DOCKETED

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Project Title:	Carlsbad Energy Center - Compliance
TN #:	206434
Document Title:	Biological Resources Mitigation Implementation and Monitoring Plan
Description:	Condition of Certification â€“ BIO-6, Biological Resources Mitigation Implementation and Monitoring Plan
Filer:	Jonathan Fong
Organization:	NRG Energy
Submitter Role:	Applicant
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July 16, 2015

Mr. Jonathan Fong
Compliance Project Manager
Docket No. 07-AFC-06C
California Energy Commission
1516 Ninth Street, MS2000
Sacramento, CA 95814

Subject: Amended Carlsbad Energy Center Project,
Docket No. 07-AFC-06C,
Condition of Certification – BIO-6, Biological Resources Mitigation Implementation and Monitoring Plan

Dear Mr. Fong:

Carlsbad Energy Center LLC ("Project Owner") submits the attached revised Biological Resources Mitigation Implementation and Monitoring Plan (BRMIMP) in compliance with condition of certification (COC) BIO-6 for the Amended Carlsbad Energy Center Project (Amended CECP) located at 4600 Carlsbad Boulevard, Carlsbad, California.

COC BIO-6 requires review and approval of the BRMIMP by the California Energy Commission Compliance Project Manager and submittal to the California Department of Fish and Wildlife and the US Fish and Wildlife Service for review and comment.

If you have any questions regarding this submittal, please contact George Piantka at (760) 710-2156.

Sincerely,

George Piantka,
Director, Environmental Regulatory Services
NRG Energy, West Region

Enclosures: Biological Resources Mitigation Implementation and Monitoring Plan for the Amended Carlsbad Energy Center Project San Diego County, California (07-AFC-06C), Prepared by CH2M HILL, July 2015

C: File

BIO-6

Biological Resources Mitigation Implementation and Monitoring Plan Amended Carlsbad Energy Center Project

(07-AFC-06C)

San Diego County, California

Prepared for

Carlsbad Energy Center LLC

5790 Fleet Street, Suite 200
Carlsbad, CA 92008

July 2015

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Acronyms and Abbreviations

AFC	Application for Certification
AST	aboveground storage tank
BRMIMP	Biological Resources Mitigation Implementation and Monitoring Plan
CCR	California Code of Regulations
CDFW	California Department of Fish and Wildlife
CEC	California Energy Commission
Amended CECP	Amended Carlsbad Energy Center Project
CEQA	California Environmental Quality Act
COC	Condition of Certification
CPM	Compliance Project Manager
CTG	combustion turbine generator
dBA	decibel(s)
EPS	Encina Power Station
GPS	global positioning system
HMP	Habitat Management Plan
I-5	Interstate 5
kV	kilovolt(s)
LCP	Local Coastal Program
LORS	Laws, ordinances, regulations, and standards
LUP	Land Use Plan
MHCP	Multiple Habitat Conservation Plan
MW	megawatt(s)
STG	steam turbine generator
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
WEAP	Worker Environmental Awareness Program

SECTION 1

Purpose and Background

Carlsbad Energy Center LLC ("Project Owner") has prepared this Biological Resources Mitigation Implementation and Monitoring Plan (BRMIMP) for the Amended Carlsbad Energy Center Project ("Amended CECP" or "Project") in San Diego County, California. This BRMIMP is applicable to the activities associated with the Petition to Amend (PTA), as submitted by the Project Owner in April of 2014. This BRMIMP has been prepared in accordance with Conditions of Certification (COC) BIO-6 in the California Energy Commission's (CEC) Amended CECP Presiding Member's Proposed Decision (PMPD, June 2015).

The purpose of this BRMIMP is to identify all mitigation, monitoring, and compliance measures related to biological resources to ensure compliance with the CEC COC BIO-6. The Project Owner agrees with and will implement BIO-6 upon adoption by the CEC of the Final Commission Decision for the Amended CECP (07-AFC-06C).

This BRMIMP has been prepared to address Amended CECP activities including demolition of Tanks 1, 2, and 4, removal of associated aboveground pipelines and equipment, as needed soil remediation in the tank basins for Tanks 1, 2, 4, 5, 6 and 7 and berm removal between Tanks 4 and 5, 5 and 6, and 6 and 7. Tanks 4–7 are located within the portion of Encina Power Station (EPS) that is east of the railroad tracks, west of Interstate-5 (I-5) and north of Cannon Road. Tanks 1 and 2 are located within the portion of EPS that is west of the railroad tracks, west of I-5 and north of Cannon Road.

A BRMIMP was submitted in August 2014 (revised June 2015) for CECP Phase I demolition/removal activities for Tanks 5, 6, and 7, in support of the relevant COCs adopted by the CEC in its June 2012 Final Commission Decision (07-AFC-06C). After CEC Compliance Project Manager (CPM) approval in December 2014, compliance measures, as prescribed in the approved BRMIMP, have been monitored at the site and reported on in monthly compliance reports (MCR) submitted to the CEC CPM. Phase I demolition of Tanks 5-7 commenced in February 2014.

Laws, ordinances, regulations, and standards (LORS) applicable to the Amended CECP are provided in Table 4-1. A description of the Worker Environmental Awareness Program (WEAP), required by COC BIO-5 and prepared for the CECP as licensed, is also addressed in this document. A copy of the WEAP handbook is provided in Appendix A.

This plan incorporates the terms and conditions of the following license, permits, opinions, and agreements:

- Applicant-proposed mitigation, monitoring, and compliance measures from the CECP Application for Certification (AFC) filed with the CEC in September 2007 (Carlsbad Energy Center, LLC, 2007);
- CEC – Biological Resource Findings of Fact, Conclusions of Law, and Conditions of Certification from the Commission Decision in Docket No. 07-AFC-06; and
- Other Permits issued to Amended CECP (included in Appendix B of this BRMIMP).

1.1 Overview

This BRMIMP summarizes the biological resources that potentially will be affected by the Amended CECP and the measures required to avoid, minimize, or compensate for impacts to these resources. This BRMIMP is being implemented to ensure that the project is completed in a manner that minimizes and/or avoids impacts to the natural environment by appropriate compliance with terms and conditions of various permits and approvals. The Project Owner will ensure the Amended CECP will adhere to all permit conditions.

This BRMIMP includes the following primary components:

- A description of Amended CECP activities

- Responsibilities of participants, qualifications of the Designated Biologist and Biological Monitor, and lines of communication
- An overview of the WEAP
- Preconstruction monitoring and reporting responsibilities, including a description of timing and location of surveys
- All biological resource CEC conditions of certification, Project Owner proposed measures, and the terms and conditions of applicable state and federal regulations
- A description of impact avoidance, minimization, and mitigation measures
- A process for proposing plan modification to the Compliance Project Manager (CPM) and appropriate agencies for review and approval

1.2 Conditions of Certification

Table 1-1 provides a list of the Biological Resource COCs associated with the Amended CECP. A full description of all COCs is provided in Appendix C.

TABLE 1-1
Conditions of Certification for Biological Resources

COC #	Condition of Certification
BIO-1	Designated Biologist Selection
BIO-2	Designated Biologist Duties
BIO-3	Biological Monitor Qualifications
BIO-4	Designated Biologist and Biological Monitor Authority
BIO-5	Worker Environmental Awareness Program (WEAP)
BIO-6	Biological Resources Mitigation Implementation and Monitoring Plan
BIO-7	Impact Avoidance Mitigation Features
BIO-8	Mitigation Management to Avoid Harassment or Harm

1.2.1 Condition of Certification BIO-6

The project owner shall submit two copies of the proposed BRMIMP to the Compliance Project Manager (CPM) (for review and approval) and to California Department of Fish and Wildlife (CDFW) and United States of Fish and Wildlife Service (USFWS) (for review and comment) and shall implement the measures identified in the approved BRMIMP.

The BRMIMP shall be prepared in consultation with the Designated Biologist and shall identify:

1. all biological resource mitigation, monitoring, and compliance measures proposed and agreed to by the project owner;
2. all project owner-proposed mitigation measures presented in the Application for Certification;
3. all biological resource conditions of certification in the Final Commission Decision to avoid or mitigate impacts;
4. all biological resource mitigation, monitoring, and compliance measures required in other state agency terms and conditions, such as those provided in the Regional Water Quality Control Board permits;

5. all biological resource mitigation, monitoring, and compliance measures required in local agency permits, such as site grading and landscaping requirements;
6. all sensitive biological resources to be impacted, avoided, or mitigated by project construction, operation, and closure;
7. all required mitigation measures for each sensitive biological resource;
8. a detailed description of measures that shall be taken to avoid or mitigate temporary disturbances from construction activities;
9. all locations on a map, at an approved scale, of sensitive biological resource areas subject to disturbance and areas requiring temporary protection and avoidance during construction;
10. aerial photographs, at an approved scale, of all areas to be disturbed during project construction activities — one set prior to any site (and related facilities) mobilization disturbance and one set subsequent to completion of project construction. Include planned timing of aerial photography and a description of why times were chosen;
11. duration for each type of monitoring and a description of monitoring methodologies and frequency;
12. performance standards to be used to help decide if/when proposed mitigation is or is not successful;
13. all performance standards and remedial measures to be implemented if performance standards are not met;
14. a preliminary discussion of biological resources-related facility closure measures;
15. restoration and revegetation plan; and
16. a process for proposing plan modifications to the CPM and appropriate agencies for review and approval.

Verification: The project owner shall provide the specified document at least 60 days prior to start of any project-related ground disturbing activities.

The CPM will determine the BRMIMP's acceptability within 45 days of receipt. If there are any permits that have not yet been received when the BRMIMP is first submitted, these permits shall be submitted to the CPM, the CDFW, and USFWS within five days of their receipt, and the BRMIMP shall be revised or supplemented to reflect the permit condition within 10 days of their receipt by the project owner. Ten days prior to site (and related facilities) mobilization, the revised BRMIMP shall be resubmitted to the CPM.

The project owner shall notify the CPM no less than five working days before implementing any modifications to the approved BRMIMP to obtain CPM approval.

Any changes to the approved BRMIMP must also be approved by the CPM in consultation with CDFW, the USFWS, and appropriate agencies to ensure no conflicts exist.

Implementation of BRMIMP measures will be reported in the monthly compliance reports by the Designated Biologist (i.e. survey results, construction activities that were monitored, species observed). Within 30 days after completion of project construction, the project owner shall provide to the CPM, for review and approval: a written construction closure report identifying which items of the BRMIMP have been completed; a summary of all modifications to mitigation measures made during the project's site mobilization, ground disturbance, grading, and construction phases; and which mitigation and monitoring items are still outstanding." (COC BIO-6) (CEC, 2015).

SECTION 2

Project Description

2.1 Introduction

The Project Owner will develop the 2015 Amended CECP, a natural-gas-fired generating facility that will be a fast start, high-efficiency facility that will support San Diego Gas & Electric's (SDG&E) local load and provide overall system reliability.

2.2 Project Location

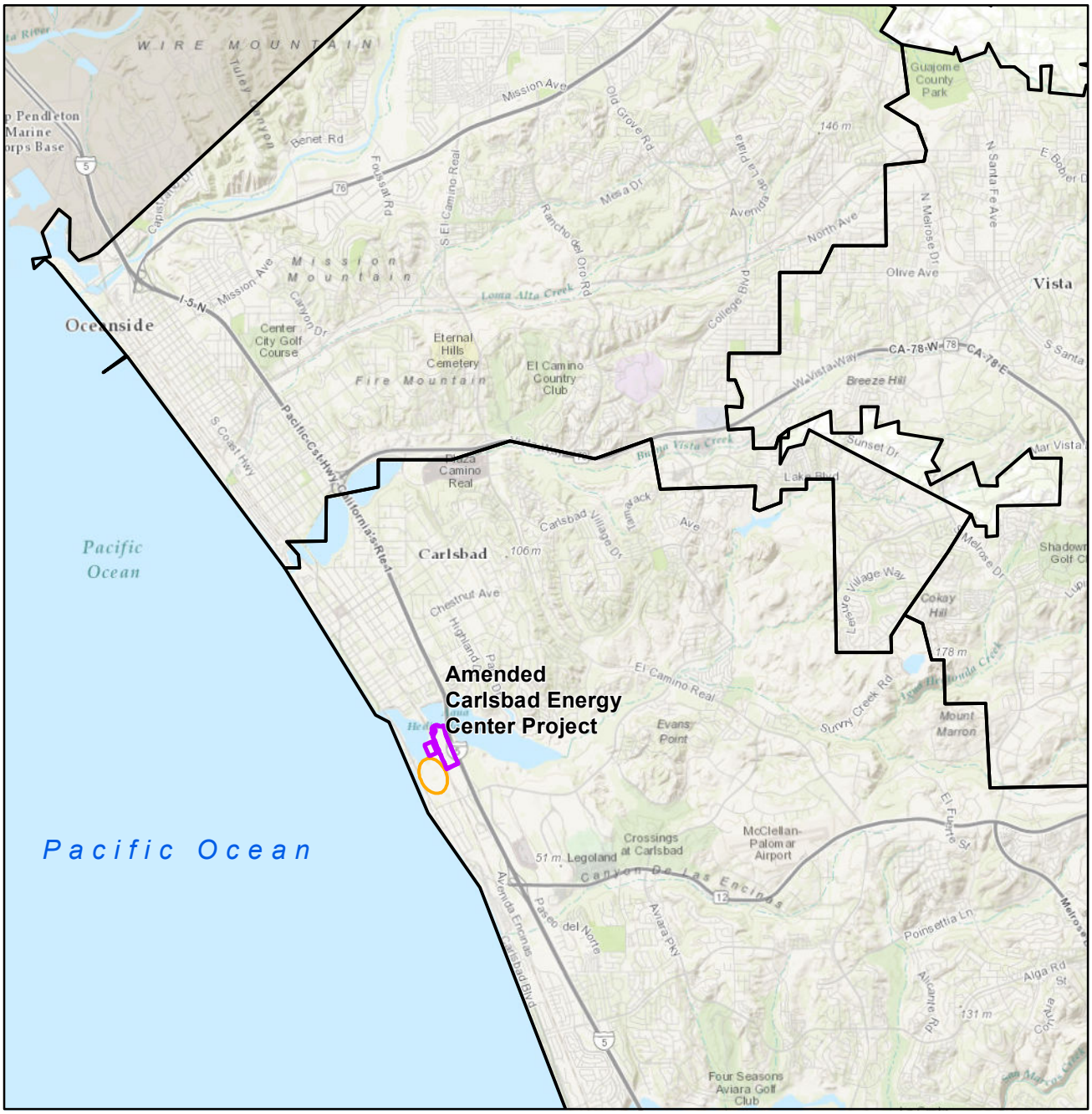
The Amended CECP site is located in Carlsbad, San Diego County, California (Figures 1 and 2). The site address is 4600 Carlsbad Blvd., Carlsbad, California 92008. The Amended CECP site is located on a portion of the approximately 95-acre EPS located in Township 12 South, Range 4 West, Section 7, in San Diego County. Elevation of the Amended CECP site varies between approximately 32 and 50 feet above mean sea level. The Amended CECP site is located within the northeastern portion of the existing EPS, which is bordered to the east by I-5, to the south by the SDG&E switchyard and Cannon Substation, to the west by the Pacific Ocean, and to the north by the Agua Hedionda Lagoon. The project site is bisected by the North County Transit District (NCTD) Railroad Right-Of-Way that runs north and south through the Encina Power Station (EPS). Cabrillo Power I operates a private rail crossing under a license agreement with NCTD, enabling internal vehicle traffic to cross the rail line. The predominant land use in the vicinity of the site is mainly industrial. Residential, commercial, and open space land uses are also situated nearby.

The nearest significant natural habitat areas are the Pacific Ocean, approximately 0.3 mile west of the Amended CECP site, and Agua Hedionda Lagoon, approximately 0.1 mile north and east of the Amended CECP site, on the opposite side of I-5 (CEC, 2012).

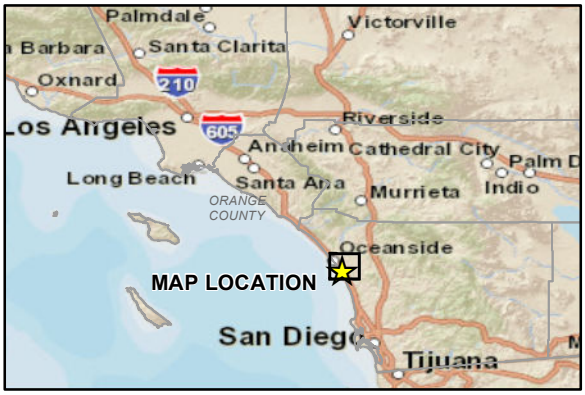
2.3 Project Description

The Amended CECP has been divided into four phases as follows:

- **Phase I** - Above grade demolition/removal activities for Tanks 1, 2, 4, 5, 6 and 7 including soil remediation in the tank basins, as needed, and berm removal between Tanks 4 and 5, 5 and 6, and 6 and 7. This phase includes soil disturbance and excavations associated with soil remediation activities. Above grade demolition and removal of Tanks 5, 6 and 7 is being accomplished under the existing CEC License for CECP.
- **Phase II** – Site preparation, construction and commissioning of the Amended CECP as modified by the PTA.
- **Phase III** – Retirement and decommissioning of the EPS facility.
- **Phase IV** – Demolition of the EPS facility. Phase IV specifically excludes below grade demolition and site remediation, which will be accomplished under the authority of San Diego County Environmental Health Department (site remediation) and the City of Carlsbad (redevelopment of the site for future use) subsequent to the completion of Phase IV.



VICINITY MAP



LEGEND

- Amended CECP Project Site
- Parking and Staging
- CA City Limits

N

0 0.75 1.5

Miles

FIGURE 1
Vicinity Map
Amended Carlsbad Energy Center Project

LEGEND

- Amended CECP site boundary
- Encina Power Station Site
- Demo and Construction Worker Access

0 375 750
Feet

N

Aerial Imagery Source: Google Earth Pro, 2015

Figure 2
Project Location Map
Amended Carlsbad Energy Center Project

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SECTION 3

Summary of Biological Resources

3.1 Existing Vegetation and Wildlife

Surveys conducted for the CECP site and vicinity include historic surveys[1]; a preconstruction survey for the CEMS concrete pad in June 2011; a site reconnaissance-level survey in February 2014 for a portion of the Amended CECP site; and a preconstruction survey for the CECP site on December 10, 2014. The survey of the Amended CECP site included an inventory of all plant and wildlife species observed and an assessment of potential habitat suitability for special-status species. The following description of biological resources presents the results of previous surveys of the Amended CECP site and ongoing biological resources compliance monitoring for Phase I activities, which began in December 2014.

The Amended CECP site is highly disturbed and/or developed because of the ongoing operations of the existing EPS and demolition activities for Tanks 5-7. The majority of the Amended CECP footprint consists of bare ground or a combination of bare ground and gravel with scattered ruderal vegetation. Plant species observed include iceplant (*Mesembryanthemum* sp.), tocalote (*Centaurea melitensis*), horseweed (*Conyza* sp.), black mustard (*Brassica nigra*), fountain grass (*Pennisetum setaceum*), wild oat (*Avena fatua*), foxtail chess (*Bromus madritensis* ssp. *rubens*), tree tobacco (*Nicotiana glauca*), western marsh-rosemary (*Limonium californicum*), salt heliotrope (*Heliotropium curasavicum*), buckwheat (*Eriogonum sp.*), and cudweed (*Gnaphalium* sp.). Eucalyptus (*Eucalyptus* sp.) plantings occur along the northern and eastern perimeter of the Amended CECP site and serve as visual screens of the EPS. These plantings are mature eucalyptus trees greater than 45 feet in height and of sufficient canopy cover to potentially support nesting raptors.

Due to the frequency and intensity of disturbance from operation of the EPS, the Amended CECP site does not provide habitat capable of supporting a diverse assemblage of wildlife. Direct wildlife observations in the project area include common species such as California ground squirrel (*Spermophilus beecheyi*), western fence lizard (*Sceloporus occidentalis*), and a variety of bird species typically found in disturbed and developed areas, including the following: American crow (*Corvus branchyrhynchos*), Anna's hummingbird (*Calypte anna*), black phoebe (*Sayornis nigricans*), California towhee (*Pipilo crissalis*), common yellowthroat (*Geothlypis trichas*), European starling (*Sturnus vulgaris*), house finch (*Carpodacus mexicanus*), house sparrow (*Passer domesticus*), lesser goldfinch (*Spinus psaltria*), mallard (*Anas platyrhynchos*), mourning dove (*Zenaida macroura*), northern mockingbird (*Mimus polyglottus*), rock dove (*Columba livia*), western gull (*Larus occidentalis*), and white-throated swift (*Aeronautes saxatalis*). One bat species, Mexican free-tailed bat (*Tadarida brasiliensis*), was observed within the CECP site during Phase I compliance monitoring.

A storm drain within the Amended CECP site contains hydrophilic vegetation including cattails (*Typha sp.*), sedge (*Carex* sp.), and umbrella-plant (*Cyperus involucratus*). This storm drain has the potential to support common amphibian species such as western toad (*Bufo boreas*) and Pacific treefrog (*Hyla regilla*). However, no amphibian species have been observed within the CECP site.

Nesting birds and raptors are protected by the Migratory Bird Treaty Act (MBTA) and California Fish and Game Code and require special consideration when construction activities could cause nest abandonment. Additionally, these laws and regulations prohibit the destruction of the nest or eggs of any bird species. Common urban-adapted species, such as those listed in the previous section, have the potential to nest within the project site. In addition, killdeer (*Charadrius vociferus*) often nest in open gravel areas such as those found in the project area.

[1] An aquatic survey of Agua Hedionda Lagoon for SDG&E in 1994 and 1995; a biological resource survey of the entire EPS in 2003; and a reconnaissance-level survey, which included the Amended CECP site and a 1-mile buffer, conducted in August 2007.

3.2 Special-Status Species

Special-status species include those listed as threatened or endangered under the Federal Endangered Species Act and/or the California Endangered Species Act, species proposed for listing, candidates for listing, California Species of Special Concern, and other species that have been identified by the USFWS or CDFW as unique or rare.

Although special-status plant and wildlife species and sensitive vegetation communities are known to occur within the vicinity of the Amended CECP site, they are generally restricted to the estuarine and open water habitats associated with the Agua Hedionda Lagoon, Pacific Ocean, and the surrounding natural habitats and are not expected to occur within the Amended CECP site. The Amended CECP site is characterized by a combination of developed areas, disturbed habitat, and ornamental landscaping. Additionally, no special-status plant or wildlife species were observed using the Amended CECP site during biological surveys, and the Amended CECP area does not provide suitable habitat for special-status species (Figure 3). In addition, demolition and construction activities of the Amended CECP will not result in the removal of native vegetation communities or sensitive plants species.

3.3 Sensitive Habitat

3.3.1 Aqua Hedionda Lagoon

Regular maintenance dredging of Agua Hedionda Lagoon began in 1954 to supply cooling water to the EPS and to ensure adequate tidal flow to maintain the overall lagoon health. The coastal lagoon has a permanent opening to the Pacific Ocean and is, therefore, primarily saltwater with associated estuarine habitat. Source waters include Agua Hedionda Creek and Calavera Creek (City of Carlsbad, 2004). The Agua Hedionda Lagoon system comprises the Inner Lagoon, Middle Lagoon, and Outer Lagoon; the Outer Lagoon is the location of the existing EPS intake.

Habitats include open water, sand and mud substrates, rock revetment, pilings, and aquaculture grow-out floats, which support diverse infaunal, bird, and fish communities. Additionally, the Agua Hedionda Lagoon supports important populations of special-status species such as the southwestern pond turtle (*Actinemys marmorata pallida*), white-faced ibis (*Plegadis chihi*), and western snowy plover (*Charadrius nivosus* ssp. *nivosus*) and provides foraging habitat for peregrine falcon (*Falco peregrinus*) and osprey (*Pandion haliaetus*). The estuarine and marsh habitat surrounding the lagoon provides suitable nesting habitat for special-status species such as the California least tern (*Sternula antillarum browni*), elegant tern (*Sterna elegans*), Belding's savannah sparrow (*Passerculus sandwichensis beldingi*), California brown pelican (*Pelecanus occidentalis*), and coastal California gnatcatcher (*Polioptila californica californica*).

The lagoon also provides various recreational opportunities (e.g., YMCA youth camp, water skiing, and boating) and marine aquaculture resources (e.g., mussels, oysters, and sea bass).

3.4 Aquatic Species

Amended CECP is not anticipated to result in impacts to aquatic species.

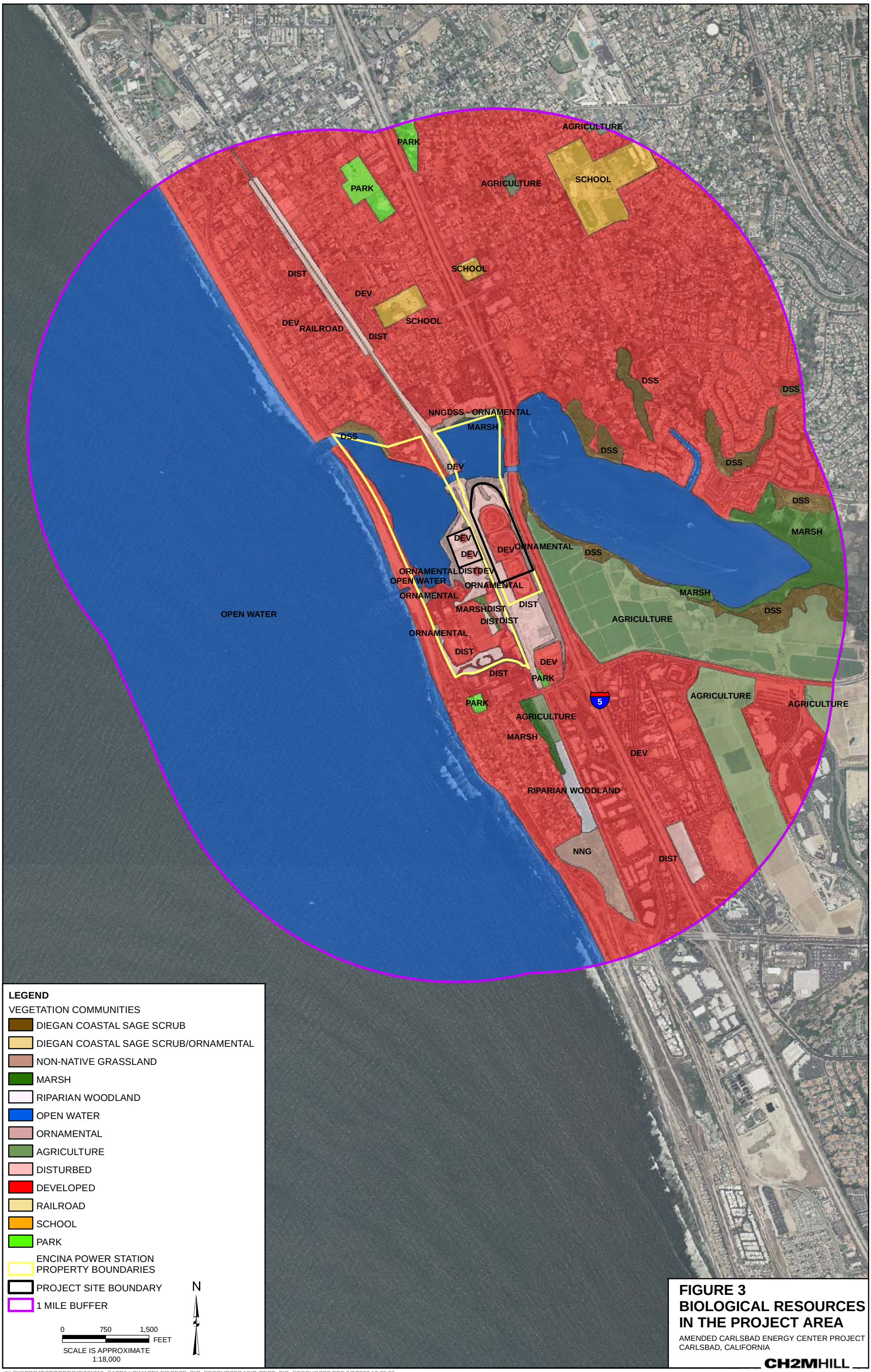

FIGURE 3
BIOLOGICAL RESOURCES IN THE PROJECT AREA

AMENDED CARLSBAD ENERGY CENTER PROJECT
CARLSBAD, CALIFORNIA

CH2MHILL

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SECTION 4

Authority and Lines of Communication

The first part of this section describes the responsibilities of three groups of participants: regulatory agencies; the Designated Biologist; and the Project Owner, its employees, contractors, and demolition crews. The qualifications of the Designated Biologist are also described in this section.

The second part of this section describes the lines of communication, chain of command, and identifies which persons have the authority to stop or temporarily suspend surface-disturbing activities during Amended CECP construction.

4.1 Definitions of Participants

The CEC has designated a staff member to serve as the CPM. The CPM oversees compliance with the CEC COCs for the Amended CECP. The CPM is also responsible for processing post-certification changes, documenting and tracking compliance filings, and ensuring that compliance files are maintained and accessible.

The Designated Biologist, Project Owner's environmental compliance manager, and biological monitors will represent the Project Owner and will be responsible for compliance reporting to the CPM. These responsibilities and relationships are described in more detail in this section.

Project owner construction personnel will be referred to as contractors and include the construction project manager, construction inspector, plant manager, contractor supervisor, resident engineer, and the crew foreman and crew.

Regulatory agencies involved may include USFWS and CDFW. However, special-status plant and wildlife species are not expected to occur within the Amended CECP boundary, so additional agency coordination regarding special-status plant and wildlife species is not anticipated.

4.2 Responsibilities of Participants

Although responsibilities are divided, ultimately the Project Owner construction team and the Designated Biologist collectively have the responsibility to reach a consensus when conflicts arise during Amended CECP construction. From time to time, it is possible that one or more of the regulatory agencies may be consulted as part of conflict resolution.

4.2.1 Designated Biologist Selection (BIO-1)

The Project Owner has assigned Melissa Fowler of CH2M HILL as the Designated Biologist for the Amended CECP. CEC CPM has approved Ms. Fowler to serve as the Designated Biologist. As required, Ms. Fowler has the following minimum qualifications:

- A bachelor's degree in biological sciences, zoology, botany, ecology, or a closely related field;
- Three years of experience in field biology or current certification of a nationally recognized biological society such as the Ecological Society of America or The Wildlife Society; and
- At least one year of field experience with biological resources found in or near the project area.

No site or related facility activities will commence until an approved Designated Biologist is available to be onsite. If a Designated Biologist needs to be replaced, the specified information of the proposed replacement will be submitted to the CPM at least 10 working days prior to the termination or release of the preceding Designated Biologist. In an emergency, the Project Owner will immediately notify the CPM to discuss the qualifications and approval of a short-term replacement while a permanent Designated Biologist is proposed to the CPM for consideration.

4.2.2 Designated Biologist Duties (BIO-2)

The Project Owner shall ensure that the Designated Biologist performs the following during any site (or related facilities) mobilization, ground disturbance, grading, construction, operation, and closure activities. The Designated Biologist may be assisted by approved biological monitor(s), but remains the contact for the Project Owner and CPM. The Designated Biologist shall:

1. Advise the Project Owner's construction and operation managers on the implementation of the Biological Resources Conditions of Certification;
2. Consult on the preparation of this Biological Resources Mitigation Implementation and Monitoring Plan (BRMIMP) submitted by the Project Owner;
3. Be available to supervise, conduct, and coordinate mitigation, monitoring, and other biological resource compliance efforts, particularly in areas requiring avoidance or containing sensitive biological resources, such as wetlands and special-status species or their habitat;
4. Clearly mark sensitive biological resource areas and inspect these areas at appropriate intervals for compliance with regulatory terms and conditions;
5. Inspect active construction areas where animals may have become trapped prior to construction commencing each day. At the end of the day, inspect for the installation of structures that prevent entrapment or allow escape during periods of construction inactivity. Periodically inspect areas with high vehicle activity (i.e., parking lots) for animals in harm's way;
6. Notify the Project Owner and the CPM of any non-compliance with any Biological Resources Condition of Certification;
7. Respond directly to inquiries of the CPM regarding biological resource issues;
8. Maintain written records of the tasks specified above and those included in the BRMIMP. Summaries of these records shall be submitted in the monthly compliance report and the annual report; and
9. Train the biological monitors as appropriate, and ensure their familiarity with the BRMIMP, Worker Environmental Awareness Program (WEAP) training, and all permits.

The Designated Biologist shall submit in the monthly compliance report to the CPM copies of all written reports and summaries that document biological resources activities.

4.2.3 Biological Monitor Qualifications (BIO-3)

The Project Owner has submitted the résumés, including references and contact information, for each biological monitor to the CPM for approval. Each résumé demonstrates that each proposed biological monitor has the appropriate education and experience to accomplish the assigned biological resource tasks.

Biological monitor(s)'s training by the Designated Biologist will include familiarity with the COCs, BRMIMP, WEAP, and all permits. Upon completion of training, the Designated Biologist will submit a written statement to the CPM confirming that the individual biological monitor(s) has been trained, including the date when training was completed.

4.2.4 Agency Responsibilities

Regulatory agency personnel are responsible for enforcing state and federal laws protecting sensitive species and natural resources. Staff from these agencies generally have broad authority to monitor and evaluate projects implemented under permits authorized by the agencies and can take enforcement actions

if violations occur. The following agencies have authority associated with biological and water resources at the Amended CECP site:

- CEC through the CPM verifies compliance with COCs and approves changes in implementation methodology.
- USFWS is responsible for protecting federally listed Endangered and Threatened species and for taking actions pursuant to an ESA Section 7, Incidental Take authorization. This would include measures in the project description or mitigation intended to avoid, minimize, or compensate for adverse impacts to federally listed, proposed, or candidate species and designated critical habitat. The USFWS contact will be notified immediately if a listed wildlife species is involved in an injury or fatality.
- CDFW is responsible for protecting species under the California Endangered Species Act and Fish and Game Code. The CDFW contact will be notified immediately if a listed species is involved in an injury or fatality.

The agencies and the CPM will receive copies of the relevant monitoring reports that detail compliance with the permits and authorizations issued for the project. These agencies may also conduct unannounced site visits to ensure compliance with project conditions.

4.3 Authority and Lines of Communication

The regulatory agencies and the Designated Biologist have different responsibilities regarding implementing mitigation measures to protect biological resources. This section of the BRMIMP describes how they will interact on the Amended CECP.

4.3.1 Regulatory Agencies

If compliance problems arise during any phase of the project, agency representatives would discuss the issue with the CPM, Designated Biologist, and the Project Owner, including contractors. If violations occur, work can be stopped on the whole project, or on portions of the project. However, before work is stopped, the aforementioned parties will undertake a good-faith effort to resolve any violations.

4.3.2 Roles and Authority of the Designated Biologist and Biological Monitors

4.3.2.1 Roles of the Designated Biologist and Biological Monitors

The Designated Biologist and biological monitor(s), although contracted to the Project Owner, are responsible for independently ensuring that the requirements described in the BRMIMP are carried out completely and in a timely manner. As stated above, pending the CPM's approval, Melissa Fowler is intended to be named as the Designated Biologist. Ms. Fowler's resume and resumes of qualified Biological Monitors for the Amended CECP are included in Appendix D.

4.3.2.2 Authority of the Designated Biologist and Biological Monitors

The Project Owner's demolition managers will act on the advice of the Designated Biologist and biological monitors to ensure conformance with the biological resources COCs. If required by the Designated Biologist and biological monitors, the Project Owner's demolition managers will halt applicable site mobilization, ground disturbance, grading, and demolition activities in areas specified by the Designated Biologist. The Designated Biologist may require a halt of all activities in any area when their continuance might cause an unauthorized adverse impact to biological resources.

The Designated Biologist will perform the following actions:

- Inform the Project Owner and the demolition managers when to resume activities; and
- Notify the CPM if a halt of any activities occurs and advise the CPM of any corrective actions that have been taken, or will be instituted, as a result of the work stoppage. If the Designated Biologist is unavailable for direct consultation, the biological monitor will act on behalf of the Designated Biologist.

The Designated Biologist or biological monitor will notify the CPM immediately, and no later than the morning following an incident or Monday morning following a weekend incident, of any noncompliance or a halt of any site mobilization, ground disturbance, grading, and demolition activities. The Project Owner will notify the CPM of the circumstances and actions being taken to resolve the problem.

The form that the Biological Monitor and contractors will use to report observations of wildlife within the project site are provided in Appendix E.

4.3.3 Roles and Authority of the Project Owner Personnel

The Project Owner is committed to fully implementing the COCs and mitigation measures described in this BRMIMP. Demolition contractors, by signing the contract documents when the job is awarded, will also commit to comply with the relevant mitigation measures and to cooperate with the Designated Biologist and/or biological monitors. The bid package will clearly identify the need to comply with environmental protection regulations, including requirements for the WEAP and cooperation with the Designated Biologist and/or biological monitors.

The Resident Engineer is obligated to cooperate with the Designated Biologist by (1) assisting with formulating solutions to problems and potential problems related to the protection of biological resources, and (2) requiring all crews to follow the directions of the Designated Biologist and/or biological monitors. Table 4-1 summarizes the applicable LORS.

TABLE 4-1
Laws, Ordinances, Regulations, and Standards Applicable to Biological Resources

Element	Goal/Policy	Applicability
Federal		
Federal Endangered Species Act (Federal ESA, 16; USC, 1531 et seq.)	Applicants for projects that could result in adverse impacts on any federally listed species are required to consult with and mitigate potential impacts in consultation with USFWS.	The Amended CECP site does not include habitat for federally listed species. Construction and operation will avoid significant impacts to federally listed species and their habitat. The Amended CECP will not affect tidewater goby critical habitat within Agua Hedionda, Unit 10.
Migratory Bird Treaty Act (16 USC 703 to 711)	Protects all migratory birds, including nests and eggs.	The Amended CECP site does not include habitat that would likely attract migratory birds. Stacks will be low in profile (90 feet) and are not likely to result in significant bird strikes. Transmission lines will tie-in to the existing switchyards. If necessary, noise minimization measures will be implemented during the breeding season.
Bald and Golden Eagle Protection Act (16 USC 668)	Specifically protects bald and golden eagles from harm or trade in parts of these species.	The Amended CECP site does not include habitat or other features that would likely attract eagles. Stacks will be low in profile (90 feet) and are not likely to result in significant bird strikes. Transmission lines will tie-in to the existing switchyard.
State		
California Endangered Species Act (Fish and Game Code, Section 2050 et seq.).	Species listed under this act cannot be “taken” or harmed, except under specific permit.	The Amended CECP site and vicinity was analyzed and it was determined that Amended CECP construction or operation will not affect listed species and, therefore, not result in “take” of listed species.

TABLE 4-1
Laws, Ordinances, Regulations, and Standards Applicable to Biological Resources

Element	Goal/Policy	Applicability
Fish and Game Code, Section 3511	Describes bird species, primarily raptors that are "fully protected." Fully protected birds may not be taken or possessed, except under specific permit requirements.	Amended CECP construction or operation is not anticipated to result in "take." Stacks will be low in profile (90 feet) and are not likely to result in significant bird strikes. Transmission lines will tie-in to the existing switchyard. If it is determined that take may be required, Project Owner will coordinate with the respective agencies as needed to obtain required permits.
Fish and Game Code, Section 3503	States that it is unlawful to take, possess, or needlessly destroy the nest or eggs of any bird, except as otherwise provided by this code or any regulation made pursuant thereto.	Although the eucalyptus perimeter provides suitable raptor nesting habitat, the Amended CECP site was analyzed and does not include features that would encourage nest building. Any encountered nests would be avoided during the species' breeding season. If it is determined that take may be required, Project Owner will coordinate with the respective agencies as needed to obtain required permits.
Fish and Game Code, Section 3503.5	Protects all birds of prey and their eggs and nests.	Stacks will be low in profile (90 feet) and are not likely to result in significant bird strikes. Transmission lines will tie-in to the existing switchyard. Although the eucalyptus perimeter provides suitable raptor nesting habitat, the Amended CECP site does not include features that would encourage nest building.
Fish and Game Code, Section 3513	Makes it unlawful to take, possess, or destroy any birds of prey or to take, possess, or destroy the nest or eggs of any such bird.	With the implementation of preconstruction surveys, Amended CECP construction or operation is not anticipated to result in "take" of birds of prey, their nests, or eggs. Site features have been designed to avoid avian strikes. If it is determined that take may be required, Project Owner will coordinate with the respective agencies as needed to obtain required permits.
Fish and Game Code, Sections 4700, 5050, and 5515	Lists mammal, amphibian, and reptile species that are fully protected in California.	The Amended CECP site was analyzed and does not include likely habitat for fully protected mammal, amphibian, or reptile species.
Fish and Game Code, Sections 1900 et seq.,	The Native Plant Protection Act lists threatened, endangered, and rare plants listed by the state.	The Amended CECP site was analyzed and does not include likely habitat for protected plant species.
Title 14, California Code of Regulations, Sections 670.2 and 670.5	Lists animals designated as threatened or endangered in California.	The Amended CECP site was analyzed and does not include likely habitat for state-listed species.
Fish and Game Code Sections 1601 through 1607	Prohibits alteration of any stream, including intermittent and seasonal channels and many artificial channels, without a permit from CDFW.	The Amended CECP site construction was analyzed and will not include alteration of any stream or channel.
California Environmental Quality Act (CEQA) (Public Resources Code, Section 15380)	CEQA requires that the effects of a project on environmental resources must be analyzed and assessed using criteria determined by the lead agency.	The AFC/PTA analysis and approval process is CEQA equivalent. All requirements under CEQA are met with the analysis in the CECP AFC/PTA and Final Decision.

TABLE 4-1
Laws, Ordinances, Regulations, and Standards Applicable to Biological Resources

Element	Goal/Policy	Applicability
Warren Alquist Act (Public Resources Code, Section 25000, et seq.)	Warren-Alquist Act is a CEQA-equivalent process implemented by the CECP.	The AFC/PTA analysis and approval process is CEQA-equivalent. All requirements under the Warren-Alquist Act are met with the analysis in the CECP AFC/PTA and Final Decision.
Local and Other Jurisdictions		
North County Multiple Habitat Conservation Plan (MHCP)	Long-term conservation program that addresses existing biological resources, proposed urban growth, habitat losses, and direct, indirect, and cumulative effects on sensitive species throughout the San Diego region.	The Amended CECP site will not affect the long-term conservation goals for the MHCP. Potential noise impacts to wildlife in adjacent habitat are expected to be less than significant.
Habitat Management Plan (HMP) for Natural Communities in the City of Carlsbad	A comprehensive, citywide program to preserve the diversity of habitat and protect sensitive biological resources while allowing for additional development consistent with the City's General Plan and its Growth Management Plan.	The Amended CECP site will not affect conservation goals within the HMP plan area or Agua Hedionda. Potential noise impacts to wildlife in adjacent habitat are expected to be less than significant.
Local Coastal Program (LCP) and Agua Hedionda Land Use Plan (LUP)	The City of Carlsbad's LCP, adopted in 1996, includes the City's land use plans, policies, and standards and an implementing ordinance (Zoning Ordinance) for the City's Coastal Zone.	The Amended CECP site will not conflict with the LCP or LUP because the Commission overrode any conflicting land use LORS in the Final Decision.
City of Carlsbad General Plan Comprehensive Open Space and Conservation Resource Management Plan	The City of Carlsbad's Open Space and Conservation Resource Management Plan provides the framework for protection of the City's open space resources and includes five open space categories: a. Open Space for Preservation of Natural Resources b. Open Space for Managed Production of Resources c. Open Space for Outdoor Recreation d. Open Space for Aesthetic, Cultural and Educational Purposes e. Open Space for Public Health and Safety.	The Amended ECP site will not affect the City of Carlsbad's ability to maintain and protect open space resources.

SECTION 5

Worker Environmental Awareness Program

As required by COC BIO-5, the Project Owner will develop and implement a CPM-approved WEAP in which each of Project Owner's employees, as well as employees of contractors and subcontractors who work on the project site or in any related facilities during site mobilization, ground disturbance, grading, demolition, and construction, are informed about the biological resources potentially associated with the Project.

5.1 Program Overview

Consistent with the CEC's requirements set forth in COC BIO-5, the WEAP:

- Was developed by or in consultation with the Designated Biologist and consists of an on-site or training center presentation. Supporting written material and electronic media are made available to all participants;
- Discusses the locations and types of sensitive biological resources on the project site and adjacent areas;
- Presents the reasons for protecting these resources;
- Presents the meaning of various temporary and permanent habitat protection measures;
- Identifies whom to contact if there are further comments and questions about the material discussed in the program; and
- Includes a training acknowledgment form to be signed by each worker indicating that he/she received training and shall abide by the guidelines.

A copy of the WEAP handbook is included in Appendix A.

5.2 Documentation of Training

The Project Owner prepared and submitted the WEAP for Phase I in August 2014. The WEAP is applicable and no changes are anticipated for the Amended CECP (see Appendix A). All supporting written materials and script for electronic media (video or DVD) were prepared or reviewed by the Designated Biologist. The Project Owner will provide in the monthly compliance report the number of people who have completed the training in the prior month and a total of all who have completed the training to date. The Project Owner will submit two copies of the CPM-approved training materials and electronic media to the CPM. The signed training acknowledgement forms from construction will be kept on file by the Project Owner for a period of at least 6 months after the start of commercial operation. During project operation, signed statements for active project operational personnel will be kept on file for 6 months following the termination of an individual's employment.

SECTION 6

Impacts and Mitigation

6.1 Construction Impacts and Mitigation

6.1.1 Impacts to General Vegetation

Significant impacts to native vegetation would not occur, and no mitigation is proposed. In addition because no significant impacts to native vegetation will occur within the Amended CECP site, a restoration and revegetation plan will not be prepared.

A Landscaping Plan will be prepared and submitted in accordance with COCs **VIS-2** and **VIS-3**. All proposed and installed landscaping will adhere to **BIO-7**.

6.1.2 Impacts to General Wildlife

Construction activities during the nesting season (March through August) could adversely affect breeding birds. The Project Owner has proposed the following measures to avoid impacts to nesting birds (CECP, 2007, pp. 5.2-19 and 5.2-22):

- Nesting substrate for songbirds (taller plants) would be removed outside of the breeding season (September through February) before construction activities begin.

  Minimal amounts of vegetation are present within the project site. If vegetation removal is required during the nesting season, a preconstruction survey will be conducted prior to vegetation clearing.

- Open areas requiring grading would be graded prior to March 1 and would be routinely inspected for nesting activities throughout construction and demolition.

  It is not feasible for the project construction to occur outside of the breeding season. A preconstruction survey will be conducted prior to site mobilization and a Biological Monitor will be present during construction and demolition activities when applicable.

- Surveys would be conducted by a qualified biologist for nesting raptors within 300 feet of the project site prior to the start of construction between January 1 and August 31. Should a raptor nest be observed within 300 feet of the Amended CECP site, a qualified biologist would determine whether or not construction activities could potentially disturb nesting raptors and implement appropriate measures (e.g., on-site monitor, timing restriction) to adequately protect nesting raptors.

  A preconstruction nesting raptor survey will be conducted prior to site mobilization within the Amended *CECP site and a 300-foot buffer. Additionally, a Biological Monitor will be present during construction and demolition activities as applicable.*

- Any nests found in or adjacent to disturbance areas would be flagged and the area immediately around the nest protected from construction equipment. Construction activities would not be affected by nests on site; rather the protection and monitoring of the nests would allow construction activities to continue. The nests would be monitored and the results included in the monthly compliance reports to CPM.

  A preconstruction survey will be conducted prior to site mobilization if construction and demolition activities will occur during the nesting season. If nesting birds are identified within the project site, appropriately-sized no-disturbance buffers will be established and a Biological Monitor will be present during construction and demolition activities as applicable.

- Additionally, Staff recommends a survey for migratory birds if work is proposed between March 1 and August 15, and additional measures to protect nesting birds, as presented in Condition of Certification **BIO-8** (Mitigation Management to Avoid Harassment or Harm), which would ensure compliance with the

MBTA. With implementation of the applicant-proposed mitigation measures above and Conditions of Certification **BIO-6** and **BIO-8**, significant impacts to nesting birds would not result from proposed project construction activities.

A preconstruction survey will be conducted within the Amended *CECP site to identify any potential nesting avian species protected by the MBTA.*

- Wildlife could become entrapped in open trenches during construction and demolition, especially if trenches remain open during inactive construction periods. Staff recommends Condition of Certification **BIO-8** (Mitigation Management to Avoid Harassment or Harm), which would require exclusion measures for open trenches (e.g., fencing or covering), inspection of trenches prior to resuming construction activities each day, and installation of escape ramps so that animals that fall in the trench could escape. Implementation of this measure would mitigate adverse impacts to wildlife from entrapment.

  This protection measure is addressed in the Worker Environmental Awareness Program (WEAP) and a Biological Monitor will be present during construction activities to inspect any trenches as applicable.

6.1.3 Impacts to Special-Status Species

6.1.3.1 Native Vegetation

Special-status plants are not expected to occur in the project area, and significant adverse impacts to special-status plants would not occur from construction of the Amended CECP.

6.1.3.2 Wildlife

Construction activities would not directly affect Agua Hedionda Lagoon; indirect impacts to nesting special-status birds that occur within the marsh, scrub, and estuarine habitat associated with Agua Hedionda Lagoon are discussed under “General Construction Impacts” below.

6.1.3.3 Critical Habitat

Because the upland habitat associated with Agua Hedionda Lagoon would not be adversely affected by the Amended CECP, no impacts to critical habitat for the coastal California gnatcatcher, or other federally listed species would occur.

6.1.4 General Construction Impacts

6.1.4.1 Noise

For land uses adjacent to estuarine habitat, the HMP specifies standard best management practices that require attenuation measures for activities that generate excessive noise occurring within 200 feet of important breeding habitat during the breeding season (City of Carlsbad, 2004). Further, the following Project Owner-proposed mitigation measures would minimize impacts to sensitive species in Agua Hedionda Lagoon resulting from excessive construction and demolition noise (CECP, 2007, pp. 5.2-13 and 5.2-21):

- To avoid the riparian bird nesting season, excessively noisy construction activities would not occur between March 15 and August 31 if possible, especially during dusk and early morning hours if birds are nesting in the middle lagoon (the limit of the 200-foot MHCP boundary). Construction equipment will be in good working condition with properly operated and maintained mufflers.

  The Amended *CECP site is located over 200 feet away from Agua Hedionda Lagoon and therefore is located outside of the noise buffer.*

- If construction cannot avoid the nesting season, then a qualified biologist would conduct a preconstruction survey within the Amended CECP site and the middle lagoon of Agua Hedionda prior to ground disturbance and construction activities between March 1 and August 15. The survey would be conducted no more than two weeks prior to construction activities and would be conducted by a

qualified biologist familiar with the identification and vocalizations for coastal California gnatcatcher and other estuarine species.

A preconstruction survey will be conducted within the Amended *CECP site to identify nesting avian species protected by the MBTA.*

6.1.4.2 Lighting

If night construction were required, task-specific lighting would be used to the extent practicable, and lighting would be shielded and pointed toward the center of where the activities are occurring (CECP, 2007, p. 5.13-12). Further, the HMP specifies that direct lighting within 200 feet of Agua Hedionda must be directed away from the lagoon (Carlsbad 2004). These measures are incorporated into Condition of Certification **BIO-7** (Impact Avoidance Mitigation Features). With implementation of these measures, impacts to wildlife from temporary construction night lighting would be less than significant.

Any task-specific lighting that will be used for night construction and demolition will adhere to BIO-7.

6.2 Operation Impacts and Mitigation

Potential impacts resulting from operation of the Amended CECP include bird collision with and/or electrocution by the interconnection facilities and disturbance to wildlife due to increased noise and lighting, and impacts to aquatic resources in Agua Hedionda Lagoon due to operation of the proposed ocean water purification system and industrial wastewater discharge.

Any potential significant impacts from operational impacts will be mitigated through implementation of BIO-7.

SECTION 7

Mitigation, Monitoring, and Compliance Measures

The project owner shall implement the following measures to manage its construction site (and related facilities) in a manner to avoid or minimize impacts to local biological resources:

1. Install temporary fencing and provide wildlife escape ramps for construction areas that contain steep-walled holes or trenches if outside an approved, permanent exclusionary fence. The temporary fence shall be hardware cloth or similar material that is approved by USFWS and CDFW;
2. Ensure that all food-related trash is disposed of in closed containers and removed at least once a week;
3. Prohibit feeding of wildlife by staff and subcontractors;
4. Prohibit non-security-related firearms or weapons on site;
5. Prohibit pets on site;
6. Avoid work between March 1 and August 15 to avoid impacts to birds protected under the Migratory Bird Treaty Act.

   A. If this is not feasible, a survey shall be conducted for nesting birds within the project area.

   B. Should an active nest be discovered, the Designated Biologist or biological monitor shall establish an appropriate buffer zone (in which construction activities are not allowed) to avoid disturbance in the vicinity of the nest.

   - Construction activities shall not commence until the Designated Biologist or biological monitor has determined that the nestlings have fledged or that construction activities will not affect adults or newly fledged young; OR
   - The Designated Biologist or biological monitor shall develop a monitoring plan that permits the activity to continue in the vicinity of the nest while monitoring nesting activities to ensure that nesting birds are not disturbed.

7. Report all inadvertent deaths of sensitive species to the biological monitor, who will notify CDFW or USFWS, as appropriate; and
8. Minimize use of rodenticides and herbicides in the project area.

Verification: All mitigation measures and their implementation methods shall be included in the BRMIMP. Implementation of the measures shall be reported in the monthly compliance reports by the Designated Biologist. Within 30 days after completion of project construction, the project owner shall provide to the CPM, for review and approval, a written construction termination report identifying how biological resource measures have been completed.

SECTION 8

Construction Monitoring and Reporting

8.1 Scope of Monitoring

The intensity and frequency of monitoring depends on the biological resources in and near the work area and the kinds of activity underway. When trenches and holes are open, large volumes of supplies are deployed for installation, and construction traffic is very heavy, some environmental compliance monitoring would be necessary. During such periods, monthly or more frequent inspections would include the following:

- Evaluate the fencing and staking of exclusion zones and no work activities would be conducted within the designated exclusion zones.
- Ensure that straw wattles or silt fences are in place where appropriate.
- Ensure that fill would be limited to the minimum amount necessary to accomplish the agreed activities. Excess fill would be moved offsite at project completion.
- Confirm that all project-generated debris, building materials, and rubbish would be handled appropriately.
- Verify all excess project materials are removed from the project site.
- Confirm that transmission lines and towers would be designed with suitable spacing between conductor wires to minimize risk of electrocution for birds.
- Confirm that all construction and operation workers in the project area have completed an employee orientation and WEAP program. Training would be offered at the start of work.
- Evaluate compliance with installation of escape ramps or covers to prevent entrapment of wildlife.
- Confirm that ground-disturbing activities on transmission lines and pipelines would be limited to daylight hours, unless otherwise authorized.
- Verify that any employee who inadvertently kills or injures a listed species or who finds any such animal either dead, injured, or entrapped, would be required to report the incident immediately to the Designated Biologist/Biological Monitor. In the case of entrapped listed animals, escape ramps or structures would be installed immediately if possible to allow the subject animal(s) to escape unimpeded.

Although the inspections listed below may be done whenever a monitor is in the construction area, inspections would be conducted monthly to confirm that the following are being performed:

- Weekly compliance inspection reports are maintained by the project owner for review by USFWS, CEC, and CDFW upon request.
- Exclusion zone flagging and fencing is in place where needed and has been removed in areas where construction is completed.
- Construction area boundaries are clearly delineated by fencing or staking and flagging and/or rope or cord.
- Equipment storage and parking are confined to the designated areas.
- All food-related trash items are being disposed of in closed containers and are being removed at least once a week from the site.

- Deliberate feeding of wildlife is not occurring.
- No firearms, except for those carried by security personnel, are on the project site.
- No pets are on the project site.
- Use of rodenticides or herbicides in project areas is minimized and there is no use of chemicals and pesticides known to cause harm to amphibians. All users of approved rodenticides and herbicides are observing label requirements and other restrictions per federal and state legislation.

8.2 Conflict Resolution

Remediation of noncompliance issues will require the cooperation of the Designated Biologist, ECM, Resident Engineer, Construction Inspector, Contractor Supervisor, and Crew Foreman. Through this cooperative effort, all involved parties would become aware of the issues, remediation measures, and reasons for future avoidance of similar and related noncompliance issues. However, to ensure that these issues are given the priority that they deserve, all incidences of noncompliance as well as other problems that may become noncompliance issues will be discussed at the weekly project status meeting.

8.3 Summary of Reporting Responsibilities of Construction Monitoring

Monthly monitoring reports will be prepared by the Designated Biologist and will be submitted to the project owner ECM for transmittal to the CEC CPM. In addition, the CPM will be notified immediately, in writing, if monitoring reveals that any of the protective measures were not implemented during the period indicated in this program, or if it appears that measures will not be implemented within the time period specified. The CPM will also be notified if any of the protective measures are not providing a level of protection that is appropriate for the impact that is occurring. The CPM will be notified of recommendations, if any, for alternative protective measures.

The first monthly report will be prepared within one month of the beginning of surface-disturbing activities. Subsequent reports will be prepared for any month during which the Designated Biologist determines that monitoring is necessary for the protection of sensitive biological resources. Each monthly compliance report will include the following information:

- Areas and activities monitored during the reporting month;
- Summary of the BRMIMP measures that were implemented;
- Incident Reports and resolution of each reported situation
- Species relocated, killed, or injured during project construction; the dates, times, and locations of capture, mortality, or injury; and descriptions of relocation sites;
- Construction and monitoring activities planned for the following month, along with anticipated problems; and
- Methods used to resolve noncompliance issues, including agency and project owner personnel contacted.

In addition, any reporting or documentation requirements that are specified by other permits will be performed and submitted to applicable agencies as needed.

8.4 Reporting Injured Wildlife

Any employee who inadvertently kills or injures a wildlife species, or who finds any animal either dead, injured, or entrapped, is required to report the incident immediately to the Designated Biologist. Injured

special-status animals will be reported to CDFW and USFWS as applicable. The project owner will follow instructions that are provided by CDFW and USFWS for special-status species.

In the case of entrapped listed animals, escape ramps or structures would be installed immediately, if possible, to allow the subject animal(s) to escape unimpeded.

In the event that an animal is found dead on the project site and the species of animal is classified as threatened or endangered, the Designated Biologist would immediately (within 24 hours) notify USFWS (Carlsbad Fish & Wildlife Office at 760-431-9440) and CDFW (CDFW South Coast Region at 858-467-4201) by phone and would document initial notification in writing within two working days of the finding of any such animal(s). Notification would include the date, time, location, species, and circumstances of the incident.

Any listed species found dead or injured would be delivered to the USFWS, CDFW, or designated veterinarian immediately for care, analysis, or disposition.

SECTION 9

Post-Construction Monitoring and Reporting

According to COC BIO-6, within 30 days after completion of project construction, the project owner will provide to the CEC CPM for review and approval a written construction termination report. This report will identify how COCs and protection measures for biological resources have been completed. The Designated Biologist will conduct a post-construction site visit to determine whether all implemented protection measures related to biological resources were successful. The results of the inspection will be included in the post-construction report (BIO-6).

Upon completion of construction, all areas subject to temporary disturbances will be subject to post-construction cleanup by the contractors. Cleanup will consist of removal of gravel, stakes, lathes, temporary erosion control devices, flagging, barrels, cans, drums, accidental spills, and any other refuse generated by construction. Reclamation will consist of recontouring soil surfaces to natural lines and grades.

Although the construction area will be kept cleared of trash, food-related items, construction debris, and other litter during the entire construction period, a post-construction inspection and cleanup will be conducted. The Designated Biologist will accomplish the inspection within 15 days of completion of construction in each construction area. All construction debris, unneeded signs, and other trash and litter will be removed within 15 days of the inspection. The Designated Biologist will be responsible for removing all stakes, lathes, flagging, and signs associated with protected areas; the construction contractor will be responsible to remove all other debris. Disposal of all debris will be at an approved waste facility.

SECTION 10

Implementation Monitoring/Verification Program

Verification of compliance with the COCs will be documented on daily monitoring logs, in monthly compliance reports, and in the final BRMIMP Summary of Mitigation Measures for the Amended CECP that will be submitted to the CEC within 30 days after completion of construction.

Compliance of each mitigation measure will be monitored by the Designated Biologist and/or Biological Monitors and will be documented on compliance verification forms or daily logs for each site visit. The daily forms will record where, when, and how demolition activities are performed and whether compliance was met. Monthly compliance reports will summarize the activities for each month. The summaries will include a discussion of whether the mitigation measures were successful, compared with the success criteria where applicable. The summaries will also include all plan modifications and remedial measures taken if the success criteria were not met during the mitigation monitoring process.

SECTION 11

Facility Closure

Permanent and unexpected permanent and temporary closure scenarios are addressed in this section. Permanent closure will occur at the end of the facility's operational phase, but unexpected permanent or temporary closures may be necessary in the event of disastrous events or unfavorable economic conditions.

As required by the CEC General Conditions, a permanent closure plan will be prepared 12 months prior to closure activities. The permanent closure plan would be subject to approval by the responsible agencies.

In the case of unexpected permanent or temporary closure, measures to protect biological resources will be needed only if surface disturbances or releases of harmful materials occurred during a disaster. If such an event occurs, the project owner would consult with responsible agencies to plan cleanup and mitigation of impacts to biological resources.

SECTION 12

Modifications to the BRMIMP

Permits that have not yet been received when the BRMIMP is first submitted, will be submitted to the CPM, the CDFW, and USFWS within five days of their receipt, and the BRMIMP will be revised or supplemented to include the permit received in Appendix B within 10 days of their receipt by the Project Owner. The Project Owner will ensure Amended CECP will adhere to all permit conditions.

The Project Owner will notify the CEC CPM no less than 5 working days before implementing any modifications to the approved BRMIMP to obtain CPM approval. Any changes to the approved BRMIMP will also be approved by the CPM and will be submitted to the USFWS and CDFW, as applicable, to ensure that no conflicts exist. The following list of items is required when modifications to the BRMIMP and CPM approval are necessary:

1. Identify changes considered necessary:
    a. Describe the proposed change.
    b. Describe the reasons for the change.
    c. Describe how the change will be implemented.
2. Determine whether CEC COC or project amendment (requires approval of full Commission) is required:
    a. Contact CPM.
    b. Notify other permitting agencies and interested parties.

SECTION 13

References

California Energy Commission (CEC). 2015. Presiding Member's Proposed Decision on the Carlsbad Energy Center Project dated June 2015. Docket Number 07-AFC-06.

Carlsbad Energy Center, LLC. 2007. Application for Certification for Carlsbad Energy Center Project. Submitted to the California Energy Commission on September 11, 2007.

City of Carlsbad. 2004. Habitat Management Plan for Natural Communities in the City of Carlsbad. Amended December 1999. Final approval, November 2004.

Appendix A
Worker Environmental Awareness Program Handbook

Carlsbad Energy Center Project (CECP)

Worker Environmental Awareness Program Handbook for Biological, Cultural, & Paleontological Resources

CH2MHILL

2485 Natomas Park Drive
Sacramento, California 95833

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NRG Commitment

NRG is committed to protecting environmental resources. Such resources have been identified for the Carlsbad Energy Center Project(CECP) and the project design has been modified to ensure their protection. Protection measures have been developed in order to minimize project impacts. Knowledge and practice of these measures will be the responsibility of all on-site personnel. Violation of these protection measures could result in costly project delays or shutdowns, as well as serious consequences for the responsible individuals.

This handbook provides an overview of the sensitive biological, cultural, and paleontological resources that may affect the CECP. It also includes a description of the laws, protection measures, responsibilities, and penalties associated with those resources and this project.

As part of the Worker Environmental Awareness Program (WEAP), let this handbook guide you in understanding your responsibilities, taking the proper precautions on the job, and contacting the appropriate person when you have questions. Remember, the Biological, Cultural, and Paleontological monitors are there to help you. Always ask before you act. With your cooperation, the CECP is sure to be a success.

Cooperation and communication are key to success. Always ask before you act.

Sensitive Biological Resources

The CECP site does not provide suitable habitat for special-status species. However, sensitive plant and wildlife species and sensitive vegetation communities are found in the adjacent Agua Hedionda Lagoon estuarine and open water habitats, Pacific Ocean, and surrounding natural habitats.

Special-status species found in the Agua Hedionda Lagoon:

- Supports southwestern pond turtle, white-faced ibis, and western snowy plover.
- Provides foraging habitat for American peregrine falcon and osprey.
- Estuarine and marsh habitat surrounding the lagoon provide habitat for California least tern, elegant tern, Belding's savannah sparrow, California brown pelican, and coastal California gnatcatcher.

Nesting Birds

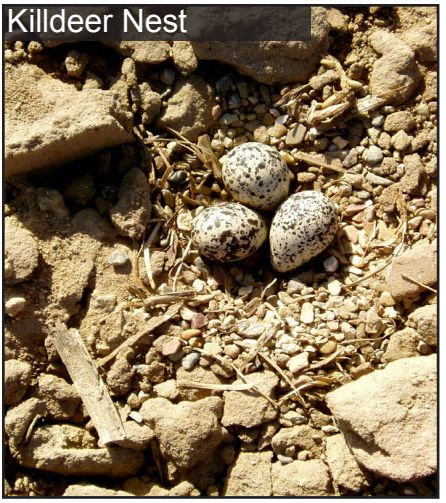
The CECP project site provides various nesting opportunities for native raptors and songbirds.

- Eucalyptus trees along the northern and eastern perimeter of the CECP site have sufficient canopy cover to support nesting raptors.
- Common species that have the potential to nest within the CECP include killdeer, house finch and mourning dove.

The birds, nests, eggs, and young are all protected under California Department of Fish and Wildlife (CDFW) laws and by the Federal Migratory Bird Treaty Act (MBTA).

The nesting season for most birds occurs in the early spring through mid-summer, which includes nest building, egg laying, and raising chicks. Work areas will be surveyed for nesting birds prior to and during construction. If an active nest is found, the immediate area will be temporarily off limits. **Be sure to get clearance from the Biological Monitor before initiating work in previously undisturbed areas, including gravel pads and equipment yards.**


Killdeer


Killdeer Nest

If dead or injured birds are found, contact the Designated Biologist, Biological Monitor, or the Environmental Compliance Manager.

Not all nests are in trees. Many birds build their nests in human structures and some even make nests on the ground such as killdeer. Construction sites can actually provide unlikely nesting opportunities for a variety of bird species.

A killdeer nest is little more than a scrape on the ground in a large barren area, making a cleared graveled construction site a perfect nesting opportunity.

Killdeer eggs can be difficult to see but if you notice lots of killdeer activity in an area, a nest is probably close by.

Like chickens and ducks, after hatching, the killdeer chicks are on the move. In addition, the chicks can be difficult to see but they usually stay close to their parents. When threatened, the chicks will freeze making them even more difficult to see and avoid.

Other birds, like mourning doves and house finches may build their nests directly in or on site structures or equipment. If you observe birds building nests in equipment or on the ground contact the Biological Monitor immediately.

With the exception of a few bird species, the majority of birds are


Mourning Dove Nest


Mourning Dove

protected by federal and state laws. Destruction of nests or eggs is a violation of the MBTA and CDFW regulations. An offense is considered criminal and can include substantial fines and possible jail time.

Designated Biologist and Biological Monitors

The CECP Designated Biologist is responsible for implementing the project's Biological Resources Mitigation Implementation and Monitoring Plan (BRMIMP) and providing direct assistance in avoiding impacts to natural resources. **The Designated Biologist and Biological Monitor have the authority to stop work if activities do not comply with protection measures outlined in the project's BRMIMP.**

Duties of the Designated Biologist and Biological Monitor:

- Advise the project owner's construction and operation managers on the implementation of the Biological Resources Conditions of Certification and BRMIMP;
- Prepare and supervise the implementation of this WEAP;
- Supervise, conduct, and coordinate mitigation, monitoring, and other biological resource compliance efforts, particularly in areas requiring avoidance or containing sensitive biological resources, such as wetlands and special-status species or their habitat;
- Notify onsite personnel if there are any changes in the plan;
- Clearly mark sensitive biological resource areas and inspect these areas at appropriate intervals for compliance with regulatory terms and conditions;
- Inspect active construction areas where animals may have become trapped prior to construction commencing each day. At the end of the day, inspect to ensure the proper installation of structures that prevent entrapment or allow escape during periods of construction inactivity. Periodically inspect areas with high vehicle activity (i.e., parking lots) for animals in harm's way;
- Require a halt to all activities in any area when determined that there would be an unauthorized adverse impact to biological resources if the activities continued;
- Notify the project owner and the CPM of any non-compliance with any Biological Resources Condition of Certification (COC); and
- Submit monthly and annual reports to the CEC that document implementation of the COCs.

The Biological Monitors will be onsite during earthwork activities and will clear areas before any and all surface disturbance begins. Mitigation measures for the project are described in the BRMIMP, available for review from the Environmental Compliance Manager.

Your Responsibility

- All personnel, equipment, and vehicles are to remain inside the project boundary fence or in designated parking areas.
- Do not handle wildlife.
- If any animals are present in your work area, temporarily stop work and notify the Biological Monitor to remove it.
- If wildlife is accidentally harmed, immediately notify the Biological Monitor.
- Wildlife Observation form (in Environmental Compliance Manager's trailer and safety orientation office) needs to be completed for wildlife observed on the site, including eggs, nests or dens and injured or dead animals.
    - If full time biological monitoring is required at the site and the Biological Monitor is present, verbally report the observation to the Biological Monitor, and the monitor will complete the observation form.
    - If full time monitoring is not required at the site, you will need to complete the observation form for submittal to the Designated Biologist.
- Do not feed or disturb wildlife.

Remember: The Designated Biologist and Monitors have the authority to stop work if construction activities are non-compliant.

Wildlife Observation Form

It is the responsibility of all personnel to verbally report sightings to a biological monitor (if a biological monitor is present onsite) or complete a wildlife observation form (if a biological monitor is not present) whenever they encounter an injured animal or an animal nest, or other animal sign onsite that requires translocation. These forms will be available in the Environmental Compliance Manager's trailer and the safety orientation office. The monitor will assist you if you have any questions about completing these forms.

Figure G-1. Wildlife Observation Form

WILDLIFE OBSERVATION FORM

To Record Animals Found In Carlsbad Energy Center Project Areas

To be filled out by personnel who find eggs, nests or dens and injured or dead animals during daily construction activities.

Name of employee:

Date:

Location of observation:

Wildlife Species:

Condition of wildlife:

alive ☐ dead ☐

Possible cause of injury or death:

Where is the animal currently?

Is the resource in danger of project (or other) impacts?

Comments:

Please contact the Designated Biologist for questions and report any eggs, nests, or dens and injured or dead animals observed in the project area that could be disturbed. The Designated Biologist will advise personnel on measures required by California Department of Fish and Wildlife (CDFW) and United States Fish and Wildlife Service (USFWS) to protect fish, wildlife and vegetation from construction impacts.

DESIGNATED BIOLOGIST/BIOLOGICAL MONITOR: Melissa Fowler Cell (714) 768-1173

BIOLOGICAL FIELD MONITOR:

COMPANY: CH2MHILL ADDRESS: 2485 Natomas Park Drive, St. 600

CH2MHILL 2485 Natomas Park Drive, Suite 600, Sacramento, California 95833 (916) 920-0300

General Work Practices

- Stay in approved work areas (construction zone limits).
- Use only approved access roads.
- Keep out of designated exclusion areas.
- Inspect open trenches for wildlife each morning before starting work and at the end of each day.
- Do not litter.
- Dispose of all food-related trash in closed containers and remove at least once a week.
- No pets, firearms or hunting allowed on the project site or in the project area.
- No fires.
- Smoke only in authorized cleared areas or in vehicles.
- Do not feed or disturb wildlife.
- Minimize use of rodenticides and herbicides in the project area.
- Clean up and report all hazardous material spills immediately.
- Do not discharge water into unapproved areas.
- Report wildlife observations to the Biological Monitor or Designated Biologist.
- Report trapped, injured, or dead wildlife to the Biological Monitor and record the specifics on a Wildlife Observation Form (if a biological monitor is not present on-site). Forms are available in the Environmental Compliance Manager's office and safety orientation office.
- Keep fluid spill containment and clean up materials readily available.

Remember: Always ask before you act.

Environmental Laws, Regulations, and Penalties

Many of the resources found in the vicinity of the project area are protected by state and federal laws.

Migratory Bird Treaty Act (MBTA): Makes it illegal for anyone to take, possess, import, export, transport, sell, purchase, barter, or offer for sale, purchase, or barter, any migratory bird, or the parts, nests, or eggs.

California Department of Fish and Wildlife codes: Prohibit take (i.e. hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill) of protected plants and animals in California, and protects areas designated as significant habitat for protected animals and plants.

The Clean Water Act: Oversees protection of jurisdictional wetlands and waterways.

The following agencies have regulatory authority in the area and will also monitor construction activities. They could be on site at any time:

- The California Energy Commission
- California Department of Fish and Wildlife
- San Diego Regional Water Quality Control Board
- U.S. Fish and Wildlife Service
- U.S. Army Corps of Engineers
- U.S. Environmental Protection Agency

Stay out of exclusion zones. They protect sensitive habitats.

Violation of state and/or federal environmental laws can result in penalties including fines as high as $100,000 and/or up to one year in jail.

Violations can involve corporate and individual penalties.

Violations can result in stop work orders and construction delays.

Environmental Impacts and Mitigation Measures

MBTA

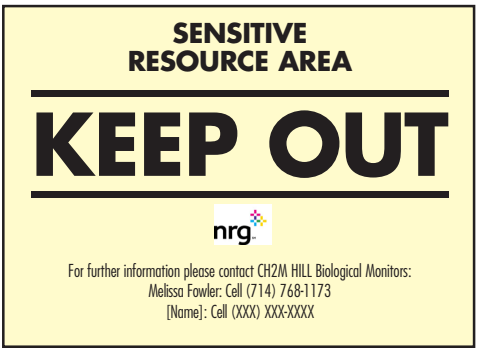
MBTA Measures to be implemented for construction activities occurring during the nesting season (March through August) to avoid impacts to nesting and breeding birds:

- Avoid work between March 1 and August 15 to avoid impacts to birds protected under the Migratory Bird Treaty Act.
- If this is not feasible, a survey shall be conducted for nesting birds within the project area.
- Should an active nest be discovered, the Designated Biologist or biological monitor shall establish an appropriate buffer zone (in which construction activities are not allowed) to avoid disturbance in the vicinity of the nest.
- Construction activities shall not commence until the Designated Biologist or biological monitor has determined that the nestlings have fledged or that construction activities will not affect adults or newly fledged young; OR
- The Designated Biologist or biological monitor shall develop a monitoring plan that permits the activity to continue in the vicinity of the nest while monitoring nesting activities to ensure that nesting birds are not disturbed.
- If necessary, noise minimization measures will be implemented during the breeding season.

General Wildlife

Wildlife could become entrapped in open trenches during construction, especially if trenches remain open during inactive construction periods.

- Install temporary fencing and provide wildlife escape ramps for construction areas that contain steep-walled holes or trenches if outside an approved, permanent exclusionary fence. The temporary fence shall be hardware cloth or similar material that is approved by USFWS and CDFW.
- Open trenches, shall be inspected at the beginning, middle and end of each day.



Minimizing construction impacts:

Noise Impacts

Measures to minimize impacts to sensitive species resulting from excessive construction noise (i.e activities that generate excessive noise within 200 feet of important breeding habitat during the breeding season):

- Excessively noisy construction activities will be scheduled around the breeding season as feasible.
- If construction cannot avoid the nesting season, a qualified biologist will conduct a preconstruction survey within the CECP site and the middle lagoon of Agua Hedionda prior to ground disturbance and construction activities.
- Construction equipment will be in good working condition with properly operated and maintained mufflers.
- If nesting bird species are detected, then noise monitoring and mitigation will be incorporated.
- Should the project generate excessive noise near nesting sites during the breeding season, implement the following noise reduction measures to reduce noise levels, as feasible:

- Locate stationary equipment away from biologically sensitive areas
- Shield nesting sites by installing sound barriers.
- Once the average noise are reduced, the construction activities can resume.

Lighting Impacts

- If night construction is required, task-specific lighting would be used to the extent practicable, and lighting would be shielded and pointed toward the center of where the activities are occurring.
- Direct lighting within 200 feet of Agua Hedionda must be directed away from the lagoon

Minimizing operation impacts:

- Stormwater runoff must not contain hazardous waste, debris, or sediment that could affect biological resources.

Cultural Resources

Any trace of past human activity greater than 50 years old may be an important cultural resource. Places or sites where these traces occur are a part of a proud heritage that belongs to all of us. While significant archaeological and historical sites were not discovered during the field surveys for the CECP, since numerous archaeological sites were previously recorded nearby, it is possible that subsurface construction could encounter buried archaeological deposits.Significant cultural resources represent historical events, engineering achievements, and art or architecture styles that define what Americans have experienced. Ethnographic resources are also cultural resources and they may include traditional plant gathering areas, shrines and ceremonial areas, cemeteries, natural landscape features, and ethnic structures or districts. Because these achievements define what we are and affect what we become, the past belongs to us all and we all have a responsibility to help preserve significant cultural resources.

Archaeological and historical sites are a non-renewable resource. Though we are always creating new cultural resources for people of the future to interpret or preserve for posterity, historical and archaeological sites, once destroyed, cannot be recreated.

Archaeological remains are often so fragmentary that it is possible to scrape, dig, or bulldoze right through a buried site without realizing it. Here's what to look for:

- Discolored soil, particularly gray-black soil with a "greasy" feel to it, in an area of lighter colored soils.
- Any animal or human bone. The proper treatment of Native American graves is of great concern. Unauthorized removal or possession of artifacts or human remains from a Native American grave or cairn may be punishable as a felony (PRC 5097.99).
- A thin layer, or series of layers, particularly dark layers containing charcoal or ash, in an excavation side wall.
- Shell, freshwater or marine, or shell artifacts
- A concentration of small pieces of broken rock, particularly obsidian or chert with sharp edges.
- A concentration of historic-era trash, including bottles, broken glass, broken ceramic, bone, and metal pieces.
- A concentration of brick, concrete, or mortared stone that might indicate a structural foundation.

Cultural Resources Monitors

Full time cultural resource monitoring is required during ground-disturbing activities to ensure that there are no impacts to previously undiscovered cultural resources. The CRS will determine whether prescriptive treatment may be applied to newly discovered cultural material.

Materials Considered Less Than 50 Years of Age:
All of the materials listed below are less than 50 years of age and, unless of exceptional significance, will not be considered cultural resources that merit consideration for recordation or mitigation. If there is any doubt regarding the age of a historic-period find, the project owner and CRS will discuss this with the CPM when giving notice of the find.

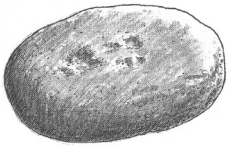
The following materials will not be reported unless exceptional:

- Plastic products limited to Styrofoam® and other foamed polystyrene products, Velcro®, Teflon® -coated cookware, polyvinylchloride (PVC) pipe, high-density polyethylene, polypropylene, polyimide, thermoplastic polyester, linear low density polyethylene, liquid crystal polymers, and products marked with resin codes
- Cans made from aluminum or bi-metal, or those with pull-tab or push-tab (metal or plastic) openings
- Aluminum foil containers
- Synthetic tires, car parts
- Modern electronics (CD players, VCRs, electronic appliances, personal electronics, computers, printers)
- Compact disks, floppy computer disks, magnetic tape media
- Unidentifiable metal fragments
- Rubberized metal
- Clothing or shoes made of plastic or synthetic materials

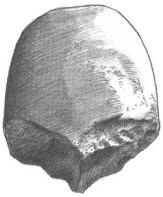
Examples of Cultural Resources

The following are examples of cultural resources that could be uncovered in the project area. The first seven examples are all stone tools shaped for specific functions.

The first example is a small **hammer stone**. Hammer stones were used for a wide range of tasks and may show wear at one or both ends.



Hammer Stone



Flaked Cobble

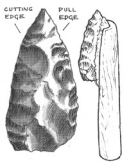
Flaked cobbles were used for scraping, digging, or cutting. They can occur in a variety of shapes and sizes with a smooth end for holding.

Scrapers had a variety of uses including preparing animal skins, shaping wood, or preparing food. Depending on their function, scrapers come in many shapes and sizes.

Scraper

Lithic Debitage

Lithic debitage is the waste material produced during the manufacture of flaked stone tools such as knives and projectile points. Debitage may be found in a variety of shapes and sizes, often as a concentration of small flakes of stone.

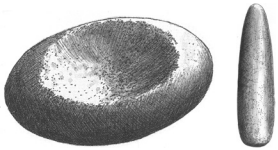


Flaked Knives

Flaked knives are very distinctive and easily identified by shape and flaking pattern. Flaked knives can be found in a large number of shapes and sizes.

Projectile Points are also very distinctive, and are commonly referred to as arrowheads. Projectile points can range in size from one to six inches long and several inches wide.

Arrowheads

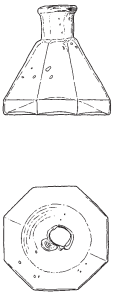


Mortar and Pestle

The **Mortar** and **Pestle** were used together as a grinding tool. They were used to prepare foods, pigments, medicines, and potions.

Historic artifacts that may be present include glass bottles, bone, ceramics, metal cans and other metal objects, including wire, nails, and building hardware, as well as the remains of former building foundations and underground utilities.

Medicine Bottle



Glass Ink Bottle
Clear glass octagonal ink bottle early 20th century

Glass Milk Bottle
One quart milk bottle Hester Dairy, San Jose, CA circa 1935

Your Responsibility

If a Cultural Resources Monitor is present when a cultural resource is exposed, he or she will direct you to stop work at the location of the "find." The Cultural Resource Specialist (CRS) and Cultural Resource Monitors (CRM) have the authority to halt construction in the area of a Discovery to an extent sufficient to ensure that the resource is protected from further impacts, as determined by the CRS. Stopping construction in the vicinity of an archaeological find is an important condition of the project's permit from the CEC and one with which we expect you to comply. Work may be stopped or redirected for only a few minutes, or it may be shut down for an extended period of time, depending on what is found.

If a CRM is not present when a cultural resource is found, it is your responsibility to stop work and notify your supervisor and the CRS or CRM. Work shall not resume at the discovery site until all of the following have occurred:

1. The specialist has notified the CPM of the find and the work stoppage
2. The CRS and the Project Owner have consulted with the CPM, and the CPM has concurred with the recommended eligibility of the discovery and proposed data recovery or other mitigation.
3. Any needed data recovery and mitigation has been completed.

The deliberate destruction and removal of cultural resources on private land is prohibited under the conditions of the project's permit from the CEC. In addition, disturbing Native American burial sites is a felony under California Public Resources Code Section 5097.99.

The following state and federal laws and regulations affect the management of cultural resources:

- Archaeological Resources Protection Act
- National Historic Preservation Act
- California Environmental Quality Act
- California Public Resources Code (Sections 5097.5, 5097.9, and 5097.99)

Violations of these regulations can result in federal indictment, and are punishable by civil and criminal penalties, including both fines and/or imprisonment, and could result in the revocation of project certifications, and shutdown of the project at the direction of the appropriate state agency.

Only authorized personnel may handle cultural resources. Notify the CRM or Site Superintendent if you think you may have found a cultural resource. Do not touch or move the object.

If you have any questions about these procedures, please ask your Site Superintendent or CRM for more information.

Paleontological Resources

Along with the project's commitments to cultural and biological resources, the Conditions of Certification of the California Energy Commission require everyone on this project to watch out for and avoid impacts to Paleontological Resources, or fossils. NRG is committed to adhering to the rules regarding paleontological resources monitoring and mitigation during construction at CECP.

Paleontological resources, or fossils, are the remains of prehistoric plants and animals. Fossils include animal bones and teeth, and plant remains such as logs and even prehistoric leaf litter. Fossils also include such things as ancient burrows and tracks, and even very small remains such as the bones of birds and rodents, and even seeds.

Paleontological resources are protected by State and Federal Laws, and it can be a violation of those laws to disturb fossils except in the course of a scientific recovery, or to collect fossils without proper authorization.

Paleontological resources monitoring will be implemented and managed by a CEC-approved Paleontological Resources Specialist (PRS). Paleontological Resources Monitors (PRMs) will be on-site during excavation of native soil that might contain fossils. If a potential fossil is discovered, the PRM will consult with the PRS and evaluate the find. **Like the CRM, the PRM will have the authority to stop or redirect work in the immediate vicinity of the fossil find until the fossils are properly recorded and recovered.**

Examples of Paleontological Resources

It's important that you be able to recognize fossils that might be encountered during excavations for this project. Scientifically significant fossils take all shapes and sizes: Here we see the track of an extinct trilobite preserved in mica-rich shale with a trilobite fossil of about the size to match the tracks. These animals went extinct some 270 million years ago.

And here we have an array of fossil marine shells recovered from rocks in San Diego County. While they may appear to be "just seashells", they are actually millions of years old and can provide important information on the ancient environment, as well as on the geological changes that left these fossils on dry land.

Fossils are non-renewable resources because they provide information on life and environments that no longer exist. If they're destroyed or taken without proper, scientifically controlled collection the detailed evidence of that past life is lost forever. It doesn't help if the fossil is in somebody's private collection because scientists won't have access to it for study. When properly collected though, fossils provide important scientific evidence not only of the types of animals and plants that were here in the distant past, but also data on past environments and even natural climate change.

As important scientific and educational resources, fossils are protected by State and Federal law. It's those laws that require all of us to specifically watch for and take steps to protect fossils during excavations for the CECP. The laws protecting fossils are specific: NO individual can disturb fossils except in the course of their scientific investigation and controlled recovery. So we need to take care during excavations to identify and protect any fossils that may be uncovered until they are evaluated and, if determined important, removed by a qualified paleontologist.

The Project site is covered by a veneer of disturbed fill; however, below that fill undisturbed sediments may be encountered. The geological units present in the project area that have the potential to yield fossils are a middle Tertiary marine sedimentary unit, and the overlying Quaternary terrace and shore (paralic) deposits. The terrace and shore deposits have moderate paleontological sensitivity; fine-grained facies could yield significant fossil resources. The middle Tertiary sediments mapped as the Santiago Formation beneath the CECP possess high paleontological sensitivity. Because of this paleontological sensitivity, monitoring of excavations is required.

Important fossils have come from soils like those at the CECP site. Nearby construction projects have encountered fossils that are millions of years old, including those of marine and land mammals, birds, and invertebrates. From studies of the geology of the site we know that there may be areas underlain by sediment containing these fossils. That's why the California Energy Commission requires a paleontological monitor to be present during excavations that will disturb sediments with fossil potential. But we need your help as well.

Be on the look-out for anything that looks strange or different- a bone, or a log, or other remain that is just out of place or is shaped strangely. These need to be brought to the attention of either the PRM or the CRM, or to your construction supervisor. What you find may be a fossil that will need to be recovered properly to avoid violating laws protecting it.

A PRM will be present during excavations in paleontologically sensitive sediment. But the monitor has only two eyes, and your eyes are needed too. If it doesn't look like a rock, it probably isn't a rock, and it might be a fossil. Even if you don't recognize what it is, if it's unusual it might be important. When they are covered with dirt, fossils are never as obvious as these specimens. Here we have a vertebra of the extinct North American tapir, a large animal that looked like the cross between a pig and a hippo. Other fossils that may occur here include the remains of extinct Ice Age mammals, such as the mammoth, and their teeth are unusually patterned:

Fossil Fish

Tapir Vertebra

Mammoth Tooth

Some fossils are scientifically important for what they tell us of the environment, such as this fragment of petrified wood, which experts can identify to the species of tree that grew on an island in the ocean that covered western California some 40 million years ago.

Fossil Shorebird

Petrified Wood

What To Do if a Fossil Discovery is Made

It is important to remember that, like the CRM, the PRM has the authority to direct that excavations stop near any fossil find. First, the monitor will stake off the site of the find for heavy-equipment avoidance as well as for the safety of the crew investigating the discovery. Then the PRS in consultation with the PRM will determine whether something scientifically significant has actually been found. If so, the avoidance barrier will stay up until the find is scientifically recovered, while excavation work can continue in other areas away from the find, provided it continues to be properly monitored.

Do not congregate near the find or impede the scientists investigating the find in any way- they're working to get it out of the way as quickly as possible while recovering its scientific values as required by law.

To repeat: If a paleontological finds is made, construction excavations still can continue elsewhere while the fossil find is assessed and removed. Depending on the nature of the sediment, steps might also be taken to remove and save a sample of the dirt for later screening for small bones and teeth. After scientific recovery is completed, the avoidance barrier will be taken down and you or your supervisor will be informed that you may resume work there. The delay while recovery takes place will be kept as short as possible to scientifically recover the fossil find.

Your Responsibility

If you think you've found a fossil, leave it where it is, contact the PRM or Environmental Compliance Manager, and divert construction activities away from the find. If a monitor is not immediately available, stake and flag it yourself in such a way that others will know not to enter that area. Use construction avoidance fencing, or lathe and construction avoidance tape, to create an exclusion zone where the fossil find can be protected until removed, and where the paleontologists can work to clear the find without having to worry about heavy equipment.

NRG is committed to the protection of fossil resources. **Remember: it is your duty to help with this protection effort.** If you think you have found a fossil, stop work in the immediate area and notify the Environmental Compliance Manager and/or the PRM so that your "find" can be evaluated as quickly as possible.

The following state and federal laws and regulations affect the management of paleontological resources:

- Federal Antiquities Act of 1906
- California Environmental Quality Act
- California Public Resources Code (Sections 5097.5 and 5097.9)
- San Diego County ordinance

Violation of these regulations may be punishable by civil and criminal penalties, including both fines and/or imprisonment, and could result in the revocation of project certification and shut-down of the project at the direction of the appropriate state agency.

Conclusion

There is the potential for anyone involved with excavations to find paleontological resources on the CECP construction site. These resources are important scientific and educational resources that are protected by State and local ordinances. Protect yourself, your supervisor, and your company from legal and financial liability by reporting all possible finds of historic and prehistoric remains.

Contact Personnel

CECP Environmental Compliance Manager, Scott Seipel
(909) 648-5008

Biological Resources Contacts

Designated Biologist/Biological Monitor, Melissa Fowler
Cell (714) 768-1173

Cultural Resources Contacts

Designated Cultural Resources Specialist, Clint Helton
Cell (949) 500-2496

Paleontological Resources Contacts

Designated Paleontological Resources Specialist, Dr. Geof Spaulding
Cell (702) 524-5860, Office (702) 953-1233

Paleontological Resources Monitor, James Verhoff
Cell (267) 253-9236

Carlsbad Energy Center Project

LEGEND

- Encina Power Station Site
- Licensed CECP
- Poseidon Desalinization Site
- KOP
- Tanks to be Removed as a Part of the Licensed CECP

0 300 600
Feet

N

Appendix B
Other Permits

Appendix C
CEC Conditions of Certification

APPENDX C

Biological Resources Conditions of Certification for the Carlsbad Energy Center Project

Conditions of Certification		Comments
BIO-1 Designated Biologist	The project owner shall assign a Designated Biologist to the project. The project owner shall submit the resume of the proposed Designated Biologist, with at least three references and contact information, to the compliance project manager (CPM) for approval. The Designated Biologist must at least meet the following minimum qualifications: 1. Bachelor's degree in biological sciences, zoology, botany, ecology, or a closely related field; and 2. Three years of experience in field biology or current certification from a nationally recognized biological society, such as The Ecological Society of America or The Wildlife Society; and 3. At least one year of field experience with biological resources found in or near the project area. In lieu of the above requirements, the resume shall demonstrate to the satisfaction of the CPM, that the proposed or alternate Designated Biologist has the appropriate training and background to implement effectively the applicant-proposed mitigation measures and conditions of certification. Verification: The project owner shall submit the specified information at least 90 days prior to the start of any site (or related facilities) mobilization. No site or related facility activities shall commence until an approved Designated Biologist is available to be on site. If a Designated Biologist needs to be replaced, the specified information of the proposed replacement must be submitted to the CPM at least 10 working days prior to the termination or release of the preceding designated biologist. In an emergency, the project owner shall immediately notify the CPM to discuss the qualifications and approval of a short-term replacement while a permanent Designated Biologist is proposed to the CPM for consideration.	The Designated Biologist will be CH2M HILL biologist Melissa Fowler. Ms. Fowler's qualifications are provided in Appendix D.

APPENDX C

Biological Resources Conditions of Certification for the Carlsbad Energy Center Project

Conditions of Certification		Comments
BIO-2 Designated Biologist Duties	The project owner shall ensure that the Designated Biologist performs the following during any site (or related facilities) mobilization, ground disturbance, grading, construction, operation, and closure activities. The Designated Biologist may be assisted by the approved biological monitor(s), but remains the contact for the project owner and CPM. The designated biologist shall: 1. Advise the project owner's construction and operation managers on the implementation of the biological resources conditions of certification; 2. Consult on the preparation of the Biological Resources Mitigation Implementation and Monitoring Plan (BRMIMP), to be submitted by the project owner; 3. Be available to supervise, conduct, and coordinate mitigation, monitoring, and other biological resource compliance efforts, particularly in areas requiring avoidance or containing sensitive biological resources, such as wetlands and special-status species or their habitat; 4. Clearly mark sensitive biological resource areas and inspect these areas at appropriate intervals for compliance with regulatory terms and conditions; 5. Inspect active construction areas where animals may have become trapped prior to construction commencing each day. At the end of the day, inspect for the installation of structures that prevent entrapment or allow escape during periods of construction inactivity. Periodically inspect areas with high vehicle activity (i.e., parking lots) for animals in harm's way; 6. Notify the project owner and the CPM of any non-compliance with any biological resources condition of certification; 7. Respond directly to inquiries of the CPM regarding biological resource issues; 8. Maintain written records of the tasks specified above and those included in the BRMIMP. Summaries of these records shall be submitted in the monthly compliance report and the annual report; and 9. Train the biological monitors as appropriate, and ensure their familiarity with the BRMIMP, Worker Environmental Awareness Program (WEAP) training, and all permits. **Verification**: The Designated Biologist shall submit in the monthly compliance report to the CPM copies of all written reports and summaries that document biological resources activities. If actions may affect biological resources during operation, a Designated Biologist shall be available for monitoring and reporting. During project operation, the Designated Biologist shall submit record summaries in the annual compliance report unless his/her duties are ceased as approved by the CPM.	No supplemental comments.

APPENDX C

Biological Resources Conditions of Certification for the Carlsbad Energy Center Project

	Conditions of Certification	Comments
BIO-3 Biological Monitor Qualifications	The project owner's CPM-approved Designated Biologist shall submit the resume, at least three references, and contact information of the proposed biological monitor(s) to the CPM for approval. The resume shall demonstrate to the satisfaction of the CPM, the appropriate education and experience to accomplish the assigned biological resource tasks. Biological monitor(s) training by the Designated Biologist shall include familiarity with the conditions of certification, BRMIMP, WEAP, and all permits. **Verification**: The project owner shall submit the specified information to the CPM for approval at least 30 days prior to the start of any site (or related facilities) mobilization. The Designated Biologist shall submit a written statement to the CPM confirming that individual biological monitor(s) has been trained including the date when training was completed. If additional biological monitors are needed during construction, the specified information shall be submitted to the CPM for approval 10 days prior to their first day of monitoring activities.	Qualifications of biological monitors for the Amended CECP are provided in Appendix D.
BIO-4 Designated Biologist and Biological Monitor Authority	The project owner's construction and operation manager shall act on the advice of the Designated Biologist and biological monitor(s) to ensure conformance with the biological resources conditions of certification. If required by the Designated Biologist and biological monitor(s), the project owner's construction and operation manager shall halt all site mobilization, ground disturbance, grading, construction, and operation activities in areas specified by the Designated Biologist. The Designated Biologist shall: 1. Require a halt to all activities in any area when determined that there would be an unauthorized adverse impact to biological resources if the activities continued; 2. Inform the project owner and the construction and operation manager when to resume activities; and 3. Notify the CPM if there is a halt of any activities and advise the CPM of any corrective actions that have been taken, or will be instituted, as a result of the work stoppage. If the Designated Biologist is unavailable for direct consultation, the lead biological monitor shall act on behalf of the Designated Biologist. **Verification**: The project owner shall ensure that the Designated Biologist or biological monitor notifies the CPM immediately (and no later than the following morning of the incident, or Monday morning in the case of a weekend) of any non-compliance or a halt of any site mobilization, ground disturbance, grading, construction, and operation activities. The project owner shall notify the CPM of the circumstances and actions being taken to resolve the problem. Whenever corrective action is taken by the project owner, a determination of success or failure will be made by the CPM within 5 working days after receipt of notice that corrective action is completed, or the project owner will be notified by the CPM that coordination with other agencies will require additional time before a determination can be made.	No supplemental comments.

APPENDX C

Biological Resources Conditions of Certification for the Carlsbad Energy Center Project

Conditions of Certification		Comments
BIO-5 Worker Environmental Awareness Program	The project owner shall develop and implement a CPM-approved Worker Environmental Awareness Program (WEAP) in which each of its employees, as well as employees of contractors and subcontractors who work on the project site or any related facilities during site mobilization, ground disturbance, grading, construction, operation and closure, is informed about sensitive biological resources associated with the project. The WEAP must: 1. Be developed by or in consultation with the Designated Biologist and consist of an on-site or training center presentation in which supporting written material and electronic media are made available to all participants; 2. Discuss the locations and types of sensitive biological resources on the project site and adjacent areas; 3. Present the reasons for protecting these resources; 4. Present the meaning of various temporary and permanent habitat protection measures; 5. Identify whom to contact if there are further comments and questions about the material discussed in the program; and 6. Include a training acknowledgment form to be signed by each worker indicating that he/she received training and shall abide by the guidelines. The specific program can be administered by a competent individual(s) acceptable to the Designated Biologist. **Verification**: At least 60 days prior to the start of any project-related ground disturbing activities, the project owner shall provide to the CPM two copies of the proposed WEAP and all supporting written materials and electronic media prepared or reviewed by the Designated Biologist and a resume of the person(s) administering the program. The project owner shall provide in the monthly compliance report the number of persons who have completed the training in the prior month and a running total of all persons who have completed the training to date. At least 10 days prior to site (and related facilities) mobilization, the project owner shall submit two copies of the CPM-approved materials. The signed training acknowledgement forms from construction shall be kept on file by the project owner for a period of at least 6 months after the start of commercial operation. During project operation, signed statements for active project operational personnel shall be kept on file for 6 months following the termination of an individual's employment.	The WEAP is provided in Appendix A.

APPENDX C

Biological Resources Conditions of Certification for the Carlsbad Energy Center Project

	Conditions of Certification	Comments
BIO-6 Biological Resources Mitigation Implementation and Monitoring Plan	The project owner shall submit two copies of the proposed BRMIMP to the CPM (for review and approval) and to CDFW and USFWS (for review and comment) and shall implement the measures identified in the approved BRMIMP. The BRMIMP shall be prepared in consultation with the Designated Biologist and shall identify: 1. All biological resource mitigation, monitoring, and compliance measures proposed and agreed to by the project owner; 2. All project owner-proposed mitigation measures presented in the application for certification; 3. All biological resource conditions of certification in the Final Commission Decision to avoid or mitigate impacts; 4. All biological resource mitigation, monitoring and compliance measures required in other state agency terms and conditions, such as those provided in the Regional Water Quality Control Board permits; 5. All biological resource mitigation, monitoring, and compliance measures required in local agency permits, such as site grading and landscaping requirements; 6. All sensitive biological resources to be impacted, avoided, or mitigated by project construction, operation, and closure; 7. All required mitigation measures for each sensitive biological resource; 8. A detailed description of measures that shall be taken to avoid or mitigate temporary disturbances from construction activities; 9. all locations on a map, at an approved scale, of sensitive biological resource areas subject to disturbance and areas requiring temporary protection and avoidance during construction; 10. Aerial photographs, at an approved scale, of all areas to be disturbed during project construction activities — one set prior to any site (and related facilities) mobilization disturbance and one set subsequent to completion of project construction. Include planned timing of aerial photography and a description of why times were chosen; 11. Duration for each type of monitoring and a description of monitoring methodologies and frequency; 12. Performance standards to be used to help decide if/when proposed mitigation is or is not successful; 13. All performance standards and remedial measures to be implemented if performance standards are not met; 14. A preliminary discussion of biological resources-related facility closure measures; 15. Restoration and revegetation plan; and 16. A process for proposing plan modifications to the CPM and appropriate agencies for review and approval. **Verification**: The project owner shall provide the specified document at least 60 days prior to start of any project-related ground disturbing activities.	No impacts to native vegetation will occur. The mitigation measures proposed for wildlife species and general construction impacts are listed in Section 7.

APPENDX C

Biological Resources Conditions of Certification for the Carlsbad Energy Center Project

	Conditions of Certification	Comments
BIO-6, Cont. Biological Resources Mitigation Implementation and Monitoring Plan	The CPM will determine the BRMIMP's acceptability within 45 days of receipt. If there are any permits that have not yet been received when the BRMIMP is first submitted, these permits shall be submitted to the CPM, the CDFW, and USFWS within 5 days of their receipt, and the BRMIMP shall be revised or supplemented to reflect the permit condition within ten days of their receipt by the project owner. Ten days prior to site (and related facilities) mobilization, the revised BRMIMP shall be resubmitted to the CPM. The project owner shall notify the CPM no less than five working days before implementing any modifications to the approved BRMIMP to obtain CPM approval. Any changes to the approved BRMIMP must also be approved by the CPM in consultation with CDFW, the USFWS, and appropriate agencies to ensure no conflicts exist. Implementation of BRMIMP measures will be reported in the monthly compliance reports by the designated biologist (i.e., survey results, construction activities that were monitored, species observed). Within 30 days after completion of project construction, the project owner shall provide to the CPM, for review and approval, a written construction closure report identifying which items of the BRMIMP have been completed; a summary of all modifications to mitigation measures made during the project's site mobilization, ground disturbance, grading, and construction phases; and which mitigation and monitoring items are still outstanding.	
BIO-7 Impact Avoidance Mitigation Features	Any time the project owner modifies or finalizes the project design, all feasible measures shall be incorporated that avoid or minimize impacts to the local biological resources. The project owner shall: 1. design, install, and maintain transmission line poles, access roads, pulling sites, and storage and parking areas to avoid identified sensitive resources; 2. design, install, and maintain transmission lines and all electrical components in accordance with the Suggested Practices for Avian Protection on Power Lines: The State of the Art in 2006 to reduce the likelihood of electrocutions of large birds; 3. install bird flight diverters on the overhead ground wires of proposed transmission lines (230- and 138-kV) to reduce the likelihood of bird collision with power lines; if overhead ground wires are not installed, bird flight diverters shall be placed on the conductors. 4. eliminate from landscaping plans any List A California exotic pest plants of concern as defined by the California Exotic Pest Plant Council; 5. prescribe a road sealant that is non-toxic to wildlife and plants; and 6. design, install, and maintain facility lighting to prevent side casting of light toward wildlife habitat (i.e., Agua Hedionda Lagoon); obstruction lighting shall be white flashing lights unless specifically prohibited by the FAA. **Verification:** All mitigation measures and their implementation methods shall be included in the BRMIMP. Implementation of the measures shall be reported in the monthly compliance reports by the Designated Biologist. Within 30 days after completion of project construction, the project owner shall provide to the CPM, for review and approval, a written construction termination report identifying how measures have been completed.	No supplemental comments.

APPENDX C

Biological Resources Conditions of Certification for the Carlsbad Energy Center Project

	Conditions of Certification	Comments
BIO-8 Mitigation Management to Avoid Harassment or Harm	The project owner shall implement the following measures to manage its construction site (and related facilities) in a manner to avoid or minimize impacts to local biological resources: 1. Install temporary fencing and provide wildlife escape ramps for construction areas that contain steep-walled holes or trenches if outside an approved, permanent exclusionary fence. The temporary fence shall be hardware cloth or similar material that is approved by USFWS and CDFW; 2. Ensure that all food-related trash is disposed of in closed containers and removed at least once a week; 3. Prohibit feeding of wildlife by staff and subcontractors; 4. Prohibit non-security-related firearms or weapons on site; 5. Prohibit pets on site; 6. Avoid work between March 1 and August 15 to avoid impacts to birds protected under the Migratory Bird Treaty Act. A. If this is not feasible, a survey shall be conducted for nesting birds within the project area. B. Should an active nest be discovered, the Designated Biologist or biological monitor shall establish an appropriate buffer zone (in which construction activities are not allowed) to avoid disturbance in the vicinity of the nest. i. Construction activities shall not commence until the Designated Biologist or biological monitor has determined that the nestlings have fledged or that construction activities will not affect adults or newly fledged young; OR ii. The Designated Biologist or biological monitor shall develop a monitoring plan that permits the activity to continue in the vicinity of the nest while monitoring nesting activities to ensure that nesting birds are not disturbed. 7. Report all inadvertent deaths of sensitive species to the biological monitor, who will notify CDFW or USFWS, as appropriate; and 8. Minimize use of rodenticides and herbicides in the project area. **Verification**: All mitigation measures and their implementation methods shall be included in the BRMIMP. Implementation of the measures shall be reported in the monthly compliance reports by the Designated Biologist. Within 30 days after completion of project construction, the project owner shall provide to the CPM, for review and approval, a written construction termination report identifying how biological resource measures have been completed.	No supplemental comments.

Appendix D
Resumes of Designated Biologist and Biological Monitors

BIO-1
Designated Biologist

Melissa Fowler

Small Mammal Ecologist/Wildlife Biologist

Education

M.S., Environmental Studies, Emphasis: Environmental Science, California State University, Fullerton, 2010
B.S., Biological Science, California State University, Fullerton, 2005
A.A., Liberal Studies, Fullerton College, Fullerton, 2001

Distinguishing Qualifications

- More than 13 years of experience conducting wildlife studies
- Experience conducting botanical surveys, wildlife surveys, habitat assessments, vegetation mapping, biological monitoring, rare plant surveys (primarily in the Mojave Desert), re-vegetation monitoring and wetland delineations
- Experience with preparing various environmental documents and permitting applications

Relevant Experience

Ms. Fowler is a biologist specializing in small mammal ecology, particularly desert species, and wildlife biology. She has over 13 years of experience conducting a variety of wildlife studies in a range of California habitats, including aquatic (freshwater and marine) and terrestrial ecosystems, and has worked with a wide range of species that include large carnivores, small mammals, raptors and other avian species, reptiles, marine fishes and aquatic macroinvertebrates. Ms. Fowler has conducted a variety of surveys for commercial and federal projects including botanical surveys, wildlife surveys, habitat assessments, vegetation mapping, biological monitoring, rare plant surveys (primarily in the Mojave Desert), re-vegetation monitoring and wetland delineations. She has a scientific collecting permit for mammals and reptiles in Kern, Los Angeles, Riverside and San Bernardino Counties and the coast horned lizard in Region 5 (SC-11611). In addition, she has prepared a wide variety of environmental documents, including Application for Certifications (AFC), Environmental Impact Reports/Environmental Impact Statements (EIR/EIS), Environmental Impact Assessments/Environmental and Social Impact Assessments (EIA/ESIA), permitting, environmental compliance-related documents and mitigation plans.

Specialized Training

California Rapid Assessment Method (CRAM) Trained Professional (2014)

Certified Ecologist, Ecological Society of America (2013-2018)

Wetland Training Institute: Basic Wetland Delineation 40-hour Training, 2012

Desert Tortoise Council: Introduction to Surveying, Monitoring, and Handling Techniques Workshop, 2011

Legends of the Fall: Exploring the Clandestine Flora of Early Fall in the Eastern Mojave Desert Workshop, 2011

Occupational Safety and Health Administration 10-hour Construction Safety and Health certified

Safety Coordinator - Construction

CPR, First Aid and AED certified

Unites States Fish and Wildlife Service, Pacific Pocket Mouse Monitoring Workshop for Marine Corps Base Camp Pendleton Pacific Pocket Mouse Working Group, 2007

Melissa Fowler

Representative Projects and Dates of Involvement

Biologist, AES Southland Development; Alamitos Energy Center (AEC); Los Angeles County, California; 2011 to Present (2014). Prepared the biological resources section for an AFC for a natural gas-fired power plant, coordinated with resource agencies and conducted site reconnaissance survey.

Biologist; AES Southland Development; Redondo Beach Energy Project (RBEP); Los Angeles County, California; 2011 to Present (2014). Prepared the biological resources section for an AFC for a natural gas-fired power plant, coordinated with resource agencies and conducted site reconnaissance survey. Responded to California Energy Commission (CEC) data requests and comments; participated in agency site tour.

Biologist; AES Southland Development; Huntington Beach Energy Project (HBEP); Orange County, California; 2011 to Present (2014). Assisted with the preparation of the biological resources section for an AFC for a natural gas-fired power plant, coordinated with resource agencies, conducted initial site visit and supplemental botanical and wildlife survey, technical representative for public workshops, and responded to CEC data requests and comments in the discovery phase.

Biologist; Union Pacific Railroad; Sunset Route; Imperial County, California; 2012 to Present (2014). Conducted preconstruction clearance surveys for burrowing owls, habitat assessments and construction monitoring for desert pupfish. Provide ongoing environmental compliance support.

Biologist; Confidential Client; United Arab Emirates; 2013-2014. Prepared biological resources and marine ecology sections for a Terms of Reference/scoping report for a confidential project. Prepared the biological resources section for the associated EIA.

Biologist; Confidential Client; Saudi Arabia; 2012-2013. Prepared baseline sections for terrestrial biological resources and marine ecology, impact assessments, and mitigation sections for an EIA for a chemical plant, including a 2013 revised EIA.

Biologist; North Sky River Wind Energy Project; NextEra; Kern County, California; 2012 to 2013. Conducted rare plants surveys along a transmission line corridor. Attended county planning meeting and participated in the renewable energy forum, which included multiple stakeholders. Assisted with biological monitoring during the construction phase.

Biologist; Confidential Client; Saudi Arabia; 2012. Prepared baseline sections for terrestrial biological resources and marine ecology, impact assessments, and mitigation sections for a chemical plant needed to support the automobile and construction industry.

Biologist; Confidential Client; San Bernardino County, California and Mohave County, Arizona; 2012. Assisted with wetland delineations and vegetation mapping.

Biologist, Confidential Solar Energy Client, Kern County, California; 2011-2012. Conducted raptor migration and raptor landscape use surveys throughout the proposed wind energy site.

Biologist; Confidential Client; Iraq; 2011 to 2012. Prepared baseline ecology, impact assessment, and mitigation sections for an ESIA for a water treatment plant. Ecology baseline included terrestrial and wetland habitats.

Biologist; Confidential Solar Energy Client; San Bernardino County, California; 2011 to 2012. Conducted delineation surveys of ephemeral washes for a potential mitigation site in the Mojave Desert. Prepared associated report and analyzed the suitability of confidential location as a mitigation site for a solar project.

Biologist; NRG Energy; Carlsbad Energy Center Project (CECP); San Diego County, California; 2011. Assisted with a site survey for the Initial Construction Phase for CECP – construction of the CEMS concrete pad (June 2011) to support air permitting issues. Prepared and provided the associated Worker Environmental Awareness Training (WEAP) to site personnel and conducted biological monitoring.

Biologist; San Timoteo Canyon Derailment; Union Pacific Railroad; Riverside County, California; 2011. Conducted re-vegetation monitoring of site restoration activities for derailment affected areas, replanting of native vegetation and establishment of weed management areas were conducted in accordance with U.S. Army Corps of Engineers (USACE) (USACE #2006-01654-JPL) and State Water Resources Control Board (State Water Board) (WDID #836C343929) requirements. Prepared annual re-vegetation monitoring report.

Biologist; Confidential Client; Saudi Arabia; 2011. Prepared baseline sections for terrestrial ecology and marine ecology, impact assessments, and mitigation sections for an EIA for an expansion project for an existing refinery.

Biologist; Confidential Solar Energy Client; Inyo County, California; 2011. Prepared the Clean Water Act (CWA) Section 401 Water Quality Certification (WQC) for the Colorado River Basin Regional Water Quality Control Board (RWQCB).

Biologist; Confidential Wind Energy Client; Riverside County, California; 2011. Prepared application packages for a proposed wind energy project for a Lake and Streambed Alteration (LSA) Notification for California Department of Fish and Game (CDFG) and the CWA Section 401 WQC for the Colorado River Basin RWQCB.

Biologist; Confidential Solar Energy Client; Riverside County, California; 2011. Prepared the Evaporation Pond Plan and assisted with preparing the Biological Resources Mitigation Implementation and Monitoring Plan.

Biologist; TID Almond 2 Power Plant; Turlock Irrigation District; Stanislaus County, California; 2011. Conducted construction and dewatering monitoring for the giant garter snake within areas of suitable habitat.

Biologist; Oakdale Irrigation District; Stanislaus County, California; 2011. Prepared a jurisdictional delineation of wetlands and Waters of the United States report.

Biologist; Confidential Solar Energy Client; Imperial County, California; 2011. Prepared and revised avian and bat protection plans for two proposed solar farms in Imperial County, California.

Biologist; Terra-Gen Power, LLC; Kern County, California; 2010 to Present (2014). Supported multiple projects by conducting wetland delineations, habitat assessments, vegetation mapping, condor and raptor monitoring and multiple wildlife surveys, desert tortoise and Mohave ground squirrel monitoring, geotechnical escorting, potholing monitoring, preconstruction clearance surveys, assisted with protocol southwestern willow flycatcher surveys, supported project permitting, including multiple LSAs and Section 401 Waste Discharge Requirements (WDR), and prepared technical memos. Lead the re-vegetation monitoring effort for multiple projects and prepared associated annual reports.

Biologist and Field Lead; Tehachapi Renewable Transmission Project (TRTP)—Segments 4-11 Compliance Monitoring; Southern California Edison (SCE); California; 2010 to Present (2014). CH2M HILL is providing environmental compliance support to SCE during construction of the TRTP in accordance with the National Environmental Policy Act (NEPA) and California Environmental Quality Act (CEQA). The TRTP includes construction of new and upgrade of 173 miles of transmission lines, construction of one new substation, major upgrade of one existing substation and upgrade of other ancillary facilities. When complete the TRTP will deliver up to 4300 MW of renewable energy to the Los Angeles Basin and the western Inland Empire. Provided general project support including preparing mitigation plans, conducting historical research on oil fields and obtaining abandonment details when applicable for the entire project. Field lead for

preconstruction photographic documentation, coordinated with subcontractors, quality assurance/quality control of fieldwork and data, developed field protocols to streamline and standardize fieldwork and prepared task-related deliverables.

Biologist; Chiquita Canyon Landfill Master Plan Revision; Waste Management, Inc.; Los Angeles County, California; 2010 to Present (2014). Revised and updated the biological resources section of the Draft EIR. Conducted vegetation mapping, oak tree surveys, re-vegetation monitoring, amphibian surveys, and updated all vegetation mapping in accordance with the expanded project boundary.

Biologist and Task Manager; Los Angeles World Airports (LAWA); Los Angeles, California; 2010 to 2012. Prepared cost estimate and met with client for the Riverside Fairy Shrimp relocation project to help determine the cost effectiveness of mitigation site alternatives. Coordinated with client and subcontractors, ensured tasks are within scope of work, finalized and distributed deliverables, prepared meeting agendas and summaries.

Biologist; Alpine Solar Project; NRG Solar Alpine, LLC; Los Angeles County, California; 2010 to 2012. Conducted preconstruction surveys for coast horned lizards, burrowing owls and badgers, rare plants surveys and assisted with preparing the biological technical report for an additional 35-acre project.

Biologist; Devers-Palo Verde No. 2 Transmission Line Project (DPV2) - Compliance Monitoring; Southern California Edison (SCE); California; 2010 to 2012. CH2M HILL provided environmental compliance support to SCE during construction of the DPV2 in accordance with the NEPA and CEQA. The DPV2 included construction of 153 miles of new transmission lines, construction of one new substation, major upgrades of two existing substations and upgrade of other ancillary facilities. Data entry of environmental data sheets, compiled all environmental data entry into a single database, prepared summaries of surveys needed and tasks completed at a proposed substation, and reviewed project-related mitigation plans.

Biologist; Beaver to Junction; Central Federal Lands Highway Division; Fishlake National Forest, Utah; 2010. Performed acoustic goshawk surveys in summer of 2010.

Experience Prior to CH2M HILL

Research Assistant; California State University; Fullerton. Vertebrate Ecology and Conservation Laboratory of Dr. Paul Stapp; 2009. Assisted with the completion of a long-term research project in the Mojave National Preserve. Monitoring the abundance of small mammals, and the effects of large and small herbivores and granivores on post-fire vegetation recovery.

Research Associate; Irvine Ranch Conservancy; Irvine, California; 2007 to 2009. Established and managed the wildlife and human access monitoring project with remote cameras, supervised and directed project volunteers, trained project interns, maintained and created the project database, quality control of database, compiled data entry from various project interns, edited and contributed with preparing project-related documents, collaborated with other organizations, and coordinated and facilitated small mammal monitoring projects with consultants. Assisted with other department projects as needed, such as restoration projects.

Research Assistant; California State University; Fullerton; 2003 to 2006. *Vertebrate Ecology and Conservation Laboratory of Dr. Paul Stapp.* Researched the foraging behaviors of desert rodents (*Chaetodipus penicillatus* and *C. formosus*) in response to moonlight effects and rattlesnake olfactory cues in the Mojave National Preserve, California. Prepared and published project manuscript. Received an Undergraduate Student Research Award from the American Society of Mammalogists for this work. Assisted with developing the experimental design and site selection of a long-term monitoring project in the Mojave National Preserve investigating the effects of small and large herbivores and granivores on post-fire vegetation recovery. Also conducted live-trapping for field demonstrations and lab activities for Dr. Stapp's courses.

Teaching Assistant; California State University; Fullerton; 2005 to 2006. Developed weekly lesson plans, quizzes, tests, instructional materials, presented 30 to 60 minute lectures for two laboratory sections/week, and graded all course-related materials.

Student Assistant; Tucker Wildlife Sanctuary; Modjeska Canyon, California; 2004 to 2005. Assisted with restoration of woodland, chaparral and riparian habitats. Cared for museum animals, such as captive desert tortoises other reptiles, amphibians, and invertebrates, maintained facilities, and led educational tours. Monitored local avian species.

Student Research Scholar; California State University; Fullerton; 2002 to 2005. *Southern California Ecosystems Research Program (SCERP)*. Worked in the Mojave National Preserve researching the road effects on desert perennials, monitored water quality and measured biodiversity of macroinvertebrates in two creeks located in the Starr Ranch Sanctuary in southern Orange County, and compared the nursery function of two different habitats in the Upper Newport Bay.

Professional Affiliations and Memberships

American Society of Mammalogists
California Native Plant Society
Ecological Society of America

Publications and Presentations

“Small mammal community structure in response to post-fire vegetation changes in the Mojave National Preserve.” California State University, Fullerton (2010).

“Foraging behaviors of *Chaetodipus* spp. (pocket mice) in response to predation risk.” Published in *Dimensions* (2006).

“Foraging of *Chaetodipus* pocket mice in response to rattlesnake odors” (poster). Presented at the American Society of Mammalogists in Springfield, Missouri. Co-authored with Dr. Paul Stapp (2005).

“Foraging behavior of desert rodents in response to rattlesnake olfactory cues and predation risk” (poster). Presented at the Southern California Animal Behavior annual meeting in Riverside, California. Co-authored with Dr. Paul Stapp (2005).

"Road effects on desert perennials, *Larrea tridentata* and *Ambrosia dumosa*, across a bajada in the eastern Mojave Desert" (poster). Presented at the Society for Advancement of Chicanos and Native Americans in Science (SACNAS) Anaheim, California. Co-authored with Robert Rodarte, Victor Galvan, Susana Espino-Hernandez, and Maria Vega-Velez (2002).

"Anthropogenic effects on water quality and the potential impact on diversity of macroinvertebrates in southern California creeks" (poster). Presented at the Society for Advancement of Chicanos and Native Americans in Science (SACNAS) in Anaheim, California. Co-authored with Robert Rodarte, Victor Galvan, Susana Espino-Hernandez, and Maria Vega-Velez (2002).

“Differential Habitat Use by Fishes in Upper Newport Bay: Evidence for Nursery Function.” A presentation to the local community of the Upper Newport Bay at the Marine Studies Center in Newport, California. Co-authored with Victor Galvan, Susana Espino-Hernandez, Robert Rodarte, Maria Vega-Velez, and Dr. Michael Horn (2002).

References

Jay Lorenz (CH2M HILL), Technologist Professional, (503) 736-4033
Bridget Canty (CH2M HILL), Biologist, (831) 430-6326
Kathy Rose (CH2M HILL), Scientist, (916) 286-0287.

BIO-3
Biological Monitors

Bridget Canty

Sr. Ecologist/ Permitting Specialist

Education

Graduate Studies, Environmental Science & Resources, 2003-2005, Portland State University, Portland, Oregon

B.S., Biology, 1991, Lewis & Clark College, Portland, Oregon

Distinguishing Qualifications

- 16 years of professional experience as a consultant to private industry, state and federal government
- Manages biological resource tasks of permitting and compliance projects for the energy industry including electrical transmission, wind, solar, oil and gas, and pipelines
- Coordinates and conducts resource assessments: surveys for special-status wildlife and plant species, habitat mapping, and wetland delineations
- Experienced in managing biological tasks related to National Environmental Policy Act (NEPA), California Environmental Quality Act (CEQA), Washington State Environmental Policy Act (SEPA), Federal Energy Regulatory Commission (FERC), California Energy Commission Applications for Certification, Oregon Energy Facility Siting Commission (EFSC) Applications for Site Certificates
- Coordinates and conducts pre-construction and construction monitoring of biological resources, stormwater, and general environmental resources
- Certified Wildlife Biologist

Relevant Experience

Ms. Canty is an Ecologist and Permitting Specialist with expertise in the areas of energy facility siting, natural resource assessment, ESA consultation, permitting, NEPA/SEPA documentation, project/task management, avian risk assessment, special-status species surveys, construction monitoring, and analyzing/mitigating project impacts. She has prepared numerous environmental reports, permit applications, and constraints analyses for clients in California, Oregon, Washington, Idaho, and Wyoming.

Representative Projects and Dates of Involvement

Environmental Inspector; TS-008 and TS-023 Strength Test Pipeline Project PG&E; Soledad, California; 2014. Conduct weekly environmental inspections of project work and staging areas. Monitoring focuses on effective use of BMPs and compliance with erosion control and stormwater measures. Trained construction crew about environmental requirements for site. Prepare and submit inspection reports after each inspection detailing daily progress, environmental issues encountered, interactions with inspectors, etc. Interact directly with client's Senior Environmental Field Specialist, contacted construction crew, and project foreman and superintendent.

Environmental Inspector; R-230 Pipeline Replacement Project; PG&E; Salinas, California; 2014. Conducted weekly environmental inspections of R-230 pipeline project. Monitoring focused on effective use of BMPs and compliance with erosion control and stormwater measures. Collected samples of excavated soils for testing prior to disposal. Trained construction crew about environmental requirements for site. Prepared and submitted inspection reports after each inspection detailing daily progress, environmental issues encountered, interactions with inspectors, etc. Interacted directly with client's Senior Environmental Field Specialist, in-house construction crew, and project PM and field engineer.

Biological Monitor; L-109 Pipeline Replacement Project; PG&E; Santa Clara County, California; 2013. 2012. Conducted construction monitoring of several locations of pipeline project. Monitoring focused on compliance with worksite boundaries, avoidance of sensitive areas, and hydraulic directional drilling (HDD) activities. Trained construction crew on sensitive biological resources at the sites. Prepared and submitted monitoring reports after each inspection detailing daily progress, biological issues encountered, interactions with inspectors, etc. Interacted directly with construction crews.

Stormwater Inspector; PSEP L-103 and L-181A Pipeline Replacement Projects; PG&E; Monterey Count7y, California; 2012-2013. Conducted weekly stormwater monitoring of pipeline projects and additional monitoring during rain events in compliance with projects Stormwater Pollution Prevention Plan (SWPPP). Monitoring focused on installation and maintenance of stormwater BMPs. Trained construction crews in maintenance of stormwater BMPs. Prepared and submitted inspection reports after each inspection detailing daily progress, stormwater issues encountered, interactions with inspectors, etc. Interacted directly with construction crews, biological monitors, foremen, and senior SWPPP specialist.

Compliance Monitor; Topaz Solar Facility; MidAmerican Solar; San Luis Obispo County, California; 2013-2014. Conducted compliance monitoring for 3,200-acre solar project. Monitoring focused on compliance with various environmental measures required by the project's permits. Submitted daily compliance tracking spreadsheet, contributed to daily compliance meetings with client and client subcontractors.

Vegetation Monitor. Ruby Pipeline; Kinder Morgan (formerly El Paso); Wyoming, Utah, Nevada, and California; 2012. Field lead for vegetation monitoring along Nevada sections of the 675-mile pipeline right-of-way. Involved from the inception including developing project specific protocols, H&S, conducting vegetation and weed monitoring, and senior review of annual reports.

Task Manager/Project Manager; Site Certificate Application and Construction Monitoring; South Mist Pipeline Extension Phase 4/5, Northwest Natural Gas, Washington, Marion, and Clackamas counties, Oregon; 2002-2006. Planned and conducted biological surveys for variety of Willamette Valley special-status species including bald eagle, nesting migratory birds, pond turtle, and several rare plants. Managed and co-authored exhibits addressing habitat and special-status species for 62-mile natural gas pipeline between Bacona in Washington County and Molalla in Clackamas County. Managed and coordinated construction monitoring, including fish salvage operations resulting from unintentional frac-out related to two HDD crossings.

Project Biologist; Biological Resources Investigation Coordination and Application for Certification; Almond 2 Power Plant; Turlock Irrigation District; Stanislaus County, California; 2008-2011. Planned and conducted biological resource investigation for species including Swainson's hawk, burrowing owl, San Joaquin kit fox, and giant garter snake. Coordinated subcontractors to conduct biological resource surveys. Prepared biological resource section of AFC for submittal to California Energy Commission. Conducted construction monitoring for stream crossings.

Other Projects and Dates of Involvement

Task Manager; Biological Assessment; FERC Resource Reports, OR LNG Terminal and Pipeline; Astoria, Oregon; 2009-Present. Primary author of FERC resource reports addressing fish, wildlife, and habitat for three iterations of proposed Liquified Natural Gas Terminal near the mouth of the Columbia River in northwestern Oregon and associated 86-mile natural gas pipeline along the Oregon and Washington border. Contributed to USFWS BA addressing project impacts to listed fish and wildlife species.

Project Biologist; Biological Review; Pipeline Safety Enhancement Program; PG&E; Various projects in Monterey, Santa Cruz, San Benito, Contra Costa, and Santa Clara counties, California; 2010-Present. Conducted site reconnaissance surveys consisting of habitat assessment, identification of sensitive biological resources, and location of potential project constraints. Results memos were used to assist planners in prioritizing projects.

Task Manager; Biological Resources Section of Petition to Amend License; Carlsbad Energy Center Project; NRG; Carlsbad, California; 2014. Prepared biological resources section of PTA for replacement of existing fuel oil storage tanks and steam boilers to more efficient single-cycle natural gas-fired combustion turbines. Conducted pre-construction nesting bird survey and field reconnaissance of existing tank farm.

Staff Biologist; Avian Nest Surveys; Hydrotest Program; PG&E; Solano, Contra Costa, Alameda, Santa Cruz, San Benito, and Monterey Counties; California; 2011-2014. Conducted pre-construction avian nesting surveys for multiple natural gas pipeline retrofitting projects. Raptors were surveyed out to ½-mile and passerines were surveyed out to 100 feet. Prepared technical memorandums summarizing the methods and results, including locations of active nests to be avoided during construction.

Project Manager; Eagle Risk Assessment; Stillwater Geothermal Gen-tie Line; Enel Green Power; Churchill County, Nevada; 2013. Conducted preliminary risk assessment of older generation transmission line evaluating collision risk for bald and golden eagles. Assisted client to prioritize retrofitting of existing utility poles to meet current Avian Power Line Interaction Committee avian safe standards. Technical memorandum formed the basis for the client's Avian Protection Plan.

Project Biologist; Special-status Wildlife Species Investigation; Sevier Playa Project; Peak Minerals; Millard County, Utah; 2013. Conducted surveys for special-status species including: burrowing owl, nesting raptors, kit fox, Utah prairie dog for proposed 96,000-acre potash mining project in west-central Utah. Prepared resource report detailing methods, results, impacts, and recommended avoidance and mitigation measures.

Task Manager; Biological Resources Review; Critical Issues Analysis; Confidential Client; Confidential Wind Project; San Luis Obispo and Kern Counties, CA; 2013. Conducted review of biological resources for critical issues analysis for proposed wind energy facility in eastern San Luis Obispo County/western Kern County. Client used resulting report during feasibility planning.

Task Manager; Biological Resources Investigation Coordination, DEIR, LEHCP, APP; Terra-Gen; Alta-Mojave Oak Creek Wind Project, Kern County, California; 2008-2013. Coordinated and/or participated in biological resources investigations for proposed 800-MW wind project including a 16.8-mile 500-kV transmission line. Contributed to summary reports and mitigation planning for state and federal special-status species including burrowing owl, Swainson's hawk, migratory birds, desert tortoise, desert kit fox, and Bakersfield cactus. Prepared permit applications. Assisted with preparation of APP. Currently preparing Low Effect Habitat Conservation Plan (LEHCP). Minimization measures included retrofitting the power line to Avian Safe standards.

Jessica Birnbaum

Biologist/Environmental Planner

Education

M.S., Natural Resource Planning, Humboldt State University: Arcata, CA, December 2007
B.S. Biology, Trinity College: Hartford, CT, May 2002

Distinguishing Qualifications

- Environmental Planning/Permitting
- Wetland Delineation
- GPS and GIS Mapping
- Special-Status Plant and Wildlife Species Surveys and Habitat Assessment
- Environmental Impact/Biological Assessment Reports
- Habitat Restoration
- Construction Compliance and Monitoring

Relevant Experience

Ms. Birnbaum is a Biologist and Environmental Planner with 10 years of experience conducting and managing botanical and wildlife surveys, including protocol surveys for special-status species, endangered species habitat assessment, wetland delineations, vegetation and stream monitoring, and habitat restoration. She is a strong botanist and has experience surveying for a wide range of wildlife species, particularly in the desert. The wildlife species that she has fairly extensive experience with include desert tortoise, burrowing owl, blunt-nosed leopard lizard, flat-tailed horned lizard, and Blainville's horned lizard (coast horned lizard).

Ms. Birnbaum has her master's in Natural Resource Planning and has 5 years of experience providing environmental assessment of planning projects, drafting the necessary biological resource reports and permitting documents (California Environmental Quality Act [CEQA] /National Environmental Policy Act [NEPA] environmental regulations and compliance, BAs, Environmental Impact Statements[EIS] / Environmental Impact Report [EIRs], and ITPs.

Representative Projects and Dates of Involvement

Biological Resource Reports/Environmental Permitting

Section 401 Clean Water Act Water Quality Certification Application Package, SouthEast Connector (SEC) Phase 2 Project, Regional Transportation Commission of Washoe County, Reno and Sparks, NV. June 2013. The SEC project would provide improved North/South regional connectivity between south Truckee Meadows and the City of Sparks. The Truckee Meadows is drained by two perennial streams, Truckee River and Steaboat Creek. Drafted 401 permit application package describing affected waterbodies, potential for impacts to threatened or endangered species. Application provided the avoidance, minimization, and mitigation measures that would be employed to prevent adverse impacts to sensitive biological resources.

Biological Assessment, Kyle Canyon State Route 157 Improvement Project, Federal Highway Administration and Central Federal Lands Highway Division; Clark County, Nevada, July 2012. Drafted biological assessment for a road improvement project. Project could directly affect the desert tortoise (*Gopherus agassizii*), a federally endangered and state threatened species.

Biological Assessment, Fort Irwin National Training Center Solar Facility Project, United States Army; San Bernardino County, California, July 2012. Drafted biological assessment for a solar photovoltaic facility on up to 380 acres. Project could directly affect Mojave desert tortoise, a federally endangered and state threatened species.

Biological Assessment, Incidental Take Permit Application for California Tiger Salamander, Natural Environment Study, Section 404 Permit Application; Madrone Avenue Left-turn Channelization Project; California Department of Transportation (Caltrans); Sonoma County, CA; September 2011 to May 2012. Drafted biological permitting documents for a proposed roadway safety project near Cotati, CA. Key issues of concern included loss of California tiger salamander habitat and wetland habitat.

Biological Assessment, Gleason Beach Roadway Realignment Project, California Department of Transportation; Sonoma County, CA. December 2011 to January 2012. Drafted Biological Assessment Report for a proposed roadway realignment near Bodega Bay, California. Project could directly affect California red-legged frog and Myrtle's silverspot butterfly.

Botanist

Habitat Mapping, Sevier Playa Project, Peak Minerals Inc., Delta, UT. June 2013. Project will be designed to produce 300,000 metric tons of potash per year in the form of K2SO4 or sulfate of potash. Conducted survey of the vegetation within the footprint of all Project components. Project components include 52-mile 69-kV power line, approximately 30-mile gas line, approximately 3-mile water line, rail facility, staging areas, and temporary use areas. The purpose of the survey was to field verify and update the SWReGAP land cover mapping. Land cover type was determined based upon the dominant plant species, percent cover, and associated plant species. This mapping was then used to extrapolate what type of wildlife habitat is found within the Project site.

Rare Plant Survey, Marin-Sonoma Narrows (MSN) Project, Caltrans; Petaluma, CA. April 2013. Performed protocol-level special-status plant survey to search for and document locations of special-status plants and plant communities within the project area.

Vegetation Monitoring, Ruby Pipeline Restoration and Revegetation Project, Kinder Morgan; Nevada and Wyoming, June and November 2012. Project involves the restoration of vegetation within the pipeline ROW in Wyoming, Utah, Nevada, and Oregon. Established experimental plots at specific locations to evaluate seeding mixes (i.e. Sagebrush Scrub and Pinyon-Juniper Woodland), invasive weed control, and the use of fertilizers. The studies provide guidance to the revegetation of sagebrush-steppe and salt-desert shrub habitats. Also provided an evaluation of seedling establishment for the first growing season, including density and diversity.

Rare Plant Survey, Gleason Beach Roadway Realignment Project, California Department of Transportation (Caltrans); Sonoma County, CA. March to May 2012. Performed rare plant surveys within and surrounding proposed project roadway alignment near Bodega Bay, CA.

Wetland Biologist

Wetland Delineation, Road Improvement Projects, Nebraska Department of Roads; throughout Nebraska; July and October 2012, April and May 2013. Delineated potentially jurisdictional wetlands and waters of the United States (U.S.). Coauthor for Wetlands and Water Resource Report.

Wetland Delineation, Fort Ross Slide Repair Project, Caltrans. Sonoma County, CA. March 2013. Caltrans proposes roadway improvements to address a roadway slip-out failure along the southbound edge and shoulder of State Route 1 near Fort Ross State Historic Park. Delineated wetlands and other waters the U.S. within the Project area.

Wetland Delineation, PG&E Hydrotest Program. Petaluma and Sebastopol, CA. June 2012. PG&E's pipeline hydrotest work includes testing and replacement of natural gas lines. Performed wetland delineation and jurisdictional analysis. Assisting author for wetland delineation report.

Special-Status Wildlife Biologist

Burrowing Owl and Kit Fox Survey, Sevier Playa Project, Peak Minerals Inc., Millard County, UT. June 2013. Burrowing owl and kit fox burrow survey was conducted along the entire length of Project components and a 0.25-mile buffer on either side of the construction-related ground disturbance.

Nesting Bird Surveys and Biological Monitoring, Marin-Sonoma Narrows (MSN) Project, Caltrans. Petaluma, CA. February to June 2013. Conducted nesting bird surveys prior to vegetation removal to ensure that no active nests were impacted by the project. Other wildlife species of concern include the threatened California red-legged frog and the endangered salt marsh harvest mouse. Provided clearance surveys for sensitive wildlife species and monitored when construction work was conducted within sensitive habitats. Provided WEATs (worker environmental awareness training).

Nesting Bird Surveys, SON 101 Airport Boulevard/Fulton Road Interchange Project, Caltrans; Windsor, CA. February to May 2013. Conducted nesting bird surveys prior to vegetation removal to ensure that no active nests were impacted by the project. Provided WEATs (worker environmental awareness training).

Desert Tortoise Survey, Kelso to Dunn Power Project, Union Pacific Railroad (UPRR), San Bernardino County, CA. August 2012. Identified certain segments of the 49 mile railroad corridor as suitable habitat for desert tortoise, which reduced the length that needed to be surveyed to just 20 miles of the railroad track ROW. Conducted survey of potentially active desert tortoise habitat.

Desert Tortoise Survey, Fort Irwin National Training Center Solar Facility Project, United States Army; Fort Irwin, CA. March 2012 and April 2013. Led team of 4 biologists in conducting desert tortoise protocol level presence/absence surveys for 2 alternative sites for a solar facility, each site covered approximately 400 acres of desert tortoise habitat. Also surveyed along the proposed linear transmission line corridor and within the surrounding zone of influence (ZOI).

Swainson's Hawk Survey, Ridgetop Wind Project, Brightsource; Tehachapi, CA. May 2012. Performed surveys of nest structures suitable for Swainson's hawks surrounding a potential wind project site to search for evidence of nesting, none were observed. Survey covered a Project area of approximately

Desert Tortoise and Burrowing Owl Survey, Kyle Canyon State Route 157 Improvement Project, Federal Highway Administration and Central Federal Lands Highway Division; Clark County, Nevada, April 2012. Led crew of 4 biologists in conducting protocol level presence/absence surveys for desert tortoise and burrowing owl along the proposed 17-mi-long construction corridor and within the surrounding zone of influence (ZOI).

Swainson's Hawk Survey, Solar Project, Pacific Valley; Five Points, CA. June 2011. Performed survey of nest structures suitable for Swainson's hawks surrounding a potential solar project site to search for evidence of nesting. Active Swainson's hawk nests and nesting behavior were noted.

Biological Resource Surveys/Biological Monitoring

Biological Resource Survey, PG&E Hydrotest Program in Napa, CA, December 2012 and February 2013: PG&E's pipeline hydrotest work includes testing and replacement of natural gas lines. Conducted habitat assessment and biological resource survey to identify potential impacts to biological resources from the Project. Surveyed for special-status species, sensitive natural communities, nesting birds or potential for nesting birds, and mammal burrows that could serve as underground refugia for burrowing owl and other special-status species.

Biological Monitor, PG&E Hydrotest Program in Isleton, CA. November 2012. Monitored crews and monitors to ensure that no sensitive biological resources were compromised and that construction BMPs were employed properly. The sensitive species included western pond turtle and sensitive wetland habitat.

Jessica Birnbaum

Environmental Inspector, PG&E Hydrotest Program in Pittsburg, CA, October 2011. Monitored crews and monitors to ensure that no sensitive biological resources were compromised and that construction BMPs were employed properly.

Preconstruction Biological Resource Survey and Biological Monitor, PG&E Hydrotest Program in Pittsburg, Watsonville, Woodside, and Redwood City, CA, August 2011. Conducted preconstruction biological resource survey. The sensitive species with a potential to occur and that were surveyed for included California tiger salamander, vernal pool fairy shrimp, California linderiella, and big tarplant. Monitored construction work to ensure that no sensitive species or habitat is compromised during work and that work is in compliance with Avoidance and Minimization Measures (AMMs).

Preconstruction Biological Resource Survey, PG&E Hydrotest Program; Palo Alto, CA. August 2011. Conducted literature search to determine what sensitive species to target during site survey. The sensitive species of concern included California tiger salamander, vernal pool fairy shrimp, California linderiella, and big tarplant. Determined what Avoidance and Minimization Measures (AMMs) should be implemented in order to minimize impacts to sensitive habitat.

Victoria L Kilbert

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San Diego, CA 92103
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EDUCATION: The Pennsylvania State University — University Park, PA
Bachelor of Science in Environmental Resource Management — December 2008
Minor in Environmental Soil Science
Minor in Watershed and Water Resource Management

- USACE Wetland Delineation Training- Atlantic and Gulf Coast Supplement — February 2012
- FERC Environmental Review and Compliance for Natural Gas Seminar — February 2013
- OH EPA Rapid Assessment Method (ORAM) Training — May 2013
- HAZWOPER 40 Hour Training — February 2014

CURRENT EMPLOYER:
CH2M Hill; San Diego, CA — 5/2012-present

Environmental Staff Scientist

- Lead and participate on pre and post construction field surveys, including but not limited to wetland and waterbody delineations, environmental inspection, vegetation monitoring and habitat assessments
- Gather and review critical data to successfully complete evaluations, including mapping and region specific information
- Assist with completion of necessary environmental reporting and permitting at local, state and federal level
- Act as Safety Coordinator on field efforts, ensuring safe work conditions and practices

EMPLOYMENT HISTORY:
Chesapeake Research Consortium
Chesapeake Bay Program; Annapolis, MD — 9/2009-5/2012

Water Quality Goal Implementation Team Staffer

- Supported EPA's Chesapeake Bay TMDL and Jurisdictions' Watershed Implementation Plans development and evaluation
- Prepared materials for executive briefings and internal review
- Informed public through presentations, data analysis, and email correspondence
- Progressed toward professional goals through developmental opportunities including conferences and coursework

Center of Wetland Cooperative
Penn State University; University Park, PA — 5/2009-8/2009

Research Assistant

- Sampled mitigated and reference wetlands to draw comparison of functionality
- Surveyed and photographed site, sampled soils, and documented overall health, hydrology, geography and geology
- Led vegetation identification efforts
- Researched location, developed site map, and investigated site history

Millbrook Marsh Nature Center
Centre Region Recreation Authority; State College, PA — 4/2009-6/2009

Environmental Educator

- Taught children to explore wildlife, vegetation and ecosystem of surroundings
- Organized and planned programs based on children's level of learning and objectives desired
- Researched and presented on archeology, anthropology, biological evolution, ecology, botany, limnology, hydrology, water cycle, human impacts and watershed development
- Ensured children and parents enjoyed a fulfilling, informative, and inspiring experience

SPECIALIZATIONS:
Google Earth, ArcGIS, TerraSync and Trimble GPS units
Microsoft Office (including Excel, Outlook and Project)
Wetland Delineation, Mitigation and Conservation
Environmental Education and Awareness

Field Assistant
Rising Tree Wind Farm
Tehachapi, CA

- Performed tasks necessary to sample sediment for fossilized material

Project Assistant
San Diego Gas and Electric and Southern California Gas Pipeline Safety Enhancement Plan
Throughout Southern California

- Support Project Management (POs, Invoicing, WAs, documentation)
- Conduct in-field investigations of potentially impacted resources
- Serve as Site Supervisor when recycled water is used for hydrotesting

Field Survey Lead/Assistant/Safety Coordinator
Columbia Gas/NiSource
Throughout OH, WV, Northern KY, and Western PA

- Evaluate sites of necessary maintenance projects for potential to impact natural resources (wetlands, waterbodies, and special species habitat)
- Complete report after field effort and assist with any necessary permitting

Field Assistant
Kinder Morgan
Ruby Pipeline (specifically Northern NV)

- Gain access to remote sites
- Assist Biological Lead in evaluating establishment of post construction vegetation and overall post construction recovery

Field Lead
NE Department of Roads
Throughout Nebraska

- Lead environmental surveys to identify resources potentially impacted during roadway construction
- Lead reporting effort

Field Lead/Assistant/Safety Coordinator
TransCanada (Pipelines)
Throughout the Midwest (NE, MO, IA, KS, IL)

- Led or acted as assistant in effort to identify features potentially impacted during maintenance activities, at times on active construction sites
- Led or assisted in evaluation of post construction recovery, including vegetation establishment, avoidance of invasive establishment, and success rate of tree plantings

Contact
TransCanada (Pipelines)
Throughout Southeast (KY, TN, MI, AR, LA, TX)

- Contacted first responders along existing pipeline to confirm knowledge of pipeline and improve records of structures in the vicinity
- Investigated newly established facilities within pipeline buffer zone, gathering contact information and information on occupancy.

Field Lead/ Assistant/Safety Coordinator
Buckeye Pipeline
Throughout Midwest (IA, MO)

- Evaluate sites of necessary maintenance projects for potential to impact natural resources (wetlands, waterbodies, and special species habitat)
- Complete report after field effort and assist with any necessary permitting

Field Lead/ Assistant/Safety Coordinator
Columbia Gas
Throughout Northeast and Midwest (PA, OH, KY, WV)

- Evaluate sites of necessary maintenance projects for potential to impact natural resources (wetlands, waterbodies, and special species habitat)
- Complete report after field effort and assist with any necessary permitting
- Evaluate sites after construction for establishment of permanent vegetative cover

Field Lead/Assistant/Safety Coordinator
First Energy (Transmission Lines)

- Evaluate sites of necessary installation/maintenance projects for potential to impact natural resources (wetlands, waterbodies, and special species habitat)
- Complete report after field effort and assist with any necessary permitting

Gretchen Chaney
Ecologist

GANDA

EXPERTISE

General Wildlife Surveys
Water Sampling
Air Quality Sampling
Soil Sampling
Construction Monitoring

EDUCATION

California Polytechnic State University, San Luis Obispo, B.S. Biology, 1996

PROFESSIONAL PROFILE

Ms. Chaney has a broad range of experience with her 17 years of work in the environmental compliance and natural resource management arena including both public and private sector projects. Ms. Chaney's experience with Garcia and Associates includes conducting pre-construction surveys for special-status species, nesting bird surveys, and biological monitoring. Ms. Chaney has conducted background research for technical reports and contributed to numerous environmental documents including Biological Assessments/Evaluations and Proponents Environmental Assessments (PEA) reports. Ms. Chaney has experience conducting general surveys for wildlife in California. She has surveyed for and collected both plant and wildlife species throughout the western Pacific states including salamanders, terrestrial mollusks, lichens, fungi, and vascular plants in accordance with U.S Forest Service protocols.

In addition to her natural resource experience, Ms. Chaney has experience with water quality, air quality, and hazardous substances compliance.

SELECT PROJECT EXPERIENCE

- **Southern California Gas Company (SCG) and San Diego Gas & Electric (SDG&E) Natural Gas Pipeline Safety Enhancement Project, Riverside County, CA (2013-Present).** Ms. Chaney is the Lead biological and environmental monitor for GANDA on the Pipeline Safety Enhancement Project (PSEP). As the Lead Monitor for GANDA's PSEP Projects, Ms. Chaney provides technical assistance to field monitors, coordinating PSEP documentation review and submittal, and hosts weekly PSEP Conference Calls with field monitors to discuss pipeline segment issues and lessons learned in the field. Ms. Chaney has monitored and provided technical support on multiple task orders including: All segments of the Line 2000 Hydro Test from Banning to Corona, CA, Whitewater Valve Station replacement, Line 36-09-9N, Segments 3 and 4 in San Luis Obispo, CA, Supply Line 37-07 in Inglewood, CA, Supply Line 38-539 in Tulare, CA, Supply Line 38-512 in Lemoore, and Supply Line 36-1032 Segment 3 in Lompoc, CA, and

several segments for Line 2001 West. Ms. Chaney has conducted nesting bird surveys, pre-construction surveys, preliminary JD surveys, construction monitoring, performed PCB sampling on removed or abandoned pipe segments, and has conducted soil and water samples on impacted soil. Ms. Chaney was also tasked with providing SCG workers and sub-contractors with Workers Environmental Awareness Procedure (WEAP) training that covered basic environmental compliance and general work practices for construction personnel including: biological resources, cultural resources, air quality and dust control, water quality, hazardous materials and spill prevention, and constraints associated with each of these areas of concerns. She performed daily surveys on the project site and provided recommendations to maintain compliance with local, state, and federal permit regulations.

- **San Diego Gas & Electric (SDG&E) On-Call Biological Projects, San Diego County, CA (2014-Present).** Under a contract with AECOM, GANDA and Ms. Chaney support biological monitoring and biological survey efforts such as pre-construction surveys, nesting bird surveys, and biological monitoring for nesting birds and special-status wildlife and botanical species under the Natural Communities Conservation Plan (NCCP). Monitoring and survey efforts have been conducted for operations and maintenance projects including pole replacements, C-Truss installations, and insulator changes outs to name a few. Additional monitoring and survey support have been conducted for new project installations such as Substation communication towers and new access road establishments. Work under this contract include projects throughout Marine Corps Base Camp Pendleton, as well as land owned by the Parks Department and leased by the Marine Corps, and throughout San Diego County.

- **Southern California Edison (SCE) Path 42 Reconductoring Project, Palm Springs, Riverside County, CA (2014).** Ms. Chaney provided pre-construction wildlife and botanical surveys, nesting bird surveys, and construction monitoring for a 15-mile long reconductoring project within sensitive habitat for desert tortoise (*Gopherus agassizii*), burrowing owl (*Athene cunicularia*), Coachella Valley fringe-toed lizard (*Uma inornata*), Palm Springs pocket mouse (*Perognathus longimembris bangsi*), Le Conte's thrasher (*Toxostoma lecontei*), little San Bernardino Mountain linanthus (*Linanthus maculatus*), and Coachella Valley milk-vetch (*Astragalus lentiginosus var. coachellae*).

- **San Diego Gas & Electric (SDG&E) Camp Pendleton Pole Replacement Projects, San Diego County, CA (2010-Present).** Ms. Chaney conducted pre-construction surveys and biological monitoring for nesting birds and special-status wildlife and botanical species under the Natural Communities Conservation Plan (NCCP) prior to the replacement of SDG&E wood poles throughout Camp Pendleton as well as land owned by the Parks Department and leased by the Marine Corps.

- **San Diego Gas & Electric (SDG&E) Camp Pendleton Road Grading Project, San Diego County, CA (2010-2013).** Ms. Chaney provided pre-construction nesting bird and botanical surveys during the reconstruction and grading of SDG&E transmission line corridor roads. Ms. Chaney also made recommendations to maintain compliance with the Migratory Bird Treaty Act (MBTA).

- **San Diego Gas & Electric (SDG&E) Camp Pendleton Insulator Change-Out Projects, San Diego County, CA (2012).** Ms. Chaney conducted pre-construction surveys and biological monitoring for nesting birds and special-status wildlife and botanical species under the Natural Communities Conservation Plan (NCCP) prior to the replacement of SDG&E transmission tower insulators throughout Camp Pendleton as well as land owned by the Parks Department and leased by the Marine Corps.

- **San Diego Gas & Electric (SDG&E) Helicopter Pad Installation Project, Fallbrook, CA (2012).** Ms. Chaney provided pre-construction nesting bird and botanical surveys during the construction of SDG&E

helicopter pad installations in remote areas of Fallbrook. Ms. Chaney also managed company personnel and scheduling during the three month long project.

- **San Diego Gas & Electric (SDG&E) Camp Pendleton Brush Clearing Project – Talega Canyon, San Diego County, CA (2011).** Ms. Chaney acted as the biologist and Range Safety Officer (RSO) on the Talega Canyon brush clearing project within Marine Corps Base Camp Pendleton. Ms. Chaney conducted surveys for nesting birds and sensitive species along Talega Canyon road and all spur roads to SDG&E tower sites.

- **Southern California Edison (SCE) Deteriorated Poles Project, Riverside County, CA (2010).** Ms. Chaney conducted a CNDDB search, habitat assessment, and species surveys to assist with the replacement of deteriorated poles. A brief report was prepared documenting the results of the effort, including a description of the site conditions, photographs, and maps depicting any observed sensitive resources.

- **San Diego Gas & Electric (SDG&E) Pole Replacement Project, San Diego County, CA (2010).** Ms. Chaney provided Pre-activity Study Reports (PSRs) under the San Diego County Natural Communities Conservation Plan (NCCP) providing biological information prior to the replacement of deteriorated poles. A report was prepared documenting the results of the survey effort, including a description of the site conditions and photograph documentation depicting any observed sensitive resources in the immediate area. Ms. Chaney also made recommendations to maintain compliance with the MBTA and avoidance of special-status species.

- **PG&E Palermo to Rio Oso Reconductoring Transmission Line Project, Butte and Sutter counties, CA (2009).** Ms. Chaney provided pre-construction nesting bird surveys in accordance with the MBTA along a 26-mile long transmission line reconductoring project. Swainson's hawk (*Buteo swainsoni*) surveys were also conducted along the project line. Several pairs of nesting Swainson's hawks were located and avoidance measures were implemented prior to the projects reconductoring and pole replacement.

- **PG&E Atlantic Substation Expansion Project, Sacramento, CA (2009).** Ms. Chaney was the biological monitor on a substation expansion project. Ms. Chaney was tasked with providing PG&E workers and sub-contractors with worker environmental awareness (WEAP) training that covered such items as special-status species awareness for vernal pool species, SWPPP monitoring, historical and archeological avoidance, and general work practices for all construction personnel. She performed daily surveys on the project site, including nesting bird surveys, and provided recommendations to maintain compliance with local and state regulations.

- **PG&E Natural Gas Line Extension Project, Grady, CA (2008).** Ms. Chaney was the biologist on site during a PG&E natural gas pipeline extension project near Grady, California. Ms. Chaney was in charge of conducting construction monitoring for giant garter snake (*Thamnophis gigas*), as well as providing recommendations for BMPs to minimize the impact of construction on special status species habitat, and performed daily monitoring and reports of the project site.

- **PG&E Noxious Weed and Herbicide Monitoring Project on Feather River, Marysville, CA (2008).** As part of PG&E's Noxious Weed Management Program, Ms. Chaney assisting with the collection of water samples on the Feather River. Samples were collected at various locations along PG&E's hydrologic ROW pre- and post- storm events. Water samples were analyzed to determine whether runoff

occurred into the river due to the application of herbicides for the control of noxious weeds.

- **Sound Transit Link Light Rail Project, Seattle, WA (2003-2004).** Ms. Chaney was the Environmental Specialist tasked with conducting Phase I Environmental Site Assessments (ESA) in accordance with ASTM standards with respect to the range of contaminants within the scope of Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) (42 U.S.C. 9601) and petroleum products during the initial property acquisition phase of the Link Light Rail project. Hazardous property assessments were evaluated for all properties along the approximately 15-mile long Rail route. Ms. Chaney conducted present and historical research to assess the existence of hazardous substances from underground storage tanks (USTs), above ground storage tanks (ASTs), and other potentially hazardous commercial and industrial practices on acquired land.

- **Seattle City Lights, Seattle, WA (2003-2004).** Ms. Chaney was the Environmental Specialist tasked with conducting Phase I Environmental Site Assessments (ESA) for Seattle City Lights during the city agency's property acquisitions. Ms. Chaney conducted present and historical research to assess the existence of hazardous substances from underground storage tanks (UST), above ground storage tanks (AST), and other potentially hazardous commercial and industrial practices on acquired land.

- **Qwest Communications Compliance Projects, Seattle, WA (2000-2002).** Ms. Chaney was the Environmental Specialist tasked with collecting and analyzing hydrologic data from monitoring wells throughout Qwest Communications service area at their maintenance yards, fleet fueling stations, and manufacturing facilities.

- **U.S. Forest Service, Mt. Baker, Gifford Pinchot, Siuslaw, Wenatchee/Okanogan, Umpqua, and Shasta National Forests, Pacific Northwest States (2000-2002).** Ms. Chaney served as project manager for the survey and monitoring of Current Vegetation Survey (CVS) plots to determine forest health. Plots were located throughout the Pacific Northwest in Washington, Oregon, and Northern California national forests and were designated by the USFS' geographical grid system. Ms. Chaney managed a crew of 50 personnel throughout seven national forests conducting fungi, lichen, terrestrial mollusk, and vascular plant surveys. Surveys were conducted along 100-meter transects at random plot locations over the course of eight seasons.

- **U.S. Forest Service, Umpqua National Forest, Oregon (2002).** Ms. Chaney was the assistant project manager for USFS salamander surveys conducted within the Umpqua National Forest. Seasonal transect surveys were conducted throughout various locations within the forest. Ms. Chaney was tasked with coordinating crew personnel, transect locations, and equipment. She maintained communication with Forest Service personnel on data collection, project QA/QC, and project timelines.

- **Unocal Oil Spill Clean-up Project, Avila Beach, CA (1997-1999).** Ms. Chaney was an Environmental Specialist on the hazardous waste clean-up site contaminated by over 400,000-gallons of crude oil, diesel oil and gasoline due to a leaking underground pipeline. Ms. Chaney was part of the fugitive dust and air quality team that monitored dust particulates and air quality. Ms. Chaney was in charge of equipment set-up, calibration, data analysis, and reports for data collected from PM 10 and PM 2.5 particulate samplers. Ms. Chaney also conducted ambient and indoor air sampling throughout the contaminated site according to California EPA Air Resource Board methods and requirements for volatile organic compounds (VOCs), semi-volatile compounds, as well as carbonyls such as formaldehyde, acetaldehyde, and sulfur.

- **PG&E Diablo Canyon Nuclear Power Plant, San Luis Obispo County, CA (1993-1997).** Ms. Chaney was a biologist on site at the Diablo Canyon Nuclear Power Plant in Avila Beach, CA. Ms. Chaney was in charge of studying weekly plankton samples to determine barnacle larvae species and quantities during seasonal influxes. Power plant intake outages were re-scheduled based on Ms. Chaney's findings in an effort to reduce implantation of barnacles on the intake structure's walls and subsequent sloughing off of barnacles into the intake system. Ms. Chaney also conducted physiological tests on local abalone species to better understand Withering Syndrome (WS) in abalone populations. She conducted daily monitoring of the power plants intake bays for potential hazards due to aquatic wildlife and botanical obstructions. Ms. Chaney also conducted Whole Effluent Toxicity (WET) or acute and chronic bioassays on the power plant's discharge waters for compliance with NPDES permits and Nuclear Regulatory Commission (NRC) requirements.

PROFESSIONAL HISTORY

Garcia and Associates (GANDA)	Wildlife Biologist	2008 to Present
Sound Environmental Strategies	Environmental Specialist	2003-2004
Boateng and Associates	Project Manager/Biologist	2000-2002
Mesa Associates	Environmental Specialist	1997-1998
Aquatic Systems Incorporated	Junior Aquatic Biologist	1993-1997

(An on-site sub-contractor for Pacific Gas and Electric (PG&E) at the Diablo Canyon Nuclear Power Plant in San Luis Obispo County)

Michael S. Zerwekh
Wildlife Biologist

EDUCATION

- B.A., Biology – University of Kansas, 2006

PROFESSIONAL HISTORY

- **Wildlife Biologist,** Garcia and Associates, Oceanside, CA, June 2014 - Present
- **Staff Biologist,** Pangea Biological, Encinitas, CA, February 2014 – June 2014
- **Wildlife Biologist,** Garcia and Associates, Oceanside, CA, October 2011 – March 2013
- **Environmental Biologist,** PAR Electrical Contractors/Greenstone Environmental, November 2010 – September 2011
- **Biological Field Technician**, Garcia and Associates, May 2010 – November 2010
- **Volunteer Field Biologist,** University of Kansas, Kansas Biological Survey, May 2009 – May 2010
- **Wildlife Biologist,** Western Riverside County Biological Monitoring Program (MSHCP), Riverside, CA, May 2008 – May 2009

PROFESSIONAL PROFILE

Mr. Zerwekh is a wildlife biologist and environmental compliance specialist with over four years of professional experience. He has worked with numerous species of wildlife and plants in Southern California, and specializes in herpetology. His field work with herpetofauna include USGS protocol-level arroyo toad surveys, anuran call surveys, trapping surveys for western pond turtles, radio telemetry surveys for timber rattlesnakes in Kansas, and presence/absence surveys for numerous other amphibian and reptile species. His additional field work includes surveys for Stephen's kangaroo rat, desert kit fox, burrowing owl, raptors, and rare plants throughout Southern California. Since 2010, Mr. Zerwekh has assisted with protocol-level surveys, and served as a biological and environmental compliance monitor for numerous energy-related development projects throughout California. During his time as a professional wildlife biologist, Mr. Zerwekh has become well-acquainted with field collection techniques, USGS and MSHCP protocols, the Migratory Bird Treaty Act, FESA/CESA, and NEPA/CEQA guidelines.

SELECTED PROJECT EXPERIENCE

Tehachapi Renewable Transmission Project (June 2014 to Present) Los Angeles and San Bernardino Counties, CA.
Mr. Zerwekh is currently a wildlife biologist and on-site environmental compliance monitor during construction of a 500 kV transmission line in Angeles National Forest, and a 3.5-mile underground 500 kV transmission line in Chino Hills, California. Responsibilities include

monitoring for sensitive biological resources, including the arroyo toad, California red-legged frog, nesting birds, and special-status trees and plants, and submitting daily reports.

SDG&E On-call Monitoring (March 2015 – April 2015) MCB Camp Pendleton, San Diego County, CA
Mr. Zerwekh was a wildlife biologist and on-site environmental compliance monitor during construction of a communications pole within Stuart Substation at MCB Camp Pendleton. Responsibilities included monitoring for nesting birds and other wildlife, insuring that appropriate BMPs were used, and submitting a weekly report.

Pangea Biological (February 2014 – Present) San Diego County, CA
Mr. Zerwekh was a staff biologist and biological compliance monitor for several SDG&E operations and maintenance projects. Responsibilities included conducting pre-activity surveys for NCCP-covered wildlife and plants, writing pre-activity survey reports, and serving as an on-site environmental compliance monitor during construction activities. Mr. Zerwekh also attended the 2014 Arroyo Toad Workshop, and volunteered on protocol-level arroyo toad surveys with the United States Geological Survey.

DPV2 Transmission Project (October 2011 – November 2012) Riverside County, CA
Mr. Zerwekh was a wildlife biologist and on-site biological compliance monitor during construction of the Devers to Palo Verde No. 2 transmission line. Responsibilities included performing protocol-level pre-construction surveys and habitat assessments for sensitive biological resources, including the Coachella Valley fringe-toed lizard, flat-tailed horned lizard, desert tortoise, desert kit fox, nesting birds, and rare plants, and monitoring for biological compliance during construction activities.

SDG&E Helicopter Pad Installation (April 2012 – June 2012) San Diego County, CA
Mr. Zerwekh was a wildlife biologist and on-site biological compliance monitor during helicopter pad installations near Fallbrook, CA. Responsibilities included monitoring for nesting birds and other wildlife, and documenting compliance-related issues. Mr. Zerwekh also received Range Safety Officer (RSO) training at Camp Pendleton Marine Corps Base.

Sunrise Powerlink (November 2010 – September 2011) San Diego and Imperial Counties, CA
Mr. Zerwekh was an environmental biologist and on-site compliance monitor during construction of the Sunrise Powerlink transmission line. Responsibilities included BMP and SWPPP inspections, spill clean-ups, and coordinating with other environmental compliance monitors to resolve compliance-related issues. Mr. Zerwekh also received training in identification and handling of flat-tailed horned lizards from the California Department of Fish and Wildlife.

Alta-Oak Creek Wind Development Project (May 2010 – November 2010) Kern County, CA
Mr. Zerwekh was a biological field technician and on-site environmental compliance monitor during construction of a wind farm. He performed protocol-level pre-construction surveys for desert tortoises and rare plants at proposed sites for wind turbines, and was also an on-site

biological and environmental compliance monitor for desert tortoises during construction activities.

CH2MHill/PG&E Yolo Pipeline Line 406 Project (May 2010 – July 2010) Yolo County, CA
Mr. Zerwekh was a biological field technician and on-site environmental compliance monitor during construction of a natural gas pipeline. He performed protocol-level pre-construction surveys for raptors and burrowing owls, and was also an on-site environmental compliance monitor during construction activities for sensitive biological resources, including wetlands, vernal pools, burrowing owls, Swainson's hawk, California tiger salamander, and giant garter snake.

Western Riverside County Biomonitoring Program (May 2008 – May 2009) Riverside County, CA
Mr. Zerwekh performed USGS and MSHCP protocol-level surveys for sensitive biological resources within the Western Riverside County MSHCP, including the arroyo toad, western pond turtle, California red-legged frog, and other native and introduced herpetofauna. He also assisted with trapping surveys for Stephen's kangaroo rat, and carnivore tracking surveys.

PERMITS AND CERTIFICATES

- California Dept. of Fish and Wildlife – Authorized flat-tailed horned lizard biologist

TRAINING AND WORKSHOPS

- 2014 Arroyo Toad Workshop
- Range Safety Officer (RSO) Training – Camp Pendleton Marine Corps Base
- 2011 Desert Tortoise Council Workshop – Introduction to Surveying, Monitoring, and Handling Techniques

PUBLICATIONS

Observations of cavity roosting behavior in Costa Rican Lophostoma brasiliense (Chiroptera: Phyllostomidae). Published in Mammalian Biology, vol. 73/3, pp. 230-232.

A Field Study of the Timber Rattlesnake in Leavenworth County, Kansas, Published in September 2004 edition of the Journal of Kansas Herpetology, pp. 18-24.

Large Northern Water Snake (Nerodia sipedon) from Kansas, Published in September 2003 edition of the Journal of Kansas Herpetology, p. 12.

Mark Canfield

Biologist

Education

B.S. Biology: Ecology. California State University Long Beach. 2004.

Professional Credentials

- California Department of Fish and Wildlife Scientific Collecting Permit
- Certified contractor - BNSF, Union Pacific RR, Norfolk Southern, CN, CSX, and Conrail.

Distinguishing Qualifications

- More than 8 years' experience conducting biological studies throughout southern California.
- Authorized Biologist (USFWS) - California red-legged frog (CRLF) and arroyo toad (ARTO). Mr. Canfield served as one of the authorized biologists/handlers for CRLF and ARTO for Tehachapi Renewable Transmission Project, Southern California Edison, Los Angeles County, CA.

Relevant Experience

Mark Canfield is a wildlife biologist with the CH2M Hill Environmental and Nuclear Services Business Group in Santa Ana, California. Mr. Canfield has over 8 years of experience in research and monitoring of native southern California non-game animal species. Much of his work has been conservation driven, with emphasis on FESA listed herpetofauna and small mammals, and how the interface of anthropogenic activity and core habitat requirements affect these animal populations. Mr. Canfield is experienced in vertebrate inventory, population monitoring, and habitat assessment survey techniques, which include: visual surveys, plant surveys, small mammal trapping, turtle trapping, carnivore trapping, pitfall trapping, remote sensing (camera trap and YSI water quality sensors), radio-telemetry, environmental DNA (eDNA) survey, dip-net and seine surveys, exotic species removal, and translocation of FESA listed amphibian species. Mr. Canfield has worked extensively throughout California's diverse array of habitats within San Diego, Orange, Riverside, San Bernardino, Los Angeles, Ventura, and Santa Barbara Counties. He has worked on projects in collaboration with the U.S. Fish and Wildlife Service, California Department of Fish and Wildlife, National Forest Service, National Parks Service, State Parks, United States Marine Corps, United States Army, NGOs (zoos, conservation organizations), and multiple municipalities throughout the greater southern California metropolitan area.

Representative Projects

Market Segment Projects

Biologist; Pipeline Safety Enhancement Plan (PSEP); San Diego Gas and Electric/Sempra Energy Utilities/Southern California Gas Company; Southern California; (January 2015-Present). Mr. Canfield conducts pre-construction biological surveys for rare plants, special status wildlife, and nesting birds. In addition to biological surveys, he also serves as Environmental Monitor during construction activities, which require a full-time monitor on site (e.g. trenching), to ensure client compliance with local, state, and federal environmental permitting regulations.

Environmental Monitor; Tehachapi Renewable Transmission Project, Southern California Edison, Los Angeles County, CA (February to March 2015). Mr. Canfield was employed as Environmental Monitor to ensure client compliance with environmental permitting regulations.

Biologist; West of Devers Upgrade Project, Southern California Edison, Riverside County, CA (April 2015). Mr. Canfield conducted rare plant surveys as part of a pre-construction discovery and mapping survey crew within the alignment and designated buffer areas.

Mark Canfield

Experience Prior to CH2M HILL

Authorized Biologist; **Tehachapi Renewable Transmission Project, Southern California Edison, Los Angeles County, CA (2014), ECORP Consulting Inc.** - California red-legged frog (CRLF) and arroyo toad (ARTO). Mr. Canfield was one of the authorized biologists/handlers for CRLF and ARTO in project areas that fell within the seasonal restriction areas for these species. Other duties performed included monitoring of construction activity and updating biological resources within the project right-of-way.

Biologist; First Industrial Grove View, Perris, CA (2014), URS. Biological evaluation on proposed site of a 21 acre commercial complex. Mr. Canfield performed site biological assessments for common and special status plants and wildlife species. He also conducted protocol level burrowing owl habitat assessment and surveys following Riverside MSHCP protocol.

Biologist; **I-15/I-215 Interchange Improvement Project, Caltrans, Devore, CA, (2014), URS.** Mr. Canfield assisted in the installation of avian exclusion devices and monitored nesting bird activity on Project bridges. He also conducted nesting bird surveys for Project vegetation clearance along I-15 and performed construction monitoring/compliance supervision within ESAs. In addition, he performed small mammal trapping targeted to San Bernardino kangaroo rat (SBKR) for translocation out of project right-of-way.

Biologist; Palomar Street Improvement Project, City of Wildomar, Wildomar, CA (2014), URS. Preconstruction evaluation of Palomar Street widening Project. Mr. Canfield conducted USFWS protocol level presence/absence surveys for least Bell's vireo and yellow-billed cuckoo.

Biologist; SR-47 Schuyler Heim Bridge Replacement, Caltrans, Los Angeles, CA (2014). Biologist, URS. Mr. Canfield conducted peregrine falcon surveys for nesting activity on the Schuyler Heim and Badger Bridges as well as general bird species presence/absence observations.

Biologist; High Speed Rail Project, California High-Speed Rail (HSR) Authority, Los Angeles County, CA (2014), URS. Mr. Canfield conducted protocol rare plant surveys along the proposed Project route from Palmdale to Los Angeles in support of preparation of a Project Level EIR/EIS. Surveys conducted in linear transects within sections of proposed HSR corridor and the corresponding 1,000 foot buffer in the Palmdale, Lancaster, and Acton region.

Lead Biologist; Exotic Water Snake (Nerodia fasciata) Removal and Trap Efficacy Project. Ken Malloy-Harbor Regional Park: Machado Lake, Harbor City, CA (2010), USGS. Project conducted to assess the population status of introduced banded watersnakes (Nerodia fasciata) in Machado Lake, to test various methods of watersnake capture, and to reduce the snake population in the lake. Managed field operations and three person crew for 10 week aquatic trapping effort. Other responsibilities included coordinating with property owner, coordinating snake specimen chain of custody with Sacramento research institution, and on site public relations. Developed new method for trap configuration and placement in water at 3 m depth.

Biologist; Herpetofaunal Pitfall Survey, Marine Corps Base Camp Pendleton (MCBCP), San Diego County, CA (2009-2011), USGS. Project conducted for AC/S Environmental Security, Marine Corps Base Camp Pendleton, to assess wildfire impacts on herpetofaunal communities over a two year period. Handling/processing of all endemic, as well as exotic, herpetofauna with the exception of venomous snakes. Small mammals were also a significant part of this effort. Data QA/QC and summary reporting were regular activities throughout the project.

Biologist; MSCP Post Fire Recovery Herpetofaunal Pitfall Surveys, Santa Ysabel Open Space Preserve, San Diego County, CA (2009-2012), USGS. Post fire project to assess wildfire impact on herpetofaunal communities. Mr. Canfield processed all endemic, as well as exotic, herpetofauna and small mammals for physical character data.

Post Fire Recovery Herpetofaunal Pitfall Surveys, Palomar Mountain, San Diego County, CA (2009). Biologist. Post fire project to assess wildfire impact on herpetofaunal communities. Handling/processing of all endemic, as well as exotic, herpetofauna and small mammals

Selected Species Specific Experience

Arroyo Toad

Mr. Canfield has worked as an integral team member on two long-term arroyo toad projects investigating population ecology and habitat use. He has observed thousands of arroyo toads, across all life stages, in the wild. Mr. Canfield is experienced in tadpole identification, protocol-level physical character processing, tissue collection, PIT tagging, and radio telemetry methodology and tracking of this species.

Biologist; Marine Corps Base Camp Pendleton (MCBCP) Arroyo Toad (Anaxyrus californicus) Monitoring Project, San Diego County, CA (April-July 2009-2012), USGS. Long-term project conducted for AC/S Environmental Security, Marine Corps Base Camp Pendleton, to monitor arroyo toad populations within the Santa Margarita River, San Onofre Creek, and San Mateo Creek. Mr. Canfield conducted diurnal protocol surveys for the presence of eggs and tadpoles, in addition to protocol night surveys for juveniles and adults. Eggs and tadpoles were visually observed, juveniles and adults were processed (sexed, weighed, measured, photographed) and released. Habitat data was collected in the presence of eggs and/or tadpoles during daytime surveys. Observed >1000 tadpoles, 41 juveniles, 17 adults

Biologist; Arroyo Toad (Anaxyrus californicus) Upland Habitat Use on MCBCP Project, San Diego County, CA (weekly, 2011-2014), USGS. Long-term, ongoing project conducted for AC/S Environmental Security, Marine Corps Base Camp Pendleton, with the objective to determine habitat use and upland movement patterns in arroyo toad populations. Mr. Canfield conducted protocol night surveys within the Santa Margarita River, San Onofre Creek, and San Mateo Creek drainages to capture, process (sex, weigh, measure, and photograph), and fit adult toads with radio-transmitter belts. Radio-transmitter belted individuals were then tracked once per week, diurnally, and animal location, as well as habitat data, recorded. Once every six weeks, radio-transmitter belted individuals were tracked and retrieved from burrows during the night for animal welfare inspection. Mr. Canfield also conducted pitfall trapping to capture toads moving through the upland habitat between the months February-June, 2012-2014. Data collection and processing followed the night survey protocol, with radio-transmitter fitting and animal release. Toads too small for radio transmitters were toe-clipped according to location and released. All other non-toad animal captures were documented and animals released. Handled > 1300 adults over the course of the project. Observed >1000 tadpoles. Project Suspended in 2014 due to severe drought.

Biologist; Aquatic Vertebrate Surveys in Silverado Creek, Irvine Ranch Conservancy, Orange County, CA (Mar.-Jun 2012), USGS. Short-term project conducted for Irvine Ranch Conservancy to assess presence/absence of arroyo toad and western pond turtle in Silverado Creek. Mr. Canfield participated in several protocol surveys that utilized visual detection, dip nets, and seines for detection of arroyo toad and western pond turtle. Neither species was detected.

California Red Legged Frog

Mr. Canfield has participated in numerous California red-legged frog (Rana draytonii) surveys covering all life stages. He is experienced in egg mass identification and measurement, tadpole identification, protocol-level physical character processing (juveniles and adults), tissue collection, and PIT tagging.

Biologist; California Red-Legged Frog Genetics Project, Ventura and Santa Barbara Counties, CA (May, 2010), USGS. A project conducted in the spring of 2010 to determine genetic relationships of CRLF populations throughout the state. Mr. Canfield performed multiple, protocol, day and night surveys across Ventura and Santa Barbara counties. Adults were captured and processed (sexed, weighed, measured, swabbed, photographed, and toe clipped for tissue collection) and released. Handled 33 adults, observed >150 tadpoles.

Biologist; California Red-Legged Frog Egg Mass Surveys, East Las Virgenes Creek and San Francisquito Canyon, Ventura and Los Angeles Counties, CA (Jan.-Mar. 2009-2013), USGS. A long term project monitoring the California red-legged frog populations in East Las Virgenes Creek and San Francisquito Canyon. Mr. Canfield participated in protocol egg mass surveys during the months of February-March, 2009-2013, to determine CRLF breeding. Egg mass physical characteristics were measured and recorded, as well as microhabitat characteristics around the egg masses. Adults were captured and processed (sexed, weighed, measured, swabbed, photographed, and PIT tagged) when detected, and released. Handled 13 adults, observed >30 tadpoles, observed 47 egg masses

Biologist; California Red-Legged Frog Surveys, Aliso Canyon (Angeles National Forest, Los Angeles County, CA (2009-2013), USGS. Mr. Canfield performed protocol visual encounter, as well as dip net/hand capture surveys for CRLF in the greater Aliso Canyon drainage during Oct.-Dec., 2009. Egg mass surveys were conducted during subsequent years (Jan.-Mar. 2010-2013) to assess presence/absence, post Station Fire. Egg mass physical characteristics were measured and recorded, as well as microhabitat characteristics around the egg masses. Adults were captured and processed (sexed, weighed, measured, swabbed, photographed, and PIT tagged) when detected, and released. Handled 4 adults, observed 11 egg masses.

Sierra Madre Yellow-Legged Frog

Biologist; Sierra Madre Yellow-Legged Frog (Rana muscosa) Surveys, San Gabriel, San Bernardino, San Jacinto, and Palomar Mountains, CA (May-Oct., 2009-2013), USGS. Mr. Canfield was involved in numerous protocol surveys monitoring mountain yellow-legged frog populations within their remaining range. Surveys were visual detection/dip net capture. Adults were captured and processed (sexed, weighed, measured, swabbed, photographed, and PIT tagged) when detected, and released. Tadpoles were recorded when detected. Handled 53 adults, 72 juveniles, observed >1000 tadpoles, observed 3 egg masses.

Biologist; Sierra Madre Yellow-Legged Frog (Rana muscosa) Captive Juvenile Release, UCR James Reserve, San Jacinto Mountains, CA (April 2012), USGS. Mr. Canfield was involved in the release of captive bread mountain yellow-legged juvenile frogs and their subsequent tracking via radio-transmitter belts. Groups of 20 frogs were belted and released into three different sections of Indian Creek. Mr. Canfield then performed telemetry tracking of the frogs, twice a week, to determine frog movement. Mr. Canfield also performed welfare checks when capture was possible. All transmitters were removed over the course of weeks 3-6. Tadpoles from the previous year's tadpole release were detected by Mr. Canfield while tracking juvenile frogs. Handled 60 juveniles. Observed 8 tadpoles. All work performed was protocol directed.

Sierra Madre Yellow-Legged Frog (Rana muscosa) Translocation, San Gabriel Mountains, CA (Sep. 2013), USGS. Mr. Canfield participated in the translocation of approximately 60 juvenile mountain yellow-legged frogs from Devil's Canyon (Angeles National Forest) to another suitable canyon on the desert side of the San Gabriel Mountains. Handled 84 juveniles, observed > 200 tadpoles. All work performed was protocol directed.

Sierra Madre Yellow-Legged Frog (Rana muscosa) Discovery Surveys, San Bernardino Mountains, CA (June-August, 2013). Biologist. Mr. Canfield performed protocol diurnal visual surveys for detection of mountain yellow-legged frog in Burnt Canyon. No frogs were detected.

Western Pond Turtle

Biologist; Distribution and Abundance Assessment of the Western Pond Turtle (Actinemys marmorata) on Marine Corps Base Camp Pendleton (MCBCP), San Diego County, CA (2010-2011), USGS. Two year project throughout the coastal regions of Camp Pendleton. Performed turtle trapping using commercial hoop net traps baited with mackerel chunks or sardines. Turtles were processed and PIT tagged. Gravid females x-rayed. Exotic species removed from wild and given to local herpetological society for adoption.

Biologist; Distribution and Abundance Assessment of the Western Pond Turtle (Actinemys marmorata) in Orange and San Bernardino Counties, CA (2010), USGS. Turtle trapping effort to obtain tissue samples in support of genetic analysis of turtle distribution. Performed turtle trapping using commercial hoop net traps baited with mackerel chunks or sardines in Victorville area, Mojave River, Aliso Creek, Oso Creek, and San Juan Creek. Visual protocol surveys performed in Carbon, Tonner, Brea and Soquel Canyons.

Other Species Experience

Biologist; Desert Tortoise (Gopherus agassizii) Population Assessment, Monitoring, and Translocation Project, US Geological Survey, U. S. Army National Training Center, Fort Irwin, San Bernardino County, CA (June-July, 2011), USGS. Tortoise were tracked weekly using radio telemetry transmitters attached to the carapace, and assessed monthly for welfare (nasal swabs, blood). Daily data QA/QC and GIS mapping were performed to ensure permit compliance and to provide accurate tracking maps for subsequent telemetry work.

Biologist; Habitat Connectivity and Human Impacts on Puente Hills Bobcat (Lynx rufus) population, Puente Hills Habitat Preservation Authority, Puente Hills Preserve, CA (2012-2013), USGS. Three year project to develop models of wildlife movement and habitat connectivity within the Preserve. Mr. Canfield installed, monitored, and maintained 18 remote camera traps throughout Preserve. Live trapping of bobcats was conducted in late winter resulting in two successfully captured and collared bobcats. Project was postponed indefinitely due to litigation between Preserve and other land interests.

Biologist; Pacific Pocket Mouse (Perognathus longimembris pacificus) Monitoring Project, Marine Corps Base Camp Pendleton (MCBCP), San Diego County, CA (2010-2013), USGS. Assisted in trapping and processing of animals for population monitoring. Also performed installation, monitoring and maintenance of passive detection tracking tubes at sites throughout the base.

Biologist; Stephen's kangaroo rat (Dipodomys stephensi, SKR) Monitoring Project, Marine Corps Base Camp Pendleton (MCBCP), San Diego County, CA (2010-2013), USGS. Assisted in trapping and processing of SKR for population monitoring.

Mark Canfield

Biologist; Santa Ana Sucker (Catostomus santaanae) Big Tujunga Die-Off Surveys, Angeles National Forest, CA (2011), USGS. Performed seine survey in Big Tujunga Canyon in support of die-off investigation. Later assisted in tissue preparation and preservation for subsequent analysis.

Bioogist; Post Fire (Station Fire) Fish Survey, Angeles National Forest, CA (2009), USGS. Mr. Canfield conducted seine surveys for arroyo chub (Gila orcuttii), speckled dace (Rhinichthys osculus), Santa Ana sucker (Catostomus santaanae), and rainbow trout (Omnyrunkus mykiss) in creeks and rivers throughout fire-affected areas in support of post fire population assessment efforts.

Specialized Electronics and Computer Skills

Mr. Canfield has a broad range of experience in using and maintaining electronic equipment for field data collection and remote sensing. Additionally, he is proficient in SCE FRED, Microsoft Office Professional Suite, Adobe Professional Suite, ESRI ArcGIS Desktop 10.1, TOPO, Boxcar, HOBOware Pro, Ecowatch, and many other support software applications

Supplemental Information

Years Experience Prior to CH2M HILL: 8
CH2M HILL Hire Date: January 2015

Employment History

ECORP Consulting Inc., consulting biologist, September 2014-December 2014

URS Corporation, consulting biologist, June 2014-December2014

U. S. Geological Survey, Biologist, April 2009-April 2014

Stream Ecology and Assessment Laboratory, CSU Long Beach, Environmental Specialist/Taxonomist, September 2005-June 2008

Minh Dao
Wildlife Biologist

EDUCATION

- B.S., Conservation Biology/Applied Vertebrate Ecology, 2013, Humboldt State University, Arcata, CA 95521

PROFESSIONAL HISTORY

- **Biologist,** Garcia and Associates, Oceanside, CA, May 2015 – present
- **Associate Biologist,** Chambers Group Inc., San Diego, CA, April 2014 –present
- **Biological Intern,** URS Corporation, La Jolla, CA, July 2012 – February 2013
- **Bird-banding Assistant,** Redwood Sciences Laboratory, Arcata, CA, 2009-2011
- **Field Technician,** Oregon State University, Lassen National Forest, CA June 2010-August 2010
- **Field Technician,** Duke University, Blythe, CA, July 2013
- **Field Assistant,** Arizona Game and Fish, Seligman, AZ, April 2013

PROFESSIONAL PROFILE

Minh Dao is a biologist with over 5 years of experience working in California through various universities and consulting firms in the private sector. Her areas of expertise include identification of passerines by sight and sound, active nest surveys, biological construction monitoring, passerine and nocturnal raptor mist-netting, nocturnal raptor nest surveys, desert tortoise surveys, small mammal and mesocarnivore trapping and tracking, handling of venomous reptiles, vegetation and habitat mapping with ArcGIS, radio telemetry, implantation of PIT-tags, and camera trapping. Ms. Dao has worked in diverse array of Californian habitats, ranging from old growth redwood (*Sequoia sempervirens*) in northern California to creosote (*Larrea tridentata*) scrub in southeastern California. Ms. Dao has experience with energy projects, wildlife biology research and surveys, study design, report writing, and data management. Ms. Dao has assessed habitat viability and presence of several special status species including: California gnatcatcher, coastal cactus wren, western burrowing owl, southwestern willow flycatcher, arroyo toad, desert tortoise, Northern spotted owl, black-footed ferret, pine marten, and fisher.

SELECTED PROJECT EXPERIENCE

San Diego Gas and Electric AES (Advanced Energy Storage) Installation, Quest Diagnostics, San Juan Capistrano, 2014. Ms. Dao was the primary biological monitor on the project site. This project installed an AES (Advance Energy Storage) unit on the Quest Diagnostics facility. Completion of this project required habitat clearing and grading. Her responsibilities included conducting pre-construction surveys assessing the potential occurrence of California gnatcatcher, cactus wren, and arroyo toad, wildlife surveys, relocation of wildlife, compliance

with the NCCP, and writing environmental assessments for all new proposed workspaces. Ms. Dao communicated directly with the client (SDG&E) and construction crews to document and ensure minimal environmental impacts.

San Diego Gas and Electric TL6914 Wood to Steel, Alpine to Lakeside, San Diego County, California, 2014-2015. Ms. Dao worked as a general biologist on the Tie-line 6914 Wood to Steel Project which replaced wooden power poles with steel poles that spanned between two substations in Alpine and Lakeside. Ms. Dao's responsibilities included: maintaining compliance with the NCCP (Natural Community Conservation Planning), construction monitoring, general wildlife surveys, active nest surveys and monitoring, relocation of wildlife (e.g., reptiles and small mammals), evaluating present biological resources and documenting negative impacts, coordinating with SWPPP in case of spills, and environmental training. Ms. Dao also successfully located and monitored nesting California gnatcatchers on-site.

FiRM 2014 C73 Reconductor, Descanso, California, 2015. Ms. Dao worked as a general biologist on San Diego Gas and Electric's FiRM 2014 C73 Reconductor. The project upgraded wooden power poles to steel poles throughout Descanco. She provided biological monitoring and consulting services to ensure compliance with the NCCP and MBTA. Her duties also included general wildlife surveys, nest surveys and monitoring, and wildlife relocation.

San Diego Gas & Electric Sunrise Powerlink Project, San Diego and Imperial Counties, California, 2014-2015. Ms. Dao served as an on-call biologist, working sporadically on Sunrise Powerlink Project. Her duties included general wildlife surveys, active nest surveys, identification of sensitive flora and fauna, and biological report writing. Surveys were done on an on-call basis and determined the presence of active nests on transformers and along associated right of ways before any proposed work was conducted.

FiRM 2014 C220 Reconductor, Santa Ysabel, California, 2015. Ms. Dao worked as a general biologist on San Diego Gas and Electric's FiRM 2014 C220 Reconductor. The project upgraded wooden power poles to steel poles throughout Santa Ysabel in oak woodland habitat. She provided biological monitoring and consulting services to ensure compliance with the NCCP and MBTA. Her responsibilities included general wildlife surveys, nesting bird and raptor surveys, and wildlife relocation.

FiRM 2015 C273 Reconductor, Pamo Valley, California, 2015. Ms. Dao served as a general biologist in Pamo Valley. She assisted in writing a PSR (Preactivity Study Report), assessing various habitat types and quality within the proposed work area. Her responsibilities included identification of all present flora and fauna, citing the potential habitat for nesting tri-colored blackbird and western bluebird on-site.

Centinela Solar Project, Calexico, California, 2014-2015. Ms. Dao served as a general biologist assisting with the BBCS (Bird and Bat Conservation Strategy). Her duties included surveying the site for avian mortality associated with powerline strikes, nesting ravens and raptors within the transmission towers, and general avian surveys that detected the presence of southwestern willow flycatcher on-site.

BrightSource Energy Rio Mesa Solar Electric Generating Facility, Riverside County, California, 2012-2013. Ms. Dao worked as an assistant biologist and data manager during the pre-construction phase of the project. She participated in migratory bird point counts, bird transects, jurisdictional wetland delineations, and writing of the BTR (Biological Technical Report). Ms. Dao managed data collection during avian surveys, with duties such as oversight of sub-contractors, certification of ordered and complete data collection, and quality assessment and quality control of all data. Within the project site, there was potential for the occurrence of several special status species such as: desert tortoise, western burrowing owl, southwester willow flycatcher, Mojave fringe-toed lizard, and. western spadefoot toad.

Redwood Sciences Laboratory, Arcata, CA, 2009-2011. Ms. Dao participated in a long-term study on bird survivorship. Her responsibilities included: mist-netting and banding birds, with primary focus on passerines. She also participated in an owl mist-netting targeting local owls using species specific vocalizations (e.g., northern Saw-whet owl).

Green Diamond Resource Company, Korbel, CA, 2010. Ms. Dao participated in northern spotted owl (*Strix occidentalis caurina*) nest searches, following the USFWS protocol, where she assisted with playing calls and mousing owls in order to locate local breeding pairs within Green Diamond Resource Company's land.

Humboldt State University, Arcata, CA, 2011. Ms. Dao designed and conducted a study evaluating habitat use of Steller's jays within Arcata, CA. The study evaluated potential factors impacting presence of Steller's jays between different habitats types found within the small town of Arcata, CA. The results of this study were presented in a student poster session at the National Wildlife Society conference in Hawaii in 2011.

Gateway, Mojave, CA, 2013. Ms. Dao participated in a clearance survey for Desert tortoise (*Gopherus agassizii*) in the Antelope Valley near California City. Surveys were comprised of 3 or 4 person teams walking along transects, scanning for tortoise sign within a 5-meter radius of themselves.

Oregon State University, Lassen National Forest, CA 2010. Ms. Dao aided a Ph.D study in summer marten (*Martes americana*) movement ecology in Lassen National Forest. Her responsibilities included: triangulating animal locations using radio-telemetry, setup of titration lines consisting of track plates and camera traps, assisting in trapping and processing martens, and assessing vegetation and habitat types in marten rest areas.

Duke University, Blythe, CA, 2013. Ms. Dao aided a Ph.D study focused on factors affecting desert kit fox (*Vulpes macrotic arsipus*) den occupancy in Blythe, CA. She trapped and processed small mammals, primarily kangaroo rats (*Dipodomys* spp.) using Sherman traps. She also assisted in establishing and testing the project's spotlighting protocol.

Arizona Game and Fish, Seligman, AZ, 2013. Ms. Dao volunteered on an ongoing monitoring of the re-introduced black-footed ferret (*Mustela nigripes*) population in Aubrey Valley. Survey periods would run from dusk until dawn, spotlighting for ferrets and setting traps near the burrows of sighted individuals.

Plains Exploration and Production Company, Lompoc, CA, 2013. Ms. Dao assisted with the in field vegetation mapping of Sea-cliff buckwheat (*Erigonum parvifolium*), which provides critical habitat for the endangered El Segundo blue butterfly (*Euphilotes battoides allyni*), along the gas and oil pipelines near Vandenberg Air Force Base.

TRAINING AND WORKSHOPS

- Passerine and nocturnal raptor Banding, Redwood Sciences Lab, Arcata, CA, 2009-2011
- Small Mammal trapping
    - Microtus spp., Humboldt State University, Arcata, CA, 2010
    - Dipodomys spp., Duke University, Blythe, CA, 2013
- Mesocarnivore trapping
    - *Martes americana*, Oregon State University, Lassen National Forest, CA, 2010
    - *Mustela nigripes*, Arizona Game and Fish, Seligman, AR, 2013.
- Rattlesnake handling and reptile survey techniques, Humboldt State University, Black Rock Desert, NV, 2011.
- ArcGIS, Humboldt State University, 2012
- Wildlife Techniques, Humboldt State University, 2009-2012
    - PIT-tagging, radio-telemetry and triangulation, northern spotted owl surveys, culvert trapping, herptile survey techniques, and mammal tracking

PROFESSIONAL AFFILIATES

- The Wildlife Society (2009-present)
- Northcoast Chapter of the Wildlife Society (2009-2012)

Marcus Collado
Wildlife Biologist

EDUCATION

- B.S., Wildlife Ecology, concentration in Conservation Biology, University of Maine, Orono, ME, 2009

PROFESSIONAL HISTORY

- **Biologist,** Garcia and Associates, Oceanside, CA, May 2015 – present
- **Biologist,** Chambers Group Inc., October 2014 -present
- **Spotted Owl Biological Technician,** Mendocino Redwood Company, Ft Bragg, CA. February 2014– August 2014
- **Golden Eagle Biologist,** Wildlife Research Institute, San Diego, CA, September 2011 – December 2013
- **Spotted Owl Biological Technician,** Rocky Mountain Research Station-USFS, Cloudcroft, NM, May 2011 – August 2011
- **Biological Technician/Radar Technician**, WEST-Inc., Hammond, NY and Seligman, AZ, August – November 2009 and January- May 2011
- **Biological Technician,** USFWS Leslie Canyon/San Bernardino National Wildlife Refuge Complex, Douglas, AZ, Summer 2010
- **Apache Trout Biologist,** Arizona Department of Fish and Game, Pinetop, AZ, Fall 2009
- **Field Technician,** Auburn University, Auburn, AL, summer 2009
- **Lab Technician/Field Biologist,** Saros Lab, Climate Change Institute, UMaine, Orono, ME, Fall 2007 – Spring 2009
- **Field Biologist,** BioDiversity Research Institute, Rangeley Lakes, ME, summer 2007

PROFESSIONAL PROFILE

Marcus Collado is a biologist with over 8 years of experience at both federal and state agencies, non-profit research institutes, and several consulting firms in the private sector. His areas of expertise include songbird identification by sight and sound, nest and territory mapping, callback surveys for wetland avifauna and nocturnal raptors, helicopter surveys of raptor nests, handling venomous reptiles and implanting PIT-tags, conducting radio and satellite telemetry, use of ArcGIS for data analysis and creating maps, evaluating impacts to special status species and habitats, and conservation of amphibians and fish in desert ecosystems. Mr. Collado has experience with energy projects, avian biology research and surveys, study design, and report writing. He has participated in many aspects of focused fish and wildlife surveys and written sections of biological resources evaluations for environmental documents. Mr. Collado has conducted investigations of many sensitive or threatened and endangered species, including: least Bell's vireo, California gnatcatcher, southwestern willow flycatcher, yellow-billed cuckoo, peregrine falcon, golden eagle, Mexican spotted owl, western burrowing owl, Gila monster, flat-tailed horned lizard, Mojave fringe-toed lizard, Sonora mud turtle, Chiricahua leopard frog,

beautiful shiner, Yaqui catfish, Apache trout, Gila trout, Yaqui chub, and peninsular desert bighorn sheep.

SELECTED PROJECT EXPERIENCE

FiRM 2015 C222 Reconductor, Ramona, California, 2015-present. Mr. Collado serves as a biologist for environmental and biological compliance oversight for San Diego Gas and Electric's FiRM C222 Reconductor Project. The project involves the replacement of wooden poles with steel poles and conductor upgrades. Potential for special-status and listed species include rare plants, Coastal California Gnatcatcher, Burrowing Owl, arroyo toad, and nesting birds and raptors subject to the Migratory Bird Treaty Act. Mr. Collado conducts field surveys and construction monitoring to protect sensitive biological resources and ensure compliance.

San Diego Gas and Electric TL6914 Wood to Steel, Alpine to Lakeside, San Diego County, California, 2014-2015. Mr. Collado served as a general biologist for this project, performing various duties including nesting bird surveys, California gnatcatcher nest locating and monitoring, territory mapping, nest observation, snake and lizard relocation, planting cactus to increase nesting habitat for cactus wren, providing environmental training, documenting negative impacts to sensitive resources, monitoring construction crews, and advising crews on maintaining compliance during construction.

Centinela Solar Project, Calexico, California, 2014-2015. Mr. Collado worked as a field biologist to support several studies relating to the post-construction impacts of the Centinela Solar project and its associated distribution towers and substation. Duties included locating and monitoring nests of common ravens and assessing their impact in local flat-tailed horned lizard population, monitoring raptor nests, conducting bird-mortality surveys from line-strike along distribution lines, and leading field operations of the Drew Yard Substation road-improvement project, which required monitoring of active bird nests and modification of work activities.

San Diego Gas & Electric Sunrise Powerlink Project, San Diego and Imperial Counties, California, 2012-2015. Mr. Collado served as a biologist for several companies on this extensive project. During the pre-construction phase he helped locate and monitor raptor nests, focusing on golden eagles. Surveys involved ground observation, aerial flights via helicopter, installation of nest cameras to assess golden eagle behavior, and vehicle-based surveys. During construction he monitored nests and helped ensure that aircraft used during construction maintained proper buffers from raptor nests. In post-construction Mr. Collado has conducted various linestrike surveys, nest surveys and monitoring, and nesting songbird surveys.

Mendocino Redwood Company Northern Spotted Owl Monitoring Plan, Ft. Bragg, CA, 2014. Mr. Collado helped conduct population demographics surveys on private timberlands. Duties included callback surveys, mousing, nest location, capture and banding of new individuals, and documenting other notable species.

Tule Wind Energy Project, Iberdrola Renewables, San Diego County, California, 2011-2013. Mr. Collado served as a raptor biologist to help assess biological impacts from the construction of

windmills. Duties focused on golden eagles and peregrine falcons, and involved golden eagle nest locating, nest monitoring, golden eagle behavioral observations, nest camera installation, review of nest camera photos, and brief peninsular desert bighorn sheep surveys. Mr. Collado lead the nest camera study and sorted through hundreds of thousands of photos to write yearly reports documenting several golden eagle pairs and their nest habits and any changes associated with increased construction activity.

Ivanpah Solar Project, Mojave Desert, California, 2010, 2012. Mr. Collado reviewed biological assessments that focused on the Mojave desert tortoise and helped determine that the assessments were inadequate. Mr. Collado also surveyed for golden eagles near the project and captured and banded one eagle chick whose territory bordered the project area.

Gregory Canyon Landfill, Pala, California, 2012. Mr. Collado helped conduct raptor nest surveys to assess biological impacts form the possible construction of the landfill. He helped monitor golden eagles in the canyon and helped install nest cameras to determine eagle activity and which foods were brought back to the nest.

Boquillas Wind Project, Seligman, AZ 2011. Mr. Collado conducted surveys for Mexican spotted owls and golden eagles during the pre-construction phase. Surveys focused on behavioral observations of eagles and determining presence of other sensitive avifauna.

Biological Monitoring at Leslie Canyon/San Bernardino NWR in Douglas, AZ, 2010. Mr. Collado served as a field biologist to work with a wide variety of species, including many threatened and endangered species. Duties were many, but included bird banding, capture of Gila monsters and rattlesnakes, capture and raising of threatened Chiricahua leopard frogs and their subsequent release into new habitat, capture and propagation of endangered fish such as beautiful shiner and releasing them back into the wild, burrowing owl surveys, yellow-billed cuckoo surveys, riparian bird surveys, general herpetile surveys and capture, and invertebrate sampling.

Stone Church Wind Farm, Iberdrola Renewables, Hammond, NY, 2010, 2009. Mr. Collado served as a biological technician assessing the potential impacts of a wind farm on migrating birds and bats over the proposed project site. He operated a radar at night to study the number, density, direction, and height of migrating birds and bats. He also used night-vision goggles and an infrared spotlight to identify some species.

Auburn University Sensitive Species on State Lands Surveys, Alabama, 2009. Mr. Collado conducted surveys for birds, herpetiles, and plants on state lands as part of an effort to assess the occurrence of sensitive species across the state of Alabama. Mr. Collado was required to be knowledgeable of a wide variety of plants and animals, including the ability to identify over a hundred species of bird by sound alone.

Climate Change Research, Saros Lab at the Climate Change Institute, Orono, ME, 2007-2009. Mr. Collado helped in a wide array of tasks related to understanding climate change by studying diatoms. Tasked ranged from lab duties such as slide preparation, sample distillation, and

microscopic investigations to extensive field work to collect samples in alpine lakes in the Rocky Mountains.

Common Loon Demographics, Western Maine, 2007. As part of a project investigating heavy metal toxins in freshwater ecosystems, Mr. Collado helped conduct population monitoring of common loons in western Maine. By kayak and motorboat, loon territories were located and mapped, and duties required capture and banding. Tissue samples were also collected for toxin analysis.

PERMITS AND CERTIFICATES

- ATV Safety Course, Mendocino Redwood Company, 2014
- USFS Chainsaw Safety Course, 2015 and 2006
- CPR/First Aid 2014

TRAINING AND WORKSHOPS

- Advanced Bird Banding Workshop, Audubon Starr Ranch, Trabuco Canyon, CA, 2015
- Golden Eagle Advanced Aging Techniques, Wildlife Research Institute, 2011
- Aerial Survey Raptor Nest Identification, Wildlife Research Institute, 2011
- Spotted Owl Identification and Survey Techniques, RMRS-USFWS, 2011
- PIT-tag Insertion, USFWS, AZ, 2010
- Electrofishing Techniques, AZDFG, 2010
- Wildlife Field Survey Techniques, University of Maine, 2008

PROFESSIONAL AFFILIATES

- Society for Conservation Biology
- The Wildlife Society Student Chapter, University of Maine

Appendix E
Wildlife Observation Form

WILDLIFE OBSERVATION FORM

To Record Animals Found In Amended Carlsbad Energy Center Project (Amended CECP) Work Areas

To be filled out by personnel who find active nest sites, dens, and dead or injured wildlife, or other biological resources during daily construction activities.

Name of employee:

Date:

Location of observation:

Wildlife Species:

Condition of wildlife:

alive ☐ dead ☐

Possible cause of injury or death:

Where is the animal currently?

Is the resource in danger of project (or other) impacts?

Comments:

Please contact the Designated Biologist for questions and to report any wildlife, nest, or den in the project area that could be disturbed. The Designated Biologist will advise personnel on measures required by California Department of Fish and Wildlife (CDFW) and United States Fish and Wildlife Service (USFWS) to protect fish, wildlife and vegetation from construction impacts.

DESIGNATED BIOLOGIST:
Melissa Fowler; Melissa.Fowler@ch2m.com; Cell: (714) 768-1173; Office (714) 435-6262

COMPANY: CH2MHILL
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