The Boeing Company
Santa Susana Field Laboratory
5800 Woolsey Canyon Road
Canoga Park, CA 91304-1148

HAND DELIVERED

May 15, 2007
In reply refer to SHEA-105451

BOEING

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 2007 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 (SSFL) for the First Quarter of 2007. This DMR provides the results of the sampling that occurred for the SSFL Outfalls (Figure 1) for the period of January 1st through March 31st of 2007 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 SSFL 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 2007 DISCHARGE MONITORING REPORT (DMR) CONTENTS AND DISCHARGE SUMMARY

Figure 1 is a site location map indicating the locations of the 18 regulated outfalls at the SSFL. A summary of the First Quarter 2007 precipitation measured at SSFL is presented in Appendix A. All sanitary wastes from the domestic sewage treatment plants (STPs I, II, and III; Outfalls 015, 016, and 017; respectively) were shipped

off-site and appropriately managed with no discharges occurring from these outfalls. Details of all liquid waste shipments including the STP waste are summarized in Appendix B. Because discharge did not occur, samples were not collected from these outfalls. Discharges did not occur at Outfalls 012, 013 or 014 (Alfa Test Stand, Bravo Test Stand, or Advanced Propulsion Testing Facility [APTF]), as rocket and propulsion testing activities have ceased at the SSFL. Therefore, samples were not collected at these outfalls.

A field inspection was conducted at the storm water outfall locations during and/or after each rain event. There were four rain events during the First Quarter 2007. As detailed in Appendix A, Boeing observed four rain events with greater than 0.1 inches of rainfall in a 24-hour period. These rainfall events occurred on January 28, February 19, February 22 and February 27, 2007. Due to a power outage and maintenance activities at the facility, no rainfall depth measurements were available in late January, but a storm event did occur for the January 28, 2007 rainfall event. A nearby rain gauge at Bell Canyon, maintained by the County of Los Angeles Department of Public Works, measured approximately 0.76 inches of rainfall during this storm event.

Flow was observed at Outfalls 003, 006, 009 and 010 on January 28, 2007 and on February 19, 2007. On February 22, 2007, the site rain gauge recorded a total of 0.48 inches of rain. However, because the permit specifies that sample collection is to occur once per week and flow was not observed at any additional outfalls no samples were collected during this event. Flow was observed and a sample collected at Outfall 006 on February 27, 2007. Flow was not observed at any other storm water outfalls during the First Quarter 2007. Therefore, surface water samples were collected from the respective outfalls only as noted above. 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 2007. 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 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

Dioxins and Furans: TCDD Toxic Equivalent Quotient (TEQ)

A single NPDES Permit exceedance occurred during the First Quarter of 2007 for TCDD TEQ. An exceedance of the TCDD limit occurred in a storm water sample collected from Outfall 009 on February 19, 2007, as detailed in Appendix E of this DMR. The reported concentration of TCDD_TEQ was 7.64×10^{-7} micrograms per liter (µg/L), which is above the NPDES Permit limit of 2.80×10^{-8} µg/L. 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; Gullet and Touati, 2003). These findings are further substantiated by previously completed on- and offsite studies (MWH, 2005a) as presented in the Flow Science Background Report (Flow Science, 2006) and reported in the first, second and fourth 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 reasonable 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.

pH

Field pH measurements at Outfall 003 indicated a pH of 9.6 on January 28, 2007, and a pH of 9.0 on February 19, 2007. Both measured pH values are in excess of the NPDES Permit limit of 8.5. The elevated pH values at Outfall 003 in January and February may result from the on-going construction activities at this outfall and the presence of concrete that had been recently installed and had not fully cured yet. During the First Quarter of 2007, a flume for monitoring surface water flow was installed along a concrete channel upstream of the sample point. Flume installation involved concrete pouring to set the flow measurement device in the existing channel. Concrete that is not fully cured can increase the pH of water that contacts it. It will typically take about a month for concrete to fully cure. Elevated pH values are believed to have resulted when runoff contacted the newly-poured concrete.

The pH exceedances occurred during the first two storm events of 2007. A lower pH value of 9.0 was observed during the second sampling event as compared to the pH value of 9.6 observed during the first sampling event. These two exceedances occurred shortly after the installation of the concrete channel and the installation of the flume installed at Outfall 003 on January 16-17, 2007 and February 5-6, 2007; respectively. Once aware of these exceedances, Boeing rinsed the concrete channel on January 25, 2007 and February 20, 2007 to accelerate the curing of the concrete upstream of the sampling location to prevent similar occurrences in the future. All

rinse water was captured and will be shipped offsite for proper disposal. In future instances where new concrete is freshly poured, Boeing will flush the freshly poured concrete and capture the water to alleviate the potential for permit limit exceedances of pH. Boeing will continue to monitor pH data at Outfall 003 and, if necessary, further rinse the concrete to attempt to prevent elevated pH.

Gross Beta

Two NPDES Permit exceedances for gross beta occurred during the First Quarter of 2007. An exceedance of the gross beta limit occurred in a routine storm water sample collected from Outfall 003 on January 28, 2007. The second exceedance occurred in an annual storm water sample collected from Outfall 006 on February 19, 2007, as detailed in Appendix E of this DMR. Based on additional evaluation of the samples as discussed below, it does not appear that the source of the gross beta detections is man-made.

The reported concentrations of gross beta in the Outfall 003 January sample and the Outfall 006 February sample were 56.3 ± 1.9 picocuries per liter (pCi/L) and 63.8 ± 2.8 pCi/L, respectively. The NPDES Permit limit for gross beta is 50 pCi/L.

The sample collected on January 28, 2007, at Outfall 003 was analyzed as a routine sampling event. Pursuant to the 2006 Position Paper (Boeing, 2006), all Outfall 003 events are analyzed for the entire radiological constituent list (gross alpha, gross beta, total combined radium, strontium-90, and tritium).

Annual samples collected on February 19, 2007, from Outfalls 003, 006, 009, and 010 were analyzed for gross alpha and gross beta as indicated in the NPDES Permit. Outfall 003 was again tested for the remaining radiological constituents as well (total combined radium, strontium-90, and tritium). Analysis from this sampling event did not show any NPDES Permit limit exceedances at Outfall 003. However, the sample collected from Outfall 006 showed an exceedance of gross beta. In accordance with the NPDES permit, total combined radium was subsequently analyzed from the same sample. Total combined radium results were below the daily maximum permit limits, therefore no further contingent analyses were required as stated in the NPDES Permit.

A reanalysis was conducted for gross beta to verify both of the above exceedances. Page T-8, footnote 6 of the NPDES Permit indicates that following an exceedance of an annual constituent, monitoring frequency is increased to once per discharge until the results of four consecutive analyses demonstrate compliance with the effluent limitations. Therefore, following the gross beta exceedance in the sample collected at Outfall 006 on February 19, 2007, the subsequent Outfall 006 sample, collected February 27, 2007 was analyzed for gross beta. Analysis from the February 27 sampling event for Outfall 006 did not indicate an exceedance. Boeing will continue to monitor for gross beta at Outfall 006 when flow occurs as required by the NPDES

Permit. Monitoring of radiological constituents will also continue for samples collected from Outfall 003 to provide a better understanding of the presence of gross beta at these outfalls.

Additional analyses not required by the NPDES Permit were conducted[1] on excess sample volume from the two samples that showed gross beta exceedances. Gamma spectroscopy analysis was performed, which can detect the presence of natural and man-made gamma emitting nuclides that may be a source of gross beta in the samples where NPDES Permit limit exceedances were detected.

No man-made beta/gamma emitting radionuclides were detected above their respective minimum detectable activity (MDAs). Initial gamma spectroscopy results indicated high MDAs, therefore Boeing requested a longer count time to be conducted for these samples for a more accurate MDA at lower concentration levels. Both analyses are reported in the data tables in Appendix D. These included SSFL beta/gamma contaminants of concern (cesium-134, cesium-137, cobalt-60, europium-152, europium-154, and manganese-54)[2]. In addition the beta emitters, strontium-90 and tritium, were below their MDAs for the January 28th sample for Outfall 003. Therefore no man-made radionuclides from operations at SSFL have been identified that could have caused the high beta values at Outfall 003 and Outfall 006.

The gamma spectrometry analysis, however, was not able to identify a natural source for the high beta results. Natural sources of beta-gamma emitters include potassium-40 (K-40) and lead-210 (Pb-210). For Outfall 003, both K-40 and PB-210 were below the detection limits, which were 24 pCi/L for K-40 and 160 pCi/L for Pb-210. For Outfall 006, both K-40 and Pb-210 were below the detection limits, which were 52 pCi/L for K-40 and 100 pCi/L for Pb-210.

Subsequent gamma spectroscopy analysis of the water used to rinse the new filtration media and water flowing over new roadbed gravel at outfall 007 has indicated high naturally occurring K-40 (a beta and gamma emitter), which in turn resulted in high beta results for those samples[3]. Consequently significant circumstantial evidence appears to indicate that the high beta values from outfalls

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[1] According to Federal Drinking Water Standards (40 CFR Part 141), when gross beta activity exceeds 50pCi/L, additional analyses are required that test for man-made beta-gamma emitters. In the context of drinking water regulations, the purpose of this additional testing is to ensure that potential doses from these beta/gamma-emitting radionuclides do not exceed four millirem per year. Note this standard assumes exposure through ingestion as drinking water, which is unlikely to occur in storm water runoff. Flow is so intermittent that drinking water standards based on a lifetime of consumption should not apply. Because drinking water limits are used as the basis for NPDES permit limits, this additional step was followed to further investigate the cause of the gross beta exceedances.

[2] Sum of the lowest MDAs for these isotopes equals 10.49 pCi/L for Outfall 003 and 18.8 pCi/L for Outfall 006 which is less than the 50 pCi/L gross beta permit limit.

[3] Collected storm water from Outfall 007 had gross beta detections of 294 pCi/L and K-40 at 302 pCi/L. Collected rinse water from several outfalls had a gross beta of 162 pCi/L and K-40 at 135 pCi/L. All collected water is currently stored and will be shipped off-site for proper disposal.

003 and 006 are likely to have been caused by K-40 dissolving out of the new filter media and/or new roadbed gravel. Detailed results of filter media and rinse water will be submitted in a follow-up report.

It is widely reported in scientific literature that in the absence of man-made nuclides, the naturally occurring beta-gamma emitters K-40 and Pb-210 are common and major contributors of gross beta in environmental and drinking water samples (OEHHA, 2003). This is addressed in the Federal and California Drinking Water Standards by allowing the exclusion of detected K-40 concentrations from gross beta concentrations used for compliance purposes.

All outfall radiological monitoring data for the First Quarter 2007 are included as Appendix D. Analytical laboratory reports are provided in Appendix G. All non-NPDES radiological analyses related to BMP materials and collected rinse water will be included in a separate report.

Chloride

Chloride was detected at Outfall 006 on January 28, 2007 as indicated in Appendix E. Boeing has compared this daily maximum NPDES Permit limit exceedance at Outfall 006 against other samples collected at this location, all of which were below NPDES Permit limits, and believes that this concentration of chloride is atypical. However, sporadic elevated chloride detections have occurred at other outfalls and Boeing believes the elevated chloride concentration could be attributed to on-going construction activities and wash-off from sand filter media, as discussed below.

As part of the best management practice (BMP) evaluation program, Boeing implemented an evaluation test of the BMP material at Outfall 010 to determine its effectiveness in removal of permitted constituents. Water was applied to the area and influent and effluent samples were collected to review the removal of constituents, including chloride. Approximately 6,500 gallons of water was allowed to flow through the drainage and filtration area. Three influent and three effluent samples were collected at one hour intervals during the evaluation. Water used in this evaluation was captured and containerized to prevent discharges from the outfall.

A review of the results of the evaluation indicated chloride concentrations were significantly higher in the effluent samples collected from water flowing through the media filter than in the influent samples. These results indicate the presence of naturally occurring chloride in the sand filter that was installed in the BMP at Outfall 010. Chloride is a naturally occurring compound (Hunter and Davis, 2001). BMP materials installed at the site, including fresh sand, zeolite, and activated carbon, may also contain chloride that may be flushed or rinsed from filter media as shown by the test conducted at Outfall 010.

Due to the consistent use of the same filter media at the BMPs, Boeing believes the results of an evaluation at Outfall 006 would be the same as the results at Outfall 010. Following the permit limit exceedances at Outfall 006, Boeing rinsed the media filter. Rinse water was collected for proper disposal.

Rinsing of the media is expected to remove this chloride and other salts and reduce the risk of further exceedances. A subsequent storm water sample collected from Outfall 006 on February 19, 2007, did not contain chloride at a concentration that exceeded the NPDES Permit limit.

Boeing will continue to monitor chloride concentrations at this outfall to try to identify sources. Measures to reduce chloride will be implementing to the extent possible. Additionally, where new BMP materials are added, Boeing will flush the materials and collect the rinse water to eliminate potential for permit limit exceedances in the future.

FIRST QUARTER 2007 CORRECTIVE ACTIONS TAKEN

Throughout the First Quarter 2007, Boeing took actions to improve the quality of surface water discharges. These actions included the rinsing of the BMP material at various outfalls and the continued implementation of the site-wide Storm Water Pollution Prevention Plan (SWPPP). Specific activities by outfall are identified in Table 1.

Table 1: BMP Activities during the First Quarter 2007

OUTFALL	BMP ACTIVITIES DURING FIRST QUARTER 2007
001 (South Slope below Perimeter Pond)	Sediment control BMPs inspected. No activity required.
002 (South Slope below R-2 Pond)	Sediment control BMPs inspected. No activity required.
003 (RMHF)	Completed installation of flume and flow meter. Conducted structural BMP and storm water filter system inspections. Cleaned up debris. Rinsed filtration media.
004 (SRE)	Completed installation of flume and flow meter. Conducted structural BMP and storm water filter system inspections. Cleaned up debris. Rinsed filtration media.
005 (FSDF-1)	Conducted BMP, sedimentation basin and filtration system inspections. Cleaned up debris.
006 (FSDF-2)	Completed installation of flume and flow meter. Conducted structural BMP and storm water filter system inspections. Cleaned up debris. Rinsed filtration media.
007 (Building 100)	Conducted structural BMP, sedimentation basin and filtration system inspections. Cleaned up debris.

OUTFALL	BMP ACTIVITIES DURING FIRST QUARTER 2007
008 (Happy Valley)	Sediment control BMPs inspected. Repaired and replaced straw bales, fiber rolls, and silt fence. Cleaned up debris.
009 (WS-13 Drainage)	Cleaned up debris.
010 (Building 203)	Completed installation of flume and flow meter. Conducted structural BMP and sedimentation/filtration basin inspections. Cleaned up debris. Rinsed filtration media.
011 (Perimeter Pond)	Conducted BMP and drainage system inspections. Cleaned up debris.
012 (ALFA Test Stand)	No activity. No longer in use.
013 (BRAVO Test Stand)	No activity. No longer in use.
014 (APTF Test Stand)	No activity. No longer in use.
015 (STP I)	Wastewater currently hauled offsite – no discharges.
016 (STP II)	Wastewater currently hauled offsite – no discharges.
017 (STP III)	Wastewater currently hauled offsite – no discharges.
018 (R-2 Spillway)	Completed installation of structural BMP that consists of a series of eight filter cells in the R-2 Pond concrete overflow channel. Each filter cell is connected in a parallel flow arrangement, with each filter cell filled with GAC and zeolite in bulk form. The top of each filter cell is covered with 4-inches of 2-inch minus crushed rock to prevent erosion of the filter media. Underdrain pipes are installed on the bottom of each filter cell, and covered with a filter sleeve and bedded in 6-inches of a coarse sand to prevent loss of GAC through the underdrain system. Rinsed filtration media. Completed installation of flume and flow meter.

Flow meters are still being installed and calibrated (storm activity has not been sufficient to fully calibrate and troubleshoot the flow meters). Once the flow monitoring systems are complete, accurate flow information will be provided for each outfall location.

REASONABLE POTENTIAL ANALYSIS (RPA)

Outfall monitoring data were collected during the First Quarter 2007 for Outfalls 003, 006, 009 and 010 only. These data were added to the RPA data set per the MWH Americas, Inc. (MWH) and Flow Science 2006 RPA procedures. For the outfall monitoring group (Outfalls 003-010) the analytical results for this sampling

period did not trigger reasonable potential for any constituents not already regulated under the current NPDES Permit. Complete RPA tables for the outfall monitoring group are provided in Appendix F.

As summarized in the MWH and Flow Science Technical Memo submitted to the Regional Board on April 28, 2006 (MWH and Flow Science, 2006), Boeing does not believe the currently used RPA procedures are appropriate for storm water and storm water-dominated discharges from the SSFL.

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 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 SSFL presents the State of California Water Resources Control Board (SWRCB or "State Board") 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 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 (daily maximum permit limit of 0.10 µg/L and 0.13 µg/L, monthly average limit of 0.05 µg/L, RL of 0.2 µg/L); cyanide (monthly average limit of 4.3 µg/L, RL of 5.0 µg/L); and Bis- (2-ethylhexyl) phthalate (daily maximum permit limit of 4.0, RL of 5.0 µg/L). Concentrations of mercury, cyanide, and Bis-(2-ethylhexyl) phthalate were all below reporting limits for the First Quarter 2007.

FACILITY CONTACT

If there are any questions regarding this DMR or its enclosures, you may contact Ms. Lori Wynd 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 2007 at The Boeing Company, SSFL.

Sincerely,

Tom Gallacher
Director, SHEA & Remediation Programs

Figure: 1 Storm Water Drainage System and Outfall Locations

Appendices:
A First Quarter 2007 Rainfall Data Summary
B First Quarter 2007 Liquid Waste Shipment Summary Tables
C First Quarter 2007 Summary Tables, Discharge Monitoring Data, Outfalls 003, 006, 009 and 010
D First Quarter 2007 Radiological Monitoring Data, Outfalls 003, 006, 009 and 010
E First Quarter 2007 Summary of Permit Limit Exceedances
F Reasonable Potential Analysis (RPA) Summary Tables
G First Quarter 2007 Analytical Laboratory Reports, Chain-of-Custody, and Validation Reports

cc: Jim Pappas, Department of Toxic Substances Control
Robert Marshall, California State University – Northridge, Library
Dale Redfield, Simi Valley Library
Lynn Light, Platt Branch, Los Angeles Library
Stephen Baxter, Department of Toxic Substances Control

References Cited:

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