LAX MASTER PLAN

MITIGATION MONITORING AND REPORTING PROGRAM (MMRP)

2015 ANNUAL PROGRESS REPORT

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Los Angeles World Airports

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Prepared by

Los Angeles World Airports

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Nancy Price, LAWA

Tom Bradley International Terminal and the
LAX Federal Aviation Administration (FAA) Control Tower behind it

Disclaimer: LAWA obtained data from a variety of sources to generate this report. The reporting team did not have access to each individual primary document and thus was not able to verify all data sets fully against the source documents. Due to these limitations, it is possible that certain numbers may not be accurate.

LAX Master Plan MMRP 2015 Annual Progress Report

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Appendices:

A. LAX Master Plan MMRP as adopted December 2004 – Reference LAWA Website http://www.lawa.org/ourLAX/AnnualReports.aspx?id=8067 for a copy of the document

B. MMRP (CFTP, BWP, WAMA, and MSC-specific measures)

C. LAX El Segundo Blue Butterfly 2015 Report dated December 2015

D. Southern Tarplant Restoration Project Fifth Annual Monitoring Report dated October 2015

1.0 Introduction/Background

On December 7, 2004, the Los Angeles City Council certified the LAX Master Plan Final Environmental Impact Report (FEIR) and related entitlements for the future development of LAX, and adopted the LAX Master Plan Mitigation Monitoring and Reporting Program (MMRP).

Pursuant to Section 15097 of the California State CEQA Guidelines, the lead agency, Los Angeles World Airports (LAWA), is responsible for reporting, monitoring, and ensuring implementation of all applicable mitigation measures in accordance with the adopted MMRP. This document is the eleventh annual progress report for the LAX Master Plan MMRP. This report provides a status update on applicable mitigation activities, policies, and programs that have been and are being implemented by LAWA to ensure compliance with mitigation measures identified in the LAX Master Plan FEIR.

The MMRP (reference ***Appendix A***) documents all mitigation measures set forth in the LAX Master Plan FEIR as well as mitigation measures required in conjunction with environmental (i.e., CEQA) review of individual projects proposed under the Master Plan.

As a result, project-specific mitigation measures are included for the South Airfield Improvement Project (SAIP), Crossfield Taxiway Project (CFTP), Bradley West Project (BWP), West Aircraft Maintenance Area (WAMA), and the Midfield Satellite Concourse (MSC). The Los Angeles City Council approved the SAIP and certified its FEIR on January 11, 2006, the CFTP and its FEIR on February 9, 2009, the BWP and its FEIR on October 14, 2009, the WAMA and its FEIR on April 1, 2014, and the MSC and its FEIR on July 21, 2014. The Board of Airport Commissioners and the Los Angeles City Council adopted MMRPs for the SAIP, CFTP, BWP, WAMA, and MSC to mitigate or avoid potentially significant effects on the environment during construction of these projects.

The primary purpose of this report is to document and report on the status of the current and recently completed mitigation measures set forth in the LAX Master Plan MMRP. This report covers the period January 1, 2015 through December 31, 2015.

2.0 Noise

2.0.A N-1 Maintenance of Applicable Elements of Existing Aircraft Noise Abatement Program (ANAP)

The LAX Master Plan MMRP states:

*"**Maintenance of Applicable Elements of Existing Aircraft Noise Abatement Program**. All components of the current airport noise abatement program that pertain to aircraft noise will be maintained."*

The existing Aircraft Noise Abatement Program (ANAP) at LAX currently is maintained by LAWA's Noise Management Section (NMS). The existing ANAP at LAX sets forth LAWA's noise abatement procedures for aircraft traffic, flight, and runway use. All aircraft operations at LAX must comply with FAA regulations and procedures for noise abatement and noise emission standards and with all rules, policies, procedures, resolutions, and ordinances established by the State of California, City of Los Angeles, LAWA, and LAWA's Board of Airport Commissioners relative to noise abatement. LAWA's NMS will continue to maintain the ANAP throughout implementation of the LAX Master Plan projects. Actions indicating compliance include submission of the Quarterly Report per the 2011 Noise Variance (Variance), currently in effect, to the County of Los Angeles. Included in each quarterly report is a short summary of actions indicating compliance with each condition of the variance, including "continue, in full force and effect, the implementation and enforcement of the…. noise abatement policies to the extent of its authority."

Status→ Existing Policy:
LAWA complied with this commitment in 2015 by maintaining the existing Aircraft Noise Abatement Program (ANAP) at LAX, as well as submitting the summary report with each Quarterly Report to the County of Los Angeles, per the Variance requirement.

2.0.B MM-N-4 Update the Aircraft Noise Abatement Program Elements as applicable to adapt to the future Airfield configuration

The LAX Master Plan MMRP states:

*"**Update the Aircraft Noise Abatement Program Elements as applicable to adapt to the future Airfield configuration.** When existing runways are relocated or reconstructed as part of the Master Plan, the aircraft noise abatement actions associated with those runways shall be modified and re-established as appropriate to assure continuation of the intent of the existing program."*

Status→ No action required at this time:
No existing runways were relocated or reconstructed as part of the Master Plan, therefore no changes to the ANAP were required by this mitigation measure during the 2015 reporting period.

2.0.C MM-N-5 Conduct Part 161 Study to Make Over-Ocean Procedures Mandatory

The LAX Master Plan MMRP states:

*"**Conduct Part 161 Study to Make Over-Ocean Procedures Mandatory.** A 14 CFR Part 161 Study shall be initiated to seek federal approval of a locally-imposed Noise and Access Restriction on departures to the east during Over-Ocean Operations, or when Westerly Operations remain in effect during the Over-Ocean Operations time period."*

The Part 161 Study is a technical and legal study regarding implementation of a Noise and Access Restriction. The proposed restriction included departures between the hours of midnight and 6:30 a.m. over the communities to the east of LAX, when LAX is operating in either over-ocean operations or remains in westerly operations, and excluding times when LAX operates in easterly operations (49 U.S.C. Section 47521 et seq.). The Part 161 Study must meet the relevant requirements of the Airport Noise and Capacity Act of 1990 (ANCA) and the Part 161 regulations (14 C.F.R. Part 161).

Status→ Completed:
The Part 161 Study process encompassed three general elements including: (1) data collection and analysis to justify the LAX Proposed Restriction; (2) evaluation and explanation of the legal, environmental, and economic impacts of the proposed restriction; and (3) preparation and submittal to the FAA of the required reports and application materials. LAWA began the Part 161 Study in June 2005.

The Part 161 Study Process was completed in 2014 when FAA issued a formal rejection of the application. All materials related to this application and study, and all formal communications with LAWA and FAA may be found at *http://www.lawa.org/LAXPart161.aspx?id=7203*

2.0.D. MM-N-7 Construction Noise Control Plan

The LAX Master Plan MMRP states:

*"**Construction Noise Control Plan.** A Construction Noise Control Plan will be prepared to provide feasible measures to reduce significant noise impacts throughout the construction period for all projects near noise sensitive uses. For example, noise control devices shall be used and maintained, such as equipment mufflers, enclosures, and barriers. Natural and artificial barriers such as ground elevation changes and existing buildings may be used to shield construction noise."*

BWP Status→ Completed

WAMA Status→ Ongoing:
No construction occurred within 600 feet of any noise-sensitive uses during the 2015 reporting period. Therefore, a construction noise control plan was not required in the 2015 reporting period.

2.0.E. MM-N-8 Construction Staging

The LAX Master Plan MMRP states:

*"**Construction Staging.** Construction operations shall be staged as far from noise-sensitive uses as feasible."*

BWP Status→ Completed

WAMA Status→ Ongoing:
Staging for the WAMA project (including both the WAMA and Qantas hangar components) is located in an existing LAX construction-staging area near the southwest corner of the airport, south of World Way West and east of Pershing Drive. This area is located away from noise-sensitive uses and has been used for construction staging for many years.

2.0.F. MM-N-9 Equipment Replacement

The LAX Master Plan MMRP states:

*"**Equipment Replacement.** Noisy equipment shall be replaced with quieter equipment (for example, rubber tired equipment rather than track equipment) when technically and economically feasible."*

BWP Status→ Completed

WAMA Status → Ongoing:
Noisy equipment has been replaced with quieter equipment (for example, rubber tired equipment rather than track equipment) when technically and economically feasible. Some construction equipment, such as dump trucks and front loaders, is rubber-tired. Other equipment, such as dozers and excavators, is required to be tracked equipment due to site requirements and to ensure safety. Construction equipment is well-maintained, which reduces noise.

2.0.G. MM-N-10 Construction Scheduling

The LAX Master Plan MMRP states:

*"**Construction Scheduling.** The timing and/or sequence of the noisiest on-site construction activities shall avoid sensitive times of the day, as feasible (9 p.m. to 7 a.m. Monday-Friday; 8 p.m. to 6 a.m. Saturday; anytime on Sunday or Holidays)."*

BWP Status→ Completed

WAMA Status→ Ongoing:
The timing and/or sequence of the noisiest on-site construction activities avoided sensitive times of the day when feasible. The majority of construction activities occurred outside of sensitive times of day. Limited construction activity occurred periodically on

weekends and during nighttime hours in the 2015 reporting period. In particular, construction activity related to the taxiway was conducted at night to minimize disruption to aircraft activity. The construction occurred far from residents and was not disruptive to communities. No noise complaints were received. There were no noisy activities, such as pile driving or jack hammering, during weekend or nighttime hours.

2.0.H. MM-N-11 Automated People Mover (APM) Noise Assessment and Control

The LAX Master Plan MMRP states in part:

*"**Automated People Mover (APM) Noise Assessment and Control Plan.** In conjunction with detailed design and engineering of the proposed APM systems, a noise control plan shall be prepared specifying noise attenuation measures to reduce APM noise levels at the two significantly impacted hotels to acceptable level (i.e. less than 67 dBA [A-weighted decibels] Community Noise Equivalency Level [CNEL] for the Courtyard by Marriott and the Four Points Sheraton)."*

Status→ No action required at this time:
This measure was not applicable during the 2015 reporting period because LAWA had not entered into the engineering or design phases of the APM Project.

3.0 Land Use

3.0.A LU-1 Incorporation of City of Los Angeles Ordinance No. 159,526 (Q) Zoning Conditions for LAX Northside into the LAX Northside/Westchester Southside Project

The LAX Master Plan MMRP states in part:

*"**Incorporation of City of Los Angeles Ordinance No. 159,526 (Q) Zoning Conditions for LAX Northside into the LAX Northside/Westchester Southside Project.** To the maximum extent feasible, all [Q] Conditions (Qualifications of Approval) from City of Los Angeles Ordinance No. 159,526 that address the Northside project area will be incorporated by LAWA into a new LAX Zone/LAX Specific Plan for the LAX Northside/Westchester Southside project."*

Status→ In Progress:
The LAX Specific Plan, adopted by the City Council in December, 2004, established the LAX Northside as a distinct land use designation and added the LAX-N Zone to the Los Angeles Municipal Code. The LAX Northside Plan Update established new regulations and permits future development in the approximately 340 acre site. The Project has been reviewed and approved by the Los Angeles Board of Airport Commissioners, the City Planning Commission, the City Council's Planning and Land Use Management Committee, and the Los Angeles County Airport Land Use Commission. The Project will also be reviewed by the FAA, as needed in the future. The entitlements associated with the Project include, among other things, an amendment to the LAX Specific Plan, Vesting Tentative Tract Map No. 72148, and grading/building permits. As part of the

Project, a Final EIR was released in December 2014 and adopted by the Board of Airport Commissioners. Subsequently, an Addendum to the previously certified Final EIR was prepared in 2015 and was scheduled for adoption by the Board of Airport Commissioners in the first quarter of 2016.

3.0.B LU-2 Establishment of a Landscape Maintenance Program for Parcels Acquired due to Airport Expansion

The LAX Master Plan MMRP states:

*"**Establishment of a Landscape Maintenance Program for Parcels Acquired due to Airport Expansion.** Land acquired and cleared for airport development will be fenced, landscaped, and maintained regularly until the properties are actually developed for airport purposes."*

Status→ Plan Established, Implementation Ongoing:
LAWA completed the LAX Street Frontage and Landscape Development Plan (LDP) was completed in March 2005. It addresses landscaping requirements for parcels acquired under the LAX Master Plan. This measure was not applicable during the 2015 reporting period as LAWA did not acquire any Alternative D parcels in 2015.

3.0.C LU-4 Neighborhood Compatibility Program

The LAX Master Plan MMRP states in part:

*"**Neighborhood Compatibility Program.** Ongoing coordination and planning will be undertaken by LAWA to ensure that the airport is as compatible as possible with surrounding properties and neighborhoods."*

Status→ Ongoing:
LAWA consults with neighboring communities on all projects (including LAX Master Plan projects) subject to the LAX Plan Compliance Review (LAX Specific Plan Section 7). The LAX Plan Compliance Review process includes community input before approval. Conditions of development along the northern and southern boundaries of the airport property include, but are not limited to, setbacks, buffer zones and landscaping.

3.0.D LU-5 Comply with City of Los Angeles Transportation Element Bicycle Plan

The LAX Master Plan MMRP states in part:

*"**Comply with City of Los Angeles Transportation Element Bicycle Plan.** LAWA will comply with bicycle policies and plans in the vicinity of LAX, most notably those outlined in the City of Los Angeles Transportation Element Bicycle Plan and the General Plan Framework, including Pershing Drive, Sepulveda Boulevard, and Aviation Boulevard."*

Status→ Ongoing:
The City of Los Angeles approved the 2010 Bicycle Master Plan (independent of LAWA) in March 2011. The Plan includes streets that are expected to have bike routes and bike lanes in the future. LAWA used the information in the Los Angeles Bicycle Master Plan when considering off-airport mitigations for the Specific Plan Amendment Study. LAWA is in compliance with the Plan. The Bicycle Plan was incorporated into the Mobility Plan 2035 and is no longer a stand-alone plan.

3.0.E MM-LU-1 Implement Revised Aircraft Noise Mitigation Program

The LAX Master Plan MMRP states:

*"**Implement Revised Aircraft Noise Mitigation Program.** LAWA shall expand and revise the existing Aircraft Noise Mitigation Program (ANMP) in coordination with affected neighboring jurisdictions, the State, and the FAA. The expanded Program shall mitigate land uses that would be rendered incompatible by noise impacts associated with implementation of the LAX Master Plan, unless such uses are subject to an existing avigation easement and have been provided with noise mitigation funds. LAWA shall accelerate the ANMP's timetable for achieving full compatibility of all land uses within the existing noise impact area pursuant to the requirements of the California Airport Noise Standards (California Code of Regulations, Title 21, Subchapter 6) and current Noise Variance. With the exception of a possible new interior noise level standard for schools to be established through the study required by Mitigation Measure MM-LU-3, Conduct Study of the Relationship Between Aircraft Noise Levels and the Ability of Children to Learn, the relevant performance standard to achieve compatibility for land uses that are incompatible due to aircraft noise (i.e., residences, schools, hospitals and churches) is adequate acoustic performance (sound insulation) to ensure an interior noise level of 45 CNEL or less. As an alternative to sound insulation, incompatible property may also achieve compatibility if the incompatible use is converted to a noise-compatible use.*

LAWA shall revise the ANMP to incorporate new, or expand existing measures, including, but not necessarily limited to, the following:

- *Continued implementation of successful programs to convert existing incompatible land uses to compatible land uses through sound insulation of structures and the acquisition and conversion of incompatible land use to compatible land use.*

- *Ongoing monitoring and provision of annual updates in support of the requirements of the current Variance pursuant to the California Airport Noise Standards, with the updates made available (upon request) to affected local jurisdictions, the Airport Land Use Commission of Los Angeles County, and other interested parties.*

- *Continue the current pre- and post-insulation noise monitoring to ensure achievement of interior noise levels at or below 45 CNEL.*

- *Accelerated rate of land use mitigation to eliminate noise impact areas in the most timely and efficient manner possible through:*

- *Increased annual funding by LAWA for land use mitigation;*

  - *Reevaluating avigation easements requirements with sound insulation mitigation;*
  - *Provision by LAWA of additional technical assistance, where needed, to local jurisdictions to support more rapid and efficient implementation of their land use mitigation programs;*

  - *Reduction or elimination, to the extent feasible, of structural and building code compliance constraints to mitigation of sub-standard housing.*

- *Revised criteria and procedures for selection and prioritization of properties to be sound insulated or acquired in consideration of the following:*

  - *Insulation or acquisition of properties within the highest CNEL measurement zone;*
  - *Acceleration of the fulfillment of existing commitments to owners wishing to participate within the current ANMP boundaries prior to proceeding with newly eligible properties;*
  - *Insulation or acquisition of incompatible properties with high concentrations of residents or other noise-sensitive occupants such as those housed in schools or hospitals.*

- *Amend the ANMP to include libraries as noise-sensitive uses eligible for aircraft noise mitigation.*

- *Upon completion of the acquisition and/or soundproofing commitment under the current Program, expand the boundaries of the ANMP as necessary over time. LAWA will continue preparing quarterly reports that monitor any expansion of the 65 CNEL noise contours beyond the current ANMP boundaries. Based upon these quarterly reports, LAWA will evaluate and adjust the ANMP boundaries, periodically as appropriate, so that as the 65 CNEL noise contours expand, residential and noise sensitive uses newly impacted by 65 CNEL noise levels would be included within the Program."*

  The Aircraft Noise Mitigation Program (ANMP) describes the ongoing efforts by LAWA to convert existing incompatible land uses surrounding LAX to compatible land uses through the implementation of two noise mitigation strategies: (1) sound insulation of structures; and (2) acquisition of property followed by the conversion of its incompatible land use to compatible land use (land recycling).

  LAWA implements the ANMP in an effort to reduce adverse impacts of airport noise and achieve airport standards as set forth in Chapter 6 of Title 21 of the California Code of Regulations. ANMP reports are also specifically required by the State of California as a formal condition of approval of the three-year variances granted by the State to LAWA airports that have not achieved land use compatibility. Based on current data and funding commitments, the ANMP documents the progress made toward achieving land use compatibility and projects the ultimate date when full compatibility will be reached.

Status→ In Progress:
As described above, LAWA has an existing program in place with periodic updates to the State of California and the County of Los Angeles. In addition, specific updates are as follows:

- LAWA continues to implement two programs to convert existing incompatible land uses to compatible land uses through sound insulation of structures (LAWA's LAX Soundproofing program) and the acquisition and conversion of incompatible land use to compatible land use (LAWA's Residential Acquisition program). LAWA completed the final phase of the LAX Soundproofing program in 2014.

- Annual updates in support of the requirements of the current Variance pursuant to the California Airport Noise Standards are submitted with the Quarterly Report for the second quarter each year, with the updates provided to all affected jurisdictions, and made available upon request to other interested parties.

- Pre- and post-insulation noise monitoring audits are regularly conducted to ensure achievement of interior noise levels at or below 45 CNEL.

- Land use mitigation programs are being implemented as quickly as possible given that participation in the programs is voluntary.

- LAWA makes available land use mitigation funds as soon as the jurisdiction has met all program requirements and upon approval of the Board of Airport Commissioners (BOAC).

- Avigation easements are no longer required for sound insulation, except for limited circumstances. Avigation easements are still required for land acquisition using LAWA funds.

- Under very limited circumstances, as required by California Airport Noise Standards where acoustical treatments alone are insufficient to convert residential land uses to compatible uses with airport operations, noise easements are required for residential sound insulation mitigation.

- Where needed, LAWA makes available the resources for timely technical assistance to local jurisdictions to support more rapid and efficient implementation of their land use mitigation programs.

- The following criteria are used to select and prioritize properties to be sound insulated or acquired:

    a. Insulation or acquisition of properties within the highest CNEL measurement zone.

    b. Acceleration of the fulfillment of existing commitments to owners wishing to participate within the current ANMP boundaries prior to proceeding with newly eligible properties.

3.0.F MM-LU-2 Incorporate Residential Dwelling Units Exposed to Single Event Awakenings Threshold into Aircraft Noise Mitigation Program

The LAX Master Plan MMRP states:

*"**Incorporate Residential Dwelling Units Exposed to Single Event Awakenings Threshold into Aircraft Noise Mitigation Program.** In addition to any restrictive measures that may be implemented resulting from completion of Mitigation Measure MM-N-5, Conduct Part 161 Study to Make Over-Ocean Departure Procedures Mandatory, the boundaries of the ANMP will be expanded to include residential uses newly exposed to single event exterior nighttime noise levels of 94 dBA SEL, based on the Master Plan alternative that is ultimately approved and periodic reevaluation and adjustments by LAWA. Uses that are newly exposed would be identified based on annual average conditions as derived from the most current monitored data."*

Status→ In Progress:
All of the newly impacted area would be outside of the 65 CNEL area as defined by the ANMP. Therefore, they will be prioritized after the completion of the current residential program. As part of the standard Variance requirements, annual ANMP progress reports and periodic ANMP report updates will continue to be submitted to the County of Los Angeles.

3.0.G MM-LU-3 Conduct Study of the Relationship Between Aircraft Noise Levels and the Ability of Children to Learn

The LAX Master Plan MMRP states:

*"**Conduct Study of the Relationship Between Aircraft Noise Levels and the Ability of Children to Learn.** Current studies of aircraft noise and the ability of children to learn have not resulted in the development of a statistically reliable predictive model of the relative effect of changes in aircraft noise levels on learning. Therefore a comprehensive study shall be initiated by LAWA to determine what, if any, measurable relationship may be present between learning and the disruptions caused by aircraft noise at various levels. An element of the evaluation shall be the setting of an acceptable replacement threshold of significance for classroom disruption by both specific and sustained aircraft noise events."*

Status→ In Progress:
The Transportation Research Board's (TRB's) Airport Cooperative Research Program (ACRP) completed the study entitled "Evaluating the Impact of Aviation Noise on Learning." A panel created by the TRB, including one LAWA staff member, defined the scope and objectives of the study, selected the contractor to perform the work, evaluated the work, and reviewed and commented on the draft and final reports.

The objectives of the ACRP study were to determine when aircraft noise impacts student learning and what noise metric(s) best defines impact on learning. In 2010, ACRP hired a contractor to perform the study, which ACRP and TRB staff finalized. The study included a recommendation for follow-on research, including specific case studies.

ACRP funded a follow-on research project in the amount of $600,000, entitled Assessing Aircraft Noise Conditions Affecting Student Achievement – Case Studies (Case Studies research). The objectives of the Case Studies research are to (1) develop and implement a rigorous case study methodology to identify and measure those factors at the individual classroom, student, and teacher level that influence the impact of aircraft noise on student achievement, especially as it relates to reading comprehension; (2) identify appropriate metrics that define the level and characteristics of aircraft noise that impact student achievement; and (3) develop practical guidance for use by decision makers on how to reduce the impact of aircraft noise on student achievement.

Similar to the first study, the panel for the Case Studies research includes one LAWA staff member, and has already defined the scope of work and objectives of the study as stated above. In February 2014, the panel selected the contractor to perform the study, and the project commenced in May of 2014. During 2014, the panel reviewed and approved the proposed research plan, including the selection of schools to be included in the research. The data collection, data analysis, and draft report preparation have been delayed, and are currently scheduled to take place during the spring of 2016, with the final report now scheduled for completion later in 2016.

Upon completion of these studies, LAWA will assess the conclusions of the studies against the goal of setting an acceptable replacement threshold of significance for classroom disruption by both specific and sustained aircraft noise events. If the goals are met, then further study will not be necessary. If the goals are not met, or only partially met, then LAWA will assess the need for additional study, as needed.

3.0.H MM-LU-4 Provide Additional Sound Insulation for Schools Shown by MM-LU-3 to be Significantly Impacted by Aircraft Noise

The LAX Master Plan MMRP states:

*"**Provide Additional Sound Insulation for Schools Shown by MM-LU-3 to be Significantly Impacted by Aircraft Noise.** Prior to completion of the study required by Mitigation Measure MM-LU-3, Conduct Study of the Relationship Between Aircraft Noise Levels and the Ability of Children to Learn, and within six months of the commissioning of any relocated runways associated with implementation of the LAX Master Plan, LAWA shall conduct interior noise measurements at schools that could be newly exposed to noise levels that exceed the interim LAX interior noise thresholds for classroom disruption of 55 dB Lmax, 65 dB Lmax, or 35 Leq(h), as presented in Section 4.1 Noise, of the Final EIS/EIR. All school classroom buildings (except those within schools subject to an avigation easement) that are found through the noise measurements to exceed the interim interior noise thresholds, as compared to the 1996 baseline conditions presented in the Final EIS/EIR, would become eligible for soundproofing under the ANMP.*

Upon completion of the study required by Mitigation Measure MM-LU-3 and acceptance of its results by peer review of industry experts, any schools found to exceed a newly established threshold of significance for classroom disruption based on comparison with 1996 baseline conditions due to implementation of the LAX Master Plan, shall be eligible for participation in the ANMP administered by LAWA, unless they are subject to an existing avigation easement. A determination of which schools become eligible will be made following application of the new threshold based on measured data."

Status→ No action required at this time:
LAWA will implement this measure's requirements contingent on the results from the study required by MM-LU-3. There is ongoing work related to settlement agreements between LAWA and both the Inglewood Unified and Lennox School Districts. LAWA actively assists each school district in its efforts to mitigate the impacts to schools, per those agreements.

On October 2, 2008, Congress amended Section 40117(b) of Title 49 of the United States Code, which allowed eligibility for Passenger Facility Charge (PFC) funding for noise mitigation of certain schools located within the LAX noise impact area in both the Lennox School District (LSD) and the Inglewood Unified School District (IUSD), notwithstanding the grant of an easement to LAWA.

On July 9, 2009, LAWA submitted a letter to the FAA asking that a determination be made related to which schools are impacted. On August 24, 2009 the FAA responded to LAWA by letter with information that this determination will be made as part of the PFC application process. LAWA proceeded with the PFC application with information from each respective school district sufficient for the FAA to make such a determination.

Lennox School District

In January and February 2011, the BOAC authorized and LAWA submitted a PFC application to the FAA for authorization to collect and use PFC funds to sound insulate impacted schools in the Lennox School District (the District).

On May 2, 2011 the FAA issued the Final Agency Decision finding the schools in LSD to be "significantly impacted and adversely affected by aircraft noise," and authorized the expenditure of up to $34,089,058 in PFC funds to insulate the schools listed in the Settlement Agreement between LAWA and LSD.

On September 19, 2011, BOAC approved the Letter of Agreement between LAWA and LSD, and authorized the release of $10 million to LSD for the first year of the sound insulation program. The funds were delivered to LSD on December 12, 2011. The initial schools treated were Felton Elementary, Lennox Middle School, Animo Leadership High School, and Jefferson (new construction phase).

In September 2012, sound attenuation work was completed for the Animo Leadership High School, the District's charter school managed by Green Dot.

In September 2013, the District sent LAWA a written request to remove Lennox Fine and Performing Arts Academy from the list of approved new schools to be mitigated because the school will not be built by the District.

On June 2, 2014, LAWA authorized $10 million for the Second Work Plan and released $4,079,000 as the first installment. This Second Work Plan focuses on existing Jefferson Elementary and Buford Elementary Schools. Sound attenuation plans for both of these schools were submitted to the Division of State Architect (DSA).

In August 2015, work at both Lennox Middle School and Felton Elementary were deemed completed and closed out by the Lennox School Board.

The District is in compliance with all program requirements.

Felton Elementary School, September 2014
New double-paned windows and solid doors

Inglewood Unified School District (IUSD)

LAWA worked with the Inglewood Unified School District (IUSD) and the FAA to complete the PFC application process requesting authorization to use PFC funding for sound insulation of impacted schools for the IUSD. LAWA submitted the PFC application to the FAA on August 19, 2013 for $64 million dollars, which would attenuate seven schools plus the Child Development Center at Woodworth Elementary.

In October, 2014, the FAA issued the Final Agency Decision for the IUSD, finding the schools to be “significantly impacted”. The FAA approved $44,378,659 to fund sound attenuation projects in the IUSD with PFC funds. The Los Angeles International Airport will collect PFC funds to pay for the sound attenuation of five campuses and the Child Development Center at Woodworth. Two schools, Inglewood High School and Hudnall Elementary, are located outside the 65 dB of the FAA-approved noise contour and were not approved for PFC funding by FAA. The schools/campuses approved for sound attenuation are as follows:

- Morningside High School
- Oak Street Elementary School
- Payne Elementary School
- Woodworth Elementary School
- Monroe Middle School
- Child Development Center at Woodworth Elementary

In the spring of 2015, LAWA worked with IUSD to develop their First Work Plan, which will outline the schools that are scheduled for design and construction phases first. The District identified Payne Elementary, Woodworth Elementary, and Woodworth Child Development Center for the schools in the First Work Plan.

The BOAC approved the Work Plan and the initial funding allocation for $10 million in August 2015.

In the fall of 2015, the District contracted with an architectural firm to begin designs for Payne Elementary School.

New windows at Payne Elementary School, October 2015

3.0.I MM-LU-5 Upgrade and Expand Noise Monitoring Program

The LAX Master Plan MMRP states:

"***Upgrade and Expand Noise Monitoring Program.*** *LAWA shall upgrade and expand its existing noise monitoring program in surrounding communities through new system procurement, noise monitor location, and equipment installation. Permanent or portable monitors shall be located in surrounding communities to record noise data 24 hours per day, seven days per week for correlation with FAA radar data to cross-reference noise episodes with flight patterns. The upgraded system will support LAWA and other jurisdictional ANMP's when considering adjustments to airport noise mitigation boundaries."*

Status→ Completed:
On February 4, 2010, CalTrans approved LAWA's Noise Monitoring Plan for LAX, Ontario, and Van Nuys airports that included the upgraded and expanded Aircraft and Noise Monitoring and Management System (ANMMS). The system is fully functional at this time.

As part of the new system design, LAWA replaced all of the actual noise monitoring equipment located throughout the communities impacted by LAX operations. LAWA installed many new permanent noise monitors to better represent the actual noise levels in different areas, including areas well outside of the current 65 dB CNEL Noise Impact Area. A total of 39 noise monitors have been installed at LAX and all are operational. These monitors all are permanent sites, and will be collecting data continuously. Data from each site is downloaded nightly into the Airport Noise and Operations Monitoring System (ANOMS), and processed with the flight data to determine the noise levels associated with airport operations. The data then is used to calculate the annual noise levels represented in the State-required Quarterly Reports.

4.0 Surface Transportation (On-Airport)

4.0.A ST-2 Non-Peak CTA Deliveries

The LAX Master Plan MMRP states:

*"**Non-Peak CTA Deliveries.** Deliveries to the CTA terminal reconstruction projects will be limited to non-peak traffic hours whenever possible."*

Status→ Ongoing:
LAWA established the Coordination and Logistic Management (CALM) team. Working in cooperation with LAWA staff, including Terminal Operations, Airport Police, Capital Programming and Planning Group, and the Commercial Development Group, the CALM team monitors construction traffic, coordinates lane and roadway closures and analyzes traffic conditions to determine the need for additional traffic controls, lane restriping and traffic signal modifications. The CALM team established an approval process for proposed construction work in which contractors submit request forms describing the work, when the work is proposed to take place, duration, and coordination efforts with other projects, among other items. If pedestrian or vehicular traffic will be impacted, the submittal form will include proposed traffic control plans. The CALM team and other LAWA divisions review these requests and address any concerns prior to approval. The CALM team also develops an informational campaign for construction activities, including wayfinding signage for pedestrians to locate ground transportation facilities and parking during construction, information for commercial shuttle drivers regarding lane closures and detours, and traffic alerts on LAWA's website for the public and airport employees. The CALM team holds weekly meetings to discuss minimizing the construction impacts of current and future projects.

In 2015, the CALM team and LAWA staff reviewed deliveries that required lane closures in the Central Terminal Area (CTA). LAWA imposed restrictions whenever possible to limit deliveries during certain times of the day or certain days of the week depending on anticipated traffic impacts.

4.0.B ST-7 Adequate GTC, ITC, and APM Design

The LAX Master Plan MMRP states:

***Adequate GTC, ITC, and APM Design.** LAWA will ensure that the surface transportation system and curbfront for the GTC and ITC, commercial vehicle staging areas, and APM systems will be designed to adequately accommodate all forecast vehicular activity through 2015.*

Status→ No action required at this time:
This measure was not applicable in 2015 because no design occurred.

4.0.C ST-8 Limited Short-Term Lane Closures

The LAX Master Plan MMRP states:
*"**Limited Short-Term Lane Closures.** When construction of any new ramps at the Century Boulevard/Sepulveda Boulevard interchange or construction for the GTC, ITC, or APM elevated structures require short-term lane closures, the lane closures will be for as brief a period as practical, with a goal that closures would principally be scheduled for non-peak periods."*

Status→ No action required at this time:
No new ramps at the Century Boulevard/Sepulveda Boulevard interchange were constructed in 2015, and the Ground Transportation Center (GTC), Intermodal Transportation Center (ITC), and the APM were not under construction in 2015.

4.0.D MM-ST-1 Require CTA Construction Vehicles to Use Designated Lanes

The LAX Master Plan MMRP states:

*"**Require CTA Construction Vehicles to Use Designated Lanes.** Whenever feasible, construction vehicles shall be restricted to designated roadways or lanes of traffic on CTA roadways adjacent to the existing close-in parking, thus limiting the mix of construction vehicles and airport traffic."*

Status→ Ongoing:
LAWA established the Coordination and Logistic Management (CALM) team. Working in cooperation with LAWA staff, including Terminal Operations, Airport Police, Capital Programming and Planning Group, and the Commercial Development Group, the CALM team monitors construction traffic, coordinates lane and roadway closures and analyzes traffic conditions to determine the need for additional traffic controls, lane restriping and traffic signal modifications. CALM established an approval process for proposed construction work in which contractors submit request forms describing the work, when the work is proposed to take place, duration, and coordination efforts with other projects, among other items. If pedestrian or vehicular traffic will be impacted, the submittal form will include proposed traffic control plans. The CALM team and other LAWA divisions review these requests and address any concerns prior to approval. The CALM team also develops an informational campaign for construction activities, including wayfinding signage for pedestrians to locate ground transportation facilities and parking during construction, information for commercial shuttle drivers regarding lane closures and detours, and traffic alerts on LAWA's website for the public and airport employees. The CALM team holds weekly meetings to discuss minimizing construction impacts of current and future projects.

In 2015, the CALM team and LAWA staff reviewed deliveries that required lane closures in the Central Terminal Area (CTA). LAWA imposed restrictions whenever possible to limit deliveries during certain times of the day or certain days of the week depending on anticipated traffic impacts.

4.0.E MM-ST-2 Modify CTA Signage

The LAX Master Plan MMRP states:

*"**Modify CTA Signage.** During construction, additional signage will be installed, as required, to separate construction traffic from non-construction traffic to the extent feasible."*

Status→ Ongoing:
LAWA established the Coordination and Logistic Management (CALM) team. Working in cooperation with LAWA staff, including Terminal Operations, Airport Police, Capital Programming and Planning Group, and the Commercial Development Group, the CALM team monitors construction traffic, coordinates lane and roadway closures and analyzes traffic conditions to determine the need for additional traffic controls, lane restriping and traffic signal modifications. CALM established an approval process for proposed construction work in which contractors submit request forms describing the work, when the work is proposed to take place, duration, and coordination efforts with other projects, among other items. If pedestrian or vehicular traffic will be impacted, the submittal form will include proposed traffic control plans. The CALM team and other LAWA divisions review these requests and address any concerns prior to approval. The CALM team also develops an informational campaign for construction activities, including wayfinding signage for pedestrians to locate ground transportation facilities and parking during construction, information for commercial shuttle drivers regarding lane closures and detours, and traffic alerts on LAWA's website for the public and airport employees. The CALM team holds weekly meetings to discuss minimizing construction impacts of current and future projects.

In 2015, LAWA staff and the CALM team reviewed and approved worksite traffic control plans for construction projects within the CTA. These worksite traffic control plans include the need for additional and modified signage.

4.0.F MM-ST-3 Develop Designated Shuttle Stops for Labor Buses and ITC-CTA Buses

The LAX Master Plan MMRP states:

*"**Develop Designated Shuttle Stops for Labor Buses and ITC-CTA Buses.** Develop shuttle stops for labor buses (i.e. buses carrying construction workers) and the ITC-CTA shuttle buses at the CTA arrivals level. All ITC-CTA shuttle buses will be routed to these lower level (arrivals) curb areas. These buses will not circulate through the upper level (departures) curbfront."*

Status→ No action required at this time:
There were no LAX Master Plan projects that required labor or shuttle buses for construction workers in the CTA in 2015.

4.0.G MM-ST (BWP)-2 Improve the Intersection of Center Way and World Way South

The Bradley West Project MMRP states in part:
*"**Improve the Intersection of Center Way and World Way South.** Widen World Way South approach on the east side of the roadway to provide an additional right turn lane. The resulting configuration would be a single left turn lane, one through-left turn lane, two through lanes, and two right turn lanes."*

Status→ Completed:
This project was completed in the third quarter of 2015.

4.0.H MM-ST (BWP)-3 Widen World Way Across from TBIT

The Bradley West Project MMRP states:

*"**Widen World Way Across from TBIT.** Widen the arrivals-level outer roadway across from TBIT by changing the left-most lane that currently terminates at Center Way to a through/left lane and extending this lane to World Way South."*

Status→ Completed:
This improvement was completed in June 2013 as part of the Central Utility Plant upgrade.

4.0.I MM-ST (BWP)-12 Distribution of Contractor Employee Parking between the Northwest Construction Staging/Parking Area and the East Contractor Employee Parking Area or Southeast Construction Staging/Parking Area

The Bradley West Project MMRP states in part:

*"**Distribution of Contractor Employee Parking between the Northwest Construction Staging/Parking Area and the East Contractor Employee Parking Area or Southeast Construction Staging/Parking Area.** General parking for Bradley West Project contractor employees within the Northwest Construction Staging/Parking Area and within the East Contractor Employee Parking Area or Southeast Construction Staging/Parking Area shall be distributed such that neither the northwest area (i.e., Northwest Construction Staging/Parking Area) or the east/southeast area (i.e., East Contractor Employee Parking Area or Southeast Construction Staging/Parking Area) is assigned parking for more than 601 vehicles."*

Status→ Completed

5.0 Surface Transportation (Off-Airport)

5.0.A ST-9 Construction Deliveries

The LAX Master Plan MMRP states:

*"**Construction Deliveries.** Construction deliveries requiring lane closures shall receive prior approval from the Construction Coordination Office. Notification of deliveries shall be made with sufficient time to allow for any modifications to approved traffic detour plans."*

BWP Status→ Ongoing:
No lane closures were required for construction deliveries in 2015.
WAMA Status→ Ongoing:
Prior to the initiation of construction in 2014, the contractor developed a Construction Traffic Management Plan and a Logistics Plan, both of which LAWA reviewed. The plans specify a number of traffic-related provisions, including procedures related to construction deliveries. The plans were in effect during the 2015 reporting period, however, there were no closures on public roads for construction deliveries in 2015. (Although there were no road closures for construction deliveries in 2015, the flyover lane at the intersection of Pershing Drive and World Way West was intermittently closed due to grading and construction of a retaining wall.)

MSC Status→ Ongoing:
There were light construction deliveries during 2015, including some materials deliveries and delivery of concrete for the relocated FAA Remote Transmitter Receiver (RTR) foundation. A brief lane closure was required along Westchester Parkway; the lane closure was coordinated with LAWA's Coordination and Logistic Management (CALM) Team.

5.0.B ST-12 Designated Truck Delivery Hours

The LAX Master Plan MMRP states:
*"**Designated Truck Delivery Hours.** Truck deliveries shall be encouraged to use night-time hours and shall avoid the peak periods of 7:00 a.m. to 9:00 a.m. and 4:30 p.m. to 6:30 p.m."*

BWP Status→ Ongoing:
LAWA monitors truck deliveries and such deliveries are strictly enforced by LAWA inspectors and mitigation monitors. On occasion, waivers are granted for deliveries during peak periods when required for engineering/construction reasons, such as for large-scale concrete pours that must be completed on a continuous basis over the course of many hours. No truck waivers were granted during the 2015 reporting period.

WAMA Status → Ongoing:
Prior to the initiation of construction, the contractor developed a Construction Traffic Management Plan and a Logistics Plan, both of which LAWA reviewed. The plans specify a number of traffic-related provisions, including provisions relating to construction delivery hours. In accordance with the MMRP and these plans, LAWA monitors truck

deliveries, and such deliveries are strictly enforced by LAWA inspectors and mitigation monitors. On occasion, waivers may be granted for deliveries during peak periods when required for engineering/construction reasons, such as for large-scale concrete pours that must be completed on a continuous basis over the course of many hours. LAWA did not grant any truck waivers in 2015.

MSC Status→ Ongoing:
LAWA monitors truck deliveries associated with construction activities. Such deliveries are strictly enforced by LAWA inspectors and mitigation monitors. On occasion, waivers may be granted for deliveries during peak periods when required for engineering and/or construction reasons, such as for large-scale concrete pours that must be completed on a continuous basis over the course of many hours. Construction deliveries associated with the MSC project in 2015 occurred outside of peak hours. No truck waivers were requested during 2015.

5.0.C ST-14 Construction Employee Shift Hours

The LAX Master Plan MMRP states:

*"**Construction Employee Shift Hours.** Shift hours that do not coincide with the heaviest commuter traffic periods (7:00 a.m. to 9:00 a.m., 4:30 p.m. to 6:30 p.m.) will be established. Work periods will be extended to include weekends and multiple work shifts, to the extent possible and necessary."*

BWP Status→ Completed

WAMA Status→ Ongoing:
Prior to the initiation of construction, the contractor developed a Construction Traffic Management Plan and a Logistics Plan, both of which LAWA reviewed. The plans specify a number of traffic-related provisions, including provisions related to construction employee shift hours. The standard shift for the WAMA project (including both the LAWA WAMA construction component and the Qantas hangar component) conforms to the restrictions contained in this measure. To meet engineering and scheduling requirements, some shifts extended past 4 pm; however, this was not typical and consisted of a very limited crew (e.g., 2 to 4 workers).

MSC Status→ Ongoing:
The standard shift for the MSC project conforms to the restrictions contained in this measure. Worker shifts typically started around 5:00 a.m.

5.0.D ST-16 Designated Haul Routes

The LAX Master Plan MMRP states:

*"**Designated Haul Routes.** Every effort will be made to ensure that haul routes are located away from sensitive noise receptors."*

BWP Status→ Completed

WAMA Status→ Ongoing:
Prior to the initiation of construction, the contractor developed a Construction Traffic Management Plan and a Logistics Plan, both of which LAWA reviewed. The plans specify a number of traffic-related provisions, including haul routes. In accordance with these plans and with the MMRP, no haul routes in noise-sensitive areas were used during 2015.

MSC Status→ Ongoing:
All haul routes used in 2015 were in accordance with the MMRP; no haul routes in noise-sensitive areas were used during 2015.

5.0.E ST-17 Maintenance of Haul Routes

The LAX Master Plan MMRP states:

*"**Maintenance of Haul Routes.** Haul routes on off-airport roadways will be maintained periodically and will comply with City of Los Angeles or other appropriate jurisdictional requirements for maintenance. Minor striping, lane configurations, and signal phasing modifications will be provided as needed."*

BWP Status→ Ongoing:
Off-airport roadways required no maintenance by construction contractors during 2015.

WAMA Status→ Ongoing:
Off-airport roadways required no maintenance by construction contractors during 2015.

MSC Status→ Ongoing:
Off-airport roadways required no maintenance by construction contractors during 2015.

5.0.F ST-18 Construction Traffic Management Plan

The LAX Master Plan MMRP states:

*"**Construction Traffic Management Plan.** A complete construction traffic plan will be developed to designate detour and/or haul routes, variable message and other sign locations, communication methods with airport passengers, construction deliveries, construction employee shift hours, construction employee parking locations and other relevant factors."*

BWP Status→ Ongoing:
LAWA inspectors and construction monitors conducted ongoing monitoring of construction-related traffic in 2015, including haul routes, delivery hours, posting of variable signs, construction employee shift hours, construction employee parking locations, and other considerations. Construction employees parked in a designated area east of the north airfield and were shuttled to the construction site. Construction employee hours were reported weekly.

WAMA Status→ Ongoing:
Prior to the initiation of construction, the contractor developed a Construction Traffic Management Plan, which LAWA reviewed. LAWA inspectors and construction monitors monitored construction traffic, including haul routes, delivery hours, construction employee shift hours, construction employee parking locations, and other considerations. Construction employees on the LAWA construction component parked in a designated area within the construction site, accessed via Pershing Drive. Construction employee hours were reported weekly. Construction employees working on the Qantas hangar component parked onsite.

MSC Status→ Ongoing:
Only minor enabling projects were initiated in 2015; a Construction Traffic Management Plan was not required for these projects. A Construction Traffic Management Plan will be developed prior to construction of the MSC project itself.

5.0.G ST-19 Closure Restrictions of Existing Roadways

The LAX Master Plan MMRP states:

*"**Closure Restrictions of Existing Roadways.** Other than short time periods during nighttime construction, existing roadways will remain open until they are no longer needed for regular traffic or construction traffic, unless a temporary detour route is available to serve the same function. This will recognize that there are three functions taking place concurrently: (1) airport traffic, (2) construction haul routes, and (3) construction of new facilities."*

MSC Status→ No action required at this time:
This measure was not applicable during the 2015 reporting period as there were no MSC projects under construction that required road closures.

5.0.H ST-20 Stockpile Locations

The LAX Master Plan MMRP states:

*"**Stockpile Locations.** Stockpile locations will be confined to the eastern area of the airport vicinity, to the extent practical and feasible. After the eastern facilities are under construction in Alternative D, stockpile locations will be selected that are as close to I-405 and I-105 as possible, and can be accessed by construction vehicles with minimal disruption to adjacent streets. Multiple stockpile locations may be provided, as required."*

Status→ No action required at this time:
This measure was not applicable during the 2015 reporting period because eastern area airport facilities were not under construction.

5.0.I ST-21 Construction Employee Parking Locations

The LAX Master Plan MMRP states:

*"**Construction Employee Parking Locations.** During construction of the eastern airport facilities, employee parking locations will be selected that are as close to I-405 and I-105 as possible and can be accessed by employee vehicles with minimal disruption to adjacent streets. Shuttle buses will transport employees to construction sites. In addition, remote parking locations (of not less than 1 mile away from project construction activities) will be established for construction employees with shuttle service to the airport. An emergency return system will be established for employees that must leave unexpectedly."*

Status→ No action required at this time:
This measure was not applicable during the 2015 reporting period because eastern area airport facilities were not under construction.

5.0.J ST-22 Designated Truck Routes

The LAX Master Plan MMRP states in part:

*"**Designated Truck Routes.** For dirt and aggregate and all other materials and equipment, truck deliveries will be on designated routes only (freeways and non-residential streets). Every effort will be made for routes to avoid residential frontages…."*

BWP Status→ Completed

WAMA Status→ Ongoing:
Designated truck routes are specified in the construction contract for the LAWA construction component. In addition, the Qantas lease requires compliance with the WAMA Project Design Features, Commitments, and Mitigation Monitoring and Reporting Program (MMRP), including this provision (ST-22). The designated truck routes for both project components avoid residential frontages. LAWA inspectors and monitors checked to see that trucks used the designated routes.

MSC Status→ Ongoing:
The designated truck routes used in 2015 avoided residential frontages. LAWA inspectors and monitors checked to see that trucks used the designated routes.

5.0.K ST-23 Expanded LAX Gateway Improvements/Greening of Impacted Communities

The LAX Master Plan MMRP states in part:

*"**Expanded LAX Gateway Improvements/Greening of Impacted Communities.** Gateway LAX improvements will be enabled through transportation improvements along Century Boulevard to the east as they are proposed to extend into low-income and minority communities in the City of Inglewood. LAWA anticipates*

making financial contribution, on a fair-share basis up to a maximum of ten million dollars, to various off-airport surface transportation related components."

Status→ Completed:
The funding and implementation of the Master Plan commitments, as well as the MMRP mitigation measures, are subject to LAWA's ability to use airport revenue to the extent permissible under federal law and policies, or to develop other state or federal funding sources. In 2006, LAWA requested a determination on the use of funds for this measure. As LAWA had not received a final determination on whether airport revenues may be used, LAWA submitted a new request on December 3, 2013 that FAA make a determination to provide funding for MMRP Commitment ST-23, Expanded Gateway Improvements/Greening of Impacted Communities. On November 23, 2015, LAWA received a letter from the FAA stating that airport revenues may not be used to provide funding for LAX Master Plan Commitment ST-23.

5.0.L ST-24 Fair Share Contribution to Congestion Management Plan (CMP) Improvements

The LAX Master Plan MMRP states in part:

*"**Fair Share Contribution to Congestion Management Plan (CMP) Improvements.** At the time of substantial completion of the LAX Master Plan, LAWA will contribute funding on a fair-share basis to future transportation improvements identified through the Congestion Management Plan (CMP) analysis completed for Alternative D."*

Status→ No action required at this time:
As the LAX Master Plan was not substantially complete in 2015, no action was required.

5.0.M MM-ST-6 Add New Traffic Lanes

The LAX Master Plan MMRP states in part:

*"**Add New Traffic Lanes.** Traffic lanes shall be added to select intersections to the satisfaction of LADOT or other appropriate jurisdiction, sufficient to increase the capacity of the intersection without unnecessarily reducing sidewalk widths, removing on-street parking, or encroaching onto other land uses."*

Status→ No action required at this time:
Per the LAX Master Plan traffic mitigation program, no action was required in 2015.

5.0.N MM-ST-7 Restripe Existing Facilities

The LAX Master Plan MMRP states in part:

*"**Restripe Existing Facilities.** Existing traffic lanes shall be restriped to the satisfaction of LADOT or other appropriate jurisdiction, so that additional lane capacity will be provided without adding any new pavement to the intersection or road segment."*

Status→ No action required at this time:
Per the LAX Master Plan traffic mitigation program, no action was required in 2015.

5.0.O MM-ST-8 Add ATSAC, ATCS or Equivalent

The LAX Master Plan MMRP states in part:

*"**Add ATSAC, ATCS or Equivalent.** Automated Traffic Surveillance and Control (ATSAC) or Adaptive Traffic Control System (ATCS) capability or equivalent shall be added to select intersections to the satisfaction of LADOT or other appropriate jurisdiction. The improved capability will result in a more effective traffic signal network."*

Status→ No action required at this time:
Per the LAX Master Plan traffic mitigation program, no action was required in 2015.

5.0.P MM-ST-10 Modify Signal Phasing

The LAX Master Plan MMRP states in part:

*"**Modify Signal Phasing.** The traffic signal phasing of select intersections shall be modified to the satisfaction of LADOT or other appropriate jurisdiction, to allow more efficient use of the intersections, particularly those that will experience a notable change in traffic characteristics as a result of the project."*

Status→ No action required at this time:
Per the LAX Master Plan traffic mitigation program, no action was required in 2015.

5.0.Q MM-ST-12 Provide New Ramps Connecting I-105 to LAX Between Aviation Boulevard and La Cienega Boulevard

The LAX Master Plan MMRP states:

*"**Provide New Ramps Connecting I-105 to LAX Between Aviation Boulevard and La Cienega Boulevard.** These ramps shall be provided to allow for direct access and egress to/from the ITC and GTC via I-105, between Aviation Boulevard and La Cienega Boulevard. A feasibility study is underway to determine the best design for these ramps."*

Status→ No action required at this time:
LAWA amended the LAX Specific Plan in 2013. The amended Specific Plan removed the Intermodal Transportation Center (ITC) and the Ground Transportation Center (GTC). Therefore, this measure no longer applies to the LAX Master Plan or individual Master Plan projects.

5.0.R MM-ST-13 Create a New Interchange at I-405 and Lennox Boulevard

The LAX Master Plan MMRP states:

*"**Create a New Interchange at I-405 and Lennox Boulevard.** This interchange shall provide grade-separated ramps from I-405 directly into airport property, and vice-versa. It shall be located approximately mid-way between Century Boulevard and Imperial Highway. A feasibility study is underway to determine the best design for the interchange. Should this proposed interchange not be constructed, suitable and alternate traffic mitigation measures shall be designed and implemented to the satisfaction of LADOT and the Bureau of Engineering."*

Status→ No action required at this time.
Per the LAX Master Plan traffic mitigation program, no action was required in 2015.

5.0.S MM-ST-14 Ground Transportation/Construction Coordination Office Outreach Program

The LAX Master Plan MMRP states:

*"**Ground Transportation/Construction Coordination Office Outreach Program.** The construction coordination office proposed in Master Plan Commitment C-1, Establishment of a Ground Transportation/Construction Coordination Office, shall establish appropriate mechanisms to involve and coordinate with other major airport-area development projects to the extent feasible, to ensure that the cumulative impacts of construction in the airport area are coordinated and minimized."*

Status→ Ongoing:
In 2015, LAWA's CALM team worked in cooperation with LAWA staff including Terminal Operations, Airport Police, Capital Programming, Planning and Engineering Group, and Commercial Development Group, to monitor construction traffic, coordinate lane and roadway closures and analyze the need for additional traffic controls.

5.0.T MM-ST-15 Provide Fair-Share Contributions to Transit Improvements

The LAX Master Plan MMRP states in part:

*"**Provide Fair-Share Contributions to Transit Improvements.** Provide fair-share contributions to benefit transit to and from LAX to the satisfaction of LADOT and/or other appropriate jurisdiction or agency."*

Status→ No action required at this time.
No action was required in 2015.

5.0.U MM-ST-16 Provide Fair-Share Contribution to LA County's project to extend the Marina Expressway

The LAX Master Plan MMRP states in part:

*"**Provide Fair-Share Contribution to LA County's project to extend the Marina Expressway.** Provide fair-share contribution to Los Angeles County's project to extend the Marina Expressway (Route 90) to Admiralty Way or complete alternative off-site improvements at the following intersections: By 2015: Lincoln Boulevard & Washington Boulevard, Bali Way & Lincoln Boulevard, Fiji Way & Lincoln Boulevard, Lincoln Boulevard & Marina Expressway, Lincoln Boulevard & Maxella Avenue, Lincoln Boulevard & Mindanao Way…"*

Status→ No action required at this time:
Per Los Angeles County, the Marina Expressway extension project is not currently programmed or funded. Per the LAX Master Plan traffic mitigation program, no action was required in 2015 for the alternative off-site improvements.

5.0.V MM-ST (BWP)-1 Trip Reduction Measures

The Bradley West Project MMRP states:

*"**Trip Reduction Measures.** LAWA will implement the following trip reduction measures:*

(a) Continue to promote and expand the FlyAway services in accordance with LAX Master Plan Mitigation Measure MM-AQ-3. It is anticipated that the continued expansion of the FlyAway service will promote a shift in mode-share away from the private vehicle mode which would reduce traffic volume using the CTA roadway system.

(b) Continue to promote the consolidation of shuttle services (e.g., hotel/motel, off-airport parking, rental cars) or programs to reduce trips associated with these modes."

Status→ Ongoing:
In December 2015, LAWA began FlyAway service between LAX and the Woodley Avenue station of the Orange Line Busway in the San Fernando Valley. Marketing included FlyAway signage on Metro's Orange Line buses and selected transit stops. Also in December 2015, LAWA began FlyAway service between LAX and the City of Long Beach (at the intersection of First Street and Long Beach Boulevard).

5.0.W MM-ST (BWP)-4 Modify the Intersection of Airport Boulevard and Manchester Avenue (Intersection #9)

The Bradley West Project MMRP states in part:

*"**Modify the Intersection of Airport Boulevard and Manchester Avenue (Intersection #9).** The eastbound approach to the Airport Boulevard and Manchester Avenue intersection shall be restriped to provide one left-turn lane, two through lanes, and a through/right lane… Implementation of this measure shall occur if/when*

international passenger activity levels at TBIT increase to 19.7 million annual passengers."

Status→ Completed:
In 2014, this intersection improvement was completed as part of another project unrelated to the airport.

5.0.X MM-ST (BWP)-5 Modify the Intersection of Arbor Vitae Street and Aviation Boulevard (Intersection #10)

The Bradley West Project MMRP states in part:

*"**Modify the Intersection of Arbor Vitae Street and Aviation Boulevard (Intersection #10).** The eastbound approach to the Arbor Vitae Street and Aviation Boulevard intersection shall be widened to provide one left-turn lane, two through lanes, and a right-turn lane.…Los Angeles and City of Inglewood. Implementation of this measure shall occur if/when international passenger activity levels at TBIT increase to 20.7 million annual passengers."*

Status→ In Progress:
In 2015, LADOT approved a conceptual improvement plan.

5.0.Y MM-ST (BWP)-6 Modify the Intersection of Imperial Highway and Sepulveda Boulevard (Intersection #71)

The Bradley West Project MMRP states in part:

***"Modify the Intersection of Imperial Highway and Sepulveda Boulevard (Intersection #71).** The northbound approach to the Imperial Highway and Sepulveda Boulevard intersection shall be restriped to provide one left-turn lane, three through lanes, and two right-turn lanes. …… Implementation of this measure shall occur if/when international passenger activity levels at TBIT increase to 19.7 million annual passengers."*

Status→ In Progress:
In 2015, LAWA hired a consultant, T.Y. Lin International, to prepare full design plans for this improvement. As the intersection is within Caltrans' jurisdiction, Caltrans must approve the design plans prior to construction.

5.0.Z MM-ST (BWP)-7 Modify the Intersection of La Cienega Boulevard and I-405 Ramps N/O Century Boulevard (Intersection #96)

The Bradley West Project MMRP states in part:

*"**Modify the Intersection of La Cienega Boulevard and I-405 Ramps N/O Century Boulevard (Intersection #96).** The southbound approach to the La Cienega Boulevard and I-405 Ramps N/O Century Boulevard intersection shall be widened to provide two left-turn lanes and two through lanes….*

Implementation of this measure shall occur if/when international passenger activity levels at TBIT increase to 20.7 million annual passengers."

Status→ In Progress:
LAWA proposed to LADOT and Caltrans to substitute the widening of southbound La Cienega Boulevard for the widening of the southbound off-ramp from the I-405 Freeway at La Cienega Boulevard. This refined improvement will mitigate the impact at this intersection. In 2015, initial discussions took place with Caltrans regarding the widening of the southbound off-ramp and the process required for their approval.

5.0.AA MM-ST (BWP)-8 Modify the Intersection of La Tijera Boulevard and Sepulveda Boulevard (Intersection #101)

The Bradley West Project MMRP states in part:

*"**Modify the Intersection of La Tijera Boulevard and Sepulveda Boulevard (Intersection #101).** The westbound approach to the La Tijera Boulevard and Sepulveda Boulevard intersection shall be restriped and the traffic signal modified to provide two left-turn lanes, one through lane, and a through/right lane. … Implementation of this measure shall occur if/when international passenger activity levels at TBIT increase to 18.7 million annual passengers."*

Status→ Monitoring:
In 2015, there were only 12.12 million annual international passengers at TBIT. When discussing the implementation of this mitigation with the Los Angeles Department of Transportation, LAWA discovered that LADOT is pursuing a separate project to install bike lanes on LaTijera Boulevard east of Sepulveda Boulevard, and if both the bike lane project and MM-ST (BWP)-8 were installed, it would result in the loss of approximately 18 parking spaces on LaTijera Boulevard between Sepulveda Boulevard and Sepulveda Eastway. A traffic analysis conducted in 2014 revealed that this intersection is operating at Level of Service B during the AM and PM peak hours, which is significantly better than the Level of Service D which was projected to occur during these peak hours when LAX reached 18.7 million annual international passengers. The mitigation, and the resulting parking loss if both the mitigation and LADOT's bike lane project were installed, was discussed at a Westchester Neighborhood Council meeting on August 5, 2014 and at a meeting with the Westchester Business Improvement Association on August 21, 2014. LAWA has received requests to postpone implementation of this traffic mitigation, to monitor the level of service at this intersection and report back to LADOT for a determination as to when the traffic mitigation should be implemented.

5.0.BB MM-ST (BWP)-9 Modify the Intersection of Sepulveda Boulevard and 76th/77th Street (Intersection #136)

The Bradley West Project MMRP states in part:

***"Modify the Intersection of Sepulveda Boulevard and 76th/77th Street (Intersection #136).** The eastbound approach to the Sepulveda Boulevard and 76th/77th Street intersection shall be restriped to provide two left-turn lanes, a through/left-turn lane, and*

one right-turn lane…. Implementation of this measure shall occur if/when international passenger activity levels at TBIT increase to 19.7 million annual passengers."

Status→ In Progress:
In 2015, there were only 12.12 million annual international passengers at TBIT. LAWA discussed this improvement with LADOT staff. In 2014, LADOT changed the signal phasing and installed a crosswalk on the north leg of the intersection. The existing traffic signal now conflicts with the mitigation measure.

5.0.CC MM-ST (BWP)-10 Modify the Intersection of Imperial Highway and Main Street (Intersection #68)

The Bradley West Project MMRP states:

"Modify the Intersection of Imperial Highway and Main Street (Intersection #68). *Modify the median island on the east leg of the intersection to provide a second left turn lane. The resulting westbound configuration would be comprised of a dual left-turn lane and two through lanes."*

Status→ Completed:
LAWA completed this project on February 14, 2012.

5.0.DD MM-ST (BWP)-11 Modify the Intersection of Imperial Highway and Pershing Drive (Intersection #69)

The Bradley West Project MMRP states:

*"**Modify the Intersection of Imperial Highway and Pershing Drive (Inter-section #69).** Widen the north side of the westbound approach of Imperial Highway to provide a second right-turn lane. The resulting westbound lane configuration would be comprised of one left turn lane, two through lanes, and two right turn lanes."*

Status→ Completed:
LAWA completed this project on February 14, 2012.

5.0.EE MM-ST (MSC)-1 Restripe Manchester Avenue at Sepulveda Boulevard

The MSC MMRP states:

*"**Restripe Manchester Avenue at Sepulveda Boulevard**. Restripe Manchester Avenue westbound approach to provide a right-turn lane and one additional left-turn lane. The resulting westbound lane configuration would be comprised of two left-turn lanes, two through lanes, and one right-turn lane."*

Status→ In Progress:
LAWA had not yet begun mitigation of this measure in 2015.

6.0 Relocation of Residences and Businesses

6.0.A RBR-1 Residential and Business Relocation Program

The LAX Master Plan MMRP states in part:

*"**Residential and Business Relocation Program.** To address the acquisition of properties and relocation of businesses and residents associated with the proposed Master Plan, LAWA will prepare a Residential and Business Relocation Plan (Relocation Plan) in compliance with the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended, state and local regulations, and FAA Advisory Circular 150/5100-17, prior to the commencement of acquisition."*

Status→ Completed:
LAWA completed an LAX Master Plan Program, Alternative D Draft Relocation Plan in April 2004 in accordance to the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended, and Title 49 of the Code of Federal Regulations Part 24 to address proposed acquisition and relocation of properties under Alternative D of the LAX Master Plan. However, no LAX Master Plan improvements requiring acquisition and relocation in the Alternative D Proposed Property Acquisition Areas occurred in 2015.

6.0.B MM-RBR-1 Phasing for Business Relocations

The LAX Master Plan MMRP states in part:

*"**Phasing for Business Relocations.** To maximize opportunities for airport/airport-dependent businesses and other businesses being acquired to relocate in proximity to their current sites, LAWA shall, to the maximum degree feasible, schedule acquisition phasing and/or development phasing to accommodate interested parties on airport property in a manner that would avoid delays to the overall construction and development schedule."*

Status→ No action required at this time:
This measure was not applicable during the 2015 reporting period, as no LAX Master Plan improvements requiring acquisition and relocation in the Alternative D Proposed Property Acquisition Areas occurred in 2015.

6.0.C MM-RBR-2 Relocation Opportunities through Aircraft Noise Mitigation Program

The LAX Master Plan MMRP states in part:

*"**Relocation Opportunities through Aircraft Noise Mitigation Program.** As a special project under the Aircraft Noise Mitigation Program (ANMP) for LAX, LAWA shall coordinate with the City of Inglewood and the County of Los Angeles to identify residential land uses that are subject to high levels of aircraft noise where land*

acquisition and conversion to compatible land uses is contemplated under applicable plans or is otherwise deemed appropriate."

Status→ Ongoing:
LAWA supports the efforts of Inglewood and Los Angeles County in using land acquisition to achieve land use compatibility. However, because LAWA does not run their mitigation programs, it is up to those jurisdictions to identify properties for acquisition and make requests for funding to LAWA via the Grant Implementation Plan (GIP) process. During 2015, neither Inglewood nor the County submitted an acquisition GIP. Los Angeles County has never identified any properties for acquisition, and has no plans to submit an acquisition GIP.

7.0 Environmental Justice

7.0.A EJ-1 Aviation Curriculum

The LAX Master Plan MMRP states:

*"**Aviation Curriculum.** LAWA will work with local school districts to offer aviation-related curriculum at elementary schools, middle schools, high schools and colleges in affected communities near the Los Angeles International Airport. Potential pilot schools could include: Beulah Payne Elementary School, Lennox Middle School, Hillcrest Continuation School, Inglewood High School, Morningside High School, and Los Angeles Southwest College."*

Status→ Ongoing:
In 2015, LAWA continued to coordinate with local school districts in developing aviation-related curriculum. In July, LAWA offered a one-week Aviation Career Education Academy for middle school students and another for high school students. Students were recruited from Orville Wright Middle School, Westchester High School, and from other area high schools. In November, LAWA collaborated with Loyola Marymount University to organize the inaugural Day of Discovery. The event purpose was to educate and inspire local communities in the aviation and aerospace industry. LAWA held a Santa Fly-In event in December 2015 for kindergarten students from neighboring schools. At this event, students were given safety talks and introduced to airport-related jobs. LAWA also offered an on-site Flight Simulation training for students in the local communities.

7.0.B EJ-2 Aviation Academy

The LAX Master Plan MMRP states:

*"**Aviation Academy.** LAWA will work with local school districts to provide comprehensive educational and trade training for aviation-related careers, targeting students in the affected communities to provide them with increased career opportunities."*

Status→ Ongoing:
The Aviation Career Education (ACE) Academy is a free, week-long motivational program to provide students with a basic understanding of career opportunities within the aviation industry, as well as a general knowledge about LAX. This program is open to seventh-and eighth-grade students (between the ages of 12 and 14) and high school students (between the ages of 15 and 18) in communities surrounding LAX, including El Segundo, Hawthorne, Inglewood, Lennox, and Westchester/Playa del Rey. Program participants attend site visits and presentations by organizations such as the Federal Aviation Administration, NASA Jet Propulsion Laboratory, Transportation Security Administration, Airlines, Encore Flight Academy, Los Angeles Airport Police, LAX Airport Operations, and others. Approximately 35 local students participated in the program during the summer of 2015.

The Gateways Internship Program provides college and high school students with exposure to career opportunities in the aviation industry and other airport-related jobs. The Internship Program gives students on-the-job practical experience in various airport jobs through education, training, and mentoring activities to better prepare them to enter the workforce. See Section 7.0.C Job Outreach Center for more information on The Gateways Internship Program.

The BJRC conducted extensive outreach to students by attending Career Days and job fairs facilitated by various colleges, community organizations and Worksource Centers. Internship job descriptions were posted to college career and social media websites such as Facebook to create awareness. BJRC staff worked with various colleges' career advisors to continue strengthening its partnership and in 2015, LAWA's BJRC staff disseminated internship information at 34 community job fairs. Additionally, BJRC established a relationship with the Port of Los Angeles in order to create a referral system that would afford interested students living in communities surrounding the airport, an opportunity to be placed into an internship in another City Department. BJRC has and will continue to work with the Economic Workforce Development Department to be a worksite for the Mayor's Hire LA's Youth Program. Other organizations that remain partners are the International Trade Education Program (ITEP) and the Gardena Global Leadership Academy.

In addition to students from local and out-of-state schools, the BJRC also attracts international students who wish to intern at LAX. In 2015, BJRC placed international students from Brazil, China, Hong Kong, Japan, Korea and Taiwan.
Job Shadow Day is an opportunity for students to learn about the aviation industry and its career possibilities while experiencing the workplace. LAWA hosts a group of students and introduces them to the airport and the career possibilities in aviation. Each student shadows an airport employee throughout the day to witness the individual's daily work activities. In 2015, LAWA coordinated with Saint Bernard High School (Westchester) to host Job Shadow Day for approximately 20 students.

Students with one of the mentors during Job Shadow Day at LAX

The "Flight Path Flyer" flight simulation program offers basic flying skills and operating techniques on flight simulators for six-Saturday sessions at the Flight Path Museum at LAX. This community-educational based program is free and offered three times per year aimed at novice students, ranging from middle school to senior citizens. This year, each class had a one-to-one ratio of student-per-simulator, offering a more structured and personal class. In 2015, 60 students in the local communities participated in the flight simulation program.

Students participating in Flight Simulation Program hosted at the LAX Flight Path Museum

Passport to Success – launched by the Families In Schools (FIS) organization - is an innovative family engagement initiative to reduce summer learning loss by encouraging students and families to participate in summer learning activities. LAWA participated in the Passport to Success Program by hosting students at the Flight Path Learning Museum at LAX to promote aviation related careers and the rich history of LAX and aviation in Southern California. Students from kindergarten through high school participated in the program and over 100 students from various LAUSD schools visited the Flight Path Center during the summer in 2015.

Day of Discovery is a community aviation and aerospace event to educate, inspire and explore that was organized by LAWA Community Relations and Loyola Marymount University Community Relations. The inaugural event featured a booth expo, comprised of air museums, aviation schools, aerospace companies and other organizations associated with aviation or aerospace, as well as a keynote address by General Kevin Chilton, who piloted the Shuttle Endeavor. The event took place in November 2015, with over 400 attendees.

Attendees with General Kevin Chilton at the Day of Discovery

LAWA hosted schools at LAX for Aviation Career Days. These events feature speakers in the aviation industry about career opportunities at LAX and other airports. In 2015, LAWA hosted students from Los Angeles High, Leapwood Elementary, the Lennox Youth Coordinating Council, The Westside Christian Academy (TWCA), the Zeta Rho Foundation that mentors 'at risk' youth from South Central Los Angeles and students from Cal Poly Pomona.

LAX Airfield Construction Tours are an opportunity for students, airport neighbors and local community groups to learn about the various improvements being made at LAX. Tour attendees also have the opportunity to learn about careers and jobs in aviation. In 2015, LAX Community Relations hosted more than 27 civic and community, scout troops, school and college groups, chambers and rotary groups on tours to learn about the modernization of LAX and other new and ongoing construction projects at LAX. Students were mentored by LAWA professionals about aviation-related careers, and current and future plans for LAX.

LAWA continues to coordinating with local school districts to provide education and trade training programs for aviation-related careers. Participants in these education outreach programs gave the programs positive feedback.

7.0.C EJ-3 Job Outreach Center

The LAX Master Plan MMRP states in part:

"***Construction and Other LAX-Related Job Outreach -*** *LAWA will create or utilize an existing resource center to assist historically underrepresented and at-risk local*

residents to find construction and other substantive jobs with LAWA and surrounding airport-related businesses through training and comprehensive outreach."

Status→ Ongoing:

Gateways Internship Program

The Gateways Internship Program provides college and high school students with exposure to career opportunities in the aviation industry and other airport-related jobs. The Internship Program gives students on-the-job practical experience in various airport jobs through education, training, and mentoring activities to better prepare them to enter the workforce.

The Gateways Internship Program partners with various colleges such as UCLA, USC, Cal State University of Long Beach, Cal State University of Los Angeles, Loyola Marymount, West Los Angeles College, Cal State Fullerton, Cal State University, Northridge, Cal State University Dominquez Hills, Cerritos College, Santa Monica College, East Los Angeles Community College, Los Angeles Trade Technical College, and Southwest College.

LAWA partners with various community and faith based organizations such as the Brotherhood Crusade, Watts Labor Community Action Committee (WLCAC), and Los Angeles Job Corps to place students into its internship program. Since its inception, the Gateways Program has placed more than 1,212 students in a wide range of internship positions including: Accounting, Administration, Airport Operations, Airports Development Group, City Attorney Office, Commercial Development Group, Community Relations, Human Resources, Information Management and Technology Group, Planning and Engineering, Facilities Maintenance and Utilities, Environmental and Land Use Planning, Office of Regulatory Compliance & Standards, Public Relations, and FAA-related.

LAWA's Gateways Program is comprised of four internship programs

- Gateways College Student Professional Worker Program
- Gateways College Volunteer Internship Program
- Gateways International Student Professional Worker Program
- Gateways High School Volunteer Internship Program

In 2015, the BJRC placed over 42 students through its four programs in various internships in LAWA divisions. BJRC placed students into the internship program primarily through partnerships with local Universities, Community Colleges and Community and Faith-based organization.

The BJRC conducted extensive outreach to students by attending Career Days and job fairs facilitated by various colleges, community organizations and Worksource Centers. Internship job descriptions were posted to college career and social media websites such as Facebook to create awareness. BJRC staff worked with various colleges' career advisors to continue strengthening its partnership, and in 2015, BJRC staff disseminated internship information at 34 community job fairs. Additionally, BJRC established a relationship with the Port of Los Angeles to create a referral system that would afford

interested students living in communities surrounding the airport, an opportunity to be placed into an internship in another City Department. BJRC has and will continue to work with the Economic Workforce Development Department to be a worksite for the Mayor's Hire LA's Youth Program. Other partner organizations are the International Trade Education Program (ITEP), Gardena Global Leadership Academy.

In addition to students from local and out-of-state schools, the BJRC also attracts international students who wish to intern at LAX. In 2015, BJRC placed international students from Brazil, China, Hong Kong, Japan, Korea and Taiwan.

Job Training Program

Although the FAA has not approved a job training program (JTP) for LAWA, and therefore no LAWA funds may be used for job training, LAWA uses its relationships with various agencies funded to provide job training.

Through relationships with over 15 JTP partners, LAWA, through its Business and Job Resources Division (BJRD), initiated its JTP in January 2007. LAWA worked with agencies funded through other means to provide job training opportunities to residents in the Project Impact Area (PIA). Currently, LAWA is working with agencies that provide an array of training, including computer skills, customer service, time management, bilingual skills, leadership skills, and other classes.

Many local residents have completed training in customer service, retail sales, auto mechanics and other disciplines through the LAWA partnerships. The Mayor's Office initiated discussions with area Work Source Centers, the Los Angeles Community College District and surrounding LAWA businesses to conduct Hospitality Training for local residents. Plans are underway to create training modules that will result in career paths for residents within the hospitality industry. Upon the completion of training, these candidates will be well-positioned to compete for job opportunities at the hotels or with various Airport employers.

JTP Referrals in 2015:	45	Program-to-Date:	883
Completed Training in 2015:	22	Program-to-Date:	510

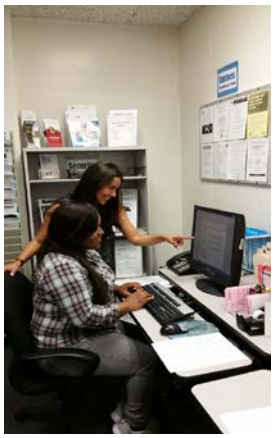
First Source Hiring Program

The First Source Hiring Program (FSHP) is designed to provide residents from the communities surrounding the airport and those most impacted by airport operations access to airport jobs. Those communities are a part of the Project Impact Area (PIA) and are comprised of South Los Angeles, El Segundo, Hawthorne, Inglewood, and Lennox.

The Business and Jobs Resources Center (BJRC) works closely with local Community Organizations such as Work Source Centers, One-Stop Centers, and faith-based organizations to promote airport jobs for LAX employers. FSHP provides training to these organizations on how to apply for jobs at LAX and what is needed to obtain a job at LAX.

In October 2015, the FSHP implemented a new online website and technology named Jobs@LAX. The new website can be viewed by the public at www.jobsatlax.org.

Jobs@LAX's technology allows airport employers to have their jobs automatically posted to the website from their company website and, also, allows the airport employer to manually post jobs to the website. This technology is a vast improvement from the former technology used by the FSHP because it encourages airport employer participation resulting in more airport jobs being posted for job seekers. The public's and airport's responses to the new technology have been positive. BJRC also participates in community job fairs and events to promote the FSHP and provide employment assistance to job seekers. In 2015, BJRC attended 37 job fairs.



LAWA representative informing job seeker at El Camino College Job Fair of employment opportunities available at LAWA

LAWA representatives announcing new website, Jobs at LAX, at a job fair

	January 1 to October 13, 2015 Former Technology	**October 14 to December 31, 2015 New Technology**
Job Openings	1,246	742
LAX Employers	168	137
Community Organizations	104	104

For more information on the First Source Hiring Program, please visit the program website at http://www.lawa.org/bjrc/Employment.aspx?id=2058.

7.0.D EJ-4 Community Mitigation Monitoring

The LAX Master Plan MMRP states:

*"**Community Mitigation Monitoring.** LAWA will include community participation in monitoring the implementation of the final Mitigation Measures and Master Plan Commitments in order to ensure agency compliance and accountability. The community participation will include a diverse group of residents, stakeholders, environmental specialists and community leaders that will convene on a regular basis."*

Status→ Ongoing:
The Los Angeles City Council created the LAX Master Plan Stakeholders Liaison Office (LAX MP SLO) as a component of the LAX Plan and the LAX Specific Plan to ensure public participation in the implementation of the LAX Master Plan. The LAX MP SLO provides stakeholders with direct access to applicable information on the LAX Master Plan.

In 2015, LAWA did not process any new LAX Master Plan projects.

8.0 Air Quality

8.0.A AQ-1 Air Quality Source Apportionment Study

The LAX Master Plan MMRP states in part:

*"**Air Quality Source Apportionment Study.** LAWA will conduct an air quality source apportionment study to evaluate the contribution of on-airport aircraft emissions to off-airport air pollutant concentrations."*

Status → Completed:
LAWA completed the LAX Air Quality and Source Apportionment Study (AQSAS) in 2013, and presented it to LAWA's Board of Airport Commissioners on June 18, 2013.

The study and informational materials can be found, at http://www.lawa.org/AirQualityStudy.aspx?id=7716, entitled Final Report and Materials..

8.0.B AQ-2 School Air Filters

The LAX Master Plan MMRP states:

*"**School Air Filters.** LAWA will provide funding for air filtration system at qualifying public schools with air conditioning systems in place. The qualifying schools will be determined based upon review of the conclusions and recommendations of the Air*

Quality Source Apportionment Study to be conducted in Master Plan Commitment AQ-1."

Status→ In Progress:
The funding and implementation of the Master Plan commitments, as well as the MMRP mitigation measures, are subject to LAWA's ability to use airport revenue to the extent permissible under federal law and policies, or to develop other state or federal funding sources. On December 3, 2013, LAWA requested that the FAA make a determination on whether airport revenues may be used to provide funding for MMRP Commitment AQ-2, School Air Filters. LAWA did not receive FAA's formal response in 2015.

8.0.C AQ-3 Mobile Health Research Lab

The LAX Master Plan MMRP states:

"***Mobile Health Research Lab**. LAWA will explore the ability to fund/co-fund, to the extent feasible and permissible by federal and local regulations, or seek funding sources to support the goal of a Mobile Health Research Lab. The goal of the Mobile Health Research Lab will be to research and study, not diagnose or treat, upper respiratory and hearing impacts that may be directly related to the operation of LAX."*

Status→ Completed:
The funding and implementation of the Master Plan commitments, as well as the MMRP mitigation measures, are subject to LAWA's ability to use airport revenue to the extent permissible under federal law and policies, or to develop other state or federal funding sources. On November 23, 2015, LAWA received a letter from the FAA stating that airport revenues may not be used to provide funding for MMRP Commitment AQ-3, Mobile Health Research Lab. A mobile lab was not included in the 2005 LAX Master Plan's Record of Decision as mitigation to Alternative "D" at LAX, significant portions of which LAWA has yet to implement. Also, the FAA stated that a mobile health research lab is not a design refinement of, nor a mitigation of, an airport development project.

8.0.D MM-AQ-1 LAX Master Plan – Mitigation Plan for Air Quality (Framework)

The LAX Master Plan MMRP states in part:

*"**LAX Master Plan - Mitigation Plan for Air Quality** - LAWA shall expand and revise the existing air quality mitigation programs at LAX through the development of an LAX Master Plan – Mitigation Plan for Air Quality (LAX MP-MPAQ)."*

Status→ Plan Established, Implementation Ongoing:
In 2005, LAWA completed a Mitigation Plan for Air Quality that established the overall framework for the implementation of specific measures for mitigating air quality impacts associated with the LAX Master Plan. The BOAC adopted the MM-AQ-1 Plan in December 2005, in conjunction with approval of the SAIP - prior to implementation of the first project under the LAX Master Plan.

8.0.E MM-AQ-2 Construction-Related Mitigation Measures

The LAX Master Plan MMRP states in part:

*"**Construction-Related Mitigation Measures** - The required components of the construction-related air quality mitigation measures are itemized below [starting on page 4-725 of the FEIR]. These components include numerous specific actions to reduce emissions from on-road and non-road mobile sources and stationary engines. All of these measures must be in place prior to commencement of the first Master Plan construction project and must remain in place through build out of the Master Plan. An implementation plan will be developed which provides available details as to how each of the elements of this construction-related mitigation measures will be implemented and monitored."*

Status→ Plan Established, Implementation Ongoing:
LAWA completed a Construction-Related Mitigation Plan that set forth specific implementation requirements for the measures referenced in the LAX Master Plan Final EIR. The BOAC adopted the MM-AQ-2 Plan in December 2005, in conjunction with approval of the SAIP - prior to implementation of the first project under the LAX Master Plan - and LAWA has integrated required measures into the individual project construction specifications as appropriate, including those for BWP, WAMA, and MSC. The execution of this implementation plan (the MM-AQ-2 Plan) occurs in conjunction with construction of each Master Plan project.

BWP Status→ Ongoing:
Several components of the BWP were underway in 2015, including interior improvements to the Bradley West core and continued work on the TBIT Renovation, including renovation of the east aprons. The interior improvements did not involve work that required compliance with MM-AQ-2. Mitigation monitors checked construction work on the TBIT Renovation on an ongoing basis.

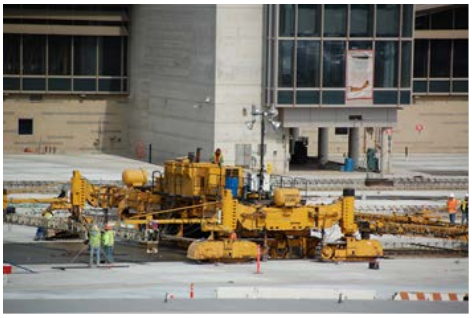
For the TBIT Renovation, the contractors implemented measures to minimize fugitive dust in compliance with mitigation requirements and with SCAQMD Rule 403, including regular watering of construction areas, watering or covering of soil stockpiles, street sweeping of roadways and exits, use of track out plates and wheel washing, and covers for trash and haul trucks. Contractors also implemented mitigations for on-road mobile source emissions, including scheduling regular shift times to avoid off-peak periods (when travel speeds are lower), and use of an on-site rock crushing facility for concrete removed from the aprons**.** Mobile source controls followed the requirements of MM-AQ-2. Construction vehicles were parked in areas away from sensitive receptors and employees were shuttled from a construction employee parking lot to the work site by bus, which served to reduce employee vehicle emissions. Vehicle operators were instructed that no vehicle idling is permitting in excess of 5 minutes during periods of non-active vehicle use. Vehicle idling is monitoring by an independent Third Party Monitor; no written violations pertaining to excessive equipment idling occurred. In addition, mitigation monitors reviewed maintenance plans for construction equipment. Contractors use only ultra-low sulfur diesel (ULSD) fuel in construction equipment, as this is the only fuel commercially available. No shortage of ULSD was experienced within Southern California during the 2015 reporting period and no substitution of ULSD occurred on the BWP project.

Use of Best Available Emissions Control Devices (BACT)

The Independent Third Party Monitor reviewed the documentation submitted by the Contractors for each piece of diesel equipment used or planned to be used on the TBIT Renovation – East Aprons project relative to compatibility with Best Available Emissions Control Devices. To assist in performance of this measure, the Independent Third Party Monitor developed and implemented a monitoring process to track each piece of diesel equipment and document each construction firm's compliance as it related to outfitting their diesel construction equipment with the best available emissions control devices.

To date, the Independent Third Party Monitor has evaluated a total of 343 pieces of equipment. For on-road vehicles, a total of 80 trucks were evaluated; 28 met or exceeded the EPA 2007 standards and were equipped with a factory installed VDECS. Five (5) additional vehicles have undergone a VDECS retrofit. It was determined that 34 on-road vehicles did not have a compatible CARB-verified or EPA certified VDECS available at the time construction commenced. Finally, 13 on-road trucks were found to have a compatible VDECS available; these vehicles were either awaiting VDECS installation prior to accessing the airfield construction site or were removed from consideration by the construction contractor. Relative to off-road diesel equipment, a total of 263 pieces of construction equipment have undergone independent monitoring. One hundred-sixty (160) were certified by the USEPA as compliant with Tier 4 or Tier 4-Interim Emissions Standards – this equipment is configured with a factory-installed diesel emission control system. Thirty-seven (37) pieces of off-road equipment have undergone a VDECS retrofit. Ten (10) pieces of equipment were determined to not have a VDECS available at the time construction commenced. Twenty-two (22) pieces of equipment were granted a driver safety "line of sight" exemption in accordance with Cal/OSHA requirements and Section X.F.4 of the Community Benefits Agreement. A total of 30 vehicles were identified as having one or more compatible VDECS commercially available; these vehicles were either awaiting VDECS installation or were removed from project consideration. Finally, the Third Party Monitor was unable to identify any documentation relative to four (4) pieces of equipment – this equipment may no longer be proposed for airfield use.

Off-road diesel equipment operating on the TBIT Renovation – East Aprons construction project whose engines were determined to be compatible with a Level 3 VDECS, but not retrofitted with the best available emissions control technology, were documented to ensure that the equipment had been granted an exemption in accordance with Section X.F.4 of the Community Benefits Agreement.



Paving Equipment Operating at TBIT Renovation – East Apron

Emission Reduction

Approximately 443 vehicles and equipment associated with both the BWP TBIT Renovation – East Aprons project and the WAMA project (including both the LAWA component and the Qantas Hangar component) were equipped with diesel emission control systems that met or exceeded the CARB Level 3 standard of 85 percent or greater reduction in diesel particulate matter. No Level 1 or Level 2 VDECS were identified for equipment assessed pursuant to Section X.F.1 of the Community Benefits Agreement.

The Third Party Monitor verified with CARB that the Level 3 devices utilized on the TBIT Renovation – East Apron construction project did not result in an increase of any pollutant above which is standard for that equipment's engine.

Exemptions

The Third Party Monitor reviewed each piece of diesel construction equipment proposed for use on the TBIT Renovation – East Aprons construction project as it pertained to the requirements of Sections X.F.1 and X.F.3 of the Community Benefits Agreement and independently determined if a CARB verified or USEPA certified diesel emission control system was compatible. These findings were documented and compared with exemptions granted by LAWA.

Equipment whose use on the TBIT Renovation – East Aprons construction project would not exceed twenty (20) calendar days per calendar year are eligible to be granted a "20-day" exemption by LAWA. The Third Party Monitor maintains an independent database of all equipment operating under the 20-day exemption rule, including the date the equipment was moved onsite and the date the equipment was required to be removed from the airfield. No 20-day exemptions have been granted to date on the Tom Bradley International Terminal Renovation – East Aprons project.

The Third Party Monitor reviewed and documented cases where it was determined that the VDECS would impair the equipment operator's field of vision. These vehicles were granted a safety exemption by LAWA. Specific classes of diesel equipment, including motor graders, received an exemption from LAWA on the basis of safety. The Independent Third Party Monitor reviewed and documented each piece of diesel construction equipment that received a safety exemption. To date, approximately 24 pieces of equipment have been granted a safety waiver on approximately 22 pieces used on the Tom Bradley International Terminal Renovation – East Aprons project.

WAMA Status→ Ongoing:
WAMA's compliance with this measure is accomplished through implementation of LAX-AQ-2. See measure 8.0.I LAX-AQ-2 – Construction-Related Measures (WAMA), below.

MSC Status→ Ongoing:
MSC's compliance with this measure is accomplished through implementation of LAX-AQ-2. See measure 8.0.M LAX-AQ-2 – Construction-Related Measures (MSC), below.

8.0.F MM-AQ-3 Transportation-Related Mitigation Measures

The LAX Master Plan MMRP states in part:

*"**Transportation-Related Mitigation Measure** - The primary feature of the transportation-related air quality mitigation measure is the development and construction of at least eight (8) additional sites with Flyaway service similar to the service provided by the Van Nuys Flyaway currently operated by LAWA. The intent of these FlyAway sites is to reduce the quantity of traffic going to and from LAX by providing regional locations where LAX employees and passengers can pick up an LAX-dedicated, clean-fueled bus that will transport them from a FlyAway closer to their home or office into LAX and back."*

Status→ In Progress:
In 2015, LAWA operated six FlyAway routes between LAX and remote boarding locations at Van Nuys, Union Station, Westwood/UCLA, Santa Monica, Hollywood, and Long Beach. The Long Beach Line FlyAway opened in late December 2015.

The full 2015 FlyAway network service realized an average daily ridership of 4,486 passengers, reduced vehicle emissions by 19.7 tons each day, and removed 3,507 vehicles trips per day, travelling a combined total of 71,550 miles per day on roads accessing and egressing LAX Airport.

LAWA continues to promote the FlyAway at various travel, aviation and community events. Complete information about the FlyAway is available at www.LAXFlyAway.org.

In 2016, one new FlyAway location is planned at the Orange Line station on Woodley in Van Nuys. This location will provide a seamless transit link from the Orange Line in the San Fernando Valley, and bus connections to the Orange Line from points north and south of the Orange Line and from Simi Valley.

Union Station to LAX FlyAway

Table 1: Summary of CY 2015 FlyAway Network Service Locations & Level of Service					
Route Name	Week Operating	Bus Trips Runs	Passengers	Average Passengers/ Bus	Operating Dates
Van Nuys	52	43,338	989,513	22.8	Since 1975; facility upgraded: 12/2005
Union Station	52	33,067	512,902	15.5	Since 03/15/2006
Westwood	52	12,667	47,592	3.8	Since 06/14/2007
Santa Monica	26	12,664	16,180	1.3	Since 07/15/2014
Hollywood	52	12,556	71,164	5.7	Since 09/03/2014
Long Beach	1	n/a	70		Opened December 2015
La Brea/ Expo	0	0	0		07/01/2016 to 09/02/2014
Irvine	0	0	0		11/16/2009 to 08/31/2012
Orange Line	0	0	0		Pending
TOTALS:		**114,292**	**1,637,421**		

Table 2: LAX FlyAway Network Emissions Reduction Summary: CY 2007 thru 2015

(Emissions reported include NOX, CO, ROG, PM10 and CO2) - *Locations open partial year shown in italics.*

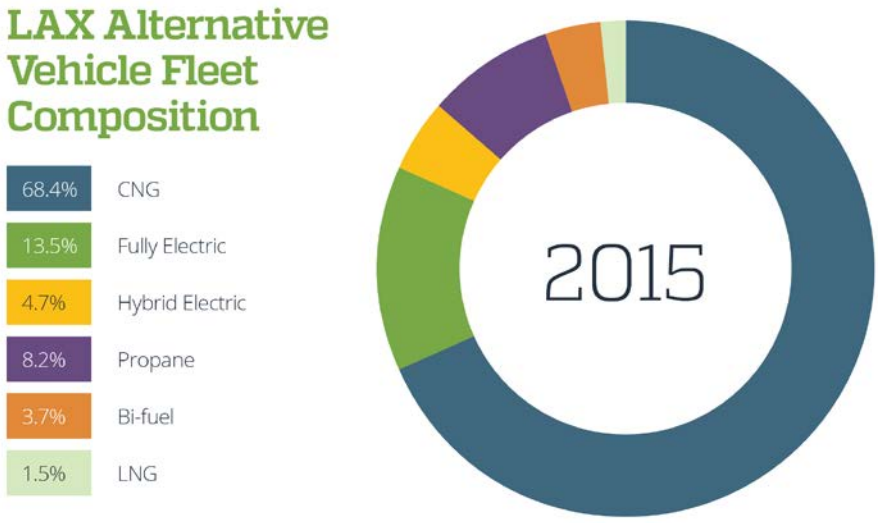
ROUTE DATA		2007	2008	2009	2010	2011	2012	2013	2014	2015
Van Nuys	Ridership	946,018	987,705	880,024	807,485	835,346	887,260	890,740	957,602	989,513
	Vehicle Trips Saved	790,203	839,491	747,969	686,315	709,995	754,119	741,013	796,636	823,183
	Reduction in Miles Traveled	16.6 million	17.6 million	15.7 million	14.4 million	14.9 million	15.8 million	15.6 million	16,729,354 miles	17,286,840 miles
	Emissions reduced	5,484 tons	7,400.6 tons	6,455.5 tons	5,595.2 tons	6,033.5 tons	6,296.8 tons	4,808.3 tons	5,264.0 tons	5,495.3 tons
	Auto operating cost savings	$9,325,979	$11.0 million	$9.8 million	$6.8 million	$8.4 million	$9.4 million	$9.5 million	$9,853,589	$10,043,654
Union Station	Ridership	329,323	433,216	409,491	413,975	434,096	455,919	508,019	531,702	512,902
	Vehicle Trips Saved	275,082	368,208	348,043	351,854	368,956	387,504	352,277	368,699	355,663
	Reduction in Miles Traveled	5.4 million	7.3 million	6.9 million	6.9 million	7.3 million	7.7 million	6.9 million	7,300,241 miles	7,042,118 miles
	Emissions reduced	801 tons	2,549.8 tons	2,322.2 tons	2,328.9 tons	2,496.3 tons	2,674.3 tons	1,751.8 tons	1,804.4 tons	1,707.8 tons
	Auto operating cost savings	$3,060,998	$4.5 million	$4.3 million	$3.3 million	$4.1 million	$4.6 million	$4.2 million	$4,299,842	$4,091,471
Westwood	Ridership	49,137	125,288	115,048	107,136	97,337	84,179	78,030	62,704	47,592
	Vehicle Trips Saved	41,044	106,487	97,784	91,059	82,731	71,547	60,460	48,585	36,876
	Reduction in Miles Traveled	316,038	1.3 million	1.2 million	1.1 million	1.0 million	0.9 million	0.7 million	583,020 miles	442,509 miles
	Emissions reduced	- 633.0 tons	67.7 tons	211.9 tons	204 tons	187.4 tons	158.2 tons	174.6 tons	118.3 tons	60.9 tons
	Auto operating cost savings	$177,613	$796,000	$731,000	$618,000	$562,000	$511,000	$441,000	$343,399	$257,098
Santa Monica	Ridership								7,407	16,180
	Vehicle Trips Saved								5,762	12,588
	Reduction in Miles Traveled								46,101 miles	100,704 miles
	Emissions reduced								-19.4 tons	- 40.4 tons
	Auto operating cost savings								$27,154	$722,397
Hollywood	Ridership								16,682	71,164
	Vehicle Trips Saved								12,144	51,807
	Reduction in Miles Traveled								291,466 miles	1,243,369 miles
	Emissions reduced								- 67.5 tons	- 48.2 tons
	Auto operating cost savings								$171,674	$58,509
Long Beach	Ridership									70
	Vehicle Trips Saved									
	Reduction in Miles Traveled									
	Emissions reduced									
	Auto operating cost savings									
Orange Line	Ridership									
	Vehicle Trips Saved									
	Reduction in Miles Traveled									
	Emissions reduced									
	Auto operating cost savings									
La Brea Expp	Ridership							1,210	848	
	Vehicle Trips Saved							932	654	
	Reduction in Miles Traveled							7,000 miles	5,227 miles	
	Emissions reduced							- 19.4 tons	- 26.5 tons	
	Auto operating cost savings							$4,534	$3,079	
Irvine	Ridership			1,500	13,604	16,504	11,897			
	Vehicle Trips Saved			1,275	11,563	14,027	10,112			
	Reduction in Miles Traveled			60 Th. miles	580 Th. miles	701 Th. miles	505 Th. miles			
	Emissions reduced			N/A	- 81 tons	- 20.3 tons	5.5 tons			
	Auto operating cost savings			$40,000	$327,000	$397,000	$301,000			
Network Summary	Ridership	1,324,478	1,546,209	1,406,063	1,342,200	1,383,283	1,439,255	1,477,999	1,576,945	1,637,421
	Vehicle Trips Saved	11,063,329	1,314,186	1,195,295	1,140,791	1,175,709	1,223,282	1,154,682	1,232,480	1,280,117
	Reduction in Miles Traveled	22.3 M. miles	26.2 M. miles	23.8 M. miles	23.0 M. miles	23.9 M. miles	24.9 M. miles	23.2 M. miles	24.9 miles	26,115,540 miles
	Emissions reduced	5,652 tons	10,018 tons	8,990 tons	7,966 tons	8,697 tons	9,134.8 tons	6,715.3 tons	7,073.3 tons	7,175.4 tons
	Auto operating cost savings	$12,6 million	$16.3 million	$14.9 million	$13.0 million	$13.5 million	$14.8 million	$14.1 million	$14.7 million	$15,173,129

*"**Transportation-Related Mitigation Measure** – Other feasible mitigation elements may be developed to ensure that the emission reductions for this transportation-related measure are achieved. These may include, for example"… Clean Vehicle Fleets measures such as:*

- *Promoting commercial vehicles/trucks/vans using terminal areas (LAX and regional intermodal) to install SULEZ/ZEV engines to reduce vehicle air emissions.*

100% of LAWA's LAX Shuttles are fueled by Compressed Natural Gas (CNG)

Status→ In Progress:
LAWA's fleet is the largest Alternative Fuel Vehicle (AFV) airport fleet in the nation. In 2015, 59 percent of the LAX fleet (a total of 1,013 vehicles) used alternative fuels, consisting primarily of compressed natural gas (CNG), liquefied natural gas (LNG), propane, full electric, and hybrid-electric vehicles. Additionally, 100 percent of the LAX courtesy shuttle fleet was powered by natural gas. LAWA has a state-of-the-art, high-technology LNG/LCNG fueling station at LAX.



LAWA's LAX Alternative Fuel Vehicle Fleet by Fuel Type

In 2015, LAWA installed its first level-3 DC fast charger in parking structure P1, inside the LAX Central Terminal Area. The fast charger is available on a first come, first served basis for a maximum of 30 minutes. It can charge an electric vehicle in 20 minutes or less. The Los Angeles Department of Water and Power (LADWP) installed the charger in September 2015, bringing the number of electric vehicle (EV) charging stations at LAX to 60, including 53 for public use.

Additionally LAWA's Commercial Development Group (CDG) identified the Admin West, P2-B, and P7 parking lots as the locations for 24 new level-2 chargers to be installed during 2016. The new chargers are funded by a California Energy Commission (CEC) grant, PON-13-606, awarded to LADWP and LAWA as part of their Alternative and Renewable Fuel and Vehicle Technology Program.

LAWA's AFV program has been recognized as
one of the most successful airport AFV programs in the nation
and a world-class model for airports and other agencies

8.0.G MM-AQ-4 Operations-Related Mitigation Measures

The LAX Master Plan MMRP states in part:

*"**Operations-Related Mitigation Measure:** The primary component of the operations-related air quality mitigation measure consists of one airside item, the conversion of ground support equipment (GSE) to extremely low emission technology (such as electric power, fuel cells, or other future technological developments)."*

Status→ In Progress:
LAWA updated the 2007 LAX GSE inventory by completing a comprehensive e-GSE feasibility study in 2013. Based on the updated feasibility study, LAWA reviewed and analyzed strategies and options to achieve GSE emission reductions in consultation with airlines. LAWA's GSE strategies are aligned with the California Air Resources Board's current approach to achieving GSE emission reductions. In April 2015 LAWA's Board of Airport Commissioners adopted a Ground Support Equipment Emissions Policy to reduce emissions. This requirement is in effect at LAX. The Policy calls for GSE operators to:

1. Reduce their fleet-wide GSE emissions to 2.65 g/bhp-hr by December 31, 2021;
2. Provide LAWA with an interim assessment of the fleet-wide emission as of March 1, 2019;
3. Provide LAWA with an annual accounting of the composite HC plus NOx emission factors of their LAX GSE fleet; and
4. Provide LAWA with fleet inventory data for their LAX GSE Fleet that is consistent with data provided to the California Air Resources Board (CARB) and in a form or forms as requested by LAWA on an annual basis.

Current LAX GSE inventory includes emission-saving electric forklift

Current LAX GSE inventory includes emission-saving SmarteCarte electric baggage cart retriever

WAMA Status→ Ongoing:
WAMA's compliance with this measure is accomplished through implementation of LAX-AQ-4. See measure 8.0.J LAX-AQ-4 – Operations-Related Control Measures (WAMA), below

MSC Status→ Ongoing:
MSC's compliance with this measure is accomplished through implementation of LAX-AQ-4. See measure 8.0.O LAX-AQ-4 – Operations-Related Control Measures (MSC), below.

8.0.H LAX-AQ-1 – General Air Quality Control Measures (WAMA)

The WAMA MMRP states in part:

"This measure describes a variety of specific actions to reduce air quality impacts associated with projects at LAX, and applies to all projects. Specific measures are identified below:"

1a "Watering (per SCAQMD Rule 403 and CalEEMod default) – twice daily"
1b "Ultra-low sulfur diesel (ULSD) fuel will be used in construction equipment.
1c Post a publicly visible sign with the telephone number and person to contact regarding dust complaints; this person shall respond and take corrective action within 24 hours. "
1d "Prior to final occupancy, the applicant demonstrates that all ground surfaces are covered or treated sufficiently to minimize fugitive dust emissions."
1e "All roadways, driveways, sidewalks, etc., being installed as part of the project should be completed as soon as possible; in addition, building pads should be laid as soon as possible after grading."
1f "Prohibit idling or queuing of diesel-fueled vehicles and equipment in excess of five minutes. This requirement will be included in specifications for any LAX projects requiring on-site construction."
1g "Require that all construction equipment working on-site is properly maintained (including engine tuning) at all times in accordance with manufacturers' specifications and schedules."

WAMA Status→ Ongoing:
The status of these measures during the reporting period is as follows:

1a Both the LAWA and Qantas components of the WAMA project employ effective dust control programs. Watering for dust control during construction activities was done in accordance with SCAQMD Rule 403.
1b ULSD is the only fuel commercially available and is used in all construction equipment. No shortage of ULSD was experienced within Southern California during the 2015 reporting period, and no substitution of ULSD occurred on the WAMA project.
1c Completed. A sign was posted on Pershing Drive (see photo). No phone calls were received during the reporting period.

Dust Complaint Sign on Pershing Drive

1d On the LAWA component, LAWA completed all major concrete work associated with the WAMA apron in 2015 and Phase I of the project was operational in December 2015. The remaining disturbed ground surfaces will be treated in 2016. For the Qantas hangar component, LAWA contractors poured concrete foundations in 2015; the remainder of the site remained unpaved and under construction.

1e On the LAWA component, LAWA completed all major concrete work associated with the WAMA apron was completed in 2015 and Phase I of the project was operational in December 2015. For the Qantas hangar component, LAWA contractors poured concrete foundations in 2015.

1f This requirement is included in the construction specifications for the LAWA WAMA project and is required as a condition of the Qantas lease**.** LAWA monitors and inspectors monitored compliance with this requirement. There were no written violations in 2015.

1g This requirement is included in the construction specifications for the WAMA project and is required as a condition of the Qantas lease**.** LAWA inspectors and monitors monitor compliance with this requirement. When new diesel equipment was proposed to be used, construction firm was required to submit, in writing, the scheduled maintenance procedures for the equipment. All such maintenance plans were reviewed by LAWA monitors.

8.0.I LAX-AQ-2 – LAX Master Plan - Mitigation Plan for Air Quality; Construction-Related Measures (WAMA)

The WAMA MMRP states:

"This measure describes numerous specific actions to reduce fugitive dust emissions and exhaust emissions from on-road and off-road mobile and stationary sources used in construction. Some components of LAX-AQ-2 are not readily quantifiable, but would be implemented as part of LAX Master Plan projects. These control strategies are expected to reduce construction-related emissions." The mitigation elements presented in LAX-AQ-2 were derived from LAX Master Plan Mitigation Measure MM-AQ-2. "Specific measures applicable to the Project are below:"

2a "All diesel-fueled equipment used for construction will be outfitted with the best available emission control devices, where technologically feasible, primarily to reduce emissions of diesel particulate matter (PM), including fine PM ($PM_{2.5}$), and secondarily, to reduce emissions of NO_X. This requirement shall apply to diesel-fueled off-road equipment (such as construction machinery), diesel-fueled on-road vehicles (such as trucks), and stationary diesel-fueled engines (such as electric generators). (It is unlikely that this measure will apply to equipment with Tier 4 engines.) The emission control devices utilized in construction equipment shall be verified or certified by California Air Resources Board or US Environmental Protection Agency for use in on-road or off-road vehicles or engines. For multi-year construction projects, a reassessment shall be conducted annually to determine what constitutes a best available emissions control device."

2b "Watering (Watering (per SCAQMD Rule 403 and CalEEMod default) – three times daily."

2c *"Pave all construction access roads at least 100 feet onto the site from the main road."*

2d *"To the extent feasible, have construction employees' work/commute during off-peak hours."*

2e *"Make available on-site lunch trucks during construction to minimize off-site worker vehicle trips."*

2f *"Utilize on-site rock crushing facility, when feasible, during construction to reuse rock/concrete and minimize off-site truck haul trips."*

2g *"Specify combination of electricity from power poles and portable diesel- or gasoline-fueled generators using "clean burning diesel" fuel and exhaust emission controls."*

2h *"Suspend use of all construction equipment during a second- stage smog alert in the immediate vicinity of LAX."*

2i *"Utilize construction equipment having the minimum practical engine size (i.e., lowest appropriate horsepower rating for intended job)."*

2j *"Prohibit tampering with construction equipment to increase horsepower or to defeat emission control devices."*

2k *"The contractor or builder shall designate a person or persons to ensure the implementation of all components of the construction-related measure through direct inspections, record reviews, and investigations of complaints."*

2l *"LAWA will locate rock-crushing operations and construction material stockpiles for all LAX-related construction in areas away from LAX-adjacent residents, to the extent possible, to reduce impacts from emissions of fugitive dust."*

2m *"LAWA will ensure that there is available and sufficient infrastructure on-site, where not operationally or technically infeasible, to provide fuel to alternative-fueled vehicles to meet all requests for alternative fuels from contractors and other users of LAX. This will apply to construction equipment and to operations-related vehicles on-site. This provision will apply in conjunction with construction or modification of passenger gates related to implementation of the LAX Master Plan relative to the provision of appropriate infrastructure for electric GSE."*

2n *"On-road trucks used on LAX construction projects with a gross vehicle weight rating of at least 19,500 pounds shall, at a minimum, comply with USEPA 2007 on-road emissions standards for PM10 and NOX."*

WAMA Status→ Ongoing:

The status of these measures during the reporting period is as follows:

2a The Third Party Monitor reviewed each piece of diesel construction equipment proposed for use on the WAMA project, including both the LAWA component and the Qantas Hangar component. The results of this monitoring are described below.

Use of Best Available Emissions Control Devices (BACT)

The Independent Third Party Monitor reviewed the documentation submitted by the Contractors for each piece of diesel equipment utilized or planned for possible utilization on LAWA and Qantas hangar components of the WAMA project relative to compatibility with Best Available Emissions Control Devices. To assist in performance of this measure, the Independent Third Party Monitor developed and implemented a monitoring process to track each piece of diesel

equipment and document each construction firm's compliance as it related to outfitting their diesel construction equipment with the best available emissions control devices.

To date, a total of 360 pieces of equipment have undergone Independent Third Party Monitor evaluation. Of this value, LAWA approved 298 pieces or airfield use. A total of 142 on-road vehicles were evaluated; 103 met or exceeded the USEPA 2007 standards and were equipped with a factory installed VDECS. Forty-two (42) on-road vehicles, primarily dirt and rock-hauling trucks, were granted an exemption in accordance with Section X.F.4 of the Community Benefits Agreement. With respect to off-road equipment, a total of 218 pieces of construction equipment have undergone independent monitoring. One hundred (100) were certified by the USEPA as compliant with Tier 4 or Tier 4-Interim Emissions Standards – this equipment is configured with a factory-installed diesel emission control system. Finally, a total of 62 vehicles or pieces of equipment were not approved for airfield use by LAWA due to their failure to meet the requirements of Section X.F.1 of the Community Benefits Agreement. Off-road diesel equipment operating on the WAMA construction projects whose engines were determined to be compatible with a Level 3 VDECS, but not retrofitted with the best available emissions control technology, were documented to ensure that the equipment had been granted an exemption in accordance with Section X.F.4 of the Community Benefits Agreement.

Paving Substantially Complete at WAMA Construction Site as of December 2015

Qantas Hangar Construction Adjacent to LAWA Component Site

Emission Reduction

Approximately 443 vehicles and equipment associated with both the BWP TBIT Renovation – East Aprons project and the WAMA project (including both the LAWA component and the Qantas Hangar component) were equipped with diesel emission control systems that met or exceeded the CARB Level 3 standard of 85 percent or greater reduction in diesel particulate matter. No Level 1 or Level 2 VDECS were identified for equipment assessed pursuant to Section X.F.1 of the Community Benefits Agreement.

The Third Party Monitor verified with CARB that the Level 3 devices utilized on the WAMA construction projects did not result in an increase of any pollutant above which is standard for that equipment's engine.

Exemptions

The Third Party Monitor reviewed each piece of diesel construction equipment proposed for use on the WAMA project, including both the LAWA component and the Qantas Hangar component, as it pertained to the requirements of Sections X.F.1 and X.F.3 of the Community Benefits Agreement and independently determined if a CARB verified or USEPA certified diesel emission control system was compatible. These findings were documented and compared with exemptions granted by LAWA. Findings for this measure are as follows:

Equipment whose engine is compatible with a CARB verified or USEPA certified diesel emission control system, but whose use on the WAMA project would not exceed twenty (20) calendar days per calendar year was granted a "20-day" exemption by LAWA. The Third Party Monitor maintained an independent database of all equipment operating under the 20-day exemption rule, including the date the equipment was moved onsite and the date the equipment was required to be removed from the airfield. Three (3) pieces of equipment received a 20-day exemption on the WAMA project.

The Third Party Monitor reviewed and documented cases where it was determined that the VDECS would impair the equipment operator's field of vision. These vehicles were granted a safety exemption by LAWA. Specific classes of diesel equipment, including motor graders, received an exemption from LAWA on the basis of safety. The Independent Third Party Monitor reviewed and documented each piece of diesel construction equipment that received a safety exemption. To date, one (1) piece of equipment associated with the LAWA and Qantas hangar components was granted a safety waiver. In addition, one (1) piece of construction equipment was granted an exemption based on having an engine less than 50 horsepower (hp).

2b Both the LAWA and Qantas components of the WAMA project employ very effective dust control programs. Watering for dust control during construction activities was done in accordance with SCAQMD Rule 403.

2c Complete. The entrance to the construction area is paved with asphalt.

2d For the LAWA WAMA project and the Qantas hangar project, standard construction shift hours did not coincide with the heaviest commuter traffic periods during the 2015 reporting period. However, due to construction

requirements, some specialty workers worked longer shifts that ended during the evening peak period; however, this was not typical and consisted of a very limited crew (e.g., 2 to 4 workers).

2e Lunch trucks visited the construction site or nearby construction staging/office area on a regular basis.

2f An on-site rock crushing facility was used to crush stockpiles located on the LAWA component project site. The crushed material was used as fill on the WAMA and Qantas portions of the project site as well as other LAWA airside projects. In addition, for the Qantas hangar component, equipment was used to remove the asphalt roadway; this equipment pulverized the material onsite.

2g For the LAWA WAMA project, construction equipment was powered from grid power during the 2015 reporting period. On occasion, some construction equipment was powered by clean-burning generators for work that was of short duration and not located in proximity to grid power sources. LAWA WAMA construction offices were powered by grid power in 2015. For the Qantas project, construction equipment and offices used clean-burning generators during the 2015 reporting period.

2h Not applicable during the 2014 reporting period.

2i This requirement is included in the construction specifications for the LAWA WAMA project and is required as a condition of the Qantas lease.

2j This requirement is included in the construction specifications for the LAWA WAMA project and is required as a condition of the Qantas lease.

2k Project staff, including both LAWA personnel and construction contractor personnel, are responsible for implementing construction-related mitigation measures. Compliance with these measures is discussed at weekly project meetings and at pre-activity meetings prior to starting new construction activities. A number of people are responsible for ensuring implementation of all components of the construction-related measure, including LAWA inspectors and mitigation monitors. Monitoring includes direct inspections, reviews of monthly reports, and investigation of complaints.

2l Complete. The rock-crushing operation and related stockpiles were located in the central portion of the LAWA WAMA project site, away from adjacent residents in the first and second quarters of 2015, after which time the rock crusher was no longer required.

2m Sweepers are fueled by alternative fuels (compressed natural gas). In addition, many staff and some construction contractor vehicles are alternative-fueled vehicles. There is available and sufficient infrastructure to provide fuel to these alternatively-fueled vehicles.

2n All construction equipment is subject to review and approval by LAWA monitors prior to being allowed to operate at the airport. All on-road trucks with a gross vehicle weight rating of at least 19,500 pounds comply with USEPA 2010 on-road emissions standards for PM10 and NOx.

In addition to these required measures, in the 2015, a temporary Airport Operations Area (AOA) fence was constructed as part of the LAWA component of the WAMA project. In order to provide the required lighting associated with the temporary fence, solar-powered light stands were installed. This avoided the use of diesel fuel to power the light stands.

8.0.J LAX-AQ-4 – Operations-Related Control Measures (WAMA)

The WAMA MMRP states in part:

2n. "This measure requires the conversion of LAX GSE to low and ultra-low emission technology (e.g., electric, fuel cell, and other future low-emission technologies)."

Status→ No action required at this time:
This component was not applicable during the 2015 reporting period because the WAMA project was not operational. In April 2015 LAWA's Board of Airport Commissioners adopted a Ground Support Equipment Emissions Policy to reduce emissions. This requirement is in effect at LAX and applies to WAMA, once the project is operational.

Other measures required by LAX-AQ-4 include the following:

4d. LAWA will require the use of electric lawn mowers and leaf blowers, as these unites become available for commercial use, for landscape maintenance
4e. LAWA will require the conversion of sweepers to alternative fuels or electric power for ongoing airfield and roadway maintenance. HEPA filters will be installed on airport sweepers where technologically and financially feasible without posing a safety hazard to airport operations.
4f. LAWA will ensure that there is available and sufficient alternative-fuel infrastructure.

Status→ No action required at this time:
Components 4d, 4e, and 4f were not applicable during the 2015 reporting period because the WAMA project was not operational.

8.0.K MM-AQ (WAMA)-1

The WAMA MMRP states:

"On-road trucks used on LAX construction projects with a gross vehicle weight rating of at least 19,500 pounds shall, at a minimum, comply with USEPA 2010 on-road emissions standards for PM10 and NOX. Contractor requirements to utilize such on-road haul trucks or the next cleanest vehicle available will be subject to the provisions of LAWA Air Quality Control Measure 2"x" (part of LAX Master Plan Commitment LAX-AQ-2, LAX Master Plan - Mitigation Plan for Air Quality; Construction-Related Measures). All off-road diesel-powered construction equipment greater than 50 horsepower shall meet, at a minimum, USEPA Tier 3 off-road emission standards. In addition, all off-road diesel-powered construction equipment greater than 50 hp with engines meeting USEPA Tier 3 off-road emission standards shall be retrofitted with a CARB-verified Level 3 Diesel Emissions Control Strategies (DECS). Any emissions control device used by the Contractor shall achieve emissions reductions that are no less than what could be achieved by a Level 3 diesel emissions control strategy for a similarly sized engine as defined by CARB regulations. In the event the Contractor is using off-road diesel-powered construction equipment with engines meeting USEPA Tier 4 off-road emission standards and is already supplied with a factory-equipped diesel particulate filter, no retrofitting with DECS is required. Contractor requirements to utilize Tier 3 equipment or next cleanest equipment available will be subject to the provisions of LAWA Air Quality Control Measure 2"x" (part of LAX Master Plan Commitment LAX-AQ-

2, LAX Master Plan - Mitigation Plan for Air Quality; Construction-Related Measures). LAWA will encourage construction contractors to apply for SCAQMD "SOON" funds to accelerate clean-up of off-road diesel engine emissions."

WAMA Status→ Ongoing:
During the 2015 reporting period, construction contractors working on the WAMA project (including both LAWA's component of the project and the Qantas hangar component) were required to submit documentation for each piece of diesel equipment to be utilized on the project. Mitigation monitors developed and implemented a monitoring process to track each piece of equipment and document compliance with the provisions of MM-AQ (WAMA)-1. On-road trucks were reviewed to determine their compliance with USEPA 2010 on-road emissions standards for PM_{10} and NO_x. In addition, off-road diesel-powered construction equipment greater than 50 hp was monitored for compliance with USEPA Tier 3 off-road emissions standards, retrofit standards, and emissions reductions achieved.

Of the on-road vehicles that were evaluated, 103 met or exceeded the USEPA 2007 standards and were equipped with a factory installed VDECS. Forty-two (42) on-road vehicles, primarily dirt and rock-hauling trucks, were granted an exemption in accordance with Section X.F.4 of the Community Benefits Agreement. Of the off-road construction equipment that was reviewed by monitors, 100 pieces of equipment were certified as compliant with USEPA Tier 4 or Tier 4-Interim emission standards. A total of 62 vehicles or pieces of equipment were not approved for airfield use due to their failure to meet requirements. All equipment that was determined to be compatible with a Level 3 VDECS, but that was not retrofitted with the best available emission control technology, was documented to show that the equipment had been granted an exemption in accordance with LAWA policies and procedures (i.e., the equipment was the next cleanest vehicle available and/or the equipment was used onsite for a period less than 20 calendar days per calendar year). The monitor verified that the Level 3 devices that were utilized on the WAMA project during the 2015 reporting period did not result in an increase of any pollutant above the level that is standard for that equipment's engine.

8.0.L LAX-AQ-1 – General Air Quality Control Measures (MSC)

The MSC MMRP states in part:

"This measure describes a variety of specific actions to reduce air quality impacts associated with projects at LAX, and applies to all projects. Specific measures are identified below:"

1a "Watering (per SCAQMD Rule 403 and CalEEMod default) – twice daily"
1b "Ultra-low sulfur diesel (ULSD) fuel will be used in construction equipment.
1c "Post a publicly visible sign with the telephone number and person to contact regarding dust complaints; this person shall respond and take corrective action within 24 hours. "
1d "Prior to final occupancy, the applicant demonstrates that all ground surfaces are covered or treated sufficiently to minimize fugitive dust emissions."

1e "All roadways, driveways, sidewalks, etc., being installed as part of the project should be completed as soon as possible; in addition, building pads should be laid as soon as possible after grading."

1f "Prohibit idling or queuing of diesel-fueled vehicles and equipment in excess of five minutes. This requirement will be included in specifications for any LAX projects requiring on-site construction."

1g "Require that all construction equipment working on-site is properly maintained (including engine tuning) at all times in accordance with manufacturers' specifications and schedules."

MSC Status→ Ongoing:

Construction activities related to the MSC project were very limited in 2015, and included installation of perimeter fencing, temporary utility work, relocation of the FAA Remote Transmitter/Receiver (RTR) facility to a site south of Westchester Parkway and west of Arbor Vitae, and relocation of an airport rotating beacon to a site near the fuel farm. The status of these measures during the reporting period is as follows:

1a Watering for dust control during construction activities was conducted in accordance with SCAQMD Rule 403. Due to the overlapping construction areas associated with the MSC's relocated RTR site and LAWA's construction activities on Runway 6L-24R (which were unrelated to the MSC project), watering activities were shared between the two projects.

1b ULSD is the only fuel commercially available and is used in all construction equipment. No shortage of ULSD was experienced within Southern California during the 2015 reporting period, and no substitution of ULSD occurred on the MSC project.

1c Completed. Signs were posted on at the RTF entrance and job site trailers. No phone calls were received during the reporting period.

1d Not applicable during the 2015 reporting period.

1e Not applicable during the 2015 reporting period.

1f This requirement is included in the construction specifications for the MSC project**.** There were no written violations in 2015.

1g This requirement is included in the construction specifications for the MSC project**.** There were no written violations in 2015.

Water truck up top spraying the pile with water to prevent fugitive dust during the concrete crushing operation

8.0.M LAX-AQ-2 – Construction-Related Measures (MSC)

The MSC MMRP states:

"This measure describes numerous specific actions to reduce fugitive dust emissions and exhaust emissions from on-road and off-road mobile and stationary sources used in construction. Some components of LAX-AQ-2 are not readily quantifiable, but would be implemented as part of LAX projects. Specific measures are outlined below:"

2a "All diesel-fueled equipment used for construction will be outfitted with the best available emission control devices, where technologically feasible, primarily to reduce emissions of diesel particulate matter (PM), including fine PM ($PM_{2.5}$), and secondarily, to reduce emissions of NO_X. This requirement shall apply to diesel-fueled off-road equipment (such as construction machinery), diesel-fueled on-road vehicles (such as trucks), and stationary diesel-fueled engines (such as electric generators). (It is unlikely that this measure will apply to equipment with Tier 4 engines.) The emission control devices utilized in construction equipment shall be verified or certified by California Air Resources Board or US Environmental Protection Agency for use in on-road or off-road vehicles or engines. For multi-year construction projects, a reassessment shall be conducted annually to determine what constitutes a best available emissions control device."

2b "Watering (Watering (per SCAQMD Rule 403 and CalEEMod default) – three times daily."

2c "Pave all construction access roads at least 100 feet onto the site from the main road."

2d "To the extent feasible, have construction employees' work/commute during off-peak hours."

2e "Make available on-site lunch trucks during construction to minimize off-site worker vehicle trips."

2f "Utilize on-site rock crushing facility, when feasible, during construction to reuse rock/concrete and minimize off-site truck haul trips."

2g "Specify combination of electricity from power poles and portable diesel- or gasoline-fueled generators using "clean burning diesel" fuel and exhaust emission controls."

2h "Suspend use of all construction equipment during a second- stage smog alert in the immediate vicinity of LAX."

2i "Utilize construction equipment having the minimum practical engine size (i.e., lowest appropriate horsepower rating for intended job)."

2j "Prohibit tampering with construction equipment to increase horsepower or to defeat emission control devices."

2k "The contractor or builder shall designate a person or persons to ensure the implementation of all components of the construction-related measure through direct inspections, record reviews, and investigations of complaints."

2l "LAWA will locate rock-crushing operations and construction material stockpiles for all LAX-related construction in areas away from LAX-adjacent residents, to the extent possible, to reduce impacts from emissions of fugitive dust."

2m "LAWA will ensure that there is available and sufficient infrastructure on-site, where not operationally or technically infeasible, to provide fuel to alternative-fueled vehicles to meet all requests for alternative fuels from contractors and

other users of LAX. This will apply to construction equipment and to operations-related vehicles on-site. This provision will apply in conjunction with construction or modification of passenger gates related to implementation of the LAX Master Plan relative to the provision of appropriate infrastructure for electric GSE."

MSC Status→ Ongoing:
Construction activities related to the MSC project were very limited in 2015, and included installation of perimeter fencing, temporary utility work, relocation of the FAA RTR facility to a site south of Westchester Parkway and west of Arbor Vitae, and relocation of an airport rotating beacon to a site near the fuel farm. The status of applicable measures during the reporting period is as follows:

2a Due to the limited nature of construction activities in 2015, this measure did not apply during the 2015 reporting period.
2b Watering for dust control during construction activities was done in accordance with SCAQMD Rule 403.
2c For the RTR facility construction, porous pavement was installed from Westchester Parkway to the facility site. Gravel was laid on other construction access roads to reduce dust emissions.
2d The standard construction shift for the MSC project did not coincide with the heaviest commuter traffic periods during the 2015 reporting period. Worker shifts typically started around 5:00 a.m.
2e Lunch trucks visited the RTR construction site, the construction site office, and the construction area located near World Way West.
2f Not applicable during the 2015 reporting period.
2g The majority of the power requirements were provided by grid power during the 2015 reporting period. There was a one-time use of a generator for less than one day during the 2015 reporting period.
2h Not applicable during the 2015 reporting period.
2i This requirement is included in the construction specifications for the MSC project. There were no written violations in 2015.
2j This requirement is included in the construction specifications for the MSC project. There were no written violations in 2015.
2k Project staff, including both LAWA personnel and construction contractor personnel, are responsible for implementing construction-related mitigation measures. Compliance with these measures is discussed at weekly project meetings and at pre-activity meetings prior to starting new construction activities. A number of people are responsible for ensuring implementation of all components of the construction-related measure, including LAWA inspectors and mitigation monitors. Monitoring includes direct inspections, reviews of monthly reports, and investigation of complaints.
2l Not applicable during the 2015 reporting period.
2m Not applicable during the 2015 reporting period.

8.0.N LAX-AQ-4 – Operations-Related Control Measures (MSC)

The MSC MMRP states in part:

"The principal feature of this measure is the conversion of LAX GSE to low and ultra-low emission technology (e.g., electric, fuel cell, and other future low-emission technologies). Specific measures are identified below:"

4a "LAX GSE will be converted to low- and ultra-low emission technology (e.g., electric, fuel cell, and other future low-emission technologies). Both LAWA- and tenant-owned equipment will be included in this conversion program, which will be implemented in phases. LAWA will assign a GSE coordinator whose responsibility it will be to ensure the successful conversion of GSE in a timely manner. This coordinator will have adequate authority to negotiate on behalf of the City and have sufficient technical support to evaluate technical issues that arise during the implementation of this measure."

4b "*All passenger gates newly constructed at LAX shall be equipped with and able to provide grid electricity to parked aircraft (for lighting and ventilation) from and after the date of initial operation. LAWA will ensure that all aircraft (unless exempt) use the gate-provided grid electricity in lieu of electricity provided by operation of an auxiliary or ground power unit. This provision applies in conjunction with construction or modification of passenger gates."*

4e "LAWA will require the conversion of sweepers to alternative fuels or electric power for ongoing airfield and roadway maintenance. In the 2006 GSE inventory, two of ten sweepers were electric-powered and one was either CNG or LPG fueled. HEPA filters will be installed on airport sweepers where the use of HEPA filters is technologically and financially feasible and does not pose a safety hazard to airport operations."

4f "LAWA will ensure that there is available and sufficient infrastructure on-site, where not operationally or technically infeasible, to provide fuel to alternative-fueled vehicles to meet all requests for alternative fuels from contractors and other users of LAX. This will apply to construction equipment and to operations-related vehicles on-site. This provision will apply in conjunction with construction or modification of passenger gates related to implementation of the LAX Master Plan relative to the provision of appropriate infrastructure for electric GSE.

MSC Status→ : No action required at this time:
This component was not applicable during the 2015 reporting period because the MSC project was not operational. In April 2015, LAWA's Board of Airport Commissioners adopted a Ground Support Equipment Emissions Policy to reduce emissions. This requirement is in effect at LAX and will apply to MSC, once the project is operational.

8.0.O MM-AQ (MSC)-1

The MSC MMRP states in part:

2n "On-road trucks used on LAX construction projects with a gross vehicle weight rating of at least 19,500 pounds shall, at a minimum, comply with USEPA 2010 on-road emissions standards for PM10 and NOx. Contractor requirements to

utilize such on-road haul trucks or the next cleanest vehicle available will be subject to the provisions of LAWA Air Quality Control Measure 2p below.

2o Prior to January 1, 2015, all off-road diesel-powered construction equipment greater than 50 horsepower shall meet, at a minimum, USEPA Tier 3 off-road emission standards. After December 31, 2014, all off-road diesel-power construction equipment greater than 50 horsepower shall meet USEPA Tier 4(final) off-road emissions standards. Tier 4(final) equipment shall be considered based on availability at the time the construction bid is issued. Contractor requirements to utilize Tier 4(final) equipment or the next cleanest equipment available will be subject to the provisions of LAWA Air Quality Control Measure 2p below. LAWA will encourage construction contractors to apply for SCAQMD "SOON" funds to accelerate clean-up of off-road diesel engine emissions

2p The on-road haul truck and off-road construction equipment requirements set forth in Air Quality Control Measures 2n and 2o above shall apply unless any of the following circumstances exist and the Contractor provides a written finding consistent with project contract requirements that:

- The Contractor does not have the required types of on-road haul trucks or off-road construction equipment within its current available inventory and intends to meet the requirements of the Measures 2n and 2o as to a particular vehicle or piece of equipment by leasing or short-term rental, and the Contractor has attempted in good faith and due diligence to lease the vehicle or equipment that would comply with these measures, but that vehicle or equipment is not available for lease or short-term rental within 120 miles of the project site, and the Contractor has submitted documentation to LAWA showing that the requirements of this exception provision (Measure 2p) apply.

- The Contractor has been awarded funding by SCAQMD or another agency that would provide some or all of the cost to retrofit, repower, or purchase a piece of equipment or vehicle, but the funding has not yet been provided due to circumstances beyond the Contractor's control, and the Contractor has attempted in good faith and due diligence to lease or short-term rent the equipment or vehicle that would comply with Measures 2n and 2o, but that equipment or vehicle is not available for lease or short-term rental within 120 miles of the project site, and the Contractor has submitted documentation to LAWA showing that the requirements of this exception provision (Measure 2p) apply.

- Contractor has ordered a piece of equipment or vehicle to be used on the construction project in compliance with Measures 2n and 2o at least 60 days before that equipment or vehicle is needed at the project site, but that equipment or vehicle has not yet arrived due to circumstances beyond the Contractor's control, and the Contractor has attempted in good faith and due diligence to lease or short-term rent a piece of equipment or vehicle to meet the requirements of Measures 2n and 2o, but that equipment or vehicle is not available for lease or short-term rental within 120 miles of the project, and the Contractor has submitted documentation to LAWA showing that the requirements of this exception provision (Measure 2p) apply.

- Construction-related diesel equipment or vehicle will be used on the project site for fewer than 20 calendar days per calendar year. The Contractor shall not consecutively use different equipment or vehicles that perform the same or a substantially similar function in an attempt to use this exception (Measure 2p) to circumvent the intent of Measures 2n and 2o.

In any of the situations described above, the Contractor shall provide the next cleanest piece of equipment or vehicle as provided by the step down schedules in Table 4.1-45 for Off-Road Equipment and Table 4.1-46 for On-Road Equipment. (Tables provided in MMRP)"

MSC Status→ : No action required at this time:
Due to the limited nature of construction activities in 2015, this measure did not apply during the reporting period.

9.0 Hydrology and Water Quality

9.0.A HWQ-1 Conceptual Drainage Plan

The LAX Master Plan MMRP states in part:

*"**Conceptual Drainage Plan.** Once a Master Plan alternative is selected, and in conjunction with its design, LAWA will develop a conceptual drainage plan of the area within the boundaries of the Master Plan alternative (in accordance with FAA guidelines and to the satisfaction of the City of Los Angeles Department of Public Works, Bureau of Engineering). The purpose of the drainage plan will be to assess area-wide drainage flows as related to the Master Plan project area, and at a level of detail sufficient to identify the overall improvements necessary to provide adequate drainage capacity to prevent flooding."*

Status→ Completed:
LAWA completed a Conceptual Drainage Plan which was adopted in conjunction with the SAIP.

9.0.B MM-HWQ-1 Update Regional Drainage Facilities

The LAX Master Plan MMRP states:

*"**Update Regional Drainage Facilities.** Regional drainage facilities should be upgraded, as necessary, in order to accommodate current and projected future flows within the watershed of each stormwater outfall resulting from cumulative development. This could include upgrading the existing outfalls, or building new ones. The responsibility for implementing this mitigation measure lies with the Los Angeles County Department of Public Works and/or the City of Los Angeles Department of Public Works, Bureau of Engineering. A portion of the increased costs for the upgraded flood control and drainage facilities would be paid by LAX tenants and users in accordance with the possessory interest tax laws and other legal assessments, consistent with federal airport revenue diversion laws and regulations and in compliance with state, county and city*

laws. The new or upgraded facilities should be designed in accordance with the drainage design standards of each agency."

Status→ Ongoing:
Although not responsible for implementing this mitigation measure, LAWA evaluates the post-construction drainage conditions for ongoing and future projects to determine if regional drainage facilities should be upgraded.

10.0 Historical/Architectural and Archaeological/Cultural Resources

10.0.A HR-1 Preservation of Historic Resources

The LAX Master Plan MMRP states:

"Preservation of Historic Resources. *In implementing the LAX Plan and conducting ongoing activities associated with operation of the airport, LAWA will support the preservation of identified significant historic/architectural resources through careful review of design and development adjacent to those resources and by undertaking any modifications to those resources in a manner consistent with the Secretary of the Interior's Standards for the Treatment of Historic Properties. Additionally, where sound insulation is proposed for identified significant historic/architectural resources under the Aircraft Noise Mitigation Program, LAWA will ensure that methods are developed with the approval of a qualified architectural historian or historic architect, who meets the Secretary of the Interior's Professional Qualifications Standards, in compliance with the Secretary of the Interior's Standards for Rehabilitation."*

Status→ No action required at this time:
Any project at LAWA involving a designated City of Los Angeles Historic-Cultural Monument is required to be reviewed by the Office of Historic Resources of the City of Los Angeles before any changes to the resource are approved. The historic preservation architect within this division of the Department of City Planning is charged with this responsibility. No action was required during the 2015 reporting period as there were no LAX Master Plan projects in 2015 that triggered this measure.

Additionally, a historic resources survey of property owned by LAWA at LAX was conducted in 2015 to identify any additional potential historic resources. A Preservation Plan for LAX is currently being prepared to: provide appropriate guidance for the future repair, maintenance, and alteration of historic resources; and to create an appropriate process for review of future projects with respect to historic resources.

10.0.B MM-HA-1 Historic American Buildings Survey (HABS) Document

The LAX Master Plan MMRP states in part:

*"**Historic American Buildings Survey (HABS) Document.*** *For historic properties eligible at the federal, state or local levels that are proposed for demolition or partial demolition (i.e., the International Airport Industrial District), a Historic American Buildings Survey (HABS) document shall be prepared by LAWA in accordance with the Secretary*

of the Interior's Guidelines for Architectural and Engineering Documentation Standards. The level of documentation (I, II, III) shall be determined by the National Park Service (NPS)."

Status→ No action required at this time:
No action was required during the 2015 reporting period as no historic buildings were proposed for demolition or partial demolition in 2015.

10.0.C MM-HA-2 Historic Educational Materials

The LAX Master Plan MMRP states in part:

Historic Educational Materials. *For the significant historic resources proposed for demolition or partial demolition, educational materials suitable for the general public, secondary school use, and/or aviation historians and enthusiasts shall be designed with the assistance of a qualified historic preservation professional and implemented by LAWA.*

Status→ No action required at this time:
No action was required during the 2015 reporting period as no significant historic resources were proposed for demolition or partial demolition in 2015.

10.0.D MM-HA-4 Discovery

The LAX Master Plan MMRP states in part:

*"**Discovery.** The FAA shall prepare an archaeological treatment plan (ATP), in consultation with SHPO, that ensures the long-term protection and proper treatment of those unexpected archaeological discoveries of federal, state, and/or local significance found within the APE of the selected alternative."*

Status→ Completed:
Subsequent to the adoption of this measure, LAWA prepared an Archaeological Treatment Plan (ATP) in June 2005. In addition to fulfilling the requirements of MM-HA-4, the ATP incorporates the requirements of LAX Master Plan Mitigation Measures MM-HA-4 through MM-HA-10 and provides details regarding compliance with these measures. Master Plan projects comply with the ATP and thus comply with Mitigation Measure MM-HA-4.

10.0.E MM-HA-5 Monitoring

The LAX Master Plan MMRP states in part:

*"**Monitoring.** Any grading and excavation activities within LAX proper or the acquisition areas that have not been identified as containing redeposited fill material or having been previously disturbed shall be monitored by a qualified archaeologist."*

Status→ Ongoing:
Monitoring of grading and excavation activities is required on all Master Plan projects with the potential for encountering archaeological resources. Each project at LAX undergoes environmental analysis and clearances before grading and excavation activities are performed, and this environmental clearance identifies the potential need for a project archeologist. LAWA and project archeologists adhere to the guidelines provided in the Archeological Treatment Plan (ATP), in compliance with Section 106 of the National Historic Preservation Act (NHPA), the California Environmental Quality Act (CEQA), and the environmental guidelines of local agencies regarding the treatment of unexpected archeological discoveries of federal, state, and/or local significance that may be encountered during construction activities.

10.0.F MM-HA-6 Excavation and Recovery

The LAX Master Plan MMRP states:

*"**Excavation and Recovery**. Any excavation and recovery of identified resources (features) shall be performed using standard archaeological techniques and the requirements stipulated in the ATP. Any excavations, testing, and/or recovery of resources shall be conducted by a qualified archaeologist selected by LAWA."*

Status→ No action required at this time:
This measure was not applicable during the 2015 reporting period because no archaeological resources were encountered during Master Plan construction activities.

10.0.G MM-HA-7 Administration

The LAX Master Plan MMRP states:

*"**Administration.** Where known resources are present, all grading and construction plans shall be clearly imprinted with all of the archaeological/cultural mitigation measures. All site workers shall be informed in writing by the on-site archaeologist of the restrictions regarding disturbance and removal as well as procedures to follow should a resource deposit be detected."*

Status→ No action required at this time:
This measure was not applicable during the 2015 reporting period because no archaeological resources were encountered during Master Plan construction activities.

10.0.H MM-HA-8 Archaeological/Cultural Monitor Report

The LAX Master Plan MMRP states in part:

*"**Archaeological/Cultural Monitor Report.** Upon completion of grading and excavation activities in the vicinity of known archaeological resources, the Archaeological/Cultural monitor shall prepare a written report. The report shall include the results of the fieldwork*

and all appropriate laboratory and analytical studies that were performed in conjunction with the excavation."

Status→ No action required at this time:
This measure was not applicable during the 2015 reporting period because no grading and excavation activities in the vicinity of known archaeological resources were completed within the period.

10.0.I MM-HA-9 Artifact Curation

The LAX Master Plan MMRP states:

"***Artifact Curation.*** *All artifacts, notes, photographs, and other project-related materials recovered during the monitoring program shall be curated at a facility meeting federal and state standards."*

Status→ No action required at this time:
This measure was not applicable during the 2015 reporting period because no archaeological resources were encountered during Master Plan construction activities.

10.0.J MM-HA-10 Archaeological Notification

The LAX Master Plan MMRP states:

"***Archaeological Notification.*** *If human remains are found, all grading and excavation activities in the vicinity shall cease immediately and the appropriate LAWA authority shall be notified: compliance with those procedures outlined in Section 7050.5(b) and (c) of the State Health and Safety Code, Section 5097.94(k) and (i) and Section 5097.98(a) and (b) of the Public Resources Code shall be required. In addition, those steps outlined in Section 15064.5(e) of the CEQA Guidelines shall be implemented."*

Status→ No action required at this time:
This measure was not applicable during the 2015 reporting period because no human remains were encountered during Master Plan construction activities.

10.0.K MM-HA (BWP)-1 Conformance with LAX Master Plan Archaeological Treatment Plan

The Bradley West Project MMRP states in part:

"***Conformance with LAX Master Plan Archaeological Treatment Plan.*** *Prior to initiation of grading and construction activities, LAWA will retain an on-site Cultural Resource Monitor (CRM), as defined in the LAX Master Plan MMRP ATP, who will determine if the proposed project area is subject to archaeological monitoring."*

BWP Status→ Completed:
LAWA retained an on-site Cultural Resource Monitor for the Bradley West Project. Archaeological resource monitoring was conducted during the excavation phase, which was completed in June 2011.

10.0.L ARCHAEO-1

The WAMA MMRP states in part:

"Prior to initiation and construction activities, LAWA will retain an on-site Cultural Resources Monitor (CRM), as defined in the LAX Master Plan Mitigation Monitoring and Reporting Program (MMRP) Archaeological Treatment Plan (ATP), who will determine if the project site is subject to archaeological monitoring. If the CRM determines that the Project site is subject to archaeological monitoring, a qualified archaeologist… shall be retained by LAWA to inspect excavation and grading activities that occur within native material."

WAMA Status→ Ongoing:
Prior to the initiation of construction of the WAMA project (including both the LAWA project component and the Qantas hangar component), LAWA retained an on-site Cultural Resource Monitor (CRM). During the reporting period, the CRM monitored excavation and grading activities that occurred within native materials. No archaeological resources were encountered during construction during the 2015 reporting period.

10.0.M MM-HA (MSC)-1 Conformance with LAX Master Plan Archaeological Treatment Plan

The MSC MMRP states in part:

"Conformance with LAX Master Plan Archaeological Treatment Plan. Prior to initiating grading and construction activities, LAWA will retain an on-site Cultural Resource Monitor (CRM), as defined in the LAX Master Plan Mitigation Monitoring and Reporting Program Archaeological Treatment Plan (ATP), who will determine if the proposed project area is subject to archaeological monitoring."

MSC Status→ Ongoing:
During the reporting period, no excavation and grading activities occurred within native materials, i.e., within areas subject to archaeological monitoring. No archaeological resources were encountered during construction in 2015.

11.0 Paleontological Resources

11.0.A MM-PA-1 Paleontological Qualification and Treatment Plan

The LAX Master Plan MMRP states:

*"**Paleontological Qualification and Treatment Plan.** A qualified paleontologist shall be retained by LAWA to develop an acceptable monitoring and fossil remains treatment plan (that is, a Paleontological Management Treatment Plan - PMTP) for construction-related activities that could disturb potential unique paleontological resources within the project area. This plan shall be implemented and enforced by the project proponent during the initial phase and full phase of construction development. The monitoring and treatment plan shall be subject to approval by the Vertebrate Paleontology Section of the Natural History Museum of Los Angeles County to comply with paleontological requirements, as appropriate."*

Status→ Completed:
The Paleontological Management Treatment Plan (PMTP) was prepared and revised in December 2005. In addition to fulfilling the requirements of MM-PA-1, the PMTP incorporates the requirements of LAX Master Plan Mitigation Measures MM-PA-2 through MM-PA-7 and provides details regarding compliance with these measures. Master Plan projects comply with the PMTP and thus comply with Mitigation Measure MM-PA-1.

11.0.B MM-PA-2 Paleontological Authorization

The LAX Master Plan MMRP states:

*"**Paleontological Authorization.** The paleontologist shall be authorized by LAWA to halt, temporarily divert, or redirect grading in the area of an exposed fossil to facilitate evaluation and, if necessary, salvage. No known or discovered fossils shall be destroyed without the written consent of the project paleontologist."*

Status→ No action required at this time:
This measure was not applicable during the 2015 reporting period because no exposed fossils were encountered during Master Plan construction activities.

11.0.C MM-PA-3 Paleontological Monitoring Specifications

The LAX Master Plan MMRP states:

***"Paleontological Monitoring Specifications.** Specifications for paleontological monitoring shall be included in construction contracts for all LAX projects involving excavation activities deeper than six feet."*

BWP Status→ Completed:
Excavation conducted in 2015 was not subject to paleontological monitoring.

11.0.D MM-PA-4 Paleontological Resources Collection

The LAX Master Plan MMRP states:

"Paleontological Resources Collection. *Because some fossils are small, it will be necessary to collect sediment samples of promising horizons discovered during grading or excavation monitoring for processing through fine mesh screens. Once the samples have been screened, they shall be examined microscopically for small fossils."*

Status→ No action required at this time:
This measure was not applicable during the 2015 reporting period because no fossils were encountered during Master Plan construction activities.

11.0.E MM-PA-5 Fossil Preparation

The LAX Master Plan MMRP states:

"Fossil Preparation. *Fossils shall be prepared to the point of identification and catalogued before they are donated to their final repository."*

Status→ No action required at this time:
This measure was not applicable during the 2015 reporting period because no fossils were encountered during Master Plan construction activities.

11.0.F MM-PA-6 Fossil Donation

The LAX Master Plan MMRP states:

"Fossil Donation. *All fossils collected shall be donated to a public, nonprofit institution with a research interest in the materials, such as the Los Angeles County Museum of Natural History."*

Status→ No action required at this time:
This measure was not applicable during the 2015 reporting period because no fossils were encountered during Master Plan construction activities.

11.0.G MM-PA-7 Paleontological Reporting

The LAX Master Plan MMRP states:

"Paleontological Reporting. *A report detailing the results of these efforts, listing the fossils collected, and naming the repository shall be submitted to the lead agency at the completion of the project."*

Status→ No action required at this time:
This measure was not applicable during the 2015 reporting period because no fossils were encountered during Master Plan construction activities.

11.0.H MM-PA (BWP)-1 Conformance with LAX Master Plan Paleontological Management Treatment Plan

The Bradley West Project MMRP states in part:

*"**Conformance with LAX Master Plan Paleontological Management Treatment Plan.** Prior to the initiation of grading and construction activities, LAWA will retain a professional paleontologist, as defined in the Final LAX Master Plan MMRP PMTP, who will determine if the project site exhibits a high or low potential for subsurface resources."*

BWP Status→ Completed:
LAWA retained an on-site Paleontological Resource Monitor for the Bradley West Project. Paleontological resource monitoring was conducted during the excavation phase, which was completed in June 2011.

11.0.I MM-PA (BWP)-2 Construction Personnel Briefing

The Bradley West Project MMRPs states:

*"**Construction Personnel Briefing.** In accordance with the PMTP, construction personnel will be briefed by the consulting paleontologist in the identification of fossils or fossilferous deposits and in the correct procedures for notifying the relevant individuals should such a discovery occur."*

BWP Status→ Completed

11.0.J PALEO-1 (WAMA)

The WAMA MMRP states in part:

"Conformance with LAX Master Plan Paleontological Management Treatment Plan: (PMTP): Prior to the initiation of grading and construction activities, LAWA will retain a professional paleontologist, as defined in the Final LAX Master Plan MMRP PMTP, who will determine if the Project site exhibits a high or low potential for subsurface resources."

WAMA Status→ Ongoing:
Prior to the initiation of construction of the WAMA project (including both the LAWA project component and the Qantas hangar component), LAWA retained an on-site Paleontological Resource Monitor. During the 2015 reporting period, the monitor monitored excavation and grading activities that occurred within native materials. No paleontological resources were encountered during construction during the 2015 reporting period.

11.0.K PALEO-2 (WAMA)

The WAMA MMRP states:

"Construction Personnel Briefing: In accordance with the PMTP, construction personnel will be briefed by the consulting paleontologist in the identification of fossils or fossilferous deposits and in the correct procedures for notifying the relevant individuals should such a discovery occur."

WAMA Status→ Completed:
LAWA's consulting paleontologist conducted construction personnel briefings for the WAMA LAWA project component personnel and the Qantas hangar component personnel on October 24, 2014 and November 18, 2014, respectively.

11.0.L MM-PA (MSC)-1 Conformance with LAX Master Plan Paleontological Management Treatment Plan

The MSC MMRP states in part:

"Conformance with LAX Master Plan Paleontological Management Treatment Pla*n. Prior to the initiation of grading and construction activities, LAWA will retain a professional paleontologist, as defined in the LAX Master Plan Mitigation Monitoring and Reporting Program Paleontological Management Treatment Plan (PMTP), who will determine if the project site exhibits a high or low potential for subsurface resources."*

MSC Status→ Ongoing:
During 2015, no excavation and grading activities occurred within native materials. No paleontological resources were encountered during construction during 2015.

11.0.M MM-PA (MSC)-2 Construction Personnel Briefing

The MSC MMRP states:

"Construction Personnel Briefing*. In accordance with the PMTP, construction personnel will be briefed by the consulting paleontologist in the identification of fossils or fossiliferous deposits and in the correct procedures for notifying the relevant individuals should such a discovery occur."*

MSC Status→ Ongoing:
LAWA held pre-construction conferences to review MMRP measures, including the Paleontological Management Treatment Plan. No paleontological resources were encountered during construction during the 2015 reporting period.

12.0 Biotic Communities

12.0 A MM-BC-1 Conservation of State-Designated Sensitive Habitat Within and Adjacent to the El Segundo Blue Butterfly Habitat Restoration Area

The LAX Master Plan MMRP states in part:

"Conservation of State-Designated Sensitive Habitat Within and Adjacent to the El Segundo Blue Butterfly Habitat Restoration Area. *LAWA or its designee shall take all necessary steps to ensure that state-designated sensitive habitats within and adjacent to the Habitat Restoration Area are conserved and protected during construction, operation, and maintenance."*

Status→ In Progress:
LAWA continues to maintain and manage the El Segundo Blue Butterfly (ESBB) Habitat Restoration Area.

LAWA's ESBB conservation program has three components:

- Restoration of the native sand dunes habitat
- Monitoring the progress of the program
- Public awareness

Restoration
Because human activity negatively impacts the ESBB and its food plant (coast buckwheat), the area is protected and activities are controlled to meet the restoration goals. A major threat to both the ESBB and buckwheat are invasive plant species that dominate the habitat. In the past, LAWA has performed maintenance within the habitat area to conduct vegetative management, weeding, and trash removal.

In 2014, LAWA submitted an application to renew its endangered species recovery permit to the U.S. Fish and Wildlife Service (USFWS). LAWA and USFWS negotiated the terms of the renewed permit in 2015. When granted, the new permit will allow for volunteer restoration activities in the El Segundo Blue Butterfly Habitat Restoration Area when a monitoring biologist is present and measures are taken to prevent take of an endangered species. Additional training and regulatory signage are included in the draft permit as measures to prevent accidental take of endangered species. LAWA's Maintenance Services Division conducted weeding and/or trash removal throughout the Dunes in 2015.

As noted above, LAWA continued to maintain Block 23, where coast buckwheat was planted in 2011. The plants are now flowering, and El Segundo Blue Butterfly have been observed in Block 23. In order to ensure that LAWA activities in the Dunes do not adversely affect the ESBB or its habitat, LAWA has provided training events for staff who conduct work in the Dunes. As a result, the LAWA Film Office and Airport Police stay on roads to prevent impacts to ESBB. In addition, LAWA Airport Police K-9 training occurs outside of the portion of the Dunes occupied by ESBB (i.e., north of Sandpiper Street)

Monitoring

LAWA completed annual monitoring of the ESBB and the coast buckwheat host plant in 2015. It was the fourth consecutive year of severe drought conditions, which are thought to have affected the duration of buckwheat flowering and resulted in a shorter flight season of the ESBB. There was an 11 percent decline in El Segundo Blue Butterfly numbers from the previous year, and the population estimate was the lowest observed in 20 years. See Appendix C for the LAX El Segundo Blue Butterfly 2015 Report dated December 2015.

Public Awareness

Volunteer events to remove weeds and conduct restoration were coordinated by Friends of the LAX Dunes. Friends of the LAX Dunes held 12 events throughout the year.

12.0.B MM-BC-2 Conservation of Floral Resources: Lewis' Evening Primrose

The LAX Master Plan MMRP states in part:

"Conservation of Floral Resources: Lewis' Evening Primrose. *LAWA or its designee shall prepare and implement a plan to compensate for the loss of individuals of the sensitive Lewis' evening primrose, currently located at the westerly end of the north runway and within the Habitat Restoration Area. LAWA or its designee shall collect seed from those plants to be removed, and properly clean and store the collected seed until used. If possible, seeds shall be collected in multiple years to ensure an adequate seed supply for planting. A mitigation site of suitable habitat equal to the area of impact shall be delineated within areas of the Los Angeles/El Segundo Dunes as described in MM-BC-13."*

Status→ No action required at this time:

This measure was not applicable during the 2015 reporting period, as there were no LAX Master Plan projects that would affect Lewis' evening primrose.

12.0.C MM-BC-3 Conservation of Floral Resources: Mature Tree Replacement

The LAX Master Plan MMRP states in part:

"Conservation of Floral Resources: *Mature Tree Replacement. LAWA or its designee shall prepare and implement a plan to compensate at a ratio of 2:1 for the loss of approximately 300 mature trees, which would occur as a result of implementation of the LAX Northside project."*

Status→ No action required at this time:

This measure was not applicable during the 2015 reporting period as there were no current LAX Master Plan projects that resulted in the removal of mature trees.

12.0.D MM-BC-8 Replacement of Habitat Units

The LAX Master Plan MMRP states in part:

"Replacement of Habitat Units. *LAWA or its designee shall undertake mitigation for the loss of habitat units resulting from implementation of Alternative D. Implementation of Alternative D would result in the loss of 45.43 habitat units. These habitat units shall be replaced at a 1:1 ratio within the Los Angeles/El Segundo Dunes."*

Status→ In Progress:
This measure was partially fulfilled by MM-BC (SA)-1, Replacement of Habitat Units Associated with the SAIP. The SAIP project identified an impact to 17.17 habitat units (rounded to 17.2 habitat units in the project-specific mitigation measure); 16.8 habitat units were restored in an offsite location in 2007. Construction staging activities for SAIP, CFTP, and BWP affected additional acreage, requiring a total of 21.43 habitat units to be provided as mitigation.

As noted above, 16.80 habitat units were restored in an offsite location. Replacement of the remaining 4.63 habitat units associated with the SAIP, BWP, and CFTP projects commenced in 2013 with implementation of the LAX Coastal Dunes Improvement Project within the 48-acre LAX/El Segundo Dunes area north of Sandpiper Street. Phase I of the Coastal Dunes Improvement Project was completed by February 2014, and approximately 6 acres of hardscape (roads, sidewalks and retaining walls and gravel beds) were removed and replaced with native seed (hand-seeded, locally collected seeds, crimped into the soil with sterile rice straw). Iceplant, arundo, and other undesired non-native plants were also removed from portions of the site (approximately 2 acres), and native plants are recovering in many of the weed removal areas. Areas with sensitive plants were protected and left undisturbed. Acacia is being slowly removed on a weekly basis and given to the Los Angeles Zoo as fodder. In addition, LAWA's Maintenance Services Division conducted weeding and/or trash removal throughout the Dunes in 2015. Volunteers also helped with weed removal throughout the 48-acre site generally one time per month.

As the native vegetation becomes more established in the road removal and weed removal areas, and weeding continues throughout the 48-acre area during Phase II of the project, it is anticipated that the number of habitat units ultimately accomplished by the Coastal Dunes Improvement Project will complete the replacement of the remaining 4.63 habitat units associated with the SAIP, BWP, and CFTP, projects, as well as contribute additional habitat replacement units to fulfill, and even exceed, the total 45.43 units required by the LAX Master Plan. By 2021, it is anticipated that a total of 48 acres will have been improved to a habitat value (HV) of 0.80 HV per acre, yielding approximately 35 habitat replacement units (0.8 HV is the maximum feasible target habitat value for restoration and enhancement of biotic communities).


Before Road Removal


After Road Removal

12.0.E MM-BC-9 Conservation of Faunal Resources

The LAX Master Plan MMRP states in part:

"Conservation of Faunal Resources. *LAWA or its designee shall develop and implement a relocation and monitoring plan to compensate for the loss of 1.34 habitat units of occupied western spadefoot toad habitat and for the loss of western spadefoot toad individuals currently in the southwestern portion of the AOA; 2.38 habitat units of occupied San Diego black-tailed jackrabbit habitat and for the loss of individuals of this species within the AOA; and 10.83 habitat units utilized by loggerhead shrike within the western airfield. LAWA shall minimize incidental take of active nests of loggerhead shrike though pre-construction surveys and construction avoidance measures. LAWA shall conduct pre-construction surveys for silvery legless lizard, San Diego horned lizard and burrowing owls and relocate individuals, if required."*

Status→ Completed for the Bradley West Project

Status→ No action required at this time:
No action was required during the 2015 reporting period, as there were no LAX Master Plan projects that resulted in impacts to species addressed in this measure.

12.0.F MM-BC-13 Replacement of State-Designated Sensitive Habitats

The LAX Master Plan MMRP states in part:

"Replacement of State-Designated Sensitive Habitats. *LAWA or its designee shall undertake mitigation for the loss of State-designated sensitive habitat within the Los Angeles/El Segundo Dunes, including the Habitat Restoration Area."*

Status→ No action required at this time:
No action was required during the 2015 reporting period, as there were no LAX Master Plan projects that resulted in the loss of State-designated sensitive habitat within the Dunes Area.

12.0.G MM-BC (CFTP)-1 Conservation of Floral Resources: Southern Tarplant

The Crossfield Taxiway Project MMRP states in part:

*"**Conservation of Floral Resources: Southern Tarplant.*** *LAWA or its designee shall prepare a special status plant mitigation program. The loss of the southern tarplant individuals shall be mitigated through seed collection and seeding into a suitable mitigation site within undeveloped property owned by LAWA, determined based on habitat, soil type, moisture levels, and other relevant conditions. … The monitoring plan shall include the following success criteria: germination, flowering and seed set of at least 29 individuals (100 percent of the original population size) by year five."*

Status→ Completed:
The southern tarplant mitigation program for the Crossfield Taxiway Project was combined with the mitigation program for the Bradley West Project. An unsuccessful

seeding effort took place in 2009. Remedial mitigation at an alternative site commenced in fall of 2010 for MM-BC (CFTP)-1 and MM-BC (BWP)-1 at a mitigation site in the southwest corner of the airport near the water retention basins along Pershing Drive. The combined mitigation requirement of the two measures is 329 germinating, flowering, or senesced individuals by year five (to replace 29 plants affected by the Crossfield Taxiway Project and 300 plants affected by the Bradley West Project).

Monitoring completed after Year 1 (2011) showed that the mitigation project had far exceeded the requirement of approximately 200 plants flowering and setting seed for the first year, with a total estimated population of about 10,000 individual flowering plants. Year 2 (2012) was the first in a succession of drought years, during which a much lower number of southern tarplant grew and flowered (688). The quantitative survey for Year 3 (2013) showed 310 individual flowering southern tarplant, exceeding the success criteria of 264 plants for that year, while Year 4 had a decline to only 138 plants as a result of the severe drought conditions.. In Year 5 (2015), a total of 412 tarplant individuals were observed within the mitigation site. LAWA maintenance staff disked small portions of the mitigation site in 2014. It was noted during monitoring of the mitigation site that the disking activities may have resulted in the increase in tarplant germination in 2015. The number of tarplants identified in 2015 successfully achieved the success criteria of 329 germinating, flowering, or senesced individuals required for Year 5. Therefore, this mitigation measure is complete. See Appendix D for the Southern Tarplant Fifth Annual Monitoring Report.

12.0.H MM-BC (BWP)-1 Conservation of Floral Resources: Southern Tarplant

The Bradley West Project MMRP states in part:

*"**Conservation of Floral Resources: Southern Tarplant.** LAWA or its designee shall prepare a special status plant mitigation program for the southern tarplant. The loss of the southern tarplant individuals shall be mitigated through seed collection and seeding into a suitable mitigation site within undeveloped property owned by LAWA or at a suitable off-site location, determined based on habitat, soil type, moisture levels, and other relevant conditions … The monitoring plan shall include the following success criteria: germination, flowering and seed set of 100 percent of the original population size [300 plants] by year five. "*

Status→ Completed:
The southern tarplant mitigation program for the Bradley West Project was combined with the mitigation program for the Crossfield Taxiway Project. See the Crossfield Taxiway project-specific discussion of Mitigation Measure MM-BC (CFTP)-1, Conservation of Floral Resources: Southern Tarplant, in Section 12.0.H, above. As indicated in that discussion, an unsuccessful seeding effort took place in 2009 and remedial mitigation commenced in fall of 2010 for MM-BC (CFTP)-1 and MM-BC (BWP)-1 at a mitigation site in the southwest corner of the airport near the water retention basins along Pershing Drive. The combined mitigation requirement of the two measures is 329 germinating, flowering, or senesced individuals by year five (to replace 29 plants affected by the Crossfield Taxiway Project and 300 plants affected by the Bradley West Project).

Monitoring completed after Year 1 (2011) showed that the mitigation project had far exceeded the requirement of approximately 200 plants flowering and setting seed for the first year with a total estimated population of about 10,000 individual flowering plants. Year 2 (2012) was the first in a succession of drought years, during which a much lower number of southern tarplant grew and flowered (688). The quantitative survey for Year 3 (2013) showed 310 individual flowering southern tarplant, exceeding the success criteria of 264 plants for that year, while Year 4 had a decline to only 138 plants as a result of the severe drought conditions. In Year 5 (2015), a total of 412 tarplant individuals were observed within the mitigation site. LAWA maintenance staff disked small portions of the mitigation site in 2014. It was noted during monitoring of the mitigation site that the disking activities may have resulted in the increase in tarplant germination in 2015. The number of tarplants identified in 2015 successfully achieved the success criteria of 329 germinating, flowering, or senesced individuals required for Year 5. Therefore, this mitigation measure is complete. See Appendix D for the Southern Tarplant Fifth Annual Monitoring Report.

12.0.I MM-BC (BWP)-2 Conservation of Floral Resources: Lewis' Evening Primrose

The Bradley West Project MMRP states in part:

*"**Conservation of Floral Resources: Lewis' Evening Primrose.** Prior to any work activities (i.e., vegetation clearing, invasive species removal and/or spraying, and sediment removal) on the project site, including construction staging areas, pre-construction focused surveys shall be conducted during the period of March through May by a qualified biologist to determine the presence or absence of Lewis' evening primrose."*

Status→ Completed:
Prior to the implementation of construction staging, laydown, and parking areas associated with the Bradley West Project, LAWA conducted focused plant surveys in November 2008 for the Lewis' evening-primrose *(Camissonia lewisii)* and California spineflower *(Mucronea californica)*. Neither species was observed during the focused surveys. No additional mitigation is required.

12.0.J MM-BC (BWP)-3 Conservation of Floral Resources: California Spineflower

The Bradley West Project MMRP states in part:

*"**Conservation of Floral Resources: California Spineflower.** Prior to any work activities (i.e., vegetation clearing, invasive species removal and/or spraying, and sediment removal) on the project site, including construction staging areas, pre-construction focused surveys shall be conducted during the period of March through July by a qualified biologist to determine the presence or absence of California spineflower."*

Status→Completed:
See status of MM-BC (BWP)-2 above.

12.0.K MM-BC (BWP)-4 Conservation of Faunal Resources: Burrowing Owl

The Bradley West Project MMRP states in part:

*"**Conservation of Faunal Resources: Burrowing Owl.** Prior to any work activities (i.e., vegetation clearing, invasive species removal and/or spraying, and sediment removal) within the Southeast Construction Staging/Parking Area (also known as the Continental City site), a survey for burrows by a qualified biologist will be conducted by walking through the suitable habitat within the site in accordance with CDFG-accepted protocols."*

Status→ Completed:
Prior to the implementation of construction staging, laydown, and parking areas associated with the Bradley West Project, LAWA conducted focused surveys in June 2009 for the western burrowing owl *(Athene cunicularia hypugea)*. The burrowing owl was not observed during the spring surveys. However, based on previous reports of burrowing owl within the western portion of LAX, it was recommended that monthly surveys be conducted between September and January, during development of the West Construction Staging Area. These surveys were undertaken by the LAX USDA wildlife biologist under contract to LAWA. No burrowing owls were observed during these monthly surveys. No additional mitigation is required.

12.0.L MM-BC (BWP)-5 Conservation of Faunal Resources: Loggerhead Shrike

The Bradley West Project MMRP states in part:

*"**Conservation of Faunal Resources: Loggerhead Shrike.** If construction is scheduled to occur during the nesting season for the loggerhead shrike (March 15 to August 15), vegetation that will be impacted by the proposed project shall be removed outside the nesting season if feasible."*

Status→ Completed:
Vegetation that was required to be removed to develop construction staging and parking areas associated with the Bradley West Project was removed in 2010 prior to the nesting season for the loggerhead shrike.

12.0.M MM-BC (BWP)-6 Conservation of Faunal Resources: San Diego Black-Tailed Jackrabbit

The Bradley West Project MMRP states in part:

*"**Conservation of Faunal Resources: San Diego Black-Tailed Jackrabbit.** Prior to the commencement of clearing operations or other activities involving significant soil disturbance at locations identified in Table 4.7-2 with suitable habitat, a survey shall be conducted to locate black-tailed jackrabbits within 100 feet of the outer extent of projected soil disturbance activities."*

Status→ Completed:
Prior to clearing operations associated with development of construction staging and parking areas for the Bradley West Project, surveys for the presence of black-tailed jackrabbits were conducted by the LAX USDA wildlife biologist from September 2009 through February 2010 under contract to LAWA. No black-tailed jackrabbits were observed. No additional mitigation is required.

12.0.N MM-BC (BWP)-7 Conservation of Floral Resources: Mature Tree Replacement

The Bradley West Project MMRP states in part:

*"**Conservation of Floral Resources: Mature Tree Replacement.** LAWA or its designee shall compensate at a ratio of 2:1 for the loss of mature trees, which would occur as a result of implementation of Northwest Construction Staging/Parking Area."*

Status→ Completed:
In conjunction with the implementation of the Bradley West Project's Northwest Construction Staging Area, LAWA entered into letters of agreement with TreePeople, a non-profit environmental organization, and funds were provided to plant 66 native mature trees at Westchester Park and 64 trees at Morningside High School and the adjacent, student-run Empowerment Community Garden. The mature tree plantings were initiated in 2010 and were completed by June 2012. As of June 2012, 67 trees had been planted at Westchester Park as part of the TreePeople project, 66 of which are associated with Mitigation Measure MM-BC (BWP)-7. In addition, TreePeople led six tree care events in Westchester Park in 2012.

The Morningside High School/Empowerment Community Garden project was expanded to encompass a large-scale greening plan in the City of Inglewood, in conjunction with the non-profit Social Justice Learning Institute. In addition to the 41 trees that had been planted in in 2011, TreePeople and community volunteers planted 32 trees at Vincent Park in Inglewood. As of June 2012, 73 trees had been planted as part of the TreePeople project in Inglewood, 64 of which are associated with Mitigation Measure MM-BC (BWP)-7. The trees were planted at the Empowerment Community Garden, Warren Lane Elementary School (a feeder school to Morningside High School), Queen Park and Vincent Park. The Orchard that was planted at the Empowerment Community Garden is growing and the trees are already bearing fruit. In addition, three Tree Care follow-up events were held in 2012.

12.0.O MM-BC (BWP)-8 Conservation of Faunal Resources: Nesting Birds/Raptors

The Bradley West Project MMRP states in part:

*"**Conservation of Faunal Resources: Nesting Birds/Raptors.** To comply with the Migratory Bird Treaty Act, for those areas of the project site that are not actively maintained and have a potential for nesting birds/raptors, if construction is scheduled to occur during the nesting season for birds/raptors (generally February 1 to June 30 for raptors and March 15 to August 15 for nesting birds), vegetation that will be impacted by the proposed project shall be removed outside the nesting season if feasible."*

Status→ Completed:
Prior to the removal of trees associated with implementation of the North Construction Staging Area for the Bradley West Project, LAWA conducted surveys for nesting raptors in April 2010. No birds exhibiting breeding behavior or active nests were observed during the survey. Moreover, according to the LAX USDA wildlife biologist, the West Construction Staging Area does not contain suitable habitat for raptors to nest and no nesting raptors have been observed in this area in the past 8 years. As a result, surveys for nesting raptors were not conducted for this construction staging area prior to the removal of vegetation. No additional mitigation is required.

13.0 Endangered and Threatened Species

13.0.A MM-ET-1 Riverside Fairy Shrimp Habitat Restoration

The LAX Master Plan MMRP states in part:

*"**Riverside Fairy Shrimp Habitat Restoration.** LAWA or its designee shall undertake mitigation for direct impacts to 0.04 acre (1,853 square feet) of degraded wetland habitat containing embedded cysts of Riverside fairy shrimp and potential indirect impacts to 1.26 acres of degraded wetland habitat containing embedded cysts of the Riverside fairy shrimp."*

Status→ In Progress:
Efforts to create a vernal pool habitat for Riverside Fairy Shrimp at Madrona Marsh were not successful. At the suggestion of the U.S. Fish and Wildlife Service (USFWS), LAWA began to explore acquisition of an existing vernal pool as an alternate conservation option. Letters to nine landowners were mailed out. One willing seller responded, but LAWA could not reach an agreement on acquiring the property. LAWA will continue to coordinate with USFWS.

13.0.B MM-ET-3 El Segundo Blue Butterfly Conservation: Dust Control

The LAX Master Plan MMRP states:

*"**El Segundo Blue Butterfly Conservation: Dust Control.** To reduce the transport of fugitive dust particles related to construction activities, soil stabilization, watering or other dust control measures, as feasible and appropriate, shall be implemented with a goal to reduce fugitive dust emissions by 90 to 95 percent during construction activities within 2,000 feet of the El Segundo Blue Butterfly Habitat Restoration Area. In addition, to the extent feasible, no grading or stockpiling for construction activities should take place within 100 feet of occupied habitat of the El Segundo blue butterfly."*

Status→ In Progress:
The West Aircraft Maintenance Area (WAMA) project was the only Master Plan project with ongoing grading and excavation activities in proximity to the El Segundo Blue Butterfly Habitat Restoration Area in 2015. Both the LAWA and Qantas components of the WAMA project employed very effective dust control measures. Watering for dust

control occurred essentially full-time during grading and excavation activities during the 2015 reporting period. The entrance to the construction area is paved with asphalt to reduce dust generation. No grading or stockpiling occurred within 100 feet of occupied habitat of the El Segundo Blue Butterfly.

13.0.C MM-ET-4 El Segundo Blue Butterfly Conservation: Habitat Restoration

The LAX Master Plan MMRP states in part:

*"**El Segundo Blue Butterfly Conservation: Habitat Restoration.** LAWA or its designee shall take all necessary steps to avoid the flight season of the El Segundo blue butterfly (June 14 - September 30) when undertaking installation of navigational aids and associated service roads proposed under Master Plan Alternative D within habitat occupied by the El Segundo blue butterfly. Installation of navigational aids within the Habitat Restoration Area should be required to take place between October 1st and May 31st.*
…As possible, depending on the location and condition of individual plants, FAA and LAWA shall salvage existing coast buckwheat plants and any larvae on the plant or pupae in the soil below the plant that would be removed to accommodate the replacement navigational aids to further conserve this species. These plants shall be salvaged immediately prior to the installation of the replacement navigational aids outside of the butterfly flight season. These salvaged plants shall be transported in a suitable container and replanted after the onset of winter rains in subsite 23…"

Status→ No action required at this time:
No action was required during the 2015 reporting period for these components of the measure.

"In conformance with the Biological Opinion, activities associated with navigational aids development shall be limited to the existing roads and proposed impact areas as depicted in the Final EIS/EIR. Coast buckwheat shall be planted a minimum of three years prior to the impact, not only to allow for establishment of the plants, but also to ensure that the plants are mature enough to bloom. The plantings of coast buckwheat shall be located within the southwest corner of subsite 23 of the Habitat Restoration Area, as depicted in Figure F5-5, and shall encompass 1.25 acres in conformance with the Biological Opinion. Coast buckwheat plants will be planted at an initial density of 200 plants per acre to ensure the long-term planting density target (130 plants per acre). Coast buckwheat plants will be placed in clusters or groupings based on microtopographic features present within subsite 23 to better support the El Segundo Blue Butterfly, which is known to prefer large clusters of plants for nectaring and shelter."

Status→ In Progress:
LAWA continued to maintain Block 23, where 325 coast buckwheat plants were planted in 2011 in clusters of 3 to 5 plants. In 2015, a survey showed a 21 percent survival rate, and 69 plants. This does not meet the requirement for 1.25 acres of coast buckwheat at a long-term density of 130 plants per acre. As a result, additional plants for supplemental planting are being raised in the nursery for planting in the future. The surviving plants from the initial planting are now flowering, and El Segundo Blue Butterfly have been observed in Block 23.

"…LAWA shall coordinate with the USFWS to create educational materials on the El Segundo blue butterfly for integration into LAWA's public outreach program."

Status→ Completed

13.0.D MM-ET (BWP)-1 Mitigation for Riverside Fairy Shrimp

The Bradley West Project MMRP states in part:

*"**Mitigation for Riverside Fairy Shrimp.** If Riverside fairy shrimp are found to be located on-site, LAWA shall coordinate with FAA and USFWS to initiate consultation under the federal Endangered Species Act and prepare a Mitigation Plan in consultation with the USFWS."*

Status→ Completed:
Prior to the implementation of the Southeast Construction Staging/Parking Area associated with the Bradley West Project, two wet season surveys and one focused dry season survey for Riverside fairy shrimp (*Streptocephalus woottoni)* were conducted in 2009 and 2010 in accordance with USFWS protocol guidelines. No federally-listed Riverside fairy shrimp were observed within the survey area.

14.0 Energy Supply

14.0.A E-1 Energy Conservation and Efficiency Program

The LAX Master Plan MMRP states in part:

***"Energy Conservation and Efficiency Program.** LAWA will seek to continually improve the energy efficiency of building design and layouts during the implementation of the LAX Master Plan. Title 24, Part 6, Article 2 of the California Administrative Code establishes maximum energy consumption levels for heating and cooling of new buildings to assure that energy conservation is incorporated into the design of new buildings."*

BWP Status→ Completed

14.0.B E-2 Coordination with Utility Providers

The LAX Master Plan MMRP states:

***"Coordination with Utility Providers.** LAWA will implement Master Plan activities in coordination with local utility providers. Utility providers will provide input on the layout of utilities at LAX to assure that LAX and the surrounding region receive both safe and uninterrupted service. When service by existing utility lines could be affected by airport design features, LAWA will work with the utility to identify alternative means of providing equivalent or superior post-construction utility service."*

BWP Status→ Completed

14.0.C PU-1 Develop a Utility Relocation Program

The LAX Master Plan MMRP states in part:

*"**Develop a Utility Relocation Program.** LAWA will develop and implement a utilities relocation program to minimize interference with existing utilities associated with LAX Master Plan facility construction."*

BWP Status→ Completed

15.0 Light Emissions

15.0.A LI-2 Use of Non-Glare Generating Building Materials

The LAX Master Plan MMRP states:

*"**Use of Non-Glare Generating Building Materials**. Prior to approval of final plans, LAWA will ensure that proposed LAX facilities will be constructed to maximize use of non-reflective materials and minimize use of undifferentiated expanses of glass."*

BWP Status→ Completed

15.0.B LI-3 Lighting Controls

The LAX Master Plan MMRP states in part:

"***Lighting Controls**. Prior to final approval of plans for new lighting, LAWA will conduct reviews of lighting type and placement to ensure that lighting will not interfere with aeronautical lights or otherwise impair Airport Traffic Control Tower or pilot operations."*

BWP Status→ Completed

16.0 Solid Waste

16.0.A SW-1 Implement an Enhanced Recycling Program

The LAX Master Plan MMRP states in part:

"**Implement an Enhanced Recycling Program.** *"LAWA will enhance their existing recycling program, based on successful programs at other airports and similar facilities."*

Status→ Plan Completed, Ongoing Implementation:
LAWA completed an enhanced recycling plan in 2011 for LAX. The total recycling and source reduction achieved by LAWA's Maintenance Services Division's Recycling and Source Reduction Program for calendar year 2015 was 26,175 tons.

LAX recycles corrugated boxes

Recycling bins throughout LAX terminals

Some notable achievements for the Recycling and Source Reduction Program include the following:

• Paper	1,516 tons
• Plastics	873 tons
• Glass	10 tons
• Metals	377 tons
• Wood/pallets	1,755 tons
• Green materials	146 tons
• Tires	17 tons
• Food Donations	60 tons
• Construction and demolition debris/ Processed miscellaneous base	20,179 tons
• Cardboard	792 tons
• Other[1]	1,241 tons
Total 2015 Recycling	26,175 tons

[1] Includes CPUs/Monitors, Jet Fuel/Engine Oil, Mixed Recyclables, Paint Chips , Textiles, and Toner Cartridges

Total Master Plan construction concrete recycling[2] 185,500 cubic yards

Features of the enhanced recycling program will include:
"..development of a recycling program at LAX Northside/Westchester Southside.."

Status→ No action required at this time:
This provision was not applicable during the 2015 reporting period because the LAX Northside project had not been approved nor constructed.

"…lease provisions requiring that tenants meet specified division goals…"

"…and preference for recycled materials during procurement, where practical and appropriate."

Status→ Ongoing:
The LAX Procurement Services Division (PSD) promotes resource efficiency with contract language that includes recycling requirements and through direct purchase of products with sustainable attributes and certifications. In 2015, 52 percent of LAX's custodial products were environmentally preferable products. Paper Products used in 2015 were 30 percent post-consumer recycled paper. Cleaners used were certified by Green Seal.

16.0.B SW-2 Requirements for the Use of Recycled Materials During Construction

The LAX Master Plan MMRP states:

*"**Requirements for the Use of Recycled Materials During Construction.** LAWA will require, where feasible, that contractors use a specified minimum percentage of recycled materials during construction of LAX Master Plan improvements. The percentage of recycled materials required will be specified in the construction bid documents. Recycled materials may include, but are not limited to, asphalt, drywall, steel, aluminum, ceramic tile, cellulose insulation, and composite engineered wood products. The use of recycled materials in LAX Master Plan construction will help to reduce the project's reliance upon virgin materials and support the recycled materials market, decreasing the quantity of solid waste requiring disposal."*

BWP Status→ Completed

16.0.C SW-3 Requirements for the Recycling of Construction and Demolition Waste

The LAX Master Plan MMRP states:

*"**Requirements for the Recycling of Construction and Demolition Waste.** LAWA will require that contractors recycle a specified minimum percentage of waste materials generated during demolition and construction. The percentage of waste materials required to be recycled will be specified in the construction bid documents. Waste*

[2] Construction concrete recycled in 2015 for the West Aircraft Maintenance Area (WAMA) project

materials to be recycled may include, but are not limited to, asphalt, concrete, drywall, steel, aluminum, ceramic tile, and architectural details."

BWP Status→ Completed

16.0.D MM-SW-1 Provide Landfill Capacity

The LAX Master Plan MMRP states:

*"**Provide Landfill Capacity.** Additional landfill capacity in the Los Angeles region should be provided through the siting of new landfills, the expansion of existing landfills, or the extension of permits for existing facilities. As an alternative, or to augment regional landfill capacity, landfill capacity outside the region could be accessed by developing the necessary rail haul infrastructure. The responsibility for implementing this mitigation measure lies with state, county, and local solid waste planning authorities. The costs for implementing this mitigation measure will be passed on to LAX and other solid waste generators through increased solid waste disposal costs."*

Status→ No action required:
LAWA has no jurisdiction regarding this mitigation measure which must be implemented by state, county, and local solid waste planning authorities.

17.0 Construction Impacts

17.0.A C-1 Establishment of a Ground Transportation/Construction Coordination Office

The LAX Master Plan MMRP states in part:

*"**Establishment of a Ground Transportation/Construction Coordination Office.** Establish this office for the life of the construction projects to coordinate deliveries, monitor traffic conditions, advise motorists and those making deliveries about detours and congested areas, and monitor and enforce delivery times and routes."*

BWP Status→ Completed

WAMA Status→ Ongoing:
LAWA established the Coordination and Logistic Management (CALM) team to, among other responsibilities, coordinate logistics relating to LAX Master Plan construction projects, including construction-related traffic. In addition, LAWA monitors are responsible for monitoring construction activities, including construction-related traffic and deliveries. In 2015, the CALM team and LAWA monitors worked with the WAMA project staff and contractors, including staff of the LAWA WAMA component and staff of the Qantas component, to coordinate deliveries, monitor traffic conditions, and monitor and enforce delivery times and routes during the reporting period. There were no detours required for the WAMA project during the 2015 reporting period.

MSC Status→ Ongoing:
LAWA established the Coordination and Logistic Management (CALM) team to, among other responsibilities, coordinate logistics relating to LAX Master Plan construction

projects, including construction-related traffic. In addition, LAWA monitors are responsible for monitoring construction activities, including construction-related traffic and deliveries. In 2015, the CALM team and LAWA monitors worked with the MSC project staff and contractors to coordinate deliveries, monitor traffic conditions, and monitor and enforce delivery times and routes during the reporting period. There were no detours required for the MSC project during the 2015 reporting period.

17.0.B C-2 Construction Personnel Airport Orientation

The LAX Master Plan MMRP states:

*"**Construction Personnel Airport Orientation.** All construction personnel will be required to attend an airport project-specific orientation (pre-construction meeting) that includes where to park, where staging areas are located, construction policies, etc."*

BWP Status→ Completed

WAMA Status→ Ongoing:
In 2015, pre-construction meetings were held for the WAMA project to make contractors aware of parking areas, construction staging areas, and construction policies. In addition, weekly status meetings were held to discuss issues relating to construction.

MSC Status→ Ongoing:
In 2015, pre-construction meetings were held for the MSC project to make contractors aware of parking areas, construction staging areas, and construction policies. In addition, weekly status meetings were held to discuss issues relating to construction.

18.0 Design, Art, and Architecture Applications/Aesthetics

18.0.A DA-1 Provide and Maintain Airport Buffer Areas

The LAX Master Plan MMRP states:

*"**Provide and Maintain Airport Buffer Areas.** Along the northerly and southerly boundary areas of the airport, LAWA will provide and maintain landscaped buffer areas that will include setbacks, landscaping, screening or other appropriate view-sensitive improvements with the goals of avoiding land use conflicts, shielding lighting, enhancing privacy and better screening views of airport facilities from adjacent residential uses. Use of existing facilities in buffer areas may continue as required until LAWA can develop alternative facilities."*

Status→ No action required at this time:
In 2015, LAWA continued to provide and maintain all buffer areas surrounding the airport. The Street Frontage and Landscape Development Plan provides integrated and coordinated landscape design guidelines for new development along the perimeter areas of LAX consistent with the LAX Master Plan. Emphasis is placed on buffer areas between the airport and surrounding land uses to the north and south of the airport while

incorporating all the necessary airport security guidelines and maximizing neighborhood compatibility. Additionally, the LAX Northside sub-area of the LAX Specific Plan was undergoing an update which includes an update to the 1989 Northside Design Plan and Development Guidelines. These guidelines will also include additional landscape guidelines and buffer areas to the northern boundary of LAX.

18.0.B DA-2 Update and Integrate Design Plans and Guidelines

The LAX Master Plan MMRP states in part:

*"**Update and Integrate Design Plans and Guidelines**. The following plans and guidelines will be individually updated or integrated into a comprehensive set of design-related guidelines and plans; LAX Street Frontage and Landscape Development Plan (June 1994), LAX Air Cargo Facilities Development Guidelines (April 1998; updated August 2002), and LAX Northside Design Plan and Development Guidelines (1989), including conditions addressing heights, setbacks and landscaping."*

Status→ In Progress:
The Street Frontage and Landscape Plan was updated in March 2005. The LAX Air Cargo Facilities Development Guidelines were updated in August 2002. These plans include requirements to be incorporated into Master Plan projects.

With the California Green Building Code and the LA Green Building Ordinance now in effect, LAWA's program is: "All building projects with an Los Angeles Department of Building and Safety (LADBS) permit-valuation over $200,000 shall achieve LAGBC Tier-1 conformance, to be certified by LADBS during Final Plan-Check (on the issued building permit) and validated by the LADBS inspector during Final Inspection (on the Certificate of Occupancy)." These guidelines were incorporated into LAWA's Design and Construction Handbook and the program went into effect on November 7, 2012.

18.0.C DA-3 Undergrounding of Utility Lines

The LAX Master Plan MMRP states:

*"**Undergrounding of Utility Lines**. In conjunction with the extension of the Century Freeway and other roadway/right-of-way improvement projects, LAWA will pursue opportunities to place existing overhead utility lines underground wherever feasible and appropriate."*

Status→ No action required at this time:
There were no roadway projects during the 2015 reporting period that triggered this requirement.

18.0.D MM-DA-1 Construction Fencing

The LAX Master Plan MMRP states:

*"**Construction Fencing**. Construction fencing and pedestrian canopies shall be installed by LAWA to the degree feasible to ensure maximum screening of areas under construction along major public approach and perimeter roadways, including Sepulveda Boulevard, Century Boulevard, Westchester Parkway, Pershing Drive, and Imperial Highway west of Sepulveda Boulevard. Along Century Boulevard, Sepulveda Boulevard, and in other areas where the quality of public views are a high priority, provisions shall be made by LAWA for treatment of the fencing to reduce temporary visual impacts."*

BWP Status→ Completed

WAMA Status→ Ongoing:
The elevation of the WAMA construction site in comparison to Pershing Drive provided some screening of construction activities from public view. Stockpiles associated with grading activities were available from publically-accessible areas in 2015. However, the quality of public views of this portion of the airport from Pershing Drive are not identified as high priority viewsheds.

19.0 Hazardous Materials

19.0.A HM-1 Ensure Continued Implementation of Existing Remediation Efforts

The LAX Master Plan MMRP states in part:

"***Ensure Continued Implementation of Existing Remediation Efforts.*** *Prior to initiating construction of a Master Plan component, LAWA will conduct a pre-construction evaluation to determine if the proposed construction will interfere with existing soil or groundwater remediation efforts."*

WAMA Status→ Ongoing:
LAWA conducted soil investigations prior to commencement of grading for the WAMA project. In addition, WAMA contractors comply with LAWA policies regarding the handling of impacted soils encountered during construction. No groundwater remediation wells are located on the WAMA project site, including both the LAWA WAMA site and the Qantas site. There are several groundwater monitoring wells near the eastern border of the LAWA WAMA site that are associated with a groundwater remediation effort located to the east. Some well heads were damaged during construction, but were replaced. No wells were taken offline during construction.

19.0.B HM-2 Handling of Contaminated Materials Encountered During Construction

The LAX Master Plan MMRP states in part:

*"**Handling of Contaminated Materials Encountered During Construction.** Prior to the initiation of construction, LAWA will develop a program to coordinate all efforts associated with the handling of contaminated materials encountered during construction. The intent of this program will be to ensure that all contaminated soils and/or groundwater encountered during construction are handled in accordance with all applicable regulations."*

Status→ Completed:
A Hazardous Materials Management Plan was developed and revised in December 2005, and all LAWA contractors are required to comply with its provisions as they apply to the different projects.

19.0.C MM-HAZ (WAMA)-1

The WAMA MMRP states:

Prior to construction at the Project site, additional research shall be undertaken to determine if abandoned/plugged wells at the Project site were abandoned per the current regulations. If necessary, these wells shall be properly abandoned per current regulations. Since the Division of Oil, Gas, and Geothermal Resources (DOGGR) maps are not guaranteed to be accurate, a magnetometer survey shall be completed to determine the exact location of these abandoned/plugged oil wells. If the magnetometer survey successfully determines the location of these oil wells, a subsurface investigation in coordination with the DOGGR and City of Los Angeles Fire Department, as applicable, will be performed to determine if the abandoned wells pose a risk during the grading and construction activities.

Specific DOGGR regulations and requirements for the inspection, testing, plugging, and abandonment of oil wells are contained within Chapter 4, Development, Regulation, and Conservation of Oil and Gas Resources, Article 3 of the State of California Code of Regulations. These regulations require a specific set of actions be taken, dependent on the found state of the abandoned oil wells (e.g. for open holes, a cement plug must extend from the total depth of the well or from at least 100 feet below the bottom of each oil or gas zone to at least 100 feet above the top of each oil or gas zone, for cased holes, all perforations are to be plugged with cement, with the plug extending at least 100 feet above the top of a landed liner, the uppermost perforations, the casing cementing point, the water shut-off holes, or the oil or gas zone, whichever is highest). Chapter V, Article 7, (Fire Code) (57.90.01-45) of the Los Angeles City Municipal Code further regulates the location, drilling safeguards, and abandonment of oil wells in the City. In the event oil wells are found that have not been properly abandoned, the procedures and agency oversight prescribed in these regulations would serve as performance standards to ensure that significant impacts associated with the potential migration of fluids and groundwater contamination would be avoided during construction of the proposed Project. Construction will comply with all applicable requirements of

DOGGR and the City of Los Angeles Fire Department for the investigation and/or re-abandonment of the well(s).

WAMA Status→ Completed:
The location of an abandoned well was identified in 2014. The well was flagged to prevent damage to the well. The project improvements did not require covering the abandoned well. Therefore, construction did not affect the well. There were no impacts to the well, and re-abandonment was not required.

Abandoned Oil Well at LAWA WAMA construction Site

19.0.D MM-HM (MSC)-1 Asbestos-Containing Materials and Lead Based Paint

The MSC MMRP states:

"***Asbestos-Containing Materials and Lead Based Paint.*** *Prior to construction activities, LAWA, or its contractors, will conduct an evaluation of all buildings (built prior to 1980) to be demolished to evaluate the presence of asbestos-containing materials and lead-based paint. Remediation will be implemented in accordance with the recommendation of these evaluations."*

MSC Status→ Ongoing:
LAWA conducted a hazardous material survey prior to demolition of the American Airlines Maintenance (Non-Power) Shop. The building required remediation of asbestos and lead-based paint prior to demolition.

19.0.E MM-HM (MSC)-2 Hazardous Materials Contingency Plan

The MSC MMRP states:

*"**Hazardous Materials Contingency Plan.** LAWA or its contractors will prepare a hazardous materials contingency plan addressing the potential for discovery of unidentified USTs, hazardous materials, petroleum hydrocarbons, or hazardous or solid wastes encountered during construction. The contingency plan will address UST decommissioning, field screening and materials testing methods, mitigation and contaminant management requirements, and health and safety requirements."*

MSC Status→ Ongoing:
LAWA developed a Hazardous Materials Contingency Plan for the 2015 MSC construction activities.

19.0.F MM-HM (MSC)-3 Hazardous and Solid Waste Disposal

The MSC MMRP states:

*"**Hazardous and Solid Waste Disposal.** Construction contractors will dispose of all hazardous or solid wastes and debris encountered or generated during construction and demolition activities in accordance with all federal, state, and local laws and regulations."*

MSC Status→ Ongoing:
A small amount of contaminated soils was encountered in 2015 during excavation associated with the MSC project. The contaminated soils were disposed of off-site in accordance with all federal, state, and local laws and regulations.

20.0 Water Use

20.0.A W-1 Maximize Use of Reclaimed Water

The LAX Master Plan MMRP states:

*"**Maximize Use of Reclaimed Water.** To the extent feasible, LAWA will maximize the use of reclaimed water in Master Plan-related facilities and landscaping. The intent of this commitment is to maximize the use of reclaimed water as an offset for potable water use and to minimize the potential for increased water use resulting from implementation of the LAX Master Plan. This commitment will also facilitate achievement of the City of Los Angeles' goal of increased beneficial use of its reclaimed water resources. This commitment will be implemented by various means, such as installation and use of reclaimed water distribution piping for landscape irrigation."*

BWP Status→ Completed

20.0.B W-2 Enhance Existing Water Conservation Program

The LAX Master Plan MMRP states:

*"**Enhance Existing Water Conservation Program**. "LAWA will enhance the existing Street Frontage and Landscape Plan for LAX to ensure the ongoing use of water conservation practices at LAX facilities. The intent of this program, to minimize the potential for increased water use due to implementation of the LAX Master Plan program, is also in accordance with regional efforts to ensure adequate water supplies for the future. Features of the enhanced conservation program will include identification of current water conservation practices and an assessment of their effectiveness; identification of alternate future conservation practices; continuation of the practice of retrofitting and installing new low-flow toilets and other water-efficient fixtures in all LAX buildings, as remodeling takes place or new construction occurs; use of Best Management Practices for maintenance; use of water efficient vegetation for landscaping, where possible; and continuation of the use of fixed automatic irrigation for landscaping."*

Status→ Completed:
The Street Frontage and Landscape Plan was updated in March, 2005 and it includes policies pertaining to the use of reclaimed water in Master Plan-related landscaping and new policies enhancing the ongoing use of water conservation practices at LAX.

Some landscaped areas at LAX are irrigated by reclaimed water. The number of landscaped areas served is limited to those areas accessible to the reclaimed water supply pipeline. In 2015, the reclaimed water use at LAX was 36,248,080 gallons, and by 2015, 95% of irrigation at LAX had been converted to computerized irrigation. The remaining area was in the CTA. Approximately 30,000 square feet of turf was removed from the Theme Building in 2015, with a projected savings of about 1,554,000 gallons of water per year. This system further conserves valuable water resources.

All buildings and passenger terminals at LAX feature low-flow devices on all toilets and sinks, with telephone numbers prominently posted in all restrooms so that people can notify maintenance staff if they encounter leaky faucets or other water problems. LAWA's Design and Construction Handbook specifications for new and replacement water closets and urinals specify that the maximum water closet flush is to be limited to 1.28 gallons per flush and the maximum urinal flush is to be limited to 0.125 gallons per flush. In addition, water used in on-airport car wash facilities is recycled.

New signage was installed along Westchester Parkway to increase public awareness of reclaimed water use at the airport.

21.0 Wastewater

21.0.A MM-WW-1 Provide Additional Wastewater Treatment Capacity to Accommodate Cumulative Flows

The LAX Master Plan MMRP states:

*"**Provide Additional Wastewater Treatment Capacity to Accommodate Cumulative Flows**. Additional wastewater capacity within the City of Los Angeles should be provided by the expansion/upgrade of the City's wastewater treatment systems via a combination of improvements to address the projected wastewater [capacity] shortfall resulting from cumulative development. Such improvements could include increasing capacity at the Hyperion Treatment Plant (HTP), building new reclamation capacity upstream of HTP, conservation of potable water, and infiltration/inflow reduction. Implementation of this mitigation measure is the responsibility of the City of Los Angeles Department of Public Works, Bureau of Sanitation. Specific improvements will be identified in the City's IPWP and Wastewater Facilities Plan component of the City's Integrated Resources Plan. The cost for implementing this mitigation measure would be passed on to LAX and other wastewater generators through increased wastewater fees."*

Status→ No action required:
LAWA has no jurisdiction regarding this mitigation measure which will be implemented by the City of Los Angeles Department of Public Works, Bureau of Sanitation.

22.0 Fire Protection

22.0.A FP-1 LAFD Design Recommendations

The LAX Master Plan MMRP states in part:

*"**LAFD Design Recommendations**. During the design phase prior to initiating construction of a Master Plan component, LAWA will work with LAFD to prepare plans that contain the appropriate design features applicable to that component, such as those recommended by LAFD*."

BWP Status→ Completed

MSC Status→ Ongoing:
The MSC project was in the design phase during the 2015 reporting period. Design efforts were coordinated with LAFD.

22.0.B PS-1 Fire and Police Facility Relocation Plan

The LAX Master Plan MMRP states:

*"**Fire and Police Facility Relocation Plan**. Prior to any demolition, construction, or circulation changes that would affect LAFD Fire Stations 51, 80, and 95, or on-airport police facilities, a Relocation Plan will be developed by LAWA through a cooperative process involving LAFD, LAWAPD, the LAPD LAX Detail, and other airport staff. The performance standards for the plan will ensure maintenance of required response times, response distances, fire flows, and a transition to new facilities such that fire and law enforcement services at LAX will not be significantly degraded. The plan will also address future facility needs, including details regarding space requirement, siting, and design."*

BWP Status→ Completed

MSC Status→ No action required at this time:
MSC construction activities during the 2015 reporting period did not include project components that would affect access to any LAFD fire stations or on-airport police facilities.

22.0.C PS-2 Fire and Police Facility Space and Siting Requirements

The LAX Master Plan MMRP states:

*"**Fire and Police Facility Space and Siting Requirements**. During the early design phase for implementation of the Master Plan elements affecting on-airport fire and police facilities, LAWA and/or its contractors will consult with LAFD, LAWAPD, LAPD, and other agencies as appropriate, to evaluate and refine as necessary, program requirements for fire and police facilities. This coordination will ensure that final plans*

adequately support future facility needs, including space requirements, siting and design."

BWP Status→ Completed

MSC Status→ No action required at this time:
MSC project components would not directly affect any on-airport fire or police facilities.

23.0 Law Enforcement

23.0.A LE-1 Routine Evaluation of Manpower and Equipment Needs

The LAX Master Plan MMRP states:

*"**Routine Evaluation of Manpower and Equipment Needs.** LAWA will ensure that LAWAPD and LAPD LAX Detail continue to routinely evaluate and provide additional officers, supporting administrative staff, and equipment, to keep pace with forecasted increases in activity and development at LAX in order to maintain a high level of law enforcement services. This will be achieved through LAWA notification to LAWAPD and LAPD regarding pending development and construction and through LAWA review of status reports on law enforcement services at LAX."*

Status→ Ongoing:
LAWAPD monitors law enforcement needs on an ongoing basis to adjust, as needed, law enforcement assignments and services at LAX in light of changes in conditions/circumstances including, but not limited to, passenger activity level increases. The ongoing monitoring and adjustments include officers, administrative staff, and equipment. Operational meetings are conducted regularly and steps are taken to adjust resources as needed. During 2015, which saw a six percent increase in passenger activity levels at LAX, staffing levels and assignments were monitored and adjusted as needed to maintain an acceptable level of law enforcement services at LAX.

In addition, the CALM team is responsible for coordinating with LAWAPD to ensure adequate law enforcement services associated with LAX Master Plan construction projects. In 2015, additional staffing was required for several Airport Operations Area (AOA) access posts used by construction vehicles.

23.0.B LE-2 Plan Review

The LAX Master Plan MMRP states:

*"**Plan Review**. During the design phase of terminal and cargo facilities and other major airport development, the LAPD, LAWAPD, and other law enforcement agencies will be consulted to review plans so that, where possible, environmental contributors to criminal activity, such as poorly-lit areas, and unsafe design, are reduced."*

BWP Status→ Completed

24.0 Project Design Features – West Aircraft Maintenance Area (WAMA)

24.0.A WAMA-PDF-1 Quarterly Reporting

The WAMA MMRP states in part:

"The tenants of the WAMA site will be required to provide to LAWA a quarterly report indicating the number, time of day, duration, and specific aircraft type of all aircraft engine high-power and low-power ground run-ups conducted during the reporting period….."

Status→ No action required at this time:
This measure was not applicable during the 2015 reporting period as there was no aircraft activity for that area because the project was not operational.

"In conjunction with application of a ground run-up reporting program, LAWA will develop a tiered penalty program applicable to violations of the LAX nighttime curfew for aircraft engine high-power ground run-ups….."

Status→ No action required at this time:
This measure was not applicable during the 2015 reporting period as there was no aircraft activity for that area because the project was not operational.

24.0.B WAMA-PDF-2 APU Usage While Aircraft is Parked

The WAMA MMRP states:

"Aircraft parked at the WAMA site shall not utilize on-board auxiliary power units (APUs) for aircraft electrical power or interior cooling at parking spaces where ground power and preconditioned air are available, with the exceptions being: (1) if an APU is being serviced or checked relative to those functions; or (2) for some limited time if APU is required to tug/tow aircraft to/from WAMA site (i.e., for proper operation of essential on-board electronics while being moved). In addition to the proposed RON kits with ground power and preconditioned air for aircraft parking positions along the perimeter of the site (i.e., at hangar areas along World Way West and RON/RAD positions along Pershing Drive), the final WAMA site design will include additional aircraft ground power connect ports at the two interior RON/RAD positions within the site."

Status→ No action required at this time:
This measure was not applicable during the 2015 reporting period as there was no aircraft activity for that area because the project was not operational.

24.0.C WAMA-PDF-3 Aircraft Taxiing

The WAMA MMRP states:

"All aircraft traveling to or from WAMA during nighttime hours (11:00 p.m. to 6:00 a.m.) must be tugged/towed and are not allowed to taxi under own power, unless otherwise directed by LAWA Airport Operations in situation-specific circumstances where taxiing is required to maintain airfield safety and efficiency."

Status→ No action required at this time:
This measure was not applicable during the 2015 reporting period as there was no aircraft activity for that area because the project was not operational.

24.0.D WAMA-PDF-4 Aircraft Engine Ground Run-Ups

The WAMA MMRP states:

"Aircraft engine high-power ground run-ups of any duration and low-power run-ups of five minutes or more can only occur at the onsite blast fence; and, all run-ups (high-power and low-power of any duration) are prohibited anywhere on the WAMA site between 11:00 p.m. and 6:00 a.m."

Status→ No action required at this time:
This measure was not applicable during the 2015 reporting period as there was no aircraft activity for that area because the project was not operational.

24.0.E WAMA-PDF-5 Use of the WAMA Site

The WAMA MMRP states:

"Aircraft parking spaces at WAMA site cannot be used for passenger boarding or deplaning (i.e., cannot be used as remote gates), except during or as a result of emergency circumstances."

Status→ No action required at this time:
This measure was not applicable during the 2015 reporting period as there was no aircraft activity for that area because the project was not operational.

24.0.F WAMA-PDF-6 Automated Run-Up Monitoring System

The WAMA MMRP states:

"An aircraft engine ground run-up monitoring system, including a sound level meter and video camera, will be provided at the run-up area. LAWA will make all reasonable efforts to make data from the monitoring system accessible to the public via an internet link provided on LAWA's website (i.e., lawa.org)."

Status→ No action required at this time:
This measure was not applicable during the 2015 reporting period as there was no aircraft activity for that area because the project was not operational.

24.0.G WAMA-PDF-7 Resurfacing a Portion of Imperial Highway

The WAMA MMRP states:

"LAWA will work with City of Los Angeles Bureau of Street Services (LABSS) to contribute its reasonable allocable share subject to FAA approval toward resurfacing of Imperial within the City of Los Angeles's jurisdiction; if the LABSS undertakes this resurfacing project, LAWA will also work with LABSS and the Council District 11 office to schedule resurfacing work. LAWA commits to meetings with Caltrans (alongside the City of El Segundo) to discuss improvements to areas under Caltrans control but cannot make any guarantees as to Caltrans' actions."

WAMA Status→ No action required at this time:
Imperial Highway extends along the southern border of LAX from Pershing all the way to Aviation Boulevard. Along this segment, Imperial intersects with Sepulveda Boulevard (Highway 1), which is under Caltrans jurisdiction. No improvements were required in 2015 in areas under Caltrans jurisdiction. After making inquiries with the City of Los Angeles' Bureau of Street Services, LAWA knows of no pending resurfacing project for westbound Imperial Highway. The eastbound lanes were resurfaced approximately 5 years ago."

APPENDIX A

LAX MASTER PLAN MMRP AS ADOPTED DECEMBER 2004

REFERENCE

LAWA Website:
http://www.lawa.org/uploadedFiles/OurLAX/Past_Projects_and_Studies/Past_Publications/mmrp.pdf

for a copy of the document

APPENDIX B

LAX MASTER PLAN PROJECT-SPECIFIC MEASURES

(SAIP, CFTP, BWP, WAMA, AND MSC-SPECIFIC MEASURES)

SOUTH AIRFIELD IMPROVEMENT PROJECT
MITIGATION MONITORING & REPORTING PROGRAM
FOR NEW MITIGATION MEASURES[1]

	Master Plan Commitments/ Mitigation Measures	Potential Impact Being Addressed	Timing of Implementation	Monitoring Frequency	Actions Indicating Compliance
	Biotic Communities				
MM-BC (SA)-1 **Monitoring Agency:** **LAWA**	**Replacement of Habitat Units Associated with the South Airfield Improvement Project.** LAWA or its designee shall undertake mitigation for the loss of 17.2 habitat units resulting from implementation of the SAIP. These habitat units shall be replaced at a 1:1 ratio within the FAA owned habitat preserve at the former Marine Corps Air Station El Toro (El Toro site), or other appropriate site.	Impacts on Disturbed/Bare Ground and Non-Native Grassland/Ruderal areas	Preparation of Replacement Plan prior to or concurrent with commissioning of relocated Runway 7R-25L	As per Replacement Plan for Habitat Units	Preparation of Replacement Plan for Habitat Units; Periodic Monitoring Report
MM-BC (SA)-2 **Monitoring Agency:** **LAWA**	**Conservation of Faunal Resources Associated with the South Airfield Improvement Project.** Directed surveys for the San Diego black-tailed jackrabbit and the loggerhead shrike shall be undertaken by a qualified wildlife biologist at least 14 days before construction activities. LAWA or its designee shall relocate any observed San Diego black-tailed jackrabbit individuals currently inhabiting the SAIP project areas. Relocation efforts shall be coordinated with CDFG.	Impacts on San Diego black-tailed jackrabbit habitat and loggerhead shrike habitat	Initiated and completed prior to or concurrent with commissioning of relocated Runway 7R-25L	As per Replacement Plan for Habitat Units	Preparation of Replacement Plan for Habitat Units; Periodic Monitoring Report

[1] The South Airfield Improvement Project is subject to many of the LAX Master Plan Commitments and Mitigation Measures adopted in conjunction with the LAX Master Plan Final EIR. See User Guide located at front of the MMRP.

CROSSFIELD TAXIWAY PROJECT
MITIGATION MONITORING & REPORTING PROGRAM
FOR NEW MITIGATION MEASURES[1]

CFTP-Specific Mitigation Measures		Potential Impact Being Addressed	Timing of Implementation	Monitoring Frequency	Actions Indicating Compliance
Historical/Architectural and Archaeological/Cultural Resources					
MM-HA (CFTP)-1 **Monitoring Agency:** **LAWA**	**Conformance with LAX Master Plan Archaeological Treatment Plan**: Prior to initiation of grading and construction activities, LAWA will retain an on-site Cultural Resource Monitor (CRM), as defined in the LAX Master Plan MMRP ATP, who will determine if the proposed project area is subject to archaeological monitoring. As defined in the ATP, areas are not subject to archaeological monitoring if they contain redeposited fill or have previously been disturbed. The CRM will compare the known depth of redeposited fill or disturbance to the depth of planned grading activities, based on a review of construction plans. If the CRM determines that the proposed project site is subject to archaeological monitoring, a qualified archaeologist (an archaeologist who satisfies the Secretary of the Interior's Professional Qualifications Standards [36 CFR 61]) shall be retained by LAWA to inspect excavation and grading activities that occur within native material. The extent and frequency of inspection shall be defined based on consultation with the archaeologist. Following initial inspection of excavation materials, the archaeologist may adjust inspection protocols as work proceeds.	Potential to unexpectedly encounter and impact subsurface archaeological resources, including Native American remains, during grading and excavation associated with construction of the CFTP	Prior to initiation of grading and/or excavation activities associated with the construction of the CFTP	As per the Cultural Resource Monitor determining proposed project area being subject to archaeological monitoring, the extent and frequency of inspection shall be defined based on consultation with the archeologist	Conformance with LAX Master Plan Archaeological Treatment Plan

[1] The Crossfield Taxiway Project is subject to many of the LAX Master Plan Commitments and Mitigation Measures adoption in conjunction with the LAX Master Plan Final EIR. See User Guide at front of MMRP.

CROSSFIELD TAXIWAY PROJECT
MITIGATION MONITORING & REPORTING PROGRAM
FOR NEW MITIGATION MEASURES[1]

CFTP-Specific Mitigation Measures		Potential Impact Being Addressed	Timing of Implementation	Monitoring Frequency	Actions Indicating Compliance
Paleontological Resources					
MM-PA (CFTP)-1 **Monitoring Agency:** **LAWA**	**Conformance with LAX Master Plan Paleontological Management Treatment Plan**: Prior to the initiation of grading and construction activities, LAWA will retain a professional paleontologist, as defined in the Final LAX Master Plan MMRP PMTP, who will determine if the project site exhibits a high or low potential for subsurface resources. If the project site is determined to exhibit a high potential for subsurface resources, paleontological monitoring will be conducted in accordance with the procedures stipulated in the PMTP. If the project site is determined to exhibit a low potential for subsurface deposits, excavation need not be monitored as per the PMTP. In the event that paleontological resources are discovered, the procedures outlined in the PMTP for the identification of resources will be followed.	Potential to unexpectedly encounter and impact subsurface paleontological resources during grading and excavation associated with construction of the CFTP	Prior to initiation of grading and/or excavation activities associated with the construction of the CFTP	As per the professional paleontologist determining proposed project area being subject to paleontological monitoring, the extent and frequency of inspection shall be defined based on procedures outlined in the PMTP	Conformance with LAX Master Plan Paleontological Management Treatment Plan
MM-PA (CFTP)-2 **Monitoring Agency:** **LAWA**	**Construction Personnel Briefing**: In accordance with the PMTP, construction personnel will be briefed by the consulting paleontologist in the identification of fossils or fossilferous deposits and in the correct procedures for notifying the relevant individuals should such a discovery occur.	Potential to unexpectedly encounter and impact subsurface paleontological resources during grading and excavation associated with construction of the CFTP	Prior to initiation of grading and/or excavation activities associated with the construction of the CFTP	Once	Completion of briefing of construction personnel on identification of fossils or fossilferous deposits and notification procedures in accordance with the PMTP

CROSSFIELD TAXIWAY PROJECT
MITIGATION MONITORING & REPORTING PROGRAM
FOR NEW MITIGATION MEASURES[1]

CFTP-Specific Mitigation Measures		Potential Impact Being Addressed	Timing of Implementation	Monitoring Frequency	Actions Indicating Compliance
Biotic Communities					
MM-BC (CFTP)-1 **Monitoring Agency:** **LAWA**	**Conservation of Floral Resources: Southern Tarplant.** LAWA or its designee shall prepare a special status plant mitigation program. The loss of the southern tarplant individuals shall be mitigated through seed collection and seeding into a suitable mitigation site within undeveloped property owned by LAWA, determined based on habitat, soil type, moisture levels, and other relevant conditions. A qualified Seed Collector shall monitor the tarplant phenology to determine the appropriate timing for seed collection. Tarplant seed shall be collected from all tarplants within the impact area, which shall be delineated in the field with lath and flagging by a Qualified Biologist. The Biologist shall ensure that seed shall only be collected from plants that will be impacted by the CFTP. Upon completion of seed collection, the seed collector shall clean the seeds to prepare for the seeding effort. A mitigation plan shall be developed at a level of detail necessary for successful program implementation by a Landscape Contractor. The detailed program shall contain the following items: ◆ *Responsibilities and qualifications of the personnel to implement and supervise the plan.* The plan shall specify the responsibilities and qualifications of the personnel who will supervise and implement the mitigation plan, including LAWA, Technical Specialists, and Maintenance Personnel.	Impacts on the loss of the southern tarplant individuals	Preparation of a special status plant mitigation program prior to relocation/ construction of the existing American Airlines employee parking lot	As per special status plant mitigation program for southern tarplant resources; Regular site visits (i.e. monthly, quarterly) for no more than 5 years or until germination, flowering and seed set of at least 29 individuals (100 percent of the original population size)	Preparation of special status plant mitigation program; Periodic Monitoring Report

CROSSFIELD TAXIWAY PROJECT
MITIGATION MONITORING & REPORTING PROGRAM
FOR NEW MITIGATION MEASURES[1]

CFTP-Specific Mitigation Measures		Potential Impact Being Addressed	Timing of Implementation	Monitoring Frequency	Actions Indicating Compliance
	◆ *Site selection.* The site for the mitigation shall be determined in coordination with LAWA, and shall be located in a suitable area within the boundaries of LAX. The appropriate site shall consist of approximately 0.14 acre and shall have suitable hydrology, soils, and other factors necessary for the establishment of the southern tarplant. Such suitable sites exist within the boundaries of LAX, including but not limited to areas within LAX Northside and in the southwestern portion of the airport, west of the south airfield complex. ◆ *Site preparation and planting implementation.* The plan shall include specifications for seed collection and storage and guidelines for on-site preparation. The guidelines shall contain specifications for (1) existing native species protection; (2) trash and weed removal; (3) soil treatments (e.g., imprinting and decompacting); (4) temporary irrigation installation as needed; (5) erosion control measures (e.g., rice or willow wattles); and (6) seed application. ◆ *Schedule.* A schedule shall be developed, which includes planting, to occur in late fall and early winter (between October and January 30). ◆ *Maintenance plan/guidelines.* A three to five year maintenance plan shall include (1) weed control; (2) herbivory control; (3) trash removal; (4) irrigation system maintenance; (5) maintenance training; and (6) replacement seeding, if necessary. Ten percent of the original seed collected shall be stored in the event it is needed for replacement seeding.				

CROSSFIELD TAXIWAY PROJECT
MITIGATION MONITORING & REPORTING PROGRAM
FOR NEW MITIGATION MEASURES[1]

	CFTP-Specific Mitigation Measures	Potential Impact Being Addressed	Timing of Implementation	Monitoring Frequency	Actions Indicating Compliance
	◆ *Monitoring plan.* The monitoring plan shall include the following success criteria: - Germination, flowering and seed set of at least 17 individuals (60 percent of the original population size) in year one; - Germination, flowering and seed set of at least 23 individuals (80 percent of the original population size) by year three; - Germination, flowering and seed set of at least 29 individuals (100 percent of the original population size) by year five. If these success criteria are not met, or are unlikely to be met within the required time periods, remedial measures will be required. This plan may include qualitative and quantitative monitoring. Qualitative monitoring includes site visits at regular intervals (i.e., monthly, quarterly, etc.) to determine the overall general performance of the site and maintenance needs. Quantitative monitoring is conducted on an annual basis and includes data collection specific to the performance standards established in the monitoring plan. *Long-term preservation.* Long-term preservation of the site shall also be outlined in the conceptual mitigation plan to ensure that future development does not impact the mitigation site.				

Mitigation Monitoring and Reporting Program
Bradley West Project-Specific Mitigation Measures

Bradley West Project-Specific Mitigation Measures		Impact Being Addressed	Timing of Implementation	Monitoring Frequency	Actions Indicating Compliance
Surface Transportation					
MM-ST (BWP)-1 **Monitoring Agency:** **LAWA**	**Trip Reduction Measures.** LAWA will implement the following trip reduction measures: (a) Continue to promote and expand the FlyAway services in accordance with LAX Master Plan Mitigation Measure MM-AQ-3. It is anticipated that the continued expansion of the FlyAway service will promote a shift in mode-share away from the private vehicle mode which would reduce traffic volume using the CTA roadway system. (b) Continue to promote the consolidation of shuttle services (e.g., hotel/motel, off-airport parking, rental cars) or programs to reduce trips associated with these modes.	Traffic congestion and delays along on-airport roadways during airport operations	Ongoing programs	Annually	Status updates/confirmation in annual MMRP progress report
MM-ST (BWP)-2 **Monitoring Agency:** **LAWA**	**Improve the Intersection of Center Way and World Way South.** Widen World Way South approach on the east side of the roadway to provide an additional right turn lane. The resulting configuration would be a single left turn lane, one through-left turn lane, two through lanes, and two right turn lanes. During the Future (2013) Without Project overall airport peak hour the intersection of Center Way and World Way South operates at a V/C of 0.978 which is LOS E. With an intersection operating at a LOS E condition, the volume to capacity ratio can be increased by 0.01 without generating an impact. This	Traffic congestion and delays at the intersection of Center Way and World Way South during airport operations	When traffic levels reach the conditions specified in the measure	(1) Prior to implementation of intersection improvements, this measure will be monitored annually to determine whether CTA average daily traffic volumes in the peak month (August) have	Confirmation that the subject intersection improvement has been completed

Bradley West Project-Specific Mitigation Measures		Impact Being Addressed	Timing of Implementation	Monitoring Frequency	Actions Indicating Compliance
	equates to an increase in the intersection's V/C ratio from 0.978 to 0.988, or approximately 1.1 percent (i.e., 0.988/0.978) in the critical movement traffic volume without triggering an impact. LAWA will monitor traffic conditions at this intersection to determine when an estimated impact has been "triggered" in accordance with the LOS thresholds described above. Specifically, LAWA will monitor future CTA average daily traffic volumes in August to determine when CTA average daily traffic volumes have increased by more than 1.1 percent relative to the Future (2013) Without Project average daily traffic volumes. In addition, LAWA will record turning movement volumes at this intersection annually during the airport's peak month (August). When the August average daily CTA volumes have increased by 1.1 percent as compared to the Future (2013) Without Project estimated volume, LAWA will complete a V/C analysis using the same intersection methodology described in the Bradley West Draft EIR (Section 4.1.3.7) to determine if an impact has occurred. The mitigation measure would be constructed once both (a) the CTA average daily traffic volumes are 1.1 percent greater than the Future (2013) Without Project and (b) the V/C for the intersection meets or exceeds 0.988. The intersection analysis would be subject to approval by LADOT regarding timing of the mitigation measure.			increased by more than 1.1 percent relative to the Future (2013) Without Project average daily traffic volumes, based on annual passenger activity reports. (2) Following implementation of intersection improvements, the monitoring frequency will be reduced to once, upon completion of subject intersection improvement	

Mitigation Monitoring and Reporting Program
Bradley West Project-Specific Mitigation Measures

Bradley West Project-Specific Mitigation Measures		Impact Being Addressed	Timing of Implementation	Monitoring Frequency	Actions Indicating Compliance
MM-ST (BWP)-3 **Monitoring Agency:** **LAWA**	**Widen World Way Across from TBIT.** Widen the arrivals-level outer roadway across from TBIT by changing the left-most lane that currently terminates at Center Way to a through/left lane and extending this lane to World Way South.	Traffic congestion and delays along on-airport roadways during airport operations	The subject widening shall occur in conjunction with the project-related construction at TBIT, which is anticipated to be completed in 2013	Once, upon completion of subject roadway widening	Confirmation that the subject roadway widening has been completed
MM-ST (BWP)-4 **Monitoring Agency:** **LAWA**	**Modify the Intersection of Airport Boulevard and Manchester Avenue (Intersection #9).** The eastbound approach to the Airport Boulevard and Manchester Avenue intersection shall be restriped to provide one left-turn lane, two through lanes, and a through/right lane. Three parking spaces on the south side of Manchester Avenue west of Belford Avenue and two parking spaces on the south side of Manchester Avenue east of Belford Avenue shall be restricted during the PM peak period. Alternatively, the westbound approach to the Airport Boulevard and Manchester Avenue intersection shall be restriped and the traffic signal modified to provide two left-turn lanes, two through lanes, and a right-turn lane. This mitigation measure will be implemented to the standards and satisfaction of the City of Los Angeles. Implementation of this measure shall occur if/when international passenger activity levels at TBIT increase to 19.7 million annual passengers.	Traffic congestion and delays at the intersection of Airport Boulevard and Manchester Avenue during airport operations	If/when international passenger activity levels at TBIT increase to 19.7 million annual passengers	(1) Prior to implementation of the intersection improvements, this measure will be monitored annually to determine whether TBIT passenger activity levels have reached 19.7 MAP, based on annual passenger activity reports. (2) Following implementation of the intersection improvement, the monitoring frequency will be reduced to	Confirmation that the subject intersection improvement has been completed

Bradley West Project-Specific Mitigation Measures		Impact Being Addressed	Timing of Implementation	Monitoring Frequency	Actions Indicating Compliance
				occurring just once, upon completion of the intersection improvement	
MM-ST (BWP)-5 **Monitoring Agency:** **LAWA**	**Modify the Intersection of Arbor Vitae Street and Aviation Boulevard (Intersection #10).** The eastbound approach to the Arbor Vitae Street and Aviation Boulevard intersection shall be widened to provide one left-turn lane, two through lanes, and a right-turn lane. This mitigation measure will be implemented to the standards and satisfaction of the City of Los Angeles and City of Inglewood. Implementation of this measure shall occur if/when international passenger activity levels at TBIT increase to 20.7 million annual passengers.	Traffic congestion and delays at the intersection of Arbor Vitae Street and Aviation Boulevard during airport operations	If/when international passenger activity levels at TBIT increase to 20.7 million annual passengers	(1) Prior to implementation of the intersection improvement, this measure will be monitored annually to determine whether TBIT passenger activity levels have reached 20.7 MAP, based on annual passenger activity reports. (2) Following implementation of the intersection improvement, the monitoring frequency will be reduced to occurring just once, upon completion of the intersection	Confirmation that the subject intersection improvement has been completed

Mitigation Monitoring and Reporting Program
Bradley West Project-Specific Mitigation Measures

Bradley West Project-Specific Mitigation Measures		Impact Being Addressed	Timing of Implementation	Monitoring Frequency	Actions Indicating Compliance
				improvement	
MM-ST (BWP)-6 **Monitoring Agency:** **LAWA**	**Modify the Intersection of Imperial Highway and Sepulveda Boulevard (Intersection #71).** The northbound approach to the Imperial Highway and Sepulveda Boulevard intersection shall be restriped to provide one left-turn lane, three through lanes, and two right-turn lanes. While restriping this intersection as described above would mitigate this impact, an alternative would be to widen the east side of Sepulveda Boulevard south of Imperial Highway to provide one left-turn lane, three through lanes, and two right-turn lanes on the northbound approach. However, provided the right-of-way is available, the provision of additional travel lane area would require disruption of traffic flows, generation of construction-related air pollutant emissions and noise impacts, and therefore the restriping is recommended rather than the widening. This mitigation measure will be implemented to the standards and satisfaction of the City of Los Angeles, City of El Segundo, and Caltrans. Implementation of this measure shall occur if/when international passenger activity levels at TBIT increase to 19.7 million annual passengers.	Traffic congestion and delays at the intersection of Imperial Highway and Sepulveda Boulevard during airport operations	If/when international passenger activity levels at TBIT increase to 19.7 million annual passengers	(1) Prior to implementation of the intersection improvement, this measure will be monitored annually to determine whether TBIT passenger activity levels have reached 19.7 MAP, based on annual passenger activity reports. (2) Following implementation of the intersection improvement, the monitoring frequency will be reduced to occurring just once, upon completion of the intersection improvement	Confirmation that the subject intersection improvement has been completed

Mitigation Monitoring and Reporting Program
Bradley West Project-Specific Mitigation Measures

Bradley West Project-Specific Mitigation Measures		Impact Being Addressed	Timing of Implementation	Monitoring Frequency	Actions Indicating Compliance
MM-ST (BWP)-7 **Monitoring Agency:** **LAWA**	**Modify the Intersection of La Cienega Boulevard and I-405 Ramps N/O Century Boulevard (Intersection #96).** The southbound approach to the La Cienega Boulevard and I-405 Ramps N/O Century Boulevard intersection shall be widened to provide two left-turn lanes and two through lanes. This mitigation measure will be implemented to the standards and satisfaction of the City of Los Angeles, City of Inglewood, and Caltrans. Implementation of this measure shall occur if/when international passenger activity levels at TBIT increase to 20.7 million annual passengers.	Traffic congestion and delays at the intersection of La Cienega Boulevard and I-405 Ramps N/O Century Boulevard during airport operations	If/when international passenger activity levels at TBIT increase to 20.7 million annual passengers	(1) Prior to implementation of the intersection improvement, this measure will be monitored annually to determine whether TBIT passenger activity levels have reached 20.7 MAP, based on annual passenger activity reports. (2) Following implementation of the intersection improvement, the monitoring frequency will be reduced to occurring just once, upon completion of the intersection improvement	Confirmation that the subject intersection improvement has been completed
MM-ST (BWP)-8 **Monitoring Agency:**	**Modify the Intersection of La Tijera Boulevard and Sepulveda Boulevard (Intersection #101).** The westbound approach to the La Tijera Boulevard and Sepulveda Boulevard intersection shall be restriped	Traffic congestion and delays at the intersection of La Tijera Boulevard and	If/when international passenger activity levels at TBIT	(1) Prior to implementation of the intersection improvement, this	Confirmation that the subject intersection improvement has been completed

Mitigation Monitoring and Reporting Program
Bradley West Project-Specific Mitigation Measures

Bradley West Project-Specific Mitigation Measures		Impact Being Addressed	Timing of Implementation	Monitoring Frequency	Actions Indicating Compliance
LAWA	and the traffic signal modified to provide two left-turn lanes, one through lane, and a through/right lane. This mitigation measure will be implemented to the standards and satisfaction of the City of Los Angeles. Implementation of this measure shall occur if/when international passenger activity levels at TBIT increase to 18.7 million annual passengers.	Sepulveda Boulevard during airport operations	increase to 18.7 million annual passengers	measure will be monitored annually to determine whether TBIT passenger activity levels have reached 18.7 MAP, based on annual passenger activity reports. (2) Following implementation of the intersection improvement, the monitoring frequency will be reduced to occurring just once, upon completion of the intersection improvement	

Mitigation Monitoring and Reporting Program
Bradley West Project-Specific Mitigation Measures

Bradley West Project-Specific Mitigation Measures		Impact Being Addressed	Timing of Implementation	Monitoring Frequency	Actions Indicating Compliance
MM-ST (BWP)-9 **Monitoring Agency:** **LAWA**	**Modify the Intersection of Sepulveda Boulevard and 76th/77th Street (Intersection #136).** The eastbound approach to the Sepulveda Boulevard and 76th/77th Street intersection shall be restriped to provide two left-turn lanes, a through/left-turn lane, and one right-turn lane. This mitigation measure will be implemented to the standards and satisfaction of the City of Los Angeles. Implementation of this measure shall occur if/when international passenger activity levels at TBIT increase to 19.7 million annual passengers.	Traffic congestion and delays at the intersection of Sepulveda Boulevard and 76th/77th Street during airport operations	If/when international passenger activity levels at TBIT increase to 19.7 million annual passengers	(1) Prior to implementation of the intersection improvement, this measure will be monitored annually to determine whether TBIT passenger activity levels have reached 19.7 MAP, based on annual passenger activity reports. (2) Following implementation of the intersection improvement, the monitoring frequency will be reduced to occurring just once, upon completion of the intersection improvement	Confirmation that the subject intersection improvement has been completed
MM-ST (BWP)-10 **Monitoring Agency:**	**Modify the Intersection of Imperial Highway and Main Street (Intersection #68).** Modify the median island on the east leg of the intersection to provide a second left turn lane. The resulting westbound	Traffic congestion and delays at the intersection of Imperial Highway and Main	The preparation of intersection improvement plans, pursuit of	Once, upon completion of the subject intersection	Confirmation that the subject intersection improvement has been completed

Bradley West Project-Specific Mitigation Measures		Impact Being Addressed	Timing of Implementation	Monitoring Frequency	Actions Indicating Compliance
LAWA	configuration would be comprised of a dual left-turn lane and two through lanes.	Street due to peak construction traffic	necessary approvals, and scheduling for receipt of contractor estimates/bids shall commence immediately upon approval of the Bradley West Project	improvement	
MM-ST (BWP)-11 **Monitoring Agency:** **LAWA**	**Modify the Intersection of Imperial Highway and Pershing Drive (Inter-section #69).** Widen the north side of the westbound approach of Imperial Highway to provide a second right-turn lane. The resulting westbound lane configuration would be comprised of one left turn lane, two through lanes, and two right turn lanes.	Traffic congestion and delays at the intersection of Imperial Highway and Pershing Drive due to peak construction traffic	The preparation of intersection improvement plans, pursuit of necessary approvals, and scheduling for receipt of contractor estimates/bids shall commence immediately upon approval of the Bradley West Project	Once, upon completion of the subject intersection improvement	Confirmation that the subject intersection improvement has been completed
MM-ST (BWP)-12 **Monitoring Agency:**	**Distribution of Contractor Employee Parking between the Northwest Construction Staging/Parking Area and the East Contractor Employee Parking Area or Southeast Construction Staging/Parking Area.** General parking for Bradley	Traffic congestion and delays at off-airport intersections during project construction	Prior to start of construction of the Bradley West Project	Once, prior to finalization of construction bid documents for activities that	Confirmation that construction bid documents for activities involving the subject parking areas

Mitigation Monitoring and Reporting Program
Bradley West Project-Specific Mitigation Measures

Bradley West Project-Specific Mitigation Measures		Impact Being Addressed	Timing of Implementation	Monitoring Frequency	Actions Indicating Compliance
LAWA	West Project contractor employees within the Northwest Construction Staging/Parking Area and within the East Contractor Employee Parking Area or Southeast Construction Staging/Parking Area shall be distributed such that neither the northwest area (i.e., Northwest Construction Staging/Parking Area) or the east/southeast area (i.e., East Contractor Employee Parking Area or Southeast Construction Staging/Parking Area) is assigned parking for more than 601 vehicles. Should the need for contractor employees' daily general parking exceed 601 vehicles in either of these areas (northwest area or east/southeast area), the additional increment of daily parking demand shall be assigned to the other area.			would use the subject contractor employee parking areas	include the parking limitations specified in the measure

Mitigation Monitoring and Reporting Program
Bradley West Project-Specific Mitigation Measures

Bradley West Project-Specific Mitigation Measures		Impact Being Addressed	Timing of Implementation	Monitoring Frequency	Actions Indicating Compliance
Historical/Architectural and Archaeological/Cultural Resources					
MM-HA (BWP)-1 **Monitoring Agency:** **LAWA**	**Conformance with LAX Master Plan Archaeological Treatment Plan.** Prior to initiation of grading and construction activities, LAWA will retain an on-site Cultural Resource Monitor (CRM), as defined in the LAX Master Plan MMRP ATP, who will determine if the proposed project area is subject to archaeological monitoring. As defined in the ATP, areas are not subject to archaeological monitoring if they contain redeposited fill or have previously been disturbed. The CRM will compare the known depth of redeposited fill or disturbance to the depth of planned grading activities, based on a review of construction plans. If the CRM determines that the proposed project site is subject to archaeological monitoring, a qualified archaeologist (an archaeologist who satisfies the Secretary of the Interior's Professional Qualifications Standards [36 CFR 61]) shall be retained by LAWA to inspect excavation and grading activities that occur within native material. The extent and frequency of inspection shall be defined based on consultation with the archaeologist. Following initial inspection of excavation materials, the archaeologist may adjust inspection protocols as work proceeds.	Potential to unexpectedly encounter and impact subsurface archaeological resources, including Native American remains, during grading and excavation associated with construction of the Bradley West Project	Prior to initiation of grading and/or excavation activities associated with the construction of the Bradley West Project	The extent and frequency of inspection shall be defined based on consultation with the qualified archaeologist if the Cultural Resource Monitor determines that the project area is subject to archaeological monitoring	Conformance with LAX Master Plan Archaeological Treatment Plan

Mitigation Monitoring and Reporting Program
Bradley West Project-Specific Mitigation Measures

Bradley West Project-Specific Mitigation Measures		Impact Being Addressed	Timing of Implementation	Monitoring Frequency	Actions Indicating Compliance
Paleontological Resources					
MM-PA (BWP)-1 **Monitoring Agency:** **LAWA**	**Conformance with LAX Master Plan Paleontological Management Treatment Plan.** Prior to the initiation of grading and construction activities, LAWA will retain a professional paleontologist, as defined in the Final LAX Master Plan MMRP PMTP, who will determine if the project site exhibits a high or low potential for subsurface resources. If the project site is determined to exhibit a high potential for subsurface resources, paleontological monitoring will be conducted in accordance with the procedures stipulated in the PMTP. If the project site is determined to exhibit a low potential for subsurface deposits, excavation need not be monitored as per the PMTP. In the event that paleontological resources are discovered, the procedures outlined in the PMTP for the identification of resources will be followed.	Potential to unexpectedly encounter and impact subsurface paleontological resources during grading and excavation associated with construction of the Bradley West Project	Prior to initiation of grading and/or excavation activities associated with the construction of the Bradley West Project	The extent and frequency of inspection shall be defined based on procedures outlined in the PMTP if the professional paleontologist determines that the project area is subject to paleontological monitoring	Conformance with LAX Master Plan Paleontological Management Treatment Plan
MM-PA (BWP)-2 **Monitoring Agency:** **LAWA**	**Construction Personnel Briefing.** In accordance with the PMTP, construction personnel will be briefed by the consulting paleontologist in the identification of fossils or fossilferous deposits and in the correct procedures for notifying the relevant individuals should such a discovery occur.	Potential to unexpectedly encounter and impact subsurface paleon-tological resources during grading and excavation associated with construction of the Bradley West Project	Prior to initiation of grading and/or excavation activities associated with the construction of the Bradley West Project	Once, prior to the initiation of grading and/or excavation activities	Completion of briefing of construction personnel on identification of fossils or fossilferous deposits and notification procedures in accordance with the PMTP

Mitigation Monitoring and Reporting Program
Bradley West Project-Specific Mitigation Measures

Bradley West Project-Specific Mitigation Measures		Impact Being Addressed	Timing of Implementation	Monitoring Frequency	Actions Indicating Compliance
Biotic Communities					
MM-BC (BWP)-1 **Monitoring Agency:** **LAWA**	**Conservation of Floral Resources: Southern Tarplant.** LAWA or its designee shall prepare a special status plant mitigation program for the southern tarplant. The loss of the southern tarplant individuals shall be mitigated through seed collection and seeding into a suitable mitigation site within undeveloped property owned by LAWA or at a suitable off-site location, determined based on habitat, soil type, moisture levels, and other relevant conditions. One suitable off-site location is the Three Sisters Reserve located on the Palos Verdes Peninsula. A qualified Seed Collector shall monitor the tarplant phenology to determine the appropriate timing for seed collection. Tarplant seed shall be collected from all tarplants within the impact area, which shall be delineated in the field with lath and flagging by a qualified biologist. The biologist shall ensure that seed shall only be collected from plants that will be impacted by the Bradley West Project. Upon completion of seed collection, the seed collector shall clean the seeds to prepare for the seeding effort. A mitigation plan shall be developed at a level of detail necessary for successful program implementation by a landscape contractor. The detailed program shall contain the following items: ◆ *Responsibilities and qualifications of the personnel to implement and supervise the plan*. The plan shall specify the responsibilities and	Loss of southern tarplant individuals	Preparation of a special status plant mitigation program upon project approval and prior to initiation of construction of the Bradley West Project	As per special status plant mitigation program for southern tarplant ; Regular site visits (i.e., monthly, quarterly) for no more than 5 years or until germination, flowering and seed set of at least 300 individuals (100 percent of the original population size)	Preparation of special status plant mitigation program; periodic monitoring report, at least annually

Bradley West Project-Specific Mitigation Measures		Impact Being Addressed	Timing of Implementation	Monitoring Frequency	Actions Indicating Compliance
	qualifications of the personnel who will supervise and implement the mitigation plan, including LAWA, Technical Specialists, and Maintenance Personnel. ◆ *Site selection*. The site for the mitigation shall be determined in coordination with LAWA, and shall be located in a suitable area within the boundaries of LAX or at a suitable off-site location. The appropriate site shall consist of approximately 0.76 acre and shall have suitable hydrology, soils, and other factors necessary for the establishment of the southern tarplant. Such suitable sites exist within the boundaries of LAX, including but not limited to areas within LAX Northside and in the southwestern portion of the airport, west of the south airfield complex. If a site at LAX is selected, site selection will occur in consultation with LAWA's USDA Wildlife Hazard Biologist and will be consistent with FAA Advisory Circular No. 150/5200-33 "Hazardous Wildlife Attractants on or Near Airports" and LAWA's "LAX Wildlife Hazard Mitigation Plan" to avoid increasing wildlife hazards to aircraft. ◆ *Site preparation and planting implementation*. The plan shall include specifications for seed collection and storage and guidelines for on-site preparation. The guidelines shall contain specifications for (1) existing native species protection; (2) trash and weed removal; (3) soil treatments (e.g., imprinting and decompacting); (4) temporary irrigation installation as needed; (5) erosion control measures (e.g., rice or willow				

Bradley West Project-Specific Mitigation Measures		Impact Being Addressed	Timing of Implementation	Monitoring Frequency	Actions Indicating Compliance
	wattles); and (6) seed application. ◆ *Schedule*. A schedule shall be developed, which includes planting, to occur in late fall and early winter (between October and January 30). ◆ *Maintenance plan/guidelines*. A three to five year maintenance plan shall include (1) weed control; (2) herbivory control; (3) trash removal; (4) irrigation system maintenance; (5) maintenance training; and (6) replacement seeding, if necessary. Ten percent of the original seed collected shall be stored in the event it is needed for replacement seeding. ◆ *Monitoring plan*. The monitoring plan shall include the following success criteria: − Germination, flowering and seed set of 60 percent of the original population size in year one; − Germination, flowering and seed set of 80 percent of the original population size by year three; − Germination, flowering and seed set of 100 percent of the original population size by year five. If these success criteria are not met, or are unlikely to be met within the required time periods, remedial measures will be required. Such measures could include reseeding, transplanting container plants or selection of an alternative site if required. This plan may include qualitative and quantitative monitoring. Qualitative monitoring includes site visits at regular intervals (i.e., monthly, quarterly,				

Bradley West Project-Specific Mitigation Measures		Impact Being Addressed	Timing of Implementation	Monitoring Frequency	Actions Indicating Compliance
	etc.) to determine the overall general performance of the site and maintenance needs. Quantitative monitoring is conducted on an annual basis and includes data collection specific to the performance standards established in the monitoring plan. ◆ *Long-term preservation*. Long-term preservation of the site shall also be outlined in the conceptual mitigation plan to ensure that future development does not impact the mitigation site.				
MM-BC (BWP)-2 **Monitoring Agency:** **LAWA**	**Conservation of Floral Resources: Lewis' Evening Primrose.** Prior to any work activities (i.e., vegetation clearing, invasive species removal and/or spraying, and sediment removal) on the project site, including construction staging areas, pre-construction focused surveys shall be conducted during the period of March through May by a qualified biologist to determine the presence or absence of Lewis' evening primrose. Known populations of this species shall be monitored to determine the best time to conduct the surveys. The surveys shall follow guidelines developed by the CNPS and the CDFG. If this species is not observed, no further mitigation shall be required. If this plant species is observed on-site, a qualified botanist and LAWA shall evaluate the number of individuals, their location and the type of impact that would occur to determine if the anticipated impact would result in a substantial adverse effect or substantial net reduction in the population, given the species' rarity and abundance. If impacts are deemed not significant, no additional measures are warranted.	Potential loss of Lewis' evening primrose individuals that would result in a substantial adverse effect or substantial net reduction in population	Prior to any work activities, pre-construction focused surveys during the period of March through May to determine the presence or absence of Lewis' evening primrose. If it is determined that a substantial net reduction in population would occur, preparation of a special status plant mitigation program prior to initiation of construction of the Bradley West	If required, as per special status plant mitigation program for Lewis' evening primrose; regular site visits (e.g., quarterly, annually) for no more than 5 years or until germination, flowering and seed set of at least an equal number of plants impacted	If required, preparation of special status plant mitigation program; periodic monitoring report, at least annually

Mitigation Monitoring and Reporting Program
Bradley West Project-Specific Mitigation Measures

Bradley West Project-Specific Mitigation Measures		Impact Being Addressed	Timing of Implementation	Monitoring Frequency	Actions Indicating Compliance
	If it is determined that a substantial net reduction in population would occur, LAWA or its designee shall prepare and implement a plan to compensate for the loss of individuals of the sensitive Lewis' evening primrose. LAWA or its designee shall collect seed from those plants to be removed, and properly clean and store the collected seed until used. A mitigation site of suitable habitat equal to the area of impact shall be delineated within the boundaries of LAX or at a suitable off-site location. If a site at LAX is selected, site selection will occur in consultation with LAWA's USDA Wildlife Hazard Biologist and will be consistent with FAA Advisory Circular No. 150/5200-33 "Hazardous Wildlife Attractants on or Near Airports" and LAWA's "LAX Wildlife Hazard Mitigation Plan" to avoid increasing wildlife hazards to aircraft. Collected seed shall be broadcast (distributed) after the first wetting rain. LAWA or its designee shall implement a monitoring plan to monitor the establishment of individuals of Lewis' evening primrose for a period of not more than five years. Performance criteria shall include the establishment of an equal number of plants as that impacted in the first year following the distribution of seed within the mitigation site. Performance criteria shall also include confirmation of recruitment for two years following the first year flowering is observed and establishment of individuals throughout the mitigation area within three years following the first year flowering is observed.		Project		

Mitigation Monitoring and Reporting Program
Bradley West Project-Specific Mitigation Measures

Bradley West Project-Specific Mitigation Measures		Impact Being Addressed	Timing of Implementation	Monitoring Frequency	Actions Indicating Compliance
MM-BC (BWP)-3 **Monitoring Agency:** **LAWA**	**Conservation of Floral Resources: California Spineflower.** Prior to any work activities (i.e., vegetation clearing, invasive species removal and/or spraying, and sediment removal) on the project site, including construction staging areas, pre-construction focused surveys shall be conducted during the period of March through July by a qualified biologist to determine the presence or absence of California spineflower. Known populations of this species shall be monitored to determine the best time to conduct the surveys. The surveys shall follow guidelines developed by the CNPS and the CDFG. If this species is not observed, no further mitigation shall be required. If this plant species is observed on-site, a qualified botanist and LAWA shall evaluate the number of individuals, their location and the type of impact that would occur to determine if the anticipated impact would result in a substantial adverse effect or substantial net reduction in the population, given the species' rarity and abundance. If impacts are deemed not significant, no additional measures are warranted. If impacts to California spineflower are found to be adverse, LAWA or its designee shall prepare and implement a plan to compensate for the loss of individuals of the sensitive California spineflower. LAWA or its designee shall collect seed from those plants to be removed, and properly clean and store the collected seed until used. A mitigation site of suitable habitat equal to the area of impact shall be delineated within the boundaries of LAX or at a suitable off-site location. If a site at LAX is selected,	Potential loss of California spineflower individuals that would result in a substantial adverse effect or substantial net reduction in population	Prior to any work activities, pre-construction focused surveys during the period of March through July to determine the presence or absence of California spineflower. If it is determined that a substantial net reduction in population would occur, preparation of a special status plant mitigation program prior to initiation of construction of the Bradley West Project	If required, as per special status plant mitigation program for California Spineflower; regular site visits (e.g., quarterly, annually) for no more than 5 years or until germination, flowering and seed set of at least an equal number of plants impacted	If required, preparation of special status plant mitigation program; periodic monitoring report, at least annually

Bradley West Project-Specific Mitigation Measures		Impact Being Addressed	Timing of Implementation	Monitoring Frequency	Actions Indicating Compliance
	site selection will occur in consultation with LAWA's USDA Wildlife Hazard Biologist and will be consistent with FAA Advisory Circular No. 150/5200-33 "Hazardous Wildlife Attractants on or Near Airports" and LAWA's "LAX Wildlife Hazard Mitigation Plan" to avoid increasing wildlife hazards to aircraft. Collected seed shall be broadcast (distributed) after the first wetting rain. LAWA or its designee shall implement a monitoring plan to monitor the establishment of individuals of California spineflower for a period of not more than five years. Performance criteria shall include the establishment of an equal number of plants as that impacted in the first year following the distribution of seed within the mitigation site. Performance criteria shall also include confirmation of recruitment for two years following the first year flowering is observed and establishment of individuals throughout the mitigation area within three years following the first year flowering is observed.				
MM-BC (BWP)-4 **Monitoring Agency:** **LAWA**	**Conservation of Faunal Resources: Burrowing Owl.** Prior to any work activities (i.e., vegetation clearing, invasive species removal and/or spraying, and sediment removal) within the Southeast Construction Staging/Parking Area (also known as the Continental City site), a survey for burrows by a qualified biologist will be conducted by walking through the suitable habitat within the site in accordance with CDFG-accepted protocols. If the site contains burrows that could be used by burrowing owls, four surveys will be conducted during the burrowing owl breeding season (April 15 through July	Potential loss of burrowing owl individuals	Prior to any work activities within the Southeast Construction Staging/Parking Area, a survey for burrows that could be used by burrowing owls and, if burrows are present, four additional surveys	If required, monthly removal of burrows between September and January every year during construction period. If nesting owls are identified during the four surveys,	If required, preparation of Habitat Restoration Plan including periodic monitoring report, at least annually. Removal of burrows annually, if present, until entire staging area is in use; reports submitted periodically, at least annually, during construction or

Bradley West Project-Specific Mitigation Measures		Impact Being Addressed	Timing of Implementation	Monitoring Frequency	Actions Indicating Compliance
	15). If an active burrow is observed during the nesting season, disturbance of the owls would constitute a significant impact and the burrow will be protected until nesting activity has ended to ensure compliance with Section 3503.5 of the California Fish and Game Code. Nesting activity for burrowing owl normally occurs from February 1 through August 31. To protect any active burrow, the following restrictions are required between February 1 and August 31 (or until burrows are no longer active as determined by a qualified biologist): (1) clearing limits will be established a minimum of 300 feet in any direction from any occupied nest and (2) access and surveying will be restricted within 200 feet of any occupied nest. Any encroachment into the 300/200 foot buffer area around the known nest will only be allowed if it is determined by a qualified biologist that the proposed activity will not disturb the nest occupants. These avoidance measures will be coordinated with LAWA's USDA Wildlife Hazard Biologist and will be consistent with FAA Advisory Circular No. 150/5200-33 "Hazardous Wildlife Attractants on or Near Airports" and LAWA's "LAX Wildlife Hazard Management Plan." If nesting individuals are observed, LAWA or its designee will develop and implement a habitat replacement plan to compensate for the loss of habitat associated with use of the site for construction staging and parking. The objective of the habitat replacement plan will be to replace the habitat value to be lost with equal or greater habitat value. The habitat replacement will occur at an off-site location to avoid		between April 15 and July 15 followed by monthly removal of any burrows onsite between September and January until such time as the entire staging area is in active use	protection of active burrows between February 1 and August 31	until entire staging area is in use

Bradley West Project-Specific Mitigation Measures		Impact Being Addressed	Timing of Implementation	Monitoring Frequency	Actions Indicating Compliance
	potential conflicts with aircraft activities at LAX. Off-site locations for habitat replacement may include Madrona Marsh Nature Center in Torrance, Three Sisters Reserve located on the Palos Verdes Peninsula, or another location deemed appropriate. Whether or not any nesting burrowing owls are identified on-site, after the end of the nesting period (August 31), LAWA or its designee will remove all burrows from the site on a monthly basis between September and January. Removal may include physically collapsing the burrows or installing one-way doors in burrow entrances. Such maintenance will continue annually until such time as the entire staging area is in active use.				
MM-BC (BWP)-5 **Monitoring Agency:** **LAWA**	**Conservation of Faunal Resources: Loggerhead Shrike.** If construction is scheduled to occur during the nesting season for the loggerhead shrike (March 15 to August 15), vegetation that will be impacted by the proposed project shall be removed outside the nesting season if feasible. If this is not feasible, a qualified biologist shall inspect the shrubs/trees at least 14 days prior to construction activities to ensure that no nesting shrike are present. If a nest is present, construction avoidance measures shall include flagging of all active nests and a 300-foot wide buffer area around the active nests. These construction avoidance measures will be coordinated with LAWA's USDA Wildlife Hazard Biologist and will be consistent with FAA Advisory Circular No. 150/5200-33 "Hazardous Wildlife Attractants on or Near Airports"	Potential loss of nesting loggerhead shrike individuals	If construction is scheduled to occur between March 15 and April 15, removal of vegetation outside the nesting season, if feasible. If not feasible, pre-construction surveys 14 days prior to construction	If nests are present, a Biological Monitor shall be present between March 15 and August 15	Removal of vegetation between August 16 and March 14 prior to initiation of construction followed by a report of activities. Alternatively, if required, pre-construction surveys 14 days prior to construction occurring between March 15 and April 15. If required, establishment of construction avoidance measures and onsite monitoring between

Bradley West Project-Specific Mitigation Measures		Impact Being Addressed	Timing of Implementation	Monitoring Frequency	Actions Indicating Compliance
	and LAWA's "LAX Wildlife Hazard Mitigation Plan" to avoid increasing wildlife hazards to aircraft. In addition, a Biological Monitor shall be present to ensure the buffer area is not infringed upon and vegetation clearing within the designated 300-foot buffer only takes place from August 16 to March 14.				March 15 and August 15 and written report documenting construction avoidance measures undertaken; reports submitted periodically, at least annually, during construction or until vegetation has been removed
MM-BC (BWP)-6 **Monitoring Agency:** **LAWA**	**Conservation of Faunal Resources: San Diego Black-Tailed Jackrabbit.** Prior to the commencement of clearing operations or other activities involving significant soil disturbance at locations identified in Table 4.7-2 with suitable habitat, a survey shall be conducted to locate black-tailed jackrabbits within 100 feet of the outer extent of projected soil disturbance activities. The locations of any observed jackrabbits shall be clearly marked and identified on the construction plans. If this species is present, a monitoring biologist shall be on-site during any clearing to flush the jackrabbit from occupied habitat areas immediately prior to brush-clearing and earth-moving activities. The monitoring biologist shall have authority to halt construction activities until individual jackrabbits can be removed from the construction impact areas to assure that the jackrabbit shall not be directly impacted by brush-clearing and earth-moving equipment in a manner that also allows for construction activities on a timely basis.	Potential loss of San Diego black-tailed jackrabbit individuals	Prior to commencement of clearing operations or other activities involving significant soil disturbance within the Northwest Construction Staging/Parking Area, West Construction Staging Area, or Southeast Construction Staging/Parking Area	If species is present, a monitoring biologist shall be onsite prior to and during any brush-clearing and earth-moving activities	If required, onsite monitoring during brush-clearing and earth-moving activities and written documentation of field activities submitted periodically, at least annually, during construction or until all clearing and soil disturbance at identified locations is complete

Mitigation Monitoring and Reporting Program
Bradley West Project-Specific Mitigation Measures

Bradley West Project-Specific Mitigation Measures		Impact Being Addressed	Timing of Implementation	Monitoring Frequency	Actions Indicating Compliance
MM-BC (BWP)-7 **Monitoring Agency:** **LAWA**	**Conservation of Floral Resources: Mature Tree Replacement.** LAWA or its designee shall compensate at a ratio of 2:1 for the loss of mature trees, which would occur as a result of implementation of Northwest Construction Staging/Parking Area. The species of newly planted replacement trees shall be local native tree species to the extent feasible. Each mitigation tree shall be at least a 15-gallon or larger specimen. The replacement will be implemented within the boundaries of LAX or at a suitable off-site location. It mitigation occurs within LAX boundaries, the replacement site and tree species will be determined in consultation with LAWA's USDA Wildlife Hazard Biologist and will be consistent with FAA Advisory Circular No. 150/5200-33 "Hazardous Wildlife Attractants on or Near Airports" and LAWA's "LAX Wildlife Hazard Mitigation Plan" to avoid increasing wildlife hazards to aircraft.	Potential loss of mature trees	Prior to removal of mature trees within the Northwest Construction Staging/Parking Area	If mitigation occurs within LAX boundaries, periodic site visits to ensure trees are established, at least annually	Replacement of trees, if required and monitoring report one year following planting
MM-BC (BWP)-8 **Monitoring Agency:** **LAWA**	**Conservation of Faunal Resources: Nesting Birds/Raptors.** To comply with the Migratory Bird Treaty Act, for those areas of the project site that are not actively maintained and have a potential for nesting birds/raptors, if construction is scheduled to occur during the nesting season for birds/raptors (generally February 1 to June 30 for raptors and March 15 to August 15 for nesting birds), vegetation that will be impacted by the proposed project shall be removed outside the nesting season if feasible. If this is not feasible, then a qualified biologist shall inspect the shrubs/trees prior to project activities to ensure that no nesting birds/raptors are present. If the	Potential loss of nesting birds/raptors subject to the Migratory Bird Treaty Act	If construction occurs between February 1 and August 15, removal of vegetation outside the nesting season, if feasible. If not feasible, pre-construction surveys	If active nests are present and may be impacted, a Biological Monitor shall be present during those periods when construction activities will occur near active nest areas	If required, establishment of buffer zones and construction avoidance measures between February 1 and August 15 and written report documenting construction avoidance measures undertaken; reports submitted periodically,

Bradley West Project-Specific Mitigation Measures		Impact Being Addressed	Timing of Implementation	Monitoring Frequency	Actions Indicating Compliance
	biologist finds an active nest within the construction area and determines that the nest may be impacted, the biologist will delineate an appropriate buffer zone; the size of the buffer zone will depend on the species and the type of construction activity, and will be determined in consultation with CDFG. Only construction activities (if any) that have been approved by a Biological Monitor will take place within the buffer zone until the nest is vacated. The biologist shall serve as a construction monitor during those periods when construction activities shall occur near active nest areas to ensure that no inadvertent impacts on these nests shall occur. These construction avoidance measures will be coordinated with LAWA's USDA Wildlife Hazard Biologist and will be consistent with FAA Advisory Circular No. 150/5200-33 "Hazardous Wildlife Attractants on or Near Airports" and LAWA's "LAX Wildlife Hazard Mitigation Plan" to avoid increasing wildlife hazards to aircraft.				at least annually, during construction or until vegetation is removed
Endangered and Threatened Species of Flora and Fauna					
MM-ET (BWP)-1 **Monitoring Agency:** **LAWA**	**Mitigation for Riverside Fairy Shrimp.** If Riverside fairy shrimp are found to be located on-site, LAWA shall coordinate with FAA and USFWS to initiate consultation under the federal Endangered Species Act and prepare a Mitigation Plan in consultation with the USFWS. The plan shall provide mitigation for direct impacts to affected habitat through salvage and relocation of soil containing Riverside fairy shrimp. The receiver site of the soil and cysts shall be equal or	Potential loss of Riverside fairy shrimp individuals at Southeast Construction Staging/Parking Area	If required, preparation of Mitigation Plan for Riverside fairy shrimp prior to clearing or other construction activities within the Southeast	If required, monthly during the first year following relocation of cyst-bearing soils, quarterly in years 2-4, biannually in years 5, 7 and 9,	If required, preparation of Mitigation Plan for Riverside Fairy Shrimp; annual monitoring reports due to USFWS on September 1 of each specified monitoring year

Bradley West Project-Specific Mitigation Measures		Impact Being Addressed	Timing of Implementation	Monitoring Frequency	Actions Indicating Compliance
	greater in biological value, as determined by the USFWS. Specific requirements of the Mitigation Plan shall be subject to the Section 7 consultation with USFWS, but generally will require that soils containing embedded cysts of the Riverside fairy shrimp be salvaged and translocated to created Riverside fairy shrimp habitat at a suitable site. One potential site is the Madrona Marsh Nature Center in Torrance, 20 miles south of LAX. Responsibility for habitat creation and maintenance of the created habitat may be transferred to a LAWA designee at any time with USFWS approval. Soils containing embedded cysts of the Riverside fairy shrimp shall not be translocated to the created habitat until the habitat is established and has met certain success criteria specified during Section 7 consultation. Success criteria for the created habitat will likely include holding water for a minimum of 60 days, having less than 10 percent absolute cover exotic herbaceous species within the created habitat, having less than 20 percent absolute cover of exotic herbaceous species within 300 feet of the area from limits of the created habitat, removal of all non-herbaceous plant species within the created habitat and 300 feet from the created habitat annually, and providing suitable water quality for Riverside fairy shrimp. Duration of inundation, exotic species removal, and water quality analyses may be undertaken within the first year after habitat creation. The performance criteria for percent absolute cover of		Construction Staging/Parking Area; Implementation per Mitigation Plan	annually in year 10	

Bradley West Project-Specific Mitigation Measures		Impact Being Addressed	Timing of Implementation	Monitoring Frequency	Actions Indicating Compliance
	exotic herbaceous species within 300 feet of the area from limits of the created habitat may be redesignated by mutual agreement of FAA, LAWA, and USFWS. Upon meeting success criteria and approval from the USFWS, soils containing embedded cysts of the Riverside fairy shrimp may be brought to the created habitat. LAWA shall make every effort to collect all cyst-bearing soils from the entire surface area of the occupied habitat, however it is expected that some small number of undetected individual cysts will remain in the soil. Soil containing the cysts shall be salvaged and translocated during the dry season to minimize damage to the cysts during transport. The soil shall be collected using a hand trowel, removed in chucks, and kept out of direct sunlight to ensure viability. Soil shall be stored in properly labeled boxes or bags with adequate ventilation. The soils shall then be deposited and spread out in small basins or pool-like areas of similar size without active mechanical compaction to minimize potential damage to the cysts. Any potential indirect environmental impacts resulting from habitat construction activities shall be compliant with best management practices and terms and conditions stipulated by the permitting agencies. LAWA or its designee, in conjunction with the USFWS and a qualified wildlife biologist, shall also develop a program to monitor created habitat for the presence of Riverside fairy shrimp as described in the Mitigation Plan. LAWA shall be responsible for implementing a monitoring and reporting program to demonstrate successful achievement of the performance standards				

Bradley West Project-Specific Mitigation Measures		Impact Being Addressed	Timing of Implementation	Monitoring Frequency	Actions Indicating Compliance
	to be determined in consultation with USFWS for off-site relocation over a 10-year period: ◆ Monthly during the first year, following relocation of soils containing embedded cysts of the Riverside fairy shrimp ◆ Quarterly in the second, third, and fourth years, following relocation of soils containing embedded cysts of the Riverside fairy shrimp ◆ Biannually in the fifth, seventh, and ninth years, following relocation of soils containing embedded cysts of the Riverside fairy shrimp ◆ Annually in the tenth year, following relocation of soils containing embedded cysts of the Riverside fairy shrimp LAWA shall provide the USFWS with annual monitoring reports as specified in the Mitigation Plan. The monitoring report, due on September 1 of each specified monitoring year, shall provide information regarding the implementation of habitat creation, restoration, and maintenance activities. The yearly report shall also discuss the effectiveness of the project as it pertains to the existing condition of the created habitat and Riverside fairy shrimp population. To measure the effectiveness of the created habitat, the FAA and LAWA shall work with the USFWS to develop long-term goals and objectives as part of their habitat creation plan.				

Project-Specific Project Design Features

PDF		Timing of Implementation	Monitoring Frequency	Actions Indicating Compliance
WAMA-PDF-1 **Monitoring Agency:** **LAWA**	**Quarterly Reporting**: The tenants of the WAMA site will be required to provide to LAWA a quarterly report indicating the number, time of day, duration, and specific aircraft type of all aircraft engine high-power and low-power ground run-ups conducted during the reporting period. This reporting requirement shall also extend to any airline using the WAMA site for ground run-ups as shall be monitored by LAWA Airfield Operations. The completeness and accuracy of the report shall be attested to by a company official of the tenant. In conjunction with application of a ground run-up reporting program, LAWA will develop a tiered penalty program applicable to violations of the LAX nighttime curfew for aircraft engine high-power ground run-ups. The penalty structure will be modeled after policies seen at other similarly situated airports (e.g., Seattle Tacoma International Airport). An example of the penalty structure includes: a Letter of Admonishment for first offense within a one year period and fines for second, third and additional offences within a one year period. It is anticipated that LAWA's development of a financial penalty program, to the extent allowed by law, will be tiered, whereby the amount of financial penalty is progressively higher for each recurring violation, with a substantial increase in penalty amounts for repeat violations that occur within a short amount of time.	First implemented prior to occupancy of the proposed Project	Quarterly	LAWA will require tenants of the WAMA site to abide by the requirement; status updates in annual LAX MMRP progress report.
WAMA-PDF-2 **Monitoring Agency:** **LAWA**	**APU Usage While Aircraft is Parked:** Aircraft parked at the WAMA site shall not utilize on-board auxiliary power units (APUs) for aircraft electrical power or interior cooling at parking spaces where ground power and preconditioned air are available, with the exceptions being: (1) if an APU is being serviced or checked relative to those functions; or (2) for some limited time if APU is required to tug/tow aircraft to/from WAMA site (i.e., for proper operation of essential on-board electronics while being moved). In addition to the proposed RON kits with ground power and preconditioned air for aircraft parking positions along the perimeter of the site (i.e., at hangar areas along World Way West and RON/RAD positions along Pershing Drive), the final WAMA site design will include additional aircraft ground power connect ports at the two interior RON/RAD positions within the site.	First implemented prior to occupancy of the proposed Project	Ongoing	LAWA will require tenants of the WAMA site to abide by the requirement; status updates in annual LAX MMRP progress report.
WAMA-PDF-3 **Monitoring**	**Aircraft Taxiing:** All aircraft traveling to or from WAMA during nighttime hours (11:00 p.m. to 6:00 a.m.) must be tugged/towed and are not allowed to taxi	First implemented prior to occupancy	Ongoing	LAWA will require tenants of the WAMA site to

Project-Specific Project Design Features

PDF		Timing of Implementation	Monitoring Frequency	Actions Indicating Compliance
Agency: **LAWA**	under own power, unless otherwise directed by LAWA Airport Operations in situation-specific circumstances where taxiing is required to maintain airfield safety and efficiency.	of the proposed Project		abide by the requirement; status updates in annual LAX MMRP progress report.
WAMA-PDF-4 **Monitoring Agency:** **LAWA**	**Aircraft Engine Ground Run-Ups:** Aircraft engine high-power ground run-ups of any duration and low-power run-ups of five minutes or more can only occur at the onsite blast fence; and, all run-ups (high-power and low-power of any duration) are prohibited anywhere on the WAMA site between 11:00 p.m. and 6:00 a.m.	First implemented prior to occupancy of the proposed Project	Ongoing	LAWA will require tenants of the WAMA site to abide by the requirement; status updates in annual LAX MMRP progress report.
WAMA-PDF-5 **Monitoring Agency:** **LAWA**	**Use of the WAMA Site:** Aircraft parking spaces at WAMA site cannot be used for passenger boarding or deplaning (i.e., cannot be used as remote gates), except during or as a result of emergency circumstances.	First implemented prior to occupancy of the proposed Project	Ongoing	LAWA will require tenants of the WAMA site to abide by the requirement; status updates in annual LAX MMRP progress report.
WAMA-PDF-6 **Monitoring Agency:** **LAWA**	**Automated Run-Up Monitoring System:** An aircraft engine ground run-up monitoring system, including a sound level meter and video camera, will be provided at the run-up area. LAWA will make all reasonable efforts to make data from the monitoring system accessible to the public via an internet link provided on LAWA's website (i.e., lawa.org).	Final Design Plans; Prior to occupancy of the proposed Project	Plan Check; Ongoing	Completion of an aircraft engine ground run-up monitoring system; status updates in annual LAX MMRP progress report.
WAMA-PDF-7 **Monitoring Agency:** **LAWA**	**Resurfacing a Portion of Imperial Highway:** LAWA will work with City of Los Angeles Bureau of Street Services (LABSS) to contribute its reasonable allocable share subject to FAA approval toward resurfacing of Imperial within the City of Los Angeles's jurisdiction; if the LABSS undertakes this resurfacing project, LAWA will also work with LABSS and the Council District 11 office to schedule resurfacing work. LAWA commits to meetings with Caltrans (alongside the City of El Segundo) to discuss improvements to areas under Caltrans control but cannot make any guarantees as to Caltrans' actions.	Planning process associated with resurfacing of Imperial within the City of Los Angeles' jurisdiction	Ongoing	Status updates in annual LAX MMRP progress report.

Project-Specific Mitigation Measures

	MM	Impact Being Addressed	Timing of Implementation	Monitoring Frequency	Actions Indicating Compliance
Air Quality					
MM-AQ (WAMA)-1 **Monitoring Agency:** **LAWA**	On-road trucks used on LAX construction projects with a gross vehicle weight rating of at least 19,500 pounds shall, at a minimum, comply with USEPA 2010 on-road emissions standards for PM10 and NOX. Contractor requirements to utilize such on-road haul trucks or the next cleanest vehicle available will be subject to the provisions of LAWA Air Quality Control Measure 2"x" (part of LAX Master Plan Commitment LAX-AQ-2, LAX Master Plan - Mitigation Plan for Air Quality; Construction-Related Measures). All off-road diesel-powered construction equipment greater than 50 horsepower shall meet, at a minimum, USEPA Tier 3 off-road emission standards. In addition, all off-road diesel-powered construction equipment greater than 50 hp with engines meeting USEPA Tier 3 off-road emission standards shall be retrofitted with a CARB-verified Level 3 Diesel Emissions Control Strategies (DECS). Any emissions control device used by the Contractor shall achieve emissions reductions that are no less than what could be achieved by a Level 3 diesel emissions control strategy for a similarly sized engine as defined by CARB regulations. In the event the Contractor is using off-road diesel-powered construction equipment with engines meeting USEPA Tier 4 off-road emission standards and is already supplied with a factory-equipped diesel particulate filter, no retrofitting with DECS is required. Contractor requirements to utilize Tier 3 equipment or next cleanest equipment available will be subject to the provisions of LAWA Air Quality Control Measure 2"x" (part of LAX Master Plan Commitment LAX-AQ-2, LAX Master Plan - Mitigation Plan for Air Quality; Construction-Related Measures). LAWA will encourage construction contractors to apply for SCAQMD "SOON" funds to accelerate clean-up of off-road diesel engine emissions.	Air pollutant emissions associated with the construction (On- and Off-Road Mobile sources) of the proposed Project	Prior to issuance of grading or demolition permit of the proposed Project	Once, upon completion of implementation plan, and as specified in the implementation plan	Inclusion of measure in construction contracts. Completion of implementation plan for construction-related measures within the MRP; status updates in annual LAX MMRP progress report.

Project-Specific Mitigation Measures

	MM	Impact Being Addressed	Timing of Implementation	Monitoring Frequency	Actions Indicating Compliance
Hazards and Hazardous Materials					
MM-HAZ (WAMA)-1 **Monitoring Agency:** **LAWA**	Prior to construction at the Project site, additional research shall be undertaken to determine if abandoned/plugged wells at the Project site were abandoned per the current regulations. If necessary, these wells shall be properly abandoned per current regulations. Since the Division of Oil, Gas, and Geothermal Resources (DOGGR) maps are not guaranteed to be accurate, a magnetometer survey shall be completed to determine the exact location of these abandoned/plugged oil wells. If the magnetometer survey successfully determines the location of these oil wells, a subsurface investigation in coordination with the DOGGR and City of Los Angeles Fire Department, as applicable, will be performed to determine if the abandoned wells pose a risk during the grading and construction activities. Specific DOGGR regulations and requirements for the inspection, testing, plugging, and abandonment of oil wells are contained within Chapter 4, Development, Regulation, and Conservation of Oil and Gas Resources, Article 3 of the State of California Code of Regulations. These regulations require a specific set of actions be taken, dependent on the found state of the abandoned oil wells (e.g. for open holes, a cement plug must extend from the total depth of the well or from at least 100 feet below the bottom of each oil or gas zone to at least 100 feet above the top of each oil or gas zone, for cased holes, all perforations are to be plugged with cement, with the plug extending at least 100 feet above the top of a landed liner, the uppermost perforations, the casing cementing point, the water shut-off holes, or the oil or gas zone, whichever is highest). Chapter V, Article 7, (Fire Code) (57.90.01-45) of the Los Angeles City Municipal	Potential hazards associated with abandoned/plugged oil wells on the Project site.	Prior to construction	Once prior to construction	Completion of a magnetometer survey to determine the exact location of abandoned/plugged oil wells. Completion of implementation plan for construction-related measures within the MRP; status updates in annual LAX MMRP progress report.

Project-Specific Mitigation Measures

	MM	Impact Being Addressed	Timing of Implementation	Monitoring Frequency	Actions Indicating Compliance
	Code further regulates the location, drilling safeguards, and abandonment of oil wells in the City. In the event oil wells are found that have not been properly abandoned, the procedures and agency oversight prescribed in these regulations would serve as performance standards to ensure that significant impacts associated with the potential migration of fluids and groundwater contamination would be avoided during construction of the proposed Project. Construction will comply with all applicable requirements of DOGGR and the City of Los Angeles Fire Department for the investigation and/or re-abandonment of the well(s).				

Applicable LAX Master Plan Commitments and Mitigation Measures

Master Plan Commitments/ Mitigation Measures		Impact Being Addressed	Timing of Implementation	Monitoring Frequency	Actions Indicating Compliance
Air Quality					
MM-AQ-1 **Monitoring Agency:** **LAWA**	**LAX-AQ-1 – General Air Quality Control Measures** This measure describes a variety of specific actions to reduce air quality impacts associated with projects at LAX, and applies to all projects. Specific measures are identified below:				
1a	Watering (per SCAQMD Rule 403 and CalEEMod default) – twice daily.	Air pollutant emissions associated with the construction (Fugitive Dust) of the proposed Project	During construction of the proposed Project	Periodically during construction	Inclusion of measure in construction contracts; status updates in annual LAX MMRP progress report.

Applicable LAX Master Plan Commitments and Mitigation Measures

Master Plan Commitments/ Mitigation Measures		Impact Being Addressed	Timing of Implementation	Monitoring Frequency	Actions Indicating Compliance
1b	Ultra-low sulfur diesel (ULSD) fuel will be used in construction equipment.	Air pollutant emissions associated with the construction (On- and Off-Road Mobile sources) of the proposed Project	During construction of the proposed Project	Periodically during construction	Inclusion of measure in construction contracts; status updates in annual LAX MMRP progress report.
1c	Post a publicly visible sign with the telephone number and person to contact regarding dust complaints; this person shall respond and take corrective action within 24 hours.	Air pollutant emissions associated with the construction (Fugitive Dust) of the proposed Project	During construction of the proposed Project	Prior to commencing construction	Inclusion of measure in construction contracts; status updates in annual LAX MMRP progress report.
1d	Prior to final occupancy, the applicant demonstrates that all ground surfaces are covered or treated sufficiently to minimize fugitive dust emissions.	Air pollutant emissions associated with the construction (Fugitive Dust) of the proposed Project	Prior to final occupancy	Once prior to occupancy	Inclusion of measure in construction contracts; status updates in annual LAX MMRP progress report.
1e	All roadways, driveways, sidewalks, etc., being installed as part of the project should be completed as soon as possible; in addition, building pads should be laid as soon as possible after grading.	Air pollutant emissions associated with the construction (Fugitive Dust) of the proposed Project	During construction of the proposed Project	Periodically during construction	Inclusion of measure in construction contracts; status updates in annual LAX MMRP progress report.
1f	Prohibit idling or queuing of diesel-fueled vehicles and equipment in excess of five minutes. This requirement will be included in specifications for any LAX projects requiring on-site construction.	Air pollutant emissions associated with the construction (On- and Off-Road Mobile sources) of the proposed Project	During construction of the proposed Project	Periodically during construction	Inclusion of measure in construction contracts; status updates in annual LAX MMRP progress report.

Applicable LAX Master Plan Commitments and Mitigation Measures

Master Plan Commitments/ Mitigation Measures		Impact Being Addressed	Timing of Implementation	Monitoring Frequency	Actions Indicating Compliance
1g	Require that all construction equipment working on-site is properly maintained (including engine tuning) at all times in accordance with manufacturers' specifications and schedules.	Air pollutant emissions associated with the construction (Mobile and Stationary sources) of the proposed Project	Prior to issuance of grading or demolition permit of the proposed Project and during construction of the proposed Project	Prior to commencing construction and periodically during construction	Inclusion of measure in construction contracts; status updates in annual LAX MMRP progress report.
LAX-AQ-2 Monitoring Agency: **LAWA**	**LAX-AQ-2 – LAX Master Plan - Mitigation Plan for Air Quality; Construction-Related Measures** This measure describes numerous specific actions to reduce fugitive dust emissions and exhaust emissions from on-road and off-road mobile and stationary sources used in construction. Some components of LAX-AQ-2 are not readily quantifiable, but would be implemented as part of LAX Master Plan projects. These control strategies are expected to reduce construction-related emissions. Specific measures applicable to the Project are below:				
2a	All diesel-fueled equipment used for construction will be outfitted with the best available emission control devices, where technologically feasible, primarily to reduce emissions of diesel particulate matter (PM), including fine PM ($PM_{2.5}$), and secondarily, to reduce emissions of NO_X. This requirement shall apply to diesel-fueled off-road equipment (such as construction machinery), diesel-fueled on-road vehicles (such as trucks), and stationary diesel-fueled engines (such as electric generators). (It is unlikely that this measure will apply to equipment with Tier 4 engines.) The emission control devices utilized in construction equipment shall be verified or certified by California Air Resources Board or US Environmental Protection Agency for use in on- road or off-road vehicles or engines. For multi-year construction projects, a reassessment shall be conducted annually to determine what constitutes a best available emissions control device.	Air pollutant emissions associated with the construction (Off-Road and On-Road Mobile sources) of the proposed Project	During construction of the proposed Project	Periodically during construction	Inclusion of measure in construction contracts; status updates in annual LAX MMRP progress report.

Applicable LAX Master Plan Commitments and Mitigation Measures

Master Plan Commitments/ Mitigation Measures		Impact Being Addressed	Timing of Implementation	Monitoring Frequency	Actions Indicating Compliance
2b	Watering (per SCAQMD Rule 403 and CalEEMod default) – three times daily.	Air pollutant emissions associated with the construction (Fugitive Dust) of the proposed Project	During construction of the proposed Project	Periodically during construction	Inclusion of measure in construction contracts; status updates in annual LAX MMRP progress report.
2c	Pave all construction access roads at least 100 feet onto the site from the main road.	Air pollutant emissions associated with the construction (Fugitive Dust) of the proposed Project	Prior to issuance of grading or demolition permit of the proposed Project	Prior to commencing construction/ grading	Inclusion of measure in construction contracts; status updates in annual LAX MMRP progress report.
2d	To the extent feasible, have construction employees' work/commute during off-peak hours.	Air pollutant emissions associated with the construction (On-Road Mobile sources) of the proposed Project	During construction of the proposed Project	Periodically during construction	Inclusion of measure in construction contracts; status updates in annual LAX MMRP progress report.
2e	Make available on-site lunch trucks during construction to minimize off-site worker vehicle trips.	Air pollutant emissions associated with the construction (On-Road Mobile sources) of the proposed Project	During construction of the proposed Project	Periodically during construction	Inclusion of measure in construction contracts; status updates in annual LAX MMRP progress report.
2f	Utilize on-site rock crushing facility, when feasible, during construction to reuse rock/concrete and minimize off-site truck haul trips.	Air pollutant emissions associated with the construction (on-road mobile sources) of the proposed Project	During construction of the proposed Project	Periodically during construction	Inclusion of measure in construction contracts; status updates in annual LAX MMRP progress report.
2g	Specify combination of electricity from power poles and portable diesel- or gasoline-fueled generators using "clean burning diesel" fuel and exhaust emission controls.	Air pollutant emissions associated with the construction (stationary point source controls) of the proposed Project	Prior to commencement of construction	Once prior to construction	Inclusion of measure in construction contracts; status updates in annual LAX MMRP progress report.

Applicable LAX Master Plan Commitments and Mitigation Measures

Master Plan Commitments/ Mitigation Measures		Impact Being Addressed	Timing of Implementation	Monitoring Frequency	Actions Indicating Compliance
2h	Suspend use of all construction equipment during a second- stage smog alert in the immediate vicinity of LAX.	Air pollutant emissions associated with the construction (mobile and stationary sources) of the proposed Project	During construction/ grading of the proposed Project	During any second stage smog alerts occurring during construction	Inclusion of measure in construction contracts; status updates in annual LAX MMRP progress report.
2i	Utilize construction equipment having the minimum practical engine size (i.e., lowest appropriate horsepower rating for intended job).	Air pollutant emissions associated with the construction (mobile and stationary sources) of the proposed Project	During construction/ grading of the proposed Project	Periodically during construction	Inclusion of measure in construction contracts; status updates in annual LAX MMRP progress report.
2j	Prohibit tampering with construction equipment to increase horsepower or to defeat emission control devices.	Air pollutant emissions associated with the construction (mobile and stationary sources) of the proposed Project	Prior and during construction/ grading of the proposed Project	Periodically during construction	Inclusion of measure in construction contracts; status updates in annual LAX MMRP progress report.
2k	The contractor or builder shall designate a person or persons to ensure the implementation of all components of the construction-related measure through direct inspections, record reviews, and investigations of complaints.	Air pollutant emissions associated with the construction of the proposed Project	Prior to issuance of grading or demolition permit of the proposed Project	Once prior to issuance of grading or demolition permit of the proposed Project	Inclusion of measure in construction contracts; status updates in annual LAX MMRP progress report.
2l	LAWA will locate rock-crushing operations and construction material stockpiles for all LAX-related construction in areas away from LAX-adjacent residents, to the extent possible, to reduce impacts from emissions of fugitive dust.	Air pollutant emissions associated with the construction (fugitive dust) of the proposed Project	Prior to issuance of grading or demolition permit of the proposed Project	Once prior to issuance of grading or demolition permit of the proposed Project	Inclusion of measure in construction contracts; status updates in annual LAX MMRP progress report.

Applicable LAX Master Plan Commitments and Mitigation Measures

Master Plan Commitments/ Mitigation Measures		Impact Being Addressed	Timing of Implementation	Monitoring Frequency	Actions Indicating Compliance
2m	LAWA will ensure that there is available and sufficient infrastructure on-site, where not operationally or technically infeasible, to provide fuel to alternative-fueled vehicles to meet all requests for alternative fuels from contractors and other users of LAX. This will apply to construction equipment and to operations-related vehicles on-site. This provision will apply in conjunction with construction or modification of passenger gates related to implementation of the LAX Master Plan relative to the provision of appropriate infrastructure for electric GSE.	Air pollutant emissions associated with the construction (mobile sources) of the proposed Project	Prior and during construction/ grading of the proposed Project	Once prior to construction and periodically during construction	Inclusion in specifications for the WAMA project; status updates in annual LAX MMRP progress report.
2n	On-road trucks used on LAX construction projects with a gross vehicle weight rating of at least 19,500 pounds shall, at a minimum, comply with USEPA 2007 on-road emissions standards for PM_{10} and NO_X.	Air pollutant emissions associated with the construction (on-road mobile sources) of the proposed Project	Prior and during construction/ grading of the proposed Project	Once prior to construction and periodically during construction	Inclusion of measure in construction contracts; status updates in annual LAX MMRP progress report.
LAX-AQ-4 Monitoring Agency: **LAWA**	**LAX-AQ-4 – Operations-Related Control Measures** The principal feature of this measure is the conversion of LAX GSE to low and ultra-low emission technology (e.g., electric, fuel cell, and other future low-emission technologies). It should be noted that no estimate of the air quality benefit (i.e., emission reductions) of other secondary measures is made in this analysis. Specific operations-related control measures applicable to the Project are identified below:				
4a	LAX GSE will be converted to low- and ultra-low emission technology (e.g., electric, fuel cell, and other future low-emission technologies). Both LAWA- and tenant-owned equipment will be included in this conversion program, which will be implemented in phases. LAWA will assign a GSE coordinator whose responsibility it will be to ensure the successful conversion of GSE in a timely manner. This coordinator will have adequate authority to negotiate on behalf of the City and have sufficient technical support to evaluate technical issues that arise during the implementation of this measure.	Operations-related air pollutant emissions.	Work with assigned GSE coordinator regarding implementation conversion	Ongoing	Inclusion of measure in construction contracts; Status updates in annual LAX MMRP progress report.

Applicable LAX Master Plan Commitments and Mitigation Measures

Master Plan Commitments/ Mitigation Measures		Impact Being Addressed	Timing of Implementation	Monitoring Frequency	Actions Indicating Compliance
4d	LAWA will require the use of electric lawn mowers and leaf blowers, as these units become available for commercial use, for landscape maintenance associated with the proposed project.	General air pollutant emissions.	Prior to completion of proposed Project	Once prior to completion of the proposed Project	Inclusion of measure in landscaping maintenance contracts; status updates in annual LAX MMRP progress report.
4e	LAWA will require the conversion of sweepers to alternative fuels or electric power for ongoing airfield and roadway maintenance. In the 2006 GSE inventory, two of ten sweepers were electric powered and one was either CNG or LPG fueled. HEPA filters will be installed on airport sweepers where the use of HEPA filters is technologically and financially feasible and does not pose a safety hazard to airport operations.	General air pollutant emissions.	Work with assigned GSE coordinator regarding implementation	Ongoing	Status updates in annual LAX MMRP progress report.
4f	LAWA will ensure that there is available and sufficient infrastructure on-site, where not operationally or technically infeasible, to provide fuel to alternative-fueled vehicles to meet all requests for alternative fuels from contractors and other users of LAX. This will apply to construction equipment and to operations-related vehicles on-site. This provision will apply in conjunction with construction or modification of passenger gates related to implementation of the LAX Master Plan relative to the provision of appropriate infrastructure for electric GSE.	Air pollutant emissions related to operational vehicles.	Work with assigned GSE coordinator regarding implementation	Ongoing	Status updates in annual LAX MMRP progress report.
Greenhouse Gas Emissions					
MM-AQ-1 **Monitoring Agency:** **LAWA**	**LAX-AQ-1 – General Air Quality Control Measures** This measure describes a variety of specific actions to reduce air quality impacts associated with projects at LAX, and applies to all projects. Specific measures are identified below:				

Applicable LAX Master Plan Commitments and Mitigation Measures

Master Plan Commitments/ Mitigation Measures		Impact Being Addressed	Timing of Implementation	Monitoring Frequency	Actions Indicating Compliance
1f	Prohibit idling or queuing of diesel-fueled vehicles and equipment in excess of five minutes. This requirement will be included in specifications for any LAX projects requiring on-site construction.	Air pollutant emissions associated with the construction (On- and Off-Road Mobile sources) of the proposed Project	During construction of the proposed Project	Periodically during construction	Inclusion of measure in construction contracts; status updates in annual LAX MMRP progress report.
1g	Require that all construction equipment working on-site is properly maintained (including engine tuning) at all times in accordance with manufacturers' specifications and schedules.	Air pollutant emissions associated with the construction (Mobile and Stationary sources) of the proposed Project	Prior to issuance of grading or demolition permit of the proposed Project and during construction of the proposed Project	Prior to commencing construction and during construction	Inclusion of measure in construction contracts; status updates in annual LAX MMRP progress report.
LAX-AQ-2 Monitoring Agency: **LAWA**	**LAX-AQ-2 – LAX Master Plan - Mitigation Plan for Air Quality; Construction-Related Measures** This measure describes numerous specific actions to reduce fugitive dust emissions and exhaust emissions from on-road and off-road mobile and stationary sources used in construction. Some components of LAX-AQ-2 are not readily quantifiable, but would be implemented as part of LAX Master Plan projects. These control strategies are expected to reduce construction-related emissions. Specific measures applicable to the Project are below:				
2d	To the extent feasible, have construction employees' work/commute during off-peak hours.	Air pollutant emissions associated with the construction (On-Road Mobile sources) of the proposed Project	During construction of the proposed Project	Periodically during construction	Inclusion of measure in construction contracts; status updates in annual LAX MMRP progress report.
2e	Make available on-site lunch trucks during construction to minimize off-site worker vehicle trips.	Air pollutant emissions associated with the construction (On-Road Mobile sources) of the proposed Project	During construction/ grading of the proposed Project	Periodically during construction	Inclusion of measure in construction contracts; status updates in annual LAX MMRP progress report.

Applicable LAX Master Plan Commitments and Mitigation Measures

Master Plan Commitments/ Mitigation Measures		Impact Being Addressed	Timing of Implementation	Monitoring Frequency	Actions Indicating Compliance
2f	Utilize on-site rock crushing facility, when feasible, during construction to reuse rock/concrete and minimize off-site truck haul trips.	Air pollutant emissions associated with the construction (on-road mobile sources) of the proposed Project	During construction of the proposed Project	Periodically during construction	Inclusion of measure in construction contracts; status updates in annual LAX MMRP progress report.
2g	Specify combination of electricity from power poles and portable diesel- or gasoline-fueled generators using "clean burning diesel" fuel and exhaust emission controls.	Air pollutant emissions associated with the construction (stationary point source controls) of the proposed Project	Prior to commencement of construction	Once prior to construction.	Inclusion of measure in construction contracts; status updates in annual LAX MMRP progress report.
2i	Utilize construction equipment having the minimum practical engine size (i.e., lowest appropriate horsepower rating for intended job).	Air pollutant emissions associated with the construction (mobile and stationary sources) of the proposed Project	During construction/ grading of the proposed Project	Periodically during construction	Inclusion of measure in construction contracts; status updates in annual LAX MMRP progress report.
2j	Prohibit tampering with construction equipment to increase horsepower or to defeat emission control devices.	Air pollutant emissions associated with the construction (mobile and stationary sources) of the proposed Project	Prior and during construction/ grading of the proposed Project	Periodically during construction	Inclusion of measure in construction contracts; status updates in annual LAX MMRP progress report.
2k	The contractor or builder shall designate a person or persons to ensure the implementation of all components of the construction-related measure through direct inspections, record reviews, and investigations of complaints.	Air pollutant emissions associated with the construction of the proposed Project	Prior to issuance of grading or demolition permit of the proposed Project	Once prior issuance of grading or demolition permit of the proposed Project	Inclusion of measure in construction contracts; status updates in annual LAX MMRP progress report.

Applicable LAX Master Plan Commitments and Mitigation Measures

Master Plan Commitments/ Mitigation Measures		Impact Being Addressed	Timing of Implementation	Monitoring Frequency	Actions Indicating Compliance
2m	LAWA will ensure that there is available and sufficient infrastructure on-site, where not operationally or technically infeasible, to provide fuel to alternative-fueled vehicles to meet all requests for alternative fuels from contractors and other users of LAX. This will apply to construction equipment and to operations-related vehicles on-site. This provision will apply in conjunction with construction or modification of passenger gates related to implementation of the LAX Master Plan relative to the provision of appropriate infrastructure for electric GSE.	Air pollutant emissions associated with the construction (mobile sources) of the proposed Project	Prior and during construction/ grading of the proposed Project	Once prior to construction and periodically during construction	Inclusion in specifications for the WAMA project; status updates in annual LAX MMRP progress report.
LAX-AQ-4 Monitoring Agency: **LAWA**	**LAX-AQ-4 – Operations-Related Control Measures** The principal feature of this measure is the conversion of LAX GSE to low and ultra-low emission technology (e.g., electric, fuel cell, and other future low-emission technologies). It should be noted that no estimate of the air quality benefit (i.e., emission reductions) of other secondary measures is made in this analysis. Specific operations-related control measures applicable to the Project are identified below:				
4a	LAX GSE will be converted to low- and ultra-low emission technology (e.g., electric, fuel cell, and other future low-emission technologies). Both LAWA- and tenant-owned equipment will be included in this conversion program, which will be implemented in phases. LAWA will assign a GSE coordinator whose responsibility it will be to ensure the successful conversion of GSE in a timely manner. This coordinator will have adequate authority to negotiate on behalf of the City and have sufficient technical support to evaluate technical issues that arise during the implementation of this measure.	Operations-related air pollutant emissions.	Work with assigned GSE coordinator regarding implementation	Ongoing	Inclusion of measure in construction contracts; Status updates in annual LAX MMRP progress report.
4d	LAWA will require the use of electric lawn mowers and leaf blowers, as these units become available for commercial use, for landscape maintenance associated with the proposed project.	General air pollutant emissions	Prior to completion of proposed Project	Once prior to completion of the proposed Project	Inclusion of measure in landscaping maintenance contracts; status updates in annual LAX MMRP progress report.

Applicable LAX Master Plan Commitments and Mitigation Measures

Master Plan Commitments/ Mitigation Measures		Impact Being Addressed	Timing of Implementation	Monitoring Frequency	Actions Indicating Compliance
4e	LAWA will require the conversion of sweepers to alternative fuels or electric power for ongoing airfield and roadway maintenance. In the 2006 GSE inventory, two of ten sweepers were electric powered and one was either CNG or LPG fueled. HEPA filters will be installed on airport sweepers where the use of HEPA filters is technologically and financially feasible and does not pose a safety hazard to airport operations.	General air pollutant emissions	Work with assigned GSE coordinator regarding implementation	Ongoing	Status updates in annual LAX MMRP progress report.
4f	LAWA will ensure that there is available and sufficient infrastructure on-site, where not operationally or technically infeasible, to provide fuel to alternative-fueled vehicles to meet all requests for alternative fuels from contractors and other users of LAX. This will apply to construction equipment and to operations-related vehicles on-site. This provision will apply in conjunction with construction or modification of passenger gates related to implementation of the LAX Master Plan relative to the provision of appropriate infrastructure for electric GSE.	Air pollutant emissions related to operational vehicles	Work with assigned GSE coordinator regarding implementation	Ongoing	Status updates in annual LAX MMRP progress report.
Hazards and Hazardous Materials					
HM-1 **Monitoring Agency:** **LAWA**	**Ensure Continued Implementation of Existing Remediation Efforts.** Prior to initiating construction of a Master Plan component, LAWA will conduct a pre-construction evaluation to determine if the proposed construction will interfere with existing soil or groundwater remediation efforts. For sites currently on LAX property, LAWA will work with tenants to ensure that, to the extent possible, remediation is complete prior to the construction. If remediation must be interrupted to allow for Master Plan-related construction, LAWA will notify and obtain approval from the regulatory agency with jurisdiction, as required, and will evaluate whether new or increased monitoring will be necessary. If it is determined that contamination has migrated during construction,	Potential for construction activities to interfere with existing soil or groundwater remediation efforts	Prior to initiation of construction	Once prior to construction	Status updates in annual LAX MMRP progress report.

Applicable LAX Master Plan Commitments and Mitigation Measures

Master Plan Commitments/ Mitigation Measures		Impact Being Addressed	Timing of Implementation	Monitoring Frequency	Actions Indicating Compliance
	temporary measures will be taken to stop the migration. As soon as practicable following completion of construction in the area, remediation will be reinstated, if required by the Regional Water Quality Control Board (RWQCB) or another agency with jurisdiction. In such cases, LAWA will coordinate the design of the Master Plan component and the re-design of the remediation systems to ensure that they are compatible and to ensure that the proposed remediation system is comparable to the system currently in place. If it is determined during the pre-construction evaluation that construction will preclude reinstatement of the remediation effort, LAWA will obtain approval to initiate construction from the agency with jurisdiction. For properties to be acquired as part of the LAX Master Plan, LAWA will evaluate the status of all existing soil and groundwater remediation efforts. As part of this evaluation, LAWA will assess the projected time required to complete the remediation activities and will coordinate with the land owner and the agency with jurisdiction to ensure that remediation is completed prior to scheduled demolition and construction activities, if possible. In cases where remediation cannot be completed prior to demolition and construction activities, LAWA will undertake the same steps required above, namely, an evaluation of the need to conduct monitoring; implementation of temporary measures to stop migration, if required; and reinstatement of remediation following completion of construction, if required.				

Applicable LAX Master Plan Commitments and Mitigation Measures

Master Plan Commitments/ Mitigation Measures		Impact Being Addressed	Timing of Implementation	Monitoring Frequency	Actions Indicating Compliance
HM-2. **Monitoring Agency:** **LAWA**	**Handling of Contaminated Materials Encountered During Construction.** Prior to the initiation of construction, LAWA will develop a program to coordinate all efforts associated with the handling of contaminated materials encountered during construction. The intent of this program will be to ensure that all contaminated soils and/or groundwater encountered during construction are handled in accordance with all applicable regulations. As part of this program, LAWA will identify the nature and extent of contamination in all areas where excavation, grading, and pile-driving activities are to be performed. LAWA will notify the appropriate regulatory agency when contamination has been identified. If warranted by the extent of the contamination, as determined by the regulatory agency with jurisdiction, LAWA will conduct remediation prior to initiation of construction. Otherwise, LAWA will incorporate provisions for the identification, segregation, handling and disposal of contaminated materials within the construction bid documents. In addition, LAWA will include a provision in all construction bid documents requiring all construction contractors to prepare site-specific Health and Safety Plans prior to the initiation of grading or excavation. Each Health and Safety Plan would include, at a minimum, identification/description of the following: site description and features; site map; site history; waste types encountered; waste characteristics; hazards of concern; disposal methods and practices; hazardous material summary; hazard evaluation; required protective equipment; decontamination procedures; emergency contacts; hospital map and contingency plan. In the event that any threshold of significance listed in the Hazardous Materials section of the EIS/EIR for the LAX Master Plan is exceeded due to the discovery of soil or groundwater contaminated by hazardous	Potential for encountering hazardous materials/waste during construction activities	Prior to initiation of construction	Once prior to construction	Compliance with the provisions contained in the *Procedure for the Management of Contaminated Materials Encountered During Construction*, including the preparation of a detailed Health and Safety Plan; status updates in annual LAX MMRP progress report.

Applicable LAX Master Plan Commitments and Mitigation Measures

Master Plan Commitments/ Mitigation Measures		Impact Being Addressed	Timing of Implementation	Monitoring Frequency	Actions Indicating Compliance
	materials or if previously unknown contaminants are discovered during construction or a spill occurs during construction, LAWA will notify the lead agency(ies) with jurisdiction and take immediate and effective measures to ensure the health and safety of the public and workers and to protect the environment, including, as necessary and appropriate, stopping work in the affected area until the appropriate agency has been notified. *Note: Subsequent to the approval of the LAX Master Plan, LAWA adopted the Procedure for the Management of Contaminated Materials Encountered During Construction for application to all LAX Master Plan projects. The Procedure, provides further guidance for implementing LAX Master Plan Commitment HM-2, especially for projects involving excavation and grading of soils.*				
Hydrology and Water Quality					
HWQ-1. **Monitoring Agency:** **LAWA**	**Conceptual Drainage Plan.** Once a Master Plan alternative is selected, and in conjunction with its design, LAWA will develop a Conceptual Drainage Plan (CDP) of the area within the boundaries of the Master Plan (in accordance with FAA guidelines and to the satisfaction of the City of Los Angeles Department of Public Works [LADPW], Bureau of Engineering). The purpose of the drainage plan will be to assess area-wide drainage flows as related to the Master Plan area, and at a level of detail sufficient to identify the overall improvements necessary to provide adequate drainage capacity to prevent flooding. The CDP will provide the basis and specifications from which detailed drainage improvement plans will be designed in conjunction with site engineering specific to each Master Plan.	Significant changes in surface hydrology or adverse impacts to surface water quality due to new development associated with the Master Plan	Prior to issuance of a grading/building permit for a project involving substantial surface alterations or substantial changes to existing operations	Once upon completion of conceptual drainage plan	Completion of conceptual drainage plan.

Applicable LAX Master Plan Commitments and Mitigation Measures

Master Plan Commitments/ Mitigation Measures		Impact Being Addressed	Timing of Implementation	Monitoring Frequency	Actions Indicating Compliance
	BMPs will be incorporated to minimize the effect of airport operations on surface water quality and to prevent a net increase in pollutant loads to surface water resulting from the selected Master Plan alternative. To evaluate drainage capacity, LAWA will use either the Peak Rate Method specified in Part G - Storm Drain Design of the City of Los Angeles' Bureau of Engineering Manual or the Los Angeles County Modified Rational Method, both of which are acceptable to the LADPW and the City of Los Angeles Bureau of Engineering. In areas within the boundary of the selected alternative where the surface water runoff rates are found to exceed the capacity of the storm water conveyance infrastructure with the potential to cause flooding, LAWA will take measures to either reduce peak flow rates or increase the structure's capacity. These drainage facilities will be designed to ensure that they adequately convey storm water runoff and prevent flooding by adhering to the procedures set forth by the Peak Rate Method/Los Angeles County Modified Rational Method. Methods to reduce the peak flow could include: o Decreasing impervious area by removing unnecessary pavement or utilizing porous concrete or modular pavement o Building storm water detention structures o Diverting runoff to pervious areas (reducing directly-connected impervious areas) o Diverting runoff to outfalls with additional capacity o Redirecting storm water flows to increase the time of concentration o Measures to increase drainage capacity could				

Applicable LAX Master Plan Commitments and Mitigation Measures

Master Plan Commitments/ Mitigation Measures		Impact Being Addressed	Timing of Implementation	Monitoring Frequency	Actions Indicating Compliance
	include: - Increasing the capacity of storm water conveyance structures - Increasing the number of storm water conveyance structures and/or outfalls To evaluate the effect of the selected Master Plan alternative on surface water quality, LAWA will prepare a specific Standard SUSMP for the selected alternative, as required by the LARWQCB. The SUSMP addresses water quality and drainage issues by specifying source control, structural, and treatment control BMPs with the objective of reducing the discharge of pollutants from the storm water conveyance system to the maximum extent practicable. Once BMPs are identified, an updated pollutant load estimate will be calculated that takes into account reductions from treatment control BMPs. These BMPs will be applied to both existing and future sources with the goal of achieving no net increase in loadings of pollutants of concern to receiving water bodies. LAWA will therefore address water quality issues, including erosion and sedimentation, and comply with the SUSMP requirements, by incorporation of the BMPs specified in the SUSMP, including: o Vegetated swales and strips o Oil/Water separators, clarifiers and Media filtration o Detention basins, and catch basin inserts and screens				

Applicable LAX Master Plan Commitments and Mitigation Measures

Master Plan Commitments/ Mitigation Measures		Impact Being Addressed	Timing of Implementation	Monitoring Frequency	Actions Indicating Compliance
	o Continuous flow deflective systems o Bioretention and infiltration o Manufactured treatment units and hydrodynamic devices Other structural BMPs may also be selected from the literature and the many federal, state and local guidance documents available. Performance of structural BMPs varies considerably based on their design. USEPA has published estimated ranges of pollutant removal efficiencies for structural BMPs based on substantial document review. In addition to the structural BMP types that will be used, non-structural/source control BMPs will continue to be a part of the LAX program to reduce pollutant loadings. Existing practices and potentially new ones will be extended to acquisition areas and to the areas where airport operations will increase in frequency or duration. These source control BMPs will be incorporated into the SWPPP and will consequently be required of LAWA and all airport tenants at all locations where industrial activities occur that have the potential to impact water quality. The overall result of LAX Master Plan Commitment HWQ-1 will be drainage infrastructure that provides adequate drainage capacity to prevent flooding and control peak flow discharges, that incorporates BMPs to minimize the effect of airport operations on surface water quality, and that prevents a net increase of pollutant loads to receiving waters.				

Applicable LAX Master Plan Commitments and Mitigation Measures

Master Plan Commitments/ Mitigation Measures		Impact Being Addressed	Timing of Implementation	Monitoring Frequency	Actions Indicating Compliance
MM-HWQ-1. **Monitoring Agency:** **LAWA**	**Update Regional Drainage Facilities.** Regional drainage facilities should be upgraded, as necessary, in order to accommodate current and projected future flows within the watershed of each storm water outfall resulting from cumulative development. This could include upgrading the existing outfalls, or building new ones. The responsibility for implementing this mitigation measure lies with the LACDPW and/or LADPW, Bureau of Engineering. A portion of the increased costs for the upgraded flood control and drainage facilities would be paid by LAX tenants and users in accordance with the possessory interest tax laws and other legal assessments, consistent with federal airport revenue diversion laws and regulations and in compliance with state, county and city laws. New facilities should be designed in accordance with the drainage design standards of each agency.	Impacts to storm drain infrastructure	Ongoing	Ongoing	Status updates in annual LAX MMRP progress report. Once the necessary improvements to the offsite facilities have been approved, the need for monitoring ceases.
Noise					
MM-N-7 **Monitoring Agency:** **LAWA**	**Construction Noise Control Plan.** A Construction Noise Control Plan will be prepared to provide feasible measures to reduce significant noise impacts throughout the construction period for all projects near noise sensitive uses. For example, noise control devices shall be used and maintained, such as equipment mufflers, enclosures, and barriers. Natural and artificial barriers such as ground elevation changes and existing buildings may be used to shield construction noise.	Significant noise impacts at noise-sensitive receivers during construction	Prior to the earliest of either the issuance of a grading permit, issuance of a demolition permit, or construction commencement of the Project with noise sensitive uses within 600 feet of Project site	Once, upon completion of Noise Control Plan and as specified in the Noise Control Plan	Inclusion of requirement of a Noise Control Plan in subcontract agreement and subsequent approval of the Noise Control Plan by LAWA; status updates in annual LAX MMRP progress report.

Applicable LAX Master Plan Commitments and Mitigation Measures

Master Plan Commitments/ Mitigation Measures		Impact Being Addressed	Timing of Implementation	Monitoring Frequency	Actions Indicating Compliance
MM-N-8 **Monitoring Agency:** **LAWA**	**Construction Staging.** Construction operations shall be staged as far from noise-sensitive uses as feasible.	Significant noise impacts at noise-sensitive receivers during construction	Prior to the earliest of either the issuance of a grading permit, issuance of a demolition permit, or construction commencement of the Project with noise sensitive uses within 600 feet of Project site	Once, upon approval of construction staging area by LAWA	Approval of construction staging area by LAWA; status updates in annual LAX MMRP progress report.
MM-N-9 **Monitoring Agency:** **LAWA**	**Equipment Replacement.** Noisy equipment shall be replaced with quieter equipment (for example, rubber tired equipment rather than track equipment) when technically and economically feasible.	Significant noise impacts at noise-sensitive receivers during construction.	Prior to the earliest of either the issuance of a grading permit, issuance of a demolition permit, or construction commencement of the Project with noise sensitive uses within 600 feet of the Project site	Once, upon completion of Noise Control Plan and as specified in the Noise Control Plan	Inclusion of requirement of a Noise Control Plan in subcontract agreement and subsequent approval of the Noise Control Plan by LAWA; status updates in annual LAX MMRP progress report.

Applicable LAX Master Plan Commitments and Mitigation Measures

Master Plan Commitments/ Mitigation Measures		Impact Being Addressed	Timing of Implementation	Monitoring Frequency	Actions Indicating Compliance
MM-N-10 **Monitoring Agency:** **LAWA**	**Construction Scheduling.** The timing and/or sequence of the noisiest on-site construction activities shall avoid sensitive times of the day, as feasible (9 p.m. to 7 a.m. Monday - Friday; 8 p.m. to 6 a.m. Saturday; anytime on Sunday or Holidays).	Significant noise impacts at noise-sensitive receivers during construction.	Prior to the earliest of either the issuance of a grading permit, issuance of a demolition permit, or construction commencement of the Project with noise sensitive uses within 600 feet of the Project site	Once, upon completion of Noise Control Plan and as specified in the Noise Control Plan	Inclusion of requirement of a Noise Control Plan in subcontract agreement and subsequent approval of the Noise Control Plan by LAWA; status updates in annual LAX MMRP progress report.
N-1 **Monitoring Agency:** **LAWA**	**Maintenance of Applicable Elements of Existing Aircraft Noise Abatement Program.** All components of the current airport noise abatement program that pertain to aircraft noise will be maintained**.**	Expose noise-sensitive areas to 65 CNEL or greater with at least a 1.5 CNEL increase	Already being implemented. Will continue noise abatement program throughout implementation and use	Ongoing	Submission of Annual Report per Variance Conditions to County of Los Angeles; status updates in annual LAX MMRP progress report.
ST-16 **Monitoring Agency:** **LAWA**	**Surface Transportation, Designated Haul Routes.** Every effort will be made to ensure that haul routes are located away from sensitive noise receptors.	Traffic noise	At issuance of approved haul route	Once, at approval of haul route	Approval of haul route by LAWA Ground Transportation/Construction Coordination Office; status updates in annual LAX MMRP progress report

Applicable LAX Master Plan Commitments and Mitigation Measures

Master Plan Commitments/ Mitigation Measures		Impact Being Addressed	Timing of Implementation	Monitoring Frequency	Actions Indicating Compliance
ST-22 **Monitoring Agency:** **LAWA**	**Surface Transportation, Designated Truck Routes.** For dirt and aggregate and all other materials and equipment, truck deliveries will be on designated routes only (freeways and non-residential streets). Every effort will be made for routes to avoid residential frontages. The designated routes on City of Los Angeles streets are subject to approval by LADOT's Bureau of Traffic Management and may include, but will not necessarily be limited to: Pershing Drive (Westchester Parkway to Imperial Highway); Florence Avenue (Aviation Boulevard to I-405); Manchester Boulevard (Aviation Boulevard to I-405); Aviation Boulevard (Manchester Avenue to Imperial Highway); Westchester Parkway/Arbor Vitae Street (Pershing Drive to I-405); La Cienega Boulevard (north of Imperial Highway); Airport Boulevard (Arbor Vitae Street to Century Boulevard); Sepulveda Boulevard (Westchester Parkway to Imperial Highway); I-405; and I-105.	Traffic congestion and delay as they relate to construction activities	At issuance of haul route approval	Once, upon approval of each haul route	Approval of haul route by LAWA Ground Transportation/Construction Coordination Office; status updates in annual LAX MMRP progress report
Land Use					
LU-4 **Monitoring Agency:** **LAWA**	**Neighborhood Compatibility Program.** Ongoing coordination and planning will be undertaken by LAWA to ensure that the airport is as compatible as possible with surrounding properties and neighborhoods. Measures to enforce this policy will include: ○ Along the northerly and southerly boundary areas of the airport, LAWA will provide and maintain landscaped buffer areas that will include setbacks, landscaping, screening or other appropriate view sensitive uses with the goal of avoiding land use conflicts, shielding lighting, enhancing privacy and better screening views of airport facilities from adjacent residential uses. Use of existing facilities in buffer areas may continue as required until LAWA can	Conflict with any applicable land use plan, policy, or regulation (including, but not limited to, the general plan, specific plans, local coastal program or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect	Ongoing	Ongoing	Compliance with the provisions of the LAX Zone/LAX Specific Plan and LAX Plan; status updates in annual LAX MMRP progress report.

Applicable LAX Master Plan Commitments and Mitigation Measures

Master Plan Commitments/ Mitigation Measures		Impact Being Addressed	Timing of Implementation	Monitoring Frequency	Actions Indicating Compliance
	develop alternative facilities. ○ Locate airport uses and activities with the potential to adversely affect nearby residential land uses through noise, light spill-over, odor, vibration and other consequences of airport operations and development as far from adjacent residential neighborhoods as feasible. ○ Provide community outreach efforts to property owners and occupants when new development on airport property is in proximity to and could potentially affect nearby residential uses.				
Construction Surface Transportation					
C-1. **Monitoring Agency:** **LAWA**	**Establishment of a Ground Transportation/Construction Coordination Office.** Establish this office for the life of the construction projects to coordinate deliveries, monitor traffic conditions, advise motorists and those making deliveries about detours and congested areas, and monitor and enforce delivery times and routes. LAWA would periodically analyze traffic conditions on designated routes during construction to see whether there is a need to improve conditions through signage and other means. This office may undertake a variety of duties, including but not limited to: ○ Inform motorists about detours and congestion by use of static signs, changeable message signs, media announcements, airport website, etc.; ○ Work with airport police and the Los Angeles Police Department to enforce delivery times and routes;	Traffic congestion and delays as they relate to construction activities	Prior to issuance of any permits. Complete set of duties for this office will be established prior to issuance of any permit for the project that may significantly impact surface streets	Ongoing coordination by the LAWA Ground Transportation/Construction Coordination Office in conjunction with LAWA Construction and Logistics Management (CALM) team	LAWA Ground Transportation/Construction Coordination Office prior to approval; status updates in annual LAX MMRP progress report.

Applicable LAX Master Plan Commitments and Mitigation Measures

Master Plan Commitments/ Mitigation Measures		Impact Being Addressed	Timing of Implementation	Monitoring Frequency	Actions Indicating Compliance
	○ Establish staging areas; ○ Coordinate with police and fire personnel regarding maintenance of emergency access and response times; ○ Coordinate roadway projects of Caltrans, City of Los Angeles, and other jurisdictions with those of the Airport construction projects; ○ Monitor and coordinate deliveries; ○ Establish detour routes; ○ Work with residential and commercial neighbors to address their concerns regarding construction activity; and ○ Analyze traffic conditions to determine the need for additional traffic controls, lane restriping, signal modifications, etc. *Note: Subsequent to the approval of the LAX Master Plan, LAWA established a "Ground Transportation/Construction Coordination Office" in the form of the CALM team. The CALM team coordinates and monitors construction traffic, coordinates with agencies as necessary, and reviews traffic control plans to address any concerns prior to approval. The CALM team, discussed in detail in Section 4.7.3.8, above, provides implementation of the LAX Master Plan Commitment C-1.*				
C-2. **Monitoring Agency:** **LAWA**	**Construction Personnel Airport Orientation.** All construction personnel will be required to attend an airport project-specific orientation (pre-construction meeting) that includes where to park, where staging areas are located, construction policies, etc.	Traffic congestion and delays as they relate to construction activities	Prior to commencement of construction	As required by arrival of new personnel	Contractor certification; signatures of orientation attendees; status updates in annual LAX MMRP progress report.

Applicable LAX Master Plan Commitments and Mitigation Measures

Master Plan Commitments/ Mitigation Measures		Impact Being Addressed	Timing of Implementation	Monitoring Frequency	Actions Indicating Compliance
ST-9. **Monitoring Agency:** **LAWA**	**Construction Deliveries.** Construction deliveries requiring lane closures shall receive prior approval from the Construction Coordination Office. Notification of deliveries shall be made with sufficient time to allow for any modifications to approved traffic detour plans.	Traffic congestion and delay as they relate to construction activities	During construction	Ongoing during construction	Status updates in annual LAX MMRP progress report.
ST-12 **Monitoring Agency:** **LAWA**	**Designated Truck Delivery Hours.** Truck deliveries shall be encouraged to use night-time hours and shall avoid the peak periods of 7:00 AM to 9:00 AM and 4:30 PM to 6:30 PM.	Traffic congestion and delay as they relate to construction activities	LAWA approval of delivery schedule as part of the Construction Traffic Management Plan	Ongoing during construction	Status updates in annual LAX MMRP progress report.
ST-14 **Monitoring Agency:** **LAWA**	**Construction Employee Shift Hours.** Shift hours that do not coincide with the heaviest commuter traffic periods (7:00 AM to 9:00 AM, 4:30 PM to 6:30 PM) would be established. Work periods will be extended to include weekends and multiple work shifts, to the extent possible and necessary.	Traffic congestion and delay as they relate to construction activities	Prior to construction activities	Once, during review of Construction Traffic Management Plan	LAWA approval of employee work schedule as part of the Construction Traffic Management Plan; status updates in annual LAX MMRP progress report.
ST-16 **Monitoring Agency:** **LAWA**	See discussion of ST-16 under Noise.				
ST-17 **Monitoring Agency:** **LAWA**	**Maintenance of Haul Routes.** Haul routes on off-airport roadways will be maintained periodically and will comply with City of Los Angeles or other appropriate jurisdictional requirements for maintenance. Minor striping, lane configurations, and signal phasing modifications would be provided as needed.	Roadway safety	Ongoing during construction	Ongoing during construction	Field inspection report; maintenance logs; status updates in annual LAX MMRP progress report.

Applicable LAX Master Plan Commitments and Mitigation Measures

Master Plan Commitments/ Mitigation Measures		Impact Being Addressed	Timing of Implementation	Monitoring Frequency	Actions Indicating Compliance
ST-18 **Monitoring Agency:** **LAWA**	**Construction Traffic Management Plan.** A complete construction traffic plan will be developed to designate detour and/or haul routes, variable message and other sign locations, communication methods with airport passengers, construction deliveries, construction employee shift hours, construction employee parking locations and other relevant factors.	Traffic congestion, delay and safety related to construction activities	Prior to commencement of construction	Ongoing during construction,	LAWA approval of Construction Traffic Management Plan by LAWA Ground Transportation/Construction Coordination Office in conjunction with LAWA CALM Team; status updates in annual LAX MMRP progress report.
ST-22 **Monitoring Agency:** **LAWA**	See discussion of ST-22 under Noise.				
Miscellaneous Applicable Mitigation Measures					
ARCHAEO-1 **Monitoring Agency:** **LAWA**	Prior to initiation and construction activities, LAWA will retain an on-site Cultural Resources Monitor (CRM), as defined in the LAX Master Plan Mitigation Monitoring and Reporting Program (MMRP) Archaeological Treatment Plan (ATP), who will determine if the project site is subject to archaeological monitoring. As defined in the ATP, areas are not subject to archaeological monitoring if they contain redeposited fill or have previously been disturbed. LAWA shall retain an archaeologist to monitor excavation activities in native or virgin soils in accordance with the detailed monitoring procedures and other procedures outlined in the ATP regarding treatment for archaeological resources that are accidentally encountered during construction. In accordance with the methods and guidelines provided in the ATP, the CRM will compare the known depth of	Potential to unexpectedly encounter and impact subsurface archaeological resources, including Native American remains, during grading and excavation	Prior to issuance of grading or demolition permit of the proposed Project, with continued monitoring efforts in accordance with the ATP	Once, upon retention of archaeologist and ongoing during excavation and grading activities, as identified in ATP	Retention of archaeologist and filing of periodic monitoring reports with LAWA, as stipulated in the ATP; status updates in annual LAX MMRP progress report.

Applicable LAX Master Plan Commitments and Mitigation Measures

Master Plan Commitments/ Mitigation Measures		Impact Being Addressed	Timing of Implementation	Monitoring Frequency	Actions Indicating Compliance
	redeposited fill or disturbance to the depth of planned grading activities, based on a review of construction plans. If the CRM determines that the Project site is subject to archaeological monitoring, a qualified archaeologist (an archaeologist who satisfies the Secretary of the Interior's Professional Qualifications Standards [36 CFR 61]) shall be retained by LAWA to inspect excavation and grading activities that occur within native material. The extent and frequency of inspection shall be defined based on consultation with the archaeologist. Following initial inspection of excavation materials, the archaeologist may adjust inspection protocols as work proceeds. Identification, evaluation, and recovery of cultural resources shall be conducted in accordance with the methods, guidelines, and measures established in the ATP. If Native American cultural resources are encountered, LAWA shall comply with guidance established in the ATP for retaining a Native American monitor. If human remains are found, LAWA shall comply with the State Health and Safety Code regarding the appropriate treatment of those remains as outlined in the ATP. Reporting shall be completed in conformance with the requirements established in the ATP to document the archaeological monitoring effort and guidance as to the proper curation and archiving of artifacts in accordance with industry and federal standards.				

Applicable LAX Master Plan Commitments and Mitigation Measures

Master Plan Commitments/ Mitigation Measures		Impact Being Addressed	Timing of Implementation	Monitoring Frequency	Actions Indicating Compliance
PALEO-1 **Monitoring Agency:** **LAWA**	Conformance with LAX Master Plan Paleontological Management Treatment Plan: (PMTP): Prior to the initiation of grading and construction activities, LAWA will retain a professional paleontologist, as defined in the Final LAX Master Plan MMRP PMTP, who will determine if the Project site exhibits a high or low potential for subsurface resources. If the Project site is determined to exhibit a high potential for subsurface resources, paleontological monitoring will be conducted in accordance with the procedures stipulated in the PMTP. If the Project site is determined to exhibit a low potential for subsurface deposits, excavation need not be monitored as per the PMTP. In the event that paleontological resources are discovered, the procedures outlined in the PMTP for the identification of resources will be followed to ensure that unique paleontological resources are studied and treated in accordance with applicable regulations and procedures such that significant impacts are avoided.	Potential loss or destruction of important paleontological resources	Prior to issuance of grading or demolition permits for the proposed project, with continued monitoring efforts in accordance with the PMTP	Once, upon retention of paleontologist and ongoing during excavation and grading activities, as identified in PMTP	Retention of paleontologist and filing of periodic monitoring reports with LAWA, as stipulated in the PMTP; status updates in annual LAX MMRP progress report.
PALEO 2 **Monitoring Agency:** **LAWA**	Construction Personnel Briefing: In accordance with the PMTP, construction personnel will be briefed by the consulting paleontologist in the identification of fossils or fossilferous deposits and in the correct procedures for notifying the relevant individuals should such a discovery occur.	Potential loss or destruction of important paleontological resources	Prior to commencement of grading or excavation for the proposed Project, with continued monitoring efforts in accordance with the PMTP	Once for each worker involved with excavation and grading activities	Sign-in sheets for workers attending the construction briefing; status updates in annual LAX MMRP progress report.

Midfield Satellite Concourse
Mitigation Monitoring and Reporting Program

June 2014

This document constitutes the Mitigation Monitoring and Reporting Program (MMRP) for the Midfield Satellite Concourse (MSC). This MMRP specifies the monitoring and reporting requirements for the MSC, as related to implementation of applicable LAX Master Plan commitments and mitigation measures, applicable Bradley West Project (BWP)-specific mitigation measures (i.e., measures adopted in connection with approval of the Bradley West Project, which also pertain to, and have been considered within, the analysis completed for the MSC EIR), applicable Specific Plan Amendment Study (SPAS)-specific mitigation measures, and MSC-specific mitigation measures identified in the MSC Final EIR. Such commitments and measures include many of those set forth in the LAX Master Plan Final EIS/EIR, as well as additional new measures identified in the MSC Final EIR. The LAX Master Plan commitments and measures, along with the BWP-specific measures identified below, are already being implemented consistent with the MMRPs adopted for the LAX Master Plan and BWP, and were considered part of the project analyzed in the MSC EIR.

This MMRP provides the number and title of each applicable LAX Master Plan commitment, LAX Master Plan mitigation measure, Bradley West Project-specific mitigation measure, Specific Plan Amendment Study-specific mitigation measure, and MSC-specific mitigation measure, and the timing of implementation, monitoring frequency, and actions indicating compliance. The MMRP identifies each commitment and measure by the environmental discipline of the measure, including applicability for both the MSC North Project and the future phase(s) of the MSC Program. **Table 1** below lists the MSC-specific mitigation measures; **Table 2** lists the BWP- and SPAS-specific mitigation measures. **Table 3** lists the LAX Master Plan Commitments and Mitigation Measures that are applicable to environmental impacts by discipline.

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Table 1: MSC-Specific Mitigation Measures

Mitigation Measures		Impact Being Addressed	Timing of Implementation	Monitoring Frequency	Actions Indicating Compliance	Applicability to MSC North Project and/or MSC Program
Air Quality, Greenhouse Gases, Human Health						
MM-AQ (MSC)-1 **Monitoring Agency: LAWA**	o 2n: On-road trucks used on LAX construction projects with a gross vehicle weight rating of at least 19,500 pounds shall, at a minimum, comply with USEPA 2010 on-road emissions standards for PM_{10} and NO_x. Contractor requirements to utilize such on-road haul trucks or the next cleanest vehicle available will be subject to the provisions of LAWA Air Quality Control Measure 2p below. o 2o: Prior to January 1, 2015, all off-road diesel-powered construction equipment greater than 50 horsepower shall meet, at a minimum, USEPA Tier 3 off-road emission standards. After December 31, 2014, all off-road diesel-power construction equipment greater than 50 horsepower shall meet USEPA Tier 4(final) off-road emissions standards. Tier 4(final) equipment shall be considered based on availability at the time the construction bid is issued. Contractor requirements to utilize Tier 4(final) equipment or the next cleanest equipment available will be subject to the provisions of LAWA Air Quality Control Measure 2p below. LAWA will encourage construction contractors to apply for SCAQMD "SOON" funds to accelerate clean-up of off-road diesel engine emissions. o 2p: The on-road haul truck and off-road construction equipment requirements set forth in Air Quality Control Measures 2n and 2o above shall apply unless any of the following circumstances exist and the Contractor provides a written finding consistent with project contract requirements that: o The Contractor does not have the required types of on-road haul trucks or off-road construction equipment within its current available inventory and intends to meet the requirements of the Measures 2n and 2o as to a particular vehicle or piece of equipment by leasing or short-term rental, and the Contractor has attempted in good	Construction-related air pollutant emissions	Implemented prior to initiation of grading or demolition activities	Once prior to commencement of construction (each construction contractor)	Inclusion of measure in construction contracts; status updates in annual LAX MMRP progress report	MSC North Project and future phase(s) of the MSC Program

Table 1: MSC-Specific Mitigation Measures

Mitigation Measures		Impact Being Addressed	Timing of Implementation	Monitoring Frequency	Actions Indicating Compliance	Applicability to MSC North Project and/or MSC Program
	faith and due diligence to lease the vehicle or equipment that would comply with these measures, but that vehicle or equipment is not available for lease or short-term rental within 120 miles of the project site, and the Contractor has submitted documentation to LAWA showing that the requirements of this exception provision (Measure 2p) apply. o The Contractor has been awarded funding by SCAQMD or another agency that would provide some or all of the cost to retrofit, repower, or purchase a piece of equipment or vehicle, but the funding has not yet been provided due to circumstances beyond the Contractor's control, and the Contractor has attempted in good faith and due diligence to lease or short-term rent the equipment or vehicle that would comply with Measures 2n and 2o, but that equipment or vehicle is not available for lease or short-term rental within 120 miles of the project site, and the Contractor has submitted documentation to LAWA showing that the requirements of this exception provision (Measure 2p) apply. o Contractor has ordered a piece of equipment or vehicle to be used on the construction project in compliance with Measures 2n and 2o at least 60 days before that equipment or vehicle is needed at the project site, but that equipment or vehicle has not yet arrived due to circumstances beyond the Contractor's control, and the Contractor has attempted in good faith and due diligence to lease or short-term rent a piece of equipment or vehicle to meet the requirements of Measures 2n and 2o, but that equipment or vehicle is not available for lease or short-term rental within 120 miles of the project, and the Contractor has submitted documentation to LAWA showing that the requirements of this exception provision (Measure 2p) apply. o Construction-related diesel equipment or vehicle will be used on the project site for fewer than 20					

Table 1: MSC-Specific Mitigation Measures

<table>
<tr><th colspan="2">Mitigation Measures</th><th>Impact Being Addressed</th><th>Timing of Implementation</th><th>Monitoring Frequency</th><th>Actions Indicating Compliance</th><th>Applicability to MSC North Project and/or MSC Program</th></tr>
<tr><td></td><td>
calendar days per calendar year. The Contractor shall not consecutively use different equipment or vehicles that perform the same or a substantially similar function in an attempt to use this exception (Measure 2p) to circumvent the intent of Measures 2n and 2o.
In any of the situations described above, the Contractor shall provide the next cleanest piece of equipment or vehicle as provided by the step down schedules in Table 4.1-45 for Off-Road Equipment and Table 4.1-46 for On-Road Equipment.

Table 4.1-45

Off-Road Vehicle Compliance Step-Down Schedule
<table>
<tr><th>Compliance Alternative</th><th>Engine Standard</th><th>CARB-verified DECS (VDECS)</th></tr>
<tr><td>1</td><td>Tier 4 interim</td><td>N/A*</td></tr>
<tr><td>2</td><td>Tier 3</td><td>Level 3</td></tr>
<tr><td>3</td><td>Tier 2</td><td>Level 3</td></tr>
<tr><td>4</td><td>Tier 1</td><td>Level 3</td></tr>
<tr><td>5</td><td>Tier 2</td><td>Level 2</td></tr>
<tr><td>6</td><td>Tier 2</td><td>Level 1</td></tr>
<tr><td>7</td><td>Tier 2</td><td>Uncontrolled</td></tr>
<tr><td>8</td><td>Tier 1</td><td>Level 2</td></tr>
</table>
Notes:
Equipment less than Tier 1, Level 2 shall not be permitted.
* Tier 4 (interim or final) or 2007 model year equipment not already supplied with a factory-equipped diesel particulate filter shall be outfitted with Level 3 VDECS.

Source: CDM Smith, January 2014.
</td><td></td><td></td><td></td><td></td><td></td></tr>
</table>

Table 1: MSC-Specific Mitigation Measures

Mitigation Measures		Impact Being Addressed	Timing of Implementation	Monitoring Frequency	Actions Indicating Compliance	Applicability to MSC North Project and/or MSC Program
	Table 4.1-46 **On-Road Vehicle Compliance Step-Down Schedule** **Compliance Alternative / Engine Standard / CARB-verified DECS (VDECS)** 1 / 2007 / N/A* 2 / 2004 / Level 3 3 / 1998 / Level 3 4 / 2004 / Uncontrolled 5 / 1998 / Uncontrolled Notes: Equipment with a model year earlier than model year 1998 shall not be permitted. * Tier 4 (interim or final) or 2007 model year equipment not already supplied with a factory-equipped diesel particulate filter shall be outfitted with Level 3 VDECS. Nothing in the above measures shall require an emissions control device (i.e., VDECS) that does not meet OSHA standards. Source: CDM Smith, January 2014.					
Cultural Resources						
MM-HA (MSC)-1 **Monitoring Agency: LAWA**	**Conformance with LAX Master Plan Archaeological Treatment Plan.**[1] Prior to initiating grading and construction activities, LAWA will retain an on-site Cultural Resource Monitor (CRM), as defined in the LAX Master Plan Mitigation Monitoring and Reporting Program Archaeological Treatment Plan (ATP), who will	Potential to encounter and impact previously unidentified sub-surface	Prior to initiation of grading and construction activities associated with the construction of the	Once, upon retention of archaeologist and ongoing during excavation and grading activities,	Retention of archaeologist and filing of periodic monitoring reports with LAWA, as stipulated in the	MSC North Project and future phase(s) of the MSC Program

[1] This measure has been developed to ensure compliance with the ATP, which incorporates the requirements of LAX Master Plan Mitigation Measures MM-HA-4 through MM-HA-10.

Table 1: MSC-Specific Mitigation Measures

Mitigation Measures		Impact Being Addressed	Timing of Implementation	Monitoring Frequency	Actions Indicating Compliance	Applicability to MSC North Project and/or MSC Program
	determine if the proposed project area is subject to archaeological monitoring. As defined in the ATP, areas are not subject to archaeological monitoring if they contain re-deposited fill or have previously been disturbed. The CRM will compare the known depth of re-deposited fill or disturbance to the depth of planned grading activities, based on a review of construction plans. If the CRM determines that the project site is subject to archaeological monitoring, a qualified archaeologist (an archaeologist who satisfies the Secretary of the Interior's Professional Qualifications Standards [36 CFR 61]) shall be retained by LAWA to inspect excavation and grading activities that occur within native material. The extent and frequency of inspection shall be defined based on consultation with the archaeologist. Following initial inspection of excavation materials, the archaeologist may adjust inspection protocols as work proceeds.	archaeological resources discovered during construction of the MSC.	MSC, with continued monitoring efforts in accordance with the ATP	as identified in ATP	ATP; status updates in annual LAX MMRP progress report	
MM-PA (MSC)-1 **Monitoring Agency: LAWA**	**Conformance with LAX Master Plan Paleontological Management Treatment Plan.** Prior to the initiation of grading and construction activities, LAWA will retain a professional paleontologist, as defined in the LAX Master Plan Mitigation Monitoring and Reporting Program Paleontological Management Treatment Plan (PMTP), who will determine if the project site exhibits a high or low potential for subsurface resources. If the project site is determined to exhibit a high potential for subsurface resources, paleontological monitoring will be conducted in accordance with the procedures stipulated in the PMTP. If the project site is determined to exhibit a low potential for subsurface deposits, excavation need not be monitored as per the PMTP. In the event that paleontological resources are discovered, the procedures outlined in the PMTP for the identification of resources will be followed.	Potential loss or destruction of important paleontological resources	Prior to issuance of any excavation and grading permits for the MSC, with continued monitoring efforts in accordance with the PMTP	Once, upon retention of paleontologist and ongoing during excavation and grading activities, as identified in PMTP	Retention of paleontologist and filing of periodic monitoring reports with LAWA, as stipulated in the PMTP; status updates in annual LAX MMRP progress report	MSC North Project and future phase(s) of the MSC Program
MM-PA (MSC)-2	**Construction Personnel Briefing.** In accordance with the PMTP, construction personnel will be briefed by the consulting paleontologist in the identification of fossils or	Potential loss or destruction of important	Prior to initiation of construction, with continued	Once for each worker involved with excavation	Sign-in sheets for workers attending the construction	MSC North Project and future phase(s) of the

Table 1: MSC-Specific Mitigation Measures

Mitigation Measures		Impact Being Addressed	Timing of Implementation	Monitoring Frequency	Actions Indicating Compliance	Applicability to MSC North Project and/or MSC Program
Monitoring Agency: LAWA	fossiliferous deposits and in the correct procedures for notifying the relevant individuals should such a discovery occur.	paleontological resources	monitoring efforts in accordance with the PMTP	and grading activities	briefing; status updates in annual LAX MMRP progress report	MSC Program
Hazards and Hazardous Materials						
MM-HM (MSC)-1 **Monitoring Agency: LAWA**	**Asbestos-Containing Materials and Lead Based Paint.** Prior to construction activities, LAWA, or its contractors, will conduct an evaluation of all buildings (built prior to 1980) to be demolished to evaluate the presence of asbestos-containing materials and lead-based paint. Remediation will be implemented in accordance with the recommendation of these evaluations.	Potential for encountering hazardous materials/ during construction activities	Prior to initiation of construction	Once prior to construction	Status updates in annual LAX MMRP progress report	MSC North Project and future phase(s) of the MSC Program
MM-HM (MSC)-2 **Monitoring Agency: LAWA**	**Hazardous Materials Contingency Plan.** LAWA or its contractors will prepare a hazardous materials contingency plan addressing the potential for discovery of unidentified USTs, hazardous materials, petroleum hydrocarbons, or hazardous or solid wastes encountered during construction. The contingency plan will address UST decommissioning, field screening and materials testing methods, mitigation and contaminant management requirements, and health and safety requirements.	Potential for encountering hazardous materials/ waste during construction activities	Prior to initiation of construction	Once prior to construction	Status updates in annual LAX MMRP progress report	MSC North Project and future phase(s) of the MSC Program
MM-HM (MSC)-3 **Monitoring Agency: LAWA**	**Hazardous and Solid Waste Disposal.** Construction contractors will dispose of all hazardous or solid wastes and debris encountered or generated during construction and demolition activities in accordance with all federal, state, and local laws and regulations.	Potential for encountering hazardous materials/ waste during construction activities	During construction	On-going during construction	Status updates in annual LAX MMRP progress report	MSC North Project and future phase(s) of the MSC Program

Table 1: MSC-Specific Mitigation Measures

Mitigation Measures		Impact Being Addressed	Timing of Implementation	Monitoring Frequency	Actions Indicating Compliance	Applicability to MSC North Project and/or MSC Program
Construction Surface Transportation						
MM-ST (MSC)-1 **Monitoring Agency: LAWA**	**Restripe Manchester Avenue at Sepulveda Boulevard.** Restripe Manchester Avenue westbound approach to provide a right-turn lane and one additional left-turn lane. The resulting westbound lane configuration would be comprised of two left-turn lanes, two through lanes, and one right-turn lane.	Construction-related surface traffic at the intersection of Sepulveda Blvd and Manchester Ave	When the Future With Project PM construction peak hour volume/capacity ratio is within approximately 5% of the significant impact level (0.887 x 0.95 = 0.843).	(1) Once construction begins, this intersection will be monitored annually to determine whether the PM construction peak hour volume/capacity ratio has reached 0.843. Once this volume/capacity ratio has been reached, implementation of the intersection improvements shall begin. (2) Following implementation of intersection improvements, the monitoring frequency will be reduced to once, upon completion of subject intersection improvement	Confirmation that the subject intersection improvement has been completed	MSC North Project

Table 2: Other LAWA EIR Mitigation Measures

Mitigation Measures		Impact Being Addressed	Timing of Implementation	Monitoring Frequency	Actions Indicating Compliance	Applicability to MSC North Project and/or MSC Program
On-Airport Transportation						
MM-ST (BWP)-2 **Monitoring Agency: LAWA**	**Improve the Intersection of Center Way and World Way South.** Widen World Way South approach on the east side of the roadway to provide an additional right turn lane. The resulting configuration would be a single left turn lane, one through-left turn lane, two through lanes, and two right turn lanes.	Traffic congestion and delays at the intersection of Center Way and World Way South during airport operations	When the traffic levels reach the conditions specified in the measure	(1) Prior to implementation of intersection improvements, this measure will be monitored annually to determine whether CTA average daily traffic volumes in the peak month (August) have increased by more than 1.1 percent relative to the Future (2013) Without Project average daily traffic volumes, based on annual passenger activity reports. (2) Following implementation of intersection improvements, the monitoring frequency will be reduced to once, upon completion of subject intersection improvement	Confirmation that the subject intersection improvement has been completed	Applicable to Bradley West Project; assumed to be in place for future phase(s) of the MSC Program
MM-ST (BWP)-3	**Widen World Way Across from the TBIT.** Widen the arrivals level outer roadway across from the TBIT by changing the left-most lane that currently terminates at	Traffic congestion and delays along on-	The subject widening is currently under	Once, upon completion of subject roadway	Confirmation that the subject roadway widening	Applicable to Bradley West Project; assumed

Table 2: Other LAWA EIR Mitigation Measures

Mitigation Measures		Impact Being Addressed	Timing of Implementation	Monitoring Frequency	Actions Indicating Compliance	Applicability to MSC North Project and/or MSC Program
Monitoring Agency: LAWA	Center Way to a through/left lane and extending this lane to World Way South.	airport roadways during airport operations	construction as part of the Central Utility Plant; it is expected to be complete by December 2014.	widening	has been completed	to be in place for future phase(s) of the MSC Program
MM-ST On-Airport (OA) (SPAS)-2 **Monitoring Agency: LAWA**	**Change Departures and Arrivals Level Commercial Vehicle Curbside Operations Under Future (2025) Conditions.** LAWA will implement operational changes to commercial modes such that SPAS-related impacts to roadway links would not exceed the threshold of significance. LAWA will determine at the time of implementation which commercial mode(s) should be relocated. LAWA will consider options such as changing hotel and rental car shuttle operations from their current dual loop operation to a single loop operation on the departures and arrivals level curbsides respectively, while the employee shuttle operation could be changed from its existing single level operation on the departures level to a dual loop operation.	Significant roadway congestion at outer curb lane, west of inner curb entrance from Terminal 1.	This measure will be implemented when airport peak hour traffic at LAX, as measured once annually by traffic counts into and out of the CTA and driveway at LAX-related facilities, increases over 2009 baseline levels by no more than 50 percent, resulting in a total airport peak hour traffic volume of no more than 16,839 trips. The basis for this increment in airport-related traffic is described in the SPAS Final EIR MMRP.	Once upon implementation of the selected change in commercial mode operations.	Visual confirmation that the selected change in commercial mode operations is occurring.	Applicable to SPAS Project; assumed to be in place for future phase(s) of the MSC Program

Table 3: Applicable LAX Master Plan Commitments and Mitigation Measures

Master Plan Commitments/Mitigation Measures		Impact Being Addressed	Timing of Implementation	Monitoring Frequency	Actions Indicating Compliance	Applicability to MSC North Project and/or MSC Program
Aesthetics						
DA-1	**Provide and Maintain Airport Buffer Areas.** Along the northerly and southerly boundary areas of the airport, LAWA will provide and maintain landscaped buffer areas that will include setbacks, landscaping, screening or other appropriate view-sensitive improvements with the goals of avoiding land use conflicts, shielding lighting, enhancing privacy, and better screening views of Airport facilities from adjacent residential uses. Use of existing facilities in buffer areas may continue as required until LAWA can develop alternative facilities.	Avoidance of view degradation	Prior to approval of development plans for projects abutting residential and view sensitive uses along the northern and southern boundaries of airport by LAWA	Once, during plan review on a project-by-project basis	Provision of landscape buffer areas, to the extent feasible, in the development and landscape plans	MSC North Project and future phase(s) of the MSC Program
MM-DA-1	**Construction Fencing.** Construction fencing and pedestrian canopies shall be installed by LAWA to the degree feasible to ensure maximum screening of areas under construction along major public approach and perimeter roadways, including Sepulveda Boulevard, Century Boulevard, Westchester Parkway, Pershing Drive, and Imperial Highway west of Sepulveda Boulevard. Along Century Boulevard, Sepulveda Boulevard, and in other areas where the quality of public views are a high priority, provisions shall be made by LAWA for treatment of the fencing to reduce temporary visual impacts.	Avoidance of temporary view degradation	Prior to issuance of grading or building permits for each project along a major public approach or perimeter roadway	Once, prior to issuance of grading or building permits for each project along a major public approach or perimeter roadway	Installation of construction fencing and pedestrian canopies to the extent feasible.	MSC North Project and future phase(s) of the MSC Program
Air Quality, Greenhouse Gases, Human Health [2]						
MM-AQ-1 **Monitoring Agency: LAWA**	**LAX-AQ-1. General Air Quality Control Measures.** This measure describes a variety of specific actions to reduce air quality impacts associated with projects at LAX, and applies to all projects. Some components of LAX-AQ-1 are not readily quantifiable, but would be implemented as part of LAX projects. Specific measures are outlined below:					

[2] Project-specific adaptations of other applicable Air Quality LAX Master Plan Commitments and Mitigation Measures can be found in Table 1: MSC-Specific Mitigation Measures.

Table 3: Applicable LAX Master Plan Commitments and Mitigation Measures

Master Plan Commitments/Mitigation Measures		Impact Being Addressed	Timing of Implementation	Monitoring Frequency	Actions Indicating Compliance	Applicability to MSC North Project and/or MSC Program
1a	Watering (per SCAQMD Rule 403 and CalEEMod default) – twice daily.	Air pollutant emissions associated with the construction (Fugitive Dust) of the proposed Project	During construction of the proposed Project	Periodically during construction	Inclusion of measure in construction contracts; status updates in annual LAX MMRP progress report.	MSC North Project and future phase(s) of the MSC Program
1b	Ultra-low sulfur diesel (ULSD) fuel will be used in construction equipment.	Air pollutant emissions associated with construction (On- and Off-Road Mobile sources) of the proposed Project	During construction of the proposed Project	Periodically during construction	Inclusion of measure in construction contracts; status updates in annual LAX MMRP progress report.	MSC North Project and future phase(s) of the MSC Program
1c	Post a publicly visible sign with the telephone number and person to contact regarding dust complaints; this person shall respond and take corrective action within 24 hours.	Air pollutant emissions associated with construction (Fugitive Dust) of the proposed Project	During construction of the proposed Project	Prior to commencing construction	Inclusion of measure in construction contracts; status updates in annual LAX MMRP progress report.	MSC North Project and future phase(s) of the MSC Program
1d	Prior to final occupancy, the applicant demonstrates that all ground surfaces are covered or treated sufficiently to minimize fugitive dust emissions.	Air pollutant emissions associated with construction (Fugitive Dust) of the proposed Project	Prior to final occupancy	Once prior to occupancy	Inclusion of measure in construction contracts; status updates in annual LAX MMRP progress report.	MSC North Project and future phase(s) of the MSC Program

Table 3: Applicable LAX Master Plan Commitments and Mitigation Measures

Master Plan Commitments/Mitigation Measures		Impact Being Addressed	Timing of Implementation	Monitoring Frequency	Actions Indicating Compliance	Applicability to MSC North Project and/or MSC Program
1e	All roadways, driveways, sidewalks, etc., being installed as part of the project should be completed as soon as possible; in addition, building pads should be laid as soon as possible after grading.	Air pollutant emissions associated with construction (Fugitive Dust) of the proposed Project	During construction of the proposed Project	Periodically during construction	Inclusion of measure in construction contracts; status updates in annual LAX MMRP progress report.	MSC North Project and future phase(s) of the MSC Program
1f	Prohibit idling or queuing of diesel-fueled vehicles and equipment in excess of five minutes. This requirement will be included in specifications for any LAX projects requiring on-site construction.	Air pollutant emissions associated with construction (On- and Off-Road Mobile sources) of the proposed Project	During construction of the proposed Project	Periodically during construction	Inclusion of measure in construction contracts; status updates in annual LAX MMRP progress report.	MSC North Project and future phase(s) of the MSC Program
1g	Require that all construction equipment working on-site is properly maintained (including engine tuning) at all times in accordance with manufacturers' specifications and schedules.	Air pollutant emissions associated with construction (Mobile and Stationary sources) of the proposed Project	Prior to issuance of grading or demolition permit of the proposed Project and during construction of the proposed Project	Prior to commencing construction and periodically during construction	Inclusion of measure in construction contracts; status updates in annual LAX MMRP progress report.	MSC North Project and future phase(s) of the MSC Program
MM-AQ-2 **Monitoring Agency: LAWA**	**LAX-AQ-2. Construction-Related Control Measures**. This measure describes numerous specific actions to reduce fugitive dust emissions and exhaust emissions from on-road and off-road mobile and stationary sources used in construction. Some components of LAX-AQ-2 are not readily quantifiable, but would be implemented as part of LAX projects. Specific measures are outlined below:					
2a	All diesel-fueled equipment used for construction will be outfitted with the best available emission control devices, where technologically feasible, primarily to reduce emissions of diesel particulate matter (PM), including	Air pollutant emissions associated with the	During construction of the proposed Project	Periodically during construction	Inclusion of measure in construction contracts; status	MSC North Project and future phase(s) of the MSC Program

Table 3: Applicable LAX Master Plan Commitments and Mitigation Measures

Master Plan Commitments/Mitigation Measures		Impact Being Addressed	Timing of Implementation	Monitoring Frequency	Actions Indicating Compliance	Applicability to MSC North Project and/or MSC Program
	fine PM ($PM_{2.5}$), and secondarily, to reduce emissions of NO_x. This requirement shall apply to diesel-fueled off-road equipment (such as construction machinery), diesel-fueled on-road vehicles (such as trucks), and stationary diesel-fueled engines (such as electric generators). (It is unlikely that this measure will apply to equipment with Tier 4 engines.) The emission control devices utilized in construction equipment shall be verified or certified by California Air Resources Board or US Environmental Protection Agency for use in on-road or off-road vehicles or engines. For multi-year construction projects, a reassessment shall be conducted annually to determine what constitutes a best available emissions control device.	construction (Mobile and Stationary sources) of the proposed Project			updates in annual LAX MMRP progress report.	
2b	Watering (per SCAQMD Rule 403 and CalEEMod default) – three times daily.	Air pollutant emissions associated with the construction (Fugitive Dust) of the proposed Project	During construction of the proposed Project	Periodically during construction	Inclusion of measure in construction contracts; status updates in annual LAX MMRP progress report.	MSC North Project and future phase(s) of the MSC Program
2c	Pave all construction access roads at least 100 feet onto the site from the main road.	Air pollutant emissions associated with the construction (Fugitive Dust) of the proposed Project	Prior to issuance of grading or demolition permit of the proposed Project	Prior to commencing construction/ grading	Inclusion of measure in construction contracts; status updates in annual LAX MMRP progress report.	MSC North Project and future phase(s) of the MSC Program
2d	To the extent feasible, have construction employees' work/commute during off-peak hours.	Air pollutant emissions associated with the construction	During construction of the proposed Project	Periodically during construction	Inclusion of measure in construction contracts; status updates in annual	MSC North Project and future phase(s) of the MSC Program

Table 3: Applicable LAX Master Plan Commitments and Mitigation Measures

Master Plan Commitments/Mitigation Measures		Impact Being Addressed	Timing of Implementation	Monitoring Frequency	Actions Indicating Compliance	Applicability to MSC North Project and/or MSC Program
		(On-Road Mobile sources) of the proposed Project			LAX MMRP progress report.	
2e	Make available on-site lunch trucks during construction to minimize off-site worker vehicle trips.	Air pollutant emissions associated with the construction (On-Road Mobile sources) of the proposed Project	During construction of the proposed Project	Periodically during construction	Inclusion of measure in construction contracts; status updates in annual LAX MMRP progress report.	MSC North Project and future phase(s) of the MSC Program
2f	Utilize on-site rock crushing facility, when feasible, during construction to reuse rock/concrete and minimize off-site truck haul trips	Air pollutant emissions associated with the construction (On-Road Mobile sources) of the proposed Project	During construction of the proposed Project	Periodically during construction	Inclusion of measure in construction contracts; status updates in annual LAX MMRP progress report.	MSC North Project and future phase(s) of the MSC Program
2g	Specify combination of electricity from power poles and portable diesel- or gasoline-fueled generators using "clean burning diesel" fuel and exhaust emission controls.	Air pollutant emissions associated with the construction (stationary point source controls) of the proposed Project	During construction of the proposed Project	Periodically during construction	Inclusion of measure in construction contracts; status updates in annual LAX MMRP progress report.	MSC North Project and future phase(s) of the MSC Program
2h	Suspend use of all construction equipment during a second-stage smog alert in the immediate vicinity of LAX.	Air pollutant emissions associated with the	During construction and grading of the proposed Project	During any second stage smog alerts occurring during	Inclusion of measure in construction contracts; status	MSC North Project and future phase(s) of the MSC Program

Table 3: Applicable LAX Master Plan Commitments and Mitigation Measures

Master Plan Commitments/Mitigation Measures		Impact Being Addressed	Timing of Implementation	Monitoring Frequency	Actions Indicating Compliance	Applicability to MSC North Project and/or MSC Program
		construction (mobile and stationary sources) of the proposed Project		construction	updates in annual LAX MMRP progress report.	
2i	Utilize construction equipment having the minimum practical engine size (i.e., lowest appropriate horsepower rating for intended job).	Air pollutant emissions associated with the construction (mobile and stationary sources) of the proposed Project	During construction and grading of the proposed Project	Periodically during construction	Inclusion of measure in construction contracts; status updates in annual LAX MMRP progress report.	MSC North Project and future phase(s) of the MSC Program
2j	Prohibit tampering with construction equipment to increase horsepower or to defeat emission control devices.	Air pollutant emissions associated with the construction (mobile and stationary sources) of the proposed Project	Prior and during construction/ grading of the proposed Project	Periodically during construction	Inclusion of measure in construction contracts; status updates in annual LAX MMRP progress report.	MSC North Project and future phase(s) of the MSC Program
2k	The contractor or builder shall designate a person or persons to ensure the implementation of all components of the construction-related measure through direct inspections, record reviews, and investigations of complaints.	Air pollutant emissions associated with the construction of the proposed Project	Prior to issuance of grading or demolition permit of the proposed Project	Once prior to issuance of grading or demolition permit of the proposed Project	Inclusion of measure in construction contracts; status updates in annual LAX MMRP progress report.	MSC North Project and future phase(s) of the MSC Program
2l	LAWA will locate rock-crushing operations and construction material stockpiles for all LAX-related	Air pollutant emissions	Prior to issuance of grading or	Once prior to issuance of	Inclusion of measure in	MSC North Project and future

Table 3: Applicable LAX Master Plan Commitments and Mitigation Measures

Master Plan Commitments/Mitigation Measures		Impact Being Addressed	Timing of Implementation	Monitoring Frequency	Actions Indicating Compliance	Applicability to MSC North Project and/or MSC Program
	construction in areas away from LAX-adjacent residents, to the extent possible, to reduce impacts from emissions of fugitive dust.	associated with the construction (Fugitive Dust) of the proposed Project	demolition permit of the proposed Project	grading or demolition permit of the proposed Project	construction contracts; status updates in annual LAX MMRP progress report.	phase(s) of the MSC Program
2m	LAWA will ensure that there is available and sufficient infrastructure on-site, where not operationally or technically infeasible, to provide fuel to alternative-fueled vehicles to meet all requests for alternative fuels from contractors and other users of LAX. This will apply to construction equipment and to operations-related vehicles on-site. This provision will apply in conjunction with construction or modification of passenger gates related to implementation of the LAX Master Plan relative to the provision of appropriate infrastructure for electric GSE.	Air pollutant emissions associated with construction (Mobile Sources) of the proposed Project	Prior and during construction/ grading of the proposed Project	Once prior to construction and periodically during construction	Inclusion of measure in construction contracts; status updates in annual LAX MMRP progress report.	MSC North Project and future phase(s) of the MSC Program
MM-AQ-3 **Monitoring Agency: LAWA**	**LAX-AQ-3. Transportation-Related Control Measures**. This measure applies to mass transit, surface traffic, and on-site parking facilities. The principal feature of this measure is to replicate and expand the current LAX FlyAway service to other communities within regions of Los Angeles County. This initiative also includes a public outreach program to encourage the use of both the existing and new facilities. The remaining, secondary transportation-related air quality control measures may also be implemented. Specific measures are outlined below:					
3a	Construct on-site or off-site bus turnouts, passenger benches, or shelters to encourage transit system use.	Surface traffic-related air pollutant emissions	During construction of roadway modifications as part of the MSC Program	Once, upon completion of construction	Visual confirmation of bus turnouts, benches, and/or shelters; status updates in annual LAX MMRP progress report	Future phase(s) of the MSC Program
3b	Construct on-site or off-site pedestrian improvements, including showers for pedestrian employees to encourage walking/bicycling to work by LAX employees.	Traffic congestion and delays; surface	During construction of roadway modifications as	Once, upon completion of construction	Visual confirmation of pedestrian	Future phase(s) of the MSC Program

Table 3: Applicable LAX Master Plan Commitments and Mitigation Measures

Master Plan Commitments/Mitigation Measures		Impact Being Addressed	Timing of Implementation	Monitoring Frequency	Actions Indicating Compliance	Applicability to MSC North Project and/or MSC Program
		traffic-related air pollutant emissions	part of the MSC Program		improvements; status updates in annual LAX MMRP progress report	
3c	Link Intelligent Transportation Systems (ITS) with off-airport parking facilities with ability to divert/direct trips to these facilities to reduce traffic/parking congestion and the associated air emissions in the immediate vicinity of the airport.	Traffic congestion and delays; surface traffic-related air pollutant emissions	During construction of Master Plan-related parking improvements	Ongoing	Completion of implementation plan; status updates in annual LAX MMRP progress report	Future phase(s) of the MSC Program
3d	Expand ITS and Adaptive Traffic Control Systems (ATCS), concentrating on I-405 and I-105 corridors, extending into South Bay and Westside surface street corridors to reduce traffic/parking congestion and associated air emissions in the immediate vicinity of the airport.	Traffic congestion and delays; surface traffic-related air pollutant emissions	During construction of Master Plan related parking and traffic improvements	Ongoing	Completion of implementation plan; status updates in annual LAX MMRP progress report	Future phase(s) of the MSC Program
3e	Link LAX traffic management system with airport cargo facilities, with ability to re-route cargo trips to/from these facilities to reduce traffic/parking congestion and associated air emissions in the immediate vicinity of the airport.	Traffic congestion and delays; surface traffic-related air pollutant emissions	During construction of Master Plan related parking and traffic improvements	Ongoing	Completion of implementation plan; status updates in annual LAX MMRP progress report	Future phase(s) of the MSC Program
3f	Develop a program to minimize use of conventional-fueled fleet vehicles during smog alerts to reduce air emissions from vehicles at the airport.	Surface traffic-related air pollutant emissions	Ongoing	During any second stage smog alerts	Completion of implementation plan; status updates in annual LAX MMRP progress report	Future phase(s) of the MSC Program
3g	Provide free parking and preferential parking locations for ultra-low emission vehicles/super low emission vehicles/zero emission vehicles (ULEV/SULEV/ZEV) in all (including employee) LAX lots; provide free charging stations for ZEV; include public outreach to reduce air	Surface traffic-related air pollutant emissions	Ongoing	Ongoing	Status updates in annual LAX MMRP progress report	Future phase(s) of the MSC Program

Table 3: Applicable LAX Master Plan Commitments and Mitigation Measures

Master Plan Commitments/Mitigation Measures		Impact Being Addressed	Timing of Implementation	Monitoring Frequency	Actions Indicating Compliance	Applicability to MSC North Project and/or MSC Program
	emissions from automobiles accessing airport parking.					
3h	Develop measures to reduce air emissions of vehicles in line to exit parking lots such as pay-on-foot (before getting into car) to minimizing idle time at parking check out, including public outreach.	Surface traffic-related air pollutant emissions	Ongoing	Ongoing	Status updates in annual LAX MMRP progress report	Future phase(s) of the MSC Program
3i	Implement on-site circulation plan in parking lots to reduce time and associated air emissions from vehicles circulating through lots looking for parking.	Surface traffic-related air pollutant emissions	During construction of Master Plan related parking improvements	Once prior to implementation	Completion of implementation plan; status updates in annual LAX MMRP progress report	Future phase(s) of the MSC Program
3j	Encourage video conferencing capabilities at various locations on the airport to reduce off-site local business travel and associated VMT and air emissions in the vicinity of the airport.	Surface traffic-related air pollutant emissions	Ongoing	Ongoing	Status updates in annual LAX MMRP progress report	Future phase(s) of the MSC Program
3k	Expand LAWA's rideshare program to include all airport tenants.	Surface traffic-related air pollutant emissions	Ongoing	Ongoing	Status updates in annual LAX MMRP progress report	Future phase(s) of the MSC Program
3l	Promote commercial vehicles/trucks/vans using terminal areas (LAX and regional intermodal) to install SULEV/ZEV engines to reduce vehicle air emissions.	Surface traffic-related air pollutant emissions	Ongoing	Ongoing	Status updates in annual LAX MMRP progress report	Future phase(s) of the MSC Program
3m	Promote "best-engine" technology for rental cars using on-airport rent-a-car facilities to reduce vehicle air emissions.	Surface traffic-related air pollutant emissions	Ongoing	Ongoing	Status updates in annual LAX MMRP progress report	Future phase(s) of the MSC Program
3n	Consolidate non-rental car shuttles using SULEV/ZEV engines to reduce vehicle air emissions.	Surface traffic-related air pollutant emissions	Ongoing	Ongoing	Status updates in annual LAX MMRP progress report	Future phase(s) of the MSC Program

Table 3: Applicable LAX Master Plan Commitments and Mitigation Measures

Master Plan Commitments/Mitigation Measures		Impact Being Addressed	Timing of Implementation	Monitoring Frequency	Actions Indicating Compliance	Applicability to MSC North Project and/or MSC Program
3o	Cover, if feasible, any parking structures that receive direct sunlight, to reduce volatile emissions from vehicle gasoline tanks; and install solar panels on these roofs where feasible to supply electricity or hot water to reduce power production demand and associated air emissions at utility plants.	Surface traffic-related air pollutant emissions	During construction	Once, when construction is complete	Status updates in annual LAX MMRP progress report	Future phase(s) of the MSC Program
3p	LAWA will develop an information technology system that LAWA employees and the general public can utilize with consumer electronics that will provide real-time information regarding local and regional traffic conditions for travel to and from LAX.	Surface traffic-related air pollutant emissions	Ongoing	Once, when the program is operational; then periodically during operations.	Completion of implementation plan; status updates in annual LAX MMRP progress report	Future phase(s) of the MSC Program
3q	LAWA will incorporate quick entry and exit parking systems in the project level design of future parking lots/structures associated with the SPAS project.	Surface traffic-related air pollutant emissions	During design of any parking/lots structures associated with SPAS	Once, prior to construction	Confirmation of parking system construction; status updates in annual LAX MMRP progress report	Future phase(s) of the MSC Program
3r	LAWA will include advanced signage in the design of future parking structures that could advise airport users of available parking spaces within the structure.	Surface traffic-related air pollutant emissions	During design of any parking/lots structures	Once, prior to construction	Visual confirmation of signage; status updates in annual LAX MMRP progress report	Future phase(s) of the MSC Program
MM-AQ-4 **Monitoring Agency: LAWA**	**LAX-AQ-4. Operations-Related Control Measures**. The principal feature of this measure is the conversion of LAX GSE to low and ultra-low emission technology (e.g., electric, fuel cell, and other future low-emission technologies). Specific measures are identified below:					
4a	LAX GSE will be converted to low- and ultra-low emission technology (e.g., electric, fuel cell, and other future low-emission technologies). Both LAWA- and tenant-owned equipment will be included in this	Operations-related air pollutant emissions	Work with assigned GSE coordinator regarding implementation	Ongoing	Status updates in annual LAX MMRP progress report	MSC North Project and future phase(s) of the MSC Program

Table 3: Applicable LAX Master Plan Commitments and Mitigation Measures

Master Plan Commitments/Mitigation Measures		Impact Being Addressed	Timing of Implementation	Monitoring Frequency	Actions Indicating Compliance	Applicability to MSC North Project and/or MSC Program
	conversion program, which will be implemented in phases. LAWA will assign a GSE coordinator whose responsibility it will be to ensure the successful conversion of GSE in a timely manner. This coordinator will have adequate authority to negotiate on behalf of the City and have sufficient technical support to evaluate technical issues that arise during the implementation of this measure.					
4b	All passenger gates newly constructed at LAX shall be equipped with and able to provide grid electricity to parked aircraft (for lighting and ventilation) from and after the date of initial operation. LAWA will ensure that all aircraft (unless exempt) use the gate-provided grid electricity in lieu of electricity provided by operation of an auxiliary or ground power unit. This provision applies in conjunction with construction or modification of passenger gates.	Operations-related air pollutant emissions	During construction of the MSC North Project	Once upon construction completion; ongoing inclusion of measure in construction contracts~~;~~	Status updates in annual LAX MMRP progress report	MSC North Project and future phase(s) of the MSC Program
4e	LAWA will require the conversion of sweepers to alternative fuels or electric power for ongoing airfield and roadway maintenance. In the 2006 GSE inventory, two of ten sweepers were electric-powered and one was either CNG or LPG fueled. HEPA filters will be installed on airport sweepers where the use of HEPA filters is technologically and financially feasible and does not pose a safety hazard to airport operations.	General air pollutant emissions	Work with assigned GSE coordinator regarding implementation	Ongoing	Status updates in annual LAX MMRP progress report	MSC North Project and future phase(s) of the MSC Program
4f	LAWA will ensure that there is available and sufficient infrastructure on-site, where not operationally or technically infeasible, to provide fuel to alternative-fueled vehicles to meet all requests for alternative fuels from contractors and other users of LAX. This will apply to construction equipment and to operations-related vehicles on-site. This provision will apply in conjunction with construction or modification of passenger gates related to implementation of the LAX Master Plan relative to the provision of appropriate infrastructure for electric GSE.	Air pollutant emissions related to operational vehicles	Work with assigned GSE coordinator regarding implementation	Ongoing	Status updates in annual LAX MMRP progress report	MSC North Project and future phase(s) of the MSC Program

Table 3: Applicable LAX Master Plan Commitments and Mitigation Measures

Master Plan Commitments/Mitigation Measures		Impact Being Addressed	Timing of Implementation	Monitoring Frequency	Actions Indicating Compliance	Applicability to MSC North Project and/or MSC Program
Cultural Resources [3]						
MM-HA-5 **Monitoring Agency: LAWA**	**Archaeological Monitoring.** Any grading and excavation activities within LAX proper or the acquisition areas that have not been identified as containing redeposited fill material or having been previously disturbed shall be monitored by a qualified archaeologist. The archaeologist shall be retained by LAWA and shall meet the Secretary of the Interior's Professional Qualifications Standards. The project archaeologist shall be empowered to halt construction activities in the immediate area if potentially significant resources are identified. Test excavations may be necessary to reveal whether such findings are significant or insignificant. In the event of notification by the project archaeologist that a potentially significant or unique archaeological/cultural find has been unearthed, LAWA shall be notified and grading operations shall cease immediately in the affected area until the geographic extent and scientific value of the resource can be reasonably verified. Upon discovery of an archaeological resource or Native American remains, LAWA shall retain a Native American monitor from a list of suitable candidates obtained from the Native American Heritage Commission.	Loss or destruction of important archaeological resources	Continued monitoring efforts in accordance with the ATP	On-going during excavation and grading activities, as identified in ATP	Retention of archaeologist and filing of periodic monitoring reports with LAWA, as stipulated in the ATP	MSC North Project and future phase(s) of the MSC Program
MM-HA-6 **Monitoring Agency: LAWA**	**Excavation and Recovery.** Any excavation and recovery of identified resources (features) shall be performed using standard archaeological techniques and the requirements stipulated in the Archaeological Treatment Plan (ATP). Any excavations, testing, and/or recovery of resources shall be conducted by a qualified archaeologist selected by LAWA.	Loss or destruction of important archaeological resources	Upon discovery of potential archaeological resources by qualified archaeologist	On-going during excavation and grading activities, as identified in ATP	Filing of appropriate reports (i.e. excavation/recovery report) with LAWA by project archaeologist pursuant to ATP. If no resources are found, a	MSC North Project and future phase(s) of the MSC Program

[3] Project-specific adaptations of other applicable Cultural Resources LAX Master Plan Commitments and Mitigation Measures can be found in Table 1: MSC-Specific Mitigation Measures.

Table 3: Applicable LAX Master Plan Commitments and Mitigation Measures

Master Plan Commitments/Mitigation Measures		Impact Being Addressed	Timing of Implementation	Monitoring Frequency	Actions Indicating Compliance	Applicability to MSC North Project and/or MSC Program
					report indicating as much should be filed	
MM-HA-7 **Monitoring Agency: LAWA**	**Administration.** Where known resources are present, all grading and construction plans shall be clearly imprinted with all of the archaeological/cultural mitigation measures. All site workers shall be informed in writing by the on-site archaeologist of the restrictions regarding disturbance and removal as well as procedures to follow should a resource deposit be detected.	Loss or destruction of important archaeological resources	Prior to approval of excavation and grading plans (for MM/MPC imprint component); Prior to excavation and grading activities pursuant to ATP (for on-site training component)	Once, upon approval of excavation and grading plans (for MM/MPC imprint component); Prior to initiation of excavation and grading activities, and with construction staff change-outs, pursuant to ATP (for on-site training component)	Sign off of plans by project archaeologist (for MM/MPC imprint component); filing of sign-in sheet with LAWA by project archaeologist, as specified by ATP (for on-site training component)	MSC North Project and future phase(s) of the MSC Program
MM-HA-8 **Monitoring Agency: LAWA**	**Archaeological/Cultural Monitor Report.** Upon completion of grading and excavation activities in the vicinity of known archaeological resources, the Archaeological/Cultural monitor shall prepare a written report. The report shall include the results of the fieldwork and all appropriate laboratory and analytical studies that were performed in conjunction with the excavation. The report shall be submitted in draft form to the FAA, LAWA, and City of Los Angeles-Cultural Affairs Department. City representatives shall have 30 days to comment on the report. All comments and concerns shall be addressed in a final report issued within 30 days of receipt of city comments.	Loss or destruction of important archaeological resources	Upon completion of grading & excavation activities per ATP	Once, upon completion of excavation and grading activities on a project by project basis, pursuant to ATP	Receipt of final report on a project by project basis by LAWA	MSC North Project and future phase(s) of the MSC Program
MM-HA-9 **Monitoring Agency: LAWA**	**Artifact Curation.** All artifacts, notes, photographs, and other project-related materials recovered during the monitoring program shall be curated at a facility meeting federal and state requirements.	Loss or destruction of important archaeological resources	Upon completion of each project during which resources were recovered, as stipulated in ATP	Once, at completion of excavation and grading activities on a project by	Acceptance letter of curated artifacts from selected repository, or offer	MSC North Project and future phase(s) of the MSC Program

Table 3: Applicable LAX Master Plan Commitments and Mitigation Measures

Master Plan Commitments/Mitigation Measures		Impact Being Addressed	Timing of Implementation	Monitoring Frequency	Actions Indicating Compliance	Applicability to MSC North Project and/or MSC Program
				project basis, as stipulated in ATP	letter from LAWA to repository	
MM-HA-10 **Monitoring Agency: LAWA**	**Archaeological Notification.** If human remains are found, all grading and excavation activities in the vicinity shall cease immediately and the appropriate LAWA authority shall be notified: compliance with those procedures outlined in Section 7050.5(b) and (c) of the State Health and Safety Code, Section 5097.94(k) and (i) and Section 5097.98(a) and (b) of the Public Resources Code shall be required. In addition, those steps outlined in Section 15064.5(e) of the CEQA Guidelines shall be implemented.	Loss or destruction of important archaeological resources	During excavation and grading activities	When any bone material is encountered and project archaeologist identifies it as human remains	Compliance of those steps outlined in Section 15064.5(e) of the CEQA Guidelines and sign off by project archaeologist and, if applicable, selected Native American monitor	MSC North Project and future phase(s) of the MSC Program
MM-PA-2 **Monitoring Agency: LAWA**	**Paleontological Authorization.** The paleontologist shall be authorized by LAWA to halt, temporarily divert, or redirect grading in the area of an exposed fossil to facilitate evaluation and, if necessary, salvage. No known or discovered fossils shall be destroyed without the written consent of the project paleontologist.	Loss or destruction of important paleontological resources	Continued monitoring in accordance with the PMTP	On-going during excavation and grading activities, as identified in the PMTP	Filing of periodic monitoring reports with LAWA, as stipulated in the PMTP	MSC North Project and future phase(s) of the MSC Program
MM-PA-3 **Monitoring Agency: LAWA**	**Paleontological Monitoring Specifications.** Specifications for paleontological monitoring shall be included in construction contracts for all LAX projects involving excavation activities deeper than six feet.	Loss or destruction of important paleontological resources	Prior to finalization and approval of construction contracts for projects involving excavation deeper than six feet	Once, upon approval of each construction contract on a project-by-project basis	Review and approval of relevant construction contracts by project paleontologist and the filing of such contracts with LAWA	MSC North Project and future phase(s) of the MSC Program
MM-PA-4 **Monitoring Agency: LAWA**	**Paleontological Resources Collection.** Because some fossils are small, it will be necessary to collect sediment samples of promising horizons discovered during grading or excavation monitoring for processing through fine mesh screens. Once the samples have	Loss or destruction of important paleontological resources	During excavation and grading activities, as identified in the PMTP	On-going during excavation and grading activities, as identified in the PMTP	Filing of collection/ recovery reports with LAWA by project	MSC North Project and future phase(s) of the MSC Program

Table 3: Applicable LAX Master Plan Commitments and Mitigation Measures

Master Plan Commitments/Mitigation Measures		Impact Being Addressed	Timing of Implementation	Monitoring Frequency	Actions Indicating Compliance	Applicability to MSC North Project and/or MSC Program
	been screened, they shall be examined microscopically for small fossils.				paleontologist, as stipulated in the PMTP	
MM-PA-5 **Monitoring Agency: LAWA**	**Fossil Preparation.** Fossils shall be prepared to the point of identification and catalogued before they are donated to their final repository.	Loss or destruction of important paleontological resources	Upon discovery of significant fossils by project paleontologist	During grading and excavation activities as identified in the PMTP	Filing of appropriate reports by paleontologist with LAWA, as stipulated in the PMTP	MSC North Project and future phase(s) of the MSC Program
MM-PA-6 **Monitoring Agency: LAWA**	**Fossil Donation.** All fossils collected shall be donated to a public, nonprofit institution with a research interest in the materials, such as the Los Angeles County Museum of Natural History.	Loss or destruction of important paleontological resources	Upon completion of each project during which fossils were discovered, as outlined in the PMTP	Once, upon completion of excavation activities on a project-by-project basis	Acceptance letter of fossils from accepting repository, or offer letter from LAWA to repository	MSC North Project and future phase(s) of the MSC Program
MM-PA-7 **Monitoring Agency: LAWA**	**Paleontological Reporting.** A report detailing the results of these efforts, listing the fossils collected, and naming the repository shall be submitted to the lead agency at the completion of the project.	Loss or destruction of important paleontological resources	Upon completion of excavation activities, as outlined in the PMTP	Once, upon completion of excavation activities on a project-by-project basis	Receipt of paleontological report by LAWA. If no resources are found, a report indicating as much should be filed	MSC North Project and future phase(s) of the MSC Program
Hazards and Hazardous Materials [4]						
MM-HM-2	**Handling of Hazardous Materials Encountered During Construction.** Prior to the initiation of	Potential for encountering	Prior to initiation of construction	Once prior to construction	Preparation of Hazardous	MSC North Project and future

[4] Project-specific adaptations of other applicable Hazards and Hazardous Materials LAX Master Plan Commitments and Mitigation Measures can be found in Table 1: MSC-Specific Mitigation Measures.

Table 3: Applicable LAX Master Plan Commitments and Mitigation Measures

Master Plan Commitments/Mitigation Measures		Impact Being Addressed	Timing of Implementation	Monitoring Frequency	Actions Indicating Compliance	Applicability to MSC North Project and/or MSC Program
Monitoring Agency: LAWA	construction, LAWA will develop a program to coordinate all efforts associated with the handling of contaminated materials encountered during construction. The intent of this program will be to ensure that all contaminated soils and/or groundwater encountered during construction are handled in accordance with all applicable regulations.	hazardous materials/ waste during construction activities			Materials/ Wastes Management Plan	phase(s) of the MSC Program
Public Services – Fire Protection						
FP-1 **Monitoring Agency: LAWA**	**LAFD Design Recommendations.** During the design phase prior to initiating construction of a Master Plan component, LAWA will work with LAFD to prepare plans that contain the appropriate design features applicable to that component, such as those recommended by LAFD, and listed below: • *Emergency Access*. During Plot Plan development and the construction phase, LAWA will coordinate with LAFD to ensure that access points for off-airport LAFD personnel and apparatus are maintained and strategically located to support timely access. In addition, at least two different ingress/egress roads for each area, which will accommodate major fire apparatus and will provide for major evacuation during emergency situations, will be provided. • *Fire Flow Requirements*. Proposed Master Plan development will include improvements, as needed, to ensure that adequate fire flow is provided to all new facilities. The fire flow requirements for individual Master Plan improvements will be determined in conjunction with LAFD and will meet, or exceed, fire flow requirements in effect at the time. • *Fire Hydrants*. Adequate off-site public and onsite private fire hydrants may be required, based on determination by the LAFD upon review of proposed plot plans. • *Street Dimensions*. New development will conform	Avoidance of compromised fire prevention and protection	Prior to issuance of building permits or B-permits	Once, upon sign-off of plans for each project	LAFD sign-off on plans prior to issuance of building permits or prior to issuance of B-permit for street improvements	MSC North Project and future phase(s) of the MSC Program

Table 3: Applicable LAX Master Plan Commitments and Mitigation Measures

Master Plan Commitments/Mitigation Measures		Impact Being Addressed	Timing of Implementation	Monitoring Frequency	Actions Indicating Compliance	Applicability to MSC North Project and/or MSC Program
	to the standard street dimensions shown on the applicable City of Los Angeles Department of Public Works Standard Plan. • *Road Turns*. Standard cut-corners will be used on all proposed road turns. • *Private Roadway Access*. Private roadways that will be used for general access and fire lanes shall have at least 20 feet of vertical access. Private roadways will be built to City of Los Angeles standards to the satisfaction of the City Engineer and the LAFD. • *Dead-End Streets*. Where fire lanes or access roads are provided, dead-end streets will terminate in a cul-de-sac or other approved turning area. No fire lane shall be greater than 700 feet in length unless secondary access is provided. • *Fire Lanes*. All new fire lanes will be at least 20 feet wide. Where a fire lane must accommodate a LAFD aerial ladder apparatus or where a fire hydrant is installed, the fire lane will be at least 28 feet wide. • *Building Setbacks*. New buildings will be constructed no greater than 150 feet from the edge of the roadways of improved streets, access roads, or designated fire lanes. • *Building Heights*. New buildings exceeding 28 feet in height may be required to provide additional LAFD access. • *Construction/Demolition Access*. During demolition and construction activities, emergency access will remain unobstructed. • *Aircraft Fire Protection Systems*. Effective fire protection systems will be provided to protect the areas beneath the wings and fuselage portions of large aircraft. This may be accomplished by incorporating foam-water deluge sprinkler systems with foam-producing and oscillating nozzle (per NFPA 409, aircraft hangars for design criteria).					

Table 3: Applicable LAX Master Plan Commitments and Mitigation Measures

Master Plan Commitments/Mitigation Measures		Impact Being Addressed	Timing of Implementation	Monitoring Frequency	Actions Indicating Compliance	Applicability to MSC North Project and/or MSC Program
PS-1 **Monitoring Agency: LAWA**	**Fire and Police Facility Relocation Plan.** Prior to any demolition, construction, or circulation changes that would affect LAFD Fire Stations 5, 51, 80, and 95, or on-airport police facilities, a Relocation Plan will be developed by LAWA through a cooperative process involving LAFD, LAWA Police Division (LAWAPD), the LAPD LAX Detail, and other airport staff. The performance standards for the plan will ensure maintenance of required response times, response distances, fire flows, and a transition to new facilities such that fire and law enforcement services at LAX will not be significantly degraded. The plan will also address future facility needs, including details regarding space requirement, siting, and design.	Avoidance of compromised fire prevention and protection	Prior to any construction activities affecting on-airport fire and police facilities	Once, upon completion of Fire and Police Facility Relocation Plan; as necessary during relocation process	Completion of Fire and Police Facility Relocation Plan	MSC North Project and future phase(s) of the MSC Program
PS-2 **Monitoring Agency: LAWA**	**Fire and Police Facility Space and Siting Requirements.** During the early design phase for implementation of the Master Plan elements affecting on-airport fire and police facilities, LAWA and/or its contractors will consult with LAFD, LAWAPD, LAPD, and other agencies as appropriate, to evaluate and refine as necessary, program requirements for fire and police facilities. This coordination will ensure that final plans adequately support future facility needs, including space requirements, siting, and design.	Avoidance of compromised fire prevention and protection	Prior to any construction activities affecting on-airport police and fire facilities	On-going during early design phase	Approval of facility requirements by involved agencies	MSC North Project and future phase(s) of the MSC Program
C-1 **Monitoring Agency: LAWA**	**Establishment of a Ground Transportation/Construction Coordination Office**. Establish this office for the life of the construction projects to coordinate deliveries, monitor traffic conditions, advise motorists and those making deliveries about detours and congested areas, and monitor and enforce delivery times and routes. LAWA will periodically analyze traffic conditions on designated routes during construction to see whether there is a need to improve conditions through signage and other means. This office may undertake a variety of duties, including but not limited to: • Inform motorists about detours and congestion by use of static signs, changeable message signs,	Traffic congestion and delays as they relate to construction activities	Coordination with the LAWA Ground Transportation/ Construction Coordination Office prior to issuance of any permits for the project.	On-going coordination by the LAWA Ground Transportation/ Construction Coordination Office in conjunction with LAWA Construction and Logistics Management (CALM) team	LAWA Ground Transportation/ Construction Coordination Office prior to approval; status updates in annual LAX MMRP progress report.	MSC North Project and future phase(s) of the MSC Program

Table 3: Applicable LAX Master Plan Commitments and Mitigation Measures

Master Plan Commitments/Mitigation Measures		Impact Being Addressed	Timing of Implementation	Monitoring Frequency	Actions Indicating Compliance	Applicability to MSC North Project and/or MSC Program
	media announcements, airport website, etc.; • Work with airport police and the Los Angeles Police Department to enforce delivery times and routes; • Establish staging areas; • Coordinate with police and fire personnel regarding maintenance of emergency access and response times; • Coordinate roadway projects of Caltrans, City of Los Angeles, and other jurisdictions with those of the Airport construction projects; • Monitor and coordinate deliveries; • Establish detour routes; • Work with residential and commercial neighbors to address their concerns regarding construction activity; and • Analyze traffic conditions to determine the need for additional traffic controls, lane restriping, signal modifications, etc.					
ST-9 **Monitoring Agency: LAWA**	**Construction Deliveries.** Construction deliveries requiring lane closures shall receive prior approval from the Construction Coordination Office. Notification of deliveries shall be made with sufficient time to allow for any modifications to approved traffic detour plans.	Traffic congestion and delays as they relate to construction activities	During construction	On-going during construction	Status updates in annual LAX MMRP progress report.	MSC North Project and future phase(s) of the MSC Program
ST-12 **Monitoring Agency: LAWA**	**Designated Truck Delivery Hours**. Truck deliveries shall be encouraged to use night-time hours and shall avoid the peak periods of 7:00 AM to 9:00 AM and 4:30 PM to 6:30 PM.	Traffic congestion and delays as they relate to construction activities	LAWA approval of delivery schedule as part of the Construction Traffic Management Plan	On-going during construction	Status updates in annual LAX MMRP progress report.	MSC North Project and future phase(s) of the MSC Program
ST-14 **Monitoring Agency: LAWA**	**Construction Employee Shift Hours**. Shift hours that do not coincide with the heaviest commuter traffic periods (7:00 AM to 9:00 AM, 4:30 PM to 6:30 PM) would be established. Work periods will be extended to include weekends and multiple work shifts, to the extent	Traffic congestion and delays as they relate to construction	Prior to construction activities	Once, during review of Construction Traffic Management Plan	LAWA approval of employee work schedule as part of the Construction	MSC North Project and future phase(s) of the MSC Program

Table 3: Applicable LAX Master Plan Commitments and Mitigation Measures

Master Plan Commitments/Mitigation Measures		Impact Being Addressed	Timing of Implementation	Monitoring Frequency	Actions Indicating Compliance	Applicability to MSC North Project and/or MSC Program
	possible and necessary.	activities			Traffic Management Plan; status updates in annual LAX MMRP progress report.	
ST-17 **Monitoring Agency: LAWA**	**Maintenance of Haul Routes**. Haul routes on off-airport roadways will be maintained periodically and will comply with City of Los Angeles or other appropriate jurisdictional requirements for maintenance. Minor striping, lane configurations, and signal phasing modifications would be provided as needed.	Roadway safety	On-going during construction	On-going during construction	Field inspection report; maintenance logs; status updates in annual LAX MMRP progress report.	MSC North Project and future phase(s) of the MSC Program
ST-18 **Monitoring Agency: LAWA**	**Construction Traffic Management Plan**. A complete construction traffic plan will be developed to designate detour and/or haul routes, variable message and other sign locations, communication methods with airport passengers, construction deliveries, construction employee shift hours, construction employee parking locations and other relevant factors.	Traffic congestion, delay and safety, related to construction activities	Prior to construction	On-going during construction	LAWA approval of Construction Traffic Management Plan by LAWA's Ground Transportation/ Construction Coordination Office in conjunction with LAWA CALM team; status updates in annual LAX MMRP progress report.	MSC North Project and future phase(s) of the MSC Program
ST-19 **Monitoring Agency: LAWA**	**Closure Restrictions of Existing Roadways.** Other than short time periods during nighttime construction, existing roadways will remain open until they are no longer needed for regular traffic or construction traffic, unless a temporary detour route is available to serve the same function. This will recognize that there are three functions taking place concurrently: (1) airport traffic, (2) construction haul routes, and (3) construction of new	Traffic congestion and delay as they relate to construction activities	As construction dictates	As stipulated in Construction Traffic Management Plan, approved by LAWA's Construction Coordination	Street closure permit; approval by LAWA's Ground Transportation/ Construction Coordination Office	MSC North Project and future phase(s) of the MSC Program

Table 3: Applicable LAX Master Plan Commitments and Mitigation Measures

Master Plan Commitments/Mitigation Measures		Impact Being Addressed	Timing of Implementation	Monitoring Frequency	Actions Indicating Compliance	Applicability to MSC North Project and/or MSC Program
	facilities.			Office		
ST-21 **Monitoring Agency: LAWA**	**Construction Employee Parking Locations.** During construction of the eastern airport facilities, employee parking locations will be selected that are as close to I-405 and I-105 as possible and can be accessed by employee vehicles with minimal disruption to adjacent streets. Shuttle buses will transport employees to construction sites. In addition, remote parking locations (of not less than 1 mile away from project construction activities) will be established for construction employees with shuttle service to the airport. An emergency return system will be established for employees that must leave unexpectedly.	Traffic congestion and delay as they relate to construction activities	Prior to construction	Once, upon approval of construction employee parking locations by LAWA's Construction Coordination Office	LAWA approval of construction employee parking locations as part of the Construction Management Traffic Plan	MSC North Project and future phase(s) of the MSC Program
ST-22 **Monitoring Agency: LAWA**	**Designated Truck Routes.** For dirt and aggregate and all other materials and equipment, truck deliveries will be on designated routes only (freeways and non-residential streets). Every effort will be made for routes to avoid residential frontages. The designated routes on City of Los Angeles streets are subject to approval by LADOT's Bureau of Traffic Management and may include, but will not necessarily be limited to: Pershing Drive (Westchester Parkway to Imperial Highway); Florence Avenue (Aviation Boulevard to I-405); Manchester Boulevard (Aviation Boulevard to I-405); Aviation Boulevard (Manchester Avenue to Imperial Highway); Westchester Parkway/Arbor Vitae Street (Pershing Drive to I-405); Century Boulevard (Sepulveda Boulevard to I-405); Imperial Highway (Pershing Drive to I-405); La Cienega Boulevard (north of Imperial Highway); Airport Boulevard (Arbor Vitae Street to Century Boulevard); Sepulveda Boulevard (Westchester Parkway to Imperial Highway); I-405; and I-105.	Traffic congestion and delay as they relate to construction activities	At issuance of haul route approval	Once, upon approval of each haul route	Approval of haul route by LAWA Ground Transportation/ Construction Coordination Office; status updates in annual LAX MMRP progress report.	MSC North Project and future phase(s) of the MSC Program

Table 3: Applicable LAX Master Plan Commitments and Mitigation Measures

Master Plan Commitments/Mitigation Measures		Impact Being Addressed	Timing of Implementation	Monitoring Frequency	Actions Indicating Compliance	Applicability to MSC North Project and/or MSC Program
Construction Surface Transportation [5]						
C-1 **Monitoring Agency: LAWA**	This is the same measure discussed under Public Services – Fire Protection, LAX Master Plan Commitment C-1.					
C-2 **Monitoring Agency: LAWA**	**Construction Personnel Airport Orientation**. All construction personnel will be required to attend an airport project-specific orientation (pre-construction meeting) that includes where to park, where staging areas are located, construction policies, etc.	Traffic congestion and delays as they relate to construction activities	Prior to commencement of construction	As required by arrival of new personnel	Contractor certification; signatures of orientation attendees; status updates in annual LAX MMRP progress report.	MSC North Project and future phase(s) of the MSC Program
ST-9 **Monitoring Agency: LAWA**	This is the same measure discussed under Public Services – Fire Protection, LAX Master Plan Commitment ST-9.					
ST-12 **Monitoring Agency: LAWA**	This is the same measure discussed under Public Services – Fire Protection, LAX Master Plan Commitment ST-12.					
ST-14 **Monitoring Agency: LAWA**	This is the same measure discussed under Public Services – Fire Protection, LAX Master Plan Commitment ST-14.					

[5] Project-specific adaptations of other applicable Construction Surface Transportation LAX Master Plan Commitments and Mitigation Measures can be found in Table 1: MSC-Specific Mitigation Measures.

Table 3: Applicable LAX Master Plan Commitments and Mitigation Measures

Master Plan Commitments/Mitigation Measures		Impact Being Addressed	Timing of Implementation	Monitoring Frequency	Actions Indicating Compliance	Applicability to MSC North Project and/or MSC Program
ST-16 **Monitoring Agency: LAWA**	**Designated Haul Routes:** Every effort will be made to ensure that haul routes are located away from sensitive noise receptors.	Traffic noise	At issuance of approved haul route	Once, at approval of haul route	Approval of haul route by LAWA Ground Transportation/ Construction Coordination Office; status updates in annual LAX MMRP progress report	MSC North Project and future phase(s) of the MSC Program
ST-17 **Monitoring Agency: LAWA**	This is the same measure discussed under Public Services – Fire Protection, LAX Master Plan Commitment ST-17.					
ST-18 **Monitoring Agency: LAWA**	This is the same measure discussed under Public Services – Fire Protection, LAX Master Plan Commitment ST-18.					

APPENDIX C

LOS ANGELES INTERNATIONAL AIRPORT
EL SEGUNDO BUTTERFLY
2015 REPORT
DATED DECEMBER 2015

REPORT
LOS ANGELES INTERNATIONAL AIRPORT
EL SEGUNDO BLUE BUTTERFLY
2015

Entomological Consulting Services, Ltd.
Richard A. Arnold, Ph.D.

REPORT OF EL SEGUNDO BLUE BUTTERFLY MONITORING ACTIVITIES IN 2015 AT THE LOS ANGELES INTERNATIONAL AIRPORT

Conducted under USFWS Permit
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Final Report:
December 2015

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SECTION 1
INTRODUCTION

This report describes the findings of monitoring surveys for the federally-listed, endangered El Segundo Blue (ESBB) butterfly (*Euphilotes battoides allyni*) and its foodplant, Coast Buckwheat (*Eriogonum parvifolium*) that occurred in May through August 2015, at the Los Angeles International Airport (LAX). All activities described in this report were conducted under the auspices of a recovery permit issued by the U.S. Fish & Wildlife Service to Richard Arnold, Ph.D., President of Entomological Consulting Services, Ltd.

During the ESBB's adult flight season in 2015, the following butterfly and habitat monitoring activities were performed at LAX:

a) Surveys began in May to check on the flowering status of the ESBB's food plant, Coast Buckwheat and estimate the start of the butterfly's flight season;
b) 13 counts of ESBB adults were conducted along the historical transect route;
c) a single block count of ESBB adults throughout the entire dune preserve area was conducted at the peak of the butterfly's 2015 flight season;
d) a seasonal population estimate was calculated for the entire 2015 flight season of the ESBB and throughout the entire 202.8-acre LAX preserve;
e) the buckwheat food plant of the butterfly was mapped and flowerhead numbers tallied for the entire historical transect route (1.5 miles) and 126 randomly placed transects (10.1 miles) in the blocks; and
f) selected target areas were mapped as exemplars of where invasive plant control is needed.

The remainder of this report describes the LAX study site, plus the 2015 ESBB monitoring activities and findings. The 2015 monitoring results are compared to findings from previous years to discern year-to-year trends in the ESBB population numbers plus buckwheat plant and flowerhead numbers at LAX, as well as to identify habitat management actions.

SECTION 2
LAX STUDY SITE

2.1 Site Description.

The LAX dunes comprise a 307.1–acre site located west of the runways and terminals at the Los Angeles International Airport. These dunes are generally bounded by Waterview St. on the north, Imperial Highway on the south, Pershing Blvd. on the east and Vista Del Mar on the west. The southern approximately 202.8 acres of the LAX dunes comprises the preserve, which was designated the El Segundo Blue Butterfly Habitat Restoration Area (hereafter, Habitat Restoration Area, study area, or preserve) in 1987. Approximately 104.3 acres of undeveloped, but degraded dunes lie immediately north of the Habitat Restoration Area. The Habitat Restoration Area, where the annual monitoring studies of the ESBB and its habitat were focused, is depicted in Figure 1 on the Venice 7.5' quadrangle U.S. Geological Survey topographic map (Range 15 West, Township 3, South).

Weather conditions at LAX are characterized by a Mediterranean climate as is typical of coastal areas in Southern California. The summer temperatures are warmest between June and October, with daily high temperatures typically between 75 and 85^{o} F. Winter, spring, and fall temperatures are generally mild, with a daytime high in the 70^{o}s F and nightly low in the 50^{o}s F. The rainy season is measured between July 1 and June 30 and the annual, average rainfall totals 12 inches.

Predominant dune landforms that remain today at LAX include foredunes, backdunes, and deflation plain. Strand and bluff landforms were formerly located where Dockweiler Beach State Park is now located, immediately west of LAX dunes (Figure 1). There are approximately 210.2 acres of foredunes, 24.4 acres of backdune, and 34 acres of deflation plain. In addition to the dune communities, there are also 23 acres of non-dune soil type and about 15.5 acres of developed or heavily disturbed areas. Approximately 38.6 acres of roads overlay on these habitats, which remain from the former residential community that was razed during 1966-1972, and buildings and other structures that are used for current airport operations. The historical transect route (Figure 2), which is walked repeatedly throughout the ESBB's flight season to document the timing and abundance of the butterfly, includes portions of the foredunes and backdunes, as well as the edge of the deflation plain.

Figure 3 illustrates the various subsites, based upon former residential blocks and located within the Habitat Restoration Area, that were used for the ESBB's annual block count. The blocks vary in size as delineated by the existing streets in the central and northern portions, or by natural landmarks in the southern and eastern portions of the Habitat Restoration Area. These pre-existing polygons or "blocks" were used as the sampling areas for the ESBB block count. Blocks to the north and northwest of the Habitat Restoration Area are also checked annually during the block count, but the ESBB and its food plant have not been observed outside of the preserve portion of the LAX dunes for many years. In addition, buckwheat monitoring was performed along 126 transects that were randomly located throughout the blocks, as illustrated in Figure 4.

2.2 Plant Communities.

Because of the former residential neighborhood, movement of sand to uplift the current VOR site (VHF Omnidirectional Range navigational system for the airplanes), former sand mining activities, and the construction of roads around the periphery of the dunes, most of the dunes have been disturbed to some degree. The disturbance is reflected in the mixture of native plant communities and various weeds and exotics that now grow at the dunes. During the past couple of decades, habitat restoration activities have resulted in the removal of various non-native plant species, (see earlier monitoring reports prepared by Dr. Rudi Mattoni) in portions of the dunes and some plantings of native species, primarily Coast Buckwheat, to improve habitat quality. However, the weeds continue to colonize and continue to dominate in portions of the dunes.

Native plant communities at the LAX dunes include southern foredune, southern dune scrub, and valley needlegrass grassland; however, all have been degraded by past land use activities and colonization by invasive plants. The southern foredune community is found on the foredunes, the southern dune scrub on the backdunes, and the valley needlegrass grassland (or prairie) on the deflation plain. Coast Buckwheat, also sometimes referred to as Seacliff or Dune buckwheat, is the sole larval and primary adult food plant of the ESBB and grows primarily in the foredune and backdune portions of the preserve, although a few individuals can be found in a few scattered, small remnants of the valley needlegrass grassland.

The southern foredune plant community is dominated by perennials with a high proportion of shrubs and sub-shrubs. Characteristic species of the southern foredune plant community include: Coast Buckwheat (*Eriogonum parvifolium*), Bush Lupine (*Lupinus chamissonis*), Coast Goldenbush (*Ericameria ericoides*), Beach Evening Primrose (*Camissonia chieranthifolia*), Dune Wallflower (*Erysimum suffrutescens*), Beach Sand Verbena (*Abronia umbellata*), and Beach Bur (*Ambrosia chamissonis*). The southern dune scrub plant community consists of a coastal scrub community of shrubs and sub-shrubs characterized by most of the aforementioned taxa. One of the main differences between these two communities is the degree of plant cover, as the southern foredune is generally characterized by sparser vegetative cover than the dense vegetative growth characteristic of southern dune scrub plant communities. At the LAX dunes, the distinction between these two plant communities is also blurred due to the infusion of various non-native weeds and grasses that have colonized the formerly more open portions of the dunes.

The valley needlegrass grassland community is now almost completely absent at the LAX dunes due to grading for the construction of Pershing Boulevard, and subsequent invasion of exotics and annual grasses that now dominate in portions of the dunes where the valley needlegrass grassland formerly occurred. A few, very small patches of the needlegrass still grow on the slopes adjacent to Pershing Boulevard and at some widely scattered locations elsewhere in the dunes. Under more natural conditions, this prairie would be dominated by bunchgrasses, primarily, Purple Needle Grass (*Nassella cernua*), a mixture of herbaceous flowers and shrubs, including California Encelia (*Encelia californica*), Lewis' Evening Primrose (*Camissonia lewisii*), Deerweed (*Lotus scoparius*),

and Bush Lupine. Today the dominant grasses are introduced species, including Ripgut Brome (*Bromus diandrus*), Bermuda Grass (*Cynodon dactylon*), and Veldt Grass (*Ehrharta* sp.).

2.3 Coast Buckwheat

Eriogonum parvifolium serves as both the larval and primary adult food plant of the ESBB. It is a perennial shrub (also sometimes referred to as a subshrub) that grows in sand dunes, coastal scrub, coastal strand, and on coastal bluffs between San Diego and Monterey counties. In the northern part of its geographic range it is also commonly known as Seacliff Buckwheat. When full grown, it is characterized by loosely branched, decumbent stems that may get as tall as about three feet, or in windblown areas may be prostrate. The stems terminate in one or more white flowerheads, about the size of a small cotton ball, which contain numerous individual flowers.

Arnold (unpublished data) has followed the growth and survivorship of individual Coast Buckwheat plants at the nearby Chevron Refinery in El Segundo since 1977. Individual buckwheat plants commonly live 25-30 years and exhibit five growth stages: seedling, juvenile, mature, senescent, and dead. Seedlings spend most of their energy developing a deep root system, so few if any flowerheads are produced during the first couple years of life. Juvenile plants are small statured, but the number of flowerheads and branches increase rapidly with each year's growth. The seedling and juvenile stages are apparent during the first 4-7 years of life, with plants in sheltered portions of the dunes growing faster than those in windy locations. The buckwheat's mature stage typically refers to the "middle-aged" years of the plant's lifespan and is characterized by hundreds and often thousands of flowerheads. This is the life stage of greatest value to the ESBB since both its larval and adult life stages feed on the flowers. In its later years, flowerhead numbers decline on an aging or senescent buckwheat plant as it directs most of its energy into just surviving. Dead plants do not have any flowerheads.

2.4 El Segundo Blue Butterfly

The El Segundo Blue was recognized as an endangered species by the US Fish & Wildlife Service in 1976. It is a small butterfly, whose wingspan is about one inch. Uppersides of the males' wings are blue, while those of females are brownish-gray (see report cover). Background color of the undersides of the wings in both sexes is light gray, with numerous black, irregularly-shaped markings and a row of orange markings near the outer margin of the hind wings.

At the time of its recognition as endangered, the butterfly was only known from the Chevron refinery in El Segundo and at LAX. Both of these sites are remnant populations that occur on the formerly more extensive El Segundo Sand Dunes, which ranged from Playa del Rey south to the Malaga Cove area at the northern end of the Palos Verdes Peninsula. Subsequent surveys have found the butterfly at a few coastal bluff locations on the Palos Verdes Peninsula, a sand dune remnant at the Ballona Wetlands, and most recently in Santa Barbara County in both coast sage scrub and sand dune habitats. Recent sand dune habitat restoration efforts in Redondo Beach and at Dockweiler State Beach have also successfully attracted ESBBs that colonized these newly restored habitat locations.

At all locations the ESBB larvae feed on the flowerheads of *Eriogonum parvifolium.* The flowers of this plant also serve as the primary nectar source for adults. This dual dependence of both larvae and adults on the flowers of its buckwheat host is somewhat unusual among butterflies. Most butterflies feed as larvae on one or a few closely related plants, and then as adults on several flowers that are generally not related to the larval food plant.

The adult flight season generally occurs between about mid-June through late August, although there is annual variation in the starting and ending times of the flight season, as well as, its duration. On average, individual adults generally live less than a week under field conditions. During this time, they mate and females lay eggs in the flowerheads of the buckwheat. About one week later, the caterpillar (or larva) emerges and begins feeding on the buckwheat. As it grows in size, it molts four times during about a one month period. When the larva is full grown it crawls down and burrows in the sand or leaf litter beneath the buckwheat and pupates. The pupal stage lasts until the next summer, when the next generation of the adult butterfly emerges.

SECTION 3
METHODS

3.1 Historical Transect Survey

Dr. Rudi Mattoni established a transect route that has been used for monitoring the El Segundo Blue butterfly at the airport since 1984. Mattoni (1990, Figure 11), in his summary report on the ESBB at LAX, illustrated his transect as a nearly continuous route that is very similar to the route followed since 1996 at LAX. Mattoni et al. (2001, Figure 1) illustrated his route as five, discrete transects, which did not survey all habitat along the transect route, including some areas supporting significant stands of buckwheat (e.g., Block 9) situated between the boundaries of these transects. The route used for the historical transect surveys conducted since 1996 follows the nearly continuous route originally established in 1984 and is illustrated in Figure 2.

During the 2015 ESBB flight season, the historical transect route was surveyed on 13 days between June 4th and August 7th. Additional specific survey dates included June 12, 19, and 25, July 1, 3, 7, 9, 16, 24, and 30, plus August 6 and 7. Richard Arnold conducted all transect counts during 2015.

The historical transect route (Figure 2) meanders approximately 1.3 miles through a portion of the foredunes that lie immediately west of the VOR facility, and along the top and toe of the backdunes in the southern and eastern portions of the Habitat Restoration Area. The backdune portion of the transect begins east of the VOR and meanders north, generally parallel to Pershing Blvd. to the entrance road (Century Blvd.) of the Habitat Restoration Area. The historical transect route traverses sectors of the Habitat Restoration Area where the ESBB's food plant, *Eriogonum parvifolium*, was abundant and thriving in prior years, areas where the food plant is currently abundant, some hillside areas where natural regeneration has occurred, areas where non-natives have been removed, areas where non-natives still need to be removed, and portions of the dune preserve where restoration activities have occurred in prior years.

Beginning in 1996, the beginning, ending, and intermediate points along the historical transect route were marked by stakes (Interval Posts in Figure 2) in the field with unique alphanumeric identifiers. During 2002, the stakes were remarked, due to loss of the older identification tags, with pre-numbered, aluminum tags to facilitate the identity of interval boundaries. The distance between two consecutive stakes along the transect route is referred to as an interval. There are 35 intervals in the entire transect route (Figure 2), which vary in length from about 65 to 837 feet (Table 1). The intervals vary in length because the beginning and ending points of each interval are located where there are changes in the vegetation, changes in topographic relief, and man-made features, all of which are used to identify the transect route in the field (Figure 2). Table 1 provides the length of every interval of the historical transect route and the total transect length, which equals 7,114 feet. A Trimble XR Pro global positioning system (GPS), with real-time submeter precision, was used to obtain positional information using Universal Trans Mercator (UTM) geographic coordinates (a world-wide coordinate system based on the metric system of measurement and similar to latitude and longitude) for every stake along the entire route of the historical transect during 2002. These

coordinates were differentially corrected via post-processing to improve the accuracy of the positional readings. Data collected with the GPS were transferred to a geographic information system, ArcGIS from software developer ESRI, to measure interval lengths.

As an observer walks the historical transect from beginning to end (i.e., intervals #1 to #35), the numbers of adult ESBBs that are observed along the route within 10 feet on either side of the transect centerline are counted. Tallies are recorded as males or females when diagnostic characteristics are clearly observed, and as undetermined sex when sexual characteristics cannot be observed. No ESBBs are captured or otherwise handled. The locations of observed adults are noted by obtaining positional coordinates using a Trimble GPS unit.

A Kestrel 2000 Pocket Thermo Wind Meter was used to measure air temperature and wind speed during all butterfly counts. Cloud cover was also noted during the counts. All transect counts occurred when weather conditions were suitable for ESBB activity, usually greater than 68^{o} F and winds less than 5 mph, and as evidenced by ESBB adults and other butterflies being active at the times of the transect counts.

3.2 Block Count Survey

When the historical transect was initiated in 1984, the distribution of *Eriogonum parvifolium* at LAX was restricted primarily to the backdunes along the transect route and in the foredunes west of the VOR facility. However, due to restoration efforts in the early 1990's, *E. parvifolium* now grows in portions of the foredunes where the residential neighborhood once existed. Since the historical transect route did not include most portions of the Habitat Restoration Area where buckwheat propagation activities were undertaken, an alternative survey method was necessary to monitor the ESBB in these areas. Starting in 1996, and annually thereafter, block count surveys have been utilized in addition to the historical transect survey to monitor the ESBB population throughout the entire 200-acre Habitat Restoration Area.

ESBB counts were conducted in 86 blocks, which collectively comprise the entire 202.8 acres of Habitat Restoration Area at the LAX dunes. The blocks are numbers 1-60, although some blocks are divided into an east and west or north and south blocks, which results in the 86 total blocks. Only the blocks within the Habitat Restoration Area, where Coast Buckwheat grows, are illustrated in Figure 3. These include blocks #1 through #45, and #49 through #52. The remaining blocks lie north of the Habitat Restoration Area and include blocks #46 through #48, and #53 through #60.

During the block count, all blocks are visited once during the flight season within a period of a few days. The visit is timed to coincide with the approximate peak of the ESBB's flight season. In 2015, these counts were performed between July 1st and 4th by Richard Arnold. Using the information gathered from the counts along the historical transect route, the timing of the approximate peak of the ESBB flight season can be estimated while the flight season is in progress by examining the trend in the numbers of butterflies observed on the transect counts and the sex ratio of males to females.

Each block is uniquely identified and is delineated by either the streets or, as in

the southern and eastern portions of the LAX dunes, by natural or topographic features with the boundaries marked by stakes (Figure 3). During the block count, the observer systematically surveys all portions of a particular block and visits every buckwheat plant only once, while looking for ESBB adults. As adults are observed, their numbers were tallied and their locations were mapped using a handheld, WAAS-enabled GPS manufactured by Trimble (GeoExplorer 6000). Tallies were recorded as males or females when diagnostic characteristics could be observed. Tallies were recorded as undetermined sex when sexual characteristics could not be readily observed, or in a few cases, when butterflies were so abundant at a single plant that individuals could not be tracked to reliably sex all individuals. No ESBBs are captured or otherwise handled. When possible, behaviors were also noted. All 86 blocks were surveyed in four days using one observer on each survey day.

The data dictionary of the GPS was programmed to store all butterfly observations for every block as well as the associated behaviors. The GPS was used to obtain a positional fix for the location of every observation, which may include more than one butterfly. Data files were downloaded from the GPS unit to a laptop computer at the end of each survey day. During post-processing, the coordinates were differentially corrected to improve the positional accuracy. After completion of the field survey portion of the block counts, the coordinates and other butterfly data were transferred to a data base to facilitate the analysis of the block count data, and to link the data file to a geographic information system to prepare maps of the findings for this report.

Under ideal circumstances, all 86 blocks in the preserve would be simultaneously inventoried and the counts of observed ESBB adults would represent a census (i.e., a complete count of all individuals) of the butterfly population at that time. This approach would minimize the chance of counting the same individual more than once during the census, which could result in inflated census counts. Using this approach, the ESBB population could be considered demographically and geographically closed, because the sampling period is short enough that no births, deaths, immigration, or emigration occurs.

Since 86 qualified and permitted surveyors were not available to conduct the counts of the 86 blocks simultaneously, the counts were performed over a 4-day period in 2015 (3 days for the ESBB occupied blocks in the Habitat Restoration Area and a fourth day for the unoccupied blocks outside of the Habitat Restoration Area). Because the butterflies were not marked, it is possible that some individuals were counted more than once during the census effort as the butterflies dispersed from one location to another within the dunes. Similarly, because the count occurred over a 4-day period, some unknown quantity of births and deaths occurred during this period, thus the ESBB population is considered open during the block count. Also, it is possible that some unknown number of butterflies dispersed from the LAX dunes during the census period and were not detected.

Despite these limitations, the block count is a very valuable method of estimating the overall ESBB population as well as assessing the butterfly's distribution and relative abundance throughout the entire Habitat Restoration Area. The results of the block count surveys from different years are compared to evaluate the stability of the ESBB

population, document its fluctuations and detect any trends, and to provide insight for maintenance, monitoring, and restoration recommendations that will benefit the ESBB and LAX dunes.

3.3 Seasonal Population Estimate for the El Segundo Blue Butterfly.

After the 1998 monitoring report was submitted, Dr. Andrew Huang, formerly of LAX but now retired, developed a mathematical methodology to calculate a seasonal population estimate for the ESBB within the detection area of the historical transect route. This value, in conjunction with the tallies of the block count and information from prior capture-recapture studies[1] of the ESBB (Arnold 1983 and 1986), were then used to extrapolate a seasonal population estimate for the entire LAX dune preserve. These methods are briefly summarized in the remainder of this section, but are explained in greater detail in Dr. Huang's memo (1998). Although Dr. Huang's methodology has not been published, it has been informally reviewed by insect population biologists at Yale University and the University of California, Davis, and a statistical ecologist at Stanford University (Arnold, personal communication).

Monitoring observations and the transect counts establish the starting and ending dates of the ESBB's flight season, plus the magnitude and shape of the seasonal population curve. When the transect counts are plotted against the flight day, the seasonal population curve of ESBB adult numbers closely tracks a normal bell shape or Gaussian curve, which can be described mathematically.

On any particular day of the ESBB's flight season, the butterfly population consists of individuals that emerged earlier that same day, as well as individuals that emerged on prior days and survived to the present day. Similarly, the butterflies observed on the day of each transect count are comprised of individuals that just emerged and survivors from previous days. Estimated residence rates for the ESBB at the Chevron refinery in El Segundo and at LAX were derived from prior capture-recapture studies of the ESBB (Arnold 1983 and 1986). These capture-recapture studies also revealed that the maximum residence for ESBB adults in the field is six days, even though the maximum observed adult life span under lab conditions is about 14 days (Mattoni 1992). The shorter lifespan in the field is due to mortality from predation and inclement weather conditions (i.e., foggy days or cool temperatures that can prevent cold-blooded ESBB adults from warming up sufficiently and limit their activity).

Thus, mathematically the transect survey count for the butterflies, P(x), on any particular survey date within the ESBB's flight season can be expressed as:

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[1] Capture-recapture (also sometimes referred to as "capture-mark-recapture" or "mark-release-recapture") is a technique for estimating the population density and other population parameters, such a birth and death rates, and dispersal for mobile animals. A sample of the population is captured, marked, and released and marked individuals are subsequently recaptured. Various statistical models have been devised to estimate population numbers and other population parameters for each sampling period.

$$P(x) = P_1(x) + P_2(x) + P_3(x) + P_4(x) + P_5(x) + P_6(x) \quad \textbf{(1)}$$

where x is the flight day of the survey. $P_1(x)$, $P_2(x)$, $P_3(x)$, $P_4(x)$, $P_5(x)$, and $P_6(x)$, are the butterflies that just emerged, and those who survived from two, three, four, five and six days ago, respectively. $P_1(x) > P_2(x) > P_3(x) > P_4(x) > P_5(x) > P_6(x)$, as fewer and fewer butterflies are left in each successive day, as demonstrated by the capture-recapture studies (Arnold 1983 and 1986).

The rate of mortality for a population can be expressed mathematically by the following equation from Pianka (1988):

$$dN/dt = -a\,N \quad \textbf{(2)}$$

This commonly accepted model assumes that the rate of decrease in a population is proportional to the number of individuals within that population. Using equation (2) and the fact that the ESBB lives only 4 to 6 days under field conditions, the remaining butterflies for each successive day after the first day of emergence can be described mathematically as:

$$N=N_0 \exp(-a(t-1)) \quad 2 \leq t \leq 6 \quad \textbf{(3)}$$

$$= 0 \quad 6<t$$

where t is in days and N_0 is the number of butterflies emerging on day one.

Assuming that at the end of day four, only 5% of the original butterflies that emerged 4 days earlier still remained, then the value of "a" in the above equation can be shown to be 0.998. Substituting this value and evaluating equation (3) for day 2, 3, 4, 5 and 6, we have mathematically

$$P(x) = 1.00\,P_1(x) + 0.37\,P_1(x) + 0.14\,P_1(x) + 0.05\,P_1(x) + 0.02\,P_1(x) + 0.01\,P_1(x) \quad \textbf{(4a)}$$

or

$$P(x) = 1.59\,P_1(x) \quad \textbf{(4b)}$$

Equation 4b suggests that on any day of the transect survey, the actual number of emerging butterflies is the total number counted divided by 1.59, as suggested by Huang's mathematical derivation, or 1.66 as indicated by field results. Either number can be used since they are close in value. In this report, both values are used to provide a range of seasonal population estimates for the ESBB at LAX. A capture-recapture study at the Chevron preserve for the ESBB indicates that this factor may be as low as 1.21 (Arnold 1986).

For the entire flight season, the total ESBB population size is the number of newly

emerged butterflies on each day added over the total days of the flight season. This summation is equivalent to integrating $P_1(x)$, the population distribution function, over the total number of flight days. Mathematically, it is described by:

$$\text{Total seasonal count} = \int P_1(x)\, dx \qquad \textbf{(5)}$$

Equation (5) can be assessed from the field count data by using equation (4b), in which we have

$$\text{Total seasonal count} = \int P_1(x)\, dx = \int P(x)\, dx / 1.59 \qquad \textbf{(6)}$$

To calculate a seasonal population estimate for the entire dunes, the first step is to determine the number of butterflies for the entire flight season for the transect acreage alone. This is mathematically equivalent to evaluating the right side of equation (6). The integral $\int P(x)\, dx$ is simply the area under the Gaussian curve that illustrates the ESBB seasonal population numbers based on the transect counts. Huang (1998) described two methods to solve this integral; using a trapezoidal numerical approximation method and a best-fitted Gaussian curve integration method. Both methods yield similar solutions. In this report, the 2014 ESBB transect survey data, in conjunction with the trapezoidal numerical approximation method, were used to estimate the total seasonal population number of ESBB for the transect route in 2014.

After establishing the total seasonal ESBB population number for the historical transect, this number is scaled up proportionately to estimate the seasonal population number for the entire 202.8 acre, Habitat Restoration Area. Since the block count data were obtained during or close to the peak flight period of the ESBB, the scaling factor is simply the ratio of the block count to the transect peak value. Thus, the ESBB seasonal count for the entire LAX dunes is obtained by multiplying the total seasonal population number of the transect survey by this scaling factor.

3.4 Buckwheat Monitoring.

Monitoring of the ESBB at LAX during the past several years has revealed that population numbers of the ESBB fluctuate dramatically from year-to-year. A variety of factors affect population numbers of the butterfly, including seasonal weather conditions, levels of parasitism, disease, and predation, plus abundance of its sole larval and primary adult food plant, Coast Buckwheat, as well as the numbers of buckwheat flowerheads

Arnold (1985) demonstrated the positive correlation that exists between buckwheat plant and flowerhead numbers with ESBB numbers based on his studies performed at the nearby Chevron refinery in El Segundo. Arnold and Goins (1987) further elaborated upon this relationship. Since information on the numbers of buckwheat plants and flowerheads can provide insight as to why ESBB numbers increase or decrease annually, monitoring of the buckwheat was initiated in 2002 and has been

performed annually since. At LAX the 2015 inventories of buckwheat plant numbers, age classes, and flowerhead numbers were obtained for:

a) the entire length of the historical transect route; and
b) 126 transects laid in other portions of the Habitat Restoration Area (i.e., outside of the historical transect route).

Lengths of the 35 intervals of the historical transect route are presented in Table 1, while the lengths of the 126 transects are presented in Table 2. Buckwheats were inventoried along the entire 1.3-mile length of the historical transect. The 126 other transects collectively measure 10.1 miles in total length. Results of the 2015 buckwheat monitoring efforts are compared to those of prior years for the historical transect and the block transects to identify any trends.

For both buckwheat monitoring activities, a Trimble Ranger GPS with real-time submeter precision was used to map the locations of buckwheat plants. A laser rangefinder, the bluetooth TruPulse model of Laser Technololgy, Inc., was used with the GPS to obtain the positional coordinates for every buckwheat so the operator did not have to stand next to each plant with the GPS antenna, which could have damaged the buckwheat or life stages of the ESBB. The positional information for all buckwheats was differentially corrected during post-processing to improve the accuracy of all positional fixes.

All buckwheats growing within the 20-foot wide corridor of the historical transect route were mapped using the GPS and laser rangefinder. In addition, the age class (seedling, juvenile, mature, or senescent) and number of flowerheads for every buckwheat plant was also recorded and later transferred to a data base to perform various summary statistics and to link the information to the GIS to summarize the findings in a series of maps.

3.5 Relationships Between Rainfall, Buckwheat Flowerheads and ESBB Numbers.

The relationships between annual rainfall, the annual number of buckwheat flowerheads, and annual numbers of ESBB adults observed during the block counts was examined using linear regression analysis. Regression analysis is a statistical method used for testing hypotheses about the relationships between two variables, which can also be used for prediction or estimation purposes. The results of regression analyses are equations that show the mathematical relationship between the dependent variables (in this case the annual number of flowerheads and ESBB adults) and the independent or explanatory variable (in this case rainfall and number of flowerheads). Thus the linear regression equations are used to estimate the numbers of flowerheads and butterflies one could “expect” to observe this year. For comparative purposes, two different sets of regression equations are utilized, one using data from 2002 through 2014 and the second using data from 2002 through 2015.

SECTION 4
RESULTS AND DISCUSSION

4.1 Timing and Length of the ESBB's Flight Season.

The first adults of ESBB at LAX in 2015 were observed on June 4th. This date is 6 days later than the first ESBB observation of 2014 (Arnold 2015). One worn ESBB female was observed during a historical transect count that was performed on August 6th, and based on its physical condition is presumed to have died on that date. Thus, the butterfly's flight season was at about 64 days during 2015 or approximately 9 weeks in duration. In prior years, the ESBB flight season has ranged from 60-76 days in length (Arnold 1997, 1998, 1999, 2001, 2002, 2003, 2004, 2005a, 2007a, 2007b, 2009, 2010, 2011, 2012a, 2012b, 2013, 2015, plus Arnold and Rios 2000). Thus the timing and duration of the ESBB's 2014 flight season was at the shorter end of the range that has been documented during the past 20 years. The fourth consecutive year of severe drought conditions probably contributed to the shorter flight season, as the duration of buckwheat flowering was also shorter during 2015.

4.2 Historical Transect Survey.

A total of 537 adult ESBBs were observed on the 13 survey dates in 2015, including 326 males and 211 females. The seasonal total applies to only the detection area of the transect route, which measures approximately 20 ft. x 7,114 ft. or 3.3 acres, rather than to the entire dune preserve. Table 3 summarizes the total numbers (males + females) of ESBB adults observed by survey date. The transect counts suggest that the seasonal population peak occurred on July 3rd, when 88 butterflies were observed. Observed ESBB numbers per interval of the historical transect throughout the 2015 flight season ranged from 0 in nine intervals to 183 within interval #33 (Table 3).

Table 4 summarizes the annual ESBB counts for the historical transect at LAX for the years 1984 through 2015. The historical transect counts have been performed annually since 1984, except for 1985 when no counts were undertaken. As depicted in Table 4, the 2011 seasonal tally of 4,690 ESBB adults was the highest seasonal total observed. The 2015 ESBB seasonal total of 537 is only 11% of the 2011 seasonal total. Furthermore, the 2015 seasonal EBS total of 537 was well below the average seasonal total of 1,636 adults.

The precipitous decline in ESBB numbers is undoubtedly related to the decline in buckwheat and flowerhead numbers that have occurred in recent years. The continued drought conditions are likely responsible for much of the observed buckwheat mortality and reduced flowerhead numbers, but many of the buckwheat plants along the historical transect have died or are becoming senescent as they age. These factors are discussed further in Section 4.6 and other portions of this report.

4.3 Block Count Survey.

In 2015, a total of 1,378 adult ESBBs were observed during the block count, including 895 males and 483 females (Table 5). Each block, as illustrated on the attached map of the LAX dunes (Figure 3), was visited only once during the period July 1st through July 4th. Table 5 summarizes the numbers of ESBBs that were observed in every

block during 2016.

Figure 5 is a map that illustrates the location of every ESBB adult noted during the 2015 block count. Behaviors of adult ESBBs observed during the block counts are also summarized in Table 5 for each block where butterflies were seen. The vast majority of individuals (77.4%) were observed flying, while smaller percentages of individuals exhibited perching (5.5%), basking (5.5%), courtship (2.9%), mating (1.0%), foraging (i.e., nectaring, 7.1%), or oviposition (0.6%) behaviors. These percentages are comparable to the observed frequencies of these behaviors in prior monitoring years.

Within the approximately 200-acre Habitat Restoration Area, tallies of the numbers of ESBB adults observed during the 2015 block count ranged from zero individuals in 9 blocks to 121 individuals in block #36N. Outside of the Habitat Restoration Area (blocks #46 - #48 and #53 - #60), ESBB adults were not observed. One additional buckwheat grows outside of the Habitat Restoration Area, in block #46S near the park located on Vista Del Mar Avenue and one ESBB adult was observed there.

Annual block count data presented in Table 6 indicates that during the 20-year period of 1996-2015, ESBB adults were generally found in the same blocks in all years and most blocks exhibited similar trends in population numbers during this period. Results of the block counts indicate that ESBB population numbers declined about 7% in 2015 compared to 2014 (Table 7).

4.4 Seasonal Population Estimate for the ESBB.

Using the trapezoidal numerical integration method, the 2015 seasonal population estimate for the ESBB throughout the entire Habitat Restoration Area at LAX was 24,559 to 25,641 individuals (Table 8). These seasonal estimates indicate that ESBB population numbers decreased about 11% in 2015 compared to the seasonal population estimates for 2014 (Arnold 2015).

4.5 Year-to-Year ESBB Population Trends.

All three population estimation techniques, the historical transect counts (11%), the block count (7%), and the seasonal population estimate (11%), indicate that the ESBB numbers declined in 2015 compared to 2014. Table 8 summarizes the seasonal population estimates for the ESBB for the years 1998 through 2015. During this 18-year period, estimated seasonal population numbers have fluctuated from a low of 24,559 in 2015 to 142,727 in 2006, a factor of 5.8 times. The 2015 ESBB estimates are the lowest observed during this 20-year period.

Declines and increases of this magnitude are not unusual among insects, especially those that have only a single generation per year, such as the ESBB. Indeed, several moths that are routinely monitored because they are forest pests, can exhibit a 10-fold increase in population numbers within a few generations (i.e., an outbreak) or may decline just as rapidly (Varley, Gradwell, and Hassell 1974). Factors such as seasonal weather conditions, increased parasitism and predation, a higher incidence of disease, or a decline in food plant numbers (or flowerhead numbers in the case of the ESBB), may individually or collectively affect population numbers.

One factor that influences annual ESBB population numbers is rainfall, which in turn influences flower production of the Coast Buckwheat. Table 9 presents annual rainfall totals, measured between July 1 and June 30, for the years 1996 through 2015. During this 20-year period average annual rainfall was 11.4 inches, with a low of 2.63 inches in 2007 and a high of 31.28 inches in 1998. During this same period, annual ESBB numbers, as measured during the block counts, ranged from 1,378 to 5,675 individuals. The graph associated with Table 9 illustrates the very strong positive correlation between ESBB numbers and annual rainfall during this 20-year period.

During this monitoring program, dramatic fluctuations in ESBB population numbers have been witnessed even between consecutive generations of the butterfly. For example, ESBB numbers nearly doubled between 1996 and 1998, between 2002 and 2003, and between 2004 and 2005. In contrast, substantial declines have also been observed. For example, there was an approximate 50% decline between 1998 and 1999, between 2001 and 2002, between 2003 and 2004, a 68% decline between 2006 and 2007, as well as a 76% decline between 2010 and 2015. These dramatic increases and decreases in annual numbers may be within the "normal" range of population fluctuations for the ESBB. Even though population data on the butterfly have now been collected in a consistent manner for the past several years, statisticians would insist that another 10 years may be needed to evaluate the full range of normal variation on annual population numbers. Regardless, due to the unusual weather conditions that the Los Angeles area experienced in the past few years, the extremes in fluctuations of ESBB numbers may have already been observed, even within this relatively short period of time.

4.6 Buckwheat Monitoring and Trends.

Figure 6 illustrates the locations of Coast Buckwheat plants that grew within the historical transect route in 2015. It also summarizes the numbers of plants and flowerheads in each of the 35 intervals. Six intervals (an increase of one interval compared to 2014) supported no buckwheat plants, 15 intervals supported between 1 and 10 plants, 9 intervals supported between 11 and 20 plants, 2 intervals supported between 21 and 30 plants, 1 intervals supported between 31 and 40 plants, 0 intervals between 41 and 50 plants, 1 interval between 51 and 60 plants, and 1 interval had 63 plants.

Table 10 provides a breakdown of the buckwheat age classes (seedling, juvenile, mature, and senescent) that were observed in every interval along the historical transect route in 2015. Survey results indicated that approximately 48% of the buckwheats were mature plants (a decline of 15% compared to 2015, while 42% were senescent (an increase of 13% compared to 2014), 9% were juveniles, and 1% were seedlings.

A total of 422 Coast Buckwheat plants grew within the historical transect route during 2015, which represents an 8% decrease in plant numbers between 2014 and 2015 (Table 11). These plants produced an estimated total of 250,706 flowerheads in 2015, which represents a 23% decrease from the 2014 tally. The number of flowerheads in a particular transect interval ranged from 0 (6 intervals) to 99,902 (Figure 6). As in recent past years, five transect intervals, #30, #31, #33, #34, and #35 accounted for approximately 81% of the buckwheat flowerheads observed along the entire historical

transect route in 2015.

As detailed in Table 11, buckwheat plant numbers along the historical transect exhibited a net decline of 28% (692 to 501) between 2002 and 2008, but increased to 552 in 2011. Between 2011 and 2015 plant numbers declined to only 422, the lowest number throughout the period of 2002 through 2015.

Even though plant numbers declined, the average numbers of flowerheads of mature buckwheats doubled between 2002 and 2006, but declined 49% in 2007 (a drought year) to return to the 2002 level (Table 12). Because of the drought of 2007 (Table 9), total flowerhead biomass declined 80% between 2007 and 2006. Fortunately, rainfall during the winter of 2007- 2008 was nearer normal levels and the average flowerhead numbers doubled in 2008 compared to 2007 (Table 12). Between 2008 and 2009, rainfall was below average, but again near normal, and average flowerhead numbers more than doubled, increasing 61% (Table 12). Precipitation totals were normal during the 2009-2010 rainy season and flowerhead numbers remained high in 2010. Higher than normal precipitation during the 2010-2011 rainy season enabled flowerhead numbers to continue to increase in 2011. Precipitation during the 2011-2012 rainy season was only about 63% of normal, so not surprisingly, the average number of flowerhead numbers dropped slightly. With 2015 being the fourth consecutive year of drought (65% of average annual rainfall), the decline in average flowerhead numbers (586 in 2015) continued (Table 12).

Arnold (1985) described the strong positive correlation between buckwheat plant numbers, flowerhead numbers, and ESBB adults. Table 13 details this relationship for the historical transect during the period of 2002 through 2015.

Outside of the historical transect route, 126 transects were randomly placed throughout the blocks of the Habitat Restoration Area to collect data on the numbers of Coast Buckwheat plants and flowerheads, as well as their locations. Figure 7 illustrates the locations of these transects and the buckwheats growing along them. Of the 126 transects, buckwheat data was also collected from 56 of these same transects during 2002, while 70 new transects were added during 2003 (Table 2) and have been monitored annually since then. Table 14 lists the number of plants and average numbers of flowerheads observed along each transect during 2015.

Tables 15 and 16 summarize the numbers of buckwheat plants by age class and the average numbers of flowerheads by age class for all 126 transects for the 13-year period, 2003 through 2015. Although the overall numbers of buckwheats increased 4% in 2015 compared to 2014, mature buckwheats declined by 10% during the same period (Table 15). The proportion of seedlings and juveniles in the buckwheat population remained steady between 2014 and 20154, while the proportion of senescent plants increased from 41% to 46% during this period. Average number of flowerheads for all buckwheat plants, regardless of age class, increased about 11% between 2014 and 2015 (Table 16).

Table 17 summarizes the annual block counts of ESBB, buckwheat plants, and

buckwheat flowerhead numbers for the period of 2003 through 2015 at the LAX dunes. It also graphically illustrates the correlations between ESBB and buckwheat plant (including all age classes) numbers, as well as the ESBB and flowerhead numbers. Although the increases and declines in ESBB numbers correlate well with changes in buckwheat plant numbers, an even stronger positive correlation exists between ESBB numbers and buckwheat flowerhead numbers.

4.7 Relationships Between Rainfall, Buckwheat Flowerheads, and ESBB Numbers.

Table 18 and its associated graphs illustrate the strong positive correlation between ESBB adult numbers from the block counts and the buckwheat flowerhead numbers. Both flowerhead and ESBB numbers are positively correlated with annual (July 1 – June 30) rainfall totals. The flowerhead/rainfall and ESBB/flowerhead correlation coefficients are 0.46 and 0.50, respectively.

The regression equations that were estimated in 2014 (data from 2002 – 2014) were used to predict the estimated numbers of buckwheat flowerheads and ESBB to be tallied in 2015. The regression equations are provided in a note to Table 19. This exercise is one way to look at the ability of statistical analysis to predict expected population numbers.

Using these regression equations, predicted numbers of flowerheads and ESBBs are also presented in Table 19. The total rainfall for the 2015 growing season (July 1, 2014 – June 30, 2015) was 7.45 inches. The estimated number of flowerheads was 1,169 or 1,157 using the 2014 and 2015 equations, respectively. Remarkably, both equations slightly over estimated the actual number of flowerheads observed, 1,039. Based on the number of flowerheads, 1,039, the estimated numbers of ESBB adults in 2015 are 3,673 or 3,445, which is about 2.7 times higher than the 1,378 ESBB adults actually observed during the block counts during 2015. I don't have a good explanation for the difference in the predictive power of the regression equations, but it is possible that the effects of the continued drought may be greater on the ESBB than the buckwheat. Alternatively, additional years of data on the ESBB and buckwheat flowerheads may be necessary to improve their correlation and the predictive power of their regression equation.

Table 20 and its associated graphs illustrate the observed trends in buckwheat plant and flowerhead numbers for both the historical transect route and the block transects during the period of 2003 through 2015. Buckwheat numbers along the historical transect have declined while numbers along the block transects have increased during this 13-year period. There has been a downward trend in buckwheat numbers on the historical transect route over the past 13 years. Even though the number of flowerheads has varied considerably annually, there is a slight upward trend in flowerhead numbers during this same period, but the correlation coefficient for this equation only 0.03, indicating that the trend is not significant. As noted earlier, during 2015 both plant and flowerhead numbers were down.

While the regression equations demonstrate there is a strong positive relationship between the number of flowerheads and the ESBB adults observed, additional factors that

are not included in the equations may also influence butterfly numbers. For example, it would be useful to know what percentage of ESBB pupae may not emerge the next year if they don't receive the proper environmental cues and how many years they can delay their emergence. Also, rainfall during certain periods of the year may be more important to the buckwheat and its flowerhead development. For example, during the summers of 2014 and 2015, flower buds were frequently observed in many flowerheads that failed to actually flower. Also, the duration of the buckwheat flowering season was shorter than normal in both 2014 and 2015, which in turn contributed to shorter flight seasons for the ESBB. Thus, while the existing data and analyses have established the importance of rainfall to flowerheads and flowerheads to support the ESBB, other factors likely play a role in these relationships but are not accounted for by the current regression equations.

Additionally, the existing data set is relatively small, spanning only 12 years for prediction of 2015 estimates. Statisticians generally want a minimum of 30 observations (in this case, 30 years of data) upon which to base any statistically significant conclusions for these types of analyses. As encouraging as the predicted estimates have been thus far, additional years of observations, data analyses, and inclusion of other factors should improve our understanding of these relationships.

SECTION 5
HABITAT MANAGEMENT ACTIVITIES AND RECOMMENDATIONS

5.1 Routine Habitat Management Activities.

The Maintenance Services Division of Los Angeles World Airports (LAWA) has a dedicated two-man crew that works at the LAX dunes to perform regular trash and debris removal, weeding, and other vegetation management activities. This crew works throughout the entire 307.1-acre dune area, not just the 202.8 Habitat Restoration Area where the ESBB occurs.

Although some habitat management activities occur throughout the Habitat Restoration Area, in recent years the emphasis of these activities has been in the peripheral portions of the Habitat Restoration Area as approved by USFWS in 2005 as part of the short-term weed removal plan (Arnold 2005b). In 2005, Richard Arnold trained the crew and their supervisors to recognize the butterfly's buckwheat food plant and how to distinguish it from other buckwheat taxa that currently grow at the LAX dunes, as well as about 15 other invasive weeds that were targeted for control in the aforementioned short-term weed management plan. In recent years, much of the crew's weed removal activities have focused on the southern border (i.e., adjacent to Imperial Highway) and the western border (i.e., adjacent to Vista Del Mar). In other portions of the Habitat Restoration Area, removal of acacias, sea lavender, *Eriogonum fasiculatum*, dead palm trees, and castor bean has been performed at various locations.

As noted in my recent annual reports, I recommend that the crew refocus its weed removal efforts to the other blocks of the Habitat Restoration Area where the ESBB and its buckwheat food plant occur, as well as blocks where invasive plants dominate. Ice plant, acacia, three buckwheat taxa, and various weedy grasses, especially Veldt grass, are expanding and increasing in abundance throughout these areas and reducing habitat quality not only for the ESBB but also other dune endemic plants and animals. These weeds are at least partially responsible for observed declines in ESBB and buckwheat numbers.

It is my understanding that LAWA recently received its ESBB permit from the US Fish & Wildlife Service, which will enable the crew to resume its weed control efforts at the LAX dunes preserve. To guide the crew's weed control efforts, Figures 8, 9, and 10 illustrate selected locations of three non-endemic buckwheats *Eriogonum fasiculatum, E. grandiflorum, and E. cinereum)*, acacia, pine, ice plant, Veldt grass, and non-native succulents grow within the Habitat Restoration Area at the LAX dunes that particularly need attention. My recent annual reports (Arnold 2012a, 2013, and 2015) illustrate additional examples of where these weeds need to be controlled. I emphasize that the illustrated areas are not the only locations where these invasive plants are problematic at the LAX dunes; rather they are intended to serve as examples of what the crew could target in its annual work plan to control the invasive plants. Appendix A is a set of ground-level photographs, which illustrate selected weed locations mapped in Figures 8, 9, and 10. Similarly, appendices attached to my recent annual reports provide more ground-level photographs for additional problem locations provided in my 2012, 2013 reports). As in past years, the 2015 photographs of exemplar problem locations were

taken with a GPS-enabled camera to obtain a positional fix for each photo location. The photo location identification numbers, as illustrated in Figures 8, 9, and 10, are also the photo identifiers illustrated in Appendix A.

Appendix B provides copies of the work logs for the crew for the period of January through December 2015. The logs describe the types of habitat management activities that were performed and their locations within the dunes. As detailed in the logs, numerous truck loads of trash, which continually blow onto the dunes from the adjacent Dockweiler State Beach and vehicles that park along Vista Del Mar, are hauled out of the dunes regularly along with other debris and uprooted weeds (mostly Russian Thistle). Although additional trash cans along Vista Del Mar have helped to reduce the trash problem, trash pickup still consumes much of the 2-man crew's time, which preferably should be spent dealing with the weeds and other vegetation management issues.

5.2 Buckwheat Outplanting in Block #23.

A total of 330 Coast Buckwheat seedlings were outplanted at the LAX dunes on November 29, 2011 in block #23. The buckwheats were planted in groups of five seedlings at 66 locations (Figure 11). This block was chosen for the outplanting effort because it had only a few naturally occurring buckwheats, but is situated between neighboring areas on all sides that support larger patches of the ESB's food plant. Prior to the outplanting, acacias, non-native cacti, and ice plant were removed and a drip irrigation system was installed to provide supplemental water to the buckwheat plants in the event that rainfall was insufficient to facilitate survival and establishment of these new plants. The outplants were propagated by The Tree of Life Nursery (San Juan Capistrano, CA) using seeds collected at the LAX dunes.

These outplants were monitored on July 8, 2015 to assess their survival rate and overall condition. As detailed in Table 21, 69 of the original 330 outplants were still alive, which is a 21% survival rate. Table 22 summarizes the numbers of outplants and flowerheads by age class. Nearly 70% (n = 48) of the survivors are mature plants. Appendix C has photographs of selected, outplanted buckwheats.

5.3 Need for Additional Buckwheat Outplanting at LAX.

Five blocks, #9, #36N, #37S, #38N, and #40N have supported about one-third of the ESBB adults observed during the annual block counts. Figure 23 illustrates the relationship between the numbers of ESBB adults, buckwheat plants, and flowerheads. These five blocks exhibit similar trends between 2003 and 2015, with substantial declines occurring since 2011.

Long term survival and maintenance of the ESBB butterfly population at the LAX dunes preserve is dependent on the replacement of the mature and aging buckwheat plants that characterize much of the habitat. As illustrated in Figure 23, results of monitoring of the resident buckwheats throughout the entire Habitat Restoration Area during the past several years reveal that insufficient numbers of seedling and juvenile buckwheats are present to replace the mature, senescent, and dead individuals that comprise the vast majority of the population of the ESBB's larval and adult food plant. Although drought

conditions in recent years have caused a substantial decline in the estimated annual numbers of the ESBB, the observed decline has been further exasperated by a decline in the numbers of buckwheat plants and their flowerheads.

Coast Buckwheats often require several years of survival and growth to produce adequate flowerhead numbers to benefit the ESBB. Thus, propagation and outplanting of Coast Buckwheat should be continued at the LAX dunes, preferably on an annual basis. Ideally, other dune indigenous plants should also be propagated and outplanted along with the Coast Buckwheat to revegetate areas that are weeded at the LAX dunes to re-establish the habitat and improve habitat values for not only the ESBB but also other plants and animals endemic to this remnant of the El Segundo dunes system.

Throughout the LAX dunes a primary cause of the lack of buckwheat seedlings is the presence and abundance of various herbaceous weeds, annual grasses, and ornamental plants that continue to spread throughout the dunes and are locally abundant. Site management with an emphasis on invasive vegetation control is an important component in maintaining and improving the health of the LAX dunes preserve for the ESBB butterfly. Continued weeding should enable increased numbers of seedlings and juveniles of the Coast Buckwheat to establish naturally and eventually become mature plants to support future generations of the ESBB.

SECTION 6
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SECTION 7
TABLES

Table 1. Lengths of the 35 intervals along the historical ESB transect at LAX.

Interval Number	Length (feet)
1	510
2	837
3	142
4	75
5	168
6	107
7	223
8	140
9	126
10	119
11	79
12	184
13	200
14	194
15	94
16	137
17	214
18	295
19	234
20	193
21	226
22	230
23	89
24	89
25	264
26	186
27	89
28	65
29	107
30	101
31	294
32	125
33	105
34	383
35	490
Total Length	7,114

Table 2. Lengths of the 126 transects for the block buckwheat monitoring.

Transect Number	Length (feet)
1	662
2	430
3	540
4	557
5	787
6	766
7	71
8	139
9	168
10	178
11	201
12	230
13	277
14	295
15	329
16	430
17	191
18	233
19	276
20	301
21	295
22	259
23	245
24	244
25	562
26	556
27	535
28	384
29	507
30	498
31	493
32	467
33	231
34	239
35	274
36	317
37	318
38	317
39	860
40	411
41	461
42	320

Transect Number	Length (feet)
43	287
44	255
45	243
46	240
47	269
48	279
49	278
50	314
51	259
52	268
53	248
54	248
55	254
56	252
57	283
58	164
59	254
60	240
61	238
62	702
63	924
64	830
65	858
66	175
67	133
68	176
69	213
70	261
71	288
72	286
73	284
74	401
75	411
76	390
77	384
78	170
79	198
80	191
81	157
82	398
83	321
84	322

Transect Number	Length (feet)
85	379
86	958
87	959
88	300
89	256
90	257
91	281
92	352
93	361
94	369
95	333
96	379
97	379
98	420
99	442
100	285
101	292
102	307
103	318
104	987
105	1,171
106	309
107	304
108	309
109	292
110	369
111	244
112	239
113	270
114	1,432
115	1,432
116	1,422
117	1,454
118	897
119	846
120	1,015
121	744
122	603
123	835
124	674
125	39
126	439
Total Length	53,153

Table 3. Daily ESB Counts for the Historical Transect in 2015 (M = male, F = female).

Transect Interval Number	ESB Counts by Survey Date and Transect Number																								Seasonal Total		
	4-Jun		12-Jun		19-Jun		25-Jun		1-Jul		3-Jul		7-Jul		9-Jul		16-Jul		24-Jul		30-Jul		6-Aug		7-Aug				
	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M+F
1	0	0	0	0	1	0	1	0	2	1	1	1	1	0	2	2	1	0	0	0	0	0	0	0	0	0	9	4	13
2	0	0	0	0	0	0	1	0	0	0	1	0	0	1	1	1	1	0	0	0	0	0	0	0	0	0	4	2	6
3	1	0	0	0	0	0	0	0	2	1	1	0	1	0	1	1	0	0	0	0	0	0	0	0	0	0	6	2	8
4	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	1	1	1	0	0	0	0	0	0	3	2	5
5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	1
12	0	0	1	0	2	1	4	1	2	1	1	0	1	0	0	0	2	2	1	1	0	0	0	0	0	0	14	6	20
13	0	0	0	0	1	0	0	0	0	0	1	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	3	1	4
14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17	0	0	0	0	0	1	0	0	1	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	3	1	4
18	0	0	0	0	1	0	1	0	1	0	1	0	1	0	0	1	1	0	0	1	0	0	0	0	0	0	6	2	8
19	0	0	0	0	0	0	0	0	2	0	2	1	1	1	0	1	0	0	0	0	0	0	0	0	0	0	5	3	8
20	0	0	2	0	2	0	1	0	1	0	1	1	0	1	1	1	1	0	0	0	0	0	0	0	0	0	9	3	12
21	0	0	0	0	1	0	2	1	2	1	1	1	1	0	0	0	1	1	0	0	0	0	0	0	0	0	8	4	12
22	0	0	0	0	1	0	1	1	3	0	2	1	1	1	1	1	1	0	1	0	0	0	0	0	0	0	11	4	15
23	0	0	1	0	1	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	2	2	4
24	0	0	0	0	1	0	2	0	2	2	1	2	1	0	1	0	1	1	1	0	0	0	0	0	0	0	10	5	15
25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	1	1	2
26	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
27	0	0	1	0	0	0	0	1	1	1	1	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	5	2	7
28	0	0	0	0	0	0	1	0	1	2	1	2	0	1	1	0	1	0	0	0	0	0	0	0	0	0	5	5	10
29	0	0	0	0	1	0	1	0	2	2	2	1	1	1	2	2	0	0	0	0	0	0	0	0	0	0	9	6	15
30	0	0	0	0	2	0	2	1	2	1	1	0	0	0	1	0	1	1	1	1	0	0	0	0	0	0	10	4	14
31	0	0	0	0	1	0	2	1	0	2	2	0	1	1	2	1	1	0	0	1	0	0	0	0	0	0	9	6	15
32	0	0	1	0	5	2	7	3	8	4	4	6	7	8	5	6	2	3	1	1	0	1	0	0	0	0	40	34	74
33	0	0	2	1	4	2	15	7	11	5	21	14	17	14	13	14	17	11	5	4	3	3	0	0	0	0	108	75	183
34	0	0	1	0	2	0	5	2	3	3	3	4	4	5	3	4	3	2	1	2	1	2	0	1	0	0	26	25	51
35	0	0	1	0	0	0	4	1	6	2	3	2	3	3	1	1	1	2	0	0	0	0	0	0	0	0	19	11	30
Daily Total	1	0	10	1	27	6	52	19	52	29	52	36	42	38	36	36	37	27	13	12	4	6	0	1	0	0	326	211	537
M+F	1		11		33		71		81		88		80		72		64		25		10		1		0				
Sex Ratio	1.00		0.91		0.82		0.73		0.64		0.59		0.53		0.50		0.58		0.52		0.40		0.00						

Table 4. Summary of Annual ESB Historical Transect Counts at LAX for 1984-2015

Year	Number of Survey Dates	Span of Survey Dates (days)	Number of ESB Adults
1984	4	16	193
1985	Not surveyed		
1986	5	35	258
1987	9	56	473
1988	10	61	1,049
1989	11	54	1,390
1990	10	63	1,192
1991	12	90	906
1992	15	111	1,051
1993	10	58	925
1994	8	63	500
1995	10	69	1,239
1996	4	21	1,455
1997	4	21	126
1998	6	60	2,175
1999	11	64	1,741
2000	13	59	2,107
2001	10	64	2,652
2002	14	67	1,236
2003	14	72	2,688
2004	15	72	2,123
2005	14	70	2,653
2006	14	69	3,049
2007	12	60	777
2008	14	68	2,173
2009	13	70	2,859
2010	14	76	3,898
2011	14	76	4,690
2012	13	70	2,731
2013	13	64	1,319
2014	12	60	562
2015	13	64	537

Table 5. 2015 El Sequndo Blue Block Counts and Observed Behaviors (Census dates July 1 - July 4, 2015)

Block	No. of ESB Observed		No. of ESB Observed by Type of Behavior						
No.	Female	Male	Fly	Perch	Bask	Nectar	Court	Mate	Oviposit
1	22	29	42	-	-	4	2	2	1
2	8	12	13	1	1	1	2	2	-
3	-	1	1	-	-	-	-	-	-
4	3	8	9	-	-	-	2	-	-
5	3	5	5	1	-	2	-	-	-
6	7	7	11	-	-	1	2	-	-
7	7	16	15	2	3	1	2	-	-
8	11	18	17	4	3	5	-	-	-
9	21	29	31	6	5	3	2	2	1
10	6	14	18	1	-	1	-	-	-
11	4	5	7	-	1	1	-	-	-
12	-	1	1	-	-	-	-	-	-
13	8	18	15	1	3	3	2	2	-
14	14	25	37	-	-	-	2	-	-
15	13	21	30	2	1	1	-	-	-
16	22	31	48	-	-	2	2	-	1
17	-	-	-	-	-	-	-	-	-
18	6	11	16	-	1	-	-	-	-
19	1	-	1	-	-	-	-	-	-
20	4	5	6	1	1	1	-	-	-
21	-	-	-	-	-	-	-	-	-
22	1	-	-	-	-	1	-	-	-
23	-	2	2	-	-	-	-	-	-
24	1	1	1	-	-	1	-	-	-
25	4	6	6	-	-	-	2	2	-
26	-	2	2	-	-	-	-	-	-
27	7	5	11	-	-	-	-	-	1
28	-	-	-	-	-	-	-	-	-
29	-	-	-	-	-	-	-	-	-
30	-	-	-	-	-	-	-	-	-
31	1	1	2	-	-	-	-	-	-
32	-	-	-	-	-	-	-	-	-
33	-	-	-	-	-	-	-	-	-
34	-	-	-	-	-	-	-	-	-
35	8	15	23	-	-	-	-	-	-
36N	37	84	86	12	11	10	2	-	-
36S	31	55	84	-	-	-	2	-	-
37N	8	24	26	2	2	-	2	-	-
37S	26	92	72	11	21	14	-	-	-
38N	44	60	85	-	-	14	2	2	1
38S	8	31	37	-	-	2	-	-	-
39N	6	6	10	-	-	-	-	2	-
39S	6	23	21	-	2	3	2	-	1
40C	-	3	3	-	-	-	-	-	-
40N	8	28	30	3	3	-	-	-	-
40S	10	15	18	1	2	2	2	-	-
41N	8	20	18	4	2	1	2	-	1
41S	8	22	12	10	3	3	2	-	-
42N	16	17	30	-	-	3	-	-	-
42S	17	16	27	-	-	4	2	-	-
43N	19	12	23	8	-	-	-	-	-
43E	18	28	40	-	-	5	-	-	1
43W	1	1	2	-	-	-	-	-	-
44N	13	28	34	5	1	1	-	-	-
44S	13	27	28	-	7	3	2	-	-
45N	-	2	2	-	-	-	-	-	-
45S	4	12	8	1	3	4	-	-	-
46-60	-	1	1	-	-	-	-	-	-
Circle	-	-	-	-	-	-	-	-	-
TOTALS	483	895	1,067	76	76	97	40	14	8
F + M	1,378								
% Males	64.9%								

Table 6. Summary of Annual ESB Block Counts at LAX (1996 - 2015)

Block No.	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	20-Year Totals
1	107	51	96	64	3	110	77	365	119	260	256	124	132	105	186	158	115	72	47	51	2,498
2	34	25	170	72	80	123	27	166	69	134	134	38	52	74	67	58	51	41	17	20	1,452
3	0	0	14	1	0	9	119	9	15	9	10	7	5	2	6	1	1	1	3	1	213
4	22	1	1	16	1	6	66	95	30	59	43	15	61	36	107	92	56	28	16	11	762
5	26	3	10	18	10	13	18	68	9	46	25	6	12	21	27	23	14	5	3	8	365
6	8	1	13	9	125	16	19	51	14	37	28	13	25	22	55	48	30	16	17	14	561
7	23	1	8	4	24	47	40	111	40	70	88	39	64	49	101	98	52	23	24	23	929
8	103	9	147	46	47	127	42	179	47	139	161	45	58	86	71	61	29	27	30	29	1,483
9	221	48	539	286	310	258	198	512	94	493	456	74	230	200	304	293	157	85	43	50	4,851
10	54	18	134	60	28	66	86	120	55	175	135	34	84	59	131	103	85	34	11	20	1,492
11	14	1	0	1	7	3	21	61	13	106	79	24	37	10	73	60	31	11	5	9	566
12	85	55	66	57	33	53	35	5	4	0	3	2	5	15	12	9	2	1	1	1	444
13	152	35	113	92	65	107	96	168	38	340	139	33	59	103	169	135	116	61	17	26	2,064
14	5	3	19	9	15	14	26	133	30	68	121	49	71	139	117	112	117	59	19	39	1,165
15	55	0	108	27	38	81	75	234	39	128	222	50	110	186	103	96	104	65	25	34	1,780
16	6	0	36	15	13	35	47	59	12	23	73	52	83	117	94	90	51	43	32	53	934
17	3	0	1	0	1	5	0	1	0	0	1	1	1	1	2	2	2	1	1	0	23
18	47	28	120	75	65	90	48	106	15	188	83	39	80	59	137	137	88	45	14	17	1,481
19	10	10	16	27	37	30	24	2	0	0	1	1	1	1	0	0	1	4	1	1	167
20	50	75	169	245	175	346	87	133	85	118	190	16	64	70	122	86	73	36	16	9	2,165
21	11	5	37	6	7	3	0	0	1	2	3	0	0	0	0	1	2	3	1	0	82
22	1	0	4	0	1	2	7	5	2	14	9	15	16	14	9	5	11	4	1	1	121
23	1	0	0	0	1	0	1	0	0	2	4	4	5	4	3	3	8	5	3	2	46
24	18	0	20	6	23	34	0	34	6	7	6	3	9	6	4	3	6	4	3	2	194
25	0	0	4	28	53	48	33	62	19	39	53	17	42	39	16	14	23	17	6	10	523
26	6	0	4	19	25	22	0	5	10	5	14	5	18	20	17	9	17	10	7	2	215
27	0	1	0	2	0	18	6	27	14	57	49	22	56	50	26	26	27	26	15	12	434
28	1	0	1	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
29	2	0	0	9	6	7	0	0	0	0	0	1	0	0	0	0	0	0	0	0	25
30	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
31	2	0	6	5	26	23	16	41	7	5	65	11	18	12	12	14	16	10	2	2	293
32	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
33	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
34	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
35	25	3	40	43	82	126	32	81	38	66	114	46	136	133	89	84	100	73	35	23	1,369

Table 6. Summary of Annual ESB Block Counts at LAX (1996 - 2015) - continued

Block No.	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	20-Year Totals
36N	56	10	141	19	64	269	139	333	179	307	569	145	309	307	301	282	303	215	136	121	4,205
36S	36	1	46	16	68	60	56	95	34	117	134	29	147	150	97	103	122	102	75	86	1,574
37N	47	14	112	42	41	116	49	103	98	109	173	40	82	119	148	143	146	89	32	32	1,735
37S	59	5	76	19	64	156	105	255	162	198	333	143	238	264	329	334	232	202	151	118	3,443
38N	77	100	269	113	169	309	172	439	232	359	935	302	367	393	699	674	339	249	170	104	6,471
38S	52	6	32	48	82	148	67	130	72	145	271	77	197	226	180	196	162	111	57	39	2,298
39N	40	1	65	25	26	42	25	41	33	53	101	33	48	83	92	74	63	24	14	12	895
39S	29	3	74	36	58	75	38	93	38	93	143	40	55	71	119	101	70	57	28	29	1,250
40C	24	9	28	9	33	23	20	33	29	25	45	25	38	29	31	25	31	15	2	3	477
40N	91	26	385	65	161	274	163	198	184	370	461	148	239	216	262	266	178	107	45	36	3,875
40S	53	6	113	8	35	51	27	46	58	99	126	32	55	98	84	82	83	69	28	25	1,178
41N	19	0	16	18	23	80	14	41	33	79	110	49	87	108	83	83	89	61	31	28	1,052
41S	88	3	88	35	50	124	55	154	102	126	226	83	87	133	107	101	120	89	36	30	1,837
42N	39	11	51	27	87	122	53	177	60	93	108	82	196	229	232	218	161	65	39	33	2,083
42S	179	86	466	229	277	306	187	218	103	200	495	113	148	187	181	171	123	87	40	33	3,829
43N	27	29	45	70	108	170	73	135	67	114	115	41	66	121	251	247	112	66	38	31	1,926
43E	31	13	92	51	122	283	114	234	133	188	284	97	233	218	78	90	111	52	51	46	2,521
43W	28	29	34	39	77	126	49	75	26	39	64	26	51	52	42	33	21	8	4	2	825
44N	15	0	20	8	46	98	71	86	110	155	205	86	131	99	150	160	86	78	43	41	1,688
44S	7	1	12	6	43	37	19	47	51	51	76	42	87	85	109	105	77	70	36	40	1,001
45N	0	0	1	0	6	3	0	15	6	7	29	5	10	4	3	10	12	4	3	2	120
45S	2	0	2	2	8	23	0	3	5	18	51	13	27	14	32	25	33	26	14	16	314
46N	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
46S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
47A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
47B	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
47C	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
47D	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
47E	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
48	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
49	0	0	5	0	9	0	0	0	0	0	0	0	1	0	1	1	0	0	0	1	18
50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
51	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
52	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

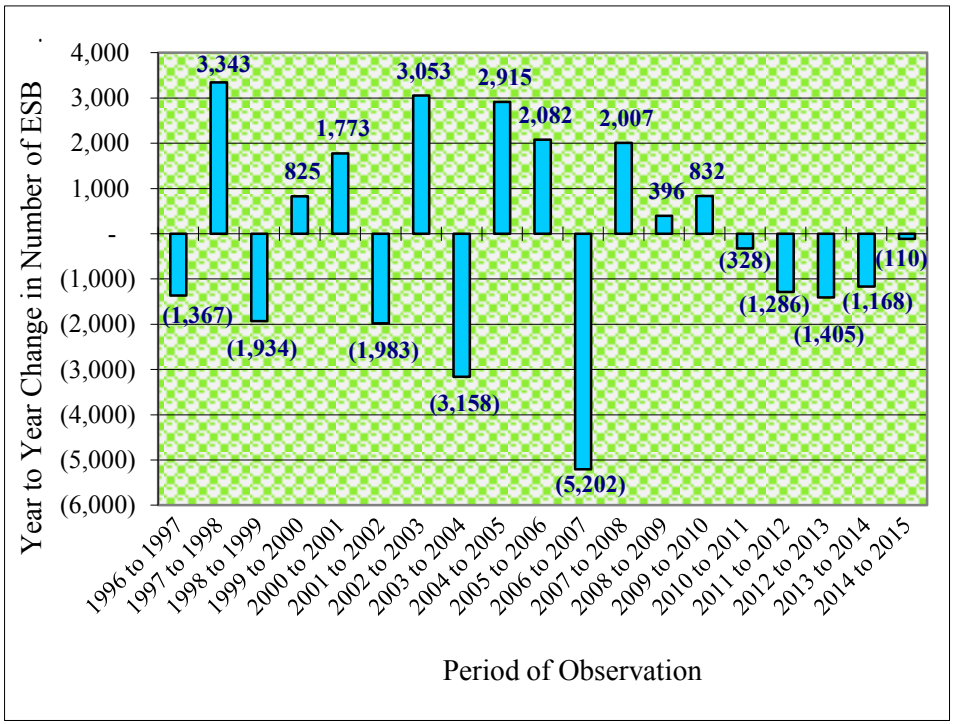
Table 6. Summary of Annual ESB Block Counts at LAX (1996 - 2015) - continued

Block No.	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	20-Year Totals
53	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
55M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
55N	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
55S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
56M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
56N	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
56S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
57N	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
57S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
58N	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
58S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
59N	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
59S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
60M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
60N	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
60S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Circle	0	0	0	8	0	15	8	19	5	25	23	3	14	4	4	2	2	0	0	0	132
Total	6,085	4,720	8,065	6,133	6,960	8,735	6,754	9,809	6,653	9,570	11,654	2,440	4,447	4,843	5,675	9,369	8,085	6,682	5,516	5,408	137,603

Table 7. Year-to-year changes in number and percentage change in Block ESBs Census (1996 - 2015)

Measure	1996 to 1997	1997 to 1998	1998 to 1999	1999 to 2000	2000 to 2001	2001 to 2002	2002 to 2003	2003 to 2004	2004 to 2005	2005 to 2006	2006 to 2007	2007 to 2008	2008 to 2009	2009 to 2010	2010 to 2011	2011 to 2012	2012 to 2013	2013 to 2014	2014 to 2015
Number	(1,367)	3,343	(1,934)	825	1,773	(1,983)	3,053	(3,158)	2,915	2,082	(5,202)	2,007	396	832	(328)	(1,286)	(1,405)	(1,168)	(110)
Percent	-65%	460%	-48%	39%	60%	-42%	111%	-54%	110%	37%	-68%	82%	9%	17%	-6%	-24%	-35%	-44%	-7%

1 2 3 4 5 6 7 8 9 10 1 2 3 4 5 6 7 8 9 10



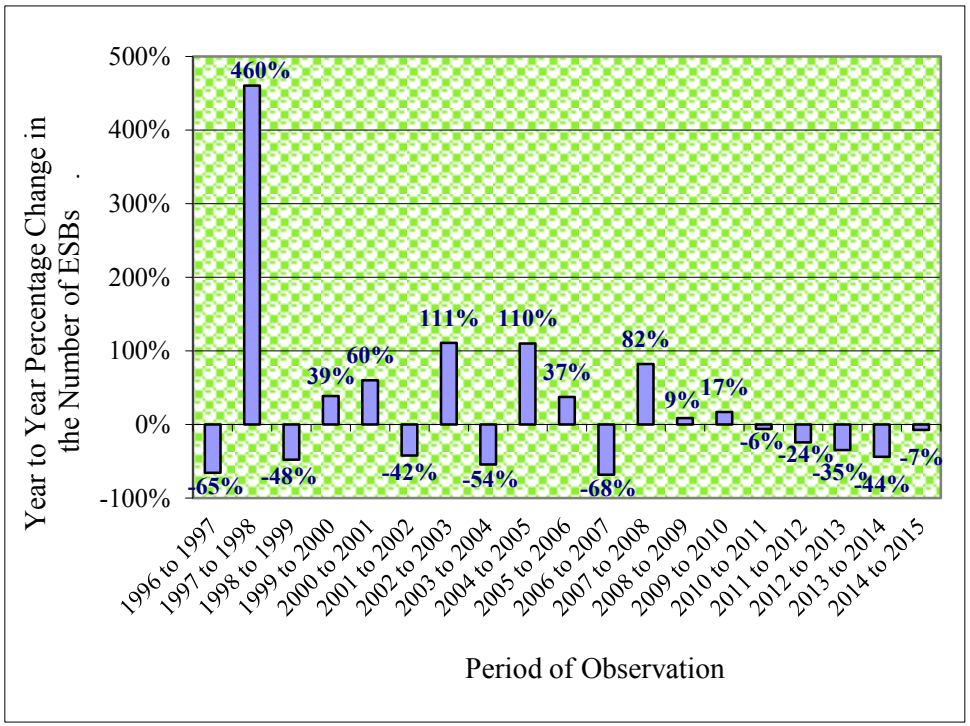


Table 8. Comparison of ESB Seasonal Population Estimates for 1998 - 2015

Year	Low Population Estimate	High Population Estimate
1998	83,000	87,000
1999	36,624	39,282
2000	66,650	69,584
2001	75,773	79,109
2002	51,725	54,002
2003	105,183	109,814
2004	49,617	51,801
2005	84,088	87,790
2006	136,708	142,727
2007	41,915	43,761
2008	64,576	67,419
2009	78,893	82,460
2010	111,562	116,474
2011	120,910	125,920
2012	83,943	87,639
2013	43,492	45,406
2014	26,302	27,460
2015	24,559	25,641

Table 9. Annual ESB Numbers (from the Block Counts) and Annual (July 1st through June 30th) Rainfall Totals

Survey Year	ESB Numbers	Rainfall
1996	2,093	10.29
1997	726 *	13.30
1998	4,069	31.28
1999	2,135	9.27
2000	2,960	10.11
2001	4,733	15.56
2002	2,750	4.16
2003	5,803	10.38
2004	2,645	8.63
2005	5,560	26.51
2006	7,642	10.89
2007	2,440	2.63
2008	4,447	10.24
2009	4,843	8.13
2010	5,675	12.43
2011	5,347	17.85
2012	4,061	7.61
2013	2,656	6.89
2014	1,488	4.48
2015	1,378	7.45

* Note - only latter part of the 1997 season was surveyed

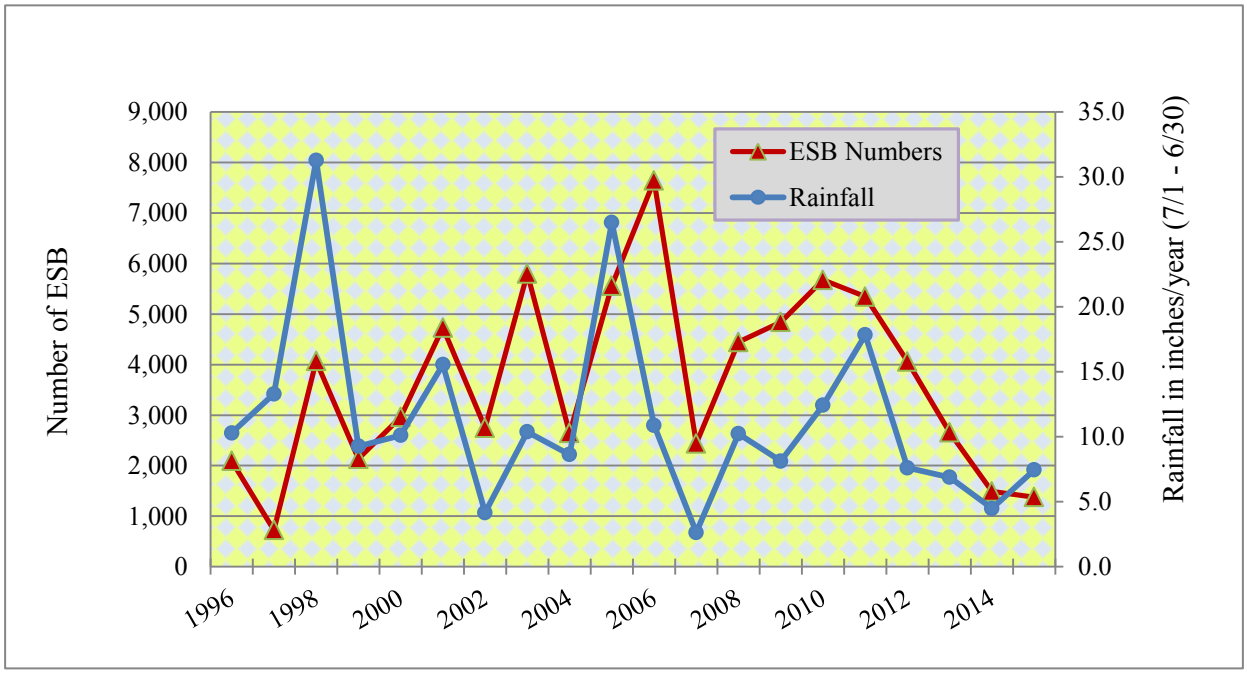
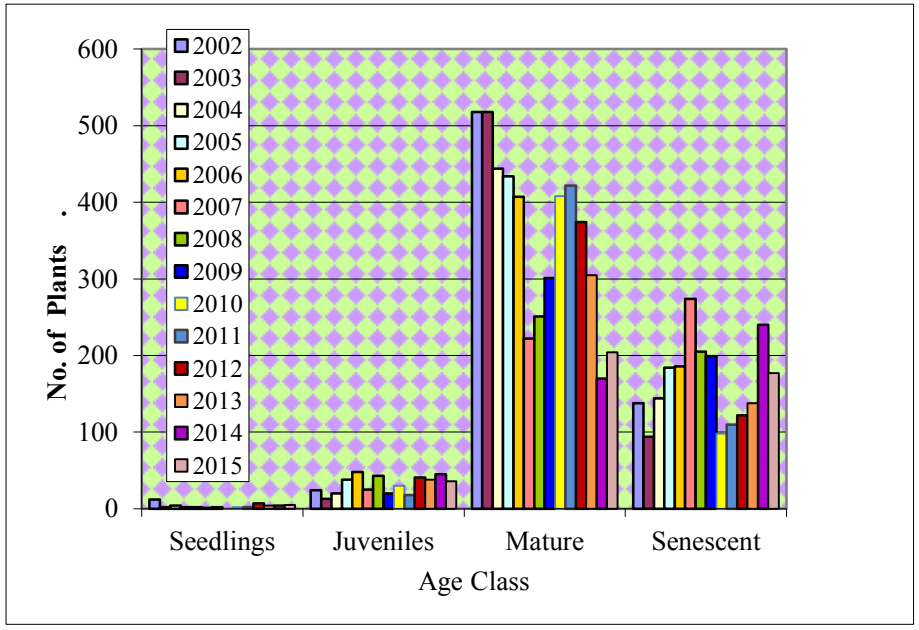


Table 10. 2015 Summary of Buckwheat Plants on the Historical Transect: Age Class and Flowerheads per Plant

Historical Interval Number	All Age Classes		Seedlings			Juveniles			Mature			Senescent		
	Total Plants	Average Flowerheads per Plant	Total Plants	Percent Seedlings	Average Flowerheads per Plant	Total Plants	Percent Juveniles	Average Flowerheads per Plant	Total Plants	Percent Mature	Average Flowerheads per Plant	Total Plants	Percent Senescent	Average Flowerheads per Plant
1	5	54	0	0.0%	0	0	0.0%	0	3	60.0%	57	2	40.0%	50
2	3	43	0	0.0%	0	0	0.0%	0	1	33.3%	35	2	66.7%	48
3	7	86	0	0.0%	0	2	28.6%	30	2	28.6%	193	3	42.9%	52
4	3	350	0	0.0%	0	0	0.0%	0	3	100.0%	350	0	0.0%	0
5	0	0	0	na	0	0	na	0	0	na	0	0	na	0
6	0	0	0	na	0	0	na	0	0	na	0	0	na	0
7	0	0	0	na	0	0	na	0	0	na	0	0	na	0
8	3	35	0	0.0%	0	0	0.0%	0	0	0.0%	0	3	100.0%	35
9	0	0	0	na	0	0	na	0	0	na	0	0	na	0
10	7	117	0	0.0%	0	0	0.0%	0	0	0.0%	0	7	100.0%	117
11	20	174	0	0.0%	0	5	25.0%	15	4	20.0%	263	11	55.0%	214
12	39	138	5	12.8%	3	14	35.9%	9	3	7.7%	515	17	43.6%	218
13	4	133	0	0.0%	0	0	0.0%	0	1	25.0%	35	3	75.0%	165
14	2	78	0	0.0%	0	0	0.0%	0	1	50.0%	135	1	50.0%	20
15	0	0	0	na	0	0	na	0	0	na	0	0	na	0
16	0	0	0	na	0	0	na	0	0	na	0	0	na	0
17	5	160	0	0.0%	0	1	20.0%	9	1	20.0%	600	3	60.0%	63
18	10	60	0	0.0%	0	0	0.0%	0	1	10.0%	150	9	90.0%	49
19	1	40	0	0.0%	0	0	0.0%	0	0	0.0%	0	1	100.0%	40
20	13	830	0	0.0%	0	0	0.0%	0	3	23.1%	142	10	76.9%	1,037
21	16	146	0	0.0%	0	4	25.0%	20	2	12.5%	163	10	62.5%	193
22	16	177	0	0.0%	0	4	25.0%	21	9	56.3%	194	3	18.8%	337
23	12	310	0	0.0%	0	0	0.0%	0	6	50.0%	478	6	50.0%	142
24	2	885	0	0.0%	0	0	0.0%	0	2	100.0%	885	0	0.0%	0
25	23	217	0	0.0%	0	0	0.0%	0	11	47.8%	235	12	52.2%	201
26	1	240	0	0.0%	0	0	0.0%	0	0	0.0%	0	1	100.0%	240
27	10	87	0	0.0%	0	0	0.0%	0	7	70.0%	61	3	30.0%	147
28	5	57	0	0.0%	0	1	20.0%	12	2	40.0%	45	2	40.0%	93
29	11	39	0	0.0%	0	0	0.0%	0	1	9.1%	50	10	90.9%	38
30	19	531	0	0.0%	0	0	0.0%	0	17	89.5%	489	2	10.5%	885
31	20	716	0	0.0%	0	0	0.0%	0	17	85.0%	788	3	15.0%	308
32	19	308	0	0.0%	0	0	0.0%	0	7	36.8%	356	12	63.2%	280
33	24	1,262	0	0.0%	0	2	8.3%	17	14	58.3%	1,707	8	33.3%	796
34	63	1,586	0	0.0%	0	1	1.6%	12	47	74.6%	1,981	15	23.8%	451
35	59	814	0	0.0%	0	2	3.4%	45	39	66.1%	1,078	18	30.5%	327
Total	422	586	5	1.2%	3	36	8.5%	16	204	48.3%	974	177	41.9%	290

Table 11. Number of buckwheat plants by age class on the Historical Transect.

Year	Total	Number of Plants by Age Class							
		Seedlings		Juveniles		Mature		Senescent	
		No.	Percent	No.	Percent	No.	Percent	No.	Percent
2002	692	12	2%	24	3%	518	75%	138	20%
2003	627	2	0%	13	2%	518	83%	94	15%
2004	612	4	1%	20	3%	444	73%	144	24%
2005	658	2	0%	38	6%	434	66%	184	28%
2006	643	2	0%	48	7%	407	63%	186	29%
2007	522	1	0%	25	5%	222	43%	274	52%
2008	501	2	0%	43	9%	251	50%	205	41%
2009	520	0	0%	20	4%	301	58%	199	38%
2010	538	2	0%	30	6%	408	76%	98	18%
2011	552	2	0%	18	3%	422	76%	110	20%
2012	544	7	1%	41	8%	374	69%	122	22%
2013	485	4	1%	38	8%	305	63%	138	28%
2014	459	4	1%	45	10%	170	37%	240	52%
2015	422	5	1%	36	9%	204	48%	177	42%



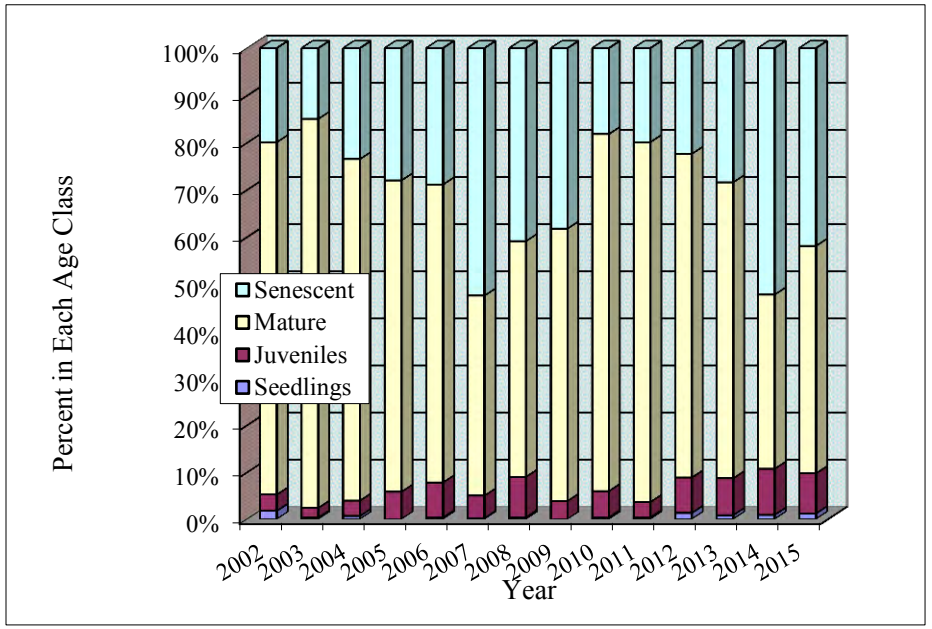


Table 12. Average number of flowerheads per plant by age class on the Historical Transect.

Year	Average All Plants	Average Flowerheads per Plant by Age Class			
		Seedlings	Juveniles	Mature	Senescent
2002	486	31	41	634	44
2003	638	20	40	763	43
2004	594	6	23	797	63
2005	771	3	29	1,114	122
2006	833	3	20	1,255	146
2007	318	2	9	642	91
2008	621	2	16	1,112	153
2009	1,001	-	23	1,613	194
2010	1,137	2	19	1,482	121
2011	1,667	2	19	2,147	188
2012	1,612	2	18	2,270	276
2013	1,108	3	17	1,666	238
2014	707	1	13	1,611	223
2015	586	3	16	974	290

Table 13. Total number of buckwheat plants, flowerheads and ESB butterflies on the Historical Transect (2002 - 2015)

Year	Number of Plants	Number of Flowerheads	Number of ESB
2002	692	336,013	1,236
2003	627	399,783	2,688
2004	612	363,584	2,123
2005	658	506,660	2,653
2006	643	535,619	3,049
2007	522	165,996	777
2008	501	311,200	2,173
2009	520	524,599	2,859
2010	538	617,236	3,898
2011	552	926,982	4,690
2012	544	883,431	2,731
2013	485	541,616	1,319
2014	459	328,030	562
2015	422	250,706	537

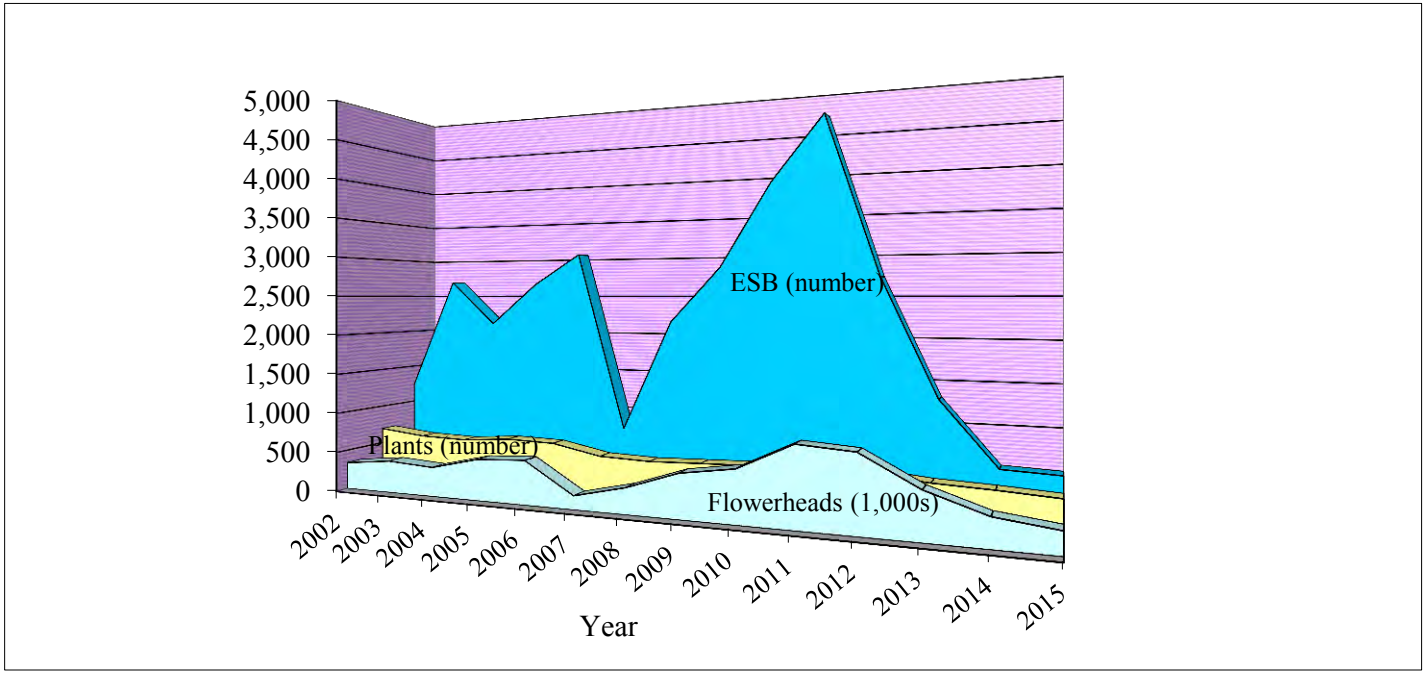


Table 14. 2015 Summary of Buckwheat Plants on Buckwheat Block Transects: Age Class and Flowerheads per Plant
El Segundo Blue Butterfly Preserve at LAX

Block Transect Number	All Age Classes		Seedlings			Juveniles			Mature			Senescent		
	Total Plants	Average Flowerheads per Plant	Total Plants	Percent Seedlings	Average Flowerheads per Plant	Total Plants	Percent Juveniles	Average Flowerheads per Plant	Total Plants	Percent Mature	Average Flowerheads per Plant	Total Plants	Percent Senescent	Average Flowerheads per Plant
1	18	722	0	0.0%	0	5	27.8%	19	7	38.9%	1,340	6	33.3%	588
2	2	525	0	0.0%	0	0	0.0%	0	0	0.0%	0	2	100.0%	525
3	16	253	1	6.3%	1	3	18.8%	8	9	56.3%	411	3	18.8%	107
4	29	112	3	10.3%	3	6	20.7%	14	8	27.6%	234	12	41.4%	108
5	88	115	4	4.5%	2	36	40.9%	14	17	19.3%	363	31	35.2%	110
6	48	155	0	0.0%	0	16	33.3%	21	15	31.3%	377	17	35.4%	84
7	0	0	0	na	0	0	na	0	0	na	0	0	na	0
8	2	23	0	0.0%	0	1	50.0%	6	0	0.0%	0	1	50.0%	40
9	5	72	0	0.0%	0	1	20.0%	7	3	60.0%	97	1	20.0%	65
10	4	594	0	0.0%	0	0	0.0%	0	3	75.0%	617	1	25.0%	525
11	1	900	0	0.0%	0	0	0.0%	0	1	100.0%	900	0	0.0%	0
12	0	0	0	na	0	0	na	0	0	na	0	0	na	0
13	23	141	0	0.0%	0	13	56.5%	13	6	26.1%	428	4	17.4%	128
14	7	28	0	0.0%	0	3	42.9%	19	0	0.0%	0	4	57.1%	35
15	4	339	0	0.0%	0	0	0.0%	0	0	0.0%	0	4	100.0%	339
16	0	0	0	na	0	0	na	0	0	na	0	0	na	0
17	46	555	0	0.0%	0	23	50.0%	12	12	26.1%	1,733	11	23.9%	405
18	12	117	0	0.0%	0	9	75.0%	19	1	8.3%	750	2	16.7%	243
19	28	210	0	0.0%	0	10	35.7%	22	9	32.1%	513	9	32.1%	114
20	33	388	0	0.0%	0	7	21.2%	14	12	36.4%	782	14	42.4%	236
21	12	269	1	8.3%	4	1	8.3%	21	1	8.3%	725	9	75.0%	276
22	37	358	5	13.5%	5	18	48.6%	19	12	32.4%	958	2	5.4%	700
23	63	127	12	19.0%	3	19	30.2%	15	6	9.5%	597	26	41.3%	159
24	6	515	0	0.0%	0	0	0.0%	0	4	66.7%	675	2	33.3%	195
25	2	113	0	0.0%	0	0	0.0%	0	0	0.0%	0	2	100.0%	113
26	5	150	0	0.0%	0	0	0.0%	0	1	20.0%	450	4	80.0%	75
27	5	213	0	0.0%	0	2	40.0%	22	2	40.0%	450	1	20.0%	120
28	8	110	0	0.0%	0	0	0.0%	0	3	37.5%	175	5	62.5%	71
29	53	376	0	0.0%	0	5	9.4%	11	16	30.2%	710	32	60.4%	267
30	49	429	3	6.1%	4	11	22.4%	17	27	55.1%	707	8	16.3%	216
31	81	424	8	9.9%	3	24	29.6%	20	32	39.5%	861	17	21.0%	371
32	115	275	6	5.2%	3	56	48.7%	18	26	22.6%	939	27	23.5%	229

Table 14. 2015 Summary of Buckwheat Plants on Buckwheat Block Transects: Age Class and Flowerheads per Plant
El Segundo Blue Butterfly Preserve at LAX - continued

Block Transect Number	All Age Classes		Seedlings			Juveniles			Mature			Senescent		
	Total Plants	Average Flowerheads per Plant	Total Plants	Percent Seedlings	Average Flowerheads per Plant	Total Plants	Percent Juveniles	Average Flowerheads per Plant	Total Plants	Percent Mature	Average Flowerheads per Plant	Total Plants	Percent Senescent	Average Flowerheads per Plant
33	46	125	7	15.2%	3	20	43.5%	12	8	17.4%	96	11	23.9%	428
34	27	151	0	0.0%	0	12	44.4%	11	4	14.8%	313	11	40.7%	245
35	12	1,030	0	0.0%	0	0	0.0%	0	11	91.7%	1,033	1	8.3%	1,000
36	29	481	2	6.9%	3	18	62.1%	23	3	10.3%	4,298	6	20.7%	105
37	17	289	0	0.0%	0	7	41.2%	12	5	29.4%	877	5	29.4%	90
38	17	48	0	0.0%	0	5	29.4%	12	2	11.8%	120	10	58.8%	51
39	32	187	0	0.0%	0	4	12.5%	18	4	12.5%	391	24	75.0%	181
40	37	93	0	0.0%	0	3	8.1%	15	3	8.1%	117	31	83.8%	99
41	53	183	4	7.5%	2	7	13.2%	17	18	34.0%	312	24	45.3%	166
42	39	157	0	0.0%	0	17	43.6%	13	10	25.6%	437	12	30.8%	129
43	14	243	0	0.0%	0	4	28.6%	16	0	0.0%	0	10	71.4%	334
44	13	167	0	0.0%	0	4	30.8%	18	3	23.1%	388	6	46.2%	155
45	61	255	3	4.9%	2	24	39.3%	14	15	24.6%	655	19	31.1%	283
46	4	60	0	0.0%	0	0	0.0%	0	0	0.0%	0	4	100.0%	60
47	24	335	1	4.2%	1	0	0.0%	0	15	62.5%	348	8	33.3%	354
48	53	291	0	0.0%	0	7	13.2%	23	15	28.3%	663	31	58.5%	171
49	31	114	0	0.0%	0	9	29.0%	20	1	3.2%	450	21	67.7%	138
50	46	187	6	13.0%	3	11	23.9%	19	11	23.9%	598	18	39.1%	100
51	21	148	0	0.0%	0	8	38.1%	23	6	28.6%	277	7	33.3%	181
52	46	97	5	10.9%	3	26	56.5%	14	8	17.4%	318	7	15.2%	221
53	39	528	0	0.0%	0	11	28.2%	14	11	28.2%	1,442	17	43.6%	270
54	7	959	0	0.0%	0	0	0.0%	0	3	42.9%	2,050	4	57.1%	140
55	12	1,277	0	0.0%	0	2	16.7%	11	4	33.3%	3,213	6	50.0%	408
56	4	1,229	0	0.0%	0	0	0.0%	0	2	50.0%	2,300	2	50.0%	158
57	9	244	0	0.0%	0	0	0.0%	0	1	11.1%	250	8	88.9%	243
58	25	217	0	0.0%	0	6	24.0%	22	3	12.0%	665	16	64.0%	206
59	5	1,143	0	0.0%	0	1	20.0%	24	3	60.0%	1,883	1	20.0%	40
60	25	429	0	0.0%	0	4	16.0%	22	8	32.0%	634	13	52.0%	428
61	26	721	0	0.0%	0	9	34.6%	7	8	30.8%	1,835	9	34.6%	444
62	39	255	0	0.0%	0	0	0.0%	0	10	25.6%	660	29	74.4%	116
63	9	438	0	0.0%	0	1	11.1%	10	6	66.7%	641	2	22.2%	45
64	75	127	0	0.0%	0	25	33.3%	25	9	12.0%	421	41	54.7%	125

Table 14. 2015 Summary of Buckwheat Plants on Buckwheat Block Transects: Age Class and Flowerheads per Plant
El Segundo Blue Butterfly Preserve at LAX - continued

Block Transect Number	All Age Classes		Seedlings			Juveniles			Mature			Senescent		
	Total Plants	Average Flowerheads per Plant	Total Plants	Percent Seedlings	Average Flowerheads per Plant	Total Plants	Percent Juveniles	Average Flowerheads per Plant	Total Plants	Percent Mature	Average Flowerheads per Plant	Total Plants	Percent Senescent	Average Flowerheads per Plant
65	62	402	6	9.7%	2	15	24.2%	17	15	24.2%	1,306	26	41.9%	196
66	16	871	0	0.0%	0	2	12.5%	26	7	43.8%	1,822	7	43.8%	161
67	6	9	0	0.0%	0	6	100.0%	9	0	0.0%	0	0	0.0%	0
68	10	629	0	0.0%	0	0	0.0%	0	6	60.0%	938	4	40.0%	166
69	13	1,148	0	0.0%	0	1	7.7%	29	6	46.2%	2,426	6	46.2%	56
70	26	140	3	11.5%	2	6	23.1%	28	8	30.8%	357	9	34.6%	69
71	6	96	0	0.0%	0	0	0.0%	0	0	0.0%	0	6	100.0%	96
72	0	0	0	na	0	0	na	0	0	na	0	0	na	0
73	6	1,333	0	0.0%	0	0	0.0%	0	2	33.3%	3,800	4	66.7%	100
74	7	195	0	0.0%	0	3	42.9%	17	1	14.3%	535	3	42.9%	260
75	8	766	0	0.0%	0	0	0.0%	0	4	50.0%	1,359	4	50.0%	173
76	17	518	0	0.0%	0	7	41.2%	18	6	35.3%	1,380	4	23.5%	98
77	4	494	0	0.0%	0	0	0.0%	0	3	75.0%	592	1	25.0%	200
78	2	1,205	0	0.0%	0	0	0.0%	0	2	100.0%	1,205	0	0.0%	0
79	0	0	0	na	0	0	na	0	0	na	0	0	na	0
80	1	225	0	0.0%	0	0	0.0%	0	1	100.0%	225	0	0.0%	0
81	0	0	0	na	0	0	na	0	0	na	0	0	na	0
82	41	607	5	12.2%	2	13	31.7%	21	14	34.1%	1,572	9	22.0%	287
83	7	308	0	0.0%	0	2	28.6%	22	4	57.1%	511	1	14.3%	70
84	1	125	0	0.0%	0	0	0.0%	0	1	100.0%	125	0	0.0%	0
85	23	1,119	0	0.0%	0	9	39.1%	16	10	43.5%	2,518	4	17.4%	104
86	149	224	6	4.0%	2	22	14.8%	15	39	26.2%	564	82	55.0%	135
87	75	349	8	10.7%	2	12	16.0%	12	18	24.0%	863	37	49.3%	283
88	29	1,072	0	0.0%	0	0	0.0%	0	21	72.4%	1,353	8	27.6%	336
89	21	719	0	0.0%	0	2	9.5%	17	10	47.6%	1,362	9	42.9%	159
90	18	902	0	0.0%	0	4	22.2%	11	6	33.3%	2,133	8	44.4%	424
91	9	640	0	0.0%	0	1	11.1%	9	3	33.3%	1,245	5	55.6%	403
92	39	1,199	0	0.0%	0	8	20.5%	12	12	30.8%	3,646	19	48.7%	152
93	24	390	0	0.0%	0	0	0.0%	0	6	25.0%	1,067	18	75.0%	164
94	7	989	0	0.0%	0	0	0.0%	0	1	14.3%	6,100	6	85.7%	138
95	4	465	0	0.0%	0	0	0.0%	0	2	50.0%	833	2	50.0%	98
96	24	120	0	0.0%	0	1	4.2%	8	8	33.3%	261	15	62.5%	52

Table 14. 2015 Summary of Buckwheat Plants on Buckwheat Block Transects: Age Class and Flowerheads per Plant
El Segundo Blue Butterfly Preserve at LAX - continued

Block Transect Number	All Age Classes		Seedlings			Juveniles			Mature			Senescent		
	Total Plants	Average Flowerheads per Plant	Total Plants	Percent Seedlings	Average Flowerheads per Plant	Total Plants	Percent Juveniles	Average Flowerheads per Plant	Total Plants	Percent Mature	Average Flowerheads per Plant	Total Plants	Percent Senescent	Average Flowerheads per Plant
97	25	98	1	4.0%	2	5	20.0%	19	6	24.0%	204	13	52.0%	87
98	31	228	0	0.0%	0	2	6.5%	18	6	19.4%	804	23	74.2%	96
99	20	350	1	5.0%	3	3	15.0%	22	9	45.0%	662	7	35.0%	140
100	50	405	9	18.0%	1	3	6.0%	12	6	12.0%	1,894	32	64.0%	277
101	30	493	0	0.0%	0	0	0.0%	0	6	20.0%	1,763	24	80.0%	175
102	20	770	0	0.0%	0	0	0.0%	0	2	10.0%	3,895	18	90.0%	423
103	15	942	0	0.0%	0	0	0.0%	0	5	33.3%	2,352	10	66.7%	238
104	54	226	1	1.9%	2	3	5.6%	18	14	25.9%	547	36	66.7%	125
105	29	431	0	0.0%	0	0	0.0%	0	7	24.1%	1,583	22	75.9%	65
106	4	178	0	0.0%	0	0	0.0%	0	3	75.0%	215	1	25.0%	65
107	16	569	0	0.0%	0	1	6.3%	8	9	56.3%	752	6	37.5%	388
108	5	148	0	0.0%	0	2	40.0%	26	1	20.0%	525	2	40.0%	83
109	9	267	0	0.0%	0	0	0.0%	0	2	22.2%	575	7	77.8%	179
110	51	343	0	0.0%	0	5	9.8%	19	11	21.6%	1,287	35	68.6%	92
111	36	175	0	0.0%	0	3	8.3%	11	7	19.4%	358	26	72.2%	144
112	15	172	0	0.0%	0	1	6.7%	12	3	20.0%	482	11	73.3%	102
113	3	157	0	0.0%	0	1	33.3%	16	1	33.3%	440	1	33.3%	15
114	13	352	0	0.0%	0	1	7.7%	32	2	15.4%	1,550	10	76.9%	145
115	44	319	0	0.0%	0	5	11.4%	20	12	27.3%	907	27	61.4%	113
116	25	169	0	0.0%	0	0	0.0%	0	7	28.0%	340	18	72.0%	102
117	36	496	0	0.0%	0	4	11.1%	16	7	19.4%	1,778	25	69.4%	213
118	14	327	0	0.0%	0	0	0.0%	0	7	50.0%	604	7	50.0%	50
119	6	445	0	0.0%	0	1	16.7%	20	5	83.3%	530	0	0.0%	0
120	2	68	0	0.0%	0	0	0.0%	0	1	50.0%	85	1	50.0%	50
121	1	50	0	0.0%	0	0	0.0%	0	0	0.0%	0	1	100.0%	50
122	0	0	0	na	0	0	na	0	0	na	0	0	na	0
123	1	20	0	0.0%	0	0	0.0%	0	0	0.0%	0	1	100.0%	20
124	7	3,037	0	0.0%	0	0	0.0%	0	7	100.0%	3,037	0	0.0%	0
125	2	3,200	0	0.0%	0	0	0.0%	0	2	100.0%	3,200	0	0.0%	0
126	3	100	0	0.0%	0	0	0.0%	0	2	66.7%	138	1	33.3%	25
Total	2,921	355	111	3.8%	3	668	22.9%	17	809	27.7%	968	1,333	45.6%	184

Table 15. Number and percentage of buckwheat plants by age class on the Block Transects.
(126 Transects)

Year	Total	Number of Plants by Age Class							
		Seedlings		Juveniles		Mature		Senescent	
		No.	Percent	No.	Percent	No.	Percent	No.	Percent
2003	2,192	4	0%	131	6%	1,583	72%	474	22%
2004	2,246	4	0%	145	6%	1,507	67%	590	26%
2005	2,519	137	5%	232	9%	1,543	61%	607	24%
2006	2,575	120	5%	434	17%	1,508	59%	513	20%
2007	2,006	24	1%	329	16%	649	32%	1,004	50%
2008	2,185	15	1%	392	18%	872	40%	906	41%
2009	2,244	3	0%	222	10%	1,079	48%	940	42%
2010	2,348	12	1%	194	8%	1,507	64%	635	27%
2011	2,490	62	2%	304	12%	1,560	63%	564	23%
2012	2,640	73	3%	403	15%	1,569	59%	595	23%
2013	2,614	117	4%	395	15%	1,131	43%	971	37%
2014	2,818	207	7%	572	20%	894	32%	1,145	41%
2015	2,921	111	4%	668	23%	809	28%	1,333	46%

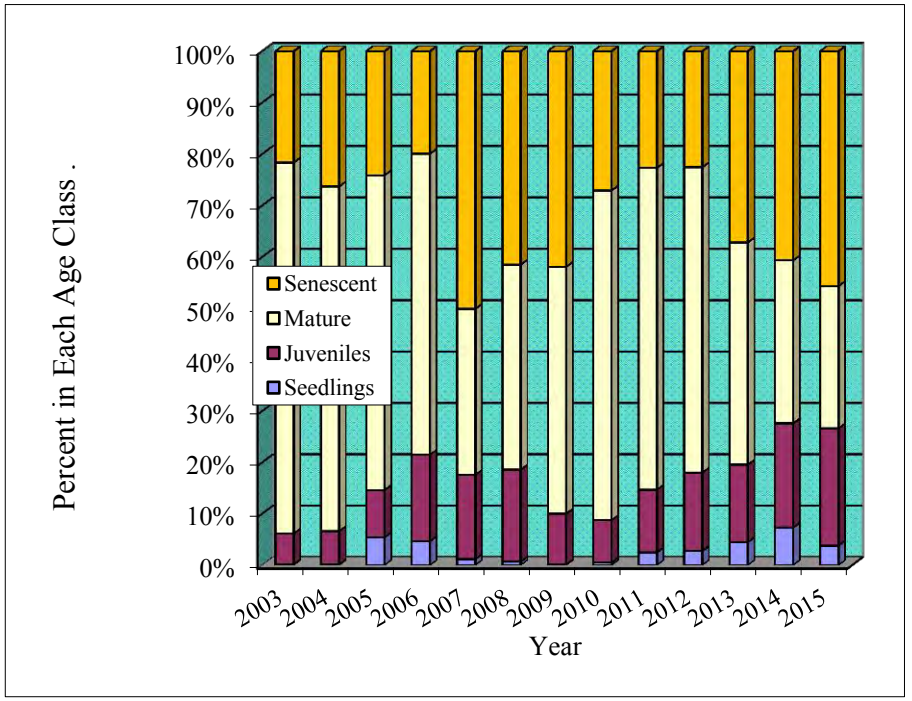


Table 16. Average number of flowerheads per plant by age class on the Block Transects (126 Transects)

Year	Average All Plants	Average Flowerheads per Plant by Age Class			
		Seedlings	Juveniles	Mature	Senescent
2003	493	6	31	662	57
2004	412	5	27	586	65
2005	884	2	26	1,378	156
2006	997	3	18	1,642	159
2007	237	4	17	564	104
2008	517	2	18	1,132	150
2009	476	2	18	895	106
2010	528	2	14	755	155
2011	714	1	14	1,057	224
2012	600	4	19	947	156
2013	485	2	18	966	174
2014	316	2	13	801	149
2015	355	3	17	968	184

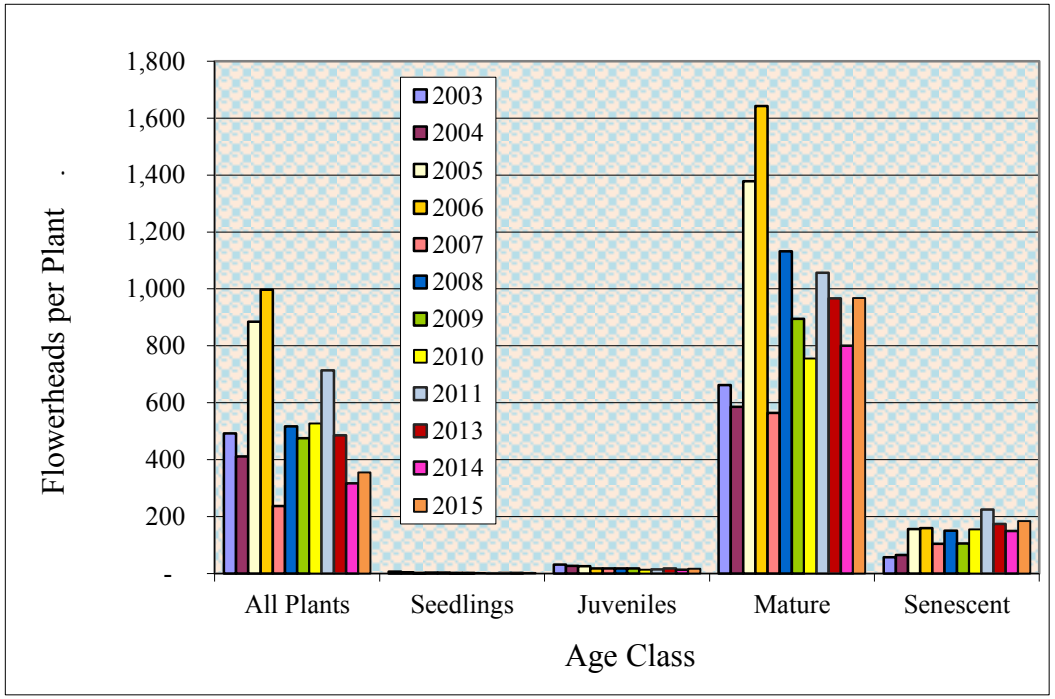


Table 17. Total number of buckwheat plants and flowerheads on the Block Transects
Total number of ESB butterflies observed during July Block Counts (2003 - 2015)

Year	Number of Plants	Number of Flowerheads	Number of ESB
2003	2,192	1,079,811	5,803
2004	2,246	924,629	2,645
2005	2,519	2,227,099	5,560
2006	2,575	2,566,623	7,642
2007	2,006	476,552	2,440
2008	2,185	1,130,353	4,447
2009	2,244	1,069,559	4,843
2010	2,348	1,239,858	5,675
2011	2,490	1,779,673	5,347
2012	2,640	1,586,425	4,061
2013	2,614	1,269,247	2,656
2014	2,818	894,208	1,488
2015	2,921	1,039,297	1,378

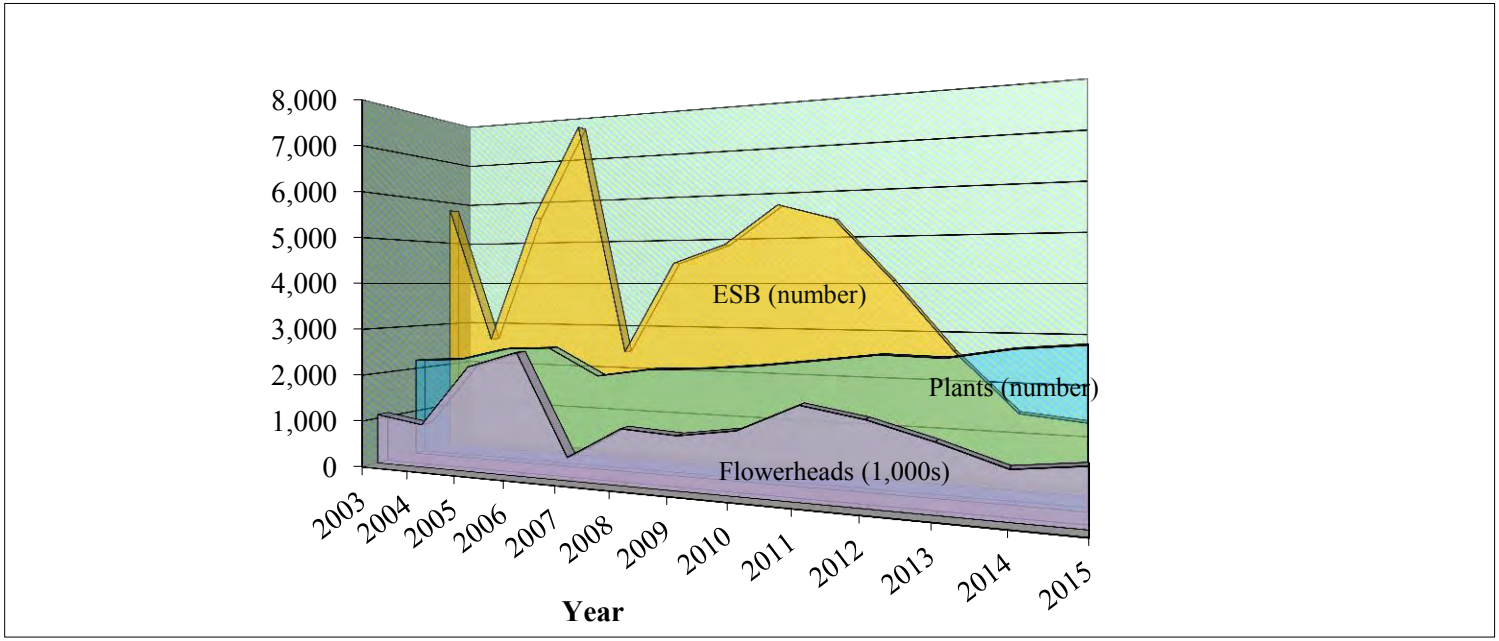
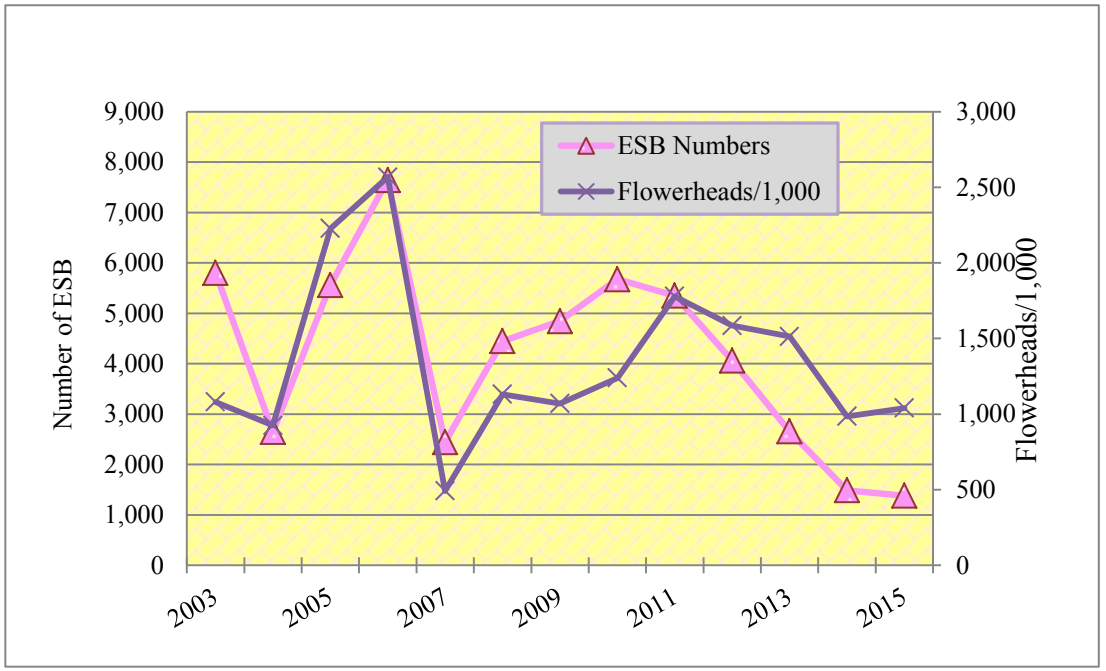
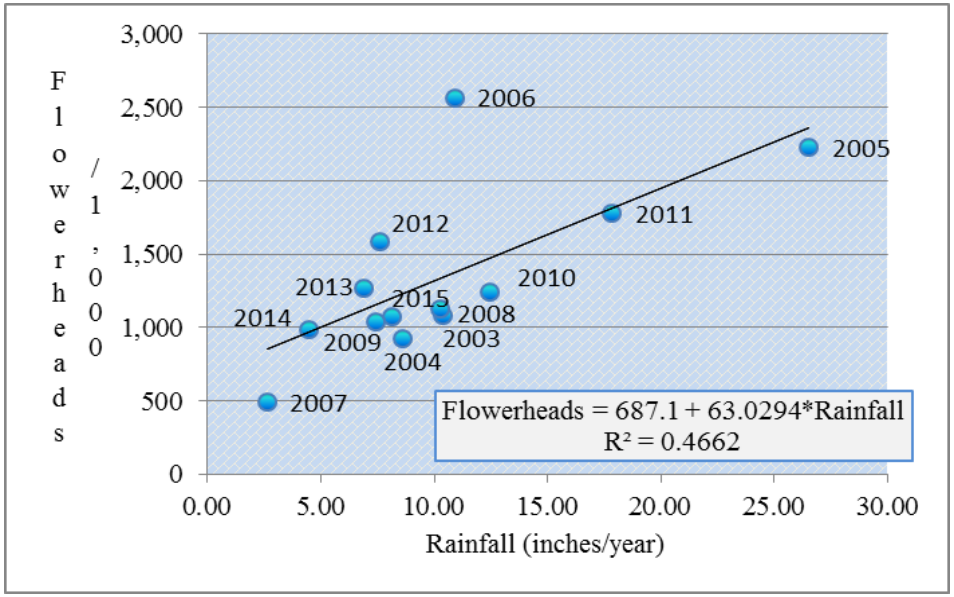


Table 18. Annual ESB Numbers (from the Block Counts), Annual Rainfall and Flowerheads (in 1,000s from the Block Transect Count)

Survey Year	ESB Numbers	Rainfall (July 1 - June 30)	Flowerheads/ 1,000
2003	5,803	10.38	1,080
2004	2,645	8.63	925
2005	5,560	26.51	2,227
2006	7,642	10.89	2,567
2007	2,440	2.63	491
2008	4,447	10.24	1,130
2009	4,843	8.13	1,070
2010	5,675	12.43	1,239
2011	5,347	17.85	1,778
2012	4,061	7.61	1,585
2013	2,656	6.89	1,512
2014	1,488	4.45	984
2015	1,378	7.45	1,039





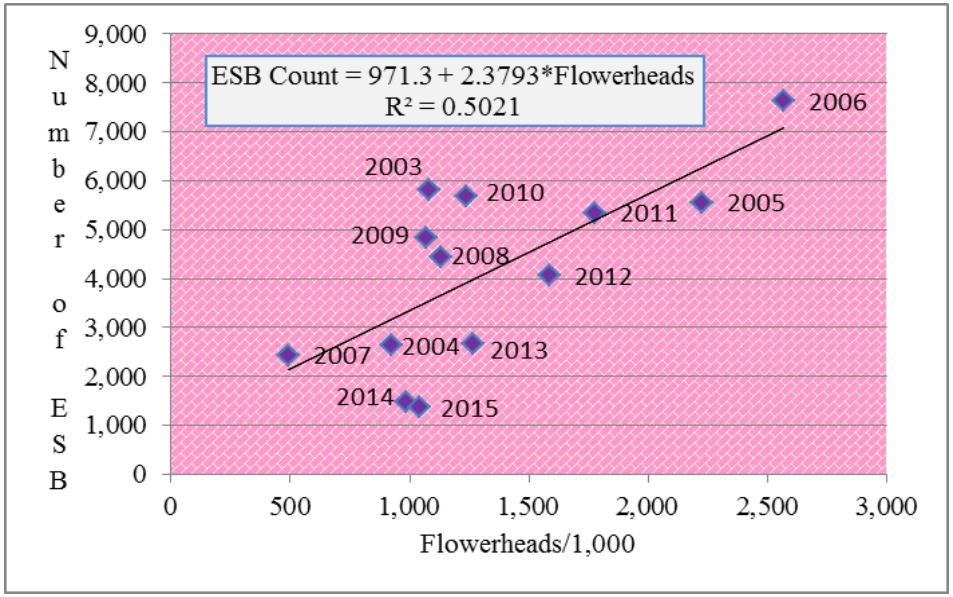


Table 19: Estimates of the number of flowerheads on Block Transects and ESB butterflies observed in Block Census Counts

Estimates made using equations estimated using annual rainfall amounts and flowerhead counts

Equation Used (see note below)	Independent Variable		Dependent Variable		
			No. of Flowerheads in 2015 (in 1,000's)		
	Variable Name	Value	Estimate	Actual	Difference
2014 Equation (1)	Rainfall (inches)	7.45	1,169	1,039	(130)
2015 Equation (2)	Rainfall (inches)	7.45	1,157	1,039	(117)
			No. of ESB butterflies in 2015		
			Estimate	Actual	Difference
2014 Equation (3)	Flowerheads (1,000's)	1,169	3,959	1,378	(2,581)
2014 Equation (3)	Flowerheads (1,000's)	1,039	3,673	1,378	(2,295)
2015 Equation (4)	Flowerheads (1,000's)	1,039	3,445	1,378	(2,067)

Note: The equations used are summarized below

Flowerheads [F] (in 1,000's) = f(Rainfall [R] (in inches July 1 - June 30))

2014 Equation (1) F = 705.50 + 62.208*R Used data from the 2003 - 2014 period

2015 Equation (2) F = 687.06 + 63.029*R Used data from the 2003 - 2015 period

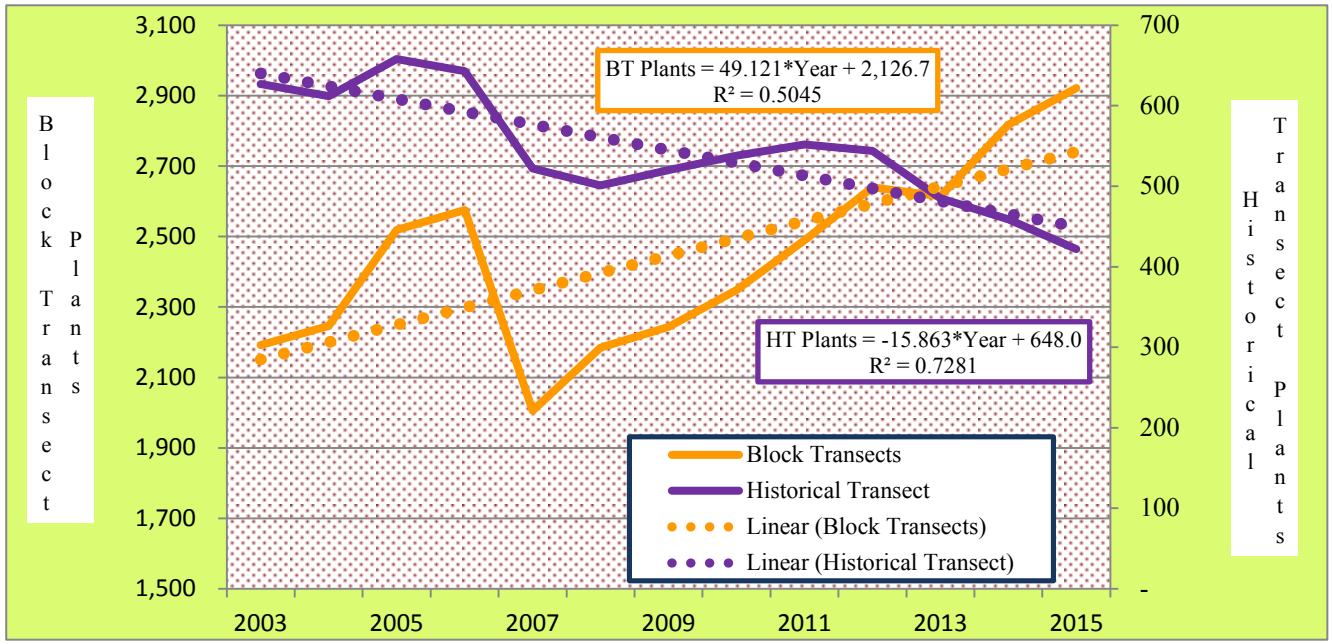
El Segundo Blue butterflies [ESB] = f(Flowerheads [F] (in 1,000;s))

2014 Equation (3) ESB = 1,385.1 + 2.202*F Used data from the 2003 - 2014 period

2015 Equation (4) ESB = 971.3 + 2.380*F Used data from the 2003 - 2015 period

Table 20. Trends in the the Total Number of Buckwheat Plants and Flowerheads on the Historical Transect and Block Transects

Year	Number of Plants	
	Historical Transect	Block Transects
2003	627	2,192
2004	612	2,246
2005	658	2,519
2006	643	2,575
2007	522	2,006
2008	501	2,185
2009	520	2,244
2010	538	2,348
2011	552	2,490
2012	544	2,640
2013	485	2,614
2014	459	2,818
2015	422	2,921



Year	Number of Flowerheads	
	Historical Transect	Block Transects
2003	399,783	1,079,811
2004	363,584	924,629
2005	506,994	2,227,099
2006	538,852	2,566,623
2007	167,649	476,552
2008	311,200	1,130,353
2009	524,599	1,069,559
2010	617,236	1,239,858
2011	926,982	1,779,673
2012	883,431	1,586,425
2013	541,616	1,269,247
2014	328,030	894,208
2015	250,706	1,039,297

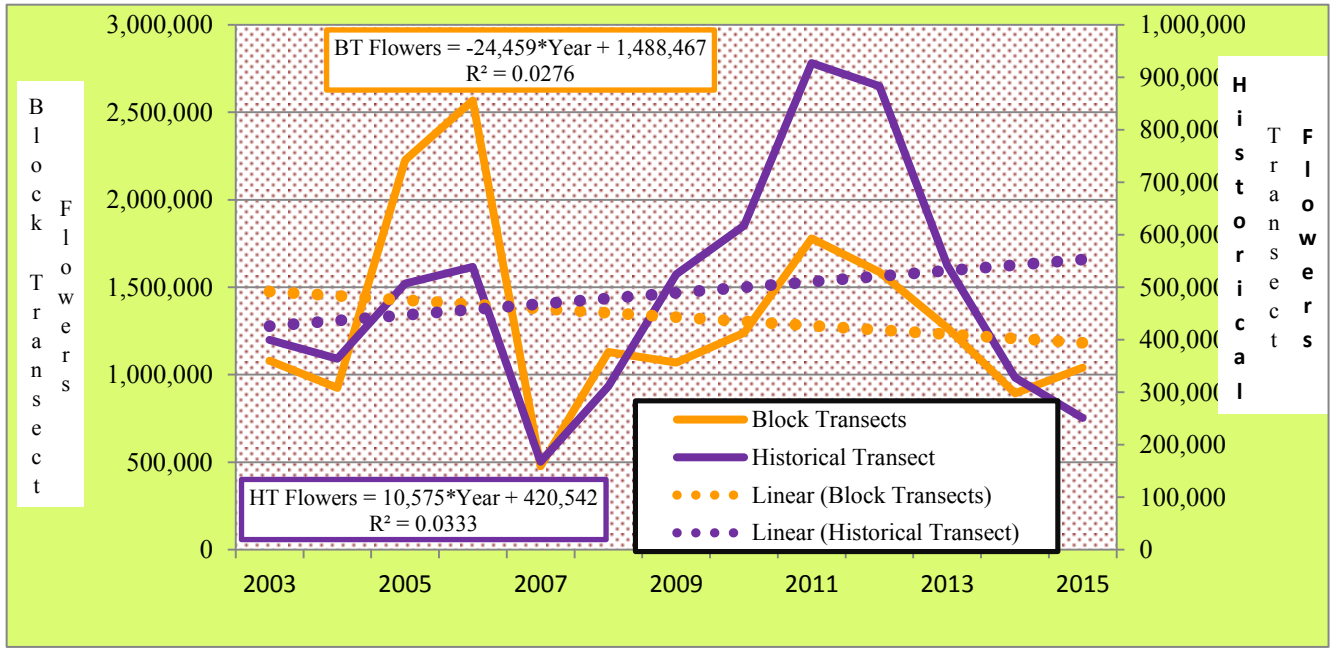


Table 21. Number of Surviving Buckwheat Plants
at Outplanting Site in Block 23

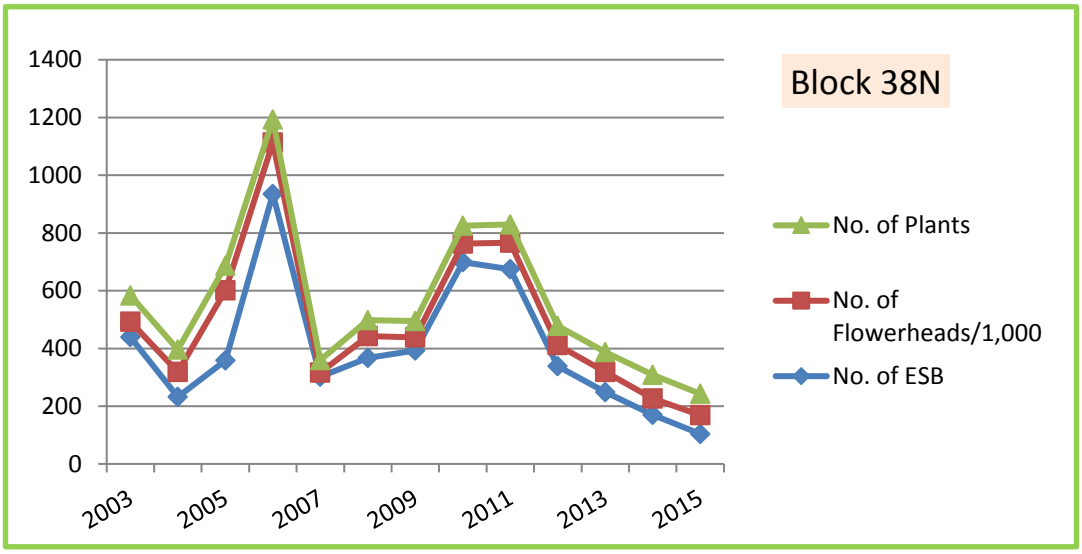
Drip Line ID	No. Planted 11/29/2011	Number of Successful Plants On:							
		16-Jan-12	29-May-12	17-Jul-12	24-Aug-12	27-Nov-12	18-Mar-13	13-May-13	8-Jul-15
1	30	30	28	24	23	18	13	13	12
2	30	30	25	24	24	13	6	6	6
3	40	40	36	34	32	18	15	17	9
4	30	30	25	25	23	15	13	13	12
5	35	34	32	26	26	18	15	15	13
6	25	25	24	18	15	11	9	11	1
7	25	24	21	20	19	11	8	8	3
8	40	40	34	32	31	21	16	16	5
9	35	35	28	24	23	14	8	8	4
10	40	40	33	29	28	15	7	9	4
Total	330	328	286	256	244	154	110	116	69
Percent	100%	99%	87%	78%	74%	47%	33%	35%	21%

Table 22. Age Class & Flowerehead numbers for Buckwheat Plants
at Outplanting Site in Block 23 - Survey date July 8, 2015

Drip Line ID	Age Class									
	Seedlings		Juveniles		Mature		Senescent		All Plants	
	Number of Plants	Number of Flowerheads	Number of Plants	Number of Flowerheads	Number of Plants	Number of Flowerheads	Number of Plants	Number of Flowerheads	Number of Plants	Number of Flowerheads
1			1	10	11	2,330			12	2,340
2			1	20	5	3,845			6	3,865
3			4	20	5	735			9	755
4	1	-	4	32	5	1,065	2	10	12	1,107
5			5	62	6	2,325	2	2	13	2,389
6					1	180			1	180
7					3	690			3	690
8					5	1,465			5	1,465
9			1	40	3	3,020			4	3,060
10					4	880			4	880
Total	1	-	16	184	48	16,535	4	12	69	16,731

Average Flowerheads /Plant		-	12	344	3	242

Figure 23. Trends in Plant Numbers, Flowerheads and ESBBs Observed in in five blocks accounting for 32.3% of all ESBBs observed between 2003 and 2015



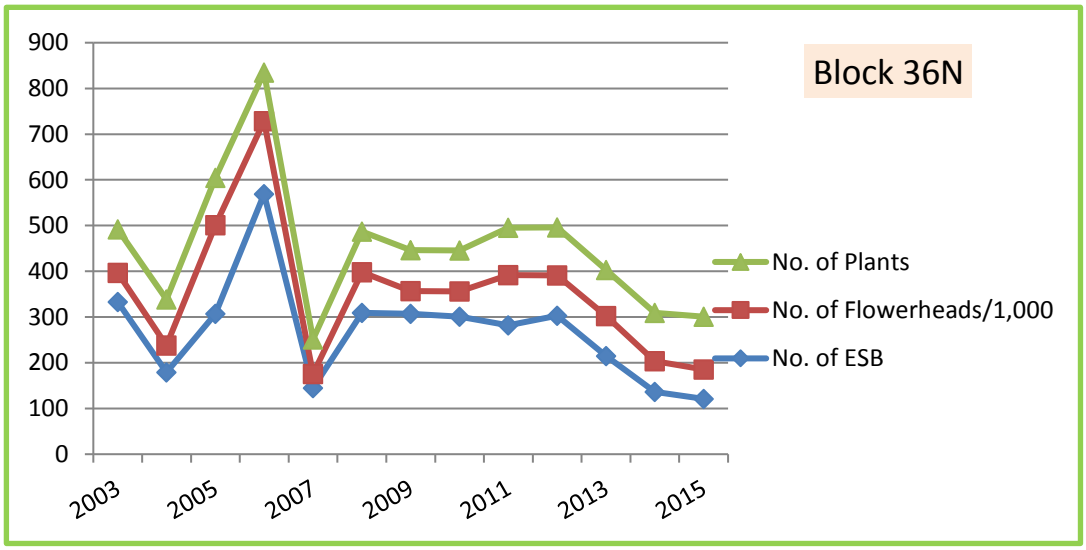
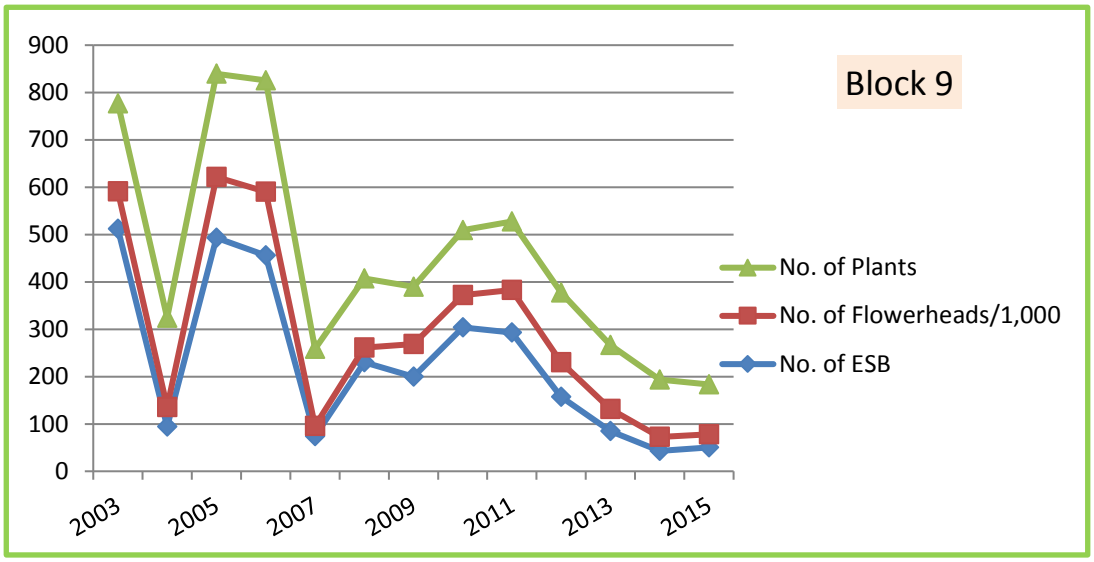
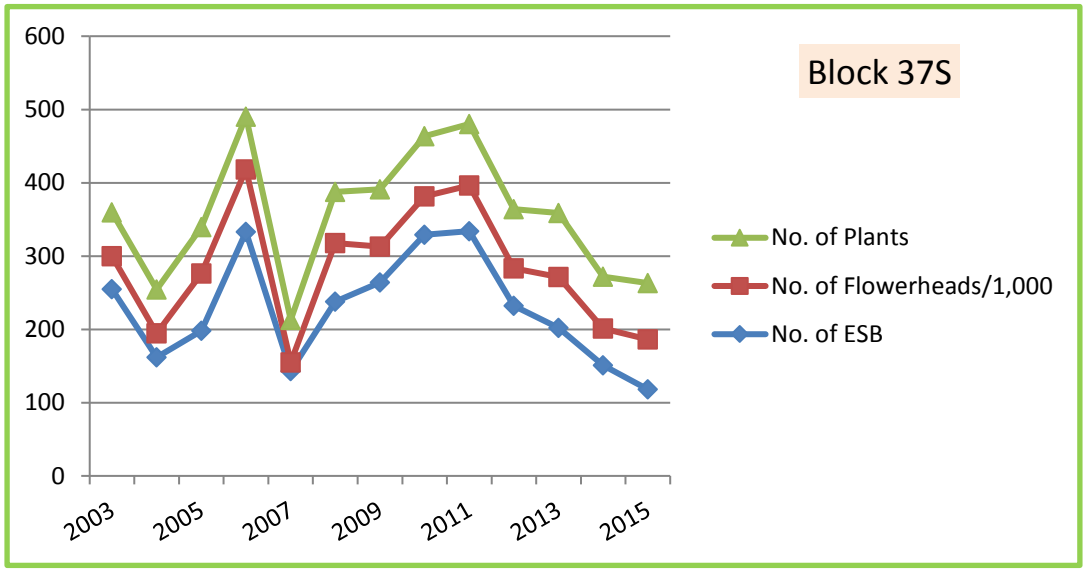
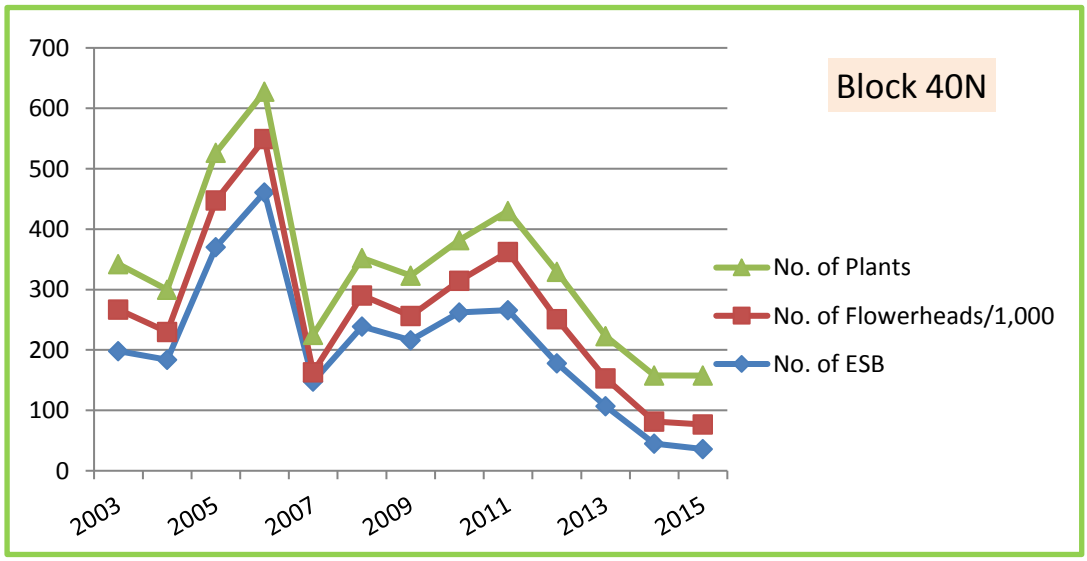


Figure 23. (continued)







SECTION 8
FIGURES

Figure 1. Study Area for the El Segundo Blue Butterfly at the Los Angeles International Airport

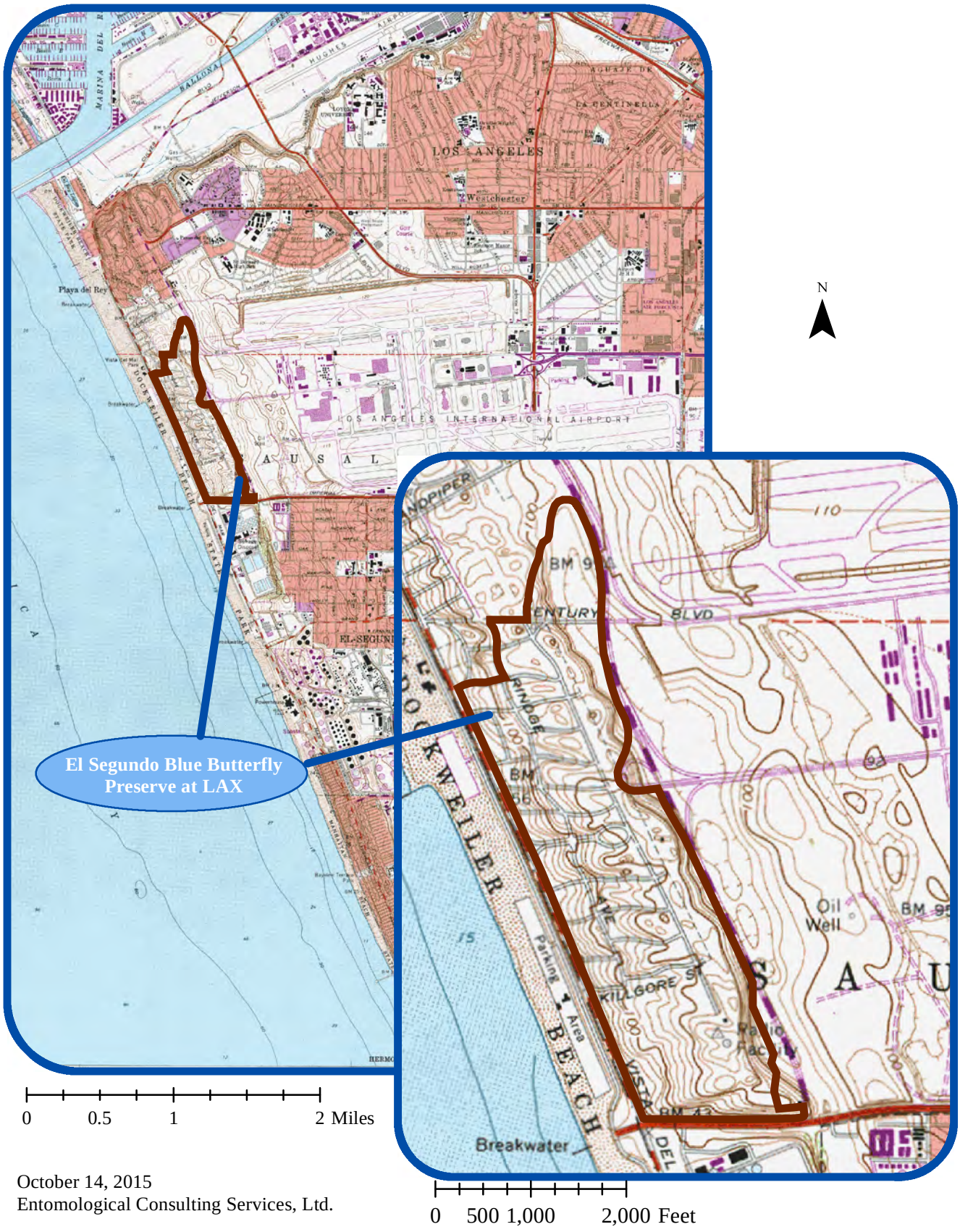


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Figure 2. Historical Transect Route Intervals
El Segundo Blue Butterfly Preserve at LAX

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Figure 3. Habitat Boundary and Block Identification
El Segundo Blue Butterfly Preserve at LAX

0 500 1,000 2,000 Feet

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Figure 4. Habitat Boundary and Locations of the Block Buckwheat Transects
El Segundo Blue Butterfly Preserve at LAX

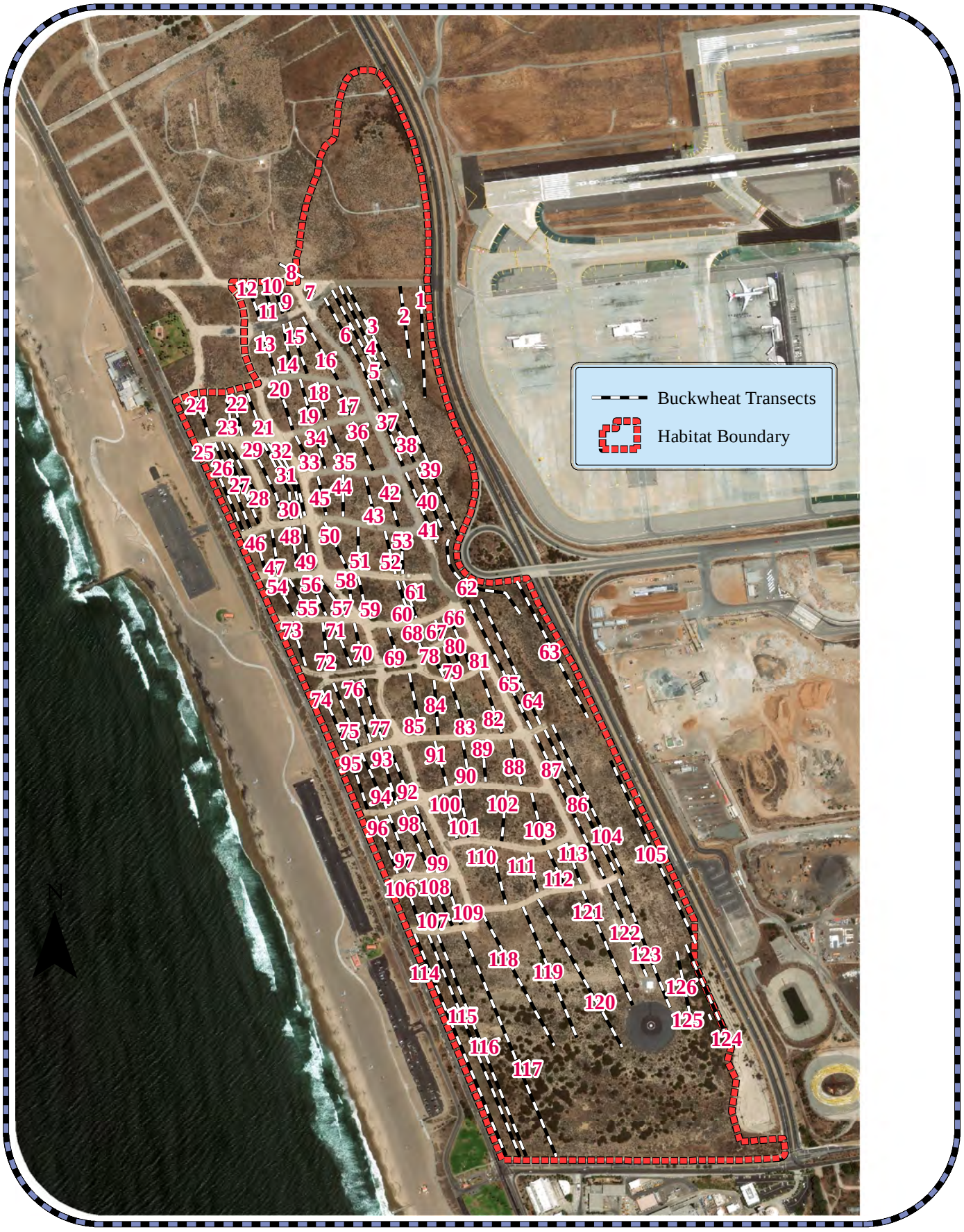

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Figure 5. Locations of El Segundo Blue Butterflies Observed during the July 1 - 4, 2015 Block Counts at the El Segundo Blue Butterfly Preserve at LAX

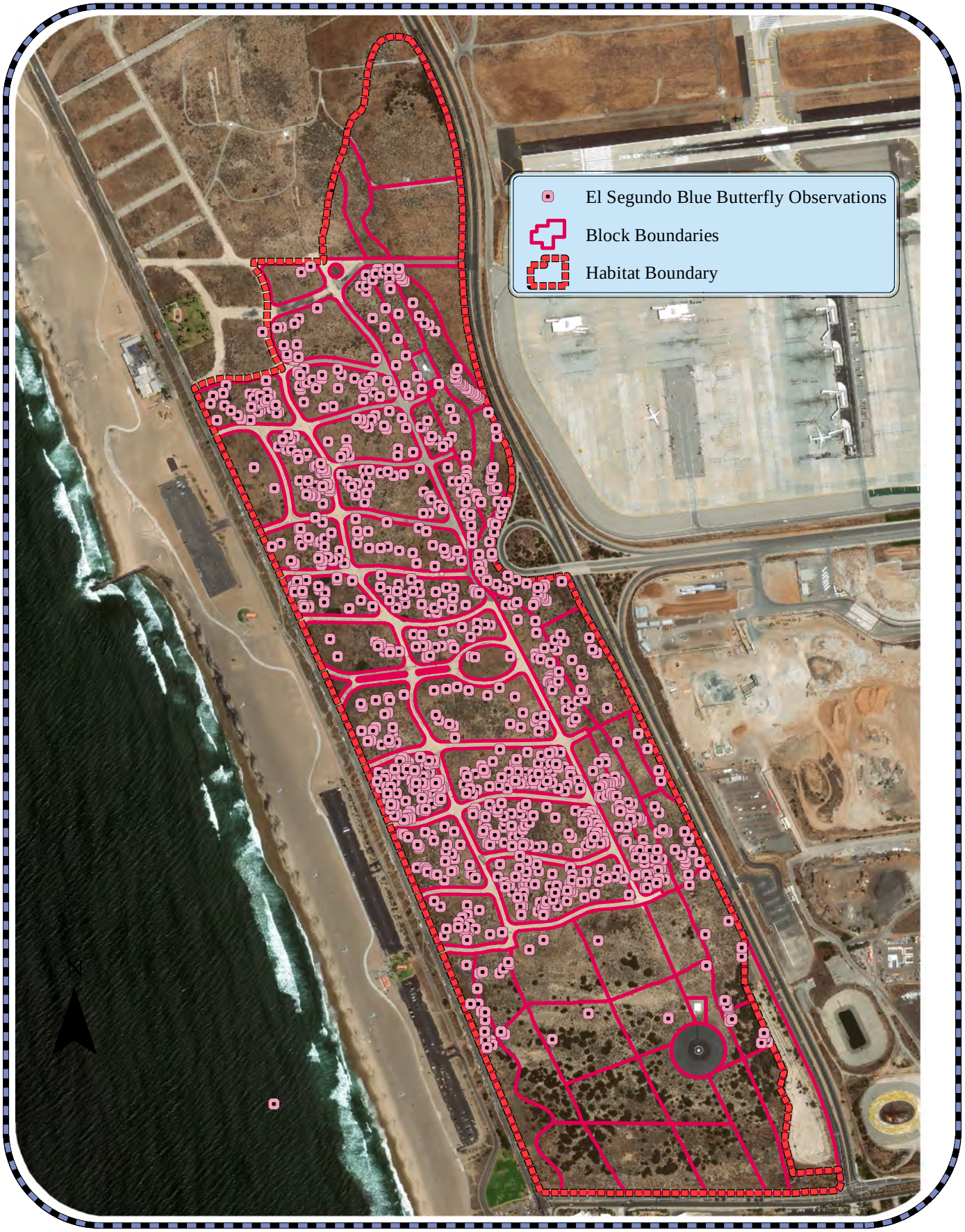

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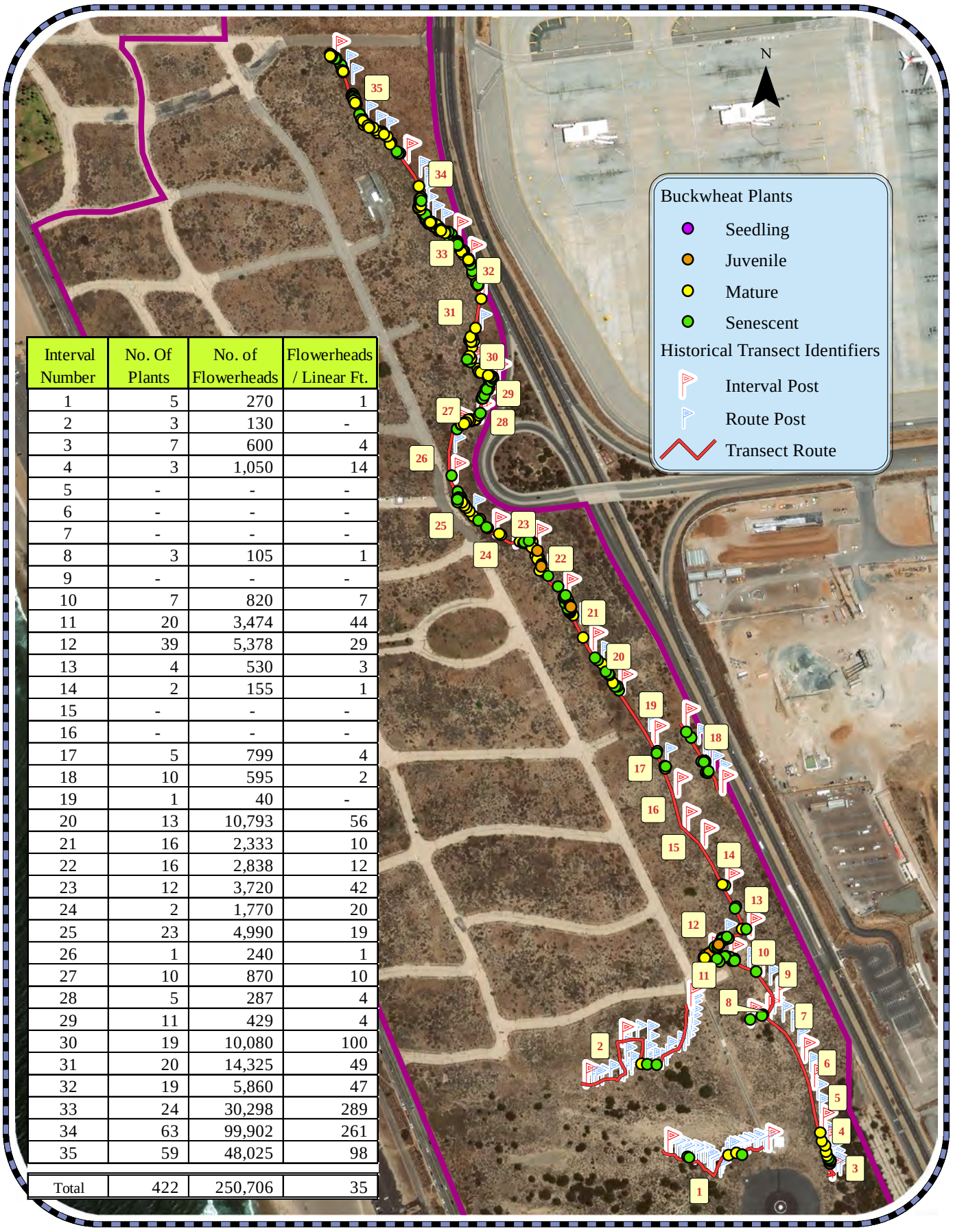
Figure 6. Overview of Buckwheat Plants on the Historical Transect: Age Class and Flowerhead Counts, by Interval



Interval Number	No. Of Plants	No. of Flowerheads	Flowerheads / Linear Ft.
1	5	270	1
2	3	130	-
3	7	600	4
4	3	1,050	14
5	-	-	-
6	-	-	-
7	-	-	-
8	3	105	1
9	-	-	-
10	7	820	7
11	20	3,474	44
12	39	5,378	29
13	4	530	3
14	2	155	1
15	-	-	-
16	-	-	-
17	5	799	4
18	10	595	2
19	1	40	-
20	13	10,793	56
21	16	2,333	10
22	16	2,838	12
23	12	3,720	42
24	2	1,770	20
25	23	4,990	19
26	1	240	1
27	10	870	10
28	5	287	4
29	11	429	4
30	19	10,080	100
31	20	14,325	49
32	19	5,860	47
33	24	30,298	289
34	63	99,902	261
35	59	48,025	98
Total	422	250,706	35

0 375 750 1,500 Feet

October 14, 2015
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Figure 7. Overview of Buckwheat Plants on the Block Buckwheat Transects by Age Class

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Figure 8. Example locations for removal of Acacia, Palm, Pine & Shrubs [photographs locations are shown - photographs are in Appendix A]

0 500 1,000 2,000 Feet

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Figure 9. Example locations for removal of invasive buckwheats
[photograph locations are shown - photographs are in Appendix A]

0 500 1,000 2,000 Feet

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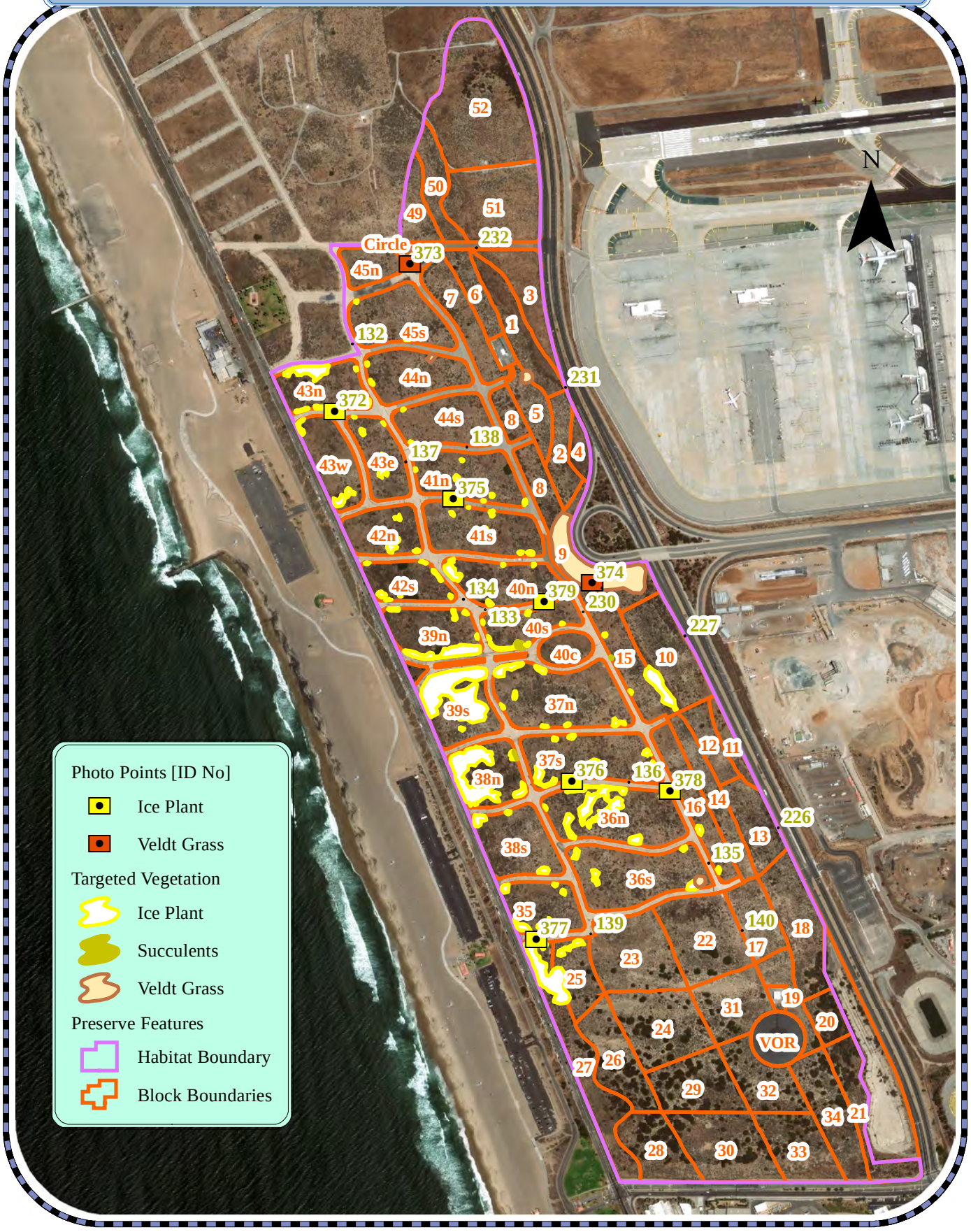
Figure 10. Example locations for removal of Ice Plant, Succulents & Veldt Grass
[photograph locations are shown - photographs are in Appendix A]



0 500 1,000 2,000 Feet

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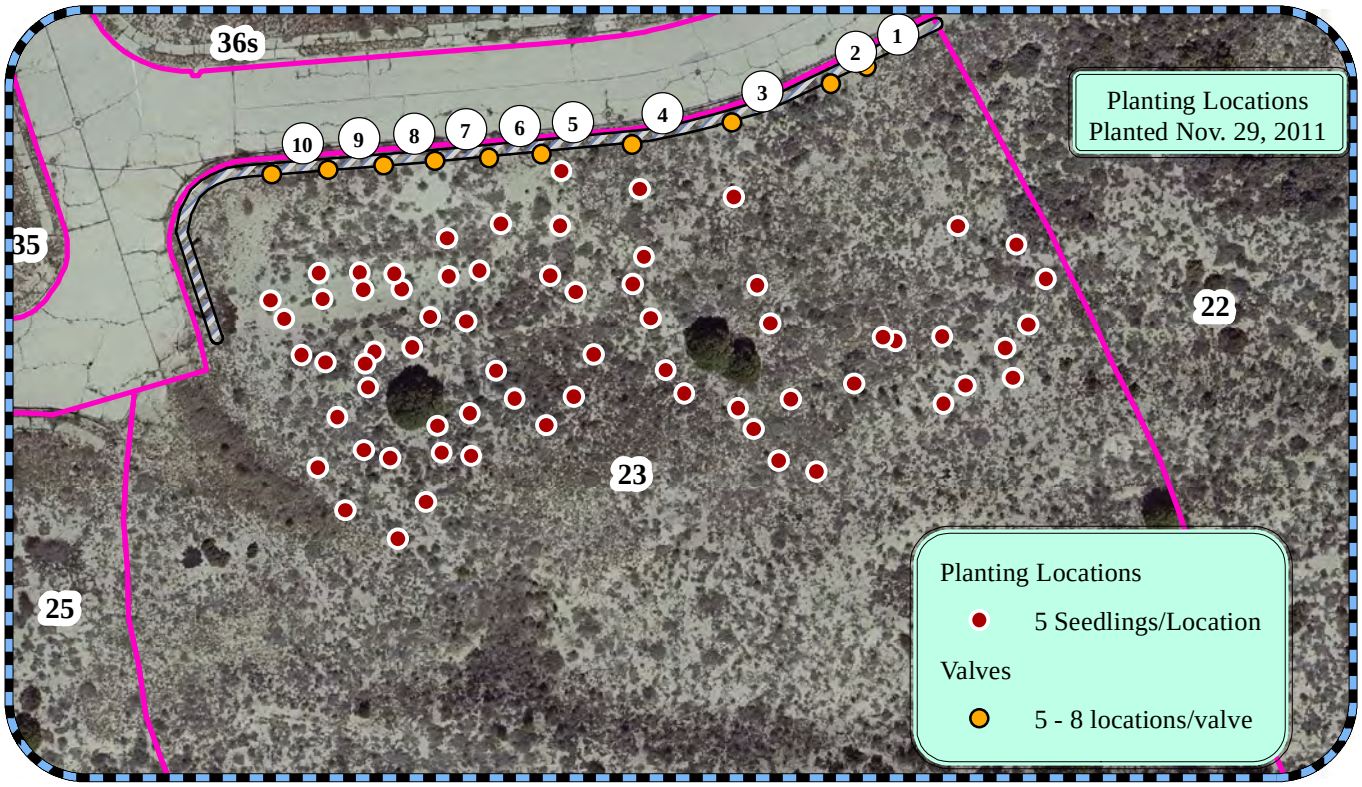
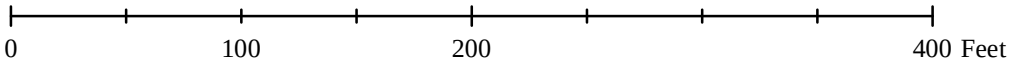
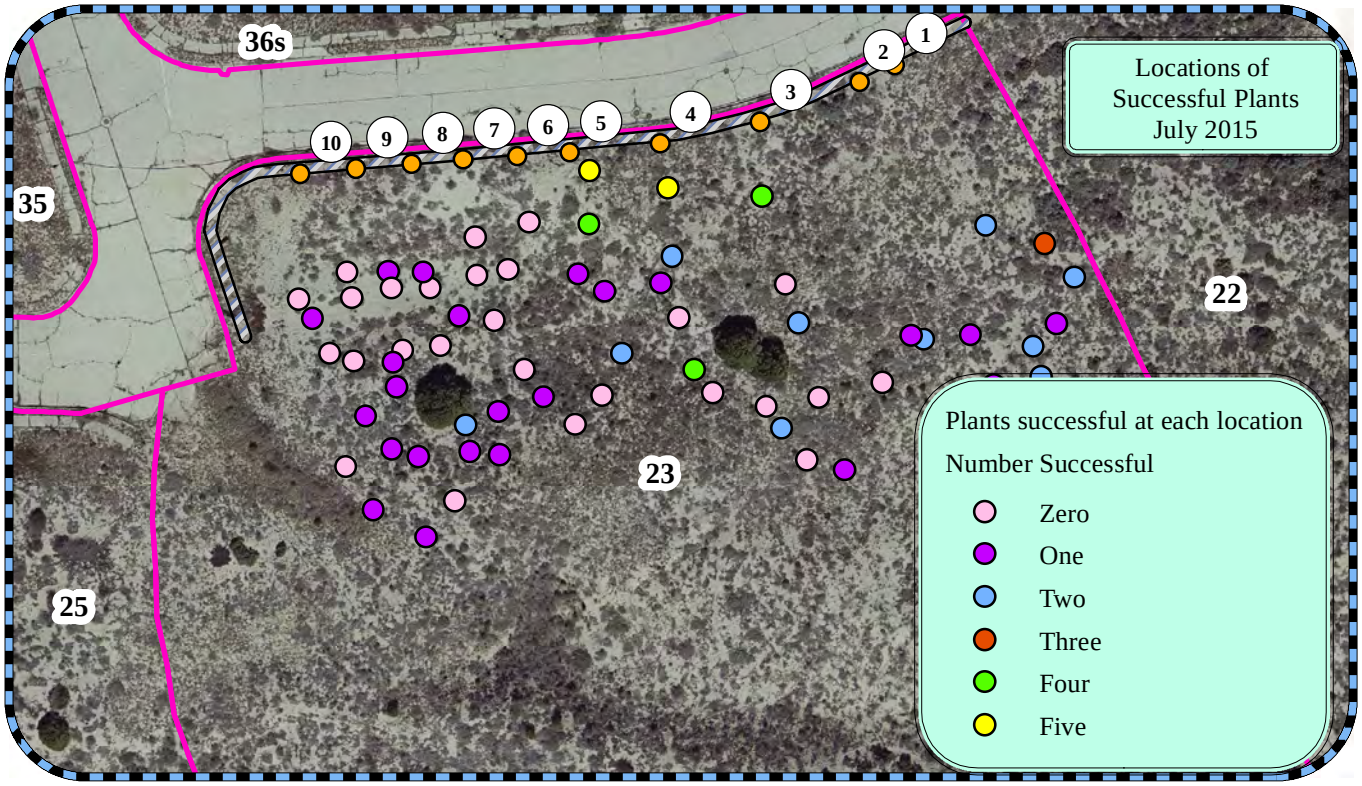
Figure 11. Buckwheat Mitigation on Block 23
Planting locations and July 2015 survey results







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SECTION 9
APPENDIX A:

PHOTODOCUMENTATION OF SELECTED WEED LOCATIONS

LAX ESB Preserve

Photodocumentation of Selected Areas Needing Vegetation Control

Photo Pt 132 - Block 44n

Photo Pt 133 - Blocks 40s & 39n

Photo Pt 134 - Blocks 40n & 42s

Photo Pt 135 - Block 36s

Photo Pt 136 - Block 36n

Photo Pt 137 - Block 41n

LAX ESB Preserve

Photodocumentation of Selected Areas Needing Vegetation Control

Photo Pt 138 - Block 41n

Photo Pt 139 - Blocks 23 & 24

Photo Pt 140 - Block 17

Photo Pt 226 - Block 13

Photo Pt 227 - Block 10

Photo Pt 228 - Block 9

LAX ESB Preserve

Photodocumentation of Selected Areas Needing Vegetation Control

Photo Pt 229 - Block 40n

Photo Pt 230 - Block 40s

Photo Pt 231 - Block 1

Photo Pt 232 - Blocks 1 & 3

Photo Pt 372 - Block 43n

Photo Pt 373 - Block Circle

LAX ESB Preserve

Photodocumentation of Selected Areas Needing Vegetation Control

Photo Pt 374 - Block 9

Photo Pt 375 - Block 41n

Photo Pt 376 - Block 37s

Photo Pt 377 - Block 27

Photo Pt 378 - Block 36n

Photo Pt 379 - Block 40n

SECTION 10
APPENDIX B: WORK LOGS

JAN 2015

EL SEGUNDO DUNES MAINTENANCE

DATE	NUMBER OF EMPLOYEES/ Total Hr.		WORK PERFORMED	LOCATION
1/5/15	2	18	Litter Pick UP Although the dunes. Picking up dawny Palmer and some tumble Weeds	
1/6/15	2	18	Coastal dunes Removing Castor Bean and tumble Weeds Litter and Ice Plants. "10 bags"	Coastal Dunes
1/7/15	2	18	Litter Pick UP and Removing Some Ice Plant, Cutting down Acacia. "10 bags"	Coastal Dunes Ranch steps
1/8/15	2	18	Cutting Acacia trees and Ficus from the Los Angeles 200. 120 Acacia 25 Ficus	North side
1/12	2	18	Litter Pick UP Although the Dunes.	
1/13	2	18	Removing New growth Acacia Trees and Some Castor Bean Tumble Weeds. "10 Bags"	Coastal Dunes North Side Dunes
1/15	2	18	cutting and Removing Ficus and Acacia Trees from the Los Angeles 200. Clean out Some Ice plants area + 23. 120 Acacia 20 Ficus	North side Dunes
1/20	2	18	Litter Pick UP through out both Sides of the Dunes. Removed Some Castor Bean 2 Bags	Coastal Dunes North side
1/21	2	18	Litter Pick UP. Helping out Peggy Working in the Nursery	Water View Coastal Dunes

2015

EL SEGUNDO DUNES MAINTENANCE

DATE	NUMBER OF EMPLOYEES/ Total Hr.	WORK PERFORMED	LOCATION
1/27	2 18	Cutting and Removing Some Acacia Trees and Some Ficus Litter Pick UP	North Side Water View
1/28	2 18	Litter Pick UP Although out the Dunes. Cut and Remove Some Ice Plants and Some Buckwheat.	Water View Coastal Dunes North Side
1/29	2 18	Litter Pick UP Although the Dunes. Cut and Removal Some Acacia Trees and Some Ficus 130 Pieces 85 Ficus Los Angeles 200.	Water View North Side

FEB 2015 Coastal Dunes

EL SEGUNDO DUNES MAINTENANCE

DATE	NUMBER OF EMPLOYEES/ Total Hr.		WORK PERFORMED	LOCATION
2/4	2	18	Picking up Litter and Removing some Weeds and Tumble Weeds.	Although out the Dunes.
2/5	2	18	Picking up Litter on Water Views cutting the Trees For the Los Angeles 200 ACACia – 120 Ficus – 20 Pieces	Water Views North Side Dunes
2/9	2	18	Litter Pick although out the Dunes. Cut and Removed Some Acacia Trees.	Water Views Coastal Dunes North Side Dunes
2/10	2	18	cutting and Removing Weeds and Some Castor Beans. "10" Bags. Working on Area #23 cutting Bacil Weeds.	North side Dunes Coastal Dunes
~~2/11~~	~~2~~	~~18~~		
2/12	2	18	Cutting the Acacia Trees For the Los Angeles 200. "125" Acacia "25" Ficus Removed some Ice Plant and Some Castor Beans.	North Side
2/17	2	18	Litter Pick up Although out the Dunes.	Coastal North side
2/19	2	18	Cutting and Removing Some Acacia and Ficus. 170 Ficus 30 Pieces LA	

200

FEB 2015

EL SEGUNDO DUNES MAINTENANCE

DATE	NUMBER OF EMPLOYEES/Total Hr.	WORK PERFORMED	LOCATION
2/23	2 18	Litter PICK UP Alting the Dunes and Water View & Cleaning out the Weeds and Mustard Plants.	Coastal Dunes North Side
2/24	2 18	Litter Pick UP Cleaning out the Weeds and Mustard Plants. 10 BAGS cut and Removed some New growth Acacias	North side Coastal Dunes
2/25	VALLEY		
2/26	2 18	Cutting and Removing Acacias & Ficus For the LOS Angeles 200. 130 Acacias 25 FICUS	
[redacted]			

MARCH 2015

EL SEGUNDO DUNES MAINTENANCE

DATE	NUMBER OF EMPLOYEES/ Total Hr.		WORK PERFORMED	LOCATION
3/2	2	18	Litter Pick UP ALThrough out the Dunes. Removing Down Palms and some Ice Plants.	Coastal North side
3/3	2	18	Litter Pick UP on Water View. Cutting and Removing Mustard Plants	North side Dunes
3/5	2	18	Cutting and Removing Acacia and Ficus trees From the LOS Angeles 200. 130 Pieces Acacia 25 Pieces Ficus	North side Dunes
3/9	2	18	Litter Pick UP ALThrough out the Dunes.	coastal Dune North side
3/12	2	18	Cutting Ficus and Acacia From the LOS Angeles 200. 120 Pieces 25	
3/26	2	18	Cutting Acacia and Ficus From the LOS Angeles 200. 130 Acacia 25 Ficus	

APRIL

EL SEGUNDO DUNES MAINTENANCE

DATE	NUMBER OF EMPLOYEES/ Total Hr.	WORK PERFORMED	LOCATION
4/2	2 18	Cutting and Removing Acacia and Ficus Trees. 130 25	Northside Dunes
4/16	2 18	Cutting and Removing Acacia and Ficus Trees 130 Pieces 30 Pieces	Northside Dunes
4/23	2 18	Cutting the Trees For the Los Angeles 200. 120 35	Northside Dunes
4/30	2 18	Cutting and Removing Some Acacia and Ficus Trees For the Los Angeles 200 "125" "30" Pieces	Northside Dunes
5/7	2 18	Los Angeles 200 140 Pieces Acacia 30 Pieces Ficus	
5/14	2 18	Los Angeles 200 140 Acacia 30 Ficus	
5/21	2 18	Cutting Trees For the 200 125 Acacia 30 Ficus	

EL SEGUNDO DUNES MAINTENANCE

DATE	NUMBER OF EMPLOYEES/ Total Hr.		WORK PERFORMED	LOCATION
5/28	2	18	Cutting and Removing Some Acacia and Ficus For the LOS Angeles 200.	
6/5	2	18	Cutting and Removing Acacia Trees For the 200. 130 Acacia 25 Ficus	
6/12	2	18	Los Angeles 200 Picking Up Acacia and Ficus 150 Acacia 30 Ficus	
6/19	2	18	Cutting and Removing Acacia trees and Ficus. Removing Some bags For Peggy.	
6/26	2	18	Cutting and Removing Acacia and Ficus For the Los Angeles 200.	
July				
7/2	2	18	Cutting and Removing Acacia and Ficus For the Los Angeles 200. 130 Pieces of Acacia 70 Pieces Ficus	
7/9	2	18	Cutting and Removing Acacia and Ficus. For the Los Angeles 200. Removing trash bags For Peggy	

July & AUG 2015

EL SEGUNDO DUNES MAINTENANCE

DATE	NUMBER OF EMPLOYEES/ Total Hr.		WORK PERFORMED	LOCATION
7/[illegible]	2	18	Litter Pick up Alltheway thru Dunes.	North side South side
7/16	2	18	Cutting and Removing Acacia Trees and Ficus From the Los Angeles Zoo. 120 Pieces Acacia 50 Ficus	North side
7/20	2	18	Cleaned up some Trash and Weeds. Litter Pick up every where in the Dunes	North side South side
7/23	2	18	Cutting and Removing some Acacia and Ficus from the LA Zoo.	North side
7/[illegible]3	2	18	Litter Pick up throughout the Coastal Dunes.	
8/6	2	18	Cut and Removed Acacia, Ficus Los Angeles Zoo.	
8/10	2	18	Litter Pick up Alltheway out the Dunes	Coastal Dunes North side
8/13	2	18	Cutting and Removing Acacia Trees and Ficus From the Los Angeles Zoo. 130 Pieces Acacia 50 Ficus	North Side Dunes
8/20	2	18	Cutting and Removing Acacia and Ficus Trees From the Los Angeles Zoo. 130 Pieces Acacia 50	

2015

EL SEGUNDO DUNES MAINTENANCE

DATE	NUMBER OF EMPLOYEES/ Total Hr.	WORK PERFORMED	LOCATION
8/27	2 16	Cutting and Removing the Acacia and Ficus tree for the Los Angeles 200. 130 Piecies Acacia 50 Ficus	North side Dunes
9/4	2 18	Cutting and Removing the Acacia trees For the Los Angeles 200. 100 Piecies 50 Ficus	North side Dunes
9/8	2 18	Litter Pick Up through Out All the Dunes.	
9/11	2 18	Cutting and Removing the Acacia and Ficus Tree. For the Los Angeles 200.	North Side Dunes
9/14	2 18	Litter Pick Up through OUT All the Dunes. Removed Some Ice plants and Tumble Weeds.	Coastal Dunes
9/18	2 18	Cutting and Removing Some Acacia and Ficus Trees For the Los Angeles 200 130 Piecies Acacia 50 Ficus	North side Dunes
9/25	2 18	CUT and Remove Some Acacia & Ficus Trees. Los Angeles 200. 120 Acacia 30 Ficus	North side Dunes

2015

EL SEGUNDO DUNES MAINTENANCE

DATE	NUMBER OF EMPLOYEES/Total Hr.		WORK PERFORMED	LOCATION
9/28	2	18	Litter Pick up throughout Both Sides of the Dunes. Removed some Tumble Weeds.	Coastal & North Side Dunes
10/1	2	18	Cutting and Removing Some Acacia and Ficus Trees. 120 Pieces Acacia 50 Ficus	
10/8	2	18	Cutting and Removing Some Acacia & Ficus Trees. 120 Pieces Acacia 50 Ficus	North Side Dunes
10/13	2	18	Litter Pick up throughout Both Sides of the Dunes Weed Removal cutting down some Ficus.	Coastal & North Side Dunes
10/15	2	18	Cutting Down Acacia & Ficus Trees From the Los Angeles Zoo. 140 Pieces Acacia 30 Ficus	North Side Dunes
10/19	2	18	Removed Some Ice Plants and Picked up Some Litter Throughout the Dunes.	
10/22	2	18	Cutting and Removing Acacia & Ficus Trees From the Los Angeles Zoo.	North Side Dunes

OCT 2015 November

EL SEGUNDO DUNES MAINTENANCE

DATE	NUMBER OF EMPLOYEES/ Total Hr.	WORK PERFORMED	LOCATION
10/26	2 18	Litter PICK UP through out the Dunes.	Coastal & North Side Dunes
10/29	2 18	Cutting and Removing Acacia & Ficus Trees.	North side Dunes
		November	
11/2	2 18	Litter Pick UP Removing Some Caster Bean, Some Tumble Weeds and Some Ice Plants	Coastal Dunes
11/5	2 18	Cutting and Removing Some Acacia & Ficus trees For the Los Angeles ZOO.	North side Dunes
11/9	2 18	Litter Pick UP throughout the Dunes. Removed Some Acacia on the South Side Dunes.	
11/12	2 18	Cutting and Removing Acacia Tree. For the Los Angeles ZOO. 140 pieces Acacia	North side Dunes
11/19	2 18	Cutting and Removing Some Acacia Tree For the ZOO 120 pieces	North side Dunes
11/23	2 18	Removed Some Ice Plants Acacia tree on the South side Litter PICK UP through out the Dunes.	

Nov & Dec 2015

EL SEGUNDO DUNES MAINTENANCE

DATE	NUMBER OF EMPLOYEES/ Total Hr.	WORK PERFORMED	LOCATION
11/30	2 - 18	Litter Pick up through out the Dunes.	
		December	
12/4	2 18		

SECTION 11
APPENDIX C:

PHOTODOCUMENTATION OF OUTPLANTED BUCKWHEATS IN BLOCK #23

LAX ESB Preserve

Photodocumentation of Selected Outplanted Buckwheat Plants in Block 23

Overview of Block 23

Block 23

Block 23

Block 23

Block 23

Block 23

APPENDIX D

SOUTHERN TARPLANT RESTORATION PROJECT
FIFTH ANNUAL MONITORING REPORT
DATED OCTOBER 2015

SOUTHERN TARPLANT RESTORATION PROJECT

Fifth Annual Monitoring Report

Prepared for
Alta Environmental
3777 Long Beach Blvd, Annex Building,
Long Beach, CA 90807

October 2015

SOUTHERN TARPLANT RESTORATION PROJECT

Fifth Annual Monitoring Report

Prepared for
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SOUTHERN TARPLANT RESTORATION PROJECT

Fifth Annual Monitoring Report – October 2015

Introduction

Environmental Science Associates (ESA) conducted the fifth annual monitoring of Southern Tarplant Restoration required for the Bradley West Expansion Project and the Crossfield Taxiway American Airlines Employee Parking Lot Relocation Project (Project). In accordance with the Southern Tarplant Mitigation Plan (STMP) (LAWA et al., 2011a), a total of five consecutive years of monitoring is required of the mitigation areas to ensure success criteria and performance standards are met. This report also constitutes the third quarter quantitative monitoring report for 2015, and the final quantitative analysis for the Project.

Project Location

The project is located at the Los Angeles International Airport (LAX), One World Way, Los Angeles, CA 90045, at the southwest corner of the airport in an area designated as open space (**Figure 1 – Regional Location Map**). This open space area is bound by Pershing Drive to the west and to the north, and to the east and south by various structures and development associated with LAX.

Background

As shown in **Figure 2 - BWP and CFTP Mitigation Areas**, the one-acre mitigation site is divided into six sub-plots (1a, 1b, 2, 3, 4a and 4b). In an effort to increase the probability of establishing a viable population, each sub-plot received a different source of seed. Seed was either purchased from a distributor or collected within vicinity of the mitigation site, and was either described as clean (outer seed husk removed) or rough (outer husk retained). Sowing of the mitigation site took place in January and February of 2011 and scheduled watering of the mitigation site took place between November of 2011 and June 2012. Watering of the subplots discontinued following spring rains that occurred prior to the second annual monitoring event.

The Second Annual Monitoring Report (Tetra Tech, 2012) confirmed that an estimated 688 individuals successfully bloomed and/or seeded within the mitigation site. Of those individuals, approximately 98% occurred within Subplot 3; however, the occurrence numbers far exceeded the Year-Two success criterion required in accordance with the STMP. The third Annual Monitoring Report (ESA, 2013) confirmed that approximately 310 individuals successfully bloomed and/or seeded within the mitigation site. Approximately 40% of the observed individuals occurred within Subplot 1a as opposed to Subplot 3 in 2012, while the remaining individuals were distributed relatively evenly throughout the remainder of the mitigation site.

Despite this drop in numbers, the Year-Three success criterion of 264 individuals was far exceeded. In 2014, numbers within the mitigation site again dropped drastically, below the Year-One performance standard of 198, with a total of 138 observed for the season. Similar to what was observed in 2013, numbers were highest in Subplot 1a with remaining individuals evenly distributed elsewhere. This (Fifth) annual monitoring report outlines the results of the 2015 quantitative and third qualitative monitoring event and discusses conclusions and recommendations for future management of the mitigation site.

Pursuant to the STMP, all impacts made to southern tarplants during the construction of the Project were required to be mitigated at a 1:1 ratio. A total of 329 individual plants were initially documented prior to construction within the impacted areas. Based on these findings, it was established that a minimum of 329 individuals would be required to sustain (i.e., germinate, flower and set seed) by the completion of the five year monitoring period. **Table 1** below outlines the performance standards outlined in the STMP.

TABLE 1
PERFORMANCE STANDARDS

Year	Minimum Number of Southern Tarplant Individuals
One	198 (60% of Required Number)
Three	264 (80% of Required Number)
Five	329 (100% of Required Number)

**Includes all individuals that are germinating, flowering and/or setting seed.*

An unsuccessful seeding effort took place in 2009; however, to remain in compliance with the 1:1 replacement ratio within the five year monitoring period, LAWA reinitiated seeding efforts in 2010 to establish and maintain a viable population. A new mitigation site was established and seeded in January and February 2011. A 90-Day Establishment report, followed by Quarterly Monitoring letter reports (LAWA et al., 2011b; LAWA et al., 2011c, respectively) were prepared in 2011 to present an overview of the reseeding success in the new mitigation site during the first year of monitoring. In 2012, a Second Annual Monitoring Report (Tetra Tech, 2012); in 2013, a Third Annual Monitoring Report (ESA, 2013) and in 2014, a Fourth Annual Monitoring Report (ESA, 2014) was drafted to document the overall status of the mitigation site on the second, third and fourth years, respectively after seeding.

SOURCE: ESRI

Southern Tarplant - Annual Monitoring Report . 130072

Figure 1

Project Location

SOURCE: UltraSystems Environmental Inc. 2011.(Mitigation Areas)

Figure 2

BWP and CFTP Mitigation Areas

Methodology

On September 16, 2015, ESA's botanist Robert Sweet and Senior biologist Gregory Ainsworth conducted the fifth annual monitoring event between the hours of 1200 and 1400. Weather was relatively moderate during the survey with temperatures remaining at approximately 73ºF under intermittent cloud cover. In an effort to accurately document the status of the subplots, a quantitative and qualitative study of the restoration site was conducted. The methodology used for these surveys is described in detail below.

Quantitative Survey

Pursuant to methods outlined in the STMP, linear transects were conducted at approximately ten meters apart to obtain 100 percent visual coverage of each subplot. As required in the STMP, all tarplant individuals observed to be germinating, flowering, setting seed or in a senesced state were tallied within each subplot, as the presence of these life stages suggests possible active recruitment and regeneration of the introduced populations.

Qualitative Survey

While conducting quantitative surveys, the overall health and distribution of southern tarplants in each subplot was studied. Other notable observations included plant density (including other native and non-native species), presence of weed species, trash, herbivory, vandalism, and overall environmental conditions.

Results

The overall growing condition of the six subplots was relatively good for germination and natural recruitment and overall tarplant distribution increased drastically from the 2014 results, effectively achieving the Year - Five performance standards. A summary of the Quantitative and Qualitative Survey results is provided below.

Quantitative Survey

A total of 412 tarplant individuals were observed within the mitigation site during the fifth annual monitoring event. **Table 2** below shows the density and distribution of tarplant individuals identified within the mitigation site between 2012 and 2015. As indicated below, the number of tarplants observed within each subplot in 2015 was much greater than numbers reported for 2014; successfully achieving the success criteria of 329 germinating, flowering or senesced individuals required for Year - Five.

TABLE 2.
SOUTHERN TARPLANT DISTRIBUTION OBSERVED IN 2013 COMPARED TO 2012

Subplot	2012 Results	2013 Results	2014 Results	2015 Results
1a	0	121	88	177
1b	13	33	5	20
2	1	4	1	4
3	671	63	20	166
4a	3	31	13	27
4b	0	58	11	18
Total	688	310	138	412

As reported in the Second Annual Monitoring Report (Tetra Tech, 2012), 98% of southern tarplants observed were in Subplot 3. However, the number of individuals observed within Subplot 3 decreased substantially in 2013, and even more so in 2014. Overall, there was a 97% reduction in Subplot 3 from 2012 to 2014. In contrast, no southern tarplants were observed in Subplot 1a and 4b in 2012; whereas numbers increased to 121 and 58 individuals, respectively in 2013; dropping again in 2014. Numbers in Subplot 2 and 4a remained relatively stable throughout 2012, 2013 and 2014, without a significant variation in numbers. Overall, the total number of tarplant individuals within the mitigation site decreased drastically between 2012 and 2014; with total numbers decreasing by almost one-half each year, recorded at 688, 310 and 138, respectively. Based on the 2015 quantitative monitoring, the total number of tarplant individuals increased substantially compared to previous years, almost tripling the numbers in 2014, second only to those reported in 2012. Population densities are greatest in Subplot 1a and 3.

Qualitative Survey

A substantial amount of non-native herbaceous groundcover remains throughout the mitigation areas. The herbaceous cover is dominated by non-native herbs and forbs, many of which have senesced, and occur in varying densities within each subplot, including such species as ripgut brome (*Bromus diandrus*), red brome (*Bromus madritensis* ssp. *rubens*), green-stem filaree (*Erodium moschatum*), crown daisy (*Glebionis coronaria*), and bur clover (*Medicago polymorpha*). Shrubs are distributed in the same locations and densities as previously documented (see individual subplot results below). It was noted that, while still present throughout the mitigation area, Bermuda grass (*Cynodon dactylon*) is not as prevalent as previously recorded during qualitative monitoring.

Numerous tarplant individuals were observed throughout the mitigation area, within all subplots. Some of the individuals displayed only vegetative growth, while others were observed to be flowering or were senesced during the site visit.

Subplots 1a and 1b

Subplots 1a and 1b are immediately adjacent to each other; however, dominance of vegetation tends to vary between the two plots. Both subplots are vegetated by dense herbaceous cover of non-native grasses and forbs. Senesced green-stem filaree and red brome currently dominate the vegetative cover in Subplot 1a; whereas, crown daisy and senesced red brome dominate the vegetative cover in Subplot 1b. Various native and non-native herbaceous species occur intermittently throughout both subplots including Spanish clover (*Acmispon americanus*), annual bursage (*Ambrosia acanthacarpa*), Australian saltbush (*Atriplex semibaccata*), wild oats (*Avena fatua*), ripgut brome (*B. diandrus*), red-stem filaree (*E. cicutarium*), Italian ryegrass (*Festuca perrenis*), bur clover (*Medicago polymorpha*) and common plantain (*Plantago major*). Native deerweed (*Acmispon glaber*) shrubs and large patches of Bermuda grass were observed throughout these subplots as well.

The density of vegetation and composition within this subplot was relatively unchanged from the July 2015 qualitative survey, with the majority of herbaceous vegetation in a senesced state. Approximately 177 tarplant individuals both in a flowering and senesced state were observed throughout the north central and south central portion of Subplot 1a. Approximately 20 individuals were observed scattered throughout the western portion of Subplot 1b. All tarplants observed within the subplots were located in areas with relatively sparse vegetation, allowing for viable seeds to germinate and establish. In areas dominated by Bermuda grass, no tarplant individuals were observed.

Subplot 2

Subplot 2 is currently dominated by senesced green-stem filaree throughout the central and eastern portion of the subplot with senesced wild oats along the western perimeter. Other native and non-native species noted in varying densities include bur clover, Bermuda grass, common plantain, red brome, red-stem filaree and Spanish clover. In addition, one non-native acacia shrub (*Acacia retinoides*), four large mulefat shrubs (*Baccharis salicifolia*) and one red willow (*Salix laevigata*) persist along the west side of the subplot. Four southern tarplant individuals both in a flowering and senesced state were observed within the central portion of the subplot.

Subplot 3

Subplot 3 is currently dominated by senesced bur clover with large thatches of Bermuda grass observed throughout. Various other herbaceous and shrub species occur intermittently as well, including common plantain, Italian ryegrass, sweet clover (*Melilotus indicus*), red-stem filaree, Spanish clover and wild oats, with a few deerweed subshrubs situated along the southern portion of the subplot. The large thatches of Bermuda grass previously observed throughout this subplot are displaying new vegetative growth.

A grouping of approximately 166 tarplant individuals both in a flowering and senesced state were detected throughout the central portion of the subplot, in sparsely vegetated areas. As noted in

previous surveys, areas dominated by dense thatches of Bermuda grass tended not to support substantial tarplant growth.

Subplot 4a and 4b

Subplot 4a and 4b are both dominated with herbaceous cover including senesced bur clover and green-stem filaree, with various other herbaceous species interspersed including Bermuda grass, common plantain, crown daisy, red brome, curly dock (*Rumex crispus*), Spanish clover and sweet clover. In addition, one acacia, mulefat, and red willow shrub persist along the north perimeter of Subplot 4b.

A grouping of approximately 27 tarplant individuals were observed within the eastern portion of Subplot 4a and 18 individuals within the western portion of Subplot 4b, both in a flowering and senesced state.

Discussion

A total of 412 tarplants were counted during the fifth annual monitoring period. As reflected in Table 1, these results have met the performance standards set forth for the fifth year of monitoring by 329 individuals. LAWA maintenance staff disked small portions of the mitigation site in. Subplot 1a and b; and Subplot 3 in May and June, 2014. It was noted during routine qualitative and quantitative monitoring of the mitigation site that the disking activities may have scarified the seed bank based on the dramatic increase in tarplant germination in areas where tarplants had not occurred.

Recommendations

In an effort to support continued growth and persistence of a viable southern tarplant population within the mitigation site, control of non-native grasses with selective herbicide applications and disking to thin areas dominated with thatches of Bermuda grass is recommended. Based on the observed success of the disking activities, disking should be implemented between January - March throughout the mitigation site each year to optimize annual recruitment.

References

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LAWA/UltraSystems/Endemic Environmental, April 2011b. Southern Tarplant (*Centromadia parryi* ssp. *australis*) Quarterly Report.

LAWA/UltraSystems/Endemic Environmental, April 2011c. Southern Tarplant (*Centromadia parryi* ssp. *australis*) Quarterly Report.

Tetra Tech and UltraSystems Environmental, Inc. 2012. *Southern Tarplant Second Annual Monitoring Report for the Los Angeles International Airport, Bradley West Expansion and Crossfield Taxiway Relocation Projects, Los Angeles County.*

APPENDIX A
Photographic Log

Subplots 1a and 1b

Photo 1. Facing southwest at the northeast corner of Subplot 1a. Photo depicts the relatively dense herbaceous layer, dominated by senesced greenstem filaree (*Erodium moschatum*). Southern tarplant denoted by pin flags can be seen in the distance.

Photo 2. Facing southeast at the northwest corner of Subplot 1a. Photo depicts the relatively dense herbaceous layer, dominated by senesced green stem filaree. Southern tarplant denoted by pin flags can be seen in the distance.

Photo 3. Facing northeast at the southwest corner of Subplot 1a. Photo depicts the relatively dense herbaceous layer, dominated by senesced green-stem filaree and red brome (*Bromus madritensis* ssp. *rubens*). Southern tarplant denoted by pin flags can be seen in the distance.

Photo 4. Facing northwest at the southeast corner of Subplot 1a. Photo depicts the relatively dense herbaceous layer, dominated by senesced green stem filaree and red brome. Southern tarplant denoted by pin flags can be seen in the distance.

Photo 5. Facing northeast at the southwest corner of Subplot 1b. Photo depicts the relatively dense herbaceous layer, dominated by senesced red brome.

Photo 6. Facing northwest at the southeast corner of Subplot 1b. Photo depicts the relatively dense herbaceous layer, dominated by senesced crown daisy to the northwest and red brome elsewhere.

Photo 7. Facing southwest at the northeast corner of Subplot 1b. Photo depicts the dense herbaceous layer, dominated by crown daisy and senesced red brome throughout.

Photo 8. Facing south at the north boundary of Subplot 1a, where it meets Subplot 1b. Photo depicts the dense herbaceous layer, dominated by crown daisy and senesced red brome to the east and senesced green-stem filaree and red brome to the west. Southern tarplant denoted by pin flags can be seen in the distance.

Sub-plot 2

Photo 1. Facing north at the southwest corner of Subplot 2. Photo depicts a relatively dense herbaceous layer, dominated by senesced ripgut brome (*Bromus diandrus*). In addition, a mature mulefat shrub (*Baccharis salicifolia*) is visible in the foreground.

Photo 2. Facing northwest at the southeast corner of Subplot 2. Photo depicts a relatively dense herbaceous layer, dominated by senesced green-stem filaree in the foreground and senesced wild oats along the western portion of the subplot. In addition, mature mulefat and red willow (*Salix laevigata*) shrubs are visible in the foreground.

Photo 3. Facing southwest at the northeast corner of Subplot 2. Photo depicts a relatively dense herbaceous layer, dominated by senesced green-stem filaree in the foreground and wild oats along the western portion of the subplot. In addition, mature mulefat and red willow shrubs are visible in the foreground.

Photo 4. Facing south at the northwest corner of Subplot 2. Photo depicts a relatively dense herbaceous layer, dominated by senesced green-stem filaree in the foreground and wild oats along the western portion of the subplot. In addition, mature mulefat and willow shrubs are visible in the foreground.

Subplot 3

Photo 1. Facing northwest at the southeast corner of Subplot 3. Photo depicts a relatively dense herbaceous layer, dominated by senesced green-stem filaree and bur clover (*Medicago polymorpha*). In addition, patches of Bermuda grass can be seen interspersed throughout.

Photo 2. Facing southwest at the northeast corner of Subplot 3. Photo depicts a relatively dense herbaceous layer, dominated by senesced bur clover and green-stem filaree. In addition, patches of Bermuda grass can be seen interspersed throughout.

Photo 3. Facing southeast at the northwest corner of Subplot 3. Photo depicts a relatively dense herbaceous layer, dominated by senesced bur clover and green-stem filaree. In addition, patches of Bermuda grass can be seen interspersed throughout.

Photo 4. Facing northeast at the southwest corner of Subplot 3. Photo depicts a relatively dense herbaceous layer, dominated by senesced bur clover and green-stem filaree. In addition, patches of Bermuda grass can be seen interspersed throughout.

Subplot 4a and b

Photo 1. Facing northeast at the southwest corner of Subplot 4a. Photo depicts a relatively dense herbaceous layer, dominated by senesced bur clover and green-stem filaree in the foreground and senesced wild oats along the northern perimeter of the subplot. Southern tarplant denoted by pin flags can be seen in the foreground.

Photo 2. Facing southeast at the northwest corner of Subplot 4a. Photo depicts a relatively dense herbaceous layer, dominated by senesced bur clover and green-stem filaree in the foreground and senesced wild oats along the northern perimeter of the subplot. Vegetative and flowering southern tarplant denoted by pin flags can be seen in the foreground.

Photo 3. Facing southwest at the northeast corner of Subplot 4a. Photo depicts a relatively dense herbaceous layer, dominated by senesced bur clover and green-stem filaree in the foreground and senesced wild oats along the northern perimeter of the subplot. Southern tarplant denoted by pin flags can be seen in the foreground.

Photo 4. Facing northwest at the southeast corner of Subplot 4a. Photo depicts a relatively dense herbaceous layer, dominated by senesced bur clover and green-stem filaree in the foreground and senesced wild oats along the northern perimeter of the subplot. Southern tarplant denoted by pin flags can be seen in the foreground.

Photo 5. Facing northeast at the southwest corner of Subplot 4b. Photo depicts a relatively dense herbaceous layer, dominated by senesced bur clover and green-stem filaree in the foreground and senesced wild oats along the northern perimeter of the subplot. In addition, mature mulefat and red willow shrubs can be seen in the northeast corner of the subplot. Southern tarplant denoted by pin flags can be seen in the foreground.

Photo 6. Facing southeast at the northwest corner of Subplot 4b. Photo depicts a relatively dense herbaceous layer, dominated by senesced bur clover and green-stem filaree to the south and senesced wild oats along the northern perimeter In addition, mature mulefat and red willow shrubs can be seen in the northeast corner of the subplot. Southern tarplant denoted by pin flags can be seen in the foreground.

Photo 7. Facing southwest at the northeast corner of Subplot 4b. Photo depicts a relatively dense herbaceous layer, dominated by senesced bur clover and green-stem filaree. In addition, mature mulefat and red willow shrubs are visible in the foreground. Southern tarplant denoted by pin flags can be seen in the distance.

Photo 8. Facing northwest at the southeast corner of Subplot 4b. Photo depicts a relatively dense herbaceous layer, dominated by senesced bur clover and green-stem filaree. In addition, a small grouping of shrubs including acacia, mulefat and red willow can be seen in the foreground. Southern tarplant denoted by pin flags can be seen in the distance.

APPENDIX B
Field Data Sheets

ESA Biological Resources

2015 LAWA Southern Tarplant Annual Quantitative Monitoring

Site Location: LAX

Observers: RCS, GCA

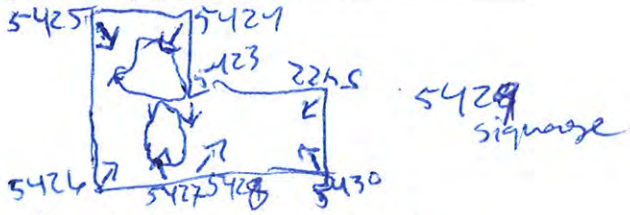
Date: 04/16/15

Cloud Cover (%): 10%

Time: 1445

Temperature (F): 73°F

Plot #: 1A+B



General Site Conditions:

Same Constituents as before. Bermuda seems to be increasing in density throughout plots, Most vegetation within subplot is senesced.

Qualitative Site Observations:

Item	Yes	No	Remedial Actions
Trash Present		✓	
Irrigation Required		✓	possibly
Vandalism		✓	
Photos Taken	✓		
Herbivore Damage		✓	
Weed Species Present	✓		
Southern Tarplant Present	✓		

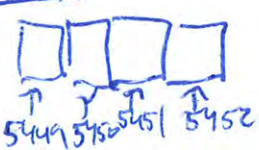
Overall S. Tarplant Condition:

Description	Yes	No
Germinating		✓
Seeding		✓
Senecence	✓	
Flowering	✓	
Healthy	✓	
Disease		✓
Wilting		✓
Yellowing		✓

Southern Tarplant Metrics:

Quantity (# of individuals)			
1A		1B	
Senesced	alive	Senesced	Alive
IIII IIII IIII	Greg H's	IIII IIII	IIII IIII
IIII IIII IIII I	alive		IIII IIII
IIII IIII IIII IIII	IIII IIII IIII		
IIII IIII IIII IIII	11+64		
IIII IIII IIII IIII			

Test plots



ESA Biological Resources

Observations/Recommendations:

Hand weeding / Possibly tilling

LAWA Escort: Steven Durkee

Name of botanist onsite: Robert Sweet

Signature of botanist onsite: Robert Sweet

For questions please contact:

Robert Sweet

Wildlife Biologist

ESA, Biological Resources

Office: 818-703-8600

Cell: 805-279-2569

Email: rsweet@esassoc.com

ESA Biological Resources

2015 LAWA Southern Tarplant Annual Quantitative Monitoring

Site Location: LAX

Observers: RCS, CCA

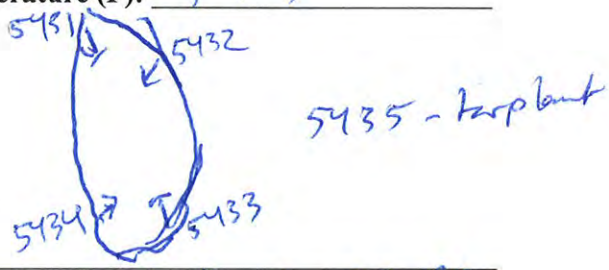
Date: 09/16/15

Cloud Cover (%): 10%

Time: 1500

Temperature (F): 73°F

Plot #: 2



General Site Conditions:

Same constituents as before. Most vegetation in the plot is senescent

Qualitative Site Observations:

Item	Yes	No	Remedial Actions
Trash Present		✓	
Irrigation Required			Possibly
Vandalism		✓	
Photos Taken	✓		
Herbivore Damage		✓	
Weed Species Present	✓		
Southern Tarplant Present	✓		

Overall S. Tarplant Condition:

Description	Yes	No
Germinating		—
Seeding		—
Senecence	✓	
Flowering	✓	
Healthy	✓	
Disease		✓
Wilting		✓
Yellowing		✓

Southern Tarplant Metrics:

Quantity (# of individuals)
4 tarplants

ESA Biological Resources

Observations/Recommendations:

Hand weeding / Possibly tilling

LAWA Escort: Steven Durkee

Name of botanist onsite: Robert Sweet

Signature of botanist onsite: Robert Sweet

For questions please contact:

Robert Sweet

Wildlife Biologist

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Email: rsweet@esassoc.com

ESA Biological Resources

2015 LAWA Southern Tarplant Annual Quantitative Monitoring

Site Location: LAX

Observers: RCS, GCA

Date: 09/16/15

Cloud Cover (%): 10%

Time: ____

Temperature (F): 73°F

Plot #: 3

General Site Conditions:

Same constituents as before. Bermuda grass is increasing in dominance again

Qualitative Site Observations:

Item	Yes	No	Remedial Actions
Trash Present		✓	
Irrigation Required			possibly
Vandalism		✓	
Photos Taken	✓		
Herbivore Damage		✓	
Weed Species Present	✓		
Southern Tarplant Present	✓		

Overall S. Tarplant Condition:

Description	Yes	No
Germinating	—	—
Seeding	—	—
Senecence	✓	
Flowering	✓	
Healthy	✓	
Disease		✓
Wilting		✓
Yellowing		✓

Southern Tarplant Metrics:

Quantity (# of individuals)	
Senesced	Alive
卌 卌 卌	卌 卌 卌 卌 卌 卌 卌 卌 卌 卌
	卌 卌 卌 卌 卌 卌 卌 卌 卌 卌
	卌 卌 卌 卌 卌 卌 卌 卌 卌 I

ESA Biological Resources

Observations/Recommendations:

Hand weeding / Possibly filling

LAWA Escort: Steven Durkee

Name of botanist onsite: Robert Sweet

Signature of botanist onsite: Robert Sweet

For questions please contact:

Robert Sweet

Wildlife Biologist

ESA, Biological Resources

Office: 818-703-8600

Cell: 805-279-2569

Email: rsweet@esassoc.com

ESA Biological Resources

2015 LAWA Southern Tarplant Annual Quantitative Monitoring

Site Location: LAX **Observers:** RES, GCA

Date: 09/16/15 **Cloud Cover (%):** 10%

Time: ____________ **Temperature (F):** 73°F

Plot #: 4a + 6

General Site Conditions:

Same ~~as be~~ constituents as before. Same conditions

Qualitative Site Observations:

Item	Yes	No	Remedial Actions
Trash Present		✓	
Irrigation Required			possibly
Vandalism		✓	
Photos Taken	✓		
Herbivore Damage		✓	
Weed Species Present	✓		
Southern Tarplant Present	✓		

Overall S. Tarplant Condition:

Description	Yes	No
Germinating	—	—
Seeding	—	—
Senecence	✓	
Flowering	✓	
Healthy	✓	
Disease		✓
Wilting		✓
Yellowing		✓

Southern Tarplant Metrics:

Quantity (# of individuals)			
4A		4B	
senesced	alive	senesced	alive
卌 卌 卌 ||	卌 ||||	|||	卌 卌 卌

ESA Biological Resources

Observations/Recommendations:

Hand weeding / possibly filling

LAWA Escort: Steven Durkee

Name of botanist onsite: Robert Sweet

Signature of botanist onsite: Robert Sweet

For questions please contact:

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