

SECTION 30

POST RECLAMATION LAND USE

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SECTION 30

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SECTION 30

POST RECLAMATION LAND USE

LIST OF REVISIONS DURING PERMIT TERM

REV. NUMBER	REVISION DESCRIPTION	DATE APPROVED
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30 POST-RECLAMATION LAND USE

The postmining land use for the Navajo Mine coal leasehold has been designated as rangeland for the grazing of domestic livestock and wildlife habitat. This designated land use was developed in agreement with the Navajo Nation and BIA ([Appendix 30.A](#)) and is the same as the premining land use. Objective No. 2 of Navajo Mine's Land Reclamation Program states:

“Adequate forage at least equal in extent of cover to the natural vegetation of the area”

Navajo Mine has grazed livestock (cattle) for brief periods on the mine as early as 1991. Since 1995 cattle have grazed areas on a year round basis. The Grazing Management Program (GMP) has been based upon a Holistic Resource Management (HRM) Model. Using this HRM model all persons with a interest in the land were invited to collaboratively develop the GMP goals and plans

The initial start of grazing on Navajo Mine (1991) involved using large herds of livestock to impact small plots in pre-law areas. The following phase of the program involved large-scale planned grazing of livestock on several hundred acres of reclaimed land in Watson and Bitsui. Knowledge gained from these phases was used to develop a biological plan which eventually lead to grazing nearly all pre-law and many interim areas from Mason to the north end of the Mine.

The GMP program is successful in demonstrating that reclaim areas can support the postmine land use (livestock grazing) at Navajo Mine. Grazing has occurred during severe drought and favorable precipitation periods. Through all these environmental conditions the health of the reclaim areas were at best maintained and in many instances improved.

One goal of the GMP program is to assist in training local livestock operators in all grazing management decisions. To this point in the program all day to day maintenance and decision making has been accomplished by GMP technicians employed by NTEC. The next phase of the program is to allow local livestock owners to perform the day to day livestock maintenance and herd movement. This will enable greater participation with the Grazing Management Program in creating the land use plans that will guide management of the reclaimed lands following final bond release. In this way, continuity in management will be assured during the transition of reclaimed lands from NTEC to their postmining managers. NTEC will continue to provide expertise in developing grazing plans. It is noted that responsibly for grazing reclaim land rest solely with NTEC until final bond release. Therefore, it is made clear to all participants in the program, that a condition for their participation is their stated recognition that the authority for the program rests with NTEC.

NTEC will replace several preexisting livestock watering ponds that have been or are scheduled to be disturbed in the mining process. For details regarding these livestock watering ponds refer to Section 16 – Fish and Wildlife and Exhibit 16-3. NTEC will interact with the BIA and Navajo Nation to determine if fences and or roads used in the mining process may remain after reclamation. Roads and fences which the BIA and Navajo Nation agree to maintain in order to support livestock grazing postmining will remain following land release.

The Wildlife Mitigation Plan contains a discussion on how wildlife habitat will be achieved along with supporting activities.

30.1 Grazing Rights

Grazing rights on the Navajo Reservation are administered by the BIA and Navajo Nation Grazing Committees. Individuals or families of Navajo descent are issued grazing permits that allow them to graze a fixed number of livestock in a specific area, often called a "customary use area". This system of grazing permits is in effect for the Navajo Mine leasehold and customary use areas are shown on Exhibit 6-2. With the development of the North Area and Area 2 mining leasehold land within a grazing Permit Area was withdrawn from that Permit Area and the holder of the permit was compensated for the loss of grazing rights. This land will be returned to the Navajo Nation following reclamation and compliance with all applicable laws and regulations. The extent of the compensation areas is shown on Exhibit 6-2. This practice was changed with development of the extreme southern portion of Area 2 and Area 3. In these areas, the grazing permit holder has retained grazing rights and they will be returned directly to the permit holder following reclamation and final bond release.

The predominant use on those areas not disturbed of the Navajo Mine leasehold was and is currently for the grazing of livestock. In discussions with representatives of the Navajo Nation, the trend is toward the use of cattle. Sheep will still be the primary class of livestock grazed on the reclaimed areas. However, the end use is optional to the user.

30.2 Livestock Nutrient Requirements

Revegetation success standards presented in Section 37 – Post-Reclamation Vegetation for vegetation cover, production, species diversity and woody plant density ensure that a productive and nutritious balance of forage will be available to domestic livestock, as well as meeting wildlife species needs for food and cover habitat. The plant species used in the revegetation program were selected on the basis of:

1. Adaptability to local environmental conditions,
2. Palatability and nutritional value to livestock and wildlife, and
3. Ability to provide cover for wildlife.

To meet basic physiological functions, range livestock and wildlife species require a proper balance of forage nutrition. Positive benefits in terms of animal gains and conditioning are realized when the quality of forage is above that which is necessary to meet minimum nutritional needs. Providing forage above nutritional minimums not only improves economic returns, but also better allows animals to maintain themselves during seasonal periods when forage quality and quantity is low. Protein, energy, phosphorus and carotene (Vitamin A) are the four nutrients most critical to range livestock production. In "Nutritive Value of Seasonal Ranges" (Cook and Harris, 1977), the authors demonstrated that digestible protein was the best indicator of forage quality and was one of the better nutrients associated with animal gains. Forage nutrient quality is directly related to the growth stage of the plant species, the plant's palatability, and seasonal variations in both of these factors. Proper range and livestock management is therefore related to sustaining the quantity and quality of range forage during different seasons and over the succeeding future years.

[Table 30-1](#) shows the nutrient requirements for digestible protein, energy, phosphorus and carotene for both sheep and cattle.

[Table 30-2](#) lists the nutrient content of the major range forage species contained in the reclamation seed mix. The mixture of warm and cool season grasses, and palatable shrubs ensures forage of sufficient nutrient quality will be available during both the growing and dormant seasons. A comparison of Tables 30-1 and 30-2 shows that the forage resources of reclaimed areas will provide forage of suitable quality during all four seasons. While only minimum maintenance needs may be met during the winter months, forage resources of higher quality during the growing seasons will provide animal gains and conditioning benefits to livestock that may be drawn upon during lean periods.

A suitable grazing management plan must be applied to reclaimed areas to ensure the long-term availability and sustained productive capability of the forage resource on these areas. The Navajo Nation has indicated that livestock will be grazed year-round on the areas in and around the Navajo Mine leasehold. In order to maximize use of the range forage resource and to protect against its degradation, the grazing management plan outlined in this Section has been developed for use on reclaimed areas at the Navajo Mine.

30.3 Alternative Post-Reclamation Land Uses

The applicant has received strong indication from the BIA and Navajo Nation that the postmine land use will be grazing of domestic livestock and establishment of wildlife habitat. However, to satisfy conditions of CFR 30: 780.23 (b) the following is a brief discussion of the potential alternative uses for reclaim lands at Navajo Mine.

Correspondence with the BIA indicate that attempts have been made to produce crops using dryland agriculture prior to mining on or near Navajo Mine lease which resulted in limited success. Physical and chemical characteristics of the soil combine with variable precipitation are factors that would preclude reclaim areas from being prime farmland.

The following are potential land uses, which may be possible for reclaim areas at Navajo Mine.

- Industrial: Landfill – A pit could remain open after mining which could be filled with waste material.
- Commercial Vehicle Training Facility – Haulroads could be used to train individuals to operate large commercial vehicles.
- Recreational: Hiking/Bird watching – Morgan Lake attracts a variety of bird species; reclaim areas next to the lake could provide hiking and bird watching opportunities.
- Residential: A small subdivision (NAPI Region II housing) is located close to current mine lease. With appropriate engineering practices reclaimed land may be used for residential purposes.

30.4 Post-Reclamation Land Use Information Collection and Analysis

30.1.1 Reclamation Objectives

Navajo Mine is committed to a reclamation goal that will restore the land affected by mining to a condition comparable to the pre-mining conditions and uses. Major objectives in achieving this goal include:

Objective 1: Restoring the affected land to a condition capable of supporting the land uses it was capable of supporting prior to mining.

The primary pre-mining land use is livestock grazing. Navajo Mine will restore the affected land to a grazing capability equal to or greater than the pre-mining capability.

Secondarily, the land serves as wildlife habitat. Specific surveys to monitor wildlife use of reclaimed areas are conducted annually during the summer and winter. The procedure involves vehicle or on-foot surveys during which the observed species and their numbers are recorded. Results of these monitoring activities will be submitted to the regulatory agencies. These studies will be periodically evaluated as to their utility in monitoring wildlife use of reclaimed areas.

Objective 2: Conserving and utilizing the suitable plant growth media, including topdressing, alluvial sandy materials, and lighter textured overburden on affected lands to the extent necessary to meet Objective 1.

Suitable topdressing materials will be salvaged to a maximum depth of five feet from sites prior to mining. Suitable regolith will be salvaged as required to maintain a material balance. These materials will be redistributed on graded land or placed in stockpiles as required.

Objective 3: Establishing on all affected areas a diverse, effective, and long lasting vegetative cover of the same seasonal variety as the native vegetation.

The vegetation will be self-perpetuating with cover and production values equivalent to those established in the baseline surveys. Revegetation will be oriented toward the postmining land uses of livestock grazing on rangeland and enhancement of wildlife habitat.

Objective 4: Reclaim affected areas in an environmentally sound manner and as contemporaneously as possible with the mining operation.

Results from baseline studies and research programs are integrated into the reclamation plan to ensure that adequate environmental protection and conservation measures are conducted in the reclamation practices. Such measures include: use of native species where suitable for revegetation, use of species palatable for livestock and wildlife, and use of fencing to minimize unauthorized grazing on revegetated areas.

Objective 5: Minimize disturbance to the hydrologic balance and restore prominent drainage features of the Permit Area to approximate the pre-mining conditions.

Results from investigations of the hydrologic functions of the affected area have been incorporated into the operation and reclamation plan to ensure the hydrologic integrity of the site. Final hydrologic conditions will approximate those prior to mining.

All reclamation activities will be in compliance with plans submitted in the application.

30.1.2 Annual Reclamation Timetable

Topdressing and regrade operations are year-round activities, as shown in [Table 30-3](#). Topdressing verification and removal (Section 20 – Mining Operations) take place immediately ahead of drilling and blasting operations. Primary grading is conducted to meet reclamation timetables. Secondary grading is performed as necessary to form the final contours. Topdressing replacement (Section 36 – Post-Reclamation Soil) follows grading after the spoil analyses have been reviewed and the root zone has been determined to be suitable.

Rough discing follows topsoil placement, when necessary, to help prevent erosion, promote water infiltration, and minimize compaction created by topdressing equipment.

Revegetation may occur any time between March and October. Irrigation on newly seeded plots begins in April and continues through October. Fencing of reclaimed areas, following seeding, is conducted year-round, as necessary, to keep livestock out.

Vegetation is sampled during the last two years of the liability period and as often as needed in the interim to determine trends of successful revegetation. The sampling is done from June through October.

References

Cook, C.W. and L.E. Harris. 1977. Nutritive Value of Seasonal Ranges, Bulletin 472. Utah Agricultural Experiment Station, March. Soil Conservation Service. National Range Handbook, U.S. Department of Agriculture, July 1976.

Table 30 -1 Recommended Nutrient Requirements for Cattle and Sheep under Range Conditions During Gestation and Lactation on a Dry Matter Basis¹

Phase of production	Percentage of Ration or Amount/Pound of Feed			
	DP ² %	ME ³ (kcal/lb)	P (%)	Carotene (mg/lb)
Gestation	4.4	665	0.17	0.6
Lactation				
First 8 weeks	5.4	900	0.22	1.6
Last 12 weeks	4.5	700	0.20	1.6

¹Nutrient requirements are slightly higher for sheep because smaller animals have a somewhat higher metabolic requirement per unit of body weight.

²DP represents digestible protein.

³ME represents metabolizable energy.

Source: Cook and Harris, 1977.

Table 30-2 Nutrient Content at Various Stages of Growth for Forage Species in Revegetation Seed Mix

Species	Stage of Growth	DP1 (%)	ME2 (kcal/lb)	P (%)	Carotene (mg/lb)
Alkali sacaton	Vegetative	5.3	950	.24	45.00
(Sporobolus	flower	7.2	890	.22	-
airoides)	mature	3.4	880	.14	25.00
	standing cured	1.4	750	.08	0.67
Fourwing Saltbush	Vegetative	9.4	1180	.21	65.00
<u>(Atriplex</u>					
<u>canescens)</u>	mature	6.5	1060	.19	25.00
	standing cured	5.8	847	.10	18.01
Galleta (<u>Hilaria</u>	Vegetative	5.6	845	.20	-
<u>jamesii)</u>	boot	5.4	845	.06	-
	mature	4.4	621	.12	25.00
	standing cured	1.9	429	.08	0.92
Giant dropseed ³	Vegetative	5.4	1090	.24	46.00
<u>(Sporobolus</u>					
<u>giganteus)</u>	boot	4.2	973	.22	-
	mature	3.9	933	.10	0.52
	standing cured	1.6	913	.05	0.61
Indian ricegrass	Vegetative	9.0	1276	.26	35.00
<u>(Oryzopsis</u>					
<u>hymenoides)</u>	flower	5.6	992	.25	0.40
	mature	4.2	851	.15	-
	standing cured	1.4	760	.09	0.09
Sand dropseed	Vegetative	5.4	1090	.24	46.00
<u>(Sporobolus</u>					
<u>cryptandrus)</u>	boot	4.2	973	.22	-
	mature	3.9	933	.10	0.52

Table 30-2 (Continued)

Species	Stage of Growth	DP1 (%)	ME2 (kcal/lb)	P (%)	Carotene (mg/lb)
	standing cured	1.6	913	.05	0.61
Shadscale (<u>Atriplex confertifolia</u>)	Vegetative	9.1	918	.17	25.00
	mature	8.1	920	.14	22.00
	standing cured	4.4	916	.06	-
Western Wheatgrass (<u>Agropyron smithii</u>)	4th leaf	5.0	1068	.20	-
	boot	11.9	1080	.26	60.00
	mature	3.9	1000	.16	-
	standing cured	4.4	995	.10	0.10
Winterfat (<u>Ceratoides lanata</u>)	Vegetative	9.0	960	.27	35.00
	boot	8.2	842	.18	25.00
	mature	6.1	749	.19	20.00
	standing cured	6.0	488	.14	5.00
Scarlet globemallow (<u>Sphaeralcea coccinea</u>)	Vegetative	12.2	1344	.18	-
	full leaf	9.4	1270	.18	-
	mature	8.1	1264	.15	-
	standing cured	6.6	928	.15	-

¹ DP represents digestible protein

² ME represents metabolizable energy

³ Sand dropseed values were also used for Giant dropseed, because of the species similarity and the unavailability of specific values for Giant dropseed.

Source: Cook and Harris, 1977

Table 30-3 Annual Reclamation Timetable

Activity	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Topdressing Sampling	X	X	X	X	X	X	X	X	X	X	X	X
Topdressing Removal	X	X	X	X	X	X	X	X	X	X	X	X
Primary Grading	X	X	X	X	X	X	X	X	X	X	X	X
Secondary Grading	X	X	X	X	X	X	X	X	X	X	X	X
Topdressing Placement	X	X	X	X	X	X	X	X	X	X	X	X
Seedbed Preparation	X	X	X	X	X	X	X	X	X	X	X	X
Seeding			X	X	X	X	X	X	X	X		
Mulching And Crimping			X	X	X	X	X	X	X	X		
Irrigation			X	X	X	X	X	X	X	X		
Fencing	X	X	X	X	X	X	X	X	X	X	X	X

Appendix 30.A

Land Use Correspondence

INTER-OFFICE CORRESPONDENCE

TO: A. F. GEIGER

DATE: April 5, 1971

FROM: A. KING

COPIES TO:

 B. Grant Files

SUBJECT: NAVAJO AMENDMENT # 4

REFERENCE: Contract No. # 14-20-603-2505
Mining Lease - Tribal Indian Lands

The Amendment # 4 was passed 68-0 at a regular chapter meeting at the Nenahnezad Chapter on April 4, 1971. Although it took two meetings and a total of about six hours discussion on the amendment, the following were the peoples' main concern;

1. Reclamation in all areas that are mined, so eventually they will be able to reuse the land for grazing. They were assured the company will make all efforts to knock down the spoil piles and make it safe enough so the land will be reuseable.
2. Employment of as many Navajos as we possibly can take. It was mentioned that there are many non-Navajos employed where a Navajo should be working. They were told that we employ Navajos where they are qualified, but we have to have experience and trained personnel on all technical positions.
3. Compensation for their grazing rights and personal property on leased lands. They were advised that the tribe will make appraisal of the grazing land, property, and we are sure they will be fair and make proper compensation.

The meeting was very orderly, but was slow at times. Everything was settled in a friendly atmosphere.

A. King

cc. J. S. Anderson
C. C. Dietrich



United States Department of the Interior

BUREAU OF INDIAN AFFAIRS

Shiprock Agency

P.O. Box 966

Shiprock, New Mexico 87420

IN REPLY REFER TO:
Economic Development
Land Operations

March 4, 1983

Navajo Mine
William Skeet
Environmental Coordinator
P.O. Box 155
Fruitland, New Mexico 87416

Dear Mr. Skeet:

The intent of this correspondence is to clarify the land use status of the area presently under lease by Utah International (Navajo Mine).

The predominant use of the area in question has been in the form of livestock grazing. Although dryland farming has been attempted, these endeavors have been very limited in scope and have met with marginal results.

Furthermore, the physical and chemical characteristics of the soil types in the area, when coupled with the lack of available irrigation water, precludes the existence of prime farmland in the vicinity of the lease.

If I can be of any further assistance, please do not hesitate to contact me.

Respectfully,

Jerry W. Thomas
Natural Resource Manager



RESOLUTION OF THE
RESOURCES COMMITTEE
OF THE NAVAJO TRIBAL COUNCIL

Adopting the Grazing Concept of the
Holistic Resource Management or Other Adequate Practices
On Strip Mine Lands and Other Disturbed Rangelands

WHEREAS:

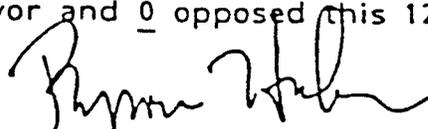
1. In accordance with Navajo Tribal Code, T2 § 692 and their Plan of Operation, the Resources Committee of Navajo Tribal Council is responsible for the Nation's Natural Resources which includes the development of long range plans for efficient utilization of grazing resources.
2. The Resources Committee recognizes the Surface Mining Control and Reclamation Act of 1977 and subsequent regulations governing the reclamation of minelands and other disturbed lands; and
3. The Resource Committee understands the need for more intensive reclamation and grazing management practices on disturbed Navajo rangelands; and
4. The Resources Committee has previously adopted the use of the Holistic Resource Management (HRM) as a means of improving and maintaining the Navajo Nation's rangeland and livestock economy; and
5. The Resources Committee also recognizes the beneficial influence of proper grazing program on reclaimed rangelands, whether disturbed by mining or were subjected to previous grazing mismanagement; and
6. The Resources Committee would like these disturbed lands be returned to their former productive state or better through proper grazing management programs.

NOW THEREFORE BE IT RESOLVED THAT:

1. The Resources Committee hereby adopts the concept of utilizing HRM and other proper grazing practices as reclamation treatments on disturbed rangelands; and
2. The Resources Committee directs the NCMA staff to develop proper grazing management treatment programs on reclaimed stripmine lands on the Navajo Reservation.

C E R T I F I C A T I O N

I hereby certify that the foregoing resolution was duly considered by the Resources Committee of the Navajo Tribal Council at a duly called meeting in Window Rock, Navajo Nation (Arizona), at which a quorum was present and that same was passed by a vote of 5 in favor and 0 opposed this 12th day of October, 1983.



Byron Huskon, Presiding Chairman
Resources Committee