CLOSURE REPORT

EAST MESA GEOTHERMAL TEST FACILITY

JULY 31,1998

UNITED STATES
DEPARTMENT OF ENERGY
Oakland Operations

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ACRONYMS AND ABBREVIATIONS

Bechtel	Bechtel Environmental, Inc.
BLM	Bureau of Land Management
Corps	United States Army Corps of Engineers
CCR	California Code of Regulations
CFR	Code of Federal Regulations
DOE	United States Department of Energy
EE	DOE Office of Energy Efficiency and Renewable Energy
EM	DOE Office of Environmental Management and Waste Management
EPA	United States Environmental Protection Agency
gpm	gallons per minute
GTF	East Mesa Geothermal Test Facility
IAG	Interagency Agreement
MDC	minimum detectable concentration
mg/kg	milligrams per kilogram
mg/L	milligrams per liter
mrem/hr	millirems per hour
NEPA	National Environmental Policy Act
NORM	naturally occurring radioactive material
OHM	OHM Remediation Services Corp.
pci/kg	picocurries per kilogram
RAO	Remedial Action Objective
RCRA	Resource Conservation and Recovery Act
STLC	Soluble Threshold Limit Concentration
TCLP	Toxicity Characteristic Leaching Procedure
TDS	total dissolved solids
TPH	total petroleum hydrocarbons
TTLC	Total Threshold Limit Concentration
μCi/ml	microcurries per milliliter
WET	Waste Extraction Test (California)
yd^3	cubic yards

This report was prepared by Systematic Management Services, Inc. under Contract No. 98-EW40473

EAST MESA GEOTHERMAL TEST FACILITY
CLOSURE REPORT

Section I

INTRODUCTION

The purpose of the *East Mesa Geothermal Test Facility (GTF) Closure Report* is two fold. The first is to provide a document that validates the completion of remediation at this Department of Energy (DOE) waste cleanup project. The report's second purpose is to provide a review of the project cost and performance information and technology applications so that any experience gained can be applied to other similar cleanup projects.

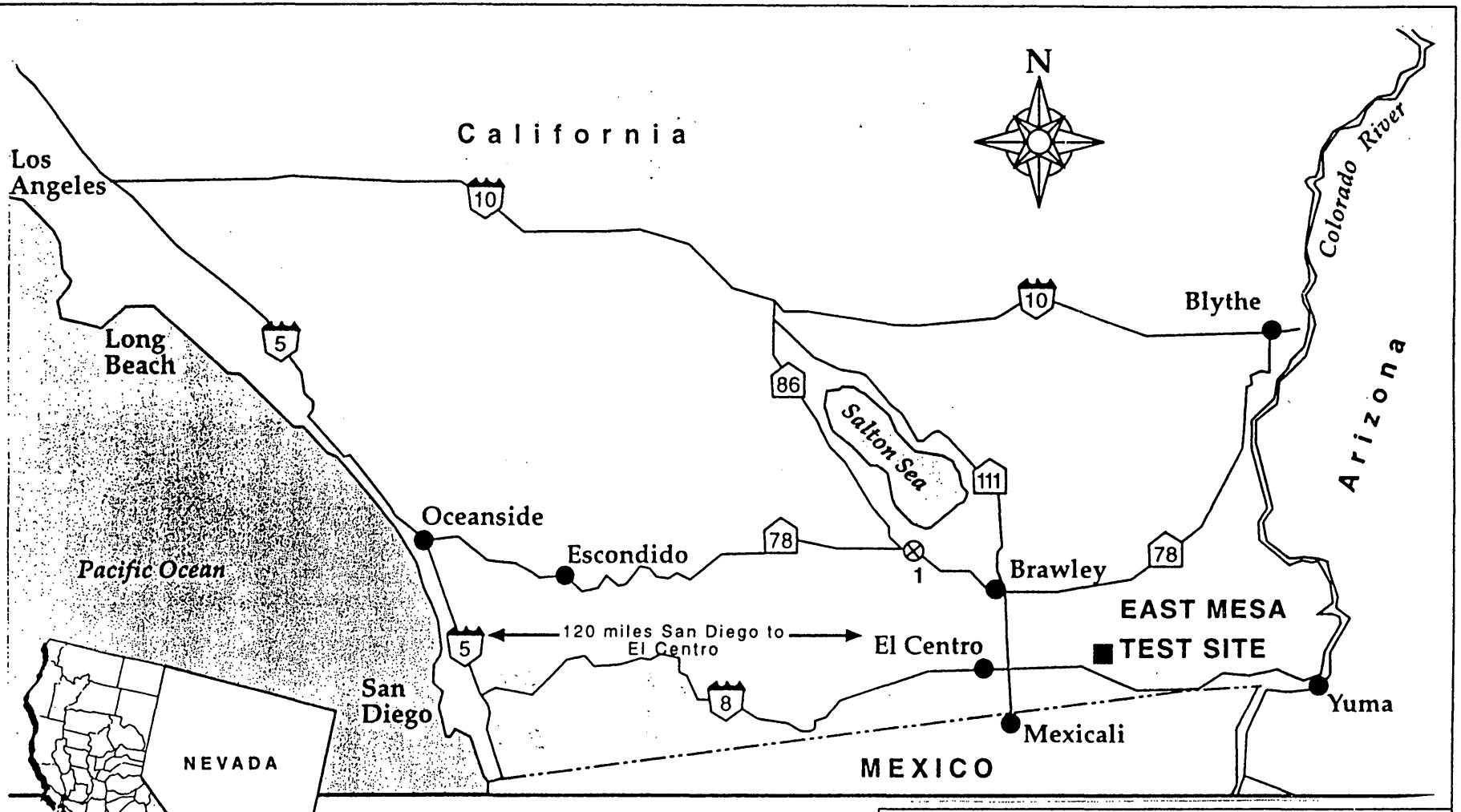
Since 1987, GTF had been a non-operational and abandoned experimental geothermal power generation and desalting facility situated on 82 acres of Bureau of Land Management (BLM) land in California's Imperial Valley. Experimental work was initiated at GTF in 1968 by the BLM. In 1978, DOE became the exclusive site operator with the DOE Office of Energy Efficiency and Renewable Energy (EE) as the operating office. DOE was granted a right-of-way agreement with the BLM to operate the site. Geothermal test activities were discontinued in 1987 and the facility was declared surplus by EE. In 1992, the issue of remediating the GTF site began to receive Congressional interest. DOE agreed in 1993 to remediate the site and return it to the BLM.

GTF consisted of a six-acre brine pond, a one-acre spray pond, two prefabricated buildings, fencing, cooling tower, septic system and drains, five production/injection wells, experimental apparatus, piping, concrete pads, and road base. From 1987 to 1997, the site was in a safe shutdown condition. Site investigation work by EE identified minimal contamination at the site. Contamination was found in the six-acre brine pond and consisted of a portion (less than one-acre) of the pond residue slightly above State of California acceptable contaminant levels for arsenic. In addition, asbestos was identified in the structures.

A Memorandum of Agreement for remediation of GTF was reached in 1995 between EE and the DOE Office of Environmental Restoration and Waste Management (EM). EE provided funding for building and legacy equipment demolition and removal activities, and for site restoration of the non-pond areas. EM provided funding for remediation and removal activities of the brine and spray ponds, and for returning the pond areas to a natural state. Four GTF geothermal wells and associated piping were transferred to adjacently located commercial geothermal companies. Environmental restoration activities were completed in 1997.

The restoration work at GTF was accelerated as a result of including GTF in the EM's Small Site Initiative. This initiative focused technical and financial resources at small DOE cleanup sites that could be completely remediated within a five year period, thereby reducing mortgage liability and overall project costs. Employing this initiative, using creative partnering and contracting approaches, recycling, and working closely with regulators and stakeholders resulted in completing the project well ahead of schedule and under budget.

J.N. 18904 DWG. NAME: 100GT1-1.DWG PLOT @ 1=100 DATE: 6-26-96 J.B.M.



⊗ Disposal Facility (Approximate Location)
1. Laidlaw Environmental

SOURCE:
URIBE & ASSOCIATES ENVIRONMENTAL CONSULTING SERVICES, 1996

OHM Remediation Services Corp.
SAN DIEGO, CALIFORNIA

SITE LOCATION MAP

EAST MESA GEOTHERMAL TEST FACILITY EL CENTRO, CALIFORNIA

DRAWN BY	DATE	CHK'D. BY	DATE
J.B.MOSS	6-26-96	D. OLSON	6-26-96
APP'D BY	DATE	PROJECT MANAGER	DATE
P. EVERDS	6-26-96	J. PEPIN	6-26-96

PROJECT NO. 18904 | FIGURE 1-1

Section 2

SITE INFORMATION

2.1 Physical Setting

The East Mesa Geothermal Test Facility encompassed approximately 82 acres in the Imperial Valley area of Imperial County, California, about 20 miles east of El Centro and 1.5 miles north of Interstate Highway 8 (Figure 1-1). The Imperial Valley is the largest desert irrigation development in the United States, with over 500,000 acres of otherwise arid desert lands which have been transformed into one of the most productive agricultural areas in the nation by the importation of Colorado River water. In addition to its agricultural value, the area serves as a significant source of geothermal power resources.

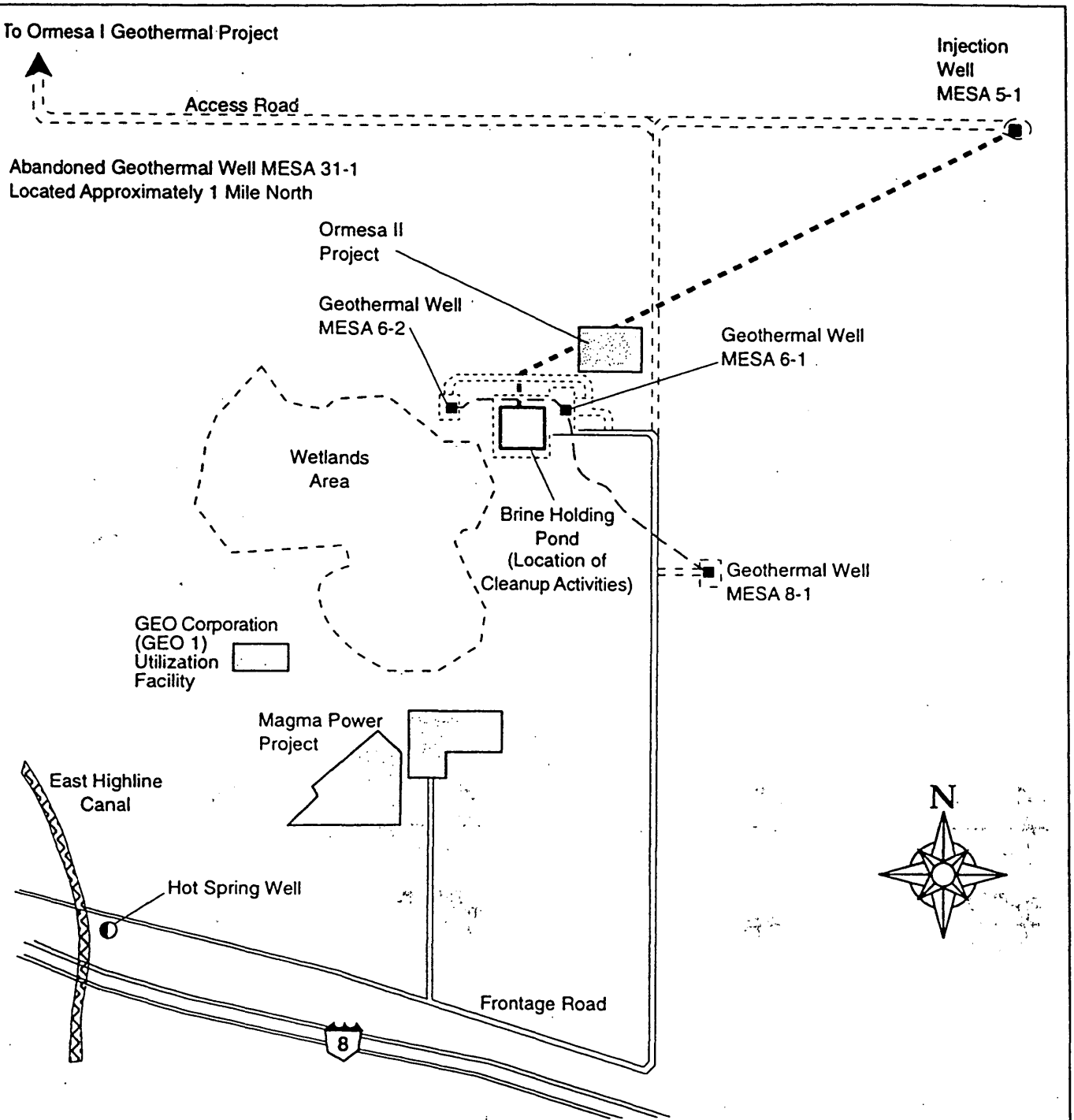
Vegetation in the East Mesa area is scarce and consists largely of scattered creosote bushes except along some of the larger washes where small desert hardwood trees, chiefly paloverde and desert ironwood, are abundant. The topography is relatively flat with a gradual slope that merges with the central Imperial Valley. The site elevation is approximately 28 feet above mean sea level. A north-south road running from the frontage road that parallels Interstate 8 provided access to the site.

The major man-made features at GTF included a six-acre brine pond, a one-acre spray pond, two prefabricated buildings, fencing, cooling tower, septic system and drains, five production/injection wells, experimental apparatus, piping, concrete pads, and road base. Prior to 1994, the responsibilities for four of the five geothermal wells had been shifted from DOE to local geothermal companies and the fifth well was plugged and abandoned. The major contaminated feature was the six-acre brine pond. Asbestos contamination was also identified in the structures.

The six-acre brine pond was located west of the buildings (Figure 1- 2). It was approximately square, 540 feet by 500 feet. An 8-foot high soil berm surrounded the pond. The pond side slope was 3:1 and the berm slope on the outside was 1.5:1 9 (horizontal to vertical). A 4- to 8-inch layer of brine sludge remained in the pond base after deactivation. The brine layer was underlain by a 6- to 9-inch protective sand layer over a 10-mil PVC liner. No free-standing liquid was present in the pond prior to and during remediation. The upper 2- to 4-inches of brine residues were dry and brittle underlain by moist brine residues with the consistency of a plastic clay.

2.2 Site Background/History

The US Bureau of Reclamation initiated studies of the geothermal resources at the East Mesa Site in 1968 as a potential method of augmenting the Lower Colorado River water supply. Operation of experimental desalting plants at the site began in 1972. DOE became the exclusive operator of the site in October 1978. Operation of three pilot-scale geothermal desalting plants were among numerous geothermal research activities performed at the site. The three pilot-scale plants included a vertical tube evaporator, a multi-stage flash evaporator, and a high temperature electrodialysis unit. The PVC-lined brine holding pond was installed in 1972 to temporarily store and evaporate brine blow down water and untreated brines extracted in the geothermal exploration process.



Source: EMO Limited Feasibilty Study, August 1992

0 1000 2000 3000

SCALE IN FEET

SOURCE:
URIBE & ASSOCIATES ENVIRONMENTAL CONSULTING SERVICES, 1996

OHM Remediation Services Corp.
SAN DIEGO, CALIFORNIA

SITE VICINITY MAP
EAST MESA GEOTHERMAL TEST FACILITY
EL CENTRO, CALIFORNIA

DRAWN BY	DATE	CHK'D. BY	DATE
J.B.MOSS	6-26-96	D. OLSON	6-26-96
APP'D BY	DATE	PROJECT MANAGER	DATE
P. EVERDS	6-26-96	J. PEPIN	6-26-96

PROJECT NO. 18904 | FIGURE 1-2

J.N. 18904 DWG. NAME: 100GT1-2.DWG PLOT @ 1=100 DATE: 6-26-96 J.B.M.

During site operations from 1972 to 1975, the waste brine was discharged into the holding pond. Loss rates from the pond due to evaporation were estimated to range from as high as 60 gallons per minute (gpm) in the summer to negligible amounts during the winter. The holding capacity of the pond was inadequate to handle increased site activities; consequently a waste brine injection system was installed in 1976. The holding pond was used intermittently after installation of the injection system, both to supplement the injection system, and to provide for brine disposal when the injection system was not in operation. The ponded brine was monitored monthly for dissolved oxygen, total dissolved solids, pH, and conductivity. Geothermal research activities at the site were discontinued by 1987 as commercial-scale geothermal power development matured in the region.

Field investigations and feasibility studies of the site that supply more detailed information can be obtained from the following sources:

Field Investigation Report, Bechtel Environmental, Inc., 1991. Report covering characterization of the brine pond residues and the health and safety monitoring, focusing on potential radiological concerns (Bechtel, 1991).

Limited Feasibility Study, Bechtel Environmental, Inc., 1992. Study of the development and analysis of four remedial action alternatives for remediation of the brine pond based on the Field Investigation Report (Bechtel, 1992).

Site Restoration Phase II Report, Dames and Moore, 1993. Report on the results of Phase I and Phase II site securing, safety, and sampling/analysis activities. Focused primarily on facilities and equipment (Dames and Moore, 1993).

2.3 Site Logistics/Contacts

Organization	Name	Phone No.
DOE EE Project Manger	Greg Collette	303-275-4734
DOE Headquarters EE Program Manger	Ray Fortuna	202- 586-1711
DOE EM Project Manger	Hemant Patel	510-637-1568
DOE Headquarters EM Program Manger	Rod Cummings	301- 903-7606
US Army Corps of Engineers Project Manager	Andy Winslow	402-293-2532
BLM Field Engineer	Larry Caffey	619-337-4425
Regional Water Quality Control Board Project Manager	Neal Krull	619-776-8942

2.4 Technology Application

Innovative technologies were not applied in the brine pond remediation because the excavation and off-site disposal alternative was determined to be the most cost and time effective remedial alternative.

Section 3

MATRIX AND CONTAMINANT DESCRIPTION

3.1 Matrix Identification

The contaminated matrix was limited to sand/residue in the six-acre brine pond. No contaminated groundwater at the site resulting from DOE operations was identified.

3.2 Regional Geology/Stratigraphy

The East Mesa Geothermal Test Facility is situated in the southern California desert on the eastern edge of the Imperial Valley. This valley is part of the topographic and structural trough (Salton Trough) in southeastern California. The Salton Trough is about 130 miles long and as much as 70 miles wide, with much of the land surface at an elevation below mean sea level. Surface drainage is north toward the lowest part of the trough which is occupied by the Salton Sea. The trough is a tectonically active feature with many faults within its boundaries, most notably the southeast-northwest trending San Andreas fault zone.

Broad alluvial fans and plains sloping to playas, creating closed dry drainage basins, are representative of the area. Frequent faulting in the area causes separation of basin-fill deposits. The basement complex consists of Precambrian to recent metamorphic and igneous rocks. The eastern shoreline of the prehistoric Lake Cahuilla is near the western boundary of the site. Surficial deposits are composed of unconsolidated deltaic sand, windblown sand, gravel, and silt.

The geographic and geologic controls that govern the occurrence, movement, and chemical quality of groundwater of the Salton Trough, specifically within the East Mesa area, vary widely. The variability of the chemical quality of the water contained in the rocks is due to differences in location with respect to the water table and opportunities for recharge, to compositional differences in sources of recharge, and to the high evaporation rate in the arid climate.

Some of the deeper groundwater in the area may be moderately altered connate ocean water. At the shallower depths, the water consists of evaporation residuals of water from prehistoric Lake Cahuilla or earlier freshwater lakes. These shallow aquifers are slightly saline because canal leakage and, to a much lesser extent, storm runoff have leached soluble evaporates from sedimentary rocks now above the water table.

3.3 Contaminant Characterization and Properties

The Bechtel Environmental, Inc. *Field Investigation Report* (Bechtel, 1991) presents a description of the field investigation and characterization activities conducted on the brine pond residues, health and safety monitoring procedures, and potential radiological concerns. The focus of the analytical work was to ascertain whether or not the residues could be considered hazardous by either the State of California or Federal regulations.

A total of one hundred samples were collected within the confines of the pond, and combined into 25 composite samples. The pond was divided into a 5 by 5 grid, and within each grid section, four samples were collected and composited. In addition, two sample duplicates were collected from the pond residues and two grab samples were collected from areas which appeared different from the bulk of the pond residues, resulting in a total of 29 samples.

The samples were analyzed for a variety of parameters including total soluble threshold limits for the seventeen metals listed under California Code of Regulations (CCR) Title 22. The soluble threshold limits for these metals were assessed using the California Waste Extraction Test (WET). Samples were tested for Resource Conservation and Recovery Act (RCRA) hazardous waste characteristics of ignitability, corrosivity, toxicity (Toxicity Characteristic Leaching Procedure [TCLP]), and reactivity. Gross alpha and gross beta radiation counts, as well as oil and grease, total petroleum hydrocarbons (TPH), and the California 96-hour static acute bioassay tests were performed.

Oil and grease and total petroleum hydrocarbons were present at negligible levels, with all values well below 100 mg/kg. At only three of the twenty seven locations examined, arsenic concentrations were at or slightly above the soluble threshold limits (5.0 mg/L for arsenic).

Naturally Occurring Radioactive Material (NORM) was also identified in the brine pond residue. In order to investigate radiological concerns, comprehensive sampling and analysis were conducted continuously during field activities. Gross alpha ranged between 8,200 and 180,000 pCi/kg, with gross beta counts between 2,300 and 170,000 pCi/kg.

Inhalation exposures to long-lived radioactive particulate matter derived from air sampling were well below the occupational limit of 4.25×10^{-12} μCi/mL for continuous exposure. The maximum limit of detection for any sample was 9×10^{-13} μCi/mL.

External gamma radiation dose rates obtained from site surveys and absorbed dose measurements were approximately 0.03 mrem/hr. The average of the absorbed dose measurements taken during this project on the pond surface at 1 meter elevation was 0.026 mrem/hr. This is about 1 percent of the annual limit for continuous occupational exposure. As a result, no external personal dosimetry, record keeping, or access time limitations were required for work on this site based upon external exposure considerations.

Environmental monitoring results were similar to personnel sampling results. All three samples collected contained less than the minimum detectable concentration (MDC). MDCs ranged from 1.7×10^{-14} μCi/mL to 5×10^{-14} μCi/mL. The MDC for environmental samples was less than that for personnel air samples because of larger air collection volumes.

Three brine pond samples were selected at random from the 29 samples collected during the field investigation, and each sample was subjected to the California WET with the exception that deionized water was substituted for the standard citric acid reagent. The extraction test was conducted with a 1:10 ratio (weight: volume) of soil to extraction fluid. The water wash produced a total dissolved solids (TDS) content of about 16,000 mg/L, composed almost entirely of sodium chloride.

The results of the characterization of brine pond residue were:

- The brine residue was not a RCRA-defined hazardous waste based on characteristics of ignitability, corrosivity, toxicity, and reactivity.
- The brine residue was not a California-defined hazardous waste based on Total Threshold Limit Concentration (TTLC) analytical results and California 96-hour static acute bioassay tests.
- Soluble Threshold Limit Concentration (STLC) analytical results indicated soluble concentrations of the 17 California Code of Regulations (CCR) Title metals were below regulatory limits except for arsenic.
- Soluble arsenic was detected at or above the California hazardous waste regulatory limit of 5.0 mg/L in 3 composite samples.
- TPH (EPA Method 418.1) and oil and grease (EPA Method 413.2) were below California typical soil cleanup levels.
- TDS concentration of brine residue was approximately 16,000 mg/L.
- NORM levels met US Department of Transportation Hazardous Materials Transportation regulations [49 Code of Federal Register (CFR) 171-78]. At that time there were no Federal or California regulations for NORM waste.
- The State of California required off-site disposal at a Class I disposal facility because of the geothermal origin and associated concentration of NORM of the waste.

3.4 Nature and Extent of Contamination

Soil contamination was found to be contained within the perimeter of the brine pond. The brine pond was surrounded by 8-foot high soil berm. The pond was underlain by a 6- to 9- inch protective sand layer over a 10-mil PVC liner. Confirmatory sampling verified that the liner was effective in preventing the vertical migration of contaminants. The contaminant characterization is reviewed above.

No groundwater contamination was identified.

Section 4

REMEDIATION SYSTEM DESCRIPTION

The non-pond area materials were removed, recycled, and/or disposed. The project scope consisted of the following:

- Asbestos abatement of pipe insulation, transite cooling tower boards, and floor tiles
- Testing and removal of septic system
- Removal of concrete pads, floor slabs, and pipe supports
- Demolition of the shop building and office/lab building
- Demolition of storage tanks
- Demolition of piping materials
- Demolition of equipment such as cooling tower, electrical duct banks, and platforms
- Removal of asphalt paving
- Removal of boundary fencing
- Plug and abandon or transfer to local industries all geothermal or other wells
- Removal of buried construction materials

The brine pond residue was excavated using conventional equipment and loaded in dump trucks. Due to the geothermal origin of the waste and associated concentration of NORM, off-site disposal was required at a Class I disposal facility. The Westmoreland Landfill was the only disposal facility in southern California permitted to accept NORM geothermal waste streams. Disposal sites were also evaluated in Arizona, but due to permitting and transportation issues, they were not selected. The waste was transported in covered semi-end dump trucks. Transportation and disposal activities were initiated on October 1, 1996 after completion of waste profile documents. Hauling and disposal activities were completed on November 8, 1996. Appendix A shows photographs before, during, and after remediation of the brine pond residue.

Four geothermal wells were transferred to commercial companies operating in the vicinity of the GTF project. BLM approved the transfer of the wells identified as 5-1, 6-1, 6-2, and 8-1 in a letter dated 10/4/93 (Appendix B). The transfer released DOE from the responsibility of the ultimate disposition of the four wells and from including the wells in the GTF remediation effort. The commercial companies accepted the ultimate responsibility of plugging the wells when they were no longer in operation.

Section 5

REMEDIATION SYSTEM PERFORMANCE

The non-pond area demolition and restoration project was successfully completed through EE during 1996. About 300 cubic yards of material was disposed in a local landfill. The remaining material was recycled. Recycled material included:

- 1400 cubic yards of concrete
- 550 cubic yards of asphalt
- 150 tons of scrap metal, including 2.4 miles of pipe
- Laboratory and warehouse buildings taken down and reused
- 10,000 gallon water tank
- 780 feet of chain link and barbed wire fencing
- One mile of copper wire
- Septic tank

Successful brine pond residue excavation, transportation, and off-site disposal and the subsequent site restoration of the brine pond at GTF was performed by OHM Remediation Services Corp. (OHM). EM contracted the Army Corps of Engineers (Corps) to remediate the brine pond and the Corps contracted with OHM to perform the actual remediation work.

Detailed information on the GTF remediation system performance can be obtained from the *Final Report for Geothermal Test Facility Restoration* (DOE, 1996) and the *Final Closure Report - East Mesa Geothermal Test Facility - El Centro, California* (OHM, 1996).

Section 6

REMEDIATION SYSTEM COSTS

During the 1994 appropriations process, language was added to the Senate Energy and Water Development Appropriation allowing the expenditure of up to $5M to restore GTF as an expedited response action. EE originally estimated post-1993 non-pond remediation costs to be $.6M and EM originally estimated pond remediation and associated project management costs to be $3.6M, for a total DOE remediation cost of $4.2M. EE post-1993 actual remediation costs totaled $.5M and EM actual remediation costs totaled $2.7M, for a total post-1993 DOE remediation cost of $3.2M. From 1991 through 1993, EE incurred $415K in remediation costs for pond assessments, building interior cleanups, a limited feasibility study, and Phase I and II remediation efforts.

The EE portion of the GTF Demolition Project total budget for 1996 was $620,000. The project was broken into four distinct areas; demolition and disposal, testing and sampling, travel, and State of California Water Board Annual Fee. The actual total project cost was $485,268 ($456,494 for demolition and disposal, $17,816 for testing and sampling, $6958 for travel, and $4000 for State of California Water Board Annual Fee).

Most of the non-pond area remediation cost savings can be attributed to the recycling of concrete, asphalt, and iron pipe. Disposal of the concrete and asphalt in a landfill would have cost $32 per cubic yard. Instead it was recycled at a cost of about $10 per cubic yard. The iron pipe was sold to a recycling company which included the removal of the pipe from the site.

The EM budget for remediation of the brine pond was $3.6M. Actual remediation costs totaled $2.7M for a cost saving of $909K. These cost savings were realized by utilizing local companies, proactive procurement processes, forming an Interagency Agreement (IAG) with the Corps that had programs in place to effectively remediate a site such as GTF, and the Corps Rapid Response Contract with OHM. Brine pond residue remediation cost savings are summarized below:

Activity	**Savings**
Compressed schedule from three years to one year	$325K
Completed project management requirements by DOE Project Manager	$84K
Aggressively negotiated disposal fees	$344K
Negotiated immediate use of Construction Work Plan	$5K
Eliminated requirement for imported backfill material	$50K
Negotiated deal with local operator to use their nearby water supply at no cost	$40K
Used loader and dozer for multiple purposes, reduced mobilization costs	$10K
Aggressively negotiated reduced rate for waste transportation	$40K
Utilized primarily local labor	$6K
Utilized site Supervisor and Foreman to perform multiple duties	$5K
Total:	**$909K**

Section 7

REGULATORY/INSTITUTIONAL ISSUES

Regulators and stakeholders were involved directly throughout the remediation process at GTF. Remedial Actions Objectives (RAOs) were established early with all involved parties participating so cleanup activities proceeded forward expeditiously. There were no prolonged review time/decision making periods. Everyone knew what the end goal was and how to most effectively reach that goal. Through the Small Sites Initiative, sufficient funding was provided so work could keep progressing forward.

Appendix B contains a copy of the letter from the BLM that documents the transfer to commercial companies, with subsequent operation and ultimate responsibility for plugging, four geothermal wells known as 5-1, 6-1, 6-2, and 8-1. The letters from the commercial companies accepting responsibility are included. This letter also contains the acceptance of responsibility by a commercial company for the removal of cyclone fence at well site 31-1. The original well 31-1 was previously plugged and abandoned.

Appendix C contains copies of the letters from the California Regional Water Quality Control Board rescinding Cleanup and Abatement Order No. 96-023 and Waste Discharge Requirements Order No. 89-027. With the rescission of these orders, EM had completed its restoration activities at GTF.

Appendix D contains a copy of the formal relinquishment and termination by the BLM of the right-of-way reservation for GTF.

Section 8

SCHEDULE

The original schedule to complete remediation activities at GTF in 1999 was aggressive considering the site was not accepted into the EM program until 1994. With the infusion of the Small Sites Initiative funding, all remediation activities were completed by 1997. The mobilization, brine waste removal and disposal, and demobilization were completed over a three month period from August 19, 1996 to November 15, 1996.

Section 9

OBSERVATIONS AND LESSONS LEARNED

Factors that made the GTF remediation project a success are:

- Regulators and stakeholders involved directly early and throughout the remediation process at GTF.
- RAOs established activities early with all involved parties participating so cleanup activities proceeded forward expeditiously.
- Prolonged review time/decision making periods avoided.
- Sufficient funding provided (via Small Sites Initiative) so work could keep progressing forward.
- Recycled concrete, asphalt, iron pipe, and buildings.
- Transferred geothermal wells to private companies.
- Used local contractors.
- Utilized proactive procurement processes.
- Formed IAG with the Corps that had programs in place to effectively remediate a site such as GTF.
- Enacted Corps Rapid Response Contract with OHM.

Section 10

REFERENCES

Bechtel Environmental, Inc., 1991. *Field Investigation Report - Field Activities at US Department of Energy's Former Geothermal Test Facility Near El Centro, California.* November 1991.

Bechtel Environmental, Inc., 1992. *Limited Feasibility Study Remedial Activities at US Department of Energy's Former Geothermal Test Facility Near El Centro, California.* August 1991.

Dames and Moore, 1993. *El Centro Geothermal Test Component Facility Site Restoration Phase II Report.* June 1993.

US Department of Energy, 1996. *Final Report for Geothermal Test Facility Restoration (Not Including Pond Area).* June 1996

OHM Remediation Services Corp., 1996. *Final Closure Report - East Mesa Geothermal Test Facility - El Centro, California.* December 1996.

Section 11

VALIDATION STATEMENT

This analysis accurately reflects the performance and cost of remediation at the East Mesa Geothermal Test Facility. Regulator acceptance of remediation is documented in the Appendices C and D.

Rod Cummings
DOE HQ Program Manager
Oakland Operations

APPENDIX A

SITE PHOTOGRAPHS

Brine pond prior to remediation

Brine residue being removed from pond

Brine residue being removed from pond

Brine residue being removed from pond

Brine residue removed and berms flattened

Pond filled with clean material

APPENDIX B

GEOTHERMAL WELL TRANSFERS

United States Department of the Interior

BUREAU OF LAND MANAGEMENT
California State Office
2800 Cottage Way, Room E-2845
Sacramento, California 95825-1889

TAKE PRIDE IN AMERICA

IN REPLY REFER TO:
CACA-5427
CACA-6218
CACA-6219
CACA-17568
3200
CA-922.5

OCT 04 1993

Mr. Jeffrey M. Baker, Director
ES&H/Operations Division
U.S. Department of Energy
1617 Cole Blvd.
Golden, Colorado 80401-3393

Dear Mr. Baker:

In our continuing efforts to assist the Department of Energy (DOE) with the reclamation of the East Mesa Geothermal Test Facility (EMGTF), we are providing you with the four enclosed documents which will resolve the issues surrounding the continued use and eventual plugging of four (4) geothermal wells on East Mesa. The attached letters are from the federal lessees at East Mesa and address the ultimate responsibility for plugging geothermal wells identified as 5-1, 6-1, 6-2, and 8-1, as long as the lessee may continue to utilize the wells in their current operations. From our standpoint, these letters shift the responsibility of the wells from the DOE to the lessees. As such, this letter is to inform you that the DOE is no longer responsible for the ultimate disposition of these four wells and so we will not require the DOE to address these wells through the decommissioning of the EMGTF.

The acceptance of this responsibility by the lessees provides benefits to both the federal government and the lessees in several ways. First, the financial burden associated with the plugging and abandonment of the four (4) geothermal wells (estimate to total over $300,000) is shifted from the DOE to the lessees. At the same time, however, the lessee benefit from the continued exclusive use of the wells for injection. This use has an estimated value of between $250,000 and $500,000 per well since this is what the lessees would spend to drill and complete a new well to maintain their existing level of operations. The current level of federal royalties, more than $3.5 million per year, is also maintained since the lessees will not have to scale down production until new injection wells are drilled and completed.

A summary of the specific responsibilities willing to be accepted by each individual lessee, as identified in the enclosed documents, is as follows:

CACA-6218:

East Mesa Partners (EMP) is willing to accept the responsibilities associated with well 5-1. In addition, AMOR 12 Corporation, a sublessee of EMP, is willing to accept the responsibilities associated with wells 6-1, and 6-2, along with certain specific portions of pipelines connected to wells 6-1 and 6-2. Neither EMP or AMOR 12 Corporation are willing to accept any responsibilities associated with the equipment, buildings, ponds, or other appurtenant structures at the EMGTF.

CACA-6219:

GEO East Mesa Limited Partnership is willing to accept responsibility for well 8-1.

CACA-17568:

Ormesa Geothermal is willing to accept the responsibility for the removal of the cyclone fence surrounding wellsite 31-1 pad. The original DOE 31-1 well was plugged and abandoned last year by the lessee so no additional well plugging responsibilities are associated with this site.

Through this letter, we are documenting that the subject lessees, along with their future interests or assignees, will retain the responsibilities accepted herein. Therefore, BLM will not require DOE to plug and abandon the four wells or remove the specific pipelines and other appurtenant structures described in the enclosed documents as part of DOE's actions to reclaim the EMGTF.

We will continue to work with both DOE and the lessees during the entire EMGTF reclamation process to ensure that each party to this arrangement is fulfilling their part. We hope that the DOE will now proceed in an expeditious manner to complete the required reclamation of the EMGTF.

Please contact Sean E. Hagerty, in the Division of Mineral Resources, at (916) 978-4735 if you have any questions associated with the contents of the enclosed documents or DOE's remaining responsibilities associated with the EMGTF.

Sincerely,

(Ag) Jean Rivers - Council
ACTG

Ed Hastey,
State Director

4 Enclosures
Encl 1 - Letter from East Mesa Partners dtd 2/15/93 (4 pps)
Encl 2 - Letter from Geo East Mesa dtd 2/17/93 (2 pps)
Encl 3 - Letter from Ormesa Geothermal dtd 5/12/93 (2 pps)
Encl 4 - Letter from East Mesa Partners dtd 5/14/93 (9 pps)

cc: w/enclosures
CA-064
CA-065
CA-067
WO-610
Ray Fortuna, DOE
Michael J. Perry, PSC Geothermal Services
Michael B. Pierce, ORMESA Operators
Leo Allegranza, Mission Operations & Maintenance
Robert E. Perdue, California Regional Water Quality Control Board, Colorado River Region

East Mesa Partners

February 15, 1993

Mr. Sean Hagerty
Bureau of Land Management
California State Office -- Minerals
2800 Cottage Way
Sacramento, California 95825

Re: Federal Geothermal Resource Lease CACA-6218

Dear Mr. Hagerty:

East Mesa Partners is the lessee under Federal Geothermal Resource Lease CACA-6218 (the "Lease"). The Department of Energy holds Right-of-Way Reservation CACA-5427 (the "ROW") for its East Mesa Geothermal Test Facility, over lands included within the Lease.

The Department of Energy has indicated that it intends to relinquish geothermal wellsite and well DOE 5-1 from the ROW, and the Bureau of Land Management has indicated that it will agree to recognize such relinquishment and to transfer all surface and subsurface rights so relinquished by the Department of Energy to East Mesa Partners upon acceptance by East Mesa Partners of certain rights and responsibilities with respect to abandonment of well DOE 5-1. Special Stipulation 8 of the Lease provides for such a transfer contingent upon East Mesa Partners' acceptance of such responsibilities.

By this letter, East Mesa Partners hereby acknowledges its acceptance of the DOE 5-1 well and wellsite abandonment responsibilities pursuant to Special Stipulation 8 of the Lease. This acceptance is limited to geothermal well DOE 5-1 and those lands surrounding well DOE 5-1 expressly described in the attached Exhibit A, and specifically excludes responsibility with respect to any other wells or wellsites or the underground concrete

P.O. Box 86 ▬ Holtville, CA 92250 Phone (619) 356-4551 ▬ FAX (619) 356-5286

injection pipeline located within the lands described in the attached Exhibit A. In that regard, this letter supersedes and replaces in its entirety the letter from East Mesa Partners to you dated August 7, 1991.

Sincerely,

EAST MESA PARTNERS
a California general partnership

By ACME Ormesa II Partners, L.P.,
a California limited partnership
Managing Partner

By NP Ormesa II, Inc.,
a California corporation
Managing General Partner

By _____
Name Randall Goltstein
Title VP

cc: Jeffrey Baker -- U.S. Department of Energy, Golden, Colorado
Michael B. Pierce -- Ormesa Operators, Holtville, California
Dwight Carey -- EMA, Brea, California

Exhibit A

TESCO
TECHNICAL ENGINEERING & SURVEYING COMPANY
1560-I Ocotillo Drive - Post Office Box 3306
El Centro, California 92244
TEL (619) 352-2716 - FAX (619) 352-2917

PROFESSIONAL LAND SURVEYOR
HARRISON P. GIBSON
No. 5397
9-30-92
STATE OF CALIFORNIA
4/5/91

LEASE SURVEY
LEGAL DESCRIPTION
MESA 5-1 WELL SITE

That portion of Section 5, Township 16 South, Range 17 East and Section 32, Township 15 South, Range 17 East, San Bernardino Meridian, Imperial County, California according to Department of Interior, Bureau of Land Management Right-of-Way Serial No. CA-5427 and depicted on Right-of-Way Survey Drawings entitled TESCO, Geothermal Component Test Facility, East Mesa, located in said Townships, Range, County and State, consisting of three sheets attached to and made a part of said Serial No. CA-5427, being more particularly described as follows:

Commencing at the Northeast corner of said Section 5;

Thence along the North line of said Section 5 SOUTH 89° 50' 29" WEST a distance of 399.81 feet (South 89°50'27" West 399.87 feet per CA-5427) to the TRUE POINT OF BEGINNING;

Thence along the Easterly boundary of said Right of Way NORTH 05° 52' 34" EAST a distance of 50.22 feet (North 05°52'45" East 50.28 feet per CA-5427) to an angle point;

Thence along the Northerly boundary of said Right of Way parallel with the North line of said Section 5, SOUTH 89° 50' 29" WEST a distance of 353.40 feet (South 89°50'27" West 353.28 feet per CA-5427) to an angle point;

Thence along the Westerly boundary of said Right of Way SOUTH 05° 51' 54" WEST a distance of 50.22 feet (South 5°52'45" West 50.28 feet per CA-5427) to the point of intersection with the North line of said Section 5;

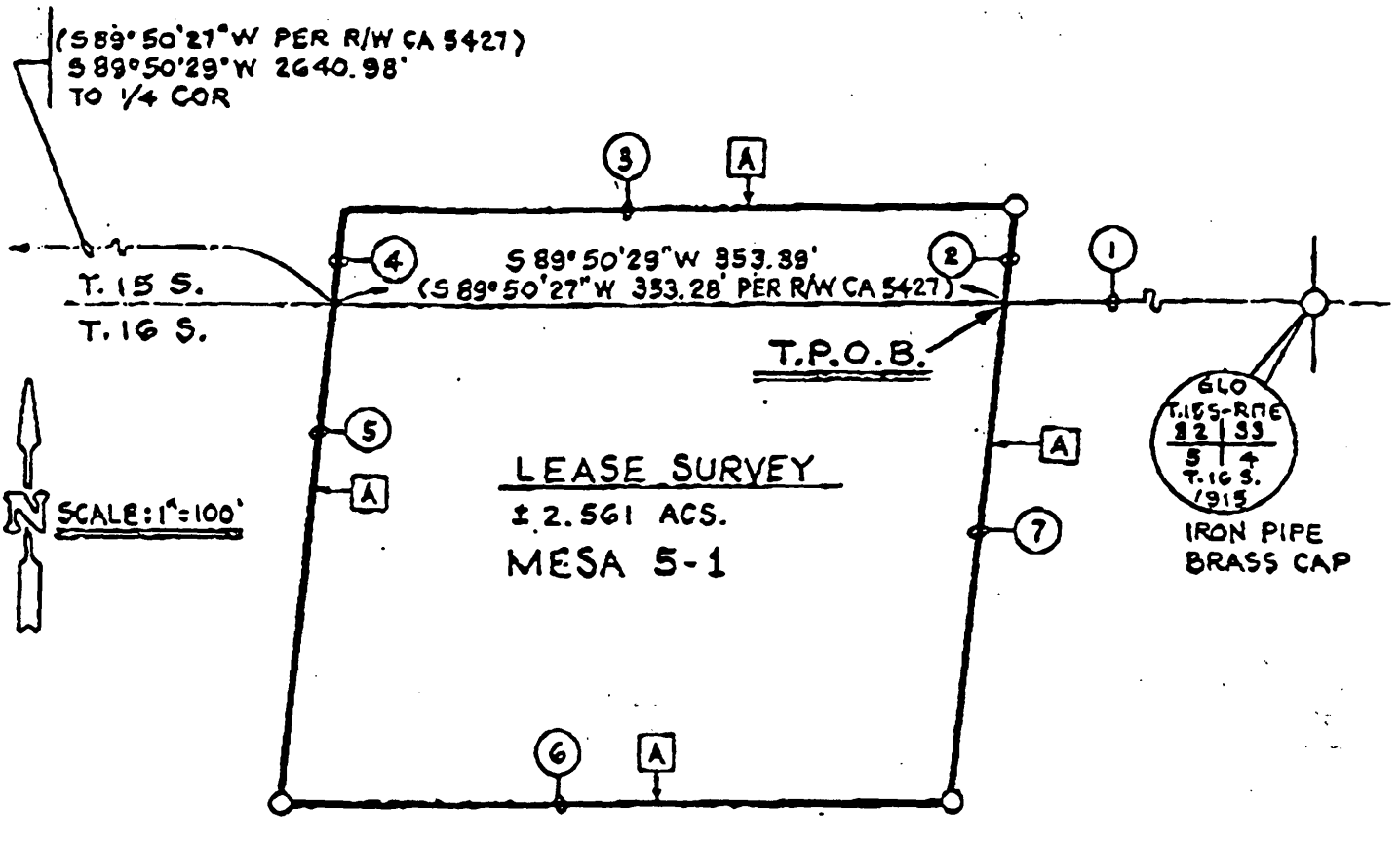
Thence continuing along said Right of Way boundary SOUTH 05° 51' 54" WEST a distance of 267.32 feet (South 5°52'45" West 267.00 feet per CA-5427) to an angle point;

Thence continuing along said Right of Way boundary NORTH 89° 48' 26" EAST a distance of 353.36 feet (North 89°50'27" West 353.28 feet per CA-5427) to an angle point;

Thence continuing along said Right of Way boundary NORTH 05° 52' 34" EAST a distance of 267.11 feet (North 5°52'45" East 267.00 feet per CA-5427) to the TRUE POINT OF BEGINNING.

Containing 2.561 Acres, more or less.

Exhibit A



(1) S 89°50'29"W 399.81'
(S 89°50'27"W 399.87' R/W CA 5427)

(2) N 05°52'34"E 50.22'
(N 05°52'45"E 50.28' R/W CA 5427)

(3) S 89°50'29"W 353.40'
(S 89°50'27"W 353.28' R/W CA 5427)

(4) S 05°51'54"W 50.22'
(S 05°52'45"W 50.28' R/W CA 5427)

(5) S 05°51'54"W 267.32'
(S 05°52'45"W 267.00' R/W CA 5427)

(6) N 89°48'26"E 353.36'
(N 89°50'27"W 353.28' R/W CA 5427)

(7) N 05°52'34"E 267.11'
(N 05°52'45"E 267.00' R/W CA 5427)

LEGEND

○ 1½" IRON PIPE TAGGED RCE 27137 PER TESCO PROJECT 79-S-148, EXCEPT WHERE NOTED OTHERWISE.

(2) LINE CALL DESIGNATION.

[A] EXISTING BLM PERMITTED RIGHT OF WAY BOUNDARY PER CA 5427 FOR YARD AREA.

( ) RECORD BEARING AND DISTANCE PER PERMIT SERIAL NUMBER NOTED.

PROFESSIONAL LAND SURVEYOR
HARRISON B. CLOPTON
No. 5197
9/30/92
STATE OF CALIFORNIA

REF: TESCO PROJECT 79-S-148

TESCO
SURVEYORS AND ENGINEERS
P O BOX 3306, EL CENTRO, CA 92244
PH. NO. (619) 352-2716

LEASE SURVEY
POR. SECTION 5, T.16S., R.17E., S.B.M., IMPERIAL COUNTY, CALIFORNIA

BY: J. FAVILA
DATE: 2-8-91
CHK'D: H. BARTON
REF(S): 79-S-148
JOB NO.

Geo East Mesa Limited Partnership

18101 Von Karman Avenue, Suite 1700 • Irvine, California 92715-1007
(714) 752-5588 • Fax: (714) 752-5624

Richard M. Banister
Executive Director

February 17, 1993

Sean E. Hagerty
Geologist, Geothermal Program Lead
Bureau of Land Management
Federal Building
2800 Cottage Way
Sacramento, CA 95825

Dear Mr. Hagerty:

GEO East Mesa Limited Partnership (GEMLP) would like to indicate its desire and willingness to assume responsibility and liability for the geothermal well in Section 8, Township 17 East, Range 16 South, San Bernardino Base & Meridian known as Department of Energy (DOE) Mesa 8-1 (API Number 02590041). (See attached map.)

The well was drilled in 1974 by the DOE (then the Bureau of Reclamation) as part of its East Mesa Geothermal Test Facility (GTF). However, in late 1991, GEMLP took over operation of the shut-in well and converted it to an injector for use in its East Mesa Geothermal Field operation. On November 24, 1992, GEMLP received a letter indication the DOE's intention to decommission the GFT and abandon all associated facilities, including well 8-1, within 90 days. If permission is granted by the DOE to do so, GEMLP will assume all future responsibility for operation and maintenance of the well and will plug and abandon it in accordance with requirements of the Bureau of Land Management at such time as GEMLP deems necessary, in GEMLP's sole discretion.

Sincerely,

Richard M. Banister

RMB:kab
geo.069

ORMESA GEOTHERMAL

4G00 Kruse Way Place • Building One, Suite 255 • Lake Oswego, OR 97035 • (503) 636-9620 • FAX (503) 697-0288

May 12, 1993

Mr. Sean Haggerty
Bureau of Land Management
California State Office
2800 Cottage Way
Sacramento, California 95825

RE: Geothermal Resources Lease CA-17568

Dear Mr. Haggerty:

Ormesa Geothermal ("Ormesa Geothermal") is lessee under Geothermal Resources Lease CA-17568 ("the Lease"). The Department of Energy ("DOE") holds Right of Way Reservation CA-5427 ("the ROW") for its East Mesa Geothermal Test Facility, over lands included within the Lease.

By letter to you dated April 23, 1991, Ormesa Geothermal agreed contingent on DOE's concurrent ROW relinquishment of Wellsite 31-1 to accept certain well abandonment responsibilities in accordance with Lease Special Stipulation 8 for the Wellsite 31-1 ("Abandonment Responsibilities"). In that the Abandonment Responsibilities have been satisfactorily completed without benefit of the above described DOE ROW relinquishment, this letter retracts, supercedes and replaces in its entirety the letter from Ormesa Geothermal to you dated April 23, 1991.

Notwithstanding the completion of the Abandonment Responsibilities your office has informed Ormesa Geothermal that "cyclone fencing" installed by the DOE around the perimeter of Wellsite 31-1 is still in place ("Fencing"). Because Ormesa Geothermal desires the Fencing to remain to benefit its present and future operations under the Lease, Ormesa Geothermal hereby agrees to accept responsibility for its final removal in accordance with the terms of the Lease. Ormesa Geothermal's acceptance herein is expressly limited to the Fencing and it shall not be responsible for abandonment, remediation or reclamation of any

facilities, wells, wellsite areas, property, items, structures, improvements, lands, materials, wastes, pollution or any other thing associated with the ROW, whether located within or without of the ROW.

Sincerely,

ORMESA GEOTHERMAL

By: ORMAT GEOTHERMAL, INC.
Managing Partner

By: _____

Its: Secretary

Acknowledged and agreed to this _____ day of _____, 1993
Bureau of Land Management, California State Office

By: _____
Its: _____

cc: Jeffrey Baker - U.S. Department of Energy, Golden, Colorado
Mike Perry - PSC Geothermal, Holtville, California
Dwight Carey - EMA, Brea, California

11079R

East Mesa Partners

May 14, 1993

Mr. Sean Hagerty
Bureau of Land Management
California State Office
2800 Cottage Way
Sacramento, California 95825

RE: Federal Geothermal Resources Lease CA-6218

Dear Mr. Hagerty:

East Mesa Partners ("Lessee") is lessee under Geothermal Resources Lease CA-6218 ("the Lease"). AMOR 12 Corporation ("Sublessee") is sublessee under the Lease in accordance with a Transfer of Operating Rights (Sublease) in a Lease for Oil and Gas or Geothermal Resources effective August 1, 1988 ("Sublease"). The Department of Energy ("DOE") holds Right of Way Reservation CA-5427 ("the ROW") for its East Mesa Geothermal Test Facility, over lands included within the Lease and Sublease.

Lessee and the DOE have reached verbal agreement concerning certain current and future uses, operations and abandonment responsibilities relating to Well Mesa 6-1 and Well Mesa 6-2 and their appurtenant well cellars and pipelines (collectively "Wellsites 6-1 and 6-2") currently located within the ROW. Wellsites 6-1 and 6-2 are currently utilized by or available to support Sublessee's Ormesa IH Geothermal Project. The agreement is limited to the following site-specific facilities of Wellsites 6-1 and 6-2: a steel 10 inch diameter geothermal fluid pipeline, pipeline supports, a concrete pipeway, two concrete cellar boxes, a concrete slab, two wellbores, and two wellheads, each as further described, and only to the extent so described, in the surface facilities description and survey attached hereto as Exhibits A and B and hereby incorported herein (as so described, the "Wellsite Facilities"). The Wellsite Facilities do not include the various materials scattered about in the vicinity of the Wellsite Facilities. In consideration for DOE's and BLM's agreement and continuing commitment to allow Lessee, Sublessee and their respective successors and assigns, the continued uninterrupted use and enjoyment of Wellsites 6-1 and 6-2, including the free and unimpeded ingress and egress thereto granted in the Lease, Lessee and Sublessee agree to accept certain well abandonment responsibilities but only with respect to the Wellsite Facilities, such well abandonment responsibilities to be in accordance with the provisions of Special Stipulation 8 of the Lease.

Lessee's and Sublessee's acceptance herein is expressly limited to the Wellsite Facilities. Lessee and Sublessee shall not be responsible for abandonment, remediation, or reclamation of any facilities, wells, wellsites, areas, property, items, structures, improvements, lands, materials, wastes, pollution, or any other thing associated with the DOE East Mesa Geothermal Test Facility, whether located within or without the DOE ROW (other than the specific Wellsite Facilities) including without limitation the following: the administration building; the maintenance

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building; all graded, paved, or other surfaced areas; the main test pad and associated facilities; the geothermal fluid (brine) holding pond and associated facilities; the emergency spray pond; the cooling tower and associated facilities; all geothermal fluid separators, pipelines, (including without limitation the discontinuous portions of the DOE pipeline which lays on the same pipe supports as the pipeline described as part of the Wellsite Facilities) channels, trenches and handling equipment; all chemical handling facilities, including the propane and gasoline tanks and storage areas, the laboratory chemical waste dump, and the flammable materials storage area; monitoring and water wells; the Sperry facility; and the equipment storage yard.

Sincerely,

EAST MESA PARTNERS,
a California general partnership

By: ACME Ormesa II Partners, L.P.,
a California limited partnership
Managing Partner

By: NP Ormesa II, Inc.,
a California corporation,
Managing Partner

By: Steven Bookspan
Name: STEVEN BOOKSPAN
Its: ASST. SECRETARY

Joined into and approved
AMOR 12 Corporation
a Delaware corporation

By: T Cooke
Name: Theodore C. Cooke
Its: Secretary

Acknowledged and agreed to this _____ day of _____, 1993
Bureau of Land Management, California State Office

By: _____
Name: _____
Its: _____

cc: Jeffrey Baker - U.S. Department of Energy, Golden, Colorado
Michael B. Pierce - Ormesa Operators, Holtville, California
Dwight Carey - EMA, Brea, California

EXHIBIT "A"

SURFACE FACILITIES DESCRIPTION

Those certain surface facilities located in a portion of Section 6, Township 16 South, Range 17 East, San Bernardino Meridian, County of Imperial, State of California, described as follows:

COMMENCING at the Southeast corner of said Section 6;

THENCE along the East line of said Section 6 **NORTH 00°06'54" WEST** 712.00 feet to a point;

THENCE departing from said East line **NORTH 89°59'18" WEST** 33.00 feet to the Southeast corner of the Department of Interior, Bureau of Land Management Permit numbers CA 5427 and CA 24678, said CA 24678 being on file as Document No, 89-15594 recorded September 22, 1989 in Book 1632, Page 1528, Official Records of Imperial County, California;

THENCE along the South line of said Permits CA 5427 and CA 24678 **NORTH 89°59'18" WEST** 2118.18 feet to an angle point in said CA 5427 permit boundary;

THENCE continuing along said Permit CA 5427 boundary **NORTH 00°03'00" WEST** 692.32 feet to an angle point in said permit boundary;

THENCE continuing along said Permit CA 5427 boundary **NORTH 88°05'05" WEST** 525.93 feet to a point in said boundary;

THENCE departing said Permit CA 5427 boundary **NORTH 00°48'56 EAST** 21.88 feet to the Southwest corner of concrete cellar box encompassing Geothermal Well Mesa 6-2, and **TRUE POINT OF BEGINNING;**

THENCE along West edge of said cellar box **NORTH 00°48'56" EAST** 13.96 feet to the Northwest corner thereof;

THENCE along North edge of said cellar box **SOUTH 89°26'06" EAST** 9.98 feet to the Northeast corner thereof;

THENCE along East edge of said cellar box **SOUTH 01°00'58" WEST** 13.97 feet to the Southeast corner thereof;

THENCE along South edge of said cellar box **NORTH 89°24'42" WEST** 9.93 feet to the **TRUE POINT OF BEGINNING;**

IN ADDITION TO Geothermal Well Mesa 6-2 well head contained within the aforedescribed cellar box, the vertical centerline of said well at said well head bears **NORTH 36°29'54" EAST** 8.45 feet from Southwest corner of said aforedescribed cellar box.

SAID surface facility being shown and delineated on **EXHIBIT "B"** attached hereto and made a part hereof.

EXHIBIT "A"

SURFACE FACILITIES DESCRIPTION

Those certain surface facilities located in a portion of Section 6, Township 16 South, Range 17 East, San Bernardino Meridian, County of Imperial, State of California, described as follows:

COMMENCING at the Southeast corner of said Section 6;

THENCE along the East line of said Section 6 **NORTH 00°06'54" WEST** 712.00 feet to a point;

THENCE departing from said East line **NORTH 89°59'18" WEST** 33.00 feet to the Southeast corner of the Department of Interior, Bureau of Land Management Permit numbers CA 5427 and CA 24678, said CA 24678 being on file as Document No, 89-15594 recorded September 22, 1989 in Book 1632, Page 1528, Official Records of Imperial County, California;

THENCE along the South line of said Permits CA 5427 and CA 24678 **NORTH 89°59'18" WEST** 890.80 feet to the Southwest corner of said Permit CA 24678;

THENCE along the West line of said Permit CA 24678 **NORTH 00°00'00" EAST** 506.14 feet, more or less, to the point of intersection with the centerline of a steel 10 inch diameter geothermal fluid pipeline, said point being the **TRUE POINT OF BEGINNING;**

(1) **THENCE** along centerline of said pipeline **NORTH 89°45'43" WEST** 51.78 feet to an angle point;

(2) **THENCE** continuing along said centerline **NORTH 88°03'21" WEST** 65.40 feet to an angle point.

(3) **THENCE** continuing along said centerline **NORTH 88°39'35" WEST** 26.34 feet to an angle point over a type II pier;

(4) **THENCE** continuing along said centerline **NORTH 88°39'03" WEST** 38.81 feet to an angle point over a type II pier;

(5) **THENCE** continuing along said centerline **NORTH 84°26'58" WEST** 2.20 feet to an angle point;

(6) **THENCE** continuing along said centerline **SOUTH 88°44'23" WEST** 2.75 feet to an angle point;

(7) **THENCE** continuing along said centerline **NORTH 89°31'13" WEST** 2.50 feet to an angle point over a type IV pier;

(8) **THENCE** continuing along said centerline **NORTH 89°19'45" WEST** 20.98 feet to an angle point over a type IV pier;

(9) THENCE continuing along said centerline NORTH 89°37'11" WEST 13.79 feet to an angle point over a type IV pier;

(10) THENCE continuing along said centerline NORTH 89°25'26" WEST 8.20 feet to an angle point over a type IV pier;

(11) THENCE continuing along said centerline SOUTH 89°53'28" WEST 24.82 feet to an angle point over a type IV pier;

(12) THENCE continuing along said centerline NORTH 89°50'20" WEST 12.78 feet to an angle point;

(13) THENCE continuing along said centerline NORTH 00°23'39" WEST 3.80 feet to an angle point over a type V pier;

(14) THENCE continuing along said centerline NORTH 00°25'29" EAST 26.22 feet to an angle point over a type V pier;

(15) THENCE continuing along said centerline NORTH 00°18'02" EAST 27.12 feet to an angle point over a type V pier;

(16) THENCE continuing along said centerline NORTH 00°18'42" EAST 25.88 feet to an angle point over a type V pier;

(17) THENCE continuing along said centerline NORTH 00°07'49" EAST 19.74 feet to an angle point over a type III pier;

(18) THENCE continuing along said centerline NORTH 00°26'54" WEST 5.42 feet to an angle point;

(19) THENCE continuing along said centerline NORTH 32°43'48" WEST 6.22 feet to an angle point;

(20) THENCE continuing along said centerline NORTH 00°06'04" WEST 7.05 feet to an angle point over a type II pier;

(21) THENCE continuing along said centerline NORTH 00°09'47" EAST 41.88 feet to an angle point over a type II pier;

(22) THENCE continuing along said centerline NORTH 01°41'15" WEST 1.28 feet to an angle point;

(23) THENCE continuing along said centerline NORTH 23°16'30" EAST 0.16 feet to a point on said centerline which intersects a vertical plane of the South edge of a concrete pipeway, said point hereinafter being referred to a POINT "A";

(24) THENCE continuing along said centerline NORTH 03°37'25" EAST 2.90 feet to an angle point;

(25) THENCE continuing along said centerline NORTH 00°07'00" EAST 26.23 feet to an angle point;

(26) THENCE continuing along said centerline NORTH 02°12'38" EAST 2.67 feet to an angle point;

(27) THENCE continuing along said centerline NORTH 04°19'14" WEST 1.71 feet to an angle point over a type I pier;

(28) THENCE continuing along said centerline NORTH 00°09'19" WEST 10.85 feet to an angle point over a type I pier;

(29) THENCE continuing along said centerline NORTH 00°20'04" EAST 9.02 feet to a point in said centerline which intersects a vertical plane of the South edge of a concrete cellar box encompassing Geothermal Well Mesa 6-1, said point hereinafter referred to as POINT "B";

(30) THENCE continuing along said centerline NORTH 00°20'04" EAST 2.21 feet to an angle point;

(31) THENCE continuing along said centerline NORTH 01°14'12" WEST 2.54 feet to an angle point;

(32) THENCE continuing along said centerline NORTH 02°04'38" WEST 2.47 feet to center of Geothermal Well Mesa 6-1 at master valve assembly with aforementioned concrete cellar box.

IN ADDITION TO the following described concrete slab:

BEGINNING at said aforedescribed POINT "A";

(33) THENCE along the exterior edge of said concrete slab NORTH 89°48'32" EAST 3.38 feet to the Northeast corner;

(34) THENCE continuing along said exterior edge of said slab SOUTH 00°13'47" WEST 64.37 feet to the Southeast corner;

(35) THENCE continuing along said exterior edge of said slab SOUTH 89°19'19" WEST 4.78 feet to the Southwest corner;

(36) THENCE continuing along said exterior edge of said slab NORTH 00°08'11" EAST 64.41 feet to the Northwest corner;

(37) THENCE continuing along said exterior edge of said slab NORTH 89°48'32" EAST 1.50 feet to POINT "A" and TRUE POINT OF BEGINNING;

ALSO IN ADDITION TO the following described concrete pipeway:

BEGINNING at said aforedescribed POINT "A";

(33) THENCE along the exterior edge of said concrete pipeway NORTH 89°48'32" EAST 3.38 feet to the Southeast corner;

(38) THENCE continuing along the exterior edge of said concrete pipeway NORTH 00°03'46" EAST 31.26 feet to the Northeast corner;

(39) THENCE continuing along the exterior edge of said concrete pipeway SOUTH 89°48'02" WEST 4.87 feet to the Northwest corner;

(40) THENCE continuing along the exterior edge of said concrete pipeway SOUTH 00°05'09" WEST 31.26 feet to the Southwest corner;

(37) THENCE continuing along the exterior edge of said concrete pipeway NORTH 89°48'32" EAST 1.50 feet to POINT "A" and THE TRUE POINT OF BEGINNING;

ALSO IN ADDITION TO the following described concrete cellar box encompassing Geothermal Well Mesa 6-1:

BEGINNING a said afordescribed POINT "B";

(41) THENCE along the exterior edge of said concrete cellar box SOUTH 89°45'30" EAST 5.12 feet to the Southeast corner;

(42) THENCE continuing along said exterior edge of said concrete cellar box NORTH 00°09'07" WEST 13.98 feet to the Northeast corner;

(43) THENCE continuing along said exterior edge of said concrete cellar box NORTH 89°40'16" WEST 9.95 feet to the Northwest corner;

(44) THENCE continuing along said exterior edge of said concrete cellar box SOUTH 00°22'06" EAST 14.00 feet to the Southeast corner;

(45) THENCE continuing along said exterior edge of said concrete cellar box SOUTH 89°45'30" EAST 4.78 feet to said Point "B" and TRUE POINT OF BEGINNING;

ALSO IN ADDITION TO Geothermal Well Mesa 6-1 well head contained within the aforedescribed cellar box, the vertical centerline of said well at said well head bears NORTH 32°52'03" EAST 8.57 feet from the Southwest corner of daid cellar box.

SAID surface facilities being shown and delineated on EXHIBIT "B" attached hereto and made a part hereof.

APPENDIX C

RESCISSION OF ORDERS

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
COLORADO RIVER BASIN • REGION 7
73-720 FRED WARING DR., SUITE 100
PALM DESERT, CA 92260
Phone (619) 346-7491
FAX (619) 341-6820

December 23, 1996

Hemant Patel - Project Manager
United States Department of Energy
Oakland Operations Office
1301 Clay Street
Oakland, CA 94612-5208

R:E Cleanup and Abatement Order No. 96-023 for the East Mesa Geothermal Test Facility Located South of Holtville, CA

Regional Board staff has reviewed the document entitled "Final Closure Report" dated December 13, 1996. This Closure Report documents the excavation operation and off-site disposal of approximately 21,260 tons of brine residue and contaminated soil located at the subject site.

Based on the results submitted in the "Final Closure Report", Cleanup and Abatement Order No. 96-023 is hereby rescinded.

Please be advised the Waste Discharge Requirements for this facility have been scheduled for consideration of rescission at the January 22, 1997 Regional Board Meeting.

If you have any questions concerning this matter, please contact Neal Krull at (619) 776-8942.

Phil Gruenberg

PHIL GRUENBERG
Executive Officer

NK/jb

File Ref: 7A130704011, USDOE, East Mesa Geothermal, Board Order No. 89-027

STATE OF CALIFORNIA - CALIFORNIA ENVIRONMENTAL PROTECTION AGENCY PETE WILSON, *Governor*

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
COLORADO RIVER BASIN • REGION 7
73-720 FRED WARING DR., SUITE 100
PALM DESERT, CA 92260
Phone (619) 346-7491
FAX (619) 341-6820

JAN 24 1997

U.S. Department of Energy
Geothermal Test Facility, East Mesa
1301 Clay Street
Oakland, CA 94612-5208

Re: Rescission of Waste Discharge Requirements for U.S. Department of Energy, Geothermal Test Facility, East Mesa - El Centro, Imperial County

Enclosed is a copy of Order No. 97-014. This Order was adopted by the Regional Board at its meeting in Indian Wells on January 22, 1997. This Order rescinded Order No. 89-027 for said facility.

Should you have any questions concerning this Order, please feel free to contact this office.

Gary L. Morris
GARY L. MORRIS
Assistant Executive Officer

NK/ci

Enc: As noted above

File: WDID 7A130704011, U.S. Dept. of Energy, East Mesa, Board Order No. 89-027

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
COLORADO RIVER BASIN REGION

ORDER NO. 97-014

RESCISSION OF WASTE DISCHARGE REQUIREMENTS

The California Regional Water Quality Control Board, Colorado River Basin Region, finds that:

1. The below-listed Board Order contains waste discharge requirements not in use and has never been active.

2. The site has been remediated.

3. It is desirable to rescind said below-listed Board Order.

4. The Board forwarded timely notices by mail to persons responsible for the below-listed Board Order, explaining the Board's consideration of rescinding the particular Board Order, and requesting timely comments.

5. The Board in a public meeting heard and considered all comments pertaining to the proposed rescission of the below-listed Board Order.

IT IS HEREBY ORDERED, the following Board Order containing waste discharge requirements be rescinded:

Order No.	Name-Location	Date Adopted
89-027	United States Department of Energy Geothermal Test Facility, East Mesa Geothermal Resource Area El Centro - Imperial County	May 15, 1989
91-007	Granite Construction Company Needles Pit Indio - Riverside County	May 15, 1991

I, Philip A. Gruenberg, Executive Officer, do hereby certify the foregoing is a full, true and correct copy of an Order adopted by the California Regional Water Quality Control Board, Colorado River Basin Region, on January 22, 1997.

Philip A. Gruenberg
Executive Officer

APPENDIX D

TRANSFER OF RIGHT-OF-WAY

United States Department of the Interior

BUREAU OF LAND MANAGEMENT
El Centro Resource Area
1661 South 4th Street
El Centro, California 92243-4561

TAKE PRIDE IN AMERICA

IN REPLY REFER TO:
CA-5427
2800
CA-067.21

May 21, 1998

CERTIFIED MAIL P 010 604 722
RETURN RECEIPT REQUESTED

DECISION

Frank Stewart Department of Energy Golden Field Office 1617 Cole Boulevard Golden, CO 80401-3393	:	Right-of-Way Reservation CA-5427

Relinquishment Accepted
Right-of-Way Terminated

In June 1980, the Bureau of Land Management (BLM) granted right-of-way reservation CA-5427 to the Department of Energy (DOE) for the Geothermal Component Test Facility (GTF), located in Imperial County, California.

DOE's use of the site has terminated. The California Regional Water Quality Control Board found remediation of the site to be in conformance with the State's regulatory requirements. A field examination by BLM confirmed that reclamation has been completed and the site left in a condition satisfactory to the BLM authorized officer.

BLM hereby acknowledges that DOE has met all of the requirements necessary in the restoration of the GTF site in Imperial County, CA, and that DOE has no further responsibility in the restoration of this site.

Relinquishment of right-of-way reservation CA-5427 is hereby accepted, and the right-of-way terminated as of the date of this decision.

Terry A. Reed
Field Manager