98-100
2-inch	15-100
1-1/2-inch	0-40
1-inch	0-20
No. 4	0-10

Type B

7-inch	98-100
5-inch	15-100
4-inch	0-50
3-inch	0-25
1/2-inch	0-10

Type C

20-inch	98-100
15-inch	40-100
12-inch	10-50
8-inch	10-25
4-inch	0-15
2-inch	0-10

Type D

28-inch	98-100
22-inch	50-100
18-inch	25-50
12-inch	12-25
8-inch	0-15
4-inch	0-10

- b. Maximum Size: No individual piece shall be greater than 90 percent of the riprap layer thickness.

2. Bedding:

<u>U.S. Standard Sieve Size (Square Openings)</u>	<u>Percent Passing (by weight)</u>
3-inch	100
2-inch	55-100
1-1/2-inch	50-80
No. 4	30-55
No. 20	17-35
No. 200	0-5

PART 3 - EXECUTION

3.1 PLACEMENT AND COMPACTION

- A. Subgrade preparation for apron shall conform to Specification Section 02200.
- B. Where the required bedding material thickness is 6 inches, the bedding material shall be spread and compacted in one layer.
- C. Each lift of bedding material shall be compacted by four passes of a 2- to 3-ton working weight vibratory smooth drum roller operating across the slope, over the entire area of placement.
- D. Riprap material shall be placed so that the larger pieces are uniformly distributed and the smaller pieces serve to fill the spaces between them to provide well-keyed, densely placed layers of riprap of the specified thicknesses.
- E. Riprap material may be placed by end-dumping and may be spread by bulldozers or other suitable equipment.

- F. Construction equipment other than spreading and compaction equipment shall not be allowed to move over the placed riprap material and bedding material layers except at equipment crossovers as designated by the Contractor. Each crossover shall be cleaned of all contaminating materials and approved by the Contractor before additional materials are placed in these areas.

3.2 TOLERANCES

- A. The material layers shall be placed generally to the limits and thicknesses shown on the Subcontract Drawings within the following tolerances:
1. Top of bedding material shall be within 0.1 foot of elevations shown on the Subcontract Drawings.
 2. The minimum in-place thickness shall not be less than 90 percent of the thickness shown.
 3. The maximum in-place thickness shall not be more than 125 percent of the thickness shown.
 4. Local irregularities will be permitted provided that such irregularities do not form noticeable mounds, ridges, swales or depressions which in the opinion of the Contractor could cause concentrations of surface runoff or form ponds or gullies.

3.3 FIELD QUALITY CONTROL

- A. Source Quality Control: The Subcontractor shall provide a qualified engineering geologist to monitor materials acquisition and production to ensure that only materials acceptable under Article 2.2 as confirmed by the Contractor, are processed. During excavation or blasting of materials, the Contractor will inspect the site to ensure that stripping and material selection procedures are adequate to prevent inclusion of deleterious materials in processed materials. The Contractor reserves the right to inspect and test the materials at any time during or after production and placement.
- B. Placement Quality Control: The placement of the materials will be inspected and tested by the Contractor during and after placement to ensure that the following requirements are met:

1. Material of the correct type and quality is being placed. The quality of particles size smaller than 12-inch will be determined by inspection and testing of bulk samples. Particles of size 12-inch and larger will be inspected, and unsatisfactory particles will be removed as per Paragraph D below.
 2. The material being placed is clean and free of unsuitable material.
 3. The material is being loaded, transported and placed in a manner which minimizes segregation.
 4. The material is being placed to line and grade within the tolerances and limits designated in Article 3.2 above.
 5. The material placed meets the gradation requirements specified.
- C. Materials segregated or not placed according to the above requirements shall be regraded or adjusted, using appropriate equipment, to conform with the tolerances and limits given above, at no additional cost to the Contractor.
- D. Materials not meeting the requirements of this Section shall be removed and replaced with specified materials at no additional cost to the Contractor. Rejected materials shall be disposed of at designated disposal sites and at no additional cost to the Contractor. Materials not meeting the grading requirements shall be reprocessed or discarded. The Contractor may require modification of the processing and grading operations to ensure that the specified grading requirements are met.

PART 4 - MEASUREMENT AND PAYMENT

4.1 MEASUREMENT

- A. Measurement for payment for furnishing and installing the following materials will be by the cubic yards of material placed. The quantities will be calculated from the lines and dimensions shown on the Subcontract Drawings:

1. Riprap Material, Type A
2. Riprap Material, Type B

3. Riprap Material, Type C
4. Riprap Material, Type D
5. Bedding Material

4.2 PAYMENT

Payment for the items of Article 4.1.A above, will be by their applicable unit prices per cubic yards quoted therefor in the Bid Schedule. The prices quoted shall include full compensation for furnishing labor, materials, tools, equipment and incidentals and for performing specified work including development of the source (where applicable), obtaining required permits (if applicable), clearing, stripping and excavating; processing the materials; testing and evaluating the materials; transporting to placement locations; placing; compacting and consolidating complete in place.

END OF SECTION 02278

TABLE A
ROCK QUALITY SCORING CRITERIA

	Weighting Factor			Score										
	Lime- stone	Sand- stone	Igne- ous	10	9	8	7	6	5	4	3	2	1	0
Specific Gravity	12	5	9	2.75	2.70	2.65	2.60	2.55	2.50	2.45	2.40	2.35	2.30	<2.3
Absorp- tion (%)	13	5	2	0.1	0.3	0.5	0.67	0.83	1.0	1.5	2.0	2.5	3.0	>3.0
Sodium Sulfate (%)*	4	3	11	1	3	5	6.7	8.3	10	12.5	15	20	25	>25
Abrasion (%)**	1	8	1	1	3	5	6.7	8.3	10	12.5	15	20	25	>25
Schmidt Hammer	11	13	3	70	65	60	54	47	40	32	24	16	8	<8
Splitting Tensile Strength (psi)	5	4	10	1400	1200	1000	833	666	500	400	300	200	100	<100

Note: Any rock to be used must be qualitatively rated at least "fair" in a petrographic examination conducted by a geologist experienced in petrographic analysis.

* 5 cycles

** 100 revolutions

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Erosion Protection

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SECTION 02613

CORRUGATED STEEL PIPE

PART 1 - GENERAL

1.1 DESCRIPTION

This Section describes the requirements for furnishing, installing, testing and maintaining corrugated steel pipe and special sections for new culvert pipes within the UC and NC areas, as indicated on the Subcontract Drawings and in accordance with the provisions of this Section.

1.2 APPLICABLE PUBLICATIONS

A. The publications listed below form a part of this Specification to the extent referenced. The publications are referred to in the text by the basic designation only:

1. Standard Specifications for Road and Bridge Construction, 1981 Edition, (Colorado Standard Specifications). For the purposes of this Subcontract, all references to "Engineer" shall mean "Site Manager"; all references to "Division" shall mean "Contractor"; and all references to "Contractor" shall mean "Subcontractor". The provisions for measurement and payment shall not be applicable. All references to "special provisions" shall not be applicable. Measurement and payment provisions shall be as specified in this Section.
2. Standard Plans, M&S Standards, January 1982 (Colorado Standard Plans).

1.3 SUBMITTALS

A. The Subcontractor shall submit the following in accordance with the general submittal requirements specified in Section 01300:

1. Outline drawings of corrugated steel pipe and joint details.

2. Certification from the manufacturer stating that all materials furnished comply in all respects with these Specifications.
3. Shop test reports.
4. Manufacturer's installation instructions.

1.4 DELIVERY AND STORAGE OF MATERIALS

Corrugated steel pipe, structures, and related material shall be delivered in time to ensure uninterrupted progress of the work. Materials shall be stored in a manner to preclude damage and to permit ready access for inspection and identification of each shipment. Pipe, structures and accessories shall be kept free from dirt, grease, and other foreign matter. Materials showing evidence of unrepairable damage, as determined by the Contractor, will be rejected and shall be immediately removed from the work.

PART 2 - PRODUCTS

2.1 GENERAL

- A. The materials shall conform to the applicable provisions of the following Subsections of the Colorado Standard Specifications:
 1. Structure Backfill: Subsection 206.02
 2. Corrugated Steel Pipe and Coupling Bands: Subsection 707.02
- B. Special Sections:
 1. Special sections such as elbows, wyes, tees, crosses, bends, reducers and flared inlets shall be furnished as called for on the Subcontract Drawings or as required by the Contractor.
 2. Generally special sections shall conform to the requirements specified for the pipe with which they are used and shall be connected to the pipe or to each other with connecting bands specified for use with the pipe to which they are connected.

- C. Dimensions and Thicknesses: The pipes shall be furnished as follows:

<u>Nominal Inside Diameter (inches)</u>	<u>Corrugations</u>	<u>Min. Thickness (inches)</u>
12	2-2/3" x 1/2"	0.64
18	2-2/3" x 1/2"	0.64
36	2-2/3" x 1/2"	0.64

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Existing Culverts: Damaged ends of existing 24-inch diameter corrugated steel pipe culverts shall be cut out and disposed of prior to making connections with the new extensions.
- B. The excavating, placing, joining, backfilling and repairing of the pipe shall conform to the following Subsections of the Colorado Standard Specifications.
1. Excavation: Subsection 603.03
 2. Placing: Subsection 603.05
 3. Joining: Subsection 603.06
 4. Backfilling: Subsection 603.08
 5. Repair of Damaged Pipe: Subsection 603.10
- C. Additionally, trenching and backfilling shall also conform to the details shown for flexible pipe on the Colorado Standard Plan M-604-1.

PART 4 - MEASUREMENT AND PAYMENT

4.1 MEASUREMENT

- A. Measurement for payment for furnishing and installing following corrugated steel pipe culverts will be by the linear feet of pipes furnished and installed. The length

of pipe to be paid for will be the slope length designated on the Subcontract Drawings. Pipe placed in excess of the length designated will not be paid for, unless pipes are cut to fit a structure or slope. When pipes are cut to fit a structure or slope, the quantity to be paid for will be the length of pipe necessary to be placed before cutting, measured in 2-foot increments:

1. 12-inch Inside Diameter Corrugated Steel Pipe
2. 18-inch Inside Diameter Corrugated Steel Pipe
3. 36-inch Inside Diameter Corrugated Steel Pipe

B. Separate measurement for payment will not be made for corrugated steel pipe elbows, wyes, tees, coupling bands, and other fittings and accessories.

4.2 PAYMENT

- A. Payment for furnishing and installing corrugated steel pipe culverts mentioned in Article 4.1.A above will be by their applicable unit prices per linear foot quoted therefor in the Bid Schedule.
- B. The unit prices quoted shall include full compensation for furnishing all labor, materials, tools, equipment and incidentals, and for performing all work for complete installation of pipe, complete in place, including structure excavation and structure backfill, cutting old pipe and connecting new pipe to existing pipes, testing and maintaining, complete as shown on the Subcontract Drawings, and as specified in this Specification and as required by the Contractor.

END OF SECTION 02613

SECTION 02771

MEMBRANE LINER

PART 1 - GENERAL

1.1 SCOPE

This Specification Section describes the requirements for furnishing and installing membrane liner systems for wastewater retention basins and spillways.

1.2 SYSTEM DESCRIPTION

- A. Liner system shall consist of liner, adhesives and accessories required for sterilizing ground and installing liner, vents and other appurtenances.
- B. The retention basins and spillways, where lining is required, will carry water produced from stormwater runoff, decontamination and dewatering operations, including minor amounts of sediment.
- C. The liner will be installed without a protective earthen cover and will be exposed to all natural weathering elements, such as direct sunlight, cold and hot air temperatures, snow, ice and wind.

1.3 RELATED WORK

- A. Section 01300 - Submittals
- B. Section 02200 - Earthwork

1.4 APPLICABLE PUBLICATIONS

- A. The Publications listed below form a part of this Specification to the extent referenced. The Publications are referred to in the text by the basic designation only:

- 1. American Society for Testing and Materials (ASTM):

- D792-86 Standard Test Methods for Specific Gravity (Relative Density) and Density of Plastics by Displacement

- 2. National Sanitation Foundation (NSF):

- SN54 (Revised Nov. 85)
Flexible Membrane Liners

3. Federal Standard (FS):

101C Test Methods for Puncture Resistance and
Elongation Test (Method 2065.1)

101C Test Method for Puncture Resistance (Method
2031)

1.5 QUALITY ASSURANCE

- A. Manufacturer: The manufacturer of the liner shall have manufactured in excess of 10,000,000 square feet of membrane liner. The manufacturer shall also certify in writing that the liner meets or exceeds the NSF Standard 54 physical properties as specified in this Section, and shall withstand a minimum of 5 years of outdoor weathering without cover. The certification shall also state that the liner material is formulated from 100 percent virgin raw materials.
- B. Fabricator: The liner fabricator shall have fabricated in excess of 10,000,000 square feet of liner.
- C. Installation: The Installation Supervisor shall have supervised installation of lining material in excess of 1,000,000 square feet of liner.

1.6 SUBMITTALS

- A. General submittal requirements are specified in Section 01300.
- B. The Subcontractor shall submit the following to the Contractor for review and approval 30 days before placement of the material:
 - 1. Product data.
 - 2. Samples of material and accessories.
 - 3. Certificate signed by the manufacturer that the system proposed meets the Specification.
 - 4. Installation details.
 - 5. Fabricator's or manufacturer's installation instructions.

6. Test reports.
7. Qualifications of installer and supervisor in accordance with the requirements of Article 1.5.C.
8. Certification from a recognized independent testing laboratory that the liner meets the requirements of this Specification and is suitable for its intended purpose.

1.7 SITE CONDITIONS

The site is at an approximate elevation of 5550 feet and is located near Slick Rock, Colorado. Temperatures could range from a high of 100°F to a low of -20°F. Average annual wind speed is 7 mph.

1.8 WARRANTY

- A. Liner materials and factory seams shall be warranted to be free from defects in materials and workmanship for a period of 5 years from the date of acceptance. Installation and field seams shall be warranted free of defects for a period of 5 years from the date of acceptance.
- B. Upon written notification by the Contractor, the Subcontractor shall promptly and completely repair or replace defective lining materials on site which become apparent during such 5-year period. Such repair or replacement shall be done at no cost to the Contractor. The Subcontractor shall be responsible for removal of all liquids, dirt, soil, or contaminated materials required to enable him to carry out the necessary repairs.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

The liner material shall be the product of a manufacturer successfully engaged in the business of manufacturing liner materials for the last five years.

2.2 MATERIAL

- A. The thermoplastic elastomer lining material shall be manufactured from a synthetic rubber compound and shall be high density polyethylene (HDPE) or polyethylene (PE), chlorinated polyethylene (CPE), or polyvinyl chloride (PVC), specifically compounded for use in hydraulic facilities. In addition, the lining material shall be formulated to withstand a minimum of 5 years of outdoor exposure without cover.
- B. The liner shall have a smooth uniform surface with no visible defects and shall be free of holes, blisters, gels, undispersed ingredients and any contamination or defect that may affect its serviceability. The liner shall be uniform in thickness with a maximum 10 percent deviation from the nominal thickness. The edges shall be straight and free of nicks and cuts. Inspection for pinholes shall be made prior to shipment to the field.
- C. The liner material shall be specifically compounded to conform to the physical properties set forth in the National Sanitation Foundation Standard SN54 and the standards set forth below.

Property	Test Method	Data
<u>High Density Polyethylene (HDPE) or Polyethylene (PE)*</u>		
Density	ASTM D792	0.93 gms/cc min.
Gauge (Nominal)		60 mils
Puncture Resistance	FED STD 101C Method 2065.1	175 lbs. min.
<u>Chlorinated Polyethylene (CPE)</u>		
Gauge (Nominal)		30 mils
Puncture Resistance	FED STD 101C Method 2065.1	175 lbs. min.
<u>Polyvinyl Chloride (PVC)</u>		
Gauge (Nominal)		20 mils
Puncture Resistance	FED STD 101C Method 2031	130 lbs. min.

- * The specifications for High Density Polyethylene (HDPE) and Polyethylene (PE) are listed in the National Sanitation Foundation Standard SN54 under High Density Polyethylene (HDPE).

2.3 FABRICATION

The roll goods shall be factory fabricated into optimum sized panels up to 20,000 square feet, using an approved seaming method as prescribed by the manufacturer. When the seam is tested for shear and peel, failure of the material including the seam shall not occur at the bonded surfaces.

PART 3 - EXECUTION

3.1 GENERAL

The liner systems shall be installed as shown on the Sub-contract Drawings and as recommended by the manufacturer and the fabricator.

3.2 GROUND SURFACE PREPARATION

- A. Surfaces to be lined shall be smooth and free of sharp rocks and vegetation. If the liner is not applied within 15 days of surface preparation, the surface shall be protected against growth of vegetation by the application of a suitable short-lived soil sterilant as approved by the Contractor. The soil sterilant used shall be compatible with the liner material to ensure against damaging the liner.
- B. Certification from the Installation Supervisor shall be required stating that the surface on which the liner is to be placed is acceptable. No installation of lining shall commence until this certification is furnished to the Contractor. The receiving surface shall be kept in the accepted condition until the installation of the lining is accomplished.

3.3 FIELD SEAMS

- A. PVC/CPE Liner: All field seams for PVC or CPE liner materials shall be performed using only the fabricator's approved methods, adhesives and application directions. The minimum width of overlap of field seams shall be 4 inches. The contact surfaces of the panel overlap shall be cleaned to remove all dirt, dust or other foreign materials. A nominal 6-inch overlap of liner panels shall be allowed to keep dirt out of the field seams. When bonding the seams, the temperature of the sheet and adhesive shall

be not less than 55°F. Artificial heat shall be applied if ambient conditions create lower temperatures.

B. HDPE or PE Liner:

1. Field joints shall be made with overlapping adjacent sheets and inserting a ribbon of fusion joining resin between the overlapping sheets or over the joint between them. Appropriate alternate seaming procedures as recommended by the manufacturer or fabricator such as a hot air or hot wedge method may be proposed for the Contractor's approval. The minimum width of overlap of field seams shall be 3 inches.
 - a. Joints between liner sheets shall be field welded using the fabricator's fusion joining apparatus and technique. The joining procedure shall consist of softening the liner material by heated air. Directly following the application of heat, a minimum 1-1/2 inch wide hot strip of the same HDPE or PE from which the sheet is made shall be extruded between the overlapping sheets. The overlapping sheets shall then be pressed together with a minimum pressure of 14 psi to form the fusion joint.
 - b. Penetrations through the liner for pipes, flashings, patches, and the like shall be field welded using a fusion joint gun. The joining procedure will consist of softening the liner material by heated air. Directly following the application of heat, a hot strip of the same material from which the sheet is made shall be extruded over the joint to produce the fusion joint.
 - c. Prior to fusion joining, all areas to become joint interfaces shall be cleansed of dust and dirt.
 - d. Fusion joining shall not take place unless the sheet is dry and shall not be attempted when the ambient temperature is below 45°F or above 90°F as determined by the Contractor.

3.4 INSPECTION AND TESTING

A. HDPE or PE Liner:

1. All fusion joined seams shall be visually examined and probed for voids or imperfect bonds.

2. All fusion joined seams shall be ultrasonically tested along their entire lengths with a testing device furnished by the Subcontractor. The device shall be capable of locating weld defects including internal cracks, unjointed interfaces, voids, cavities, gravel inclusions and other foreign particles above 1 mm (0.04 inches) in size. The Subcontractor shall furnish to the Contractor a copy of the ultrasonic test results coordinated with the seam pattern shown on the approved Shop Drawings.
3. All seams made for the HDPE or PE liner shall be tested using vacuum testing in addition to ultrasonic testing. Vacuum testing shall consist of placing a rectangular box (approximately 30 inches long) into the liner seam. The suction chamber shall be connected to the vacuum pump. A foaming agent shall be applied to the seam area under test to indicate possible leaks. The seam shall be maintained under 5 psig suction for a minimum of 10 seconds, and certification given to the Contractor that the seams will provide a film tearing bond. The test areas shall have a minimum of 3-inch overlap from the previous test section.
4. Defects found during the testing shall be repaired and retested. Such tests and adjustments shall be repeated until, in the opinion of the Contractor, the repairs are satisfactory and complete. All repairs shall be made by the Subcontractor at no additional expense to the Contractor.
5. The Subcontractor shall furnish to the Contractor, on a daily basis, if requested, seam samples for testing cut from that days installation. The samples may be tested to determine strength and durability. Any seams not meeting the requirements specified herein shall be repaired by the Subcontractor at no additional expense to the Contractor.
6. The Subcontractor shall repair all areas damaged by sampling immediately after the sample is taken. The repairs shall be made at no additional expense to the Contractor.

B. PVC/CPE Liner:

1. All field seams shall be air lance tested along their entire lengths using one eighth inch orifice at 50 psi.

2. Defects found during the testing shall be repaired and retested. Such tests and adjustments shall be repeated until, in the opinion of the Contractor, the repairs are complete. All repairs shall be made by the Subcontractor at no additional expense to the Contractor.
3. The Subcontractor shall furnish to the Contractor, on a daily basis, if requested, seam samples for testing cut from that days installation. The samples may be tested to determine strength and durability. Any seams not meeting the requirements specified herein shall be repaired by the Subcontractor at no additional expense to the Contractor.
4. The Subcontractor shall repair all areas damaged by sampling immediately after the sample is taken. The repairs shall be made at no additional expense to the Contractor.

3.5 GAS VENTS AND LINER HOLD-DOWNS

- A. Gas vents as recommended by the manufacturer and the fabricator and approved by the Contractor shall be installed in the liner around the perimeter of the basin. Vents shall have a minimum diameter of 4 inches, located 6 inches below the top of the dike and at a maximum spacing of 50 feet on centers.
- B. Liner hold-downs, as recommended by the manufacturer and the fabricator and approved by the Contractor, shall be installed over the liner on the embankment and excavation slopes. The holddowns shall be placed on maximum 30-foot centers or over every field seam, whichever is closer.

3.6 ANCHORING

During installation, necessary precautions shall be taken to insure the liner will not be damaged or moved by wind, rain or dust. The liner shall be installed in such a manner that the liner will be protected from damage or movement by wind, water, and dust. Venting to prevent damage to the liner shall be provided per the manufacturer's recommendations.

3.7 TEMPORARY EROSION PROTECTION-CONSTRUCTION PHASE

- A. Synthetic membrane shall be placed on the prepared wastewater retention basins subgrade including the emergency spillways, as shown on the Subcontract Drawings.

- B. The Subcontractor shall maintain and if required, repair synthetic membrane to provide protection from runoff erosion and contamination.

3.8 REMOVAL AND DISPOSAL OF MEMBRANE LINER

After the completion of the construction phase or when retention basin is no longer required, the synthetic membrane shall be removed, and disposed of as specified in Section 02050 and as required by the Contractor.

PART 4 - MEASUREMENT AND PAYMENT

4.1 MEASUREMENT

- A. Measurement for payment for furnishing and installing of membrane liner for the wastewater retention basins and spillways will be by the square yards of material installed. The quantities for payment will be calculated from the lines and dimensions shown on the Subcontract Drawings. Overlaps shall not be measured for quantity calculations. The surfaces shall be measured parallel to the liner material installed.
- B. Measurement for payment for preparation of subgrade shall be as specified in Section 02200.

4.2 PAYMENT

- A. Payment for furnishing and installing of membrane liner for the wastewater retention basins and spillways will be by the unit price per square yard quoted therefor in the Bid Schedule. The price quoted shall include full compensation for furnishing all labor, materials, tools, equipment, Installation Supervisor, incidentals and for performing all work including, but not limited to, seaming, installation of gas vents and liner hold-downs, excavating, backfilling of anchor trenches, maintaining, removal and disposal of the liner as specified.
- B. Payment for preparation of subgrade shall be as specified in Section 02200.

END OF SECTION 02771

SECTION 02832

CHAIN LINK FENCE AND GATES

PART 1 - GENERAL

1.1 SCOPE

This Specification Section describes the requirements for furnishing, installing, maintaining and removing chain link fencing including gates, posts, fittings, hardware, and concrete footings.

1.2 RELATED WORK

Section 02834 - Barbed Wire Fence

1.3 DEFINITIONS

For the purposes of this Subcontract and for payment purposes, a gate shall be defined as a single shutter or leaf. (Example: A forty-foot opening in a fence would require two gates, each 20 feet in size.)

1.4 APPLICABLE PUBLICATIONS

- A. The Publications listed below form a part of this Specification to the extent referenced. The Publications are referred to in the text by the basic designation only:

1. Chain Link Fence Manufacturers Institute:

- a. Standards for Galvanized Steel Chain Link Fence Fabric
- b. Industrial Steel Specifications for Fence Posts, Gates, and Accessories
- c. Standards for Chain Link Fence Installation

2. American Society for Testing and Materials (ASTM):

- A90-81 Test Method for Weight of Coating on Zinc-Coated (Galvanized) Iron or Steel Articles

A120-84	Specification for Pipe, Steel, Black and Hot-Dipped Zinc-Coated (Galvanized) Welded and Seamless, for Ordinary Uses
A123-84	Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products
A153-82	Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware
A239-73	Test Method for Locating the Thinnest Spot in a Zinc (Galvanized) Coating on Iron or Steel Articles by the Preece Test (Copper Sulfate Dip) (R1983)
A370-87	Standard Test Methods and Definitions for Mechanical Testing of Steel Products
A392-84	Specification for Zinc-Coated Steel Chain-Link Fence Fabric
C33-86	Specification for Concrete Aggregates
C94-86	Specification for Ready-Mixed Concrete
C150-86	Standard Specification for Portland Cement
F552-83	Definitions of Terms Relating to Chain Link Fencing

PART 2 - PRODUCTS

2.1 MATERIALS

- A. General: Fencing shall include fabric, framework, concrete footings, gates, closure at grade depressions, hardware, and all appurtenances and accessories as required for a complete installation. All members, except fittings, shall be steel, hot-dip galvanized after fabrication. Fittings shall be malleable iron, wrought iron, or pressed steel, hot-dip galvanized after fabrication. Fence fabric and tension wire shall be zinc-coated as specified. Heights of fences shall be as shown on the Sub-contract Drawings. Tolerance for fabric height is ± 1 inch.

B. Fence Fabric: No. 9 gage, chain-link steel wire helically woven into 2-inch diamond mesh, hot-dip galvanized, conforming to ASTM A392. Fabric shall be twisted and barbed on the top selvage and knuckled on the bottom selvage. Loops of knuckled selvage shall be closed or nearly closed with a space not exceeding the diameter of the wire. The twisted wire shall be twisted in a closed helix of 1-1/2 machine turns equivalent to three full twists, and cut at an angle to provide sharp barbs. The wire ends beyond the twist shall be at least 1/4-inch long. Steel wire for the fabric, when drawn to the wire gage specified, shall have a minimum tensile strength of 75,000 pounds per square inch when tested in accordance with ASTM A370. Coating of fabric shall be Class II, 2.0 ounces of hot-dip zinc galvanizing per square foot of uncoated wire surface. The Standard length of fabric roll shall be 50 linear feet \pm 1 percent. Each roll shall be a one-piece length. Tolerance for fabric heights shall be plus or minus 1 inch.

C. Posts:

1. Post shall be Schedule 40 galvanized pipe. Use shall be in accordance with the following table except as noted on the Subcontract Drawings. All pipe shall conform to ASTM A120 for weight and galvanized coating. Line post shall be spaced at no more than 10-foot centers.

<u>Post Type and Shape</u>	<u>Nominal Pipe Size, Inches</u>
2. End, Corner and Pull Posts: Round	2.5
3. Intermediate or Line Posts: Round	2.0
4. Gate Posts: Single Leaf Gate Opening Width:	
6 Feet and Less: Round	2.5
6 to 13 Feet: Round	3.5
13 to 18 Feet: Round	6.0
Over 18 Feet: Round	8.0

- D. Post-Bracing Assembly: Horizontal braces shall be 1-1/4 inch Schedule 40 steel pipe, conforming to ASTM A120. Diagonal truss type braces shall be 3/8-inch diameter galvanized steel rods with turnbuckle adjustment. Couplings, fittings, and attachment accessories shall be included as required. Horizontal braces (intermediate rails) shall be provided at all corners, terminals, pulls, and at gate posts.
- E. Wire Ties and Clips: Wire ties or clips shall be provided for attaching fabric to line posts, top rail, or tension wire. Wire ties and clips shall be at intervals not greater than 15 inches when attaching fabric to line posts, and the space interval shall not exceed 24 inches when attaching fabric to top rails or tension wire. Wire ties and clips shall be not less than the fabric wire gage size and of the same material and coatings. The minimum weight for zinc coated wire ties and clips is 0.8 ounces of zinc per foot of coated surface area.
- F. Tension Wire, Zinc-Coated Steel: Tension wire for top and bottom edge support of fence fabric shall be No. 7 gage marcelled or crimped coil spring hard tempered carbon steel wire with minimum tensile strength of 70,000 psi, and zinc coating of not less than 1.20 ounce per square foot of coated area.
- G. Post Caps: Post caps shall be standard malleable iron, wrought iron, or pressed steel, galvanized, designed as a weathertight closure cap for tubular posts.
- H. Stretcher Bars: Stretcher bars shall be one-piece lengths equal to full height of fabric with a minimum crosssection of 3/16 inch by 3/4 inch. Provide one stretcher bar for each gate and end post, and 2 for each corner and pull post.
- I. Stetcher Bar Bands: Bands shall be heavy pressed steel, or malleable iron, spaced not over 15 inches on center to secure stretcher bars to end, corner, pull, and gate posts.
- J. Gates:
1. Gates shall be of chain link fabric, single- or double-leaf swing type as shown on the Subcontract Drawings and furnished complete with all hardware and accessories as required. For this Subcontract, the size of the gate shall be measured in terms of the horizontal clear distance between the gate posts.

2. Gate Frames: Frames shall be round pipe to match posts in accordance with the following table:

<u>Gate Size</u>	<u>Nominal Pipe Size</u>
Leaf Width 8 Feet or Less: Round	1-1/4 Inch Schedule 40
Leaf Width Over 8 Feet: Round	1-1/2 Inch Schedule 40

3. Fabrication of Gates: Assemble gate frames by welding or with fittings and rivets for rigid connections. When fittings are used as the construction method for gate frames, the frames shall be fitted with 5/16-inch minimum diameter truss rods. The frames shall be zinc-coated after fabrication. When frames are not zinc-coated after fabrication the welds shall be coated with a zinc rich paint. Use same fabric as for fence. Install fabric with stretcher bars at vertical edges, and tie wires at top and bottom edges. Attach stretcher bars to gate frame at not more than 15 inches on center. Attach hardware with rivets or by other means which will provide security against removal or breakage. Provide additional horizontal and vertical members to ensure proper gate operation and for attachment of fabric, hardware, and accessories. Provide diagonal crossbracing consisting of 3/4-inch diameter adjustable length truss rods on gates where necessary to provide frame rigidity without sag or twist. All gates shall be constructed so that they may be operated by one person.
4. Gate Hardware: Provide the following hardware and accessories for each gate:
- a. Gate Hinges: Gate hinges shall be of adequate strength for the gate, and shall have large bearing surfaces for clamping or bolting in position. Hinge action shall be such that gates may be easily opened and closed by one person. Hinges shall provide for full 180° swing of gate leaf.
 - b. Latch: Forked type or plunger-bar type to permit operation from either side of gate. Provide padlock eye as integral part of latch. Locking

devices shall be constructed so that the center drop rod or plunger bar cannot be raised when locked.

- c. Keeper: Provide keeper, which automatically engages the gate leaf and holds it in the open position until it is manually released, for each gate leaf.
- d. Double Gates: Provide gate stops for double gates, consisting of mushroom type or flush plate with anchors. Set in concrete to engage the center drop rod or plunger bar. Provide locking device and padlock eyes as an integral part of the latch, requiring one padlock for locking both gate leaves.

K. Accessories: Furnish all miscellaneous materials and accessories, ties, clips, anchors and fastenings as required for a complete installation. Unless otherwise specified, all ferrous items shall be hot dip zinc-coated with an average weight of not less than 1.2 ounces of zinc per square foot of coated surface area.

L. Galvanizing:

- 1. Fence and gate framework, hardware and appurtenances shall be hot dip galvanized per ASTM A120, A123, or A153 as applicable.
- 2. Galvanizing of wire fabric shall be after weaving in accordance with ASTM A392, immersions when tested in accordance with ASTM A239.

2.2 FABRICATION

Chain link fencing shall be fabricated and pre-assembled by the manufacturer in the factory or shop as far as practicable.

2.3 CONCRETE

Concrete: ASTM C94; 2500 psi at 28 days; normal Portland cement conforming to ASTM C150; 3-inch slump; maximum 1-inch size aggregates conforming to ASTM C33; and clean water.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Installation of fencing shall be in accordance with the Subcontract Drawings, shop drawings, and the manufacturer's detailed installation drawings, instructions, and recommendations. All posts shall be plumb and rigid after installation. Chain-link fabric shall be smooth and uniformly stretched tight and straight. Tension wires shall be pulled taut.
- B. Chain-link fabric shall be extended to provide approximately 4 inches clearance to the surfaces of grade depressions, drainage swales or ditches. The extended fabric shall be the same piece of the fencing material or a piece of fabric securely attached or welded to adjacent fabric of the fencing. A stretcher bar shall be provided through the vertical height of the fence at the lowest point in the depression to stiffen the extended fabric. The stretcher bars shall be threaded through and attached to the fabric by wire ties. At drainage ditches or swales, no line posts shall be installed within 5 feet of the centerline of the drainage ditches or swales. Adjacent line posts shall be spaced evenly from the centerline of the ditch or swale.
- C. Gates shall be installed plumb, level, and secure for full opening without interference. Install ground-set items in concrete for anchorage as recommended by the fence manufacturer. Adjust hardware for smooth operation and lubricate. Gates shall operate smoothly and easily to minimize noise.
- D. All posts shall be embedded into concrete except intermediate or line posts, which may be mechanically driven 3'6" into the ground, as shown on the Subcontract Drawings.
- E. Dimensions of drill holes for post footings and concrete embedment of the posts shall be as shown on the Subcontract Drawings.
- F. Line posts shall be spaced at no more than 10-foot centers.
- G. Corner posts shall be installed at all changes in direction where the deflection angle exceeds 30 degrees.

3.2 CONCRETE PLACEMENT

Concrete shall be placed around posts in a continuous pour. Each post shall be checked for vertical and top alignment, and shall be held in position during placement and finishing operations.

3.3 MAINTENANCE AND REMOVAL

The fence and gates constructed under the Subcontract shall be maintained during the term of the Subcontract and later removed and disposed of as Subcontractor's property when no longer required.

PART 4 - MEASUREMENT AND PAYMENT

4.1 MEASUREMENT

- A. Measurement for payment for furnishing and installing chain link fence will be by the linear feet of fence installed as shown on the Subcontract Drawings and as accepted by the Contractor. Measurements will be made along the top of the fence to the nearest foot. Gates will be measured separately for payment.
- B. Measurement for payment for furnishing and installing gates will be by the number of gates furnished and installed:
 - 1. Vehicular Gates, Eight Numbers, Size: 15-foot.
 - 2. Vehicular Gates, Two Numbers, Size: 20-foot.

4.2 PAYMENT

- A. Payment for furnishing and installing chain link fence will be by the unit price per linear foot quoted therefor in the Bid Schedule. Payment shall include full compensation for furnishing all labor, tools, equipment, and incidentals, and for performing all work involved in constructing, maintaining, removal and disposal of fences, including any clearing, stripping, tree removal, excavation, concrete or cement, complete in place, as shown on the Drawings and as accepted by the Contractor.

- B. Payment for furnishing and installing gates will be by their applicable unit prices per each type and size quoted therefor in the Bid Schedule. Prices quoted shall include full compensation for furnishing all labor, materials, equipment, hardware and incidentals and for performing all work of installing, maintaining, removal and disposal as specified in this Section.

END OF SECTION 02832

SECTION 02834

BARBED WIRE FENCE

PART 1 - GENERAL

1.1 SCOPE

This Specification Section describes the requirements for furnishing, installing, maintaining and removing barbed wire fence as shown on the Subcontract Drawings and as specified in this Section.

1.2 APPLICABLE PUBLICATIONS

- A. The Publications listed below form a part of this Specification to the extent referenced. The Publications are referred to in the text by the basic designation only:

1. American Society for Testing and Materials (ASTM):

A121-86	Standard Specification for Zinc-Coated (Galvanized) Steel Barbed Wire
C33-86	Specification for Concrete Aggregates
C94-86	Standard Specification for Ready-Mixed Concrete (Rev. B)
C150-86	Standard Specification for Portland Cement

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Fencing shall include posts, barbed wire, and all appurtenances and accessories required for complete installation.
- B. Barbed wire shall conform to the requirements of ASTM A121, and shall consist of four lines of double stranded 12-1/2-gage galvanized wire with either 2-point or 4-point barbs spaced at 18-, 6-, and 12-inch intervals. Galvanizing shall be Class 1.

- C. All fence wire ties, clips, clamps, staples, and other wire appurtenances shall be galvanized in accordance with ASTM A116, Class 1.
- D. Line post shall be tee, channel or U-bar shape, 1.33 lbs. per foot.
- E. Braces shall be 1-1/4-inch Schedule 40 steel pipe, or steel angle section, 2 x 2 x 3/16 inches.
- F. End, corner and pull posts shall be 2-inch Schedule 40 steel pipe, or steel angle section 2-1/2 x 2-1/2 x 1/4 inches.
- G. Hardware for connecting members shall conform to commercial standards.

2.2 CONCRETE

Concrete: ASTM C94; 2500 psi at 28 days; normal Portland cement conforming to ASTM C150; 3-inch slump; maximum 1-inch size aggregates conforming to ASTM C33; and clean water.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. General: Wire fence shall be constructed in accordance with the details shown on the Subcontract Drawings unless otherwise directed by the Contractor.
- B. Line posts shall be set plumb and to the depth and spacing shown on the Subcontract Drawings.
- C. Fence wire shall be stretched by mechanical stretcher or other device designed for such use. The length between pull posts shall not exceed 660 feet for barbed wire.

3.2 CONCRETE PLACEMENT

Concrete shall be placed around posts in a continuous pour. Each post shall be checked for vertical and top alignment, and shall be held in position during placement and finishing operations.

3.3 MAINTENANCE AND REMOVAL

The fence constructed under the Subcontract shall be maintained during the term of the Subcontract and later removed and disposed of as Subcontractor's property when no longer required.

PART 4 - MEASUREMENT AND PAYMENT

4.1 MEASUREMENT

Measurement for payment for barbed wire fence will be by the linear feet of fence installed and removed as shown on the Subcontract Drawings and as accepted by the Contractor. Measurements will be made along the top of the fence to the nearest foot.

4.2 PAYMENT

Payment for barbed wire fence will be by the unit price per linear foot quoted therefor in the Bid Schedule. Payment shall include full compensation for furnishing all labor, tools, equipment, and incidentals, and for performing all work involved in constructing, maintaining, and removing and disposal of fences, including any clearing, stripping, tree removal, excavation, concrete work, complete, as shown on the Subcontract Drawings and as accepted by the Contractor.

END OF SECTION 02834

SECTION 02935

SEEDING

PART 1 - GENERAL

1.1 SCOPE

This Specification Section covers seeding for final site grading at UC, NC, final stockpile area, and borrow areas as indicated on the Subcontract Drawings.

1.2 MATERIAL STORAGE

- A. Seeds shall be stored in sealed waterproof containers in a cool, dry location and shall be kept out of direct sunlight until ready for use.
- B. Fertilizer, if required, shall be delivered and stored in waterproof containers which will show the chemical analysis and name of manufacturer.

PART 2 - MATERIALS

2.1 SEED MIX

- A. The following seed mix shall be used for seeding of final grades except as specified in Paragraph B.2 below:

<u>Seed Species</u>	<u>Seeding Rate Pure Live Seed (Pounds Per Acre)</u>
Shadscale	1.00
Rincon Fourwing Saltbush	1.00
Castle Valley Clover Saltbush	1.00
Alkali Sacaton	0.25
Sand Dropseed	0.10
Paloma Indian Ricegrass	<u>3.00</u>
Total	6.35

- B. The seeding rates shown are for drill applied. These rates shall be increased by 100 percent if broadcasting method of application is used. Hydroseeding shall not be used.

2.2 ACCEPTANCE OF SEED

Final acceptance of seed will be made by the Contractor based on the following: Seed shall be furnished separately or in mixture in standard sealed containers with the following information provided by the seed vendor on each seed container label: (1) seed name; (2) lot number; (3) net weight; (4) percentages of purity and of germination; (5) seed coverage, in acres, on a pure live seed basis; and (6) percentage of maximum weed seed content clearly marked for each kind of seed. Seeds shall be packaged by the vendor in even acre coverage containers. The Subcontractor shall furnish the Contractor duplicate copies of a statement by the vendor, certifying that each lot of seed has been tested by a recognized laboratory for seed testing within 6 months of date of delivery. This statement shall include: (1) name and address of laboratory, (2) date of test, (3) lot number for each kind of seed, and (4) results of tests as to name, percentages of purity and of germination, and percentage of weed content, for each kind of seed furnished, and, in case of a mixture, the proportions of each kind of seed.

2.3 FERTILIZER

Fertilizer shall be a standard commercial grade and provide the minimum percentage of available nutrients specified. Fertilizer shall be furnished in new, clean, and sealed containers with the name, weight, and guaranteed analysis of contents clearly marked. A liquid form of fertilizer containing the minimum percentage of available nutrients may be used.

2.4 MULCH

Mulch shall consist of cereal straw. Cereal straw shall be from grain crops that are free from all viable seed, mold, or other objectionable material. Mulch shall be in an air-dry condition and suitable for placing with mulch blower equipment. Final acceptance of mulch will be by the Contractor.

2.5 WATER

Water used in the planting or care of vegetation shall be free of oils, acids, alkalies, salts, or any substance injurious to plant life.

PART 3 - EXECUTION

3.1 PREPARATION

A. Timing:

1. Seeding: All final grades not covered by gravel or riprap shall be seeded as soon as practical after their completion or as directed by the Contractor. Seeding materials shall not be applied during windy weather, when the ground is excessively wet or frozen, or when snow is present.

- B. Grading and Seedbed Preparation: Before applying seed in a given area, any stockpiled topsoil and select fill shall be put in place and the area shall be graded as shown on the Drawings, with surfaces sloping gradually towards drainage courses, with no enclosed low spots where water can accumulate. Areas to be seeded that have been damaged by erosion or other causes shall be restored prior to seeding and then cultivated to provide a reasonably firm but friable seedbed. A minimum of 6 inches of surface soil shall be in a loose condition at the time of fertilizer and seed application.

- C. Enrichment: Drainage ditches and final grades shall be enriched by applying fertilizer to the surface of prepared soil prior to the application of the seed and mulch. Nitrogen fertilizer shall be applied at the rate of 60 pounds per acre, unless Subcontractor can demonstrate to the Contractor that a different fertilizer mix or a lesser rate of application is justified on the basis of laboratory testing of the soil to be seeded.

3.2 APPLICATION

- A. Seed shall be applied by a rangeland drill to a depth of 0.5 to 0.75 inch. To the greatest extent possible, seeding shall be oriented along (parallel to) land contours. For slopes too steep to use a drill, a mechanical broadcaster may be used and the seed raked in.

- B. Immediately following seeding and enrichment, mulch shall be applied at a rate of 2 tons per acre to all areas seeded, and the mulch shall be crimped with a mulch crimper.

3.3 CARE DURING CONSTRUCTION

The Subcontractor shall be responsible for protecting and caring for areas seeded before final acceptance of the work. The Subcontractor shall repair any damage to seeded areas caused by erosion or construction operations without additional compensation.

3.4 PLANT ESTABLISHMENT

The Subcontractor shall be responsible for watering and caring for seeded areas, as required, until adequate vegetative cover is established. Reseeding, if required, will be at no additional cost to the Contractor.

PART 4 - MEASUREMENT AND PAYMENT

4.1 MEASUREMENT

- A. Measurement for payment for seeding will be by the acres of surfaces actually seeded and approved.
- B. Separate measurement for payment will not be made for any incidental products, work and services; e.g., loosening the surface, applying fertilizer, mulching, watering, and erosion repair related to seeding.

4.2 PAYMENT

Payment for seeding will be by the unit price per acre quoted therefor in the Bid Schedule. The price quoted shall include full compensation for furnishing all materials, tools, equipment, incidentals, labor, and for performing all work specified herein for complete work.

END OF SECTION 02935

Subcontract Drawings

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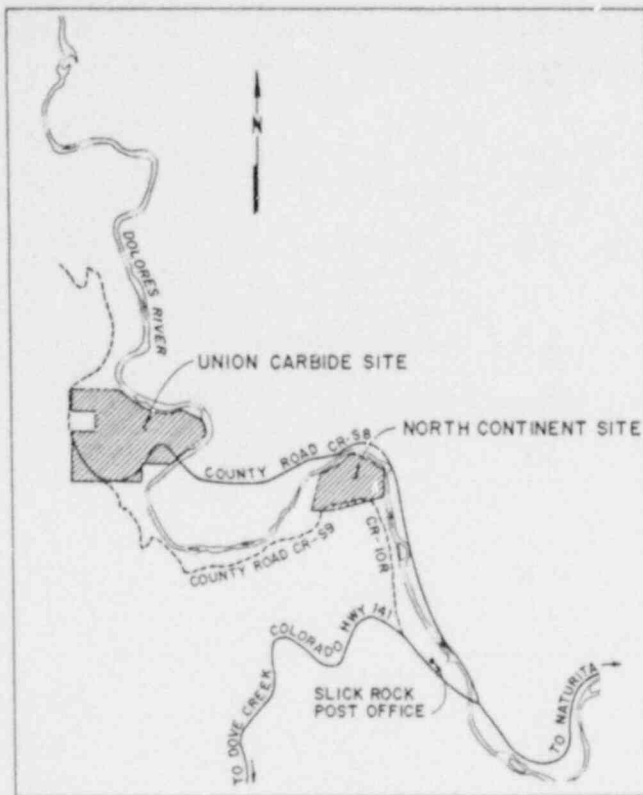
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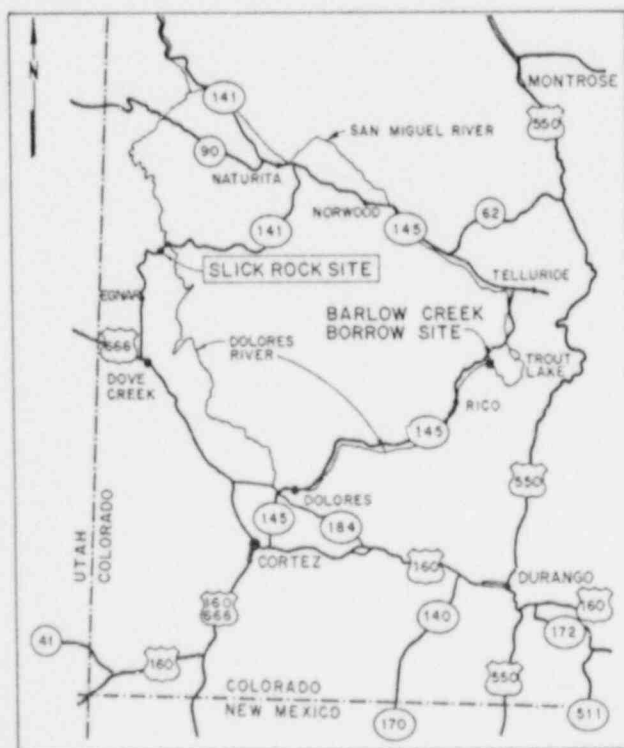
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LOCATION MAP



VICINITY MAP



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NORTH CONTINENT PROCESSING SITE	

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LIST OF DRAWINGS

RAWING NO.	DRAWING TITLE
SRK-GE-10-0201	TITLE SHEET
SRK-GE-10-0202	LOCATION MAP, VICINITY MAP, AND LIST OF DRAWINGS
SRK-GE-10-0203	FENCE AND GATE DETAILS
SRK-GE-10-0204	BORROW AREAS
SRK-GE-10-0205	HAUL ROAD BETWEEN NORTH CONTINENT AND UNION CARBIDE MILL AREAS
SRK-PS-10-0206	SITE PLAN AND CONSTRUCTION FACILITIES
SRK-PS-10-0207	TEMPORARY SITE DRAINAGE PLAN
SRK-PS-10-0208	TEMPORARY DRAINAGE DITCHES - SECTIONS AND DETAILS
SRK-PS-10-0209	ACCESS CONTROL AREA
SRK-PS-10-0210	WASTEWATER RETENTION BASIN - SECTIONS AND DETAILS
SRK-PS-10-0211	CONTAMINATED MATERIAL EXCAVATION PLAN
SRK-PS-10-0212	TAILINGS EMBANKMENT EXCAVATION PLAN
SRK-PS-10-0213	TAILINGS EMBANKMENT PLAN
SRK-PS-10-0214	TAILINGS EMBANKMENT - SECTIONS AND DETAILS (SHEET 1 OF 3)
SRK-PS-10-0215	TAILINGS EMBANKMENT - SECTIONS AND DETAILS (SHEET 2 OF 3)
SRK-PS-10-0216	TAILINGS EMBANKMENT - SECTIONS AND DETAILS (SHEET 3 OF 3)
SRK-PS-10-0217	FINAL SITE GRADING PLAN (SHEET 1 OF 2)
SRK-PS-10-0218	FINAL SITE GRADING PLAN (SHEET 2 OF 2)
SRK-PS-10-0219	BORINGS AND TEST PITS LOCATION PLAN
SRK-PS-10-0220	EXISTING UTILITIES AND DEMOLITION PLAN
SRK-PS-10-0221	RELOCATION PLAN
SRK-PS-10-0222	COUNTY ROAD CR-22 TEMPORARY DETOUR PLAN
SRK-PS-10-0223	COUNTY ROAD CR-22 TEMPORARY DETOUR PROFILE, SECTIONS AND DETAILS
SRK-PS-10-0224	SITE PLAN AND TEMPORARY SITE DRAINAGE PLAN
SRK-PS-10-0225	WASTEWATER RETENTION BASIN - SECTIONS AND DETAILS
SRK-PS-10-0226	TEMPORARY DRAINAGE DITCHES - PROFILES AND SECTIONS (SHEET 1 OF 2)
SRK-PS-10-0227	TEMPORARY DRAINAGE DITCHES - PROFILES AND SECTIONS (SHEET 2 OF 2)
SRK-PS-10-0228	CONTAMINATED MATERIAL EXCAVATION PLAN
SRK-PS-10-0229	FINAL SITE GRADING PLAN
SRK-PS-10-0230	BORINGS AND TEST PITS LOCATION PLAN
SRK-PS-10-0231	EXISTING UTILITIES AND DEMOLITION PLAN

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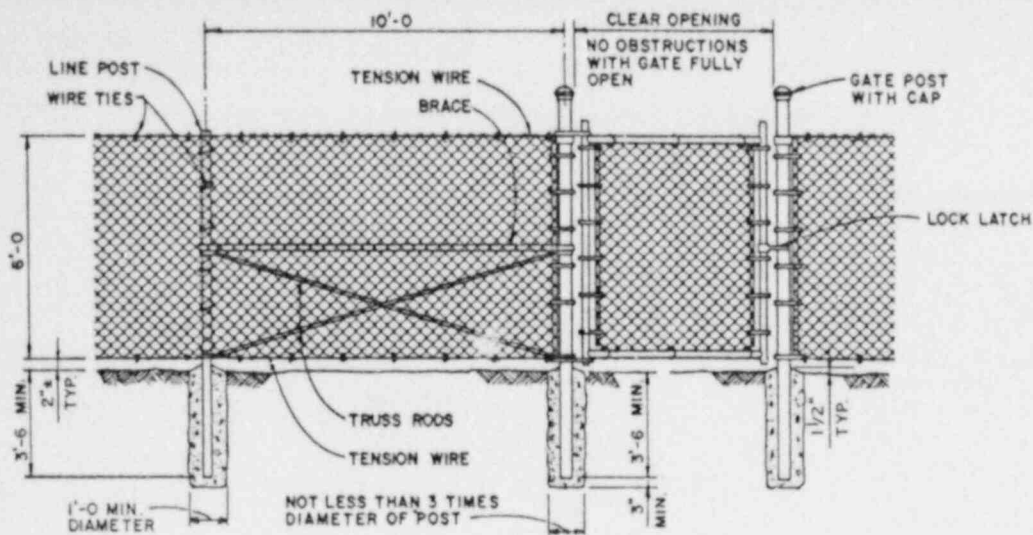
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PRELIMINARY REVIEW	
CHIEF ENGINEER <i>J. Jordan</i>	QA MANAGER <i>J. Jordan</i>

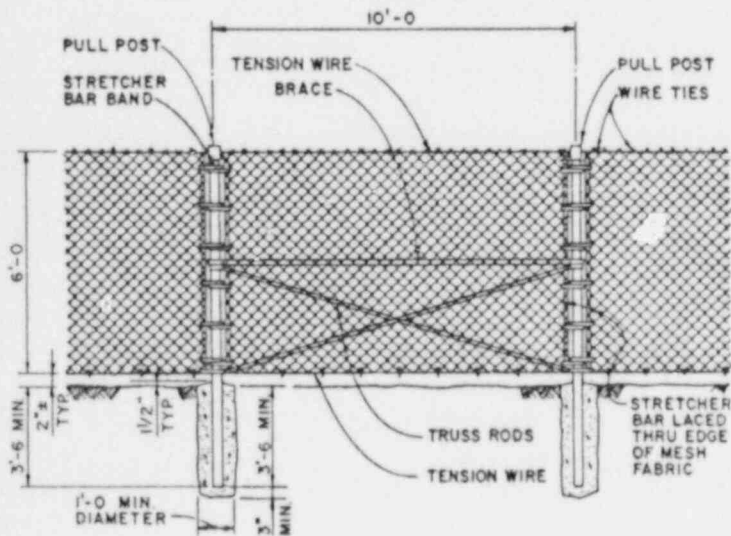
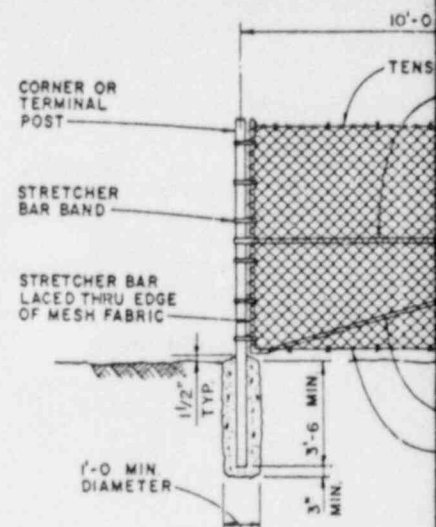
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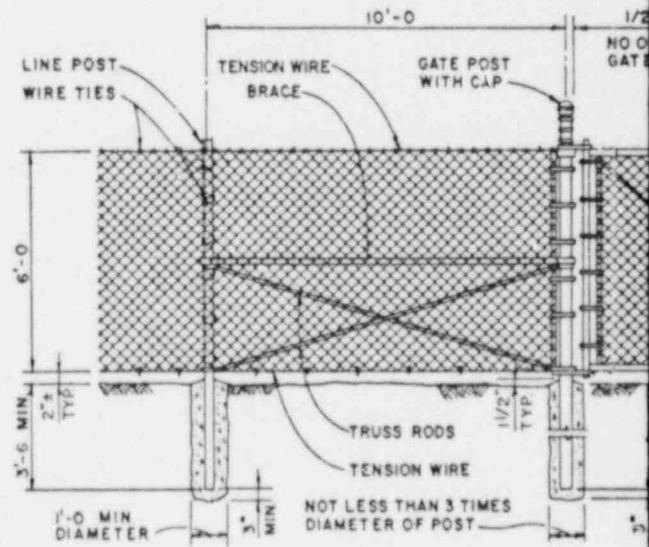
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TYPICAL SINGLE SWING GATE DETAIL
NOT TO SCALE

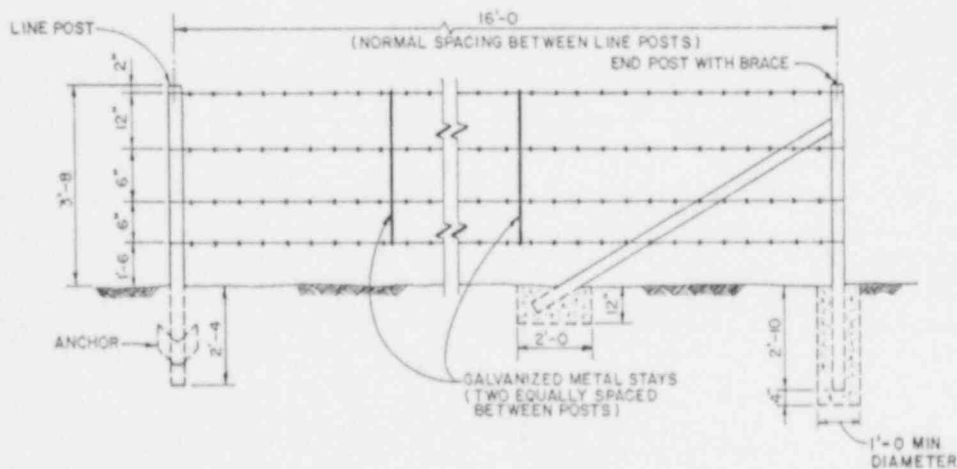


TYPICAL PULL POST ASSEMBLY
NOT TO SCALE



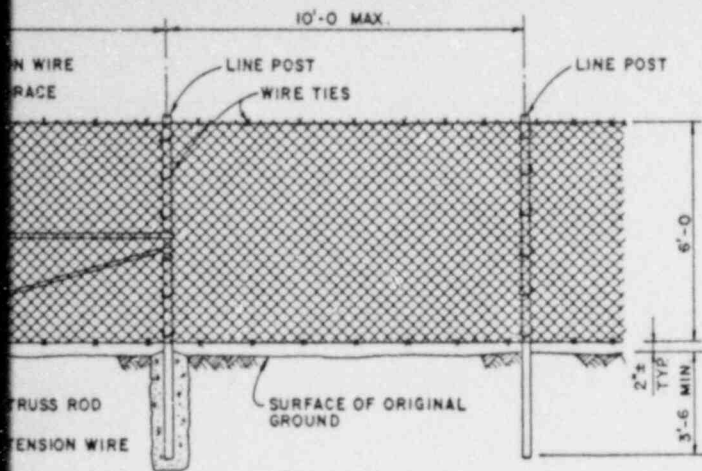
TYPICAL DOUBLE SWING GATE
NOT TO SCALE

CHAIN LINK FENCE



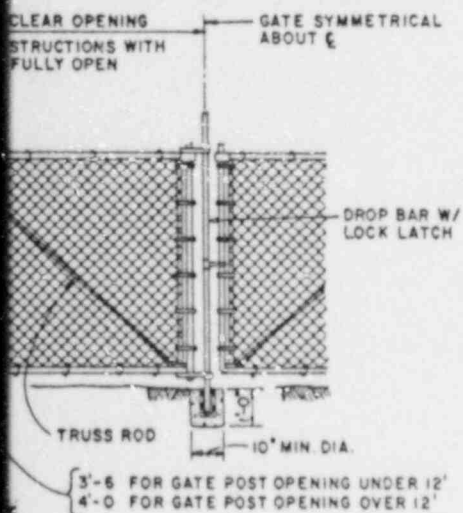
BARBED WIRE FENCE WITH METAL POSTS
NOT TO SCALE

PR
ESD MANA
10/10
GA
NO
DAY



TYPICAL CORNER AND TERMINAL DETAIL

NOT TO SCALE



ASSEMBLY

NOTES:

1. MINOR ADJUSTMENTS TO DETAILS SHOWN WILL BE ACCEPTABLE IN ORDER TO CONFORM TO LOCAL STANDARD PRACTICE.
2. ALL GATES SHALL BE CHAIN-LINK TYPE.

REFERENCE DRAWINGS:

- SRK-GE-10-0205, HAUL ROAD BETWEEN NORTH CONTINENT AND UNION CARBIDE MILL AREAS
- SRK-PS-10-0206, SITE PLAN AND CONSTRUCTION FACILITIES
- SRK-PS-10-0224, SITE PLAN AND TEMPORARY SITE DRAINAGE PLAN

TI
APERTURE
CARD

Also Available On
Aperture Card

8804110022-03

PRELIMINARY REVIEW

BY	CHIEF ENGINEER	QA MANAGER
	<i>[Signature]</i>	<i>[Signature]</i>

ISSUED FOR PRELIMINARY REVIEW	REVISIONS	BY	CR	E B D	CHIEF	TAC	DOE

U. S. DEPARTMENT OF ENERGY
ALBUQUERQUE, NEW MEXICO

SLICK ROCK SITE
SLICK ROCK, COLORADO

FENCE AND GATE DETAILS

DESIGNED	DRAT
<i>[Signature]</i>	RBC
CHECKED	
<i>[Signature]</i>	
INSPECTED	
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APPROVED	
<i>[Signature]</i>	

DATE		DOE PROJECT ENGINEER	DATE
PROJECT NO.		DE-AC04-83AL18796	
DRAWING NO.		SRK-GE-10-0203	
REV		A	

MORRISON-KNUDSEN ENGINEERS, INC.
A MORRISON-KNUDSEN COMPANY
UMTRA PROJECT
300 HENRIE ST. SAN FRANCISCO, CA 94104

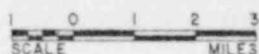
DOLPHES RIVER BORROW SITE

U.S. CARBIDE SITE

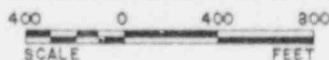
NORTH MONTINE SITE

DISAPPOINTMENT VALLEY BORROW SITE

DOLORES RIVER AND DISAPPOINTMENT
VALLEY BORROW AREA LOCATION PLAN



DOLORES RIVER BORROW SITE



GRAVEL
COUNTY
ROAD






SECTION 35. T44N, R18W, N.M.P.M.

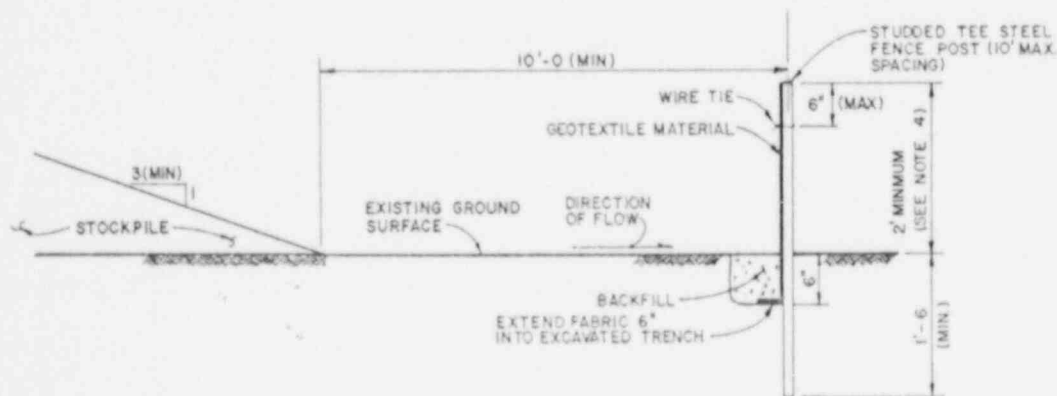
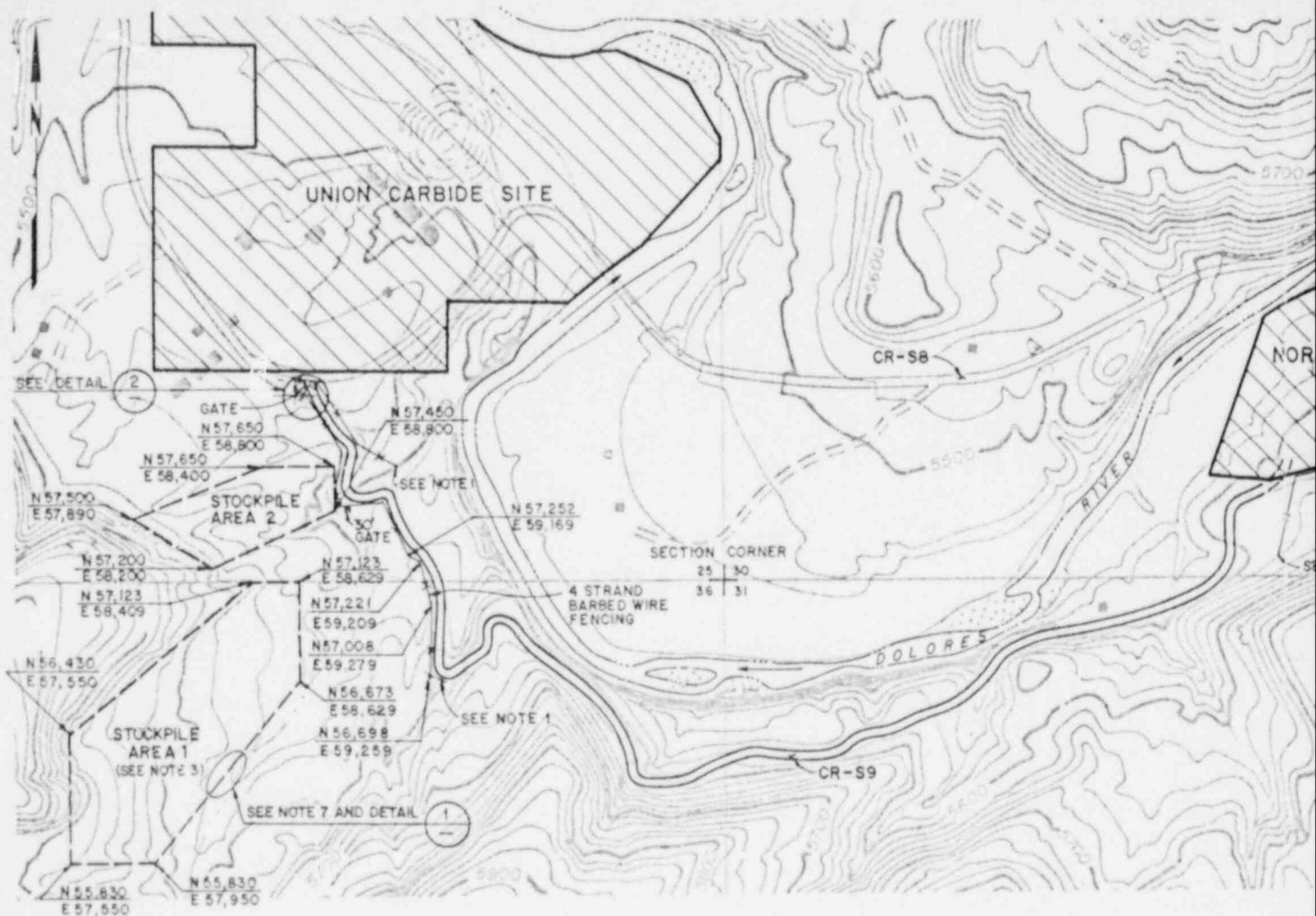
SECTION LINE

TO SLICK RO

PR

EBD MANA

		
		
		
		
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GA MK-F	NC	DA



TYPICAL SILT FENCE DETAIL
NOT TO SCALE

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ROAD INT
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PORTABLE
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E & D MANA		
J.R. J.		
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REVISED

BY	CK	LEO	CHIEF	TAC	DO
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PROJECT NO.	DE - AC04 - 83AL18796
DRAWING NO.	SRK - GE - 10 - 0205

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TI APERTURE CARD

Also Available On
Aperture Card

NOTES:

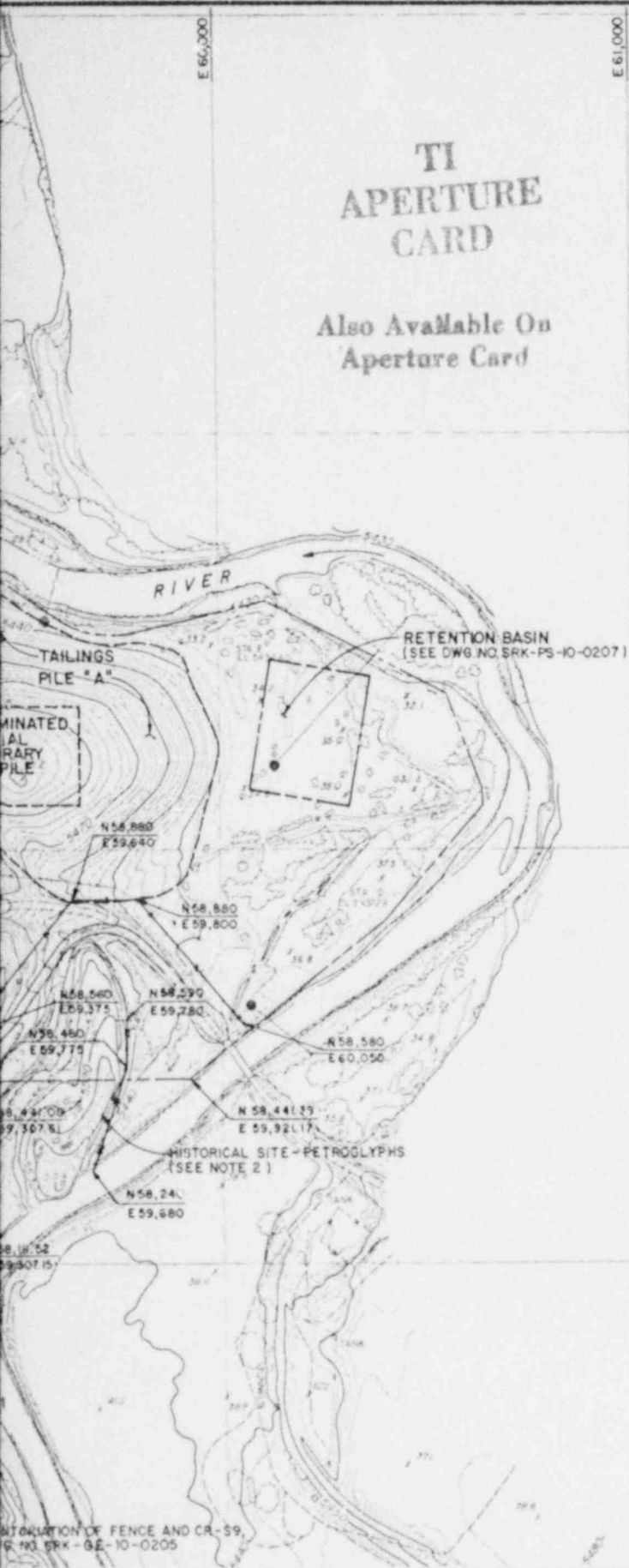
1. THE FENCE SHALL BE TIED INTO THE ROCK FACE TO MAKE THE ROAD INACCESSIBLE.
2. THE PETROGLYPH SITE LOCATED ON THE CLIFF FACE WEST OF THE COUNTY ROAD BRIDGE IS DESCRIBED IN UMTRA ARCHEOLOGICAL REPORT NO. 14, INFORMATION TO BIDDERS. A CHAIN LINK FENCE APPROXIMATELY 370 FEET IN LENGTH SHALL BE ERRECTED TO PROTECT THE PETROGLYPH SITE ON THE CLIFF FACE. FINAL LOCATION SHALL BE DETERMINED IN THE FIELD.
3. SITE BOUNDARY SHOWN IS FOR PROJECT DESCRIPTION PURPOSES ONLY, ACTUAL CONSTRUCTION SHALL BE WITHIN PERMITTED AREAS.
4. SITE BOUNDARY AND COORDINATES ARE FROM THE SURVEY CONDUCTED BY M.H. SMITH, R.L.S. 10738, ESTABLISHING HORIZONTAL AND VERTICAL CONTROL FOR THE SLICK ROCK SITES,

REFERENCE DRAWINGS:

- | | |
|-----------------|--|
| SRK-GE-10-0203, | FENCE AND GATE DETAILS |
| SRK-GE-10-0205, | HALL ROAD BETWEEN NORTH CONTINENT AND UNION CARBIDE MIL., AREAS |
| SRK-PS-10-0207, | TEMPORARY SITE DRAINAGE PLAN |
| SRK-PS-10-0209, | ACCESS CONTROL AREA |
| SRK-PS-10-0210, | WASTEWATER RETENTION BASIN SECTIONS AND DETAILS |
| SRK-PS-10-0212, | TAILINGS EMBANKMENT EXCAVATION PLAN |
| SRK-PS-10-0221, | RELOCATION PLAN |
| SRK-PS-10-0222, | COUNTY ROAD CR-S8 TEMPORARY DETOUR PLAN |
| SRK-PS-10-0223, | COUNTY ROAD CR-S8 TEMPORARY DETOUR PROFILE, SECTIONS AND DETAILS |

LEGEND:

- | | |
|-----|---|
| --- | SITE BOUNDARY |
| —+— | BARBED WIRE FENCE (TEMPORARY) |
| —•— | CHAIN LINK FENCE (TEMPORARY) |
| ⊙ | BRASS SURVEY CAP SET IN CONCRETE (EXISTING) |



8804110022-06



U. S. DEPARTMENT OF ENERGY
ALBUQUERQUE, NEW MEXICO

DESIGNED
MLW
CHECKED
KLO
INSPECTED
RAC
RECOMMENDED
J.P. Schina
APPROVED

SLICK ROCK SITE
SLICK ROCK, COLORADO
UNION CARBIDE PROCESSING SITE

SITE PLAN AND CONSTRUCTION FACILITIES

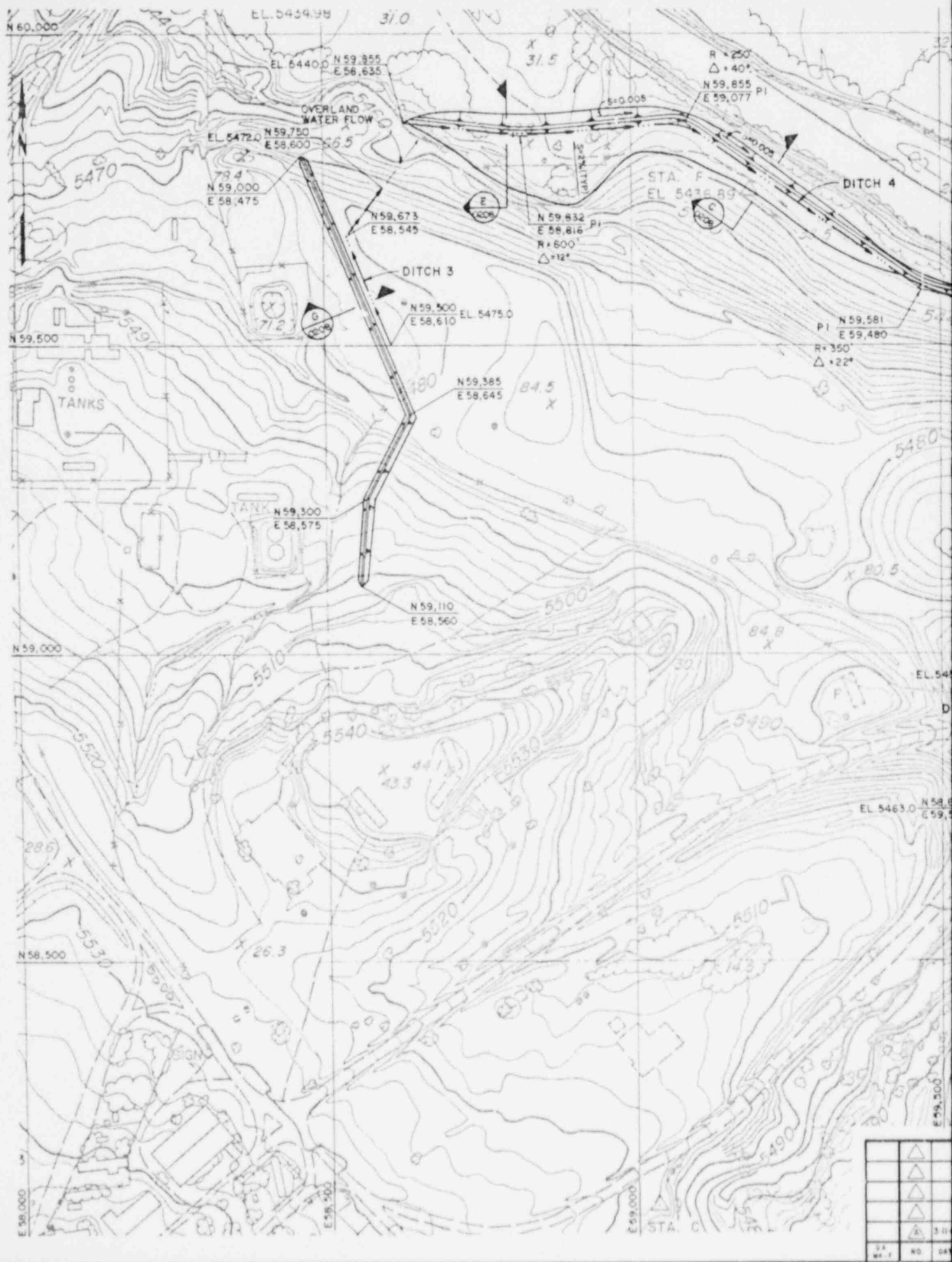
MORRISON-KNUDSEN ENGINEERS, INC.
UMTRA PROJECT
180 HOWARD ST. SAN FRANCISCO, CA 94105

PROJECT NO.
DE-AC04-83AL18796
DRAWING NO.
SRK-PS-10-0206
REV
A

ISSUED FOR PRELIMINARY REVIEW

REVISIONS

BT CK EBD CHIEF TAC DOE
WGR ENG REV APP



PRELIMINARY REVIEW

E & D MANAGER	CHIEF ENGINEER	QA MANAGER
<i>J. S. [Signature]</i>	<i>J. [Signature]</i>	<i>[Signature]</i>

NOTES:

1. AREAS BETWEEN DITCHES 2 AND 4, BEHIND THE RETENTION BASIN THAT ARE LOWER THAN ELEVATION 5434.0 SHALL BE BACKFILLED AND GRADED TO DRAIN INTO THE RETENTION BASIN.



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REFERENCE DRAWINGS:

- SRK-PS-10-0208, TEMPORARY DRAINAGE DITCHES-SECTIONS AND DETAILS
- SRK-PS-10-0210, WASTEWATER RETENTION BASIN-SECTIONS AND DETAILS

LEGEND:

- CENTERLINE OF TEMPORARY DITCH
- EXCAVATION
- EMBANKMENT

8804110022-07

100 0 100 200
SCALE FEET

U. S. DEPARTMENT OF ENERGY
ALBUQUERQUE, NEW MEXICO

DESIGNED *MLW*
CHECKED *KLO*
INSPECTED *KAC*
RECOMMENDED *J. P. [Signature]*
APPROVED

SLICK ROCK SITE
SLICK ROCK, COLORADO
UNION CARBIDE PROCESSING SITE

TEMPORARY SITE DRAINAGE PLAN

DATE DOE PROJECT ENGINEER DATE

MORRISON-KNUDSEN ENGINEERS, INC.
UMTRA PROJECT
40 HUNTER ST. SAN FRANCISCO, CA 94103

PROJECT NO.
DE-AC04-83AL18796

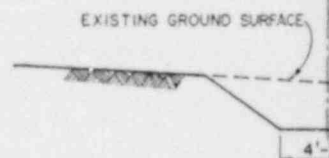
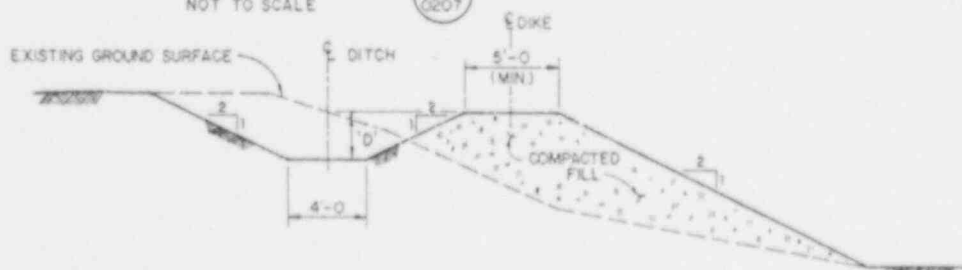
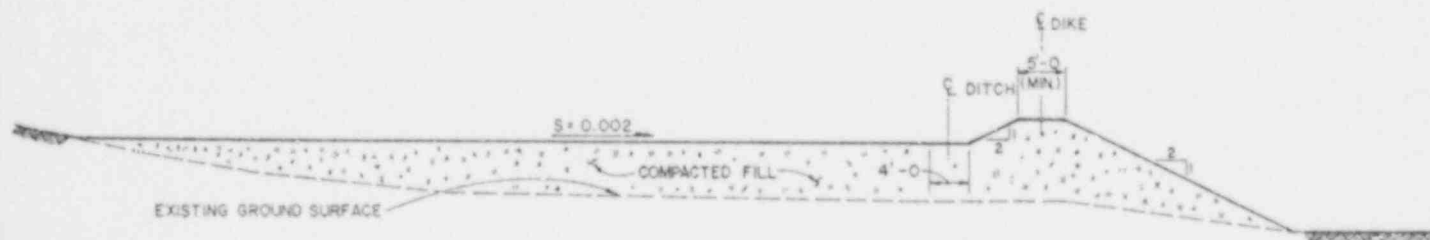
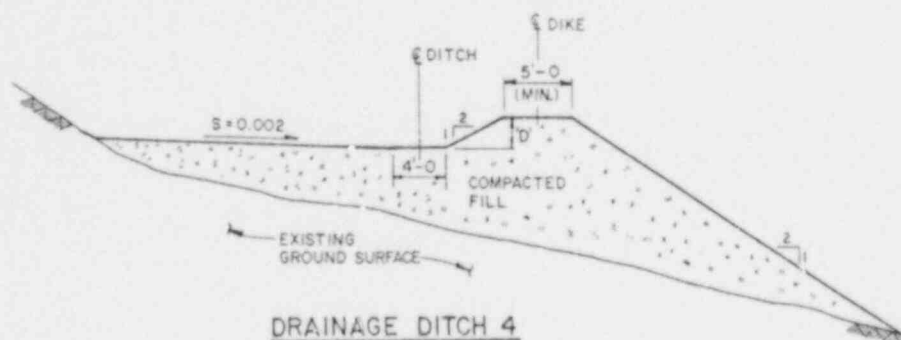
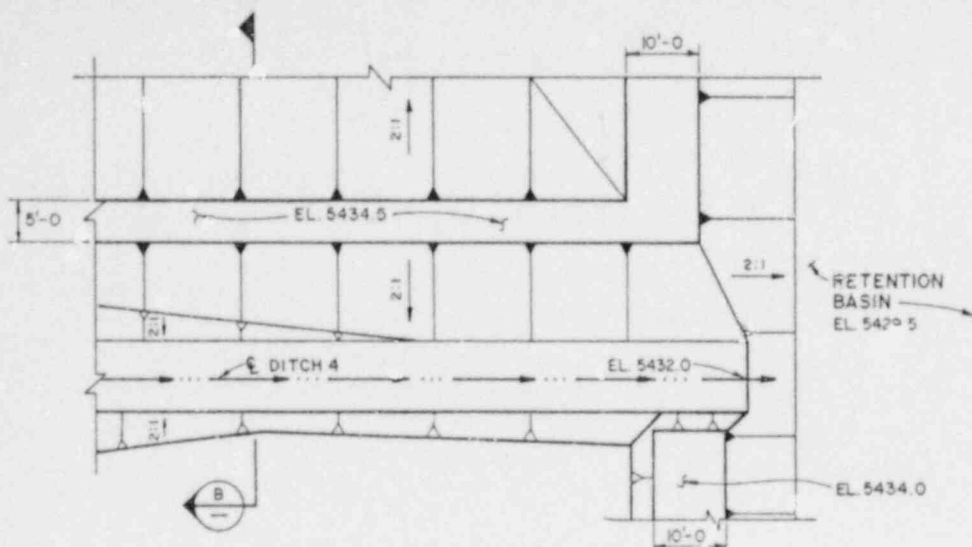
DRAWING NO.
SRK-PS-10-0207

REV.
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ISSUED FOR PRELIMINARY REVIEW

REVISIONS

BY CK E&D MUR CHIEF ENG TAG REV DOE APP

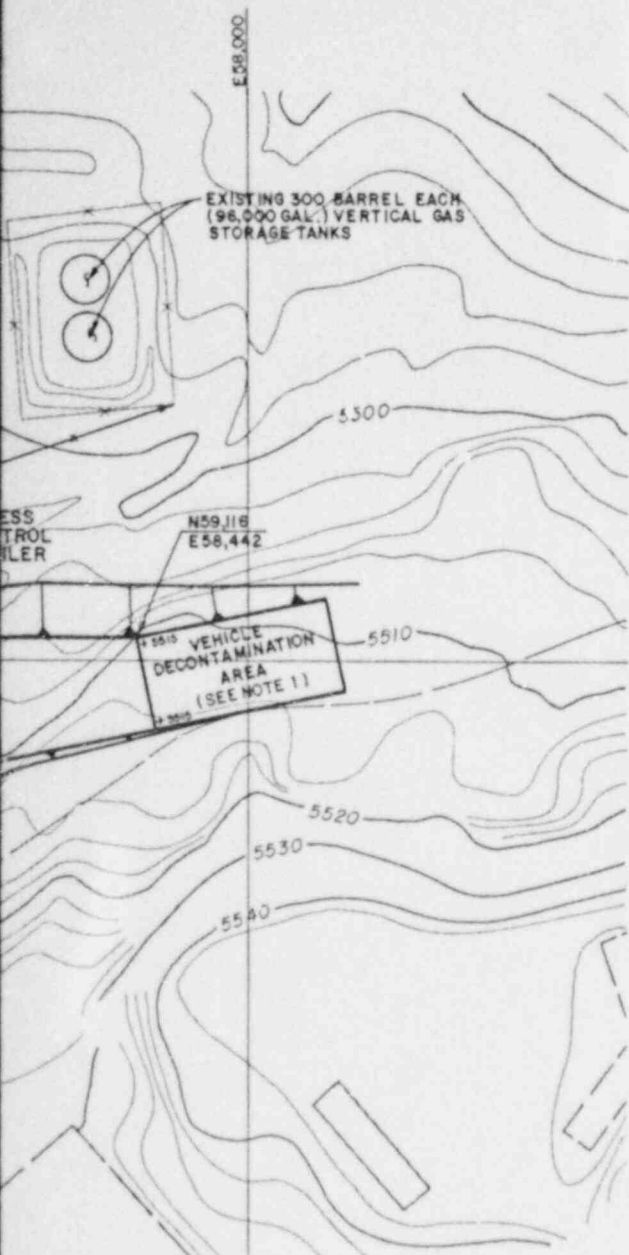


CONNECTING

SEC
NOT TO







NOTES:

- SUBCONTRACTOR SHALL DESIGN VEHICLE DECONTAMINATION AREA, RECIRCULATION SYSTEM AND WASHWATER COLLECTION SYSTEM.

TI
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Aperture Card

REFERENCE DRAWINGS:

SRK-PS-10-0206 SITE PLAN AND CONSTRUCTION FACILITIES

LEGEND:

	EXISTING SITE FEATURES AND CONTOURS
	EXISTING ROAD
	EMBANKMENT
	TEMPORARY BARBED WIRE FENCE
	TEMPORARY CHAIN LINK FENCE

8804110022 - 09

PRELIMINARY REVIEW

DESIGN MANAGER	CHIEF ENG. / QA MGR.	PMC ENG'S. MANAGER

U. S. DEPARTMENT OF ENERGY ALBUQUERQUE, NEW MEXICO

DESIGNED 	DRAWN RBC
CHECKED 	
INSPECTED 	
RECOMMENDED 	
APPROVED	

SLICK ROCK SITE
SLICK ROCK, COLORADO
UNION CARBIDE PROCESSING SITE

ACCESS CONTROL AREA


ISSUED FOR PRELIMINARY REVIEW

REVISIONS

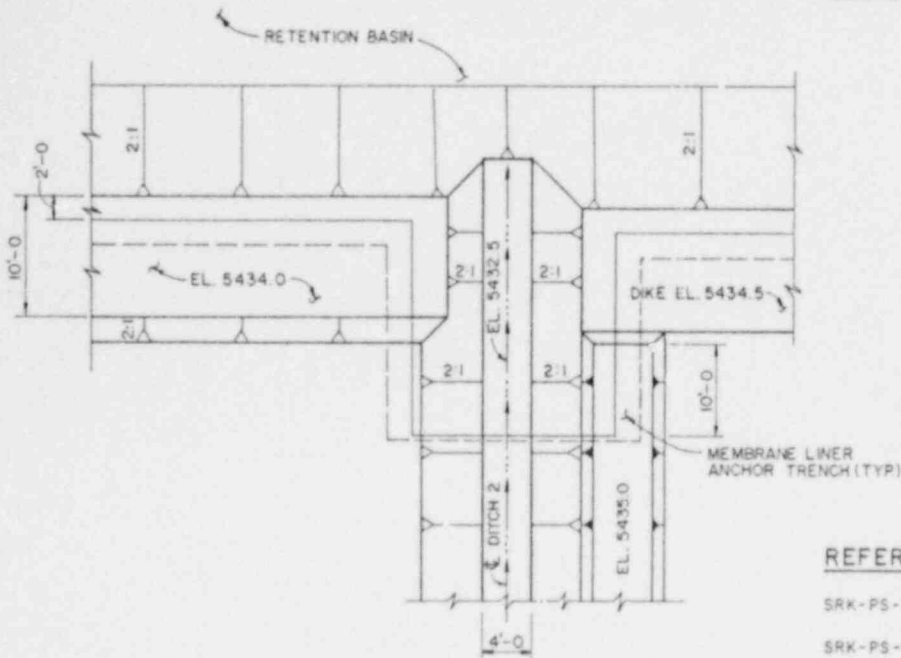
BY CR T&D MGR CHIEF ENG. TAG REV DOE APP

MORRISON-KNUDSEN ENGINEERS, INC.
A MORRISON-KNUDSEN COMPANY
UMTRA PROJECT
800 HOWARD ST. SAN FRANCISCO, CA 94102

PROJECT NO.
DE-AC04-83AL18796
DRAWING NO.
SRK-PS-10-0209
REV
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NOTES:



DITCH INLET DETAIL 2
NOT TO SCALE Q207

REFERENCE DRAWINGS:

SRK-PS-10-0206, SITE PLAN AND CONSTRUCTION FACILITIES
SRK-PS-10-0207, TEMPORARY SITE DRAINAGE PLAN

TI
APERTURE
CARD

Also Available On
Aperture Card

LEGEND:

- — — — — CENTERLINE OF TEMPORARY DITCH
- ▽ ▽ EXCAVATION
- ▽ ▽ EMBANKMENT

8804110022 - 10

PRELIMINARY REVIEW

END MANAGER	CHIEF ENGINEER	QA MANAGER
<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>

U. S. DEPARTMENT OF ENERGY
ALBUQUERQUE, NEW MEXICO

DESIGNED
CHECKED
DRAWN
INTEGRATED
RECOMMENDED
APPROVED

SLICK ROCK SITE
SLICK ROCK, COLORADO
UNION CARBIDE PROCESSING SITE

WASTEWATER RETENTION BASIN
SECTIONS AND DETAILS

MORRISON-KNUDSEN ENGINEERS, INC.
UMTRA PROJECT
80 HOWARD ST. SAN FRANCISCO, CA 94102

PROJECT NO.
DE-AC04-83AL18796

DRAWING NO.
SRK-PS-10-0210

ISSUED FOR PRELIMINARY REVIEW

REVISIONS

BY

CK

END

CHIEF

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DATE

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CARD
Also Available On
Aperture Card



PRELIMINARY REVIEW

E & D MANAGER	CHIEF ENGINEER	QA MANAGER
<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>

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	△	
QA	NO	DATE
44	44	44

LOCATION	NORTH COORDINATE	EAST COORDINATE
1	N 59,350	E 58,675
2	N 59,815	E 58,950
3	N 59,485	E 58,930
4	N 59,350	E 58,930
5	N 59,690	E 59,000
6	N 59,620	E 58,930
7	N 59,430	E 59,310
8	N 59,600	E 58,530
9	N 58,860	E 59,155
10	N 59,400	E 59,300
11	N 59,015	E 59,340
12	N 59,115	E 59,410
13	N 58,970	E 59,860
14	N 58,940	E 59,610
15	N 58,895	E 59,940
16	N 58,855	E 59,675
17	N 58,910	E 59,080
18	N 58,780	E 58,950
19	N 59,535	E 58,675
20	N 59,485	E 58,675
21	N 58,960	E 59,140
22	N 59,115	E 59,260
23	N 59,115	E 58,890
24	N 59,410	E 59,140
25	N 59,395	E 59,260

NOTES:

1. ALL CUTS SHALL BE 2(H):1(V) UNLESS OTHERWISE NOTED.
2. FINAL LIMITS OF WATER BORNE CONTAMINATION AT BOTTOM OF CORRALDRAW WILL BE DETERMINED IN THE FIELD.
3. ALL LOOSE SOIL ON THE ROCK OUTSIDE THE TOE OF THE FINAL DISPOSAL EMBANKMENT SHALL BE REMOVED. THE EXPOSED ROCK SURFACE SHALL THEN BE WASHED DOWN TO REMOVE SURFACE CONTAMINATION. ROCK EXCAVATION WILL BE REQUIRED WHERE CONTAMINATION HAS PENETRATED THE ROCK. LIMITS OF ROCK EXCAVATION TO BE DETERMINED IN THE FIELD. MAXIMUM DEPTH OF EXCAVATION IS ESTIMATED TO BE 6 INCHES.
4. CONTAMINATION MATERIAL FROM AREA "A" SHALL BE PLACED IN THE DISPOSAL EMBANKMENT WITH TAILINGS PRIOR TO OTHER OFF-PILE CONTAMINATED SOILS.
5. NO EXCAVATIONS WILL BE DONE IN THE NATURAL GAS PIPELINE CORRIDOR (50 FEET R.O.W.). PIPELINE TO BE LOCATED IN THE FIELD AND CLEARLY MARKED PRIOR TO ANY WORK IN THE AREA.
6. FINAL LIMITS TO BE DETERMINED IN THE FIELD.

REFERENCE DRAWINGS:

SRK-PC-10-0213, TAILINGS EMBANKMENT PLAN

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CARD

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LEGEND:



LIMIT AND DEPTH IN FEET OF
WINDBLOWN CONTAMINATED
MATERIAL

AREA "A"

8804110022 - 11

200 0 200 400
SCALE FEET

U. S. DEPARTMENT OF ENERGY
ALBUQUERQUE, NEW MEXICO

SLICK ROCK SITE
SLICK ROCK, COLORADO
UNION CARBIDE PROCESSING SITE

CONTAMINATED MATERIAL
EXCAVATION PLAN

DESIGNED BY
CHECKED BY
RECOMMENDED BY
APPROVED BY

DATE

DOE PROJECT ENGINEER

DATE



MORRISON-KNUDSEN ENGINEERS, INC.

UMTRA PROJECT

80 HOWARD ST. SAN FRANCISCO, CA 94102

PROJECT NO.

DE-AC04-83AL18796

DRAWING NO.

SRK-PS-10-0211

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ISSUED FOR PRELIMINARY REVIEW

REVISIONS

BY CR EBD CHIEF TAG DOX



NOTES:

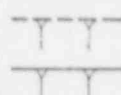
1. EXCAVATE TO COMPETENT BEDROCK (FORMATIONAL MATERIAL ON LOGS) EXCEPT WHERE ELEVATIONS ARE SHOWN.
2. APPROXIMATE LOCATION WHERE SLOPE MEETS BEDROCK.
3. REMOVE ALL SOIL, LOOSE MATERIALS AND DEBRIS ABOVE BEDROCK WITHIN THE EXCAVATION LIMITS.
4. CONTRACTOR SHALL GRADE AREA AROUND INTERSECTION OF THE COUNTY ROADS AS REQUIRED.
5. EXCAVATE TO ELEVATIONS SHOWN EVEN IF BEDROCK IS ENCOUNTERED AT HIGHER ELEVATIONS.
6. STAGE 1 EXCAVATION CONSISTS OF REMOVING OVERBURDEN IN AREA SHOWN PRIOR TO CONSTRUCTING THE COUNTY ROAD DETOUR AND RELOCATION OF GAS PIPELINE. GAS PIPELINE WILL BE RELOCATED BY OTHERS.
7. STAGE 2 EXCAVATION SHALL BEGIN AFTER RELOCATION OF GAS PIPELINE BY OTHERS.
8. CONTAMINATED MATERIALS FROM EXCAVATIONS TO BE STOCKPILED IN THE AREA SHOWN IN DRAWING SRK-PS-10-0206.
9. EXCESS UNCONTAMINATED SOILS FROM THE EXCAVATIONS, NOT REQUIRED FOR CONSTRUCTION FILL, SHALL BE STOCKPILED IN THE AREA SHOWN IN DRAWING SRK-GE-10-0206.

REFERENCE DRAWINGS:

- SRK-GE-10-0206, HAUL ROAD BETWEEN NORTH CONTINENT AND UNION CARBIDE MILL AREAS
- SRK-PS-10-0206, SITE PLAN AND CONSTRUCTION FACILITIES
- SRK-PS-10-0211, CONTAMINATED MATERIAL EXCAVATION PLAN
- SRK-PS-10-0213, TAILINGS EMBANKMENT PLAN
- SRK-PS-10-0219, BORINGS AND TEST PITS LOCATION PLAN

TI
APERTURE
CARD

LEGEND:



- STAGE 1 EXCAVATION
- STAGE 2 EXCAVATION

Also Available On
Aperture Card

8804110022-12

PRELIMINARY REVIEW

DESIGNED	CHIEF ENGINEER	QA MANAGER
ELO	AMC	
MLW		
INSPECTED		
APPROVED		

100 0 100 200
SCALE FEET

U. S. DEPARTMENT OF ENERGY
ALBUQUERQUE, NEW MEXICO

SLICK ROCK SITE
SLICK ROCK, COLORADO
UNION CARBIDE PROCESSING SITE

TAILINGS EMBANKMENT EXCAVATION PLAN

DESIGNED
CHECKED
INSPECTED
APPROVED

DESIGNED	CHIEF ENGINEER	QA MANAGER
ELO	AMC	
MLW		
INSPECTED		
APPROVED		

ISSUED FOR PRELIMINARY REVIEW

REVISIONS

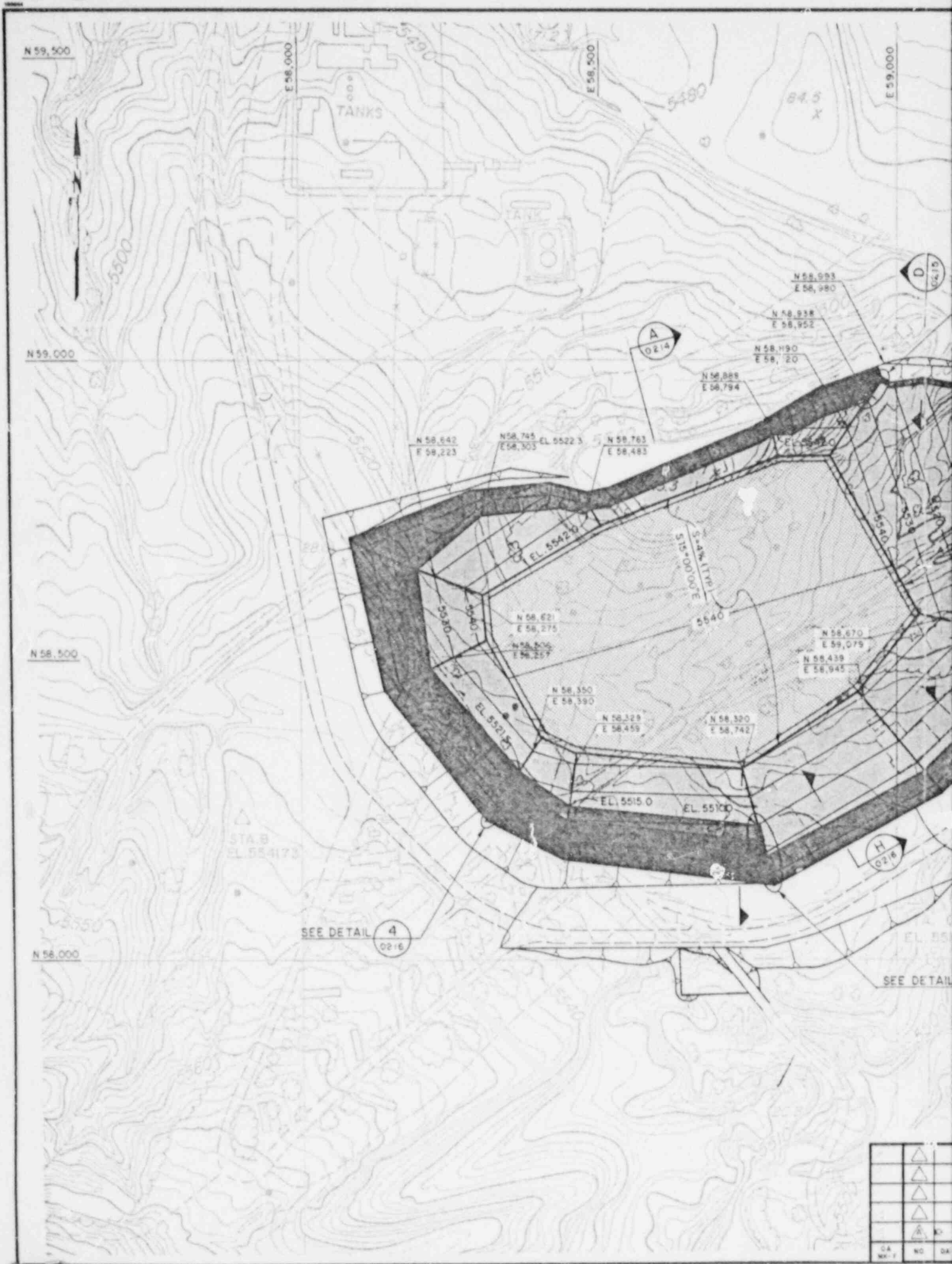
BY CX EAO CHIEF ENG TAC DDE

MORRISON-KNUDSEN ENGINEERS, INC.
UMTRA PROJECT
400 VICHARD ST. SAN FRANCISCO, CA 94102

PROJECT NO.
DE-AC04-83AL18796

DRAWING NO.
SRK-PS-10-0212

REV
A





NOTES:

1. SEE DRAWING NO. SRK-PS-10-0212 FOR EXCAVATION LIMITS.
2. FINAL HEIGHT OF EMBANKMENT MAY BE ADJUSTED TO MATCH VOLUME OF CONTAMINATED MATERIAL ACTUALLY PLACED.
3. CORNERS SHALL BE ROUNDED AS APPROVED BY THE CONTRACTOR.

TI APERTURE CARD

Also Available On
Aperture Card

REFERENCE DRAWINGS:

- SRK-PS-10-0212, TAILINGS EMBANKMENT EXCAVATION PLAN
- SRK-PS-10-0214, TAILINGS EMBANKMENT - SECTIONS AND DETAILS (SHEET 1 OF 3)
- SRK-PS-10-0215, TAILINGS EMBANKMENT - SECTIONS AND DETAILS (SHEET 2 OF 3)
- SRK-PS-10-0216, TAILINGS EMBANKMENT - SECTIONS AND DETAILS (SHEET 3 OF 3)

LEGEND:

- EMBANKMENT
- EXCAVATION
- FINISHED GRADE CONTOUR
- RIPRAP TYPE A
- RIPRAP TYPE B
- RIPRAP TYPE C
- RIPRAP TYPE D

8804110022-13

PRELIMINARY REVIEW

E & D MANAGER	CHIEF ENGINEER	QA MANAGER
<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>

100 0 100 200
SCALE FEET

U. S. DEPARTMENT OF ENERGY
ALBUQUERQUE, NEW MEXICO

SLICK ROCK SITE
SLICK ROCK, COLORADO
UNION CARBIDE PROCESSING SITE

TAILINGS EMBANKMENT PLAN

DESIGNED <i>[Signature]</i>	DRAWN J. MINA
CHECKED <i>[Signature]</i>	
INVESTIGATED <i>[Signature]</i>	
RECOMMENDED <i>[Signature]</i>	
APPROVED	

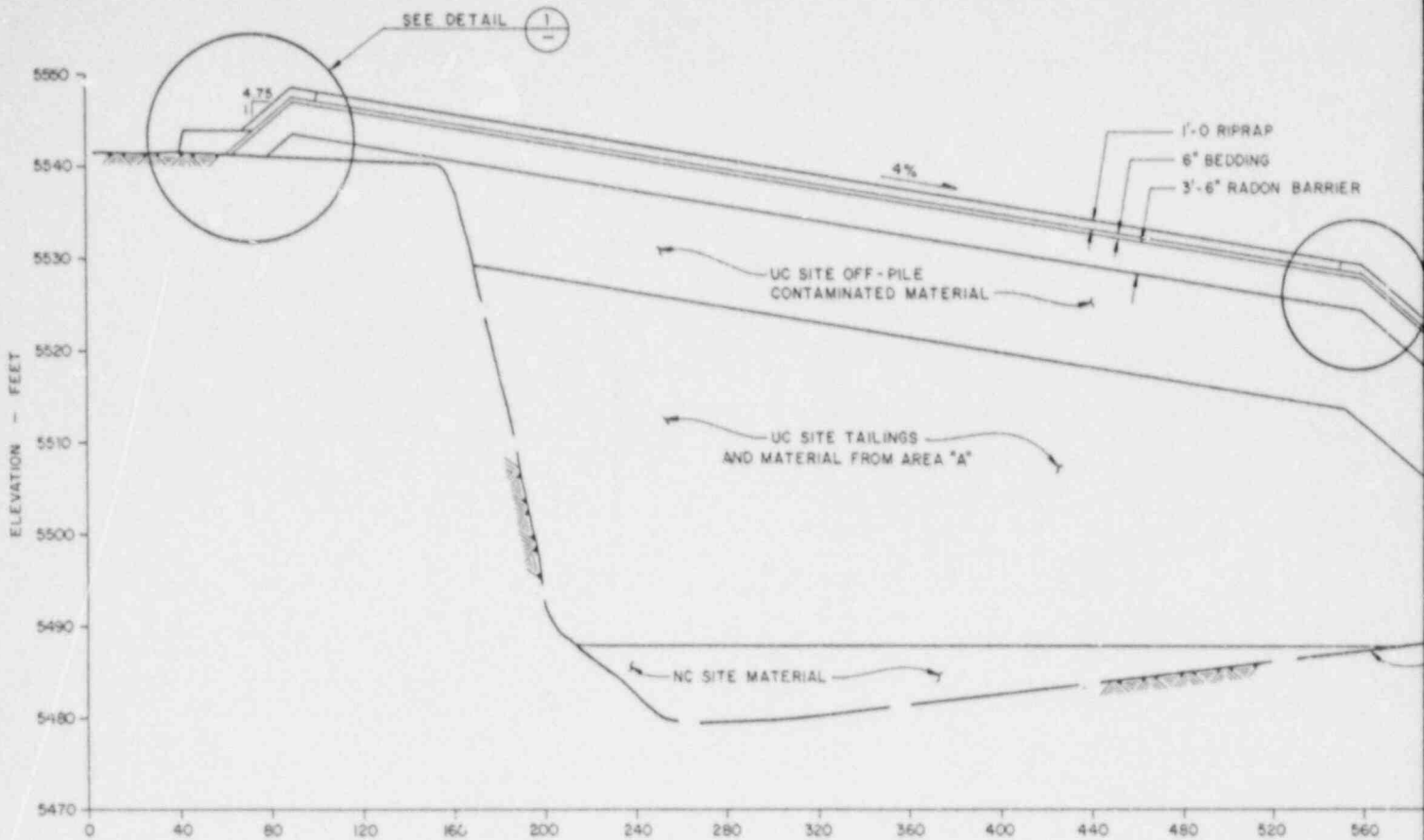
MORRISON-KNUDSEN ENGINEERS, INC.
A MORRISON-KNUDSEN COMPANY
UMTRA PROJECT
360 HOLLAND ST. SAN FRANCISCO, CA 94103

PROJECT NO. DE-AC04-83AL18796	DATE	DATE
DRAWING NO. SRK-PS-10-0213	REV A	

ISSUED FOR PRELIMINARY REVIEW

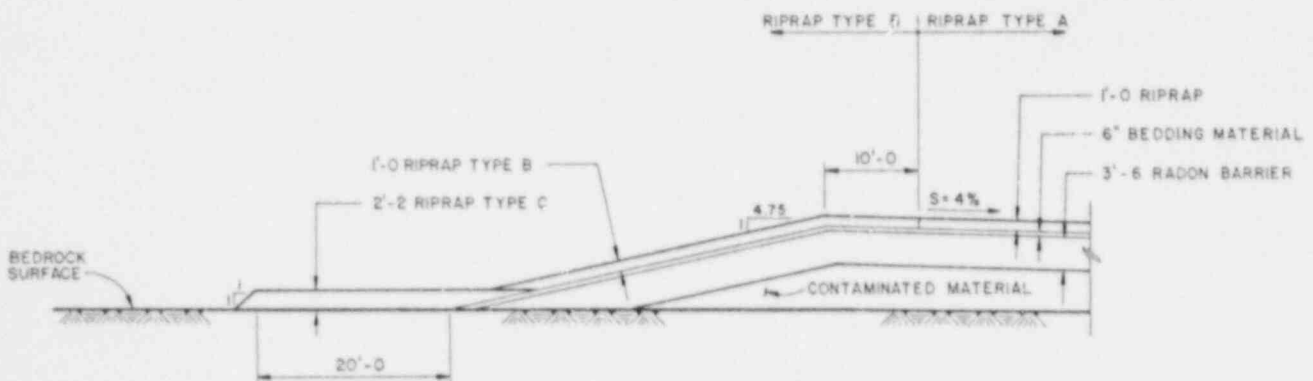
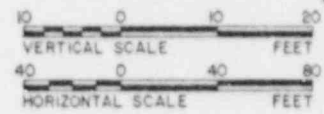
REVISIONS

BY CK END MOD CHIEF ENG TAC REV DCE APP



EMBANKMENT SECTION

A
0213

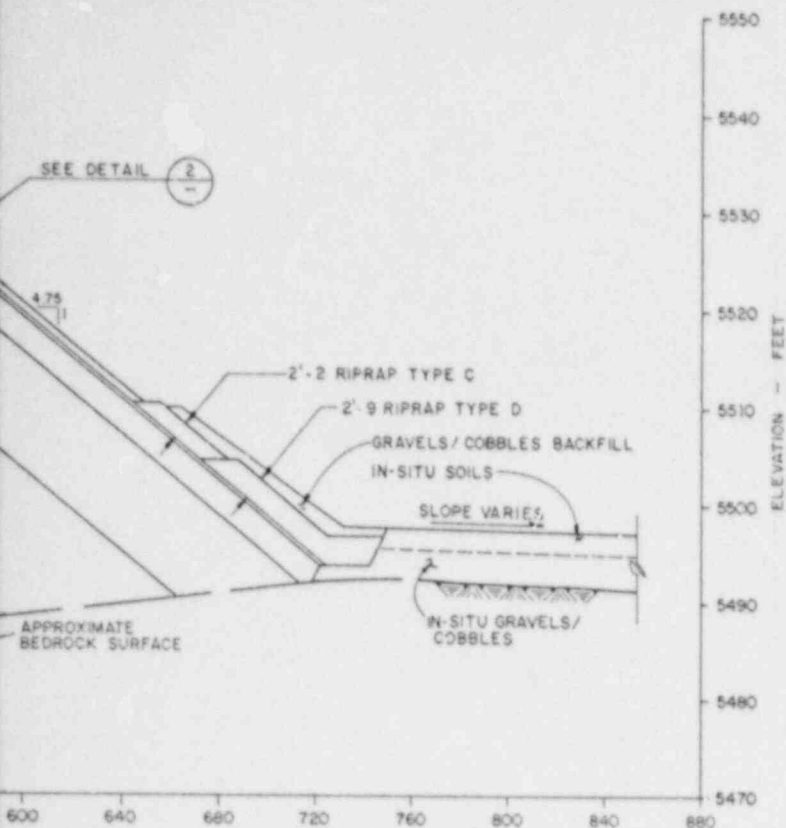


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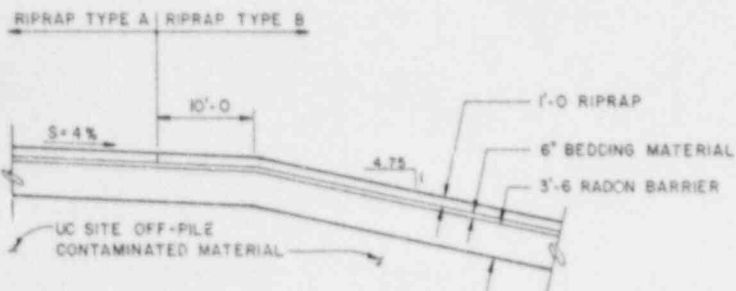
REFERENCE DRAWINGS:

SRK-PS-10-0213, TAILINGS EMBANKMENT PLAN

TI APERTURE CARD

Also Available On
Aperture Card

8804110022-14



PRELIMINARY REVIEW

E & D. MANAGER	CHIEF ENGINEER	QA MANAGER
<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>

U. S. DEPARTMENT OF ENERGY
ALBUQUERQUE, NEW MEXICO

SLICK ROCK SITE
SLICK ROCK, COLORADO
UNION CARBIDE PROCESSING SITE

TAILINGS EMBANKMENT SECTIONS AND DETAILS (SHEET 1 OF 3)

DESIGNED <i>[Signature]</i>	DRAWN AMC
CHECKED <i>[Signature]</i>	
INSPECTED <i>[Signature]</i>	
RECOMMENDED <i>[Signature]</i>	
APPROVED <i>[Signature]</i>	

DATE: _____ DOE PROJECT ENGINEER: *[Signature]* J.C.L.

MORRISON-KNUDSEN ENGINEERS, INC.
A MORRISON ENGINEERS COMPANY
UMTRA PROJECT
800 HONARD ST. SAN FRANCISCO, CA 94103

PROJECT NO.
DE-AC04-83AL18796

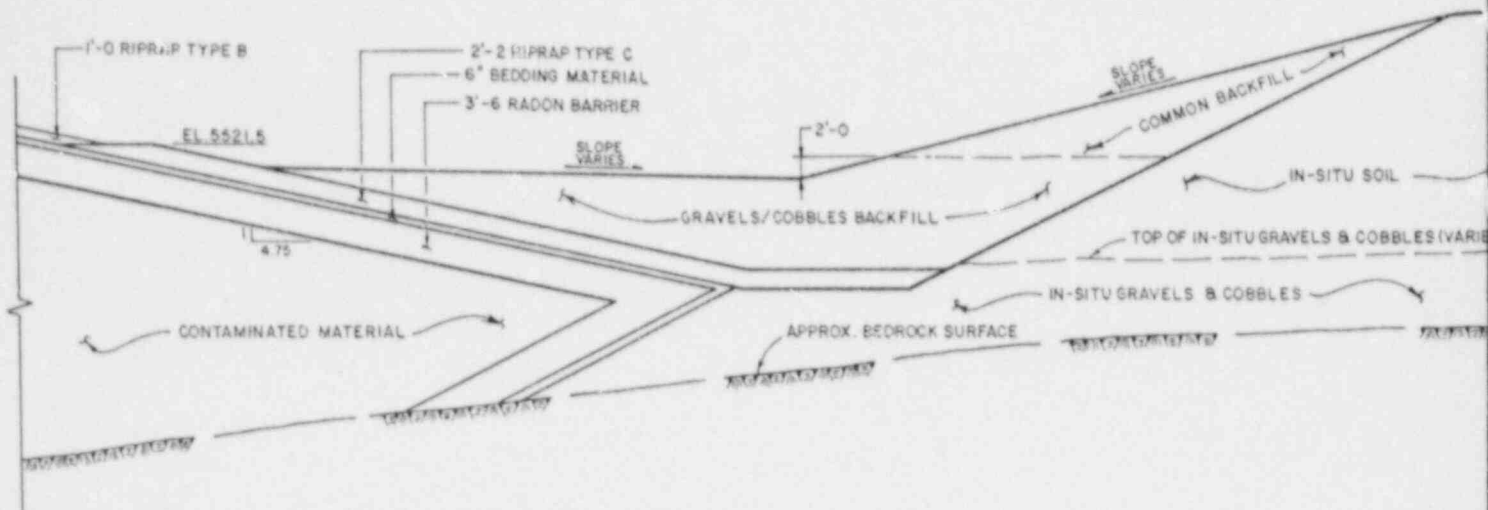
DRAWING NO.
SRK-PS-10-0214

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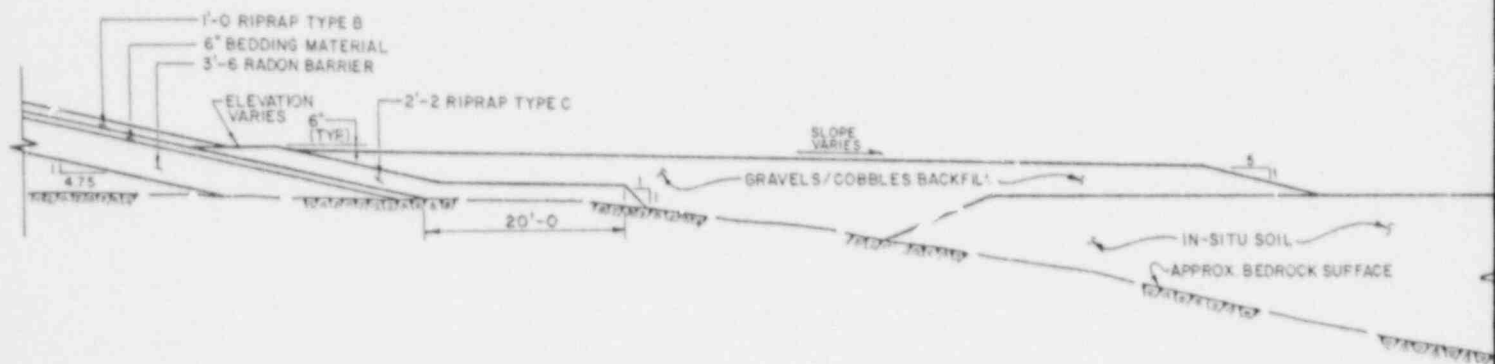
REVISIONS

BY: _____ CHK: _____ E&D: _____ CHIEF: _____ TAG: _____ DOE: _____



SECTION

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0217



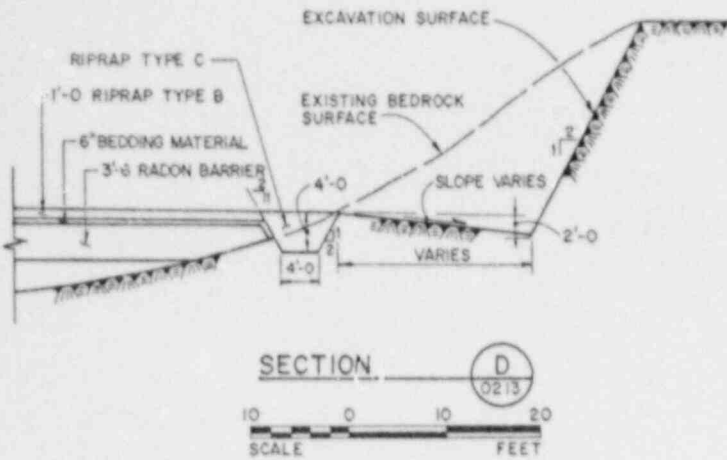
SECTION

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0217



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NOTES:



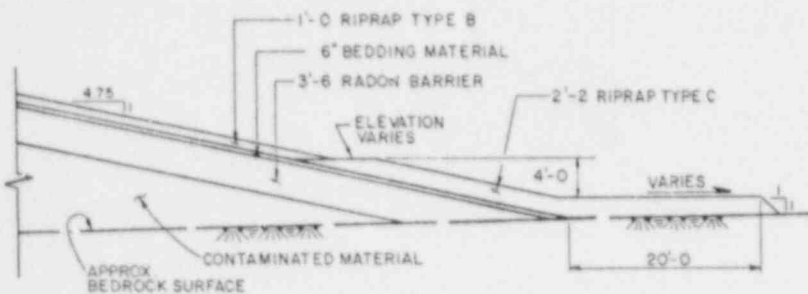
REFERENCE DRAWINGS:

SRK-PS-10-0213 TAILINGS EMBANKMENT PLAN
SRK-PS-10-0217 FINAL SITE GRADING PLAN - SHEET 1 OF 2

LEGEND:

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APERTURE
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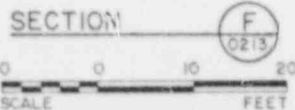
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8804110022-15

PRELIMINARY REVIEW

E & D MANAGER	CHIEF ENGINEER	QA MANAGER
<i>J. B. Thomas</i>	<i>J. B. Thomas</i>	<i>J. B. Thomas</i>



U. S. DEPARTMENT OF ENERGY
ALBUQUERQUE, NEW MEXICO

DESIGNED BY
CHECKED BY
INSPECTED BY
RECOMMENDED BY
APPROVED BY

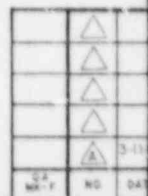
SLICK ROCK SITE
SLICK ROCK, COLORADO
UNION CARBIDE PROCESSING SITE

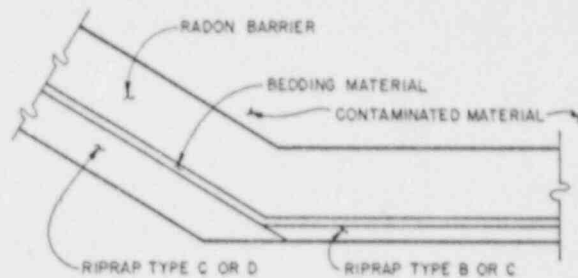
TAILINGS EMBANKMENT
SECTIONS AND DETAILS
(SHEET 2 OF 3)

MORRISON-KNUDSEN ENGINEERS, INC.
A MORRISON-KNUDSEN COMPANY
UMTRA PROJECT
80 HOBART ST. SAN FRANCISCO, CA 94103

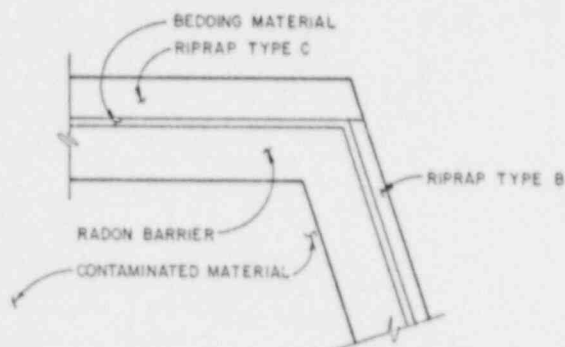
PROJECT NO.
DE-AC04-83AL18796
DRAWING NO.
SRK-PS-10-0215
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ISSUED FOR PRELIMINARY REVIEW	BY	CK	E & D MGR	CHIEF ENG	T/C REV	DOE APP
REVISIONS						

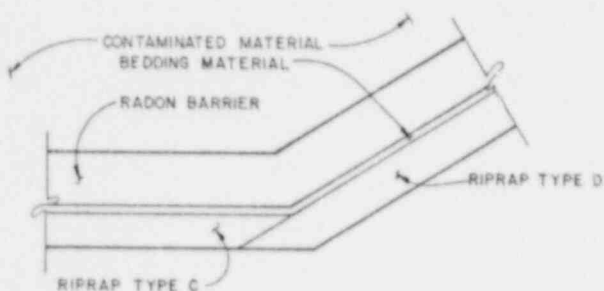




DETAIL 5
NOT TO SCALE 0213



DETAIL 3
NOT TO SCALE 0213



DETAIL (4)
NOT TO SCALE (0213)

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Also Available On
Aperture Card

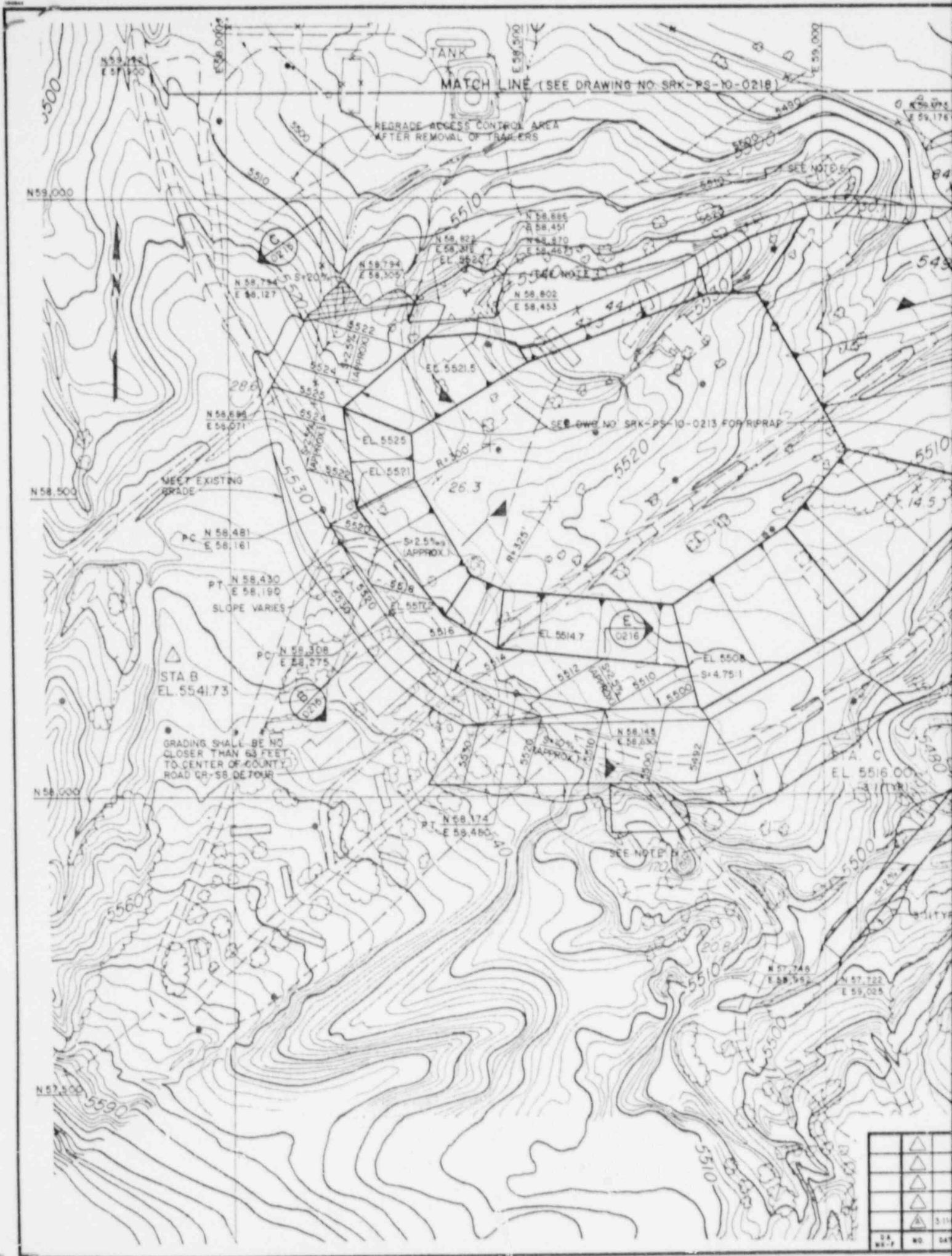
SRK - PS - 10 - 0213 TAILINGS EMBANKMENT PLAN
SRK - PS - 10 - 0217 FINAL SITE GRADING PLAN - SHEET 1 OF 2

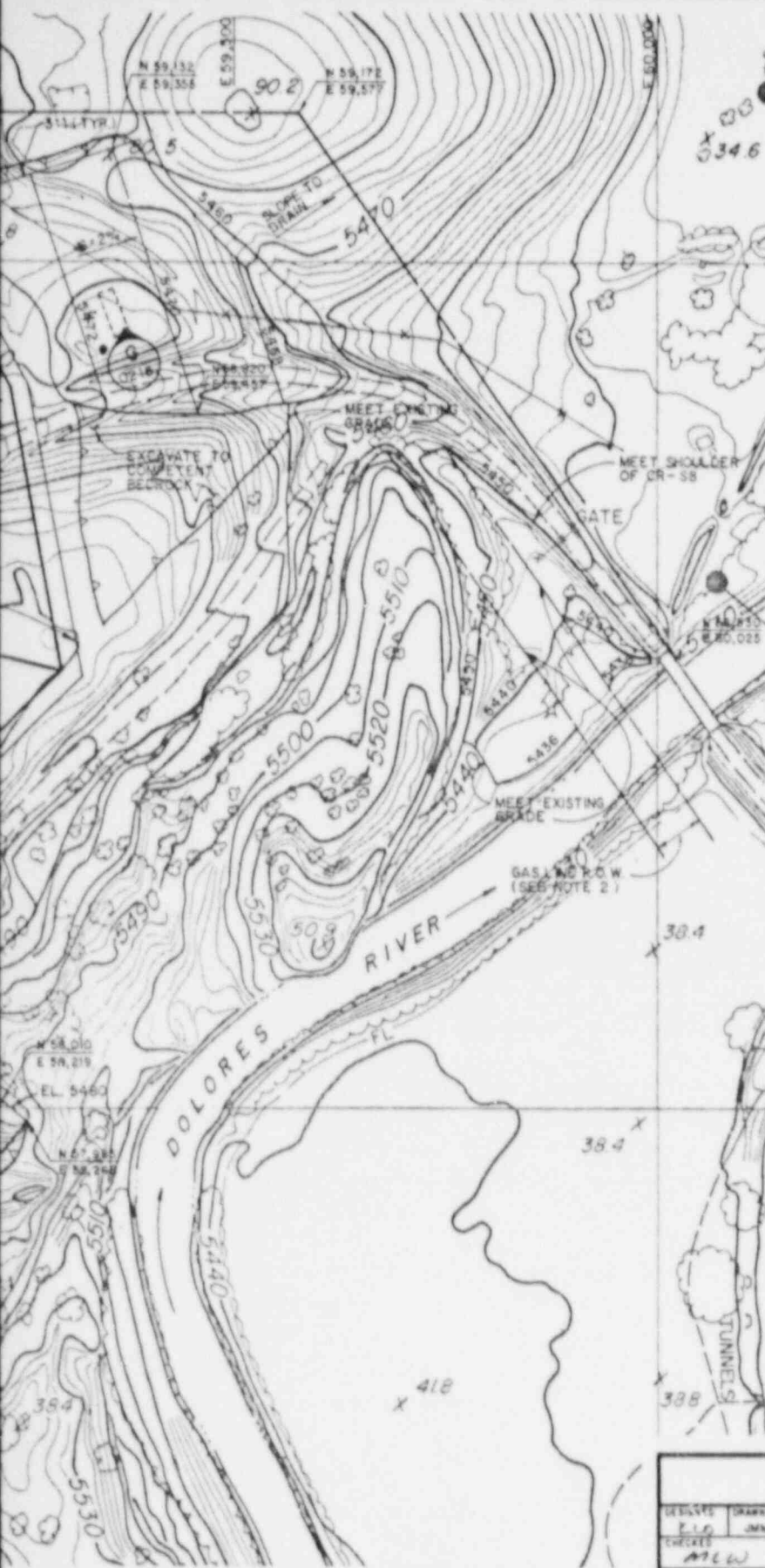
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E & O MANAGER	CHIEF ENGINEER	QA MANAGER
<i>R. S. ...</i>	<i>G. L. Jordan</i>	<i>[Signature]</i>

RE ISSUED FOR PRELIMINARY REVIEW									
REVISIONS	BY	CK	END WLD	CHIEF ENL	TSC SEC	DOF AW			

U. S. DEPARTMENT OF ENERGY			
ALBUQUERQUE, NEW MEXICO			
DESIGNED EVO	DRAWN ECG	SLICK ROCK SITE SLICK ROCK, COLORADO UNION CARBIDE PROCESSING SITE	
CHECKED MCW	TAILINGS EMBANKMENT SECTIONS AND DETAILS (SHEET 3 OF 3)		
INSPECTED JDC			
APPROVED J. P. [Signature]			
APPROVED	DATE	DATE PROJECT ENGINEER	DATE
 MORRISON-KNUDSEN ENGINEERS, INC. A WORLDWIDE ENGINEER COMPANY ULTRA PROJECT 80 HOWARD ST. SAN FRANCISCO, CA 94105		PROJECT NO. DE-AC04-83AL18796	REV A
		DRAWING NO. SRK-PS-1C-Q216	





NOTES:

1. EXCAVATE TO COMPETENT BEDROCK OR EL. 5520, WHICHEVER IS HIGHER.
2. NO EXCAVATION OR REGRADING SHALL BE DONE WITHIN THE GAS LINE RIGHT OF WAY.
3. SEE DRAWING NO. SRK-PS-10-0218 FOR FINAL SITE GRADING OUTSIDE OF MATCH LINE.
4. FINAL SLOPES FOR EARTH CUTS SHALL BE NO STEEPER THAN 3(H):1(V) UNLESS NOTED OTHERWISE. FINAL SLOPES FOR ROCK CUTS SHALL NOT BE STEEPER THAN 1(H):1(V) UNLESS NOTED OTHERWISE.
5. NO REGRADING IS REQUIRED ON THE STAGE 1 EXCAVATION SLOPES.
6. NO REGRADING IS REQUIRED ON THE ROCK CUTS AT THE NE CORNER OF THE EMBANKMENT.

REFERENCE DRAWINGS:

- SRK-PS-10-0212, TAILINGS EMBANKMENT EXCAVATION PLAN
- SRK-PS-10-0213, TAILINGS EMBANKMENT PLAN
- SRK-PS-10-0214, TAILINGS EMBANKMENT-SECTIONS AND DETAILS (SHEET 1 OF 3)
- SRK-PS-10-0215, TAILINGS EMBANKMENT-SECTIONS AND DETAILS (SHEET 2 OF 3)
- SRK-PS-10-0216, TAILINGS EMBANKMENT-SECTIONS AND DETAILS (SHEET 3 OF 3)
- SRK-PS-10-0218, FINAL SITE GRADING PLAN (SHEET 2 OF 2)

LEGEND:

- EMBANKMENT
- EXCAVATION
- PC POINT OF CURVATURE
- PT POINT OF TANGENCY

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CARD

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Aperture Card

8804110022-17

PRELIMINARY REVIEW

E & D MANAGER	CHIEF ENGINEER	QA MANAGER
<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>



U. S. DEPARTMENT OF ENERGY ALBUQUERQUE, NEW MEXICO

DESIGNED	DRANK
CHECKED	JMM
APPROVED	
BY	
DATE	

SLICK ROCK SITE
SLICK ROCK, COLORADO
UNION CARBIDE PROCESSING SITE

FINAL SITE GRADING PLAN (SHEET 1 OF 2)

MORRISON-KNUDSEN ENGINEERS, INC.
A MORRISON-KNUDSEN COMPANY
UNTRA PROJECT
80 HORNARD ST. SAN FRANCISCO, CA 94103

PROJECT NO.
DE-AC04-83AL18796
DRAWING NO.
SRK-PS-10-0217
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ISSUED FOR PRELIMINARY REVIEW

REVISIONS

BY CR E&D CHIEF TAG DDE

LEGEND:

- LIMIT OF CONTAMINATED MATERIAL REMOVAL
- - - - - TEMPORARY DRAINAGE DITCH
- 5470 — FINISH GRADE CONTOUR

NOTES:

1. FINISHED GRADE CONTOURS ARE APPROXIMATE AND MAY BE ADJUSTED BASED ON FINAL CONTOURS AFTER REMOVAL OF CONTAMINATED MATERIAL.
2. EXCAVATIONS THAT ARE BELOW ADJACENT GRADE SHALL BE BACKFILLED TO MATCH ADJACENT GRADES.
3. CONTAMINATED MATERIALS FROM TEMPORARY DITCHES AND RETENTION BASINS SHALL BE REMOVED AND PLACED IN THE DISPOSAL EMBANKMENT. TEMPORARY DITCHES SHALL BE BACKFILLED TO MATCH ADJACENT GRADES. DIKES FOR THESE DITCHES SHALL BE LEVELED.
4. FOR LOCATION OF DITCHES AND RETENTION BASIN SEE DWG. NO. SRK-PS-10-0207.
5. NO REGRADING SHALL BE DONE WITHIN GAS PLANT BOUNDARIES.
6. FINAL SLOPES FOR EARTH CUTS SHALL NOT BE STEEPER THAN 3:1 (H:V) UNLESS NOTED OTHERWISE. FINAL SLOPES FOR ROCK CUTS SHALL BE NO STEEPER THAN 1:1 (H:V) UNLESS NOTED OTHERWISE.

REFERENCE DRAWINGS:

- SRK-PS-10-0207, TEMPORARY SITE DRAINAGE PLAN
- SRK-PS-10-0211, CONTAMINATED MATERIAL EXCAVATION PLAN
- SRK-PS-10-0213, TAILINGS EMBANKMENT PLAN
- SRK-PS-10-0214, TAILINGS EMBANKMENT - SECTIONS AND DETAILS (SHEET 1 OF 3)
- SRK-PS-10-0217, FINAL SITE GRADING PLAN (SHEET 1 OF 2)

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CARD

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SCALE FEET

U. S. DEPARTMENT OF ENERGY
ALBUQUERQUE, NEW MEXICO

SLICK ROCK SITE
SLICK ROCK, COLORADO
UNION CARBIDE PROCESSING SITE

FINAL SITE GRADING PLAN
(SHEET 2 OF 2)

DESIGNED E.O.
CHECKED M.L.W.
INSPECTED J.B.C.
RECOMMENDED J.B. Thiers
APPROVED

DATE DATE DATE PROJECT ENGINEER DATE

MORRISON-KNUDSEN ENGINEERS, INC.
A MORRISON-KNUDSEN COMPANY
LIMTRA PROJECT
80 HOWARD ST. SAN FRANCISCO, CA 94102

PROJECT NO.
DE-AC04-83AL18796

DRAWING NO.
SRK-PS-10-0218

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ISSUED FOR PRELIMINARY REVIEW

REVISIONS

BY CR

END

WIR

CHIEF

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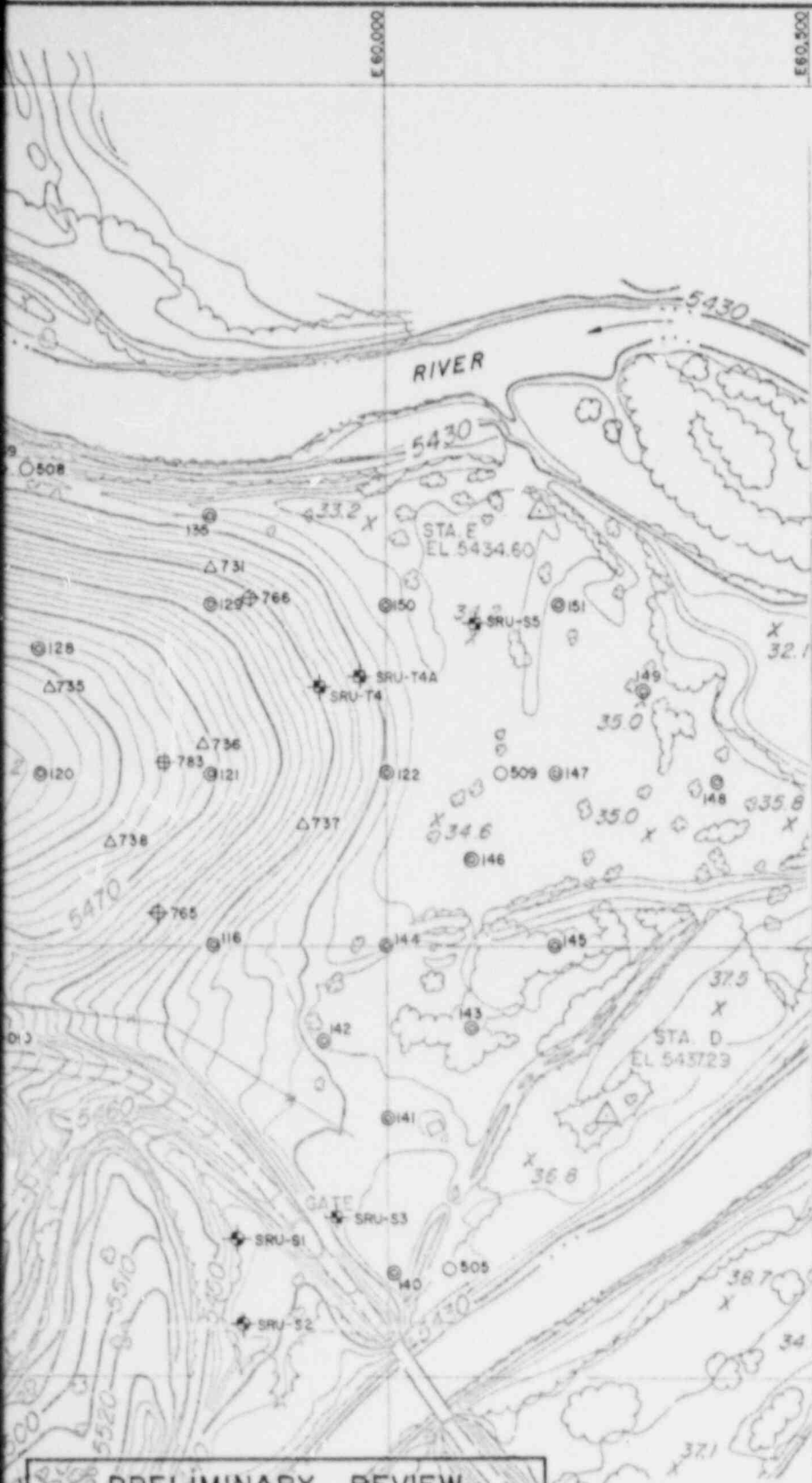
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DATE

APP.





TI APERTURE CARD

Also Available On
Aperture Card

LEGEND:

- 506 MONITOR WELLS
- ⊕ 768 BORINGS (1986)
- ⊕ SRU-DIO BORINGS (OCT., 1987)
- ⊕ 125 BORINGS (JACOBS, 1985)
- △ 735 PIEZOCONES (1986)
- ⊕ 785 TEST PITS (1986)
- ⊕ SRU-T4 TEST PITS (OCT., 1987)
- ⊕ BRASS CAP SET IN CONCRETE POST
- ⊕ SRU-DIO TEST PITS (DEC., 1987)

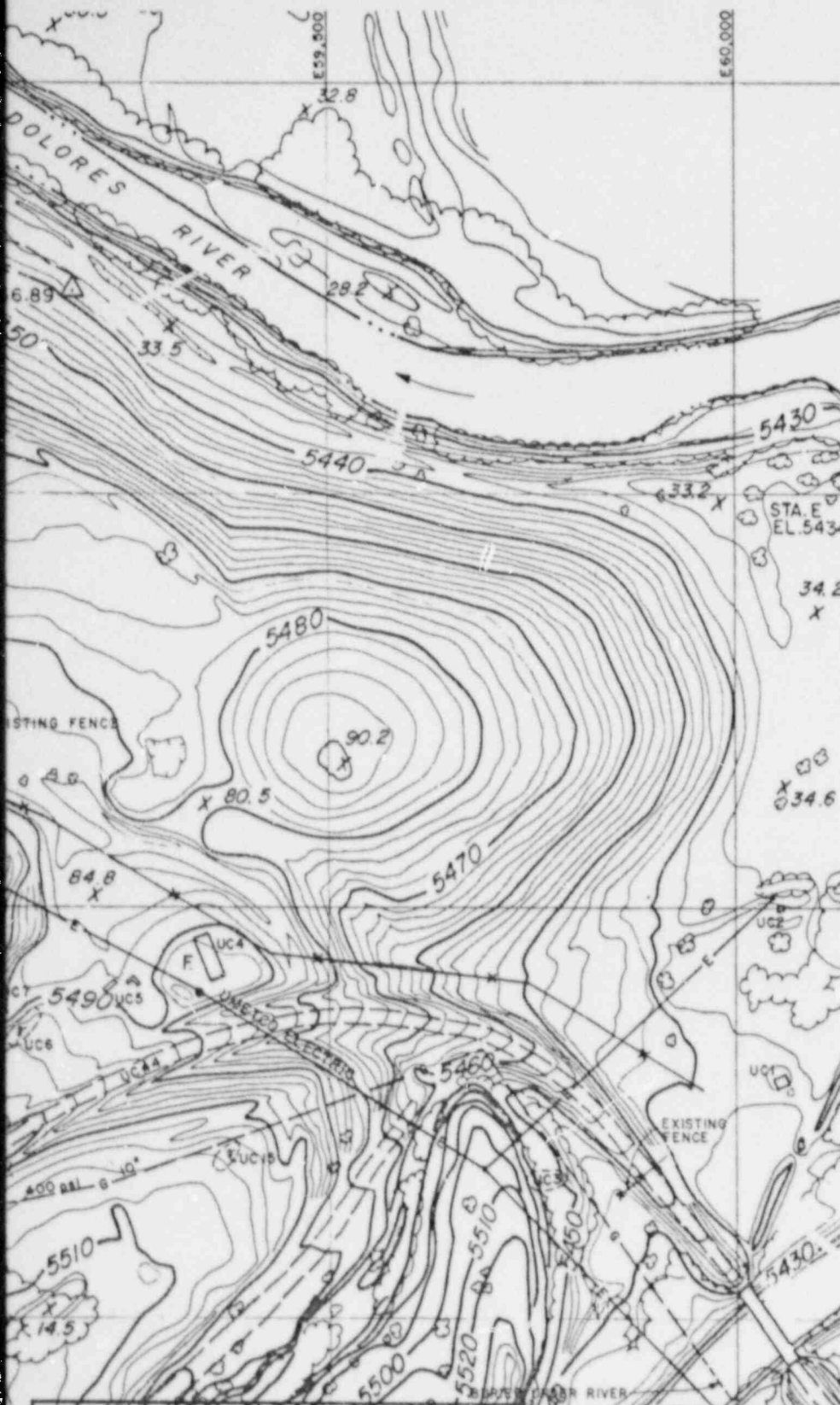
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PRELIMINARY REVIEW		
E & D MANAGER	CHIEF ENGINEER	QA MANAGER
<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>

U. S. DEPARTMENT OF ENERGY ALBUQUERQUE, NEW MEXICO			
SLICK ROCK SITE SLICK ROCK, COLORADO UNION CARBIDE PROCESSING SITE			
BORINGS AND TEST PITS LOCATION PLAN			
DESIGNED KLO	DRAWN EG	DATE	DATE
CHECKED MLU	REVIEWED [Signature]	DATE	DATE
APPROVED		DATE	DATE
MORRISON-KNUDSEN ENGINEERS, INC. A MORRISON-KNUDSEN COMPANY UMTRA PROJECT 80 HORNAND ST. SAN FRANCISCO, CA 94101		PROJECT NO. DE-AC04-83AL18796	DATE
ISSUED FOR PRELIMINARY REVIEW		DRAWING NO. SRK-PS-10-0219	REV A
REVISIONS		BY	DATE
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53	54	55	56
57	58	59	60
61	62	63	64
65	66	67	68
69	70	71	72
73	74	75	76
77	78	79	80
81	82	83	84
85	86	87	88
89	90	91	92
93	94	95	96
97	98	99	100





NOTES:

1. LOCATION OF ROCKY MOUNTAIN NATURAL GAS TRANSMISSION LINE IS APPROXIMATE. ACTUAL LOCATION TO BE DETERMINED IN THE FIELD BY TRANS-COLORADO.
2. ROCKY MOUNTAIN NATURAL GAS PIPELINE IS BURIED APPROXIMATELY 2'-2 1/2', EXCEPT UNDER THE COUNTY ROAD WHERE THE DEPTH IS 4'-8'.
3. ALL THE ABANDONED UTILITIES IN THE FORMER MILL SITE AREA HAVE NOT BEEN LOCATED. ABANDONED WATER, SEWAGE, GAS LINES AND ELECTRIC CONDUIT THAT ARE NOT SHOWN ON THIS DRAWING MAY BE ENCOUNTERED DURING CONSTRUCTION.
4. UTILITIES SHOWN ARE FOR INFORMATION ONLY. A PLAN FOR ABANDONMENT OR RELOCATION OF UTILITIES WILL BE SUBMITTED BY THE SUBCONTRACTOR AND APPROVED BY THE SITE MANAGER, AS PER SECTION 01300 OF THE SPECIFICATIONS.
5. SEE SECTION 02050 OF SPECIFICATIONS FOR ITEMS TO BE DEMOLISHED OR RELOCATED.
6. FIREHOUSE (UC-31) AND HOUSING TRAILERS (UC-42 AND 43) WILL BE RELOCATED. DORMITORY (UC-33) WILL REMAIN INTACT.
7. EXISTING FENCES WILL BE REMOVED EXCEPT FOR FENCES AROUND GAS PLANT, FLARE PIT AND TANKS.

TI APERTURE CARD

REFERENCE DRAWINGS:

SRK-PS-10-0221, RELOCATION PLAN

Also Available On
Aperture Card

LEGEND:

- +—+— EXISTING FENCE
- A— UNDERGROUND ALARM CABLE
- E— OVERHEAD ELECTRIC LINES (UNLESS NOTED OTHERWISE)
- G— UNDERGROUND GAS LINES
- T— UNDERGROUND TELEPHONE (OPTIC FIBERS)
- SS— SEWER SYSTEM
- W— UNDERGROUND WATER
- UC9 MKE DESCRIPTIVE NUMBERING SYSTEM. FOR DESCRIPTION OF STRUCTURE OR AREA SEE INFORMATION TO BIDDERS
- ⊙ FIRE HYDRANT

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SCALE FEET

U. S. DEPARTMENT OF ENERGY
ALBUQUERQUE, NEW MEXICO

SLICK ROCK SITE
SLICK ROCK, COLORADO
UNION CARBIDE PROCESSING SITE

EXISTING UTILITIES AND DEMOLITION PLAN

DESIGNED
#C
CHECKED
ELO
INSPECTED
HSC
RECOMMENDED
H. R. HARRIS
APPROVED

DATE DOE PROJECT ENGINEER DATE

MORRISON-KNUDSEN ENGINEERS, INC.
LIMITED PROJECT
1000 CALIFORNIA STREET, SAN FRANCISCO, CA 94108

PROJECT NO.
DE-AC04-83AL1879C
DRAWING NO.
SRK-PS-10-0220
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PRELIMINARY REVIEW

BY DATE

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ISSUED FOR PRELIMINARY REVIEW

REVISIONS

BY

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E.D.

CHKP

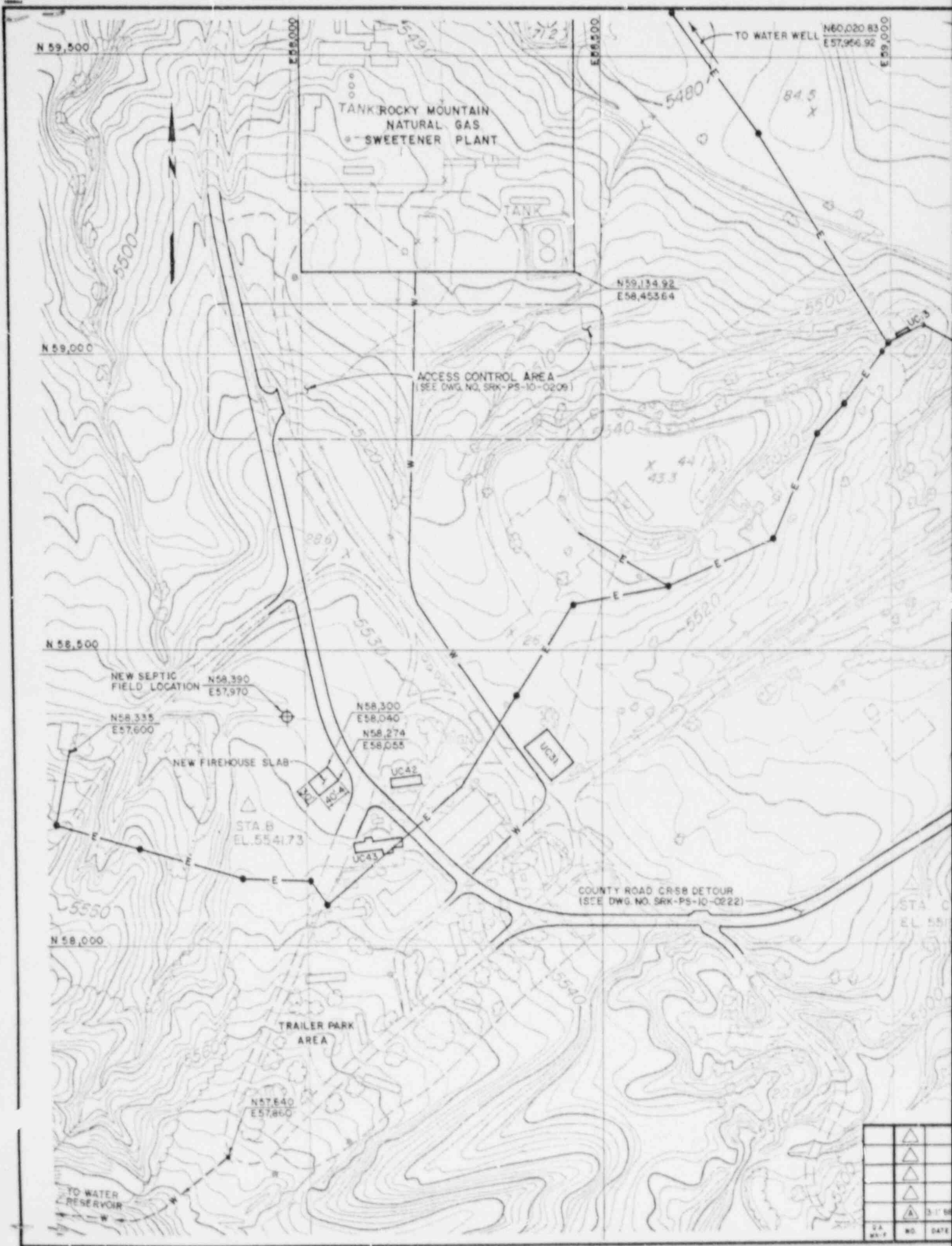
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APP





NOTES:

- SUBCONTRACTOR SHALL RELOCATE UMETCO OVERHEAD ELECTRIC SERVICE, INCLUDING THE SUBSTATION (UC131), FROM N56,680 E59,685 TO SERVICE THE MOBILE HOMES IN THE TRAILER PARK AREA, THE PRIVATE RESIDENCE LOCATED AT N58,335 E57,600 AND THE WATER WELL LOCATED AT N60,020 E57,956.92 AND THE RELOCATED FIREHOUSE.
- SAN MIGUEL ELECTRIC LINE WILL BE RELOCATED BY OTHERS.
- THE 1-INCH AND 10-INCH DIAMETER ROCKY MOUNTAIN NATURAL GAS PIPELINES AND THE ALARM CABLE WILL BE RELOCATED BY OTHERS.
- EAGLE TELECOMMUNICATION COMPANY SERVICE WILL BE RELOCATED BY OTHERS.
- EXISTING MOBILE HOMES WILL BE RELOCATED TO UNOCCUPIED SITES WITHIN THE TRAILER PARK. THE HOME SITES WILL BE RESTORED TO THEIR ORIGINAL CONDITION. NEW UTILITY SERVICE INCLUDING GAS, WATER AND ELECTRIC POWER WILL BE INSTALLED (SEE NOTES 1, 7 & 8).
- FIREHOUSE UC3 WHICH IS A 30FT x 40FT - 4 IN. BOLTED STEEL FRAME STAR BUILDING WILL BE RELOCATED AND RESTORED TO ITS EXISTING CONDITION ON A NEW CONCRETE SLAB CONSTRUCTED AT THE LOCATION SHOWN. ANY DAMAGED ELEMENTS OF THE BUILDING WILL BE REPAIRED OR REPLACED.
- SUBCONTRACTOR SHALL PROVIDE NEW NATURAL GAS PIPELINE SERVICE, 1" DIAMETER MINIMUM, FROM THE ROCKY MOUNTAIN GAS SWEETENER PLANT TO ALL OCCUPIED AND RELOCATED MOBILE HOMES.
- SUBCONTRACTOR SHALL PROVIDE NEW BURIED WATER LINE SERVICE FROM THE EXISTING LINE NEAR THE GAS PLANT TO THE EXISTING LINE SUPPLYING THE WATER RESERVOIR TANK NEAR N57,640 E57,860. DEPTH OF BURIAL SHALL BE BELOW THE LOCAL FROST DEPTH TO PREVENT FREEZING OF THE LINE IN WINTER.
- SUBCONTRACTOR SHALL DESIGN, OBTAIN PERMIT, FURNISH AND INSTALL A SEPTIC TANK SEWER SYSTEM. THE SYSTEM SHALL BE SIZED TO SERVICE 20 MOBILE DWELLING UNITS. THE SEPTIC FIELD SHALL BE LOCATED IN THE VICINITY OF N58,390 E57,970.
- ALL UTILITY RELOCATIONS SHALL BE PLACED ADJACENT TO THE DETOURED COUNTY ROAD CR-58. ALL RELOCATIONS SHALL NOT INTERFERE WITH SUBSEQUENT CONSTRUCTION.
- ALL RELOCATION WORK SHALL CONFORM TO THE SPECIFICATIONS AND STANDARDS OF SAN MIGUEL COUNTY. THE SEWER AND SEPTIC SYSTEM SHALL CONFORM TO COLORADO DEPARTMENT OF HEALTH STANDARDS.
- SUBCONTRACTOR SHALL SUBMIT ALL RELOCATION PLANS TO CONTRACTOR'S SITE MANAGER FOR APPROVAL PRIOR TO CONSTRUCTION.
- SUBCONTRACTOR SHALL BE REQUIRED TO COORDINATE CONSTRUCTION SCHEDULES WITH OTHER CONTRACTOR'S RELOCATION OPERATIONS.

REFERENCE DRAWINGS:

- SRK-PS-10-0206, SITE PLAN AND CONSTRUCTION FACILITIES
- SRK-PS-10-0209, ACCESS CONTROL AREA
- SRK-PS-10-0220, EXISTING UTILITIES AND DEMOLITION PLAN
- SRK-PS-10-0222, COUNTY ROAD CR-58 TEMPORARY DETOUR PLAN

LEGEND:

- OVERHEAD ELECTRIC LINES (UNLESS NOTED OTHERWISE)
- UNDERGROUND WATER

UKE DESCRIPTIVE NUMBERING SYSTEM. FOR DESCRIPTION OF STRUCTURE OR AREA SEE INFORMATION TO BIDDERS

PRELIMINARY REVIEW

E & D MANAGER	CHIEF ENGINEER	QA MANAGER
<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>

100 0 100 200
SCALE FEET

Also Available On
Aperture Card

U. S. DEPARTMENT OF ENERGY ALBUQUERQUE, NEW MEXICO

SLICK ROCK SITE
SLICK ROCK, COLORADO
UNION CARBIDE PROCESSING SITE

RELOCATION PLAN

DESIGNED
CHECKED
E.L.O.
INSPECTED
RECOMMENDED
APPROVED
[Signature]

DATE DATE DATE PROJECT ENGINEER DATE

MORRISON-KNUDSEN ENGINEERS, INC.
A MORRISON-KNUDSEN COMPANY
UMTRA PROJECT
860 HOPKINS ST. SAN FRANCISCO, CA 94103

PROJECT NO.
DE-AC04-83AL18796

DRAWING NO. SRK-PS-10-0221 REV. A

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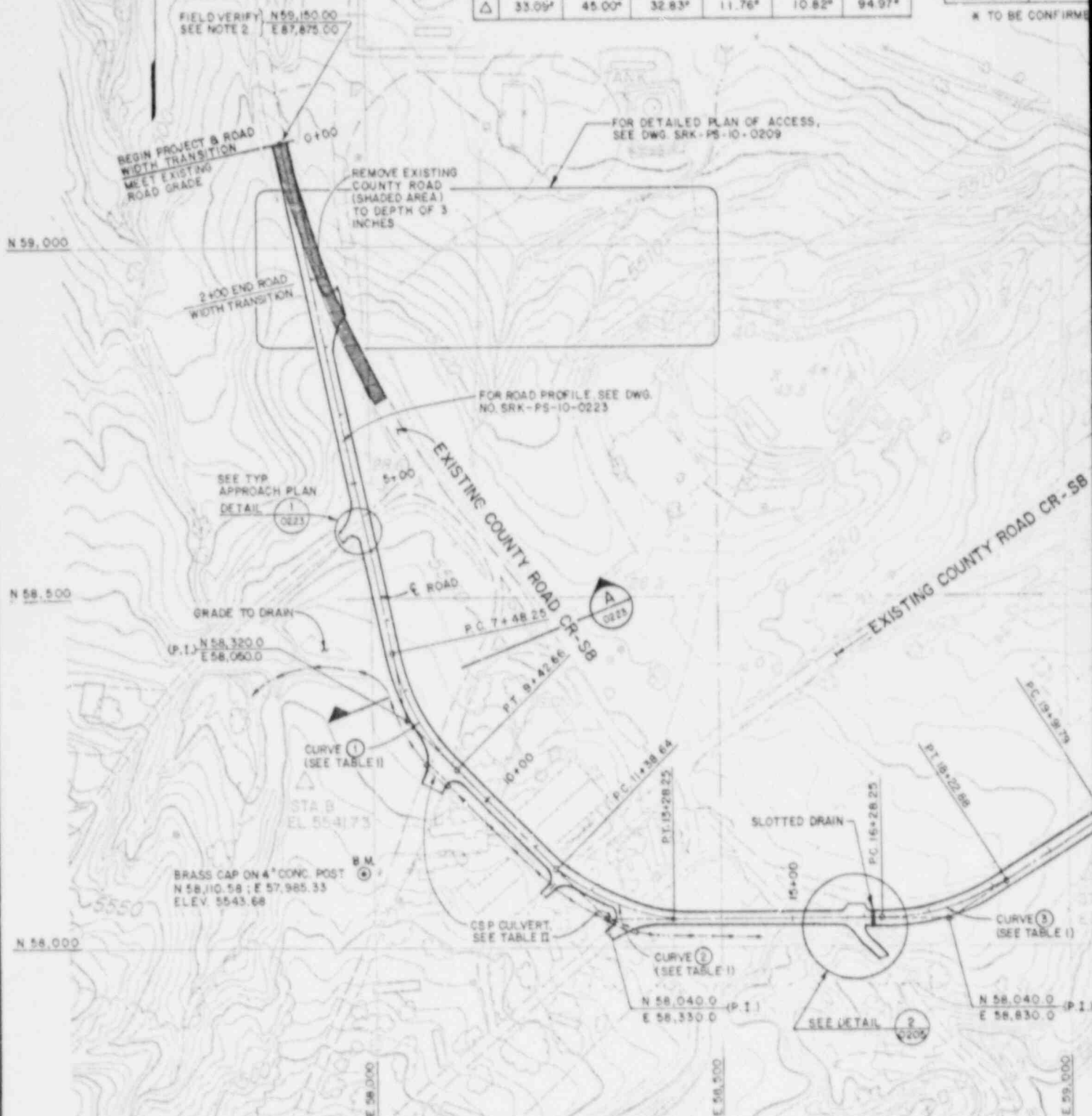
REVISIONS

BY CR E&D CHIEF TAC DUE

TABLE I: HORIZONTAL CURVE DATA						
	CURVE 1	CURVE 2	CURVE 3	CURVE 4	CURVE 5	CURVE 6
R	336.58'	241.42'	339.46'	938.05'	1055.92'	91.68'
L	194.41'	189.61'	194.63'	199.25'	199.40'	151.97'
T	100.00'	100.00'	100.00'	100.00'	100.00'	100.00'
Δ	33.09°	45.00°	32.83°	11.76°	10.82°	94.97°

CULVERT LOCATION (STA.)	APPROX. LENGTH (F.T.)*
25' OFFSET FROM 9+25	50
25' OFFSET FROM 12+50	40

* TO BE CONFIRMED



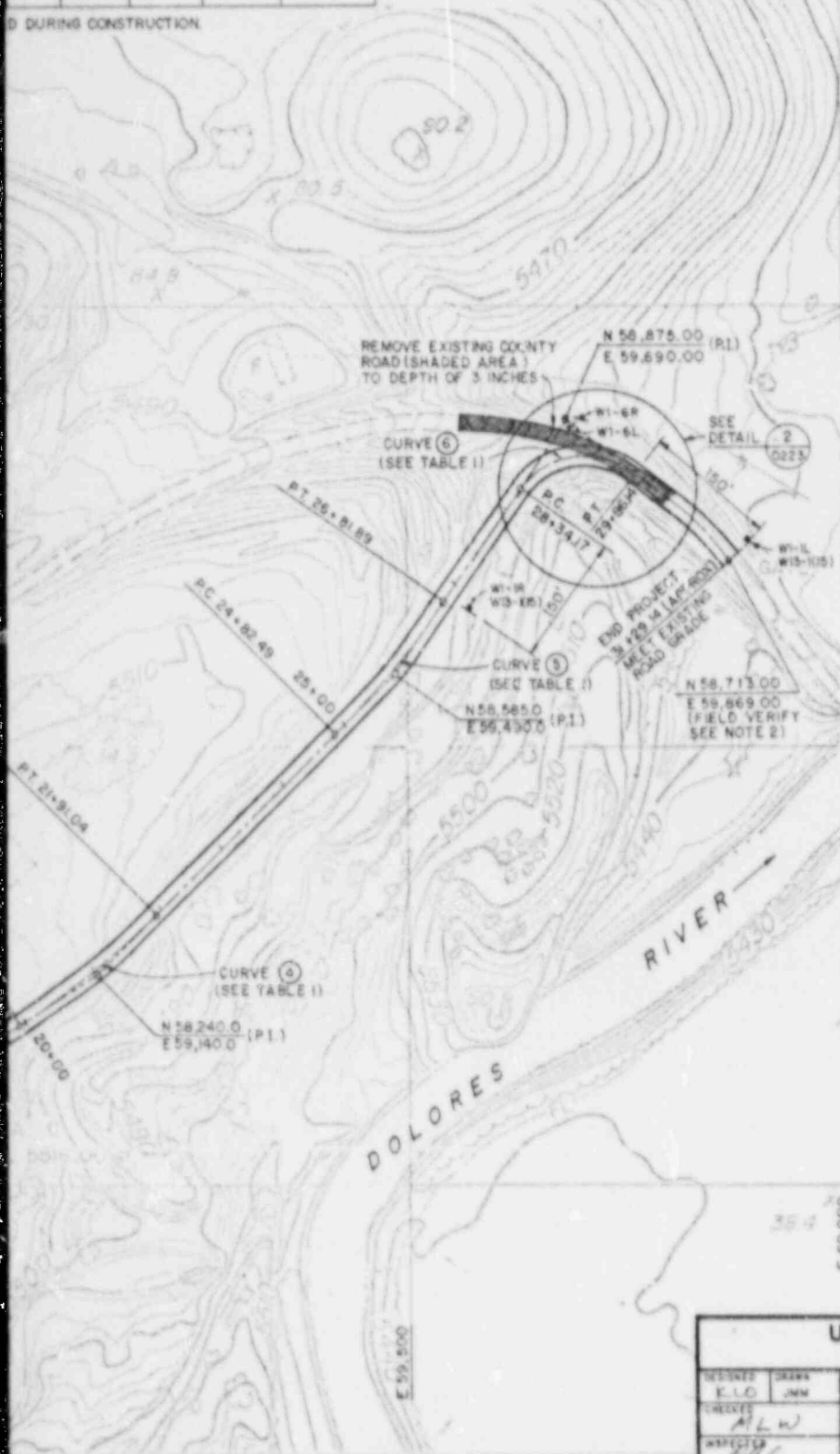
PRELIMINARY REVIEW		
E.S.D. MANAGER	CHIEF ENGINEER	QA MANAGER
<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
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TABLE II: CULVERT DATA

CSP SIZE (IN.)	APPROX. INVERT EL. (FT.)		APPROX. SKEW (DEG)	MIN. COVER HEIGHT (FT.)
	INLET	OUTLET		
18	5535.0	5534.6	26° RT	1.0
12	5535.5	5535.2	28° LT	1.0

D DURING CONSTRUCTION



NOTES:

- TOPOGRAPHY PREPARED BY OLYMPIA AERIAL SURVEYS, INC., SALT LAKE CITY UTAH, MAP DATED SEPT. 1, 1982 AND U.S.G.S. 7 1/2 MIN. HORSE RANGE MESA QUADRANGLE, DATED 1960.
- ALL COORDINATES, BEARINGS, AND OTHER PERTINENT DATA THAT ARE NECESSARY FOR THE LAYOUT OF THE DETOURED ROAD, ARE TO BE FIELD VERIFIED PRIOR TO BEGINNING DETOUR CONSTRUCTION.
- BENCHMARK ELEVATION IS DERIVED FROM U.S. GEOLOGICAL SURVEY B.M. 5587, ELEV. 5587.41, COORDINATES N56,682.40, E59,244.50.
- LOCATE ALL SIGNS IN FIELD TO PROVIDE MAXIMUM VISIBILITY FOR APPROACHING VEHICLES.
- ROAD SIGNS SHALL CONFORM TO THE FOLLOWING:
DEPT. OF HWYS., STATE OF COLORADO STD S-614-2, GROUND SIGN INSTALLATIONS.
DEPT. OF HWYS., STATE OF COLORADO STD S-614-1, TYPICAL GROUND SIGN PLACEMENT.



W1-6L

46" x 24"



30" x 30"

15
MPH

24" x 24"

W1-1L
W13-1(15)

REFERENCE DRAWINGS:

- SRK-GE-10-0205, HAUL ROAD BETWEEN NORTH CONTINENT AND UNION CARBIDE MILL AREAS
SRK-PS-10-0206, SITE PLAN AND CONSTRUCTION FACILITIES
SRK-PS-10-0209, ACCESS CONTROL AREA
SRK-PS-10-0223, COUNTY ROAD CR-S8 TEMPORARY DETOUR PROFILE, SECTIONS AND DETAILS

TI
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CARD

Also Available On
Aperture Card

LEGEND:

- PC - POINT OF CURVATURE
PT - POINT OF TANGENCY
PI - POINT OF INTERSECTION
Δ - INTERSECTION ANGLE
R - RADIUS OF CIRCULAR CURVE
L - LENGTH OF CIRCULAR CURVE
T - TANGENT LENGTH
BM - BENCHMARK
CSP - CORRUGATED STEEL PIPE
LT - LEFT
RT - RIGHT

--- CENTERLINE DRAINAGE DITCH

--- ROAD CENTERLINE

8804110022-22

100 0 100 200
SCALE FEET

U. S. DEPARTMENT OF ENERGY
ALBUQUERQUE, NEW MEXICO

DESIGNED
K.L.O.
CHECKED
J.M.M.
INSPICED
M.L.W.
APPROVED
H.A. Chan

SLICK ROCK SITE
SLICK ROCK, COLORADO
UNION CARBIDE PROCESSING SITE

COUNTY ROAD CR-S8 TEMPORARY
DETOUR PLAN

APPROVED

DATE

DOE PROJECT ENGINEER

DATE



MORRISON-KNUDSEN ENGINEERS, INC.

UNTRA PROJECT

800 NORTH 1ST ST. SAN FRANCISCO, CA 94108

PROJECT NO.

DE-AC04-83AL18796

DRAWING NO.

SRK-PS-10-0222

REV.

A

ISSUED FOR PRELIMINARY REVIEW

REVISIONS

BY

CK

CSD

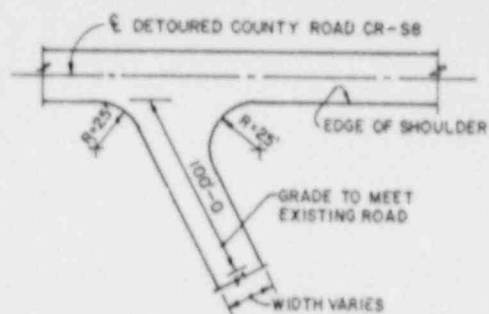
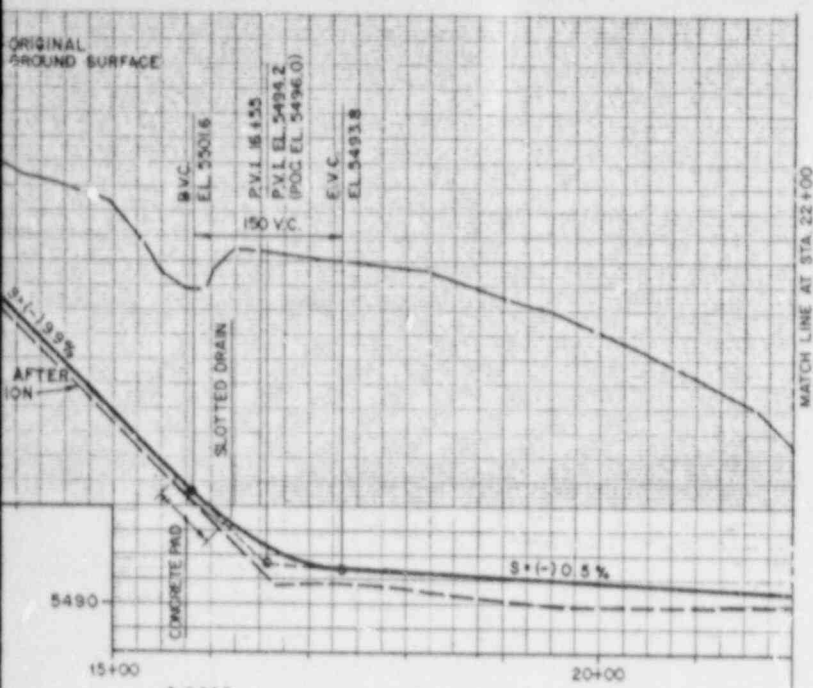
CHIEF

ENG.

TAC

DIA

7/8



TYPICAL APPROACH

PLAN DETAIL

NOT TO SCALE

0222

NOTES:

- SUBBASE AND BASE COURSES SHALL CONFORM TO SECTION III.0 OF THE DRAFT DESIGN STANDARDS AND CONSTRUCTION SPECIFICATIONS FOR ROAD CONSTRUCTION IN SAN MIGUEL COUNTY.
- PERMANENT RELOCATION OF COUNTY ROAD CR-S8 IS BY OTHERS.

REFERENCE DRAWINGS:

- SRK-PL-10-0206, SITE PLAN AND CONSTRUCTION FACILITIES
- SRK-PS-10-0209, ACCESS CONTROL AREA
- SRK-PS-10-0222, COUNTY ROAD CR-S8 TEMPORARY DETOUR PLAN

LEGEND:

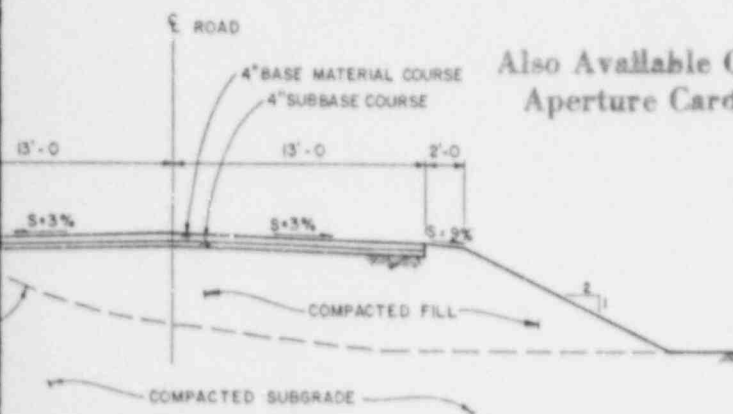
- P.C. POINT OF CURVATURE
- P.T. POINT OF TANGENCY
- P.I. POINT OF INTERSECTION
- P.V.I. POINT OF VERTICAL INTERSECTION
- P.O.C. POINT ON CURVE
- B.V.C. BEGIN VERTICAL CURVE
- E.V.C. END VERTICAL CURVE
- EXCAVATION
- EMBANKMENT
- ROAD CENTERLINE

L ROAD CROSS-SECTION

A

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STA. 28 + 64.57

CROSS-SECTION

B

SCALE FEET

U. S. DEPARTMENT OF ENERGY
ALBUQUERQUE, NEW MEXICO

SLICK ROCK SITE
SLICK ROCK, COLORADO
UNION CARBIDE PROCESSING SITE

COUNTY ROAD CR-S8 TEMPORARY
DETOUR PROFILE, SECTIONS AND DETAILS

DESIGNED
E.D.
CHECKED
M.L.W.
INSPECTED
R.C.
RECOMMENDED
S.P. / J.M.
APPROVED

DATE

SEE PROJECT SHEET

DATE

MORRISON-KNUDSEN ENGINEERS, INC.
A MORRISON-KNUDSEN COMPANY
ULTRA PROJECT
80 HOWARD ST. SAN FRANCISCO, CA 94102

PROJECT NO.
DE-AC04-83AL18796

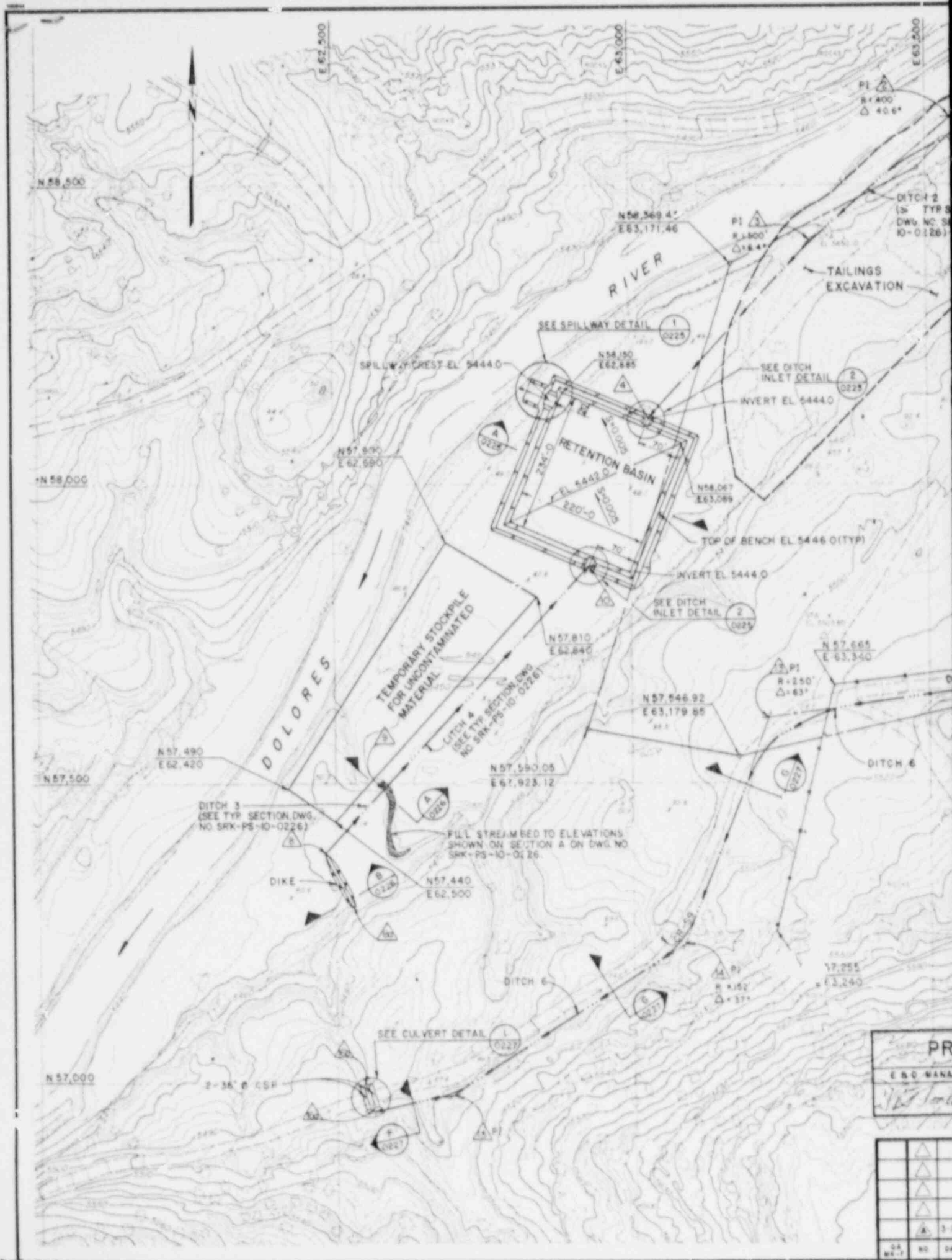
DRAWING NO.
SRK-PS-10-0223

REV.
A

ISS. cv FOR PRELIMINARY REVIEW

REVISIONS

BY CK E.D. CHIEF E.N. TAC REV CDE APP



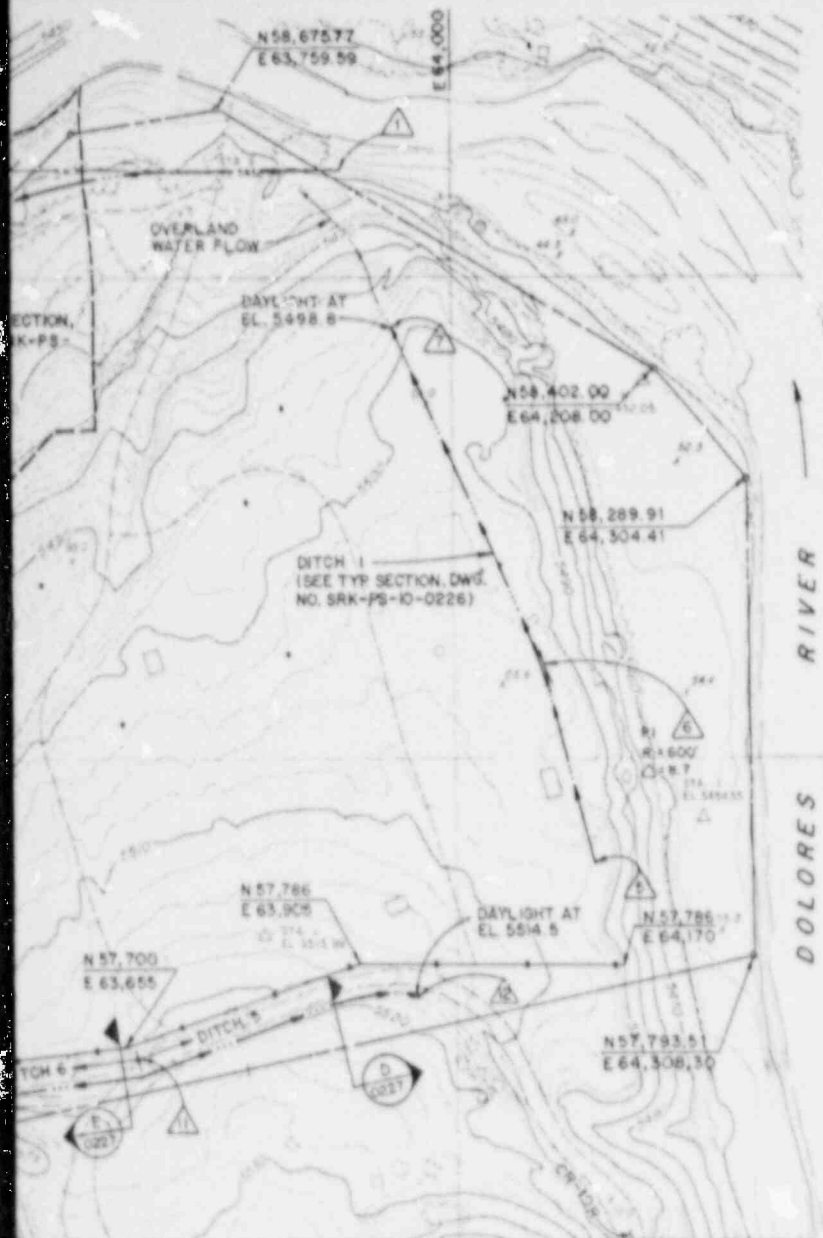


TABLE 1 - TEMPORARY DRAINAGE DITCHES

DITCH NO.	CONTROL POINTS	COORDINATES		INVERT ELEVATION (FT.)
		NORTH	EAST	
2	1	N58,610	E63,888	5449.2
2	2 PI	N58,610	E63,545	---
2	3 PI	N58,400	E63,300	---
2	4	N58,110	E63,030	5444.0
1	5	N57,885	E64,143	5501.5
1	6 PI	N58,090	E64,090	---
1	7	N58,440	E63,950	5498.8
3	8	N57,382	E62,483	5449.0
DIKE	9a	N57,295	E62,530	---
3&4	9	N57,500	E62,590	5448.2
4	10	N57,863	E62,928	5445.7
5&6	11	N57,670	E63,670	5516.0
5	12	N57,755	E63,920	5514.5
6	13 PI	N57,610	E63,230	---
6	14 PI	N57,235	E63,090	---
7	15 PI	N56,980	E62,695	---
CULVERT CHANNEL	16a	N56,950	E62,565	5488.0
	16b	N57,000	E62,550	5187.5

NOTE:

1. FOR DITCH 6, THE GRADE BETWEEN CONTROL POINTS 11 AND 15 WILL VARY. THE GRADE WILL GENERALLY FOLLOW GROUND CONTOURS BUT NOT LESS THAN 0.005 SLOPE.
2. SUBCONTRACTOR MAY VARY DITCH ALIGNMENT TO SUIT THE LOCAL TERRAIN.

REFERENCE DRAWINGS:

- SRK-GE-10-0203, FENCE AND GATE DETAILS
- SRK-GE-10-0205, HAUL ROAD BETWEEN NORTH CONTINENT AND UNION CARBIDE MILL AREAS
- SRK-PS-10-0225, WASTEWATER RETENTION BASIN-SECTIONS AND DETAILS
- SRK-PS-10-0226, TEMPORARY DRAINAGE DITCHES-PROFILES AND SECTIONS (SHEET 1 OF 2)
- SRK-PS-10-0227, TEMPORARY DRAINAGE DITCHES-PROFILES AND SECTIONS (SHEET 2 OF 2)

LEGEND:

- CENTERLINE OF TEMPORARY DITCH
- ELEVATION
- TEMPORARY DRAINAGE CONTROL POINT
- 4-STRAND BARBED WIRE FENCE
- SITE BOUNDARY
- CULVERT

TABLE 2
MINIMUM DEPTHS

DITCH NO.	DEPTH (FT.)
1	2.0
2	2.5
3	2.0
4	2.0
5	2.0
6	2.0
CULVERT CHANNEL	4.0

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CARD

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Aperture Card

100 0 100 200
SCALE FEET

ELIMINARY REVIEW

CHIEF ENGINEER	QA MANAGER
<i>[Signature]</i>	<i>[Signature]</i>

U. S. DEPARTMENT OF ENERGY
ALBUQUERQUE, NEW MEXICO

SLICK ROCK SITE
SLICK ROCK, COLORADO
NORTH CONTINENT PROCESSING SITE

SITE PLAN AND
TEMPORARY SITE DRAINAGE PLAN

DESIGNED BY
DRAWN BY
CHECKED BY
E.L.O.
REVIEWED BY
P.S.C.
APPROVED BY
K.E. Thim

DATE DOE PROJECT ENGINEER

MORRISON-KNUDSEN ENGINEERS, INC.
A MORRISON-KNUDSEN COMPANY
UMTRA PROJECT
80 HUMBOLDT ST. SAN FRANCISCO, CA 94103

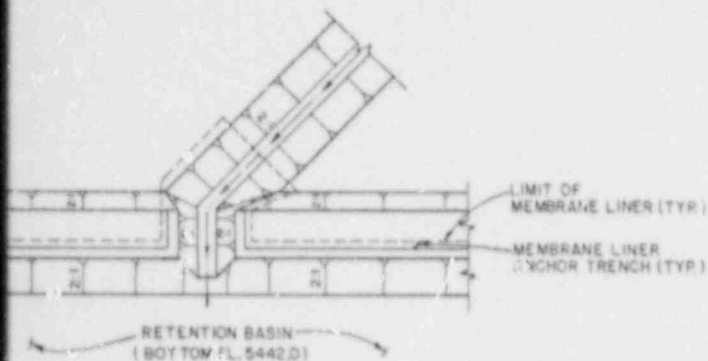
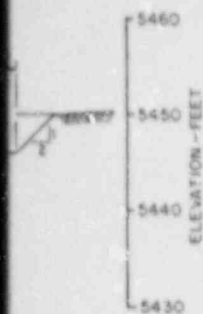
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DE-AC04-83AL1796
DRAWING NO.
SRK-PS-10-0224
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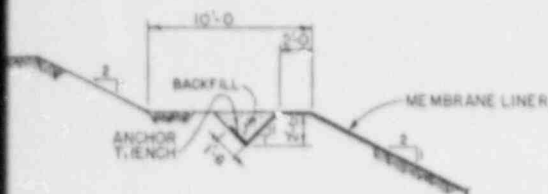
REVISIONS

BY OR L&D MGR. CHIEF ENG. T&E MGR. DOE APP.

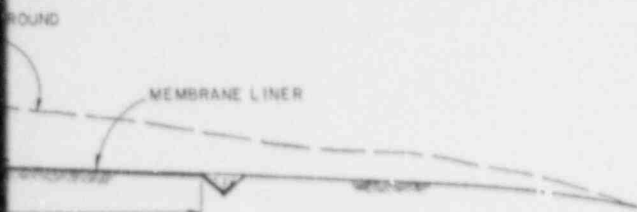
		
		
		
		
		
QA	NO.	DATE



TYPICAL DITCH INLET DETAIL (2)
NOT TO SCALE 0224



TYPICAL ANCHOR TRENCH DETAIL (3)
NOT TO SCALE



SECTION B

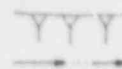
REFERENCE DRAWINGS:

SRK-PS-10-0224, SITE PLAN AND TEMPORARY SITE DRAINAGE PLAN

TI
APERTURE
CARD

Also Available On
Aperture Card

LEGEND:



EXCAVATION

CENTERLINE OF TEMPORARY DITCH

8 8 0 4 1 1 0 0 2 2 - 2 5

PRELIMINARY REVIEW

END MANAGER	CHIEF ENGINEER	QA MANAGER
<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>

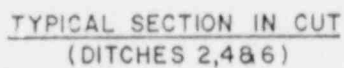
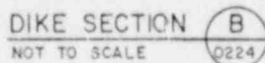
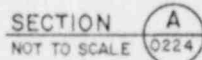
U. S. DEPARTMENT OF ENERGY
ALBUQUERQUE, NEW MEXICO

SLICK ROCK SITE
SLICK ROCK, COLORADO
NORTH CONTINENT PROCESSING SITE

WASTEWATER RETENTION BASIN
SECTIONS AND DETAILS

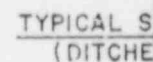
DESIGNED <i>[Signature]</i>	DRAWN <i>[Signature]</i>
CHECKED <i>[Signature]</i>	
APPROVED <i>[Signature]</i>	

MORRISON-KNUDSEN ENGINEERS, INC. A BATHURST COMPANY LIMITED PROJECT 40 HOPKINS ST. SAN FRANCISCO, CA 94102	PROJECT NO. DE-AC04-S3AL18796
ISSUED FOR PRELIMINARY REVIEW	DRAWING NO. SRK-PS-10-0225
REVISIONS	REV A








NOT TO SCALE

NOTE:
'D' = DEPTH (VARIES)
(SEE TABLE 2 ON DWG.
NO. SRK-PS-10-0224)

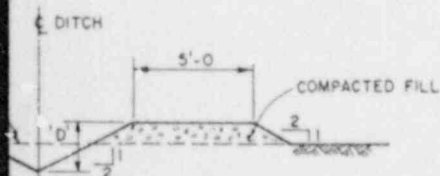


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Aperture Card

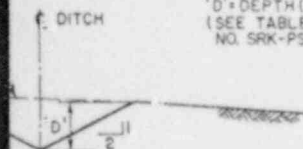
SRK-PS-10-0224, SITE PLAN AND TEMPORARY SITE DRAINAGE PLAN



ACTION IN FILL

NOTE:

'D' = DEPTH (VARIES)
(SEE TABLE 2 ON DWG.
NO. SRK-PS-10-0224)



SECTION IN CUT
(S 1, 3 & 5)

TO SCALE

ESD MANAGER	CHIEF ENGINEER	QA MANAGER
<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>

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U. S. DEPARTMENT OF ENERGY
ALBUQUERQUE, NEW MEXICO

SLICK ROCK SITE
SLICK ROCK, COLORADO
NORTH CONTINENT PROCESSING SITE

TEMPORARY DRAINAGE DITCHES
PROFILES AND SECTIONS
(SHEET 1 OF 2)

DESIGNED MLW	DRAWN RDB
CHECKED KLS	
INSPECTED RJC	
RECOMMENDED E. R. Thiers	

△ 2007年10月1日施行

Test	Score
1	85
2	78
3	92
4	88
5	75
6	82
7	90
8	87
9	79
10	84
11	91
12	86
13	77
14	83
15	93
16	89
17	76
18	81
19	94
20	80

DOE PROJECT ENGINEER

1999

MORRISON-KNUDSEN ENGINEERS, INC.

JMTRA PROJECT

200 HOWARD ST. SAN FRANCISCO, CA 94105

PROJECT NO.	
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DE-AC04-83AL18796

DRAWING NO.

SRK-PS-10-0226

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ISSUED FOR PRELIMINARY REVIEW

REVISIONS

BY

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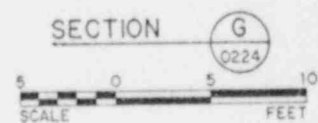
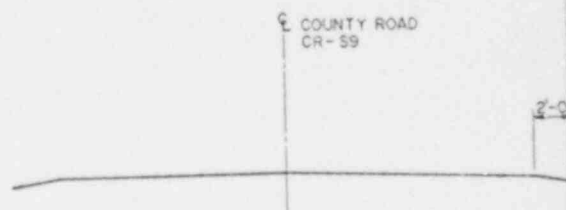
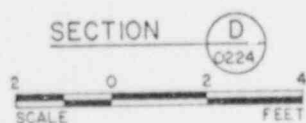
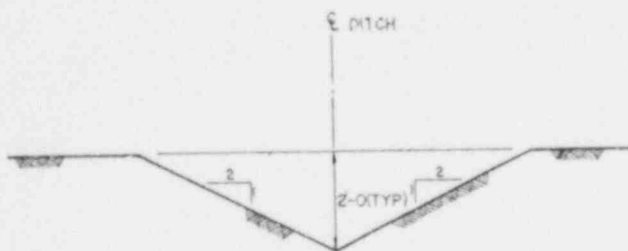
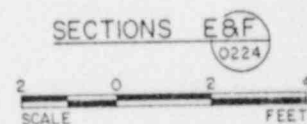
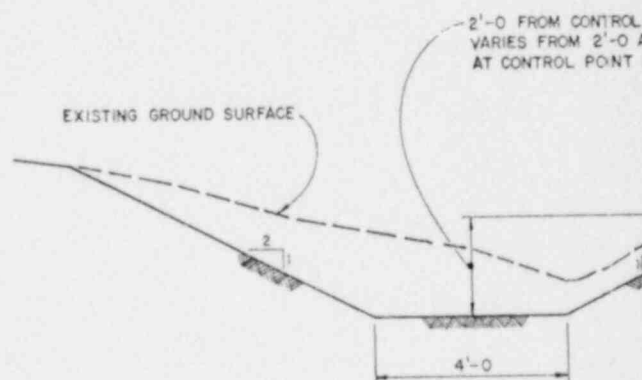
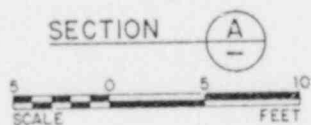
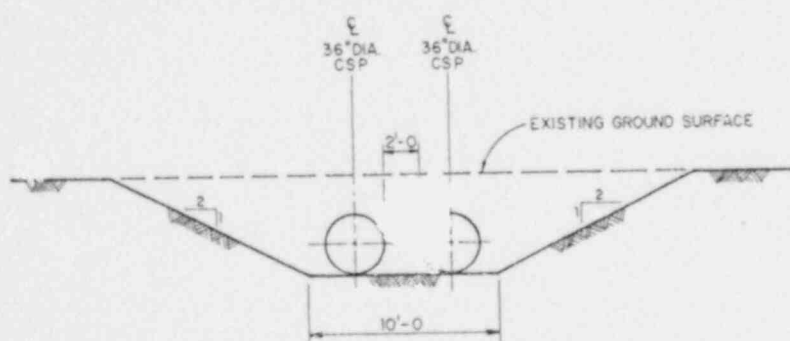
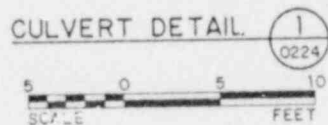
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


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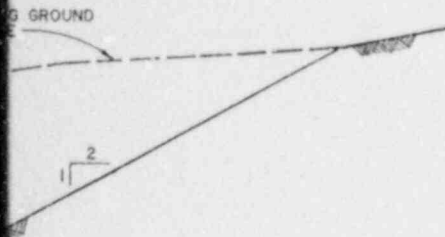
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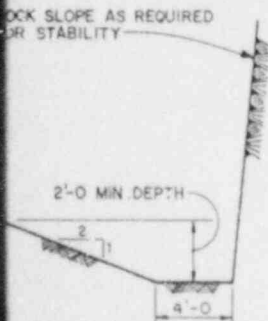
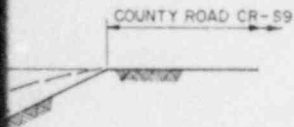


		
		
		
		
		
QA	NO.	D.

NOTES:



POINT 11 TO CONTROL POINT 15.
CONTROL POINT 15 TO 4'-0"



REFERENCE DRAWINGS:

SRK-PS-10-0224, SITE PLAN AND TEMPORARY SITE DRAINAGE PLAN

LEGEND:

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Also Available On
Aperture Card

8804110022-27

PRELIMINARY REVIEW

E B D MANAGER	CHIEF ENGINEER	QA MANAGER
<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>

**U. S. DEPARTMENT OF ENERGY
ALBUQUERQUE, NEW MEXICO**

DESIGNED <i>MLD</i>	DRAWN <i>JMY</i>
CHECKED <i>CLD</i>	
INSPECTED <i>ABC</i>	
APPROVED <i>S. R. Thiers</i>	

SLICK ROCK SITE
SLICK ROCK, COLORADO
NORTH CONTINENT PROCESSING SITE

**TEMPORARY DRAINAGE DITCHES
PROFILES AND SECTIONS
(SHEET 2 OF 2)**

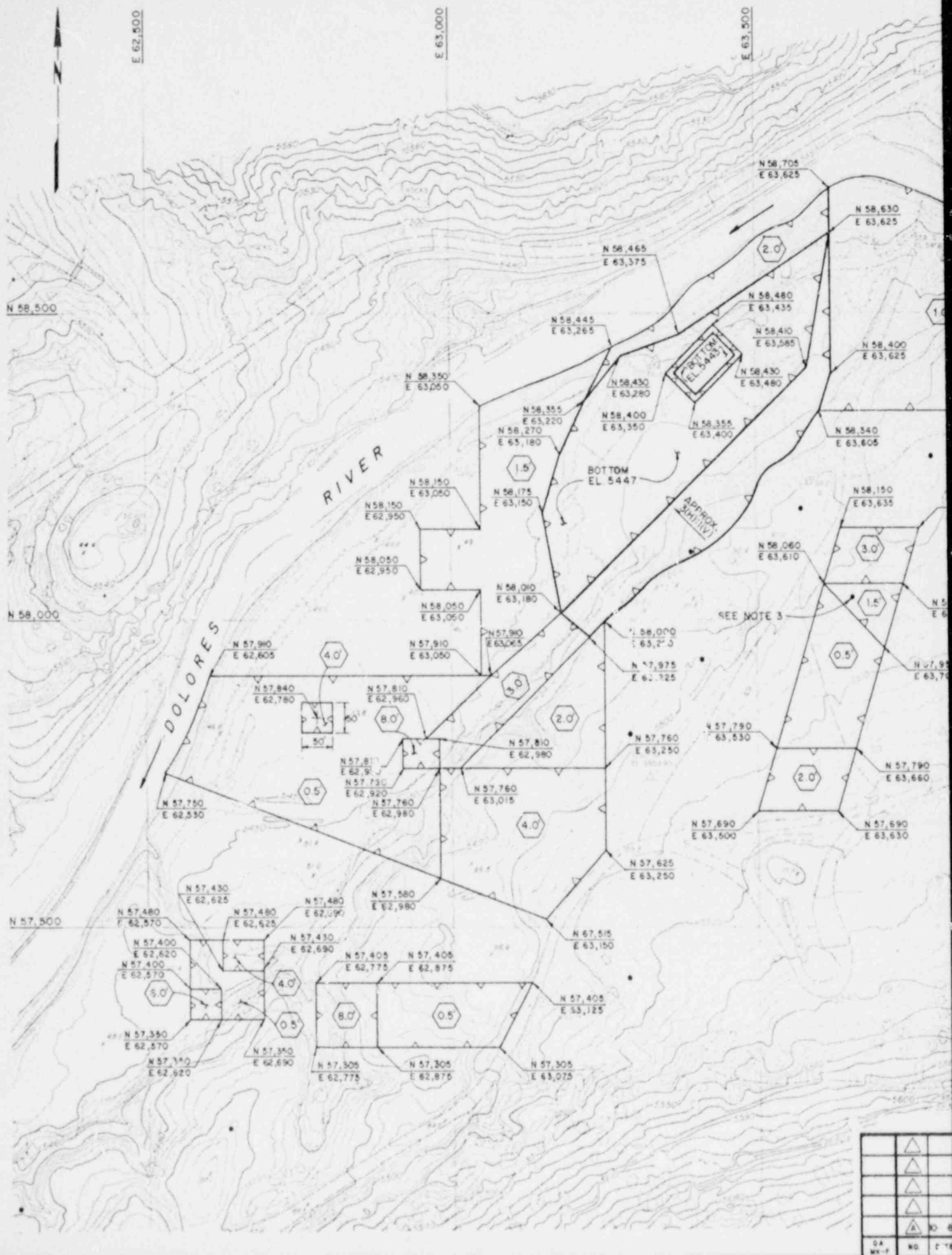
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PROJECT NO. DE-AC04-83AL18796		DRAWING NO. SRK-PS-10-0227	
REV. A			

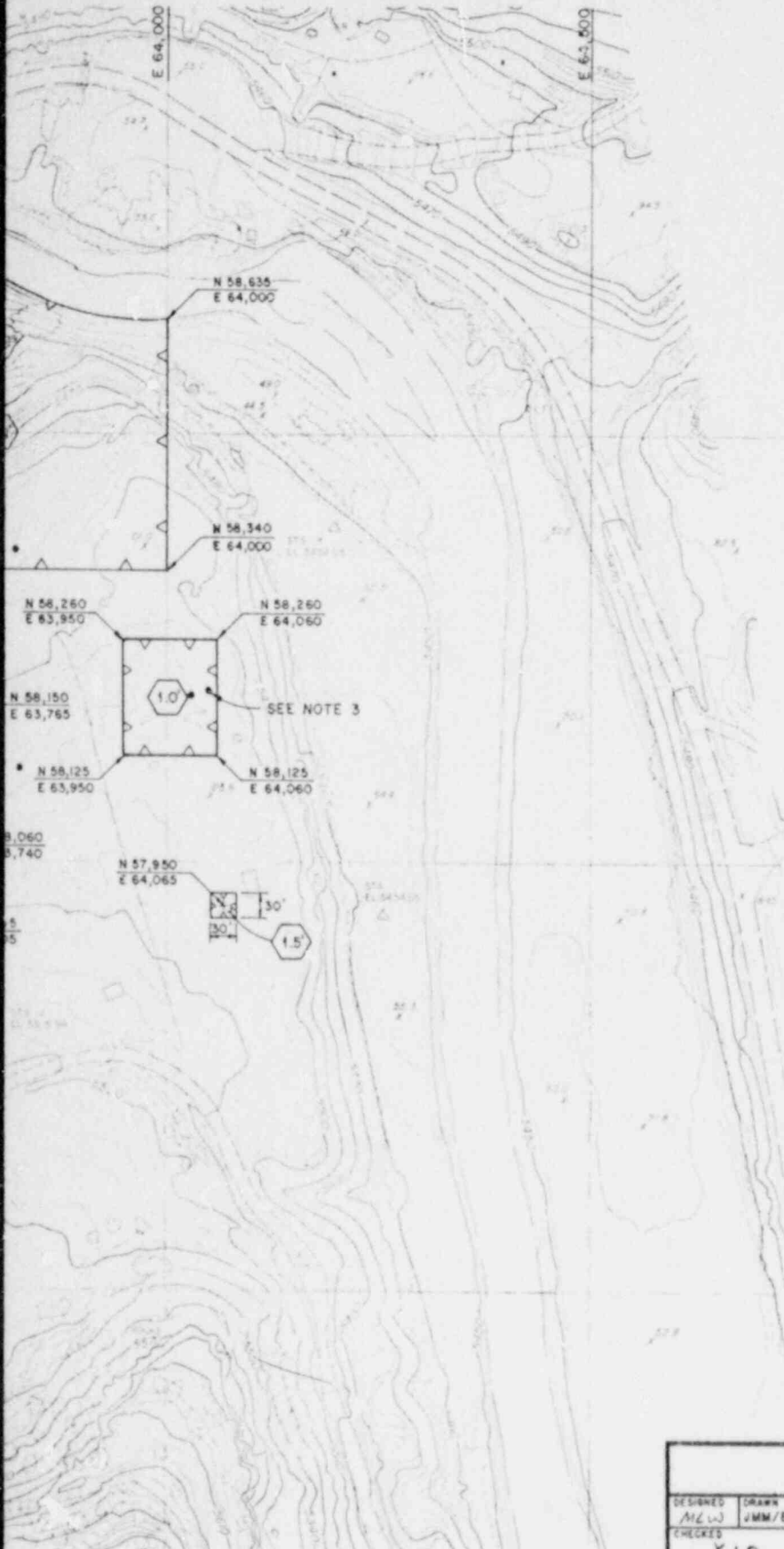
ISSUED FOR PRELIMINARY REVIEW

REVISIONS

BY CK EBD CHIEF TAC DOE

MORRISON-KNUDSEN ENGINEERS, INC.
UMTRA PROJECT
80 HOWARD ST. SAN FRANCISCO, CA 94105





NOTES:

1. ALL CUTS SHALL BE 2(H):1(V) UNLESS OTHERWISE NOTED.
2. FINAL EXCAVATION LIMITS TO BE DETERMINED IN THE FIELD.
3. MATERIAL WITHIN 5 FEET OF EXISTING POWER LINE POLES SHALL BE LEFT IN PLACE.

REFERENCE DRAWINGS:

SRK-PS-10-0229, FINAL SITE GRADING PLAN
 SRK PS 10 0230, BORINGS AND TEST PITS LOCATION PLAN

TI APERTURE CARD

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LEGEND:

- EXCAVATION
- LIMIT AND DEPTH IN FEET OF WINDBLOWN CONTAMINATED MATERIAL
- EXISTING POWER LINE POLE

8804110022-28

PRELIMINARY REVIEW

EBD MANAGER	CHIEF ENGINEER	QA MANAGER
<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>

100 0 100 200
 SCALE FEET

U. S. DEPARTMENT OF ENERGY ALBUQUERQUE, NEW MEXICO

DESIGNED MELW	DRAWN JMM/EG
CHECKED KID	
INSPECTED HDL	
RECOMMENDED H.P. S. BILM	
APPROVED	

SLICK ROCK SITE
 SLICK ROCK, COLORADO
 NORTH CONTINENT PROCESSING SITE

CONTAMINATED MATERIAL EXCAVATION PLAN

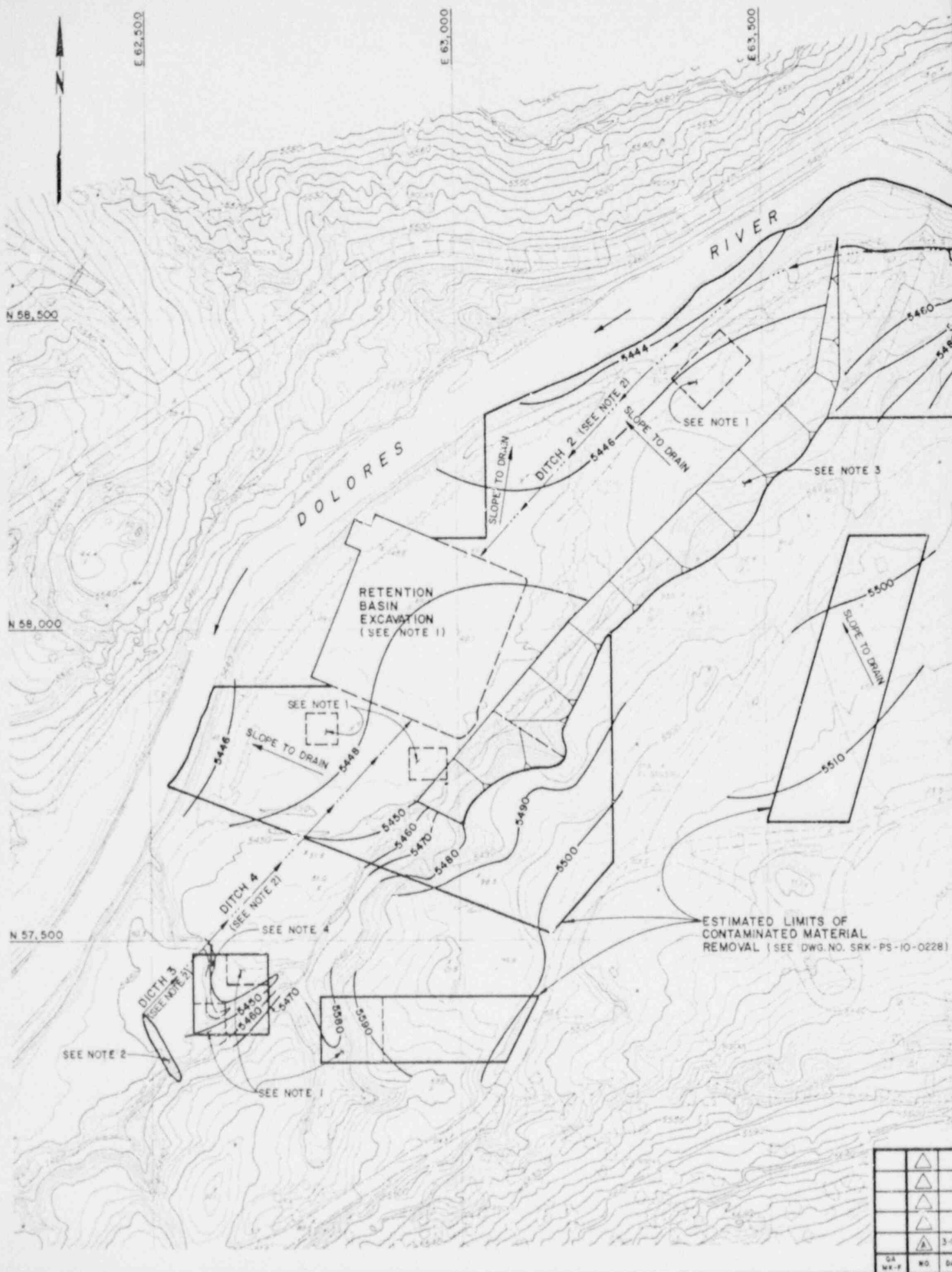
MORRISON-KNUDSEN ENGINEERS, INC.
 A BIRMINGHAM ENGINEERING COMPANY
 UMTRA PROJECT
 80 HERRARD ST. SAN FRANCISCO, CA 94104

PROJECT NO.
 DE-AC04-83AL18796
 DRAWING NO.
 SRK-PS-10-0228
 REV
 A

ISSUED FOR PRELIMINARY REVIEW

REVISIONS

BY CK EBD CHIEF TAC DGE
 WSR ENG REV APP





NOTES:

- EXCAVATIONS THAT ARE BELOW ADJACENT GRADE, INCLUDING ABANDONED CESSPOOLS SHALL BE BACKFILLED TO MATCH ADJACENT GRADES.
- CONTAMINATED MATERIALS FROM TEMPORARY DITCHES AND RETENTION BASIN SHALL BE REMOVED AND PLACED IN THE DISPOSAL EMBANKMENT AT THE UNION CARBIDE SITE. TEMPORARY DITCHES NOS. 1, 2, 3, AND 4 SHALL BE BACKFILLED TO MATCH ADJACENT GRADES. Dikes FOR THESE DITCHES SHALL BE LEVELED.
- FINAL ROCK CUTS SHALL BE GRADED NO STEEPER THAN 1(H):1(V). FINAL SLOPES FOR EARTH CUTS SHALL BE NO STEEPER THAN 3(H):1(V).
- BACKFILL IN DRAINAGE COURSE SHALL BE REMOVED AND COURSE REGRADED TO DRAIN.
- ALL EXCAVATED AREAS SHALL BE GRADED TO DRAIN. FINAL SLOPES SHALL BE NO STEEPER THAN 3(H):1(V) EXCEPT FOR ROCK CUTS.
- DITCH NOS. 5 AND 6, AND THE CULVERT CHANNEL DO NOT REQUIRE REGRADEING.
- FOR LOCATION OF DITCHES AND RETENTION BASIN SEE DWG. NO. SRK-PS-10-0224.
- ALL NATURAL DRAINAGE COURSES THAT EXISTED PRIOR TO REMOVAL OF CONTAMINATED SOILS SHALL BE RESTORED.
- FINISHED GRADE CONTOURS ARE APPROXIMATE AND MAY BE ADJUSTED BASED ON FINAL CONTOURS AFTER REMOVAL OF CONTAMINATED MATERIALS.
- THE RETENTION BASIN AT THE N.C. SITE IS TO REMAIN AND SERVE AS A RESERVE BASIN FOR THE U.C. SITE RETENTION BASIN, UNTIL THE U.C. SITE BASIN IS REMOVED.

TI APERTURE CARD

REFERENCE DRAWINGS:

SRK-PS-10-0224, SITE PLAN AND TEMPORARY SITE DRAINAGE PLAN
SRK-PS-10-0225, CONTAMINATED MATERIAL EXCAVATION PLAN

Also Available On
Aperture Card

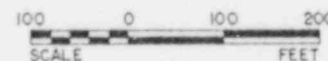
PRELIMINARY REVIEW

END MANAGER	CHIEF ENGINEER	QA MANAGER
<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>

LEGEND:

	EXCAVATION
	LIMIT OF CONTAMINATED MATERIAL REMOVAL
	TEMPORARY DRAINAGE DITCH
	FINISHED GRADE CONTOUR

8804110022-29



U. S. DEPARTMENT OF ENERGY ALBUQUERQUE, NEW MEXICO

DESIGNED C.D.	DRAWN C.C.R.
CHECKED MLW	
INSPECTED H.C.	
RECOMMENDED R.B. Thiers	
APPROVED	

SLICK ROCK SITE
SLICK ROCK, COLORADO
NORTH CONTINENT PROCESSING SITE

FINAL SITE GRADING PLAN

MORRISON-KNUDSEN ENGINEERS, INC.
A MORRISON-KNUDSEN COMPANY
UMTRA PROJECT
80 HENRIARD ST. SAN FRANCISCO, CA 94103

PROJECT NO.
DE-AC04-83AL18796
DRAWING NO.
SRK-PS-10-0229
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A

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REVISIONS

BY CR END MOR CHIEF ENG TAC REV DOE APP



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Aperture Card

PRELIMINARY REVIEW		
E & D MANAGER	CHIEF ENGINEER	QA MANAGER
<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>

LEGEND:

- ◆ SRN-T2 BORINGS (1987)
- ⊙ 202 BORINGS (JACOBS, 1985)
- 501 MONITOR WELLS
- ◆ SRN-S2 TEST PITS (1987)
- ⊕ 727 TEST PITS (1986)
- ⊙ BRASS CAP SET IN CONCRETE POST

8 8 0 4 1 1 0 0 2 2 - 3 0



U. S. DEPARTMENT OF ENERGY
ALBUQUERQUE, NEW MEXICO

SLICK ROCK SITE
SLICK ROCK, COLORADO
NORTH CONTINENT PROCESSING SITE

BORINGS AND TEST PITS LOCATION PLAN

DESIGNED K.D.	DRAWN E.G.
CHECKED M.L.W.	
INSPCTD H.A.C.	
RECOMMENDED S.R. Thiers	
APPROVED	DATE

DOE PROJECT ENGINEER DATE



MORRISON-KNUDSEN ENGINEERS, INC.
UMTRA PROJECT
800 HOWARD ST. SAN FRANCISCO, CA 94105

PROJECT NO.
DE-AC04-83AL18796

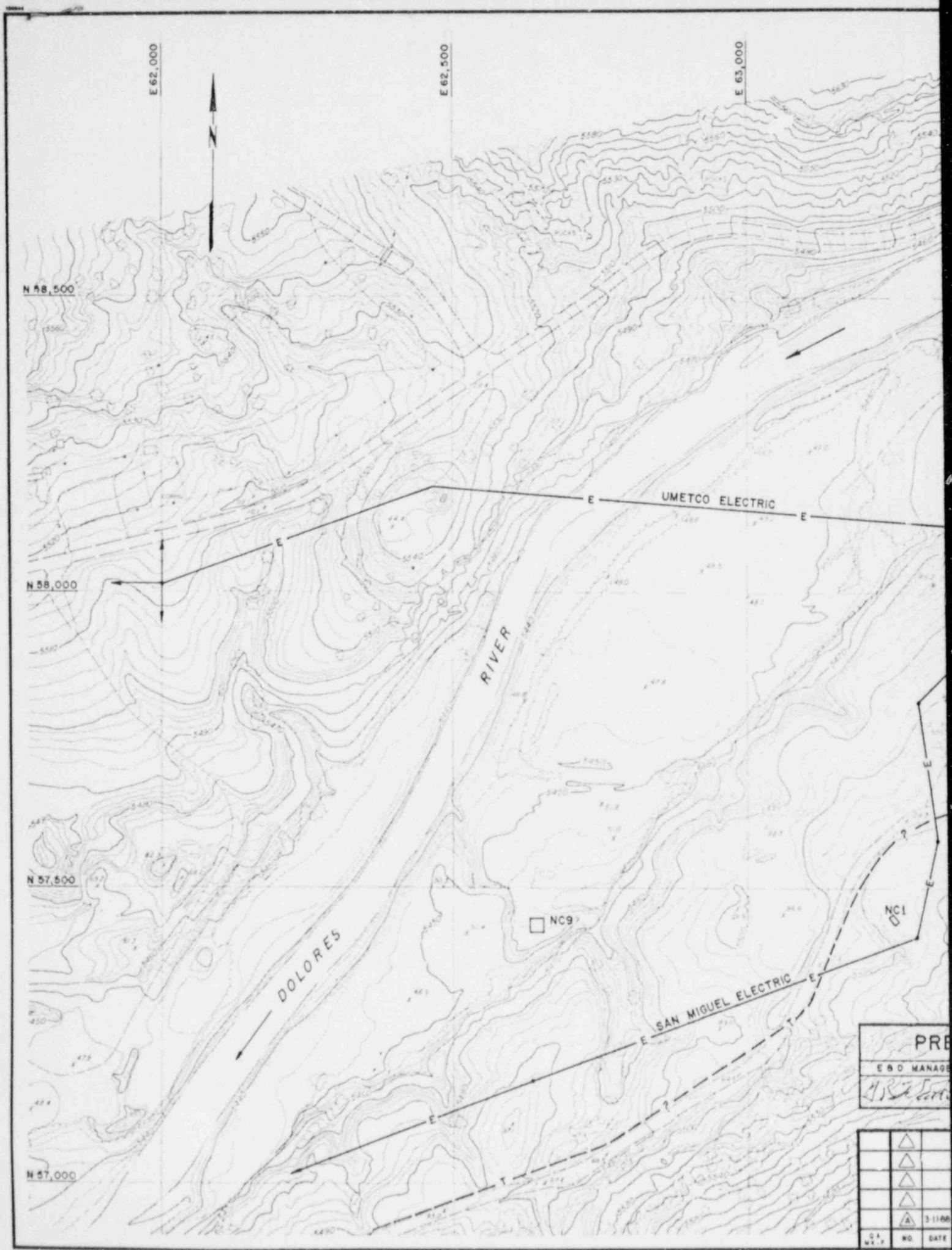
DRAWING NO.
SRK-PS-10-0230

REV
A

ISSUED FOR PRELIMINARY REVIEW

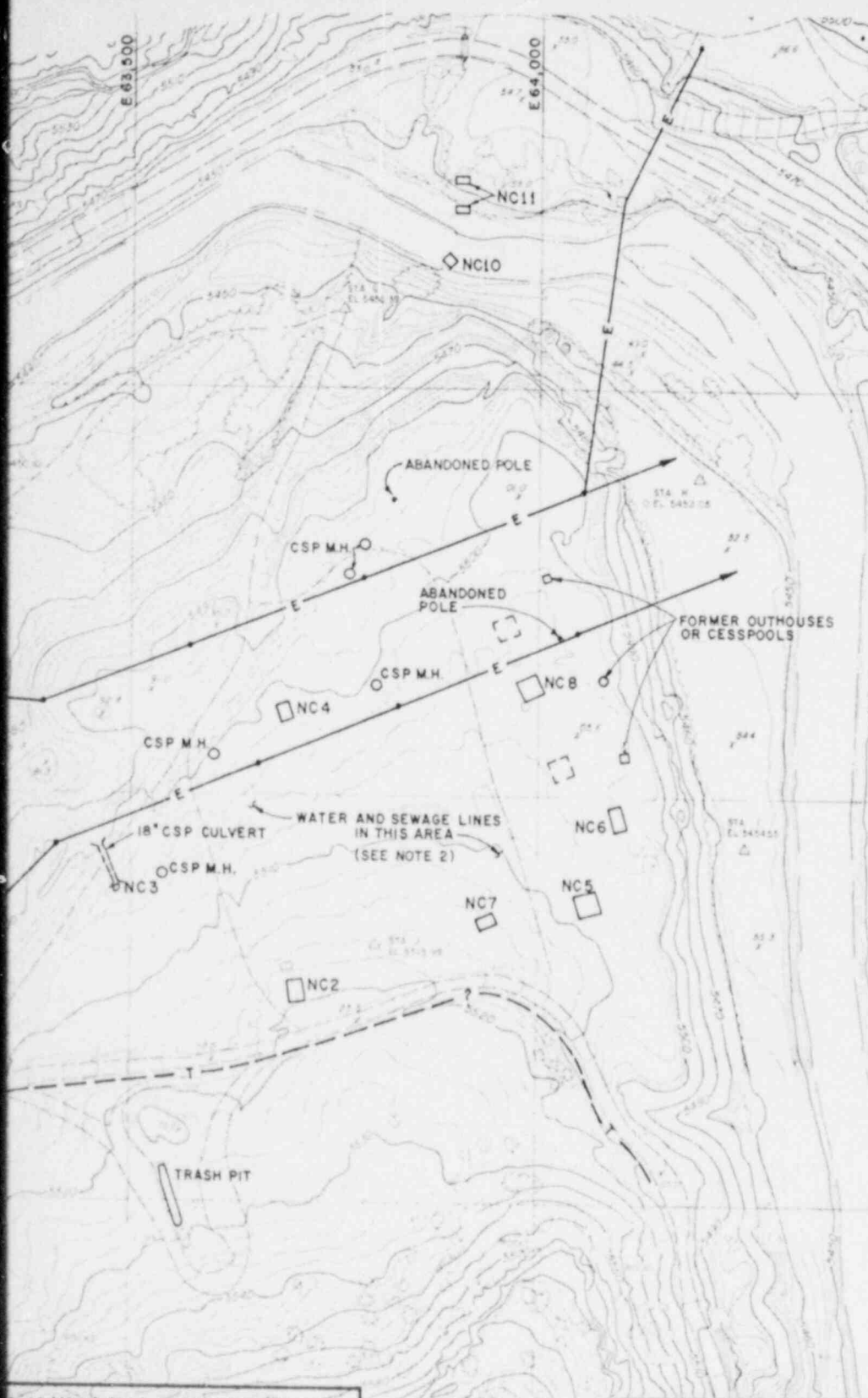
REVISIONS

BY	CK	E & D MGR	CHIEF ENG	TAC REV	DOE APP



PRE
E&D MANAGE
Handwritten signature

	△	
	△	
	△	
	△	
	△	
QA	NO	DATE
NY-P		



NOTES:

1. C.S.P. MANHOLES ARE APPROXIMATELY 3 FEET TO 4 FEET DEEP APPARENTLY INTERCONNECTED WITH TERRA COTTA PIPE. THE C.S.P. SHALL BE REMOVED AND THE HOLES BACKFILLED WITH UNCONTAMINATED MATERIAL.
2. UNDERGROUND UTILITIES MAY BE LEFT IN PLACE IF UNCONTAMINATED.
3. EXCAVATIONS SHALL BE NO CLOSER THAN 5 FEET AWAY FROM EXISTING POWER POLES.

TI APERTURE CARD

Also Available On
Aperture Card

REFERENCE DRAWINGS:

SRK-GE-10-0205, HAUL ROAD BETWEEN NORTH CONTINENT AND UNION CARBIDE MILL AREAS

LEGEND:

- CSP M.H. CORRUGATED STEEL PIPE MANHOLE
- E — OVERHEAD ELECTRIC LINES.
- T --- UNDERGROUND TELEPHONE (FIBER OPTICS).
- NC MKE DESCRIPTIVE NUMBERING SYSTEM. FOR DESCRIPTION OF STRUCTURE OR AREA SEE INFORMATION FOR BIDDERS.
- FORMER SITES, NO APPARENT MATERIAL.

8804110022-31

100 0 100 200
SCALE FEET

PRELIMINARY REVIEW

CHIEF ENGINEER	QA MANAGER
<i>[Signature]</i>	<i>[Signature]</i>

U. S. DEPARTMENT OF ENERGY ALBUQUERQUE, NEW MEXICO

DESIGNED *[Signature]*
DRAWN RB
CHECKED KLD
INSPECTED *[Signature]*
RECOMMENDED *[Signature]*
APPROVED

SLICK ROCK SITE
SLICK ROCK, COLORADO
NORTH CONTINENT PROCESSING SITE

EXISTING UTILITIES AND DEMOLITION PLAN

MORRISON-KNUDSEN ENGINEERS, INC.
UMTRA PROJECT
800 HOWARD ST. SAN FRANCISCO, CA 94102

PROJECT NO.
DE-ACO4-83AL18796
DRAWING NO.
SRK-PS-10-0231
REV A

ISSUED FOR PRELIMINARY REVIEW

REVISIONS

BY CK E&D MUR CHIEF ENG TAC REV DDE APP