







The Expert Panel (Panel) for the Santa Susana Field Laboratory (SSFL) Stormwater Engineered Natural Treatment Systems (ENTS) project was asked to review and provide recommendations for (a) the proposed site specific design storm (applicable to all NPDES compliance outfalls at the SSFL) and (b) the ENTS designs proposed for implementation in the Outfalls 008 and 009 watersheds. This Consensus Recommendation is intended to primarily address (a) above. This final design storm<sup>1</sup> recommendation was primarily based upon an evaluation of the types, locations, design sizing, and configuration of the proposed draft conceptual ENTS for the Outfall 008 and 009 watersheds. This design storm recommendation therefore also includes additional recommendations related to the selection and design of ENTSSs and other BMPs for the Outfall 008 and 009 watersheds.

It is the Panel's intent that the resulting overall recommended stormwater program for the Outfall 008 and 009 watersheds will result in a sustainable set of controls that go far beyond the norm for stormwater treatment systems nationally, while also protecting the natural characteristics and values of the Outfall 008 and 009 watersheds. The Panel is working to develop a system of ENTS/BMPs and a design storm that:

- Are protective to downstream residents and the environment
- Maintain the natural site conditions and ecological functions
- Maximize the spatial opportunities to construct ENTS and BMPs based on the site's constraints and implementation feasibility considerations
- Are designed to come as close as feasible to meeting the numerical effluent limits set by the Board within the practical limits of the ENTS technology by reducing both the mass loading and concentration of water quality constituents.

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Key findings of the Panel are as follows:

1. Site Specific Design Storm - This storm would be used to assess when numeric effluent limits, as specified in the NPDES Permit, will apply. (The NPDES Permit does not currently specify an allowable frequency of exceedances.) For rainfall events less than or equal to the design storm, the NPDES limit will apply. However, the Panel recommends that when a rainfall event exceeds the design storm based on local gauge measurements, the NPDES permit limits should become non-enforceable “benchmarks,” as discussed in #7, below.
2. Site Specific Design Storm Recommendation - The panel recommends that the 1-year return interval storm event be used as the single site-wide design storm. The Panel reviewed the March 2007 technical memorandum by MWH that evaluated the existing proposed 1-year storm, using local rain gauges. The 1-year storm was originally proposed as the site specific design storm based upon the “full capture” storm in the trash Total Maximum Daily Load (TMDL) for the Los Angeles River. The panel requested a more detailed design storm evaluation using continuous long-term ENTS performance modeling to show the percentage of runoff that would be treated if a hypothetical single treatment system were built at an outfall and were designed to capture and treat runoff from the entire design storm using a range of storm sizes. This modeling approach is consistent with that used to evaluate various proposed alternative design storms by the Los Angeles TMDL Design Storm Task Force.

Based on a review of the long-term continuous ENTS performance modeling results, the Panel determined that with a single hypothetical ENTS facility de

The Panel believes that requiring a larger design storm than a 1-year return period event is not justified based upon the modeling analyses of the 008 and 009 watersheds. A larger design storm would lead to ENTS footprints that would require significant additional impacts to the natural values of the site that are not warranted.

Specific elements of the design storm recommendation include:

- a. Based on site-specific long-term continuous hydrologic/hydraulic modeling, the Panel has confirmed that the Panel's 90 percent capture and treatment objective

3. Sample Collection. The Panel recommends that flow-weighted composite samples be collected and used to assess compliance with permit limits for constituents where this is appropriate. Flow-weighted composite samples provide a more accurate estimate of discharge water quality than is possible with the current method of manual grab sampling. For those parameters where composite sampling is not possible (e.g., VOCs and oil and grease), manual grab samples should still be collected as per the current permit requirements. In addition, the panel recommends that a discrete grab sample from the first hour of runoff or within some other suitable early part of the storm (e.g. runoff representing first 0.1 or 0.2 inches of runoff) also be collected and analyzed as an indication of how composite and “first-flush” concentrations vary. It is recommended that this additional sample should not be subject to compliance assessment, but be used to provide information to the Regional Board and Boeing.
4. Compliance Assessment with Flow-Weighted Composite Sampling. If flow-weighted composite sampling is allowed or required for assessing compliance with permit limits, then the Panel suggests the following proposed compliance assessment approach:

*“If the total precipitation depth from the on-site precipitation gauge is equal to or greater than 2.5 inches for the first 24-hours of the storm for which a NPDES compliance flow-weighted composite sample is required to be collected or if the precipitation total for any hour of that storm prior to the end of the composite sample period is greater than 0.6 inches, then the permit effluent limit values for those parameters which can be collected as flow-weighted composites will function as benchmarks (i.e., triggering BMP evaluation and upgrade, as necessary) rather than enforceable numeric limits (where exceedances would be subject to a notice of violation and enforcement penalty).”*

For those parameters which must be collected as grab samples, the Panel suggests that the existing grab sampling protocols be continued.

5. Compliance Assessment with Continued Grab Sampling. If grab sampling for permit compliance must remain as is or for those constituents for which composite samples cannot be collected, then the Panel suggests the following proposed compliance assessment approach:

*“If the total precipitation depth from the on-site precipitation gauge is equal to or greater than 2.5 inches for the first 24-hours of the storm for which a NPDES compliance grab sample is required to be collected or if the precipitation total for any hour within 24 hours prior to the grab sample collection time is greater than 0.6 inches, then the permit effluent limit values will function as benchmarks (i.e., triggering BMP evaluation and upgrade, as necessary) rather than enforceable numeric limits (where exceedances would be subject to a notice of violation and enforcement penalty).”*

6. Additional Controls. For the Outfall 008 and 009 watersheds, a combination of controls should be implemented that include the ENTS described above as well as multiple source controls (or pollution prevention techniques) such that the overall water quality protection will significantly exceed and be more sustainable than possible with single controls at the compliance points. The Panel will work with Boeing to select and implement multiple optimally-designed BMPs (to reduce pollutant discharges) throughout the outfall 008 and 009 watersheds. Source controls will include, where feasible, removal/covering of treated wood, galvanized metals, and other sources; removal of impervious areas; control of eroding areas; outfall protection; stream stability enhancements; and other source controls identified by the panel or Boeing.
  
7. Water Quality. The Panel believes that the ENTS together with erosion and source controls can significantly improve water quality in runoff discharges from Outfalls 008 and 009, leading to a reduction in the total load and concentrations of constituents listed in the permit. However, even with expected significant water quality improvements with the ENTS and other BMPs, the Panel believe that it may not be possible to consistently achieve compliance with the NPDES permit's numeric effluent limits for all constituents, including for storms that are smaller than the design storm.
  - a. Stormwater BMPs, including ENTS, of all types have an observed variability in performance, including values that would exceed the numeric limits in Boeing's permit. For example, the Panel believes that the dioxin limit ( $2.80E-08$   $\mu\text{g/L}$  TCDD TEQ) is not consistently attainable, even for storms below the design storm, because the Panel estimates that to achieve this limit, total suspended solids (TSS) levels would need to be consistently below 1 mg/l. This value is not achievable as observed average effluent concentrations in BMPs are rarely below 10 mg/l. In addition, attempting to treat to this extremely low level could result in other unintended and significant environmental impacts (e.g., treatment systems would significantly alter habitat within their footprint areas, as well as starve downstream receiving waters of sediment, leading to increased stream erosion downstream).
  
  - b. The dioxin levels at the site in untreated runoff appear to be similar to dioxin levels measured in runoff from other areas that have been studied (for example in studies of runoff in other parts of the Los Angeles area). Therefore, the Panel is concerned that the permit limits may be too strict given background concentrations observed elsewhere. The Panel is aware that there are potential sources of dioxin at the site that need to be addressed, but, the permit levels for dioxin do not appear to be consistently achievable and are lower than observed in other studies of runoff.



- c. There are other pollutants where it may not be feasible to consistently meet the permit's numeric effluent limits based upon ENTS performance information from

modification of BMPs as needed. The Panel believes that an additional option would be to temporarily apply benchmarks, not numeric limits to watersheds where a significant portion had been burned for some specified period of time and for all storms, with the provision that appropriate BMPs and re-vegetation efforts be implemented.

With the uncertainties, caveats, and recommendations as stated, the Panel believes that an