

A.

APPARENT COMPLETENESS REVIEW

TOWER RESOURCES, INC.  
PINNACLE MINE  
ACT/007/019

UMC 771.27(pp 6) - Verification of Application.

It is presumed that Mr. Quigley verified the application as an official of the Company, probably as the Mine Engineer. Please confirm.

UMC 782.13(a)(3)(pp 8) - Identification of Interests.

It is presumed there are no other lessors of surface rights in the area affected or proposed to be affected by surface activities. Please confirm.

(e) Plate III indicates that J and S Critchlow and Pacific Gas & Electric are surface owners of "contiguous" surface. They should also be listed in this category. The address for the Division of State Lands is 231 East 400 South, Salt Lake City, Utah 84111.

(g)(pp 12) It is presumed that the rights to other minerals that could be affected by the proposed operation are not, to Tower's knowledge, leased. Is that correct?

(f)(pp 8) Does MSHA #42-01474 apply to all three portal areas or only to the existing portal?

UMC 782.14(c)(5)(pp 13) - Compliance Information.

A review of actions taken by Tower Resources to abate violations indicates satisfactory compliance with regard to notices issued by the Division of Oil, Gas and Mining on October 3, 1980. Please provide a description of abatement actions taken on violations issued on December 16, 1980.

UMC 782.16(a)(pp 19) - Areas Unsuitable for Mining.

Please delineate the exact location of the public (county) road right-of-way and its terminus and its exact spatial relationship to all surface coal mining operations, and if such operations are within 100 feet of the road right-of-way, please identify if Board action to comply with UMC 761.11(d) is necessary. (See also 783.24(h))

UMC 782.17(pp 19-20) - Permit Term.

It is presumed that the permit term applied for is 5 years. If other than 5 years, please specify this and supply the demonstration of need to obtain "necessary financing of equipment and the opening of the operation" as required by UMC 786.25(a). As is noted in UMC 783.12(a), and UMC 783.24(c), the application must be more specific in terms of the proposed (projected) timing of both surface and underground operations.

(pp 20) Plates VIII and II do not clearly show the seven acres, "one-third" previous disturbance, or the 20 acre proposed disturbance. (See also UMC 783.25))

UMC 782.19(pp 21-22) - Other Licenses and Permits.

The majority of the permits listed appear to apply to the existing operations in the Gilson seam and either are not applicable to, or must be amended to apply to the proposed operations in the two additional seams. In order that the applicant not be unnecessarily delayed in initiating approved operations, please list the applicability of each permit to the proposed 3-seam projects and identify the additional permits required and permit amendments required.

UMC 783.12 - General Environmental Resources.

Provide the proposed starting dates for construction of surface facilities at Aberdeen and Lower Sunnyside portals, roads, and other necessary surface facilities.

The applicant should delineate on a map in accordance with 783.24(c), the subareas on an annual basis for permitting in accordance with 5 year permit terms on Plate V. Intended mining for the life of the mine for the Lower Sunnyside Seam, Plate V, and the Aberdeen Seam, Plate VII, should also be shown for sequence in 5 year increments. The applicant should also indicate a conceptual layout for the other seam portal facilities and the starting dates for construction.

Note: It is recognized that future marketing, permit delays incomplete, applications, strikes and other unanticipated conditions will affect these projections. Nonetheless, they must be made to evaluate protection of the coal resource and to evaluate reclamation.

UMC 783.14 - Geology.

Provide adequate cross-sections based on available data, showing the geohydrologic relationships between the stratigraphy of overburden and interburden and spring locations, to enable the regulatory authority to ascertain the short term and long term effect of mining on depth of water and spring flow. These cross-sections and other necessary representations will provide a basis to interpolate between these and the data already provided.

Regarding underground development or waste rock, refer to UMC 784.11(b)(4).

UMC 783.15/783.16 - Groundwater/Surface Water.

Surface and groundwater baseline data is not adequate to delineate seasonal trends or variation. Baseline data from similar applicable, alternative sources has not been provided or referenced. If such an alternative is elected, sufficient data must be provided to verify the ability to extrapolate from one drainage basin to another. (i.e., climatology, topography, vegetation, geology, soils, etc.)

UMC 783.15 - Groundwater.

The applicant makes a commitment to test the quality and the quantity of groundwater in the area by drilling two wells (pp 76-77, Vol. 1). There is some question as to when the first well will be drilled. Also what aquifer(s) will the well be monitoring (ie., where will perforations be)? There is also some confusion as to whether these wells will be drilled at all, as per Addendum A submitted March 3, 1981. Clarification is requested from the applicant.

UMC 783.16 - Surface Water.

The generalized description of the surface water system presented by the applicant, relates only to the Right Fork drainage and the associated disturbances as applicable to the mining of the Gilson seam. The applicant has indicated that the Aberdeen and Lower Sunnyside seams will also be mined. As such, other drainages will be disturbed and/or undermined as a consequence of expanded mining development. (ie., new portals, roads, etc.)

Additional watershed information of the sort presented in Exhibit III-A, in addition to accurate estimates of flow and quality depicting seasonal trends, for all pertinent drainages to be affected within the mine area should be incorporated into the mining and reclamation plan. (ie., drainage area(s), runoff characteristics, diversions, sedimentation ponds, etc.)

The applicant has provided information pertaining to water use and water rights within and adjacent to the permit area in Addendum A (March 3, 1981). All water rights as delineated on Figure 5 are not properly recorded within Table 5 (ie., 91-2571, 91-3663). The applicant should correct these deficiencies and any other which may become apparent upon revision of these documents.

UMC 783.18(a) - Climatological Information.

(pp 80) It is presumed the precipitation data were collected at Price. Is that correct?

(pp 89) Have there been any on-site measurements of wind speed and direction? If so, please provide results in order to allow assessment of transport of coal fines and efficiency of controls which are planned for the site.

UMC 783.19 - Vegetation Information.

Indicate how and where the analysis (survey?) for threatened and endangered species was performed. No reference to Welsh (1977) is found on page 108 or in Exhibit IV-C.

Tower Resources, Inc. has utilized the Range Site Method for analyzing vegetation resources at the proposed mine site. The site was analyzed by trained employees of the Soil Conservation Service employing technical guidelines issued by the USDA (National Range Handbook 1976). The use of such technical guides in Utah's permanent regulatory program has not yet been evaluated by the Director of the Office of Surface Mining (see 30 CFR

817.116). The only currently approved method in Utah for measuring revegetation success for bond release is through the use of reference areas. The use of reference areas requires specific cover, productivity and density measurements to be made, prior to mining, on the areas of proposed disturbances and on proposed reference areas. (See Vegetation Guidelines, DOGM, June, 1980). These same measurements must also be made when nearing the bond release stage of mining.

The Division will, at this time, accept one of three possible approaches in submitting vegetation information for later bond release. The three approaches are: (1) the use of reference areas; (2) the use of the range site method; and (3) the use of reference areas set up through the use of the range site method. With this third approach, detailed sampling is still required on the reference area for bond release. The caveat of this statement on accepted approaches is that approaches 2 and 3 are slated to be submitted to OSM for evaluation and approval, but no approval has been granted to date. If either of these two approaches is adopted, the Division could only conditionally grant approval on the plan, as the use of approach 2 or 3 would be subject to the approval of the OSM director.

Since the applicant, through contact with the Division, has indicated a preference to utilize the reference area approach, an analysis has been made of the information submitted only in relation to this approach. If the applicant were to request it, an analysis for compliance with the Range Site Method could be made.

Reference areas must be shown on a map (and marked in the field) as soon as they have been identified and agreed to by the regulatory authority (required also by UMC 783.24(f)).

The applicant should provide a map, possibly developed from aerial photographs, which shows the general vegetation communities or range sites over the underground mine site. It is suggested that the map scale be 1"-500' or larger.

The vegetation measurements do not provide adequate cover, species, or production information to allow an assessment of the permanent revegetation seeding mix or identification of a standard of success for the disturbed areas. It is recognized that some of the areas have been previously mined and, therefore, that pursuant to 817.116(b)(3)(i) the ground cover must be that which can be supported by the best available "topsoil" in the area. However, inadequate quantitative data have been presented to provide a standard. Therefore, the applicant must provide on-site, quantitative and representative data for the areas to be disturbed in the future by surface activities and for representative areas outside the disturbed areas ("reference areas"). The applicant is encouraged to meet with DOGM and OSM to design an adequate vegetation measurement program immediately. An adequate plan to obtain adequate baseline information should be agreed to prior to taking final action on the submission. Similarly, a procedure to determine "success" must be identified. (See 784.13(b)(5))

UMC 817.21-25 - Soil Resource Information.

As was discussed with applicant's staff, the soils information should clearly cover all areas to be disturbed as well as those that are already disturbed. Plate XIII should be clearly related to the areas of prior and present surface disturbance by tie-marks (at a minimum) that facilitate overlays.

It will be necessary to carefully assess the nature of all materials proposed to be placed within the root zone on reclaimed areas. Therefore, the character of the existing, disturbed materials that likely will have to serve as part of the plant growth medium must, prior to reclamation, be evaluated to determine whether special revegetation procedures are required. All areas to be disturbed in the vicinity of the new portals must be mapped and evaluated prior to disturbance to allow a plan for protection of soils to be developed. Analysis of previously disturbed areas should be discussed in the context of revegetation and erosional stabilization at the meeting encouraged above (783.19). Acceptable plans to accomplish this must be implemented prior to further surface disturbance. The amount of topsoils stockpiled to date should be identified.

The topsoil is rated as poor to fair (pp 21, Exhibit IV-C). The applicant should provide at least one set of laboratory data for each major horizon in order to assist with the assessment of the suitability of the soils to be disturbed or regraded for stabilization. It is suggested the analyses include pH, EC, SAR, saturation percentage, soluble Ca, Mg, and Na, organic matter and texture (USDA procedure). Analyses should include the soil presently stockpiled.

UMC 783.24 - Maps: General Requirements.

(c) Submit a map showing the size, sequence and timing of mining of sub areas by years.

(e) It is presumed that there are no pipelines or transmission lines over the mine area. Please confirm.

(h) As noted under 782.16(a), clearly show the extent of the public road right-of-way.

(l) Please note certification requirement for maps, plans, and cross-sections involving surveying and engineering.

UMC 783.25 - Cross-section, Maps and Plans.

Provide maps such as Plate VIII for all other face-up areas proposed. (Please also ensure that soils, vegetation and other such maps can be overlaid on facilities maps or are of the same scale.)

UMC 783.27 - Prime Farmland Investigation.

A determination (a letter from the Soil Conservation Service, Dr. Theron B. Hutchings, Salt Lake City) on Prime Farmland must be included in the Mining and Reclamation Plan.

UMC 784.11 - Operation Plan: General Requirements.

(a) The description of type and method should include the sequence of development and retreat mining, size of pillars, roof spans, barrier pillars, etc. This information can be used for protection of the resource as well as subsidence.

(pp 34) Plates V, VI and VII do not reflect the "mirror image" of underground workings stated in the text.

The applicant should show how the lower Sunnyside will be columnized as far as development. The applicant must demonstrate that pillar extraction in the Gilson Seam will not sterilize or prevent extraction from the Lower Sunnyside Seam in compliance with 817.59. The applicant should also discuss how the mining of the two seams will influence the Aberdeen Seam.

(b) (pp 24 et. seq.) The narrative description should include the construction, use, maintenance, and removal of dams, embankments, impoundments, storage areas, coal handling areas, transportation areas, structures, mine facilities, and water pollution control facilities for the Lower Sunnyside Seam and Aberdeen Seam operations. (See also 784.23)

(b)(4) It is assumed that upon development, for ventilation overcasts, brushing the floor, or caves, that some underground development waste will be generated. The applicant should discuss how this waste will be properly stowed underground if as mentioned there is no waste disposal facilities planned for the surface. The applicant should gain approval from MSHA to accomplish underground stowing. The applicant should show how pillars will be pulled in sections, if crosscuts are to be used for stowing.

UMC 784.12 - Operation Plan: Existing Structures.

(pp 25, 26) The discussion of existing structures does not clearly identify existing roads, diversions, culverts or their designs and as-built characteristics. As an example, an explanation of the "as-built" conditions of the two sedimentation ponds and the culverts should be incorporated in the text. Since there appear to be no violations regarding the specifications of these structures, it is presumed they meet the permanent program performance standards. But it is not known if the ponds were built as indicated in the design or if site conditions precluded meeting those specifications. It is also noted that no engineering analysis of the fills and cuts is provided. Thus, it is difficult to analyze erosional and mass stability. Therefore, the applicant must submit additional information regarding existing structures. Show all embankments, cutslopes, location of road embankments, road grades, etc. This information should be of such detail to show how the existing structures meet applicable performance standards. The applicant should provide cross-sections similar to Plate VIII-A and the stability of cuts and embankments should be provided. These cross-sections should be provided in the area of the fan and the warehouse, as well as a cross-section north-south across facilities. Cross-sections "as-built" through the sedimentation ponds should be provided.

Plate VI and XII indicate two intake portals. Plate VIII shows one intake portal.

Cross-sections through the office building area would be useful.

The applicant should show the drainfield for the bathhouse or the location of the sewage line from the bathhouse to the drainfield and cleanouts. It is noted that the applicants drainage field capacity is based on existing levels of employment. The applicant should show how he intends to expand the drainage field to meet future employment projections.

UMC 784.13 - Reclamation Plan: General Requirements.

The reclamation plan must address the specific disturbed areas associated with all portals, roads, and other facilities.

The discussion on bonding must be revised to include a "detailed estimate of the cost of reclamation." We suggest that the bond amount be based on the estimated amounts of labor, materials, and equipment required to achieve the approved reclamation plan for the site.

The applicant should provide cross-sections and final reclamation contours to demonstrate that the performance standards of 817.101, 103 and 106 are met. ?

Since soils in as yet undisturbed areas are not quantified and since the quality of material expected to be exposed after regrading is not clearly identified, the discussion of postmining topsoil redistribution is not complete. Since visual observation of the stockpiled topsoil indicates that little material is available, the statement: "The thickness of the re-established soil will be consistent with soils in the vicinity" as is stated in the plan is in question. Provide information as to the thickness of soils in the vicinity. Stockpiled as well as in-place soils that will be (further) disturbed must be quantified and the suitability for use in reclamation identified.

The revegetation seed mix has not been shown in the application to meet the requirements of 817.111-116. This seed mix should be discussed at the meeting encouraged pursuant to 783.19. The objectives of the revegetation plan as well as the utility of introduced species must be evaluated. The seeding mix provided to describe the past seeding (SCS letter of Sept. 3, 1980) differs from the proposed seed mix. Please explain. We also note that the mulch does not appear to have been adequately anchored. Please incorporate plans to improve retention of mulch.

The specific measurement procedures proposed to monitor revegetation should be identified. The procedures should produce statistically valid data. The measurements and all other procedures should be coordinated through the regulatory authority. As noted under 783.19, reference areas must be established. For those areas which are previously mined, the standards of UMC 817.116(b)(3)(1) must be met. For those areas which will have a post-mining land-use of wildlife habitat, the requirements of UMC 817.116(b)(3)(iv) apply. Additional information regarding revegetation survey requirements are available on request.

The applicant should provide the revised number of acres to be revegetated as well as outlining two distinct areas on a reclamation map, one area for final reclamation and one for postconstruction contemporaneous reclamation with acreages verified.

The applicant must submit information on the anticipated timetable for temporary and contemporaneous reclamation (817.100) following construction and during operations. Interim plantings need only consist of one or a few species (817.114(c)).

The applicant should discuss disposal of oil and grease, disposal of solids collected in the septic tank and obtain a letter from the sanitary land fill, authority that they will accept certain wastes. The applicant should discuss storage and handling of wastes on the minesite in accordance with 817.89.

The applicant must describe disposal methods for removal of debris developed during removal of applicants facilities upon abandonment. Such debris includes concrete, machinery, steel structures, pipelines, culverts, etc.

It is assumed mine openings will be sealed with cinderblock seals. This must be identified to assist in calculating the bond amount.

UMC 784.14 - Reclamation Plan: Protection of Hydrologic Balance.

See comments for UMC 78<sup>4</sup>6.16.

UMC 784.15(a)(3) - Reclamation Plan: Post-mining Land-uses.

(pp 103) There is no evidence that an evaluation of the consistency of underground mining with surface owner plans (i.e., J&S Critchlow) has been made because the surface owner plans, and any comments received from the surface owner, are not provided.

UMC 784.16 - Reclamation Plan: Ponds, Impoundments, Etc.

It is noted that the plan does not include removal of diversions, ponds, or culverts. These plans must be provided.

(a)(pp 29, Exhibit IIIA) Pond, diversion, and culvert designs must be provided for the two or more new portal areas. Exhibit III-A, in the section concerning culverts, references "attached maps." Is this Plate VIII? UMC 784.16(a)(v) contains an optional procedure that the applicant could follow. However, there must be a specific time schedule for submission of designs agreed to. It is preferable to review the site specific designs now rather than in the near future since this would expedite the construction approval process later on.

(b) Are ponds proposed to be retained after mining and reclamation? If so, 784.16(b)(1) must be complied with. If not, please clearly identify reclamation procedures and ensure calculations are included in estimates of the performance bond. Please identify "approved location" for storage of sediment removed from pond or locations proposed. By identifying the chemical nature of sediments unloaded, the proper procedures for disposal of them can be taken.

UMC 784.17 - Protection of Public Parks and Historic Places.

The applicant must provide a map indicating the boundaries of the 1976 survey, site locations, and areas of proposed and existing surface disturbance. Estimates of acres examined during each of the inventories must be provided to assess the adequacy of inventory coverage in the permit area.

How were the areas to be surveyed selected and what was the purpose of examining only canyon bottoms? Figure 1, Page 2 (Hawkins and Deward 1980) appear to indicate that certain areas above the flood plains were examined. How were these areas selected for examination?

Items 16 and 17 on the submitted site forms (Recommendation and National Register potential) should be completed.

What criterion was used i.e., number of artifacts and/or features that need to be present to consider an area a site versus an isolated find?

Justified final assessments of the eligibility or ineligibility for listing in the National Register of Historic Places of the following sites must be submitted to the regulatory authority: 42Cb176, 177, 178, 179, 180 and 181 and the Hileman Mine. These assessments must be made using the National Register Criteria for Evaluation and Criteria of Considerations 36 CFR 1202.6.

The Zion Mine (42Cb176), activated in 1925, exceeds 50 years in age and therefore, must be considered in terms of National Register eligibility, contrary to the recommendations made in the report (Hawkins and Seward) under Criteria for Evaluation a, b, c, and/or d. This is because age cannot be used as the sole basis for ineligibility in light of Criteria Consideration (g) of 36 CFR 1202.6. In order to justify the ineligibility of 42Cb177, 178 and 179, the sites must be viewed as components of the broad resource base typifying early coal mining in Utah. Justifications could include a discussion of other sites in the region which better represent and illustrate this period of Utah history due to state of preservation, architectural style, period of operation, etc.

The location, description and evaluation of the Hileman Mine must be recorded. If this site is in an impact area and is considered eligible for the National Register of Historic Places, the impact mitigation/prevention measures must be devised.

Should any of these sites be determined eligible Criteria 36 CFR 800.3(b) must be applied in determining the effects of the mining operation of the site(s).

One additional point concerning further samples in relation to subsidence impacts has yet to be resolved, pending a meeting of the Office of Surface Mining and SHPO staff.

UMC 784.18 - Relocation or Use of Public Roads.

(pp 45) Since the road servicing the Gilson seam facilities and the proposed lower Sunnyside facilities is a County road (pp 28) and is therefore a public road, it would appear that operations are being and will be conducted within 100 feet of the right-of-way of this road. If this is the case, a hearing must be held to allow retention of the public road at the present location.

The applicant should obtain approvals from the county authorities pursuant to UMC 761.12(d).

UMC 784.19 - Underground Development Waste.

(pp 45) There appears to be a high probability of developing underground rock wastes (see 784.11(b)(4)) and additional discussion is requested of the stratigraphic situations expected at all operations that preclude development of such wastes.

UMC 784.20 - Subsidence Control Plan.

(pp 42) The fact that surface water drainages, vegetation, and, likely, groundwater resources exist over the underground mining operations, strongly suggests that renewable resources exist over the mine. (See definition of "renewable resource lands"). Therefore additional attention must be paid to the effects of inevitable collapse of the underground workings on the overlying strata and on the land surface. It is expected that surface effects will be evident where overburden is thin near the outcrop, and that surface effects may be negligible, where overburden is thick. We request that the 3-seam mining plan be reanalyzed to indicate where, under the stratigraphic and topographic conditions, surface effects of subsidence may be expected. Then, as discussed with the applicant's staff, we request that a short-term subsidence monitoring network be established over the first areas in which pillars are to be extracted and over which a measurable degree of changes in surface evaluation as a result of subsidence may be expected. This network and any results would then be used to design any additional monitoring required. Since it is expected, once the mining sequence maps are submitted, that the near-future mining will involve only main and submain entries, we need only to establish a satisfactory time schedule for designing and installing this system.

The applicant should discuss the projected subsidence based on the underground layout. For instance draw angles should be shown and depicted in the mine permit area. In addition, the ratio of width of mined out areas versus depth of cover, the potential near outcrop areas for shear caving less than 300 feet overburden, and the size of barriers to induce crushing after mining so that subsidence will progress more uniformly, should be discussed.

The applicant should describe how information will be gained by monitoring. A monitoring program should include the frequency of measurement, to what accuracy, survey control for the monitoring stations, monitoring stations should extend 1.4d (d = depth of overburden) beyond the perimeter of the workings.

UMC 784.23 - Operation Plan: Maps and Plans.

As noted previously, please provide site layout maps (at scale compatible with information needs) for two additional portal areas as well as for roads. All text discussions should include the necessary maps, cross-sections, and plans.

Any designs submitted for embankment or cut slope stability must be certified.

UMC 784.24 - Transportation Facilities.

(pp 28 et. seq.) The application does not provide the information required by this section. Specifically, paragraph (a) is not satisfied since design specifications or any other information necessary for a finding of compliance are lacking.

Any road within the mine permit area or access road must be addressed with respect to width, gradient, cut and fill embankments, culverts, drainage ditches and structures in compliance with 817.150, etc.

If the road is not demonstrated to be a county road then the applicant should provide all information required under b-e of UMC 784.24.

UMC 784.26 - Air Pollution Control Plan.

(Exhibit II-A) The letter from Mr. Bradford indicates the following conditions on the Tower Resources Construction Permi;

1. Production limited to 960,000 tons,
4. Storage piles chemically stabilized,
5. Conveyors covered,
6. Rail loadout area approved,
7. Visible emissions and fugitive dust not to exceed 20% opacity, and
10. Record of spraying-stabilization.

The plan does not adequately address that compliance with these requirements will be met.

UMC 785.19 - Alluvial Valley Floors.

The statement presented in Addendum A (March 3, 1981) concerning the absence of any alluvial deposits within a two mile radius of the mine plan area, is not an adequate basis for a negative declaration as to the possible existence of an alluvial valley floor(s). The regulatory authority suggests that the applicant supply either topographic or aerial imagery maps on a scale of 1" = 200' for all major drainages to be affected, delineating all terraces and floodplains. This information could provide a basis from which the regulatory authority may be able to make a preliminary determination.

UMC 785.21 - Support Facilities.

(pp 24, 28 Exhibits I, X, X-A) The information provided for the rail loadout at Wellington does not provide a basis for action as requested (pp 28). It is stated (pp 24) that approval has been granted by the Division. Therefore, the material provided to support the States approval pursuant to 785.21 should be included in the submission to support the requested action.

UMC 806.12 - Terms and Conditions of the Bond.

The existing escrow account under the terms of the Utah Mined Land Reclamation Act must be updated to comply with permanent program requirements as set forth in this section.

UMC 806.14 - Liability Insurance.

Insurance must comply with these terms in this section and remain in force for the life of the mine. Exhibit II-B indicates that the policy expires July 1, 1981.

UMC 817.97 - Fish and Wildlife Protection.

(pp 96,97) While it is agreed that the effects of the proposed operations on wildlife should not, theoretically, be substantial, the limited analysis of the wildlife resources and the lack of analysis as to whether impacts can be mitigated and whether enhancement is possible diminishes the regulatory authority's ability to check for compliance with UMC 817.97, as well as the Federal Land Management Policy Act and associated regulations. It is suggested that the varying degrees of importance of wildlife habitat be determined in consultation with the Division which will in turn consult with the other proper agencies. The guidance received from these agencies should be documented. This consultation could be used to agree upon a mitigation and, possibly, enhancement plan.

Information which will aid in demonstrating and planning compliance with the performance standards is as follows: The availability of water, the topography, and habitats of value to wildlife of high interest which are or will be impacted by the operations.

Methods are not identified for the evaluations of mule deer, mountain lion, black bear, or elk presented on page 94. In order to ensure the proper degree of analysis, please identify the methods used to assess the presence or absence of these species especially mule deer. Although the plan mentions the presence of elk and mule deer range, there are no maps or discussions of whether migration routes are specifically located in the canyon of impact.

The design of electrical transmission lines should be indicated in this submission since the Office of Surface Mining did not review and approve the interim submission and therefore has received no information on this item.

Please identify the nature of the Boner (1977) survey for threatened or endangered species and specifically show the relationship of the survey to the mine area. The reference is not described on page 108.

The applicant should also substantiate claims that the reclamation plan will enhance the site for wildlife by explaining how revegetation will create the plant diversity and groupings beneficial to wildlife as per UMC 817.97(d)(9). If the applicant believes that an effort toward enhancement of wildlife habitat would not produce observable effects because of the small size of the area, it should be so stated.

The applicant should provide a plan for the restoration of any riparian vegetation to be disturbed.

B.

# TOWER RESOURCES, INC

P. O. BOX 1027  
PRICE, UTAH 84501  
(801) 637-5385

June 5, 1981

Mr. Cleon B. Feight, Director  
State of Utah  
Department of Natural Resources  
Division of Oil, Gas, and Mining  
1588 West North Temple  
Salt Lake City, Utah 84116

Dear Mr. Feight:

Enclosed herewith please find six (6) copies of Tower Resources' response to the "Apparent Completeness Review" of the Mining and Reclamation (Centennial Project) submitted January 19, 1981.

Some of the information requested has been previously addressed in the January 19, 1981 submittal. In such cases the volume, chapter, section, and page number where the information can be found is listed. All items have been responded to as completely and accurately as possible.

If you have any questions or comments, please do not hesitate to contact this office.

Thank you very much.

Respectfully submitted,



Allen D. Emmel  
Environmental Planning Coordinator

ADE/ac

Enclosures

cc: File

# TOWER RESOURCES, INC

P. O. BOX 1027  
PRICE, UTAH 84501  
(801) 637-5385

June 5, 1981

Mr. Donald Crane  
Regional Director, Region V  
U.S. Department of the Interior  
Office of Surface Mining  
Brooks Tower  
1020 15th Street  
Denver, Colorado 80202

Dear Mr. Crane:

Enclosed herewith please find seven (7) copies of Tower Resources' response to the "Apparent Completeness Review" of the Mining and Reclamation (Centennial Project) submitted January 19, 1981.

Some of the information requested has been previously addressed in the January 19, 1981 submittal. In such cases the volume, chapter, section, and page number where the information can be found is listed. All items have been responded to as completely and accurately as possible.

If you have any questions or comments, please do not hesitate to contact this office.

Thank you very much.

Respectfully submitted,



Allen D. Emmel  
Environmental Planning Coordinator

ADE/ac

Enclosures

cc: File

## Addendum B

Tower Resources, Inc.  
Centennial Project

Mining and Reclamation Plan  
(Submitted January 19, 1981)

### Response to Apparent Completeness Review

#### Introduction

This is Tower's response to the "Apparent Completeness Review" for its Mining and Reclamation Plan, Centennial Project. Each item is responded to in order of listing in the Apparent Completeness Review. Information required by several of the items has been previously addressed in Volumes I and II of the Mining and Reclamation Plan submitted January 19, 1981. In such cases the chapter, section, and page number where the information can be found is listed. All items have been responded to as completely and accurately as possible.

#### UMC 771.27 (pp 6) - Verification of Application

Mr. Samuel C. Quigley, General Manager - Western Operations, verified the application as an official of Tower Resources, Inc. Mr. Quigley has been appointed lawful attorney for Tower Resources, to sign and execute any applications for permits and approvals required by federal, state, and local regulations for the development and operation of a coal mine and related activities. Refer to the copy of the Power of Attorney included as Appendix D.

#### UMC 782.13(a)(3)(pp 8) - Identification of Interests

There are no lessors of surface rights in affected areas. Refer to Chapter II, 3.1-1 (p 8) "No other private or state land will be impacted by surface facilities".

The following should be added to Chapter II, 3.1-3 (p 11) "Owners of Property Contiguous to the Permit Area":

J. and S. Critchlow  
Route #1, Box 331  
Price, Utah 84501

Pacific Gas and Electric (Eureka Energy)  
1010 Kearns Building  
136 South Main Street  
Salt Lake City, Utah 84101

Chapter II, 3.1-3 (p 11), "State of Utah, 1588 West North Temple Street, Salt Lake City, Utah", should be changed as follows:

Division of State Lands  
231 East 400 South  
Salt Lake City, Utah 84111

Tower's operation will not adversely affect any other existing contiguous leased mineral rights.

MSHA Identification No. 42-01474 applies only to the existing mine and mine portals.

UMC 782.14(c)(5)(pp 13) - Compliance Information

Regarding violations NOV-80-1-18-2:

#1 of 2 (Failure to retain non-waste material) - abated by demonstration of slope stability as required. (This slope stability study as reformed by Rollins, Brown and Gunnel, February, 1981 is included as Appendix E).

#2 of 2 (Failure to monitor groundwater) - abated by revised ground water monitoring program. (This monitoring program is included in the Hydrologic Inventory, February, 1981, by Vaughn Hansen Associates, submitted as part of Addendum A).

UMC 782.16(a)(pp 19) - Areas Unsuitable for Mining

The terminus of the county road is located 1,200 feet north of the south 1/4 corner, Section 7, T.13S., R.11E. Refer to Plate XIX for the exact location and spatial relationship to surface activities. Board action may be necessary if required by the Division (See Appendix H).

UMC 782.17 (pp 19-20) - Permit Term

The application is for a permit term of five years. Refer to Chapter II, F.1 - "The requested term of the permit is for five years".

Regarding demonstration of need for financing, the permit term will be for five years with renewals. The requested permit term is not longer than five years [UMC 786.25(a)]. Refer to Plates V-R, VI-R, and VII-R, showing the five year projections for mining sequence.

Previously disturbed areas at existing facilities are shown on Plate XIX. Disturbed areas at the proposed portal sites are also shown on Plate XIX.

### UMC 782.19 (pp 21-22) - Other Licenses and Permits

Permits and licenses for mining in all three seams:

- 1) This Mining and Reclamation Plan (Centennial Project), submitted January 19, 1981 will apply to all three seams.
- 2) The Mining and Reclamation Plan submitted in 1976 under the 211 regulations applies to all three seams and should be considered as part of the current plan.
- 3) All new MSHA permits will be obtained for each the Lower Sunnyside and Aberdeen Seams.
- 4) Other new surface permits to be obtained for each seam will include the following:
  - a) Revised N.P.D.E.S. Permits
  - b) Revised Septic and Waste Disposal Plans for possible new bathhouse facilities
  - c) P.S.D. permit not required
  - d) No new B.L.M. Right-of-Ways will be required - once this Mining and Reclamation Plan is approved.

### UMC 783.12 - General Environmental Resources

Construction dates for the proposed facilities are as follows:

Lower Sunnyside Mine - construction scheduled to begin during the third quarter of 1981.

Aberdeen Mine - construction scheduled to begin during the second quarter of 1982.

Mining sequences in accordance with five year permit terms for each seam are shown on Plates V-R, VI-R, and VII-R. The conceptual layouts for the proposed Lower Sunnyside and Aberdeen facilities are shown on Plate XIX.

### UMC 783.14 - Geology

Plate XXII is a cross section indicating the stratigraphic location of the springs in relation to the coal seams.

Regarding UMC 784.11 (b)(4), there will be no spoil, processing, development, or non-coal waste, nor removal, handling, storage, transportation, or disposal thereof.

### UMC 783.15/783.16 - Groundwater/Surface Water

One year hydrologic baseline data is currently being collected. Collection began October 21, 1980. Refer to the regional groundwater and surface water information included in the Hydrologic Inventory performed by Vaughn Hansen Associates (Addendum A).

### UMC 783.15 - Groundwater

Regarding groundwater monitoring, refer to the revised Groundwater Monitoring Program in the Hydrologic Inventory (p. 22) in Addendum A. As stated in this report, the new monitoring program supercedes the previous submission.

### UMC 783.16 - Surface Water

Surface water information in the Hydrologic Inventory (Addendum A) covers all major drainages and proposed facility locations. Also Plate XXIII depicts specific watersheds for existing and proposed facilities; and all diversions, culverts, and sedimentation ponds for these facilities are indicated on Plate XIX.

The following change should be made to Table 5 of the Hydrologic Inventory (Addendum A):

Water Use Claim No.:	91-3663
Owner:	Jay L. Critchlow
Source:	Big Summit Creek

Regarding Water Use Claim No. 91-2571, refer to Table 1 of the Hydrologic Inventory (Addendum A).

### UMC 783.18(a) - Climatological Information

As stated in Chapter IV, C.1., precipitation data were collected at Price. As referenced, the source of this information is the U.S. Weather Bureau. This information was obtained from the area B.L.M. office.

There have been no on-site measurements of wind speed and direction. However, state air quality ambient air conditions from the Huntington Canyon monitoring station are considered applicable. It should also be pointed out that a P.S.D. Permit is not required and that State Air Quality Approval Order has been issued for 960,000 tpy.

### UMC 783.19 - Vegetation Information

Information concerning threatened and endangered species was obtained from the 1979 U.S.D.I., Final Environmental Statement - Development of Coal Resources in Central Utah, Site Specific Analysis, Part 2 (p. DC-II-6, part 5). As referenced in this publication:

Welsh, S.L. 1977, Endangered and threatened plant species of the central coal lands, Utah: Provo, Utah, Brigham Young University: 48 p.

According to verbal communication with the Division of Oil, Gas, and Minerals, March 29, 1981:

O.S.M. has agreed that the range site method is sufficient for measuring revegetation success. Therefore, no reference areas will be required.

Future disturbed areas will be evaluated using approved range site methods.

UMC 817.21-25 - Soil Resource Information

Previously disturbed areas are partially indicated on Plate XIII by the symbol "DM" (mine dumps). Also refer to revised Plate XIX indicating previous disturbed areas.

Detailed studies, specifically Order I surveys, will be performed for areas to be disturbed in the vicinity of proposed facilities; as required by the D.O.G.M. guidelines.

Laboratory data will be forthcoming for each major soil horizon as well as for the soil presently stockpiled.

Soil characteristics will be modified to support required vegetation.

UMC 783.24 - Maps: General Requirements

Plates V-R, VI-R, and VII-R indicate the size, sequence, and timing of mining by years.

There are no pipelines or transmission lines over the mine as indicated on Plate I.

The extent of the public road right-of-way is indicated on Plate XIX. As previously stated, the terminus of this road is 1,200 ft. N of the S-1/4 corner, section 7, T.13S., R.11E.

UMC 783.25 - Cross-sections, Maps, and Plans

All existing and proposed face-up areas are shown on Plate XIX.

UMC 783.27 - Prime Farmland Investigation

A letter of negative determination on Prime Farmland from the Soil Conservation Service will be forthcoming.

### UMC 784.11 - Operation Plan: General Requirements

The type and method of mining including the sequence of development and retreat mining, size of pillars, roof spans, and barrier pillars are described in the Roof Control and Ventilation Plans previously submitted.

Plates V-R, VI-R, and VII-R show the mine plans, reflecting the "mirror image" of underground workings.

Construction and removal of surface structures, as well as reclamation at the proposed Lower Sunnyside and Aberdeen Mines will be similar to methods described for the Pinnacle Mine. Included as Appendix F are narrative descriptions of the surface facilities and reclamation procedures for each proposed mine.

No waste rock leaves the mine. According to MSHA regulations, it is allowable to store such waste rock underground as long as there is very little associated coal. MSHA plans show typical pillar extraction.

### UMC 784.12 - Operation Plan: Existing Structures

All structures (ponds, etc.) were constructed as per specifications included in the engineering plans regarding locations, depths, and areas. Refer to Plate XX, a North-South Cross-Section of existing facilities through the sedimentation ponds.

A slope stability study by Rollins, Brown, and Gunnel is included in this Addendum as Appendix E. It should be noted that the area of this study is the most extreme slope on the permit area. This slope stability study is an engineering analysis of the fills and cuts. Also refer to Plates XX and XI.

Two intake portals are shown on Plate VIII, one labeled "Intake Air", the second labeled "Sec. Intake Air" and also on Plate XIX.

The bathhouse drainfield along with the location of the sewage line and cleanouts are shown in Exhibit III-D. The existing bathhouse is designed for 45 employees. Additional facilities will be constructed as indicated on Plate XIX according to the same specifications and will conform to State Health regulations.

### UMC 784.13 - Reclamation Plan: General Requirements

All disturbed areas and areas to be disturbed are indicated on Plate XIX. All disturbed areas will be reclaimed. Reclamation of these specific sites is discussed in the narratives describing proposed surface facilities for the Lower Sunnyside and Aberdeen Mines included as Appendix F.

A revised bond estimate including all three minesites is included as Appendix G.

Plate XX indicates a typical final reclamation (original) contour at the Pinnacle Mine. As discussed in the text, present land use consists of grazing and hunting. Due to the limited resources both physical and scenic, and considering the extent and nature of similar lands in the Book Cliffs, no uses other than the present uses can be forecast. These uses are also consistent with surface owner plans. All disturbed land will be restored in a timely manner according to Chapter III, part E, to conditions that are capable of supporting the uses they were capable of supporting before mining. Therefore, based on revegetation success, post-mining land use may not require re-contouring.

Exhibit IV-C (Order I Soil Survey) contains information regarding quantification and thickness of soils in the vicinity of the existing mine. Additional soil information will be supplied for areas of proposed disturbances according to Division guidelines. However, through personal communication, the S.C.S. has indicated that identical soils and conditions will be encountered at the proposed mine sites.

The seeding mix in the application is very general and based on the general area, while the seeding mix describing past seeding (SCS letter of September 3, 1980) is specific and based on the Order I survey of the minesite.

Mulch appears to Tower to have been adequately anchored, or to at least have served its purpose, since current revegetation success is excellent.

Revegetation information will be based on soil and range surveys. Revegetation success will be measured according to Division guidelines.

Six acres have been revegetated. No final reclamation or revegetation has been done. Total number of acreage to be revegetated is approximately 15 acres.

Post-construction contemporaneous reclamation has been completed for the Pinnacle Mine. Post-construction contemporaneous reclamation for the Lower Sunnyside Mine will be carried out immediately following completion of construction activities. Post-construction contemporaneous reclamation at the Aberdeen minesite will be carried out immediately following completion of construction activities. Revegetation at these proposed sites will consist of reseeding with the mix recommended by the S.C.S. Final reclamation will be carried out upon completion of mining activities as described in Appendix F.

Septic tank solids are collected and disposed of by a septic tank cleaning company. No oil or grease are or will be disposed of outside of the mine.

Regarding disposal of debris developed during removal of facilities, some will be salvaged and that to be scrapped will be hauled to a landfill or other acceptable site.

All mine openings will be sealed with solid concrete block seals.

UMC 784.14 - Reclamation Plan: Protection of Hydrologic Balance

Refer to the Hydrologic Inventory by Vaughn Hansen Associates (Addendum A) and to the response to UMC 784.16.

UMC 784.15(a)(3) - Reclamation Plan: Post-Mining Land Uses

There are no proposed land use changes, with the only proposed disturbances to be on fee or B.L.M. land. John and Sophia Critchlow currently use the land solely for grazing and intend to use the land solely for grazing. Surface owner plans therefore appear to be consistent with underground mining. As stated in the text, no comments have been received from the surface owner, consequently none have been provided.

UMC 784.16 - Reclamation Plan: Ponds, Impoundments, Etc.

Regarding removal of diversions, ponds, and culverts, refer to Chapter V, 4.1-1.2 (p 73), "All drainage control structures will be removed upon completion of mining activities according to reclamation plans". Also refer to Chapter III, 3.1.

All proposed and existing drainage control structures are shown on Plate XIX.

"Attached maps" referenced in Exhibit III-A is Plate VIII.

Drainage control designs for the proposed facilities will be forthcoming.

As stated previously all drainage control structures, including ponds, are to be removed upon cessation of mining operations. Refer to Chapter IV, 4.1-1.2 and Chapter III, 3.1. The performance bond indicates that all structures will be removed.

Any sediment removed from the ponds will be transported to a nearby landfill or, after chemical analysis, will be used for reclamation as a growth medium according to recommendations by the Division.

UMC 784.17 - Protection of Public Parks and Historic Places

Maps indicating the boundaries of the archaeological survey are included in Exhibit IV-E. Approximately 315 acres, over 10% of the lease area, has been surveyed. Existing and proposed surface disturbance is indicated on Plate XIX.

Assessments of the eligibility or ineligibility for listing in the National Register of Historic Places of the sites in question will be addressed in a forthcoming letter from Bruce Hawkins of the Utah State Historical Society.

Regarding selection of survey areas, as stated in the Walker Survey (p 4), "The main impact (of operations) would be on the canyon floor and this is why it was intensively surveyed". Also as stated in the abstract of the Hawkins survey, "The survey portions were small sections of the valley floor that have been selected for development by Tower Resources..."

Items 16 and 17, although not completed on several of the forms are referenced by Hawkins on pages 36 and 38 of his survey, "Recommendations".

#### UMC 784.18 - Relocation or Use of Public Roads

A public hearing to allow retention of the public road at the present location will be held if required by the Division.

A letter of approval from Carbon County Authorities pursuant to UMC 761.12(d) is included as Appendix H.

#### UMC 784.20 - Underground Development Waste

Page 45 does not make reference to the development of underground rock waste. However, any rock waste that may be developed as a result of ventilation procedures (overcasts) will be disposed of underground (that is the immediate roof). Also refer to the response to UMC 784.11 (b)(4) in this Addendum.

#### UMC 784.20 - Subsidence Control Plan

Subsidence monitoring stations will be set up in areas where possible surface effects of subsidence might be expected. The proposed locations of these stations are indicated on Plate XXIII. However, according to the sequence of mining indicated on Plates V-R, VI-R, and VII-R, no pillars will be extracted until the first quarter of 1983 (Lower Sunnyside Seam). Prior to any extraction, monitors will be set up.

Subsidence monitors will consist of lengths of appropriately sized rebar, cemented into the ground on 500' centers over an area of pillar extraction. The rebar will be situated such that an appropriate length protrudes above the surface. The elevations of the protruding rebar can then be surveyed periodically from established control points. Thus any subsidence which may occur can be measured. These stations will be measured twice each year for two years after extraction has been completed. The accuracy of measurement will be to 1' horizontal and vertical.

This proposed subsidence monitoring plan will be amended according to recommendations of the regulatory authorities.

#### UMC 784.23 - Operation Plan: Maps and Plans

Conceptual lay-outs for the two additional portal areas are shown on Plate XIX.

#### UMC 784.24 - Transportation Facilities

The access and haulroad to the existing minesite is a county road. Also refer to Plates XIX, XX, XXI, and Appendix H.

#### UMC 784.26 - Air Pollution Control Plan

The conditions indicated in Mr. Bradford's letter (Exhibit II-A) have been met. Production is far below the 960,000 tpy limit; there are no storage piles on the site, but rather a "live" coal pile; the existing conveyor is covered and all proposed conveyors will be covered; the rail loadout area does not belong to Tower; visible emissions and fugitive dust do not exceed 20% opacity; and a record of chemical stabilization of the roads has been kept and is included as Appendix I.

#### UMC 785.19 - Alluvial Valley Floors

Concerning alluvial valley floors, refer to the watershed map, Plate XXIII. The alluvial valley floor determination by Vaughn Hansen (Addendum A) is based on a detailed hydrologic survey of the area. It is also based on the Doelling (1972) survey of the area in which there were no alluvial deposits identified within a two mile radius of the mine plan area.

#### UMC 785.21 - Support Facilities

The Mining and Reclamation Plan submitted in 1978 and approved by the State contains the required rail loadout information. This Plan should be considered as part of the current submission. The only portion of the loadout information excluded from the January 19, 1981 submittal is that concerning a wash plant facility.

#### UMC 806.12 - Terms and Conditions of the Bond

The escrow account will be updated based on a revised reclamation bond estimate which includes the proposed minesites. This updated Reclamation Cost Projection is included as Appendix G.

#### UMC 806.14 - Liability Insurance

Compensation Policy BC44913 and Comprehensive General Liability Policy ZC34668 will be renewed effective July 1, 1981 and will continuously be renewed over the life of the mining operations.

#### UMC 817.97 - Fish and Wildlife Protection

Included as Appendix J is fish and wildlife resource information for the mine plan area as compiled by the Division of Wildlife Resources as required by UMC 783.20. Also so included is the Division's recommended fish and wildlife plan for the mine plan area. These recommendations are consistent with the performance standards of UMC 817.97. Tower will follow these recommended mitigation and impact avoidance procedures in all possible instances.

Data concerning mule deer, mountain lion, black bear, and elk was obtained, as referenced, from the 1979 U.S.D.I., Final Environmental Statement - Development of Coal Resources in Central Utah, Part 1 and 2.

General specifications for the transmission line are included as Appendix K. This transmission line was designed to provide for protection of raptors.

Information concerning threatened and endangered species was obtained from the 1979 U.S.D.I., Final Environmental Statement - Development of Coal Resources in Central Utah, Part 2, Site Specific Analysis (p DC-II-6, part 6). As referenced in this statement:

Boner, T.C. 1977, Final report - Endangered and unique terrestrial wildlife species within the coal study area: Utah State Division of Wildlife Resources report to Bureau of Land Management on contract no. YA-512-C26-257.

Wildlife habitat will be enhanced, where possible, by using the seed mixes recommended by the Division of Wildlife Resources during revegetation.

Mitigation procedures for restoration of any disturbed riparian habitat will consist of avoidance where possible. Any disturbance to such habitat will be minimal and will be reclaimed as soon as practical after mining operations have ceased. Revegetation will consist in this instance of replacing vegetation common to the riparian habitat. Current plans call for no disturbance of riparian habitat.

#### Road to Drill Water Well into Old Mine Workings

See Appendix L

APPENDIX D



APPENDIX E

SLOPE STABILITY INVESTIGATION

TOWER RESOURCES, INC.  
PINNACLE MINE

PRICE, UTAH

FEBRUARY 1981

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ROLLINS, BROWN AND GUNNELL, INC.

PROFESSIONAL ENGINEERS

1435 WEST 820 NORTH, P.O. BOX 711, PROVO, UTAH 84601  
TELEPHONE 374-5771

SLOPE STABILITY INVESTIGATION

TOWER RESOURCES, INC.  
PINNACLE MINE

PRICE, UTAH

FEBRUARY 1981

ROLLINS, BROWN AND GUNNELL, INC.  
Professional Engineers  
1435 West 820 North, P.O. Box 711, Provo, Utah 84601

ROLLINS, BROWN AND GUNKELL, INC.

PROFESSIONAL ENGINEERS

February 13, 1981

Tower Resources, Inc.  
P.O. Box 1027  
Price, Utah 84501

ATTENTION: Mike Glasson

Gentlemen:

A slope stability investigation has been completed at the site of the Pinnacle Mine surface facilities north of Price, Utah. The investigation was performed to determine the factor of safety of an existing roadway located near the mine facilities. The work has been completed in accordance with a written proposal submitted to your organization for the work, and the results of the investigation are outlined in the following sections of this report.

The information contained in the report is discussed under the following headings: (1) geological and existing site conditions, (2) subsurface soil and water conditions, (3) the results of field and laboratory tests, (4) the results of a stability analysis performed for the roadway profile, and (5) summary and conclusions.

1. Geological and Existing Site Conditions

The Tower Resources, Inc. mine facilities are located on the northwestern flank of a large anticline which existed in tertiary time about fifty million years ago. The center of the anticline was located near the San Raphael Swell about sixty miles south of Price, Utah. The center of the anticline has been removed by erosion and a steep erosional escarpment characterizes the periphery of the anticline. Many steep-walled canyons have been eroded through the periphery of the anticline and the Tower Resources mining facilities are located in one of these canyons.

The principal geological formation in the area is the Blackhawk Formation, which is characterized by interbedded sandstones, mudstones, shales and coal. The general layout of the Pinnacle Mine surface facilities is presented in Figure No. 1 and the topography of the existing area prior to the construction of the surface facilities is presented in Figure No. 2.

The roadway where the stability analysis has been performed is located on fill formed from material blasted out of the mountainside. We understand that the fill material was permitted to reach equilibrium under the forces of gravity and no special provisions have been made for the densification or shaping of the existing fill.

A profile through the roadway, showing the approximate location of the original natural slope, the roadway cut, and the fill material is presented in Figure No. 3.

## 2. Subsurface Soil and Water Conditions

Based upon field observations, the most critical slope, insofar as stability is concerned, was selected along the line designated as AB. The characteristics of the subsurface material along this profile were defined by drilling one test hole to a depth of approximately 40 feet and excavating seven test pits along the slope of the fill material. The location of the drill hole and the test pits is presented in Figure No. 1.

The log for the test hole is presented in Figure No. 4, and it will be observed that the fill material extends to a depth of approximately 24 feet below the roadway surface. The natural material below the fill consists of a weathered shale layer, a fine coal seam, and sandstone. The fill material generally consists of silty, sandy gravel intermixed with coal refuse.

During the drilling of the test hole, sampling was performed at approximately 3-foot intervals throughout the upper portion of the soil profile and at 5-foot intervals thereafter. Continuous cores were obtained in the lower portion of the drill hole.

Samples were obtained by driving a 2-inch split spoon sampling tube through a distance of 18 inches, using a 140-pound weight dropped from a distance of 30 inches. The number of blows to drive the sampling spoon through each 6 inches of penetration is presented on the boring logs.

The sum of the last two blow counts, which represents the number of blows to drive the sampling spoon through 12 inches, is defined as the standard penetration value. The standard penetration value provides a reasonable indication of the in-place density of sandy material; however, some caution must be exercised in interpreting the results of penetration values in gravelly type soils, particularly where the size of the gravel particles is greater than the inside diameter of the spoon.

The results of the standard penetration tests performed at this location indicate that the fill material in the upper 15 feet of the soil profile is in a relatively loose condition. Below a depth of 15 feet, the fill material appears in a more dense state.

In-place density tests were performed in each of the test holes excavated along the slope, as shown in Figure No. 1. The results of these tests indicate that the in-place density of the fill material varies from 82 pounds per cubic foot to 110 pounds per cubic foot.

Each sample obtained during the drilling operations was classified in the laboratory according to the Unified Soil Classification System. The symbols designating the soil type according to this system are presented on the boring logs. A description of the Unified Soil Classification System is presented in Figure No. 5, and the meaning of the various symbols shown on the boring logs can be obtained from this figure.

Each sample obtained in the test pit was also classified according to the Unified Soil Classification System, and the symbols designating the soil type are presented in Table No. 1, Summary of Test Data.

No groundwater was encountered in the test boring drilled at this site, and it is not anticipated that any groundwater will be located within the fill material at this location.

### 3. The Results of Field and Laboratory Tests

The field and laboratory tests performed during this investigation to define the characteristics of the fill material include standard penetration tests, in-place unit weight, natural moisture content, mechanical analysis, and triaxial shear tests.

The standard penetration tests performed during the field investigations have been previously discussed, and the results of these tests are presented on the boring log.

As indicated earlier in this report, in-place density tests were performed in each of the test pits excavated along the slope of the fill. The results of these tests, along with the natural moisture content, are presented in Table No. 1, Summary of Test Data. The in-place density values varied from about 82 to 110 pounds per cubic foot, while the natural moisture content varied from about 8.6 to 13.9 percent.

The results of the mechanical analysis performed on each of the samples obtained from the test pits are presented in Table No. 1, Summary of Test Data, and it will be observed that the fill material appears to be relatively well-graded with an appreciable quantity of the material in the silt and clay size range.

The results of the mechanical analysis performed on samples obtained from the test hole are also shown in Table No. 1, and it will be observed that the gradation of this material compares favorably with the gradation of the material obtained from the test pits.

Moisture-density relationships were determined for material obtained from Test Pit Nos. 4 and 7, and the results of these tests are presented in Figure Nos. 5 and 6. The moisture-density relationships were determined in accordance with ASTM D 698-70, which is commonly known as the Standard Proctor. It will be observed that the maximum density varied from about 103.4, for the sample obtained from Test Pit No. 4, to 117.0 pounds per cubic foot, for the sample obtained from Test Pit No. 7.

The strength characteristics of the existing fill material were defined by performing three consolidated, drained, tri-axial shear tests on representative samples of the Minus No. 4 material obtained from Test Pit Nos. 2, 4 and 7. The results of these tests are presented in Figure Nos. 7 through 9. The moisture content and the density to which each sample was compacted is shown for each of the samples tested. It will be noted that the in-place density of the samples ranged from 88 to 99 pounds per cubic foot.

The friction angle for the three tests performed ranged from 30.5 degrees to 33 degrees, while the cohesion varied from 0, for the sample obtained from Test Pit No. 7, to 2300 pounds per square foot, for the sample obtained from Test Pit No. 2.

It is our opinion that these tests provide a reasonable indication of the strength characteristics of the subsurface material within the existing fill.

#### 4. The Results of the Stability Analysis

A. Method of Analysis. The method of analysis used in the stability computations during this investigation followed a procedure outlined by Spencer. Spencer's method satisfies both force and moment equilibrium and is recognized as a satisfactory slope stability procedure. The computer program used in the analysis was developed by Stephen Wright of the University of Texas, and involves a search routine to determine the critical failure surface. The program is capable of performing either a total or an effective stress analysis.

B. Selection of the Shear Strength Parameters. The results of the subsurface investigation performed, both along the roadway and within the slope materials, indicate that no groundwater exists throughout the subsurface profile at this site. Furthermore, there is little indication that the fill material will ever be saturated throughout the life of the facility and that the material will exist in an unsaturated state with the approximate moisture contents as those determined during this investigation. For this reason, it is our opinion that shear strength parameters characteristic of the in-place material should be used in a stability analysis for the fill at this location.

Based upon the results of the triaxial shear tests, a friction angle of 32 degrees and a cohesion not exceeding 250 pounds per square foot have been assumed in this analysis. It is our opinion that a cohesion value of this magnitude is a reasonable assumption, since two of the triaxial shear tests performed indicated cohesive strengths considerably greater than the value indicated above.

Since the subsurface materials throughout the site contain an appreciable quantity of material in the silt and clay size range, and since the material is unsaturated, it would be expected that the fill material would possess some cohesion due to capillary effects. In performing the stability analysis, an in-place unit weight equal to 102 pcf was assumed for the fill material.

C. The Results of the Analysis. The stability analysis was performed assuming a profile through the roadway as shown in Figure No. 3. The line designating the original natural slope was based upon observations along the roadway, along with the depth at which bedrock was encountered in the drill hole. Since the strength of the bedrock is substantially greater than the strength of the fill material, it was assumed in the stability analysis that the failure surface would not extend below the original ground surface line.

Factors of safety were obtained for a friction angle of 32 degrees and cohesion values, varying from 100 to 250 pounds per square foot. The factors of safety associated with the various combinations of friction angle and cohesion are presented in Table No. 2 shown on the following page. The critical failure surfaces for each of the factors of safety shown in the table are presented in Figure No. 3.

Table No. 2  
Factors of Safety for  
Various Shearing Strength Parameters

<u>Friction Angle</u>	<u>Cohesion</u>	<u>Factor of Safety</u>
32	100	1.31
32	150	1.44
32	200	1.56
32	250	1.68

It will be observed that a factor of safety of greater than 1.5 is obtained for a friction angle of 32 degrees and a cohesion value of 200 pounds per square foot. It is our opinion that a cohesion value of 200 pounds per square foot is a conservative estimate of the existing cohesion within the fill material, and that the existing slope has a factor of safety of at least 1.5.

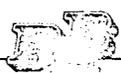
#### 5. Summary and Conclusions

A stability investigation has been performed for a roadway fill in the vicinity of the Pinnacle Mine facilities north of Price, Utah. The roadway fill was formed, in part, from material blasted out of the mountainside. The fill material was permitted to reach equilibrium under the force of gravity and no special provisions were made to densify the fill material.

The characteristics of the subsurface material within the fill were defined by drilling one test hole and excavating seven test pits along the slope of the fill. The results of the field investigations indicate that the fill material is in a relatively low-density state.

The shear strength parameters were determined for the fill material by performing three consolidated, drained, triaxial shear tests on representative samples of the subsurface material. The specimens used in the triaxial shear tests were densified to unit weights approximating those in the fill material. The results of the triaxial shear tests indicated that a friction angle of 32 degrees and a cohesion of at least 250 pounds per square foot could be used to characterize the strength of the fill material.

The results of a computer stability analysis indicate that the slope defined by Figure No. 3 has a factor of safety of at least 1.5 against a slope stability failure.



Tower Resources, Inc.  
Page 7  
February 13, 1981

If there are any questions relative to the information contained herein, please advise us.

Yours truly,

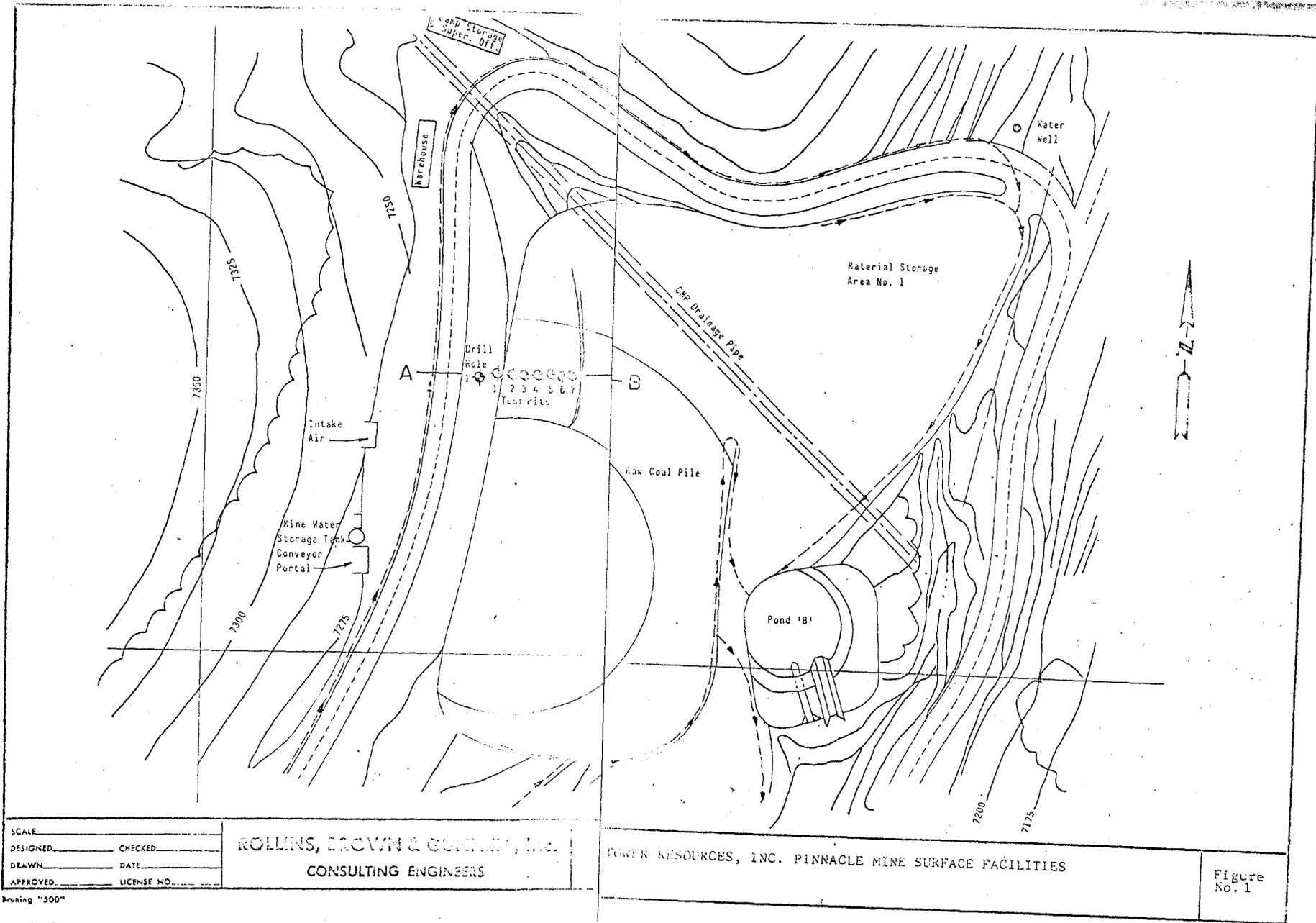
ROLLINS, BROWN AND GUNNELL, INC.

*Ralph L. Rollins*

Ralph L. Rollins

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Enclosures



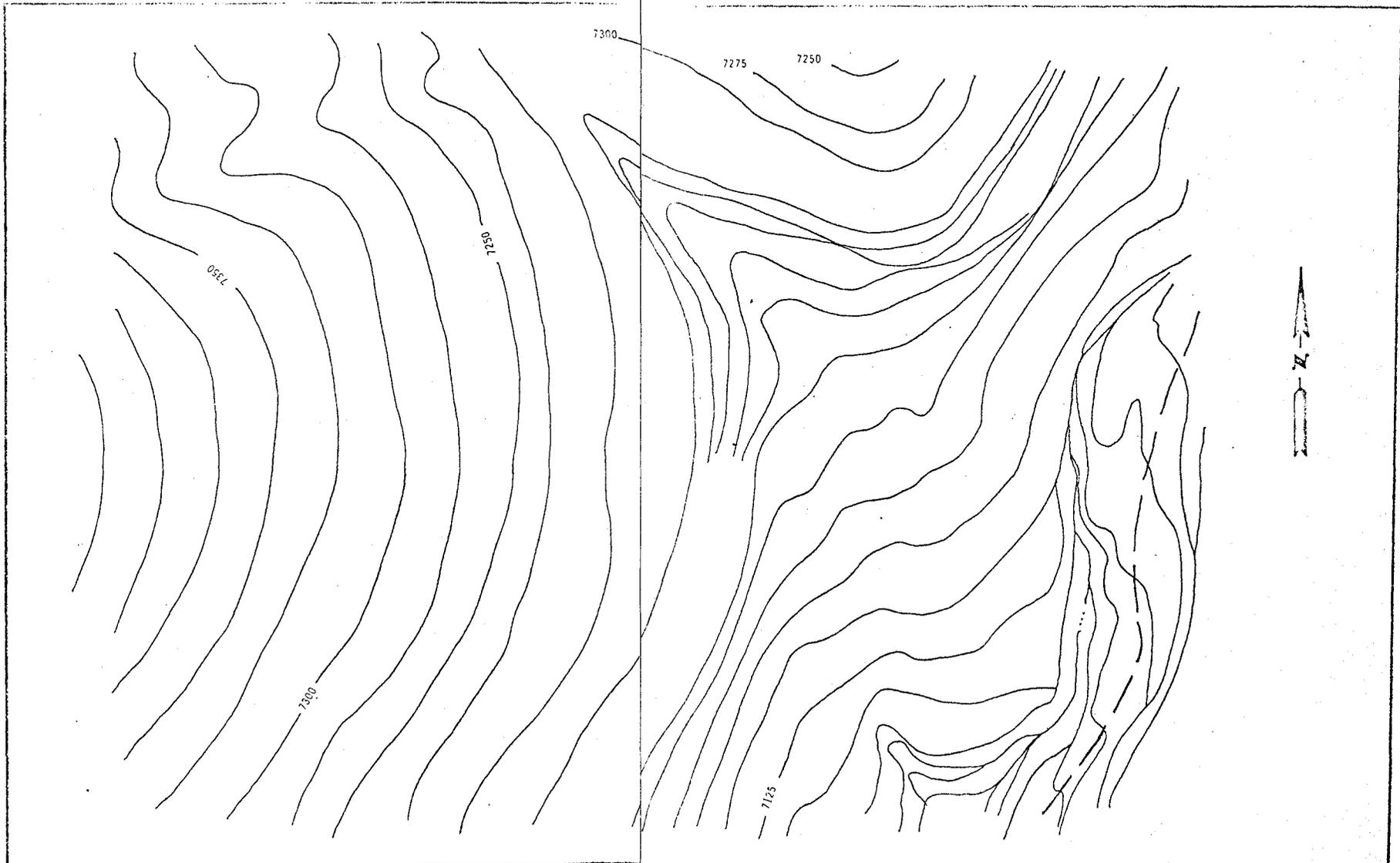
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 DRAWN \_\_\_\_\_ DATE \_\_\_\_\_  
 APPROVED \_\_\_\_\_ LICENSE NO. \_\_\_\_\_

**ROLLINS, BROWN & GUNDEL, INC.**  
 CONSULTING ENGINEERS

POWER RESOURCES, INC. PINNACLE MINE SURFACE FACILITIES

Figure No. 1

Drawing "500"

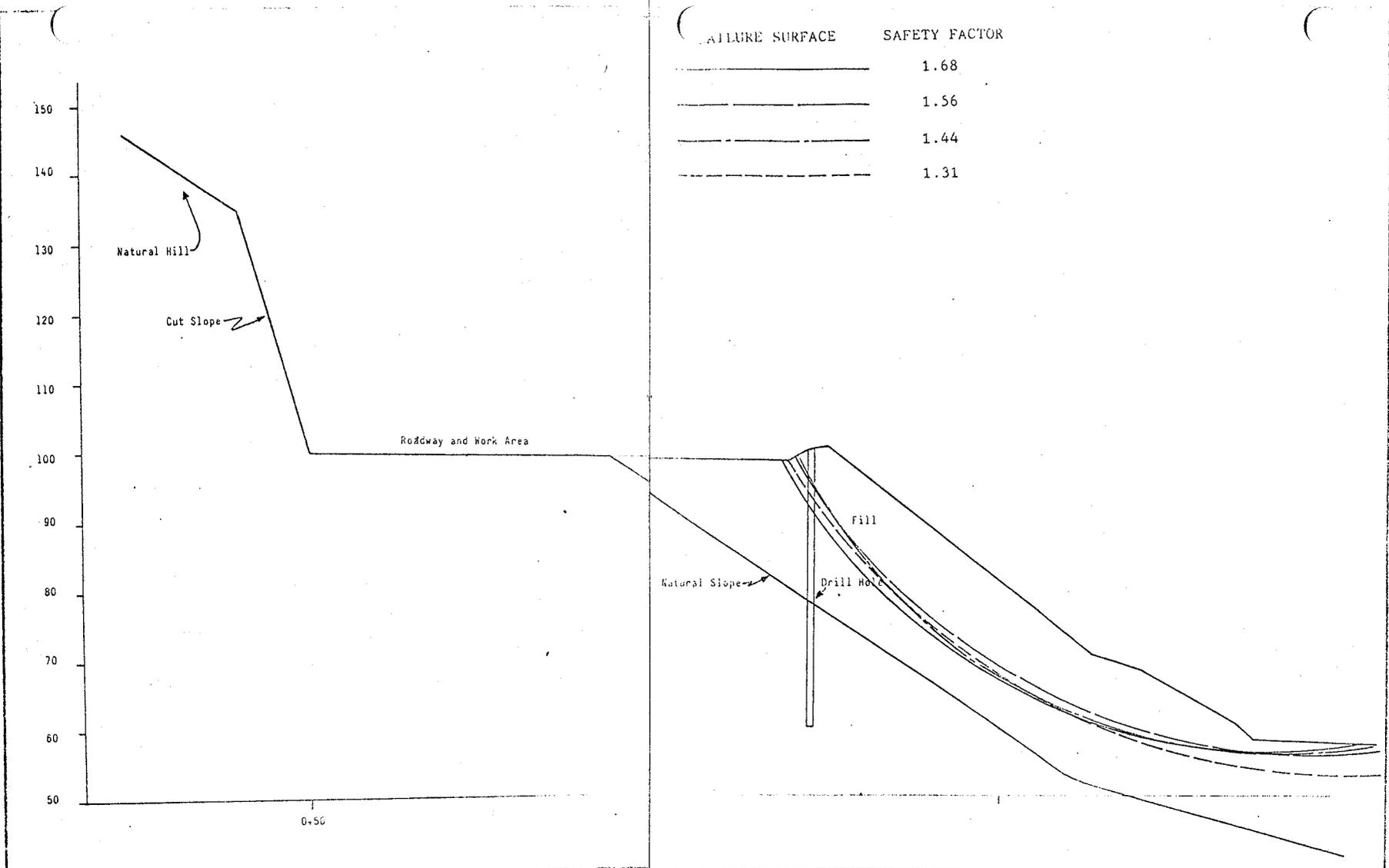


SCALE _____	CHECKED _____
DESIGNED _____	DATE _____
DRAWN _____	LICENSE NO. _____
APPROVED _____	

**ROLLINS, BROWN & GUNNELL, Inc.**  
**CONSULTING ENGINEERS**

NATURAL CONTOUR  
 UNDER RESOURCES, INC. PINNACLE MINE

Figure  
 No. 2



FAILURE SURFACE	SAFETY FACTOR
—————	1.68
-----	1.56
-----	1.44
-----	1.31

SCALE \_\_\_\_\_  
 DESIGNED \_\_\_\_\_ CHECKED \_\_\_\_\_  
 DRAWN \_\_\_\_\_ DATE \_\_\_\_\_  
 APPROVED \_\_\_\_\_ LICENSE NO. \_\_\_\_\_

**ROLLINS, BROWN & GUNNELL, Inc.**  
 CONSULTING ENGINEERS

MINERAL RESOURCES, INC. PINNACLE MINE  
 MINE PROFILE

Figure  
 No. 3

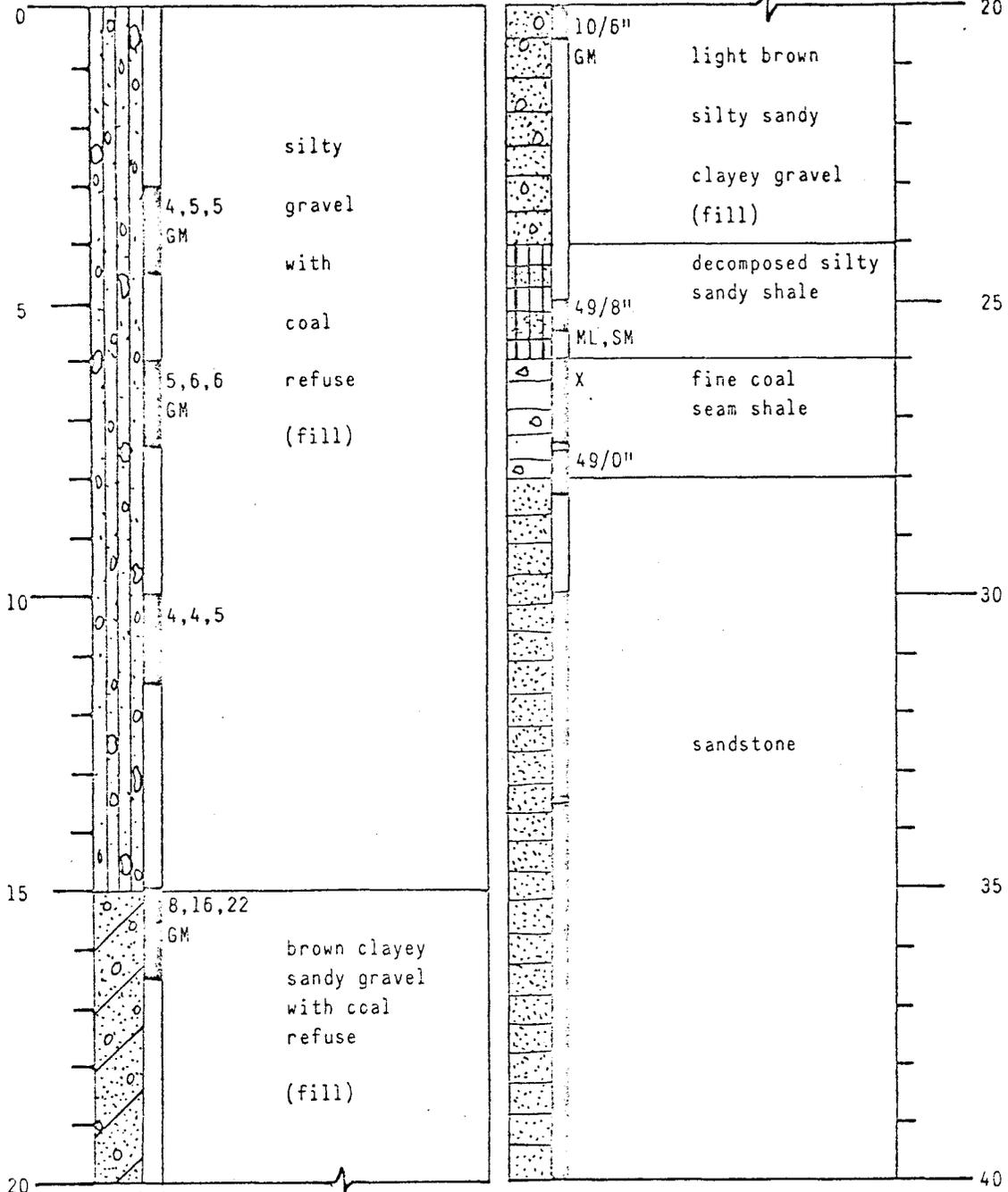
Drawing "500"

DEPTH

Hole No. 1

(Cont'd.)

DEPTH



SAMPLE LOCATION  
 X, 0.61 ← TORVANE VALUE  
 UNDISTURBED SAMPLE  
 7, 11, 12  
 NO. OF BLOWS PER 6" WITH STD. SPOON  
 GROUNDWATER ELEVATION

LEGEND

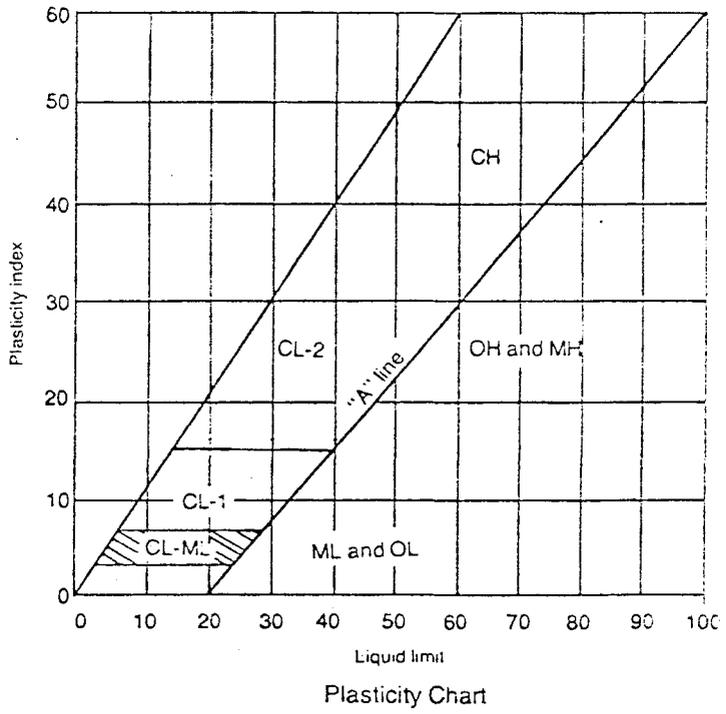
LOG OF BORINGS FOR:  
Tower Resources, Inc.

ROLLINS, BROWN AND GUNNELL, INC.  
CONSULTING ENGINEERS

FIGURE  
No. 4

Unified Soil Classification System

Major divisions		Group symbols	Typical names	Laboratory classification criteria		
Coarse-grained soils (More than half of material is larger than No. 200 sieve size)	Gravels (More than half of coarse fraction is larger than No. 4 sieve size)	Clean gravels (Little or no fines)	GW	Well-graded gravels, gravel-sand mixtures, little or no fines	$C_u = \frac{D_{60}}{D_{10}}$ greater than 4, $C_c = \frac{(D_{30})^2}{D_{10} \times D_{60}}$ between 1 and 3	
			GP	Poorly graded gravels, gravel-sand mixtures, little or no fines		
		Gravels with fines (Appreciable amount of fines)	GM*	$\begin{array}{ c } \hline a \\ \hline c \\ \hline \end{array}$	Silty gravels, gravel-sand-silt mixtures	Atterberg limits below "A" line or P.I. less than 4  Atterberg limits above "A" line with P.I. greater than 7
			GC		Clayey gravels, gravel-sand-clay mixtures	
		Sands (More than half of coarse fraction is smaller than No. 4 sieve size)	Clean sands (Little or no fines)	SW	Well-graded sands, gravelly sands, little or no fines	$C_u = \frac{D_{60}}{D_{10}}$ greater than 6, $C_c = \frac{(D_{30})^2}{D_{10} \times D_{60}}$ between 1 and 3
			SP	Poorly graded sands, gravelly sands, little or no fines		
	Sands with fines (Appreciable amount of fines)		SM*	$\begin{array}{ c } \hline a \\ \hline c \\ \hline \end{array}$	Silty sands, sand-silt mixtures	Atterberg limits below "A" line or P.I. less than 4  Atterberg limits above "A" line with P.I. less than 7
			SC		Clayey sands, sand-clay mixtures	
	Determine percentages of sand and gravel from grain-size curve. Depending on percentage of fines (fraction smaller than No. 200 sieve size), coarse-grained soils are classified as follows: Less than 5 percent ..... GW, GP, SW, SP More than 12 percent ..... GM, GC, SM, SC 5 to 12 percent ..... Borderline cases requiring dual symbols**					
	Fine-grained soils (More than half of material is smaller than No. 200 sieve)	Sils and clays (Liquid limit less than 50)	ML	Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity	Limits plotting in shaded zone with P.I. between 4 and 7 are borderline cases requiring use of dual symbols	
CL			$\begin{array}{ c } \hline 1 \\ \hline 2 \\ \hline \end{array}$	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays		
OL				Organic silts and organic silty clays of low plasticity		
Sils and clays (Liquid limit greater than 50)		MH	Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts	Limits plotting in shaded zone with P.I. between 4 and 7 are borderline cases requiring use of dual symbols		
		CH	Inorganic clays of high plasticity, fat clays			
		OH	Organic clays of medium to high plasticity, organic silts			
		Pt	Peat and other highly organic soils			



\* Division of GM and SM groups into subdivisions of c and u for roads and airfields only. Subdivision is based on Atterberg limits, suffix c used when L.L. is 26 or less and the P.I. is 6 or less, the suffix u used when L.L. is greater than 26  
 \*\* Borderline classifications, used for soils possessing characteristics of two groups, are designated by combinations of group symbols. For example, GW-GC, well-graded gravel-sand mixture with clay binder.

FIGURE 6 SOIL MOISTURE DENSITY RELATIONSHIP  
ASTM D 698-70  
MAXIMUM DENSITY 103.4 LBS. PER CU. FT.  
OPTIMUM MOISTURE 13.5 %

PROJECT: Tower Resources, Inc.  
LOCATION: Pinnacle Mine, Test Pit No. 4

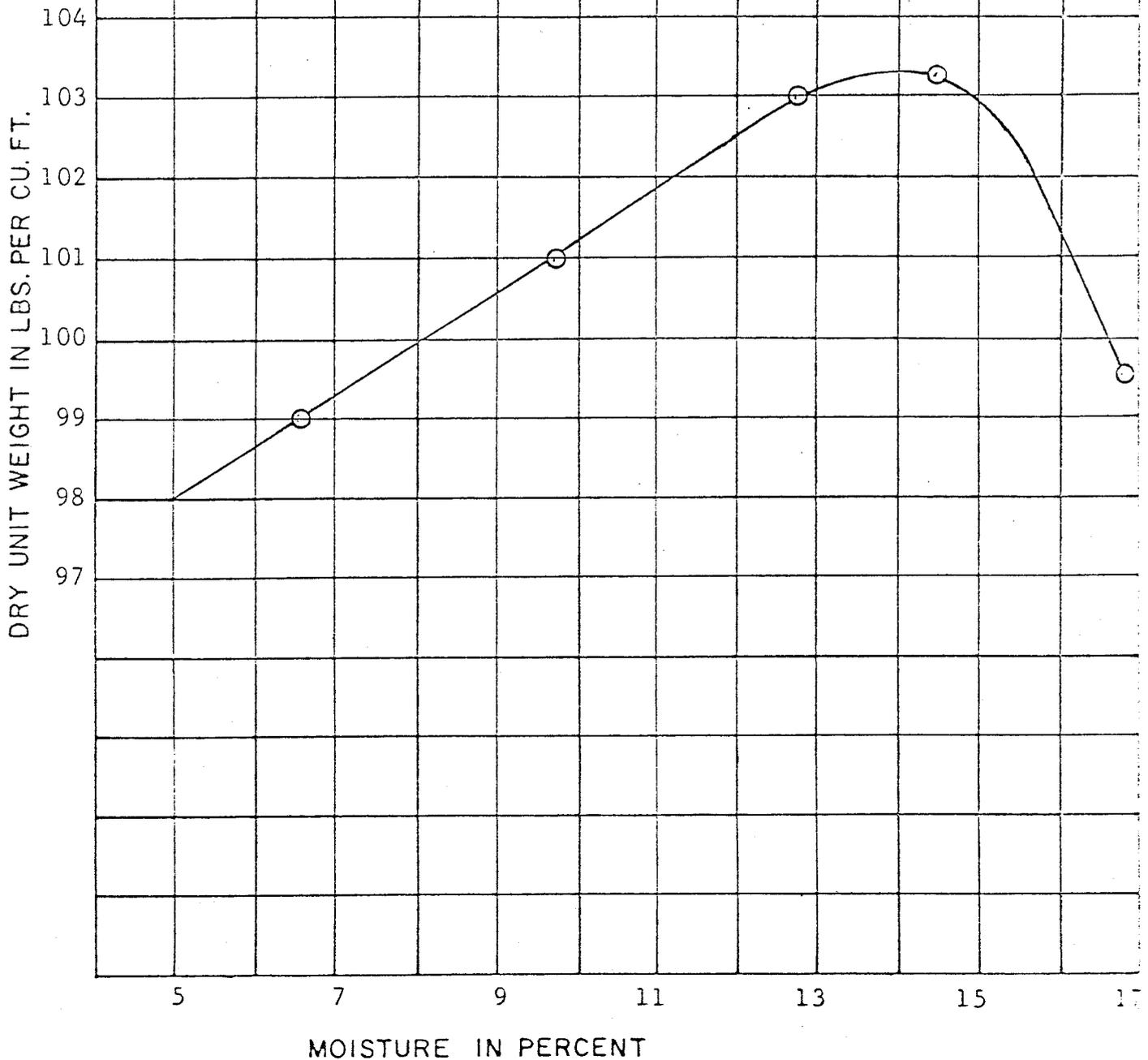


FIGURE 7 SOIL MOISTURE DENSITY RELATIONSHIP  
ASTM D 698-70

MAXIMUM DENSITY 117.0 LBS. PER CU.FT.

OPTIMUM MOISTURE 10.1 %

PROJECT: Tower Resources, Inc.

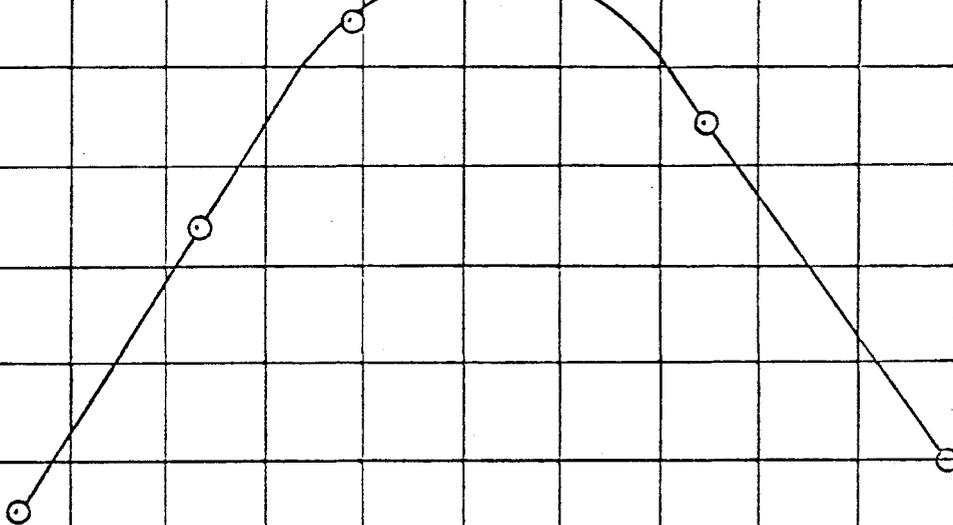
LOCATION: Pinnacle Mine, Test Pit No. 7

DRY UNIT WEIGHT IN LBS. PER CU. FT.

118  
116  
114  
112  
110

2 4 6 8 10 12 14

MOISTURE IN PERCENT



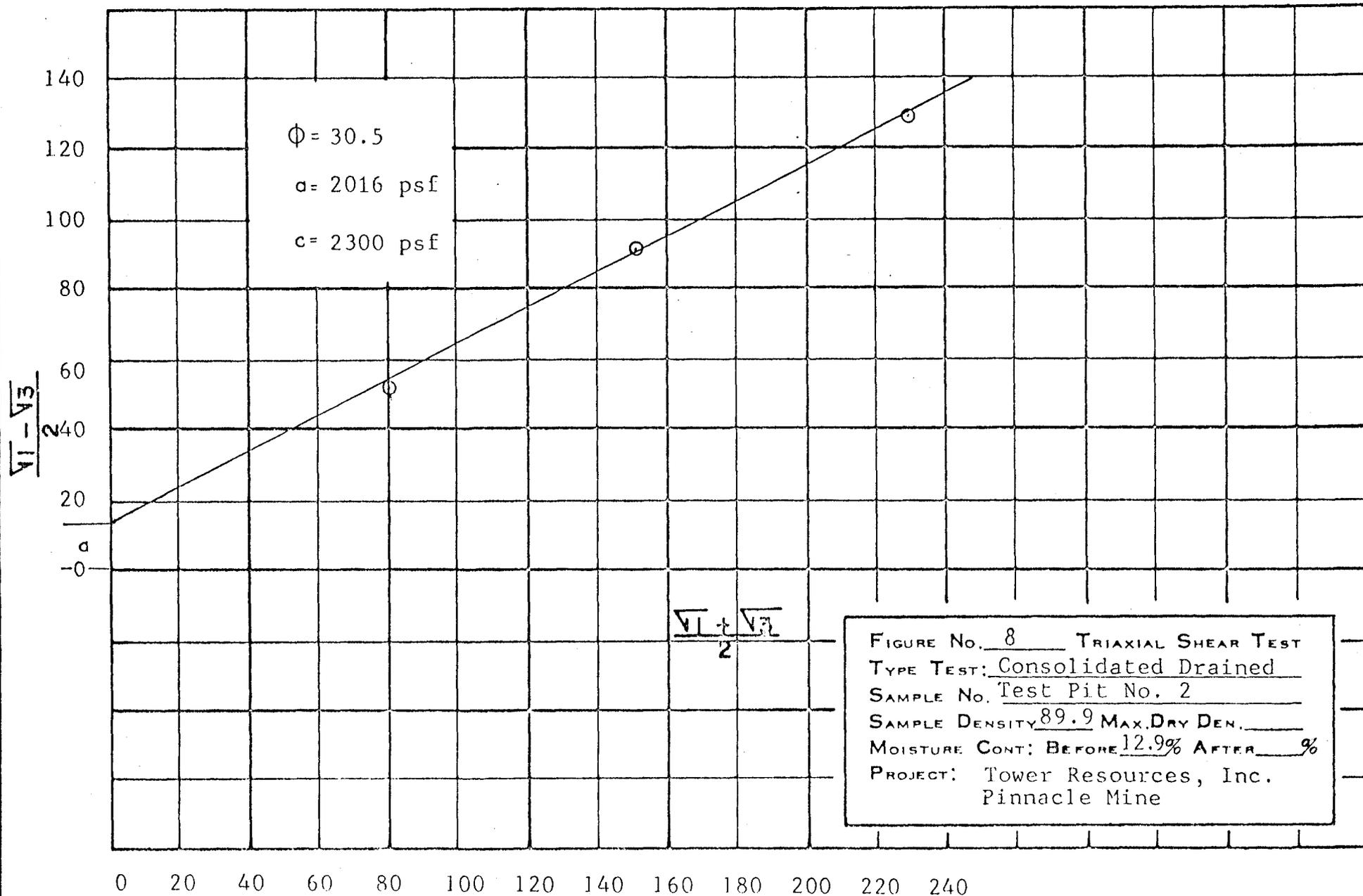


FIGURE No. 8 TRIAXIAL SHEAR TEST  
 TYPE TEST: Consolidated Drained  
 SAMPLE No. Test Pit No. 2  
 SAMPLE DENSITY 89.9 MAX. DRY DEN. \_\_\_\_\_  
 MOISTURE CONT: BEFORE 12.9% AFTER \_\_\_\_\_%  
 PROJECT: Tower Resources, Inc.  
 Pinnacle Mine

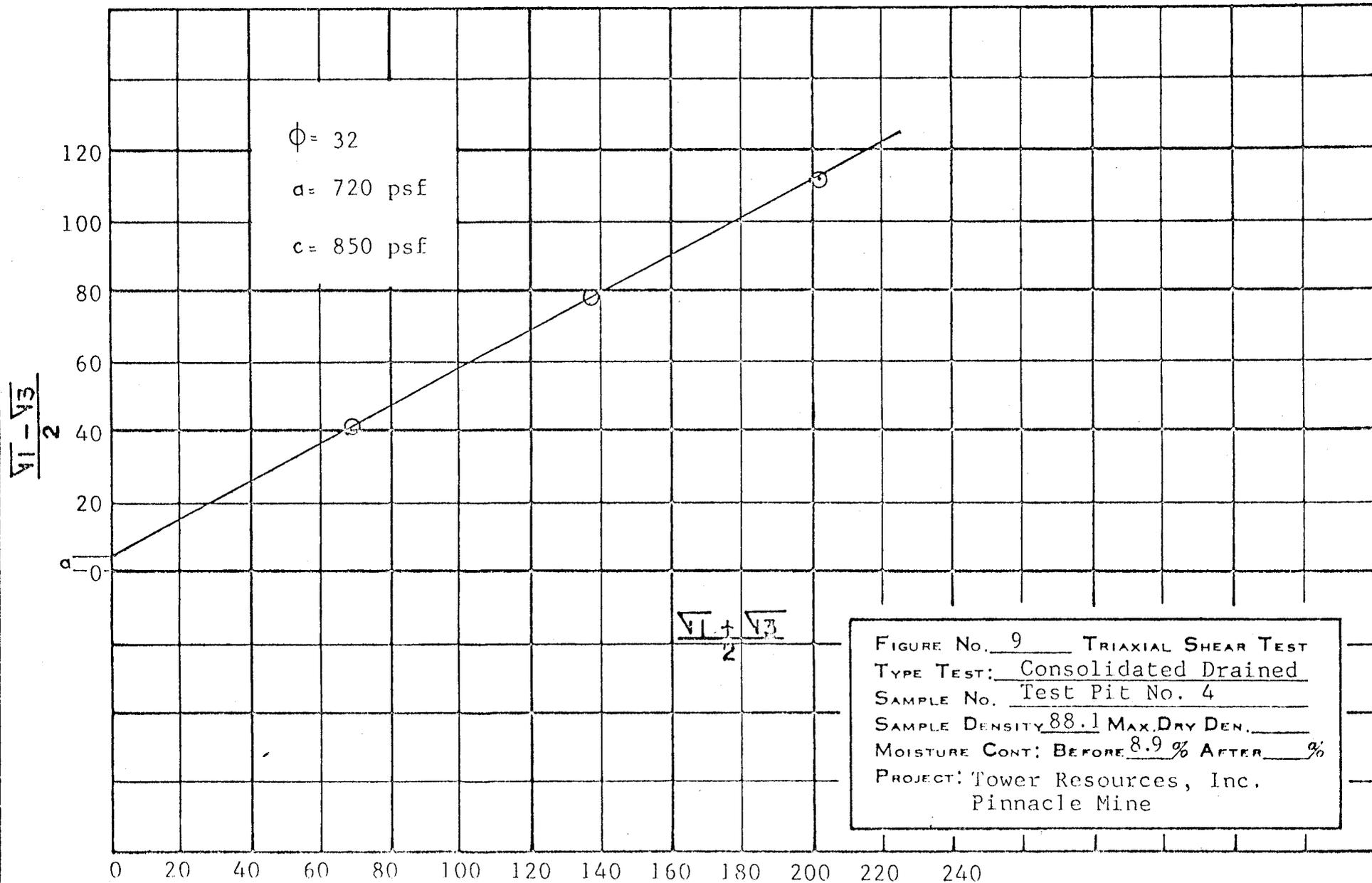


FIGURE No. 9 TRIAXIAL SHEAR TEST  
 TYPE TEST: Consolidated Drained  
 SAMPLE No. Test Pit No. 4  
 SAMPLE DENSITY 88.1 MAX. DRY DEN. \_\_\_\_\_  
 MOISTURE CONT: BEFORE 8.9 % AFTER \_\_\_\_\_ %  
 PROJECT: Tower Resources, Inc.  
 Pinnacle Mine

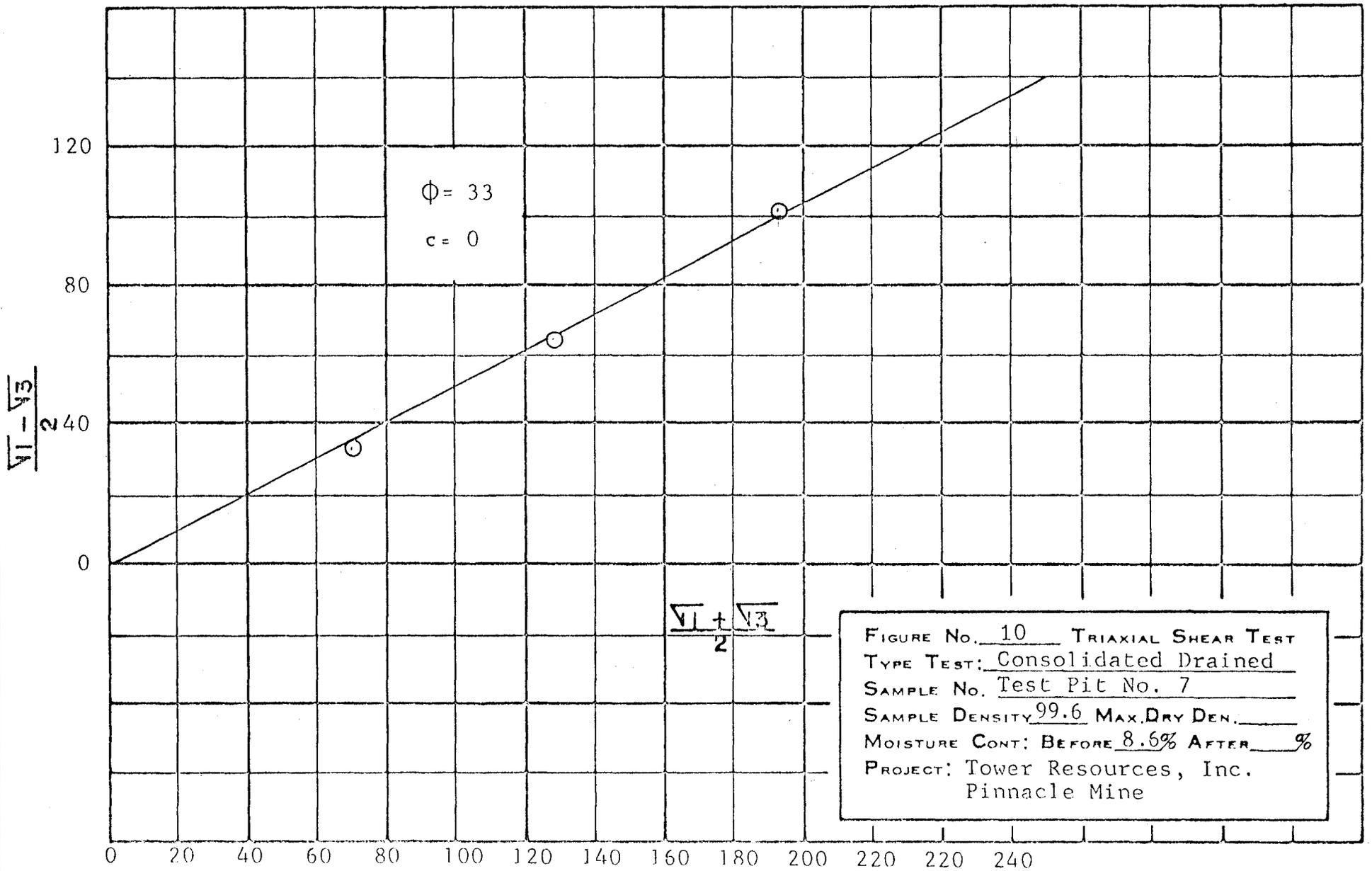


TABLE NO. 1 SUMMARY OF TEST DATA

PROJECT Tower Resources Inc. FEATURE Foundations LOCATION Price, Utah  
Pinnacle Mine

HOLE NO.	DEPTH BELOW GROUND SURFACE	STANDARD PENETRATION BLOWS PER FOOT	IN-PLACE			UNCONFINED COMPRESSIVE STRENGTH LB/FT <sup>2</sup>	FRICTION ANGLE $\phi$	CONSISTENCY LIMITS			MECHANICAL ANALYSIS			UNIFIED SOIL CLASSIFICATION SYSTEM
			UNIT WEIGHT LB/FT <sup>3</sup>	MOISTURE PERCENT	VOID RATIO			L.L. %	P.L. %	P.I. %	% GRAVEL	% SAND	% SILT & CLAY	
1*	6' down		101.2	11.5							31.4	37.5	31.1	GM
2	12' down		101.9	12.9							42.8	26.5	30.7	GM
3*	18' down		81.6	8.6							46.5	31.8	21.7	GM
4	22' down		85.0	8.9							45.2	34.4	20.4	GM
5*	27' down		104.7	10.8							29.1	40.9	30.0	GM
6	29' down		109.7	13.9							57.1	26.7	16.2	GM
7*	35' down		81.7	8.6							20.9	56.4	22.7	GM
1	3-4.5*	10									32.7	30.1	37.2	GM
	6-7.5*	12									47.2	31.1	21.7	GM
	10-11.5*	9									54.0	31.1	14.1	GM
	15-16.5*	36									24.1	43.2	32.7	SM
	20-20.5	10/6									17.4	43.1	39.5	SM
	25-25.5	49/6								NON-PLASTIC	16.3	34.8	48.9	ML, GM
	25-27.5*	SHALEY								NON-PLASTIC	0.0	27.4	72.6	GM

APPENDIX F

# LOWER SUNNYSIDE MINE SURFACE AND SUPPORT FACILITIES

## Introduction

Construction is scheduled to begin on the Lower Sunnyside Mine surface and support facilities during the last half of 1981. The projected schedule will be dependent on the coal market and approval of the Centennial Project Mining and Reclamation Plan. All proposed surface and support facilities are shown on Plate XIX and will consist of the following:

Material Storage Area	1.46 acres
Bathhouse	14' x 60'
Warehouse	14' x 60'
Water Well #6	
Culinary Water Storage Tank	12' x 16'
Substation	60' x 100'
Coal Pile Storage Area	1.4 acres
Water Well #5	
Coal Pile (Live)	7,500 tons (.35 acres)
Portals	5' x 20' (4 ea.)
Mine Fan	72"
Mine Water Storage Tank	12' x 16'
Topsoil Storage Area	.06 acres
Sedimentation Ponds	
Pond C	.18 acres
Pond D	.16 acres

This proposed minesite has been previously impacted by mining activity.

## Construction

Once topsoil has been removed, sites for these surface and support facilities will be leveled using dozers, trucks, and front end loaders. Surface pads will be gravelled and all other areas (ponds, embankments, etc.) will be reseeded according to recommendations of the appropriate regulatory authorities. Any blasting necessary for highwall preparation will be conducted in accordance with 30 CFR 817.61-68. All construction activities will be conducted as outlined in Chapter III, Volume I, of this Mining and Reclamation Plan.

## Topsoil

Topsoil will be removed as a separate operation from areas to be disturbed by surface installation. It will be removed from the sites and transported to the designated topsoil storage area. It will be segregated, stockpiled and protected from wind and water erosion and contaminants through revegetation. This storage area will be clearly marked with appropriate signs.

## Transportation Corridors

The existing jeep trail from the Pinnacle Mine will be upgraded to serve as both an access and haul road for the proposed Lower Sunnyside Mine. It will be widened and upgraded with new surface gravel, culverts, and drainage ditches. During its life this road will be constantly maintained. All necessary repairs will be made in a timely manner. The road will be chemically treated with a magnesium chloride solution to control dust. In winter months, snow will be removed, the road graded and kept open. Signs will be posted at strategic points along the road to warn of any possible hazards which might exist.

## Portals

Portals and the exhaust fan will be located near the northwest end of the canyon. Portal and mine fan will be located on the Coal Pile Storage Area. This pad will contain a conveyor portal, two intake portals, the exhaust fan portal and 72 inch exhaust fan. These portals will be enlarged above the coal seam to facilitate men and equipment at the mine openings and will be generally 5 feet high and twenty feet wide. Steel sets will be used to support the roof in the portal area. There will be only four portals opening on the surface; however, an additional return air portal will be driven underground making it a five entry system.

## Coal Handling and Storage

As mining begins, coal will be discharged from a shuttle car onto a 36" panel or a 42" main conveyor belt for transportation to the outside. Once outside the coal will be discharged onto a live coal stockpile (approximately 7,500 tons). The pad containing this stockpile will cover approximately 2.4 acres and will include an area for truck loading and turn-around. Coal will be loaded from this stockpile by front end loader onto 40 ton trucks and hauled to various loadouts as described in Chapter III, Volume I, of this Mining and Reclamation Plan.

## Water System

Water for mining use, such as for providing face fire protection and dust suppression, will be obtained from Water Well #5 located on the coal storage pad. This water will be pumped to the Mine Water Storage Tank located on the portal pad. The water will be pumped into the mine using a high pressure pump. A sump will be cut in the mine for the purpose of reclaiming and storing water as all available water will be needed.

Water for culinary use will be obtained from Water Well #6 located on the storage pad. It will be stored in the water storage tank also located on the storage pad.

Permission will be obtained from the State of Utah before any wells are drilled.

A septic system with drain fields conforming to State codes will be established to handle waste water. The quality of all culinary water will conform to State Department of Health Standards.

## Power System

A substation or switchrack will be constructed on the north end of the storage pad. Power supply will be a distribution voltage of 7,200 volts, 3-phase, 60 Hertz from the existing substation at the Pinnacle Mine. This proposed substation will supply both the mine and surface facilities. This incoming 7,200 volts for primary underground usage will be fracture reduced to 440, 220 and 110 volts for equipment operation. Surface power will be on a 440 volt system. This power system will be constructed according to Electrical Specifications included as Exhibit III-B in Volume I of this Mining and Reclamation Plan and according to recommendations given by Utah Power and Light. It will be installed by a private local contractor.

## Additional Support Facilities

Additional support facilities will include a 15 ft. by 60 ft. bathhouse and a 14 ft. by 60 ft. warehouse, as well as parking areas for employees. These additional facilities are located on the storage pad. All parking areas will be covered with gravel and magnesium chloride and will be maintained.

## Sediment Control

The proposed minesite will have a total disturbed area of approximately 4.3 acres. The major drainages in the proposed minesite area will be allowed to by-pass the site via culverted channels. In order to minimize additional sediment loading into the main drainage, the run-off from disturbed areas will be collected and passed into two separate sedimentation ponds. Most of the run-off from undisturbed areas in the proposed minesite vicinity will be unaltered and allowed to pass through existing natural channels. Berms will be placed on the lower edge of all disturbed areas to prevent run-off from reaching natural drainages before passing through the sedimentation ponds.

The proposed ponds are to be located just west of the main drainage. They will be located downslope of disturbed areas to simplify collection of run-off water. The ponds have been designed to fully contain the expected run-off and a sediment load from a 50 year - 24 hour precipitation event in the area of drainage. These sedimentation ponds have been designed according to O.S.M. regulations and will be constructed similarly to the "Sedimentation and Drainage Control Plan" certified by a State Registered Professional Engineer. This Plan is included as Exhibit III-A in Volume I of this Mining and Reclamation Plan.

The proposed sites for these ponds have been chosen for effective control of sediment and for minimization of environmental destruction. These sites require no disturbance of established natural drainage channels in the area.

The ponds will be inspected after each storm and will be cleaned at a minimum when sediment reaches 60% of volume. Water monitoring stations will be established at the outlet of each pond and will be sampled according to frequencies specified in the NPDES permit.

## Mine Operations

All mining activity in the proposed Lower Sunnyside Mine will be in accordance with methods outlined in Chapter III, Volume I, of this Mining and Reclamation Plan.

## Reclamation and Revegetation

When building and final site preparation have been completed, the soil will be revegetated to prevent erosion and any disturbed areas no longer needed for the conduct of mining operations will be immediately reclaimed and revegetated.

Upon completion of mining operations in the Lower Sunnyside Seam, all disturbed areas will be returned, in a timely manner, to conditions they were capable of supporting before any mining began. As this is an underground mine with minimal surface disturbance, reclamation will not be complicated. The terrain will be returned to as nearly the original as practical.

Reclamation will be accomplished according to the methods outlined in Volume I, Chapter III, Part E.

Revegetation will be accomplished according to the methods outlined in Volume I, Chapter IV, Part D-5.

ABERDEEN MINE  
SURFACE AND SUPPORT FACILITIES

Introduction

Construction is scheduled to begin on the Aberdeen Mine surface and support facilities during the second quarter of 1982. The projected schedule will be dependent on the coal market and approval of the Centennial Project Mining and Reclamation Plan. All proposed surface and support facilities are shown on Plate XIX and will consist of the following:

Coal Pile Storage Area	1.5 acres
Coal Pile (Live)	10,000 tons
Fan and Portal Area	.5 acres
Portals	5' x 20' (4 ea.)
Mine Fan	72"
Mine Water Storage Tank	12' x 16'
Topsoil Storage Area	.05 acres
Sedimentation Pond	.20 acres

This proposed minesite has been previously impacted by mining activity.

Construction

Once topsoil has been removed, sites for these surface and support facilities will be leveled using dozers, trucks, and front end loaders. Surface pads will be gravelled and all other areas (ponds, embankments, etc.) will be reseeded according to recommendations of the appropriate regulatory authorities. Any blasting necessary for highwall preparation will be conducted in accordance with 30 CFR 817.61-68. All construction activities will be conducted as outlined in Chapter III, Volume I, of this Mining and Reclamation Plan.

Topsoil

Topsoil will be removed as a separate operation from areas to be disturbed by surface installation. It will be removed from the sites and transported to the designed topsoil storage area. It will be segregated, stockpiled and protected from wind and water erosion and contaminants through revegetation. This storage area will be clearly marked with appropriate signs.

Transportation Corridors

Access to the portal area will be via the existing road to the office site.

During its life this road will be constantly maintained. All necessary repairs will be made in a timely manner. The road will be chemically treated with a magnesium chloride solution to control dust. In winter months, snow will be removed, the road graded and kept open. Signs will be posted at strategic points along the road to warn of any possible hazards which might exist.

### Portals

Portals and exhaust fan will be located as shown on Plate XIX. This pad will contain a conveyor portal, two intake portals, the exhaust fan portal and 72 inch exhaust fan. These portals will be enlarged above the coal seam to facilitate men and equipment at the mine openings and will be generally 5 feet high and twenty feet wide. Steel sets will be used to support the roof in the portal area. There will be only four portals opening on the surface; however, an additional return air portal will be driven underground making it a five entry system.

### Coal Handling and Storage

As mining begins, coal will be discharged from a shuttle car onto a 36" panel or a 42" main conveyor belt for transportation to the outside. Once outside the coal will be discharged onto a live coal stockpile (approximately 10,000 tons). The pad containing this stockpile will cover approximately 1.5 acres and will include an area for truck loading and turn-around. Coal will be loaded from this stockpile by front end loader onto 40 ton trucks and hauled to various loadouts as described in Chapter III, Volume I, of this Mining and Reclamation Plan.

### Water System

Water for mining use such as for providing face fire protection and dust suppression, will be stored in the Mine Water Tank as shown on Plate XIX. The water will be pumped into the mine using a high pressure pump. A sump will be cut in the mine for the purpose of reclaiming and storing water as all available water will be needed.

### Power System

Power supply will be from the existing substation located at the Pinnacle Mine.

### Sediment Control

The proposed minesite will have a total disturbed area of approximately 2.05 acres. The major drainages in the proposed minesite area will be allowed to by-pass the site via culverted channels. In order to minimize additional sediment loading into the main drainage, the run-off from disturbed areas will be collected and passed into a sedimentation pond. Most of the run-off from undisturbed areas in the proposed minesite vicinity will be unaltered and allowed to pass through existing natural channels. Berms will be placed on the lower edge of all disturbed areas to prevent run-off from reaching natural drainages before passing through the sedimentation pond.

The proposed pond will be located as shown on Plate XIX. This pond has been designed to fully contain the expected run-off and a sediment load from a 50 year - 24 hour precipitation event in the area of drainage. These sedimentation ponds have been designed according to O.S.M. regulations and will be constructed similarly to the "Sedimentation and Drainage Control Plan" certified by a State Registered Professional Engineer. This Plan is included as Exhibit III-A in Volume I of this Mining and Reclamation Plan.

The proposed site for this pond has been chosen for effective control of sediment and for minimization of environmental destruction.

The pond will be inspected after each storm and will be cleaned at a minimum when sediment reaches 60% of volume. Water monitoring stations will be established at the outlet of the pond and will be sampled according to frequencies specified in the NPDES permit.

#### Mine Operations

All mining activity in the proposed Aberdeen Seam will be in accordance with methods outlined in Chapter III, Volume I, of this Mining and Reclamation Plan.

#### Reclamation and Revegetation

When building and final site preparation have been completed, the soil will be revegetated to prevent erosion and any disturbed areas no longer needed for the conduct of mining operations will be immediately reclaimed and revegetated.

Upon completion of mining operations in the Aberdeen Seam, all disturbed areas will be returned, in a timely manner, to conditions they were capable of supporting before any mining began. As this is an underground mine with minimal surface disturbance, reclamation will not be complicated. The terrain will be returned to as nearly the original as practical.

Reclamation will be accomplished according to the methods outlined in Volume I, Chapter III, Part E.

Revegetation will be accomplished according to the methods outlined in Volume I, Chapter IV, Part D-5.

APPENDIX G

# Reclamation Cost Projection

## Centennial Project

### Lower Sunnyside Mine

Restoration to pre-mining land use will require:

	<u>Job Description</u>	<u>Equipment</u>	<u>Hours</u>	<u>Cost</u>
1.	Coal Pile Storage Area (1.6 acres) (including sedimentation pond)			
	a. Seal portals, remove conveyor, etc.	Loader	8	\$ 3,000
	b. Fill pad	Loader	55	3,500
	c. Contour slope	D-7	30	2,100
	d. Compact	Loader	15	900
	e. Replace topsoil	Loader	23	1,450
	f. Grade topsoil	Grader	15	900
	g. Revegetate	Drill	7	275
	h. Stake	Engineer	14	700
	Total Coal Pile Area:			\$12,825
2.	Roads 1/4 Mile			
	a. Recontour	D-7	5	\$ 350
	b. Compact	Loader	3	195
	c. Replace topsoil	Loader	2	130
	d. Grade topsoil	Grader	2	120
	e. Revegetate	Drill	1	30
	Total Roads:			\$ 825
3.	Seal Wells (2)			
	a. Fill, cement		6	\$ 400
	Total Wells:			\$ 400
4.	Material Storage Area (1.7) (including topsoil pile and sedimentation pond)			
	a. Remove all structures	5 man crew	120	\$ 6,000
	b. Recontour	D-7	16	1,120
	c. Compact	Loader	4	260
	d. Replace topsoil	Loader	8	520
	e. Grade topsoil	Grader	4	240
	f. Revegetate	Drill	2	300
	g. Stake	Engineer	14	700
	Total Material Storage:			\$ 9,140

## Gilson (Pinnacle Mine)

Restoration to the pre-mining land use will require:

	<u>Job Description</u>	<u>Equipment</u>	<u>Hours</u>	<u>Cost</u>
1.	Mine Portal area (.282 acres)			
a.	Seal portals, remove conveyor, etc.	Loader	8	\$ 3,000
b.	Fill pad	Loader	12	780
c.	Contour slope	D-7	8	560
d.	Compact	Loader	4	260
e.	Replace topsoil	Loader	6	390
f.	Grade Topsoil	Grader	4	240
g.	Revegetate	Drill	2	50
h.	Stake slope	Engineer	4	200
	Total Portal:			<u>\$ 5,480</u>
2.	Roads (1 mile)			
a.	Recontour	D-7	20	\$ 1,400
b.	Compact	Loader	10	650
c.	Topsoil	Loader	8	520
d.	Grade	Grader	8	480
e.	Revegetate	Drill	4	100
	Total Roads:			<u>\$ 3,150</u>
3.	Coal Pile Area (.416 acres)			
a.	Fill pad	Loader	16	\$ 1,040
b.	Contour slope	D-7	8	560
c.	Compact	Loader	4	240
d.	Topsoil	Loader	6	390
e.	Grade	Grader	4	240
f.	Revegetate	Drill	2	75
g.	Stake	Engineer	4	200
	Total Stockpile Area:			<u>\$ 2,745</u>
4.	Seal Wells			
a.	Remove monitors		8	\$ 400
b.	Fill, cement		8	400
	Total Wells:			<u>\$ 800</u>
5.	Material Storage & Building Areas (1.6)			
a.	Remove all structures	5 man crew	120	\$ 6,000
b.	Recontour	D-7	16	1,120
c.	Compact	Loader	4	260
d.	Replace topsoil	Loader	8	520
e.	Grade	Grader	4	240
f.	Revegetate	Drill	2	300
	Total Material:			<u>\$ 8,440</u>

Aberdeen Mine

Restoration to the pre-mining land use will require:

	<u>Job Description</u>	<u>Equipment</u>	<u>Hours</u>	<u>Cost</u>
1.	Mine Portal Area (.5 acres)			
a.	Seal portals, remove conveyor, etc.	Loader	8	\$ 3,000
b.	Fill pad	Loader	24	1,600
c.	Contour slope	D-7	16	1,100
d.	Compact	Loader	8	600
e.	Replace topsoil	Loader	12	750
f.	Grade topsoil	Grader	8	550
g.	Revegetate	Drill	4	150
h.	Stake slope	Engineer	8	400
	Total Portal Area:			<u>\$ 8,150</u>
2.	Coal Pile Area (1.6 acres) (including topsoil storage and sedimentation pond)			
a.	Fill pad	Loader	50	\$ 3,200
b.	Contour slope	D-7	30	2,100
c.	Compact	Loader	15	900
d.	Replace topsoil	Loader	22	1,400
e.	Grade topsoil	Grader	15	900
f.	Revegetate	Drill	7	275
g.	Stake slope	Engineer	14	700
	Total Stockpile Area:			<u>\$ 9,475</u>

Office Site

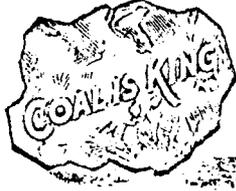
Restoration to pre-mining land use will require:

	<u>Job Description</u>	<u>Equipment</u>	<u>Hours</u>	<u>Cost</u>
1.	Office Site (.4 acres)			
	a. Remove structures	5 man crew	50	\$ 2,500
	b. Recontour	D-7	8	560
	c. Compact	Loader	4	240
	d. Replace topsoil	Loader	4	240
	e. Grade topsoil	Grader	4	240
	f. Revegetate	Drill	2	75
	g. Stake slope	Engineer	4	200
	Total Office Site:			<u>\$ 4,055</u>
2.	Seal Well (1)			
	a. Fill, cement		4	<u>\$ 200</u>
	Total Well:			<u>\$ 200</u>
3.	Roads 1/4 Mile			
	a. Recontour	D-7	5	\$ 350
	b. Compact	Loader	3	195
	c. Replace topsoil	Loader	2	130
	d. Grade topsoil	Grader	2	120
	e. Revegetate	Drill	1	30
	Total Roads:			<u>\$ 825</u>

Total Projected Reclamation Costs:

Lower Sunnyside Mine	\$23,190
Gilson (Pinnacle) Mine	20,615
Aberdeen Mine	17,625
Office Site	5,080
	<u>\$66,510</u>

APPENDIX H



## CARBON COUNTY

### PRICE, UTAH

January 16, 1978

AMCA Coal Leasing, Inc.  
P. O. Box 1027  
Price, Utah 84501

Attn. Mr. Sam Quigley

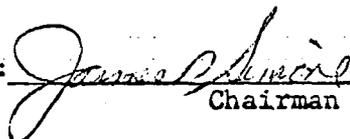
Gentlemen:

The Carbon County Board of Commissioners hereby grants AMCA Coal Leasing, Inc., permission to upgrade County Road No. 299 north to Dead Man.

If you plan on making any radical changes to the re-alignment of said County road, permission must be obtained from Carbon County. Before actual work is done on this road, we would appreciate your contacting our County Road Supervisor, Mr. Burke Johnstun. It is mutually agreed that there will be no restrictions on this road as far as traffic is concerned.

Sincerely yours,

BOARD OF CARBON COUNTY COMMISSIONERS

By: 

Chairman

JPS:JW

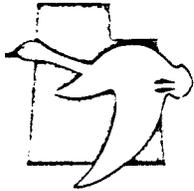


APPENDIX I

CHEMICAL STABILIZATION WITH MAGNESIUM CHLORIDE

FIRST APPLICATION - JULY, 1980  
SECOND APPLICATION - MAY, 1981  
FUTURE APPLICATIONS WHEN NEEDED

APPENDIX J



DIVISION OF WILDLIFE RESOURCES

DOUGLAS F. DAY  
Director

EQUAL OPPORTUNITY EMPLOYER

1596 West North Temple/Salt Lake City, Utah 84116/801-533-9333

April 13, 1981

Reply To SOUTHEASTERN REGIONAL OFFICE  
455 West Railroad Avenue, Box 840, Price, Utah 84501  
(801) 637-3310

Mr. Sam Quigley  
Tower Resources Inc.  
Centennial Mining Project  
82 West Main  
Price, Utah 84501

Attention: Mike Glasson

Dear Sam:

I want to take this opportunity to extend thanks for the assistance you and Mike have provided our staff in becoming familiar with existing and planned surface facilities on the area encompassed by Tower Resources Inc.'s Centennial Mining Project. I believe that you will find the enclosed information helpful at filing a mine and reclamation plan.

In response to your request for wildlife resource information (UMC 783.20) the attached map, data and comments are provided. The wildlife resource information is consistent with the formal guidelines for acquisition of fish, wildlife and habitat information that will be provided your Company by Utah's Division of Oil, Gas and Mining. In instances where your Company was or will be required to provide for study beyond existing information, such findings need be appended to this report.

Please note that the enclosed wildlife plan (UMC 784.21) represents our recommendations; Utah's Division of Oil, Gas and Mining is the regulatory authority for approval of the mining and reclamation plan. Implementation of the recommended wildlife plan should assist the Company in compliance with performance standards UMC 817.97.

Thank you for an opportunity to assist your Company in complying with the State's permanent program for coal mining and reclamation and the resultant protection of Utah's wildlife resources. If the Division can be of any further service, please coordinate with our Regional Resource Analyst (Larry Dalton, phone 801-637-3310) as appropriate.

Sincerely,

*John Livesay*  
John Livesay, Supervisor  
Southeastern Region

JL:LBD:gp

Enclosure

UMC 784.21; FISH AND WILDLIFE PLAN  
TOWER RESOURCES INC., CENTENIAL MINING PROJECT

Mitigation and Impact Avoidance Procedures General to all Wildlife

Utah Division of Wildlife Resources provides the following recommendations in order to minimize disturbances and impacts on wildlife and their habitats that could be impacted during developmental, operational and reclamation operations at the Company's mining project. The recommendations address how enhancement of the wildlife resource and their habitats as discussed in UMC 783.20 can be achieved. They are also consistent with the performance standards of UMC 817.97. In instances where it would be necessary to restore or could be beneficial to enhance or develop high value habitats for fish and wildlife, recommended plant materials and rates of application are provided as "Appendix B" (UMC 817.97 and UMC 817.111 through 817.117). This list should prove useful in meeting the additional requirements to be imposed upon the operator if the primary or secondary land use will be for wildlife habitats (UMC 817.97 d 9). Additionally, "Appendix C" represents a list of commercial sources for plant materials.

The project and adjacent areas are represented by seven basic wildlife habitats which are inhabited on occasion and during different seasons of the year by about 184 species of vertebrate wildlife. The wildlife habitats and use areas for the "high interest" species from this group of wildlife have been ranked into four levels of importance. The most valuable to an individual species or ecological assemblage are the critical sites followed in respective importance by high-priority, substantial value and limited value sites. Each type of use area requires various and specific levels of protection from man's activities. Additionally, due to the variability of vegetation communities in each use area, various and specific technologies in site development will need to be evaluated for possible mitigations, enhancements of wildland habitats or the required level of reclama-

tion. It is recommended that all land clearing impacts be designed so that irregular shaped openings are created in contrast to openings that would have straight edges.

It is recommended that the Company make significant efforts to educate all employees associated with their coal handling operation of the intricate values of the wildlife resource associated with the project and adjacent areas and the local area. Each employee should be advised not to unnecessarily or without proper permits harass or take any wildlife. (Apprehension of wildlife violators has increased by nearly 250 percent during recent years in the region). It is especially important that wildlife not be harassed during winter periods, breeding seasons and early in the rearing process. Exploration should be limited as much as possible during these crucial periods.

During winter wildlife are always in a depleted condition. Unnecessary disturbance by man causes them to use up critical and limited energy reserves which, often times, results in mortality. In less severe cases, the fetus being carried by mammals may be aborted or absorbed by the animal, thus reducing reproductive success of a population.

During breeding seasons, disturbance by man can negatively affect the number of breeding territories for some species of wildlife. Disturbance can also interrupt courtship displays and preclude timely interactions between breeding animals. This could result in reduced reproductive success and ultimate reductions in population levels.

Early in the rearing process, young animals need the peace and tranquillity normally afforded by remote wildlands. It is also during this crucial period that young animals gain the strength and ability to elude man and other predators. This allows the young animal to develop in relatively unstressed situations and to utilize habitats that are secure from predators. Disturbance by man can compromise this situation and result in abandonment of the young by the female, increased accidents that result in mortality to young animals or increased natural predation.

It is recommended that employees be cautioned against disturbing young animals or females with young if accidentally located.

Employees associated with coal handling operations should be instructed that when wildlife are encountered during routine work that they not stop vehicles for viewing purposes. Moving traffic is less disturbing to wildlife than traffic that stops or results in out-of-the-vehicle activities. If viewing is desirable, the vehicle should only be slowed, but not stopped.

Hunting and other state and federal wildlife regulations must be adhered to by sportsmen utilizing the project area.

#### Mitigation and Impact Avoidance Procedures for Aquatic Wildlife

There are no recommendations for a wildlife plan that would enhance any perennial water or fishery since none are associated with the Company's proposed operation.

#### Mitigation and Impact Avoidance Procedures for Terrestrial Habitats

It is recommended that all habitats associated with dry washes be maintained. Roads and other facility developments should not destroy or degrade these limited and highly productive habitats. Roads crossing through those areas should do so in a manner that is least damaging to the habitat. Wetlands and riparian habitats associated with dry washes are of similar character to riparian habitats in other areas. They are ranked as being of critical value and are the most productive sites in terms of herbage and biota produced as compared to other local habitat types. It is probable that a majority of the vertebrate wildlife that inhabit the project area make some use of such sites.

It is important to note that roads and other surface facilities to be constructed should as far as practicable be placed at sites where they will not compromise wildlife or their use areas. Also, surface facilities, including roads, should be screened if possible from wildlife use areas by vegetation or terrain.

In situations where wildland habitats have been or will be disturbed, reclamation is required. Also, there are sites where development or enhancement of

wildland habitats through vegetation treatments and/or seedlings and transplants of seedlings could benefit wildlife. "Appendix B" depicts the Division's recommendation for plant materials to be utilized for various wildlife habitats on wildland treatments that are intended to benefit wildlife. If circumstances arise where seed or seedling transplants for a recommended plant species are not available, suitable alternates are also recommended.

Seedling transplants from nursery stock as well as nearby rangelands would also be acceptable for some wildland treatments.

Appendix C represents an exhaustive list of commercial sources for plant materials for use in wildland treatments.

Temporary control of rodents may be required to ensure a successful rangeland treatment. It is recommended that the county agent be consulted in this area of concern. Poisoned oats are the most common and acceptable method for rodent control; however, only licensed persons may apply the treatment.

Currently, there are some new concepts in methodology for revegetation that are being successfully implemented in other parts of the nation and world. One promising method is a procedure where a large scoop removes, from a natural and stabilized site, a small area of earth intact with vegetation and subsurface soils for placement on a site to be restored. This same procedure can be utilized when disturbing pristine sites, except that the native vegetation is stored for use in latent reclamation. Another meritorious method for stimulating natural revegetation, in combination with other reclamation techniques, is to plan facility developments so that islands of natural, native vegetation remain. This will allow for natural vegetation to spread from the islands. These techniques can also be useful for enhancement of poor quality sites that currently exist on the mine plan area.

Encapsulation of seed and fertilizer for several releases over a period of years after a single application is a new and possibly advantageous procedure. This technique along with soil stabilizing structures has been successfully used in South Africa. Dr. J. Van Wyk in the Department of Botany at Potchetstroom

University in South Africa could provide additional information on this new technique.

There are also new specialized techniques coming to the forefront for stabilization of problem sites such as roadbanks and steep slopes. It is important that these sites be promptly and permanently revegetated in order to reduce siltation into local riverine systems. This will mitigate for damage to aquatic wildlife populations and habitats from siltation. Enhancement of existing problem sites or reclamation of disturbed sites can mitigate for salt loading of local river systems. It is believed that natural, nonpoint sources represent 50 percent of the salinity in the upper basin of the Colorado River system into which this mine plan area drains.

It is recommended the Company make numerous contacts with appropriate agencies, institutions and persons to ensure that enhancement or reclamation projects achieve the required degree of permanency, plant diversity, extent of cover and capability of regeneration to ensure plant succession. Generally speaking, seeding should be accomplished as late in the fall as possible. Seedling transplants need to be coordinated with local soil moisture conditions which are usually at optimum in the early spring just as the snow melts.

It is paramount that suitable vegetation be maintained and/or re-established if the life requirements of wildlife are to be satisfied in the postmining period. Success in this area of concern along with cessation of man's disturbances will likely result in a natural reinvasion and the resultant inhabitation by most wildlife species of an impacted site.

It is important to note that enhancement or reclamation projects that are to benefit wildlife must be properly designed so that all the life requirements of the target species are considered in conjunction with forage. Water must be provided or be present and thermal cover along with escape and hiding cover has to be in abundance. Loafing areas and travelways between the many types of use areas must also be provided. In order to meet these goals, a considerable degree of consul-

tation will be required between the Company and Utah Division of Wildlife Resources.

As a service and also to ensure that the needs of wildlife are met, the various expertise within the Division of Wildlife Resources are available to the Company for consultation. For the most part, Larry Dalton, Resource Analyst, for the Southeastern Regional Office at 455 West Railroad Avenue in Price, Utah 84501 (phone 637-3310) will coordinate any needed contacts. Richard Stevens, Wildlife Biologist, at the Great Basin Research Center, Box 704, in Ephraim, Utah 84627 (phone 283-4441) is available for consultation and site specific analysis concerning species for vegetation plantings, timing and techniques to achieve the best results.

In instances where revegetation projects are to be planned over coal waste areas, heavy metal uptake by the plants must be evaluated. It is recommended that the Company initiate an appropriate long-term monitoring program to determine the magnitude and resolutions, if needed, for this problem.

It is recommended that persistent pesticides not be utilized on the project area. Other alternate pesticides or forms of control should be utilized.

All hazards associated with the project operation should be fenced or covered to preclude use by wildlife; of special concern would be sites having potential to entrap animals or toxic materials.

#### Mitigation and Impact Avoidance Procedures for Amphibians and Reptiles

Enhancement or development of habitats that provides a diversity of vegetation will benefit amphibians and reptiles. It is important to note that all of these species are protected by Utah law. Due to the myriad of myths that surround these animals, it is urged that individual specimens not be destroyed. This is especially true for snakes since they are a valuable component of the ecosystem.

Snake dens are ranked as being of critical value to the population and are protected by law. If a den is located, it should be reported to the Utah Division of Wildlife Resources. Snake dens can be moved, but only with intensive efforts that may take a year or more (snakes are caught and removed in the spring and fall).

Thus, construction of facility developments may take place in denning locations if there is sufficient lead time to relocate the occupants.

#### Mitigation and Impact Avoidance Procedures for Avifauna

It is recognizable that development and operation of a mining project will in some cases negatively impact many avian species through physical destruction of habitats and continual disturbance that makes other habitats unavailable or less desirable to an individual bird. It is also true that impacts that are negative to one species may be beneficial to another species. It is recommended that the Company plant native and/or ornamental berry producing shrubs around surface facilities. When mourning doves are a target species, sunflowers or blazing star should be planted. This will provide food and cover for many of the smaller species of birds, resulting in enhancement of their substantial value and high-priority habitats. This action would also mitigate for disturbances and destruction of avifauna habitats at other sites associated with project operations.

It is important to note that the nests of all avifauna (except the house sparrow, starling and ferral pigeon) when active and their eggs are protected by federal (Federal Migratory Bird Treaty Act) or state laws (Utah Code 23-17-1 and 23-17-2). All avifauna utilize a nest during their reproductive process. Dependent upon the species, some nests are well developed while others may be represented by only a scrape on the ground. These sites when being utilized are critical to maintenance of individual bird populations; each species has a specific crucial time period in which the nest is occupied. It is during this crucial period that the nest must be protected from disturbance.

Several species of raptors frequent the project area. Their nests when active should not be disturbed and abandoned stick nests are never to be damaged. Every effort should be made to eliminate man's disturbance within visual sight or one-half kilometer radius of an active raptor nest. This distance would have to be increased to a one-kilometer radius if the cause for disturbance were to originate within view and from above the nest. This effort is demanded in the instance of

golden eagles and cliff nesting falcons since they are sensitive to disturbance and could abandon the nest. Termination of man's use of a site would not be required if eagles or falcons constructed their nest after mining had been initiated, since it would demonstrate the individual bird's willingness to tolerate mining activities and the associated disturbance by man.

Roost trees for eagles, if located, must not be disturbed or destroyed. Similarly, activities planned for high-priority concentration areas of eagles must be designed and implemented so that they are not of significant disturbance to the birds.

As a general comment, whenever active raptor nests are observed or roost trees for eagles located, they need to be reported to the Utah Division of Wildlife Resources and the U.S. Fish and Wildlife Service.

Design and construction of all electrical power lines and other transmission facilities shall be designed in accordance with guidelines set forth in "Environmental Criteria for Electric Transmission System" published by the USDA and USDI in 1970 and/or the REA Bulletin 61-10 "Powerline Contacts by Eagles and Other Large Birds". It is also recommended that placement of utility poles over flat or rolling terrain be planned so that they are out of view of roads or at least 300 meters away from any roads. This will lessen opportunity for illegal killing of these valuable birds, since the poles can serve as suitable hunting perches for raptors. In some instances poles can result in an extension of raptor hunting territories, which would represent a beneficial impact.

During the crucial period of December through February spruce-fir forests and aspen forests need to be protected from man's disturbance so that blue grouse will not be impacted. Destruction of these wildlife habitats at any time of the year need be minimized due to their value to wildlife.

During the spring period (mid-March through mid-June) care needs to be taken that male blue grouse are not disturbed or precluded from establishing breeding territories.

Mature trees with natural cavities and dead snags need to be protected for use by cavity nesting birds. Trees with such a character are ranked as being of critical value to cavity nesting birds. The project should be planned so that three such trees are left standing per acre within 500 feet of forest openings and two such trees per acre in dense forested areas.

#### Mitigation and Impact Avoidance Procedures for Mammals

The lodges, nests and dens of all mammals or roosts in the instance of bat like mammals represent a critical use area for maintenance of their individual populations. The crucial period for any species is when the lodge, den, nest or roost is occupied. Therefore, such sites for any mammal must be protected from disturbance during that period when it is being utilized.

Many species of mammals develop food caches in order to carry individual animals or family groups through periods when they cannot forage. Such sites are of critical value to maintenance of their populations and if located should not be destroyed or subjected to regular disturbance by man.

It is important to realize that within natural ecosystems there exists a predator-prey relationship. One species of animal may represent a prey source for other species. Therefore, it is important that project operations be designed and implemented so as to not unnecessarily disturb or destroy any wildlife or their habitats.

Big game ungulates--mule deer and elk--each have seasonal use areas ranked as being of critical value to an individual herd. Such sites need to be protected from any of man's activities or developments that could result in destruction, loss or permanent occupancy of the site by man or has facility developments. If these types of impacts cannot be avoided the site must ultimately be reclaimed and re-vegetated. Also, critical valued areas need protection from disturbance during their appropriate crucial period.

High-priority valued use areas for all wildlife and particularly big game ungulates need to be protected from man's activities or facility developments.

Actions that would result in loss or permanent occupancy of significant acreages (25 or more acres) of habitat are of special concern. In any event impacts to high-priority valued areas should be limited and ultimate reclamation planned. Many impacts can be avoided simply by precluding exploration, developmental or other activities during the period of time when a high interest specie is present.

Haulage of coal between the various mine projects and distribution points should be planned so that impacts to wildlife are lessened; of special concern is haulage of coal through wintering areas for big game. It is recommended that the Company, when hauling coal with motor vehicles, develop coal haulage contracts that require personnel involved with coal haulage to use extreme caution so that accidental collisions between motor vehicles and big game are reduced. Without doubt, a reduction in speed across winter ranges would alleviate this problem during the period between November 1 and May 15 each year.

At present the most successful and cost effective technique for reducing deer-highway mortality is a system of warning reflectors. This system (manufactured by Strieter Corporation, 2100 Eighteenth Avenue, Rock Island, Illinois 61201 and known as "Swareflex") is only of value at night time, but it is during darkness that most deer-highway mortality occurs. Strieter Corporation describes the effect of the reflector system as follows: "The headlights of approaching vehicles strike the wildlife reflectors which are installed on both sides of the road. Unnoticeable to the driver, these reflect red lights into the adjoining terrain and an optical warning fence is produced. Any approaching wildlife is [are] alerted and stops or returns to the safety of the countryside. Immediately after the vehicle has passed, the reflectors become inactive, thereby permitting the animals to cross safely".

Installation of a wildlife warning reflector system, a reduction in speed of coal-haulage trucks and other mine related traffic and increased awareness of wildlife values by mine associated employees should result in a reduction of deer-highway mortality problems. Such a reduction would represent satisfactory miti-

gation.

In instances where conveyors, slurry lines or any other structure having potential to be a barrier to big game movement is to be developed, passage structures must be provided. Generally speaking overpass and underpass type structures are recommended in order to allow passage of big game to habitats either side of any barrier. These crossings should be placed at the points to be identified from intensive study of big game movements in relation to the mine plan area. Such study would not be required if the structure was adequately elevated to allow uninhibited passage of big game along its entire length.

Underpasses should have a minimum clearance of three meters maintained across a span of at least five meters. Overpasses should be designed as a circular earthen ramp with the barrier bisecting the ramp into two equal halves as follows:

On either side of the conveyor a half-round ramp with a slope no greater than 3:1 on a five meters wide path placed at an angle 90 degrees to the conveyor and tapering around to a slope of 5:1 at paths adjacent and parallel to the conveyor. The platform over the conveyor should be concrete or some other material that would not echo when being crossed by big game and should be of character similar to rock or natural earth.

Soils associated with either crossing style should be of the A or B horizons to allow for development of vegetation. Vegetative cover must be established in association with all crossing sites. This will lessen anxiety of individual animals using the site through development of a natural appearing environment.

Mature pinion or juniper trees and an abundance of browse plants need to be placed proximal to crossing points in order to provide a safe travelway. The browse plants will also serve as a permanent attraction for big game to crossing points. Additionally, a mixture of grass and forb seeds should be broadcast over each crossing point to stabilize the soil and enhance the forage situation.

Appropriately sized boulders may need to be placed at crossing sites in order to control off-road vehicles utilized in outdoor recreation.

Industrial developments are encouraged on habitat use areas that are ranked as being of limited value to wildlife. It should be noted, however, that reclamation is ultimately expected on any wildlife use area, regardless of its value to

Table 1. Ranking of value per ecological association for wildlife habitats of vertebrate species having high interest to the state of Utah. Crucial-critical (C) habitats (the highest valued followed in respective order) high-priority (H), substantial value (S) and limited valued (L) habitats.

Ecological Association	Wildlife Habitats										
	Riparian and Wetland	Desert Scrub	Pasture and Fields	Urban or Parks	Cliffs and Tallus	Sagebrush P-J Forest	Shrubland	Aspen Forest	Ponderosa Forest	Parkland	Spruce-fir Forest
LOWER SONORAN LIFE ZONE											
Warm Desert	This ecological association does not exist in the Southeastern Region										
UPPER SONORAN LIFE ZONE											
Cold Desert C(H <sup>1</sup> , S <sup>2</sup> )	S	S	S	S	H						
TRANSITION LIFE ZONE											
Submontane C(H <sup>1</sup> , S <sup>2</sup> )	S	S	S	H	S	S	S				
CANADIAN LIFE ZONE											
Montane C(H <sup>1</sup> L <sup>2</sup> )	S	L	S				S	S	S	S	
HUDSONIAN LIFE ZONE											
Montane H(S <sup>1</sup> , L <sup>2</sup> )				S							S
ALPINE LIFE ZONE											
Montane	This ecological association does not exist in the Southeastern Region										

This Table represents a summation of effort where by numerical values were assigned as a ranking per high interest specie to each wildlife habitat. The numerical values were as follows: critical, 1; high-priority, 2; substantial, 3; and limited, 4. Once the individual values were assigned they were then summed and a mean calculated, for each wildlife habitat. A mean value lying between 1.0 and 1.8 was ranked as critical; a value between 1.9 and 2.3 was ranked as high-priority; a value between 2.4 and 3.4 was ranked as substantial; and a value between 3.5 and 4.0 was ranked as limited.

1. Habitat ranking value for species associated with the riparian-wetland type that represents just the wet meadow situation.
2. Habitat ranking value for species associated with the riparian-wetland type that represents just the dirt bank situation.

In Utah. Crucial-critical (1), sections are the highest valued followed in respective order by high-priority (2), substantial value (3) and limited valued (4) sections.

BOOK CLIFFS

T.	R.	Section	Rank
12	8	1-36	1
12	9	2,4-12,14,16-18,31-35	1
		1,3,13,15,19-30,36	2
12	10	2-11,13-17,19-21	1
		1,12,18,28-36	2
12	11	16-26,33-35	1
		1-15,29-32,36	2
12	12	19,27-30,32-34	1
		1-18,20-26,31,35,36	2
13	8	1-3,5-16,19,20,22-24,26-31	1
		4,17,18,21,25-27,32-35	2
13	9	1-11,14,15,17,18,28,29,31-35	1
		12,13,16,19-27,30,36	2
13	10	1,2,6	1
		3-5,7-36	2
13	11	14-16,21-28,34-36	1
		1-13,17-20,29-33	2
13	12	4,19,30,31,35	1
		1-3,5-18,20-29,32-35	2
13	13	1-35	2
14	13	1-35	2
14	14	33	1
		1-32,34-36	2
15	14	1-21,23-26,28-36	2
		22,27	3
16	14	24-26,35,36	1
		1-23,27-34	2
16	15	3,10,11,14,23-25,29-33	1
		1,2,4-9,12,13,15-22,26-28,34-36	2
17	14	1,12,13,24,25,36	1
		2,3,10,11,14,15,22,23,26,27,34,35	2
17	15	4-9,16-22,27-34	1
		1-3,10-15,23-25,35,36	2
18	14	1,27	1
		2,3,10-15,22-28,34-36	2
19	15	4-10,15-18	1
		1-2,11-14,19,21-25,30-32	2
		3,20,26-29,33-36	3

HENRY MOUNTAINS

T.	R.	Section	Rank
27	9	1-36	1
30	9	25,32-36	3
		19-24,26-31	4
30	10	20-29,32-36	1
		19,30,31	3
31	8	1,7,12,13,18,19,24,25,30,31,36	3
		2-6,10-11,14-17,20-23,26-29,32-35	4
31	9	4-9,16-21,28-33	3
32	8	30,31	2
		1-6,7,10-15,18,20-29,33-36	3
		2-5,8,9,16,17,19,32	4
32	9	1,12,13,24,25,35,36	1
		2-11,14-23,26-34	3
33	8	6-8,12-14,17-24,22-35	2
		1-4,9-11,15,16	3
		5,21	4
33	9	1-3,9-17,20-28,34-36	1
		7,18,19,29-32	2
		4-6,8,33	3
34	8	1-3,10-13,15	2
		14	3
34	9	3	1
		2,5-11,13,14,16-19	2
		1,4,12,15,20-24,26-28	3
		25,29-36	4
34	10	1-23,26-30,32-34,36	2
		24,25,35	3
		31	4

KAIPAROWITS PLATEAU

T.	R.	Section	Rank
33	1	26,27,34-36	1
		28,33	2
		19-25,29-32	3
33	2	28,31-33	1
		19-21,29-30	3
34	1	1-3,10-14,24	1
		4-9,15-23,25-36	2
34	2	4-7,17,18,20,21,28,29	1
		8,9,16,19,30-33	2
35	24	3-10,16-19	1

KAIPAROWITS PLATEAU (CONTINUED)

T.	R.	Section	Rank
35	1	1-34	2
		35-36	3
35	2	4-9,16-20,25	2
		21-24,26-36	3
35	3	30-32	2
		19-29,33-36	3
36	3W	1-3,10-12,14,15	2
		13	4
36	2W	1-6,8-12	3
		7,13-18,22-27,34-36	4
36	1W	36	1
		1,24-26,35	2
		2-23,27-34	3
36	1	4-9,19-36	2
		1-3,10-18	3
36	2	30,31	2
		1-29,32-36	3
36	3	5,8,17,20,21,27,28,33-35	2
		1-4,6,7,9-16,18,19,22-26,29-32,36	3
37	1W	1,2,11-14,23-26,35,36	2
		3-10,15-22,27-34	3
37	1	1-36	3
37	2	6,7,12,13,17-20,24,25,29-32,36	2
		1-5,8-11,14-16,21-23,26-28,33-35	3
37	3	1,2,6-9,12,15-23,25-36	2
		3-5,10,11,13,14,24	3
37	4	20,21,28-33	2
		19	3
38	1W	1-3,11-14	2
		4-10,15-18	3
38	1	1-18,22-27,34-36	2
38	2	17	1
		1,4-9,12,13,16,18-21,24,25,28-33,36	2
38	3	1-36	2
38	4	2-36	2
		1	4
38	5	19-22,26-36	2
		23-25	4
39	1	1-18,22-27,34-36	2
39	2	1,2,4-9,11-20,22-36	3
		3,10,21	3
39	3	1-36	2
39	4	1-36	2
39	5	1-36	2
40	2	1-36	2
40	3	1-36	2
40	4	1-36	2
40	6	4-9,16-21,28-33	2
41	2	1-30	2
		31-36	3
41	3	31-36	1
		1-21,29,30	2
41	4	22-28	3
		31-36	1
		1-17,20-28	2
		18,19,29,30	3
41	5	31-33	1
		1-9,11-14,18,23-26,35,36	2
		10,15-17,19-22,27-30,34	4
42	1W	13-36	1
		4,9	2
		1-3,5-8,10-12	4
42	3	1-36	1
42	4	1-36	1
42	5	2-36	1
		1	2
43	3	1-11,14-18	1
		12,13	4

WASATCH PLATEAU NORTH

T.	R.	Section	Rank
12	6	1-26,29,31,34-36	1
		27,28,30,32,33	2
12	7	1-15,17-36	1
		16	3
12	8	1-36	1
13	6	1,2,5-8,10,13,17-20	1
		3,4,9,11,12,14-16,21-36	2
13	7	1-4,9-17,19,22-26,31,32,35,36	1
		5-8,13,20,21,27-30,33,34	2

WASATCH PLATEAU NORTH (CONTINUED)

T.	R.	Section
14	6	28-33
		1-27,34-36
14	7	1,4-6,9,12,13,16
		2,3,7,8,10,11,14,15,17-36
15	6	4-6,10-15,22-24
		1-3,7-9,16-21,25-36
15	7	32-36
		1-31
15	8	9,15,20-22,27-29,32,33
		1-8,10-14,16-19,23-26,30,31,34-36
16	6	11,13,14,16,20-26,28,29,31-33,35,36
		1-10,12,15,17-19,27,30,34
16	7	1-5,9-16,21-28,34-36
		6-8,17-20,29-33
16	8	4,7,9,17-21,28-31
		1-3,5,6,8,10-16,22-27,32-36
17	6	4-9,11-14,16-22,24-35
		1-3,10,15,23,36
17	7	1,2,7,12,18,19,25,30
		3-6,8-11,13-17,20-24,26-29,31-36
17	8	5,6,16,19
		4,7-9,17,18,20,21,28-33
18	6	1-3,10,11,13-15,22-27,34-36
		12
18	7	4,5,7-11,13-17,19-27,29-32,34-36
		1-3,6,12,18,28,33
19	6	1-3,10-15,22-27,34-36
19	7	1-3,5,23,27-34
		4,24-26,35,36

WASATCH PLATEAU SOUTH

T.	R.	Section
20	5	20-29,31-36
		19,30
20	6	19-36
21	4	1-3,10-15,19-36
		4-9,16-18
21	5	1-36
21	6	4-9,16-21,28-33
22	3	1-3,10-15,22-27,34-36
22	4	1-4,9-16,21-28,33-36
		5-8,17-20,29-32
22	5	1-20,22-24,29-30
		21,25-20,31-36
23	3	1,12,13
		2,3,10,11,14,15,22-27,34-36
23	4	2-4,6-11,14-18,20-29,31-36
		1,5,12,13,19,30
24	4	2,4-9,16-18
		1,3,10-15

This Table represents a summation of work published in 1977 as a "Ranking of Wildlife Values on Federal Coal Lands". Robert W. Scott performed the work as a Division of Wildlife Resources employee under contract (No. 14-16-006-3125) for the U.S. Fish and Wildlife Service. Scott's procedure ranked habitat use areas as critical, high-priority, substantial and limited value for selected individual species of high interest. After which the individual values were evaluated per legal section of land and a cumulative value was determined.

UMC 783.20; FISH AND WILDLIFE RESOURCE INFORMATION  
TOWER RESOURCES INC., CENTENIAL MINING PROJECT

General Wildlife Resource Information--All Species of Vertebrate Wildlife

The mine plan area encompasses a portion of the West Tavaputs Plateau in Carbon County, Utah. This area drains into Hayes Wash which is tributary of the Price River, which flows into the Green River and ultimately into the Colorado River at a point upstream from Lake Powell. Generally speaking, the West Tavaputs Plateau is encompassed by cold desert (upper Sonoran life zone), submontane (Transition life zone) and montane (Canadian life zone) ecological associations. These life zones could be inhabited on occasion and during different seasons of the year by about 364 species of vertebrate wildlife--20 fish species, 5 amphibian species, 15 reptile species, 244 bird species and 80 mammal species. It is interesting to note that 84 percent of these species are protected.

The mine plan area itself is represented by the Transition and Canadian life zones and provides habitat for approximately 184 species of wildlife--no fish species, 3 amphibian species, 15 reptile species, 106 bird species and 60 mammal species. Forty-seven of these species are of high interest to the State of Utah.

The Division Publication No. 78-16 "Species List of Vertebrate Wildlife that Inhabit Southeastern Utah" is appended (Appendix A) to this report since it represents a low level of study for the wildlife species listed. It identifies those species having potential to inhabit the region as well as those inhabiting the environs of the mine plan area. Appendix A also identifies which species are considered to be of high interest for the habitats and local area represented.

High interest wildlife are defined as all game species; any economically important species; and any species of special aesthetic, scientific or educational

significance. This definition would include all federally listed, threatened and endangered species of wildlife.

A ranking and display of wildlife habitats and use areas relative to high interest species of vertebrate wildlife has been developed (Table 1 and 2 and the attached map). Critical wildlife use areas followed in respective importance by high-priority, substantial value and limited value wildlife use areas require various levels of protection from man's activities and developments. Wildlife habitats and use areas ranked as being of critical or high-priority value to wildlife should be protected from surface disturbance, subsidence impacts and human or industrial disturbance. This can be accomplished through development and implementation of a wildlife plan.

For purposes of clarification the classification of waters in Utah that will be referenced in the following narrative represents a Division of Wildlife Resources system developed and applied to all of the State's waters in 1970. The classification system determined a numerical rating for each of the stream sections or lakes within Utah. (Insofar as possible, each stream section represents an ecologically and physically uniform stream segment.) The numerical values were developed through an evaluation at each water of esthetics, availability of the water to sportsmen and production of fish. Class 1 waters are the best and Class 6 are the poorest.

Critical wildlife use areas are "sensitive use areas" necessary to sustain the existence and perpetuation of one or more species of wildlife during crucial periods in their life cycles. These areas are restricted in area and lie within high-priority wildlife use areas. All stream sections, reservoirs, lakes and ponds identified by Utah Division of Wildlife Resources as Class 1 or 2 are classified as being critical. Biological intricacies dictate that significant disturbances cannot be tolerated by the members of an ecological assemblage on critical sites. Professional opinion is that disturbance to critical use areas or habitats will result in irreversible changes in species composition and/or

biological productivity of an area.

High-priority wildlife use areas are "intensive use areas" for one or more species of wildlife. "Intensive use areas" are not restricted in area and in conjunction with limited value use areas form the substantial value distribution for a wildlife species. All stream sections, reservoirs, lakes and ponds identified by Utah Division of Wildlife Resources as Class 3 are classified as being of high-priority. In addition, wildlife use areas where surface disturbance or underground activities may result in subsidence that could interrupt underground aquifers and result in a potential for local loss of ground water and decreased flows in seeps and springs should be considered as being of high-priority to wildlife.

Substantial value wildlife use areas are "existence areas" for one or more species of wildlife. "Existence areas" represent a herd or population distribution and are formed by the merging of high-priority and limited value wildlife use areas for a species. All stream sections, reservoirs, lakes and ponds identified by Utah Division of Wildlife Resources as Class 4 are classified as being of substantial value.

Limited value wildlife use areas are "occasional use areas" for one or more species of wildlife. "Occasional use areas" are part of the substantial value wildlife use area for a species. All stream sections, reservoirs, lakes and ponds identified by Utah Division of Wildlife Resources as Class 5 or 6 are classified as being of limited value.

#### MAPPING

##### Vegetation and Wildlife Habitats

It is recommended that the Company's primary effort be placed on identifying species of vegetation in each wildlife habitat within the various wildlife use areas for purposes of reclamation. The Division does not have site specific information relative to vegetation types at the mine plan area. However, there are

seven wildlife habitats present--riparian wetlands, cliffs and tallus, sagebrush, pinion-juniper forest, shrubland, ponderosa forest (limited to just scattered trees) and spruce-fir forest. The Company should identify each of these habitat associations on appropriately scaled maps.

It is believed that if satisfactory reclamation is achieved and man's disturbance does not continue or become a factor, that most species of wildlife displaced from the mine plan area will return. Without doubt, the key to success for enhancing or restoring wildlands will be development of habitats so that the postmining condition as compared to the premining condition will have similar species, frequency and distribution of permanent plants in each vegetative type. This will allow for natural plant succession. Additionally, other habitat features that represent the various life requirements for local wildlife must be provided.

#### Wildlife Use Areas

The enclosed map displays mapable, high value use areas for high interest wildlife on or adjacent to the mine plan area. This display includes stream sections and bodies of water, if any, utilized by high interest fish species. Also displayed are known seeps, springs, wetlands and riparian zones. Note that there are high interest wildlife distributions that are so broad that they cover the entire map and therefore are not illustrated. However, all vertebrate species of high interest wildlife and their distributions are discussed in the following narrative.

#### Water

Due to demands of state and federal coal mining regulations, the Company will probably be required to identify and appropriately monitor all surface waters for potential impacts from subsidence. This information should be correlated with the wildlife use area information due to the value of water to wildlife.

## FISH AND WILDLIFE INVENTORY

### Aquatic Use Areas

#### Macrophytes, Macroinvertebrates and Fish

No perennial streams are associated with the project, thus data relative to aquatic wildlife would not be practicable for presentation in the permit application.

It is important to note that no species of fish having relative abundances so low as to have caused them to be federally listed as threatened or endangered inhabit the mine plan or adjacent areas. The endangered humpback chub, bonytail chub and Colorado squawfish inhabit the Green and Colorado Rivers. Additionally, the humpback (razorback) sucker also inhabits those rivers; it is likely that this species will one day be federally listed as threatened. It is not believed that implementation and operation of the Company's project will impact any of these species.

### Terrestrial Use Areas

#### Wildlife Habitat Types

Of the seven wildlife habitat types present on the mine plan area wetlands and riparian habitats are ranked as being of critical value to all wildlife. These critical valued habitats are normally associated with drainage bottoms (ephemeral or intermittent), or perennial streams (UMC 700.5), seeps and springs within the upper Sonoran, Transition and Canadian life zones. Cliffs and their associated tallus areas that lie within the upper Sonoran or Transition life zones are ranked as being of high-priority value to all wildlife. When compared to all other wildlife habitats the aforementioned situations are considered to represent unique habitat associations (Table 1).

Riparian and wetland areas are highly productive in terms of herbage produced and use by wildlife as compared to surrounding areas. Experience has shown that as much as 70 percent of a local wildlife population are dependent upon riparian zones. Cliffs and tallus are of special importance to many high interest wildlife.

These unique habitat types must be identified in the permit application and protected due to their high value for all wildlife.

Quantitative (acreage) and qualitative (condition, successional stage and trend) data concerning the wildlife habitats in each ecological association should be included as part of the mine permit application. It is important to note that each legal section of land represented by the mine plan and adjacent areas has been ranked as to its value for the total wildlife resource. Sections 5, 6, 7, 8, 9, 12, 17 and 18 of Township 13 South Range 11 East have each been ranked as being of high-priority value to wildlife. These rankings were developed through an analysis of cumulative values for use areas of individual wildlife species inhabiting each legal section of land (Table 2).

#### Amphibians--Species Occurrence and Use Areas

Five species of amphibians, all of which are protected, are known to inhabit the biogeographic area in which the mine plan and adjacent areas are located. It is probable that three of these species inhabit the project area. Only one species of the amphibians inhabiting the project area has been determined to be of high interest to the State of Utah (Appendix A).

The tiger salamander is a yearlong resident animal that may inhabit the project area. The substantial value use area for the adult form is represented by any moist underground site or any similar habitat such as inside rotten logs, cellars or animal burrows. Such sites can be found within any wildlife habitat extending from the cold desert (upper Sonoran life zone) through the submontane (Transition life zone) and into the montane (Canadian life zone) ecological association. The larva form, often referred to as a mud-puppy, is a gilled animal that must remain in water within the above described ecological associations. It is interesting to note that the larva may fail to transform into an adult, even after their second season, and they can breed in the larva condition.

Once the larva is transformed into the adult form the animal is primarily terrestrial. Salamanders do migrate to water in the spring for breeding and

may remain there during much of the summer. Such an intensive use area would be ranked as being of high-priority value to the animal. In September the newly transformed animals leave the water to find suitable places to spend the winter.

The tiger salamander breeds from March through June and is sexually mature after one year. The male deposits a small tent-shaped structure containing a myriad of sperm on the pool bottom. During courtship the female picks up this structure in her cloaca; then the eggs are fertilized internally before or just at the time they are laid. The eggs, singly or in small clusters, adhere to submerged vegetation; after 10 to 12 days they hatch. Obviously, a critical period for maintenance of the population is when breeding salamanders, eggs or their larva are inhabiting a water.

Post-embryonic development of a salamander's larval form progresses at a pace somewhat controlled by water temperature; in some cold waters the larva may not transform into an adult and drying up of a pool may hasten the process.

Migration to or from water usually occurs at night, during or just after a rain storm. When inhabiting terrestrial sites the tiger salamander is most active at night, particularly on rainy nights, from March through September.

Larva, when small feed on aquatic invertebrates and become predacious to the point of cannibalism when they are larger. Food items for adults include insects, earthworms and occasionally small vertebrates.

No amphibians have relative abundances that are so low to have caused the animal to be federally listed as a threatened or endangered species.

#### Reptiles--Species Occurrence and Use Areas

Fifteen species of reptiles, all of which are protected, are known to inhabit the biogeographic area in which the mine plan and adjacent areas are located. It is probable that all of these species inhabit the project area. Only one specie of the reptiles inhabiting the project area have been determined to be of high interest to the State of Utah (Appendix A).

The Utah milk snake is a yearlong resident animal of the project area. Its

substantial value use area encompasses all wildlife habitats extending from the upper Sonoran (cold desert life zone) through the submontane (Transition life zone) and into the montane (Canadian and possibly Hudsonian life zone) ecological associations. Although its use area spans a multitude of habitats, the animal is extremely secretive, mostly nocturnal and is often found inside or under rotten logs, stumps, boards, rocks or within other hiding places. At night they can be found in the open where they hunt for small rodents, lizards and other small snakes. Occasionally, the milk snake may take small birds or bird eggs.

The milk snake may live beyond twenty years and it becomes sexually mature during its third spring season. After mating, which occurs during spring or early summer when they are leaving the den, female milk snakes produce clutches which average seven eggs. The eggs are secreted in a moist warm environ and then abandoned; incubation lasts 65 to 85 days. The site where an individual snake has deposited its clutch of eggs is of critical value to maintenance of the species.

To date snake dens, which are protected and of critical value to snake populations, have not been identified on or adjacent to the project area. It is important to note that inventory for such has not been attempted. If the Company at some later time discovers a den it should be reported to the Utah Division of Wildlife Resources. If a den(s) is currently known, its location must be included with the permit application.

No reptiles have relative abundances that are so low to have caused the animal to be federally listed as a threatened or endangered species.

#### Birds--Species Occurrence and Use Areas

Two hundred forty-four species of birds, all of which are protected, are known to inhabit the biogeographic area in which the mine plan and adjacent areas are located. It is probable that one hundred six of these species inhabit the project area. Twenty-eight species of the birds inhabiting the project area

have been determined to be of high interest to the State of Utah (Appendix A).

The project and adjacent areas provides substantial valued habitat for a multitude of raptors--turkey vulture, bald and golden eagles, four species of falcons (prairie, American peregrine and arctic peregrine falcon and American kestrel), five species of hawks (goshawk, sharp-shinned, Cooper's, red-tailed and Swainson's hawks) and seven species of owls (barn, screech, flammulated, great horned, pygmy, long-eared and saw-whet owls). Many of these species are of high federal interest pursuant to 43 CFR, 3461.1 (n-1). All of these species are of high interest to the State of Utah (Appendix A).

Realistically, nesting habitat does not exist on the project or adjacent areas for most, if not all, of these species. However, if a species were to nest on or adjacent to the project area, it would have a specific crucial period during which the aerie would need protection from disturbance; this period of time lies between February 1 and August 15. Generally speaking, aerie represent a critical valued site and need protection from significant or continual disturbance within a one-half kilometer radius of the nest. This consideration need only be implemented during the period of time that the nest is occupied. Species specific protective stipulations for aeries are available from the Utah Division of Wildlife Resources and the U.S. Fish and Wildlife Service.

The current level of data relative to site specific use of the area by raptors is unsatisfactory. Likely, there are aeries that have not been identified. Many of these species are highly sensitive to man's disturbances. Therefore, it is recommended that intensive surveys be initiated on the mine plan and adjacent areas for determination of locations for raptor aerie territories. Such data needs to be merged with information provided within this report.

Golden eagles are a common yearlong resident of the mine plan area. To date no active aerie territories are known. (Note, an aerie territory is utilized by one pair of eagles but may contain several nest sites.) It is believed that aerie territories may exist on the project area. This belief is based upon

the fact that suitable nesting habitat is widespread on the mine plan area and throughout the local area.

An active golden eagle nest site is extremely sensitive to disturbance within a one-half kilometer radius. This buffer zone is ranked as being of critical value to maintenance of the eagle population when the bird is actually utilizing the aerie; that period of time is normally between April 15 and June 15. The radius for a buffer zone may need to be increased to one kilometer if a disturbance were to originate from above and within direct line of sight to the eagle aerie.

To date there are no known high-priority concentration areas or critical roost trees for golden eagles on the project area. The mine plan and adjacent areas have been ranked as being of substantial value to golden eagles.

The northern bald eagle is an endangered winter resident (November 15 to March 15) of the local area. To date there are no known high-priority concentration areas or critical roost trees for this species on or adjacent to the project. The mine plan area has been ranked as being of substantial value to wintering bald eagles. Note that no bald eagles are known to nest in Utah, however, historic data documents nesting activity by these birds in the State. There is no known historic evidence of the northern bald eagle nesting on the mine plan or adjacent areas.

The American peregrine falcon (status is endangered) and the prairie falcon (status is common) are yearlong residents of the mine plan and adjacent areas. Each of these species utilizes cliff nesting sites. To date there are no known aerie sites for cliff nesting falcons on the project area. However, suitable nesting habitat for the prairie falcon is widespread. Suitable nesting habitat for the American peregrine falcon cannot be found on the mine plan and adjacent areas. The project area has been ranked as being of substantial value to these two cliff nesting falcons.

For each falcon their aerie site while being utilized and a one-half kilo-

meter radius would be ranked as being of critical value to maintenance of their populations. The falcon's period of use at the aerie site spans the spring and early summer period--prairie falcon, April 15 to June 30; peregrine falcon, March 1 to June 30.

The level of data relative to site specific use of the project area by cliff nesting falcons (not including the kestrel) is unsatisfactory and there could be aeries that have not been identified. Therefore, it is recommended that intensive surveys be initiated on the area for determination of locations for cliff falcon aerie sites.

The endangered arctic peregrine falcon is a winter resident (November 15 through March 15) of the local area. This species has not been observed to utilize the environs on or adjacent to the mine plan area, however, its occasional presence would not be unlikely. Therefore, the project area is ranked as being of limited value to this species.

The blue grouse is a yearlong resident of the project area. Adult birds prefer open stands of conifers. During winter the blue grouse feeds exclusively upon needles and buds of douglas-fir and spruce trees. Thus, this wildlife habitat (spruce-fir forest) is ranked as being of critical value to over-winter survival of the population during the crucial period of December through February.

Blue grouse annually exhibit what has been termed a reverse vertical migration. That is, during the spring months, they migrate from the high elevation spruce-fir habitat to lower elevation sagebrush, pinion-juniper or shrubland habitats. This movement is caused by a need of the birds to feed on early developing vegetation. Such movement also facilitates successful breeding, nesting and brooding of their young. Then as the year progresses, they move to the higher elevations.

The males are polygamous and will set up and defend territories for booming and breeding activities against other breeding males. Such territories are critical to maintenance of the population during the crucial period of mid-March through mid-June.

After breeding the female develops a nest site which is secreted on the ground; the nest is of critical value to maintenance of the blue grouse population. Upon hatching, which occurs in late May and early June, the young accompanied by the hen immediately leave the nest. The young blue grouse while being brooded rely heavily on insects for their protein needs during the first several months of development. The adult bird also shifts its diet during this period to include a high proportion of insects. Brooding areas are ranked as being of high-priority value to blue grouse. The crucial period extends from hatching into mid-August.

As summer progresses into the fall season the grouse consumes large quantities of berries.

The chukar is a yearlong resident of the project area. It is important to note that they are an exotic species introduced from Asia during the 1950's. These birds prefer open rocky areas in the cold desert and submontane ecological associations. During summer chukars feed on grass shoots and insects, but during winter their diet is primarily seeds. Their substantial valued habitats are the cliff and tallus type and the associated desert scrub or shrubland types.

The winter season is a crucial period (early December through mid-February) for chukars; the birds concentrate on selected areas. Winter range has been ranked as being of critical value to over-winter survival of the chukar populations. Disturbance on winter range must be avoided when chukars are present.

Chukars are monogamous; the pairs nest between early April and late May. Nest sites are critical to maintenance of the population during the crucial nesting period.

It is important to note that all sources of water within the substantial valued use area for chukars are critical to maintenance of their populations on a yearlong basis.

Mourning doves normally inhabit the project and adjacent areas, which represents a substantial valued use area for these birds, between May 1 and September

15 each year. They nest throughout most of this period and each pair produces two clutches. The pinion-juniper and riparian habitats are ranked as being of high-priority value for nesting. Locally, mourning doves show two peaks in on-nest activity--early July and early August. Successful nesting activities and any water sources are critical to maintenance of the mourning dove population.

The black swift is a summer resident of the West Tavaputs Plateau. The montane ecological association represents the swift's substantial valued use area. Normally, the bird is associated with a small flock that represents a colony. Black swifts are usually observed soaring as pairs and they feed upon flying insects. A colony's nests are scattered along precipitous terrain where the nest is often secreted behind a waterfall. Such a moist habitat is not known to exist on the project area. Cliff and tallus wildlife habitats are ranked as being of high-priority value to the black swift. There is evidence that pair bonds are long lasting and that a nest may be utilized in successive years.

The pileated woodpecker is a species having high federal interest pursuant to 43 CFR 3461.1 (n-1). The spruce-fir and aspen wildlife habitats of the montane ecological association represent this birds substantial valued use area. It is important to note that the pileated woodpecker has never been documented to utilize the environs of the biogeographic area that surrounds the project site. In areas of the State where the bird is known to exist, it is a yearlong resident with a relative abundance considered to be rare.

The Williamson's sapsucker is another species having high federal interest pursuant to 43 CFR 3461.1 (n-1). Typically, the substantial valued use area for this species is the spruce-fir habitat of the Hudsonian life zone in the montane ecological association. Therefore, the spruce-fir habitat of the Canadian life zone on the project site would only represent the substantial valued use area for the yellow-bellied sapsucker. The yellow-bellied sapsucker is a yearlong resident of the environs associated with the project area and it has a relative abundance considered to be common. Where as the Williamson's sapsucker has never

been documented to utilize the environs of the biogeographic area that surrounds the project site. In areas of the State where the Williamson's sapsucker is known to exist, it is a summer resident with a relative abundance considered to be uncommon.

The Lewis woodpecker is also another species having high federal interest pursuant to 43 CFR 3461.1 (n-1). Its substantial valued use area is represented by riparian habitats characterized by cottonwood stands and ponderosa forests. These habitats do not exist on the project site. It is important to note that the Lewis woodpecker has never been documented to utilize the environs of the biogeographic area that surrounds the project site. In areas of the State where the bird is known to exist, it is a summer resident or only a transient. Its relative abundance is unknown.

The western bluebird is an uncommon summer resident known to inhabit the environs of the biogeographic area that surrounds the project site. Where as the mountain bluebird is a common yearlong resident of the area. Both birds are cavity nesting species. The western bluebird nests from the pinion-juniper habitat of the submontane ecological association up into the lower forest habitats within the Canadian life zone of the montane ecological association. The mountain bluebird utilizes the same continuum of habitats for nesting, but also extends its nesting use across the Canadian and Hudsonian life zones and into the Alpine life zone. During winter both species show elevational and longitudinal migrations; they then utilize all habitats associated with the cold desert ecological association. Therefore, the substantial valued use area for each species spans a broad continuum of habitats. It is important to note that trees with cavities located on the project area can be of critical value to bluebirds.

Grace's warbler is a species having high federal interest pursuant to 43 CFR 3461.1 (n-1). Its substantial valued use area is shrublands and associated ponderosa forest habitats of the submontane and montane ecological associations. This bird's nest is built twenty or more feet above ground in a ponderosa tree.

It is important to note that the Grace's warbler has never been documented to utilize the environs of the biogeographic area that surrounds the project site. In areas of the State where it is known to exist, it is a summer resident with a relative abundance considered to be uncommon.

Scott's oriole is also a species having high federal interest pursuant to 43 CFR 3461.1 (n-1). Its substantial valued use areas are riparian habitats characterized by cottonwood stands and the continuum of habitats extending from the pinion-juniper forest into shrublands of the submontane ecological association. The oriole's nest is characterized as a grassy pouch and is hung in a tree. It is important to note that the Scott's oriole has never been documented to utilize the environs of the biogeographic area that surrounds the project site. In areas of the State where it is known to exist, it is a summer resident with a relative abundance considered to be uncommon.

The grasshopper sparrow is a rare transient species known to inhabit the environs of the biogeographic area that surrounds the project site. It only frequents dry grassland areas in the desert scrub habitat of the cold desert ecological association during spring and fall migration periods; the project borders such areas. Since its use of such sites is best described as "occasional", those habitats in the region are only ranked as being of limited value to the bird.

#### Mammals--Species Occurrence and Use Areas

Eighty species of mammals, of which 22 percent are protected, are known to inhabit the biogeographic area in which the project and adjacent areas are located. It is probable that sixty of these species inhabit the project area. Seventeen species of the mammals inhabiting the project area have been determined to be of high interest to the State of Utah (Appendix A).

The dwarf (least) shrew is a yearlong inhabitant of the biogeographic area that surrounds the project site. This animal's substantial valued use area is characterized as open grass covered areas of any wildlife habitat in the submontane and montane (Canadian life zone) ecological associations. Since this

shrew has a relative abundance determined to be limited, its use areas should be ranked as being of high-priority value to the animal.

The red bat is a summer resident of the biogeographic area that surrounds the project site. The animal roosts in wooded areas (riparian woods and pinion-juniper forests) of the submontane ecological association. Such areas represent this animals substantial valued use area. An occasional individual has been known to utilize caves; those individuals could hibernate and remain over winter.

The western big-eared bat is a yearlong resident of the biogeographic area that surrounds the project site. This animal roosts and hibernates within caves, mine tunnels or suitable buildings located in the pinion-juniper, shrubland and low elevation spruce-fir habitats of the submontane and montane (Canadian life zone) ecological association. Such areas represent this bats substantial valued use area.

The cottontail rabbit (mountain cottontail inhabits sites lying between 7,000 and 9,000 feet in elevation and the desert cottontail inhabits sites lower than 7,000 feet in elevation) is a yearlong resident of the biogeographic area that surrounds the project site. The entire project area represents a substantial valued use area for cottontails. Their young are born between April and July. This is a crucial period for maintenance of the cottontail population.

The red fox and kit fox are yearlong inhabitants of the biogeographic area that surrounds the project site. The substantial valued use area for the red fox would include all wildlife habitats extending from the cold desert through the montane (Canadian life zone) ecological associations. The substantial valued use area for the kit fox is restricted to all of the habitats of the cold desert ecological association and extends into the sagebrush and pinion-juniper habitats of the submontane ecological association. Almost nothing is known of their population dynamics. Without doubt a crucial period for both species is when they are caring for young in the den. Dens while being inhabited are a critical use area.

The gray wolf is a historic inhabitant of the biogeographic area that surrounds the project site. Currently its relative abundance is so low that the animal is listed as endangered with extinction. The wolf's substantial valued use area would be represented by any remote habitat in any ecological association.

Black bears are inhabitants of the biogeographic area that surrounds the project site. Their substantial valued use area is represented by all natural wildlife habitats (excluding the pasture and fields and urban or park types) extending from the submontane into the montane (Canadian and Hudsonian life zones) ecological associations. These animals go into a semi-hibernation during winter. During this crucial period, which may last from December through March, the animal secretes itself in a den in order to conserve body energy reserves. The young are born in the den during January or February. Dens while being inhabited represent a critical valued use area for bears.

The wolverine and badger are the only members of the family mustelidae having potential to inhabit the biogeographic area that surrounds the project site. They are protected and classified as furbearers.

The substantial valued use area for wolverine is the montane ecological association. This specie may be found in the environs of the project site.

The substantial valued use area for badger spans all wildlife habitats other than dense forests in the cold desert, submontane and montane (Canadian life zone) ecological associations. They are dependent upon a suitable prey source.

A crucial period for maintenance of all furbearer populations is when they have young in a den. Such sites are critical for reproductive success.

Bobcat and cougar are known to inhabit the biogeographic area that surrounds the project site. For both of these species a crucial period for maintenance of their population is when the female has her young secreted at a den site. Such sites are of critical value when being utilized. It is also crucial to their survival that a female accompanied by young not be killed or harassed.

The substantial valued use area for bobcats extends from the cold desert through the submontane and into the montane (Canadian life zone) ecological association. The bobcat is normally associated with precipitous terrain, but has been observed in every wildlife habitat within the aforementioned ecological associations. Their primary prey source is represented by small mammals and birds or any other small animal they can catch. It is important to note that bobcats occasionally do kill the young of big game animals.

The substantial valued use area for the cougar (locally known as mountain lion) extends from the submontane into the montane (Canadian and Hudsonian life zone) ecological association. Due to the dependency of the cougar upon mule deer as a prey source, a ranking of the lion's seasonal distribution parallels that of the deer.

Mule deer are inhabitants of the biogeographic area that surrounds the project site. Their substantial valued use area spans all wildlife habitats extending from the cold desert through the submontane and montane ecological associations. In some situations deer show altitudinal migrations in response to winter conditions. There are, however, habitats where deer reside on a yearlong basis.

Migration of mule deer from summer range to winter range is initiated during late October; probably, the annual disturbance of the fall hunting season coupled with changing weather conditions is the initial stimulus. The onset of winter weather reinforces the deer's urge to migrate and continued adverse weather keeps the deer on the winter range.

The project site represents winter range for mule deer herd unit 27b. Winter ranges for mule deer are all ranked as being of high-priority value to the animal; these areas are usually inhabited between November 1 and May 15 each year. During winters with severe conditions the higher elevation portion of the winter range becomes unavailable to deer due to snow depth. Traditionally, some restricted portions of the winter range have shown concentrated use by the deer; these sites are ranked as being of critical value. Critical valued sites must be protected from man's disturbance when the deer are physically present on the

range (see attached map).

Deer begin their migration back to summer range during mid-May and remain there throughout October. There are no summer ranges on the project area.

Mule deer fawn during the month of June. The continuum of wildlife habitats extending from the pinion-juniper through the shrubland and into the aspen type probably represents the fawning area. All riparian areas are of critical value for fawning and maintenance of the deer population. To date no specific areas showing annual use for fawning are known. It is probable that such areas exist; they would be ranked as being of critical value to deer. It is important to note that June represents a crucial period for maintenance of deer populations.

Rocky mountain elk are inhabitants of the biogeographic area that surrounds the project site. Their substantial valued use area spans all wildlife habitats extending from the submontane through the montane ecological association. Elk do not show as strong of altitudinal migration as mule deer do in response to winter conditions, but they do migrate to wintering areas.

Migration of elk from summer range to winter range is initiated during late October; probably, the annual disturbance of the fall hunting seasons coupled with changing weather conditions is the initial stimulus. The onset of winter weather reinforces the elk's urge to migrate and continued adverse weather keeps elk on the winter range.

The project site represents winter range for the Avintiquin elk herd. Winter ranges for elk are ranked as being of either high-priority or limited value to the animal; these areas are usually inhabited between November 1 and May 15 each year (see attached map).

During winters with severe conditions some portions of the winter range becomes unavailable to elk due to snow depth. High-priority valued sites need to be protected from man's disturbance when the elk are physically present on the range.

Elk begin their migration back to summer range during mid-May and remain

there throughout October. There are no summer ranges for elk on the project area.

Elk calf during the month of June, but no animals would be expected to calf on the project area.

Currently, there are no other known high interest wildlife species or their habitat use areas on or adjacent to the project area. It is not unreasonable to suspect that in the future, some additional species of wildlife may become of high interest to the local area, Utah or the Nation. If such is the case, the required periodic updates of project permits and reclamation plans can be adjusted and appropriate recommendations made.

APPENDIX K

# AMCA COAL LEASING, INC.

P. O. BOX 1027

PRICE, UTAH 84501

801-637-5385

RLG 12078-1

Rev. 1/18/79

## A M C A C O A L L E A S I N G , I N C .

### 46 KV POWER TRANSMISSION LINE

### SPECIFICATIONS

#### 1. GENERAL

All construction work shall be done in a thorough and workmanlike manner in accordance with the Plans, Specifications, and Construction Drawings, and shall be subject to the acceptance of the Owner.

Deviation from the Plans, Specifications, and Construction Drawings shall not be permitted except upon the written permission of the Owner.

If any construction problem arises that is not covered by these Specifications, the Contractor shall consult with the Owner for approval on material, type of construction, reclamation, or procedure to be followed.

#### 2. DRAWINGS AND MAPS

The Vicinity Map is presented to show the general route of the transmission line. Each Plan and Profile sheet, as listed separately hereinafter, becomes part of these Plans and Specifications. The Construction Drawings and the Pole Data sheets showing the type of construction to be used, where indicated on the Plan and Profile, are also listed and are part of these Plans and Specifications. No deviation from the Plan and Profile drawings or Specifications shall be made without the written approval of the Owner.

#### 3. LOCATIONS OF STRUCTURE

Structure, guys, etc., shall be placed in locations determined by the Engineer and staked by the Engineer as shown on the Plan and Profile sheets and structure lists. Structures, guys, etc., shall not be erected in any other location without prior approval of the Owner.

Survey stakes established by the Owner shall be preserved by the Contractor. Any stakes destroyed or ruined by the Contractor without the Owner's approval shall be replaced at the Contractor's expense.

4. RIGHT-OF-WAY CLEARING

The Contractor shall clear the right-of-way of all trees, brush and other obstructions as required for stringing conductors and as specified hereinafter or as otherwise specified by Owner.

The Contractor shall clear all trees, brush, stumps, and large boulders from around each pole and anchor location for a radius of fifteen (15) feet and as close to the ground as possible.

Trees, brush or other vegetation which has grown to within ten (10) feet of the nearest conductor, or if when turned in an arc from it's base would strike within ten (10) feet of the nearest conductor, shall be removed by the Contractor.

Any hazard to the transmission line shall be removed by the Contractor as specified by the Owner. A hazard to the transmission line shall include any tree, boulder, stump, or other object within the right-of-way, which may, at some future time, fall or roll onto, or come in contact with the transmission line causing damage. Any hazard apparent outside the right-of-way shall be noted and a request for removal shall be made to the Bureau of Land Management.

All areas cleared along the right-of-way shall be vegetated, as dictated by the Owner, to prevent erosion and unnecessary damage.

5. CONSTRUCTION & ACCESS ROADS

The Contractor shall use the right-of-way furnished by the Owner for construction where practical. Access to the right-of-way shall be from intersecting or adjacent public or private roads.

No access or construction road shall be built by the Contractor, whether on or off the right-of-way, without the Owner's consent. Such roads, as approved by the Owner, shall be built and maintained by the Contractor. Upon completion of the job, access roads which have been built shall be obliterated, the soil shall be reseeded with vegetation and the terrain returned to it's original form, as dictated by the Owner.

Any existing access roads used by the Contractor shall be left in as good or better condition than when the Contractor's use commenced.

6. POLES

A. All poles shall conform to American National Standard Institute (ANSI) 05.1-1972 standards with respect to fiber stresses, class, dimensions, and defect limitations.

B. All poles shall be fully treated Douglas Fir conforming to EEI standard TD-100.

C. All poles are to possess a low conductivity. The measured resistance over a twenty (20) foot length of pole must be greater than 1,000,000 ohms.

D. All poles are to be new and free of splits, splinters, and other signs of visable abuse.

E. Poles shall not be dropped in unloading or handling.

F. All poles are to be set and buried at not less than their standard depths; the minimum setting depths shall be as follows:

<u>Pole Length</u> (feet)	<u>Setting Depth</u> (feet)
45	6.5
50	7.0
55	7.5
60	8.0
65	8.5
70	9.0

G. For multiple pole structures, holes shall be carefully dug to the setting depth specified by the Engineer, except that the distance from the butt to the gain shall be measured for each pole and the depth of holes adjusted as required. If necessary, the top of one pole of a multiple pole structure shall be cut and reframed to bring crossarms level.

On sloping ground, the depth of the hole shall always be measured from the low side of the hole.

Holes shall be approximately eight (8) inches larger than the butt diameter of the pole, and shall be at least as large at the bottom as at the top.

H. All poles shall be set in alignment, except on line angles, and plumb. At line angles, where suspension construction is used, poles shall be offset on the bisector of the angle so that conductors will hang directly over the point of intersection or in line with the tangent in both directions. All poles shall be plumb after conductors are strung.

6. POLES (Continued)

I. In backfilling, holes shall be thoroughly tamped in layers of six inches or less for the full depth. Earth shall be banked up around each pole. After completion of the job, holes shall be inspected and any settlement refilled.

Frozen earth or any material subject to decay shall not be used in backfilling. Holes shall be dewatered before any backfilling is attempted. Gravel shall be used in backfilling holes under muddy conditions.

J. The tops of full length treated poles shall not be cut except under very exceptional conditions and upon the approval of the Owner. If cutting is deemed necessary, the pole top shall be painted with creosote compound and covered completely with a copper or aluminum cap plate or other approved method.

K. Under no circumstances shall the butt on any pole be cut.

L. All unused holes in poles shall be plugged prior to line completion using treated cedar wood dowel pins.

7. TIMBERS AND ARMS

A. All timbers are to be high-grade structural timbers conforming to the specifications of the Timber Manufacturer's Associations.

B. All arms are to be treated Douglas fir conforming to structural specifications and EEI specifications TD-90 and TD-92.

C. The maximum crushing strength of each timber and arm shall not be less than that set forth by ASTM specifications.

D. All timbers and arms shall be new and free of splits, splinters, and other signs of visible defects.

E. Any field bored holes which are not used shall be plugged with tight-fitting treated cedar plugs.

F. Any timber or arm shall only be cut upon approval of Owner, and when cut shall receive at least two applications of preservative.

G. Timbers and arms shall be installed level to horizontal and perpendicular to the center line except as noted for certain structure types. Timbers or arms used on angle structures shall be set on the bisection of the angle.

8. CONDUCTORS AND OVERHEAD GROUND WIRE

A. Care shall be exercised to avoid kinking, twisting, or abrading the conductor or overhead ground wire in any manner. Conductors or overhead ground wires shall not be tramped on, run over by vehicles, or dragged over sharp rocks. The wire on each reel shall be inspected for cuts, kinks, or other injuries. Injured portions or crooked or imperfect splices in either the conductor or overhead ground wire shall be cut out and the wire respliced. Badly nicked conductors shall not be acceptable.

B. Conductors and overhead ground wires shall be pulled over suitable rollers or stringing blocks properly mounted on the pole or crossarm, to prevent binding while stringing.

C. Installation of conductors and accessories shall be done in accordance with manufacturers' recommendations.

D. Phase conductors shall be 266.8 MCM ACSR (Partridge) throughout. The ground conductors (static) shall be 3/8" EHS Grade B 7 strand galvanized steel.

E. The conductor SAG design shall be set at 40 percent of ultimate (4520 pounds maximum design tension) and for medium loading. Stock bridge dampers shall be installed on the 266.8 MCM ACSR so that they hang directly under the phase conductors. Dampers shall be carefully attached to the conductor in accordance with the wire manufacturers recommendations with regards to the damper spacing, weights, and quantity. Contractor shall ascertain that drain holes in weights are open after dampers are installed.

Included with these specifications are the ALCOA SAG-tension data for 266.8 MCM ACSR based on 40 percent of ultimate. This data lists the final and initial SAGS for 50 foot increments from 100 to 900 foot spans. Also included is ALCOA's recommendations for the damper applications.

This information from ALCOA is intended as a guide for the contractor to follow in determining the damper cost. The actual application shall depend on the specific recommendations by the manufacturer of the cable. It shall be the responsibility of the Contractor to obtain and follow these recommendations based on the brand of conductor purchased.

F. The sag of all conductors after stringing shall be in accordance with the Manufacturers' recommendations, except that a maximum increase of three (3) inches of the specified

8. CONDUCTORS AND OVERHEAD GROUND WIRES (Continued)

sag in any span will be acceptable. Under no circumstances will a decrease in the specified sag be allowed. Sagging by sighting between targets is recommended.

The minimum allowable ground clearance should be no less than twenty-five (25) feet at any point along the line.

The air temperature at the time and place of stringing shall be determined by a certified etched-glass thermometer. The temperature at which the conductor is sagged in and the spans in which sags are measured shall be recorded and the information given to the Owner.

G. There shall not be more than one splice per conductor in any span, and no splice shall be located within fifteen (15) feet of the conductor support. There shall be no splices in spans over 1200 feet. Splices shall be limited to not more than one every 2,000 feet. Where splices are necessary, they shall be made with high quality, compression-type sleeves suitable for the application and they shall be approved by the Owner.

All splicing sleeves shall be carefully installed so that the completed splice is as straight as possible and presents no undue twisting or kinks to the conductor.

After the compression sleeve has been installed, it shall be finished in a workmanlike manner with all the corners and sharp projections tapered or rounded.

H. Utmost care shall be exercised in installing parallel groove clamps. The contact surface of the clamp and the wire shall be clean and bright. A steel brush shall be the principal cleaning medium. These same precautions for cleaning shall apply to the conductor before splicing.

9. INSULATORS

A. Care shall be exercised in handling and erecting insulators and in assembling suspension units to insure that all cotter keys are in place.

B. String and suspension insulators shall be ball and socket type, 5 3/4" x 10", 15,000 pound M&E, ANSI Class 52-3, Light Gray Glaze.

C. Dead end strings will be made up of six (6) insulators having an overall length of  $34\frac{1}{2} \pm$ .

9. INSULATORS (Continued)

D. Angle string will be made up of five (5) insulators for an overall length of 28 3/4" ±.

E. Tangent strings will be made up of four (4) insulators for an overall length of 23" ±.

F. Post insulators shall be clamp type, Lapp No. 4766.

G. Any insulation type with broken or chipped glass shall not be acceptable.

10. GUYS AND ANCHORS

A. Guys shall be installed in locations specified by the Engineer. Points of attachment to poles shall be via Pole Bands as shown on construction drawings. Guys shall be installed before conductors or overhead ground wires are strung. Down Guys shall be installed at a 1 to 1 slope.

B. Holes for anchors shall be dug in locations staked by the Engineer. Anchor rods shall be in line with the strain and so installed that approximately eight (8) inches of the rod shall remain out of the ground. Under no circumstances shall the eye of the rod be covered. Holes shall be backfilled and tamped in the same manner as for pole holes. The setting of each anchor, in regards to depth and position, shall be inspected by the Engineer and his approval given before the anchor hole is backfilled.

C. Anchors are to be set against undisturbed earth with the rod trenched upward at an angle equal to the guy wire.

D. All guy wire shall be one common size of 1/2" Grade B galvanized extra high strength steel throughout.

E. All guy attachments shall be as near as possible to the conductor they are supporting.

F. All guys shall be of the insulated type with fiberglass strains used where insulation from energized conductors is required.

G. All anchors shall be rated in the 20,000 pound class.

H. Colored fiberglass guy guards shall be installed on all down guys.

I. Adjustable grip deadends shall be installed for down guy tension adjustments.

11. LINE ACCESSORIES AND HARDWARE

- A. All hardware shall be hot dipped galvanized.
- B. All hardware shall be new equipment.
- C. All bolts, angle brackets, etc., shall be at least 3/4" in diameter unless specified otherwise.
- D. All accessories and hardware shall conform to pole structure specifications or accepted standard requirements.
- E. Where practical, locknuts shall be used on all bolts.

12. GROUNDS

- A. Pole grounds shall be run on every pole with a 12" "Bayonet" brought above the pole.
- B. All ground wire shall be #6 AWG Copper Weld.
- C. Copper butt plates shall be used on all poles.
- D. In addition to the butt plates, 3/4" x 8' ground rods shall be driven between poles on the three (3) pole "H" structures and tied to the pole grounds.
- E. On two (2) and three (3) pole structures, where more than one static wire is pulled, the static shall be tied together.
- F. The #6 AWG pole ground conductor shall be stapled to the pole approximately every two (2) feet using ground wire clips.
- G. The pole ground conductor and the overhead static conductor shall be tied together at every pole using compatible connectors.
- H. All pole grounds shall be meggered for ground resistance. If the ground resistance of any structure measures greater than 20 ohms ground rods will be driven, but not to exceed two (2) rods per structure. Contractor will notify Owner if less than 20 ohms cannot be achieved.

13. MISCELLANEOUS

These specifications are intended as minimum acceptable standards. The following pole data sheets, comprised of the specific pole type and material list, along with the reference drawings, are intended to pinpoint the construction as much as

13. MISCELLANEOUS (Continued)

practical. However, the material lists are in no way conclusive. The responsibility for the correct quantities will fall on the successful Contractor who is solely responsible for providing a complete 46 KV transmission line ready to be energized. The quality of the material shall be no less than that specified. For particular items showing no manufacturer, the material selected shall be of comparable grade to the specified components. In such cases, the Owner reserves the right to refuse certain materials considered below grade or inferior.

POLE DATA SHEETS

<u>Pole Number</u>	<u>Constr. type</u>	<u>Pole Size Height/Class</u>	<u>Span (from Preceding Pole)</u>
0.	SPECIAL	50ft/3 40ft/3	Disconnect-Meter Structure (Str.)
1.	PlTS	55ft/3	256 ft.
2.	PlTS	60ft/3	400 ft.
3.	PlTS	55ft/3	400 ft.
4.	PlTS	60ft/3	400 ft.
5.	PlTS	55ft/3	400 ft.
6.	PlTS	55ft/3	400 ft.
7.	PlTS	60ft/3	400 ft.
8.	PlTS	65ft/3	400 ft.
9.	PlTS	65ft/3	400 ft.
10.	PlTS	65ft/3	400 ft.
11.	PlTS	60ft/3	400 ft.
12.	PlTS	65ft/3	400 ft.
13.	PlDE	60ft/2	400 ft.
14.	PlTS	60ft/3	375 ft.
15.	PlTS	60ft/3	375 ft.
16.	PlTS	55ft/3	375 ft.
17.	PlTS	60ft/3	375 ft.
18.	PlTS	60ft/3	375 ft.
19.	PlTS	55ft/3	375 ft.
20.	PlTS	60ft/3	375 ft.
21.	PlTS	55ft/3	375 ft.
22.	PlTS	55ft/3	400 ft.
23.	PlTS	55ft/3	375 ft.
24.	PlTS	55ft/3	375 ft.
25.	PlTS	55ft/3	375 ft.
26.	PlTS	60ft/3	375 ft.
27.	PlTS	60ft/3	375 ft.
28.	PlDE	60ft/2	390 ft.
29.	PlTS	55ft/3	390 ft.
30.	PlTS	55ft/3	390 ft.

POLE DATA SHEETS

(Page 2)

<u>Pole Number</u>	<u>Constr. type</u>	<u>Pole Size Height/Class</u>	<u>Span (from Preceding Pole)</u>
31.	PLTS	55ft/3	390 ft.
32.	PLTS	60ft/3	390 ft.
33.	PLTS	55ft/3	390 ft.
34.	PIMA	60ft/2	400 ft.
35.	PLTS	55ft/3	400 ft.
36.	PLTS	55ft/3	400 ft.
37.	PLTS	55ft/3	400 ft.
38.	PLTS	55ft/3	400 ft.
39.	PLTS	60ft/3	400 ft.
40.	PLTS	55ft/3	400 ft.
41.	PLTS	60ft/3	400 ft.
42.	PLDE	65ft/2	400 ft.
43.	PLTS	55ft/3	400 ft.
44.	PLTS	60ft/3	400 ft.
45.	PLTS	55ft/3	400 ft.
46.	PIMA	60ft/2	400 ft.
47.	PLTS	55ft/3	400 ft.
48.	PLTS	60ft/3	400 ft.
49.	PLTS	55ft/3	400 ft.
50.	PLTS	65ft/3	400 ft.
51.	PLTS	55ft/3	400 ft.
52.	PLTS	55ft/3	400 ft.
53.	PLTS	55ft/3	400 ft.
54.	PLTS	60ft/3	400 ft.
55.	PLTS	55ft/3	400 ft.
56.	H3/LA	55ft/3 55ft/3 55ft/3	400 ft.
57.	H3/LA	55ft/3 55ft/3 55ft/3	705 ft.
58.	PLYS	60ft/3	455 ft.
59.	PLYS	60ft/3	455 ft.
60.	PLYS	60ft/3	455 ft.

POLE DATA SHEETS

(Page 3)

<u>Pole Number</u>	<u>Constr. type</u>	<u>Pole Size Height/Class</u>	<u>Span (from Preceding Pole)</u>
61.	P1YS	60ft/3	442 ft.
62.	P1YS	60ft/3	438 ft.
63.	P1DE	55ft/2	525 ft.
64.	P1MA	55ft/2	400 ft.
65.	P1TS	55ft/3	350 ft.
66.	P1TS	55ft/3	350 ft.
67.	P1DE	60ft/2	350 ft.
68.	P1TS	55ft/3	383 ft.
69.	P1TS	65ft/3	275 ft.
70.	P1TS	60ft/3	385 ft.
71.	P1MA	55ft/2	385 ft.
72.	P1TS	60ft/3	341 ft.
73.	H3/LA	60ft/3 60ft/3 60ft/3	331 ft.
74.	H2TS	60ft/2 65ft/2	645 ft.
75.	H3/LA	55ft/3 55ft/3 60ft/3	694 ft.

APPENDIX L

# TOWER RESOURCES, INC

P. O. BOX 1027  
PRICE, UTAH 84501  
(801) 637-5385

April 16, 1981

file copy  
Mr. Cleon B. Feight, Director  
State of Utah  
Department of Natural Resources  
Division of Oil, Gas, and Mining  
1588 West North Temple  
Salt Lake City, Utah 84116

Attn.: Ms. Mary Ann Wright

Dear Mr. Feight,

The following information is in response to that portion of the Apparent Completeness Review dealing with the 325 foot road to drill a water well into old mine workings near Tower's Pinnacle Mine in Carbon County. This should be used in conjunction with the information submitted to the B.L.M. on April 13, 1981.

The purpose of this proposed action is to gain access to a location where a hole can be drilled into old mine workings referred to as the "Olsen Mine". The Olsen contains a small amount of water for which Tower has appropriated the rights through the Division of Water Rights (approved application enclosed). This water is to be used in the Pinnacle Mine (underground) for dust and fire suppression.

Although this well is not to be considered a part of Tower's ground water monitoring program, information as to the volume of water pumped from the Olsen mine will be supplied to the Division if the Division so requests. Naturally, it is not possible to accurately determine the volume of water present, but rough estimates indicate there is approximately 1.5 million gallons present. This would be sufficient water, if used consistently at our current level of production to run the mine for about 6 months.

I have enclosed two maps which show the proposed route of this access road. Also enclosed is a plan and profile for the road. It should be noted that there is no actual "drill pad" proposed; the hole will simply be drilled at the end of the road.

After the hole is drilled, it will be cased and a submersible well pump will be placed in the well. Discharge at the surface will be into a 2" diameter steel pipe. This pipe will be placed above ground and routed directly across the canyon where the water will be discharged into the Pinnacle Mine Sump for storage. It should also be noted that this

Mr. Cleon B. Feight, Director  
April 16, 1981  
Page Two

project is not only crucial to the operation of the Pinnacle Mine for the water needs, but it is necessary to drain the Olsen Mine so that it can be accurately surveyed. The Pinnacle Mine will "skirt" these old works and we must be certain as to their extremities so that a sufficient barrier is left.

It is anticipated that the access road will be constructed using a D-8 or similar, smaller dozer. Through consultation with the Department of Agriculture, Soil Conservation Service, it has been determined that topsoil is probably not present in any significant quantities. However, the growth medium available is defined as a "bouldery loam", approximately 12 inches thick with 15% cobbles, stones and boulders. Below the bouldery loam is a "very gravelly loam" to a depth of 31 inches with 35% gravel and 12% cobbles, stones and boulders. Tower will scrape up any available growth medium material with a loader as a separate operation and will temporarily stockpile the material in an area which is segregated from disturbance by vehicular traffic. Once the road has been completed and the well is in place, this material will be spread back over the road bench and seeded with the mix recommended by the S.C.S., which has proven successful on our site. Also, during construction, every effort will be made to avoid disturbance to existing vegetation. It is estimated that this project will be one month's duration, more or less. As the well will require routine maintenance, the road will not be recontoured. This will keep access to the well site open for the maintenance (probably not more than once or twice per year). Efforts will be made to assure prompt and sufficient revegetation takes place.

When the use of this well is no longer required the pump and casing will be removed and the hole will be plugged with concrete. The entire pipeline will be removed. Also, according to the Class III road standards (UMC 817.176), the culvert will be removed and the drainage returned to its natural state.

As can be seen from the profile, the road is on approximately a 10% grade. Also addressed in the 817.176 regulations, road cuts and embankments will be at an absolute minimum as the road is on either flat or very gently sloping ground. As mentioned above, when the well is no longer needed, the temporary drainage structures will be removed. Also, according to 817.176, upon final reclamation the road will be recontoured and revegetated again.

We greatly appreciate your timely consideration of this matter.

Sincerely,



Michael W. Glasson  
Senior Geologist

MWG/ac

Enclosure

C.

TOWER RESOURCES, INC.  
CENTENNIAL PROJECT

RESPONSE TO REVIEW OF  
APPARENT COMPLETENESS REVIEW RESPONSE

AUGUST 25, 1981

# TOWER RESOURCES, INC

P. O. BOX 1027  
PRICE, UTAH 84501  
(801) 637-5385

August 17, 1981

Mr. James W. Smith, Jr.  
Coordinator of Mined Land Development  
Department of Natural Resources  
Division of Oil, Gas and Mining  
1588 West North Temple  
Salt Lake City, Utah 84116

Attn.: Ms. Sally Kefer

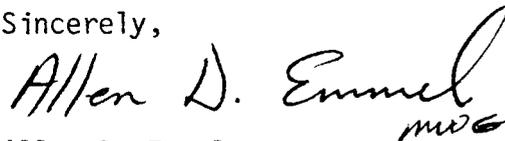
Dear Mr. Smith:

Pursuant to your request, enclosed please find thirteen (13) copies of a cross-reference index of the 211 regulations. This index should be considered a permanent part of Tower's Mining and Reclamation Plan.

The submissions indexed include Volume I, Volume II, Addendum A, Addendum B and the Roof Control and Ventilation Plan Volume; all part of the Mining and Reclamation Plan for Tower's Centennial Project.

If you have any questions or require additional information, please contact me.

Sincerely,

A handwritten signature in cursive script that reads "Allen D. Emmel". There are some initials or a mark at the end of the signature.

Allen D. Emmel  
Environmental Planning Coordinator

ADE/ac

Enclosures

cc: File

# TOWER RESOURCES, INC

P. O. BOX 1027  
PRICE, UTAH 84501  
(801) 637-5385

August 24, 1981

Mr. Fred Halverson  
Carbon County Assessor  
Courthouse Building  
Price, Utah 84501

Re.: Tower Resources, Inc. Mining and Reclamation Plan  
Centennial Project

Dear Mr. Halverson:

Pursuant to Title 30, Code of Federal Regulations and the State of Utah Mining Code, enclosed for review and public inspection is an addition to Tower's Mining and Reclamation Plan, including addendums, currently on file in your office.

This plan is also on file with the U.S. Department of Interior; Office of Surface Mining, Geological Survey and Bureau of Land Management; State of Utah; Department of Natural Resources, Division of Oil, Gas and Mining, Division of Wildlife Resources and the State Health Department, where it is being reviewed.

If you have any questions regarding this plan, please call this office.

Thank you.

Sincerely,



Michael W. Glasson  
Senior Geologist

MWG/ac

Enclosures

cc: File

# TOWER RESOURCES, INC

P. O. BOX 1027  
PRICE, UTAH 84501  
(801) 637-5385

Rec'd. SR/PR AUG 20 1981

August 18, 1981

Mr. Leon Berggren  
Area Manager  
Price Area  
Bureau of Land Management  
P.O. Drawer AB  
Price, Utah 84501

Attn.: Mr. Mark Mackiewicz

Dear Mr. Berggren:

Enclosed for your review is an application for a nonlinear Right-of-Way to be located adjacent to Tower's coal leases in Carbon County, Utah. This application has been made under 90 stat. 2743; 43 U.S.C. 1701 et. seq. (October 21, 1976). This proposed right-of-way is located in Township 13 South, Range 11 East, S.L.B.M. in section 18; E $\frac{1}{2}$ E $\frac{1}{2}$ NE $\frac{1}{4}$ NW $\frac{1}{4}$ , and can be described as follows:

Beginning at the South  $\frac{1}{4}$  Corner  
Section 7, T.13S., R.11E., S.L.B.M.  
Thence West 330'  
Thence South 1320'  
Thence East 330'  
Thence North 1320' to the point of beginning  
containing 10 acres more or less.

In accordance with instructions in 6.(d) of the application, a \$250.00 filing fee has been enclosed on check #433.

This right-of-way will be very closely interrelated with both existing and future projects on both private and public lands as well as other rights of ways previously issued to Tower such as U-45965.

As you are aware, Tower Resources opened the Pinnacle Mine on the Zion's fee property under a permit issued by the State of Utah, Department of Natural Resources. The Pinnacle Mine is currently operating on fee coal. On January 19, 1981, Tower submitted a mining and reclamation plan under the permanent program for mining and associated surface facilities for two new mines adjacent to the Pinnacle Mine, on federal surface and coal. We find after completing the engineering plans

Mr. Leon Berggren  
August 18, 1981  
Page Two

that due to the location of our leases relative to the base of Deadman Canyon there is insufficient area to construct all the necessary structures at one of the two new mines, specifically the administrative office area and sediment control structures (sedimentation ponds). Please refer to the enclosed plans which show the boundaries of the requested right-of-way and the location of these ponds relative to our proposed surface facilities for the three mines. Also enclosed is a detailed plan and profile of the ponds themselves showing specific dimensions.

Regulations regarding the surface effects of underground coal mining are very specific relating to protection of the hydrologic balance and sediment control measures. The proposed structures shown on the 1":50' plate are necessary for the efficient protection of the prevailing hydrologic conditions and therefore are not only beneficial but necessary to assure no additional sediment loading takes place as a result of the mining installations to be installed in the fall of 1981.

As per requirements found in the Utah Mining Code Part 816 and Title 30 CFR Part 816, these ponds have been designed by a Registered Professional Engineer to insure the integrity and the safety of the structures.

As this right-of-way is part of our overall mining and reclamation plan, it would be necessary for this right-of-way to be granted before the State Board of Oil, Gas and Mining and the U.S. Department of Interior could grant approval for construction. However, because this right-of-way would not be granted in time to meet with Tower's schedule for construction, (we anticipate approval by October 1, 1981), we would request that your office write us a letter copied to Oil, Gas and Mining and O.S.M. stating that although the right-of-way cannot be issued in time, that you have reviewed the application and concur with the need for its issuance and that it will be issued. Mr. Mark Mackiewicz of your office indicated it might be completed by January of 1982. Such a letter would give D.O.G.M. and O.S.M. grounds to grant approval for this particular segment of our plan. Naturally, they will review the technical specifications of the structures before granting approval.

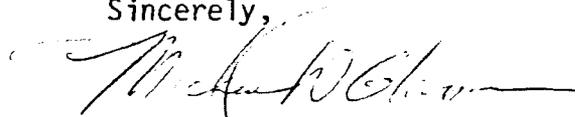
We greatly appreciate the B.L.M.'s expeditious review of this application and their cooperation in assisting Tower to obtain all necessary permits for mining its coal resource.

Mr. Leon Berggren  
August 18, 1981  
Page Three

Please call this office if you require additional information or  
consultation.

Thank you.

Sincerely,

A handwritten signature in cursive script, appearing to read "Michael W. Glasson". The signature is written in dark ink and is positioned above the typed name.

Michael W. Glasson  
Senior Geologist

MWG/ac

Enclosures

cc: File

state of utah



DIVISION OF WILDLIFE RESOURCES  
DOUGLAS F. DAY  
Director

EQUAL OPPORTUNITY EMPLOYER

1596 West North Temple/Salt Lake City, Utah 84116/801-533-9333

August 24, 1981

Reply To SOUTHEASTERN REGIONAL OFFICE  
455 West Railroad Avenue, Box 840, Price, Utah 84501  
(801) 637-3310

Mr. Michael Glasson  
Senior Geologist  
Tower Resources  
P. O. Box 1027  
Price, UT 84501

Dear Sir:

In response to your inquiry of August 24, 1981. Construction of the power lines to the Deadman Mine on the Bureau of Land Management right-of-way and distribution lines to operational sites were constructed under guidelines developed by the Utah State Division of Wildlife Resources.

Sincerely,

Game Manager-Southeastern Region

JWB:hm

# TOWER RESOURCES, INC

P. O. BOX 1027  
PRICE, UTAH 84501  
(801) 637-5385

August 19, 1981

Mr. John Nadolski  
Hydrologist  
U.S. Department of Interior  
Office of Surface Mining  
Brooks Tower  
1020 15th Street  
Denver, Colorado 80202

Dear Mr. Nadolski,

Enclosed for your review are three (3) copies of Tower Resources' response to the Apparent Completeness Review which was discussed at a meeting held August 13, 1981 in the State D.O.G.M. office.

The information included in this submission will be more than adequate to answer all the questions raised in the Apparent Completeness Review.

Seven (7) copies of this submittal have been directed to your office in Denver. At your suggestion, two of the seven copies were taken to the U.S.G.S. in Salt Lake City and two were taken to the B.L.M. in Price.

We greatly appreciate O.S.M.'s cooperation and expeditious review of the submissions.

If there are any questions at all, please call this office.

Thank you.

Sincerely,



Michael W. Glasson  
Senior Geologist

MWG/ac

Enclosures

cc: File

# TOWER RESOURCES, INC

P. O. BOX 1027  
PRICE, UTAH 84501  
(801) 637-5385

August 19, 1981

Mr. Jack Moffitt  
Area Mining Supervisor  
U.S. Department of Interior  
Geological Survey  
1745 West 1700 South  
Room 2040 Administration Building  
Salt Lake City, Utah 84104

Dear Mr. Moffitt,

Enclosed for your review are two (2) copies of Tower Resources' response to the Apparent Completeness Review which was discussed at a meeting held August 13, 1981 in the State D.O.G.M. office.

The information included in this submission will be more than adequate to answer all the questions raised in the Apparent Completeness Review.

Seven (7) copies of this submittal have been directed to O.S.M. in Denver. At the suggestion of Mr. John Nadolski, O.S.M., two of the seven copies are hereby transmitted to the U.S.G.S. and two have been taken to the B.L.M. in Price.

We greatly appreciate the U.S.G.S.'s cooperation and expeditious review of the submissions.

If there are any questions at all, please call this office.

Thank you.

Sincerely,



Michael W. Glasson  
Senior Geologist

MWG/ac

Enclosures

cc: File

# TOWER RESOURCES, INC

P. O. BOX 1027  
PRICE, UTAH 84501  
(801) 637-5385

August 19, 1981

Mr. Leon Berggren  
Area Manager  
U.S. Department of Interior  
Bureau of Land Management  
P.O. Drawer AB  
Price, Utah 84501

Dear Mr. Berggren,

Enclosed for your review are two (2) copies of Tower Resources' response to the Apparent Completeness Review which was discussed at a meeting held August 13, 1981 in the State D.O.G.M. office.

The information included in this submission will be more than adequate to answer all the questions raised in the Apparent Completeness Review.

Seven (7) copies of this submittal have been directed to O.S.M. in Denver. At the suggestion of Mr. John Nadolski, two of the seven copies were taken to the U.S.G.S. in Salt Lake City and two are hereby transmitted to the B.L.M. in Price.

We greatly appreciate the B.L.M.'s cooperation and expeditious review of the submissions.

If there are any questions at all, please call this office.

Thank you.

Sincerely,



Michael W. Glasson  
Senior Geologist

MWG/ac

Enclosures

cc: File

# TOWER RESOURCES, INC

P. O. BOX 1027  
PRICE, UTAH 84501  
(801) 637-5385

August 19, 1981

Mr. Cleon Feight  
Director  
State of Utah  
Department of Natural Resources  
Division of Oil, Gas and Mining  
1588 West North Temple  
Salt Lake City, Utah 84116

Attn.: Mr. Gilbert Hunt

Dear Mr. Feight,

Enclosed for your review are six (6) copies of Tower Resources' response to the Apparent Completeness Review which was discussed at a meeting held August 13, 1981 in the Division office.

The information included in this submission will be more than adequate to answer all the questions raised in the Apparent Completeness Review.

Seven (7) copies of this submittal have been directed to O.S.M. in Denver. At the suggestion of Mr. John Nadolski, two of the seven copies were taken to the U.S.G.S. in Salt Lake City and two were taken to the B.L.M. in Price.

We greatly appreciate the Division's cooperation and expeditious review of the submission.

If there are any questions at all, please call this office.

Thank you.

Sincerely,



Michael W. Glasson  
Senior Geologist

MWG/ac

Enclosures

cc: File

RESPONSE TO REVIEW OF ACR RESPONSE  
TOWER RESOURCES, INC.  
CENTENNIAL PROJECT  
MINING AND RECLAMATION PLAN

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PLATES

<u>Plate #</u>	<u>Title</u>	<u>Scale</u>
1	Surface Facilities - Apex .....	1" = 50'
2	Surface Facilities - Aberdeen .....	1" = 50'
3	Topography - Apex .....	1" = 50'
4	Topography - Aberdeen .....	1" = 50'
5	Cross Sections - Apex .....	1" = 50'
6	Cross Sections - Aberdeen .....	1" = 50'
7	Plan and Profile: Pond C .....	1" = 20'
8	Plan and Profile: Pond D .....	1" = 20'
9	Plan and Profile: Pond E .....	1" = 20'
10	Final Reclamation Contours .....	1" = 100'
11	Final Reclamation Cross Sections .....	1" = 50'
12	Watershed and Culvert Sizing .....	1" = 400'
13	Disturbed Area Runoff .....	1" = 200'
14	Wildlife Distribution .....	1" = 400'
15	Subsidence Monitoring Stations .....	1" = 400'

RESPONSE TO REVIEW OF ACR RESPONSE  
TOWER RESOURCES, INC.  
CENTENNIAL PROJECT  
MINING AND RECLAMATION PLAN

UMC 782.13(g). As stated previously, the operation will not adversely affect any existing contiguous leased mineral rights. There are no existing contiguous leased mineral rights other than coal.

UMC 782.16(a). Tower is currently awaiting a policy decision by the Division as to what action, if any, will be necessary concerning County Road 299. The right-of-way extends fifty feet on either side of the center line (refer to letter from County, dated 8-20-81, Appendix M).

UMC 782.19. Applications for permits and approvals have been filed with the appropriate agencies for the proposed Apex (Lower Sunnyside) and Aberdeen Mines as follows:

- 1) Mining and Reclamation Plan (Centennial Project)
  - State of Utah, Division of Oil, Gas and Mining
  - U.S. Department of the Interior, Office of Surface Mining
- 2) Required M.S.H.A. Permits
  - Mine Safety and Health Administration (M.S.H.A.)
- 3) N.P.D.E.S. Permits
  - Environmental Protection Agency
- 4) Septic and Waste Disposal Plans
  - State of Utah, Department of Health
- 5) B.L.M. Right-of-Way for Construction of Proposed Surface Facilities  
(This application will not be processed nor final approval granted until early 1982; however, a letter from B.L.M. stating that approval will be given is to be submitted).

Copies of these letters of application are included as Appendix O.

UMC 783.15. The exact intraformational location of spring S18-1 is near the interface between a unit within the Mancos shale and the impermeable shale below, 600 feet below the lowest coal seam (Aberdeen Seam). Spring S34-1 is located 1,600 feet above the highest coal seam (Lower Sunnyside Seam).

UMC 783.16. The required water monitoring data has been sent to the Division (c/o Wayne Hedberg) by Vaughn Hansen Associates. This data includes lab reports and summaries. Additional data will be submitted by Vaughn Hansen as collected. The watershed shows right fork drainage only due to the fact that surface facilities will be placed in the right fork only. (See Plate 12)

UMC 817.21-25. The required soil analysis data will be submitted to the Division the first week of September, 1981. Analysis data was obtained from an Order 2 soil survey (as defined by the National Cooperative Soil Survey) performed by Earth Environmental Consultants of Albuquerque, New Mexico. Presently E.E.C. is awaiting the results of detailed laboratory analysis before submitting a final report. This report will include soil classification according to Soil Taxonomy (Agricultural Handbook 436) to the family level. Detailed pedon descriptions were taken and each major horizon to each major taxonomic unit was sampled and submitted to a testing lab for chemical and textural analysis. Also lab data will be provided for the soil presently stockpiled at the existing facilities. A soil map will be submitted showing the distribution and extent of the soil map units and location of sample sites. The soils will also be rated for topsoil suitability.

UMC 783.27. A letter of negative determination for prime farmland from the Soil Conservation Service has been previously submitted to the Division.

UMC 784.11. Columnization of the three coal seams will be as indicated on Plates V-R, VI-R and VII-R (Addendum B). As has been discussed in earlier submissions, due to the nature of the formation mining in one seam will not adversely affect another. This is because there is an average of 200 feet of interburden between seams which contain massive sandstone units. Tower Resources has no intention of using any mining practice which could possibly have an adverse effect on our coal resource. This obviously would not be in the best interest of the company.

Our mining plans have been carefully reviewed and approved by the U.S. Geological Survey. Plans for any modification of these mine plans will be approved by the Survey.

UMC 784.12. Plate 1 shows a schematic of the location of the new bathhouse and associated drainfield. This new bathhouse and drainfield is necessary due to the expansion of mining and personal requirements. It should be noted that this drainfield will be built according to a registered professional engineer's design based on Health Department requirements and will consist of 15 separate ditches 100 feet long and 3 feet wide (refer to Appendix O for letter of application). The application naturally includes detailed specifications regarding location of sewage line and cleanouts.

UMC 784.16. Permission has been obtained from Carbon County authorities to use the county landfill for disposal of any sediment removed from the ponds. A letter documenting this approval is included as Appendix M.

UMC 784.18. Regarding the letter from the Board of Carbon County Commissioners of January 16, 1978, concerning County Road 299: Deadman refers to the terminus of said public road. Included as Appendix M is a recent letter from Carbon County granting Tower Resources permission "to use Carbon County Road 299 in conjunction with its mining activity and coal hauling" with "no restrictions as to the volume of traffic or the upgrading of the road from pavement through the minesite", and that the county is fully aware of operations being within 100 feet of said road.

UMC 784.19. Rock waste which is developed will consist of roof rock shot down in the construction of ventilation overcasts. This rock will be sloped away from the outside of the overcast which will reduce friction on the air current as it passes over the overcast. This will increase the efficiency of the ventilation around overcasts. Also, since overcasts are used sparingly, the placing of the rock in such a manner could not possibly sterilize any coal reserve.

It should be emphasized that Tower's mine has no faults nor are any anticipated. Also, Tower's mine has excellent roof conditions, therefore, waste rock is not generated from these sources.

In the very unlikely event that a rock problem such as a fault is encountered, Tower will consult with the U.S. Geological Survey to determine the best method for underground storage of the waste. It would most likely be stored in every other cross-cut to maintain access to the pillars for final extraction. Therefore, none of the reserve will be sterilized.

It should be noted that M.S.H.A. has approved of underground rock storage so long as the coal present with the rock is below a certain percentage. The rock waste discussed here contains negligible coal.

UMC 784.20. Plate 15 depicts Tower's plan for Subsidence Monitoring. As can be seen there are 12 stations which will eventually be set up. As mining progresses to the extremes of the property, each station will be established prior to the removal of any pillars near a particular station. These stations will be set up for easy monitoring from an established survey point and it will be possible to detect both vertical and horizontal movement in the rebar. A grid of rebar will be placed above areas to be pillared (refer to description in ACR response, page 9).

A sufficient network of stations has been set up to cover the angle of draw over and outside the entire lease area.

UMC 784.23. Cross-sections, maps and plans for the two proposed portal sites as well as for roads are included as the following Plates:

- Plate 1 "Surface Facilities - Apex (Lower Sunnyside) Mine"
- Plate 2 "Surface Facilities - Aberdeen Mine"  
-conceptual layout of surface facilities

- Plate 3 "Topography - Apex Mine"  
Plate 4 "Topography - Aberdeen Mine"  
-baseline surveys for cross sections
- Plate 5 "Cross Sections - Apex Mine"  
Plate 6 "Cross Sections - Aberdeen Mine"  
-cross sections (on 50' intervals) through proposed facilities including cuts and fills as well as cross sections through the existing undistributed area
- Plate 7 "Plan and Profile - Pond C"  
Plate 8 "Plan and Profile - Pond D"  
Plate 9 "Plan and Profile - Pond E"  
-complete plan and details including cross sections for each pond, certified by a registered professional engineer
- Plate 12 "Watershed and Culvert Sizing Map"  
-complete watershed in area of disturbance, minimum culvert sizes and sizes to be used.
- Plate 13 "Disturbed Area Run-off"  
-run-off on disturbed area indicating run-off from specific areas into specific ponds

Also refer to the narrative, "Explanation of Engineering Design - Surface Facilities, Centennial Project" included as Appendix N, and the "Sedimentation and Drainage Control Plan - Centennial Project" included as Appendix P. This engineering design data has been certified by a registered professional engineer.

UMC 784.24. Design specifications for roads within the mine permit area with respect to width, gradient, cut and fill embankments, culverts, drainage ditches and structures are indicated on Plates 1, 2, 3, 4, 5, 6 and 12 and discussed in "Explanation of Engineering Design - Surface Facilities, Centennial Project" (Appendix N). Also refer to Appendix P.

UMC 785.21. At such time as Tower deems the rail loadout at Wellington practicable and if the Division deems necessary, information will be provided as a separate volume for approval by the Division before any construction begins.

UMC 783.19. A final revegetation report prepared by Earth Environmental Consultants of Albuquerque, New Mexico will be submitted the first week in September, 1981. This report will identify and map the ecological plant communities in the area of proposed disturbances. The plant communities will be described in regard to cover, production, diversity and density and will be indicative of the vegetation existing within the study area. A vegetative map will be included showing the distribution and extent of the individual communities and a species list

will be provided for each community. A discussion relating areas of existing facilities to those included in the study area will also be included. Those specific approved and requested sampling methods, discussed during the July 15 meeting between the Division, Tower and E.E.C., were used to sample vegetation. These included randomization of all samples using line-intercept transects and use of the point-quarter method for determining density. The number of samples needed for each parameter sampled was calculated with the following formula using a double tailed t value:

$$n = \frac{(t \text{ value})^2 S^2}{[(\bar{x}) (.1)]^2}$$

UMC 784.13(b)(5)(ii). The following seed mixtures are recommended by the State of Utah, Division of Wildlife Resources to benefit wildlife through enhancement of disturbed habitats. The seed mixtures used for final reclamation will be based upon these Division of Wildlife Resources recommendations. Table 1 indicates the recommended seed mixtures for enhancement of pinyon-juniper habitats and Table 2 indicates recommended seed mixtures for enhancement of riparian habitats. Tower Resources will, to the best of their ability, acquire the following, or similar equivalent mixtures for final reclamation.

TABLE 1

Recommended seed mixtures that will benefit wildlife through enhancement of moderately disturbed piñon-juniper habitats of the submontane ecological association. Also included are acceptable alternatives if seed for a plant species is not available. Alternatives marked with an asterisk (\*) are for use in special treatments such as erosion control or roadbank stabilization. If disturbance was severe and total reclamation is needed, increase amount of seed by a factor of 2 to 3 times. Information assembled from Plummer, A.P., D.R. Christensen and S.B. Monsen, 1968. Restoring big game range in Utah. Utah Division of Fish and Game (now Utah Division of Wildlife Resources) Publication No. 68-3. 183 pp. Also from personal contacts with A. Perry Plummer.

Species Mixture	Lower elevation (Precipitation less than 12 in.)		Upper elevation (Precipitation 12 in. or more)		Alternate Species
	Broadcast	Drilled	Broadcast	Drilled	
<b>Grasses:</b>					<b>Grasses:</b>
Fairway crested wheatgrass	4	2	3	1-1/2	Bearded or beardless blue-bunch wheatgrass
Standard crested wheatgrass	1	1	1	1/2	Mountain rye*
Bluestem wheatgrass	1	1/2	0	0	Orchardgrass
Intermediate wheatgrass	1	1/2	1	1	Bottlebrush squirreltail
Pubescent wheatgrass	1	1/2	1	1	Sheep fescue
Russian wildrye	1	1/2	1	1	Bulbous barley
Smooth brome (southern strain)	0	0	1	1/2	Bulbous bluegrass
					Great Basin wildrye
					Siberian wheat grass
					Hard fescue
					Indian ricegrass
					Meadow brome*
					Sulcata sheep fescue
					Tall wheatgrass
					Winter rye*
<b>Forbs:</b>					<b>Forbs:</b>
Alfalfa (Rambler, Nomad, Travois, or Ladak - equal amount of each	1	1	2	1	Lewis' flax
Chickpea milkvetch	0	0	1	1/2	Nevada showy goldeneye
Utah sweetvetch	1	1/2	1	1/2	Nuttall lomatium
Yellow sweetclover	1	1/2	1	1/2	Pacific aster
Arrowleaf balsamroot	1	1/2	1	1/2	Showy goldeneye
Small burnet	1	1	1	1/2	Eaton penstemon*
					Gooseberryleaf globe- mallow*
					Louisiana sagebrush*
					Nevada lupine*
					Bouncing-bet*
					Bramble vetch*
					German iris*
					Cutleaf balsam
					Sicklepod alfalfa
					Oneflower
					helianthus
					Palmer penstemon
					Parry goldeneye
					Silky lupine*
					Small aster*
					Tarragon sage
					Thickleaf penstemon
					Toadflax penstemon
					Vegetable oilseed salsify*
					Wasatch penstemon

TABLE 1 (con't)

Species Mixture	Lower elevation (Precipitation less than 12 in.)		Upper elevation (Precipitation 12 in. or more)		Alternate Species	
	Broadcast	Drilled	Broadcast	Drilled		
<b>Shrubs:</b>					<b>Shrubs:</b>	
Big sagebrush	1	1/2	1	1/2	Nevada ephedra	Longflower sage
Black sagebrush	1	1/2	1	1/2	Littleleaf mountain-	Martin ceanoth
Rubber rabbitbrush	1	1/2	1	1/2	mahogany	Mountain snow
Winterfat	1	1/2	1	1/2	Squaw-apple	Peking cotone
Fourwing saltbush	1	1	1	1	Tatarian honeysuckle	Rocky Mountain
Totals:	19	11-1/2	20	12-1/2	Apache-plume*	smooth sumac
<b>Shrubs for pits, major disturb-</b>					Arizona cypress*	Roundleaf buff
<b>ance areas, and tractor cleat-</b>					Black common chokecherry*	ber
<b>marks by dribblers:</b>					Blueberry elder*	Russian-olive*
Antelope bitterbrush	2	1	3	2	Common lilac*	Siberian peach
Cliffrose or desert bitterbrush	1	1/2	0	0	Desert peachbrush*	Skunk bush sage
Fourwing saltbush	2	2	1-1/2	1	Fringed sagebrush*	Spineless hop
Utah serviceberry	1	1/2	0	0	Gardner saltbush*	Spiny hopsage*
Green ephedra	1	1/2	1	1		Wyeth eriogon
Birchleaf mountain-mahogany	1	1/2	1-1/2	1		
Curleaf mountain-mahogany	1	1/2	1-1/2	1		
Woods rose	0	0	1	1		
Golden currant	0	0	1/2	1/4		
Totals:	9	5-1/2	10	7-1/4		

TABLE 2

Recommended seed mixtures and seedling or larger sized transplants that will benefit wildlife through enhancement of moderately disturbed riparian habitats characterized as upland stream side vegetation in the submontane ecological association. Also included are acceptable alternatives if seed for a plant species is not available.

Species	North exposures and shady areas		Sunny exposures (south, west, east)		Mixture for tall mountain brush type, shaded sites.
	Broadcast	Drilled	Broadcast	Drilled	Broadcast
-Pounds per acre-					
Grasses: (seed mixture, transplants are not practicable)			Grasses: (seed mixture, transplants not practicable)		
Fairway crested wheatgrass	2	1	2	1	Smooth brome (Southern strain) 5
Smooth brome (Southern Strains)	4	2	2	1	Fairway crested wheatgrass 1
Intermediate wheatgrass	4	2	2	1	Intermediate wheatgrass 3
Pubescent wheatgrass	0	0	2	1	Orchardgrass (Utah grown) 2
Bluestem wheatgrass	0	0	1	1/2	Tall oatgrass 1
Orchardgrass	1	1/2	1	1/2	Mountain brome 1
Russian wildrye	0	0	1	1/2	
Tall oatgrass	1	1/2	0	0	
Forbs: (seed mixture, transplants are not practicable)			Forbs: (seed mixture, transplants not practicable)		
Alfalfa (Nomad, Rambler, Travois, Ladak-equal parts)	2	1	2	1	Alfalfa (creeping strains or Ladak) 1
Chickpea milkvetch	0	0	1	1/2	Pacific aster 1/4
Utah Sweetvetch	0	0	1	1/2	Oneflower helianthella 1/2
Yellow sweetclover	0	0	1	1/2	Snowy goldeneye 1/4
Arrowleaf balsamroot	1	1/2	1	1/2	
Pacific aster	1	1/2	1	1/2	
Shrubs: (seed mixture, transplants not usually successful)					
Fourwing saltbrush	0	0	1	1/2	
Rubber Rabbitbrush	1/2	1/4	1/2	1/4	
Douglas Rabbitbrush	1/2	1/4	1/2	1/4	

TABL 2 (con't)

Species	Any exposure
Density per acre	
Shrubs and Trees: (seedling or larger sized transplants)	
Big sagebrush	A mixture of all trees and shrubs so that one plant will be planted in every 50 square feet of disturbed area. This equals 1,000 plants per acre.
Antelope bitterbrush	
Golden currant	
Birchleaf mountain mahogany	
Curleaf mountain mahogany	
Cliffrose	
Green ophedra	
Woods rose	
Saskatoon serviceberry	
Narrow leaf cottonwood	
Bigtooth maple	
Rocky mountain maple	
Willow (use shoots or entire clumps from local area)	
Dogwood	
Birch	
Alder	

TABLE 2 (con't)

Alternate Species for Upland Stream side Vegetation in the transition life zone

Grasses:

Bearded bluebunch wheatgrass	Great Basin wildrye	Sand dropseed*
Beardless bluebunch wheatgrass	Green needlegrass*	Siberian wheatgrass
Big bluegrass *	Hard sheep fescue	Slender wheatgrass
Bluestem wheatgrass	Indian ricegrass*	Standard crested wheatgrass
Bottlebrush squirreltail *	Kentucky bluegrass*	Sulcata sheep fescue
Bulbous barley*	Meadow brome*	Tall wheatgrass *
Bulbous bluegrass*	Mountain rye *	Winter rye *

Forbs:

American vetch*	Louisiana sagebrush*	Small burnet
Bouncing bet	Low penstemon*	Stream globemallow*
Bramble vetch*	Nevada showy goldeneye	Sweetanise*
Common cowparsnip*	Nuttall lomatium	Tall milkvetch*
Cutleaf balsamroot	Palmer penstemon*	Tarragon sagebrush*
Eaton penstemon*	Parry goldenrod*	Thickleaf penstemon*
German iris*	Sicklepod milkvetch	Toadflax penstemon*
Gooseberryleaf globemallow*	Sidehill penstemon*	Wasatch penstemon*
Lewis (or blue) flax	Silky lupine*	Cushion eriogonum*

Shrubs:

Apache-plume*	Desert bitterbrush*	Nevada ephedra*
Arizona cypress*	Desert peachbrush*	New Mexican forestiera*
Black common chokecherry*	Dwarf rabbitbrush*	Oldman wormwood (stem cuttings)*
Black sagebrush	Fringed sagebrush*	Parry rabbitbrush*
Blueberry elder *	Gambel oak*	Peking cotoneaster*
Boxelder*	Gardner saltbush*	Purpleosier willow*
Common bladdersenna*	Longflower snowberry*	Redberry elder*
Common lilac*	Martin ceanothus*	Rocky Mountain sumac*
Creeping barberry*	Mountain snowberry*	

TABLE 2 (con't)

Table Continued

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 Alternate Species for Stream side Vegetation in the transition life zone
 

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## Shrubs: (continued)

Rocky Mountain juniper\*

Roundleaf buffaloberry\*

Russian-olive\*

Siberian peashrub\*

Silver buffaloberry\*

Skunk bush sumac\*

Squaw apple\*

Tatarian honeysuckle\*

Utah serviceberry

Western virginsbower\*

Winterfat\*

Wyeth eriogonum

Yellowbrush

UMC 817.97(a). A wildlife map indicating use of the mine plan area is included as Plate 14. It should be noted that the entire area shown on Plate 14 is located within area considered high priority winter and summer range for mule deer, and of substantial value for elk, ruffed grouse, blue grouse, snowshoe-hare and mourning dove. There are no traditional migration routes over the mine plan area. Plate 14 was drawn based on information and maps provided by the D.W.R. A letter from the Division of Wildlife Resources is included as Appendix O stating that the existing transmission line is raptor proof and that the poles are, in fact, beneficial for raptors. Transmission lines to proposed facilities will be constructed according to the same specifications and pole design and will be safe for raptors.

UMC 784.12. Design of existing embankments, cut slopes, location of road embankments, road grades, etc., is indicated on Plates 1, 2, 10, 12 and 13. Cross-sections are included as Plate 11. The "as built" pond specifications were submitted June 5, 1981 (Addendum B, Plate XX).

UMC 784.12(a)(3). Construction began on existing structures May, 1980 and was completed in February, 1981; some minor modifications to existing structures are now being approved.

UMC 784.13. All existing and proposed disturbed areas for all mine facilities are clearly defined on Plates 1, 2, 12 and 13.

Cross-sections and final reclamation contours are indicated on Plates 10 and 11. Temporary contemporaneous reclamation and seeding will be done following completion of construction in a season that gives promise of optimum conditions for establishment of vegetation. The recommended season for most species is late fall. Therefore, if construction proceeds according to schedule, temporary contemporaneous reclamation will be completed at the Apex (Lower Sunnyside) Mine by the end of 1981 and at the Aberdeen Mine by the end of 1982. Final reclamation will begin upon cessation of mining activities and removal of surface structures. As the anticipated life of the project is approximately 35 years, final reclamation is anticipated to begin sometime in 2016.

Areas of post construction contemporaneous reclamation consisting of approximately 5.2 acres are indicated on Plates 1 and 2. Area for final reclamation, approximately 24.25 acres, are indicated on Plate 10.

Oil and grease will be collected at the minesite in barrels and disposed of at the Carbon County landfill. Included as Appendix M is a letter from Carbon County granting Tower permission to dispose of oil and grease at the county landfill. The barrels in which oil and grease is collected at the minesite will be stored in an area covered by Tower's S.S.C.P. plan.

UMC 784.16. Upon cessation of mining activities or when no longer needed, each temporary diversion, excepting sediment ponds, will be removed. Any structures which cannot be re-used such as culverts, unrecoverable pipe, cinder blocks, steel and wood, will be disposed of at the county landfill. A letter from Carbon County granting Tower permission to dispose of such material is included as Appendix M. All affected land will be backfilled and graded to the approximate original contour. All fill will be transported, backfilled, compacted to ensure stability and graded to eliminate highwalls and depressions within reasonable limits (refer to Plate 10). Backfilled material will be placed to support post-mining land use. Final graded slopes will not exceed in grade the approximate premining slopes or any lesser slopes approved by the regulatory authority. Slopes will not exceed the angle of repose with the exception of ledgerrock highwalls. All final grading and placement will be done along the contour or in a manner which minimizes erosion or instability, or slippage of topsoil.

Topsoil will be redistributed in a manner that achieves an approximate uniform, stable thickness, consistent with postmining land use, slopes and surface drainage systems; and that prevents excess compaction of the topsoil, and protects the topsoil from wind and water erosion before and after revegetation. Any necessary nutrients and soil amendments will be added to the redistributed topsoil.

Re-seeding and planting will take place during the first season where optimum conditions exist for re-establishment of vegetation. Suitable mulch will be used to control erosion, promote germination of seeds and increase moisture retention of the soil. The specific seeding mixes used will be based on the recommendations of the D.W.R. (Tables 1 and 2). Revegetation will be monitored to determine success. Areas which fail to support sufficient growth to stabilize conditions will be tested and reseeded until a proper cover is established.

Once the disturbed areas have been restored, vegetation established and any drainage entering the sediment ponds has met applicable State and Federal water quality requirements, the ponds will be removed. The affected land will be reclaimed and revegetated in the same manner described above.

Pond, diversion and culvert designs for the proposed disturbed areas are indicated on Plates 1, 2, 3, 4, 5, 6, 7, 8, 9, 12 and 13 and discussed in the "Explanation of Engineering Design - Surface Facilities, Centennial Project" (Appendix N), and "Sedimentation and Drainage Control Plan - Centennial Project (Appendix P).

211 Cross Reference Index. The following is a cross reference index of the 211 regulations as requested by the U.S.G.S. The submissions indexed include Volume I, Volume II, Addendum A, Addendum B and the Roof Control and Ventilation Volume.

## Attachment 1

	<u>UMC</u>	<u>Section*</u>	<u>Page</u>
(1) 211.10 (c)(1) Names, addresses, and telephone numbers of persons responsible for operations under the plan to whom notices and orders are to be delivered, and the names and addresses of surface owners of record, and owners of record of subsurface minerals, if other than the United States.	782.13 (a)	2.2	Vol. I: pp. 7-8, 11-12 Vol. II: Plates III, IV Addendum B: pp. 1-2
211.10 (c)(2) A description of geologic conditions, with maps and tables where appropriate, within the area where mining is to be conducted and including any Logical Mining Unit. Such description shall include, as a minimum, potential geologic hazards; and a description of the structural features of the coal and overlying strata, including faults, cleats, joints and fractures and any other information which would affect the orientation of the mine or production methods.	783.14	3.3 6.0	Vol. I: pp. 49-63 Vol II: Plates II, XV, XVI, XVII, XVIII Addendum A: Part II, Laboratory Analysis Addendum B: p. 3 Plate XXII
211.10 (c)(6)(i) The nature and extent of the coal deposit in terms of Btu content, ash, water, sulphur, volatile matter and carbon content, and any other available information that may affect blending or combustion and including estimated recoverable reserves. The recoverable reserves shall be reported for all coal seams of mineable thickness, considering the type of mining and the value of the coal. (This information must conform with the requirements of General Mining Order No 1.)	783.25 (c), (d)	3.3.1 6.5.5.2	Vol. I: pp. 4, 25, 33, 38, Exhibit IV-B
211.10 (c)(6)(ii) The method of mining, including mining sequence and proposed production rate; the plan for any lease issued or readjusted after August 4, 1976, must provide for the mining of all the reserves of the logical mining unit of which the lease is a part in a period of not more than forty years; that period shall begin on the date of approval of the first mining plan for that logical mining unit.	784.11 (a)	3.3.1.3	Vol. I: pp. 24, 25, 32-40 Addendum B: Plates V-R, VI-R, VII-R Roof Control & Ventilation Submittal
The plan must include planned sequence of mining by year for the first 5 years and by number in 5-year increments for remainder of mine life.	783.12 (a)	3.3.1.4 3.3.7 & 3.3.8	Addendum B: Plates V-R, VI-R, VII-R

\*Suggested sections listed in Utah DOGM "Permit Application Guidelines"

	<u>UMC</u>	<u>Section</u>	<u>Page</u>
211.10 (c)(6)(iv) The engineering techniques proposed to be used in mining. The plan shall describe the method of mining and present justifications for the method selected. The selected mining system shall conform to sound mining practices and be based on current technology and economics.	784.11 (a)	3.3.1.3	Vol. I: pp. 24-40 Addendum B: pp. 6, 9 Plates V-R, VI-R, VII-R
211.10 (c)(6)(v) A list of all major equipment.	784.11 (a)	3.3.4	Vol. I: pp. 37, 38-39
211.10 (c)(6)(vii) The method of operation and measures by which the operator plans to comply with the obligations and requirements set forth in 211.4 and 211.40 of this Part and any special terms and conditions of the lease, permit, or license. (This can be by a narrative statement and must include only those items related to resource recovery.)	784.13 (a)(2)	3.3.3	Vol. I: pp. 37, 38, 42-45
211.10 (c)(6)(viii) The anticipated starting and termination dates of each phase of the mining operation and number of acres of land to be affected.	782.17 (a) 784.13 (b)(1)	3.36	Vol. I: pp. 25, 26, 34, 37, 40 Addendum B: pp. 2, 6 Plates V-R, VI-R, VII-R
211.10 (c)(6)(x) The measures for ensuring the maximum practicable recovery of the mineral resource.	784.13 (b)(6)	3.3.3.1	Vol. I: pp. 25, 33, 34, 37, 38 Exhibit IV-B Addendum B: Plates V-R, VI-R, VII-R
(Sufficient data should be submitted to substantiate the anticipated recovery factor of the resource for the coal reserve base. Data includes sufficient information in the form of narrative, cross-sections, coal thickness isopachs, overburden isopachs and quality and quantity data (Btu content, ash, moisture, sulfur, volatile matter, and fixed carbon and any other available information that may affect blending or combustion) of all known potentially minable seams on the lands involved. The areal extent of mining of each seam to be mined should be delineated. This information must conform with the requirements of General Mining Order No. 1.)			
211.10 (c)(6)(xi) The method of abandonment of coal mine operations including protection of unmined coal and other mineral resources.	784.13 (b)(8) 784.14 (d)		Vol. I: pp. 38, 46-48 Addendum B: pp. 6-7, 8, 10

	<u>UMC</u>	<u>Section</u>	<u>Page</u>
211.10(c)(6)(xii) Furnish complete logs of all exploration drill holes (both surface and underground) in Federal leases.	783.14 (a)(1) (ii)	6.5	Vol. I: pp. 56-59 Exhibit IV-A
211.10 (c)(6)(xiv) Plans for protecting oil, gas, and water wells as well as oil, gas, and underground water resources, when encountered.	783.25 (5)	3.3.2.1	Vol. I: pp. 12, 42, 72, 73 Addendum A: Part IV-Hydrologic Inventory
211.10 (c)(6)(xv) Any justification for not recovering any coal deposits that may be detrimentally affected in terms of future recovery by the coal development operations proposed.	784.13 (b)(6)	3.3.3.2	Not Applicable
(If no coal preparation plant is planned and if the operator plans not to mine coal beds or portions of coal beds because of high sulfur, high ash, or other chemical or physical properties, the operator shall submit a narrative and analyses of the rationale for not mining such beds or portions of seams.)			
211.10 (c)(7) Suitable topographic maps or aerial photographs showing:			
(i) Topographic and natural drainage features, roads and vehicular trails.	783.25 (k)		Vol II: Plates I, II, XI Addendum A: Part IV-Hydrologic Inventory
(ii) The name of the watershed and location of the surface stream or tributary into which mine waters will be discharged, if applicable.	783.16 (a) 783.25 (y)		Addendum B: Plate XIX Not Applicable
(iii) Cross sections and plan views of the land to be affected, including the actual area to be mined, showing elevation and location of drill holes and depicting the following information: the nature and depth of the various strata of overburden; the nature and thickness and extent of any coal, or if rider seams above the specific coal proposed to be mined; the nature of the strata beneath the coal to be mined for a vertical distance of at least 20 meters beneath the base of the coal seam; the location of the next known deeper coal seam below the deepest seam to be mined and representative characteristics thereof; the location of any	783.25 (a) 783.25 (j)		Vol. I: pp. 53, 54, 55 Vol. II: Plates V, VI, VII, XV, XVI, XVII, XVIII Addendum A: Part IV-Hydrologic Inventory Addendum B: pp. 11 Plates XIX, XXII

	<u>UMC</u>	<u>Section</u>	<u>Page</u>
other mineral values encountered within the logical mining unit; hydrologic data and other information relevant to the mining plan; all mineral crop lines and the strike and dip of the coal to be mined within the area of land to be affected; location and extent of known surface and underground mine workings (active and abandoned), oil or gas wells, and water wells within 1/4 mile of the affected lands. (Hydrologic information is required only as relevant to resource recovery.)			
Plan maps of the area to be mined on a suitable topographic base showing: lease boundaries and numbers, boundaries of nonfederal coal, LMU boundaries, and surface ownership boundaries.		4.3.1 4.3.2	Vol. I: pp. 3, 15 Vol. II: Plates I, II, III, IV
(iv) Locations of surface structures and facilities, including loading facilities.	784.23 (b)(1)	3.2.3 3.2.4	Vol. II: Plates I, II, VIII, VIII-A, IX, X, X-A Addendum B: Plate XIV
(v) For an underground mine, in addition, the planned mine layout, including location and dimensions of shafts, slopes, drifts, crosscuts, rooms, haulageways, aircourses, entries, and barrier pillars; show typical panel recovery, sequence of development and retreat.		3.3.1.2	Vol. I: pp. 32-40 Roof Control & Ventilation Plan Vol.
Submit the Roof Control and Ventilation System and Methane and Dust Control Plans approved by Mine Safety and Health Administration (MSHA) as a part of the mining and reclamation plan.		3.3.1.6	Vol. I: Exhibit II-A - Roof Control & Ventilation Plan Vol.
Include a structural contour map of bed(s) to be mined.		6.4.2	Vol. I: pp. 53-55 Vol. II: Plates XV, XVI, XVII, XVIII
If several seams are involved, include interburden isopach map(s) on 10-foot intervals.		6.5.5	Vol. I: pp. 53-55 Vol. II: Plates XV, XVI, XVII, XVIII
Include an isopach map of overburden of surface mines on 20-foot intervals.		6.5.5	Not Applicable
Include an isopach map of overlying strata over underground mines on 250-foot intervals.		6.5.5	Vol. I: pp. 53-55 Vol. II: Plates XV, XVI, XVII, XVIII
Furnish a copy of any subsidence control plan required by 30 UMC 784.20.		3.4.2	Vol. I: pp. 42-43 Addendum B: pp. 9

(vi) If auger mining is proposed, the location and diameter of auger holes, the depth to be drilled, and the estimated percentage of recovery. In determining whether or not to recommend approval of proposed auger mining, the Regional Director and mining supervisor shall take into account the percentage of recovery, which shall in general exceed 30 percent, and probable adverse effects upon water quality.

UMC  
(SMC)  
785.20

Section

Page

Not Applicable

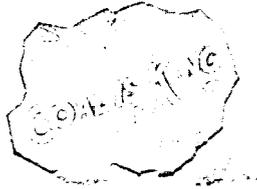
If surface mining is proposed, include a general layout of the proposal including location and width of box cut(s), location of main haulroads, and location and width of coal fenders.

Not Applicable

211.10 (c)(8) Any requests for variances from the performance standards of 30 CFR Part 211.

Not Applicable

APPENDIX M



# CARBON COUNTY

## PRICE, UTAH 84501

August 19, 1981

Michael W. Glasson,  
Senior Geologist  
Tower Resources, Inc.  
P. O. Box 1027  
Price, Utah 84501

Re; Use of County Road 299 and County Landfill

Dear Mr. Glasson:

As per your request and at the request of the State of Utah, Division of Oil, Gas and Mining, this letter is to assure all those concerned that Carbon County is aware Tower Resources is using County Road 299 and that activities associated with mining are taking place on and within 100 feet of said road. Tower Resources, Inc. (AMCA Coal Leasing, Inc.) has permission to use Carbon County Road 299 in conjunction with its mining activity and coal hauling and there are no restrictions as to the volume of traffic or the upgrading of the road from the pavement through the minesite so long as approval is obtained prior to making any "radical" changes (refer to letter from Carbon County dated January 16, 1978, enclosed.)

This letter is also to grant permission for Tower Resources to use the Carbon County landfill to dispose of various items. These items will include excess vegetation removed during the construction of the new mine facilities in Deadman Canyon. Tower also has permission to dispose of used oil which is collected at the minesite from time to time in metal containers.

Carbon County understands that during periods of high runoff, the sediment collection structures located at the minesite will reach their maximum allowable volume. In such instances, Tower has permission to dispose of this sediment at the County Landfill. Carbon County also understands that under State and Federal regulations Tower is required to reclaim the minesite upon cessation of all mining activities. Reclamation will involve the removal of certain structures. Those structures which cannot be used may be disposed of at the County Landfill. These items may include culverts as well as unrecoverable pipes, cinder blocks, steel and wood, etc.

If there are any questions regarding these measures, please call this office.

Respectfully,

BOARD OF CARBON COUNTY COMMISSIONERS

Lee Semken,  
Chairman

APPENDIX N



## CARBON COUNTY

PRICE, UTAH

January 16, 1978

AMCA Coal Leasing, Inc.  
P. O. Box 1027  
Price, Utah 84501

Attn. Mr. Sam Quigley

Gentlemen:

The Carbon County Board of Commissioners hereby grants AMCA Coal Leasing, Inc., permission to upgrade County Road No. 299 north to Dead Man.

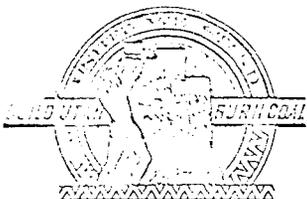
If you plan on making any radical changes to the re-alignment of said County road, permission must be obtained from Carbon County. Before actual work is done on this road, we would appreciate your contacting our County Road Supervisor, Mr. Burke Johnstun. It is mutually agreed that there will be no restrictions on this road as far as traffic is concerned.

Sincerely yours,

BOARD OF CARBON COUNTY COMMISSIONERS

By: James D. Moore  
Chairman

JPS:JW



## Explanation of Engineering Design Centennial Project Surface Facilities

Plates 1 and 2 show the planned surface facilities for Tower Resources Centennial Project. The earthwork for this project will consist of construction of access roads, mine portal areas, material storage yards, coal storage pads, office yards and sedimentation control features such as ponds, dams, dikes, diversion ditches and culverts. To arrive at the final configuration of the planned facilities, cut and fill were balanced laterally at 50' intervals along a centerline running basically along the canyon bottom throughout the length of the project. The original topography of the canyon is shown on Plates 3 and 4. This topography was prepared by aerial photography and mapping done by Olympus Aerial Surveys of Salt Lake City in 1979. These plates show the centerline of the cross-sections as well as the cross-section intervals. (This same centerline is shown in red on the site plans, Plates 1 and 2, for easier reference). Point 0+00 on the centerline coincides with the south quarter corner of Section 7 T.13S., R.11E., S.L.B.M. Cross-sections were prepared off the topographic maps and many additional cross-sections in critical areas were made by field surveys conducted by Bruce Ware, licensed land surveyor. These cross-sections are shown on Plates 5 and 6. Note that cross-sections from 2+50 to 11+50 have been deleted from the plates because this is the area of the existing Pinnacle Mine and no further earthwork is planned in this area. However, cross-sections for this area are shown on the reclamation map (Plate 11) on 200' intervals. From the cross-sections, cuts and fills were balanced and the resulting site plan based thereon.

All sedimentation ponds, culverts, diversion structures and ditches have been designed using the formulas and criteria as listed in the enclosed addendum "Plan for Construction and Maintenance of Sedimentation Ponds".

To the best of my knowledge the surface facilities for the Centennial Project and all earthen structures included therein have been designed according to sound and accepted engineering procedures.

APPENDIX 0

# TOWER RESOURCES, INC

P. O. BOX 1027  
PRICE, UTAH 84501  
(801) 637-5385

August 21, 1981

Mr. John W. Barton  
District Manager  
Mine Safety & Health Administration  
P.O. Box 25367  
Denver, Colorado 80225

Dear Mr. Barton:

Tower Resources, Inc., plans to open a new coal mine in Carbon County, Utah. In compliance with CFR 30 75.1721(b), the following information is submitted:

- 1) The mine will be called the Apex Mine and will be located in Deadman Canyon approximately 10 miles north of Price on the Airport Road. The mine will be located approximately 2000' up canyon from the existing Pinnacle Mine which is owned and operated by Tower Resources. The legal identity number for the new Apex Mine is 42-01750.
- 2) The mine will be operated by Tower Resources, Inc., of Madisonville, Kentucky. Samuel C. Quigley, Price, Utah, will be the General Manager of the mine.
- 3) Thomas R. May, Price, Utah, is the Safety Director and will be in charge of health and safety at the mine.
- 4) The Apex Mine will operate in the Lower Sunnyside Seam which varies in height from 4' to 7'.
- 5) Room and pillar mining will be done using continuous miners with shuttle car face haulage. Coal will be transported to the surface by conveyor belt.
- 6) The proposed roof control plan as required by 75.200-5 is included herein.
- 7) The proposed ventilation plan and methane and dust control plan is required by 75.316-1 and 75.316-2 is included herein.
- 8) The proposed plan for training and retraining as required by 75.166-1 is included herein.

Mr. John W. Barton  
August 21, 1981  
Page Two

- 9) The proposed plan for sealing abandon areas is required by 75.330-1 is included herein.
- 10) The proposed plan for searching miners for smoking materials as required by 75.1702 is included herein.
- 11) The proposed plan for emergency medical assistance and emergency communication as required by 75.1713-1 and 75.1713-2 is included herein.

If you have further questions, please call me.

Sincerely,



David E. Shaver  
Chief Engineer

DES/ac

Enclosures

cc: File

# TOWER RESOURCES, INC

P. O. BOX 1027  
PRICE, UTAH 84501  
(801) 637-5365

August 01, 1981

Mr. Roger Frenette  
Chief, Water & Hazardous Wastes  
Enforcement Branch  
United States EPA  
Region VIII  
1860 Lincoln Street  
Denver, Colorado 80295

Attn.: Ms. Cathy Ruggiero

Dear Mr. Frenette:

On November 13, 1980, Tower submitted to your office an area map depicting the location of our two permitted point discharges. This letter is to update the status of our point sources.

We have still not received our renewed NPDES permit (original expired 12-31-80) and we want you to be aware of new proposals.

As you are aware, Tower's two permitted sedimentation ponds are for the collection of precipitation runoff across our disturbed area only. These two permitted discharge points are shown on the enclosed area map as A and B.

Tower will be constructing new underground coal mining facilities this fall adjacent to the existing mine which will require three new sedimentation control structures and will represent three new point sources. We are hereby requesting a new NPDES permit to cover these new structures under the same limitations of our existing permit (UT 0023507). It should be noted that in the last year there has been no discharge from our existing permitted structures.

Attached is EPA form 7550-8 (1-78) and a map depicting the exact location of our existing (A and B) and our proposed (C, D and E) sedimentation ponds.

If you have any questions or require additional information, please do not hesitate to call.

Sincerely,



Michael W. Glasson  
Senior Geologist

YAG/ac

Attachments

# TOWER RESOURCES, INC

P. O. BOX 1027  
PRICE, UTAH 84501  
(801) 637-5385

August 21, 1981

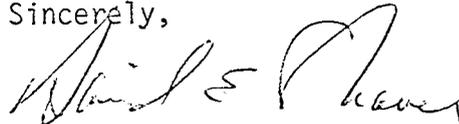
Mr. Don Ostler  
Utah Bureau of Water Pollution Control  
150 West North Temple  
Salt Lake City, Utah 84103

Dear Mr. Ostler:

Tower Resources, Inc., plans to construct a central bathhouse for its' Centennial Project, a coal mining operation in Carbon County, Utah. Please find enclosed herein for your approval, complete engineering design for a wastewater disposal system for this bathhouse consisting of a septic tank and drain field. The system has been designed by Dan Guy, registered professional engineer in the State of Utah, using the criteria outlined in Part V, Small Underground Wastewater Disposal System.

Your expeditious review of this system will be greatly appreciated. If you have further questions or need additional information, please contact me.

Sincerely,



David E. Shaver  
Chief Engineer

DES/ac

Enclosure

cc: File

# TOWER RESOURCES, INC

P. O. BOX 1027  
PRICE, UTAH 84501  
(801) 637-5385

Rec'd. SA/PA AUG 20 1981

August 18, 1981

Mr. Leon Berggren  
Area Manager  
Price Area  
Bureau of Land Management  
P.O. Drawer AB  
Price, Utah 84501

Attn.: Mr. Mark Mackiewicz

Dear Mr. Berggren:

Enclosed for your review is an application for a nonlinear Right-of-Way to be located adjacent to Tower's coal leases in Carbon County, Utah. This application has been made under 90 stat. 2743; 43 U.S.C. 1701 et. seq. (October 21, 1976). This proposed right-of-way is located in Township 13 South, Range 11 East, S.L.B.M. in section 18; E $\frac{1}{2}$ E $\frac{1}{2}$ NE $\frac{1}{2}$ NW $\frac{1}{2}$ , and can be described as follows:

Beginning at the South  $\frac{1}{4}$  Corner  
Section 7, T.13S., R.11E., S.L.B.M.  
Thence West 330'  
Thence South 1320'  
Thence East 330'  
Thence North 1320' to the point of beginning  
containing 10 acres more or less.

In accordance with instructions in 6.(d) of the application, a \$250.00 filing fee has been enclosed on check #433.

This right-of-way will be very closely interrelated with both existing and future projects on both private and public lands as well as other rights of ways previously issued to Tower such as U-45965.

As you are aware, Tower Resources opened the Pinnacle Mine on the Zion's fee property under a permit issued by the State of Utah, Department of Natural Resources. The Pinnacle Mine is currently operating on fee coal. On January 19, 1981, Tower submitted a mining and reclamation plan under the permanent program for mining and associated surface facilities for two new mines adjacent to the Pinnacle Mine, on federal surface and coal. We find after completing the engineering plans

Mr. Leon Berggren  
August 18, 1981  
Page Two

that due to the location of our leases relative to the base of Deadman Canyon there is insufficient area to construct all the necessary structures at one of the two new mines, specifically the administrative office area and sediment control structures (sedimentation ponds). Please refer to the enclosed plans which show the boundaries of the requested right-of-way and the location of these ponds relative to our proposed surface facilities for the three mines. Also enclosed is a detailed plan and profile of the ponds themselves showing specific dimensions.

Regulations regarding the surface effects of underground coal mining are very specific relating to protection of the hydrologic balance and sediment control measures. The proposed structures shown on the 1":50' plate are necessary for the efficient protection of the prevailing hydrologic conditions and therefore are not only beneficial but necessary to assure no additional sediment loading takes place as a result of the mining installations to be installed in the fall of 1981.

As per requirements found in the Utah Mining Code Part 816 and Title 30 CFR Part 816, these ponds have been designed by a Registered Professional Engineer to insure the integrity and the safety of the structures.

As this right-of-way is part of our overall mining and reclamation plan, it would be necessary for this right-of-way to be granted before the State Board of Oil, Gas and Mining and the U.S. Department of Interior could grant approval for construction. However, because this right-of-way would not be granted in time to meet with Tower's schedule for construction, (we anticipate approval by October 1, 1981), we would request that your office write us a letter copied to Oil, Gas and Mining and O.S.M. stating that although the right-of-way cannot be issued in time, that you have reviewed the application and concur with the need for its issuance and that it will be issued. Mr. Mark Mackiewicz of your office indicated it might be completed by January of 1982. Such a letter would give D.O.G.M. and O.S.M. grounds to grant approval for this particular segment of our plan. Naturally, they will review the technical specifications of the structures before granting approval.

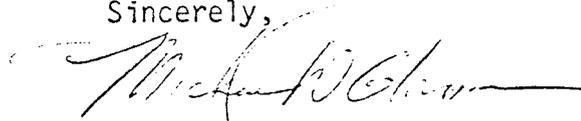
We greatly appreciate the B.L.M.'s expeditious review of this application and their cooperation in assisting Tower to obtain all necessary permits for mining its coal resource.

Mr. Leon Berggren  
August 18, 1981  
Page Three

Please call this office if you require additional information or  
consultation.

Thank you.

Sincerely,

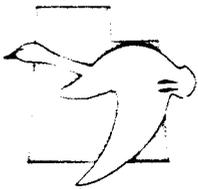
A handwritten signature in cursive script, appearing to read "Michael W. Glasson". The signature is written in dark ink and is positioned above the typed name.

Michael W. Glasson  
Senior Geologist

MWG/ac

Enclosures

cc: File



DIVISION OF WILDLIFE RESOURCES

DOUGLAS F. DAY  
Director

EQUAL OPPORTUNITY EMPLOYER

1595 West North Temple/Salt Lake City, Utah 84116/801-533-9333

August 24, 1981

Reply To SOUTHEASTERN REGIONAL OFFICE  
455 West Railroad Avenue, Box 840, Price, Utah 84501  
(801) 637-3310

Mr. Michael Glasson  
Senior Geologist  
Tower Resources  
P. O. Box 1027  
Price, UT 84501

Dear Sir:

In response to your inquiry of August 24, 1981. Construction of the power lines to the Deadman Mine on the Bureau of Land Management right-of-way and distribution lines to operational sites were constructed under guidelines developed by the Utah State Division of Wildlife Resources.

Sincerely,

Game Manager-Southeastern Region

JWB:hm

APPENDIX P

SEDIMENTATION  
AND  
DRAINAGE CONTROL PLAN  
FOR THE  
CENTENNIAL PROJECT  
(REVISED 08-21-81)

PREPARED FOR:  
TOWER RESOURCES, INC.  
BY  
DAN W. GUY  
REGISTERED PROFESSIONAL ENGINEER  
STATE OF UTAH NO. 4548

PLAN FOR CONSTRUCTION AND MAINTENANCE  
OF SEDIMENTATION PONDS  
CENTENNIAL PROJECT

General Description

Tower Resources Centennial Project will be comprised of three mines located closely together in Deadman Canyon. The Pinnacle Mine is presently in operation mining the Gilson Seam. The other two mines will be the Apex Mine in the Lower Sunnyside Seam and the Aberdeen Mine in the A Seam. Surface runoff from the Pinnacle Mine is controlled by Ponds A and B. Engineering design for these ponds have been presented to the Division of Oil, Gas and Mining on 4-3-80 and 7-7-81. Surface runoff from the Apex and Aberdeen Mines will be controlled by Ponds C, D and E. Design for these ponds are shown on Plates 7, 8 and 9 included herein.

The Centennial Project is to be located in the Right Fork of Deadman Canyon. This is an ephemeral drainage flowing only from direct runoff and eventually reaches the Price River some 12 miles to the south. The major drainages in the minesite area will be routed under the site through large culverts. The projected minesite will have a disturbed area of approximately 24.25 acres. In order to minimize additional sediment loading to the main drainage, it is proposed to collect the runoff from this disturbed area and pass it into 5 separate sedimentation ponds. Berms will be placed on the lower edge of all disturbed areas to prevent runoff from reaching natural drainages before it has passed through the sedimentation ponds.

# Centennial Project

## Sedimentation Pond Specifications

### Location

The proposed ponds are to be located superimposed over the main drainage of the Right Fork of Deadman Canyon. The main canyon drainage will be routed through a 42" culvert located under the ponds. The sites are located downslope of the disturbed areas to simplify collection of runoff water. (See attached maps)

### Design

The proposed ponds are designed to fully contain the expected runoff and sediment load from a 10 year - 24 hour precipitation event in this area. The design has been certified by a registered professional engineer.

### Construction

The construction of the ponds will be as per the specifications set forth in the Construction Specifications sheet attached to this plan.

### Capacity

Each pond is designed to contain the runoff and sediment load from a 10 year - 24 hour precipitation event in the area of drainage. In addition, each pond has an overflow capacity in excess of that required for a 25 year - 6 hour event.

### Safety Precautions

The ponds will be built as per specifications and under supervision of a qualified, registered professional engineer. The structures will be regularly inspected by a licensed individual as required by law. Ponds will be cleaned at minimum when sediment reaches 20% of volume.

Measuring devices will be installed in the ponds to show when the ponds have filled with sediment to the clean-out level.

#### Monitoring

Water monitoring stations will be established at the outlet of the ponds. Sample parameters and frequencies shall be as per specification of the NPDES permit.

#### Maintenance

The ponds shall be inspected after each storm and the sediment cleaned as necessary. In no event shall sediment be allowed to build beyond 20% of pond capacity. Sediment removed shall be disposed of at the Carbon County sanitary landfill.

#### Seeding

An approved seed mix will be applied to all feasible disturbed areas in an effort to minimize erosion and sediment loading to the ponds. The proper seed mixture for this area has been obtained through the local BLM.

#### Culverts

All culverts are shown on the attached maps. Calculations for sizing are also included. It should be noted that all culvert sizes were arrived at and approved through consultation with the DOGM hydrologic engineer.

#### Calculations

The following sheets reflect the calculations for sizing and details of each separate pond. Attached maps show pond locations and volumes as well as watershed areas.

Construction Specifications  
For Sedimentation Ponds

1. All construction of sedimentation ponds will be performed under the direction of a qualified registered professional engineer.
2. Dams shall be constructed with primary overflows 3 ft. from the top, and emergency overflows 2 ft. from the top.
3. The areas of pond construction shall be examined for topsoil, and if present in removable quantities such soil shall be removed separately and stored in an approved topsoil storage location.
4. In areas where fill is to be placed, natural ground shall be removed for at least 12" below the base of the structure.
5. Native materials will be used where practical. Fill will be placed in lifts not to exceed 15" and compacted prior to placement of next lift. Compaction of all fill materials shall be at least 95%.
6. Rip-rap will be placed at all inlets and outlets to prevent scouring. Rip-rap will consist of substantial (non-slaking) rock material of 6" or greater size.
7. Each pond shall be fitted with an inverted inlet to the primary overflow, to prevent the passage of oil into the discharge.
8. Slopes of the dams shall not be steeper than 2.0:1, inside and outside.

9. Tops and external slopes of the dams shall be planted with an approved seed mix to prevent erosion and promote stability.  
Compaction of the slopes shall be at least 95%.
10. Top width of dams shall be not less than  $(H + 35)/5$ .

## Pond C

1. Use 1.82" for 10 year - 24 hour event

2. Disturbed Watershed - 10.50 acres

3. Runoff Curve No. = CN = 1

4. Area Runoff = Q (in.) =  $(P-0.25)^2 / (P+0.85)$ ; Where:

$$S = (1,000/CN) - 10$$

$$P = 1.82''$$

$$Q \text{ (in.)} = [1.82-0.2(1.11)]^2 / [1.82+0.8(1.11)] =$$

$$\frac{2.553}{2.709} = .94 \text{ in.} = 0.0785 \text{ ft.}$$

$$\text{Volume} = 10.50 \text{ acres} \times 0.0785 \text{ ft.} = 0.824 \text{ acre-ft.}$$

5. Sediment Storage Volume

$$10.50 \text{ acres} \times 0.1 \text{ acre-ft./acre} = 1.05 \text{ acre-ft.}$$

6. Direct Precipitation into Pond

$$\text{Area of Ponds} = .39 \text{ acres}$$

$$.39 \text{ acres} \times 1.82 \text{ in.} \times 1/12 \text{ ft./in.} = 0.059 \text{ acre-ft.}$$

7. Total Required Pond Volume

$$0.824 + 1.05 + 0.059 = 1.933$$

8. Pond Volume @ Outlet

$$\text{Pond C} = .789 \text{ acre-ft.}, \text{ Pond C2} = 1.629 \text{ acre-ft.}$$

$$\text{Total Pond Volume} = 2.418 \text{ acre-ft.}$$

$$\text{At 20\% cleaning point} - \text{Volume} = 1.934 \text{ acre-ft.}$$

9. Conclusion: Pond size is adequate to contain the runoff and sediment load from a 10 year - 24 hour precipitation event in the area of drainage to the pond.

## Pond D

1. Use 1.82" for 10 year - 24 hour event
2. Disturbed Watershed - 0.746 acres
3. Runoff Curve No. = CN = 90
4. Area Runoff =  $Q$  (in.) =  $(P-0.25)^2 / (P+0.85)$ ; Where:  
 $S = (1,000/CN) - 10$   
 $P = 1.82$   
 $Q$  (in.) =  $[1.82-0.2(1.11)]^2 / [1.82+0.8(1.11)] =$   
 $\frac{2.553}{2.709} = .94$  in. = .0785 ft.  
Volume = 0.746 acres x 0.0785 ft. = 0.059 acre/ft.
5. Sediment Storage Volume  
0.746 acres x 0.1 acre/ft./acre = 0.074 acre-ft.
6. Direct Runoff into Pond  
Area of Pond = 0.115 acres  
0.115 acres x 1.82 in. x 1/12 ft./in. = 0.017 acre-ft.
7. Total Required Pond Volume  
.059 + .074 + .017 = 0.15 acre-ft.
8. Pond Volume @ Outlet = 0.303 acre-ft.  
at 20% Cleaning Point = 0.242 acre-ft.
9. Conclusion: Pond size is adequate to contain the runoff and sediment load from a 10 year - 24 hour precipitation event in the area of drainage to the pond.

## Pond E

1. Use 1.82" for 10 year - 24 hour event

2. Disturbed Watershed - 6.02 acres

3. Runoff Curve No. = CN = 90

4. Area Runoff = Q (in.) =  $(P-0.25)^2 / (P+0.85)$ ; Where:

$$S = (1,000/CN) - 10$$

$$P = 1.82"$$

$$Q \text{ (in.)} = [1.82 - 0.2(1.11)]^2 / [1.82 + 0.8(1.11)] =$$

$$\frac{2.553}{2.709} = .94 \text{ in.} = .0785 \text{ ft.}$$

$$\text{Volume} = 6.02 \text{ acres} \times 0.0785 \text{ ft.} = 0.472 \text{ acre-ft.}$$

5. Sediment Storage Volume

$$6.02 \times 0.075 \text{ acre-ft./acre} = 0.451 \text{ acre-ft.}$$

Note: 0.075 sediment loading factor used because much of the disturbed area (Aberdeen Mine storage yard and truck turn around) is level and will contribute little if any sediment during a 10 year - 24 hour precipitation event.

6. Direct Precipitation into Ponds

$$\text{Area of Ponds} = 0.165 \text{ acres}$$

$$0.165 \text{ acres} \times 1.82 \text{ in.} \times 1/12 \text{ ft./in.} = 0.025 \text{ acre-ft.}$$

7. Total Required Pond Volume

$$0.472 + 0.451 + 0.025 = 0.948$$

8. Pond Volume @ Outlet = 1.205 acre-ft.

$$\text{at 20\% Cleaning Point} = 0.964$$

9. Conclusion: Pond size is adequate to contain the runoff and sediment load from a 10 year - 24 hour precipitation event in the area of drainage to the pond.

## Pond Discharge Structures

Principle Spillways - These will consist of an 18" culvert, fitted with an inverted inlet to provide for oil skimming. The inlet will be approximately 1' below water level. The culvert will be located 3' below the top of the dam, and will discharge directly onto a rip-rapped channel leading to the main drainage as in Pond E or directly into the main 42" culvert in Ponds D and E. These spillways will provide for the normal dewatering of the pond at base capacity.

Emergency Spillways - The emergency spillway for Pond E will be the open notch type with a trapezoidal cross section. The spillway dimensions will be as shown on the attached sheet. This will be located 12" above the principal spillway and 2' below the top of the dam. This structure will be rip-rapped through the point of discharge and into the main channel. This spillway will provide an added safety factor to protect the dam in the event of overload on the culvert discharge.

The emergency spillway for Pond C will consist of an open 36" culvert which empties directly into the main 42" culvert which drains the main canyon. This emergency spillway will be open at the top and will extend to within 2' of the top of the dam. At right angle to this emergency spillway culvert will be an 18" culvert to handle non-emergency overflow conditions. This 18" pipe will have an inverted inlet to skim oil and grease and flotsam from the water.

The emergency spillway for Pond D will be a rip-rapped ditch leading to Pond E. This is a small pond which collects runoff from a very small area. If the pond should ever overflow from a massive influx of water the overflow will run into Pond E and from there into the main drainage.

## Calculations

### Source of Formulae

B.L.M. State Engineer

### Rational Formula

$$QP = Cia$$

QP = Peak Discharge (C.f.s.)

C = Runoff Coefficient (@ 100% runoff, C = 1)

i = Rainfall intensity (in./hr.) for a 25 year - 6 hour storm in

Price, i = .255

a = Area (acres)

### Manning Equation

$$D = \left[ \frac{(2.16Qn)}{\sqrt{s}} \right]^{0.375}$$

D = Diameter (feet)

Q = QP = Peak Discharge (cfs)

n = Roughness factor (0.02 for steel culvert)

s = Slope (0.0556% = 1 foot for 18 feet)

### Pond C (Principle Spillway)

1. QP = Cia; C=1, i=.255, a=10.96 acres

$$QP = (1) (0.255) (10.96)$$

$$QP = 2.795 \text{ cfs}$$

2.  $D = \left[ \frac{(2.16Qn)}{\sqrt{s}} \right]^{.375}$ ; Q = 2.795, n = 0.02,  $\sqrt{s} = .2357$

$$D = \left[ \frac{(2.16)(2.795)(0.02)}{0.2357} \right]^{.375}$$

Req. D = .778 ft. = 9.34 inches

Actual D = 36 inches

Pond D (Principle Spillway)

1.  $QP = Cia$ ;  $C=1$ ,  $i=.255$ ,  $a=0.746$  acres

$$QP = (1) (.255) (.746)$$

$$QP = 0.1902 \text{ cfs}$$

2.  $D = \left[ \frac{(2.16Qn)}{\sqrt{s}} \right]^{.375}$ ;  $Q = 0.1902$ ,  $n = 0.02$ ,  $\sqrt{s} = .2357$

$$D = \left[ \frac{(2.16)(.1902)(.02)}{.2357} \right]^{.375}$$

Req.  $D = .28 \text{ ft.} = 3.4 \text{ inches}$

Actual  $D = 18 \text{ inches}$

Pond E (Principle Spillway)

1.  $QP = Cia$ ;  $C=1$ ,  $i=.255$ ,  $a=6.02$  acres

$$QP = (1) (.255) (6.02)$$

$$QP = 1.535 \text{ cfs}$$

2.  $D = \left[ \frac{(2.16Qn)}{\sqrt{s}} \right]^{.375}$ ;  $Q = 1.535$ ,  $n = .02$ ,  $\sqrt{s} = .2357$

$$D = \left[ \frac{(2.16)(1.535)(.02)}{.2357} \right]^{.375}$$

Req.  $D = .6215 \text{ ft.} = 7.46 \text{ inches}$

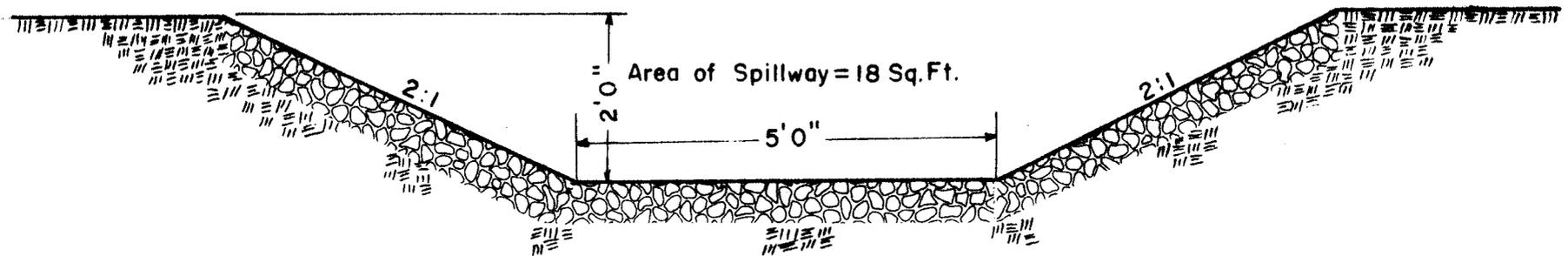
Actual  $D = 18 \text{ inches}$

Conclusion. The above calculations show the principle discharge structures for each pond to be more than adequate to pass the runoff from a 25 year - 6 hour precipitation event draining to the ponds. Since the emergency spillway has a cross-sectional area of 10 times that of the culverts ( $18 \text{ ft.}^2$  vs.  $1.77 \text{ ft.}^2$ ) it is obvious that it will be adequate to safely pass much larger events if necessary.

# Tower Resources, Inc.

Price, Utah

## Centennial Project



Typical Section of Emergency Spillways

Scale : 1" = 2'0"

Date : 8-20-81

## Culverts

### General

Culverts will be sized as per the designations on the attached maps, and will be placed to drain on a minimum of .0556% slope (1 ft./18 ft.). Each culvert will be fitted with a trash rack on the inlet to help prevent plugging from washed-in debris. Each culvert shall discharge onto a protected surface (i.e. rip-rap, conveyor belting, flexible downspouts, or other) to prevent scouring and erosion. The use of energy dissipators shall be employed as necessary to reduce velocities and prevent erosion from culvert discharges.

### Maintenance

Culverts shall be inspected regularly, and cleaned as necessary to provide for passage of designed flows. Inlets and outlets shall also be maintained so as to prevent plugging or undue restriction of water flow.

## CULVERT SIZE DETERMINATION

### SOURCE:

Bureau of Land Management State Engineer

### RATIONAL FORMULA:

$$QP = C ia$$

QP = Peak Discharge (cubic feet per second)

C = Runoff coefficient (@ 100% runoff, C=1)

i = Rainfall intensity (inches per hour) for a 10 year - 24 hour storm in Price  $i=0.0758$

a = area (acres)

### MANNING EQUATION

$$D = \left[ \frac{2.16Qn}{\sqrt{s}} \right]^{0.375}$$

D = Diameter (feet)

Q = QP = Peak Discharge (cfs)

n = roughness factor (0.02 for steel culvert)

s = slope (0.0556% = 1 foot for 18 feet)

Using the above formulas minimum culvert sizes were calculated based on 100% runoff from a 10 year - 24 hour storm:

### WATERSHED AND CULVERT SIZING MAP

<u>Culvert</u>	<u>Watershed Area (acres)</u>	<u>Culvert Needed (in.)</u>	<u>Culvert Used (in.)</u>
C1	467.58	24.2	30
C2	25.71	8.2	18
C3	493.29	24.7	36
C4	87.78	12.9	18
C5	581.07	26.3	36
C6	40.04	9.6	18
C7	621.11	26.9	36
C8	53.63	10.7	18
C9	674.74	27.8	42
C10	29.38	8.6	18
C11	704.12	28.2	42
C12	74.20	12.1	18
C13	778.32	29.3	42
C14	27.18	8.3	18
C15	805.50	29.7	42

It should be noted that the culvert sizes Tower will use are sufficient for 100% runoff from a 100 year, 24 hour storm in Price.

## Diversion Structures

### General

Diversion ditch locations are shown on the enclosed Surface Facilities Map. The direction of flow is also shown. All diversions are classed as temporary, and will be removed upon final reclamation.

### Specifications

Diversions along the upslope side of the road will be as per specifications on the haul road design. At a minimum, these, and any other diversions shown, will meet the minimum size specifications on the attached Diversion Ditch Typical sheet. Diversions are sized to carry the runoff from a 50 year - 24 hour precipitation event in the area.

### Maintenance

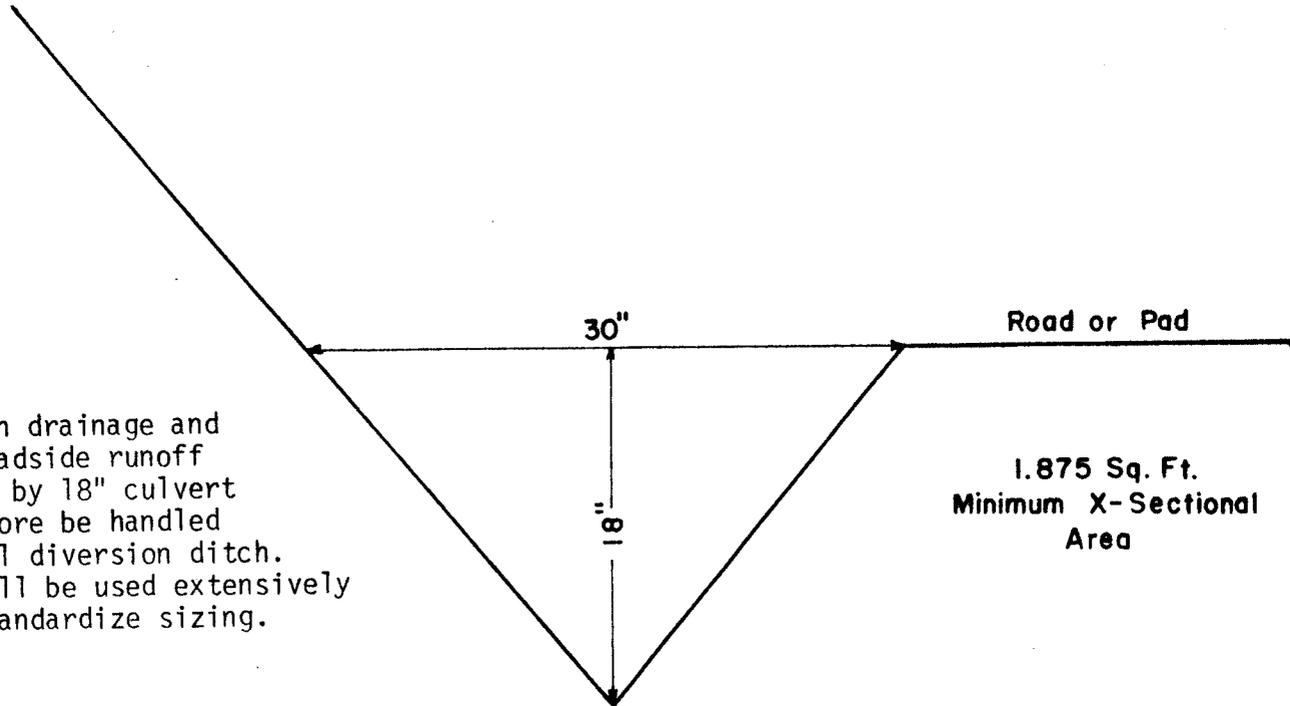
All diversions will be maintained so as to pass the volumes of water for which they were designed. Sluffage will be cleaned out along with regular road maintenance procedures, and any blockage will be removed as soon as practicable after occurrence. Velocities will be controlled as needed to prevent excessive scouring.

# Tower Resources, Inc.

Price, Utah

## Centennial Project

Note: All side canyon drainage and all pad and roadside runoff can be handled by 18" culvert and can therefore be handled by this typical diversion ditch. 18" culvert will be used extensively in order to standardize sizing.



### Diversion Ditch Typical

Scale: 1" = 10"

Date: 8-20-81 J.B

D.

SCOTT M. MATHESON  
Governor

TEMPLE A. REYNOLDS  
*Executive Director,*  
NATURAL RESOURCES

CLEON B. FEIGHT  
*Director*



STATE OF UTAH  
DEPARTMENT OF NATURAL RESOURCES  
DIVISION OF OIL, GAS, AND MINING  
1588 West North Temple  
Salt Lake City, Utah 84116  
(801) 533-5771

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MARGARET BIRD  
HERM OLSEN

September 28, 1981

Mr. Mike Glasson  
Tower Resources, Inc.  
P. O. Box 1027  
Price, Utah 84501

RE: Determination of  
Apparent Completeness  
Centennial Project  
Tower Resources, Inc.  
ACT/007/019  
Carbon County

Dear Mr. Glasson:

The Utah Division of Oil, Gas and Mining has completed a cursory review of the Mining and Reclamation Plan (MRP) and amendments submitted by Tower Resources Inc., for their Centennial Project. This Division has determined the plan to be apparently complete. In compliance with Section UMC 786.11(b) and (c) of the Utah Coal Mining Reclamation Act (UCA, Section 40-10-1 et seq), notice is hereby given to all appropriate agencies having jurisdiction over or an interest in the area of the proposed (or existing) operations that a complete plan is available for public review for this existing operation.

The project is located approximately 10 miles north, northeast of Price, Utah, in Carbon County, Township 13 South, Range 11 East. The projected minesite will have a disturbed area of 24.25 acres.

The proposed Mining and Reclamation Plan (MRP) involves underground multiple seam mining, lower Sunnyside, Gilson and Aberdeen seams, on approximately 2,240 acres controlled by Tower Resources, Inc. Production scheduling projects an increase from 200,000 tons the first year to full production of about 1,200,000 tons in the fourth and fifth years. The life of the mine is estimated to be 30-40 years. The term of the mining and reclamation permit is five years.

Mr. Mike Glasson  
ACT/007/019  
September 28, 1981  
Page two

Approximate location (Section, Township and Range):

Sections 5, 6, 7, 8, 9, 17 and 18 of T. 13 S., R. 11 E.

Federal Coal Leases: SL-027304, SL-063058 and U-010581

The Division of Oil, Gas and Mining will now prepare a technical assessment (TA) to determine whether the proposed plan meets all the criteria of the Permanent Program Performance Standards according to the requirements of UCA, Section 40-10-1 et seq.

Upon completion of the TA for said plan, a decision will be made as to approval or disapproval of the permit application. No decision will be taken by the Director for a minimum period of 30 days after submission of this Notice of Availability to the appropriate agencies. This plan is available for public review at the Utah Division of Oil, Gas and Mining, 1588 West North Temple, Salt Lake City, Utah 84116-3156.

Comments on the proposed MRP may be addressed to the Director of this office: Cleon B. Feight, Director, Utah Division of Oil, Gas and Mining, 1588 West North Temple, Salt Lake City, Utah 84116-3156.

For further information, please contact: Mr. James W. Smith, Jr., Coordinator of Mined Land Development, at the address above.

Sincerely,



JAMES W. SMITH, JR.  
COORDINATOR OF MINED  
LAND DEVELOPMENT

JWS/GLH/btm

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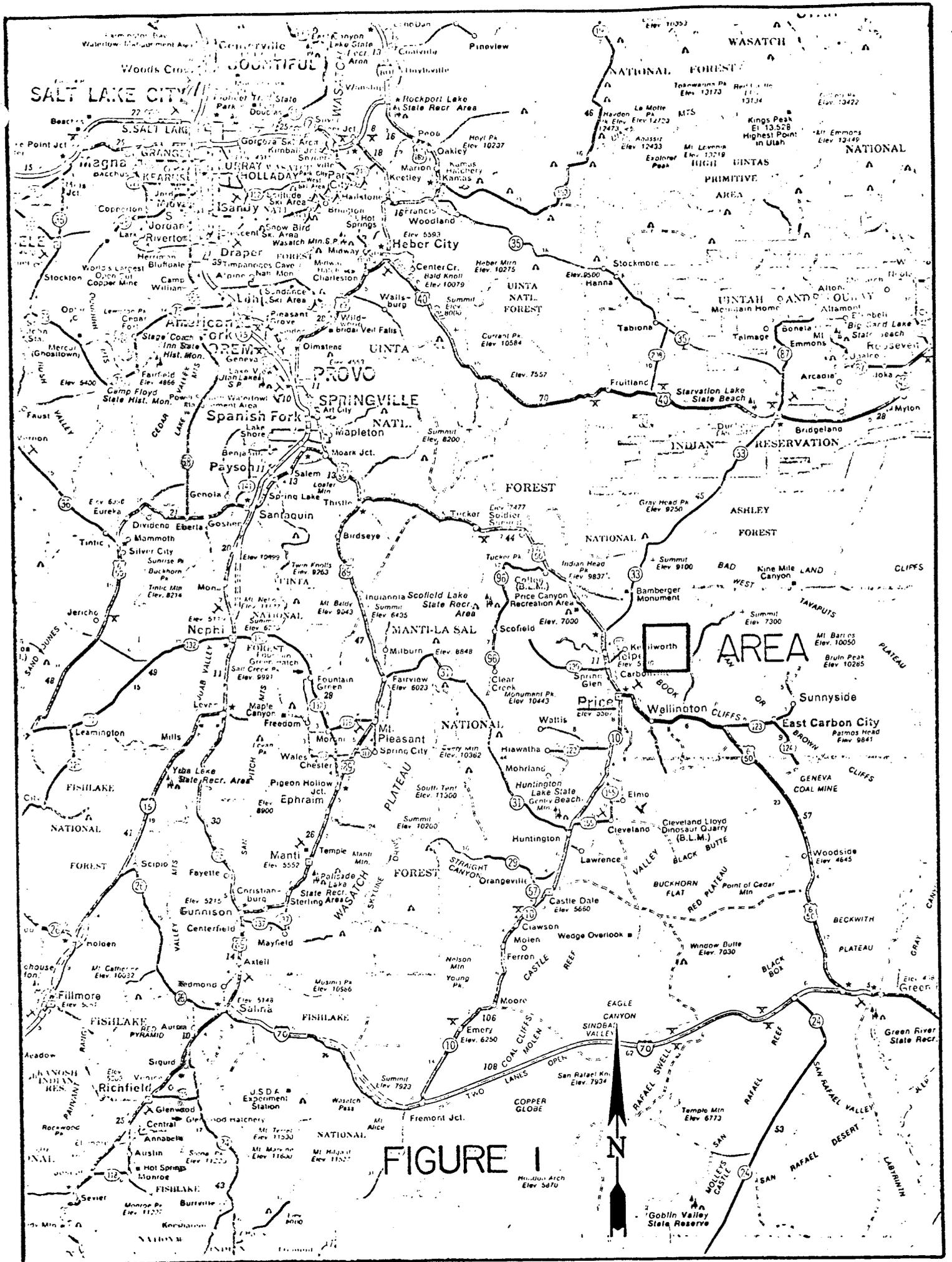


FIGURE I

Due to the nature and location of these subject coal deposits, there are no known competitive interests in the subject lands and they cannot be developed as part of any existing or potential independent operation. If not leased and mined by Tower, these deposits will in all probability be by-passed in the reasonably foreseeable future. These deposits can be easily mined as a continuation of Tower's existing and proposed mining activities and they can be easily incorporated into the overall Mining and Reclamation Plan as part of the Centennial Project. Therefore, Tower believes that a lease modification making possible the mining of said coal deposits would substantially serve the interests of the United States. This coal will be used to maintain scheduled production rates and to meet present and future contractual commitments.

Tower is submitting this application for review and approval. The text includes the qualifications of the applicant, a description of subject and existing properties, maps and plans, and preliminary data to assist in conducting an environmental analysis. It is hoped that with the approval of this application for lease modification coal deposits which would otherwise be by-passed will be mined. All mining will be conducted in accordance with Tower's Permanent Mining and Reclamation Plan and all applicable state and federal Regulations. Any necessary additional information will be supplied upon request.

## II. Qualifications of Applicant

### Applicant

Tower Resources, Inc., is the applicant for the subject property. Tower's office address is P.O. Box 1027, Price, Utah 84501, telephone (801) 637-5385.

### Business Entity Information

Tower Resources, Inc., is a corporation organized and existing under the laws of Delaware and qualified to do business in Utah.

### Names and Addresses of Officers, Partners, Directors of Applicant

Tower's officers and directors are listed below. There are no partners.

#### Officers

P.J. Cullimore .....	President
Robert Anderson, Jr. ....	Executive Vice President
Dennis L. Halliburton .....	Vice President/Finance

#### Directors

H.P. Mitchell .....	Chairman of the Board of Directors
P.J. Cullimore .....	Director
Robert Anderson, Jr. ....	Director
Mary-Jean Mitchell Green .....	Director
M.I. Mair .....	Director
George D. Coates .....	Director

The address for all of the above is Tower Resources, Inc., P.O. Box 775, Madisonville, Ky. 42431.

### Names and Addresses of Principal Shareholders of Applicant

The capital stock of Tower Resources is 100 percent owned and controlled by Cada Am Holding N.V., c/o Dr. J.A. Schiltkamp, 10A Kerkstraat, Curacao, Netherland Antilles.

### Resident Agent for Service of Process

The resident agent of the applicant is C.T. Corporation Systems, 175 South Main, Salt Lake City, Utah 84111.

### Statement of Interests in Leases

A signed statement is included in the appendix, showing that with the area applied for, applicant's interests in leases do not exceed 46,080 acres in any one state or more than 100,000 acres in the United States.

### Statement of Sole Party in Interest

A signed statement indicating that the applicant is the sole party in interest in the application and lease, is included in the appendix.

### Proof of Signatory's Authority

Since this application has been executed by other than an officer named, proof of the signatory's authority to execute this instrument is included in the appendix.

### Signature of Applicant

Signature of the applicant is included in the appendix.

### Operator

Tower Resources will be the operator on the subject property and is the operator of the existing mining operation (Pinnacle Mine).

### Mine Name and Identification Number

The existing mine name is the Pinnacle Mine. The M.S.H.A. Identification Number for the mine and all sections is 42-01474.

### Licenses and Permits

Tower Resources currently has all necessary licenses, permits, right-of-way grants, and approval for plans and programs necessary for operating the Pinnacle Mine.

The State of Utah Identification Number of the approved Mining and Reclamation Plan for the Pinnacle Mine is ACT 007/019.

#### IV. Preliminary Data

##### Exploration

Exploration in the area has been completed. A number of holes were drilled on Tower's federal and fee leases. Numerous samples were taken from outcrops and from the faces of abandoned mines in the area. Sample and drill hole locations are shown on Plates V, VI, and VII. No additional exploration activity is necessary. Reserves were calculated based on coal thickness isopachs and cover lines obtained from the exploration program.

##### Mining Method

Mining method will be consistent with that described in the Permanent Mining and Reclamation Plan. It will consist of the underground method of coal extraction utilizing continuous miners, shuttle cars, and conveyor haulage. Room and pillar design will be employed with development extraction estimated at 35 percent of the coal of the subject deposit. When mining is progressing concurrently in two seams, the upper seam mine plan will in effect be a "mirror image" of the lower seam. This will assure that maximum roof support is accomplished. Once development is completed, pillar extraction will commence. Final pillar extraction will result in a total recovery of approximately 65 to 70 percent.

##### Mining Sequence

The Pinnacle Mine will progress onto the subject property (Gilson Seam) utilizing one continuous miner section of equipment. Mining in the Aberdeen Seam will commence in conjunction with mining operations outlined in the Permanent Mining and Reclamation Plan. Room and pillar design will be employed in the development phase. Upon completion of development, pillar extraction will commence.

##### Production Rate

The Pinnacle Mine is currently mining at the rate of 200,000 tons per year. The rate is scheduled to double by this spring and to be over 500,000 tons by the start of the second year of production. Production for the Centennial Project is scheduled at 800,000 tons in the third year and over 1,000,000 tons in the fourth and fifth years. This planned production schedule must be followed in order to fulfill contractual obligations. Production from the subject deposits will be used to meet these scheduled rates.

##### Anticipated and Existing Operations

Mining activities on the subject property will be easily incorporated into the overall Mining and Reclamation Plan for the Centennial Project. Plates V, VI, VII show the projected mine plans for proposed activities as well as the plan being followed in the development of the Pinnacle Mine.

All necessary support and surface facilities for the Pinnacle Mine have been constructed and are located entirely on the Zion's fee property. These facilities are shown on Plates I, II, and V. No other support facilities will be required for the proposed Gilson seam operations on the subject property. Mining on the subject property will be merely a continuation of current underground operations at the Pinnacle Mine. Mining in the Aberdeen Seam will be a continuation of a planned mine. Support and surface facilities will be located in previously impacted areas.

Considering the location of the subject property, these reserves will probably never be mined if not by Tower.

### Existing Land Use

Due to the rugged topography and sparse rainfall, the subject property and adjacent area is presently used only for grazing, wildlife habitat, and outdoor recreation. Historically, the adjacent area has also been used for coal mining. County zoning regulations (1974), indicate all lands in the immediate area are within zone M and G1, which is for mining and grazing.

Livestock grazing has been the most intense use of the land. However, due to the expansive cliff formations and the roughness of the canyon walls, grazing has been limited to the canyon bottoms.

Mule deer are found within the lease area as well as the usual small mammals, predators, and passerine and raptorial birds.

For recreational purposes the land is suitable only for deer hunting and enjoyment of open space. Snow cover is too light and slopes too steep for snowmobiling, crosscountry skiing or snow shoeing. The number of people using the area is small due to the rough terrain, poor access, and lack of water.

It should be noted that there will be no change in existing land use. All necessary support and surface facilities will be located in areas previously impacted by mining.

### Geology

The subject property is part of the Book Cliffs Coal Fields. The Book Cliffs is the major physiographic feature in the region. These Cliffs rise from a base at approximately 5,500 feet in elevation, to over 8,500 feet. Numerous canyons dissect these Cliffs. The area exhibits extreme topographic relief and is mountainous with steep cliffs and deeply incised drainages.

The major coal seams of the area are found in the Blackhawk Formation of the Upper Cretaceous Mesaverde Group. The rugged topography is the result of erosion-resistant sandstone in the Blackhawk and overlying Castlegate Sandstone and Price River Formations. The base of the Book Cliffs and pediment surfaces

to the south are formed by the Mancos Shale underlying the Mesa Verde Group. Structure contours are aligned basically east-west. The coal beds dip northward at approximately six degrees. No faults are known to exist in the immediate area.

There are several major coal seams of the Blackhawk Formation in the region. However, only the Lower Sunnyside, Gilson, and Castlegate "A" (Aberdeen) beds are found in commercial thickness in the immediate area. Each seam is separated by 200 plus feet. Included in this separation between each seam is a massive sandstone. These sandstones provide an extremely competent unit (See Figure 3).

#### Cultural, Paleontological, and Archaeological Features

No cultural, paleontological, or archaeological features will be affected by any proposed activities. All surface facilities will be located in areas previously impacted by mining.

No survey of paleontological resources has been conducted. The subject property is located in a "potential fossil bearing area of slight value" (U.S.D.I., 1979).

There are no archaeological or features of historic significance known to exist in the area. Archaeological surveys conducted on Tower's adjacent lease areas resulted in no sites meeting National Register qualifications.

There are no public parks or areas of national significance in the area. No other cultural features of interest exist in the area. There is no part of the property designated unsuitable for mining according to Title 30 of the Code of Federal Regulations.

#### Hydrology

Occurrence of ground water in the area is isolated and very limited due to the nature of area geology. Ground water exists as perched aquifers due to the lenticular nature of the porous and permeable sandstone of the area. Some of the sandstone beds from above to Mancos Shale to the top of the Castlegate sandstone are water bearing in the area. However, many of the beds are dry and partially drained of water near the cliff faces. Ground water movement is generally downdip. The beds are very lenticular and therefore any water bearing units are small in areal extent. The nearest spring is located north of Tower's Federal leases.

Streams existing in the area are ephemeral and flow only in direct response to rainfall and snowmelt. The area is semi-arid, therefore precipitation is sparse. There are no surface bodies of water in the area.

Water for mining on the subject property will be supplied from wells drilled on the Zion's fee property. There will be no disturbances of surface water and no diminution of area ground water.

#### Fish and Wildlife

There are no aquatic fauna in the area as there are no perennial streams or bodies of water. Game species which may be present include mule deer, elk, mountain lion, black bear, blue grouse, ruffed grouse, mourning doves, and cottontail rabbits. Small mammals, various birds, reptiles, as well as several types of predators may also be found in the area. There are no threatened or endangered species of plants or animals known to exist in the area.

No existing wildlife habitat will be disturbed. All surface and support facilities will be located on previously impacted federal land. Mining will simply be an extension of existing and proposed underground activities.

#### Control and Prevention Measures

##### Fire Prevention

No fire prevention plan is deemed necessary, as this is an underground mine.

##### Soil Erosion Prevention

There should be no soil erosion other than that normally expected to occur.

##### Pollution of Surface or Ground Water

Ground water is very limited in the area and no diminution or pollution will occur as a result of proposed activities. As there are no bodies of water or perennial streams on the subject property, no pollution or diminution of surface water will occur.

##### Fish and Wildlife Protection

No wildlife or wildlife habitat will be affected. There are no fish or aquatic fauna as there are no perennial streams or bodies of water in the area. There are no threatened or endangered species known to exist on the property. All surface and support facilities will be located in areas previously impacted by mining.

##### Protection of Natural Resources

The most advanced technology will be followed to assure maximum recovery of the coal reserves. There are no other replenishable or non-replenishable resources within the area.

### Air and Noise Pollution

Mining on the subject property will be underground. There will be no air or noise pollution.

### Socioeconomic Impacts

The area is located in an area where coal mining is the major industry. The community is geared for coal operations. The labor supply is excellent, well-trained, and available. Most people in this area have a very possible favorable attitude towards increased coal activity. No adverse affect on the social and infrastructure systems of the community is foreseen.

### Hazards to Public Health and Safety

There will be no hazards to public health and safety as a result of the proposed activities.

### Reclamation

Reclamation on the subject property will be as outlined in in our permanent Mining and Reclamation Plan.

### Laws and Regulations

All pertinent federal and state laws and regulations will be complied with.

### Subsidence Control

No major subsidence is expected to occur. As mining progresses and pillars are pulled, it is assumed that the roof will cave in behind the crew as it retreats. This is the normal scheme of mining in this type of development. However, in this area where average cover over the coal seam is more than 1,000 feet, these caves will appear on the surface as minor cracks, if at all. In other words, a solid block of overburden, 1,000 feet thick will not drop into the five or six foot void resulting from pillar extraction. In fact, the rock will bridge off very quickly and result in minimal disturbance to the overlying country rock. Any minor subsidence which might occur would result in no material damage or diminution of value or foreseeable use of the land.

### Intended Use of Coal

The coal covered by this lease modification application will be used to maintain scheduled production rates. These rates must be maintained in order to meet contractual commitments to various consumers.

VI. References

The narrative of this application is based on information contained within the Tower Resources' Inc., Centennial Project, Mining and Reclamation Plan, currently being reviewed for approval by the Office of Surface Mining and the State of Utah, Division of Oil, Gas, and Mining.

VI. APPENDIX

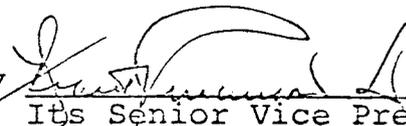
POWER OF ATTORNEY

KNOW ALL MEN BY THESE PRESENTS, that AMCA COAL LEASING, INC., a corporation duly organized and existing under the laws of the State of Delaware, has made, constituted and appointed, and by these presents does make, constitute and appoint SAMUEL C. QUIGLEY of Price, Carbon County, State of Utah, the true and lawful attorney for said corporation and in the name, place and stead of said corporation to make, sign, execute and deliver to the appropriate federal, state and local agencies any and all applications for permits and approvals required by federal, state and local laws and regulations for the development and operation of a coal mine and related activities on or in connection with real and personal property and interests therein, owned and held by said corporation in Carbon County, State of Utah, and to execute and sign any bonds, or escrow agreements or escrow instructions required by such laws or regulations.

GIVING AND GRANTING unto said attorney full power and authority to do and perform all and every act and thing whatsoever requisite and necessary to be done in connection with the previously enumerated actions and/or powers as fully to all intents and purposes as said corporation might or could do if personally present and hereby ratifying and confirming all that said Attorney shall lawfully do or cause to be done by virtue of these presents.

IN WITNESS WHEREOF, AMCA COAL LEASING, INC. caused this instrument to be sealed with its corporate seal and duly attested by the signatures of its Senior Vice President and Assistant Secretary.

AMCA COAL LEASING, INC.

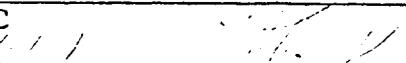
By  Its Senior Vice President

ATTEST:

STATE OF KENTUCKY)  
: ss.  
COUNTY OF HOPKINS)

On the 17 day of May, 1980, personally appeared before me Robert Anderson, Jr. and Dennis Halliburton who being by me duly sworn, did say that they are the Senior Vice President and Assistant Secretary, respectively, of AMCA COAL LEASING, INC., a Delaware corporation, and that the within and foregoing instrument was signed in behalf of said corporation by authority of a resolution of its board of directors and said Senior Vice President and Assistant Secretary acknowledged to me that said corporation executed the same.

My Commission Expires:

NOTARY PUBLIC  
Residing at: 

## VII. Plates (Maps and Plans)

Included here as plates are maps and plans in order to better define material in the text of this application. These maps and plans will be updated as required by the regulatory authority. Plates are listed below.

- Plate I - General Location Map  
(topography, physical features, existing roads, vehicular trails, utility systems, access roads, location of water sources, area of surface facilities).
- Plate II - Seam Outcrop, Lease Boundary, and Portal Sites  
(topography, physical features, roads, area of surface facilities).
- Plate III - Surface Ownership
- Plate IV - Subsurface Mineral Ownership
- Plate V - Proposed Gilson Seam Mine Plan  
(roads, drill holes and sample locations, area of surface facilities).
- Plate VI - Proposed Aberdeen Seam Mine Plan  
(roads, drill holes and sample locations, area of surface facilities).
- Plate VII - Proposed Lower Sunnyside Seam Mine Plan  
(roads, drill holes and sample locations, area of surface facilities).

DESCRIPTION OF FEDERAL LEASES

T13S, RE11, SLBM, Carbon County, Utah

<u>Lease No.</u>	<u>Acres</u>	<u>Description</u>
SL-027304	120	S $\frac{1}{2}$ SE $\frac{1}{4}$ Section 7 NW $\frac{1}{4}$ NE $\frac{1}{4}$ Section 18
SL-063058	240	S $\frac{1}{2}$ SW $\frac{1}{4}$ Section 8 N $\frac{1}{2}$ NW $\frac{1}{4}$ Section 17 SE $\frac{1}{4}$ NW $\frac{1}{4}$ Section 17 NE $\frac{1}{4}$ NE $\frac{1}{4}$ Section 18
U-010581	1,682.39	All Section 5 All Section 6 NE $\frac{1}{4}$ Section 7 N $\frac{1}{2}$ NW $\frac{1}{4}$ Section 7 N $\frac{1}{2}$ SE $\frac{1}{4}$ Section 7 N $\frac{1}{2}$ Section 8 N $\frac{1}{2}$ SW $\frac{1}{4}$ Section 8 SE $\frac{1}{4}$ Section 8 W $\frac{1}{2}$ SW $\frac{1}{4}$ Section 9 N $\frac{1}{2}$ NE $\frac{1}{4}$ Section 17

DESCRIPTION OF PROPOSED EXPANSIONS

T13S, RE11, SLBM, Carbon County, Utah

<u>Lease No.</u>	<u>Acres</u>	<u>Description</u>
SL-027304 Expansion	120	SW $\frac{1}{4}$ SW $\frac{1}{4}$ Section 7 N $\frac{1}{2}$ NW $\frac{1}{4}$ Section 18
SL-063058 Expansion	160	N $\frac{1}{2}$ NW $\frac{1}{4}$ NW $\frac{1}{4}$ Section 16 NW $\frac{1}{4}$ SW $\frac{1}{2}$ NW $\frac{1}{4}$ Section 16 SW $\frac{1}{4}$ NW $\frac{1}{2}$ NW $\frac{1}{4}$ Section 16 S $\frac{1}{2}$ NE $\frac{1}{4}$ Section 17 NE $\frac{1}{4}$ SE $\frac{1}{4}$ Section 17
U-063058 Expansion	160	N $\frac{1}{2}$ NE $\frac{1}{4}$ SW $\frac{1}{4}$ Section 17 N $\frac{1}{2}$ NW $\frac{1}{4}$ SW $\frac{1}{4}$ Section 17 SW $\frac{1}{4}$ NW $\frac{1}{2}$ SW $\frac{1}{4}$ Section 17 SW $\frac{1}{4}$ NW $\frac{1}{4}$ Section 17 N $\frac{1}{2}$ SE $\frac{1}{4}$ NE $\frac{1}{4}$ Section 18 SE $\frac{1}{4}$ SE $\frac{1}{4}$ NE $\frac{1}{4}$ Section 18 N $\frac{1}{2}$ SW $\frac{1}{4}$ NE $\frac{1}{4}$ Section 18 E $\frac{1}{2}$ NE $\frac{1}{4}$ SE $\frac{1}{4}$ Section 18

# GEOLOGIC COLUMN OF CENTENNIAL AREA

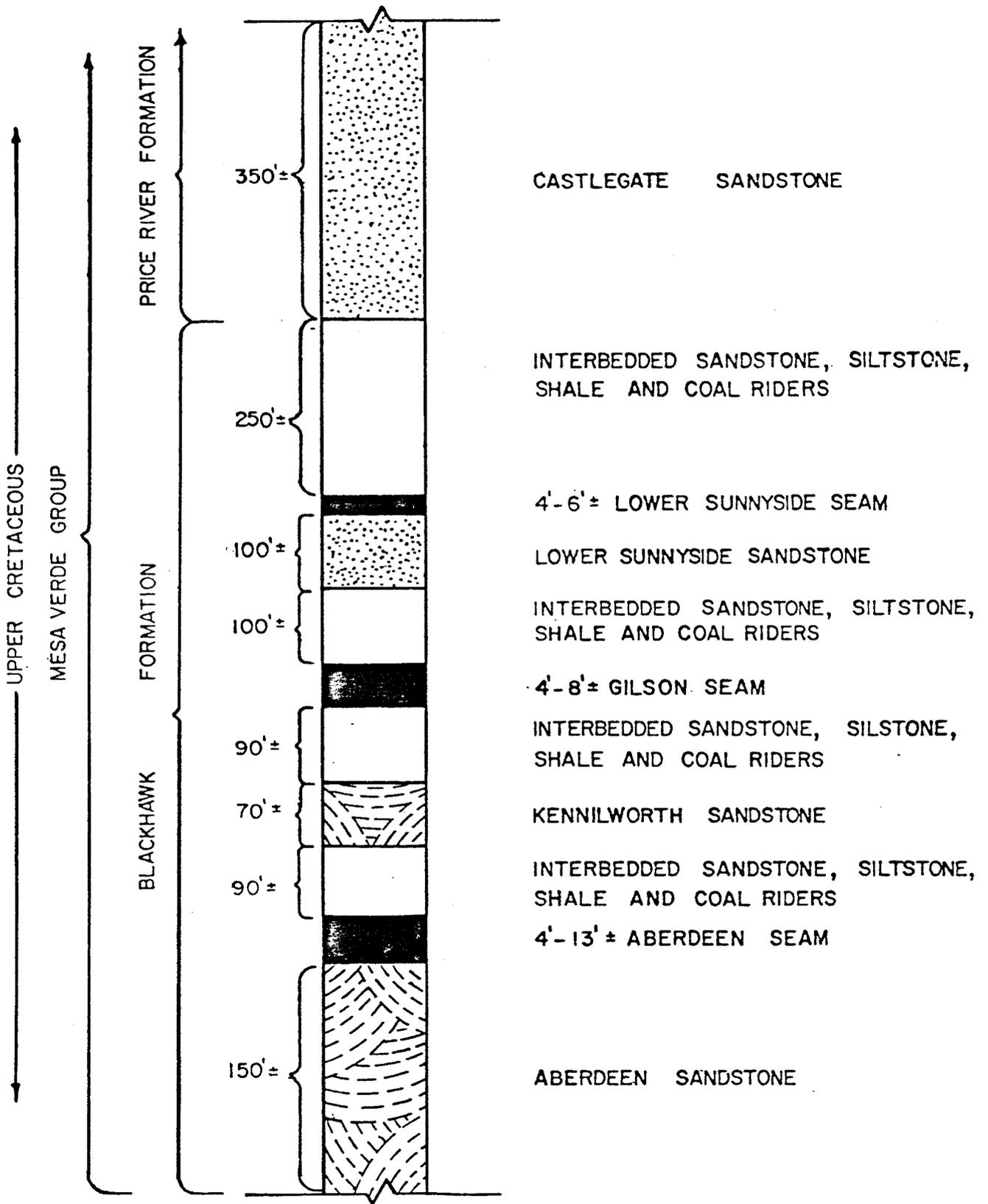
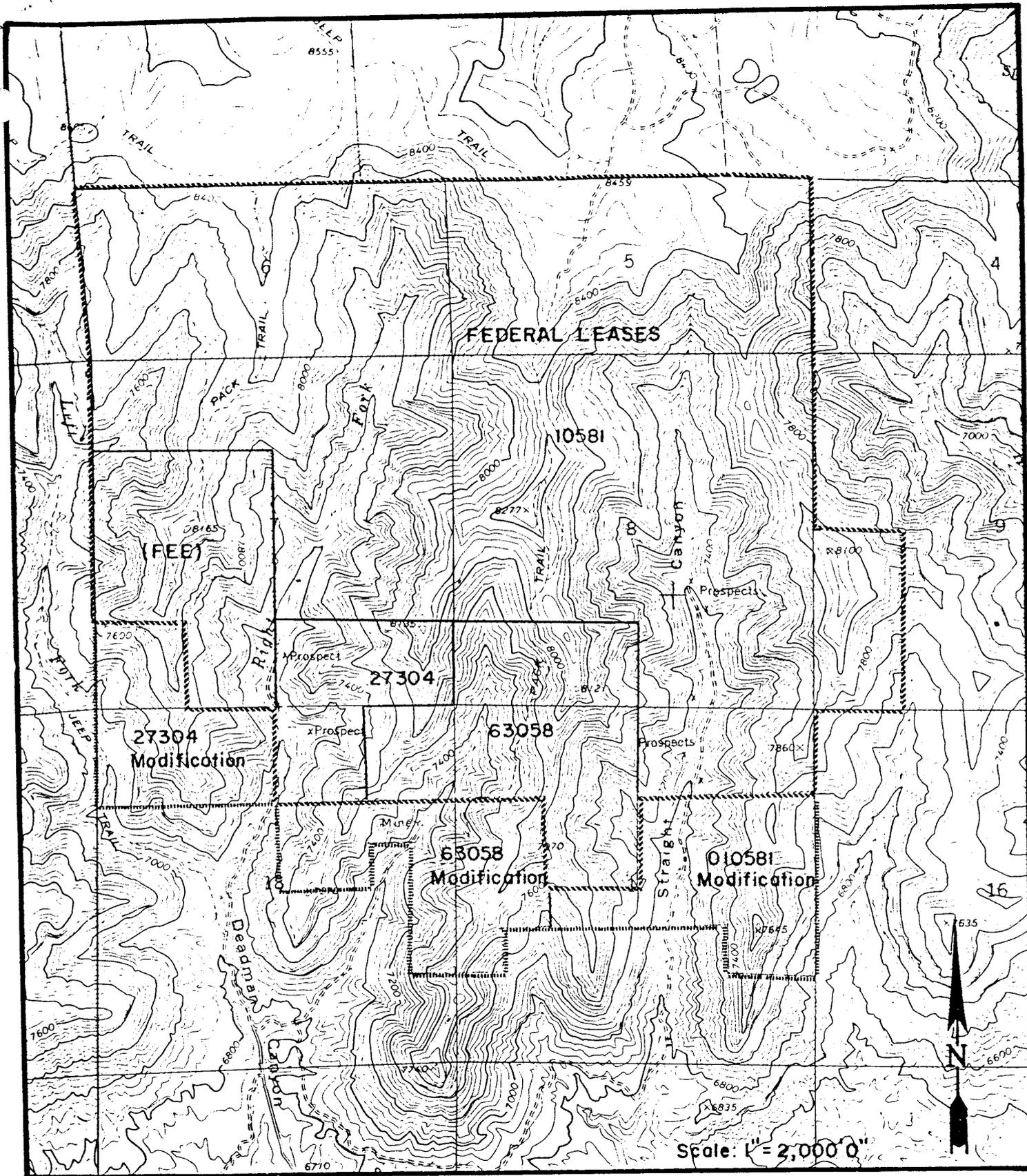


FIGURE 3



Location Map-Centennial Project- Leases

ADDENDUM TO TOWER RESOURCES' APPROVED  
MINING AND RECLAMATION PLAN  
FOR THE ADDITION OF EMERGENCY LEASE #U-52341

CENTENNIAL PROJECT

SUBMITTED: APRIL, 1984

*Copy through  
APP. A.*

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Appendix A

List of Current and Previous Coal Mining Permits

List of Violations

State of Kentucky

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Certificates of Liability Insurance

The Mined Lands Reclamation Act-Bond

Appendix B

Revised Hydrologic Inventory

Appendix C

Plate I - General Location Map

Plate II - Surface Ownership

Plate III - Subsurface Mineral Rights

Plate IV - Subsidence Monitoring Plan

Plate V - Wildlife Distribution Map

Plate VI - Proposed Mine Plan - Gilson Seam (Pinnacle Mine)

Plate VII - Gilson Seam Isopach

Chapter I. Introduction

ADDENDUM TO TOWER RESOURCES'  
APPROVED MINING AND RECLAMATION PLAN  
FOR THE ADDITION OF EMERGENCY LEASE #U-52341

CHAPTER I - Introduction

Tower Resources, Inc., a corporation organized and existing under the laws of Delaware and qualified to do business in the State of Utah, is proposing to add a 120 acre federal emergency lease (#U-52341) to its currently approved Centennial Project. The lease contains approximately 700,000 tons of recoverable coal in the Gilson Seam and was granted to Tower Resources in November, 1983. All reserves will be mined simply as an underground extension of the existing, approved and currently operating Pinnacle Mine. Assuch, no additional surface disturbances of any kind. Access to and handling and extraction of all coal will be through existing Pinnacle Mine (Gilson Seam) facilities. There are no other mineable seams within this emergency lease.

The Centennial Project comprises approximately 2,798 acres of private and federal coal leases (including the 120 acre emergency lease) and is located approximately ten miles north-northeast of Price, Utah in Carbon County. The entire permit area is indicated on Fig. 1. AMCA Coal Leasing, Inc., the land acquisition and development branch of Tower Resources, controls all leases within this permit area. Mineable reserves within this mine plan area total approximately 30 million tons.

Three seams of mineable coal are located within the permit area and the approved Mining and Reclamation Plan for the Centennial Project calls for the eventual development of a separate mine in each of these seams. Currently two mines, the Pinnacle (Gilson Seam) and Apex (Lower Sunnyside Seam), have been developed and are currently operating. The third mine in the Aberdeen Seam has yet to be developed.

Initial mining operations of the Centennial Project began in October, 1980 in the Pinnacle Mine on the Zion's fee lease. The original Mining and Reclamation Plan was approved in January, 1982 and mining progressed onto the federal leases. In June, 1982 the Apex Mine was opened. In October, 1981 modifications were granted to each of the three federal leases thus adding 436 acres to the overall mine plan area. In November, 1983 the 120 federal emergency lease was granted due to the possibility of by-pass of coal located thereon in the reasonably foreseeable future.

This addendum is now being submitted as per the requirements of the U.S. Department of the Interior, Office of Surface Mining and the State of Utah, Division of Oil, Gas and Mining in order that mining may progress onto this 120 acre federal emergency lease. It should be stressed once again that all coal to be mined from this lease will be extracted merely as an underground extension of the existing Pinnacle Mine operation. There will be no additional construction activities or surface disturbance whatsoever.

CENTENNIAL  
PROJECT LEASES

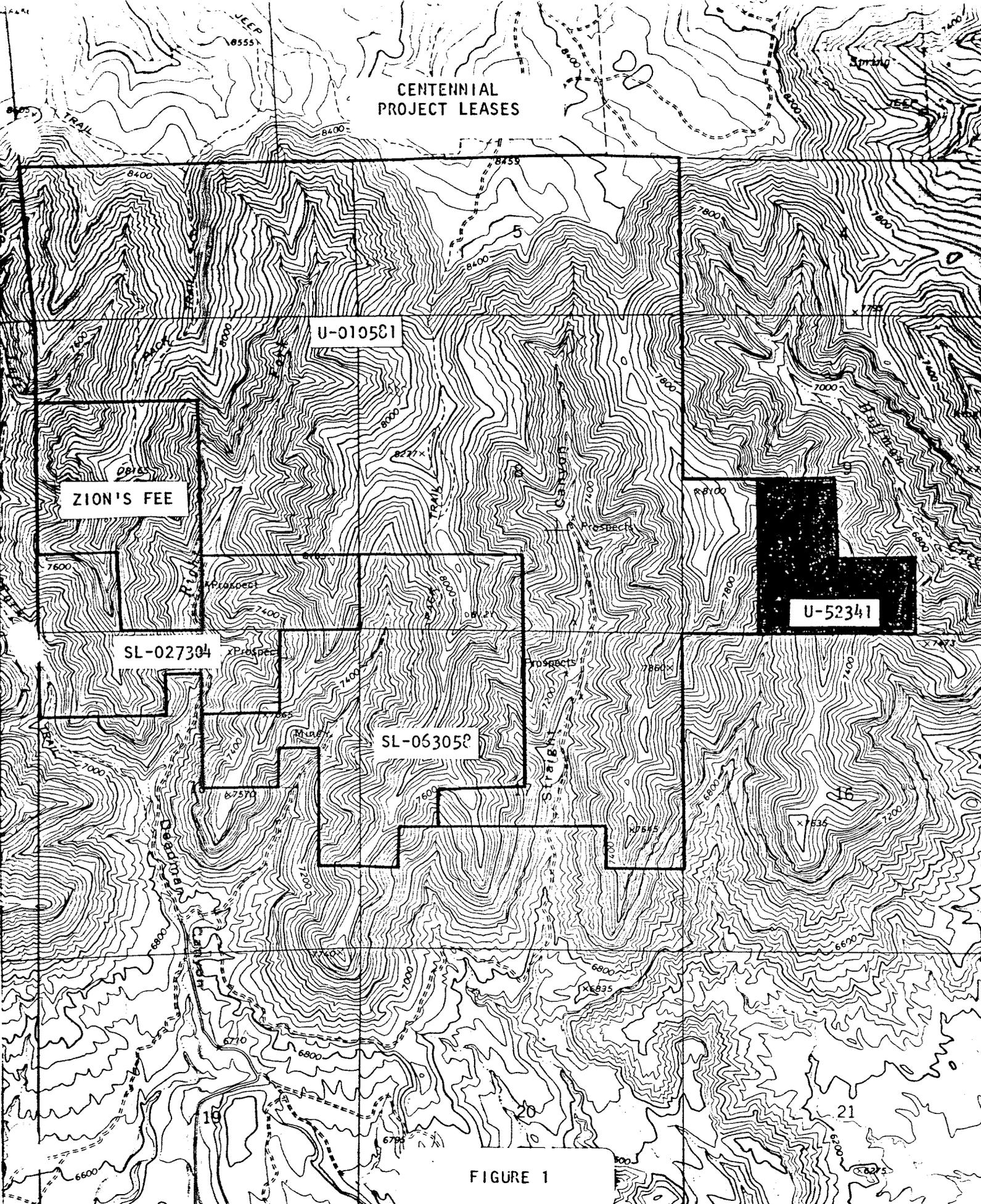


FIGURE 1

## Chapter II. Scope

ADDENDUM TO TOWER RESOURCES'  
APPROVED MINING AND RECLAMATION PLAN  
FOR THE ADDITION OF EMERGENCY LEASE #U-52341

CHAPTER II - Scope

This addendum to Tower's currently approved Mining and Reclamation Plan, State of Utah permit identification number ACT/007/019, is merely for the incidental addition of a 120 acre federal emergency lease to the Centennial Project. Reserves contained within this lease will be mined simply as an underground extension of the existing, approved, permitted and currently operating Pinnacle Mine. As such no additional surface facilities are required nor will there be any additional surface disturbances of any kind. Access to and handling and extraction of all coal will be through existing Pinnacle Mine (Gilson Seam) facilities. There are no other mineable seams within this emergency lease.

The objective of this addendum is to include the 120 acre emergency lease as part of Tower's Centennial Project and to set forth all relative information, descriptions of environmental resources and plans, and to address performance standards as required under the regulations set forth in the Utah Mining Code. Basically this addendum does not differ from the original, approved Mining and Reclamation Plan since there will be no additional surface disturbances or construction activities. All of the original environmental surveys and descriptions in the approved plan also cover the emergency lease area as part of the overall mine plan study area. There will be no changes to the approved operation, reclamation or environmental protection plans with the exception of an extension of the Pinnacle Mine underground workings. For these reasons, the original Mining and Reclamation Plan is referenced where applicable. In those few cases where additional specific information is required, it is included here. All maps have been revised where applicable and are also included. Also the maps contained in the original Hydrologic Inventory have been revised to indicate the 120 acre emergency lease and this complete Hydrologic Inventory in revised form is also included here.

References are made to the various portions of the approved Mining and Reclamation Plan. These include the following:

- Volumes I, II - submitted January, 1981
- Addendum A - submitted March, 1981
- Addendum B - submitted June, 1981
- Response to Review of Apparent Completeness Review Response - submitted August, 1981
- Soil and Vegetation Inventory - submitted September, 1981
- Miscellaneous Submittals (consisting of correspondence and information submitted in response to requests for data by the Division; as well as updates to the approved plan) - submitted at various times following approval of the Mining and Reclamation Plan.

There is no significant change in this addendum from the approved plan. Most information in the approved Mining and Reclamation Plan for the Centennial Project also applies to this emergency lease except for specific cases such as the actual mine plans or the addition of this lease to the boundaries of the original maps. Therefore, although this addendum addresses the Utah Mining Code part by part, the reviewer is referred back to the original plan in most cases.

Chapter III. Verification of Application

ADDENDUM TO TOWER RESOURCES'  
APPROVED MINING AND RECLAMATION PLAN  
FOR THE ADDITION OF EMERGENCY LEASE #U-52341

CHAPTER III - Verification of Application

Included here is a verification statement signed by Michael W. Glasson, Senior Geologist for Tower Resources, Inc., attesting that all information contained in this application is true and correct to the best of his information and belief.

VERIFICATION STATEMENT

STATE OF Utah

COUNTY OF Carbon

I, Michael W. Glasson, having been duly sworn, depose and attest that all of the representations contained in the foregoing application are true to the best of my knowledge; that I am authorized to complete and file this application on behalf of the Applicant and this application has been executed as required by law.

Signed: Michael W. Glasson

Taken, subscribed and sworn to me before the undersigned authority in my said county, this 12th day of April, 1984.

Notary Public: Donna G. Smith

My Commission Expires: 5-27-87

Chapter IV. UMC 782

ADDENDUM TO TOWER RESOURCES'  
APPROVED MINING AND RECLAMATION PLAN  
FOR THE ADDITION OF EMERGENCY LEASE #U-52341

CHAPTER IV - Part UMC 782 - Requirements for Legal, Financial,  
Compliance, and Related Information

Scope

The objective of this chapter is to set forth all relevant information concerning ownership and control of Tower Resources, Inc., the ownership and control of the property to be affected by mining activities and all other information and documentation required under Part UMC 782.

This addendum to the approved Mining and Reclamation Plan, permit identification number ACT/007/019, is merely for the incidental addition of a 120 acre federal lease to Tower's current permit area. These reserves will be mined simply as an underground extension of the existing, approved, permitted and currently operating Pinnacle Mine. As such, no additional surface disturbances whatsoever are required. Access to and extraction and handling of all coal will be through existing facilities.

Legal, financial, and compliance information as required by Part UMC 782 and presented here is basically the same information presented in the approved plan. All required information is presented here once again; however in an updated form.

UMC 782.13 Identification of Interests

a) Permit Applicant

Tower Resources, Inc.  
P.O. Box 902  
Price, Utah 84501  
(801) 637-5385

b) Legal and Equitable Owners of Record

There will be no additional surface facility construction. All existing facilities are located either on land owned by Zions Securities Corporation or on federal land. The addresses of these owners of record are as follow:

Bureau of Land Management  
Utah State Office  
136 East South Temple  
Salt Lake City, Utah 84111

Zion Securities Corporation  
10 East South Temple  
Salt Lake City, Utah 84111

All coal to be mined on the 120 acre addition is owned by the federal government. Coal to be mined over the rest of the mine plan area is owned either by the federal government or by Zion Securities Corporation. The addresses of these owners of record are as follows:

Bureau of Land Management  
Utah State Office  
136 East South Temple  
Salt Lake City, Utah 84111

Zion Securities Corporation  
10 East South Temple  
Salt Lake City, Utah 84111

c) Purchasers of Record under Real Estate Contracts

There are no purchasers of record under any real estate contracts of areas to be affected by surface operations and facilities of this mine plan and there are no purchasers of record under any real estate contracts of the coal to be mined.

d) Operator

Tower Resources, Inc.  
P.O. Box 902  
Price, Utah 84501  
(801) 637-5385

e) Resident Agent of Applicant

C.T. Corporation System  
175 South Main  
Salt Lake City, Utah 84111

f) Business Entity Statement

The applicant, Tower Resources, Inc., is a corporation organized and existing under the laws of Delaware and qualified to do business in Utah.

g) Officers, Partners and Directors

Officers:

Robert Anderson, Jr. .... President  
Dennis L. Halliburton .... Vice President/Finance  
Keith Smith .... Vice President/Marketing  
Kenneth Taylor .... Vice President/Operations

Directors:

Mary-Jean Mitchell Green ..... Chairman of the Board of  
Directors  
Robert Anderson, Jr. .... Director  
Dennis L. Halliburton .... Director  
M.I. Mair ..... Director  
George D. Coates ..... Director

The address for all of the above is:

Tower Resources, Inc.  
Suite 370, Plainview Triad East  
10200 Linn Station Road  
Louisville, Kentucky 40223

h) Principal Shareholders

The capital stock of Tower Resources, Inc., is 100 percent owned and controlled by Cada Am Holding N.V., whose address is as follows:

C/O Dr. J.A. Schiltkamp  
10 A Kerkstratt  
Curacao, Netherland Antilles

i) Other Operating Names

Other names under which the principal shareholder has or is operating coal mining activities in the United States within the last five years preceding the date of this application are listed below:

Don Bow Mine  
Cimarron Coal Corporation  
Badgett Mine Stripping Corporation  
West Ken Coal Corporation  
AMCA Processing, Inc.  
AMCA Resources, Inc.

j) Single Proprietor

Tower Resources, Inc., holds the exclusive coal operating interests in the permit area.

k) Current or Previous Coal Mining Permits

A list of current and previous coal mining permits held by the principal shareholder is included in Appendix A.

l) Owners of Record of Surface and Subsurface Contiguous Areas

Names and addresses of all owners of record for all surface and subsurface areas contiguous to the permit area are listed below and indicated on Plates II and III.

Subsurface Owners

Franklin Real Estate Company  
#2 Broadway  
New York, New York

Sunedco Coal Company  
7401 West Mansfield Avenue  
Suite 418  
P.O. Box 35-B  
Lakewood, Colorado 80235

Bureau of Land Management  
Utah State Office  
Salt Lake City, Utah 84111

State of Utah  
1588 West North Temple  
Salt Lake City, Utah

Surface Owners

Bureau of Land Management  
Utah State Office  
136 East South Temple  
Salt Lake City, Utah 84111

Gladys R. Artman  
P.O. Box 1200  
Lakeland, Florida 33802

F. and D. Shimmin  
711 North 5th East  
Price, Utah 84501

R. and E. Nelson  
583 Sundial Drive  
Moab, Utah 84532

D. Mathis  
Sunnyside Star Route  
Price, Utah 84501

State of Utah  
1588 West North Temple  
Salt Lake City, Utah

m) Mine Name and MSHA Identification

The Centennial Project includes the development of three separate mines. Two of these mines are currently in operation. The names and M.S.H.A. I.D. numbers for these existing mines and all sections are as follow:

Pinnacle Mine - M.S.H.A. I.D. #42-01474  
Apex Mine - M.S.H.A. I.D. #42-01750

The third mine is at this time only proposed and has yet to be named or given an M.S.H.A. I.D. number. All coal from the 120 acre emergency lease for which this addendum is being submitted will be mined simply as an underground extension of the existing Pinnacle Mine.

n) Interests in Contiguous Lands

Tower Resources, Inc., has formally submitted an expression of leasing interest for a 328 acre coal tract for consideration as part of the Uinta-Southwestern Utah Coal Region, coal lease sale offerings. This tract, known as the Graves tract, contains 327.58 acres and can be described as follows:

Township 13 South, Range 11 East, S.L.B.&M.  
Section 1: SE $\frac{1}{4}$ , S $\frac{1}{4}$ NW $\frac{1}{4}$   
Section 12: NE $\frac{1}{4}$ NE $\frac{1}{4}$

Township 12 South, Range 11 East, S.L.B.&M.  
Section 31: SW $\frac{1}{4}$ SW $\frac{1}{4}$  (lots 6,22)

Other than this tract and Rights-of-Way granted by the Bureau of Land Management, Tower Resources has no interests in lands, options or pending bids for lands which are contiguous to the permit area.

#### UMC 782.14 Compliance Information

a) Suspension and Revocation

Tower Resources, Inc., affiliates or persons controlled by or under common control with Tower have not had a mining permit suspended or revoked within the last five years.

b) Forfeiture of Bond

Tower Resources, Inc., affiliates or persons controlled by or under common control with Tower have not forfeited a mining bond or similar security in lieu of bond.

c) History of Violations

Appendix A contains a listing of all violations received within the last three years prior to the date of this application by Tower and affiliated companies.

#### UMC 782.15 Right of Entry and Operation Information

Tower Resources, Inc., in sublease agreement with AMCA Coal Leasing, Inc., currently holds 2,798.35 acres of private and federal coal leases in this permit area. Tower basis its legal right to enter and conduct mining activities in the permit area pursuant to the language contained in the Federal Coal Leases, Section 2, Rights of Lessee as follows:

"The lessor, in consideration of any bonus paid (or to be paid if deferred), rents and royalties and other conditions hereinafter set forth, hereby grants and leases to the lessee the exclusive right and privilege to mine and dispose of all coal... subject to the conditions, limitations and prohibitions provided in this lease and in applicable acts and regulations, the right to construct all works, buildings, structures, equipment, and appliances which may be necessary and convenient for the mining and preparation of the coal for market, and subject to the conditions herein provided, to use so much of the surface as may reasonably be required in the exercise of the rights and privileges herein granted..."

A similar right to enter and conduct underground mining activities is contained in the private lease agreement with the Zion Securities Corporation as follows:

"During the life of the lease, so long as lessee is not in default hereunder, it may freely prospect, mine and develop the lease premises, extract and sell such coal therefrom as it may elect, and use the surface and underground thereof for all lawful purposes including the exploration and mining to be conducted therein and thereon. It may also use the leased lands in connection with the mining and development of other lands which it may own, lease, or acquire as a part of its general mining operations in the area."

The Federal Coal Leases are described as follows:

SL-027304:

Tract 1: T.13S., R.11E., SLM, Utah  
Sec. 7, S $\frac{1}{2}$ SE $\frac{1}{4}$ ,  
Sec. 18, NW $\frac{1}{4}$ NE $\frac{1}{4}$ .

Tract 2: T.13S., R.11E., SLM, Utah  
Sec. 6, lot 4;  
Sec. 18, lot 1, N $\frac{1}{2}$ NE $\frac{1}{4}$ NW $\frac{1}{4}$ , SW $\frac{1}{2}$ NE $\frac{1}{4}$ NW $\frac{1}{4}$

containing 235.96 acres, more or less.

This lease was originally assigned to W.F. Olsen on September 1, 1925. On May 1, 1959, the lease was assigned to F.H. Larson and then to Centennial Coal Associates on February 1, 1973. AMCA Coal Leasing, Inc., acquired the lease in February, 1977 and subsequently added Tract 2 through lease modification criteria on October 26, 1981.

SL-063058:

Tract 1: T.13S., R.11E., SLM, Utah  
Sec. 8, S $\frac{1}{4}$ SW $\frac{1}{4}$ ;  
Sec. 17, N $\frac{1}{2}$ NW $\frac{1}{4}$ , SE $\frac{1}{4}$ NW $\frac{1}{4}$ ;  
Sec. 18, NE $\frac{1}{4}$ NE $\frac{1}{4}$ .

Tract 2: T.13S., R.11E., SLM, Utah  
Sec. 17, SW $\frac{1}{4}$ NW $\frac{1}{4}$ , SE $\frac{1}{4}$ NW $\frac{1}{2}$ SW $\frac{1}{4}$ , W $\frac{1}{2}$ NW $\frac{1}{4}$ SW $\frac{1}{4}$ ,  
Sec. 18, E $\frac{1}{2}$ SE $\frac{1}{4}$ NE $\frac{1}{4}$ , NW $\frac{1}{4}$ SE $\frac{1}{4}$ NE $\frac{1}{4}$ , SW $\frac{1}{4}$ NE $\frac{1}{4}$ ,  
E $\frac{1}{2}$ NE $\frac{1}{4}$ SE $\frac{1}{4}$ .

containing 400 acres, more or less.

The original lease of 80 acres was assigned to C.D. Sutton on August 3, 1942. On July 27, 1950, the lease was amended to embrace 200 acres. An additional 40 acres was added December 13, 1951. The leases were posted to F.H. Larson on May 1, 1970 and then to Centennial Coal Associates on February 1, 1973. AMCA Coal Leasing, Inc., acquired the lease in February, 1977 and subsequently added Tract 2 through the Federal lease modification criteria.

U-010581:

Tract 1: T.13S., R.11E., SLM, Utah  
Secs. 5, and 6, all;  
Sec. 7, lot 1 NE $\frac{1}{4}$ , NE $\frac{1}{4}$ NW $\frac{1}{4}$ , N $\frac{1}{2}$ SE $\frac{1}{4}$ ;  
Sec. 8, N $\frac{1}{2}$ , N $\frac{1}{2}$ S $\frac{1}{2}$ , S $\frac{1}{2}$ SE $\frac{1}{4}$ ;  
Sec. 9, W $\frac{1}{2}$ SW $\frac{1}{4}$ ;  
Sec. 17, N $\frac{1}{2}$ NE $\frac{1}{4}$ .

Tract 2: T.13S., R.11E., SLM, Utah  
Sec. 17, S $\frac{1}{2}$ NW $\frac{1}{4}$ , N $\frac{1}{2}$ NE $\frac{1}{4}$ SW $\frac{1}{4}$ ,  
NE $\frac{1}{4}$ SE $\frac{1}{4}$ , N $\frac{1}{2}$ NW $\frac{1}{4}$ SE $\frac{1}{4}$

containing 1,842.39 acres, more or less.

This lease was assigned to C.D. Sutton on February 1, 1956. On May 1, 1970 the lease was assigned to F.H. Larson and then to Centennial Coal Associates on February 1, 1973. AMCA Coal Leasing, Inc., acquired the lease in February, 1977 and subsequently added Tract 2 through the federal lease modification criteria.

U-52341:

T.13S., R.11E., SLM, Utah  
Sec. 9, E $\frac{1}{2}$ SW $\frac{1}{4}$ , SW $\frac{1}{4}$ SE $\frac{1}{4}$

containing 120 acres, more or less.

This lease was acquired by AMCA Coal Leasing, Inc., in November, 1983 through the emergency lease criteria.

The private fee lease is described as follows:

T.13S., R.11E., SLBM, Carbon County, Utah  
Sec. 7: S $\frac{1}{2}$ NW $\frac{1}{4}$   
N $\frac{1}{2}$ SW $\frac{1}{4}$   
SE $\frac{1}{4}$ SW $\frac{1}{4}$

containing 200 acres, more or less.

The name and address of the lessor is Zion Securities Corporation, 10 East South Temple Street, Salt Lake City, Utah. This lease was originally made and entered into between Zion's and Centennial Coal Associates on August 1, 1972. AMCA Coal Leasing, Inc., acquired the lease in February, 1977.

#### UMC 782.16 Relationship to Areas Designated Unsuitable for Mining

The permit area is not within an area designated unsuitable for the surface effects of underground coal mining activities under UMC 764 or under study for designation in an administrative proceeding initiated under those parts. Further, there are no occupied dwellings within 300 feet of the permit area.

#### UMC 782.17 Permit Term Information

All coal will be mined simply as an underground extension of the existing Pinnacle Mine operation. The starting and termination dates as well as the horizontal and vertical extent of the proposed underground mining activities over the total life of the permit are indicated on the revised Pinnacle underground layout map included as Plate VI. Also refer to the underground layout maps for the Apex and Aberdeen Mines previously submitted.

The requested term of this permit is five years. Tower will then apply for five year extensions over the life of the mine.

UMC 782.18 Personal Injury and Property Damage Information

Appendix A contains certificates of liability insurance covering personal injury and property damage resulting from this operation.

UMC 782.19 Identification of Other Licenses and Permits

The following is a list of all other licenses and permits under applicable State and Federal land-use, air and water quality, water rights and health and safety laws and regulations held by Tower in order to conduct underground coal mining activities.

State:

- 1) State of Utah  
Department of Natural Resources  
Division of Oil, Gas and Mining  
4241 State Office Building  
Salt Lake City, Utah 84116
  - Mining and Reclamation Plan for Tower Resources' Centennial Project  
Permit I.D. Number ACT/007/019  
Approved January 4, 1982
  
- 2) State of Utah  
Department of Health  
Division of Environmental Health  
150 West North Temple  
P.O. Box 2500  
Salt Lake City, Utah 84110
  - Air Quality Construction and Operation Permit  
Approved June 13, 1980
  
  - Water Quality - Sediment and Drainage  
Approved May 14, 1980
  
  - Septic and Culinary Plan (2)  
Approved September 17, 1980 (Office Site)  
Approved May 8, 1980 (Bathhouse Facility)

Federal:

- 1) Environmental Protection Agency  
Region VIII  
1860 Lincoln Street  
Denver, Colorado 80295
  - National Pollutant Discharge Elimination System (NPDES)  
Permit I.D. - UT-0023507  
Issued April 25, 1982
  - Prevention of Significant Deterioration of Air Quality (NPDES)  
Unissued: Determined by the E.P.A. to be unnecessary
  
- 2) Bureau of Land Management  
Utah State Office  
136 East South Temple  
Salt Lake City, Utah 84111
  - Access Road Right-of-Way  
Permit Number U-45966  
Granted September 1, 1980
  - Buried Telephone Cable Right-of-Way  
Permit Number U-36739  
Granted November 20, 1978
  - Power Transmission Line Right-of-Way  
Permit Number U-36741  
Granted November 20, 1978
  - Material Storage Site Right-of-Way  
Permit Number U-45965  
Granted September 11, 1980
  
- 3) Mine Safety and Health Administration (M.S.H.A.)  
P.O. Box 25367  
Denver, Colorado 80225  
(District 9)  
Pinnacle Mine I.D. 42-01474  
Apex Mine I.D. 42-01750
  - Roof Control Plan  
Reviewed and approved every six months
  - Ventilation System and Methane and Dust Control Plan  
Reviewed and approved every six months
  - Fan Stoppage Plan  
Approved September 21, 1978

- Smoking Prohibition Plan  
Approved September 21, 1978
- Training Plan  
Approved August 19, 1980
- Instruction Program: Firefighting and Evacuation Plan  
Approved November 5, 1980
- Medical Program  
Approved September 6, 1978

UMC 782.20 Identification of Location of Public Office for Filing of Application

A copy of this addendum will be filed simultaneously for public inspection with the County Recorder of Carbon County, Carbon County Courthouse, Price, Utah.

UMC 782.21 Newspaper Advertisement and Proof of Publication

A copy of the newspaper advertisement of this addendum and proof of publication of the advertisement will be filed with the Division and made part of the complete application not later than 4 weeks after the last date of publication.

Chapter V. UMC 783

ADDENDUM TO TOWER RESOURCES'  
APPROVED MINING AND RECLAMATION PLAN  
FOR THE ADDITION OF EMERGENCY LEASE #U-52341

CHAPTER V - Part UMC 783-Requirements for Information on Environmental Resources

Scope

The objective of this chapter is to set forth complete and accurate descriptions of all environmental resources that may be impacted or affected by the proposed underground activities in order to address all requirements of Part UMC 783.

This addendum to the approved Mining and Reclamation Plan permit identification number ACT/007/019, is merely for the incidental addition of a 120 acre federal lease to Tower's current mine plan area. These additional reserves will be mined simply as an underground extension of the existing, approved and currently operating Pinnacle Mine operation. As such, no additional surface disturbances whatsoever will be required. Access to and extraction and handling of all coal will be through existing facilities.

All necessary surface and support facilities have been constructed, approved and are in operation; therefore there will be no additional environmental impacts as a result of the activities proposed by this revision.

Each part of UMC 783 is addressed below. Complete environmental resource information for the mine plan area, including the proposed 120 acre addition, is included in the approved Mining and Reclamation Plan; therefore applicable portions of the approved plan are referenced. Where necessary, maps have been revised to indicate the mine plan boundary change and are included with this submittal.

UMC 783.11 General Requirements

All coal will be mined simply as an underground extension of the existing Pinnacle Mine operation. There will be no additional surface disturbances required. All existing pre-mining environmental resources within the mine plan area and adjacent areas were described in the currently approved Mining and Reclamation Plan. Refer to the following sections of this approved plan:

- Volume I, Chapter IV
- Addendum A
- Addendum B
- Response to Review of Apparent Completeness Review Response
- Miscellaneous Submittals

UMC 783.12 General Environmental Resources Information

- a) All coal will be mined simply as an underground extension of the existing Pinnacle Mine operation. There will be no additional surface disturbances required. Mining operations under the approved Mining and Reclamation Plan, I.D. #ACT/007/019, began in October, 1980. The term of this permit is for five years covering the entire mine plan area. Tower will then apply for five year extensions to this permit to cover the entire mine plan area over the life of the mine. The life of the operation is projected to be approximately thirty years. Refer to Plate VI, included with this submittal, for a projected yearly mining sequence in the Pinnacle Mine.
- b) All coal will be mined simply as an underground extension of the existing Pinnacle Mine operation. There will be no additional surface disturbances required. There are no cultural or historic resources listed on the National Register of Historic Places or known archaeological sites within the proposed permit area or adjacent areas. Archaeological surveys of the area have been performed and were submitted as part of the approved Mining and Reclamation Plan. Refer to the following sections of this approved plan:
- Volume I, Chapter II - D  
                  Chapter IV - I
  - Addendum B - 784.17, p.8
  - Miscellaneous Submittals

UMC 783.13 Description of Hydrology and Geology: General Requirements

All coal will be mined simply as an underground extension of the existing Pinnacle Mine operation. There will be no additional surface disturbances required. The geology, hydrology and water quality and quantity of the mine plan area, including the 120 acre proposed addition, is described in the approved Mining and Reclamation Plan. Refer to the following sections of the approved plan:

- Volume I, Chapter II - D  
                  Chapter IV - A,B
- Addendum A - Chapter II, IV
- Addendum B - 783.14, p.3  
                  783.15, p.4  
                  783.16, p.4  
                  784.14, p.8
- Response to Review of Apparent Completeness Review Response  
          783.15, p.1  
          783.16, p.1

Also refer to the revised "Hydrologic Inventory" included as Appendix B with this submittal.

#### UMC 783.14 Geology Description

All coal will be mined simply as an underground extension of the existing Pinnacle Mine operation. A specific geologic description of the mine plan area, including the 120 acre proposed addition, is included in the approved Mining and Reclamation Plan. Refer to the following sections of the approved plan:

- Volume I, Chapter IV - A
- Addendum A - Chapter II
- Addendum B - 783.14, p.3

Also refer to the Geologic Area Map included as Appendix B as part of the revised Hydrologic Inventory.

#### UMC 783.15 Ground Water Information

All coal will be mined simply as an underground extension of the existing Pinnacle Mine operation. Specific ground water information is presented in the revised "Hydrologic Inventory" included as Appendix B with this submittal. Also refer to the following sections of the approved plan:

- Volume I, Chapter IV - B
- Addendum A - Chapter IV
- Addendum B - 783.15/783.16, p.3  
783.15, p.4
- Response to Review of Apparent Completeness Review Response  
783.15, p.1  
783.16, p.1

#### UMC 783.16 Surface Water Information

All coal will be mined simply as an underground extension of the existing Pinnacle Mine. There will be no additional surface disturbance whatsoever. Specific surface water information is presented in the revised "Hydrologic Inventory" included as Appendix B with this submittal. Also refer to the following sections of the approved plan:

- Volume I, Chapter IV - B
- Addendum A - Chapter IV
- Addendum B - 783.15/783.16, p.3  
783.16, p.4

#### UMC 783.17 Alternative Water Supply Information

All coal will be mined simply as an underground extension of the existing Pinnacle Mine. No additional surface disturbances are required. There will be no contamination, diminution or interruption of any underground or surface source of water within the proposed mine plan or adjacent area. Refer to parts UMC 783.15 and UMC 783.16 of this submittal.

#### UMC 783.18 Climatological Information

All coal will be mined simply as an underground extension of the existing and approved Pinnacle Mine operation. Complete climatological information for the mine plan area is included in the approved Mining and Reclamation Plan. Refer to the following sections of the approved plan:

- Volume I, Chapter IV - C
- Addendum B - 783.18, p.4

#### UMC 783.19 Vegetation Information

All coal will be mined simply as an underground extension of the existing and approved Pinnacle Mine. There will be no additional surface disturbances. The two ecological plant communities (range sites) existing over the proposed 120 acre addition are mountain stony loam (oak) and upland stony loam (pinyon-juniper). Complete vegetation information is included in the approved Mining and Reclamation Plan. Refer to the following sections of the approved plan:

- Volume I, Chapter IV - D
- Addendum B - 783.19, p.4
- Response to Review of Apparent Completeness Review Response  
783.19, p.4
- Soil Survey and Vegetation Inventory prepared by Earth Environmental Consultants

#### UMC 783.20 Fish and Wildlife Resources Information

All coal will be mined simply as an underground extension of the existing and approved Pinnacle Mine. There will be no additional surface disturbances. Complete fish and wildlife information for the mine plan area is included in the approved Mining and Reclamation Plan. Refer to the following sections of this approved plan:

- Volume I, Chapter IV - E
- Addendum B - 817.97, p.10
- Response to Review of Apparent Completeness Review Response  
817.97(a), p.12

Also refer to the revised Wildlife Distribution map included as Plate V. with this submittal.

#### UMC 783.21 Soil Resources Information

All coal will be mined simply as an underground extension of the existing and approved Pinnacle Mine operation. There will be no additional surface disturbances. Complete soil resources information is included in the approved Mining and Reclamation Plan. Refer to the following sections of this approved plan:

- Volume I, Chapter IV - F
- Addendum B - 817.21-25, p.5  
784.13, p.6
- Response to Review of Apparent Completeness Review Response  
817.21-25, p.2
- Soil Survey and Vegetation Inventory prepared by Earth Environmental  
Consultants

UMC 783.22 Land-Use Information

All coal will be mined simply as an underground extension of the existing and approved Pinnacle Mine operation. There will be no additional surface disturbances. There will be no change in land-use status from pre-mining to post-mining use. Complete land-use information for the mine plan area is included in the approved Mining and Reclamation Plan. Refer to the following sections of this approved plan:

- Volume I, Chapter IV - H
- Addendum B - 784.13, p.6  
784.15, p.8

UMC 783.24 Maps: General Requirements

All coal will be mined simply as an underground extension of the existing Pinnacle Mine. There will be no additional surface disturbance whatsoever. Most of the maps previously submitted as part of the approved Mining and Reclamation Plan are applicable as referenced below. Where necessary original maps have been revised to indicate the emergency lease and these revisions are included with this submittal.

- 1) All boundaries of lands and names of present owners of record of these lands:

Refer to Plates II and III of this submittal

- 2) Boundaries of land upon which applicant has the legal right to enter and begin underground mining activities:

Refer to Plate I of this submittal

- 3) Boundaries of all areas proposed to be affected over the life of the mine:

Refer to the following portions of the approved plan:

- Miscellaneous Submittals - Underground Mining Layouts for the Lower Sunnyside and Aberdeen Seams

Also refer to Plate VI of this submittal

- 4) The only buildings in or within 1,000 feet of the proposed permit area are those specifically associated with mining activities.

Refer to the following portions of the approved plan.

- Response to Review of Apparent Completeness Review Response  
Plates 1 and 2
- Miscellaneous Submittals

- 5) The only man-made features passing through or over the permit area are an electrical transmission line and buried telephone cable specifically for mine use.

Refer to Plate I included with this submittal.

- 6) Revegetation success will be determined by the range site method.
- 7) All hydrologic information is included in the revised Hydrologic Inventory included as Appendix B with this submittal.
- 8) Each public road located in or within 100 feet of the proposed permit area

Refer to Plate I of this submittal for the location of County Road 299.

- 9) There are no public parks or locations of any cultural or historical resource listed or eligible for listing in the National Register of Historic Places or known archaeological sites within the mine plan or permit area.
- 10) There are no public or private cemeteries or Indian burial grounds located in or within 100 feet of the permit area.
- 11) There is no land within the mine plan area or adjacent area which is within the boundaries of any units of the National System of Trails or the Wild and Scenic Rivers System.

#### UMC 783.25 Cross-Sections, Maps and Plans

All coal will be mined simply as an underground extension of the existing Pinnacle Mine. There will be no additional surface disturbance whatsoever. The only change from the approved plan will be an extension of the Pinnacle Mine underground workings. Most of the cross-sections, maps and plans of the approved plan remain applicable and are referenced below. Where necessary original maps have been revised to indicate the emergency lease and these revisions are included with this submittal.

- 1) Elevations and location of test borings and core samplings:

Refer to the following portions of the approved plan:

- Volume I, Chapter IV - A

- 2) Elevations and locations of monitoring stations used to gather data on water quality and quantity:

Refer to the revised Hydrologic Inventory included as Appendix B with this submittal.

- 3) Nature, depth and thickness of coal seams to be mined, each stratum of overburden and the stratum immediately below the lowest coal seam to be mined:

Refer to the following portions of the approved plan:

- Volume I, Chapter IV - A  
- Addendum A, Chapter II

Also refer to Plate VII of this submittal.

- 4) All coal crop lines and strike and dip of the coal to be mined within the proposed mine plan area:

Refer to the following portion of the approved plan:

- Volume I, Chapter IV - A

Also refer to Plate VII of this submittal.

- 5) Location and extent of known workings of active, inactive or abandoned underground mines, including openings to the surface within the proposed mine plan and adjacent areas:

Refer to the following portion of the approved plan:

- Miscellaneous Submittals - proposed underground workings for the Apex (Lower Sunnyside) Mine and the Aberdeen Mine

Also refer to Plate VI, included with this submittal.

- 6) Location and extent of sub-surface water within the proposed mine plan or adjacent areas:

Refer to the revised Hydrologic Inventory included as Appendix B with this submittal.

- 7) Location of surface bodies of water. (There are no drains or irrigation ditches within the proposed mine plan or adjacent area.)

Refer to the revised Hydrologic Inventory included as Appendix B with this submittal.

- 8) There are no existing or previously surface-mined areas within the mine plan area.
- 9) location of dams, embankments, other impoundments and water treatment facilities. (There are no areas of spoil, waste, coal development waste, non-coal development waste, non-coal waste disposal or air pollution control facilities within the permit area.)

Refer to the following sections of the approved plan:

- Response to Review of Apparent Completeness Review Response  
Plates 1,2,5,6,7,8,9 and 12
- Miscellaneous Submittals

Also refer to the revised Hydrologic Inventory included as Appendix B with this submittal.

- 10) There are no oil or gas wells within the mine plan or adjacent areas.
- 11) Sufficient slope measurements to adequately represent the existing land surface configuration of the area affected by surface operations and facilities.

Refer to the following portions of the approved plan:

- Addendum B, Appendix E
- Response to Review of Apparent Completeness Review Response  
Plates 1,2,3,4,5,6,10 and 11

#### UMC 783.27 Prime Farmland Investigation

All coal will be mined simply as an underground extension of the existing Pinnacle Mine operation. There will be no additional surface disturbance whatsoever. There are no lands within the mine plan area which are prime farmland. Refer to the following portions of the approved plan:

- Volume I, Chapter IV - F
- Miscellaneous Submittals - Letter of negative determination for prime farmland from the Soil Conservation Service