Boeing and its predecessors' operations at SSFL since 1950 include research, development, assembly, disassembly, and testing of nuclear reactors, rocket engines, and chemical lasers. DOE conducted past operations in research and development of energy related programs, and seismic testing experiments. Current DOE activities onsite are solely related to facility closure, environmental remediation, and restoration.

SSFL was permitted to discharge excess water from its groundwater treatment system, industrial activities, onsite wastewater reclamation system, and rainfall runoff that has the potential to contain pollutants from the facilities. Approximately 60% of the discharge exited the property via two southerly discharge points (Discharge Outfalls 001 and 002) to Bell Creek, a tributary to the Los Angeles River, a water of the United States, with its confluence located near the intersection of Bassett Street and Owensmouth Avenue in Canoga Park, see Figure 1).

Past operations at the SSFL that may potentially contribute contaminants to discharges from the site include:

- Nuclear Operations, decontamination and decommissioning
- Monomethyl Hydrazine Usage,
- CTL-3 Chemical Laser Testing, and
- Energy Technology Engineering Center (ETEC) Cogeneration Operations.
- Rocket Engine and Component Testing

Nuclear Operations, decontamination and decommissioning: Nuclear research and development for the U.S. Department of Energy (DOE) and its predecessors was conducted at the SSFL from 1954 – 1989. The activities included developing and operating reactors, and fabricating and disassembling nuclear fuel. The government began to phase out the program in the 1960s. The last reactor was shut down in 1980, and nuclear research was terminated in 1989. This research and the associated activities resulted in residual contamination in Area IV.

There are currently no programs at the SSFL which employ special nuclear materials. Current decommissioning activities have reduced the inventory of radioactive waste at the SSFL to approximately 5 curies. Essentially all of this material is stored in shielded vaults located at the Radioactive Materials Handling Facility (RMHF). SSFL continues to utilize radioisotopes in the form of calibration sources which are necessary to calibrate radiation detectors and counting equipment. Periodic radiological monitoring of surface waters is conducted under the existing NPDES permit. Three radiological facilities located in Area IV of the SSFL remain to be decommissioned. Storm water run-off from Area IV of the SSFL is monitored for radioactivity. The Department of Energy (DOE) is responsible for the cost of decontamination and decommissioning.

Monomethyl Hydrazine Usage: Monomethyl hydrazine (MMH), a propellant, was used for research, development, and testing of rocket engines at the SSFL since 1955. The MMH, which was generated from testing operations was captured and treated by an ozonation unit under a variance, granted by the Department of Toxic Substances Control (DTSC). MMH is no longer used at SSFL.

CTL-3 Chemical Laser Testing: CTL-3 Chemical Laser Testing was not operational in 2004. In 2005, limited operations resumed at the facility. There is no discharge to surface waters from this area.

Energy Technology Engineering Center (ETEC) Cogeneration Operations: The Sodium Component Testing Installation (SCTI) (cogeneration) unit of ETEC utilized two cooling tower operations, Power Pac and E-5. Both systems were shut down and will not be reactivated. The facility has been decommissioned and was demolished in July 2003.

Rocket Engine and Component Testing: An engine test consisted of a cycle of one to three engine runs lasting one to three minutes each. A test cycle may take one to two weeks to complete. Each engine run results in the use of 50,000 to 200,000 gallons of deluge/cooling water that may come in contact with fuels such as LOX or kerosene and associated combustion products. The frequency of testing historically varied depending on production requirements. In July 2004 the frequency of testing was one test cycle every one to two months. In January 2006 the Discharger indicated that the frequency of testing had significantly decreased over the past year and was likely to shut down completely during the life of this permit (expiration date June 10, 2009). The updated ROWD submitted February 2007 provided documentation that rocket engine and component testing operations at the facility had terminated.

Current and Future Operations: Since the SSFL is a test facility, it is difficult to anticipate future test projects and possible wastewater generation. Following are descriptions of expected operations:

1. Treatment Under Tiered Permitting Rules. Boeing may explore the feasibility of treating certain waste streams by either a mobile or fixed hazardous waste treatment unit operating under DTSC Permit-by-Rule requirements. Treated effluent would then be released into the ponds.

2. Unspecified waste streams generated during remediation, cleaning, assembly, testing and support operations at the facility.

Groundwater Remediation: During the early 1950s to the mid-1970s, volatile organic compounds were utilized for the cleaning of hardware and rocket engine thrust chambers, and for the cleaning of other equipment. These solvents migrated into the subsurface, contaminating groundwater primarily with trichloroethylene (TCE) and 1,2-dichloroethylene (1,2-DCE).

As a result, in July 2004 there was an extensive groundwater remediation/investigation program in progress at the SSFL, which included pumping, treating and storing groundwater at the facility. The system was composed of eight treatment systems, five being active (two currently in use) and three being inactive (standby status), which had the capability of producing up to 578 million gallons per year of groundwater treated to remove the volatile organic compounds. The treatment system was not designed to treat other pollutants such as perchlorate or metals. The chemical treatments used in groundwater treatment operations consisted of ultraviolet light and hydrogen peroxide oxidation, carbon adsorption, and the physical treatment consisted of air stripping towers. These treatment systems were regulated under Resource Conservation and Recovery Act (RCRA) part A and part B hazardous waste permits by DTSC, and various air quality control permits

issued by Ventura County. Boeing plans to treat effluent from the SSFL groundwater remediation operation in either a mobile or fixed hazardous waste treatment unit operating under DTSC Permit-By-Rule requirements. The waste stream to be treated would be classified under these regulations as non-RCRA or RCRA exempt hazardous waste. In addition, there will also be intermittent pilot projects where test wells will be drilled and groundwater treated to determine optimum locations for future wells. Effluent from the groundwater remediation operations will be discharged to a separate outfall (Outfall 019).

Sewage Treatment Plants: Historically, two package-type activated sludge sewage treatment plants (STP1 and STP3) provide secondary and tertiary treatment for the sewage. Disinfected sewage effluent from the activated sludge facilities was directed to the ponds. A third activated sludge sewage treatment plant (STP2) was available, but was used only as a pump station to STP-3 and as temporary storage of excess sewage. There were no discharges to receiving waters from STP-2.

Operations terminated at STP3 in October 2001 and at STP1 in December 2001. Recently, domestic sewage that had previously been treated at STP1 and STP3 has been diverted offsite. The STP1 and STP3 basins are used as collection points. Every few days, vacuum trucks transport the accumulated waste offsite for treatment. In July 2004, the Discharger requested that the permit continue to cover potential discharges from these plants, as it may be necessary to bring them back on line in the future.

The ROWD submitted in February 2007 indicated that discharges from the sewage treatment plants would not be resumed. Waste water collected would continue to be shipped offsite for disposal at one of the Los Angeles County Sanitation District's publicly owned treatment wastewater (POTW) facilities. The Discharger also requested that the compliance locations be deleted from this order (R4-2007-0055).

Water Reclamation System and Discharges: When in operation, effluent discharges from STP1 and STP3, the two sewage treatment plants, subsequently enter an onsite water retention system. Historically, SSFL utilized a system of natural, unlined and man-made ponds and channels to collect water from onsite operations. Water supplied to the retention system came from any one or a combination of the following sources: storm water, treated groundwater, treated sanitary sewage, rocket engine test cooling water, or domestic water purchased from an established purveyor. The water was stored in a series of 100,000-gallon steel tanks located in Area 2 called Skyline. Water from Perimeter and R-1 ponds may be pumped to the Skyline tanks where it can be transferred to Silvernale Pond. Water purchased from the Calleguas Water District was also stored at Skyline where it was used to cool test stands during engine testing and discharges to Silvernale Pond.

The water reclamation system consisted of five ponds.

R-1 Pond	capacity 3.7 million gallons
Perimeter Pond	capacity 1.3 million gallons
Silvernale Pond	capacity 6.0 million gallons
R2-B Pond	capacity 200,000 gallons
R2-A Pond	capacity 2.5 million gallons

The Coca Pond was previously used as a retention basin to collect water from the space shuttle main engine testing area. When Coca Pond was filled to capacity, it discharged to

the R-2 Pond. The pond was used to collect water that leaked from the fire suppression system located in the former test area. If sufficient leaks occurred, the pond discharged to R-2.

Area I utilized the R-1 Pond as a reservoir. Water retained in the R-1 Pond was primarily comprised of storm water. Other sources included effluent from Sewage Treatment Plant 1 and treated groundwater. While this was a water reclamation system in the past, it is currently used as a retention system to minimize discharges.

Storm water collected at the facility is primarily stored at Silvernale Pond and R-2A Pond. As in Area I, the primary source of water stored in the ponds comes from storm water. Other sources included effluent from Sewage Treatment Plant 3, cooling water runoff from test operations and treated groundwater. While this was a water reclamation system in the past, it is currently used as a retention system to minimize discharges. Historically, if the supply of reclaimed water exceeded requirements, the water was discharged to the south through R-2A Pond, and then to Bell Creek through Outfall 002.

The SSFL is underlain by alluvium, weathered bedrock and unweathered bedrock. The alluvium occurs in narrow drainages and alluvial valleys and is underlain by the Chatsworth Formation. The Chatsworth Formation consists of fractured sandstone with interbeds of siltstone and claystone, which can transmit water as well as contaminants.

The groundwater system at the SSFL is divided into two aquifers; the shallow and the deep. The alluvium and weathered bedrock comprise the shallow aquifer, and the unweathered and fractured Chatsworth Formation comprise the deep aquifer.

The groundwater in the shallow aquifer generally reflects surface topography. In April 2002, groundwater depths in the shallow aquifer ranged from approximately 6 feet to 40 feet below grade. Wells in the deeper aquifer, contained groundwater between approximately 23 feet to approximately 520 feet below grade.

In dry weather, ongoing activities were normally sufficient to use the water generated from onsite groundwater treatment systems. However, in recent years this water balance has changed. In July 2004, the Discharger indicated that water added into the system from the Calleguas Water District, plus the reduction of testing activities, had caused releases from R-2A Pond (located upstream from Outfall 002) to become intermittent. During hot weather, the water released either evaporated or percolated into the ground before reaching Discharge Outfall 002. Thus, no offsite discharge of water occurred.

Historically, discharges from the groundwater treatment systems, the engine test stands and the water reclamation ponds located onsite in most cases enter naturally occurring drainage channels. Some of these channels are unlined, but portions of many of them have been lined or the flow is transported using piping to a natural drainage channel. Since the wastewater entered natural water transport channels onsite, these channels are considered waters of the United States and are thus subject to the Clean Water Act. These onsite natural drainage channels are tributaries to Bell Creek, hence limitations for discharges to them must protect the beneficial uses for discharges to Bell Creek and the downstream reaches of the Los Angeles River. Similarly, because certain natural drainage channels are unlined and groundwater recharge is a designated beneficial use in Bell Creek and its tributaries,

limitations for discharges to the channels must protect the underlying beneficial uses of the groundwater.

Many of the areas that discharged wastewater to the drainage areas and streambeds were associated with RCRA activities that are being directed by DTSC. The RCRA activities at the site include Post Closure Permits and investigation and corrective action oversight of contaminated areas. The Post Closure Permits cover the operation of the groundwater treatment systems. The investigation and corrective action oversight includes the site characterization and delineation of areas of contamination as well as subsequent cleanup operations at areas of concern onsite.

The 1995 Final SB 1082 Framework which was issued on December 14, 1995 documents the framework for implementing Health and Safety Code Section 25204.6(b) dealing with jurisdictional overlap between DTSC and the Regional Water Quality Control Boards (RWQCBs). SB 1082 requires that "sole jurisdiction over the supervision of that action [meaning oversight of those corrective action activities] is vested in either the department or the State Water Resources Control Board and the California Regional Water Quality Control Boards." Since many of the identified wastewater sources are currently involved in the RCRA corrective action or the Post Closure Permits with DTSC as the oversight agency, consistent with RCRA, DTSC will ensure that the discharges from these operations through the RCRA permitting process meet the substantive Clean Water Act requirements. Regional Board staff will provide appropriate comments during the revision of RCRA permits to ensure the Clean Water Act, Porter-Cologne Act, and the Basin Plan requirements are met. However, at all times, the final downstream Outfalls 001 and 002 will be regulated by the accompanying NPDES permit and will implement relevant water quality standards.

There were several other operations that discharged wastewater to the onsite drainageways and streambeds which were not included in the RCRA corrective action. Order R4-2004-0111 covered these activities.

The operations evaluated at SSFL, the agency (Regional Board or DTSC) with primary oversight authority, and the NPDES outfall number associated with the operation if the Regional Board has oversight are listed below and in Figure 2.

	Operation	NPDES Outfall No.	Agency
1.	Wastewater and Storm water runoff	001	RWQCB
2.	Wastewater and Storm water runoff	002	RWQCB
3.	Storm water Radioactive Material Handling Facility	003	RWQCB
4.	Storm water Sodium Reactor Exp.	004	RWQCB
5.	Storm water Sodium Burn Pit 1	005	RWQCB
6.	Storm water Sodium Burn Pit 2	006	RWQCB

	Operation	NPDES Outfall No.	Agency
7.	Storm water Building 100	007	RWQCB
8.	Storm water Happy Valley	008	RWQCB
9.	Storm water WS-13 Drainage	009	RWQCB
10.	Storm water Building 203	010	RWQCB
11.	R-1 Pond	-----	DTSC
12.	Perimeter Pond	011	RWQCB
13.	R-2 Ponds (R-2A and R-2B)	-----	DTSC
14.	R-2 Spillway	018	RWQCB
15.	Silvernale Pond	-----	DTSC
16.	Alfa Test Stand	012	RWQCB
17.	Bravo Test Stand	013	RWQCB
18.	WS-5 Groundwater Treatment System (GWTS)	-----	DTSC
19.	RD-9 GWTS	-----	DTSC
20.	Alfa GWTS	-----	DTSC
21.	Delta GWTS	-----	DTSC
22.	STLV-IV GWTS	-----	DTSC
23.	Area 1 Road GWTS/AST	-----	DTSC
24.	Bravo GWTS/AST	-----	DTSC
25.	Canyon GWTS/AST	-----	DTSC
26.	Interim GWTS near FSDF*	-----	DTSC
27.	Interim GWTS near Bldg 59*	-----	DTSC
28.	Interim GWTS near RMHF*	-----	DTSC
29.	APTF	014	RWQCB
30.	STP-1 – effluent	015	RWQCB
31.	STP-2 – effluent	016	RWQCB
32.	STP-3 – effluent	017	RWQCB
33.	Groundwater Treatment System	019	RWQCB

* Implemented in Interim Measures at the site. If the systems continue they will be included in the revised Post Closure Permit.

Operations enumerated in items 1 through 32 were included in Order R4-2004-0111 and subsequent revisions (Orders R4-2006-0008 and R4-2006-0036). Item 33 identifies a new outfall that is added in this Order (R4-2007-0055). The updated ROWD submitted on February 20, 2007, included a request to discharge treated groundwater from a new groundwater treatment system, operating under Permit-By-Rule requirements, to the streambed downstream of Outfall 011 and upstream of Outfall 001. The treated groundwater is a wastewater discharged from a point source. The discharge will be regulated by the RWQCB in this permit. Order R4-2004-0111 and subsequent revisions did not regulate treated groundwater at the point of discharge. However, once the treated groundwater was mixed with wastewater from the sewage treatment plants, rocket engine test operations, and storm water runoff in the onsite water reclamation/retention system and was subsequently discharged via Outfalls 011, 018, 001, and 002 it was regulated as a component of the mixed wastewater. The new compliance point (Outfall 019) will be the compliance point for the treated groundwater only. The groundwater treatment systems listed in the table above will be taken off line and the new groundwater treatment system operating under Permit-By-Rule

requirements are permitted in Order R4-2007-0055. The new compliance point is included in the previous table.

Operations at the test stands (Outfalls 012 -014) and the sewage treatment plants (Outfalls 015 – 017) have ceased. No further process waste discharges are expected from these areas.

Storm Water Discharges

In 1989, EPA conducted an investigation and submitted a report on SSFL environmental issues. The report specified under the recommended and planned actions that the Regional Board was to use the Clean Water Act to ensure run-off from the northwest side of Area IV was not contaminated. In response to the request, Boeing developed a surface water monitoring program for the northwest slope area that was subsequently approved by EPA and implemented.

The topography of the SSFL is such that approximately 70% of rainfall runoff is routed to one of the two southerly-located retention ponds and is discharged from the site via Discharge Outfalls 001 or 002. Storm water runoff from the northwest slope of the facility is monitored at Discharge Outfalls 003, 004, 005, 006, 007, 009, AND 010 which discharge towards the Arroyo Simi. The outfall locations near the Northwest slope are located such that they capture runoff from past and existing radiological facilities.

There is one more storm water monitoring location Discharge Outfall 008 (formerly referred to as Happy Valley and Happy Valley 1). This outfall captures runoff from an area that has previously been used for operations that involved perchlorate and monitoring events have yielded detections of perchlorate in the storm water runoff. Storm water from Happy Valley flows to Dayton Canyon Creek. The flow from Dayton Canyon Creek joins Chatsworth Creek, which flows south to Bell Creek southwest of the intersection of Shoup Avenue and Sherman Way. Bell Creek flows east to the Los Angeles River. Order R4-2004-0111 implements effluent limitations for conventional pollutants and perchlorate at Outfall 008. Monitoring for the emergent chemicals and EPA priority pollutants except asbestos was also required in that Order.

The objective of this Order is to protect the beneficial uses of receiving waters. To meet this objective, storm water runoff discharges from the SSFL are subject to requirements stipulated in this NPDES permit and the Discharger will be required to comply with all applicable provisions of the Storm Water Pollution Prevention Plan (Attachment A of the Order). This plan includes requirements to develop, implement, and when appropriate update a Storm Water Pollution Prevention Plan (SWPPP) along with Best Management Practices (BMPs) that will prevent all pollutants from contacting storm water and with the intent of keeping all contaminants of concern from moving into receiving waters.

Storm water sampling events during 1999, 2000 and 2001 yielded exceedances of existing effluent limitations for several contaminants of concern. These effluent violations indicate that the implementation of best management practices (BMPs) to control the transport of contaminants off site were not effective. Storm water runoff exiting the northern boundary of the site travels via Meier and Runkle Canyons to the Arroyo Simi, a tributary of Calleguas Creek. Hence, this Order includes effluent limitations for the storm water discharges from the site for priority pollutants with reasonable potential.

In 2004, site inspections resulted in the identification of two other storm water monitoring locations:

- WS-13 Drainage Area Discharge Outfall 009
- Building 203 Discharge Outfall 010

Storm water runoff from the area that drains to discharge points 001, and 002 is estimated at 34 and 51 million gallons per day (MGD) (based on a 24-hour duration, 10-year return storm). Historically, this runoff was mixed with industrial waste collected in the ponds prior to discharge. Discharges from Outfall 008 are composed solely of storm water runoff.

The estimated flow from the area that drains storm water only from the northwest slope and discharges it via discharge points 003, 004, 005, 006, 007, 009 and 010 and via various drainage channels into Meier, Runkle and Woolsey Canyons is 35 MGD. (Figure 2).

The locations and the associated drainage areas are listed below for each of the seven storm water only discharge locations:

Discharge Outfall	Latitude (North)	Longitude (West)	Vicinity
*003 (RMHF)	34º 14' 4.0"	118º 42' 38.4"	Radioactive Materials Handling Facility
*004 (SRE)	34º 14' 9.1"	118º 42' 23.9"	Former Sodium Reactor Experiment
*005 (SBP-1)	34º 13' 48.1"	118º 43' 3.9"	Former Sodium Burn Pit 1
*006 (SBP 2)	34º 13' 50.7"	118º 42' 59.9"	Former Sodium Burn Pit 2
*007 (B100)	34º 13' 50.2"	118º 42' 52.5"	Building 100
009(WS-13)	34º 14' 17"	118º 41' 38"	WS-13 Drainage Area
010(Bldg. 203)	34º 14' 17"	118º 41' 56"	Building 203

* Established after EPA investigation.

The storm water samples collected are analyzed for radioactivity and for a number of other priority pollutants that may be present.

There is no flow from these locations except during heavy rainfall. For purposes of access and safety, these sampling stations have been established inside the SSFL northwest property boundary. The stations are located in close proximity to past and/or existing radiological facilities or other operations, as noted in the vicinity column above.

Storm water from APTF flows toward Bell Creek and the Los Angeles River. Current operations at the facility have shut down. Past operations included small engine testing using kerosene (RP-1), hydrogen, potentially alcohol, methanol, peroxide, and liquid oxygen (LOX). Nitrogen was also used for purge gas. After testing the staging areas were not routinely washed down to remove residual contaminants from the test operations. During normal operations testing may have occurred during storm events.

It is likely that contaminants associated with the engine test material would be present in the storm water runoff from the area. Hence, this permit requires that the storm water runoff from the area be monitored. If the monitoring data indicates reasonable potential,

the permit will be reopened and effluent limitations will be implemented. In July 2004, the Discharger indicated that the standard operating procedures for the area in the future would include washdowns of the staging areas after engine tests. The water associated with the washdown would be collected and disposed of offsite. If testing operations occurred during storm events, the Discharger would collect the storm water runoff from the staging area for offsite disposal. If washdowns did not occur after test operations or if testing occurs during storm events and the water is not collected for offsite disposal, the Discharger would be required to sample it as stipulated for other storm water monitoring locations.

Historical engine testing in the area has likely resulted in residual contamination. Therefore, this permit (Order R4-2007-0055) includes requirements to monitor storm water runoff from the area (Outfall 014).

Compliance History

Discharges from the Santa Susana Field Laboratory historically, have exceeded effluent limitations included in the NPDES permit constituents that are present at elevated concentrations onsite. These constituents with elevated concentrations are present as a result of past operations. The permit exceedances have resulted in a number of enforcement actions. Following is a summary of the enforcement actions to date.

A Notice of Violation (NOV) was issued for exceedances occurring after January 2000 on June 27, 2001 and SSFL provided additional information. A revised NOV was issued on October 19, 2001 and the Administrative Civil Liability complaint was issued on April 29, 2002. The Discharger completed the stipulated requirements on October 9, 2002.

On February 6, 2004 a NOV was issued for the violations identified in the Table that occurred prior to January 2000, and subsequent to the previously mentioned NOV that have not been adequately addressed by the Discharger.

Order No. R4-2004-0111 was adopted on July 1, 2004 and implemented effluent limitations that are more stringent than those from Order 98-051. That Order was updated in January 2006 and in March 2006. The discharger has reported numerous violations of the effluent limitations included in these orders. Notices of Violation were issued on February 6, 2004, March 14, 2005, October 7, 2005, April 20, 2006, and November 7, 2006, for violations included in self monitoring reports submitted through May 31, 2006.

The Regional Board on July 25, 2007, issued Complaint No. R4-2007-0035 for Administrative Civil Liability against the Boeing Company in the amount of $471,190. On August 27, 2007, Boeing waived its right to a hearing and submitted full payment of the civil liability. A Notice of Conclusion of Enforcement Action was issued referencing this case on September 11, 2007.

On June 11, 2008, the Regional Board issued a NOV for 24 violations of Order Nos. R4-2004-0111, R4-2006-0008, R4-2006-0036, and R4-2007-0055. That NOV included violations at Outfalls 003, 004, 006, 009, 010, 011, and 018 for 4th Quarter 2006 through the 1st Quarter of 2008. There were no discharges in the 2nd and 3rd Quarters of 2008. The 4th Quarter monitoring yielded exceedances of pH and chronic toxicity at Outfall 004 and an exceedance of pH at Outfall 006.

IV. Applicable Statutes, Plans, Policies, and Regulations

A. *Clean Water Act* (CWA). The federal CWA requires that any point source discharge of pollutants to a water of the United States must be done in conformance with an NPDES permit. NPDES permits establish effluent limitations that incorporate various requirements of the CWA designed to protect water quality.

B. *Water Quality Control Plan for the Coastal Watersheds of Los Angeles and Ventura Counties* (Basin Plan). The Basin Plan contains water quality objectives and beneficial uses for inland surface waters and for the Pacific Ocean. The receiving water for storm water runoff from Outfall 008 (Happy Valley) is Dayton Canyon Creek which flows to Chatsworth Creek. Chatsworth Creek merges with Bell Creek and Bell Creek flows into the Los Angeles River. The receiving water for the permitted discharge of the treated effluent via Outfalls 001, 002, 011 and 018 is Bell Creek a tributary to the Los Angeles River. The beneficial uses of the Dayton Canyon Creek, Bell Creek and the Los Angeles River are:

Dayton Canyon Creek – Hydrologic Unit 405.21

Existing: wildlife habitat
Intermittent: groundwater recharge, contact and non-contact water recreation; warm freshwater habitat.

Bell Creek – Hydrologic Unit 405.21

Existing: wildlife habitat
Intermittent: groundwater recharge, contact and non-contact water recreation; warm freshwater habitat.

The Los Angeles River upstream of Figueroa Street – Hydrologic Unit 405.21:

Existing: groundwater recharge; contact and non-contact water recreation, warm freshwater habitat; wildlife habitat; and wetland habitat.
Potential: industrial service supply.

Los Angeles River downstream of Figueroa Street –Hydrologic Unit 405.15

Existing: groundwater recharge, contact and non-contact water recreation, and warm freshwater habitat.
Potential: industrial service supply and wildlife habitat.

Los Angeles River downstream of Figueroa Street – Hydrologic Unit 405.12

Existing: groundwater recharge; contact and noncontact water recreation; warm freshwater habitat; marine habitat; wildlife habitat; and rare, threatened, or endangered species.
Potential: industrial service supply; industrial process supply; migration of aquatic organisms; spawning, reproduction, and/or early development; and shellfish harvesting.

Los Angeles River Estuary – Hydrologic Unit 405.12

Existing: industrial service supply; navigation; contact and non-contact water recreation; commercial and sport fishing; estuarine habitat; marine habitat; wildlife habitat; rare, threatened, or endangered species; migration of aquatic organisms; spawning, reproduction, and/or early development; and wetland habitat.
Potential: shellfish harvesting.

Dayton Canyon Creek, Bell Creek and all of the reaches of the Los Angeles River listed except for the estuary also have municipal and domestic supply (MUN) listed as a potential beneficial use with an asterisk in the Basin Plan. This is consistent with Regional Board Resolution 89-03; however the Regional Board has only conditionally designated the MUN beneficial uses and at this time cannot establish effluent limitations designed to protect the conditional designation.

The storm water runoff from Outfalls 003 through 007, 009 and 010 discharges from the SSFL exit the site to the northwest and flows down the Meier and Runkle Canyons toward the Arroyo Simi. The Arroyo Simi is tributary to the Calleguas Creek. The beneficial uses for the receiving water are listed below.

Arroyo Simi – Hydrologic Unit 403.62

Existing: wildlife habitat, rare, threatened, or endangered species habitat,
Intermittent: industrial process supply, groundwater recharge, freshwater replenishment, contact and non-contact water recreation, warm freshwater habitat;

Arroyo Las Posas – Hydrologic Unit 403.62

Existing: groundwater recharge, freshwater replenishment, contact and non-contact water recreation, warm freshwater habitat, wildlife habitat,
Potential: industrial process supply, industrial service supply, agricultural supply, and cold freshwater habitat.

Calleguas Creek – Hydrologic Unit 403.12

Existing: industrial service supply, industrial process supply, agricultural supply, groundwater recharge, contact and non-contact water recreation, warm freshwater habitat, and wildlife habitat,

Calleguas Creek – Hydrologic Unit 403.11

Existing: agricultural supply, groundwater recharge, freshwater replenishment; contact and non-contact water recreation, warm freshwater habitat, cold freshwater habitat, wildlife habitat, rare, threatened or endangered species, and wetland habitat,

Calleguas Creek Estuary – Hydrologic Unit 403.11

Existing: noncontact water recreation, commercial and sport fishing, estuarine habitat, wildlife habitat, rare, threatened or endangered species, migration of aquatic organisms, spawning, reproduction, and/or early development, and wetland habitat;
Potential: navigation and water contact recreation.

Mugu Lagoon – Hydrologic Unit 403.11

Existing: navigation, non-contact water recreation, commercial and sport fishing, estuarine habitat, marine habitat, preservation of biological habitats, wildlife habitat, rare, threatened or endangered species, migration of aquatic organisms, spawning, reproduction, and/or early development, shellfish harvesting, and wetland habitat,
Potential: water contact recreation.

All of the reaches of Calleguas Creek except the estuary also include conditional municipal and domestic supply designations as an intermittent or potential beneficial use in the Basin Plan.

C. **Ammonia Basin Plan Amendment**. The 1994 Basin Plan provided water quality objectives for ammonia to protect aquatic life, in Tables 3-1 through Tables 3-4. However, those ammonia objectives were revised on April 25, 2002, by the Regional Board with the adoption of Resolution No. 2002-011, *Amendment to the Water Quality Control Plan for the Los Angeles Region to Update the Ammonia Objectives for Inland Surface Waters (including enclosed bays, estuaries and wetlands) with Beneficial Use designations for protection of Aquatic Life*. The ammonia Basin Plan amendment was approved by the State Board, the Office of Administrative Law, and USEPA on April 30, 2003, June 5, 2003, and June 19, 2003, respectively. Although the revised ammonia water quality objectives may be less stringent than those contained in the 1994 Basin Plan, they are protective of aquatic life and are consistent with USEPA's 1999 ammonia criteria update.

D. ***Title 22 of the California Code of Regulations.*** The California Department of Health Services established primary and secondary maximum contaminant levels (MCLs) for a number of chemical and radioactive contaminants. These MCLs can be found in Title 22, California Code of Regulations (Title 22). Chapter 3 of the Basin Plan incorporates portions of Title 22 by reference. In addition, narrative objectives require the ground waters shall not contain taste or odor-producing substances in concentrations that affect beneficial uses. The secondary MCLs in Title 22 are designed to ensure that the water's taste and odor does not affect its suitability as drinking water. Title 22 MCLs have been incorporated into NPDES permits and Non-Chapter 15 WDRs to protect the municipal and domestic supply (MUN) and groundwater recharge (GWR), where the underlying groundwater has a designated MUN beneficial use.

Groundwater Recharge. Sections of Bell Creek and Arroyo Simi, near the SSFL discharge points, are designated as GWR indicating that groundwater recharge is a beneficial use. Surface water from the Bell Creek enter the Los Angeles River

Watershed. The headwaters of the Los Angeles River originate in the Santa Monica, Santa Susana, and San Gabriel Mountains. Four basins in the San Fernando Valley area contain substantial deep groundwater reserves and are recharged mainly through runoff and infiltration.

Surface water discharges from the north west edge of the SSFL are directed to Arroyo Simi, a tributary located in the Calleguas Creek Watershed. Supplies of groundwater are critical to agricultural operations and industry (sand and gravel mining) in this watershed.

Moreover, much of the population in the watershed relies upon groundwater for drinking. Since groundwater from these basins is used to provide drinking water to a large portion of the population, Title 22-based limitations are needed to protect that drinking water supply. By limiting the contaminants in the SSFL discharges, the amount of pollutants entering the surface waters and groundwater basins are correspondingly reduced. Once groundwater basins are contaminated, it may take years to clean up, depending on the pollutant. Compared to surface water pollution, investigations and remediation of groundwater are often more difficult, costly, and extremely slow. For these reasons Title 22-based limitations will remain in the NPDES permit where there is reasonable potential.

On December 17, 2003, the Regional Board received the December *2003 Technical Memorandum Analysis of Groundwater Recharge, Santa Susana Field Laboratory, Ventura County, California*, prepared by Montgomery Watson Harza on behalf of the Boeing Company. This document was submitted to DTSC in order to present a qualitative and quantitative analysis of groundwater recharge at the Santa Susana Field Laboratory. Regional Board staff have also reviewed this document and finds that a reasonable conclusion for the amount of rainfall that infiltrates soil using a water balance method is between 23% and 26%. Using a chloride mass balance method resulted in a range of 1% to 12% rainfall infiltration. As these calculations by different methodologies differ significantly and are inconclusive, Regional Board staff finds that there is insufficient data to suggest that rainfall will not significantly recharge groundwater in the underlying surficial soils, weathered and fractured bedrock. In addition, there has been no site-specific soil attenuation factor/model submitted for Regional Board staff review. Inasmuch, those limitations placed in this Order to protect groundwater recharge beneficial uses and beneficial uses of underlying groundwater apply at end-of-pipe.

Notification Levels. California Department of Health Services (DHS) establishes Notification Levels (NLs), or health based advisory levels, for chemicals in drinking water that lack MCLs. Through 2004, the Notification Levels were referred to as Action Levels (ALs). An AL is the concentration of a chemical in drinking water that is considered not to pose a significant risk to people ingesting that water on a daily basis. ALs may be established by DHS for non-regulated chemical contaminants when one of the following occurs:

1. A chemical is found in an actual or proposed drinking water source, or
2. A chemical is in proximity to a drinking water source, and guidance is needed, should it reach the source.

An AL is calculated using standard risk assessment methods for non-cancer and cancer endpoints, and typical exposure assumptions, including a 2-liter per day ingestion rate, a 70-kilogram adult body weight, and a 70-year lifetime. For chemicals that are considered carcinogens, the AL is considered to pose "de minimus" risk, i.e., a theoretical lifetime risk of up to one excess case of cancer in a population of 1,000,000 people – the 10^{-6} risk level. (In that population, approximately 250,000 – 300,000 cases of cancer would be anticipated to occur naturally.) ALs may be revised from time to time to reflect new risk assessment information. Chemicals for which ALs are established may eventually be regulated by MCLs, depending on the extent of contamination, the levels observed, and the risk to human health. A number of the contaminants for which action levels were originally established now have MCLs.

In 1997, DHS established an 18 µg/L AL for perchlorate. DHS used the upper value of the 4 to 18 µg/L range that resulted from the "provisional" reference dose that USEPA prepared in support of its Superfund activities. A revised external review draft perchlorate reference dose corresponding to a drinking water concentration of 1 µg/L was released in 2002. DHS concluded that the AL needed to be revised downward. On January 18, 2002, DHS reduced the perchlorate AL to 4 µg/L. The revised AL coincided with the analytical detection limit for purposes of reporting and was at the lower end of the 4 to 18 µg/L range from the USEPA 1992-1995 assessment. The Public Health Goal (PHG) for perchlorate was developed by Office of Environmental Health Hazard Assessment based on a contemporary health risk assessment. This new information was provided to DHS and on March 11, 2004, the AL for perchlorate was revised to 6 µg/L, a value identical to the PHG that will be used by DHS to develop the MCL for perchlorate.

Perchlorate and its salts are used in, but not limited to, solid propellant for rockets, missiles, and fireworks. The defense and aerospace industries purchase more than 90 percent of all the perchlorate manufactured. Perchlorate has historically been used at SSFL and thus is considered a chemical of concern at the site. Monitoring data collected during the tenure of the current permit indicates that perchlorate was present in the storm water runoff in Happy Valley and it has been detected in some of the groundwater wells utilized in the cleanup operations ongoing with DTSC oversight.

Perchlorate can interfere with iodide uptake by the thyroid gland; this can result in a decrease in the production of thyroid hormones, which are needed for prenatal and postnatal growth and development, as well as for normal body metabolism. Neither, the CTR, NTR or the Basin Plan has requirements stipulated for perchlorate. Since there is no drinking water standard, or maximum contaminant level (MCL), the DHS uses the AL as an advisory level. The Regional Board, exercising its best professional judgement, in the review of the "best available science" has in the past considered and used ALs when deemed appropriate to establish final effluent limitations in WDRs and NPDES permits adopted by this Board, to implement the Basin Plan narrative WQO, *"all waters shall be maintained free of toxic substance that produce detrimental physiological responses in human, plant, animal, or aquatic life,"* and to prevent degradation of valuable groundwater sources of drinking water.

E. Under title 40 Code of Federal Regulations (40 CFR) section 122.44(d), *Water Quality Standards and State Requirements*, "Limitations must control all pollutants or pollutant parameters (either conventional, non-conventional, or toxic pollutants), which the Director determines are or may be discharged at a level which will cause, have the reasonable potential to cause, or contribute to an excursion above any State water quality standard, including State narrative criteria for water quality." Where numeric effluent limitations for a pollutant or pollutant parameter have not been established in the applicable state water quality control plan, 40 CFR section 122.44(d)(1)(vi) specifies that water quality-based effluent limitations (WQBELs) may be set based on United States Environmental Protection Agency (USEPA) criteria, and may be supplemented where necessary by other relevant information to attain and maintain narrative water quality criteria, and to fully protect designated beneficial uses.

F. Section 402(p) of the federal Clean Water Act (CWA), as amended by the Water Quality Act of 1987, requires NPDES permits for storm water discharges. The Discharger in addition to meeting the effluent limitations included in this permit for storm water discharges only will be required to develop and implement a SWPPP as stipulated in Finding 27 of the Waste Discharge Requirements. These requirements as they are met will protect and maintain existing beneficial uses of the receiving water.

G. On May 18, 2000, the USEPA promulgated numeric criteria for priority pollutants for the State of California [known as the *California Toxics Rule* (CTR) and codified as 40 CFR section 131.38]. On March 2, 2000, the State Board adopted the *Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California (State Implementation Policy or* SIP). The SIP was effective on April 28, 2000 with respect to the priority pollutant criteria promulgated for California by the USEPA through National Toxics Rule (NTR) and to the priority pollutant objectives established by the Regional Boards in their Basin Plans, with the exception of the provision on alternate test procedures for individual discharges that have been approved by the USEPA Regional Administrator. The alternate test procedures provision was effective on May 22, 2000. The SIP was effective on May 18, 2000, with respect to the priority pollutant criteria promulgated by the USEPA through the CTR. The State Board adopted an amendment to the SIP on February 24, 2005, that became effective on July 13, 2005. The SIP establishes implementation provisions for priority pollutant criteria and objectives and provisions for chronic toxicity control.

H. Section 402(o) of the Clean Water Act and 40 CFR section 122.44(l) require that water-quality based effluent limitations in re-issued permits must be at least as stringent as in the existing permit (anti-backsliding). There are, however, exceptions to the prohibition which are codified in sections 303(d)(4) and/or 402(o)(2) of the Clean Water Act. Hence, many of the limitations from the existing waste discharge requirements contained in Regional Board Order No. 98-051, adopted by the Regional Board on June 29, 1998 have been included in this Order. For those limitations carried forward, the Regional Board has determined that there is reasonable potential for the pollutant to cause or contribute to an exceedance of water quality standards in accordance with State Board Order No. WQO 2003-0009. Reasonable potential is

determined using the procedures established in the SIP, informed by professional judgment.

I. Antidegradation. On October 28, 1968, the State Board adopted Resolution No. 68-16, Maintaining High Quality Water, which established an antidegradation policy for State and Regional Boards. Similarly, the CWA (section 304(d)(4)(B)) and USEPA regulations (40 CFR section 131.12) require that all NPDES permitting actions be consistent with the federal antidegradation policy. Specifically, waters that are of a higher quality than needed to maintain designated beneficial uses shall be maintained at the higher water quality unless specific findings are made.

J. *Watershed Management Approach.* The Regional Board has implemented a Watershed Management Approach, in accordance with *Watershed Protection: A Project Focus* (EPA841-R-95-003, August 1995), to address water quality protection in the Los Angeles Region. Programs covered under the Watershed Management Approach include regulatory (e.g., NPDES), monitoring and assessment, basin planning and water quality standards, watershed management, wetlands, TMDLs, 401 certifications, groundwater (as appropriate), and nonpoint source management activities. The Watershed Management Approach integrates the Regional Board's many diverse programs, particularly, permitting, planning, and other surface-water oriented programs. It emphasizes cooperative relationships between regulatory agencies, the regulated community, environmental groups, and other stakeholders in the watershed to achieve the greatest environmental improvements with the resources available. This approach facilitates a more accurate assessment of cumulative impacts of pollutants from both point and nonpoint sources.

The Los Angeles River watershed is one of the largest in the Region. The headwaters of the Los Angeles River originate in the Santa Monica, Santa Susana, and San Gabriel Mountains. The river flows through industrial and commercial areas and is bordered by rail yards, freeways, and major commercial and government buildings. The Los Angeles River tidal prism/estuary begins in Long Beach at Willow Street and runs approximately three miles before joining with Queensway Bay located between the Port of Long Beach and the city of Long Beach.

The wastewater discharge from Outfalls 001 and 002 at the SSFL enters Bell Creek near the headwaters of the Los Angeles River. The storm water runoff from Happy Valley (Outfall 008) exits the site via Dayton Canyon Creek which flows to Bell Creek and subsequently the Los Angeles River.

The other storm water runoff exiting the SSFL site does so near the northwest site boundary from Outfalls 003 through 007, 009 and 010. The receiving water for the storm water runoff from these locations is the Arroyo Simi, a tributary of Calleguas Creek. The Calleguas Creek Watershed extends from the Santa Monica Mountains and Simi Hills in the south, to the Santa Susana Mountains, South Mountain, and Oak Ridge in the north. Land uses vary throughout the watershed. Urban developments are generally restricted to the city limitations of Simi Valley, Moorpark, Thousand Oaks, and Camarillo. Agricultural activities are spread out along valleys and on the Oxnard Plain.

The storm water discharge exits the site and travels down Meier and Runkle Canyons towards the Arroyo Simi. Most of the land use around the facility is open area. Overall the Calleguas Creek Watershed is considered an impaired watershed. It appears that the sources of many of these pollutants are agricultural activities. Approximately fifty percent of the watershed is still open space although there is a severe lack of benthic and riparian habitat present. The discharge, when it is sufficient to reach the Arroyo Simi, enters it in Reach 1 – Hydrological Unit 403.62.

K. *303(d) Listing of Impaired Waterways.* Bell Creek, which is the receiving water for the wastewater discharge from Outfalls 001, and 002 is on the 2002 303(d) list with high coliform count as the stressor.

The storm water runoff discharge from Outfalls 003 through 007, 009 and 010, when it is sufficient to reach the Arroyo Simi, enters it in Reach 1 – Hydrological Unit 403.62. The stressors listed in the 2002 State Board's California 303(d) list for this reach of Arroyo Simi are ammonia, boron, chloride, sulfates, fecal coliform, organophosphorous pesticides, sediment/siltation, and total dissolved solids.

L. Total Maximum Daily Load (TMDL)

The TMDL development for the Los Angeles River watershed and for Calleguas Creek has been developed for a number of the constituents on the California State Water Board 2002 303(d) list. The WQBELS in this permit have been analyzed to ensure they are consistent with the assumptions and requirements of the WLAs in those TMDLS. The TMDLs, which are not scheduled for completion within the lifetime of this permit, will include WLAs for the 303(d) listed pollutants. When each TMDL is complete, the Regional Board will adopt WQBELs consistent with the corresponding WLAs. If authorized, a time schedule may be included in a revised permit to require compliance with the final WQBELs.

M. LA River Nitrogen (Nutrients) TMDL. The TMDL for Nitrogen (nutrients) in the Los Angeles River received Regional Board approval on July 10, 2003 (Resolution No. 03-009) and State Board approval with adoption of Order 2003-0074 on November 19, 2003. Office of Administrative Law (OAL) and USEPA approval dates were February 27, 2003 and March 18, 2003, respectively. The Regional Board filed a Notice of Decision with the California Resources Agency on March 23, 2004 and the TMDL was effective as of that date. The Los Angeles River Nutrient TMDL revision with Interim WLAs was approved by the Regional Board on December 4, 2003 (Resolution No. 2003-016). The State Board approved the TMDL with Resolution 2004-0014 on March 24, 2004. OAL approved it on September 27, 2004, and the effective date for the Order was September 27, 2004.

The TMDL includes numeric targets for ammonia as nitrogen (NH3-N), Nitrate-nitrogen and nitrite-Nitrogen within Reach 5 (within Sepulveda Basin), Reach 3 (Riverside Drive to Figueroa Street), and the Burbank Western Channel. Waste loads are allocated to minor point sources in these reaches that are enrolled in industrial and construction storm water permits.

N. LA River Metals TMDL. The current version of the TMDL for metals in the Los Angeles River was approved by the Regional Board during the September 6, 2007

hearing (Resolution No. R4-2007-014). State Board approved the TMDL on June 17, 2008. OAL approved the TMDL on October 14, 2008, and EPA approved it on October 29, 2008. The TMDL for metals in storm water is in effect for discharges to the specified reaches of the Los Angeles River.

The metals TMDL implements numeric water quality targets that are based on objectives established by USEPA in the CTR. Targets for copper, lead, zinc and/or selenium (total recoverable) are established in designated reaches of the Los Angeles River. Separate water quality targets are established for dry and wet weather discharges.

The TMDL for metals in the Los Angeles River includes an implementation schedule for non-storm water NPDES permits (including POTWs, other major, minor, and general permits). SSFL is included in this group of permittees. The implementation schedule states that NPDES permits shall achieve waste load allocations, which shall be expressed as NPDES water quality-based effluent limitations. Compliance schedules may allow up to five years in individual NPDES permits to meet permit requirements.

Discharges from SSFL, of wastewater and of storm water runoff only, exiting the site enter Bell Creek or Dayton Canyon Creek. Dry weather numeric water quality targets for copper, lead, and selenium are established for Bell Creek in the TMDL. WLAs are assigned to all point source discharges to Bell Creek and tributaries to Bell Creek. Wet-weather numeric targets for cadmium, copper lead and zinc are established for Los Angeles (LA) River Reach 1 in the TMDL. WLAs are assigned to all point source discharges to LA River Reach 1 and all upstream reaches and tributaries to Reach 1 (including Bell Creek and tributaries to Bell Creek). Hence, effluent limitations for cadmium, copper, lead, zinc, and selenium in discharges to Bell Creek, Dayton Canyon Creek, or any tributaries of the LA River will be based on WLAs established by the TMDL or existing permit limitations, whichever are more protective.

O. LA River Trash TMDL. The Los Angeles River Trash TMDL was adopted by the Regional Board on September 19, 2001. The TMDL established a numeric target of zero trash in the river. The TMDL was to be implemented via storm water permits in a phased reduction for a period of ten years. The LA River Trash TMDL was approved by the State Water Resources Control Board on February 19, 2002, Office of Administrative Law on July 16, 2002 and by the US EPA on August 1, 2002. The TMDL became effective on August 28, 2002.

There were a number of challenges to the LA River Trash TMDL. The consideration of the challenges resulted in a requirement that the TMDL be set aside and not implemented until the California Environmental Quality Act (CEQA) requirements have been satisfied. On June 8, 2006, the Los Angeles Regional Water Quality Control Board adopted a resolution to set aside the adopted TMDL (06-013). On July 17, 2006, the State Board adopted Resolution 2006-0051, setting the TMDL aside.

The Regional Board on August 9, 2007, adopted a new TMDL for trash in the Los Angeles River Watershed that includes WLAs of zero for trash. The TMDL became effective July 17, 2006. The TMDL is implemented through storm water permits and

via the authority vested in the Executive Officer by section 13267 of the Porter-Cologne Water Quality Control Act. It requires phased reductions in the amount of trash over a nine year period. No WLAs were established for individual permittees.

P. Calleguas Creek Chloride (Salts) TMDL. On March 22, 2002, the consent decree deadline for the establishment of a chloride TMDL, USEPA Region 9 established the Calleguas Creek Total Maximum Daily Load for chloride. The TMDL adopted by USEPA was based largely on the technical efforts produced by the Regional Board staff.

The Calleguas Creek Watershed Group in collaboration with USEPA Region 9 and the Regional Board is developing the *Calleguas Creek Watershed Salts TMDL Work Plan*. The work plan addresses chloride, TDS, sulfate and boron in the watershed. The Regional Board and USEPA may use the work product from the Calleguas Creek Watershed Group to establish a subsequent TMDL for chloride in the Calleguas Creek Watershed.

Discharges from SSFL enter the Calleguas Creek Watershed in Arroyo Simi Reach 7, which is included on the 303 (d) list as a chloride water quality limited segment in the Calleguas Creek Watershed. There are no waste load allocations (WLAs) for point source discharges or load allocations (LAs) for nonpoint sources in effect under storm conditions in the TMDL. Since all discharges from the SSFL to the Arroyo Simi occur as a result of storm water runoff, no chloride WLAs will be included in this Order for discharges from Outfalls 003 through 007, 009 and 010 to Arroyo Simi. Based on existing data, SSFL does not appear to contribute chloride loading to the watershed at levels that would alter the assumptions of the TMDL or contribute to further impairment.

Q. Calleguas Creek Nitrogen Compounds and Related Effects TMDL. On October 24, 2002, the Regional Board adopted Resolution No. 2002-017, Amendment to the *Basin Plan for the Los Angeles Region* to Include a TMDL for Nitrogen Compounds and Related Effects in Calleguas Creek (*Nitrogen Compounds and Related Effects* TMDL). The State Board approved the Nitrogen Compounds and Related Effects TMDL on March 19, 2003. The Office of Administrative Law approved the TMDL on June 5, 2003 and USEPA approved it on June 20, 2003.

The *Nitrogen Compounds and Related Effects* TMDL includes waste load allocations for ammonia (NH_3), nitrite as nitrogen (NO_2–N), nitrate as nitrogen (NO_3–N), and nitrate plus nitrite as nitrogen (NO_2–N + NO_3–N). The TMDL authorizes interim limitations (expressed as interim waste allocations) for total nitrogen (NO_3-N + NO_2-N). The WLA applied to the publicly owned treatment works (POTW) in the watershed and the LAs are specified for agricultural discharges. Hence, this Order does not include the TMDL limitations for ammonia, nitrate as nitrogen, nitrite as nitrogen, or nitrate plus nitrite as nitrogen for discharges of storm water only from the SSFL to Arroyo Simi and Calleguas Creek. However, based on existing data, SSFL does not appear to contribute nitrogen loading to the watershed at levels that would alter the assumptions of the TMDL or contribute to further impairment.

R. Calleguas Creek Toxicity, Chlorpyrifos, Diazinon TMDL. The Regional Board approved the Basin Plan amendment to incorporate the TMDL for toxicity,

chlorpyrifos, and diazinon in the Calleguas Creek, its tributaries and Mugu Lagoon (Resolution No. R4-2005-009) on July 7, 2005. The TMDL addresses impairment to water quality due to elevated levels of chlorpyrifos, diazinon, other pesticides and/or other toxicants. The amendment includes numeric targets, WLAs, and load allocations for Toxicity Unit Chronic, chlorpyrifos, and diazinon. It also includes a compliance schedule of two years from the effective date of the TMDL to meet the final WLAs and ten years to meet the LAs applied to nonpoint sources.

State Board approved the TMDL on September 22, 2005 (Resolution No. 2005-0067). OAL and EPA approvals were effective on November 27, 2005, and March 14, 2006, respectively. The TMDL became effective on March 24, 2006. A wasteload of 1.0 TUc is allocated to the major point sources (POTWs) and minor port sources discharging to the Calleguas Creek Watershed. Interim and final waste load allocations and were also established for chlorpyrifos and diazinon. The implementation schedule specifies that the interim limitations for chlorpyrifos and diazinon in storm water NPDES permits be in stream limitations. The appropriate waste load allocations will be translated into permit limitations and included in this Order (R4-2007-0055).

S. Calleguas Creek and Mugu Lagoon OC Pesticides, PCBs, and Siltation TMDL. Resolution No. R4-2005-0010, a TMDL for organochlorine (OC) pesticides, polychlorinated biphenyl (PCBs) and siltation in Calleguas Creek, its tributaries, and Mugu Lagoon, was also approved by the Regional Board on July 7, 2005. The TMDL addresses impairment to water quality due to elevated concentrations of OC pesticides and PCBs, which can bioaccumulate in fish tissue and cause toxicity to aquatic life in estuarine and inland waters. Siltation may transport these contaminants to surface waters and impair aquatic life and wildlife habitats. The TMDL establishes water column targets, fish tissue targets, and sediment targets to ensure the protection of beneficial uses. The TMDL establishes a twenty-year compliance plan for reducing OC pesticides, PCBs and siltation loads from point sources and nonpoint sources.

State Board approved the TMDL on September 22, 2005 (Resolution No. 2005-0068). OAL and EPA approvals followed on January 20, 2006, and March 14, 2006, respectively. The TMDL was effective on March 24, 2006. The appropriate targets will apply to discharges from Outfalls 003 through 007, 009, and 010 which enter Arroyo Simi, a tributary of Calleguas Creek.

The TMDL also includes waste load allocations for OC pesticides and PCBs in sediment in Calleguas Creek and its tributaries. The waste load allocations have been translated directly into ambient contaminant concentrations in the sediment of Arroyo Simi. Those ambient contaminant concentrations will be compared directly to sediment concentrations measured in the samples collected to determine compliance with the interim or final waste load allocations stipulated.

The Calleguas Creek OC Pesticides and PCBs TMDL includes a compliance schedule of twenty years. As per the May 10, 2007, memorandum with the subject "Compliance Schedules for Water Quality-Based Effluent limitations in NPDES Permits" from James A. Hanlon, Director of Wastewater Management to Alexis Strauss, Director of the Water Division at USEPA Region 9, this permit includes

both the final and interim WLAs with a compliance schedule providing a maximum of five years of operation utilizing the interim WLAs. The permit includes a provision to reopen the permit to implement the final WLAs if the data collected supports implementation of the final WLAs prior to the renewal of the permit.

The waste load allocations in the water column will be translated into effluent limitations utilizing the steady state model from the SIP. The calculated effluent limitations will be included in the permit as receiving water effluent limitations. Since the discharge is storm water and it is near the top of the watershed, the Discharger may utilize the option of sampling the discharge for the OC pesticides and PCBs or sampling the receiving water. The Discharger may also choose to join the Calleguas Creek Watershed TMDL Monitoring Program (CCWTMP) and monitor at an established compliance sampling location in Arroyo Simi.

T. Calleguas Creek and Mugu Lagoon Metals and Selenium TMDL. Resolution R4-2006-012, the TMDL for metals and selenium for Calleguas Creek, its tributaries and Mugu Lagoon was adopted by the Los Angeles Regional Board on June 8, 2006. The TMDL establishes numeric targets for dissolved copper, nickel, and zinc, and in total recoverable mercury and selenium. It also includes fish tissue targets for mercury, bird egg targets for mercury and selenium and sediment quality guidelines for copper, nickel, and zinc.

State Board approved the TMDL on October 25, 2006 (Resolution No. 2006-0078). OAL and EPA approval the TMDL on February 6, 2007, and March 26, 2007, respectively. The TMDL became effective on March 26, 2007. The TMDL includes final waste load allocations for wet weather total recoverable copper and nickel. A concentration-based waste load allocation applied during both wet and dry weather was also included in the TMDL for mercury.

Discharges from the Boeing SSFL site (Outfalls 003 through 007, 009, and 010) enter Calleguas Creek in Reach 7, which was noted as Arroyo Simi Reaches 1 and 2 in the 1998 303(d) List. Dry weather discharges from this area do not reach Calleguas Creek and Mugu Lagoon. Therefore, no dry weather waste load allocations are established for the constituents in the water column. Selenium waste load allocations have not been developed for this reach as it is not on the 303 (d) list. The final waste load allocation developed for mercury was 0.051 µg/L based on CTR. The mercury waste load allocation was used to develop a daily maximum effluent limit, implemented at Outfalls 003 through 007, 009, and 010.

Final waste load allocations for wet daily maximum concentrations of copper and nickel are stipulated as 31.0 and 958 µg/L, respectively. The daily maximum limit for copper is included in the permit. The TMDL-based daily maximum for nickel (958 µg/L), which was developed to protect aquatic life in the lower Calleguas Creek and Mugu Lagoon, is greater than the Title 22-based MCL limit of 100 µg/L. Since the groundwater basin below the Arroyo Simi has the municipal and domestic supply as an existing beneficial use and Arroyo Simi has groundwater recharge as an intermittent beneficial use, the effluent limitation implemented must be protective of both groundwater recharge and of the downstream aquatic life beneficial uses. Therefore, the 100 µg/L effluent limitation, which is protective of the beneficial uses of Arroyo Simi and the groundwater basin below it, has been implemented for nickel.

V. Regulatory Basis for Effluent Limitations

A. General Basis for Effluent Limitations

B. Effluent limitations established pursuant to Sections 301 (Effluent Limitations), 302 (Water Quality-Related Effluent Limitations), 303 (Water Quality Standards and Implementation Plans), 304 (Information and Guidelines), and 402 (NPDES) of the Federal Clean Water Act and amendments thereto, are applicable to the discharges covered by the tentative order. Water Quality Based Effluent Limitations (WQBELs)

The WQBELs are based on the Basin Plan, other State plans and policies, or USEPA water quality criteria. These requirements, as they are met will protect and maintain existing beneficial uses of the receiving water. Where numeric water quality objectives have not been established in the Basin Plan, 40 CFR section 122.44(d) specifies that WQBELs may be set based on USEPA criteria and supplemented, where necessary by, other relevant information to attain and maintain narrative water quality criteria to fully protect designated beneficial uses.
The previous NPDES permit for SSFL (Order No. 98-051) included monthly averages for chemicals of concern discharged from Outfalls 003 through 008. The discharges from these outfalls consist solely of storm water runoff. These discharges are seasonal and infrequent. Individual NPDES permits that regulate storm water runoff only discharges issued recently by the Regional Board do not contain monthly average limitations. Hence, this Order does not contain monthly average limitations for the storm water runoff only discharges from these outfalls.

C. Reasonable Potential Analysis

Discharges from the engine test stands had not been previously regulated independently. These discharges did not have specific monitoring requirements or effluent limitations. This permit includes effluent limitations for conventional pollutants and requires monitoring for the EPA priority pollutants excluding asbestos from the engine test areas.

In accordance with Section 1.3 of the SIP, the Regional Board will conduct a reasonable potential analysis (RPA) for each priority pollutant with an applicable criterion or objective to determine if a WQBEL is required in the permit. The Regional Board will analyze effluent data to determine if a pollutant in a discharge has a reasonable potential to cause or contribute to an excursion above a state water quality standard. For all parameters that have a reasonable potential, numeric WQBELs are required. The RPA considers water quality objectives outlined in the CTR, NTR, as well as the Basin Plan. To conduct the RPA, the Regional Board must identify the maximum observed effluent concentration (MEC) for each constituent, based on data provided by the Discharger.

Section 1.3 of the SIP provides the procedures for determining reasonable potential to exceed water applicable water quality criteria and objectives. The preliminary steps involve the following:

- Identifying the lowest or most stringent criterion or water quality objective for the pollutant "(C)";

- Adjusting the selected criterion/objective, when appropriate, for hardness, pH, and translators of the receiving water (C_a). There is no hardness data available for Arroyo Simi. For the storm water only discharges to Arroyo Simi, the hardness used was 100 mg/L as $CACO_3$, which is the default value. Consequently, the default value was used to complete the calculation of the final effluent limitations. The acute and chronic dilution factors utilized to complete the calculation are zero since Arroyo Simi, which is a tributary to Calleguas Creek, has intermittent flows and many of the beneficial uses specified for Arroyo Simi are intermittent. A site-specific study would need to be completed to determine if seasonal dilution factors would be appropriate.

  Wastewater discharges from industrial process and storm water from Happy Valley exit the site and flow into Bell Creek, a tributary to the Los Angeles River. The hardness data submitted by the Discharger for the receiving water provided hardness values less than the 100 mg/L as $CACO_3$ default.

  In fact, the hardness data was very similar for the discharge and the receiving water, indicating that the discharge was a primary contributing flow to the receiving water. The default value of 100 mg/L for hardness was used to adjust the selected criteria.

- Collating the appropriate effluent data for the pollutant;

- Determining the observed maximum concentration in the effluent (MEC) from the effluent data; and

- Determining the observed maximum ambient background concentration of the pollutant (B). Ambient data was submitted for Bell Creek upstream of Discharge Serial 001 and 002. This ambient data was included in the calculation of effluent limitations for the wastewater discharges from these two locations. Ambient data was not available for Arroyo Simi and was not included in the analysis of the discharges from Outfalls 003 through 007.

The SIP specifies three triggers to complete a RPA:

1. Trigger 1 – If the MEC is greater than or equal to the CTR water quality criteria or applicable objective (C), a limitation is needed. For certain constituents present in this discharge that were nondetect, the MEC was set at the method detection limit consistent with section 1.3 of the SIP.

2. Trigger 2 – If MEC<C and background water quality (B) > C, a limitation is needed.

3. Trigger 3 – If other related information such as CWA 303(d) listing for a pollutant, discharge type, compliance history, etc. indicates that a WQBEL is required.

The first two triggers were evaluated using the California Permit Writers Training Tool (CAPWTT). While on contract with the State Board, Scientific Applications International Corporation (SAIC) developed this software to determine RPAs and, when reasonable potential exists, calculate the WQBELs, following procedures in SIP. The third trigger is evaluated by the permit writer utilizing all other information available to determine if a water quality-based effluent limitation is required to protect beneficial uses.

The results of the RPA for each analyte evaluated is presented in Attachment 1 for discharges from Outfall 001 and 002 and in Attachment 2 for the storm water only discharges (Outfalls 003 – 007) of Order No. R4-2004-0111. Most of the targeted analytes evaluated have a response of (Best Professional Judgement) BPJ or No Criteria required. The BPJ response requires the permit writer use all other available information to determine if a limit should be stipulated and if necessary to determine the applicable limit. The No Criteria result indicated that CTR does not include criteria to evaluate this analyte.

A numeric limit has not been prescribed for a toxic constituent if it has been determined that it has no reasonable potential to cause or contribute to excursions of water quality standards. However, if the constituent had a limit in the previous permit, and if none of the Antibacksliding exceptions apply, then the limit will be retained if the Regional Board concludes there is reasonable potential. For those pollutants with existing effluent limitations where the CAPWTT did not statistically determine reasonable potential, the Regional Board staff conducted a further analysis under Trigger 3 of the SIP. If reasonable potential was found based on Trigger 3, the basis for that decision is articulated in this fact sheet. A narrative limit to comply with all water quality objectives is provided in *Standard Provisions* for the priority pollutants, which have no available numeric criteria.

Sufficient effluent and ambient data are needed to conduct a complete RPA. If data are not sufficient, the Discharger will be required to gather the appropriate data for the Regional Board to conduct the RPA. Upon review of the data, and if the Regional Board determines that WQBELs are needed to protect the beneficial uses, the permit will be reopened for appropriate modification.

D. Calculating WQBELs

If a reasonable potential exists to exceed applicable water quality criteria or objectives, then a WQBEL must be established in accordance with one of three procedures contained in Section 1.4 of the SIP. These procedures include:

1) If applicable and available, use of the wasteload allocation (WLA) established as part of a total maximum daily load (TMDL).

2) Use of a steady-state model to derive maximum daily effluent limitations (MDELs) and average monthly effluent limitations (AMELs).

3) Where sufficient effluent and receiving water data exist, use of a dynamic model, which has been approved by the Regional Board.

4) WQBELs Calculation Example

Using Copper as an example, the following demonstrates how WQBELs were established for this Order.

Concentration-Based Effluent Limitations

A set of AMEL and MDEL values are calculated separately, one set for the protection of aquatic life and the other for the protection of human health. The AMEL and MDEL limitations for aquatic life and human health are compared, and the most restrictive AMEL and the most restrictive MDEL are selected as the WQBEL.

Calculation of aquatic life AMEL and MDEL:

Step 1: For each constituent requiring an effluent limit, identify the applicable water quality criteria or objective. For each criterion determine the effluent concentration allowance (ECA) using the following steady state equation:

$ECA = C + D(C-B)$ when $C > B$, and
$ECA = C$ when $C <= B$,

Where
- C = The priority pollutant criterion/objective, adjusted if necessary for hardness, pH and translators. In this Order a hardness value of 100 mg/L (as $CaCO_3$) was used for development of hardness-dependant criteria, and a pH of 8.1 was used for pH-dependant criteria.
- D = The dilution credit, and
- B = The ambient background concentration

As discussed above, for this Order, dilution was not allowed; therefore:

$ECA = C$

For copper the applicable water quality criteria are (reference Table F-5):

ECA_{acute}= 14.00 µg/L
$ECA_{chronic}$= 9.33 µg/L

Step 2: For each ECA based on aquatic life criterion/objective, determine the long-term average discharge condition (LTA) by multiplying the ECA by a factor (multiplier). The multiplier is a statistically based factor that adjusts the ECA to account for effluent variability. The value of the multiplier varies depending on the coefficient of variation (CV) of the data set and whether it is an acute or chronic criterion/objective. Table 1 of the SIP provides pre-calculated values for the multipliers based on the value of the CV. Equations to develop the multipliers in place of using values in the tables are provided in Section 1.4, Step 3 of the SIP and will not be repeated here.

$$LTA_{acute} = ECA_{acute} \times Multiplier_{acute\ 99}$$

$$LTA_{chronic} = ECA_{chronic} \times Multiplier_{chronic\ 99}$$

The CV for the data set must be determined before the multipliers can be selected and will vary depending on the number of samples and the standard deviation of a data set. If the data set is less than 10 samples, or at least 80% of the samples in the data set are reported as non-detect, the CV shall be set equal to 0.6.

For copper, the following data were used to develop the acute and chronic LTA using equations provided in Section 1.4, Step 3 of the SIP (Table 1 of the SIP also provides this data up to three decimals):

CV	ECA Multiplier$_{acute\ 99}$	ECA Multiplier$_{chronic\ 99}$
0.581	0.32	0.53

$$LTA_{acute} = 14.00\ \mu g/L \times 0.33 = 4.48\ \mu g/L$$

$$LTA_{chronic} = 9.33\ \mu g/L \times 0.54 = 4.94\ \mu g/L$$

Step 3: Select the most limiting (lowest) of the LTA.

$$LTA = \text{most limiting of } LTA_{acute} \text{ or } LTA_{chronic}$$

For Copper, the most limiting LTA was the $LTA_{chronic}$

$$LTA = 4.48\ \mu g/L$$

Step 4: Calculate the WQBELs by multiplying the LTA by a factor (multiplier). WQBELs are expressed as Average Monthly Effluent Limitations (AMEL) and Maximum Daily Effluent Limitation (MDEL). The multiplier is a statistically based factor that adjusts the LTA for the averaging periods and exceedance frequencies of the criteria/objectives and the effluent limitations. The value of the multiplier varies depending on the probability basis, the coefficient of variation (CV) of the data set, the number of samples (for AMEL) and whether it is a monthly or daily limit. Table 2 of the SIP provides pre-calculated values for the multipliers based on the value of the CV and the number of samples. Equations to develop the multipliers in place of using values in the tables are provided in Section 1.4, Step 5 of the SIP and will not be repeated here.

$$AMEL_{aquatic\ life} = LTA \times AMEL_{multiplier\ 95}$$

$$MDEL_{aquatic\ life} = LTA \times MDEL_{multiplier\ 99}$$

AMEL multipliers are based on a 95th percentile occurrence probability, and the MDEL multipliers are based on the 99th percentile occurrence probability. If the number of samples is less than four (4), the default number of samples to be used is four (4).

For copper, the following data were used to develop the AMEL and MDEL for aquatic life using equations provided in Section 1.4, Step 5 of the SIP (Table 2 of the SIP also provides this data up to two decimals):

No. of Samples Per Month	CV	$Multiplier_{MDEL\ 99}$	$Multiplier_{AMEL\ 95}$
4	0.6	3.11	1.55

$AMEL_{aquatic\ life}$ = 4.48 x 1.55 = 6.94 µg/L

$MDEL_{aquatic\ life}$ = 4.48 x 3.11 = 13.9 µg/L

Calculation of human health AMEL and MDEL:

Step 5: For the ECA based on human health, set the AMEL equal to the $ECA_{human\ health}$

However, for copper, the $ECA_{human\ health}$ = Not Available. The CTR does not contain a numeric copper criterion protective of human health; therefore, it was not possible to develop a copper AMEL based on human health criteria.

Step 6: Calculate the MDEL for human health by multiplying the AMEL by the ratio of the $Multiplier_{MDEL}$ to the $Multiplier_{AMEL}$. Table 2 of the SIP provides pre-calculated ratios to be used in this calculation based on the CV and the number of samples.

A copper $MDEL_{human\ health}$ could not be calculated because a copper $AMEL_{human\ health}$ was not available. There are no criteria protective of human health for copper; therefore, none of the limitations for copper are based on human health criteria.

Step 7: Select the lower of the AMEL and MDEL based on aquatic life and human health as the WQBEL for the Order.

For copper:

$AMEL_{aquatic\ life}$	$MDEL_{aquatic\ life}$	$AMEL_{human\ health}$	$MDEL_{human\ health}$
7.0 µg/L	14 µg/L	Not Applicable	Not Applicable

The lowest (most restrictive) effluent limitations are based on aquatic toxicity and were incorporated into this Order. For copper, there are no human health criteria; therefore, the AMEL and MDEL based on aquatic life criteria are considered for WQBELs.

E. Impaired Water Bodies in 303 (d) List

Section 303(d) of the CWA requires states to identify specific water bodies where water quality standards are not expected to be met after implementation of technology-based effluent limitations on point sources. For all 303(d) listed water bodies and pollutants, the Regional Board plans to develop and adopt TMDLs that will specify WLAs for point sources and load allocations (LAs) for non-point sources,

as appropriate.

The USEPA has approved the State's 303(d) list of impaired water bodies. Certain receiving waters in the Los Angeles and Ventura County watersheds do not fully support beneficial uses and therefore have been classified as impaired on the 2002 303(d) list and have been scheduled for TMDL development.

The Los Angeles River flows for 55 miles from the Santa Monica Mountains at the western end of the San Fernando Valley to the Pacific Ocean. The Los Angeles River drains an area of about 825 square miles. Approximately 324 square miles of the watershed are covered by forest or open space land. The rest of the watershed is highly developed. The river flows through industrial, residential, and commercial areas, including major refineries and petroleum products storage facilities, major freeways, rail lines, and rail yards serving the Ports of Los Angeles and Long Beach.

The majority of the Los Angeles River watershed is considered impaired due to a variety of point and nonpoint sources. The 2002 303(d) list includes total aluminum, dissolved cadmium, dissolved copper, dissolved zinc, high coliform count, pH, ammonia, nutrients (algae), odors, lead, coliform, trash, scum, oil, dichloroethylene, tetrachloroethylene, and trichloroethylene. High coliform count is a pollutant stressor for Bell Creek. The pollutant stressors listed for the Los Angeles River estuary include chlordane, DDT, lead, PCBs and zinc in sediment. The beneficial uses potentially threatened or impaired by degraded water quality are aquatic life, recreation, groundwater recharge, and municipal water supply.

Calleguas Creek Watershed and its major tributaries, Revlon Slough, Conejo Creek, Arroyo Conejo, Arroyo Santa Rosa, and Arroyo Simi drain an area of 343 square miles in southern Ventura and a small portion of western Los Angeles County. The northern boundary of the watershed is formed by the Santa Susana Mountains, South Mountain, and Oak Ridge; the southern boundary is formed by the Simi Hills and Santa Monica Mountains.

Urban developments within the watershed are generally restricted to the city limits of Simi Valley, Moorpark, Thousand Oaks, and Camarillo. Agricultural activities, primarily cultivation of orchards and row crops, are spread out along valleys and on the Oxnard Plain.

The Watershed Management Initiative characterizes the Calleguas Creek Watershed as a very impaired watershed. Calleguas Creek Reach 7 (the Arroyo Simi) is on the 2002 303 (d) list for ammonia, chloride, boron, sulfates, total dissolved solids, fecal coliform, organophosphorus pesticides, and sedimentation/siltation. The 2006 303(d) list includes the constituents listed on the 2002 303 (d) list except ammonia, organoposphorous pesticides and sedimentation/siltation. The beneficial uses potentially threatened or impaired by degraded water quality are wildlife habitat, and rare, threatened or endangered species habitat. The intermittent beneficial uses potentially impacted include industrial process supply, groundwater recharge, freshwater replenishment, contact and non-contact water recreation, and warm freshwater habitat.

F. Whole Effluent Toxicity

Whole Effluent Toxicity (WET) protects the receiving water quality from the aggregate toxic effect of a mixture of pollutants in the effluent. WET tests measure the degree of response of exposed aquatic test organisms to an effluent. The WET approach allows for protection of the narrative "no toxics in toxic amounts" criterion while implementing numeric criteria for toxicity. There are two types of WET tests: acute and chronic. An acute toxicity test is conducted over a short time period and measures mortality. A chronic toxicity test is conducted over a longer period of time and measures mortality, reproduction, and growth.

The Basin Plan specifies a narrative objective for toxicity, requiring that all waters be maintained free of toxic substances in concentrations that are lethal to or produce other detrimental response on aquatic organisms. Detrimental response includes but is not limited to decreased growth rate, decreased reproductive success of resident or indicator species, and/or significant alterations in population, community ecology, or receiving water biota. The existing permit does not contain toxicity limitations or monitoring requirements.

In accordance with the Basin Plan, acute toxicity limitations dictate that the average survival in undiluted effluent for any three consecutive 96-hour static or continuous flow bioassay tests shall be at least 90%, with no single test having less than 70% survival. Consistent with Basin Plan requirements, this Order includes acute toxicity limitations.

In addition to the Basin Plan requirements, Section 4 of the SIP states that a chronic toxicity effluent limitation is required in permits for all discharges that will cause, have the reasonable potential to cause, or contribute to chronic toxicity in receiving waters.

The Discharger will be required to conduct chronic toxicity testing. The Order includes a chronic testing trigger hereby defined as an exceedance of 1.0 toxic units chronic (TUc) in a critical life stage test for 100% effluent. (The monthly median for chronic toxicity of 100% effluent shall not exceed 1.0 TUc in a critical life stage test.) If the chronic toxicity of the effluent exceeds 1.0 TUc, the Discharger will be required to immediately implement accelerated chronic toxicity testing according to Monitoring and Reporting Program, Item IV.D.1. If the results of two of the six accelerated tests exceed 1.0 TUc, the Discharger shall initiate a toxicity identification evaluation (TIE).

G. Specific Rationale for Each Numerical Effluent Limitation

Section 402(o) of the Clean Water Act and 40 CFR 122.44(l) require that effluent limitations standards or conditions in re-issued permits are at least as stringent as in the existing permit unless an antibacksliding exception applies. The Regional Board has determined that reasonable potential exists for all pollutants that are regulated under the current permit; therefore effluent limitations have been established for these pollutants. Furthermore, effluent limitations for several contaminants have been included based on BPJ with the CTR WQBELs or with effluent limitations from the current Order.

In compliance with 40 CFR 122.45(f), mass-based limitations have also been established in the proposed Order for conventional and priority pollutants. The mass for both the maximum and the monthly or 30-day average limitations and when appropriate the 7-day average effluent limitations were calculated using the flow for the associated operation, which was provided by the Discharger.

When calculating the mass for discharges, the maximum permitted flow rate was used to calculate the daily maximum, the monthly average, or 7-day average mass. When calculating the appropriate mass for the discharge event or events evaluated the actual flow rate should be substituted in the following equation. The daily maximum flow will be used to calculate the daily maximum, the monthly average, 30-day average or 7-day average flows will be used to calculate the respective mass discharge limit.

Mass (lbs/day) = flow rate (MGD) X 8.34 X effluent limitation (mg/L):
where: mass = mass limit for a pollutant in lbs/day
effluent limitation = concentration limit for a pollutant, mg/L
flow rate = discharge flow rate in MGD

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Outfalls 001 and 002. RPAs were performed using CAPWTT for each of 126 priority pollutants for which effluent data were available. The input data for the RPAs were provided in the Self-Monitoring Reports submitted by the Discharger. One RPA was performed for discharges from Outfalls 001 and 002, which are composed of treated wastewater, water from the groundwater treatment systems, excess reclaimed water, water from the engine test stands, and storm water. Four analytes had reasonable potential to exceed WQBELs: copper, lead, mercury, and TCDD. Three of these analytes (copper, lead, and mercury) had effluent limitations in the previous order (Order No. 98-051).

The Discharger also submitted data for the receiving water associated with discharges from Outfalls 001 and 002. This data was collected using elevated detection limits and hence several other constituents had reasonable potential. The constituents are 2,4,6-trichlorophenol, 2,4-dinitrotoluene, alpha-BHC, bis(2-ethylhexyl)phthalate, N-nitrosodimethlyamine and pentachlorophenol. Effluent limitations for these constituents have also been included in this Order.

Since perchlorate has been detected above the Department of Health Services action level in storm water runoff from the facility and it has been detected in the influent to some of the groundwater treatment systems, BPJ has been used to establish reasonable potential for it to be present in discharges from the site via Outfalls 001 and 002. Consequently an effluent limit for perchlorate has been included in this Order for these discharges. Since perchlorate is typically not a naturally occurring pollutant and its presence in the receiving waters is the result of operations at the facility, the effluent limitation was developed based on anti-degradation grounds (State Board Res. No. 68-16 and 40 CFR § 131.12). The effluent limitation was therefore set at 6 µg/L, which would prevent the degradation of receiving waters and maintain and protect receiving water quality.

Several volatile organic compounds (VOCs) had effluent limitations in Order No. 98-051 for discharges from Outfalls 001 and 002. The number of samples evaluated for each contaminant ranged from 19 to 60, and none of the contaminants were detected. The CTR based effluent limitations for all of the VOCs except 1,1-dichloroethylene, were less stringent than the limitations in Order No. 98-051. Since none of the contaminants were detected during numerous sampling events and the limitations in the tentative Order would be the same as those from the previous Order, the limitations for these analytes were not included. The only VOC that has limitations in the tentative Order is 1,1-dichloroethylene. The limit is included since the CTR based limit for this analyte is more stringent than the limit included in the previous Order.

As set forth above, Section 1.3 of the State Board's State Implementation Plan (SIP) establishes a stepwise procedure for determining which toxic pollutants require water quality-based effluent limitations in conformance with 40 C.F.R. § 122.44(d). This stepwise procedure for toxic pollutants is called a reasonable potential analysis. The SIP's reasonable potential analysis applies to water quality standards for priority pollutants, whether promulgated by USEPA or established as water quality objectives by the Regional Board. Steps 1 through 6 establish an analytical procedure for requiring water quality-based limitations based solely on discharge and ambient receiving water data. Except as noted in the preceding paragraph, reasonable potential for toxic pollutants regulated by this Order was determined using the analytical procedure in Steps 1 through 6 of SIP section 1.3 as explained above.

Step 7 of SIP Section 1.3 recognizes that in certain instances a rote, mathematical analysis of the data will not be sufficient to protect beneficial uses. Step 7 therefore reserves for the Regional Board the obligation to "review other available information to determine if a water quality-based effluent limitation is required, notwithstanding the above analysis in *Steps 1* through *6*, to protect beneficial uses." Among the factors the State Board identifies as relevant to the Step 7 analysis are: the facility type, discharge type, and potential toxic impact of the discharge. With respect to the Facility, the Regional Board finds sufficient, unusual circumstances to require a water quality-based effluent limitation for trichloroethylene (TCE). Data and testimony indicate that approximately 530,000 gallons of TCE were released to the soil and groundwater at the Facility. The tremendous volume of TCE released at the site warrants significant scrutiny. While recent monitoring data do not show TCE in surface water discharges, scouring from large storm events may release soils with adsorbed TCE. The large volumes of TCE in scoured soils may become chemically available in the surface water runoff and cause or contribute to an exceedance of the water quality standard. In addition, the existing monitoring data has been collected far downstream from on-site sources. The data may not reliably indicate the presence of TCE in waters of the United States because the turbid conditions may have volatilized the TCE before it reached existing monitoring points. Further, contamination is spotty and not completely characterized; pathways are not always predictable and are not fully characterized; and the site is in a hilly environment with uncertain pathways and seeps which could possibly lead to surfacing of water with contamination that cannot be predicted. Finally, TCE is a probable carcinogen that can cause skin rashes on contact, and when ingested has been associated with liver and kidney damage,

impaired immune system function, and in large volumes unconsciousness, impaired heart function, or death. Considering the toxic nature of TCE and that past practices at the site released extraordinary volumes of TCE into the environment that can continue to leach into surface water through the scouring from storm events, and further considering that the existing monitoring data may not be representative of direct discharges to waters of the United States since the data were collected downstream of the initial discharge, the Regional Board has determined that a water quality-based effluent limitation for TCE is necessary to protect beneficial uses.

Outfalls 003 through 007. Discharges from Outfall 003 through 007 are storm water runoff only. Daily maximum and monthly average limitations for storm water were included in Order No. 98-051. This Order does not include monthly average limitations for priority pollutants in storm water only discharges since storm events are infrequent and often
occur less than once per month during the rainy season. This change in the limitations is consistent with permits adopted by the Regional Board for storm water discharges only.

The storm water only discharges from Discharge Outfalls 003 through 007 were also evaluated using CAPWTT (Attachment 2 of Order No. R4-2004-0111). The analytes with statistical reasonable potential are cadmium, copper, cyanide, mercury, and TCDD (Attachment 2 page 1). Cyanide was detected only once during the period evaluated at a concentration of 5.8 micrograms/liter. That detection triggered the reasonable potential since it exceeds that calculated average monthly effluent limit (AMEL). However, the discharges evaluated are storm water only discharges, which do not have monthly average limitations. When the maximum effluent concentration (MEC) of 5.8 µg/L is compared to the maximum daily effluent limit (MDEL) the MEC is less than the MDEL. Consequently, this permit does not include an effluent limit for cyanide in the storm water only discharges. CTR-WQBELs for cadmium copper, mercury and TCDD have been included in this Order. The previous order included effluent limitations for all of these analytes except TCDD. The effluent limitations for the analytes with a positive RPA are the most stringent of the limit included in Order 98-051, and the applicable CTR criteria which include the freshwater aquatic life criteria, and the human health criteria for consumption of organisms only. The previous permit included limitations for these analytes from Title 22, which are more stringent than the CTR limitations. The compliance history reveals that the effluent limit for antimony (6 µg/L) was exceeded at Outfalls 005 and 007 in 1999 and the limit for thallium (2 µg/L) was exceeded at Outfall 005 on March 8, 2000. Therefore, limitations for antimony and thallium were established using best professional judgement.

The monthly average effluent limit for mercury included in Order No. 98-051 (0.012 µg/L) was based on freshwater continuous criteria from 40 CFR 131.36. This limit is based on a fish consumption advisory, which appeared in the July 1, 1998 edition but was subsequently withdrawn. CTR included criteria for mercury, which was used to develop the WQBEL for mercury that is included in Order R4-2004-0111.

The CTR-WQBELs for cadmium in the tentative Order is greater than the limit stipulated in Order 98-051 (previous order). The daily maximum concentrations for cadmium from the previous order were taken directly from NTR and were expressed

as dissolved criteria. The daily maximum limitations for all metals included in this order were calculated based on criteria that appears in CTR when they were the most protective criteria available. The dissolved criteria were adjusted using conversion factors to total recoverable. Since the effluent limit for cadmium in the Order R4-2004-0111 is total cadmium it is slightly higher than the limit included in the Order 98-051.

The criteria stipulated for TDS, sulfate, chloride, and nitrogen also changed for storm water discharges to the Arroyo Simi, a tributary of Calleguas Creek. The criteria listed previously were the stipulated criteria for the Los Angeles River Watershed. The criteria stipulated for Calleguas Creek above Potrero Road are 850, 250, 150, 1.0, and 10 mg/L for TDS, sulfate, chloride, boron and nitrogen respectively.

Outfall 008. The area commonly referred to as Happy Valley receives storm water runoff from the former solid propellant testing area. Operations at the former solid propellant testing area ended in 1994. A major component of the propellant was perchlorate. Since the propellant has been used in the area and it has been detected in the storm water runoff at concentrations exceeding the Department of Health Services action level of 4 µg/L (which was changed to 6 µg/L on March 11, 2004), an effluent limit for perchlorate has been included in this Order. The effluent limitation for perchlorate is established based on antidegradation as explained for Outfalls 001 and 002. A requirement for sampling of the storm water runoff all other constituents tested for at Outfalls 003 through 007, has also been included in this Order. The new storm water monitoring location is Discharge Outfall 008. Storm water from Happy Valley flows to Dayton Canyon Creek. Dayton Canyon Creek merges with flows from Chatsworth Creek, which flows south to Bell Creek southwest of the intersection of Shoup Avenue and Sherman Way. Bell Creek subsequently flows east to the Los Angeles River.

This area has since undergone an interim measure cleanup, with final excavation occurring in September 2004, under the direction of DTSC.

Outfalls 009. The WS-13 Drainage area begins near the entrance to the property and traverses several potential areas of concern. The WS-13 drainage area collects storm water runoff from the Area 1 and Area 2 Landfills, and the former LOX plant located on NASA owned property. In addition, WS-13 picks up storm water run on from Sage Ranch where agricultural operations took place and a gun shooting range is located. Prior to Order R4-2004-0111, this drainage had only been sampled once. Additional data would provide information regarding the transport of contaminants in these areas offsite by storm water runoff. The WS-13 Drainage area will become Discharge Outfall 009; this outfall drains to Arroyo Simi.

Outfall 010. Building 203 was formally used as an instrumentation laboratory where various types of instrumentation were repaired and calibrated. The instrumentation included but was not limited to, thermometers and manometers that contained mercury. Currently the building houses operations related to laser research. Operations include polishing fibers, hand wipe solvent and chemical cleaning, assembly and test of various components in both open warehouse and clean room environments. All wastes are currently containerized and transported off site for disposal. An interim measures cleanup was completed in this area during the summer of 2004. With DTSC oversight, soil containing mercury and trichloroethylene was

removed, hauled offsite and disposed of at a permitted disposal facility.

Outfall 011. The Perimeter Pond collects wastewater generated from Area 1. The discharges from groundwater treatment systems located in Area 1, discharges from Sewage Treatment Plant 1 and storm water runoff from the vicinity is discharged initially to R-1 Pond which flows to the Perimeter Pond. Discharges from the Perimeter Pond exit the site via Outfall 001. The Perimeter Pond is the final step in the storage of water. Consequently, this Order includes effluent limitations and requirements for monitoring of the effluent from the pond for the priority pollutants and for other targeted chemicals of concern at the site.

Outfalls 012 – 014. The various test stands are used to test fire rocket engines built onsite. The fire suppression water used during testing may contain residual fuels and solvents. This wastewater is directed via lined and unlined channels to the reclamation ponds, which are used to store wastewater collected from the various onsite operations along with any storm water runoff for reuse onsite.

The Regional Board will have oversight of the discharges from the engine test stands. R4-2004-0111 included requirements for monitoring of the discharges. The data collected will be used to evaluate reasonable potential of the discharge to exceed applicable requirements and if warranted; effluent limitations will be implemented for the discharges.

Outfalls 015 – 017. In July 2004 the two operational plants (STP-1 and STP-3) were activated sludge sewage treatment plants that provided secondary and tertiary treatment for the domestic sewage from the facility. The disinfected sewage effluent was subsequently directed to the reclaimed water system reservoir. The two plants which are currently being used as collection reservoirs only, previously had effluent limitations for $BOD_5 20^oC$, coliform, and turbidity on discharges from the facilities. Sewage sludge was hauled offsite to the one of the facilities operated by Los Angeles County Sanitation Districts. The monitoring program for the sewage treatment plants included requirements for the previously mentioned constituents as well as pH, oil and grease and suspended solids. Order R4-2004-0111 included requirements to monitor for priority pollutants except asbestos, perchlorate, N-nitrosodimethylamine, 1,4-dioxane, and 1,2,3-trichloropropane to provide the data required to evaluate reasonable potential. If reasonable potential exists, effluent limitations will be implemented.

Outfall 018. The R-2A and R-2B Ponds are used to collect wastewater from Areas II and III. R-2A Ponds collect wastewater from the Delta Groundwater Treatment System and storm water runoff from the location of the former Delta Test Stand. The R-2B Ponds receive overflow from the Silvernale Pond which includes discharges from the Bravo, Alpha and RD-9 Groundwater Treatment Systems and storm water runoff from the Alpha and Bravo Engine Test Stands. The R-2B Pond also receives wastewater discharges and storm water runoff from the STL-IV Test Stand area. The R-2 Spillway is an overflow area used to allow the wastewater from the two ponds to flow via a drainageway to Outfall 002. Wastewater released from the R-2 Spillway travels approximately 4,500 feet prior to reaching Outfall 002. Hence, this permit includes a monitoring requirement for discharges from the R-2 Spillway.

Data collected from August 20, 2004 (the effective date of Order R4-2004-0111) through May 5, 2005 was used to evaluate reasonable potential at the compliance points enumerated in that Order. This analysis has been completed to supplement the initial results presented in Order R4-2004-0111.

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Outfalls 001 002, 011, and 018 discharge wastewater and storm water runoff from SSFL to Bell Creek at the south. Outfalls 011, the Perimeter Pond, and 018, the R-2 Pond Spillway, are located directly upstream of Outfalls 001 and 002 respectively. Discharges from Outfalls 011 and 018 receive no additional treatment prior to exiting Outfalls 001 and 002. However, storm water runoff traversing other RCRA areas of concern may pick up other contaminants and subsequently enter the streambed between the upstream outfalls (Outfalls 011 and 018) and the corresponding downstream outfalls (Outfalls 001 and 002). Since there was no additional treatment, the discharges from these outfalls were evaluated together.

The statistical analysis yielded reasonable potential for copper, lead, mercury, and TCDD. The data, site history, and other information available were incorporated into the BPJ analysis. This analysis supported the retention of effluent limitations established at Outfalls 001 and 002 in Order No. R4-2004-0111 and it supported the inclusion of those effluent limitations for discharges from Outfalls 011 and 018.

Outfalls 008, 009 and 010 are storm water only outfalls. Data collected at these locations since the adoption of Order No. R4-2004-0111 indicated that the discharges from these locations are very similar to those from the other storm water only discharge locations. The statistical RPA of the data collected from all of the storm water locations resulted in Tier 1 RPA for copper, lead, mercury and TCDD. Since the discharges from Outfalls 008, 009 and 010 are very similar to those from Outfalls 003 through 007, BPJ was used to establish effluent limitations for other priority pollutants and other chemicals of concern (i.e. perchlorate) at all of the storm water only outfalls.

Outfalls 012-014 (Rocket Engine Test Stands) Data collected at Outfall 012 resulted in Tier 1 reasonable potential using the method specified in the SIP for copper, lead, mercury, TCDD. Additional constituents including settleable solids, total suspended solids, 1,4-dioxane, total petroleum hydrocarbons, naphthalene, oil and grease, tertiary-butyl alcohol, and ethlyene dibromide demonstrated RP utilizing the TSD method. RP was established for total dissolved solids and perchlorate based on BPJ. These constituents as well as other applicable Basin Plan constituents have been included in this addendum.

During the development and adoption of Order R4-2004-0111, Regional Board staff was informed that Boeing was not utilizing the three package type sewage treatment plants located onsite (STP1, STP2, STP-3), which are NPDES Outfalls 15-17. A rain event on January 11, 2005, resulted in the discharge of partially treated wastewater from Outfalls 015 and 017. The evaluation of the data collected resulted in Tier 1 reasonable potential for cadmium, chromium III, copper, mercury, nickel, TCDD. Other constituents of concern that demonstrate reasonable potential include MBAS,