S 614 #369en

STATE OF MONTANA

DEPARTMENT OF STATE LANDS

STATE CAPITOL HELENA 59601 (406) 449-2074

JUN 6 1977

June 11, 1976

Dear Sir:

Western Energy Company's (WECo) Rosebud Mine is located in Rosebud County, Montana adjacent to the town of Colstrip. Initial mining at this site by WECo began in 1968.

Attached is a Preliminary Environmental Review (PER) for the proposed approval of an amendment to WECo's 1976 Surface Mining Permit (#76003). WECo's coal mining operations in Area A have previously been reviewed in Departmental environmental impact statements distributed in December 1973 and April 1975 and in another PER distributed in February 1976.

In this amendment WECo is seeking approval to: (1) strip mine - 223 acres previously permitted for "roads, rails, shop and tipple facilities" or for "associated disturbance";(2) strip mine 111 acres not previously permitted by the Department; (3) permit 323 acres for "road, rails, shop, and tipple facilities"; and (4) permit 1 previously unpermitted acre for "associated disturbance". If this permit amendment is approved, a total of 1656 acres will to date have been permitted by the Department in mining Area A: the permitted acreage for the entire Rosebud Mine would total 2318 acres.

At the present time, WECo does not control all of the mineral rights for the lands which this amended permit application relates to. A "lease modification" for the E½ of Section 32 T1N R40E is pending from the Washington office of the Bureau of Land Management (BLM). In March 1976 the BLM (Miles City Office) prepared an environmental analysis on the impacts of continuing mining in Area A with and without such a lease modification.

The attached PER indicates that the issuance of the amended permit to WECo does not constitute an action which might significantly affect the quality of the human environment and therefore a draft environmental impact will not be issued by the Department.

This document was prepared in accordance with Rules implementing the Montana Environmental Policy Act (Chapter 65, Title 69, R.C.M. 1947).

All materials submitted to the Department by WECo as part of their applications for a permit pursuant to the requirements of the Montana Strip Mining and Reclamation Act (Chapter 10, Title 50, R.C.M. 1947) are on file and available for public review in the Department's office in Helena.

Sincerely,

Jo Ann E. Vorozilchak

Jo Ann E. Vorozilchak
Assistant Environmental Coordinator
Department of State Lands

JEV:ks
Attachment

PRELIMINARY ENVIRONMENTAL REVIEW

Proposed Approval of an Amendment to

Western Energy Company's

1976 Surface Mining Permit

Rosebud Mine, (Area A)

Big Horn County, Montana

Montana Department of State Lands

Helena, Montana

June 11, 1976

Submitted pursuant to
Montana Environmental Policy Act
Section 69-6504(b)(3)

I. DESCRIPTION OF THE PROPOSED ACTION

On April 1, 1976, Western Energy Company (WECo) submitted an application to amend their Surface Mining Permit for Area A of their Rosebud Mine at Colstrip (SMP #74003-A003). WECo is seeking to further expand their coal strip mining operation in Area A to meet contract obligations.

In their amendment, (Figures 1 & 2) WECo is seeking approval to:

(1) strip mine 223 acres previously permitted for "roads, rails, shop, and tipple facilities" or for "associated disturbance"

(2) strip mine 111 acres not previously permitted by the Department

(3) to permit 323 acres previously unpermitted acres for "roads, rails, shop, and tipple facilities"

(4) to permit 1 previously unpermitted acre for "associated disturbance"

Figure 1 depicts the presently permitted acreage for Mining Area A and may be compared with Figure 2. Figure 2 depicts the proposed permit additions and changes for Mining Area A represented by the subject permit amendment.

If this permit amendment is approved, a total of 1656 acres will to date have been permitted by the Department in Mining Area A; the permitted acreage for the entire Rosebud Mine would total approximately 2318 acres.

II. LEGAL CONCERNS

The Department of State Lands (DSL) administers the Montana Strip and Underground Mine Reclamation Act (Title 50, Chapter 10, R.C.M. 1947). The Reclamation Act specifies that, "An operator may not engage in strip or underground mining (for coal or uranium) without first having obtained from the Department a permit...." (Section 50-1039). Strip mine permits are issued for one year and may be renewed annually upon application to the Department. Permit amendments may also be issued, to increase acreages but

the initial term of the permit is not extended. Also, permit amendments have the same application and review requirements as do original permits.

Rules implementing the Montana Environmental Policy Act require that a Preliminary Environmental Review be prepared on certain Departmental actions in order to determine whether they will have a significant effect on the human environment (MAC 26-2.2(18) - p. 280). If such a significant effect is determined, a draft Environmental Impact Statement will be prepared.

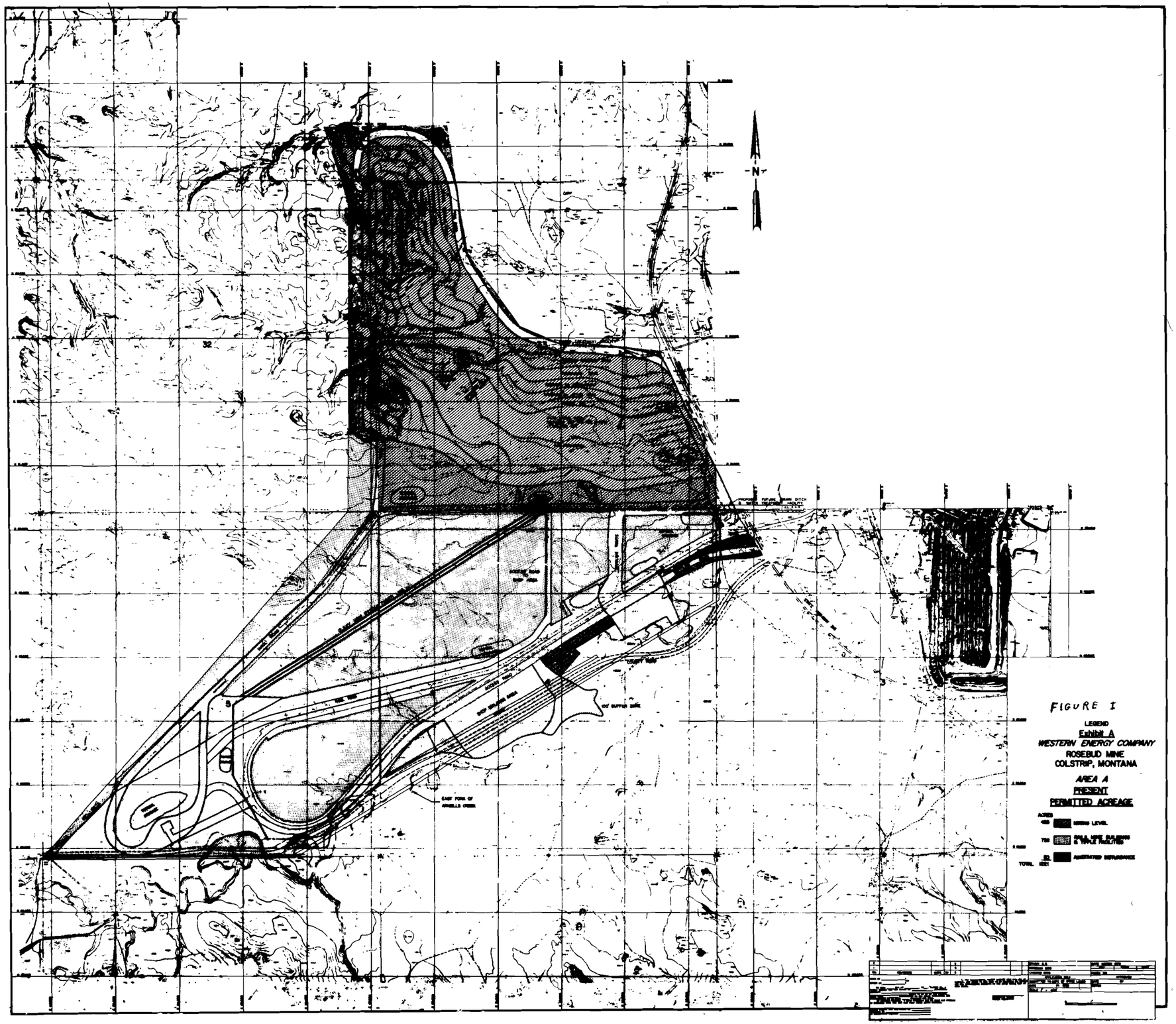
III. LOCATION

The community of Colstrip is located in Rosebud County 45 miles south of Forsyth. Access is via federally assisted secondary highway 315. Colstrip is surrounded by WECo's Rosebud Mine (Figure 3). Area A (Figure 1) presently includes parts of Sections 28, 29, 32, and 33, T2N, R41E and parts of Sections 3, 4, and 5, T1N, R41E. Presently mining is confined to Section 33. This proposed amendment (Figure 2) would extend mining into Sections 29, 32, T2N, R41E and Section 5, T1N, R41E, when the Federal leases are obtained for Section 32.[1]

IV. HISTORY

The Rosebud Mine was operated from 1924-1958 by the Northern Pacific Railroad as a source of fuel for its steam locomotives. In thirty-four years of mining at Colstrip, Northern Pacific produced forty-million tons of coal.[2] Spoils from the Burlington Northern operation were left unreclaimed until 1971 when the railroad began a voluntary reclamation program. Most of these old spoils are now at some stage of reclamation.

The Montana Power Company purchased the Rosebud Mine in 1959. In testimony before the Board of Natural Resources in January 1976, Warren P. Schmechel, President of WECo stated:[2]


N
FIGURE 1
LEGEND
Exhibit A
WESTERN ENERGY COMPANY
ROSEBUD MINE
COLSTRIP, MONTANA
AREA A
PRESENT
PERMITTED ACREAGE

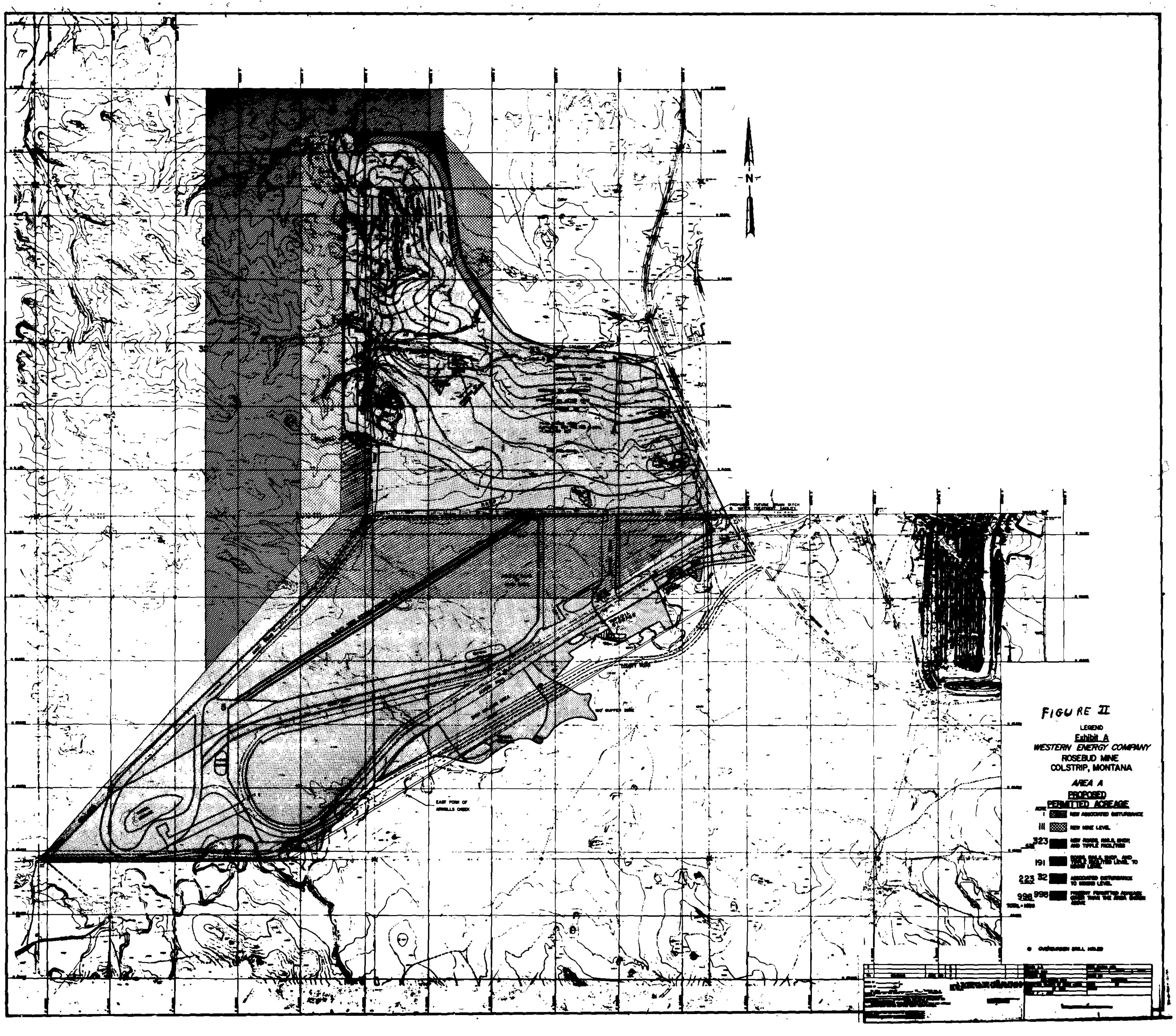

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FIGURE II
LEGEND
Exhibit A
WESTERN ENERGY COMPANY
ROSEBUD MINE
COLSTRIP, MONTANA
AREA A
PROPOSED
PERMITTED ACREAGE
1
111
323
191
223 32
998 998

"Montana Power acquired from Northern Pacific mining leases covering approximately 5 million tons of proven coal reserves, certain large mining machinery, the townsite and accompanying town properties at Colstrip. In 1966, Western Energy Company was formed as a subsidiary of Montana Power to manage the Colstrip properties and development. Additional mining leases, machinery and land have been subsequently acquired by Western Energy Company.

In 1968, Western Energy re-opened the Rosebud Mine at Colstrip. Coal was produced initially for the Montana Power Company's Corette Steam Electric Generating Plant at Billings, commencing in July, 1968. Thereafter, Western Energy Company entered into contracts for the sale of coal to other utility and industrial customers in the Midwest. Coal production since 1968 has been as follows:

1968 -	150,000 tons
1969 -	521,000 tons
1970 -	1,658,000 tons
1971 -	5,161,000 tons
1972 -	5,501,000 tons
1973 -	4,254,000 tons
1974 -	3,212,000 tons
1975 -	6,400,000 tons

Projected production for 1976 is 10,300,000 tons; 1977, 13,000,000 tons; 1978, 13,200,000 tons; 1979, 14,600,000 tons. Assuming that Colstrip (electric generation) units 3 and 4 will be constructed and will be in operation, coal production is projected to reach 19,000,000 tons by 1981."

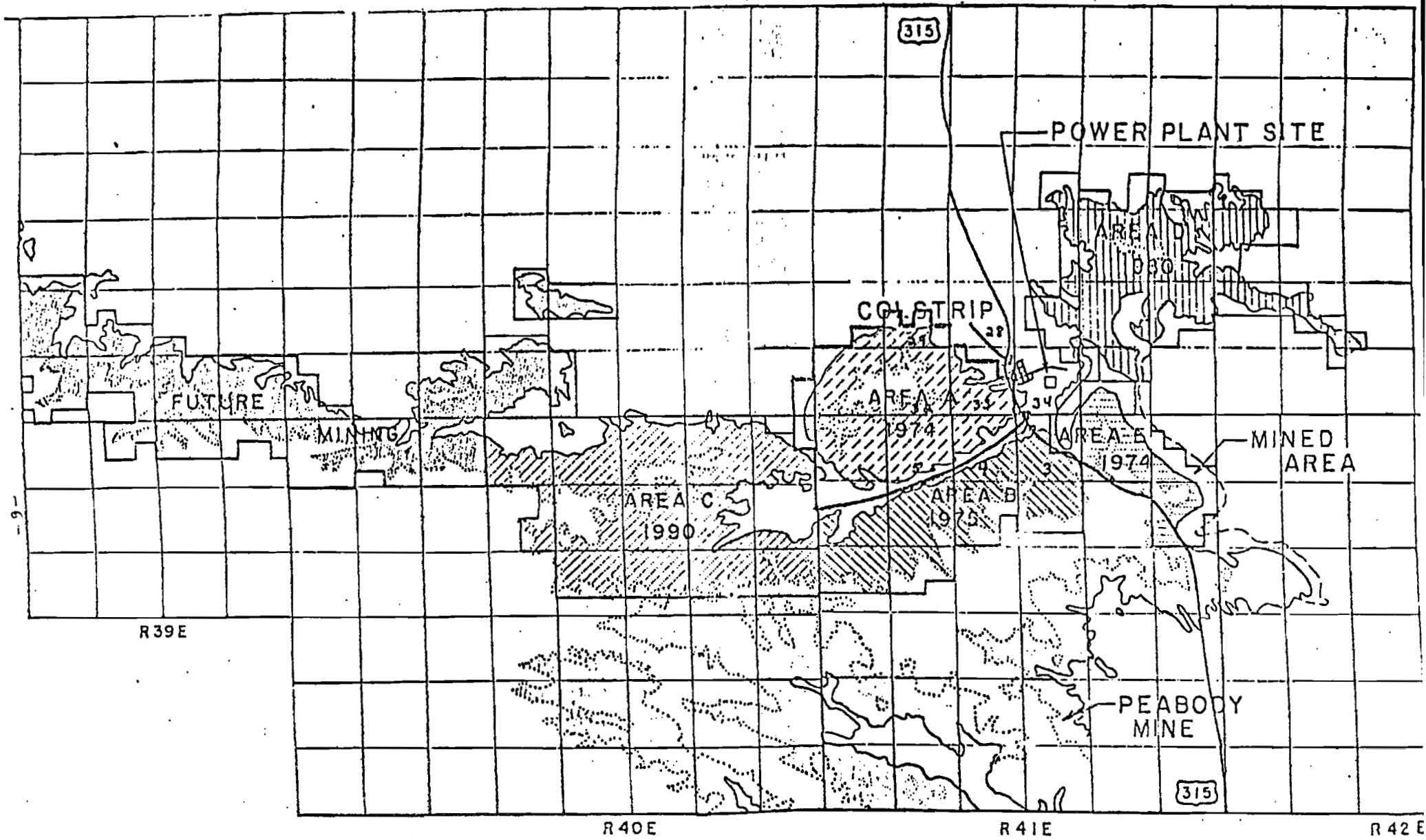

FIGURE III

Western Energy Company's Rosebud Mine
(adapted from Matson & Blumer, 1973; DNR, 1974)

~~ Limit of Rosebud

..... 150 ft. overburden limit

N

Currently WECo is mining in Areas A and E. Pit 6 has been mined and is being reclaimed. WECo has received nine permits or permit amendments since the company came under the jurisdiction of the Montana Strip and Underground Mine Reclamation Act in 1973.

The Company's most recent permit was an amendment to expand mining in Area A that was issued by DSL on February 19, 1976. For the entire Rosebud mine, WECo currently has under permit 1,199 acres for strip mining or spoiling, 107.04 for haul roads and facilities, and 577.02 acres for associates disturbance.[3]

Presently Western Energy has three permits in various stages of review at the Department of State Lands:

Area B - Final Environmental Impact Statement pending

Area E amendment - incomplete application

Area A amendment - Preliminary Environmental Review completed

WECo's Coal Mining operations in Area A were formerly reviewed in Environmental Impact Statements distributed in November, 1973 and December, 1974 and in a Preliminary Environmental Review distributed in February, 1976.[4,5,6]

In addition to these reference sources, the Bureau of Land Management recently distributed an "Environmental Analysis Record", for a Coal Lease Modification in Section 32.[7] WECo must receive this lease modification before expanding their mine into Section 32. The BLM environmental analysis record is a thorough document containing all the elements of an environmental impact statement. It discusses in greater detail much of what follows in this Preliminary Environmental Review.

V. MINING PLAN[1]

Mining will continue the pattern begun in section 33. Proposed stripping pits run north-south. Topsoil is stripped by scrapers and either stockpiled or immediately redistributed on previously mined and regraded areas. Scrapers will also be used to strip sandy subsoil material and place it on regraded spoils which are unsatisfactory for placement of topsoil if such spoils occur. Dozers may assist in deep overburden removal by pushing the material over the highwall into the previous mined area creating an extended bench for the dragline or leveling hills for drilling and blasting of overburden.

After drilling and blasting, overburden is removed in two passes by the dragline, a 60 cubic yard Marion 8050. The second pass includes spoils rehandling to provide spoils room for the next cut. Coal is drilled and blasted with ANFO (ammonium nitrate and fuel oil), then loaded with a 17 cubic yard Bucyrus-Erie 280B shovel into 120 ton Euclid haul trucks.

In the event of a shovel breakdown, front end loaders will be used for loading the haul trucks. Coal is hauled to the crushing and loadout facility for crushing and screening to a 1½ (inches) minus size and either stockpiled or loaded into railroad cars for shipment.

Reclamation is to be kept concurrent with mining (within two spoils ridges). Regrading, with dozers, will be to the approximate original contour with slopes reduced to 5:1. Haul and ramp roads through the spoils will be reclaimed separately at the conclusion of mining.

When overburden depths cause mining to become uneconomical, mining will cease. Upon the termination of mining, the remaining highwall will be reduced to a slope of 3:1 or less.

VI. IMPACTS ON PHYSICAL ENVIRONMENT

A. Topography

Near Colstrip, the topography is largely determined by the geologic

strata's resistance to erosion. Area A includes isolated buttes, mesa-like hills, dissected plateaus, and long, narrow divides. Area A is essentially an upland ridge bordered on the south and east by the broad valley of the East Fork Armells Creek, and along the north by Stocker Creek (an east flowing tributary of East Fork Armells Creek). Red, clinker-capped, dissected, upland mesas and buttes occur along the northern portion, and isolated yellow erosional sandstone remnants form bluffs in lower lying areas. This sandstone overlies the Rosebud coal bed.[4] Elevation ranges from 3360 to 3500 feet.

The post-mining contour map shows that this area will be leveled to low rolling hills.[1] The final configuration of the drainages submitted with the permit application are not satisfactory to the Department as they appear to be misplaced. These and other inadequacies will have to be corrected by WECo before a permit can be issued by the Department.

B. Soils

Western Energy is utilizing the soil survey report submitted with the original application on October 15, 1973 as part of the amendment application.

All the soils in the area affected are delineated on the soils map submitted with the amendment application except for the far northwest corner of the amendment (Section 29) area. A soils map of this area will be required by the Department prior to disturbance. In addition, the Department will also require WECo to submit analytical data of profiles of Elso-McRae loam 15-35% slopes; McRae-Elso loams, 6-15% slopes; McRae loams, 0-2%; and McRae loam 15-35% as this information was also not submitted with the amendment application. Sampling intensity also needs to be increased, especially for such large mapping units as McRae silty clay loam.

Suitable depths for the stripping of topsoil vary from 0-5+ feet and can vary several feet within a single mapping unit (i.e. McRae-Elso loams).[8]

This is at least partly a function of the variation in topography and parent material. The majority of the soil phases affected by the amendment appear suitable for some discrete topsoil removal and stockpiling. There does not appear to be any particularly hazardous salt or exchangeable sodium content problem. However, it should be noted that conductivity measurements were based on 1:2 soil to water ratios which reduces the conductivity values relative to Department of State Lands guidelines which are based on a saturated soil paste. Thus the 305 foot level of Thurlow clay loam and Heldt silty clay loam might actually approach a low salinity hazard (i.e., 4 mmhos/cm at 25^{o} C). Stripping depths are further subject to the constraints of drill hole analysis discussed later.

Certain soils such as Remitt fine sandy loam and Tullock complex are relatively coarse textured and would benefit from mixing with soils such as Thurlow clay loam and McRae silty clay loam to increase water and nutrient storage capacities.[8] The last two soil types would benefit by a reduction in relative clay content. This mixing would be facilitated by the fact that these soils exist adjacent to one another in sections 4, 32, and 33.

Maintaining the "A" soil horizon in an intact condition during the salvaging of topsoil (as discussed in the Departments Draft EIS for Area B) is strongly recommended.[9] This horizon is important to grassland plant communities as it is the layer containing the maximum accumulation of organic matter and associated decomposing activities of soil microorganisms.[9] This condition results in enhanced soil nutrient and water storage capacities, in establishing and maintaining recycling mechanisms for important nutrients, and in the formation of water-stable soil crumbs.

If the topsoil is homogenized during salvage, the organic accumulation of the A horizon will be diluted to very low levels. A possible way to mitigate such an impact would be the addition of an organic mulch such as

peat moss or manure to the "reclaimed" topsoil. Rapid plant colonization would also, of course, effect increases in soil organic content.

C. Overburden and innerburden (Geology)

The youngest sedimentary unit in the Colstrip area is the Tongue River Member of the Fort Union Formation, of Paleocene age. This unit, which comprises interbedded sandstone, siltstone, and shale has a maximum thickness in Colstrip area of about 450 feet.

Two significant coal seams occur within 200 feet of the surface in the Colstrip area. The upper of these, the Rosebud seam, has a thickness of about 17-25 feet and is currently being mined at the Western Energy mine as well as at Peabody's Big Sky mine immediately to the south.

The eight feet thick McKay coal seam underlies the Rosebud. Parting (innerburden) of 8-25 feet (average 20 feet) separates the seams. McKay coal is not currently mined by Western Energy because its high sulfur and poor burning characteristics make it unmarketable.

The locations and depths of overburden and innerburden materials with critical levels of chemical and physical constituents are given in Appendix B of the application for permit amendment of Area A. The analyses of several of the drill holes are characterized by potentially very toxic levels of zinc in the innerburden. Thus, the Department will require that all innerburden around drill holes with extractable zinc greater than 30-40 ppm will be buried at least eight feet from the surface and bottom of the pit. Various levels of overburden also contain potential problem concentrations of zinc, nickel, clay, and soluble salts and critical SAR values. The materials containing these constituents appear unsuitable as spoils directly underlying topsoil and will require burial or thorough mixing with other layers.

The surface layers listed for N52000, E47000; N53000, E48000; and N49000, E46000; and the 3-8 foot layer of N49000,E50000 are above the critical

value for soluble salt content (ie. greater than 4 mmhos/cm at 25° C). Also the surface layer of N49000, E46000 is at the critical level for SAR (i.e., greater than 10). More extensive surface sampling should be done in the area adjacent to all of these holes to determine more precisely the vertical and horizontal boundaries of these salt accumulations and thus whether and to what extent soluble salts occur in strippable topsoil as determined by the soil survey. That these potential hazards were not found in the original soil survey illustrates the importance of increasing soil sampling intensity and providing analytical data of the profiles of all soil phases.

A potential problem that exists is the utilization of deep-lying strata (such as the 130-150 foot layer of N52000, E47000) as surface or near surface materials after mining. This material will begin weathering once on the surface with possible consequent release of micronutrients.[9] Micronutrient analysis of drill hole material thus provides no information on the potential dynamic nature of micronutrients of formerly deep-lying materials that become subject to weathering.

Spoils handling decisions based on drill hole analysis only become possible by extending the analysis to some area surrounding the drill hole. The logical approach is to increase the sampling intensity both horizontally and vertically so that potential problem materials could be mapped, correlations between these materials and lithology could be achieved, and thus spoils handling could be done more effectively. The only alternative is to designate the area of influence of each drill hole analysis as some fixed distance in any direction to the next drill hole, a procedure that is completely arbitrary.

D. Climate

Climatic data for Colstrip is available from the U.S. Department of Commerce and is summarized in the following discussion:[10]

Colstrip has an annual precipitation of 15.79 inches, three-fourths of which falls during the period of April to September. Winter precipitation, mostly falling as snow is light with just over a half inch per month falling during the period of November through February. Summer precipitation almost always occurs as showers. Late spring sometimes will produce rains of several hours in duration, and late September and October in some years can have rainstorms of the same general character. Thunderstorms are common during the summer months - probably occurring about 20-30 days a year.

Summers at Colstrip are characterized by warm days, but most nights even during mid-summer, cool down to 60 degrees or less, so really opressive hot spells are not common. Temperatures of 90 degrees or more occur about 40 days each year and can occur in any month from May through October; although most of the 90 degree temperatures occur in July and August.

Winters at Colstrip are cold, but not extremely so. While minimum temperatures rarely fail to cool to 32 degrees or colder during the winter, most days will find afternoons warming to at least the middle thirties. An occasional cold spell will generate sub-zero temperatures, but these spells seldom last more than two or three days. Wind is seldom a factor during cold spells, the coldest portion of a cold wave usually finds the sky clear with a light north to east wind.

Spring and fall are transition seasons between the cold of winter and the warmth of summer, and are the two seasons when day to day changes can be large -- particularly late fall and early spring. The annual average precipitation at Colstrip is adequate for growing many types of grains and grasses. Almost six inches falls during the early part of the growing season when the moisture supply is most important to the vegetation.

Dust from coal mining operations at Colstrip may become condensation nuclei if the particles are hygroscopic and there is water vapor available for condensation; thereby increasing the precipitation on the windward side of the dust source.

Blackening of the ground's surface with coal dust causes the ground to heat faster and retain the heat longer (albedo effect). This would cause changes in diurnal air temperature variation as the blackened areas would be hotter than surrounding areas and convective thermal updrafts could hence occur. Such updrafts could affect local wind patterns and upper level stability. Regional and long-term effects of the addition of coal dust to the earth's surface are not known at this time however.

E. Air Quality

Colstrip air quality should not change substantially from its present state as a result of this expansion of the Area A mine.

Air quality of the Colstrip area has been discussed many times - most recently in the Department's Draft EIS for the Expansion of Western Energy Company's Rosebud Mine into Mining Area B and the P.E.R. for Montana Power Company's unconsolidated soil mine in section 29.[9,11]

Until vegetation is reestablished on the spoils areas, large areas of solid materials will be exposed to wind (and water) erosion. Revegetation on such sites will be undertaken as soon as practicable. Current mitigation practices of watering haul roads and planting vegetative cover on the topsoil stockpiles will continue.

A decrease in equipment usage in Area A will occur if the Area B permit is granted by the Department as there is presently a double compliment of equipment in Area A.

Cumulative impacts on the air quality in the Colstrip vicinity resulting from the simultaneous operation of several strip mine sites, two or more electric generation plants, block farming, and natural air degrading factors is yet to be determined.

F. Water Quality and Quantity

(1) Ground water hydrology

The geohydrologic environment in the vicinity of the Area A mine has two primary features: (1) the bedrock aquifers and (2) the alluvial aquifer of East Fork Armell's Creek. Beds of coal and sand in the Tongue River Member of the Fort Union Formation serve as the shallowest, and most accessible, bedrock aquifers. Deeper aquifers principally the Tullock Member of the Fort Union are also locally used, but are unaffected by present mine activity. Van Voast and Hedges, 1974 describe ground water use of bedrock aquifers in the area:[12]

> In township tiers 3N (part) and 2N, most wells and springs obtain water from aquifers stratigraphically below the McKay coal bed. Most of these sources are sandstone aquifers near the base of the Tongue River Member and the top of the Tullock Member of the Fort Union Formation. In township tiers 1N and 1S, aquifers stratigraphically below, between, and above the strippable coal beds are all heavily relied upon as sources of ground water. Yields of most wells are less than about 10 gallons per minute but are adequate for most stock and domestic needs. Yields as great as about 50 gallons per minute have been obtained for the town of Colstrip from sandstone in the Tullock Member. All springs inventoried near Colstrip supply water for stock. Almost all of them flow less than five gallons of water per minute.

Mining activity already permitted at Area A has encountered very little ground water flow. Van Voast and Hedges (1974), reported that the Rosebud seam is dry in most of the presently permitted area. The additional area requested for mining in the amendment is either dry or substantially drained by the existing operation. As an indication of the scarcity of intercepted groundwater, there has been insufficient water at the Area A mine for the spraying of haul roads. Water must be hauled from lakes that exist in previously mined areas east of East Fork Armells Creek. Since the Rosebud seam is dry or substantially drained in the area requested for mining, impacts on the bedrock aquifer system will be minimal.

The alluvial aquifer of East Fork Armells Creek is the most important near

surface source of groundwater in the area. Current work by Van Voast and Hedges (personal communications) shows that this aquifer is recharged by both intermittent stream flow in the channel and from bedrock aquifers which subcrop the valley alluvium. In the valley reaches upstream of Colstrip in the vicinity of the Area A mine, the principal bedrock aquifer recharging the alluvian system is the McKay coal seam. Since mining activity does not disrupt the McKay seam, impacts on the alluvial aquifer from extended mining activities are unlikely.

(2) Surface Water Hydrology

No extensions of mining or related activities have been proposed onto the valley floor of East Fork Armells Creek. Thus, the impacts of further Area A mining to East Fork Armells Creek will principally be in the reclamation phase of mining when drainage is reestablished and soil loss from reclaimed slopes may yield substantial silt loads to East Fork Armells Creek and its ephemeral tributaries. Settling ponds will be required at the lowest points on reclaimed drainages, above the point where they discharge onto natural ground.

If no mining is proposed for the drainage in Section 29, it should be preserved in its natural state, and spoiling should be prohibited within the 100 year flood plain of the drainage.

All channels in the reclaimed area should be established in a meandering pattern. Channel area should approximate natural conditions, with flood flows allowed to spill onto a flood plain.

WECo has received no discharge permits from the Water Quality Bureau for any discharges from its Colstrip mines. To date, WECo is revising its applications for discharge permits which, when completed, will be reviewed and acted upon by the Water Quality Bureau.

VII. IMPACTS ON THE BIOLOGICAL ENVIRONMENT

A. Terrestrial & Aquatic Life

Mule deer are abundant in the Colstrip area and are often observed in the vicinity of various mining activities there. Mule deer productivity on the Colstrip 10 x 20 mile wildlife survey increased considerably from 1973 and 1974 and slightly increased from 1974 to 1975.[13] Fawn:adult ratios for January 1975 were 60:100, and for March 1975 were 40:100. The fawn:doe ratios for September, October, and November 1975 were 68:100. Some mule deer habitat will be disturbed by the mining activity. Fresh deer tracks and pellets are occasionally observed on Section 32. This section is among the areas with lower incidences of wildlife observations on the Colstrip 10 x 20 mile, Colstrip wildlife survey area systematically studied since 1972.

Section 32 has not been observed to be of high or unusually frequent use by any particular species of wildlife. It is, however, part of the overall habitat used by numerous species including coyotes, sharp-tailed grouse, rabbits, mice, song birds and raptors.[13]

Raptors commonly observed in the Colstrip vicinity include golden eagles, marsh hawks, rough-legged hawks, red-tailed hawks, and American kestrels. Great horned owls are commonly observed. No known raptor nests exist on Section 32.[13]

Rattlesnakes have occasionally been observed in the Colstrip area and it is possible that they occur on Section 32.[13]

No aquatic species will be directly impacted by mining Section 32.[13]

B. Vegetation

Common grasses found on Section 32 are bluebunch wheatgrass (Agropyron spicatum), threadleaf sedge (Carex filifolia), needle-and-thread (Stipa comata), junegrass (Koeleria spp.), Japanese chess (Bromus japonicus), sideoats grama

(Bouteloua curtipendual), plains muhly (Muhlenbergia cuspidata), green needle grass (Stipa virdula), cheatgrass (Bromus tectorum), western wheatgrass (Agropyron smithii), prairie sand reedgrass (Calamovilfa longifolia), and Indian ricegrass (Oryzopsis hymenoides).

Overstory vegetation where it occurs, consists of ponderosa pine (Pinus ponderosa), some box elder (Acer negundo), Rocky Mountain juniper (Juniperus scopulorum), and a few other species.

The amendment area contains several vegetative habitat types.[14] Elevations in the area range from 3,350 to 3,503 feet. The major plant community types mapped and quantitatively sampled on Section 32 include: Pinus ponderosa/Agropyron spicatum, Artemisia cana/Agropyron smithii/Stipa viridula/Poa spp., Artemisia cana/Agropyron smithii/Stipa viridula/Bromus spp., Rhus tribobata/Stipa comata/Agropyron smithii, Chrysothamnus nauseosus/ Agropyron spicatum/Oryzopsis hymenoides, Acer negundo/Fraxinus pennsylvanica/ Poa spp. Some land in the amendment area was previously used for agriculture. A vegetation map was submitted with the application.[1]

Vegetation in areas proposed for coal mining and associated disturbance will be destroyed. As mitigation all available topsoil in the amendment area will be stripped prior to mining and stockpiled. As mining progresses, the reclamation process prescribed by Montana law and regulations will return the land to its approximate original contours, followed by retopsoiling and reseeding. The seeding mixture proposed by WECo includes Agropyron spp., green needlegrass, prairie sandreed, blue grama, sideoats grama, and other species which are primarily native.

Ultimate surface utility of the land depends on successful reclamation.

VIII. IMPACTS ON THE HUMAN ENVIRONMENT

Socio-economic impacts of coal mining in the Colstrip area have been extensively discussed in the Department's recently distributed draft EIS for

Area B and the reader is referred to that report for a more thorough discussion.

A. Employment

WECo has indicated that approval of this proposed permit amendment will not add to the current Rosebud Mine work force. Granting the permit will prevent the lay-off of employees in Mining Area A until such time as the next mine expansion is required.

B. Social and Cultural

Area A mine employees are mostly residents of the Colstrip-Forsyth vicinity so there will be no new social-cultural impacts on these areas as a result of the mine expansion. Miners whose jobs are long-term tend to adopt local attitude towards the land and people after several years residence.[9] Housing has previously been in short supply, however, since the recent layoffs of construction workers for Colstrip units 1 and 2 began, housing has become available in Colstrip.[19]

C. Transportation

Highway 315 is in poor condition and inadequate for the traffic it carries. Granting this permit should not increase the traffic on this road.

D. Taxes

Area A of WECo's Rosebud Mine provides considerable income to the State of Montana and to Rosebud County in the form of tax revenues. Table 1, below, gives estimates of the taxes accrued in 1975 from the Area A coal production. These sums are payable in current and future periods.

Table 2 - Estimated 1975 Accrued Taxes - Area A, Rosebud Mine[a]

Resource Indemnity[b]	Property[c]	Severance[d]	Gross Proceeds[e]
$41,420	$115,170	$3,008,000	$496,500

a. Estimates provided by WECo
b. To the State
c. Mostly to the county, as a rule of thumb, 98% of all property taxes go to local government.
d. The new coal severance tax, effective July 1, 1975, provides revenue for the state general fund and to eight other funds.
e. Basically a property tax to the county.

Granting of this permit amendment by the Department will help maintain the flow of Rosebud Mine tax revenues to Rosebud County and to the State of Montana.

E. Aesthetics

Mining operations are very visible. Draglines are obvious against the skyline. It is not possible to screen the operation from view. The aesthetic impact depends on the individual viewer's opinion of strip mines in general and Colstrip in particular. The eventual regrading, recontouring and revegetation will partially restore the present visual effect of low rolling hills.

F. Historical and Archaeological

Four archaeological sites are either in or immediately adjacent to the proposed Area A expansion.[15,16] The Ellison Petroglyph Site in the extreme northeast corner of Section 31, T2N, R41E is the most valuable.[15,17,18] Serious deterioration of this site from the period of 1971 to 1973 has been documented.[7,16] Blasting at the various Rosebud mine sites has probably accelerated such deterioration.[7] Ms. Betty Lou Connor, an amateur archaeologist, reports she has made latex casts of two of the four panels at the Ellison Petroglyph Site - one of a panel that is almost totally obliterated and one other.[18] Dr. Leslie B. Davis, Museum of the Rockies, strongly recommends that these petroglyphs be recorded now by latex casts before further deterioration occurs. Latex casts are recommended because they form exact negatives of the petroglyphs permanently recording their depth and tool marks, and are available to make plaster positive casts for study.[17] Latex casts are

relatively inexpensive - probably less than $1000 to cast the two panels and the fallen sandstone boulder which is said to contain figures (if it can be turned over to expose the figures).[18]

Dr. Davis said the Museum of the Rockies would accept the latex casts either as donation or for protective custody. This would make the casts available for study and would insure an exact record of the carvings which are often subject to vandalism.[17]

Section 50-1042 of the Montana Strip and Underground Mine Reclamation Act requires that particular attention be paid to preserving Plains Indian history and culture. Since several authorities agree that this is an important site, and methods of exactly duplicating these carvings at a reasonable cost is available, these latex cast records should be made. It is desirable that the latex casts be made this summer before further deterioration takes place. In situ preservation should also be undertaken.

The Ellison Rock Site (a habitation site), the Farley Ridge Site (a hunting approach path) and the Western Energy Shelter (a rock shelter of historic times) have been excavated and recorded.[7,15] Imminent destruction of the Western Energy Shelter is not considered significant since it has been recorded and excavated and is of late historic times - probably white men's work - and of unknown purpose.[17]

G. Unique, Endangered or Fragile Resources

The Department is most concerned with the condition of the Ellison Petroglyphs and is pursuing discussions with WECo about their salvage prior to further mine expansions in the area.

The Department has determined that the amendment area does not possess special, exceptional, critical, or unique characteristics as defined in Section 9(2) of the Montana Strip and Underground Mine Reclamation Act. The Ellison Petroglyphs are a half mile to the west of the amendment area.

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