Pacific Gas and Electric Company

Yvonne J. Meeks
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May 29, 2007

Ms. Cathy Wolfe-White
U.S. Department of the Interior
Bureau of Land Management
Program Manager, Planning & Environmental
2610 Sweetwater Avenue
Lake Havasu City, Arizona 86406

Mr. John Earle
U.S. Fish and Wildlife Service
Department of the Interior
Havasu National Wildlife Refuge
Refuge Manager
P.O. Box 3009
317 Mesquite Avenue
Needles, California 92363

Subject: Biological Resources Completion Report for the California Slant Drilling Project: Topock Compressor Station
PG&E Topock Compressor Station, Needles, California

Dear Ms. White & Mr. Earle:

This letter transmits the Biological Resources Completion Report for the California Slant Drilling Project: Topock Compressor Station. The document is submitted in conformance with the December 2006 *Biological Assessment for the Pacific Gas and Electric Company, Topock Compressor Station Groundwater Characterization Beneath the Colorado River by Slant Drilling*, and Condition #31 of the Havasu National Wildlife Refuge's approval letter for the slant well installation, dated January 30, 2007.

If you have questions, please do not hesitate to contact me. I can be reached at (805) 234-2247.

Sincerely,

Yvonne Meeks

cc: Jim Priest/BLM
Carrie Marr/USFWS
Casey Padgett/DOI
Aaron Yue/DTSC

Biological Resources Completion Report for the California Slant Drilling Project: Topock Compressor Station

Needles, California

Prepared for

United States Bureau of Land Management
United States Fish and Wildlife Service

on behalf of

Pacific Gas and Electric Company

May 2007

CH2MHILL
155 Grand Avenue, Suite 1000
Oakland, California 94612

Contents

Acronyms and Abbreviations

BLM	United States Bureau of Land Management
CDFG	California Department of Fish and Game
CFR	Code of Federal Regulations
DTSC	California Department of Toxic Substances Control
FESA	Federal Endangered Species Act
GPS	global positioning system
HNWR	Havasu National Wildlife Refuge
I-40	Interstate 40
MW	monitoring well
PG&E	Pacific Gas and Electric Company
USC	United States Code
USFWS	United States Fish and Wildlife Service

1.0 Introduction

Pacific Gas and Electric Company (PG&E) is addressing chromium in groundwater at the Topock Compressor Station under the oversight of the California Environmental Protection Agency, Department of Toxic Substances Control (DTSC) and United States Department of the Interior. The Topock Compressor Station is located in eastern San Bernardino County, California about 15 miles southeast of Needles (Figure 1). DTSC has recently directed PG&E to conduct additional investigative activities addressing groundwater below the Colorado River.

Recently completed activities include clearing vegetation and constructing two groundwater monitoring wells clusters under the Colorado River by slant drilling from the western shoreline of the river. The slant drilling activities were located south of the Burlington Northern Santa Fe railroad bridge and I-40 within the Havasu National Wildlife Refuge (HNWR) managed by United States Fish and Wildlife Service (USFWS).

Prior to issuing approval for constructing the two groundwater monitoring well clusters, the USFWS requested preparation of a biological assessment pursuant to Section 7 of the federal Endangered Species Act (FESA). In response to this request, the December 2006 *Biological Assessment for the Pacific Gas and Electric Topock Compressor Station Groundwater Characterization Beneath the Colorado River by Slant Drilling* (CH2M HILL, 2006) was prepared and submitted to USFWS. The biological assessment was prepared to analyze the effects of implementing these activities. Section 7 of the Endangered Species Act (16 United States Code [USC] 1531 et seq.), as amended in 1978, 1982, and 1988, directs federal agencies to ensure that actions authorized, funded, or carried out by these agencies are not likely to jeopardize the continued existence of any species listed as threatened or endangered or cause destruction or adverse modification of designated critical habitats (16 USC 1536(a)(2)). The biological assessment served as a written request, under the provisions of Title 50 Code of Federal Regulations (CFR) Part 402.14, to initiate Section 7 consultation under the Endangered Species Act with USFWS. As the federal action agency, the USFWS HNWR initiated consultation with the USFWS Southwest Region 2, Ecological Services in Phoenix, Arizona.

The USFWS approved these activities in a letter dated December 20, 2006 (USFWS, 2006). The project authorizations and approvals are provided in Appendix A.

The purpose of this report is to fulfill the mitigation measure in the biological assessment which states:

> Once the slant drilling and well installation activities are completed, the biologist will return to the site to photo document and GPS [Global Positioning System] the post-construction conditions. The data will be included in a brief report that will be submitted to the DTSC, BLM [Bureau of Land Management], and USFWS within 60 days of well installation. The report will document pre- and post-activity conditions.

This report also provides information on awareness training sessions, pre-activity surveys, compliance monitoring, and land use. Construction of the subject activities was completed March 30, 2007; this completion report has been prepared for submittal to USFWS and the BLM by May 29, 2007.

1.1 Regional Environmental Setting

The Topock Compressor Station is located near Needles, California. Agriculture and public lands along the surrounding landscape dominate the area. Public lands in the area are owned and managed by a number of federal and regional agencies including the BLM, USFWS, United States Bureau of Reclamation, and San Bernardino County.

Dominant features of the area include the Colorado River to the east; the Chemehuevi Mountains to the west; the Burlington Northern Santa Fe railroad tracks and bridge; and I-40 that links Barstow, California and Topock, Arizona. Topography in the area is abrupt, rising from around 450 feet above mean sea level at the Colorado River to over 1,200 feet above mean sea level within 1 mile to the south and southwest. Slopes encountered west of the river reflect a series of ancient river terraces. The regional vicinity of the Topock Compressor Station is shown on Figure 1.

1.2 Project Location

The project location addressed in this report is located within the western floodplain of the Colorado River, to the south of I-40 and the Burlington Northern-Santa Fe Railroad bridge, and east of National Trails Highway. The project location addressed in this report is located on the HNWR, which is managed by the USFWS.

2.0 Project Description

The project consisted of two elements: removal of vegetation to allow access for equipment and personnel, and construction of two groundwater monitoring well clusters under the Colorado River by slant drilling from the western shoreline of the river, known as MW-52 and MW-53. The two project elements are described in the following sections. The project site location and associated facilities are depicted in Figure 2.

2.1 Vegetation Removal

Prior to vegetation removal, the access route, slant drill work site, and the surrounding area were surveyed for nesting birds, native trees, and sensitive habitats; none were detected. The existing access route between National Trails Highway and the existing MW-43 well was used to provide equipment access. From MW-43, a new route was cleared below the I-40 bridge to provide access to the drill site. Where access allowed, the boundary of the work area was delineated with flagging.

Vegetation was removed from the slant drill work area along the California side of the Colorado River floodplain on February 15, 2007. The work area was dominated by non-native salt cedar (*Tamarix ramosissima*) trees with sub dominates of arrow weed (*Pluchea sericea*) and native screwbean mesquite (*Prosopis pubescens*) trees. No native trees were removed.

No native vegetation was removed along the pre-existing equipment access route; however, eleven screwbean mesquite trees were temporarily relocated to accommodate access for the drill rig and supporting vehicles. These eleven trees are a portion of the 100 screwbean mesquite trees that were planted in 2006 as part of the MW-43 revegetation effort along the access route. The eleven trees were removed, placed in 5-gallon buckets, and moved to the onsite nursery until all equipment could be removed from the work site. The mesquite trees have been replanted along the access route.

In the newly-cleared area, sixteen salt cedar clusters were cut to ground level using chainsaws and removed from the slant drill work area by hand. Approximately 50 percent of the removed trunks and branches were dead. In addition, several arrow weed clusters were trimmed at ground level. All of the arrow weed root balls were kept in place and protected with mounded soil and naturally-occurring mulch. Cut vegetation was immediately carried by hand to an awaiting truck and chipper for disposal. Green wood was chipped into a truck, while dead branches and trunks were loaded onto the truck by hand to prevent damaging the chipper blades. All cleared vegetation was hauled offsite for disposal. Approximately 0.08 acre of salt cedar and arrow weed were cleared from the slant drill work area on February 15, 2007. Subsequently, on March 5, 2007, an additional 100 square feet of salt cedar were removed to accommodate the drill rig worker platform at the second drill location within the cleared work area. Therefore, 0.082 acre of vegetation was removed from the work area to accommodate for equipment access and installation of the wells. In May, the site was revisited and most of the trimmed arrow weed plants have re-established themselves.

2.2 Slant Drill Well Construction

Well construction for the slant drill project included drilling and well installations between February 24 and March 30, 2007. The project involved the installation of two multilevel groundwater monitoring wells, known as MW-52 and MW-53, extending below the Colorado River. The wells were installed by slant drilling from the western shoreline of the Colorado River. Prior to the well installation activities, the United States Geological Survey conducted a seismic survey of the geology below the river bottom.

Well installation was accomplished by the use of a track-mounted rotosonic drilling rig, which involved advancing a rotating and vibrating drill head or core barrel through the subsurface. Two slant borings were extended approximately 150 feet and 250 feet eastward below the Colorado River. Following the drilling and testing of the boreholes, multilevel groundwater monitoring wells were installed in the borings and surface well monuments were constructed.

Additional details on the well construction may be found in the December 2006 *Biological Assessment for the Pacific Gas and Electric Topock Compressor Station Groundwater Characterization beneath the Colorado River by Slant Drilling* (CH2M HILL, 2006).

2.3 Federal Regulations and Standards

The following are the various applicable federal regulations and policies, provided here for general information purposes.

- Federal Endangered Species Act, including the coordination requirement of Section 7 (16 USC §§1531 *et seq.*; 50 CFR Part 402). Section 9 of FESA prohibits the "take" of species federally listed as threatened or endangered. "Take" is further defined to include any harm or harassment, including significant habitat modification or degradation that could potentially kill or injure wildlife by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering. "Take" incidental to otherwise lawful activities can be authorized under Section 7 of FESA, where a federal agency is involved.
- Migratory Bird Treaty Act (16 USC 703-712; 50 CFR 10). The federal Migratory Bird Treaty Act prohibits the "take" of migratory birds, unless permitted. The definition of 'take', as defined by 50 CFR 10.12, means to pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to pursue, hunt, shoot, wound kill, trap, capture, or collect migratory birds (or parts thereof).

2.4 State Regulations and Standards

The following are the various applicable state regulations and policies, provided here for general information purposes.

- California Endangered Species Act (California Department of Fish and Game [CDFG] Code §§2050 *et seq.*). Section 2050 of the CDFG Code prohibits any activities that would jeopardize or "take" a species listed as threatened or endangered within the state. Under the CDFG Code §86 "take" is defined as hunt, pursue, catch, capture, or kill, or attempt

to hunt, pursue, catch, capture, or kill. Projects that have the potential to impact species listed as threatened or endangered by the state might require an Incidental Take Permit from the CDFG under Section 2081 of the CDFG code.

- CDFG Code 1600 – Streambed Alteration Agreement (CDFG Code §1600). Section 1600 of the CDFG Code regulates the alteration of the bed, bank, or channel of a stream, river, or lake, including dry washes. Generally, CDFG asserts jurisdiction up to the top of significant bank cuts or to the outside of any riparian vegetation associated with a water course. Activities that have the potential to affect jurisdictional areas can be authorized through issuance of a Streambed Alteration Agreement.
- California Fully-protected Wildlife Species Provisions (CDFG Code §§3511, 4700, 5050, and 5515). These provisions prohibit the taking of fully-protected birds, mammals, amphibians, and fish.

3.0 Awareness Training

As per the USFWS and BLM stipulations described in the biological assessment, awareness training was provided to personnel before commencing construction activities. The awareness training focused on southwestern willow flycatcher (*Empidonax traillii extimus*) for activities on the floodplain project area. PG&E and CH2M HILL biologists provided training to all onsite personnel prior to initiating work activities. The core groups were trained at the project initiation meeting, and new personnel were identified at safety meetings each morning before work. Training included a discussion of species description, habitat, natural history, threats, legal protection under the Endangered Species Act(s), potential penalties, current survey findings, management, and protection measures. Applicable protection measures identified in the USFWS approval letter were reviewed with staff. Attendance was documented on sign-in sheets, which are provided in Appendix B.

4.0 Pre-Activity Surveys

Prior to vegetation clearing and construction activity, work sites and the surrounding areas were surveyed for sensitive biological resources. No southwestern willow flycatchers or nesting bird species were observed during the pre-activity surveys. Flora and fauna observed during the pre-activity surveys and construction monitoring are listed below in Table 1.

TABLE 1
List of Observed Plants and Wildlife Incidental to Pre-activity Surveys

Common Name	Scientific Name
Plants	
Arrow weed	*Pluchea sericea*
Allscale saltbush	*Atriplex polycarpa*
Brome	*Bromus* sp.
Burrobush	*Ambrosia dumosa*
Catclaw	*Acacia greggii*
Common reed	*Phragmites australis*
Creosote bush	*Larrea tridentate*
Desert trumpet	*Eriogonum inflatum*
Honey mesquite	*Prosopis glandulosa*
Russian thistle	*Salsola tragus*
Saltcedar	*Tamarix ramosissima*
Screwbean mesquite	*Prosopis pubescens*
Reptiles	
Side-blotched lizard	*Uta stansburiana*
Birds	
Abert's towhee	*Pipilo fuscus*
American coot	*Fulica Americana*
American kestrel	*Falco sparverius*
Anna's hummingbird	*Calypte anna*
Black vulture	*Coragyps atratus*
Brewer's blackbird	*Euphagus cyanocephalus*
Cliff swallow	*Petrochelidon pyrrhonota*
Common raven	*Corvus corax*

TABLE 1
List of Observed Plants and Wildlife Incidental to Pre-activity Surveys

Common Name	Scientific Name
Greater roadrunner	*Geococcyx californianus*
Great-tailed grackle	*Quiscalus mexicanus*
Mourning dove	*Zenaida macroura*
Northern flicker	*Colaptes auratus*
Osprey	*Pandion haliaetus*
Phainopepla	*Phainopepla nitens*
Red-tailed hawk	*Buteo jamaicensis*
Red-winged blackbird	*Agelaius phoeniceus*
Ring-billed gull	*Larus delawarensis*
Rock dove	*Columba livia*
Tree swallow	*Tachycineta bicolor*
Turkey vulture	*Cathartes aura*
Western kingbird	*Tyrannus verticalis*
White-crowned sparrow	*Zonotrichia leucophrys*
Mammals	
Cottontail rabbit	*Sylvilagus audubonii*
Desert woodrat	*Neotoma lepida*

5.0 Compliance Monitoring

A biologist was onsite full-time during the project initiation meeting, site walk, and vegetation clearing to ensure compliance with USFWS and BLM stipulations. The first day of compliance monitoring began February 15, 2007 during vegetation clearing. A biologist remained onsite the entire duration of vegetation clearing to ensure that no impacts to sensitive biological resources occurred and to ensure that the 0.082 acre clearing threshold was not exceeded. The second day of compliance monitoring was conducted on March 14, 2007 during the relocation of the 11 mesquite trees and the equipment staging.

As per an e-mail request from the HNWR Manager to PG&E dated March 13, 2007, a biological monitor was required to document bird activity each day between March 15 and March 22 (early morning, midday, and evening—one hour each) (USFWS, 2007). Bird activity would then be monitored every other day after 22 March (early morning, midday, and evening) until drilling completion. Daily avian survey forms were completed from March 20-28 during this monitoring event and are provided in Appendix C.

6.0 Land Use

Various past activities have resulted in previous land use of the general area where the construction occurred. The general area is traversed by a major railway line, several gas pipelines, historic US Route 66, and the National Trails Highway.

During design, much care was taken to avoid impacts to sensitive biological resources. The project staging areas were located in the previously disturbed areas at the MW-20 bench, near MW-32 and the Topock Compressor Station.

To assess land use associated with the slant drilling and well installation, a survey using a GPS unit was conducted to delineate the areas subject to construction activities. Such activities included vegetation clearing and the installation of groundwater wells associated with characterizing groundwater beneath the Colorado River. Data collected during the GPS survey was imported into the Geographic Information System that is maintained for the Topock project. A polygon was defined for the area used as a result of the construction activities (Figure 2). The acreage of the polygon was determined, and the total land use area resulting from slant drilling and well installation activities was calculated. The access route and staging area were not included in the land use calculation because these areas had been previously used and will continue to be used by project personnel for other investigative and remedial activities associated with the Topock Compressor Station.

The total amount of land use resulting from project activities was approximately 0.082 acre. Pre- and post-construction photographs are available in Appendix D.

7.0 Conclusion

Construction of MW-52 and MW-53 was approved by the state and federal regulatory agencies. In conformance with USFWS stipulations, personnel were provided with awareness training, and pre-activity surveys were conducted of all areas subject to construction use. Under the terms of the USFWS approval, construction work was timed and conducted in areas where significant biological resources were not present. In addition, a biological monitor was onsite during the vegetation clearing, and a part-time monitor was onsite during well drilling and installation activities.

The minimization measures were effective and met the requirements of the USFWS. There are no recommendations for modifying the measures to enhance species protection. The project was conducted under a "may affect, not likely to adversely affect" determination for the southwestern willow flycatcher and a "no effect" determination for the desert tortoise, Yuma clapper rail, razorback sucker, bonytail chub, and Colorado pikeminnow. In compliance with these determinations, there was no "take" of these species.

8.0 References

CH2M HILL. 2006. *Biological Assessment for the Pacific Gas and Electric Topock Compressor Station Groundwater Characterization beneath the Colorado River by Slant Drilling*. December 2006.

United States Fish and Wildlife Service (USFWS). 2006 Letter from Steven L. Spangle/USFWS to Jim Priest/BLM. Subject: Concurrence Pacific Gas and Electric Topock Compressor Station Groundwater Characterization beneath the Colorado River by Slant Drilling. December 20.

_____. 2007. E-mail correspondence from John Earl/USFWS to Robert Knutson/PG&E. Subject: Request for additional biological monitoring for construction extending beyond March 15, 2007. March 13.

Figures

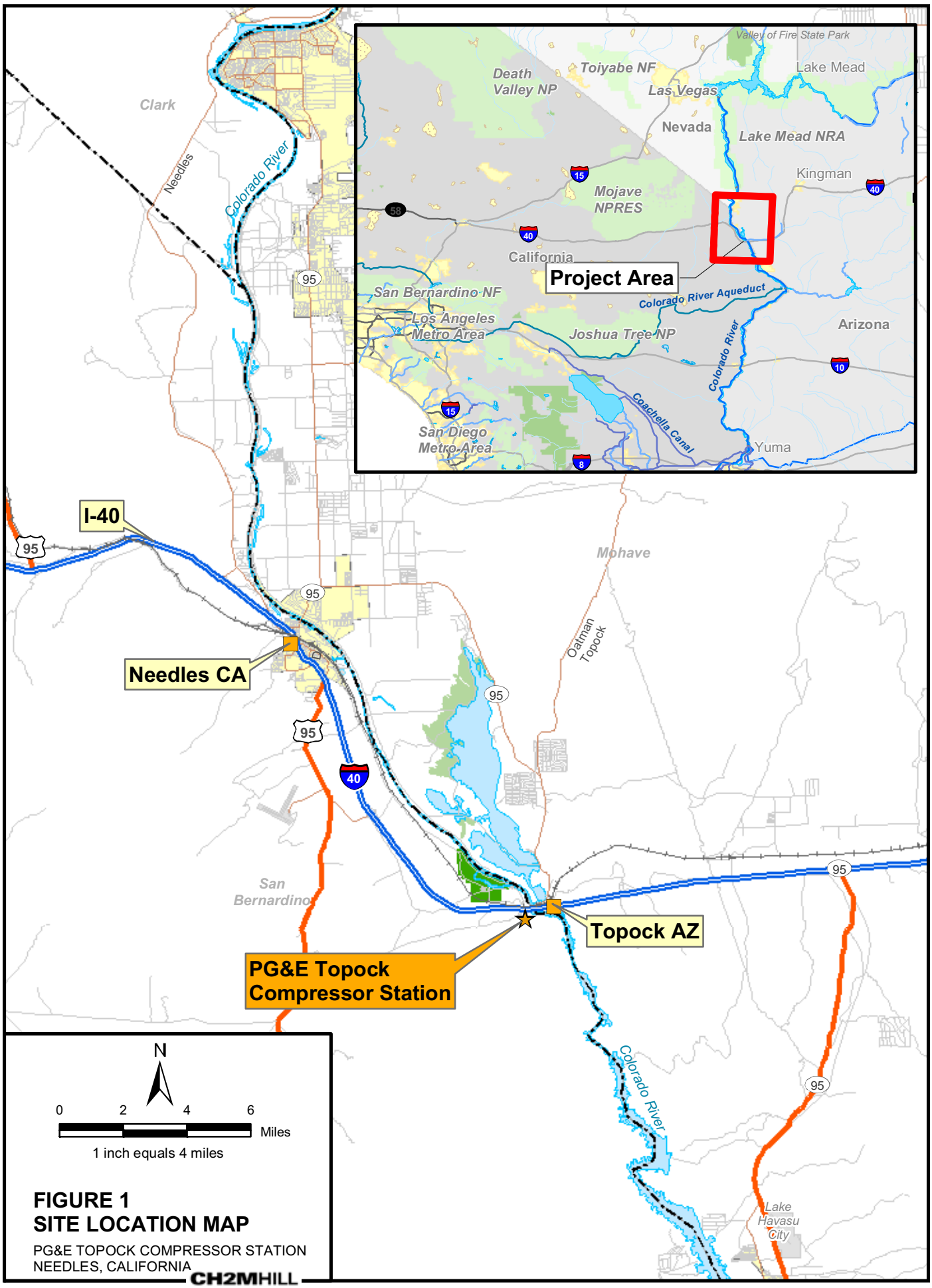

FIGURE 1
SITE LOCATION MAP

PG&E TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

CH2MHILL

RDD \\ZINFANDEL\PROJ\PACIFICGASELECTRICCO\TOPOCKPROGRAM\GIS\MXD\2005\LOCATION_MAP_PORTRAIT.MXD 12/13/2005 16:33:49

FIGURE 2
ANGLE BORING VEGETATION REMOVAL FOR COLORADO RIVER DRILLING INVESTIGATION

CA SLANT DRILL BIO COMPLETION REPORT
PG&E TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

CH2MHILL

Appendix A
Authorizations and Approvals

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Havasu National Wildlife Refuge
Post Office Box 3009
Needles, California 92363
760/326-3853 FAX 760/326-5745

30 January 2007

Ms. Yvonne Meeks
Pacific Gas and Electric Company
4325 South Higuera Street
San Luis Obispo, CA 93401

Dear Ms. Meeks:

With this letter, I am authorizing, with special conditions, your request as outlined in the *Work Plan for Additional Groundwater Characterization Beneath the Colorado River by Slant Boring in California* and its addendum. The special conditions are attached.

If you have any questions or I may be of any assistance, please feel free to contact me.

Sincerely,

John Earle
Refuge Manager

attachment

cc: Casey Padgett
Joe Liebhauser
Tim Smith

OPTIONAL FORM 99 (7-90)

FAX TRANSMITTAL # of pages ▶ 6

To JULIE SAKINS	From HAVASU NWR
Dept./Agency CH2MHILL	Phone # 7606263853
Fax # 5106622947	Fax # 5745

NSN 7540-01-317-7368 5099-101 GENERAL SERVICES ADMINISTRATION

TAKE PRIDE IN AMERICA

ATTACHMENT

Work Plan for Additional Groundwater Characterization Beneath the Colorado River by Slant Boring in California

HAVASU NATIONAL WILDLIFE REFUGE
SPECIAL CONDITIONS

The authorization to perform the subject action is subject to Pacific Gas and Electric Company's (PG&E) agreement to comply with and be bound by the following Special Conditions.

1. All activities are subject to the laws, regulations, and policies of the U.S. Fish and Wildlife Service and Havasu National Wildlife Refuge (Refuge), except as allowed by this letter.

2. A copy of this letter will be in possession of the field crew while on Refuge property.

3. This letter authorizes activities and facilities for a period not to exceed two years. The authorized activity and related facilities/property must cease and be removed, respectively, within two years unless an extension is issued by the Refuge Manager at least 14 days prior to the expiration of this time.

4. PG&E agrees to indemnify and hold harmless the United States, including the Department of the Interior, the U.S. Fish and Wildlife Service (Service), and their agents and employees, from any and all claims or causes of action arising from or on account of acts or omissions of PG&E, its employees, successors, agents, contractors, subcontractors or other persons, in carrying out activities authorized by this letter. PG&E further agrees that the United States, and its agencies and employees, shall not be held as a party to any contract entered into by PG&E in carrying out activities under this letter.

5. All project activities will be conducted in a manner that avoids a take of any wildlife, particularly threatened and/or endangered (listed) species. Take is defined to include any harm or harassment, including significant habitat modification or degradation that could potentially kill or injure wildlife by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering. Should a listed species enter the project site or become harmed or killed by project activities, the project will be shut down and PG&E will consult immediately with the Service and the California Department of Fish and Game (CDFG). Negative effects to wildlife habitat will also be minimized to the maximum possible extent.

6. Mitigation and conservation measures identified in the biological assessment and cultural resource investigations developed for this project will be implemented fully. The Service recommends and encourages PG&E to have on site, during all construction activities, a cultural resources specialist/monitor identified by the Fort Mohave Tribe.

7. PG&E is authorized to conduct activities identified in the subject work plan after 15 March 2007 as long as these activities are initiated prior to 15 March 2007.

8. Wildlife of any kind will not be handled or harassed. Encounters with listed species will be reported to the CH2MHILL project and Refuge biologists. These biologists will maintain records of all listed species encountered during project activities. This information will include for each individual: the locations (narrative, vegetation type, and maps) and dates of observations, general conditions and health, any apparent injuries and state of healing, and diagnostic markings.

9. To the maximum extent possible, facilities (e.g., pipelines, wells, and access routes) will be sited within an existing right-of-way and previously disturbed or barren areas to limit new surface disturbance.

10. All PG&E employees and contractors involved with the proposed project will be required to attend PG&E's threatened and endangered species and cultural resources sensitivity education program prior to initiation of activities. New employees will receive formal, approved training prior to working on-site.

11. Trash and food items will be contained in closed containers and removed daily to reduce attractiveness to wildlife or feral animals.

12. Lights will be angled toward the ground, reduced in intensity to levels compatible with safety concerns, and limited in duration of usage. The hue of lighting will be that which is most compatible with and least disturbing to wildlife.

13. Employees will not bring pets to the project site.

14. Firearms will be prohibited from the proposed project site.

15. Employees will be required to check under their equipment or vehicle before it is moved. If a desert tortoise is encountered, the vehicle is not to be moved until the animal has voluntarily moved to a safe distance away from the parked vehicle.

16. Upon completion of well and piping installation, all unused material and equipment will be removed from the site.

17. Upon locating a dead or injured individual of a listed species, PG&E will make initial notification to the Refuge and the Service within three working days. The notification must be made in writing to the Service's Division of Law Enforcement in Torrance (370 Amapola Avenue, Suite 114, Torrance, California 90501; (310) 328-1516) and by telephone and writing to the Ventura Fish and Wildlife Office (2493 Portola Road, Suite B, Ventura, California 93003; (805) 644-1766). The report will include the date and time of the finding or incident (if known), location of the carcass, a photograph, probable cause of death (if known), and other pertinent information. Animals injured through

PG&E activities will be transported to a qualified veterinarian for treatment at the expense of PG&E. If an injured animal recovers, the CDFG and the Refuge will be contacted for final disposition of the animal.

18. The CH2MHill project biologist will be responsible for assisting PG&E employees and contractors in compliance with the minimization measures, performing surveys in front of the crew as needed to locate and avoid listed species, and monitoring compliance. Preconstruction surveys by a biologist will be implemented for special-status wildlife species in areas of planned disturbance immediately prior to initiation of ground-disturbing activities. The inspection will provide 100 percent coverage of the area within the project limits. All desert tortoise burrows and pallets outside of, but near, the project footprint will be flagged at that time so that they may be avoided during work activities. At the conclusion of work activities, all flagging will be removed.

19. Preconstruction surveys for avian nesting pairs, nests, and eggs will occur in areas proposed for any vegetation removal and active nesting areas flagged. If nesting birds are detected, vegetation removal will be avoided and Refuge and CH2MHill biologists will be notified.

20. All native vegetation (particularly Palo verde, ocotillo, mesquite, willow species, cottonwood, cat-claw, smoke tree, and cacti species) are considered sensitive by the Refuge. To the maximum extent practicable, PG&E will avoid negative effects to these species.

21. PG&E will designate a field contact representative (FCR) who will be responsible for overseeing compliance with the minimization measures. The FCR must be onsite during all construction activities. The FCR will have authority to halt all activities that are in violation of any Special Conditions. The FCR will have a copy of all special conditions when work is being conducted on the site. The FCR may be a project manager, PG&E representative, or a biologist.

22. The area of disturbance will be confined to the smallest practical area, considering topography, placement of facilities, location of burrows, nesting sites or dens, public health and safety, and other limiting factors. As needed, work area boundaries will be delineated with flagging or other marking to minimize surface disturbance associated with vehicle or equipment straying.

23. All activities will be restricted to a pre-determined corridor. If unforeseen circumstances require project expansion, the potential expanded work areas will be surveyed for listed species prior to use of the area. All appropriate minimization measures will be implemented within the expanded work areas based on the judgment of the Refuge biologist. Work outside of the original Refuge-designated area will proceed only after receiving written approval from the Refuge, Service, and CDFG describing the exact location of the expansion.

24. All open holes and trenches will be inspected for trapped desert tortoises at the beginning, middle, and end of the work day, at a minimum. PG&E has the option of erecting desert tortoise fencing in lieu of inspection of open trenches. During excavation of trenches or holes, earthen ramps will be provided to facilitate the escape of any wildlife species that may inadvertently become entrapped. If a desert tortoises is trapped, the Refuge biologist will be notified immediately. The desert tortoise will be allowed to escape before work continues in that location. A final inspection of the open trench segment will also be made immediately before back filling. All open pipe segments will be covered when work activity is not occurring at the site. Trenches must meet the safety requirements of the Occupational Safety and Health Administration before personnel enter open trenches to remove wildlife.

25. All construction vehicles and equipment will be periodically checked to ensure proper working condition and to ensure that there is no potential for fugitive emissions of oil, hydraulic fluid or other hazardous products. The Refuge will be informed of any hazardous spills.

26. Prior to entry onto the Refuge, all construction equipment will be inspected for and cleaned of any vegetative material.

27. Workers will exercise caution when traveling to and from the project area. To minimize the likelihood for vehicle strikes of wildlife, the speed limit when traveling unpaved area roads will be 15 miles per hour.

28. Intentional killing or collection of plants, other than authorized by this letter is prohibited. PG&E will notify the Refuge of any such occurrences.

29. For emergency situations involving a pipeline leak or spill or any other immediate safety hazard, PG&E will notify the Refuge within 24 hours. As a part of this emergency response, the Refuge may require specific measures to protect wildlife. During cleanup and repair, the Refuge may also require measures to recover damaged habitats.

30. Once the well facility and access route are no longer needed, PG&E will be required, as directed by the Refuge, to restore disturbed areas in a manner that will assist in the re-establishment of biological values. Methods of such restoration will include the reduction of erosion, planting with appropriate native tress, and irrigation of reestablished vegetation for three years following planting.

31. Within 60 days of completion of construction activities, the FCR and PG&E biologist will prepare a brief report for the Refuge documenting the effectiveness of the minimization measures and making recommendations for modifying the measures to enhance species protection. The report will also provide information on survey and monitoring activities, observed listed species, and the actual acreage disturbed by the project.

32. All areas within the proposed action area and within the potential impact of the action will be monitored semiannually by PG&E during the active period for tortoise by a biologist knowledgeable of desert tortoise ecology. These surveys will be completed throughout the duration of the action to verify the presence or absence of desert tortoise and reports will be provided to the biologists at the Refuge office on an annual basis.

33. PG&E will survey riparian areas surrounding the proposed action site for southwestern willow flycatchers according to the protocol established by the Service. These surveys will be completed each year by a biologist permitted by the Service to carry out flycatcher surveys until the action has been completed and all facilities have been removed. Reports will be provided to the biologists at the Refuge office on an annual basis.

Appendix B
Awareness Training Sheets

Biological & Cultural Resources Awareness Training Attendance Sheet
Pacific Gas and Electric Topock IM-3 Project 2007

Your signature constitutes an agreement to abide by the biological and cultural resources avoidance and minimazation measures presented in this training.

Date	Name (print)	Company/Affiliation	Telephone	Signature
2/14/2007	CURT RUSSELL	PG&E	760-326-5582	
2/14/2007	Aaron Yue	DTSC	714-484-5459	ayue@dtsc.ca.gov
2/14/07	CHRIS GUERRE	DTSC	714-484-5422	
2-14-07	CHRIS SMITH	PG&E	918-645-8294	
2-14-07	Barry Collom	CH2M Hill	541-740-3250	
2-14-07	Emmanuel Campos	TRIM A TREE	7-63-44-42	
2-14-07	Richard Williams	TRIM A TREE	763-4442	
2-14-07	MOISES G.	TRIM TREE	763 4442	
2-14-07	Daniel Roberts	Prosonic	760-236-0741	
2-14-07	Todd GRAY	TRIM A TREE	763 4442	
2-14-07	~~Barry Bolton~~			~~Barry Bolton~~
2-14-07	Rob TWEIDT	NORTHSTAR	949-633-6514	
2-14-07	MIKE CAVALIERE	CH2M HILL	510-325-0022	
2-14-07	JAY PIPER	CH2M HILL	(702) 525 1137	
2-14-07	Lisa Smick	CRIT	[illegible]	
2-14-07	Jim Priest	BLM	928-505-1246	
2/14/07	ROBERT HERNANDEZ	CH2M HILL	714-227-4546	
2/14/07	LINDA OTERO	H. MOJAVE TRAIL	928-768-4475	
2/14/07	FELTON BRISCOE	FT MOJAVE TRIBE	928-346-1990	

Biological & Cultural Resources Awareness Training Attendance Sheet
Pacific Gas and Electric Topock IM-3 Project 2007

Your signature constitutes an agreement to abide by the biological and cultural resources avoidance and minimazation measures presented in this training.

Date	Name (print)	Company/Affiliation	Telephone	Signature
2-21-07	CHRIS SMITH	PGE	918 6458 94	
2-21-07	MIKE CAVALIERE	CH2MHILL	510.325.0022	
2-21-07	Ralph DeLaRosa	Northstar	(949) 202-0968	
2-21-07	ROB TWEIDT	NORTHSTAR	(415) 633-6514	
2-21-07	Dave Roberts	Parsons	(562) 239 1026	
2-21-07	Norman Greene	OSS International	(760) 819-5555	
2-21-07	Rick Cavil	CH2M HILL	408 896-0140	
2-21-07	Shawn Duffy	CH2M HILL	530-941-9227	
2-21-07	DENNIS REED	BOART	775-843-8496	
2-21-07	DANIEL VENTURA	PARSONS	740-706-1248	
2-21-07	JOEL HALLOWELL	PARSONS	740-581-0203	
2-21-07	JAMES HESKETH	PARSONS/BOART	480-393-6191	
2-21-07	David Schoen	Parsons/Boart	623 341 7365	
2/21/07	Bob Treybble	CH2M HILL	907-240 8259	
2-21-07	ROBERT HOWARTH	CH2M HILL	714-227 4546	

Appendix C
Compliance Monitoring Forms

PG&E Topock Slant Drilling Avian Survey Form 2007

DATE: 3-20-07	OBSERVER: B. Collom / CH2M	PAGE 1 OF 3

WEATHER	TEMPERATURE (F°): 65-70°F	PRICIPITATION: Ø	WIND SPEED: 10-15 variable DIRECTION: from S.

CLOUD COVER (%): overcast most of the day 80%	VISIBILITY (mi): 12-15	CEILING (ft):	CONSTRUCTION ACTIVITY: Sonic drilling

START	0725	END	0830

Species	#	Dist (m)	Ht. (m)	Dir.	Behavior	Nat Com	Duration	Location	Comments
Cliff Swallow	20-25	25-100	25+	circling	hunting bugs	Salt cedar near River	0730-0830	slant drilling site	many nests located under I-40 bridge
Turkey Vulture	5	100-150	50+	circling	hunting	"	0815-0825	"	Drilling in progress - V. noisy
pigeons	3	200+	80	~~from~~ dirge N.	short flights	"	0825-0835	railroad trestle	"

PG&E Topock Slant Drilling Avian Survey Form 2007

DATE: 3-20-07	OBSERVER: B. Colborn / CH2M Hill	PAGE 3 OF 3

WEATHER	~~Partly~~ TEMPERATURE (F°): ~80°F	PRICIPITATION: Ø	WIND SPEED: 5-10 DIRECTION: from S

CLOUD COVER (%): partly cloudy 40%	VISIBILITY (mi): 15m.	CEILING (ft):	CONSTRUCTION ACTIVITY: Sonic drilling

START	1635	END	1740

Species	#	Dist (m)	Ht. (m)	Dir.	Behavior	Nat Com	Duration	Location	Comments
Raven	1	50	80	W	soaring	Salt cedar near River	3m	CA slant drilling site	Drilling complete for today, all personnel gone
Black Vulture	2	150	100+	NW	Soaring circling	"	8 m	"	"

PG&E Topock Slant Drilling Avian Survey Form 2007

DATE: 3-20-07	OBSERVER: B. Collom / CH2M Hill	PAGE 2 OF 3

WEATHER	TEMPERATURE (F°): ~85°F	PRICIPITATION: Ø	WIND SPEED: 10-15 DIRECTION: from S.

CLOUD COVER (%): Partly cloudy 50%	VISIBILITY (mi): 15	CEILING (ft):	CONSTRUCTION ACTIVITY: Sonic drilling

START 1325		END	1430

Species	#	Dist (m)	Ht. (m)	Dir.	Behavior	Nat Com	Duration	Location	Comments
pigeons	2	50	70	S	repeated short flights	Salt cedar near River	5m.	CA slant drilling site	Drilling underway - very noisy
Turkey Vulture	1	100+	100+	W	soaring	"	2m	"	"
Northern Flicker	1	80	40	SW	flapping steadily	"	1m	"	"

PG&E Topock Slant Drilling Avian Survey Form 2007

DATE: 3-21-07	OBSERVER: B. Collom / CH2M	PAGE 1 OF 3

WEATHER	TEMPERATURE (F°): ~65°F	PRICIPITATION: Ø	WIND SPEED: 5-10 DIRECTION: from SE

CLOUD COVER (%): Partly cloudy all day 15%	VISIBILITY (mi): 20	CEILING (ft):	CONSTRUCTION ACTIVITY: Sonic drilling

START	0615	END	0750

Species	#	Dist (m)	Ht. (m)	Dir.	Behavior	Nat Com	Duration	Location	Comments
pigeons	4	50	80	W	flapping	salt cedar near river	2m.	CA slant drilling site	Drilling underway last 40 min - very loud
ravens	2	80	80	E	"	"	1.5m	"	"
red-winged blackbirds	30+	100	50	SW	"	"	2m	"	"
Cliff swallows	20+	50+	100+	circling	hunting bugs	"	1.5hr.	"	" Nests under I-40 bridge

PG&E Topock Slant Drilling Avian Survey Form 2007

DATE: 3-21-07	OBSERVER: B. Collom / CH2M	PAGE 2 OF 3

WEATHER	Sunny TEMPERATURE (F°): 85°F	PRICIPITATION: 0	WIND SPEED: 5-10 DIRECTION: from SE

Partly cloudy all day CLOUD COVER (%): 15%	VISIBILITY (mi): 20	CEILING (ft):	CONSTRUCTION ACTIVITY: Sonic drilling

START	1305	END	1410

Species	#	Dist (m)	Ht. (m)	Dir.	Behavior	Nat Com	Duration	Location	Comments
ravens	2	50	80	W	soaring	salt cedar near river	15 m	CA slant drilling site	Isoflow water sampling, less noise
un-identified humming bird	1	50	20	E	flapping	"	10 sec.	"	"
pigeons	2	70	60	SE	"	"	30sec.	"	"
ring billed? Sea gulls	6	200	300+	circling	soaring	over river	3m.	"	"
pigeons	3	50	50	~~roosting~~ W	perched ~~roosting~~ on bridge	salt cedar near river	20m	"	Back to drilling - loud...
Turkey vulture	1	100	100	S	soaring	"	1 m	"	"

PG&E Topock Slant Drilling Avian Survey Form 2007

DATE: 3-21-07	OBSERVER: B. Collom / CHZM	PAGE 3 OF 3

WEATHER	TEMPERATURE (F°): ~85°F	PRICIPITATION: Ø	WIND SPEED: 0-5	DIRECTION: from SE

CLOUD COVER (%): 5% clear	VISIBILITY (mi): 20	CEILING (ft):	CONSTRUCTION ACTIVITY: sonic drilling

START	1635	END	1740

Species	#	Dist (m)	Ht. (m)	Dir.	Behavior	Nat Com	Duration	Location	Comments
pigeons	2	80	50	circling N	short flights	Salt cedar near river	15 m	CA slant drilling site	Drilling underway — very loud
Osprey	1	300	80	~~perched~~ S.	perched	pipe bridge over river	10 m	"	"

PG&E Topock Slant Drilling Avian Survey Form 2007

DATE: 3-22-07	OBSERVER: B. Colborn / CHzM	PAGE 1 OF 3

WEATHER	TEMPERATURE (F°): ~65-70°F	PRICIPITATION: Ø	WIND SPEED: 5-10 DIRECTION: from S.

CLOUD COVER (%): mostly cloudy 70%	VISIBILITY (mi): 15 m.	CEILING (ft):	CONSTRUCTION ACTIVITY: Sonic drilling

START	0615	END	0715

Species	#	Dist (m)	Ht. (m)	Dir.	Behavior	Nat Com	Duration	Location	Comments
Cliff swallows	20+	50	80-100	circling	soaring - foraging	salt cedar near river	30m.	MW53 CA slant drilling	Drilling under way - v. loud; Setting up - quiet
Ravens	2	80	50	E	flapping	"	2m	"	"
pigeons	3	80	50	W	perched	"	40m	"	"

PG&E Topock Slant Drilling Avian Survey Form 2007

DATE: 3-22-07	OBSERVER: B. Collom / CH2M	PAGE 2 OF 3

WEATHER	TEMPERATURE (F°): 75-80°F	PRICIPITATION: Short duration - ~1 Hr, but hard	WIND SPEED: 5-10 DIRECTION: from SE

CLOUD COVER (%): 70%	VISIBILITY (mi): 10	CEILING (ft):	CONSTRUCTION ACTIVITY: Sonic drilling

START	1305	END	1405

Species	#	Dist (m)	Ht. (m)	Dir.	Behavior	Nat Com	Duration	Location	Comments
Ravens	2	80	50	NW	short flights	salt cedar near river	15m	MW53 CA slant drilling	Drill rig shut down - lightening in area
Red tail hawk	1	40	80	S	Soaring	"	5m	"	"
Raven	1	above site	15	SE	flapping	"	20s	"	Drilling underway
V/I swallows	~20	100	30+	S	Soaring circling	"	10m	"	" "

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PG&E Topock Slant Drilling Avian Survey Form 2007

DATE: 3-22-07	OBSERVER: B. Collom / CH2M	PAGE 3 OF 3

WEATHER	TEMPERATURE (F°): ~80°F	PRICIPITATION: not since mid-day	WIND SPEED: 5-10 DIRECTION: from S.

CLOUD COVER (%): st. cloudy ~25%	VISIBILITY (mi): 15	CEILING (ft):	CONSTRUCTION ACTIVITY: Sonic drilling

START	1640	END	1740

Species	#	Dist (m)	Ht. (m)	Dir.	Behavior	Nat Com	Duration	Location	Comments
Tree swallow	1	10	5	W	perched	salt cedar near river	3m	MW53 CA slant drill site	Drill rig down for maint.
Great tailed Grackles	2	20	20	E	flapping	"	40s	"	" "
pigeons	4	40	40	W	Perched	"	15m	"	" "
cliff swallows	20+	50	50+	SE	circling-hunting	"	15m	"	" "
Ravens	2	20	40	SW	flapping	"	2m	"	" "

PG&E Topock Slant Drilling Avian Survey Form 2007

DATE: 3-23-07	OBSERVER: B. Collom / CH2M	PAGE 1 OF 3

WEATHER	TEMPERATURE (F°): ~60°F	PRICIPITATION: sprinckles & breaks	WIND SPEED: 5-10 DIRECTION: from SE

CLOUD COVER (%): overcast 100%	VISIBILITY (mi): 7-10	CEILING (ft):	CONSTRUCTION ACTIVITY: Sonic drilling

START	0615	END	0715

Species	#	Dist (m)	Ht. (m)	Dir.	Behavior	Nat Com	Duration	Location	Comments
cliff swallows	20+	50	50+	E	circling	salt cedar near river	25m	MW53 CA slant drill site	Drill rig still down for repairs
pigeons	3	40	40	W	short flights	"	10 m	"	"
Ravens	2	50	50	SE	flapping	"	5 m	"	"
Western Kingbird	1	20	5	N	perched-foraging	"	5 m	"	"

PG&E Topock Slant Drilling Avian Survey Form 2007

DATE: 3-23-07	OBSERVER: B. Collom / CHzm	PAGE 2 OF 3

WEATHER	TEMPERATURE (F°): ~70°F	PRICIPITATION: sprinkles sporadically	WIND SPEED: 5-10 DIRECTION: from S

CLOUD COVER (%): overcast 100%	VISIBILITY (mi): 7-10	CEILING (ft):	CONSTRUCTION ACTIVITY: sonic drilling

START	1235	END	1335

Species	#	Dist (m)	Ht. (m)	Dir.	Behavior	Nat Com	Duration	Location	Comments
Pigeons	4	60	30	W	perched, short flights	Salt cedar near river	10m	MW53 CA slant drill site	Rig is down - drillers on lunch
Phaino-pepla	male 1	20	10	N	perched	"	2m	"	" "
Ravens	2	80	40	NW	flapping	"	1m	"	" "
Brewers Blackbirds	40+	70	0-30	W	flapping, on ground	"	7m	"	" "

PG&E Topock Slant Drilling Avian Survey Form 2007

DATE: 3-23-07	OBSERVER: B. Collom / CH2M	PAGE 3 OF 3

WEATHER	TEMPERATURE (F°): ~70°F	PRICIPITATION: Ø	WIND SPEED: 5-10 DIRECTION: from SE

CLOUD COVER (%): Partly cloudy 20%	VISIBILITY (mi): 15	CEILING (ft):	CONSTRUCTION ACTIVITY: Sonic drilling

START	1640	END	1740

Species	#	Dist (m)	Ht. (m)	Dir.	Behavior	Nat Com	Duration	Location	Comments
Ravens	2	50	40	NW	flapping	Salt cedar near river	1 m	MW53 CA slant drill site	Drill rig is down for repairs
Osprey	1	100	50	S	perched - eating fish	river	7 m	"	"
Turkey Vulture	1	150	100	E	Soaring	river	1 m	"	"
pigeons	3	60	50	W	perched - short flights	Salt cedar near river	10 m	"	"

PG&E Topock Slant Drilling Avian Survey Form 2007

DATE: 3-24-07	OBSERVER: B. Collom / CHZM	PAGE 1 OF 3

WEATHER	TEMPERATURE (F°): ~65°F	PRICIPITATION: Ø	WIND SPEED: 5-10 DIRECTION: from SE

CLOUD COVER (%): clear Ø %	VISIBILITY (mi): 20	CEILING (ft):	CONSTRUCTION ACTIVITY: Sonic drilling

START 1010		END	1110

Species	#	Dist (m)	Ht. (m)	Dir.	Behavior	Nat Com	Duration	Location	Comments
Ravens	2	70	50	SW	flapping	salt cedar near river	1 m	MW53 CA slant drill site	Drill rig is down awaiting repairs
pigeons	4	50	40	NW	circling short flights	"	10 m	"	"
cliff swallows	15+	70	40+	SE	circling -hunting	" + over river	20m	"	"
U/I small gleaner	1	1-5	1-5	N	foraging in under brush	salt cedar near river	2m	"	"

PG&E Topock Slant Drilling Avian Survey Form 2007

DATE: 3-24-07	OBSERVER: B.Callom/CHZM	PAGE 2 OF 3

WEATHER	TEMPERATURE (F°): ~80s	PRICIPITATION: Ø	WIND SPEED: 5-10 DIRECTION: from S.

CLOUD COVER (%): Sunny Ø%	VISIBILITY (mi): 20	CEILING (ft):	CONSTRUCTION ACTIVITY: sonic drilling

START	1305	END	1405

Species	#	Dist (m)	Ht. (m)	Dir.	Behavior	Nat Com	Duration	Location	Comments
Raven	1	70	30	E	flapping	Salt cedar near river	1 m	MW53 CA Slant drill site	Drilling underway
Brewers black birds	15+	100	on ground	W	foraging	"	10m	"	"
pigeons	2	50	30	NW	flapping	"	1 m	"	"
Turkey Vultures	2	100	100+	S	soaring	"	3 m	"	"
American Kestrel	1	80	80	W	soaring-gliding	"	1 m	"	"
Osprey	1	200	70	S	perched	over River	15m	"	"

PG&E Topock Slant Drilling Avian Survey Form 2007

DATE: 3-24-07	OBSERVER: B. Collom / CHZM	PAGE 3 OF 3

WEATHER	TEMPERATURE (F°): ~85°F	PRICIPITATION: Ø	WIND SPEED: 0-5 DIRECTION: from S.

CLOUD COVER (%): Ø	VISIBILITY (mi): 20	CEILING (ft):	CONSTRUCTION ACTIVITY: sonic drilling

START	1610	END	1710

Species	#	Dist (m)	Ht. (m)	Dir.	Behavior	Nat Com	Duration	Location	Comments
Ravens	2	60	40	SW	flapping	salt cedar near river	2m	mw53 CA slant drill site	Drill rig is shut down for today
pigeons	4	40	40	W	perching	"	15m	"	"
Great tailed grackle	2 males	50	40	SE	flapping	"	1m	"	"
Brewers blackbirds	20+	80	20	W	flapping	"	1m	"	"
U/I hummingbird	1	40	15	E	"	"	10s	"	"

PG&E Topock Slant Drilling Avian Survey Form 2007

DATE: 3-25-07	OBSERVER: B. Colborn/CH2M	PAGE 1 OF 9

WEATHER	TEMPERATURE (F°): 65°F	PRICIPITATION: Ø	WIND SPEED: 5-10 DIRECTION: from S.

CLOUD COVER (%): Ø	VISIBILITY (mi): 15	CEILING (ft): —	CONSTRUCTION ACTIVITY: Sonic drilling

START	0730	END	0835

Species	#	Dist (m)	Ht. (m)	Dir.	Behavior	Nat Com	Duration	Location	Comments
Road-runner	1	60	on ground	NW	running-foraging	salt cedar near river	15 s	mw 53 CA slant drill site	Collecting Bo flow sample rig not operating
cliff Swallows	15+ 4	50	10-50+	E	circling foraging	"	10 m	"	"
Ravens	2	40	50	W	flapping	"	1 m	"	"
pigeons	2	50	50	W	perched	"	5 m	"	"

PG&E Topock Slant Drilling Avian Survey Form 2007

DATE: 3-25-07	OBSERVER: B. Collom / CH2M	PAGE 2 OF 3

WEATHER	TEMPERATURE (F°): ~80°F	PRICIPITATION: Ø	WIND SPEED: 5-10 DIRECTION: from S.

CLOUD COVER (%): Ø	VISIBILITY (mi): 20	CEILING (ft):	CONSTRUCTION ACTIVITY: Sonic drilling

START	1145	END	1250

Species	#	Dist (m)	Ht. (m)	Dir.	Behavior	Nat Com	Duration	Location	Comments
Ravens	2	70	30	E	flapping	salt cedar near river	40s	MW53 CA slant drilling site	Drilling underway
pigeons	3	80	40	N	circling	"	5m	"	"
western Kingbird	1	60	10	N	perched - foraging	"	3m	"	"

PG&E Topock Slant Drilling Avian Survey Form 2007

DATE: 3-25-07	OBSERVER: B. Collom / CH2M	PAGE 3 OF 3

WEATHER	TEMPERATURE (F°): ~80°F	PRICIPITATION: Ø	WIND SPEED: 0-5	DIRECTION: from SE

CLOUD COVER (%): Ø	VISIBILITY (mi): 20	CEILING (ft): —	CONSTRUCTION ACTIVITY: Sonic drilling

START	1600	END	1700

Species	#	Dist (m)	Ht. (m)	Dir.	Behavior	Nat Com	Duration	Location	Comments
Ravens	2	50	30	N	circling	salt cedar near river	3 m	MW 53 CA slant drill site	Drill rig shut down for the day
pigeons	4	60	40	W	short flights	"	10 m	"	"
cliff swallows	20+	10-50+	10-100+	SW + SE	circling foraging	"	15 m	"	"
U/I Hummingbird	1	15	10	SE	flapping	"	15 s	"	"
turkey vultures	4	70	100+	SE	soaring-foraging	"	10 m	"	"

PG&E Topock Slant Drilling Avian Survey Form 2007

DATE: 3-26-07	OBSERVER: B. Colborn / CH2M	PAGE 1 OF 3

WEATHER	TEMPERATURE (F°): ~85°F	PRICIPITATION: Ø	WIND SPEED: 0-5	DIRECTION: from E

CLOUD COVER (%): Ø	VISIBILITY (mi): 20	CEILING (ft):	CONSTRUCTION ACTIVITY: Sonic drilling

START	0720	END	0825

Species	#	Dist (m)	Ht. (m)	Dir.	Behavior	Nat Com	Duration	Location	Comments
Ravens	2	50	30	N	perched	Salt cedar near river	5m	mw53 CA slant drilling site	Drill rig not operating
pigeons	4	50	40	W	perched	"	10m	"	"
cliff swallows	20+	10 - 50	10 - 100+	SE + SW	circling foraging	"	15 m	"	"

PG&E Topock Slant Drilling Avian Survey Form 2007

DATE: 3-26-07	OBSERVER: B. Collom / CH2M	PAGE 2 OF 3

WEATHER	TEMPERATURE (F°): ~80°F	PRICIPITATION: Ø	WIND SPEED: 0-5 DIRECTION: from SE

CLOUD COVER (%): Ø	VISIBILITY (mi): 20	CEILING (ft):	CONSTRUCTION ACTIVITY: Sonic drilling

START	1220	END	1325

Species	#	Dist (m)	Ht. (m)	Dir.	Behavior	Nat Com	Duration	Location	Comments
Ravens	2	70	30	NE	flapping	salt cedar near river	2 m	MW53 CA slant drill site	Drill rig not operating
pigeons	3	60	40	NW	short flights	"	5 m	"	"
turkey vultures	3	50+	80-100+	SE	circling - foraging	"	10 m	"	"

PG&E Topock Slant Drilling Avian Survey Form 2007

DATE: 3-26-07	OBSERVER: B. Collom / CHZM	PAGE 3 OF 3

WEATHER	TEMPERATURE (F°): ~85°F	PRICIPITATION: ∅	WIND SPEED: 0-5 DIRECTION: from S.

CLOUD COVER (%): ∅	VISIBILITY (mi): 20	CEILING (ft):	CONSTRUCTION ACTIVITY: Sonic drilling

START	1535	END	1700

Species	#	Dist (m)	Ht. (m)	Dir.	Behavior	Nat Com	Duration	Location	Comments
Ravens	2	60	40	N	circling - short flights	salt cedar near river	3 m	mw53 CA slant drill site	drill rig not operating
pigeons	3	60	40	W	perched	"	15 m	"	"
Turkey Vultures	4	100	100+	S	soaring-foraging	"	10 m	"	"
Brewers blackbirds	20+	80	on ground	W	foraging	"	5 m	"	"

PG&E Topock Slant Drilling Avian Survey Form 2007

DATE: 3-28-07	OBSERVER: B. Collom / CH2M	PAGE 1 OF 3

WEATHER	TEMPERATURE (F°): ~60°F	PRICIPITATION: Ø	WIND SPEED: 5-10	DIRECTION: from S

CLOUD COVER (%): Clear, 5%	VISIBILITY (mi): 20	CEILING (ft): —	CONSTRUCTION ACTIVITY: sonic drilling

START	0610	END	0705

Species	#	Dist (m)	Ht. (m)	Dir.	Behavior	Nat Com	Duration	Location	Comments
Ravens	4	70	40	NW	perched - short flights	salt cedar near river	15m	mw53 CA slant drill site	Drill rig not yet in operation
Brewers black-birds	15-20	80	on ground	NW	foraging	"	10m	"	"
Pigeons	4	60	40	W	perched	"	10m	"	"
* Abert's Towhee	2	100	on ground	NW	short flights to ground	"	3m	"	"
cliff swallows	20+	10-100	10-100+	SE + SW	circling foraging	"	15m	"	"

PG&E Topock Slant Drilling Avian Survey Form 2007

DATE: 3-28-07	OBSERVER: B. Collom / CHzm	PAGE 2 OF 3

WEATHER	TEMPERATURE (F°): Clear ~70°F ~~10%~~	PRICIPITATION: Ø	WIND SPEED: 0-5 DIRECTION: from S.E.

CLOUD COVER (%): Clear 5-10%	VISIBILITY (mi): 20	CEILING (ft): —	CONSTRUCTION ACTIVITY: Sonic drilling

START	1210	END	1315

Species	#	Dist (m)	Ht. (m)	Dir.	Behavior	Nat Com	Duration	Location	Comments
Ravens	3	60	20	NW	short flights	salt cedar near river	5 m	mw 53 CA slant drill site	Drill rig down for lunch
pigeons	3	50	40	NW	Perched	"	10 m	"	"
U/I Hummingbird	1	15	5	S	flapping	"	5s	"	"

PG&E Topock Slant Drilling Avian Survey Form 2007

DATE: 3-28-07	OBSERVER: B. Collom / CH2M	PAGE 3 OF 3

WEATHER	TEMPERATURE (F°): ~70°F	PRICIPITATION: ∅	WIND SPEED: 0-5 DIRECTION: from E.

CLOUD COVER (%): partly cloudy ~60%	VISIBILITY (mi): 20	CEILING (ft):	CONSTRUCTION ACTIVITY: Sonic drilling

START	1545	END	1650

Species	#	Dist (m)	Ht. (m)	Dir.	Behavior	Nat Com	Duration	Location	Comments
Ravens	2	60	30	W	flapping	salt cedar near river	3m	MW53 CA slant drill site	Drill rig not operating prep'ing to pump grout
cliff swallows	15+	10-100	10-100	SE + SW	circling foraging	"	15m	"	"
pigeons	2	50	20	NW	flapping	"	1m	"	"
osprey	1	100	30	S	perched	"	10m	"	"
turkey Vulture	2	100	60	NE	soaring foraging	"	3m	"	Drill rig operating - pumping grout

Appendix D
Photograph Documentation

Photo 1: Pre-clearing. Viewing south at direction of slant drill work area from MW-43 prior to vegetation removal.

Photo 2: Post-clearing. Viewing south at path to the slant drill work area from MW-43 after vegetation removal.

Photo 3: Pre-drilling. Viewing east from northwest corner of slant drill work area after vegetation removal, but prior to drilling and well installation.

Photo 4: Post-drilling. Viewing east from northwest corner of slant drill work area after drilling and well installation.

Photo 5: Pre-drilling. Viewing north from the southwest corner of the slant drill work area after vegetation removal, but prior to drilling and well installation.

Photo 6: Post-drilling. Viewing north from the southwest corner of the slant drill work area after drilling and well installation.