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United States De, artment of Energy

Remedial Action Plan and Site Design for Stabilization of the Inactive Uranium Mill Tailings Site at Riverton, Wyoming

Final

Appendix B of the Cooperative Agreement No. DE-FC04-83AL19454

June, 1987

Uranium Mill Tailings Remedial Action Project UMTRAP

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REMEDIAL ACTION PLAN

AND

SITE DESIGN FOR STABILIZATION

OF THE

INACTIVE URANIUM MILL TAILINGS SITE

AT

RIVERTON, WYOMING

FINAL

APPENDIX B OF THE COOPERATIVE AGREEMENT

NO. DE-FC04-83AL19454

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1.0 INTRODUCTION

1.1 PURPOSE

This Remedial Action Plan (RAP) has been developed to serve a two-fold purpose. It presents the series of activities which are proposed by the U.S. Department of Energy (DOE) to effect long-term stabilization and control of radioactive materials at the inactive uranium processing site located in Riverton, Wyoming. It also serves to document the concurrence of both the State of Wyoming and the U.S. Nuclear Regulatory Commission (NRC) in the remedial action. This agreement, upon execution by DOE and the State and concurrence by NRC, becomes Appendix B of the Cooperative Agreement.

1.2 RESPONSIBILITIES

In 1978, Congress passed Public Law 95-604 (PL95-604), the Uranium Mill Tailings Radiation Control Act (UMTRCA) of 1978, expressly finding that uranium mill tailings located at inactive (and active) mill sites may pose a potential health hazard to the public. Title I to the UMTRCA identified sites to be designated for remedial action. On November 9, 1979, Riverton was designated as one of 24 sites.

UMTRCA charged the U.S. Environmental Protection Agency (EPA) with the responsibility for promulgating remedial action standards for inactive mill sites. The purpose of these standards is to protect the public health and safety and the environment from radiological and non-radiological hazards associated with radioactive materials at the sites. The final standards were promulgated with an effective date of March 7, 1983.

As provided in Title I, Section 108(a)(1) of the UMTRCA, the DOE may designate another entity to perform remedial action. The DOE will select as its designee to perform remedial action a company that owns and operates a mill tailings site located in the Gas Hills, Wyoming, area and is licensed by the NRC pursuant to Title II of the UMTRCA.

The DOE will select and execute a plan of remedial action that will satisfy the EPA standards and other applicable Federal and state laws. Under UMTRCA, the DOE and the State of Wyoming entered into a cooperative agreement effective December 23, 1983, for remedial action at the Riverton site. The cooperative agreement will be modified to affirm the agency responsibilities and the assumptions for remedial action at the Riverton site. Those assumptions are as follows:

- DOE is responsible for excavation of the Riverton Title I tailings (unlicensed tailings defined in the UMTRCA), relocation of the tailings to a Title II (licensed) disposal site in the Gas Hills area, and restoration of the Title I Riverton processing site.

- NRC will, at the request of the Title II licensee/DOE designee, amend the byproduct material license to allow for commingling of the Title I and Title II tailings and the ultimate stabilization

to meet NRC regulations (10 CFR Part 40) and EPA standards (40 CFR Part 192, Subpart d).

- The DOE designee shall identify and accomplish the work needed to stabilize the Riverton tailings at the Title II disposal site as required under the NRC license amendment and to comply with the EPA standards and NRC regulations.

- DOE will require adequate financial surety arrangements, as determined by the NRC pursuant to the requirements of 10 CFR Part 40, to be established by the Title II licensee/DOE designee to carry out the reclamation/stabilization of the commingled tailings in the event that the DOE designee should default prior to completion of tailings stabilization. The State of Wyoming will receive and hold the surety instrument.

- DOE shall pre-qualify Title II disposal sites to ensure that the Title II disposal site has sufficient capacity to receive in excess of 1,500,000 cubic yards of tailings and contaminated materials that will be relocated from the Riverton site. The Title II licensee shall provide evidence of Title II disposal site land ownership or land use authorization as well as permits and licenses required for disposal of tailings which shall remain in effect until NRC termination of the Title II license.

- DOE and the State, per an approved cost-sharing agreement, will cover any incremental costs, which result from the addition of Title I tailings to the existing Title II tailings, associated with permanent reclamation/stabilization of the commingled tailings. The Title II licensee/DOE designee will be responsible for all other costs of reclamation/stabilization of the commingled tailings.

- DOE is responsible for groundwater protection or mitigative measures to meet Title I EPA standards at the Riverton processing site, pending EPA reissuance of remedial standards.

- The Title II licensee/DOE designee is responsible for groundwater protection or mitigative measures which may be necessary to meet the Title II EPA standards for the commingled tailings at the disposal site.

- The Title II licensee/DOE designee is responsible for surveillance and maintenance of the commingled tailings pile at the disposal site until such time as reclamation/stabilization is determined by NRC to be complete.

- DOE or another Federal agency designated by the President will be responsible to obtain a license for and to implement surveillance and maintenance of the stabilized tailings and obtain legal title to the disposal site.

The DOE will fund 90 percent and the state will fund 10 percent of allowable costs up to $14.3 million of the project cost (which is the estimated stabilization in place cost). The portion of the project cost over $14.3 million will be funded 75 percent by DOE and 25 percent by the

state. A project cost ceiling will be established after the remedial action subcontract has been awarded, above which the state will assume 100 percent of additional costs. Costs for aquifer restoration, groundwater protection measures at the processing site, and incremental costs associated with permanent reclamation of the commingled tailings which are incurred as a result of adding Title I tailings to the existing Title II tailings will be cost shared on the basis of 90 percent DOE funding and 10 percent state funding.

All remedial actions must be selected and performed with the concurrence of the NRC. In conformance with the UMTRCA, the required NRC concurrence with the selection and performance of proposed remedial actions and the licensing of long-term monitoring and maintenance of disposal sites will be for the purpose of ensuring compliance with the standards established by the EPA. Therefore, the RAP constitutes the initial document in the licensing process. A detailed listing of the responsibilities of the project participants is included in Section 6.0 of this report.

1.3 SCOPE AND CONTENT

This document has been structured to provide a comprehensive understanding of the remedial action proposed for the Riverton site. It includes specific design requirements for the detailed design and construction of the remedial action. It is important to stress that the site design summarized in Section 4.0 establishes that the remedial action can be completed to comply with the EPA standards. The detailed design in Appendix C contains the remedial action specifications and accompanying drawings.

An extensive amount of data and supporting information have been generated for this remedial action plan which cannot all be incorporated into this single document. Pertinent information and data are included with reference given to the supporting documents.

Section 2.0 presents the EPA standards, including a discussion of their objectives. Section 3.0 traces the history of operations at the Riverton site with a description of the present site characteristics. Section 4.0 provides a summary of the proposed remedial action. Section 5.0 summarizes the plan for ensuring health and safety protection for the surrounding community and the on-site workers. Section 6.0 presents a detailed listing of the responsibilities of the project participants. Section 7.0 describes the long-term surveillance and maintenance responsibilities. Section 8.0 is a summary presentation of the UMTRA Project Quality Assurance Plan. Section 9.0 documents the on-going activities to keep the public informed and participating in the project.

Attached as part of the RAP are appendices which describe in more detail various aspects of the remedial action.

Appendix A, Regulatory Compliance, describes in detail the permits necessary for the remedial action activities.

Appendix B, Radiological Support Plan, describes the procedures used to characterize the present radiological condition of the site and the procedures to be used to control and verify the results of remedial action activities.

Appendix C, Final Plans and Specifications, contains the bid schedule, special conditions, specifications, and subcontractor drawings.

1.4 COLLATERAL DOCUMENTS

The Processing Site Characterization Report (PSCR) (DOE, 1985a) and the Environmental Assessment (EA) (DOE, 1987) describe the existing conditions at the site and the results of the remedial action, respectively. These documents include details that are not reported in the RAP.

The PSCR contains all of the geotechnical, hydrological, radiological, meteorological, and physical data necessary to describe the existing conditions at the Riverton site. The report also contains data which characterize potential remedial action construction materials.

The EA describes the proposed remedial action and alternatives and the environmental impacts of the proposed actions.

An additional supporting document is the Technical Approach Document (TAD) (DOE, 1986a). This document describes technical approaches and procedures used in the UMTRA Project. It includes discussions of major technical areas: design considerations; surface-water hydrological erosion control; geotechnical aspects of pile design; radiological issues; and protection of groundwater resources.

Copies of all of these documents, as well as supporting data and calculations, are on file in the UMTRA Project Office in Albuquerque, New Mexico.

2.0 EPA STANDARDS

The requirements and considerations for long-term isolation and stabilization of tailings, radon control, cleanup of land and buildings, and protection of water quality have been discussed and published in the Plan for Implementing EPA Standards for UMTRA Sites (DOE, 1984). This document was used as a guide in the development of the Remedial Action Plan and is the basis for the following discussion of the EPA standards.

2.1 GENERAL

Pursuant to the requirements of the UMTRCA, EPA has promulgated health and environmental standards to govern cleanup, stabilization, and control of residual radiological materials at inactive uranium mill tailings sites. The promulgated standards establish requirements for long-term stability and radiation protection and provide procedures for ensuring the protection of groundwater quality.

In developing the standards, EPA determined "that the primary objective for control of tailings should be isolation and stabilization to prevent their misuse by man and dispersal by natural forces such as wind, rain, and flood waters" and that "a secondary objective should be to reduce radon emissions from tailings piles." A third objective should be "the elimination of significant exposure to gamma radiation from tailings piles." (Ref. preamble to Standards for Remedial Actions at Inactive Uranium Processing Sites, 40 CFR Part 192, Subparts A, B, and C.) These conclusions were based on a determination that the most significant public health risks associated with inactive tailings were posed by exposure to people living and working in structures contaminated by tailings. The EPA further concluded that the potential for contamination of groundwater and surface water should be evaluated on a site-specific basis.

The EPA standards are discussed in the following paragraphs and are summarized in Table 2.1.

2.2 LONG-TERM STABILITY

Isolation and stabilization of tailings in order to prevent misuse by man and dispersal by natural forces is the primary objective of the EPA standards. Accordingly, long-term stability was emphasized in the development and promulgation of the standards. This is consistent with the guidance provided by the legislative history of the UMTRCA which stresses the importance of avoiding remedial actions which would be effective only for a short period of time and which would require future Congressional consideration.

The EPA standard-setting process distinguished "passive controls" such as thick earthen covers, below-ground disposal, rock covers, and massive earth and rock dikes, from "active controls" such as semi-permanent covers, warning signs, and restrictions on land use. Active control covers could be expected to need frequent replacement or other

PART 192 - HEALTH AND ENVIRONMENTAL PROTECTION STANDARDS FOR URANIUM MILL TAILINGS

SUBPART A - Standards for the Control of Residual Radioactive Materials from Inactive Processing Sites

192.02 Standards

Control shall be designed to:

(a) Be effective for up to one thousand years, to the extent reasonably achievable, and, in any case, for at least 200 years, and,

(b) Provide reasonable assurance that releases of radon-222 from residual radioactive material to the atmosphere will not:

(1) Exceed an average release rate of 20 picocuries per square meter per second, or
(2) Increase the annual average concentration of radon-222 in air at or above any location outside the disposal site by more than one-half picocurie per liter.

SUBPART B - Standards for Cleanup of Land and Buildings Contaminated with Residual Radioactive Materials from Inactive Uranium Processing Sites

192.12 Standards

Remedial actions shall be conducted so as to provide reasonable assurance that, as a result of residual radioactive materials from any designated processing site:

(a) The concentration of radium-226 in land averaged over any area of 100 square meters shall not exceed the background level by more than -

(1) 5 pCi/g, averaged over the first 15 cm of soil below the surface, and
(2) 15 pCi/g, averaged over 15 cm thick layers of soil more than 15 cm below the surface.

(b) In any occupied or habitable building -

(1) The objective of remedial action shall be, and reasonable effort shall be made to achieve, an annual average (or equivalent) radon decay product concentration (including background) not to exceed 0.02 WL. In any case, the radon decay product concentration (including background) shall not exceed 0.03 WL, and
(2) The level of gamma radiation shall not exceed the background level by more than 20 microroentgens per hour.

SUBPART C - Implementation (condensed)

192.20 Guidance for Implementation

Remedial action will be performed with the "concurrence of the Nuclear Regulatory Commission and the full participation of any state that pays part of the cost" and in consultation as appropriate with other government agencies.

192.21 Criteria for Applying Supplemental Standards

The implementing agencies may apply standards in lieu of the standards of Subparts A or B if certain circumstances exist, as defined in 192.21.

192.22 Supplemental Standards

"Federal agencies implementing Subparts A and B may in lieu thereof proceed pursuant to this section with respect to generic or individual situations meeting the eligibility requirements of 192.21."

(a) ". . .the implementing agencies shall select and perform remedial actions that come as close to meeting the otherwise applicable standards as is reasonable under the circumstances."

(b) ". . .remedial actions shall, in addition to satisfying the standards of Subparts A and B, reduce other residual radioactivity to levels that are as low as is reasonably achievable."

(c) "The implementing agencies may make general determinations concerning remedial actions under this Section that will apply to all locations with specified characteristics, or they may make a determination for a specific location. When remedial actions are proposed under this Section for a specific location, the Department of Energy shall inform any private owners and occupants of the affected location and solicit their comments. The Department of Energy shall provide any such comments to the other implementing agencies [and] shall also periodically inform the Environmental Protection Agency of both general and individual determinations under the provisions of this section."

Ref: Federal Register, Volume 48, No. 3, January 5, 1983, 40 CFR Part 192.

TABLE 2.1 EPA STANDARDS

major repairs requiring the appropriation and expenditure of public funds. In setting the standards, EPA called for designs which rely primarily on passive controls.

The standard is framed as a longevity requirement which recognizes the difficulty in predicting very long-term performance with a very high degree of confidence. In establishing the longevity requirement, EPA concluded that existing knowledge permits the design of control systems that have a good expectation of lasting at least 1000 years. Therefore, a design objective of 1000 years was established to be satisfied whenever reasonably achievable, but in any case, with a minimum performance period of 200 years.

The standard recognizes the need for institutional controls such as custodial maintenance, monitoring, and contingency response measures. In its preamble to the standards, EPA calls for such controls to be provided as an essential backup to the primary passive controls.

2.3 RADON EMISSIONS CONTROL

The EPA identified a reduction of radon emission from tailings piles as the second objective in its standards for the control of tailings. In developing the standards, the EPA considered several alternative approaches and selected an emission limitation as the primary form of the standard. In addition, a concentration limit was established by the EPA as an alternative form of the standards for use in cases where the DOE determined that the alternative was appropriate.

In establishing the emission limitation for tailings piles, the EPA sought to reduce both the maximum risk to individuals living very near to the sites and the risk to the population as a whole. With regard to individuals very near to disposal sites, the EPA estimates that exposure to radon emissions will be reduced by more than 96 percent. The radon standard will limit the increase in radon concentration attributable to a pile to a small increase above the background radon level near the disposal site. Both radon standards are design standards with compliance to be determined on the basis of predicted rather than measured emission rates and concentrations. The EPA states that "post-remediation monitoring will not be required to show compliance, but may serve a useful role in determining whether the anticipated performance of the control system is achieved."

In establishing the radon standard, the EPA determined that the emission limitation could be achieved by well-designed thick earthen covers and that such control techniques would be compatible with the requirements of the EPA longevity standard.

2.4 WATER-QUALITY PROTECTION

The EPA reviewed available water-quality data at inactive tailings sites and determined that there was little evidence of recent movement of contaminants into groundwater. They also determined that any degradation

of groundwater quality should be evaluated in the context of potential beneficial uses of the groundwater as determined by background water quality and the available quantity of groundwater.

Rather than establish specific numerical limitations for contaminant discharges or groundwater quality, EPA determined that the most appropriate course of action would be to require site-specific analyses of potential future contaminant discharge and a case-by-case evaluation of the significance of such a discharge. The implementation guidelines for the EPA standards call for adequate hydrological and geochemical surveys at each site as a basis for determining whether specific water-protection measures should be applied.

Specific site assessments must include monitoring programs sufficient to establish background groundwater quality through one or more upgradient wells, and to identify the present movement and extent of contaminant plumes associated with the tailings piles. The site assessments further call for judgements of the need for restoration or prevention, or both, to be guided by EPA's hazardous waste management system and relevant state and Federal water-quality criteria. Decisions on specific actions to protect or restore water quality are to be guided by such factors as the technical feasibility of improving the aquifer, the cost of applicable restorative or protective programs, the present and future value of the aquifer as a water source, the availability of alternate water supplies, and the degree to which human exposure is likely to occur.

The UMTRCA requires that the standards promulgated by EPA ". . . to the maximum exient practicable, be consistent with the requirements of the Solid Waste Disposal Act, as amended." In setting the standards, EPA determined that the statutory requirement for NRC to concur with the selection and performance of remedial actions and to issue licenses encompassing "monitoring, maintenance, or emergency measures necessary to protect public health, safety, and the environment" was consistent with the EPA regulations implementing the Solid Waste Disposal Act (47 FR 32274, July 26, 1982). Accordingly, EPA established the implementation procedures requiring case-by-case evaluations of potential contamination at sites. Decisions regarding monitoring or remedial actions will be guided by relevant considerations in the hazardous waste management systems.

On September 3, 1985, the United States Tenth Circuit Court of Appeals set aside the EPA Standard applicable to the protection of waterways and groundwater, 40 CFR Part 192.20(a)(2)-(3). The water protection standard was remanded to the EPA for further consideration in light of the Court's opinion that the water standard promulgated by the EPA on March 7, 1983, was site-specific rather than of general application as required by the legislation. EPA has not identified a date for re-issuance of 40 CFR Part 192.20(a)(2)-(3), but it is anticipated that such re-issuance will not occur until after remedial action has been initiated at the Riverton site. Therefore, DOE and the State of Wyoming will implement the remedial action plan, with the concurrence of NRC and after consultation with EPA. As implementing agencies with regard to the EPA Standards, DOE, the State of Wyoming, and NRC, by executing the

Remedial Action, will make every reasonable effort to ensure that water resources are adequately protected.

Whether EPA, in re-issuing the water standard, sets forth a technical approach similar to either the current active site water standard or that proposed prior to promulgation of 40 CFR 192.20 (a)(2)-(3) for the inactive sites, DOE has thoroughly characterized conditions at the Riverton processing site and does not anticipate that any substantive changes to the remedial action will be required.

2.5 CLEANUP OF LANDS AND BUILDINGS

The EPA evaluated the risk associated with the dispersal of tailings off the sites and concluded that the principal risk to man was the exposure to radon daughter products inside buildings. The EPA therefore stated that the objective of the cleanup of tailings from around existing structures was to achieve an indoor radon daughter concentration (RDC) of less than 0.02 working level (WL). For open lands, the purpose of removing the contamination is to remove the potential for excessive indoor radon daughter concentrations that might arise from new construction on contaminated land. The 5 pCi/g and 15 pCi/g Ra-226 concentration limits for 15-cm surface and subsurface layers were considered adequate to limit indoor RDCs to below 0.02 WL. A secondary concern was to limit exposure to people from gamma radiation.

The standard requires that residual radioactive materials be removed from buildings exceeding 0.03 WL. In cases where levels are between 0.02 and 0.03 WL, the Federal Government will have the flexibility to use measures such as sealants, filtration devices, or ventilation devices to reduce concentrations to below 0.02 WL.

3.0 SITE CHARACTERIZATION

Site characterization describes the Riverton site as it exists today. Emphasis is given to the three major concerns of stability, radiation, and groundwater. The data to support the characterization may be found in the Processing Site Chracterization Report (PSCR) (DOE, 1985a).

3.1 HISTORY

The mill near Riverton was constructed in 1958 and operated by Fremont Minerals, Inc., whose name was subsequently changed to Susquehanna-Western, Inc. The mill processed uranium for sale to the U.S. Atomic Energy Commission (AEC) from 1958 until 1963. The location of the abandoned mill site is shown in Figures 3.1 and 3.2.

A variety of uranium ores were shipped to the mill from the surrounding area by rail and truck. The mill included both acid and carbonate circuits to provide flexibility for the many types of ore received. During the five years of operation, approximately 900,000 dry tons of ore were processed. The mill also included a sulfuric acid plant (FBDU, 1981).

Fremont Minerals, Inc. acquired the property from a private owner; afterward, their name changed to Susquehanna-Western and the plant shut down in 1963. Susquehanna-Western dismantled portions of the buildings and process tanks, and covered the tailings pile with 18 inches of fill in 1965.

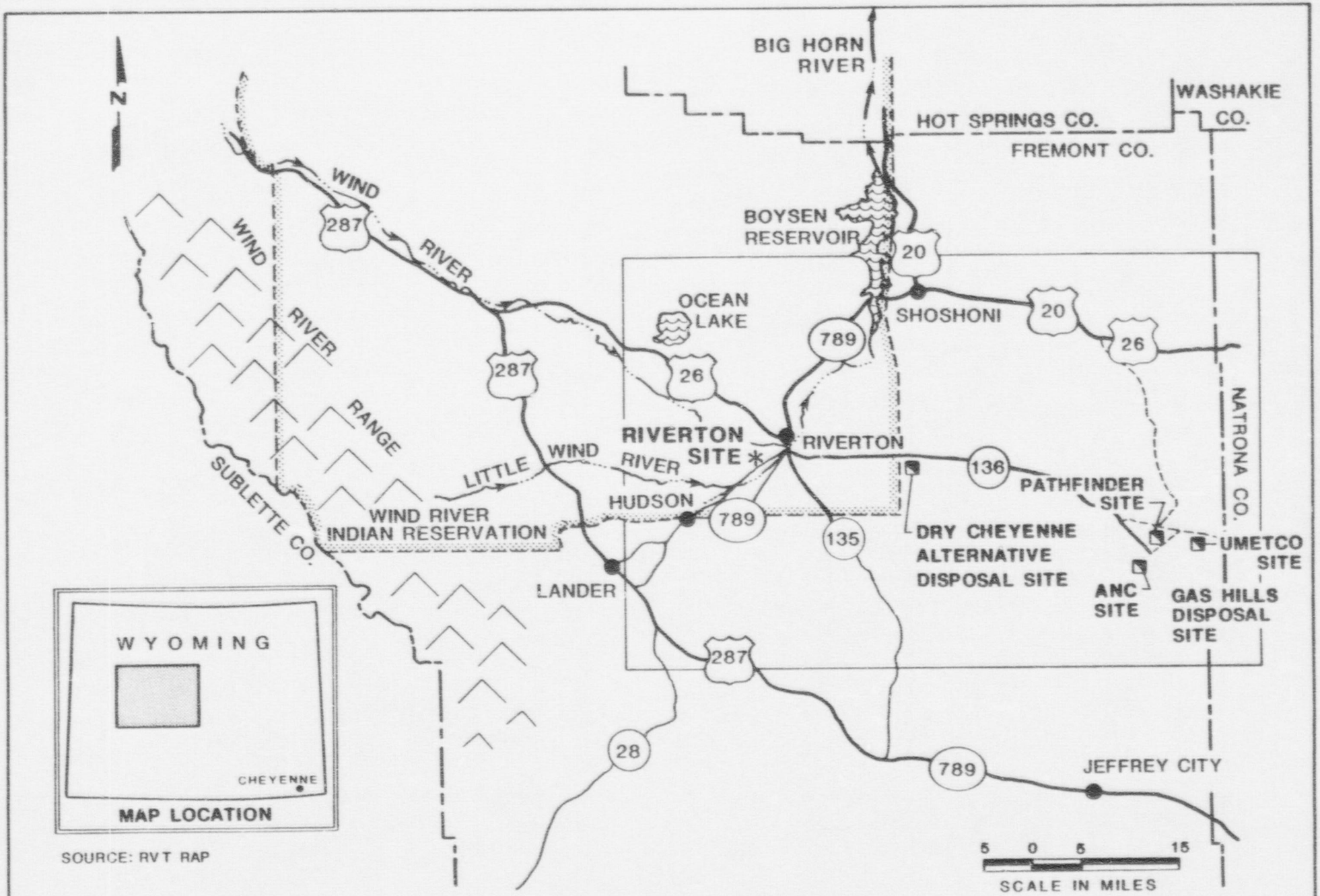
Western Nuclear, Inc. bought the acid plant in early 1967. In 1985, Western Nuclear sold the acid plant to Chemical Marketing Services, Inc. Solution Engineering Company of Alice, Texas, acquired the remainder of the site from Western Nuclear in 1976. The present owner, Lome Drilling and Well Service, acquired the designated site, except for the acid plant, and additional property to the west from Solution Engineering in 1978.

Chemical Marketing Services owns a portion of the designated processing site and some land south of the acid plant and west of the tailings pile. The designated site and land ownership are shown in Figure 3.3.

3.2 PHYSICAL DESCRIPTION

Surface features of the Riverton site

The Riverton site is in an unincorporated rural area about 2.5 miles southwest of the center of Riverton, on the north side of State Highway 138 (formerly State Highway 789) in Fremont County, Wyoming (Figure 3.2). The total site, which covers about 173 acres, is generally bounded by BIA Route 28 (Goes In Lodge Road) on the north, a vacant field (owned by Lome Drilling and Well Service) on the west, State Highway 138 to the south, and irrigated farmland on the east. The designated site is surrounded by



SOURCE: RVT RAP

FIGURE 3.1 RIVERTON SITE LOCATION

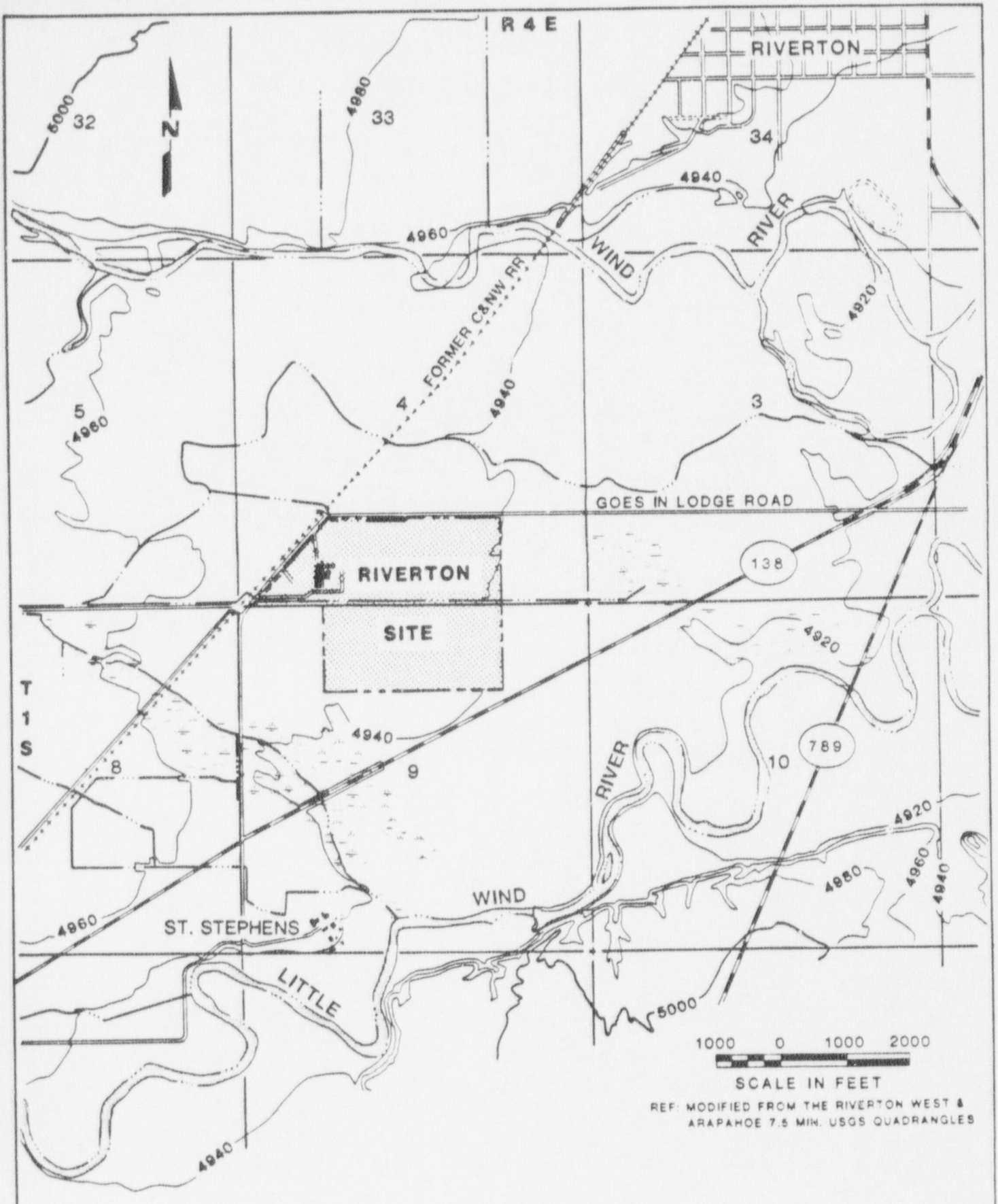


FIGURE 3.2 RIVERTON TAILINGS SITE

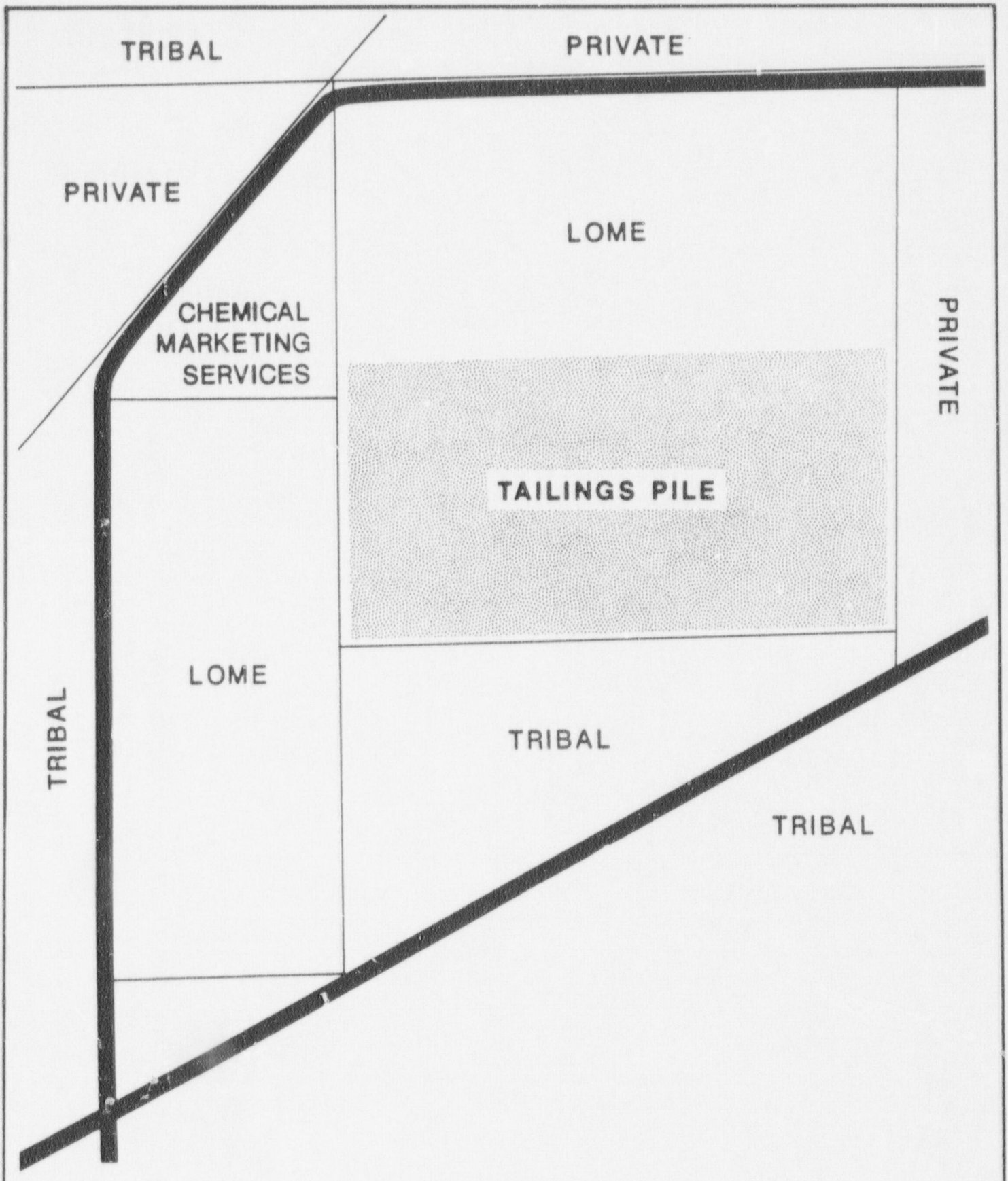


FIGURE 3.3 LAND OWNERSHIP AROUND THE RIVERTON SITE

the Wind River Indian Reservation. The neighboring properties are owned by members of the Arapahoe and Shoshone Indian Tribes and others (see Figure 3.3).

The designated site is rectangular, with the exception of a triangular projection on the northwestern boundary where the original mill site is located. The site is partially bisected from east to west and north to south by irrigation canals. Both native grasses and those intentionally seeded grow on the open areas and the pile. Portions of the mill building were dismantled; however, the structure and foundations remain along with some steel tanks. Other associated buildings remain, including a pump house which supplies the water tower, a scale house which is used by Chemical Marketing Services, and a wash house. Several piles of rubble spot the area and some of the process tanks and debris have been buried on the site. The ore storage area previously occupied the northwest corner of the site and contaminated the upper soil layer. The rectangular tailings pile in the southern half of the designated site occupies about 70 acres; the pile is higher on the west side and slopes to the east. The pile was contoured and covered with 18 inches of material from the surrounding edges of the pile. The excavation for the cover created a swale around the pile which collects runoff from the pile. The cover was seeded with crested wheatgrass which controls wind and water erosion to some degree.

Subsurface features for the Riverton site

The Riverton tailings site lies within the Wind River Basin, part of the Wyoming Basin subdivision of the Middle Rocky Mountain physiographic province. The topography of the Wind River Basin has been greatly influenced by glaciation and is characterized by glacial and post-glacial deposits, including terrace and pediment gravels and modern river alluvium.

The tailings site is on a floodplain terrace which is five feet higher than the streambed of the Wind River. Geomorphic conditions at the site reflect the depositional history of the floodplain. The surface of the terrace on which the tailings rest is marked by older channels of the Wind River that have been filled with unstratified eolian sand (SHB, 1984). Floodplain materials beneath the tailings consist of one to three feet of fine-textured eolian sand and 18 feet of coarse-grained alluvium that is classified as sandy gravel containing rounded granitic cobbles. The alluvial materials were deposited on an irregularly-eroded bedrock surface (FBD, 1983).

Bedrock under the tailings site is the Wind River Formation of Eocene age (36,000,000 to 58,000,000 years ago). Results of core drilling indicate that the bedrock materials are moderately weathered claystones to very fine-grained siltstones and sandstones (FBD, 1983). Lithologic changes tend to be gradational, with some lensing of both claystone and sandstone. Saturated strata exist in layers below 50 feet. The stratigraphic units are nearly horizontal and extend to a depth of at least 2000 feet (FBDU, 1981).

Soils present within the designated tailings site are sandy loam over gravel (Bigwin series) and sandy loam formed on alluvial fans (Apron series) (Iiams, 1984). The Bigwin series consists of somewhat poorly-drained, sandy loams that are underlain by sand and gravel to a depth of 20 to 40 inches. The Apron series consists of well-drained, sandy loams that formed on alluvial fans. Runoff is slow, and the hazard of water erosion is slight for both soils (SCS, 1974).

There are important deposits of industrial minerals, fossil fuels, and metallic ores in both the Wind River Basin and the adjacent Precambrian uplifts. Oil and gas exploration and development are ongoing in the area around Riverton. Alluvial sand and gravel deposits exist beneath and around the tailings site, and similar deposits are widespread throughout the Wind River valley. The mineral rights for the designated site are owned by Lome Drilling and Well Service; therefore, they are not subject to mining claims or mineral leasing.

Further details on the subsurface features of the tailings site may be found in the Riverton Processing Site Chracterization Report (PSCR) (DOE, 1985a).

3.3 STABILITY

No earthquakes greater than Intensity VI have been recorded in the Riverton area. One earthquake, interpreted as Intensity VII (modified Mercalli scale) occurred in 1897 near Casper, which is 110 miles east of Riverton. Because few people lived in the Casper area in 1897, the interpretation may be inaccurate. In general, the region has a low seismic risk (ATC, 1978).

For establishing earthquake design parameters, the impact of a Maximum Credible Earthquake (MCE) is used. An MCE of magnitude 6.8 (Richter scale) was estimated for the North Granite Mountain fault system which lies 40 miles south of the existing tailings site. An earthquake of this magnitude would generate an on-site horizontal ground acceleration of 0.13g. The effective duration of ground motion greater than 0.05g would range from 11 to 16 seconds in soil and three to eight seconds in rock as described in the PSCR (DOE, 1985a).

The Riverton tailings site is located on a low floodplain terrace in the Wind River Basin, 2.5 miles upstream of the confluence of the Wind and Little Wind Rivers. The Wind River is one mile north of the site, and the Little Wind River is 0.5 mile southeast of the site. The site is bordered by drainage ditches and irrigation canals.

The Wind River has a drainage basin of 2300 square miles. The Little Wind River drains an area of 2000 square miles. Peak monthly flows for both rivers generally occur during the month of June as a result of snow-melt runoff. A maximum flow of 13,300 cubic feet per second (cfs) was recorded in 1935 for the Wind River; a maximum of 14,700 cfs was recorded in 1963 for the Little Wind River (USGS, 1984).

A geomorphic evaluation of the tailings site (SHB, 1984) has indicated that, disregarding any engineering control features, the channels of the Wind and Little Wind Rivers could move toward the site due to aggradation or very large flood events (greater than 100-year events). Geologic evidence indicates that the hazard is primarily from the Wind River which could migrate laterally across its floodplain within a 2000-year period depending upon the frequency and severity of floods. The extent of channel migration is unknown; however, the rate of migration could exceed 0.5 mile per 1000 years.

3.4 RADIATION

Radioactive elements occur naturally throughout the earth's air, water, and soil. The concentration of these elements varies greatly throughout the United States, and the concentrations in the Riverton area are generally higher than the average for other areas because of local mineralization. Background soil radioactivity levels typical of the Riverton area and not influenced by the Riverton tailings pile have been established as 0.9 pCi/g for radium-226 (Ra-226) (ORNL, 1980).

The average background gamma radiation exposure rate from both terrestrial and cosmic sources measured at three feet above the ground is 13 microroentgens per hour (microR/hr) with a range of 12 to 13 microR/hr (ORNL, 1980). Cosmic rays (radiation from the sun and other sources external to the earth) contribute approximately 7.7 microR/hr (55 percent) to the 13 microR/hr background gamma exposure rate in the Riverton area (EG&G, 1983).

The average outdoor background radon concentration in the Riverton area is 1.1 picocuries per liter (pCi/l) based on measurements at two locations southwest and north of Riverton. The range of radon concentrations for these 24-hour samples was 0.8 to 1.3 pCi/l (FBDU, 1977).

The average Ra-226 content of the tailings pile and the existing earthen cover is 342 pCi/g (DOE, 1985a). The Ra-226 concentrations ranged from 180 to 1200 pCi/g (ORNL, 1980).

Gamma radiation exposure rates have been measured around the Riverton tailings site by many programs (PHS, 1970; EPA, 1977; ORNL, 1980; BFEC, 1983; EG&G, 1983), and all reported rates are in general agreement. Over the eastern half of the mill site, the gamma exposure ranges from 180 to 360 microR/hr. Over the western half of the pile and around the edges of the ore storage area, the exposure rates range from 90 to 180 microR/hr. Along a band about 200 feet wide ringing the entire site, the exposure rate is about 60 to 90 microR/hr. Extending about 2000 feet to the southeast of the pile, is an area of windblown contamination producing an exposure rate of 20 to 60 microR/hr. Background gamma exposure rates are reached within about 1000 feet of the pile in all other directions.

Radon flux through the cover of the existing pile ranges from 51 to 81 picocuries per square meter per second (pCi/m^2s), with an area

averaged flux of 65 pCi/m^2s (FBDU, 1977). The radon flux source term was back calculated using the RAECOM model and an average Ra-226 concentration of 342 pCi/g (NRC, 1984). The calculation resulted in an annual average radon flux of 170 pCi/m^2s from the bare tailings.

The soil beneath the tailings pile exceeds the EPA standards of 15 pCi/g of Ra-226 to an average depth of about three feet. The Ra-226 concentration in this material ranges from four to 1300 pCi/g based on data from the analyses of interface samples collected by Mountain States Research and Development (MSRD, 1982).

The tailings have been dispersed by wind and water erosion and have contaminated soils adjacent to the tailings pile. Figure 3.4 shows the areal extent of the displaced tailings as well as the contaminated ore storage and mill areas.

Along the eastern half of the ore storage area, the contaminated material is less than one foot deep. Along the western half of the ore storage area, and over most of the mill area, the contaminated material ranges from two to four feet in depth. Contamination in this area is slightly elevated above the EPA standard for radium in soils with isolated spots of higher activity. Windblown contamination around the tailings pile consists of diluted tailings, and is generally slightly elevated above the EPA standard. The total number of acres of contamination off the pile is approximately 118 acres.

3.5 GROUNDWATER

Groundwater occurs under unconfined and confined conditions within the alluvial deposits and the sedimentary strata of the Wind River Formation in the Riverton area. An unconfined system exists in the shallow alluvial deposits and the hydrologically-connected upper sandstone unit of the Wind River Formation. The unconfined system is affected by irrigation during late spring and early summer. A confined system exists in the deeper sandstone strata of the Wind River Formation. Details on the stratigraphy of the two systems may be found in the PSCR and EA (DOE, 1985a; 1987).

The groundwater flow direction in the unconfined aquifer is predominantly to the south-southeast toward and into the Little Wind River. The hydraulic gradient is estimated to be 12 feet per mile. Recharge to the aquifer is from precipitation, snowmelt, and irrigation seepage. The groundwater discharges into the Little Wind River 2800 feet downgradient from the tailings site (LBL, 1984).

Comparisons of the water-table configuration and potentiometric surfaces for the first confined sandstone layer and sandstones deeper than 200 feet indicate that there is a greater degree of communication between the unconfined aquifer and first confined sandstone than between the first confined sandstone and deeper sandstone. Using estimates based on Darcy's Law, hydrologic calculations indicate that water would require at least 20 years to migrate from the unconfined aquifer to the first confined sandstone and an additional 1800 years to migrate from the first confined sandstone to the sandstones at depths greater than 200 feet (DOE, 1987).

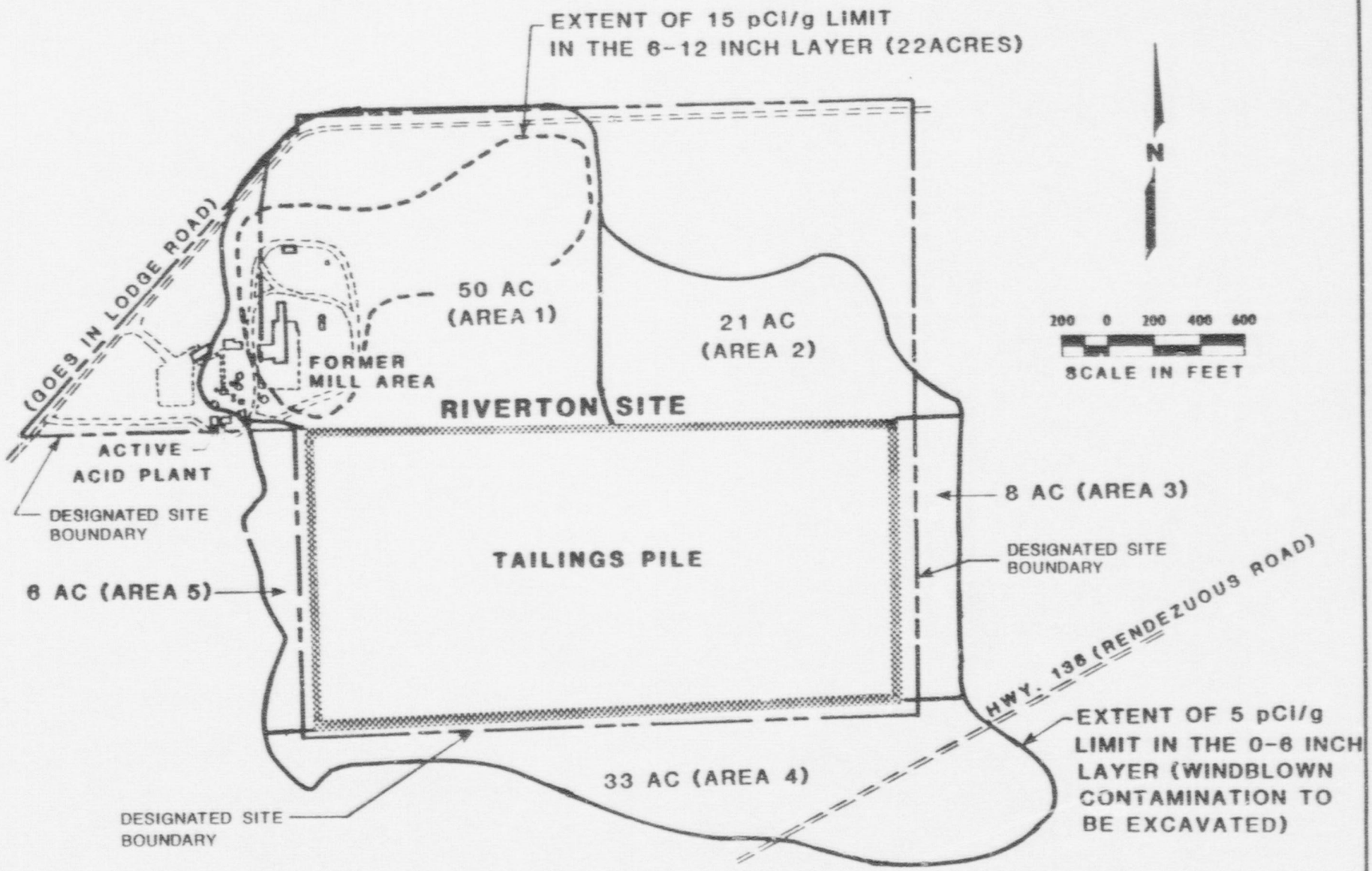


FIGURE 3.4 LIMITS OF EXCAVATION FOR THE WINDBLOWN AREA, RIVERTON SITE

The background water quality or chemistry of the two aquifer systems is different. The unconfined system has a poor quality caused by the natural dissolution and leaching of salts which are deposited in the floodplain. The confined system is used for domestic purposes by the residents around the tailings site and by the city of Riverton which has a group of 15 wells. Some residents use the unconfined water for stock watering and irrigation; however, no wells in this aquifer were identified downgradient of the tailings pile in the contaminated plume.

Although portions of the pile contain water that is highly acidic, the carbonate tailings, ambient groundwater, and natural soils contain sufficient bicarbonate to neutralize this acidity. As neutralization occurs, sulfate, hydroxide, and oxide minerals precipitate in the unsaturated zone and shallow aquifer. These precipitates coprecipitate with and absorb most of the toxic elements and compounds found in the tailings pore water. These layers of precipitation also occlude the pore space in the soils and restrict the infiltration of water (DOE, 1987).

Even with the action of the precipitated minerals, some contaminant concentrations are elevated in the groundwater beneath and downgradient of the pile. However, based on EPA primary drinking water standards, no appreciable health hazard is associated with the presently observed groundwater contamination resulting from the Riverton mill tailings (DOE, 1987). However, there are no standards for two of the key contaminants, uranium and molybdenum. If necessary, water resource protection will be implemented following issuance of the new EPA groundwater standards.

4.0 SITE DESIGN

4.1 INTRODUCTION

This section describes the final remedial action to be implemented at the Riverton processing site. The purpose and objectives of this section are:

- To demonstrate that the design meets the requirements of PL95-604 and the EPA standards applicable to the UMTRA Project.
- To provide concurring parties with a description of the final remedial work at the processing site.
- To document procedures that will govern completion of the remedial work at the processing site.

This document does not cover the design or implementation of work at the Gas Hills disposal site. Only the work involved in removing the tailings and transporting them to the Gas Hills site is described. Final stabilization of the tailings will be described in documentation produced by the NRC or NRC licensees. Accordingly, this final design section should be read in conjunction with other such documentation related to final stabilization of the tailings.

This section is divided into six subsections. The first is this introduction; the second is a brief summary of the final remedial action; the third is a more detailed description of the various significant design aspects of the remedial work; the fourth is a description of significant aspects of the construction work involved in completing the remedial work at the processing site; the fifth is the reprocessing assessment; and the sixth discusses site acquisition.

4.2 SUMMARY OF THE PROPOSED REMEDIAL ACTION

The principal feature of the final remedial action is the relocation of 1.5 million cubic yards of tailings and contaminated materials from the existing tailings pile, mill yard, windblown contaminated areas, and vicinity properties to the Gas Hills site.

Section 3.0 of this RAP describes current conditions at the processing site. Figure 4.1 shows the layout of the Riverton processing site. All contaminated materials will be excavated, loaded into trucks, and transported from the processing site to the Gas Hills disposal site via the route shown in Figure 4.2. The transportation route is approximately 45 miles, primarily along State Highway 136.

After tailings and contaminated materials have been removed from the processing site, the excavation will be backfilled with uncontaminated soil to a level compatible with the surrounding terrain, recontoured to promote surface drainage, revegetated as necessary, and released for any use consistent with existing local land use controls. The need for institutional controls limiting use of contaminated groundwater will be determined after the new EPA groundwater standards have been issued.

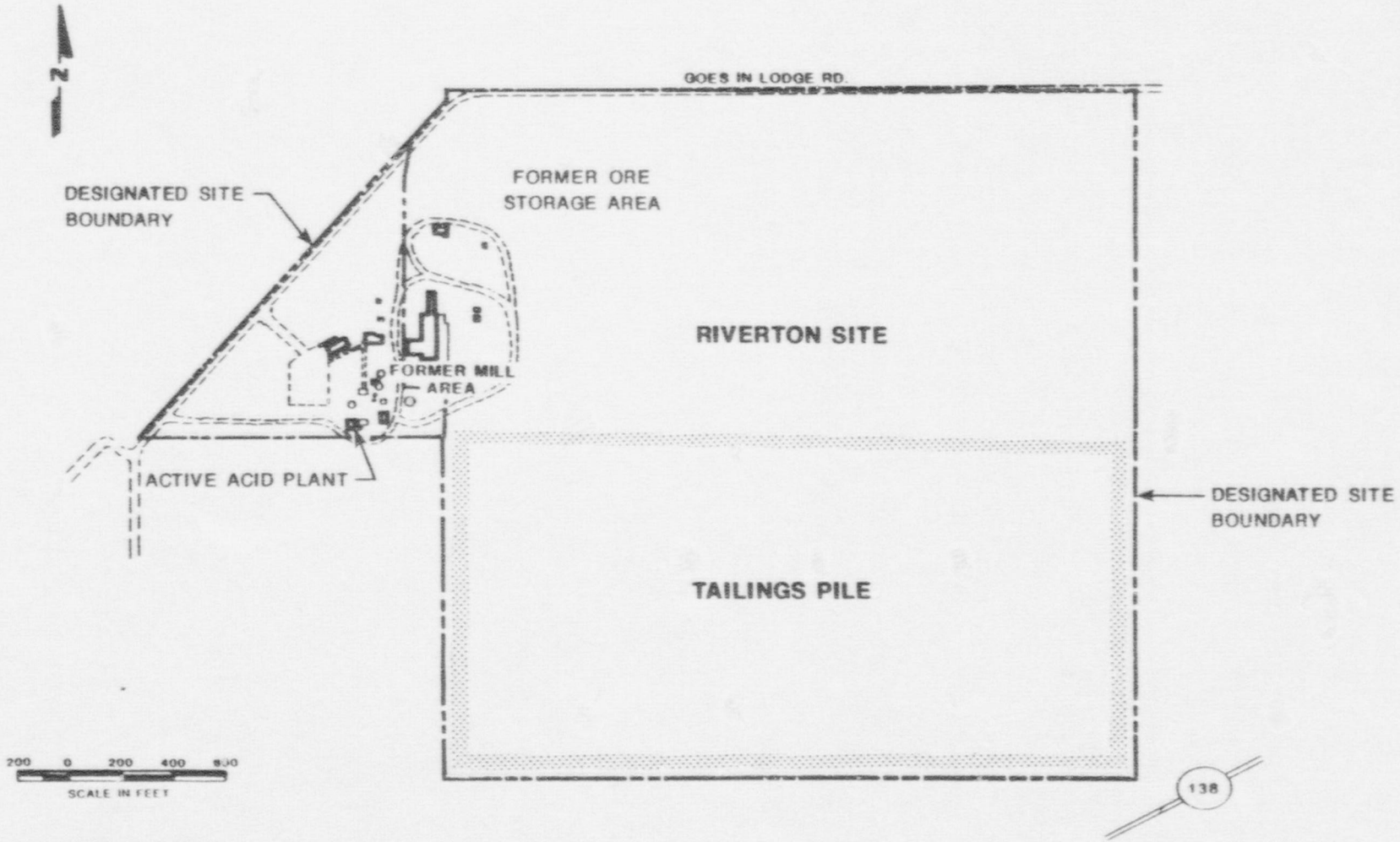


FIGURE 4.1 RIVERTON SITE LAYOUT

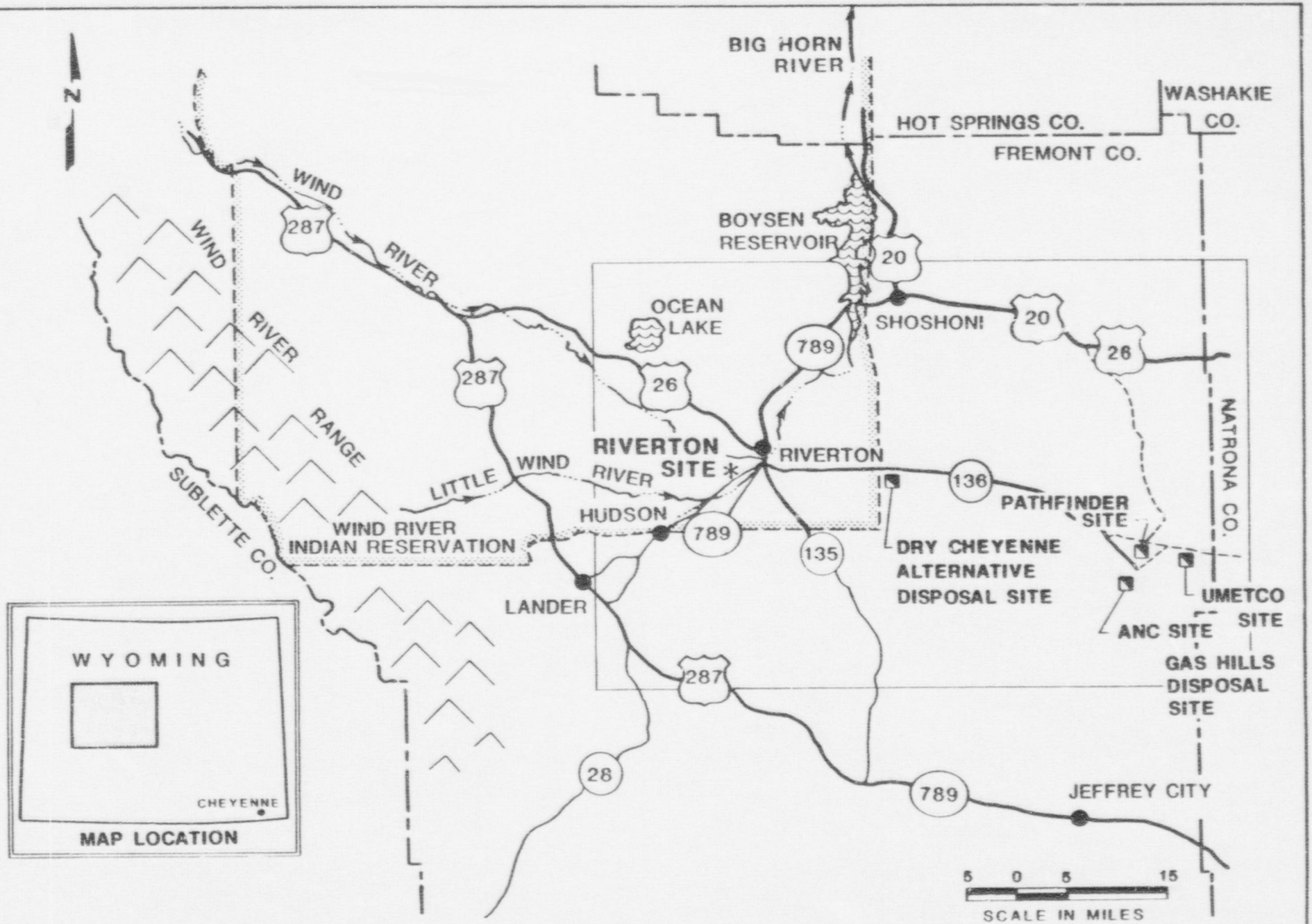


FIGURE 4.2 TRANSPORTATION ROUTE, RIVERTON TO GAS HILLS

4.3 DESIGN DETAILS

4.3.1 Introduction

This section provides details of significant aspects of the remedial action at the Riverton processing site. The site design specifications and drawings (Appendix C) contain additional quantitative information about the remedial action design.

4.3.2 Pile location

The tailings and other contaminated materials will be relocated to the Gas Hills site. Background information regarding the decision to relocate the tailings is contained in the Environmental Assessment (DOE, 1987).

4.3.3 Decontamination and restoration

Decontamination of the 188-acre processing site will be achieved by removal of all the contaminated materials from the site. Removal of the tailings and contaminated subgrade materials may require the subsequent placement of clean backfill materials to restore natural surface drainage. Such backfill materials would be obtained from a borrow site to be selected by the remedial action subcontractor. The disturbed areas of the processing site will be revegetated as necessary.

4.3.4 Hydrogeology

The two basic approaches to mitigation of groundwater contamination are groundwater protection and aquifer restoration. The former approach involves remedial action measures that will reduce the potential for future contamination. To address present groundwater contamination, active aquifer restoration and other controls are assessed.

The nature and extent of remedial actions or mitigative measures chosen to resolve groundwater concerns associated with the Riverton site are based on the following:

- The lateral extent, depth, and concentrations of presently observed contamination.
- The nature of contaminant sources.
- The rates and directions of and hydrodynamic controls on groundwater flow.
- The geochemical controls on solute transport.
- The health effects associated with presently observed and predicted future levels of contamination.

- The contaminated groundwater quality compared with background groundwater quality and applicable Federal and state standards.

- The present water use and expected water use of contaminated or potentially contaminated water.

- The availability of alternate water supplies.

Health effects associated with concentrations of various contaminants found presently in the groundwater are emphasized.

Groundwater protection

Relocation of the tailings and contaminated materials to the Gas Hills disposal site will eliminate the primary source of future groundwater contamination at the Riverton site. Relocation activities could cause a short-term increase in groundwater contamination; however, the increase will only be in effect until all materials are removed. Existing contamination will continue to migrate downgradient and discharge into the Little Wind River until the concentrations of contaminants in the aquifer have returned to background levels.

Solute transport modeling was conducted to assess the impact of pile relocation on existing groundwater plumes (DOE, 1987). The results indicate that current sulfate contamination will be reduced to background levels through natural mechanisms in approximately 45 years. However, less mobile contaminants, specifically molybdenum, may require more time to reach background concentrations as a result of natural mechanisms. A detailed discussion of the solute-transport modeling is provided in the Riverton EA (DOE, 1987).

Two features of the remedial action plan will ensure groundwater protection at the Riverton site during and after relocation. These include construction of an evaporation pond and sealing of unneeded monitoring wells.

The cleanup and excavation of the tailings and contaminated materials may require a small amount of dewatering. This water and other water from equipment washing and decontamination will be disposed of in a small evaporation pond. The pond will be constructed with a liner to ensure groundwater protection. All the water will be evaporated and the pond will be abandoned upon completion of remedial action activities to prevent any future groundwater contamination.

During or after relocation, unneeded monitoring wells at the Riverton site will be plugged to prevent them from acting as vertical channels for potential groundwater contamination. The wells will be grouted to the land surface in accordance with State of Wyoming regulations for monitor well abandonment (Appendix A, Regulatory Compliance).

No interim institutional controls are needed presently to protect groundwater users because there is only one user within the contaminated plume and that use is only for gardening (DOE, 1987). The need for long-term institutional controls (e.g., prohibition of wells completed in the contaminated aquifer) will be determined based on the new EPA groundwater standards.

Aquifer restoration

Mitigative measures to protect or restore groundwater quality may be necessary as part of the remedial action. The requirements for possible aquifer restoration will be defined by groundwater standards to be reissued by EPA (previously remanded by the United States Tenth Circuit Court of Appeals) and by the State of Wyoming groundwater standards. After the new standards have been promulgated by EPA, the DOE will evaluate the conditions at the Riverton site and develop a plan for compliance with the EPA and state regulations.

4.4 CONSTRUCTION FEATURES AT THE RIVERTON PROCESSING SITE

4.4.1 Overview

This section describes the significant aspects of the construction activities involved in completing the remedial action at the Riverton processing site.

Construction will take place at the processing site, the restoration fill borrow site, along the transportation routes, and at the Gas Hills disposal site. Temporary facilities including exact locations and sizes of staging areas, decontamination facilities, temporary drainage ditches, waste-water retention basins, and access control are presented in Appendix C. Final design features at the disposal site will be presented by the Title II licensee/DOE designee in a reclamation plan which must be approved by the NRC.

During construction, temporary facilities will be provided at each site for construction workers, along with supervisory, engineering, administrative, security, and radiation monitoring personnel. The facilities will include office space, toilets, and change rooms.

An equipment decontamination pad will be constructed near the vehicle access gate. Waste water from the decontamination pad will be directed to a retention basin on the site. Construction fences will control traffic entering and leaving the site and prevent unauthorized entry to the controlled area.

4.4.2 Tailings transport

The tailings and other contaminated materials will be transported from the site in trucks. The trucks will be equipped with

gate seals and tarpaulin covers to prevent leakage and dispersion of tailings enroute to the disposal site. The trucks will be washed at the decontamination pad prior to leaving the processing site. The transportation route will be along highways and roads as indicated in Figure 4.2.

4.4.3 Drainage, erosion control, and waste water

During construction, contaminated drainage will be contained on the processing site. Disturbed areas on the site will be graded to direct potentially contaminated runoff to a retention basin, while uncontaminated runoff will be directed off the site. Ditches will be designed to convey the runoff from the site-specific 10-year one-hour storm. The waste-water retention basin will be designed to retain the runoff from a 10-year 24-hour storm at the processing site. Waste water from the decontamination pad and effluent from any dewatering operations also will be directed to the retention basin. The retention basin will be equipped with an emergency spillway designed to discharge the runoff from the site-specific 25-year one-hour storm.

Treatment of the water retained in the basin is not anticipated. The average annual evaporation in Riverton is expected to exceed the probable waste-water volume generated during the remedial action. If it becomes necessary to discharge water (either raw or treated) from the basin, a National Pollutant Discharge Elimination System (NPDES) permit may be required.

4.4.4 Dust control

Dust generated by excavation, earth moving, vehicle use, temporary material stockpiling, and other similar activities will be controlled and minimized by the use of water, surfactants, or salt solutions (such as magnesium chloride). Dust control in uncontaminated areas will be accomplished with clean water solutions, while dust control on the tailings pile may be accomplished with waste water.

4.4.5 Utilities

Existing utilities at the Riverton processing site will be protected during construction or temporarily relocated as necessary. Potable water will be provided by the subcontractor. Electrical power, natural gas, and telephone service are available at the processing site.

4.4.6 Dewatering

Excavation below the water table may be required at times during the remedial action. Preliminary analysis indicates that

the volume of materials excavated from the saturated zone will be negligible, hence no special provisions for dewatering the excavation are anticipated. Saturated materials may be mixed with drier materials for transport and disposal at the Gas Hills site. Should it become necessary to dewater the excavation itself, temporary well points or sumps may be installed, with the discharge directed to the waste-water retention basin.

4.4.7 Demolition

Existing steel and concrete structures at the processing site, including foundations, will be demolished and transported to the Gas Hills site for disposal. Prior to demolition, structural contamination may be removed or fixed to control its spread. The pumphouse, scale, scale house, and water tower will be decontaminated and retained.

4.4.8 Borrow area restoration

The Little Wind River site is a possible borrow source for processing site restoration materials. The borrow site is three road miles southeast of the processing site. The materials at the Little Wind River site have not been characterized, and it is recognized that the remedial action construction contractor may elect to choose another source for restoration materials.

4.4.9 Construction sequence

The following is the generalized construction sequence for the remedial action. The actual sequence may vary from the hypothesized scenario, given that the remedial action construction contractor will be granted some flexibility in accomplishing the contract scope of work.

Initially, the site preparation phase will include equipment mobilization, installation of a site security system, and establishment of an equipment staging area. This phase will also include construction of a decontamination pad, temporary drainage ditches, and a retention basin. Uncontaminated soils excavated during such construction may be stockpiled for use as backfill during the site restoration phase. Other drainage and erosion control features will be constructed at this time, as well as construction or upgrading of access roads at the site.

The next phase of construction will be tailings relocation. That work will include building demolition and excavation of the tailings pile (including contaminated foundation soils), windblown tailings, and contaminated mill yard soils. All such materials will be transported in trucks to the Gas Hills site for ultimate disposal.

The restoration phase will begin during the latter part of the tailings relocation phase. That work will include importation of any necessary clean backfill materials, grading to promote drainage at the restored processing site, and revegetation of all disturbed areas. The accumulated contaminated sediments and liner from the waste-water retention basin will be transported to the Gas Hills site for disposal, and the excavations for the basin and temporary drainage ditches will be backfilled with stockpiled materials, graded, and revegetated. The construction equipment will be decontaminated and inspected prior to release from the construction area.

Figure 4.3 is a proposed schedule for completion of remedial action at the Riverton processing site.

4.4.10 Cost estimate

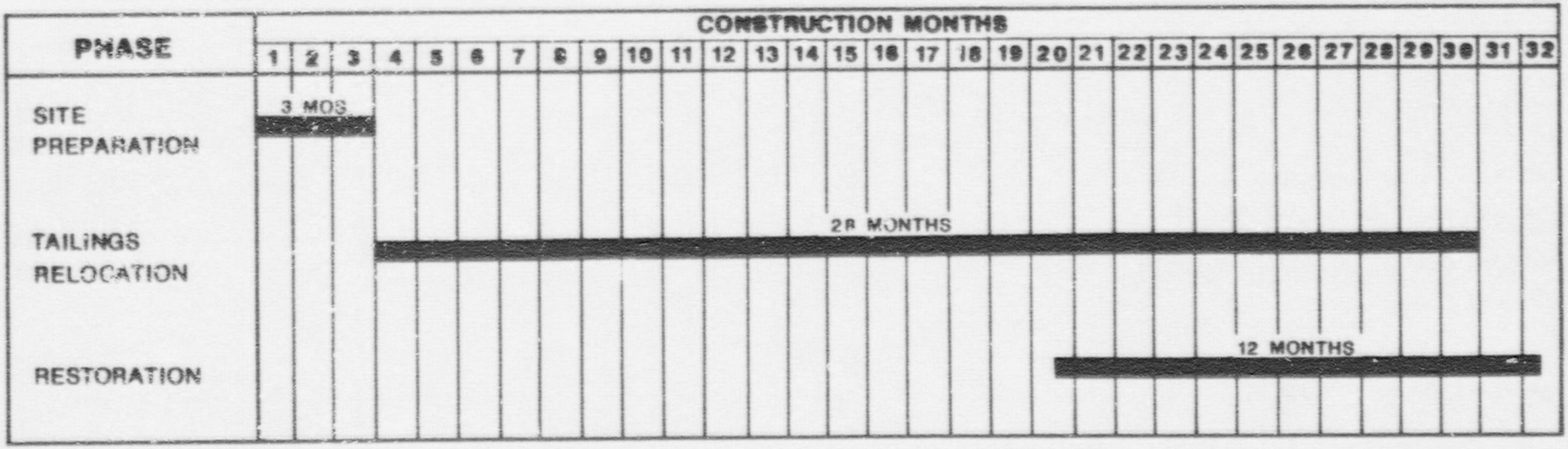
The cost estimate summary for the proposed Riverton remedial action will be provided in Table 4.1.

4.5 REPROCESSING ASSESSMENT

An aspect of the project which must be addressed in order to comply with PL95-604 is the economic and technical feasibility of reprocessing the tailings for the recovery of residual uranium and vanadium. In 1981, Mountain States Research and Development (MSRD) was contracted to perform an economic evaluation of reprocessing the Riverton tailings. MSRD conducted a drilling and sampling program to determine the amount of recoverable uranium, vanadium, and molybdenum. Laboratory leaching tests were conducted on the samples to estimate extractability and the process to be applied. The evaluation compared the recoverable values of the metals versus the capital and operating costs for processing. Site excavation, haulage, and final disposal costs were not included. The results of the study indicated that reprocessing was not economical at 1982 prices for the metals (MSRD, 1982).

4.6 SITE ACQUISITION

Legal access to the Riverton processing site will be by means of a remedial action agreement or purchase agreement between the DOE, the State of Wyoming, and Lome Drilling and Well Service and Chemical Marketing Services, the owners of the processing site. The disposal site will remain under the ownership of the Title II site licensee during the remedial action.



NOTE SCHEDULE DOES NOT TAKE INTO ACCOUNT WINTER SHUTDOWN.

FIGURE 4.3 CONSTRUCTION SCHEDULE

Table 4.1 Site cost estimate summary (1987 - $000)

(To be completed after the remedial action subcontract has been awarded.)			

5.0 ENVIRONMENTAL, HEALTH, AND SAFETY

5.1 POLICY

It is the policy of the UMTRA Project that the DOE and its contractors take all reasonable precautions in the performance of the remedial action work to protect the environment, ensure the health and safety of employees and the public, and provide protection of the U.S. Government. The DOE and its contractors will comply with all applicable Federal and state health and safety regulations and requirements including, but not limited to, those established pursuant to the Occupational Safety and Health Act (OSHA).

The site Remedial Action Contractor (RAC) will have the principal responsibility for implementing a health and safety program. The program should include an on-site professional radiation health staff responsible for implementing monitoring, sampling, training, and reporting procedures. The surrounding community and the on-site workers must be protected to prevent avoidable accidents and radiation exposure. The RAC will prepare a site-specific Environmental, Health, and Safety Plan which meets the requirements of the UMTRA Project Environmental, Health, and Safety Plan (DOE, 1985b), and its revisions. The site-specific plan will be available for NRC and state review prior to its field implementation.

5.2 SITE CONDITIONS AFFECTING HEALTH AND SAFETY PLANNING

Health and safety considerations at the Riverton site will require special attention by the RAC because of the physical, radiological, and industrial hygiene hazards that may exist there. This section of the Remedial Action Plan describes those specific conditions that represent potential hazards and are suspected or known to exist. The following text is not intended to provide a comprehensive list of potential hazards, but rather describes conditions that have been noted during prior work activities at the Riverton site. The site-specific health and safety plan, to be developed by the RAC, will address the appropriate precautions for those conditions.

Figure 5.1 shows the locations of existing utilities at the Riverton site. The Processing Site Characterization Report (DOE, 1985a), contains additional descriptions and maps of the existing utilities at the Riverton site. Buried gas, electric, water, and sewer lines, and above-ground electric lines exist on and around the processing site. Buried fuel tanks have not been reported, but could exist in the former mill areas.

Numerous buildings and structures remain standing at the Riverton site. The mill building is in poor condition and has been partially demolished. Rubble from the mill building is scattered near the remaining mill structure. Radiological contamination and exposure rates have been measured in some of the buildings, and the results are reported in the radiological characterization report (BFEC, 1983). Potential physical hazards and exposures to residual process chemicals should be addressed

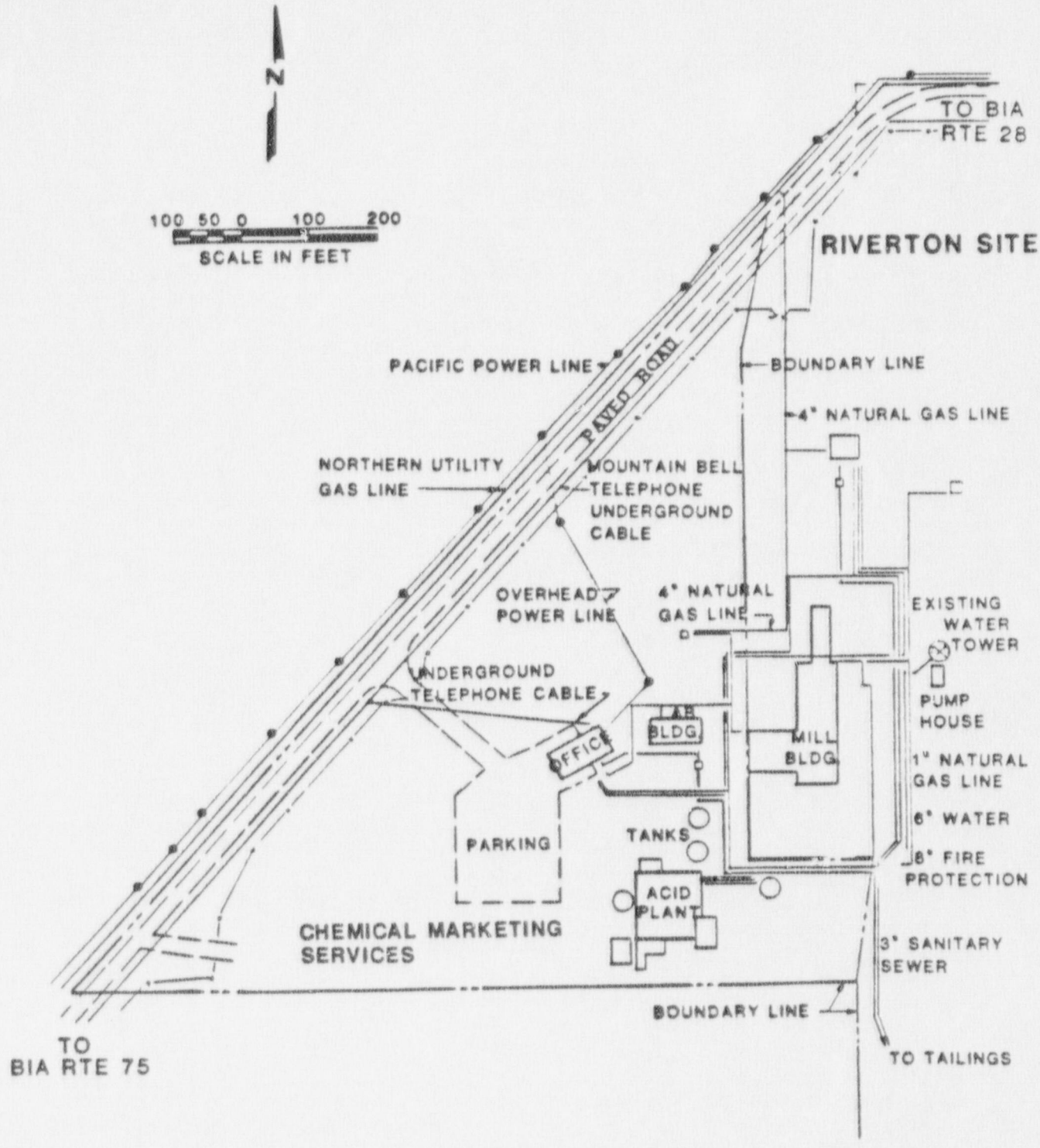


FIGURE 5.1 LOCATION OF EXISTING UTILITIES, RIVERTON SITE

before working in the abandoned buildings. The ages of the buildings indicate that asbestos containing materials may be encountered if buildings are dismantled or demolished. Potential exposures should be evaluated and appropriate precautions taken during work activities. Guidance for handling asbestos is provided by the Occupational Health and Safety Administration (29 CFR Part 1910.1001, Subheading - Asbestos; and 29 CFR Part 1926.58), and the Environmental Protection Agency (40 CFR Part 61 subpart M - National Emission Standard for Asbestos). Recommended procedures for handling and disposing of asbestos containing materials are provided in two EPA publications (EPA, 1985a,b).

The site is located southwest of the city of Riverton, Wyoming, adjacent to State Highway 138. The proximity of the site to the city and the highway indicates that potential vehicle hazards and traffic accidents should be considered in planning the remedial actions, and in developing employee orientation and safety training programs.

Emergency response facilities are easily accessible in the city of Riverton in case of an emergency. The location of the hospital, and phone numbers for emergency response organizations are:

Fire/Ambulance and Police (Riverton)	911
Police/Sheriff (Gas Hills)	1-332-5611
HCA Riverton Hospital (2100 West Sunset, Riverton)	856-4161

6.0 RESPONSIBILITIES OF PROJECT PARTICIPANTS

6.1 INTRODUCTION

The following defines the various responsibilities of the U.S. Department of Energy (DOE) UMTRA Project Office, the U.S. Nuclear Regulatory Commission (NRC), and the State of Wyoming during detailed design, remedial action, and through certification. Responsibilities are divided into major categories to be performed by the parties. Most of the state of Wyoming's responsibilities will be performed by the Department of Environmental Quality (DEQ).

Major areas of responsibilities for future actions by the DOE, the State of Wyoming, and the NRC can be summarized as follows:

- DOE:

  Manage and coordinate project.
  Obtain permits and approvals.
  Prepare detailed designs and specifications.
  Prepare quality assurance plan.
  Prepare and implement public participation and information plan.
  Provide funds.
  Conduct remedial action.
  Audit remedial action.
  Certify remedial action.
  Appoint designee under Section 108 for completion of stabilization/reclamation of commingled tailings.

- State of Wyoming:

  Review and concur in Remedial Action Plan including designs and specifications.
  Assist in obtaining local permits.
  Assist in site acquisition.
  Issue state permits.
  Assist in public participation and information.
  Provide funds.

- NRC:

  Review and concur in RAP.
  Review final design.
  Concur in site certification.
  Review and approve reclamation plan/license amendment.
  Determine amount of surety required to assure reclamation/stabilization of commingled tailings.

6.2 DETAILED RESPONSIBILITIES

Detailed responsibilities of the project participants are in the areas of permitting, land acquisition, detailed design, construction, health and safety, public information, radiological support, and quality assurance.

6.2.1 Regulatory compliance

Requirements for regulatory compliance, previously identified by Federal, state, tribal, and local agencies (Agencies), are incorporated into the final design specifications, as needed, by the DOE. Revisions to the design and specifications resulting from internal DOE reviews are incorporated prior to the Agencies' review for permits.

During the remedial action, the DOE audits construction activities for compliance with provisions in the permits and approvals. (Permitting agencies may independently audit relevant activities consistent with normal practice.) Summary audit reports are prepared by the DOE and are submitted to the appropriate Agencies as required. Depending upon Agency comments, revisions to construction compliance activities are implemented.

Upon completion of the permitted action, the DOE conducts a final review and prepares a close-out report for submittal to the Agencies. Permits are then terminated.

6.2.2 Land acquisition

The DOE, the State of Wyoming, and the processing site owner enter into a remedial action agreement allowing legal access to the processing site for the remedial action.

6.2.3 Detailed design

The DOE prepares preliminary engineering drawings for internal review. Based upon this review, final design drawings, specifications, and bid packages are prepared. Once finalized, the bid packages are advertised pursuant to Federal regulations and a construction contractor is selected.

Final design and specifications are shown in Appendix C.

6.2.4 Construction

The DOE prepares guideline documents to comply with health and safety, security, quality assurance, public information, and other regulatory requirements. Revisions resulting from internal DOE review are incorporated into each document.

Site mobilization and initiation of construction activities occur in accordance with the DOE-approved construction schedule.

Construction activity is audited by the DOE. The state, NRC, and other regulatory agencies may also audit the remedial action. Revisions to the remedial action resulting from site audits are incorporated into the final design and the remedial action plan, as necessary, by the DOE.

Audit reports are made available to the NRC and the state upon request. Upon completion of the remedial action, the remediated processing site is certified by the DOE. The NRC concurs in certification.

6.2.5 Health and safety

The DOE prepares an Environmental, Health, and Safety Plan in conformance with the UMTRA Project Health and Safety Plan. Based upon this guidance, site-specific implementation procedures are developed by the DOE. As part of the implementation procedures, the DOE institutes radiation control and environmental monitoring, and develops response procedures for severe weather and medical emergencies.

Construction contractors comply with approved procedures and file reports with the DOE that record the results of monitoring, and report accidents and illnesses. Records are maintained by the DOE following remedial action construction.

Employee and public complaints are investigated by the DOE. The DOE audits construction activities. Others such as the state and the NRC may perform independent audits.

6.2.6 Public information

The DOE establishes a local site manager who provides input into the public information process.

Prior to and during construction, the DOE, with assistance from the state and local citizens, conducts public information meetings to inform the interested public of key aspects and current progress of the remedial action.

Concurrent with the public meetings, the DOE provides status and progress reports for the state and other agencies (e.g., NRC, EPA, Shoshone and Arapahoe Indian Tribes, and Bureau of Indian Affairs).

6.2.7 Radiological support

The DOE prepares and implements a Radiological Support Plan, and takes measures to independently assure the quality of the analyses and compliance with the procedures. Based upon review of the analyses, the construction sequencing and design may be revised by the DOE with input by the state.

After remedial action, the DOE prepares a completion report, conducts a final certification survey, and provides a recommendation for site certification. The NRC concurs in the final site certification

6.2.8 Quality assurance

The DOE prepares the Quality Assurance (QA) Plan in conformance with guidelines established in the UMTRA Project Quality Assurance Plan (DOE, 1986b). The DOE audits the construction activities and prepares audit reports as appropriate.

6.2.9 Surveillance and maintenance

The NRC prepares the Site Surveillance and Maintenance Plan and ensures that the plan is implemented by the Federal agency that assumes custodial responsibility of the Gas Hills disposal site.

7.0 SURVEILLANCE AND MAINTENANCE

After the remedial action is complete and the processing site has been certified, a need is not anticipated for long-term surveillance and maintenance at the Riverton processing site. However, when the EPA issues revisions to the water protection standards (40 CFR Part 192.20(a)(2)-(3)), the DOE will re-evaluate the groundwater issues at the Riverton site to assure that the revised standards are met. The DOE will determine the need for institutional controls, aquifer restoration, or other controls and will take appropriate action so as to comply with the reissued standards. Any necessary, long-term surveillance and maintenance at the Riverton site will be the responsibility of the DOE or other designated Federal agency. The Title II licensee/DOE designee will be responsible for surveillance and maintenance of the commingled tailings pile at the disposal site until such time as reclamation/stabilization is determined by the NRC to be complete. Long-term surveillance and maintenance of the disposal site will be the responsibility of the NRC or another designated Federal agency.

8.0 QUALITY ASSURANCE

8.1 GENERAL

The RAC shall provide and maintain an effective quality assurance (QA) program and procedural system which will assure that all work, materials, supplies, and services required under the contract conform to contract requirements, whether constructed or processed by the RAC or its subcontractors or procured by subcontractors or vendors. The RAC shall perform or have performed adequate inspections and tests as will ensure and substantiate that all work, materials, supplies, and services conform to contract requirements.

The RAC shall furnish a QA test and inspection plan which defines the health, safety, and environmental activities to be incorporated into the design and/or performed during construction to ensure contract compliance and site certification. Test and inspection requirements shall be approved by the DOE prior to the start of any physical job site construction work under this contract. If the RAC revises the plan, the RAC shall concurrently furnish a copy of the revision to the DOE for approval prior to implementing the revision on work under the contract.

8.2 QUALITY ASSURANCE PLAN

Before construction operations are started, the RAC shall meet with the authorized DOE QA representative to review and discuss the RAC's proposed project QA plan. The meeting shall develop mutual understanding relative to details of the individual site plan requirements including the formats to be used for recording and reporting tests and inspections, administration of the plan, personnel assignments, and the interrelationship between the RAC and the DOE QA representative. The RAC shall furnish a list of the procedures required to implement the project plan. This list shall include, at a minimum, procedures for data collection, analyzing samples, inspection and testing, and formats of reports to be used.

8.3 DAILY INSPECTION REPORT

The RAC shall prepare a daily report for every day worked, and a weekly summary report covering the RAC and/or subcontractor's operations in an appropriate format. These daily reports shall be maintained at the site until work is complete. These logs shall provide complete and factual evidence that continuous, effective quality control construction inspections and tests have been performed, including but not limited to: (1) the type and number of inspections and tests involved; (2) results of inspections and tests; (3) nature of deficiencies requiring corrections; and (4) corrective actions taken or to be taken.

The RAC shall maintain current records of all inspections and shall furnish, as part of the files at the end of the project, copies of the inspection reports and all other files appropriate to each individual

subcontract. The reports of inspection shall cover all work placement subsequent to the previous report and shall be verified by the RAC's designated QA representative.

8.4 MEASURING AND TEST EQUIPMENT CALIBRATION AND CONTROL

The RAC shall provide measuring and test equipment having the precision and accuracy needed to establish conformance with specified quality requirements. Calibrations shall be in accordance with nationally recognized standards. The RAC shall identify procedural systems for test equipment calibration and recall.

8.5 NONCONFORMANCES

A nonconformance and change procedural system shall be developed by the RAC and approved by the DOE.

8.6 RECORDS CONTROL

The RAC shall be responsible for generation, retention, and retrieval of legible records which provide objective evidence of conformance to the specified quality requirements. These records shall be considered valid only if they are completed and signed or otherwise authenticated and dated by authorized personnel. These records should include, but are not limited to:

- o Radionuclides in soil data.
- o Air monitoring data.
- o Design review files.
- o Water contaminant analysis.
- o Personnel radiation exposure data.
- o As-built drawings.
- o Test and inspection reports.
- o Engineering specifications.
- o Material certifications.
- o Certificates of compliance.
- o Reports and corrective action requests.
- o Operating procedures.
- o Change orders.
- o Unusual occurrence reports.

All records shall be available to the DOE for review upon request. All personnel radiation exposure records shall be turned over to DOE upon completion of the site remedial action.

8.7 CODES AND STANDARDS

The RAC shall have on the job site, no later than three weeks after site mobilization, the applicable quality assurance codes and standards available for ready reference by all personnel. The RAC shall maintain

at the job site copies of all approved-for-construction drawings, specifications, and other documents which describe the remedial action.

8.8 RECORD DRAWINGS

The RAC shall develop QA procedural systems to ensure the use of authorized (approved-for-construction) drawings and specifications and the maintenance of current record drawings. Two full-sized sets of contract drawings shall be used by the RAC for this purpose. All variations from the contract drawings shall be depicted. Generally, the drawings shall reflect only such changes and/or corrections to data and dimensions shown on contract drawings. Where the contract specifications or drawings permit optional use of more than one type of material or equipment, the type of material or equipment installed shall be shown on the drawings. The drawings shall, at all times, be maintained in a current condition, and made available for review by the DOE. Variations from the contract drawings shall be shown in the contract working drawings and shall be incorporated into the record drawings. Upon physical completion of the contract work, two reproducible copies of these drawings shall be furnished to DOE.

8.9 MATERIAL CERTIFICATION

The technical specifications may require that certain materials be certified. Two types of certifications that may be specified are:

- Certificate of compliance.
- Certified material test report (CMTR). When a CMTR is requested from the RAC or its subcontractors, it shall be accompanied by a certificate of compliance certifying that the tested material is actually that material incorporated in the work.

8.10 QUALITY ASSURANCE PROGRAM VERIFICATION

Verification of the QA Program implementation by DOE may be accomplished by:

- Review of daily or weekly summary reports.
- On-site inspections and surveillance.
- Periodic audits.
- Acceptance of DOE QA recommendations based on DOE QA audits of RAC activities.
- Any combination of the above.

8.11 REMEDIAL ACTION FIELD CHANGES

During the course of remedial action, design changes are expected to occur. Some of these changes may impact compliance with EPA Standards, but most changes are expected to be unrelated to critical design elements of the stabilized tailings pile. The following sections define three classes of changes and establish guidelines to be used when implementing changes.

8.11.1 Class 1 changes

A Class 1 change is a change which may affect compliance with the EPA Standards (40 CFR Part 192). Class 1 changes will be reflected in a Modification to the Remedial Action Plan (RAP), which will ultimately result in a change to the State Cooperative Agreement. The NRC and the State of Wyoming will be required to concur on all Class 1 changes.

Class 1 changes include, but are not limited to, the following:

- Discovery of unusually high levels of residual radioactive materials which will change the radon emission concentrations post-remedial action according to the final design as presented within the final RAP.
- Disposal of hazardous/mixed wastes within the disposal cell.

8.11.2 Class 2 changes

A Class 2 change is a change to any permanent construction feature which does not clearly affect compliance with the EPA Standards. Class 2 changes will be forwarded to the NRC and the state of Wyoming for informative purposes. At any time that the NRC and/or state feel a change has been incorrectly designated as Class 2, the change may be redesignated as Class 1 upon verification of error. By approaching Class 2 in such a manner, construction delays will be avoided, and the NRC and state will consistently be aware of all changes affecting the RAP. Class 2 changes will not require formal NRC or state concurrence unless the change results in a cost impact to the project. All changes which affect the cost of remedial action must be concurred in by the state. Class 2 changes will not require a modification to the RAP or Cooperative Agreement.

Class 2 changes include, but are not limited to, the following:

- Adjustments to specifications which will <u>not</u> affect the major aspects of design, such as permeability, infiltration, radon flux, or groundwater contamination.

- Requests for additional well sealing for newly discovered wells.

- Changes in location of permanent fencing.

8.11.3 Class 3 changes

A Class 3 change is a change to temporary features which have no impact on the design for the stabilization of the tailings pile. Class 3 changes will not require NRC or state concurrence unless the change results in a cost impact to the project. All changes which affect the cost of remedial action must be concurred in by the state. Class 3 changes may be approved by a Remedial Action Contractor representative of appropriate supervisory position.

Class 3 changes include, but are not limited to, the following:

- Changes in location or use of construction/excavation materials.

- Change in location of temporary fencing.

- Alteration of temporary drainage facilities, roads, or site office facilities.

8.11.4 General requirements

The general requirements which are to be fully understood and commonly interpreted by all parties (DOE, NRC, state) in utilization of the above classification of changes are as follows:

- All changes will be logged on a Project Interface Document (PID), which will be initiated by the Remedial Action Contractor (RAC) and forwarded to the DOE Project Office (PO). The DOE PO will then forward copies of the PID and supporting data, if required, to the NRC and the affected state as outlined below.

- For all Class 1 changes, the DOE will notify the NRC and state no later than one working day after notification by the RAC. The NRC and the state will then be copied on all pertinent data necessary for review and concurrence or comment within one working day after receipt of same by the DOE PO. This may be transmitted verbally or telefaxed prior to formal issuance.

- RAP Modifications may be handled as a group as opposed to separate issuance of individual modifications for each Class 1 change.

- For all Class 2 changes, appropriate justification data will be forwarded to the NRC and state as submitted to the DOE PO by the RAC. This may be transmitted following verbal or telefaxed notification as noted under the second general requirement above. Written justification will be forwarded by the PO within five working days after receipt.

- For all Class 1 changes requiring immediate approval to avoid impacting construction, the DOE/State/NRC shall give that change top priority for expeditious review and approval as necessary to avoid delay. Comments and/or concurrence should be transmitted to DOE within 10 working days of receipt of all pertinent data necessary for review and concurrence.

- For all Class 3 changes, the PID will be forwarded to the NRC and the State of Wyoming within a reasonable time.

- The RAC shall maintain an up-to-date record of all changes for all sites. In addition, the DOE PO will maintain an up-to-date file of all PIDs.

- Comment or nonconcurrence by the state or NRC will be accompanied by a technical evaluation supporting the area in question.

- All changes, regardless of classification, which affect the cost of remedial action must be concurred in by the state. However, the state agrees that concurrence need not be granted prior to implementation of the change. As in the previous comment above, comment or nonconcurrence by the state must be accompanied by a technical evaluation supporting the state's position.

9.0 PUBLIC INFORMATION AND PUBLIC PARTICIPATION

9.1 INTRODUCTION

Section III of the UMTRCA states,

> "In carrying out the provisions of this title, including the designation of processing sites, establishing priorities for such sites, the selection of remedial actions and the execution of cooperative agreements, the Secretary (of Energy), the Administrator (of the Environmental Protection Agency), and the (Nuclear Regulatory) Commission shall encourage public participation and, where appropriate, the Secretary shall hold public hearings relative to such matters in the state where processing sites and disposal sites are located."

It is the intent of the public information and public participation program to fully inform the interested public and use the feedback in the decision-making processes and remedial action activities relative to the UMTRCA-designated site near the city of Riverton, Fremont County, Wyoming. The following sections describe the actions the DOE and state will take to encourage the participation of an informed public in this project.

9.2 PUBLIC PARTICIPATION

The National Environmental Policy Act (NEPA) of 1969 requires an evaluation of the environmental impacts of major Federal actions that may significantly affect the environment. Before remedial action construction can begin, an Environmental Assessment (EA) will be completed for the Riverton site. Public participation is an important part of the preparation of the EA; the participation requirements are detailed in the Council on Environmental Quality (CEQ) Regulations (effective July, 1979) for implementing the provisions of NEPA, and in the DOE guidelines of 1980 for NEPA compliance.

In preparing the EA, DOE has conducted and will continue to conduct individual and group meetings with community officials and private citizens to discuss the purpose of the proposed remedial actions and ascertain the extent of pubic interest in this project. At these meetings, the public is given the opportunity to express their concerns and identify what they believe to be significant issues.

The identified issues are documented in the EA and incorporated into the decision-making process. Interested parties were given the opportunity to comment on the EA at a public meeting in Riverton after the EA was published.

In addition to meetings on the EA, the DOE has held public information meetings in Riverton to describe the remedial action plan for the project and received comments which were used in the design for the remedial action.

A Task Force comprised of local citizens, formed to serve as a major communication link in the decision-making process, has met with the DOE and state to convey community response on project activities. The Task Force should continue to meet periodically throughout the duration of remedial action construction.

Frequent meetings and briefings have been held to provide information and project status updates and solicit public participation in the project activities. DOE, state, local officials, and interested citizens will be involved in frequent discussions regarding remedial action construction schedules, radiation monitoring reports, groundwater protection plans, and other project activities. These meetings will be advertised as to time and place.

9.3 PUBLIC INFORMATION

In order for public participation to be effective, the public must be informed concerning the remedial action project in Riverton. Several methods of information dissemination will be used by the DOE. Press releases and press packets are prepared for project status updates, including report summaries, texts of presentations, and graphics.

The names and addresses of some 165 individuals, media representatives, and Federal, state, and local officials have been computerized for information dissemination purposes. Information is provided to interested persons in the Federal Government, state, tribal, and local administrations, public interest groups, private citizens, and private businesses in Fremont County.

A public preconstruction meeting is conducted by DOE. Principal topics of discussion include the remedial action construction and schedules.

An on-site representative is designated by DOE to respond to public inquiries during remedial action construction. This representative works closely with the DOE to provide information, and meets frequently with the public throughout the construction period.

A variety of printed materials have been prepared concerning the UMTRA Project and the Riverton site. These include project fact sheets, a site fact sheet, and the environmental assessment (EA). As they are printed, these materials and other fact sheets are sent to interested individuals and are available in the Riverton and Cheyenne areas at the public libraries, city and county offices, and the Wyoming Department of Environmental Quality offices. The same materials are also available at DOE libraries nationwide.

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GLOSSARY

absorbed dose, radiological	The energy imparted to matter by ionizing radiation per unit mass of irradiated material at the place of interest. The unit of absorbed dose is the rad; one rad equals 100 ergs per gram.
alluvium	Fragmental sediment deposited by the operation of modern rivers.
alpha particle	A positively-charged particle emitted from certain radionuclides. It is composed of two protons and two neutrons, and is identical to the helium nucleus.
aquifer	A saturated, permeable, geologic unit that can transmit significant quantities of water under normal hydraulic gradients.
aquitard	A water-bearing zone that transmits water at a very slow rate.
atom	A unit of matter; the smallest unit of an element consisting of a dense, central, positively-charged nucleus surrounded by a system of electrons, equal in number to the number of nuclear protons and characteristically remaining undivided in chemical reactions except for a limited removal, transfer, or exchange of certain electrons.
background radiation	Levels of radiation, or concentration of radionuclides which are typical of an undisturbed area, or area not affected by residual radioactive material.
beta particle	Charged particle emitted from the nucleus of an atom, with mass and charge equal to those of an electron.
bioassay	A method for quantitatively determining the concentration of radionuclides in a body by measuring the quantities of those radionuclides that are eliminated from the body, usually in the urine or the feces.
confined aquifer	An aquifer bounded above and below by relatively impermeable beds.
contamination	In this report, the presence of radioactive material in undesirable concentrations and in undesirable locations.
daughter product(s)	A nuclide resulting from radioactive disintegration of a radionuclide, formed either directly or as a result of successive transformations in a radioactive series; it may be either radioactive or stable.

decay, radioactive	Disintegration of the nucleus of an unstable nuclide by spontaneous emission of charged particles, photons, or both.
decontamination	The reduction of radioactive contamination from an area to a predetermined level set by a standards-setting body such as the EPA, by removing the contaminated material.
disintegrations per minute or second	The number of radioactive decay events occurring per minute or second.
DOE	U.S. Department of Energy.
dose	A general term denoting the quantity of radiation or energy absorbed, usually by a person; for special purposes, it must be qualified. If unqualified, it refers to absorbed dose.
dose, absorbed	The amount of energy imparted to matter by ionizing radiation per unit mass of irradiated material at the point of interest; given in units or rads.
dose commitment	The cumulative dose equivalent that results and will result from exposure to radioactive materials over a discrete time period; given in units of rems.
dose equivalent	The quantity that expresses all kinds of radiation on a common scale for calculating the effective absorbed dose; defined as the product of the absorbed dose in rads and modifying factors, especially the qualifying factor; given in terms of rems. Often abbreviated "dose."
dose, external	The absorbed dose that is due to a radioactive source external to the individual as opposed to radiation emitted by inhaled or ingested sources.
dose, internal	The absorbed dose or dose commitment resulting from inhaled or ingested radioactivity.
EA	Environmental Assessment.
EPA	U.S. Environmental Protection Agency.
exposure	A measure of the ionization produced in air by x or gamma radiation. It is the sum of the electrical charges on all ions of one sign produced in air when all electrons liberated by photons in a volume element of air are completely stopped in air, divided by the mass of the air in the volume element. The unit of exposure is the roentgen (R).

FONSI	Finding of No Significant Impact.
flux, radon	The emission of radon gas from the earth or other material, usually measured in units of picocuries per square meter per second.
gamma dose	Radiation dose caused by gamma radiation.
gamma logging (or logs)	A technique for determining gamma radiation levels at various depths in a borehole.
gamma ray	Short wave length electromagnetic radiation of nuclear origin with energies ranging from 10 KeV to 9 MeV.
gamma spectral analysis (gamma spectroscopy)	An analytical technique for identifying radionuclides based on their different gamma energy levels.
groundwater	Subsurface water in fully saturated soils and geologic formations.
hydraulic gradient	Rate of change of hydraulic head per unit of distance of flow at a given point. The driving force for advective flow in a porous medium.
half-life	The time required for a radioactive substance to lose 50 percent of its activity by decay. Each radionuclide has a unique half-life.
in-situ	In the natural or original position.
isotopes	Nuclides having the same number of protons in their nuclei, but differing in the number of neutrons. The chemical properties of isotopes of a particular element are almost identical.
licensing	In this report, the process by which the NRC will, after the remedial actions are completed, approve the final disposition and controls over a disposal site.
maintenance, custodial	The repair of fencing; repair or replacement of monitoring equipment; revegetation; minor additions to soil cover; general disposal site upkeep such as mowing grass.
man-rem	Unit of population exposure obtained by summing individual dose-equivalent values for all people in the population. Thus, the number of man-rems attributed to one person exposed to 100 rems is equal to that attributed to 100 people each exposed to one rem.
micro	A prefix meaning one millionth (x 1/1,000,000 or 10^{-6}).
milli	A prefix meaning one thousandth (x 1/1000 or 10^{-3}).

Modified Mercalli (scale)	A standard scale for the evaluation of the local intensity of earthquakes based on observed phenomena such as the resulting level of damage. Not to be confused with magnitude, such as measured by the Richter scale, which is a measure of the comparative strength of earthquakes at their sources.
monitor	To observe and make measurements resulting in data for evaluation of the performance and characteristics of the disposal site.
MSRD	Mountain States Research and Development.
NEPA	National Environmental Policy Act.
NRC	U.S. Nuclear Regulatory Commission.
OSHA	Occupational Safety and Health Act.
passive institutional controls	Those controls which require action by a governmental agency to preclude human contact with the waste or require a continuing social order. Examples include Federal ownership of a disposal site, monuments on the site, records with agencies, and physical barriers (e.g., riprap covers, vegetation, waste burial).
perched groundwater	Groundwater that is unconfined and separated from an underlying body of groundwater by an unsaturated zone.
permeability	The capacity of a rock or soil mass to transmit a fluid.
permissible dose	That dose of ionizing radiation that is considered acceptable by standards-setting bodies such as the EPA. Also, the dose of radiation that may be received by an individual within a specified period with the expectation of no substantially harmful result.
person-rem	Same as man-rem.
pico	A prefix meaning one trillionth (1 x 1/1,000,000,000,000 or 10^{-12}).
picocurie	A unit of radioactivity defined as 0.037 disintegrations per second.
potentiometric (piezometric) surface	An imaginary surface that everywhere coincides with the static hydraulic head of the water in the aquifer.
promulgate	To make known by open declaration; proclaim.
proton	Elementary nuclear particle with a positive electric charge equal numerically to the charge of the electron and a mass of 1.007277 mass units. Also the nucleus of a hydrogen atom.

PSCR	Processing Site Characterization Report.
RAC	Remedial Action Contractor.
rad	A unit of measure for the absorbed dose of radiation. It is the equivalent of 100 ergs per gram of material.
radioisotope	A radioactive isotope of an element with which it shares almost identical chemical properties.
radionuclide	A radioactive nuclide.
radium-226, Ra-226	A radioactive daughter product of uranium-238. Radium is present in all uranium-bearing ores; it has a half-life of 1620 years.
radon-222, Rn-222	An inert gas continuously generated by the decay of Ra-226 in rock and soil with a half-life of 3.8 days generating a series of non-gaseous radioactive decay products.
radon-daughter product	One of several short-lived radioactive daughter products of radon-222. All are solids.
RAP	Remedial Action Plan.
RDC	Radon daughter concentration.
recharge	The process involved in the replenishment of water to the zone of saturation.
rem	A unit of dose equivalent equal to the absorbed dose in rads times quality factor times any other necessary modifying factor. It represents the quantity of radiation that is equivalent in biological damage to one rad of x-rays.
roentgen	The unit of exposure. One roentgen equals 2.58×10^{-4} coulombs per kilogram of air. One roentgen (R) in air is approximately equal to one rad and one rem in tissue.
soil infiltration rate	The rate at which water enters the soil surface and moves vertically downward.
soil percolation rate	The rate at which water moves through soil in all directions.
stabilization	The reduction of radioactive contamination in an area to a predetermined level by a standards-setting board such as the EPA, by encapsulating or covering the contaminated materials.
standard Proctor	A test procedure to measure moisture-density relationship (ASTM D698).

surveillance	The observation of the disposal site for purposes of visual detection of need for custodial care, evidence of intrusion, and compliance with other license and regulatory requirements.
TAC	Technical Assistance Contractor.
tailings, uranium-mill	The waste material remaining after most of the uranium has been extracted from uranium ore.
TDS	Total dissolved solids.
thorium-230, Th-230	A radioactive daughter product of uranium-238; it has a half-life of 80,000 years and is the parent of radium-226.
transmissivity, hydraulic	A measure of the ability of an aquifer to transmit water, equal to the product of the hydraulic conductivity and the saturated thickness of the aquifer.
UMTRA	Uranium Mill Tailings Remedial Action.
UMTRCA	Uranium Mill Tailings Radiation Control Act.
unconfined aquifer	An aquifer that is not confined by impermeable beds. The upper water surface is called the water table.
uranium-238 U-238	A naturally-occurring radioisotope with a half-life of 4.5 billion years; it is the parent of uranium-234, thorium-230, radium-226, radon-222, and others.
vicinity property	A property in the vicinity of the Riverton site that is determined by the DOE, in consultation with the NRC, to be contaminated with residual radioactive material derived from the Riverton site, and which is determined by DOE to require remedial action.
water table	The upper surface of a zone of saturation in an unconfined aquifer.
working level (WL)	A measure of radon-daughter-product concentrations. Technically, it is any combination of short-lived radon decay products in one liter of air that will result in the ultimate emission of alpha particles with a total energy of 130,000 MeV.
working-level month (WLM)	Exposure to a worker resulting from inhalation of air with a concentration of one WL of radon daughters for 170 working hours. Continuous exposure of a member of the general public to one WL for one year results in approximately 53 WLM.

APPENDIX A

REGULATORY COMPLIANCE DESCRIPTION

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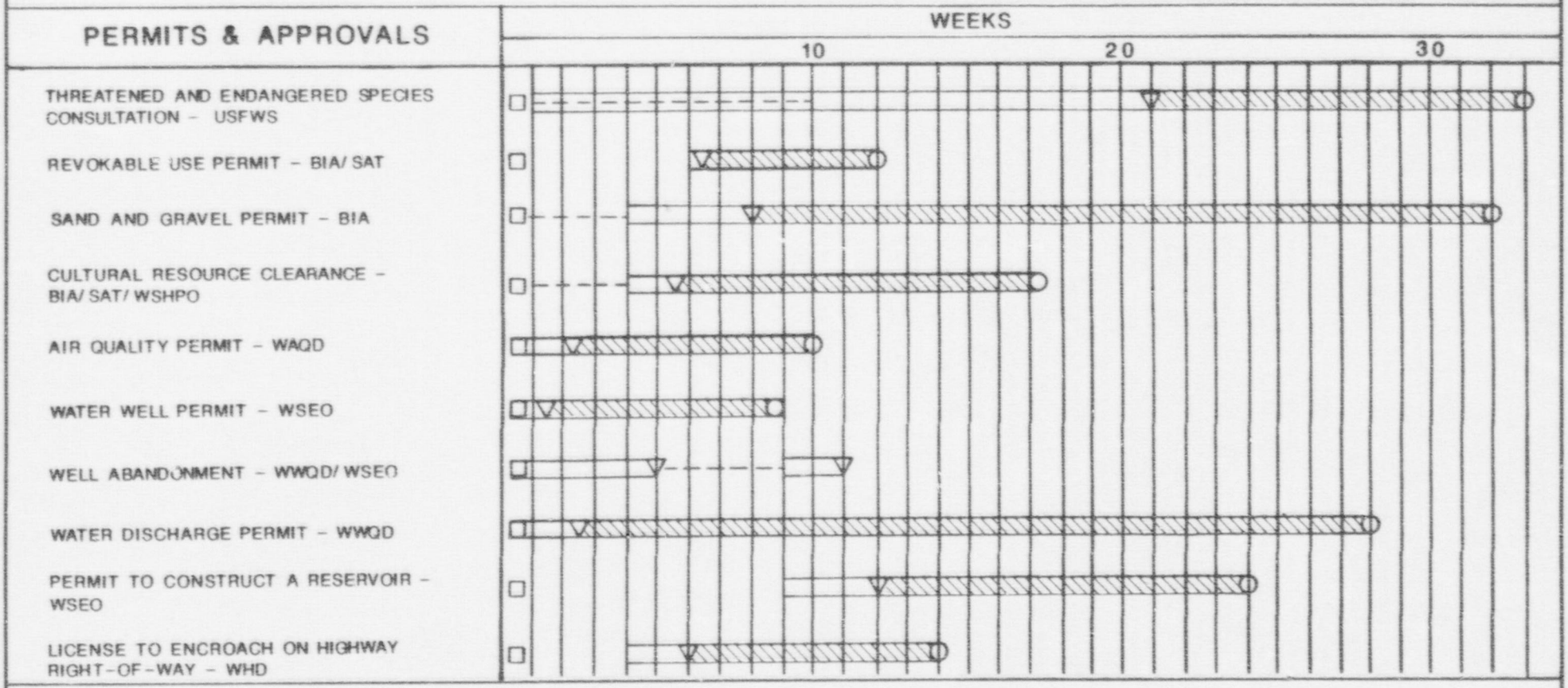
A.1 INTRODUCTION

This appendix is intended to identify and describe the permits, licenses, and approvals that are likely to be required for the proposed action (Section 4.0). Other permits, licenses, and approvals may be required for activities beyond the scope of the Remedial Action Plan (RAP) or due to its modification.

Procedures for preparing permit, license, or approval applications and agency review processes are outlined in the following sections. The principal technical and supervisory personnel at the regulatory agencies are listed as well. This appendix should be considered as an introduction to the permitting process as details must be obtained from the regulatory agencies. Applications must be submitted to Federal, state, and local agencies depending on the type of permit, license, or approval sought.

A tentative schedule for regulatory compliance activities (Figure A.1.1) is included for initial planning purposes. Figure A.1.2 illustrates the regulatory compliance matrix. The preparation and filing of applications will be sequenced so that permits, licenses, and approvals will be received in a timely manner without causing delay to construction activities.

FIGURE A.1.1 REGULATORY COMPLIANCE SCHEDULE RIVERTON, WYOMING, UMTRA PROJECT SITE



BIA - BUREAU OF INDIAN AFFAIRS
SAT - SHOSHONE & ARAPAHOE TRIBES
USFWS - U.S. FISH & WILDLIFE SERVICE
WAQD - WYOMING AIR QUALITY DIVISION
WHD - WYOMING HIGHWAY DEPARTMENT
WSEO - WYOMING STATE ENGINEER'S OFFICE
WSHPO - WYOMING STATE HISTORIC PRESERVATION OFFICER
WWQD - WYOMING WATER QUALITY DIVISION

□ AGENCY CONSULTATION
- - - DATA COLLECTION
——— PREPARE APPLICATION OR REPORT
○ PERMIT APPROVAL
▽ SUBMIT APPLICATION
▨ AGENCY REVIEW
* PUBLIC HEARING

FIGURE A.1.2

REGULATORY COMPLIANCE MATRIX
RIVERTON, WYOMING UMTRA PROJECT SITE

PERMIT OR APPROVAL	REGULATORY AGENCY							
	USFWS	BIA	SAT	WSHPO	WAQD	WWQD	WSEO	WHD
THREATENED & ENDANGERED SPS. CONSULT.	L							
CULTURAL RESOURCE CLEARANCE		L	C	C				
SAND & GRAVEL PERMIT		L	C					
REVOKABLE USE PERMIT		L	C					
AIR QUALITY CONSTRUCTION PERMIT					L			
WATER WELL PERMIT							L	
MONITOR WELL ABANDONMENT						L	L	
WASTE WATER DISCHARGE PERMIT						L		
PERMIT TO CONSTRUCT A RESERVOIR							L	
LICENSE TO ENCROACH ON HIGHWAY R.O.W.								L

KEY

USFWS - U.S. FISH & WILDLIFE SERVICE
BIA - BUREAU OF INDIAN AFFAIRS
SAT - SHOSHONE & ARAPAHO TRIBES
WSHPO - WY STATE HISTORIC PRESERVATION OFFICER
WAQD - WY AIR QUALITY DIVISION
WWQD - WY WATER QUALITY DIVISION
WSWP - WY SOLID WASTE PROGRAM
WSEO - WY STATE ENGINEER'S OFFICE
WHD - WY HIGHWAY DEPT.

L - LEAD AGENCY

C - COOPERATING OR CERTIFYING AGENCY

ACTIVITY: THREATENED AND ENDANGERED SPECIES CONSULTATION

LEGAL CITATION: Endangered Species Act of 1973, Section 7;
16 USC 1531, *et seq.*

AGENCY/CONTACT: U.S. Fish and Wildlife Service
Endangered Species Office
Federal Building, U.S. Courthouse
P.O. Box 10023
Helena, Montana 59626
ATTN: Wayne Brewster, (406) 449-5225
Field Supervisor

PROCEDURE: A Federal agency must ensure that any action authorized, funded, or implemented by the agency is not likely to jeopardize the continued existence of any threatened and endangered (T&E) species or their critical habitats. The responsible Federal agency must consult with the U.S. Fish and Wildlife Service (USFWS) to determine what effect, if any, the proposed action might have on any T&E species.

A letter is sent by the Federal agency to the USFWS outlining the proposed action. If the USFWS determines that no T&E species would be adversely affected by the action, no further consultation is necessary. If the USFWS identifies any T&E species that may be affected, the Federal agency is required to prepare a biological assessment considering the species identified by the USFWS, make a "no effect" or "may effect" determination for the species and, for a "may affect" determination, recommend appropriate mitigation measures. The USFWS will review and concur in the determination and the mitigative measures.

SPECIAL CONSIDERATIONS: No T&E species would be affected by the remedial actions at the processing site. However, use of the Little Wind borrow site or other borrow sites will require Section 7 consultation.

SCHEDULE: After obtaining the list of T&E species from the USFWS, the Federal agency has 180 days or another mutually agreeable time period to complete a biological assessment. The Federal agency requests a Section 7 consultation, and the USFWS is required to issue a biological opinion within 90 days.

ACTIVITY: REVOKABLE USE PERMIT

LEGAL CITATION: 25 CFR Part 169

AGENCY/CONTACT: Bureau of Indian Affairs (BIA)
Wind River Agency
Fort Washakie, WY 82514

ATTN:	David Allison, Superintendent	(307) 332-7810
	Dan Nueman, Realty Officer	(307) 332-4639
	Arthur Hallett, Supervisory Highway Engineer	

Bureau of Indian Affairs
Billings Area Office
316 N. 26th St.
Billings, MT 59101

ATTN:	Richard Whitesell, Area Director	(406) 657-6315
	Larry Moran, Realty Officer	(406) 657-6301

PROCEDURE: The purpose of this permit is to gain legal access to BIA roads for decontamination. An application for a revokable use permit is filed by sending a letter to the Superintendent, Wind River Agency, with the following information:

(1) Explanation of the proposed decontamination activities along Bureau of Indian Affairs (BIA) roads and on allotted lands.

(2) Legal description of lands involved.

(3) Schedule of operations.

SPECIAL CONSIDERATIONS: A copy of the application letter should be sent to the Area Director, Billings Area Office. Consent of the Arapahoe and Shoshone tribes will be required if tribal trust lands are involved or if the mineral rights are held by the tribes. Decontamination of allotted Indian lands will probably require the approval of the allottee heirs and the BIA.

SCHEDULE: Review and approval by the BIA may involve two to three months.

PERMIT: SAND AND GRAVEL PERMIT

LEGAL CITATION: 25 CFR Part 216

AGENCY/CONTACT: Bureau of Indian Affairs
Wind River Agency
Fort Washakie, WY 82514
ATTN: Dan Nueman, Realty Officer (307) 332-4639

PROCEDURE: This permit is required for the excavation of borrow materials (e.g., earth, gravel, rock) within the Wind River Reservation. Issuance of a sand and gravel permit is based upon review of a completed application form 5-154j (original and four copies) and accompanying information. The following information is required:

(1) Name, address, and telephone number of applicant.

(2) Land ownership.

(3) Location of proposed operation (map).

(4) Proposed expiration date of permit.

(5) Exact acreage of land to be covered by the permit.

(6) Metes and bounds description of the property boundary.

(7) Royalty rate or royalty waiver explanation.

(8) Description of the type of material to be mined.

(9) Performance bond to assure reclamation of the site (form 5-154b).

(10) Approval by the Joint Business Council will be required or written consent of current owners of allotted lands if tribal lands and/or minerals are involved.

Exhibit A of the application should include:

(1) Description of the project.

(2) Description of project purpose and need.

(3) Summary of existing environmental conditions, including:
- o Land use.
- o Vegetation.
- o Water.
- o Air.
- o Biology.
- o Existing facilities.

(4) Statement of influence on the environment.

(5) Summary of environmental impacts.

(6) Mining and reclamation plan, including:
- o Type of equipment to be used.
- o Topsoil to be stockpiled for later reclamation use.
- o Revegetation procedures based on recommendations of the Branch of Land Operations, BIA.

The application is evaluated by the Realty Officer to determine if a site-specific environmental assessment is needed in addition to the environmental assessment completed for the remedial action. Stipulations for impact mitigation may be attached to the permit approval.

SPECIAL CONSIDERATIONS: Concurrence must be obtained by the BIA from the Shoshone and Arapahoe Joint Business Council prior to issuance of the permit.

A production royalty is charged for the extraction of borrow materials. Cultural resource clearance and T&E species consultation for the borrow site must be obtained prior to permit approval.

SCHEDULE: The time required for review and processing of the application is typically three to six months although special handling of the application may considerably reduce the review period.

ACTIVITY: CULTURAL RESOURCE CLEARANCE
(WITHIN THE WIND RIVER RESERVATION)

LEGAL CITATION: National Historic Preservation Act of 1966, Section 106
36 CFR Part 800 and 25 CFR Part 261

AGENCY/CONTACT: Bureau of Indian Affairs
Wind River Agency
Fort Washakie, WY 82514
ATTN: David Allison, Superintendent (307) 332-7810

Bureau of Indian Affairs
Billings Area Office
316 N. 26th St.
Billings, MT 59101
ATTN: Jim Charles, Area Archaeologist (406) 657-6145
Richard Whitesell, Area Director (406) 657-6315

State Historic Preservation Office
State Archives, Museum and Historical
Department
Barrett Building
Cheyenne, WY 82002
ATTN: Robert Bush,
State Historic Preservation Officer (307) 777-7695
Tom Marceau, Review and
Compliance Section Head

PROCEDURE: All Federal agencies are required to comply with Section 106 of the National Historic Preservation Act with regard to any action which could impact archaeological or historical resources. Prior to surface-disturbing activities on Shoshone/Arapahoe allotted or trust lands, cultural resource clearance should be obtained from the Bureau of Indian Affairs (BIA). The person or government agency proposing the activity should contract with an approved archaeologist to conduct a Class III archaeological survey of the land to be affected. If a survey has been completed previously, a new survey may not be required. Prior to commencement of the survey, the archaeologist must obtain a valid permit from the Area Office. The survey report and a copy of the Riverton UMTRA Project Environmental Assessment should be sent to the Billings Area Office with a copy to the Wind River Agency. If archaeological resources are involved, the Bureau seeks the approval of the tribes and consults with the State Historic Preservation Officer (SHPO) prior to making a final determination of mitigation measures. The Bureau can either grant clearance or, if significant archaeological or historical features are present, require avoidance or possibly excavation of features that may have been identified. Correspondence should be directed to the Area Director (ATTN: Area Archaeologist), with copies sent to the Wind River Agency Superintendent.

SPECIAL CONSIDERATIONS: A cultural resource survey conducted near the tailings site identified two lithic scatters that were not eligible for

inclusion to the National Register of Historic Places (NRHP). The survey also identified a concentration of historic homestead materials which need additional data to determine eligibility. The cultural resources report recommended archaeological monitoring during construction as some sites have been found in the area at depths of up to four feet.

An ethnographic survey identified one area of concern for the Araphoe; this is the historic site identified in the cultural resource survey. Additional research will be required to determine if the site is important to the Arapahoe.

The Little Wind borrow site or other borrow sites have not been surveyed for cultural resources. Prior to surface disturbance of undisturbed areas, a Class III survey must be conducted. In addition, an ethnographic survey may be required.

The discovery of archaeological sites during the course of Federally assisted, permitted, funded, or licensed construction or land alteration must be reported to the land management agency with jurisdiction for the area. If a previously undiscovered site is revealed during the course of construction, the official in charge should halt construction and request an on-site assessment by the Area Archaeologist.

SCHEDULE: Completion of a Class III archaeological survey usually requires two to four weeks, depending upon the size of the area and availability of archaeologists. Review by BIA and SHPO usually involves three to five weeks.

ACTIVITY: CULTURAL RESOURCE CLEARANCE
(OFF THE WIND RIVER RESERVATION)

LEGAL CITATION: Historic Preservation Act of 1966, Section 106, 16 USC 470; Executive Order 11593; and 36 CFR Part 800

AGENCY/CONTACT: State Historic Preservation Office
State Archives, Museum
and Historical Department
Barrett Building
Cheyenne, WY 82002
ATTN: Robert Bush, State Historic Preservation Officer (307) 777-7695
Tom Marceau, Review and Compliance Section Head

PROCEDURE: Federal agencies are required to conduct appropriate studies and provide information necessary for an adequate review of the effect a proposed undertaking may have on a property eligible for, or listed on, the National Register of Historic Places (NRHP). In most cases this involves field inventories of the areas subject to surface disturbance to discover and evaluate cultural resources. Resources found to be on the NRHP or eligible for nomination to the NRHP shall be afforded protection from the proposed undertaking or shall be mitigated. Effect determinations and proposed mitigative measures shall be reviewed and accepted by the BLM (if on their land), the Wyoming State Historic Preservation Officer (SHPO), and, if necessary, the Advisory Council on Historic Preservation (ACHP) prior to remedial action or use of borrow sources.

The organization sponsoring the action should contract with an archaeologist with a valid antiquities permit to conduct cultural resource inventories. If a cultural resources inventory of the undertaking area has been completed previously, a new inventory may not be required. The inventory report shall be sent to the BLM (if required), Wyoming SHPO, and the Wyoming Department of Environmental Quality (DEQ), Land Quality Division. Clearance from the Land Quality Division is usually given in the form of mine permit approval.

SPECIAL CONSIDERATIONS: The discovery of archaeological sites on public lands during the course of Federally assisted, permitted, funded, or licensed construction or land alteration must be reported to the BLM of the U.S. Department of the Interior. If previously unknown resources are revealed during the course of construction, the official in charge should halt constructon in the vicinity of the discovery and request an on-site assessment by the BLM. The BLM will respond within three working days with a professional assessment of the significance of the site. In consultation with agency officals, the BLM representative makes an on-site decision for (a) salvage, (b) burial, or (c) destruction of the site. The local area office of BLM can be contacted at (307) 332-7822.

CULTURAL RESOURCE CLEARANCE (OFF THE WIND RIVER RESERVATION) (Concluded)

SCHEDULE: The SHPO review involves approximately one month for review of archaeological reports. BLM reviews take two weeks to two months to complete.

ACTIVITY: AIR QUALITY CONSTRUCTION PERMIT

LEGAL CITATION: Wyoming Environmental Quality Act, W.S. 35-11-101 through 35-11-1207, and Wyoming Air Quality Standards and Regulations

AGENCY/CONTACT: Wyoming Department of Environmental Quality
Air Quality Division
210 Lincoln Street
Lander, WY 82520
ATTN: Dan Fauth, District Engineer (307) 332-3144

Wyoming Department of Environmental Quality
Air Quality Division
Herschler Building
Cheyenne, WY 82002
ATTN: Charles Collins, (307) 777-7391
Air Quality Administrator

PROCEDURE: A permit is required to construct or modify any facility which may cause the issuance of an air contaminant. A completed application form is submitted to the Air Quality Division (the Division) which requires the following information:

(1) Description of the proposed remedial action with:
- Quantities of materials moved.
- Number, type, and models of vehicles and equipment to be used.

(2) Description of air pollution control methods to be used.

(3) An estimate of air emissions from the proposed operation.

(4) Description of facility location.

(5) Schedule of construction activities.

(6) Evidence of compliance with local land use plans.

(7) Evidence that the applicant has legal access to or ownership of the land.

The total suspended particulate (TSP) air standards are 60 micrograms/meter^3 and 150 micrograms/meter^3 for one 24-hour period annually.

SPECIAL CONSIDERATIONS: Best Available Control Technology (BACT) is required to reduce dust emissions. This includes application of surfactants or chemical stabilizers on unpaved access roads and water spray on work areas. An emission inventory and air-quality impact computer simulation were completed as part of the environmental assessment for the remedial action. The ISCST computer model was used in the study.

A minor source may receive an exemption from permit requirements if it is determined to be insignificant in both emission rate and ambient air quality impact. The procedure involved in obtaining an exemption is to send a letter to the Division Administrator requesting a permit determination. The letter should describe the proposed minor source(s), including an estimate of air emissions and a project schedule. The Division evaluates these requests on a case-by-case basis.

Approval by letter is commonly granted for open burning of trees and brush cleared from construction sites; however, burning of lumber from building demolition would not be approved.

SCHEDULE: Upon receipt of an application, the Division has 30 days to determine if the application is complete. An additional 60 days are allotted to review the technical aspects of the application and to determine whether to approve or deny the application. The public notice and comment period involves an additional 45 to 60 days. The review period may be extended if the Division determines that additional information is needed before the technical review can proceed.

ACTIVITY: PERMIT TO APPROPRIATE GROUNDWATER

LEGAL CITATION: State Engineer's Office Rules and Regulations
Parts II and III

AGENCY/CONTACT: Wyoming State Engineer's Office
Herschler Building
Cheyenne, WY 82002
ATTN: Jeff Fasset, (307) 777-7354
State Engineer
Mike Penz,
Groundwater Geologist

PROCEDURE: Prior to drilling monitor wells or supply wells, an Application for Permit to Appropriate Groundwater should be filed with and approved by the Wyoming State Engineer's Office. Information required in Form U.W.5 is as follows:

(1) Name, address, and telephone number of applicant and agent.

(2) Proposed use for the water (monitor wells are considered a miscellaneous use).

(3) Location of the well.

(4) Proposed depth.

(5) Quantity of water to be developed and beneficially used.

(6) Land ownership.

SPECIAL CONSIDERATIONS: Temporary acquisition of an existing water right is allowed as described in the State Engineer's Regulations, Part II, Section 13.

Following completion of well construction, a Statement of Completion and Description of Well Form (U.W.6) shall be filed. If the water is to be beneficially used, Form U.W.8 (Proof of Appropriation and Beneficial Use) shall also be filed.

SCHEDULE: Review and approval of water well permits usually involves one to three months after the application is submitted to the State Engineer's Office.

ACTIVITY: MONITOR WELL ABANDONMENT

LEGAL CITATION: Wyoming Environmental Quality Act, W.S. 35-11-404; Water Quality Division Rules and Regulations, Chapter XI; and State Engineer's Office Rules and Regulations, Part III, Water Well Minimum Construction Standards

AGENCY/CONTACT: Wyoming Department of Environmental Quality
Water Quality Division
210 Lincoln Street
Lander, WY 82520
ATTN: Ed Baruth, District Supervisor (307) 332-3144

Wyoming State Engineer's Office
Herschler Building
Cheyenne, WY 82002
ATTN: Mike Penz, Groundwater Geologist (307) 777-7354

PROCEDURE: Any monitor well that is not converted into a permanent water well shall be properly plugged and sealed. Requirements of the State Engineer's Office are as follows:

When any wells, including test wells, are to be permanently removed from service, they shall be destroyed so as to prevent the wells from being channels that allow vertical movement of water or allow contamination of the groundwater supply. An uncased well shall be destroyed by filling it with grout, cement or concrete grout, drilling mud, or bentonite.

A cased well in unconsolidated formations shall be destroyed by placing a cement or concrete plug opposite all perforations or screens. The remainder of the well shall be filled with grout, cement or concrete grout, drilling mud, or bentonite.

A well in consolidated formations shall be destroyed by filling it with grout, cement or concrete grout, drilling mud, or bentonite. Any section of the well intersecting cavernous or creviced rock shall be filled with concrete or cement grout, or alternate layers of cement grout, and gravel or stone aggregate. A concrete or cement plug shall extend to at least 10 feet above the cavernous zone and 10 feet below the cavernous zone, or to the bottom of the well, whichever distance is less.

An artesian well shall be destroyed in such a manner that a cement or concrete plug completely seals the artesian aquifer and extends above the artesian zone for a minimum of 10 feet. This seal shall also extend 10 feet below the artesian zone or to the bottom of the well, whichever distance is less. If necessary to stop surface or subsurface leakage from the artesian zone, the entire zone shall be pressure grouted. The remainder of the well shall be filled with grout, cement or concrete grout, drilling mud, or bentonite.

A gravel-packed well shall be destroyed by pressure grouting the entire perforated or screened section of the casing. The remainder of the well shall be filled with grout, cement or concrete grout, drilling mud, or bentonite.

Water Quality Division Regulations, Chapter XI, governing well abandonment are as follows:

Section 70. Plugging and Abandonment

(a) All wells that are no longer useful (including test wells) must be plugged in order to assure that the groundwater supply is protected and preserved for further use and to eliminate the potential physical hazard. A well is considered "abandoned" when it has not been used for a period of one year, unless the owner demonstrates his intention to use the well again by properly maintaining the well in such a way that:

- The well has no defects which will allow the impairment of quality of water in the well or in the water-bearing formations penetrated.

- The well is covered and the cover is water-tight.

- The well is marked so that it can be clearly seen.

- The area surrounding the well is kept clear of brush or debris.

Observation or test wells used in the investigation or management of usable sources of groundwater by state agencies or by engineering or research organizations are not considered "abandoned" so long as they are maintained for this purpose. These wells shall be covered with an appropriate cap and labeled for their particular use.

(b) Preliminary work. Before a well is plugged and abandoned, it shall be investigated by the permittee (owner/operator) to determine its condition, details of construction, and whether there are obstructions that will interfere with the process of filling and sealing.

(c) Filling and sealing. The following are requirements to be observed when plugging wells.

- Wells wholly situated in unconsolidated material in an unconfined groundwater zone shall have the uppermost 30 feet sealed with impervious material. The remainder of the well shall be filled with clay, sand, or other suitable inorganic matters, as described in paragraph (e).

- Wells penetrating several aquifers or formations containing usable water sources shall have the uppermost 30 feet sealed with an impervious material. All screened or perforated intervals shall be sealed to prevent vertical movement of waters from the producing or injected formation. Impervious material shall be placed opposite the confining formation above and below (and including) the screened or perforated interval for a minimum of 50 feet.

- Any uncased hole below the well shoe shall be filled with an impervious material, as described in paragraph (e), to a depth of at least 50 feet above the shoe.

- Whenever production casing has been severed or inadvertently removed, the well bore shall be filled with impervious material from a point 50 feet below to a point 50 feet above the point of severance, or to the surface limit.

- Wells penetrating crevices or fractured rock shall have the portions of the well opposite this formation sealed with neat cement, sand-cement grout, or concrete. If these formations extend to considerable depth, alternate layers of coarse stone and cement grout or concrete may be used to fill the well.

- Wells in nonfractured, consolidated formations shall have the uppermost 30 feet filled with impervious material and the non-creviced, consolidated formation portion of the well may be filled with clay or other suitable material.

(d) Placement of material. The following requirements shall be observed in placing fill or sealing a plugged or abandoned well.

- No material shall be placed in the well unless the administrator has been notified that plugging and abandonment operations are to commence. A minimum of 30 days' notice must be given.

- The well shall be filled with the appropriate material, as decribed in paragraph (e), from the bottom of the well up.

- Sealing materials shall be placed in the interval or intervals to be sealed by methods that prevent free fall, dilution, and/or separation of aggregates from cementing materials.

- When the underground pressure head producing flow is such that a counter-pressure must be applied to force a sealing material into the annular space, this counter-pressure shall be maintained for the length of time required for the cementing mixture to set as specified in Section 65, paragraph (c) (viii) of this part.

- To assure that the well is filled and there has been no bridging of the material, verification shall be provided that the volume of material placed in the well installation at least equals the volume of the empty hole.

(e) Material. Requirements for sealing and fill materials are as follows:

- Impervious sealing materials. Sealing materials shall have a permeability of 10^{-7} cm/sec or less. Impervious materials

include neat cement, sand-cement grout, concrete, and bentonite clay as described in Section 66, paragraph (c). Used drilling muds are not acceptable.

- Filler material. Material such as clay, silt, sand, gravel, crushed stone, native soil, and mixtures of these materials, as well as those described in the preceding paragraph, may be used as filler material. Material containing organic matter or used drilling muds shall not be used.

(f) Markings. The top of the plug of any plugged and abandoned well shall show clearly, by permanent markings, whether inscribed in the cement or on a steel plate embedded in the cement, the permit number, well identification number, and date of plugging.

(g) Reports. Within 15 days after a well has been plugged and abandoned, the owner shall file a plugging record with the Water Quality Division (the Division).

SPECIAL CONSIDERATIONS: None.

SCHEDULE: Notification to the Division is required 30 days prior to sealing wells. A report of the results of well sealing and abandonment shall be sent to the Division within 15 days of sealing and abandonment.

ACTIVITY: WASTE-WATER DISCHARGE PERMIT

LEGAL CITATION: Wyoming Environmental Quality Act W.S. 35-11-301
Wyoming Water Quality Rules and Regulations, Chapter II

AGENCY/CONTACT: Wyoming Department of Environmental Quality
Water Quality Division
Herschler Building
Cheyenne, WY 82002
ATTN: John Wagner, (307) 777-7082
Technical Support Supervisor

PROCEDURE: The permit applies to all operations discharging to waters of the state from a point source. Application is made by filing completed U.S. Environmental Protection Agency (EPA) Forms 1 and 2C under the EPA Consolidated Permits Program. Information required on Form 1 includes:

(1) Name, mailing address, and location of the facility.

(2) Facility contact.

(3) Standard industrial classification code for the facility.

(4) Name of facility operator and status (i.e., Federal, state).

(5) Existing Federal, state, or local permits.

(6) A map covering an area extending at least one mile beyond the facility property boundaries. The map should be based on a 7.5-minute U.S. Geological Survey (USGS) Quadrangle map.

(7) A description of the nature of the business.

Form 2C requires the following information:

(1) Location, by Latitude and Longitude, and number designation of each effluent outfall.

(2) Name of receiving water for each outfall.

(3) A schematic flow diagram indicating sources of water, operations contributing waste water for the effluent water balance, and treatment processes for each waste stream.

(4) A list of each operation, average flow, and treatment related to each outfall.

(5) Description of the variation and frequency of water flow.

(6) Explanation of any Federal, state, or local implementation schedule for construction or improvement of waste-water treatment, or other environmental programs.

(7) Influent and effluent characteristics:

- Pollutants present.
- Source of pollutants.
- Concentration of pollutants.
- Temperature of effluent.
- Flow of effluent.
- pH of effluent.

SPECIAL CONSIDERATIONS: This permit is equivalent to an NPDES Permit. EPA has approved the Wyoming State Implementation Plan for administering the NPDES Program. Discharge limitations will be based on the EPA Uranium Ore Mining and Dressing Standards, and the quality of the receiving water body.

Form C may be used as an alternative to Form 2C in the application. The conceptual design specifies that a zero discharge evaporation pond will be used to receive contaminated water. For this type of facility, the main purpose in obtaining an NPDES permit is to limit the liability of the operator for discharges that may result from a very large precipitation event or other unanticipated situations. DEQ officials encourage operators to obtain a permit for a no-discharge facility. Prohibitions of a discharge permit include, but are not limited to, the following:

(1) No discharge is allowed that will violate state, regional, or local land use plans unless all requirements and conditions of applicable Federal and state statutes and regulations are met or will be met according to a schedule of compliance. Similarly, no discharge is permitted that, by itself or in combination with other pollutants, will result in pollution of the receiving waters in excess of standards, unless the permit contains effluent limitations and a schedule of compliance with water-quality requirements.

(2) No discharge of any radiological, chemical, or biological warfare agent or high-level radioactive waste is permitted. Limits of radiological wastes that may be discharged are determined by state water-quality standards.

(3) No discharge from a point source that is in conflict with an established water-quality management plan promulgated under Sections 201, 208, 209, and 303(e) of the Federal Water Pollution Control Act of 1972 and the Clean Water Act of 1977 is permitted unless the waste discharge permit contains limitations and a schedule of compliance approved by the DEQ.

SCHEDULE: An applicant is to apply for a permit at least 180 days in advance of the date the discharge is to begin.

ACTIVITY: PERMIT TO CONSTRUCT A RESERVOIR

LEGAL CITATION: Wyoming Statutes 41-26 to 41-46
State Engineer's Office Regulations and Instructions
Part I, Surface Water

AGENCY/CONTACT: Wyoming State Engineer's Office
Herschler Building
Cheyenne, WY 82002
ATTN: Paul Thompson, Senior Analyst (307) 777-7354

PROCEDURE: A permit to construct a reservoir is required for sedimentation and evaporation ponds. Application is made by filing completed Forms SW3, SW3-A, and an accompanying map. The following information is required:

(1) Name of the facility.

(2) Name and address of the applicant/agent.

(3) Description of the intended use of the water (i.e., pollution control).

(4) Capacities of the reservoir, active and inactive.

(5) Surface area of the high-water line in acres.

(6) Total available capacity.

(7) Source of the water.

(8) Location of outlet as described by bearing and distance to a section corner or quarter corner.

(9) Listing and legal description of lands at the reservoir site that are owned by the Federal or state government.

(10) Name of ditch and ditch capacity that will be used to fill the reservoir.

(11) Volume and type of materials to be used for dam construction.

(12) Type of protection or armoring of the dam face.

(13) The estimated time for commencement and completion of construction.

(14) Specifications of dam design (e.g., cross section of dam, profile of dam site, cross section of spillway).

SPECIAL CONSIDERATIONS: Reservoirs for pollution control or flood-water detention are subject to Chapter VI, Part I, Special Applications of the State Engineer's Office Rules and Regulations. Plans for water collection channels and modification of existing irrigation or drainage ditches should be sent to the State Engineer to be recorded and made a matter of public record. Use of water from the pond for dust control or soil compaction would necessitate filing an application for beneficial use of water.

SCHEDULE: Applications are usually reviewed and approved in approximately three months.

ACTIVITY: LICENSE TO ENCROACH ON HIGHWAY RIGHT-OF-WAY

LEGAL CITATION: Wyoming Statutes 24-64

AGENCY/CONTACT: Wyoming Highway Department
P.O. Box 351
Basin, Wyoming 82410
ATTN: George A. (Pat) Brown, (307) 568-3321
District Engineer

PROCEDURE: This license is required for removal of contaminated soils along Highway 138 and for access roads to state highways. Four copies of completed Highway Department Form E-54 must be submitted to the District Engineer. Required information includes:

(1) Name of licensee/applicant.

(2) Description of installation or activity.

(3) Location description (i.e., section; township and range; route number; county; maintenance section and mile post).

(4) A drawing showing the alignment, grade, clearance, materials, pressures, land ties, and mile post ties to be labeled as Appendix A.

SPECIAL CONSIDERATIONS: The Wyoming Highway Department (the Department) requires that the licensee be the sponsoring organization (i.e., DOE) rather than the contractor executing the plan. The licensee must comply with standards in the Department Roadway Work Operations Manual or alternate traffic control standards approved prior to the construction work.

The Department requires that clean soil be brought in to fill areas where contaminated soil has been removed. Areas on the highway rights-of-way that are affected by the cleanup should be revegetated according to specifications of the Department.

Weight limitations on heavy equipment and haul trucks may be imposed by the Department after review of project plans and consideration of highway strength and deterioration.

SCHEDULE: The normal time involved in processing an application by the Department is one to two months.

A.2 CONCLUDING REMARKS

This section provides brief discussions of issues that do not, at this time, require permits or that might require permits if the Remedial Action Plan (RAP) is significantly modified.

It should be noted that the issue of who has permit authority for the Little Wind borrow site has not been resolved. If the mineral and surface rights are privately held, the State of Wyoming will have permit authority.

EXEMPTION FROM PERMIT TO MINE

A statement sent by the remedial action contractor agreeing to abide by the appropriate state statutes to the Department of Environmental Quality will allow the remedial action activities to be exempt from the Permit to Mine.

SPILL PREVENTION CONTROL AND COUNTERMEASURES PLAN (SPCC)

If on-site fuel and oil storage facilities exceed a total of 1320 gallons or any single on-site fuel or oil tank exceeds a 660-gallon capacity, the EPA requires the operator to prepare an SPCC plan meeting the specifications cited in 40 CFR Part 112 and certified by a professional engineer. No permit is required, but a copy of the plan must be kept at the storage facilities and be available for review by the EPA in the event of a spill or general inspection.

APPROVAL OF BORROW SITE EXPLORATION PERMITS

A letter of notification of test pit work on private lands within the reservation should be sent to the Land Quality Division of the Department of Environmental Quality in Lander, Wyoming. There is no approval involved.

WILDLIFE CONSULTATION

The Wyoming Game and Fish Department acts in an advisory capacity. A copy of the Riverton UMTRA Project Environmental Assessment should be sent to their Lander office for review.

NOTICE OF INTENT TO DEMOLISH STRUCTURES CONTAINING ASBESTOS

An estimate of the types and quantities of asbestos (if present) should be sent to the EPA Office in Denver.

APPENDIX B

RADIOLOGICAL SUPPORT PLAN

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B.1 INTRODUCTION

The Uranium Mill Tailings Radiation Control Act of 1978 (PL95-604) gave the responsibility of developing standards for remedial actions to the U.S. Environmental Protection Agency (EPA). Section 108 of PL95-604 states that the DOE shall "select and perform remedial actions at designated processing sites and disposal sites in accordance with the general standards" prescribed by the EPA. The EPA standards state:

> "Section 108 of the Act requires the Secretary of Energy to select and perform remedial actions with the concurrence of the Nuclear Regulatory Commission and the full participation of any State that pays part of the cost, and in consultation, as appropriate, with affected Indian Tribes and the Secretary of the Interior. These parties, in their respective roles under Section 108, are referred to hereafter as 'the implementing agencies.'
>
> The implementing agencies shall establish methods and procedures to provide 'reasonable assurance' that the provisions of Subparts A and B are satisfied. This should be done primarily through use of analytical models, in the case of Subpart A, and for Subpart B through measurements performed within the accuracy of currently available types of field and sampling procedures. These methods and procedures may be varied to suit conditions at specific sites."

Subpart B consists of standards for cleanup of land and buildings. The standards applicable to the project are:

> "Remedial actions shall be conducted so as to provide reasonable assurance that, as a result of residual radioactive materials from any designated processing site:
>
> A. the concentration of Radium-226 in land averaged over any area of 100 square meters shall not exceed the background level by more than --
>
> (1) 5 pCi/g, averaged over the first 15 cm of soil below the surface, and
>
> (2) 15 pCi/g, averaged over 15-cm-thick layers of soil more than 15 cm below the surface.
>
> B. in any occupied or habitable building --
>
> (1) the objective of remedial action shall be, and reasonable effort shall be made to achieve, an annual average (or equivalent) radon decay product concentration (including background) not to exceed 0.02 WL. In any case, the radon decay product concentration (including background) shall not exceed 0.03 WL, and
>
> (2) the level of gamma radiation shall not exceed the background level by more than 20 microR/h."

In addition to the EPA standards for buildings, surface contamination shall not exceed the guidelines in the "UMTRA Project Environmental, Health,

and Safety Plan," as revised (DOE, 1985b). This limit will ensure that potential airborne radionuclide concentrations will not exceed 10 CFR 20 Appendix B standards and that physical contact with the surfaces by occupants of the structures will not result in a measurable radiation exposure.

As indicated earlier, the standards suggest that the implementing agencies determine what methods and procedures will be used to provide "reasonable assurance" that the standards are met. Reasonable assurance implies that a site-specific analysis is appropriate where the cost of demonstrating compliance with the standards is to be weighed against the health risks or other impacts associated with leaving areas which slightly exceed the standards.

The sections which follow provide the procedures proposed for use at the Riverton site. Consideration was given to the time required to collect samples and perform the analyses.

B.2 BASIS FOR RADIOLOGICAL SURVEY STRATEGY

The Riverton site consists of a tailings pile, mill area, ore storage area, and windblown areas. Removal of the contaminated material from the mill and ore storage areas adjacent to the tailings pile will require excavation of from one to two feet below grade, followed by restoration to normal grade using clean fill. This clean fill will minimize the potential health effects due to residual contamination.

The windblown areas will be decontaminated by removing a thin layer of tailings from the surface. Clean fill will not be required in some of these areas, and residual contamination may remain exposed at the surface. In those areas where backfill after excavation is not required, it is highly desirable that the residual contamination not exceed the five pCi/g limit when averaged over an area equivalent to the size of a house. One hundred square meters, or approximately 1100 square feet, will be used.

Any occupied or habitable building will be decontaminated as needed, and surveys will be conducted to reasonably ensure that the standard is met. Most buildings and structures will be demolished and transported to the Gas Hills site for disposal. Details of the demolition plans are presented in Appendix C, Final Plans and Specifications.

B.3 REMEDIAL ACTION RADIOLOGICAL SURVEY PLAN

Radiological surveys are performed for three purposes: site characterization, excavation control, and final radiological verification. Site characterization surveys or pre-remedial action surveys are performed to identify volumes of material which exceed the standard. The results are used for planning and engineering design. Excavation control monitoring is performed as the work is being done to guide and control the amount of contaminated material removed. Finally, when excavation control monitoring results indicate that there is a high probability that the area meets the standards, a final radiological survey is carefully performed and the results documented.

B.3.1 SITE CHARACTERIZATION SURVEYS

Radiological surveys have been performed by Mountain States Research Development (MSRD) and by Bendix Field Engineering Corporation (BFEC) to identify the subsurface boundary of the tailings pile to be excavated as well as the depth and area of windblown tailings on adjacent land. Subsurface evaluations were performed using gamma well logging techniques and by analyzing cores from boreholes. In general, these measurements were made on a 200-foot grid. Additional measurements were performed in areas of radiological interest. The grid points have been identified by a land survey tied to a U.S. Geological Survey (USGS) survey point and all recordable data located by these coordinates.

Radiological surveys were performed by BFEC inside the buildings to determine gamma exposure rates and the levels and extent of surface contamination.

B.3.2 EXCAVATION CONTROL MONITORING

The purpose of excavation control monitoring is to guide excavation through the use of real-time radiological measurements. It is designed to ensure that the five pCi/g (surface) and 15 pCi/g (subsurface) standards are met. In addition, it minimizes the possibility that material meeting the standards is also excavated. Properly performed excavation control monitoring simultaneously ensures that neither underexcavation nor over-excavation occurs.

Excavation will be monitored by qualified technicians relying principally on gamma field measurements employing hand-held instruments such as gamma-scintillation detectors. This technique will only be used where measurements are not seriously impaired by interference from nearby tailings deposits. In areas where significant interference exists, alternate monitoring techniques will be used. These techniques may include use of a shielded probe gamma-scintillation instrument (operated in a gross count mode or in a delta mode) or the immediate counting of soil samples. In all cases, these techniques will be routinely calibrated by comparison of the field measurements to soil samples analyzed in the laboratory and reported on a fully equilibrated

dry-weight basis. Because the standards are based upon average areas of 100 m^2, the excavation control monitoring will be performed on areas of this characteristic size as well.

Elevated gamma-ray radiation fields will preclude exclusive use of in-situ monitoring devices to estimate the surface radionuclide concentrations in soil on or immediately adjacent to the Riverton pile. When in-situ measurements cannot be performed, the suggested method for analysis is to take individual or composite samples of soil, seal by canning, and immediately count the sample by gamma-ray spectrometry. Errors associated with this approach will be reduced by taking several samples 30 days prior to starting work to determine calibration factors. These samples will be counted, dried, pulverized, and screened with recanning for subsequent analysis. They will be counted later after the Ra-226 daughters reach equilibrium. Analyses of these prepared samples can then be compared to standards. Several samples will be collected weekly during the remedial action and analyzed to provide a measure of the variation of the calibration factor.

B.3.3 FINAL RADIOLOGICAL VERIFICATION SURVEY FOR LAND

The final radiological survey will be based on 100-m^2 areas, with a composite sample used to obtain a measure of the average Ra-226 concentration in an area. The Ra-226 measurement will be reported on a dry-weight basis. For measurements based on gamma spectrometry of Ra-226 daughters, full equilibrium will be assured. It is expected that at least preliminary measurement results will be obtained prior to backfilling. The error limits for Ra-226 verification measurement techniques must be better than plus or minus 30 percent, at the 95 percent confidence level.

The average Ra-226 concentration on each 100-m^2 area which is surveyed will be determined by a composite sample composed of a number of 15-cm-deep samples of approximately equal mass taken on a uniform spacing over the survey area. Nineteen to 24 samples is an appropriate number for forming the composite, but fewer may be used if shown to be sufficient to characterize the mean concentration and if approved in advance by the UMTRA Project Office. The sampling error associated with composite sampling should be routinely estimated by collection of duplicate samples (two to five percent pair-wise basis) with the same number of samples forming each composite.

B.4 DATA AND SAMPLE MANAGEMENT

During the cleanup operations, the Remedial Action Contractor will collect data to support excavation control. Data used in declaring an area adequately decontaminated will be documented in a format approved by the UMTRA Project Office.

Site characterization survey data, excavation control data, and the final radiological survey data will be collected using procedures and analytical methods meeting the requirements of the UMTRA Project Management and Overview Quality Assurance Program Plan (UMTRA DOE/AL-400325). All data used in describing the final radiological conditions of the site as well as other data as specified by the UMTRA Project Office will be provided in a convenient format for input into the UMTRA Project Data Management System. Data generated in the remedial action will be presented in a report documenting the final radiological condition of the property. Verification samples will be archived pending orders for transfer or disposal from the UMTRA Project Office.

B.5 CERTIFICATION

Certification is a professional judgement by an independent party that the remedial action has been completed according to the site-specific Remedial Action Plan and meets the applicable standards.

During the remedial action operations, the Remedial Action Contractor will make available to appropriate state agencies, Federal agencies, or UMTRA Project designated contractors data related to the cleanup. In addition, samples collected during the cleanup operations may be split for analyses by these agencies to allow comparison of analytical results. These data, along with any additional data collected at the discretion of the certifying agent, will be used in the final certification report.

APPENDIX C

FINAL PLANS AND SPECIFICATIONS

UMTRA PROJECT - RIVERTON, WYOMING

SUBCONTRACT DOCUMENTS RVT

FINAL DESIGN FOR CONSTRUCTION

JUNE 1987

Bid Schedule

UMTRA PROJECT

RIVERTON, WYOMING

SUBCONTRACT DOCUMENTS RVT

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UMTRA PROJECT

RIVERTON, WYOMING

SUBCONTRACT DOCUMENTS RVT

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
000 - MOBILIZATION						
001	01019	Mobilization	L.S.	100%	N/A	_____
002	SC-23	Payment for Bond Premium	L.S.	100%	N/A	_____
200 - SITE PREPARATION						
201	01500	Contractor's Trailers	L.S.	100%	N/A	_____
202	01500	Temporary Roads and Parking Areas	L.S.	100%	N/A	_____
203	01500	Janitorial Service	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	01500	Decontamination Washwater Recycling System	L.S.	100%	N/A	_____
208	01500	Portable Scales Pad	L.S.	100%	N/A	_____

Item No.	Spec. Section	Description	Unit	Approx. Quantity	Unit Price	Amount
209	01500	Temporary Chain Link Fence and Gates	L.F.	1,250	_____	_____
210	01500	Temporary Woven Wire Fence	L.F.	4,700	_____	_____
211	02090	Sealing Monitor Wells	L.F.	500	_____	_____
212	02200	Excavation of Uncontaminated Material for the Wastewater Retention Basin	C.Y.	3,000	_____	_____
213	02771	Membrane Liner for Wastewater Retention Basin and Spillway	S.Y.	15,500	_____	_____
214	03361	Shotcrete	L.S.	100%	N/A	_____
300 - DEMOLITION						
301	02050	Demolition of All Existing Structures	L.S.	100%	N/A	_____
302	02050	Removal and Disposal of Miscellaneous Asbestos Debris	L.S.	100%	N/A	_____
303	02050	Decontamination of Existing Scale House and Scales	L.S.	100%	N/A	_____
304	02060	Protection, Replacement, Removal, Abandonment, Demolition and Maintenance of Existing Utilities	L.S.	100%	N/A	_____
400 - TAILINGS PILE						
401	02200	Excavation of Contaminated Materials from Existing Tailings Pile	C.Y.	1,504,500	_____	_____

Item No.	Spec. Section	Description	Unit	Approx. Quantity	Unit Price	Amount
402	02200	Excavation of Contaminated Materials from Windblown Areas, Ore Handling Areas, and Other Site Areas	C.Y.	122,000	_____	_____
403	02200	Handling and Transportation of Vicinity Property Materials	C.Y.	90,000	_____	_____
800 - SITE RESTORATION						
801	02200	General Fill	C.Y.	472,800	_____	_____
802	02200	Topsoil Fill	C.Y.	69,500	_____	_____
803	02935	Seeding of Final Grades	Acre	188	_____	_____
		TOTAL (SUBCONTRACT PRICE)			$	_____

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

END OF BID SCHEDULE

Special Conditions

UMTRA PROJECT

RIVERTON, WYOMING

SUBCONTRACT DOCUMENTS RVT

SPECIAL CONDITIONS

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SC-23	MEASUREMENT AND PAYMENT

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 laydown 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. Bid - The offer or proposal of the bidder submitted on the prescribed form setting forth the prices for the Work to be performed.

4. Bonds - Bid, performance and payment bonds.

5. Construction (Support) Facilities - Construction facilities shall include furnishing and installing or constructing of temporary features required during construction under this Subcontract. These facilities shall include the following: Temporary drainage ditches, wastewater retention basins, and dewatering facilities.

6. Contaminated Materials - Tailings and other materials having radioactive contamination levels greater than specified in the applicable US Environmental Protection Agency Standards. Contamination levels will 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.

7. Controlled Area - See Section SC-9, Paragraph A.7 of the Special Conditions. Also included are areas with access controlled by ribbons, signs and tags.

8. General Requirements - Division 1 of the Specifications.

9. 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.

10. 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.

11. 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.

12. Permanent Facilities - Construction of permanent facilities shall include construction of permanent features including the following: Excavation and disposal of tailings and other contaminated materials; sealing monitor wells; disposal of vicinity property materials; removal and disposal of construction (support) facilities; and finish grading of the site.

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

14. 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.

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

16. 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.

17. 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.

18. 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.

19. 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.

20. Subcontract Price - The moneys payable by Contractor to Subcontractor under the Subcontract Documents as stated in the Agreement.

21. Subcontract Time - The number of days or the date stated in the Agreement for the completion of the Work.

22. Temporary Facilities - Facilities specified in Section 01500 including, but not limited to, construction equipment and machinery, tools, accessories, fuel, power, light, heat, telephone, water, sanitary facilities, pad for portable scale, decontamination washwater facilities, equipment and material storage area, parking area for all field personnel including construction, maintenance and service personnel, temporary roads, temporary offices, temporary fencing and gates, incidentals etc. necessary for the construction and completion of the Work specified in the Subcontract.

23. Temporary Roads - Improvements to existing roads and construction of new roads, if any, by the Subcontractor, for his convenience in the performance of the Subcontract.

24. Uncontaminated Materials - 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.

25. Work - The entire completed construction required under the Subcontract Documents. Work is the result of performing services, furnishing labor and furnishing and incorporating materials and equipment into the construction, 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
Presidents' Day
Memorial Day
Independence Day
Labor Day
Columbus Day
Veterans Day
Thanksgiving Day
Christmas Day

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

C. Upon receipt of seven days advance written notice from the Subcontractor, the Contractor will make his Site Manager available to work on holidays.

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. Stop Work in Case of Excessive Radionuclide or Other Toxic Concentrations: The Site Manager will monitor construction activities and may stop the Work or require modification of Subcontractor activities during periods of significant downwind airborne contaminations and in the event that gaseous or particulate radionuclide or other toxic concentrations associated with construction activities exceed allowable limits. Any work stoppage 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.

C. 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.

D. If the Subcontractor uncovers any archaeological artifacts or human remains during the execution of the Subcontract, he shall immeditely halt operations in the immediate vicinity of such a discovery and notify the Contractor. Further work in these areas shall not resume until a qualified archaeologist has inspected the site and completed all resource recovery work.

E. The Subcontractor shall allow Vicinity Properties Subcontractors to use the decontamination facilities constructed under this Subcontract.

SC-4 SITE LOCATION AND ACCESS

A. Location: The location of the site is specified in Specification Section 01010.

B. Access: The Contractor will impose mandatory enforcement of the following restraints to all persons seeking construction site access:

1. Private, personal or agency vehicles will not be allowed on the Project Site except in designated parking areas outside of the controlled area.

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.

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 LABOR, MATERIALS, EQUIPMENT AND TEMPORARY FACILITIES

A. Unless otherwise specified elsewhere in the Specifications, Subcontractor shall furnish and assume full responsibility for all materials, equipment, labor, transportation, construction equipment and machinery, tools, appliances, fuel, power, light, heat, telephone, water, sanitary facilities, temporary facilities and all other facilities and incidentals necessary for the furnishing, performance, and completion of the Work.

B. Pursuant to the provisions of Specification Section 01500 - Temporary Facilities, during the construction period, the Subcontractor will be permitted on-site temporary storage of material at a location approved by the Site Manager.

SC-7 CLEANUP AND WASTE DISPOSAL

A. Cleanup: The Subcontractor will be required to clean up construction work areas including temporary office facilities and materials and equipment laydown areas and dispose of waste material. Cleanup of the 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 large enough quantities to create an unsightly appearance, a safety or fire hazard, nor shall it interfere in any way with free access to, and operation of existing facilities. All construction areas shall be thoroughly cleaned to the satisfaction of the Contractor prior to final acceptance of the completed Subcontract.

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 and the waste will be classified into the following categories for disposal purposes:

a. Uncontaminated Waste: Uncontaminated domestic (office) waste and construction waste shall be disposed of as follows:

1) Domestic (Office) Waste: The Subcontractor shall provide suitable receptacles for all domestic waste material. Such waste shall be disposed of offsite as Subcontractor's property. No waste material or debris shall be buried on the site. The Subcontractor shall be responsible for locating the dump for trash and debris, and for haul and disposal costs.

2) Construction Waste: This will include waste materials resulting from clearing, stripping, excavation, demolition, drilling, and other construction operations. This type of waste shall be disposed of as specified in Specification Sections 02110 and 02200.

b. Contaminated Waste: Waste materials identified as contaminated materials defined in Section SC-1 will be disposed of as specified in Section 02200.

C. Hazardous Waste: The Site Manager shall be notified immediately if chemically hazardous or toxic wastes are encountered during construction. Such wastes will be identified and disposed of by others in accordance with applicable State and Federal hazardous waste management regulations.

SC-8 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, 120 vac, 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, 29CFR 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. Hazardous Materials Identification: If any of the materials are identified by the Site Manager to be hazardous, the Subcontractor will be notified immediately of the applicable standards to be complied with for personnel safety and health protection.

J. Galvanized Fence Materials: Personal respiratory protection or ventilation is required if a heat process takes place with galvanized fencing materials.

K. Back Up Alarms: It is mandatory for all heavy equipment to have functioning audible back up alarms while in use on an UMTRA project.

L. Asbestos:

1. Friable asbestos has been identified in materials to be handled. Asbestos removal and disposal is specified in Section 02050. The Subcontractor shall comply with Federal Safety and Health Regulations for Construction (29 CFR 1926.58) which includes control by a "competent person" as defined in the regulations.

2. Other required compliance is the National Emission Standard for Asbestos 40 CFR 61, Subparts A and M.

M. Industrial Hygiene:

1. Noise: Hearing protection shall be provided by the Subcontractor for personnel exposed to noise levels in excess of 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.

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 montoring and will inform the Subcontractor about the need for respiratory protection.

N. Manhour Reporting:

1. The Subcontractor shall tabulate total manhours worked each week including manhours spent by the lower-tier subcontractor personnel, and submit this information to the Contractor at the Albuquerque address.

2. This information will be used by the Contractor's Safety Department in compliance with record keeping and reporting requirements.

SC-9 HEALTH PHYSICS

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 will be provided to the Subcontractor at no charge on a loan basis. Clothing, when required, will be issued by Contractor personnel at the access control office.

2. Radiation Dressing Requirements:

   a. All controlled area protective clothing, when required, shall be put on and removed at the controlled 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. For respirator training and employee requirement, see Special Condition, SC-8.B.2 and SC-8.B.4. 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.

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. Some areas on the construction site may have localized Health Physics restrictions. These are controlled by ribbons, signs, and tags. Such 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 transfers within 8 working hours of termination 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. The Subcontractor's foreman and employees shall take action as directed. The Subcontractor's representative shall obtain the name, position, and agency of the messenger 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 Site Manager 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, and shall comply with decontamination limits specified in the UMTRA Project Health and Safety Plan. 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 equitable adjustment shall constitute a dispute within the meaning of article GP-7 of the General Provisions.

f. In view of the foregoing, the Subcontractor is encouraged to plan his work so as to minimize the transfer of equipment into and out of the construction area.

SC-10 SUBMITTALS

Pursuant to the provisions of Specification Section 01300, Submittals, the Subcontractor shall submit samples of materials, schedules and reports, shop drawings, product data, manufacturer's instructions, design calculations and design drawings to the Contractor.

SC-11 QUALITY ASSURANCE

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-12 PERMITS

A. The Contractor will provide following permits and notifications, as required, for project activities at and in the immediate vicinity of the processing site, except as noted below in Sections SC-12.B and SC-12.C:

1. Revokable Use Permit for work within windblown contaminated areas on tribal lands
(Bureau of Indian Affairs, Wind River Agency)

   a. Consent of Allottees

2. Cultural Resource Clearance for work within windblown contaminated areas
(State Historic Preservation Office, Bureau of Indian Affairs)

3. Road Right-of-Way Cleanup Approval
(Bureau of Indian Affairs)

4. Well Abandonment Notification
(WY State Engineer's Office)

5. Wastewater Discharge Permit
(WY-DEQ, Water Quality Division)

6. Permit to Construct a Reservoir (On-Site Retention Basin)
(WY-State Engineer's Office)

7. License to Encroach in Highway Right-of-Way (Highway 138)
(WY-Highway Department)

8. Exemption from Permit to Mine
(WY-DEQ, Land Quality Division)

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 the provisions of Article GP-13 of the General Provisions:

1. Spill Prevention Control and Countermeasures Plan for Fuel/Oil Storage Facilities
(U.S. Environmental Protection Agency)

2. Water Well Permits
(WY-State Engineer's Office)

a. Permit to Appropriate Ground Water
b. Statement of Completion
c. Description of Well
d. Proof of Appropriation and Beneficial Use

3. Well Completion Report/Plugging Record
(WY-DEQ, Water Quality Division)

4. Drill Hole Abandonment Report
(WY-DEQ, Land Quality Division)

5. Notice of Intent to Demolish Structures Containing Asbestos
(U.S. Environmental Protection Agency)

C. The Subcontractor shall provide all required notifications, permits, clearances and agreements for the use of borrow areas, or shall determine that the owner/operator of an existing borrow pit has obtained all required permits and notifications for the use and operation of such borrow areas in accordance with the requirements of Article GP-13 of the General Provisions. Permits and approvals needed for the development and operation of borrow sites may include the following:

1. Air Quality - Construction Permit
(WY-DEQ Air Quality Division)

2. Cultural Resource Clearance
(State Historic Preservation Officer or Bureau of Indian Affairs)

3. Wildlife Consultation for Threatened or Endangered Species
(U.S. Fish and Wildlife Service)

D. The Subcontractor shall comply with the provisions of the permits at all times during the execution of the Subcontract.

SC-13 ROAD CONSTRUCTION AND TRAFFIC CONTROL INCLUDING HAUL ROAD AND PUBLIC ROAD

A. 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.

B. 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.

C. 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.

D. The Subcontractor shall be responsible for providing all necessary bonding required by the applicable city, county and state highway departments.

E. The Subcontractor shall be responsible for grading, repairs and other maintenance of public and private roads used for construction purposes.

SC-14 ENVIROMENTAL PROTECTION

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 Section SC-8 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 and tribal regulations.

SC-15 SUBCONTRACTOR LABOR AND EQUIPMENT RATES

A. Subcontractor shall furnish to the Contractor in writing, within seven calendar days after the equipment is brought on site, a list of all equipment to be used on the Project. The list shall include as a minimum the following: make, model, type, year of manufacture, equipment no., and H.P. or capacity.

B. The Subcontractor shall provide, at the same time, a list of all labor rates including fringes, overhead and profit used on the Project and a list of rental rates for the above referenced equipment for the following time periods: hourly, daily, weekly and monthly. Said rates shall be broken down as follows: rental, and operating and maintenance. These rates shall not exceed 60% of the current edition of the Rental Rate Blue Book for Construction Equipment.

C. The above rates will be used for changes or work which is not included in the original Subcontract.

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 costs over the rate of regular time

plus actual payroll burdens (applicable taxes, fringes, benefits, etc.).

SC-16 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-17 UNIT PRICE WORK

A. Where the Subcontract Documents provide that all or part of the Work is to be Unit Price Work, initially the Subcontract Price will be deemed to include for all Unit Price Work an amount equal to the sum of the established unit prices for each separately identified item of Unit Price Work times the estimated quantity of each item as indicated in the Agreement. The estimated quantities of items of Unit Price Work are not guaranteed and are solely for the purpose of comparison of Bids and determining an initial Subcontract Price. Determinations of the actual quantities and classifications of Unit Price Work performed by Subcontractor will be made by the Contractor.

B. Each unit price will be deemed to include an amount considered by Subcontractor to be adequate to cover Subcontractor's overhead and profit for each separately identified item.

C. Variations in Quantities:

1. For Bid Items paid for on a unit price basis, variations in quantity of a Bid Item will be determined by comparing the total pay quantity of the Bid Item with the Contractor's estimated quantity in the Bid Schedule.

2. Payment for a Bid Item which has a final total value (extended amount) of less than two percent of the total Subcontract Price will be made at the Subcontract unit price regardless of variations in quantities.

3. If the total pay quantity of a Bid Item, which has a total value (extended amount) of two percent or more of the total Subcontract Bid price:

   a. Varies from the Contractor's quantity estimate by 10 percent or less, payment for the Bid Item will be made at the Subcontract unit price.

   b. Varies from the Contractor's quantity estimate by more than 10 percent, the compensation payable to the Subcontractor will be a subject of review by the Subcontractor and the Contractor, and an equitable adjustment will be made by means of a Change Order to credit the Contractor with any reduction in cost or to compensate the Subcontractor for any increase in cost resulting from variations between estimated and actual pay quantities. The adjustment review will be made at a time mutually acceptable to the Contractor and the Subcontractor.

SC-18 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-19 REMEDIAL ACTIONS ON LANDS OF INDIAN TRIBES

A. Pursuant to Section 105 of Public Law 95-605, the Uranium Mill Tailings Radiation Control Act of 1978 and the Co-

operative Agreement between the United States Department of Energy and the State of Wyoming, all Subcontractors shall make maximum use of any local qualified members of Indian Tribe residents in the vicinity of the mill tailings site, vicinity properties, and designated disposal areas for remedial action.

B. The Subcontractor shall submit with his proposal a plan for assuring the maximum utilization of local Indian labor as referenced above.

SC-20 FUNDING LIMITATIONS

A. Of the total Subcontract Price, the sum of $4,600,000 is presently available for payment to the Subcontractor under this Subcontract during fiscal year 1987. 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 September 30, 1987. 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 Sub-

contractor 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-21 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-22 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-23 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 SPECIAL CONDITIONS

Division 1

General Requirements

SECTION 01010

SUMMARY OF WORK

PART 1 - GENERAL

1.1 PROJECT LOCATION AND ACCESS

A. Project Location: The project site is located in Fremont County in western Wyoming. It is located approximately 2-1/2 miles southwest of Riverton. The site is generally bounded by BIA Route 28 (goes in Lodge Road) on the north, a vacant field on the west, State Highway 138 to the south, and irrigated farmland on the east. The topography slopes toward the southeast.

B. Borrow area for site restoration shall be provided by the Subcontractor.

C. Construction site access will be provided via an access gate to be constructed under this Subcontract.

1.2 SCOPE OF WORK

A. General:

1. The Work is generally described as site work related to the excavation of contaminated residual radioactive materials from the abandoned uranium mill tailings pile and from areas contaminated with windblown contaminants (windblown areas), and transportation of these materials to an off-site disposal area. The Work is outlined in Article 1.2.B below. Such Work is more fully detailed in the Specifications and Subcontract Drawings included herein.

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. Dust Control: Dust generated by vehicle use, temporary materials stockpiling, temporary stockpiling, mixing of contaminated materials and of uncontaminated materials, and other activities shall be controlled and minimized by the use of water and water-based surfactants sprayed from hoses or trucks. Dust control is specified in detail in Section 01500.

3. Temporary Facilities: Construction, operation, maintenance and removal of temporary facilities as specified in detail in Section 01500.

4. Construction Facilities: Construction facilities shall include the construction of temporary features required during construction of the permanent facilities. These temporary features shall include, but not be limited to, the following:

   a. Construction, operation, maintenance and removal of dewatering and drainage facilities including dewatering and disposal of water from contaminated and uncontaminated construction areas specified in Section 02141.

   b. Maintenance of existing fences is specified in Section 01019.

   c. Temporary relocation of existing irrigation ditches to assure uninterrupted delivery of irrigation water during the irrigation season. (Section 02060).

5. Permanent Facilities: Permanent facilities shall include construction of permanent features including, but not be limited to, the following. Permanent facilities are specified in detail in various Specification Sections:

   a. Excavation and transportation off-site of tailings and contaminated materials. (Section 02200)

   b. Demolition and transportation off-site of structures and utilities. (Sections 02050 and 02060)

   c. Sealing monitor wells. (Section 02090)

   d. Finish grading and seeding. (Section 02200)

C. The above description of the Work is for general information only, and in no way limits the responsibility of the Subcontractor for completing 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, Fremont County, Bureau of Indian Affairs, State Department of Environmental Quality, and other involved state and federal agencies having jurisdiction, and in accordance with the requirements of General Provisions, General Conditions and Special Conditions.

1.3 OTHER SUBCONTRACTS

A. Following subcontracts awarded by the Contractor will be in progress during the term of this Subcontract. The Contractor or his authorized representative will be responsible for coordinating all activities between the subcontractors in accordance with the requirements of Section SC-3.A of the Special Conditions. Other Subcontracts include the following:

1. Vicinity Properties Subcontracts

B. The Subcontractor shall allow Vicinity Properties Subcontractors to use the decontamination facilities constructed/installed under this Subcontract, as required by the Contractor.

1.4 CONSTRUCTION SEQUENCE

A. Unless otherwise specified, directed, or modified the Subcontractor shall follow the sequence of operations as set forth below and as indicated on the Subcontract Drawings. Full compensation for conforming to such requirements will be considered as included in the related Bid Schedule items of Work and no additional compensation will be allowed therefor:

B. The sequence of operations:

1. Mobilization as specified in Section 01019.

2. Removal of interior fences, and utilities; sealing of monitor wells; and construction of temporary facilities as specified in Section 01500.

3. Construction of retention basin including spillway and temporary collection and discharge ditches; and opening of borrow sites. Transport contaminated material excavated from retention basin and temporary drainage ditches to the off-site tailings embankment; stockpiling uncontaminated material excavated from retention basin, spillway and temporary drainage ditches for later use as fill; and grading for site drainage.

4. Transport contaminated tailings and demolished materials and debris to the off-site disposal site.

5. Restoration and finish grading of the existing irrigation and drainage ditches shall be performed as soon as practicable after decontamination of those areas.

6. Site Cleanup: Removal and disposal of stockpiled materials and removal of site perimeter fencing.

7. Site Restoration: Grading of the site to provide drainage including placement of uncontaminated fill, and revegetation.

1.5 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.

1.6 TIME OF COMPLETION

A. The Subcontractor shall commence Work under this Subcontract within five (5) calendar days from receipt of Notice to Proceed, and shall complete the Work within 1280 calendar days of receipt of Notice to Proceed.

B. Termination for default, damages for delay and time extensions are specified in Article GP-6 of General Provisions.

1.7 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.

1.8 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.

1.9 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.

1.10 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.

1.11 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 to inspect all 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. State of Wyoming
4. Fremont County
5. Bureau of Indian Affairs
6. Authorized Arapahoe and Shoshone Tribal Representatives

B. The inspections will be performed in conjunction with an inspection by the Contractor. Reasonable facilities for the proper handling of the materials and inspection of 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. Maintenance of existing fences, construction equipment, materials, and supplies including decontamination of equipment, cleaning of equipment for salvage, cleaning of the site, and restoration and reseeding of the offsite temporary roads.

1.2 RELATED WORK

Section 01500 - Temporary Facilities

1.3 DESCRIPTION

A. Mobilization shall include:

1. 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. Maintenance of all facilities and utilities including removal of snow from all office areas, roads and fences through the term of the Subcontract, and final cleanup of the site.

4. Decontamination of equipment, materials, supplies, appurtenances; and cleaning of equipment for salvage.

5. Subsequent removal from the site of all construction equipment, materials, supplies, appurtenances, and the like upon completion of the Work.

6. Maintenance of existing fences, cleaning of the site, and restoration and reseeding of the offsite temporary roads, as required by the Contractor.

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 made at the lump sum price quoted therefor in the Bid Schedule, and shall include all items as specified herein. Payment 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.

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 shall 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. Special Conditions - Section SC-17: 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 by the Contractor 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 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 Sections GC-4B of the General Conditions and SC-14 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 Section SC-17 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 will be made.

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 survey stakes 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 responsibility for the 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 the 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 will 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:

Type of Line or Mark	Horizontal Position	Elevation
Permanent reference points	1 in 10,000	± .01 ft.
General Excavation and earthworks	1 in 2,000	± .10 ft.

B. Tolerances for designed thicknesses shown on Subcontract Drawings with the exception of erosion protection materials, and for elevations shown on the Subcontract Drawings shall be ± 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. Cost Profile
2. Shop Drawings
3. Samples
4. Schedules and Reports
5. Product Data
6. Manufacturer's Instructions
7. Design Calculations and Design Drawings

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

C. All submittals shall be in English language.

D. The Subcontractor shall submit all technical submittals including, but not limited to, shop drawings, schedules and reports, product data, manufacturer's instructions, design calculations and design drawings etc. to the Site Manager. A copy of the submittal, marked information only, shall be sent to the Contractor's Subcontract Administrator by the Subcontractor. These submittals shall be numerically serialized by the Subcontractor. The submittal serial numbers shall be consecutive and not a part of another correspondence tracking system. The Site Manager will review the submittal and clearly label as follows and return to the Subcontractor:

Submittal Review Status:

- o Approved
- o Approved as Noted
- o Revise and Resubmit
- o Rejected

1.2 COST PROFILE

A. In compliance with the U.S. Department of Energy's fiscal year funding procedures, the Subcontractor shall submit a Cost Profile reflecting the schedule of work (Project Construction Schedule) to be performed. The Cost Profile shall include the scheduled costs by month through completion of the Work scope defined in the Subcontract Documents. The cost profile shall be submitted within 30 days of receiving the Notice to Proceed.

B. At the beginning of each fiscal year (October 1), the Contractor will evaluate the Subcontractor's fiscal requirements and determine if there are sufficient funds available.

C. Where conflicts arise between the Subcontractor's anticipated Cost Profile and the available U.S. Department of Energy fiscal year funding, the Subcontractor will submit a revised schedule of Cost Profile to the Contractor for approval.

1.3 SHOP DRAWINGS

A. 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.

B. 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.

C. 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. Only upon a special approval from the Site Manager a larger size of 36 inches x 42 inches will be used.

D. A clear space of 3 inch by 3 inch shall be provided on each drawing for the Contractor's review stamp and comments.

E. Shop drawings shall be submitted to the Contractor in the form of a reproducible transparency, along with one blackline or blueline print. Manufacturers' literature, brochures, catalog cuts, and other pertinent printed matter or data shall be submitted in triplicate.

F. After the Contractor has performed his review of shop drawings, he will return one print to the Subcontractor with one of the notations indicated in Article 1.1.D above.

G. When shop drawings and other submittals are returned marked with either "Revise and Resubmit" or "Rejected", the Subcontractor shall make such revisions and corrections and resubmit the drawings or other material in the same manner as specified above.

H. The Contractor will review and return shop drawings within thirty days of receipt.

1.4 SAMPLES

A. 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.

B. The Subcontractor shall furnish the Contractor samples 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.

C. 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 within fourteen days of the Subcontractor's submission. All approvals of samples will be given by the Contractor in writing.

D. 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.

E. After the Contractor has performed his review and analysis of samples, he will retain two samples and will return the remaining sample to the Subcontractor, along with the Contractor's comments.

F. 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.

G. 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.

H. Unless otherwise specified, all samples, where applicable, shall be furnished in sizes required by the Site Manager.

I. Test samples, as designated by the Contractor, will also be selected from the materials or equipment delivered by the Subcontractor to the site for use in the work, or as requested by the Contractor. If any test sample fails to meet the specification requirements, previous approval will be withdrawn, and such materials or equipment which fail the testing, shall be subject to removal and replacement by the Subcontractor with materials or equipment meeting the Specification requirements.

J. 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.

1.5 SCHEDULES AND REPORTS: GENERAL

A. The Subcontractor shall prepare and submit schedules and reports in accordance with the requirements of Section GC-4B of General Conditions and the requirements of this Section. Where conflicts occur between the General Conditions and the General Requirements, the General Requirements will govern.

B. The Schedules and reports shall describe the Subcontractor's work plan in sufficient detail as delineated below to provide:

1. 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,

2. A basis for determining the progress of the work, and

3. A basis for the Contractor's internal planning activities.

C. Within 15 calendar days after Notice to Proceed, the Subcontractor shall provide the schedules specified in this Section.

D. The schedules shall be in a reproducible form of the same scale or some of the schedules may be combined as required by the Contractor.

E. 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's Subcontract Administrator and Site Manager.

F. The Subcontractor shall obtain approval of the various schedules specified in this Section before submitting the first application for payment.

G. The Subcontractor's schedules and reports shall include the following:

1. Site Mobilization Schedule

2. Project Construction Schedule

3. Schedule of Values

4. Schedule of Submittals

5. Weekly Status Reports

1.6 SITE MOBILIZATION SCHEDULE

A. Format: The Subcontractor shall present, at the preconstruction conference, 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.

B. 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.

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

1.7 PROJECT CONSTRUCTION SCHEDULE

A. Scheduling: A preliminary issue of the Project Construction Schedule shall be prepared for review at the preconstruction conference. 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.

B. Format:

1. The preliminary issue distributed at the preconstruction conference will consist of:

a. A time scaled Critical Path Method (CPM) Schedule which depicts proper restraints, activity durations, total float and free float for the entire duration of the subcontract.

b. Method of Construction Narrative

c. The following critical milestone dates shall be clearly identifiable in the Subcontractor's CPM:

1) Start/Complete Mobilization

2) Start/Complete Site Preparation

3) Start/Complete Temporary Drainage Ditches

4) Start/Complete Wastewater Retention Basin

5) Start/Complete Tailings and Contaminated Material Removal

6) Start/Complete Windblown Contaminated Material Removal

7) Start/Complete Site Restoration

8) Start/Complete Demobilization

2. The issued for approval Project Construction Schedule will consist of the revised items listed in B.1. above.

3. The approved Project Construction Schedule will consist of the following items, each compatible with the other and developed from the same basis:

a. Method of Construction Narrative

b. CPM Schedule

c. Critical Milestone Dates identified in Article 1.7.B.1.c above.

C. Method of Construction: Method of construction submitted at the preconstruction conference 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.

D. The Use of Scheduled Float: In as much as Subcontractor's Schedule represents the Project Construction Schedule, the calculated scheduled float for an activity is shared by the Subcontractor and Contractor. Adjustments to the scheduled float will be equitably resolved by the Contractor.

E. Computer Generated Schedule: The Subcontractor may generate the CPM Schedule manually or by using a computer. Samples of actual project applications and computer reports produced shall be provided. The CPM Schedule shall include all definable critical items of Work.

F. Comments incorporated: The Subcontractor shall incorporate the Contractor's comments into revisions of the Project Construction Schedule, adjust the manpower loading accordingly and resubmit the schedule to the Contractor, for approval along with a summary of the changes or other means showing the changes.

G. Approved Project Construction Schedule:

1. Upon approval the Subcontractor will issue for construction use the Project Construction Schedule.

2. Status Updating: The status of the schedule shall be updated at least monthly by the Subcontractor and reviewed by the Contractor. The status of the CPM Schedule shall indicate percent complete by activity, remaining duration of in-progress activities, total float and free float.

3. Revisions to the Schedule shall be accomplished to reflect the impact thereon of new developments and in accordance with the requirements of the Contractor. Revisions made to the schedule will be given a new revision number and submitted to the Contractor for approval.

1.8 SCHEDULE OF VALUES

A. 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 be based upon that specific revision of the Construction Schedule, and presented in such a format to clearly provide total cost information by month and cumulative for the entire duration of the Subcontract. If specific funding limitations have been set forth, the Schedule of Values shall be within said limits.

B. The format and the substance of the finalized Schedule of Values shall be as approved by the Contractor.

1.9 SCHEDULE OF SUBMITTALS

A. Vendor Data Submittals list including data submittals, required return dates, and material deliveries shall be submitted to the Contractor's Site Manager.

B. Subcontractor Submittals List consisting of all submittals required under this Subcontract but are not included in the schedules listed in this Section shall be submitted to the Site Manager. Copies shall be submitted to the Subcontract Administrator.

C. Shop Drawings List:

1. A Shop Drawings list shall be submitted by the Subcontractor as a supplement to the Project Construction Schedule.

2. The list shall depict submittal delivery dates of the shop drawings by the Subcontractor's Vendors.

3. The list shall be continually updated for progress and revised upon issuance of changes which would substantially affect the list. The updates shall be furnished upon request by the Contractor.

4. Revisions to the Shop Drawings list shall be reflected on the Project Construction Schedule.

1.10 WEEKLY STATUS REPORTS

The Subcontractor shall submit a Weekly Status Report to the Subcontract Administrator with a copy to the Site

Manager 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. Delinquency in submitting Weekly Status Reports may cause delays in progress payments.

1.11 PRODUCT DATA

A. 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.

B. The Subcontractor shall submit the number of copies which the Subcontractor requires, plus two copies which will be retained by the Contractor.

1.12 MANUFACTURER'S INSTRUCTIONS

When required in individual Specification Sections, the Subcontractor shall submit manufacturer's printed instructions for delivery, storage, assembly, installation, adjusting, and finishing, in quantities specified for product data.

1.13 DESIGN CALCULATIONS AND DESIGN DRAWINGS

A. 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.

B. Design Drawings:

1. When requested by the Contractor, design drawings shall be submitted to the Contractor for review.

2. Pertinent requirements of Article 1.3 of this Section shall be applicable for submittal of design drawings.

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

SECTION 01500

TEMPORARY FACILITIES

PART 1 - GENERAL

1.1 SCOPE

A. The Subcontractor shall furnish, install and maintain all required temporary facilities as shown or specified herein plus such facilities and equipment as are required for proper performance of the Subcontract.

B. 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.

C. Upon completion of the Subcontract, the status of the temporary facilities shall be as specified in Article 1.24.

D. 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.

E. All utilities within the fenced area surrounding office trailers shall be installed underground. This shall include, but not be limited to, telephone, electricity, water, sanitary sewer and storm drainage systems. The utilities shall be designed and constructed to provide uninterrupted service during winter.

F. All land disturbances related to 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 as specified.

1.2 RELATED WORK

A. Special Conditions: Definitions.

B. Section 01019 - Mobilization: Payment.

C. Section 01300 - Submittals.

D. Section 02050 - Demolition

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. Uniform Building Code (UBC):
1985 Edition, applicable Chapters and Sections.

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

B. All required facilities, equipment and utilities shall also be constructed/installed, maintained and operated in accordance with the 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 SUBMITTALS

A. General submittal requirements are specified in Section 01300.

B. The Subcontractor shall, at least 30 days prior to start of installation operations, submit his proposed designs for the following including calculations, drawings and equipment list with their capacities, to the Contractor for review:

1. Temporary Sanitary Facilities

2. Temporary Water

3. Decontamination Washwater Recycling System

4. Portable Scales Pad

5. Temporary Fencing

1.5 SUBCONTRACTOR'S TEMPORARY OFFICE TRAILER

A. Subcontractor shall furnish and install, in good condition, on the site, at least one temporary office trailer of suitable size for himself and his office staff.

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

1.6 CONTRACTOR'S TRAILERS

A. Subcontractor-Furnished Trailers:

1. The Subcontractor shall furnish and install following trailers for the Contractor's staff 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 No. 1

b. Access Control Trailer

c. CNSI Trailer

2. Each trailer except the access control trailer shall be not less than 720 (12 ft. x 60 ft.) square feet. Access control trailer shall be 400 (10 ft. x 40 ft.) square feet.

3. Each trailer shall, as a minimum, contain rooms with lockable doors, toilet room with toilet, and a wash basin. Access control trailer shall also be equipped with a single shower and change facilities for occasional use by personnel working on the site.

B. Contractor-Furnished Trailers:

1. The Subcontractor will install the following Contractor-furnished trailers and storage van for the use of his own staff as shown on the Subcontract Drawings:

a. Contractor's Office Trailer No. 2

b. Trailer for the use of State of Wyoming (State Trailer)

c. Storage Van

C. Each trailer including the storage van and state trailer shall be provided with power (see Article 1.14 E), and shall be properly lighted and temperature conditioned for summer and winter use. Each trailer except the storage van and the state trailer shall be provided with sanitary water. Wash basins and toilets from the trailers shall be connected to sanitary facilities specified in Article 1.13.

D. All Contractor's trailers except the storage van and the state trailer shall be equipped with skirting all around.

E. All Contractor's trailers including the storage van and the state trailer shall be connected by a system of walkways.

1.7 PARKING AREAS

A. Construction Vehicles: Vehicles used for construction purposes will be allowed inside the area, but will be monitored for radioactive contamination at the access gate or control point before leaving the area.

B. Non-Construction Vehicles: Non-construction vehicles include private, personal, agency, Subcontractor, Contractor, delivery, repair and maintenance, and authorized representatives and visitors of the Contractor and Subcontractor. The Subcontractor shall provide parking area for non-construction vehicles as specified in Section SC-4 of the Special Conditions. The capacity of the parking area shall be limited to 40 cars.

1.8 JANITORIAL SERVICE

A. The Subcontractor shall provide daily janitorial 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.

1.9 TEMPORARY ROADS

A. The following improvements to existing roads and construction of new roads shall be made by the Subcontractor as shown on the Subcontract Drawings and as specified below:

1. Construct a paved turnout, and accelerating and decelerating lanes on State Highway 138 at the Project site access to match existing structural section and grades of the highway, complete with signs, pavement marking, lighting, and the like, ready to open to traffic.

2. Improve the intersection of State Highways 789 and 138 complete with signs, lighting, directional light signals with all controls, and the like, ready to open to traffic.

3. Improve the geometrics of the pavement of the Private Road at the intersection with State Highways 789 and 136 to facilitate right turns from the private road to Highway 136, complete with signs, as required.

4. Improve the private road between State Highways 789 and 136 by widening the pavement to 30 feet, furnishing and placing aggregate surfacing, constructing drainage ditches and culverts, and the like, as required. The Subcontractor shall acquire the required permits, notifications and right-of-way to improve this road.

B. Improvements to state highways shall conform to the applicable provisions of Wyoming Highway Department Specifications for Road and Bridge Construction.

C. County roads, if required to be improved, shall be improved in conformance with the requirements of Fremont County. Evidence of county approval of Subcontractor Plans shall be submitted to the Contractor fifteen days prior to the start of such work.

D. Improvements, if any, to existing Goes In Lodge Road shall conform to the applicable requirements of Bureau of Indian Affairs.

E. Construction shall be coordinated with local utilities, fire and police departments, and shall be as approved by the Contractor.

F. The Subcontractor shall provide and maintain an uninterrupted access to existing scale house for vehicles using the scale house.

G. 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.

H. Improvements, if any, to Gas Hills Road shall not be included in the Scope of Work of this Subcontract.

1.10 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 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.

1.11 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.

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 Section SC-13 of the Special Conditions.

1.12 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 required by the Contractor.

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.

1.13 TEMPORARY SANITARY FACILITIES

A. Subcontractor shall provide temporary sanitary facilities for use by all employees and persons engaged in the work, including Contractor, DOE, their employees, and authorized agents of the agencies mentioned in Article 1.10 of Section 01010.

B. Sanitary facilities shall be designed, installed, maintained and operated in accordance with the applicable requirements of the local public health standards.

C. Sanitary facilities for the Contractor, DOE, and their employees shall consist of toilets, washing sinks, collection pipes, tanks, and disposal equipment, where required. Wastewater from the wash sinks shall be collected into an underground tank by a separate piping system. The sanitary waste from toilets shall be collected into an underground septic tank by a separate piping system. Both tanks shall be kept pumped out at required intervals to prevent overflow and contamination of the ground, flowing streams or surface drainage.. The contents of the wastewater tank shall be pumped into the wastewater retention basin. The contents of the septic tank shall be disposed of offsite as Subcontractor's property.

D. Additional toilets or 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. Open pit or trench latrines will not be permitted.

E. 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.

F. At completion of the Work, sanitary facilities shall be properly disinfected and all evidence of the same, including buried tanks and concrete foundations, removed from the site to the satisfaction of the Contractor unless otherwise directed.

1.14 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. Riverton Valley Electrical Association provides power in the area. The Subcontractor shall make arrangements with the utility company and shall pay all charges for providing and maintaining electrical service including usage costs at the site. The Subcontractor shall be responsible for making

his own determinations regarding availability of power from the utility company and his own requirements of power for the project. All temporary wiring, feeders, and connections, and, if required, standby generators or generating capacity required in excess of the serving utility capacity 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.

1.15 TEMPORARY WATER

A. General: Temporary water service for drinking, sanitation and construction purposes shall be provided as specified in this Section and as shown on the Subcontract Drawings.

B. Drinking Water: Chilled drinking water shall be furnished in bottles from an approved source to all Contractor's trailers.

C. Sanitation Water: Water for domestic use shall be furnished to fixtures in all Contractor's trailers.

D. Construction Water: Two possible sources of construction water have been identified at the site. The well at the existing pumphouse is owned by Lome Drilling Company, and part of the capacity of this well is being purchased and used by Chemical Marketing Services, owner and operator of the adjoining acid plant. Chemical Marketing Services also has a well on their property which they do not now use, because of its inferior quality. The Subcontractor shall be responsible for obtaining water for construction purposes.

1.16 DECONTAMINATION WASHWATER RECYLING SYSTEM

A. The Subcontractor shall design, furnish, install, operate, maintain, remove and dispose of a high-pressure, water recycling wash system for:

1. Washing contamination from vehicles, equipment, tools and materials that become contaminated during use in the Work.

2. Recycling washwater from wastewater recirculation pond for reuse as washwater for decontamination.

3. Furnishing make-up water and emptying surplus water, when required, to maintain the water level in the recirculation pond to 3/4 full.

4. Emptying solids from the sump, as required.

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

1. High-pressure (75 to 100 psi), low-flow wash system capable of decontaminating vehicles, tools and equipment, as required.

2. Decontamination pad.

3. Lined sump, 5,000-gallon capacity.

4. Six-inch diameter polyvinyl chloride (PVC) overflow pipe.

5. Recirculation lined pond or tank, 5-foot deep, 15,000-gallon capacity. The pond or tank shall have two compartments for separation of solids. The system shall provide for removal of solids by mechanical equipment.

C. Contaminated washwater and sediments shall be collected from the decontamination pad by gravity into the lined sump. Overflow from the sump shall be collected by gravity through a 6-inch minimum diameter PVC pipe into the wastewater recirculation pond. The water from the pond shall be recycled for reuse as washwater by a pumping system. The water level in the pond shall be maintained to 3/4 full. Excess capacity shall be pumped out to the retention basin.

D. At the completion of the Subcontract, the Subcontractor shall remove and dispose of all equipment; demolish decontamination pad, sump, membrane liner, PVC pipe, and transport the debris to an off-site disposal area; and restore the area to near original conditions existing prior to the start of the Work.

E. Demolition of decontamination pad, sump, membrane liner and PVC pipe shall conform to Section 02050.

1.17 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.

1.18 TEMPORARY TELEPHONE SERVICE

A. The Subcontractor shall make all necessary arrangements for telephone service for his use.

B. All costs of telephone service connections, external and internal, shall be borne by the Subcontractor.

C. The Contractor will provide telephones for his own use, and will also be responsible for paying the monthly usage bills chargeable to his phones.

D. The State of Wyoming will provide telephones for use in its own trailer, and will also be responsible for paying the monthly usage bills chargeable to the trailer.

1.19 PORTABLE SCALES PAD

The Subcontractor shall design, construct, operate, maintain, remove and dispose of a portable scales pad for use by the Wyoming Highway Department to check vehicle weights. The pad shall be designed and constructed to the dimensions indicated on the Subcontract Drawings, and shall be capable of handling all and any vehicles leaving the decontamination pad for access onto the State Highway system.

1.20 BARRICADES, LIGHTS, AND FLAG PERSONS

A. Pursuant to Article GP-34 of General Provisions, Section GC-3D of General Conditions, and Sections SC-13 and SC-18 of Special 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. Leave all protection in place and maintain until removal is authorized.

B. 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.

1.21 TEMPORARY FENCING

A. The Subcontractor shall furnish, install, maintain, remove and dispose of the following types of fences with gates as indicated on the Subcontract Drawings:

1. Chain Link Fence and Gates

2. Woven Wire Fence

B. The fences and gates shall be installed in accordance with the requirements of the drawings and details prepared by the Subcontractor and approved by the Contractor.

1.22 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.

1.23 MAINTENANCE

A. Subcontractor shall maintain all temporary facilities as required by the Contractor during the term of the Subcontract.

B. With the exception of the following, all roads, including state highways, signals, signs, lighting and other elements of transportation route, and access control areas shall be maintained by the Subcontractor, for the safe and efficient transport of equipment, supplies and personnel:

1. State Highway 136 from the intersection with the Private Road to the Gas Hills Road will be maintained by others.

1.24 STATUS AT COMPLETION

A. Upon completion of the Work, or prior thereto when so required by the Contractor, Subcontractor shall:

1. Decontaminate and remove all temporary facilities including all concrete foundations, unless otherwise specified, indicated or directed.

2. Repair existing roads (except Gas Hills Road) used as temporary roads. Repair work will include recompacting and resurfacing to at least equal or better conditions existing prior to the start of the Subcontract Work.

3. Repair new roads (except those mentioned in 4 below) to the conditions existing prior to opening to traffic.

4. Obliterate new roads including access road to the site, roads within the site, and the turnout and the accelerating and decelerating lanes at State Highway 138 as directed by the Contractor.

5. Restore the areas utilized for temporary facilities to their near original contours by grading, and seed the area to match existing vegetation. For disturbed areas within the site, seeding shall conform to Section 02935. For disturbed areas outside of the site, seeding shall conform to the requirements of the agency having jurisdiction over the area.

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 items will be by their lump sum basis:

1. Contractor's trailers.
2. Temporary roads and parking areas.
3. Janitorial service.
4. Temporary sanitary facilities.
5. Temporary electric power.
6. Temporary water.
7. Decontamination washwater recycling system.
8. Portable scales pad.

B. Measurement for payment for the following fences will be by the linear feet of each type of fence and gates installed and removed as shown on the Subcontract Documents and as accepted by the Contractor. Measurements will be made along the top of the fence to the nearest foot:

1. Temporary chain link fence and gates.
2. Temporary woven wire fence.

C. Separate measurement for payment will not be made for any other item of work specified in this Section.

4.2 PAYMENT

A. Payment for items 1 through 8 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 labor, materials, equipment, tools, accessories, and incidentals, and for performing all work including designing, fabricating, installing/constructing, operating, maintaining, removing and disposal of facilities through the term of the Subcontract.

B. Payment for items 1 and 2 of Article 4.1.B above will be by their applicable unit prices 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 furnishing, constructing, maintaining, removing, and disposal of fences, including any clearing, stripping, tree removal, excavation, concrete or cement, complete in place, as shown on the Subcontract Drawings and as accepted by the Contractor.

C. Separate payment will not be made for any other item of work specified in this Section. Full compensation for such work will be considered to be included in the applicable related items of Work under the Subcontract.

END OF SECTION 01500

Division 2

Sitework

SECTION 02050

DEMOLITION

PART 1 - GENERAL

1.1 SCOPE

A. This Specification Section describes the requirements for:

1. Demolition of the following structures and transportation of the demolished materials and debris to an off-site disposal area:

   a. Existing structures complete with their foundations, other facilities, tanks, piping, and miscellaneous junk and debris scattered throughout the site, including but not limited to, the following:

      1) Mill Building and Superstructure

      2) Ore Storage Building and Bins

      3) Concrete Platform and Tank Footing

      4) Concrete Foundation (Crushing and Sampling Building)

      5) Miscellaneous Structures

      6) Miscellaneous Debris

      7) Decontamination Pad and Sump

   b. Decontamination pad, sump, membrane liner and PVC pipe constructed/installed under the Scope of Work of this Subcontract.

2. Removal of asbestos and asbestos containing materials and disposal in an off-site area.

3. Decontamination of existing scale house and scales.

B. Structures and facilities excluded from demolition work shall be protected from damage.

1.2 WORK NOT INCLUDED

Identification, removal and disposal of the contents of tanks, vats, and the like, and chemically hazardous or toxic waste will be by others.

1.3 RELATED WORK

A. Special Conditions - Sections SC-7 and SC-8

B. Section 01500 - Temporary Facilities

C. Section 02060 - Existing Utilities

D. Section 02090 - Sealing Monitor Wells

E. Section 02200 - Earthwork

F. Section 02771 - Membrane Liner

1.4 DEFINITIONS

Demolition includes complete wrecking of structures including all contents, associated outside services and piping, foundations and below grade slabs, footings, and the like, and removal and transportation of demolished materials and debris, as shown on the Subcontract Drawings and as specified in this Section.

1.5 SUBMITTALS

A. General submittal requirements are specified in Section 01300.

B. Thirty days prior to the start of Work, the Subcontractor shall submit to the Contractor, for review, a demolition plan including the following:

1. Methods of demolition to be used

2. Schedule showing dates and structures to be demolished

3. List of equipment to be used

1.6 AVAILABLE INFORMATION

Descriptions of Structures and Facilities to be Demolished: Descriptions of structures, facilities, tanks, piping, miscellaneous junk and debris located on the site and contained in Articles 1.9 through 1.16 of this Section are approximate and incomplete.

1.7 DISCLAIMER

A. The information described above is being made available to the Subcontractor solely for his information and convenience. The information does not constitute a part of the Subcontract.

B. The Contractor makes no representation that the information being made available is complete, accurate, and that it shows the complete range of conditions which will be encountered in the construction of the Project.

C. The Contractor disclaims responsibility for any opinions, conclusions, interpretatons, or deductions that may be expressed or implied in any of the information being made available, it being expressly understood that the making of deductions, interpretations, and conclusions is the Subcontractor's sole responsibility.

1.8 EXAMINATION OF SUBCONTRACT DOCUMENTS, SITE, AND CONDITIONS OF WORK

A. Before submitting a Bid, the Subcontractor shall (a) examine the Subcontract Documents thoroughly; (b) visit the site to familiarize himself with local conditions that may in any manner affect cost, progress or performance of the Work; (c) familiarize himself with federal, state and local laws, ordinances, rules and regulations that may in any manner affect cost, progress or performance of the Work; and (d) study and carefully corelate his observations with the Subcontract Documents.

B. Before submitting his Bid the Subcontractor shall, at his own expense, make such additional investigations, measurements, and tests as he may deem necessary to determine his Bid for performance of the Work in accordance with the time, scope of work, and other terms and conditions of the Subcontract Documents. Upon request, the Contractor will provide the Subcontractor access to the site to conduct such investigations, measurements, and tests as he deems necessary for submission of his Bid.

C. The submission of a Bid will constitute an incontrovertible representation by the Subcontractor that he has complied with every requirement of this Article.

1.9 MILL BUILDING

A. Floor and Footings:

1. Dimensions: 132'W x 184'L + 64'W x 100'L

2. Type: Reinforced concrete, details unknown. Thickness to 6 ft. or more in some areas.

B. Superstructure:

1. Dimensions: 132'W x 82'L + 64'W x 100'L

2. Type: Steel framed, corrugated metal sheeting, miscellaneous steel platforms, details unknown. Contains piping, some with asbestos covering.

1.10 ORE STORAGE BUILDING AND BINS

A. Dimensions: 33'W x 88'L

B. Type: Steel framed building containing three ore storage bins. Frame and foundations include slabs, isolated footings and perimeter footings.

1.11 CONCRETE PLATFORM AND TANK FOOTING

A. Dimensions: 44'W x 283'L

B. Type: Reinforced concrete slab with four separate circular thickener pads at 40-foot diameter and one separate octagonal pad adjacent to the platform. Depth of slab and pads is 2 to 3 feet minimum.

1.12 CONCRETE FOUNDATION (CRUSHING AND SAMPLING BUILDING)

A. Dimensions: 26'W x 86'L

B. Type: Reinforced concrete slab with curb around the slab and various small piers across the slab. Depth of footings and slab is 1 foot minimum.

1.13 MISCELLANEOUS STRUCTURES

A. Several isolated small structures and slabs including, but not limited to, the following:

1. South of Scale House Area:

   a. 2-foot x 3-foot concrete pad for air conditioner.

   b. 4-foot x 1-foot reinforced concrete slab with 6-foot depth.

   c. 0.67-foot x 5-foot reinforced concrete footing with 4-foot depth.

   d. 4-foot x 4-foot concrete pad with 1-1/2-foot diameter steel pipe with hinged lid. Depth of slab is unknown. Pipe extends down approximately 10 feet with presence of water (sump).

   e. 8-foot x 8-foot shed structure with framed shed, corrugated iron sheeting, tank base slab.

   f. Several separate 1-1/4 feet x 1-1/4 feet reinforced concrete footings, with 4-foot depth.

2. West of Ore Storage Bins and North Portion of Mill Building:

   a. 13-foot square concrete foundation slab for kerosene storage tank, depth unknown.

   b. 50-foot diameter slab for thickener, depth unknown.

   c. Three 15-foot diameter tank footings for pachucas, depth unknown.

   d. Miscellaneous slabs, concrete pavement and other footings surrounding and adjacent to items above, depths unknown.

3. Scattered footings, etc. Includes one small 4-foot x 4-foot framed shed east of Scale House.

4. 20-foot x 20-foot reinforced concrete tank slab east of pumphouse.

5. 36-foot x 90-foot reinforced concrete garage slab southeast of mill building.

6. One 12-foot diameter x 10-foot high and one 10-foot diameter x 15-foot high steel plate tanks west of tailings pile.

7. 24-foot x 13-foot x 8-foot deep reinforced concrete pit with 1-foot thick wall. Structural steel "Tees" (grizzly) grating covers the pit. Metal building 8-foot x 14-foot with 0.67-foot thick reinforced concrete slab.

1.14 MISCELLANEOUS DEBRIS

Several piles of scrap metal and discarded equipment, including minor amounts of wood objects, are scattered around the site.

1.15 MISCELLANEOUS ASBESTOS DEBRIS

A. The following asbestos or asbestos containing debris shall be removed and disposed of in conformance with the applicable Federal, State and local regulations:

1. Approximately 65 decomposed bags presumed to contain asbestos.

2. Asbestos elbow insulation on pipe runs insulated with fiberglass products.

3. Scattered insulation material on the building floor, assumed to be asbestos.

1.16 DECONTAMINATION PAD AND SUMP

A. Decontamination pad, sump, membrane liner and PVC pipe constructed/installed under this Subcontract shall be demolished and the demolished materials and debris transported off-site.

B. Grading shall be performed to restore existing grades unless otherwise indicated on the Subcontract Drawings.

1.17 DECONTAMINATION OF SCALE HOUSE AND SCALES

Existing scale house and scales shall be decontaminated by sandblasting, steam cleaning and washing with water as directed by the Contractor.

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. Locations of buildings, foundations, and other structures to be demolished are shown on the Subcontract Drawings.

C. Pollution Controls:

1. Water sprinkling, temporary enclosures, and other Contractor approved methods shall be used to limit the amount of airborne dust, dirt and radioactive and other hazardous material 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:

1. General: 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 shown on the Subcontract Drawings shall be demolished and the materials and debris stockpiled as specified herein.

2. Explosives: The use of explosives will not be permitted in accordance with the requirements of Section GC-12 of the General Conditions.

3. Pipes and Ducts: Pipes and ducts shall be cut to sizes no greater than 20 feet in length.

4. Tanks and Vessels: Tanks and vessels shall be emptied of contents by others prior to removal and demolition. Tanks and vessels shall be cut to pieces not greater than 20 feet long by 8 feet wide and flattened.

5. 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.

6. Metal objects with voids shall be crushed to sizes no greater than 27 cubic feet in volume with least dimension not exceeding 6 inches.

E. Removal and transportation of existing utilities shall be as specified in Section 02060.

F. Sealing of monitor wells shall be as specified in Section 02090.

3.2 DISPOSAL OF DEMOLISHED MATERIALS AND DEBRIS

A. Demolished materials and debris including asbestos debris shall be transported to an off-site disposal site by the Subcontractor.

B. Burning of demolished materials and debris will not be permitted.

PART 4 - MEASUREMENT AND PAYMENT

4.1 MEASUREMENT

A. Measurement for payment for the demolition of all existing structures specified in this Section will be on a lump sum basis.

B. Measurement for payment for the following will be on a lump sum basis:

1. Removal and disposal of miscellaneous asbestos debris.

2. Decontamination of scale house and scales.

C. Separate measurement for payment will not be made for demolition of decontamination pad, sump, membrane liner, PVC pipe, and the like constructed/ installed under this Subcontract, and transportation of demolished materials and debris to an off-site disposal area.

4.2 PAYMENT

A. Payment for demolition of all existing structures 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, tools, equipment, incidentals, and for performing all work including all clearing, demolishing, breaking the debris into small pieces, removal and decontamination of facilities where required, and transportation of demolished materials and debris to an off-site disposal area as specified in this Section.

B. Payment for the items of Article 4.1.B above will be by their applicable lump sum prices quoted therefor in the Bid Schedule.

C. Separate payment will not be made for demolition of decontamination pad, sump, membrane liner, PVC pipe, and the like constructed/installed under this Subcontract, and for transportation of demolished materials and debris to an off-site disposal area. Full compensation for such work will be considered to be included in the Bid Schedule item for decontamination washwater recycling system specified in Section 01500.

END OF SECTION 02050

SECTION 02060

EXISTING UTILITIES

PART 1 - GENERAL

1.1 WORK INCLUDED

A. This Section describes the requirements for the following:

1. Protection, replacement, removal, abandonment and demolition of existing utilities shown on the Subcontract Drawings.

2. Transportation of demolished materials and debris to an off-site disposal area.

3. Maintenance of uninterrupted services to existing customers.

1.2 DEFINITIONS

Utility: For the purpose of this Section, utility means any service, such as electric power systems; gas distribution systems; irrigation water systems; telephone; water including fire protection water distribution; storm drain; sanitary sewer services; sand tailings lines; slurry lines; and associated services; and other pipes encountered during excavation of contaminated materials.

1.3 RELATED WORK

Special Conditions: Articles SC-7 and SC-8.

PART 2 - PRODUCTS

(Not Used)

PART 3 - EXECUTION

3.1 GENERAL

A. The following utilities shall be maintained without interruption during their removal, replacement, abandonment and demolition work as indicated on the Subcontract Drawings:

1. Irrigation Water Supply
2. Water Supply including Fire Protection Water
3. Power Supply to Pumphouse and Scalehouse

B. Removal or plugging of the utility shall not be undertaken until written approval for such work has been obtained from the Contractor. In the event of disruption of service from utilities to be maintained during construction, a 24-hour written advance notice shall be given to the Contractor.

C. Unless otherwise specifically indicated on the Subcontract Drawings or otherwise authorized in writing by the Contractor:

1. All aboveground utilities shall be removed and disposed of.

2. All underground utilities exposed during demolition and excavation in the contaminated areas shall be removed and disposed of and the ends of the utilities left shall be plugged.

D. Relocation of lines, where required, shall be performed by the Subcontractor. 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. The Subcontractor shall remove all subsurface lines encountered in excavations except as indicated on the Subcontract Drawings and shall solidly plug the on-site ends with a concrete grout, unless otherwise directed. 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.

E. The Contractor will obtain approval from the affected utility companies including, but not limited to, Riverton Valley Electrical Association, five working days before disturbing utilities. Utilities shall be protected from damage by demolition operations until they are removed from service.

F. The demolished materials and debris resulting from work under this Specification Section shall be transported to an off-site disposal area.

PART 4 - MEASUREMENT AND PAYMENT

4.1 MEASUREMENT

Measurement for payment for protection, replacement, removal, abandonment, demolition and maintenance of existing utilities will be on a lump sum basis.

4.2 PAYMENT

Payment for protection, replacement, removal, abandonment, demolition and maintenance of existing utilities 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 and accessories and for performing all work specified in this Section including, but not limited to, transportation of demolished materials and debris to an off-site disposal area and maintenance of uninterrupted services to existing consumers.

END OF SECTION 02060

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. All known wells to be sealed are shown in Table 02090-A. All other wells shall be protected, unless otherwise directed by the Contractor.

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. Environmental Protection Agency (EPA): Manual of Water Well Construction Practices, EPA-570/9-75-001.

2. Wyoming Environmental Quality Act, W.S. 35-11-404; Water Quality Division Regulations, Chapter XI, Section 70, Plugging and Abandonment, and Chapter XV of the Land Quality Division Rules and Regulations.

3. American Society for Testing and Materials (ASTM): C150-85 Standard Specification for Portland Cement (Rev. A).

1.3 SITE CONDITIONS

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

TABLE 02090-A

WELLS TO BE SEALED

Well No.	Depth of Well (ft.)	Well Dia. (in.)	Casing Diameter (in.) and Type	Casing Depth (ft.)	Screen Interval (ft.)	Approximate Coordinates North	Approximate Coordinates East
P-14	6.7	7"	1.5" PVC	6.7	Lower 2 ft.	24018.77	24187.80
P-15	6.7	7"	1.5" PVC	6.7	Lower 2 ft.	23973.99	24683.24
P-16	Unknown	7"	1.5" PVC	Unknown	Lower 2 ft.	23878.64	26147.21

All wells are shallow piezometers completed in alluvial aquifer.

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 II (moderate 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 7 gallons of potable water. The weight of the neat cement shall be sufficient to prevent flow of water into the well from any aquifer penetrated. Calcium chloride may be added to a Portland cement 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. Wells shall 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 criterion are outlined in the Environmental Protection Agency (EPA) Manual of Water Well Construction Practices, EPA-570/9-75-001, Article 56, pages 133-142 and in Wyoming Water Quality Division Requirements, Chapter XI, Section 70. The basic premise of the EPA criteria 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 site:

1. Well sealing operations shall be performed by a licensed drilling or grouting contractor, with demonstrated experience in sealing of wells.

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 earthwork 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 or the materials are found to be contaminated, they shall be decontaminated as required by the Contractor, or disposed of in an off-site disposal area. 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 neat cement 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 cementing 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, or as required by the Contractor. 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 fine-grained (ML or CL) soil and a minimum of 25 percent by weight of commercially processed sodium bentonite and 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 as shown on the Subcontract Drawings or as required by the Contractor. Grouting shall extend to 2 feet below the grade cut elevation. The interval from the top of the grout to the existing surface shall be filled with a mixture of uncontaminated fine-grained (ML or CL) soil and a minimum of 25 percent by weight of commercially processed sodium bentonite and shall be hand-tamped, as required.

f. The top of the plug of each abandoned well shall be clearly and permanently marked by inscription, either in the cement or on a steel plate embedded in the cement, with the permit number, well identification number and date of plugging.

6. The Subcontractor shall provide the following notification of the well sealing operation:

a. The Subcontractor shall notify the Contractor one week prior to commencement of well sealing operations.

b. Within 15 days of the completion of well sealings, the Subcontractor shall submit a written well sealing record with the Water Quality Control Division.

PART 4 - MEASUREMENT AND PAYMENT

4.1 MEASUREMENT

Measurement for payment for sealing of monitor wells will be by the linear feet of casing sealed. The measurement will be from bottom of casing to the top of 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. 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.

B. 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.

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: Disposal of Contaminated Materials

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.

B. Uncontaminated cleared materials may be disposed of by burning. The Subcontractor shall be responsible for obtaining required permits for burning such wastes from:

Wyoming Department of Environmental Quality
Air Quality Division

3.3 STRIPPING

A. Uncontaminated Areas: Stripping will be required in the following areas:

1. Beneath all fills in areas where excavation is not otherwise required;

2. In areas of excavation where excavated materials are to be used as fill.

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.

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

3.4 STOCKPILING OF TOPSOIL

Stockpiling of 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 offsite as Subcontractor's property. Stockpiled topsoil will be used in finish grading and seeding of the site. Seeding is specified in Section 02935.

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 02141

DEWATERING AND DRAINAGE

PART 1 - GENERAL

1.1 SCOPE

A. This Specification Section describes the requirements for dewatering and drainage of work areas and disposal of surface water.

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 plan 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 uncontaminated water from work areas.

D. A gravity dewatering plan for work in disturbed 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, well point system, or a combination of systems for dewatering of contaminated water from work areas. Dewatering from windblown tailings and off-pile areas will be accomplished incrementally as removal of contaminated materials proceeds.

E. The Subcontractor shall furnish, install and maintain drainage pipes (includes culvert pipes) shown on the Subcontract Drawings.

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 providing drainage facilities including swales, ditches, interceptor dikes, pipes, and other drainage structures. Water from uncontaminated areas and from undisturbed contaminated areas shall be pumped, or allowed to flow by gravity, to diversion ditches or drainage ditches leading to existing

drainage courses that flow offsite. Water from disturbed contaminated areas shall be pumped, or allowed to flow by gravity, to collection ditches leading to the wastewater retention basin. Wastewater from decontamination pad shall be collected into the sump or pond and pumped into the wastewater retention basin. Water stored in the wastewater retention basin shall be detained until tested, and if found meeting the discharge requirements, pumped to the existing drainage swales and ditches.

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

C. The Subcontractor shall be responsible for assuring continuous operation of the existing irrigation and drainage system shown on the Subcontract Drawings.

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 01300 - Submittals

B. Section 02200 - Earthwork

C. Section 02771 - Membrane Liner

D. Section 02935 - Seeding

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 Association of State Highway and Transportation Officials (AASHTO):

M36-86 Corrugated Steel Pipe, Metallic Coated for Sewers and Drains

2. National Corrugated Steel Pipe Association (NCSPA):

Corrugated Steel Pipe Installation Recommendations

PART 2 - PRODUCTS

2.1 MATERIALS AND EQUIPMENT

A. 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.

B. Drainage Pipes shown on Subcontract Drawings:

1. Drainage pipes: Drainage pipes (CSP) shown on the Subcontract Drawings shall be corrugated steel pipe conforming to AASHTO M36, Type I (circular section), and shall be provided complete with fittings, coupling bands, and all required accessories.

2. Diameters of pipes shall be as shown on the Subcontract Drawings. Unless otherwise indicated on the Subcontract Drawings the thickness of the pipe shall be 16 gage minimum.

PART 3 - EXECUTION

3.1 DEWATERING PROCEDURES

A. Water from uncontaminated and from undisturbed contaminated areas shall be pumped, or allowed to flow by gravity to natural drainage courses including diversion ditches. Erosion protection features including, but not limited to, silt fences, check dams, temporary detention ponds and the like shall be provided by the Subcontractor, if required, to minimize off-site siltation in the receiving stream. Subcontractor shall submit to the Contractor, for review, his design, layout and calculations, fifteen days prior to the construction of such features.

B. Water from disturbed contaminated areas shall be pumped or allowed to flow by gravity to collection ditches leading to the wastewater retention basin. Silt fences may be required in some areas during excavation.

C. Wastewater from the retention basin shall be discharged to the existing drainage swales and ditches. The Subcontractor will be responsible for assurance that all discharge requirements are met.

D. 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 SEEDING AND MULCHING

Sides and inverts of ditches, not finished with membrane liner or riprap protection, shall be seeded and mulched as specified in Section 02935.

3.3 WASTEWATER RETENTION BASIN AND DRAINAGE DITCHES

Wastewater retention basin and drainage ditches shown on the Subcontract Drawings shall be constructed as specified in Sections 02200 and 02771.

3.4 DRAINAGE PIPES SHOWN ON SUBCONTRACT DRAWINGS

Unless otherwise shown on the Subcontract Drawings, excavation, installation, backfilling and compaction for drainage pipes shown on the Subcontract Drawings shall conform to the requirements of the National Corrugated Steel Pipe Association (NCSPA). All pipes utilized for temporary drainage during construction shall be removed by the Subcontractor at the completion of site work.

3.5 MAINTENANCE

The Subcontractor shall be responsible for the maintenance of drainage facilities during construction. 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,

including membrane liner, because of clogging, damage, or deterioration.

3.7 REMOVAL

A. When no longer required for water control:

1. Dewatering equipment shall be removed and disposed of as Subcontractor's property.

2. Contaminated sediments deposited in ditches and the wastewater retention basin shall be removed and disposed of off-site as specified in Section 02200 and as required by the Contractor.

3. Areas occupied by the wastewater retention basin, dike, spillway, 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. All costs for work specified in this Section will be considered to be included in the related applicable items of Work under the Subcontract.

END OF SECTION 02141

SECTION 02200

EARTHWORK

PART 1 - GENERAL

1.1 SCOPE

A. This Specification Section covers earthwork for, or related to, the following operations:

1. Excavation of contaminated materials.

2. Handling and transportation of the vicinity properties materials to be delivered and stockpiled onsite by others.

3. Construction of temporary drainage ditches.

4. Construction of wastewater retention basin.

5. Finish grading of the site including excavation, filling and backfilling of site areas, and restoration and regrading, as required, of site areas including, but not limited to, areas occupied by the wastewater retention basin, spillway, temporary drainage ditches and restoration of existing irrigation and drainage ditches shown on the Subcontract Drawings.

1.2 WORK NOT INCLUDED

Earthwork related to the construction of temporary facilities is not included in this Section.

1.3 RELATED WORK

A. Section 01300 - Submittals

B. Section 02110 - Site Clearing

C. Section 02141 - Dewatering and Drainage

D. Section 02935 - Seeding

1.4 DEFINITIONS

A. Contaminated materials and uncontaminated materials are defined in Section SC-1 of the Special Conditions.

B. Excavation: Excavation shall include excavation of topsoil, silt, clay, sand, gravel, talus, soft or disintegrated rock, boulders or detached pieces of solid rock; and shall also include removal of mill tailings deposits and other contaminated material. Excavation shall be classified into: 1) Contaminated materials excavation and 2) Uncontaminated materials excavation.

C. Contaminated Materials Excavation: Contaminated materials excavation shall include excavation of contaminated materials from the existing tailings pile, areas contaminated by the spread of contaminated materials by wind, ore handling areas and off-pile areas, including wet tailings, building debris and rippable rock, but shall exclude rocks requiring drilling and blasting operations. In addition to the tailings, the tailings pile contains (1) stockpiles of vicinity property material, (2) remains of a lined spent acid pond, (3) individual items of discarded mill equipment, and (4) cased wells installed for site investigation and monitoring purposes.

D. Uncontaminated Materials Excavation: Uncontaminated materials excavation shall include excavations of uncontaminated materials from the various areas of the site, including but not limited to excavations for drainage ditches, retention basin, trenches, swales, and finish grading.

E. Overexcavation: Overexcavation is defined as excavation carried out beyond the lines and grades indicated on the Subcontract Drawings or in the Subcontract Specifications.

F. Percent Maximum Density: Percent maximum density is a percentage of the maximum density obtained by the test procedure presented in ASTM D698, as applicable.

G. Optimum Moisture Content: See ASTM D698.

H. Topsoil: Topsoil for seed bed shall be free of any admixture of subsoil, foreign matter, objects larger than 1 inch in any dimension, toxic substances, and any material or substance that may be harmful to plant growth.

I. Finish grading of the site shall include excavation, fill and backfill of various areas of the site and the vicinity including, but not limited to, the areas of contaminated materials, the areas occupied by the wastewater retention basin, spillway, and temporary drainage ditches, as required and as specified in this Specification.

J. Vicinity Property Materials: Vicinity property materials shall consist of contaminated soil, rubble and demolished materials and debris to be excavated from the vicinity properties and to be delivered and stockpiled on the site by others.

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
D1556-82	Test Method for Density of Soil in Place by the Sand-Cone Method
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
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. Moisture Content: ASTM D2216

3. Laboratory Moisture-Density Relations: ASTM D698

C. Suitability of Materials: The suitability of all materials for foundations and backfill will be determined by the Contractor. Fill material will be approved material from borrow areas or required excavations.

D. The Contractor may direct that inspection trenches or test pits be cut into fills 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. Tolerances: See Specification Section 01052, Article 1.6.

1.7 SUBMITTALS

A. General submittal requirements are specified in Section 01300.

B. The Subcontractor shall submit to the Contractor for approval, 30 days before he intends to dispose of any material in a spoil area, a plan showing the layout of his proposed activities. The plan shall show: location of rock spoil, location of excavated material, stockpile for topsoil, layout of any sediment traps, and any other measures for pollution control.

1.8 PROTECTION

A. The Subcontractor shall protect the following:

1. Trees, shrubs and other features remaining as a portion of final grading.

2. Bench marks and monuments, existing structures, fences, walks, pavings, curbs, etc. from equipment and vehicular traffic.

3. Utilities not specified for removal.

4. Excavations from cave-in by shoring, bracing, sheet-piling, underpinning or by other methods.

5. Bottoms of excavations and soil adjacent to and beneath foundations from frost.

6. Perimeter of excavation top to prevent surface water runoff into excavation.

7. Monitor wells to be saved.

8. Finished work.

9. Existing features not part of this Subcontract.

PART 2 - PRODUCTS

2.1 FILL MATERIALS

A. General:

1. Fill materials shall be obtained from required excavations and from other approved borrow areas selected by the Subcontractor. The Subcontractor shall be responsible for obtaining required permits and approvals for Subcontractor-selected borrow areas in accordance with the provisions of Section SC-11 of the Special Conditions.

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

3. Submittals for approval of sources proposed for use by the Subcontractor shall include boring logs, borrow area maps and supporting laboratory test data. The Subcontractor also shall provide evidence of availability, right of access to private property including by the Contractor for sampling and testing, and his plan for hauling the materials to the site. Submittals for approval of sources for uncontaminated fill materials shall be received by the Contractor at least 30 days before use of the material at the site. The

Contractor may perform additional tests to determine if the materials meet the requirements specified herein.

4. Approval will be based on evidence of compliance with the requirements specified herein and on verification by the Subcontractor that the volume of materials available is sufficient for construction requirements.

B. Uncontaminated Fill Materials:

1. Topsoil: Topsoil for top 6 inches of fill used in finish grading of the site shall be as defined in Article 1.4.

2. General Fill: Uncontaminated fill materials for common/general fill to be used as fill or backfill of the site shall conform to the following requirements:

a. Uncontaminated common/general fill material shall not contain organic material or other deleterious substances.

b. Maximum particle size shall not be greater than the compacted lift thickness in any dimension, except as noted hereinafter. 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 3.7.

PART 3 - EXECUTION

3.1 SEASONAL SHUTDOWNS

A. During seasonal shutdowns, the Subcontractor 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 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. Clearing and stripping shall be as specified in Section 02110.

2. Required lines, levels, contours and datum shall be identified before the start of earthwork operations.

3. The Subcontractor shall verify the existing aboveground and underground utilities, identify them, and notify the Contractor immediately of his finding, if any, for appropriate action.

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.

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

E. The uncontaminated materials shall be used as fill in various areas of the site including the construction of dikes, general fill, roadway fill, structure fill, backfill, and fill for the final grading of the site, as required. Uncontaminated excavated material may be stockpiled for later use.

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 as required by the Contractor's Health Physics Personnel for contaminated materials.

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

3. 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.

4. The Subcontractor shall perform required excavation to the lines and grades indicated on the Subcontract Drawings or as directed by the Contractor. He shall remove all excavated material from the excavation site and dispose of it in fills required at the site or as initial backfill at the site or use it for other purposes, as approved by the Contractor.

5. Unsuitable or low density subgrade material not readily capable of in-place compaction shall be excavated as directed by the Contractor and disposed of as specified in Article 3.4.

6. Adequate working space for safety of personnel shall be provided within the limits of the excavation.

7. All unstable material, large stones, and debris shall be removed from bottoms of the excavation to a minimum depth of 12 inches.

8. 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 the existing conditions.

9. 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.

10. Excavated material shall be placed at sufficient distance from edge of excavations to prevent cave-ins or bank slides.

11. Where practicable, suitable materials removed from excavation shall be used as fill or backfill.

B. Contaminated Materials Excavation:

1. Tailings Pile and Off-pile Areas: The Subcontractor shall minimize the open excavation area of contaminated materials at any time during excavation work to the extent practicable. 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, or as required by the Contractor. Excavation shall be carried out to the limits and grades required by the Health Physics personnel.

2. Handling and Transportation of Vicinity Properties Materials: Vicinity properties materials to be excavated, delivered and stockpiled on the site by others shall be excavated from the stockpile and transported to an off-site disposal area by the Subcontractor.

C. Uncontaminated Materials Excavation:

1. Temporary Drainage Ditches:

a. Temporary drainage ditches shall be excavated at locations shown on the Subcontract Drawings to collect and transport wastewater and waterbound contaminated material to the retention basin during construction, and to divert and transport storm runoff away from the construction area.

b. Temporary drainage ditches shall be excavated, fine graded, compacted, and maintained to provide drainage during construction.

2. Wastewater Retention Basin:

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 or placed in the tailings embankment as shown on the Subcontract Drawings, then the excavation and fill for the retention basin shall be accomplished.

b. The retention basin shall be backfilled and graded after removal of the membrane liner, as specified in this Section.

3.4 DISPOSAL OF EXCAVATED MATERIALS

A. Contaminated Materials: All contaminated materials excavated from the tailings pile, retention basin, windblown, and other areas of the site shall be disposed of off-site by the Subcontractor.

B. Uncontaminated Materials:

1. Uncontaminated materials excavated from the site, including excavations for trenches, drainage ditches and retention basins which do not classify as contaminated materials, shall be used as uncontaminated material fill for construction of various features including site grading, or stockpiled for later use, as specified in this Section and as required by the Contractor.

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.

C. Unsatisfactory or Excess Materials: Unsatisfactory uncontaminated material including rock generated during the Work and not approved for use in the Work shall be disposed of in off-site areas as Subcontractor's property.

D. Garbage, refuse, debris, oil, and any waste material which is harmful to the environment shall be removed from the job site and disposed of offsite in a manner approved by the authority having jurisdiction over the disposal site.

E. All operations in the stockpile/spoil 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/spoil areas does not enter nearby waterways. If required, temporary dikes, detention ponds, silt fence, or other facilities shall be constructed by the Subcontractor.

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 fill materials, the in-place density of the subgrade shall be as specified in Article 3.7. Subgrade preparation, where required, shall be as specified in Article 3.6.

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. 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. Method of dumping and spreading the materials shall ensure uniform distribution of the material.

6. Loose thickness of each layer of materials shall not be greater than that required to achieve the specified compaction, 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 or embankment material foundations, nor shall frozen material be used as fill.

9. When no longer needed for control of contamination, as determined by the Contractor, the wastewater retention basin, the dikes, the spillway, and the temporary drainage ditches shall be backfilled and the area restored and finish graded as shown on the Subcontract Drawings.

C. Compaction Requirements:

1. Each layer of fill materials shall be compacted to a minimum density specified in Article 3.7.

2. During compaction the moisture content of fill material shall be maintained 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 layer of fill is too dry or too smooth to bond properly with the layer of material to be placed thereon, it shall be scarified and moistened by sprinkling to the acceptable moisture content prior to placement of the next layer of fill.

4. If the rolled surface of any layer of the fill in place is too wet for proper compaction of the layer of fill material to be placed thereon, it shall be removed, allowed to dry 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.

5. Fill placed at 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.

D. Field Quality Control:

1. General: The Contractor will take samples and perform tests throughout the construction period, and the Subcontractor 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.

2. Tests: The Contractor will perform in-place density and moisture content tests, a minimum of one test per 5000 cubic yards of uncontaminated material placed.

3. The placing and compaction of temporary stockpiles will be subject to the approval of the Contractor.

3.6 SUBGRADE PREPARATION

A. Subgrade Preparation: Subgrade preparation includes fine grading and compaction of excavations (including temporary collection drainage ditches and wastewater retention basin), backfills, and other soft spots upon which pavement, base, subbase, liner or other structures are constructed.

B. The entire surface of the subgrade shall be plowed, harrowed, and mixed to a depth of at least 6 inches. Compac-

tion shall be carried out for the full area below finished subgrade to at least the density specified in Article 3.7 below.

3.7 COMPACTION DENSITIES

Subgrade and each layer of backfill material shall be compacted to at least 90 percent of maximum dry density, as determined by ASTM D698.

PART 4 - MEASUREMENT AND PAYMENT

4.1 MEASUREMENT

A. Measurement for payment for the following items of excavations will be by the cubic yards of material excavated. The quantities for payment will be computed from the dimensions shown on the Subcontract Drawings, or in areas where lines and dimensions are not shown, by the average end area method from surveys conducted before and after excavation operations, or by the methods determined by the Contractor:

1. Excavation of contaminated materials from existing tailings pile.

2. Excavation of contaminated materials from windblown areas, ore handling areas and other site areas.

3. Excavation of uncontaminated material for the wastewater retention basin.

4. Handling and transportation of vicinity properties materials.

B. Measurement for payment for the following items of fills or backfills will be by the cubic yards of material placed. The quantities for payment will be computed from the lines and dimensions shown on the Subcontract Drawings, or in areas where lines and dimensions are not shown, by the average end area method from surveys conducted before and after fill or backfill operations, or by the methods determined by the Contractor:

1. Topsoil fill.

2. Common/General fill.

C. Overexcavation: Overexcavation for the Subcontractor's convenience or due to error or lack of control by the Subcontractor will not be measured for payment and, instead, shall be backfilled with compacted uncontaminated fill, as required, at the Subcontractor's expense.

D. Separate measurement for payment will not be made for any other excavations or fills specified in this Section. Fill for the retention basin dikes will be considered to be included in applicable item under 4.1.B above.

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 and hauling the excavated materials to an offsite disposal area including temporary stockpiling and required rehandling, if any.

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 fill construction including furnishing material from other excavations, stockpiles, or from borrow areas.

C. Separate payment will not be made for any other excavations or fills specified in this Section. All costs for excavations or for furnishing and placing such fills will be considered to be included in the related items of excavation.

END OF SECTION 02200

SECTION 02771

MEMBRANE LINER

PART 1 - GENERAL

1.1 SCOPE

This Specification Section describes the requirements for furnishing, installing, maintaining, removing and disposing of membrane liner systems for wastewater retention basin and spillway as shown on the Construction Drawings.

1.2 SYSTEM DESCRIPTION

A. Liner system shall consist of liner, adhesives and accessories required for sterilizing ground and installing liner, and other appurtenances.

B. The retention basin, where lining is required, will store water produced from stormwater runoff, decontamination and dewatering operations, including transported sediment.

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):

D638-84 Test Method for Tensile Properties of Plastics

D792-66 Test Methods for Specific Gravity and Density of Plastics by Displacement (R1979)

D1004-66 Test Method for Initial Tear Resistance of Plastic Film and Sheeting (R1981)

D1593-81 Specification for Nonrigid Vinyl Chloride Plastic Sheeting

D2301-84 Specification for Vinyl Chloride Plastic Pressure-Sensitive Electrical Insulating Tape

2. Federal Standards (FS):

101C Test Methods for Packaging of Materials

1.5 QUALITY ASSURANCE

A. Manufacturer:

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

2. The manufacturer of the liner shall have manufactured, fabricated and supervised installation of at least 1,000,000 square feet of membrane liners.

B. Installation Worker Qualifications: The installation workers shall have installed a minimum of 500,000 square feet of membrane liners.

C. Installation Supervisor: Installation of the membrane liner shall be performed under the supervision of an Installation Supervisor qualified and approved by the manufacturer.

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. Manufacturer's installation instructions.

6. Test reports.

1.7 WARRANTY

Liner materials and factory seams shall be warranteed 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 warranteed free of defects for a period of 5 years from the date of acceptance.

PART 2 - PRODUCTS

2.1 MATERIAL

A. The thermoplastic elastomer lining material shall be manufactured from a synthetic rubber compound and shall be polyethylene (PE) or chlorinated polyethylene (CPE), specifically compounded for use in hydraulic facilities.

B. The lining shall be of unreinforced construction consisting of calendered synthetic rubber sheeting.

C. Physical Properties:

Property	Test Method	Data
Density	ASTM D792	0.930 gms/cc, min.
Thickness	ASTM D1593 or D2301	CPE 30 mil, nominal PE 40 mil, nominal
Puncture Resistance	FED STD 101C, Method 2031	130 lbs. min.
Tensile Strength @ Yield @ Break	ASTM D638,	 45 lbs/inch, min. 105 lbs/inch, min.

Elongation @ Break	ASTM D638	650 percent, min.
Tear Resistance	ASTM D1004	15 lbs., min.

2.2 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 to shear, failure of the material including the seam shall not occur at the bonded surfaces.

2.3 ALTERNATIVE LINER MATERIAL

The Subcontractor may propose an alternative liner material compatible for use in the contaminated water environment. A list of major contaminants is available from the Contractor's office in Albuquerque, for review. Poly Vinyl Chloride (PVC) type of material shall not be acceptable for wastewater retention basin.

PART 3 - EXECUTION

3.1 GENERAL

The liner systems shall be installed as shown on the Subcontract Drawings and as recommended by the manufacturer.

3.2 GROUND SURFACE PREPARATION

A. Surfaces to be lined shall be smooth and free of sharp rocks or 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.

B. Certification from an 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

All field seams shall be performed using only the manufacturer'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.

3.4 INSPECTION AND TESTS

A. The site shall be available at all reasonable times for inspection of finished work or work in progress by the Contractor.

B. All field seams shall be 100 percent inspected by the Installation Supervisor or by the qualified persons under his direct supervision.

C. The Subcontractor shall perform tests to ensure continuity of bond at the seams. Tests shall be performed by mechanical point stressing or by the use of vacuum boxes or by other methods recommended by the manufacturer of the liner. Copies of test records shall be submitted to the Contractor.

D. Any seams or areas found to be defective shall be repaired according to the manufacturer's instructions at no cost to the Contractor.

3.5 ANCHORING

During, after installation, and throughout the term of the Subcontract, necessary materials shall be provided and precautions shall be taken to ensure that the liner is not damaged or moved by wind, rain or dust.

3.6 RUNOFF AND SEDIMENT COLLECTION-CONSTRUCTION PHASE

A. Synthetic membrane shall be placed on the prepared wastewater retention basin subgrades including the spillways, with anchoring trenches, as shown on the Subcontract Drawings. Subgrade preparation shall be as specified in Section 02200.

B. Membrane edges to be joined are overlapped and sealed as recommended by the manufacturer.

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

3.7 REMOVAL AND DISPOSAL OF MEMBRANE LINER

After the completion of the construction phase, the synthetic membrane shall be removed, decontaminated and disposed of as required by the Contractor. If the membrane cannot be decontaminated by practical means, it shall be disposed of in an offsite disposal area.

PART 4 - MEASUREMENT AND PAYMENT

4.1 MEASUREMENT

A. Measurement for payment for furnishing and installing membrane liner for wastewater retention basin and spillway 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. The surfaces shall be measured parallel to the liner material installed.

4.2 PAYMENT

A. Payment for furnishing and installing membrane liner for wastewater retention basin and spillway 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 materials, tools, equipment, Installation Supervisor, incidentals and for performing all work as specified, including preparation and backfill of the anchor trenches, subgrade preparation, and removal and disposal of the liner.

B. Payment for preparation of subgrade shall be as specified in Section 02200.

END OF SECTION 02771

SECTION 02935

SEEDING

PART 1 - GENERAL

1.1 SCOPE

This Specification Section covers seeding. All disturbed exposed areas not covered by riprap shall be seeded as required to control erosion.

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 shall be delivered and stored in waterproof containers that clearly show the chemical analysis and name of manufacturer.

PART 2 - MATERIALS

2.1 SEED MIX

A. Drainage Ditches:

1. The seed mix for all temporary drainage ditches shall consist of the following:

Seed Species	Seeding Rate (Pounds of Pure Live Seed Per Acre)
Slender Wheatgrass (Primar)	6
Western Wheatgrass (Arriba)	6
Total	12

2. The seeding rates shown are for seed applied by mechanical broadcasting; these rates may be reduced by 50 percent if a rangeland drill is used.

B. General Cover:

1. The following seed mix shall be used for seeding of final grades except as noted in Article 2.1.A:

Seed Species	Seeding Rate (Pounds of Pure Live Seed Per Acre)
Western Wheatgrass (Arriba)	4
Tall Wheatgrass (Alkar)	3
Inland Saltgrass	1
Sand Dropseed	1
Total	9

2. The seeding rates shown are for seed applied by a rangeland drill.

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 species 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 that provides the minimum percentage of available nutrients speci-

fied. 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 or hay mulch. 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: All drainage ditches shall be seeded immediately upon their completion, or as directed by the Contractor. All final grades not covered by erosion protection materials 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, 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 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 40 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 for drainage ways shall be applied by a rangeland drill or by a mechanical broadcaster.

B. Seed for all other final grades 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.

C. Immediately following seeding mulch shall be applied at a rate of 2 tons per acre to all areas seeded for permanent cover, 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 of final grades will be by the acres of surfaces actually seeded and approved.

B. Separate measurement for payment will not be made for seeding of temporary drainage ditches, and for any incidental work and services; e.g. loosening the surface, applying fertilizer, mulching, mowing or watering.

4.2 PAYMENT

A. Payment for seeding of final grades 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.

B. Separate payment will not be made for seeding of temporary drainage ditches, and for any incidental work and services. Full compensation for such work will be considered to be included in the applicable related item of work or incidental to the Subcontract.

END OF SECTION 02935

Division 3
Concrete

SECTION 03361

SHOTCRETE

PART 1 - GENERAL

1.1 SCOPE

This Specification Section covers the requirements for furnishing and application of shotcrete by the wet mix process as shown on the Subcontract Drawings and as specified herein.

1.2 APPLICABLE STANDARDS

A. Pertinent provisions of the following listed codes and standards shall apply to the work of this Section, except as they may be modified herein, and are hereby made a part of this Specification to the extent required:

1. American Concrete Institute (ACI):

   506-66 Recommended Practice for Shotcreting

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

   A185-85 Specifications for Steel Welded Wire Fabric, Plain, for Concrete Reinforcement

   C33-86 Specifications for Concrete Aggregates

   C94-86 Specification for Ready-Mixed Concrete

   C150-85 Specification for Portland Cement

   C231-82 Test Method for Air Content of Freshly Mixed Concrete by the Pressure Method

   C260-86 Specification for Air-Entraining Admixtures for Concrete

   C309-81 Specification for Liquid Membrane-Forming Compounds for Curing Concrete

   C494-86 Specifications for Chemical Admixtures for Concrete

1.3 QUALITY CONTROL

A. Determination of Shotcrete Proportions and Placement Procedures:

1. The Subcontractor shall provide the following for use in determination of shotcrete proportions and placement procedures, in sufficient quantities to perform the testing herein specified:

   a. Shotcrete materials as accepted.

   b. Equipment of the exact type proposed for use in applying shotcrete.

   c. Personnel for operation of the shotcreting equipment.

2. Before shotcrete is placed for each shotcrete mix, test sections shall be fabricated to simulate actual placement. Trial mixes shall be designed by the Subcontractor in accordance with Article 2.2 herein. Mixes shall be modified as directed by the Contractor to produce satisfactory test sections.

3. Satisfactory test sections shall consist of a minimum 4-inch thickness of dense, uniform shotcrete without rebound inclusions, segregation, or voids. Test sections shall be a minimum 3 feet wide and 6 feet high and shall be shot against a 0.8 to 1.0 slope to simulate actual placement to a full depth of 4 inches. For each satisfactory test section produced, record the mix proportions and details of the placement procedure such as nozzle distance, rate and angle of application, time lapse between mixing and application, and the like. Satisfactory test sections shall be cured with curing compound.

4. The Subcontractor shall make one full depth saw cut for the full length of each test section and expose the cut face for the Contractor's inspection. Where the results of tests are unacceptable, additional test sections shall be fabricated using revised materials, mix proportions, mixing and application equipment, or application procedures, until acceptable test sections are achieved.

5. The Subcontractor shall not apply any shotcrete in the work until the mix design and placement equipment and procedures have been accepted as specified herein.

B. Qualification of Shotcreting Personnel:

1. Foremen, Nozzlemen, and Reboundmen before employment on the work shall satisfy the Contractor that each has done satisfactory work in similar capacities elsewhere for a sufficient period of time to be fully qualified to properly perform the work in accordance with the requirements indicated. Foremen shall have had at least two years experience as nozzlemen, and at least two years experience on similar work. Nozzlemen shall be qualified workmen, having had at least one year experience in similar work and shall be certified in accordance with ACI 506 including written test and cores on test sections. .

PART 2 - PRODUCTS

2.1 MATERIALS

A. Cement: Cement shall conform to the requirements of ASTM C150, Type I or Type II.

B. Aggregate: Aggregate shall conform to the requirements of ASTM C33 having gradations as shown hereunder. All aggregate shall be uniformly well-graded and shall not exhibit extremes of gradation. The gradation of the combined coarse and fine aggregate mixture shall be within the following limits:

U.S. Standard Sieve Size	Percent Passing by Weight
3/4 inch	---
1/2 inch	100
3/8 inch	95-100
No. 4	72-85
No. 8	52-73
No. 16	36-55
No. 30	20-38
No. 50	7-20
No. 100	2-12
No. 200	0-5

C. Admixtures: Admixtures may be used at the Subcontractor's option.

D. Water: Water for mixing and curing shall be clean, and free from substances which may be injurious to concrete or steel.

E. Reinforcement: Welded wire fabric shall conform to the requirements of ASTM A185.

2.2 MIX DESIGN

A. General: The Subcontractor shall provide shotcrete mixes composed of portland cement, aggregates, water, and admixtures, as acceptable by the Contractor, capable of being placed without excessive rebound or segregation, and capable of developing the required characteristics. Mix design will be a result of trial mixes specified under Article 1.3, Quality Control.

B. Proportioning:

1. The proportions of shotcrete mixes shall be such that the compressive strength requirements are met with the lowest practicable water cement ratio.

2. Proportioning of aggregate and cement shall be accomplished on a weight basis.

C. Strength:

1. The compressive strength of shotcrete shall be 3500 psi at 90 days determined in accordance with the requirements of ASTM C94 (one test in five).

2. The mix design shall have sufficient overdesign strength to allow for variations in workmanship and meet strength and other requirements during shotcrete application.

D. Air entrainment shall be 8 to 10 percent prior to shooting and 4 to 8 percent in place.

E. High range water reducing admixture may be used to obtain fluidity and rapid slump loss.

PART 3 - EXECUTION

3.1 EQUIPMENT

A. All shotcrete equipment shall be approved by the Contractor before its use in the Work, and shall be operated and

maintained in accordance with the manufacturer's instructions.

B. Wet-mix shotcrete equipment shall include a mixing chamber and pump which are adequate to ensure a steady delivery of well mixed shotcrete ingredients to the nozzle. The shotcrete shall leave the nozzle with sufficient velocity to ensure that the in-place shotcrete is of uniform consistency and hardens to the specified strength at all times.

C. No supply system shall be used that delivers air contaminated by oil, or that is incapable of maintaining constant pressure.

3.2 PREPARATION

A. Treatment of Surfaces: Surfaces that are to receive shotcrete shall be cleaned of loose material, mud, and other foreign matter. Such surfaces shall be maintained moist from the time cleaning is completed until shotcrete is applied.

B. When required by the Contractor, the thickness of shotcrete in any area shall be checked by probing immediately after the shotcrete has been applied, or by the prior placement of 1/4-inch diameter thickness pins, or by other approved means. Thickness pins, if used, shall be fixed in position by a method approved by the Contractor.

3.3 CONTROL OF WATER

Ground water flows and seepage shall be controlled in such a manner that effects detrimental to the installation are eliminated. Such water shall be drained by pipes, chases, or other appropriate methods accepted by the Contractor.

3.4 REINFORCEMENT

The wire fabric shall be fixed in position to provide a minimum cover of 2 inches of shotcrete over the fabric. The fabric shall not be disturbed before or during subsequent shotcreting operations. At all splices the wire fabric shall be lapped a minimum of 8 inches or butted and provided with a 16-inch wide lap piece. Welded wire fabric may be spliced mechanically if the full tensile strength of the fabric can be developed.

3.5 SHOTCRETE APPLICATION

A. General: Shotcrete shall be applied in accordance with the details of the procedures recorded in the fabrication of acceptable test sections as specified under Article 1.3 Quality Control.

B. No shotcrete shall be placed when the ambient temperature is below 40 degrees F if the temperature is falling, or below 35 degrees F if the temperature is rising.

3.6 CURING

A. Permanent shotcrete shall be cured for a period of 14 days by the membrane curing method conforming to ASTM C309 or shall be kept continuously moist by fog spray water nozzles, sprinklers or other approved wet method. If air temperatures are above 75 degrees F or wind is blowing, shotcrete shall be cured by the membrane curing method.

PART 4 - MEASUREMENT AND PAYMENT

4.1 MEASUREMENT

Measurement for payment for shotcrete will be by the lump sum.

4.2 PAYMENT

Payment for shotcrete 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 the work specified in this Section and as shown on the Subcontract Drawings.

END OF SECTION 03361

Subcontract Drawings

UNITED STATES
DEPARTMENT OF ENERGY

UMTRAP
URANIUM MILL TAILINGS REMEDIAL ACTION PROJECT

CONSTRUCTION DRAWINGS

RIVERTON, WYOMING

U. S. DEPARTMENT OF ENERGY
ALBUQUERQUE, NEW MEXICO

RIVERTON SITE
RIVERTON, WYOMING

TITLE SHEET

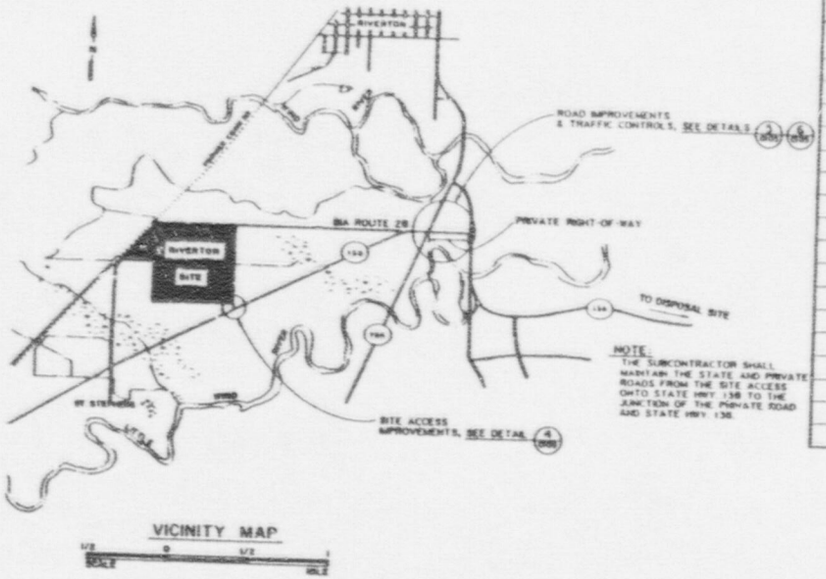
MORRISON-KNUDSEN ENGINEERS, INC.

PROJECT NO
DE-AC04-83AL18796

DRAWING NO
RVT-PS-10-0101

REV
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NO	DATE	REVISIONS
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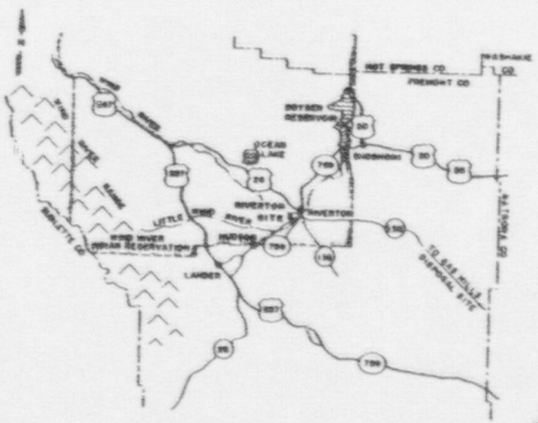


VICINITY MAP

SCALE

LIST OF DRAWINGS

DRAWING NO.	DRAWING TITLES
RVT-PS-10-0101	TITLE SHEET
RVT-PS-10-0102	VICINITY MAP, LOCATION MAP & LIST OF DRAWINGS
RVT-PS-10-0103	SITE PLAN & TEMPORARY FACILITIES
RVT-PS-10-0104	SECTIONS & DETAILS SHEET 1 OF 2
RVT-PS-10-0105	SECTIONS & DETAILS SHEET 2 OF 2
RVT-PS-10-0106	ACCESS CONTROL & STAGING AREA
RVT-FS-10-0107	CONTAMINATED MATERIAL EXCAVATION PLAN
RVT-PS-10-0108	CONTAMINATED MATERIAL EXCAVATION SECTIONS
RVT-PS-10-0109	UTILITY LOCATION PLAN
RVT-PS-10-0110	DEMOLITION PLAN
RVT-PS-10-0111	FINAL GRADING PLAN
RVT-PS-10-0112	BORING LOCATION PLAN



LOCATION MAP

SCALE

NO.	DATE	REVISIONS	BY	CK	LEAD	PROJ. ENGR.	DISC. ENGR.	CONST. ENGR.
0	5-28-87	ISSUED FOR CONSTRUCTION						

U. S. DEPARTMENT OF ENERGY
ALBUQUERQUE, NEW MEXICO

RIVERTON SITE
RIVERTON, WYOMING

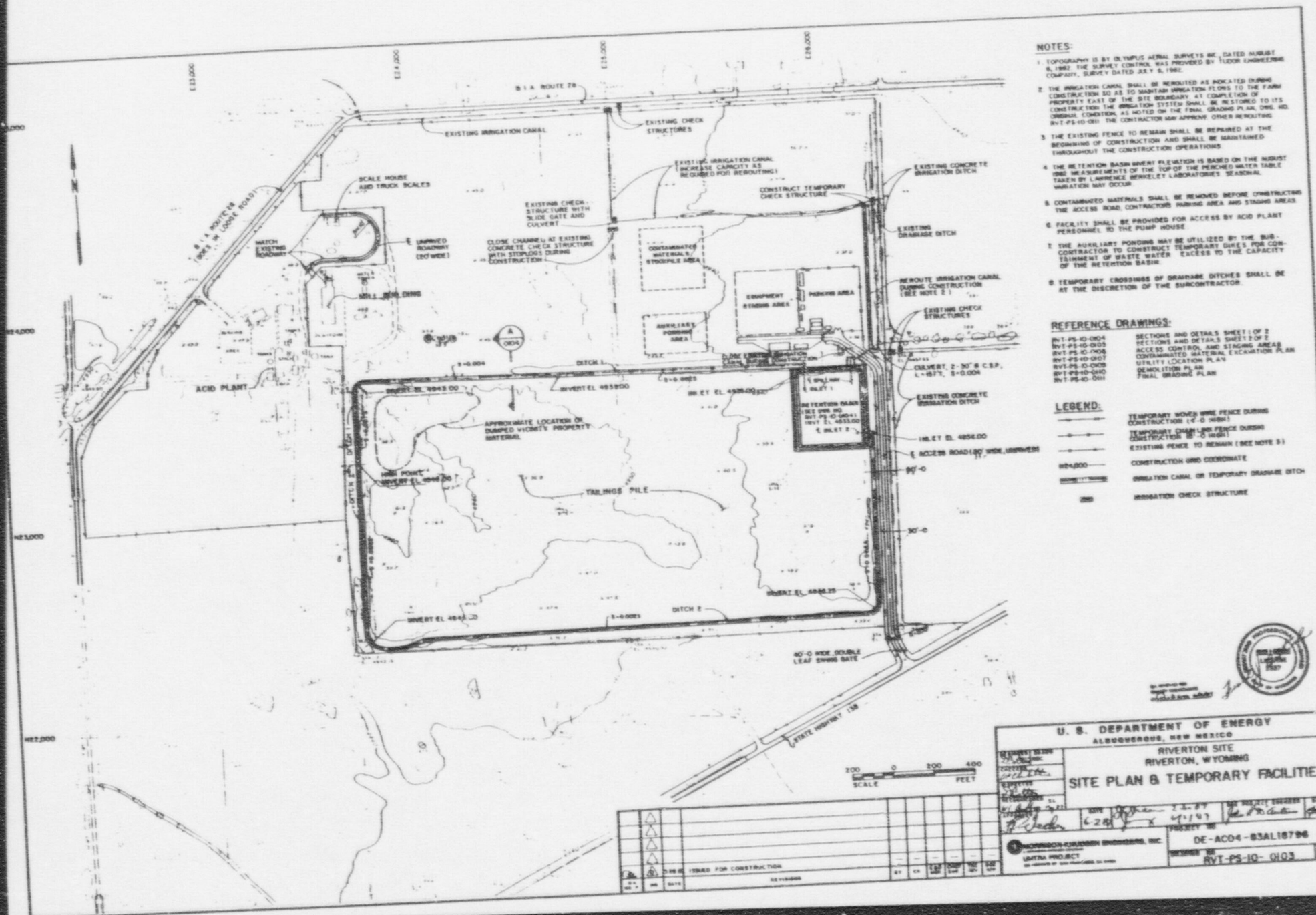
VICINITY MAP, LOCATION MAP & LIST OF DRAWINGS

MORRISON-KNUDSEN ENGINEERS, INC.
UMTRA PROJECT

PROJECT NO.
DE-AC04-83AL18796

DRAWING NO.
RVT-PS-10-0102

REV. 0



NOTES:

1. TOPOGRAPHY IS BY OLYMPUS AERIAL SURVEYS INC., DATED AUGUST 6, 1982. THE SURVEY CONTROL WAS PROVIDED BY TUDOR ENGINEERING COMPANY, SURVEY DATED JULY 6, 1982.
2. THE IRRIGATION CANAL SHALL BE REROUTED AS INDICATED DURING CONSTRUCTION SO AS TO MAINTAIN IRRIGATION FLOWS TO THE FARM PROPERTY EAST OF THE SITE BOUNDARY AT COMPLETION OF CONSTRUCTION THE IRRIGATION SYSTEM SHALL BE RESTORED TO ITS ORIGINAL CONDITION, AS NOTED ON THE FINAL GRADING PLAN, DWG NO. RVT-PS-10-0111. THE CONTRACTOR MAY APPROVE OTHER REROUTING
3. THE EXISTING FENCE TO REMAIN SHALL BE REPAIRED AT THE BEGINNING OF CONSTRUCTION AND SHALL BE MAINTAINED THROUGHOUT THE CONSTRUCTION OPERATIONS
4. THE RETENTION BASIN INVERT ELEVATION IS BASED ON THE AUGUST 1982 MEASUREMENTS OF THE TOP OF THE PERCHED WATER TABLE TAKEN BY LAWRENCE BERKELEY LABORATORIES SEASONAL VARIATION MAY OCCUR
5. CONTAMINATED MATERIALS SHALL BE REMOVED BEFORE CONSTRUCTING THE ACCESS ROAD, CONTRACTORS PARKING AREA AND STAGING AREAS
6. FACILITY SHALL BE PROVIDED FOR ACCESS BY ACID PLANT PERSONNEL TO THE PUMP HOUSE
7. THE AUXILIARY PONDING MAY BE UTILIZED BY THE SUB-CONTRACTOR TO CONSTRUCT TEMPORARY DIKES FOR CONTAINMENT OF WASTE WATER EXCESS TO THE CAPACITY OF THE RETENTION BASIN
8. TEMPORARY CROSSINGS OF DRAINAGE DITCHES SHALL BE AT THE DISCRETION OF THE SUBCONTRACTOR.

REFERENCE DRAWINGS:

RVT-PS-10-0104	SECTIONS AND DETAILS SHEET 1 OF 2
RVT-PS-10-0105	SECTIONS AND DETAILS SHEET 2 OF 2
RVT-PS-10-0106	ACCESS CONTROL AND STAGING AREAS
RVT-PS-10-0107	CONTAMINATED MATERIAL EXCAVATION PLAN
RVT-PS-10-0109	UTILITY LOCATION PLAN
RVT-PS-10-0110	DEMOLITION PLAN
RVT-PS-10-0111	FINAL GRADING PLAN

LEGEND:

- TEMPORARY WOVEN WIRE FENCE DURING CONSTRUCTION (4'-0 HIGH)
- TEMPORARY CHAIN LINK FENCE DURING CONSTRUCTION (8'-0 HIGH)
- EXISTING FENCE TO REMAIN (SEE NOTE 3)
- N14,000 — CONSTRUCTION GRID COORDINATE
- IRRIGATION CANAL OR TEMPORARY DRAINAGE DITCH
- 2500 — IRRIGATION CHECK STRUCTURE

NO.	DATE	REVISION	BY	CK				
1	6/29/84	ISSUED FOR CONSTRUCTION						

U. S. DEPARTMENT OF ENERGY
ALBUQUERQUE, NEW MEXICO

RIVERTON SITE
RIVERTON, WYOMING

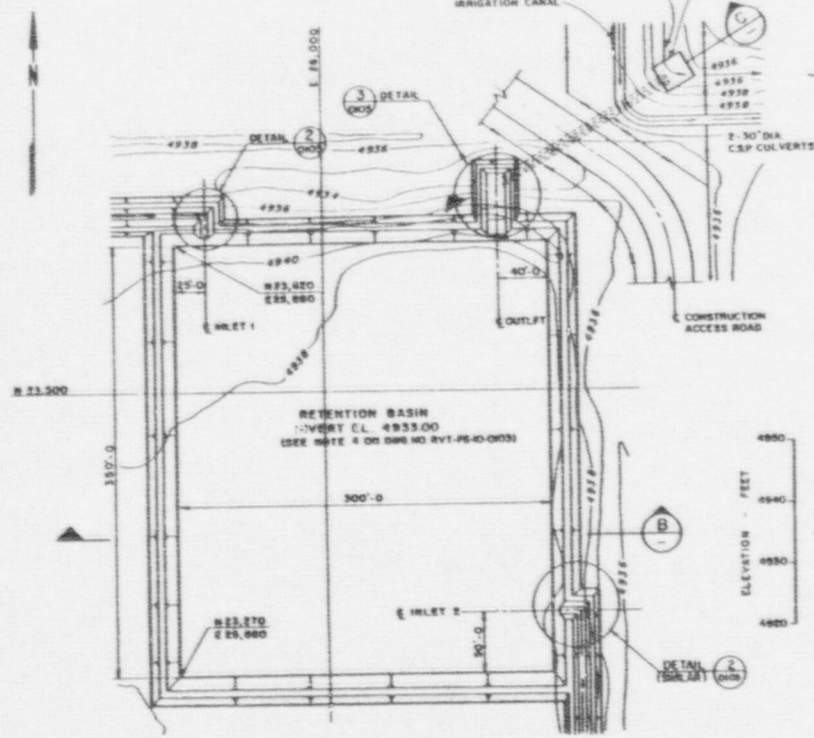
SITE PLAN & TEMPORARY FACILITIES

DESIGNED	DATE	SUBMITTED	DATE
DRAWN	6/29/84	APPROVED	DATE
CHECKED			
APPROVED			

MORRISON-KNUDSEN ENGINEERS, INC.
UMTRA PROJECT

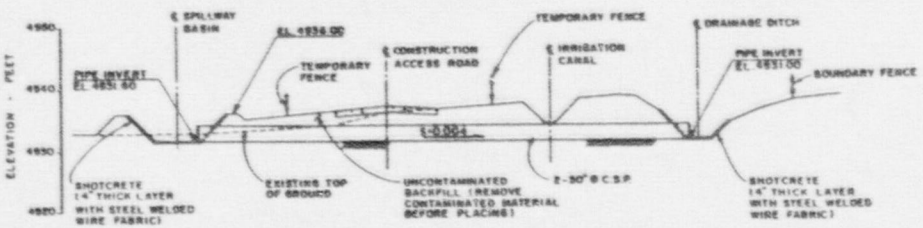
PROJECT NO. DE-AC04-83AL18796

DRAWING NO. RVT-PS-10-0103 REV. 1



RETENTION BASIN PLAN

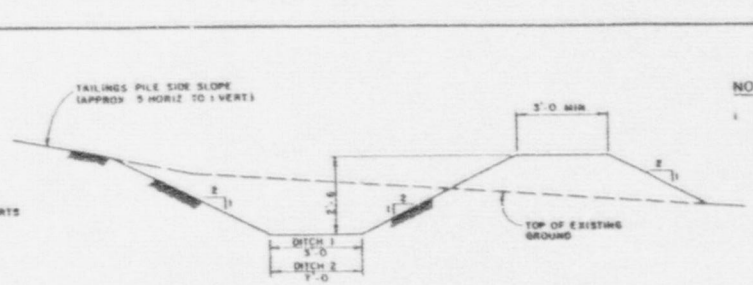
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SECTION C

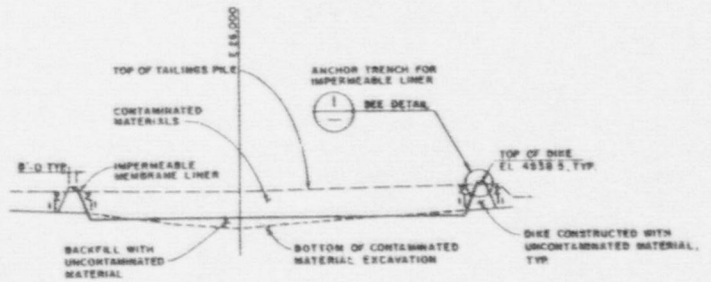
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VERTICAL SCALE 10 0 10 20 FEET



TYP SECTION A

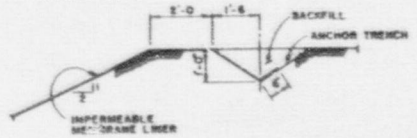
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SECTION B

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VERTICAL SCALE 10 0 10 20 FEET



TYPICAL IMPERMEABLE MEMBRANE LINER ANCHOR TRENCH DETAIL 1

NOT TO SCALE

NOTES:

1. CONTAMINATED MATERIALS SHALL BE REMOVED FROM THE RETENTION BASIN AREA BEFORE CONSTRUCTION OF THE BASIN BEGINS. THE RETENTION BASIN SHALL BE CONSTRUCTED WITH UNCONTAMINATED MATERIALS.

REFERENCE DRAWINGS:

RVT-PS-10-0103	SITE PLAN AND TEMPORARY FACILITIES
RVT-PS-10-0105	SECTION AND DETAILS (SHEET 2 OF 2)
RVT-PS-10-0106	ACCESS CONTROL AND STAGING AREAS
RVT-PS-10-0107	CONTAMINATED MATERIAL EXCAVATION PLAN

LEGEND:

N73,500	CONSTRUCTION GRID COORDINATE
	TEMPORARY BARBED WIRE FENCE DURING CONSTRUCTION (4'-0 HIGH)
	EXISTING BOUNDARY FENCE TO REMAIN
	IRRIGATION CANAL OR DRAINAGE DITCH

0	5-19-89	ISSUED FOR CONSTRUCTION	

U. S. DEPARTMENT OF ENERGY
ALBUQUERQUE, NEW MEXICO

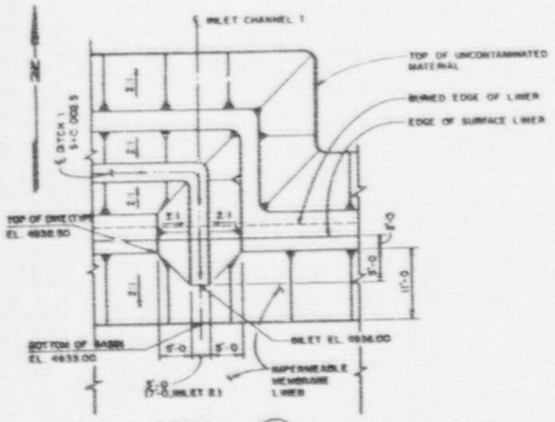
RIVERTON SITE
RIVERTON, WYOMING

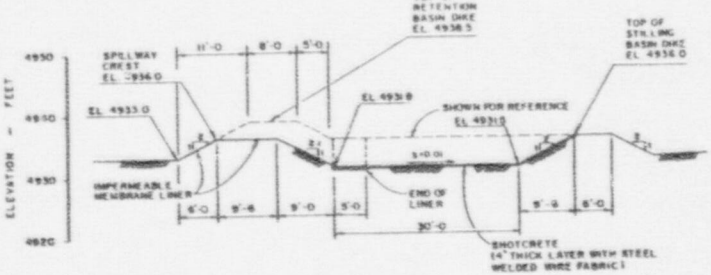
SECTIONS & DETAILS
(SHEET 1 OF 2)

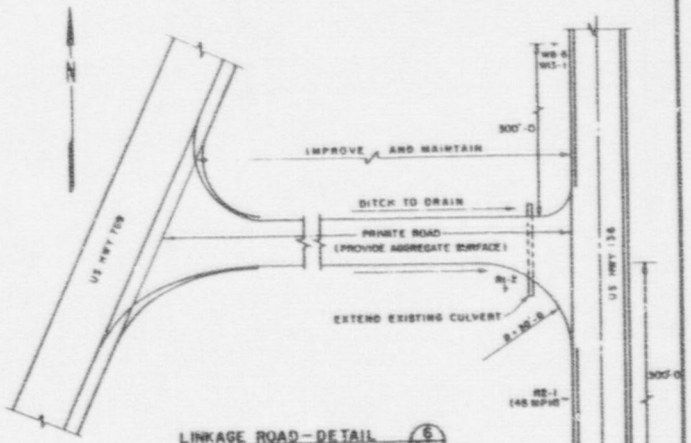
MORRISON-KNUDSEN ENGINEERS, INC.
UMTRA PROJECT

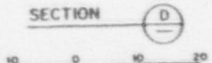
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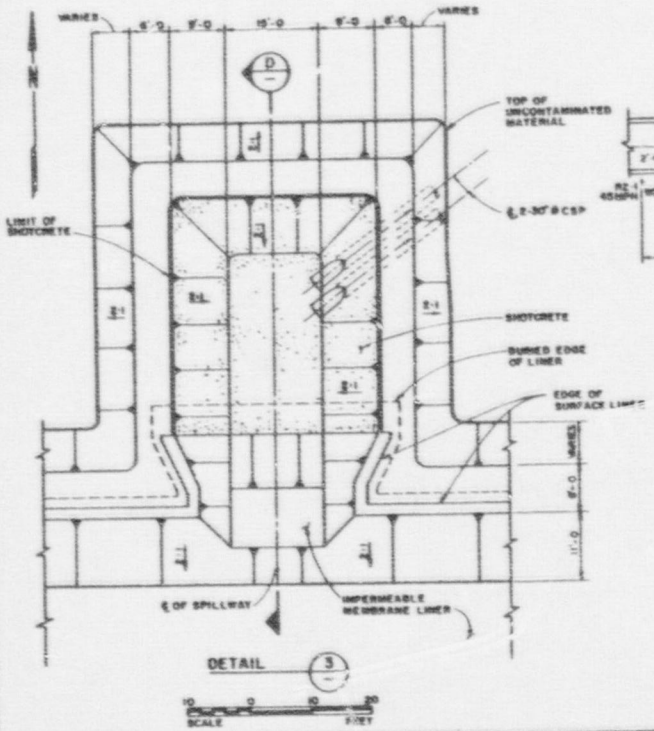
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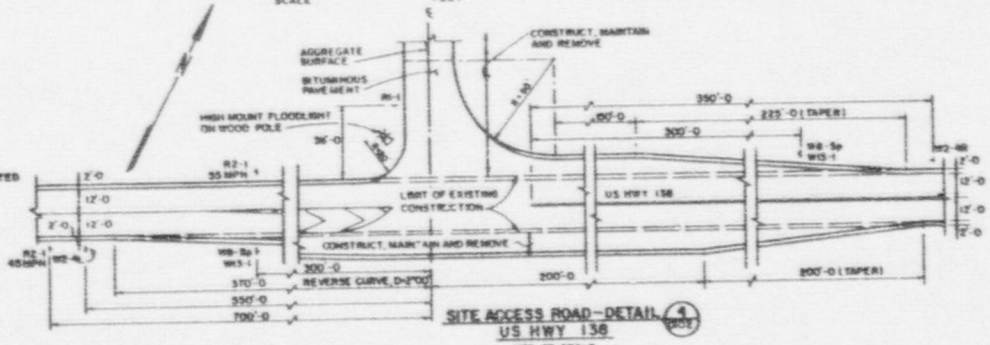


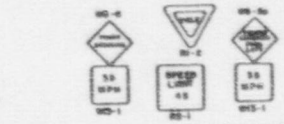




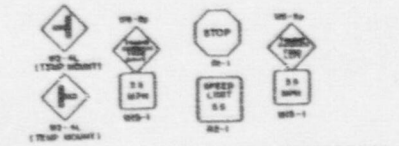


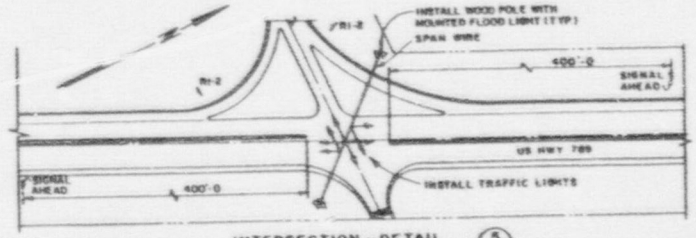












U. S. DEPARTMENT OF ENERGY
ALBUQUERQUE, NEW MEXICO

RIVERTON SITE
RIVERTON, WYOMING

SECTIONS & DETAILS
(SHEET 2 OF 2)

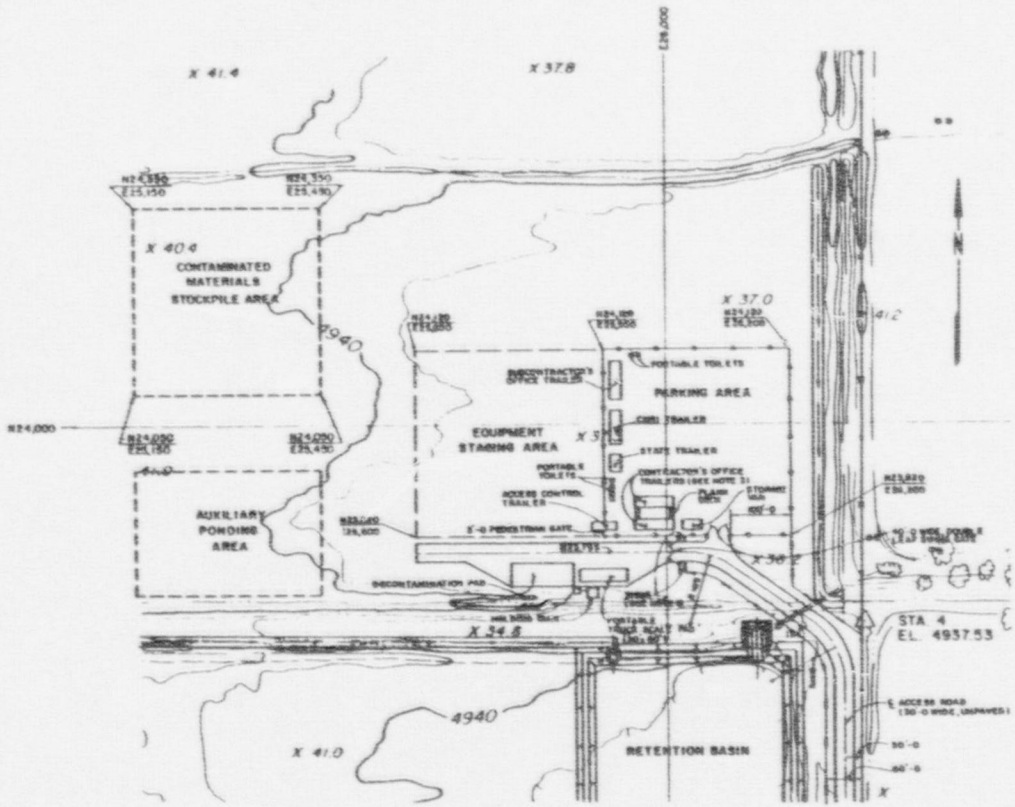
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0

ISSUED FOR CONSTRUCTION

UMTRA PROJECT



ACCESS CONTROL AND STAGING AREA

(RVT-PS-10-0103)

SCALE 100 0 100 200 FEET

NOTES:

1. GRADE TO PROVIDE SMOOTH APPROACH AND EXIT CONDITIONS FOR THROUGH TRAFFIC ACROSS THE DECONTAMINATION AND SCALE PADS.
2. CONTRACTOR'S OFFICE, PARKING AREAS AND ACCESS ROAD SHALL BE GRADED TO PROVIDE POSITIVE DRAINAGE. CONTAMINATED MATERIALS SHALL BE REMOVED FROM AREA BEFORE GRADING.
3. CONTRACTOR'S TRAILER NO.3, TRAILER FOR THE STATE OF WYOMING AND STORAGE VAN WILL BE FURNISHED BY THE CONTRACTOR.
4. PROVIDE TWO SIGNS WITH LARGE LEGIBLE LETTERS 'CONTROLLED ACCESS AREA - AUTHORIZED PERSONNEL ONLY - VISITORS USE THE OTHER GATE'. SIGNS TO BE REMOVED AT COMPLETION OF ALL SUBCONTRACT WORK.
5. A SUMP AND HOLDING TANK SHALL BE PROVIDED AS DESCRIBED IN THE SPECIFICATIONS. EXCESS CONTAMINATED WATER FROM THE HOLDING TANK AND THE SUMP SHALL BE DISPOSED OF IN THE RETENTION BASIN.

REFERENCE DRAWINGS:

RVT-PS-10-0104	SITE PLAN AND TEMPORARY FACILITIES

LEGEND:

N24,000	CONSTRUCTION GRID COORDINATE
	TEMPORARY WOVEN WIRE FENCE(6'-0 HIGH)
	TEMPORARY CHAIN LINK FENCE (8'-0 HIGH)
	EXISTING FENCE TO REMAIN
	IRRIGATION CANAL OR TEMPORARY DRAINAGE DITCH

U. S. DEPARTMENT OF ENERGY
ALBUQUERQUE, NEW MEXICO

RIVERTON SITE
RIVERTON, WYOMING

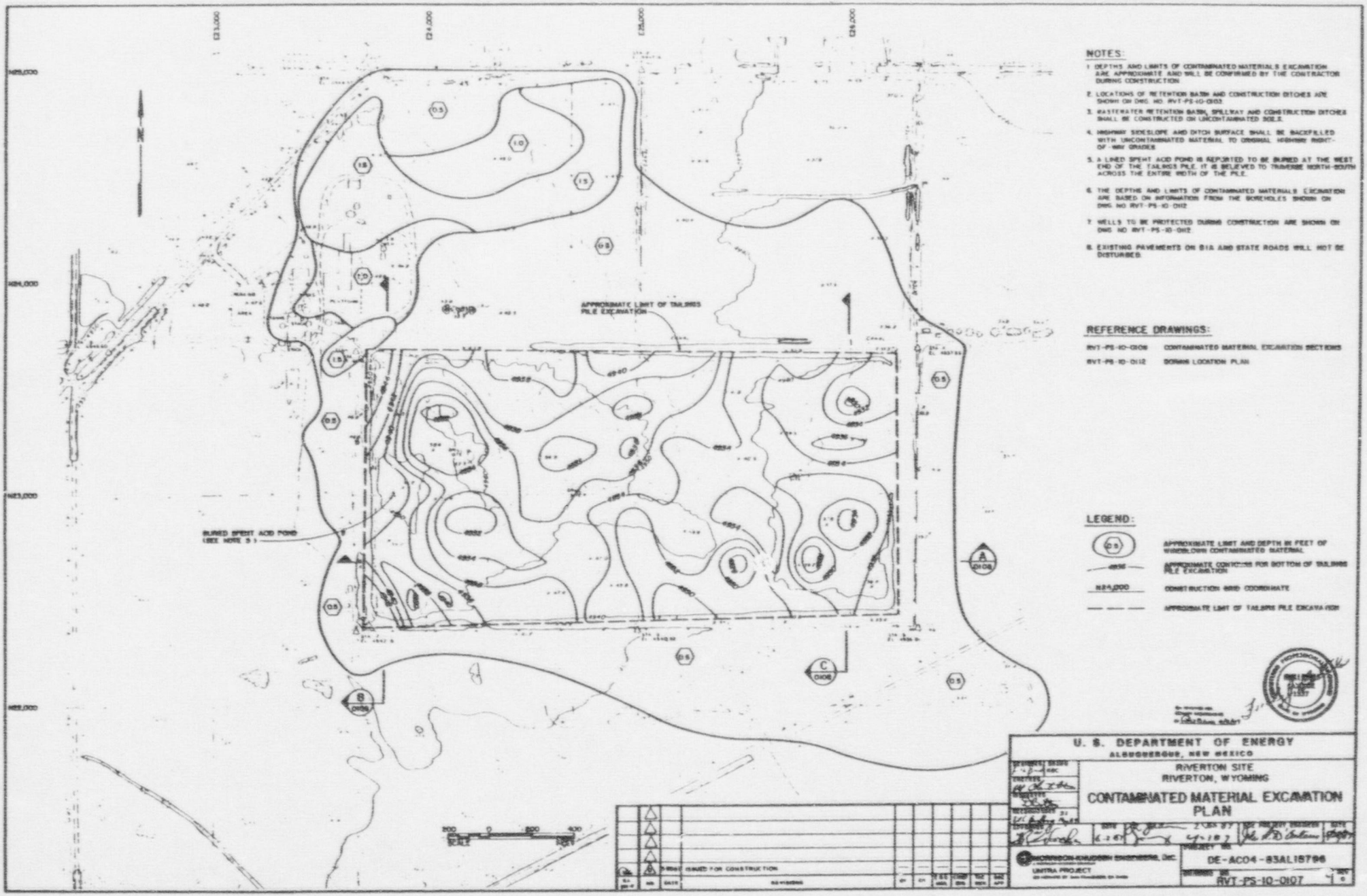
ACCESS CONTROL & STAGING AREA

DE-AC04-83AL18796

RVT-PS-10-0106

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NOTES:

1. DEPTHS AND LIMITS OF CONTAMINATED MATERIALS EXCAVATION ARE APPROXIMATE AND WILL BE CONFIRMED BY THE CONTRACTOR DURING CONSTRUCTION.
2. LOCATIONS OF RETENTION BASIN AND CONSTRUCTION DITCHES ARE SHOWN ON DWG. NO. RVT-PS-10-0103.
3. WASTEWATER RETENTION BASIN, SPILLWAY AND CONSTRUCTION DITCHES SHALL BE CONSTRUCTED ON UNCONTAMINATED SOILS.
4. HIGHWAY SIDESLOPE AND DITCH SURFACE SHALL BE BACKFILLED WITH UNCONTAMINATED MATERIAL TO ORIGINAL HIGHWAY RIGHT-OF-WAY GRADES.
5. A LINED SPENT ACID POND IS REPORTED TO BE BURIED AT THE WEST END OF THE TAILINGS PILE. IT IS BELIEVED TO TRAVERSE NORTH-SOUTH ACROSS THE ENTIRE WIDTH OF THE PILE.
6. THE DEPTHS AND LIMITS OF CONTAMINATED MATERIALS EXCAVATION ARE BASED ON INFORMATION FROM THE BOREHOLES SHOWN ON DWG. NO. RVT-PS-10-0112.
7. WELLS TO BE PROTECTED DURING CONSTRUCTION ARE SHOWN ON DWG. NO. RVT-PS-10-0112.
8. EXISTING PAVEMENTS ON BIA AND STATE ROADS WILL NOT BE DISTURBED.

REFERENCE DRAWINGS:

RVT-PS-10-0108	CONTAMINATED MATERIAL EXCAVATION SECTIONS
RVT-PS-10-0112	BORING LOCATION PLAN

LEGEND:

(0.5)	APPROXIMATE LIMIT AND DEPTH IN FEET OF WINDBLOWN CONTAMINATED MATERIAL
4950	APPROXIMATE CONTOURS FOR BOTTOM OF TAILINGS PILE EXCAVATION
N24,000	CONSTRUCTION GRID COORDINATE
	APPROXIMATE LIMIT OF TAILINGS PILE EXCAVATION

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RIVERTON SITE
RIVERTON, WYOMING

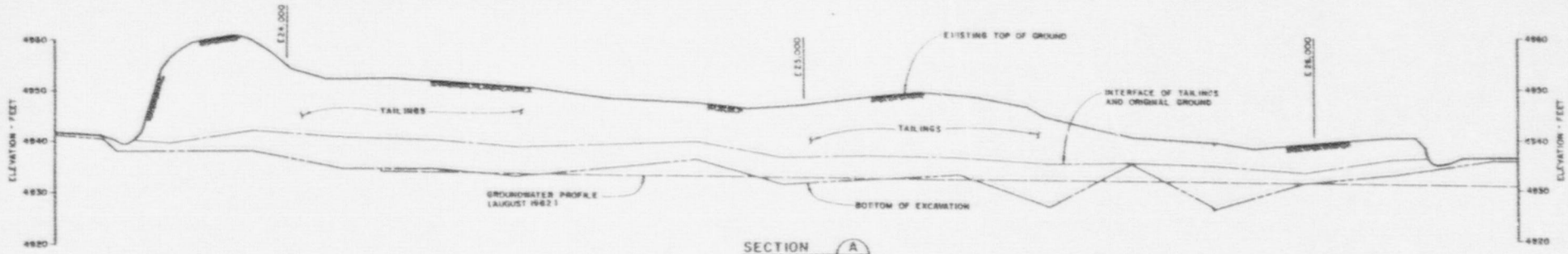
CONTAMINATED MATERIAL EXCAVATION PLAN

MORRISON-KNUDSEN ENGINEERS, INC.
UMTRA PROJECT

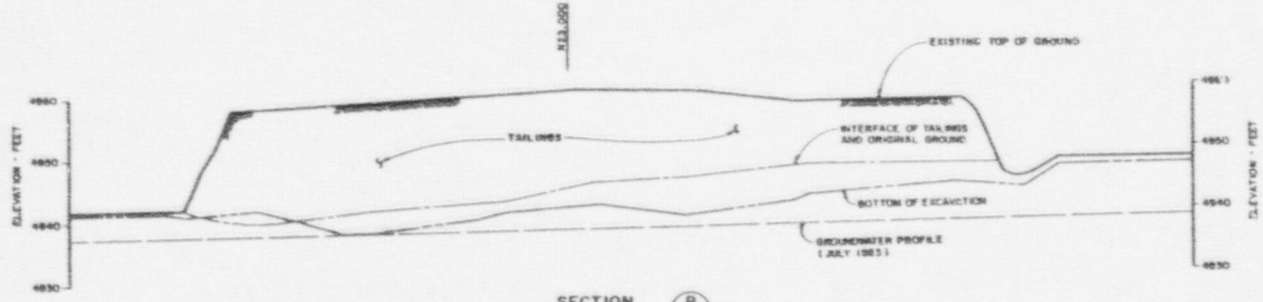
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RVT-PS-10-0107

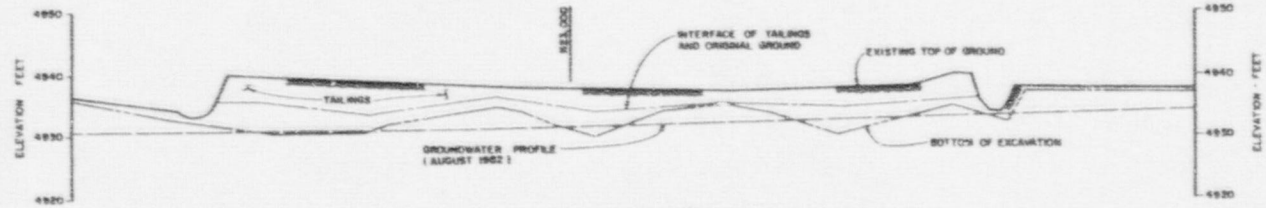
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SECTION A (DH07)



SECTION B (DH07)



SECTION C (DH07)

NOTES:

1. THE APPROXIMATE ELEVATIONS OF THE TOP OF THE PERCHED WATER TABLE ARE DERIVED FROM MEASUREMENTS TAKEN IN AUGUST 1982 BY LAWRENCE BERKELEY LABORATORIES. SEASONAL VARIATIONS IN ELEVATION MAY OCCUR.
2. THE APPROXIMATE ELEVATIONS OF THE TOP OF THE PERCHED WATER TABLE AT WEST SIDE OF THE TAILINGS (SECTION B) ARE DERIVED FROM MEASUREMENTS TAKEN IN JULY 1983 BY LAWRENCE BERKELEY LABORATORIES. SEASONAL VARIATIONS IN ELEVATION MAY OCCUR.

REFERENCE DRAWINGS:

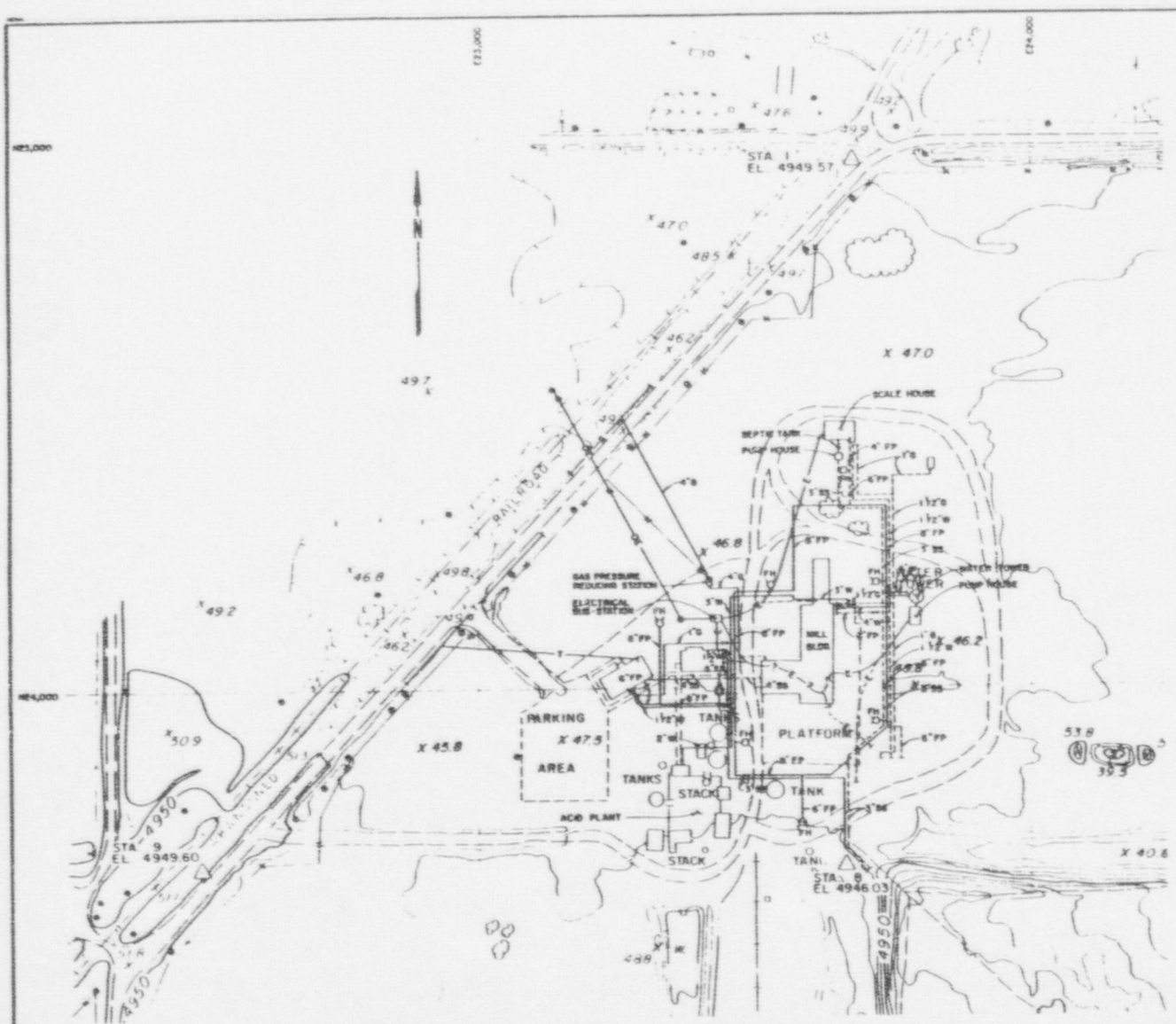
RVT-PS-10-0107 CONTAMINATED MATERIAL EXCAVATION PLAN

LEGEND:

- EXISTING TOP OF GROUND
- APPROXIMATE INTERFACE OF TAILINGS AND ORIGINAL GROUND SURFACE (GROUND SURFACE PRIOR TO TAILINGS PLACEMENT)
- APPROXIMATE BOTTOM OF CONTAMINATED MATERIAL EXCAVATION
- APPROXIMATE TOP OF PERCHED WATER TABLE

10 0 10 20
VERTICAL SCALE FEET

100 0 100 200
HORIZONTAL SCALE FEET



NOTES:

1. ALL UTILITY LOCATIONS ARE APPROXIMATE AND SHALL BE FIELD VERIFIED PRIOR TO EXCAVATION OR DEMOLITION
2. DEMOLITION OR RELOCATION OF UTILITIES SHALL BE CARRIED OUT IN A MANNER THAT WILL AVOID DISRUPTION OF OPERATIONS AT THE ACID PLANT
3. UTILITIES TO REMAIN IN OPERATION SHALL BE RELOCATED WHERE NECESSARY TO FACILITATE CLEAN-UP OF CONTAMINATED MATERIALS OR DEMOLITION
4. VARIOUS UTILITIES TO THE WEST OF THE PROJECT BOUNDARIES ON PRIVATE LANDS AND ON ROAD RIGHT-OF-WAYS ARE NOT SHOWN

REFERENCE DRAWINGS:

RVT-PS-10-0110 DEMOLITION PLAN

LEGEND:

N24,000	CONSTRUCTION GRID COORDINATE
	UTILITIES TO REMAIN IN OPERATION
	UTILITIES TO BE DEMOLISHED
	VALVE (PIV ON FIRE PROTECTION LINE)
FH	FIRE HYDRANT
E	ELECTRICAL CABLES (UNDERGROUND)
OE	OVERHEAD ELECTRICAL LINE
T	TELEPHONE LINE (UNDERGROUND)
FP	FIRE PROTECTION
W	WATER
G	NATURAL GAS
GS	SANITARY SEWER
	POWER OR TELEPHONE POLE

U. S. DEPARTMENT OF ENERGY
ALBUQUERQUE, NEW MEXICO

RIVERTON SITE
RIVERTON, WYOMING

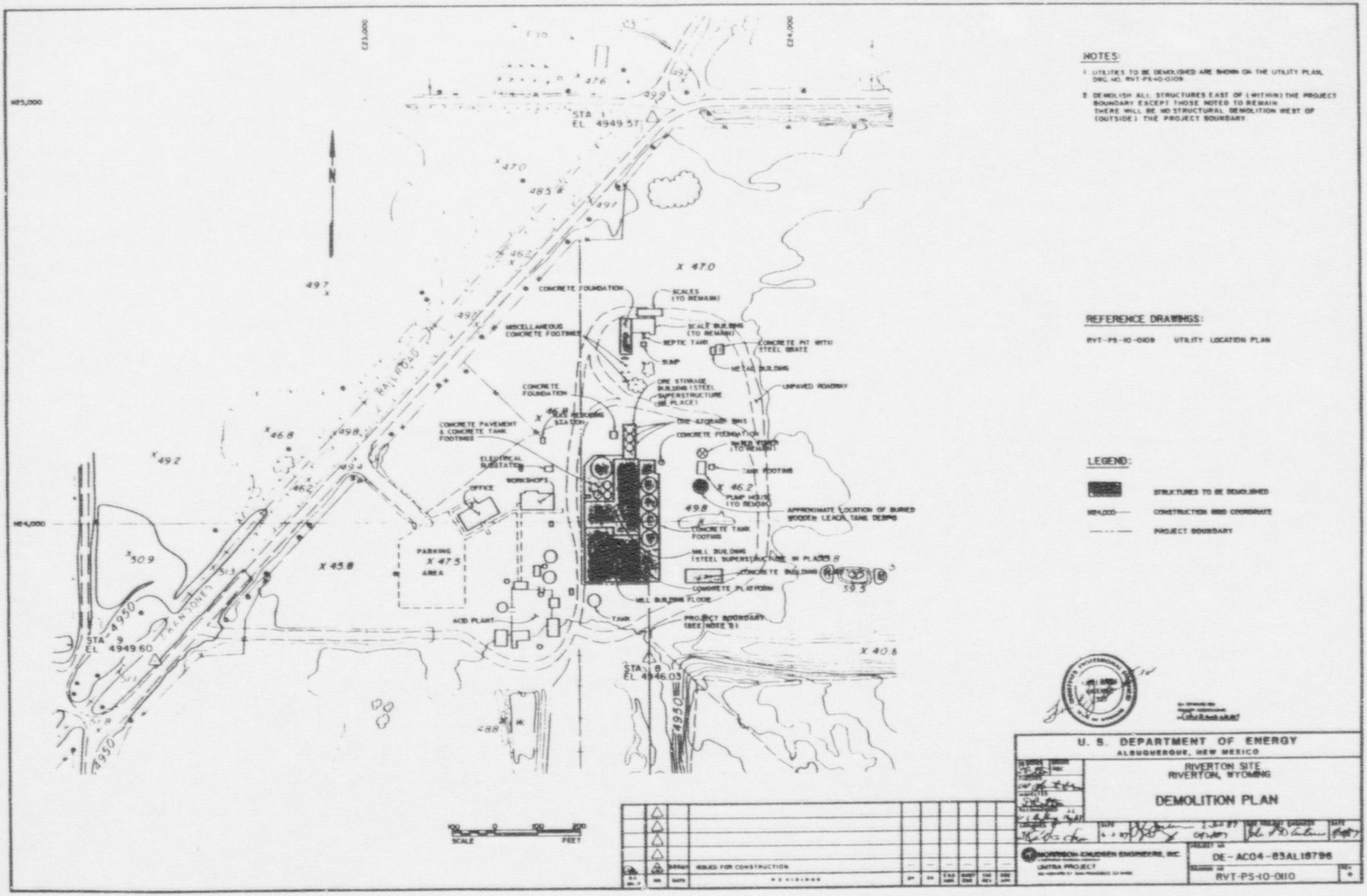
UTILITY LOCATION PLAN

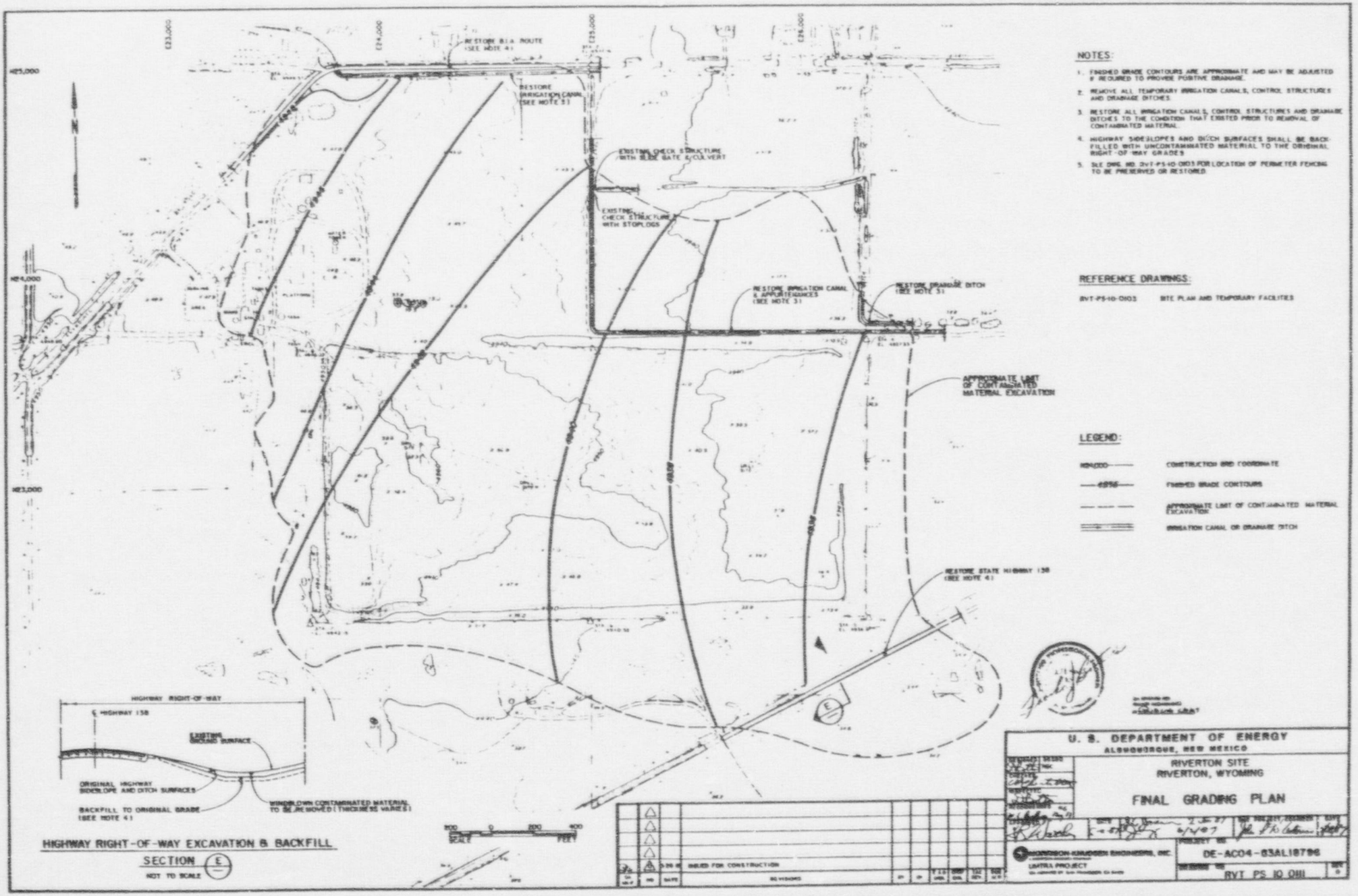
MORRISON-KNUDSEN ENGINEERS, INC.
UMTRA PROJECT

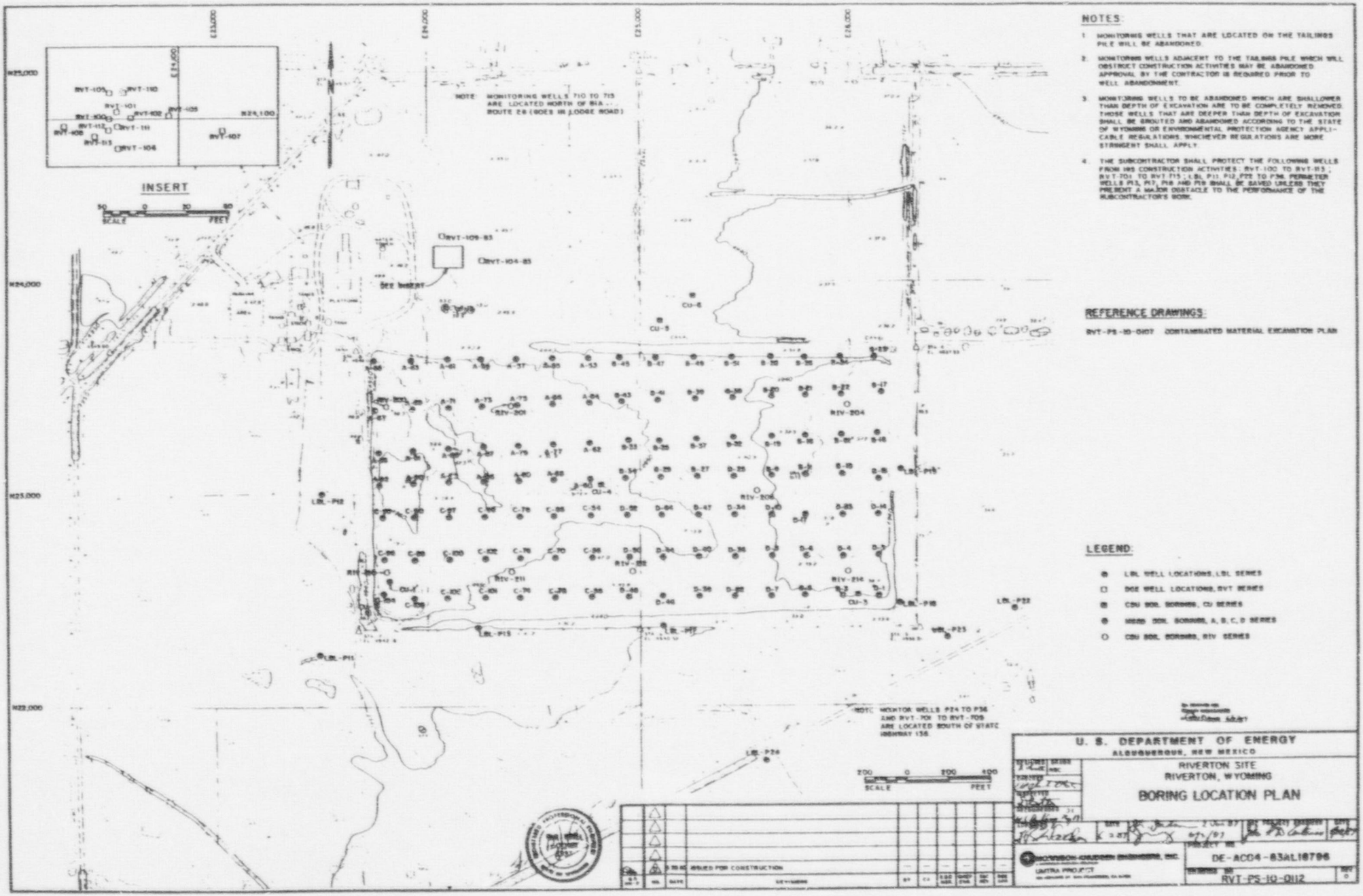
DE-AC04-83AL18796

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NOTES:
1. UTILITIES TO BE DEMOLISHED ARE SHOWN ON THE UTILITY PLAN, DRG. NO. RVT-PS-10-0109
2. DEMOLISH ALL STRUCTURES EAST OF (WITHIN) THE PROJECT BOUNDARY EXCEPT THOSE NOTED TO REMAIN. THERE WILL BE NO STRUCTURAL DEMOLITION WEST OF (OUTSIDE) THE PROJECT BOUNDARY.
REFERENCE DRAWINGS:
RVT-PS-10-0109 UTILITY LOCATION PLAN
LEGEND:
STRUCTURES TO BE DEMOLISHED
CONSTRUCTION GRID COORDINATE
PROJECT BOUNDARY
E23,000
E24,000
N15,000
N14,000
STA 1 EL 4949.57
STA 9 EL 4949.60
STA 9 EL 4946.03
CONCRETE FOUNDATION
SCALES (TO REMAIN)
SCALE BUILDING (TO REMAIN)
MISCELLANEOUS CONCRETE FOOTINGS
SEPTIC TANK
CONCRETE PIT WITH STEEL GRATE
SUMP
METAL BUILDING
ORE STORAGE BUILDING (STEEL SUPERSTRUCTURE TO BE PLACED)
UNPAVED ROADWAY
CONCRETE FOUNDATION
CONCRETE PAVEMENT & CONCRETE TANK FOOTINGS
GAS METERING STATION
ORE STORAGE BINS
CONCRETE FOUNDATION
BURIED PIPING (TO REMAIN)
ELECTRICAL SUBSTATION
TANK FOOTING
WORKSHOPS
OFFICE
PUMP HOUSE (TO REMAIN)
APPROXIMATE LOCATION OF BURIED WOODEN LEACH TANK DEBRIS
PARKING AREA
CONCRETE TANK FOOTING
MILL BUILDING (STEEL SUPERSTRUCTURE IN PLACE)
CONCRETE BUILDING
CONCRETE PLATFORM
MILL BUILDING FLOOR
TANK
ACID PLANT
PROJECT BOUNDARY (SEE NOTE 2)
RAILROAD
TRANSMISSION
SCALE
0
100
200
FEET
ISSUED FOR CONSTRUCTION
U. S. DEPARTMENT OF ENERGY
ALBUQUERQUE, NEW MEXICO
RIVERTON SITE
RIVERTON, WYOMING
DEMOLITION PLAN
MORRISON-KNUDSEN ENGINEERS, INC.
UMTRA PROJECT
DE-AC04-83AL18796
RVT-PS-10-0110


E23,000
E24,000
E25,000
E26,000
N25,000
N24,000
N23,000
RESTORE B1A ROUTE (SEE NOTE 4)
RESTORE IRRIGATION CANAL (SEE NOTE 3)
EXISTING CHECK STRUCTURE WITH SLUICE GATE & CULVERT
EXISTING CHECK STRUCTURE WITH STOPLOGS
RESTORE IRRIGATION CANAL & APPURTENANCES (SEE NOTE 3)
RESTORE DRAINAGE DITCH (SEE NOTE 3)
APPROXIMATE LIMIT OF CONTAMINATED MATERIAL EXCAVATION
RESTORE STATE HIGHWAY 136 (SEE NOTE 4)
NOTES:
1. FINISHED GRADE CONTOURS ARE APPROXIMATE AND MAY BE ADJUSTED IF REQUIRED TO PROVIDE POSITIVE DRAINAGE.
2. REMOVE ALL TEMPORARY IRRIGATION CANALS, CONTROL STRUCTURES AND DRAINAGE DITCHES.
3. RESTORE ALL IRRIGATION CANALS, CONTROL STRUCTURES AND DRAINAGE DITCHES TO THE CONDITION THAT EXISTED PRIOR TO REMOVAL OF CONTAMINATED MATERIAL.
4. HIGHWAY SIDESLOPES AND DITCH SURFACES SHALL BE BACK-FILLED WITH UNCONTAMINATED MATERIAL TO THE ORIGINAL RIGHT-OF-WAY GRADES.
5. SEE DWG. NO. 2-V-T-PS-10-0103 FOR LOCATION OF PERIMETER FENCING TO BE PRESERVED OR RESTORED.
REFERENCE DRAWINGS:
RVT-PS-10-0103 SITE PLAN AND TEMPORARY FACILITIES
LEGEND:
CONSTRUCTION GRID COORDINATE
FINISHED GRADE CONTOURS
APPROXIMATE LIMIT OF CONTAMINATED MATERIAL EXCAVATION
IRRIGATION CANAL OR DRAINAGE DITCH
HIGHWAY RIGHT-OF-WAY
℄ HIGHWAY 136
EXISTING GROUND SURFACE
ORIGINAL HIGHWAY SIDESLOPE AND DITCH SURFACES
BACKFILL TO ORIGINAL GRADE (SEE NOTE 4)
WINDROWN CONTAMINATED MATERIAL TO BE REMOVED (THICKNESS VARIES)
HIGHWAY RIGHT-OF-WAY EXCAVATION & BACKFILL
SECTION ℄
NOT TO SCALE
SCALE FEET
ISSUED FOR CONSTRUCTION
U. S. DEPARTMENT OF ENERGY
ALBUQUERQUE, NEW MEXICO
RIVERTON SITE
RIVERTON, WYOMING
FINAL GRADING PLAN
SHERMAN-KNUDSEN ENGINEERS, INC.
UMTRA PROJECT
DE-AC04-83AL18796
RVT PS 10 0111


E23,000
E24,000
E25,000
E26,000
N25,000
N24,000
N23,000
N22,000
INSERT
SCALE
FEET
NOTE: MONITORING WELLS 710 TO 715 ARE LOCATED NORTH OF SIA... ROUTE 28 (GOES W. LODGE ROAD)
SEE INSERT
NOTE: MONITOR WELLS P24 TO P36 AND RVT-700 TO RVT-705 ARE LOCATED SOUTH OF STATE HIGHWAY 136.
NOTES:
1. MONITORING WELLS THAT ARE LOCATED ON THE TAILINGS PILE WILL BE ABANDONED.
2. MONITORING WELLS ADJACENT TO THE TAILINGS PILE WHICH WILL OBSTRUCT CONSTRUCTION ACTIVITIES MAY BE ABANDONED APPROVAL BY THE CONTRACTOR IS REQUIRED PRIOR TO WELL ABANDONMENT.
3. MONITORING WELLS TO BE ABANDONED WHICH ARE SHALLOWER THAN DEPTH OF EXCAVATION ARE TO BE COMPLETELY REMOVED. THOSE WELLS THAT ARE DEEPER THAN DEPTH OF EXCAVATION SHALL BE GROUTED AND ABANDONED ACCORDING TO THE STATE OF WYOMING OR ENVIRONMENTAL PROTECTION AGENCY APPLICABLE REGULATIONS. WHICHEVER REGULATIONS ARE MORE STRINGENT SHALL APPLY.
4. THE SUBCONTRACTOR SHALL PROTECT THE FOLLOWING WELLS FROM HIS CONSTRUCTION ACTIVITIES: RVT-100 TO RVT-113; RVT-701 TO RVT-715; LBL P11, P12, P22 TO P36, PERIMETER WELLS P13, P17, P18 AND P19 SHALL BE SAVED UNLESS THEY PRESENT A MAJOR OBSTACLE TO THE PERFORMANCE OF THE SUBCONTRACTOR'S WORK.
REFERENCE DRAWINGS:
RVT-PS-10-0107 CONTAMINATED MATERIAL EXCAVATION PLAN
LEGEND:
LBL WELL LOCATIONS, LBL SERIES
SGE WELL LOCATIONS, RVT SERIES
CSU SOIL BORINGS, CU SERIES
MEDO SOIL BORINGS, A, B, C, D SERIES
CSU SOIL BORINGS, RIV SERIES
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ALBUQUERQUE, NEW MEXICO
RIVERTON SITE
RIVERTON, WYOMING
BORING LOCATION PLAN
ISSUED FOR CONSTRUCTION
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RVT-PS-10-0112