APPENDIX A
DISTRIBUTION LIST

Federal Government Agencies

Army Corps of Engineers, Sacramento District Headquarter Office
Engineering/Design Branch, Regulatory Branch, Planning Branch
1325 J Street, Room 1350
Sacramento, California 95814
Phone: (916) 557-5250
Fax: (916) 557-5306

Department of the Interior
San Francisco Regional Office – AS, AZ, CA, CNMI, GU, HI, NV
Ms. Patricia Sanderson Port
Regional Environmental Officer
Department of the Interior
333 Bush Street
San Francisco, CA 94104
Phone: 415-296-3350
Email: patricia_port@ios.doi.gov
Website: http://www.doi.gov/pmb/oepc/san-francisco.cfm

EPA Region 9 – AS, AZ, CA, GU, HI, MP, NV
Mr. Scott Sysum
Department of Energy Reviewer
Environmental Review Office
Environmental Protection Agency
75 Hawthorne Street (CED-2)
San Francisco, CA 94105
Phone: 415-972-3742
Email: sysum.scott@epa.gov
Website: www.epa.gov/region09

California NEPA Points of Contact:
Mr. Scott Morgan
Director, California State Clearinghouse
Governor's Office of Planning and Research
PO Box 3044
Sacramento, CA 95812-3044
Phone: 916-445-0613
Email: state.clearinghouse@opr.ca.gov

U.S. Senators and Representatives:

The Honorable Senator Barbara Boxer

Fresno Office
Office of U.S. Senator Barbara Boxer
2500 Tulare Street, Suite 5290
Fresno, CA 93721
(559) 497-5109
(202) 228-3864 fax

Washington, D.C. Office
Office of U.S. Senator Barbara Boxer
112 Hart Senate Office Building
Washington, D.C. 20510
(202) 224-3553

The Honorable Senator Dianne Feinstein

Fresno Office (for San Joaquin County)
2500 Tulare Street, Suite 4290
Fresno, CA 93721
Phone: (559) 485-7430
Fax: (559) 485-9689

Washington, D.C. Office
United States Senate
331 Hart Senate Office Building
Washington, D.C. 20510
Phone: (202) 224-3841
Fax: (202) 228-3954
TTY/TDD: (202) 224-2501

9th U.S. Congressional District

The Honorable Representative Jerry McNerney

Stockton Office
2222 Grand Canal Blvd. #7
Stockton, CA 95207
Phone: (209) 476-8552
Fax: (209) 476-8587

Washington, D.C. Office
1210 Longworth House Office Building
Washington, D.C. 20515
Phone: (202) 225-1947
Fax: (202) 225-4060

10th U.S. Congressional District

The Honorable Representative Jeff Denham

Modesto Office
Modesto, CA
4701 Sisk Road, Suite 202
Modesto, CA 95356
Phone: (209) 579-5458
Fax: (209) 579-5028

Washington, D.C. Office:
1730 Longworth HOB
Washington, DC 20515
Phone: (202) 225-4540
Fax: (202) 225-3402

California State Representatives:

State Assembly (District 13)
Assembly Member
The Honorable Susan Talamantes Eggman

Capitol Office:
State Capitol
P.O. Box 942849
Sacramento, CA 94249-0013
Tel: (916) 319-2013
Fax: (916) 319-2113

District Office:
31 East Channel Street
Suite 306
Stockton, CA 95202
Tel: (209) 948-7479
Fax: (209) 465-5058

State Senate (District 5)

The Honorable Senator Cathleen Galgian
Capitol Office
State Capitol, Room 4082
Sacramento, CA 95814
Phone: (916) 651-4005

Stockton District Office
31 E. Channel Ste 440
Stockton, CA 95202
Phone: (209) 948-7930

Native American Tribes (federally listed):

Buena Vista Rancheria of Me-Wuk Indians of California
Rhonda Morningstar Pope, Chairperson
1418 20th Street, Suite 200
Sacramento, CA 95811

Phone No: 916-491-0011 Fax: 916-491-0012
E-mail: Not Available
Web site: www.buenavistatribe.com

Dr. Roselynn Lwenya
Environmental Resources Director/THPO
Buena Vista Rancheria of Me-Wuk Indians
1418 20th Street, Suite 200
Sacramento, CA 95811

Jeannette Simons
THPO Advisor
Buena Vista Rancheria
1418 20th Street, Suite 200
Sacramento, CA 95811
Email: jeannettesimons@gmail.com

California Valley Miwok Tribe, California
Silvia Burley, Chairperson
10601 N. Escondido Place
Stockton, CA 95212
Phone No.: 209-931-4567 Fax: 209-931-4333
Express Mail: 10601 N. Escondido Pl., Stockton, CA 95212

E-mail: s.burley@californiavalleymiwoktribe-nsn.gov
Web site: www.californiavalleymiwoktribe-nsn.gov

Chicken Ranch Rancheria of Me-Wuk Indians of California
Lloyd Mathieson, Chairman
P.O. Box 1159
Jamestown, CA 95327
Phone No: 209-984-4806 Fax No.: 209-984-5606
Express Mail: 16955 Nelson Road, Jamestown, CA 95327
E-mail: chixrnch@mlode.com
Web site: None

Ione Band of Miwok Indians of California
Johnny Jamerson, Acting Tribal Chairperson
P.O. Box 699
Plymouth, CA 95669
Phone No.: 209-245-5800 Fax: 209-245-3112
Express Mail: 9252 Bush Street, Plymouth, CA 95669
E-mail: Not Available
Web site: www.ionemiwok.org

Jackson Rancheria of Me-Wuk Indians of California
Irvin Marks, Chairperson
P.O. Box 1090
Jackson, CA 95642
Phone No: Fax No: 209-223-1935 Fax No.: 209-223-5366
Express Mail: 12222 New York Ranch Road, Jackson, CA 95642
E-mail: Not Available
Web site: www.jacksoncasino.com

Middletown Rancheria of Pomo Indians of California
Carl Rivera, Chairman
P.O. Box 1035
Middletown, CA 95461
Phone No. 707-87-3670 Fax No.: 707-987-9091
Express Mail: 22223 Hwy 29 @ Rancheria Road, Middletown, CA 95461
E-mail: Not Available
Web site: None

Shingle Springs Band of Miwok Indians, Shingle Springs Rancheria (Verona Tract), California
Nick H. Fonseca, Chairman
P.O. Box 1340 (Verona Tract)

Shingle Springs, CA 95682
Phone No: 530-676-8010 Fax No: 530-676-8033
Express Mail: 5281 Honpie Road, Placerville, CA 95667
E-mail: Not Available
Web site: www.shinglespringsrancheria.com

Andrew Godsey
Assistant Cultural Resource Director
Shingle Springs Band of Miwok Indians
5281 Honpie Road,
Placerville, CA 95667

Tuolumne Band of Me-Wuk Indians of the Tuolumne Rancheria of California
Kevin Day, Chairman
P.O. Box 699
Tuolumne, CA 95379
Phone No: 209-928-3475 Fax No: 209-928-1677
Express Mail: 19595 Mi-wu Street, Tuolumne, CA 95379
E-mail: Not Available
Web site: www.miwok.com

Native American individuals and non-federally listed tribes

Briana Creekmore
PO Box 84
Wilseyville, CA 95257

Andrew Franklin
Chairperson
Wilton Rancheria
9300 W. Stockton
Suite 200
Elk Grove, CA 95758

Katherine Erolinda Perez
PO Box 717
Linden, CA 95236

Randy Yonemura
4305 – 39th Avenue
Sacramento, CA 95824

State, Regional and Local Government Agencies and Other recipients:

Ms. Kim Turner, Assistant Field Supervisor
ESA / Regulatory Division
Bay - Delta Fish & Wildlife Office
U.S. Fish and Wildlife Service
650 Capital Mall, Suite 8-300
Sacramento, CA 95814

Habitat Conservation Planning Branch
CA Department of Fish and Wildlife
1416 Ninth Street, 12th Floor
Sacramento, CA 95814
(916) 653-4875

California State Parks
Office of Historic Preservation
State Historic Preservation Officer (SHPO)
Milford Wayne Donaldson
1725 23rd Street, Suite 100
Sacramento, CA 95816
PH: 916-445-7000
FAX: 916-445-7053
E-mail: calshpo@parks.ca.gov

APPENDIX B
CONSULTATIONS AND PUBLIC COMMENTS

This appendix contains copies of the consultation letter from DOE to the California State Historic Preservation Officer and the responses in Appendix B1. DOE sent similar letters to the tribal officials of the following Native American groups and individuals who have expressed interest in federal actions in San Joaquin County:

- Buena Vista Rancheria of Me-Wuk Indians of California
- California Valley Miwok Tribe, California
- Chicken Ranch Rancheria of Me-Wuk Indians of California
- Ione Band of Miwok Indians of California
- Jackson Rancheria of Me-Wuk Indians of California
- Middletown Rancheria of Pomo Indians of California
- Shingle Springs Band of Miwok Indians
- Tuolumne Band of Me-Wuk Indians of the Tuolumne Rancheria of California
- Wilton Rancheria

These are found in Appendix B2. DOE also sent a letters to the FWS for Section 7 consultation under the Endangered Species Act, and the FWS responded to concur with DOE's finding (Appendix B3). Within each appendix, the correspondence is ordered by date.

APPENDIX B1

CORRESPONDENCE WITH THE STATE HISTORIC PRESERVATION OFFICER

NATIONAL ENERGY TECHNOLOGY LABORATORY
Albany, OR • Morgantown, WV • Pittsburgh, PA
U.S. DEPARTMENT OF ENERGY

June 7, 2013

Ms. Carol Roland-Nawi
State Historic Preservation Officer
Office of Historic Preservation
1725 23rd Street, Suite 100
Sacramento, CA 95816
E-mail: calshpo@parks.ca.gov

Re: National Historic Preservation Act Section 106 Compliance
Compressed Air Energy Storage Compression Testing Project

Dear Ms. Roland-Nawi:

The U.S. Department of Energy (DOE) is proposing to provide a financial assistance grant (DOE's Proposed Action) to Pacific Gas and Electric Company (PG&E) as part of the Smart Grid Technologies Program, which is funded through the American Recovery and Reinvestment Act of 2009. If PG&E receives the grant, it would construct a temporary site facility (TSF) to test the performance of a geological formation as a potential storage reservoir for possible future use as a Compressed Air Energy Storage (CAES) facility. PG&E would install wells and temporary compressors for injecting compressed air into a depleted natural gas field at a depth of several thousand feet, followed by controlled releases of this air to observe and measure the performance of the air storage reservoir. Associated facilities would include a 2.5-acre gravel work pad, temporary compression equipment and the extension of electrical service to the TSF on a distribution line. The 4.25-mile-long distribution line would include the unmodified use of existing lines, reconductoring of existing lines, and construction of 2.4 miles of new line.

The compression testing would take approximately 10 months, including site preparation and equipment installation and would begin in 2014. However, PG&E would upgrade and install the distribution line starting in August 2013 under authorization by DOE as an interim action. Upon completion of the proposed testing project, the wells would be capped and either retained for future use or abandoned in accordance with state and federal standards. If the project does not move forward, the well pad and associated wells would be transferred to the owner of the subsurface rights.

The TSF would be located adjacent to an existing natural gas well in an agricultural area on King Island in rural San Joaquin County, California, 1.8 miles northwest of the City of Stockton's northern boundary. Access to the site would be along Eight Mile Road, King Island Road, and unpaved agricultural access roads. Figure 1, attached, shows the proposed project location.

In May 2013, a technical report was completed for a historical and archaeological resources investigation of the project's Area of Potential Effects (APE). The report indicates that intensive field studies of the APE did not result in the identification of properties meeting the criteria for listing in the National Register of Historic Places (NRHP) within or immediately adjacent to the Project APE. A total of four historic-era properties were identified near the APE, consisting of

3610 Collins Ferry Road, P.O. Box 880, Morgantown, WV 26507
joseph.zambelli@netl.doe.gov • Voice (304) 285-4913 • Fax (304) 285-4403 • www.netl.doe.gov

three mid-twentieth century vernacular buildings associated with agricultural activities, and the navigation and irrigation canal referred to as Bishop Cut. None of these appear to be historic properties as defined under Section 106 of the National Historic Preservation Act (NHPA) and the criteria for NRHP listing in 36 CFR 60.4.

Based on these findings of the literature research and field inventory of the project APE, DOE has made a finding of No Historic Properties Affected for historic and archeological properties in regards to this undertaking. DOE asks for your concurrence with this finding and thanks you in advance for your consideration. Please see the supporting documents attached to this letter for further details on this project.

An environmental assessment (EA) is being prepared and will be released to the public in the near future. DOE will provide your office a copy of the EA where you may further comment on any of your concerns. All correspondence between DOE and the SHPO will be included in an appendix to the EA. At this time, DOE anticipates a 30-day public comment period for this proposed project.

If you have any questions, I can be reached at (304) 285-4913 or by e-mail at Joseph.Zambelli@NETL.doe.gov.

DOE asks for your concurrence and thanks you in advance for your consideration. Please forward the results of your review and any requests for additional information to:

Mr. Joe Zambelli
U.S. Department of Energy
National Energy Technology Laboratory
3610 Collins Ferry Road
P.O. Box 880
M/S: I07
Morgantown, WV 26507-0880
Email: joseph.zambelli@netl.doe.gov

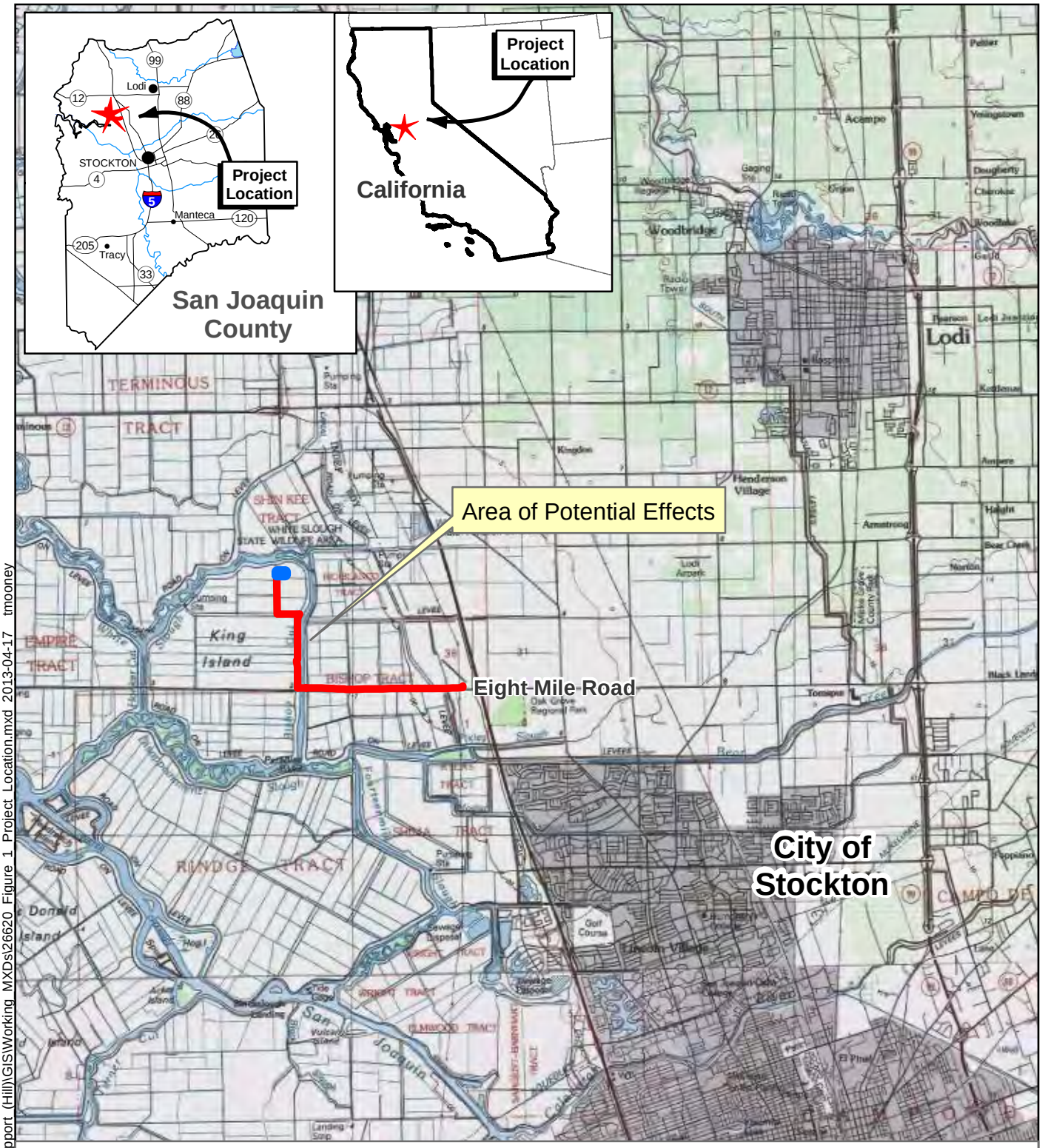
Sincerely,

Joe Zambelli
NEPA Document Manager

Attachments:

Figure 1 – Project Location
Cultural Resources Inventory and Evaluation Report of the PG&E Compressed Air Energy Storage Compression Testing Project, King Island, San Joaquin County, California

cc: PG&E (Mr. Bob Booth)
Ms. Nuhfer



Area of Potential Effects

Distribution Line

Well Pad

USGS 7.5 Quad:
Terminous - Revised 1993

N

0 1 2 4

Miles

G:\Projects\26620_CAES_EA_Support_(Hill)\GIS\Working_MXDs\26620_Figure_1_Project_Location.mxd 2013-04-17 tmooney

North State Resources, Inc.

CAES PDEA - King Island

Figure 1
Project Location

OFFICE OF HISTORIC PRESERVATION
DEPARTMENT OF PARKS AND RECREATION
1725 23rd Street, Suite 100
SACRAMENTO, CA 95816-7100
(916) 445-7000 Fax: (916) 445-7053
calshpo@parks.ca.gov
www.ohp.parks.ca.gov

June 26, 2013 Reply Reference To: DOE_2013_0612_001

Joseph Zambelli, M/S: I07
NEPA Document Manager
U.S. Dept. of Energy - National Energy Technology Laboratory
3610 Collins Ferry Road
PO Box 880
Morgantown, WV 26507-0880

Re: Section 106 Consultation for Compressed Air Energy Storage Compression Testing Project, King Island, San Joaquin County, CA

Dear Mr. Zambelli:

Thank you for initiating consultation regarding the Department of Energy's (DOE) efforts to comply with Section 106 of the National Historic Preservation Act of 1966 (16 U.S.C. 470f), as amended, and its implementing regulation found at 36 CFR Part 800. Funding for this undertaking was provided by the Department of Energy through the American Recovery and Reinvestment Act.

The DOE is proposing to provide a financial assistance grant to Pacific Gas and Electric through the Smart Grid Technologies Program. Funding would be used to construct a temporary site facility to determine whether a porous geological formation would be a suitable site for a future Compressed Air Energy Storage facility. Project components include the injection of compressed air approximately 4800 feet below grade, establishment of a 2.5 acre gravel work pad, installation of a 4.25 mile electrical distribution line extension and 2.4 miles of new distribution line and construction of well pads and access roads.

According to the *Cultural Resource Inventory and Evaluation Report: Compassed Air Energy Storage Compression Testing Project, King Island, San Joaquin County, California* (Ludwig: May 2013), no eligible or listed National Register of Historic Places properties have been identified within the project area. The DOE is requesting my concurrence with their effects determination of no historic properties affected pursuant to 36 CFR Part 800.4 (d)(1). After reviewing the information provided, I concur with this finding of effects. Please be advised that under certain circumstances, such as an unanticipated discovery or a change in project description, you may have future responsibilities for this undertaking under 36 CFR Part 800.

Thank you for seeking my comments and considering historic properties as part of your project planning. If you have any questions or concerns, please contact Ed Carroll of my staff at (916) 445-7006 or Ed.Carroll@parks.ca.gov.

Sincerely,

Carol Roland-Nawi, PhD
State Historic Preservation Officer

NATIONAL ENERGY TECHNOLOGY LABORATORY
Albany, OR • Morgantown, WV • Pittsburgh, PA
U.S. DEPARTMENT OF ENERGY

June 28, 2013

Ms. Carol Roland-Nawi
State Historic Preservation Officer
Office of Historic Preservation
1725 23rd Street, Suite 100
Sacramento, CA 95816
E-mail: calshpo@parks.ca.gov

Re: National Historic Preservation Act Section 106 Compliance Compressed Air Energy Storage Compression Testing Project

Dear Ms. Roland-Nawi:

In support of Pacific Gas and Electric Company's (PG&E's) Compressed Air Energy Storage (CAES) Compression Testing project, the U.S. Department of Energy (DOE) initiated National Historic Preservation Act Section 106 consultation with the Office of Historic Preservation on June 7, 2013, with the submittal of a technical report completed for a historic properties inventory and evaluation of the project's Area of Potential Effects (APE). This letter supplements the historic properties report and request for concurrence submitted on June 7, 2013, with a minor expansion of the APE.

After submittal of the technical report, PG&E revised the project description to accommodate the installation or replacement of three electrical distribution line poles adjacent to Bishop Cut. To accommodate the pole installation, the APE has been expanded by 1.1 acres east of the project's distribution line crossing of Bishop Cut. PG&E would replace one distribution pole north of the crossing along a levee road, and install two poles south of the crossing on the south side of and adjacent to Eight Mile Road.

Replacement Figure 2a (attached) for the historic properties report depicts the expanded APE. The intensive cultural resources survey conducted on April 3, 2013, included the expanded APE. No prehistoric or historic-era cultural resources were noted within the expanded APE as a result of this survey.

If you have any questions, I can be reached at (304) 285-4913 or by e-mail at Joseph.Zambelli@NETL.doe.gov.

3610 Collins Ferry Road, P.O. Box 880, Morgantown, WV 26507
joseph.zambelli@netl.doe.gov • Voice (304) 285-4913 • Fax (304) 285-4403 • www.netl.doe.gov

DOE asks for your concurrence and thanks you in advance for your consideration. Please forward the results of your review and any requests for additional information to:

Mr. Joe Zambelli
U.S. Department of Energy
National Energy Technology Laboratory
3610 Collins Ferry Road
P.O. Box 880
M/S: I07
Morgantown, WV 26507-0880
Email: joseph.zambelli@netl.doe.gov

Sincerely,

Joe Zambelli
NEPA Document Manager

Attachments:
Replacement Figure 2a – APE Map-Distribution Lines and Roadways

cc: Bob Booth - PG&E
Kimberly Nuhfer - NETL

New Overhead Lines
Existing Overhead Lines - Reconductor
Existing Overhead Lines - No work required
New Underground Lines
Expanded Project Area
TSF Facility

N

0 1,000 2,000 4,000
Feet

G:\Projects\26620_CAES_EA_Support_(Hill)\GIS\Working_MXDs\26620_Figure_2a_Ape_Map_Replacement.mxd 2013-05-24 tmooney revised 2013-05-22 2013-06-25

North State Resources, Inc.

CAES - PDEA King Island

Replacement Figure 2a
APE Map-Distribution Lines and Roadways
June 25, 2013

OFFICE OF HISTORIC PRESERVATION
DEPARTMENT OF PARKS AND RECREATION
1725 23rd Street, Suite 100
SACRAMENTO, CA 95816-7100
(916) 445-7000 Fax: (916) 445-7053
calshpo@parks.ca.gov
www.ohp.parks.ca.gov

July 03, 2013 Reply Reference To: DOE_2013_0612_001

Joseph Zambelli, M/S: I07
NEPA Document Manager
U.S. Dept. of Energy - National Energy Technology Laboratory
3610 Collins Ferry Road
PO Box 880
Morgantown, WV 26507-0880

Re: Section 106 Consultation Amendment for Compressed Air Energy Storage Compression Testing Project, King Island, San Joaquin County, CA

Dear Mr. Zambelli:

Thank you for continuing consultation regarding the Department of Energy's (DOE) efforts to comply with Section 106 of the National Historic Preservation Act of 1966 (16 U.S.C. 470f), as amended, and its implementing regulation found at 36 CFR Part 800. Funding for this undertaking was provided by the Department of Energy through the American Recovery and Reinvestment Act.

The DOE previously received concurrence from my office that the above referenced project will not affect historic properties. Since that time, the APE has been modified to accommodate the installation of additional electrical distribution lines. The amended project area was addressed by the archeological survey and literature search previously submitted in support if this project.

The DOE is requesting my concurrence with their determination that modifications to the APE and undertaking definition will not alter their original finding of no historic properties affected. After reviewing the submitted information, I concur with this determination. Please be advised that under certain circumstances, such as an unanticipated discovery or a change in project description, you may have future responsibilities for this undertaking under 36 CFR Part 800.

Thank you for seeking my comments and considering historic properties as part of your project planning. If you have any questions or concerns, please contact Ed Carroll of my staff at (916) 445-7006 or Ed.Carroll@parks.ca.gov.

Sincerely,

Carol Roland-Nawi, PhD
State Historic Preservation Officer

NATIONAL ENERGY TECHNOLOGY LABORATORY
Albany, OR • Morgantown, WV • Pittsburgh, PA
U.S. DEPARTMENT OF ENERGY

August 1, 2013

Ms. Carol Roland-Nawi
State Historic Preservation Officer
Office of Historic Preservation
1725 23rd Street, Suite 100
Sacramento, CA 95816

Re: National Historic Preservation Act Section 106 Compliance Compressed Air Energy Storage Compression Testing Project

Dear Ms. Roland-Nawi:

In support of Pacific Gas and Electric Company's (PG&E) Compressed Air Energy Storage (CAES) Compression Testing project, U.S. Department of Energy (DOE) initiated National Historic Preservation Act Section 106 consultation with the Office of Historic Preservation on June 7, 2013, with the submittal of a technical report completed for a historic properties inventory and evaluation of the project's area of potential effects (APE). This letter supplements the historic properties report and request for concurrence submitted on June 7, 2013 with a minor expansion of the APE.

After submittal of the technical report, PG&E sent a letter to your office on June 20, 2013, notifying you of revisions to the project description necessary to accommodate the replacement or installation of poles to support electrical distribution lines adjacent to Bishop Cut; this modification expanded the APE a total of approximately 1.1-acres. This letter is to inform you that PG&E has made additional modifications to the project description resulting in the further expansion of the APE near the intersection of Eight Mile Road and Regatta Lane (1.13-acres) and at Eight Mile Road and Bishop Cut (12.35-acres) (see attached Replacement Figure 2a). With the addition of these new areas, the project APE now encompasses a total of approximately 57.04-acres.

Intensive cultural resources surveys conducted on April 3, 2013, examined the property contained within the initial APE including the expanded APE discussed in the June 20, 2013, letter. On July 25, 2013, the newly revised APE outlined above was also subjected to a cultural resources survey. No prehistoric or historic-era sites, features, or artifacts were noted within the newly revised APE as a result of this survey.

DOE asks for your concurrence and thanks you in advance for your consideration. Please forward the results of your review and any requests for additional information to:

3610 Collins Ferry Road, P.O. Box 880, Morgantown, WV 26507
joseph.zambelli@netl.doe.gov • Voice (304) 285-4913 • Fax (304) 285-4403 • www.netl.doe.gov

Mr. Joe Zambelli
U.S. Department of Energy
National Energy Technology Laboratory
3610 Collins Ferry Road
P.O. Box 880
M/S: I07
Morgantown, WV 26507-0880
Email: joseph.zambelli@netl.doe.gov

If you have any questions, I can be reached at (304) 285-4913 or by e-mail at Joseph.Zambelli@NETL.doe.gov.

Sincerely,

Joe Zambelli
NEPA Document Manager

Attachments:
Replacement Figure 2a – APE Map-Distribution Lines and Roadways

cc:
Mr. Bob Booth, PG&E

Ms. Kimberly Nuhfer,NETL

G:\Projects\26620_CAES_EA_Support_(Hill)\GIS\Working_MXDs\26620_Figure_2a_Ape_Map_Replacement.mxd 2013-05-24 tmooney revised 2013-05-22 2013-06-25 2013-07-26

North State Resources, Inc.

PG&E CAES Project - King Island

Replacement Figure 2a
APE Map-Distribution Lines and Roadways
July 31, 2013

OFFICE OF HISTORIC PRESERVATION
DEPARTMENT OF PARKS AND RECREATION
1725 23rd Street, Suite 100
SACRAMENTO, CA 95816-7100
(916) 445-7000 Fax: (916) 445-7053
calshpo@parks.ca.gov
www.ohp.parks.ca.gov

August 07, 2013

Reply Reference To: DOE_2013_0612_001

Joseph Zambelli, M/S: I07
NEPA Document Manager
U.S. Dept. of Energy - National Energy Technology Laboratory
3610 Collins Ferry Road
PO Box 880
Morgantown, WV 26507-0880

Re: Section 106 Consultation Second Amendment for Compressed Air Energy Storage Compression Testing Project, King Island, San Joaquin County, CA

Dear Mr. Zambelli:

Thank you for continuing consultation regarding the Department of Energy's (DOE) efforts to comply with Section 106 of the National Historic Preservation Act of 1966 (16 U.S.C. 470f), as amended, and its implementing regulation found at 36 CFR Part 800. Funding for this undertaking was provided by the Department of Energy through the American Recovery and Reinvestment Act.

The DOE previously received concurrence from my office that the above referenced project will not affect historic properties. Since that time the APE has been modified to accommodate additional project activities. It is my understanding the additional project area has been subject to a records search and pedestrian survey.

The DOE is requesting my concurrence with their determination that this APE revision will not alter their original finding of no historic properties affected. After reviewing the submitted information, I concur with this determination. Please be advised that under certain circumstances, such as an unanticipated discovery or a change in project description, you may have future responsibilities for this undertaking under 36 CFR Part 800.

Thank you for seeking my comments and considering historic properties as part of your project planning. If you have any questions or concerns, please contact Ed Carroll of my staff at (916) 445-7006 or Ed.Carroll@parks.ca.gov.

Sincerely,

Carol Roland-Nawi, PhD
State Historic Preservation Officer

APPENDIX B2

CORRESPONDENCE WITH NATIVE AMERICAN TRIBES AND INDIVIDUALS

NATIONAL ENERGY TECHNOLOGY LABORATORY
Albany, OR • Morgantown, WV • Pittsburgh, PA
U.S. DEPARTMENT OF ENERGY

June 20, 2013

[See attached list of names and addresses]

Re: Pacific Gas and Electric Company Compressed Air Energy Storage Compression Testing Project, King Island, San Joaquin County, California.

Dear [*name*]:

The U.S. Department of Energy (DOE) is proposing to provide financial assistance (DOE's Proposed Action) to Pacific Gas and Electric Company's Compressed Air Energy Storage (CAES) Compression Testing Project (the Project) located on King Island in San Joaquin County, California. All cultural resources investigations are being conducted in accordance with Section 106 of the National Historic Preservation Act and the National Environmental Policy Act.

The Project Area of Potential Effects (APE) is located in unincorporated San Joaquin County near the cities of Lodi and Stockton and lies within the U.S. Geological Survey 7.5-minute *Terminous* topographic quadrangle map (Figure 1). The proposed project would involve the use of compressors to inject air into an underground reservoir for later withdrawal. The air compression and withdrawal will simulate the operation of CAES facility that would store electricity from the grid during off-peak hours for late use during periods of peak energy use. This new technology, if successful, will allow for efficient storage of electricity from intermittent sources, such as wind and solar renewables. The CAES project would expand and modify an existing well pad to approximately 2.5 acres. The extension of electrical distribution lines for 4.5 miles to the site by use of existing lines, reconductoring of existing lines, and construction of new lines would also be required.

DOE is initiating consultation and requesting information you may have on properties of traditional religious and cultural significance within the vicinity of the proposed CAES Compression Testing Project and any comments or concerns you have regarding the potential for the Project to affect those properties. This information is being requested to aid in the preparation of an Environmental Assessment (EA) and to meet our obligations under Section 106 of the National Historic Preservation Act.

Please forward the results of your review and any requests for information to:

Mr. Joe Zambelli
U.S. Department of Energy
National Energy Technology Laboratory
3610 Collins Ferry Road
P.O. Box 880
M/S: I07

3610 Collins Ferry Road, P.O. Box 880, Morgantown, WV 26507
joseph.zambelli@netl.doe.gov • Voice (304) 285-4913 • Fax (304) 285-4403 • www.netl.doe.gov

Morgantown, WV 26507-0880
Email: joseph.zambelli@netl.doe.gov

An EA is currently being prepared and will be released to the public in the near future. DOE will provide your office a copy of the EA where you may further comment on any of your concerns. All correspondence between the DOE and yourself will be included in an appendix to the EA. At this time, DOE anticipates a 30-day public comment period for the Project.

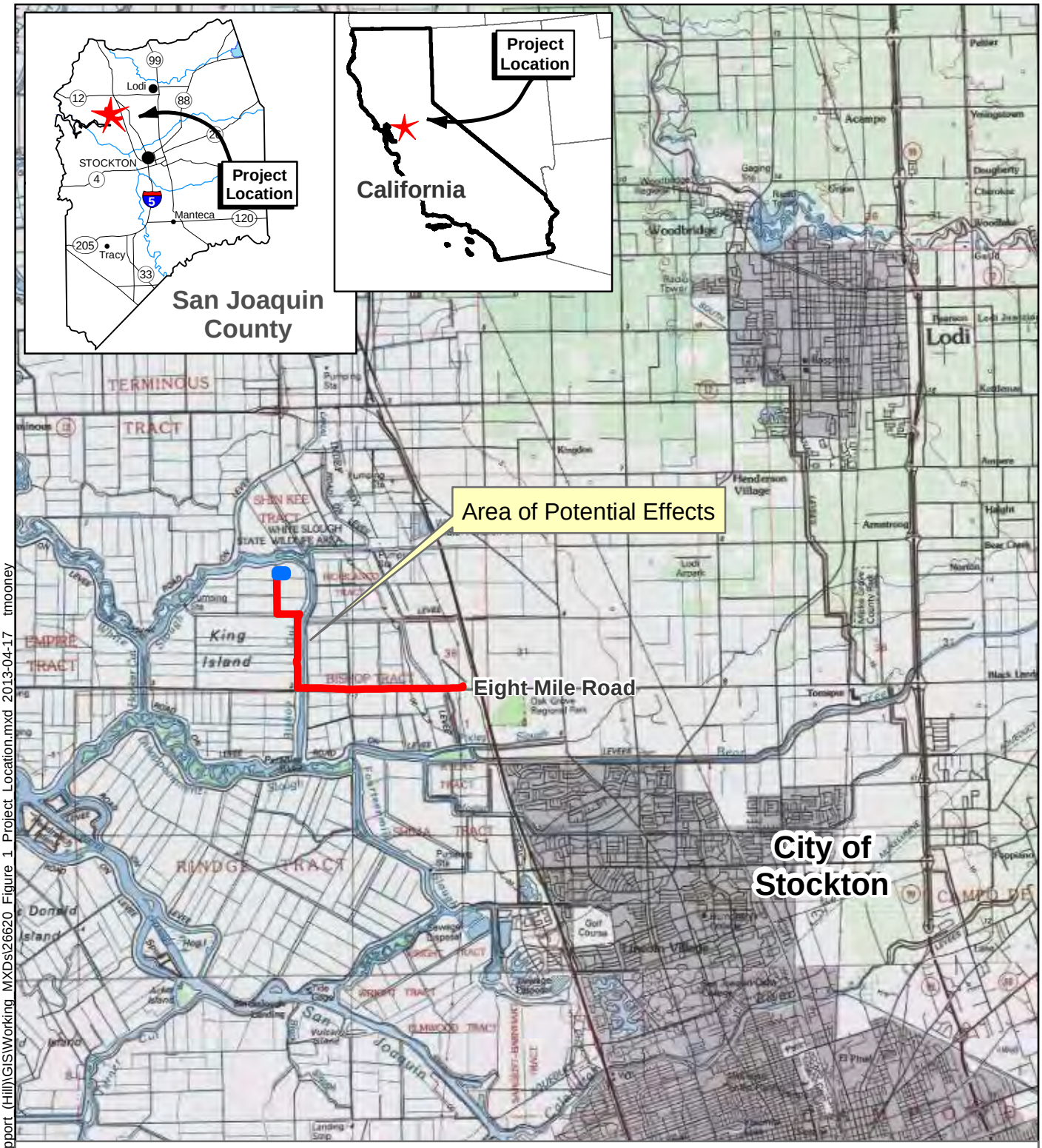
If you have any questions, please feel free to contact me at your convenience. I can be reached by phone at (304) 285-4913 or by e-mail at joseph.zambelli@netl.doe.gov.

Sincerely,

Joe Zambelli
NEPA Document Manager

Attachments:
Figure 1 – Project Location
Cultural Resources Inventory and Evaluation Report of the PG&E Compressed Air Energy Storage Compression Testing Project, King Island, San Joaquin County, California

cc: PG&E (Mr. Bob Booth)
Ms. Nuhfer



Area of Potential Effects

Distribution Line

Well Pad

USGS 7.5 Quad:
Terminous - Revised 1993

N

0 1 2 4

Miles

G:\Projects\26620_CAES_EA_Support_(Hill)\GIS\Working_MXDs\26620_Figure_1_Project_Location.mxd 2013-04-17 tmooney

North State Resources, Inc.

CAES PDEA - King Island

Figure 1
Project Location

This letter was distributed on June 20, 2013 to the following names/addresses:

Silvia Burley
Chairperson
California Valley Miwok Tribe of California
10601 N. Escondido Place
Stockton, CA 95212

Anthony Burris
Chairperson
Ione Band of Miwok Indians
Cultural Committee
PO Box 699
Plymouth, CA 95699

Briana Creekmore
PO Box 84
Wilseyville, CA 95257

Kevin Day
Chairman
Tuolumne Band of Me-Wuk Indians of the Tuolumne Rancheria
Of California
PO Box 699
Tuolumne, CA 95379

Katherine Erolinda Perez
P.O. Box 717
Linden, CA 95236

Nick H. Fonseca
Chairman
Shingle Springs Band of Miwok Indians
Shingle Springs Rancheria
(Verona Tract) California
PO Box 1340 (Verona Tract)
Shingle Springs, CA 95682

Andrew Franklin, Chairperson
Wilton Rancheria
9300 W. Stockton
Suite 200
Elk Grove, CA 95758

Steven Hutchason
Director of Cultural Preservation
Wilton Rancheria
9300 W. Stockton

Suite 200
Elk Grove, CA 95758

Johnny Jamerson
Acting Tribal Chairperson
Ione Band of Miwok Indians of California
PO Box 699
Plymouth, CA 95669

Irvin Marks, Chairperson
Jackson Rancheria of Me-Wuk Indians of California
PO Box 1090
Jackson, CA 95642

Lloyd Mathieson, Chairman
Chicken Ranch Rancheria of Me-Wuk Indians of California
PO Box 1159
Jamestown, CA 95327

Rhonda Morningstar Pope, Chairperson
Buena Vista Rancheria of Me-Wuk Indians of California
PO Box 162283
Sacramento, CA 95816

Carl Rivera, Chairman
Middletown Rancheria of Pomo Indians of California
PO Box 1035
Middletown, CA 95461

Randy Yonemura
4305 39th Avenue
Sacramento, CA 95824

CALIFORNIA VALLEY MIWOK TRIBE

601 N. Escondido Pl.. Stockton. CA 95212 Ph: (209) 931.4567 Fax: (209) 931.4333
Website: http://www.californiavalleymiwoktribe-nsn.gov **Email:** office@cvmt.net

CALIFORNIA VALLEY MIWOK TRIBE
A Federally Recognized Native Sovereign Nation

Silvia Burley
Chairperson

10601 North Escondido Place
Stockton, CA 95212-9231
Phone: 209.931.4567 Fax: 209.931.4333
s.burley@californiavalleymiwoktribe-nsn.gov
Main Office Email: office@cvmt.net
http://californiavalleymiwoktribe-nsn.gov

June 11, 2013

Mr. Joe Zambelli,
NEPA Document Manager
U.S. Department of Energy
National Energy Technology Laboratory
3610 Collins Ferry Road
P.O. Box 880
Morgantown, WV 26507-0880
Email: joseph.zambelli@netl.doe.gov

Re: Pacific Gas and Electric Company Compressed Air Energy Storage Compression Testing Project, King Island, San Joaquin County, California

Dear Mr. Zambelli,

The California Valley Miwok Tribe (CVMT) is in receipt of your letter (dated June 20, 2013) in which the U.S. Department of Energy (DOE) is proposing to provide a financial assistant grant to the Pacific Gas and Electric Company's Compressed Air Energy Storage (CAES) Compression Testing Project located on King Island in San Joaquin County, California.

CVMT is of the understanding that the APE is located in unincorporated San Joaquin County near the cities of Lodi and Stockton. The proposed project would involve the use of compressors to inject air into an underground reservoir for later withdrawal. The air and compression and withdrawal will simulate the operation of CAES facility that would store electricity from the grid during off-peak hours for late use during periods of peak energy use. It is stated that the CAES project would expand and modify an existing well pad to approximately 2.5 acres. The extension of electrical distribution lines for 4.5 miles to the site by use of existing lines, reconductoring of existing lines, and construction of new lines would also be required.

Comments:
The only concern that the California Valley Miwok Tribe has with the proposed project is that with ground disturbance occurring, there is a heightened possibility that Miwok artifacts and/or human remains may be found, therefore, the tribe is requesting that it be notified of Miwok artifacts and/or human remains if any are discovered at the project site location(s).

Respectfully,

Silvia Burley
Chairperson

NATIONAL ENERGY TECHNOLOGY LABORATORY
Albany, OR • Morgantown, WV • Pittsburgh, PA
U.S. DEPARTMENT OF ENERGY

June 28, 2013

[See attached list of names and addresses]

Re: Pacific Gas and Electric Company Compressed Air Energy Storage Compression Testing Project, King Island, San Joaquin County, California.

Dear [*name*]:

The U.S. Department of Energy (DOE) is proposing to provide financial assistance to Pacific Gas and Electric Company's Compressed Air Energy Storage (CAES) Compression Testing Project located on King Island in San Joaquin County, California. On June 20, 2013, the DOE sent a letter to you requesting information you may have on properties of traditional religious and cultural significance within the vicinity of the proposed CAES Compression Testing Project, and any comments or concerns you have regarding the potential for the project to affect those properties. This letter supplements that request with a notification that PG&E has made a minor expansion of the project's Area of Potential Effects (APE).

After DOE sent the information request letter, PG&E revised the project description to accommodate the replacement or installation of poles to support electrical distribution lines adjacent to Bishop Cut. To accommodate the pole placement, the APE has been expanded by 1.1 acres east of the project's distribution line crossing of Bishop Cut. PG&E would replace one distribution pole north of the crossing along a levee road, and replace two poles south of the crossing on the south side of and adjacent to Eight Mile Road.

Replacement Figure 1 (attached) depicts the expanded APE. The intensive cultural resources survey conducted on April 3, 2013, included the area within this expanded APE. No prehistoric or historic-era cultural resources were noted within the expanded APE as a result of this survey.

As stated in the previous letter, this information is being requested to aid in the preparation of an environmental assessment (EA) and to meet our obligations under Section 106 of the National Historic Preservation Act.

Please forward the results of your review and any requests for information to:

Mr. Joe Zambelli
U.S. Department of Energy
National Energy Technology Laboratory
3610 Collins Ferry Road
P.O. Box 880
M/S: I07
Morgantown, WV 26507-0880

Email: joseph.zambelli@netl.doe.gov

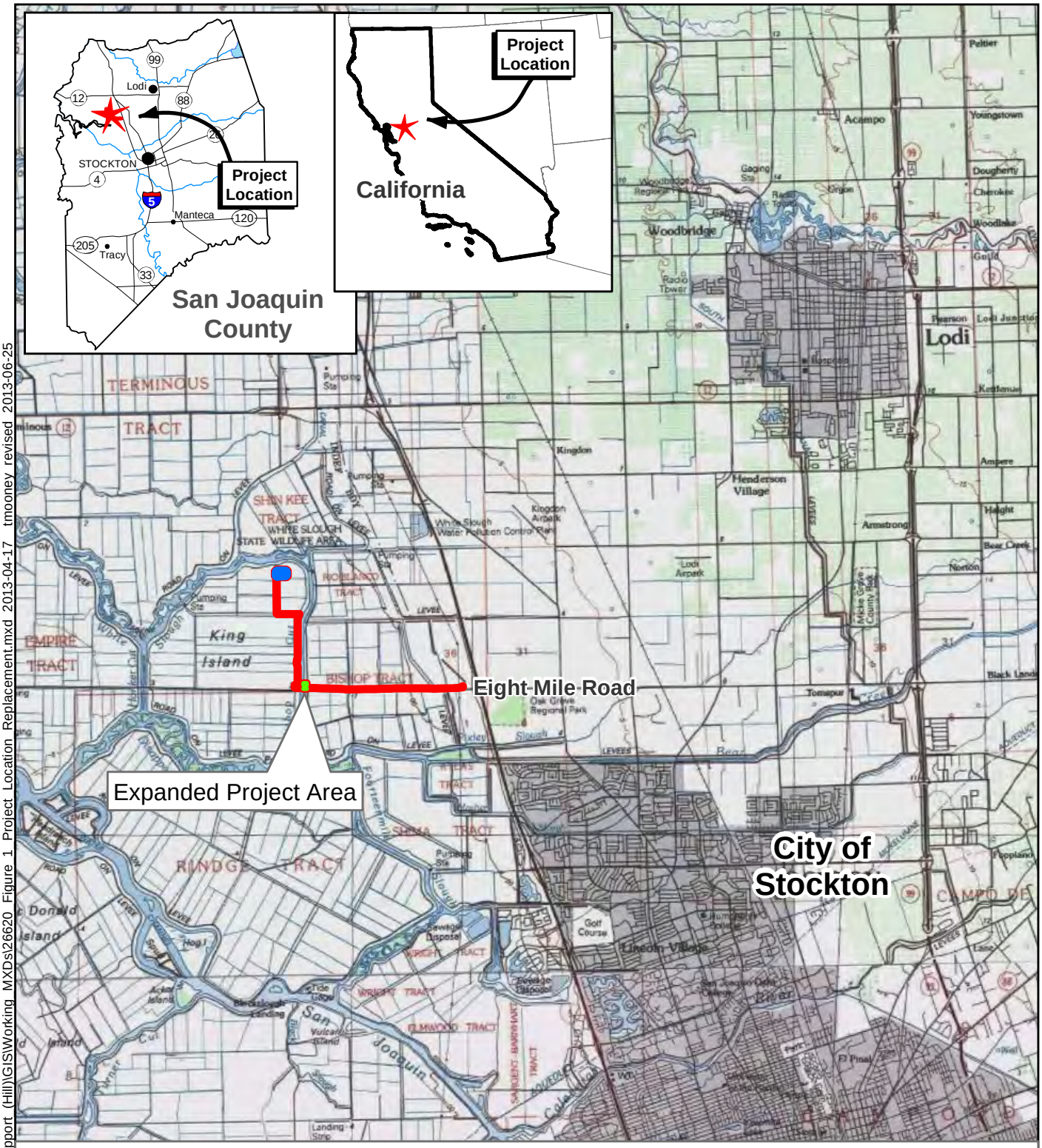
If you have any questions or require additional information, please feel free to contact me at your convenience. I can be reached by phone at 304-285-4913.

Sincerely,

Joe Zambelli
NEPA Document Manager

Attachments:
Figure 1 – Project Location

cc: Bob Booth - PG&E
Kimberly Nuhfer - NETL



Distribution Line

Expanded Project Area

TSF Site

USGS 7.5 Quad:
Terminous - Revised 1993

N

0 1 2 4

Miles

G:\Projects\26620_CAES_EA_Support_(Hill)\GIS\Working_MXDs\26620_Figure_1_Project_Location_Replacement.mxd 2013-04-17 tmooney revised 2013-06-25

North State Resources, Inc.

CAES PDEA - King Island

Replacement Figure 1
Project Location
June 25, 2013

This letter was distributed on June 28, 2013 to the following names/addresses:

Silvia Burley
Chairperson
California Valley Miwok Tribe of California
10601 N. Escondido Place
Stockton, CA 95212

Anthony Burris
Chairperson
Ione Band of Miwok Indians
Cultural Committee
PO Box 699
Plymouth, CA 95699

Briana Creekmore
PO Box 84
Wilseyville, CA 95257

Kevin Day
Chairman
Tuolumne Band of Me-Wuk Indians of the Tuolumne Rancheria
Of California
PO Box 699
Tuolumne, CA 95379

Katherine Erolinda Perez
P.O. Box 717
Linden, CA 95236

Nick H. Fonseca
Chairman
Shingle Springs Band of Miwok Indians
Shingle Springs Rancheria
(Verona Tract) California
PO Box 1340 (Verona Tract)
Shingle Springs, CA 95682

Andrew Franklin, Chairperson
Wilton Rancheria
9300 W. Stockton
Suite 200
Elk Grove, CA 95758

Steven Hutchason
Director of Cultural Preservation
Wilton Rancheria
9300 W. Stockton

Suite 200
Elk Grove, CA 95758

Johnny Jamerson
Acting Tribal Chairperson
Ione Band of Miwok Indians of California
PO Box 699
Plymouth, CA 95669

Irvin Marks, Chairperson
Jackson Rancheria of Me-Wuk Indians of California
PO Box 1090
Jackson, CA 95642

Lloyd Mathieson, Chairman
Chicken Ranch Rancheria of Me-Wuk Indians of California
PO Box 1159
Jamestown, CA 95327

Rhonda Morningstar Pope, Chairperson
Buena Vista Rancheria of Me-Wuk Indians of California
PO Box 162283
Sacramento, CA 95816

Carl Rivera, Chairman
Middletown Rancheria of Pomo Indians of California
PO Box 1035
Middletown, CA 95461

Randy Yonemura
4305 39th Avenue
Sacramento, CA 95824

SHINGLE SPRINGS RANCHERIA
P.O. BOX 1340; SHINGLE SPRINGS, CA 95682
(530) 676-8010; FAX (530) 676-3582

July 9, 2013

National Energy Technology Laboratory
3610 Collins Ferry Road
Morgantown, WV 26507

RE: Pacific Gas and Electric Company Compressed Air Energy Storage Compression Testing Project, King Island, San Joaquin County, California.

Dear Joe Zambelli

Thank you for your letter dated for June 28, 2013 seeking information regarding the proposed Compressed Air Energy Storage Compression Testing Project that is located in San Joaquin County. Based on the information provided, the Shingle Springs Band of Miwok Indians not aware of any known cultural resources on this site. However, SSR would like to have continued consultation through updates, as the project progresses this will foster a greater communication between the Tribe and your agency.

SSR would also like to request any and all completed record searches and or surveys that were done in or around the project area up to and including environmental, archaeological and cultural reports.

If during the progress of the project new information or human remains are found we would like to be able to go over our process with you that we currently have in place to protect such important and sacred artifacts (especially near rivers and streams).

Please contact the following individuals if such finds are made:

Andrew Godsey, Assistant Cultural Resource Director / NAI
Office: (530) 698-1403 agodsey@ssband.org

And copy all communications to:
Angela Rivera, Administrative Assistant anrivera@ssband.org Office: (530) 698-1557

Thank you for providing us with this notice and opportunity to comment.

Sincerely,

Daniel Fonseca
Cultural Resource Director
Tribal Historic Preservation Officer (THPO)
Most Likely Descendent (MLD)

SHINGLE SPRINGS RANCHERIA

Shingle Springs Band of Miwok Indians,
Shingle Springs Rancheria
(Verona Tract), California
5281 Honpie Road, Placerville, CA 95667

July 19, 2013

National Energy Technology Laboratory
3610 Collins Ferry Road
Morgantown, WV 26507

Dear Joe Zambelli

The Most likely Descendant, Daniel Fonseca would like to initiate consultation process with NETL for the proposed Compressed Air Energy Storage Compression Testing Project that is located in San Joaquin County. Among other things, we would like this consultation to address the cultural and historic resource issues, pursuant to the regulations implementing Section 106 of the National Historic Preservation Act.

Prior to meeting we would like to request any and all completed record searches and or surveys that were done in or around the project area up to and including environmental, archaeological and cultural reports.

Please let this letter serve as a formal request for the Shingle Springs Band of Miwok Indians to be added as a consulting party in identifying any Traditional Cultural Properties (TCPs) that may exist within the project's Area of Potential Effects (APE).

Please contact Andrew Godsey, Assistant Cultural Resource Director, (530) 391-7091 agodsey@ssband.org or Angela Rivera, Administrative Assistant at (530) 698-1557 anrivera@ssband.org, to schedule a consultation meeting pursuant to Section 106 of the NHPA.

Sincerely,

Daniel Fonseca
Cultural Resources Director
Tribal Historic Preservation Officer (THPO)
Most Likely Descendent (MLD)

NATIONAL ENERGY TECHNOLOGY LABORATORY
Albany, OR • Morgantown, WV • Pittsburgh, PA
U.S. DEPARTMENT OF ENERGY

August 1, 2013

[See attached list of names and addresses]

Re: Pacific Gas and Electric Company Compressed Air Energy Storage Compression Testing Project, King Island, San Joaquin County, California.

Dear [*name*]:

The U.S. Department of Energy (DOE) is proposing to provide financial assistance to Pacific Gas and Electric (PG&E) Company's Compressed Air Energy Storage (CAES) Compression Testing Project located on King Island in San Joaquin County, California. On June 20, 2013, DOE sent a letter to you requesting information you might have on properties of traditional religious and cultural significance within the vicinity of the proposed CAES Compression Testing Project and any comments or concerns you have regarding the potential for the project to affect those properties.

After DOE sent the June 20, 2013, information request letter, PG&E revised the project description to accommodate the replacement or installation of poles to support electrical distribution lines adjacent to Bishop Cut. This modification expanded the area of potential effects (APE) a total of approximately 1.1-acres. This letter is to inform you that PG&E has made additional modifications to the project description resulting in the further expansion of the APE near the intersection of Eight Mile Road and Regatta Lane (1.13-acres) and at Eight Mile Road and Bishop Cut (12.35-acres) (see Figure 1). With the addition of these new areas, the project APE now encompasses a total of approximately 57.04-acres.

The entire project APE, including the new areas at Eight Mile Road and Regatta Lane and around Bishop Cut, is situated on a landform that was developed in the late 19th and early 20th centuries. Prior to this time, King Island consisted of marshes and did not exist as a dry landform until massive reclamation efforts that were largely complete by the mid-1900s. These efforts consisted of the construction of a widespread levee system, roadways and canals, and the draining and filling of low-lying areas and marshes. Consequently, the land on which the APE has been mapped did not exist during the prehistoric era and would not exhibit traces of early Native American habitation and activities.

Intensive cultural resources surveys conducted on April 3, 2013, examined the property contained within the APE including the expanded APE discussed in the June 20, 2013, letter. On July 25, 2013, the newly revised APE outlined above was also subjected to a cultural resources survey. No prehistoric or historic-era sites, features, or artifacts were noted within the newly revised APE as a result of this survey. As stated in the previous letters, DOE is requesting any information you might have regarding Native American resources and traditional properties that could be affected by the proposed project. This information will aid DOE in the preparation of an environmental assessment (EA) and to meet our obligations under Section 106 of the National Historic Preservation Act.

3610 Collins Ferry Road, P.O. Box 880, Morgantown, WV 26507
joseph.zambelli@netl.doe.gov • Voice (304) 285-4913 • Fax (304) 285-4403 • www.netl.doe.gov

Please forward the results of your review and any requests for information to:

Mr. Joe Zambelli
U.S. Department of Energy
National Energy Technology Laboratory
3610 Collins Ferry Road
P.O. Box 880
M/S: I07
Morgantown, WV 26507-0880

Email: joseph.zambelli@netl.doe.gov

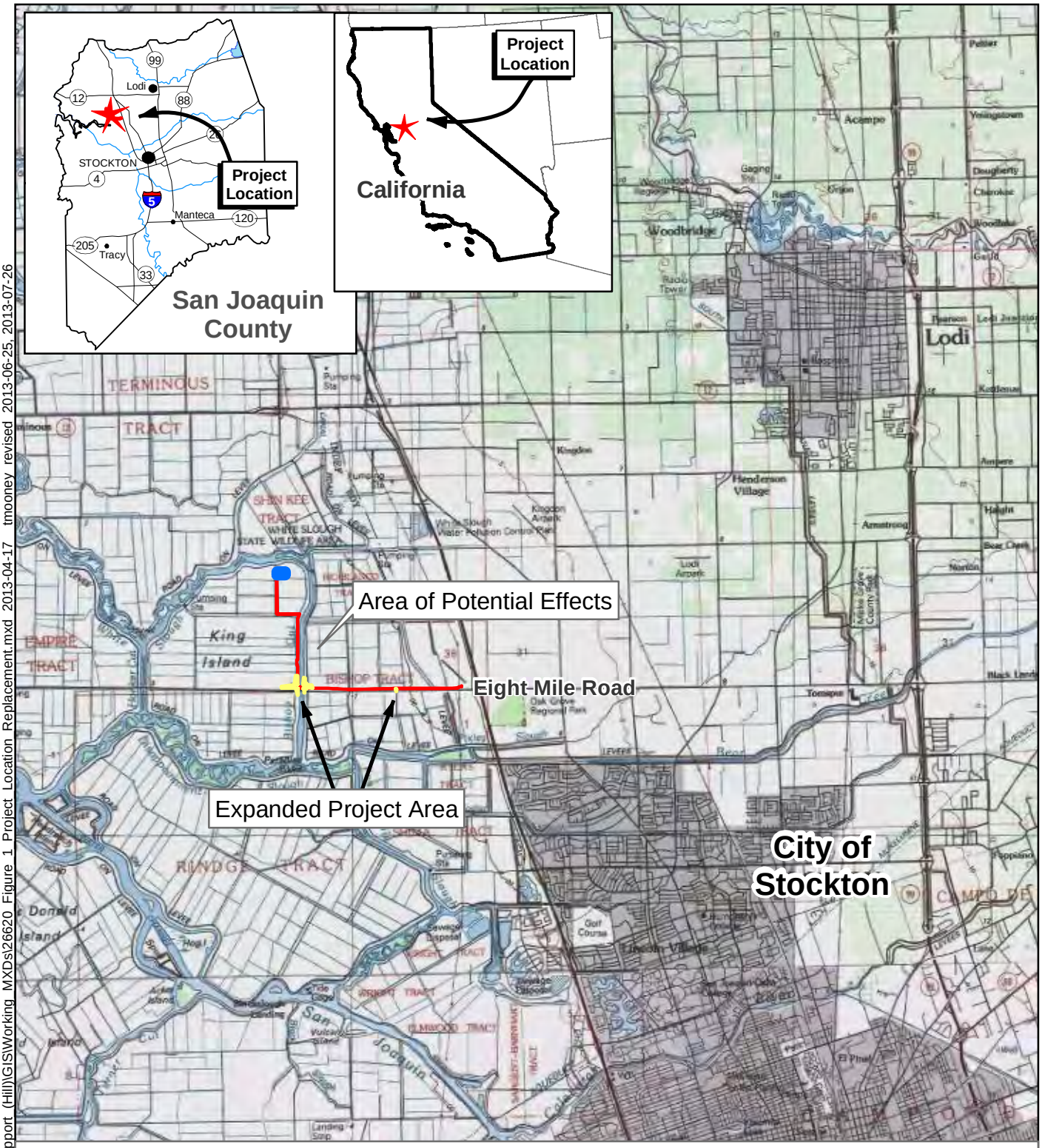
If you have any questions or require additional information, please feel free to contact me at your convenience. I can be reached by phone at 304-285-4913 or by e-mail at joseph.zambelli@netl.doe.gov.
.

Sincerely,

Joe Zambelli
NEPA Document Manager

Attachments:
Figure 1 – Project Location

cc: Bob Booth - PG&E
Kimberly Nuhfer - NETL



G:\Projects\26620_CAES_EA_Support_(Hill)\GIS\Working_MXDs\26620_Figure_1_Project_Location_Replacement.mxd 2013-04-17 tmooney revised 2013-06-25, 2013-07-26

North State Resources, Inc.

PG&E CAES Project - King Island

Replacement Figure 1
Project Location
Revised July 31, 2013

This letter was distributed on August 1, 2013 to the following names/addresses:

Silvia Burley
Chairperson
California Valley Miwok Tribe of California
10601 N. Escondido Place
Stockton, CA 95212

Anthony Burris
Chairperson
Ione Band of Miwok Indians
Cultural Committee
PO Box 699
Plymouth, CA 95699

Briana Creekmore
PO Box 84
Wilseyville, CA 95257

Kevin Day
Chairman
Tuolumne Band of Me-Wuk Indians of the Tuolumne Rancheria
Of California
PO Box 699
Tuolumne, CA 95379

Katherine Erolinda Perez
P.O. Box 717
Linden, CA 95236

Nick H. Fonseca
Chairman
Shingle Springs Band of Miwok Indians
Shingle Springs Rancheria
(Verona Tract) California
PO Box 1340 (Verona Tract)
Shingle Springs, CA 95682

Andrew Franklin, Chairperson
Wilton Rancheria
9300 W. Stockton
Suite 200
Elk Grove, CA 95758

Steven Hutchason
Director of Cultural Preservation
Wilton Rancheria
9300 W. Stockton

Suite 200
Elk Grove, CA 95758

Johnny Jamerson
Acting Tribal Chairperson
Ione Band of Miwok Indians of California
PO Box 699
Plymouth, CA 95669

Irvin Marks, Chairperson
Jackson Rancheria of Me-Wuk Indians of California
PO Box 1090
Jackson, CA 95642

Lloyd Mathieson, Chairman
Chicken Ranch Rancheria of Me-Wuk Indians of California
PO Box 1159
Jamestown, CA 95327

Rhonda Morningstar Pope, Chairperson
Buena Vista Rancheria of Me-Wuk Indians of California
PO Box 162283
Sacramento, CA 95816

Carl Rivera, Chairman
Middletown Rancheria of Pomo Indians of California
PO Box 1035
Middletown, CA 95461

Randy Yonemura
4305 39th Avenue
Sacramento, CA 95824

Joseph Zambelli - PG and E Compressed Air Energy Storage Compresstion Testing Project, King Island, San Joaquin Co. CA

From: <s.burley@californiavalleymiwoktribe-nsn.gov>
To: <joseph.zambelli@netl.doe.gov>
Date: 8/5/2013 2:33 AM
Subject: PG and E Compressed Air Energy Storage Compresstion Testing Project, King Island, San Joaquin Co. CA

August 04, 2013

Mr. Joe Zambelli
U.S. Department of Energy
National Energy Technology Laboratory
3610 Collins Ferry Road
P.O. Box 880 M/S: 107
Morgantown, WV 26507-0880
joseph.zambelli@netl.doe.gov

Re: Pacific Gas and Electric Company Compressed Air Energy Storage Compression Testing Project, King Island, San Joaquin County, California

Dear Mr. Zambelli,

This letter is in response to your letter dated 06/28/2013, in regards to the Pacific Gas and Electric Company Compressed Air Energy Storage Compression Testing Project, King Island, San Joaquin County, California

Comments
The California Valley Miwok Tribe (CVMT) is of the understanding that PG and E has revised its project description to accommodate the replacement or installation of poles to support electrical distribution lines adjacent to Bishop Cut. To accommodate the pole placement, the APE has been expanded by 1.1. acres east of the project's distribution line crossing of Bishop Cut. PG and E would replace one distribution pole north of the crossing along a levee road, and replace two poles south of the crossing on the south side of and adjacent to Eight Mile Road. With ground disturbance occurring, there is a heightened possibility that Miwok artifacts and/or human remains may be found; therefore, the Tribe is requesting that it be notified of Miwok artifacts and /or human remains if any are discovered at the proposed project site location(s).

Respectfully,

/s/
Silvia Burley, Chairperson
s.burley@californiavalleymiwoktribe-nsn.gov

.....
California Valley Miwok Tribe
10601 N. Escondido Pl.
Stockton, CA 95212
Ph: (209) 931-4567 Fax: (209) 931-4333
Office Email: office@cvmt.net
Tribal Council: tribe@californiavalleymiwoktribe-nsn.gov

Website: http://www.californiavalleymiwoktribe-nsn.gov

From: Roselynn Lwenya <rlwenya@buenavistatribe.com>
To: Joseph Zambelli <Joseph.Zambelli@NETL.DOE.GOV>
Date: 10/1/2013 2:34 PM
Subject: Re: Pacific Gas and Electric Company Compressed Air Energy Storage Compression Testing Project, King Island, San Joaquin County, California
Attachments: # 4native-american-traditional-cultural-landscapes-action-plan-11-23-2011[1].pdf; # 4 NA Trad Cul Lands ACHP.pdf; 20131001110516341.pdf

Dear Mr. Zambelli,

The Buena Vista Rancheria of Me-Wuk Indians is in receipt of your letter dated August 1, 2013 providing updated information on the area of potential effect (APE) for the above referenced project and; for according us the opportunity to comment and provide information.

Please find attached comments and observations from Buena Vista Rancheria. In addition, Buena Vista Rancheria encourages the Department of Energy, National Energy Technology Laboratory, to study the attached documents prepared by the Advisory Council on Historic Preservation concerning American Indian traditional cultural resources and landscapes (Native American Traditional Cultural Landscapes and the Section 106 Review Process: Questions and Answers; and Native American Traditional Cultural Landscapes Action Plan).

I have send the packet out by surface mail as well.

If you have any questions feel free to call me at (916)-491-0011 or by email me at roselynn@buenavistatribe.com<mailto:roselynn@buenavistatribe.com> . Thank you.

Sincerely,

Roselynn Lwenya, Ph.D
Environmental Resources Director / THPO
Buena Vista Rancheria
1418 20th Street, Suite 200
Sacramento, CA 95811
TEL: 916.491.0011
FAX: 916.491.0012
roselynn@buenavistatribe.com<mailto:roselynn@buenavistatribe.com>

October 1, 2013

Mr. Joe Zambelli
U.S. Department of Energy
National Energy Technology Laboratory
3610 Collins Ferry Road
P.O. Box 880
M/S: I07
Morgantown, WV 26507-0880

Re: Pacific Gas and Electric Company Compressed Air Energy Storage Compression Testing Project, King Island, San Joaquin County, California

Thank you for your letter dated August 1, 2013 providing updated information on the area of potential effect (APE) for the subject project and the opportunity to comment and provide information. According to your letter, the entire project APE, including the new areas, is situated on a landform that was developed in the late 19th and earth 20th centuries. Prior to that time, King Island consisted of marshes and until reclamation efforts that were completed by the mid-1900s. Reclamation included the construction of a widespread levee system, roadways and canals, and the draining and filling of low-lying areas and marshes. Your letter further states that because the land on which the APE has been mapped did not exist during the prehistoric era it would not exhibit traces of early Native American habitation and activities. In addition, your letter states that intensive cultural resources surveys conducted suggest there are no prehistoric or historic era sites, features, or artifacts noted within the new APE.

The Buena Vista Rancheria of Me-Wuk Indians offers the following comments:

The APE is within ancestral homelands of the Me-Wuk peoples, who for thousands of years would have managed and nurtured the marshlands as a source of spiritual and cultural sustenance. The Buena Vista Rancheria believes that it is unlikely that no trace of the ancestor's habitation and activities exist in the APE landscape. It is highly likely that materials including resources such as artifacts protected by the National Historic Preservation Act, materials protected under the Native American Graves Protection and Repatriation Act are present within the APE. In as much as there were no laws and no protective measures practiced in the 19th and 20th centuries when the marshland was destroyed and turned to levees, roadways, canals, and so on, there is a high probability for secondary deposits containing Native American ancestral materials, as well as a possibility for an unexpected discovery of an intact deposit containing artifacts, human remains, funerary objects, and objects of cultural patrimony.

No information is provided in your letter identifying who conducted the intensive cultural resources surveys, their professional qualifications, or what role Native Americans had in the survey and decision making concerning the presence/absence of resources having spiritual and cultural significance to American Indians within the APE. Buena Vista Rancheria encourages

P.O. BOX 162283 Sacramento CA 95816
TEL 916.491.0011 FAX: 916.491.0012
www.buenavistatribe.com

the Department of Energy, National Energy Technology Laboratory, to study the attached documents prepared by the Advisory Council on Historic Preservation concerning American Indian traditional cultural resources and landscapes (*Native American Traditional Cultural Landscapes and the Section 106 Review Process: Questions and Answers*, and *Native American Traditional Cultural Landscapes Action Plan*).

We believe it is important to preserve what remains of the rich cultural and natural heritage, and that it is important for the American Indian community be involved with any ground disturbing activities that have potential to expose remnants of their ancestors. Financial assistance provided by the U.S. Department of Energy to Pacific Gas and Electric Company to implement this Compressed Air Energy Storage Commission Testing Project on King Island in San Joaquin County, California should include funds to ensure the involvement of the American Indian community in the protection of their heritage.

Buena Vista Rancheria appreciates the opportunity to comment on this project, and requests that you keep us informed regarding the progress. If you have any questions feel free to contact me at (916)-491-0011 or by email at roselynn@buenavistatribe.com.

Sincerely,

Roselynn Lwenya, Ph.D.
THPO/Environmental Resources Director
Buena Vista Rancheria of Me-Wuk Indians

Preserving America's Heritage

Native American Traditional Cultural Landscapes and the Section 106 Review Process: Questions and Answers

The consideration of Native American traditional cultural landscapes in Section 106 reviews has challenged federal agencies, Indian tribes, and Native Hawaiian organizations for some time. There has been confusion regarding what makes a place a traditional cultural landscape, whether they can be considered historic properties, and whether the size of such places influences their consideration under the National Historic Preservation Act. While these are all critical issues worthy of much thought and deliberation among federal agencies, Indian tribes, and Native Hawaiian organizations, the Advisory Council on Historic Preservation (ACHP) wishes to advance this dialogue by first addressing common questions about how such historic properties should be considered in the Section 106 process. While we anticipate that further dialogue will be necessary to resolve these and other issues, this Q and A is offered to move the dialogue forward and improve the consideration of these places in the Section 106 process.

This guidance assumes that readers have a basic understanding of the Section 106 review process. For more information, go to www.achp.gov.

Since this is not an exhaustive list of the issues related to Native American traditional cultural landscapes that one might encounter in a Section 106 review process, we would welcome suggestions for additional questions the ACHP should consider addressing. Further, please send us additional information or sources regarding Native American traditional cultural landscapes that you believe would be helpful for others.

1) What is a traditional cultural landscape?

The term "traditional cultural landscape" has not yet been formally defined by the National Park Service, the agency responsible for defining historic properties and maintaining the National Register of Historic Places (NRHP). While there is currently no formal NRHP definition of a traditional cultural landscape, the recent interest in these places has led the National Park Service to launch an initiative regarding updating National Register (NR) Program guidance for identifying, evaluating, and documenting properties that are historically significant as Traditional Cultural Properties (TCPs) and/or Native American landscapes. NPS will be soliciting written comments and suggestions through October 31, 2012, and may be submitted to **nr_info@nps.gov**. Respondents should identify their submission(s) as a "TCP/NAL Comment" in their e-mail "subject" box. Responses submitted via email will be posted on an ongoing basis beginning the first week of June 2012 on the NR website located at: **http://www.nps.gov/history/nr/publications/guidance/TCP comments.htm**. Respondents who do not want their names and/or e-mail addresses posted on the NR website along with their comments, or do not want their comments published at all, should clearly indicate that preference in their e-mail.

2) Can traditional cultural landscapes be considered historic properties under Section 106 of the National Historic Preservation Act?

Traditional cultural landscapes are considered by the NRHP to be a type of significance rather than a property type. Property types are limited to those specified in the NHPA and the NRHP regulations and include districts, buildings, structures, sites, and objects. Traditional cultural landscapes can and often do embrace one or more of these property types. It is important to note that the size of such properties or the potential challenges in the management of them should not be considerations in the evaluation of their significance. Any questions regarding eligibility for listing in the National Register of Historic Places should be referred to the National Register of Historic Places. Information about the National Register can be found at www.nps.gov/nr. See question 8 for additional resources.

3) How are traditional cultural landscapes identified in the Section 106 review process?

Traditional cultural landscapes, because they are often a property type such as a district or site, are identified in the same manner in the Section 106 process as other types of historic properties of religious and cultural significance to Indian tribes or Native Hawaiian organizations. The regulations at 36 CFR Section 800.4 outline several steps a federal agency must take to identify historic properties. In summary, to determine the scope of identification efforts, a federal agency, in consultation with the State Historic Preservation Officers (SHPO)/Tribal Historic Preservation Officer (THPO), must:

1. Determine and document the area of potential effect for its undertaking;
2. Review existing information; and,
3. Seek information from consulting parties including Indian tribes or Native Hawaiian organizations.

Based on the information gathered through these efforts, the federal agency, in consultation with the SHPO and any Indian tribe or Native Hawaiian organization that attaches religious and cultural significance to historic properties that may be affected by the undertaking, develops and implements a strategy to identify historic properties within the area of potential effects. Identification efforts may include background research, oral history interviews, scientific analysis, and field investigations.

A federal agency's consultation with Indian tribes or Native Hawaiian organizations is intended to ensure historic properties that may be of religious and cultural significance to them are both identified and appropriately considered in the Section 106 review process. In fact, the Section 106 regulations at Section 800.4(c)(1) require federal agencies to acknowledge the special expertise of Indian tribes and Native Hawaiian organizations in assessing the eligibility of historic properties that may be of religious and cultural significance to them.

4) Why is it important for federal agencies to consult with Indian tribes or Native Hawaiian organizations regarding traditional cultural landscapes?

Many assume that archaeologists can identify, through archaeological surveys, those properties that are of significance to Indian tribes or Native Hawaiian organizations. However, unless an archaeologist has been specifically authorized or permitted by an Indian tribe or Native Hawaiian organization to speak on its behalf, or has been determined by that entity to be qualified to conduct such surveys, it should not be assumed that the archaeologist possesses the appropriate expertise to determine what properties are or are not of religious and cultural significance to an Indian tribe or Native Hawaiian organization. The appropriate individual to make such a determination is the representative designated by the tribe or Native Hawaiian organization for this purpose. Efforts to identify these types of properties may include site visits and interviews with tribal elders or cultural experts.

Additionally, unless such traditional cultural landscapes have already been publicly identified, frequently the only entities aware of these landscapes are either an Indian tribe or a Native Hawaiian organization. Since such places are often comprised of related locations across some distance and for which the connections may not be obvious to those outside of the culture that holds them significant, it stands to reason that the most appropriate entity to inform such identifications and evaluations are either Indian tribes or Native Hawaiian organizations.

5) How can issues of confidentiality be addressed when traditional cultural landscapes may be affected by an undertaking?

Many Indian tribes or Native Hawaiian organizations have belief systems that require the location and even the existence of properties of traditional religious and cultural significance, including traditional cultural landscapes, not be divulged. Therefore, it is vital that the federal agency work with tribes or Native Hawaiian organizations to identify sensitive locations while respecting desires to withhold specific information about such sites. The Section 106 regulations at 36 CFR Section 800.4(b)(1) state, in part, that "[t]he agency official shall take into account any confidentiality concerns raised by Indian tribes or Native Hawaiian organizations during the identification process."

The NHPA and the Section 106 regulations also provide a vehicle for protecting information that an Indian tribe or Native Hawaiian organization has disclosed for the purpose of identification and evaluation of historic properties in the Section 106 process. Section 304 of the NHPA (16 U.S.C. 470w-3(a)) and the regulations at 36 CFR Section 800.11(c)(1) provide that the head of an agency, after consultation with the Secretary of the Interior, "shall withhold from disclosure to the public" information about the location, character, or ownership of a historic property when the agency head determines that the disclosure of such information may cause a significant invasion of privacy; risk harm to the historic property; or, impede the use of a traditional religious site by practitioners. After such a determination, the Secretary of the Interior, in consultation with the relevant agency, will determine who, if anyone, may have access to the information for purposes of the NHPA. When the information in question has been developed in the course of an agency's compliance with Section 106, the Secretary shall consult with the ACHP in reaching determinations on the withholding and release of information.

One important caveat: the Section 304 confidentiality provisions only apply to properties that are listed or eligible for listing in the NRHP. Thus, it is possible that information disclosed prior to an eligibility determination may not be protected. Therefore, the ACHP suggests that agencies and Indian tribes or Native Hawaiian organizations contact NR staff for guidance regarding the amount of information and detail needed to make a determination of eligibility when such information may be at risk of disclosure. It may be possible for a tribe or Native Hawaiian organization to share just enough information for the agency to identify the existence of a site and make a determination of eligibility without compromising the site or the beliefs associated with it. Such information might include general aspects of the historic property's attributes, i.e., that an important yearly ceremony takes place in a certain general location, that quiet is required in the area, that visual impacts will impede the ability to properly perform a required ritual, or that important ceremonial harvesting activities must occur at a particular place, time, or under certain conditions, as well as basic information about the relationship of the property to the project area. However, if there are questions about the adequacy of such information in making determinations of eligibility, the NR staff should be consulted.

Issues of confidentiality and sensitivity of information require flexibility and cooperation among the consulting parties. There may be situations where a tribe or Native Hawaiian organization is only willing to share information with the federal agency and not with the other non-federal consulting parties. This can challenge the traditional Section 106 process where the federal agency also consults with the SHPO to

determine eligibility of properties. In such cases, it is recommended that the agency promptly talk with the ACHP or the NR staff about how to resolve such a situation.

6) What types of features may be part of a traditional cultural landscape?

There is no single defining feature or set of features that comprise a traditional cultural landscape. Such places could be comprised of natural features such as mountains, caves, plateaus, and outcroppings; water courses and bodies such as rivers, streams, lakes, bays, and inlets; views and view sheds from them, including the overlook or similar locations ; vegetation that contributes to its significance; and, manmade features including archaeological sites; buildings and structures; circulation features such as trails; land use patterns; evidence of cultural traditions, such as petroglyphs and evidence of burial practices; and markers or monuments, such as cairns, sleeping circles, and geoglyphs.

7) What is the role of the Advisory Council on Historic Preservation in the consideration and protection of traditional cultural landscapes in the Section 106 process?

A federal agency must afford the ACHP an opportunity to participate in consultation regarding the resolution of adverse effects to any historic property, including a traditional cultural landscape, if the property is listed or determined eligible for listing on the NRHP. The ACHP can also offer its advisory opinion on the substance of any finding, determination, or decision regarding the adequacy of an agency's compliance with the Section 106 regulations at any time at the request of any individual, agency, or organization. The ACHP cannot, however, comment on the eligibility of a property for listing on the NRHP. Therefore, an Indian tribe or Native Hawaiian organization can request that the ACHP review an agency's finding, determination, or decision regarding the potential effects of its undertaking and the resolution of effects to historic properties of significance to them.

8) Where can I get more information on cultural landscapes in general?

The U.S. National Park Service (NPS) provides additional information on cultural landscapes at:

http://www.nps.gov/history/hps/hli/landscape_guidelines/index.htm
http://www.nps.gov/history/hps/hli/landscape_guidelines/using.htm

NPS also provides additional information on traditional cultural properties, which can also be landscapes at:

http://www.nps.gov/nr/publications/bulletins/pdfs/nrb38.pdf

International sources of information:

http://unesdoc.unesco.org/images/0013/001331/133121e.pdf
http://www.international.icomos.org/centre_documentation/bib/culturallandscapes.pdf
http://whc.unesco.org/en/news/588

Issued on July 11, 2012

Preserving America's Heritage

NATIVE AMERICAN TRADITIONAL CULTURAL LANDSCAPES ACTION PLAN

The Advisory Council on Historic Preservation (ACHP) has seen an increasing number of Section 106 reviews involving large scale historic properties of religious and cultural significance to Indian tribes or Native Hawaiian organizations (NHOs). Improvements in federal agency consultation with Indian tribes and NHOs and greater recognition of their expertise in identifying historic properties of significance to them have likely contributed to this increase. It is equally likely that there have also been increasing development pressures in places not previously developed.

These large scale properties are often comprised of multiple, linked features that form a cohesive "landscape." The recognition, understanding, and treatment of such places can be a struggle for the non-tribal or non-Native Hawaiian participants in the Section 106 process, partly due to the lack of experience in addressing such places and partly due to the lack of guidance regarding these traditional cultural landscapes.

In response to growing concerns about the impacts to these properties of religious and cultural significance to Indian tribes and Native Hawaiian organizations, in 2009, the ACHP began an informal dialogue with tribal representatives primarily via teleconferences and e-mail exchanges. During the Tribal Summit on Renewable Energy in January 2011 (go to www.achp.gov/renewable_energy.html for more information), participants recognized the importance of identifying and considering historic properties at the landscape level and avoiding inappropriately breaking these larger properties into smaller units that are managed separately and out of context. As a result of these discussions as well as the ACHP's experience in individual Section 106 reviews, it is evident that the issues are complex and warrant the attention of the larger preservation community. To that end, the ACHP held a forum in August 2011, to introduce the ACHP members to the challenges of recognizing and protecting Native American traditional cultural landscapes and to elevate the issues to policy levels within the federal preservation program (go to www.achp.gov for more information).

This proposed plan is based on the suggestions the ACHP has received and the discussions with its preservation partners since 2009. It sets forth actions designed to affirmatively address the challenges the ACHP believes are most critical for both protecting these important historic properties as well as addressing identified hurdles in the Section 106 and National Environmental Policy Act (NEPA) processes when proposed projects may impact Native American traditional cultural landscapes. The appropriate and early involvement of those parties for whom these places are so important, Indian tribes and NHOs, and the clarification of how these landscapes are to be recognized and treated in Section 106 and NEPA reviews are key elements to accomplishing these goals.

The first set of action items focuses on raising awareness both within the preservation community and among our partners about the existence of traditional cultural landscapes and their importance to Indian tribes and Native Hawaiian organizations. This purpose of this outreach is to ensure that Native American traditional cultural landscapes are considered early in land management and project planning decisions.

Early consultation with Indian tribes and Native Hawaiian organizations to identify areas of religious and cultural significance prior to project siting decisions is not only the most effective means to avoid impacts to these places but is also the best way to minimize project delays.

The second set of action items focuses on the Section 106 process and the development of tools to assist all participants in the recognition and consideration of Native American traditional cultural landscapes. Given the increasing threats to these places from large-scale developments, the ACHP will focus its attention on this action items in FY 2012 and early FY 2013.

In order to ensure the success of these proposed measures, the ACHP and the Department of Interior (DOI) must formally commit to work together to address the broad issues surrounding Native American traditional cultural landscapes. The ACHP, as the agency with responsibility for overseeing the Section 106 review process, and DOI, through the National Park Service (NPS), as the agency with responsibility for overseeing the National Register of Historic places, should provide leadership in addressing Native American cultural landscapes in the national historic preservation program. Together, the ACHP and NPS should:

- Promote the recognition and protection of Native American traditional cultural landscapes both within the federal government and the historic preservation community as well as at the state and local levels, and,

- Address the challenges of the consideration of these historic properties in the Section 106 review process as well as in NEPA reviews.

To meet these goals, the ACHP and NPS should, in consultation with key partners including Indian tribes, Tribal Historic Preservation Officers (THPOs), Native Hawaiian organizations, State Historic Preservation Officers (SHPOs), federal agencies, preservation organizations, cultural landscape experts, and industry representatives, carry out the following actions:

1. Promote the recognition and protection of Native American traditional cultural landscapes both within the federal government and the historic preservation community as well as at the state and local levels.

- NPS and the ACHP should work with the National Association of Tribal Historic Preservation Officers (NATHPO) and other intertribal organizations to advance the recognition of Native American traditional cultural landscapes in the broader national preservation program through their interaction with preservation partners including the National Conference of State Historic Preservation Officers, the National Trust for Historic Preservation, federal agencies, and others.

- DOI, the ACHP, the Council on Environmental Quality (CEQ), and other federal agencies should work with Indian tribes, THPOs, and NHOs to reach out to applicants and trade associations to promote the early consideration of, and consultation with Indian tribes, THPOs, and NHOs about sacred sites and Native American traditional cultural landscapes in project planning and scoping.

- Federal agencies should develop long-term, meaningful relationships with Indian tribes, THPOs, and NHOs to ensure effective and early consultation that leads to better planning and, where appropriate, identifying areas of cultural sensitivity.

- The ACHP and CEQ should encourage federal agencies to integrate consultation and coordination with Indian tribes, THPOs, and NHOs as early as possible in their planning processes to identify and address potential cultural resource concerns.

- The Administration should include the protection of Native American landscapes and historic properties in its agenda for the annual Tribal Nations Meeting at the White House to engage and hear from tribal leaders on this issue.

- The Administration should promote training for federal officials on working more effectively with tribal governments and developing greater cultural sensitivity.

2. Address the challenges of the consideration of Native American traditional cultural landscapes in the Section 106 review process as well as in NEPA reviews.

- NPS should issue additional guidance on how to apply the National Register criteria to these historic properties. The guidance should define "traditional cultural landscapes" as they relate to Indian tribes or Native Hawaiian organizations. It should also address what constitutes adequate documentation; how to protect sensitive and confidential Native American cultural knowledge and information; and, the role of traditional cultural knowledge in making determinations of eligibility.

- NPS should update National Register Bulletin 38: *Guidelines for Evaluating and Documenting Traditional Cultural Properties* to clarify how this guidance applies to historic properties of religious and cultural significance to Indian tribes and Native Hawaiian organizations. NPS should also explore how guidance regarding Native American traditional cultural landscapes might inform the treatment of large historic properties or landscapes of significance to non-Native communities.

- The ACHP should develop a policy statement and issue formal guidance on the need for early tribal and Native Hawaiian consultation and the consideration of Native American traditional cultural landscapes in the Section 106 review process to include the role of Indian tribes, THPOs, and Native Hawaiian organizations and how to determine effects on such historic properties.

- The ACHP should work with NATHPO to develop a special case digest of Section 106 cases, best practices, and examples where federal agencies effectively managed such places, consulted tribes, developed innovative mitigation approaches, etc.

- The ACHP and DOI should work with their preservation partners to address the perceived conflicts regarding confidentiality of sensitive information and the transparency of agency decision making in the Section 106 process.

- The ACHP should promote the consideration of Native American traditional cultural landscapes through its leadership role in the Interagency Working Group on Indian Affairs as a means to reach a broader federal audience and to explore the potential intersections with other federal programs and initiatives including climate change and sacred sites protection.

With the formal adoption of this action plan by the ACHP members on November 10, 2011, the ACHP is committed to carrying out its responsibilities under this plan.

November 23, 2011

October 28, 2013

Joseph Zambelli
NEPA Document Manager
U.S. Department of Energy
National Energy Technology Laboratory
3610 Collins Ferry Road
P.O. Box 880
Morgantown, WV 26507-0880

RE: Pacific Gas and Electric Company Compressed Air Energy Storage Compression Testing Project, King Island, San Joaquin County, California

Dear Mr. Zambelli:

On behalf of the Buena Vista Rancheria of Me-Wuk Indians ("Tribe"), I am writing to follow up on your letter dated August 1, 2013, to initiate tribal consultation regarding the above referenced project. By way of background, a project site visit was arranged for the Tribe on October 11, 2013, with Pacific Gas & Electric Company ("PG&E") and North State Resources ("NSR"). The site visit was followed by conference call on October 16, 2013, in which the Tribe, PG&E, NSR and the U.S. Department of Energy ("DOE") participated. During the conference call, the Tribe requested for the following information:

1. Status of the National Environmental Protection Act (NEPA) and National Historic Preservation Act (NHPA) tribal consultation and review process as it pertains to the subject project;
2. Clarification of the DOE's government-to-government consultation policies, in general, and how they are to be specifically applied for this project;
3. Information on timing and sequencing of project activities;
4. Identification of which Native American tribes are participating in the project;
5. Copies of the following documents regarding the project: relevant permits, environmental assessments, feasibility study documents, and categorical exclusions documents among others;
6. Project timelines and implementation schedule(s); and
7. The historical properties treatment plan, archeological discovery plan and monitoring protocol for the project

The Tribe, during the call, also expressed interest in monitoring the project during ground disturbance work (temporary power phase and related activities).

The Tribe has received the requested information under Item 1 above and eagerly looks forward to receiving the remaining items. We also look forward to our active participation in the consultation process and to further discussing the Tribe's role monitoring activities as the project progresses.

P.O. BOX 162280 Sacramento, CA 95816
TEL: 916.491.0011 FAX: 916.491.0012
www.buenavistatribe.com

If you have any questions concerning this letter, feel free to contact me by email at roselynn@buenavistatribe.com or by telephone at (916) 491-0011. Thank you

Sincerely,

Roselynn Lwenya, Ph.D
Tribal Historic Preservation Officer
BUENA VISTA RANCHERIA OF ME-WUK INDIANS

>>> Roselynn Lwenya <rlwenya@buenavistatribe.com> 11/1/2013 4:53 PM >>>

Dear Mr. Zambelli,

Thank you for your October 29 letter that provided responses to issues raised by Buena Vista Rancheria of Me-Wuk Indians. Although there are still details to be worked out regarding finalizing a monitoring agreement with BVR prior to the start of construction of the temporary electrical distribution system, we feel that you and PG&E have substantially addressed our concerns and that we have a clear understanding of how we can all work together for a successful project while meeting our mutual responsibilities to protect the natural resource and Native American cultural resource heritage; while meeting our respective needs. Thus, upon finalizing the agreement, BVR is available to move forward in partnership with DOE/PG&E to install the temporary power upgrade portion of the project later this month. However, we do request that all subsequent project phases be addressed in the forthcoming EA.

If you have any questions please contact me by email at roselynn@buenavistatribe.com or by phone at (916) 491-0011.

Thank you

Respectfully,

Roselynn Lwenya, Ph.D
Environmental Resources Director / THPO
Buena Vista Rancheria
1418 20th Street, Suite 200
Sacramento, CA 95811
TEL: 916.491.0011
FAX: 916.491.0012
roselynn@buenavistatribe.com

APPENDIX B3

CORRESPONDENCE WITH THE UNITED STATES FISH AND WILDLIFE SERVICE

NATIONAL ENERGY TECHNOLOGY LABORATORY
Albany, OR • Morgantown, WV • Pittsburgh, PA
U.S. DEPARTMENT OF ENERGY

June 3, 2013

Ms. Kim Turner
ESA Regulatory Division
Bay-Delta Fish and Wildlife Office
U.S. Fish and Wildlife Service
650 Capitol Mall, Suite 8-300
Sacramento, California 95814

Subject: Section 7 Consultation under the Endangered Species Act. Compressed Air Energy Storage Compression Testing Project

Dear Ms. Turner:

The U.S. Department of Energy (DOE) is proposing to provide a financial assistance grant (DOE's Proposed Action) to Pacific Gas and Electric Company (PG&E) as part of the Smart Grid Technologies Program, which is funded through the American Recovery and Reinvestment Act of 2009. If PG&E receives the grant, it would construct a temporary site facility to test the performance of a geological formation as a potential storage reservoir for future use as a Compressed Air Energy Storage (CAES) facility. PG&E would install wells and compressors for injecting compressed air into a depleted natural gas field at a depth of several thousand feet, followed with controlled releases of this air to observe and measure the performance of the air storage reservoir. Associated facilities would include a 2.5-acre gravel work pad for the temporary site facilities (TSF) and an electrical distribution line. The 4.5-mile distribution line would include the use of existing lines for 0.3-miles, reconductoring over 1.8-miles, and construction of 2.4-miles of new line. Under authorization as an interim action, PG&E would upgrade and install the majority of the distribution line between August and October 2013. Some segments of the line may be upgraded or installed between November 2013 and March 2014.

The compression testing will take approximately 10 months, including site preparation and equipment installation, beginning in 2014. PG&E would upgrade and install the distribution line in 2013 under authorization as an interim action. Upon completion of the proposed testing project, the wells would be capped and possibly retained for future use or abandoned in accordance with state and federal standards. Ownership of the well work pad would be transferred to the subsurface rights owner as a condition its agreement with PG&E. The goal of the project is to evaluate the geological formation for potential use as a compressed air energy storage facility at this location, at a future date.

The TSF would be located adjacent to an existing natural gas well in an agricultural area on King Island in rural San Joaquin County, California, 1.8-miles northwest of the City of Stockton's

3610 Collins Ferry Road, P.O. Box 880, Morgantown, WV 26507
joseph.zambelli@netl.doe.gov • Voice (304) 285-4913 • Fax (304) 285-4403 • www.netl.doe.gov

northern boundary. Access to the site would be along Eight Mile Road, King Island Road, and unpaved agricultural access roads. Figure 1, attached, shows the proposed project location.

One of the species that is listed on the federal threatened list that may occur on the project site or be affected by project activities is the giant garter snake (*Thamnophis gigas*) (GGS). Irrigation ditches and adjacent uplands near the TSF pad area provide low-quality habitat for the GGS. DOE reviewed the U.S. Fish and Wildlife Service (USFWS) list of federally endangered and threatened species that are known to be found in San Joaquin County and found no other threatened or endangered species that might occur on the site.

A biological survey and effects assessment (attached) found that the potential aquatic and upland habitats for the GGS in the proposed project area are of low-quality and isolated from higher quality habitats. The survey also concluded that given the GGS populations in the Sacramento-San Joaquin Delta region are generally at very low densities with most suitable habitat unoccupied they are unlikely to occur in the proposed project area, or in areas where project activities would result in ground disturbance.

There is minimal likelihood that the GGS would occur within the proposed TSF work pad area, where the majority of ground disturbances and other activities associated with the project are planned. Furthermore, PG&E has committed to following the avoidance and mitigation measures listed in the biological survey report that further reduce the risk to the GGS. These include preconstruction surveys, exclusionary fencing, worker environmental training, burrow and road shoulder avoidance, speed limits, and biological monitoring.

In relation to migratory birds, if any construction activities occurred during the nesting season, PG&E would survey the site to ensure there were no active migratory bird nests present. If nests are found, PG&E would take steps to avoid impacts or develop appropriate mitigation actions.

The parcel where the compression testing would occur is adjacent to an existing gas well and surrounded by active farms that are regularly harvested and disked on an annual rotation. Based on the above information and attachments, DOE determined that the proposed compression testing activity is not likely to adversely affect federally threatened or endangered species. After the compression testing is completed, the proposed test site would be evaluated to determine its viability for further development of a CAES energy storage facility.

An environmental assessment (EA) is being prepared for the TSF and compression testing. DOE will release the draft EA for public review and comment within the next several weeks. Although the activities associated with upgrading the electrical distribution lines, to provide power to the compression testing equipment, would take place prior to DOE's completion of the EA (DOE/EA-1752) for the compression testing project, DOE has determined that upgrading of the existing distribution line would not have an adverse environmental impact nor limit the choice of reasonable alternatives for the project.

DOE will provide your office a copy of the draft EA and you may further comment on any of your concerns. All correspondence between DOE and the USFWS will be included in the EA's appendix. At this time, DOE anticipates a 30-day public comment period for this proposed project.

DOE asks for your concurrence. Please forward the results of your review and any requests for additional information to:

Mr. Joe Zambelli
U.S. Department of Energy
National Energy Technology Laboratory
3610 Collins Ferry Road
P.O. Box 880
M/S: I07
Morgantown, WV 26507-0880
Email: joseph.zambelli@netl.doe.gov

Thank you in advance for your consideration.

Sincerely,

Joe Zambelli
NEPA Document Manager

Attachments:
Figure 1 – Project Location
Effects Assessment of the King Island Site, San Joaquin County, California

cc: PG&E (Mr. Bob Booth)
Ms. Nuhfer

NATIONAL ENERGY TECHNOLOGY LABORATORY
Albany, OR • Morgantown, WV • Pittsburgh, PA
U.S. DEPARTMENT OF ENERGY

June 28, 2013

Ms. Kim Turner
ESA Regulatory Division
Bay-Delta Fish and Wildlife Office
U.S. Fish and Wildlife Service
650 Capitol Mall, Suite 8-300
Sacramento, California 95814

Re: Section 7 Consultation Under the Endangered Species Act Compressed Air Energy Storage Compression Testing Project—Revised Action Area

Dear Ms. Turner:

In support of Pacific Gas and Electric Company's (PG&E) Compressed Air Energy Storage (CAES) facility, the U.S. Department of Energy (DOE) initiated Endangered Species Act Section 7 consultation with the U.S. Fish and Wildlife Service on May 31, 2013 with the submittal of the *Pacific Gas and Electric Company Compressed Air Energy Storage Compression Testing Project-Draft Assessment of Effects on Federally Listed Species* (effects assessment) and request for concurrence. This letter supplements the effects assessment submitted on May 31, 2013, with a minor expansion of the action area and an additional assessment of effects on the giant garter snake (GGS) within the expanded area.

After submittal of the effects assessment, PG&E revised the project description to accommodate the installation or replacement of three electrical distribution line poles adjacent to Bishop Cut (expanded action area). To accommodate the pole installation, the action area has been expanded by 1.1 acres north and south of the original footprint on the east side of the project's distribution line crossing of Bishop Cut (revised effects assessment Figure 3d, attached). PG&E would replace one distribution pole north of the crossing along a levee road, and install two poles south of the crossing on the south side of and adjacent to Eight Mile Road.

The vegetation communities and aquatic habitat within the expanded action area are consistent with those described in the effects assessment dated May 31, 2013, for other parts of the action area. Ruderal habitat occurs throughout the expanded action area, with sparse fresh emergent vegetation occurring in an irrigation ditch that runs perpendicular to Eight Mile Road. Annual row crops occur east of the irrigation ditch. The irrigation ditch is intermittently wetted throughout the irrigation season.

The expanded action area is a minor extension of the location previously evaluated for effects and includes a portion of an irrigation ditch that was previously described in the effects assessment. The irrigation ditch contains low quality habitat and, based on low densities of the GGS in the region as described in the effects assessment, it is unlikely the GGS would occur in the expanded action area. PG&E will implement the Avoidance and Minimization Measures as described in the effects analysis to further reduce the risk to the GGS in this area.

3610 Collins Ferry Road, P.O. Box 880, Morgantown, WV 26507
joseph.zambelli@netl.doe.gov • Voice (304) 285-4913 • Fax (304) 285-4403 • www.netl.doe.gov

If you have any questions, I can be reached at (304) 285-4913 or by e-mail at Joseph.Zambelli@NETL.doe.gov.

Thank you for your consideration in this matter.

Please forward the results of your review and any requests for additional information to:

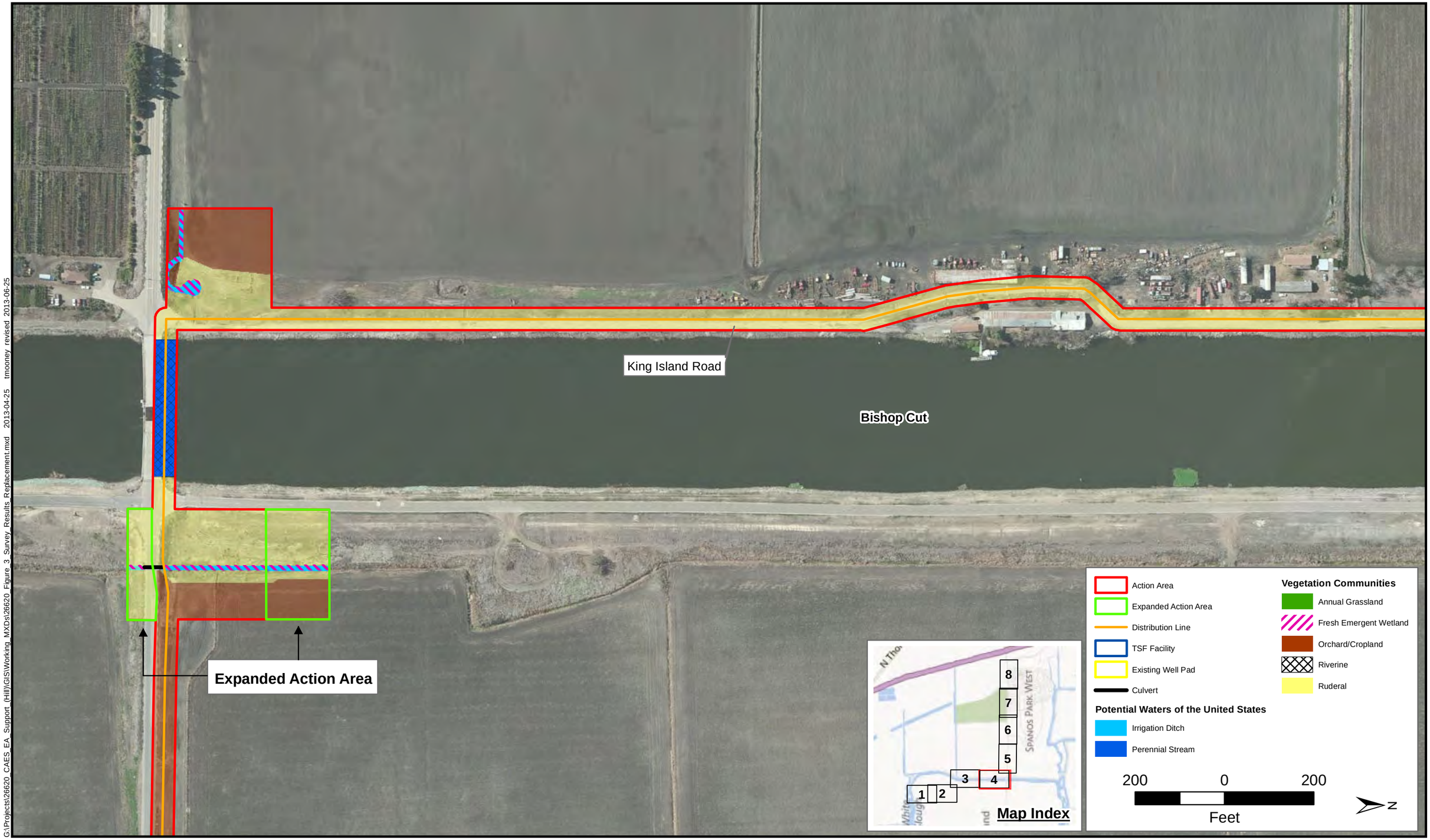
Mr. Joe Zambelli
U.S. Department of Energy
National Energy Technology Laboratory
3610 Collins Ferry Road
P.O. Box 880
M/S: I07
Morgantown, WV 26507-0880
Email: joseph.zambelli@netl.doe.gov

Sincerely,

Joe Zambelli
NEPA Document Manager

Attachments:
Replacement Figure 3d – Survey Results

cc: Bob Booth - PG&E
Kimberly Nuhfer - NETL



G:\Projects\26620_CAES_EA_Support_(Hill)\GIS\Working_MXDs\26620_Figure_3_Survey_Results_Replacement.mxd 2013-04-25 tmooney revised 2013-06-25

North State Resources, Inc.

PG&E CAES Project - King Island

Replacement Figure 3d
Survey Results
June 25, 2013

NATIONAL ENERGY TECHNOLOGY LABORATORY
Albany, OR • Morgantown, WV • Pittsburgh, PA
U.S. DEPARTMENT OF ENERGY

July 24, 2013

Ms. Kim Turner
ESA Regulatory Division
Bay-Delta Fish and Wildlife Office
U.S. Fish and Wildlife Service
650 Capitol Mall, Suite 8-300
Sacramento, California 95814

Re: Section 7 Consultation Under the Endangered Species Act for the Pacific Gas and Electric Company's Compressed Air Energy Storage Compression Testing Project—Revised Project Description

Dear Ms. Turner:

Please find attached a revised project description to assist you in your review, regarding the U.S. Department of Energy's initiated Endangered Species Act Section 7 consultation, as it pertains to Pacific Gas and Electric Company's (PG&E) Compressed Air Energy Storage facility. Maral Kasparian has been in communication with Ernie Ralston of PG&E and requested that the attached information be provided.

If you have any questions, I can be reached at (304) 285-4913 or by e-mail at Joseph.Zambelli@NETL.doe.gov.

Thank you for your consideration in this matter.

Sincerely,

Joe Zambelli
NEPA Document Manager

Attachment:
Project Description

cc: Bob Booth - PG&E
Kimberly Nuhfer - NETL

3610 Collins Ferry Road, P.O. Box 880, Morgantown, WV 26507
joseph.zambelli@netl.doe.gov • Voice (304) 285-4913 • Fax (304) 285-4403 • www.netl.doe.gov

United States Department of the Interior

FISH AND WILDLIFE SERVICE
San Francisco Bay-Delta Fish and Wildlife Office
650 Capitol Mall, Suite 8-300
Sacramento, California 95814

In reply refer to:
08FBDT00-2013-I-0036

AUG 02 2013

Mr. Joe Zambelli
NEPA Document Manager
U.S. Department of Energy
National Energy Technology Laboratory
3610 Collins Ferry Road
M/S: B07
Morgantown, West Virginia 26507-0880

Subject: Informal Consultation for the Pacific Gas and Electric Compressed Air Energy Storage Compression Testing Project at King Island, San Joaquin County, California

Dear Mr. Zambelli:

This letter is in response to the U.S. Department of Energy's (DOE) June 3, 2013, letter requesting informal consultation with the U.S. Fish and Wildlife Service (Service) on the Pacific Gas and Electric (PG&E) Compressed Air Energy Storage (CAES) Compression Testing Project (project) at King Island, in San Joaquin County, California. The DOE has determined that the proposed project may effect, but is not likely to adversely affect the threatened giant garter snake (GGS; *Thamnophis gigas*). This response is in accordance with Section 7 of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 *et seq.*) (Act).

In reviewing this project, the Service has relied upon: (1) the June 3, 2013, DOE letter requesting consultation initiation for the project; (2) the May 29, 2013, *Pacific Gas and Electric Compressed Air Energy Storage Compression Testing Project Draft Assessment of Effects on Federally Listed Species* document, prepared by North State Resources, Inc. (consultants); (3) the July 24, 2013, DOE letter describing changes to the project footprint; (4) and other information available to the Service.

Project Description

Project Purpose

The objective of the proposed project is to study the feasibility of using an underground porous rock formation (depleted natural gas field) for a Compressed Air Energy Storage (CAES) project. CAES technology involves two major processes: (a) air compression for storage and (b) air release for electricity generation. During the air compression and storage process, electric motor-driven compressors inject air into a sealed and porous underground geological formation for storage under high pressure. During the air release phase, the high-pressure air is released from the underground reservoir, heated using natural gas (if necessary), and expanded through sequential turbines ("expanders"), which drive an electrical generator. The stored energy can be used during periods of higher electric demand, improving the efficiency of energy distribution through the power grid. This proposed project's goal is to conduct pressure testing of the formation. This would consist of injecting air to build a subsurface bubble within the reservoir sands of the depleted King Island Gas Field, and then conducting a series of pressure tests to further confirm the geologic suitability of the formation and provide more detailed information for project engineering.

PG&E proposes to construct a temporary site facility (TSF), and perform drilling and compression tests to determine if a geological formation has the potential as a storage reservoir for future use as a CAES facility. An action that is interrelated to the construction of the TSF, drilling, and compression testing is the development of an electric distribution line that would provide power to the TSF. Development of the distribution line would involve re-conductoring existing lines and construction of new lines. This site for the compression tests is located at the King Island Piacentine Well Pad Site (King Island), located in San Joaquin County, California.

King Island Well Pad Site Setting

The proposed King Island TSF for compression testing is located approximately 1.8-miles northwest of the city of Stockton at Eight Mile Road in northwestern San Joaquin County, California. It is situated immediately north of West 8 Mile Road between White Slough and Bishop Cut, and can be accessed from Interstate 5 via West Eight Mile Road and King Island Road (31.082284° Longitude and -121.421892° Latitude). For project construction , site access is from the southwest, along an unnamed dirt road. The dirt road is graded and well-maintained, and is surfaced with gravel. The project area includes the area for the development of the TSF site and the electric distribution line, and the following: (1) a 200-foot buffer around the TSF pad; (2) a 20-foot buffer around all dirt access roads; and (3) a 50-foot-wide corridor along the 4.25-mile electrical distribution alignment that would provide power to the TSF pad.

The area surrounding the TSF is generally level and ranges in elevation from approximately 5 to 10-feet below sea level. Water levels in White Slough and Bishop Cut are slightly above sea level and are separated from King Island by a series of levees topped by paved and unpaved roads. The area surrounding the TSF is crossed by a series of dirt and gravel ranch roads that provide access to the various ranch fields and to the test site. Several agricultural residences are located approximately 0.5 to 0.75-mile south of the TSF along the south side of an east-west-trending gravel road.

Cropland and/or orchard (e.g., corn, asparagus, onions, safflower, and walnut orchard) are the dominant vegetation types within the proposed TSF pad and along the distribution line, with the exception of few areas along Eight Mile Road that are dominated by annual grassland. The TSF pad is entirely within a young walnut orchard and the open areas between the rows are disked and or mowed on an annual basis. Most crops along the distribution line are annual row crops. All fields are actively farmed and annually disked, harvested and/or disturbed up to the edge of existing roads.

The project area on either side of the Bishop Cut and along the golf course on Eight Mile Road support annual grassland. Since the golf course installation, non-native annual grasses have re-colonized the area. Fresh emergent wetlands are present in irrigation ditches with sufficient hydration throughout the project area and in ponds located on the golf course in the eastern portion of the project area. Irrigation ditches are located parallel to the gravel access road to the TSF pad, and are located perpendicular and parallel to Eight Mile Road. The irrigation ditches appear to be subject to regular vegetation management using both mechanical and chemical techniques. Irrigation ditches adjacent to the TSF pad and gravel access road, and those perpendicular to Eight Mile Road, are perennially inundated and support fresh emergent vegetation. Irrigation ditches on either side of Bishop Cut, and those at the western portion of the project area near the PG&E Eight Mile substation are intermittently inundated during the irrigation season and are generally devoid of vegetation. Perennially inundated irrigation ditches and ponds support patches of fresh emergent vegetation.

Bishop Cut provides riverine habitat for aquatic species at the Eight Mile Road Bridge crossing. The Bishop Cut is an artificial navigation and irrigation channel connecting White Slough to the north and Disappointment Slough to the south. Within the project area, the levee banks are rip-rapped with large rock and the channel is generally devoid of vegetation. Banks of Bishop Cut and adjacent road shoulders show signs of frequent disturbance (e.g., mowed, disked).

No seasonal wetlands, vernal pools, elderberry shrubs (*Sambucus nigra*), riparian wetlands or other sensitive natural community are present in the project area. Fresh emergent wetlands exist only in the ditches and golf course ponds. Farmed agricultural lands do not provide habitat for special-status plant species. Vernal pools, mesic areas, alkaline or serpentine soils, chenopod scrub, and riparian forest or scrub habitats that would support special-status plant species are not present within the project area.

Construction Activities

Project construction actions for developing the King Island TSF include construction of the TSF pad, well drilling, and compression and cycling testing. All staging, well drilling, compression, and cycling testing would occur on the TSF pad. Other associated project activities include access road maintenance (if deemed necessary) and development of the distribution line to power the activities at the TSF site. The expected timeline for construction activities is as follows:

- The development of the distribution line is expected to occur between August 2013 through March 2014;

- The access road maintenance, if needed, is expected to occur during the TSF pad construction time period of January 2014 through March 2014; and
- TSF pad construction, well drilling, and compression testing would occur from February 2014 through August 2014.

TSF Pad Construction and Well Drilling

A pad to support the project and its operations (TSF pad) would be constructed to approximately 650-feet by 165-feet, or 2.5-acres in size, of which 0.7-acre was previously created for the geological core drilling task associated with this project. The TSF pad would be constructed as shown on the site plan. Access road maintenance, pad construction, and drilling of the wells to complete the TSF pad at King Island are expected to take approximately 3 months.

The existing 0.7-acre pad would be expanded by additional clearing, grubbing, scarifying, and compacting into an area that is currently planted with sapling-stage walnut trees, requiring the removal of approximately 90 small trees. Geotextile material would be placed over the compacted work area, then up to 18-inches of sub-base material and Class II aggregate base would be placed and compacted. The work area would be crowned and sloped so that stormwater sheet-flows off the pad. PG&E would constrain all construction activities to the pad and a 20-foot buffer area. During the construction of the TSF pad, eight workers, five trucks and trucks to haul material, road grader/maintainer, dozer (D-5 or equal), sheep's foot compactor, roller compactor, water truck, and similar construction equipment would be used. Approximately 28 truck trips would be required to import material to the TSF pad.

Once the TSF pad is constructed, a drilling rig and associated equipment would be mobilized to the project. Primary drilling equipment includes the drill rig, mud and water tanks and pumps, shaker tanks, electric generators, diesel fuel tanks, and drill pipe racks. Two wells would be drilled into the formation–one well for injection and withdrawal of air (IW well), and the second well for monitoring field pressures and responses to the injection and withdrawal process. The construction Contractor would place all waste, cuttings, and drilling mud associated with well drilling in proper storage receptacles for offsite disposal at an authorized disposal facility. An additional five truck trips would be required to remove drill cuttings and associated material from the site. Drilling crew, engineers, temporary workers and site visitors would number an average of approximately 12 workers/people per shift, with three shifts per day. To accommodate continuous work shifts, night-time lighting would be used. Up to a maximum of 20 workers may be present at one time during various operations. In addition to worker vehicles, service, equipment, and material delivery vehicles would access the site during the drilling phase, generating an estimated 40 trips per day. Total duration of this task is approximately six-weeks.

Water for pad construction and well drilling would be trucked to the project area from off-site municipal water supply sources. All drilling activities would be completed in compliance with the U.S. Environmental Protection Agency (EPA) Underground Injection Control (UIC) permit. Construction wastewater would be hauled offsite and disposed of in a permitted, commercial injection well in Rio Vista. Once the two wells are drilled and the drilling equipment demobilized from the work area, the compression and cycling equipment would be installed.

Development of the facility includes installation of compression equipment, closed-loop cooling system, portable office trailer, tank for drilling mud, and lighting.

Compression and Cycling Testing

The construction and installation phase would be followed by four to five months of compression and withdrawal cycling that simulates the operation of a CAES facility. The testing will involve, initially, creating the compressed air reservoir or "bubble" by pumping the compressed air into the geological formation. Creation of this bubble can take up to two months.

After the bubble is created, a series of pressure tests would be conducted and data would be collected from the IW well, the observation well and possibly from additional existing nearby gas wells to assess the reservoir response. The testing protocols are still being developed and would include a series of sequential injection, pressure buildup, pressure fall off, and possibly flow tests. The final compression testing plan would be developed to collect data that allows assessment of the reservoirs characteristics to support refinement of the computer reservoir model constructed for the project.

Other than the IW wells, the primary equipment used during the compression test would include the following:

- High-pressure compressor train capable of injecting the compressed air at flow rates up to 17-million standard cubic-feet per day and compressor outlet pressures up to a maximum of 2,700-pounds per square-inch;
- After-cooler to cool the compressed air to a temperature no higher than approximately 140 degrees Fahrenheit before injection;
- If necessary, for safety purposes, the air supply stream may include oxygen-depleted air generated using a portable membrane filtration system or similar equipment;
- Appurtenant equipment including a temporary electrical supply, a step-down transformer, a power distribution system, a compressor cooling system, high-pressure piping, and control circuitry;
- Equipment to support withdrawal testing including high-pressure piping, a choke valve, a propane or electric line heater, a phase separator, one or more produced water storage tanks, and an air discharge vent; and
- Monitoring and measurement equipment including:
    - Wellhead pressure and temperature sensors at the wells,
    - A sensor array along the discharge piping to measure flow, pressure, temperature, combustible gas concentrations, oxygen concentrations and relative humidity, and
    - A sensor array along the injection piping to measure flow, pressure, temperature, oxygen concentrations, and relative humidity.

During this approximate 4 to 5-month period of compression and cycling testing, approximately 12 workers would be on site per day, staffing three eight-hour shifts. Night-time lighting would be required to accommodate a 24-hour work schedule. Workers, service vehicles and site visitors are expected to generate approximately15 trips per day.

Following completion of the compression testing, all of the drilling, compression, and other equipment would be removed from the site. If the compression testing has indicated the formation demonstrates appropriate characteristics for a CAES project, the pad along with established wells would be left in place for use in development of the CAES facility. If the testing demonstrates otherwise, the wells would be plugged and abandoned per California Department of Conservation Division of Oil, Gas, and Geothermal Resources regulations and the requirements of the UIC permit issued by the EPA for the project. If the project does not move forward, the well pad and associated wells would be transferred to the subsurface rights owner as a condition of its agreement with PG&E. The pad material may be retained or removed from the site at the discretion of the subsurface rights owner. If the TSF pad is removed, equipment, workers and trips would be similar to the TSF pad construction as described above, but duration would be shortened to approximately 4-weeks.

Access Road Maintenance

Given that existing access roads are available, no road construction is necessary for project construction. Maintenance to the existing access roads would be limited to light graveling of the unnamed dirt road if determined to be necessary during the TSF pad construction and compression testing (this work would occur between January and March), with the assumption that no additional grading would be required. If grading is required, it would be limited to leveling and/or smoothing the existing road and would not extend beyond the compacted surface. All vehicle traffic would be on the existing access roads and all staging would be contained within the southeast portion of the existing well pad. Water trucks would be used as necessary to reduce dust during site access and other construction activities.

Electric Distribution Line

PG&E would develop an electrical distribution line to provide power to the equipment needed for compression testing. The distribution line would involve a combination of the use of existing overhead lines with no improvements, re-conductoring of existing overhead lines, and construction of new overhead and underground lines. The distribution line would be designed to or retrofitted within avian protection specifications to protect raptors and migratory birds from electrocution.

The distribution line serving the project would begin at the PG&E Eight Mile Road Substation and would be approximately 4.25-miles in length from the substation to the TSF pad. A new 300-foot long underground line would be installed from the substation to an existing overhead line. Continuing west, the first 0.3-mile of this existing overhead line is adequate for project electric load and minimal modifications are required, but the remaining 0.6-mile segment will require re-conductoring and the installation of a pad-mounted transformer in the public road right of way. The route would then continue west to King Island Road along a 1.3-mile segment that would require entirely new construction, and would cross Bishop Cut (a navigation channel) on existing tall lattice steel structures required for vessel passage. After crossing Bishop Cut, the route would

extend north along King Island Road, turning west and then north again on unnamed farm roads to the TSF. The first 1.4-miles of this portion of the route would involve re-conductoring and pole replacement, and the remaining 0.6-mile segment to the TSF pad would require new construction.

Distribution line construction would occur along existing public and private roads, and would not require construction of access routes or roads. Except for the water crossing at Bishop Cut, conductor support would consist of wooden poles with a span length of approximately 300-feet. Construction would occur within a 50-foot wide work area, centered on the line.

The crossing of Bishop Cut would involve extension of the existing lattice steel structures to provide the necessary navigation clearance for the conductors over Bishop Cut. PG&E proposes to use a helicopter to complete the mast extension and re-conductoring of the span over Bishop Cut. Since the existing distribution lines must be removed from the top of the lattice steel structures before the tops can be extended, these lines will be relocated to temporary wood poles installed around the perimeter of the lattice steel structure work areas. A service line to a nursery on the southwest side of Eight Mile Road and the crossing currently connected to the top of the mast will require temporary poles as well. Once the top extension is complete the distribution line will be relocated to the top of the lattice steel structures and the temporary wood poles removed. Construction details such as staging areas, work areas at the pole sites, pull and tension sites, areas where special construction methods may need to be employed, and areas where vegetation removal may occur, etc., would be provided to the Contractor as the information becomes available. The Bishop Cut lattice steel structure extension would require a 100 x 100 foot work area on each side of the levee approximately 300 feet from the base of the mast in the cultivated field.

Electric distribution line construction would include up to two line crews (eight to ten workers total) over a period of approximately 12-weeks. Equipment would include line trucks with augers, bucket trucks, puller rig, conductor reel trailers and crew trucks.

Proposed Avoidance and Minimization Measures

PG&E proposes the following avoidance and minimization measures to be utilized during the development of the transmission line, TSF pad, access road maintenance, drilling and coring to avoid and/or minimize potential negative project effects to GGS and sensitive habitats:

1. Prior to working on any phase of the project, all workers will be provided with Environmental Awareness Training by a qualified biologist. The training will address the identification and general ecology of GGS and other special-status species that have potential to occur in the project area, and the measures to be implemented in order to avoid impacts on these resources. Areas to be avoided will also be addressed in the training. Please contact PG&E project biologist, Catalina Reyes (925-808-8811) two weeks prior to construction to schedule the training.

2. Prior to construction of any phase of the project, all work areas (e.g., vehicle access, parking, staging) needed to complete the project will be identified in coordination with the monitoring biologist. Due to the presence of sensitive resources, some work areas may need to be adjusted. All work areas will be limited to the minimum area necessary to

complete work. Laydown and staging will be limited to the road shoulder or previously developed or disturbed areas.

3. Prior to constructing the TSF pad, high visibility fencing will be erected 20 feet beyond the proposed TSF pad to contain personnel and equipment. The construction Contractor will inspect fencing before the start of each workday and the fencing will be maintained by the Contractor until completion of the project.

4. Because construction of the TSF pad will occur within 200 feet of aquatic habitat for giant garter snake in the irrigation ditch along the gravel access road, exclusionary fencing will be installed along the irrigation ditch on the west side of the road a minimum of 200 feet from the TSF pad in both directions to prohibit snake entry. Exclusionary fencing will be placed during the GGS active period between (May 1 and October 1), so that the fence is erected before snakes move to upland refugia that may occur in the TSF pad. Snake exclusionary fencing will be buried at least six inches below the ground to prevent snakes from attempting to move under the fence. If burrows are present along the ditch, methods to hold the exclusionary fencing flush with the ground (e.g., sand or rock bags, pins) will be employed as appropriate to avoid damage to burrows. The fencing will not contain any holes along the ground large enough for snakes to enter the construction site. Fencing can be as high as 12 to 24 inches above ground.

5. Due to the temporary nature of pole installation along the irrigation ditches along the gravel access road and Eight Mile Road, and near the golf course ponds, exclusionary fencing is not required for the distribution line. However, a biological monitor will be present during all distribution line activities conducted within 200 feet of GGS aquatic habitat (i.e., irrigation ditches and golf course ponds). PG&E proposes to construct the section of distribution line located along the irrigation ditch near the TSF pad during the GGS active period.

6. To ensure that wildlife does not become trapped or entangled, no wattles or other materials with plastic monofilament netting are permitted. Burlap or coconut wattles are appropriate substitutes.

7. If practicable, ground disturbing activity (e.g. vegetation removal, compaction, placement of gravel fill, new pole placement) will be conducted during the active season for GGS (i.e., between May 1 and October 1). If ground-disturbing activity cannot be conducted during the active season, preconstruction surveys for potential wintering sites (e.g., burrows and soils crevices) within proposed disturbance areas will be conducted by a qualified biologist approved by the Service and the California Department of Fish and Wildlife (CDFW). The pre-construction survey will be conducted no more than two weeks prior to construction activities. All burrows or potential refuge habitat will be flagged and avoided. If work is suspended for a period of five days or greater, than the project area must be resurveyed for GGS. If it is determined that potential giant garter snake wintering habitat (e.g., burrows and crevices) is present within areas planned for ground disturbance, ground-disturbing activities will be postponed until the GGS active season (i.e., between May 1 and October 1).

8. A biological monitor approved by the Service and CDFW will be on site during all phases of construction to direct traffic and construction work around irrigation ditches and other sensitive habitats capable of supporting giant garter snake. Full-time monitoring will be employed during construction activities that require increase vehicle traffic and ground disturbance (i.e., TSF pad construction, distribution line development, access road maintenance, and mobilization/demobilization to escort large equipment). Part-time monitoring (1-2 days per week) will be employed during project activities limited to the well pad with limited traffic (i.e., well drilling and compression testing). The purpose of the part-time monitor is to ensure that these measures are in place and to meet the crews monitoring needs (e.g., access road maintenance monitoring, environmental awareness training for new crew members, mobilization/demobilization of large equipment or other unforeseeable need for a monitor). The biological monitor will coordinate closely with construction personnel to ensure monitors are present during key construction activities.

9. If any GGS are observed within the project area during work activities, work will cease and the on-site project manager will immediately contact the PG&E project biologist, Catalina Reyes (925-808-8811) prior to resuming work. The biological monitor has the authority to stop construction to resolve any biological concerns.

10. Access to the TSF pad and distribution line will be confined to existing roads, road shoulders, and other compacted areas. Travel along roads will be restricted to the centerline. If placement of gravel or grading on access roads is necessary, the placement will be limited to the existing road surface. No gravel will be placed on ditch banks or other areas that may support burrows that could be used by GGS. No grading will occur along segments of existing roads that may support burrows that could be used by giant garter snake.

11. The irrigation ditches, golf course ponds, and Bishop Cut will be designated as environmentally sensitive areas and physical disturbance to these features will be avoided during construction.

12. A qualified biologist approved by Service and CDFW will perform a general pre-construction survey for special-status species and other wildlife within 72 hours of the start of project construction.

13. Portable lighting would only be used during construction when absolutely necessary for worker safety, or as necessary to accomplish critical construction equipment maintenance or time-critical continuous process tasks that extend into nighttime hours. When in operation the temporary flood lighting will be directed towards the work area to minimize illumination of areas beyond the immediate work areas, and minimize reflected glare and illumination of the nighttime sky to the maximum extent practicable. When not in immediate use the temporary floodlights will be directed downward or turned off.

14. Reduce construction night lighting on sensitive habitats. Exterior lighting within the project area adjacent to preserved habitat will be of the lowest illumination allowed for human safety, selectively placed, shielded, and directed away from sensitive habitat to the maximum extent practicable.

15. Provide escape ramps at a 45 degree angle or less for any excavations that are greater than one foot that are left open overnight. For smaller holes, cover so that no gaps occur and inspect each morning for wildlife. Inspect prior to filling any trenches or holes. If wildlife become entrapped, work will stop and the PG&E project biologist, Catalina Reyes (925-808-8811), will be notified immediately to determine next steps.

16. Prior to moving parked vehicles or equipment, construction personnel will visually check for snakes and other wildlife.

17. Ground disturbance and vegetation removal will be limited to the minimum amount necessary to complete work.

18. If a plant or animal is found at the work site and is believed to be a protected species, work must STOP and the onsite biological monitor or PG&E Biologist, Catalina Reyes (925-808-8811), must be contacted for guidance. Care will be taken not to harm the plant or animal species. No wildlife or plant species will be handled and/or removed from the site by anyone except qualified biologists.

19. Construction equipment will be maintained to prevent leaks of fuels, lubricants or other pollutants into aquatic habitats.

20. Whenever possible, refueling and maintenance of vehicles will be conducted offsite. In cases when this is not practicable, refueling and maintenance of vehicles and equipment will be conducted over drip pans and at least 100 feet from any waterway.

21. Open ends of pipes, conduits or other materials stored onsite will be covered to exclude wildlife and will be inspected prior to use.

22. Vehicular speed within the project area will be limited to 10 miles per hour in order avoid impacts on wildlife that may be located on or near roadways. If ground disturbing activities, addition of gravel to roads, or movement of large equipment occurs during the GGS active period (May 1 to October 1), a biological monitor will drive in front of heavy construction vehicles (e.g., dump trucks, drill rigs) on all gravel roads during entry/exit of project site. Biologist(s) will lead vehicles at a speed of 10 mph or less, watch for signs of snakes, and stop and investigate the road if there are any concerns.

23. Watering of roads during dry season work will be performed as necessary in order to reduce potential dust resulting from project associated traffic.

24. Caution will be used when handling and/or storing chemicals (fuel, hydraulic fluid, etc.). As part of standard PG&E Best Management Practices (BMPs), crews will have appropriate materials on site to provide secondary containment and prevent and manage spills. If groundwater is encountered, contact PG&E Environmental Specialist Jim Struhs (209-628-7016).

25. Crews will implement all BMPs outlined in the project's National Pollution Discharge Elimination System Construction Storm Water Pollution Prevention Plan.

26. If the scope of work or project location changes, contact PG&E project biologist (Catalina Reyes, 925-808-8811) prior to commencing work. The PG&E project biologist or Land Planner (Ernie Ralston, 707-217-0960) will contact the Service's Bay-Delta Fish & Wildlife Office ESA/Regulatory Division (Kim S. Turner, 916-930-5604) and the CDFW Bay Delta Region (Crystal Spurr, 209-234-3442) upon notice of any such changes.

27. Remove construction related trash from the site daily and upon work completion and return site to near pre-construction contours and conditions upon project completion.

28. A silencer will be used on the air release vent during compression testing that will attenuate noise levels to less than 60dBA within an approximate 0.25 mile distance from the TSF pad, consistent with ambient noise levels (e.g. noise from farm equipment such as tractors, generators and pumps).

At the King Island site, Bishop Cut is connected to White Slough and runs along King Island Road. Perennial irrigation ditches, Bishop Cut, and associated uplands provide potential habitat for GGS. The ditches are located immediately adjacent to the project access road and Bishop Cut is located adjacent to the alternate access road. However, ditches are subject to regular vegetation management using both mechanical and chemical techniques, and these aquatic habitats offer poor to marginal habitat for GGS. The upland habitats adjacent to these ditches are agricultural croplands that are not suited for GGS. The nearest known GGS occurrence is located at Coldani Marsh less than 1.7 miles north of the TSF pad (CNDDB 2012; Hansen 2011)[1]. The TSF pad location is greater than 200 feet from potential GGS aquatic habitat, and therefore the risk of encountering GGS is greatly reduced. Also, the project area lacks marshes, expansive aquatic habitat and/or wet rice fields to attract GGS. PG&E's proposed construction site for both the TSF pad and transmission line footprint is within and/or adjoins actively farmed and regularly harvested cropland. Disked agricultural activities occur near the project site on an annual rotational basis. No burrows or other refugia were observed around the existing well pad, in the pad expansion area, or along the access road, and no ground squirrel activity was observed during PG&E's August 20, 2012, field surveys of these areas. Based on this information, the likelihood of GGS occurring within this project area is very low.

Although the likelihood of GGS occurring in the project area is low, PG&E will incorporate BMPs and avoidance and minimization measures to minimize possible, negative construction effects to GGS, its prey and upland refugia, including the prevention of oil and chemical spills and silting or fill of canals and ditches during construction and decommissioning, limiting the majority of ground disturbing activities during the GGS active period, and installing exclusionary fencing to prevent snakes from entering the project construction areas.

The DOE has determined that the proposed project may effect, but is not likely to adversely affect the GGS. They have made this determination because of the low likelihood that GGS would occur in the project area based on CNDDB occurrence and species survey data, the relatively small project footprint located within actively farmed orchard and cropland, and PG&E will adhere to

---

1 California Natural Diversity Database (CNDDB). 2012. Natural Heritage Division, California. Department of Fish and Wildlife. RareFind 4. Accessed October 2012.

Hansen, E. C. 2011. Implementation of Priority 1, Priority 2, and Priority 3 Recovery Tasks for Giant Garter Snake (*Thamnophis gigas*): Status and distribution of giant garter snakes at the eastern Delta's White Slough Wildlife Area, San Joaquin County, CA.

the aforementioned avoidance and minimization measures to minimize negative, project effects to GGS.

The Service concurs with the DOE determination that the proposed project is not likely to adversely affect GGS. The proposed avoidance and minimization measures described above are designed to sufficiently reduce direct, indirect, and/or cumulative effects to GGS to an insignificant or discountable level. This concurrence is provided specifically for project activities at the King Island site and for the Pacific Gas & Electric CAES Compression Testing Project only, as described in this document.

Unless new information reveals effects of the proposed action may affect listed species to an extent not considered or a new species or critical habitat is designated that may be affected by the proposed action, no further action pursuant to the Act is necessary. This letter does not authorize take of listed species. Any actions or proposed actions that are modified in a manner that causes an effect to listed species or critical habitat that was not considered in this consultation will require re-initiation.

This concludes informal consultation for the Pacific Gas & Electric CAES Compression Air Testing Project, in San Joaquin County, California. Please address any questions or concerns regarding this response to Maral Kasparian, Senior Fish and Wildlife Biologist, at Maral_Kasparian@fws.gov or (916) 930-5614. Please refer to Service File No. 08FBDT00-2013-I-0036 in any future correspondence regarding this project.

Sincerely,

For Kim S. Turner
Assistant Field Supervisor

cc:
Crystal Spurr, California Department of Fish and Wildlife, Stockton, California
Thomas Leeman, U.S. Fish and Wildlife Service, Sacramento, California

APPENDIX C
BIOLOGICAL SURVEY REPORT

This appendix contains a copy of the 2013 biological survey report.

North State Resources, Inc.

Technical Memorandum

Date:	July 25, 2013	**PG&E Order #:**	8105484
To:	Pacific Gas and Electric Company		
From:	North State Resources, Inc.		
Project:	PG&E Compressed Air Energy Storage Compression Testing Project		
Subject:	Draft Biological Constraints Analysis, San Joaquin County, California		

Introduction and Summary

North State Resources, Inc. (NSR) conducted a biological constraints analysis for the proposed Compression Testing Phase of the Pacific Gas and Electric Company (PG&E) Compressed Air Energy Storage Project (project) at the King Island Temporary Site Facilities (TSF) project area (project area).

The project consists of development of a TSF to conduct compression testing and evaluate the feasibility of development of a Compressed Air Energy Storage (CAES) project. Development of the TSF would include limited maintenance on existing access roads. The U.S. Department of Energy (DOE) is co-funding the TSF project and is serving as the National Environmental Policy Act (NEPA) lead agency.

Development of a distribution line is required to provide power to the TSF. Development of the distribution line would involve re-conductoring existing lines and construction of new lines. The DOE is the NEPA lead agency for development of the electric distribution line, which is being authorized separately from the TSF as an interim action.

The objective of the compression testing phase is to confirm the geologic suitability of the site and provide more detailed information for project engineering.

The biological constraints analysis included both a desktop review of biological resources and a field review of the project area. The purpose of the biological constraints analysis is to:

1) Characterize the habitats and vegetation communities present;
2) Evaluate the potential for the occurrence of special-status plant and animal species;
3) Determine the presence or absence of waters of the United States;
4) Determine the presence or absence of other sensitive biological resources (e.g., riparian habitats, nesting raptors)
5) Determine potential impacts on biological resources resulting from site ingress/egress, TSF pad development, localized excavations, pole installation, and temporary stockpiling of excavated material;
6) Recommend practicable avoidance and minimization measures (AMMs) that may be considered by PG&E to minimize and avoid potential impacts; and
7) Evaluate whether the proposed activities, in combination with the recommended AMMs, would avoid adverse effects on sensitive biological resources.

Giant garter snake, listed as threatened under the federal Endangered Species Act (ESA) and the California Endangered Species Act (CESA); Swainson's hawk, listed as threatened under CESA; northern harrier, burrowing owl, and loggerhead shrike, designated as California species of special concern; and white-tailed kite, a state fully protected species, have at least some potential to be present in or near the project area. Without the implementation of AMMs, there is a potential for the project to result in adverse effects on these species. With the implementation of the recommended AMMs, the project is not expected to result in adverse effects on these species.

The irrigation ditches within the project area appear to meet wetland criteria and may be considered potential waters of the United States. One wetland area along Eight Mile Road would not likely qualify as waters of the United States. Bishop Cut is a navigable water and qualifies as a waters of the United States. All determinations concerning waters of the United States should be considered preliminary and tentative unless verified in writing by the U.S. Army Corps of Engineers (USACE).

Because the project would receive federal funding from the DOE, the DOE is required under section 7 of the federal Endangered Species Act to determine whether the project may affect federally listed or designated critical habitat. If the DOE determines that the project may affect federally listed species or designated critical habitat, consultation with the U.S. Fish and Wildlife Service and/or National Marine Fisheries Services is required.

Project Description

Project Purpose

The objective of the proposed project is to study the feasibility of using an underground porous rock formation (depleted natural gas field) for a CAES project. CAES technology involves two major processes: (a) air compression for storage and (b) air release for electricity generation. During the air compression and storage process, electric motor-driven compressors inject air into a sealed and porous underground geological formation for storage under high pressure. During the air release phase, the high-pressure air is released from the underground reservoir, heated using natural gas (if necessary), and expanded through sequential turbines ("expanders"), which drive an electrical generator. The stored energy can be used during periods of higher electric demand, improving the efficiency of energy distribution through the power grid. This proposed project's goal is to conduct pressure testing of the formation. This would consist of injecting air to build a subsurface bubble within the reservoir sands of the depleted King Island Gas Field, and then conducting a series of pressure tests to further confirm the geologic suitability of the formation and provide more detailed information for project engineering.

PG&E proposes to construct a TSF, and perform drilling and compression tests to determine if a geological formation has the potential as a storage reservoir for future use as a CAES facility. An action that is interrelated to the construction of the TSF, drilling, and compression testing is the development of an electric distribution line that would provide power to the TSF. Development of the distribution line would involve re-conductoring existing lines and construction of new lines.

This site for the compression tests is located at the King Island Piacentine Well Pad Site (King Island) located in San Joaquin County, California. The proposed TSF is located approximately 1.8

miles northwest of the City of Stockton's northern boundary at Eight Mile Road in northwestern San Joaquin County, California. The TSF site would be situated on King Island between White Slough and Bishop Cut, and can be accessed from Interstate 5 via West Eight Mile Road and King Island Road (Figures 1 and 2a, Appendix A).

Project activities will include the construction and operation of the King Island TSF and access road maintenance. The electric distribution line will be upgraded by a combination of re-conductoring and new construction to provide power to operate the compression testing.

King Island Temporary Site Facilities

Project construction actions for developing the King Island TSF include construction of the TSF pad, well drilling, and compression and cycling testing. All staging, well drilling, compression, and cycling testing would occur on the TSF pad. Other associated project activities include access road maintenance (if deemed necessary) and development of the distribution line to power the activities at the TSF site. The expected timeline for construction activities is as follows:

- The development of the distribution line is expected to occur between August 2013 through March 2014;
- The access road maintenance, if needed, is expected to occur during the TSF pad construction time period of January 2014 through March 2014; and

TSF pad construction, well drilling, and compression testing would occur from February 2014 through August 2014.

TSF Pad Construction and Well Drilling

A pad to support the project and its operations (TSF pad) would be constructed to approximately 650 feet by 165 feet, or 2.5 acres in size, of which 0.7 acre was previously created for the geological core drilling task associated with this project. The TSF pad would be constructed as shown on the site plan (Figure 2b, Appendix A). Access road maintenance, pad construction, and drilling of the wells to complete the TSF pad at King Island is expected to take approximately 3 months.

The existing 0.7-acre pad would be expanded by additional clearing, grubbing, scarifying, and compacting into an area that is currently planted with sapling-stage walnut trees, requiring the removal of approximately 90 small trees. Geotextile material would be placed over the compacted work area, then up to 18 inches of sub-base material and Class II aggregate base would be placed and compacted. The work area would be crowned and sloped so that stormwater sheet-flows off the pad. PG&E would constrain all construction activities to the pad and a 20-foot buffer area

During the construction of the TSF pad, eight workers, five trucks and trucks to haul material, road grader/maintainer, dozer (D-5 or equal), sheep's foot compactor, roller compactor, water truck, and similar construction equipment would be used. Approximately 28 truck trips would be required to import material to the TSF pad.

Once the TSF pad is constructed, a drilling rig and associated equipment would be mobilized to the project. The primary drilling equipment includes the drill rig, mud and water tanks and pumps, shaker tanks, electric generators, diesel fuel tanks, and drill pipe racks. Two wells would be drilled into the formation– one well for injection and withdrawal of air (IW well), and the second well for monitoring

field pressures and responses to the injection and withdrawal process. The construction contractor would place all waste, cuttings, and drilling mud associated with well drilling in proper storage receptacles for offsite disposal at an authorized disposal facility. An additional five truck trips would be required to remove drill cuttings and associated material from the site. Drilling crew, engineers, temporary workers and site visitors would number an average of approximately 12 workers/people per shift, with three shifts per day. To accommodate continuous work shifts, night-time lighting would be used. Up to a maximum of 20 workers may be present at one time during various operations. In addition to worker vehicles, service, equipment, and material delivery vehicles would access the site during the drilling phase, generating an estimated 40 trips per day. Total duration of this task is approximately six weeks.

Water for pad construction and well drilling would be trucked to the project area from off-site municipal water supply sources. All drilling activities would be completed in compliance with the U.S. Environmental Protection Agency (EPA) Underground Injection Control (UIC) permit. Construction wastewater would be hauled offsite and disposed of in a permitted, commercial injection well in Rio Vista. Once the two wells are drilled and the drilling equipment demobilized from the work area, the compression and cycling equipment would be installed.

Once the two wells are drilled and the drilling equipment demobilized from the work area, the compression and cycling equipment would be installed.

Development of the facility includes installation of compression equipment, closed-loop cooling system, portable office trailer, tank for drilling mud, and lighting.

Compression and Cycling Testing
The construction and installation phase would be followed by four to five months of compression and withdrawal cycling that simulates the operation of a CAES facility. The testing would involve, initially, creating the compressed air reservoir or “bubble” by pumping the compressed air into the geological formation. Creation of bubble can take up to two months.

After the bubble is created, a series of pressure tests would be conducted and data would be collected from the IW well, the observation well and possibly from additional existing nearby gas wells to assess the reservoir response. The testing protocols are still being developed and would include a series of sequential injection, pressure buildup, pressure fall off, and possibly flow tests. The final compression testing plan would be developed to collect data that allows assessment of the reservoirs characteristics to support refinement of the computer reservoir model constructed for the project.

Other than the IW wells, the primary equipment used during the compression test would include the following:

- High-pressure compressor train capable of injecting the compressed air at flow rates up to 17 million standard cubic feet per day and compressor outlet pressures up to a maximum of 2,700 pounds per square inch,

- After-cooler to cool the compressed air to a temperature no higher than approximately 140 degrees Fahrenheit before injection,
- If necessary for safety purposes, the air supply stream may include oxygen-depleted air generated using a portable membrane filtration system or similar equipment,
- Appurtenant equipment including a temporary electrical supply, a step-down transformer, a power distribution system, a compressor cooling system, high-pressure piping, and control circuitry,
- Equipment to support withdrawal testing including high-pressure piping, a choke valve, a propane or electric line heater, a phase separator, one or more produced water storage tanks, and an air discharge vent, and
- Monitoring and measurement equipment including:
    - Wellhead pressure and temperature sensors at the wells;
    - A sensor array along the discharge piping to measure flow, pressure, temperature, combustible gas concentrations, oxygen concentrations and relative humidity; and
    - A sensor array along the injection piping to measure flow, pressure, temperature, oxygen concentrations, and relative humidity.

During this approximate 4- to 5-month period of compression and cycling testing, approximately 12 workers would be on site per day, staffing three eight-hour shifts. Night-time lighting would be required to accommodate a 24-hour work schedule. Workers, service vehicles and site visitors are expected to generate approximately15 trips per day.

Following completion of the compression testing, all of the drilling, compression, and other equipment would be removed from the site. If the compression testing has indicated the formation demonstrates appropriate characteristics for a CAES project, the pad along with established wells would be left in place for use in development of the CAES facility. If the testing demonstrates otherwise, the wells would be plugged and abandoned per California Department of Conservation Division of Oil, Gas, and Geothermal Resources (DOGGR) regulations and the requirements of the UIC permit issued by the EPA for the project. If the project does not move forward, the well pad and associated wells would be transferred to the subsurface rights owner as a condition of its agreement with PG&E. The pad material may be retained or removed from the site at the discretion of the subsurface rights owner. If the TSF pad is removed, equipment, workers and trips would be similar to the TSF pad construction as described above, but duration would be shortened to approximately 4 weeks.

Access Road Maintenance

Given that existing access roads are available, no road construction is necessary for project construction. Maintenance to the existing access roads would be limited to light graveling of the unnamed dirt road if determined to be necessary during the TSF pad construction and compression testing (this work would occur between January and March 2014) with the assumption that no additional grading would be required. If grading is required, it would be limited to leveling and/or smoothing the existing road and would not extend beyond the compacted surface. All vehicle traffic would be on the existing access roads

and all staging would be contained within the southeast portion of the existing well pad. Water trucks would be used as necessary to reduce dust during site access and other construction activities.

Electric Distribution Line

PG&E would develop an electrical distribution line to provide power to the equipment needed for compression testing. The distribution line would involve a combination of the use of existing overhead lines with no improvements, re-conductoring of existing overhead and underground lines to upgrade them to higher voltage and load capacity, and construction of new overhead lines (Figure 2a, Appendix A). The distribution line would be designed to or retrofitted within avian protection specifications to protect raptors and migratory birds from electrocution. Construction and improvements to the distribution line would occur between August 2013 and March 2014.

The distribution line serving the project would begin at the PG&E Eight Mile Road Substation and would be approximately 4.25 miles in length from the substation to the TSF pad (Figure 2a, Appendix A). A new 300-foot long underground line would be installed from the substation to an existing overhead line. Continuing west, the first 0.3-mile of this existing overhead line is adequate for project electric load and minimal modifications are required, but the remaining 0.6-mile segment will require re-conductoring and the installation of a pad-mounted transformer in the public road right of way. The route would then continue west to King Island Road along a 1.3-mile segment that would require entirely new construction, and would cross Bishop Cut (a navigation channel) on existing tall lattice steel structures required for vessel passage. The height of the existing structures will be extended as required for vessel passage. Pole replacement would be required on the east side of the levee to accommodate height extension and re-conductoring of the existing structures. After crossing Bishop Cut, the route would extend north along King Island Road, turning west and then north again on unnamed farm roads to the TSF. The first 1.4 miles of this portion of the route would involve re-conductoring and pole replacement, and the remaining 0.6-mile segment to the TSF pad would require new construction.

Distribution line construction would occur along existing public and private roads, and would not require construction of access routes or roads. Except for the water crossing at Bishop Cut, conductor support would consist of wooden poles with a span length of approximately 300-feet.. Construction would occur within a 50-foot wide work area, centered on the line.

The crossing of Bishop Cut would involve extension of the existing lattice steel structures to provide the necessary navigation clearance for the conductors over Bishop Cut. PG&E proposes to use a helicopter to complete the mast extension and re-conductoring of the span over Bishop Cut. Since the existing distribution lines must be removed from the top of the lattice steel structures before the tops can be extended, these lines will be relocated to temporary wood poles installed around the perimeter of the lattice steel structure work areas. A service line to a nursery on the southwest side of Eight Mile Road and the crossing currently connected to the top of the mast will require temporary poles as well. Once the top extension is complete the distribution line will be relocated to the top of the lattice steel structures and the temporary wood poles removed. Construction details such as staging areas, work areas at the pole sites, pull and tension sites, areas where special construction methods may need to be employed, and areas where vegetation removal may occur, etc., would be provided to the Contractor as the information becomes available. The Bishop Cut lattice steel structure extension would require a 100 x 100 foot work area on each side of the levee approximately 300 feet from the base of the mast in the cultivated field.

Electric distribution line construction would include up to two line crews (eight to ten workers total) over a period of approximately 12 weeks. Equipment would include line trucks with augers, bucket trucks, puller rig, conductor reel trailers and crew trucks.

Habitat and Affected Environment

The project area is situated in a landscape that currently supports active agricultural operations, an existing natural gas well site, access roads, several agricultural residences, and appurtenant facilities/equipment (e.g., farm equipment, staging area, and barn). It also includes a 0.7-acre well pad previously developed for the core-drilling phase of the project. The project area is located within the "Delta Islands," which are areas of former marshlands of the Sacramento–San Joaquin Delta that were historically reclaimed for agricultural use by the construction of levees/dikes and draining.

The area surrounding the TSF is generally level and ranges in elevation from approximately 5 to 10 feet below sea level. Water levels in White Slough and Bishop Cut are slightly above sea level and are separated from King Island by a series of levees topped by paved and unpaved roads. The area surrounding the TSF is crossed by a series of dirt and gravel ranch roads that provide access to the various ranch fields and to the test site. Several agricultural residences are located approximately 0.5 to 0.75 mile south of the test site along the south side of an east-west-trending gravel road.

Most of the project area occurs in agricultural fields and road shoulders that are frequently disturbed and nearly all native vegetation has been removed. The distribution line (existing and proposed new line) borders a golf course and a residential neighborhood in the eastern portion of the project area along the shoulder of Eight Mile Road.

Vegetation communities within the project area, include annual grassland, cropland/orchard, fresh emergent wetland, riverine, and ruderal (Figure 3a–3i, Appendix A). Vegetation communities are classified based on descriptions provided in *A Guide to Wildlife Habitats of California* (Mayer and Laudenslayer 1988).

Areas along the golf course on Eight Mile Road support annual grassland. The golf course was historically farmed up to Eight Mile Road prior to 1998 (Google Earth Imagery, August 17, 1998). Since the golf course installation, non-native annual grasses have re-colonized the area. Herbaceous cover is dense and is dominated by wild oat (*Avena fatua*), Johnson grass (*Sorghum halepense*), perennial ryegrass (*Festuca perenne*), fiddleneck (*Amsinckia menziesii*), wild radish (*Raphanus raphanistrum*), ripgut brome (*Bromus diandrus*), and milk thistle (*Silybum marianum*).

Cropland/orchard (e.g., corn, asparagus, onions, safflower, walnut orchard) is the dominant vegetation community within the proposed TSF pad and along the distribution line, with exception of few areas along Eight Mile Road that are dominated by annual grassland. The TSF pad is entirely within a young walnut orchard and the open areas between the rows are disked and or mowed on an annual basis. Most crops along the distribution line are annual row crops. All fields are actively farmed and annually disked, harvested and/or disturbed up to the edge of existing roads.

Fresh emergent wetlands are present in irrigation ditches with sufficient hydration throughout the project area and in ponds located on the golf course in the eastern portion of the project area. Irrigation ditches are located parallel to the gravel access road to the TSF pad, and are located perpendicular and parallel to Eight Mile Road. The irrigation ditches appear to be subject to regular vegetation management using

both mechanical and chemical techniques. Irrigation ditches adjacent to the TSF pad and gravel access road, and those perpendicular to Eight Mile Road are perennially inundated and support fresh emergent vegetation. Irrigation ditches on either side of Bishop Cut, and those at the western portion of the project area near the PG&E Eight Mile Substation are intermittently inundated during the irrigation season and are generally devoid of vegetation. Perennially inundated irrigation ditches and ponds support patches of fresh emergent vegetation including water primrose (*Ludwigia* sp.), cattails (*Typha* sp.), smartweed (*Persicaria* sp.), mosquito fern (*Azolla* sp.), and water hyacinth (*Eichhornia crassipes*).

Bishop Cut provides riverine habitat for aquatic species at the Eight Mile Road Bridge crossing. The Bishop Cut is an artificial navigation and irrigation channel connecting White Slough to the north and Disappointment Slough to the south. Within the project area, the levee banks are rip-rapped with large rock and the channel is generally devoid of vegetation. The section of the Bishop Cut levee road that will be used for project access is paved.

Areas that are often disturbed (e.g., mowed, disked) were classified as ruderal. Ruderal areas are located along the levee banks of Bishop Cut and adjacent road shoulders. Dominant plant species include common mallow (*Malva neglecta*), poison hemlock (*Conium maculatum*), mustard (*Brassica* sp.), milk thistle, Johnson grass, redroot pigweed (*Amaranthus retroflexus*), and common knotweed (*Polygonum aviculare*).

No seasonal wetlands, vernal pools, elderberry shrubs (*Sambucus nigra*), riparian wetlands or other sensitive natural community (e.g., California Natural Diversity Database (CNDDB) ranked rare natural communities) are present in the project area. Fresh emergent wetlands only occur in the ditches and golf course ponds (outside of the project area). Farmed agricultural lands do not provide habitat for special-status plant species. Vernal pools, mesic areas, alkaline or serpentine soils, chenopod scrub, and riparian forest or scrub habitats that would support special-status plant species are not present within the project area.

Methods

The status of habitat for special-status species, waters of the United States, and other sensitive biological resources within the project area was determined through desktop analysis and field reconnaissance. The following areas were evaluated during the desktop analysis and field reconnaissance and are referred to as the project area: (1) a 200-foot buffer around the TSF pad; (2) a 20-foot buffer around all gravel access roads; (3) a 50-foot-wide corridor along the approximate 4.25-mile electrical distribution alignment, and (4) within the work areas identified on either side of Bishops Cut (Figure 3a-3i, Appendix A). A discussion of the methodology for the desktop analysis and field reconnaissance is provided below.

Desktop Analysis

Multiple information sources were reviewed to evaluate biological resources within the project area. The following is a list of the principal resources:

- The *Terminous, California* USGS 7.5-minute topographic quadrangle;
- Color aerial photographs of the project area and vicinity;
- The U.S. Fish and Wildlife Service (USFWS) official list of endangered and threatened species that may occur, or be affected by projects, in the *Terminous, California*, 7.5-minute quadrangle (Appendix B);

- The California Department of Fish and Wildlife (CDFW) California Natural Diversity Database (CNDDB) (California Department of Fish and Wildlife 2013a) plant and animal records within 5 miles of the project area (Appendix B);
- The California Native Plant Society (CNPS) online Inventory of Rare and Endangered Plants (California Native Plant Society 2010) records for the *Terminous, California* and eight adjacent quadrangles (Appendix B);
- GIS shapefiles of designated critical habitat from the USFWS Critical Habitat Portal website;
- U.S. Department of Agriculture (USDA) Web Soil Survey;
- USFWS National Wetlands Inventory;
- CDFW publications including State and Federally Listed Endangered, Threatened and Rare Plants of California (California Department of Fish and Wildlife 2013a); Special Vascular Plants, Bryophytes, and Lichens (California Department of Fish and Wildlife 2013b); State and Federally Listed and Threatened Animals of California (California Department of Fish and Wildlife 2013c); and Special Animals List (California Department of Fish and Wildlife 2011); and
- Pertinent biological literature including the following: *The Jepson Manual: Vascular Plants of California* (Baldwin et al. 2012), *Amphibian and Reptile Species of Special Concern* (Jennings and Hayes 1994), and *Bird Species of Special Concern in California* (Shuford and Gardali 2008).

These resources were used to create a list of regionally occurring special-status species that may occur near the project area. Species listed in the U.S. Fish and Wildlife (USFWS) species list for San Joaquin County and special-status species identified in the CNDDB records were considered in the evaluation (e.g., listed shrimp, valley elderberry longhorn beetle, giant garter snake) (Appendix B). Additionally, special-status species not included in the USFWS species list or CNDDB records were considered due to their known geographic range and/or the presence of potential habitat (e.g., white-tailed kite and loggerhead shrike).

For the purpose of this evaluation, special-status plant species include plants that are (1) listed as threatened or endangered under the California Endangered Species Act (CESA) or the federal Endangered Species Act (ESA), (2) proposed for federal listing as threatened or endangered, (3) state or federal candidate species, (4) designated as rare by the CDFW, and (5) California Rare Plant Rank (RPR) 1A, 1B, or 2 species. Special-status animal species include species that are (1) listed as threatened or endangered under the CESA or ESA, (2) proposed for federal listing as threatened or endangered, (3) state or federal candidate species, and (4) identified by the CDFW as species of special concern or fully protected species.

Determination of wetlands was based on the approach outlined in the Corps of Engineers Wetlands Delineation Manual (Environmental Laboratory 1987) and the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region (Version 2.0) (U.S. Army Corps of Engineers 2008). Additionally, the assessment for potential “other waters” was based on the presence of an ordinary high water mark as defined in USACE regulations (33 CFR 328.3 and 33 CFR 328.4).

Field Reconnaissance

A field reconnaissance was conducted on August 20, 2012 by NSR Biologist John Hunt, and PG&E Biologist Catalina Reyes, on April 3, 2013 by NSR Biologist Brandon Amrhein, and on July 17 by NSR

Biologist Patrick Martin. The biological field review consisted of pedestrian surveys to view all areas to the extent necessary to document the existing conditions. Mr. Eric Hansen, Consulting Biologist, reviewed the TSF pad and access road to assess potential giant garter snake aquatic and upland habitat.

Special-Status Species

Table 1 (Appendix C) lists special-status species that have potential to occur within the project area based on habitat documented during the field surveys. Species for which habitat does not exist within the project area were not included in Table 1 and are not discussed further in this document.

Special-Status Plant Species

Irrigation ditches and the area along Bishop Cut within the project area provide potential habitat for 12 special-status plant species. Habitat for seven RPR 1B species potentially occurs in the project area including, slough thistle (*Cirsium crassicaule*), woolly rose-mallow (*Hibiscus lasiocarpus* var. *occidentalis*), Delta tule pea (*Lathyrus jepsonii* var. *jepsonii*), Mason's lilaeopsis (*Lilaeopsis masonii*), Sanford's arrowhead (*Sagittaria sanfordii*), and Suisun marsh aster (*Symphyotrichum lentum*). Habitat for five RPR 2 species potentially occur and include watershield (*Brasenia schreberi*), bristly sedge (*Carex comosa*), Delta mudwort (*Limosella subulata*), eel-grass pondweed (*Potamogeton zosteriformis*), marsh skullcap (*Scutellaria galericulata*), and side-flowering skullcap (*Scutellaria lateriflora*). These species are generally found in marshes and swamp habitat, which the perennially inundated irrigation ditches and Bishop Cut may provide.

Suitable habitat for these species is located within the irrigation ditches and along Bishop Cut. The project would not result in disturbance to the irrigation ditches or Bishop Cut. Therefore, the project would not adversely affect special-status plant species.

Special-Status Animal Species

Seven special-status animal species were determined to have the potential to occur in or near the project area, and could be affected by the proposed project (Table 1, Appendix C). These species include:

- giant garter snake (*Thamnophis gigas*), federal and state threatened;
- western pond turtle (*Emys marmorata*), California species of special concern;
- Swainson’s hawk (*Buteo swainsoni*), state threatened;
- white-tailed kite (*Elanus leucurus*), California fully protected species;
- northern harrier (*Circus cyaneus*), California species of special concern;
- western burrowing owl (*Athene cunicularia*), California species of special concern; and
- loggerhead shrike (*Lanius ludovicianus*), California species of special concern.

Giant Garter Snake

Perennial irrigation ditches throughout the project area and the golf course ponds north of the eastern portion of the project area potentially provides low quality aquatic habitat for the giant garter snake (GGS). The uplands within 200 feet of these areas potentially provides low quality upland habitat. Most of the dirt access road to the TSF pad borders a perennially inundated irrigation ditch (Figures 3a – 3i, Appendix A). The distribution line bisects three perennially inundated irrigation ditches and runs parallel to ponds located approximately 45 to 165 feet north of the eastern portion of the project area on the golf course.

The CNDDB contains reported GGS occurrences from marsh habitat within Coldani Marsh approximately 1.7 north of the TSF pad. Documentation of GGS within Coldani Marsh also includes surveys conducted by Eric Hansen during 2009–2010 (Hansen 2011). Although GGS are known to occur in Coldani Marsh, the densities of GGS populations in the Delta region is known to be very low and survey efforts since the mid-1980s suggest that much of the Delta is unoccupied or supports few GGS (Hansen 2013). For example, surveys conducted approximately 2 miles south of Coldani Marsh, which is 1.5 miles north of the eastern portion of the distribution line, did not detect GGS (Hansen 2011).

Essential habitat components required for GGS include (1) adequate water during the snake's primary active period; (2) suitable prey base; (3) abundant emergent, herbaceous wetland vegetation, such as cattails (*Typha* spp.) and bulrushes (*Scirpus* spp.) for escape cover and foraging habitat; (4) upland habitat for basking, cover, and retreat sites; and (5) higher elevation uplands for cover and refuge from flood waters (Miller et al. 1999).

Although vegetation is actively managed along ditches, emergent vegetation persists and these ditches may provide aquatic habitat for GGS when inundated. Because the ditches appear to be subject to regular vegetation management using both mechanical and chemical techniques and the water level fluctuates with respect to different periods of the irrigation cycle, the suitability of the ditches in providing cover and retreat habitat for GGS is limited and the habitat is considered low quality. Prey items such as mosquito fish (*Gambusia affinis*), bullfrogs (*Lithobates catesbeianus*), and Sierran treefrogs (*Psuedacris sierra*) are present within the perennially inundated ditches along the dirt access road and Eight Mile Road.

Based on studies conducted by Wylie et al. (Wylie et al. 1995; Wylie et al. 1997; Wylie et al. 2002a; Wylie et al. 2002b), the Solano Multispecies Habitat Conservation Plan (Solano HCP) analyzed landscape habitat use and found that low quality ditch habitat associated with rice fields include an artificial marsh habitat that provides the essential components (e.g., appropriate cover, high food availability, upland refuge) to support GGS. In addition, studies conducted in high quality marsh habitat surrounded by fallow fields did not locate GGS or found them at very low densities. Based on these results, areas supporting marginal to poor habitat or small, isolated patches of good habitat are presumed to not support GGS due to lack of surrounding aquatic habitat (Solano County Water Agency 2009). The project area lacks marshes or other expansive aquatic habitat (e.g., rice fields) and the potential GGS aquatic habitat that is present (e.g., irrigation ditches) is of marginal to poor quality. Therefore, it is unlikely that GGS would utilize the irrigation ditches in the project area.

Burrows and other underground refugia are important to GGS during winter and summer to escape unfavorable winter cold temperatures or excessive summer heat. The GGS Recovery Plan states that wintering habitat can be up to 250 meters (820 feet) from the edge of marsh habitat (Miller et al. 1999). Typically, the USFWS defines upland habitat as all areas occurring within 200 feet of aquatic habitat (White 1997).

The upland habitat in the agricultural portions of the project area is poor to marginal habitat for GGS. As part of existing agricultural activities, the agricultural uplands are extensively disked, tilled and periodically may be planted with row crops between the walnut orchard rows. These activities largely preclude the development/persistence of burrows created by small mammals that are used as refugia by GGS. Additionally, GGS require open space for basking and predator avoidance, and tend to avoid areas with extensive canopy cover because of excessive shade and lack of basking sites (Miller et al. 1999).

Canopy cover provided by the young walnut orchard that occupies the TSF pad limits available open habitat, which reduces suitability of upland habitat.

The ponds on the golf course north of the distribution line (Figure 3h, Appendix A) support fresh emergent wetlands and provide the essential habitat components for GGS, with the ponds providing potential aquatic habitat and the ruderal areas around the golf course providing potential upland habitat. The golf course ponds are in proximity to a series of irrigation canals, irrigation ditches, and fresh emergent wetland habitat that connects to the Coldani Marsh population of GGS located approximately 3.5 miles north of the distribution line near the golf course ponds. However, the potential for GGS to occur in the golf course ponds is considered to be low for the following reasons: 1) few burrows are present in the ruderal areas of the golf course; 2) the golf course is not surrounding by marshes or other expansive aquatic habitat; 3) surveys for GGS conducted in 2009–2010 in aquatic habitat 2 miles south of Coldani Marsh (e.g., in the aquatic corridor between the golf course and Coldani Marsh) had negative results (Hansen 2011); and 4) the densities of GGS populations in the Delta region is known to be very low (Hansen 2013).

The proximity of the distribution line to the golf course ponds ranges from approximately 65 to 145 feet. A large berm (approximately 20 feet wide and 15 feet tall) separates the golf course from the distribution line and Eight Mile Road is located immediately south of the distribution line. The areas south of Eight Mile Road near the golf course consist of residential developments and upland agricultural fields. GGS are not anticipated to occur within the distribution alignment near the golf course for the following reasons: 1) GGS are not likely to occur in the golf course ponds; 2) a large berm separates the golf course from the distribution alignment; 3) the distribution alignment is limited to the road side of the berm; and 4) no suitable habitat is present within or south of distribution alignment and, thus, there is no reason for GGS to move through the area.

In summary, given the nature of potential aquatic and upland habitats for GGS in the project area (e.g., low-quality and isolated from higher quality habitats) and the characteristics of GGS populations in the Delta region (e.g., very low densities, most potential habitat is unoccupied), GGS are unlikely to occur in the project area and very unlikely to occur in areas where the project activity would result in ground disturbance. The majority of ground disturbance and other activities associated with the project would be at the TSF pad. As part of project planning and environmental review for the well pad that was previously developed at the TSF pad for the core drilling phase, PG&E contracted with Eric C. Hansen (Consulting Environmental Biologist) to evaluate the potential for GGS to occur within the project area. Based on a review of the habitat characteristics, previous survey results in nearby areas of the Delta, and other factors, Mr. Hansen determined that there was minimal to no likelihood that GGS occur within the area of the proposed TSF pad. The report prepared by Mr. Hansen also included a summary of Delta-wide GGS survey efforts. A copy of Mr. Hansen's report is provided as Appendix D.

Project Effects

Project effects on GGS vary based on the GGS activity period (e.g., inactive or active) in which the work is conducted. Construction and operation of all activities associated with this phase of the project are anticipated to commence in August 2013 and continue through October 2014. Development of the distribution line is anticipated to start August 2013 and be completed by March 2014. Construction of the TSF pad and any road maintenance is anticipated to occur January through March 2014, with commissioning and operations to occur April through August 2014, and decommissioning activities to occur in September and October 2014.

The TSF pad construction and decommissioning would be conducted during the GGS inactive period (October 2–April 30). TSF operations would be conducted during the GGS active period (May 1–October 1). The development of the distribution line would be conducted during both the GGS active and inactive period. The following sections describe effects based on the phase of construction and the GGS activity season.

Construction, Drilling, and Decommissioning

Construction of the TSF pad, road maintenance and decommissioning of the project are expected to occur during the GGS inactive period. If GGS are present within the project area, GGS could be affected by road grading, ground disturbance, use of hazardous materials (e.g., fuel, oils), noise disturbance, lighting disturbance, and other activities associated with project construction and decommissioning.

Based on the project schedule, ground disturbance for the TSF pad and road maintenance activities would occur from January through March, and the decommissioning period would occur from September through October, 2014. The periods for construction and decommissioning roughly correspond with the GGS inactive period. During the inactive period, GGS are anticipated to be within burrows or other refugia within 200 feet of aquatic habitat (White 1997). The highest potential for effects on GGS during construction and decommissioning is from activities along the access roads where they border irrigation ditches (e.g., heavy traffic, road grading). Although suitable winter refugia (e.g., burrows) is generally lacking in the project area, GGS could be directly affected if burrows occupied by GGS were disturbed (e.g., effects resulting from crushing or collapsing burrows). Potential direct effects resulting from disturbance to burrows would be avoided with implementation of AMMs.

It is anticipated that construction and decommissioning activities would result in sound levels of approximately 81 to 90 decibels (dB) at the TSF pad based on the equipment that would be used and drilling of two wells (U.S. Fish and Wildlife Service 2006). Sources of construction noise would include medium-sized to large construction equipment, drill rigs, pneumatic tools, and medium-sized to large diesel engines. The level of noise generated from construction and decommissioning would be similar to existing farming activities (e.g., noise from farming equipment like diesel engines, generators, pumps, and power tools), but the noise would be more stationary and longer in duration at specific locations (e.g., drilling at TSF pad). Effects on GGS from construction noise are not expected and are not considered to be adverse because these activities would occur during the inactive period when GGS are in winter refugia.

Well drilling during the construction phase would occur over a 24-hour period, which would require night-time lighting. As with noise disturbance, GGS would be in winter refugia and disturbance from night-time lighting is not expected and would not result in adverse effects.

Construction and decommissioning would not involve ground-disturbance in potential aquatic habitats for GGS. However, construction and decommissioning would involve the use of fuels, oils, and other hazardous materials. GGS could be affected if hazardous materials were released into aquatic habitats occupied by GGS. Potential direct effects resulting from hazardous materials would be avoided with implementation of AMMs.

Development of Distribution Line and Project Operation

Development of the distribution line is expected to occur during the GGS inactive and active period and the project operation period (compression and cycle testing) is expected to occur during the GGS active

period. The greatest potential for GGS to be affected by distribution line development would be from vehicle access and pole replacement activities. The greatest potential for GGS to be affected during project operation activities would be from light traffic leaving and entering the TSF pad, and from noise and light generated at the TSF pad.

During development of the distribution line, line trucks and other vehicles would be accessing the distribution line to install poles or re-conductor overhead lines. Effects could result from direct contact with vehicles, collapse of refugia in which snakes may take cover, or GGS avoidance of foraging habitat (e.g., irrigation ditches, ponds). Potential direct effects resulting from vehicle traffic or excavation would be avoided or minimized with implementation of AMMs.

Project personnel and service vehicle traffic are expected to decrease during the operation phase of the project (approximately April–August), which is within the active period for GGS (active period is May 1–October 1). Snakes are expected to be within, and immediately adjacent to, aquatic habitats during the active period. GGS foraging in the irrigation ditches and GGS basking on or near roadway surfaces (e.g., near the irrigation ditches) could be disturbed by vehicle traffic. Traffic entering and leaving the TSF pad could results in direct effects on GGS. Effects could result from direct contact with vehicles or avoidance of available foraging habitat in the irrigation ditches due to the increased level of disturbance. Potential direct effects resulting from vehicle traffic would be avoided or minimized with implementation of AMMs.

Operations at the TSF pad would generate noise by compression testing over a five-month period from April through August 2014. Noise generation would be concentrated at the TSF pad. There would be two testing phases, each expected to last 3 weeks. Injection and withdrawal would be alternated on repeating daily schedules for 4 to 5 days, followed by a short period to inject air and stabilize the reservoir. Daily withdrawal would be conducted from 5 to 10 hours depending on the rates being tested. The air release vent would be installed with a silencer and air withdrawal would not result in sudden high noise levels, but would ramp-up over a 10-minute period. With a silencer on air release vent, the compression testing would generate noise reaching 65 to 90 A-weighted sound pressure levels (dBA) adjacent to the TSF pad, attenuating to less than 60 dBA approximately 0.25 mile from the TSF pad (Figures 4a and 4b, Appendix A).

Although the noise levels that would be generated at the TSF pad are similar to ambient conditions (e.g., noise from farming equipment like diesel engines, generators, pumps, and power tools), the noise would be stationary and longer in duration. Given the stationary nature of the noise and the duration of the noise, GGS in close proximity to the TSF pad could be affected. Although snakes do not have external ears or an ear drum, they do have an inner ear that is connected to their jawbone. Snakes “hear” by sensing vibrations traveling through the ground (and possibly the air), which cause vibrations in the jawbone that are relayed to the brain via the inner ear. Effects on GGS from noise could result from avoidance of aquatic or upland habitats if noise vibrations interfere with foraging activities or are otherwise uncomfortable for the snake. Given the low potential for snakes to be present near the TSF pad, the attenuation of noise with increasing distance from the TSF pad, and the ability of snakes to move away from the area, noise effects from operations are not considered to be adverse.

Operation of the project would require night-time lighting at the TSF pad seven days a week for the duration of the project. The lighting would be focused on the TSF pad and would be shielded to minimize the illumination of areas outside the TSF pad. However, the segment of irrigation ditch

immediately west of the TSF pad and along the access road could be illuminated. If GGS utilize this segment of irrigation ditch, effects could result from avoidance of the area, changes in behavior, or reduced availability of prey. Given the low potential for snakes to be present near the TSF pad, the small area of potential habitat that would be affected, and the ability of snakes to move away from the area, effects from night-time lighting are not considered to be adverse.

Western Pond Turtle

The golf course ponds north of the distribution line in the eastern portion of the project area and associated uplands provide suitable habitat for western pond turtle (Figure 3h, Appendix A). Upland nesting habitat is also present adjacent to the golf course. Western pond turtles are documented to occur in the irrigation canal approximately 1.3 miles northwest of the portion of the distribution line along the southern boundary of the golf course (California Department of Fish and Wildlife 2013d). Because of the presence of habitat and occurrences within proximity of the golf course, this species has a moderate potential to occur in the project area.

Although ditches in the project area are perennial, and contain some fresh emergent vegetation, the banks are steep and do not contain available basking sites. Ditches are actively maintained which likely precludes occupation by pond turtles. Additionally, upland breeding sites are unavailable in the cropland habitat within the project area. Due to lack of basking habitat and upland breeding sites, pond turtles are not expected to occur in the agricultural portions of the project area near the TSF pad.

Project Effects

The project could have adverse effects on western pond turtle if an individual or a nest were crushed during the construction or operation phase of the project. The peak of construction activity would occur in the winter between January and March. Western pond turtles generally hibernate under water during colder periods (i.e., winter months) (Zeiner et al. 1988) and would not likely be encountered during construction activities. Pond turtles move overland during the spring and early summer and have been documented to move over 325 feet (Jennings and Hayes 1994). Installation of the distribution line would occur in the road shoulders, which is too compacted to provide nesting substrate for western pond turtles. It is expected that only adults could be encountered along roads during project implementation.

Because the duration of the project is approximately 10 months and turtles are generally restricted to aquatic habitats, long-term effects are not expected. Implementation of AMMs provided below would minimize the potential for adverse effects on western pond turtle. These measures include a preconstruction survey and stop work measures if a turtle is encountered.

Swainson's Hawk

Suitable nesting habitat (e.g., trees, power poles/towers) for Swainson's hawk occurs within 0.5 mile of the project area. Suitable nesting habitat within 0.25 mile of the project area is limited to one eucalyptus tree (*Eucalyptus* sp.), which is located approximately 700 feet north of the TSF pad, and trees located along King Island Road, north and south of Eight Mile Road west of Bishops Cut. Foraging habitat is abundant in the agricultural lands near the project area. However, walnut orchards currently within the proposed TSF pad do not provide foraging habitat (California Department of Fish and Game 1994). CNDDB records include one Swainson's hawk occurrence approximately 0.2 mile southeast of the PG&E Eight Mile Road Substation, one 2001 Swainson's hawk nest approximately 1 mile south of Eight Mile Road at Bishops Cut along Disappointment Slough, and Swainson's hawks nested in 2009 approximately 1 mile northeast of the TSF pad.

Surveys following the guidance provided in *Recommended Timing and Methodology for Swainson's Hawk Nesting Surveys in California's Central Valley* (Swainson's Hawk Technical Advisory Committee 2000) were conducted by NSR during the spring of 2013 within 0.5 mile of the project area. No Swainson's hawk nests were detected within 0.5 mile of the project area (North State Resources 2013). One Swainson's hawk pair exhibited nesting behavior during April 2013 approximately 1.5 miles north of the project area (North State Resources 2013).

Given that there is a general lack of nesting habitat within 0.25 mile of the project area, and that the 2013 surveys did not detect nesting Swainson's hawks within 0.5 mile of the project area, the potential for Swainson's hawks to nest within 0.5 mile of the project area during project activities is considered to be low.

Project Effects

Noise generated during construction and operation activities could affect Swainson's hawks if active nests are located within 0.25 mile of the project area (California Department of Fish and Game 1994). As discussed above, it is anticipated that construction of the TSF pad, well drilling, and installation of the distribution line would result in a high sound level of approximately 81 to 90 dB, which is similar to the ambient sound level generated by annual crop farming occurring year-round (e.g., tilling, planting spraying, pumping, harvesting); however, drilling would be stationary and of longer duration.

Construction of the TSF pad and drilling noise would be generated continuously for 3 months and is anticipated to occur between January and March 2014. Decommissioning would occur during September and October, thus construction and decommissioning would largely occur during the non-nesting season for Swainson's hawk (non-nesting season is October 1 to February 28). Given that construction and decommissioning would occur outside the Swainson's hawk nesting period, effects on Swainson's hawks is not expected.

Development of the distribution line would occur between August 2013 and March 2014. Initiation of the distribution line improvements would occur at the end, but completed before the start of the Swainson's hawk nesting period (March 1 through September 15). Activities associated with development of the distribution line (e.g., noise and line-of-sight disturbance) could result in effects on nesting Swainson's hawks (e.g., nest abandonment). However, work would occur after the post-fledgling period (June 10-July 30) (Swainson's Hawk Technical Advisory Committee 2000) and effects on young would not be expected for they would have likely have fledged by early August.

During the operation phase (compression testing), most noise generation would be concentrated within the TSF pad. Operation sound levels would be at a similar sound level as for the construction phase of the project (approximately 65-90 dbA with a silencer). With a silencer on the air release vent, the decibel rating at 0.25-mile would be less than 60 dBA, which is a low sound level (U.S. Fish and Wildlife Service 2006). Compression testing would occur during the nesting season for Swainson's hawk (nesting season is March 1–September 15). Noise generation during drilling and compression testing are similar in sound level and duration. These sound levels are comparable to ambient sound levels; however, noise would be stationary and continuous for a longer duration than farming activities.

Because the operation phase would occur during the nesting season for Swainson's hawk, effects on Swainson's hawk from noise could result in the incidental loss of fertile eggs, nestlings, or otherwise lead to nest abandonment, which could adversely affect the species. However, noise would be of similar level

and duration between the drilling and compression testing. If Swainson's hawks begin nesting after the commencement of drilling in January 2014 near the project area and compression testing follows drilling, effects are not expected.

Given that (1) the potential for Swainson's hawk to nest within 0.25 mile of the TSF pad is very low, (2) nest sites greater than 0.25 mile from the TSF pad would be subject less than 60 dBA, which is lower than ambient conditions, and (3) noise conditions are similar between drilling and compression testing, which would commence prior to the nesting season, impacts on nesting Swainson's hawks are considered low.

Both the construction and the operation phase of the project would require night-time lighting seven days a week during the drilling activities and compression testing, respectively. Because the low potential for Swainson's hawks to nest within 0.25 mile of the project area, lighting would be consistent from the onset of the nesting season, and operations would cease in the fall/winter of 2014, adverse lighting effects on nesting Swainson's hawks, if present, are not expected.

Project activities could adversely affect Swainson's hawk if the project starts at the end of the nesting season (e.g., distribution line) or does not start prior to the nesting season (e.g., construction and operation activities). Swainson's hawk surveys would be conducted to determine presence/absence if project activities begin during any time of the nesting season. If present, determination of buffers or a limited operating period may be required. If nesting occurs within 0.5 mile while construction/drilling or operation phases (compression testing) are in progress, nesting activity should be monitored to confirm noise or line-of-sight disturbance during construction or operation activities does not disrupt nesting success. Implementation of the AMMs provided below would minimize the potential for adverse effects on Swainson's hawks.

Other Special-Status Birds

Habitat for white-tailed kite, northern harrier, western burrowing owl, and loggerhead shrike is present in the project area. Nesting habitat for loggerhead shrike and white-tailed kite is present in the trees and shrubs in the project area. Open areas near ponds at the golf course may provide nesting habitat for northern harrier. Burrows and other structures (e.g., culverts) in annual grasslands and ruderal habitats along road shoulders, open areas, and levee berms provide habitat for burrowing owl. White-tailed kite is documented by the CNDDB to nest 2 miles northeast of the project area and burrowing owl is reported to occur within 3.8 miles southeast of the project area (California Department of Fish and Wildlife 2013d). Northern harrier was observed nesting 1.5 miles north of the project area during April 2013 (North State Resources 2013). Because of the presence of habitat and known occurrences near the project area, white-tailed kite, and loggerhead shrike have a low potential to occur in the TSF pad, and a moderate potential to occur along the distribution line; northern harrier has a moderate potential to occur near the golf course ponds along the distribution line; and western burrowing owl has a moderate potential to occur along the distribution line.

Project Effects

As described for the Swainson's hawk, construction and operation activities could affect nesting success for other special-status birds. Ground disturbing activities and vegetation removal could directly affect birds nesting on the ground or in trees slated for removal (e.g., mortality of young in nest). Direct effects (e.g., nest abandonment due to noise disturbance) on nesting birds may result if construction activities commence after the nesting season begins.

Construction of the distribution line occurs within non-nesting and nesting habitat for the burrowing owl. Burrowing owls occupy burrows throughout the year and effects on burrowing owl could occur during any time of year. Although no burrowing owls were observed during the field reconnaissance on April 3 and July 17 2013, burrowing owls could move into the area prior to construction. Habitat is limited to the distribution line and effects on owls would only be anticipated during installation of the distribution line.

Noise and lighting effects resulting from construction/decommissioning (January-March; September-October) and operation activities (April-August) would be the same as those described for the Swainson's hawk. Because high sound levels and ongoing night-time lighting would be present from the onset of potential nesting activity and operations would cease in the fall/winter of 2014, no effects on birds nesting near the TSF pad are expected. However, if construction phase does not start until after the nesting season begins, effects on nesting birds could be adverse if nests are located in or near the project area.

Implementation of the AMMs provided below would reduce the potential for adverse effects on special-status birds. These measures include preconstruction surveys for burrowing owl and, if work does not commence prior to the nesting season, preconstruction surveys for other nesting special-status birds.

Waters of the United States

An assessment for potential waters of the United States was conducted during the August 20, 2012, April 3, and July 17, 2013 field reconnaissance visits. Some of the irrigation ditches within the project area were observed to support a prevalence of hydrophytic vegetation, and some reaches of the irrigation ditches contained flowing or ponded water (Photographs 1 and 2). Water is generally pumped in or out of White Slough or Bishop Cut depending on need to irrigate farmland or to keep the area from flooding. The irrigation ditches within the project area are adjacent (separated by a levee) to White Slough or Bishop Cut, which qualify as waters of the United States. Given that the irrigation ditches support hydrophytic vegetation, are subject to extended inundation and/or saturation, and are adjacent to waters of the United States, the features are considered as potential waters of the United States. The project would not result in any physical disturbance of irrigation ditches or Bishop Cut, and would not result in direct impacts on potential waters of the United States. AMMs have been incorporated into the project to avoid indirect impacts to potential waters of the United States.

A small area (3 feet by 4 feet) south of Eight Mile Road adjacent to the subdivision is hydrated with nuisance water from landscape irrigation. Cattails (*Typha* sp.) and barnyard grass (*Echinochloa crusgalli*), which are both hydrophytic plants, have colonized the area at the interface of the paved road and adjacent soil (Photograph 13). Wetland plants thrive due to continued irrigation run-off. Because of the dominance of hydrophytic vegetation, sufficient hydrology augmented by irrigation, and soil saturation, the area would likely meet the USACE definition of a wetland (per 33 CFR 328.3).

The hydrology that supports this wetland would not likely persist if irrigation ceased. The area is nearly level and water collects at the slight rise in the topography where the pavement meets a gravel road that is perpendicular to the paved shoulder. The area is rehydrated and inundated with reoccurring landscape irrigation. Based on the depth of the ponded area (less than 2 inches), it is likely, during normal precipitation events, the area dries or percolates and would not be hydrated for a sufficient duration to support a prevalence of hydrophytic vegetation, and would revert to upland vegetation. Based on USACE guidance, the feature would not qualify as waters of the United States because the area is artificially irrigated and would likely revert to upland vegetation if irrigation was to cease (U.S. Army Corps of Engineers 2011). However, because this area would be used as an access route access and staging would

be limited to the gravel road and disturbed areas, this area will be avoided and no direct impacts on this feature are expected. Implementation of BMPs and AMMs incorporated into the project would avoid indirect effects on this feature.

One roadside ditch occurs adjacent to the golf course in the eastern portion of the project area. Vegetation in the ditch is dominated by upland and facultative upland plant species including ripgut brome and poison hemlock (Photograph 14). Because the duration of inundation is insufficient to support a dominance of hydrophytic vegetation and the ditch does not exhibit evidence of hydrology that supports long-duration saturation or inundation (e.g., lacks water marks, drift lines, sediment deposits) to support wetland vegetation, the ditch does not qualify as a federal jurisdictional wetland (per 33 CFR 328.3). Additionally, the ditch does not exhibit evidence of scour or sediment deposition, which indicates that it is not subject to frequent or high-velocity flows. It also gradually loses depth, and terminates west and east of the golf course entrance, which is evidence that it is not tributary to waters of the United States or other water body features. Based on lack of wetland hydrology and hydrophytic vegetation, these ditches may collect water during storm events, but water either percolates or evaporates quickly. The ditch is not considered to qualify as waters of the United States because it: (1) is not a natural stream that has been altered; (2) was not excavated in waters of the United States; (3) does not have relatively permanent flowing or standing water; (4) does not connect two or more jurisdictional waters of the United States; and (5) does not drain natural water bodies (including wetlands) into the tributary system of a traditional navigable or interstate water (U.S. Army Corps of Engineers 2011).Although the USFWS National Wetlands Inventory identifies the entire project area as farmed wetlands, the existing access roads, the existing well pad, and the proposed TSF pad do not appear to currently meet wetland criteria. The existing access roads and the existing well pad consist of compacted surfaces that are graded and unvegetated; and do not exhibit evidence of long-duration ponding or saturation, or exhibit other indications of wetland hydrology. The proposed TSF pad expansion area currently supports a leveled and routinely disked agricultural field that is planted with a young walnut orchard. Field inspection of this area did not identify the presence of hydrophytic vegetation or evidence of soil inundation/saturation unrelated to routine irrigation. Based on observation of the water level in ponded portions of the irrigation ditch, the surface of the agricultural field is several feet above the water table. Given the lack of hydrophytic vegetation and an absence of indications of a current wetland hydrology, the existing access roads, the existing well pad, and the TSF pad are not considered to qualify as waters of the United States.

It is important to note that the field assessment did not involve a formal delineation using USACE methodology and no detailed investigations for wetland hydrology were conducted. The entire project area was historically Sacramento–San Joaquin Delta marshland prior to dikes/draining and conversion to agricultural production. Areas of agricultural production that were formerly wetlands may still qualify as jurisdictional wetlands if hydrological characteristics remain to the extent that hydrophytic vegetation would return if the agricultural activities ceased and the levees were breached. All determinations provided in this document concerning waters of the United States should be considered preliminary and tentative unless verified in writing by the USACE.

Other Sensitive Biological Resources

Migratory birds and raptors (i.e., birds of prey) protected under the federal Migratory Bird Treaty Act and California Fish and Game Code may nest on open ground, vegetation, or structures within the project area. Multiple stick nests and mud nests were observed during the field visits. Cliff swallow (*Petrochelidon pyrrhonota*) nests were observed under the Eight Mile Road Bridge over Bishop Cut.

As described for the Swainson's hawk, construction and operation activities could have adverse effects on nesting success for birds nesting near the construction site. Implementation of AMMs provided below would reduce the potential for adverse effects on nesting migratory birds and raptors. If work does not commence prior to the nesting season, preconstruction surveys for nesting birds should be conducted.

The project also occurs within a PG&E designated raptor concentration zone. Birds that perch or build nests on utility poles may become electrocuted if they come in contact with live wires. Raptors and other migratory birds utilize power poles to perch and build nests. As discussed in the project description, the distribution line would be built or retrofitted to avian protection specifications.

Wildlife corridors connect habitat that is separated by human activities. Wildlife corridors are important as they increase available habitat by providing protective passage between suitable habitat. Nursery habitat provides habitat elements necessary to raise young to maturity (e.g., caves, rookeries, wetland, rivers). Bishop Cut provides migratory, spawning, and rearing habitat for several fish species. The project would not occur within Bishop Cut and would not interfere with the movement of any native resident or migratory fish or wildlife species, with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites.

Tree removal required for the project is limited to removal of approximately 90 sapling-sized walnut trees in a portion of a walnut orchard. The walnut orchard is not considered a sensitive biological resource and the tree removal would not require authorization under, or conflict with, a tree ordinance.

The project area occurs within the San Joaquin County Multispecies Habitat Conservation and Open Space Plan (SJMSCP) planning area. The proposed project is not subject to discretionary approval by San Joaquin County, and as such would not conflict with the SJMSCP.

Recommended Avoidance and Minimization Measures:

1. Prior to working on any phase of the project, all workers will be provided with Environmental Awareness Training by a qualified biologist. The training will address the identification and general ecology of giant garter snake, Swainson's hawk, nesting birds and other special-status species that have potential to occur in the project area, and the AMMS to be implemented in order to avoid impacts on these resources. Areas to be avoided will also be addressed in the training. Please contact PG&E project biologist two weeks prior to construction to schedule the training.

2. Prior to construction of any phase of the project, all work areas (e.g., vehicle access, parking, staging) needed to complete the project will be identified in coordination with the monitoring biologist. Due to the presence of sensitive resources, some work areas may need to be adjusted. All work areas will be limited to the minimum area necessary to complete work. Laydown and staging will be limited to the road shoulder or previously developed or disturbed areas along the golf course.

3. Prior to constructing the TSF pad, high visibility fencing will be erected 20 feet beyond the proposed TSF pad to contain personnel and equipment. The Construction Contractor will inspect fencing before the start of each workday and the fencing will be maintained by the Contractor until completion of the project.

4. Because construction of the TSF pad will occur within 200 feet of aquatic habitat for giant garter snake in the irrigation ditch along the gravel access road, exclusionary fencing will be installed along the irrigation ditch on the west side of the road a minimum of 200 feet from the TSF pad in both directions to prohibit snake entry. Exclusionary fencing will be placed during the active period between (May 1 and October 1), so that the fence is erected before snakes move to upland refugia that may occur in the TSF pad. Snake exclusionary fencing will be buried at least six inches below the ground to prevent snakes from attempting to move under the fence. If burrows are present along the ditch, methods to hold the exclusionary fencing flush with the ground (e.g., sand or rock bags, pins) will be employed as appropriate to avoid damage to burrows. The fencing will not contain any holes along the ground large enough for snakes to enter the construction site. Fencing can be as high as 12 to 24 inches above ground.

5. Due to the temporary nature of pole installation along the irrigation ditches along the gravel access road and Eight Mile Road, and near the golf course ponds, exclusionary fencing is not required for the distribution line. However, a biological monitor will be present during all distribution line activities conducted within 200 feet of GGS aquatic habitat (i.e., irrigation ditches and golf course ponds). PG&E proposes to construct the section of distribution line located along the irrigation ditch near the TSF pad during the GGS active period.

6. To ensure that wildlife does not become trapped or entangled, no wattles or other materials with plastic monofilament netting are permitted. Burlap or coconut wattles are appropriate substitutes.

7. If practicable, ground disturbing activity (e.g. vegetation removal, compaction, placement of gravel fill, new pole placement) will be conducted during the active season for giant garter snake (i.e., between May 1 and October 1). If ground-disturbing activity cannot be conducted during the active season, preconstruction surveys for potential wintering sites (e.g., burrows and soils crevices) within proposed disturbance areas will be conducted by a qualified biologist approved by the USFWS and CDFW. The preconstruction survey will be conducted no more than two weeks prior to construction activities. All burrows or potential refuge habitat will be flagged and avoided. If work is suspended for a period of five days or greater, than the project area must be resurveyed for giant garter snake. If it is determined that potential giant garter snake wintering habitat (e.g., burrows and crevices) is present within areas planned for ground disturbance, ground-disturbing activities will be postponed until the giant garter snake active season (i.e., between May 1 and October 1).

8. A biological monitor approved by the USFWS and CDFW will be on site during all phases of construction to direct traffic and construction work around irrigation ditches and other sensitive habitats capable of supporting giant garter snake. Full-time monitoring will be employed during construction activities that require increase vehicle traffic and ground disturbance (i.e., TSF pad construction, distribution line development, access road maintenance, and mobilization/demobilization to escort large equipment). Part-time monitoring (1-2 days per week) will be employed during project activities limited to the well pad with limited traffic (i.e., well drilling and compression testing). The purpose of the part time monitor is to ensure that AMMs are in place and to meet the crews monitoring needs. The purpose of the part time monitor is to ensure that AMMs are in place and to meet the crews monitoring needs (e.g., access road maintenance monitoring, environmental awareness training for new crew members, mobilization/demobilization of large equipment or other unforeseeable need for a monitor). The

biological monitor will coordinate closely with construction personnel to ensure monitors are present during key construction activities.

9. If any giant garter snakes are observed within the project area during work activities, work will cease and the on-site project manager will immediately contact the PG&E project biologist subsequently the USFWS and CDFW will be contacted before work proceeds. The biological monitor has the authority to stop construction to resolve any biological concerns.

10. Access to the TSF pad and distribution line will be confined to existing roads, road shoulders, and other compacted areas. Travel along roads will be restricted to the centerline. If placement of gravel or grading on access roads is necessary, the placement will be limited to the existing road surface. No gravel will be placed on ditch banks or other areas that may support burrows that could be used by giant garter snake. No grading will occur along segments of existing roads that may support burrows that could be used by giant garter snake.

11. The irrigation ditches, golf course ponds, and Bishop Cut will be designated as environmentally sensitive areas and physical disturbance to these features will be avoided during construction.

12. A qualified biologist approved by USFWS and CDFW will perform a general pre-construction survey for special-status species and other wildlife within 72 hours of the start of project construction.

13. Portable lighting would only be used during construction when absolutely necessary for worker safety, or as necessary to accomplish critical construction equipment maintenance or time-critical continuous process tasks that extend into nighttime hours. When in operation the temporary flood lighting will be directed towards the work area to minimize illumination of areas beyond the immediate work areas, and minimize reflected glare and illumination of the nighttime sky to the maximum extent practicable. When not in immediate use the temporary floodlights will be directed downward or turned off.

14. Reduce construction night lighting on sensitive habitats. Exterior lighting within the project area adjacent to preserved habitat will be of the lowest illumination allowed for human safety, selectively placed, shielded, and directed away from sensitive habitat to the maximum extent practicable.

15. Provide escape ramps at a 45 degree angle or less for any excavations that are greater than one foot that are left open overnight. For smaller holes, cover so that no gaps occur and inspect each morning for wildlife. Inspect prior to filling any trenches or holes. If wildlife becomes entrapped, work will stop and the PG&E project biologist will be notified immediately to determine next steps.

16. Prior to moving parked vehicles or equipment, construction personnel will visually check for snakes and other wildlife.

17. Ground disturbance and vegetation removal will be limited to the minimum amount necessary to complete work.

18. If a plant or animal is found at the work site and is believed to be a protected species, work must STOP and a biological monitor must be contacted for guidance. Care will be taken not to harm the plant or animal species. No wildlife or plant species will be handled and/or removed from the site by anyone except qualified biologists.

19. Construction equipment will be maintained to prevent leaks of fuels, lubricants or other pollutants into aquatic habitats.

20. Whenever possible, refueling and maintenance of vehicles will occur offsite. In cases when this is not practicable, refueling and maintenance of vehicles and equipment will be conducted over drip pans and at least 100 feet from any waterway.

21. Open ends of pipes, conduits or other materials stored onsite will be covered to exclude wildlife and will be inspected prior to use.

22. Vehicular speed within the project area will be limited to 10 miles per hour in order avoid impacts on wildlife that may be located on or near roadways. If ground disturbing activities, addition of gravel to roads, or movement of large equipment (May 1–October 1), a biological monitor will drive in front of heavy construction vehicles (e.g., dump trucks, drill rigs) on all gravel roads during entry/exit of project site. Biologist will lead vehicles at a speed of 10 mph or less, watch for signs of snakes, and stop and investigate the road if there are any concerns.

23. Watering of roads during dry season work will be performed as necessary in order to reduce potential dust resulting from project associated traffic.

24. All potential nesting substrate (e.g., shrubs and trees) that requires removal to construct the project should be removed before the onset of the nesting season (i.e., prior to February 15), if practicable. This will help preclude nesting and substantially decrease the likelihood of direct impacts on nesting birds. If this is not feasible then a nesting bird survey of potential nesting substrate will be performed 72 hours prior to its removal.

25. Surveys for nesting birds will be required if project construction is to occur during the nesting season. Surveys will be conducted by a qualified biologist approved by USFWS and CDFW.

    Surveys for Swainson's hawk will be conducted within a 0.5-mile radius between March 1 and September 15, and follow guidance provided by the Swainson's Hawk Technical Advisory Committee (see Appendix E).

    Surveys for burrowing owl within suitable habitat will be conducted within 72 hours of the start of construction.

    Surveys for other nesting birds will consist of performing an initial survey after February 15, 2013 or within a month of the start of project date if project is to begin later in the nesting bird season. A second nesting bird survey will be performed within 72 hours of the start of construction. Surveys will be completed within a 250-foot buffer of the project area. The surveys will be repeated if work is suspended for five days or more. Please contact PG&E project biologist two weeks prior to construction schedule surveys.

26. Caution will be used when handling and/or storing chemicals (fuel, hydraulic fluid, etc.). As part of standard PG&E Best Management Practices (BMPs), crews will have appropriate materials on site to provide secondary containment and prevent and manage spills. If groundwater is encountered, contact the PG&E Environmental Specialist.

27. Crews will implement all BMPs outlined in the project's NPDES Construction Storm Water Pollution Prevention Plan.

28. If the scope of work or project location changes, contact PG&E project biologist prior to commencing work. The PG&E project biologist or Land Planner will contact the USFWS Bay-Delta Fish & Wildlife Office ESA/Regulatory Division and the Dept. of Fish & Wildlife - Bay Delta Region upon notice of any such changes.

29. Remove construction related trash from the site daily and upon work completion and return site to near pre-construction contours and conditions upon project completion.

References

Baldwin, B. G., D. H. Goldman, R. P. D. J. Keil, T. J. Rosatti, and D. H. Wilken. 2012. *The Jepson manual: vascular plants of California*. 2nd ed. Berkeley, California: University of California Press.

California Department of Fish and Game. 1994. Staff report regarding mitigation for impacts to Swainson's hawks (Buteo swainsoni) in the Central Valley of California.

California Department of Fish and Wildlife. 2011. Special animals list. January 2011.

———. 2013a. State and federally listed endangered, threatened, and rare plants of California. January 2013.

———. 2013b. Special vascular plants, bryophytes, and lichens list. January 2013.

———. 2013c. State and Federally Listed Endangered, Threatened Animals of California. January 2013.

———. 2013d. Rarefind. California natural diversity database (CNDDB). April 23, 2013.

California Native Plant Society. 2010. Inventory of rare and endangered plants (online edition, v8-01a). http://www.rareplants.cnps.org/ cited March 25, 2013.

Hansen, E. C. 2011. Implementation of Priority 1, Priority 2, and Priority 3 Recovery Tasks for Giant Garter Snake (Thamnophis gigas) - Status and distribution of giant garter snakes at the eastern Delta's White Slough Wildlife Area, San Joaquin County, CA.

———. 2013. Giant Garter Snake Impacts Review for the Pacific Gas and Electric Company (PG&E) Compressed Air Energy Storage Project-King Island Piacentine Well Pad Expansion and Core Well Drilling Project. January 23, 2013.

Jennings, M. R., and M. P. Hayes. 1994. Amphibian and reptile species of special concern in California. California Department of Fish and Game, Inland Fisheries Division.

Mayer, K. E., and W. F. Laudenslayer, Jr., eds. 1988. *A guide to wildlife habitats of California*. Sacramento: California Department of Forestry and Fire Protection.

Miller, K. J., K. Hornaday, U. S. Fish and Wildlife Service, Sacramento Fish and Wildlife Office, and The Giant Garter Snake Recovery Team. 1999. Draft recovery plan for the giant garter snake (Thamnophis gigas). U.S. Fish and Wildlife Service. 1999.

North State Resources. 2013. PG&E CAES Project-King Island and East Island Swainson's Hawk Survey Results. Unpublished.

Shuford, W. D., and T. Gardali. 2008. *California bird species of special concern*. Vol. 1. Camarillo Sacramento, California: Western Field Orinthologists, California Department of Fish and Game.

Solano County Water Agency. 2009. Solano Multispecies Habitat Conservation Plan Final Administrative Draft.

Swainson's Hawk Technical Advisory Committee. 2000. Recommended timing and methodology for Swainson's hawk nesting surveys in California's Central Valley. May 31, 2000.

U.S. Army Corps of Engineers. 2008. Regional supplement to the Corps of Engineers wetland delineation manual: arid west region (version2.0). U. S. Army Corps of Engineers Engineer Research and Development Center. Report No. ERDC/EL TR-08-28.

———. 2011. Draft guidance on identifying waters protected by the Clean Water Act. April 27, 2011.

U.S. Fish and Wildlife Service. 2002. Recovery plan for the California red-legged frog (*Rana aurora draytonii*). U.S. Fish and Wildlife Service.

———. 2006. Estimating the effects of auditory and visual disturbance to northern spotted owls and marbled murrelets in northwestern California. July 26, 2006.

White, W. S. 1997. Programmatic formal consultation for U.S. Army Corps of Engineers 404 permitted projects with relatively small effects on the giant garter snake within Butte, Colusa, Glenn, Fresno, Merced, Sacramento, San Joaquin, Solano, Stanislaus, Sutter, and Yolo Counties, California. Sacramento Fish and Wildlife Office. November 13, 1997.

Wylie, G. D., M. L. Casazza, and J. K. Daugherty. 1997. 1996 Progress report for giant garter snake study. Unpublished report. USGS Biological Resources Division Dixon Research Station.

Wylie, G. D., M. L. Casazza, and L. L. Martin. 2002a. The distribution of giant garter snakes and their habtiat in the Natomas Basin. USGS, Western Ecological Research Center, Dixon Field Station.

Wylie, G. D., M. L. Casazza, L. L. Martin, and M. Carpenter. 2002b. Monitoring giant garter snakes at Colusa National Wildlife Refuge: 2002 progress report. Prepared for U.S. Fish and Wildlife Service and U.S. Bureau of Reclamation. USGS Western Ecological Research Center, Dixon Field Station.

Wylie, G. D., T. Graham, M. L. Cassaza, M. M. Paquin, and J. K. Daugherty. 1995. National biological service giant garter snake study progress report for the 1995 field season. Unpublished report. USGS Biological Resources Division, Dixon Research Station.

Zeiner, D. C., W. F. Laudenslayer Jr., K. E. Mayer, and M. White, eds. 1988. *California's wildlife Volume I: Amphibians and reptiles*. Sacramento, California: California Department of Fish and Game.

Representative Photographs
Photographs taken on August 20, 2012 and April 3, 2013

Photograph 1. Irrigation ditch south of TSF pad. Photograph taken August 20, 2012.

Photograph 2. Irrigation ditch near the TSF pad. Photograph taken April 3, 2013.

Photograph 3. Walnut orchard adjacent to TSF pad. Photograph taken August 20, 2012.

Photograph 4. TSF pad and access road. Photograph taken April 3, 2013.

Photograph 5. Existing core drilling pad. Photograph taken April 3, 2013.

Photograph 6. King Island Road looking south. Bishop Cut is on the left. Photograph taken August 20, 2012.

Photograph 7. Western pull location and work area at the intersection of King Island Road and Eight Mile Road. Photograph taken April 3, 2013.

Photograph 8. Irrigation ditch and drainage located at the western pull location and work area at the intersection of King Island Road and Eight Mile Road. Photograph taken April 3, 2013.

Photograph 9. Bishop Cut at Eight Mile Road Bridge. Swallow nests are present under the bridge. Photograph taken April 3, 2013.

Photograph 10. Eastern pull location and work area at the intersection of King Island Road and Eight Mile Road. Photograph taken April 3, 2013.

Photograph 11. Representative intermittent irrigation ditch. Ditch located in the eastern pull location work area. Photograph taken April 3, 2013.

Photograph 12. Ruderal area between the PG&E Eight Mile Road Substation and the golf course in the eastern portion of the project area. Photograph taken April 3, 2013.

Photograph 13. Small wetland area created by nuisance irrigation water. Wetland would not likely qualify as waters of the United States. Photograph taken July 17, 2013.

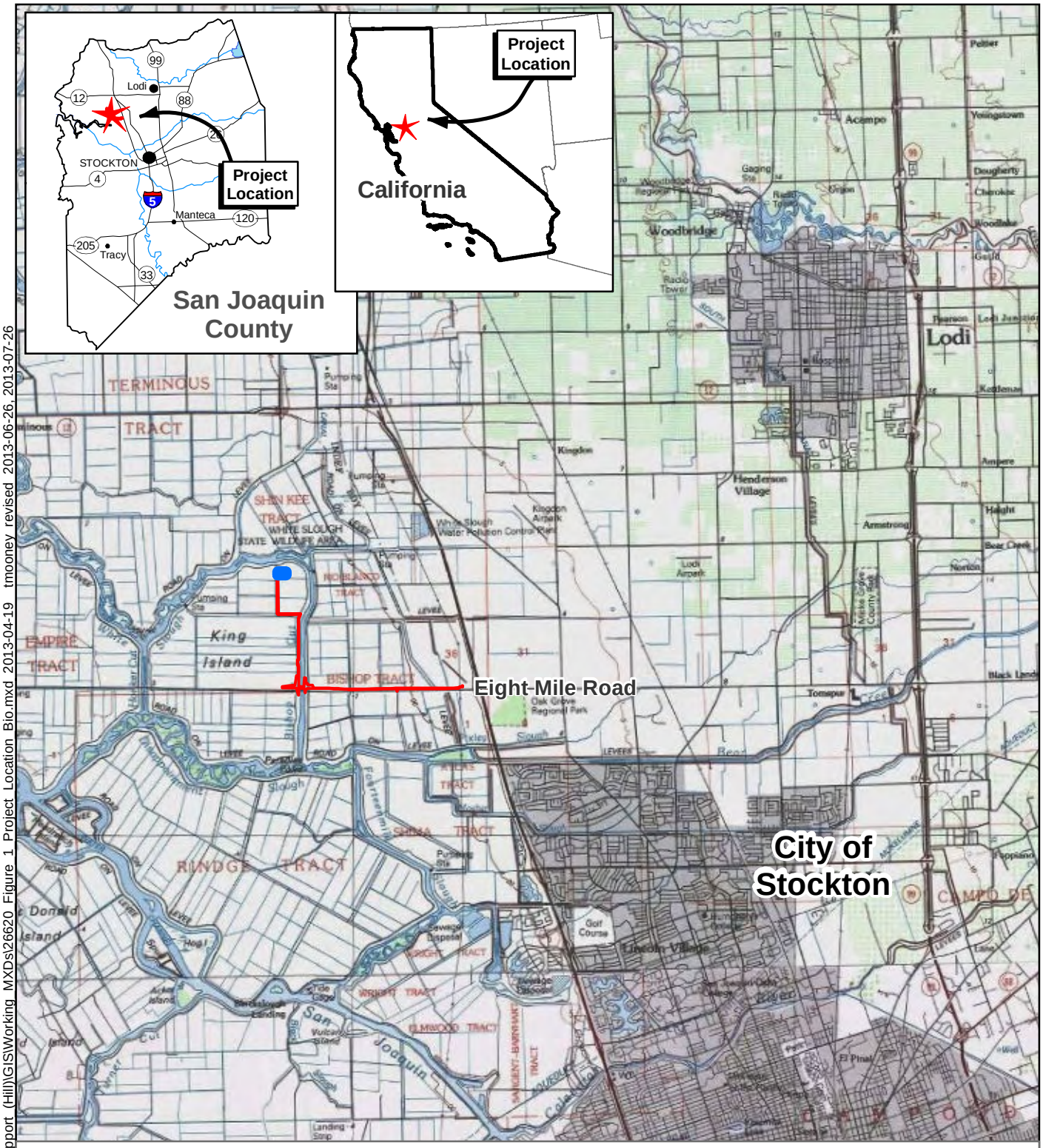
Photograph 14. Annual grassland located at the golf course entrance. Roadside ditch (beneath vegetation, red arrow) does not qualify as a waters of the United States. Photograph taken April 3, 2013.

Photograph 15. Representative pond and berm on the golf course adjacent to the distribution corridor in the eastern portion of the project area. Photograph taken April 3, 2013.

Photograph 16. Representative irrigation ditch in the eastern portion of the project area along Eight Mile Road. Photograph taken April 3, 2013.

APPENDIX A

Figures

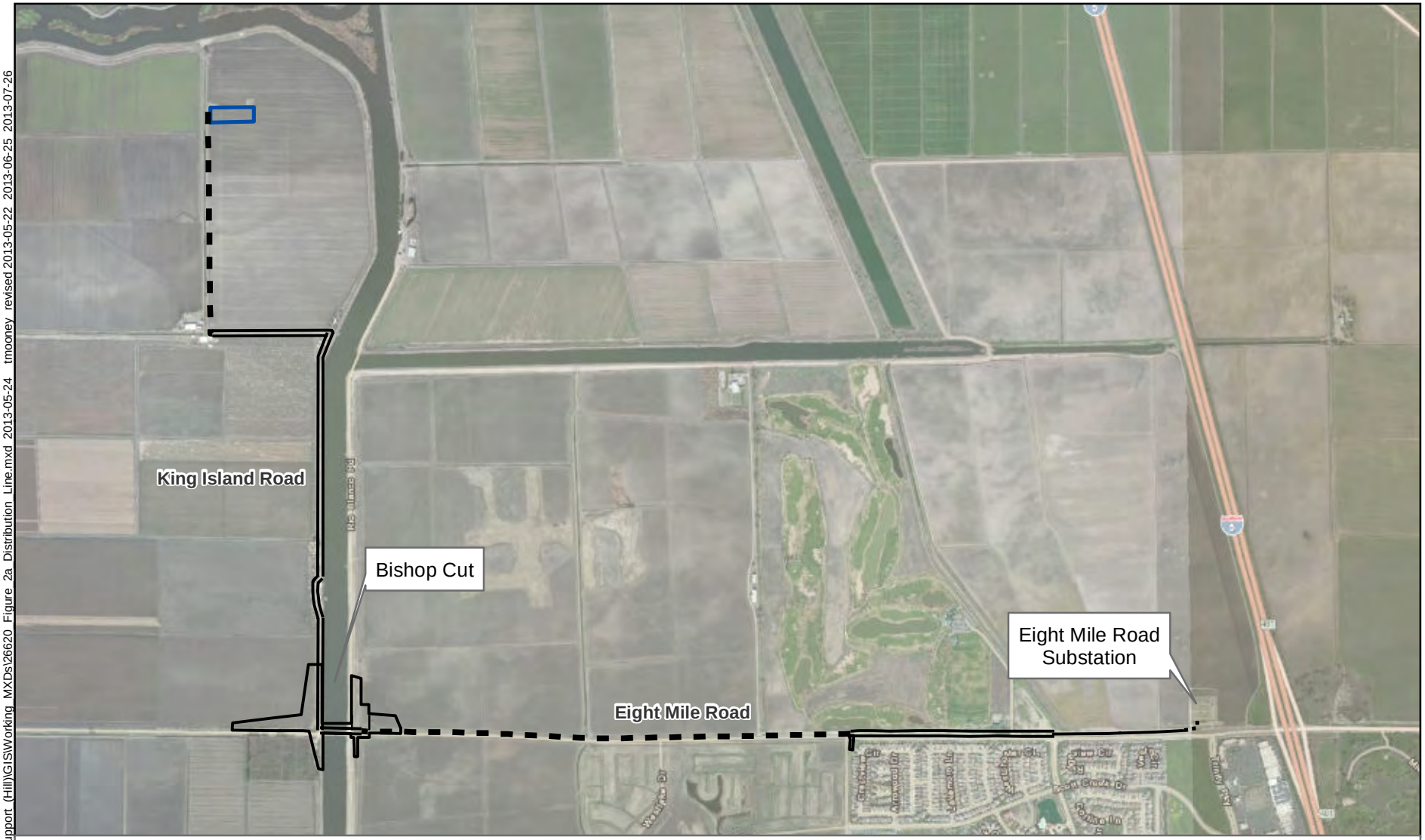


G:\Projects\26620_CAES_EA_Support_(Hill)\GIS\Working_MXDs\26620_Figure_1_Project_Location_Bio.mxd 2013-04-19 tmooney revised 2013-06-26, 2013-07-26

North State Resources, Inc.

PG&E CAES Project - King Island

Figure 1
Project Location



New Overhead Lines
Existing Overhead Lines - Reconductor
Existing Overhead Lines - No work required
New Underground Lines
Work Areas
TSF Facility

N

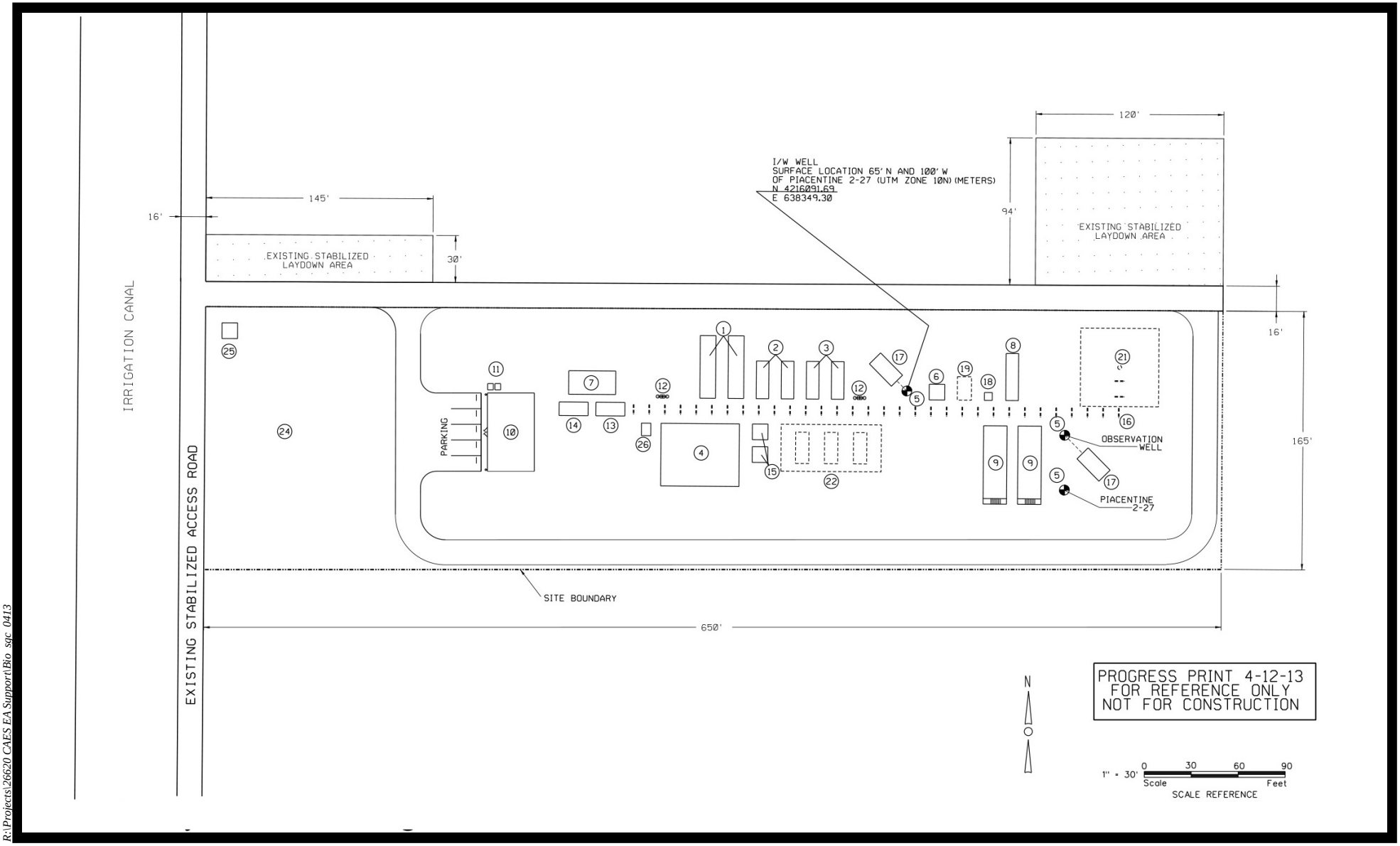
0 1,000 2,000 4,000
Feet

G:\Projects\26620_CAES_EA_Support_(Hill)\GIS\Working_MXDs\26620_Figure_2a_Distribution_Line.mxd 2013-05-24 tmooney revised 2013-05-22 2013-06-25 2013-07-26

North State Resources, Inc.

PG&E CAES Project - King Island

Figure 2a
Distribution Line



R:\Projects\26620 CAES EA Support\Bio sqc 0413

North State Resources, Inc.

PG&E CAES Project – King Island

Figure 2b
Site Layout

G:\Projects\26620_CAES_EA_Support_(Hill)\GIS\Working_MXDs\26620_Figure_3_Survey_Results_Revised_July_26_2013_Study_Area.mxd 2013-04-25 tmooney revised 2013-07-26

North State Resources, Inc.

PG&E CAES Project - King Island

Figure 3a
Survey Results
July 26, 2013

G:\Projects\26620_CAES_EA_Support_(Hill)\GIS\Working_MXDs\26620_Figure_3_Survey_Results_Revised_July_26_2013_Study_Area.mxd 2013-04-25 tmooney revised 2013-07-26

North State Resources, Inc.

PG&E CAES Project - King Island

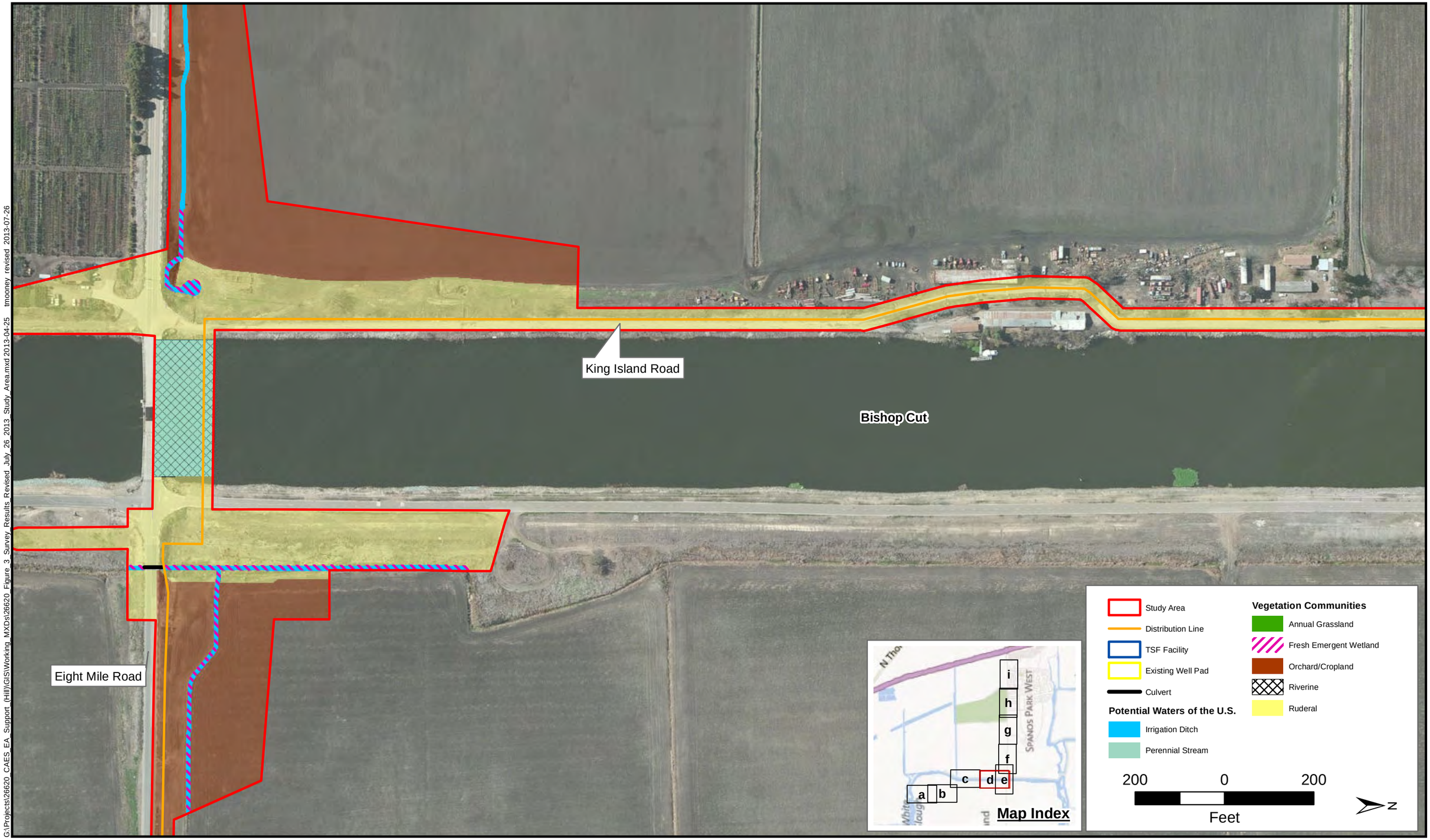
Figure 3b
Survey Results
July 26, 2013

G:\Projects\26620_CAES_EA_Support_(Hill)\GIS\Working_MXDs\26620_Figure_3_Survey_Results_Revised_July_26_2013_Study_Area.mxd 2013-04-25 tmooney revised 2013-07-26

North State Resources, Inc.

PG&E CAES Project - King Island

Figure 3c
Survey Results
July 26, 2013

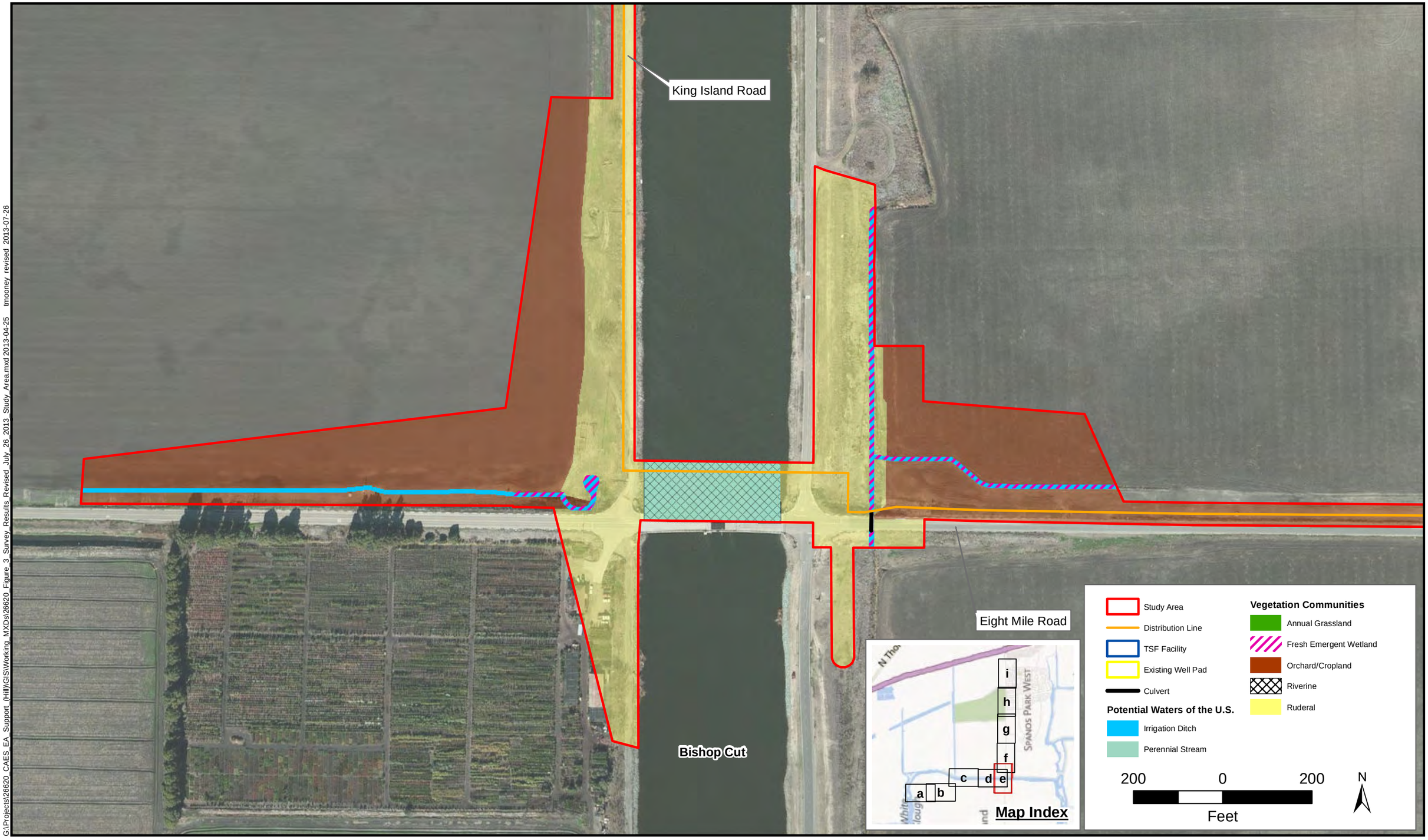


G:\Projects\26620_CAES_EA_Support_(Hill)\GIS\Working_MXDs\26620_Figure_3_Survey_Results_Revised_July_26_2013_Study_Area.mxd 2013-04-25 tmooney revised 2013-07-26

North State Resources, Inc.

PG&E CAES Project - King Island

Figure 3d
Survey Results
July 26, 2013



G:\Projects\26620_CAES_EA_Support_(Hill)\GIS\Working_MXDs\26620_Figure_3_Survey_Results_Revised_July_26_2013_Study_Area.mxd 2013-04-25 tmooney revised 2013-07-26

North State Resources, Inc.

PG&E CAES Project - King Island

Figure 3e
Survey Results
July 26, 2013

G:\Projects\26620_CAES_EA_Support_(Hill)\GIS\Working_MXDs\26620_Figure_3_Survey_Results_Revised_July_26_2013_Study_Area.mxd 2013-04-25 tmooney revised 2013-07-26

North State Resources, Inc.

PG&E CAES Project - King Island

Figure 3f
Survey Results
July 26, 2013

G:\Projects\26620_CAES_EA_Support_(Hill)\GIS\Working_MXDs\26620_Figure_3_Survey_Results_Revised_July_26_2013_Study_Area.mxd 2013-04-25 tmooney revised 2013-07-26

North State Resources, Inc.

PG&E CAES Project - King Island

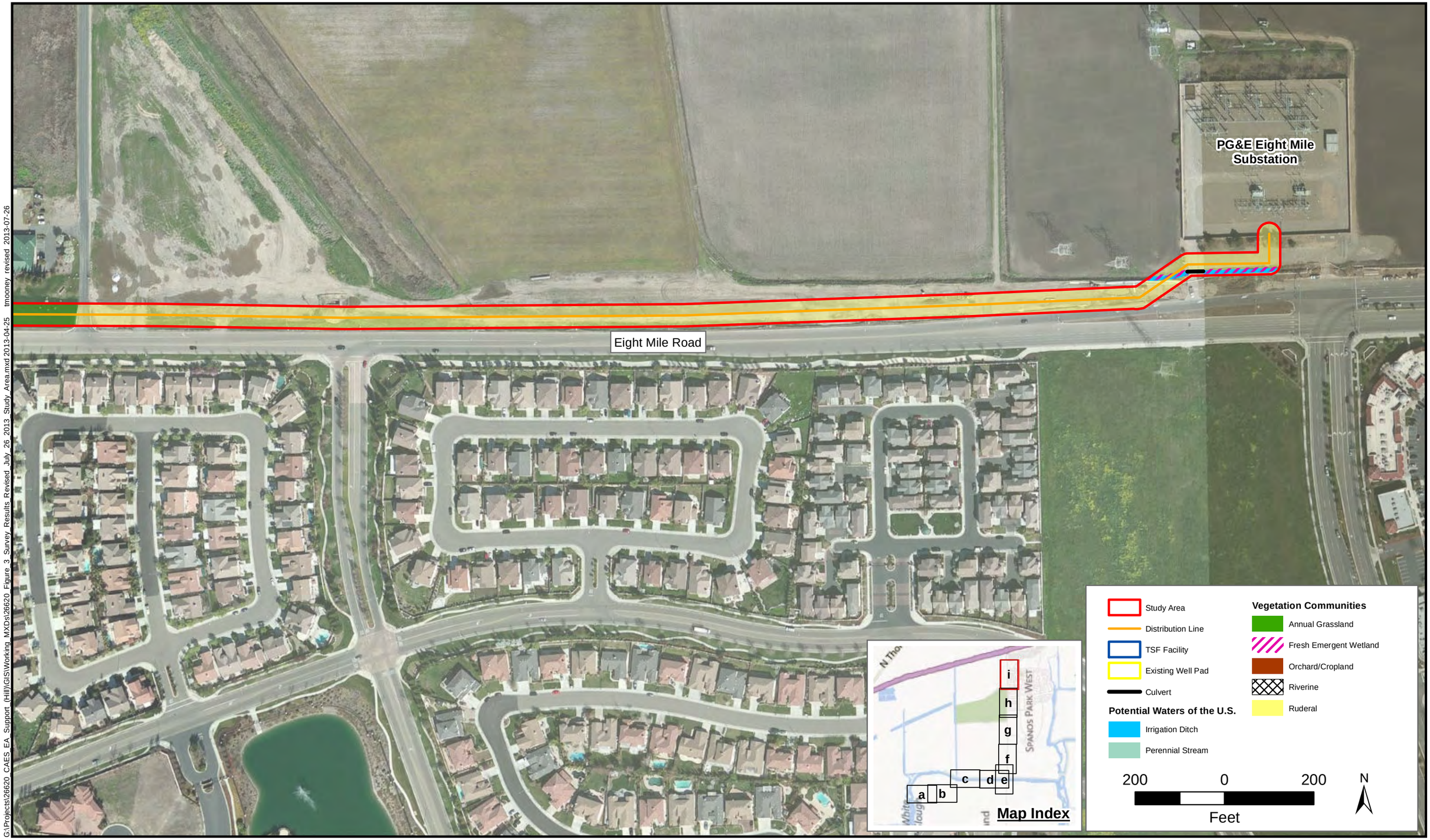
Figure 3g
Survey Results
July 26, 2013

G:\Projects\26620_CAES_EA_Support_(Hill)\GIS\Working_MXDs\26620_Figure_3_Survey_Results_Revised_July_26_2013_Study_Area.mxd 2013-04-25 tmooney revised 2013-07-26

North State Resources, Inc.

PG&E CAES Project - King Island

Figure 3h
Survey Results
July 26, 2013

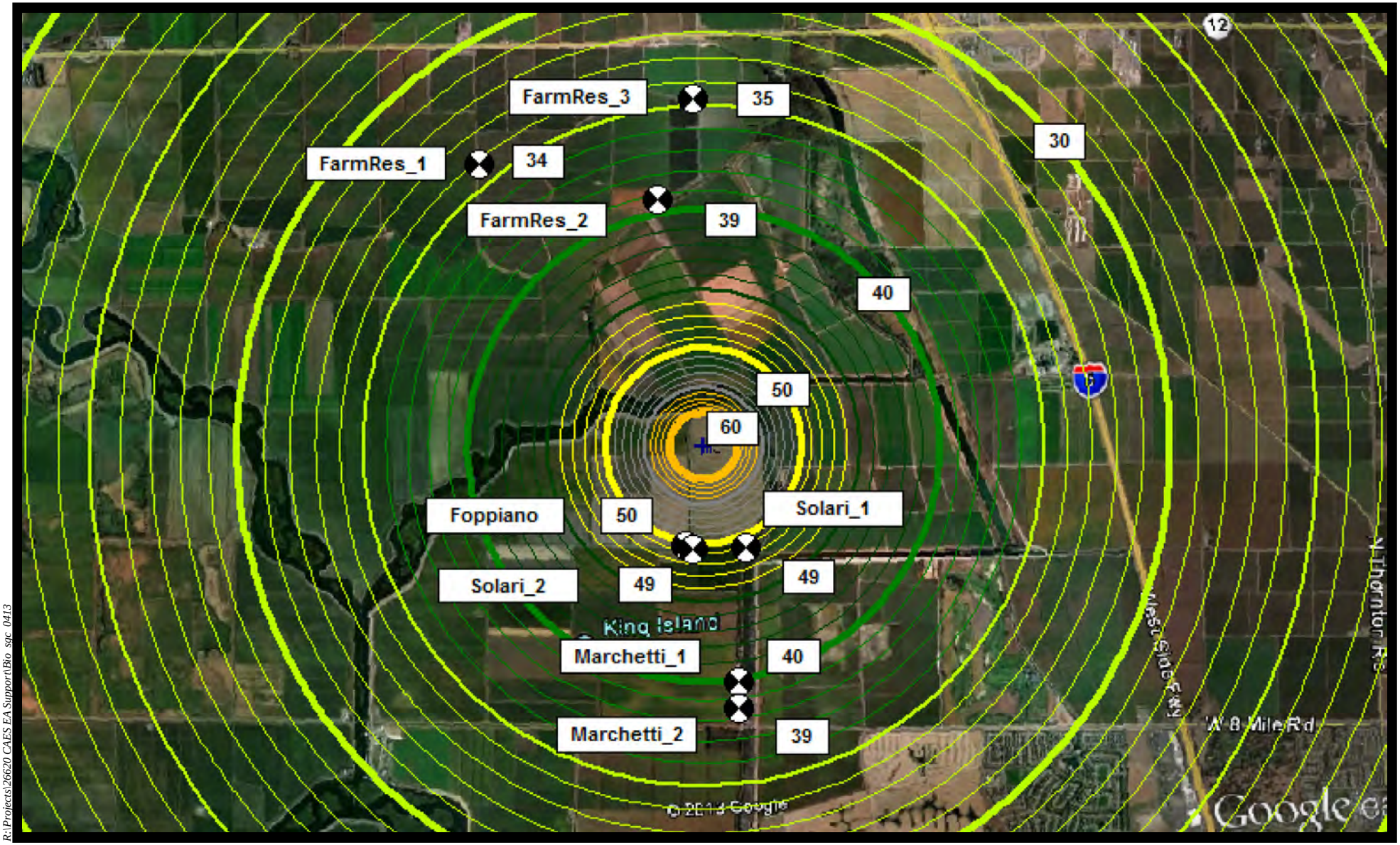


G:\Projects\26620_CAES_EA_Support_(Hill)\GIS\Working_MXDs\26620_Figure_3_Survey_Results_Revised_July_26_2013_Study_Area.mxd 2013-04-25 tmooney revised 2013-07-26

North State Resources, Inc.

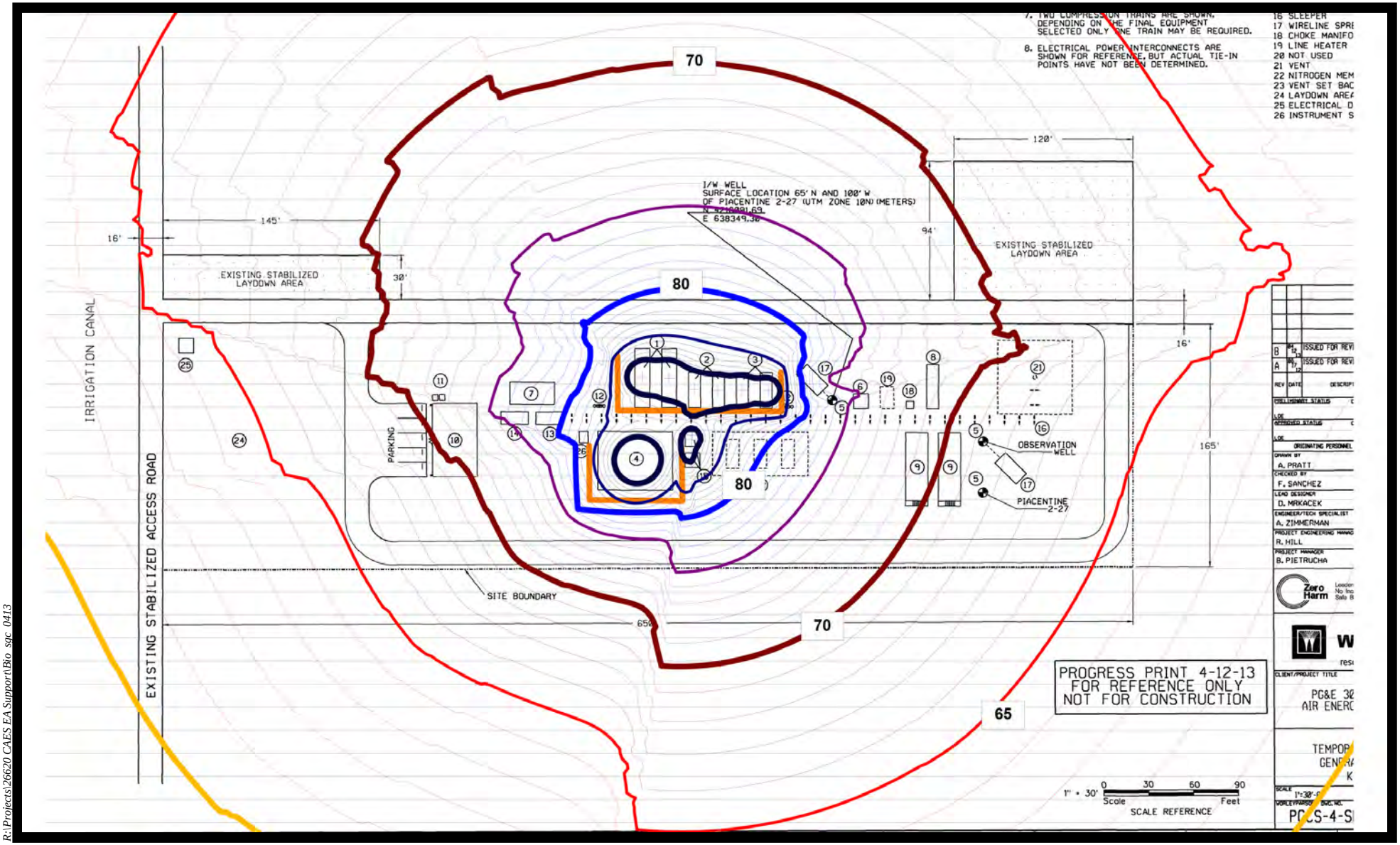
PG&E CAES Project - King Island

Figure 3i
Survey Results
July 26, 2013



R:\Projects\26620 CAES EA Support\Bio sqc 0413

Figure 4a
Noise Contours with Mitigation



R:\Projects\26620 CAES EA Support\Bio sqc 0413

Figure 4b
Noise Contours at TSF Pad with Mitigation

APPENDIX B

USFWS, CNDDB, and CNPS Queries

United States Department of the Interior

FISH AND WILDLIFE SERVICE

Sacramento Fish and Wildlife Office
2800 Cottage Way, Room W-2605
Sacramento, California 95825

April 19, 2013

Document Number: 130419063611

Heather L. Kelly
North State Resources
5000 Bechelli Lane Ste 203
Redding, ca 96002

Subject: Species List for CAES Project

Dear: Ms. Kelly

We are sending this official species list in response to your April 19, 2013 request for information about endangered and threatened species. The list covers the California counties and/or U.S. Geological Survey 7½ minute quad or quads you requested.

Our database was developed primarily to assist Federal agencies that are consulting with us. Therefore, our lists include all of the sensitive species that have been found in a certain area *and also ones that may be affected by projects in the area*. For example, a fish may be on the list for a quad if it lives somewhere downstream from that quad. Birds are included even if they only migrate through an area. In other words, we include all of the species we want people to consider when they do something that affects the environment.

Please read Important Information About Your Species List (below). It explains how we made the list and describes your responsibilities under the Endangered Species Act.

Our database is constantly updated as species are proposed, listed and delisted. If you address proposed and candidate species in your planning, this should not be a problem. However, we recommend that you get an updated list every 90 days. That would be July 18, 2013.

Please contact us if your project may affect endangered or threatened species or if you have any questions about the attached list or your responsibilities under the Endangered Species Act. A list of Endangered Species Program contacts can be found here.

Endangered Species Division

TAKE PRIDE IN AMERICA

U.S. Fish & Wildlife Service

Sacramento Fish & Wildlife Office

Federal Endangered and Threatened Species that Occur in or may be Affected by Projects in the Counties and/or U.S.G.S. 7 1/2 Minute Quads you requested

Document Number: 130419063611

Database Last Updated: September 18, 2011

Quad Lists

Listed Species

Invertebrates

Branchinecta lynchi
vernal pool fairy shrimp (T)

Desmocerus californicus dimorphus
valley elderberry longhorn beetle (T)

Lepidurus packardi
vernal pool tadpole shrimp (E)

Fish

Acipenser medirostris
green sturgeon (T) (NMFS)

Hypomesus transpacificus
Critical habitat, delta smelt (X)
delta smelt (T)

Oncorhynchus mykiss
Central Valley steelhead (T) (NMFS)
Critical habitat, Central Valley steelhead (X) (NMFS)

Oncorhynchus tshawytscha
Central Valley spring-run chinook salmon (T) (NMFS)
winter-run chinook salmon, Sacramento River (E) (NMFS)

Amphibians

Ambystoma californiense
California tiger salamander, central population (T)

Rana draytonii
California red-legged frog (T)

Reptiles

Thamnophis gigas
giant garter snake (T)

Mammals

Sylvilagus bachmani riparius
riparian brush rabbit (E)

Quads Containing Listed, Proposed or Candidate Species:

TERMINOUS (479C)

County Lists

No county species lists requested.

Key:

(E) *Endangered* - Listed as being in danger of extinction.

(T) *Threatened* - Listed as likely to become endangered within the foreseeable future.
(P) *Proposed* - Officially proposed in the Federal Register for listing as endangered or threatened.
(NMFS) Species under the Jurisdiction of the National Oceanic & Atmospheric Administration Fisheries Service. Consult with them directly about these species.
Critical Habitat - Area essential to the conservation of a species.
(PX) *Proposed Critical Habitat* - The species is already listed. Critical habitat is being proposed for it.
(C) *Candidate* - Candidate to become a proposed species.
(V) Vacated by a court order. Not currently in effect. Being reviewed by the Service.
(X) *Critical Habitat* designated for this species

Important Information About Your Species List

How We Make Species Lists

We store information about endangered and threatened species lists by U.S. Geological Survey 7½ minute quads. The United States is divided into these quads, which are about the size of San Francisco.

The animals on your species list are ones that occur within, **or may be affected by** projects within, the quads covered by the list.

- Fish and other aquatic species appear on your list if they are in the same watershed as your quad or if water use in your quad might affect them.
- Amphibians will be on the list for a quad or county if pesticides applied in that area may be carried to their habitat by air currents.
- Birds are shown regardless of whether they are resident or migratory. Relevant birds on the county list should be considered regardless of whether they appear on a quad list.

Plants

Any plants on your list are ones that have actually been observed in the area covered by the list. Plants may exist in an area without ever having been detected there. You can find out what's in the surrounding quads through the California Native Plant Society's online Inventory of Rare and Endangered Plants.

Surveying

Some of the species on your list may not be affected by your project. A trained biologist and/or botanist, familiar with the habitat requirements of the species on your list, should determine whether they or habitats suitable for them may be affected by your project. We recommend that your surveys include any proposed and candidate species on your list. See our Protocol and Recovery Permits pages.

For plant surveys, we recommend using the Guidelines for Conducting and Reporting Botanical Inventories. The results of your surveys should be published in any environmental documents prepared for your project.

Your Responsibilities Under the Endangered Species Act

All animals identified as listed above are fully protected under the Endangered Species Act of 1973, as amended. Section 9 of the Act and its implementing regulations prohibit the take of a federally listed wildlife species. Take is defined by the Act as "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect" any such animal.

> Take may include significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding, or shelter (50 CFR §17.3).

Take incidental to an otherwise lawful activity may be authorized by one of two procedures:

- If a Federal agency is involved with the permitting, funding, or carrying out of a project that may result in take, then that agency must engage in a formal consultation with the Service.

  During formal consultation, the Federal agency, the applicant and the Service work together to avoid or minimize the impact on listed species and their habitat. Such consultation would result in a biological opinion by the Service addressing the anticipated effect of the project on listed and proposed species. The opinion may authorize a limited level of incidental take.

- If no Federal agency is involved with the project, and federally listed species may be taken as part of the project, then you, the applicant, should apply for an incidental take permit. The Service may issue such a permit if you submit a satisfactory conservation plan for the species that would be affected by your project.

  Should your survey determine that federally listed or proposed species occur in the area and are likely to be affected by the project, we recommend that you work with this office and the California Department of Fish and Game to develop a plan that minimizes the project's direct and indirect impacts to listed species and compensates for project-related loss of habitat. You should include the plan in any environmental documents you file.

Critical Habitat

When a species is listed as endangered or threatened, areas of habitat considered essential to its conservation may be designated as critical habitat. These areas may require special management considerations or protection. They provide needed space for growth and normal behavior; food, water, air, light, other nutritional or physiological requirements; cover or shelter; and sites for breeding, reproduction, rearing of offspring, germination or seed dispersal.

Although critical habitat may be designated on private or State lands, activities on these lands are not restricted unless there is Federal involvement in the activities or direct harm to listed wildlife.

If any species has proposed or designated critical habitat within a quad, there will be a separate line for this on the species list. Boundary descriptions of the critical habitat may be found in the Federal Register. The information is also reprinted in the Code of Federal Regulations (50 CFR 17.95). See our Map Room page.

Candidate Species

We recommend that you address impacts to candidate species. We put plants and animals on our candidate list when we have enough scientific information to eventually propose them for listing as threatened or endangered. By considering these species early in your planning process you may be able to avoid the problems that could develop if one of these candidates was listed before the end of your project.

Species of Concern

The Sacramento Fish & Wildlife Office no longer maintains a list of species of concern. However, various other agencies and organizations maintain lists of at-risk species. These lists provide essential information for land management planning and conservation efforts. More info

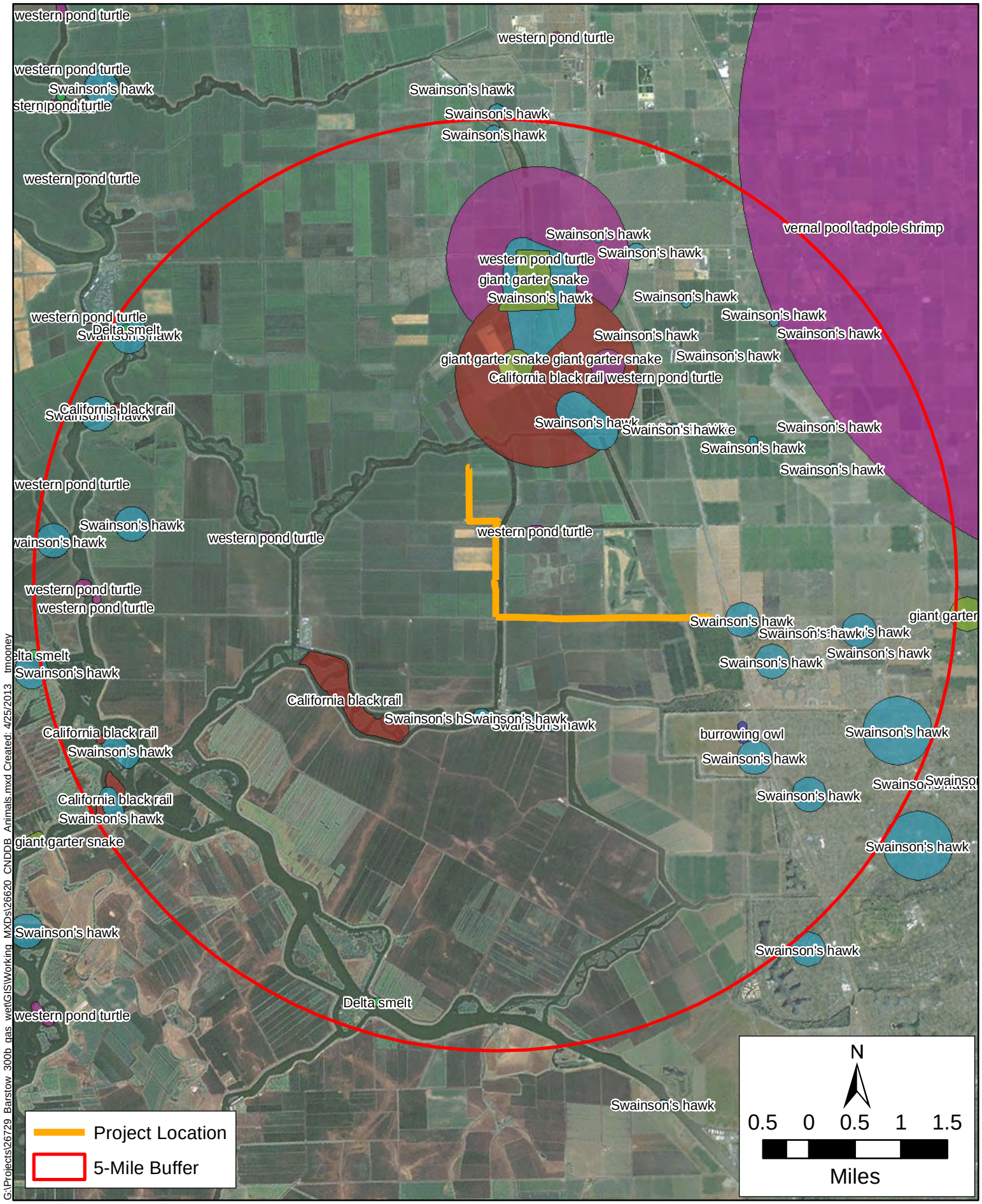
Wetlands

If your project will impact wetlands, riparian habitat, or other jurisdictional waters as defined by section 404 of the Clean Water Act and/or section 10 of the Rivers and Harbors Act, you will need to obtain a permit from the U.S. Army Corps of Engineers. Impacts to wetland

habitats require site specific mitigation and monitoring. For questions regarding wetlands, please contact Mark Littlefield of this office at (916) 414-6520.

Updates

Our database is constantly updated as species are proposed, listed and delisted. If you address proposed and candidate species in your planning, this should not be a problem. However, we recommend that you get an updated list every 90 days. That would be July 18, 2013.

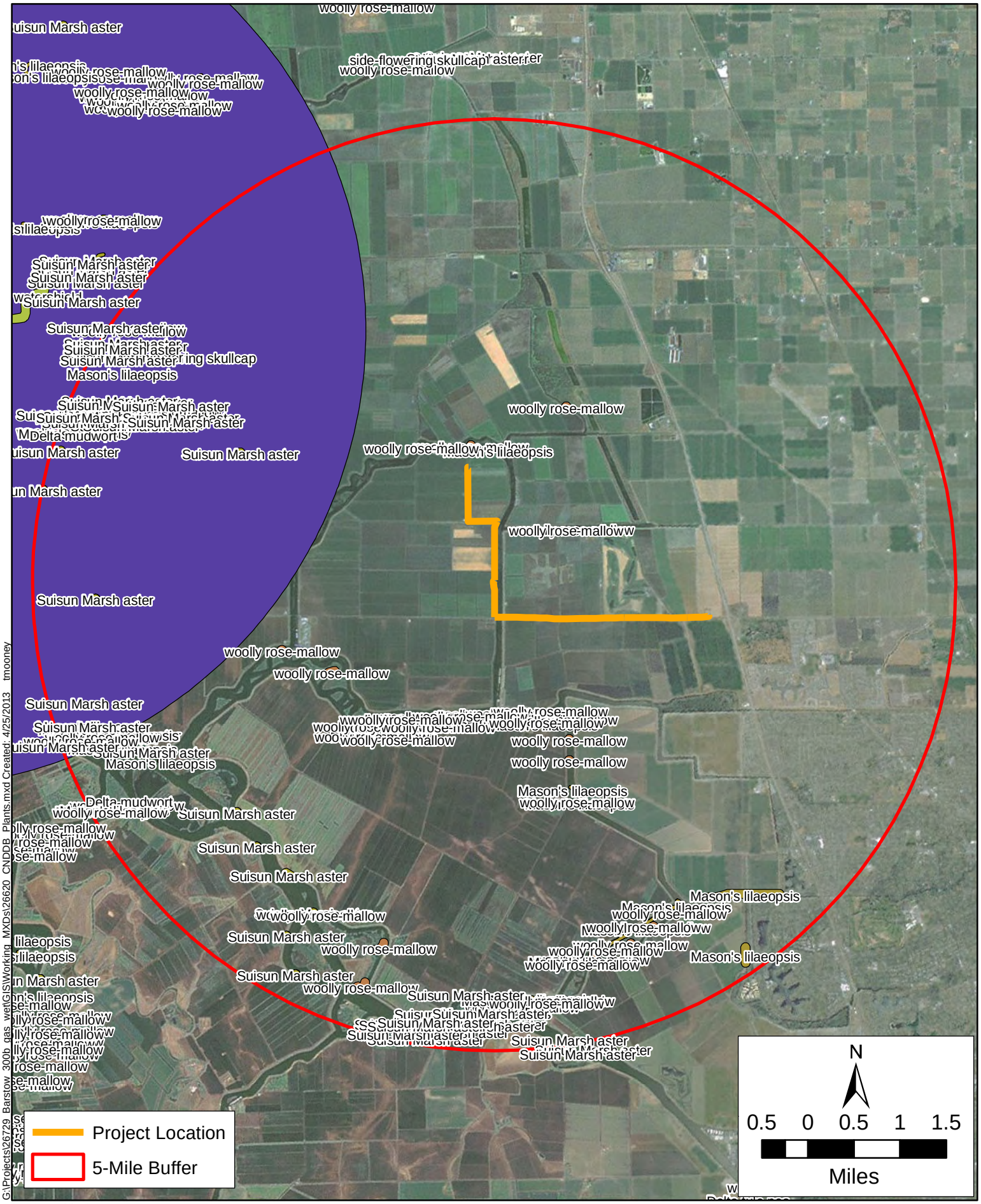


G:\Projects\26729 Barstow 300b gas wetGISWorking MXDs\26620 CNDDB Animals.mxd Created: 4/25/2013 tmooney

North State Resources, Inc.

CAES PDEA - King Island

Animal CNDDB Results



North State Resources, Inc.

CAES PDEA - King Island

Plants CNDDB Results

G:\Projects\26729_Barstow_300b_gas_wet\GIS\Working_MXDs\26620_CNDDB_Plants.mxd Created: 4/25/2013 tmooney

CNDDB 5-Mile Radius, April 23, 2013

SNAME	CNAME	FEDLIST	CALLIST	RPLANTRANK
Athene cunicularia	**burrowing owl**	None	**None**	
Buteo swainsoni	**Swainson's hawk**	None	**Threatened**	
Elanus leucurus	**white-tailed kite**	None	**None**	
Emys marmorata	**western pond turtle**	None	**None**	
Hibiscus lasiocarpos var. occidentalis	**woolly rose-mallow**	None	**None**	1B.2
Hypomesus transpacificus	**Delta smelt**	Threatenec	**Endangered**	
Laterallus jamaicensis coturniculus	**California black rail**	None	**Threatened**	
Lathyrus jepsonii var. jepsonii	**Delta tule pea**	None	**None**	1B.2
Lepidurus packardi	**vernal pool tadpole shrimp**	Endangere	**None**	
Lilaeopsis masonii	**Mason's lilaeopsis**	None	**Rare**	1B.1
Limosella australis	**Delta mudwort**	None	**None**	2.1
Scutellaria lateriflora	**side-flowering skullcap**	None	**None**	2.2
Symphyotrichum lentum	**Suisun Marsh aster**	None	**None**	1B.2
Thamnophis gigas	**giant garter snake**	Threatenec	**Threatened**	
Grand Total				

CNPS Inventory of Rare and Endangered Plants

Status: Plant Press Manager window with 25 items - Fri, Apr. 19, 2013 20:46 ET c

Reformat list as: Standard List - with Plant Press controls

ECOLOGICAL REPORT

scientific	family	life form	blooming	communities	elevation	CNPS
Astragalus tener var. tener	Fabaceae	annual herb	Mar-Jun	•Playas (Plyas) •Valley and foothill grassland (VFGrs) (adobe clay) •Vernal pools (VnPls)/alkaline	1 - 60 meters	List 1B.2
Atriplex cordulata var. cordulata	Chenopodiaceae	annual herb	Apr-Oct	•Chenopod scrub (ChScr) •Meadows and seeps (Medws) •Valley and foothill grassland (VFGrs) (sandy)/saline or alkaline	0 - 560 meters	List 1B.2
Atriplex joaquinana	Chenopodiaceae	annual herb	Apr-Oct	•Chenopod scrub (ChScr) •Meadows and seeps (Medws) •Playas (Plyas) •Valley and foothill grassland (VFGrs)/alkaline	1 - 835 meters	List 1B.2
Blepharizonia plumosa	Asteraceae	annual herb	Jul-Oct	•Valley and foothill grassland (VFGrs)/Usually clay.	30 - 505 meters	List 1B.1
Brasenia schreberi	Cabombaceae	perennial rhizomatous herb aquatic	Jun-Sep	•Marshes and swamps (MshSw)/freshwater	30 - 2200 meters	List 2.3
California macrophylla	Geraniaceae	annual herb	Mar-May	•Cismontane woodland (CmWld) •Valley and foothill grassland (VFGrs)/clay	15 - 1200 meters	List 1B.1
Carex comosa	Cyperaceae	perennial rhizomatous herb	May-Sep	•Coastal prairie (CoPrr) •Marshes and swamps (MshSw) (lake margins) •Valley and foothill grassland (VFGrs)	0 - 625 meters	List 2.1
Chloropyron palmatum	Orobanchaceae	annual herb hemiparasitic	May-Oct	•Chenopod scrub (ChScr) •Valley and foothill grassland (VFGrs)/alkaline	5 - 155 meters	List 1B.1
Cirsium	Asteraceae	annual/perennial	May-Aug	•Chenopod scrub (ChScr) •Marshes and swamps (MshSw)	3 - 100	List

crassicaule	Asteraceae	herb	May-Aug	swamps (MshSw) (sloughs) •Riparian scrub (RpScr)	meters	1B.1
Delphinium recurvatum	Ranunculaceae	perennial herb	Mar-Jun	•Chenopod scrub (ChScr) •Cismontane woodland (CmWld) •Valley and foothill grassland (VFGrs)/alkaline	3 - 790 meters	List 1B.2
Downingia pusilla	Campanulaceae	annual herb	Mar-May	•Valley and foothill grassland (VFGrs) (mesic) •Vernal pools (VnPls)	1 - 445 meters	List 2.2
Eryngium racemosum	Apiaceae	annual/perennial herb	Jun-Oct	•Riparian scrub (RpScr)(vernally mesic clay depressions)	3 - 30 meters	List 1B.1
Eschscholzia rhombipetala	Papaveraceae	annual herb	Mar-Apr	•Valley and foothill grassland (VFGrs) (alkaline, clay)	0 - 975 meters	List 1B.1
Gratiola heterosepala	Plantaginaceae	annual herb	Apr-Aug	•Marshes and swamps (MshSw) (lake margins) •Vernal pools (VnPls)/clay	10 - 2375 meters	List 1B.2
Hibiscus lasiocarpos var. occidentalis	Malvaceae	perennial rhizomatous herb emergent	Jun-Sep	•Marshes and swamps (MshSw) (freshwater)	0 - 120 meters	List 1B.2
Lathyrus jepsonii var. jepsonii	Fabaceae	perennial herb	May-Jul(Sep), Months in parentheses are uncommon.	•Marshes and swamps (MshSw) (freshwater and brackish)	0 - 4 meters	List 1B.2
Lilaeopsis masonii	Apiaceae	perennial rhizomatous herb	Apr-Nov	•Marshes and swamps (MshSw) (brackish or freshwater) •Riparian scrub (RpScr)	0 - 10 meters	List 1B.1
Limosella australis	Scrophulariaceae	perennial stoloniferous herb	May-Aug	•Marshes and swamps (MshSw) (freshwater or brackish) •Riparian scrub (RpScr)/Usually mud banks	0 - 3 meters	List 2.1
Madia radiata	Asteraceae	annual herb	Mar-May	•Cismontane woodland (CmWld) •Valley and foothill grassland (VFGrs)	25 - 1215 meters	List 1B.1
Sagittaria sanfordii	Alismataceae	perennial rhizomatous herb emergent	May-Oct	•Marshes and swamps (MshSw) (assorted shallow freshwater)	0 - 650 meters	List 1B.2

				freshwater)		
Scutellaria galericulata	Lamiaceae	perennial rhizomatous herb	Jun-Sep	•Lower montane coniferous forest (LCFrs) •Meadows and seeps (Medws) (mesic) •Marshes and swamps (MshSw)	0 - 2100 meters	List 2.2
Scutellaria lateriflora	Lamiaceae	perennial rhizomatous herb	Jul-Sep	•Meadows and seeps (Medws) (mesic) •Marshes and swamps (MshSw)	0 - 500 meters	List 2.2
Symphyotrichum lentum	Asteraceae	perennial rhizomatous herb	May-Nov	•Marshes and swamps (MshSw) (brackish and freshwater)	0 - 3 meters	List 1B.2
Trichocoronis wrightii var. wrightii	Asteraceae	annual herb	May-Sep	•Meadows and seeps (Medws) •Marshes and swamps (MshSw) •Riparian forest (RpFrs) •Vernal pools (VnPls)/alkaline	5 - 435 meters	List 2.1
Tropidocarpum capparideum	Brassicaceae	annual herb	Mar-Apr	•Valley and foothill grassland (VFGrs) (alkaline hills)	1 - 455 meters	List 1B.1

APPENDIX C

Regional Special-Status Species Review

Table 1. Special-Status Species with Potential to Occur in the Project Area, Impacts Analysis, and Avoidance and Minimization Measures

Common Name Scientific Name	Listing Status[1] (Fed/State)	Habitat Requirements	Potential for Significant Impact	Avoidance and Minimization Measures
Delta smelt *Hypomesus transpacificus*	T/T	Estuarine systems in the Sacramento-San Joaquin Delta.	No. Bishop Cut provides spawning habitat for this species and is designated critical habitat. Because the road is paved, no additional roadwork on levee road is anticipated, and work areas used to span Bishop Cut would be 190 feet from surface water on the down-slope side opposite of Bishop Cut, effects from silting, fill or spills are not expected.	Water quality BMPs
Central Valley steelhead DPS *Oncorhynchus mykiss*	T/—	Spawns in cool, moderately fast flowing water with gravel bottom.	No. Bishop Cut provides migratory habitat for this species and is designated critical habitat. Because the road is paved, no additional roadwork on levee road is anticipated, and work areas used to span Bishop Cut would be 190 feet from surface water on the down-slope side opposite of Bishop Cut, effects from silting, fill or spills are not expected.	Water quality BMPs
Winter-run Chinook salmon ESU *Oncorhynchus tshawytscha*	E/E	Spawn and rear in main-stem Sacramento River. Require cool year-round water temperatures, since spawning occurs during the summer. Requires deep pools and riffles, and clean gravel and cobble substrate to spawn.	No. Bishop Cut provides migratory habitat for this species. Because the road is paved, no additional roadwork on levee road is anticipated, and work areas used to span Bishop Cut would be 190 feet from surface water on the down-slope side opposite of Bishop Cut, effects from silting, fill or spills are not expected.	Water quality BMPs

Table 1. Special-Status Species with Potential to Occur in the Project Area, Impacts Analysis, and Avoidance and Minimization Measures

Common Name Scientific Name	Listing Status[1] (Fed/State)	Habitat Requirements	Potential for Significant Impact	Avoidance and Minimization Measures
Central Valley spring-run Chinook salmon ESU Oncorhynchus tshawytscha	T/T	Cool streams that reach the ocean and that have shallow, partly shaded pools and clear-water depression pools.	No. Bishop Cut provides migratory habitat for this species. Because the road is paved, no additional roadwork on levee road is anticipated, and work areas used to span Bishop Cut would be 190 feet from surface water on the down-slope side opposite of Bishop Cut, effects from silting, fill or spills are not expected.	Water quality BMPs
Green sturgeon, southern DPS *Acipenser medirostris*	T/SC	DPS includes green sturgeon that spawn in rivers south of the Eel River and includes the Sacramento-San Joaquin Delta. Preferred spawning substrate is large cobble, but can range from clean sand to bedrock.	No. Bishop Cut provides migratory habitat for this species and is designated critical habitat. Because the road is paved, no additional roadwork on levee road is anticipated, and work areas used to span Bishop Cut would be 190 feet from surface water on the down-slope side opposite of Bishop Cut, effects from silting, fill or spills are not expected.	Water quality BMPs
Longfin smelt San Francisco Bay-Delta DPS *Spirinchus thaleichthys*	C/SC	Sloughs of Suisun Bay and Delta.	No. Bishop Cut provides spawning habitat for this species. Because the road is paved, no additional roadwork on levee road is anticipated, and work areas used to span Bishop Cut would be 190 feet from surface water on the down-slope side opposite of Bishop Cut, effects from silting, fill or spills are not expected.	Water quality BMPs

Table 1. Special-Status Species with Potential to Occur in the Project Area, Impacts Analysis, and Avoidance and Minimization Measures

Common Name Scientific Name	Listing Status[1] (Fed/State)	Habitat Requirements	Potential for Significant Impact	Avoidance and Minimization Measures
Central Valley fall/late fall-run Chinook salmon ESU *Oncorhynchus tshawytscha*	SC/SC	Spawn and rear in main-stem Sacramento River and suitable perennial tributaries. Spawn and rear in main-stem Sacramento River and suitable perennial tributaries. Requires cool water temperatures for spawning, egg-incubation and juvenile rearing. Spawn in riffles with gravel and cobble.	No. Bishop Cut provides migratory habitat for this species. Because the road is paved, no additional roadwork on levee road is anticipated, and work areas used to span Bishop Cut would be 190 feet from surface water on the down-slope side opposite of Bishop Cut, effects from silting, fill or spills are not expected.	Water quality BMPs
Sacramento splittail *Pogonichthys macrolepidotus*	—/SC	Shallow, dead-end sloughs with submerged vegetation.	No. Bishop Cut provides spawning habitat for this species. Because the road is paved, no additional roadwork on levee road is anticipated, and work areas used to span Bishop Cut would be 190 feet from surface water on the down-slope side opposite of Bishop Cut, effects from silting, fill or spills are not expected.	Water quality BMPs
River lamprey *Lampetra ayresi*	—/SC	Anadromous fish found in rivers from San Francisco Bay watershed north to Alaska. Spawn in similar habitat as salmon.	No. Bishop Cut provides migratory habitat for this species. Because the road is paved, no additional roadwork on levee road is anticipated, and work areas used to span Bishop Cut would be 190 feet from surface water on the down-slope side opposite of Bishop Cut, effects from silting, fill or spills are not expected.	Water quality BMPs

Table 1. Special-Status Species with Potential to Occur in the Project Area, Impacts Analysis, and Avoidance and Minimization Measures

Common Name Scientific Name	Listing Status[1] (Fed/State)	Habitat Requirements	Potential for Significant Impact	Avoidance and Minimization Measures
California red-legged frog *Rana draytonii*	T/SC	Require aquatic habitat for breeding, also uses a variety of other habitat types including riparian and upland areas. Adults prefer dense, shrubby or emergent vegetation associated with deep-water pools with fringes of cattails and dense stands of overhanging vegetation. This species also breeds in ephemeral ponds that support little or no vegetation.	No. The project is outside the current known range (CWHR) of this species and there are no CNDDB reports within 5 miles of the project area. Additionally, the California red-legged frog recovery plan concludes that CRLF is extirpated from the valley floor (U.S. Fish and Wildlife Service 2002). This species is not expected to occur in the project area.	None required.
Giant garter snake *Thamnophis gigas*	T/T	Freshwater marshes and low gradient streams with emergent vegetation. Adapted to drainage canals and irrigation ditches with mud substrate.	Low. Perennially inundated irrigation ditches, golf course ponds, and associated uplands within the project area provide potential habitat. An extant population occurs within the Coldani Marsh-White Slough area approximately 1.7 miles to the northeast of the TSF pad and 3.5 miles north of the distribution line along the southern portion of the golf course. This population is connected by a series of irrigation ditches and golf course ponds within the project area. Ground disturbance activities that disrupt burrows could adversely affect this species. Because giant garter snakes are absent from larger rivers, it is not anticipated that Bishop Cut would provide habitat for this species (Miller et al. 1999).	Pre-construction surveys Biological monitor Water quality BMPs Maintain speed limits less than 10 mph.

Table 1. Special-Status Species with Potential to Occur in the Project Area, Impacts Analysis, and Avoidance and Minimization Measures

Common Name Scientific Name	Listing Status[1] (Fed/State)	Habitat Requirements	Potential for Significant Impact	Avoidance and Minimization Measures
Western pond turtle *Emys marmorata*	—/SC	Slow water aquatic habitat with available basking sites. Hatchlings require shallow water with dense submergent or short emergent vegetation. Requires an upland oviposition site near the aquatic site.	Low. Perennially inundated irrigation ditches and the ponds at the golf course north of Eight Mile Road provide aquatic habitat. Pond habitat and adjacent uplands provide aquatic and upland nesting habitat. The nearest CNDDB record to suitable aquatic habitat is 1.2 miles northwest of the golf course ponds. Although ditches in the project area are perennial, and contain fresh emergent vegetation, the banks are steep and do not contain available basking sites. Ditches are actively maintained which likely precludes occupation by pond turtles. Additionally, upland breeding sites are unavailable in the cropland habitat. Due to lack of basking habitat and upland nesting sites, pond turtles are unlikely to occur in the agricultural portions of the project area.	Pre-construction surveys Avoidance measures Maintain speed limits below 10 mph
California black rail *Laterallus jamaicensis coturniculus*	—/T, FP	Coastal and inland marsh habitat.	No. Marsh habitat suitable for this species is absent from the project area and no impacts are expected.	None required
Swainson's hawk *Buteo swainsoni*	--/T	Breeds in stands with few trees in juniper-sage flats, riparian areas, and oak savannah; forages in adjacent livestock pasture, grassland or grain fields.	Low. Larger trees and stands of trees occurring within 0.5 mile of the project area provide potential nesting habitat for Swainson's hawk. There are sixteen recorded CNDDB occurrences of nesting Swainson's hawk within 5 miles of the project area with the nearest approximately 1 mile south of the project area. Surveys and monitoring associated with the CAES coring phase did not detect nesting during the 2013-nesting season (North State Resources 2013). Noise generated by project activities could disrupt nesting behavior and nest success if Swainson's hawks are nesting within 0.25 mile of the project area.	Pre-construction surveys if work is expected to occur during nesting season (March 1 to September 15)

Table 1. Special-Status Species with Potential to Occur in the Project Area, Impacts Analysis, and Avoidance and Minimization Measures

Common Name Scientific Name	Listing Status[1] (Fed/State)	Habitat Requirements	Potential for Significant Impact	Avoidance and Minimization Measures
White-tailed kite *Elanus leucurus*	—/FP	Nests in tall shrubs and trees, forages in grasslands, agricultural fields and marshes.	Low. Isolated trees and shrubs near proposed access roads and existing farm facilities provide potential nesting habitat for this species.	Pre-construction surveys if work is expected to occur during nesting season (February 15–August 31)
Northern harrier *Circus cyaneus*	—/SC	Forages in marshes, grasslands, and ruderal habitats; nests in extensive marshes and wet fields.	Low. Wet meadows and wetlands near the golf course may provide nesting habitat for northern harrier. Exposure to project activities would only be during installation of distribution lines. Potential nesting habitat is north of a bermed area, which would reduce effects on nesting birds, if present.	Pre-construction surveys if work is expected to occur during nesting season (February 15–August 31)
Western burrowing owl *Athene cunicularia*	—/SC	Grasslands and ruderal habitats.	Low. Annual grassland and ruderal habitat present along the distribution line provide habitat for this species. Ground squirrel burrows observed along the distribution line route. Grassland may grow too high to support burrowing owl foraging habits. No owls observed during the field reconnaissance; however, they could move into the area prior to construction.	Pre-construction surveys
Loggerhead shrike *Lanius ludovicianus*	—/SC	Nests in tall shrubs and dense trees, forages in grasslands, marshes, and ruderal habitats.	Low. Isolated trees and shrubs near proposed access roads and existing farm facilities provide potential nesting habitat for this species.	Pre-construction surveys if work is expected to occur during nesting season (February 15–August 31)

[1]Status Codes: : Federal and State Codes: Endangered; T = Threatened; C=Candidate; SC = Species of Concern (federal), Species of Special Concern (State), FP = Fully Protected (State)

APPENDIX D

Giant Garter Snake Impacts Review for the Pacific Gas and Electric Company (PG&E) Compressed Air Energy Storage Project-King Island Piacentine Well Pad Expansion and Core Drilling Project-January 2013

Eric C. Hansen
Consulting Environmental Biologist

4200 North Freeway Boulevard, Suite 4
Sacramento, CA
95834-1235

Phone 916-921-8281
Fax 916-921-8278
Mobile 916-214-7848

To: Catalina Reyes
Pacific Gas and Electric Co.
3401 Crow Canyon Road, Rm 150E
San Ramon, CA 94583

Re: Giant Garter Snake Impacts Review for the Pacific Gas and Electric Company (PG&E) Compressed Air Energy Storage Project— King Island Piacentine Well Pad Expansion and Core Well Drilling Project

Date: 23 January, 2013

Dear Ms. Reyes:

This letter/memorandum provides a brief review of environmental documents prepared by North State Resources, Inc. (NSR) in support of the Pacific Gas and Electric Company (PG&E) Compressed Air Energy Storage Project—King Island Piacentine Well Pad Expansion and Core Well Drilling Project. The King Island project area is located approximately 5 miles northwest of the city of Stockton in San Joaquin County at approximately Latitude 38.082284° , Longitude -121.421892. The project will require the expansion of the existing well pads and improvements of existing roads to access the project area.

Conducted in light of potential impacts to the giant garter snake (*Thamnophis gigas*, GGS), this review is based on the following documents:

1. Pacific Gas and Electric. 2012. *Pacific Gas and Electric Company Compressed Air Energy Storage Project— King Island Piacentine Well Pad Expansion and Core Well Drilling: Assessment of Effects on Federally Listed Species*. Prepared by North State Resources, Inc. Prepared for U.S. Department of Energy National Energy Technology Laboratory. October 12, 2012.

2. Pacific Gas and Electric. 2013. *Giant Garter Snake Burrow Baseline Surveys Results Summary—East Island and King Island Project Areas*. Technical Memorandum from Patrick Martin, North State Resources, Inc. to Catalina Reyes, Pacific Gas and Electric Company. January 9, 2013.

The purpose of this review is to provide a quality assurance assessment of the findings in the two PG&E documents prepared by NSR and an independent review and summary of potential risks to GGS. A site visit was also conducted for this purpose at the proposed King Island well pad site on 17 January, 2013. This memorandum includes a summary of the conclusions presented by NSR, a discussion of the site's suitability and impact potential for GGS, and provides broader context by providing a summary of Delta-wide GGS survey efforts to illustrate negative results that are not available in the California Natural Diversity Database (Appendix 1). Photographs illustrating the site's general character are provided in a separate photo appendix (Appendix 2).

The results of this review confirm what I feel is a thorough and accurate assessment by NSR, whose findings suggest that: 1) potential habitat on the project site is largely unsuitable due the canopy cover provided by the young walnut orchard comprising the entirety of the site; 2) overwintering opportunities are diminished or eliminated by annual intercropping of safflower between the walnut rows; and 3) that the distance and poor quality of aquatic habitat likely precludes access by GGS to the few burrows that could function as winter refugia.

As part of a thorough assessment, NSR has appropriately identified all features with even the most remote potential to support GGS. Based on the results of my site visit, my experience in the region, and my experience with the species as a whole, I concur that GGS are not likely to occur for the reasons stated above. Most noteworthy are the canopy cover, the annual intercropping of safflower, and the fact that the site falls more than 450 feet from the nearest potential aquatic habitat, all of which are factors that are generally incompatible with the life history of GGS. Only the very poor-quality drainage canal provides a potential source for GGS; however, even in the unlikely event that GGS should occupy the canal, there would no foreseeable incentive for them to move such a substantial distance over inhospitable terrain to overwinter, and very little chance of finding the few small burrows identified by NSR even if they did so.

Finally, I would emphasize that the density of GGS in the Delta is known to be extremely low, and that this further reduces the likelihood of GGS occurring in the sub-optimal landscape surrounding the project site. Historically, GGS occurred in both the south and north Delta regions (Hansen and Brode 1980; Hansen 1988; CNDDB 2012). However, the extent to which these historically occupied areas represent viable breeding populations is unclear, given agricultural conversion of much of the Delta. Nonetheless, survey efforts since the mid-1980s suggest that much of the Delta is unoccupied or supports few GGS.

To assess the likelihood of GGS occurring in the project vicinity, NSR's assessment necessarily relies heavily upon records reported in the California Natural Diversity Database (CNDDB). However, this approach tends to result in

very conservative assessments because: 1) the CNDDB does not provide negative survey results; and 2) because the gray literature/technical reports summarizing negative survey results are generally unavailable to the public. In order to supplement the material provided by NSR and to place the known GGS distribution within the Delta in better perspective, I am including a summary of Delta-wide GGS survey efforts illustrating negative survey results that are not available in the CNDDB. This summary, which details the historical and current survey work and occurrence information available in the Delta proper, is included as Appendix 1.

In closing, I believe that NSR has conducted a thorough and reasonable assessment of site conditions and has presented an appropriately conservative evaluation of potential impacts. I agree with NSR's conclusion that GGS are unlikely to occur on site due to the incompatibility of the existing aquatic habitat, land cover, and agricultural practices with GGS life history. I would emphasize that the low-quality aquatic habitat lies well beyond 200 feet boundary from linear bank margins that the USFWS generally considers as suitable upland for GGS when assessing a project's disturbance area (USFWS 1997, 2004). I would also emphasize the lack of positive survey data within this portion of the Delta when evaluating the likelihood that GGS might occur. In my professional opinion, this combination of factors eliminates virtually all likelihood that GGS occur on the project site. Finally, I agree with NSR that impacts to potential refugia occurring along access roads within 200 feet of aquatic habitat can be avoided and are not likely to be adversely impacted by project activities.

If you have questions regarding this review or any of the subsequent comments, please do not hesitate to contact me. I will gladly expand on any of these topics upon request.

Sincerely,

Eric C. Hansen
Consulting Environmental Biologist

Appendices:

1. Summary of Delta GGS Sampling Efforts
2. Photographs of relevant features
3. References

APPENDIX 1. SUMMARY OF DELTA GGS SAMPLING EFFORTS

Overview

Historically, giant garter snakes occurred in both the south and north Delta regions (Hansen and Brode, 1980; Hansen 1988; CNDDB 2012). Individuals have been observed in the north Delta region east of the Sacramento River at North Stone Lake, Beach Lake, and near Locke (CNDDB 2012). The species also was recorded on Sherman Island near the Antioch Bridge north of the City of Oakley (CNDDB 2012). Other documented occurrences are distributed around the periphery of the north and east Delta. The extent to which these historically occupied areas represent viable breeding populations is unclear, given agricultural conversion of much of the Delta. Nonetheless, survey efforts since the mid-1980s suggest that much of the Delta is unoccupied or supports few giant garter snakes.

Despite negative survey findings, Hansen (1988) reported that although the major permanent waterways of the Delta are apparently unsuitable for the giant garter snake, small backwater sloughs and toe drains support suitable habitat for, and thus could potentially support, small numbers of giant garter snakes.

The following describes the historical and current survey work and occurrence information in the Delta proper.

South Delta

During 1987 and 1988, live trapping and visual surveys were conducted at various locations in the California Department of Water Resources (DWR) South Delta Water Management Project area, including Trapper Slough, Salmon Slough, and along the irrigation canal at SR 4 near the Clifton Court Forebay expansion area. No giant garter snakes were observed during either year, although virtually all islands and channels contained some suitable habitat (ECOS 1990).

In 1994, surveys were conducted to determine the status of the giant garter snake in DWR's Interim South Delta Project area. The purpose of this study was to focus on particular areas containing the most suitable habitat and to conduct live trapping as well as additional ground surveys. Ground surveys for giant garter snakes were undertaken during previous work in the south Delta region in 1987, 1988, and 1993. Although no giant garter snakes were observed during any of these surveys, suitable habitat for the snake was present in some of the more remote sloughs and waterways in the project area (e.g., Tom Paine Slough, Salmon Slough, and Paradise Cut). Based on the presence of apparently suitable habitat, the potential for isolated populations of the giant garter snake was not ruled out (Miriam Green Associates 1995).

There are only two isolated records of giant garter snakes on the south side of the San Joaquin River in the northern aspect of the species' range. Although the historical and current distribution of giant garter snake in the Delta is poorly

understood, the south bank of the San Joaquin River lies within the apparent gap between the northern and southern populations (CNDDB 2012). The isolated records on Sherman Island represents the northern population's known southern extent in the Plan Area. The known southern terminus of the northern population outside of the Plan Area occurs north and east of the San Joaquin River in Duck Creek (CNDDB 2012). The nearest locality record to the south lies approximately 50 air miles distant in Merced County; no giant garter snakes are documented in Stanislaus County between the documented extremes of the Sacramento Valley and San Joaquin Valley populations.

North Delta

Surveys were also conducted to determine the status of giant garter snakes in DWR's Interim North Delta Program area (Miriam Green Associates 1996). The species was observed at scattered locations in the program area during 1994 surveys, but was not encountered in the major waterways of the North Delta. The species was observed in marsh and canal habitats along the Upland Canal from the confluence of Sycamore Slough and the Upland Canal south to the vicinity of White Slough on the Terminous and Shin Kee Tracts. Giant garter snakes also occur in the Upland Canal and the Coldani Marsh, north and east of Shin Kee Tract, respectively (Miriam Green Associates 1996).

Coldani Marsh/White Slough and Eastern Delta Fringe

Between 1974 and 1978, 13 rectangular borrow pits were excavated from 1 to 5 miles west of I-5 to provide fill for freeway construction (California Department of Water Resources 1995). The pits are fed by groundwater and periodic runoff from precipitation, irrigation, and high canal flows, creating a series of ponds characterized by vegetated sloping or vertical banks and open water with adjacent uplands and high ground. White Slough Wildlife Area encompasses ponds 7 through 13 along a roughly 14-mile (22.5-kilometer) stretch between Thornton and Stockton.

The White Slough Wildlife Area supports one of 13 extant giant garter snake populations recognized by USFWS (Coldani Marsh/White Slough population) (USFWS 1999). First identified on site in 1974 (CNDDB 2012), giant garter snakes were observed at the White Slough Wildlife Area from 1976 until the mid-1990s (Hansen and Brode 1980; Hansen 1988, 1996). Among sites supporting two giant garter snake populations recognized in San Joaquin County, the White Slough location is perhaps the only locality still supporting a viable snake population.

Most giant garter snake observations at White Slough Wildlife Area are concentrated at Pond 9, but surveys conducted by George Hansen in 1994 yielded additional sightings at Pond 7, Pond 11, and a site between Ponds 6 and 7

(California Department of Water Resources 1995; CNDDB 2012). Although channels and drainages including Telephone Cut, Sycamore Slough, Hog Slough, and Beaver Slough were surveyed, observations were made only at the ponds (M. Green, pers. comm.). Each of the ponds where snakes were observed are characterized by slow-moving water with mud banks and bottoms, vegetation cover, and access to high ground (California Department of Water Resources 1995).

In 2009 and 2010, under a grant provided by the Central Valley Project (CVP) Habitat Restoration Program, Hansen conducted rigorous trap and visual encounter sampling at Ponds 7–13 of the White Slough Wildlife Area to determine the current status and distribution of giant garter snake. Giant garter snakes were only confirmed within the emergent wetlands west of Pond 9 along the Upland Canal (Coldani Marsh), east of Guard Road and south of SR 12 (CNDDB 2012; Hansen 2011). In total, 27 snakes representing a normal age/size and gender distribution were captured. Surveys conducted in and near Lost Slough in 1996, 2004 and 2009 failed to detect giant garter snakes east of I-5 (Hansen 2004;Patterson, pers. comm.; Wylie pers. comm.

Antioch/Oakley and West Delta

Recent, intensive trapping surveys conducted within Contra Costa County independently by Eric Hansen and by Swaim Biological have failed to detect giant garter snakes. Likewise, Swaim Biological intensively trapped in regions northeast of Oakley in 2003 and 2005, including Marsh Creek, Big Break, and Contra Costa Canal, without success (Swaim Biological 2004; 2005a, b,c,d,e,f; 2006). With few exceptions, these surveys spanned 3 to 5 months of the species' active period. Swaim Biological also rigorously investigated bullfrog stomach contents to see if undetected giant garter snakes had been consumed; none was detected. While all of these surveys produced captures of common snake species, giant garter snakes were not detected, and, in all cases, it was determined that self-sustaining populations were unlikely to occur. Each report cited marginal habitat value as probable explanations for the species' absence. While the final disposition of Swaim Biological results and recommendations are unknown, USFWS concurred with Eric Hansen's findings that the species was unlikely to occur within the areas sampled.

Central Delta

In support of DWR's Delta Wetlands Project, Eric Hansen intensively trapped for giant garter snakes on Webb Tract and on Bacon Island in 2003 and 2004 without success (Patterson and Hansen, 2004; Patterson 2005.

All Delta

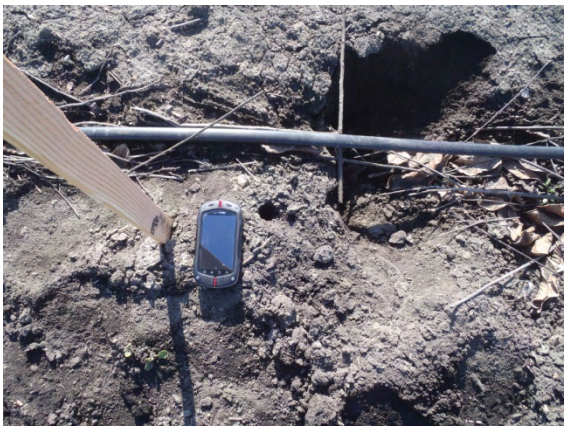
APPENDIX 1. SUMMARY OF DELTA GGS SAMPLING EFFORTS

In 2009, as part of the Delta Habitat Conservation and Conveyance Program, DWR biologists deployed 62, 50-trap traplines at White Slough Wildlife Area and throughout the Delta proper, resulting in approximately 42,700 accrued trap-days. Trap distribution ranged from the vicinity of Elk Grove to the north, I-5 to the east, Sherman Island to the west, and the vicinity of Clifton Court Forebay to the south. GGS were not detected during these surveys (Patterson pers. comm).

APPENDIX 2. PHOTOGRAPHS OF RELEVANT FEATURES

1. Margin in the transition zone between the existing well pad and proposed expansion

2. Example of inter-row vegetation



3. Example of the small string of burrows falling along only one row of the walnut orchard

4. Denuded ditch situated approximately 450 feet west of the project site

APPENDIX 3. REFERENCES

Literature Cited

California Natural Diversity Database (CNDDB). 2012. Rarefied 3; updated version as of December 2012. California Department of Fish and Wildlife, Natural Heritage Division, Sacramento, CA.

ECOS, Inc. 1990. Sensitive Species Survey Report for the South Delta Water Management Project. Prepared for the Department of Water Resources Division of Planning, 1416 Ninth Street, Sacramento, CA 94236 and U.S. Bureau of Reclamation Mid-Pacific Regional Office, 2800 Cottage Way Sacramento, CA 95825. September 1990.

Fitch, H.S. 1951. A simplified type of funnel trap for reptiles. Herpetologica 7:77-80.

California Department of Water Resources. 1995. 1994 Biological characterization of the East Delta Properties. Prepared for the Department of Water Resources East Delta Land Management Committee. January 1995. 64 pp.

Hansen, E. C. 2011. 2011 Implementation of Priority 1, Priority 2, and Priority 3 Recovery Tasks for Giant Garter Snake (Thamnophis gigas) – Status and Distribution Of Giant Garter Snakes at the Eastern Delta's White Slough Wildlife Area, San Joaquin County, CA. Draft report prepared for the U.S. Fish and Wildlife Service pursuant to FWS Agreement No. 802709G514. January 28.

Hansen, E. C. 2004. Summary of Year 2004 Surveys for Giant Garter Snakes (Thamnophis gigas) at Lost Slough and Associated Wetlands within the Cosumnes River Preserve. Prepared for the Nature Conservancy. September 15, 2004. Unpublished. 9pp.

Hansen, G.E. and J.M. Brode. 1980. Status of the giant garter snake *Thamnophis couchii* gigas (Fitch). Inland Fisheries Endangered Species Special Publication 80(5):1-14. California Department of Fish and Game, Sacramento, CA.

Hansen, G.E. 1988. Review of the Status of the giant garter snake (*Thamnophis couchii gigas*) and its supporting habitat during 1986-87. Final report for the California Department of Fish and Game, Contract C-2060. Unpublished. 31 pp.

Hansen, G.E. 1996. Status of the giant garter snake (*Thamnophis gigas*) in the San Joaquin Valley. Final report for California Department of Fish and Game. Standard Agreement No. FG4052IF. Unpublished. 31 pp.

APPENDIX 3. REFERENCES

Miriam Green Associates. 1995. Status of the giant garter snake (*Thamnophis gigas*) and its supporting habitat within the Interim South Delta Project Area. Prepared for the Department of Water Resources Division of Planning, 1416 Ninth Street, Sacramento, CA 94236 and U.S. Bureau of Reclamation Mid-Pacific Regional Office, 2800 Cottage Way Sacramento, CA 95825. July 12, 1995.

Miriam Green Associates. 1996. Biological Assessment Endangered, Threatened, and Candidate Species, Interim North Delta Program. Prepared for the Department of Water Resources Division of Planning, 1416 Ninth Street, Sacramento, CA 94236 and U.S. Bureau of Reclamation Mid-Pacific Regional Office, 2800 Cottage Way Sacramento, CA 95825. September 1996.

Patterson, L. and E. Hansen. 2004. Giant Garter Snake Surveys on Bacon Island and Webb Tract and Re-evaluation of Habitat Quality in 2003. Report Prepared for the California Department of Water Resources. March 2004. Unpublished. 24 pp.

Patterson, L. 2005. Giant Garter Snake Surveys for the In-Delta Storage Program: Year-End and Summary Report. California Department of Water Resources, 1725 23rd Street, Suite 220, Sacramento, CA 95816. March 2005. Unpublished. 18 pp.

Swaim Biological, Incorporated. 2004. Results of Surveys for the Giant Garter Snake (Thamnophis gigas) in Marsh Creek and the Contra Costa Canal Northeast Contra Costa County, California. Prepared for Sycamore Associates, LLC, Walnut Creek, CA.

Swaim Biological, Incorporated. 2005. Proposal to Conduct Status Surveys for the Giant Garter Snake (Thamnophis gigas) in 2005. Prepared for Sycamore Associates, L.L.C. for Submission to FWS.

Swaim Biological, Incorporated 2005. Results of Surveys for the Giant Garter Snake (Thamnophis gigas) at the Dal Porto South Property Contra Costa County, California. Prepared for Sycamore Associates, LLC, Walnut Creek, CA.

Swaim Biological, Incorporated. 2005. Results of Surveys for the Giant Garter Snake (Thamnophis gigas) at the Lesher Property Contra Costa County, California. Prepared for Sycamore Associates, LLC, Walnut Creek, CA.

Swaim Biological, Incorporated. 2005. Results of Surveys for the Giant Garter Snake (Thamnophis gigas) at the Biggs Property, Contra Costa County, California. Prepared for Sycamore Associates, LLC, Walnut Creek, CA.

APPENDIX 3. REFERENCES

Swaim Biological, Incorporated. 2005. Results of Surveys for the Giant Garter Snake (Thamnophis gigas) at the Gilbert Property, Contra Costa County, California. Prepared for Zentner and Zentner, Oakland, CA.

Swaim Biological, Incorporated. 2005. Results of Surveys for the Giant Garter Snake (Thamnophis gigas) at the Biggs Property, Contra Costa County, California. Prepared for Zentner and Zentner, Oakland, CA.

Swaim Biological, Incorporated. 2006. Results of Surveys for the Giant Garter Snake (Thamnophis gigas) at the Gilbert and Burrows Properties in Contra Costa County, California. Prepared for Zentner and Zentner, Oakland, CA.

USFWS (U.S. Fish and Wildlife Service). 1997. Programmatic formal consultation for U.S. Army Corps of Engineers 404 permitted projects with relatively small effects on the giant garter snake within Butte, Colusa, Glenn, Fresno, Merced, Sacramento, San Joaquin, Solano, Stanislaus, Sutter and Yolo counties, California. U.S. Fish and Wildlife Service, Sacramento Fish and Wildlife Office. 1-1-F-97-149.

USFWS. 2004. Programmatic formal consultation for U.S. Army Corps of Engineers 404 permitted projects with relatively small effects on the giant garter snake within Butte, Colusa, Glenn, Fresno, Merced, Sacramento, San Joaquin, Solano, Stanislaus, Sutter and Yolo counties, California. U.S. Fish and Wildlife Service, Sacramento Fish and Wildlife Office. 1-1-F-97-149.

USFWS. 1999. Draft recovery plan for the giant garter snake (*Thamnophis gigas*). U.S. Fish and Wildlife Service, Portland, Oregon. Ix+ 192 pp.

Personal Communications

Patterson, Laura. Department of Water Resources, Division of Environmental Sciences. Sacramento, CA

Wylie, G.D. Research Biologist. Dixon Field Station; U.S. Geological Survey Western Ecological Research Center, 6924 Tremont Road; Dixon, CA 95620

APPENDIX E

Swainson's Hawk Survey Guidance

RECOMMENDED TIMING AND METHODOLOGY FOR SWAINSON'S HAWK NESTING SURVEYS IN CALIFORNIA'S CENTRAL VALLEY

Swainson's Hawk Technical Advisory Committee

May 31, 2000

This set of survey recommendations was developed by the Swainson's Hawk Technical Advisory Committee (TAC) to maximize the potential for locating nesting Swainson's hawks, and thus reducing the potential for nest failures as a result of project activities/disturbances. The combination of appropriate surveys, risk analysis, and monitoring has been determined to be very effective in reducing the potential for project-induced nest failures. As with most species, when the surveyor is in the right place at the right time, Swainson's hawks may be easy to observe; but some nest sites may be very difficult to locate, and even the most experienced surveyors have missed nests, nesting pairs, mis-identified a hawk in a nest, or believed incorrectly that a nest had failed. There is no substitute for specific Swainson's hawk survey experience and acquiring the correct search image.

METHODOLOGY

Surveys should be conducted in a manner that maximizes the potential to observe the adult Swainson's hawks, as well as the nest/chicks second. To meet the California Department of Fish and Game's (CDFG) recommendations for mitigation and protection of Swainson's hawks, surveys should be conducted for a ½ mile radius around all project activities, and if active nesting is identified within the ½ mile radius, consultation is required. In general, the TAC recommends this approach as well.

Minimum Equipment

Minimum survey equipment includes a high-quality pair of binoculars and a high quality spotting scope. Surveying even the smallest project area will take hours, and poor optics often result in eye-strain and difficulty distinguishing details in vegetation and subject birds. Other equipment includes good maps, GPS units, flagging, and notebooks.

Walking vs Driving

Driving (car or boat) or "windshield surveys" are usually preferred to walking if an adequate roadway is available through or around the project site. While driving, the observer can typically approach much closer to a hawk without causing it to fly. Although it might appear that a flying bird is more visible, they often fly away from the observer using trees as screens; and it is difficult to determine from where a flying bird came. Walking surveys are useful in locating a nest after a nest territory is identified, or when driving is not an option.

Angle and Distance to the Tree

Surveying subject trees from multiple angles will greatly increase the observer's chance of detecting a nest or hawk, especially after trees are fully leafed and when surveying multiple trees

in close proximity. When surveying from an access road, survey in both directions. Maintaining a distance of 50 meters to 200 meters from subject trees is optimal for observing perched and flying hawks without greatly reducing the chance of detecting a nest/young: Once a nesting territory is identified, a closer inspection may be required to locate the nest.

Speed
Travel at a speed that allows for a thorough inspection of a potential nest site. Survey speeds should not exceed 5 miles per hour to the greatest extent possible. If the surveyor must travel faster than 5 miles per hour, stop frequently to scan subject trees.

Visual and Aural Ques
Surveys will be focused on both observations and vocalizations. Observations of nests, perched adults, displaying adults, and chicks during the nesting season are all indicators of nesting Swainson's hawks. In addition, vocalizations are extremely helpful in locating nesting territories. Vocal communication between. hawks is frequent during territorial displays; during courtship and mating; through the nesting period as mates notify each other that food is available or that a threat exists; and as older chicks and fledglings beg for food.

Distractions
Minimize distractions while surveying. Although two pairs of eyes may be better than one pair at times, conversation may limit focus. Radios should be off, not only are they distracting, they may cover a hawk's call.

Notes and Species Observed
Take thorough field notes. Detailed notes and maps of the location of observed Swainson's hawk nests are essential for filling gaps in the Natural Diversity Data Base; please report all observed nest sites. Also document the occurrence of nesting great homed owls, red-tailed hawks, red-shouldered hawks and other potentially competitive species. These species will infrequently nest within 100 yards of each other, so the presence of one species will not necessarily exclude another.

TIMING

To meet **the minimum level** of protection for the species, surveys should be completed for **at least** the two survey periods immediately prior to a project's initiation. For example, if a project is scheduled to begin on June 20, you should complete 3 surveys in Period III and 3 surveys in Period V. However, it is always recommended that surveys be completed in Periods II, III and V. **Surveys should not be conducted in Period IV.**

The survey periods are defined by the timing of migration, courtship, and nesting in a "typical" year for the majority of Swainson's hawks from San Joaquin County to Northern Yolo County. Dates should be adjusted in consideration of early and late nesting seasons, and geographic differences (northern nesters tend to nest slightly later, etc). If you are not sure, contact a TAC member or CDFG biologist.

Survey dates **Justification and search image**	**Survey time**	**Number of Surveys**
I. *January-March 20 (recommended optional)*	*All day*	*1*

Prior to Swainson's hawks returning, it may be helpful to survey the project site to determine potential nest locations. Most nests are easily observed from relatively long distances, giving the surveyor the opportunity to identify potential nest sites, as well as becoming familiar with the project area. It also gives the surveyor the opportunity to locate and map competing species nest sites such as great homed owls from February on, and red-tailed hawks from March on. After March 1, surveyors are likely to observe Swainson's hawks staging in traditional nest territories.

II. *March 20 to April 5*	*Sunrise to 1000* *1600 to sunset*	*3*

Most Central Valley Swainson's hawks return by April 1, and immediately begin occupying their traditional nest territories. For those few that do not return by April 1, there are often hawks ("floaters") that act as place-holders in traditional nest sites; they are birds that do not have mates, but temporarily attach themselves to traditional territories and/or one of the site's "owners." Floaters are usually displaced by the territories' owner(s) if the owner returns.

Most trees are leafless and are relatively transparent; it is easy to observe old nests, staging birds, and competing species. The hawks are usually in their territories during the survey hours, but typically soaring and foraging in the mid-day hours. Swainson's hawks may often be observed involved in territorial and courtship displays, and circling the nest territory. Potential nest sites identified by the observation of staging Swainson's hawks will usually be active territories during that season, although the pair may not successfully nest/reproduce that year.

III. *April 5 to April 20*	*Sunrise to 1200* *1630 to Sunset*	***3***

Although trees are much less transparent at this time, 'activity at the nest site increases significantly. Both males and females are actively nest building, visiting their selected site frequently. Territorial and courtship displays are increased, as is copulation. The birds tend to vocalize often, and nest locations are most easily identified. This period may require a great deal of "sit and watch" surveying.

IV. *April 21 to June 10*	*Monitoring known nest sites only* ***Initiating Surveys is not recommended***	

Nests are extremely difficult to locate this time of year, and even the most experienced surveyor will miss them, especially if the previous surveys have not been done. During this phase of nesting, the female Swainson's hawk is in brood position, very low in the nest, laying eggs, incubating, or protecting the newly hatched and vulnerable chicks; her head may or may not be visible. Nests are often well-hidden, built into heavily vegetated sections of trees or in clumps of mistletoe, making them all but invisible. Trees are usually not viewable from all angles, which may make nest observation impossible.

Following the male to the nest may be the only method to locate it, and the male will spend hours away from the nest foraging, soaring, and will generally avoid drawing attention to the nest site. Even if the observer is fortunate enough to see a male returning with food for the female, if the female determines it is not safe she will not call the male in, and he will not approach the nest; this may happen if the observer, or others, are too close to the nest or if other threats, such as rival hawks, are apparent to the female or male.

V. ***June 10 to JuIy 30 (post-fledging)*** ***Sunrise to 1200*** ***3***
1600 to sunset

Young are active and visible, and relatively safe without parental protection. Both adults make numerous trips to the nest and are often soaring above, or perched near or on the nest tree. The location and construction of the nest may still limit visibility of the nest, young, ‘and adults.

DETERMINING A PROJECT'S POTENTIAL
FOR IMPACTING SWAINSON'S HAWKS

LEVEL OF RISK	REPRODUCTIVE SUCCESS (Individuals)	LONGTERM SURVIVABILITY (Population)	NORMAL SITE CHARACTERISTICS (Daily Average)	NEST MONI-TORING
HIGH	Direct physical contact with the nest tree while the birds are on eggs or protecting young. (Helicopters in close proximity)	Loss of available foraging area. Loss of nest trees.	Little human-created noise, little human use: nest is well away from dwellings, equipment yards, human access areas, etc. *Do not include general cultivation practices in evaluation.*	MORE
	Loss of nest tree after nest building is begun prior to laying eggs.	Loss of potential nest trees.		
	Personnel within 50 yards of nest tree (out of vehicles) for extended periods while birds are on eggs or protecting young that are < 10 days old.	Cumulative: Multi-year, multi-site projects with substantial noise/personnel disturbance.		
	Initiating construction activities (machinery and personnel) within 200 yards of the nest after eggs are laid and before young are > 10 days old.	Cumulative: Single-season projects with substantial noise/personnel disturbance that is greater than or significantly different from the daily norm.		
	Heavy machinery only working within 50 yards of nest.		Substantial human-created noise and occurrence: nest is near roadways, well-used waterways, active airstrips, areas that have high human use. *Do not include general cultivation practices in evaluation.*	
	Initiating construction activities within 200 yards of nest before nest building begins or after young > 10 days old.	Cumulative: Single-season projects with activities that "blend" well with site's "normal' activities.		
LOW	All project activities (personnel and machinery) greater than 200 yards from nest.			LESS

APPENDIX D
SMART GRID DEMONSTRATIONS PROGRAM
ENVIRONMENTAL SYNOPSIS

This appendix contains a copy of the 2009 environmental synopsis for Smart Grid Demonstrations Program Area of Interest 2.

Environmental Synopsis of

Smart Grid Demonstrations Program
Area of Interest Two – Energy Storage

Funding Opportunity Announcement
DE-FOA-0000036

Prepared for

U.S. Department of Energy
National Energy Technology Laboratory
Morgantown, West Virginia

October 2009

Prepared by
Jason Associates Corporation
San Diego, California

CONTENTS

Section Page

1. Introduction and Background 1
2. Description of Applications 3
3. Assessment Approach 6
4. Summary of Potential Environmental Impacts 7
5. References 9

LIST OF TABLES

Page

Table 1
Potential Impacts of Smart Grid Demonstration Projects Rollup – Area of Interest 2 9

1. INTRODUCTION AND BACKGROUND

With funds made available by the *American Recovery and Reinvestment Act of 2009*, the U.S. Department of Energy (DOE or the Department) Office of Electricity Delivery and Energy Reliability issued a competitive Funding Opportunity Announcement (FOA) (DE-FOA-0000036), *Recovery Act – Smart Grid Demonstrations* (DOE 2009). Smart grid projects funded under the FOA would include regionally unique demonstrations to verify smart grid technology viability, quantify smart grid costs and benefits, and validate new smart grid business models, all at a scale that can be readily adapted and replicated around the country. These projects would demonstrate technologies that are widely available for use in the United States.

The goal of the FOA is to demonstrate technologies in regions across the states, districts, and U.S. territories that embody essential and salient characteristics of each region and present a suite of use cases for national implementation and replication. From these use cases, the goal is to collect and provide information necessary for customers, distributors, and generators to change their behavior in a way that reduces system demands and costs, increases energy efficiency, optimally allocates and matches demand and resources to meet that demand, and increases the reliability of the grid. The social benefits of a smart grid are reduced emissions, lower costs, increased reliability, and greater security and flexibility to accommodate new energy technologies, including renewable, intermittent, and distributed sources.

To reap the full benefits of smart grid technologies, advancements in grid-scale energy storage are also needed. Electric grid operators can utilize electricity storage devices to manage the amount of power required to supply customers at times when the need is greatest, which is during peak load. Electricity storage devices can also help make renewable energy resources, whose power output cannot be controlled by grid operators, more manageable. They can also balance microgrids to achieve a good match between generation and load. Storage devices can provide frequency regulation to maintain the balance between the network's load and power generated, increase asset utilization of both renewables and electric systems, defer technology and development investments, and achieve a more reliable power supply for high-tech industrial facilities.

The FOA included two program Areas of Interest (AOIs): (1) Smart Grid and (2) Energy Storage. This environmental synopsis addresses AOI-2; a separate synopsis has been prepared to address AOI-1.

The objective of the FOA under AOI-2 for energy storage is to support demonstration projects for major, utility-scale, energy storage installations. The projects will help to establish costs and benefits, verify technical performance, and validate system reliability and durability at scales that can be readily adapted and replicated across the United States. Energy storage systems include the following technologies: advanced battery systems (including flow batteries), ultra-capacitors, flywheels, and compressed air energy systems. Project areas include wind and photovoltaic integration with the grid, upgrade deferral of transmission and distribution assets,

congestion relief, and system regulation. Projects also include demonstrations of promising utility-scale storage technologies in order to rapidly advance their market readiness in the United States.

As a federal agency, DOE must comply with the *National Environmental Policy Act of 1969* (NEPA) (42 USC 4321 et seq.) by considering potential environmental issues associated with its actions prior to undertaking those actions. The NEPA environmental review of projects evaluated under the Smart Grid Demonstrations FOA will be prepared pursuant to Council on Environmental Quality (CEQ) regulations (40 CFR Parts 1500 – 1508), and the Department's NEPA implementing procedures (10 CFR Part 1021), which provide directions specific to procurement actions that DOE may undertake or fund before completing the NEPA process. Per these regulations, DOE has prepared an environmental critique and this environmental synopsis to support the procurement selection process.

The environmental critique prepared for AOI-2 evaluated nine proposals submitted for the Smart Grid Demonstrations AOI-2. The critique was developed to meet the DOE NEPA implementing procedures and, specifically, to meet the requirements in those procedures for environmental critiques of procurements, financial assistance, and joint ventures [10 CFR 1021.216(f) and (g)].

Only those proposals for which an environmental assessment or environmental impact statement could be required were evaluated. The critique did not address proposals submitted for the FOA that could be categorically excluded in accordance with Subpart D of 10 CFR Part 1021.

The environmental critique provided an evaluation and comparison of potential environmental impacts for each proposal deemed to be within the competitive range. DOE used the critique to evaluate appreciable differences in the potential environmental impacts from those proposals. As delineated in 10 CFR 1021.216(g), the environmental critique focused on environmental issues pertinent to a decision among the proposals and included a brief discussion of the purpose of the procurement and each proposed project, a discussion of the salient characteristics of each project, and a brief comparative evaluation of the environmental impacts of the projects. The critique represents one aspect of the formal process used to select among applicants for funding under the Smart Grid Demonstration AOI-2 FOA. As such, it is a procurement-sensitive document and subject to all associated restrictions.

This document is the environmental synopsis, which is a publicly available document corresponding to the environmental critique. The environmental synopsis documents the evaluation of potential environmental impacts associated with the proposals in the competitive range and does not contain procurement-sensitive information. The specific requirements for an environmental synopsis delineated in 10 CFR 1021.216(h) are as follows:

> *(h) DOE shall prepare a publicly available environmental synopsis, based on the environmental critique, to document the consideration given to environmental factors and to record that the relevant environmental consequences of reasonable alternatives have been evaluated in the selection process. The synopsis will not*

contain business, confidential, trade secret or other information that DOE otherwise would not disclose pursuant to 18 U.S.C. 1905, the confidentiality requirements of the competitive procurement process, 5 U.S.C. 552(b) and 41 U.S.C. 423. To assure compliance with this requirement, the synopsis will not contain data or other information that may in any way reveal the identity of offerors. After a selection has been made, the environmental synopsis shall be filed with EPA, shall be made publicly available, and shall be incorporated in any NEPA document prepared under paragraph (i) of this section.

To address the above requirements, this environmental synopsis includes: (1) a brief description of background information related to the Smart Grid Demonstration AOI-2, (2) a general description of the proposals received in response to the FOA and deemed to be within the competitive range, (3) a summary of the assessment approach used in the environmental critique to evaluate the potential environmental impacts associated with the proposals, and (4) a summary of the environmental impacts presented in the critique, focusing on potential differences among the proposals. Because of confidentiality concerns, the proposals and environmental impacts are discussed in general terms.

2. DESCRIPTION OF APPLICATIONS

The environmental critique evaluated nine projects under AOI-2. The projects evaluated are large- and small-scale energy storage demonstration projects, most of which include one or more of the following activities:

- Installation of new battery storage systems, generally to be integrated with new or existing photovoltaic or wind energy systems;
- Construction of new compressed air energy storage (CAES) systems connected to the grid and including use of caverns, mines, and aquifers for the air storage component; and
- Construction of flywheel energy storage systems.

The following are brief descriptions of the characteristics of the nine projects evaluated. The aspects of the projects that could result in environmental impacts, and that were considered in the Environmental Critique, are briefly described. All procurement sensitive information has been removed from the descriptions. Most projects include other activities that would result in minor or no impacts on the environment (for example, installing control equipment meters and running electric lines in the immediate area of the energy storage devices); such activities are not described.

1. Project 1

Period: 5.5 years
Location: Texas

This project would involve the construction of one of the largest CAES facilities in the United States, at about 130 megawatts. The project would make use of an existing storage cavern in a salt dome formation nearly 3,000 feet underground. The project would include a 30-acre construction site, discharge of non-contact cooling water to a nearby tributary, and injection of brine removed from the storage cavern.

2. Project 2

Period: 4 years
Location: New York

This project would design, build, test, commission, and operate a utility-scale, 20-megawatt flywheel energy storage frequency regulation plant and provide frequency regulation services to the grid operator. Project objectives include demonstrating to grid operators the technical, cost, and environmental advantages of fast-response flywheel-based frequency regulation; lowering the cost to build a 20-megawatt flywheel energy storage plant; speeding deployment of this technology to other grid operator regions; and stimulating international market demand for flywheel energy storage. The project includes construction of the facility in an industrial park and connecting to an adjacent grid transmission line.

3. Project 3

Period: 4 years
Location: Iowa

Many high-potential wind energy areas of the Midwest are located long distances from significant electrical load. This creates instability and over-capacity for the existing transmission system. In addition, most wind energy is generated during the off-peak hours, which does not match the demands of the electrical system. This project would demonstrate the benefits of a CAES plant to allow transmission systems to efficiently absorb vast amounts of wind energy in areas of high wind penetration and low load. In addition, the applicant would demonstrate and quantify the cost savings and benefits of using a CAES plant to optimize the existing generating assets of the utility systems receiving the wind energy. The applicant proposes to build a 270-megawatt CAES facility. Air would be stored in an underground aquifer.

The project would proceed in two phases:

- Phase 1 would involve air injection tests to demonstrate and prove the capability of the geologic formation to store and release the pressurized air at the desired rates.
- Phase 2 would involve the design, construction, and startup of the 270-megawatt CAES plant on approximately 20 acres of land.

4. Project 4

Period: 2 years
Location: Illinois

The applicant would design, build, test, commission, and operate a 20-megawatt flywheel energy storage frequency regulation plant and provide frequency regulation services to the grid operator. In addition, the applicant would collect critical data needed to measure the achievement of these project objectives and organize and disseminate that data to DOE, other grid operators, and the public in appropriately useful formats. The project site would be about 3.5 acres and involve the use of 200 high-energy flywheels.

5. Project 5

Period: 3 years
Location: Ohio

The applicant would install a compressed air power generating facility, which would be capable of 268 megawatts of power generation and would be located at a limestone mine. The project would include two power generation units designed specifically for the CAES application. The facility would be designed to operate on natural gas only. The project is already permitted for up to 800 Megawatts of power generation. Construction on the 92-acre site, which is previously disturbed and zoned for heavy industry, would include the power generation building, a control building, and a cooling tower.

6. Project 6

Period: 5 years
Location: California

The applicant would install a compressed air power generating facility using a saline porous rock formation as the storage reservoir. The project would take a phased approach to build and validate the design, performance, and reliability of an advanced underground CAES plant (300 megawatts with 10 hours of storage).

7. Project 7

Period: 4 years
Location: Hawaii

The project consists of the construction of a large battery enclosure and a substation, with a combined footprint of less than an acre. These facilities would be adjacent to existing wind energy facilities.

8. Project 8

Period: 5 years
Location: New York

The proposed project would include final design, layout, and construction of a 130-megawatt electric-peaking CAES plant. The plant would use electric-drive compressors during times of low electric demand to compress air into an existing salt cavern for subsequent use to generate electricity during times of high demand. A new 1.5-mile long electric transmission line and substation would be constructed to tie the new facility into the existing electric grid. The project site would be a leased 10-acre section of a much larger parcel. The tallest structure (stack) would be about 80 feet, and a building about 60 feet tall and 130 feet long would be constructed to house large equipment. New wells would likely be drilled into the cavern. Pumps and a water line (approximately 1,600 feet long) from a nearby recreational lake would be installed to provide access to fresh water for cooling towers.

9. Project 9

Period: 4 years
Location: New Mexico

This project would combine a 2.8-megawatt hour battery system with an existing 500-kilowatt solar photovoltaic installation. The goal is to employ the battery, along with a control system, to turn solar photovoltaic into a reliable, dispatchable, distributed generation resource. Data collection and analysis based on this design would produce information for a range of possible applications. The project would also yield computer-based modeling tools that would simulate the behavior of distribution feeders under varying loads, with and without distributed generation and storage attached. Construction would be on 5 acres within a currently undeveloped 27-acre site, and would include access roads, a pad for the battery system, and a 1,000-foot line to existing transmission lines.

3. ASSESSMENT APPROACH

Each of the applicants that provided a proposal in response to the Smart Grid Demonstrations FOA was required to submit an environmental questionnaire. The questionnaires included detailed information on the project including the following:

- Project Summary and objectives
- Work locations
- Materials used and produced (e.g., water, electricity, wastewater, air emissions)
- Proposed alternatives
- Land use changes

- Proximity to local, state, or national parks, forests, monuments, scenic waterways, wilderness, recreation facilities, or Tribal lands
- Potential impacts of construction activities
- Potential impacts to surface waters , floodplains, or wetlands
- Potential impacts to any vegetation and wildlife resources
- Changes that could result in socioeconomic or infrastructure conditions
- Potential impacts to historic or cultural resources
- Attainment status for the air quality conditions for the immediate project area
- Potential air emissions from the proposed project
- Potential amounts of solid and hazardous wastes produced
- Unique health and safety factors associated with the project
- Any required permitting or other regulatory compliance activities
- Potential for public controversy

For each project considered in the environmental critique, the potential direct and indirect effects, short-term and long-term effects, and unavoidable adverse effects were identified for 20 resource areas. These resource areas are included as the first 20 entries in Table 1 in Section 4. The critique also includes a summary of project activities, mitigation measures proposed by the applicant, areas where important environmental information is incomplete and unavailable, unresolved environmental issues, and practicable mitigation measures. Also included is a list of federal, tribal, state, and local government permits, licenses, and approvals identified by the applicants or known to be required for each project.

4. SUMMARY OF POTENTIAL ENVIRONMENTAL IMPACTS

This section provides a summary of potential impacts for each project. Table 1 identifies the resource areas that could be adversely or beneficially impacted for each of the nine projects. For each project, the potential direct and indirect, short-term and long-term, and unavoidable impacts were identified and classified into one of the following four color-coded categories:

- No impacts to a resource area are expected – blank
- Potential for minor adverse or beneficial impacts or unknown impacts of possible minor concern – black text or dot, no shading
- Potential for moderate adverse impacts or unknown impacts of possible moderate concern – light shading
- Potential for major adverse impacts or unknown impacts of possible major concern – darker shading

As summarized in Table 1, many of the projects have the potential to affect multiple aspects of the environment. Because of the nature of many of these projects (for example, construction of

new facilities, often with power-generating, or conversion, capabilities), many of the projects would have minor or moderate impacts on a range of environmental resource areas including aesthetics, air quality, human health and safety, land use, noise, waste and materials, transportation, and utilities. Some of the projects would also have minor or moderate impacts on cultural, biological, groundwater, and surface water resources. The geologic-based CAES are also identified as having the potential for moderate impacts on geology because of the unknowns associated with how the geologic features would respond to the repeated pressurization and release cycles. Most or all of the projects would have minor beneficial impacts on socioeconomic conditions (by increasing employment and the monetary infusion into the community) and utility operations (by improving the efficiency of the transmission system).

Many of the projects highlighted in Table 1 as having the potential for moderate adverse impacts are actually characterized in the environmental critique as having minor-to-moderate impacts. This characterization is often associated with unknowns with respect to some project quantity or the existing characteristics of the project site. The classification of these impacts may eventually be downgraded as the design of projects mature and more information becomes available.

Only one project was identified with the potential to have major adverse impacts. This was due to the projected amount of air emissions that would be involved, likely requiring a Prevention of Significant Deterioration permit for the project.

Table 1. Potential Impacts of Smart Grid Demonstration Projects Rollup – Area of Interest 2

Resource Areas	1	2	3	4	5	6	7	8	9
Aesthetics	●	●	●	●	●	●	●	●	●
Air Quality	●	●	■	●	●	●	●	●	
Biological Resources		●	●			●	●		●
Climate									
Community Services									
Cultural Resources			●					●	●
Environmental Justice									
Floodplains									
Geology	●				●	●		●	
Groundwater	●		●			●		●	
Human Health and Safety	●	●	●	●	●	●	●	●	●
Land use	●	●	●	●	●	●	●	●	●
Noise	●	●	●	●	●	●	●	●	
Wastes & Materials		●	●	●	●	●		●	●
Soils		●	●	●		●	●	●	●
Socioeconomics	●	●	●	●	●	●	●	●	●
Surface Water	●		●			●	●	●	●
Transportation/Traffic	●	●	●	●	●	●		●	●
Utilities	●	●	●	●	●	●	●	●	
Wetlands	●							●	
Public Controversy	●		●			●		●	●
Permits	●	●	●	●	●	●	●	●	●
Mitigation	●	●		●	●	●		●	●

	(Blank) No impacts expected.
●	Potential to be minor adverse or beneficial impacts or there are unknowns of possible minor concern.
●	Potential to be moderate adverse impacts or there are unknowns of possible moderate concerns.
●	Potential to be major adverse impacts or there are unknowns of possible major concerns.

5. REFERENCES

DOE 2009 U.S. Department of Energy, National Energy Technology Laboratory, *Recovery Act – Smart Grid Demonstrations, Funding Opportunity Number: DE-FOA-0000036*, June 25, 2009.