LAX MASTER PLAN

MITIGATION MONITORING AND REPORTING PROGRAM (MMRP)

2006 ANNUAL PROGRESS REPORT

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Los Angeles World Airports

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Prepared by

Mitigation Compliance Division

Los Angeles World Airports

LAX Master Plan MMRP Annual Progress Report
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1. Executive Summary

The Los Angeles City Council certified the LAX Master Plan Final Environmental Impact Report (FEIR) and adopted the LAX Master Plan Mitigation Monitoring and Reporting Program (MMRP) on December 7, 2004. 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 second 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.

Additional project specific mitigation measures were identified in the South Airfield Improvement Project Final Environmental Impact Report (SAIP FEIR), the first project-level tiered environmental review document for the LAX Master Plan Program. The Los Angeles City Council approved the SAIP and certified the FEIR on January 11, 2006. The Los Angeles City Council also adopted a SAIP MMRP to mitigate or avoid potentially significant effects on the environment during construction of the project. The status of the SAIP project-specific mitigation measures is also reported in this document.

Mitigation measures applicable to the LAX Master Plan and the SAIP are in the process of being implemented. Mitigation measures are implemented, monitored, and reported on in accordance to four main categories: (1) Program plans; (2) Construction-related mitigation measures; (3) Design mitigation requirements; and (4) “Stand-alone” mitigation plans.

Program plans are documents that address program-wide mitigation measures specified in the LAX Master Plan MMRP. The program plans provide a framework to clearly identify the mitigation measure, define the process of implementation, and establish monitoring and reporting requirements. Some of the program plans are required to update existing operating procedures within appropriate LAWA Divisions and some program plans may be required to develop new procedures and guidelines. Examples of updating existing operations include the maintenance of applicable elements of existing Aircraft Noise Abatement Program (ANAP) or implementing a Revised Aircraft Noise Mitigation Program. New program plans were developed to address specific mitigation measures from the MMRP, such as, the Mitigation Plan for Air Quality (MPAQ) to address air quality impacts. To mitigate or avoid potential significant impacts on the environment during construction, construction-related mitigation measures are implemented by requiring the Construction Contractors to comply with specific environmental requirements. Key areas of mitigation include reduction of traffic impacts by requiring construction deliveries not to coincide with peak traffic periods; and construction equipment replacements and/or retrofit for noise control and air pollution. Some mitigation measures, such as measures to maximize use of reclaimed water, were incorporated into the design of the SAIP project and will be incorporated into all other LAX Master Plan projects during the design process. “Stand-alone” mitigation plans are specifically developed to address specific impacts that are not linked to any particular project within the LAX Master Plan. These stand-alone plans are summarized in Section 6 of this report.

2. Introduction/Background

In December 2005, the Los Angeles City Council approved the LAX Master Plan and related entitlements for the future development of LAX. The LAX Master Plan provides the first major new facilities for, and improvements to, the airport since 1984, and plans how projected growth in passengers and cargo at LAX can be accommodated, in part, through the year 2015. The approved LAX Master Plan includes airfield modifications, development of new terminals, and new landside facilities to accommodate passenger and employee traffic, parking, and circulation. The LAX Master Plan serves as a broad policy statement regarding the conceptual strategic planning framework for future improvements at LAX and working guidelines to be consulted by Los Angeles World Airports (LAWA) as it formulates and processes site-specific projects under the LAX Master Plan program.

Together with its approval of the LAX Master Plan, the Los Angeles City Council certified the LAX Master Plan Final Environmental Impact Report (FEIR) and adopted the LAX Master Plan Mitigation Monitoring and Reporting Program (MMRP). The MMRP (reference ***Appendix A***) documents all mitigation measures set forth in the FEIR. The basic framework of, and requirements for, the MMRP were established in conjunction with approval of the LAX Master Plan and are anticipated to remain in effect throughout implementation of the Master Plan. If additional new mitigation measures are required in conjunction with subsequent environmental (i.e., CEQA) review of individual projects proposed under the Master Plan, such as the South Airfield Improvement Project (SAIP), the MMRP will be updated to include such additional project-specific measures. ***Appendix B*** includes the subsequent project-specific MMRP documents for the SAIP: (1) an MMRP index delineating which Master Plan commitments and mitigation measures are included within the overall MMRP; (2) Administrative refinements to the LAX Master Plan; (3) and two project-specific new mitigation measures applicable to the SAIP.

An MMRP Index included in Appendix B provides a comprehensive delineation of all Master Plan commitments, Master Plan mitigation measures, and project-specific mitigation measures adopted to date, and indicates where within Appendix A the complete text of each measure can be found, as well as an indication of the origin of each measure (i.e., the LAX Master Plan FEIR, the FAA Final Environmental Impact Statement and Record of Decision, or the South Airfield Improvement Project FEIR). The MMRP Index provides the most current and comprehensive delineation of which Master Plan commitments and mitigation measures are included within the overall MMRP, recognizing that, if other new mitigation measures are added, the MMRP Index will be updated accordingly.

This MMRP is the program by which compliance with the proposed mitigation measures, the timing of implementation, and the required reporting procedures identified is ensured. 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. LAWA's Mitigation Compliance Division (MCD) is leading this compliance effort with support from the Environmental Management Division (EMD), Noise Management Division (NMD), and the Engineering and Project Management Division (EPMD). LAWA's MCD is responsible for issuing this MMRP progress report on an annual basis.

3. LAX Master Plan Program Plans

Over half of the mitigation measures from the LAX Master Plan MMRP can be addressed by implementing comprehensive program plans such as those tentatively identified in ***Appendix C*****.** Program plans are documents that address program-wide mitigation measures under the Master Plan by providing a framework to clearly identify the mitigation measure, define the process of implementation, and establish monitoring and reporting requirements. The program plans provide sufficient detail and functionality to address the compliance activities needed to satisfy the mitigation measures (i.e., Aircraft Noise Mitigation Program, Mitigation Plan for Air Quality, etc.). Appendix C lists program plans associated with the LAX Master Plan MMRP with applicable mitigation measures addressed and a brief description of each plan. Appendix C also identifies which program plans are triggered by the SAIP and the status of each plan as of December 2006. Denoted by **BOLD** font, there are 13 program plans triggered by the SAIP.

Status→ Implemented:
Thirteen (13) of the seventeen (17) program plans are applicable to the first LAX Master Plan project, the SAIP. Of these thirteen plans, LAWA has developed 12 program plans and has implemented applicable provisions of each program plan to the SAIP. The 13th program plan, SAIP Habitat Replacement Plan, is being developed concurrent with the construction of the SAIP.

4. Design-Related Mitigation Requirements

Design mitigation measures are requirements that can be incorporated during the design phase of a project. The project-level tiered SAIP FEIR identified design mitigation requirements applicable to the SAIP. All applicable SAIP mitigation measures are identified in ***Appendix D*** and design mitigations are denoted with "*Italics*" font.

Examples of design mitigation measures that have been incorporated into the SAIP are briefly described below:

MMRP Commitment or Mitigation Measure	Implementation Requirement
E-2 Coordination with Utility Providers	E-2 is a commitment from the LAX Master Plan MMRP. During the design process, the SAIP design team coordinated with all affected utility providers to ensure compatibility.
W-1 Maximize Use of Reclaimed Water	W-1 is a commitment from the LAX Master Plan MMRP. During the design process, the SAIP design team included a design requirement for the Contractor to utilize reclaimed water as feasible to satisfy this commitment.

FP-1 LAFD Design Recommendations	Commitment FP-1 LAFD Design Recommendations requires the Design team to work with LAFD to prepare plans that contain appropriate design features, such as emergency access, fire flow requirements, fire hydrants, private roadway access for fire department equipment, and other recommendations.

Status→ Implemented:
The SAIP design plans incorporated the above requirements during the design phase of the project. Currently, there is no other Master Project in the design phase.

5. Construction-Related Mitigation - South Airfield Improvement Project (SAIP)

As shown in the MMRP Index in Appendix B, the SAIP Final EIR identified mitigation measures from the LAX Master Plan MMRP and two project-specific mitigation measures, MM-BC(SA)-1 and MM-BC(SA)-2 applicable to the construction of the SAIP. ***Appendix D*** presents a spreadsheet that details further how each of the SAIP mitigation measures is complied with and the current status of each mitigation measure. The construction-related mitigation measures are identified as "**bold**" font in Appendix D. Construction related mitigation measures are complied with by inclusion of mitigation requirements into the construction contract specifications for the SAIP. For a detailed description of each mitigation measure, please reference Appendix A, the LAX Master Plan MMRP as adopted September 2004. All applicable SAIP mitigation measures are being implemented during construction and monthly progress reports are available at the project construction site. Described in this section is a brief progress summary on key mitigation measures, such as air quality, noise, and traffic for the SAIP.

5.1 Brief Project Description:

The South Airfield Improvement Project (SAIP) is the first LAX Master Plan project to be implemented and will improve airport safety by changing the way aircraft move about LAX's South Airfield. LAX has been experiencing a number of runway incursions where there was potential for contact between aircraft. To reduce the potential for runway incursion the SAIP will provide a new parallel center taxiway between the two South Airfield runways at LAX.

To accommodate the new 75 foot wide center taxiway, Runway 7R-25L will be relocated approximately 55 feet to the south of its current centerline location. The relocation of Runway 7R-25L will include the relocation and replacement of runway pavement, navigational and visual aids, and other associated site work such as utilities, lighting, signage, grading, drainage and structural improvements over the Sepulveda Tunnel.

The project will minimize the potential for runway incursions by reconfiguring the existing high-speed taxiways on the South Airfield that directly cross the departure runway (Runway 7L-25R). Arriving aircraft on the southern-most runway (Runway 7R-25L) would instead taxi onto the new parallel center taxiway and hold until it is clear to cross Runway 7L-25R.

The project began construction in March 2006 and is scheduled for completion in June 2008. The runway phase of the project is scheduled for completion in the Spring of 2007.

5.2 Key Construction-Related Mitigation Measures Implemented:

5.2.1 Air Quality:

In accordance with the LAX MMRP MM-AQ-1, LAWA has developed the LAX Master Plan Mitigation Plan for Air Quality (LAX MP-MPAQ). The LAX MP-MPAQ was developed in consultation with the Federal Aviation Administration (FAA), the U.S. Environmental Protection Agency (USEPA), the California Air Resources Board (CARB), and the South Coast Air Quality Management District (SCAQMD) to include all feasible methods to reduce air pollutant emissions from aircraft, ground support or service equipment (GSE), traffic, and construction equipment both on and off the airport. The goal of the LAX MP-MPAQ is to reduce potential air pollutant emissions associated with implementation of the LAX Master Plan to levels equal to, or less than, the thresholds of significance identified in the Final EIR for the project. The LAX MP-MPAQ included feasible mitigation measures that are grouped into three (3) categories: 1) Construction-Related Measures; 2) Transportation-Related Measures; 3) Operations-Related Measures.

The second component of the LAX MP-MPAQ, MM-AQ-2 Construction-Related Mitigation Measures is applicable to the SAIP. In accordance to MM-AQ-2, the below list of applicable measures grouped in six (6) categories are currently being implemented during the entire construction duration of the SAIP.

5.2.1.1 Fugitive Dust Source Controls: Fugitive Dust Source Controls are designed to reduce the generation of wind-blown dust from construction areas, haul roads and stockpiles of raw materials. LAWA has approved a Fugitive Dust Control Plan (FDCP) from the SAIP construction contractor and has implemented measures identified in the plan. In general, the SAIP project construction complies with Rule 403 of the SCAQMD. A daily log/checklist of fugitive dust mitigation measures developed by SCAQMD is used and submitted for LAWA's compliance review. Watering, dust suppressants, and non-toxic chemical stabilizers are the primary dust control measures for earth moving operations, disturbed soils and surface areas, unpaved roads, crushing operations, or any other construction activities that may contribute to the formation of fugitive dust. A publicly visible sign is posted within 50 feet of the project site entrance that includes a contact person and phone number for dust-related complaints. Reference ***Appendix E*** for the FDCP.

5.2.1.2 On-Road Mobile Source Controls: On-Road Mobile Source Controls are designed to reduce the potential impact from the exhaust of construction-worker vehicles and other construction vehicles or equipment on the public roadway network. The SAIP construction employee work/commute hours are scheduled during off-peak hours and the construction contractor has made on-site lunch trucks available during construction to minimize off-site worker vehicle trips.

5.2.1.3 Non-Road Mobile Source Controls: Non-road Mobile Source Controls are designed to reduce potential impacts from the exhaust of heavy construction vehicles and equipment operating on the construction site. LAWA has implemented the contractor vehicle idling compliance rule similar to the CARB commercial idling restrictions. Another mitigation measure prohibits staging or parking of construction vehicles (including workers' vehicles) on streets adjacent to sensitive receptors such as schools, daycare centers, and hospitals. A designated staging area and batch plant facility were established for the SAIP project site to minimize off-site truck haul trips. A contractor employee parking area has been designated and workers are shuttled into the jobsite. Reference exhibit ***Appendix F*** for the SAIP Construction Traffic Management Plan.

In addition, LAWA required the construction contractor to utilize Best Available Emission Control Technology (BACT) for all diesel equipment used during construction to reduce diesel emissions of PM, including fine PM, and secondarily, to reduce emissions of NOx. Exemptions are granted only if the Contractor provides written findings, based upon appropriate market research, that the best available emission control device for a particular piece of equipment is unavailable or impractical. Exemptions also can be approved if the piece of construction equipment is used on the construction site for fewer than 20 calendar days per calendar year. At publication time of this report, approximately 10% of the SAIP construction equipment has BACT devices installed at the project. In addition, LAWA has contracted an independent third party to monitor the above BACT requirement in conjunction with the Community Benefits Agreement. Additional detailed information on the BACT requirement, monitoring, and reporting is described in a separate report, the second annual 2006 Community Benefits Agreement Progress Report, that is available at LAWA and posted on LAWA's website http://www.laxmasterplan.org for review.

5.2.1.4 Stationary Point Source Controls: Stationary Point Source Controls are designed to reduce emissions from generators and other power-producing devices used on the construction site. The SAIP construction contactor has committed to use "cleaner burning diesel" fuel such as Ultra Low Sulfur Diesel fuel for all construction equipment including generators. LAWA and the construction contractor are coordinating with the City's Department of Water and Power (DWP) to eventually utilize electric power to operate stationary power-producing equipment, including generators.

5.2.1.5 Mobile and Stationary Source Controls: The Mobile and Stationary Source controls are designed to reduce the potential impact from construction activities during pollution alert periods and to reduce overall emissions by using appropriate equipment and fuels. In accordance with the SAIP contract specifications, the construction contractor is required to submit a daily log of air quality forecast monitoring second-stage smog alert periods in the immediate vicinity of the Project. If and when a second-stage smog alert occurs, the Contractor shall suspend use of all construction equipment. As of the time of publication of this report, there has not been a second-stage smog alert.

Although not specifically required by the MMRP, the Contractor has committed to using Ultra Low Sulfur Diesel for all construction equipment and to utilize construction equipment having the minimum practical engine size (i.e., lowest appropriate horsepower rating for intended job). LAWA continues to monitor all construction equipment to be properly maintained in accordance with manufacturers' specifications and schedules. All maintenance and repair records have been submitted by the contractor upon request by LAWA and a policy has been approved prohibiting the contractor from tampering with construction equipment to increase horsepower or to defeat emission control devices.

5.2.1.6 Administrative Controls: Administrative Controls calls for the designation and employment of Mitigation Monitors to monitor and report on the implementation of mitigation measures contained in MM-AQ-2. LAWA has designated an environmental mitigation monitor, the Construction Management Team, to coordinate with the Contractor's environmental compliance officer to ensure the implementation of all components of the construction-related measures through direct inspections, records reviews, and investigation of complaints. Detailed documentation of all mitigation measures is available at the construction site.

5.2.2 Noise:

Consistent with the requirements set forth in MM-N-7 Construction Noise Control Plan of the LAX MMRP, LAWA and the SAIP construction contractor have implemented a Construction Noise Control Plan (CNCP) for the entire duration of the construction of the SAIP. Attached as ***Appendix G***, the CNCP includes feasible measures to reduce potential noise impacts throughout the construction period near noise sensitive uses. The CNCP describes anticipated noise levels of proposed construction equipment and activities and noise mitigation methods. The construction Contractor is required to maintain acceptable noise levels during construction. In July, 2006, LAWA implemented a 24-hour construction noise hotline program for the general public to file noise complaints and within one hour, LAWA is required to investigate the complaint and communicates the results of the investigation to complainants. Monthly noise hotline reports are provided in ***Appendix H***.

5.2.3 Traffic:

In accordance with the LAX MMRP, a number of mitigation measures relating to traffic impacts are applicable to the SAIP. LAWA and the SAIP construction contractor have implemented a Construction Traffic Management Plan (CTMP) to mitigate potential traffic congestion during both peak and off-peak periods. Attached as ***Appendix F***, the CTMP details the designated haul routes and/or detours for construction traffic, deliveries, and construction employee trips. Haul routes are located away from residential areas and are maintained regularly by the Contractor. Construction signage is provided for traffic management. Construction employee work hours are established to avoid peak and off-peak periods to minimize employee trips to and from the project site. LAWA has established a designated employee parking location for construction workers with a shuttle system to transport workers to and from the project site.

Status→ In Progress:
Construction mitigation measures are included as specification language in the Contractor's contract documents and are enforceable with penalty clauses for non-compliance. These construction mitigation requirements are monitored and reported on a weekly basis by LAWA staff during the entire duration of the SAIP construction contract.

6. "Stand-Alone" Mitigation Plans

"Stand-alone" mitigation plans are derived from specific mitigation measures to address the overall impacts of the LAX Master Plan. These stand-alone plans are not linked to any particular project within the LAX Master Plan. Stand-alone plans are divided into five (5) major impact areas: Noise, Air Quality, Biotic Communities, Hydrology and Water Quality, and Environmental Justice. Table 1 below provides a summary status of all "stand-alone" mitigation plans. Brief descriptions of each stand-alone plan are discussed in the following subsections.

Table 1: "Stand-Alone" Mitigation Plans - Summary Status			Completed	In Progress	Existing Policy	Future Plan
6.1	*Noise Mitigation Plans*					
6.1.A	N-1	Maintenance of Aircraft Noise Abatement Program			X	
6.1.B	MM-N-4	Update the Aircraft Noise Abatement Program				X
6.1.C	MM-N-5	Conduct Part 161 Study		X		
6.1.D	MM-LU-1	Implement Revised Aircraft Noise Mitigation Program			X	
6.1.E	MM-LU-2	Incorporate Residential Dwelling Units Exposed to Single Event Awakenings Threshold into Aircraft Noise Mitigation Program		X		
6.1.F	MM-LU-3	Conduct Study of the Relationship Between Aircraft Noise Levels and the Ability for Children to Learn		X		
6.1.G	MM-LU-4	Provide additional sound insulation for schools shown by MM-LU-3 to be significant impacted by aircraft noise				X
6.1.H	MM-LU-5	Upgrade and Expand Noise Monitoring Program		X		
6.2	*Air Quality Mitigation Plans*					
6.2.A	MM-AQ-1	Mitigation Plan for Air Quality	X			
6.2.B	MM-AQ-2	Construction-Related Mitigation Measures	X			
6.2.C	MM-AQ-3	Transportation-Related Mitigation Measures		X		
6.2.D	MM-AQ-4	Operations-Related Mitigation Measures		X		
6.2.E	AQ-1	Air Quality Source Apportionment Study		X		
6.2.F	AQ-2	School Air Filters				X
6.2.G	AQ-3	Mobile Health Research Lab				X
6.3	*Biotic Communities*					
6.3.A	MM-ET-1	Riverside Fairy Shrimp Habitat Restoration		X		
6.3.B	MM-BC(SA)-1	Replacement of Habitat Units associated with the SAIP		X		
6.3.C	MM-BC(SA)-2	Conservation of Faunal Resources associated with the SAIP		X		
6.4	*Hydrology and Water Quality*					
6.4.A	HWQ-1	Develop Conceptual Drainage Plan	X			
6.6	*Environmental Justice*					
6.6.A	EJ-1	Aviation Curriculum		X		
6.6.B	EJ-2	Aviation Academy		X		
6.6.C	EJ-3	Job Outreach Center		X		
6.6.D	EJ-4	Community Mitigation Monitoring		X		

6.1. Noise Mitigation Plans

The following subsections describe the status of "stand-alone" noise mitigation plans that relate to existing LAX policies or newly developed programs to reduce noise impacts that may result from airport operations, air traffic dispersion, aircraft departures and other factors (N-1, MM-N-4, MM-N5). Mitigation Measures MM-LU-1 and MM-LU-5 address potential impacts on adjacent residential and other noise-sensitive uses newly exposed to high noise levels or significant increases in existing noise levels. MM-LU-2 addresses potential impacts on residential uses newly exposed to high single event noise levels that result in nighttime awakening that are located outside the current Aircraft Noise Mitigation Program (ANMP) boundaries. MM-LU-3 and MM-LU-4 address classroom disruption due to exposure to high single event or cumulative noise levels.

6.1.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 ANAP at LAX is currently maintained by LAWA's Noise Management Division (NMD). The existing ANAP at LAX sets forth LAWA's noise abatement traffic, flight, and runway use procedures. 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 City of Los Angeles, LAWA, and LAWA's Board of Airport Commissioners relative to noise abatement. LAWA's NMD will continue to maintain the noise abatement program throughout implementation of the LAX Master Plan projects. Actions indicating compliance by NMD include submission of the Quarterly Report per the 2005 Stipulated Variance 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 "continuing, in full force and effect, the implementation and enforcement of the…noise abatement policies."

Status→ Existing Policy:
LAWA has complied with this commitment by continually performing maintenance of the existing Aircraft Noise Abatement Program (ANAP) at LAX.

6.1.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→ Not required at this time:
LAWA NMD will update the ANAP, if required, upon the completion of the SAIP construction scheduled to occur in June 2008.

6.1.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 14CFR 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."*

LAWA initiated the Part 161 Study in June 2005. The Part 161 Study is a technical and legal study regarding implementation of a Noise and Access Restriction. The proposed restriction include departures between the hours of midnight and 6:30 a.m. over the communities to the east of LAX, when LAX is operating under normal weather conditions (when LAX is either in over-ocean operations or remains in westerly operations and excluding times when LAX operates in easterly operations). 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→ In Progress:
Based on the evaluation of proposals received from three consultant teams, LAWA selected the firm of Harris Miller Miller & Hanson Inc. (HMMH) to prepare the Part 161 Study for LAX. LAWA/HMMH began the Study in June 2005, which is expected to take approximately 3 years to complete. The Part 161 Study process encompasses 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. HMMH has completed some data collection and analysis. HMMH had submitted new fleet mix forecasts for the Study to comply with the forecast fleet mix reported in the LAX Master Plan EIR. Revisions are required to bring the document into full conformance with the Master Plan. HMMH will submit a proposed work plan to reflect additional studies required by the LAX Master Plan. A Public Outreach Program was implemented with a series of workshops in areas around LAX in October/November 2006. The scheduled completion date for required analyses of the Proposed Restrictions is June 2007. Applications and reports for submittal to FAA are scheduled in November 2007. Public outreach efforts will continue through June 2008.

6.1.D. 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 LAX Noise 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 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 previously described, LAWA has an existing program in place with periodic updates to the County of Los Angeles. The last update was the 2005 ANMP update which was submitted in October of 2006. The status of LAWA's existing Aircraft Noise Mitigation Program is also reported in Appendix C. In addition, specific updates are as follows:

- LAWA continues to implement two very 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.

- Annual updates in support of the requirements of the current LAX Noise Variance pursuant to the California Airport Noise Standards are submitted with the second quarterly report, 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 fast as possible given that participation in the program is voluntary.

- LAWA makes available land use mitigation funds as soon as requested;

- Avigation easements are no longer required;

- 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 will be required for residential sound insulation mitigation;

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

- Selection of and prioritization of properties to be sound insulated or acquired are in consideration of the following:

    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.

6.1.E. 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:
LAWA NMD is continuing to develop a methodology to produce single event noise contours. This process began in October of 2005 and was completed in October 2006. The first annual contours are still being developed for the 2006 calendar year and should be available in the first quarter of 2007. Contours will be updated annually and will be incorporated into a database. LAWA's Residential Soundproofing Section will receive the number and the exact location of the affected properties. LAWA's Soundproofing -Section will then reevaluate and amend the current program accordingly. Annual ANMP progress reports and periodic ANMP report updates will be submitted to the County of Los Angeles.

6.1.F. 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:
LAWA has developed a draft scope of services and continues to consult with noise and other academic experts to assess the feasibility of the study.

6.1.G. 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 acceptable 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→ Not required at this time:
LAWA will implement this measure's requirements contingent on the results from the study required by MM-LU-3.

6.1.H. 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 siting, 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."*

LAWA NMD currently produces quarterly Noise Monitoring Reports required by the California Airport Noise Standards variance for LAX, as well as the variances for Ontario International Airport (ONT), and Van Nuys Airport (VNY). In order to do this, LAWA operates and maintains a sophisticated Aircraft and Noise Monitoring and Management System (ANMMS). The existing ANMMS includes 46 permanent noise monitors stationed in neighborhoods around the three airports, flight data collection equipment located at the FAA Southern California Terminal Radar Approach Control in San Diego, three passive secondary surveillance radar units located at LAX, ONT, and in North Hollywood for VNY, and several other data sources and data collection devices. The existing ANMMS data is processed to: (1) determine single-event noise levels; (2) correlate detected noise events to aircraft operations; (3) calculate hourly, daily and annual average noise levels throughout the community; (4) provide input to the FAA's Integrated Noise Model that predicts aircraft noise in areas without noise monitoring stations; and (5) produce present-condition noise contour maps for each airport on a quarterly basis. This data also enables LAWA to forecast future noise contours. LAWA's Geographic Information System and land use database are then used to quantify the land use and population impacts within these noise contours.

On April 18, 2005, LAWA issued a three year contract with a firm to upgrade and expand the ANMMS for LAWA at LAX, ONT, and VNY. The new ANMMS, fully supported by a reliable system provider and utilizing "off-the-shelf" PC-based technology that is fully upgradeable, is necessary to sustaining a viable ANMMS, as required by State Law and our existing State Noise Standards variances.

Additionally, the new ANMMS will meet the requirements of MM-LU-5 as part of the LAX Master Plan MMRP.

Status→ In Progress:
LAWA has executed the contract described above in June 2005 and work is in progress to upgrade and expand the noise monitoring system. The project was kicked off in October 2005 and is currently scheduled for completion in mid-2007.

6.2 Mitigation Plan for Air Quality

The following subsections describe the status of "stand-alone" air quality mitigation plans that serve to reduce air quality impacts associated with implementation the LAX Master Plan. While the LAX Master Plan FEIR identifies the general function, purpose, and orientation of various air quality mitigation measures, the following mitigation plans provide specifics regarding the design and implementation of those measures.

6.2.A. 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→ Completed:
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 MM-AQ-1 Plan was adopted by the Board of Airport Commissioners in December 2005, in conjunction with approval of the SAIP (i.e., prior to implementation of the first project under the LAX Master Plan).

6.2.B. 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→ Completed:
LAWA completed a Construction-Related Mitigation Plan that set forth specific implementation requirements for the measures referenced in the FEIR. The MM-AQ-2 Plan was adopted by the Board of Airport Commissioners in December

2005, in conjunction with approval of the SAIP (i.e., prior to implementation of the first project under the LAX Master Plan) and have been integrated into the SAIP construction specifications as appropriate. The execution of this implementation plan (i.e., the MM-AQ-2 Plan) will occur in conjunction with construction of each Master Plan project.

6.2.C. 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 addition to Van Nuys FlyAway, LAWA has successfully added a FlyAway service to Union Station in downtown Los Angeles. LAWA has identified prospective properties in the Long Beach area for the development of another FlyAway site. LAWA continues to identify and evaluate other possible sites throughout the greater Los Angeles area. LAWA has prepared an implementation plan for MM-AQ-3, similar to the type of plan described above for other air quality related mitigation measures, and is in the process of final approval in early 2007.

6.2.D. 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 conducted a comprehensive inventory of GSE operating at LAX and are in the process of finalizing the results. (Reference preliminary results from the survey in ***Appendix I***) With the inventory results, LAWA can further evaluate the goals of MM-AQ-4 and investigate available technology and potential technological developments regarding extremely low emission GSE. Due to various events associated with the GSE Inventory, the elimination of the South Coast GSE MOU, and pending regulations by CARB, LAWA continues to evaluate the framework plan for MM-AQ-4, similar to the plans completed for MM-AQ-1 and MM-AQ-2. The MM-AQ-4 framework plan is scheduled to be completed in mid-2007.

6.2.E. 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→ In Progress:
LAWA has reconvened the AQSAS Technical Working Group (TWG), which had not met for several years but got together on September 14th , 2006 and is now meeting regularly to update the technical approach and protocol for the study. The TWG includes experts from the U.S. Environmental Protection Agency, California Air Resources Board, South Coast Air Quality Management District, academia, and has been expanded to include representatives of the LAX Coalition and the City of El Segundo. Based on input received from the meeting on September 14, as well as earlier comments from the Coalition and from an EPA Peer Review effort, LAWA's team is making edits to the technical approach/protocol for distribution to the TWG. The Air Quality Source Apportionment Study is also required as part of the Stipulated Settlement Agreement and Community Benefits Agreement.

6.2.F. 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→ Not required at this time:
LAWA will initiate the process of identifying qualifying schools following completion of AQ-1, Air Quality Source Apportionment Study.

6.2.G. 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→ Not required at this time:
LAWA will initiate this study following the completion of AQ-1, Air Quality Source Apportionment Study and availability of funds.

6.3. Biotic Communities Mitigation Plans

6.3.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."*

On April 20, 2004, the United States Fish and Wildlife Service (USFWS) issued a Biological Opinion (BO) based on their review of Alternative D of the Draft EIS/EIR for LAWA Master Plan for LAX and its effects on the federally endangered Riverside Fairy Shrimp (*Streptocephalus woottoni*, "RFS") in accordance with Section 7 of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 et seq.). The April 20, 2004 BO proposed several conservation measures (i.e. mitigation requirements) to offset direct and indirect impacts on the RFS. Subsequently, on April 8 2005, the USFWS issued a BO based on their review of the proposed operations and maintenance activities for LAX and its effects on the RFS. Details of all of the conservation measures are described in both BOs.

LAWA's Riverside Fairy Shrimp Habitat Restoration, identified as Mitigation Measure MM-ET-1 in the LAX Master Plan MMRP, is consistent with the BOs from the USFWS. This mitigation measure involves the creation of a RFS habitat at El Toro or at a comparable site approved by the USFWS. LAWA is currently investigating a comparable site at Madrona Marsh in Torrance, California. To date, LAWA's mitigation activities include the following as it pertains to MM-ET-1:

Completion of the salvage and storage of RFS cyst-bearing soils at LAX in support of the April 20, 2004 BO for Alternative D and the April 8, 2005 BO for Operations and Maintenance. Conservation Measures 5 and 9 of the April 20, 2004 BO and Conservation Measure 8 of the April 8, 2005 BO identify the methods of salvage and storage of RFS cyst-bearing soils located at LAX.

Status→ In-Progress:
On July 13, 2005 through August 8, 2005, LAWA salvaged and stored approximately 1800 cubic feet of RFS cyst-bearing soils formerly located at LAX SAIP site. The RFS cyst-bearing soils collected are being stored in a climate-controlled facility near LAX. The facility is secured and monitored by video cameras 24 hours a day. Carlsbad Fish and Wild Life Office inspected and approved the RFS-cyst storage facilities on August 2, 2005. On December 2, 2005, the FAA transmitted a letter confirming the completion of the RFS cysts conservation work to the United States Fish & Wildlife Services.

LAWA continues to negotiate with the City of Torrance for use of Madrona Marsh for RFS Habitat Restoration activities. Also, LAWA and the FAA are pursuing alternate plans to create a RFS habitat on Federal lands located at the former Marine Corps Air Station El Toro. In August 2006, the proposed RFS habitat

creation site was the subject of discussions between the FAA and the FBI regarding the future compatibility of the site between FBI training and creation of a RFS habitat. LAWA continues to coordinate with the FAA in support of these efforts.

6.3.B. MM-BC(SA)-1 Replacement of Habitat Units Associated with the SAIP (Disturbed/Bare Ground and Non-Native Grassland/Ruderal Areas)

The SAIP MMRP states in part:

*"**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."*

Status→ In Progress:
LAWA has initiated the preparation of a Habitat Replacement Plan for MM-BC(SA)-1. This plan details the strategy and monitoring requirements for LAWA to replace the habitat units of native coastal sage scrub prior to or concurrent with commissioning of relocated Runway 7R-25L. In May 2006, the USFWS recommended that LAWA prepare a native grassland restoration plan in lieu of a coastal sage scrub plan. LAWA continues to coordinate with the USFWS to finalize the Plan prior to the completion of the SAIP.

6.3.C MM-BC(SA)-2 Conservation of Faunal Resources Associated with the SAIP (San Diego black-tailed jackrabbit and the loggerhead shrike)

The SAIP MMRP states in part:

"**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.*"

Status→ Completed:
LAWA contracted with a qualified wildlife biologist who conducted surveys to comply with this measure in 2005 prior to the start of the SAIP construction. Reference the 2005 MMRP annual report for documentation of the survey. Relocation efforts are not required.

6.4 Hydrology and Water Quality

6.4.A. HWQ-1 Develop 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, at a level of detail sufficient to identify the overall improvements necessary to provide adequate drainage capacity to prevent flooding. The conceptual drainage plan will provide the basis and specifications by which detailed drainage improvement plans will be designed in conjunction with site engineering specific to each Master Plan project. Best Management Practices (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."*

Status→ Completed:
LAWA completed a draft Conceptual Drainage Plan in 2005 and circulated it for public review and comment as part of the SAIP Draft EIR. The draft Plan was finalized in late 2005 and adopted in conjunction with approval of the SAIP. On December 15, 2005, the final Conceptual Drainage Plan was determined by the California Coastal Commission to be consistent with the California Coastal Management Program (i.e., the California Coastal Act).

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

The LAX Master Plan MMRP states in part:

"*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→ Completed:
To determine if regional drainage facilities should be upgraded, LAWA is required to perform an analysis to evaluate the post-construction drainage conditions for the SAIP. This analysis is limited to one of the three drainage tributary areas of the project, the one that ultimately drains into the Dominguez Channel. This study is also required in conjunction with the Stipulated Settlement (Settlement Agreement) agreed upon by the Petitioners and the City of Los Angeles, Los Angeles World Airports (LAWA) in February 2006. In consultation and coordination with the County of Los Angeles' Department of Public Works, LAWA completed the analysis in May 2006 (Reference ***Appendix J*** SAIP Dominguez

Channel Hydrology Analysis). The hydrology analysis concluded that some form of flow restriction should be placed on the SAIP to restrict the outflow from the SAIP site to the Dominguez Channel. An "orifice" plate was designed for the SAIP to restrict the high flows from the project site to an allowable level, and was approved by the County. This device limits the capacity of the system to that suggested by the County

6.5. Environmental Justice

LAWA has worked with local and contracting communities to develop programs that address the current and projected demands for qualified employees and contractors. Some of these programs are:

6.5.A EJ-1 Aviation Curriculum.

The LAX Master Plan MMRP states in part:

*"**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→ In Progress:
LAWA is continually coordinating with the local school districts in developing aviation-related curriculum.

6.5.B. EJ-2 Aviation Academy.

The LAX Master Plan MMRP states in part:

*"**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."*

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 all Los Angeles area 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, South Los Angeles, and Westchester/Playa del Rey. Annually, 75 local students participate in the program. Program participants attend site visits and presentations by organizations such as the FAA, Boeing Aircraft, Federal Drug Enforcement Agency, Airlines, LSG Sky Chefs, and others.

The Gateways Internship Program was launched by LAWA as a collaborative initiative of the Inglewood Unified School District, South Bay Private Industry Council and the Los Angeles World Airports. The program was developed as one of several approaches to address the current and projected demand for qualified employees to fill positions at LAWA. This program provides paid internships to local youth currently attending high school or college. The program has been expanded to include the Los Angeles Unified School District, Centinela Valley High School District and the El Segundo Unified School District.

The program consists of a high school and a college internship component. The goal of the program is to expose local high school and college students to career opportunities in the aviation industry. This is accomplished by providing on-the-job practical experience in the aviation field through education, training and mentoring programs and activities.

AIRCademics, "Passport to Art Program" is comprised of a 30-week curriculum offered at the Westchester YMCA, near LAX. This school-to-career enrichment program focuses on teaching the subjects of science, math, reasoning and aviation through the completion of art projects. Participants, who are of middle school age, also learn about the history of flight while attending lectures and field trips. The final class project is the creation of a comic book about LAX. Delivery of this program has been provided to 15 participants this year.

"Wings to Fly" Mentoring Program connects positive adult role models, in this case airport employees, whit at-risk youth in local high schools. Over a seven-month period, students come to LAX twice a month for professionally facilitated workshops, guest speakers and one-on-one time with their mentors, and learn about airport opportunities in a fun atmosphere. This program has been provided to 36 participants.

Status→ In Progress:
As described above, LAWA is continually coordinating with local school districts to provide education and trade training programs for aviation-related careers. Positive feedback was received from participants surveyed in these LAX education outreach programs.

6.5.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 surrounding airport-related businesses through training and comprehensive outreach."*

LAWA's Business and Job Opportunities Division provides employment and educational outreach services to local community-based organizations, and community residents. The Division provides information regarding employment opportunities to job seekers who are interested in employment with airport tenants, surrounding airport companies and other private companies. LAWA staff assists job seekers with resume writing, interview skills and provides various resource training classes that are facilitated by our local community partners. LAWA staff also assists potential employers by providing the employer with resumes of job seekers whose skills match the needs of the employer. LAWA staff attends job fairs and career days facilitated by various community organizations and educational institutions.

Status→ In Progress:

In October 2006, LAWA opened the Business and Job Resources Center (BJRC) located at 6151 W. Century Boulevard. The BJRC is the location from which all future job training programs will operate. The BJRC is working with local Work

Source Centers and the airport employers to enhance community access to airport jobs.

6.5.D. EJ-4 Community Mitigation Monitoring

The LAX Master Plan MMRP states in part:

*"**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."*

The LAX Master Plan Stakeholders Liaison Office (LAX MP SLO) was created as a component of the LAX Plan and the LAX Specific Plan by the Los Angeles City Council 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 addition, LAWA is working with affected Cities and agencies who are part of the Stipulated Settlement, and is working in partnership with the LAX Coalition for Economic, Environmental and Educational Justice (LAX Coalition), which includes community groups, environmental organizations and labor unions, to develop a program to ensure that communities impacted by the LAX Master Plan Program also receive benefits as a result of the implementation of the Program.

Status→ In Progress:
LAWA is continually working with the Stakeholders Liaison Office, the Petitioners and the LAX Coalition to encourage community participation in the development of the LAX Master Plan.

7.0. Awards and Achievements

7.1 Proposed Diesel Emission Control Devices (DECs) Demonstration Project.

CARB is proposing a Demonstration Program for new diesel emission control devices and has expressed considerable interest in working with LAWA on the SAIP construction project. Several concepts are under consideration for a Demonstration Project, including the demonstration of on-road Verified Diesel Emission Control Devices (VDECs) in off-road equipment application and the demonstration of Diesel Emission Control Devices (DECs) used in other countries but not yet available in the U.S.

Funding has been committed for the demonstration program from SCAQMD and the Mobile Source Air Pollution Reduction Review Committee (MSRC). The program will test DECs in approximately 200 pieces of equipment. The SAIP has a number of on-road vehicles that are operating primarily in off-road conditions. While Level 3 VDECs are available for these engines, it is not yet know whether these devices will withstand the rigors of off-road use.

CARB and LAWA continue to work on the details of the Demonstration Program scope, timing, and funding.

7.2 Alternative Fuels

LAWA is committed to identify and replace fossil-fuel vehicles and equipment with alternative-fuel models. Currently, over 480 (over 60 percent) of LAX's vehicle fleet is comprised of alternative-fuel vehicles. Alternative fuels include liquefied natural gas (LNG), liquefied petroleum gas (LPG), compressed natural gas (CNG), electricity, solar power and hydrogen fuel cell. Further expansion of the program is planned.

7.3 Recycling

LAWA's Construction and Maintenance Recycling Crew at LAX diverts recyclable material from landfills, including wood, cardboard, metal, plastic, glass, paper, beverage containers, and newspapers. During 2005, LAWA diverted more than 21,000 tons of recyclable materials preventing that material from going into landfills. LAWA was able to recycle and reuse more than 61% of trash it generated in 2005. Additionally, green materials, such as grass clippings and tree branches are recycled into compost at the City's Van Norman Dam joint processing facility.

7.4 Rideshare:

Each year, LAWA's Rideshare Program saves over 6.5 million vehicle miles, over 450,000 gallons of gasoline, nearly 7.9 billion pounds of air pollutants, thousands of dollars in insurance and vehicle depreciation costs, and countless hours spent on Southern California's over-burdened streets and freeways. LAWA's multi-faceted Rideshare Program includes 63 vanpools, 35 carpools, free monthly transit passes, and marketing and advocacy activities to recruit and retain program participants. Currently, about 21% of LAWA's employees are participating in the Rideshare Program, saving over 500 vehicle trips to LAWA facilities every day. During 2006, LAWA received two national awards and one local award for the Employee Rideshare Program.

LAWA is one of only 11 organizations in the country to have received a Gold Medal in the Environmental Protection Agency's (EPA) "Best Workplaces for Commuters" (BWC) Program "2006 Race to Excellence". The BWC Program is a growing public-private partnership in which the EPA and the United States Department of Transportation assist participating employers by offering public recognition and promotion, technical assistance, training, Web-based tools, and forums for information exchange. The annual "BWC Race to Excellence" program acknowledges companies that have gone above and beyond in utilizing the BWC program tools to increase visibility and rideshare program participation.

The second national award was received from the Association for Commuter Transportation (ACT) for "Outstanding Service in the Public Sector" for LAWA's Transit Program "A Free Ride to the Airport." Since LAWA began distributing free transit passes to its employees in March 2005, transit program participation has increased over 200% and ridership continues to climb approximately 9% higher each month. Only one of these awards was given and LAWA was honored as the single best public sector rideshare in the country. In addition to

national recognition, LAWA's Rideshare Program also received the L.A. Metro/Ventura County Regional Rideshare Diamond Award in the category of "Most Innovative Rideshare Program" for LAWA's Free Transit Pass Program. LAWA was the only organization in the county to receive the award in this category.

8.0. Summary

To date, all applicable mitigation measures adopted for the LAX Master Plan MMRP on September 2004 are in the process of being implemented. Some mitigation measures were complied with by the development of program plans while others are satisfied by their incorporation into LAX Master Plan project designs and/or construction specifications. The majority of the "Stand-Alone" mitigation plans are already in-progress if not completed. All applicable mitigation measures triggered by the first LAX Master Plan project, the SAIP, have been implemented and construction for the SAIP started in March 2006 and is scheduled to continue through June 2008. LAWA will continue to monitor and report annually on the progress of the LAX Master Plan MMRP as implementation of the program progresses.

APPENDIX A

LAX MASTER PLAN MMRP AS ADOPTED SEPTEMBER 2004

REFERENCE

LAWA Website http://www.laxmasterplan.org/publications.cfm for a copy of the document.

APPENDIX B

SAIP MMRP (New Measures, Modified Measures, and SAIP Specific Measures)

USERS GUIDE

The contents of this document constitute the Mitigation Monitoring and Reporting Program (MMRP) applicable to projects developed under the Los Angeles International Airport (LAX) Master Plan. The MMRP specifies the monitoring and reporting requirements related to implementation of Master Plan Commitments and Mitigation Measures set forth in the LAX Master Plan Final Environmental Impact Report (FEIR), which is a program EIR that addresses the overall Master Plan, as well as the implementation of additional mitigation measures, if any, set forth in subsequent environmental review documents that tier off of the Master Plan FEIR, but are specific to an individual project. In addition to the FEIR and subsequent related environmental review documents completed in accordance with the requirements of the California Environmental Quality Act (CEQA), this MMRP includes the Master Plan Commitments and Mitigation Measures set forth in the LAX Master Plan Improvements Final Environmental Impact Statement (FEIS) and the related Federal Aviation Administration (FAA) Record of Decision (ROD) completed in accordance with the requirements of the National Environmental Policy Act (NEPA).

The basic framework of, and requirements for, the MMRP were established in conjunction with approval of the LAX Master Plan in December 2004, and are anticipated to remain in effect throughout implementation of the Master Plan. If, additional new mitigation measures are required in conjunction with subsequent environmental (i.e., CEQA) review of individual projects proposed under the Master Plan, the MMRP will be updated to include such additional project-specific measures. These new project-specific mitigation measures will be added at the end of the MMRP to supplement, but will not replace or duplicate the Master Plan Commitments and Mitigation Measures that otherwise apply based on the MMRP adopted for the Master Plan. The tab dividers of this document define the location of: (1) the LAX Master Plan MMRP(i.e., the "base" document); (2) a delineation of administrative refinements made to the LAX Master Plan MMRP, based on certain refinements to Master Plan commitments and mitigation measures occurring in conjunction with the Los Angeles City Council certification of the FEIR in December 2004; and (3) additional project-specific mitigation measures identified in conjunction with CEQA environmental review documents completed subsequent to the Master Plan FEIR.

The MMRP Index, which begins on the following page, provides a comprehensive delineation of all Master Plan commitments, Master Plan mitigation measures, and project-specific mitigation measures adopted to date, and indicates where within this document the completed text of each measure can be found, as well as an indication of the origin of each measure (i.e., the LAX Master Plan FEIR, the LAX Master Plan FEIS/ROD, and individual project EIR such as the South Airfield Improvements Project FEIR). **The MMRP Index provides the most current and comprehensive delineation of which Master Plan commitments and mitigation measures are included within the overall MMRP, recognizing that if, other new mitigation measures are added, the MMRP Index will be updated accordingly.**

LAX MASTER PLAN ALTERNATIVE D
MITIGATION MONITORING & REPORTING PROGRAM (INDEX)

Master Plan Commitments/Mitigation Measures (page no. within the MMRP where full text can be found)		LAX Master Plan FEIR	LAX Master Plan FEIS/ ROD	South Airfield Improve-ment Project FEIR
Noise				
N-1	**Maintenance of Applicable Elements of Existing Aircraft Noise.** (ref . page no. 3)	X	X	X
MM-N-4	**Update the Aircraft Noise Abatement Program Elements as Applicable to Adapt to the Future Airfield Configuration.** (ref . page no. 3)	X	X	X
MM-N-5	**Conduct Part 161 Study to Make Over-Ocean Procedures Mandatory.** (ref . page no. 3)	X		X
MM-N-7	**Construction Noise Control Plan.** (ref . page no. 3)	X		X
MM-N-8	**Construction Staging.** (ref . page no. 4)	X		X
MM-N-9	**Equipment Replacement.** (ref . page no. 4)	X		X
MM-N-10	**Construction Scheduling.** (ref . page no. 4)	X		X
MM-N-11	**Automated People Mover (APM) Noise Assessment and Control Plan.** (ref . page no. 5)	X		
Land Use				
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.** (ref . page no. 7)	X		
LU-2	**Establishment of a Landscape Maintenance Program for Parcels Acquired due to Airport Expansion.** (ref . page no. 7)	X		
LU-4	**Neighborhood Compatibility Program.** (ref . page no. 7)	X		
LU-5	**Comply with City of Los Angeles Transportation Element Bicycle Plan.** (ref . page no. 8)	X		
MM-LU-1	**Implement Revised Aircraft Noise Mitigation Program.** (ref . page no. 8)	X		X
MM-LU-2	**Incorporate Residential Dwelling Units Exposed to Single Event Awakenings Threshold into Aircraft Noise Mitigation Program.** (ref . page no. 11)	X		X
MM-LU-3	**Conduct Study of the Relationship Between Aircraft Noise Levels and the Ability of Children to Learn.** (ref . page no. 12)	X		X
MM-LU-4	**Provide Additional Sound Insulation for Schools Shown by MM-LU-3 to be Significantly Impacted by Aircraft Noise.** (ref . page no. 12)	X		X
MM-LU-5	**Upgrade and Expand Noise Monitoring Program.** (ref . page no. 13)	X		X
Surface Transportation (On-Airport)				
ST-2	**Non-Peak CTA Deliveries.** (ref . page no. 14)	X		
ST-7	**Adequate GTC, ITC, and APM Design.** (ref . page no. 14)	X		
ST-8	**Limited Short-Term Lane Closures.** (ref . page no. 14)	X		
MM-ST-1	**Require CTA Construction Vehicles to Use Designated Lanes.** (ref . page no. 14)	X		
MM-ST-2	**Modify CTA Signage.** (ref . page no. 14)	X		
MM-ST-3	**Develop Designated Shuttle Stops for Labor Buses and ITC-CTA Buses.** (ref . page no. 15)	X		
Surface Transportation (Off-Airport)				
ST-9	**Construction Deliveries.** (ref . page no. 16)	X		X
ST-12	**Designated Truck Delivery Hours.** (ref . page no. 16)	X		X
ST-14	**Construction Employee Shift Hours.** (ref . page no. 16)	X		X
ST-16	**Designated Haul Routes.** (ref . page no. 16)	X		X
ST-17	**Maintenance of Haul Routes.** (ref . page no. 16)	X		X
ST-18	**Construction Traffic Management Plan.** (ref . page no. 16)	X		X
ST-19	**Closure Restrictions of Existing Roadways.** (ref . page no. 17)	X		

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Master Plan Commitments/Mitigation Measures (page no. within the MMRP where full text can be found)		LAX Master Plan FEIR	LAX Master Plan FEIS/ ROD	South Airfield Improve-ment Project FEIR
ST-20	**Stockpile Locations.** (ref . page no. 17)	X		
ST-21	**Construction Employee Parking Locations.** (ref . page no. 17)	X		X
ST-22	**Designated Truck Routes.** (ref . page no. 18)	X		X
ST-23	**Expanded LAX Gateway Improvements/Greening of Impacted Communities.** (ref . page no. 18)	X		
ST-24	**Fair Share Contribution to Congestion Management Plan (CMP) Improvements.** (ref . page no. 19)	X		
MM-ST-6	**Add New Traffic Lanes.** (ref . page no. 20)	X	X	
MM-ST-7	**Restripe Existing Facilities.** (ref . page no. 20)	X	X	
MM-ST-8	**Add Automatic Traffic Signal Activation Control (ATSAC), Automatic Traffic Control System (ATCS) or Equivalent.** (ref . page no. 20)	X	X	
MM-ST-10	**Modify Signal Phasing.** (ref . page no. 21)	X	X	
MM-ST-12	**Provide New Ramps Connecting I-105 to LAX Between Aviation Boulevard and La Cienega Boulevard.** (ref . page no. 22)	X	X	
MM-ST-13	**Create a new Interchange at I-405 and Lennox Boulevard.** (ref . page no. 22)	X	X	
MM-ST-14	**Ground Transportation/Construction Coordination Office Outreach Program.** (ref . page no. 22)	X		
MM-ST-15	**Provide Fair-Share Contributions to Transit Improvements.** (ref . page no. 22)	X		
MM-ST-16	**Provide Fair-Share Contribution to LA County's project to extend the Marina Expressway.** (ref . page no. 23)	X		
Relocation of Residences and Businesses				
RBR-1	**Residential and Business Relocation Program.** (ref . page no. 24)	X	X	
MM-RBR-1	**Phasing for Business Relocations.** (ref . page no. 27)	X		
MM-RBR-2	**Relocation Opportunities through Aircraft Noise Mitigation Program.** (ref . page no. 28)	X		
Environmental Justice				
EJ-1	**Aviation Curriculum.** (ref . page no. 30)	X		X
EJ-2	**Aviation Academy.** (ref . page no. 30)	X		X
EJ-3	**Job Outreach Center.** (ref . page no. 31)	X		X
EJ-4	**Community Mitigation Monitoring.** (ref . page no. 34)	X		X
Air Quality				
AQ-1	**Air Quality Source Apportionment Study.** (ref . page no. 35)	X		X
AQ-2	**School Air Filters.** (ref . page no. 35)	X		X
AQ-3	**Mobile Health Research Lab.** (ref . page no. 35)	X		X
MM-AQ-1	**LAX Master Plan - Air Quality Mitigation Plan for Air Quality.** (ref . page no. 36)	X	X	X
MM-AQ-2	**Construction-Related Mitigation Measure.** (ref . page no. 39)	X	X	X
MM-AQ-3	**Transportation-Related Mitigation Measures.** (ref . page no. 42)	X	X	X
MM-AQ-4	**Operations-related mitigation measures.** (ref . page no. 47)	X	X	X
Hydrology and Water Quality				
HWQ-1	**Develop Detailed Drainage Plan.** (ref . page no. 50)	X		X
MM-HWQ-1	**Update Regional Drainage Facilities.** (ref . page no. 54)	X		X
Historical/Architectural and Archaeological/Cultural Resources				
HR-1	**Preservation of Historic Resources.** (ref . page no. 55)	X		

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Master Plan Commitments/Mitigation Measures (page no. within the MMRP where full text can be found)		LAX Master Plan FEIR	LAX Master Plan FEIS/ ROD	South Airfield Improve-ment Project FEIR
MM-HA-1	**Historic American Buildings Survey (HABS) Document.** (ref . page no. 55)	X		
MM-HA-2	**Historic Educational Materials.** (ref . page no. 56)	X		
MM-HA-4	**Discovery.** (ref . page no. 56)	X	X	X
MM-HA-5	**Monitoring.** (ref . page no. 57)	X	X	X
MM-HA-6	**Excavation and Recovery.** (ref . page no. 57)	X	X	X
MM-HA-7	**Administration.** (ref . page no. 58)	X	X	X
MM-HA-8	**Archaeological/Cultural Monitor Report.** (ref . page no. 58)	X	X	X
MM-HA-9	**Artifact Curation.** (ref . page no. 58)	X	X	X
MM-HA-10	**Archaeological Notification.** (ref . page no. 59)	X	X	X
MM-HA-11	**Navigational Aids Relocation and Improvements.** (ref . FAA Record Of Decision dated May 20th, 2005, page A-6))		X	
Paleontological Resources				
MM-PA-1	**Paleontological Qualification and Treatment Plan.** (ref . page no. 60)	X		X
MM-PA-2	**Paleontological Authorization.** (ref . page no. 60)	X		X
MM-PA-3	**Paleontological Monitoring Specifications.** (ref . page no. 60)	X		X
MM-PA-4	**Paleontological Resources Collection.** (ref . page no. 60)	X		X
MM-PA-5	**Fossil Preparation.** (ref . page no. 61)	X		X
MM-PA-6	**Fossil Donation.** (ref . page no. 61)	X		X
MM-PA-7	**Paleontological Reporting.** (ref . page no. 61)	X		X
Biotic Communities				
MM-BC-1	**Conservation of State-Designated Sensitive Habitat Within and Adjacent to the El Segundo Blue Butterfly Habitat Restoration Area.** (ref . page no. 62)	X	X	X
MM-BC-2	**Conservation of floral resources: Lewis' evening primrose.** (ref . page no. 63)	X		
MM-BC-3	**Conservation of floral resources: mature tree replacement.** (ref . page no. 64)	X		
MM-BC-8	**Replacement of Habitat Units.** (ref . page no. 64)	X		X
MM-BC(SA-1)	**Replacement of Habitat Units Associated with the South Airfield Improvement Project.** (ref . page no. SA-1)	X		X
MM-BC-9	**Conservation of Faunal Resources.** (ref . page no. 68)	X		X
MM-BC(SA-2)	**Conservation of Faunal Resources Associated with the South Airfield Improvement Project.** (ref . page no. SA-1)	X		X
MM-BC-13	**Replacement of state-designated sensitive habitats.** (ref . page no. 71)	X	X	
Endangered and Threatened Species				
MM-ET-1	**Riverside Fairy Shrimp Habitat Restoration.** (ref . page no. 74)	X	X	
MM-ET-3	**El Segundo Blue Butterfly Conservation: Dust Control.** (ref . page no. 86)	X	X	X
MM-ET-4	**El Segundo Blue Butterfly Conservation: habitat restoration.** (ref . page no. 86)	X	X	
Energy Supply				
E-1	**Energy Conservation and Efficiency Program.** (ref . page no. 89)	X		
E-2	**Coordination with Utility Providers.** (ref . page no. 89)	X		X
PU-1	**Develop a Utility Relocation Program.** (ref . page no. 89)	X		X

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Master Plan Commitments/Mitigation Measures (page no. within the MMRP where full text can be found)		LAX Master Plan FEIR	LAX Master Plan FEIS/ ROD	South Airfield Improve-ment Project FEIR
Light Emissions				
LI-2	**Use of Non-Glare Generating Building Materials.** (ref . page no. 91)	X		
LI-3	**Lighting Controls.** (ref . page no. 91)	X		
Solid Waste				
SW-1	**Implement an Enhanced Recycling Program.** (ref . page no. 92)	X	X	
SW-2	**Requirements for the Use of Recycled Materials During Construction.** (ref . page no. 92)	X	X	X
SW-3	**Requirements for the Recycling of Construction and Demolition Waste.** (ref . page no. 92)	X	X	X
MM-SW-1	**Provide Landfill Capacity.** (ref . page no. 93)	X		
Construction Impacts				
C-1	**Establishment of a Ground Transportation/Construction Coordination Office.** (ref . page no. 94)	X		X
C-2	**Construction Personnel Airport Orientation.** (ref . page no. 95)	X		X
Design, Art, and Architecture Applications/Aesthetics				
DA-1	**Provide and Maintain Airport Buffer Area.** (ref . page no. 96)	X		X
DA-2	**Update and Integrate Design Plans and Guidelines.** (ref . page no. 96)	X		
DA-3	**Undergrounding of Utility Lines.** (ref . page no. 96)	X		
MM-DA-1	**Construction Fencing.** (ref . page no. 96)	X	X	X
Hazardous Materials				
HM-1	**Ensure Continued Implementation of Existing Remediation Efforts** (ref . page no. 98)**.**	X	X	X
HM-2	**Handling of Contaminated Materials Encountered During Construction.** (ref . page no. 99)	X	X	X
Water Use				
W-1	**Maximize Use of Reclaimed Water.**(ref . page no. 101)	X		X
W-2	**Enhance Existing Water Conservation Program.** (ref . page no. 101)	X		X
Wastewater				
MM-WW-1	**Provide Additional Wastewater Treatment Capacity to Accommodate Cumulative Flows.** (ref . page no. 102)	X		
Fire Protection				
FP-1	**LAFD Design Recommendations.** (ref . page no. 103)	X		X
PS-1	**Fire and Police Facility Relocation Plan.** (ref . page no. 104)	X		
PS-2	**Fire and Police Facility space and siting requirements.** (ref . page no. 105)	X		
Law Enforcement				
LE-1	**Routine Evaluation of Manpower and Equipment Needs.** (ref . page no. 106)	X		
LE-2	**Plan Review.** (ref . page no. 106)	X		

LAX MASTER PLAN ALTEARNTIVE D
MITIGATION MONITORING & REPORTING PROGRAM
ADDITIONAL MITIGATION MEASURES

Master Plan Commitments/ Mitigation Measures		Potential Impact Being Addressed	Timing of Implementation	Monitoring Frequency	Actions Indication Compliance
Historical/Architectural and Archaeological/Cultural Resources					
MM-HA-11 **Monitoring Agency:**	**Navigational Aids Relocation and Improvements.** Prior to initiation of any grading and/or excavation activities associated with the proposed improvement and relocation of navigational aids, the FAA shall prepare, or cause to be prepared, an archaeological treatment plan (ATP) that ensures the long-term protection and proper treatment of any previously unknown significant archaeological resources, including any Native American remains, encountered during such grading and/or excavation within the Coastal Zone. Pursuant to Title 36, Code of Federal Regulations (CFR) Part 800, the draft ATP shall be submitted by the FAA to the California State Historic Preservation Officer (SHPO), the California Coastal Commission staff archaeologist, the California Native American Heritage Commission and interested parties for 30-days for review and comment. The final ATP, which incorporates the review comments, shall be submitted by FAA to the SHPO, and the California Coastal Commission staff archaeologist for review and approval. The ATP shall include a monitoring plan, research design, and data recovery plan. The ATP shall be consistent with the Secretary of the Interior's Standards and Guidelines for Archaeological Documentation; California Office of Historic Preservation's (OHP) Archaeological Resources Management Report, Recommended Contents and Format (1989), and the Guidelines for Archaeological Research Design (1991); and shall also take into account the ACHP's publication Treatment of Archaeological Properties: A Handbook. The ATP shall also be consistent with the Department of the Interior's Guidelines for Federal Agency Responsibility under Section 110 of the National Historic Preservation Act (NHPA). The ATP shall include a requirement that a qualified archaeologist be retained by the FAA, or its designee, to monitor the subject grading and excavation activities. The qualified archaeologist 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	Potential to unexpectedly encounter and impact subsurface archaeological resources, including Native American remains, during grading and excavation associated with relocation of existing navigational aids located within the coastal zone.	Prior to initiation of grading and/or excavation activities associated with the proposed improvement and relocation of navigational aids in coastal zone.	Once.	Completion of an archaeological treatment plan (ATP) specific to subject grading/excavation activities.

Master Plan Commitments/ Mitigation Measures		Potential Impact Being Addressed	Timing of Implementation	Monitoring Frequency	Actions Indication Compliance
	significant or unique archaeological/cultural find has been unearthed, the FAA 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. The ATP shall also include a requirement that, should any significant archaeological resource or Native American remains be encountered, a Native American monitor shall be retained following consultation with the Native American Heritage Commission, in order to establish the Most Likely Descendent (MLD) associated with the resource/remains.				
Environmental Justice					
MM-EJ-1 **Monitoring Agency:**	**Expedite Residential Soundproofing for Qualifying Property Owners.** Prior to commencing operations on the new runway (Alternative A) or relocated runway (Alternatives C and D) related to the northern runway complex, LAWA will increase funding and technical assistance in order to complete residential soundproofing related to LAX aircraft noise within the City of Inglewood and Los Angeles County to the extent feasible, and will seek federal funding assistance from the FAA. Soundproofing shall be offered and provided to all property owners who have not previously received soundproofing and who qualify and choose to participate in the ANMP program, including those who are within the current ANMP boundaries, and those who would be newly exposed to the 65 CNEL or greater noise contour due to commissioning of the northern runway complex. Following fulfillment of existing commitments within the current ANMP, those who would be newly exposed shall be identified based on modeled noise contours prepared at the time the northern runway improvements are designed in order to expedite completion of soundproofing to the extent feasible prior to the commissioning of the northern runway complex. Completion of soundproofing to the extent feasible accepts that: 1) LAWA and the FAA shall offer assistance and funding to the City of Inglewood and Los Angeles County but cannot control their efforts; 2) certain properties may not qualify or may not otherwise be feasible to mitigate; and 3) some property owners may choose not to participate in the ANMP.	Following relocation of existing runways in the northern runway complex, there is the potential for residential development to be newly exposed to the 65 CNEL and significantly impacted until noise attenuation improvements are completed at those residences that qualify for soundproofing.	Prior to commencing operations on the new (relocated) runway.	Once	Confirm notification of eligibility for soundproofing to residences that would be newly exposed to 65 CNEL due to runway relocation.

LAX MASTER PLAN ALTEARNTIVE D
MITIGATION MONITORING & REPORTING PROGRAM
REVISED MITIGATION MEASURES

Master Plan Commitments/ Mitigation Measures		Potential Impact Being Addressed	Timing of Implementation	Monitoring Frequency	Actions Indication Compliance
Land Use					
MM-LU-3 **Monitoring Agency:** **LAWA**	**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 CEQA purposes for classroom disruption by both specific and sustained aircraft noise events.	Classroom disruption due to exposure to high single event or cumulative noise levels	Initiation of study upon City Council approval of the LAX Plan	Once, upon approval of the study by LAWA	LAWA approval of completed study
MM-LU-4 **Monitoring Agency:** **LAWA**	**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 L max, 65 dB Lmax, or 35 Leq(h), as presented in Section 4.1, *Noise*, of the Final EIR for CEQA purposes. 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 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 CEQA 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	Classroom disruption due to exposure to noise levels in excess of threshold of significance established in MM-LU-3	Within six (6) months of commissioning of any relocated runways (for interim LAX interior noise thresholds component); and upon completion of the study in Mitigation Measure MM-LU-3 (for MM-LU-3 component)	Annually	Conduct noise measurements based on interim LAX interior noise thresholds and on newly established noise thresholds set by MM-LU-3, and make schools eligible for ANMP participation, as appropriate

REVISED MITIGATION MEASURES

Master Plan Commitments/ Mitigation Measures		Potential Impact Being Addressed	Timing of Implementation	Monitoring Frequency	Actions Indication Compliance
	existing avigation easement. A determination of which schools become eligible will be made following application of the new threshold based on measured data.				
	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 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. The conceptual drainage plan 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 project. Best Management Practices (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. 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.	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 the first Master Plan project involving substantial surface alternations or substantial changes to existing operations	Once, upon completion of conceptual drainage plan	Completion of conceptual drainage plan

Master Plan Commitments/ Mitigation Measures		Potential Impact Being Addressed	Timing of Implementation	Monitoring Frequency	Actions Indication Compliance
	Methods to reduce the peak flow of surface water runoff could include: ◆ Decreasing impervious area by removing unnecessary pavement or utilizing porous concrete or modular pavement ◆ Building storm water detention structures ◆ Diverting runoff to pervious areas (reducing directly-connected impervious areas) ◆ Diverting runoff to outfalls with additional capacity (reducing the total drainage area for an individual outfall) ◆ Redirecting storm water flows to increase the time of concentration Measures to increase drainage capacity could include: ◆ Increasing the size and slope (capacity) of storm water conveyance structures (pipes, culverts, channels, etc.). ◆ 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, the Conceptual Drainage Plan will address 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 stormwater 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. Subsequently, LAWA will prepare Standard Urban Stormwater Mitigation Plans (SUSMP) for individual projects associated with the selected alternative during project design and review based on the Conceptual Drainage Plan, as required by the LARWCQB. The purpose of these SUSMPs will be to evaluate water quality impacts associated with individual project components at a design level of detail, as required by LARWQCB, and to identify specific BMPs that will be				

Master Plan Commitments/ Mitigation Measures		Potential Impact Being Addressed	Timing of Implementation	Monitoring Frequency	Actions Indication Compliance
	incorporated into the project design. LAWA will therefore address water quality issues, including erosion and sedimentation, and comply with the SUSMP requirements by designing the storm water system through incorporation of the structural and treatment control BMPs specified in the SUSMP. The following list includes some of the BMPs that could be employed to infiltrate or treat storm water runoff and dry weather flows, and control peak flow rates. ◆ Vegetated swales and strips ◆ Oil/Water separators ◆ Clarifiers ◆ Media filtration ◆ Catch basin inserts and screens ◆ Continuous flow deflective systems ◆ Bioretention and infiltration ◆ Detention basins ◆ Manufactured treatment units ◆ 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.				
Biotic Communities					
MM-BC-1 **Monitoring Agency:** **LAWA**	**Conservation of State-Designated Sensitive Habitat Within and Adjacent to the El Segundo Blue Butterfly Habitat Restoration Area.** FAA is responsible for conservation measures related to the relocation of navigational aids, while LAWA is responsible for all other conservation measures. All necessary steps shall be taken to ensure that the state-designated sensitive habitats within and adjacent to the Habitat Restoration Area are conserved and protected during construction, operation, and maintenance.	Temporary construction impacts to sensitive areas and degradation of state-designated sensitive habitats	Preconstruction/construction	Once, upon completion of pre-construction evaluation and then on-going during construction if within 100 feet of the Habitat Restoration Area; Annually	Completion of pre-construction evaluation and presence of environmental monitor when construction is within 100 feet of state-designated sensitive

Master Plan Commitments/ Mitigation Measures		Potential Impact Being Addressed	Timing of Implementation	Monitoring Frequency	Actions Indication Compliance
	These steps shall, at a minimum, include the following: *Implementation of construction avoidance measures in areas where construction or staging are adjacent to the Habitat Restoration Area.* Prior to the initiation of construction of LAX Master Plan components to be located adjacent to the Habitat Restoration Area, a pre-construction evaluation shall be conducted to identify and flag specific areas of state-designated sensitive habitats located within 100 feet of construction areas. Subsequent to the pre-construction evaluation, a pre-construction meeting shall be conducted and written construction provided avoidance measures to be implemented in areas adjacent to state-designated sensitive habitats. Construction avoidance measures include erecting a 10-foot-high tarped chain-link fence where the construction or staging area is adjacent to state-designated sensitive habitats 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 to reduce fugitive dust emissions during construction activities within 2,000 feet of the El Segundo Blue Butterfly Habitat Restoration Area, with a goal to reduce fugitive dust emissions by 90 to 95 percent. In addition, to the extent feasible, no grading or stockpiling for construction activities should take place within 100 feet of a state-designated sensitive habitat. LAWA or its designee shall incorporate provisions for the identification of additional construction avoidance measures to be implemented adjacent to state-designated sensitive areas. All construction avoidance measures that address Best Management Practices shall be clearly stated within construction bid documents. In addition, provisions shall be included in all construction bid documents requiring the presence of a qualified environmental monitor. Construction drawings shall indicate vegetated areas within the Habitat Restoration Area as "Off-Limits Zone." *Ongoing maintenance and management efforts for the El Segundo Blue Butterfly Habitat Restoration Area.* LAWA or its designee shall ensure that maintenance and management efforts prescribed in the Habitat Management Plan (HMP) for the Habitat Restoration			during operation and maintenance	habitat; Periodic Monitoring Report

REVISED MITIGATION MEASURES

Master Plan Commitments/ Mitigation Measures		Potential Impact Being Addressed	Timing of Implementation	Monitoring Frequency	Actions Indication Compliance
	Area shall continue to be carried out as prescribed.				
MM-BC-2 **Monitoring Agency:** **LAWA**	**Conservation of Floral Resources: Lewis' Evening Primrose.** FAA is responsible for conservation measures related to the relocation of navigational aids, while LAWA is responsible for all other conservation measures. A plan shall be prepared and implemented 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. Seed shall be collected 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 the "Los Angeles/El Segundo Dunes Habitat Restoration Plan." Collected seed shall be broadcast (distributed) after the first wetting rain. A monitoring plan shall be implemented 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. Monitoring shall be undertaken in the manner set forth in the "Los Angeles/El Segundo Dunes Habitat Restoration Plan"..	Loss of individuals of Lewis' evening primrose	At least five (5) years prior to initiation of construction of North Runways	As per Conservation Plan for Lewis' Evening Primrose	Preparation of Conservation Plan for Lewis' Evening Primrose; Periodic Monitoring Report
MM-BC-9 **Monitoring Agency:** **LAWA**	**Conservation of Faunal Resources.** FAA is responsible for conservation measures related to the relocation of navigational aids, while LAWA is responsible for all other conservation measures. LAWA or its designee shall develop and implement a relocation and monitoring plan to compensate for the loss of 1.34 habitat units (0.3 habitat units + 1.04 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. LAWA or its designee shall identify possible relocation sites in consultation with the CDFG and USFWS and shall develop and implement a monitoring plan to monitor the success of the relocated	Loss of habitat occupied by sensitive species	Preparation of Conservation Plan for Faunal Resources within three (3) years of City Council approval of the LAX Plan; Implementation per Conservation Plan. Toad relocation and monitoring component of the	As per Conservation Plan for Faunal Resources	Preparation of Conservation Plan for Faunal Resources; Periodic Monitoring Report

Master Plan Commitments/ Mitigation Measures		Potential Impact Being Addressed	Timing of Implementation	Monitoring Frequency	Actions Indication Compliance
	tadpoles for a period of not more than five years. LAWA or its designee shall relocate the western spadefoot toad population currently inhabiting three locations on the AOA. One potential site is the Madrona Marsh Nature Center in Torrance, 20 miles south of LAX, which supports several vernal pools and one large pond capable of supporting western spadefoot toads. Spadefoot toad experts suggest the best approach to accomplish relocation is to transport tadpoles and metamorphs only, as adults return to their birth site. Site preparation shall include confirmation by a permitted biologist that no predators, such as mosquitofish or bullfrogs, are present within the proposed relocation site or in waterways surrounding the relocation site. The CDFG has suggested that if the first relocation effort is not successful, another attempt should be made the following year. Therefore, western spadefoot toads shall be collected two consecutive years prior to construction activities taking place in existing occupied spadefoot toad habitat. In addition, since the western spadefoot toad is known to become reproductively mature within three years, an additional performance criterion shall be the identification of tadpoles at the relocation site between years three and four. The success criteria should be 50 percent survival of all tadpoles and metamorphs for the first, second, and third years following the last relocation. This shall be accomplished through a five-year monitoring plan, with bi-monthly monitoring between January 31 and June 1, to document the success of this relocation effort. LAWA or its designee shall develop and implement a relocation and monitoring plan to compensate for the loss of 2.38 habitat units of occupied San Diego black-tailed jackrabbit habitat located within the AOA. LAWA or its designee shall relocate the San Diego black-tailed jackrabbit population currently inhabiting the AOA. Relocation efforts shall be coordinated with CDFG. The San Diego black-tailed jackrabbit shall be captured on the AOA using live traps and shall be released into the Habitat Restoration Area. Compensation for the loss of 2.38 habitat units shall be the utilization of at least 2.38 habitat units within the Los Angeles/El Segundo Dunes by the San Diego black-tailed jackrabbit individuals relocated to the site. Black-tailed jackrabbit is currently		Conservation Plan to be undertaken in connection with MM-ET-1 (Riverside Fairy Shrimp Habitat Restoration)		

Master Plan Commitments/ Mitigation Measures		Potential Impact Being Addressed	Timing of Implementation	Monitoring Frequency	Actions Indication Compliance
	absent for the Los Angeles/El Segundo Dunes. Opportunities for compensation for the loss of 2.38 habitat units include 13.52 habitat units from restoration of Non-Native Grassland/Ruderal habitat to a Valley Needlegrass Grassland; 14.4 habitat units from removal and restoration of 50 percent of the existing roadways to Southern Foredune; and 59.68 habitat units from restoration of Disturbed Dune Scrub/Foredune to Southern Foredune. LAWA or its designee shall implement a monitoring plan to monitor the success of the relocated individuals for a period of not more than five years. Performance criteria shall include confirmed success of survival for three years of the San Diego black-tailed jackrabbit within the Habitat Restoration Area. This shall be accomplished through a quarterly monitoring plan to document the success or failure of this relocation effort. LAWA or its designee shall compensate for the loss of areas utilized by loggerhead shrike currently located on the western airfield and composed of 10.83 habitat units (equivalent to 83.25 acres). Compensation for the loss of 10.83 habitat units of habitat utilized by the loggerhead shrike shall be the utilization of at least 10.83 habitat units within the Los Angeles/El Segundo Dunes. Opportunities for compensation for the loss of 10.83 habitat units include 13.52 habitat units from restoration of Non-Native Grassland/Ruderal habitat to a Valley Needlegrass Grassland; 14.4 habitat units from removal and restoration of 50 percent of the existing roadways to Southern Foredune; and 59.68 habitat units from restoration of Disturbed Dune Scrub/Foredune to Southern Foredune. Compensation for the loss of at least 10.83 habitat units shall take place prior to construction. LAWA or its designee shall implement a monitoring program for a period of not more than five years. Performance criteria shall include the use of at least 10.83 habitat units of improved habitat by the loggerhead shrike for foraging and nesting. Monitoring shall take place quarterly for the first three years and biannually thereafter. Monitoring shall be timed appropriately to include monitoring during the breeding period, which is between February and June. As a means of minimizing incidental take of active nests of				

Master Plan Commitments/ Mitigation Measures		Potential Impact Being Addressed	Timing of Implementation	Monitoring Frequency	Actions Indication Compliance
	loggerhead shrike, LAWA or its designee shall have all areas to be graded surveyed by a qualified biologist at least 14 days before construction activities begin to ensure maximum avoidance to active nests for loggerhead shrike. Construction avoidance measures shall include flagging of all active nests for loggerhead shrike and a 300 feet wide buffer area shall be designated around the active nests. A biological monitor shall be present to ensure that the buffer area is not infringed upon during the active nesting season, March 15 to August 15. In addition, LAWA or its designee shall require that vegetation clearing within the designated 300 feet buffer be undertaken after August 15 and before March 15. The FAA or LAWA as appropriate, or the respective designee of each, shall conduct pre-construction surveys to determine the presence of individuals of sensitive arthropod species, the silvery legless lizard, the San Diego horned lizard, and the burrowing owl within the proposed area of impact within the Los Angeles/El Segundo Dunes. Surveys will be conducted at the optimum time to observe these species as described in Section 6.1 of the "Los Angeles/El Segundo Dunes Habitat Restoration Plan." Should an individual be observed, they will be relocated to suitable habitat for that species within the Habitat Restoration Area. Prior to construction, the FAA or its designee shall develop and implement a relocation plan to avoid the potential loss of individuals from the installation of navigational aids and associated service roads. This relocation plan is provided in the "Los Angeles/El Segundo Dunes Habitat Restoration Plan". Relocation efforts shall be undertaken by a qualified biologist, in coordination with CDFG.				
MM-BC-13 **Monitoring Agency:** **LAWA**	**Replacement of State-Designated Sensitive Habitats.** FAA is responsible for conservation measures related to the relocation of navigational aids, while LAWA is responsible for all other conservation measures. Mitigation shall be undertaken for the loss of State-designated sensitive habitat within the Los Angeles/El Segundo Dunes, including the Habitat Restoration Area. Installation of navigational aids and associated service roads under	Loss of state designated sensitive habitat	Preparation of Replacement Plan for State-Designated Sensitive Habitats prior to relocation of navigational aids; Implementation per	As per Replacement Plan for State-Designated Sensitive Habitats	Preparation of Replacement Plan for State-Designated Sensitive Habitats; Periodic Monitoring Report

Master Plan Commitments/ Mitigation Measures		Potential Impact Being Addressed	Timing of Implementation	Monitoring Frequency	Actions Indication Compliance
	Alternative D would result in impacts to 66,675 square feet (1.53 acres) of State-designated sensitive habitat within the Los Angeles/El Segundo Dunes, square feet (0.24 acre) are within habitat occupied by the El Segundo blue butterfly. Impacts to 1.53 acres of State-designated sensitive habitat within the Los Angeles/El Segundo Dunes shall be replaced at a ratio of 2:1 within the Los Angeles/El Segundo Dunes as described in the "Los Angeles/El Segundo Dunes Habitat Restoration Plan". Additionally the removal of existing navigational aides no longer required to assist aircraft approaching from the west has the potential to disturb an estimated 1.4 acres of State-designated habitat within the Los Angeles/El Segundo Dunes. These 1.4 acres will be replaced at a ratio of 2:1 as described in the "Los Angeles/El Segundo Dunes Habitat Restoration Plan". The replacement of State-designated sensitive habitat shall be undertaken through restoration of 2.8 acres as described in the "Los Angeles/El Segundo Dunes Habitat Restoration Plan." The restoration and enhancement of biotic communities as related to the establishment or enhancement of wildlike habitat shall consider and comply with the provisions of FAA Advisory Circular 150/5200-33 regarding hazardous wildlife attractants on or near airports. Additionally, such restoration and enhancement shall take into account, as appropriate, the Memorandum of Agreement between the FAA and other federal agencies, including the US Fish and Wildlife Service (USFWS), pertaining to environmental conditions that could contribute to aircraft-wildlife strikes. Valley Needlegrass Grassland restoration efforts consist of site preparation, propagation and planting of Valley Needlegrass Grassland species, and maintenance and monitoring of the restoration site as described in the "Los Angeles/El Segundo Dunes Habitat Restoration Plan." Southern Foredune restoration efforts consist of site preparation, propagation, and planting of the species characteristic of the Southern Foredune community at the Los Angeles/El Segundo Dunes, and maintenance and monitoring of the restoration site as described in the "Los Angeles/El Segundo Dunes Habitat		Replacement Plan		

Master Plan Commitments/ Mitigation Measures		Potential Impact Being Addressed	Timing of Implementation	Monitoring Frequency	Actions Indication Compliance
	Restoration Plan." Replacement of the 10,597 square feet (0.24 acre) of habitat occupies by the El Segundo Blue Butterfly shall be undertaken as described in Mitigation Measure MM-ET-4, El Segundo Blue Butterfly Conservation: Habitat Restoration.				
MM-ET-4 **Monitoring Agency:** **LAWA**	**El Segundo Blue Butterfly Conservation: Habitat Restoration.** FAA is responsible for conservation measures related to the relocation of navigational aids, while LAWA is responsible for all other conservation measures. All necessary steps shall be taken 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. In conformance with the Biological Opinion, activities associated with navigational aids development shall be limited to the existing roads and proposed impacts areas as depicted in the Final 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 3 acres as described in the "Los Angeles/El Segundo Dunes Habitat Restoration Plan" (1.25 acres of which is 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. 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	Loss of habitat occupied by endangered El Segundo blue butterfly	Preparation of Habitat Restoration Plan for El Segundo Blue Butterfly 3 years prior to construction activities within its habitat, or as approved by USFWS; Monitoring for a period of not more than 5 years	As per Habitat Restoration Plan for the El Segundo Blue Butterfly	Preparation of Habitat Restoration Plan for El Segundo Blue Butterfly; Periodic Monitoring Report

Master Plan Commitments/ Mitigation Measures		Potential Impact Being Addressed	Timing of Implementation	Monitoring Frequency	Actions Indication Compliance
	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 near the restored area as described in MM-BC-13, Replacement of State-Designated Sensitive Habitats. This area shall be the designated mitigation site for planting coast buckwheat and the site to which El Segundo blue butterfly pupae shall be relocated. Gathering of coast buckwheat seed shall take place from September 15 through June 1. Propagation and planting methodologies successfully employed by LAWA during 1984 through 1994 restoration efforts shall be employed for propagation of additional coast buckwheat plants. An existing irrigation system proximal to subsite 23 will be used to increase the success of the restoration effort. Prior to navigational aid installation, a permitted and qualified biologist shall salvage El Segundo blue butterfly larvae in coordination with the USFWS in order to minimize impacts to the butterfly. Based on LAWA's restoration experience within the Habitat Restoration Area, occupation of restored habitat can occur within two to three years of restoration efforts. Therefore, there would be no net loss in acres or value of occupied habitat. Additionally, after the navigational aid system is in place and during the first subsequent flight season of the El Segundo blue butterfly, LAWA shall document El Segundo blue butterfly behavior with respect to the lighting system and submit a monitoring report to USFWS. Lastly, LAWA shall coordinate with the USFWS to create educational materials on the El Segundo blue butterfly for integration into LAWA's public outreach program.				

Master Plan Commitments/ Mitigation Measures		Potential Impact Being Addressed	Timing of Implementation	Monitoring Frequency	Actions Indicating Compliance	
Surface Transportation (Off-Airport)						
MM-ST-6 Monitoring Agency: LAWA	**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. By 2008: Arbor Vitae Street & La Cienega Boulevard, Aviation Boulevard & Century Boulevard, Aviation Boulevard & 111th Street, Aviation Boulevard & Imperial Highway, Centinela Avenue & Sepulveda Boulevard, Continental City Drive , I-105 ramps & Imperial Highway, La Cienega Boulevard & 111th Street, Lincoln Boulevard & 83rd Street, Centinela Avenue & La Cienega Boulevard, Century Boulevard & Hawthorne Boulevard/La Brea Avenue, I-405 northbound off-ramp & Imperial Highway. By 2015: Imperial Highway & Main Street, Imperial Highway & Pershing Drive, Lincoln Boulevard & Manchester Boulevard, Sepulveda Boulevard & 79th St/80th St.	Traffic congestion and delays as they relate to the LAX Master Plan program activities	By 2008 or 2015, or prior to certificate of occupancy for associated project component, as specified in the Transportation Improvements Phasing Plan	Once, at issuance of certificate of occupancy of related project	Acceptance of construction by LADOT and LADPW, or affected jurisdiction	
MM-ST-7 Monitoring Agency: LAWA	**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. By 2008: Airport Boulevard & Arbor Vitae Street, Aviation Boulevard & El Segundo Boulevard, Aviation Boulevard & Imperial Highway, Centinela Avenue and La Cienega Boulevard, Century Boulevard & Sepulveda Boulevard, Florence Avenue & La Cienega Boulevard, La Cienega Boulevard & Manchester Avenue, La Tijera Boulevard & Sepulveda Boulevard, Manchester Avenue & Sepulveda Boulevard, Hawthorne Boulevard & Imperial Highway. By 2015: Aviation Boulevard & Manchester Boulevard, Century Boulevard & La Cienega Boulevard, Grand Avenue & Vista del Mar, La Tijera Boulevard & Manchester Avenue, Arbor Vitae Street & Inglewood Avenue.	Traffic congestion and delays as they relate to the LAX Master Plan program activities	By 2008 or 2015, or prior to certificate of occupancy for associated project component, as specified in the Transportation Improvements Phasing Plan	Once, at issuance of certificate of occupancy of related project	Approval of restriping by LADOT or affected jurisdiction	

Master Plan Commitments/ Mitigation Measures		Potential Impact Being Addressed	Timing of Implementation	Monitoring Frequency	Actions Indicating Compliance	
Surface Transportation (Off-Airport)						
MM-ST-8 Monitoring Agency: LAWA	**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. By 2008: Aviation Boulevard & El Segundo Boulevard, Aviation Boulevard and Rosecrans Boulevard, El Segundo Boulevard & Sepulveda Boulevard, Florence Avenue and La Cienega Boulevard, Mariposa Avenue & Sepulveda Boulevard, Rosecrans Avenue & Sepulveda Boulevard, Hawthorne Boulevard & Imperial Highway, Century Boulevard & Inglewood Avenue, Imperial Highway & Inglewood Avenue, . By 2015: Arbor Vitae Street & La Brea Avenue, Aviation Boulevard & Manchester Avenue, El Segundo Boulevard & La Cienega Boulevard, Sepulveda Boulevard and 83rd Street, Centinela Avenue E/O La Brea Avenue (link), Imperial Highway W/O Hawthorne Boulevard (link), El Segundo Boulevard W/O Hawthorne Boulevard (link), Sepulveda Boulevard N/O Rosecrans Boulevard (link).	Traffic congestion and delays as they relate to the LAX Master Plan program activities	By 2008 or 2015, or prior to certificate of occupancy for associated project component, as specified in the Transportation Improvements Phasing Plan	Once, at issuance of certificate of occupancy of related project	Approval of signal upgrade from LADOT and LADPW, or appropriate jurisdiction	
MM-ST-10 Monitoring Agency: LAWA	**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. By 2008: Douglas Street & Imperial Highway, El Segundo Boulevard & Sepulveda Boulevard, Florence Avenue & La Cienega Boulevard, Imperial Highway & Sepulveda Boulevard, La Cienega Boulevard & Manchester Avenue, Lincoln Boulevard & 83rd Street, Manchester Avenue & Sepulveda Boulevard. By 2015: Highland Avenue/Vista del Mar & Rosecrans	Traffic congestion and delays as they relate to the LAX Master Plan program activities	By 2008 or 2015, or prior to certificate of occupancy for associated project component, as specified in the Transportation Improvements Phasing Plan	Once, at issuance of certificate of occupancy of related project	Approval of signal improvement from LADOT or appropriate jurisdiction	

Master Plan Commitments/ Mitigation Measures		Potential Impact Being Addressed	Timing of Implementation	Monitoring Frequency	Actions Indicating Compliance	
Surface Transportation (Off-Airport)						
	Boulevard, Imperial Highway & Vista del Mar.					
MM-ST-15 Monitoring Agency: LAWA MM-ST-15 (continued)	**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. By 2008: Aviation Boulevard and Imperial Highway, Jefferson Boulevard & Lincoln Boulevard, La Tijera Boulevard & Sepulveda Boulevard, Lincoln Boulevard & Teale Street, I-105 W/B off-ramp at Sepulveda Boulevard, Overland Avenue S/O Venice Boulevard (link). By 2015: Howard Hughes Parkway & Sepulveda Boulevard, Lincoln Boulevard & Manchester Avenue, Sepulveda Boulevard & 76th Street/77th Street, Lincoln Boulevard S/O Venice Boulevard (link), Lincoln Boulevard S/O Jefferson Boulevard (link).	Traffic congestion and delays as they relate to the LAX Master Plan program activities	By 2008 or 2015, or prior to certificate of occupancy for associated project component, as specified in the Transportation Improvements Phasing Plan	Once, at issuance of certificate of occupancy of related project	Approval of fair-share contribution by LADOT or appropriate jurisdiction and/or agency	
MM-ST-16 Monitoring Agency: LAWA	**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: Bali Way & Lincoln Boulevard, Lincoln Boulevard & Marina Expressway, Lincoln Boulevard & Mindanao Way	Traffic congestion and delays as they relate to the LAX Master Plan program activities	By 2008 or 2015, or prior to certificate of occupancy for associated project component, as specified in the Transportation Improvements Phasing Plan	Once, at issuance of certificate of occupancy of related project	Approval of fair-share contribution or alternative improvement by LADOT and/or Los Angeles County	

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.

APPENDIX C

Status and Implementation of Program Plans dated December 2006

LAX Master Plan Mitigation Measures and Reporting Program (MMRP)
Program Plan Status Update
December, 2006

No.	Program Plan Title	Program Plan Description	Master Plan Commitments/Mitigation Measures Addressed	Status (as of December, 2006)
1	**Aircraft Noise Abatement Program (ANAP) (existing)**	The ANAP sets forth LAWA's noise abatement traffic, flight and runway use procedures and includes ground operations restrictions and other airport noise abatement procedures, restrictions and regulations involving aircraft operations.	MM-N-4: Update the Aircraft Noise Abatement Program elements as applicable to adapt to the future airfield configuration	On-going: Existing LAWA Operations managed by LAWA Noise Management Division provides ongoing updates to ANAP, which will include updates based on modifications to the LAX airfield configuration, as appropriate.
2	**Aircraft Noise Mitigation Program (ANMP) (existing)**	The ANMP describes the ongoing efforts by LAWA to convert existing incompatible land uses surrounding each of its three noise impacted airports to compatible land uses through the implementation of two noise mitigation strategies: (1) sound insulation of structures; and the acquisition of property followed by the conversion of its incompatible land use to compatible land use (land recycling).	MM-LU-1 : Implement revised ANMP MM-LU-2 : Incorporate residential dwelling units exposed to single event awakenings into ANMP MM-LU-5 : Upgrade and Expand Noise Monitoring Program	In Progress: Existing program is in place with periodic report updates to the County of Los Angeles.
3	**Master Plan for Air Quality (MPAQ)**	The MPAQ identifies the air quality mitigation requirements for the LAX Master Plan. Briefly stated, the objectives of the MPAQ are to maintain or reduce air emissions associated with the construction and operation of the LAX Master Plan to levels equal to (or less than) the thresholds of significance and, at a minimum, keep these emissions below the levels forecasted in the LAX Master Plan EIR.	MM-AQ-1 : LAX Master Plan – Air Quality Mitigation Plan for Air Quality MM-AQ-2 : Construction-Related Mitigation Measures MM-AQ-3 : Transportation-Related Mitigation Measures MM-AQ-4 : Operations-Related Mitigation Measures	In Progress: Master Plan for Air Quality (MPAQ) consists of 4 main parts: MM-AQ-1: Completed in October 2005 and adopted by City Council on January 11, 2006 MM-AQ-2: Completed in October 2005 and adopted by City Council on January 11, 2006 MM-AQ-3: Final draft of this component is currently under review by LAWA staff scheduled to be completed in January 2007. MM-AQ-4: LAWA staff initiated the GSE Inventory and is in the process of finalizing the results. The overall framework for MM-AQ-4 plan continues to be evolving and revisited.
4	**Ground Transportation Outreach Program (GTOP)**	The GTOP establishes 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 traffic in the airport area are coordinated and minimized.	MM-ST-14: Ground Transportation/Construction Coordination Office Outreach Program C-1: Establishment of a GT/CCO	Completed: Final Ground Transportation Outreach Program issued in May 2006.
5	**Construction Transportation Management Plan (CTMP)**	The CTMP provides additional information regarding the measures from the LAX Master Plan MMRP related to the management of construction traffic during the implementation of the Master Plan. Surface transportation mitigation measures which are unrelated to the movement of construction traffic are not included in this plan.	ST-9: Construction Deliveries ST-12: Designated truck delivery hours ST-14: Construction employee shift hours ST-16: Designated haul routes ST-17: Maintenance of haul routes ST-18: Construction Traffic Management Plan ST-19: Closure restrictions of existing roadways ST-20: Stockpile locations ST-21: Construction employee parking locations ST-22: Designated truck routes	Completed: Final Plan dated May 2005.
6	**Archaeological Treatment Plan (ATP)**	The ATP focuses on the long-term protection and proper treatment of unexpected archaeological discoveries of federal, state, and/or local significance that might be encountered during construction activities of the LAX Master Plan projects. The purpose of the ATP is to achieve compliance with Section 106 of the National Historic Preservation Act (NHPA), the CEQA, and the environmental guidelines of local agencies.	MM-HA-1 : Historic American Buildings Survey (HABS) MM-HA-2 : Historic educational materials MM-HA-4 : Archaeological discovery MM-HA-5 : Archaeological monitoring MM-HA-6 : Excavation and recovery MM-HA-7 : Administration MM-HA-8 : Archaeological/Cultural Monitoring Report	Completed: Final Plan approved by the FAA and other outside agencies in early 2006.

No.	Program Plan Title	Program Plan Description	Master Plan Commitments/Mitigation Measures Addressed	Status (as of December, 2006)
			MM-HA-9 : Artifact curation MM-HA-10 : Archaeological notification	
7	**Paleontological Management Treatment Plan (PMTP)**	The PMTP focuses on the identification, recovery, proper treatment, and long-term protection and archival conservation of expected and unexpected paleontological discoveries of federal, state, and/or local significance that might be encountered during construction activities of the LAX Master Plan projects.	MM-PA-1: Paleontological Qualification and Treatment Plan MM-PA-2 : Paleontological authorization MM-PA-3 : Paleontological monitoring specification MM-PA-4 : Paleontological resources collection MM-PA-5 : Fossil preparation MM-PA-6 : Fossil donation MM-PA-7 : Paleontological reporting	Completed: Final Draft issued December 2005 by EMD. LAWA sent the PMTP to the Vertebrate Section of the County of LA Museum on January 11, 2006.
8	**Conceptual Drainage Plan (CDP)**	The CDP provides an overview of drainage and water quality conditions, capacities, constraints, regulatory framework, and analysis methodologies and identifies options for addressing the LAX Master Plan Alternative D impacts. The CDP provides the basis by which detailed drainage improvement plans shall be designed in conjunction with site engineering specific to each LAX Master Plan improvement project.	HWQ-1: Develop detailed drainage plan	Completed: Draft CDP issued in June 2005 and finalized in December 2005. Consistency Certification received from the Coastal Commission in December 2005.
9	**Procedures for Handling of Contaminated Materials during Construction**	This procedure focuses on pre-existing previously unknown contaminated materials that may be encountered or is first released, spilled, or generated during construction at any phase or project of the LAX Master Plan implementation.	HM-2: Handling of contaminated materials encountered during construction	Completed: Final document issued in December 2005.
10	**SAIP Habitat Replacement Plan (HRP)**	The SAIP HRP documents the implementation strategy for the impacted habitat units on disturbed/bare ground and non-native grassland/ruderal areas due to the construction of the SAIP.	MM-BC-8: Replacement of Habitat Units	In Progress: LAWA continues to coordinate with the FAA on the draft Habitat Replacement Plan applicable to the SAIP.
11	**Utilities Relocation Program (URP)**	The URP provides a framework to address potential impacts on the existing utilities and to minimize interference with the existing utilities associated with the LAX Master Plan construction.	PU-1: Develop a Utilities Relocation Plan E-2: coordination with utility providers DA-3: undergrounding of utility lines	Completed: Final Program completed in May 2005.
12	**Street Frontage & Landscape Development Plan (SFLDP) (Existing)**	The SFLDP provides integrated and coordinated landscape design guidelines for new development along the perimeter areas of LAX. It is not intended as a commitment by LAWA to affect and/or change existing conditions.	LU-4 : Neighborhood Compatibility Program LU-5 : Comply with City of LA Transportation Element Bicycle Plan DA-1 : Provide and Maintain Airport Buffer Areas DA-2 : Update and Integrate Design Plans and Guidelines W-1 : Maximize Use of Reclaimed Water W-2 : Enhance Existing Water Conservation Program	Completed: Final SFLDP completed on 03/02/05. After further evaluation of the SAIP project conditions, commitments DA-1and W-2 are not applicable to the SAIP. A note to file dated December 28, 2005 was developed to document the assessment.
13	Water Conservation Program (WCP)	Not yet completed.	W-2: Enhance Existing Water Conservation Program	In Progress: The Water Conservation Plan may become an appendix to the SFLDP. LAWA EMD is currently investigating funding and how to incorporate into the SFLDP.
14	Landscape Maintenance Program (LMP)	Not yet completed.	LU-2: Establishment of an LMP for parcels acquired due to airport expansion DA-1: Provide and maintain airport buffer areas	In Progress: LAWA currently integrating existing plans or existing procedures under Residential Acquisition Division (RAD) that will form the basis of the LMP. **Not triggered by the SAIP**.
15	**Residential & Business Relocation Plan (Draft Relocation Plan) (DRP)**	The DRP provides procedures for implementing LAWA's LAX MP Relocation Assistance Program (RAP) in accordance with applicable laws, regulations, and policies. The Uniform Act and Title 49 CFR Part 24 serve as the basis for the policies and procedures established in this plan.	RBR-1: Residential and Business Relocation Program MM-RBR-1: Planning for business relocation MM-RBR-2: Relocation opportunities through ANMP	In Progress: Draft Relocation Plan approved by the BOAC in Dec 2004. Final Relocation Plan is currently being developed. **Not triggered by the SAIP**
16	Fire & Police Facility Program (FPFP)	Not yet developed.	PS-1: Fire and Police Facility Relocation Plan PS-2: Fire and Police Facility space and siting requirements	Not applicable at this time: **Not triggered by the SAIP.** First project that may trigger this program plan is the RAC.
17	Solid Waste Recycling Plan (SWRP): *May or may not be required if updates to an existing plan will satisfy this commitment.*	Not yet developed.	SW-1: Implement an Enhanced Recycling Program	Not applicable at this time: **Not triggered by the SAIP.**

APPENDIX D

SAIP Applicable Mitigation Measures Status Summary

SOUTH AIRFIELD IMPROVEMENT PROJECT
LAX MASTER PLAN -- MITIGATION MONITORING REQUIREMENTS

SOUTH AIRFIELD		Compliance Strategy					Implementation Procedures (Action Items)	STATUS				Status (as of Dec 2006)/Comments
		Program Plans or Program Requirements	Construction specifications	Design Requirements	"Stand-Alone" Plans	Project Specific Requirements		Completed	In Progress	Existing Operations	Not required at this time	
												Q
MASTER PLAN COMMITMENTS / MITIGATION MEASURES												
NOISE												
N-1	N-1 - Maintenance of Applicable Elements of Existing Aircraft Noise Abatement Program.	ANAP					1. Submission of Annual Report per Variance Conditions to County of Los Angeles			X		NMD submitted annual report per variance for 2005
MM-N-4	MM-N-4 - Update the Aircraft Noise Abatement Program Elements as Applicable to Adapt to the Future Airfield Configuration.	ANAP					Not Required at this time.				X	Per LAWA Noise Management Division
MM-N-5	MM-N-5 - Conduct Part 161 Study to Make Over-Ocean Procedures Mandatory.				X		1. Board approved study on 3/21/05; 2. Notice To Proceed on June 8th, 2005.		X			Study ongoing
MM-N-7	**MM-N-7 - Construction Noise Control Plan.**	CNCP	X				1. Place requirement of Contractor to develop project specific construction noise control plan.	X				Implementated into SAIP contract specifications. Reviewed and approved the contractor's CNCP by LAWA. Enforce, monitor and reporting on progress by LAWA CM.
MM-N-8	**MM-N-8 - Construction Staging.**		X				1. Place requirement into project contract specifications for the Contractor.	X				Implemented and currently in progress as part of the Construction Contract Specifications.
MM-N-9	**MM-N-9 - Equipment Replacement.**		X				1. Place requirement into project contract specifications for the Contractor.	X				Implemented and currently in progress as part of the Construction Contract Specifications.
MM-N-10	**MM-N-10 - Construction Scheduling.**		X				1. Place requirement into project contract specifications for the Contractor.	X				Implemented and currently in progress as part of the Construction Contract Specifications.
LAND USE												

SOUTH AIRFIELD IMPROVEMENT PROJECT
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		Program Plans or Program Requirements	Construction specifications	Design Requirements	"Stand-Alone" Plans	Project Specific Requirements		Completed	In Progress	Existing Operations	Not required at this time	
												Q
MASTER PLAN COMMITMENTS / MITIGATION MEASURES												
MM-LU-1	MM-LU-1 – Implement Revised Aircraft Noise Mitigation Program.	ANMP					1. Submit annual updates to County of LA			X		Existing program in place with periodic report updates to County of LA.
MM-LU-2	MM-LU-2 - Incorporate Residential Dwelling Units Exposed to Single Event Awakenings Threshold into Aircraft Noise Mitigation Program.	ANMP					1. NMD currently developing methodology in house to produce single event contours. Contours will be updated annually and transfer into a database that will give the Soundproofing Group the number and the exact location of the affected properties. 2. Soundproofing will then gain Board approval to amend the current program accordingly.		X			In progress
MM-LU-3	MM-LU-3 - Conduct Study of the Relationship Between Aircraft Noise Levels and the Ability of Children to Learn.				X		1. Draft scope of services completed. 2. Consult with the Coalition. 3. Issue an RFP to perform the study.		X			Internal LAWA review at this time.
MM-LU-4	MM-LU-4 - Provide Additional Sound Insulation for Schools Shown by MM-LU-3 to be Significantly Impacted by Aircraft Noise.				X		Pending the outcome of MM-LU-3				X	Pending the results of the study under MM-LU-3
MM-LU-5	MM-LU-5 - Upgrade and Expand Noise Monitoring Program.	ANMP					1. Board approved the upgrade on 4/18/2005		X			In progress
SURFACE TRANSPORTATION (ON-AIRPORT)												
SURFACE TRANSPORTATION (OFF-AIRPORT)												
ST-9	**ST-9 - Construction Deliveries.**		X				1. Place requirement into project contract specifications for the Contractor.	X				Implemented into SAIP contract specifications. Also addressed in the Contractor's Construction Traffic Management Plan
ST-12	**ST-12 - Designated Truck Delivery Hours.**		X				1. Place requirement into project contract specifications for the Contractor.	X				Implemented into SAIP contract specifications. Also addressed in the Contractor's Construction Traffic Management Plan
ST-14	**ST-14 - Construction Employee Shift Hours.**		X				1. Place requirement into project contract specifications for the Contractor.	X				Implemented into SAIP contract specifications. Also addressed in the Contractor's Construction Traffic Management Plan

SOUTH AIRFIELD IMPROVEMENT PROJECT
LAX MASTER PLAN -- MITIGATION MONITORING REQUIREMENTS

SOUTH AIRFIELD		Compliance Strategy					Implementation Procedures (Action Items)	STATUS				Status (as of Dec 2006)/Comments
		Program Plans or Program Requirements	Construction specifications	Design Requirements	"Stand-Alone" Plans	Project Specific Requirements		Completed	In Progress	Existing Operations	Not required at this time	
												Q
MASTER PLAN COMMITMENTS / MITIGATION MEASURES												
ST-16	**ST-16 - Designated Haul Routes.**		X				1. Place requirement into project contract specifications for the Contractor.	X				Implemented into SAIP contract specifications. Also addressed in the Contractor's Construction Traffic Management Plan
ST-17	**ST-17 - Maintenance of Haul Routes.**		X				1. Place requirement into project contract specifications for the Contractor.	X				Implemented into SAIP contract specifications. Also addressed in the Contractor's Construction Traffic Management Plan
ST-18	ST-18 - Construction Traffic Management Plan.	CTMP					1. Develop the CTMP. 2. Approval by Office of Quality and Compliance (OQC) 3. Place requirement for Contractor to develop a project specific CTMP	X				Construction Traffic Management Plan approved in May 2006. LAWA Construction Managers are monitoring and reporting on the implementation of that plan.
ST-21	**ST-21 - Construction Employee Parking Locations.**		X				1. Place requirement into project contract specifications for the Contractor.	X				Implemented into SAIP contract specifications. Also addressed in the Contractor's Construction Traffic Management Plan
ST-22	**ST-22 - Designated Truck Routes.**		X				1. Place requirement into project contract specifications for the Contractor.	X				Implemented into SAIP contract specifications. Also addressed in the Contractor's Construction Traffic Management Plan
RELOCATION OF RESIDENCES AND BUSINESS												
ENVIRONMENTAL JUSTICE												
EJ-1	EJ-1 Aviation Curriculum	X							X			Currently being coordinated by the LAX Education Outreach Programs
EJ-2	EJ-2 Aviation Academy	X							X			Currently being coordinated by the LAX Education Outreach Programs
EJ-3	EJ-3 Job Outreach Center	X							X			Currently being coordinated by the LAX Jobs Program
EJ-4	EJ-4 Community Mitigation Monitoring	X							X			Currently being coordinated by the LAX Jobs Program and the Stakeholders Liaison
AIR QUALITY												
AQ-1	AQ-1 - Air Quality Source Apportionment Study				X		1. Draft Scope of Services. 2. Consult with the Coalition for input. 3. Issue RFP.		X			In consultation with the Coalition
AQ-2	AQ-2 - School Air Filters				X		1. Pending results of the AQ-1 study				X	Based upon the conclusions and recommendations of AQ-1 Air Quality Source Apportionment Study, LAWA shall provide funding for air filtration at qualifying public schools with air conditioning systems in place.

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SOUTH AIRFIELD		Compliance Strategy					Implementation Procedures (Action Items)	STATUS				Status (as of Dec 2006)/Comments
		Program Plans or Program Requirements	Construction specifications	Design Requirements	"Stand-Alone" Plans	Project Specific Requirements		Completed	In Progress	Existing Operations	Not required at this time	
												Q
MASTER PLAN COMMITMENTS / MITIGATION MEASURES												
AQ-3	AQ-3 - Mobile Health Research Lab				X		1. Initiate efforts to seek funding/co-fund, to the extent feasible, for a study to measure and investigate upper respiratory system and hearing loss impacts due the LAX MP. 2. Initiate consultation with the Coalition. 3. Develop draft scope of services. 4. Issue RFP.		X			Pending results of the Air Quality Source Apportionment Study.
MM-AQ-1	MM-AQ-1 - LAX Master Plan - Air Quality Mitigation Plan for Air Quality.	MPAQ					1. Drafted Master Plan for Air Quality. 2. Consult with regulatory agencies. 3. Finalize Plan. 4. Formal approval by LAWA.OQC	X				Final Plan completed in October 2005 and adopted by LA City Council on January 11, 2006
MM-AQ-2	**MM-AQ-2 - Construction-Related Mitigation Measure.**	MPAQ	X				1. Drafted Construction related measures implementation plan within MPAQ. 2. Formal approval by LAWA Office of Quality and Compliance (OQC). 3. Implement construction measures into contract specifications.	X				Final Plan completed in October 2005 and adopted by LA City Council on January 11, 2006. Incorporated applicable provisions into the SAIP.
MM-AQ-3	MM-AQ-3 - Transportation-Related Mitigation Measures.	MPAQ					1. Draft Implementation Plan within the MPAQ. 2. Formal approval by LAWA OQC.		X			Draft Plan is in progress and under internal review
MM-AQ-4	MM-AQ-4 - Operations-related mitigation measures.	MPAQ					1. Draft Implementation Plan within the MPAQ. 2. Formal approval by LAWA OQC.		X			Draft Plan is in progress and under internal review
HYDROLOGY AND WATER QUALITY												

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LAX MASTER PLAN -- MITIGATION MONITORING REQUIREMENTS

SOUTH AIRFIELD		Compliance Strategy					Implementation Procedures (Action Items)	STATUS				Status (as of Dec 2006)/Comments
		Program Plans or Program Requirements	Construction specifications	Design Requirements	"Stand-Alone" Plans	Project Specific Requirements		Completed	In Progress	Existing Operations	Not required at this time	
												Q
MASTER PLAN COMMITMENTS / MITIGATION MEASURES												
HWQ-1	HWQ-1 – Develop Detailed Drainage Plan.	CDP					1. Final Conceptual Drainage Plan Developed. 2. Consultation with Coastal Commission.	X				Final consistency certification were received on Dec 15, 2005
MM-HWQ-1	MM-HWQ-1: Update Regional Drainage Facilities.					X	1. Prepare status report on SAIP impacts to regional drainage facilities. 2. Transmit and notify effected jurisdictions (County of LA, City Departments).	X				In coordination with the County of LA, LAWA completed a hydrology analysis June 2006 on SAIP impacts to regional drainage facilities. Approved by the County of LA, the identified mitigation measure were implemented and constructed in the SAIP.
HISTORICAL/ARCHITECTURAL AND ARCHAEOLOGICAL/CULTURAL RESOURCES												
MM-HA-4	**MM-HA-4 – Archaeological Discovery.**	ATP					1. Drafted Archaeological Treatment Plan (ATP). 2. Consultation with FAA and other agencies. 3. Formal approval from LAWA OQC. 4. Implement during construction	X				Currently in consultation with FAA. Applicable provisions have been incoporated into project specifications
MM-HA-5	MM-HA-5 - Archaeological Monitoring.	ATP					Implement in accordance to the approved ATP	X				Status same as part of MM-HA-4
MM-HA-6	MM-HA-6 -Excavation and Recovery.	ATP					Implement in accordance to the approved ATP	X				Status same as part of MM-HA-4
MM-HA-7	MM-HA-7 - Administration.	ATP					Implement in accordance to the approved ATP	X				Status same as part of MM-HA-4
MM-HA-8	MM-HA-8 - Archaeological/Cultural Monitor Report.	ATP					Implement in accordance to the approved ATP	X				Status same as part of MM-HA-4
MM-HA-9	MM-HA-9 - Artifact Curation.	ATP					Implement in accordance to the approved ATP	X				Status same as part of MM-HA-4
MM-HA-10	MM-HA-10 - Archaeological Notification.	ATP					Implement in accordance to the approved ATP	X				Status same as part of MM-HA-4
MM-HA-11	MM-HA-11 Navigational Aids Relocation and Improvements	ATP					Implement in accordance to the approved ATP	X				Status same as part of MM-HA-4
PALEONTOLOGICAL RESOURCES												
MM-PA-1	**MM-PA-1 – Paleontological Qualification and Treatment Plan.**	PMTP					1. Drafted Paleontological Management Treatment Plan (PMTP). 2. Formal approval from LAWA OQC. 3. Implement into contract specifications	X				Final PMTP dated December 2005. Final PMTP was sent to the Vertebrate Section of the LA County Museum for review. Applicable provisions have been incorporated into project specifications.
MM-PA-2	MM-PA-2 - Paleontological Authorization.	PMTP					Implement in accordance to the PMTP	X				Status same as part of MM-PA-1

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SOUTH AIRFIELD		Compliance Strategy					Implementation Procedures (Action Items)	STATUS				Status (as of Dec 2006)/Comments
		Program Plans or Program Requirements	Construction specifications	Design Requirements	"Stand-Alone" Plans	Project Specific Requirements		Completed	In Progress	Existing Operations	Not required at this time	
												Q
MASTER PLAN COMMITMENTS / MITIGATION MEASURES												
MM-PA-3	MM-PA-3 - Paleontological Monitoring Specifications.	PMTP					Implement in accordance to the PMTP	X				Status same as part of MM-PA-1
MM-PA-4	MM-PA-4 -Paleontological Resources Collection.	PMTP					Implement in accordance to the PMTP	X				Status same as part of MM-PA-1
MM-PA-5	MM-PA-5 - Fossil Preparation.	PMTP					Implement in accordance to the PMTP	X				Status same as part of MM-PA-1
MM-PA-6	MM-PA-6 - Fossil Donation.	PMTP					Implement in accordance to the PMTP	X				Status same as part of MM-PA-1
MM-PA-7	MM-PA-7 - Paleontological Reporting.	PMTP					Implement in accordance to the PMTP	X				Status same as part of MM-PA-1
BIOTIC COMMUNITIES												
MM-BC-1	MM-BC-1 - Conservation of State-Designated Sensitive Habitat Within and Adjacent to the El Segundo Blue Butterfly Habitat Restoration Area.		X								X	Not required at this time. The SAIP impacts are not within 2000' of sensitive habitat areas as specified within the measure.
MM-BC-8	MM-BC-8 - Replacement of Habitat Units.	HRP					1. Develop the HRP. 2. Implement the HRP prior to or concurrent with the SAIP		X			The HRP will address the requirements to replace 17.2 habitat units (vegetation) at El Toro or another appropriate site. HRP is currently in the process of being developed.
MM-BC(SA)-1	Replacement of Habitat Units Associated with the South Airfield Improvement Project					X	1. Implement in accordance to the HRP		X			Status same as MM-BC-8
MM-BC-9	MM-BC-9 - Conservation of Faunal Resources.					X	1. Perform Directed surveys for the San Diego Black-Tailed Jackrabbit and the Loggerhead Shrike. 2. Document findings, if found, implement relocation efforts	X				LAWA performed directed surveys near SAIP impacted areas. See February 6, 2006 report by USDA Wildlife Services. Subject species surveys have been completed and found that subject species do not occur at SAIP site; hence no relocation is required.
MM-BC(SA)-2	Conservation of Faunal Resources Associated with the South Airfield Improvement Project					X	Implement according to MM-BC-9	X				Status same as MM-BC-9
ENDANGERED AND THREATENED SPECIES OF FLORA AND FAUNA												
MM-ET-3	**MM-ET-3 - El Segundo Blue Butterfly Conservation: Dust Control.**		X				1. Implemented into Contract Specifications	X				Dust control measures included in the Contract specifications
ENERGY SUPPLY												

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SOUTH AIRFIELD		Compliance Strategy					Implementation Procedures (Action Items)	STATUS				Status (as of Dec 2006)/Comments
		Program Plans or Program Requirements	Construction specifications	Design Requirements	"Stand-Alone" Plans	Project Specific Requirements		Completed	In Progress	Existing Operations	Not required at this time	
												Q
MASTER PLAN COMMITMENTS / MITIGATION MEASURES												
E-2	*E-2 – Coordination with Utility Providers.*			X			1. Coordination with utility providers during Design. 2. Submittal of utility plans to affected companies.	X				Coordination with Utility providers completed during design phase
PU-1	PU-1 – Develop a Utility Relocation Program.	URP					1. Develop program plan "Utilities Relocation Plan" - a general framework. 2. LAWA OQC approve Utilities Relocation Plan.	X				Utilities Relocation Program issued by URS/MARRS on 4/2005.
LIGHT EMISSIONS												
SOLID WASTE												
SW-2	**SW-2 - Requirements for the Use of Recycled Materials During Construction.**		X				Implemented into Contract Specifications	X				Included in SAIP contract specifications
SW-3	**SW-3 - Requirements for the Recycling of Construction and Demolition Waste.**		X				Implemented into Contract Specifications	X				Included in SAIP contract specifications
CONSTRUCTION IMPACTS												
C-1	C-1 – Establishment of a Ground Transportation/Construction Coordination Office	GTOP					1. Designated the construction coordination office and its functions. 2. Provided within the contract specifications.	X				Included in SAIP contract specifications
C-2	**C-2 - Construction Personnel Airport Orientation.**		X				1. Implemented into Contract specifications as a Contractor requirement	X				Included in SAIP contract specifications
DESIGN, ART, ARCHITECTURE/AESTHETICS												
DA-1	DA-1 - Provide and Maintain Airport Buffer Area.					X	1. Assess feasibility to incorporate into SAIP. 2. If not feasible, draft note to file				X	A memo-to-file provides clarification that this measure is not applicable to SAIP.
MM-DA-1	MM-DA-1 - Construction Fencing.					X	1. Assess feasibility to incorporate into SAIP. 2. If not feasible, draft note to file				X	A memo-to-file provides clarification that this measure is not applicable to SAIP.

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		Program Plans or Program Requirements	Construction specifications	Design Requirements	"Stand-Alone" Plans	Project Specific Requirements		Completed	In Progress	Existing Operations	Not required at this time	
												Q
MASTER PLAN COMMITMENTS / MITIGATION MEASURES												
HAZARDOUS MATERIALS												
HM-1	HM-1 – Ensure Continued Implementation of Existing Remediation Efforts.					X	1. Assess compatibility to the remediation efforts for Continental project. 2. Preparation of the construction compatibility assessment. 3. If remediation will be disrupted by construction, approval of the assessment/plan will require necessary approvals from RWQCB, DTSC, and LAFD, as appropriate				X	There are no compatibility issues with the remediation efforts for Continental and the SAIP.
HM-2	**HM-2 – Handling of Contaminated Materials Encountered During Construction.**	HAZMAT					1. Implement into Construction Contract Specifications	X				Procedures for the Handling of Contaminated Materials Encountered During Construction issued December 2005 and incorporated into the SAIP project construction specifications.
WATER USE												
W-1	*W-1 - Maximize Use of Reclaimed Water.*			X			Implemented into Contract Specifications	X				Included as part of the SAIP contract specification as applicable.
W-2	W-2 - Enhance Existing Water Conservation Program.	SFLDP					1. Assess whether SAIP has elements of the project that may address water conservation. If not, a note to file will be developed to document why this measure is not applicable.				X	A memo-to-file provides clarification that this measure is not applicable to SAIP.
WASTEWATER												1
FIRE PROTECTION												
FP-1	*FP-1 - LAFD Design Recommendations.*			X			Submitted plans to LAFD for review	X				Completed during design phase
LAW ENFORCEMENT												

KEY:

Reviewing Authority
BOAC - Board of Airport Commissioners
Caltrans
County of Los Angeles
FAA - Federal Aviation Administration
National Park Service
LAWA - Los Angeles World Airports
Los Angeles Agency Departments

Responsible Party

Program Plans:

ANAP	Aircraft Noise Abatement Program (existing)
ANMP	Aircraft Noise Mitigation Program (existing)
ATP	Archaeological Treatment Plan
CDP	Conceptual Drainage Plan
CTMP	Construction Traffic Management Plan
FPFP	Fire & Police Facility Program
GTOP	Ground Transportation Outreach Program
HRP	Habitat Replacement Plan
HZMAT	Procedure for the Management of Contaminated Materials Encountered During Construction

SOUTH AIRFIELD IMPROVEMENT PROJECT

LAX MASTER PLAN -- MITIGATION MONITORING REQUIREMENTS

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											Q
MASTER PLAN COMMITMENTS / MITIGATION MEASURES											

CM - Construction Management
EMD - Environmental Management Division
EPMD - Engineering Project Management Division
GT - Ground Transportation
LRP - Long Range Planning
OPS - LAX Operations
OQC - Office of Quality and Compliance
TBD - To Be Determined
CCO - Construction Coordination Office

MPAQ Master Plan for Air Quality
SFLDP Street Frontage Landscape Development Plan
URP Utilities Relocation Plan

APPENDIX E

SAIP Fugitive Dust Control Plan (FDCP)

Section 700 Fugitive Dust Control Plan

700.1 Objectives

The objectives of the fugitive dust control plan are to identify and control the means by which loose sediment may be picked up by the wind and introduced to the air. Due to the proximity of the construction site and work areas to both active runways and taxiways, the presence of dust in the environment is elevated from the level of "nuisance" to "hazard". Excessive airborne dust has the potential to be introduced into aircraft engine intakes and obscuring visibility for incoming and outgoing aircraft and air traffic controllers. Therefore, for this project in particular, maintenance of dust control is imperative.

700.2 Requirements

700.2.1 General Requirements

The project shall comply with Rule 403 of the South Coast Air Quality Management District (SCAQMD). A copy of Rule 403 is included in **Attachment S** of this plan. In general, this rule prohibits the emissions of fugitive dust such that:

- Dust remains visible in the atmosphere beyond the property line of the emission source,
- Emission exceeds 20 percent opacity, if the emission was caused by a motorized vehicle,

Under normal circumstances, there is an additional requirement that stipulates that the difference between upwind and downwind samples of particulate matter with an aerodynamic diameter small than or equal to 10 microns (PM_{10}) shall not exceed 50 micrograms per cubic meter. However, as described in paragraph (g)(5) operations are exempt from this requirement, provided the dust control measures listed in Table 2 is implemented on a regular basis. The measures shown on Table 2 are designed for large operations. As this project has been classified as a large operation, and therefore is required to implement the measures listed in Table 2, the project is also exempt from required sampling for particulate matter. The prerequisites to being classified as a large operation are detailed in section 700.2.2 of this plan.

In addition, paragraph (g)(2) states that the general requirements shall not apply during high wind conditions, provided that specific control measures are taken. Descriptions of contingency measures that are to be implemented during high wind conditions are detailed in Section 700.10 of this plan.

700.2.2 Large Operation Requirements

Large operations, as defined by SCAQMD (reference paragraph (c)(21) of Rule 403), are active operations on property which contains 50 or more acres of disturbed surface area; or any earth-moving operation with a daily earth-moving or throughput volume of 5,000 cubic yards or more

three (3) times during the most recent 365-day period. This project shall comply with SCAQMD's Large Operations Requirements as described in the following subsections.

700.2.2.1 Earthmoving

Watering will be the primary dust control measure implemented and will be performed during any earth moving operation which is more than 100 feet from all property lines, as required to prevent visible dust emissions from exceeding 100 feet in length in any direction.

700.2.2.2 Disturbed Surface Areas

Watering shall be done in sufficient quantity and frequency to maintain a stabilized surface. Areas which cannot be stabilized, as evidenced by wind driven dust will receive an application of water at least two (2) times per day to at least 80 percent of unstabilized areas.

Inactive disturbed surface areas, as defined by paragraph (c)(20) of Rule 403, are disturbed surface area upon which active operations have not occurred or are not expected to occur for a period of 20 consecutive days. In these areas, ONE OR MORE of the following practices shall be implemented:

- Water shall be applied to at least 80 percent of inactive areas on a daily basis when there is evidence of wind driven dust,
- Dust suppressants shall be applied in sufficient quantity and frequency to maintain a stabilized surface,
- Vegetative ground cover shall be established within 21 days after active operations have ceased.

700.2.2.3 Unpaved Roads

All unpaved roads used for vehicular traffic shall be watered once daily and construction traffic speeds will be restricted to a maximum of 15 miles per hour. Alternatively, at the Contractor's discretion, watering may occur more frequently if conditions necessitate it and/or a chemical stabilizer may be applied to the roadway.

700.2.2.4 Open Storage Piles

When there is evidence of wind driven fugitive dust, open storage piles shall receive water as necessary to control the dust. At the Contractor's discretion, one of the following alternate measures may be implemented:

- Chemical stabilizers may be applied,
- Temporary coverings may be deployed.

Alternately, at material stockpiles related to crushing and temporary concrete batch plant operations, the Contractor will have the option to install a three (3) sided enclosure around the stockpiles. The walls of this enclosure shall have no more than 50 percent porosity and will extend, at a minimum, to the top of the pile.

700.3 Street Sweeping and Vacuuming

Section (d)(4) of SCAQMD Rule 403 prohibits track-out from extending 25 feet or more in cumulative length from the point of origin from an active operation. To this extent, all track-out from active operations shall be removed at the conclusion of each work day or evening shift. To comply with this, street sweepers will be deployed as required by the Contract Documents along paved areas, along the haul route, and adjacent to work areas to remove any loose sediment or particles that may have been tracked or transported from disturbed soil areas. The intent of the sweeping is to remove loose particles before they can be introduced to the environment by the wind.

700.4 Stockpile Management

700.4.1 Stockpile Locations

Stockpiles shall be confined to the Contractor Staging Area, which will be accessed by construction vehicles with minimal disruption to adjacent streets. Whenever possible, stockpiles shall be located as follows:

- Behind natural or manufactured windbreaks,
- On the leeward side of active piles.

700.4.2 Stockpile Operational Control

During construction of stockpiles, the following procedures will be implemented where practical:

- Limit the drop of fall and exposure to wind,
- Limit the height of the stockpile,
- Minimize vehicle traffic and vehicle speeds, in and around stockpiles,
- Add or remove material from downwind portion of the stockpile,
- Avoid steep sides or faces on stockpiles.

Stockpiles will be watered, as required, to bind loose particles and reduce the potential of loose particles from being introduced into the environment. Watering of stockpiles will be performed as not to create excessive runoff.

700.5 Chemical Dust Stabilizer

At the Contractor's discretion, a chemical stabilizer may be used to supplement watering as dust control. Product data and Material Safety Data Sheets (MSDS) for the proposed chemical dust palliative, TerraLOC, manufactured by MonoSol, LLC, are included in **Attachment T** of this plan. Product data and MSDS for an alternate chemical dust stabilizer, Dustknocker, manufactured by Dustkill, Inc., is also included. In accordance with the Special Provisions, Section 21-5.2, both products are non-toxic.

700.6 Disturbed Soil Areas

The primary source of dust will be disturbed soil areas exposed to the wind. These areas include all soil exposed by construction work, such as demolition of concrete or asphalt pavement. Dust control in these areas will be implemented, as required, by applying water with water trucks to bind loose particles. Chemical binders will be applied at the Contractor's discretion to supplement the application of water to reduce or eliminate the introduction of dust to the environment.

Depending on weather conditions (i.e. dry, windy), just prior to holidays, weekends, or any period where active operations will be suspended for four (4) consecutive days, water mixed with chemical stabilizer may be applied to areas that include soil which has been disturbed by the Project's construction activities. The chemical stabilizer shall be diluted to no less than 1/20 the concentration required to stabilize a surface for six (6) months, as required by the manufacturer's product data.

700.7 Crushing Operations

In accordance with the Special Provisions, suitable demolished Portland Cement Concrete (PCC), Asphalt Concrete (AC), Asphalt-Treated Base (ATB), and Cement-Treated Base (CTB) material shall be crushed and stockpiled for use as Processed Miscellaneous Base (PMB). In accordance with Rule 403, to minimize fugitive dust emissions from the crushing operations, water will be applied to material prior to being loaded in to the crusher. Crushed material stockpiles will be watered as required to reduce dust plumes.

Alternatively, the Contractor will have the option to install a three (3) sided enclosure around stockpiles, as described in previous section 700.2.2.4.

700.8 Stabilized Construction Entrance/Exit

A stabilized construction entrance/exit will be implemented at the transition point between the unpaved area surrounding the stockpiles in the Staging Area and the paved construction access

road. The location of this feature is shown on WPCD-1 in **Attachment H**. The entrance/exit will be comprised of a layer of gravel placed between the unpaved staging area and the access road. This entrance/exit will help remove sediment from the tires of vehicles moving from the unpaved area to the access road, preventing tracking of material onto the road.

700.9 Construction Vehicles

While traveling through unpaved construction site areas, construction vehicles will comply with a 15 miles per hour speed limit. This will serve to minimize agitation of loose particles and reduce dust.

In accordance with California Vehicle Code Section (CVC) 23114, vehicles may not be driven or moved on any highway unless the vehicle is so constructed, covered, or loaded such as to prevent any of its contents or load from escaping from the vehicle. Paragraph (e)(4) further stipulates that vehicles transporting loads of aggregate materials are not required to cover their loads, provided that the vehicle maintains a minimum of six (6) inches of freeboard and that the load does not extend, at its peak, above any part of the upper edge of the cargo container area. Material hauling vehicles shall be loaded such that they comply with the aforementioned CVC 23114.

700.10 High Wind Conditions

High wind conditions are defined as conditions in which instantaneous wind speeds (wind gusts) exceed 25 miles per hour. In accordance with Rule 403 of the SCAQMD, during periods of high wind conditions, the project shall be exempt from the requirements listed in Section 700.2.1, provided the following dust control measures are implemented.

700.10.1 Earthmoving Operations

During high wind conditions, water shall be applied to all soil being subjected to earthmoving operations no more than 15 minutes prior to the actual moving of the soil.

700.10.2 Disturbed Soil Areas

Prior to forecasted high wind conditions, either one or a combination of the following actions may be taken to stabilized areas of soil that have been disturbed by this Project's construction activities:

- Chemical stabilizers shall be applied.
- Water shall be applied three (3) times per day. If evidence of wind driven dust persists, the frequency of watering shall be increased to four (4) times per day.
- Establish vegetative ground cover within 21 days after active operations have ceased.

700.10.3 Unpaved Roads

Prior to forecasted wind events, water will be applied to unpaved construction roads that are associated with this Project. In lieu of this, during active operations, water will applied more frequently or a chemical stabilizer will be added to the water.

700.10.4 Material Stockpiles

During high wind conditions, stockpiles will be watered as necessary to control dust. As an alternative, temporary covers may be deployed.

700.11 Publicly Visible Sign

In accordance with Rule 403 of the SCAQMD, a sign will be posted within 50 feet of the project site entrance, such that it is publicly visible. This sign shall include a telephone number and contact person for issued regarding dust complaints. The Contractor shall take corrective action within 24 hours of receiving the complaint. Sign shall be 48" x 96" and shall read as follows:

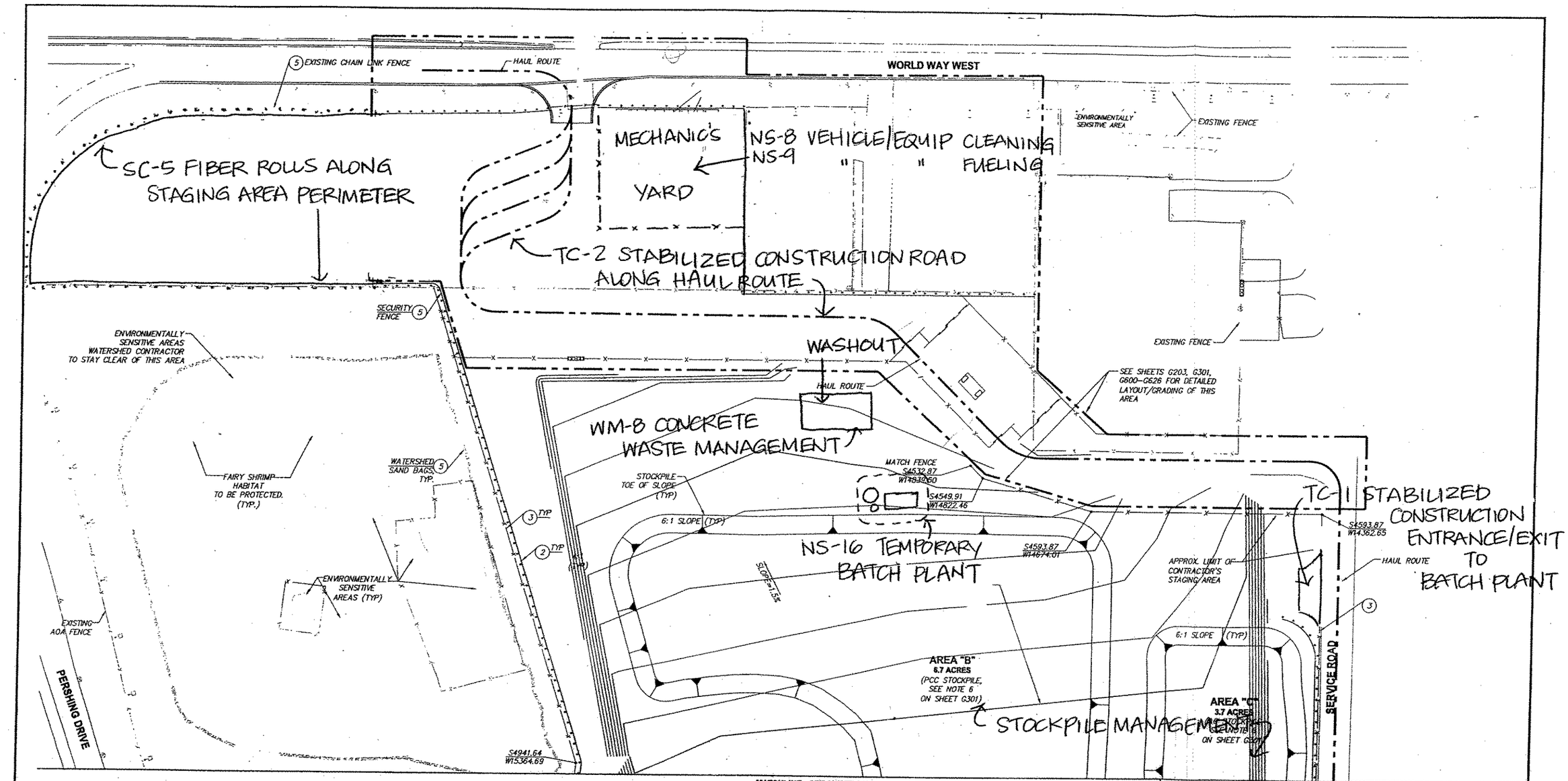
7800 World Way West	4" Lettering
Runway 25L Relocation & Center Taxiway Improvements	4" Lettering
IF YOU SEE DUST COMING FROM	4" Lettering
THIS PROJECT CALL:	4" Lettering
Joshua Logan or David Saliba at 310-491-3100	6" Lettering
If you do not receive a response, Please call	3" Lettering
The AQMD 1-800-CUT SMOG	3" Lettering

Drawing is not to scale. All text will be center justified.

The Contractor will respond to complaints and take corrective action as expeditiously as possible.

Attachment H

Water Pollution Control Drawings (WPCDs)



MATCHLINE - SEE SHEET G200

CONSTRUCTION NOTES: (THIS SHEET ONLY)

1. INSTALL LAWA FIELD OFFICES PER DETAIL 2 ON G301.
2. INSTALL FIBER ROLL, SEE DETAIL 3 ON SHEET C432.
3. INSTALL AOA CHAIN LINK FENCE AND K-RAIL TO SATISFY CONTRACTOR'S OPERATIONS SEE DETAIL 1 ON SHEET G302. FENCE AND K-RAIL SHALL BE REMOVED AT COMPLETION OF PROJECT AND EXISTING AOA LIMIT SHALL BE RE-ESTABLISHED
4. NOT USED.
5. PROTECT IN PLACE EXISTING.

GENERAL NOTE: (CONTINUE ON G301)

1. THE TEMPORARY CHAIN LINK FENCE SHOWN ON THE PLANS DEPICTS THE BOUNDARY LIMITS OF THE CONTRACTORS STAGING AREA.
2. CONTOURS SHOWN FOR GENERAL INFORMATION ONLY. SEE NOTES 14 & 15 ON SHEET G301 FOR MORE INFORMATION.

LEGEND

- REMOVE EXISTING FENCE SEE DETAIL 3 ON SHEET G302 FOR EXISTING SECTION
- TEMPORARY CHAIN LINK FENCE
- FIBER ROLL SEDIMENT FILTER
- TOE OF SLOPE
- TOP OF SLOPE, STOCKPILE MATERIAL
- CONTRACTOR'S ACCESS/HAUL ROUTE
- FAIRY SHRIMP WATERSHED
- SAND BAGS

KEYMAP

60' 0' 60' 120'
SCALE 1" = 60'-0"

REVISION NO.	DESCRIPTION	DATE
3	ADDENDUM No. 3	8/02/05

Los Angeles World Airports

RUNWAY 25L RELOCATION - PACKAGE 1
CONTRACTOR'S STAGING AREA
ROUGH GRADING AND STOCKPILE PLAN
SHEET 2 OF 2
LOS ANGELES INTERNATIONAL AIRPORT

SUBMITTED TO | APPROVED BY

DRAWN | CHECKED TTF | PLAN SET NUMBER 61 OF 717 | SHEET

SCALE | DATE 08/02/05 | DWG NO. WPCD-1

GRID LOCATIONS TO

FILE NAME LA19G201.dwg

Attachment S

South Coast Air Quality Management District (SCAQMD), Rule 403

(Adopted May 7, 1976) (Amended November 6, 1992)
(Amended July 9, 1993) (Amended February 14, 1997)
(Amended December 11, 1998)(Amended April 2, 2004)
(Amended June 3, 2005)

RULE 403. FUGITIVE DUST

(a) Purpose

The purpose of this Rule is to reduce the amount of particulate matter entrained in the ambient air as a result of anthropogenic (man-made) fugitive dust sources by requiring actions to prevent, reduce or mitigate fugitive dust emissions.

(b) Applicability

The provisions of this Rule shall apply to any activity or man-made condition capable of generating fugitive dust.

(c) Definitions

(1) ACTIVE OPERATIONS means any source capable of generating fugitive dust, including, but not limited to, earth-moving activities, construction/demolition activities, disturbed surface area, or heavy- and light-duty vehicular movement.

(2) AGGREGATE-RELATED PLANTS are defined as facilities that produce and / or mix sand and gravel and crushed stone.

(3) AGRICULTURAL HANDBOOK means the region-specific guidance document that has been approved by the Governing Board or hereafter approved by the Executive Officer and the U.S. EPA. For the South Coast Air Basin, the Board-approved region-specific guidance document is the Rule 403 Agricultural Handbook dated December 1998. For the Coachella Valley, the Board-approved region-specific guidance document is the Rule 403 Coachella Valley Agricultural Handbook dated April 2, 2004.

(4) ANEMOMETERS are devices used to measure wind speed and direction in accordance with the performance standards, and maintenance and calibration criteria as contained in the most recent Rule 403 Implementation Handbook.

(5) BEST AVAILABLE CONTROL MEASURES means fugitive dust control actions that are set forth in Table 1 of this Rule.

(6) BULK MATERIAL is sand, gravel, soil, aggregate material less than two inches in length or diameter, and other organic or inorganic particulate matter.

(7) CEMENT MANUFACTURING FACILITY is any facility that has a cement kiln at the facility.

(8) CHEMICAL STABILIZERS are any non-toxic chemical dust suppressant which must not be used if prohibited for use by the Regional Water Quality Control Boards, the California Air Resources Board, the U.S. Environmental Protection Agency (U.S. EPA), or any applicable law, rule or regulation. The chemical stabilizers shall meet any specifications, criteria, or tests required by any federal, state, or local water agency. Unless otherwise indicated, the use of a non-toxic chemical stabilizer shall be of sufficient concentration and application frequency to maintain a stabilized surface.

(9) COMMERCIAL POULTRY RANCH means any building, structure, enclosure, or premises where more than 100 fowl are kept or maintained for the primary purpose of producing eggs or meat for sale or other distribution.

(10) CONFINED ANIMAL FACILITY means a source or group of sources of air pollution at an agricultural source for the raising of 3,360 or more fowl or 50 or more animals, including but not limited to, any structure, building, installation, farm, corral, coop, feed storage area, milking parlor, or system for the collection, storage, or distribution of solid and liquid manure; if domesticated animals, including horses, sheep, goats, swine, beef cattle, rabbits, chickens, turkeys, or ducks are corralled, penned, or otherwise caused to remain in restricted areas for commercial agricultural purposes and feeding is by means other than grazing.

(11) CONSTRUCTION/DEMOLITION ACTIVITIES means any on-site mechanical activities conducted in preparation of, or related to, the building, alteration, rehabilitation, demolition or improvement of property, including, but not limited to the following activities: grading, excavation, loading, crushing, cutting, planing, shaping or ground breaking.

(12) CONTRACTOR means any person who has a contractual arrangement to conduct an active operation for another person.

(13) DAIRY FARM is an operation on a property, or set of properties that are contiguous or separated only by a public right-of-way, that raises cows or

produces milk from cows for the purpose of making a profit or for a livelihood. Heifer and calf farms are dairy farms.

(14) DISTURBED SURFACE AREA means a portion of the earth's surface which has been physically moved, uncovered, destabilized, or otherwise modified from its undisturbed natural soil condition, thereby increasing the potential for emission of fugitive dust. This definition excludes those areas which have:

(A) been restored to a natural state, such that the vegetative ground cover and soil characteristics are similar to adjacent or nearby natural conditions;

(B) been paved or otherwise covered by a permanent structure; or

(C) sustained a vegetative ground cover of at least 70 percent of the native cover for a particular area for at least 30 days.

(15) DUST SUPPRESSANTS are water, hygroscopic materials, or non-toxic chemical stabilizers used as a treatment material to reduce fugitive dust emissions.

(16) EARTH-MOVING ACTIVITIES means the use of any equipment for any activity where soil is being moved or uncovered, and shall include, but not be limited to the following: grading, earth cutting and filling operations, loading or unloading of dirt or bulk materials, adding to or removing from open storage piles of bulk materials, landfill operations, weed abatement through disking, and soil mulching.

(17) DUST CONTROL SUPERVISOR means a person with the authority to expeditiously employ sufficient dust mitigation measures to ensure compliance with all Rule 403 requirements at an active operation.

(18) FUGITIVE DUST means any solid particulate matter that becomes airborne, other than that emitted from an exhaust stack, directly or indirectly as a result of the activities of any person.

(19) HIGH WIND CONDITIONS means that instantaneous wind speeds exceed 25 miles per hour.

(20) INACTIVE DISTURBED SURFACE AREA means any disturbed surface area upon which active operations have not occurred or are not expected to occur for a period of 20 consecutive days.

(21) LARGE OPERATIONS means any active operations on property which contains 50 or more acres of disturbed surface area; or any earth-moving operation with a daily earth-moving or throughput volume of 3,850 cubic

meters (5,000 cubic yards) or more three times during the most recent 365-day period.

(22) OPEN STORAGE PILE is any accumulation of bulk material, which is not fully enclosed, covered or chemically stabilized, and which attains a height of three feet or more and a total surface area of 150 or more square feet.

(23) PARTICULATE MATTER means any material, except uncombined water, which exists in a finely divided form as a liquid or solid at standard conditions.

(24) PAVED ROAD means a public or private improved street, highway, alley, public way, or easement that is covered by typical roadway materials, but excluding access roadways that connect a facility with a public paved roadway and are not open to through traffic. Public paved roads are those open to public access and that are owned by any federal, state, county, municipal or any other governmental or quasi-governmental agencies. Private paved roads are any paved roads not defined as public.

(25) PM_{10} means particulate matter with an aerodynamic diameter smaller than or equal to 10 microns as measured by the applicable State and Federal reference test methods.

(26) PROPERTY LINE means the boundaries of an area in which either a person causing the emission or a person allowing the emission has the legal use or possession of the property. Where such property is divided into one or more sub-tenancies, the property line(s) shall refer to the boundaries dividing the areas of all sub-tenancies.

(27) RULE 403 IMPLEMENTATION HANDBOOK means a guidance document that has been approved by the Governing Board on April 2, 2004 or hereafter approved by the Executive Officer and the U.S. EPA.

(28) SERVICE ROADS are paved or unpaved roads that are used by one or more public agencies for inspection or maintenance of infrastructure and which are not typically used for construction-related activity.

(29) SIMULTANEOUS SAMPLING means the operation of two PM_{10} samplers in such a manner that one sampler is started within five minutes of the other, and each sampler is operated for a consecutive period which must be not less than 290 minutes and not more than 310 minutes.

(30) SOUTH COAST AIR BASIN means the non-desert portions of Los Angeles, Riverside, and San Bernardino counties and all of Orange

County as defined in California Code of Regulations, Title 17, Section 60104. The area is bounded on the west by the Pacific Ocean, on the north and east by the San Gabriel, San Bernardino, and San Jacinto Mountains, and on the south by the San Diego county line.

(31) STABILIZED SURFACE means any previously disturbed surface area or open storage pile which, through the application of dust suppressants, shows visual or other evidence of surface crusting and is resistant to wind-driven fugitive dust and is demonstrated to be stabilized. Stabilization can be demonstrated by one or more of the applicable test methods contained in the Rule 403 Implementation Handbook.

(32) TRACK-OUT means any bulk material that adheres to and agglomerates on the exterior surface of motor vehicles, haul trucks, and equipment (including tires) that have been released onto a paved road and can be removed by a vacuum sweeper or a broom sweeper under normal operating conditions.

(33) TYPICAL ROADWAY MATERIALS means concrete, asphaltic concrete, recycled asphalt, asphalt, or any other material of equivalent performance as determined by the Executive Officer, and the U.S. EPA.

(34) UNPAVED ROADS means any unsealed or unpaved roads, equipment paths, or travel ways that are not covered by typical roadway materials. Public unpaved roads are any unpaved roadway owned by federal, state, county, municipal or other governmental or quasi-governmental agencies. Private unpaved roads are all other unpaved roadways not defined as public.

(35) VISIBLE ROADWAY DUST means any sand, soil, dirt, or other solid particulate matter which is visible upon paved road surfaces and which can be removed by a vacuum sweeper or a broom sweeper under normal operating conditions.

(36) WIND-DRIVEN FUGITIVE DUST means visible emissions from any disturbed surface area which is generated by wind action alone.

(37) WIND GUST is the maximum instantaneous wind speed as measured by an anemometer.

(d) Requirements

(1) No person shall cause or allow the emissions of fugitive dust from any active operation, open storage pile, or disturbed surface area such that:

(A) the dust remains visible in the atmosphere beyond the property line of the emission source; or

(B) the dust emission exceeds 20 percent opacity (as determined by the appropriate test method included in the Rule 403 Implementation Handbook), if the dust emission is the result of movement of a motorized vehicle.

(2) No person shall conduct active operations without utilizing the applicable best available control measures included in Table 1 of this Rule to minimize fugitive dust emissions from each fugitive dust source type within the active operation.

(3) No person shall cause or allow PM_{10} levels to exceed 50 micrograms per cubic meter when determined, by simultaneous sampling, as the difference between upwind and downwind samples collected on high-volume particulate matter samplers or other U.S. EPA-approved equivalent method for PM_{10} monitoring. If sampling is conducted, samplers shall be:

(A) Operated, maintained, and calibrated in accordance with 40 Code of Federal Regulations (CFR), Part 50, Appendix J, or appropriate U.S. EPA-published documents for U.S. EPA-approved equivalent method(s) for PM_{10}.

(B) Reasonably placed upwind and downwind of key activity areas and as close to the property line as feasible, such that other sources of fugitive dust between the sampler and the property line are minimized.

(4) No person shall allow track-out to extend 25 feet or more in cumulative length from the point of origin from an active operation. Notwithstanding the preceding, all track-out from an active operation shall be removed at the conclusion of each workday or evening shift.

(5) No person shall conduct an active operation with a disturbed surface area of five or more acres, or with a daily import or export of 100 cubic yards or more of bulk material without utilizing at least one of the measures listed in subparagraphs (d)(5)(A) through (d)(5)(E) at each vehicle egress from the site to a paved public road.

(A) Install a pad consisting of washed gravel (minimum-size: one inch) maintained in a clean condition to a depth of at least six inches and extending at least 30 feet wide and at least 50 feet long.

(B) Pave the surface extending at least 100 feet and at least 20 feet wide.

(C) Utilize a wheel shaker/wheel spreading device consisting of raised dividers (rails, pipe, or grates) at least 24 feet long and 10 feet wide to remove bulk material from tires and vehicle undercarriages before vehicles exit the site.

(D) Install and utilize a wheel washing system to remove bulk material from tires and vehicle undercarriages before vehicles exit the site.

(E) Any other control measures approved by the Executive Officer and the U.S. EPA as equivalent to the actions specified in subparagraphs (d)(5)(A) through (d)(5)(D).

(6) Beginning January 1, 2006, any person who operates or authorizes the operation of a confined animal facility subject to this Rule shall implement the applicable conservation management practices specified in Table 4 of this Rule.

(e) Additional Requirements for Large Operations

(1) Any person who conducts or authorizes the conducting of a large operation subject to this Rule shall implement the applicable actions specified in Table 2 of this Rule at all times and shall implement the applicable actions specified in Table 3 of this Rule when the applicable performance standards can not be met through use of Table 2 actions; and shall:

(A) submit a fully executed Large Operation Notification (Form 403 N) to the Executive Officer within 7 days of qualifying as a large operation;

(B) include, as part of the notification, the name(s), address(es), and phone number(s) of the person(s) responsible for the submittal, and a description of the operation(s), including a map depicting the location of the site;

(C) maintain daily records to document the specific dust control actions taken, maintain such records for a period of not less than three years; and make such records available to the Executive Officer upon request;

(D) install and maintain project signage with project contact signage that meets the minimum standards of the Rule 403 Implementation Handbook, prior to initiating any earthmoving activities;

(E) identify a dust control supervisor that:

(i) is employed by or contracted with the property owner or developer;

(ii) is on the site or available on-site within 30 minutes during working hours;

(iii) has the authority to expeditiously employ sufficient dust mitigation measures to ensure compliance with all Rule requirements;

(iv) has completed the AQMD Fugitive Dust Control Class and has been issued a valid Certificate of Completion for the class; and

(F) notify the Executive Officer in writing within 30 days after the site no longer qualifies as a large operation as defined by paragraph (c)(18).

(2) Any Large Operation Notification submitted to the Executive Officer or AQMD-approved dust control plan shall be valid for a period of one year from the date of written acceptance by the Executive Officer. Any Large Operation Notification accepted pursuant to paragraph (e)(1), excluding those submitted by aggregate-related plants and cement manufacturing facilities must be resubmitted annually by the person who conducts or authorizes the conducting of a large operation, at least 30 days prior to the expiration date, or the submittal shall no longer be valid as of the expiration date. If all fugitive dust sources and corresponding control measures or special circumstances remain identical to those identified in the previously accepted submittal or in an AQMD-approved dust control plan, the resubmittal may be a simple statement of no-change (Form 403NC).

(f) Compliance Schedule

The newly amended provisions of this Rule shall become effective upon adoption. Pursuant to subdivision (e), any existing site that qualifies as a large operation will have 60 days from the date of Rule adoption to comply with the notification and recordkeeping requirements for large operations. Any Large Operation

Notification or AQMD-approved dust control plan which has been accepted prior to the date of adoption of these amendments shall remain in effect and the Large Operation Notification or AQMD-approved dust control plan annual resubmittal date shall be one year from adoption of this Rule amendment.

(g) Exemptions

(1) The provisions of this Rule shall not apply to:

(A) Dairy farms.

(B) Confined animal facilities provided that the combined disturbed surface area within one continuous property line is one acre or less.

(C) Agricultural vegetative crop operations provided that the combined disturbed surface area within one continuous property line and not separated by a paved public road is 10 acres or less.

(D) Agricultural vegetative crop operations within the South Coast Air Basin, whose combined disturbed surface area includes more than 10 acres provided that the person responsible for such operations:

(i) voluntarily implements the conservation management practices contained in the Rule 403 Agricultural Handbook;

(ii) completes and maintains the self-monitoring form documenting sufficient conservation management practices, as described in the Rule 403 Agricultural Handbook; and

(iii) makes the completed self-monitoring form available to the Executive Officer upon request.

(E) Agricultural vegetative crop operations outside the South Coast Air Basin whose combined disturbed surface area includes more than 10 acres provided that the person responsible for such operations:

(i) voluntarily implements the conservation management practices contained in the Rule 403 Coachella Valley Agricultural Handbook; and

(ii) completes and maintains the self-monitoring form documenting sufficient conservation management practices, as described in the Rule 403 Coachella Valley Agricultural Handbook; and

(iii) makes the completed self-monitoring form available to the Executive Officer upon request.

(F) Active operations conducted during emergency life-threatening situations, or in conjunction with any officially declared disaster or state of emergency.

(G) Active operations conducted by essential service utilities to provide electricity, natural gas, telephone, water and sewer during periods of service outages and emergency disruptions.

(H) Any contractor subsequent to the time the contract ends, provided that such contractor implemented the required control measures during the contractual period.

(I) Any grading contractor, for a phase of active operations, subsequent to the contractual completion of that phase of earth-moving activities, provided that the required control measures have been implemented during the entire phase of earth-moving activities, through and including five days after the final grading inspection.

(J) Weed abatement operations ordered by a county agricultural commissioner or any state, county, or municipal fire department, provided that:

(i) mowing, cutting or other similar process is used which maintains weed stubble at least three inches above the soil; and

(ii) any discing or similar operation which cuts into and disturbs the soil, where watering is used prior to initiation of these activities, and a determination is made by the agency issuing the weed abatement order that, due to fire hazard conditions, rocks, or other physical obstructions, it is not practical to meet the conditions specified in clause (g)(1)(H)(i). The provisions this clause shall not exempt the owner of any property from stabilizing, in accordance with paragraph (d)(2), disturbed surface areas which have been created as a result of the weed abatement actions.

(K) sandblasting operations.

(2) The provisions of paragraphs (d)(1) and (d)(3) shall not apply:

(A) When wind gusts exceed 25 miles per hour, provided that:

(i) The required Table 3 contingency measures in this Rule are implemented for each applicable fugitive dust source type, and;

(ii) records are maintained in accordance with subparagraph (e)(1)(C).

(B) To unpaved roads, provided such roads:

(i) are used solely for the maintenance of wind-generating equipment; or

(ii) are unpaved public alleys as defined in Rule 1186; or

(iii) are service roads that meet all of the following criteria:

(a) are less than 50 feet in width at all points along the road;

(b) are within 25 feet of the property line; and

(c) have a traffic volume less than 20 vehicle-trips per day.

(C) To any active operation, open storage pile, or disturbed surface area for which necessary fugitive dust preventive or mitigative actions are in conflict with the federal Endangered Species Act, as determined in writing by the State or federal agency responsible for making such determinations.

(3) The provisions of (d)(2) shall not apply to any aggregate-related plant or cement manufacturing facility that implements the applicable actions specified in Table 2 of this Rule at all times and shall implement the applicable actions specified in Table 3 of this Rule when the applicable performance standards of paragraphs (d)(1) and (d)(3) can not be met through use of Table 2 actions.

(4) The provisions of paragraphs (d)(1), (d)(2), and (d)(3) shall not apply to:

(A) Blasting operations which have been permitted by the California Division of Industrial Safety; and

(B) Motion picture, television, and video production activities when dust emissions are required for visual effects. In order to obtain this exemption, the Executive Officer must receive notification in writing at least 72 hours in advance of any such activity and no nuisance results from such activity.

(5) The provisions of paragraph (d)(3) shall not apply if the dust control actions, as specified in Table 2, are implemented on a routine basis for

each applicable fugitive dust source type. To qualify for this exemption, a person must maintain records in accordance with subparagraph (e)(1)(C).

(6) The provisions of paragraph (d)(4) shall not apply to earth coverings of public paved roadways where such coverings are approved by a local government agency for the protection of the roadway, and where such coverings are used as roadway crossings for haul vehicles provided that such roadway is closed to through traffic and visible roadway dust is removed within one day following the cessation of activities.

(7) The provisions of subdivision (e) shall not apply to:

(A) officially-designated public parks and recreational areas, including national parks, national monuments, national forests, state parks, state recreational areas, and county regional parks.

(B) any large operation which is required to submit a dust control plan to any city or county government which has adopted a District-approved dust control ordinance.

(C) any large operation subject to Rule 1158, which has an approved dust control plan pursuant to Rule 1158, provided that all sources of fugitive dust are included in the Rule 1158 plan.

(8) The provisions of subparagraph (e)(1)(A) through (e)(1)(C) shall not apply to any large operation with an AQMD-approved fugitive dust control plan provided that there is no change to the sources and controls as identified in the AQMD-approved fugitive dust control plan.

(h) Fees

Any person conducting active operations for which the Executive Officer conducts upwind/downwind monitoring for PM_{10} pursuant to paragraph (d)(3) shall be assessed applicable Ambient Air Analysis Fees pursuant to Rule 304.1. Applicable fees shall be waived for any facility which is exempted from paragraph (d)(3) or meets the requirements of paragraph (d)(3).

(Amended June 3, 2005)

TABLE 1
BEST AVAILABLE CONTROL MEASURES
(Applicable to All Construction Activity Sources)

Source Category	Control Measure	Guidance
Backfilling	01-1 Stabilize backfill material when not actively handling; and 01-2 Stabilize backfill material during handling; and 01-3 Stabilize soil at completion of activity.	✓ Mix backfill soil with water prior to moving ✓ Dedicate water truck or high capacity hose to backfilling equipment ✓ Empty loader bucket slowly so that no dust plumes are generated ✓ Minimize drop height from loader bucket
Clearing and grubbing	02-1 Maintain stability of soil through pre-watering of site prior to clearing and grubbing; and 02-2 Stabilize soil during clearing and grubbing activities; and 02-3 Stabilize soil immediately after clearing and grubbing activities.	✓ Maintain live perennial vegetation where possible ✓ Apply water in sufficient quantity to prevent generation of dust plumes
Clearing forms	03-1 Use water spray to clear forms; or 03-2 Use sweeping and water spray to clear forms; or 03-3 Use vacuum system to clear forms.	✓ Use of high pressure air to clear forms may cause exceedance of Rule requirements
Crushing	04-1 Stabilize surface soils prior to operation of support equipment; and 04-2 Stabilize material after crushing.	✓ Follow permit conditions for crushing equipment ✓ Pre-water material prior to loading into crusher ✓ Monitor crusher emissions opacity ✓ Apply water to crushed material to prevent dust plumes

(Amended June 3, 2005)

TABLE 1
BEST AVAILABLE CONTROL MEASURES
(Applicable to All Construction Activity Sources)

Source Category	Control Measure	Guidance
Cut and fill	05-1 Pre-water soils prior to cut and fill activities; and 05-2 Stabilize soil during and after cut and fill activities.	✓ For large sites, pre-water with sprinklers or water trucks and allow time for penetration ✓ Use water trucks/pulls to water soils to depth of cut prior to subsequent cuts
Demolition – mechanical/manual	06-1 Stabilize wind erodible surfaces to reduce dust; and 06-2 Stabilize surface soil where support equipment and vehicles will operate; and 06-3 Stabilize loose soil and demolition debris; and 06-4 Comply with AQMD Rule 1403.	✓ Apply water in sufficient quantities to prevent the generation of visible dust plumes
Disturbed soil	07-1 Stabilize disturbed soil throughout the construction site; and 07-2 Stabilize disturbed soil between structures	✓ Limit vehicular traffic and disturbances on soils where possible ✓ If interior block walls are planned, install as early as possible ✓ Apply water or a stabilizing agent in sufficient quantities to prevent the generation of visible dust plumes
Earth-moving activities	08-1 Pre-apply water to depth of proposed cuts; and 08-2 Re-apply water as necessary to maintain soils in a damp condition and to ensure that visible emissions do not exceed 100 feet in any direction; and 08-3 Stabilize soils once earth-moving activities are complete.	✓ Grade each project phase separately, timed to coincide with construction phase ✓ Upwind fencing can prevent material movement on site ✓ Apply water or a stabilizing agent in sufficient quantities to prevent the generation of visible dust plumes

(Amended June 3, 2005)

TABLE 1
BEST AVAILABLE CONTROL MEASURES
(Applicable to All Construction Activity Sources)

Source Category	Control Measure	Guidance
Importing/exporting of bulk materials	09-1 Stabilize material while loading to reduce fugitive dust emissions; and 09-2 Maintain at least six inches of freeboard on haul vehicles; and 09-3 Stabilize material while transporting to reduce fugitive dust emissions; and 09-4 Stabilize material while unloading to reduce fugitive dust emissions; and 09-5 Comply with Vehicle Code Section 23114.	✓ Use tarps or other suitable enclosures on haul trucks ✓ Check belly-dump truck seals regularly and remove any trapped rocks to prevent spillage ✓ Comply with track-out prevention/mitigation requirements ✓ Provide water while loading and unloading to reduce visible dust plumes
Landscaping	10-1 Stabilize soils, materials, slopes	✓ Apply water to materials to stabilize ✓ Maintain materials in a crusted condition ✓ Maintain effective cover over materials ✓ Stabilize sloping surfaces using soil binders until vegetation or ground cover can effectively stabilize the slopes ✓ Hydroseed prior to rain season
Road shoulder maintenance	11-1 Apply water to unpaved shoulders prior to clearing; and 11-2 Apply chemical dust suppressants and/or washed gravel to maintain a stabilized surface after completing road shoulder maintenance.	✓ Installation of curbing and/or paving of road shoulders can reduce recurring maintenance costs ✓ Use of chemical dust suppressants can inhibit vegetation growth and reduce future road shoulder maintenance costs

(Amended June 3, 2005)

TABLE 1
BEST AVAILABLE CONTROL MEASURES
(Applicable to All Construction Activity Sources)

Source Category	Control Measure	Guidance
Screening	12-1 Pre-water material prior to screening; and 12-2 Limit fugitive dust emissions to opacity and plume length standards; and 12-3 Stabilize material immediately after screening.	✓ Dedicate water truck or high capacity hose to screening operation ✓ Drop material through the screen slowly and minimize drop height ✓ Install wind barrier with a porosity of no more than 50% upwind of screen to the height of the drop point
Staging areas	13-1 Stabilize staging areas during use; and 13-2 Stabilize staging area soils at project completion.	✓ Limit size of staging area ✓ Limit vehicle speeds to 15 miles per hour ✓ Limit number and size of staging area entrances/exists
Stockpiles/ Bulk Material Handling	14-1 Stabilize stockpiled materials. 14-2 Stockpiles within 100 yards of off-site occupied buildings must not be greater than eight feet in height; or must have a road bladed to the top to allow water truck access or must have an operational water irrigation system that is capable of complete stockpile coverage.	✓ Add or remove material from the downwind portion of the storage pile ✓ Maintain storage piles to avoid steep sides or faces

(Amended June 3, 2005)

TABLE 1
BEST AVAILABLE CONTROL MEASURES
(Applicable to All Construction Activity Sources)

Source Category	Control Measure	Guidance
Traffic areas for construction activities	15-1 Stabilize all off-road traffic and parking areas; and 15-2 Stabilize all haul routes; and 15-3 Direct construction traffic over established haul routes.	✓ Apply gravel/paving to all haul routes as soon as possible to all future roadway areas ✓ Barriers can be used to ensure vehicles are only used on established parking areas/haul routes
Trenching	16-1 Stabilize surface soils where trencher or excavator and support equipment will operate; and 16-2 Stabilize soils at the completion of trenching activities.	✓ Pre-watering of soils prior to trenching is an effective preventive measure. For deep trenching activities, pre-trench to 18 inches soak soils via the pre-trench and resuming trenching ✓ Washing mud and soils from equipment at the conclusion of trenching activities can prevent crusting and drying of soil on equipment
Truck loading	17-1 Pre-water material prior to loading; and 17-2 Ensure that freeboard exceeds six inches (CVC 23114)	✓ Empty loader bucket such that no visible dust plumes are created ✓ Ensure that the loader bucket is close to the truck to minimize drop height while loading
Turf Overseeding	18-1 Apply sufficient water immediately prior to conducting turf vacuuming activities to meet opacity and plume length standards; and 18-2 Cover haul vehicles prior to exiting the site.	✓ Haul waste material immediately off-site

(Amended June 3, 2005)

TABLE 1
BEST AVAILABLE CONTROL MEASURES
(Applicable to All Construction Activity Sources)

Source Category	Control Measure	Guidance
Unpaved roads/parking lots	19-1 Stabilize soils to meet the applicable performance standards; and 19-2 Limit vehicular travel to established unpaved roads (haul routes) and unpaved parking lots.	✓ Restricting vehicular access to established unpaved travel paths and parking lots can reduce stabilization requirements
Vacant land	20-1 In instances where vacant lots are 0.10 acre or larger and have a cumulative area of 500 square feet or more that are driven over and/or used by motor vehicles and/or off-road vehicles, prevent motor vehicle and/or off-road vehicle trespassing, parking and/or access by installing barriers, curbs, fences, gates, posts, signs, shrubs, trees or other effective control measures.	

Table 2
DUST CONTROL MEASURES FOR LARGE OPERATIONS

FUGITIVE DUST SOURCE CATEGORY	CONTROL ACTIONS	
Earth-moving (except construction cutting and filling areas, and mining operations)	(1a)	Maintain soil moisture content at a minimum of 12 percent, as determined by ASTM method D-2216, or other equivalent method approved by the Executive Officer, the California Air Resources Board, and the U.S. EPA. Two soil moisture evaluations must be conducted during the first three hours of active operations during a calendar day, and two such evaluations each subsequent four-hour period of active operations; OR
	(1a-1)	For any earth-moving which is more than 100 feet from all property lines, conduct watering as necessary to prevent visible dust emissions from exceeding 100 feet in length in any direction.
Earth-moving: Construction fill areas:	(1b)	Maintain soil moisture content at a minimum of 12 percent, as determined by ASTM method D-2216, or other equivalent method approved by the Executive Officer, the California Air Resources Board, and the U.S. EPA. For areas which have an optimum moisture content for compaction of less than 12 percent, as determined by ASTM Method 1557 or other equivalent method approved by the Executive Officer and the California Air Resources Board and the U.S. EPA, complete the compaction process as expeditiously as possible after achieving at least 70 percent of the optimum soil moisture content. Two soil moisture evaluations must be conducted during the first three hours of active operations during a calendar day, and two such evaluations during each subsequent four-hour period of active operations.

Table 2 (Continued)

FUGITIVE DUST SOURCE CATEGORY	CONTROL ACTIONS	
Earth-moving: Construction cut areas and mining operations:	(1c)	Conduct watering as necessary to prevent visible emissions from extending more than 100 feet beyond the active cut or mining area unless the area is inaccessible to watering vehicles due to slope conditions or other safety factors.
Disturbed surface areas (except completed grading areas)	(2a/b)	Apply dust suppression in sufficient quantity and frequency to maintain a stabilized surface. Any areas which cannot be stabilized, as evidenced by wind driven fugitive dust must have an application of water at least twice per day to at least 80 percent of the unstabilized area.
Disturbed surface areas: Completed grading areas	(2c)	Apply chemical stabilizers within five working days of grading completion; OR
	(2d)	Take actions (3a) or (3c) specified for inactive disturbed surface areas.
Inactive disturbed surface areas	(3a)	Apply water to at least 80 percent of all inactive disturbed surface areas on a daily basis when there is evidence of wind driven fugitive dust, excluding any areas which are inaccessible to watering vehicles due to excessive slope or other safety conditions; OR
	(3b)	Apply dust suppressants in sufficient quantity and frequency to maintain a stabilized surface; OR
	(3c)	Establish a vegetative ground cover within 21 days after active operations have ceased. Ground cover must be of sufficient density to expose less than 30 percent of unstabilized ground within 90 days of planting, and at all times thereafter; OR
	(3d)	Utilize any combination of control actions (3a), (3b), and (3c) such that, in total, these actions apply to all inactive disturbed surface areas.

Table 2 (Continued)

FUGITIVE DUST SOURCE CATEGORY	CONTROL ACTIONS	
Unpaved Roads	(4a)	Water all roads used for any vehicular traffic at least once per every two hours of active operations [3 times per normal 8 hour work day]; OR
	(4b)	Water all roads used for any vehicular traffic once daily and restrict vehicle speeds to 15 miles per hour; OR
	(4c)	Apply a chemical stabilizer to all unpaved road surfaces in sufficient quantity and frequency to maintain a stabilized surface.
Open storage piles	(5a)	Apply chemical stabilizers; OR
	(5b)	Apply water to at least 80 percent of the surface area of all open storage piles on a daily basis when there is evidence of wind driven fugitive dust; OR
	(5c)	Install temporary coverings; OR
	(5d)	Install a three-sided enclosure with walls with no more than 50 percent porosity which extend, at a minimum, to the top of the pile. This option may only be used at aggregate-related plants or at cement manufacturing facilities.
All Categories	(6a)	Any other control measures approved by the Executive Officer and the U.S. EPA as equivalent to the methods specified in Table 2 may be used.

TABLE 3
CONTINGENCY CONTROL MEASURES FOR LARGE OPERATIONS

FUGITIVE DUST SOURCE CATEGORY	CONTROL MEASURES
Earth-moving	(1A) Cease all active operations; OR (2A) Apply water to soil not more than 15 minutes prior to moving such soil.
Disturbed surface areas	(0B) On the last day of active operations prior to a weekend, holiday, or any other period when active operations will not occur for not more than four consecutive days: apply water with a mixture of chemical stabilizer diluted to not less than 1/20 of the concentration required to maintain a stabilized surface for a period of six months; OR (1B) Apply chemical stabilizers prior to wind event; OR (2B) Apply water to all unstabilized disturbed areas 3 times per day. If there is any evidence of wind driven fugitive dust, watering frequency is increased to a minimum of four times per day; OR (3B) Take the actions specified in Table 2, Item (3c); OR (4B) Utilize any combination of control actions (1B), (2B), and (3B) such that, in total, these actions apply to all disturbed surface areas.
Unpaved roads	(1C) Apply chemical stabilizers prior to wind event; OR (2C) Apply water twice per hour during active operation; OR (3C) Stop all vehicular traffic.
Open storage piles	(1D) Apply water twice per hour; OR (2D) Install temporary coverings.
Paved road track-out	(1E) Cover all haul vehicles; OR (2E) Comply with the vehicle freeboard requirements of Section 23114 of the California Vehicle Code for both public and private roads.
All Categories	(1F) Any other control measures approved by the Executive Officer and the U.S. EPA as equivalent to the methods specified in Table 3 may be used.

Table 4
(Conservation Management Practices for Confined Animal Facilities)

SOURCE CATEGORY	CONSERVATION MANAGEMENT PRACTICES
Manure Handling **(Only applicable to Commercial Poultry Ranches)**	(1a) Cover manure prior to removing material off-site; AND (1b) Spread the manure before 11:00 AM and when wind conditions are less than 25 miles per hour; AND (1c) Utilize coning and drying manure management by removing manure at laying hen houses at least twice per year and maintain a base of no less than 6 inches of dry manure after clean out; or in lieu of complying with conservation management practice (1c), comply with conservation management practice (1d). (1d) Utilize frequent manure removal by removing the manure from laying hen houses at least every seven days and immediately thin bed dry the material.
Feedstock Handling	(2a) Utilize a sock or boot on the feed truck auger when filling feed storage bins.
Disturbed Surfaces	(3a) Maintain at least 70 percent vegetative cover on vacant portions of the facility; OR (3b) Utilize conservation tillage practices to manage the amount, orientation and distribution of crop and other plant residues on the soil surface year-round, while growing crops (if applicable) in narrow slots or tilled strips; OR (3c) Apply dust suppressants in sufficient concentrations and frequencies to maintain a stabilized surface.
Unpaved Roads	(4a) Restrict access to private unpaved roads either through signage or physical access restrictions and control vehicular speeds to no more than 15 miles per hour through worker notifications, signage, or any other necessary means; OR (4b) Cover frequently traveled unpaved roads with low silt content material (i.e., asphalt, concrete, recycled road base, or gravel to a minimum depth of four inches); OR (4c) Treat unpaved roads with water, mulch, chemical dust suppressants or other cover to maintain a stabilized surface.
Equipment Parking Areas	(5a) Apply dust suppressants in sufficient quantity and frequency to maintain a stabilized surface; OR (5b) Apply material with low silt content (i.e., asphalt, concrete, recycled road base, or gravel to a depth of four inches).

Attachment T

Dust Control Chemical Dust Stabilizer Product Data

Applications

After a short curing, TerraLOC acts like a net – impregnating the unbound or uncompacted soil overlaying the soft to firm sub-grade. While its special tackifying agent allows small airborne particulates to be captured after application, its ionic formulation increases the adhesion to sand particulates. Because it does not cross-link, TerraLOC is relatively flexible.

Treatment for jet airblast is more involved than that required for helicopter downwash and aircraft propwash. However, any of these areas may become damaged and need repairs if traffic conditions are occasional and non-channelized.

Particularly adapted for helicopter landing pads and airfield surrounding areas, TerraLOC finds its ideal field of application on flat *(or moderately sloped)* terrain having no vegetation or gravel.

The application of TerraLOC may be accomplished with a liquid pressure distributor, by a gravity-flow water distributor, or by hand-held devices. The spray apparatus should be positioned directly above the area being treated *(8-14 inches)* to preclude driftage. Runoff should be avoided.

Apply With:

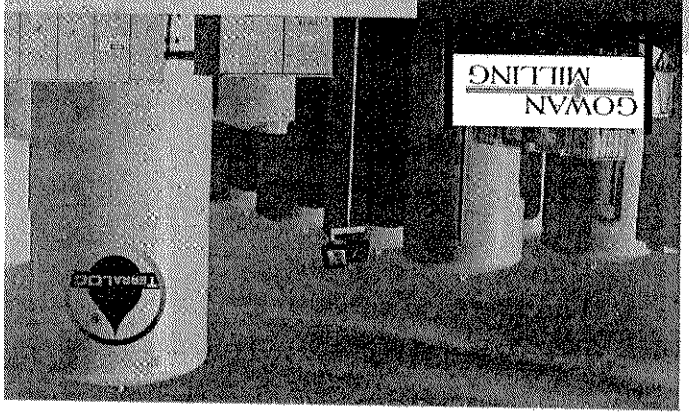
Pick-up Truck Sprayer

Hand Sprayer

Hand with Tanker

Tanker

Truck Sprayer



www.terraloc.com

Manufactured by

MonoSol, LLC

www.monosol.com

707 E. 80th Place, Suite 301
Merrillville, IN 46410 USA
Toll-Free: (800) 237.9552
Tel: 219.762.3165
Fax: 219.764.4785

***Exclusively* distributed by**

GOWAN MILLING

www.gowanmilling.com

Gowan Milling
12300 E. County 8th Street
Yuma, AZ 85365 USA
Tel: 928.317.5810

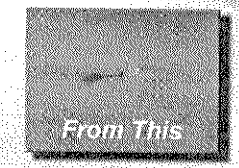
INTRODUCING

PATENT PENDING

An *Effective* Dust Abatement System

TerraLOC™ is a soil penetrant dust palliative used on sand and dusted soils.

A solution of Polyvinyl Alcohol (PVOH) and additives, TerraLOC is particularly suited for loose and dry or slightly damp surfaces such as desert soil.



Ideal for:

- *Unpaved roads*
- *Housing developments*
- *Agriculture roads*
- *Road shoulders*
- *Mining operations*
- *Coal & minerals transportation*
- *Graded construction areas*
- *Construction projects*
- *Areas bordering airfield or heliport complexes*

MONO-SOL

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TerraLOC

Another ***powerful solution*** by MonoSol

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MONO-SOL

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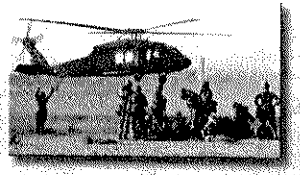
The EPA estimates that more than 25 million tons of dust are airborne every year on US soil alone, severely impacting business and industry. Road construction, mining, agricultural, and myriad other operations are impeded by the presence of dust, costing untold millions of dollars in lost productivity, equipment maintenance, environmental corruption, and, even, safety.



Airborne dust also presents life threatening dangers daily to aircrafts and helicopters. The facts are clear and indisputable:

- In a 34-month period of time, the US suffered 123 casualties because of helicopter crashes. Only 37% were due to hostile activities; the remaining 63% were the result of accidents. Dust and its effects, including brown outs, mechanical blocking and erosion of blades, have directly contributed to most of these disasters.
- Numerous incidents of jammed weapons have inhibited soldiers in critical situations.
- Transport vehicles experience more breakdowns and require more frequent maintenance because of airborne sand.
- It is important to point out that the aborted attempt to rescue hostages from Teheran in 1980 was directly caused by a brown out.

But there is an answer to these problems.

TerraLOC is an environmentally friendly, water soluble dust palliative that penetrates the soil, virtually locking down particles that would otherwise become airborne by wind or rotor wash. After a short curing, TerraLOC acts like a net, impregnating the unbound or uncompacted soil with an overlay strong enough for vehicle traffic or landing.

Product Information

- Does not require a pre-application water wetting, although its adhesion properties will benefit from it.
- Is biodegradable and is not an obstacle to underground fauna. It is not visible.
- Lifetime of application depends on factors such as wind activity, traffic, ruts etc., but it can last up to 3 months.
- Application rates range from 400 to 1,500 gal/acre (of a ready-to-use solution), depending on soil and air conditions.
- Effectiveness of application depends on the depth of penetration which is a function of the viscosity of the dust palliative and the permeability of the soil. When high dilution ratios are required to spray adjusted palliative, extra care should be taken to prevent the mixture flowing into adjacent areas where treatment may be unnecessary and/or into drainage ditches.
- Can be washed out by hot or cold water; no organic thinners are required to clean equipment, and equipment is not corroded by contact.
- Is non-toxic and skin contact is not hazardous; it may be readily washed off with water. The product does not generate fumes.
- Recommended storage temperature range is wide (50°F – 100°F).
- Requires a short curing time to allow water to evaporate. Depending on the air temperature, relative humidity, and the soil temperature and moisture content, the curing time ranges between 3 hrs and 20 hrs.
- Can be applied at any time of the day, although curing times will increase with lower air and soil temperatures.

Commitment to Quality

Superior service, excellent products, and our expansive knowledge and continuing education in the fields of agriculture and mining are all critical components of our commitment to our customers. In order to meet their diverse demands, we work closely with them from start to finish, listening and responding quickly to their problems. From on-site evaluations to custom monitoring, we ensure that we are always accessible and always looking for better ways to deliver quality and value.

MATERIAL SAFETY DATA SHEET

Another ***powerful solution*** from MonoSol

Date Issued: 03/10/2006
MSDS No: TerraLOC®
Date-Revised: 03/31/2006
Revision No: 5

TerraLOC®

1. PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: TerraLOC®

MANUFACTURER

MonoSol, LLC
1701 County Line Road
Portage IN 46368

24 HR. EMERGENCY TELEPHONE NUMBERS

Chemtrec: 1.800.424.9300
Outside U.S. +1.703.527.3887

2. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

PHYSICAL APPEARANCE: Solution is translucent and may have a slight amine odor.

IMMEDIATE CONCERNS: No immediate concern if solution is kept below 200 deg. C.

SIGNS AND SYMPTOMS OF OVEREXPOSURE

CARCINOGENICITY: Not Listed by NTP. Not Listed by IARC. Not Listed by OSHA.

ROUTES OF ENTRY: Eyes, skin, ingestion and inhalation.

3. COMPOSITION / INFORMATION ON INGREDIENTS

Chemical Name	Wt.%	CAS	EINECS
Non-hazardous proprietary mixture	8 - 16		

4. FIRST AID MEASURES

EYES: Immediately flush eyes with plenty of water. If irritation develops, seek medical attention.

SKIN: Remove from skin with soap and water.

INGESTION: If large quantities of this material are swallowed, call a physician immediately. Do NOT induce vomiting unless directed to do so by a physician. Never give anything by mouth to an unconscious person. Get medical attention.

INHALATION: If irritating to individual, remove to fresh air.

5. FIRE FIGHTING MEASURES

FLAMMABLE CLASS: Treat as a Class A fire.

GENERAL HAZARD: Above 200 deg.C the following are evolved; crotonaldehyde, acetone, and other

unknowns.

EXTINGUISHING MEDIA: Water spray, carbon dioxide, dry chemical.

HAZARDOUS COMBUSTION PRODUCTS: Complete combustion gives carbon dioxide and water. Incomplete combustion gives in addition carbon monoxide and hydrocarbon oxidation products, including organic acids, aldehydes and alcohols.

FIRE FIGHTING PROCEDURES: This product is a nonflammable substance. However, hazardous decomposition and combustion products may be formed in a fire situation.

FIRE FIGHTING EQUIPMENT: Respiratory and eye protection are required for fire fighting personnel. Full protective equipment (Bunker Gear) and self contained breathing apparatus (SCBA) should be used for all indoor fires and any significant outdoor fires. For small outdoor fires, which may easily be extinguished with a portable fire extinguisher, use of a SCBA may not be required.

6. ACCIDENTAL RELEASE MEASURES

SMALL SPILL: Absorb material. Use caution, as solution can make surfaces slippery. After absorbent is collected, wash floor with mild detergent to restore safe working area.

LARGE SPILL: Construct temporary dikes of dirt, sand, or any appropriate readily available material to prevent spreading of the material.

Wearing the appropriate personal protective equipment designated in Section 8, close or cap valves and/or block or plug hole in leaking container and transfer to another container.

Contain material as described above and call the local fire or police department for immediate emergency assistance.

7. HANDLING AND STORAGE

HANDLING: Use appropriate personal protective equipment as specified in Section 8. Handle in a well ventilated area.

Handle and use in a manner consistent with good industrial/manufacturing techniques and practices.

STORAGE: Store in unopened containers under cool and dry conditions.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

PERSONAL PROTECTIVE EQUIPMENT

EYES AND FACE: Wear safety glasses with side shields or goggles when handling this material.

SKIN: Wear gloves.

RESPIRATORY: Maintain adequate ventilation.

WORK HYGIENIC PRACTICES: Facilities storing or using this material should be equipped with an eyewash facility and a safety shower.
Good personal hygiene practices should always be followed.

COMMENTS: No PEL's, TLV's or OEL's for this product or it's ingredients are listed in the current issue of

ACGIH's Guide to Occupational Exposure Values nor have they been determined by the manufacturer.

9. PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL STATE: Liquid

ODOR: May have a slight amine odor.

APPEARANCE: Translucent liquid

COLOR: Clear; like water

pH: 7

SOLUBILITY IN WATER: Infinitely soluble

(VOC): < 0.100 wt. %

10. STABILITY AND REACTIVITY

STABLE: Yes

HAZARDOUS POLYMERIZATION: No

STABILITY: The product is stable under normal ambient conditions of temperature and pressure.

POLYMERIZATION: Will not occur

CONDITIONS TO AVOID: Temperatures above 200 degrees C. (392 deg. F).

HAZARDOUS DECOMPOSITION PRODUCTS: Irritating and toxic fumes at elevated temperatures from burning, heating or reaction with other materials.

INCOMPATIBLE MATERIALS: Oxidizing agents (i.e. perchlorates, nitrates etc.)

11. TOXICOLOGICAL INFORMATION

ACUTE

NOTES: The acute exposure information on the major component, polyvinyl alcohol, is as follows: Oral LD50:>5000mg/kg (rats); Inhalation LC50: 20.0 mg/l (rats; dust with 3-5 micron particle size; 1 hr. exposure)

EYE EFFECTS: Information representative of the major component indicates that the powder and aqueous solutions are slightly irritating to rabbit eyes, irritation subsided by 48 hours after exposure.

SKIN EFFECTS: In powder form the major component, polyvinyl alcohol, was nonirritating to rabbit skin. In aqueous solution, slight irritation to rabbit skin was noted. Not a skin sensitizer in guinea pigs when dosed as a 10% aqueous solution.

CARCINOGENICITY

IARC: Listed by IARC - No

NTP: Listed by NTP - No

OSHA: Listed by OSHA - No

12. ECOLOGICAL INFORMATION

ENVIRONMENTAL DATA: No adverse environmental impact expected.

13. DISPOSAL CONSIDERATIONS

DISPOSAL METHOD: Dispose of waste at an appropriate waste disposal facility according to current applicable laws and regulations.

14. TRANSPORT INFORMATION

DOT (DEPARTMENT OF TRANSPORTATION)
PROPER SHIPPING NAME: Not regulated.

ROAD AND RAIL (ADR/RID):
PROPER SHIPPING NAME: Not regulated.

AIR (ICAO/IATA)
SHIPPING NAME: Not regulated.

VESSEL (IMO/IMDG)
SHIPPING NAME: Not regulated.

CANADA TRANSPORT OF DANGEROUS GOODS
SHIPPING NAME: Not regulated.

15. REGULATORY INFORMATION

UNITED STATES

SARA TITLE III (SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT)

FIRE: No **PRESSURE GENERATING:** No **REACTIVITY:** No **ACUTE:** Yes **CHRONIC:** No

TSCA (TOXIC SUBSTANCE CONTROL ACT)

TSCA REGULATORY: All intentional ingredients are listed on the TSCA Inventory.

TSCA STATUS: In compliance with TSCA Inventory requirements for commercial purposes.

REGULATIONS

STATE REGULATIONS Substances on the Pennsylvania Hazardous Substance List present at concentration of 1% or more (0.01% for Special Hazardous Substances): None known
Substances known to the State of California to cause cancer, birth defects, or other reproductive harm: None known
Substances on the New Jersey Workplace Hazardous Substance List present at a concentration of 1% or more (0.1% for substances identified as carcinogens, mutagens, or teratogens): None known

16. OTHER INFORMATION

REASON FOR ISSUE: revision

APPROVED BY: Andrew Verrall **TITLE:** Director of Research & Development

PREPARED BY: Melanie C. Kroczek, CHMM

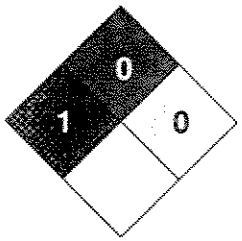
INFORMATION CONTACT: Melanie C. Kroczek

REVISION SUMMARY: Revision #: 5 This MSDS replaces the March 10, 2006 MSDS. Any changes in information are as follows: In Section 9 (pH) (Operator) VOC (Unit) (VOC) (wt%) (Operator) VOC (From)

HMIS RATING

HEALTH:	1
FLAMMABILITY:	0
PHYSICAL HAZARD:	0
PERSONAL PROTECTION:	B

NFPA CODES



MANUFACTURER DISCLAIMER: Information given herein is offered in good faith as accurate, but without guarantee. Conditions of use and suitability of the product for particular uses are beyond our control; all risks of use of the product are therefore assumed by the user. Nothing is intended as a recommendation for uses which infringe valid patents or as extending license under valid patents. Appropriate warnings and safe handling procedures should be provided to handlers and users.

Product Name: **Dustknocker**

Primary Use: Industrial Haul Roads & Long Stretches of County Roadway

Ideal for: Large Industrial Water Trucks & Municipal Applicator Trucks

Dustknocker is a bio based, 100% agriculturally derived oil. Dustknocker provides dust control for a variety of situations, especially for stone haul roads and long stretches of county roadways. Dustknocker is designed to be an additive for large industrial water trucks, but can be applied through nearly any spraying device. For smaller residential applications, you can apply Dustknocker with our 14 lb electric pump and a garden hose.

Cost Effective Applications

Because Dustknocker builds on itself, less product is needed each time it is applied. Also, since Dustknocker mixes with water before application, you control the amount of water that is added. This further reduces your cost per gallon for subsequent applications. When possible, the roadways should be graded to consist of an equal blend of stone and dust. This will allow the product to penetrate and work with the dust to bond the stone. A Dustknocker surface can be driven on immediately. Tracking is minimal because Dustknocker permeates the dust, instead of just laying over it. Dustknocker remains wet only during application and will not run off due to rain. It will continue to cure and stabilize as it controls the dust.

Coverage & Packaging

For industrial haul road use, add the Dustknocker directly into your water truck and mix with water. We recommend an initial 1:1 mix to prime your surface. After that, you can maintain most haul roads with periodic applications of a 1:4 product to water mixture. The idea is to use the Dustknocker a handful of times through out the year, instead of running a water truck every single day. You never need to remove a previous application before applying a second application. Your Dustknocker surface will only become stronger each time it is applied.

For use on county roadways, you can adjust the mix ratio how you like, but we recommend 1:1 water to product mix, applied at one quart per square yard for the first application. Generally, a double shot of Dustknocker at a half rate of the initial application, will last a couple seasons for a typical county roadway. You can also dilute at different ratios as conditions call for. Follow up applications will depend on the nature of activity that exists at the treated area. Dustknocker will strengthen with each application.

Dustknocker is available in large quantities and is shipped as a concentrate.

- 18,000 gallon railcars will cover approximately 1 million square feet of haul road.
- 5500 gallon tanker will allow you to double coat about 330,000 square feet. This would equal about 5.2 miles of county roadways at a 12' width.

Dustknocker is also available in 330 gallon totes, 55 gallon drums, and 5 gallon containers.

Pricing

- Pricing Sheet

Dustkill Inc.
552 Covered Bridge Rd.
Greenwood, IN 46142
info@arenadust.com 888.266.0080

Dustknocker Self Application Pricing

Bulk Price Per Gallon / $2.60 FOB

25 gallon drum / $100.00 FOB

- approximately 215 lbs.
- treats 1,500 square feet

55 gallon drum / $185.00 FOB

- approximately 425 lbs.
- treats 3,300 square feet

330 gallon tote / $907 FOB (plus $150 tote deposit)

- approximately 2,750 lbs.
- treats 19,800 square feet

****Reminder** Dustknocker is emulcifiable; therefore you will be adding 3 to 4 parts water on average to these amounts. Example; 330 gallon tote will make approximately 1300 - 1700 gallons of product .**

Application pump / $125.00 plus shipping

>> Previous Page << >> Contact Us <<

Dustkill Inc.
552 Covered Bridge Rd.
Greenwood, IN 46142
info@arenadust.com 888.266.0080

Material Safety Data Sheet - Dustknocker

Section I

Issue Date: 10/13/2003
Product Name: Dustknocker
Common Name: Soy Fatty Acids Distillation Residues **Formula:** CAS#:72379-27-2
Manufacturer's Name: Midwest Ag Enterprise
Manufactured For: Dustkill Inc., 552 Covered Bridge Road, Greenwood, IN 46142
Emergency Number: 507-532-2279 **Non-Emergency Number:** 888-266-0080

It is our opinion that the above named product does not meet the definition of "hazardous chemical" as defined in the OSHA "Hazard Communication Standard" regulation 29 CFR 1910.1200. This Material Safety Data Sheet is provided as general information for health and safety guidance. NA=not applicable/not available, NE=not established.

Section II- Hazardous Ingredients

Variable, consists of a variety of fatty residues from the distillation of fatty acids. No occupational exposure limits for this material have been established.

Section- III Physical And Chemical Characteristics

		Solubility In Water	Insoluble
Boiling Point (°F):	NA	Specific Gravity H^2O=1	0.93@100°F
Vapor Pressure (mm Hg):	NA	Percent Volatile by Volume (%)	Negligible
Vapor Density (air=1):	NA	Evaporation Rate (__=1)	Negligible

Appearance and Odor: Dark brown in color, mild vegetable oil odor

Section IV-Fire And Explosion Data

Flash Point(method used): 540°F-closed cup / Above 250°F AOCS Cc9b-mod. Closed cup
Flammable Limits: NA
Extinguishing Media: Foam, carbon dioxide or dry chemical
Special Fire Fighting Procedures: Class B fire; application of water to flaming oil can cause splattering
Unusual Fire and Explosion Hazards: None. Possible risk of auto ignition/ spontaneous combustion under high temperature, close conditions if material is absorbed on various fiber matrices and oxygen is present. (e.g. oily rags).

Dustknocker MSDS (Page 2)

Section V-Health Hazard Data

Ingestion: None **Inhalation:** Due to extremely low volatility of this material, inhalation exposures are not expected. **Emergency and First Aid Procedures:** Flush eyes with clean, low-pressure water, including under lids. Wash from skin with soap and warm water, no significant skin reaction expected. **Carcinogenicity:** None **Signs and Symptoms of Overexposure:** Adverse effects from over-exposure are not generally expected. **Medical Conditions Generally Aggravated by Exposure:** There are a small number of individuals who may have allergic sensitivity to ingestion of various soy-derived products.

Section VI-Reactivity Data

Stability: Stable **Conditions to Avoid:** Extended heating or overheating.
Incompatability (materials to avoid): None
Hazardous Decomposition of Byproducts: Carbon Monoxide, Aldehydes may be given off during combustion.
Hazardous Polymerization: Will Not Occur
Conditions to Avoid: Temperatures above 500°F

Section VII-Spill or Leak Procedures

No specific hazards; material is non-hazardous; contain the spill and take up spilled material with sawdust, sand, or other absorbants.
Disposal: Material is bio-degradable.

Section VIII-Special Precautions

Precautions to be taken in Handling and storage: Store away from flame and excessive heat. To avoid spontaneous fire, store wiping rags and similar materials in metal cans with tight fitting lids. Keep tanks and drums covered to prevent contamination.
Other Precautions: Use in accordance with product specifications / instructions.

APPENDIX F

SAIP Construction Traffic Management Plan (CTMP)

Runway 25L Relocation and Center Taxiway Improvements

Construction Traffic Management Plan

Tutor-Saliba/O&G, J.V.
Job No. 554
15901 Olden Street
Sylmar, CA 91342

TABLE OF CONTENTS

The intent is to describe how construction traffic impacts during both peak and off-peak traffic periods will be mitigated. The CTMP shall detail employee parking plan and shuttle system operations. Revisions may be required based on actual field conditions and will be reviewed with the Engineer for implementation.

Section 1. Haul Routes and/or Detours

Designated haul routes as shown in Sheets G200 & G201 will be used for all construction traffic, deliveries, and employee travel. Haul routes are located away from residential areas. Haul routes shall be maintained.

Section 2. Location for variable message and other signs

No variable message signs will be used. The location of other signs used for changes made to the traffic pattern on Pershing Drive and World Way West are shown on Sheet G202.

Section 3. Construction deliveries

All truck deliveries of bulk materials such as aggregate, bulk cement, dirt, etc. to the project site, and hauling of material from the project site, shall be scheduled during off peak hours to avoid the peak commuter traffic periods on designated haul routes as specified in Section 21-3.4. Peak commuter traffic periods are between 7:00 a.m. to 9:00 a.m. and 4:30 p.m. to 6:30 p.m. No staging of construction traffic in residential areas will be allowed. Should traffic staging areas be required, these areas shall be located away from residential development and shall comply with all local regulations.

No lane closures for delivery are anticipated.

Deliveries per delivery airport haul route shown on Sheet G001. Designated traffic routes are:

i. Pershing Drive (World Way West to Imperial Highway)
ii. Imperial Highway (Pershing Drive to I-405)
iii. La Cienega Boulevard (I-405 Ramps north of Imperial Highway to Imperial Highway)
iv. I-405
v. I-105

Section 4. Construction employee shift hours

Day Shift (tentative)

i. 7:00AM - 3:30PM (8 Hour)
ii. 5:30AM – 4:00PM (10Hour)

Night Shift (tentative)

i. 10:00PM - 6:00AM (8 Hour)
ii. 8:30PM - 6:30AM (10 Hour)

Section 5. Construction employee parking locations

Employee parking lot location is on La Cienega south of W. 104th Street as shown in Sheet G204

Section 5.1. Employee parking plan and shuttle system operations

Employees will park offsite at a parking lot whose entrance is located on La Cienega south of W. 104th Street. Per section 21-5.1 of the Special Provisions, the employee shuttle shall comply with the applicable CARB, SCAQMD and local rules and regulations. A complete report on the School Bus which will be used for shuttling employees has been previously submitted in revision number 10 of submittal number 5.

The shuttle will run approximately from the hours of 5:00AM to 7:00AM and 3:30PM to 4:30PM. Night shifts, when applicable, the shuttle will run approximately from the hours of 8:00PM to 10:00PM and 6:00AM to 7:00AM. Hours of operation are subject to change based on actual field shifts (8 hour or 10 hour). The shuttle will follow the path between the Parking Lot and the Staging Area as shown on sheet G001. Employees will be dropped off in the Staging Area where they will be required to show proper Airport Identification to be allowed into the AOA. Access onto the AOA will be thru the pedestrian turnstile (pedestrians) shown on sheet G602 or thru the Security Access Post (S.A.P.) (vehicles). Employees who enter thru the pedestrian turnstile will be required to have proper AOA badging to enter and then will be shuttled to the work areas by their respective crew supervision along the designated haul routes shown on sheet G101. Vehicles entering thru the S.A.P. will be checked by the designated Contractor Security Personnel prior to entry into the S.A.P. At the S.A.P., L.A.W.A. police will perform the final badging verification to allow vehicle entry.

Section 5.2. Construction Employee Airport Orientation

All construction personnel will attend a pre-construction orientation meeting where the personnel will be advised where to park, where staging area is located, informed of construction policies and informed of the environmental mitigation requirements.

Section 6. Any striping changes

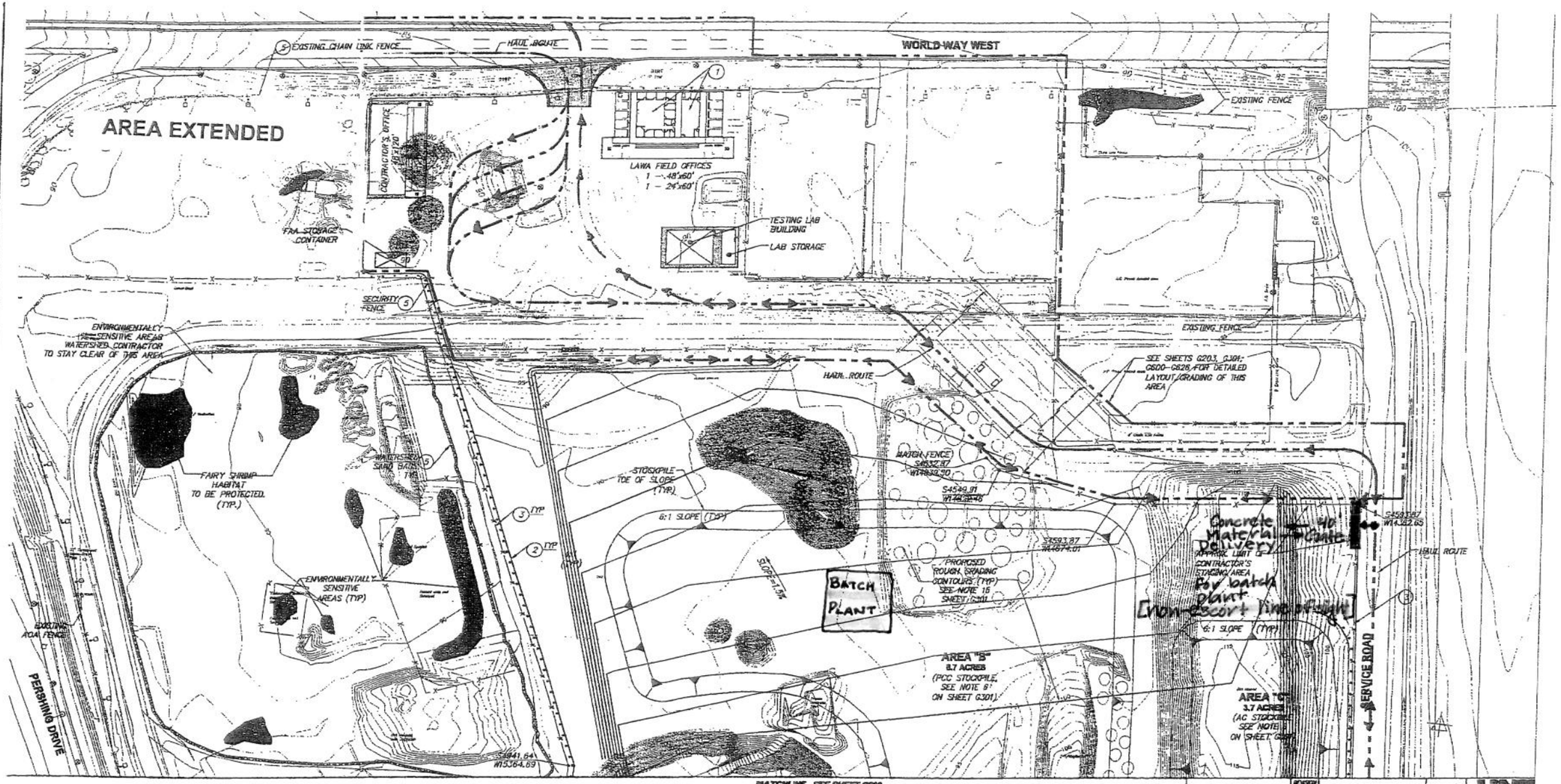
Striping Changes per G202. (Additional Pavement Markings shown on G607 & G608.)

Section 7. Any traffic signal modifications

N/A

Section 8. Other relevant traffic factors

N/A



CONSTRUCTION NOTES: (THIS SHEET ONLY)

1. INSTALL LAWA FIELD OFFICES PER DETAIL 2 ON G301.
2. INSTALL FIBER ROLL, SEE DETAIL 3 ON SHEET C432.
3. INSTALL AOA CHAIN LINK FENCE AND K-RAIL TO SATISFY CONTRACTOR'S OPERATIONS SEE DETAIL 1 ON SHEET G302. FENCE AND K-RAIL SHALL BE REMOVED AT COMPLETION OF PROJECT AND EXISTING AOA LIMIT SHALL BE RE-ESTABLISHED
4. NOT USED.
5. PROTECT IN PLACE EXISTING.

GENERAL NOTE: (CONTINUE ON G301)

1. THE TEMPORARY CHAIN LINK FENCE SHOWN ON THE PLANS DEPICTS THE BOUNDARY LIMITS OF THE CONTRACTORS STAGING AREA.
2. CONTOURS SHOWN FOR GENERAL INFORMATION ONLY. SEE NOTES 14 & 15 ON SHEET G301 FOR MORE INFORMATION.

LEGEND

- REMOVE EXISTING FENCE SEE DETAIL 3 ON SHEET G302 FOR EXISTING SECTION
- TEMPORARY CHAIN LINK FENCE
- FIBER ROLL SEDIMENT FILTER
- TOE OF SLOPE
- TOP OF SLOPE, STOCKPILE MATERIAL
- CONTRACTOR'S ACCESS/HAUL ROUTE
- FAIRY SHRIMP WATERSHED
- SAND BAGS

KEYMAP

SCALE 1" = 60'-0"

REGISTERED PROFESSIONAL ENGINEER ANDRES A. GARCIA No. CE49077 Exp. 9/30/08 CIVIL STATE OF CALIFORNIA

REVISION NO.	DESCRIPTION	DATE
1	ADDENDUM No. 3	8/02/05

HNT ENGINEERS ARCHITECTS

Los Angeles World Airports

RUNWAY 25L RELOCATION - PACKAGE 1
CONTRACTOR'S STAGING AREA
ROUGH GRADING AND STOCKPILE PLAN
SHEET 2 OF 2
LOS ANGELES INTERNATIONAL AIRPORT

SUBMITTED BY: Stuart L. Fowler, ASSIST. CHIEF AIRPORTS ENGINEER
APPROVED BY: Kenneth Dion, CHIEF AIRPORTS ENGINEER

DRAWN	CHECKED	PLAN SET NUMBER	SHEET
WPM	TTF	61 OF 717	G201
SCALE 60'	DATE 08/02/05		

GRID LOCATIONS 10

FILE NAME: LA195201.dgn

20030035-80

DESIGNATED HAUL ROUTES
SHEET G201

RECEIVED
APR 19 2006
CH2M HILL

MATCHLINE - SEE SHEET G201

CONSTRUCTION NOTES:

1. INSTALL FIBER ROLL INLET SEDIMENT FILTER, SEE DETAIL 2 ON SHEET C432.
2. INSTALL FIBER ROLL, SEE DETAIL 3 ON SHEET C432.
3. INSTALL ADA CHAIN LINK FENCE AND K-RAIL TO SATISFY CONTRACTOR'S OPERATIONS SEE DETAIL 1 ON SHEET G302. FENCE AND K-RAIL SHALL BE REMOVED AT COMPLETION OF PROJECT AND EXISTING ADA LIMIT SHALL BE RE-ESTABLISHED
4. NOT USED.
5. PROTECT IN PLACE.

GENERAL NOTE: (CONTINUE ON G301)

1. THE TEMPORARY CHAIN LINK FENCE SHOWN ON THE PLANS DEPICTS THE BOUNDARY LIMITS OF THE CONTRACTORS STAGING AREA.
2. CONTOURS SHOWN FOR GENERAL INFORMATION ONLY. SEE NOTE 14 SHEET G301 FOR MORE INFORMATION.

LEGEND

- REMOVE EXISTING FENCE SEE DETAIL 3 ON SHEET G302 FOR EXISTING SECTION
- TEMPORARY CHAIN LINK FENCE
- FIBER ROLL SEDIMENT FILTER
- TOE OF SLOPE
- TOP OF SLOPE, STOCKPILE MATERIAL
- CONTRACTOR'S ACCESS/HAUL ROUTE
- FAIRY SHRIMP WATERSHED
- SAND BAGS

KEYMAP

SCALE 1" = 60'-0"

REGISTERED PROFESSIONAL ENGINEER — ANDRES A. GARCIA — No. CO49077 — EXP. 9/30/06 — CIVIL — STATE OF CALIFORNIA — REGISTRATION SEAL

REVISION NO.	DESCRIPTION	DATE
3	ADDENDUM No. 3	8/02/05

HNTB ENGINEERS ARCHITECTS PLAN
HNTB CORPORATION
6151 W. Century Blvd., Suite 1.
Los Angeles, CA 90045
Phone: 310-417-5777
Fax: 310-417-5259

Los Angeles World Airports

RUNWAY 25L RELOCATION - PACKAGE 1
CONTRACTOR'S STAGING AREA
ROUGH GRADING AND STOCKPILE PLAN
SHEET 1 OF 2
LOS ANGELES INTERNATIONAL AIRPORT

SUBMITTED BY: Stuart L. Forbes, ASST. CHIEF AIRPORTS ENGINEER
APPROVED BY: Katherine Dent, CHIEF AIRPORTS ENGINEER

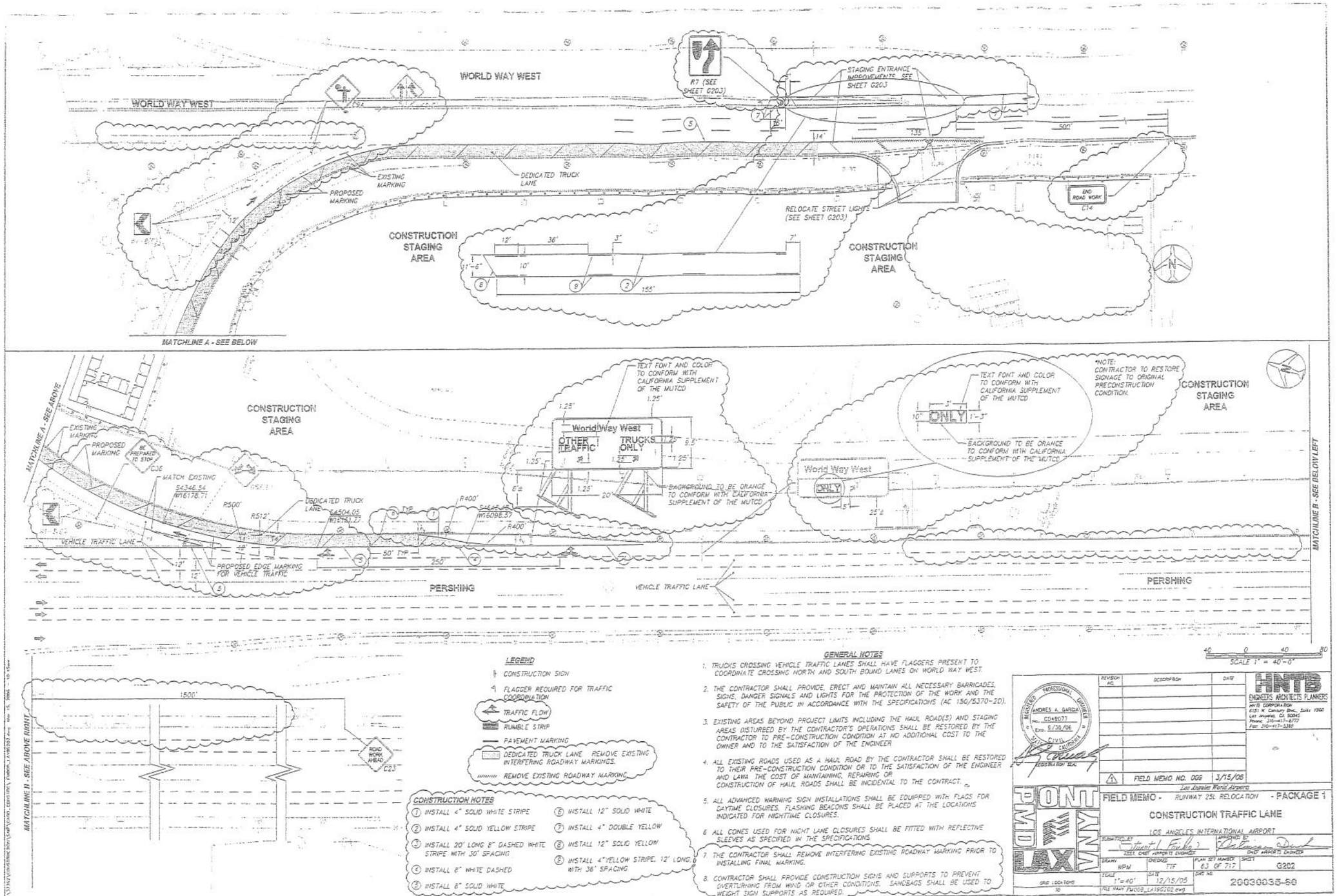
DRAWN	CHECKED	PLAN SET NUMBER	SHEET
WPM	TTF	60 OF 717	G200
SCALE: 1" = 60'	DATE: 08/02/05	DWG NO.	20030035-80

GRID LOCATIONS

PMD ONT ANA LAX

DESIGNATED HAUL ROUTES
SHEET G200

RECEIVED
APR 19 2006
10:24 am
CH2M HILL



LEGEND

- CONSTRUCTION SIGN
- FLAGGER REQUIRED FOR TRAFFIC COORDINATION
- TRAFFIC FLOW
- RUMBLE STRIP
- PAVEMENT MARKING
- DEDICATED TRUCK LANE. REMOVE EXISTING INTERFERING ROADWAY MARKINGS.
- REMOVE EXISTING ROADWAY MARKING

CONSTRUCTION NOTES

1. INSTALL 4" SOLID WHITE STRIPE
2. INSTALL 4" SOLID YELLOW STRIPE
3. INSTALL 20' LONG 8" DASHED WHITE STRIPE WITH 30' SPACING
4. INSTALL 8" WHITE DASHED
5. INSTALL 8" SOLID WHITE
6. INSTALL 12" SOLID WHITE
7. INSTALL 4" DOUBLE YELLOW
8. INSTALL 12" SOLID YELLOW
9. INSTALL 4"YELLOW STRIPE, 12' LONG, WITH 36' SPACING

GENERAL NOTES

1. TRUCKS CROSSING VEHICLE TRAFFIC LANES SHALL HAVE FLAGGERS PRESENT TO COORDINATE CROSSING NORTH AND SOUTH BOUND LANES ON WORLD WAY WEST.
2. THE CONTRACTOR SHALL PROVIDE, ERECT AND MAINTAIN ALL NECESSARY BARRICADES, SIGNS, DANGER SIGNALS AND LIGHTS FOR THE PROTECTION OF THE WORK AND THE SAFETY OF THE PUBLIC IN ACCORDANCE WITH THE SPECIFICATIONS (AC 150/5370-2D).
3. EXISTING AREAS BEYOND PROJECT LIMITS INCLUDING THE HAUL ROAD(S) AND STAGING AREAS DISTURBED BY THE CONTRACTOR'S OPERATIONS SHALL BE RESTORED BY THE CONTRACTOR TO PRE-CONSTRUCTION CONDITION AT NO ADDITIONAL COST TO THE OWNER AND TO THE SATISFACTION OF THE ENGINEER
4. ALL EXISTING ROADS USED AS A HAUL ROAD BY THE CONTRACTOR SHALL BE RESTORED TO THEIR PRE-CONSTRUCTION CONDITION OR TO THE SATISFACTION OF THE ENGINEER AND LAWA. THE COST OF MAINTAINING, REPAIRING OR CONSTRUCTION OF HAUL ROADS SHALL BE INCIDENTAL TO THE CONTRACT.
5. ALL ADVANCED WARNING SIGN INSTALLATIONS SHALL BE EQUIPPED WITH FLAGS FOR DAYTIME CLOSURES. FLASHING BEACONS SHALL BE PLACED AT THE LOCATIONS INDICATED FOR NIGHTTIME CLOSURES.
6. ALL CONES USED FOR NIGHT LANE CLOSURES SHALL BE FITTED WITH REFLECTIVE SLEEVES AS SPECIFIED IN THE SPECIFICATIONS.
7. THE CONTRACTOR SHALL REMOVE INTERFERING EXISTING ROADWAY MARKING PRIOR TO INSTALLING FINAL MARKING.
8. CONTRACTOR SHALL PROVIDE CONSTRUCTION SIGNS AND SUPPORTS TO PREVENT OVERTURNING FROM WIND OR OTHER CONDITIONS. SANDBAGS SHALL BE USED TO WEIGHT SIGN SUPPORTS AS REQUIRED.

REGISTERED PROFESSIONAL ENGINEER — ANDRES A. GARCIA — No. C049077 — Exp. 9/30/06 — CIVIL — CALIFORNIA

REVISION NO.	DESCRIPTION	DATE
1	FIELD MEMO NO. 006	3/15/06

HNTB ENGINEERS ARCHITECTS PLANNERS
HNTB CORPORATION
615 W. Century Blvd., Suite 1200
Los Angeles, CA 90045
Phone: 310-417-8777
Fax: 310-417-5369

Los Angeles World Airports

FIELD MEMO - RUNWAY 25L RELOCATION - PACKAGE 1

CONSTRUCTION TRAFFIC LANE

LOS ANGELES INTERNATIONAL AIRPORT

SUBMITTED BY: Stuart I. Faulk, ASST. CHIEF AIRPORTS ENGINEER — APPROVED BY: Patricia Diaz, CHIEF AIRPORTS ENGINEER

DRAWN	CHECKED	PLAN SET NUMBER	SHEET
WPM	TTF	63 OF 717	G202
SCALE	DATE	DWG NO.	
1" = 40'	12/15/05	20030033-80	
GRID LOCATIONS	FILE NAME: FMDOB_LAYG202.dwg		
70			

PROGRAM MANAGEMENT — LAX

LOCATION FOR VARIABLE MESSAGE STRIPING CHANGES SHEET G202

RECEIVED APR 19 2006 CH2M HILL

CONSTRUCTION DELIVERY HAUL ROUTE
TRAFFIC ROUTE EMPLOYEE SHUTTLE
SHEET G001

LEGEND

——→ DELIVERY/AIRPORT HAUL ROUTE

– – –→ EMPLOYEE SHUTTLE ROUTE

NOTES:

1. THE CONTRACTOR SHALL BE REQUIRED TO SHUTTLE EMPLOYEES TO AND FROM THE CONTRACTOR EMPLOYEE PARKING AREA AND THE WORK SITE.

HNTB ENGINEERS ARCHITECTS PLANNERS
Los Angeles World Airports
RUNWAY 25L RELOCATION - PACKAGE 1
VICINITY MAP AND LOCATION
LOS ANGELES INTERNATIONAL AIRPORT
SUBMITTED BY: ASST. CHIEF AIRPORTS ENGINEER
APPROVED BY: CHIEF AIRPORTS ENGINEER
DESIGN AG | DRAWN WFM | CHECKED AG | DATE
PLAN SET NUMBER 7 OF 654
SHEET G001
DWG NO.
SCALE
REGISTERED PROFESSIONAL ENGINEER ANDRES A. GARCIA No. 024907 Exp. 3/30/08 CIVIL STATE OF CALIFORNIA
ONT VNY LAX PMD

DETAIL OF CONSTRUCTION EMPLOYEE PARKING SHEET G204

LEGEND

CONTRACTOR EMPLOYEE PARKING

CONTRACTOR ACCESS ROUTE FOR SHUTTLE SERVICE TO WORK AREA. SEE SHEET G112 FOR OVERALL PLAN

GENERAL NOTES:

1. PARKING SHALL BE RESTRICTED AT ACCESS GATE TO CONTRACTOR EMPLOYEES ONLY.
2. CONTRACTOR EMPLOYEE PARKING AREA SHALL BE RESTRICTED TO PARKING ONLY. NO CONSTRUCTION ACTIVITIES OR STOCK PILING SHALL BE ALLOWED WITHIN THIS AREA

4"x4" WOOD POST

2"x4" WOOD POST

48"x48" MUTCD

PROPANE 4"x4" WOOD POST

CONSTRUCTION PARKING

12'-0"

4'-0"

PARKING SIGN DETAIL 1/-

NTS

SCALE 1" = 100'-0"

KEYMAP

CONSTRUCTION EMPLOYEE PARKING SEE DETAIL 1 ON THIS SHEET.

CONSTRUCTION EMPLOYEE PARKING

HNTB ENGINEERS ARCHITECTS PLANNERS

Los Angeles World Airports

RUNWAY 25L RELOCATION - PACKAGE 1

CONTRACTORS EMPLOYEE PARKING VEHICLE ENTRANCE AREA

LOS ANGELES INTERNATIONAL AIRPORT

DESIGNED MPM CHECKED TTF DATE 04/11/05

DRAWN SCALE 1"=100' FILE NAME: LA1G0204.dwg

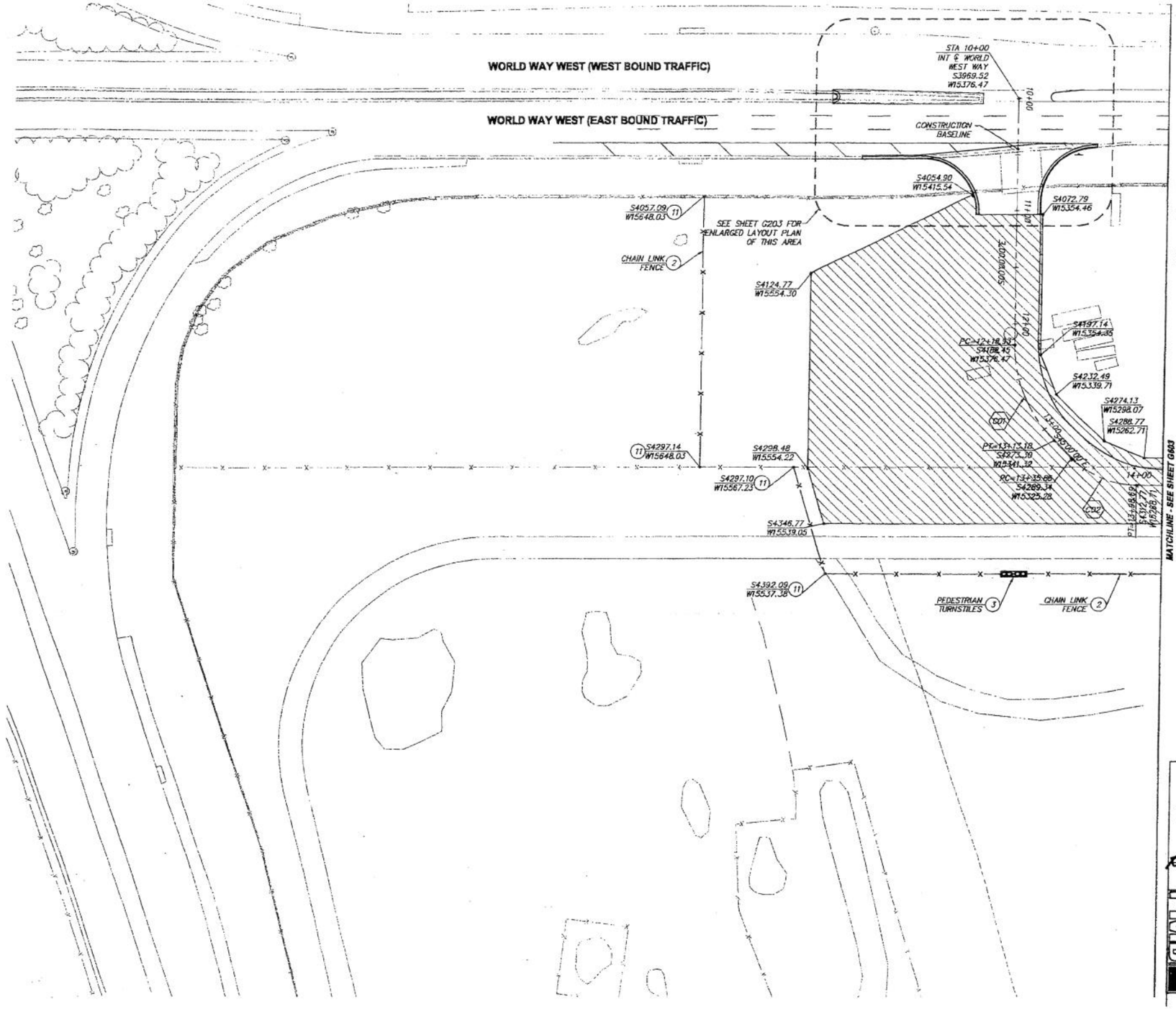
SUBMITTED BY ASSC. CHIEF AIRPORTS ENGINEER

APPROVED BY CHIEF AIRPORTS ENGINEER

PLANT SET NUMBER 64 OF 6864 SHEET G204

CONTRACT NO. 20030035-BG

ONT LAX VNY PMD



CONSTRUCTION NOTES:

1. PROTECT IN PLACE
2. INSTALL AOA CHAIN LINK FENCE AND K-RAIL PER DETAIL 1 SHEET G302.
3. INSTALL PEDESTRIAN TURNSTILES, SEE DETAIL 2 ON SHEET G613.
4. CONSTRUCT TYPE C INTEGRAL CURB PER CITY OF LOS ANGELES STANDARD PLAN S-410
5. CONSTRUCT 6" PCC CURB AND GUTTER TYPE C PER LA STANDARD PLAN S-410-2.
6. MARKING SHALL BE YELLOW, UNLESS OTHER WISE NOTED.
7. REMOVE EXISTING CALTRANS DIVIDED HIGHWAY SIGN
8. CONSTRUCT PROPOSED CALTRANS DIVIDED HIGHWAY SIGN (R4-7)
9. SEE ELECTRICAL PLANS FOR DISPOSITION, SEE SHEETS G820 - G626.
10. REMOVE EXISTING WHITE MARKING AND INSTALL PROPOSED MARKING PER STANDARD LOS ANGELES COUNTY HIGHWAY LANE.
11. TIE PROPOSED SECURITY FENCE INTO EXISTING SECURITY FENCE

GENERAL NOTES:

1. IN PCC PAVEMENT INSTALL WEAKEN PLANE JOINTS EVERY 15'.

LEGEND

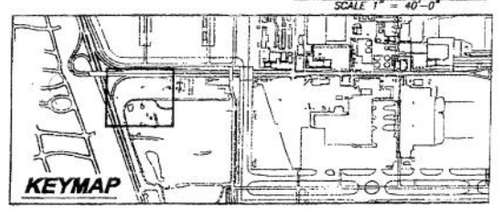
- PLACE 9" PCC (3000 psi COMPRESSIVE) OVER 4" PMB
- PLACE 4" GREENBOOK AC (A-AR-8000) OVER 6" PMB
- PROPOSED EDGE OF ROAD
- PROPOSED CENTERLINE OF ROAD
- PROPOSED SECURITY FENCE

CURVE TABLE (THIS SHEET ONLY)

CURVE	LENGTH	RADIUS	DELTA	TANGENT
C01	94.25'	120.00'	45°00'00"	49.71'
C02	49.57'	80.00'	35°30'17"	25.61'

N

40 0 40 80
SCALE 1" = 40'-0"



REGISTERED PROFESSIONAL ENGINEER
ANDRES A. GARCIA
No. C049077
Exp. 9/30/06
CIVIL
STATE OF CALIFORNIA
REGISTRATION SEAL

REVISION NO.	DESCRIPTION	DATE

HNTB
ENGINEERS ARCHITECTS PLANNERS
HNTB CORPORATION
6151 W. Century Blvd., Suite 1
Los Angeles, CA 90045
Phone: 310-417-5777
Fax: 310-417-5769

Los Angeles World Airports

RUNWAY 25L RELOCATION - **PACKAGE 1**

SECURED ACCESS POST
HORIZONTAL CONTROL AND PAVEMENT PLAN
1 OF 2

LOS ANGELES INTERNATIONAL AIRPORT

ONTARIA PMD LAX

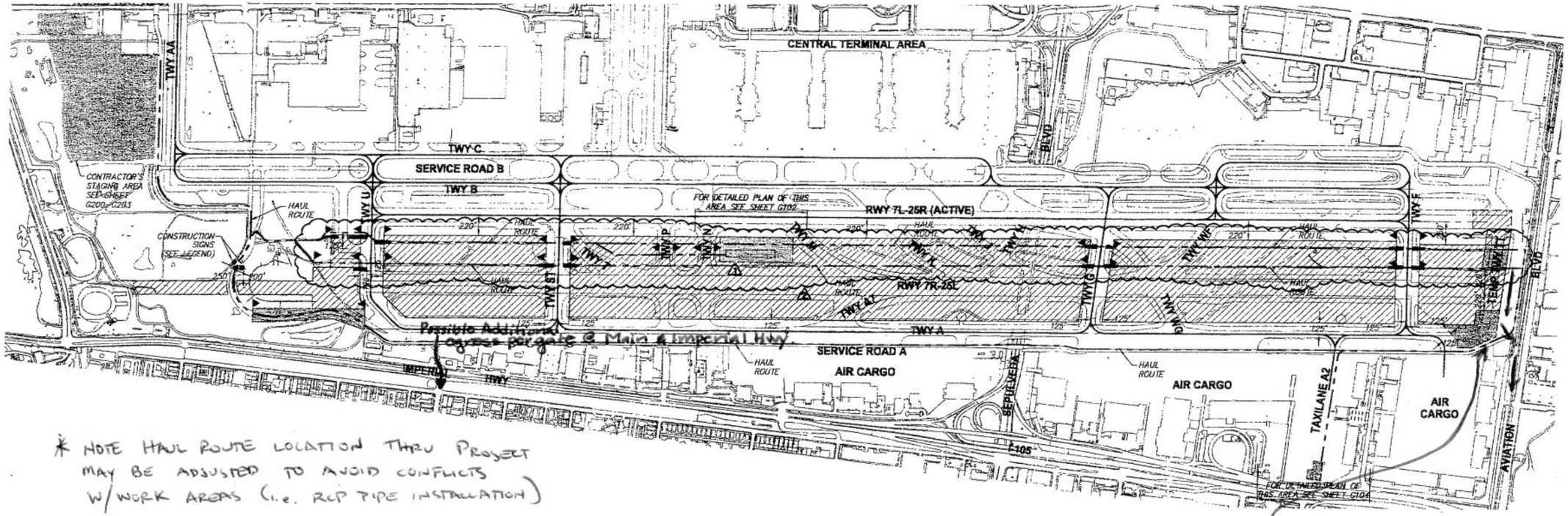
SUBMITTED BY	APPROVED BY
Stuart L. Fuller, ASST. CHIEF AIRPORTS ENGINEER	Richard Steinke, CHIEF AIRPORTS ENGINEER

DRAWN	CHECKED	PLAN SET NUMBER	SHEET
MFM	TTF	74C OF 717	G602
SCALE	DATE	DWG NO.	
1"=40'	07/12/05	20030035-80	

PEDESTRIAN TURNSTILE/ACCESS TO AOA
SHEET G602

RECEIVED
APR 19 2006
10:15AM
CH2M HILL

DESIGNATED HAUL ROUTES
SHEET G101



* NOTE HAUL ROUTE LOCATION THRU PROJECT MAY BE ADJUSTED TO AVOID CONFLICTS W/WORK AREAS (i.e. RCP PIPE INSTALLATION)

⚠

PHASE 1 - CONSTRUCTION

DESCRIPTION OF WORK	EARLIEST START DAY	DURATION	WORK HOURS
CONTRACTOR MOBILIZATION AND SETUP, SETUP CONTRACTOR'S STAGING AREA, SECURED ACCESS POST, SERVICE ROAD IMPROVEMENTS INCLUDING CONCRETE BATCH PLANT(S) AND MATERIAL CRUSHING EQUIPMENT, OBTAIN ALL REQUIRED PERMITS, PREPARATION OF REQUIRED SUBMITTALS, PRE-DEMOLITION WORK, HAUL ROUTE PAVEMENT, CONSTRUCTION SIGNAGE, PAVEMENT TEST STRIP, PRE-CONSTRUCTION WORK, PAVEMENT IMPROVEMENT PROCUREMENT AND TRANSPORT OF LONG LEAD CONSTRUCTION MATERIALS TO THE JOB SITE, FIBER OPTIC IMPROVEMENTS, TEMP TWY TT IMPROVEMENTS, TAXILANE A2 IMPROVEMENTS THAT DO NOT AFFECT EXISTING ALSF-2 LIGHTING, TEMPORARY LIGHTING AND OTHER LIGHTING WORK REQUIRED TO MAINTAIN AN OPERATIONAL AIRFIELD, AND INSTALL BARRICADES, FLAG LINES AND FENCES AS DEPICTED IN THE CONSTRUCTION DRAWINGS	DAY 0 (ISSUANCE OF NOTICE TO PROCEED)	150 DAYS TAXIWAY A-2 (MAXIMUM DURATION 90 DAYS)	NIGHTTIME WORK AREA RUNWAY 7R/25L (11:00PM - 6:00AM) RUNWAY 7L/25R (2:00AM - 5:00AM) DAYTIME WORK AREA: 2-10 HOUR SHIFTS

AIRFIELD ELEMENT	OPERATION REQUIREMENTS
RUNWAY 7R/25L	CLOSED FROM 11:00 PM TO 6:00 AM
TWY P, N, M, K, J, A7, H, WF, WG, T	CLOSED FROM 11:00 PM TO 6:00 AM
TWY U, ST, G, F	CONTRACTOR TO COORDINATE OFF-PEAK TWY CLOSINGS TO PERFORM REQUIRED PAVED HAUL ROUTE IMPROVEMENT - OTHERWISE OPEN TO AIRCRAFT TRAFFIC
TWY U AND ST	MAY NOT BE CLOSED AT THE SAME TIME
TWY G AND F	MAY NOT BE CLOSED AT THE SAME TIME
RUNWAY 7L/25R	CONTRACTOR TO COORDINATE RWY CLOSING
TEMPORARY TAXIWAY TT	CONTRACTOR TO REMOVE ALSF-2 LIGHTING DURING THE LAST NIGHT CLOSURE OF 7R/25L, DIRECTLY PRIOR TO THE BEGINNING OF PHASE 2
SERVICE ROAD IMPROVEMENTS	CONTRACTOR TO PHASE IMPROVEMENTS SUCH THAT SERVICE ROAD "A" MAINTAINS AT LEAST ONE OPEN LANE FOR AIRPORT TRAFFIC AT ALL TIMES

NOTES:

1. "DESCRIPTION OF WORK" IS A BRIEF STATEMENT THAT IS INTENDED TO CONVEY THE BROAD SCOPE OF WORK, RATHER THAN INDIVIDUAL COMPONENTS AND THEREFORE NOT ALL RELATED SITE WORK IS INCLUDED.
2. TAXIWAY LABELS DENOTE EXISTING DESIGNATIONS

LEGEND

- OFF PEAK - NIGHTTIME WORK AREA
  RUNWAY 7R/25L (11:00PM - 6:00AM)
  RUNWAY 7L/25R (2:00AM - 5:00AM)
- DAYTIME WORK AREA - TWO (2) - 10 HOUR SHIFTS
- CONTRACTORS VEHICLE CROSSING, FLAGGER REQUIRED
- AIRCRAFT ROUTE TO REMAIN OPEN
- INSTALL CONSTRUCTION SIGN PER DETAIL 5, ON SHEET G300
- HAUL ROUTE

N

500 0 500 1000
SCALE 1" = 500'-0"

REVISION NO.	DESCRIPTION	DATE
⚠	ADDENDUM No. 3	8/12/05
⚠	ADDENDUM No. 1	5/25/05

REGISTERED PROFESSIONAL ENGINEER
ANDRES A. GARCIA
No. CO49077
Exp. 9/30/06
CIVIL
STATE OF CALIFORNIA
REGISTRATION SEAL

HNTB
ENGINEERS ARCHITECTS PLANNERS
HNTB CORPORATION
6151 W. Century Blvd., Suite 1200
Los Angeles, CA 90045
Phone: 310-417-4777
Fax: 310-417-5389

Los Angeles World Airports

RUNWAY 25L RELOCATION - **PACKAGE 1**

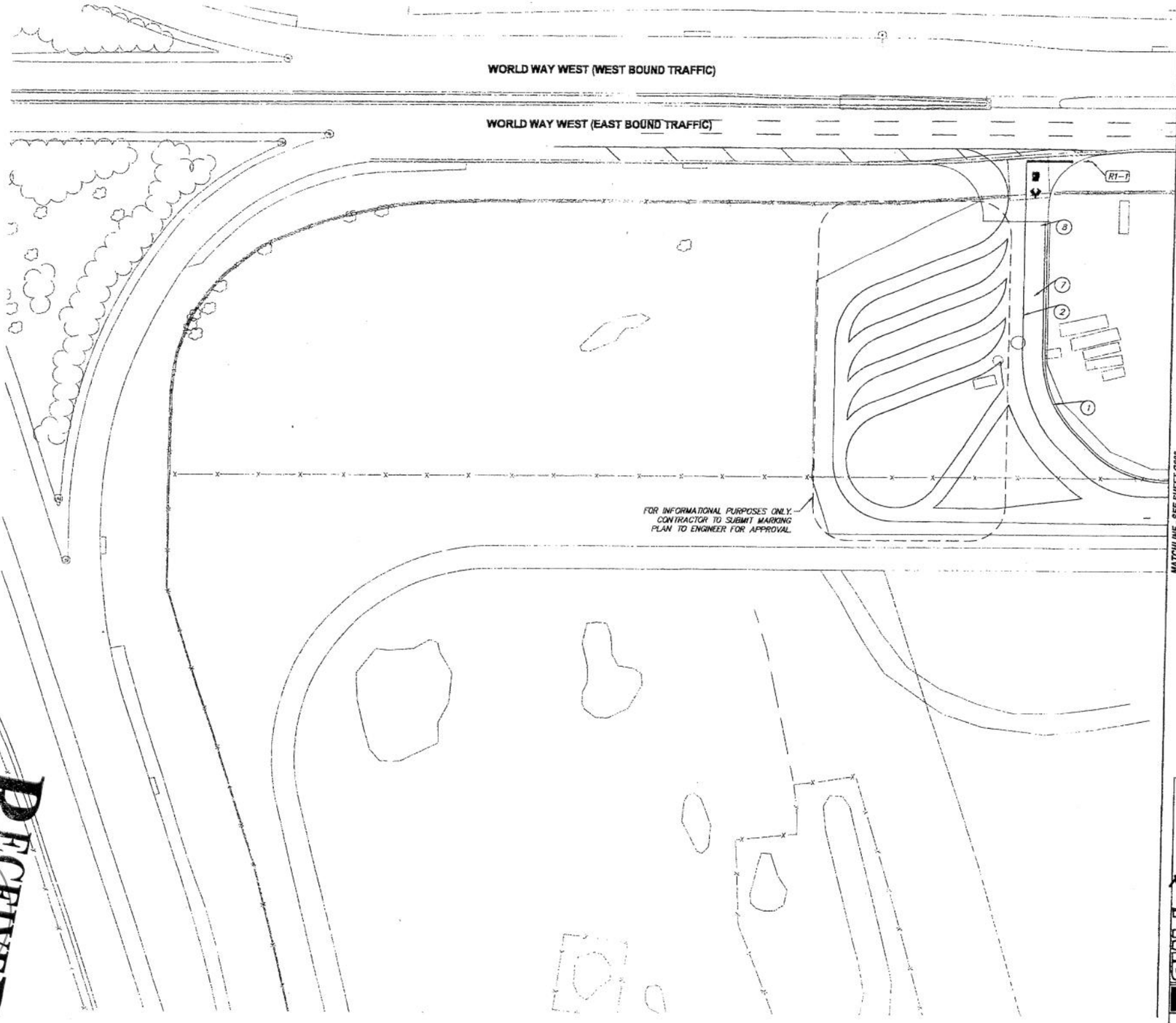
CONSTRUCTION SEQUENCING PHASE 1

LOS ANGELES INTERNATIONAL AIRPORT

SUBMITTED BY	APPROVED BY
ASST. CHIEF AIRPORTS ENGINEER	CHIEF AIRPORTS ENGINEER

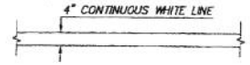
DRAWN	CHECKED	PLAN SET NUMBER	SHEET
HPM	TTF	26 OF 717	G101
SCALE 1"=500'	DATE 08/02/05	DWG NO. 20030035-80	
GRID LOCATIONS 70	FILE NAME LA19G101.dwg		

ADDITIONAL PAVEMENT MARKINGS
SHEET G607

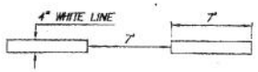


CONSTRUCTION NOTES (THIS SHEET ONLY):

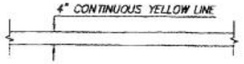
1. ROADWAY EDGE MARKING, SEE DETAIL 1, THIS SHEET.
2. DIVIDING LINE MARKING, SEE DETAIL 3, ON SHEET G613.
3. STOP BAR MARKING, SEE DETAIL 3 ON SHEET G613.
4. DIRECTIONAL MARKING, SEE DETAIL 1 ON SHEET G608.
5. DIRECTIONAL MARKING, SEE DETAIL 2 ON SHEET G608.
6. DIRECTIONAL MARKING, SEE DETAIL 3 ON SHEET G608.
7. DASHED WHITE LINE, SEE DETAIL 2, THIS SHEET.
8. DIRECTIONAL MARKING, SEE DETAIL 4 ON SHEET G608.



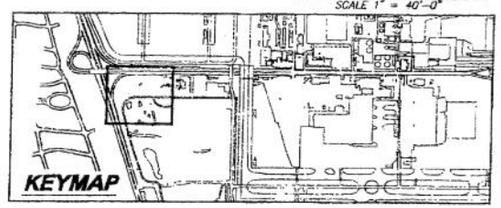
EDGE OF ROADWAY MARKING 1
NTS



DASHED WHITE LINE 2
NTS



EDGE OF ROADWAY MARKING 3
NTS



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APR 19 2006
CH2M HILL

REGISTERED PROFESSIONAL ENGINEER
ANDRES A. GARCIA
No. C049077
Exp. 9/30/06
CIVIL
CALIFORNIA
REGISTRATION SEAL

REVISION NO.	DESCRIPTION	DATE

HNTB
ENGINEERS ARCHITECTS PLANNERS
HNTB CORPORATION
615 W. Century Blvd., Suite 1200
Los Angeles, CA 90045
Phone: 310-417-5777
Fax: 310-417-5369

Los Angeles World Airports

RUNWAY 25L RELOCATION - PACKAGE 1

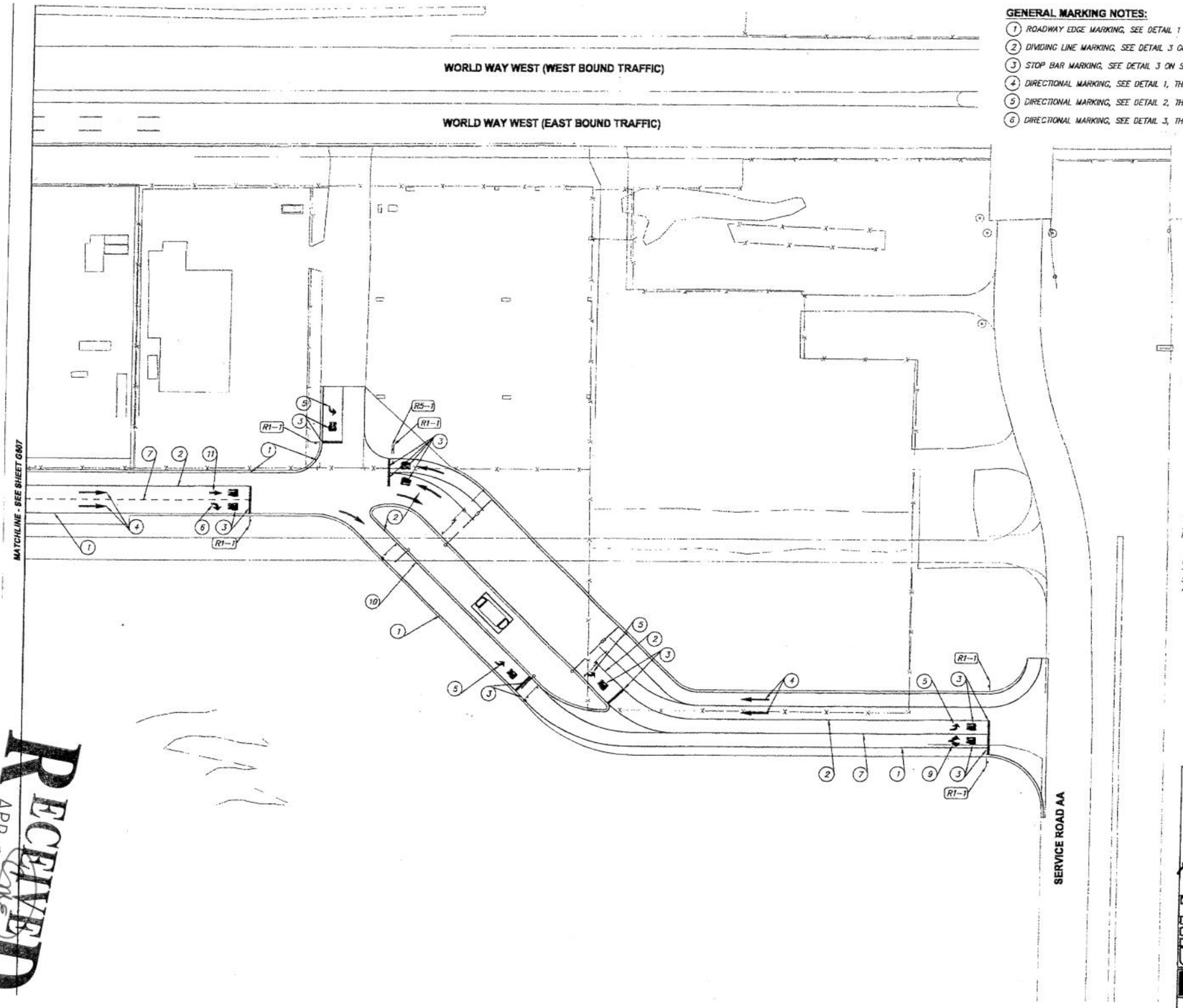
SECURED ACCESS POST
MARKING AND SIGNAGE PLAN - 1 OF 2

LOS ANGELES INTERNATIONAL AIRPORT

SUBMITTED BY	APPROVED BY
Stuart L. Fowler, ASST. CHIEF AIRPORTS ENGINEER	CHIEF AIRPORTS ENGINEER

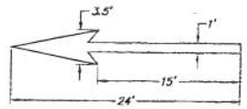
DRAWN	CHECKED	PLAN SET NUMBER	SHEET
MPM	TTF	74H OF 717	G607
SCALE 1"=40'	DATE 07/12/05	DWG NO. 20030035-80	
GRID LOCATIONS TO	TITLE NAME LA190607.dwg		

ADDITIONAL PAVEMENT MARKINGS
SHEET G608

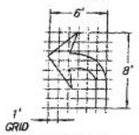


GENERAL MARKING NOTES:

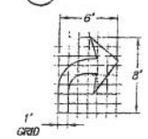
1. ROADWAY EDGE MARKING, SEE DETAIL 1 ON SHEET G607.
2. DIVIDING LINE MARKING, SEE DETAIL 3 ON SHEET G613.
3. STOP BAR MARKING, SEE DETAIL 3 ON SHEET G613.
4. DIRECTIONAL MARKING, SEE DETAIL 1, THIS SHEET.
5. DIRECTIONAL MARKING, SEE DETAIL 2, THIS SHEET.
6. DIRECTIONAL MARKING, SEE DETAIL 3, THIS SHEET.
7. DASHED WHITE LINE, SEE DETAIL 2 SHEET G607.
8. INSTALL GUARD POST SIGNAGE PER DETAILS 1–4 SHEET G611.
9. DIRECTIONAL ARROW MARKING, SEE DETAIL 4, THIS SHEET.
10. ROADWAY EDGE MARKING, SEE DETAIL 3, SHEET G607.
11. DIRECTIONAL MARKING, SEE DETAIL 5, THIS SHEET.
12. INSTALL ROADWAY SIGN ON 4"X4" WOOD POST PER CALTRANS STANDARD PLAN SHEET RS2.



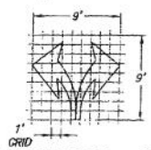
TYPE I ARROW DETAIL 1 — NTS



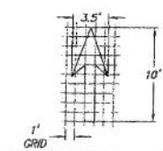
TYPE IV (L) ARROW DETAIL 2 — NTS



TYPE IV (R) ARROW DETAIL 3 — NTS



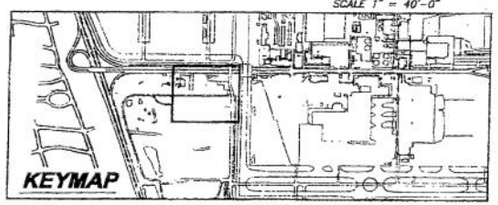
TYPE VIII ARROW DETAIL 4 — NTS



TYPE I ARROW DETAIL 5 — NTS

GENERAL MARKING NOTES:

SEE CALTRANS MANUAL FOR SIGN TYPES AND SIZES.



REGISTERED PROFESSIONAL ENGINEER
ANDRES A. GARCIA
No. C049077
Exp. 9/30/06
CIVIL
STATE OF CALIFORNIA
REGISTRATION SEAL

REVISION NO.	DESCRIPTION	DATE

HNTB
ENGINEERS ARCHITECTS PLANNERS
HNTB CORPORATION
8181 W. Century Blvd., Suite 1300
Los Angeles, CA 90045
Phone: 310-417-8777
Fax: 310-417-5369

Los Angeles World Airports

ONTARIO PMD LAX

RUNWAY 25L RELOCATION - PACKAGE 1

SECURED ACCESS POST MARKING AND SIGNAGE PLAN - 2 OF 2

LOS ANGELES INTERNATIONAL AIRPORT

SUBMITTED BY: Stuart Faiks, ASST. CHIEF AIRPORTS ENGINEER
APPROVED BY: Rafat Raouf, CHIEF AIRPORTS ENGINEER

DRAWN	CHECKED	PLAN SET NUMBER	SHEET
WPM	TTF	741 OF 717	G608
SCALE 1"=40'	DATE 07/12/05	DWG NO.	20030035-80

GRID LOCATIONS TO
FILE NAME: LAT30G08.dwg

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APPENDIX G

SAIP Contractor Noise Control Plan (CNCP)

Contractor's Noise Control Plan (CNCP)

Purpose

Consistent with the requirements set forth in Special Provisions Section 21-8.1, Paragraph 1, this document meets the requirements to have a Construction Noise Control Plan (CNCP) for construction activities associated with the South Airfield Improvements Project (SAIP) Runway 25L and Center Taxiway Project, SAIP. This Plan describes in detail anticipated noise levels of proposed construction equipment and activities, noise mitigation methods and how the Contractor will maintain acceptable noise levels during construction. This CNCP describes how the Contractor will comply with the noise provisions of the City of Los Angeles Municipal Code (Chapter XI, Article 1 and Section 41.40) and the requirements of the Contract. The intent of the CNCP is to control noise impacts to Noise Sensitive Areas, as defined in Special Provisions Section 21-8.2 and further described below. This CNCP meets all requirements of the U.S. Department of Transportation, FHWA Bulletin – Highway Construction Noise "Measurement, Prediction, and Mitigation", and the City of Los Angeles Draft CEQA Thresholds Guide dated May 14, 1998.

Noise Sensitive Areas and Times

Special Provisions Section 21-8.2 defines noise sensitive areas as "residences, apartments, hotels, schools, day care centers, places of worship and hospitals". Noise sensitive times are defined as "9:00PM to 7:00AM Monday through Friday; 8:00PM to 6:00AM Saturday; and anytime on Sunday and Holidays".

Methodology

1. Determine allowable noise increase above ambient noise level. (5 dbA, because construction activities will last more than 10 days in a three month period. The SAIP will have approximately two years duration from March 2006 through June 2008.

2. Quantification of ambient noise levels before construction, using a noise meter.

3. Identify project impacts, including duration of construction activities, type, amount and scheduling of construction equipment, and the distance form construction activities to noise sensitive areas.

4. Calculate (or measure) the noise emissions from individual equipment, the distances to the noise-sensitive areas and noise attenuation standards. Noise attenuation is 3 dbA at 50 feet from the source, and decreases by 3 dbA from each doubling of distance (100 feet, 200 feet, 400 feet, etc.) over a hard, unobstructed surface, such as asphalt. For soft surfaces such as sand or vegetation, noise decreases by 4.5 dbA for each doubling of distance.

5. Determine the combined noise levels from equipment that will be operated simultaneously.

6. Determine any cumulative impacts from related projects that coincide with this project.

7. Identify specific noise mitigation measures per Section 4.2, FHWA Special Report: Highway Construction Noise: Measurement, Prediction, and Mitigation.

Allowable Noise Increase Above Ambient

Because construction activities will last more than 10 days in a three month period, the allowable increase in noise above ambient is 5 dbA. The SAIP project will have approximately two years duration, from March 2006 through June 2008. Per Contract Special Provisions Section 21-8.1. Paragraph 4, the Contractor must comply with local ordinances regulating noise should they be more stringent. The applicable local noise ordinances are for the City of Los Angeles, and the City of El Segundo. For City of Los Angeles, Section 112.05 of the Municipal Code states that noise from construction equipment, measured at a distance of 50 feet, shall not exceed 75 dbA for construction equipment that is used within 500 feet of a residential area. Also, the City of El Segundo's Municipal Code Section 7-2-4 provides that noise shall not exceed 5 dbA above Ambient noise. Therefore, the Contractor will take steps to mitigate noise from any equipment and activities to comply with both local ordinances.

Variance from LAMC 41.40

The Los Angeles Municipal Code Section 41.40-c stipulates that "No person other than an individual homeowner engaged in the repair of construction of his single-family dwelling shall perform any construction of repair work of any kind upon, of any earth grading for, any building or structure located on land developed with residential buildings under the provisions of the Chapter 1 of this Code, or perform such work within 500 feet of land so occupied, before 8:00 a.m. or after 6:00 p.m. on Saturday or national holiday nor at any time on Sunday". This Code could be detrimental to the SAIP contract schedule. However, the L.A. Municipal Code Section 41.40-j states "As determined by the Police Commission, the provisions of subsection (c) shall not apply to major public works construction by the City of Los Angeles and its proprietary Departments (LAWA)".

Pre-construction Ambient Noise Levels

Ambient noise levels were taken before construction, using a noise meter, The ambient noise was taken in five locations along Imperial Way, the northern-most street in El Segundo. The daytime readings were 73, 56, 63, 59, and 67 dbA. The average of these five readings is 63.6 dbA. A map showing the five locations is included as Appendix A.

It is not deemed necessary to record ambient noise levels along the western boundary of the airport because there are no noise-sensitive areas. There is a major street, Pershing Way, sand dunes, and the Pacific Ocean. The eastern boundary of the airport similarly has no noise sensitive areas within 500 feet; however there are commercial buildings and parking lots. The

northern boundary of the airport is also nearly a mile from the construction and the airport terminals provide a sound barrier.

Construction Project Impacts

Project impacts due to construction of the SAIP are provided here, for duration of construction activities, amount of activities, scheduling of construction equipment, and the distance from construction activities to noise sensitive areas.

Duration

The SAIP overall schedule is from March 1, 2006 through June 13, 2008. Many activities will occur during this construction period, including preparation for construction, runway demolition and re-building, and center taxiway construction. There also will be modifications to existing taxiways and aprons. In addition, the lighting and electronic navigation equipment will be relocated and upgraded.

Types of Activities

The Major activities for the SAIP include construction of a concrete batch plant, a concrete crushing plan, demolition of the runway, excavation and hauling of the runway rubble, excavating and preparing the new runway foundation, pouring the new runway concrete, finishing the runway, excavating the new taxiway and preparing the foundations, pouring the concrete for the taxiway, and installing the new lighting and electronic navigations equipment. These activities will require typical construction equipment including motor graders, dozers, excavators, backhoes, compactors, cranes, boring units, haul trucks, dump trucks, pavers, water trucks, concrete breakers and sweepers. Most of the equipment is powered by diesel motors. The batch plant and rock crushing plant are powered by electric motors. The electric power will be furnished initially by portable generators that burn diesel fuel, and later by power from the utility grid.

Amount of Construction Equipment

The amount of construction equipment will vary as the construction progresses. Some equipment will be on the site for a short period while others will be on the site for nearly the entire time. As examples, the concrete breakers will be in operation only for approximately three weeks, while the motor graders will be required for practically the entire job.

Scheduling of Construction Equipment

Scheduling of construction equipment depends on the schedule for the entire project. The concrete breakers will be needed initially, then removed from the site. Haul trucks and dump trucks will be needed for several activities, including removal of runway rubble, dirt removal, and hauling wet concrete to the concrete pouring areas. The hours of operation will be in two

shifts of ten hours each, with a four-hour period of no activity every day. Construction will occur for six days per week, with no activity on Sunday. However, some activities will occur less than 20 hours per day.

Distance from Construction Activities to Noise Sensitive Areas

The runway 25L that will be removed and replaced runs generally east to west. The runway is angled slightly toward El Segundo such that the western end is approximately 700 feet from the city. The eastern end is farther away. Work at the western end of the runway is the closest activity to noise sensitive areas in El Segundo. The work immediately south of the runway, on taxiway A, will bring some construction equipment within 500 to 600 feet of the noise sensitive areas in El Segundo.

Noise Emissions from Individual Equipment

Estimates of noise from individual equipment and operations area as follows. These estimates are from the FHWA Special Report referenced herein, and are expressed as dbA at 50 feet from the source, over a hard surface.

• Runway Demolition by Concrete Breakers	92 dbA
• Loading Demolition Material into Dump Trucks	94 dbA*
• Batch Plant Operations	88 dbA**
• Rock Crusher Operations	94 dbA***
• Unloading Aggregate at Batch Plant	85 dbA
• Compressors	75 dbA
• Paving Operations	88 dbA****
• Generators	83 dbA*****

* *A value o three weighted decibels was added to the noise level of a 1972 Model D9 Dozer. This was done to account for spike/peak noises during the activity. The value of three decibels was used because it is the value of perceptible change to the human ear (becnet.org Section - 4.8).*

** *Concrete Batch Plant (mixers) noise level given in L.A. CEQA Thresholds Guide – pg I.1-8*

*** *Crusher operations were assumed to have the same noise level as demolition operations.*

**** *Paver noise level given in L.A. CEQA Thresholds Guide – pg I.1-8*

***** *Generator noise level given in L.A. CEQA Thresholds Guide – pg I.1-8*

Noise Attenuation Standards

Noise attenuation is 3 dbA at 50 feet from the source, and decreases by 3 dbA for each doubling of distance (100 feet, 200 feet, 400 feet, etc.) over a hard, unobstructed surface, such as asphalt. For soft surfaces such as sand or vegetation, noise decreases by 4.5 dbA for the first 50 feet, and

4.5 dbA with each doubling of distance. The result of this attenuation for the SAIP is that, at a distance of 600 feet from the source and over a hard surface, noise will decrease approximately 14 dbA. This distance represents the situation at the western end of the runway.

Simultaneous Noise

The combined noise from simultaneous activities is estimated in this section. This estimation requires data for which activities, the noise generated by each, the distance from each to the receiver, and the type of terrain between each noise source and the receiver. For SAIP activities, the equipment and activities are not stationary but move over time as the runway progresses. The type of activities that will occur simultaneously near the western end of the runway include haul trucks, and concrete breaking. However, the haul trucks travel approximately 300 feet to the north of the concrete breakers and are not expected to contribute much, if any, additional noise. After the breaking is complete, simultaneous activities include runway rubble excavation, and loading rubble into haul trucks. Following the excavation, simultaneous activities include soil excavation, grading, and compaction. Finally, the concrete pouring procedure will have simultaneous operation of pavers and dump trucks.

For estimation purposes, the combined noise is expected to be equal to the loudest noise source plus 3 dbA, measured at 50 feet from the loudest noise source. The only exception is concrete breaking and haul trucks, whish is estimated as noise from the concrete breaking only. The resulting noise levels are shown in the following table.

	Noise, dbA at 50 feet
Concrete Breaking and Haul Trucks	92
Excavation and Loading into Haul Trucks	97
Soil Excavation, Grading and Compaction	88
Pavers and Dump Trucks	91

Determine Cumulative Impacts

Specific noise mitigation measures are described in Section 4.2, FHWA Special Report: Highway Construction Noise: Measurement, Prediction, and Mitigation. The applicability of each of these to the SAIP work is discussed below.

- Design Considerations: these are listed in the FHWA reference as design considerations and project layout, sequence of operations, and alternate construction methods. Within this category, the noise levels and potential impacts on the noise sensitive areas were addressed to minimize potential impacts. These include location of the rock crusher and batch plant as far from the noise sensitive areas as practical, and where natural elevation changes can dampen noise. The sequence of operations has noisy operations occurring during daytime hours. For example, the concrete breakers are not scheduled to work at night. Alternate construction methods include locating haul roads at a distance from noise sensitive areas, using rubber-tired equipment where possible, minimizing noise from traffic near the noise sensitive areas

by recycling concrete from the runway demolition, having a remote parking lot for construction employees and using a shuttle bus system and others.

- Source Controls: these relate to controlling noise at the source, that is, from the equipment itself. In addition, all equipment used on the SAIP have mufflers, and are properly maintained. Proper maintenance includes having no loose or rattling parts, screws, bolts or metal plates that cause noise. In addition, operational procedures are in place to minimize noise, such as keeping the height of a loader bucket to a minimum when dumping material into a dump truck, and when dumping material into the rock crusher. Also, all construction equipment and vehicles are required to drive only over the designated haul routes. Finally, the smallest equipment is used that can perform a specific task.

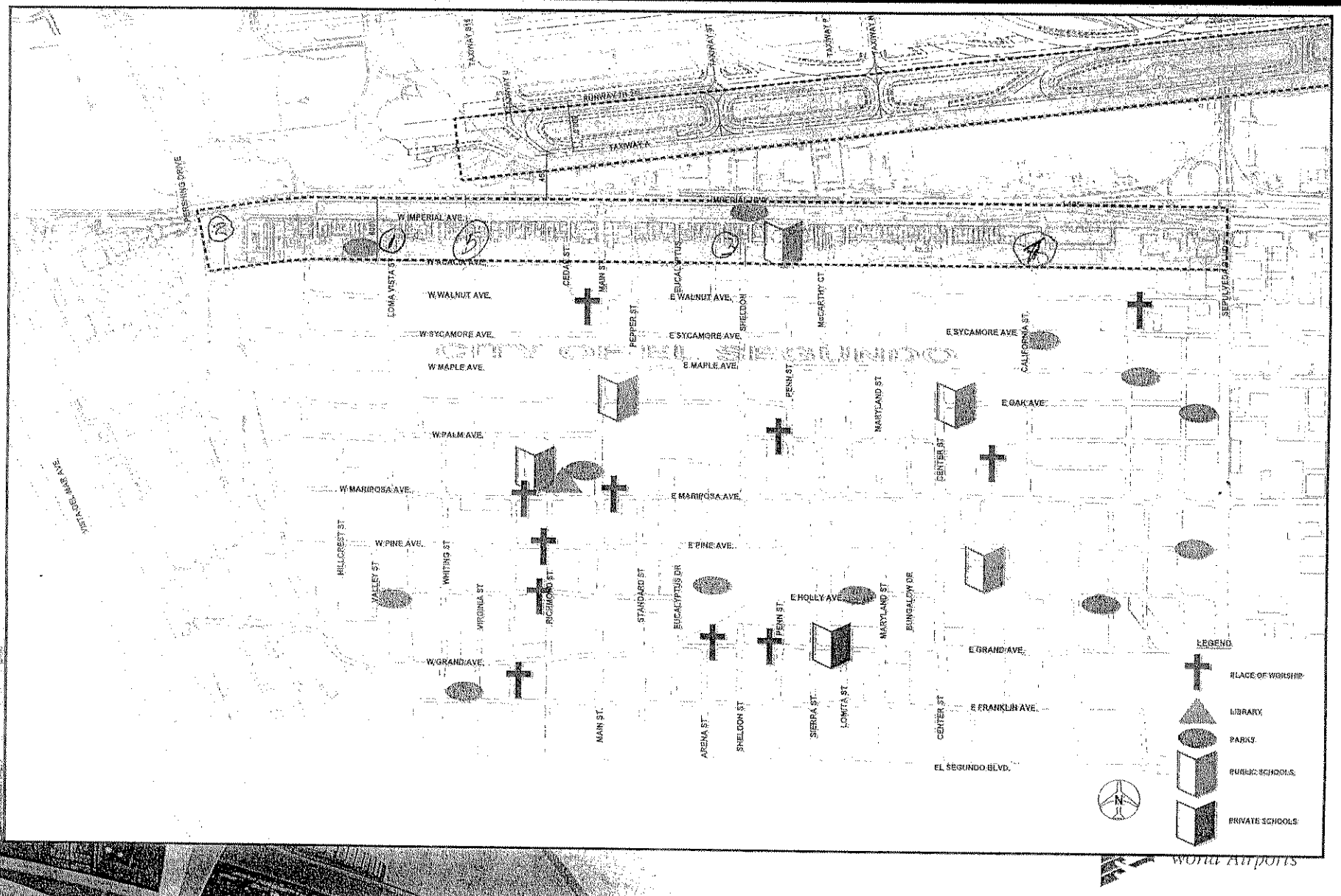
  Where additional noise mitigation measures are required, the Contractor will take steps that may include the use of noise barriers or shields, noise dampening materials, noise skins and sound aprons. Enclosures are not practical on the SAIP work because almost none of the equipment is stationary.

- Site Controls: air compressors and generators are operated as far from noise sensitive areas as possible.

- Time & Activity Constraints: every effort is made to ensure the noisiest activities do not occur during night time where the impact on noise sensitive areas is the greatest. An example is the concrete breakers do not operate at night.

- Community Awareness: public relations and community awareness are employed in inform the affected communities of the SAIP work and noise impacts. LAWA has conducted an open meeting during which noise issues were discussed with the community. Other meetings are planned as the construction progresses.

Appendix A


RUNWAY 25L
TAXIWAY A
W IMPERIAL AVE.
E IMPERIAL HWY
W WALNUT AVE.
E WALNUT AVE.
W SYCAMORE AVE.
E SYCAMORE AVE.
W MAPLE AVE.
E MAPLE AVE.
W PALM AVE.
E OAK AVE.
W MARIPOSA AVE.
E MARIPOSA AVE.
W PINE AVE.
E PINE AVE.
E HOLLY AVE.
W GRAND AVE.
E GRAND AVE.
E FRANKLIN AVE.
EL SEGUNDO BLVD.
LOMA VISTA ST
CEDAR ST
MAIN ST
PEPPER ST
EUCALYPTUS
SHELDON
MCCARTHY CT
SEPULVEDA
CALIFORNIA ST.
PENN ST.
MARYLAND ST.
CENTER ST.
HILLCREST ST
VALLEY ST
WHITING ST
VIRGINIA ST
RICHMOND ST.
STANDARD ST
EUCALYPTUS DR
ARENA ST
SHELDON ST
SIERRA ST.
LOMITA ST.
BUNGALOW DR
LEGEND
PLACE OF WORSHIP
LIBRARY
PARKS
PUBLIC SCHOOLS
PRIVATE SCHOOLS

APPENDIX H

Monthly SAIP Noise Hotline Reports

Los Angeles World Airports
Southside Airfield Improvement Project
August 2006 Noise Hotline Report

Highlights

1. Reporting period: August 1, 2006 through September 1, 2006.
2. Received one inquiry hotline call on August 21, 2006.
3. Received three complaint calls on about noise generated by early morning activities August 29, 30 and 31st, 2006.
4. Copies of the log are attached. Each log notes details about the noise complaint and follow up action taken.
5. A copy of noise measurements taken in response to complaints is also attached.

Report prepared by:

Chris Harris

Harris & Company

Phone: 213-749-3386

Email: charris@harriscompany.net

September 5, 2006

Los Angeles World Airports
Southside Airfield Improvement Program

24-hour, toll-free hotline: (866) 758-LAWA (758-5292)

Call Log / Complaint Form

Please complete all applicable spaces and print legibly.

_____ **Complaint** ___X___ **Inquiry**

Date of Call: 8/21/06 **Time of Call:** 5:05 **p.m.** **Staff:** Neil M.

Caller Name: Sandra East **Telephone No.: 310-641-4173**

Second Phone: 310-568-0102

Caller address or nearby cross-streets:

Arbor Vitae and Airport Rd.

Description of Complaint / Inquiry: Asked why planes were flying over her home all night long? They are supposed to land from over the ocean; not from the east.

Call Referred To: LAX Aircraft Noise Complaint line **Date:** 8/21/06 **Time**: 5:10 p.m.

Action Taken: Because this was not construction-related, I called the Aircraft Noise Complaint number for her. I called Ms. East back and gave her that phone number for her use in the future.

_____

_____

_____

Resident Informed of Action Taken/Next Steps: Yes **Date/Time: 8/21/06; 5:35 p.m.**

Additional Comments: _____

_____

Los Angeles World Airports
Southside Airfield Improvement Program

24-hour, toll-free hotline: (866) 758-LAWA (758-5292)

Call Log / Complaint Form

Please complete all applicable spaces and print legibly.

___X__ **Complaint** _____ **Inquiry**

Date of Call: 8/29/06 **Time of Call: 10:15 a.m.** **Staff:** Neil M.

Caller Name: Dave Wood **Telephone No.: 310-640-9815**

Second Phone: none

Caller address or nearby cross-streets:

640 E. Imperial Highway Apt. #3, El Segundo

Description of Complaint / Inquiry: Pounding noise at 6:30 a.m. near AVA Air Cargo. "Why are they starting so early?" Mr. Wood thought start time was to be 8:00 a.m.

Call Referred To: Kathy, construction office; also talked to Jake Adams **Date:** 8/29/06 **Time**: 10:17 to 10:29 a.m.

Action Taken: Mr. Adams said the construction crew would be informed not to start before 7:00 a.m.

Resident Informed of Action Taken/Next Steps: Yes **Date/Time: 8/29/06; 10:30 a.m.**

Additional Comments: Mr. Wood appreciated the information, now understands that 7:00 a.m. is the correct start time. He also appreciated that steps were being taken to prevent a repeat of the early noise.

Los Angeles World Airports
Southside Airfield Improvement Program

24-hour, toll-free hotline: (866) 758-LAWA (758-5292)

Call Log / Complaint Form

Please complete all applicable spaces and print legibly.

___X___ **Complaint** _____ **Inquiry**

Date of Call: 8/30/06 **Time of Call: 8:30 a.m.** **Staff:** Neil M.

Caller Name: Dave Wood **Telephone No.: 310-640-9815**

Second Phone: none

Caller address or nearby cross-streets:

640 E. Imperial Highway, Apt. #3, El Segundo

Description of Complaint / Inquiry: Pounding and clanging noise again at exactly 6:40 a.m. Woke him up again. Very upset that same noise was repeated, even after he had complained and been told the crew would be informed about not starting early. Said not to call back, just to tell construction managers that the noise problem was repeated and to please make it right.

Call Referred To: J'Mie, construction office; referred to Vince Hourigan. Faxed complaint logs to J'Mie. **Date:** 8/30/06 **Time**: 8:35 a.m.

Action Taken: Noise measurements taken and contractor observed.

_____

_____

_____

Resident Informed of Action Taken/Next Steps: Yes **Date/Time: 8/30/06**

Additional Comments: _____

_____

Los Angeles World Airports
Southside Airfield Improvement Program

24-hour, toll-free hotline: (866) 758-LAWA (758-5292)

Call Log / Complaint Form

Please complete all applicable spaces and print legibly.

__X____ **Complaint** ___ ___
Inquiry

Date of Call: 8/31/06 **Time of Call:** 8:45 **a.m.** **Staff:** Neil M.

Caller Name: Dave Wood **Telephone No.: 310-640-9815**

Second Phone: none

Caller address or nearby cross-streets:

640 E. Imperial Highway, Apt. #3, El Segundo

Description of Complaint / Inquiry: Loud clanging noise again. Woke him up at 6:47 a.m. Upset and said sleep is important to him. Said maybe he should go to airport police (this was left on his hotline message, not stated directly to hotline staff). Said not to call back, just do "something about it".

Call Referred To: J'Mie, construction office **Date:** 8/31/06 **Time**: 8:25 a.m.

Action Taken: Construction management team held meeting about early starts.

_____

_____

_____

Resident Informed of Action Taken/Next Steps: No **Date/Time:**

Additional Comments: Mr. Wood requested not to be called back.

To: Vince Hourigan

From: Roger Sowell

Date: 8-31-2006

Subject: **Noise Measurements of 8-31-06**

For Noise Complaint at 640 E. Imperial Avenue, Apt. 3

Noise measurements at 640 E. Imperial Ave, were taken on August 31, 2006, at 7:03 a.m. This measurement was taken in response to a complaint from a resident of El Segundo, who was disturbed by noise at 6:40 a.m. on August 30, 2006. The complainant resides at 640 E. Imperial Avenue, Apt 3, El Segundo, California.

Measurements were taken by Michael White, Tutor-Saliba Corp, and Roger Sowell, MMRP Coordinator for CM Team, while standing on the public sidewalk immediately in front of (to the north of) the apartment building at 640 E. Imperial Avenue.

Measurements were made using Tutor-Saliba's Radio Shack noise meter, set at Fast response and db A scale.

Location	Time	High Noise dbA	Ambient Noise dbA
640 E. Imperial Ave	07:02 a.m.	n/a	56 – 57

Note: Sound of Concrete Breakers was barely audible. The sound from the breakers did not register on the noise meter. Pulses of sound were approximately 1 per second, created by two breakers. Sound of the breakers was not audible when a car or truck passed by on Imperial Avenue.

The two Concrete Breakers were operating on Runway 25L, approximately 100 yards west of taxiway ST. Their operation and location were observed by M. White and R. Sowell from the observation post on Imperial Avenue at Sheldon street, at approximately 7:10 a.m.

Note: The same resident from 640 E. Imperial Avenue, Apt 3, called in at approximately 8:45 a.m. to J'Mie Montgomery to complain that the same noise started today at 6:47 a.m.

RECEIVED
SEP 19 2006
CH2M HILL

Los Angeles World Airports
Southside Airfield Improvement Program

24-hour, toll-free hotline: (866) 758-LAWA (758-5292)

Call Log / Complaint Form

Please complete all applicable spaces and print legibly.

✓ Complaint ✓ Inquiry

Date of Call: Sept 19th /06 Time of Call: 8:30 (a.m.)/ p.m. Staff: _____

Caller Name: BONNIE LIEDTKE Telephone No.: (818) 973-4322

Second Phone: (310) 666-9811

Caller address or nearby cross-streets:

Description of Complaint / Inquiry: – IN GENERAL Not Concerned about noise as MUCH AS THE HOURS of OPERATION BECAUSE NOISE of POUNDING KEPT GOING UNTIL 10:00 PM. SHE WAS CALLING TO COMPLAIN DAYS AFTER THIS OCCURRED - SHE THINKS IT WAS approx LAST THURSDAY NIGHT - A SCHOOL NIGHT SHE ADDED.

Call Referred To: COAST TRAILER Date: _____ Time: _____

Action Taken: TALKED TO JAMIE TO CONFIRM CONSTRUCTION Times. – CALLED BONNIE LIEDTKE BACK. - SHE SEEMED TO KNOW ABOUT THE HEAVY EQUIPMENT BEING USED (GUILLOTINE) JUST WANTED TO CONFIRM TIMES of USE AND TO ASK THAT IT NOT GO ON PAST 9:PM.

Resident Informed of Action Taken/Next Steps: ☑ Yes ☐ No Date/Time: _____

Additional Comments: CALLED HER BACK AT HER office AT 10:00 AM TO TRY AND PIN POINT TIME & DAYS THIS HAPPENED: APPROX THUS. night at around 10:00 PM. VERY NICE Lady - felt bad about Having To Call.

Los Angeles World Airports
Southside Airfield Improvement Project
October 2006 Noise Hotline Report

Highlights

1. Reporting period: October 1, 2006 through October 31, 2006.
2. No complaint calls were made to the noise hotline in the month of October.

Report prepared by:

Chris Harris

Harris & Company

Phone: 213-749-3386

Email: charris@harriscompany.net

November 1, 2006

Los Angeles World Airports
Southside Airfield Improvement Project
November 2006 Noise Hotline Report

Highlights

1. Reporting period: November 1, 2006 through November 30, 2006.
2. Received one complaint call on November 7, 2006, about gravel accumulating on World Way West.
3. A copy of the log is attached.

Report prepared by:

Chris Harris

Harris & Company

Phone: 213-749-3386

Email: charris@harriscompany.net

December 1, 2006

Call Log / Complaint Form

Please complete all applicable spaces and print legibly.

___x___ **Complaint** _____ **Inquiry**

Date of Call: Nov. 7, 2006 **Time of Call:** 8:30 **p.m.** **Staff:** Audrey

Caller Name: Andy Hoover **Telephone No.:** (310) 493-7860

Second Phone: (____)_____-_____

Caller address or nearby cross-streets:

World Way West

Description of Complaint / Inquiry: Mr. Hoover reported that there was more gravel accumulating on the road than previously, and that it seemed that the street hadn't been swept in a while.

_____

_____

_____

Call Referred To: Ralph Taber (cell) **Date:** Nov. 7, 2006 **Time**: 8:45 p.m.

Action Taken: Mr. Taber said he would inspect the situation; he believed the contractor had been keeping the streets swept.

_____

_____

_____

Resident Informed of Action Taken/Next Steps: X Yes ☐ **No** **Date/Time: November 8, 2006**

Additional Comments: Mr. Hoover appreciated that the team listened to his concern, investigated and called him back.

Los Angeles World Airports
Southside Airfield Improvement Project
December 2006 Noise Hotline Report

Highlights

1. Reporting period: December 1, 2006 through December 31, 2006.
2. Received no complaint calls.
3. Tested the hotline during day and night shifts. All was working well and procedures were followed properly.

Report prepared by:

Chris Harris

Harris & Company

Phone: 213-749-3386

Email: charris@harriscompany.net

January 1, 2007

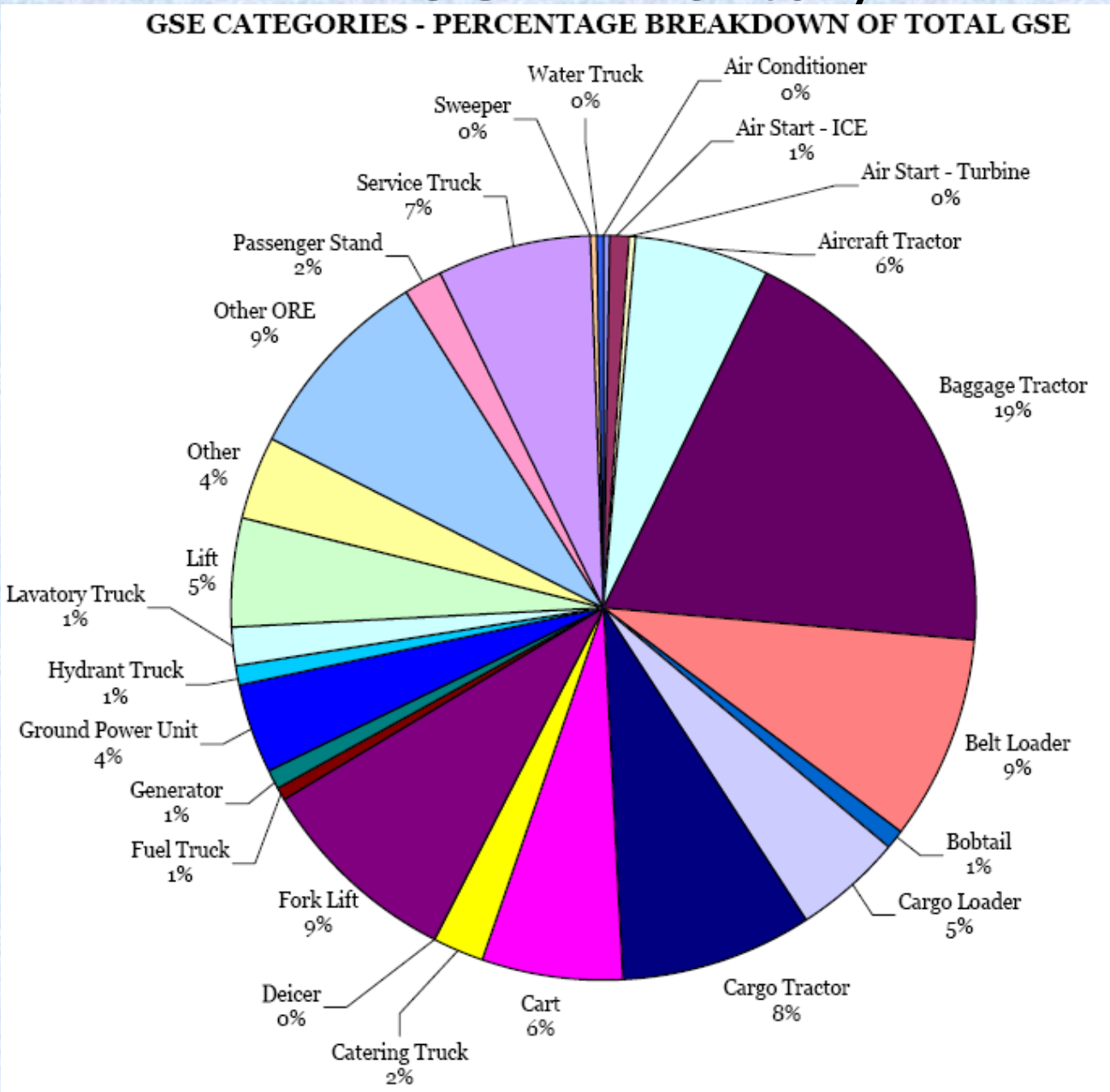
APPENDIX I

GSE Inventory Preliminary Results dated October 2006

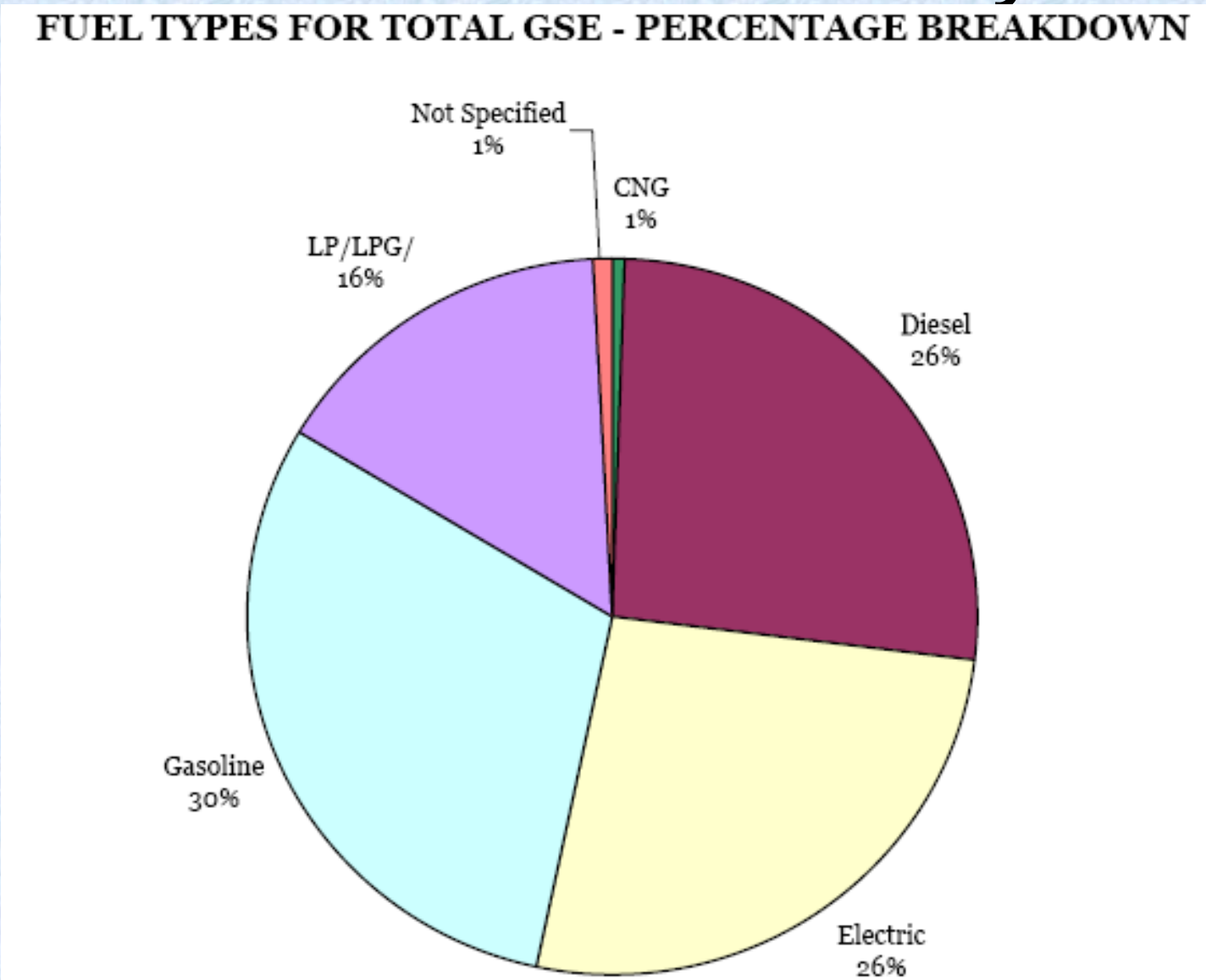
Summary of LAX GSE Equipment and Fuel Types
(October 2006)

GSE Category	Equipment Type		Fuel Type									
			Diesel		Gasoline		Electric		LPG/CNG		Not Specified	
	Count	*% of Total*	*Count*	*% of Category*	*Count*	*% of Category*	*Count*	*% of Category*	*Count*	*% of Category*	*Count*	*% of Category*
Air Conditioner	9	0.3%	8	88.9%		0.0%	1	11.1%		0.0%		0.0%
Air Start	29	1.1%	29	100.0%		0.0%		0.0%		0.0%		0.0%
Aircraft Tractor	157	5.7%	138	87.9%	3	1.9%	14	8.9%	2	1.3%		0.0%
Baggage Tractor	531	19.2%	51	9.6%	72	13.6%	293	55.2%	115	21.7%		0.0%
Belt Loaders	246	8.9%	30	12.2%	76	30.9%	103	41.9%	30	12.2%	7	2.8%
Bobtails	22	0.8%	2	9.1%	18	81.8%		0.0%	2	9.1%		0.0%
Cargo Loader	133	4.8%	132	99.2%	1	0.8%		0.0%		0.0%		0.0%
Cargo Tractor	229	8.3%	21	9.2%	109	47.6%	4	1.7%	95	41.5%		0.0%
Cart	162	5.9%	6	3.7%	2	1.2%	152	93.8%	2	1.2%		0.0%
Catering Truck	61	2.2%	41	67.2%	16	26.2%		0.0%	4	6.6%		0.0%
Deicer	1	0.0%		0.0%	1	100.0%		0.0%		0.0%		0.0%
Fork Lift	245	8.9%	20	8.2%	15	6.1%	54	22.0%	151	61.6%	5	2.0%
Fuel Truck	20	0.7%	14	70.0%	4	20.0%		0.0%	2	10.0%		0.0%
Generator	17	0.6%	11	64.7%	6	35.3%		0.0%		0.0%		0.0%
Ground Power Unit	111	4.0%	82	73.9%	16	14.4%	12	10.8%	1	0.9%		0.0%
Hydrant Truck	26	0.9%	15	57.7%	11	42.3%		0.0%		0.0%		0.0%
Lavatory Truck	40	1.4%	8	20.0%	31	77.5%		0.0%		0.0%	1	2.5%
Lift	135	4.9%	32	23.7%	44	32.6%	38	28.1%	21	15.6%		0.0%
Other	99	3.6%	49	49.5%	34	34.3%	15	15.2%	1	1.0%		0.0%
Other ORE	236	8.6%	6	2.5%	208	88.1%	7	3.0%	15	6.4%		0.0%
Passenger Stand	47	1.7%	4	8.5%	23	48.9%	19	40.4%	1	2.1%		0.0%
Service Truck	180	6.5%	30	16.7%	140	77.8%	8	4.4%	2	1.1%		0.0%
Sweeper	10	0.4%	1	10.0%	4	40.0%	2	20.0%	1	10.0%	2	20.0%
Water Truck	6	0.2%	1	16.7%	4	66.7%		0.0%		0.0%	1	16.7%
Not Specified	7	0.3%		0.0%	1	14.3%		0.0%		0.0%	6	85.7%
TOTAL NUMBER AND % OF TOTAL	**2759**	**100.0%**	**731**	**26.5%**	**839**	**30.4%**	**722**	**26.2%**	**445**	**16.1%**	**22**	**0.8%**

LAX GSE Inventory



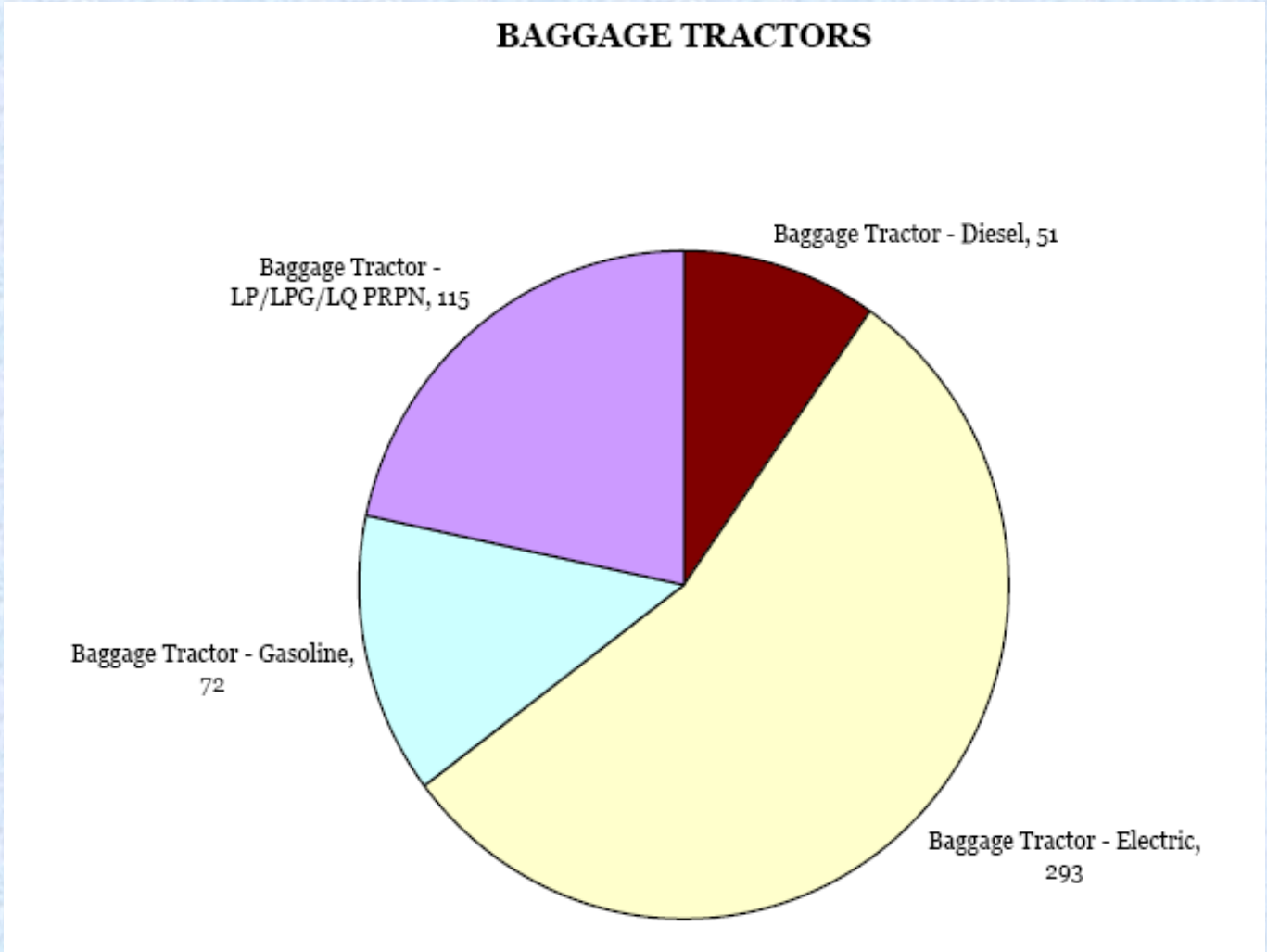
LAX GSE Inventory



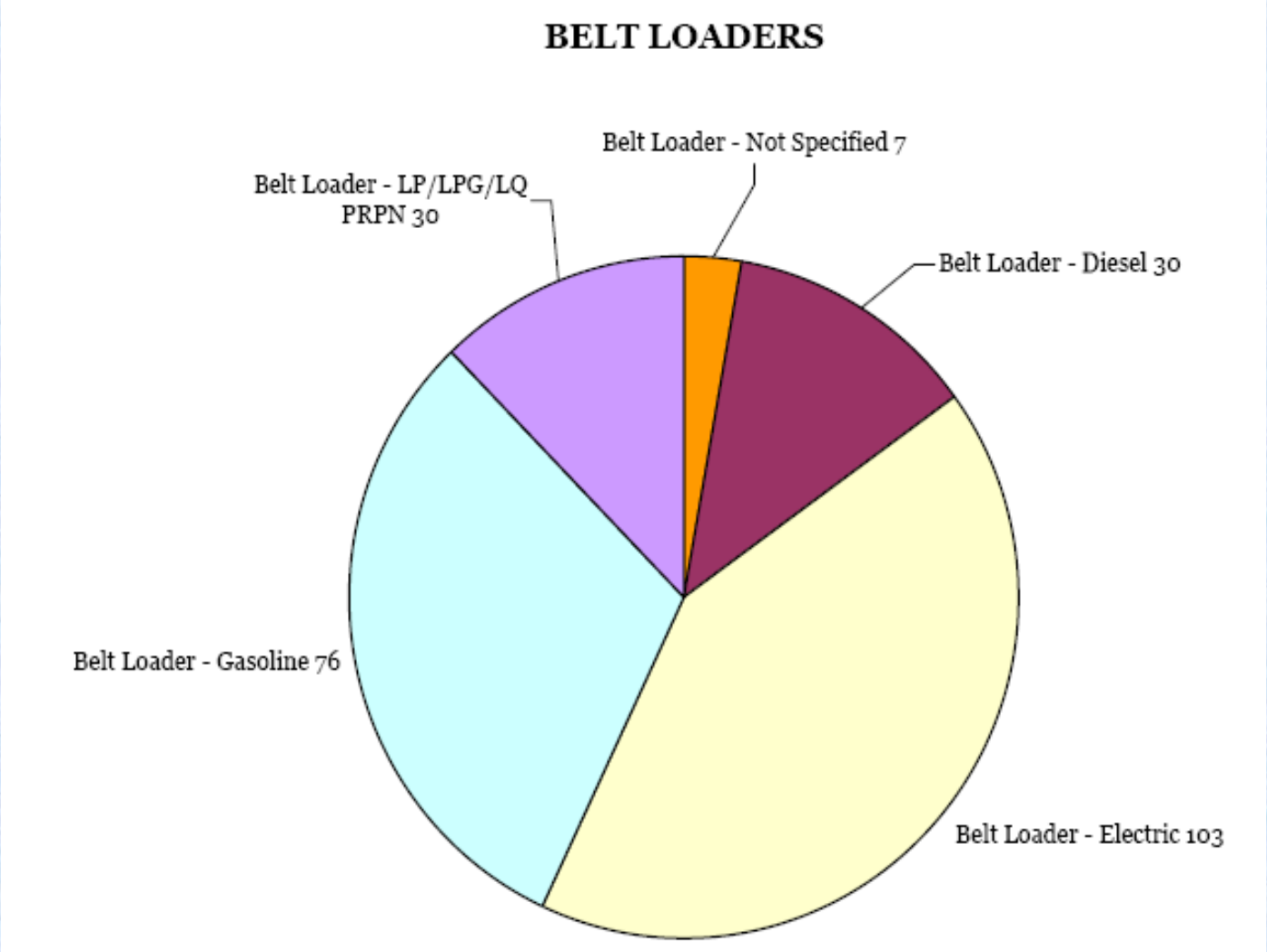
LAX GSE Inventory

Fuel Types of Top 10 GSE at LAX

LAX GSE Inventory



LAX GSE Inventory



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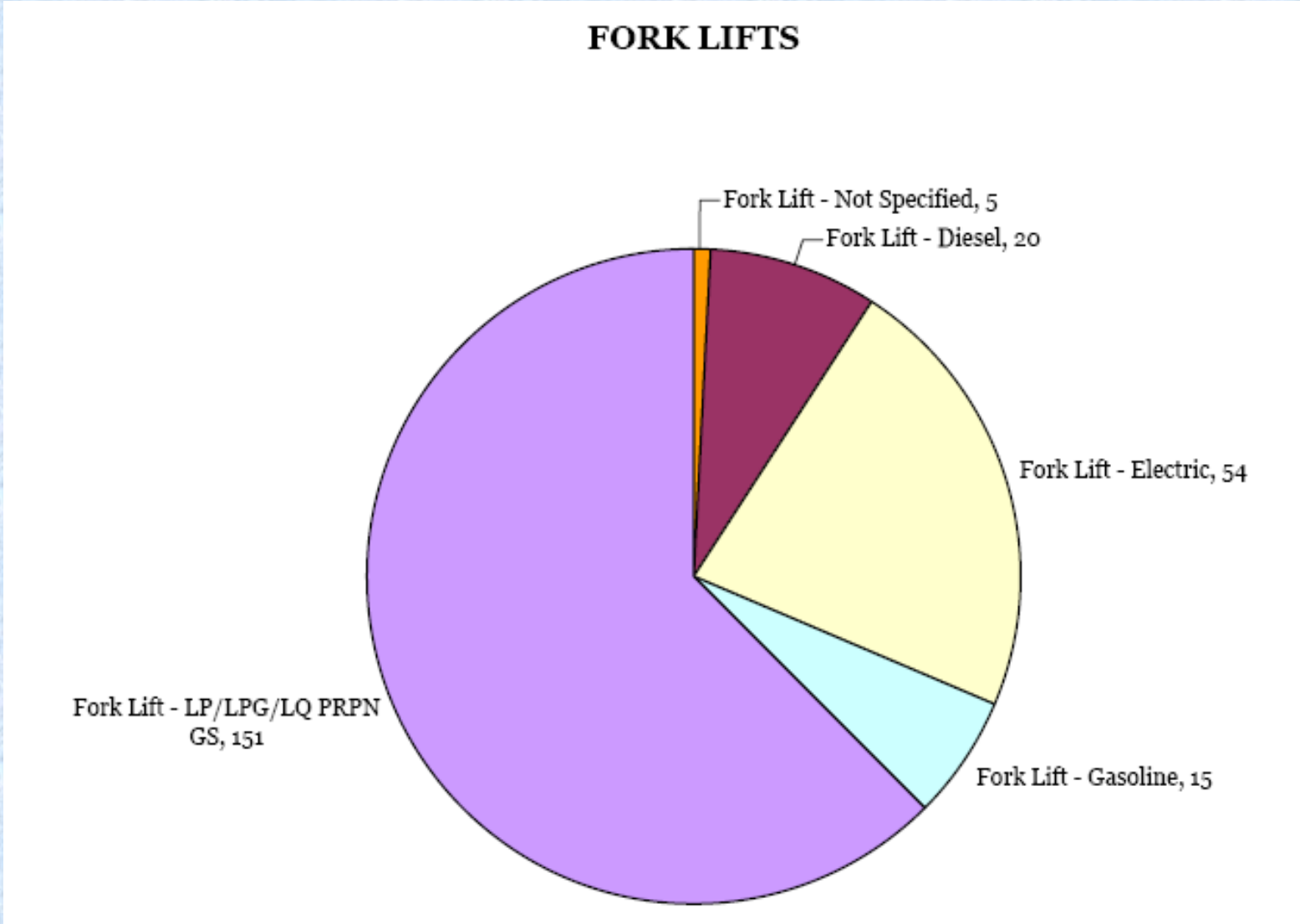

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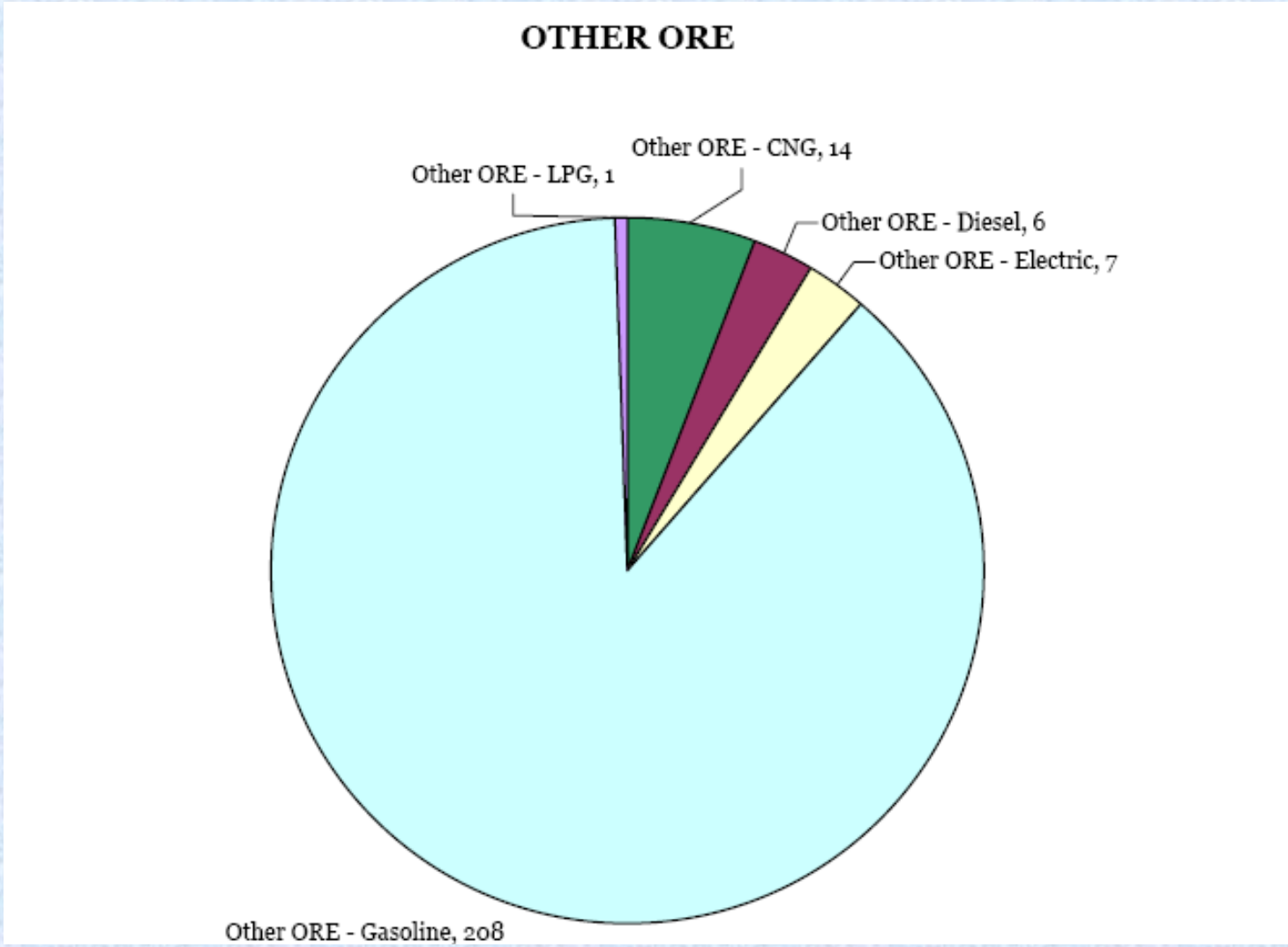

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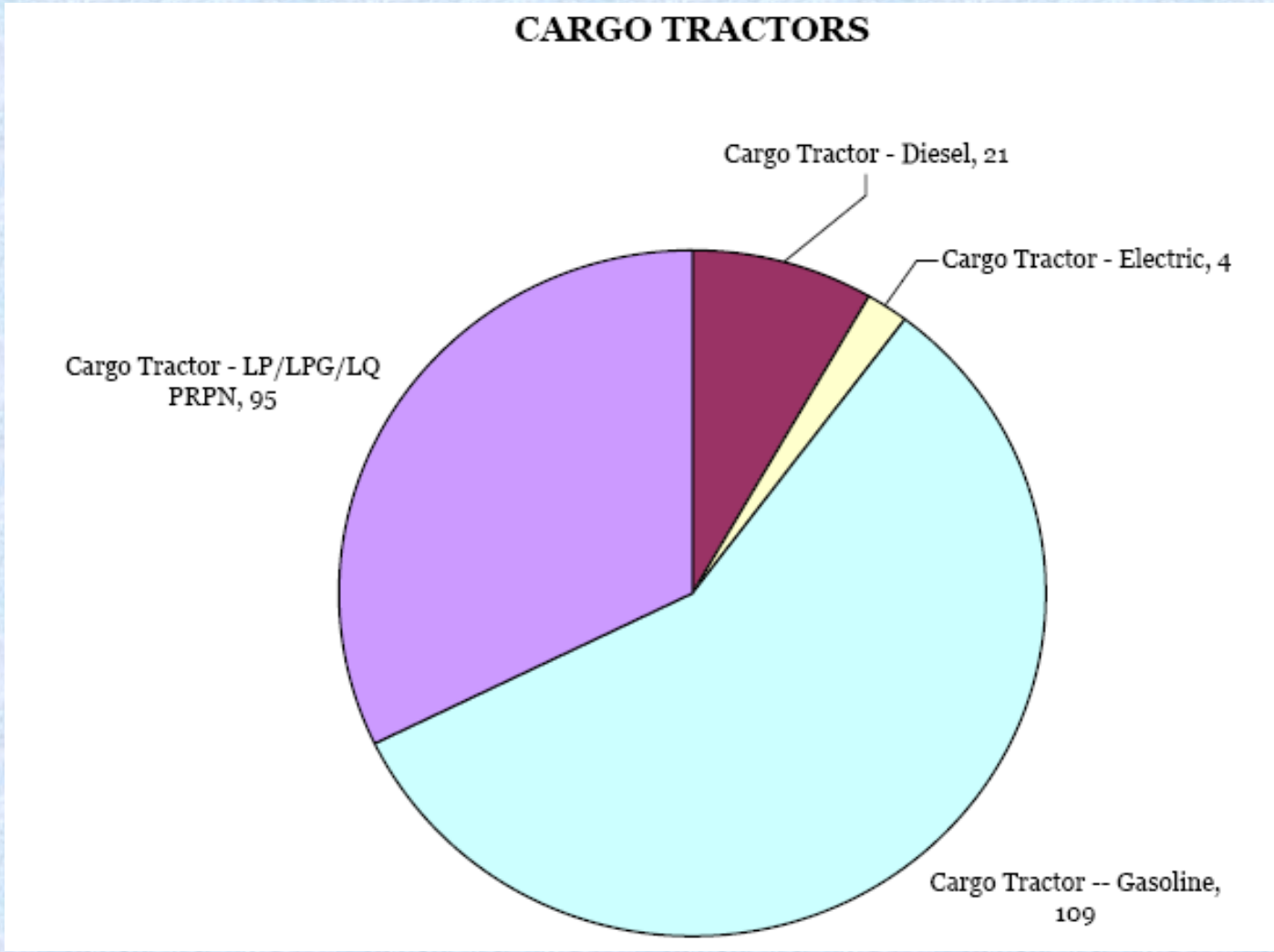

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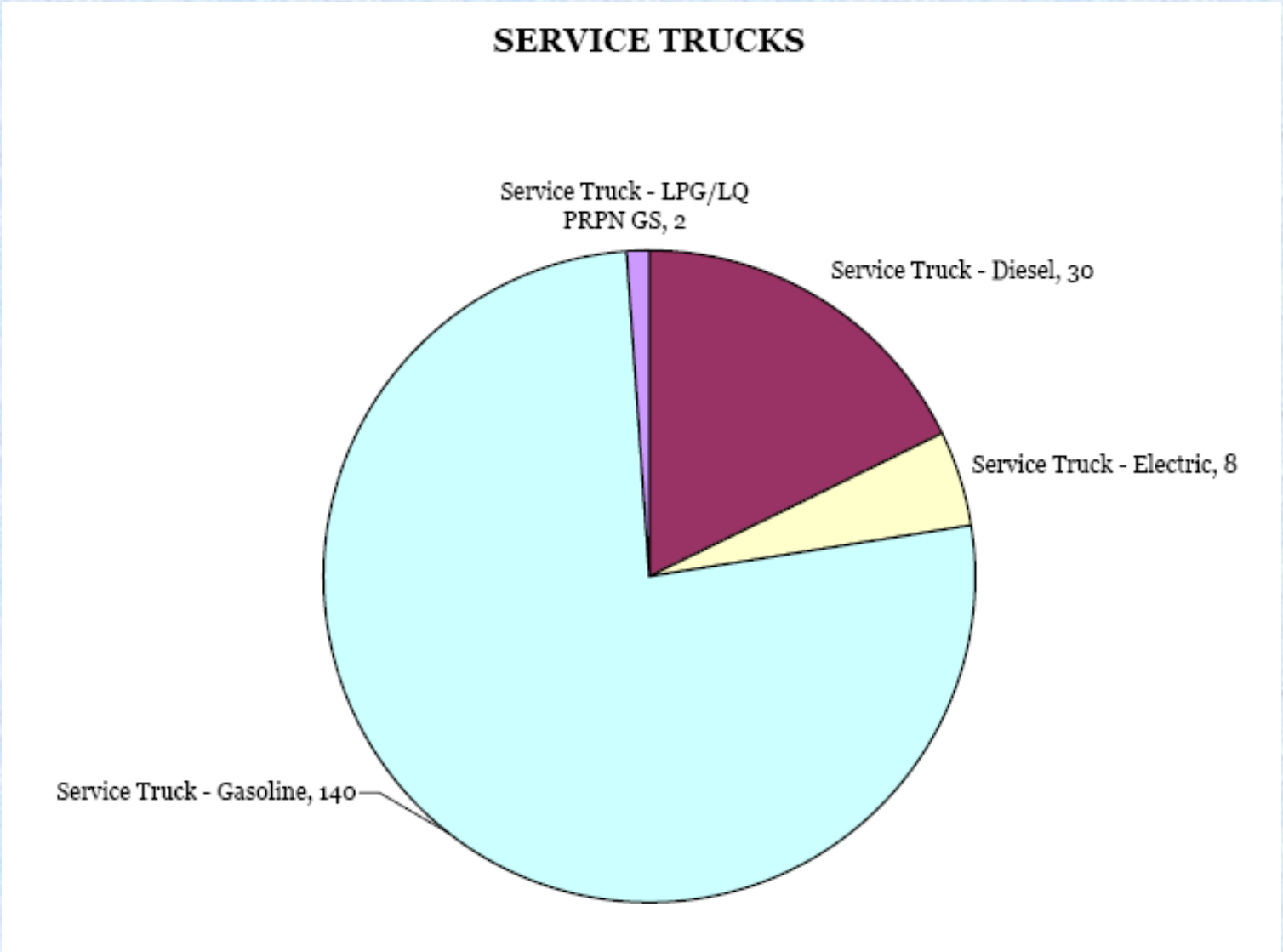

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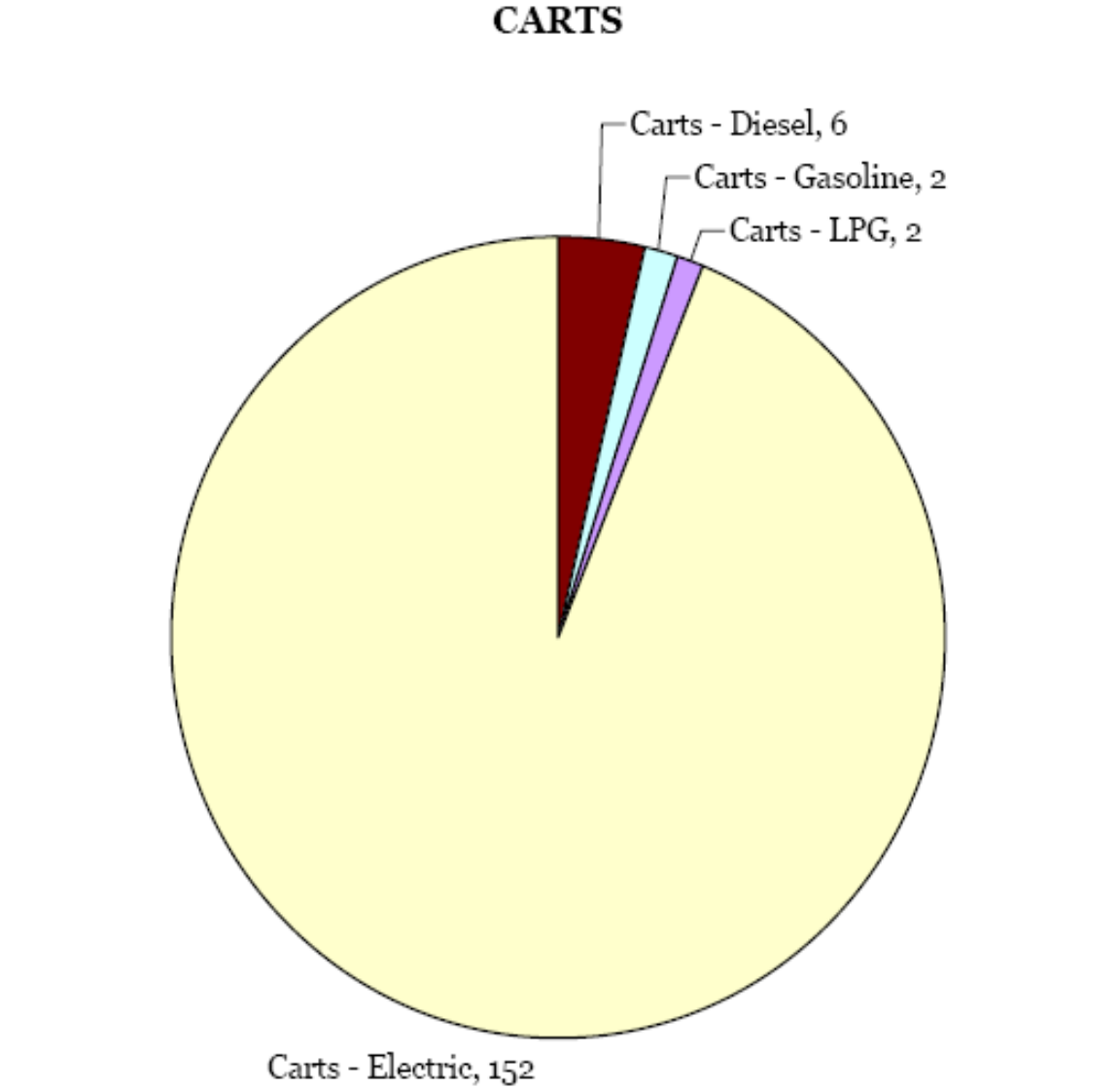

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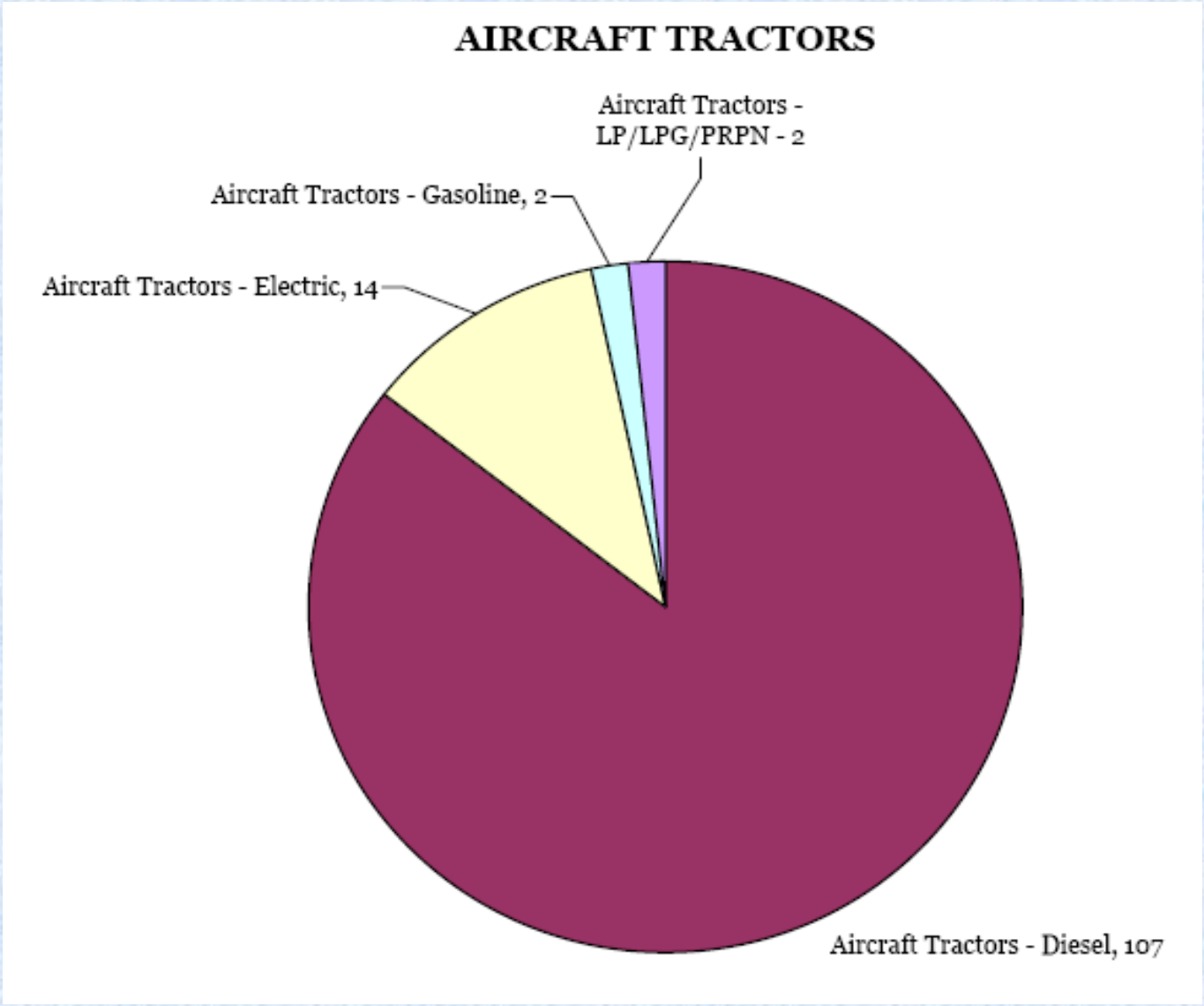

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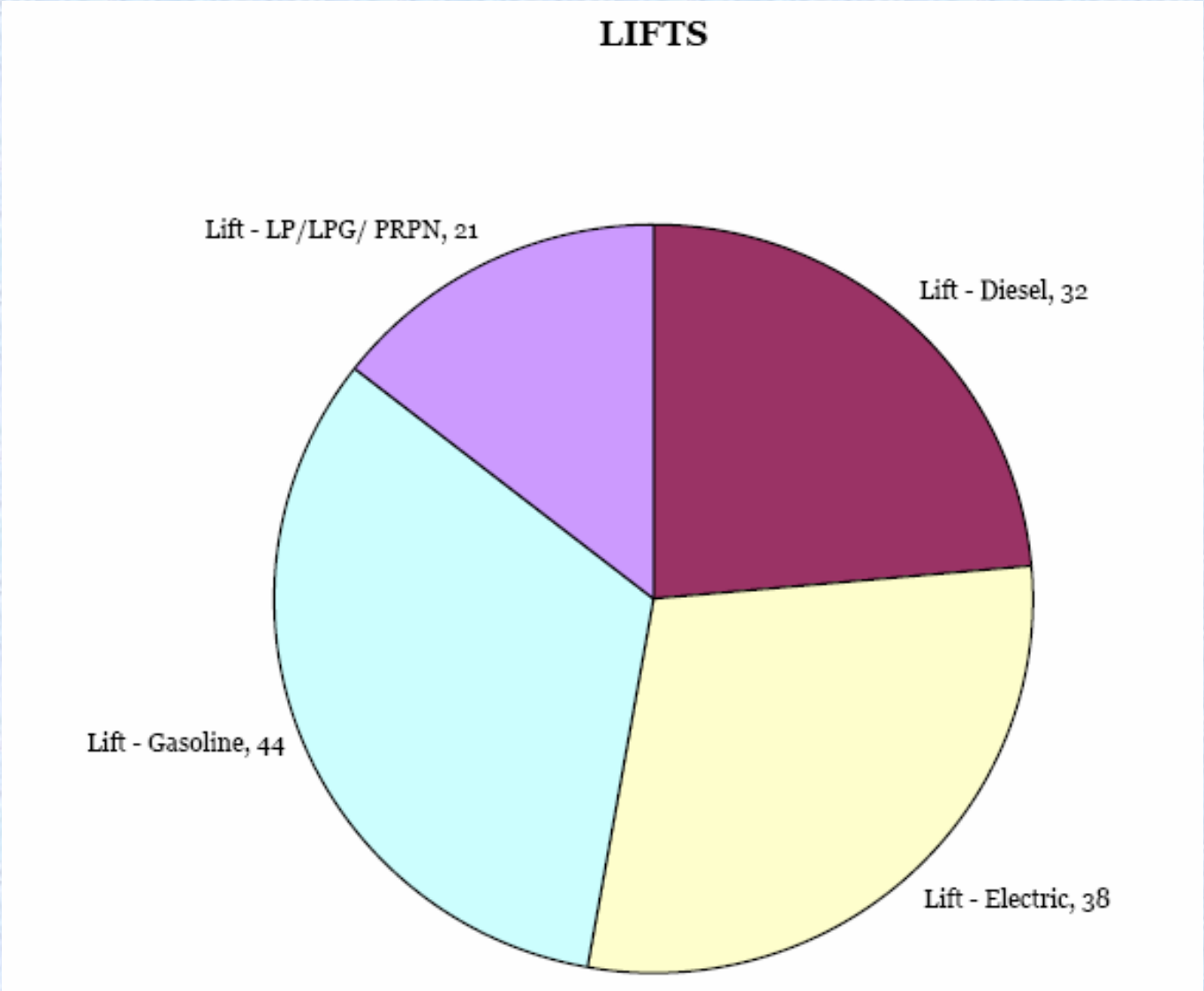
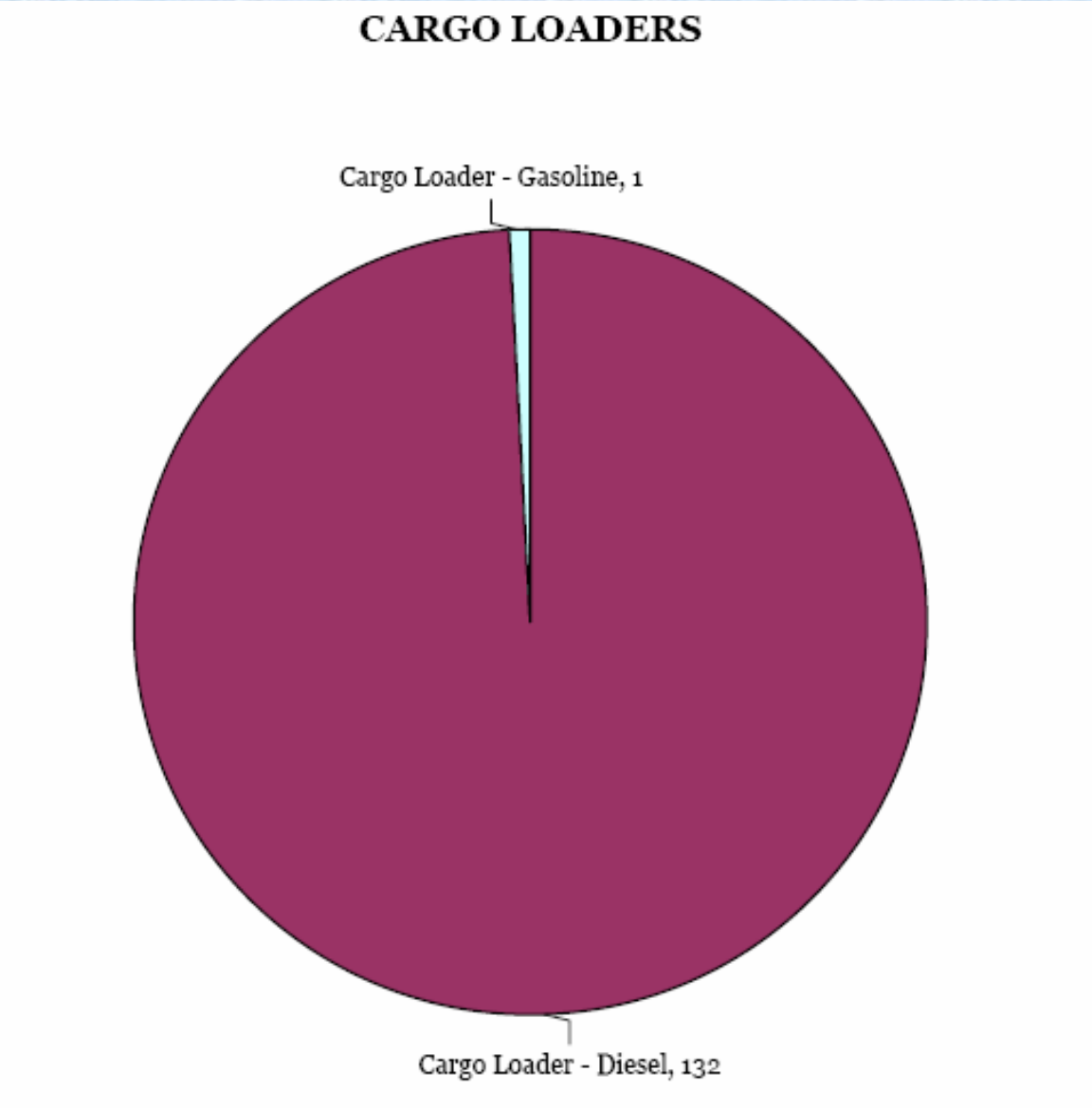


LAX GSE Inventory



APPENDIX J

SAIP Dominguez Channel Hydrology Analysis

DOMINGEZ CHANNEL HYDROLOGY ANALYSIS

Los Angeles International Airport (LAX)
South Airfield Improvement Project (SAIP)

Prepared for:

Los Angeles World Airports (LAWA)

Prepared by:

HNTB Corporation

May 2006

HNTB

1.0 INTRODUCTION

A. Purpose And Scope

The purpose of this analysis is to evaluate the post-construction drainage conditions for the Los Angeles International Airport (LAX) South Airfield Improvement Project (SAIP). This analysis is limited to one of the three drainage tributary areas of the project, the one that ultimately drains into the Dominguez Channel. This analysis partially relies of previous drainage studies prepared in support of the SAIP as documented in the Draft and Final Project-Level Environmental Impact Report (EIR) prepared for the project.

This study is being conducted as a result of the Stipulated Settlement (Settlement Agreement) agreed upon the Petitioners[1] and the City of Los Angeles, Los Angeles World Airports (LAWA). Specifically, the Settlement states under Exhibit A "Additional Mitigation Measures", Section I:

> *"In order to address drainage concerns raised by the County of Los Angeles with respect to the SAIP, LAWA shall: (1) prepare a study to determine peak flows and Hydraulic Grade Line (HGL) related to the South Airfield according to the County's new hydrology methodology; (2) consult and coordinate the results of the Study with the County's Department of Public Works; and (3) incorporate reasonable modifications to mitigate increased flows into the Dominguez Channel, if necessary. LAWA agrees to provide information on existing hydrologic conditions and the proposed design of the SAIP to the County before commencing the above Study. The County of Los Angeles shall review and comment on the results of the above study within 30 days of receipt. The Parties agree that under no circumstances shall LAWA's obligations under this provision delay construction and/or completion of the SAIP".*

B. Study Report

This short report is structured in response to the requirements included in the Settlement Agreement. After an introductory section (**Section 1**), **Section 2** of the report documents the results of the hydrology analysis conducted to determine the peak drainage flows resulting from the project. **Section 3** documents the coordination efforts undertaken with the County of Los Angeles County Department of Public Works (LADPW) to ensure that the analysis is being conducted in a manner consistent with the County practices. **Section 4** presents a discussion of the proposed mitigation measure needed to comply with the Settlement Agreement. The rationale and design of the mitigation measure is also presented in this section.

[1] The Petitioners include the City of El Segundo, City of Inglewood, City of Culver City, County of Los Angeles, and an alliance for a Regional Solution to Airport Congestion (ARSAC).

C. Existing Drainage Conditions

In general, the South Field (LAX's South Runway Complex) is divided into three watersheds. As previously documented in the project drainage studies and the D/FEIR, two of these watersheds drain directly into the Santa Monica Bay and the third one drains into the Dominguez Channel. **Figure 1** depicts the boundaries of the aforementioned watersheds.

The portion of the LAX SAIP contributing to the Dominguez Channel Watershed consists of the eastern one-third of the South Field from the Sepulveda Tunnel to Taxiway F. This watershed ultimately discharges to an outfall which is under the jurisdiction of the Los Angeles County Flood Control District (LACFCD).

The outfall for this watershed is an 8-foot by 8-foot reinforced concrete box (RCB) culvert located south of Taxiway A. The box culvert flows east where it turns to the South and runs under the west side of Aviation Boulevard. This RCB is fed by an upstream concrete-lined trapezoidal channel that parallels the Metropolitan Transit Authority (MTA) rail line and runs on the west side of Aviation Blvd. Surface runoff within the watershed is collected via a series of paved ditches and closed pipe systems before being discharged to the concrete-lined channel. According to LAWA maintenance personnel, the east end of the runway experiences occasional flooding near the concrete-lined channel along Aviation Blvd.

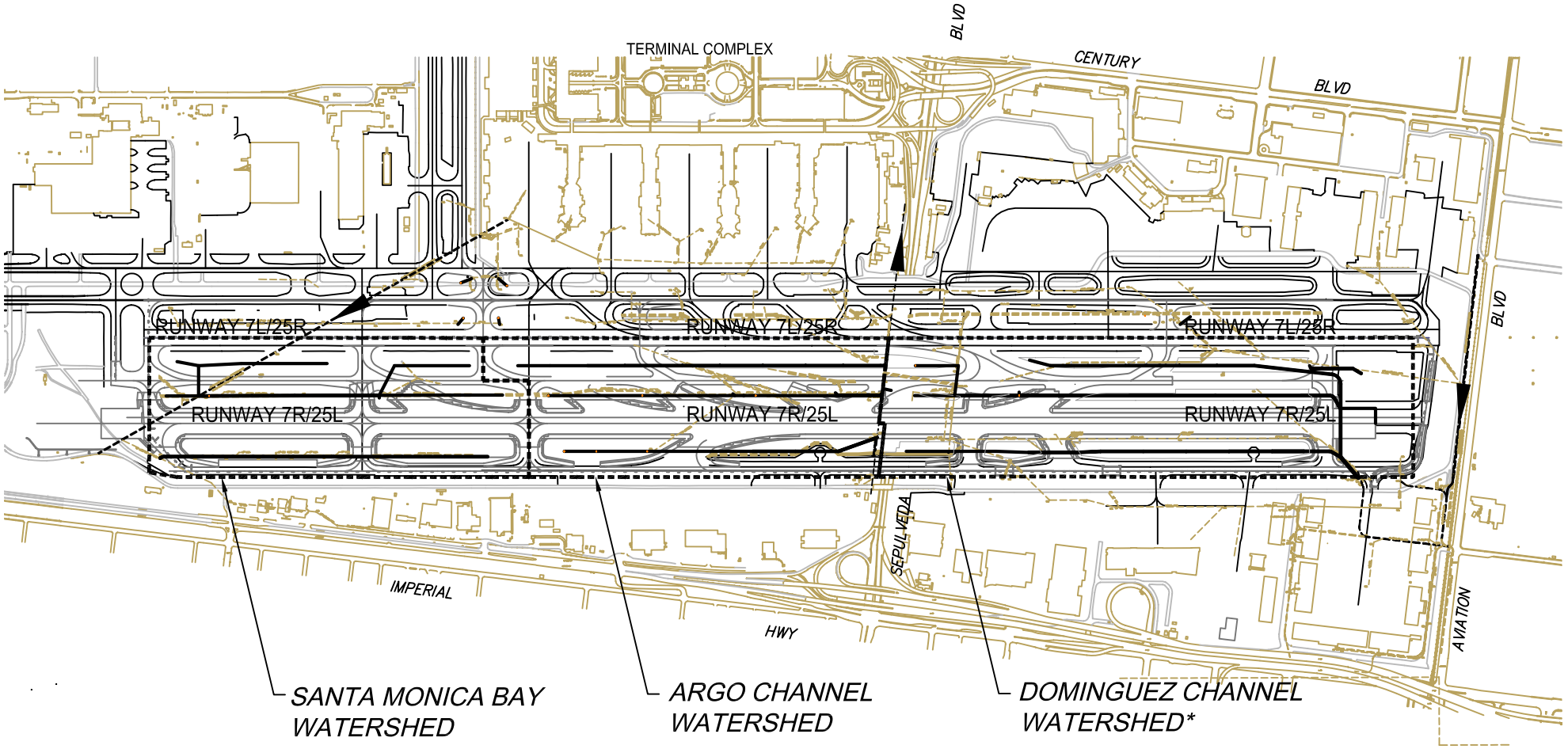
2.0 HYDROLOGY ANALYSIS

A. Methodology And Analysis Criteria

Consistent with the requirements of the Settlement Agreement, the methodology and criteria used in the analysis to determine the project site run-off tributary to the Dominguez Channel is based on the *Los Angeles County Department of Public Works (LADPW) Hydrologic Method Addendum to the 1991 Hydrology/Sedimentation Manual.*

The LADPW modified rational method requires site specific input, which includes average proportion impervious value, rainfall isohyetal information and time of concentration. **Appendix A** details the hydrology analysis for area of the Dominguez Channel within the project limits. This analysis is presented in a tabular form listing the contributing flows from each of the drainage sub-areas.

The proposed SAIP drainage system could potentially carry, and deliver at the point of connection to the regional facility, a larger flow rate than the one allowed. This requires that this analysis determine the amount of flow rate exceeding the allowable rate. LADWP staff provided site-specific capacity requirements for the hydraulic analysis.



LAX SOUTH AIRFIELD WATERSHED BOUNDARIES: FIGURE 1

5/18/06

This included an allowable flow rate of 1.04 cubic feet per second (cfs) per acre (ac). This flow rate is based on the peak runoff allowed on the project area tributary to the Dominguez Channel. Using the LADWP provided 1.04cfs/ac, it was determined that the allowable flow rate at the point of discharge is 128cfs.

Figure 2 identifies the components of the drainage system at the project outlet. These existing components were used in conjunction with the Water Surface Pressure Gradient Package (WSPGW version 14.05) to determine the existing Hydraulic Grade Line (HGL) at the system outlet. This model is a widely accepted hydrological tool and also the preferred method of analysis by LADPW. Figure 2 also contains reference labels to the WSPGW analysis runs which are included for reference in **Appendix B**.

B. Results And Assessment

The results of this hydrology analysis estimates that the proposed airfield improvements will result in additional flow as compared to existing conditions. The increase in impervious areas generates 164 cfs, which is greater than the county allowable flow of 128cfs. As required by the Settlement Agreement, the proposed system should be constrained to the LADPW allowable flow of 128cfs. Thus additional assessment was required to determine if constraining the capacity of system would create other negative effects such as localized flooding.

To determine the effects of the capacity constrained system, the storm drain system was modeled with a downstream constraint which limits the flow rate at the point of connection to 128cfs. The analysis showed that the HGL at the upstream end of the proposed drainage system would be under pressure. This condition is evidence by the fact that the computed HGL is at approximately five (5) feet above the proposed catch basin grate elevation.

The head or HGL computed at the upstream end of the system is dissipated by the drainage system further downstream. The head at the system downstream connection is estimated to be below grade; however it is higher than the soffit of the pipe. This signifies that, while the pipe is under pressure at the system outlet, the HGL is not significant enough to force water out of the system at manholes and catch basins as it leaves the project boundary. Thus the analysis estimated that the capacity constrained system would still provide sufficient capacity to drain the airfield and would only create minor localized ponding within the project site.

To determine the amount of ponding for the capacity constrained system, a unit hydrograph for the site was created using the County's spreadsheet "TC Calculator" for the fifty (50) year event. The TC calculator is a spreadsheet that calculates the unit hydrograph for a site once the correct parameters are input. The unit hydrograph was

then analyzed to determine the volume of water produced when the flows exceed the allowable 128cfs; this is the amount of water that must be retained on site due to the capacity constraint.

Using a histogram and approximating the flows in 5 minute intervals, the volume of flow retained on-site may be determined. The analysis estimated that the peak volume based on the fifty (50) year event would create approximately 9700cf. **Appendix C** provides the detailed calculations of the unit hydrograph and histogram.

The next step in the analysis was to determine if the proposed site would provide sufficient holding capacity for the volume of water to be temporarily retained onsite. Consequently, the proposed infield areas[2] were analyzed for their holding capacity. As shown in Appendix C, the holding capacity of the infield areas is approximately 305,000cf.

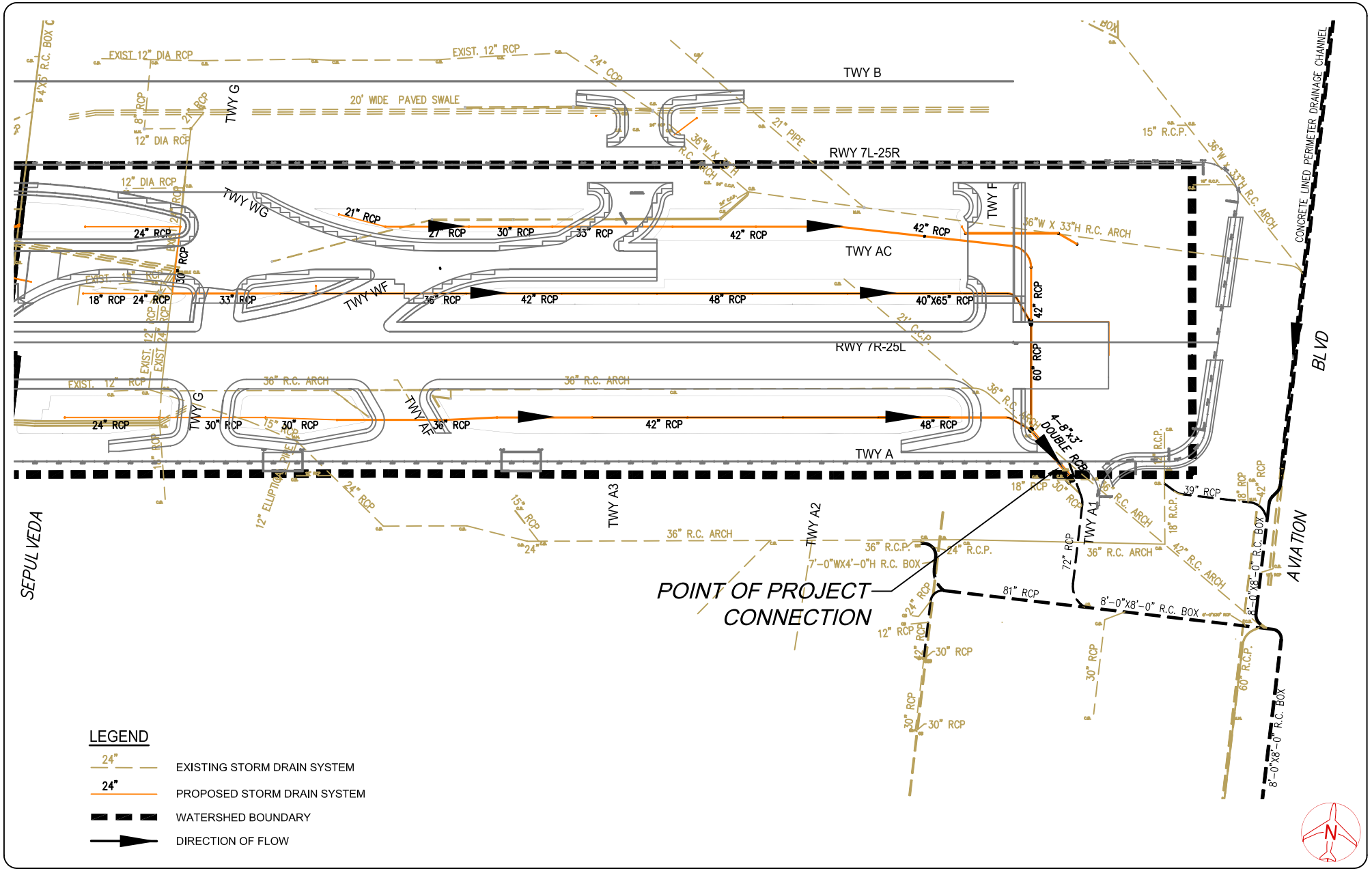
The results and analysis of the proposed constrained system suggest that there would be additional ponding in the infield areas of the airfield during the fifty-year event; however the infield holding capacity is large enough to contain this volume; thus airfield operations should not be negatively affected by the introduction of the constraint.

3.0 COORDINATION EFFORTS

LADPW was consulted early in the SAIP Dominguez hydrology analysis. Coordination efforts were not only helpful, but also ensured that the County's requirements were being met from the foundation of the study.

LADPW was contacted prior to performing this analysis and was instrumental in determining the steps that LAWA should undergo during the analysis. LAWA worked in conjunction with LADPW to develop the methodology described previously to ensure a thorough analysis of the proposed system was performed. Coordination early in the process was documented and meeting minutes were released to both parties for comments and/or clarifications. This ensured that both parties had a clear idea of the steps that would be taken and what LADWP required. Prior to the final analysis the results were reviewed by LADPW to ensure that the steps were not only accurate, but also completed to the extent determined in the pre-analysis meeting. This extensive coordination effort was used to ensure that both parties were active participants in the process.

[2] Infield areas are open space areas between Runway and Taxiway pavements.



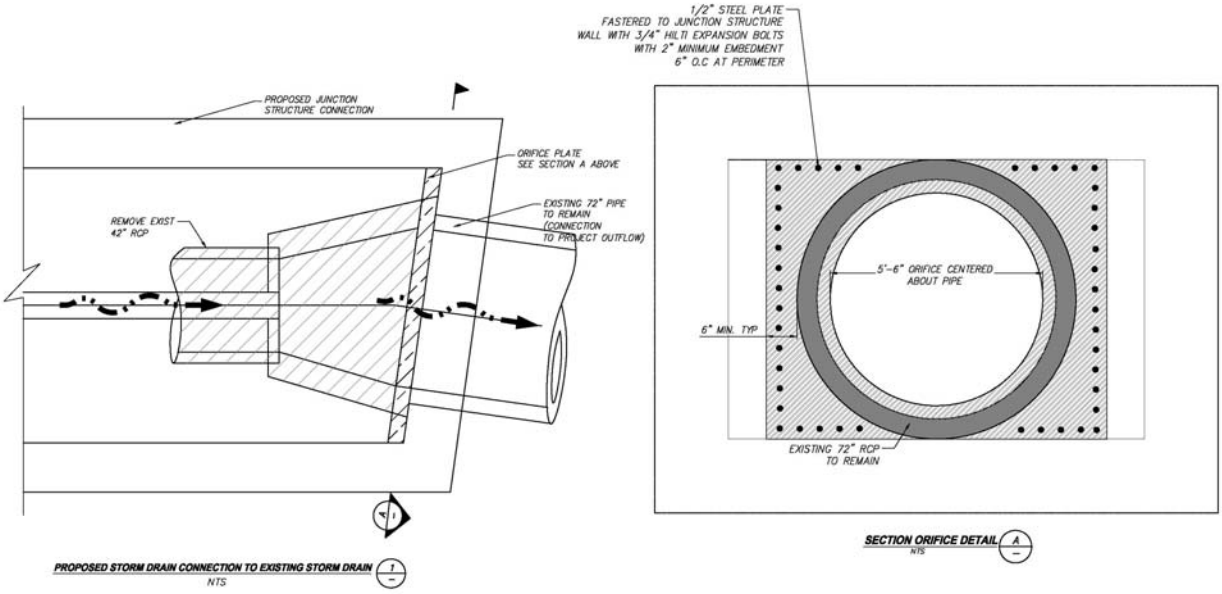
PROPOSED SAIP DRAINAGE SYSTEM: FIGURE 2

5/18/06

HNTB

4.0 PROPOSED MITIGATION

The analysis estimated that some form of flow restriction should be placed on the SAIP Dominguez Channel to restrict the outflow from the site. As suggested by the County, an "orifice" was designed that would restrict the high flows from the project site to the allowable flow of 128cfs. This orifice plate limits the capacity of the system to that suggested by the County. An additional benefit of this type of mitigation is that if the Dominguez Channel capacity is upgraded eventually by the County and additional flow is allowed from the site, this mitigation measure could be removed or altered to increase the



Appendix A
Hydrologic Analysis Based on Rational Modified Method

Design Guidelines

The proposed storm drain systems is to be designed according to the Los Angeles County Department of Public Works' (LACDPW) *Hydrology Manual* (December, 1991), Modified Rational Method. LACDPW has made modifications to the traditional rational method for determining runoff to account for variations in runoff coefficients, time of concentration, and soil conditions. Systems were analyzed based on the 50-year design storm.

Methodology

The proposed storm drain system will be designed to accommodate the ultimate runway/taxiway configuration for the South Field. The original design was based on the 25-year event, however to analyze the maximum flow expected, LADBS recommended using the fifty (50) year event for this analysis.

Design Criteria

Some of the key design criteria used in the Modified Rational Method are described as follows:

A. Rainfall Zones

Per Appendix A of the *Hydrology Manual*, the project falls within rainfall zone "K" for coastal plain conditions which corresponds to a 24-hour rainfall of 3.91 to 6.40 inches for a 50-year storm frequency.

B. Soil Classification

The soil type for the project falls into soil types "009", "010" and "014" as identified in the LACDPW design manual.

C. Time of Concentration (t_c)

Times of concentration are computed using an iterative procedure based on unburned, unbulked flow velocities and flow path lengths. The minimum t_c is 4 minutes; the maximum t_c is 30 minutes for any given tributary area.

D. Runoff Coefficients (c)

Runoff coefficients are developed for each tributary area based on the imperviousness of the soil, soil type, and the rainfall intensity.

The attached table defines the analysis performed for the proposed hydrology calculation on the Dominguez Channel; those portions included in the SAIP project. The left most columns noted as "A1", "A2" and "A3" define the three main laterals that serve the project site. The Rows at the

bottom denoted as "A1+A2" describe the cumulative flows of laterals "A1" and "A2" after are combined in the North/South Main. Furthermore the rows defined as "A1+A2+A3" describe the cumulative additive flows of laterals "A1", "A2" and "A3" before they leave the project site. The flows that were used for this analysis thus is the cumulative flow of 164cfs.

APPENDIX A
Proposed Dominguez Channel Analysis Based on 50-yr Event

	Label	Area	Area	Cumulative Area	Overland Slope	Pipe Length	Pipe Slope	Flow Speed in Pipe	Flow Time in Pipe	Cumulative Time in Pipe	E	I	I_{1440}	Assumed TC	I_t/I_{1440}	I_{Tc}	Cu	Cd	Rainfall excess	Tc Check	Diff.	Q_{peak}
		(sf)	(acres)	(acres)	%	(ft)	%	(ft/sec)	(min)	(min)		(in)	(in/hr)	(min)		(in/hr)			($Cd*I_{Tc}$)	(min)	(min)	(cfs)
A1	A1.1	297034.16	6.82	6.82	0.87%	0				0.00	0.958	5	0.21	10.00	10.34	2.15	0.80	0.90	1.93	9.80	0.20	13.16
	A1.2	12697.93	0.29	7.11	1.36%	200	0.54%	5.29	0.63	0.63	0.958	5	0.21	10.25	10.22	2.13	0.78	0.89	1.90	10.43	-0.18	13.54
	A1.3	138729.93	3.18	10.30	0.77%	350	0.20%	4.22	1.38	2.01	0.958	5	0.21	12.00	9.49	1.98	0.75	0.89	1.77	11.81	0.19	18.19
	A1.4	284120.14	6.52	16.82	1.06%	350	0.20%	4.68	1.25	3.26	0.958	5	0.21	13.00	9.14	1.90	0.75	0.89	1.70	13.05	-0.05	28.62
	A1.5	284120.14	6.52	23.34	0.64%	500	0.20%	4.68	1.78	5.04	0.958	5	0.21	14.50	8.68	1.81	0.73	0.89	1.61	14.84	-0.34	37.68
	A1.6	108749.26	2.50	25.84	0.30%	350	0.20%	4.68	1.25	6.29	0.958	5	0.21	16.00	8.29	1.73	0.73	0.89	1.54	16.08	-0.08	39.83
	A1.7	151313.35	3.47	29.31	0.72%	350	0.20%	5.11	1.14	7.43	0.958	5	0.21	17.00	8.06	1.68	0.70	0.89	1.50	17.22	-0.22	43.86
A2	A2.1	133770.58	3.07	3.07	0.99%	0				0.00	0.958	5	0.21	8.00	11.48	2.39	0.80	0.90	2.14	7.79	0.21	6.58
	A2.2	198032.35	4.55	7.62	0.68%	400	0.50%	5.09	1.31	1.31	0.958	5	0.21	9.00	10.86	2.26	0.80	0.90	2.03	9.10	-0.10	15.44
	A2.3	206250.77	4.73	12.35	0.86%	0					0.958	5	0.21	11.00	9.88	2.06	0.78	0.89	1.84	10.83	0.17	22.76
	A2.4	228615.5	5.25	17.60	0.96%	375	0.50%	5.09	1.23	1.23	0.958	5	0.21	12.00	9.49	1.98	0.75	0.89	1.77	12.06	-0.06	31.09
	A2.5	106599.37	2.45	20.05	1.01%	450	0.20%	4.22	1.78	3.09	0.958	5	0.21	14.00	8.83	1.84	0.73	0.89	1.64	13.84	0.16	32.90
	A2.6	173586.5	3.98	24.03	0.11%	450	0.20%	4.22	1.78	4.86	0.958	5	0.21	16.00	8.29	1.73	0.73	0.89	1.54	15.62	0.38	37.05
	A2.7	297632.26	6.83	30.87	0.84%	180	0.20%	4.68	0.64	5.51	0.958	5	0.21	16.00	8.29	1.73	0.73	0.89	1.54	16.26	-0.26	47.58
	A2.8	158958	3.65	34.51	0.81%	400	0.20%	4.68	1.42	6.93	0.958	5	0.21	18.00	7.84	1.63	0.70	0.89	1.46	17.68	0.32	50.28
	A2.9	160145.38	3.68	38.19	0.89%	400	0.20%	5.11	1.30	8.23	0.958	5	0.21	19.00	7.65	1.59	0.70	0.89	1.42	18.99	0.01	54.24
	A2.10	268663.83	6.17	44.36	0.88%	400	0.20%	5.11	1.30	9.54	0.958	5	0.21	20.00	7.46	1.55	0.68	0.89	1.38	20.29	-0.29	61.42
	A2.11	264559.69	6.07	50.43	0.95%	400	0.20%	5.11	1.30	10.84	0.958	5	0.21	22.00	7.14	1.49	0.68	0.89	1.32	21.60	0.40	66.78
A3	A3.1	139208.02	3.20	3.20	1.26%	0	0.00%	0.00	0.00	0.00	0.958	5	0.21	7.00	12.22	2.55	0.83	0.90	2.28	7.26	-0.26	7.30
	A3.2	273395.36	6.28	9.47	1.41%	400	0.50%	5.09	1.31	1.31	0.958	5	0.21	9.00	10.86	2.26	0.80	0.90	2.03	8.57	0.43	19.20
	A3.3	101581.66	2.33	11.80	1.46%	450	0.20%	3.74	2.01	3.32	0.958	5	0.21	11.00	9.88	2.06	0.78	0.89	1.84	10.58	0.42	21.75
	A3.4	263972.82	6.06	17.86	1.25%	300	0.20%	3.98	1.26	4.57	0.958	5	0.21	12.00	9.49	1.98	0.75	0.89	1.77	11.83	0.17	31.56
	A3.5	89974.72	2.07	19.93	1.17%	450	0.20%	4.68	1.60	6.17	0.958	5	0.21	13.00	9.14	1.90	0.75	0.89	1.70	13.44	-0.44	33.91
	A3.6	75828.12	1.74	21.67	1.17%	240	0.20%	4.68	0.85	7.03	0.958	5	0.21	14.00	8.83	1.84	0.73	0.89	1.64	14.29	-0.29	35.57
	A3.7	178544.32	4.10	25.77	0.91%	400	0.20%	4.68	1.42	8.45	0.958	5	0.21	16.00	8.29	1.73	0.73	0.89	1.54	15.71	0.29	39.72
	A3.8	176992.86	4.06	29.83	0.76%	400	0.20%	5.11	1.30	9.76	0.958	5	0.21	17.00	8.06	1.68	0.70	0.89	1.50	17.02	-0.02	44.64
	A3.9	175231.86	4.02	33.86	0.80%	400	0.20%	5.11	1.30	11.06	0.958	5	0.21	18.00	7.84	1.63	0.70	0.89	1.46	18.32	-0.32	49.32
	A3.10	178875.92	4.11	37.96	0.82%	400	0.20%	5.11	1.30	12.37	0.958	5	0.21	20.00	7.46	1.55	0.68	0.89	1.38	19.63	0.37	52.57
	A3.11	242416.26	5.57	43.53	1.25%	300	0.20%	5.11	0.98	13.35	0.958	5	0.21	21.00	7.29	1.52	0.68	0.89	1.35	20.61	0.39	58.91
A1+A2		3473579.45	79.74	79.74	0.99%					10.84	0.958	5	0.21	22.00	7.14	1.49	0.68	0.89	1.32	21.60	0.40	105.58
A2+A2+A3		5369601.37	123.27	123.27	1.26%	250	0.20%	5.11	0.82	0.82	0.958	5	0.21	21.75	7.18	1.49	0.68	0.89	1.33	21.42	0.33	164.10

Allowable Q: 1.04CFS/ACRE = 128.20

Appendix B: WSPGW ANALYSIS

ELMCHG	SUB.	PAR.NO.	ELEMENT	RECORD	CHN.TYPE	SECTION	Q-ADD	Q-FACT	NEW-Q	DCRIT	DNORM
		6100	19	6	4	17	13.160	1.000	13.160	1.351	
ELMCHG	SUB.	PAR.NO.	ELEMENT	RECORD	CHN.TYPE	SECTION	Q-ADD	Q-FACT	NEW-Q	DCRIT	DNORM
		2160	18	2	4	17	13.160	1.000	13.160	1.351	1.750
ELMCHG	SUB.	PAR.NO.	ELEMENT	RECORD	CHN.TYPE	SECTION	Q-ADD	Q-FACT	NEW-Q	DCRIT	DNORM
		3050	17	3	4	17	13.160	1.000	13.160	1.351	
ELMCHG	SUB.	PAR.NO.	ELEMENT	RECORD	CHN.TYPE	SECTION	Q-ADD	Q-FACT	NEW-Q	DCRIT	DNORM
		3050	17	3	4	15	13.160	1.000	13.550	1.279	
ELMCHG	SUB.	PAR.NO.	ELEMENT	RECORD	CHN.TYPE	SECTION	Q-ADD	Q-FACT	NEW-Q	DCRIT	DNORM
		2160	16	2	4	15	13.160	1.000	13.550	1.279	1.792
ELMCHG	SUB.	PAR.NO.	ELEMENT	RECORD	CHN.TYPE	SECTION	Q-ADD	Q-FACT	NEW-Q	DCRIT	DNORM
		3050	15	3	4	15	13.160	1.000	13.550	1.279	
ELMCHG	SUB.	PAR.NO.	ELEMENT	RECORD	CHN.TYPE	SECTION	Q-ADD	Q-FACT	NEW-Q	DCRIT	DNORM

	3050	15	3	4	13	13.160	1.000	18.190	1.444	
ELMCHG	SUB. PAR.NO.	ELEMENT	RECORD	CHN.TYPE	SECTION	Q-ADD	Q-FACT	NEW-Q	DCRIT	DNORM
	2160	14	2	4	13	13.160	1.000	18.190	1.444	2.018
ELMCHG	SUB. PAR.NO.	ELEMENT	RECORD	CHN.TYPE	SECTION	Q-ADD	Q-FACT	NEW-Q	DCRIT	DNORM
	3050	13	3	4	13	13.160	1.000	18.190	1.444	
ELMCHG	SUB. PAR.NO.	ELEMENT	RECORD	CHN.TYPE	SECTION	Q-ADD	Q-FACT	NEW-Q	DCRIT	DNORM
	3050	13	3	4	11	13.160	1.000	28.620	1.777	
ELMCHG	SUB. PAR.NO.	ELEMENT	RECORD	CHN.TYPE	SECTION	Q-ADD	Q-FACT	NEW-Q	DCRIT	DNORM
	2160	12	2	4	11	13.160	1.000	28.620	1.777	2.750
ELMCHG	SUB. PAR.NO.	ELEMENT	RECORD	CHN.TYPE	SECTION	Q-ADD	Q-FACT	NEW-Q	DCRIT	DNORM
	3050	11	3	4	11	13.160	1.000	28.620	1.777	
ELMCHG	SUB. PAR.NO.	ELEMENT	RECORD	CHN.TYPE	SECTION	Q-ADD	Q-FACT	NEW-Q	DCRIT	DNORM
	3050	11	3	4	9	13.160	1.000	37.690	1.997	

ELMCHG	SUB. PAR.NO.	ELEMENT	RECORD	CHN.TYPE	SECTION	Q-ADD	Q-FACT	NEW-Q	DCRIT	DNORM
	2160	10	2	4	9	13.160	1.000	37.690	1.997	3.000
ELMCHG	SUB. PAR.NO.	ELEMENT	RECORD	CHN.TYPE	SECTION	Q-ADD	Q-FACT	NEW-Q	DCRIT	DNORM
	3050	9	3	4	9	13.160	1.000	37.690	1.997	
ELMCHG	SUB. PAR.NO.	ELEMENT	RECORD	CHN.TYPE	SECTION	Q-ADD	Q-FACT	NEW-Q	DCRIT	DNORM
	3050	9	3	4	32	13.160	1.000	39.830	1.963	
ELMCHG	SUB. PAR.NO.	ELEMENT	RECORD	CHN.TYPE	SECTION	Q-ADD	Q-FACT	NEW-Q	DCRIT	DNORM
	2160	8	2	4	32	13.160	1.000	39.830	1.963	2.484
ELMCHG	SUB. PAR.NO.	ELEMENT	RECORD	CHN.TYPE	SECTION	Q-ADD	Q-FACT	NEW-Q	DCRIT	DNORM
	3050	7	3	4	5	13.160	1.000	39.830	1.963	
ELMCHG	SUB. PAR.NO.	ELEMENT	RECORD	CHN.TYPE	SECTION	Q-ADD	Q-FACT	NEW-Q	DCRIT	DNORM
	3050	7	3	4	3	13.160	1.000	106.610	2.943	
ELMCHG	SUB. PAR.NO.	ELEMENT	RECORD	CHN.TYPE	SECTION	Q-ADD	Q-FACT	NEW-Q	DCRIT	DNORM
	2160	6	2	4	3	13.160	1.000	106.610	2.943	3.585

ELMCHG	SUB. PAR.NO.	ELEMENT	RECORD	CHN.TYPE	SECTION	Q-ADD	Q-FACT	NEW-Q	DCRIT	DNORM
	3050	5	3	4	3	13.160	1.000	106.610	2.943	
ELMCHG	SUB. PAR.NO.	ELEMENT	RECORD	CHN.TYPE	SECTION	Q-ADD	Q-FACT	NEW-Q	DCRIT	DNORM
	3050	5	3	3	1	13.160	1.000	165.520	2.510	
ELMCHG	SUB. PAR.NO.	ELEMENT	RECORD	CHN.TYPE	SECTION	Q-ADD	Q-FACT	NEW-Q	DCRIT	DNORM
	2160	4	2	3	1	13.160	1.000	165.520	2.510	3.823
ELMCHG	SUB. PAR.NO.	ELEMENT	RECORD	CHN.TYPE	SECTION	Q-ADD	Q-FACT	NEW-Q	DCRIT	DNORM
	4100	3	8	4	22	13.160	1.000	165.520	3.688	
ELMCHG	SUB. PAR.NO.	ELEMENT	RECORD	CHN.TYPE	SECTION	Q-ADD	Q-FACT	NEW-Q	DCRIT	DNORM
	4200	3	8	4	30	13.160	1.000	165.520	3.503	
ELMCHG	SUB. PAR.NO.	ELEMENT	RECORD	CHN.TYPE	SECTION	Q-ADD	Q-FACT	NEW-Q	DCRIT	DNORM
	2160	2	2	4	30	13.160	1.000	165.520	3.503	6.000
ELMCHG	SUB. PAR.NO.	ELEMENT	RECORD	CHN.TYPE	SECTION	Q-ADD	Q-FACT	NEW-Q	DCRIT	DNORM
	1100	1	1	4	26	13.160	1.000	165.520	3.503	

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1                                    DOWNSTREAM PROCESSING DEBUGGING TRACE

 DWNSTM HDWKDS PAR.NO.  STATION       Q      DEPTH    DC        AREA      FORCE

                 30     3905.750    13.160    1.351    1.351

 DWNSTM HDWKDS PAR.NO.  STATION       Q      DEPTH    DC        AREA      FORCE

                 35     3905.750    13.160    1.351    1.351      1.992      3.912

 110    18     2

 DWNSTM RCHDS PAR.NO.  STATION       Q      DEPTH     C       DN        AREA      FORCE       WETP      SO        SC       SF

              1400     3905.750    13.160    1.351    1.351    1.750      1.992      3.912      3.755   .002018   .007776   .007776
 NO COMPUTATION OF W.S. PROFILE IN THIS REACH - A BREAK    PROFILE - STATION =   3905.750  DWNSTM RCHDS PAR 1130

 110    17     3

DWNSTM XJNCDS PAR.NO.  STATION       Q      DEPTH    DC        AREA      FORCE       WETP      SO        SF        E

              2040     3707.530    13.160    1.351    1.351      1.992      3.912      3.755   .024937   .007776      2.113

 DWNSTM XJNCDS PAR.NO.  STATION     Q-LAT    D-LAT    -LAT     A-LAT    PHI-LAT      M*COS-LAT

              2080     3707.530      .390    1.264    3.000      2.829      .00        .002

 SUMP FUNCTION PAR.NO.  KNOWN-D   KNOWN-A    KNOWN-WP   KNOWN-SF   TEST-D    TEST-A    TEST-WP    TEST-SF      SUM-P
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                120     1.350      1.991      3.752       .008    1.278      2.331      3.841       .005       .316

SUMM FUNCTION PAR.NO.  KNOWN-D   KNOWN-A    TEST-D    TEST-A      SUM-M   DEPTH-3   AREA-3    DEPTH-4   AREA-4

                160     1.350      1.991    1.278      2.331      -.257    1.264      2.829     .000       .000

DWNSTM XJNCDS PAR.NO.  STATION       M         DC       A-CRIT     M-CRIT     SUM-P     M-TOT

              2100     3707.530     2.700    1.278      2.331      2.446       .316      3.017

DWNSTM XJNCDS DEPSMP ENTERED FROM PARAGRAPH 2400

SUMP FUNCTION PAR.NO.  KNOWN-D   KNOWN-A    KNOWN-WP   KNOWN-SF   TEST-D    TEST-A    TEST-WP    TEST-SF      SUM-P

                120     1.350      1.991      3.752       .008     .105       .067       .980    111.012   -227.647

SUMM FUNCTION PAR.NO.  KNOWN-D   KNOWN-A    TEST-D    TEST-A      SUM-M   DEPTH-3   AREA-3    DEPTH-4   AREA-4

                160     1.350      1.991     .105       .067     82.167     .677      1.197     .000       .000

SUMM FUNCTION PAR.NO.  KNOWN-D   KNOWN-A    TEST-D    TEST-A      SUM-M   DEPTH-3   AREA-3    DEPTH-4   AREA-4

                160     1.350      1.991     .222       .203     25.327     .736      1.346     .000       .000

SUMP FUNCTION PAR.NO.  KNOWN-D   KNOWN-A    KNOWN-WP   KNOWN-SF   TEST-D    TEST-A    TEST-WP    TEST-SF      SUM-P
```

```
                120     1.350      1.991      3.752       .008     .222       .203      1.439      4.613     -8.817
DTEST,DELD,DIFF,SUMMT,SUMPT=          .22238E+00          .11728E+00          .34144E+02          .25327E+02          -.88173E+01

SUMM FUNCTION PAR.NO.  KNOWN-D   KNOWN-A    TEST-D    TEST-A      SUM-M   DEPTH-3   AREA-3    DEPTH-4   AREA-4

                160     1.350      1.991      .340       .377     12.401     .795      1.499     .000       .000

SUMP FUNCTION PAR.NO.  KNOWN-D   KNOWN-A    KNOWN-WP   KNOWN-SF   TEST-D    TEST-A    TEST-WP    TEST-SF      SUM-P

                120     1.350      1.991      3.752       .008     .340       .377      1.796       .789      -.577
DTEST,DELD,DIFF,SUMMT,SUMPT=          .33966E+00          .11728E+00          .12978E+02          .12401E+02          -.57732E+00

SUMM FUNCTION PAR.NO.  KNOWN-D   KNOWN-A    TEST-D    TEST-A      SUM-M   DEPTH-3   AREA-3    DEPTH-4   AREA-4

                160     1.350      1.991      .457       .579      7.149     .853      1.656     .000       .000

SUMP FUNCTION PAR.NO.  KNOWN-D   KNOWN-A    KNOWN-WP   KNOWN-SF   TEST-D    TEST-A    TEST-WP    TEST-SF      SUM-P

                120     1.350      1.991      3.752       .008     .457       .579      2.104       .235       .651
DTEST,DELD,DIFF,SUMMT,SUMPT=          .45694E+00          .11728E+00          .64983E+01          .71493E+01          .65102E+00

SUMM FUNCTION PAR.NO.  KNOWN-D   KNOWN-A    TEST-D    TEST-A      SUM-M   DEPTH-3   AREA-3    DEPTH-4   AREA-4

                160     1.350      1.991      .574       .800      4.421     .912      1.817     .000       .000

SUMP FUNCTION PAR.NO.  KNOWN-D   KNOWN-A    KNOWN-WP   KNOWN-SF   TEST-D    TEST-A    TEST-WP    TEST-SF      SUM-P

                120     1.350      1.991      3.752       .008     .574       .800      2.383       .094       .937
DTEST,DELD,DIFF,SUMMT,SUMPT=          .57422E+00          .11728E+00          .34838E+01          .44207E+01          .93690E+00
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SUMM FUNCTION PAR.NO.  KNOWN-D   KNOWN-A    TEST-D    TEST-A      SUM-M   DEPTH-3   AREA-3    DEPTH-4   AREA-4

               160     1.350      1.991     .692      1.037      2.792     .971      1.980     .000       .000

SUMP FUNCTION PAR.NO.  KNOWN-D   KNOWN-A    KNOWN-WP   KNOWN-SF   TEST-D    TEST-A    TEST-WP    TEST-SF      SUM-P

               120     1.350      1.991      3.752       .008     .692      1.037      2.644       .045       .986
DTEST,DELD,DIFF,SUMMT,SUMPT=          .69151E+00          .11728E+00          .18059E+01          .27922E+01          .98630E+00

SUMM FUNCTION PAR.NO.  KNOWN-D   KNOWN-A    TEST-D    TEST-A      SUM-M   DEPTH-3   AREA-3    DEPTH-4   AREA-4

               160     1.350      1.991     .809      1.286      1.730    1.029      2.146     .000       .000

SUMP FUNCTION PAR.NO.  KNOWN-D   KNOWN-A    KNOWN-WP   KNOWN-SF   TEST-D    TEST-A    TEST-WP    TEST-SF      SUM-P

               120     1.350      1.991      3.752       .008     .809      1.286      2.893       .025       .942
DTEST,DELD,DIFF,SUMMT,SUMPT=          .80879E+00          .11728E+00          .78743E+00          .17297E+01          .94223E+00

SUMM FUNCTION PAR.NO.  KNOWN-D   KNOWN-A    TEST-D    TEST-A      SUM-M   DEPTH-3   AREA-3    DEPTH-4   AREA-4

               160     1.350      1.991     .926      1.543       .992    1.088      2.314     .000       .000

SUMP FUNCTION PAR.NO.  KNOWN-D   KNOWN-A    KNOWN-WP   KNOWN-SF   TEST-D    TEST-A    TEST-WP    TEST-SF      SUM-P

               120     1.350      1.991      3.752       .008     .926      1.543      3.134       .015       .844
DTEST,DELD,DIFF,SUMMT,SUMPT=          .92607E+00          .11728E+00          .14821E+00          .99197E+00          .84376E+00
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SUMM FUNCTION PAR.NO.  KNOWN-D   KNOWN-A    TEST-D    TEST-A      SUM-M   DEPTH-3   AREA-3    DEPTH-4   AREA-4

               160     1.350      1.991    1.043      1.804       .456    1.147      2.484     .000       .000

SUMP FUNCTION PAR.NO.  KNOWN-D   KNOWN-A    KNOWN-WP   KNOWN-SF   TEST-D    TEST-A    TEST-WP    TEST-SF      SUM-P

               120     1.350      1.991      3.752       .008    1.043      1.804      3.371       .010       .704
DTEST,DELD,DIFF,SUMMT,SUMPT=          .10433E+01          .11728E+00          -.24762E+00          .45611E+00          .70373E+00

DEPSMP FUNCTION PAR.NO.  D-UPPER  D-LOWER  KNOWN-D    -TEST    SUM-M      SUM-P    DIFF-M-P)    INCR

                3000    1.278     .105    1.350     .926     .012       .456       .704       .148

SUMM FUNCTION PAR.NO.  KNOWN-D   KNOWN-A    TEST-D    TEST-A      SUM-M   DEPTH-3   AREA-3    DEPTH-4   AREA-4

               160     1.350      1.991     .938      1.569       .931    1.094      2.331     .000       .000

SUMP FUNCTION PAR.NO.  KNOWN-D   KNOWN-A    KNOWN-WP   KNOWN-SF   TEST-D    TEST-A    TEST-WP    TEST-SF      SUM-P

               120     1.350      1.991      3.752       .008     .938      1.569      3.158       .015       .832
DTEST,DELD,DIFF,SUMMT,SUMPT=          .93780E+00          .11728E-01           .99229E-01          .93074E+00          .83151E+00

SUMM FUNCTION PAR.NO.  KNOWN-D   KNOWN-A    TEST-D    TEST-A      SUM-M   DEPTH-3   AREA-3    DEPTH-4   AREA-4

               160     1.350      1.991     .950      1.595       .871    1.100      2.348     .000       .000

SUMP FUNCTION PAR.NO.  KNOWN-D   KNOWN-A    KNOWN-WP   KNOWN-SF   TEST-D    TEST-A    TEST-WP    TEST-SF      SUM-P
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                120     1.350      1.991      3.752       .008     .950      1.595      3.182       .014       .819
DTEST,DELD,DIFF,SUMMT,SUMPT=          .94952E+00          .11728E-01          .52544E-01          .87141E+00          .81886E+00

SUMM FUNCTION PAR.NO.  KNOWN-D   KNOWN-A    TEST-D    TEST-A      SUM-M   DEPTH-3   AREA-3    DEPTH-4   AREA-4

                160     1.350      1.991      .961      1.621       .814    1.105      2.365     .000       .000

SUMP FUNCTION PAR.NO.  KNOWN-D   KNOWN-A    KNOWN-WP   KNOWN-SF   TEST-D    TEST-A    TEST-WP    TEST-SF      SUM-P

                120     1.350      1.991      3.752       .008     .961      1.621      3.206       .013       .806
DTEST,DELD,DIFF,SUMMT,SUMPT=          .96125E+00          .11728E-01          .80677E-02          .81388E+00          .80581E+00

SUMM FUNCTION PAR.NO.  KNOWN-D   KNOWN-A    TEST-D    TEST-A      SUM-M   DEPTH-3   AREA-3    DEPTH-4   AREA-4

                160     1.350      1.991      .973      1.647       .758    1.111      2.382     .000       .000

SUMP FUNCTION PAR.NO.  KNOWN-D   KNOWN-A    KNOWN-WP   KNOWN-SF   TEST-D    TEST-A    TEST-WP    TEST-SF      SUM-P

                120     1.350      1.991      3.752       .008     .973      1.647      3.229       .013       .792
DTEST,DELD,DIFF,SUMMT,SUMPT=          .97298E+00          .11728E-01          -.34277E-01          .75809E+00          .79237E+00

DEPSMP FUNCTION PAR.NO.  D-UPPER  D-LOWER  KNOWN-D    -TEST    SUM-M      SUM-P    DIFF-M-P)    INCR

                 3000    1.278     .105    1.350     .961     .001       .758       .792       .008

SUMM FUNCTION PAR.NO.  KNOWN-D   KNOWN-A    TEST-D    TEST-A      SUM-M   DEPTH-3   AREA-3    DEPTH-4   AREA-4

                160     1.350      1.991      .962      1.624       .808    1.106      2.366     .000       .000
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SUMP FUNCTION PAR.NO.  KNOWN-D   KNOWN-A    KNOWN-WP   KNOWN-SF   TEST-D    TEST-A    TEST-WP    TEST-SF      SUM-P

               120     1.350      1.991      3.752       .008     .962      1.624      3.208       .013       .804
DTEST,DELD,DIFF,SUMMT,SUMPT=          .96242E+00          .11728E-02          .37388E-02          .80822E+00          .80449E+00

SUMM FUNCTION PAR.NO.  KNOWN-D   KNOWN-A    TEST-D    TEST-A      SUM-M   DEPTH-3   AREA-3    DEPTH-4   AREA-4

               160     1.350      1.991     .964      1.626       .803    1.107      2.368     .000       .000

SUMP FUNCTION PAR.NO.  KNOWN-D   KNOWN-A    KNOWN-WP   KNOWN-SF   TEST-D    TEST-A    TEST-WP    TEST-SF      SUM-P

               120     1.350      1.991      3.752       .008     .964      1.626      3.210       .013       .803
DTEST,DELD,DIFF,SUMMT,SUMPT=          .96360E+00          .11728E-02          -.56869E-03          .80259E+00          .80315E+00

DEPSMP FUNCTION PAR.NO.  D-UPPER  D-LOWER  KNOWN-D    -TEST    SUM-M      SUM-P    DIFF-M-P)    INCR

                3000    1.278     .105    1.350     .962     .000       .803       .803       .004


SUMM FUNCTION PAR.NO.  KNOWN-D   KNOWN-A    TEST-D    TEST-A      SUM-M   DEPTH-3   AREA-3    DEPTH-4   AREA-4

               160     1.350      1.991     .963      1.624       .808    1.106      2.366     .000       .000

SUMP FUNCTION PAR.NO.  KNOWN-D   KNOWN-A    KNOWN-WP   KNOWN-SF   TEST-D    TEST-A    TEST-WP    TEST-SF      SUM-P

               120     1.350      1.991      3.752       .008     .963      1.624      3.208       .013       .804
DTEST,DELD,DIFF,SUMMT,SUMPT=          .96254E+00          .11728E-03          .33072E-02          .80766E+00          .80435E+00
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SUMM FUNCTION PAR.NO.  KNOWN-D   KNOWN-A    TEST-D    TEST-A      SUM-M   DEPTH-3   AREA-3    DEPTH-4   AREA-4

               160     1.350      1.991     .963      1.624       .807    1.106      2.367     .000       .000

SUMP FUNCTION PAR.NO.  KNOWN-D   KNOWN-A    KNOWN-WP   KNOWN-SF   TEST-D    TEST-A    TEST-WP    TEST-SF      SUM-P

               120     1.350      1.991      3.752       .008     .963      1.624      3.208       .013       .804
DTEST,DELD,DIFF,SUMMT,SUMPT=          .96266E+00          .11728E-03          .28756E-02          .80710E+00          .80422E+00

SUMM FUNCTION PAR.NO.  KNOWN-D   KNOWN-A    TEST-D    TEST-A      SUM-M   DEPTH-3   AREA-3    DEPTH-4   AREA-4

               160     1.350      1.991     .963      1.624       .807    1.106      2.367     .000       .000

SUMP FUNCTION PAR.NO.  KNOWN-D   KNOWN-A    KNOWN-WP   KNOWN-SF   TEST-D    TEST-A    TEST-WP    TEST-SF      SUM-P

               120     1.350      1.991      3.752       .008     .963      1.624      3.209       .013       .804
DTEST,DELD,DIFF,SUMMT,SUMPT=          .96278E+00          .11728E-03          .24441E-02          .80653E+00          .80409E+00

SUMM FUNCTION PAR.NO.  KNOWN-D   KNOWN-A    TEST-D    TEST-A      SUM-M   DEPTH-3   AREA-3    DEPTH-4   AREA-4

               160     1.350      1.991     .963      1.625       .806    1.106      2.367     .000       .000

SUMP FUNCTION PAR.NO.  KNOWN-D   KNOWN-A    KNOWN-WP   KNOWN-SF   TEST-D    TEST-A    TEST-WP    TEST-SF      SUM-P

               120     1.350      1.991      3.752       .008     .963      1.625      3.209       .013       .804
DTEST,DELD,DIFF,SUMMT,SUMPT=          .96289E+00          .11728E-03          .20126E-02          .80597E+00          .80395E+00

SUMM FUNCTION PAR.NO.  KNOWN-D   KNOWN-A    TEST-D    TEST-A      SUM-M   DEPTH-3   AREA-3    DEPTH-4   AREA-4
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                160     1.350      1.991     .963      1.625       .805    1.106      2.367     .000       .000

SUMP FUNCTION PAR.NO.  KNOWN-D   KNOWN-A    KNOWN-WP   KNOWN-SF   TEST-D    TEST-A    TEST-WP    TEST-SF      SUM-P

                120     1.350      1.991      3.752       .008     .963      1.625      3.209       .013       .804
DTEST,DELD,DIFF,SUMMT,SUMPT=          .96301E+00          .11728E-03          .15826E-02          .80540E+00          .80382E+00

SUMM FUNCTION PAR.NO.  KNOWN-D   KNOWN-A    TEST-D    TEST-A      SUM-M   DEPTH-3   AREA-3    DEPTH-4   AREA-4

                160     1.350      1.991     .963      1.625       .805    1.106      2.367     .000       .000

SUMP FUNCTION PAR.NO.  KNOWN-D   KNOWN-A    KNOWN-WP   KNOWN-SF   TEST-D    TEST-A    TEST-WP    TEST-SF      SUM-P

                120     1.350      1.991      3.752       .008     .963      1.625      3.209       .013       .804
DTEST,DELD,DIFF,SUMMT,SUMPT=          .96313E+00          .11728E-03          .11514E-02          .80484E+00          .80369E+00

SUMM FUNCTION PAR.NO.  KNOWN-D   KNOWN-A    TEST-D    TEST-A      SUM-M   DEPTH-3   AREA-3    DEPTH-4   AREA-4

                160     1.350      1.991     .963      1.625       .804    1.106      2.367     .000       .000

SUMP FUNCTION PAR.NO.  KNOWN-D   KNOWN-A    KNOWN-WP   KNOWN-SF   TEST-D    TEST-A    TEST-WP    TEST-SF      SUM-P

                120     1.350      1.991      3.752       .008     .963      1.625      3.210       .013       .804
DTEST,DELD,DIFF,SUMMT,SUMPT=          .96325E+00          .11728E-03          .72092E-03          .80428E+00          .80355E+00

SUMM FUNCTION PAR.NO.  KNOWN-D   KNOWN-A    TEST-D    TEST-A      SUM-M   DEPTH-3   AREA-3    DEPTH-4   AREA-4

                160     1.350      1.991     .963      1.626       .804    1.107      2.368     .000       .000
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 SUMP FUNCTION PAR.NO.  KNOWN-D   KNOWN-A    KNOWN-WP   KNOWN-SF   TEST-D    TEST-A    TEST-WP    TEST-SF      SUM-P

                120     1.350      1.991      3.752       .008     .963      1.626      3.210       .013       .803
DTEST,DELD,DIFF,SUMMT,SUMPT=          .96336E+00          .11728E-03          .29057E-03          .80371E+00          .80342E+00

 SUMM FUNCTION PAR.NO.  KNOWN-D   KNOWN-A    TEST-D    TEST-A      SUM-M   DEPTH-3   AREA-3    DEPTH-4   AREA-4

                160     1.350      1.991     .963      1.626       .803    1.107      2.368     .000       .000

 SUMP FUNCTION PAR.NO.  KNOWN-D   KNOWN-A    KNOWN-WP   KNOWN-SF   TEST-D    TEST-A    TEST-WP    TEST-SF      SUM-P

                120     1.350      1.991      3.752       .008     .963      1.626      3.210       .013       .803
DTEST,DELD,DIFF,SUMMT,SUMPT=          .96348E+00          .11728E-03          -.13989E-03          .80315E+00          .80329E+00

 DEPSMP FUNCTION PAR.NO.  D-UPPER  D-LOWER  KNOWN-D    -TEST    SUM-M      SUM-P    DIFF-M-P)    INCR

                 3000    1.278     .105    1.350     .963     .000       .803       .803       .000

DWNSTM XJNCDS PAR.NO.  STATION       Q      DEPTH    DC        AREA      FORCE       WETP      SO        SF        E

              2250     3703.520    13.550     .963    1.278      1.626      4.165      3.210   .024937   .013172      2.069

 110    16     2

 DWNSTM RCHDS PAR.NO.  STATION       Q      DEPTH     C       DN        AREA      FORCE       WETP      SO        SC       SF

             1220     3703.520    13.550     .963    1.279    1.792      1.626      4.165      3.210   .002020   .005021   .013172
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DWNSTM RCHDS REACH ENTERED FROM PARAGRAPH 1600

REACH	SUB. PAR.	STATION	INVERT	Q	FACT	CRIT	DNORM	AREA-N	HD-VEL-N	D-PREV	AREA-P	HD-VEL P	SF-PREV
	30	3703.520	91.800	13.550	-1.0	1.279	1.279	2.333	.524	.963	1.626	1.079	.013
REACH	SUB. PAR.	STATION	INVERT	Q	FACT	CRIT	DNORM	AREA-N	HD-VEL-N	D-PREV	AREA-P	HD-VEL P	SF-PREV
	360	3697.400	91.788	13.550	-1.0	1.279	1.279	2.333	.524	.998	1.626	.981	.012
REACH	SUB. PAR.	STATION	INVERT	Q	FACT	CRIT	DNORM	AREA-N	HD-VEL-N	D-PREV	AREA-P	HD-VEL P	SF-PREV
	360	3691.619	91.776	13.550	-1.0	1.279	1.279	2.333	.524	1.036	1.626	.892	.010
REACH	SUB. PAR.	STATION	INVERT	Q	FACT	CRIT	DNORM	AREA-N	HD-VEL-N	D-PREV	AREA-P	HD-VEL P	SF-PREV
	360	3685.908	91.764	13.550	-1.0	1.279	1.279	2.333	.524	1.074	1.626	.811	.009
REACH	SUB. PAR.	STATION	INVERT	Q	FACT	CRIT	DNORM	AREA-N	HD-VEL-N	D-PREV	AREA-P	HD-VEL P	SF-PREV
	360	3680.792	91.754	13.550	-1.0	1.279	1.279	2.333	.524	1.115	1.626	.737	.008
REACH	SUB. PAR.	STATION	INVERT	Q	FACT	CRIT	DNORM	AREA-N	HD-VEL-N	D-PREV	AREA-P	HD-VEL P	SF-PREV
	360	3676.338	91.745	13.550	-1.0	1.279	1.279	2.333	.524	1.158	1.626	.670	.007

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 REACH SUB. PAR.   STATION    INVERT      Q    FACT   CRIT    DNORM     AREA-N    HD-VEL-N   D-PREV     AREA-P   HD-VEL P  SF-PREV

           360    3672.811    91.738     13.550  -1.0   1.279    1.279      2.333       .524    1.203      1.626       .609     .006

 REACH SUB. PAR.   STATION    INVERT      Q    FACT   CRIT    DNORM     AREA-N    HD-VEL-N   D-PREV     AREA-P   HD-VEL P  SF-PREV

           360    3670.573    91.733     13.550  -1.0   1.279    1.279      2.333       .524    1.250      1.626       .554     .005

 REACH SUB. PAR.   STATION    INVERT      Q    FACT   CRIT    DNORM     AREA-N    HD-VEL-N   D-PREV     AREA-P   HD-VEL P  SF-PREV

          1400    3670.220    91.733     13.550  -1.0   1.279    1.279      2.333       .524     .000       .000       .524     .005

 DWNSTM RCHDS PAR.NO.  STATION       Q      DEPTH     C       DN        AREA      FORCE       WETP      SO        SC       SF

             1600     3703.520    13.550     .963    1.279    1.279      1.626      4.165      3.210   .002020   .005021   .013172

 110    15     3

DWNSTM XJNCDS PAR.NO.  STATION       Q      DEPTH    DC        AREA      FORCE       WETP      SO        SF        E

              2040     3357.000    13.550    1.279    1.279      2.333      3.726      3.843   .028735   .005021      1.894

 DWNSTM XJNCDS PAR.NO.  STATION     Q-LAT    D-LAT    -LAT     A-LAT   PHI-LAT      M*COS-LAT

              2080     3357.000     4.640    1.311    3.000      2.968      .00        .225

 SUMP FUNCTION PAR.NO.  KNOWN-D   KNOWN-A    KNOWN-WP   KNOWN-SF   TEST-D    TEST-A    TEST-WP    TEST-SF      SUM-P
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                120     1.278      2.331      3.841       .005    1.443      2.936      4.315       .005      -.218

 SUMM FUNCTION PAR.NO.  KNOWN-D   KNOWN-A    TEST-D    TEST-A      SUM-M   DEPTH-3   AREA-3    DEPTH-4   AREA-4

                160     1.278      2.331    1.443      2.936       .829    1.311      2.968     .000       .000

 DWNSTM XJNCDS PAR.NO.  STATION       M         DC      A-CRIT     M-CRIT     SUM-P     M-TOT

              2100     3357.000     2.444    1.443      2.936      3.500      -.218      2.451
NO COMPUTATION AT POINT 2 IN A  JUNCTION  - A BREAK IN   TER SURFACE PROFILE - STATION =   3353.520   DWNSTM XJNCDS PAR.NO. 2300

 110    14     2

 DWNSTM RCHDS PAR.NO.  STATION       Q      DEPTH     C       DN        AREA      FORCE       WETP      SO        SC       SF

             1400     3353.520    18.190    1.444    1.444    2.018      2.938      5.323      4.317   .002023   .004899   .004899
NO COMPUTATION OF W.S. PROFILE IN THIS REACH - A BREAK    PROFILE - STATION =   3353.520  DWNSTM RCHDS PAR 1130

 110    13     3

DWNSTM XJNCDS PAR.NO.  STATION       Q      DEPTH    DC        AREA      FORCE       WETP      SO        SF        E

              2040     3007.530    18.190    1.444    1.444      2.938      5.323      4.317   .024939   .004899      2.130

 DWNSTM XJNCDS PAR.NO.  STATION     Q-LAT    D-LAT     -LAT     A-LAT   PHI-LAT      M*COS-LAT

              2080     3007.530    10.430    1.560    3.000      3.713      .00        .910
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 SUMP FUNCTION PAR.NO.  KNOWN-D   KNOWN-A    KNOWN-WP   KNOWN-SF   TEST-D    TEST-A    TEST-WP    TEST-SF      SUM-P

                120     1.443      2.936      4.315       .005    1.776      4.057      5.134       .005      -.884

 SUMM FUNCTION PAR.NO.  KNOWN-D   KNOWN-A    TEST-D    TEST-A      SUM-M   DEPTH-3   AREA-3    DEPTH-4   AREA-4

                160     1.443      2.936    1.776      4.057      1.861    1.560      3.713     .000       .000

 DWNSTM XJNCDS PAR.NO.  STATION       M         DC      A-CRIT     M-CRIT     SUM-P     M-TOT

              2100     3007.530     3.497    1.776      4.057      6.271      -.884      3.523
 NO COMPUTATION AT POINT 2 IN A  JUNCTION  - A BREAK IN   TER SURFACE PROFILE - STATION =   3003.520   DWNSTM XJNCDS PAR.NO. 2300

 110    12     2

 DWNSTM RCHDS PAR.NO.  STATION       Q      DEPTH     C       DN        AREA      FORCE       WETP      SO        SC       SF

             1400     3003.520    28.620    1.777    1.777    2.750      4.059      9.414      5.136   .002018   .005205   .005205
 NO COMPUTATION OF W.S. PROFILE IN THIS REACH - A BREAK    PROFILE - STATION =   3003.520  DWNSTM RCHDS PAR 1130

 110    11     3

DWNSTM XJNCDS PAR.NO.  STATION       Q      DEPTH    DC        AREA      FORCE       WETP      SO        SF        E

              2040     2503.000    28.620    1.777    1.777      4.059      9.414      5.136   .044444   .005205      2.700

 DWNSTM XJNCDS PAR.NO.  STATION     Q-LAT    D-LAT     -LAT     A-LAT    PHI-LAT      M*COS-LAT
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              2080     2503.000     9.070    1.806    3.000      4.446      .00        .575

 SUMP FUNCTION PAR.NO.  KNOWN-D   KNOWN-A    KNOWN-WP   KNOWN-SF   TEST-D    TEST-A    TEST-WP    TEST-SF      SUM-P

               120     1.776      4.057      5.134       .005    1.996      4.995      5.724       .005      -.357

 SUMM FUNCTION PAR.NO.  KNOWN-D   KNOWN-A    TEST-D    TEST-A      SUM-M   DEPTH-3   AREA-3    DEPTH-4   AREA-4

               160     1.776      4.057    1.996      4.995      1.987    1.806      4.446     .000       .000

 DWNSTM XJNCDS PAR.NO.  STATION       M         DC      A-CRIT     M-CRIT     SUM-P     M-TOT

              2100     2503.000     6.267    1.996      4.995      8.832      -.357      6.484
 NO COMPUTATION AT POINT 2 IN A  JUNCTION  - A BREAK IN   TER SURFACE PROFILE - STATION =   2499.400   DWNSTM XJNCDS PAR.NO. 2300

 110    10     2

 DWNSTM RCHDS PAR.NO.  STATION       Q      DEPTH     C       DN        AREA      FORCE       WETP      SO        SC       SF

             1400     2499.400    37.690    1.997    1.997    3.000      4.998     13.201      5.726   .002021   .005218   .005218
 NO COMPUTATION OF W.S. PROFILE IN THIS REACH - A BREAK    PROFILE - STATION =   2499.400  DWNSTM RCHDS PAR 1130

 110     9     3

DWNSTM XJNCDS PAR.NO.  STATION       Q      DEPTH    DC        AREA      FORCE       WETP      SO        SF        E

              2040     2153.000    37.690    1.997    1.997      4.998     13.201      5.726   .027777   .005218      2.971
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DWNSTM XJNCDS PAR.NO.  STATION     Q-LAT    D-LAT    -LAT     A-LAT   PHI-LAT      M*COS-LAT

              2080     2153.000     2.140    1.929    3.000      4.803      .00        .030

SUMP FUNCTION PAR.NO.  KNOWN-D   KNOWN-A    KNOWN-WP   KNOWN-SF   TEST-D    TEST-A    TEST-WP    TEST-SF      SUM-P

                120     1.996      4.995      5.724       .005    1.962      5.549      5.922       .004       .619

SUMM FUNCTION PAR.NO.  KNOWN-D   KNOWN-A    TEST-D    TEST-A      SUM-M   DEPTH-3   AREA-3    DEPTH-4   AREA-4

                160     1.996      4.995    1.962      5.549       .017    1.929      4.803     .000       .000

DWNSTM XJNCDS PAR.NO.  STATION       M         DC      A-CRIT     M-CRIT     SUM-P     M-TOT

              2100     2153.000     8.827    1.962      5.549      8.878       .619      9.475

DWNSTM XJNCDS DEPSMP ENTERED FROM PARAGRAPH 2400

SUMP FUNCTION PAR.NO.  KNOWN-D   KNOWN-A    KNOWN-WP   KNOWN-SF   TEST-D    TEST-A    TEST-WP    TEST-SF      SUM-P

                120     1.996      4.995      5.724       .005     .187       .199      1.633     51.092   -233.893

SUMM FUNCTION PAR.NO.  KNOWN-D   KNOWN-A    TEST-D    TEST-A      SUM-M   DEPTH-3   AREA-3    DEPTH-4   AREA-4

                160     1.996      4.995     .187       .199    239.171    1.042      2.181     .000       .000

SUMM FUNCTION PAR.NO.  KNOWN-D   KNOWN-A    TEST-D    TEST-A      SUM-M   DEPTH-3   AREA-3    DEPTH-4   AREA-4
```

```
                160     1.996      4.995     .365       .532     83.797    1.130      2.437     .000       .000

SUMP FUNCTION PAR.NO.  KNOWN-D   KNOWN-A    KNOWN-WP   KNOWN-SF   TEST-D    TEST-A    TEST-WP    TEST-SF      SUM-P

                120     1.996      4.995      5.724       .005     .365       .532      2.300      3.030    -10.314
DTEST,DELD,DIFF,SUMMT,SUMPT=          .36455E+00          .17745E+00          .94111E+02          .83797E+02         -.10314E+02

SUMM FUNCTION PAR.NO.  KNOWN-D   KNOWN-A    TEST-D    TEST-A      SUM-M   DEPTH-3   AREA-3    DEPTH-4   AREA-4

                160     1.996      4.995     .542       .948     43.101    1.219      2.696     .000       .000

SUMP FUNCTION PAR.NO.  KNOWN-D   KNOWN-A    KNOWN-WP   KNOWN-SF   TEST-D    TEST-A    TEST-WP    TEST-SF      SUM-P

                120     1.996      4.995      5.724       .005     .542       .948      2.831       .582      1.479
DTEST,DELD,DIFF,SUMMT,SUMPT=          .54200E+00          .17745E+00          .41621E+02          .43101E+02          .14792E+01

SUMM FUNCTION PAR.NO.  KNOWN-D   KNOWN-A    TEST-D    TEST-A      SUM-M   DEPTH-3   AREA-3    DEPTH-4   AREA-4

                160     1.996      4.995     .719      1.425     25.704    1.308      2.959     .000       .000

SUMP FUNCTION PAR.NO.  KNOWN-D   KNOWN-A    KNOWN-WP   KNOWN-SF   TEST-D    TEST-A    TEST-WP    TEST-SF      SUM-P

                120     1.996      4.995      5.724       .005     .719      1.425      3.294       .183      3.332
DTEST,DELD,DIFF,SUMMT,SUMPT=          .71944E+00          .17745E+00          .22373E+02          .25704E+02          .33317E+01

SUMM FUNCTION PAR.NO.  KNOWN-D   KNOWN-A    TEST-D    TEST-A      SUM-M   DEPTH-3   AREA-3    DEPTH-4   AREA-4
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```
                160     1.996      4.995     .897      1.948     16.421    1.397      3.224     .000       .000

SUMP FUNCTION PAR.NO.  KNOWN-D   KNOWN-A    KNOWN-WP   KNOWN-SF   TEST-D    TEST-A    TEST-WP    TEST-SF      SUM-P

                120     1.996      4.995      5.724       .005     .897      1.948      3.716       .076      3.657
DTEST,DELD,DIFF,SUMMT,SUMPT=          .89689E+00          .17745E+00          .12764E+02          .16421E+02          .36569E+01

SUMM FUNCTION PAR.NO.  KNOWN-D   KNOWN-A    TEST-D    TEST-A      SUM-M   DEPTH-3   AREA-3    DEPTH-4   AREA-4

                160     1.996      4.995    1.074      2.506     10.788    1.485      3.490     .000       .000

SUMP FUNCTION PAR.NO.  KNOWN-D   KNOWN-A    KNOWN-WP   KNOWN-SF   TEST-D    TEST-A    TEST-WP    TEST-SF      SUM-P

                120     1.996      4.995      5.724       .005    1.074      2.506      4.110       .037      3.544
DTEST,DELD,DIFF,SUMMT,SUMPT=          .10743E+01          .17745E+00          .72438E+01          .10788E+02          .35443E+01

SUMM FUNCTION PAR.NO.  KNOWN-D   KNOWN-A    TEST-D    TEST-A      SUM-M   DEPTH-3   AREA-3    DEPTH-4   AREA-4

                160     1.996      4.995    1.252      3.091      7.071    1.574      3.756     .000       .000

SUMP FUNCTION PAR.NO.  KNOWN-D   KNOWN-A    KNOWN-WP   KNOWN-SF   TEST-D    TEST-A    TEST-WP    TEST-SF      SUM-P

                120     1.996      4.995      5.724       .005    1.252      3.091      4.487       .021      3.223
DTEST,DELD,DIFF,SUMMT,SUMPT=          .12518E+01          .17745E+00          .38476E+01          .70710E+01          .32234E+01

SUMM FUNCTION PAR.NO.  KNOWN-D   KNOWN-A    TEST-D    TEST-A      SUM-M   DEPTH-3   AREA-3    DEPTH-4   AREA-4

                160     1.996      4.995    1.429      3.694      4.469    1.663      4.021     .000       .000
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SUMP FUNCTION PAR.NO.  KNOWN-D   KNOWN-A    KNOWN-WP   KNOWN-SF   TEST-D    TEST-A    TEST-WP    TEST-SF      SUM-P

               120     1.996      4.995      5.724       .005    1.429      3.694      4.853       .013      2.756
DTEST,DELD,DIFF,SUMMT,SUMPT=          .14292E+01          .17745E+00          .17128E+01          .44692E+01          .27564E+01

SUMM FUNCTION PAR.NO.  KNOWN-D   KNOWN-A    TEST-D    TEST-A      SUM-M   DEPTH-3   AREA-3    DEPTH-4   AREA-4

               160     1.996      4.995    1.607      4.310      2.567    1.751      4.285     .000       .000

SUMP FUNCTION PAR.NO.  KNOWN-D   KNOWN-A    KNOWN-WP   KNOWN-SF   TEST-D    TEST-A    TEST-WP    TEST-SF      SUM-P

               120     1.996      4.995      5.724       .005    1.607      4.310      5.211       .008      2.163
DTEST,DELD,DIFF,SUMMT,SUMPT=          .16067E+01          .17745E+00          .40451E+00          .25672E+01          .21627E+01

SUMM FUNCTION PAR.NO.  KNOWN-D   KNOWN-A    TEST-D    TEST-A      SUM-M   DEPTH-3   AREA-3    DEPTH-4   AREA-4

               160     1.996      4.995    1.784      4.930      1.130    1.840      4.546     .000       .000

SUMP FUNCTION PAR.NO.  KNOWN-D   KNOWN-A    KNOWN-WP   KNOWN-SF   TEST-D    TEST-A    TEST-WP    TEST-SF      SUM-P

               120     1.996      4.995      5.724       .005    1.784      4.930      5.566       .006      1.449
DTEST,DELD,DIFF,SUMMT,SUMPT=          .17841E+01          .17745E+00          -.31888E+00          .11302E+01          .14491E+01

DEPSMP FUNCTION PAR.NO.  D-UPPER  D-LOWER  KNOWN-D    -TEST    SUM-M      SUM-P    DIFF-M-P)    INCR

                3000     1.962     .187    1.996    1.607     .018      1.130      1.449       .405

SUMM FUNCTION PAR.NO.  KNOWN-D   KNOWN-A    TEST-D    TEST-A      SUM-M   DEPTH-3   AREA-3    DEPTH-4   AREA-4
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                160     1.996      4.995    1.624      4.371      2.405    1.760      4.311     .000       .000

SUMP FUNCTION PAR.NO.  KNOWN-D   KNOWN-A    KNOWN-WP   KNOWN-SF   TEST-D    TEST-A    TEST-WP    TEST-SF      SUM-P

                120     1.996      4.995      5.724       .005    1.624      4.371      5.246       .008      2.097
DTEST,DELD,DIFF,SUMMT,SUMPT=          .16244E+01          .17745E-01          .30880E+00          .24054E+01          .20966E+01

SUMM FUNCTION PAR.NO.  KNOWN-D   KNOWN-A    TEST-D    TEST-A      SUM-M   DEPTH-3   AREA-3    DEPTH-4   AREA-4

                160     1.996      4.995    1.642      4.433      2.248    1.769      4.337     .000       .000

SUMP FUNCTION PAR.NO.  KNOWN-D   KNOWN-A    KNOWN-WP   KNOWN-SF   TEST-D    TEST-A    TEST-WP    TEST-SF      SUM-P

                120     1.996      4.995      5.724       .005    1.642      4.433      5.282       .008      2.029
DTEST,DELD,DIFF,SUMMT,SUMPT=          .16422E+01          .17745E-01          .21869E+00          .22481E+01          .20294E+01

SUMM FUNCTION PAR.NO.  KNOWN-D   KNOWN-A    TEST-D    TEST-A      SUM-M   DEPTH-3   AREA-3    DEPTH-4   AREA-4

                160     1.996      4.995    1.660      4.495      2.095    1.778      4.364     .000       .000

SUMP FUNCTION PAR.NO.  KNOWN-D   KNOWN-A    KNOWN-WP   KNOWN-SF   TEST-D    TEST-A    TEST-WP    TEST-SF      SUM-P

                120     1.996      4.995      5.724       .005    1.660      4.495      5.318       .008      1.961
DTEST,DELD,DIFF,SUMMT,SUMPT=          .16599E+01          .17745E-01          .13402E+00          .20950E+01          .19610E+01

SUMM FUNCTION PAR.NO.  KNOWN-D   KNOWN-A    TEST-D    TEST-A      SUM-M   DEPTH-3   AREA-3    DEPTH-4   AREA-4
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                160     1.996      4.995    1.678      4.557      1.946    1.787      4.390     .000       .000

SUMP FUNCTION PAR.NO.  KNOWN-D   KNOWN-A    KNOWN-WP   KNOWN-SF   TEST-D    TEST-A    TEST-WP    TEST-SF      SUM-P

                120     1.996      4.995      5.724       .005    1.678      4.557      5.353       .007      1.891
DTEST,DELD,DIFF,SUMMT,SUMPT=          .16777E+01          .17745E-01          .54619E-01          .19460E+01          .18914E+01

SUMM FUNCTION PAR.NO.  KNOWN-D   KNOWN-A    TEST-D    TEST-A      SUM-M   DEPTH-3   AREA-3    DEPTH-4   AREA-4

                160     1.996      4.995    1.695      4.620      1.801    1.796      4.416     .000       .000

SUMP FUNCTION PAR.NO.  KNOWN-D   KNOWN-A    KNOWN-WP   KNOWN-SF   TEST-D    TEST-A    TEST-WP    TEST-SF      SUM-P

                120     1.996      4.995      5.724       .005    1.695      4.620      5.389       .007      1.821
DTEST,DELD,DIFF,SUMMT,SUMPT=          .16954E+01          .17745E-01          -.19651E-01          .18010E+01          .18206E+01

DEPSMP FUNCTION PAR.NO.  D-UPPER  D-LOWER  KNOWN-D    -TEST    SUM-M      SUM-P    DIFF-M-P)    INCR

                 3000    1.962     .187    1.996    1.678     .002      1.801      1.821       .055

SUMM FUNCTION PAR.NO.  KNOWN-D   KNOWN-A    TEST-D    TEST-A      SUM-M   DEPTH-3   AREA-3    DEPTH-4   AREA-4

                160     1.996      4.995    1.679      4.564      1.931    1.788      4.392     .000       .000

SUMP FUNCTION PAR.NO.  KNOWN-D   KNOWN-A    KNOWN-WP   KNOWN-SF   TEST-D    TEST-A    TEST-WP    TEST-SF      SUM-P

                120     1.996      4.995      5.724       .005    1.679      4.564      5.357       .007      1.884
DTEST,DELD,DIFF,SUMMT,SUMPT=          .16794E+01          .17745E-02          .46965E-01          .19313E+01          .18844E+01
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SUMM FUNCTION PAR.NO.  KNOWN-D   KNOWN-A    TEST-D    TEST-A      SUM-M   DEPTH-3   AREA-3    DEPTH-4   AREA-4

               160     1.996      4.995    1.681      4.570      1.917    1.789      4.395     .000       .000

SUMP FUNCTION PAR.NO.  KNOWN-D   KNOWN-A    KNOWN-WP   KNOWN-SF   TEST-D    TEST-A    TEST-WP    TEST-SF      SUM-P

               120     1.996      4.995      5.724       .005    1.681      4.570      5.360       .007      1.877
DTEST,DELD,DIFF,SUMMT,SUMPT=          .16812E+01          .17745E-02          .39361E-01          .19167E+01          .18773E+01

SUMM FUNCTION PAR.NO.  KNOWN-D   KNOWN-A    TEST-D    TEST-A      SUM-M   DEPTH-3   AREA-3    DEPTH-4   AREA-4

               160     1.996      4.995    1.683      4.576      1.902    1.790      4.398     .000       .000

SUMP FUNCTION PAR.NO.  KNOWN-D   KNOWN-A    KNOWN-WP   KNOWN-SF   TEST-D    TEST-A    TEST-WP    TEST-SF      SUM-P

               120     1.996      4.995      5.724       .005    1.683      4.576      5.364       .007      1.870
DTEST,DELD,DIFF,SUMMT,SUMPT=          .16830E+01          .17745E-02          .31808E-01          .19021E+01          .18703E+01

SUMM FUNCTION PAR.NO.  KNOWN-D   KNOWN-A    TEST-D    TEST-A      SUM-M   DEPTH-3   AREA-3    DEPTH-4   AREA-4

               160     1.996      4.995    1.685      4.582      1.888    1.790      4.400     .000       .000

SUMP FUNCTION PAR.NO.  KNOWN-D   KNOWN-A    KNOWN-WP   KNOWN-SF   TEST-D    TEST-A    TEST-WP    TEST-SF      SUM-P

               120     1.996      4.995      5.724       .005    1.685      4.582      5.367       .007      1.863
DTEST,DELD,DIFF,SUMMT,SUMPT=          .16848E+01          .17745E-02          .24305E-01          .18875E+01          .18632E+01

SUMM FUNCTION PAR.NO.  KNOWN-D   KNOWN-A    TEST-D    TEST-A      SUM-M   DEPTH-3   AREA-3    DEPTH-4   AREA-4
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```
                160     1.996      4.995    1.687      4.588      1.873    1.791      4.403     .000       .000

SUMP FUNCTION PAR.NO.  KNOWN-D   KNOWN-A    KNOWN-WP   KNOWN-SF   TEST-D    TEST-A    TEST-WP    TEST-SF      SUM-P

                120     1.996      4.995      5.724       .005    1.687      4.588      5.371       .007      1.856
DTEST,DELD,DIFF,SUMMT,SUMPT=          .16865E+01          .17745E-02          .16853E-01          .18730E+01          .18562E+01

SUMM FUNCTION PAR.NO.  KNOWN-D   KNOWN-A    TEST-D    TEST-A      SUM-M   DEPTH-3   AREA-3    DEPTH-4   AREA-4

                160     1.996      4.995    1.688      4.595      1.859    1.792      4.405     .000       .000

SUMP FUNCTION PAR.NO.  KNOWN-D   KNOWN-A    KNOWN-WP   KNOWN-SF   TEST-D    TEST-A    TEST-WP    TEST-SF      SUM-P

                120     1.996      4.995      5.724       .005    1.688      4.595      5.374       .007      1.849
DTEST,DELD,DIFF,SUMMT,SUMPT=          .16883E+01          .17745E-02          .94522E-02          .18585E+01          .18491E+01

SUMM FUNCTION PAR.NO.  KNOWN-D   KNOWN-A    TEST-D    TEST-A      SUM-M   DEPTH-3   AREA-3    DEPTH-4   AREA-4

                160     1.996      4.995    1.690      4.601      1.844    1.793      4.408     .000       .000

SUMP FUNCTION PAR.NO.  KNOWN-D   KNOWN-A    KNOWN-WP   KNOWN-SF   TEST-D    TEST-A    TEST-WP    TEST-SF      SUM-P

                120     1.996      4.995      5.724       .005    1.690      4.601      5.378       .007      1.842
DTEST,DELD,DIFF,SUMMT,SUMPT=          .16901E+01          .17745E-02          .21012E-02          .18441E+01          .18420E+01

SUMM FUNCTION PAR.NO.  KNOWN-D   KNOWN-A    TEST-D    TEST-A      SUM-M   DEPTH-3   AREA-3    DEPTH-4   AREA-4
```

```
                160     1.996      4.995    1.692      4.607      1.830    1.794      4.411     .000       .000

SUMP FUNCTION PAR.NO.  KNOWN-D   KNOWN-A    KNOWN-WP   KNOWN-SF   TEST-D    TEST-A    TEST-WP    TEST-SF      SUM-P

                120     1.996      4.995      5.724       .005    1.692      4.607      5.381       .007      1.835
DTEST,DELD,DIFF,SUMMT,SUMPT=          .16919E+01          .17745E-02          -.51980E-02          .18297E+01          .18349E+01

DEPSMP FUNCTION PAR.NO.  D-UPPER  D-LOWER  KNOWN-D    -TEST    SUM-M      SUM-P    DIFF-M-P)    INCR

                 3000    1.962     .187    1.996    1.690     .000      1.830      1.835       .002

SUMM FUNCTION PAR.NO.  KNOWN-D   KNOWN-A    TEST-D    TEST-A      SUM-M   DEPTH-3   AREA-3    DEPTH-4   AREA-4

                160     1.996      4.995    1.690      4.602      1.843    1.793      4.408     .000       .000

SUMP FUNCTION PAR.NO.  KNOWN-D   KNOWN-A    KNOWN-WP   KNOWN-SF   TEST-D    TEST-A    TEST-WP    TEST-SF      SUM-P

                120     1.996      4.995      5.724       .005    1.690      4.602      5.378       .007      1.841
DTEST,DELD,DIFF,SUMMT,SUMPT=          .16903E+01          .17745E-03          .13698E-02          .18426E+01          .18413E+01

SUMM FUNCTION PAR.NO.  KNOWN-D   KNOWN-A    TEST-D    TEST-A      SUM-M   DEPTH-3   AREA-3    DEPTH-4   AREA-4

                160     1.996      4.995    1.690      4.602      1.841    1.793      4.408     .000       .000

SUMP FUNCTION PAR.NO.  KNOWN-D   KNOWN-A    KNOWN-WP   KNOWN-SF   TEST-D    TEST-A    TEST-WP    TEST-SF      SUM-P

                120     1.996      4.995      5.724       .005    1.690      4.602      5.379       .007      1.841
DTEST,DELD,DIFF,SUMMT,SUMPT=          .16904E+01          .17745E-03          .63801E-03          .18412E+01          .18405E+01
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 SUMM FUNCTION PAR.NO.  KNOWN-D   KNOWN-A    TEST-D    TEST-A      SUM-M   DEPTH-3   AREA-3    DEPTH-4   AREA-4

                160     1.996      4.995    1.691      4.603      1.840    1.793      4.409     .000       .000

 SUMP FUNCTION PAR.NO.  KNOWN-D   KNOWN-A    KNOWN-WP   KNOWN-SF   TEST-D    TEST-A    TEST-WP    TEST-SF      SUM-P

                120     1.996      4.995      5.724       .005    1.691      4.603      5.379       .007      1.840
DTEST,DELD,DIFF,SUMMT,SUMPT=          .16906E+01          .17745E-03         -.94652E-04          .18397E+01          .18398E+01

 DEPSMP FUNCTION PAR.NO.  D-UPPER  D-LOWER  KNOWN-D    -TEST    SUM-M      SUM-P    DIFF-M-P)    INCR

                 3000    1.962     .187    1.996    1.690     .000      1.840      1.840       .001

DWNSTM XJNCDS PAR.NO.  STATION       Q      DEPTH    DC        AREA      FORCE       WETP      SO        SF        E


              2250     2149.400    39.830    1.690    1.962      4.602     13.998      5.379   .027777   .007057      2.866

 110     8     2

 DWNSTM RCHDS PAR.NO.  STATION       Q      DEPTH     C       DN        AREA      FORCE       WETP      SO        SC       SF

             1220     2149.400    39.830    1.690    1.963    2.484      4.602     13.998      5.379   .002158   .004293   .007057

 DWNSTM RCHDS REACH ENTERED FROM PARAGRAPH 1600

 REACH SUB. PAR.   STATION    INVERT      Q    FACT   CRIT    DNORM     AREA-N    HD-VEL-N   D-PREV     AREA-P   HD-VEL P  SF-PREV
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            30    2149.400    88.230     39.830  -1.0   1.963    1.963      5.553       .799    1.690      4.602      1.163     .007

 REACH SUB. PAR.   STATION    INVERT      Q    FACT   CRIT    DNORM     AREA-N    HD-VEL-N   D-PREV     AREA-P   HD-VEL P  SF-PREV

            360    2140.001    88.210     39.830  -1.0   1.963    1.963      5.553       .799    1.754      4.602      1.057     .006

 REACH SUB. PAR.   STATION    INVERT      Q    FACT   CRIT    DNORM     AREA-N    HD-VEL-N   D-PREV     AREA-P   HD-VEL P  SF-PREV

            360    2132.095    88.193     39.830  -1.0   1.963    1.963      5.553       .799    1.821      4.602       .961     .005

 REACH SUB. PAR.   STATION    INVERT      Q    FACT   CRIT    DNORM     AREA-N    HD-VEL-N   D-PREV     AREA-P   HD-VEL P  SF-PREV

            360    2126.617    88.181     39.830  -1.0   1.963    1.963      5.553       .799    1.892      4.602       .874     .005

 REACH SUB. PAR.   STATION    INVERT      Q    FACT   CRIT    DNORM     AREA-N    HD-VEL-N   D-PREV     AREA-P   HD-VEL P  SF-PREV

           1400    2124.775    88.177     39.830  -1.0   1.963    1.963      5.553       .799     .000       .000       .799     .004

 DWNSTM RCHDS PAR.NO.  STATION       Q      DEPTH     C       DN        AREA      FORCE       WETP      SO        SC       SF

              1600     2149.400    39.830    1.690    1.963    1.963      4.602     13.998      5.379   .002158   .004293   .007057

 110     7     3

DWNSTM XJNCDS PAR.NO.  STATION       Q      DEPTH    DC        AREA      FORCE       WETP      SO        SF        E
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              2040      722.000    39.830    1.963    1.963      5.553     13.547      5.924   .000000   .004293      2.755

DWNSTM XJNCDS PAR.NO.  STATION     Q-LAT    D-LAT    -LAT     A-LAT   PHI-LAT      M*COS-LAT

              2080      722.000    66.780    2.452    4.500      8.859      .00      15.633

SUMP FUNCTION PAR.NO.  KNOWN-D   KNOWN-A    KNOWN-WP   KNOWN-SF   TEST-D    TEST-A    TEST-WP    TEST-SF      SUM-P

                120     1.962      5.549      5.922       .004    2.942     12.016      8.743       .004     -8.724

SUMM FUNCTION PAR.NO.  KNOWN-D   KNOWN-A    TEST-D    TEST-A      SUM-M   DEPTH-3   AREA-3    DEPTH-4   AREA-4

                160     1.962      5.549    2.942     12.016      4.864    2.452      8.859     .000       .000

DWNSTM XJNCDS PAR.NO.  STATION       M         DC      A-CRIT     M-CRIT     SUM-P     M-TOT

              2100      722.000     8.873    2.942     12.016     29.375     -8.724     15.782
NO COMPUTATION AT POINT 2 IN A  JUNCTION  - A BREAK IN   TER SURFACE PROFILE - STATION =    718.880   DWNSTM XJNCDS PAR.NO. 2300

110     6     2

DWNSTM RCHDS PAR.NO.  STATION       Q      DEPTH     C       DN        AREA      FORCE       WETP      SO        SC       SF

             1400      718.880   106.610    2.943    2.943    3.585     12.021     44.618      8.745   .002248   .003938   .003938
NO COMPUTATION OF W.S. PROFILE IN THIS REACH - A BREAK    PROFILE - STATION =    718.880  DWNSTM RCHDS PAR 1130

110     5     3
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DWNSTM XJNCDS PAR.NO.  STATION       Q      DEPTH    DC        AREA      FORCE       WETP      SO        SF        E

              2040      274.000   106.610    2.943    2.943     12.021     44.618      8.745   .024691   .003938      4.256

 DWNSTM XJNCDS PAR.NO.  STATION     Q-LAT    D-LAT    -LAT     A-LAT    PHI-LAT      M*COS-LAT

              2080      274.000    58.910    2.676    4.000      8.933      .00       12.065

 SUMP FUNCTION PAR.NO.  KNOWN-D   KNOWN-A    KNOWN-WP   KNOWN-SF   TEST-D    TEST-A    TEST-WP    TEST-SF      SUM-P

                120     2.942     12.016      8.743       .004    2.509     18.399     17.369       .006      7.806

 SUMM FUNCTION PAR.NO.  KNOWN-D   KNOWN-A    TEST-D    TEST-A     SUM-M   DEPTH-3   AREA-3    DEPTH-4   AREA-4

                160     2.942     12.016    2.509     18.399      4.803    2.676      8.933     .000       .000

 DWNSTM XJNCDS PAR.NO.  STATION       M         DC      A-CRIT     M-CRIT     SUM-P     M-TOT

              2100      274.000    29.363    2.509     18.399     46.243      7.806     49.234

 DWNSTM XJNCDS DEPSMP ENTERED FROM PARAGRAPH 2400

 SUMP FUNCTION PAR.NO.  KNOWN-D   KNOWN-A    KNOWN-WP   KNOWN-SF   TEST-D    TEST-A    TEST-WP    TEST-SF      SUM-P

                120     2.942     12.016      8.743       .004     .113       .828      7.784     60.783   -771.672

 SUMM FUNCTION PAR.NO.  KNOWN-D   KNOWN-A    TEST-D    TEST-A     SUM-M   DEPTH-3   AREA-3    DEPTH-4   AREA-4
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                160     2.942     12.016     .113       .828    973.142    1.477      4.217     .000       .000

SUMM FUNCTION PAR.NO.  KNOWN-D   KNOWN-A    TEST-D    TEST-A      SUM-M   DEPTH-3   AREA-3    DEPTH-4   AREA-4

                160     2.942     12.016     .352       2.585   276.783    1.597      4.683     .000       .000

SUMP FUNCTION PAR.NO.  KNOWN-D   KNOWN-A    KNOWN-WP   KNOWN-SF   TEST-D    TEST-A    TEST-WP    TEST-SF      SUM-P

                120     2.942     12.016      8.743       .004     .352      2.585      8.743      1.594     -3.981
DTEST,DELD,DIFF,SUMMT,SUMPT=          .35248E+00          .23962E+00          .28076E+03          .27678E+03          -.39809E+01

SUMM FUNCTION PAR.NO.  KNOWN-D   KNOWN-A    TEST-D    TEST-A      SUM-M   DEPTH-3   AREA-3    DEPTH-4   AREA-4

                160     2.942     12.016     .592       4.342   145.676    1.717      5.155     .000       .000

SUMP FUNCTION PAR.NO.  KNOWN-D   KNOWN-A    KNOWN-WP   KNOWN-SF   TEST-D    TEST-A    TEST-WP    TEST-SF      SUM-P

                120     2.942     12.016      8.743       .004     .592      4.342      9.701       .325     14.592
DTEST,DELD,DIFF,SUMMT,SUMPT=          .59211E+00          .23962E+00          .13108E+03          .14568E+03          .14592E+02

SUMM FUNCTION PAR.NO.  KNOWN-D   KNOWN-A    TEST-D    TEST-A      SUM-M   DEPTH-3   AREA-3    DEPTH-4   AREA-4

                160     2.942     12.016     .832       6.099    90.988    1.837      5.631     .000       .000

SUMP FUNCTION PAR.NO.  KNOWN-D   KNOWN-A    KNOWN-WP   KNOWN-SF   TEST-D    TEST-A    TEST-WP    TEST-SF      SUM-P

                120     2.942     12.016      8.743       .004     .832      6.099     10.660       .119     17.771
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DTEST,DELD,DIFF,SUMMT,SUMPT=          .83173E+00          .23962E+00          .73217E+02          .90988E+02          .17771E+02

SUMM FUNCTION PAR.NO.  KNOWN-D   KNOWN-A    TEST-D    TEST-A      SUM-M   DEPTH-3   AREA-3    DEPTH-4   AREA-4

               160     2.942     12.016    1.071      7.856     61.285    1.957      6.110     .000       .000

SUMP FUNCTION PAR.NO.  KNOWN-D   KNOWN-A    KNOWN-WP   KNOWN-SF   TEST-D    TEST-A    TEST-WP    TEST-SF      SUM-P

               120     2.942     12.016      8.743       .004    1.071      7.856     11.618       .057     18.350
DTEST,DELD,DIFF,SUMMT,SUMPT=          .10714E+01          .23962E+00          .42936E+02          .61285E+02          .18350E+02

SUMM FUNCTION PAR.NO.  KNOWN-D   KNOWN-A    TEST-D    TEST-A      SUM-M   DEPTH-3   AREA-3    DEPTH-4   AREA-4

               160     2.942     12.016    1.311      9.613     42.773    2.076      6.589     .000       .000

SUMP FUNCTION PAR.NO.  KNOWN-D   KNOWN-A    KNOWN-WP   KNOWN-SF   TEST-D    TEST-A    TEST-WP    TEST-SF      SUM-P

               120     2.942     12.016      8.743       .004    1.311      9.613     12.577       .032     17.923
DTEST,DELD,DIFF,SUMMT,SUMPT=          .13110E+01          .23962E+00          .24849E+02          .42773E+02          .17923E+02

SUMM FUNCTION PAR.NO.  KNOWN-D   KNOWN-A    TEST-D    TEST-A      SUM-M   DEPTH-3   AREA-3    DEPTH-4   AREA-4

               160     2.942     12.016    1.551     11.371     30.202    2.196      7.067     .000       .000

SUMP FUNCTION PAR.NO.  KNOWN-D   KNOWN-A    KNOWN-WP   KNOWN-SF   TEST-D    TEST-A    TEST-WP    TEST-SF      SUM-P

               120     2.942     12.016      8.743       .004    1.551     11.371     13.535       .020     16.862
DTEST,DELD,DIFF,SUMMT,SUMPT=          .15506E+01          .23962E+00          .13340E+02          .30202E+02          .16862E+02
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SUMM FUNCTION PAR.NO.  KNOWN-D   KNOWN-A    TEST-D    TEST-A      SUM-M   DEPTH-3   AREA-3    DEPTH-4   AREA-4

               160     2.942     12.016    1.790     13.128     21.147    2.316      7.542     .000       .000

SUMP FUNCTION PAR.NO.  KNOWN-D   KNOWN-A    KNOWN-WP   KNOWN-SF   TEST-D    TEST-A    TEST-WP    TEST-SF      SUM-P

               120     2.942     12.016      8.743       .004    1.790     13.128     14.494       .014     15.283
DTEST,DELD,DIFF,SUMMT,SUMPT=          .17902E+01          .23962E+00          .58638E+01          .21147E+02          .15283E+02

SUMM FUNCTION PAR.NO.  KNOWN-D   KNOWN-A    TEST-D    TEST-A      SUM-M   DEPTH-3   AREA-3    DEPTH-4   AREA-4

               160     2.942     12.016    2.030     14.885     14.335    2.436      8.013     .000       .000

SUMP FUNCTION PAR.NO.  KNOWN-D   KNOWN-A    KNOWN-WP   KNOWN-SF   TEST-D    TEST-A    TEST-WP    TEST-SF      SUM-P

               120     2.942     12.016      8.743       .004    2.030     14.885     15.452       .010     13.236
DTEST,DELD,DIFF,SUMMT,SUMPT=          .20299E+01          .23962E+00          .10998E+01          .14335E+02          .13236E+02

SUMM FUNCTION PAR.NO.  KNOWN-D   KNOWN-A    TEST-D    TEST-A      SUM-M   DEPTH-3   AREA-3    DEPTH-4   AREA-4

               160     2.942     12.016    2.269     16.642      9.036    2.556      8.477     .000       .000

SUMP FUNCTION PAR.NO.  KNOWN-D   KNOWN-A    KNOWN-WP   KNOWN-SF   TEST-D    TEST-A    TEST-WP    TEST-SF      SUM-P

               120     2.942     12.016      8.743       .004    2.269     16.642     16.411       .007     10.740
DTEST,DELD,DIFF,SUMMT,SUMPT=          .22695E+01          .23962E+00         -.17030E+01          .90365E+01          .10740E+02

DEPSMP FUNCTION PAR.NO.  D-UPPER  D-LOWER  KNOWN-D    -TEST    SUM-M      SUM-P    DIFF-M-P)    INCR
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                3000    2.509     .113    2.942    2.030     .024      9.036     10.740      1.100

SUMM FUNCTION PAR.NO.  KNOWN-D   KNOWN-A    TEST-D    TEST-A      SUM-M   DEPTH-3   AREA-3    DEPTH-4   AREA-4

                160     2.942     12.016    2.054     15.061     13.746    2.448      8.060     .000       .000

SUMP FUNCTION PAR.NO.  KNOWN-D   KNOWN-A    KNOWN-WP   KNOWN-SF   TEST-D    TEST-A    TEST-WP    TEST-SF      SUM-P

                120     2.942     12.016      8.743       .004    2.054     15.061     15.548       .010     13.006
DTEST,DELD,DIFF,SUMMT,SUMPT=          .20538E+01          .23962E-01          .74056E+00          .13746E+02          .13006E+02

SUMM FUNCTION PAR.NO.  KNOWN-D   KNOWN-A    TEST-D    TEST-A      SUM-M   DEPTH-3   AREA-3    DEPTH-4   AREA-4

                160     2.942     12.016    2.078     15.236     13.172    2.460      8.106     .000       .000

SUMP FUNCTION PAR.NO.  KNOWN-D   KNOWN-A    KNOWN-WP   KNOWN-SF   TEST-D    TEST-A    TEST-WP    TEST-SF      SUM-P

                120     2.942     12.016      8.743       .004    2.078     15.236     15.644       .009     12.772
DTEST,DELD,DIFF,SUMMT,SUMPT=          .20778E+01          .23962E-01          .40015E+00          .13172E+02          .12772E+02

SUMM FUNCTION PAR.NO.  KNOWN-D   KNOWN-A    TEST-D    TEST-A      SUM-M   DEPTH-3   AREA-3    DEPTH-4   AREA-4

                160     2.942     12.016    2.102     15.412     12.611    2.472      8.153     .000       .000

SUMP FUNCTION PAR.NO.  KNOWN-D   KNOWN-A    KNOWN-WP   KNOWN-SF   TEST-D    TEST-A    TEST-WP    TEST-SF      SUM-P

                120     2.942     12.016      8.743       .004    2.102     15.412     15.740       .009     12.533
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DTEST,DELD,DIFF,SUMMT,SUMPT=          .21017E+01          .23962E-01          .78046E-01          .12611E+02          .12533E+02

SUMM FUNCTION PAR.NO.  KNOWN-D   KNOWN-A    TEST-D    TEST-A      SUM-M   DEPTH-3   AREA-3    DEPTH-4   AREA-4

               160     2.942     12.016    2.126     15.588     12.064    2.484      8.200     .000       .000

SUMP FUNCTION PAR.NO.  KNOWN-D   KNOWN-A    KNOWN-WP   KNOWN-SF   TEST-D    TEST-A    TEST-WP    TEST-SF      SUM-P

               120     2.942     12.016      8.743       .004    2.126     15.588     15.836       .009     12.290
DTEST,DELD,DIFF,SUMMT,SUMPT=          .21257E+01          .23962E-01          -.22623E+00          .12064E+02          .12290E+02

DEPSMP FUNCTION PAR.NO.  D-UPPER  D-LOWER  KNOWN-D    -TEST    SUM-M      SUM-P    DIFF-M-P)    INCR

                3000    2.509     .113    2.942    2.102     .002     12.064     12.290       .078

SUMM FUNCTION PAR.NO.  KNOWN-D   KNOWN-A    TEST-D    TEST-A      SUM-M   DEPTH-3   AREA-3    DEPTH-4   AREA-4

               160     2.942     12.016    2.104     15.430     12.556    2.473      8.158     .000       .000

SUMP FUNCTION PAR.NO.  KNOWN-D   KNOWN-A    KNOWN-WP   KNOWN-SF   TEST-D    TEST-A    TEST-WP    TEST-SF      SUM-P

               120     2.942     12.016      8.743       .004    2.104     15.430     15.750       .009     12.509
DTEST,DELD,DIFF,SUMMT,SUMPT=          .21041E+01          .23962E-02          .46825E-01          .12556E+02          .12509E+02

SUMM FUNCTION PAR.NO.  KNOWN-D   KNOWN-A    TEST-D    TEST-A      SUM-M   DEPTH-3   AREA-3    DEPTH-4   AREA-4

               160     2.942     12.016    2.107     15.447     12.501    2.474      8.162     .000       .000
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SUMP FUNCTION PAR.NO.  KNOWN-D   KNOWN-A    KNOWN-WP   KNOWN-SF   TEST-D    TEST-A    TEST-WP    TEST-SF      SUM-P

               120     2.942     12.016      8.743       .004    2.107     15.447     15.759       .009     12.485
DTEST,DELD,DIFF,SUMMT,SUMPT=          .21065E+01          .23962E-02          .15785E-01          .12501E+02          .12485E+02

SUMM FUNCTION PAR.NO.  KNOWN-D   KNOWN-A    TEST-D    TEST-A      SUM-M   DEPTH-3   AREA-3    DEPTH-4   AREA-4

               160     2.942     12.016    2.109     15.465     12.446    2.475      8.167     .000       .000

SUMP FUNCTION PAR.NO.  KNOWN-D   KNOWN-A    KNOWN-WP   KNOWN-SF   TEST-D    TEST-A    TEST-WP    TEST-SF      SUM-P

               120     2.942     12.016      8.743       .004    2.109     15.465     15.769       .009     12.461
DTEST,DELD,DIFF,SUMMT,SUMPT=          .21089E+01          .23962E-02          -.15090E-01          .12446E+02          .12461E+02

DEPSMP FUNCTION PAR.NO.  D-UPPER  D-LOWER  KNOWN-D    -TEST    SUM-M      SUM-P    DIFF-M-P)    INCR

                3000    2.509     .113    2.942    2.107     .000     12.446     12.461       .016

SUMM FUNCTION PAR.NO.  KNOWN-D   KNOWN-A    TEST-D    TEST-A      SUM-M   DEPTH-3   AREA-3    DEPTH-4   AREA-4


               160     2.942     12.016    2.107     15.449     12.495    2.474      8.163     .000       .000

SUMP FUNCTION PAR.NO.  KNOWN-D   KNOWN-A    KNOWN-WP   KNOWN-SF   TEST-D    TEST-A    TEST-WP    TEST-SF      SUM-P

               120     2.942     12.016      8.743       .004    2.107     15.449     15.760       .009     12.482
DTEST,DELD,DIFF,SUMMT,SUMPT=          .21068E+01          .23962E-03          .12689E-01          .12495E+02          .12482E+02

SUMM FUNCTION PAR.NO.  KNOWN-D   KNOWN-A    TEST-D    TEST-A      SUM-M   DEPTH-3   AREA-3    DEPTH-4   AREA-4
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                160     2.942     12.016    2.107     15.451     12.490    2.475      8.163     .000       .000

SUMP FUNCTION PAR.NO.  KNOWN-D   KNOWN-A    KNOWN-WP   KNOWN-SF   TEST-D    TEST-A    TEST-WP    TEST-SF      SUM-P

                120     2.942     12.016      8.743       .004    2.107     15.451     15.761       .009     12.480
DTEST,DELD,DIFF,SUMMT,SUMPT=          .21070E+01          .23962E-03          .95930E-02          .12490E+02          .12480E+02

SUMM FUNCTION PAR.NO.  KNOWN-D   KNOWN-A    TEST-D    TEST-A      SUM-M   DEPTH-3   AREA-3    DEPTH-4   AREA-4

                160     2.942     12.016    2.107     15.453     12.484    2.475      8.164     .000       .000

SUMP FUNCTION PAR.NO.  KNOWN-D   KNOWN-A    KNOWN-WP   KNOWN-SF   TEST-D    TEST-A    TEST-WP    TEST-SF      SUM-P

                120     2.942     12.016      8.743       .004    2.107     15.453     15.762       .009     12.478
DTEST,DELD,DIFF,SUMMT,SUMPT=          .21073E+01          .23962E-03          .65050E-02          .12484E+02          .12478E+02

SUMM FUNCTION PAR.NO.  KNOWN-D   KNOWN-A    TEST-D    TEST-A      SUM-M   DEPTH-3   AREA-3    DEPTH-4   AREA-4

                160     2.942     12.016    2.107     15.454     12.479    2.475      8.164     .000       .000

SUMP FUNCTION PAR.NO.  KNOWN-D   KNOWN-A    KNOWN-WP   KNOWN-SF   TEST-D    TEST-A    TEST-WP    TEST-SF      SUM-P

                120     2.942     12.016      8.743       .004    2.107     15.454     15.763       .009     12.475
DTEST,DELD,DIFF,SUMMT,SUMPT=          .21075E+01          .23962E-03          .34142E-02          .12479E+02          .12475E+02

SUMM FUNCTION PAR.NO.  KNOWN-D   KNOWN-A    TEST-D    TEST-A      SUM-M   DEPTH-3   AREA-3    DEPTH-4   AREA-4
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                160     2.942     12.016    2.108     15.456     12.473    2.475      8.165     .000       .000

 SUMP FUNCTION PAR.NO.  KNOWN-D   KNOWN-A    KNOWN-WP   KNOWN-SF   TEST-D    TEST-A    TEST-WP    TEST-SF      SUM-P

                120     2.942     12.016      8.743       .004    2.108     15.456     15.764       .009     12.473
 DTEST,DELD,DIFF,SUMMT,SUMPT=          .21077E+01          .23962E-03          .32234E-03          .12473E+02          .12473E+02

 SUMM FUNCTION PAR.NO.  KNOWN-D   KNOWN-A    TEST-D    TEST-A      SUM-M   DEPTH-3   AREA-3    DEPTH-4   AREA-4

                160     2.942     12.016    2.108     15.458     12.468    2.475      8.165     .000       .000

 SUMP FUNCTION PAR.NO.  KNOWN-D   KNOWN-A    KNOWN-WP   KNOWN-SF   TEST-D    TEST-A    TEST-WP    TEST-SF      SUM-P

                120     2.942     12.016      8.743       .004    2.108     15.458     15.765       .009     12.470
 DTEST,DELD,DIFF,SUMMT,SUMPT=          .21080E+01          .23962E-03          -.27580E-02          .12468E+02          .12470E+02

 DEPSMP FUNCTION PAR.NO.  D-UPPER  D-LOWER  KNOWN-D    -TEST    SUM-M      SUM-P    DIFF-M-P)    INCR

                 3000    2.509     .113    2.942    2.108     .000     12.468     12.470       .000

DWNSTM XJNCDS PAR.NO.  STATION       Q      DEPTH    DC        AREA      FORCE       WETP      SO        SF        E

              2250      269.950   165.520    2.108    2.509     15.456     71.337     15.764   .024691   .009011      3.907

 110     4     2

 DWNSTM RCHDS PAR.NO.  STATION       Q      DEPTH     C       DN        AREA      FORCE       WETP      SO        SC       SF
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             1220      269.950   165.520    2.108    2.510    3.823     15.456     71.337     15.764   .002004   .005730   .009011

 DWNSTM RCHDS REACH ENTERED FROM PARAGRAPH 1600

 REACH SUB. PAR.   STATION    INVERT      Q    FACT   CRIT    DNORM     AREA-N    HD-VEL-N   D-PREV     AREA-P   HD-VEL P  SF-PREV

              30     269.950    84.050    165.520  -1.0   2.510    2.510     18.407      1.256    2.108     15.456      1.781     .009

 REACH SUB. PAR.   STATION    INVERT      Q    FACT   CRIT    DNORM     AREA-N    HD-VEL-N   D-PREV     AREA-P   HD-VEL P  SF-PREV

             360     260.842    84.032    165.520  -1.0   2.510    2.510     18.407      1.256    2.211     15.456      1.619     .008

 REACH SUB. PAR.   STATION    INVERT      Q    FACT   CRIT    DNORM     AREA-N    HD-VEL-N   D-PREV     AREA-P   HD-VEL P  SF-PREV

             360     253.686    84.017    165.520  -1.0   2.510    2.510     18.407      1.256    2.319     15.456      1.472     .007

 REACH SUB. PAR.   STATION    INVERT      Q    FACT   CRIT    DNORM     AREA-N    HD-VEL-N   D-PREV     AREA-P   HD-VEL P  SF-PREV

             360     249.220    84.008    165.520  -1.0   2.510    2.510     18.407      1.256    2.432     15.456      1.338     .006

 REACH SUB. PAR.   STATION    INVERT      Q    FACT   CRIT    DNORM     AREA-N    HD-VEL-N   D-PREV     AREA-P   HD-VEL P  SF-PREV

            1400     248.243    84.007    165.520  -1.0   2.510    2.510     18.407      1.256     .000       .000      1.256     .006

 DWNSTM RCHDS PAR.NO.  STATION       Q      DEPTH     C       DN        AREA      FORCE       WETP      SO        SC       SF

             1600      269.950   165.520    2.108    2.510    2.510     15.456     71.337     15.764   .002004   .005730   .009011
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 110     3     8
NO COMPUTATION OF WS PROFILE IN BRIDGE ENTRANCE - A BREAK IN W.S. PROFILE - STATION =     10.500  DWNSTM WENTDS - PARAGRAPH  4500


 110     2     2
 NO COMPUTATION OF W.S. PROFILE IN THIS REACH - A BREAK    PROFILE - STATION =     10.500  DWNSTM RCHDS PAR 1130


 110     1     1
 NO COMPUTATION IN SYSTEM OUTLET - A BREAK IN W.S. PROFIL  - STATION =     10.000  DWNSTM OTLTDS - PARAGRAPH = 6200
1  DOWNSTREAM          STATION     INVERT     DEPTH       Q        AREA       FORCE       DNORM       DCRIT      SLOPE       SFRICT


 NO COMPUTATION FOR ELEMENT NUMBER   2

 NO COMPUTATION FOR ELEMENT NUMBER   3

 ELEMENT NO =   4 2     269.950     84.050     2.108     165.520     15.456      71.337     3.823       2.510     .00200      .009011
 ELEMENT NO =   4 2     260.842     84.032     2.211     165.520     16.210      70.404     3.823       2.510     .00200      .007956
 ELEMENT NO =   4 2     253.686     84.017     2.319     165.520     17.002      69.754     3.823       2.510     .00200      .007030
 ELEMENT NO =   4 2     249.220     84.008     2.432     165.520     17.831      69.396     3.823       2.510     .00200      .006217
 ELEMENT NO =   4 2     248.243     84.007     2.510     165.520     18.407      69.326     3.823       2.510     .00200      .005730

 ELEMENT NO =   5 3     274.000     84.150     2.943     106.610     12.021      44.618      .000       2.943     .02469      .003938
 ELEMENT NO =   5 3     269.950     84.050     2.108     165.520     15.456      71.337      .000       2.510     .02469      .009011

 NO COMPUTATION FOR ELEMENT NUMBER   6

 ELEMENT NO =   7 3     722.000     85.150     1.963      39.830      5.553      13.547      .000       1.963     .00000      .004293

 ELEMENT NO =   8 2    2149.400     88.230     1.690      39.830      4.602      13.998     2.484       1.963     .00216      .007057
 ELEMENT NO =   8 2    2140.001     88.210     1.754      39.830      4.827      13.804     2.484       1.963     .00216      .006211
 ELEMENT NO =   8 2    2132.095     88.193     1.821      39.830      5.062      13.662     2.484       1.963     .00216      .005472
 ELEMENT NO =   8 2    2126.617     88.181     1.892      39.830      5.309      13.575     2.484       1.963     .00216      .004826
 ELEMENT NO =   8 2    2124.775     88.177     1.963      39.830      5.553      13.547     2.484       1.963     .00216      .004293

 ELEMENT NO =   9 3    2153.000     88.330     1.997      37.690      4.998      13.201      .000       1.997     .02778      .005218
 ELEMENT NO =   9 3    2149.400     88.230     1.690      39.830      4.602      13.998      .000       1.963     .02778      .007057
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 NO COMPUTATION FOR ELEMENT NUMBER  10

 ELEMENT NO =  11 3    2503.000     89.190     1.777      28.620      4.059       9.414      .000       1.777     .04444      .005205

 NO COMPUTATION FOR ELEMENT NUMBER  12

 ELEMENT NO =  13 3    3007.530     90.300     1.444      18.190      2.938       5.323      .000       1.444     .02494      .004899

 NO COMPUTATION FOR ELEMENT NUMBER  14

 ELEMENT NO =  15 3    3357.000     91.100     1.279      13.550      2.333       3.726      .000       1.279     .02874      .005021

 ELEMENT NO =  16 2    3703.520     91.800      .963      13.550      1.626       4.165     1.792       1.279     .00202      .013172
 ELEMENT NO =  16 2    3697.400     91.788      .998      13.550      1.705       4.063     1.792       1.279     .00202      .011566
 ELEMENT NO =  16 2    3691.619     91.776     1.036      13.550      1.788       3.970     1.792       1.279     .00202      .010174
 ELEMENT NO =  16 2    3685.908     91.764     1.074      13.550      1.875       3.894     1.792       1.279     .00202      .008944
 ELEMENT NO =  16 2    3680.792     91.754     1.115      13.550      1.967       3.830     1.792       1.279     .00202      .007874
 ELEMENT NO =  16 2    3676.338     91.745     1.158      13.550      2.063       3.781     1.792       1.279     .00202      .006938
 ELEMENT NO =  16 2    3672.811     91.738     1.203      13.550      2.164       3.747     1.792       1.279     .00202      .006117
 ELEMENT NO =  16 2    3670.573     91.733     1.250      13.550      2.269       3.729     1.792       1.279     .00202      .005397
 ELEMENT NO =  16 2    3670.220     91.733     1.279      13.550      2.333       3.726     1.792       1.279     .00202      .005021

 ELEMENT NO =  17 3    3707.530     91.900     1.351      13.160      1.992       3.912      .000       1.351     .02494      .007776
 ELEMENT NO =  17 3    3703.520     91.800      .963      13.550      1.626       4.165      .000       1.279     .02494      .013172

 NO COMPUTATION FOR ELEMENT NUMBER  18
1  DOWNSTREAM          STATION     INVERT     DEPTH       Q         AREA        FORCE       DNORM       DCRIT      SLOPE       SFRICT


 ELEMENT NO =  19 6    3905.750     92.300     1.351      13.160      1.992       3.912      .000       1.351     .00000      .000000


1                                        UPSTREAM PROCESSING DEBUGGING TRACE


 DWNSTM OTLTUS PAR.NO.  STATION       Q      DEPTH    DC        AREA      FORCE


                31       10.000   165.520    7.430    3.503     28.274    155.347
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22

UPSTRM	RCHUS	PAR.NO.	STATION	Q	DEPTH	C	DN	AREA	FORCE	WETP	SO	SC	SF
		60	10.000	165.520	7.430	3.503	.000	28.274	155.347	18.850	.000000	.003682	.001527
UPSTRM	RCHUS	PAR.NO.	STATION	Q	DEPTH	C	DN	AREA	FORCE	WETP	SO	SC	SF
		210	10.500	165.520	7.431	3.503	.000	28.274	155.369	18.850	.000000	.003682	.001527

38

UPSTRM	WENTUS	PAR.NO.	STATION	Q	DEPTH	DC	AREA	FORCE	HEAD-VEL	EGL
		4070	10.500	165.520	7.431	3.503	28.274	155.369	.532	91.493
UPSTRM	WENTUS	PAR.NO.	STATION	Q	DEPTH	DC	AREA	FORCE	HEAD-VEL	EGL
		4300	10.500	165.520	7.145	5.000	19.635	8.430	1.103	91.779
UPSTRM	WENTUS	PAR.NO.	STATION	Q	DEPTH	DC	AREA	FORCE	HEAD-VEL	EGL
		4300	10.500	165.520	7.145	5.000	19.635	8.430	1.103	91.779
UPSTRM	WENTUS	PAR.NO.	STATION	Q	DEPTH	DC	AREA	FORCE	HEAD-VEL	EGL
		4200	10.500	165.520	7.145	3.688	19.635	134.539	1.103	91.779

42

UPSTRM RCHUS PAR.NO.	STATION	Q	DEPTH	C	DN	AREA	FORCE	WETP	SO	SC	SF
60	10.500	165.520	7.145	2.510	3.823	29.332	179.923	30.666	.002004	.005730	.002586
UPSTRM RCHUS PAR.NO.	STATION	Q	DEPTH	C	DN	AREA	FORCE	WETP	SO	SC	SF
210	269.950	165.520	7.296	2.510	3.823	29.332	184.350	30.666	.002004	.005730	.002586

53

UPSTRM XJCTUS PAR.NO.	STATION	Q	DEPTH	DC	AREA	FORCE	WETP	SO	SF	E
1040	269.950	165.520	7.296	2.510	29.332	184.350	30.666	.024691	.002586	7.796
UPSTRM XJCTUS PAR.NO.	STATION	Q-LAT	D-LAT	-LAT	A-LAT	PHI-LAT	M*COS-LAT			
1060	269.950	58.910	4.000	4.000	12.566	.00	8.577			
SUMP FUNCTION PAR.NO.	KNOWN-D	KNOWN-A	KNOWN-WP	KNOWN-SF	TEST-D	TEST-A	TEST-WP	TEST-SF	SUM-P	
220	7.296	29.332	30.666	.003	2.943	12.021	8.745	.004	-88.210	
SUMM FUNCTION PAR.NO.	KNOWN-D	KNOWN-A	TEST-D	TEST-A	SUM-M	DEPTH-3	AREA-3	DEPTH-4	AREA-4	
260	7.296	29.332	2.943	12.021	-8.933	4.000	12.566	.000	.000	

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UPSTRM XJCTUS PAR.NO.  STATION       M         DC       A-CRIT     M-CRIT     SUM-P     M-TOT
              1400      269.950    29.007    5.000     19.635     17.977    -88.210
UPSTRM XJCTUS PAR.NO.  STATION       Q       DEPTH     DC         AREA       FORCE       WETP      SO         SF         E
              1100      274.000   106.610    7.305     2.943     19.635     112.320     15.708   .024691   .001676      7.859
 62
UPSTRM RCHUS PAR.NO.   STATION       Q       DEPTH     C        DN         AREA       FORCE       WETP      SO         SC         SF
               60      274.000   106.610    7.305     2.943     3.585     19.635     112.320     15.708   .002248   .003938   .001676
UPSTRM RCHUS PAR.NO.   STATION       Q       DEPTH     C        DN         AREA       FORCE       WETP      SO         SC         SF
              210      718.880   106.610    7.050     2.943     3.585     19.635     107.322     15.708   .002248   .003938   .001676
 73
UPSTRM XJCTUS PAR.NO.  STATION       Q       DEPTH     DC         AREA       FORCE       WETP      SO         SF         E
              1040      718.880   106.610    7.050     2.943     19.635     107.322     15.708   .000000   .001676      7.511
UPSTRM XJCTUS PAR.NO.  STATION     Q-LAT     D-LAT     -LAT      A-LAT    PHI-LAT     M*COS-LAT
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              1060      718.880    66.780    4.500    4.500     15.904      .00       8.708

SUMP FUNCTION PAR.NO.  KNOWN-D   KNOWN-A    KNOWN-WP   KNOWN-SF   TEST-D    TEST-A    TEST-WP    TEST-SF      SUM-P

               220      7.050     19.635     15.708       .002    1.963      5.553      5.924       .004    -64.192

SUMM FUNCTION PAR.NO.  KNOWN-D   KNOWN-A    TEST-D    TEST-A      SUM-M   DEPTH-3   AREA-3    DEPTH-4   AREA-4

               260      7.050     19.635    1.963      5.553       .396    4.500     15.904     .000       .000

UPSTRM XJCTUS PAR.NO.  STATION       M         DC       A-CRIT     M-CRIT     SUM-P     M-TOT

              1400      718.880    17.977    3.500      9.621      5.121    -64.192

UPSTRM XJCTUS PAR.NO.  STATION       Q       DEPTH     DC         AREA       FORCE       WETP       SO         SF         E

              1100      722.000    39.830    7.339     1.963      9.621     58.893     10.996    .000000    .001567      7.603

 82

UPSTRM RCHUS PAR.NO.   STATION       Q       DEPTH     C        DN         AREA       FORCE       WETP       SO         SC        SF

               60      722.000    39.830    7.339     1.963    2.484      9.621     58.893     10.996    .002158    .004293    .001567

UPSTRM RCHUS PAR.NO.   STATION       Q       DEPTH     C        DN         AREA       FORCE       WETP       SO         SC        SF

              210     2149.400    39.830    6.509     1.963    2.484      9.621     50.911     10.996    .002158    .004293    .001567
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93

UPSTRM XJCTUS	PAR.NO.	STATION	Q	DEPTH	DC	AREA	FORCE	WETP	SO	SF	E
	1040	2149.400	39.830	6.509	1.963	9.621	50.911	10.996	.027777	.001567	6.778

UPSTRM XJCTUS	PAR.NO.	STATION	Q-LAT	D-LAT	-LAT	A-LAT	PHI-LAT	M*COS-LAT
	1060	2149.400	2.140	3.000	3.000	7.069	.00	.020

SUMP FUNCTION	PAR.NO.	KNOWN-D	KNOWN-A	KNOWN-WP	KNOWN-SF	TEST-D	TEST-A	TEST-WP	TEST-SF	SUM-P
	220	6.509	9.621	10.996	.002	1.997	4.998	5.726	.005	-32.340

SUMM FUNCTION	PAR.NO.	KNOWN-D	KNOWN-A	TEST-D	TEST-A	SUM-M	DEPTH-3	AREA-3	DEPTH-4	AREA-4
	260	6.509	9.621	1.997	4.998	-3.726	3.000	7.069	.000	.000

UPSTRM XJCTUS	PAR.NO.	STATION	M	DC	A-CRIT	M-CRIT	SUM-P	M-TOT
	1400	2149.400	5.121	3.000	7.069	6.241	-32.340	

UPSTRM XJCTUS	PAR.NO.	STATION	Q	DEPTH	DC	AREA	FORCE	WETP	SO	SF	E
	1100	2153.000	37.690	6.281	1.997	7.069	40.038	9.425	.027777	.003193	6.817

102

UPSTRM RCHUS PAR.NO.	STATION	Q	DEPTH	C	DN	AREA	FORCE	WETP	SO	SC	SF
60	2153.000	37.690	6.281	1.997	3.000	7.069	40.038	9.425	.002021	.005218	.003193

UPSTRM RCHUS PAR.NO.	STATION	Q	DEPTH	C	DN	AREA	FORCE	WETP	SO	SC	SF
210	2499.400	37.690	6.687	1.997	3.000	7.069	42.908	9.425	.002021	.005218	.003193

113

UPSTRM XJCTUS PAR.NO.	STATION	Q	DEPTH	DC	AREA	FORCE	WETP	SO	SF	E
1040	2499.400	37.690	6.687	1.997	7.069	42.908	9.425	.044444	.003193	7.135

UPSTRM XJCTUS PAR.NO.	STATION	Q-LAT	D-LAT	-LAT	A-LAT	PHI-LAT	M*COS-LAT
1060	2499.400	9.070	3.000	3.000	7.069	.00	.361

SUMP FUNCTION PAR.NO.	KNOWN-D	KNOWN-A	KNOWN-WP	KNOWN-SF	TEST-D	TEST-A	TEST-WP	TEST-SF	SUM-P
220	6.687	7.069	9.425	.003	1.777	4.059	5.136	.005	-26.515

SUMM FUNCTION PAR.NO.	KNOWN-D	KNOWN-A	TEST-D	TEST-A	SUM-M	DEPTH-3	AREA-3	DEPTH-4	AREA-4
260	6.687	7.069	1.777	4.059	-.387	3.000	7.069	.000	.000

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UPSTRM XJCTUS PAR.NO.  STATION       M         DC       A-CRIT     M-CRIT     SUM-P     M-TOT
              1400     2499.400    6.241    2.750       5.940      4.283    -26.515
UPSTRM XJCTUS PAR.NO.  STATION       Q       DEPTH     DC         AREA       FORCE       WETP      SO         SF         E
              1100     2503.000   28.620    6.784    1.777       5.940      36.409      8.639   .044444    .002929      7.299
122
UPSTRM RCHUS PAR.NO.   STATION       Q       DEPTH     C        DN         AREA       FORCE       WETP      SO         SC         SF
               60      2503.000   28.620    6.784    1.777    2.750       5.940      36.409      8.639   .002018    .005205    .002929
UPSTRM RCHUS PAR.NO.   STATION       Q       DEPTH     C        DN         AREA       FORCE       WETP      SO         SC         SF
              210      3003.520   28.620    7.240    1.777    2.750       5.940      39.117      8.639   .002018    .005205    .002929
133
UPSTRM XJCTUS PAR.NO.  STATION       Q       DEPTH     DC         AREA       FORCE       WETP      SO         SF         E
              1040     3003.520   28.620    7.240    1.777       5.940      39.117      8.639   .024939    .002929      7.606
UPSTRM XJCTUS PAR.NO.  STATION     Q-LAT     D-LAT     -LAT      A-LAT    PHI-LAT     M*COS-LAT
              1060     3003.520   10.430    3.000    3.000       7.069       .00         .478
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SUMP FUNCTION PAR.NO.	KNOWN-D	KNOWN-A	KNOWN-WP	KNOWN-SF	TEST-D	TEST-A	TEST-WP	TEST-SF	SUM-P
220	7.240	5.940	8.639	.003	1.444	2.938	4.317	.005	-25.351

SUMM FUNCTION PAR.NO.	KNOWN-D	KNOWN-A	TEST-D	TEST-A	SUM-M	DEPTH-3	AREA-3	DEPTH-4	AREA-4
260	7.240	5.940	1.444	2.938	.308	3.000	7.069	.000	.000

UPSTRM XJCTUS PAR.NO.	STATION	M	DC	A-CRIT	M-CRIT	SUM-P	M-TOT
1400	3003.520	4.283	2.500	4.909	2.093	-25.351	

UPSTRM XJCTUS PAR.NO.	STATION	Q	DEPTH	DC	AREA	FORCE	WETP	SO	SF	E
1100	3007.530	18.190	7.465	1.444	4.909	32.601	7.854	.024939	.001967	7.774

142

UPSTRM RCHUS PAR.NO.	STATION	Q	DEPTH	C	DN	AREA	FORCE	WETP	SO	SC	SF
60	3007.530	18.190	7.465	1.444	2.018	4.909	32.601	7.854	.002023	.004899	.001967

UPSTRM RCHUS PAR.NO.	STATION	Q	DEPTH	C	DN	AREA	FORCE	WETP	SO	SC	SF
210	3353.520	18.190	7.445	1.444	2.018	4.909	32.505	7.854	.002023	.004899	.001967

153

UPSTRM XJCTUS PAR.NO.	STATION	Q	DEPTH	DC	AREA	FORCE	WETP	SO	SF	E
1040	3353.520	18.190	7.445	1.444	4.909	32.505	7.854	.028735	.001967	7.662

UPSTRM XJCTUS PAR.NO.	STATION	Q-LAT	D-LAT	-LAT	A-LAT	PHI-LAT	M*COS-LAT
1060	3353.520	4.640	3.000	3.000	7.069	.00	.095

SUMP FUNCTION PAR.NO.	KNOWN-D	KNOWN-A	KNOWN-WP	KNOWN-SF	TEST-D	TEST-A	TEST-WP	TEST-SF	SUM-P
220	7.445	4.909	7.854	.002	1.279	2.333	3.843	.005	-22.011

SUMM FUNCTION PAR.NO.	KNOWN-D	KNOWN-A	TEST-D	TEST-A	SUM-M	DEPTH-3	AREA-3	DEPTH-4	AREA-4
260	7.445	4.909	1.279	2.333	-.445	3.000	7.069	.000	.000

UPSTRM XJCTUS PAR.NO.	STATION	M	DC	A-CRIT	M-CRIT	SUM-P	M-TOT
1400	3353.520	2.093	2.250	3.976	1.434	-22.011	

UPSTRM XJCTUS PAR.NO.	STATION	Q	DEPTH	DC	AREA	FORCE	WETP	SO	SF	E
1100	3357.000	13.550	7.479	1.279	3.976	26.699	7.069	.028735	.001914	7.756

162

UPSTRM RCHUS PAR.NO.	STATION	Q	DEPTH	C	DN	AREA	FORCE	WETP	SO	SC	SF
60	3357.000	13.550	7.479	1.279	1.792	3.976	26.699	7.069	.002020	.005021	.001914
UPSTRM RCHUS PAR.NO.	STATION	Q	DEPTH	C	DN	AREA	FORCE	WETP	SO	SC	SF
210	3703.520	13.550	7.443	1.279	1.792	3.976	26.554	7.069	.002020	.005021	.001914

173

UPSTRM XJCTUS PAR.NO.	STATION	Q	DEPTH	DC	AREA	FORCE	WETP	SO	SF	E
1040	3703.520	13.550	7.443	1.279	3.976	26.554	7.069	.024937	.001914	7.627
UPSTRM XJCTUS PAR.NO.	STATION	Q-LAT	D-LAT	-LAT	A-LAT	PHI-LAT	M*COS-LAT			
1060	3703.520	.390	3.000	3.000	7.069	.00	.001			
SUMP FUNCTION PAR.NO.	KNOWN-D	KNOWN-A	KNOWN-WP	KNOWN-SF	TEST-D	TEST-A	TEST-WP	TEST-SF	SUM-P	
220	7.443	3.976	7.069	.002	1.351	1.992	3.755	.008	-17.938	
SUMM FUNCTION PAR.NO.	KNOWN-D	KNOWN-A	TEST-D	TEST-A	SUM-M	DEPTH-3	AREA-3	DEPTH-4	AREA-4	
260	7.443	3.976	1.351	1.992	-1.266	3.000	7.069	.000	.000	

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 UPSTRM XJCTUS PAR.NO.  STATION       M         DC       A-CRIT      M-CRIT      SUM-P      M-TOT

               1400     3703.520     1.434     1.750       2.405       2.236     -17.938

 UPSTRM XJCTUS PAR.NO.  STATION       Q       DEPTH     DC         AREA       FORCE        WETP       SO         SF         E

               1100     3707.530    13.160     7.109     1.351       2.405      17.230       5.498    .024937    .006898       7.660

 182

 UPSTRM RCHUS PAR.NO.  STATION       Q       DEPTH     C        DN         AREA       FORCE        WETP       SO         SC         SF

                60      3707.530    13.160     7.109     1.351     1.750       2.405      17.230       5.498    .002018    .007776    .006898

 UPSTRM RCHUS PAR.NO.  STATION       Q       DEPTH     C        DN         AREA       FORCE        WETP       SO         SC         SF

               210      3905.750    13.160     8.076     1.351     1.750       2.405      19.557       5.498    .002018    .007776    .006898

 196

 UPSTRM HDWKUS PAR.NO.   STATION       Q       DEPTH     DC         AREA       FORCE

               5015      3905.750    13.160     8.076     1.351       2.405      19.557
1    UPSTREAM           STATION     INVERT      DEPTH       Q          AREA        FORCE        DNORM        DCRIT       SLOPE        SFRICT

 ELEMENT NO =   1 1       10.000      83.530      7.430      165.520      28.274      155.347       .000        3.503      .00000       .000000

 ELEMENT NO =   2 2       10.000      83.530      7.430      165.520      28.274      155.347       .000        3.503      .00000       .001527
 ELEMENT NO =   2 2       10.500      83.530      7.431      165.520      28.274      155.369       .000        3.503      .00000       .001527
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ELEMENT NO =	3	8	10.500	83.530	7.431	165.520	28.274	155.369	.000	3.503	.00000	.000000
ELEMENT NO =	3	8	10.500	83.530	7.145	165.520	19.635	134.539	.000	3.688	.00000	.000000
ELEMENT NO =	4	2	10.500	83.530	7.145	165.520	29.332	179.923	3.823	2.510	.00200	.002586
ELEMENT NO =	4	2	269.950	84.050	7.296	165.520	29.332	184.350	3.823	2.510	.00200	.002586
ELEMENT NO =	5	3	269.950	84.050	7.296	165.520	29.332	184.350	.000	2.510	.02469	.002586
ELEMENT NO =	5	3	274.000	84.150	7.305	106.610	19.635	112.320	.000	2.943	.02469	.001676
ELEMENT NO =	6	2	274.000	84.150	7.305	106.610	19.635	112.320	3.585	2.943	.00225	.001676
ELEMENT NO =	6	2	718.880	85.150	7.050	106.610	19.635	107.322	3.585	2.943	.00225	.001676
ELEMENT NO =	7	3	718.880	85.150	7.050	106.610	19.635	107.322	.000	2.943	.00000	.001676
ELEMENT NO =	7	3	722.000	85.150	7.339	39.830	9.621	58.893	.000	1.963	.00000	.001567
ELEMENT NO =	8	2	722.000	85.150	7.339	39.830	9.621	58.893	2.484	1.963	.00216	.001567
ELEMENT NO =	8	2	2149.400	88.230	6.509	39.830	9.621	50.911	2.484	1.963	.00216	.001567
ELEMENT NO =	9	3	2149.400	88.230	6.509	39.830	9.621	50.911	.000	1.963	.02778	.001567
ELEMENT NO =	9	3	2153.000	88.330	6.281	37.690	7.069	40.038	.000	1.997	.02778	.003193
ELEMENT NO =	10	2	2153.000	88.330	6.281	37.690	7.069	40.038	3.000	1.997	.00202	.003193
ELEMENT NO =	10	2	2499.400	89.030	6.687	37.690	7.069	42.908	3.000	1.997	.00202	.003193
ELEMENT NO =	11	3	2499.400	89.030	6.687	37.690	7.069	42.908	.000	1.997	.04444	.003193
ELEMENT NO =	11	3	2503.000	89.190	6.784	28.620	5.940	36.409	.000	1.777	.04444	.002929
ELEMENT NO =	12	2	2503.000	89.190	6.784	28.620	5.940	36.409	2.750	1.777	.00202	.002929
ELEMENT NO =	12	2	3003.520	90.200	7.240	28.620	5.940	39.117	2.750	1.777	.00202	.002929
ELEMENT NO =	13	3	3003.520	90.200	7.240	28.620	5.940	39.117	.000	1.777	.02494	.002929
ELEMENT NO =	13	3	3007.530	90.300	7.465	18.190	4.909	32.601	.000	1.444	.02494	.001967
ELEMENT NO =	14	2	3007.530	90.300	7.465	18.190	4.909	32.601	2.018	1.444	.00202	.001967
ELEMENT NO =	14	2	3353.520	91.000	7.445	18.190	4.909	32.505	2.018	1.444	.00202	.001967
ELEMENT NO =	15	3	3353.520	91.000	7.445	18.190	4.909	32.505	.000	1.444	.02874	.001967
ELEMENT NO =	15	3	3357.000	91.100	7.479	13.550	3.976	26.699	.000	1.279	.02874	.001914
ELEMENT NO =	16	2	3357.000	91.100	7.479	13.550	3.976	26.699	1.792	1.279	.00202	.001914

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 ELEMENT NO =  16 2    3703.520     91.800     7.443      13.550      3.976      26.554     1.792      1.279     .00202      .001914

 ELEMENT NO =  17 3    3703.520     91.800     7.443      13.550      3.976      26.554      .000      1.279     .02494      .001914
 ELEMENT NO =  17 3    3707.530     91.900     7.109      13.160      2.405      17.230      .000      1.351     .02494      .006898

 ELEMENT NO =  18 2    3707.530     91.900     7.109      13.160      2.405      17.230     1.750      1.351     .00202      .006898
 ELEMENT NO =  18 2    3905.750     92.300     8.076      13.160      2.405      19.557     1.750      1.351     .00202      .006898

 ELEMENT NO =  19 6    3905.750     92.300     8.076      13.160      2.405      19.557      .000      1.351     .00000      .000000
1    UPSTREAM          STATION     INVERT     DEPTH       Q         AREA       FORCE       DNORM      DCRIT      SLOPE       SFRICT


1                                              JUMP PROCESSING DEBUGGING TRACE
 NO PROCESSING IN SYSTEM OUTLET FOR JUMP - ELMNO =   1
 NO PROCESSING IN REACH FOR JUMP - ELMNO =   2
 NO PROCESSING IN WALL ENT FOR JUMP - ELMNO =   3


 JUMPP RCHJP PAR.NO.  STATION   D/S-STA-2  D/S-D-2    DC      U/S-F-1    D/S-F-1    U/S-F-2    D/S-F-2     SO       SC


             1050       10.500     248.243    2.510    2.510    184.350     71.337    179.923     69.326   .00200   .005730

U/S DEPTH =       .0000D/S-DEPTH =       .0000FORCE =       .0000STATION =       .0000


 JUMPP XJCTJP PAR.NO.   STATION   D/S-D-1  D/S/D-2    DC-1     DC-2    U/S-F-1    D/S-F-1    U/S-F-2    D/S-F-2


              2010      269.950    2.943    2.108    2.943    2.510    112.320     44.618    184.350     71.337
 NO PROCESSING IN REACH FOR JUMP - ELMNO =   6


 JUMPP XJCTJP PAR.NO.   STATION   D/S-D-1  D/S/D-2    DC-1     DC-2    U/S-F-1    D/S-F-1    U/S-F-2    D/S-F-2


              2010      718.880    1.963     .000    1.963    2.943     58.893     13.547    107.322       .000
```

```
 JUMPP RCHJP PAR.NO.  STATION   D/S-STA-2  D/S-D-2    DC      U/S-F-1    D/S-F-1    U/S-F-2    D/S-F-2     SO       SC

            1050      722.000    2124.775    1.963    1.963     50.911     13.998     58.893     13.547   .00216   .004293

U/S DEPTH =       .0000D/S-DEPTH =       .0000FORCE =       .0000STATION =       .0000

 JUMPP XJCTJP PAR.NO.   STATION   D/S-D-1  D/S/D-2    DC-1     DC-2    U/S-F-1    D/S-F-1    U/S-F-2    D/S-F-2

              2010     2149.400    1.997    1.690    1.997    1.963     40.038     13.201     50.911     13.998
 NO PROCESSING IN REACH FOR JUMP - ELMNO =  10

 JUMPP XJCTJP PAR.NO.   STATION   D/S-D-1  D/S/D-2    DC-1     DC-2    U/S-F-1    D/S-F-1    U/S-F-2    D/S-F-2

              2010     2499.400    1.777     .000    1.777    1.997     36.409      9.414     42.908       .000
 NO PROCESSING IN REACH FOR JUMP - ELMNO =  12

 JUMPP XJCTJP PAR.NO.   STATION   D/S-D-1  D/S/D-2    DC-1     DC-2    U/S-F-1    D/S-F-1    U/S-F-2    D/S-F-2

              2010     3003.520    1.444     .000    1.444    1.777     32.601      5.323     39.117       .000
 NO PROCESSING IN REACH FOR JUMP - ELMNO =  14

 JUMPP XJCTJP PAR.NO.   STATION   D/S-D-1  D/S/D-2    DC-1     DC-2    U/S-F-1    D/S-F-1    U/S-F-2    D/S-F-2

              2010     3353.520    1.279     .000    1.279    1.444     26.699      3.726     32.505       .000

 JUMPP RCHJP PAR.NO.  STATION   D/S-STA-2  D/S-D-2    DC      U/S-F-1    D/S-F-1    U/S-F-2    D/S-F-2     SO       SC

            1050     3357.000    3670.220    1.279    1.279     26.554      4.165     26.699      3.726   .00202   .005021
```

```
U/S DEPTH =       .0000D/S-DEPTH =       .0000FORCE =       .0000STATION =       .0000

 JUMPP XJCTJP PAR.NO.   STATION   D/S-D-1  D/S/D-2    DC-1     DC-2    U/S-F-1    D/S-F-1    U/S-F-2    D/S-F-2

              2010     3703.520    1.351     .963    1.351    1.279     17.230      3.912     26.554      4.165
 NO PROCESSING IN REACH FOR JUMP - ELMNO =  18

 JUMPP HDWKJP PAR.NO.   STATION   U/S-D-2  U/S-DC-2   D/S-F-1    U/S-F-2

              6010     3905.750    8.076     1.351      3.912     19.557
 END OF JUMP PASS

 FILE: lax1.WSW                              W S P G W - CIVILDESIGN Version 14.06                                          PAGE    1
                            Program Package Serial Number: 1651
                                            WATER SURFACE PROFILE LISTING                  Date: 8-10-2006  Time:11:24:55


 ********************************************************************************************************************* ********
         | Invert  |  Depth |  Water  |    Q    |  Vel     Vel  |  Energy | Super |Critical|Flow Top|Height/|Base Wt|      |No Wth
  Station |  Elev   |  (FT)  |  Elev   |  (CFS)  | (FPS)    Head |  Grd.El.|  Elev | Depth  | Width  |Dia.-FT|or I.D.|  ZL  |Prs/Pip
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-    -|
  L/Elem  |Ch Slope |        |         |         |         SF Ave|    HF   |SE Dpth|Froude N|Norm Dp |  "N"  | X-Fall|  ZR  |Type Ch
 *********|*********|********|*********|*********|*******|*******|*********|*******|********|********|*******|*******|***** |*******
         |         |        |         |         |                 |         |       |        |        |       |       |      |
    10.000    83.530    7.430    90.960    165.52    5.85     .53    91.49     .00    3.50      .00    6.000     .000   .00   1   .0
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-    -|-
      .500    .0000                                    .0015      .00     7.43     .00     .00    .013       .00   .00  PIPE
         |         |        |         |         |                 |         |       |        |        |       |       |      |
    10.500    83.530    7.431    90.961    165.52    5.85     .53    91.49     .00    3.50      .00    6.000     .000   .00   1   .0
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-    -|-
  WALL  ENTRANCE
         |         |        |         |         |                 |         |       |        |        |       |       |      |
    10.500    83.530    7.145    90.675    165.52    5.64     .49    91.17     .00    2.51     8.33    4.000    8.333   .00   1  1.0
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-    -|-
```

```
  259.450    .0020                                          .0026      .67     7.15     .53    3.82    .013       .00   .00  BOX
       |         |        |        |        |        |        |        |       |        |      |       |       |       |       |
  269.950    84.050    7.296    91.346    165.52    5.64     .49    91.84     .00    2.51    8.33    4.000    8.333   .00   1  1.0
      -|-       -|-      -|-       -|-       -|-      -|-     -|-       -|-     -|-      -|-     -|-      -|-      -|-     -|-     |-
JUNCT STR   .0247                                          .0021      .01    7.30     .53            .013       .00   .00  BOX
                    -------------------- WARNING - Junction Analysis - Change in Channel Type ---------------
       |         |        |        |        |        |        |        |       |        |      |       |       |       |       |
  274.000    84.150    7.305    91.455    106.61    5.43     .46    91.91     .00    2.94     .00    5.000     .000   .00   1   .0
      -|-       -|-      -|-       -|-       -|-      -|-     -|-       -|-     -|-      -|-     -|-      -|-      -|-     -|-     |-
  444.880    .0022                                          .0017      .75     7.30     .00    3.58    .013       .00   .00  PIPE
       |         |        |        |        |        |        |        |       |        |      |       |       |       |       |
  718.880    85.150    7.050    92.200    106.61    5.43     .46    92.66     .00    2.94     .00    5.000     .000   .00   1   .0
      -|-       -|-      -|-       -|-       -|-      -|-     -|-       -|-     -|-      -|-     -|-      -|-      -|-     -|-     |-
JUNCT STR   .0000                                          .0016      .01    7.05     .00            .013       .00   .00  PIPE
       |         |        |        |        |        |        |        |       |        |      |       |       |       |       |
  722.000    85.150    7.339    92.489     39.83    4.14     .27    92.76     .00    1.96     .00    3.500     .000   .00   1   .0
      -|-       -|-      -|-       -|-       -|-      -|-     -|-       -|-     -|-      -|-     -|-      -|-      -|-     -|-     |-
 1427.400    .0022                                          .0016     2.24     7.34     .00    2.48    .013       .00   .00  PIPE
       |         |        |        |        |        |        |        |       |        |      |       |       |       |       |
 2149.400    88.230    6.509    94.739     39.83    4.14     .27    95.01     .00    1.96     .00    3.500     .000   .00   1   .0
      -|-       -|-      -|-       -|-       -|-      -|-     -|-       -|-     -|-      -|-     -|-      -|-      -|-     -|-     |-
JUNCT STR   .0278                                          .0024      .01    6.51     .00            .013       .00   .00  PIPE
```



```
*********************************************************************************************************************** ********
         | Invert  |  Depth |  Water  |    Q    |  Vel     Vel  |  Energy | Super |Critical|Flow Top|Height/|Base Wt|      |No Wth
 Station |  Elev   |  (FT)  |  Elev   |  (CFS)  | (FPS)    Head |  Grd.El.|  Elev | Depth  | Width  |Dia.-FT|or I.D.|  ZL  |Prs/Pip
      -|-      -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-     -|-
 L/Elem  |Ch Slope |        |         |         |        SF Ave|    HF   |SE Dpth|Froude N|Norm Dp |  "N"  | X-Fall|  ZR  |Type Ch
*********|*********|********|*********|*********|*******|*******|*********|*******|********|********|*******|*******|***** |*******
         |         |        |         |         |       |       |         |       |        |        |       |       |      |
 2153.000    88.330    6.281    94.611     37.69    5.33     .44    95.05     .00    2.00     .00    3.000     .000   .00   1   .0
      -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-     -|-      -|-     -|-     -|-     |-
  346.400    .0020                                          .0032     1.11     6.28     .00    3.00    .013       .00   .00  PIPE
       |         |        |        |        |        |        |        |       |        |      |       |       |       |       |
 2499.400    89.030    6.687    95.717     37.69    5.33     .44    96.16     .00    2.00     .00    3.000     .000   .00   1   .0
```

```
        -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-     |-
JUNCT STR   .0444                                          .0031      .01    6.69     .00            .013       .00   .00  PIPE
          |         |        |         |        |              |        |       |        |        |        |        |      |
 2503.000    89.190    6.784    95.974    28.62    4.82     .36    96.33     .00    1.78      .00    2.750     .000   .00   1   .0
        -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-     |-
  500.520    .0020                                          .0029     1.47     6.78     .00    2.75    .013       .00   .00  PIPE
          |         |        |         |        |              |        |       |        |        |        |        |      |
 3003.520    90.200    7.240    97.440    28.62    4.82     .36    97.80     .00    1.78      .00    2.750     .000   .00   1   .0
        -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-     |-
JUNCT STR   .0249                                          .0024      .01    7.24     .00            .013       .00   .00  PIPE
          |         |        |         |        |              |        |       |        |        |        |        |      |
 3007.530    90.300    7.465    97.765    18.19    3.71     .21    97.98     .00    1.44      .00    2.500     .000   .00   1   .0
        -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-     |-
  345.990    .0020                                          .0020      .68     7.47     .00    2.02    .013       .00   .00  PIPE
          |         |        |         |        |              |        |       |        |        |        |        |      |
 3353.520    91.000    7.445    98.445    18.19    3.71     .21    98.66     .00    1.44      .00    2.500     .000   .00   1   .0
        -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-     |-
JUNCT STR   .0287                                          .0019      .01    7.45     .00            .013       .00   .00  PIPE
          |         |        |         |        |              |        |       |        |        |        |        |      |
 3357.000    91.100    7.479    98.579    13.55    3.41     .18    98.76     .00    1.28      .00    2.250     .000   .00   1   .0
        -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-     |-
  346.520    .0020                                          .0019      .66     7.48     .00    1.79    .013       .00   .00  PIPE
          |         |        |         |        |              |        |       |        |        |        |        |      |
 3703.520    91.800    7.443    99.243    13.55    3.41     .18    99.42     .00    1.28      .00    2.250     .000   .00   1   .0
        -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-     |-
JUNCT STR   .0249                                          .0044      .02    7.44     .00            .013       .00   .00  PIPE
          |         |        |         |        |              |        |       |        |        |        |        |      |
 3707.530    91.900    7.109    99.009    13.16    5.47     .46    99.47     .00    1.35      .00    1.750     .000   .00   1   .0
        -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-     |-
  198.220    .0020                                          .0069     1.37     7.11     .00    1.75    .013       .00   .00  PIPE
```



```
********************************************************************************************************************** ********
         | Invert  |  Depth |  Water  |    Q    |  Vel     Vel  |  Energy | Super |Critical|Flow Top|Height/|Base Wt|      |No Wth
 Station |  Elev   |  (FT)  |  Elev   |  (CFS)  | (FPS)    Head |  Grd.El.|  Elev | Depth  | Width  |Dia.-FT|or I.D.|  ZL  |Prs/Pip
```

L/Elem	Ch Slope				SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch	
3905.750	92.300	8.076	100.376	13.16	5.47	.46	100.84	.00	1.35	.00	1.750	.000	.00	1 .0

```
 10.00    .I                  C            H       W  E                                          .    R
 89.51    .IYYYYYYYYYYYYYYYYYYYCYYYYYYYYYYYYYYH       W  E                                          .    WE
169.01    .I            C        H               W  E                                          .    R
248.52    .                                                                                     .
328.02    .   I            C        H                  W  E                                     .    JX
407.53    .   I               C          H            W  E                                     .    R
```

```
 487.03    .                                                                .
 566.54    .                                                                .
 646.04    .                                                                .
 725.55    .        I               C          H          W E               .    JX
 805.05    .        I          C        H                  W E               .    R
 884.56    .                                                                .
 964.06    .                                                                .
1043.57    .                                                                .
1123.07    .                                                                .
1202.58    .                                                                .
1282.08    .                                                                .
1361.59    .                                                                .
1441.09    .                                                                .
1520.60    .                                                                .
```

```
1600.10    .                                                                .
1679.61    .                                                                .
1759.11    .                                                                .
1838.62    .                                                                .
1918.12    .                                                                .
1997.63    .                                                                .
2077.13    .                                                                .
2156.64    .                  I          C        H              W E        .    JX
2236.14    .                  I          C     H                 W E        .    R
2315.65    .                                                                .
2395.15    .                                                                .
2474.66    .                                                                .
2554.16    .                       I          C     H                 W E   .    JX
2633.67    .                        I         C     H                  W E   .    R
```

```
2713.17    .                                                                .
2792.68    .                                                                .
2872.18    .                                                                .
2951.69    .                                                                .
3031.19    .                    I         C     H                 W E       .    JX
3110.70    .                     I       C     H                   WE       .    R
3190.20    .                                                                .
3269.71    .                                                                .
3349.21    .                                                                .
3428.72    .                         I       C     H                  WE     .    JX
3508.22    .                         I       C    H                   WE     .    R
3587.73    .                                                                .
3667.23    .                                                                .
```

```
   3746.74    .                                          I       C    H                          WE         .    JX

   3826.25    .                                           I       C H                          W  E        .    R

   3905.75    .                                             I       C H                              W E .    R

              83.530    85.261    86.992    88.723    90.454    92.186    93.917    95.648    97.379    99.110   100.841
```

N O T E S
1. GLOSSARY
   I = INVERT ELEVATION
   C = CRITICAL DEPTH
   W = WATER SURFACE ELEVATION
   S = SUPER-ELEVATION
   H = HEIGHT OF CHANNEL
   E = ENERGY GRADE LINE
   X = CURVES CROSSING OVER
   B = BRIDGE ENTRANCE OR EXIT
   Y = WALL ENTRANCE OR EXIT
2. STATIONS FOR POINTS AT A JUMP MAY NOT BE PLOTTED EXACTLY

Appendix C
Ponding Analysis

The unit hydrograph was generated as described in the main text using the County's "TC Calculator". The unit hydrograph graph shown below as **Figure C.1** depicts the flow distribution expected on the south airfield which is tributary to the Dominguez Channel. As depicted on the graph, the allowable flow of 128cfs has been plotted along with the actual flow expected on the site. The volume of water shown under the hydrograph, but above the 128cfs threshold is the volume of water that must be temporarily retained onsite. Using a histogram and an approximation in five (5) minute intervals, the volume of water temporarily retained onsite can be determined. This histogram was then used to determine the volume of water above the flow threshold of 128cfs; this is the amount of water that must be held on site due to the introduction of the constrained system. **Table C.1** represents the time interval and flows that exceed the allowable discharge.

The ponding volume was then compared to the volume of water that can be retained in the infield areas of the runways. It was determined that the unit hydrograph only required storage of 9700 cubic feet (CF) and the infield areas allowed storage capacity close to 305,000 CF as can be seen in **Table C.2.** This suggests that the amount of flooding during the 50 year event will be minimal. The proposed infield holding area is shown in **Figure C.2** below. This flooding analysis estimates that there was sufficient capacity to retain the additional volume of water within the infield areas without flooding the adjacent runways and taxiways.

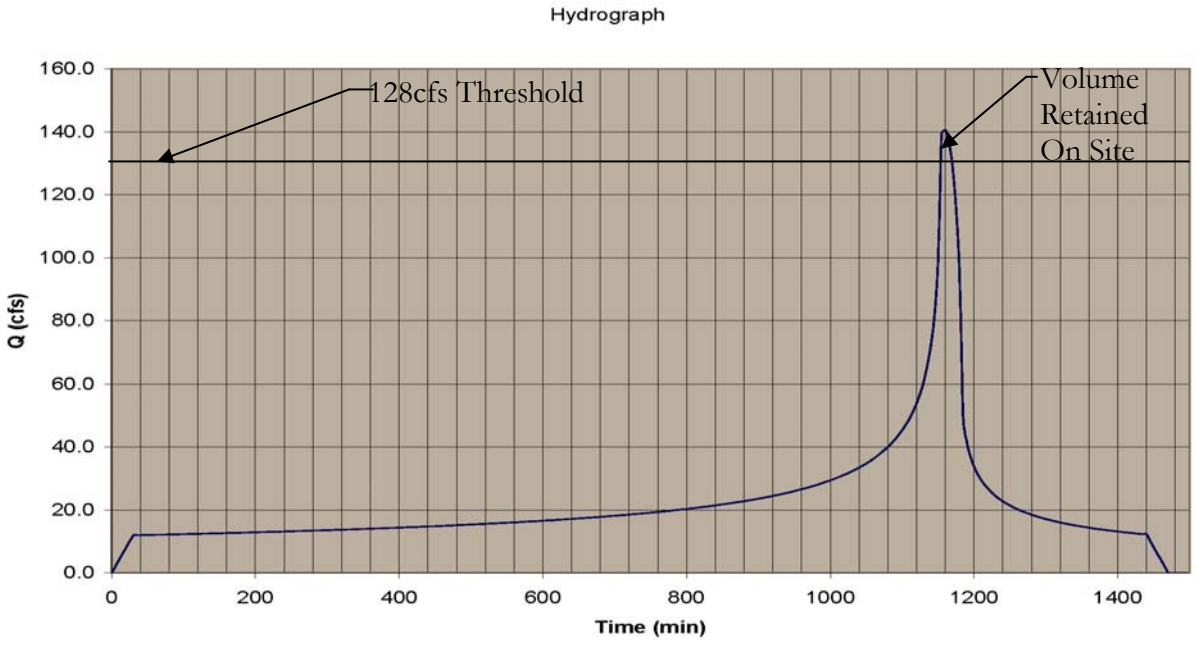

FIGURE C.1 Proposed Dominguez Channel Unit Hydrograph

Table C.1 Required On-site Storage Based on Unit Hydrograph				
Time (sec)	Q (cfs)	Excess Q (cfs)	Time (sec)	Volume (cf)
1,155	139.59	11.39	300	3,415.95
1,160	140.55	12.35	300	3,705.44
1,165	136.43	8.23	300	2,469.71
1,170	128.59	0.39	300	117.57
			Total Volume Required	**9,708.67**

Table C.2 Proposed On-site Storage Based on Infield Volume				
***Infield Designation**	**Length "L" (ft)**	**Width "B" (ft)**	**Depth "B" (ft)**	**Volume (cf)**
1	700	100	0.75	26,250
A2	1240	100	0.75	46,500
B1	500	100	0.75	18,750
B2	450	100	0.75	16,875
B3	250	60	0.45	3,375
B4	2050	100	0.75	76,875
C1	460	100	0.75	17,250
C2	521	100	0.75	19,537
C3	2120	100	0.75	79,500
			Total Volume Proposed	**304,912.5**

**Infield Designations denote the unpaved areas adjacent to runways/taxiways on the south field within the Dominguez Channel.*

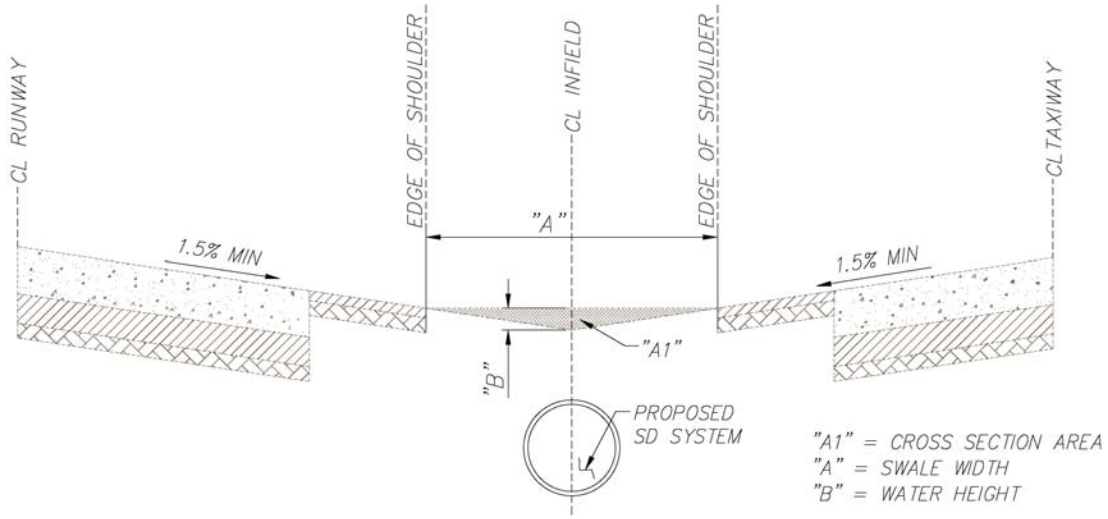

Figure C.2 Proposed Infield Geometry

Appendix D
Orifice Design Details

The Dominguez Channel analysis concluded that some type of capacity constraint is designed to limit the flows off of airport property. It was determined that an orifice would be installed to limit only the capacity of the system during high flows; this was accomplished by installing an orifice on the far downstream end of the system. To determine the amount of restriction that would be required on the outflow pipe, the drainage outlet was modeled for flow. The outflow pipe was modeled using the orifice equation to determine the amount of flow that the orifice would allow through the pipe. As outlined in table D1 below, the parameters from the WSPG runs are input into the orifice equation and the diameter is varied until the desired Q (128 CFS maximum) is produced. Additionally, figure D1 shows the proposed orifice design as suggested by the calculations.

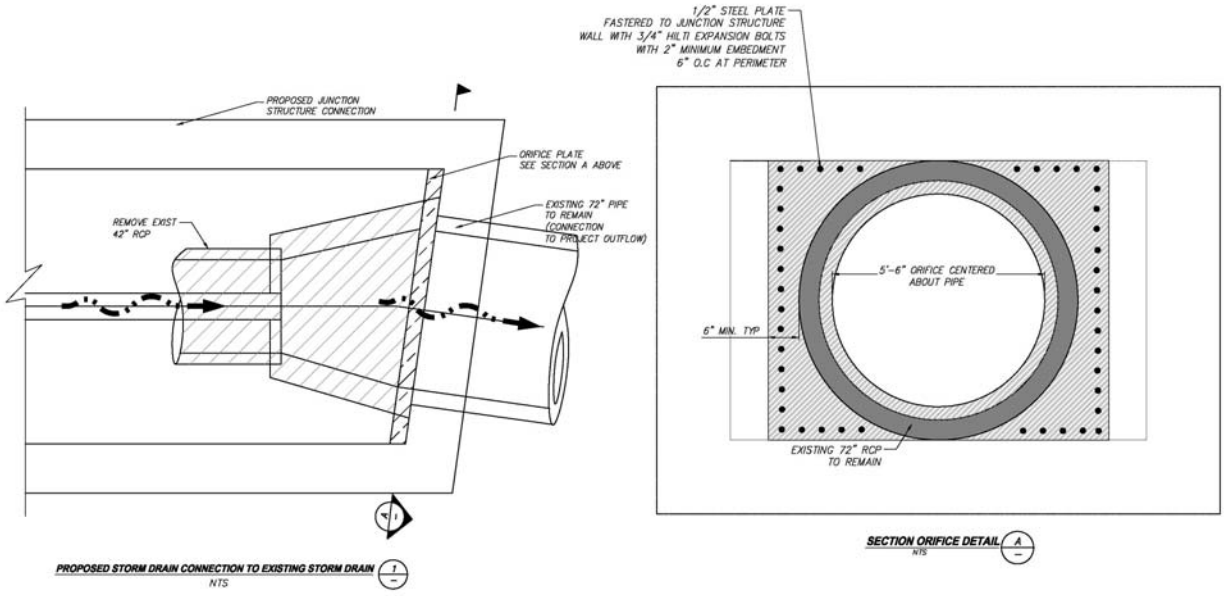

FIGURE D1: Orifice Details

Table D1: Orifice Calculations					
Head	Diameter of Orifice	Area of Orifice	Velocity of Liquid	K	Q
(ft)	(ft)	(ft^2)	(ft/sec)		(cfs)
1.64	5.50	23.76	10.28	0.51	124.52

Abbreviations:

V= Velocity (ft/sec)
Q= Quantity (ft^3/sec)
H, Head= differential head across orifice (ft)
A, Area of orifice (ft^2)
K, constant flow value for orifice
G= gravity (32.2 ft^2/sec)

Relevant Equations:

V=sqrt (2*g*H)
Q=A*V*K