

HAND DELIVERED

May 15, 2009
In reply refer to SHEA-108677

Regional Water Quality Control Board
Los Angeles Region
320 West 4th Street, Suite 200
Los Angeles, CA 90013

Attention: Information Technology Unit

Reference: Compliance File CI-6027 and NPDES No. CA0001309

Subject: First Quarter 2009 NPDES Discharge Monitoring Report Submittal
Santa Susana Field Laboratory

Dear Sir/Madam:

The Boeing Company (Boeing) hereby submits the Discharge Monitoring Report (DMR) for the Santa Susana Field Laboratory (Santa Susana site) for the First Quarter of 2009. This DMR provides the results of the sampling that occurred for the Santa Susana site outfalls (Figure 1) for the period of January 1st through March 31st of 2009 as required by National Pollutant Discharge Elimination System (NPDES) Permit No. CA0001309 (NPDES Permit).

This quarterly DMR provides information and data, including summary tables of surface water sample analytical results, rainfall summaries, liquid waste shipment summaries, and surface water sample laboratory analytical reports. The DMR is provided for the Santa Susana site outfalls authorized by the NPDES Permit. This document will be made available electronically at:

www.boeing.com/aboutus/environment/santa_susana/programs.html.

Additionally, hard copies of this DMR are available at the following: California State University at Northridge Library; Simi Valley Library; and the Platt Branch, Los Angeles Library.

**FIRST QUARTER 2009 DISCHARGE MONITORING REPORT (DMR)
CONTENTS AND DISCHARGE SUMMARY**

Figure 1 is a site location map indicating the locations of the outfalls at the Santa Susana site. A summary of the First Quarter 2009 precipitation measured at the Santa Susana site is presented in Appendix A. All sanitary wastes from the domestic sewage treatment plants (STPs) (STPs I, II, and III) were shipped off-site and appropriately managed. Details of all liquid waste shipments including the STP waste are summarized in Appendix B.

As detailed in Appendix A, Boeing observed eleven daily rain events with greater than 0.1 inches of rainfall in a 24-hour period. These rainfall events occurred on January 23,



January 24, February 5-7, February 9, February 13, February 16-17, March 4, and March 22, 2009.

Additionally, flow was observed at Outfall 009 on January 5, 2009. This flow was due to a water-main break upstream of Outfall 009, thus, creating a dry weather discharge at Outfall 009. Samples were collected according to the NPDES Permit requirements and submitted for analysis.

Field inspections are conducted at the storm water outfall locations prior to and following each rain event. For storm events that occur after working hours, a field check and/or sampling is conducted at the first available opportunity when it is safe to access the outfall. The following table provides a summary of the First Quarter 2009 sampling record (Table 1), by outfall/location per the requirements of the NPDES Permit.

Table 1. First Quarter 2009 Sampling Record -- Boeing SSFL

Date	Outfall/Location
1/5/2009	Outfall 009 (WS-13 Drainage) – Dry weather discharge
1/24/2009	Outfall 006 (FSDF-2)
	Outfall 010 (Building 203)
2/6/2009	Outfall 004 (SRE)
	Outfall 006 (FSDF-2)
	Outfall 009 (WS-13 Drainage)
	Outfall 010 (Building 203)
	Outfall 013 (Bravo Test Stand)
2/7/2009	Outfall 012 (Alfa Test Stand)
2/13/2009	Outfall 006 (FSDF-2)
	Outfall 009 (WS-13 Drainage)
	Outfall 010 (Building 203)
2/16/2009	Outfall 001 (South Slope below Perimeter Pond)
	Outfall 002 (South Slope below R-2 Pond)
	Outfall 004 (SRE)
	Outfall 008 (Happy Valley Drainage)
	Outfall 011 (Perimeter Pond Weir)
	Outfall 012 (Alfa Test Stand)
	Outfall 013 (Bravo Test Stand)
Outfall 018 (R-2 Spillway)	
2/27/2009	Arroyo Simi Receiving Water/Sediment Sampling (Frontier Park – City of Simi Valley)

No flow was observed at any of the outfalls during the January 23, February 5, February 9, February 17, March 4, and March 22 rain events. Therefore no samples were collected during these events.

As part of the ongoing efforts to assess the structural best management practices (BMPs) installed at SSFL, BMP performance monitoring is conducted for sediment concentrations. Analysis of sediment concentrations is not required by the permit, and sediment concentrations are not considered for compliance purposes. Effluent analytical results are provided in Appendix C.



Samples collected for compliance purposes were submitted to and analyzed by a California-certified analytical laboratory. Appendices C and D contain summary tables of analytical results for surface water samples collected during the First Quarter 2009. These tables identify the outfall, the constituents evaluated (analytes), the date of sampling, the analytical result, and data validation qualifiers.

A summary table of NPDES Permit limit exceedances and/or benchmark limits based on the surface water analytical data is provided in Appendix E. In addition, the results of a reasonable potential analysis (RPA) utilizing updated monitoring data are provided in Appendix F. Appendix G contains copies of the laboratory analytical reports, chains of custody, and data validation reports. Quarterly Summary Notes are a compilation of notes, abbreviations, and data validation codes that are used in the analytical data summary tables and are included as a supplement in Appendices C, D, E and F.

SUMMARY OF NONCOMPLIANCE

The following summary of noncompliance is organized by outfall location. Only those outfalls with NPDES Permit limits or benchmark limit exceedances are discussed in this report. No constituents were detected in the receiving water sample at concentrations greater than the receiving water limits for the Arroyo Simi.

Outfall 001

The following is a summary of exceedances of benchmark limits at Outfall 001 (South Slope below Perimeter Pond). The following benchmark limit exceedances are provided in Appendix E.

Dioxins and Furans: TCDD Toxic Equivalent Quotient (TEQ)

TCDD TEQ in storm water samples from Outfall 001 exceeded the TCDD TEQ daily benchmark limit on February 6, 2009. The measured concentration on this date was 7.3×10^{-7} ug/L. This value exceeds the benchmark daily maximum, 2.8×10^{-8} ug/L.

Additionally, TCDD TEQ concentration exceeded the monthly average benchmark limit concentration at Outfall 001 in February 16, 2009. This monthly average exceedance is based on the sample collected on February 6, 2009, the only sample collected at Outfall 001 during the First Quarter of 2009. Therefore, the monthly average concentration is the same as that single sample concentration¹. The monthly average TCDD TEQ for Outfall 001 in February, 2009 is 7.3×10^{-7} ug/L. This value is in excess of the monthly average benchmark limit, 1.4×10^{-8} ug/L.

TCDD congeners have been frequently detected in DTSC-approved, non-impacted background soils at the SSFL (MWH, 2005). In some areas, operations onsite have utilized combustion processes. However, when investigating these potentially impacted areas, the TCDD TEQ values in soils have been found either to be equivalent to background levels or, if elevated, they have been shown to decrease in relatively short distances to near background levels down slope or down drainage from the suspected source area.

¹ It remains Boeing's position that it is not appropriate to calculate the monthly average concentration based on a single sample taken, and that the requirement to calculate a monthly average concentration for comparison with a monthly average limit should only apply when there has been more than one sample collected during the month.



Boeing will continue to investigate sources of TCDD onsite. However, the presence of TCDD in both background soils and fire-related materials is well documented in the scientific literature (USEPA, 2000) and substantiated by previously-completed on- and offsite studies (MWH, 2005), and presented in the Flow Science Background Report (Flow Science, 2006). These reports suggest that the levels of TCDD TEQ measured in surface water at the SSFL could originate primarily from wildfire combustion processes, regional and atmospheric deposition, and other naturally occurring sources over which Boeing has no reasonable control. Continued monitoring of surface water will provide a more thorough dataset with which to further evaluate the occurrence of TCDD.



Irrespective of the source of the exceedance, Boeing is committed to fulfilling the requirements of the NPDES permit and therefore continues to take actions to reduce discharges of regulated constituents. Those actions are described in Table 2. Boeing will take additional action in coming summer months to upgrade its current BMP activities at Outfall 001. Besides maintaining the current BMP materials (fiber rolls, hay bales, etc.), Boeing will map additional areas of poor vegetation and bare soil within the watershed. Hydroseed and/or additional fiber rolls and haybales will be implemented to control sediment runoff in accessible areas. Hydroseed is a hydromulch that incorporates a native seed mixture. Hydromulch is a semi-liquid organic binder blended with hydromulch paper or wood fiber/pulp that is dispersed onto and adheres to the ground surface and soil surface to protect from further soil erosion, and to aid in minimizing sediment transport.

Metals

Iron, lead, and manganese were detected in excess of their respective benchmark daily limits at Outfall 001 in a sample that was collected on February 16, 2009, as indicated in Appendix E. Iron was detected at 8.1 mg/L. This is in excess of the benchmark daily limit for iron, 0.3 mg/L. Lead exceeded its benchmark limit, 5.2 ug/L, on February 16, 2009. The reported concentration for lead in this sample is 6.6 ug/L. Finally, manganese was found in the same sample, collected February 16, 2009, at a concentration of 110 ug/L. This value exceeds the benchmark daily maximum concentration, 50 ug/L.

Lead content also exceeded its monthly average benchmark of 2.6 ug/L. Since the sample collected on February 16, 2009 was the only sample collected at Outfall 001 during the month of February, 2009, the monthly average concentration is the same as that single sample concentration. Thus, the monthly average result for lead is 6.6 ug/L.

Boeing believes the metals concentrations in stormwater runoff from the SSFL are associated with TSS consisting of native sediments, soils, and ash. TSS and metals loading will vary based on rainfall intensity, duration, and erosion characteristics. Boeing believes that the non-compliant lead concentration is predominantly due to the erosion of native soils and ash, and its subsequent migration into storm water. Storm water flow and erosion have been intensified by post-wildfire site conditions.

As noted previously, BMPs upstream of Outfall 001 are designed to assist in controlling sediment transport into the surface water. Boeing will continue to evaluate all data and improve BMPs, as appropriate.

Irrespective of the source of the exceedance, Boeing is committed to fulfilling the requirements of the NPDES permit and therefore continues to take actions to reduce discharges of regulated constituents. Those actions are described in Table 2. Boeing will

take additional action in coming summer months to upgrade its current BMP activities at Outfall 001. Besides maintaining the current BMP materials (fiber rolls, hay bales, etc.), Boeing will map additional areas within the watershed of poor vegetation and bare soil. Hydroseed and/or additional fiber rolls and haybales will be implemented to control sediment runoff in accessible areas.

Outfall 002

The following is a summary of benchmark limit exceedances at Outfall 002 (South Slope Below R-2 Pond). The following benchmark limit exceedances are provided in Appendix E.

Dioxins and Furans: TCDD Toxic Equivalent Quotient (TEQ)

TCDD concentrations in storm water samples from Outfall 002 exceeded the NPDES benchmark limit of 2.8×10^{-8} ug/L on February 16, 2009, as indicated in Appendix E. The reported concentration of TCDD TEQ for the February 16, 2009 sample is 4.8×10^{-7} ug/L.

TCDD congeners have been frequently detected in DTSC-approved, non-impacted background soils at the SSFL (MWH, 2005). In some areas, operations onsite have utilized combustion processes. However, when investigating these potentially impacted areas, the TCDD TEQ values in soils have been found either to be equivalent to background levels or, if elevated, they have been shown to decrease in relatively short distances to near background levels down slope or down drainage from the suspected source area.

Boeing will continue to investigate sources of TCDD onsite. However, the presence of TCDD in both background soils and fire-related materials is well documented in the scientific literature (USEPA, 2000) and substantiated by previously-completed on- and offsite studies (MWH, 2005), and presented in the Flow Science Background Report (Flow Science, 2006). These reports suggest that the levels of TCDD TEQ measured in surface water at the SSFL could originate primarily from wildfire combustion processes, regional and atmospheric deposition, and other naturally occurring sources over which Boeing has no reasonable control. Continued monitoring of surface water will provide a more thorough dataset with which to further evaluate the occurrence of TCDD.

Irrespective of the source of the exceedance, Boeing is committed to fulfilling the requirements of the NPDES permit and therefore continues to take actions to reduce discharges of regulated constituents. Those actions are described in Table 2. Boeing will take additional action in coming summer months to upgrade its current BMP activities at Outfall 002. Besides maintaining the current BMP materials (fiber rolls, hay bales, etc.), Boeing will map additional areas within the watershed of poor vegetation and bare soil. Hydroseed and/or additional fiber rolls and haybales will be implemented to control sediment runoff in accessible locations.

Metals

Iron, lead, and manganese were detected in excess of their respective benchmark daily limits at Outfall 002 during First Quarter, 2009. Iron was detected at 17 mg/L on February 16, 2009. This is in excess of the benchmark daily limit for iron, 0.3 mg/L. Lead exceeded its benchmark limit, 5.2 ug/L, in a sample also collected on February 16, 2009. The reported concentration for lead in this sample is 11 ug/L. Finally, manganese was found in the same sample, collected February 16, 2009, at a concentration of 240 ug/L. This value exceeds the benchmark daily maximum concentration, 50 ug/L.



Boeing believes the metals concentrations in storm water runoff from the SSFL are associated with TSS consisting of native sediments and soils. TSS and metals loading will vary based on rainfall intensity, duration, and erosion characteristics. Boeing believes that the non-compliant metals concentration is predominantly due to the erosion of native soils, and its subsequent migration into storm water.

Irrespective of the source of the exceedance, Boeing is committed to fulfilling the requirements of the NPDES permit and therefore continues to take actions to reduce discharges of regulated constituents. Those actions are described in Table 2.

Boeing will take additional action in coming dry season to upgrade its current BMP activities at Outfall 002. Besides maintaining the current BMP materials (fiber rolls, hay bales, etc.), Boeing will map additional areas within the watershed of poor vegetation and bare soil. Hydroseed and/or additional fiber rolls and haybales will be implemented to control sediment runoff in accessible locations.

Outfall 004

The following is a summary of permit limit exceedances at Outfall 004 (SRE). The following permit limit exceedances are provided in Appendix E.

Dioxins and Furans: TCDD Toxic Equivalent Quotient (TEQ)

TCDD concentrations in storm water samples from Outfall 004 exceeded the NPDES permit limit of 2.8×10^{-8} ug/L on February 6 and February 16, 2009, as indicated in Appendix E. The reported concentration of TCDD TEQ for the February 6, 2009 sample was 6.1×10^{-7} ug/L. The February 16 TCDD concentration at Outfall 004 is 3.6×10^{-7} ug/L.

Boeing is in the process of increasing the ability of its best management practices (BMPs) at this outfall to treat larger storms more effectively. During this quarter the sand bed was replaced and maintenance was performed on the Outfall 004 HDPE walls. Summer work identified for this outfall is reduce the flow through velocity to allow for additional retention time. Additional dioxin removal can be facilitated by increasing the retention time of the water within activated carbon media contained in the BMPs installed at those outfall locations with structural BMPs where TCDD exceeded its applicable limit. However, it is unclear exactly what retention time would be necessary to achieve the water-quality based effluent limit of 2.80×10^{-8} ug/L for TCDD TEQ. Dioxin congeners are hydrophobic molecules that partition readily into the organic fraction of sediments and solid materials. Activated carbon is believed by United States Environmental Protection Agency (EPA) to be best available technology for the removal of dioxins from water (<http://www.epa.gov/OGWDW/dwh/t-soc/dioxin.html>). However, studies have not been conducted to support the development of technology-based effluent limits for dioxin when activated carbon is used and Boeing is unaware of any studies documenting what retention time, if any, in activated carbon can achieve this effluent limit. In fact, specific studies of the use of activated carbon do not show effluent concentrations as low as the water quality based permit effluent limit of 2.80×10^{-8} ug/L. One of the few studies identified while researching the literature reported an effluent concentration just below 8.1×10^{-5} ug/L (Torrens, 2000). Nevertheless, Boeing is committed to achieving the water quality based effluent limit, if possible.



Outfall 009

The following is a summary of exceedances of benchmark limits at Outfall 009 (WS-13 Drainage). The following benchmark limit exceedances are provided in Appendix E.

Dioxins and Furans: TCDD Toxic Equivalent Quotient (TEQ)

TCDD concentrations in storm water samples from Outfall 009 exceeded the NPDES benchmark limit of 2.80×10^{-8} ug/L twice during the first quarter of 2009 as indicated in Appendix E. The reported concentrations of TCDD TEQ for the February 6, 2009 and the February 13, 2009 samples were 9.5×10^{-7} ug/L and 1.2×10^{-5} ug/L, respectively. Additionally, TCDD TEQ exceeded the mass-based benchmark limit of 4.20×10^{-9} lbs/day for February 6 and February 13, 2009. The reported mass calculations are 5.6×10^{-9} lbs/day for February 6, 2009 and 1.1×10^{-8} lbs/day for February 13, 2009.



At this time, Boeing is uncertain where the TCDD in this sample originated, but Boeing will continue to investigate sources of TCDD onsite. The presence of TCDD in both background soils and fire-related materials is well documented in the scientific literature (USEPA, 2000; Gullett and Touati, 2003). These findings are further substantiated by previously completed onsite and offsite studies (MWH, 2005) as presented in the Flow Science Background Report (Flow Science, 2006) and reported in the first, second and First Quarter 2006 DMRs. These reports suggest that the levels of TCDD TEQ measured in surface water samples at the SSFL may result primarily from wildfire combustion processes, regional atmospheric deposition, and other off-site sources over which Boeing has no control. Continued monitoring of surface water at the outfall locations during storm events will provide a more thorough dataset with which to further evaluate the occurrence of TCDD.

Pursuant to the December 3, 2008 Section 13304 Order issued by the Los Angeles Regional Water Quality Control Board (Regional Board), Boeing is proceeding with source removal activities in the Outfall 009 watershed to address constituents, including TCDD, that have exceeded NPDES permit limits/benchmarks. The Interim/Source Removal Action (ISRA) Workplan was submitted to the Regional Board on May 1, 2009 for approval and source removal activities are scheduled to begin in Summer 2009.

Metals

Lead was detected at Outfall 009 on February 6, and February, 13 2009 at concentrations above its benchmark limit as indicated in Appendix E. On February 6, 2009, a lead concentration of 7.5 ug/L was recorded, which is in excess of the 5.2 ug/L NPDES benchmark limit. The lead content of the stormwater sample collected on February 13, 2009 was 20 ug/L also in excess of the benchmark daily maximum.

During 2008, cleanup activities occurred in the Northern Drainage area to remove residual lead shot and clay pigeon debris under California Department of Toxic Substance Control (DTSC) oversight. Based on confirmation sampling results, additional removal activities are planned for the 2009 dry season for the Northern Drainage. A separate lead shot removal work plan will be submitted to DTSC for review and approval. Additionally, background soils could have contributed to this exceedance. The reduction of total suspended solids (TSS) in stormwater runoff is likely to be the most effective approach for reducing lead exceedances since lead typically has low solubility and is associated with sediments. Boeing continues to investigate erosion sources and erosion control measures that can be implemented in the Outfall 009 watershed and erosion and sediment control plans, including channel stabilization, are underway for the Northern Drainage area.

Pursuant to the December 3, 2008 Section 13304 Order issued by the RWQCB, Boeing is proceeding with source removal activities in the Outfall 009 watershed to address constituents, including lead, that have exceeded NPDES permit limits/benchmarks. The ISRA Workplan was submitted to the Regional Board on May 1, 2009 for approval and source removal activities are scheduled to begin in Summer 2009.

Outfall 011

The following is a summary of exceedances of permit limits at Outfall 011 (Perimeter Pond Weir). The following permit limit exceedances are provided in Appendix E.

Dioxins and Furans: TCDD Toxic Equivalent Quotient (TEQ)

As shown in Appendix E, TCDD TEQ concentrations at Outfall 011 exceeded daily maximum permit limit, 2.8×10^{-8} ug/L, once during the first quarter of 2009. The TCDD TEQ daily average result for February 16, 2009 at Outfall 011 is 1.4×10^{-6} ug/L.

Additionally, TCDD TEQ for results Outfall 011 are in excess of the monthly average permit limit for February, 2009 as indicated in Appendix E. The monthly average permit limit is 1.4×10^{-8} ug/L. This value is exceeded by the average concentration for February, 2009, 1.4×10^{-6} ug/L. Since only one sample was collected at Outfall 011 during the month of February, the monthly average is based upon this single sample. Thus, the monthly average concentration and the daily average concentration, for the sample collected on February 16, 2009, are the same value.

Dioxin removal can be facilitated by increasing the retention time of the water within activated carbon media contained in the BMP installed at those outfall locations with structural BMPs where TCDD exceeded its applicable limit. However, it is unclear exactly what retention time would be necessary to achieve the water-quality based effluent limit of 2.8×10^{-8} ug/L for TCDD TEQ. Dioxin congeners are hydrophobic molecules that partition readily into the organic fraction of sediments and solid materials. Activated carbon is believed by United States Environmental Protection Agency (EPA) to be best available technology for the removal of dioxins from water (<http://www.epa.gov/OGWDW/dwh/t-soc/dioxin.html>). However, studies have not been conducted to support the development of technology-based effluent limits for dioxin when activated carbon is used and Boeing is unaware of any studies documenting what retention time, if any, in activated carbon can achieve this effluent limit. In fact, specific studies of the use of activated carbon do not show effluent concentrations as low as the water quality based effluent limit of 2.8×10^{-8} ug/L. One of the few studies identified while researching the literature reported an effluent concentration just below 8.1×10^{-5} ug/L (Torrens, 2000). Nevertheless, Boeing is committed to attempting to achieve the water quality based effluent limit, if possible.

Irrespective of the source of the exceedance, Boeing is committed to fulfilling the requirements of the NPDES permit and therefore Boeing continues to take actions to reduce discharges of regulated constituents. Those actions are described in Table 2.

Metals

Daily maximum permit limit exceedances occurred for iron, lead and manganese at Outfall 011 on February 16, 2009. The daily maximum for iron on February 16, 2009, is 11 mg/L, which is in excess of the permit limit, 0.3 mg/L. For lead, the permit limit daily maximum is 5.2 ug/L. The result for lead on February 16, 2009, 7.1 ug/L, exceeds this value.



Manganese was found on February 16, 2009 at Outfall 011 at a concentration of 150 ug/L, in excess of its permit limit which of 50 ug/L.

Boeing monthly average permit limit exceedances for metals occurred in at Outfall 011 the First Quarter of 2009. The February, 2009 monthly average result for lead is 7.1 ug/L. This concentration is in excess of the monthly average permit limit of 2.6 ug/L. The monthly average permit limit for zinc in is 54 ug/L. This concentration is exceeded by the monthly average for February, 2009, 60 ug/L. The sample collected on February 16, 2009 was the only sample collected at Outfall 011 during the month of February, 2009. Thus, the monthly average is based upon that single sample. The monthly average and the daily average for each respective metal will be the same. Reported exceedances can be found in Appendix E of this DMR.



Boeing believes that these metal exceedances are primarily due to the erosion and surface water transport of native uncontaminated soils as these concentrations are similar to those seen in stormwater runoff from offsite and other open areas (Flow Science, 2006). Additionally, Boeing has investigated and continues to investigate potential sources of constituents coming from areas of historical Site industrial activity with coordination from the California Department of Toxic Substance Control (DTSC). Boeing continues to investigate erosion sources and erosion control measures at the Outfall 011 watershed, and will improve BMPs as appropriate, to better control sediment and associated metals transport into surface water.

Irrespective of the source of the exceedance, Boeing is committed to fulfilling the requirements of the NPDES permit and therefore continues to take actions to reduce discharges of regulated constituents. Those actions are described in Table 2.

Boeing is developing a substantial treatment system to treat water from this watershed prior to its discharge. Because of the size of the watershed and the low effluent limits, developing such a system requires pilot testing. Boeing has been engaged in pilot testing of different aspects and process options for this treatment system for over two years. During the 1st quarter of 2009, Boeing implemented a pilot-testing program at R-2 Pond proximate to Outfall 018, to evaluate various filter media and processes that will aid in removing constituents from storm water as described below for Outfall 018. The results of this program will help determine approximate filter media and processes to be used to improve water quality discharges from all outfalls within the context of the iterative BMP process. Implementation of additional BMPs based upon the pilot program results will likely commence during the upcoming rainy season.

Outfall 012

The following is a summary of exceedances of benchmark limits at Outfall 012 (Alfa Test Stand). The following benchmark limit exceedances are provided in Appendix E.

Dioxins and Furans: TCDD Toxic Equivalent Quotient (TEQ)

Despite Boeing's continued implementation of the site-wide Storm Water Pollution Prevention Plan (SWPPP) and maintenance of current structural and non-structural BMP material at SSFL, TCDD-TEQ was detected above benchmark limits at Outfall 012. During the First Quarter of 2009, TCDD TEQ concentrations at Outfall 012 exceeded the daily maximum benchmark as indicated in Appendix E. The TCDD TEQ for the sample collected

February 16, 2009 is 7.4×10^{-7} ug/L. This concentration exceeds the daily maximum benchmark of 2.8×10^{-8} ug/L.

Outfall 012 is located directly downstream of the Alfa Test Stand, an inactive rocket engine testing facility residing within Area II of SSFL. Cooling water was previously discharged during rocket engine testing upstream of this monitoring location.

Boeing replaced the liner systems at Outfalls 012 and 013 in preparation of the BMP at the beginning of the quarter. However, in response to the reported exceedance of a benchmark, actions will be taken to reduce or prevent potential pollutants associated with former industrial activities from entering stormwater discharges. Boeing will continue to perform pollution prevention/good housekeeping BMPs that prevent pollutants from entering the storm drain system, including inspecting and cleaning pumps, pipes, pressure vessels, chemical devices used during the operation of the test stands and removal of all substance residuals, wind-blown debris, corrosion or other deterioration and stains/drips and grease from inside and around mechanical equipment. Such 'source control' BMPs are effective in minimizing contamination before it can enter stormwater.

Outfall 018

The following is a summary of exceedances of permit limits at Outfall 018 (R-2 Spillway). The following benchmark limit exceedances are provided in Appendix E. The reported concentration of TCDD TEQ for February, 2009

Dioxins and Furans: TCDD Toxic Equivalent Quotient (TEQ)

During the First Quarter of 2009, TCDD TEQ concentrations at Outfall 018 exceeded daily maximum permit limit, 2.8×10^{-8} ug/L, on February 16, 2009. The TCDD TEQ daily maximum result for this date is 2.6×10^{-6} ug/L.

Boeing is developing a substantial treatment system to treat water from this watershed prior to its discharge. Because of the size of the watershed and the low effluent limits, developing such a system requires pilot testing. Boeing has been engaged in pilot testing of different aspects and process options for this treatment system for over two years. During the first quarter of 2009, Boeing implemented a pilot-testing program at R-2 Pond proximate to Outfall 018. Initially, the pilot system had the same treatment train utilized during the tests conducted in the summer of 2008 (i.e., sand filters, multimedia filters, cartridge filters, granular activated carbon, and ion exchange). However, the heavy rain events during the first quarter 2009 demonstrated that sediment loads during the rain event was too high to be controlled with the physical filtration configuration treatment train

Boeing responded by implementing an ACTIFLO process (rapid clarification) test at pilot scale, as an alternative to control high turbidity peaks and protect the rest of the system of solids overload. This system required coagulation chemicals (ferric sulfate and anionic polymer) that were able to reduce influent turbidities ranging between 1000-2000 Nephelometric Turbidity Unit (NTU) to approximately 3-5 NTU. Initial results from the pilot study also suggests that the ACTIFLO process indicate almost complete removal of targeted metals (iron, manganese, lead, mercury, and copper), when combined with potassium permanganate as an oxidant. Additional pilot testing is currently being conducted to further treat the ACTIFLO process effluent with microfiltration membranes, using a Toray skid. The purpose is to remove turbidity to even lower levels and determine the additional removal of dioxin that can be achieved by removing more solids. When this phase of the



pilot test is concluded, it is anticipated that the final treatment system will be able to remove constituents of concerns to below permit limits. Approximately 4000 analysis was conducted as part of the pilot testing activities. This data is currently being processed and reviewed. The final results of this program will help determine approximate filter media and processes to be used to improve water quality discharges. Implementation of additional BMPs based upon the pilot program results will likely commence during the upcoming rainy season.



Dioxin removal can be facilitated by increasing the retention time of the water within activated carbon media contained in the BMP installed at those outfall locations with structural BMPs where TCDD exceeded its applicable limit. However, it is unclear exactly what retention time would be necessary to achieve the water-quality based effluent limit of 2.8×10^{-8} ug/l for TCDD TEQ. Dioxin congeners are hydrophobic molecules that partition readily into the organic fraction of sediments and solid materials. Activated carbon is believed by United States Environmental Protection Agency (EPA) to be best available technology for the removal of dioxins from water (<http://www.epa.gov/OGWDW/dwh/t-soc/dioxin.html>). However, studies have not been conducted to support the development of technology-based effluent limits for dioxin when activated carbon is used and Boeing is unaware of any studies documenting what retention time, if any, in activated carbon can achieve this effluent limit. In fact, specific studies of the use of activated carbon do not show effluent concentrations as low as the water quality based effluent limit of 2.8×10^{-8} ug/L. One of the few studies identified while researching the literature reported an effluent concentration just below 8.1×10^{-5} ug/L (Torrens, 2000). Nevertheless, Boeing is committed to attempting to achieve the water quality based effluent limit, if possible.

Metals

Daily maximum exceedances occurred for iron, lead and manganese at Outfall 018 on February 16, 2009. The measured daily maximum for iron on February 16, 2009 is 12 mg/L, which is in excess of the permit limit, 0.3 mg/L. For lead, the permit limit daily maximum is 5.2 ug/L. The result for lead on February 16, 2009, 8.2 ug/L, exceeds this value. Manganese was found on February 16, 2009 at Outfall 011 at a concentration of 140 ug/L, in excess of the permit limit which is 50 ug/L.

Boeing believes that these metal exceedances are primarily due to the erosion and surface water transport of native uncontaminated soils as these concentrations are similar to those seen stormwater runoff from offsite and other open areas (Flow Science, 2006). Additionally, Boeing has investigated and continues to investigate potential sources of constituents coming from areas of historical Site industrial activity with coordination from the California Department of Toxic Substance Control (DTSC). Boeing continues to investigate erosion sources and erosion control measures at the Outfall 018 watershed, and will improve BMPs as appropriate, to better control sediment and associated metals transport into the surface water.

Irrespective of the source of the exceedance, Boeing is committed to fulfilling the requirements of the NPDES permit and therefore continues to take actions to reduce discharges of regulated constituents. Those actions are described in Table 2.

Boeing implemented a pilot-testing program at R-2 Pond which commenced in the first quarter 2009 as discussed above, proximate to Outfall 018, to evaluate various filter media that will aid in removing constituents from stormwater. The results of this program will help

determine approximate filter media and processes to be used to improve water quality discharges. Implementation of additional BMPs based upon the pilot program results will likely commence during the upcoming rainy season.

FIRST QUARTER 2009 CORRECTIVE ACTIONS TAKEN

Throughout the First Quarter of 2009, Boeing took actions to improve the quality of surface water discharges. These actions included the continued implementation of the site-wide Storm Water Pollution Prevention Plan (SWPPP). Activities throughout the SSFL site also continued, including site-wide inspections and metal and debris removal at various areas. Specific activities by outfall are identified in Table 2.

Table 2. BMP Activities during the First Quarter 2009

OUTFALL	BMP ACTIVITIES DURING FIRST QUARTER 2009
001 (South Slope below Perimeter Pond)	Inspected and maintained erosion control BMPs, performed maintenance on the flume and conducted housekeeping activities at the sample location.
002 (South Slope below R-2 Pond)	Inspected and maintained erosion control BMPs, performed maintenance on the flume and conducted housekeeping activities at the sample location.
003 (RMHF)	Conducted structural BMP and stormwater filter system inspections. Performed maintenance on the flume and conducted housekeeping activities at the sample location.
004 (SRE)	Conducted structural BMP and stormwater filter system inspections. Installed additional sand bag check dams to slow down water into BMP. Performed maintenance on flume and conducted housekeeping activities at the sample location.
005 (FSDF-1)	Conducted BMP, sedimentation basin and stormwater filter system inspections. Conducted housekeeping activities at the sample location. Pilot study testing of a stormwater treatment system consisting of a three stage of filtration, two stage of ion exchange, one of activated carbon and membrane system.
006 (FSDF-2)	Conducted structural BMP and stormwater filter system inspections. Performed maintenance on flume and conducted housekeeping activities at the sample location. Placed crushed concrete and rinsed media bed.
007 (Building 100)	Conducted BMP, sedimentation basin and stormwater filter system inspections. Conducted housekeeping activities at the Outfall sample location. Pilot study testing of a stormwater treatment system consisting of a three stage of filtration, two stages of ion exchange, one of activated carbon and membrane system.
008 (Happy Valley)	Inspected and maintained erosion control BMPs, performed maintenance on the flume and conducted housekeeping activities at the sample location. Continued progress on permitting and design of ENTS.
009 (WS-13 Drainage)	Inspected and maintained erosion control BMPs, performed





OUTFALL	BMP ACTIVITIES DURING FIRST QUARTER 2009
	maintenance on the flume and conducted housekeeping activities at the sample location. Culvert maintenance within the 009 watershed continued. Continued progress on permitting and design of ENTS and reviewed implementation of erosion and sediment control plans for the Northern Drainage project areas.
010 (Building 203)	Conducted structural BMP and sedimentation/filtration basin inspections. Performed maintenance on the flume and conducted housekeeping activities at the sample location.
011 (Perimeter Pond)	Conducted BMP and drainage system inspections. Performed maintenance and conducted housekeeping at the sample location. Pilot study testing of a stormwater treatment system consisting of three stages of filtration, two stages of ion exchange, one of activated carbon and membrane system.
012 (ALFA Test Stand)	Conducted inspection of structural BMPs. Performed maintenance and conducted housekeeping activities at the sample location. Placement of new high-density polyethylene (HDPE) liner.
013 (BRAVO Test Stand)	Conducted inspection of structural BMPs. Performed maintenance and conducted housekeeping activities at the sample location. Placed new HDPE liner.
014 (APTF Test Stand)	Conducted inspection of BMPs. Performed maintenance and conducted housekeeping activities at the sample location. Begin preparation for demolition activities.
018 (R-2 Spillway)	Conducted structural BMP inspections. Performed housekeeping activities at the sample location. Rinsed media bed. Conducted pilot study testing of a stormwater treatment system consisting of three stages of filtration, two stages of ion exchange, one-stage of activated carbon and membrane system.
019 (GETS)	Groundwater Extraction Treatment System (GETS) under construction. Treated ground water hauled off-site. No discharges.

REASONABLE POTENTIAL ANALYSIS

Outfall monitoring data were collected during the First Quarter 2009 for Outfalls 001, 002, 004, 006, 008, 009, 010, 011, 012, 013 and 018. Data from this quarter were added to the Reasonable Potential Analysis (RPA) data set as per the MWH and Flow Science RPA Procedures Technical Memorandum for the outfall monitoring groups: Outfalls 001,002, 011, and 018; Outfalls 003-0007, 009 and 010; Outfall 008; and Outfalls 012-014 (MWH and Flow Science, 2006). Reasonable potential was triggered for constituents not regulated under the current NPDES permit. A summary RPA table for these constituents is provided below. Complete RPA tables for the outfall monitoring group are provided in Appendix F.

The analytical sampling results for this reporting period, summarized in Table 3 below, indicates that reasonable potential was triggered for constituents currently not regulated

under the NPDES permit. Complete RPA tables for the outfall monitoring group are provided in Appendix F.

Table 3. First Quarter 2009 RPA Summary

Constituent	Maximum Observed Effluent Concentration	Maximum Projected Effluent Concentration	Basin Plan/CTR Comparison Criteria	Analysis Method	Outfall Location, Sample Date
1,2-Dichloroethane	2.4 ug/L	NA	0.5 ug/L	EPA 624	018, 2/16/2009
Total Cyanide	9.6 ug/L	NA	5.2 ug/L	SM4500-CN-C,E	006, 2/6/2009
Total Cyanide	8.7 ug/L	NA	5.2 ug/L	SM4500-CN-C,E	008, 2/16/2009

NA Not Applicable

The Regional Board's RPA procedures for priority pollutants utilize the most stringent water quality criterion or objective for each pollutant. The source of the criterion specified for 1,2-dichloroethane is identified as the Regional Board's Basin Plan. The Basin Plan limit for 1,2-dichloroethane (0.0005 mg/L) is contained in Table 3-7 of the Water Quality Control Plan (Basin Plan) for the Los Angeles Region (p. 3-10 of the June 13, 1994 Basin Plan).

This limit is a Maximum Contaminant Level (MCL) for the MUN (municipal supply) beneficial use and is set forth in Table 64444-A of Section 64444 of Title 22 of the California Code of Regulations. These Title 22 regulations apply to treated drinking water as it leaves the treatment plant and enters the drinking water distribution system. Compliance with the Title 22 regulations for this chemical is determined using the average annual concentration.

Given that the waters downstream of the Santa Susana site do not have a beneficial use designation of MUN and the storm flows do not enter the drinking water distribution system, it is not appropriate to use the MCL as the basis of an RPA of the site's storm flow monitoring data. Boeing does not believe that reasonable potential was triggered for 1,2-dichloroethane at Outfall 018.

The source of the criterion specified for total cyanide is identified as the California Toxics Rule for freshwater Criterion Continuous Concentration (CCC or "chronic" CTR value). Chronic toxicity is defined as toxicity that would occur with a relatively long exposure. The CTR itself defines chronic toxicity as toxicity that would occur with relatively long exposure of four days or more (CTR, footnote D, Section 131.38 (B) (1), Federal Register Volume 65, No. 97, May 18, 2000 at page 31716). The CTR also establishes fresh water Criterion Maximum Concentration (CMC or "acute" CTR Criterion). This acute toxicity criteria, established at 22 ug/L, is generally used to evaluate a one-hour exposure.

Storm water discharges from the Santa Susana site typically last less than four days. The Outfall 006 storm water flow occurred for less than three days during the sample event on February 6, 2008. The Outfall 008 storm water flow occurred for less than two days during the sample event on February 16, 2008. Given the short duration of storm events, it is not



appropriate to use the chronic CTR criterion as the basis of an RPA of storm flow monitoring data. Boeing does not believe that reasonable potential was triggered for total cyanide at Outfalls 006 and 008.

Storm water flows are significantly different from steady-state discharges in that they exhibit highly variable rates and water quality constituent concentrations both during and between storms. It remains Boeing's position that the currently used RPA procedures, which were developed for steady-state discharges, are not appropriate for, and should not be applied to, storm water and storm water-dominated discharges from the Santa Susana site.



DATA VALIDATION AND QUALITY CONTROL DISCUSSION

In accordance with current EPA guidelines and procedures, or as specified in the monitoring program, chemical analyses of surface water discharge and receiving water samples were completed at a State of California certified laboratory. Data validation was performed on a percentage of the analytical results and quality control elements were found to be within acceptable limits for the analytical methods reported, except as noted on the analytical summary tables. Laboratory analytical reports, including validation reports and notes, are included in Appendix G. Attachment T-A of the NPDES Permit issued to the Santa Susana site presents the State of California Water Resources Control Board (SWRCB) minimum levels (MLs) for use in reporting and determining compliance with NPDES Permit limits.

The analytical laboratory achieved these MLs for this reporting period when technically possible. When the laboratory reporting limits (RLs) were elevated, the laboratory maximum detectable limits (MDLs) were below the California state MLs. However, some constituents' daily maximum or monthly average discharge limits in the NPDES Permit are less than their respective MLs, and less than the RL. In cases where the NPDES Permit limit is less than the RL and ML, the RL was used to determine compliance. The specific constituents that have NPDES Permit limits that are less than the RL and ML are: mercury, bis(2-ethylhexyl)phthalate, cyanide polychlorinated biphenyls (PCBs) (Aroclor congeners), chlordane, 4,4-DDD, 4,4-DDE, 4,4-DDT, dieldrin, toxaphene, and chlorpyrifos.

FACILITY CONTACT

If there are any questions regarding this DMR or its enclosures, you may contact Ms. Lori Blair at (818) 466-8741.

CERTIFICATION

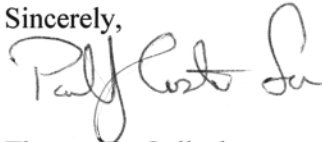
I certify under penalty of law that this document and all appendices were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted.

Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant

penalties for submitting false information, including the possibility of fine and imprisonment for a knowing violation.

Executed on the 15th of May 2009 at The Boeing Company, Santa Susana site.

Sincerely,



Thomas D. Gallacher
Director, Santa Susana Field Laboratory
Environment, Health and Safety

LB:bjc
Enclosures

Figure: 1 Storm Water Drainage System and Outfall Locations

Appendices:

- A First Quarter 2009 Rainfall Data Summary
- B First Quarter 2009 Liquid Waste Shipment Summary Tables
- C First Quarter 2009 Summary Tables, Outfalls 001, 002, 004, 006, 008, 009, 010, 011, 012, 013, 018, Arroyo Simi Receiving Water, and BMP Effectiveness Effluent Discharge Monitoring Data
- D First Quarter 2009 Radiological Monitoring Data, 001, 002, 004, 006, 008, 009, 010, 011, 012, 013, 018
- E First Quarter 2009 Summary of Exceedances
- F Reasonable Potential Analysis (RPA) Summary Tables
- G First Quarter 2009 Analytical Laboratory Reports, Chain-of-Custody, and Validation Reports

cc: Mr. Jim Pappas, Department of Toxic Substances Control
Mr. Chris Sherman, Department of Toxic Substances Control
Mr. Robert Marshall, California State University, Northridge, Library
Mr. Gabriel Lundeen, Simi Valley Library
Ms. Lynn Light, Platt Branch, Los Angeles Library

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