



Environmental Protection Department
Operations and Regulatory Affairs Division

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Lawrence Livermore National Laboratory
Pre-project Rare Plant and Wildlife Surveys
For the Pit 7 Drainage Diversion and
Groundwater Extraction and Treatment
Facility

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Introduction

In January 2007, the Department of Energy (DOE) released the final *Environmental Assessment for the Proposed Environmental Remediation at the Lawrence Livermore National Laboratory (LLNL) Site 300 Pit 7 Complex*. At the same time, the Department of Toxic Substances Control (DTSC) released the final Negative Declaration and Initial Study covering the Pit 7 remediation. No substantial adverse effect on wildlife species of concern was anticipated from the project. However, it was proposed that wildlife surveys should be conducted prior to construction because species locations and breeding areas could potentially change by the time construction activities began. Although no known populations of rare or endangered/threatened plant species were known to occur within the project impact area at the time these documents were released, rare plants listed by the California Native Plant Society had been observed in the vicinity. As such, both DOE and DTSC proposed that plant surveys would be undertaken at the appropriate time of year to determine if rare plants would be impacted by project construction. This document provides the results of wildlife and rare plant surveys taken prior to the start of construction at the Pit 7 Complex.

Wildlife

Background: Federally- or State-listed or special concern wildlife species known to occur in the Pit 7 Complex area and previously identified in the Negative Declaration and Initial Study are noted as:

Western Burrowing Owl (*Athene cunicularia*)- Species of concern, Federal;
Species of special concern, State

American badger (*Taxidea taxus*)- LLNL-protected

California tiger salamander (*Ambystoma californiense*)- Threatened, Federal;
Species of special concern, State

Golden Eagle (*Aquila chrysaetos*)- Protected, Federal; Fully-protected & Species
of special concern, State

Ferruginous Hawk (*Buteo regalis*)- Species of concern, Federal; Species of
special concern, State

Loggerhead Shrike (*Lanius ludovicianus*)- Species of concern, Federal; Species
of special concern, State

San Joaquin coachwhip (*Masticophis flagellum*)- Species of concern, Federal;
Species of special concern, State

Coast horned lizard (*Phrynosoma coronatum frontale*)- Species of concern,
Federal; Species of special concern, State

Survey Results: The description and evaluation of potential impacts to these species included in the Negative Declaration and Initial Study were based on surveys in 1986 and 2002. Final pre-activity surveys for the presence of these species were completed on April 23, May 30, and June 4, 2007. Survey results are outlined below.

Western Burrowing Owl (*Athene cunicularia*) and American badger (*Taxidea taxus*)

No active burrowing owl nest sites or incidental use of the Pit 7 area was documented during pre-activity surveys. No direct or indirect (e.g., foraging dens) evidence of badgers was discovered. Therefore, no exclusion zones are currently in effect within the project area. Burrowing owl and American badger surveys will continue within the project area periodically during construction to ensure protection of any occupied burrows or dens. This is consistent with the Mitigation Monitoring and Reporting Plan (MMRP) for the Sitewide Environmental Impact Report/Environmental Impact Statement (EIR/EIS) (SCH 90030847, August 1992). Therefore, no separate mitigation measures or monitoring would be required to assure that no impact to these species occurs.

California tiger salamander (*Ambystoma californiense*)

No tiger salamanders or suitable aquatic habitat were detected in the Pit 7 Complex during the reconnaissance surveys. The project area does represent potential upland habitat for the salamander (Pit 7 Complex lies within 2 km of a known salamander breeding site).

Golden Eagle (*Aquila chrysaetos*), Ferruginous Hawk (*Buteo regalis*), and Loggerhead Shrike (*Lanius ludovicianus*)

No nest sites for raptor species were observed in the project area. No subsequent nesting activity is anticipated this year so no additional surveys will be performed. Only one subadult eagle was seen flying several kilometers south of the Pit 7 Complex during the pre-activity surveys.

San Joaquin coachwhip (*Masticophis flagellum*)

No coachwhips were sighted during the pre-activity surveys. Snake live-trapping surveys that are being conducted (a separate project from the Pit 7 Complex remediation) several kilometers to the south have collected no coachwhip specimens during 2007. Drought-like conditions and limited spring rainfall appear to have reduced the preybase in this area of Site 300, and likely apply to a reduction in potential coachwhip presence at the Pit 7 Complex also.

Coast horned lizard (*Phrynosoma coronatum frontale*)

No horned lizards were detected during the pre-activity surveys. Monitoring during the construction phases for coast horned lizards will continue.

Recommended Protection Measures: To minimize the potential for harm, harassment, or mortality of tiger salamanders, LLNL will implement the Terms and Conditions stipulated by the U.S. Fish and Wildlife Service in their July 12, 2007 Amendment to the Biological Opinion.

Rare Plants

Background: One federally endangered plant, and six other plant species included on the California Native Plant Society's Inventory (CNPS) of Rare and Endangered Plants of California occur at Site 300. These species are:

Large-flowered fiddleneck (*Amsinckia grandiflora*)- Endangered, Federal;
Endangered, State

Big tarplant (*Blepharizonia plumosa*)- CNPS List 1B

Round-leaved filaree (*Erodium macrophyllum*)- CNPS List 2

Diamond-petaled California poppy (*Eschscholzia rhombipetala*)- CNPS List 1B

California androsace (*Androsace elongata* subsp. *acuta*)- CNPS List 4

Gypsum-loving larkspur (*Delphinium gypsophilum* subsp. *gypsophilum*)-
CNPS List 4

Stinkbells (*Fritillaria agrestis*)- CNPS List 4

Survey Results: The description and evaluation of potential impacts to these species included in the Negative Declaration and Initial Study were based on surveys and mapping in 1986, 1991, 1996, 1997, and 2002. On April 6 and 27, 2007, pre-activity rare plant surveys were conducted within the boundaries of the Pit 7 Complex. A list of all plant species observed during these surveys is included in Table 1. No plants listed under the federal or California endangered species acts or the California Native Plant Protection Act were observed during these surveys. One species included in the California Native Plant Society's Inventory of Rare and Endangered Plants of California (CNPS 2001, CNPS 2007), California androsace (*Androsace elongata* subsp. *acuta*), was observed in three isolated locations on April 6, 2007 (Figure 1). California androsace is included on CNPS List 4. List 4 is a watch list of plants of limited distribution. These plants are not yet considered "rare", but the CNPS considers them uncommon enough to recommend regular monitoring (CNPS 2001). According to the CNPS Inventory, although very few List 4 plants are eligible for listing under the Native Plant Protection Act or the California Endangered Species Act, many are significant locally and CNPS recommends evaluation of List 4 plants in CEQA documents. California androsace was addressed in the Negative Declaration and Initial Study.

At the Pit 7 Complex, California androsace occurs in three small populations located on the hillside to the west. These three populations are all found only in north facing rock outcrops, as is common for this species. Thirty-seven additional small populations of California androsace were found at Site 300 during site wide rare plant surveys conducted in 2001 and 2002 (Preston 2002). These populations were found in lichen-covered banks and rock outcrops on north-facing slopes throughout the site. Although not protected by state or federal regulations, rock-outcrops are ecologically significant at Site 300 because they serve as refuges for many native wildlife species, and they frequently support a diverse community of native plant species.

Recommended Protection Measures: Potential threats to California androsace during construction include direct impacts during excavation, and impacts that could result from the introduction of weedy plants to the site during construction. Figure 1 shows the location of California androsace in relation to the planned excavation. No excavation is planned for the rock outcrop areas that support California androsace. There is a very small chance that construction near to California androsace populations will introduce seeds of weedy plant species to the site that would compete with California androsace, and as a result reduce its abundance at the site.

Although protection of California androsace is not a regulatory requirement, the following recommendations will reduce the potential for direct and indirect impacts to the California androsace and rock outcrop habitats.

- 1) Avoid excavation in California androsace populations. It is necessary to avoid rock outcrops as part of the engineering specifications for this project. As a result, this measure can be easily accommodated.
- 2) Mark *California androsace* populations with flagging and tape, and restrict access to these sites during construction.
- 3) Thoroughly rinse hydroseeding equipment prior to use at Pit 7 Complex.
- 4) Specify native plant mix designed for restoration and erosion control at Site 300 that will be used during hydroseeding.

References

CNPS. 2001. *Inventory of Rare and Endangered Plants of California* (sixth edition). Rare Plant Scientific Advisory Committee, David P. Tibor, Convening Editor. California Native Plant Society. Sacramento, CA. 388 pp.

CNPS. 2007. CNPS on-line Inventory of Rare and Endangered Plants. <http://cnps.web.aplus.net/cgi-bin/inv/inventory.cgi>. Accessed May 22, 2007.

Preston, R. 2002. Special-status plant species surveys and vegetation mapping at Lawrence Livermore National Laboratory. Jones & Stokes. Sacramento, CA. (J & S 02-136).

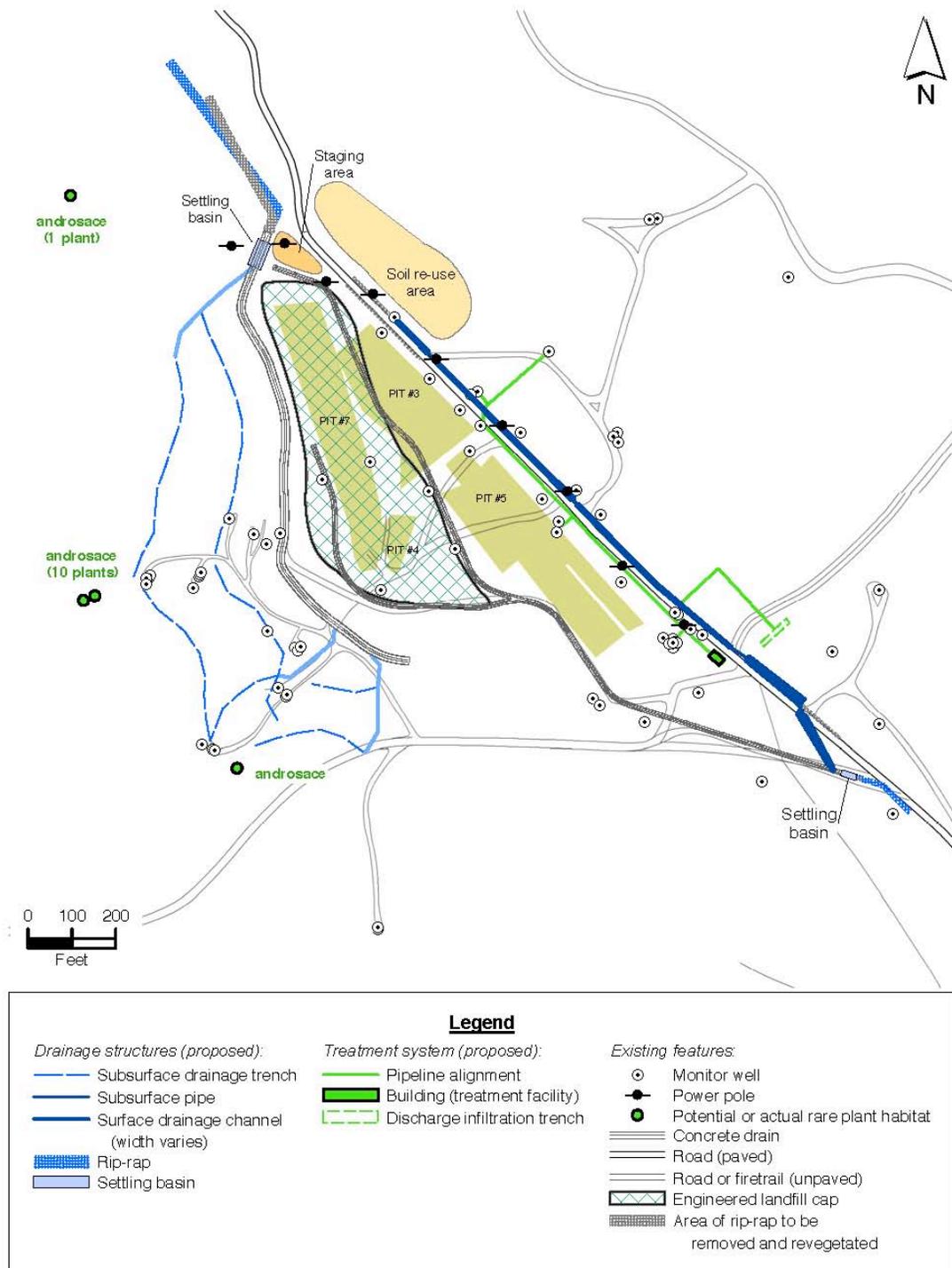


Figure 1. Current and proposed areas of ground disturbance at Pit 7 Complex showing rare plant survey.

Table 1. Species observed during rare plant surveys conducted on April 6 and 27, 2007 at the Pit 7 Complex at Lawrence Livermore National Laboratory, Site 300

Common Name	Scientific Name
Common yarrow	<i>Achillea millefolium</i>
Eastwood's fiddleneck	<i>Amsinckia eastwoodiae</i>
Tarweed fiddleneck	<i>Amsinckia lycopsoides</i>
Common fiddleneck	<i>Amsinckia menziesii</i> var. <i>intermedia</i>
Devil's lettuce	<i>Amsinckia tessellata</i> var. <i>tessellata</i>
California androsace	<i>Androsace elongata</i> subsp. <i>acuta</i>
Narrow-leaf milkweed	<i>Asclepias fascicularis</i>
Petty athysanus	<i>Athysanus pusillus</i>
Slender wild oat*	<i>Avena barbata</i>
Wild oat*	<i>Avena fatua</i>
Blow wives	<i>Achyrachaena mollis</i>
Ripgut brome*	<i>Bromus diandrus</i>
Soft chess brome*	<i>Bromus hordeaceus</i>
Red brome*	<i>Bromus madritensis</i>
Italian thistle*	<i>Carduus pycnocephalus</i>
Purple owl's-clover	<i>Castilleja exerta</i>
Soap plant	<i>Chlorogalum pmerideanum</i>
Clarkia	<i>Clarkia affinis</i>
Miner's lettuce	<i>Claytonia perfoliata</i>
Chinese houses	<i>Collinsia heterophylla</i>
Few-flowered blue-eyed Mary	<i>Collinsia sparsiflora</i>
Pygmyweed	<i>Crassula connata</i>
Pale western larkspur	<i>Delphinium hesperium</i> supsp. <i>pallescens</i>
Blue dicks	<i>Dichelostemma capitata</i>
Naked-stemmed buckwheat	<i>Eriogonum nudum</i>
Big heronbill*	<i>Erodium botrys</i>
Red-stemmed filaree*	<i>Erodium cicutarium</i>
California poppy	<i>Eschscholzia californica</i>
Narrow-leaved filago*	<i>Filago gallica</i>
Common bedstraw	<i>Gallium aparine</i>
Bird's-eye gilia	<i>Gilia tricolor</i>
Great Valley gumplant	<i>Grindelia camporum</i>
California matchweed	<i>Gutierrezia californica</i>
Common spikeweed	<i>Hemizonia pungens</i>
Mediterranean mustard*	<i>Hirschfeldia incana</i>
Foxtail barley*	<i>Hordeum murinum</i> subsp. <i>leporinum</i>
Rough cat's ear*	<i>Hypochaeris radicata</i>
Bristly junegrass	<i>Koeleria phleoides</i>
Common hareleaf	<i>Lagophylla ramosissima</i>
Small-rayed goldfields	<i>Lasthenia microglossa</i>
Shining peppergrass	<i>Lepidium nitidum</i>
Woodland star	<i>Lithophragma parviflorum</i> var. <i>parviflorum</i>

Table 1 (Continued).

Common Name	Scientific Name
Chile lotus	<i>Lotus wrangelianus</i>
Miniature lupine	<i>Lupinus bicolor</i>
Chick lupine	<i>Lupinus microcarpus</i>
Arroyo lupine	<i>Lupinus succulentus</i>
California manroot	<i>Marah fabaceus</i>
California bur-clover*	<i>Medicago polymorpha</i>
Cupped monolopia	<i>Monolopia major</i>
Nodding needlegrass	<i>Nassella cernua</i>
Soft popcorn flower	<i>Plagiobothrys canescens</i>
Annual coast plantain	<i>Plantago erecta</i>
Cream cups	<i>Platystemon californicus</i>
Long-spurred plectritis	<i>Plectritis ciliosa</i>
One-sided bluegrass	<i>Poa secunda</i>
Poison sanicle	<i>Sanicula bipinnata</i>
Arabian grass	<i>Schismus arabicus</i>
Common groundsel*	<i>Senecia vulgaris</i>
Common catchfly*	<i>Silene gallica</i>
Common chickweed	<i>Stellaria media</i>
Branched Indian clover	<i>Trifolium albopurpureum</i>
Pinpoint clover	<i>Trifolium gracilentum</i>
Tomcat clover	<i>Trifolium willdenovii</i>
Ithuriel's spear	<i>Triteleia laxa</i>
Dobie pod	<i>Tropidocarpum gracile</i>
Few-flowered fescue	<i>Vulpia microstachys</i>

*Introduced species