Arizona Department of Water Resources
Information Management Unit
P.O. Box 33589 Phoenix, Arizona 85067-3589
(602) 771-8627 • (800) 352-8488
www.azwater.gov

RECEIVED AUG 26 2008 INFO MGMT

ENTERED MO SEP - 5 2008

Well Driller Report and Well Log

FILE NUMBER: B(15-21)3AAB

WELL REGISTRATION NUMBER: 55 - 215410

PERMIT NUMBER (IF ISSUED):

THIS REPORT MUST BE FILED WITHIN **30 DAYS** OF COMPLETING THE WELL.

PLEASE PRINT CLEARLY USING BLACK OR BLUE INK.

SECTION 1. DRILLING AUTHORIZATION

Drilling Firm

Mail To:

NAME: BOART - LONGYEAR

ADDRESS: 12464 McCANN DR.

CITY / STATE / ZIP: SANTA FE SPRINGS, CA. 90670

DWR LICENSE NUMBER: 83

TELEPHONE NUMBER: 480-635-9665

FAX: 480-635-9690

SECTION 2. REGISTRY INFORMATION

Well Owner

FULL NAME OF COMPANY, ORGANIZATION, OR INDIVIDUAL: PACIFIC GAS & ELECTRIC CO.

MAILING ADDRESS: 4325 S. HIGUERA ST.

CITY / STATE / ZIP CODE: SAN LUIS OBISPO, CA 94305

CONTACT PERSON NAME AND TITLE: YVONNE MEEKS, PM

TELEPHONE NUMBER: 805-234-2257

FAX: 805-546-5232

WELL NAME (e.g., MW-1, PZ-3, Lot 25 Well, Smith Well, etc.): MW-54-195

Location of Well

WELL LOCATION ADDRESS (IF ANY): HAVASU NATIONAL WILDLIFE REFUGE

TOWNSHIP (N/S)	RANGE (E/W)	SECTION	160 ACRE	40 ACRE	10 ACRE
15	21	003	NE ¼	NE ¼	NW ¼

LATITUDE			LONGITUDE		
34 ° Degrees	43 ' Minutes	13 " N Seconds	114 ° Degrees	29 ' Minutes	13 " W Seconds

METHOD OF LATITUDE/LONGITUDE (CHECK ONE)
☐ *GPS: Hand-Held ☒ *GPS: Survey-Grade

LAND SURFACE ELEVATION AT WELL: 466.80 Feet Above Sea Level

METHOD OF ELEVATION (CHECK ONE)
☐ *GPS: Hand-Held ☒ *GPS: Survey-Grade

*GEOGRAPHIC COORDINATE DATUM (CHECK ONE)
☒ NAD-83 ☐ Other (*please specify*):

COUNTY: MOHAVE

ASSESSOR'S PARCEL ID NUMBER: BOOK | MAP | PARCEL

SECTION 3. WELL CONSTRUCTION DETAILS

Drill Method

CHECK ALL THAT APPLY
- ☐ Air Rotary
- ☐ Bored or Augered
- ☐ Cable Tool
- ☐ Dual Rotary
- ☐ Mud Rotary
- ☐ Reverse Circulation
- ☐ Driven
- ☐ Jetted
- ☐ Air Percussion / Odex Tubing
- ☒ Other (*please specify*): ROTOSONIC

Method of Well Development

CHECK ALL THAT APPLY
- ☐ Airlift
- ☒ Bail
- ☒ Surge Block
- ☒ Surge Pump
- ☐ Other (*please specify*):

Condition of Well

CHECK ONE
- ☒ Capped
- ☐ Pump Installed

Method of Sealing at Reduction Points

CHECK ONE
- ☒ None
- ☐ Packed
- ☐ Swedged
- ☐ Welded
- ☐ Other (*please specify*):

Construction Dates

DATE WELL CONSTRUCTION STARTED: 3-19-2008

DATE WELL CONSTRUCTION COMPLETED: 3-20-2008

I state that this notice is filed in compliance with A.R.S. § 45-596 and is complete and correct to the best of my knowledge and belief.

SIGNATURE OF QUALIFYING PARTY: [signature]

DATE: 5/1/08

Well Driller Report and Well Log

WELL REGISTRATION NUMBER
55 - 215410

SECTION 4. WELL CONSTRUCTION DESIGN (AS BUILT) (attach additional page if needed)

Depth

DEPTH OF BORING	DEPTH OF COMPLETED WELL
237 Feet Below Land Surface	195 Feet Below Land Surface

Water Level Information

STATIC WATER LEVEL	DATE MEASURED	TIME MEASURED	IF FLOWING WELL, METHOD OF FLOW REGULATION
15 Feet Below Land Surface	3/12/08	1113	☐ Valve ☐ Other:

Borehole			Installed Casing													
DEPTH FROM SURFACE		BOREHOLE DIAMETER (inches)	DEPTH FROM SURFACE		OUTER DIAMETER (inches)	MATERIAL TYPE (T)				PERFORATION TYPE (T)						SLOT SIZE IF ANY (inches)
FROM (feet)	TO (feet)		FROM (feet)	TO (feet)		STEEL	PVC	ABS	IF OTHER TYPE, DESCRIBE	BLANK OR NONE	WIRE WRAP	SHUTTER SCREEN	MILLS KNIFE	SLOTTED	IF OTHER TYPE, DESCRIBE	
0	187	8"	0	185	2.3		✓		Sch 80							
187	237	7"	185	195	2.3		✓		Sch 80					✓		0.020

Installed Annular Material

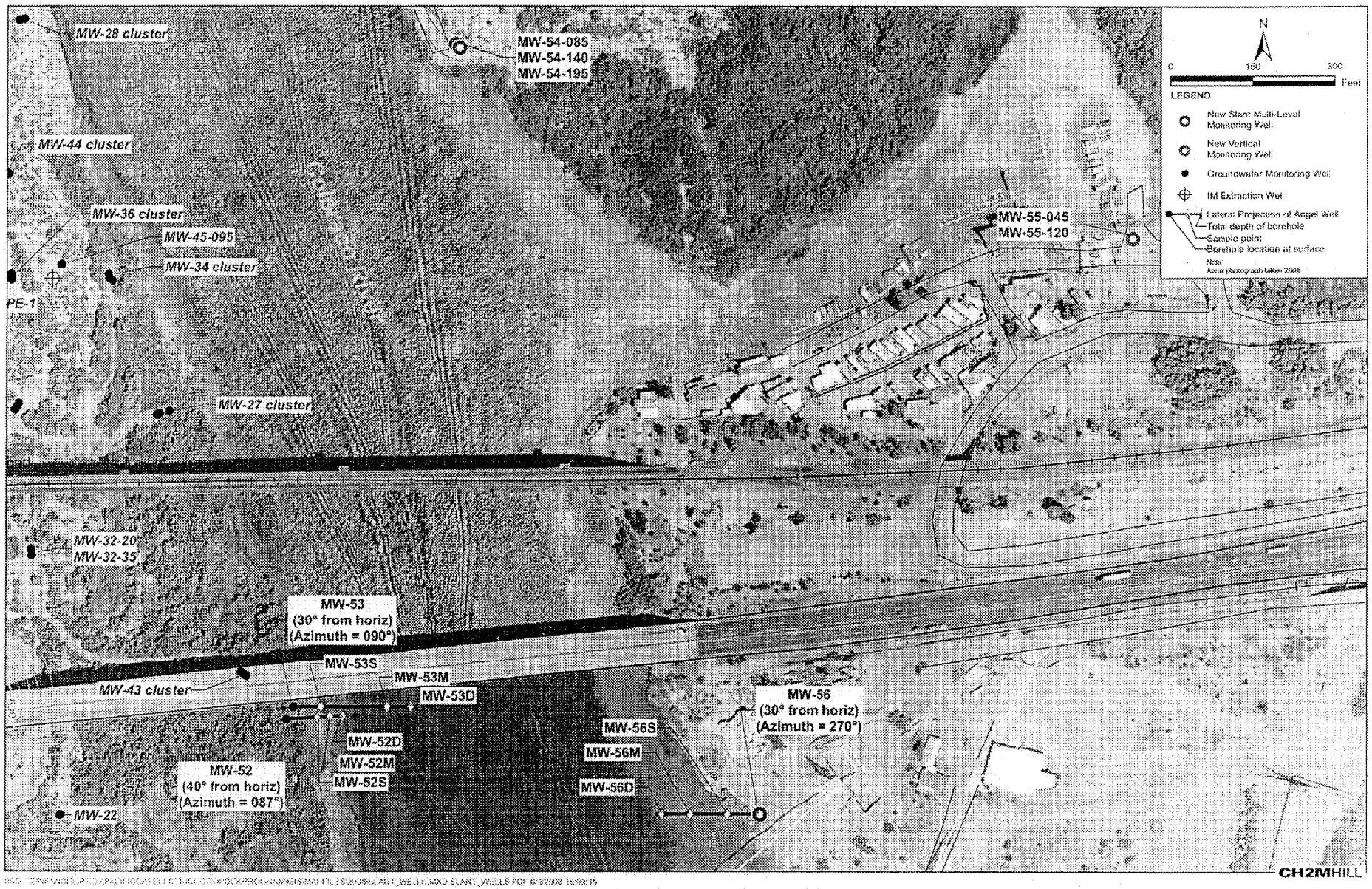
DEPTH FROM SURFACE		ANNULAR MATERIAL TYPE (T)								FILTER PACK		
						BENTONITE						
FROM (feet)	TO (feet)	NONE	CONCRETE	NEAT CEMENT OR CEMENT GROUT	CEMENT-BENTONITE GROUT	GROUT	CHIPS	PELLETS	IF OTHER TYPE OF ANNULAR MATERIAL, DESCRIBE	SAND	GRAVEL	SIZE
0.0	20.0			✓								
20.0	169.0					✓						
169.0	180.0							✓				
180.0	205.0									100		#3
205.0	237.0							✓				

Well Driller Report and Well Log

WELL REGISTRATION NUMBER
55 - 215410

SECTION 5. GEOLOGIC LOG OF WELL

DEPTH FROM SURFACE FROM (feet)	TO (feet)	Description: Describe material, grain size, color, etc.	Check (✓) every interval where water was encountered (if known)
0.0	34.0	Poorly graded sand, subangular to subrounded	Saturated at 15 ft
34.0	53.0	Silty sand with gravel, subangular to subrounded	depth to top of
53.0	54.0	Well-graded sand, subrounded, largest clast is 10-mm	bedrock (230.0 ft
54.0	60.0	Poorly graded sand, subangular to subrounded	bgs)
60.0	64.0	Well-graded gravel, rounded to subrounded, various mineralogy,	
		no structure, sharp contact with SP above, largest clast is 110-mm	
64.0	65.5	Well-graded sand, rounded to subrounded, no structure, largest clast	30-mm
65.5	67.0	Poorly graded sand, subrounded, no structure	
67.0	69.0	Well-graded gravel, rounded to subrounded, various mineralogy,	
		no structure, largest clast is 70-mm	
69.0	87.0	Poorly graded sand, subrounded, no structure, largest clast is 20-mm	
87.0	95.5	Poorly graded sand (5% fines), subrounded to subangular, no apparent structure	
95.5	97.0	Well-graded gravel, angular to subangular, various mineralogy, no structure,	
		largest clast is 150-mm	
97.0	116.0	Cobbles with boulders, angular to rounded, clast supported, various mineralogy	
116.0	117.0	Clayey gravel, subrounded to subangular, clay is soft, largest clast is 100-mm	
117.0	120.0	Poorly graded gravel with silt and sand, subrounded to subangular, matrix supported, largest clast is 100-mm	
120.0	126.0	Well-graded gravel, subrounded, largest clast is greater than 6 inches	
126.0	131.0	Inorganic clay, medium stiff, finely laminated	
131.0	135.0	Poorly graded sand, subangular, largest clast is 50-mm	
135.0	136.0	Inorganic clay, medium stiff, finely laminated	
136.0	138.0	Poorly graded gravel with silt and sand, subangular to subrounded, clast supported, largest clast is 80-mm	
138.0	195.0	Well-graded sand, subangular, no structure, largest clast is 20-mm reddish brown (first occurrence of this color)	
195.0	230.0		
230.0	237.0	Bedrock, Consolidate Miocene Conglomerate, dry	

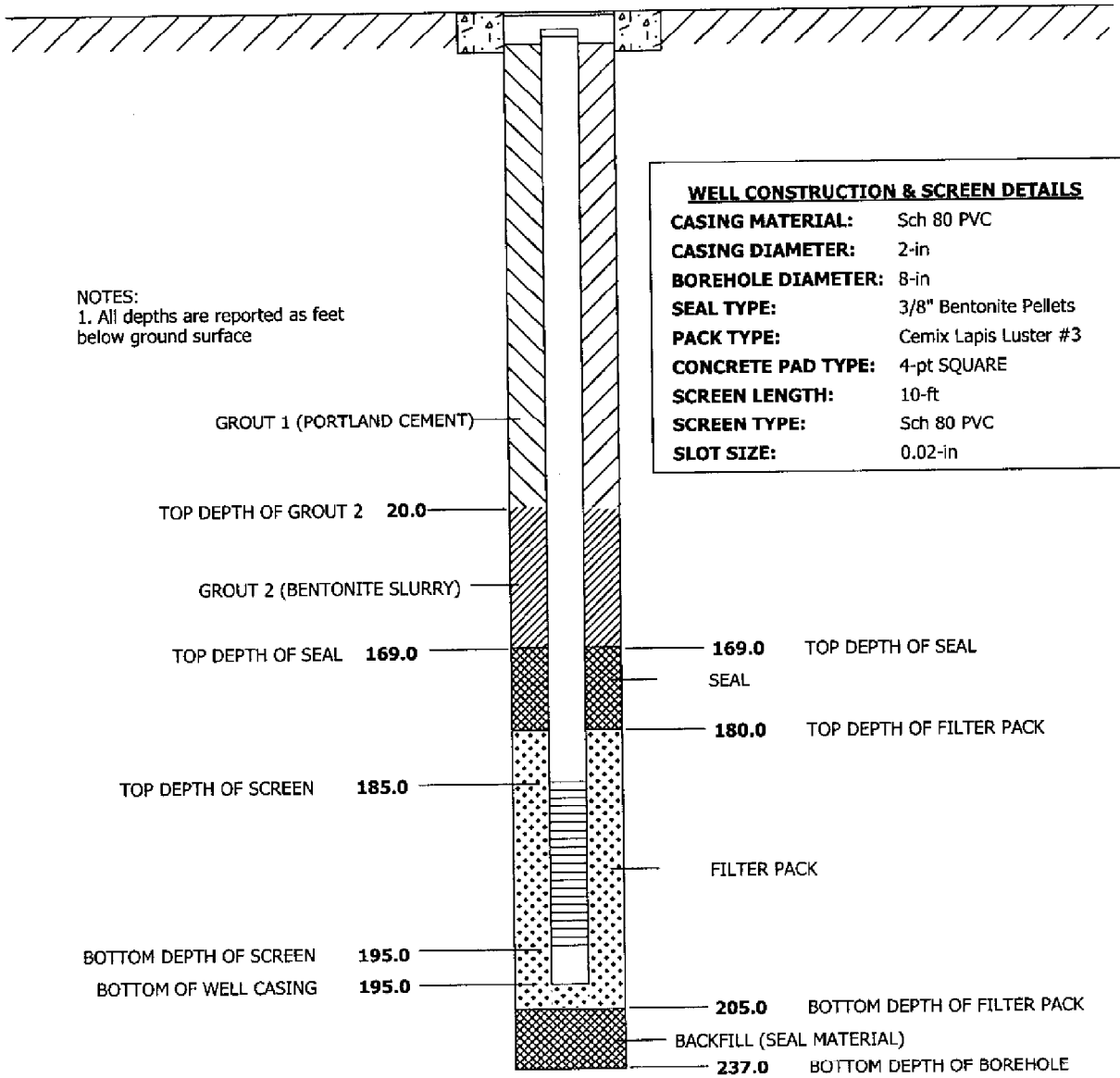

MW-28 cluster
MW-54-085
MW-54-140
MW-54-195
MW-44 cluster
MW-36 cluster
MW-45-095
MW-34 cluster
PE-1
MW-55-045
MW-55-120
MW-27 cluster
MW-32-20
MW-32-35
MW-53
(30° from horiz)
(Azimuth = 090°)
MW-53S
MW-53M
MW-53D
MW-43 cluster
MW-52D
MW-52M
MW-52S
MW-52
(40° from horiz)
(Azimuth = 087°)
MW-22
MW-56S
MW-56M
MW-56D
MW-56
(30° from horiz)
(Azimuth = 270°)
N
0
150
300
Feet
LEGEND
New Slant Multi-Level Monitoring Well
New Vertical Monitoring Well
Groundwater Monitoring Well
IM Extraction Well
Lateral Projection of Angel Well
Total depth of borehole
Sample point
Borehole location at surface
Note:
Aerial photograph taken 2008
CH2MHILL

WELL COMPLETION DIAGRAM

PROJECT NO: 354948.FP.07.FW	**PROJECT:** Topock AZ Drilling	**WELL NO:** ***MW-54-195***
LOCATION: Site 1		

DRILLING CONTRACTOR: Boart-Longyear	**DRILLING START:** 3/12/2008
DRILLING METHOD: Rotosonic	**DRILLING END:** 3/18/2008
LOGGER: A. Brewster	**WELL COMPLETION DATE:** 3/18/2008
GROUND SURFACE ELEVATION (NAVD 88): 466.80	**GENERAL REMARKS:** ---

LOCKING FLUSH COMPLETION



NOTES:
1. All depths are reported as feet below ground surface

WELL CONSTRUCTION & SCREEN DETAILS

CASING MATERIAL:	Sch 80 PVC
CASING DIAMETER:	2-in
BOREHOLE DIAMETER:	8-in
SEAL TYPE:	3/8" Bentonite Pellets
PACK TYPE:	Cemix Lapis Luster #3
CONCRETE PAD TYPE:	4-pt SQUARE
SCREEN LENGTH:	10-ft
SCREEN TYPE:	Sch 80 PVC
SLOT SIZE:	0.02-in

WELL DIAGRAM IS NOT TO SCALE

CH2MHILL

ARIZONA DEPARTMENT OF WATER RESOURCES

WATER MANAGEMENT SUPPORT SECTION

3550 N. Central Avenue
Phoenix, Arizona 85012

VARIANCE GRANTED

THIS AUTHORIZATION SHALL BE IN POSSESSION OF THE DRILLER DURING ALL DRILL OPERATIONS

WELL REGISTRATION NO: 55-215410 MW - 54D

AUTHORIZED DRILLER: BOART LONGYEAR COMPANY LICENSE NO: 83

NOTICE OF INTENTION TO DRILL A MONITOR WELL(S) HAS BEEN FILED WITH THE DEPARTMENT BY:

WELL OWNER: PACIFIC GAS AND ELECTRIC 4325 SOUTH HIGUERA ST SAN LUIS OBISPO, CA 94305

THE WELL(S) IS/ARE TO BE LOCATED IN THE:
NW ¼ OF THE NE ¼ OF THE NE ¼ SECTION 3 TOWNSHIP 15 NORTH RANGE 21 WEST

NO. OF WELLS IN THIS PROJECT: 1

THIS AUTHORIZATION EXPIRES AT MIDNIGHT ON THE 13TH DAY OF FEBRUARY, 2009

WATER MANAGEMENT SUPPORT

THE DRILLER MUST FILE A LOG OF THE WELL
WITHIN 30 DAYS OF COMPLETION OF DRILLING

GREAT SEAL OF THE STATE OF ARIZONA
DITAT DEUS
1912

ARIZONA DEPARTMENT OF WATER RESOURCES
3550 N. Central Avenue, Phoenix, Arizona 85012
Telephone (602) 771-8500
Fax (602) 771-8691

February 26, 2008

Janet Napolitano
Governor

Herbert R. Guenther
Director

PACIFIC GAS AND ELECTRIC
4325 SOUTH HIGUERA ST
SAN LUIS OBISPO, CA 94305

Registration No. 55-215410
File No. B(15-21) 3 AAB

Dear Well Owner:

Enclosed for your records is an annotated copy of the Notice of Intention to Drill (NOI) a Monitor/Piezometer/Environmental Well, which you recently filed with this Department pursuant to A.R.S. § 45-596. This is to inform you that the Department has approved the NOI and has mailed a drilling card authorizing the drilling of the well to your designated well drilling contractor. The driller may not begin drilling until he has received the drilling card, which he must keep in his possession at the well site during drilling.

Well drilling activities must be completed within one year after the date the NOI was filed with the Department. If drilling is not completed within one year, you must file a new NOI before proceeding with further drilling. If it is necessary to change the location of the proposed well, you may not proceed with drilling until you file an amended NOI with the Department. A properly amended drilling card will then be issued and must be in the possession of the well drilling contractor before drilling begins.

Since this well is being drilled as a monitor or piezometer well, or for remediation purposes, our standard Well Driller Report and Well Log form (DWR form 55-55) is being furnished to the well drilling contractor. This form must be filed with the Department within 30 days after completion of the well. A Pump Installation Completion Report form (DWR form 55-56) is being furnished to the well owner for monitor wells where a pump installation is authorized. This must be completed within 30 days of installing a pump as required by A.R.S. § 45-600. During the drilling of a new well, if it is determined that it must be abandoned, then a Well Abandonment Completion Report (DWR form 55-58) must be submitted per R12-15-816(F).

Please be advised that A.R.S. § 45-593(C) requires the person to whom a well is registered to notify the Department of a change of ownership of the well and/or information pertaining to the physical characteristics of the well, in order to keep the well registration file current and accurate. Any change in well information or a request to change well driller must be filed on a Request to Change Well Information form (DWR form 55-71A), which is enclosed for your future use.

Sincerely,

Denae Schoonover
NOI Unit
Water Management Support Section

Enclosures

Printed on recycled paper. Each ton of recycled paper saves 7,000 gallons of water.

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Arizona Department of Water Resources
Water Management Support Section
P.O. Box 458 • Phoenix, Arizona 85001-0458
(602) 771-8500 • (800) 352-8488
www.azwater.gov

Notice of Intent to Drill, Deepen, or Modify a *Monitor / Piezometer / Environmental* Well

FEE

- Review instructions prior to completing form in black or blue ink.
- You must include with your Notice:
  - $150 check or money order for the filing fee.
  - Well construction diagram, labeling all specifications listed in Section 6.
- Authority for fee: A.R.S. § 45-596.

** PLEASE PRINT CLEARLY **

AMA / INA	B	SB
—	59	
RECEIVED DATE	WS	
2-14-08	02	
ISSUED DATE	WQAR	CERCLA
2-25-08	—	—

FILE NUMBER: B(15-21)3 AAB
WELL REGISTRATION NUMBER: 55 - 215410

SECTION 1. REGISTRY INFORMATION

Well Type — CHECK ONE
- [x] Monitor
- [ ] Piezometer
- [ ] Vadose Zone
- [ ] Air Sparging
- [ ] Soil Vapor Extraction
- [ ] Other (*please specify*):

Proposed Action — CHECK ONE
- [x] Drill New Well
- [ ] Deepen
- [ ] Modify

If Deepening or Modifying:
WELL REGISTRATION NUMBER: 55 - 215410

Location of Well
WELL LOCATION ADDRESS (IF ANY): Havasu National Wildlife Refuge

TOWNSHIP (N/S)	RANGE (E/W)	SECTION	160 ACRE	40 ACRE	10 ACRE
15N	21W	003	NE ¼	NE ¼	NW ¼

COUNTY ASSESSOR'S PARCEL ID NUMBER: BOOK | MAP | PARCEL
COUNTY WHERE WELL IS LOCATED: Mojave

SECTION 2. OWNER INFORMATION

Well Owner	**Landowner** (if different from Well Owner)
FULL NAME OF COMPANY, ORGANIZATION, OR INDIVIDUAL: Pacific Gas and Electric	FULL NAME OF COMPANY, GOVERNMENT AGENCY, OR INDIVIDUAL: Havasu National Wildlife refuge
MAILING ADDRESS: 4325 South Higuera Street	MAILING ADDRESS: P.O. Box 3009 317 Mesquite Ave
CITY / STATE / ZIP CODE: San Luis Obispo CA, 94305	CITY / STATE / ZIP CODE: Needles, CA 92362
CONTACT PERSON NAME AND TITLE: Yvonne Meeks, Project Manager	CONTACT PERSON NAME AND TITLE: John Earle
TELEPHONE NUMBER: 805-234-2257 / FAX: 805-546-5232	TELEPHONE NUMBER: / FAX:

VARIANCE GRANTED

SECTION 3. DRILLING AUTHORIZATION

Drilling Firm	**Consultant** (if applicable)
NAME: BOART LONGYEAR	CONSULTING FIRM: CH2M HILL
DWR LICENSE NUMBER: 83 / ROC LICENSE CATEGORY: A-04	CONTACT PERSON NAME: Tony DeJulio / Christal 805-895-4785
TELEPHONE NUMBER: 480-635-9665 / FAX: 480-635-9690	TELEPHONE NUMBER: 951-276-3003 x4028 / FAX: 714-429-2050
E-MAIL ADDRESS: info@prosoniccorp.com	E-MAIL ADDRESS: tdejulio@ch2m.com

SECTION 4.

Questions	Yes	No	Explanation:
1. Are all annular spaces between the casing(s) and the borehole for the placement of grout at least 2 inches?	X		2-inch annular spaces are special standards required for wells located in and near groundwater contamination sites (such as CERCLA, WQARF, DOD, LUST).
2. Is the screened or perforated interval of casing greater than 100 feet in length?		X	100-foot maximum screen intervals are a special standard for wells located in and near groundwater contamination sites (such as CERCLA, WQARF, DOD, LUST).
3. Are you requesting a variance to use thermoplastic casing in lieu of steel casing in the surface seal?	X		The wells must be constructed in a vault as defined in A.A.C. R12-15-801(27).
4. Is there another well name or identification number associated with this well? (e.g., MW-1, PZ2, 06-04, etc.)	X		IF YES, PLEASE STATE MW-54D
5. Have construction plans been coordinated with the Arizona Department of Environmental Quality?	X		IF YES, PLEASE STATE AGENCY CONTACT & PHONE NUMBER Jennifer Barr 602-771-4809
6. For monitor wells, is dedicated pump equipment to be installed?		X	IF YES, PLEASE STATE DESIGN PUMP CAPACITY Gallons per Minute
7. Is this well a new well located in an Active Management Area **AND** intended to pump water for the purpose of remediating groundwater?		X	IF YES, UNLESS THE WELL IS A REPLACEMENT WELL AND THE TOTAL NUMBER OF OPERABLE WELLS ON THE SITE IS NOT INCREASING, YOU MUST ALSO FILE A SUPPLEMENTAL FORM A.R.S. § 45-454(C) & (F). *(See instructions)*
8. Will the well registration number be stamped on the vault cover or on the upper part of the casing?	X		IF NO, WHERE WILL THE REGISTRATION NUMBER BE PLACED?

Notice of Intent to Drill, Deepen, or Modify a *Monitor / Piezometer / Environmental* Well

WELL REGISTRATION NUMBER
55 - 215410

SECTION 6. WELL CONSTRUCTION DETAILS

Drill Method

CHECK ONE

- ☐ Air Rotary
- ☐ Bored or Augered
- ☐ Cable Tool
- ☐ Dual Rotary
- ☐ Mud Rotary
- ☐ Reverse Circulation
- ☐ Driven
- ☐ Jetted
- ☐ Air Percussion / Odex Tubing
- ☒ Other (*please specify*):

Rotosonic

DATE CONSTRUCTION TO BEGIN

Method of Well Development

CHECK ONE

- ☐ Airlift
- ☐ Bail
- ☐ Surge Block
- ☐ Surge Pump
- ☒ Other (*please specify*):

Bail, surge, pump

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Grout Emplacement Method

CHECK ONE

- ☐ Gravity
- ☐ Pressure Grout
- ☒ Tremie
- ☐ Other (*please specify*):

Method of Sealing at Reduction Points

CHECK ONE

- ☒ None
- ☐ Welded
- ☐ Swedged
- ☐ Packed
- ☐ Other (*please specify*):

Surface or Conductor Casing

CHECK ONE

- ☒ Flush Mount in a vault
- ☐ Extend 1' above grade

VARIANCE GRANTED

SECTION 6. PROPOSED WELL CONSTRUCTION PLAN (attach additional page if needed)

Attach a well construction diagram labeling all specifications below.

Borehole

DEPTH FROM SURFACE FROM (feet)	TO (feet)	BOREHOLE DIAMETER (inches)
0	420	6

Casing

DEPTH FROM SURFACE FROM (feet)	TO (feet)	OUTER DIAMETER (inches)	MATERIAL TYPE (T) STEEL	PVC	ABS	IF OTHER TYPE, DESCRIBE	PERFORATION TYPE (T) BLANK OR NONE	WIRE WRAP	SHUTTER SCREEN	MILLS KNIFE	SLOTTED	IF OTHER TYPE, DESCRIBE	SLOT SIZE IF ANY (inches)
0	410	2		×									
410	420	2		×							×		0.020
				×									

Annular Material

DEPTH FROM SURFACE FROM (feet)	TO (feet)	ANNULAR MATERIAL TYPE (T) NONE	CONCRETE	NEAT CEMENT OR CEMENT GROUT	CEMENT-BENTONITE GROUT	BENTONITE GROUT	CHIPS	PELLETS	IF OTHER TYPE OF ANNULAR MATERIAL, DESCRIBE	FILTER PACK SAND	GRAVEL	SIZE
0	405			×								
405	420									×		#3

IF THIS WELL HAS NESTED CASINGS, SPECIFY NUMBER OF CASING STRINGS	EXPECTED DEPTH TO WATER Feet Below Ground Surface

I state that this notice is filed in compliance with A.R.S. § 45-596 and is complete and correct to the best of my knowledge and belief.

TYPE OR PRINT NAME AND TITLE	SIGNATURE OF WELL OWNER	DATE
ROBERT C. DOSS, PRINCIPAL ENGINEER	Robert C. Doss	FEB 12 2008
TYPE OR PRINT NAME AND TITLE	SIGNATURE OF LANDOWNER, IF APPLICABLE (SEE INSTRUCTIONS)	DATE

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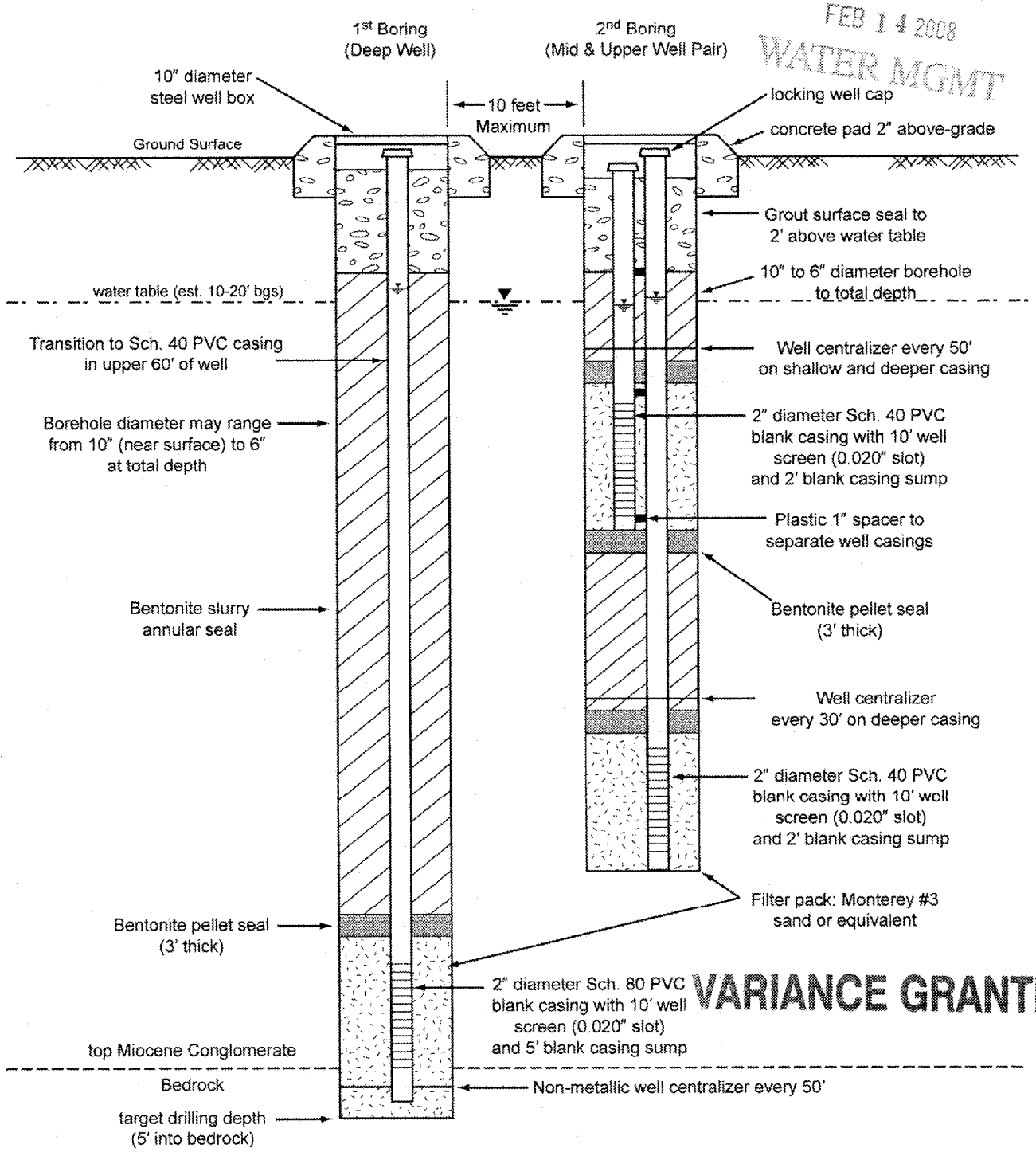
Proposed Construction
Vertical Well Cluster with Below-Grade Completion



VARIANCE GRANTED

FIGURE 5B
MONITORING WELL CLUSTER SCHEMATIC
BELOW-GRADE COMPLETION
WORK PLAN FOR WELL INSTALLATION AND GROUNDWATER CHARACTERIZATION ON ARIZONA SHORE OF THE COLORADO RIVER AT TOPOCK, ARIZONA
PG&E TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

DIAGRAM NOT TO SCALE
All depths in feet below ground surface (bgs) are approximate and will be determined based on drilling log and Isoflow(™) sampling.

CH2MHILL

ES102006003BAO_Fig5b_Well_BelowGrade.ai_022807_jl

215410

Pacific Gas and Electric Company

Yvonne Meeks
Manager

Environmental Remediation
Gas T&D Department

Mailing Address
4325 South Higuera Sreet
San Luis Obispo, CA 93401
Location
6588 Ontario Road
San Luis Obispo, CA 93405
Tel: (805) 234-2257
Email: yim1@pge.com

February 13, 2008

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Darlene Sumpter-King
Arizona Department of Water Resources
Water Management Support Section
3550 North Central Avenue, 2nd Floor
Phoenix, AZ 85012

Subject: Notices of Intent for Wells Near Topock, Arizona
PG&E Topock Compressor Station, Needles, California

Dear Ms. Sumpter-King:

Pacific Gas and Electric Company (PG&E) is continuing its remedial investigation and corrective action planning activities in the vicinity of the Topock Compressor Station in both California and Arizona. As part of this investigation, PG&E will be installing groundwater monitoring wells in several areas on the eastern shore of the Colorado River in Mojave County, Arizona.

In March 2007, PG&E submitted Notices of Intent (NOIs) to the Arizona Department of Water Resources (ADWR) for eight monitoring wells. Drilling cards were issued for six of the eight proposed monitoring wells, with the remaining two pending federal approval. Five of the approved drilling cards are due to expire on April 2, 2008 and the sixth one expires in January 2009. Due to delays in obtaining other regulatory agency approvals, PG&E has not initiated drilling at any of the Arizona locations. However, PG&E anticipates that drilling will start within the next 30 days and is anticipated to continue beyond the current April 2, 2008 expiration date of the five existing drilling approvals. Therefore, it is our understanding that PG&E must resubmit NOIs for all five wells with approvals expiring on April 2, 2008.

PG&E respectfully requests an expedited review and approval of the NOIs to minimize potential work delays or interruption of the site investigation activities. Our consultant, CH2M HILL, contacted the ADWR NOI Program Supervisor, Lori Cason, to discuss this request and she suggested that we clearly state our need for an expedited review in this cover letter.

In conformance with Ms. Cason's guidance, we are resubmitting NOI materials and filing fees for seven monitoring well locations; five to replace previously approved NOIs and two to replace previously submitted NOIs that have not yet been approved. We are also submitting the federal access agreement information for the remaining two NOIs (well registration numbers 55-215409 and 55-219410).

215410

The well registration numbers for the five approved monitoring wells that expire in April 2008 are:

55-215406	55-215407	55-215411
55-215412	55-215413	

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No information regarding the location or design of the monitoring wells has changed from the previous applications; all supporting documentation provided to ADWR for the original NOIs remains current and complete. The monitoring wells will be drilled and installed in accordance with the Arizona Department of Environmental Quality (ADEQ) Voluntary Remediation Program (VRP) in A.R.S. §49-175.

PG&E looks forward to receiving your approval. If you have any questions on these Notices of Intent, please call Tony DeJulio of CH2M HILL at 951-276-3003, extension 4028.

Sincerely,

Yvonne Meeks

Yvonne Meeks
Topock Project Manager

Enclosure

CC: Lori Cason, ADWR NOI Program Supervisor

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United States Department of the Interior

BUREAU OF LAND MANAGEMENT
FISH AND WILDLIFE SERVICE
BUREAU OF RECLAMATION

TAKE PRIDE IN AMERICA

ELECTRONIC SUBMISSION

February 11, 2008

Ms. Yvonne Meeks
Portfolio Manager – Site Remediation
Pacific Gas and Electric Company
4325 South Higuera Street
San Luis Obispo CA 93401

Subject: PG&E Topock Compressor Station Remediation Site – DOI Direction to PG&E to Implement *Revised Work Plan for Well Installation and Groundwater Characterization on Arizona Shore of the Colorado River at Topock, Arizona,* March 1, 2007

Dear Ms. Meeks:

The Department of the Interior (DOI), Bureau of Land Management, Fish and Wildlife Service, and Bureau of Reclamation (collectively the "Federal Agencies") hereby authorize PG&E to implement the field investigation activities as described in the subject Work Plan. PG&E is also authorized to modify the original schedule proposed in the Work Plan as needed. This authorization to proceed is based on the Federal Agencies' understanding that mobilization for the field investigation will begin no sooner than March 10, 2008. The Federal Agencies reserve the authority to defer that mobilization date if necessary.

These activities are part of the ongoing remedial investigation being performed by PG&E pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). These activities are necessary to delineate the nature and extent of groundwater

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contamination resulting from past releases of hazardous substances from the Topock Compressor Station. Attached please find the relevant access agreements and approvals required.

The Federal Agencies are authorizing PG&E to proceed with this groundwater investigation pursuant to the Administrative Consent Agreement entered by PG&E and the Federal Agencies in August 2005. This authorization is pursuant to the response action authority of Section 104 of CERCLA, which has been delegated to DOI by Executive Order 12580, as amended.

If you have any questions in this regard, please contact me at (303) 236-3350.

Sincerely,

Krista A. Doebbler

Kris Doebbler
DOI Topock Acting Project Manager

Attachments (4)

cc: CWG Work Group (electronically)
Tribal Chairmen (via hard copy)

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Pacific Gas and Electric Company

Yvonne J. Meeks
Topock Project Manager
Chromium Remediation Project Office
Gas Transmission & Distribution

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March 1, 2007

Mr. Jerry Smit
Manager, Voluntary Remediation Program Unit
Arizona Department of Environmental Quality
1110 West Washington Street
Phoenix, Arizona 85007

Subject: Revised Work Plan for Well Installation and Groundwater Characterization on Arizona Shore of the Colorado River at Topock, Arizona
PG&E Topock Compressor Station, Needles, California

Dear Mr. Smit:

This letter transmits the revised *Work Plan for Well Installation Groundwater Characterization on Arizona Shore of the Colorado River at Topock, Arizona*. This work plan is submitted in accordance with the Arizona Department of Environmental Quality (ADEQ) Voluntary Remediation Program (VRP) in A.R.S. §49-175. The objective of this investigation is to collect additional data to the supplement Pacific Gas and Electric Company's (PG&E's) ongoing remedial investigation and corrective action planning in response to history releases from the Topock Compressor Station.

This work plan was previously submitted on January 16, 2007, and has been modified as outlined in your letter dated January 24, 2007 as clarified in a conference call with you and Jennifer Barr from the ADEQ on January 25, 2007. In addition, this work plan has been modified in accordance with changes described in a response to comments document addressing U.S. Department of Interior comments dated February 2, 2007; changes described in a response to comment document addressing California Department of Toxic Substances Control comments dated February 28, 2007; and changes described in a response to comments document addressing Fort Mojave Indian Tribe comments dated February 28, 2007.

Upon submittal of this revised work plan, PG&E will begin seeking the necessary approvals as outlined in Section 4. We look forward to receiving ADEQ's approval for this work.

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If you have any questions, please do not hesitate to contact me. I can be reached at (805) 234-2257.

Sincerely,

[illegible]

cc. John Earle/HNWR
Casey Padgett/DOI
Carrie Marr/USFWS
Cathy Wolff-White/BLM
Jeff Smith/BOR
Aaron Yue/DTSC

Enclosure

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2.0 Field Investigation and Drilling Activities

This work plan addresses the field investigation activities for groundwater characterization along the Arizona shore of the Colorado River east of the PG&E Topock Compressor Station. The groundwater investigation will be conducted at three drilling sites, designated Sites 1, 2, and AB-2. A contingency investigation may be conducted at a fourth drilling site, designated Site 3, in the event that concentrations of Cr(VI) above background levels are detected at site AB-2. Figure 2 shows the proposed locations of the drilling sites and existing features. This section describes drill site selection; site preparation, access and staging; drilling method and requirements; depth-specific groundwater sampling; cased well geophysical logging; multilevel well installation; and groundwater sampling of the monitoring wells.

2.1 Well Site Selection

The rationale for each of the proposed well sites is described in this subsection. Multilevel monitoring wells would be installed at each site. If possible, drilling would proceed until the borings encountered bedrock at each site to provide characterization of the complete thickness of the Alluvial Aquifer. The location of screened intervals in each well would be determined based on data collected during drilling of the initial borehole.

Figure 3 shows a bedrock structure map of the investigation areas, showing inferred depth contours in feet below the river level. The depth to bedrock map is based on data collected during PG&E's completed drilling investigations in the California floodplain area, the 2004 seismic reflection survey conducted on the Colorado River (USGS, 2005), and exploration borings completed in 1962 by Caltrans for construction of the I-40 Bridge crossing at Topock, Arizona. The only well on the Arizona shore that reached bedrock is PGE-9 where bedrock was encountered at a depth of approximately 100 feet. There is uncertainty regarding depth to bedrock on the Arizona shore north of the inlet to Topock Marina. The 2004 seismic survey was not able to establish bedrock depth in this area due to the presence of a semi-consolidated older alluvium layer above the bedrock. Bedrock depths in this area have been extrapolated from the California side of the river. Depending on the characteristics of the geologic materials being penetrated, the rotosonic drilling method proposed for use in this investigation may have difficulty reaching depths greater than 400 feet. Based on our present understanding of bedrock depth and the characteristics of the geologic materials, sonic drilling methods will be near the limit of their capabilities for reaching bedrock at Site 1.

The United States Geological Survey (USGS) is planning to conduct a seismic survey during June 2007 that includes several transects across the Colorado River near the I-40 bridge to identify the deepest parts of the channel at that location. The current proposed well installation sites and slant boring angles may be revised based on the results of the survey. Any changes in well locations outside of the general areas defined in Figures 2 and 3 will require VRP review and approval. If such drilling changes are necessary, PG&E will notify

ADEQ via email, and proceed upon ADEQ's approval without a formal revision to the work plan. Interested parties will also be notified of the proposed changes.

Additional considerations for evaluating well locations included environmental, institutional, and property owner constraints. Figure B-1 in Appendix B presents the parcel and property ownership map for the proposed drilling investigation. Appendix B also provides information on existing wells in Arizona in the area.

The peninsula directly across the river from the Topock site is part of the Havasu National Wildlife Refuge (HNWR). The vegetated portions of this peninsula are habitat for the Yuma clapper rail and the southwestern willow flycatcher, both of which are endangered species. However, the westernmost portion of the peninsula area is more sparsely vegetated and is developed with an access road. Proposed investigative activities at Site 1 are adjacent to the levee road and within previously disturbed and sparsely vegetated areas approximately 400 feet from potentially suitable habitat for the flycatcher and 800 feet from occupied habitat for the rail. Therefore, potential impacts to these species are considered insignificant.

As shown in Appendix B, the property south of the inlet to the Topock Marsh is subdivided into numerous parcels. The area is relatively developed, and includes the Topock Marina, Interstate-40, the Burlington Northern and Santa Fe (BNSF) railway, houses, natural gas pipelines, and other utilities. Investigative activities within this area (Site 2, Site AB-2, and the contingent Site 3) would be limited by property use, structures, and agreements with private landowners.

2.1.1 Site 1 (Vertical Well Site)

Site 1 is located on a peninsula of the Arizona shore of the Colorado River, north of I-40 and Topock, Arizona. The peninsula separates the Topock Marsh from the Colorado River and is located on HNWR property that is managed by USFWS. This area is across the river from the chromium plume in California (Figure 2). Vertical borings with multilevel wells are designed to provide: (1) a constraint on the eastern margin of the plume; (2) measurement of hydraulic influence of IM No. 3 pumping to evaluate the effectiveness of IM No. 3 at capturing any portion of the plume beyond (east of) the MW-34 well cluster; (3) evaluation of a conceptual model expressed by the USGS, which suggests that there may be a gravel deposit just above the bedrock that could be providing a preferential pathway for groundwater flow and possible contaminant migration; (4) evaluation of a conceptual model expressed by ADEQ that density-driven flow may result in transport of contaminants to the north and east against the expected regional gradients; and (5) in conjunction with the new monitoring well cluster at Site 2, provide a pair of sentry wells located on potential groundwater flow paths between the Topock site plume and the Topock 2 and 3 production wells.

Depth to bedrock at this location is likely to be near the limit of the drilling method. If the rotosonic method is not successful in reaching bedrock, alternate methods would be proposed to complete the evaluation of potential pathways in the alluvial aquifer. Access to the Site 1 area will require travel down the levee road. DOI agencies have indicated that the well should not penetrate the levee, be located off the roadway in an area that will not impede routine maintenance of the road, and be positioned as close to the roadway as practical to avoid making new paths that might encourage off-road driving. The final

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location will be determined in concurrence with the HNWR and within the constraints of the equipment. Proposed traffic control and site management at Site 1 are addressed in Section 2.2.

2.1.2 Site 2 (Vertical Well Site)

Site 2 is located immediately north of I-40 in Arizona. This site lies between the chromium plume and water supply wells Topock 2 and 3. A vertical boring and multilevel well at Site 2 will provide data on the eastern limit of the chromium plume, groundwater gradients, and geochemistry on the Arizona side of the river. Because this location is located further from the river bank than Sites 1 and AB-2, it provides a water level monitoring point that will allow for triangulation with wells closer to the river to determine the direction of groundwater flow.

The depth to bedrock in the Site 2 area is unknown. A bedrock outcrop is present beneath the railroad bridge abutment on the Arizona side. Based on the proximity of the outcrop, it is anticipated that the bedrock will be relatively shallow in the Site 2 area. The Site 2 well locations have been chosen to be nearer the river and further from the bedrock outcrop in hopes of encountering a thicker aquifer in these areas.

The preferred Site 2 drilling location is shown on Figure 2 located in the parking lot of the Topock Marina Restaurant. This location is preferred because it is closer to the river and would therefore provide better definition of the eastern extent of the plume. Subsequent to the submittal of the draft work plan, it was learned that a commercial business has opened in a modular building that has been placed in the area identified as the primary Site 2 well location. The proximity of this new building may preclude well construction in the primary Site 2 area. An alternate location for Site 2 has been identified further to the east on HNWR property that would result in less impact on the operations of the marina (Figure 2). PG&E is currently working to obtain permission from the property owners to install wells at either the Site 2 or the Site 2 alternate location.

2.1.3 Site AB-2 (Slant Well Site)

Site AB-2 is located south of I-40 in Arizona, on private property. The location of this well may be on residential property (Site AB-2 as shown on Figure 2) or El Paso Natural Gas property (Site AB-2 alternate) depending on access arrangements with the property owners. Final determination of the location of the borehole will be made after the results of the seismic survey planned to be conducted by USGS in June 2007 are available and pending discussions with the property owner regarding access to this area. A slant boring and multilevel wells are proposed at this location to provide data on the downstream extent of plume and information on geochemistry and water levels beneath the Colorado River. Site AB-2 is part of an east-west investigation transect across the Colorado River, which includes a corresponding drill site, designated Site AB-1, on the California shore (Figure 2). The slant drilling and investigation activities proposed at corresponding Site AB-1 are under the jurisdiction of DTSC and were presented in a separate work plan that describes the same drilling technique as discussed herein (CH2M HILL, 2006d). Prior to initiation of the drilling activities at Site AB-2, PG&E will document any lessons learned from the drilling activities at Site AB-1 and proposed revisions to the well design and construction methods for AB-2.

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As noted on Figure 3, Miocene bedrock outcrops on the Arizona shore near the abutment of the BNSF railroad track. The inferred bedrock structure underneath the river at the I-40 Bridge is a bedrock structural "saddle" or rise. Based on the results of the previous 2004 seismic reflection survey, the fluvial deposits beneath the river increase in thickness to the north and south as the bedrock dips away from the rise under the I-40 Bridge. Hence, the area immediately south of the I-40 Bridge has been selected as a preferred location for the slant well(s). The 2004 seismic survey and driller's logs from the PGE-09 wells show that the depth to bedrock in this area varies from 100 feet to 300 feet. The alternate site AB-2 shown on Figure 2 is located on property owned by El Paso Natural Gas Company and would be used if access could not be obtained to the primary AB-2 site or if bedrock profiles indicated by the seismic survey planned to be conducted by USGS in June 2007 were unfavorable for borehole installation at the primary AB-2 location.

A second slant well will be installed if field conditions allow and additional characterization is warranted. Conditions that could indicate the need for a second well include the detection of elevated concentrations of Cr(VI) in the first well or in the slant wells on the California side of the river. Conditions that could preclude the need for a second slant well include bedrock contours that would not accommodate two boreholes at different angles.

2.1.4 Site 3 (Contingency Vertical or Slant Well Site)

A contingency well site has been identified as Site 3. A multilevel well may be installed at this contingency location if chromium concentrations in the groundwater at the AB-2 boring or California slant wells exceed the California maximum contaminant level (MCL) of 50 µg/L or if concentrations of Cr(VI) are above natural background levels. Based on the information gathered during implementation of the groundwater characterization activities, PG&E will work with ADEQ and DOI to determine if a well is needed at Site 3. It is anticipated that a cluster well would be installed in a single boring at this location. The well may be either vertical or slant, depending on depth to bedrock as indicated by the seismic survey and the locations and screen depths of Cr(VI) detections, if any, in the slant wells upstream.

Site 3 is located downstream of site AB-2, near the abutment of a pipeline bridge, and adjacent to existing PG&E wells PGE-9N and PGE-9S. This site is located on private commercial property owned by El Paso Natural Gas. Hexavalent chromium has not been detected in the PGE-9 wells during six sampling events between May 2005 and May 2006; however these wells are constructed as production wells with long screen intervals and large diameter casing. Properly constructed monitoring wells and contingency Site 3 could provide data on the southeastern extent of the chromium plume, if the plume extends beyond the AB-2 location.

2.2 Site Preparation, Access, and Equipment Staging

Proposed staging areas and access roads to sites without public roadways are shown in Figure 2. Two areas to the east of the levee road and south of the access gate would serve as staging areas for Site 1. Existing roads will be used for access to all drilling sites. No grading or road maintenance is anticipated to be conducted in conjunction with this project. It may be necessary to lay temporary plastic or steel traction mats over areas of soft sand to allow

vehicle access to the Site 1 and possibly the AB-2 locations. Traction mats would be removed at the completion of the drilling operations. Site preparation and staging would occur during the days immediately prior to mobilization.

A clear area south of the road to the Topock Marina from I-40 will serve as the staging area for Site 2. The staging area for Sites AB-2 and 3 is located between the two sites in a clear field on El Paso Natural Gas land. These areas will be used for staging drilling materials and IDW storage containers required during the drilling and well development activities. Drilling equipment, supplies, and storage bins in the short-term staging areas will be removed within 30 days following completion of well development of the new monitoring wells.

A temporary gate or barricade will be installed on the levee road to prevent visitors from driving to Site 1 during well installation. The design and location of the barricade will be determined in consultation with the HNWR and BOR. Signs will be posted stating the reason and the estimated duration of the closure. Appropriate signage will also be placed for personnel arriving by boat. The Site 1 wells will be completed in subgrade vaults to be inconspicuous to passersby. At Sites 2, AB-2, and 3, a traffic control plan will be developed in coordination with the property owners that will include clearly marked exclusion zones at each of the locations. Well completions at Sites 2, AB-2, and 3 may be above ground or in subgrade vaults, depending on the wishes of the property owners.

Due to the long travel time required to access Site 1 via the levee road, a small boat may be used to transport crews to the site from the Topock Marina. This would reduce the travel time for personnel once the equipment has been set up. Figure 2 shows the boat landing location adjacent to Site 1. In the event of an emergency, the fastest way to transport personnel to urgent care facilities would be via boat.

The proposed access routes and drilling sites will be field-checked and clearly delineated prior to mobilization. If modifications to the access routes are needed, additional surveys will be conducted to ensure that no sensitive habitat will be impacted, that native vegetation is protected, and that integrity of pipelines and other structures is maintained. The intent will be to avoid vegetation removal. If removal of vegetation cannot be avoided, the amount removed will be documented by the project biologist. Field activities associated with the equipment access and well drilling on federal lands will be coordinated with HNWR, BOR, and as appropriate, BLM to ensure the protection of cultural and biological resources and the flood control levee.

Site preparation shall occur prior to equipment mobilization. Site preparation shall include surveying the area for biologically and/or culturally sensitive areas; identifying subsurface utilities and other structural constraints; identifying site hazards; and establishing access routes and work areas that will minimize impacts to these features to the extent possible. Drill rigs shall be cleaned before mobilization to the site and following completion of drilling at the site if visible grease, oil, vegetation, or other contamination is evident on the equipment. After the drill rigs have been mobilized into place, the staging areas will be established in the drilling work area. Plastic sheeting will be laid on the ground surface in the staging areas to keep the drilling materials and equipment clean and to minimize impacts to the ground surface from the drilling materials and equipment. Materials to be stored at the well site include drilling equipment and well construction materials

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(e.g., casing and grout). In accordance with OSHA regulations, the exclusion zones for all of the sites, which defines the area where workers are required to have OSHA HAZWOPER training, will be marked off with caution tape.

2.3 Drilling Method and Requirements

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The drilling, core/borehole logging, and well construction will be performed under the supervision of an Arizona Registered Geologist. The drilling and well installation activities will be conducted in accordance with this work plan and modified methods and standard operating procedures (SOP) from the *Topock Program Sampling, Analysis, and Field Procedures Manual* (CH2M HILL, 2005b). The applicable SOPs that pertain to the drilling, logging, and well installation activities are presented in Appendix C.

Table 1 summarizes proposed target drilling parameters for groundwater investigation borings and wells. (All tables are located at the end of this report.) Figure 2 presents the proposed locations of the borings and monitoring wells. The methods, equipment, and procedures for drilling, logging, and depth specific groundwater sampling are described below. The methods and procedures are based on the successful implementation and experience from the prior drilling programs conducted in the floodplain area on the California side of the river in 2005 and 2006 (CH2M HILL, 2005a, c, 2006a).

2.3.1 Rotosonic Drilling Method

Drilling will be accomplished using the rotosonic drilling technique, which involves advancing a rotating and vibrating drill head or core barrel through the subsurface. This method produces a continuous core from the land surface to the target drilling depths; generates minimal drilling wastes; and typically can drill through gravel, cobble, and softer bedrock formations.

Drilling activities at Sites 2 and 3 can be conducted using standard truck-mounted rotosonic drilling equipment. Drilling at Sites 1 and AB-2 may require the use of a track-mounted all-terrain drilling rig. To support the all-terrain drilling rig, a tracked or balloon-tired forklift and one or more all-terrain vehicles will be used to transport crew, equipment, and materials from the staging area to the drill site on the floodplain. The forklift will also be used to transport cuttings and excess core generated from drilling the soil borings to lined, steel rolloff soil bins that will be temporarily stored at the staging areas. Management procedures for IDW are discussed in Section 3.0.

Any water added to the borehole during drilling will be obtained from the Colorado River. Colorado River water has a signature that is distinct from the groundwater in electrical conductivity, oxidation-reduction potential, and stable isotope signature. By using Colorado River water for drilling water, it is possible to determine when all the added water has been purged from the well. If the signature of water being produced by the well resembles river water rather than groundwater, it can be assumed that additional purging is required before the well can produce representative groundwater samples. River water was added during drilling of the slant boring on the California side. The volume of water purged from the Isoflow® samples at each sampling interval was at least twice the volume of river water that had been added. During purging for the Isoflow® samples, a very distinct shift in electrical

conductivity and oxidation-reduction potential was observed when the river water had been removed and the borehole began yielding native groundwater.

2.3.2 Core Logging

Lithologic descriptions will be logged of each soil boring based on visual inspection of the retrieved core under the supervision of an Arizona Registered Geologist. The field log will document the following information for each soil boring (Appendix C, SOP-B3):

- Unique soil boring or well identification
- Purpose of the soil boring (e.g., monitoring well)
- Location in relation to an easily identifiable landmark
- Names of the drilling subcontractor and logger
- Start and finish dates and times
- Drilling method
- If applicable, types of drilling fluids and depths at which they were used
- Diameters of surface casing, casing type, and methods of installation
- Depth at which saturated conditions were first encountered
- Lithologic descriptions (based on the Unified Soil Classification System)
- Sampling-interval depths
- Zones of caving or heaving
- Depth at which drilling fluid was lost and the volume lost
- Changes in drilling fluid properties
- Drilling rate
- Drilling rig reactions, such as chatter, rod drops, and bouncing

The results of the continuous core logging of the borings will be summarized in grain-size core plots for the hydrogeologic characterization to assist in selecting well screen intervals.

2.4 Depth-Specific Groundwater Sampling

Groundwater samples will be collected at discrete depths from each of the boreholes. The Isoflow® sampler or equivalent will be used for groundwater sample collection. This method allows relatively undisturbed groundwater samples to be collected at regular intervals so that a vertical profile of water quality can be constructed. Samples will be collected from a 10-foot open borehole at 20-foot intervals. For those depths where contamination has been found on the California side, the Isoflow® sampling interval will be decreased to 10 feet for the Arizona investigation. For Sites 1 and 2, this will be 80 to 100 feet below ground surface. For AB-2, this will be at those depths which Cr(VI) concentrations were detected above background concentrations, if any, in the California slant wells. Where feasible, a sample will also be collected from the zone just above the bedrock. Figure 4 presents a cross section of the anticipated sampling depths for collecting borehole depth-specific groundwater samples using the Isoflow® sampling method.

Depth-specific samples will be obtained from an open section of borehole below the drive casing by pumping using the Isoflow® vertical aquifer profiling system. The sampling pump incorporates a packer that is placed in the bottom of the temporary casing to isolate the open hole below the casing. Attached below the packer is a submersible pump enclosed in a short

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section of well screen. By using a packer to hydraulically isolate the sampling interval from the water standing in the temporary casing above, the purge volumes can be minimized and representative samples can be obtained from a discrete section of the borehole. An alternative to the hydraulic packer equipped Isoflow® tool, a mechanical "segregation-block" may be used on the Isoflow® pump assembly. The advantage of this method is that the water level response inside the sonic casing can be measured during borehole purging to assess the relative permeability of the open borehole interval.

Purging will involve pumping one to three borehole volumes from the open borehole interval being sampled and monitoring the field parameters (temperature, pH, specific conductance, and oxidation-reduction potential). After the field parameters have stabilized and at least one borehole volume has been removed, water quality parameters will be measured and groundwater samples will be collected for Cr(VI) and ferrous iron analyses, as presented in Table 2. The Isoflow® field parameter measurements are considered reconnaissance-level data, used primarily for determining where to place screened intervals in the monitoring wells. The Cr(VI) and ferrous iron analyses will be conducted at the onsite field laboratory currently set up at the IM No. 3 treatment plant using the HACH colorimetric method. A sufficient quantity of sample will be collected and filtered in the field so that confirmation samples can be sent to a certified laboratory for total chromium [Cr(T)] analysis if Cr(VI) is detected in any of the borehole groundwater grab samples. Because the time of field sample collection and screening precludes laboratory analysis of these samples within the Cr(VI) 24-hour holding time, the confirmation samples will be run for Cr(T) only. All groundwater grab samples will be filtered in the field prior to preservation and analysis.

2.4.1 Water Level Measurements During Borehole Groundwater Sampling

Additional characterization of the Alluvial Aquifer is proposed as part of the depth specific sampling activity. The Isoflow® sampling system can be configured with a casing segregation-block to allow the measurement of water levels during 10-foot open hole intervals for qualitative assessment of aquifer permeability. The recording of drawdown response for each zone purged may allow for distinguishing low-, medium-, and higher-permeability zones within the boreholes tested. Attempts will be made to measure drawdown during pumping for Isoflow® sample collection. For the slant borings, this will be attempted by fastening a pressure transducer secured to the Isoflow® sampling pipe. If the transducer is damaged by the process of pump insertion and retrieval, Isoflow® samples will then be collected without these water level measurements. An estimate of specific capacity would be obtained from the purging drawdown data, to provide a relative measure of the permeability of the borehole at the depth of the sample. This specific capacity data, as with the other field parameter measurements, are considered reconnaissance-level data for use in selecting more permeable zones for well screens. These data are not considered suitable for more quantitative purposes such as model calibration.

2.5 Cased Well Geophysical Logging

Immediately following completion of the deepest well at locations 1 and 2, cased well geophysical logs (natural gamma ray and induction) will be conducted (Appendix C,

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SOP-B12). The geophysical logging will be used for hydrogeologic characterization. Geophysical logging will be scheduled immediately after the deepest well is completed at each drilling location so that the results of the geophysics can be used for selecting screened intervals in the second boring at that location. These types of geophysical surveys provide formation characteristics of the aquifer intervals and can be used for hydrogeologic interpretation and water quality characterization. Geophysical logs will not be run in the angled well at Site AB-2.

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2.6 Monitoring Well Installation

2.6.1 Vertical Well Cluster Design and Specifications

The scope of work described here includes vertical well installation at two locations: Site 1, Site 2, plus contingency location Site 3. Figures 5A and 5B present generalized schematic diagrams for the construction of clustered groundwater monitoring wells to be installed in the vertical borings drilled for this investigation (Appendix C, SOP-B1). The well designs also allow the installation of pressure transducers, which will collect groundwater level data on a continual basis. The wells will be constructed in accordance with Arizona Department of Water Resources (ADWR) requirements. For the purposes of this document, screened intervals will be generically described as shallow, middle, and deep. Monitoring well screened intervals will be selected in consultation with ADEQ based on lithologic logs, depth-specific sample results, and geophysical logs. A conference call with be convened with ADEQ and other interested parties to review the information in real-time immediately after the borehole reaches total depth. PG&E will endeavor to provide at least 24 hours' notice prior to the screened interval selection conference call.

A cluster of three wells is proposed for Site 1 (MW-54). The deep well will be installed in a single boring. The nested shallow and middle wells of MW-54 will be installed in a second boring located as close as practical, but no more than 15 feet away from the first boring. A nested well pair will be installed at Site 2 (MW-55). If concentrations of Cr(VI) above background levels are detected in the slant wells at AB-2, vertical or slant wells will be installed at Site 3. A cluster of up to three wells is proposed. The multilevel wells to be installed in the borings drilled for this project will be designated as listed in Table 1.

Consistent with existing California floodplain wells, the new monitoring wells will be identified by the well number (e.g., MW-54) followed by the bottom depth of the screen rounded to the nearest 5 feet (e.g., MW-54-380, screened to a depth of 380 feet below ground surface).

2.6.1.1 Well Casing and Screen

All new vertical monitoring wells will be constructed with 2-inch-diameter Schedule 40 polyvinyl chloride (PVC) casing and 10-feet length of factory-slotted well screen. Casing requirements are as follows:

- Casing will be new, unused, and decontaminated.
- Glue will not be used to join casing, and casings will be joined only with compatible threads that will not interfere with the planned use of the well.

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- The PVC casing will conform to ASTM Standard F 480-88A or the National Sanitation Foundation Standard 14 (Plastic Pipe System).
- The casings will be straight and plumb.

Well screen requirements are as follows:

- Requirements that apply to casing also apply to well screen, except for strength requirements.
- Well screens will be factory slotted, with a size of 0.020 inch.

2.6.1.2 Borehole Completion Materials

The annular space will be filled with a filter pack, a bentonite seal, or casing grout between the well casing and the borehole wall. In the middle and/or shallow interval wells more than 50 feet deep, well centralizers will also be placed at least every 50 feet above the upper well screen on both the shallow and middle casings.

Filter Pack. The filter pack will consist of No. 3 silica sand (or equivalent) (consistent with other monitoring wells completed in the Alluvial Aquifer) and will extend from the bottom of the hole to approximately 2 feet above the top of the well screen. The top of the sand pack will be sounded to verify its depth during placement. Additional filter pack will be placed as required to return the level of the pack to 2 feet above the screen. A minimum 1-foot-thick layer of fine sand will be placed above the No. 3 sand filter pack to minimize the potential for the bentonite slurry (seal) material to invade the filter pack adjacent to the top of the well screen during well construction.

The contractor will record the volume of filter pack emplaced in the well. Potable water may be used, with the approval of the field geologist, to emplace the filter pack, as long as no contaminants are introduced to the subsurface.

Annular Seals. The bentonite seal requirements are as follows:

- The bentonite seal will consist of at least 2 feet of bentonite between the filter pack and the casing grout.
- Only 100 percent sodium bentonite will be used.
- Bentonite chips or pellets will be hydrated with potable water if the transition seal is not below the water table, otherwise a bentonite slurry (1 gallon water for 2 pounds bentonite) will be used.

A surface seal will be installed in the uppermost 20 feet of all wells. The proposed method of grouting the wells is designed to ensure that the wells can be abandoned in place and will not need to be drilled out for abandonment. The grout requirements for the surface seal are as follows:

- The casing grout will extend a minimum of 20 feet below ground surface.
- The grout will be either a cement mixture in the following proportions:

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- Ninety-four pounds of neat Type I or Type II Portland or American Petroleum Institute Class A cement.
- Not more than 4 pounds of 100 percent sodium bentonite powder.
- Not more than 8 gallons of water.

- The grout for the surface seal will be pumped into place using tremie pipe in one continuous operation.
- The expected volume of each ingredient in the grout mixture will be pre-calculated and documented.

2.6.2 Slant Drilling Multilevel Well Design and Specifications

The scope of work described here includes slant well installation at one location: Site AB-2, plus contingency location Site 3. Figure 6 presents a generalized schematic diagram for the construction of multilevel wells in the slant boring drilled at Site AB-2. The wells will be constructed in accordance with ADWR requirements. Three Barcad™ porous screens are planned for installation in the boring. Because groundwater at these sites is shallow, the Barcad™ screens will be sampled using peristaltic pumps rather than the gas lift pumping system used in conventional Barcad™ installations. The individual monitoring intervals will be selected based on the slant boring core log; and the results of Isoflow® sampling. The multilevel wells to be installed in the slant boring drilled for this project will be designated as listed in Table 1.

Following well screen selection, the individual Barcad™ sampling screens would be connected to 3/8-inch nylon tubing that would sit in the grooves of by a 1-1/2" solid PVC support rod to form a single multilevel well assembly. In the upper 30 feet, the three nylon tubes would transition to 1-inch PVC pipes that are big enough for transducer placement. Custom centralizers would be placed approximately every 10 feet around the central support rod. The centralizers will be solid blocks of Delran plastic, machined to fit the support rod and with pass through holes for tremie pipes. The natural formation will be allowed to collapse in place around the Barcad™ well screen after emplacement, with a completion interval of 8 to 10 feet maximum for each monitoring zone. The borehole above the monitoring zone will be sealed with a minimum 10 feet of a mixture of granular bentonite (Benseal) and filter-pack sand placed in the slant borehole using a tremie pipe. Alternatively, a grout slurry may be used or prepack grout assemblies may be installed on the central support rod. The process of formation collapse surrounding the well screen and placement of an overlying sand/granular bentonite seal would be repeated for the intermediate and shallower completion intervals as illustrated in Figure 6.

During the slant drilling and well installation at AB-1 on the California side, which will be conducted first, the various methods of grout placement will be evaluated. If grouting between monitoring screens cannot be accomplished successfully, the contingency would be to only place grout in the upper section of the borehole above the uppermost well screen. Prior to the initiation of the Arizona slant drilling, PG&E will document any proposed revisions to drilling methods or well design based on lessons learned during the installation of the California slant wells.

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The Barcad™ and casing requirements are:

- All Barcad™ samplers and casing will be new, unused, and decontaminated.
- Glue will not be used to join casing, and casings will be joined only with compatible threads that will not interfere with the planned use of the well.
- The Barcad™ samplers and casing will be straight.

A grout seal will be emplaced in the uppermost 20 feet of the well. The grout requirements for the surface seal are provided in Section 2.6.1.2.

2.6.3 Surface Completion

Surface completions for wells installed in this investigation will consist of a subsurface well vault with a locking cover unless an above ground, steel, locking wellhead monument is necessary or preferred by the landowners. Figures 5A and 5B provide schematic diagrams of well construction, including surface completions. For aboveground completions, the wellhead monument completion will be placed over the casing and cap and seated in a minimum 4-foot by 4-foot by 4-inch-thick concrete pad. The ground surface will be free of vegetation and scoured to a depth of 4 inches before setting the concrete pad. The concrete pad will be sloped away from the well sleeve. The identity of the well will be permanently marked on the casing cap and the protective sleeve. In addition, metal tags will be attached to each of the well casings to identify the specific wells within each well monument. For below ground completions, the well vault will be set in concrete and equipped with a traffic rated steel cover or lid. Wells inside the vault will be equipped with water-tight well seals to prevent surface water from entering the wells if the vaults fill with water. All wells will be secured as soon as possible after drilling by using corrosion-resistant locks. The locks will be keyed for opening with one master key.

2.6.4 Well Development

2.6.4.1 Vertical Well Cluster

Within 24 to 72 hours following well installation and annular seal placement, the individual vertical wells will be developed by purging, surging, and bailing. During development pumping, temperature, pH, oxidation-reduction potential, specific conductance, and turbidity will be measured using field instruments. If any of these parameters indicate that river water may still be present, or if the groundwater in the well is not distinct from river water based on these parameters, samples will be collected for stable isotope analysis. Groundwater in all but the shallow floodplain wells at the Topock site is distinct from river water in stable isotope signature. Well purging will continue until field parameters stabilize and turbidity is reduced to less than 50 nephelometric turbidity units. The purge water produced during well development will be collected in portable tanks or drums at the drill site and transferred to cuttings bins or storage tanks in the staging area. Management procedures for IDW are discussed in Section 3.0.

2.6.4.2 Slant Multilevel Wells (Barcad™ System)

Within 24 to 72 hours following well installation and annular seal placement, the individual slant monitoring wells will be developed by purging with a peristaltic pump. Due to the

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TABLE 1
Drilling and Well Installation Plan
Work Plan for Well Installation and Groundwater Characterization on Arizona Shore of the Colorado River at Topock, Arizona
PG&E Topock Compressor Station, Needles, California

Site ID Location	Drilling Plan		Depth-Specific Sampling		Well Installation Plan	Remarks
	Proposed Boring	Target Drilling Depth feet bgs	Groundwater Sampling during Drilling	Potential No. of Isoflow[R] Samples	Proposed Monitoring Zone and Well Designation	
Site 1 HNWR sandbar	vertical boring #1	420	10' zones at 20' intervals Plus 90' and 110'	22 sample zones	base Alluvial Aquifer (MW-54D)	deep exploration boring on HNWR levee road
	vertical boring #2	350	none	none	middle Alluvial Aquifer (MW-54M) upper Alluvial Aquifer (MW-54S)	drill 2nd boring 8' from 1st boring
Site 2 Topock Marina	vertical boring	90	10' zones at 20' intervals Plus 90'	5 sample zones	base Alluvial Aquifer (MW-55D) middle Alluvial Aquifer (MW-55M)	expect thin saturated zone
Site AB-2 Smith property south of I-40	slant boring #1 30 degrees from horizontal	325 slant drilled	10' zones at 20' intervals	15 sample zones	base Alluvial Aquifer (MW-56D) middle Alluvial Aquifer (MW-56M) upper Alluvial Aquifer (MW-56S)	drill & install 30° slant wells per results and procedures developed at CA slant drilling AB-1
CONTINGENCY DRILLING PLAN						
Site AB-2 Smith/EPNG property south of I-40	slant boring #2 40 degrees from horizontal	180 slant drilled	10' zones at 20' intervals	8 sample zones	middle Alluvial Aquifer (TBD) upper Alluvial Aquifer (TBD)	drill 2nd slant boring if field conditions allow & additional characterization required.
Site 3 * EPNG property under I-3 bridge	vertical boring #1	135	10' zones at 20' intervals	6 sample zones	base Alluvial Aquifer (TBD)	drill Site 3 if elevated Cr(VI) plume encountered in upstream slant wells
	vertical boring #2	100	none	none	middle Alluvial Aquifer (TBD) upper Alluvial Aquifer (TBD)	

Notes:
1. See Figure 2 for proposed drilling site locations and alternate sites. All drilling sites subject to property owner access agreements.
2. The AB-2 slant boring angles will be determined prior to drilling based on available data and site conditions.
3. Isoflow samples to be collected during drilling from purged open-hole.
4. Proposed monitoring well construction shown on Figures 5A/5B (vertical well clusters at Sites 1, 2 and 3) and Figure 6 (AB-2 slant multilevel wells).
5. EPNG = El Paso Natural Gas

* If Site 3 wells are drilled on slant rather than vertical, footages and sample zones will vary from what is shown in table

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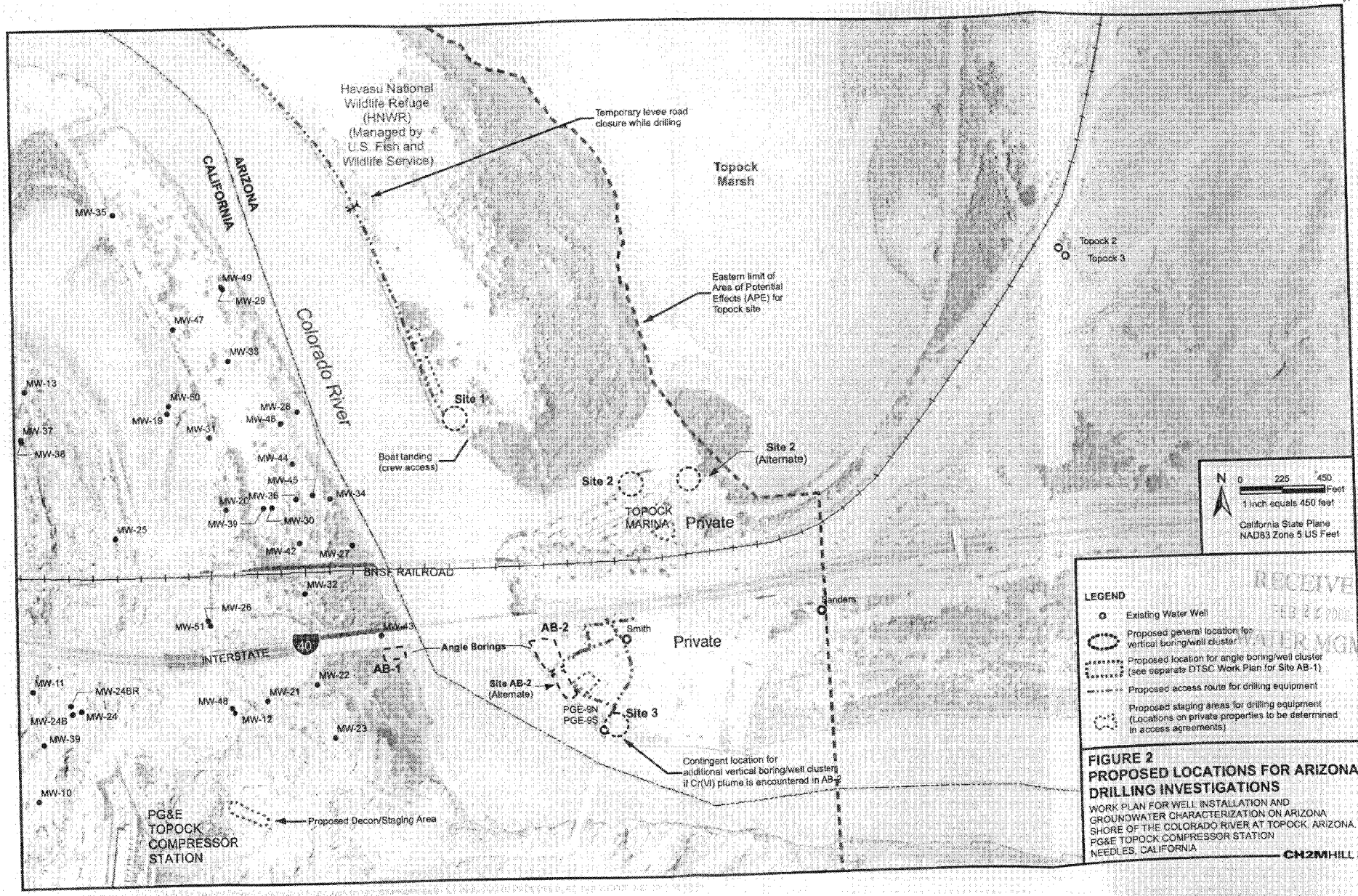

FIGURE 2
PROPOSED LOCATIONS FOR ARIZONA DRILLING INVESTIGATIONS
WORK PLAN FOR WELL INSTALLATION AND GROUNDWATER CHARACTERIZATION ON ARIZONA SHORE OF THE COLORADO RIVER AT TOPOCK, ARIZONA
PG&E TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA
CH2MHILL

CHECK DEPOSIT REQUEST

215410

ARIZONA DEPARTMENT OF WATER RESOURCES

NOTICE OF INTENT

Well No(s): (IF KNOWN)
55-7 WELL NUMBERS

Date Submitted:	2/20/2008	**Check No.:**	1513821
Submitted by:	MAIL	**Check Amount:**	$1,050.00
Applicant:	PACIFIC GAS AND ELECTRIC COMPANY	**Name on Check:** (IF DIFFERENT THAN APPLICANT)	PACIFIC GAS AND ELECTRIC COMPANY
Received By:	DENAE SCHOONOVER	**Prior Amount Paid:**	(FEES ALREADY RECEIVED FOR THIS NOI)

Code	Type of Application	Quantity	Fee (PER WELL UNLESS OTHERWISE NOTED)	Current Payment	Fees Owed
4439-06A	**Exempt** Wells **Outside AMAs** to be used for **Domestic** Purposes Only.		$100.00	$	$
4439-06B	Exempt Wells Inside AMAs and **ALL Exempt** Wells **Not** to be Used for **Domestic** Purposes.		$150.00	$	$
4439-6C	**Non-exempt** Wells **Outside AMAs**.		$150.00	$	$
4439-6D	**Mineral Exploration** or **Geotechnical**.		$150.00/per land section	$	$
4439-6E	**Cathodic, Heat Pump, Grounding,**		$150.00	$	$
4439-6F	**Monitor, Piezometer, Air Sparging Soil Vapor Extraction,**	7	$150.00	$1050.00	$
4439-6G	Non-recharge **Vadose Zone** or **Injection**.				
4439-10	**Late Registration** of a **Non-exempt** well **outside an AMA**.		$20.00	$	$
4439-11	**Late Registration** of an **Exempt** Well (not used for Irrigation inside an AMA).		$10.00	$	$
4439-08	Request to **Change** Well Information (Change of Well **Driller/reissue**).		$10.00	$	$
4439-12	Request to **Change** Well Information (Change of **Ownership**).		$10.00*	$	$
	*CHANGING TO MORE THAN 1 WELL WHERE NAMES TO BE CHANGED ARE ALL THE SAME, ONE $10.00 FEE TOTAL FOR THOSE WELLS, OTHERWISE, CHANGE OF OWNERSHIP IS $10.00/WELL.				
Well Driller Licensing (NOTE: PLEASE NOTE DRILLER'S NAME & LICENSE # ON ENVELOPE & ON ENCLOSED DOCUMENTS)					
4420-01	**Full-time** Well Driller's License.		$50.00	$	$
4420-02	Full-time Well Driller's License **Renewal.**		$10.00	$	$
4420-03	Full-time Well Driller License **Reactivation** (MUST BE WITHIN 1 YEAR OF LICENSE EXPIRATION DATE).		$20.00	$	$
Citations/Penalties					
4519	**W-19.** Failure to file Well Log		$10.00	$	$

Comments:

Total Paid*	$1,050.00	**Debt Owed:**	$

*IF FEES HAVE BEEN PAID PREVIUOSLY FOR THIS NOI, INCLUDE THAT AMOUNT

BMP# 210-48-001

Arizona Department of Water Resources
Water Management Support Section
P.O. Box 458 • Phoenix, Arizona 85001-0458
(602) 771-8500 • (800) 352-8488
www.azwater.gov

Notice of Intent to Drill, Deepen, or Modify a *Monitor / Piezometer / Environmental* Well

FEE

- Review instructions prior to completing form in black or blue ink.
- You must include with your Notice:
- $150 check or money order for the filing fee.
- Well construction diagram, labeling all specifications listed in Section 6.
- Authority for fee: A.R.S. § 45-596.

RECEIVED
APR 3 - 2007
WATER MGMT

AMA / INA	B 59 SB
RECEIVED DATE	WS 2
ISSUED DATE	WQAR CERCLA

FILE NUMBER B(15-21)3A-AB
WELL REGISTRATION NUMBER 55 - 215410

** PLEASE PRINT CLEARLY **

SECTION 1. REGISTRY INFORMATION

Well Type	Proposed Action	Location of Well
CHECK ONE	CHECK ONE	WELL LOCATION ADDRESS (IF ANY): Havasu National Wildlife Refuge
☒ Monitor	☒ Drill New Well	TOWNSHIP (N/S): 15N; RANGE (E/W): 21W; SECTION: 003; 160 ACRE: NE ¼; 40 ACRE: NE ¼; 10 ACRE: NW ¼
☐ Piezometer	☐ Deepen	COUNTY ASSESSOR'S PARCEL ID NUMBER: BOOK / MAP / PARCEL
☐ Vadose Zone	☐ Modify	COUNTY WHERE WELL IS LOCATED: Mojave
☐ Air Sparging	*If Deepening or Modifying:*	
☐ Soil Vapor Extraction	WELL REGISTRATION NUMBER	
☐ Other (*please specify*):	55 -	

SECTION 2. OWNER INFORMATION

Well Owner		Landowner (if different from Well Owner)	
FULL NAME OF COMPANY, ORGANIZATION, OR INDIVIDUAL: Pacific Gas and Electric		FULL NAME OF COMPANY, GOVERNMENT AGENCY, OR INDIVIDUAL: Havasu National Wildlife refuge	
MAILING ADDRESS: 4325 South Higuera Street		MAILING ADDRESS: P.O. Box 3009 317 Mesquite Ave	
CITY / STATE / ZIP CODE: San Luis Obispo CA, 94305		CITY / STATE / ZIP CODE: Needles, CA 92362	
CONTACT PERSON NAME AND TITLE: Yvonne Meeks, Project Manager		CONTACT PERSON NAME AND TITLE: John Earle	
TELEPHONE NUMBER: 805-234-2257	FAX: 805-546-5232	TELEPHONE NUMBER:	FAX:

SECTION 3. DRILLING AUTHORIZATION

Drilling Firm		Consultant (if applicable)	
NAME: ~~ProSonic~~ BOART		CONSULTING FIRM: CH2M Hill	
DWR LICENSE NUMBER: 83	ROC LICENSE CATEGORY: A-04	CONTACT PERSON NAME: Serena Lee	
TELEPHONE NUMBER: 480-635-9665	FAX: 480-635-9690	TELEPHONE NUMBER: 480-377-6250	FAX: 480-784-6250
E-MAIL ADDRESS: info@prosoniccorp.com		E-MAIL ADDRESS: SLee4@ch2m.com	

SECTION 4.

Questions	Yes	No	Explanation:
1. Are all annular spaces between the casing(s) and the borehole for the placement of grout at least 2 inches?	X		2-inch annular spaces are special standards required for wells located in and near groundwater contamination sites (such as CERCLA, WQARF, DOD, LUST).
2. Is the screened or perforated interval of casing greater than 100 feet in length?		X	100-foot maximum screen intervals are a special standard for wells located in and near groundwater contamination sites (such as CERCLA, WQARF, DOD, LUST).
3. Are you requesting a variance to use thermoplastic casing in lieu of steel casing in the surface seal?		X	The wells must be constructed in a vault as defined in A.A.C. R12-15-801(27).
4. Is there another well name or identification number associated with this well? (e.g., MW-1, PZ2, 06-04, etc.)	X		IF YES, PLEASE STATE MW-54D
5. Have construction plans been coordinated with the Arizona Department of Environmental Quality?	X		IF YES, PLEASE STATE AGENCY CONTACT & PHONE NUMBER Jerry Smit 602-771-2220
6. For monitor wells, is dedicated pump equipment to be installed?		X	IF YES, PLEASE STATE DESIGN PUMP CAPACITY Gallons per Minute
7. Is this well a new well located in an Active Management Area **AND** intended to pump water for the purpose of remediating groundwater?		X	IF YES, UNLESS THE WELL IS A REPLACEMENT WELL AND THE TOTAL NUMBER OF OPERABLE WELLS ON THE SITE IS NOT INCREASING, YOU MUST ALSO FILE A SUPPLEMENTAL FORM A.R.S. § 45-454(C) & (F). *(See instructions)*
8. Will the well registration number be stamped on the vault cover or on the upper part of the casing?	X		IF NO, WHERE WILL THE REGISTRATION NUMBER BE PLACED?

Notice of Intent to Drill, Deepen, or Modify a *Monitor / Piezometer / Environmental* Well

WELL REGISTRATION NUMBER
55-215410

SECTION 5. WELL CONSTRUCTION DETAILS

Drill Method

CHECK ONE

- ☐ Air Rotary
- ☐ Bored or Augered
- ☐ Cable Tool
- ☐ Dual Rotary
- ☐ Mud Rotary
- ☐ Reverse Circulation
- ☐ Driven
- ☐ Jetted
- ☐ Air Percussion / Odex Tubing
- ☒ Other (*please specify*):

Rotosonic

DATE CONSTRUCTION TO BEGIN

Method of Well Development

CHECK ONE

- ☐ Airlift
- ☐ Bail
- ☐ Surge Block
- ☐ Surge Pump
- ☒ Other (*please specify*):

Bail, surge, pump

Method of Sealing at Reduction Points

CHECK ONE

- ☒ None
- ☐ Welded
- ☐ Swedged
- ☐ Packed
- ☐ Other (*please specify*):

Grout Emplacement Method

CHECK ONE

- ☐ Gravity
- ☐ Pressure Grout
- ☒ Tremie
- ☐ Other (*please specify*):

Surface or Conductor Casing

CHECK ONE

- ☒ Flush Mount in a vault
- ☐ Extend 1' above grade

SECTION 6. PROPOSED WELL CONSTRUCTION PLAN (attach additional page if needed)

Attach a well construction diagram labeling all specifications below.

Borehole

DEPTH FROM SURFACE FROM (feet)	DEPTH FROM SURFACE TO (feet)	BOREHOLE DIAMETER (inches)
0	420	6

Casing

DEPTH FROM SURFACE FROM (feet)	DEPTH FROM SURFACE TO (feet)	OUTER DIAMETER (inches)	MATERIAL TYPE (T): STEEL	PVC	ABS	IF OTHER TYPE, DESCRIBE	PERFORATION TYPE (T): BLANK OR NONE	WIRE WRAP	SHUTTER SCREEN	MILLS KNIFE	SLOTTED	IF OTHER TYPE, DESCRIBE	SLOT SIZE IF ANY (inches)
0	410	2		×									
410	420	2		×							×		0.020
				×									

Annular Material

DEPTH FROM SURFACE FROM (feet)	DEPTH FROM SURFACE TO (feet)	ANNULAR MATERIAL TYPE (T): NONE	CONCRETE	NEAT CEMENT OR CEMENT GROUT	CEMENT-BENTONITE GROUT	BENTONITE: GROUT	CHIPS	PELLETS	IF OTHER TYPE OF ANNULAR MATERIAL, DESCRIBE	FILTER PACK: SAND	GRAVEL	SIZE
0	405			×								
405	420									×		#3

APR - 3

IF THIS WELL HAS NESTED CASINGS, SPECIFY NUMBER OF CASING STRINGS	EXPECTED DEPTH TO WATER: Feet Below Ground Surface

I state that this notice is filed in compliance with A.R.S. § 45-596 and is complete and correct to the best of my knowledge and belief.

TYPE OR PRINT NAME AND TITLE	SIGNATURE OF WELL OWNER	DATE
ROBERT C. DOSS - PRINCIPAL ENGINEER	Robert C. Doss	
TYPE OR PRINT NAME AND TITLE	SIGNATURE OF LANDOWNER, IF APPLICABLE (SEE INSTRUCTIONS)	DATE

215410

Pacific Gas and Electric Company

Yvonne J. Meeks
Topock Project Manager
Chromium Remediation Project Office
Gas Transmission & Distribution

6588 Ontario Road
San Luis Obispo, CA 93405

Mailing Address
4325 South Higuera Street
San Luis Obispo, CA 93401

805.546.5243
Internal: 664.5243
Fax:: 805.546.5232
E-Mail: YJM1@pge.com

March 30, 2007

RECEIVED
APR 3 - 2007
WATER MGMT

Arizona Department of Water Resources
Water Management Support Section
P.O. Box 458
Phoenix, AZ 85001-0458

Subject: Notices of Intent for Wells Near Topock, Arizona
PG&E Topock Compressor Station, Needles, California

To ADWR:

Enclosed are 8 Notices of Intent for wells near Topock, Arizona that Pacific Gas and Electric Company (PG&E) is intending to drill and install. Also enclosed is a check for the associated filing fees and 2 maps that identify the intended drilling locations for the 8 Notices of Intent. The monitoring wells will be drilled and installed in accordance with the Arizona Department of Environmental Quality (ADEQ) Voluntary Remediation Program (VRP) in A.R.S. §49-175. The objective of this investigation is to collect additional data to the supplement PG&E's ongoing remedial investigation and corrective action planning in response to history releases from the Topock Compressor Station in California.

PG&E is in the process of obtaining access agreements from the landowners for the wells. Copies of the access agreements will be provided in the well completion reports.

PG&E looks forward to your timely approval. If you have any questions on the Notices of Intent, please call Serena Lee/CH2M HILL at 480-377-6250.

Sincerely,

Yvonne Meeks

Enclosure

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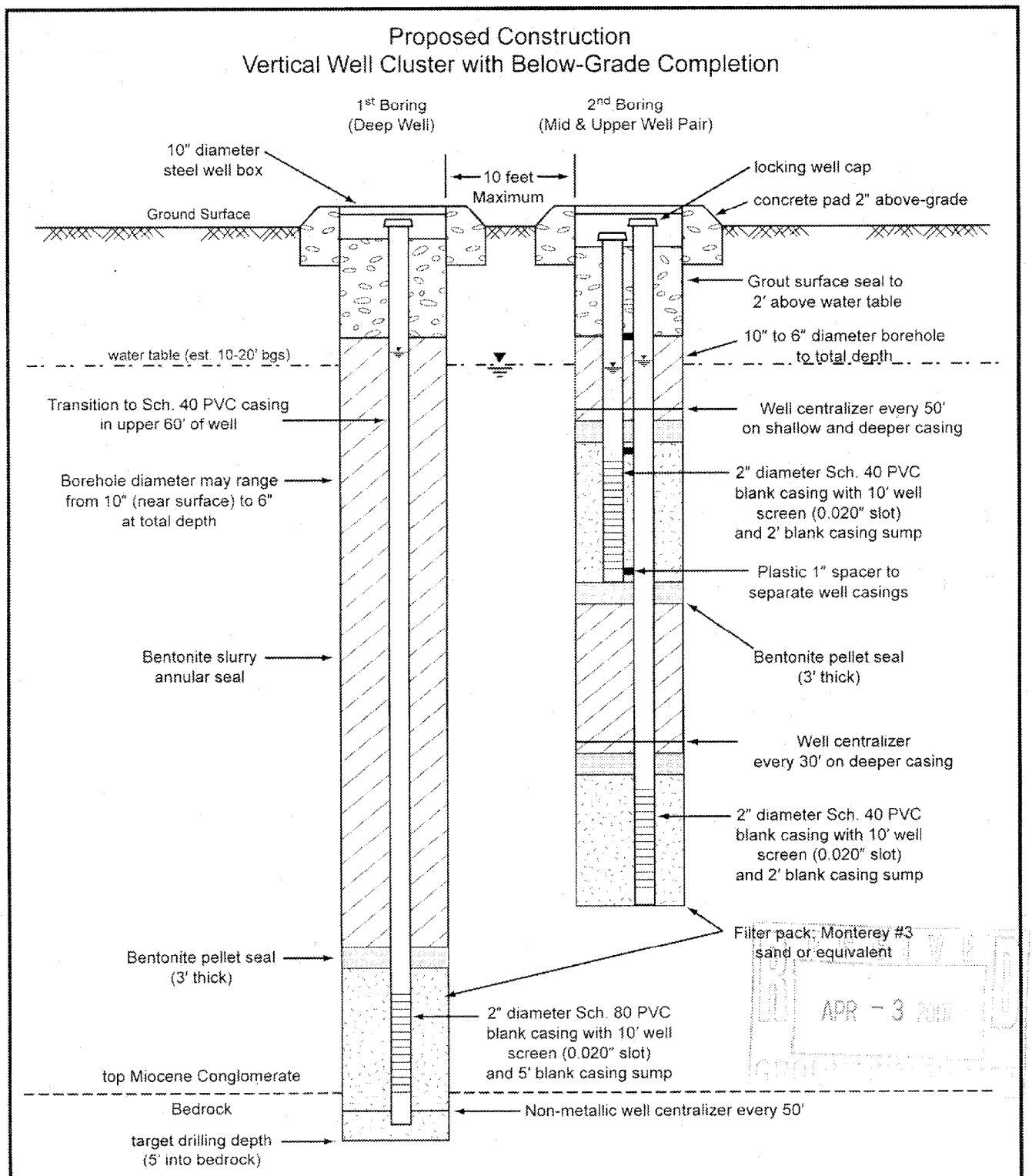

FIGURE 5B
MONITORING WELL CLUSTER SCHEMATIC
BELOW-GRADE COMPLETION
WORK PLAN FOR WELL INSTALLATION AND GROUNDWATER CHARACTERIZATION ON ARIZONA SHORE OF THE COLORADO RIVER AT TOPOCK, ARIZONA
PG&E TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

DIAGRAM NOT TO SCALE
All depths in feet below ground surface (bgs) are approximate and will be determined based on drilling log and Isoflow(™) sampling.

CH2MHILL

ES102006003BAO_Fig5b_Well_BelowGrade.ai_022607_ll

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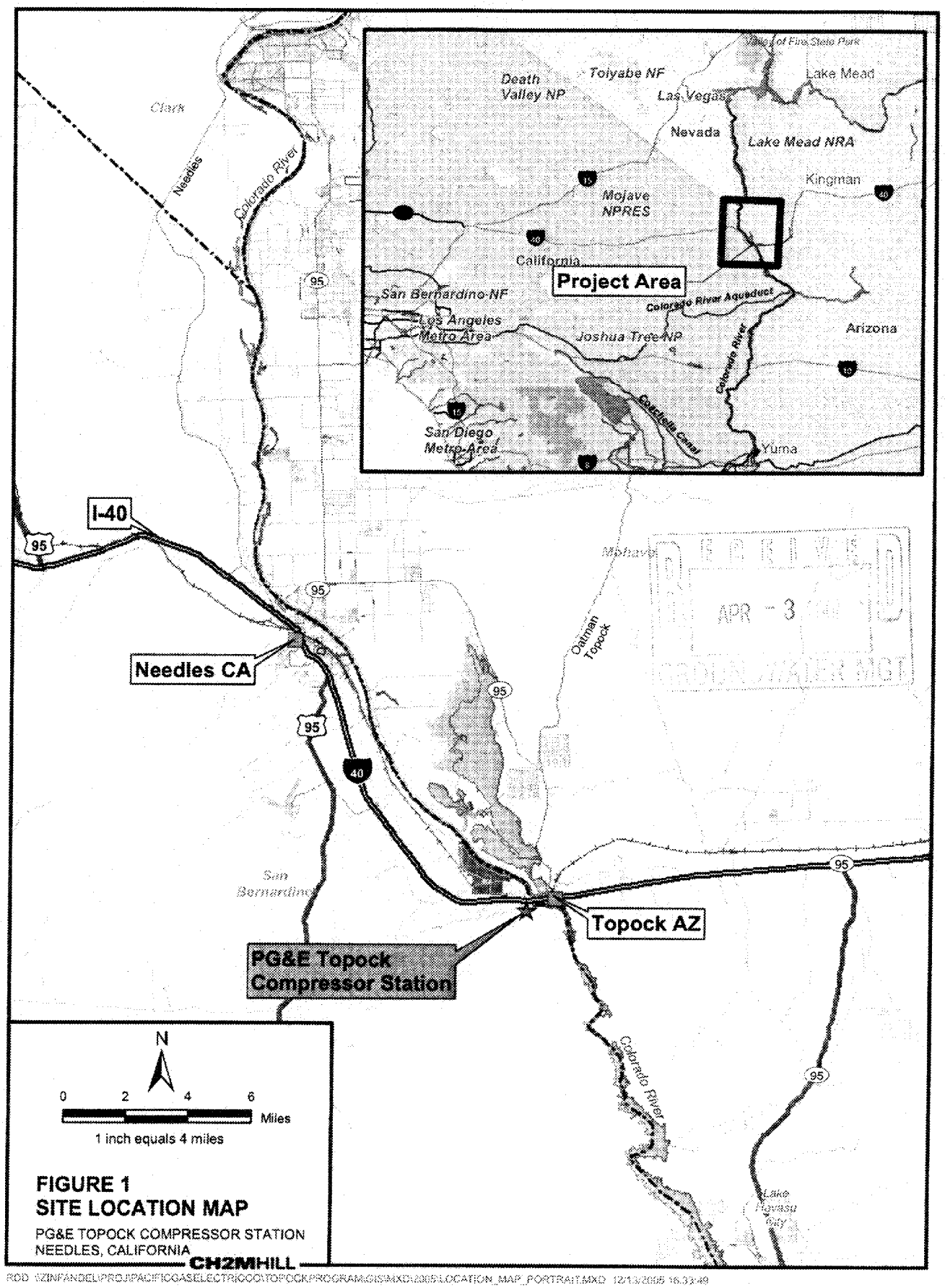

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APR - 3
RADIUM WATER MGT

FIGURE 1
SITE LOCATION MAP

PG&E TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

CH2MHILL

ROD \\ZINFANDEL\PROJ\PACIFICGASELECTRICCO\TOPOCK\PROGRAM\GIS\MXD\2005\LOCATION_MAP_PORTRAIT.MXD 12/13/2005 16:33:49

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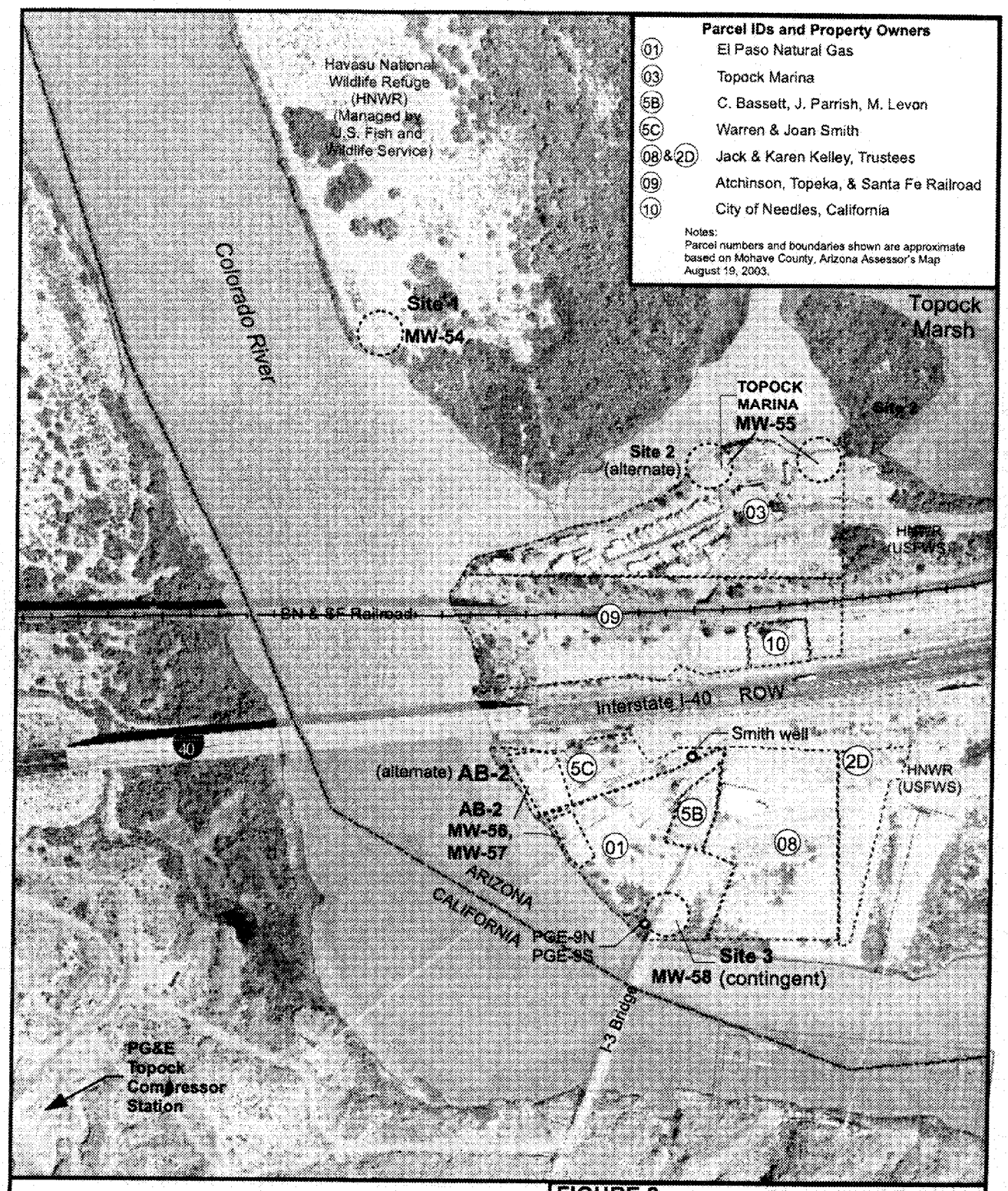

FIGURE 2
PARCEL AND PROPERTY OWNERSHIP FOR PROPOSED DRILLING PROJECT
WORK PLAN FOR WELL INSTALLATION AND GROUNDWATER CHARACTERIZATION ON ARIZONA SHORE OF THE COLORADO RIVER AT TOPOCK, ARIZONA.
PG&E TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

CH2MHILL

BAO \\ZINFANDEL\PROJ\PACIFICCASELECTRICCO\TOPOCKPROGRAM\GIS\MXD\2007\AZ_GW_PROPERTY_OWNERS.MXD
AZ_GW_PROPERTY_OWNERS.PDF 1/15/2007 10:58:20

CH2M HILL

Fax

To:	Danita Haywood (ADWR)	**From:**	Serena Lee (CH2M HILL)
Fax:	602-771-8691	**Pages:**	5 including cover page
Phone:		**Date:**	6/7/2007
Re:	Access agreement for NOI's	**CC:**	

☐ **Urgent** ☑ **For Review** ☐ **Please Comment** ☐ **Please Reply** ☐ **Please Recycle**

Dear Danita,

Attached is the access agreement with El Paso Natural Gas to drill wells MW-56, MW-57, and MW-58. Specifically, these are for the NOI's with well registration numbers:

MW-56 SMD	55-215411
MW-57 SMD	55-215406
MW-58 SMD	55-215407
MW-58 SM	55-215412
MW-58 D	55-215413

I will forward the access agreements for the remaining 2 NOIs as soon as they are completed. Thank you for your assistance. Please call me with any questions.

Sincerely,

Serena Lee

480-377-6250

LIMITED ACCESS AGREEMENT

This Limited Access Agreement ("Agreement") is made and entered into as of the 23rd day of May, 2007 by and between El Paso Natural Gas Company, with offices at 2 North Nevada, Colorado Springs, Colorado 80903 ("El Paso") and Pacific Gas and Electric Company ("PG&E"), with offices at 77 Beale Street, San Francisco, California 94105, and pertains to certain property owned by El Paso and located beneath the I-3 gas pipeline bridge on the Colorado River floodplain in Topock, Arizona, Assessor's Parcel No. 210-48-001 (the "Subject Property").

Whereas, PG&E is currently conducting an environmental investigation of the environmental condition of property adjacent to and across the Colorado River from the Subject Property, under the supervision of the Department of Toxic Substances Control and is expanding the scope of that study in coordination with the Arizona Department of Environmental Quality ("ADEQ") including, pursuant to this Agreement, the installation of groundwater monitoring wells at the Subject Property, and wishes to continue the scope of that study onto the Subject Property by installing ground water monitoring wells at the Subject Property; and

Whereas, Pursuant to the request of PG&E, El Paso is willing to provide to PG&E temporary ingress and egress on and over its property for the limited purpose of installing and sampling one or more groundwater monitoring wells at the Subject Property (the "Groundwater Study"), subject to the provisions of this Agreement; and

Whereas, PG&E recognizes and acknowledges that (a) the limited access being granted by El Paso hereunder is being extended solely and exclusively for PG&E's benefit as a courtesy by El Paso; and (b) the unqualified acceptance and strict observance of all of the terms, conditions and obligations imposed upon PG&E hereunder is essential to the continuing validity of this Agreement.

NOW, THEREFORE, in consideration of the foregoing and other good and valuable consideration, the receipt and sufficiency of which are acknowledged by both parties, El Paso hereby grants to PG&E, its agents, environmental consultants, employees and contractors, the right to enter onto the Subject Property for the limited purpose of conducting the Groundwater Study, subject to the following terms, conditions and duties of PG&E, all of which PG&E specifically accepts and agrees to execute.

1. Prior to initiating any operations at the Subject Property, PG&E shall submit a detailed written work plan to El Paso for its written approval, not to be unreasonably withheld, showing, without limitation, where monitoring wells or other structures will be located, the approximate depth to which they will be installed, and their manner of construction (e.g., as to monitoring wells, their method of installation, diameter, casing/screen materials, sand pack/grouting, etc.). In no event shall PG&E proceed with performing the work plan until it has received El Paso's written approval, nor shall PG&E's

environmental testing or any other activities at the Subject Property materially change from the testing or activities as approved by El Paso, without PG&E first having received El Paso's prior written approval. Notwithstanding the foregoing, PG&E and its consultants reserve the right to determine the exact depth of the monitoring wells and screened intervals, without further approval by El Paso.

2. PG&E shall notify El Paso at least forty-eight (48) hours prior to the time it desires to commence any operations at the Subject Property pursuant to this Agreement, and shall give like notice each time access to the Subject Property is required to perform any portion of the Groundwater Study.

3. Within three (3) business days of its receipt of the same, PG&E shall mail to El Paso copies of all receipt verified, final laboratory results, pertaining to the laboratory sampling of soil samples or ground water monitoring wells installed on the Subject Property. PG&E shall also promptly provide El Paso and El Paso's consultant (if any) with copies of all other documents, reports, summaries, submissions and data produced or received by PG&E or its consultants and pertaining in any way to the Groundwater Study.

4. All samples, waste materials, soil cuttings, hazardous wastes, hazardous substances, pollutants, contaminants, or free products of any description which result from activities conducted pursuant to this Agreement shall be the sole property of PG&E, shall be removed from El Paso's property within five (5) days of their generation, and shall at all times be handled, removed, stored, treated, transported, and disposed of, as necessary, in accordance with all applicable local, state, and federal laws, rules, regulations, and ordinances at PG&E's sole risk and expense.

5. All tools, equipment or other property of any kind used or placed upon the Subject Property by PG&E or its representatives shall remain the property of PG&E or its representatives and shall be removed by the PG&E at its sole risk and expense (or by El Paso, at PG&E's expense) promptly after the expiration or earlier termination of this Agreement.

6. PG&E shall at all times conduct its activities in a manner so as to minimize any disturbance to the existing condition of the Subject Property. Any disturbance to the Subject Property resulting from PG&E's activities shall be repaired or corrected promptly by PG&E, with the exception of disturbances which are necessary to conduct sampling of the groundwater monitoring wells, and which are required to remain in place for the performance of such activities for the duration of this Agreement. PG&E shall provide appropriate protective barriers for any structures, facilities or equipment which must be maintained on the Subject Property. At such time, during the term of this Agreement, that PG&E determines that any groundwater monitoring wells are no longer required, PG&E shall close such wells in accordance with all applicable statutes, rules and regulations and shall restore the Subject Property to substantially the same condition in which it existed prior to the Groundwater Study, at PG&E's sole risk and expense.

7. While at the Subject Property, PG&E and its representatives, agents, consultants, employees and contractors shall comply with all federal, state, or local laws,

rules, and regulations, including, but not limited to, environmental, OSHA and other health and safety laws, rules and regulations. In addition, such persons shall comply with all of El Paso's health, safety, and environmental policies, copies of which are attached as Exhibit A to this Agreement.

8. In connection with all operations conducted pursuant to this Agreement and at all times when it is in effect, PG&E shall carry insurance in the amounts and coverage indicated in this Agreement as follows: Worker's Compensation insurance and Employers' Liability insurance in accordance with the state laws. Worker's Compensation insurance shall be for the statutory limits; Employers' Liability insurance shall provide coverage of at least $100,000 for each employee and $500,000 for each occurrence. PG&E shall also secure and maintain at all times while this Agreement is in effect commercial general liability for bodily injury, property damage, and personal injury with limits of $1,000,000 for each occurrence and in the aggregate; pollution liability and professional liability with limits of no less than $1,000,000 for each claim and in the aggregate covering activities taken by it or on its behalf at the Subject Property, and shall include El Paso as an additional insured party on the general and pollution liability coverage. Prior to conducting any operations hereunder, PG&E shall furnish to El Paso certificates of insurance evidencing all such coverage.

Further, PG&E shall have the right to self insure with respect to the insurance requirements required under this Agreement. PG&E's self-insurance program is in full force and effect and in compliance with and subject to all the terms, agreements, covenants, conditions and provisions of this License.

9. PG&E shall indemnify, defend and hold harmless El Paso and its directors, officers, shareholders, employees and agents, from and against any and all suits, claims, actions, administrative proceedings, liabilities, judgments, penalties, fines, damages, losses, expenses and costs (including cost of defense, settlement and actual attorneys fees), including, without limitation, any such fees and expenses incurred by El Paso in enforcing this Agreement, which are based upon or arise out of the acts or omissions of PG&E or its agents, employees, consultants or contractors in performing the Groundwater Study and other activities conducted under this Agreement.

10. The law of the State of Arizona shall apply to the interpretation of this Agreement and to the resolution of any disputes arising out of the matters set forth herein. A determination by a Court of competent jurisdiction that any provision of this Agreement is invalid or unenforceable for any reason shall not affect the validity or enforceability of any other provision.

11. This agreement is revocable by El Paso or PG&E upon 60 days written notice. Unless revoked by 60 days written notice, this Agreement shall terminate upon completion of the Groundwater Study as it relates to the Subject Property, or upon the expiration of ten (10) years from and after the date of this Agreement, whichever first occurs; provided, however, that in no event shall the termination of this Agreement affect the duties and obligations of PG&E hereunder, it being understood and agreed that those duties and obligations shall survive such termination or expiration and remain binding on

PG&E. Upon 60 days written notice of termination, or 60 days prior to termination of this Agreement due to completion of the Groundwater Study as it relates to the Subject Property or the expiration of the ten (10) year term of this Agreement, whichever may apply, PG&E shall initiate activities to restore the Subject Property to substantially the same condition in which it existed prior to the Groundwater Study, at PG&E's sole risk and expense. Such restoration activities shall include, without limitation, the proper plugging and abandonment of any monitoring wells in accordance with all applicable statutes, rules and regulations. Restoration activities shall be conducted with all deliberate speed, and are intended to occur within the term of this Agreement; however, to the extent such restoration activities are not completed within 60 days, access for any remaining restoration activities shall be granted pursuant to this Agreement. Failure by PG&E to conduct restoration activities will trigger El Paso's right to do so on behalf of PG&E, at PG&E's expense.

12. Under this Agreement, El Paso shall also provide access to ADEQ to the Subject Property to conduct field inspection and reasonable sampling, pursuant to the Voluntary Remediation Agreement, a copy of which is attached hereto as Exhibit B to this Agreement.

13. This Agreement shall be effective upon its execution by both El Paso and PG&E, and shall thereafter be binding upon the parties and their respective successors, heirs and assigns.

IN WITNESS WHEREOF, this Agreement has been executed the day and year first above-written.

By El Paso:

Philip Baca Date: May 23, 2007

PHILIP BACA

By PG&E:

Date: May 25, 2007

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Page 1

Arizona Department of Water Resources

3550 N Central Ave
Phoenix AZ 85012

PACIFIC GAS & ELECTRIC CO

77 BEALE STREET
SAN FRANCISCO, CA
N/A

Date: 4/9/2007
Cashier: WRPAB
Type: Mail

DCS/INV#	DESCRIPTION		ATTR	SIZE	QTY	PRICE	EXT PRICE
F 72	4439-06	NOTICE OF INTENT TO DRILL WELL			8	150.00	1,200.00
				1 Unit(s)		Subtotal:	1,200.00
						RECEIPT TOTAL:	**1,200.00**
						Tendered:	1,200.00

Check #: 1,200.00 # 1188518

8 NOI'S

We Appreciate Your Business!