UCRL-AR-154174-REV-3

LAWRENCE LIVERMORE NATIONAL LABORATORY

SITE 300
EXPLOSIVE TEST FACILITY

PRESCRIBED BURN/SMOKE MANAGEMENT PLAN

Prepared By: **Wade A. Diebner**

U.S. Department of Energy

Lawrence
Livermore
National
Laboratory

Revised March 2006

This work was performed under the auspices of the U. S. Department of Energy by the University of California, Lawrence Livermore National Laboratory under Contract No. W-7405-Eng-48.

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Prepared By:
Wade Diebner
Battalion Chief
Lawrence Livermore National Laboratory

Approved By:
Randy Bradley
Fire Chief
Lawrence Livermore National Laboratory

Concurred By:
Jim Lane
Site 300 Manager
Lawrence Livermore National Laboratory Site 300

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PRESCRIBED BURN/SMOKE MANAGEMENT PLAN GOALS AND OBJECTIVES

- **Provide for the safety of employees, visitors, and neighbors during all phases of the wildland fire management process.**
- **Use prescribed fire and mechanically maintain and/or treat the Site's developed areas to reduce the threat of unwanted fire. Continue to maintain defensible space in accordance with WSS NFPA 299 "Protection of Life and Property from Wildfire" around all critical facilities at Site 300.**
- **Meet the San Joaquin Valley Air Pollution Control District's regulatory rules and policies as they pertain to prescribed burns and smoke management.**
- **Minimize the occurrences of fires that could leave the Site 300 boundaries and impact our neighbors.**
- **Manage and enhance plant biodiversity and wildlife habitat at Site 300 through the judicious use of prescribed fires.**
- **Conduct research on the effects of fire and the use of fire to enhance the habitat of the endangered large-flowered Fiddleneck and/or Tarplant.**
- **Provide a fire-safe barrier to prevent wildfires from entering Site 300.**
- **Preserve and extend the capability to safely test explosives while protecting the environment.**
- **Minimize the occurrence of unnaturally intense fires by reducing the amount of vegetation that can fuel larger, more catastrophic fires.**
- **Limit the extent of prescribed fires, which would reduce the air quality for our neighbors.**
- **Provide opportunities for public understanding of fire ecology principles, smoke management, and prescribed fire program objectives.**
- **Use minimum impact prescribed burns and fire suppression techniques, and rehabilitate disturbed areas to protect natural and cultural resources from adverse impacts attributable to fire suppression activities.**
- **Conduct all fire management activities commensurate with applicable laws, policies and regulations.**
- **Cooperate extensively with adjacent landowners to facilitate safe and prompt suppression of wildfires.**
- **Suppress all wildfires in accordance with recognized wildfire safety parameters to assure minimal impacts on the environment and cultural resources.**
- **Engender understanding among fire fighters about the impacts of fire suppression on sensitive resources. Cutting of all firebreaks, fuel reduction, and fire suppression will be done to minimize the impact on the ecosystem from soil erosion.**

DESCRIPTION OF SITE 300 BURN AREAS

Site 300 is located in the California Interior Coast Ranges, which is characterized by low rugged mountains and relatively narrow intervening valleys. It is situated 15 miles east of the Livermore Valley near the eastern edge of the Altamont Hills, close to the western boundary of San Joaquin County (Figure 1). Elevations range from 500 feet at the southern boundary to 1800 feet at the higher peaks in the northwestern areas. Site 300 covers approximately 7000 acres (about 11 square miles) of land in eastern Alameda County and western San Joaquin County. Site 300 was acquired in 1953; since then, all grazing and other agricultural activities have been terminated.

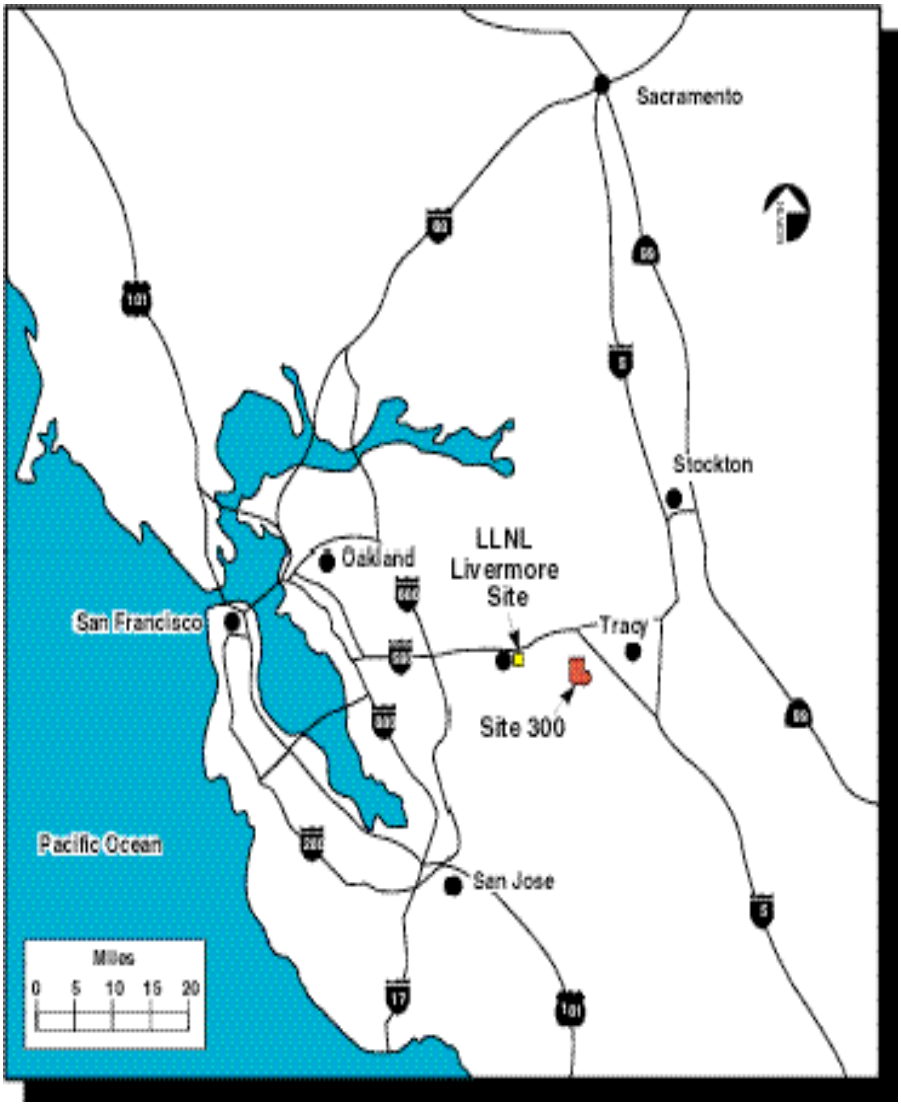

Figure 1. Location of Site 300

The 2,043-acre control burn area is divided into 24 plots ranging from less than 1 acre to 579 acres (see general map, Figure 2). A topographic map showing the specific burn areas is included herein as Appendix A. The fuel load within the control burn plots ranges between 0.74 and 1 ton per acre, depending on the grass height and distribution. Existing service roads, fire trails, and other barriers separate the plots. A combination of existing fire roads, temporary control lines, wet line firing methods, and other existing barriers isolate the plot perimeter boundaries.

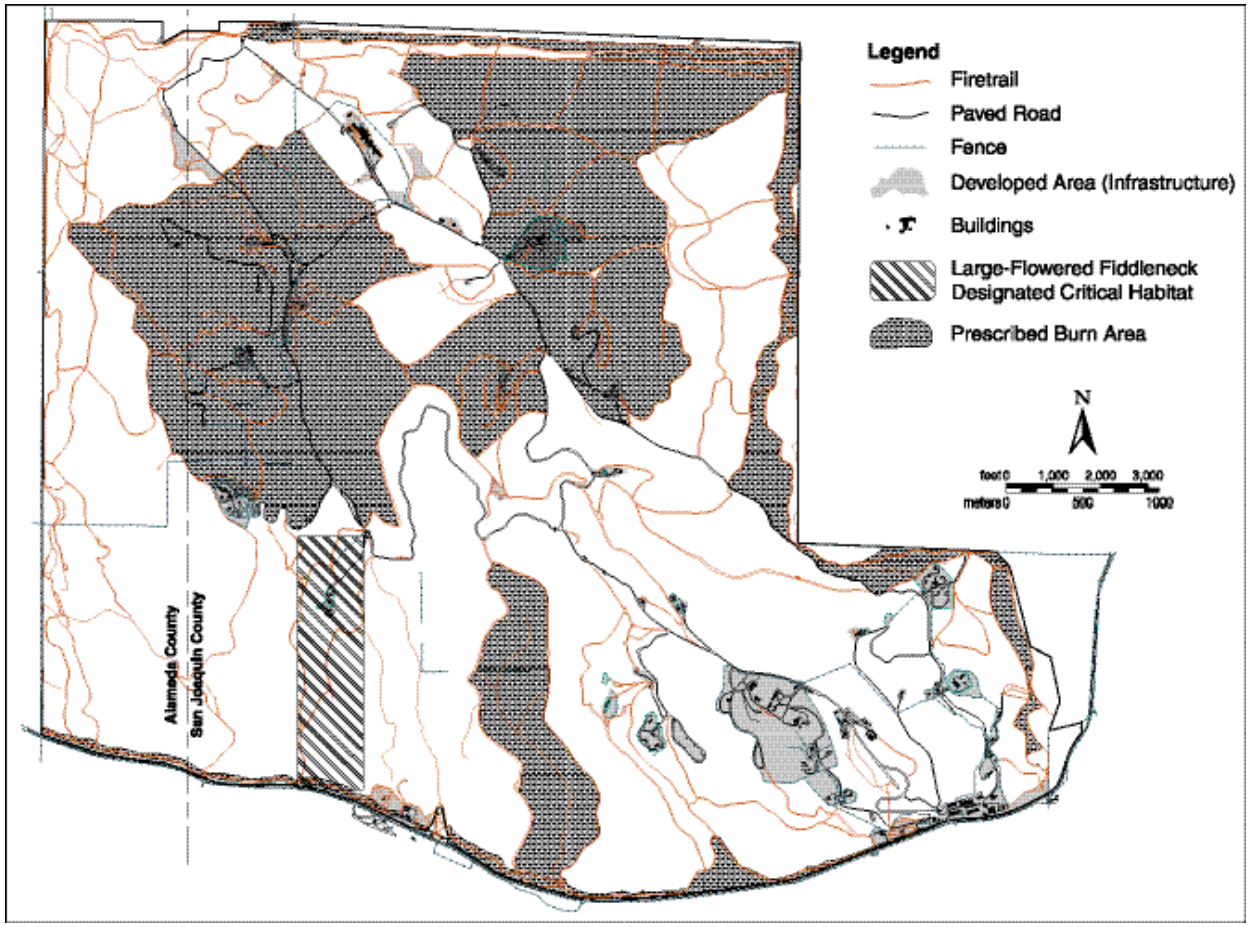

Figure 2. Annual Prescribed Burn – Site 300

Meteorology

Site 300's climate is normally characterized by mild, rainy winters and hot, dry summers. Sunshine is abundant throughout the year. It is officially classified as "Mediterranean Scrub Woodland" climate (DOE 1992). The mean annual temperature for the 30-year period, 1951 through 1980, was 14.5°C (58.1°F) with extremes ranging from –8°C (18°F) to 45°C (113°F). Almost all rainfall occurs between October and April. The average annual rainfall for the 38-year period (1959-1996) at LLNL Site 300 was 264 mm (10.4 in.).

LLNL's web-based weather pages provide access to local meteorological information and links to other weather-related sites. The Site 300 meteorological tower is located on a ridge near the center of the site. The base of the tower is about 1200 feet above MSL (mean sea level).

Land Use

The principal land use at Site 300 is research and development. The land use categories are determined by the predominant activity within an area. The majority of the area at Site 300 is undeveloped or buffers a test area and is available for development for experimentation and testing purposes. Facilities and land used for experimentation and testing are grouped together to form Activity Areas. These include the General Service Area (GSA), the manufacturing area (includes chemistry and process area), weapons test area and firing areas (east and west).

Many of the current uses represent facilities that have been physically separated because of the explosives safety stand off distances (arcs) required by the Department of Energy (DOE). Within these safety arcs, many experiments have continued with only minor modifications while intermittent explosive testing was conducted. This dual use of the area makes Site 300 both efficient and effective by accommodating multiple researchers in a location close to the Livermore Site.

Site 300 contains several habitat types and numerous special status species (e.g., threatened and endangered species, migratory birds, and rare plants) (see Table 1). Site 300 is home to the endangered large-flowered fiddleneck (*Amsinckia grandiflora*). The *Amsinckia grandiflora* Reserve was designated per a memorandum of agreement between DOE and the U.S. Fish and Wildlife Service, and consists of 160 acres of Site 300, which is not included in the annual routine prescribed burn. However, the 1997 *A. grandiflora* Recovery Plan (USFWS 1997) calls for research into the use of controlled burns as a tool for *A. grandiflora* recovery. These are small research burns conducted as part of the coordinated effort between DOE, University of California, and the U.S. Fish and Wildlife Service to enhance *Amsinckia* recovery.

Table 1. The Number of Special Status Species at Site 300 as of 2004

Taxa	Number of Special Status Species
Mammal	2
Herpetofauna	7
Avian	25
Invertebrate	2
Plants	8

The Alameda whipsnake (*Masticophis lateralis euryxanthus*), listed as a threatened species, is the focus of a six-year research project at Site 300. This research is part of a regional study, proposed by the U.S. Fish and Wildlife Service Recovery Branch/Program, to investigate effects of burns in chaparral habitats supporting the threatened Alameda whipsnake. The six-year study started in the spring 2002 with live-trapping efforts to collect baseline data information on the Alameda whipsnake and its habitat use on site. In the spring of 2003, a portion of the studied habitat was burned and has been subsequently monitored to determine Alameda whipsnake and vegetation responses to the fire.

Routine prescribed burning at Site 300 has resulted in the establishment and maintenance of large stands of native perennial grasslands. These grasslands have become increasingly rare throughout California, having been displaced by exotic annual grasses introduced from the Mediterranean area. Prescribed burns are an important component in managing these communities. In addition, a number of species considered rare by the California Native Plant Society (CNPS) occur in the areas undergoing prescribed burns and appear to benefit from the reduced competition afforded by the burns. In particular, the big tarplant *(Blepharizonia plumose),* a plant considered extremely rare by the CNPS, occurs in these areas. Fire appears to be an important component in the life history of this plant. The role of fire in maintaining and managing this and other rare species is being investigated.

ENVIRONMENTAL CONSIDERATIONS

LLNL environmental policy requires that all Laboratory operations be conducted in compliance with all applicable governmental regulations and DOE orders. A brief overview of the environmental considerations relating to existing land use are presented under the following topics.

Site 300 is inhabited by a diverse assemblage of flora and fauna. From its southern boundary within the Corral Hollow Creek floodplain, the property rises in a series of southeast-northwest trending ridges to nearly the northern perimeter. Several ephemeral streams flow through Site 300 during the wet winter months and discharge into Corral Hollow Creek at the southern boundary of the site. Most flow is direct run-off with a very small contribution from both intermittent and perennial springs.

Biota and Endangered Species

Less than 5% of Site 300′s 7000-acre property-area is developed. Developed areas with buildings are generally separated from wildland settings with high-security fences, and very few of these complexes provide habitat for native flora and fauna (Figure 2).

The primary vegetation types found at Site 300 are introduced grassland, native grassland, coastal sage scrub and oak woodlands. All of these habitats are believed to have evolved with fire (Menke 1992, Huenneke and Mooney 1989, Barbour and Major 1990). The introduced grassland community covers about 5,647 acres (2,288 hectares) with variously proportioned mixtures of introduced annual grasses; the most important species are slender wild oat, ripgut brome, soft cress and red brome.

The native perennial grassland community is dominated by pine (one-sided) bluegrass (*Poa secunda*) and purple needlegrass (*Nassella pulchra*) and covers about 723 acres (293 hectares). Stands of native grasslands are confined mainly to the northern half of

the facility. Occurrence of native grass-dominated vegetation appears to be associated with annual controlled burning. There is concern that the reduction in acreage burned at Site 300 in recent years may result in a contraction of the native grassland community at the facility.

The third major vegetation community, coastal sage scrub, occurs in the southwestern part of the site and covers approximately 108 acres (44 hectares). It contains a mixture of four shrubs: California sagebrush, California buckwheat, black sage and matchweed. The oak woodland community is restricted to the north-facing slopes in the southern canyons and covers approximately 150 acres (61 hectares). This community includes a sparse cover of blue oak with an understory predominantly of three exotic grasses: slender wild oat (*Avena barbata*), soft chess (*Bromus hordeaceus*), and ripgut brome (Bromus diandrus). Other less common vegetation types are wetlands associated with seeps and springs, seasonal pools, northern riparian woodland habitat and four localized upland plant communities.

Eight rare floral species occur at Site 300. The federally listed endangered large-flowered fiddleneck (*Amsinckia grandiflora*) occurs within the *Amsinckia grandiflora* reserve. The diamond-petaled poppy (*Eschscholzia rhombipetal*a, candidate) and big tar plant (*Blepharizonia plumosa*), both CNPS list 1B, have been found to occur at Site 300. Two small populations of the diamond-petaled poppy (from 30 to 300 plants) occur in the western portion of the site, within Draney Canyon, separated by about 3 km. Annual monitoring of this species is ongoing. The big tar plant is quite widespread throughout Site 300. Annual mapping of this species suggests the larger populations to be associated with the annual controlled burn, and this correlation will be studied during and after the 2006 burn of Area 4. The gypsum-loving larkspur (*Delphinium gypsophilum ssp. gypsophilum*, CNPS List 4) occurs in several localized areas at Site 300. The round-leaved filaree *(Erodium macrophyllum*), stinkbells *(Fritillaria agresits)*, and hogwallow starfish *(Hesperevax caulescens)*, all CNPS List 4, occur in several locations in the northern portion of the site. California androsace *(Androsace eleogata ssp acuta)*, the round-leaved filaree, and the gypsum-loving larkspur all occur within areas undergoing prescribed burns.

Isolated wetland habitats consist of northern riparian woodland, seasonal pools and herbaceous wetlands. The Federally threatened California red-legged frog (*Rana aurora draytonii*) occurs at Site 300 in association with some of the wetlands.

The blue elderberry bush (*Sambucus mexicana*) is present at numerous remote locations at Site 300; this plant species is known to be the host plant to the federally threatened valley elderberry long horn beetle (*Desmocerus californicus dimorphu*s). These beetles were discovered in the summer of 2002 in the eastern portion of the property and are suspected to occur elsewhere on site. The Alameda whipsnake is highly associated with coastal sage scrub habitat; the majority of suitable habitat is located in the southwestern quadrant of the site.

Air Quality

The San Joaquin Valley Air Pollution Control District (SJVAPCD) is currently designated as a serious non-attainment for particulate emission standards and as extreme non-attainment for ozone standards. The major air pollutant of concern from the fire is smoke. Other pollutants such as nitrogen oxides, volatile organic compounds and carbon monoxide are also produced from fire. The SJVAPCD is concerned that

prescribed burning is contributing to the non-attainment status for particulate emission. Smoke is made of a complex mixture of carbon, tars and liquids, and different gases. These smoke particles range in various sizes from less than 2.5 micrometers to 10 micrometers. The relative proportions in which each size particle is generated is often determined by the rate of energy release of the fire. High intensity fires tend to be bimodal with peaks near 0.3 micrometers and in excess of 10 micrometers. The smaller the smoke particle size, the greater the opportunity for health effects as the particle is breathed further into the lungs. Emission of smaller smoke particles occurs as a result of frequent and periodic burns.

The Site 300 annual prescribed burn is scheduled to occur when the grass is dry enough to sustain a burn, usually in the May-June timeframe. Because the amount of fuel consumed depends on the moisture content of the fuel, the timing of the burn also minimizes the amount of smoke released from the burn. These burns occur only during daylight hours and under authority of the air district. During the summer of 2005, the LLNL burns partially prevented the spread of a widespread grassland fire, believed to be started by an arsonist.

Environmental Impact of Prescribed Burns

Site 300 has been conducting prescribed burns throughout its history for wildfire control. According to the LLNL Environmental Impact Statement/Environmental Impact Report (1992 EIS/EIR), "LLNL Site 300 began a burning program in the northeastern half of the site in the 1950s and has continued the program annually since 1960" (DOE 1992). All areas of the site have been burned at least once since 1960. The southern half is more devoted to site operations.

National Environmental Policy Act

DOE's foundational vehicle for compliance with the National Environmental Policy Act (NEPA) at LLNL and Site 300 is the 2005 Final Site-wide Environmental Impact Statement for Continued Operation of Lawrence Livermore National Laboratory and Supplemental Stockpile Stewardship and management Programmatic Environmental Impact Statement. California Environmental Quality Act (CEQA) compliance is addressed by the 1992 EIS/EIR. These documents were prepared to analyze the impacts of the proposed action of continued operation of LLNL and Site 300.

Prescribed burning is discussed in these documents appropriate to the context, including safety, environmental impacts and wildfire prevention, Site 300 testing requirements and natural resource impact. NEPA reviews since 1992 occur through annual pre-burn meetings attended by LLNL's Environmental Evaluations Group (responsible for NEPA compliance) and preparation of formal evaluations as to the adequacy of the EIS/EIR documents if a given burn varies from impacts previously evaluated.

<u>Biota and Endangered Species</u>

Prescribed burning at Site 300 has had a net positive effect on vegetation communities. The 1992 EIS/EIR states the following regarding the environmental evaluation of burning done in the context of the Site-wide NEPA review:

> "Fire limits the development of coastal sage scrub vegetation on LLNL Site 300 to rocky sites and also influences the composition and distribution of native grasslands. Restriction of coastal sage scrub to rocky sites is associated with reduced dry grass fuel levels and increased patchiness of all fuels. Although vegetation in rocky areas

is subject to local fires, the rocks offer some protection and the vegetation may not be burned in every fire. Shrubs that would otherwise be eliminated then increase in importance. Native grassland communities on LLNL Site 300 occur almost exclusively in areas with annual controlled burning.

Remarkable little quantitative ecological literature exists on the role of fire in establishing and restoring native grassland communities in California (Heady 1977); however, both Barry (1972) and Heady (1972) indicate that frequent fire is required to establish and maintain grasslands dominated by native grasses in lowland California. This conclusion is borne out by grassland vegetation found at LLNL Site 300. Not all plant communities within the perimeter of annual controlled fire on Site 300 are native grass-dominated, but the lack of introduced grasses on some habitats strongly correlates with the pattern and frequency of fires (Taylor and Davilla, 1986).

A comprehensive inventory of native grasslands has not been conducted for California. Notably, Barry (1972) did not mention the presence of native grasslands in the vicinity of LLNL Site 300. An estimated 723 acres of native grassland communities occur on LLNL Site 300. Using the evaluation criteria established by Barry (1972), LLNL Site 300 could be judged one of the largest native grasslands of this kind currently known in California."

As previously discussed, the 1997 *Amsinckia grandiflora* Recovery Plan (USFWS 1997) calls for research into the use of fire to establish and maintain a more favorable habitat for *A. grandiflora*. Previous research at Site 300 on *A. grandiflora* has shown the native bunch grass habitat to provide a more favorable matrix for *A. grandiflora* (Carlsen et al. 2000). In addition, ongoing work at Site 300 on *B. plumosa* suggests that a complex interaction with fire is required to maintain the metapopulation structure of this species (Carlsen et al 2001).

Fire has been one of the primary forces that created and maintained biodiversity and specialized wildlife habitats throughout Central California (DOE 1992). Site 300 ecological communities have evolved in association with fires, and in fact, require fire for proper growth and health (DOE 1992). Just as many native plants exhibit adaptations that enable them to recover vigorously after a burn, endemic animal life history patterns also display strategies for taking advantage of and surviving periods of fire successfully (DOE 1992).

Historic patterns of local landscape fires created a mosaic of burned and unburned terrain. Fires in the Altamont Pass were frequent and driven by strong maritime winds originating from the San Francisco Bay. Heavy fuel accumulation in these predominately grassland ecosystems was unusual and rare (DOE 1992).

Native species, in general, exhibit specialized and adaptive lifestyles to survive the element of fire on the property. Many species cope with the adverse environmental conditions by retreating into their subterranean dens. Primary excavators (i.e., coyote [*Canis latrans*], American badgers [*Taxidea taxus*], ground squirrels [*Spermophilus beecheyi]*) or those species that inhabit the burrows of other excavators (i.e., California tiger salamanders [*Ambystoma californiense]*, California red-legged frog, San Joaquin whipsnake, and burrowing owls [*Athene cunicularia]*) escape the impacts of fire by sheltering themselves underground. Similarly, open habitat benefits the abundant bird-of-prey populations found at Site 300.

It is a misconception that many animals are killed by fire. Wildlife usually escapes by fleeing the area, hiding underground, or moving to adjacent unburned areas until the fire has passed. Both above- and below-ground surveys have been performed annually

during the past eight years immediately following the impacts of the prescribed burn. No mortality of any special-status species has been observed (J. Woollett pers. obs.). Landscape alteration appears to be the net primary effect of these burns, not wildlife mortality.

Air Quality and Best Available Control Measures

Prescribed fire conducted at Site 300 is considered a long-term asset to air quality as it reduces the potential for destructive wildfires. In addition, the fires remove potential airborne residues that accumulate such as pollen and other respirable matter.

Fire management practices conducted at Site 300 minimize the impact of smoke on air quality through the following Best Available Control Measures:

- Fires are only conducted on days approved for burning by the presiding air district.
- Fires are only conducted in daylight hours, at temperatures under 100 degrees Fahrenheit, and at average wind speeds not exceeding 20 mph during the burn.
- The vegetation is determined to be dry enough to sustain a complete burn.
- Fires are ignited by air district-approved methods.
- Fires are managed in strict adherence to a Smoke Management Plan approved by the air district.
- Smoke emission and behavior are visually monitored.
- Fires are not allowed to smolder after the area has been burned.

SCHEDULING

Proposed Ignition Dates: May 1 – August 1.

In an effort to minimize daily and cumulative air quality impact to the regional area, each burn occurring in San Joaquin County will be scheduled in coordination with the SJVAPCD; burns occurring in Alameda County will be scheduled with the Bay Area Air Quality Management District (BAAQMD). The project area is divided into plots to facilitate fire management and control (Appendix A). Under favorable conditions it is estimated that the entire project could be completed in ten (10) full days. However, due to weather conditions, burn day approval, acreage allocations, spare the air days, resource availability, staffing and DOE approval, the project usually takes longer and may be completed by burning over a series of days that may or may not be consecutive. Plots that are not burned during the same day will be treated as separate burns through the regulatory notification process.

All prescribed burns will be conducted only on burn days approved by the presiding air district and during favorable meteorological conditions.

MEDIA COORDINATION AND PUBLIC NOTIFICATION

The Public Affairs Office (PAO) at LLNL notifies neighbors and nearby residents of Site 300 of the intent to perform the annual burn project in advance of burn activities. This notification is conducted by mail and web using current contact information. LLNL points of contact are provided along with the PAO′s Environmental Community Relations (ECR) representative so individual questions/concerns can be addressed, e.g., specific timing for individual burn areas. In addition, the local media are notified (e.g., Tracy Press, Stockton Record, and Tri-Valley Herald) prior to the burn. The contact information telephone numbers allow for receiving and addressing complaints after the

burn. However, there have been few smoke-related complaints received during our recent burns.

The LLNL fire dispatcher will notify the following agencies/personnel on the morning of the burn:

- National Nuclear Security Administration, Livermore Site Office – (925) 424-6494
- SJVAPCD – (209) 557-6442
- BAAQMD – (415) 749-4979 (only on days of burns in Alameda County)
- California Department of Forestry, Emergency Communications Center – (408) 779-2121 (Ask the dispatcher to notify Castle Rock and Sunol stations)
- Alameda County Fire Department Station 8 – (925) 447-6611
- Site 300 /LLNL CAS operators – (925) 423-5222 and (925) 422-7222
- SRI – (925) 373-0185
- San Joaquin County Fire Dispatch – (209) 464-4648 (Ask the dispatcher to notify Tracy Fire Department)
- Site 300 Deputy Manager – (925) 423-5217
- LLNL PAO – (925) 423-3125
- Carnegie State Vehicular Recreation Area – 925-447-9027

Twin Valley fire departments, which include Livermore-Pleasanton, Alameda County, Camp Parks and San Ramon Valley Fire Departments, are notified using the mutual aid radio frequencies.

FIRE MANAGEMENT STRATEGIES

Prescribed burning is used as a measure to prevent fires from entering or leaving Site 300. The prescribed burn provides a firebreak, which a wildfire should not breach. Winds are usually out of the west. As such, fire activity will burn in an easterly direction to the fire trails and fire breaks on the east boundary.

Although not a credible event, a prescribed fire leaving Site 300 and entering a neighbors grazing land would be extinguished with the resources described herein. Lands that border Site 300 on the west, east and north are used for cattle grazing. These grasses are very similar to those found at Site 300 with the exception of the grass height. Grasses that have been grazed are usually less than 3 inches tall. In order for a wildfire to reach a populated area, a fire would have to burn unchecked for a distance of approximately nine miles, through the grazed grass, jump highway 580, jump two aqueducts, and burn through fields of irrigated crops before reaching the City of Tracy. The Site is bounded to the south by Corral Hollow Road and the Carnegie State Vehicular Recreation Area.

A full range of alternatives to burning has been considered. All of which modify approved land use, destroy wildlife habitat, create erosion or are unsafe. Those alternatives include:

- Grazing
- Sterilization
- Planting fire resistive non-native vegetation

- Disking
- Mowing.

The primary fire suppression responsibility for the area lies with the Lawrence Livermore National Laboratory, Emergency Management Division's Fire Department. Response is provided from both the LLNL fire stations. The fire department is supported by a strong secondary response by the City of Tracy and all the Alameda County fire departments and the California Division of Forestry. Mutual aid agreements between the LLNL Fire Department and the Alameda County fire departments and the California Department of Forestry have been in place since 1960. A Mutual Threat Zone Agreement is also in place with California Division of Forestry. This agreement provides aircraft, helicopters and air command aircraft in addition to their basic response.

SMOKE DISPERSAL MODEL

The National Atmospheric Release Advisory Center (NARAC) at LLNL conducted smoke dispersion simulation modeling to better understand the atmospheric dispersion of smoke from prescribed burns at Site 300, and to examine how smoke behavior might differ for different burns and burn-plot terrain. The report on the simulations is entitled "Smoke Dispersion Simulations for Prescribed Burns at Site 300, Lawrence Livermore National Laboratory," and was presented as an appendix in the 2003 "…Prescribed Burn/Smoke Management Plan." A summary of the report, "Smoke Dispersion Model Report Summary," was also presented as an appendix in the 2003 "…Prescribed Burn/Smoke Management Plan."

BURNING PRESCRIPTION, METEOROLOGICAL CONDITIONS, AND SMOKE MANAGEMENT

Weather Prescription

	Range	Optimum
Temperature	55-100	80
Relative Humidity %	20-75	35
Wind Speed	0-20	15
Wind Direction	All	NW

(For BAAQMD Only)

Fuel Moisture – 1 hour (%)	3-16	7
Minimum Forecasted Mixing Height (ft)	500	N/A

Fuel Type and Amount

The fuel loading for the project is ungrazed annual grassland estimated to be between 0.74 and 1 ton per acre.

Vegetation Type	% of Unit	Fuel Model Albini (1976)	Fuel Model NFDRS
Annual Grass	100%	1	A

Ignition Operations

At the beginning of each burn day, a small test ignition at the burn site will be conducted with a drip torch to observe ignition combustion rates and smoke behavior. Fire behavior and smoke conditions will be visually monitored to achieve compliance with the conditions set in the burn plan. All conditions, including the burn prescription, will be satisfied before the Incident Commander makes a decision to continue burning.

Ignition operations will be conducted using those set forth in the LLNL Fire Department Policies and Procedures, Tactical Plan number 1606. Strip firing, head firing and backing fire ignition patterns will be used to ignite the plot. Firing patterns and directions could change depending on safety, wind direction, other weather parameters, or smoke management concerns.

Duration of project ignition will last approximately 15 minutes to 2 hours for each plot. Combustion and burn-down time are minimal due to the light flashy fuels.

Smoke Management

Smoke volume from the project should not have a significant impact upon the surrounding communities. Due to the proximity of Corral Hollow Road, the burning of the southern most perimeter trail along Corral Hollow Road is expected to be burned during non-commute hours, between 9 AM and 2 PM. Winds from the north occasionally create decreased visibility hazards along Corral Hollow Road; these can be minimized by partial closures and postings on the road.

Smoke emission and behavior will be visually monitored on a continual basis. Any significant change in smoke emissions and/or column behavior will be reported to the Incident Commander. The Incident Commander will manage the project in a manner that will minimize impact to sensitive areas and the public. The project size, firing tactics and burn duration will be adjusted to meet these goals.

Smoke Intrusion Contingency Plan

This project will be conducted in a manner that will avoid smoke intrusion into any smoke sensitive area. In the event a smoke intrusion does occur in a smoke sensitive receptor, the following actions will be taken to reduce smoke production, if appropriate:

- Reduce the size of the burn plot by developing new control lines
- Suppress active fire
- Initiate mop-up operations
- Focus suppression and mop-up operations on areas of greater smoke production
- Contact the LLNL Public Information Officer
- Notify the affected populations.
- Resume burn, if favorable conditions return.

Personnel and Equipment Prescription

All burns will be conducted with personnel and equipment as set forth in the LLNL Fire Department Policies and Procedures Manual, Tactical Plan number 1606.

A minimum of ten (10) chief officers, captains and firefighters will be present at all burns.

Staffing

1	Incident Commander	Chief Officer
1	Safety Officer	Chief Officer or Captain
2	Division Officers	Captains or Acting Captains
2	Torch Company Officers	Captains or Acting Captains
2	Torch Persons	Firefighters
2	Observation Personnel	Firefighters

Equipment

1	Command Vehicle
4	Patrols/Engines

Monitoring and Evaluation Procedures

At 0645 hours the day of the burn, the Captain at Fire Station 2 will log onto the LLNL internal web page at www-metdat.llnl.gov/ and select reports by 15-minute readings to obtain the current weather at Site 300. Under the S-300 column, check the following:

- Wind Speed
- Wind Gust
- Wind Direction
- Air Temperature
- Dew Point
- Relative Humidity
- Under units and where appropriate, select mph and F^{o}.

Additional weather readings will be obtained at the site of the burn with portable instrumentation (Kestrel 4000). During the burn, on-site monitoring will be conducted and the Incident Commander will observe weather, smoke and fire behavior.

The day of the burn, the LLNL Fire Department Captain at Fire Station 2, will enter the following into the incident report for the controlled burn:

- Staffing and positions
- Duration of burn
- Plots burned
- Weather as captured at the start of the burn
- Total Acreage burned for the day.

Public and Personal Safety

All burn personnel will wear full standard wildland fire fighting and safety equipment at all times. All standard wildland fire fighter safety rules will be strictly enforced.

The Incident Commander will appoint a safety officer to oversee the entire operation.

Effective communications shall be maintained throughout the incident, especially between the Divisions and Torch Companies.

Escaped Fire Contingency Plan

All ignition operations will stop if spotting or slop-over occur. The Incident Commander will supervise initial attack.

The burn will be declared a wildfire if resources, not assigned to the burn, are requested and/or the resources on scene are unable to contain the escape.

Should the burn become a wildfire, the Incident Commander will make a declaration of escape. The Incident Commander will immediately notify LLNL Fire Department dispatch and request wildland alarms as specified in the Mutual Aid Plan.

All division supervisors will provide and ensure the safety of ALL personnel assigned to them prior to the escape. All personnel will be assigned holding or suppression duties.

Primary and secondary holding lines will be identified on each project map. Water sources (hydrants, drafting areas, etc.) will also be identified on the project map.

Briefing Guide and Go/No-Go Checklist

- ❑ SJVAPCD has declared it a burn day (for burns conducted in San Joaquin County).
- ❑ BAAQMD has declared it a burn day (for burns conducted in Alameda County).
- ❑ All required notifications have been made.
- ❑ Current and forecasted weather are favorable.
- ❑ All applicable burn prescriptions are met.
- ❑ All required fire apparatus and equipment is in position and working properly.
- ❑ All personnel required in burn plan are on site and fire ready.
- ❑ All personnel are briefed on burn plan objectives, strategy, and tactics.
- ❑ A safety briefing has been given to all participating personnel.
- ❑ A test fire will be conducted before initiating ignition operations.

Contact Information

Contact	Organization	Office Phone	24-Hour phone
Wade Diebner	LLNL Emergency Management	(925) 423-1811	(925) 596-1811
Duty Chief	LLNL Emergency Management	(925) 423-1810	(925) 422-7595 (Dispatcher)
Scott Wilson	LLNL Public Affairs Office	(925) 422-4736	(925) 784-3534
Karen Folks	Site 300 Environmental & Special Projects Manager	(925) 423-7191	(510) 581-5584
Jim Lane	Site 300 Manager	(925) 423-5217	(925) 443-0758

REFERENCES

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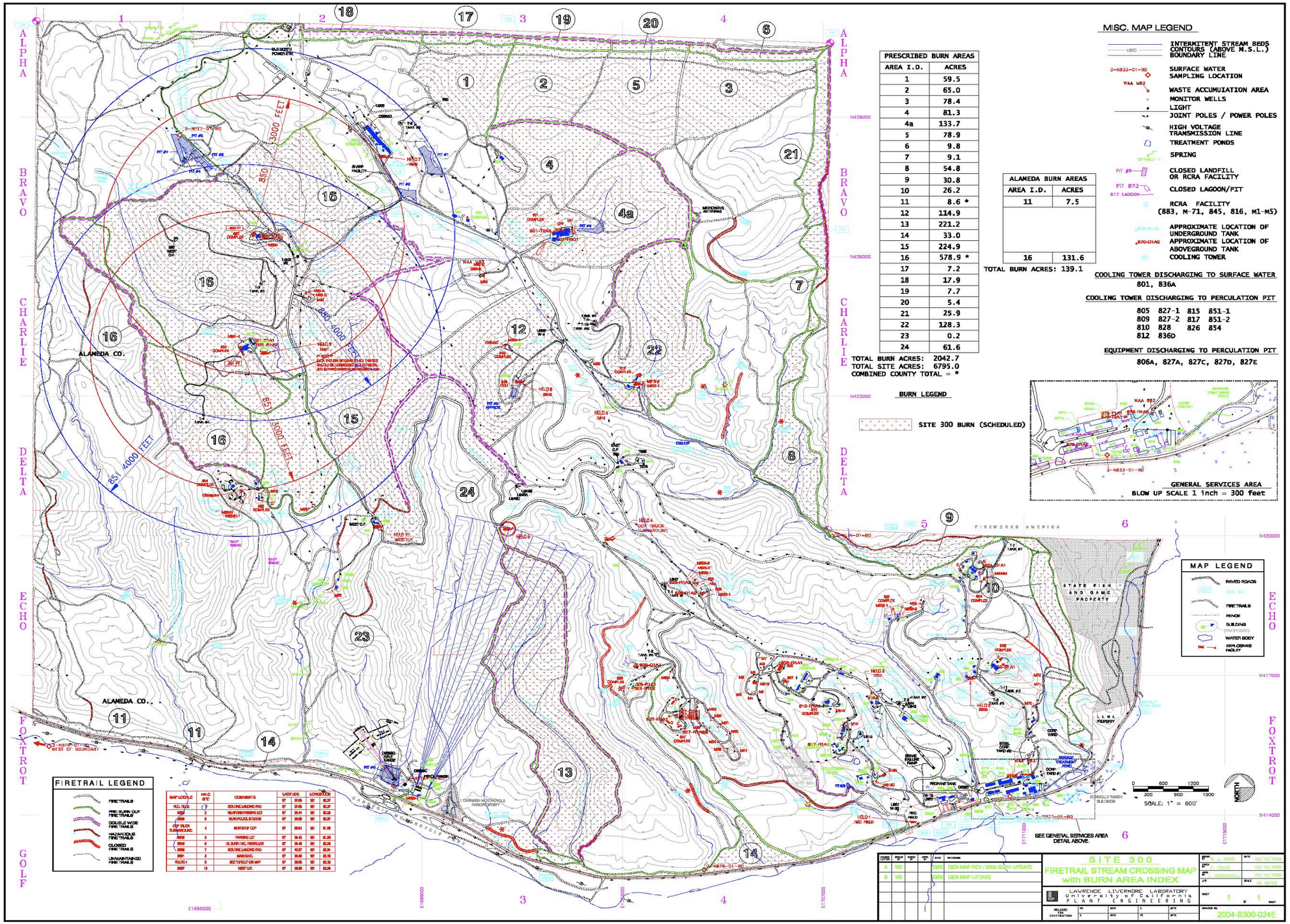
APPENDIX A

FIRETRAIL ACCESS MAP
WITH BURN AREA INDEX



PRESCRIBED BURN AREAS	
AREA I.D.	ACRES
1	59.5
2	65.0
3	78.4
4	81.3
4a	133.7
5	78.9
6	9.8
7	9.1
8	54.8
9	30.8
10	26.2
11	8.6 *
12	114.9
13	221.2
14	33.0
15	224.9
16	578.9 *
17	7.2
18	17.9
19	7.7
20	5.4
21	25.9
22	128.3
23	0.2
24	61.6

TOTAL BURN ACRES: 2042.7
TOTAL SITE ACRES: 6795.0
COMBINED COUNTY TOTAL = *

ALAMEDA BURN AREAS	
AREA I.D.	ACRES
11	7.5
16	131.6

TOTAL BURN ACRES: 139.1

BURN LEGEND

SITE 300 BURN (SCHEDULED)

MISC. MAP LEGEND

INTERMITTENT STREAM BEDS
CONTOURS (ABOVE M.S.L.)
BOUNDARY LINE
SURFACE WATER SAMPLING LOCATION
WASTE ACCUMULATION AREA
MONITOR WELLS
LIGHT
JOINT POLES / POWER POLES
HIGH VOLTAGE TRANSMISSION LINE
TREATMENT PONDS
SPRING
CLOSED LANDFILL OR RCRA FACILITY
CLOSED LAGOON/PIT
RCRA FACILITY (883, M-71, 845, 816, M1-M5)
APPROXIMATE LOCATION OF UNDERGROUND TANK
APPROXIMATE LOCATION OF ABOVEGROUND TANK
COOLING TOWER

COOLING TOWER DISCHARGING TO SURFACE WATER
801, 836A

COOLING TOWER DISCHARGING TO PERCULATION PIT
805 827-1 815 851-1
809 827-2 817 851-2
810 828 826 854
812 836D

EQUIPMENT DISCHARGING TO PERCULATION PIT
806A, 827A, 827C, 827D, 827E

GENERAL SERVICES AREA
BLOW UP SCALE 1 inch = 300 feet

University of California
Lawrence Livermore National Laboratory
Technical Information Department
Livermore, CA 94551