

MK026PR

SECTION 36

MINE

September 29, 1995

Mr. Peter Luthiger
Supervisor, Radiation Safety and Environmental Affairs
Quivira Mining Company
P.O. Box 218
Grants, NM 87020

RE: Prior Reclamation Release for Section 36 Mine, No Release for Sections 17, 19, 22, 24, 30, 30W and 33, Quivira Mining Company, McKinley County, New Mexico

Dear Mr. Luthiger:

The Mining and Minerals Division (MMD) has completed inspection of reclamation measures as requested by Quivira Mining Company.

Based on findings in the enclosed inspection reports, reclamation measures at the Section 36 Mine satisfy the requirements of the New Mexico Mining Act (NMMA) and the substantive requirements for reclamation pursuant to the NMMA Rules. Therefore, Quivira is hereby released from further requirements of the NMMA on the Section 36.

Based on findings in the enclosed inspection reports, reclamation measures at the following mines do not satisfy the requirements of the New Mexico Mining Act (NMMA) and the substantive requirements for reclamation pursuant to the NMMA Rules. However, since Quivira has completed most reclamation measures at the following mines, Quivira may apply for variances from the provisions of the NMMA Rules pursuant to Rule 10. Otherwise, pursuant to NMMA Rule 5.10.B Quivira must submit permit applications and closeout plans for existing mining operations within six months of receipt of this letter

Section 17 T14N R9W
Section 19 T14N R9W
Section 22 T14N R10W
Section 24 T14N R10W
Section 30 T14N R9W
Section 30W T14N R9W
Section 33 T14N R9W

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Quivira Prior Reclamation

The enclosed prior reclamation inspection report details the findings of the inspection but does not include the photos/slides contained in the MMD file copy.

MMD appreciates your efforts to comply with the NMMA and commends you for your safeguarding and reclamation efforts. If you have any questions please contact Holland Shepherd of the Mining Act Bureau, (505) 827-5971.

Sincerely,

A handwritten signature in black ink, appearing to read "K. Garland", written in a cursive style.

Dr. Kathleen A. Garland, Director
Mining and Minerals Division

cc: Ms. Maxine Goad, Environment Department
Mr. Mark Schmidt, New Mexico State Land Office

Enclosure

**PRIOR RECLAMATION INSPECTION REPORT
AND
RECOMMENDATION FOR RELEASE OR PERMIT REQUIREMENT**

Quivira Mining Company

**Section 17 (T 14N, R 9W), Section 19 (T 14N, R 9W), Section 22 (T 14N, R 10W),
Section 24 (T 14N, R 10W), Section 30 (T 14N, R 9W), Section 30W (T 14N, R 9W),
Section 33 (T 14N, R 9W), and Section 36 (T 14N, R 9W) Mines**

**Submitted in Partial Fulfillment of the New Mexico Mining Act
Section 69-36-7 U., Prior Reclamation**

**New Mexico Energy, Minerals and Natural Resources Department
Mining and Minerals Division
Mining Act Reclamation Bureau**

September 25, 1995

Introduction

The purpose of these inspections was to determine if reclamation measures at Quivira Mining Company's Section 17, Section 19, Section 22, Section 24, Section 30, Section 30W, Section 33, and Section 36 Mines satisfy the requirements of the New Mexico Mining Act (Section 69-36-7, Prior Reclamation) and other substantive requirements for prior reclamation pursuant to the New Mexico Mining Act Rules. The sites, their locations, and dates of inspections by the New Mexico Mining and Minerals Division are presented in Table 1.

Table 1. Quivira Mining Company's Prior Reclamation Sites.

Name of Mine	Location of Mine	Date of Inspection
Section 17	T 14N, R 9W	August 30, 1995
Section 19	T 14N, R 9W	August 29, 1995
Section 22	T 14N, R 10W	August 30, 1995
Section 24	T 14N, R 10W	August 30, 1995
Section 30	T 14N, R 9W	August 30, 1995
Section 30W	T 14N, R 9W	August 30, 1995
Section 33	T 14N, R 9W	August 29, 1995
Section 36	T 14N, R 9W	August 29, 1995

Inspection Procedures

Inspections by the Mining and Minerals Division of prior reclamation sites were conducted on the following mine sites: Section 17 (T 14N, R 9W), Section 19 (T 14N, R 9W), Section 22 (T 14N, R 10W), Section 24 (T 14N, R 10W), Section 30 (T 14N, R 9W), Section 30W (T 14N, R 9W), Section 33 (T 14N, R 9W), and Section 36 (T 14N, R 9W). All inspections were conducted and completed on August 29 and 30, 1995. Persons present during the August 29, 1995 inspection of the Section 36 Mine included: Mr. Peter Luthiger, representing Quivira Mining Company; Mr. Jim Nordstrom, Mr. Mark Schmidt, and Mr. Michael Landon, all of the New Mexico State Land Office; Ms. Mary Ann Menetery and Mr. Dennis Slifer of the New Mexico Environment Department; and, Ms. Robyn Tierney and Mr. Robert Young of the New Mexico Mining and Minerals Division. Mr. Peter Luthiger of Quivira Mining Company, Ms. Mary Ann Menetery and Mr. Dennis Slifer of the New Mexico Environment Department; and, Ms. Robyn Tierney and Mr. Robert Young of New Mexico Mining and Minerals Division were present during the August 29, 1995 inspections of the Section 33 and Section 19 Mines. Mr. Terry Anderson of Quivira Mining accompanied Ms. Robyn Tierney and Mr. Robert Young on the August 30, 1995 inspections of the Section 17, Section 22, Section 24, Section 30, and Section 30W Mines. The author of this inspection report was Ms. Robyn Tierney.

Inspections of each mine site consisted of a review of information submitted by the mine operator, subsequent discussion with the operator pertaining to mining and reclamation at each site, inspection of the condition of the reclaimed mine sites, line-intercept sampling for estimates of vegetative cover, compilation of plant species lists, measurement of reclaimed soil depths, and photo-documentation. Each of the mine sites were visually inspected for erosion features and hydrologic stability. During a walkover of each site, all slopes, areas of water concentration (ponds, diversions and areas where disturbed areas enter undisturbed lands) were visually inspected for stability. Topsoil placement and distribution also was evaluated at each site. Sampling for topsoil depth consisted of randomly digging a series of holes to identify the depth of topsoil and the presence or absence of potentially toxic waste rock at rooting depth. Grading of all waste rock piles and borrow areas was visually inspected. Placement and closure of portals and vent shafts was verified in the field. Structures (including concrete pads, buildings, shaft collars, and pump houses) remaining at each site were also identified during the course of the inspections.

The establishment and relative percent cover of reseeded and native plant species were evaluated in randomly placed transects. Four 50' transects were evaluated at each mine site using the line intercept method (Bonham 1989). These transects were used to estimate the relative percent cover of each plant species intercepted at 3' intervals along a transect. A total of 17 points per transect were recorded. In addition, a list of species present within a 50' X 6' belt transect adjacent to each transect was compiled. These sampling procedures, however, do not meet sample adequacy. Rather, these procedures were conducted to estimate the relative percent cover and to evaluate the diversity of species present at each of the eight mine sites. Additional resources would be needed to fully evaluate the vegetation of these prior reclamation sites to a level of sample adequacy and would require at least 24 additional man-hours of inspection time per site.

Results and Discussion

Maps of the eight mine sites were submitted by Quivira. The detail in these maps is sufficient to describe conditions and facilities that were present on each site prior to reclamation. Details of the reclamation activities at each site were further verified in discussions with Mr. Luthiger and Mr. Fletcher of Quivira Mining Company and by the on-site inspections conducted on August 29 and August 30, 1995.

Section 36, T 14N, R 9W

This section was reclaimed in 1990. At the request of the surface owner, the New Mexico State Land Office, the seed mixture used in the reclamation of the Section 36 Mine contained a large percentage of crested wheatgrass (*Agropyron cristatum*). Although this introduced species has achieved near co-dominance with the native sand dropseed (*Sporobolus cryptandrus*), portions of the mine site are still covered with ragweed (*Kochia scoparium*) and Russian thistle (*Salsola kali*). The following table (Table 2) contains a list of all species identified on the reclaimed Section 36 mine site. This list is not inclusive of all the plant species that may be present on this site at other times of the year.

Table 2. List of Species at Quivira's Section 36 Mine

COMMON NAME	Genus & species ¹
Alkali sacaton	<i>Sporobolus airoides</i>
Crested wheatgrass	<i>Agropyron eris/alum</i>
Western wheatgrass	<i>Agropyron smithii</i>
Blue grama grass	<i>Boueloua gracilis</i>
Indian ricegrass	<i>Oryzopsis hymenoides</i>
Bigelow's Aster	<i>Aster bigelovii</i>
Beeweed	<i>Cleome serru/ata</i>
Ragweed	<i>J.:nchia scoparium</i>
Golden crownbeard	<i>Ierhesilla encelioides</i>
Annual sunflower	<i>He/wnthus annuus</i>
Hairy goldenaster	<i>ffrterorheca l'illasa</i>
Russian thistle	<i>Sa/so/a kali</i>

COMMON NAME	<i>Genus & species'</i>
Winterfat	<i>Ceratoides lanata</i>
Blue Gillia	<i>Ipomopsis sp.</i>
Yellow clover	<i>Melilotus sp.</i>
Stickleaf	<i>Mentzelia albicaulis</i>
Fringed Sage	<i>Artemisiafrigida</i>
Fourwing saltbush	<i>Atriplex canescens</i>
Yellow snakeweed	<i>Gutierrezia sarothrae</i>

Nomenclature after; Martin, W. C. and C.R. Hutchins. 1980. A Flora of New Mexico. J Cramer, Vaduz, Germany.
 Welsh, S.L. et al. 1987. A Utah Flora. Great Basin Naturalist Memoir No. 9.

Facilities remaining on the middle portion of the site included three cased vent holes. These will remain on the site as monitoring wells. The collars and casing of these wells appear to be stable. Although there was some evidence of sheet and debris flow on the southeast corner of the mine permit area, the overall site appeared to be stable. Concerns about surface water quality have been addressed with the adequate topdressing (average depth of four test pits was 2 feet) over the tailings and wasterock pads and with extensive seeding over the entire disturbance area. Further, the entire site had been graded with slopes configured to minimize soil loss. The large depression area in the north area of the permit held some standing water, but there was no evidence of rill or gully formation on any of the slopes rimming this impoundment.

While the data presented above indicates that the Section 36 (T 14N R 9W) Mine has been revegetated with a sufficient species diversity, there was considerable evidence of grazing – both by domestic cattle and elk. The site has been fenced from grazing and has sufficient vegetative cover (Table 3) to be stabilized. There is also a good mix of perennial plant species appearing throughout the site (Table 2).

Table 3. Summary of Relative Cover Data at Quivira's Section 36 Mine.

Transect #1	Value(%)
Perennial Cover:	0
Litter Cover	6
Rock Cover	0
Bare Ground	53
Number of perennial species present in bch transect	•• ??

Section 33, T 14N, R 9W

This section was reclaimed in June of 1994. The seed mixture used in the reclamation of the Section 33, the Section 30, Section 30W, Section 24, Section 22, Section 19 and Section 17 mine sites is presented in Appendix A of this report. Most of the reclaimed Section 33 mine site is covered with the annual weeds, ragweed (*Kochia scoparium*) and Russian thistle (*Salsola kali*). However, these weeds are characteristic of early succession and typically found on newly disturbed sites. The following table (Table 4) contains a list of all the species identified on the reclaimed Section 33 mine site. This list is not inclusive of all the plant species that may be present on this site at other times of the year.

Table 4. List of Species at Quivira's Section 33 Mine

COMMON NAME	Genus & species'
Western wheatgrass	<i>Agropyron smithii</i>
Crested wheatgrass	<i>Agropyron cristatum</i>
Indian ricegrass	<i>Oryzopsis hymenoides</i>
Bigelow's Aster	<i>Aster bigelovii</i>
Beeweed	<i>Cleome serrulata</i>
Ragweed	<i>Kochia scoparium</i>
Composite species	<i>Unknown Aster? sp.</i>
Russian thistle	<i>Salsola kali</i>
Conyza	<i>Conyzasp.</i>
Evening primrose	<i>Oenothera caespitosa</i>
Pepperweed	<i>Lepidium sp.</i>
Curlycup gumweed	<i>Grindelia squarosa</i>
Fringed Sage	<i>Artemisiafrigida</i>
Fourwing saltbush	<i>Atriplex canescens</i>
Threadleaf groundsel	<i>Senecio longilobus</i>
Yellow snakeweed	<i>Gutierrezia sarothrae</i>

Nomenclature after: Martin, W. C. and C.R. Hutchins. 1980. A Flora of New Mexico. J Cramer, Vaduz, Germany.
 Welsh, S.L. et al. 1987. A Utah Flora. Great Basin Naturalist Memoir No. 9

Facilities remaining on the north edge of the site included a transformer unit and a shaft. The shaft had recently been reinforced with concrete (Luthiger, pers. comm.). The Department of Energy (DOE) had borrowed topsoil materials from the northern portion of the mine permit, then reseeded that area in February-March of 1994. DOE used this borrow material to topdress portions of their mill tailings site located directly north (across the road) of the Section 33 Mine. Concerns about surface water quality have been addressed with the adequate topdressing (average depth of two test pits was 6 inches) over the orebody stockpile area and the equipment storage area with extensive seeding over the entire disturbance area. Further, the entire site had been graded to minimize soil loss and is largely flat with no slopes or depressions.

The data presented in Table 5 indicates that the reclamation of the Section 33 (T 14N R 9W) Mine is beginning to develop with an average of 3% perennial vegetative cover in the disturbed areas. The species diversity of the surrounding and on-site vegetation (Table 4), and the relative isolation from grazing are indicative of the good growth potential at this site.

Table 5. Summary of Relative Cover Data at Quivira's Section 33 Mine.

Transect #1	Value(%)
Perennial Cover	0
Litter Cover	0
Rock Cover	0
Bare Ground	29
Number of perennial present in belt transect	1.00
Transect #2	Value (%)
Perennial Cover	6
Litter Cover	6
Rock Cover	0
Bare Ground	24
Number of perennial species present in belt transect	0
Transect #3	Value (%)
Perennial Cover	6
Litter Cover	12
Rock Cover	0
Bare Ground	41
Number of perennial species present in belt transect	1

Transect #4	Value(%)
Litter Cover	12
Rock Cover	0
Bare Ground	47
ber bfpemial species present in belt ct!	10-1

Maintenance.Items:

None.

Photoeraphs of Quivira's Section 33 Mine

The following photographs were taken during the site inspection on August 29, 1995 to document conditions at the Section 33 Mine.

#1, #2: These two photographs form a panoramic view spanning the north quadrant(# 1 or right photograph) to the west-northwest quadrant (#2 or left photograph). The photographs were taken from the reclaimed pad of the wasterock pile.

#3, #4, #5: Photographs #3, #4, and #5 were taken from the same wasterock pad and span the west quadrant (#3 or right photograph), the west-southwest quadrant (#4 or middle photograph) to the south quadrant (#5 or left photograph).

#6: This photograph is of the permit area in the vicinity of the ore pad.

Section 30, T 14N, R 9W

This section also was reclaimed in June of 1994. The seed mixture used in the reclamation of the Section 30 Mine is presented in Appendix A of this document. Table 6 contains a list of other species identified on the reclaimed Section 30 mine site. The list is not inclusive of all the plant species that may be present on the site at other times of the year.

Table 6. List of Species at Quivira's Section 30 Mine

COMMON NAME	Genus & species'
Sand dropseed	<i>Sporobolus cryptandrus</i>
Indian ricegrass	<i>Oryzopsis hymenoides</i>
Bigelow's Aster	<i>Aster bigelovii</i>
Beeweed	<i>Cleome serrulata</i>
Ragweed	<i>Kochia scoparium</i>
Composite species	Unknown (<i>Aster?</i> sp.)
Russian thistle	<i>Salsola kali</i>
Scarlet globemallow	<i>Sphaeralcea coccinea</i>
Hairy goldenaster	<i>Heterotheca villosa</i>
Yellow clover	<i>Melilotus</i> sp.
Evening primrose	<i>Oenothera caespitosa</i>
Fourwing saltbush	<i>Atriplex canescens</i>
Yellow snakeweed	<i>Gutierrezia sarothrae</i>

Nomenclature after: Mann, W. C. and C.R. Hutchins. 1980. **A Flora of New Mexico.** J. Cramer, Vaduz, Germany.
 Welsh, S.L. *et al.* 1987. **A Utah Flora.** Great Basin Naturalist Memoir No. 9.

Average perennial vegetative cover at this site is 6% – twice that of the Section 33 site (Table 7). As in the case of the Section 33 Mine, however, vegetative cover is still dominated by the annual weeds, ragweed (*Kochia scoparium*) and Russian thistle (*Salsola kali*). Permanent facilities remaining on the Section 30 site include an electrical substation, a pumping pad and a reclaimed wasterock pile. Quivira owns the both surface and mineral rights on this section.

Table 7. Summary of Relative Cover Data at Quivira's Section 30 Mine.

Transect #1	Value(%)
Perennial Cover	12
Litter Cover	0
Rock Cover	0
Bare Ground	53
Number of perennial species present in belt transect	2
Transect #2	Value (%)
Perennial Cover	0
Litter Cover	24
Rock Cover	0
Bare Ground	47
Number of perennial species present in belt transect	0
Transect #3	Value (%)
Perennial Cover	0
Litter Cover	6
Rock Cover	0
Bare Ground	77
Number of perennial species present in belt transect	0
Transect #4	Value (%)
Perennial Cover	12
Litter Cover	12
Rock Cover	0
Bare Ground	41
Number of perennial species present in belt transect	2

Maintenance Items:

None.

Photographs of Quivira 's Section 30 Mine

The following photographs were taken during the site inspection on August 29, 1995 to document the condition of the Section 30 Mine.

Section 30W, T 14N, R 9W

A single pumping pad is the only permanent facility remaining on the Section 30W mine site. Quivira Mining Company owns both surface and mineral rights. Grading and reclamation on this site was generally similar to that on the Section 30 mine. Water from recent rains has collected in small depression over portions of the wasterock pad. Although vegetative cover is dominated by the annual weeds, Russian thistle and ragweed (Table 8 and Table 9) there is good establishment of perennial species at this site. Average percent perennial vegetative cover (Table 9) was 12% – the highest percent cover of these seven recently reclaimed sites. Part of this success may be attributed to the fenced enclosure of the entire site from grazing.

Table 8. List of Species at Quivira's Section 30W Mine

COMMON NAME	Genus & species
Sand dropseed	<i>Sporobolu cryptandrus</i>
Crested wheatgrass	<i>Agropyron crislah,m</i>
Western wheatgrass	<i>Agropyron smilhff</i>
Indian ricegrass	<i>Oryzopsfs hymenofdes</i>
Bigelow's Aster	<i>Aster bigelovii</i>
Beeweed	<i>Cleome serrulala</i>
Ragweed	<i>Kochia scoparium</i>
Blanket flower	<i>Gai//ardia pulche/la</i>
Russian thistle	<i>Sa/so/a ka/f</i>
BlueGilia	<i>Ipomopsi]sp.</i>
Yellow clover	<i>Ale/iotus sp.</i>

1 Nomenclature after: Martin, W. C. and C.R. Hutchins. 1980. *A Flora or New Mexico*. J. Cramer. Vaduz, Germany.
 Welsh, S.L. *et al.* 1987. *A Utah Flora*. Great Basin Naturalist Memoir No. 9.

Table 9. Summary of Relative Cover Data at Quivira's Section 30W Mine.

Transect #1	Value(%)
Perennial Cover	6
Litter Cover	6
Rock Cover	0
Bare Ground	59

Transect #1	Value(%)
Number of perennial ,pecies present in belt tranuct	2
Transect #11	Value(%)
Perennial Cover	24
Litter Cover	6
Rock Cover	0
Bare Ground	12
Number of perennial ,peeia present in belt tranuct	2
Transect #3	Value(%)
Perennial Cover	12
Litter Cover	6
Rock Cover	0
Bare Ground	47
Number of perennial ,pecies present in belt transect	2
Transect #4	Value(%)
Perennial Cover	6
Litter Cover	12
Rock Cover	0
Bare Ground	47
Number of perennial species present in belt transect	2

Maintenance Items.

None.

Photographs of Quivira 's Section 30W Mine

The following photographs were taken during the site inspection of the Section 30W Mine on August 29, 1995.

Section 24 Mine, T 14N RIOW

Quivira owns the mineral rights, while Homestake Mining Company of California owns the surface rights to the Section 24 Mine. Permanent structures on the Section 24 Mine include an active mixing facility (regulated by the Nuclear Regulatory Commission), a pump substation, and approximately 1000 feet of graded dirt road to these facilities. The diversity of forbs and grasses on this site was low (Table 10). The perennial vegetative cover of 3% also was lower (Table 11) than that at the other mines. Much of this site had evidence of compacted soils. Average soil depth (based on three test pits) was 12 inches.

Table 10. List of Species at Quivira's Section 24 Mine

COMMON NAME	Genus & species'
Crested wheatgrass	<i>Agropyron cristatum</i>
Indian ricegrass	<i>Oryzopsis hymenoides</i>
Ragweed	<i>Kochia scoparium</i>
Russian thistle	<i>Salsola kali</i>
Winterfat	<i>Ceratoides lanata</i>

Common name nomenclature after: Hartman, W. C. and C.R. Hutchins. 1980. Flora of Nevada. J. Cramer, Vaduz, Germany. Welsh, S.L. et al. 1987. A Utah Flora. Great Basin Naturalist Memoir No. 9

Table 11. Summary of Relative Cover Data at Quivira's Section 24 Mine.

Transect #1	Value (%)
Perennial Cover	0
Litter Cover	12
Rock Cover	0
Bare Ground	65
Number of perennial species present in belt transect	0.00
Transect #12	Value (%)
Perennial Cover	0
Litter Cover	12
Rock Cover	0
Bare Ground	65
Number of perennial species present in belt transect	0

Transect #3	Value(%)
Perennial Cover	6
Litter Cover	0
Rock Cover	0
Bare Ground	53
Number of perennial species present in belt transect	0
Transect #4	Value(%)
Perennial Cover	6
Litter Cover	12
Rock Cover	0
Bare Ground	29
Number of perennial species present in belt transect	1

Maintenance Items.

None.

Photographs of Quivira's Section 24 Mine

The following photographs were taken during the site inspection of the Section 24 Mine on August 29, 1995.

Section 22, T 14N, R 9W

Surface and minerals rights for the Section 22 mine site are owned by Quivira Mining Company. A pump house, approximately 1000 feet of graded dirt road, and a H₂SO₄ lixiviant tank remain as permanent features at this site. A small subsidence area approximately 15 feet in width and 20 feet in length was observed in the south central portion of the mine area. Average soil depth over the reclaimed ore pile and wasterock areas was 11 inches. Although some rill formation was observed on the slopes of the wasterock pile, these rills appeared to be armored with coarsely fragmented sandstone materials. There was some evidence of encroachment from the surrounding native vegetation (Table 12), but perennial vegetative cover on the reclaimed portions of this site was very low (Table 13). This site, however, is currently being grazed by approximately 13 head of cattle (Terry Fletcher, pers. comm.). The cattle appear to be feeding mainly on new vegetative growth and regrowth.

Table 12. List of Species at Quivira's Section 22 Mine

COMMON NAME	Genus & species'
Alkali sacaton	<i>Sporobolus airoides</i>
Crested wheatgrass	<i>Agropyron cristatum</i>
Foxtail barley	<i>Hordeum jubatum</i>
Indian ricegrass	<i>Oryzopsis hymenoides</i>
Western wheatgrass	<i>Agropyron smithii</i>
Beeweed	<i>Cleome serotina</i>
Ragweed	<i>Kochia scoparium</i>
Mustard	<i>Brassica sp.</i>
Russian thistle	<i>Salsola kali</i>
Nightshade	<i>Solanum sp.</i>
Morning glory	<i>Convolvulus sp.</i>
Stickleaf	<i>Ilfentelia albicaulis</i>
Fourwing saltbush	<i>Atriplex canescens</i>
Tuberaria	<i>Gutierrezia sarothrae</i>

1. Nomenclature after: Martin, W. C. and C.R. Hutchins. 1980. A Flora of New Mexico. J. Cramer. Vaduz, Germany. Welsh, S.L. et al. 1987. A Utah Flora. Great Basin Naturalist Memoir No. 9

Transect #1	Value (%)
Perennial Cover	0
Litter Cover	29
Rock Cover	0
Bare Ground	35
Number of perennial species present in belt transect	0
Transect #2	Value(%)
Perennial Cover	0
Litter Cover	18
Rock Cover	0
Bare Ground	47
Number of perennial species, present in belt transect	0
Transect #3	Value(%)
Perennial Cover	0
Litter Cover	12
Rock Cover	6
Bare Ground	35
Number of perennial species present in belt transect	1
Transect #4	Value(%)
Perennial Cover	0
Litter Cover	6
Rock Cover	0
Bare Ground	82
Number of perennial species present in belt transect	0

Maintenance Items:

None.

Photographs of Qujvira's Section 22 Mine

The slides contained in the following page were taken during the site inspection on August 29, 1995.

Section 19, T 14N R 9W

The Section 19 mine site is an open flat area (approximately 50-60 acres in size). A headframe, 2 explosives magazines, 1 vent shaft, and a pumping station with a large gravelled parking area on the southwest corner of the property remain as permanent features. A large wasterock pile was topsoiled and revegetated in June 1994. Average soil depth on this site was 14 inches.

Table 14. List of Species at Quivira's Section 19 Mine

COMMON NAME	Genus & species'
Alkali sacaton	<i>Sporobolus airoides</i>
Crested wheatgrass	<i>Agropyron cristatum</i>
Blue grama grass	<i>Bouteloua gracilis</i>
Indian ricegrass	<i>Oryzopsis hymenoides</i>
Bigelow's Aster	<i>Aster bigelovii</i>
Ragweed	<i>Kochia scoparium</i>
Composite species	<i>Unknown (Aster? sp.)</i>
Russian thistle	<i>Salsola kali</i>
Rubber rabbitbrush	<i>Chrysothamnus nauseous</i>
Conyza	<i>Conyza; asp.</i>
Yellow clover	<i>Melilotus sp.</i>
Stickleaf	<i>Mentzelia alhicaulis</i>
Fourwing saltbush	<i>Atriplex canescens</i>
Yellow snakeweed	<i>Gutierrezia sarothrae</i>

Nomenclature after: Martan, W. C. and C. R. Hutchins. 1980. A Flora of New Mexico. J. Cramer, Vaduz, Germany. Welsh, S.L. et al. 1987. A Utah Flora. Great Basin Naturalist Memoir No. 9.

Table 15. Summary of Relative Cover Data at Quivira's Section 19 Mine.

Transect #1	Value(%)
Perennial Cover	12
Litter Cover	6
Rock Cover	0

Transect #1	Value(¾)
Bare Ground	65
Number of perennial species present in belt transect	1
Transect #2	Value(%)
Perennial Cover	18
Litter Cover	6
Rock Cover	0
Bare Ground	35
Number of perennial species present in belt transect	1
Transect #3	Value(%)
Perennial Cover	12
Litter Cover	0
Rock Cover	0
Bare Ground	77
Number of perennial species present in belt transect	0
Transect #4	Value(%)
Perennial Cover	6
Litter Cover	6
Rock Cover	0
Bare Ground	77
Number of perennial species present in belt transect	0

Maintenance Items:

None.

Photographs of Quivira's Section 19 Mine

The photographs contained in the following pages were taken during the site inspection on August 29, 1995 of the Section 19 Mine. The below numbered descriptions identify the current condition of the site.

Section 17, T 14N, R 9W

Table 16. List of Species at Quivira's Section 17 Mine

COMMON NAME	Genus & species'
Crested wheatgrass	<i>Agropyron cristatum</i>
Galleta	<i>Hilaria jamesii</i>
Indian ricegrass	<i>Orywpsis hymenoides</i>
Beeweed	<i>Cleome serrulata</i>
Ragweed	<i>Kochia scoparium</i>
Scarlet globemallow	<i>Sphaeralcea coccinea</i>
Russian thistle	<i>Salsola ka/i</i>
Yellow clover	<i>Jfeliotus sp.</i>
Rubber rabbitbrush	<i>Chrysothamnus nauseosus</i>

1 Nomenclature after: Hartin, W. C. and C.R. Hutchins. 1980. Δ Flora of: "lew :allexico. J. Cramer, Vaduz, Germany. Welsh, S.L. et al. 1987. A Utah Flora. Great Basin Naturalist '\-lemoir No. 9.

Table 17. Summary of Relative Cover Data at Quivira's Section 17 Mine.

Transect #	Value (o/o)
Perennial Cover	0
Litter Cover	12
Rock Cover	0
Bare Ground	47
Number of perennial species present in belt transect	1
Transect #1	Value (o/o)
Perennial Cover	0
Litter Cover	12
Rock Cover	0
Bare Ground	47
Number of perennial species prnent in belt transect	1

Transect IIB	Value (σe)
Perennial Cover	0
Litter Cover	6
Rock Cover	0
Bare Ground	59
Number of perennial species present in belt transect	2
Transect II	Value(%)
Perennial Cover	0
Litter Cover	12
Rock Cover	0
Bare Ground	59
Number of perennial species present in belt transect	0

Maintenance Items:

None.

Photographs of Quivira's Section 17 Mine

The following photographs of the Section 17 Mine were taken during the site inspection on August 29, 1995.

Transect #2	Value(%)
Perennial Cover:	18
Litter Cover	12
Rock Cover	0
Bare Ground	59
Number of al species present in bclltranscct	2
Transect #3	Value(%)
Perennial Cover:	12
Litter Cover	12
Rock Cover	0
Bare Ground	41
Number of al species present in bclltranscct	4
Transect #4	Value (of)
Perennial Cover:	0
Litter Cover	35
Rock Cover	0
Bare Ground	35
Number of perennial species present in beit	0

Maintenance Items:

None.

Photographs of Quivira's Section 36 Mine

The following photographs were taken during the site inspection on August 29, 1995 to document the condition of the Section 36 Mine.

Transect #12	Value(%)
Bare Ground	47
Number of perennial species present in belt transect	1
Transect#J	Value (1/)
PereMial Cover	0
Litter Cover	6
Rock Cover	0
Bnre Ground	59
Number of perennial species present in belt transect	2
Transect#-	Value (o/o)
PereMial Cover	0
Litter Cover	12
Rock Cover	0
Bare Ground	59
Number of perennial species present in belt transect	0

Maintenance Items:

None.

Photographs of Ouivira's Section 17 Mine

The following photographs of the Section 17 Mine were taken during the site inspection on August 29, 1995.

Summary and Conclusions

Based on the inspection of the Sections 17, 19, 22, 24, 30, 30W, 33 and 36 mine sites, review of inspection information with Mining and Minerals Division staff and MMD's resources to conduct these inspections, it is recommended that the Section 36 Mine site operated by Quivira Mining Company (Quivira) be released from further requirements of the New Mexico Mining Act. The other mine sites (*i.e.* Sections 17, 19, 22, 24, 30, 30W, and 33) were reclaimed in June-July of 1994 and cannot be released at this time. Staff has concluded that is too early to detennine whether or not these sites meet the environmental conditions that allow for the development of a 'self-sustaining ecosystem' as defined in Rule I. and put forth in Rule 5.7A of the New Mexico Mining Act. Annual weeds such as ragweed and Russian thistle predominate on these sites , while perennials are much less numerous. Such plant communities are characteristic of early succession, but do not

provide enough information to make the determination that the site will one day become self-sustaining.

Based on oral and written communication (letter from Quiñira, September 14, 1995) with the operator, and on the condition of these seven remaining reclaimed sites as documented by this inspection report, it is clear that the operator has made a good effort to complete all of the required reclamation. It is recommended that the Director of MDM grant a variance to Quiñira Mining Company from meeting the deadline of September 30, 1995 for prior reclamation under the New Mexico Reclamation Act and Rules for the Section 17, 19, 22, 24, 30, 30V, and 33 mine sites. This variance would stipulate that inspections will be conducted by MDM during the late summer of 1997 at each of the remaining sites to determine if the conditions necessary for development of a sustainable ecosystem are then present on-site, and if any further actions including (but not limited to) reseedling or interseedling by the operator are necessary.

Literature Cited

Bonham, C. D. 1989. Measurement of Terrestrial Vegetation. Wiley-Interscience. 338 pp.

Craft, Fred. 1995. Resident Manager. Homestake Mining Company. Personal Communication

Fortin, P. C., and C. R. Hutchins. 1980. A Flora of New Mexico. J. Cramer Press, Vaduz, Germany. 259 pp.

Welsh, S. L. et al. 1989. Utah Flora. Great Basin Naturalist Memoir No. 9. Brigham Young University Press. 398 pp.

#1: This photograph was taken from east of the shaft area. Looking north across the topsoiled tailings pad, this photograph identifies the tie-in between the undisturbed (left and right margins of photo) and the disturbed (midground of photo) portions of the mine site. The natural vegetation and areas adjacent to the mine site remain largely undisturbed as seen at the margins of the site.

#2 #3: These photographs also were taken east of the shaft area. The photographs are panoramic views across the topsoiled tailings pad looking northwest (#2, right photograph) and west (#3, left photograph). Mr. Dennis Slifer and Mary Ann Menetery of the New Mexico Environment Department are at right in photograph #3.

#4 #6: These photographs also were taken east of the shaft area, and provide a panoramic view of the southwest (#4, right photograph) and south (#6, left photograph) quadrants of the mine permit area. The large shrub in the foreground of the photograph is saltbush (*Atriplex canescens*).

This photograph is of the west-southwest quadrant of the mine permit area in the vicinity of the reclaimed ore pad.



Quivira section
17 Mine
#2







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Quivira Section
19 Mine
1 (R) # 2 (M)
3 (L)



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9 acres
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@ / truck

on 19 Mine

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9 acres
N 9000 sq.
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9 acres
N 9000 sq.
@ / truck

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1

Section 24 Mine
≈ 26 acres
≈ 1/1000 sq. ft.
@ 1" thick

Vegetation

(•••)

1" 5"
1" H

border

border

F

3

56108/8
8/30/95

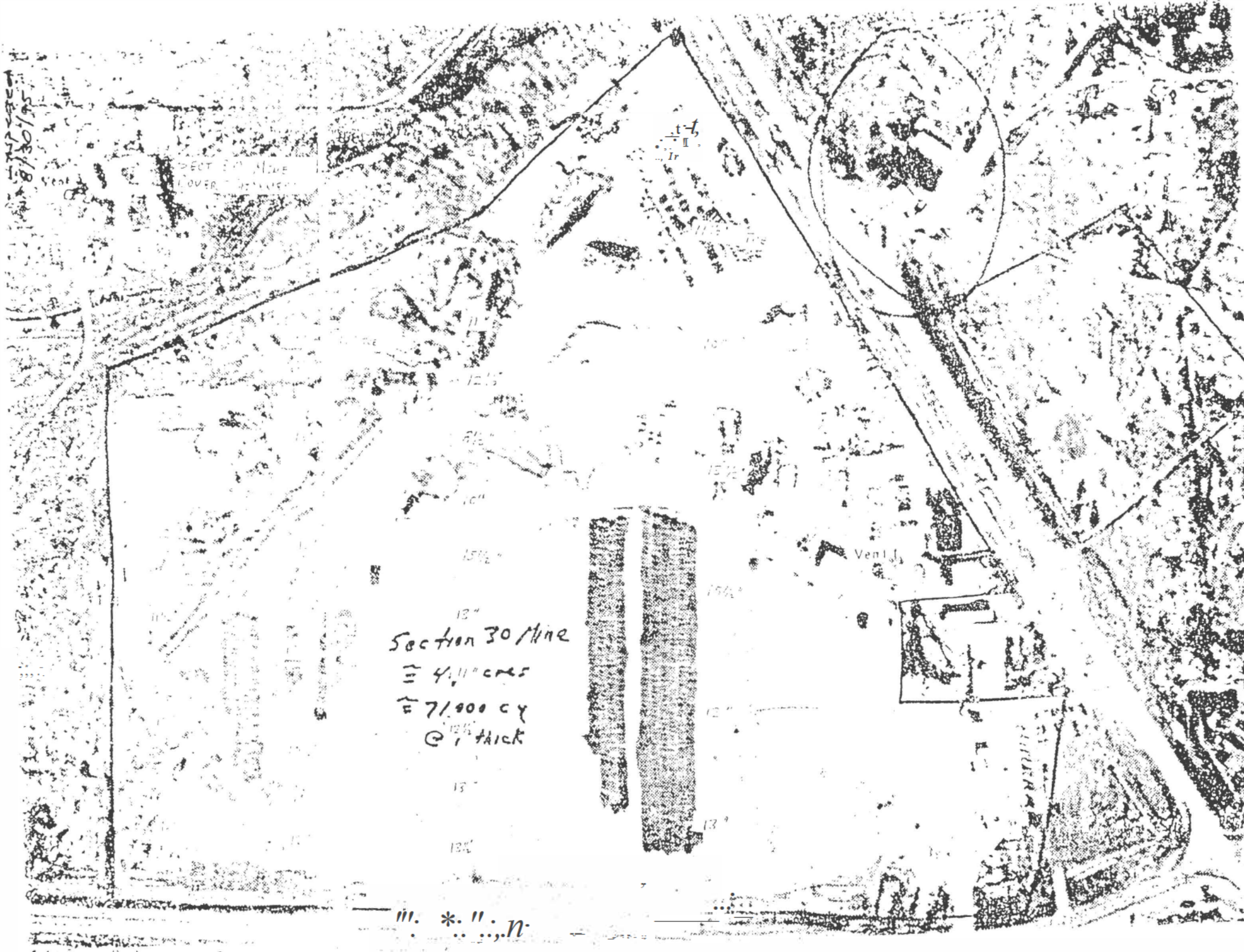
SECTION 30 Mine
OVER

t-1
II

Section 30 Mine
≅ 4.11 acres
≅ 71,900 cy
@ 1" thick

Ven 1

III. * " : n



Quivira's Section
30 June
21



Quinn's Section 30
Mine
#2



iii•i <ec:t,,,
30 Mine
#3»

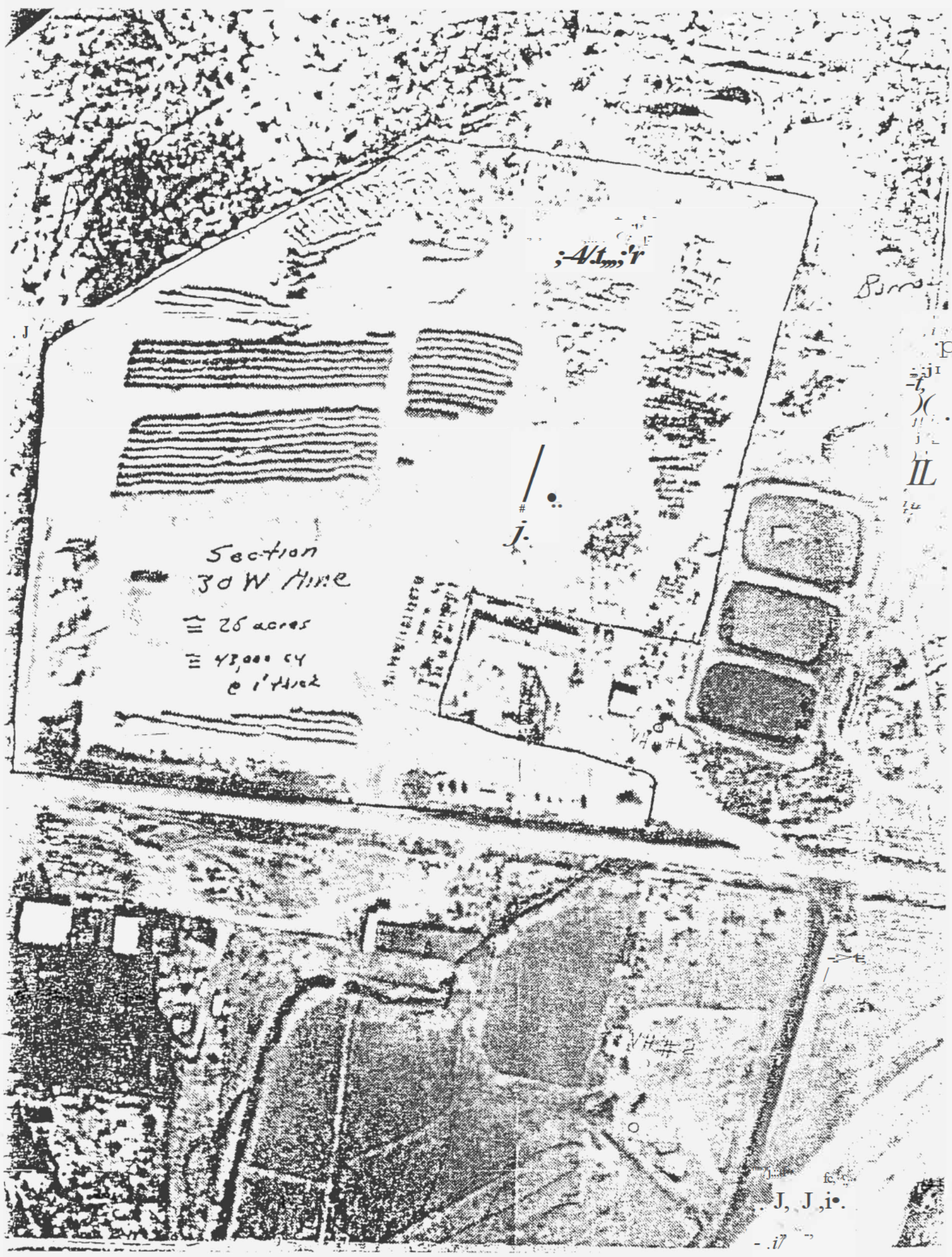


Meritas Section
30 Mine

4







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Section
30 W Mine

≡ 28 acres
≡ 48,000 cy
@ 17402

J.

VH #1

VH #2

J, J, i.

- i7

Ghivitas section
30 W line
#1





&U-;r;j 5 avz
3D W rf,tia
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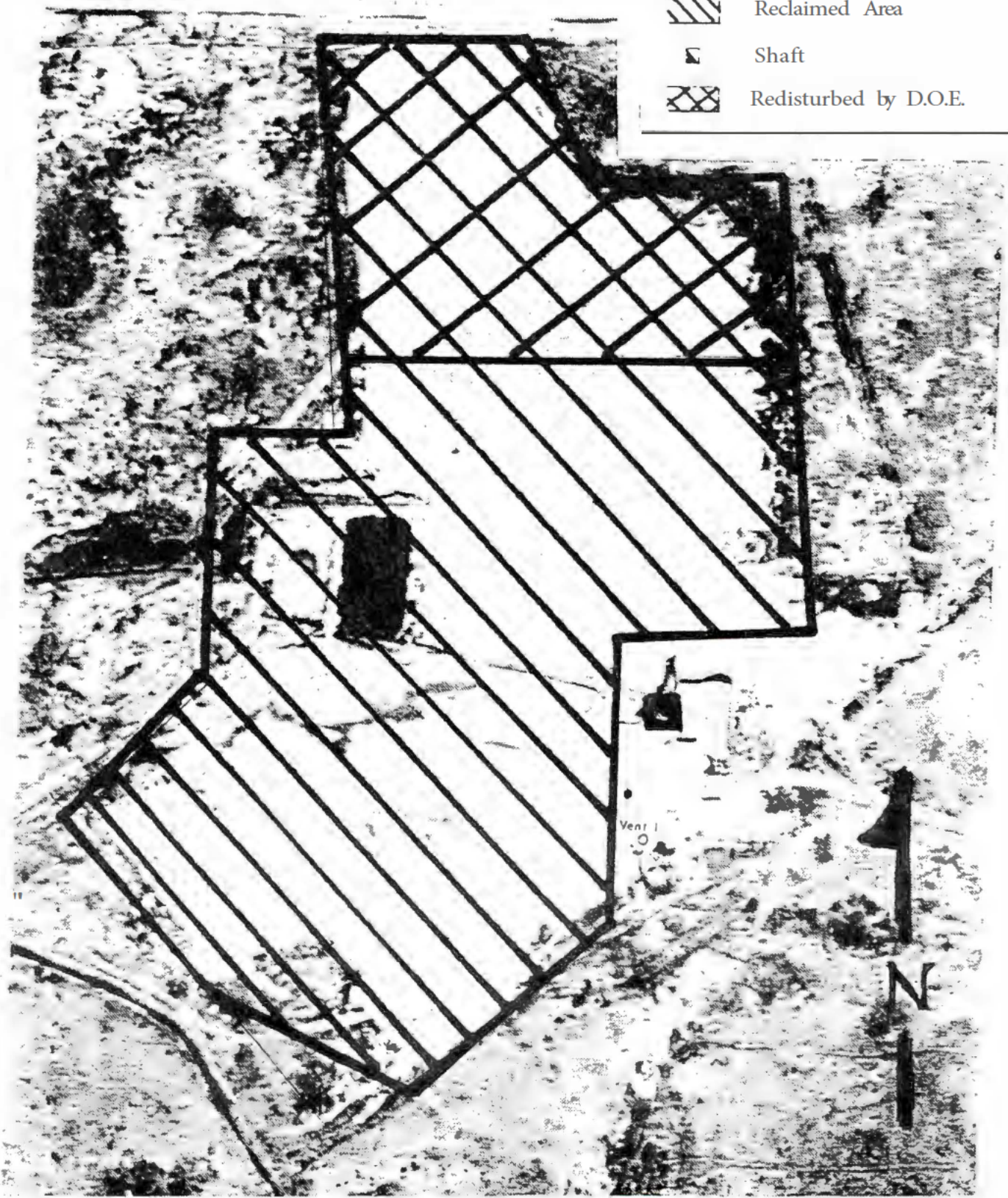
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SECTION 33 JYDNE

Figure 6 --
LEGE D

-  Reclaimed Area
-  Shaft
-  Redisturbed by D.O.E.



Rajonias
Section 33 Mine
#1 & 2



Quivira section 36
#2 & 3
Rice



33 Mine
#3,485



Inspected
8/29/95

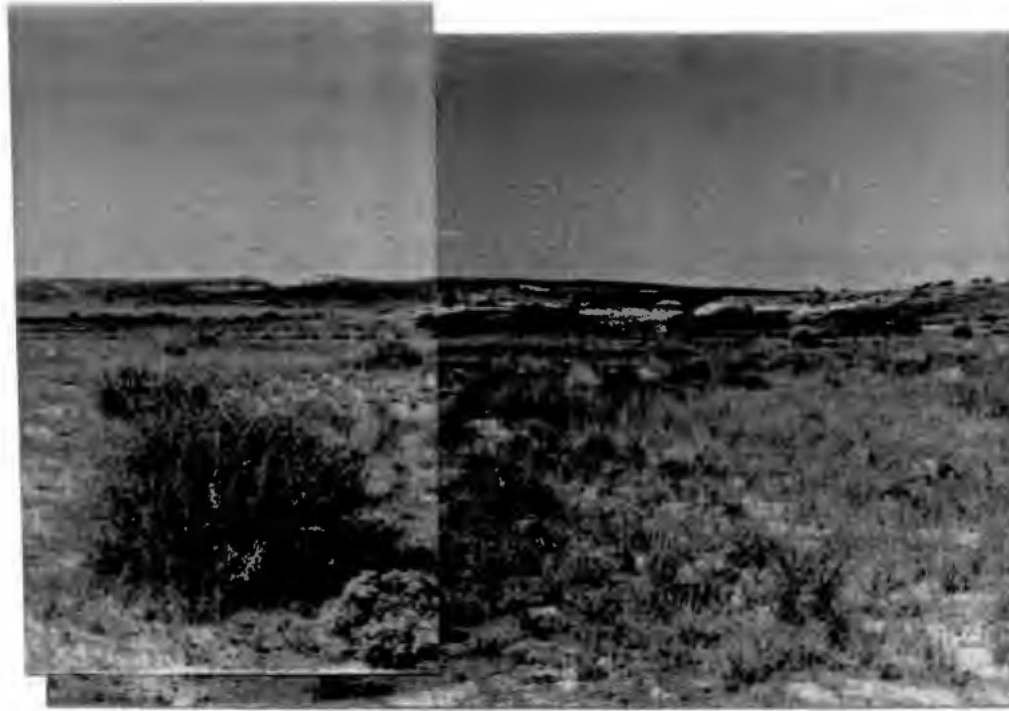
SECTION 36 ME



4). 1 ••• ,



Quinn's Section 36
986
Pine



PRIOR RECLAMATION INSPECTION



DATE: 2.29.95
CONDITIONS: moist soils (1.5" at Mill site last night)

sheet flow with sand
3 vent holes w/ pipe for monitoring (well) on central end of site running E-W
- depression towards north end w/ fill. reclaimed ~ 5 yrs ago.

SITE: Section 36, -14N-9W

OPERATOR: Quivira

PRESENT: Dennis ED, Mary Ann ED, Jim Norwood LOF, Mark Schmidt LOF
Mike London LOF, Robert Young, P. Lottiger

- Sanctio long. loba?
- Eula
- (Blue Gilia)
- Ip-
- Agam
- Yellow Clover
- Mapu
- Arfi
- Dithyrea
- Vedaceae
- Heliandrus annua
- Chrysopsis

Visual/Belt	Transsect #1	Transsect #2	Transsect #3	Transsect #4
Orhy Comp? Aggr # w/ loam	BG	BG	BG	Hojv
Kosc Mabi Atea	Kosc	BC	Spai	Kosc
Spai Eogr Cusa	BG	BC	BG	BC
Cleome cordata	BG	Kosc	Litter	Kosc
1st hole 2' depth	BG	BG	BG	Litter
2nd hole 2' moist sandy loam	Kosc	EG	BG	Mabi
3rd hole 2' fine sandy loam	SAKA	Litter	Litter	Litter
4th hole 18" some waste rock at bottom of hole	Litter	BG.	BG	Litter
	Kosc	Aggr	Spai	BG
	Kosc	BG	kosc	kosc
	Kosc	Spai	BG	BG
	BG	Aggr	BG	BG
	BG	BG	Saka	Litter
	BG	Saka	kosc	Litter
	Kosc	BG	Saka	BG
	BG	Litter	Kosc	BG
	BG	BG	Saka	Litter
	(across rd tailings pad)			
	no new species in belts			

wet swale
ditch/pit a.
Transsect #

at 7" → 2" gray band ←

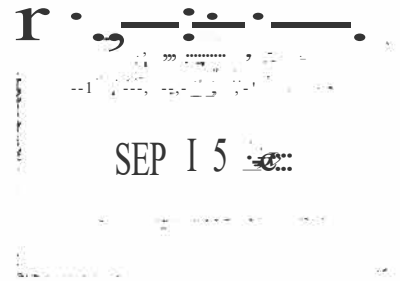
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- Photos #1 looking to N.
- #2 NW to
- #3 W
- #4 WSW to
- #5 SW
- #6 S

- 70 Perennial Cover
- Litter
- Root
- Bare Ground
- Perennial species in belt

Quivira Mining Company

September 14, 1995



Certified Mail
Return Receipt Requested (P 762 964 259)

Dr. Robin Tierney
Mining and Minerals Division
Energy, Minerals and Natural Resources Department
2040 South Pacheco
Santa Fe, NM 87505

Re: **Quivira Mining Company**
Prior Reclamation Request

Dear Dr. Tierney,

This letter represents a confirmation of our telephone conversation on September 14, 1995 regarding prior reclamation at the Ambrosia Lake site. As we discussed, although the areas have been successfully reclaimed and revegetated consistent with the requirements of the Act and Rules, due to the time period that has transpired since the areas were revegetated, the Mining and Minerals Division (**MMD**) would like to subsequently re-verify the successful reclamation efforts.

Therefore, pursuant to our discussion, Quivira's prior reclamation application would be approved by **MMD**; and in conjunction with this approval, the area would receive a one-time field re-verification review.

The objective of this one time field review would be to re-verify that the conditions to allow for establishment of a self sustaining ecosystem consistent with the surrounding area has been met for the post mining land use of grazing. This one time review would be conducted after two (2) additional growing seasons. Upon re-verification, the area would again be acknowledged by **MMD** as meeting the prior reclamation requirements. If the result of this review is contrary to this, then Quivira would develop and implement a program to address the issues raised by **MMD**.

Dr. Robin Tierney
September 14, 1995
Page 2 of 2

I would like to thank you for your effort and cooperation in this matter. If you have any questions, please do not hesitate to contact me at (505) 287-8851, extension 205.

Sincerely,

FfJJ MINING COMPANY
Peter Lut
Supervisor, Radiation Safety
and Environmental Affairs

xc: B. Ferdinand
T. Fletcher
file

Quivira Mining Company

September 14, 1995

SEP 15 1995

Certified Mail
Return Receipt Requested (P 762 964 259)

Dr. Robin Tierney
Mining and Minerals Division
Energy, Minerals and Natural Resources Department
2040 South Pacheco
Santa Fe, NM 87505

Re: **Quivira Mining Company**
Prior Reclamation Request

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Dr. Robin Tierney
September 14, 1995
Page 2 of 2

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Sincerely,

R/!i MINING COMPANY
PeterLut
Supervisor, Radiation Safety
and Environmental Affairs

xc: B. Ferdinand
T. Fletcher
file

QUIVIRA MINING COMPANY

POST OFFICE BOX 218 • GRANTS, NEW MEXICO 87020

September 1, 1995

Dr. Robin Tierney
Mining and Minerals Division
Energy, Minerals and Natural Resources Department
2040 South Pacheco
Santa Fe, NM 87505

Re: **Prior Reclamation Request**

Dear Dr. Tierney,

Pursuant to your request, I have enclosed the remaining maps of Quivira Mining Company's prior reclamation sites that you visited on August 29-30, 1995.

If you have any questions regarding this matter, please do not hesitate to contact me at (505) 287-8851, extension 205.

Regards,

QUIVIRA MINING COMPANY

E|±.

Supervisor, Radiation Safety
and Environmental Affairs

xc: B. Ferdinand
T. Fletcher
file

SECTION 17 MINE

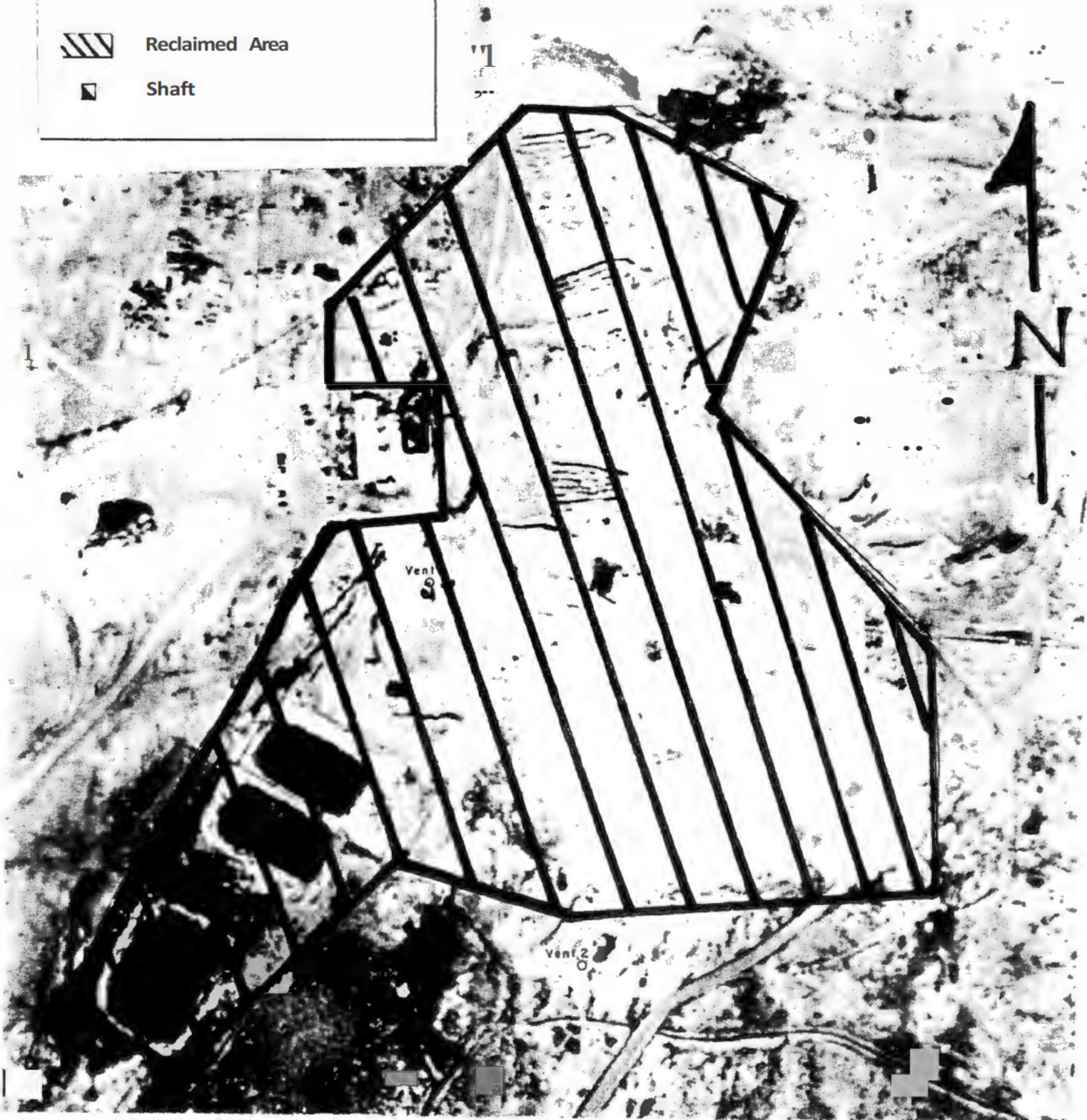
LEGEND



Reclaimed Area



Shaft



SECTION 22 IVINE



LEGEND






Reclaimed Area

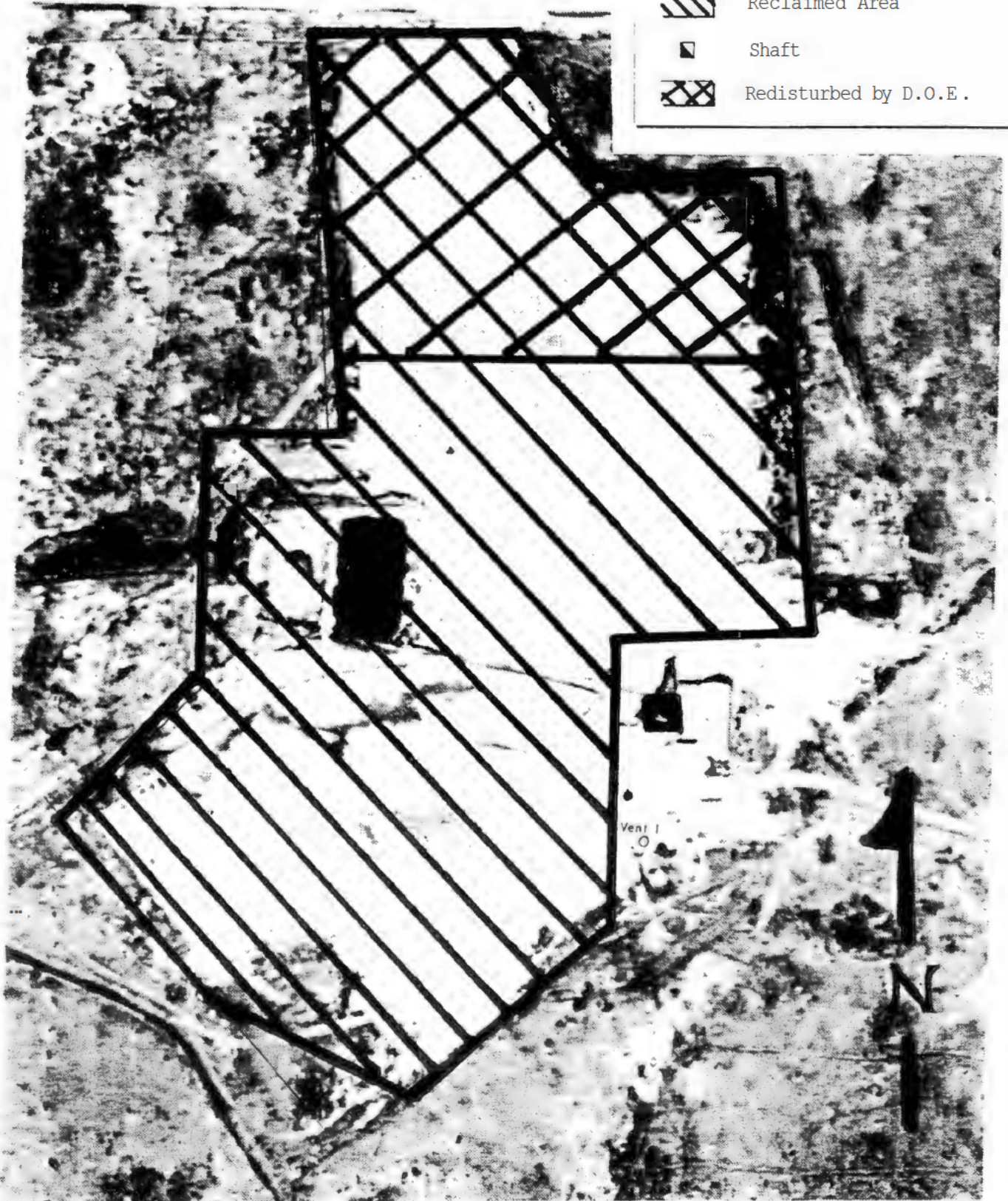


Shaft

SECTION 33 MINE

LEGEND

-  Reclaimed Area
-  Shaft
-  Redisturbed by D.O.E.



SECTION 36 NIINE



LEGEND



Reclaimed Area



Shaft

Quivira Mining Company

File with Section 17 Mine
Inter-see
Pitkin County

February 14, 1995



Certified Mail
Return Receipt Requested (P 762 964 235)

Mr. Holland Shepherd
Chief, Mining Act Reclamation Bureau
Energy, Minerals and Natural Resources Department
Mining and Minerals Division
2040 South Pacheco
Santa Fe, NM 87505

**Re: Quivira Mining Company
Prior Reclamation Application**

Dear Mr. Shepherd:

In response to your January 22, 1995 request regarding Quivira Mining Company's prior reclamation application, please find attached a map identifying the land sections where the shafts of Quivira's various mining units are located. These units, referred to as Section 17, 19, 22, 24, 30, 30 West, 33, and 36, comprise Quivira's Ambrosia Lake mining operation included within the prior reclamation application. As clearly indicated on the map, these units are all in close proximity to each other and should be treated as a single mining entity.

The legal section, township, and range for these mining units are as follows:

<u>Mining Unit</u>	<u>Specific Location</u>
Section 17	Section 17, T14N, R9W
Section 19	Section 19, T14N, R9W
Section 22	Section 22, T14N, R10W
Section 24	Section 24, T14N, R10W
Section 30	Section 30, T14N, R9W
Section 30 West	Section 30, T14N, R9W
Section 33	Section 33, T14N, R9W
Section 36	Section 36, T14N, R9W

Mr. Holland Shepherd
February 14, 1995
Page 2 of 2.

If you have any questions regarding this information, please do not hesitate to contact me at (505) 287-8851, extension 205.

Regards,

QUIVIRA MINING COMPANY

St

Supervisor, Radiation Safety
and Environmental Affairs

Attachment: As stated

xc: B. Ferdinand
T. Fletcher
file

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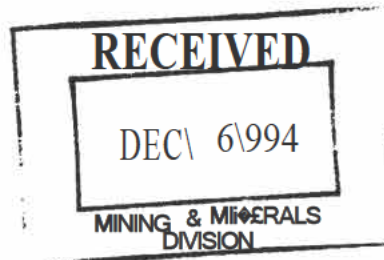
DP- 362 Exp. Oct. 5, 1977
Incl. So. 19, 22, 29,
17, 30, 30W, 33, 35
H₂O, H₂SO₄

File Rec. 10/11/94

Quivira Mining Company

December 14, 1994

Certified Mail
Return Receipt Requested (762 964 212)



Mr. Holland Shepherd
Chief, Mining Act Reclamation Bureau
Energy, Minerals, and Natural Resources Department
Mining and Minerals Division
2040 South Pacheco
Santa Fe, NM 87505

Re: **Quivira Mining Company**
Prior Reclamation Application

Dear Mr. Shepherd,

Quivira Mining Company is in receipt of the letter dated September 13, 1994 from the Mining and Minerals Division (MMD) regarding the prior reclamation application submitted by Quivira on August 30, 1994.

However, Quivira disagrees with MMD's interpretation of Rule 2.11 of the Mining Act Regulations that the fee adopted by the New Mexico Mining Commission applies to each mine site. Rule 2.11 states,

"The application fee to determine whether a mine or a portion of a mine qualifies for prior reclamation shall not exceed \$250 and shall be determined by the Director based on the estimated cost for investigation and issuance."

Quivira interprets this as each application submitted for a mine operation requires a \$250 fee. Quivira believes this to be the correct interpretation considering other interrelated portions of the Mining Act regulations, specifically Rule 5.2.F. This rule states:

"Where physically separate but interrelated mining operations are located in close proximity to each other and are under the control of the same owner or operator, the applicant may request or the Director may determine to issue one permit for all of the operations and require only

Mr. Holland Shepherd
December 14, 1994
Page 2 of 2

one permit application and closeout plan. "

Additionally, recognizing that Quivira's facilities are either adjacent to or in very close proximity to each other and were operated as a single mining unit, Quivira believes a single application fee for its operation is prudent and justified.

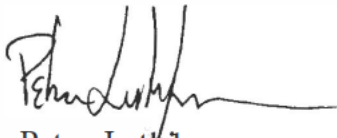
Quivira believes that since its properties meet the requirements as a single operation, and has in fact operated the facilities as a single operation, one fee for the mining unit is applicable. Further, although reclamation has been completed at these sites, a single permit will be sought if, for some reason, Quivira must permit any of these areas. As such, Quivira maintains its position that the proper application fee for the August 30, 1994 prior reclamation application has been submitted to MMD.

Quivira is currently compiling the additional information requested by MMD in order to assist the Director in determining release pursuant to Rule 5.10 of the Mining Act Regulations.

If you have any questions, please contact me at (505) 287-8851, extension 246.

Regards,

QUIVIRA MINING COMPANY



Peter Luthlger
Supervisor, Radiation Safety
and Environmental Affairs

xc: B. Ferdinand
T. Fletcher
M. Freeman
file

Quivira Mining Company

August 30, 1994

Certified Mail
Return Receipt Requested (P 340 643 879)

Mr. Holland Shepherd
Chief, Mining Act Reclamation Bureau
Energy, Minerals and Natural Resources Department
Mining and Minerals Division
2040 South Pacheco
Santa Fe, NM 87505

Re: **Quivira Mining Company**
Prior Reclamation Application



Dear Mr. Shepherd:

Pursuant to Section 5 of the New Mexico Mining Act [NMSA 69-36-5.E] and Rule 5.10.A of the New Mexico Mining Act Rules dated July 12, 1994, Quivira hereby submits this application for prior reclamation and requests approval of the prior reclamation application for the Section 17, 19, 22, 24, 30, 30 West, 33, and 36 mining areas.

In addition to this, please find attached a check in the amount of \$250.00 as required by Rule 2.1.1 of the New Mexico Mining Act Rules dated July 12, 1994.

Pursuant to Section 7.J of the New Mexico Mining Act [NMSA 1978, 69-36-7.J] and Rule 13.3 of the New Mexico Mining Act Rules dated July 12, 1994, all areas and facilities under the jurisdiction of other federal or state regulatory entities are exempt from regulation by the Mining and Minerals Division under the New Mexico Mining Act and therefore, are not included within this prior reclamation application.

The submittal of this prior reclamation application by Quivira Mining Company does not alter Quivira's contention as presented during the May 12, 1994 New Mexico Mining Commission hearings, that uranium mines may not be subject to the New Mexico Mining Act pursuant to the definition of "Mineral" and/or "Mining" because uranium is a commodity, byproduct material or waste that is regulated by the Nuclear Regulatory Commission (NRC) and/or involves the extraction, processing or disposal of same or of

Mr. Holland Shepherd
August 30, 1994
Page 2 of 2

activities regulated by NRC; and also because of the extensive federal and state duplicative regulations and preemption of regulatory power over uranium and over the above listed activities. With this submittal, Quivira does not waive or prejudice its position that its operations may be excluded from the applicability of the Act.

If you have any questions, please call me at (505) 287-8851.

Regards,

QUIVIRA MINING COMPANY

Supervisor, Radiation Safety
and Environmental Affairs

Attachment: As stated

xc: B. Ferdinand
T. Fletcher
M. Freeman
file

TO: FIRST NATIONAL BANK OF GRANTS
GRANTS, NEW MEXICO

95-220
1022

QUIVIRA MINING COMPANY
P.O. BOX 218
GRANTS, NEW MEXICO 87020

No. 2556

MO.	DAY	YEAR	PAY EXACTLY *****ZSO***** DOLLAR * 00 * ::;ENTS	DOLLARS	CENTS
08	30	94		250	00

QUIVIRA MINING COMPANY
GENERALACCOUNT


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TO
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ORDER
OF

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State of New Mexico
Mining and Minerals Division

7

Kathy J. Howard



Quivira Mining Company

March 11, 1993

Certified Mail
Return Receipt Requested P 323 276 473

Ms. Janet Witte
Environmental Specialist
New Mexico State Land Office
P.O. Box 1148
Santa Fe, New Mexico 87504

Re: Reclamation Status - Section 36-14N-9W

Dear Ms. Witte:

Please find enclosed pursuant to your telephone request and earlier discussions with Mr. Art Gebeau, Ambrosia Lake General Manager, a summary of reclamation activity performed by Quivira Mining Company on Section 36, Township 14 North, Range 9 West. The reclamation activities presented described the activities performed to date and the remaining activities yet to be completed.

If you have questions regarding this information, please contact me at (405) 842-1773.

Sincerely,

-/i.u.
Bill Ferdinand, Manager
Radiation Safety, Licensing &
Regulatory Compliance

Attachments: As Stated

xc: T. Fletcher
M. Freeman
A. Gebeau
P. Luthiger
file

QUIVIRA MINING COMPANY
 RECLAMATION ACTIVITY - SECTION 36
 TOWNSHIP 14 NORTH, RANGE 9 WEST

Introduction

Quivira Mining Company actively operated an underground uranium mine on Section 36, Township 14 North, Range 9 West from April 10, 1970 through January 1985. Prior to April 1970, the mine was owned and operated by Phillips Petroleum and several other operators. In January 1985, the mine was placed on standby status due to depressed markets conditions with the hope of reopening the facility upon market improvement.

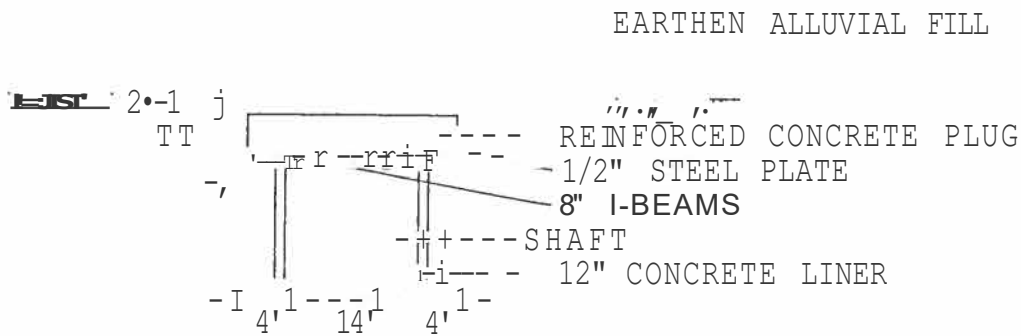
With the continued depressed market, in October 1989, a decision was made to close the mine and reclaim the area. Reclamation activity at the mine site commenced in November 1989. Contained in Appendix A is an aerial photograph showing the mine site prior to reclamation activities by Quivira Mining Company.

Reclamation Activities

The initial reclamation activity at the site consisted of dismantling and removal of the mine headframe and the mine buildings. Subsequent to completion of these items, the shaft and ventilation holes associated with the mine were plugged and sealed.

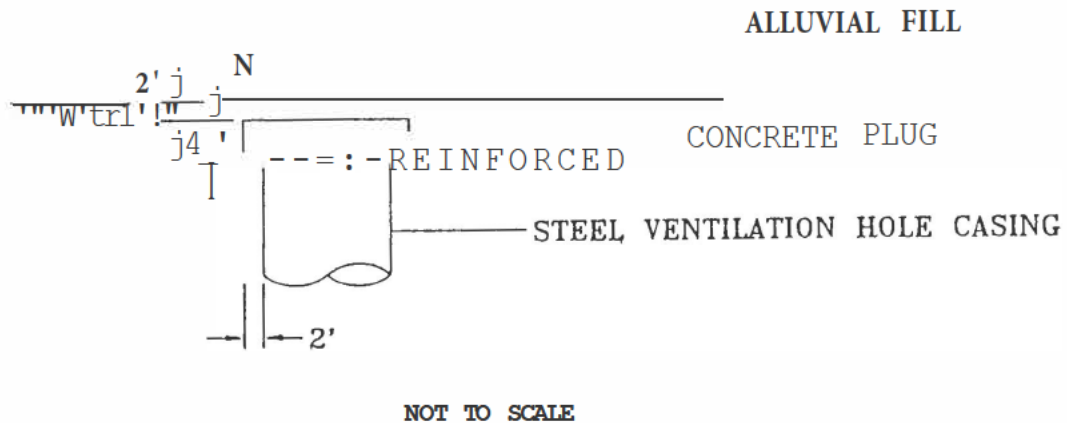
The fourteen (14) foot circular, concrete lined, two (2) compartment shaft was reclaimed by first removing all concrete and steelwork to a depth of six (6) feet below grade. Quivira then poured a twenty four (24) foot diameter, steel and rebar re-enforced concrete plug four (4) feet thick over a half-inch steel plate on top of the shaft lining. The concrete plug was then covered with a minimum of two (2) feet of alluvial fill and re-contoured. A schematic of the shaft plug is presented in Figure 1.

FIGURE 1
 SHAFT PLUG



The ventilation holes were similarly plugged and sealed. The steel ventilation hole casings were cut six (6) feet below the surface grade. A four (4) foot thick, rebar and steel reinforced concrete plug was then poured at the ventilation hole site. The installed plug diameter exceeded the inside diameter of the ventilation hole by four (4) feet to ensure stability and completeness. The plug was sealed with the placement of a minimum of two (2) feet of alluvial fill over the concrete plug. Figure 2 displays a general schematic of the ventilation hole concrete plug.

FIGURE 2
VENTHOLE PLUG



After completing the capping and plugging of the ventilation holes, the power lines, electrical poles and their associated electrical equipment were removed from the property by the company.

Mine waste material from the mine pad was then reclaimed by Quivira through pickup and removal to a disposal area north of the mine site and buried with a minimum of two (2) feet of alluvial cover.

Radiation surveys (gamma) were routinely performed during the reclamation activities to ensure all material needing to be removed and properly reclaimed was indeed identified and taken to the disposal area.

The gamma measurements were taken on a fifty (50) foot grid system with all disturbed areas monitored. Material whose activities would exceed the permissible levels of radiation from external sources of 500 mRems per year excluding background

(0.02 mRem per hr) were marked for further cleanup and removed to the disposal area. The 500 mrem/year corresponds to the maximum allowable radiation level which will comply with the annual radiation limit for the general public as contained in Section 4-150 (B) of the New Mexico Radiation Protection Regulations. For conservatism and to ensure safety to the general public, Quivira assumed a twenty four (24) hour, 365 days per year occupancy although such is not the case to derive a permissible dosage rate of 0.057 mRem/hr or 57 uRem/hr.

This is in comparison to EPA's reclamation program on the Brown-Vandever-Nanabah uranium mine site near Prewitt, New Mexico which utilized 165 uRem/hr as the reclamation limit to ensure safe exposure to the general public.^{0>} The final reclaimed survey results for the mine pads, the area west of the access road, and the disposal pit are also shown in Appendix A.

The reclaimed mine pads were then regraded and covered with approximately one (1) foot of alluvial fill and reseeded with a Crested Wheatgrass seed mixture. The seed mixture Quivira selected was based on previous suggestions received from the U.S. Bureau of Land Management (BLM) on other similar properties. It was applied at 10 pounds per acre. The seeded areas was then fertilized at 50 pounds per acre. ✓

Contained in Appendix B are photographs showing the mine site prior to reclamation, after completion of the reclamation at the site prior to the initial re-seeding and the subsequent re-growth of vegetation at the mine.

Remaining Reclamation Activity

Although Quivira re-seeded all disturbed areas within at the mine site, the SW4SW4 of the section needs additional seeding. It is Quivira's plan to re-seed this area later this year to ensure the area is properly revegetated to ensure cover and production. No other reclamation activities will remain after successful revegetation of this area.

(1) EPA Cor/Cllpordnce, July 5, 1991, Mr. Robert Dornstein. Emergency Ruptote Section to Mr. Jeff Zclibon., Director Hazardous Waste Managcmt Division., EPA Region IX

APPENDIX A

SECTION 36

FINAL RADIATION SURVEY RESULTS

QUIVIRA MINING COMPANY

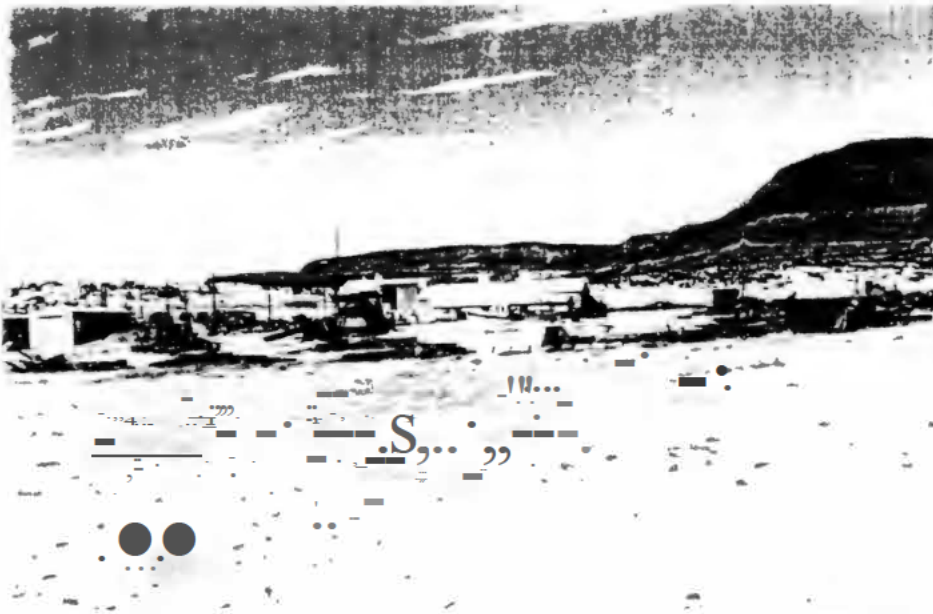
Section 36 Mine



APPENDIX B

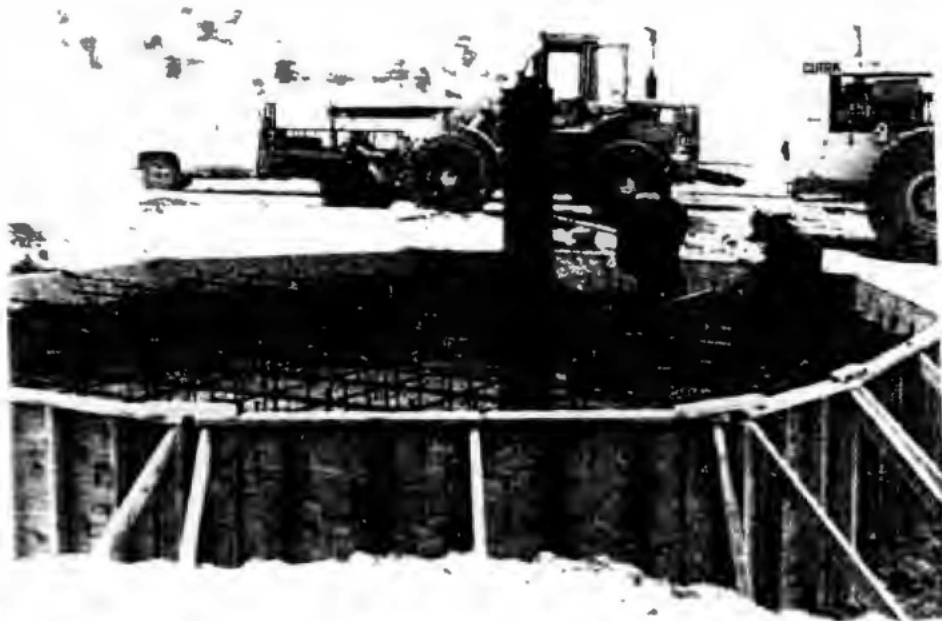
SECTION 36

RECLAMATION PHOTOGRAPHS



Microfilm

PICTO 1 - Section 36 Mine Site Prior to
Reclamation (except leadframe
which has already been taken
down).



PICTO 2 - Concrete Shaft Plug Being Prepared.

owner Site of Section 6 line
Building and Shift.



PICTO 7 - Panorama View of Section 36 ;line Site Reclaimed Prior
to Re-vegetating.