Schnitzer Steel Products Company
1101 Embarcadero West
Oakland, CA 94607

October 1, 2012

Christine Boschen
San Francisco Bay Regional Water Quality Control Board
1515 Clay Street, Suite 1400
Oakland, CA 94612

Re: Comments on Tentative Cleanup Abatement Order for
Schnitzer Steel Products Facility, 1101 Embarcadero West, Oakland, CA

Dear Ms. Boschen:

Schnitzer Steel Products Company hereby submits comments on the tentative Cleanup and Abatement Order (CAO) that was sent to us on August 27, 2012 by Shin-Roei Lee, Chief, Watershed Management Division, San Francisco Bay Regional Water Quality Control Board (Regional Board), concerning our scrap metal recycling facility in Oakland, California. Before presenting our comments on the tentative order, I wish to thank you and other Regional Board and State Board staff for taking the time to meet with us on September 14, 2012 to discuss the tentative order. While we were disappointed that we did not have an opportunity to discuss this matter with you at an earlier point in time, we found the meeting to be very useful, and we intend to continue to work cooperatively with staff to resolve all of the concerns identified during the March 29, 2012 inspection and in the tentative CAO.

As discussed near the close of our September 14, 2012 meeting, Regional Board staff is currently reviewing an update to the facility's Stormwater Quality Management Plan (SQMP) which was submitted to the Regional Board on August 14, 2012 per your earlier request. The updated SQMP incorporates a Stormwater Pollution Prevention Plan (SWPPP) for the Oakland facility. We understand that Regional Board staff may have several comments regarding the contents of the SQMP/SWPPP, and we would like to reiterate our intent to work cooperatively with Regional Board staff to respond to any questions you have and to reach consensus on appropriate final content for the facility's SQMP/SWPPP. In addition to integration of any revisions and/or additions to address the issues staff may already have identified, we believe that much, if not most of the information requested in the Technical Reports described in Section C of the tentative CAO can be included in the facility's SWPPP, either as revisions to the text or in technical appendices. Specifically, operation and maintenance of the facility's water recycling system, and management and control of material storage piles, are inter-related topics which have a significant effect on stormwater quality and on-site water storage capacity. Because these issues are logically part of the SWPPP, we are proposing to address them in the context of that document rather than in separate Technical Reports. Further, by incorporating this information

directly into the SWPPP, it will be subject to on-going review and revision as necessary to conform with changing site conditions over time. Further discussion of this issue is contained in Item 7 below.

General Overview of Comments

Industrial Storm Water Permit Considerations. As discussed at the September 14 meeting, we believe we have demonstrated our willingness to significantly improve storm water management practices at the facility and to minimize or eliminate, to the extent reasonably possible, the potential for process-related pollutants to contaminate storm water at and near the facility. We are already in the process of implementing many new and enhanced Best Management Practices (BMPs) to address the findings identified in the Inspection Report and tentative CAO, and we hope that the Regional Board will agree it is not necessary to issue a CAO at this point. Detailed information on each of these BMPs was presented at the September 14 meeting and is documented below in our comments.

Schnitzer Steel has a very strong corporate culture of environmental compliance, and the company requires all facilities and personnel to comply with applicable environmental laws and regulations, including permit conditions. With respect to our Oakland facility, our focus has always been on capturing and containing 100% of the storm water that falls on the facility so that the water can be beneficially reused and recycled in our operations. There are no storm water outfalls at the facility that flow to the Bay, and there are no drain inlets on-site that are connected to the municipal separate storm sewer system (MS4). Additional information concerning the facility's internal storm water management system and containment capacity is provided below. By collecting, storing and reusing the water on-site as cooling water in the shredder or for dust control, we have consistently avoided any discharge of storm water to the Bay and have always considered the facility to be a zero-discharge facility. In the past, to our knowledge, facility structures were not considered "conveyances" for purposes of the General Permit, and storm water run-off from these structures was not considered a "point source" discharge.

In addition, there are no municipal storm drains along the frontage road that leads to the facility (Embarcadero West), or along the western boundary of the facility, adjacent to the area where most of the heavy truck traffic occurs. The nearest municipal storm drain that could be affected by vehicle track-out is located at the corner of Embarcadero West and Market Street, near the entrance to Howard Terminal (Port of Oakland). We also regularly sweep the entire length of Embarcadero Street from our security gate to Market Street, as well as all internal paved roads, to minimize the amount of dirt on the roads.[1] Accordingly, we did not believe that track-out from heavy trucks traveling in these areas constituted a regulated "discharge" under the General Permit since the dirt is not likely to become entrained in storm water that has a potential to flow into a storm drain. Based on our observations over a period of many years, we believe that the vast majority of the storm water that falls onto Embarcadero West in the vicinity of the facility infiltrates and/or evaporates before reaching the storm drain.

[1] The tentative CAO uses the term "process sediment" to refer to the loose dirt and mud that is characteristic of our operations and that is susceptible to being tracked out of the yard by vehicles, either onto Embarcadero Road or onto the concrete pier that leads out to the dock where ships are berthed.

Our understanding of the scope of the General Industrial Storm Water Permit, as described above, has been reinforced over the years by the Regional Board's acceptance of our Annual Reports, which have not identified any storm water discharges. Nor have we submitted any storm water sampling data to the Regional Board since there have been no discharges to sample. We have never received any Notices of Violation under the storm water program despite repeated inspections by Alameda County and periodic inspections by the Regional Board over a period of many years. Prior to the Regional Board's inspection in March 2012, we believed that our operations were in full compliance.

Nevertheless, going forward, we are willing to accept staff's position that track-out and off-site dispersal of other materials related to our operations are considered regulated "discharges" if they have a potential, however slight, to enter the MS4. Similarly, in the future, we will consider run-off from docks, piers, conveyors and other over-water structures that may carry process pollutants into the water as regulated discharges, and we will develop a means of sampling this water during storm events under our Monitoring and Reporting Program. We acknowledge that BMPs must be implemented to eliminate or minimize the potential for pollutants associated with our operations to come into contact with storm water that can reach the Bay, either directly or via the MS4. To this end, we are already actively engaged in implementing significant new or enhanced structural BMPs and have already corrected, or are in the process of correcting, most of the concerns identified in the Inspection Report. If additional BMPs are needed after the currently planned corrective actions are completed, we believe we should be given an opportunity to engage in the iterative process available to all dischargers under the General Permit. In short, a number of intermediary steps were bypassed by the Regional Board in deciding to proceed directly with a CAO. Typically, a facility is given notice that its storm water management practices are considered deficient and given a reasonable opportunity to correct the situation. The "quantum leap" from compliance to tentative CAO is unusual given our experience at other facilities within this Regional Board's jurisdiction and other areas of California. We believe we should be allowed an opportunity to work with Regional Board staff to address their concerns in a more measured and typical manner. If the typical approach is ultimately not successful, the Regional Board has the authority to issue a CAO at any point in the future.

Apart from our procedural concerns, we believe it would be fundamentally unfair to issue a CAO under the circumstances stated above, and that adoption of the CAO would represent a disproportionately harsh enforcement response. Even putting aside our historical record of compliance, following the Regional Board's inspection in March 2012, we made several requests to meet with staff to discuss the concerns that had been raised and to describe the steps Schnitzer Steel is taking on its own initiative to improve storm water management at the facility and to further minimize the potential for direct discharge of material from the facility. Our purpose was to engage in a collaborative dialogue that would lead to completion of site improvements to address the Regional Board's concerns in an expeditious and cooperative manner. These requests to meet were declined until the September 14 meeting. Prior to receipt of the tentative order, the only written communication we received from the Regional Board was the July 5, 2012 letter revoking the sampling and analysis reduction certification that was approved in 1997 and that has been in effect since that time. Until receiving the tentative CAO on August 27, we never received any other formal communication from the Regional Board, either in the form of an Inspection Report documenting the results of the inspection or a Notice of Violation alleging

specific violations of the Industrial Storm Water General Permit or other requirements of law. Under these circumstances, we believe it would be very unfair to place us under the stigma of a CAO, especially given our degree of cooperation and prompt, proactive efforts to implement corrective action.

Groundwater Considerations. With respect to the remaining provisions of the tentative CAO that relate, ultimately, to the condition of groundwater beneath the facility, we believe these issues are most appropriately addressed through a request for a technical report under Water Code section 13267, rather than under a CAO. In our opinion, the Regional Board currently lacks substantial evidence that facility operations have adversely affected beneficial uses of groundwater. To the contrary, groundwater monitoring data collected over a period of 20 years demonstrate that beneficial uses are being protected (see Attachment 1). These data were collected from wells that were installed in accordance with a plan approved by the Regional Board in or around 1992, and the Regional Board has never previously questioned the location or sufficiency of the wells. While the general appearance of the facility (particularly during the rainy season) and the very heavy industrial nature of our activities may appear to be adversely affecting water quality, we do not believe this to be the case. That being said, we are willing to conduct additional groundwater sampling to demonstrate this to the Regional Board's satisfaction. However, pending the receipt of data that indicates our current understanding of site conditions is incorrect, there is no reasonable basis for concluding that any "cleanup or abatement" of soil or groundwater at the site is needed. Hence, we strongly believe that a CAO is not the proper mechanism to address the Regional Board's desire for additional information regarding groundwater conditions at the facility.

In addition to our general comments as set forth above, we have the following specific comments on the tentative order.

1. Storm water discharges from Schnitzer Steel's Oakland facility are not polluting the waters of the Oakland Estuary, the Inner Harbor or San Francisco Bay.

The tentative order states that Schnitzer Steel has discharged "process sediment, industrial process waste water and metal shredding by-products into the estuary and waterway areas of the Oakland Estuary and Inner Harbor or San Francisco Bay," and that "process sediment, industrial waste water, and metal shredder fluff from the Site continue to pollute the waters of the State and United States." See Findings 1 and 3 of the tentative order. While we acknowledge that pollutants from our operations have the potential to become entrained in storm water discharges, we believe the tentative order is based on factual assumptions that represent an overstatement of actual circumstances at the facility. The vast majority of storm water at the site is fully contained and reused on-site, and we strongly dispute that the minor discharges that may be occurring are adversely affecting beneficial uses or causing exceedences of Water Quality Objectives in any waters of the state or United States. We also note that the General Permit does not prohibit discharges of storm water associated with industrial activities, but rather requires the implementation of BMPs to minimize pollutant loadings as necessary to comply with BAT/BCT and applicable water quality standards. We believe these basic requirements of the permit are being satisfied.

Relative to the total amount of scrap metal and related process materials at the facility, the volume of material actually discharged from the facility is extremely small. These discharges occur in the form of (i) vehicle track-out, most of which is swept up before it can become entrained in storm water; (ii) wind-blown dispersion of light fibrous material[2] onto an adjacent property where some amount of it may be washed into storm drains; and (iii) intermittent run-off, drippage or falling debris from docks and other over-water structures. Since the March 29 inspection, we have taken steps to minimize or eliminate each of these potential sources of pollutants. These actions are described under Item 2 below. We do not believe our operations have adversely affected water quality or that there is a demonstrated need for "cleanup and abatement of wastes" beyond the implementation of these additional BMPs.

2. Schnitzer Steel has already implemented, or is in the process of implementing, significant new or enhanced BMPs at the Oakland facility that will effectively minimize or eliminate the potential for storm water discharges to contain process pollutants.

As described in our August 14, 2012 letter to the Regional Board and at the September 14 meeting, we have undertaken or completed each of the following action items to improve storm water management and quality at the facility:

Dock and Pier Cleaning

This work was conducted September 6-14, 2012 and is complete. Schnitzer Steel retained NRC Environmental Services to perform this work based on its significant experience in projects of this nature. All surface areas were power washed and all wash water and debris were collected and fully contained in a barge that was positioned immediately below the areas being cleaned. There were no discharges of wash water or debris to the Bay. Before and after pictures were taken and clearly show a marked improvement in the condition of the structures. We are also in the process of modifying our SWPPP to provide for more frequent inspections and periodic cleaning of these structures to prevent future accumulations of mud, dirt and debris that could be conveyed into the Bay during storm events.

Track Out Controls

We are in the process of installing heavy duty commercial wheel washing systems at the exit from the facility and at the entrance to the concrete dock. The system that will be installed at the dock must be specially designed and manufactured to accommodate the extreme weight of fully loaded mine trucks that haul shredded metal and heavy steel out to the ship. Both of these systems will collect and recycle the water that is used to wash dirt from the tires, and the recycled water will be reused in the wheel wash system. Installation of the system at the facility exit is currently underway and is scheduled for completion by October 1, 2012. Installation of the system at the dock entrance is scheduled for completion by December 1, 2012.

[2] The tentative order refers to this light fibrous material as "shredder fluff." This material is actually the non-metallic component of "aggregate," which is the mixture of non-metallic material and non-ferrous metals that remains after ferrous metals are removed from the shredder output. Because the non-ferrous recovery process is conducted partially outdoors and is not fully contained, some amount of the fibrous material can escape.

Concrete Dock Improvements

In order to minimize the potential for pollutants to be washed off the surface of the concrete dock and into the water below, we are installing an Ertec™ perimeter storm water filtration system along the entire length of the dock, on all sides of the structure. The Ertec™ barrier is a filter fabric that traps sediment and allows water to pass out the other side. Collected sediment will be manually removed from the edges of the filter using a portable vacuum system as part of regularly scheduled maintenance. Installation of the system is expected to be completed by October 31, 2012.

Conveyor Pier Improvements

The conveyor is used to transport shredded metal into the hold of a ship. The conveyor is constructed on a wooden pier that extends outward from the shoreline. Each side of the pier is fitted with rubber shields to help prevent materials that fall onto the pier from entering the water. The uppermost portion of the conveyor that extends over open water, past the end of the pier, was fully enclosed a number of years ago except for a narrow opening at the top of the housing. This enclosure effectively prevents water, metal and other debris which could potentially fall off this portion of the conveyor from falling or running directly onto the pier or into the water below. The lower portion of the conveyor is partially contained. The upper one-third of the lower conveyor is equipped with similar bottom and side containment as described above for the upper conveyor portion which extends over water. The bottom two-thirds of the lower conveyor is not currently contained. In order to provide more complete containment, a stainless steel catchment tray will be installed beneath the bottom two-thirds of the lower conveyor, up to the point where it is already enclosed. Material that falls off the conveyor will land on the tray where it can be retrieved and returned to the conveyor (this material is now being retrieved off the pier itself and returned to the conveyor). This new catchment tray will also allow drippage from dust control water or storm water to be collected and returned to the yard for reuse. An additional containment structure will be designed and fabricated to collect water and debris which can fall from the lower conveyor's tensioning system located in the approximate center of the lower conveyor.

We are also in the process of designing a system that will capture the small amount of water that "backflows" down the enclosed upper portion of the conveyor (dust control water or storm water). Currently, there is no means of capturing this water and it can drip to the pier below. The water that is collected will be returned to the yard and recycled. The conveyor pier improvements are in the design stage at this time. We hope to implement these improvements in January 2013.

Improvements to Torch Cutting Area

In July 2012, we relocated the torch cutting station to a paved, contained area to minimize the potential for storm water exposures associated with torch cutting operations. The torch cutting area is paved with concrete and overlain with gravel (torch cutting cannot safely be conducted on a concrete surface as overheated concrete has a tendency to explode). The gravel also prevents pollutants associated with this operation from escaping the immediate area. The gravel bed will be replenished or replaced as needed, with spoils properly characterized and disposed.

Expansion of Covered Maintenance Area

The covered (tented) maintenance area is in the process of being expanded to approximately twice its current size, and where possible, maintenance activities that are now conducted outdoors will be relocated to the new covered area. The tent structure has been purchased and fabrication is underway. This project is scheduled to be completed by October 31, 2012.

Installation of Drain in Non-ferrous Retail Area

A slot drain has been installed at the entrance to the non-ferrous retail area to prevent any run-off from this area from flowing out onto Embarcadero West. This project was completed in May 2012.

Control of Light Fibrous Material

As is the case with all metal shredding and non-ferrous metal separation operations, there is a potential for light, fibrous material produced by these operations to become airborne and subject to dispersal by wind and water. Schnitzer Steel has many BMPs in place to prevent the off-site dispersion of this material, but we recognize that a greater effort is needed to more effectively contain this material on-site. Control of this material, as well as other particulate materials and wastes produced by our operations (e.g., aggregate and shredder residue),[3] is currently the subject of ongoing regulatory processes initiated by the Bay Area Air Quality Management District (BAAQMD) and the Department of Toxic Substances Control (DTSC). BAAQMD is developing a rule that will require the development of an Emissions Minimization Plan to control particulate and visible emissions from metal recycling operations; these plans will be subject to review and approval by the Air Pollution Control Officer and will become enforceable requirements once approved. Similarly, DTSC is working on a new regulatory framework for shredder residue that will eventually replace the declassification letters that have been in effect for the past 25 years.

In addition to our participation in these regulatory development processes, we are in the process of obtaining internal approval to purchase and install a 30-foot high windscreen/debris barrier along the eastern (predominantly downwind) property boundary that will help significantly to contain this fibrous material on-site. Any material that collects on the windscreen will be removed as part of regularly scheduled maintenance activities. We are also in communication with SSA Terminals and have agreed to conduct more frequent inspections and removal of fibrous material from their property if observed. Other than observed accumulations of the fibrous material (that can readily be vacuumed or picked up), we are not aware of any contaminated soil at the SSA Terminal that is attributable to our operations.

[3] "Aggregate" is the mixture of non-ferrous metals and non-metallic materials that remains after the ferrous metal has been removed from the shredder output by magnets. Aggregate is an intermediate processing stream, as it contains a significant percentage of valuable recoverable non-ferrous metal. Shredder residue is the non-metallic debris that remains after the non-ferrous metal separation process has been completed. Shredder residue is treated and used as alternative daily landfill cover.

Additional Boundary Containment

As the Regional Board is aware, in 1990, Schnitzer Steel constructed a 2,200 foot concrete containment wall that runs along the entire shoreline of the facility. The purpose of this barrier is several-fold: to prevent surface flow of storm water from the property into the Bay, to provide a buffer between the shoreline and stockpiled materials that are awaiting export, and to prevent facility soils from being tracked or washed into the Bay. In August 2012, we extended this wall from its western terminus by approximately 600 feet, so that it now turns inland and parallels the western property boundary. The wall will provide more effective containment along the western boundary of the property, and will supplement the fencing and K-rails that are still in place. In addition, we have cleaned up the miscellaneous trash and other debris that was observed in this area during the inspection and have inspected the APL and Port properties to the west for any evidence of other process-related materials, including "shredder fluff." No additional materials were identified. We are therefore uncertain of the basis for the statement in the tentative order that "[a]dditional accumulated shredder fluff was observed throughout the Port of Oakland paved lot and on the APL Limited property, both west of the Site." See Finding 3.c., p. 4. This apparent observation is also inconsistent with the direction of prevailing winds (to the east).

Photographs documenting completed, or in progress, BMP enhancement projects are provided in Attachment 2.

3. Schnitzer Steel is not violating SCR Order No. 88-023; facility operations have not degraded groundwater beneath the facility or adversely affected beneficial uses.

SCR Order No. 88-023 was issued to Schnitzer Steel in 1988 following the discovery in 1986 of contaminated soils that had been excavated as part of a construction project at the facility and lawfully disposed of at a local landfill. Those soils were subsequently removed and disposed of at an alternative location. The Regional Board required Schnitzer Steel to conduct an investigation in the area of the construction to determine whether there was a need for additional remediation at the facility. These investigations were conducted under the auspices of the Regional Board and the Department of Health Services (now DTSC) and were completed in 1987, prior to issuance of SCR Order No. 88-023. Sampling results indicated that soils contained elevated levels of heavy metals and PCBs, but groundwater samples from the shoreline area "contained no PCBs, and metals at levels below those of concern to beneficial uses of the bay should they migrate to the bay." SCR Order No. 88-023, Finding 4. It is important to note that Schnitzer Steel has operated in this location since the early 1960's, and that the site was historically owned by Moore Dry Dock and used for ship repair and rebuilding.

Based on the results of the 1987 investigation, Schnitzer Steel proposed to construct the concrete wall that now extends along the entire length of the shoreline to prevent movement of soil into the Bay and to ensure that storm water could not flow into the Inner Harbor. Construction of the wall was approved by the Regional Board and DTSC as an appropriate site-wide remedy. The top of the berm is three feet higher than the lowest point of the facility, creating an internal area that has sufficient capacity to contain the water from a 10-15 year storm event, exclusive of storage tank capacity. The wall is in excellent condition and does not have any cracks, gaps or conduits that would allow storm water to run through it. Storm water is also contained on-site through grading and collection via internal sump structures and pumps that route water to the

1.2-million gallon aboveground storage tank, various storm water retention areas within the facility, or to an on-site centralized treatment device (a clarifier/thickener). Other than water that may infiltrate unpaved areas or evaporate, all storm water is collected and reused for on-site operational needs, e.g., use in the shredder (for cooling) or for dust control. None of this storm water, or any supplemental process water, is discharged off-site. Schnitzer has never experienced a breach of the perimeter wall, and cannot envision any reasonably plausible scenario in which storm water or process water from the yard could overtop the wall and enter the harbor.

We believe it is misleading to state that SCR Order No. 88-023 "was issued . . . to cleanup and abate the soil and groundwater pollution at the Site." See Finding 4.a., p. 4. To the contrary, the 1988 order did not require any additional excavation or other remediation of soils, nor did it require remediation of "groundwater pollution" since none was found. The 1988 Order did require us to conduct regular monitoring of the groundwater, which has continued to this day without any evidence of adverse impacts. Groundwater monitoring results from 1992 to 2012 are presented in Attachment 1. These results consistently show either non-detect or very low concentrations of a few metals (all below MCLs) and no material difference in groundwater quality between the upgradient well (MW-4) and downgradient wells (MW-1, 2 and 3). These data indicate that operations in the central area of the site are neither resulting in degradation of groundwater quality, nor posing any concern to beneficial uses of the Bay (as is confirmed by the Regional Board's discussion of the 2011 data near the end of Finding 4.a., p. 4). As noted in Footnote 2 of the tentative CAO (p. 5), there is no known use of groundwater underlying the site, and the primary consideration in this portion of the groundwater basin is protection of beneficial uses of surface water.[4] As evidenced by the high conductivity in the wells along the shoreline (particularly MW-1 and MW-2, and to a lesser extent MW-3), saltwater intrusion is obviously occurring at the site. Groundwater that contains ≥3,000 mg/l TDS is excluded from drinking water beneficial use (MUN). State Water Board Resolution No. 89-39 ("Sources of Drinking Water"). Any attempt to extract groundwater from beneath or near the facility would certainly result in saltwater intrusion encroaching further into the facility.

These facts regarding limited beneficial uses of groundwater near the margins of the San Francisco Bay are further supported by our consultant's Technical Memorandum which outlines significant precedent within the Regional Board's jurisdiction that beneficial groundwater uses near the margin of the Bay are essentially confined to groundwater's potential effects on surface water quality (Attachment 3). As is noted in Attachment 3, this precedent is based primarily on a determination of whether site groundwater contains an average total dissolved solids (TDS) concentration in excess of 3,000 mg/L, even if some wells on the site don't meet this criterion. The Regional Board has granted beneficial use exemptions for sites where groundwater in some areas of the site is known to contain TDS concentrations below 3,000 mg/L, provided that the average site TDS concentration exceeds 3,000 mg/L. The Schnitzer Oakland facility certainly conforms to criteria noted in previous Regional Board beneficial use exemptions as the average TDS concentration of all groundwater samples collected from the site since 2005 exceeds 15,000 mg/L.

[4] The Oakland facility lies within the northwest reach of the Santa Clara Valley: East Bay Plain Groundwater Basin, ID # 2-9.04. See Basin Plan, Ch. 2.

The tentative order suggests that the commingling and on-site ponding of storm water has contributed to the contamination of groundwater at the site. For example, Finding 3.b.i. states that "[s]tanding water was in contact with scrap, product and waste piles and errant debris throughout the Site. Various sheens were seen on the standing water, indicating the presence of pollutants." Similarly, Finding 12 states that "[t]he standing water on the Site that has been in contact with the shredding and recycling processes indicates that heavy metals and other pollutants have likely leached into the groundwater below." While we agree that water that is contained on-site may contain sediment and other process-related constituents, there is no evidence to support the assertion that groundwater has been contaminated. In fact, the available evidence is to the contrary.

We also disagree with the assertion in the tentative CAO that we are violating SCR Order No. 88-023. See Finding 4.c. The 1988 Order did not address the types of storm water-related discharges that were identified by the Regional Board during the March 29 inspection, but rather was focused on preventing surface or subsurface transport of soil contaminants to the Bay. None of the prohibitions of the order has been violated. Specifically, there have been no discharges of pollutants that have degraded water quality or adversely affected beneficial uses; there has been no migration of constituents through subsurface transport to deeper water bearing zones; and there has been no lateral migration of constituents through subsurface transport to the Inner Harbor that has degraded water quality or adversely affected its beneficial uses. Chemical and toxicological analysis of dredged sediments from periodic maintenance dredging activities at the Schnitzer dock has consistently demonstrated that sediment quality is consistent with ambient conditions around the Bay and that the sediments are acceptable for unconfined aquatic disposal in the Bay. Please see the attached report entitled "Sediment Characterization Sampling and analysis Results," documenting sediment quality at the facility in 2010 (Attachment 4).

The tentative order expressly acknowledges that "no PCBs have been detected [in the groundwater] and the metal detections have been below levels of concern." Finding 4.a., p. 4. The further statement in Finding 4.a. – that the groundwater wells at the site are "sentinel wells, just inside the shoreline concrete cap" and "do not necessarily reflect the groundwater conditions closer to the areas where waste discharges have been observed by Water Board staff" - is not a sufficient basis upon which to issue a cleanup and abatement order. Orders issued under Water Code section 13304 must be based upon substantial evidence of unlawful discharges that have caused or threaten to cause adverse effects to water quality or impairment of beneficial uses. The groundwater monitoring record for the site (Attachment 1) conversely indicates a lack of the required substantial evidence of beneficial use impairment.

4. *If further groundwater assessment is required at the facility, this work should be conducted pursuant to a request for technical report under Water Code section 13267, rather than under a Cleanup and Abatement Order*.

As indicated above, Schnitzer Steel is willing to work with Regional Board staff to develop an expanded groundwater monitoring program to more thoroughly assess groundwater conditions at the facility, pursuant to a stand-alone request for technical report under Water Code section 13267. In fact, the tentative order already relies on Section 13267 to require submission of such report, and issuance of the CAO is unnecessary to secure performance of the desired study.

Given the lack of use of the groundwater throughout the facility's +50-year history, the occurrence of saltwater intrusion over a significant portion of the site, and the very remote possibility that shallow groundwater beneath the site might be used in the future, the purpose of any further groundwater investigation must remain focused on the quality of groundwater that is intercepting the Bay. Given the relatively small size of the facility, and the fact that the operations have been conducted in essentially the same manner over the years, we believe it is reasonable to conclude that at least some evidence of impact to water quality at the Bay margin would have become apparent by now if it was occurring. Accordingly, we would like to have a better understanding of the staff's rationale for requiring this additional assessment.

If significant impairment of beneficial water uses is identified, new Site Cleanup Requirements, or amendments to Order 88-023, could be issued at that time. These SCRs could rescind or amend the 1988 SCRs and require Schnitzer Steel to conduct such further investigation, risk assessment or other evaluations as needed to determine whether cleanup of the groundwater is warranted, taking into account all of the considerations outlined in State Water Board Resolution 92-49.

5. The tentative CAO inappropriately presumes that cleanup of the facility will be required, beyond the corrective actions and other measures that have already been implemented or are already in progress.

We are very concerned about Finding 10 of the tentative order which states that "[g]iven the Regional Water Board's past experience with groundwater pollution cases of this type, it is unlikely that background levels of water quality can be restored. This initial conclusion will be verified when a remedial action plan is prepared." Similarly, Finding 12 states that information required by the order is needed "to determine appropriate cleanup methods for the Site . . . The standing water on the Site that has been in contact with the shredding and recycling processes indicates that heavy metals and other pollutants have likely leached into the groundwater below." These statements are speculative in nature, are not supported by substantial evidence (Attachment 1), and presume that remedial action will be required before it has been demonstrated that the groundwater is contaminated and, if so, to a degree that affects beneficial uses and thus requires remediation.

We are even more concerned about the implications of these findings, which suggest that the Regional Board staff believes it may be inappropriate to allow water to pond on the site. We do not believe the materials that are stockpiled at the site are susceptible to substantial leaching under ambient conditions. While there are typically piles of incoming and processed scrap metal, aggregate and shredder residue stockpiled at the facility, the material in these piles is constantly changing. Even if the material were susceptible to leaching by contact with storm water or process water, it is not exposed for long enough periods of time to result in significant leaching. We have also conducted periodic testing of treated shredder residue using landfill leachate as an extraction medium, as specified in the WDRs for the landfills where the material is used as alternative daily cover. The results from these analyses confirm that the treated residue is essentially non-leachable.

As we discussed at the September 14 meeting, it is essential that our operations be conducted outdoors, where they are inevitably exposed to rain. It is also imperative that the materials be

regularly sprayed with water to control dust in an effort to comply with a number of regulatory requirements, not the least of which are the Storm Water General Permit requirements to control non-stormwater discharges. The site is not engineered to prevent ponding. Schnitzer Steel has already installed a 1.2-million gallon tank for storage of storm water. This tank takes up a large amount of room that was previously used for product storage, and we cannot sacrifice additional space for construction of additional tankage. The cost of installing and maintaining additional concrete paved areas of the facility is also cost-prohibitive, given the extreme wear and tear that is caused by the heavy equipment used at the site. Staff's concern over ponding contradicts our ability to operate in a cost-effective manner, and is inconsistent with the facility storm water management strategy that has been implemented since 1988, with the full approval of the Regional Board.

We also believe the discussion regarding preliminary cleanup goals may be premature and overly conservative. See Finding 13. The requirement that groundwater ingestion and vapor intrusion exposure pathways be considered in developing groundwater screening levels is not defensible given that there is no current or reasonably anticipated use of site groundwater (particularly as a potential source of drinking water), and all operations are conducted outdoors or in structures that are open to the outside, thus obviating any indoor air risk. See Finding 13.a. Moreover, because fuels are drained from vehicles before they are accepted into the facility, there is minimal likelihood of contamination by volatile organic compounds at the facility. We strongly disagree with the direction that "the Discharger should assume that groundwater is a potential source of drinking water" or that there is any basis for requiring a soil gas study. See Findings 13.b. and 13.c.

6. The Tasks outlined in the tentative order do not consider the fundamental nature of Schnitzer Steel's scrap metal recycling operations.

The tasks outlined in the tentative order assume the need for a comprehensive, site-wide soil and groundwater investigation and wholesale cleanup of the facility, with attention to all potential "contaminants" and "pollutants" that may come into contact with process water, soil, groundwater or storm water at the site. See Tasks 1-4, pps. 9-11. The scope of remediation contemplated by the order includes ongoing soil vapor and groundwater extraction, even though all vehicles are drained of fuels before they enter the facility and there is no existing evidence of groundwater contamination based on 20 years of monitoring data. See Task 5, p. 11. Additionally, the tentative order calls for implementation of measures that are infeasible in the context of scrap metal recycling operations, such as:

- "preventing materials, wastes, and associated pollutants from moving around the Site"
- implementing "procedures designed to sequester pollutants within the shredder waste, bulk material, non-ferrous metals and ferrous metals"
- installing "water tight measures to ensure full . . . storm water containment" at the conveyor loading system, pier crane dock and bridge
- "minimize[ing] on-site truck traffic contact with contaminated sediments and standing water"

If literally interpreted, Task 6, p. 12 of the CAO will put Schnitzer Steel out of business, as there is no way that the business can function in a manner consistent with the requirements outlined above.

The substances that the Regional Board is labeling as "contaminants or pollutants" are, for the most part, the very metals that Schnitzer Steel is recycling through its metal shredding and downstream non-ferrous recovery plant. It is not possible to recycle scrap metal on the scale of Schnitzer's operations without placing metals and metal-containing materials on the ground where they may become entrained in site soils. The piles of inbound scrap contain crushed automobiles, buses and other vehicles, household appliances, and a vast array of other types of scrap metals from individual households, municipalities, commercial businesses, industrial operations, transportation infrastructure, manufacturing facilities, heavy equipment and many, many other sources. The shredding process pulverizes the scrap, and the resulting stockpiles of product and intermediate streams are stored outdoors on the ground where they are able to be moved by grapples, cranes, front-end loaders, mine trucks and a variety of other heavy duty equipment. These stockpiles contain pieces of metal ranging in size from tiny bits of copper wire to fist-sized and larger chunks. Other grades of scrap (e.g., railroad track, segments of bridges) are reduced in size by a shear and stockpiled, while others are baled and stacked pending shipment from the facility. The facility's many heavy industrial operations cannot be conducted in a sterile and process sediment-free manner as staff seems to envision. Despite regular and thorough sweeping, dirt and mud are ubiquitous, especially during the wet season.

We recognize that we cannot operate our business in a manner that results in unlawful (unpermitted) discharges to the waters of the United States or that adversely affect beneficial uses of surface waters or groundwater. To this end, as described above, we have already implemented, or are in the process of implementing, improvements to address each interim corrective action item listed under Task 4. We have also implemented, or are in the process of implementing, many of the BMPs listed under Task 6. We will continue to enhance these efforts, as necessary, through implementation or improvement of BMPs which can be reasonably and feasibly implemented given the constraints of scrap metal recycling operations. We have indicated our willingness to conduct a further assessment of groundwater conditions at the site under a stand-alone Section 13267 request. That process would entail developing a list of constituents of concern reasonably related to the scrap metal recycling industry (CAO Task 1) and development of a Sampling and Analysis Plan (CAO Task 2). Depending on the results, it may be appropriate to propose a formal long-term groundwater monitoring program that could include expansion of the existing groundwater monitoring program. However, rather than the approach described in the tentative order in which we would be required to "identify all pollution sources on the Site," we believe it would be far more efficient – and equally informative in terms of determining whether any site cleanup is required – to begin with the assessment of groundwater. If we are able to confirm that groundwater conditions across the site are acceptable, and that beneficial uses are not being adversely affected, there would be no reason to identify or sample individual "pollution sources." Sampling of site soils, process sediment, process water, or shredder residue will inevitably reveal the presence of various metals and possibly other constituents that are found in the materials processed at the facility. By themselves, these sampling results are not determinative if site operations have been demonstrated not to be adversely affecting beneficial uses of water and an on-going groundwater monitoring program is in place to ensure acceptable conditions persist.

By proposing this alternative approach, we wish to reiterate that we understand the need to prevent non-authorized, non-storm water discharges from the facility that have a potential to enter surface waters. In addition to improving containment of process-related materials, our enhanced BMPs include regular, thorough cleaning of the conveyor and other over-water structures so that they do not accumulate dirt and debris that can be washed off into the Bay. We also understand the need to thoroughly clean up any dirt that has been tracked out onto Embarcadero West or the concrete dock, and to remove the light fibrous material or other debris that has been observed in off-site locations or other locations where it could be carried off-site. Much of this cleanup has already been completed, and more is being done. However, given the nature of our operations, it is not reasonable to expect us to sample each discrete potential "pollution source" at the facility for the purpose of defining the lateral and vertical extent of pollution (CAO Task 2) and to prepare a report that "describe[s] the vertical and lateral extent of pollution in soil and groundwater beneath the Site down to concentrations at or below typical cleanup standards for soil and groundwater" (CAO Task 3). While we recognize that this may be the standard approach to site investigation and cleanup, this approach is infeasible in the context of a scrap metal recycling facility like the Oakland facility, unnecessary to evaluate potential beneficial use impairment relevant to the site location, and does not meet the cost-effectiveness requirement of Water Code section 13267(b).

We also question the Regional Board's rationale for requiring sampling of off-site areas that have already been cleaned up, and that are affected by municipal storm water run-off and industrial operations by numerous other sources. For example, the tentative order requires that the storm drain on Embarcadero West (which is located near the entrance to Howard Terminal) be sampled. Samples for sediment collected from a municipal storm drain, or from storm drains located on SSA Terminals that are affected by SSA's own operations, are not representative of conditions at Schnitzer Steel and could not serve as a reliable basis for imposing cleanup obligations on Schnitzer Steel. As stated above, we agree that we are obligated to identify and remove facility-sourced material found on off-site properties, but that obligation does not extend to pollutants that have been contributed by others or that are of a regional nature.

7. The requests for technical reports outlined in Section C of the tentative CAO are unnecessary, as Schnitzer Steel is willing to revise its SWPPP to include the requested information.

Section C of the tentative order requires the preparation and submission of two technical reports. The first of these reports would evaluate all aspects of the on-site water recycling system that manages process water and storm water at the facility, and is claimed to be necessary because "process and stormwater are essentially commingled on the Site and has, or threatens to discharge off-site to or near the Oakland Estuary and Inner Harbor." See Technical and Monitoring Reports, Section C.1 (p. 13). The second report would describe how the various storage piles at the facility are managed and controlled, including incoming scrap and sorted product piles, and is claimed to be necessary because "water on the Site is likely washing pollutants off of these piles and into the water recycling system and/or being discharged offsite." See Technical and Monitoring Reports, Section C.2 (p. 14). While we disagree with the Regional Board's stated reasons for requesting the reports, we agree that much of the requested information is related to, or affects, storm water management at the facility. For this reason, we agree that it would be appropriate, if not beneficial, to incorporate this discussion into the

facility's SWPPP. As previously noted, we believe reports describing operation and maintenance of the facility's water recycling system, and identifying management and control of material storage piles, are inter-related topics which have a significant effect on stormwater quality and on-site water storage capacity. As such, this information reasonably belongs in the SWPPP where it is subject to periodic review and revision as necessary to conform to changing site conditions over time.

Of greater concern to us is that these requests for technical reports appear to indicate that Regional Board staff questions the accuracy of Schnitzer Steel's representation that the Oakland facility is a zero-discharge facility. With the exception of the three categories of discharges that are discussed above at length, and that we have agreed to address (track-out, drippage from over-water structures, and wind-blown dispersion of light fibrous material), the Regional Board does not have a sufficient basis to doubt the zero-discharge status of the facility. We readily acknowledge that process water and stormwater commingle at the site, and that this water ponds on-site after heavy rain events. This water is pumped to our 1.2-million gallon storage tank based on the rated capacity of the pumps and other factors, but some portion of the water infiltrates in areas of the yard that are unpaved. We do not try to prevent infiltration of ponded water, and have no reasonable means of doing so. Similarly, we do not try to prevent "deposition" of process water onto the ground. Water is essential for use in dust control operations at the facility and of necessity is sprayed on stockpiles and directly onto the ground. We do not believe that either of these long-standing and standard operational practices is contrary to provisions of the Water Code or the Clean Water Act in the absence of discharges to surface waters or impacts to beneficial uses.

The Oakland facility has no storm water outfalls and, based on its topography and grading, is capable of retaining almost 3 million gallons of water on-site before any discharge to the Estuary or Inner Harbor would even be threatened. We have never experienced a discharge of process water or stormwater from the yard, and we are unaware of any evidence to indicate that such discharges have occurred or were seriously threatened. There is also no evidence of groundwater contamination at the facility, and sediment quality in the immediate vicinity of the facility is consistent with ambient conditions around the Bay and suitable for unconfined aquatic disposal in the Bay. We are willing to provide additional information to the Regional Board about our on-site water recycling system, but we do not believe we should be required to do so under an assertion that stormwater discharges have occurred or are threatened at the facility. We also note that the General Permit does not prohibit discharges of industrial stormwater. If the facility were to experience a discharge as a consequence of extreme storm conditions, such discharges would not be a violation of the permit given the many structural and non-structural BMPs that are implemented at the facility. In our judgment, these BMPs collectively constitute BAT/BCT.

Given the facility's ability to contain and reuse all of the commingled process water/storm water that is collected in the yard, the water that is applied to storage piles for dust control purposes has no ability to discharge off-site. We question the nature of the Regional Board's concern over "pollutants" (i.e., metals) that might be washing off these piles and into the water recycling system. Sediments routinely collect in these types of systems and are periodically removed and disposed of off-site as necessary. We are willing to provide information to the Regional Board concerning our dust suppression and fire suppression procedures, but do not believe it is necessary to invoke Section 13267 for that purpose.

8. <u>Schnitzer Steel is willing to enter into an agreement with the Regional Board for cost recovery</u>.

Notwithstanding our many significant concerns with the tentative CAO, and our disagreement with staff's belief that issuance of a cleanup and abatement order is warranted in the circumstances, we recognize that the Regional Board is proceeding in good faith and that it has expended considerable time and effort on this matter and in connection with review of the recent revision of the facility SQMP/SWPPP. We also understand that additional staff time will be needed to bring all of the issues raised by the tentative order and our comments to a reasonable resolution which respects both parties' interests. If the Regional Board agrees to the proceed in the alternative manner requested by Schnitzer Steel in this letter (i.e., addressing stormwater issues through SWPPP revisions and groundwater issues through a Section 13267 letter, rather than through a CAO), we will enter into a voluntary, enforceable written agreement with the Regional Board for payment of all reasonable costs incurred by the Board, just as if the matter were proceeding under Water Code section 13304.

* * * * *

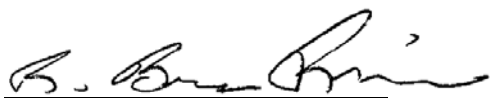
We appreciate the opportunity to submit these comments, and are hopeful that Regional Board and State Board staff will agree that the issues raised by the tentative order can be addressed more expediently and fairly in the alternative manner(s) discussed in this letter. We would appreciate an opportunity to meet with you again to discuss these comments and to explore potential alternatives in greater detail.

Thank you for your consideration.

Very truly yours,

Schnitzer Steel Products Company

Scott B. Sloan
National Environmental Director



Bruce Rieser
Regional Director

Enclosure(s)

cc: Pat Christopher
Michael Henderson
Tom Zelenka
John Hare
Luc Ong
Chris Orsolini
Margaret Rosegay
Peter Zawislanski

Attachment 1

Groundwater Monitoring Data (Table 1)

Table 1

Summary of Groundwater Monitoring Data

1992 – 2012

Schnitzer Steel Products Company

Oakland, CA

2012	Metals	Detection Limit (mg/l)	MW 1	MW 2	MW 3	MW 4
	Cadmium	0.0025	ND	ND	ND	ND
	Chromium	0.01	ND	ND	ND	ND
	Copper	0.02	ND	ND	ND	ND
	Mercury	0.0002	0.00023	0.00024	0.00021	0.00031
	Nickel	0.01	ND	ND	ND	ND
	Lead	0.005	ND	ND	ND	ND
	Zinc	0.02	ND	ND	ND	ND
2012	**PCBs**	**Detection Limit (ug/l)**	**MW 1**	**MW 2**	**MW 3**	**MW 4**
	Aroclor 1016	0.51	ND	ND	ND	ND
	Aroclor 1221	0.51	ND	ND	ND	ND
	Aroclor 1232	0.51	ND	ND	ND	ND
	Aroclor 1242	0.51	ND	ND	ND	ND
	Aroclor 1248	0.51	ND	ND	ND	ND
	Aroclor 1254	0.51	ND	ND	ND	ND
	Aroclor 1260	0.51	ND	ND	ND	ND
2011	**Metals**	**Detection Limit (mg/l)**	**MW 1**	**MW 2**	**MW 3**	**MW 4**
	Cadmium	0.01	ND	ND	ND	ND
	Chromium	0.01	ND	ND	ND	ND
	Copper	0.01	ND	ND	ND	ND
	Mercury	0.0005	ND	0.0009	ND	ND
	Nickel	0.01	ND	ND	ND	ND
	Lead	0.01	ND	ND	ND	ND
	Zinc	0.01	0.0184	ND	0.0101	0.0556
2011	**PCBs**	**Detection Limit (ug/l)**	**MW 1**	**MW 2**	**MW 3**	**MW 4**
	Aroclor 1016	1	ND	ND	ND	ND
	Aroclor 1221	1	ND	ND	ND	ND
	Aroclor 1232	1	ND	ND	ND	ND
	Aroclor 1242	1	ND	ND	ND	ND
	Aroclor 1248	1	ND	ND	ND	ND
	Aroclor 1254	1	ND	ND	ND	ND
	Aroclor 1260	1	ND	ND	ND	ND
	Aroclor 1262	1	ND	ND	ND	ND
2010	**Metals**	**Detection Limit (mg/l)**	**MW 1**	**MW 2**	**MW 3**	**MW 4**
	Cadmium	0.01	ND	ND	ND	ND
	Chromium	0.01	ND	ND	ND	ND
	Copper	0.01	ND	ND	ND	ND
	Mercury	0.0005	ND	ND	ND	ND
	Nickel	0.01	ND	ND	ND	ND
	Lead	0.01	ND	ND	ND	ND
	Zinc	0.01	ND	0.0111	ND	0.0135

2010	PCBs	Detection Limit (ug/l)	MW 1	MW 2	MW 3	MW 4
	Aroclor 1016	1	ND	ND	ND	ND
	Aroclor 1221	1	ND	ND	ND	ND
	Aroclor 1232	1	ND	ND	ND	ND
	Aroclor 1242	1	ND	ND	ND	ND
	Aroclor 1248	1	ND	ND	ND	ND
	Aroclor 1254	1	ND	ND	ND	ND
	Aroclor 1260	1	ND	ND	ND	ND
	Aroclor 1262	1	ND	ND	ND	ND
2009	**Metals**	**Detection Limit (mg/l)**	**MW 1**	**MW 2**	**MW 3**	**MW 4**
	Cadmium	0.005	ND	ND	ND	ND
	Chromium	0.005	ND	ND	ND	ND
	Copper	0.005	ND	ND	ND	ND
	Mercury	0.0005	ND	ND	ND	ND
	Nickel	0.005	0.0257	0.0052	ND	ND
	Lead	0.01	0.014	ND	ND	ND
	Zinc	0.01	0.0289	0.0105	0.0162	ND
2009	**PCBs**	**Detection Limit (ug/l)**	**MW 1**	**MW 2**	**MW 3**	**MW 4**
	Aroclor 1016	1	ND	ND	ND	ND
	Aroclor 1221	1	ND	ND	ND	ND
	Aroclor 1232	1	ND	ND	ND	ND
	Aroclor 1242	1	ND	ND	ND	ND
	Aroclor 1248	1	ND	ND	ND	ND
	Aroclor 1254	1	ND	ND	ND	ND
	Aroclor 1260	1	ND	ND	ND	ND
	Aroclor 1262	1	ND	ND	ND	ND
2008 (Feb.)	**Metals**	**Detection Limit (mg/l)**	**MW 1**	**MW 2**	**MW 3**	**MW 4**
	Cadmium	0.005	ND	ND	ND	ND
	Chromium	0.005	ND	ND	ND	ND
	Copper	0.005	ND	ND	ND	ND
	Mercury	0.0005	ND	ND	ND	ND
	Nickel	0.005	ND	ND	ND	ND
	Lead	0.01	ND	ND	ND	ND
	Zinc	0.01	0.0144	0.0175	0.0299	ND
	Zinc	0.10				ND
2008 (Feb.)	**PCBs**	**Detection Limit (ug/l)**	**MW 1**	**MW 2**	**MW 3**	**MW 4**
	Aroclor 1016	1	ND	ND	ND	ND
	Aroclor 1221	1	ND	ND	ND	ND
	Aroclor 1232	1	ND	ND	ND	ND
	Aroclor 1242	1	ND	ND	ND	ND
	Aroclor 1248	1	ND	ND	ND	ND
	Aroclor 1254	1	ND	ND	ND	ND
	Aroclor 1260	1	ND	ND	ND	ND
	Aroclor 1262	1	ND	ND	ND	ND

2008 (July)	Metals	Detection Limit (mg/l)	MW 1	MW 2	MW 3	MW 4
	Cadmium	0.005	ND	ND	ND	ND
	Chromium	0.005	ND	ND	ND	ND
	Copper	0.005	0.0052	ND	ND	ND
	Mercury	0.0005	ND	ND	ND	ND
	Nickel	0.005	ND	ND	ND	ND
	Lead	0.01	ND	ND	ND	ND
	Zinc	0.01	0.037	0.0318	0.0219	0.0241
2008 (July)	**PCBs**	**Detection Limit (ug/l)**	**MW 1**	**MW 2**	**MW 3**	**MW 4**
	Aroclor 1016	1	ND	ND	ND	ND
	Aroclor 1221	1	ND	ND	ND	ND
	Aroclor 1232	1	ND	ND	ND	ND
	Aroclor 1242	1	ND	ND	ND	ND
	Aroclor 1248	1	ND	ND	ND	ND
	Aroclor 1254	1	ND	ND	ND	ND
	Aroclor 1260	1	ND	ND	ND	ND
	Aroclor 1262	1	ND	ND	ND	ND
2007	**Metals**	**Detection Limit (mg/l)**	**MW 1**	**MW 2**	**MW 3**	**MW 4**
	Cadmium	0.005	ND	ND	ND	ND
	Chromium	0.005	ND	ND	ND	ND
	Copper	0.005	ND	ND	ND	ND
	Mercury	0.0005	ND	ND	ND	ND
	Nickel	0.005	ND	ND	ND	ND
	Lead	0.01	ND	ND	ND	ND
	Zinc	0.01	0.0558	0.0671	0.133	0.0161
2007	**PCBs**	**Detection Limit (ug/l)**	**MW 1**	**MW 2**	**MW 3**	**MW 4**
	Aroclor 1016	1		ND	ND	ND
	Aroclor 1221	1		ND	ND	ND
	Aroclor 1232	1		ND	ND	ND
	Aroclor 1242	1		ND	ND	ND
	Aroclor 1248	1		ND	ND	ND
	Aroclor 1254	1		ND	ND	ND
	Aroclor 1260	1		ND	ND	ND
	Aroclor 1262	1		ND	ND	ND
2006	**Metals**	**Detection Limit (mg/l)**	**MW 1**	**MW 2**	**MW 3**	**MW 4**
	Cadmium	0.01	ND	ND	ND	ND
	Chromium	0.05	ND	ND	ND	ND
	Copper	0.10	ND	ND	ND	ND
	Mercury	0.002	ND	ND	ND	ND
	Nickel	0.05	ND	ND	ND	ND
	Lead	0.05	ND	ND	ND	ND
	Zinc	0.10	ND	ND	ND	ND

2006	PCBs	Detection Limit (ug/l)	MW 1	MW 2	MW 3	MW 4
	Aroclor 1016	1	ND	ND	ND	ND
	Aroclor 1221	1	ND	ND	ND	ND
	Aroclor 1232	1	ND	ND	ND	ND
	Aroclor 1242	1	ND	ND	ND	ND
	Aroclor 1248	1	ND	ND	ND	ND
	Aroclor 1254	1	ND	ND	ND	ND
	Aroclor 1260	1	ND	ND	ND	ND
	Aroclor 1262	1	ND	ND	ND	ND
2005	**Metals**	**Detection Limit (mg/l)**	**MW 1**	**MW 2**	**MW 3**	**MW 4**
	Cadmium	0.01	ND	ND	ND	ND
	Chromium	0.05	ND	ND	ND	ND
	Copper	0.10	ND	ND	ND	ND
	Mercury	0.002	ND	ND	ND	ND
	Nickel	0.05	ND	ND	ND	ND
	Lead	0.05	ND	ND	ND	ND
	Zinc	0.10	ND	ND	ND	ND
2005	**PCBs**	**Detection Limit (ug/l)**	**MW 1**	**MW 2**	**MW 3**	**MW 4**
	Aroclor 1016	1	ND	ND	ND	ND
	Aroclor 1221	1	ND	ND	ND	ND
	Aroclor 1232	1	ND	ND	ND	ND
	Aroclor 1242	1	ND	ND	ND	ND
	Aroclor 1248	1	ND	ND	ND	ND
	Aroclor 1254	1	ND	ND	ND	ND
	Aroclor 1260	1	ND	ND	ND	ND
	Aroclor 1262	1	ND	ND	ND	ND
2004	**Metals**	**Detection Limit (mg/l)**	**MW 1**	**MW 2**	**MW 3**	**MW 4**
	Cadmium	0.01	ND	ND	ND	ND
	Chromium	0.05	ND	ND	ND	ND
	Copper	0.10	ND	ND	ND	ND
	Mercury	0.002	ND	ND	ND	ND
	Nickel	0.05	ND	ND	ND	ND
	Lead	0.05	ND	ND	ND	ND
	Zinc	0.05	ND	ND	ND	ND
2004	**PCBs**	**Detection Limit (ug/l)**	**MW 1**	**MW 2**	**MW 3**	**MW 4**
	Aroclor 1016	1		ND	ND	ND
	Aroclor 1221	1		ND	ND	ND
	Aroclor 1232	1		ND	ND	ND
	Aroclor 1242	1		ND	ND	ND
	Aroclor 1248	1		ND	ND	ND
	Aroclor 1254	1		ND	ND	ND
	Aroclor 1260	1		ND	ND	ND
	Aroclor 1262	1		ND	ND	ND

2003	Metals	Detection Limit (mg/l)	MW 1	MW 2	MW 3	MW 4
	Cadmium	0.01	ND	ND	ND	ND
	Chromium	0.05	ND	ND	ND	ND
	Copper	0.10	ND	ND	ND	ND
	Mercury	0.002	ND	ND	ND	ND
	Nickel	0.05	ND	ND	ND	ND
	Lead	0.005	ND	ND	ND	ND
	Zinc	0.10	ND	ND	ND	ND
2003	**PCBs**	**Detection Limit (ug/l)**	**MW 1**	**MW 2**	**MW 3**	**MW 4**
	Aroclor 1016	0.5	ND	ND	ND	ND
	Aroclor 1221	0.5	ND	ND	ND	ND
	Aroclor 1232	0.5	ND	ND	ND	ND
	Aroclor 1242	0.5	ND	ND	ND	ND
	Aroclor 1248	0.5	ND	ND	ND	ND
	Aroclor 1254	0.5	ND	ND	ND	ND
	Aroclor 1260	0.5	ND	ND	ND	ND
	Aroclor 1262	0.5	ND	ND	ND	ND
2002	**Metals**	**Detection Limit (mg/l)**	**MW 1**	**MW 2**	**MW 3**	**MW 4**
	Cadmium	0.01	ND	ND	ND	ND
	Chromium	0.05	ND	ND	ND	ND
	Copper	0.10	ND	ND	ND	ND
	Mercury	0.002	ND	ND	ND	ND
	Nickel	0.05	ND	ND	ND	ND
	Lead	0.05	ND	ND	ND	ND
	Zinc	0.10	ND	0.115	ND	ND
2002	**PCBs**	**Detection Limit (ug/l)**	**MW 1**	**MW 2**	**MW 3**	**MW 4**
	Aroclor 1016	0.5	ND	ND	ND	ND
	Aroclor 1221	2	ND	ND	ND	ND
	Aroclor 1232	0.5	ND	ND	ND	ND
	Aroclor 1242	0.5	ND	ND	ND	ND
	Aroclor 1248	0.5	ND	ND	ND	ND
	Aroclor 1254	0.5	ND	ND	ND	ND
	Aroclor 1260	0.5	ND	ND	ND	ND
	Aroclor 1262	0.5	ND	ND	ND	ND
2001	**Metals**	**Detection Limit (mg/l)**	**MW 1**	**MW 2**	**MW 3**	**MW 4**
	Cadmium	0.01	ND	ND	ND	ND
	Chromium	0.05	ND	ND	ND	ND
	Copper	0.10	ND	ND	ND	ND
	Mercury	0.002	ND	ND	ND	ND
	Nickel	0.05	ND	ND	ND	ND
	Lead	0.05	ND	ND	ND	ND
	Zinc	0.10	ND	ND	ND	ND

2001	PCBs	Detection Limit (ug/l)	MW 1	MW 2	MW 3	MW 4
	Aroclor 1016	0.5	ND	ND	ND	ND
	Aroclor 1221	2	ND	ND	ND	ND
	Aroclor 1232	0.5	ND	ND	ND	ND
	Aroclor 1242	0.5	ND	ND	ND	ND
	Aroclor 1248	0.5	ND	ND	ND	ND
	Aroclor 1254	0.5	ND	ND	ND	ND
	Aroclor 1260	0.5	ND	ND	ND	ND
	Aroclor 1262	0.5	ND	ND	ND	ND
2000	**Metals**	**Detection Limit (mg/l)**	**MW 1**	**MW 2**	**MW 3**	**MW 4**
	Cadmium	0.01	ND	ND	ND	ND
	Chromium	0.05	ND	ND	ND	ND
	Copper	0.10	ND	ND	ND	ND
	Mercury	0.002	ND	ND	ND	ND
	Nickel	0.05	ND	ND	ND	ND
	Lead	0.05	ND	ND	ND	ND
	Zinc	0.10	ND	ND	ND	ND
2000	**PCBs**	**Detection Limit (ug/l)**	**MW 1**	**MW 2**	**MW 3**	**MW 4**
	Aroclor 1016	1	ND	ND	ND	ND
	Aroclor 1221	1	ND	ND	ND	ND
	Aroclor 1232	1	ND	ND	ND	ND
	Aroclor 1242	1	ND	ND	ND	ND
	Aroclor 1248	1	ND	ND	ND	ND
	Aroclor 1254	1	ND	ND	ND	ND
	Aroclor 1260	1	ND	ND	ND	ND
	Aroclor 1262	1	ND	ND	ND	ND
1999	**Metals**	**Detection Limit (mg/l)**	**MW 1**	**MW 2**	**MW 3**	**MW 4**
	Cadmium	0.01	ND	ND	ND	ND
	Chromium	0.05	ND	ND	ND	ND
	Copper	0.10	ND	ND	ND	ND
	Mercury	0.002	ND	ND	ND	ND
	Nickel	0.05	ND	ND	ND	ND
	Lead	0.05	ND	ND	ND	ND
	Zinc	0.10	ND	ND	ND	ND
1999	**PCBs**	**Detection Limit (ug/l)**	**MW 1**	**MW 2**	**MW 3**	**MW 4**
	Aroclor 1016	0.5	ND	ND	ND	ND
	Aroclor 1221	2	ND	ND	ND	ND
	Aroclor 1232	0.5	ND	ND	ND	ND
	Aroclor 1242	0.5	ND	ND	ND	ND
	Aroclor 1248	0.5	ND	ND	ND	ND
	Aroclor 1254	0.5	ND	ND	ND	ND
	Aroclor 1260	0.5	ND	ND	ND	ND
	Aroclor 1262					

1998 (June)	Metals	Detection Limit (mg/l)	MW 1	MW 2	MW 3	MW 4
	Cadmium	0.01	ND	ND	ND	ND
	Chromium	0.05	0.07	0.08	ND	ND
	Copper	0.10	ND	ND	ND	ND
	Mercury	0.002	ND	ND	ND	ND
	Nickel	0.05	0.08	ND	ND	ND
	Lead	0.05	ND	ND	ND	ND
	Zinc	0.10	ND	ND	ND	ND
1998 (July)	**Metals**	**Detection Limit (mg/l)**	**MW 1**	**MW 2**	**MW 3**	**MW 4**
	Cadmium	0.01	ND	ND		
	Chromium	0.05	ND	ND		
	Copper	0.10	ND	ND		
	Mercury	0.002	ND	ND		
	Nickel	0.05	ND	ND		
	Lead	0.05	ND	ND		
	Zinc	0.10	ND	ND		
1998	**PCBs**	**Detection Limit (ug/l)**	**MW 1**	**MW 2**	**MW 3**	**MW 4**
	Aroclor 1016					
	Aroclor 1221					
	Aroclor 1232					
	Aroclor 1242					
	Aroclor 1248					
	Aroclor 1254					
	Aroclor 1260					
	Aroclor 1262					
1997	**Metals**	**Detection Limit (mg/l)**	**MW 1**	**MW 2**	**MW 3**	**MW 4**
	Cadmium	0.01	ND	ND	ND	ND
	Chromium	0.05	ND	ND	ND	ND
	Copper	0.10	ND	ND	ND	ND
	Mercury	0.002	ND	ND	ND	ND
	Nickel	0.05	ND	ND	ND	ND
	Lead	0.10	ND	ND	ND	ND
	Zinc	0.10	ND	ND	ND	ND
1997	**PCBs**	**Detection Limit (ug/l)**	**MW 1**	**MW 2**	**MW 3**	**MW 4**
	Aroclor 1016	0.5	ND	ND	ND	ND
	Aroclor 1221	2	ND	ND	ND	ND
	Aroclor 1232	0.5	ND	ND	ND	ND
	Aroclor 1242	0.5	ND	ND	ND	ND
	Aroclor 1248	0.5	ND	ND	ND	ND
	Aroclor 1254	0.5	ND	ND	ND	ND
	Aroclor 1260	0.5	ND	ND	ND	ND
	Aroclor 1262					

1996 (June)	Metals	Detection Limit (mg/l)	MW 1	MW 2	MW 3	MW 4
	Cadmium	0.01	ND	ND	ND	ND
	Chromium	0.05	ND	ND	ND	ND
	Copper	0.10	ND	ND	ND	ND
	Mercury	0.002	ND	ND	ND	ND
	Nickel	0.05	ND	ND	ND	ND
	Lead	0.10	ND	ND	ND	ND
	Zinc	0.10	ND	ND	ND	ND
1996 (Dec.)	**Metals**	**Detection Limit (mg/l)**	**MW 1**	**MW 2**	**MW 3**	**MW 4**
	Cadmium	0.01	ND	ND	ND	ND
	Chromium	0.05	ND	ND	ND	ND
	Copper	0.10	0.10	ND	ND	ND
	Mercury	0.002	ND	ND	ND	ND
	Nickel	0.05	ND	ND	ND	ND
	Lead	0.10	ND	ND	ND	ND
	Zinc	0.10	ND	ND	ND	ND
1996	**PCBs**	**Detection Limit (ug/l)**	**MW 1**	**MW 2**	**MW 3**	**MW 4**
	Aroclor 1016	0.5	ND	ND	ND	ND
	Aroclor 1221	2	ND	ND	ND	ND
	Aroclor 1232	0.5	ND	ND	ND	ND
	Aroclor 1242	0.5	ND	ND	ND	ND
	Aroclor 1248	0.5	ND	ND	ND	ND
	Aroclor 1254	0.5	ND	ND	ND	ND
	Aroclor 1260	0.5	ND	ND	ND	ND
	Aroclor 1262					
1995 (May)	**Metals**	**Detection Limit (mg/l)**	**MW 1**	**MW 2**	**MW 3**	**MW 4**
	Cadmium	0.01	ND	ND	ND	ND
	Chromium	0.05	ND	0.17	ND	ND
	Copper	0.10	ND	ND	ND	ND
	Mercury	0.002	ND	ND	ND	ND
	Nickel	0.05	ND	ND	ND	ND
	Lead	0.05	ND	ND	ND	ND
	Zinc	0.10	ND	ND	ND	ND
1995 (June)	**Metals**	**Detection Limit (mg/l)**	**MW 1**	**MW 2**	**MW 3**	**MW 4**
	Cadmium	0.01		ND		
	Chromium	0.05		ND		
	Copper	0.10				
	Mercury	0.002				
	Nickel	0.05				
	Lead	0.05				
	Zinc	0.10				

1995 (Dec.)	Metals	Detection Limit (mg/l)	MW 1	MW 2	MW 3	MW 4
	Cadmium	0.01	ND	ND	ND	ND
	Chromium	0.05	ND	ND	ND	ND
	Copper	0.10	ND	ND	ND	ND
	Mercury	0.002	ND	ND	ND	ND
	Nickel	0.05	ND	ND	ND	ND
	Lead	0.10	ND	ND	ND	ND
	Zinc	0.10	ND	ND	ND	ND
1995	**PCBs**	**Detection Limit (ug/l)**	**MW 1**	**MW 2**	**MW 3**	**MW 4**
	Aroclor 1016	0.5	ND	ND	ND	ND
	Aroclor 1221	2	ND	ND	ND	ND
	Aroclor 1232	0.5	ND	ND	ND	ND
	Aroclor 1242	0.5	ND	ND	ND	ND
	Aroclor 1248	0.5	ND	ND	ND	ND
	Aroclor 1254	0.5	ND	ND	ND	ND
	Aroclor 1260	0.5	ND	ND	ND	ND
	Aroclor 1262					
1994 (March)	**Metals**	**Detection Limit (mg/l)**	**MW 1**	**MW 2**	**MW 3**	**MW 4**
	Cadmium	0.01	ND	ND	ND	ND
	Chromium	0.05	ND	ND	ND	ND
	Copper	0.10	ND	ND	ND	ND
	Mercury	0.002	ND	ND	ND	ND
	Nickel	0.05	ND	ND	ND	ND
	Lead	0.05	ND	ND	ND	ND
	Zinc	0.10	ND	ND	ND	ND
1994 (June)	**Metals**	**Detection Limit (mg/l)**	**MW 1**	**MW 2**	**MW 3**	**MW 4**
	Cadmium	0.01	ND	ND	ND	ND
	Chromium	0.05	ND	ND	ND	ND
	Copper	0.10	ND	ND	ND	ND
	Mercury	0.002	ND	ND	ND	ND
	Nickel	0.05	ND	ND	ND	ND
	Lead	0.05	ND	ND	ND	ND
	Zinc	0.10	ND	ND	ND	ND
1994 (Sept.)	**Metals**	**Detection Limit (mg/l)**	**MW 1**	**MW 2**	**MW 3**	**MW 4**
	Cadmium	0.01	ND	ND	ND	ND
	Chromium	0.05	ND	ND	ND	ND
	Copper	0.10	ND	0.78	ND	ND
	Mercury	0.002	ND	ND	ND	ND
	Nickel	0.05	ND	ND	ND	ND
	Lead	0.05	ND	ND	ND	ND
	Zinc	0.10	ND	0.46	ND	ND

1994 (Dec.)	Metals	Detection Limit (mg/l)	MW 1	MW 2	MW 3	MW 4
	Cadmium	0.01	ND	ND	ND	ND
	Chromium	0.05	ND	ND	ND	ND
	Copper	0.10	ND	ND	ND	ND
	Mercury	0.002	ND	ND	ND	ND
	Nickel	0.05	ND	ND	ND	ND
	Lead	0.05	ND	ND	ND	ND
	Zinc	0.10	ND	ND	ND	ND
1994	**PCBs**	**Detection Limit (ug/l)**	**MW 1**	**MW 2**	**MW 3**	**MW 4**
	Aroclor 1016	0.5	ND	ND	ND	ND
	Aroclor 1221	2	ND	ND	ND	ND
	Aroclor 1232	0.5	ND	ND	ND	ND
	Aroclor 1242	0.5	ND	ND	ND	ND
	Aroclor 1248	0.5	ND	ND	ND	ND
	Aroclor 1254	0.5	ND	ND	ND	ND
	Aroclor 1260	0.5	ND	ND	ND	ND
	Aroclor 1262					
1993	**Metals**	**Detection Limit (mg/l)**	**MW 1**	**MW 2**	**MW 3**	**MW 4**
	Cadmium	0.01	ND	ND	ND	ND
	Chromium	0.05	ND	ND	ND	ND
	Copper	0.10	ND	ND	ND	ND
	Mercury	0.002	ND	ND	ND	ND
	Nickel	0.05	ND	ND	ND	ND
	Lead	0.05	ND	ND	ND	ND
	Zinc	0.10	ND	ND	ND	ND
1993 (March)	**PCBs**	**Detection Limit (ug/l)**	**MW 1**	**MW 2**	**MW 3**	**MW 4**
	Aroclor 1016	0.5	ND		ND	ND
	Aroclor 1221	2	ND		ND	ND
	Aroclor 1232	0.5	ND		ND	ND
	Aroclor 1242	0.5	ND		ND	ND
	Aroclor 1248	0.5	ND		ND	ND
	Aroclor 1254	0.5	ND		ND	ND
	Aroclor 1260	0.5	ND		ND	ND
	Aroclor 1262					
1993 (June)	**PCBs**	**Detection Limit (ug/l)**	**MW 1**	**MW 2**	**MW 3**	**MW 4**
	Aroclor 1016	0.5	ND	ND	ND	ND
	Aroclor 1221	2	ND	ND	ND	ND
	Aroclor 1232	0.5	ND	ND	ND	ND
	Aroclor 1242	0.5	ND	ND	ND	ND
	Aroclor 1248	0.5	ND	ND	ND	ND
	Aroclor 1254	0.5	ND	ND	ND	ND
	Aroclor 1260	0.5	ND	ND	ND	ND
	Aroclor 1262					

1993 (Sept.)	PCBs	Detection Limit (ug/l)	MW 1	MW 2	MW 3	MW 4
	Aroclor 1016	0.5	ND	ND	ND	ND
	Aroclor 1221	2	ND	ND	ND	ND
	Aroclor 1232	0.5	ND	ND	ND	ND
	Aroclor 1242	0.5	ND	ND	ND	ND
	Aroclor 1248	0.5	ND	ND	ND	ND
	Aroclor 1254	0.5	ND	ND	ND	ND
	Aroclor 1260	0.5	ND	ND	ND	ND
	Aroclor 1262					
1993 (Dec.)	**PCBs**	**Detection Limit (ug/l)**	**MW 1**	**MW 2**	**MW 3**	**MW 4**
	Aroclor 1016	0.5	ND	ND	ND	ND
	Aroclor 1221	2	ND	ND	ND	ND
	Aroclor 1232	0.5	ND	ND	ND	ND
	Aroclor 1242	0.5	ND	ND	ND	ND
	Aroclor 1248	0.5	ND	ND	ND	ND
	Aroclor 1254	0.5	ND	ND	ND	ND
	Aroclor 1260	0.5	ND	ND	ND	ND
	Aroclor 1262					
1992	**Metals**	**Detection Limit (mg/l)**	**MW 1**	**MW 2**	**MW 3**	**MW 4**
	Cadmium	0.01	ND	ND	ND	ND
	Chromium	0.05	ND	ND	ND	ND
	Copper	0.10	ND	ND	ND	ND
	Mercury	0.002	ND	ND	ND	ND
	Nickel	0.05	ND	ND	ND	ND
	Lead	0.05	ND	ND	ND	ND
	Zinc	0.10	ND	ND	ND	0.11
1992	**PCBs**	**Detection Limit (ug/l)**	**MW 1**	**MW 2**	**MW 3**	**MW 4**
	Aroclor 1016	0.5	ND	ND	ND	ND
	Aroclor 1221	2	ND	ND	ND	ND
	Aroclor 1232	0.5	ND	ND	ND	ND
	Aroclor 1242	0.5	ND	ND	ND	ND
	Aroclor 1248	0.5	ND	ND	ND	ND
	Aroclor 1254	0.5	ND	ND	ND	ND
	Aroclor 1260	0.5	ND	ND	ND	ND
	Aroclor 1262					

Attachment 2

Photographs of BMP Enhancements Completed or Underway

Demonstration of dock cleanup effectiveness. Dock face in right portion of photo has been cleaned. Dock cleanup activities completed September 6-14, 2012.

Dock cleaning activities. All wash water was captured by containment barge, profiled and disposed off-site. Dock cleanup activities completed September 6-14, 2012.

Construction project underway to install commercial wheel washing station at facility exit. Expected project completion – October 1, 2012.

New extension of concrete containment wall along southwestern facility boundary. Over 600 lineal feet of new containment installed. Project completed August 24, 2012.

New strip drain to prevent off-site flow of stormwater at retail non-ferrous department entrance. Project completed – May 2012.

Torch-cutting station relocated to paved and contained area. Project completed – June 2012.

Grading, base preparation and footing construction underway to install additional tent structure to expand covered maintenance area. Expected project completion – October 31, 2012.

Ertec™ stormwater filtration barrier awaiting installation along edges of concrete dock. Expected project completion – October 31, 2012.

Attachment 3

Criteria for Beneficial Use Exemptions for Shallow Groundwater at the Margin of San Francisco Bay

TECHNICAL MEMORANDUM

September 28, 2012

From: Peter Zawislanski, PG, CHG

To: Scott Sloan, RG, LHG, Schnitzer Steel MRB

Subject: Criteria for Beneficial Use Exemptions for Shallow Groundwater at the Margin of San Francisco Bay

Shallow groundwater[1] underlying areas along the margin of San Francisco Bay ("the Bay"), or within 500 to 1,000 feet of the Bay, is generally of poor quality and is unsuitable for development as a resource for human consumption. The use of shallow groundwater along the margin of the Bay for domestic or municipal supply is not feasible due to several factors, including:

- Shallow groundwater quality generally does not meet regulatory standards due to high salinity;
- The hydrogeology of shallow groundwater does not meet minimum well construction requirements for water supply wells; and
- Extraction of shallow groundwater in coastal areas can lead to further degradation of groundwater quality due to saltwater intrusion.

For these reasons, shallow groundwater along the margin of the Bay has not been developed in the past, is not used at present, and is not being considered for potential future development for municipal or domestic use. State agencies have recognized this issue and have concurred with the beneficial use exemption for municipal/domestic supply at many sites on the periphery of the Bay. Rather, agencies have often required that site-specific cleanup goals for shallow groundwater migrating to the Bay be based on criteria for the protection of aquatic habitat.

Regulatory Water Quality Considerations

Under State Water Resources Control Board (SWRCB) Resolution No. 88-63 (SWRCB 1988), all groundwater of the state is considered to be suitable or potentially suitable for municipal/domestic water supply, with exceptions as noted in Water Board Resolution No. 89-39, "Sources of Drinking Water," where:

[1] "Shallow" groundwater refers to the first encountered groundwater, or "A-zone" groundwater.

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Oakland, California 94612
www.terraphase.com

- The total dissolved solids (TDS) concentration exceeds 3,000 milligrams per liter (mg/L), and it is not reasonably expected by the Water Board that the groundwater could supply a public water system; or
- There is contamination, either by natural processes (which can include saltwater intrusion) or by human activity (unrelated to a specific pollution incident), that cannot reasonably be treated for domestic use using either Best Management Practices (BMPs) or best economically achievable treatment practices; or
- The water source does not provide sufficient water to supply a single well capable of producing an average, sustained yield of 200 gallons per day; or
- The aquifer is regulated as a geothermal energy-producing source or has been exempted administratively pursuant to 40 Code of Federal Regulations (CFR) Part 146.4 for the purpose of underground injection of fluids associated with the production of hydrocarbon or geothermal energy, provided that these fluids do not constitute a hazardous waste under 40 CFR Part 261.3.

Due to saltwater intrusion and the fact that many shoreline areas were formerly salt marshes that were progressively filled over the course of the 20th century, shallow groundwater along the margin of the Bay is generally brackish to saline, with TDS commonly exceeding 3,000 mg/L, and in some cases approaching that of Bay water. Therefore, shallow groundwater in these areas does not meet the SWRCB criteria for a potential beneficial use as a municipal or domestic water supply. The California Department of Public Health (CDPH) has established a TDS secondary maximum contaminant level drinking water standard for public water supplies of 1,000 mg/L. Shallow groundwater along the periphery of the Bay generally does not meet CDPH standards for drinking water and, if extracted for the purpose of human consumption, it would require treatment, such as reverse osmosis, which is not economically viable.

It should be noted that in 1999 the Water Board recommended the de-designation of the of shallow groundwater area in the East Bay Plain Groundwater Basin ("East Bay Plain") from municipal/domestic beneficial use due to naturally occurring high salinity. This area (Oakland Shoreline/Alameda Point Brackish Shallow Groundwater Zone) includes the Port of Oakland High TDS Zone (i.e., Port of Oakland, Alameda Point, Oakland Army Base). As discussed in a subsequent section of this memorandum, the Water Board and the Department of Toxic Substances Control (DTSC) have granted exemptions for the beneficial use of groundwater as a municipal/domestic supply at several sites within this zone.

Well Construction Requirements

Shallow aquifers are vulnerable to contamination from human activities due to short vertical distances from the surface to the water table and, consequently, a greater potential for contaminants reaching groundwater. This vulnerability is addressed in California through well construction standards. The California Department of Water Resources (DWR) well ordinance requires that domestic wells have a minimum annular seal of at least 20 feet below the ground surface, and that municipal supply wells have a minimum annular seal of at least 50 feet (DWR 1991).

The depth to shallow groundwater in Bay coastal areas is small, generally on the order of 5 to 20 feet below ground surface (ft bgs). Geologically, these areas often consist of filled marshland overlying Bay Mud. The depth to Bay Mud is generally 10 to 25 feet below ground surface (ft bgs). Bay Mud is not considered an aquifer for water supply due to low permeability and high salinity (SCWA 2007). The permeability of Bay Mud is reported to be in the 10^{-7} cm/s range [Fox et al. 2003; Welker et al. 2004). By comparison, productive aquifers generally have a hydraulic conductivity equal to or greater than 10^{-2} cm/s (Bear 1972). Therefore, the potentially productive zone of shallow groundwater is limited to depths within 10 to 25 feet of the ground surface. Due to these limitations, shallow groundwater production wells would generally not meet DWR minimum well construction requirements along the margin of the Bay because the minimum required annular seal cannot be installed in a manner that will allow the well to be screened in a sufficiently permeable water-bearing zone that could provide a sustained yield of 200 gallons of water per day.

Groundwater Extraction in Coastal Areas Leads to Saltwater Intrusion

Shallow groundwater along the periphery of the Bay is brackish to saline, indicating saltwater intrusion. Saltwater intrusion occurs in nearly all coastal areas, because at these locations groundwater is in direct contact with saltwater and is subject to tidal fluxes that effectively mix groundwater with saltwater. The physical relationship between groundwater and saltwater in coastal areas is well understood and is described by the Ghyben-Herzberg relation.

Groundwater quality is at risk if production wells are located close to areas where groundwater contains high salinity or is located close to the Bay. Under normal conditions, fresh water flows from inland aquifers and recharge areas to coastal discharge areas to the sea, or in this case, the Bay. This natural movement of fresh water towards the coast minimizes saltwater intrusion to freshwater coastal aquifers (Barlow 2003). Groundwater pumping/development along the Bay shoreline can decrease the amount of fresh water flowing towards the coastal discharge areas, allowing salt water to be drawn into the fresh water zones of coastal aquifers. As a result, the amount of fresh water stored in the aquifers is decreased.

Groundwater extraction from wells located in areas along the periphery of the Bay, whether for municipal/domestic or other uses, such as industrial or agricultural, would likely result in the degradation of water quality as nearby saltwater is drawn toward the production wells. Therefore, development of shallow groundwater for drinking water supply or other uses along the Bay margin is not feasible.

Regional Development of Groundwater for Municipal Supply

Shallow groundwater near the periphery of the Bay is not currently used for municipal or domestic purposes and is not expected to be used for these purposes in the future. Municipal supply wells in the East Bay Plain, which includes all or portions of the cities of Richmond, San Pablo, El Cerrito, Albany,

Berkeley, Emeryville, Piedmont, Alameda, Oakland, San Leandro, San Lorenzo and Hayward, have generally been drilled to depths no shallower than 100 feet and usually to much greater depths, up to 800 feet (Figuers 1998). As of 1999, there were no municipal water supply wells screened above the depth of 50 feet in the East Bay Plain (RWQCB 1999). In total, on record, there were only four municipal wells with screens between depths of 50 and 200 ft bgs in the East Bay Plain in 1999.

Agency Concurrence with Beneficial Use Exemption for Municipal/Domestic Supply

The Water Board and the DTSC have issued concurrence with the beneficial use exemption for municipal/domestic supply at numerous sites on the periphery of the Bay, including several sites in the Port of Oakland High TDS Zone. The following are examples of sites in Oakland, Alameda, San Francisco, and Novato where the agencies have issued concurrence with the beneficial use exemption based, either wholly or in part, on the TDS in groundwater exceeding the 3,000 mg/L threshold.

Embarcadero Cove State Superfund Site, Port of Oakland: The Final Remedial Action Plan (ERM-West 1994) concluded that the shallow groundwater was unsuitable for human consumption for reasons that are very similar to those presented above for the Site, namely high salinity, underlying Bay Mud, and non-compliance with domestic and municipal construction requirements. The DTSC issued a letter approving the Final Remedial Action Plan (DTSC 1994).

Alameda Point, Installation Restoration Site 1, Alameda, California: The Navy received concurrence from the Water Board that groundwater at the site meets the municipal and domestic water supply designation exemption criteria for groundwater due to high salinity (ChaduxTt 2009; Water Board 2003a).

Hunters Point Shipyard, San Francisco: The Navy received concurrence from the Water Board that the A-aquifer (shallow groundwater) met the exemption criteria and was not considered a potential source of drinking water (SulTech 2008; Water Board 2003b).

Navy Ballfields Site, Hamilton Field, Novato, California: The Water Board stated its determination that the shallow groundwater at this site "is not suitable for drinking water as evaluated using the State Water Board's Resolution 88-63, and there is no potential for other beneficial uses of groundwater…because of high total dissolved solids" (Water Board 2006). It should be noted that the TDS at this site ranged from 819 to 18,279 mg/L, and the average concentration of TDS was 4,898 mg/L. Therefore, the RWQCB concurred that groundwater is not of adequate quality for municipal or domestic use where the average TDS is greater than 3,000 mg/L, even if TDS in groundwater in certain parts of the site is below 3,000 mg/L.

Lot 3, Campus Bay, Richmond: In a July 29, 2005 letter, the Department of Toxic Substance Control required that the beneficial use of groundwater underlying Lot 3 be evaluated in the remedial investigation report to be prepared for the property. Lot 3 extends over 1,000 feet inland from the Bay shoreline. In the report, the property owner argued that groundwater underlying Lot 3 is not considered to have a beneficial use as a source of drinking water because TDS concentrations exceeded 3,000 mg/ll.

The DTSC approved the report, and this interpretation, in a letter dated June 10, 2008. The DTSC also approved cleanup goals based on aquatic water quality criteria for shallow groundwater at the site.

Concluding Statement

Shallow groundwater underlying areas along the margin of the Bay, or within 500 to 1,000 feet of the Bay, is generally unsuitable for development as a domestic or municipal water supply resource due to factors discussed above. Most importantly, high salinity, potential for further groundwater degradation due to saltwater intrusion, and the non-conformance with minimum production well construction requirements render the domestic or municipal use of shallow groundwater along the margin of the Bay infeasible. As illustrated through examples of several sites located in this setting, state agencies have recognized this issue and have concurred with the beneficial use exemption for municipal/domestic supply at many sites on the periphery of the Bay.

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Attachment 4

2010 Sediment Characterization Report

August 23, 2010

Mr. Robert Smith
U.S. Army Corps of Engineers
San Francisco District
1455 Market Street
San Francisco, CA 94103-1398

Dear Mr. Smith:

On behalf of Mr. Max Bosserman of the Schnitzer Steel Products Company, Inc. (SSPC), I have enclosed two (2) copies of our report "Sediment Characterization Sampling and Analysis Results (SAR) for the Schnitzer Steel Terminal Berth." In addition, copies of this SAR have been sent to the other DMMO participating agency representatives.

If you have any questions, please give me a call at (707) 207-7761. I look forward to hearing from you.

Sincerely,

Jeffrey Cotsifas
President

cc (w/enc): Brian Ross, U.S. EPA
Brenda Goeden, BCDC
Beth Christian, SFRWQCB
George Isaac, CDFG
David Woodbury, NMFS
Donn Oetzel, SLC
Max Bosserman, SSPC

This testing was performed under Lab Order 17105. The test results reported herein conform to the most current NELAC standards, where applicable, unless otherwise narrated in the body of the report, and only relate to the sample(s) tested. This report shall not be reproduced, except in full, without the written consent of Pacific EcoRisk.

DATA REPORT

Sediment Characterization Sampling and Analysis Results (SAR) for the Schnitzer Steel Terminal Berth

Maintenance Dredging Program: Episode 1

Prepared for

Schnitzer Steel Products Company, Inc.
1101 Embarcadero West
Oakland, CA 94607

Prepared by

Pacific EcoRisk
2250 Cordelia Road
Fairfield, CA 94534

August 2010

PACIFIC ECORISK
ENVIRONMENTAL CONSULTING & TESTING

Sediment Characterization Sampling and Analysis Results (SAR) for the Schnitzer Steel Terminal Berth

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List of Acronyms

ASTM	American Society for Testing and Materials
Bay	San Francisco Bay
BCDC	Bay Conservation and Development Commission
CEL	Calscience Environmental Laboratories
COC	Chain-of-custody
CV	Coefficient-of-variation
DGPS	Differential global positioning system
DMMO	Dredged Material Management Office
ESC	Elutriate Suitability Concentrations
GPS	Global positioning system
ITM	Inland Testing Manual
LTMS	Long Term Management Strategy
MLLW	Mean lower low water
PER	Pacific EcoRisk
QA/QC	Quality assurance/quality control
RPD	Relative percent difference
RWQCB	Regional Water Quality Control Board
SAP	Sampling and analysis plan
SLC	State Lands Commission
SOP	Standard operating procedures
SSPC	Schnitzer Steel Products Company, Inc.
SUAD	Suitable for undefined aquatic disposal
TOC	Total organic carbon
USACE	U.S. Army Corps of Engineers
USEPA	U.S. Environmental Protection Agency

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1. INTRODUCTION

The Schnitzer Steel Products Company, Inc. (SSPC), located in Oakland, CA (Figures 1-1 through 1-3), on the northern side of the Oakland Inner Harbor. In order to maintain essential transit and berthing operations at its terminal, it has periodically been necessary to dredge sediments from within the terminal berth area. SSPC is currently seeking a 10-year permit from both the U.S. Army Corps of Engineers (USACE) and the San Francisco Bay Conservation and Development Commission (BCDC); SSPC is also seeking a lease from the State Lands Commission for maintenance dredging of their berth area. It is anticipated that Water Quality Certifications from the San Francisco Regional Water Quality Control Board (RWQCB) will be applied for on an episode-by-episode basis. SSPC is also developing an Integrated Alternatives Analysis (IAA). SSPC was previously permitted to dispose of their dredged material at the SF-11 disposal site located off Alcatraz Island. Pacific EcoRisk has been contracted by SSPC to prepare this Sampling and Analysis Plan (SAP) supporting its Episode 1 maintenance-dredging event.

It is anticipated, that due to the small volume of material to be dredged in the first episode under the new permits, the dredged material would be disposed of at SF-11. It is proposed that the dredged material will be subject to the full suite of chemical, physical, and biological testing, with bioaccumulation testing being deferred pending analysis of the dredged material chemistry data.

To accommodate essential transit and berthing operations, SSPC requires dredging of its terminal berth to a depth of -37 ft. MLLW + 2.0 ft. over-dredge; it is proposed that these areas be sampled and tested to a total depth of -39 ft. MLLW. It is anticipated that approximately 3,700 cubic yards of material will be removed in order to maintain terminal operations and the permitted design depth. The proposed maintenance depth and estimated volumes of dredged material for the SSPC Terminal Berth, including over-depth, are summarized in Table 1-1; stormwater outfalls in the vicinity of the wharf berth are presented in Figure 1-3. A bathymetric survey with sample locations identified is presented in Figure 1-4.

Table 1-1. Proposed maintenance dredging for the Schnitzer Steel Terminal Berth

Area	Design Depth (ft. MLLW)	Design Depth Volume (yds^3)	Over-depth (ft.)	Over-depth Volume (yds^3)	Total Volume (yds^3)	Total Volume with 20% "buffer" (yds^3)
SSPC Terminal Berth	-37	740	2	2,946	3,686	4,423

This sampling and analysis report (SAR) Report has been prepared to provide the required characterization of these sediments. In order to meet permit requirements, one composite

samples representative of this area was analyzed and tested as per the Inland Testing Manual (ITM).

1.1 Objectives of the Sediment Investigation

The purpose of this investigation is to evaluate the proposed dredged material to determine whether it will represent an adverse impact during removal operations and placement at the SF-11 In-Bay disposal site. The procedures for sediment sample collection, sample processing and preparation, physical and chemical analyses, biological testing and data analyses were presented in a previously approved SAP. The specific objectives of the scope-of-work were as follows:

- Collect core samples from within the designated sampling areas following field protocol detailed in the SAP (PER 2010); and
- Conduct chemical and biological analyses to determine whether sediments are suitable for unconfined aquatic disposal (SUAD).

1.2 Organization of this Document

Sample collection and handling procedures are discussed in Sections 2 and 3. Chemical analyses and bioassay results are provided in Section 4. Section 5 presents the conclusions regarding suitability of the material for proposed placement options, and references are provided in Section 6. Appendices A-K contain supporting documentation for this study.

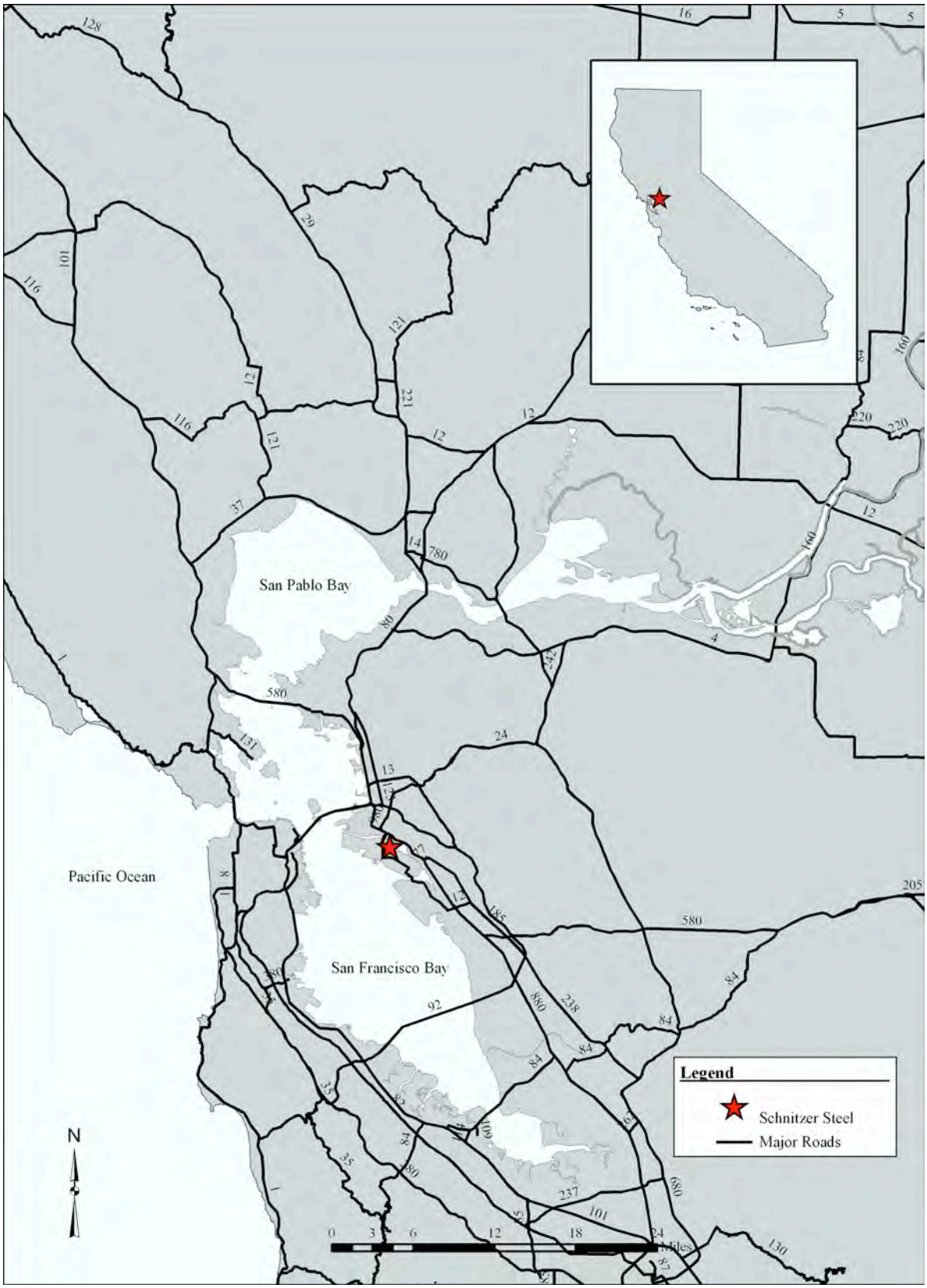


Figure 1-1. Location Map: Schnitzer Steel, Oakland, CA

Figure 1-2. Vicinity Map: Schnitzer Steel, Oakland, CA

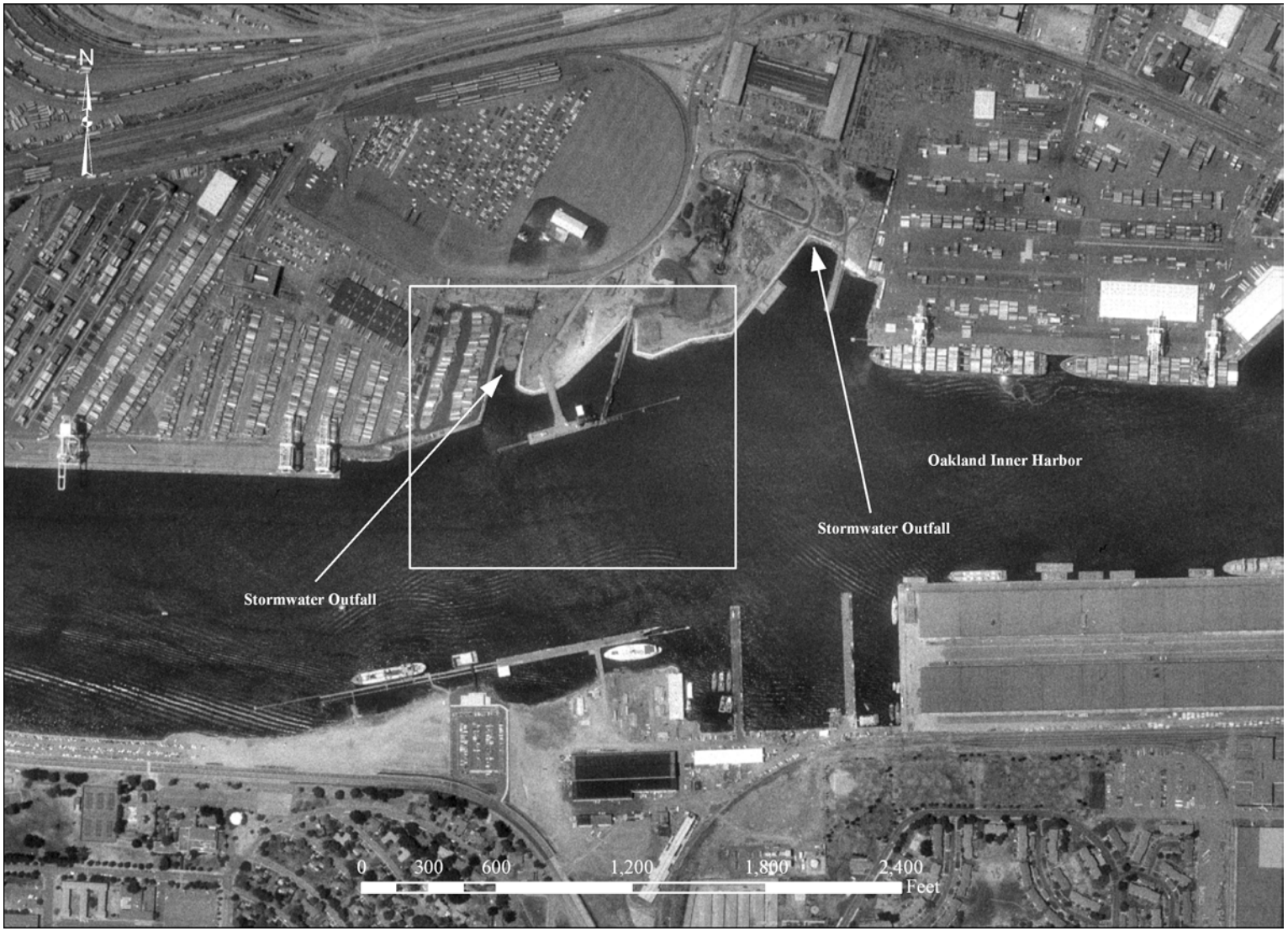
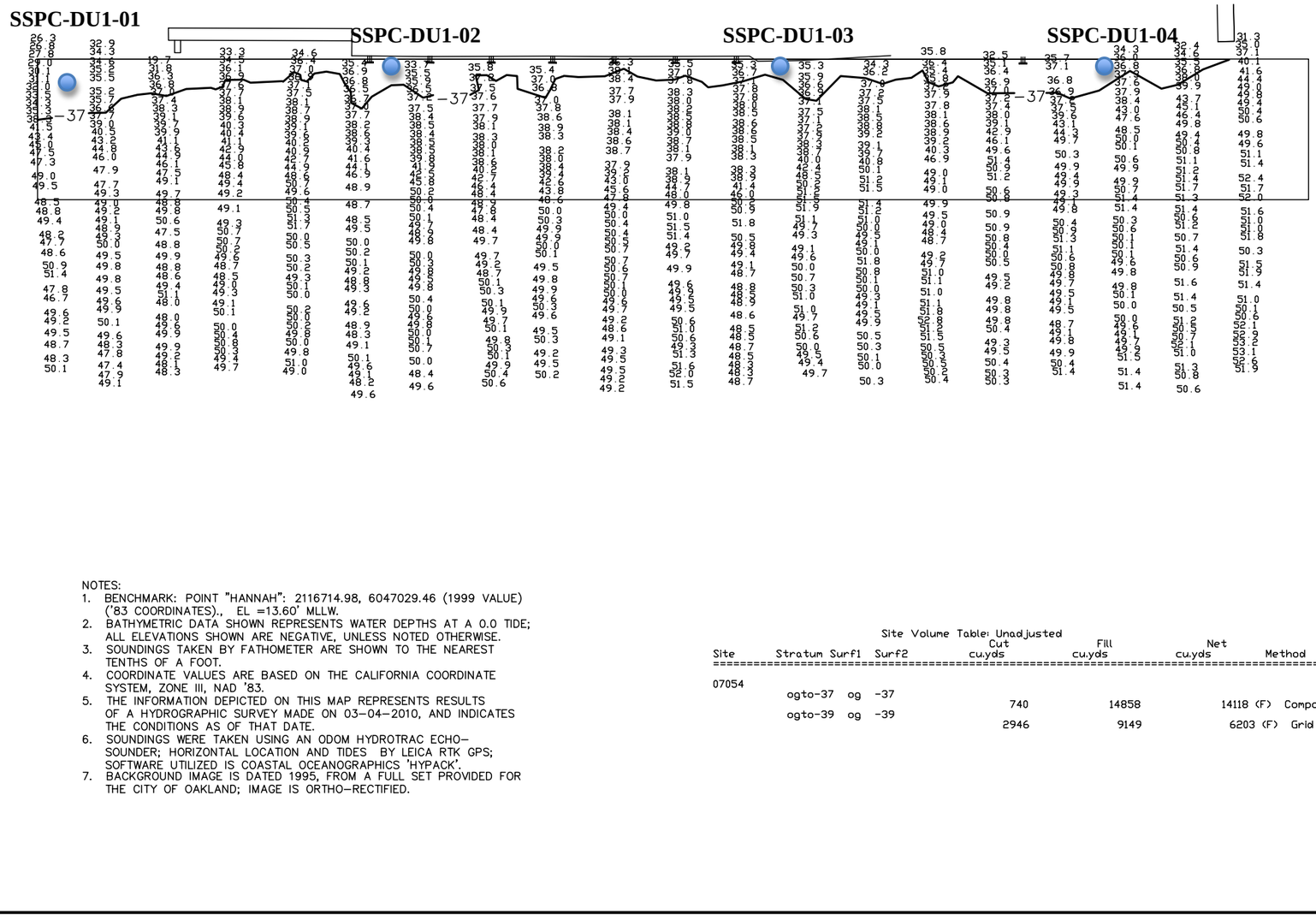


Figure 1-3. Stormwater Outfall Location Map: Schnitzer Steel, Oakland, CA



NOTES:
1. BENCHMARK: POINT "HANNAH": 2116714.98, 6047029.46 (1999 VALUE) ('83 COORDINATES)., EL =13.60' MLLW.
2. BATHYMETRIC DATA SHOWN REPRESENTS WATER DEPTHS AT A 0.0 TIDE; ALL ELEVATIONS SHOWN ARE NEGATIVE, UNLESS NOTED OTHERWISE.
3. SOUNDINGS TAKEN BY FATHOMETER ARE SHOWN TO THE NEAREST TENTHS OF A FOOT.
4. COORDINATE VALUES ARE BASED ON THE CALIFORNIA COORDINATE SYSTEM, ZONE III, NAD '83.
5. THE INFORMATION DEPICTED ON THIS MAP REPRESENTS RESULTS OF A HYDROGRAPHIC SURVEY MADE ON 03-04-2010, AND INDICATES THE CONDITIONS AS OF THAT DATE.
6. SOUNDINGS WERE TAKEN USING AN ODOM HYDROTRAC ECHO-SOUNDER; HORIZONTAL LOCATION AND TIDES BY LEICA RTK GPS; SOFTWARE UTILIZED IS COASTAL OCEANOGRAPHICS 'HYPACK'.
7. BACKGROUND IMAGE IS DATED 1995, FROM A FULL SET PROVIDED FOR THE CITY OF OAKLAND; IMAGE IS ORTHO-RECTIFIED.

Site Volume Table: Unadjusted

Site	Stratum	Surf1	Surf2	Cut cu.yds	Fill cu.yds	Net cu.yds	Method
07054	ogto-37	og	-37	740	14858	14118 (F)	Composite
	ogto-39	og	-39	2946	9149	6203 (F)	Grid

BATHYMETRIC SURVEY
OF SCHNITZER STEEL
MARCH 4, 2010
OAKLAND CALIFORNIA

NO.	REVISION	BY

PLS Surveys, Inc.
LAND & HYDROGRAPHIC SURVEYORS
2220 Livingston Street, Suite 202
Oakland, California 94605-5203
510.261.0900 FAX 510.261.3303
e-mail: plsurv@pacbell.net

DATE	03/09/2010
SCALE	1" = 80'
DESIGNER	JMB
JOB NO.	07-054
SHEET	1
OF	02 SHEETS

Figure 1-4. Project Map: Sampling Locations Schnitzer Steel Terminal Berth

2. FIELD SEDIMENT SAMPLE COLLECTION

All sediments were collected in accordance with guidelines and procedures outlined in the SAP (PER 2010). All sediment sampling field activities at the Schnitzer Steel Terminal Berth were performed on July 21 under the direction of Mr. Jeffrey Cotsifas of Pacific EcoRisk (PER). PER provided the sampling vessel, on-board positioning system, and sampling equipment. PER also provided additional Field Scientists to assist in sediment core collection. Four sediment cores were collected from the designated site (Figure 1-4). Final site positions were determined with a differential global positioning system (GPS) and are accurate to ± 3 m. Table 2-1 lists station identifiers, GPS coordinates for all core locations, mudline elevations, and core penetration depths for all stations.

Table 2-1. Locations of sampling stations, core penetration depths

SAMPLE ID	Latitude[A] (deg-dec min)	Longitude[A] (deg-dec min)	Mudline Elevation (ft MLLW)	Core Penetration Depth (ft)	Cored Depth (ft MLLW)
SSPC-DU1-01	37°47.614’	122°17.634’	-32.7	38.1*	-5.4
SSPC-DU1-02	37°47.627’	122°17.583’	-35.0	39.0	-4.0
SSPC-DU1-03	37°47.643’	122°17.523’	-35.5	39.0	-3.5
SSPC-DU1-04	37°47.653’	122°17.467’	-35.3	39.0	-3.7

[*] Hard refusal met at -38.1 ft. MLLW, fine sand in core-catcher.
[A] State Plane Coordinate System, California Zone 3, NAD 83

On June 15, PER also collected reference sediment from the Alcatraz disposal site (SF-11). The reference sediments were collected as grab samples, using a pipe dredge sampler. The GPS coordinates for the reference sediment sample collection are listed in Table 2-2.

Table 2-2. Alcatraz (SF-11) Reference Site Sample Location

Sample ID	Latitude (N) (deg-dec min)	Longitude (W) (deg-dec min)
SF-11	37º 48.8280’	122º 25.5765’

All sediment samples were maintained on ice until transported to the PER testing lab for processing. Upon receipt at PER, all samples were logged in and placed in cold storage at ≤4°C in the dark until needed. Field log sheets are presented in Appendix A. There were no unusual circumstances encountered during the fieldwork, and no major deviations from the SAP (PER 2010).

3. SAMPLE PROCESSING

The sediment materials from each core section were individually homogenized within a high-density polyethylene bucket to comprise the homogenized core sediments; a sub-sample of each homogenized core sediment sample was frozen for archival storage.

Proportionate volumes of the homogenized core sediments were composited and homogenized within a high-density polyethylene bucket to comprise the "SSPC-DU1-Comp" composite sediment. This sample was analyzed for the full suite of compounds as described in the SAP (PER 2010). The SF-11 reference sediment was also homogenized and used in the biological testing program.

All sediment was processed following procedures outlined in the SAP (PER 2010), with no deviations.

4. RESULTS OF LABORATORY ANALYSES

4.1 Results of Conventional and Chemical Analyses

Sediment samples were analyzed for the conventional and chemical parameters specified in the SAP (PER 2010). Conventional parameters included total organic carbon (TOC), total solids, and grain size. Chemical analyses of trace metals, polychlorinated biphenyls (PCBs), polycyclic aromatic hydrocarbons (PAHs), chlorinated pesticides, and butyltins were also performed. The results of these analyses (performed by Calscience Environmental Laboratories [CEL]) are summarized in Tables 4-1 through 4-7. CEL's full Data Report for the conventional and chemical analyses is provided in Appendix B.

4.1.1 SSPC-DU1-Comp Composite Analytical Chemistry Results

The "SSPC-DU1-Comp" site sediment was 46.0% total solids, and TOC levels were moderate (1.6%). Grain size analyses indicated that the sediment was 78.4% fines (silts and clays), 21.6% sand, and 0.0% gravel.

With the exception of cadmium, selenium, and zinc, all metals were similar to San Francisco Bay background levels (SFRWQCB 1998). Cadmium was measured in the sample at 1.15 mg/Kg, with a duplicate analysis concentration of 0.58 mg/Kg; both of these values are below the cadmium Effect-Range Low (ER-L) value of 1.2 mg/Kg (Long et al 1998). Zinc was measured at 549 mg/kg with a duplicate analysis concentration of 150 mg/Kg; re-analysis of the sample resulted in a reported concentration of 292 mg/Kg. Total PAHs were reported at 1360 µg/kg. All butyltins and organochlorine pesticides were below their respective method detection limits (MDLs). PCB Aroclor 1254 was measured at 25 µg/kg with a duplicate analysis of 29 µg/Kg. Since the reported PCB Aroclor concentrations were at or slightly above the San Francisco Bay 99th percentile concentration, PCB congener analysis was performed and indicated that the total PCB (as congeners) concentration in this sample was <15 µg/kg.

Table 4-1. Results of sediment grain size analysis, total solids (%), and total organic carbon (%)

Analytes	SSPC-DU1-Comp	Bay Ambient <100% Fines (SFRWQCB 1998)
% Gravel	0.00	<100% fines
% Sand	21.6	
% Silt	60.9	
% Clay	17.5	
Total % Fines <4 phi (= %silt + %clay)	78.4	-
Total Solids (%)	46.0	-
Total Organic Carbon (%)	1.6	-

Table 4-2. Sediment metals concentrations (mg/kg, dry wt.)

Metals	SSPC-DU1-Comp	SSPC-DU1-Comp Reanalysis	Bay Ambient <100% Fines (SFRWQCB 1998)
Arsenic	7.93	-	15.3
Cadmium	1.15[B]	-	0.33
Chromium	75.8	-	112
Copper	69.2	-	68.1
Lead	49.8	-	43.2
Mercury	0.215	-	0.45[A]
Nickel	76.3	-	112
Selenium	0.496	-	0.64
Silver	0.345	-	0.58
Zinc	549[C]	292 [C]	158

All results below laboratory method detection limit (MDL) are reported as < the MDL concentration.
A - San Francisco Bay 99th Percentile
B - Duplicate analysis result was 0.58 mg/Kg cadmium; both these of these results are below the ER-L of 1.2 mg/Kg.
C - Duplicate result was 150 mg/Kg zinc; reanalysis duplicate result was 240 mg/Kg.

Table 4-3. Sediment PCB Aroclor concentrations (µg/kg, dry wt)

PCB Aroclors	SSPC-DU1-Comp	SSPC-DU1-Comp (duplicate)	Bay Ambient <100% Fines (SFRWQCB 1998)
Aroclor 1016	<4.4	<4.4	see total PCB
Aroclor 1221	<4.3	<4.3	see total PCB
Aroclor 1232	<4.3	<4.3	see total PCB
Aroclor 1242	<4.3	<4.3	see total PCB
Aroclor 1248	<4.3	<4.3	see total PCB
Aroclor 1254	25	29	see total PCB
Aroclor 1260	<4.8	<4.8	see total PCB
Aroclor 1262	<4.3	<4.3	see total PCB
Total Detected PCBs	**25**	**29**	25.0[A]

All results below laboratory method detection limit (MDL) are reported as < the MDL concentration.
A - San Francisco Bay 99th Percentile (SFRWQCB).

Table 4-4. Sediment PCB Congener concentrations (µg/kg, dry wt)

PCB Congeners	SSPC-DU1-Comp	SSPC-DU1-Comp (duplicate)	Bay Ambient <100% Fines (SFRWQCB 1998)
PCB 101	<4.0	**5.3**	see total PCB
PCB 110	<3.6	**5.5**	see total PCB
PCB 118	<3.9	**4.3**	see total PCB
Total Detected PCBs	**0.0**	**15.1**	25.0[A]

Note – Only data for congener concentrations > the MDL concentration are reported in the table above.
All results below laboratory method detection limit (MDL) are reported as < the MDL concentration.
A - San Francisco Bay 99th Percentile (SFRWQCB).

Table 4-5. Sediment PAH concentrations (µg/kg, dry wt)

PAHs	SSPC-DU1-Comp	Bay Ambient <100% Fines (SFRWQCB 1998)
Acenaphthene	17 J	26.6
Acenaphthylene	20 J	31.7
Anthracene	45	88
Benzo(a)anthracene	110	244
Benzo(a)pyrene	120	412
Benzo(b)fluoranthene	100	371
Benzo(e)pyrene	77	-
Benzo(g,h,i)perylene	56	310
Benzo(k)fluoranthene	100	258
Biphenyl	<3.4	-
Chrysene	160	289
Dibenzo(a,h)anthracene	14 J	32.7
2,6-Dimethylnapthalene	6.7 J	-
Fluoranthene	190	514
Fluorene	24	25.3
Indeno(1,2,3-cd)pyrene	45	382
2-Methylnapthalene	7.1 J	-
1- Methylnaphthalene	4.8 J	-
1- Methylphenanthrene	<4.8	-
Naphthalene	53	55.8
Perylene	36	-
Phenanthrene	56	237
Pyrene	250	665
1,6,7-Trimethylnaphthalene	<3.6	-
Total Detected PAHs	**1360**	3390

All results below laboratory method detection limit (MDL) are reported as < the MDL concentration.
J - Analyte was detected at a concentration below the method reporting limit and above the laboratory MDL; reported value is an estimate.

Table 4-6. Sediment organochlorine pesticide concentrations (µg/kg, dry wt.)

Organochlorine Pesticides	SSPC-DU1-Comp	Bay Ambient <100% Fines (SFRWQCB 1998)
Aldrin	<0.67	1.1
alpha-BHC	<0.64	-
beta-BHC	<0.55	-
delta-BHC	<0.69	-
gamma-BHC (Lindane)	<0.50	-
Chlordane	<8.7	1.1
Dieldrin	<0.49	0.44
Endosulfan I	<0.77	-
Endosulfan II	<0.38	-
Endosulfan Sulfate	<0.57	-
Endrin	<0.44	0.78
Endrin Aldehyde	<0.42	-
Endrin Ketone	<0.65	-
Heptachlor	<0.48	-
Heptachlor Epoxide	<0.40	-
Methoxychlor	<0.36	-
Toxaphene	<18	-
Alpha Chlordane	<0.56	-
Gamma Chlordane	<0.56	-
2,4'-DDD	<0.44	see total DDT
2,4'-DDE	<0.39	see total DDT
2,4'-DDT	<0.30	see total DDT
4,4'-DDD	<0.56	see total DDT
4,4'-DDE	<0.65	see total DDT
4,4'-DDT	<0.71	see total DDT
Total Detected DDT	**0.0**	7.0

All results below laboratory method detection limit (MDL) are reported as < the MDL concentration.

Table 4-7. Sediment organotin concentrations (µg/kg, dry wt.)

Organotins	SSPC-DU1-Comp	Bay Ambient <100% Fines (SFRWQCB 1998)
Dibutyltin	<1.3	No data available
Monobutyltin	<2.1	No data available
Tetrabutyltin	<0.78	No data available
Tributyltin	<0.73	No data available
Total Detected Butyltins	**0.0**	NA

All results below laboratory method detection limit (MDL) are reported as < the MDL concentration.

4.1.2 Conventional and Chemical Analytical QA/QC Summary

The QA/QC review entailed reviewing the contract lab Data Report(s) for sample integrity, correct methodology, and compliance with all appropriate Lab QA/QC requirements. The overall data quality assessment found that all data were usable. Appendix B contains the conventional and chemical analysis reports, which include contract laboratory QA/QC narratives.

Any analyses that did not comply with the analytical laboratory QA/QC limits are presented below (also, see final analytical reports in Appendix B for full case narratives).

Metals – Trace levels of copper, nickel, and zinc in the method blank were found below the method reporting limit (MRL), but above the mean detection limit. However, since the concentrations found in the samples exceed the concentrations found in the method blank by and order of magnitude or more, the results were released with no further action.

The matrix spike (MS) and /or matrix spike duplicate (MSD) recoveries for chromium, copper, lead, and nickel were out of the acceptance range due to matrix interferences. However, since the associated Laboratory Control Spike/Duplicate (LCS/LCSD) recoveries were in control, the data were released with no further action.

As the zinc concentration found in the sample exceeded the MS concentration by four times or more, the MS recoveries and subsequent RPDs could not be evaluated. Because the corresponding LCS/LCSD recoveries and RPD values were within the established control limits, the data were released with no further action by the analytical laboratory. An evaluation of the RPD for cadmium, lead and zinc in the sample and duplicate sample indicated that the RPD for these compounds were greater that 20%. This variability was attributed to sample heterogeneity.

Organotins – The detection limit was elevated for a few analytes in all samples. The chromatogram indicated the presence of non-target background components. The matrix interference prevented adequate resolution of the target compounds at the normal limit.

4.2 Biological Testing

Three different toxicity tests were performed for each composite sample:

1. the 10-day amphipod survival solid-phase sediment test with *Ampelisca abdita;*
2. the 10-day polychaete survival solid-phase sediment test with *Neanthes arenaceodentata; and,*
3. the 48-hour water column (sediment elutriate) toxicity bivalve embryo survival and development test with the mussel *Mytilus galloprovinciales.*

All tests were performed following appropriate protocols as outlined in the SAP (PER 2010). Test data and summaries of the statistical analyses for the bioassay results are provided in Appendices D-I. Summaries of test conditions and test acceptability criteria are provided in Appendix J.

4.2.1 Benthic Toxicity Testing

Solid-phase bioassays were conducted with the amphipod *A. abdita* and the polychaete *N. arenaceodentata*. A summary of the measured concentrations of total ammonia and total sulfides in the sediment porewaters, and summary tables of the total ammonia concentrations measured in the test overlying waters are presented in Appendix C.

Positive and negative Lab Control treatments were tested concurrently with the bioassays. The positive Lab Control for both benthic species consisted of a 96-hr reference toxicant test of waterborne KCl. The results of these tests were compared to our in-house reference toxicant test response database to determine whether these test organisms were responding to toxic stress in a typical fashion. The negative Lab Control for *A. abdita* consisted of the "Home" sediment from which the species was originally collected. The negative Lab Control for *N. arenaceodentata* consisted of a homogenized mixture of previously collected clean reference site sediments that had been maintained at the PER Lab.

For disposal suitability determinations, the solid-phase bioassay survival results for the site sediments were statistically compared to the appropriate reference site values.

The following criteria were used for suitability determinations:

1. If survival is greater in the proposed dredged sediment than in the reference site sediment(s), the proposed dredged sediments are not acutely toxic to benthic organisms.
2. If the difference between the survival response in the proposed dredged sediment and in the reference site sediment(s) is ≤ 20% for *A. abdita*, or ≤ 10% for *N. arenaceodentata*, the proposed dredged sediments are not acutely toxic to benthic organisms.
3. If the difference between the survival response in the proposed dredged sediment and in the reference site sediment(s) is > 20% for *A. abdita*, or > 10% for *N. arenaceodentata*, and the test sediment survival response is statistically significantly less than in the reference site sediment(s), then the test sediments are considered to be acutely toxic to benthic organisms.

4.2.1.1 Sediment Porewater Characterization - On July 24, the sediment was removed from refrigerated storage, and was composited and homogenized in a large stainless steel bowl. An aliquot of this homogenized site composite sediment was centrifuged at 2,500 g for 15 minutes; the resulting supernatant porewater was carefully collected and analyzed for routine water quality characteristics (Table 4-8). Due to the measurement of elevated sediment porewater ammonia concentrations in the composite sediment that exceeded the USACE guidelines recommended threshold of 15 mg/L, the sediment in each test replicate was purged of ammonia by daily replacement of the overlying water with fresh 30 ppt seawater coupled with aeration until the porewater total ammonia levels were below 15 mg/L.

Table 4-8. Sediment porewater initial water quality characteristics

Sample ID	pH	Salinity (ppt)	Total Ammonia (mg/L N)	Total Sulfide (mg/L)
SSPC-DU1-Comp	7.43	33.0	36.6	0.070

4.2.1.2 Sediment Solid-Phase Testing with *Ampelisca abdita* - The results of these tests are summarized in Table 4-9. There was 90% survival in the Control treatment, indicating acceptable survival response by the test organisms. There was 79% survival in the reference site sediment, which is below the 85% survival requirement for use in a suitability determination. As a result, the Alcatraz Environs database value of 92% survival was used to assess sediment toxicity. There was 79% survival in the SSPC-DU1-Comp sediment sample. The site composite sediment survival response was <20% less than the Alcatraz Environs database value. In addition, the difference in survival in the site sediment and in the Lab Control was also <20%, further supporting that the sediment was ***not*** toxic to amphipods. The test data and summary of statistical analyses for this testing are attached as Appendix D.

Table 4-9. *Ampelisca abdita* survival in the solid-phase test sediments

Sediment Site	% Survival in Test Replicates					**Overall Mean % Survival**
	Rep A	Rep B	Rep C	Rep D	Rep E	
Lab Control	90	90	95	80	95	**90**
Alcatraz (SF-11)	75	75	90	75	80	**79**
SSPC-DU1-Comp	65	80	80	80	90	**79**

4.2.1.2.1 Reference Toxicant Toxicity to *Ampelisca abdita* - The results of this test are presented in Table 4-10a. The survival EC_{50} was 0.93 g/L KCl, which is within the "typical response" range established by the mean $\pm$ 2 SD of the 20 most recent reference toxicant tests performed in our laboratory (Table 4-10b), indicating that these test organisms were responding to toxic stress in a typical fashion. The test data and summary of statistical analyses for this test are presented in Appendix E.

Table 4-10a. Reference toxicant testing: Effects of KCl on *Ampelisca abdita*

KCl Treatment (g/L)	Overall Mean % Survival
Lab Control	80
0.25	95
0.5	95
1	**35***
2	**0***
4	**0***
EC_{50} =	0.93 g/L KCl

*- Significantly less than the Lab Control at p <0.05

Table 4-10b. Summary of reference toxicant database for *Ampelisca abdita*

Current LC_{50} Value	*Ampelisca abdita* Reference Toxicant Response Database Typical Response Range (mean ± 2SD)
0.93 g/L KCl	0.28 – 2.7 g/L KCl

4.2.1.3 Sediment Solid-Phase Testing with *Neanthes arenaceodentata* - The results of this testing are summarized in Table 4-11. There was 84% survival at the Lab Control treatment, which was below the acceptable Lab Control survival response of ≥90%. However, there was 90% survival in the SF-11 reference site sediment satisfying the 85% survival requirement for use in a suitability determination. There was 84% survival in the SSPC-DU1-Comp sample; the difference in survival relative to the reference site sediment survival response was <10% indicating that the sediment was ***not*** toxic to polychaetes. The test data and summary of statistical analyses for this testing are attached as Appendix F.

Table 4-11. *Neanthes arenaceodentata* survival in the solid-phase test sediments

Sediment Site	% Survival in Test Replicates					**Overall Mean % Survival**
	Rep A	Rep B	Rep C	Rep D	Rep E	
Lab Control	90	70	80	90	90	**84**
Alcatraz (SF-11)	90	90	90	90	90	**90**
SSPC-DU1-Comp	80	80	90	80	90	**84**

4.2.1.3.1 Reference Toxicant Toxicity to *Neanthes arenaceodentata* - The results of this test are presented in Table 4-12a. The survival EC_{50} was 0.84 g/L KCl, which is within the "typical response" range established by the mean ± 2 SD of the 20 most recent previous tests performed in our laboratory (Table 4-12b), indicating that these organisms were responding to toxicant stress in a typical fashion. The test data and summary of statistical analyses for this test are presented in Appendix G.

Table 4-12a. Reference toxicant testing: Effects of KCl on *Neanthes arenaceodentata*

KCl Treatment (g/L)	Overall Mean % Survival
Lab Control	90
0.25	100
0.5	90
1	100
2	**40***
4	**0***
EC_{50} =	1.9 g/L KCl

*- Significantly less than the Lab Control at $p < 0.05$.

Table 4-12b. Summary of reference toxicant database for *Neanthes arenaceodentata*

Current LC_{50} Value	*Neanthes arenaceodentata* Reference Toxicant Response Database Typical Response Range (mean ± 2SD)
1.9 g/L KCl	0.78 – 2.9 g/L KCl

4.2.2 Water Column Toxicity Testing

The 48-hr bivalve embryo development toxicity test was performed to assess the effects of dredged material disposal in the water column. Positive and negative Lab Control treatments were tested concurrently with the site sediment elutriate. The positive Lab Control consisted of a 'waterborne' reference toxicant test; the results of this test were compared to our in-house reference toxicant test response database to determine whether these test organisms were responding to toxic stress in a typical fashion. The negative Lab Control (and dilution media) consisted of 0.45 µm-filtered natural seawater (obtained from the U.C. Santa Cruz Granite Canyon Marine Laboratory), diluted to a test salinity of 30 ppt via addition of Type 1 lab water (reverse-osmosis de-ionized water).

The test results for the sediment composite elutriate were compared with the test organism responses at the negative Lab Control treatment to determine the potential impact of the proposed dredged materials on pelagic organisms at and beyond the boundaries of the disposal site (USEPA/USACE 1998). The following criteria were used for suitability determinations:

1. If the survival and/or normal development response(s) in the sediment composite 100% elutriate(s) is greater than or equal to the test organism responses in the negative Lab Control treatment, the dredged material is not predicted to be acutely toxic to water column organisms.
2. If the survival and/or normal development response(s) in the sediment composite 100% elutriate(s) is ≤10% less than the test response of the negative Lab Control treatment, the dredged material is not predicted to be acutely toxic to water column organisms, and there is no need for statistical analyses.
3. If the survival and/or normal embryo development response(s) in the sediment composite 100% elutriate(s) is >10% less than the test response of the negative Lab Control treatment, then the data must be evaluated statistically to determine the LC_{50} or EC_{50} concentration-response value, which is then compared to the estimated concentration of the sediment during disposal for determination of suitability for disposal at SF-11.

In order for the material to be suitable for disposal at SF-11, it must be in compliance with the state's narrative water quality standard. Compliance with the narrative water quality standard is determined by evaluating whether the dredge material concentration, after mixing, would exceed 1% of the LC_{50} or EC_{50} value (Elutriate Suitability Concentration (ESC)) calculated from the sediment elutriate test (whichever is most conservative), outside of the mixing zone. The results of this analysis are presented in Appendix K.

4.2.2.1 Sediment Elutriate Testing with *Mytilus galloprovinciales* embryos - The results of the water column testing with *M. galloprovinciales* are summarized in Table 4-13. There was a mean of 86.8% survival and 96.4% normal development at the Lab Control treatment, indicating an acceptable survival response by the test organisms. The test data and the summary of statistical analyses for these tests are presented in Appendix H.

Table 4-13. Effects of SSPC-DU1-Comp sediment elutriate on *Mytilus galloprovinciales*

Elutriate Treatment	Mean % Survival	Mean % Normal Development
Lab Control	86.8	96.4
Site Water Control	74.5	100
1%	91.8	96.6
10%	95.4	96.8
25%	77.6	97.5
50%	88.5	96.9
100%	**10.5***	**14.2***
Salt Control	37.4	50.0
LC_{50} or EC_{50} =	71.5%	79.4%
Disposal limit met?	Yes	Yes

*- Significantly less than the Lab Control at $p < 0.05$.

4.2.2.1.1 Reference Toxicant Toxicity to *Mytilus galloprovinciales* embryos - The results of this test are summarized in Table 4-14a. The normal embryo development EC_{50} was 2.4 g/L KCl, which is within the "typical response" range established by the mean $\pm$ 2 SD of the 20 most recent previous tests performed in our laboratory (Table 4-14b), indicating that these test organisms were responding to toxic stress in a typical fashion. The test data and summary of statistical analyses for this test are attached as Appendix I.

Table 4-14a. Reference toxicant testing: Effects of KCl on *Mytilus galloprovinciales*

KCl Treatment (g/L)	Mean % Normal Embryo Development
Lab Control	97.5
0.5	97.1
1	**92.6***
2	**89.4***
3	**0***
4	**0***
EC_{50} =	2.4 g/L KCl

* - Significantly less than the Lab Control treatment response at $p < 0.05$

Table 4-14b. Summary of reference toxicant database for *Mytilus galloprovinciales*

Current EC_{50} Value	*Mytilus galloprovinciales* Reference Toxicant Response Database Typical Response Range (mean ± 2SD)
2.4 g/L	1.6 – 3.0 g/L

4.2.3 Biological Testing Quality Lab Control

The biological testing of the sediments with these test species incorporated standard QA/QC procedures to ensure that the test results were valid. Standard QA/QC procedures included the use of negative Lab Controls, positive Lab Controls, test replicates, and measurements of water quality during testing.

Quality assurance procedures that were used for sediment testing are consistent with methods described in the U.S.EPA/ACOE (1998). The methods employed in this sediment testing program are detailed in standard guides and procedures maintained in the analytical laboratory.

Sediments for the bioassay testing were stored appropriately at ≤4°C and were used within the 8-week holding time period. The sediment interstitial water characteristics were within test acceptability limits at the start of the tests.

All measurements of routine water quality characteristics were performed as described in the PER Lab Standard Operating Procedures (SOPs). All biological testing water quality conditions were within the appropriate limits. Laboratory instruments were calibrated daily according to Lab SOPs, and calibration data were logged and initialed.

Negative Lab Control – For the *N. arenaceodentata* test, there was 84% survival at the Lab Control treatment, which was below the acceptable Control survival response of ≥90% survival. The biological responses for all the remaining the test organisms at the negative Lab Control treatments were within acceptable limits.

Positive Lab Control - The accuracy of the responses of the test organisms to toxic stress was evaluated using positive controls (reference toxicant testing). The reference toxicant test dose-response EC point estimates determined for the test organisms were within the reference toxicant test “typical response” ranges, indicating that these test species were responding to toxic stress in a typical fashion.

5. SUMMARY

The composite sediment sample from the Schnitzer Steel Terminal Berth was submitted for full conventional and chemical analyses and biological testing. With the exception of cadmium and zinc, which were measured above Bay background levels, all analytical chemistry results were generally within or below the San Francisco Bay background levels (SFRWQCB 1998). While cadmium levels were measured above Bay background levels, the observed concentrations were below the cadmium ER-L of 1.2 mg/Kg (Long et al 1998). Similarly, while zinc concentrations were above Bay ambient levels, there was no toxicity observed in any of the bulk sediment tests performed.

As indicated above, results from the amphipod and polychaete solid-phase bioassays showed no evidence of increased mortality in test sediments compared to the Alcatraz (SF-11) reference sediment or Alcatraz Environs database survival values. Results of water-column toxicity bioassay of the sediment elutriate indicated that narrative water quality limits would be met for unconfined aquatic disposal.

Base on these results it is recommended that these sediments would be considered suitable for unconfined aquatic disposal (SUAD) at the SF-11 Disposal Site.

6. REFERENCES

PER (2010) Sediment Characterization Sampling and Analysis Plan for the Schnitzer Steel Terminal Berth. Prepared for the Schnitzer Steel Terminal Berth by Pacific EcoRisk.

Long, E. R., L. J. Field, and D. D. MacDonald (1998) Predicting Toxicity in Marine Sediments with Numerical Sediment Quality Guidelines.

SFRWQCB (1998) Ambient concentrations of toxic chemicals in San Francisco Bay Sediments: Draft Staff Report. San Francisco Regional Water Quality Lab Control Board, Oakland, CA.

U.S.EPA/ACOE (1998) Evaluation of Dredged Material Proposed for Discharge in Waters of the U.S. – Testing Manual (Inland Testing Manual). U.S. Environmental Protection Agency/U.S. Army Corps of Engineers. EPA/823/B-94/002. Office of Water. Washington, DC 20460.

U.S.EPA (1998a) EPA Requirements for Quality Assurance Project Plans. United States Environmental Protection Agency, Quality Assurance Division, Washington, DC. 20460.

U.S.EPA (1998b) EPA Guidance for Quality Assurance Project Plans. United States Environmental Protection Agency, Office of Research and Development, Washington, DC 20460.

Appendix A

Sampling Field Logs and Data Sheets

Pacific EcoRisk
Environmental Consulting and Testing

Pacific EcoRisk
2250 Cordelia Road
Fairfield, CA 94534
Phone: (707) 207-7760
Fax: (707) 207-7916

Sediment Core Collection Form

Station ID: SSPC-DU1-01 **Date:** 7/21/16

Project Name: Schnitzer Steel **Project No.:** 1705

Coordinates: 37° 47.614" 122° 17.633"

Lat/Northing: 37° 47.613" Long/Easting: 122° 17.632"

Vertical Datum: (MLLW) MLW Other:

Depth Measurement: Sounder (Leadline)

Project Depth: 37.0' **Overdredge:** 2.0' +0.5' 3 Cores

	Attempt 1	Attempt 2	#3
Time:	10:40	11:10	11:20
(A) Measured Water Depth	~~37.0~~ 38.0	38.5'	37.4
(B) Tide Height	4.7'	4.7'	4.7
(C) Mudline Elevation (A−B=C)	~~32.3'~~ 33.3	33.8'	32.7
(D) Calculated Core Length (PD+OD-C=D)	~~7.2'~~ 6.2'	5.7'	6.8'
Estimated Penetration	5.3'	~~4.0~~ 4.0'	5.4'
Description of Core Drive	Smooth, Then Hard refusal	Smooth, Then Hard Refusal	Same ←
Refusal Encountered?	Yes	Yes	Yes
Total Core Length Recovered	5.3'	~~4.5~~ 4.0'	5.4'

Core Characteristics

Sediment Type	cobble, gravel, sand, C M (silt clay) organic matter	cobble, gravel, sand, C M (silt clay), organic matter
Sediment Color	(gray), black, brown, (brown surface), olivine	gray, black, brown, brown surface, olivine
Sediment Odor	(None), slight, mod, strong H,S, petroleum, septic	None, slight, mod, strong H,S, petroleum, septic
Any Layering Homogenous	Layering	

Comments: E PE: 8'
#1: Hard refusal at ~5.3', fine sand in core-catcher. retained material in Ziploc. Bag.
#2: No only a small amount of fine sand in catcher, otherwise core identical to #1.

Recorded by: DGB

#3 - Very similar to #1. fine sand in Core-Catcher. 37° 47.614" 3 #3
122° 17.634" 3

Retained all 3 Cores

Pacific EcoRisk
Environmental Consulting and Testing

Pacific EcoRisk
2250 Cordelia Road
Fairfield, CA 94534
Phone: (707) 207-7760
Fax: (707) 207-7916

Sediment Core Collection Form

Station ID: SSPC-DU1-02 **Date:** 7/21/10

Project Name: Schnitzer Steel **Project No.:** 7105

Coordinates: ATT#2: 37° 47' 37.6" 122° 17' 35.0"

Lat/Northing: 37°47'37.6" Long/Easting: 122° 17' 35.0"

Vertical Datum: (MLLW) MLW Other:

Depth Measurement: Sounder (Leadline)

Project Depth: 37.0 **Overdredge:** 2.0' + 0.5' 2 Layer

	Attempt 1	Attempt 2	
Time:	09:10	09:40	14:50
(A) Measured Water Depth	39.0'	39.5	38.3'
(B) Tide Height	4.0'	4.3'	3.0'
(C) Mudline Elevation (A–B=C)	35.0'	35.2	35.3
(D) Calculated Core Length (PD+OD-C=D)	4.5'	4.3'	4.2'
Estimated Penetration	4.5'	4.3'	4.2'
Description of Core Drive	smooth	smooth	smooth
Refusal Encountered?	No	No	No
Total Core Length Recovered	4.5'	4.3'	4.2'

Core Characteristics

Sediment Type	cobble, gravel, sand C M F; silt clay, organic matter	cobble, gravel, sand C M F, silt clay, organic matter
Sediment Color	gray, black, brown, brown surface, olivine	gray, black, brown, brown surface, olivine
Sediment Odor	None, slight, mod, strong H_2S, petroleum, septic	None, slight, mod, strong H_2S, petroleum, septic
Any Layering Homogenous	Layering	Layering
Comments:	EPE: 6' Core drive smooth. all material is silt/clay. dark gray layers evenly distributed Throughout Core	

Recorded by: DC

Core #2 same as Core #1. #3: 37°47'37.6" 122°17'35.0"

Both Cores Retained Separately
Collected 3rd Core for Volume - This core collected as well.

Pacific EcoRisk
Environmental Consulting and Testing

Pacific EcoRisk
2250 Cordelia Road
Fairfield, CA 94534
Phone: (707) 207-7760
Fax: (707) 207-7916

Sediment Core Collection Form

Station ID: SSPC - DU1-03 **Date:** 7/21/10

Project Name: Schnitzer Steel **Project No.:** 17105

Coordinates: 37° 47.643 122° 17.523

Lat/Northing: 37° 47.643 Long/Easting: 122° 17.523

Vertical Datum: (MLLW) MLW Other:

Depth Measurement: Sounder (Leadline)

Project Depth: 37.0' **Overdredge:** 2.0' + 0.5' Z Layer

	Attempt 1	Attempt 2 /3	
Time:	13:45	1400	14:25
(A) Measured Water Depth	39.1	39.0	38.
(B) Tide Height	3.6'	3.3'	3.1'
(C) Mudline Elevation (A–B=C)	35.5	35.7'	35.5'
(D) Calculated Core Length (PD+OD-C=D)	4.0'	3.8'	4.0'
Estimated Penetration	4.0'	3.8'	4.0'
Description of Core Drive	smooth	smooth	smooth
Refusal Encountered?	No	No	No
Total Core Length Recovered	4.0'	3.8'	4.0

Core Characteristics

Sediment Type	cobble, gravel, **sand C M F,** (silt clay) **organic matter**	cobble, **gravel, sand C M F,** (silt clay), organic **matter**
Sediment Color	(gray) (black) **brown,** **brown surface,** (olivine)	(gray) (black) brown, brown **surface,** (olivine)
Sediment Odor	None (slight) **mod, strong** H_2S, (petroleum) septic	(None) slight, **mod, strong** H_2S, petroleum, septic
Any Layering Homogenous	Layering	Layering

Comments: EPE: 6'
#1 - oily sheen + petroleum odor.
#2 - Similar to #1, although no sheen or petroleum odor observed

Recorded by:

Pacific EcoRisk
Environmental Consulting and Testing

Pacific EcoRisk
2250 Cordelia Road
Fairfield, CA 94534
Phone: (707) 207-7760
Fax: (707) 207-7916

Sediment Core Collection Form

Station ID: SSPE-DUP-04 **Date:** 7/21/10

Project Name: Schnitzer Steel **Project No.:** 17105

Coordinates: 37° 47.653 122 17.~~463~~ .467

Lat/Northing: 37° 47.652 Long/Easting: 122° 17.468

Vertical Datum: (MLLW) MLW Other:

Depth Measurement: Sounder (Leadline)

Project Depth: 37.0' **Overdredge:** 2.0' +0.5' Z Layer

	Attempt 1	Attempt 2	
Time:	12:15	12:30	12:45
(A) Measured Water Depth	41.0'	39.5'	39.5
(B) Tide Height	4.4'	4.2'	~~4.2~~ 4.0
(C) Mudline Elevation (A–B=C)	36.6'	35.3'	35.5
(D) Calculated Core Length (PD+OD-C=D)	~~2.4~~ 2.9'	4.2'	4.0'
Estimated Penetration	2.9'	4.2'	4.0'
Description of Core Drive	Smooth	Smooth	Smooth
Refusal Encountered?	No	No	No
Total Core Length Recovered	2.9'	4.2'	4.0'

Core Characteristics

Sediment Type	cobble, **gravel, sand C M F,** (silt clay) **organic matter**	cobble, **gravel, sand C M F,** (silt clay), organic **matter**
Sediment Color	(gray), (black) brown, (brown surface), **olivine**	(gray), (black), **brown,** (brown surface), **olivine**
Sediment Odor	(None), **slight, mod, strong** H_2S, petroleum, septic	(None), **slight, mod, strong** H_2S, petroleum, septic
Any Layering Homogenous	Layering	Layering
Comments: EPE: 6' Core 2+3 had similar structure to Core #1		

Recorded by: DG

#3: 37.47.653 122 17.467

Appendix B

Analytical Chemistry Laboratory Data Report Submitted by Calscience Environmental Laboratories

Calscience Environmental Laboratories, Inc.

August 06, 2010

Jeff Cotsifas
Pacific Ecorisk
2250 Cordelia Road
Fairfield, CA 94534-1912

Subject: **Calscience Work Order No.: 10-07-1715**
Client Reference: Schnitzer Steel

Dear Client:

Enclosed is an analytical report for the above-referenced project. The samples included in this report were received 7/23/2010 and analyzed in accordance with the attached chain-of-custody.

Calscience Environmental Laboratories certifies that the test results provided in this report meet all NELAC requirements for parameters for which accreditation is required or available. Any exceptions to NELAC requirements are noted in the case narrative. The original report of subcontracted analysis, if any, is provided herein, and follows the standard Calscience data package. The results in this analytical report are limited to the samples tested and any reproduction thereof must be made in its entirety.

If you have any questions regarding this report, please do not hesitate to contact the undersigned.

Sincerely,

Calscience Environmental
Laboratories, Inc.
Danielle Gonsman
Project Manager

Calscience Environmental Laboratories, Inc.

CASE NARRATIVE

Calscience Work Order No.: 10-07-1715
Project Name: Schnitzer Steel

Provided below is a narrative of our analytical effort, including any unique features or anomalies encountered as part of the analysis of the marine sediment samples.

Sample Condition on Receipt

One sediment sample, housed (2) 16 oz glass containers, was received for this project on July 23, 2010. The sample was transferred to the laboratory in an ice-chest with wet ice, following strict chain-of-custody (COC) procedures. The temperature of the sample upon receipt at the laboratory was 1.1°C. The sample was logged into the Laboratory Information Management System (LIMS), given laboratory identification numbers, and then stored under refrigeration pending sediment chemistry testing.

No sample receiving anomalies were noted.

Tests Performed

Trace Metals by EPA 6020/7471A
Chlorinated Pesticides by EPA 8081A
PCB Aroclors by EPA 8082
PAHs by EPA 8270C SIM
Organotins by Krone et. al.
Total Solids by SM 2540 B
TOC by EPA 9060A

Data Summary

The sample was homogenized prior to preparation/analysis.

A laboratory duplicate was performed for sample SSPC-DU1-Comp.

Holding times

All holding times were met.

Calibration

Frequency and control criteria for initial and continuing calibration verifications were met.

Reporting Limits

All sample concentrations and reporting limits were dry weight corrected. The results were evaluated to the MDL, and where applicable, "J" flags were reported.

Blanks

Concentrations of target analytes in the method blanks were found to be below reporting limits/method detection limits with the following exceptions.

Trace levels of Copper, Nickel and Zinc (by EPA 6020) were found below the RL, but above the MDL, in the Method Blank. However, since the concentrations found in the samples exceed the concentrations found in the Method Blank by ten times or more, the results are released with no further action.

Laboratory Control Samples

A Laboratory Control Sample (LCS) analysis was performed for each test and all parameters were within the specified control limits.

Matrix Spikes

Matrix spike analyses were performed for each applicable analysis. Matrix spiking was performed on sample SSPC-DU1-Comp, and all parameters were within the established control limits for each method with the following exceptions.

The MS and/or MSD recoveries for Chromium, Copper, Lead and Nickel by EPA 6020 were out of the acceptance range due to matrix interference. However, since the associated PDS/PDSD and LCS/LCSD recoveries were in control, the data are released with no further action.

Since the Zinc (by EPA 6020) concentration found in the sample exceeds the matrix spike concentrations by four times or more, the matrix spike recoveries and RPDs were out of range. Because the corresponding LCS/LCSD recoveries and RPD values were within the established control limits, the results are released with no further qualification.

For the Organotins, the matrix spike recovery for Tributyltin was outside the established control limits. Yet the results are released with no further clarification since the matrix spike duplicate and corresponding LCS/LCSD recoveries were in control.

Surrogates

Surrogate recoveries for all applicable tests and samples were within the established control limits.

Acronyms

LCS/LCSD- Laboratory Control Sample/Laboratory Control Sample Duplicate
PDS/PDSD- Post Digestion Spike/Post Digestion Spike Duplicate
MS/MSD- Matrix Spike/Matrix Spike Duplicate
RPD- Relative Percent Difference

Calscience Environmental Laboratories, Inc.

Analytical Report

Pacific Ecorisk	Date Received:	07/23/10
2250 Cordelia Road	Work Order No:	10-07-1715
Fairfield, CA 94534-1912	Preparation:	N/A
	Method:	EPA 9060A

Project: Schnitzer Steel

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
SSPC-DUI-COMP	**10-07-1715-1-A**	**07/21/10 09:10**	**Sediment**	**TOC 5**	**N/A**	**07/23/10 14:17**	**A0723TOCL1**

Comment(s): -Results were evaluated to the MDL, concentrations >= to the MDL but < RL, if found, are qualified with a "J" flag.
-Results are reported on a dry weight basis.

Parameter	Result	RL	MDL	DF	Qual	Units
Carbon, Total Organic	1.6	0.11	0.026	1		%

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
SSPC-DUI-COMP (DUPLICATE)	**10-07-1715-2-A**	**07/21/10 09:10**	**Sediment**	**TOC 5**	**N/A**	**07/23/10 14:17**	**A0723TOCL1**

Comment(s): -Results were evaluated to the MDL, concentrations >= to the MDL but < RL, if found, are qualified with a "J" flag.
-Results are reported on a dry weight basis.

Parameter	Result	RL	MDL	DF	Qual	Units
Carbon, Total Organic	1.7	0.11	0.027	1		%

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
Method Blank	**099-06-013-508**	**N/A**	**Solid**	**TOC 5**	**N/A**	**07/23/10 14:17**	**A0723TOCL1**

Comment(s): -Results were evaluated to the MDL, concentrations >= to the MDL but < RL, if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qual	Units
Carbon, Total Organic	ND	0.050	0.012	1		%

Calscience Environmental Laboratories, Inc.

Analytical Report

Pacific Ecorisk		Date Received:	07/23/10
2250 Cordelia Road		Work Order No:	10-07-1715
Fairfield, CA 94534-1912		Preparation:	N/A
		Method:	SM 2540 B

Project: Schnitzer Steel

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
SSPC-DUI-COMP	**10-07-1715-1-A**	**07/21/10 09:10**	**Sediment**	**N/A**	**07/24/10**	**07/24/10 16:00**	**A0724TSB1**

Parameter	Result	RL	DF	Qual	Units
Solids, Total	46.0	0.100	1		%

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
SSPC-DUI-COMP (DUPLICATE)	**10-07-1715-2-A**	**07/21/10 09:10**	**Sediment**	**N/A**	**07/24/10**	**07/24/10 16:00**	**A0724TSB1**

Parameter	Result	RL	DF	Qual	Units
Solids, Total	44.7	0.100	1		%

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
Method Blank	**099-05-019-1,442**	**N/A**	**Solid**	**N/A**	**07/24/10**	**07/24/10 16:00**	**A0724TSB1**

Parameter	Result	RL	DF	Qual	Units
Solids, Total	ND	0.100	1		%

RL - Reporting Limit , DF - Dilution Factor , Qual - Qualifiers

Calscience Environmental Laboratories, Inc.

Analytical Report

Pacific Ecorisk
2250 Cordelia Road
Fairfield, CA 94534-1912

Date Received: 07/23/10
Work Order No: 10-07-1715
Preparation: EPA 3545
Method: Organotins by Krone et al.
Units: ug/kg

Project: Schnitzer Steel

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
SSPC-DUI-COMP	**10-07-1715-1-A**	**07/21/10 09:10**	**Sediment**	**GC/MS Y**	**07/23/10**	**07/24/10 14:33**	**100723L18**

Comment(s): -Results were evaluated to the MDL, concentrations >= to the MDL but < RL, if found, are qualified with a "J" flag.
-Results are reported on a dry weight basis.

Parameter	Result	RL	MDL	DF	Qual	Parameter	Result	RL	MDL	DF	Qual
Dibutyltin	ND	6.5	1.3	1		Tetrabutyltin	ND	6.5	0.78	1	
Monobutyltin	ND	6.5	2.1	1		Tributyltin	ND	6.5	0.73	1	

Surrogates:	REC (%)	Control Limits	Qual
Tripentyltin	106	50-130	

SSPC-DUI-COMP (DUPLICATE)	**10-07-1715-2-A**	**07/21/10 09:10**	**Sediment**	**GC/MS Y**	**07/23/10**	**07/24/10 15:07**	**100723L18**

Comment(s): -Results were evaluated to the MDL, concentrations >= to the MDL but < RL, if found, are qualified with a "J" flag.
-Results are reported on a dry weight basis.

Parameter	Result	RL	MDL	DF	Qual	Parameter	Result	RL	MDL	DF	Qual
Dibutyltin	ND	6.7	1.3	1		Tetrabutyltin	ND	6.7	0.80	1	
Monobutyltin	ND	6.7	2.2	1		Tributyltin	ND	6.7	0.75	1	

Surrogates:	REC (%)	Control Limits	Qual
Tripentyltin	100	50-130	

Method Blank	**099-07-016-765**	**N/A**	**Solid**	**GC/MS Y**	**07/23/10**	**07/24/10 11:46**	**100723L18**

Comment(s): -Results were evaluated to the MDL, concentrations >= to the MDL but < RL, if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qual	Parameter	Result	RL	MDL	DF	Qual
Dibutyltin	ND	3.0	0.60	1		Tetrabutyltin	ND	3.0	0.36	1	
Monobutyltin	ND	3.0	0.97	1		Tributyltin	ND	3.0	0.33	1	

Surrogates:	REC (%)	Control Limits	Qual
Tripentyltin	114	50-130	

RL - Reporting Limit , DF - Dilution Factor , Qual - Qualifiers

Calscience Environmental Laboratories, Inc.

Analytical Report

Pacific Ecorisk
2250 Cordelia Road
Fairfield, CA 94534-1912

Date Received: 07/23/10
Work Order No: 10-07-1715
Preparation: EPA 3545
Method: EPA 8270C SIM PAHs
Units: ug/kg

Project: Schnitzer Steel

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
SSPC-DUI-COMP	**10-07-1715-1-A**	**07/21/10 09:10**	**Sediment**	**GC/MS BBB**	**07/23/10**	**07/26/10 11:17**	**100723L14**

Comment(s): -Results were evaluated to the MDL, concentrations >= to the MDL but < RL, if found, are qualified with a "J" flag.
-Results are reported on a dry weight basis.

Parameter	Result	RL	MDL	DF	Qual	Parameter	Result	RL	MDL	DF	Qual
Acenaphthene	17	22	3.3	1	J	2,6-Dimethylnaphthalene	6.7	22	3.7	1	J
Acenaphthylene	20	22	3.2	1	J	Fluoranthene	190	22	3.4	1	
Anthracene	45	22	2.9	1		Fluorene	24	22	3.0	1	
Benzo (a) Anthracene	110	22	4.4	1		Indeno (1,2,3-c,d) Pyrene	45	22	2.9	1	
Benzo (a) Pyrene	120	22	2.8	1		2-Methylnaphthalene	7.1	22	4.0	1	J
Benzo (b) Fluoranthene	100	22	3.4	1		1-Methylnaphthalene	4.8	22	4.5	1	J
Benzo (e) Pyrene	77	22	5.0	1		1-Methylphenanthrene	ND	22	4.8	1	
Benzo (g,h,i) Perylene	56	22	2.8	1		Naphthalene	53	22	3.6	1	
Benzo (k) Fluoranthene	100	22	4.2	1		Perylene	36	22	4.2	1	
Biphenyl	ND	22	3.4	1		Phenanthrene	56	22	4.7	1	
Chrysene	160	22	3.3	1		Pyrene	250	22	3.6	1	
Dibenz (a,h) Anthracene	14	22	2.3	1	J	1,6,7-Trimethylnaphthalene	ND	22	3.6	1	

Surrogates:	REC (%)	Control Limits	Qual	Surrogates:	REC (%)	Control Limits	Qual
2-Fluorobiphenyl	53	14-146		Nitrobenzene-d5	77	18-162	
p-Terphenyl-d14	65	34-148					

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
SSPC-DUI-COMP (DUPLICATE)	**10-07-1715-2-A**	**07/21/10 09:10**	**Sediment**	**GC/MS BBB**	**07/23/10**	**07/26/10 11:43**	**100723L14**

Comment(s): -Results were evaluated to the MDL, concentrations >= to the MDL but < RL, if found, are qualified with a "J" flag.
-Results are reported on a dry weight basis.

Parameter	Result	RL	MDL	DF	Qual	Parameter	Result	RL	MDL	DF	Qual
Acenaphthene	18	22	3.4	1	J	2,6-Dimethylnaphthalene	7.3	22	3.8	1	J
Acenaphthylene	21	22	3.2	1	J	Fluoranthene	190	22	3.5	1	
Anthracene	46	22	2.9	1		Fluorene	24	22	3.1	1	
Benzo (a) Anthracene	110	22	4.5	1		Indeno (1,2,3-c,d) Pyrene	44	22	2.9	1	
Benzo (a) Pyrene	120	22	2.9	1		2-Methylnaphthalene	7.1	22	4.1	1	J
Benzo (b) Fluoranthene	100	22	3.5	1		1-Methylnaphthalene	ND	22	4.6	1	
Benzo (e) Pyrene	81	22	5.1	1		1-Methylphenanthrene	ND	22	4.9	1	
Benzo (g,h,i) Perylene	55	22	2.9	1		Naphthalene	55	22	3.7	1	
Benzo (k) Fluoranthene	100	22	4.3	1		Perylene	37	22	4.3	1	
Biphenyl	ND	22	3.5	1		Phenanthrene	56	22	4.8	1	
Chrysene	170	22	3.4	1		Pyrene	270	22	3.7	1	
Dibenz (a,h) Anthracene	12	22	2.4	1	J	1,6,7-Trimethylnaphthalene	ND	22	3.7	1	

Surrogates:	REC (%)	Control Limits	Qual	Surrogates:	REC (%)	Control Limits	Qual
2-Fluorobiphenyl	54	14-146		Nitrobenzene-d5	69	18-162	
p-Terphenyl-d14	69	34-148					

RL - Reporting Limit . DF - Dilution Factor . Qual - Qualifiers

Calscience Environmental Laboratories, Inc.

Analytical Report

Pacific Ecorisk
2250 Cordelia Road
Fairfield, CA 94534-1912

Date Received: 07/23/10
Work Order No: 10-07-1715
Preparation: EPA 3545
Method: EPA 8270C SIM PAHs
Units: ug/kg

Project: Schnitzer Steel

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
Method Blank	**099-12-471-55**	**N/A**	**Solid**	**GC/MS BBB**	**07/23/10**	**07/24/10 16:42**	**100723L14**

Comment(s): -Results were evaluated to the MDL, concentrations >= to the MDL but < RL, if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qual	Parameter	Result	RL	MDL	DF	Qual
Acenaphthene	ND	10	1.5	1		2,6-Dimethylnaphthalene	ND	10	1.7	1	
Acenaphthylene	ND	10	1.5	1		Fluoranthene	ND	10	1.6	1	
Anthracene	ND	10	1.3	1		Fluorene	ND	10	1.4	1	
Benzo (a) Anthracene	ND	10	2.0	1		Indeno (1,2,3-c,d) Pyrene	ND	10	1.3	1	
Benzo (a) Pyrene	ND	10	1.3	1		2-Methylnaphthalene	ND	10	1.8	1	
Benzo (b) Fluoranthene	ND	10	1.5	1		1-Methylnaphthalene	ND	10	2.1	1	
Benzo (e) Pyrene	ND	10	2.3	1		1-Methylphenanthrene	ND	10	2.2	1	
Benzo (g,h,i) Perylene	ND	10	1.3	1		Naphthalene	ND	10	1.7	1	
Benzo (k) Fluoranthene	ND	10	1.9	1		Perylene	ND	10	1.9	1	
Biphenyl	ND	10	1.6	1		Phenanthrene	ND	10	2.2	1	
Chrysene	ND	10	1.5	1		Pyrene	ND	10	1.6	1	
Dibenz (a,h) Anthracene	ND	10	1.1	1		1,6,7-Trimethylnaphthalene	ND	10	1.7	1	

Surrogates:	REC (%)	Control Limits	Qual	Surrogates:	REC (%)	Control Limits	Qual
2-Fluorobiphenyl	118	14-146		Nitrobenzene-d5	127	18-162	
p-Terphenyl-d14	115	34-148					

RL - Reporting Limit , DF - Dilution Factor , Qual - Qualifiers

Calscience Environmental Laboratories, Inc.

Analytical Report

Pacific Ecorisk
2250 Cordelia Road
Fairfield, CA 94534-1912

Project: Schnitzer Steel

Date Received:	07/23/10
Work Order No:	10-07-1715
Preparation:	EPA 3545
Method:	EPA 8082
Units:	ug/kg
	Page 1 of 1

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
SSPC-DUI-COMP	**10-07-1715-1-A**	**07/21/10 09:10**	**Sediment**	**GC 58**	**07/23/10**	**07/24/10 16:43**	**100723L13**

Comment(s): -Results were evaluated to the MDL, concentrations >= to the MDL but < RL, if found, are qualified with a "J" flag.
-Results are reported on a dry weight basis.

Parameter	Result	RL	MDL	DF	Qual	Parameter	Result	RL	MDL	DF	Qual
Aroclor-1016	ND	22	4.4	1		Aroclor-1248	ND	22	4.3	1	
Aroclor-1221	ND	22	4.3	1		Aroclor-1254	25	22	4.3	1	
Aroclor-1232	ND	22	4.3	1		Aroclor-1260	ND	22	4.8	1	
Aroclor-1242	ND	22	4.3	1		Aroclor-1262	ND	22	4.3	1	

Surrogates:	REC (%)	Control Limits	Qual	Surrogates:	REC (%)	Control Limits	Qual
2,4,5,6-Tetrachloro-m-Xylene	108	50-130		Decachlorobiphenyl	127	50-130	

SSPC-DUI-COMP (DUPLICATE)	**10-07-1715-2-A**	**07/21/10 09:10**	**Sediment**	**GC 58**	**07/23/10**	**07/24/10 17:01**	**100723L13**

Comment(s): -Results were evaluated to the MDL, concentrations >= to the MDL but < RL, if found, are qualified with a "J" flag.
-Results are reported on a dry weight basis.

Parameter	Result	RL	MDL	DF	Qual	Parameter	Result	RL	MDL	DF	Qual
Aroclor-1016	ND	22	4.5	1		Aroclor-1248	ND	22	4.5	1	
Aroclor-1221	ND	22	4.5	1		Aroclor-1254	29	22	4.5	1	
Aroclor-1232	ND	22	4.5	1		Aroclor-1260	ND	22	5.0	1	
Aroclor-1242	ND	22	4.5	1		Aroclor-1262	ND	22	4.5	1	

Surrogates:	REC (%)	Control Limits	Qual	Surrogates:	REC (%)	Control Limits	Qual
2,4,5,6-Tetrachloro-m-Xylene	103	50-130		Decachlorobiphenyl	127	50-130	

Method Blank	**099-12-565-156**	**N/A**	**Solid**	**GC 58**	**07/23/10**	**07/24/10 15:13**	**100723L13**

Comment(s): -Results were evaluated to the MDL, concentrations >= to the MDL but < RL, if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qual	Parameter	Result	RL	MDL	DF	Qual
Aroclor-1016	ND	10	2.0	1		Aroclor-1248	ND	10	2.0	1	
Aroclor-1221	ND	10	2.0	1		Aroclor-1254	ND	10	2.0	1	
Aroclor-1232	ND	10	2.0	1		Aroclor-1260	ND	10	2.2	1	
Aroclor-1242	ND	10	2.0	1		Aroclor-1262	ND	10	2.0	1	

Surrogates:	REC (%)	Control Limits	Qual	Surrogates:	REC (%)	Control Limits	Qual
2,4,5,6-Tetrachloro-m-Xylene	115	50-130		Decachlorobiphenyl	112	50-130	

RL - Reporting Limit , DF - Dilution Factor , Qual - Qualifiers

Calscience Environmental Laboratories, Inc.

Analytical Report

Pacific Ecorisk		Date Received:	07/23/10
2250 Cordelia Road		Work Order No:	10-07-1715
Fairfield, CA 94534-1912		Preparation:	EPA 3545
		Method:	EPA 8081A
		Units:	ug/kg
Project: Schnitzer Steel			Page 1 of 2

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
SSPC-DUI-COMP	**10-07-1715-1-A**	**07/21/10 09:10**	**Sediment**	**GC 41**	**07/23/10**	**07/26/10 15:02**	**100723L12**

Comment(s): -Results were evaluated to the MDL, concentrations >= to the MDL but < RL, if found, are qualified with a "J" flag.
-Results are reported on a dry weight basis.

Parameter	Result	RL	MDL	DF	Qual	Parameter	Result	RL	MDL	DF	Qual
Aldrin	ND	2.2	0.67	1		Endosulfan I	ND	2.2	0.77	1	
Alpha-BHC	ND	2.2	0.64	1		Endosulfan II	ND	2.2	0.38	1	
Beta-BHC	ND	2.2	0.55	1		Endosulfan Sulfate	ND	2.2	0.57	1	
Delta-BHC	ND	2.2	0.69	1		Endrin	ND	2.2	0.44	1	
Gamma-BHC	ND	2.2	0.50	1		Endrin Aldehyde	ND	2.2	0.42	1	
Chlordane	ND	22	8.7	1		Endrin Ketone	ND	2.2	0.65	1	
Dieldrin	ND	2.2	0.49	1		Heptachlor	ND	2.2	0.48	1	
2,4'-DDD	ND	2.2	0.44	1		Heptachlor Epoxide	ND	2.2	0.40	1	
2,4'-DDE	ND	2.2	0.39	1		Methoxychlor	ND	2.2	0.36	1	
2,4'-DDT	ND	2.2	0.30	1		Toxaphene	ND	43	18	1	
4,4'-DDD	ND	2.2	0.56	1		Alpha Chlordane	ND	2.2	0.56	1	
4,4'-DDE	ND	2.2	0.65	1		Gamma Chlordane	ND	2.2	0.56	1	
4,4'-DDT	ND	2.2	0.71	1							

Surrogates:	REC (%)	Control Limits	Qual	Surrogates:	REC (%)	Control Limits	Qual
2,4,5,6-Tetrachloro-m-Xylene	99	50-130		Decachlorobiphenyl	65	50-130	

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
SSPC-DUI-COMP (DUPLICATE)	**10-07-1715-2-A**	**07/21/10 09:10**	**Sediment**	**GC 41**	**07/23/10**	**07/26/10 15:30**	**100723L12**

Comment(s): -Results were evaluated to the MDL, concentrations >= to the MDL but < RL, if found, are qualified with a "J" flag.
-Results are reported on a dry weight basis.

Parameter	Result	RL	MDL	DF	Qual	Parameter	Result	RL	MDL	DF	Qual
Aldrin	ND	2.2	0.69	1		Endosulfan I	ND	2.2	0.80	1	
Alpha-BHC	ND	2.2	0.66	1		Endosulfan II	ND	2.2	0.39	1	
Beta-BHC	ND	2.2	0.57	1		Endosulfan Sulfate	ND	2.2	0.59	1	
Delta-BHC	ND	2.2	0.71	1		Endrin	ND	2.2	0.45	1	
Gamma-BHC	ND	2.2	0.51	1		Endrin Aldehyde	ND	2.2	0.44	1	
Chlordane	ND	22	9.0	1		Endrin Ketone	ND	2.2	0.67	1	
Dieldrin	ND	2.2	0.51	1		Heptachlor	ND	2.2	0.50	1	
2,4'-DDD	ND	2.2	0.45	1		Heptachlor Epoxide	ND	2.2	0.41	1	
2,4'-DDE	ND	2.2	0.40	1		Methoxychlor	ND	2.2	0.37	1	
2,4'-DDT	ND	2.2	0.31	1		Toxaphene	ND	45	19	1	
4,4'-DDD	ND	2.2	0.58	1		Alpha Chlordane	ND	2.2	0.58	1	
4,4'-DDE	ND	2.2	0.67	1		Gamma Chlordane	ND	2.2	0.58	1	
4,4'-DDT	ND	2.2	0.73	1							

Surrogates:	REC (%)	Control Limits	Qual	Surrogates:	REC (%)	Control Limits	Qual
2,4,5,6-Tetrachloro-m-Xylene	99	50-130		Decachlorobiphenyl	67	50-130	

RL - Reporting Limit , DF - Dilution Factor , Qual - Qualifiers

Calscience Environmental Laboratories, Inc.

Analytical Report

Pacific Ecorisk
2250 Cordelia Road
Fairfield, CA 94534-1912

Date Received: 07/23/10
Work Order No: 10-07-1715
Preparation: EPA 3545
Method: EPA 8081A
Units: ug/kg

Project: Schnitzer Steel

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
Method Blank	**099-12-858-70**	**N/A**	**Solid**	**GC 41**	**07/23/10**	**07/26/10 12:12**	**100723L12**

Comment(s): -Results were evaluated to the MDL, concentrations >= to the MDL but < RL, if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qual	Parameter	Result	RL	MDL	DF	Qual
Aldrin	ND	1.0	0.31	1		Endosulfan I	ND	1.0	0.36	1	
Alpha-BHC	ND	1.0	0.29	1		Endosulfan II	ND	1.0	0.18	1	
Beta-BHC	ND	1.0	0.25	1		Endosulfan Sulfate	ND	1.0	0.26	1	
Delta-BHC	ND	1.0	0.32	1		Endrin	ND	1.0	0.20	1	
Gamma-BHC	ND	1.0	0.23	1		Endrin Aldehyde	ND	1.0	0.20	1	
Chlordane	ND	10	4.0	1		Endrin Ketone	ND	1.0	0.30	1	
Dieldrin	ND	1.0	0.23	1		Heptachlor	ND	1.0	0.22	1	
2,4'-DDD	ND	1.0	0.20	1		Heptachlor Epoxide	ND	1.0	0.18	1	
2,4'-DDE	ND	1.0	0.18	1		Methoxychlor	ND	1.0	0.17	1	
2,4'-DDT	ND	1.0	0.14	1		Toxaphene	ND	20	8.5	1	
4,4'-DDD	ND	1.0	0.26	1		Alpha Chlordane	ND	1.0	0.26	1	
4,4'-DDE	ND	1.0	0.30	1		Gamma Chlordane	ND	1.0	0.26	1	
4,4'-DDT	ND	1.0	0.33	1							

Surrogates:	REC (%)	Control Limits	Qual	Surrogates:	REC (%)	Control Limits	Qual
2,4,5,6-Tetrachloro-m-Xylene	105	50-130		Decachlorobiphenyl	101	50-130	

RL - Reporting Limit , DF - Dilution Factor , Qual - Qualifiers

Calscience Environmental Laboratories, Inc.

Analytical Report

Pacific Ecorisk		Date Received:	07/23/10
2250 Cordelia Road		Work Order No:	10-07-1715
Fairfield, CA 94534-1912		Preparation:	EPA 3050B
		Method:	EPA 6020
		Units:	mg/kg
Project: Schnitzer Steel			Page 1 of 1

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
SSPC-DUI-COMP	**10-07-1715-1-A**	**07/21/10 09:10**	**Sediment**	**ICP/MS 04**	**07/23/10**	**07/26/10 12:52**	**100723L04**

Comment(s): -Results were evaluated to the MDL, concentrations >= to the MDL but < RL, if found, are qualified with a "J" flag.
-Results are reported on a dry weight basis.

Parameter	Result	RL	MDL	DF	Qual	Parameter	Result	RL	MDL	DF	Qual
Arsenic	7.93	0.217	0.110	1		Nickel	76.3	0.217	0.0357	1	B
Cadmium	1.15	0.217	0.00977	1		Selenium	1.25	0.217	0.0750	1	
Chromium	75.8	0.217	0.0377	1		Silver	0.345	0.217	0.00768	1	
Copper	69.2	0.217	0.0397	1	B	Zinc	549	2.17	0.576	1	B
Lead	49.8	0.217	0.0194	1							

SSPC-DUI-COMP (DUPLICATE)	**10-07-1715-2-A**	**07/21/10 09:10**	**Sediment**	**ICP/MS 04**	**07/23/10**	**07/26/10 13:32**	**100723L04**

Comment(s): -Results were evaluated to the MDL, concentrations >= to the MDL but < RL, if found, are qualified with a "J" flag.
-Results are reported on a dry weight basis.

Parameter	Result	RL	MDL	DF	Qual	Parameter	Result	RL	MDL	DF	Qual
Arsenic	7.93	0.224	0.114	1		Nickel	74.5	0.224	0.0368	1	B
Cadmium	0.575	0.224	0.0101	1		Selenium	1.48	0.224	0.0772	1	
Chromium	72.3	0.224	0.0388	1		Silver	0.286	0.224	0.00790	1	
Copper	58.8	0.224	0.0409	1	B	Zinc	150	2.24	0.592	1	B
Lead	30.3	0.224	0.0199	1							

Method Blank	**096-10-002-1,785**	**N/A**	**Solid**	**ICP/MS 04**	**07/23/10**	**07/23/10 18:15**	**100723L04**

Comment(s): -Results were evaluated to the MDL, concentrations >= to the MDL but < RL, if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qual	Parameter	Result	RL	MDL	DF	Qual
Arsenic	ND	0.100	0.0507	1		Nickel	0.0222	0.100	0.0164	1	J
Cadmium	ND	0.100	0.00449	1		Selenium	ND	0.100	0.0345	1	
Chromium	ND	0.100	0.0174	1		Silver	ND	0.100	0.00353	1	
Copper	0.0502	0.100	0.0183	1	J	Zinc	0.484	1.00	0.265	1	J
Lead	ND	0.100	0.00892	1							

RL - Reporting Limit , DF - Dilution Factor , Qual - Qualifiers

Calscience Environmental Laboratories, Inc.

Analytical Report

Pacific Ecorisk		Date Received:	07/23/10
2250 Cordelia Road		Work Order No:	10-07-1715
Fairfield, CA 94534-1912		Preparation:	EPA 7471A Total
		Method:	EPA 7471A

Project: Schnitzer Steel

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
SSPC-DUI-COMP	**10-07-1715-1-A**	**07/21/10 09:10**	**Sediment**	**Mercury**	**07/23/10**	**07/23/10 15:50**	**100723L07**

Comment(s): -Results were evaluated to the MDL, concentrations >= to the MDL but < RL, if found, are qualified with a "J" flag.
-Results are reported on a dry weight basis.

Parameter	Result	RL	MDL	DF	Qual	Units
Mercury	0.215	0.0436	0.0282	1		mg/kg

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
SSPC-DUI-COMP (DUPLICATE)	**10-07-1715-2-A**	**07/21/10 09:10**	**Sediment**	**Mercury**	**07/23/10**	**07/23/10 15:52**	**100723L07**

Comment(s): -Results were evaluated to the MDL, concentrations >= to the MDL but < RL, if found, are qualified with a "J" flag.
-Results are reported on a dry weight basis.

Parameter	Result	RL	MDL	DF	Qual	Units
Mercury	0.220	0.0448	0.0291	1		mg/kg

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
Method Blank	**099-12-452-138**	**N/A**	**Solid**	**Mercury**	**07/23/10**	**07/23/10 15:34**	**100723L07**

Comment(s): -Results were evaluated to the MDL, concentrations >= to the MDL but < RL, if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qual	Units
Mercury	ND	0.0200	0.0130	1		mg/kg

RL - Reporting Limit , DF - Dilution Factor , Qual - Qualifiers

Calscience Environmental Laboratories, Inc.

Quality Control - Spike/Spike Duplicate

Pacific Ecorisk	Date Received:	07/23/10
2250 Cordelia Road	Work Order No:	10-07-1715
Fairfield, CA 94534-1912	Preparation:	EPA 3050B
	Method:	EPA 6020

Project Schnitzer Steel

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	MS/MSD Batch Number
SSPC-DUI-COMP	**Sediment**	**ICP/MS 04**	**07/23/10**	**07/23/10**	**100723S04**

Parameter	MS %REC	MSD %REC	%REC CL	RPD	RPD CL	Qualifiers
Arsenic	107	109	80-120	2	0-20	
Cadmium	98	102	80-120	4	0-20	
Chromium	70	78	80-120	4	0-20	3
Copper	44	48	80-120	2	0-20	3
Lead	67	65	80-120	1	0-20	3
Nickel	76	81	80-120	3	0-20	3
Selenium	107	108	80-120	1	0-20	
Silver	103	107	80-120	4	0-20	
Zinc	4X	4X	80-120	4X	0-20	Q

RPD - Relative Percent Difference , CL - Control Limit

Calscience Environmental Laboratories, Inc.

Quality Control - PDS / PDSD

Pacific Ecorisk
2250 Cordelia Road
Fairfield, CA 94534-1912

Date Received: 07/23/10
Work Order No: 10-07-1715
Preparation: EPA 3050B
Method: EPA 6020

Project: Schnitzer Steel

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	PDS / PDSD Batch Number
SSPC-DUI-COMP	**Sediment**	**ICP/MS 04**	**07/23/10**	**07/23/10**	**100723S04**

Parameter	PDS %REC	PDSD %REC	%REC CL	RPD	RPD CL	Qualifiers
Arsenic	99	96	75-125	3	0-20	
Cadmium	92	92	75-125	1	0-20	
Chromium	80	84	75-125	1	0-20	
Copper	57	63	75-125	3	0-20	
Lead	63	60	75-125	2	0-20	
Nickel	81	87	75-125	3	0-20	
Selenium	87	89	75-125	2	0-20	
Silver	97	98	75-125	1	0-20	
Zinc	4X	4X	75-125	4X	0-20	Q

RPD - Relative Percent Difference , CL - Control Limit

Calscience Environmental Laboratories, Inc.

Quality Control - Spike/Spike Duplicate

Pacific Ecorisk
2250 Cordelia Road
Fairfield, CA 94534-1912

Date Received: 07/23/10
Work Order No: 10-07-1715
Preparation: N/A
Method: EPA 9060A

Project Schnitzer Steel

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	MS/MSD Batch Number
SSPC-DUI-COMP	**Sediment**	**TOC 5**	**N/A**	**07/23/10**	**A0723TOCS1**

Parameter	MS %REC	MSD %REC	%REC CL	RPD	RPD CL	Qualifiers
Carbon, Total Organic	104	102	75-125	1	0-25	

RPD - Relative Percent Difference , CL - Control Limit

Calscience Environmental Laboratories, Inc.

Quality Control - Duplicate

Pacific Ecorisk	Date Received:	07/23/10
2250 Cordelia Road	Work Order No:	10-07-1715
Fairfield, CA 94534-1912	Preparation:	N/A
	Method:	SM 2540 B

Project: Schnitzer Steel

Quality Control Sample ID	Matrix	Instrument	Date Prepared:	Date Analyzed:	Duplicate Batch Number
10-07-1714-1	**Sediment**	**N/A**	**07/24/10**	**07/24/10**	**A0724TSD1**

Parameter	Sample Conc	DUP Conc	RPD	RPD CL	Qualifiers
Solids, Total	54.5	54.9	1	0-25	

RPD - Relative Percent Difference , CL - Control Limit

Calscience Environmental Laboratories, Inc.

Quality Control - Spike/Spike Duplicate

Pacific Ecorisk	Date Received: 07/23/10
2250 Cordelia Road	Work Order No: 10-07-1715
Fairfield, CA 94534-1912	Preparation: EPA 7471A Total
	Method: EPA 7471A

Project Schnitzer Steel

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	MS/MSD Batch Number
SSPC-DUI-COMP	**Sediment**	**Mercury**	**07/23/10**	**07/23/10**	**100723S07**

Parameter	MS %REC	MSD %REC	%REC CL	RPD	RPD CL	Qualifiers
Mercury	88	87	76-136	1	0-16	

RPD - Relative Percent Difference , CL - Control Limit

Calscience Environmental Laboratories, Inc.

Quality Control - Spike/Spike Duplicate

Pacific Ecorisk
2250 Cordelia Road
Fairfield, CA 94534-1912

Date Received: 07/23/10
Work Order No: 10-07-1715
Preparation: EPA 3545
Method: Organotins by Krone et al.

Project Schnitzer Steel

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	MS/MSD Batch Number
SSPC-DUI-COMP	**Sediment**	**GC/MS Y**	**07/23/10**	**07/24/10**	**100723S18**

Parameter	MS %REC	MSD %REC	%REC CL	RPD	RPD CL	Qualifiers
Tetrabutyltin	123	118	50-130	4	0-20	
Tributyltin	134	127	50-130	6	0-20	3

RPD - Relative Percent Difference , CL - Control Limit

Calscience Environmental Laboratories, Inc.

Quality Control - Spike/Spike Duplicate

Pacific Ecorisk
2250 Cordelia Road
Fairfield, CA 94534-1912

Date Received: 07/23/10
Work Order No: 10-07-1715
Preparation: EPA 3545
Method: EPA 8270C SIM PAHs

Project Schnitzer Steel

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	MS/MSD Batch Number
SSPC-DUI-COMP	**Sediment**	**GC/MS BBB**	**07/23/10**	**07/25/10**	**100723S14**

Parameter	MS %REC	MSD %REC	%REC CL	RPD	RPD CL	Qualifiers
Acenaphthene	67	68	40-160	0	0-20	
Acenaphthylene	63	64	40-160	1	0-20	
Anthracene	43	45	40-160	4	0-20	
Benzo (a) Anthracene	46	48	40-160	3	0-20	
Benzo (a) Pyrene	52	53	40-160	2	0-20	
Benzo (b) Fluoranthene	57	54	40-160	3	0-20	
Benzo (g,h,i) Perylene	49	53	40-160	7	0-20	
Benzo (k) Fluoranthene	48	47	40-160	0	0-20	
Chrysene	46	47	40-160	1	0-20	
Dibenz (a,h) Anthracene	58	59	40-160	1	0-20	
Fluoranthene	44	48	40-160	5	0-20	
Fluorene	64	66	40-160	3	0-20	
Indeno (1,2,3-c,d) Pyrene	57	59	40-160	2	0-20	
2-Methylnaphthalene	69	67	40-160	2	0-20	
1-Methylnaphthalene	67	62	40-160	7	0-20	
Naphthalene	59	59	40-160	0	0-20	
Phenanthrene	61	61	40-160	0	0-20	
Pyrene	53	49	40-160	3	0-46	

RPD - Relative Percent Difference , CL - Control Limit

Calscience Environmental Laboratories, Inc.

Quality Control - Spike/Spike Duplicate

Pacific Ecorisk	Date Received: 07/23/10
2250 Cordelia Road	Work Order No: 10-07-1715
Fairfield, CA 94534-1912	Preparation: EPA 3545
	Method: EPA 8082

Project Schnitzer Steel

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	MS/MSD Batch Number
SSPC-DUI-COMP	**Sediment**	**GC 58**	**07/23/10**	**07/24/10**	**100723S13**

Parameter	MS %REC	MSD %REC	%REC CL	RPD	RPD CL	Qualifiers
Aroclor-1016	115	118	50-135	3	0-25	
Aroclor-1260	131	124	50-135	5	0-25	

RPD - Relative Percent Difference , CL - Control Limit

Calscience Environmental Laboratories, Inc.

Quality Control - Spike/Spike Duplicate

Pacific Ecorisk
2250 Cordelia Road
Fairfield, CA 94534-1912

Date Received: 07/23/10
Work Order No: 10-07-1715
Preparation: EPA 3545
Method: EPA 8081A

Project Schnitzer Steel

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	MS/MSD Batch Number
SSPC-DUI-COMP	**Sediment**	**GC 41**	**07/23/10**	**07/27/10**	**100723S12**

Parameter	MS %REC	MSD %REC	%REC CL	RPD	RPD CL	Qualifiers
Aldrin	71	69	50-135	3	0-25	
Alpha-BHC	88	86	50-135	3	0-25	
Beta-BHC	83	80	50-135	4	0-25	
Delta-BHC	88	86	50-135	3	0-25	
Gamma-BHC	79	76	50-135	4	0-25	
Dieldrin	83	79	50-135	4	0-25	
4,4'-DDD	85	83	50-135	2	0-25	
4,4'-DDE	87	84	50-135	3	0-25	
4,4'-DDT	106	101	50-135	5	0-25	
Endosulfan I	72	68	50-135	5	0-25	
Endosulfan II	78	75	50-135	4	0-25	
Endosulfan Sulfate	86	82	50-135	4	0-25	
Endrin	80	76	50-135	4	0-25	
Endrin Aldehyde	69	59	50-135	16	0-25	
Endrin Ketone	96	94	50-135	2	0-25	
Heptachlor	68	66	50-135	4	0-25	
Heptachlor Epoxide	73	71	50-135	3	0-25	
Methoxychlor	88	88	50-135	0	0-25	
Alpha Chlordane	76	73	50-135	4	0-25	
Gamma Chlordane	77	74	50-135	3	0-25	

RPD - Relative Percent Difference , CL - Control Limit

Calscience Environmental Laboratories, Inc.

Quality Control - LCS/LCS Duplicate

Pacific Ecorisk		Date Received:	N/A
2250 Cordelia Road		Work Order No:	10-07-1715
Fairfield, CA 94534-1912		Preparation:	EPA 3050B
		Method:	EPA 6020

Project: Schnitzer Steel

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number
096-10-002-1,785	**Solid**	**ICP/MS 04**	**07/23/10**	**07/23/10**	100723L04

Parameter	LCS %REC	LCSD %REC	%REC CL	RPD	RPD CL	Qualifiers
Arsenic	99	98	80-120	1	0-20	
Cadmium	96	96	80-120	0	0-20	
Chromium	94	94	80-120	0	0-20	
Copper	100	98	80-120	2	0-20	
Lead	96	95	80-120	1	0-20	
Nickel	100	97	80-120	3	0-20	
Selenium	102	100	80-120	2	0-20	
Silver	91	91	80-120	0	0-20	
Zinc	103	100	80-120	2	0-20	

RPD - Relative Percent Difference , CL - Control Limit

Calscience Environmental Laboratories, Inc.

Quality Control - Laboratory Control Sample

Pacific Ecorisk		Date Received:	N/A
2250 Cordelia Road		Work Order No:	10-07-1715
Fairfield, CA 94534-1912		Preparation:	N/A
		Method:	EPA 9060A

Project: Schnitzer Steel

Quality Control Sample ID	Matrix	Instrument	Date Analyzed	Lab File ID	LCS Batch Number
099-06-013-508	Solid	TOC 5	07/23/10	NONE	A0723TOCL1

Parameter	Conc Added	Conc Recovered	LCS %Rec	%Rec CL	Qualifiers
Carbon, Total Organic	0.6	0.632	105	80-120	

RPD - Relative Percent Difference , CL - Control Limit

Calscience Environmental Laboratories, Inc.

Quality Control - LCS/LCS Duplicate

Pacific Ecorisk		Date Received:	N/A
2250 Cordelia Road		Work Order No:	10-07-1715
Fairfield, CA 94534-1912		Preparation:	EPA 7471A Total
		Method:	EPA 7471A

Project: Schnitzer Steel

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number
099-12-452-138	**Solid**	Mercury	**07/23/10**	**07/23/10**	100723L07

Parameter	LCS %REC	LCSD %REC	%REC CL	RPD	RPD CL	Qualifiers
Mercury	97	99	82-124	2	0-16	

RPD - Relative Percent Difference , CL - Control Limit

Calscience Environmental Laboratories, Inc.

Quality Control - LCS/LCS Duplicate

Pacific Ecorisk		Date Received:	N/A
2250 Cordelia Road		Work Order No:	10-07-1715
Fairfield, CA 94534-1912		Preparation:	EPA 3545
		Method:	Organotins by Krone et al.

Project: Schnitzer Steel

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number
099-07-016-765	Solid	GC/MS Y	07/23/10	07/24/10	100723L18

Parameter	LCS %REC	LCSD %REC	%REC CL	RPD	RPD CL	Qualifiers
Tetrabutyltin	95	99	50-130	4	0-20	
Tributyltin	108	117	50-130	8	0-20	

RPD - Relative Percent Difference , CL - Control Limit

Calscience Environmental Laboratories, Inc.

Quality Control - LCS/LCS Duplicate

Pacific Ecorisk	Date Received: N/A
2250 Cordelia Road	Work Order No: 10-07-1715
Fairfield, CA 94534-1912	Preparation: EPA 3545
	Method: EPA 8270C SIM PAHs

Project: Schnitzer Steel

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number
099-12-471-55	**Solid**	**GC/MS BBB**	**07/23/10**	**07/24/10**	**100723L14**

Parameter	LCS %REC	LCSD %REC	%REC CL	ME_CL	RPD	RPD CL	Qualifiers
Acenaphthene	88	87	48-108	38-118	1	0-11	
Acenaphthylene	84	84	40-160	20-180	0	0-20	
Anthracene	66	65	40-160	20-180	2	0-20	
Benzo (a) Anthracene	82	83	40-160	20-180	1	0-20	
Benzo (a) Pyrene	87	86	40-160	20-180	2	0-20	
Benzo (b) Fluoranthene	87	83	40-160	20-180	4	0-20	
Benzo (g,h,i) Perylene	73	73	40-160	20-180	0	0-20	
Benzo (k) Fluoranthene	81	82	40-160	20-180	1	0-20	
Chrysene	83	83	40-160	20-180	0	0-20	
Dibenz (a,h) Anthracene	79	79	40-160	20-180	0	0-20	
Fluoranthene	88	87	40-160	20-180	1	0-20	
Fluorene	91	90	40-160	20-180	1	0-20	
Indeno (1,2,3-c,d) Pyrene	84	84	40-160	20-180	0	0-20	
2-Methylnaphthalene	92	92	40-160	20-180	0	0-20	
1-Methylnaphthalene	89	87	40-160	20-180	2	0-20	
Naphthalene	88	89	40-160	20-180	1	0-20	
Phenanthrene	87	87	40-160	20-180	0	0-20	
Pyrene	83	83	40-160	20-180	0	0-16	

Total number of LCS compounds : 18
Total number of ME compounds : 0
Total number of ME compounds allowed : 1
LCS ME CL validation result : Pass

RPD - Relative Percent Difference , CL - Control Limit

Calscience Environmental Laboratories, Inc.

Quality Control - LCS/LCS Duplicate

Pacific Ecorisk		Date Received:	N/A
2250 Cordelia Road		Work Order No:	10-07-1715
Fairfield, CA 94534-1912		Preparation:	EPA 3545
		Method:	EPA 8082

Project: Schnitzer Steel

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number
099-12-565-156	**Solid**	**GC 58**	**07/23/10**	**07/24/10**	**100723L13**

Parameter	LCS %REC	LCSD %REC	%REC CL	RPD	RPD CL	Qualifiers
Aroclor-1016	103	108	50-135	4	0-25	
Aroclor-1260	104	116	50-135	11	0-25	

RPD - Relative Percent Difference , CL - Control Limit

Calscience Environmental Laboratories, Inc.

Quality Control - Laboratory Control Sample

Pacific Ecorisk	Date Received: N/A
2250 Cordelia Road	Work Order No: 10-07-1715
Fairfield, CA 94534-1912	Preparation: EPA 3545
	Method: EPA 8081A

Project: Schnitzer Steel

Quality Control Sample ID	Matrix	Instrument	Date Analyzed	Lab File ID	LCS Batch Number
099-12-858-70	Solid	GC 41	07/26/10	10072605	100723L12

Parameter	Conc Added	Conc Recovered	LCS %Rec	%Rec CL	ME_CL	Qualifiers
Aldrin	5.00	4.74	95	50-135	36-149	
Alpha-BHC	5.00	4.47	89	50-135	36-149	
Beta-BHC	5.00	4.52	90	50-135	36-149	
Delta-BHC	5.00	2.57	51	50-135	36-149	
Gamma-BHC	5.00	4.53	91	50-135	36-149	
Dieldrin	5.00	4.80	96	50-135	36-149	
4,4'-DDD	5.00	4.55	91	50-135	36-149	
4,4'-DDE	5.00	4.46	89	50-135	36-149	
4,4'-DDT	5.00	5.04	101	50-135	36-149	
Endosulfan I	5.00	4.73	95	50-135	36-149	
Endosulfan II	5.00	4.70	94	50-135	36-149	
Endosulfan Sulfate	5.00	4.29	86	50-135	36-149	
Endrin	5.00	5.01	100	50-135	36-149	
Endrin Aldehyde	5.00	4.58	92	50-135	36-149	
Endrin Ketone	5.00	4.83	97	50-135	36-149	
Heptachlor	5.00	4.98	100	50-135	36-149	
Heptachlor Epoxide	5.00	4.52	90	50-135	36-149	
Methoxychlor	5.00	4.82	96	50-135	36-149	
Alpha Chlordane	5.00	4.80	96	50-135	36-149	
Gamma Chlordane	5.00	4.59	92	50-135	36-149	

Total number of LCS compounds : 20
Total number of ME compounds: 0
Total number of ME compounds allowed : 1
LCS ME CL validation result : Pass

RPD - Relative Percent Difference , CL - Control Limit

Calscience Environmental Laboratories, Inc.

Glossary of Terms and Qualifiers

Work Order Number: 10-07-1715

Qualifier	Definition
*	See applicable analysis comment.
<	Less than the indicated value.
>	Greater than the indicated value.
1	Surrogate compound recovery was out of control due to a required sample dilution, therefore, the sample data was reported without further clarification.
2	Surrogate compound recovery was out of control due to matrix interference. The associated method blank surrogate spike compound was in control and, therefore, the sample data was reported without further clarification.
3	Recovery of the Matrix Spike (MS) or Matrix Spike Duplicate (MSD) compound was out of control due to matrix interference. The associated LCS and/or LCSD was in control and, therefore, the sample data was reported without further clarification.
4	The MS/MSD RPD was out of control due to matrix interference. The LCS/LCSD RPD was in control and, therefore, the sample data was reported without further clarification.
5	The PDS/PDSD or PES/PESD associated with this batch of samples was out of control due to a matrix interference effect. The associated batch LCS/LCSD was in control and, hence, the associated sample data was reported without further clarification.
B	Analyte was present in the associated method blank.
E	Concentration exceeds the calibration range.
J	Analyte was detected at a concentration below the reporting limit and above the laboratory method detection limit. Reported value is estimated.
ME	LCS Recovery Percentage is within LCS ME Control Limit range.
ND	Parameter not detected at the indicated reporting limit.
Q	Spike recovery and RPD control limits do not apply resulting from the parameter concentration in the sample exceeding the spike concentration by a factor of four or greater.
X	% Recovery and/or RPD out-of-range.
Z	Analyte presence was not confirmed by second column or GC/MS analysis.
	Solid - Unless otherwise indicated, solid sample data is reported on a wet weight basis, not corrected for % moisture.

CHAIN OF CUSTODY RECORD

1715

PACIFIC ECORISK
2250 Cordelia Rd
Fairfield, CA 94534
Ph: (707) 207-7760
Fax: (707) 207-7916
www.pacificecorisk.com

RESULTS TO: Same
Attn: Jeff Cotsifas
Phone:
Email:

BILL TO: Same
Attn: Cynthia Garcia
Phone:
Email:

PROJECT: Schnitzer Steel

SAMPLE IDENTIFICATION	DATE	TIME	SAMPLE MATRIX	GRAB/ COMP.	# CONTAINERS/TYPE	See ATTACHED LIST	GRAIN Size						REMARKS
SSPC-DUI-COMP	7/21/10	09:10	Soil	Comp	2 1500ml Glass	✓							
SSPC-DUI-COMP	7/21/10	09:10	Soil	Comp	1 1 Zip Loc Bag		✓						
					/								
					/								
					/								
					/								
					/								
					/								
					/								

ANALYSES REQUESTED

METHOD OF SHIPMENT: FedEx: X UPS: HAND: OTHER:

COMMENTS: Please run duplicate analysis on SSPC-DUI-COMP for Chemistry

CODES:

RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RECEIVED BY: (SIGNATURE)	DATE	TIME	PAGE #
Ce Jenkins	7/22/10	16:00	CCL	7/23/10	1030	1 OF 1

WHITE - RETURN W/ SAMPLE YELLOW - KEEP FOR YOUR RECORDS

ANALYTE LIST

Pacific EcoRisk
2250 Cordelia Rd.
Fairfield, CA 94534

Project Proponent: **Pacific EcoRisk**

Project #: Schnitzer Steel

Site #: SSPC-DU1-COMP

Standard Ocean Disposal List

Solids, Total	SMEWW 2540 B	X
Total Organic Carbon	ASTM D4129-82M	X
Grain Size	Plumb 1981/ASTM	X
Arsenic	6020	X
Cadmium	6020	X
Chromium	6020	X
Copper	6020	X
Lead	6020	X
Nickel	6020	X
Silver	6020	X
Zinc	6020	X
Mercury	7471A	X
Selenium	7740 - GFAA	X
2,4'-DDD	8081A	X
2,4'-DDE	8081A	X
2,4'-DDT	8081A	X
4,4'-DDD	8081A	X
4,4'-DDE	8081A	X
4,4'-DDT	8081A	X
Aldrin	8081A	X
alpha-BHC	8081A	X
alpha-Chlordane	8081A	X
beta-BHC	8081A	X
Chlordane	8081A	X
delta-BHC	8081A	X
Dieldrin	8081A	X
Endosulfan I	8081A	X
Endosulfan II	8081A	X
Endosulfan Sulfate	8081A	X
Endrin	8081A	X
Endrin Aldehyde	8081A	X
gamma-BHC (Lindane)	8081A	X
gamma-Chlordane	8081A	X
Heptachlor	8081A	X
Heptachlor Epoxide	8081A	X
Toxaphene	8081A	X
PCBs 1016	8082 PCBs	X
PCBs 1221	8082 PCBs	X
PCBs 1232	8082 PCBs	X
PCBs1242	8082 PCBs	X
PCBs1248	8082 PCBs	X
PCBs1254	8082 PCBs	X
PCBs1260	8082 PCBs	X
PCBs1262	8082 PCBs	X
PCBs1268	8082 PCBs	X
Acenaphthene	8270C-SIM PAH	X

Acenaphthylene	8270C-SIM PAH	X
Anthracene	8270C-SIM PAH	X
Benz(a)anthracene	8270C-SIM PAH	X
Benzo(a)pyrene	8270C-SIM PAH	X
Benzo(b)fluoranthene	8270C-SIM PAH	X
Benzo(g,h,i)perylene	8270C-SIM PAH	X
Benzo(k)fluoranthene	8270C-SIM PAH	X
Chrysene	8270C-SIM PAH	X
Dibenz(a,h)anthracene	8270C-SIM PAH	X
Fluoranthene	8270C-SIM PAH	X
Fluorene	8270C-SIM PAH	X
Indeno(1,2,3-cd)pyrene	8270C-SIM PAH	X
Naphthalene	8270C-SIM PAH	X
Phenanthrene	8270C-SIM PAH	X
Pyrene	8270C-SIM PAH	X
Di-n-butyltin	Organotins	X
n-Butyltin	Organotins	X
Tetra-n-butyltin	Organotins	X
Tri-n-butyltin	Organotins	X
QA/QC		
Duplicate analysis - SSPC-DU1-COMP		X

If you have any questions regarding this request as checked, please call Jeff Cotsifas at (707)207-7760

Alternative Methods Approved as per conversation w/ Bob Sterns

Calscience Environmental Laboratories, Inc.

WORK ORDER #: 10-07-1715

SAMPLE RECEIPT FORM

Cooler 1 of 1

CLIENT: Pacific Ecorisk DATE: 07/23/10

TEMPERATURE: Thermometer ID: SC1 (Criteria: 0.0 °C – 6.0 °C, not frozen)

Temperature 0.6 °C + 0.5 °C (CF) = 1.1 °C ☐ Blank ☑ Sample

☐ Sample(s) outside temperature criteria (PM/APM contacted by: _____).

☐ Sample(s) outside temperature criteria but received on ice/chilled on same day of sampling.

☐ **Received at ambient temperature, placed on ice for transport by Courier.**

Ambient Temperature: ☐ Air ☐ Filter ☐ Metals Only ☐ PCBs Only **Initial:** NC

CUSTODY SEALS INTACT:

☐ Cooler ☐_____ ☐ No (Not Intact) ☑ Not Present ☐ N/A **Initial:** NC

☐ Sample ☐_____ ☐ No (Not Intact) ☑ Not Present **Initial:** M

SAMPLE CONDITION:	Yes	No	N/A
Chain-Of-Custody (COC) document(s) received with samples	☑	☐	☐
COC document(s) received complete	☑	☐	☐
☐ Collection date/time, matrix, and/or # of containers logged in based on sample labels.			
☐ No analysis requested. ☐ Not relinquished. ☐ No date/time relinquished.			
Sampler's name indicated on COC	☐	☐	☑
Sample container label(s) consistent with COC	☑	☐	☐
Sample container(s) intact and good condition	☑	☐	☐
Proper containers and sufficient volume for analyses requested	☑	☐	☐
Analyses received within holding time	☑	☐	☐
pH / Residual Chlorine / Dissolved Sulfide received within 24 hours	☐	☐	☑
Proper preservation noted on COC or sample container	☐	☐	☑
☐ Unpreserved vials received for Volatiles analysis			
Volatile analysis container(s) free of headspace	☐	☐	☑
Tedlar bag(s) free of condensation	☐	☐	☑

CONTAINER TYPE:

Solid: ☐4ozCGJ ☐8ozCGJ ☑16(2)ozCGJ ☐Sleeve (_____) ☐EnCores® ☐TerraCores® ☑2

Water: ☐VOA ☐VOAh ☐VOAna_2 ☐125AGB ☐125AGBh ☐125AGBp ☐1AGB ☐1AGBna_2 ☐1AGBs ☐500AGB ☐500AGJ ☐500AGJs ☐250AGB ☐250CGB ☐250CGBs ☐1PB ☐500PB ☐500PBna ☐250PB ☐250PBn ☐125PB ☐125PBznna ☐100PJ ☐100PJna_2 ☐_____ ☐_____ ☐_____

Air: ☐Tedlar® ☐Summa® **Other:** ☐_____ **Trip Blank Lot#:**_____ **Labeled/Checked by:** CL

Container: C: Clear A: Amber P: Plastic G: Glass J: Jar B: Bottle Z: Ziploc/Resealable Bag E: Envelope **Reviewed by:** NC

Preservative: h: HCL n: HNO_3 na_2:$Na_2S_2O_3$ na: NaOH p: H_3PO_4 s: H_2SO_4 znna: $ZnAc_2$+NaOH f: Field-filtered **Scanned by:** CL

SOP T100_090 (05/10/10)

Calscience
Environmental
Laboratories, Inc.

Supplemental Report 4

August 25, 2010

The original report has been revised/corrected.

Jeff Cotsifas
Pacific Ecorisk
2250 Cordelia Road
Fairfield, CA 94534-1912

Subject: **Calscience Work Order No.: 10-07-1715**
Client Reference: Schnitzer Steel

Dear Client:

Enclosed is an analytical report for the above-referenced project. The samples included in this report were received 7/23/2010 and analyzed in accordance with the attached chain-of-custody.

Calscience Environmental Laboratories certifies that the test results provided in this report meet all NELAC requirements for parameters for which accreditation is required or available. Any exceptions to NELAC requirements are noted in the case narrative. The original report of subcontracted analysis, if any, is provided herein, and follows the standard Calscience data package. The results in this analytical report are limited to the samples tested and any reproduction thereof must be made in its entirety.

If you have any questions regarding this report, please do not hesitate to contact the undersigned.

Sincerely,

for

Calscience Environmental
Laboratories, Inc.
Danielle Gonsman
Project Manager

Case Narrative

Supplemental Report Calscience Work Order No. 10-07-1715

At the request of the client, the Selenium data was checked using method EPA 1640. This evaluation showed values considerably lower than the original Selenium values. Upon our investigation of the original metals data set, we determined that the Selenium data was loaded into LIMS incorrectly, that is, it was inadvertently loaded with an improper setting which did not account for positive interferences. This report presents the revised and correct Selenium values.

Calscience Environmental Laboratories, Inc.

Analytical Report

Pacific Ecorisk		Date Received:	07/23/10
2250 Cordelia Road		Work Order No:	10-07-1715
Fairfield, CA 94534-1912		Preparation:	N/A
		Method:	SM 2540 B

Project: Schnitzer Steel

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
SSPC-DUI-COMP	**10-07-1715-1-A**	**07/21/10 09:10**	**Sediment**	**N/A**	**07/24/10**	**07/24/10 16:00**	**A0724TSB1**

Parameter	Result	RL	DF	Qual	Units
Solids, Total	46.0	0.100	1		%

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
SSPC-DUI-COMP (DUPLICATE)	**10-07-1715-2-A**	**07/21/10 09:10**	**Sediment**	**N/A**	**07/24/10**	**07/24/10 16:00**	**A0724TSB1**

Parameter	Result	RL	DF	Qual	Units
Solids, Total	44.7	0.100	1		%

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
Method Blank	**099-05-019-1,442**	**N/A**	**Solid**	**N/A**	**07/24/10**	**07/24/10 16:00**	**A0724TSB1**

Parameter	Result	RL	DF	Qual	Units
Solids, Total	ND	0.100	1		%

RL - Reporting Limit , DF - Dilution Factor , Qual - Qualifiers

Calscience Environmental Laboratories, Inc.

Analytical Report

Pacific Ecorisk		Date Received:	07/23/10
2250 Cordelia Road		Work Order No:	10-07-1715
Fairfield, CA 94534-1912		Preparation:	EPA 3050B
		Method:	EPA 6020

Project: Schnitzer Steel

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
SSPC-DUI-COMP	**10-07-1715-1-A**	**07/21/10 09:10**	**Sediment**	**ICP/MS 04**	**07/23/10**	**07/26/10 13:27**	**100723L04**

Comment(s): -Results were evaluated to the MDL, concentrations >= to the MDL but < RL, if found, are qualified with a "J" flag.
-Results are reported on a dry weight basis.

Parameter	Result	RL	MDL	DF	Qual	Units
Selenium	0.496	0.217	0.0750	1		mg/kg

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
SSPC-DUI-COMP (DUPLICATE)	**10-07-1715-2-A**	**07/21/10 09:10**	**Sediment**	**ICP/MS 04**	**07/23/10**	**07/26/10 13:32**	**100723L04**

Comment(s): -Results were evaluated to the MDL, concentrations >= to the MDL but < RL, if found, are qualified with a "J" flag.
-Results are reported on a dry weight basis.

Parameter	Result	RL	MDL	DF	Qual	Units
Selenium	0.690	0.224	0.0772	1		mg/kg

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
Method Blank	**096-10-002-1,785**	**N/A**	**Solid**	**ICP/MS 04**	**07/23/10**	**07/23/10 18:15**	**100723L04**

Comment(s): -Results were evaluated to the MDL, concentrations >= to the MDL but < RL, if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qual	Units
Selenium	ND	0.100	0.0345	1		mg/kg

RL - Reporting Limit , DF - Dilution Factor , Qual - Qualifiers

Calscience Environmental Laboratories, Inc.

Quality Control - Spike/Spike Duplicate

Pacific Ecorisk	Date Received: 07/23/10
2250 Cordelia Road	Work Order No: 10-07-1715
Fairfield, CA 94534-1912	Preparation: EPA 3050B
	Method: EPA 6020

Project Schnitzer Steel

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	MS/MSD Batch Number
SSPC-DUI-COMP	**Sediment**	**ICP/MS 04**	**07/23/10**	**07/23/10**	**100723S04**

Parameter	MS %REC	MSD %REC	%REC CL	RPD	RPD CL	Qualifiers
Selenium	108	109	80-120	1	0-20	

RPD - Relative Percent Difference , CL - Control Limit

Calscience Environmental Laboratories, Inc.

Quality Control - PDS / PDSD

Pacific Ecorisk		Date Received	07/23/10
2250 Cordelia Road		Work Order No:	10-07-1715
Fairfield, CA 94534-1912		Preparation:	EPA 3050B
		Method:	EPA 6020

Project: Schnitzer Steel

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	PDS / PDSD Batch Number
SSPC-DUI-COMP	**Sediment**	**ICP/MS 04**	**07/23/10**	**07/23/10**	**100723S04**

Parameter	PDS %REC	PDSD %REC	%REC CL	RPD	RPD CL	Qualifiers
Selenium	89	90	75-125	2	0-20	

RPD - Relative Percent Difference , CL - Control Limit

Calscience Environmental Laboratories, Inc.

Quality Control - Duplicate

Pacific Ecorisk	Date Received:	07/23/10
2250 Cordelia Road	Work Order No:	10-07-1715
Fairfield, CA 94534-1912	Preparation:	N/A
	Method:	SM 2540 B

Project: Schnitzer Steel

Quality Control Sample ID	Matrix	Instrument	Date Prepared:	Date Analyzed:	Duplicate Batch Number
10-07-1714-1	**Sediment**	**N/A**	**07/24/10**	**07/24/10**	**A0724TSD1**

Parameter	Sample Conc	DUP Conc	RPD	RPD CL	Qualifiers
Solids, Total	54.5	54.9	1	0-25	

RPD - Relative Percent Difference , CL - Control Limit

Calscience Environmental Laboratories, Inc.

Quality Control - LCS/LCS Duplicate

Pacific Ecorisk		Date Received:	N/A
2250 Cordelia Road		Work Order No:	10-07-1715
Fairfield, CA 94534-1912		Preparation:	EPA 3050B
		Method:	EPA 6020

Project: Schnitzer Steel

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number
096-10-002-1,785	Solid	ICP/MS 04	07/23/10	07/23/10	100723L04

Parameter	LCS %REC	LCSD %REC	%REC CL	RPD	RPD CL	Qualifiers
Selenium	102	100	80-120	2	0-20	

RPD - Relative Percent Difference , CL - Control Limit

Calscience Environmental Laboratories, Inc.

Glossary of Terms and Qualifiers

Work Order Number: 10-07-1715

Qualifier	Definition
*	See applicable analysis comment.
<	Less than the indicated value.
>	Greater than the indicated value.
1	Surrogate compound recovery was out of control due to a required sample dilution, therefore, the sample data was reported without further clarification.
2	Surrogate compound recovery was out of control due to matrix interference. The associated method blank surrogate spike compound was in control and, therefore, the sample data was reported without further clarification.
3	Recovery of the Matrix Spike (MS) or Matrix Spike Duplicate (MSD) compound was out of control due to matrix interference. The associated LCS and/or LCSD was in control and, therefore, the sample data was reported without further clarification.
4	The MS/MSD RPD was out of control due to matrix interference. The LCS/LCSD RPD was in control and, therefore, the sample data was reported without further clarification.
5	The PDS/PDSD or PES/PESD associated with this batch of samples was out of control due to a matrix interference effect. The associated batch LCS/LCSD was in control and, hence, the associated sample data was reported without further clarification.
B	Analyte was present in the associated method blank.
E	Concentration exceeds the calibration range.
J	Analyte was detected at a concentration below the reporting limit and above the laboratory method detection limit. Reported value is estimated.
ME	LCS Recovery Percentage is within LCS ME Control Limit range.
ND	Parameter not detected at the indicated reporting limit.
Q	Spike recovery and RPD control limits do not apply resulting from the parameter concentration in the sample exceeding the spike concentration by a factor of four or greater.
X	% Recovery and/or RPD out-of-range.
Z	Analyte presence was not confirmed by second column or GC/MS analysis.
	Solid - Unless otherwise indicated, solid sample data is reported on a wet weight basis, not corrected for % moisture.

CHAIN OF CUSTODY RECORD

1715

PACIFIC ECORISK
2250 Cordelia Rd
Fairfield, CA 94534
Ph: (707) 207-7760
Fax: (707) 207-7916
www.pacificecorisk.com

RESULTS TO: Same
Attn: Jeff Cotsifas
Phone:
Email:

BILL TO: Same
Attn: Cynthia Garcia
Phone:
Email:

PROJECT: Schnitzer Steel

ANALYSES REQUESTED

SAMPLE IDENTIFICATION	DATE	TIME	SAMPLE MATRIX	GRAB/ COMP.	# CONTAINERS/TYPE	See ATTACHED LIST	GRAIN Size						REMARKS
SSPC-DUI-COMP	7/21/10	09:10	Soil	Comp	2 1500ml Glass	✓							
SSPC-DUI-COMP	7/21/10	09:10	Soil	Comp	1 1 Zip Loc Bag		✓						
					/								
					/								
					/								
					/								
					/								
					/								
					/								

METHOD OF SHIPMENT: FedEx: X UPS: HAND: OTHER:

COMMENTS: Please run duplicate analysis on SSPC-DUI-COMP for Chemistry

CODES:

RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RECEIVED BY: (SIGNATURE)	DATE	TIME	PAGE #
Ci Jenkins	7/22/10	16:00	CCR	7/23/10	1030	1 OF 1

WHITE - RETURN W/ SAMPLE YELLOW - KEEP FOR YOUR RECORDS

ANALYTE LIST

Pacific EcoRisk
2250 Cordelia Rd.
Fairfield, CA 94534

Project Proponent: **Pacific EcoRisk**

Project #: Schnitzer Steel

Site #: SSPC-DU1-COMP

Standard Ocean Disposal List

Solids, Total	SMEWW 2540 B	X
Total Organic Carbon	ASTM D4129-82M	X
Grain Size	Plumb 1981/ASTM	X
Arsenic	6020	X
Cadmium	6020	X
Chromium	6020	X
Copper	6020	X
Lead	6020	X
Nickel	6020	X
Silver	6020	X
Zinc	6020	X
Mercury	7471A	X
Selenium	7740 - GFAA	X
2,4'-DDD	8081A	X
2,4'-DDE	8081A	X
2,4'-DDT	8081A	X
4,4'-DDD	8081A	X
4,4'-DDE	8081A	X
4,4'-DDT	8081A	X
Aldrin	8081A	X
alpha-BHC	8081A	X
alpha-Chlordane	8081A	X
beta-BHC	8081A	X
Chlordane	8081A	X
delta-BHC	8081A	X
Dieldrin	8081A	X
Endosulfan I	8081A	X
Endosulfan II	8081A	X
Endosulfan Sulfate	8081A	X
Endrin	8081A	X
Endrin Aldehyde	8081A	X
gamma-BHC (Lindane)	8081A	X
gamma-Chlordane	8081A	X
Heptachlor	8081A	X
Heptachlor Epoxide	8081A	X
Toxaphene	8081A	X
PCBs 1016	8082 PCBs	X
PCBs 1221	8082 PCBs	X
PCBs 1232	8082 PCBs	X
PCBs1242	8082 PCBs	X
PCBs1248	8082 PCBs	X
PCBs1254	8082 PCBs	X
PCBs1260	8082 PCBs	X
PCBs1262	8082 PCBs	X
PCBs1268	8082 PCBs	X
Acenaphthene	8270C-SIM PAH	X

Acenaphthylene	8270C-SIM PAH	X
Anthracene	8270C-SIM PAH	X
Benz(a)anthracene	8270C-SIM PAH	X
Benzo(a)pyrene	8270C-SIM PAH	X
Benzo(b)fluoranthene	8270C-SIM PAH	X
Benzo(g,h,i)perylene	8270C-SIM PAH	X
Benzo(k)fluoranthene	8270C-SIM PAH	X
Chrysene	8270C-SIM PAH	X
Dibenz(a,h)anthracene	8270C-SIM PAH	X
Fluoranthene	8270C-SIM PAH	X
Fluorene	8270C-SIM PAH	X
Indeno(1,2,3-cd)pyrene	8270C-SIM PAH	X
Naphthalene	8270C-SIM PAH	X
Phenanthrene	8270C-SIM PAH	X
Pyrene	8270C-SIM PAH	X
Di-n-butyltin	Organotins	X
n-Butyltin	Organotins	X
Tetra-n-butyltin	Organotins	X
Tri-n-butyltin	Organotins	X
QA/QC		
Duplicate analysis - SSPC-DU1-COMP		X

If you have any questions regarding this request as checked, please call Jeff Cotsifas at (707)207-7760

Alternative Methods Approved as per conversation w/ Bob Sterns

Calscience Environmental Laboratories, Inc.

WORK ORDER #: 10-07-1715

SAMPLE RECEIPT FORM

Cooler 1 of 1

CLIENT: Pacific Ecorisk DATE: 07/23/10

TEMPERATURE: Thermometer ID: SC1 (Criteria: 0.0 °C – 6.0 °C, not frozen)

Temperature 0.6 °C + 0.5 °C (CF) = 1.1 °C ☐ Blank ☑ Sample

☐ Sample(s) outside temperature criteria (PM/APM contacted by: _____).

☐ Sample(s) outside temperature criteria but received on ice/chilled on same day of sampling.

☐ **Received at ambient temperature, placed on ice for transport by Courier.**

Ambient Temperature: ☐ Air ☐ Filter ☐ Metals Only ☐ PCBs Only Initial: NC

CUSTODY SEALS INTACT:

☐ Cooler ☐_____ ☐ No (Not Intact) ☑ Not Present ☐ N/A Initial: NC

☐ Sample ☐_____ ☐ No (Not Intact) ☑ Not Present Initial: M

SAMPLE CONDITION:	Yes	No	N/A
Chain-Of-Custody (COC) document(s) received with samples	☑	☐	☐
COC document(s) received complete	☑	☐	☐
☐ Collection date/time, matrix, and/or # of containers logged in based on sample labels.			
☐ No analysis requested. ☐ Not relinquished. ☐ No date/time relinquished.			
Sampler's name indicated on COC	☐	☐	☑
Sample container label(s) consistent with COC	☑	☐	☐
Sample container(s) intact and good condition	☑	☐	☐
Proper containers and sufficient volume for analyses requested	☑	☐	☐
Analyses received within holding time	☑	☐	☐
pH / Residual Chlorine / Dissolved Sulfide received within 24 hours	☐	☐	☑
Proper preservation noted on COC or sample container	☐	☐	☑
☐ Unpreserved vials received for Volatiles analysis			
Volatile analysis container(s) free of headspace	☐	☐	☑
Tedlar bag(s) free of condensation	☐	☐	☑

CONTAINER TYPE:

Solid: ☐4ozCGJ ☐8ozCGJ ☑16ozCGJ (2) ☐Sleeve (_____) ☐EnCores® ☐TerraCores® ☑2

Water: ☐VOA ☐VOAh ☐VOAna_2 ☐125AGB ☐125AGBh ☐125AGBp ☐1AGB ☐1AGBna_2 ☐1AGBs ☐500AGB ☐500AGJ ☐500AGJs ☐250AGB ☐250CGB ☐250CGBs ☐1PB ☐500PB ☐500PBna ☐250PB ☐250PBn ☐125PB ☐125PBznna ☐100PJ ☐100PJna_2 ☐_____ ☐_____ ☐_____

Air: ☐Tedlar® ☐Summa® **Other:** ☐_____ **Trip Blank Lot#:**_____ **Labeled/Checked by:** N

Container: C: Clear A: Amber P: Plastic G: Glass J: Jar B: Bottle Z: Ziploc/Resealable Bag E: Envelope **Reviewed by:** NC

Preservative: h: HCL n: HNO_3 na_2:$Na_2S_2O_3$ na: NaOH p: H_3PO_4 s: H_2SO_4 znna: $ZnAc_2$+NaOH f: Field-filtered **Scanned by:** N

SOP T100_090 (05/10/10)

Calscience Environmental Laboratories, Inc.

Supplemental Report 2

August 11, 2010

Subcontract analyses are reported as a stand-alone report.

Jeff Cotsifas
Pacific Ecorisk
2250 Cordelia Road
Fairfield, CA 94534-1912

Subject: **Calscience Work Order No.: 10-07-1715**
Client Reference: Schnitzer Steel

Dear Client:

Enclosed is an analytical report for the above-referenced project. The samples included in this report were received 7/23/2010 and analyzed in accordance with the attached chain-of-custody.

Calscience Environmental Laboratories certifies that the test results provided in this report meet all NELAC requirements for parameters for which accreditation is required or available. Any exceptions to NELAC requirements are noted in the case narrative. The original report of subcontracted analysis, if any, is provided herein, and follows the standard Calscience data package. The results in this analytical report are limited to the samples tested and any reproduction thereof must be made in its entirety.

If you have any questions regarding this report, please do not hesitate to contact the undersigned.

Sincerely,

Calscience Environmental
Laboratories, Inc.
Danielle Gonsman
Project Manager

Core Lab
RESERVOIR OPTIMIZATION

Petroleum Services Division
3437 Landco Dr.
Bakersfield, California 93308
Tel: 661-325-5657
Fax: 661-325-5808
www.corelab.com

August 11, 2010

Danielle Gonsman
Calscience Environmental Laboratories, Inc.
7440 Lincoln Way
Garden Grove, CA 92641-1432

Re: Physical Properties Analyses
Project: 10-07-1715
CL File No: 410065EN

Dear Ms Gonsman;

Enclosed are final analysis results for a sample submitted from your Project # 10-07-1715. Appropriate ASTM, EPA or API methodologies were used for this project and SOP's are available on request. The sample remnants for this project are currently in storage and will be retained for thirty days past completion of testing at no charge. At the end of thirty days the samples will be disposed. You may contact me regarding continued storage, disposal or return of the samples.

We appreciate the opportunity to be of service to Calscience Environmental Laboratories, Inc. and trust these data will prove beneficial in the development of this project. Unless otherwise notified, this electronic version will be the only report issued for this project. Please do not hesitate to contact us (661-325-5657) if you have any questions regarding these results, or if we can be of any additional service.

Sincerely,
Core Laboratories

Jeffry L. Smith
ARP Supervisor

Encl.

CLB
Listed
NYSE

SIEVE and LASER PARTICLE SIZE SUMMARY

(METHODOLOGY: ASTM D422/D4464M)

Petroleum Services

Calscience Environmental Laboratories, Inc.
Proj. No. : 10-07-1715

Core Lab File No : 57111-410065EN
Date : 8/02/2010

Sample ID	Grain Size Description (Mean from Folk)	Median Grain Size, mm	Component Percentages								Silt & Clay
			Gravel	Sand Size						Clay	
				VCoarse	Coarse	Medium	Fine	VFine	Silt		
SSPC-DU1-COMP	silt	0.01	0.00	0.01	1.99	8.63	7.45	3.56	60.86	17.50	78.4

Company : Calscience Environmental Laboratories, Inc.
Proj. No. : 10-07-1715

C.L. File No. : 57111-410065EN
Date : 8/02/2010

Sieve and Laser Particle Size Analysis (Metric)

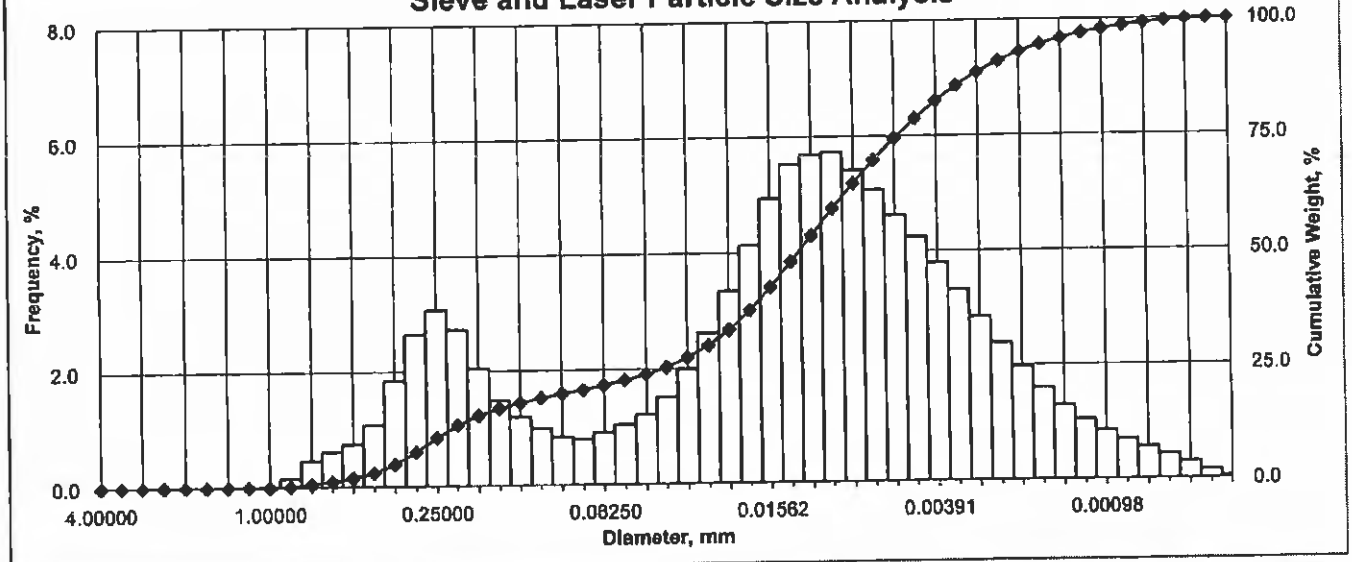
Sample ID	Component Percentages								Percentiles										Sorting Statistics (Folk)				
	Gravel	Sand					Fines		Particle Diameter (mm)										Median	Mean	Sorting	Skew.	Kurt.
		vcgr	cgr	mgr	fgr	vfgr	silt	clay	5	10	16	25	40	50	75	84	90	95	mm	mm	ϕ		
SSPC-DU1-COMP	0.00	0.01	1.99	8.63	7.45	3.56	#####	17.50	0.3515 mgr	0.2588 mgr	0.1659 fgr	** **	0.0169 silt	0.0123 silt	0.0054 silt	0.0036 clay	0.0025 clay	0.0016 clay	0.012 silt	0.019 silt	2.563 v. Poor	-0.299 coarse	** **

** Particle-size distribution pattern precludes calculation of these statistical parameters

Company : Calscience Environmental Laboratories, Inc.
Proj. No. : 10-07-1715

CL File No. : 57111-410065EN
Sample ID : SSPC-DU1-COMP

Sieve and Laser Particle Size Analysis



Particle Size Distribution

	Diameter [US Mesh]	[in.]	[mm]	[ϕ]	Weight % [Incl.]	[Cum.]
Granule	5	0.157480	4.00000	-2.00	0.000	0.00
	6	0.132425	3.36359	-1.75	0.000	0.00
	7	0.111355	2.82843	-1.50	0.000	0.00
	8	0.093638	2.37841	-1.25	0.000	0.00
	10	0.078740	2.00000	-1.00	0.000	0.00
V Crse Sand	12	0.066212	1.68179	-0.75	0.000	0.00
	14	0.055678	1.41421	-0.50	0.000	0.00
	16	0.046819	1.18921	-0.25	0.000	0.00
	18	0.039370	1.00000	0.00	0.014	0.01
Coarse Sand	20	0.033106	0.84090	0.25	0.161	0.17
	25	0.027839	0.70711	0.50	0.464	0.64
	30	0.023410	0.59460	0.75	0.616	1.26
	35	0.019685	0.50000	1.00	0.747	2.00
Medium Sand	40	0.016553	0.42045	1.25	1.078	3.08
	45	0.013919	0.35355	1.50	1.846	4.93
	50	0.011705	0.29730	1.75	2.640	7.57
	60	0.009843	0.25000	2.00	3.064	10.63
Fine Sand	70	0.008277	0.21022	2.25	2.723	13.35
	80	0.006960	0.17678	2.50	2.043	15.40
	100	0.005852	0.14865	2.75	1.488	16.88
	120	0.004921	0.12500	3.00	1.196	18.08
V. Fine Sand	140	0.004138	0.10511	3.25	1.001	19.08
	170	0.003480	0.08839	3.50	0.849	19.93
	200	0.002926	0.07433	3.75	0.798	20.73
Silt	230	0.002461	0.06250	4.00	0.915	21.64
	270	0.002069	0.05256	4.25	1.050	22.69
	325	0.001740	0.04419	4.50	1.217	23.91
	400	0.001463	0.03716	4.75	1.514	25.43
	450	0.001230	0.03125	5.00	1.896	27.42
	500	0.001035	0.02628	5.25	2.613	30.04
	635	0.000870	0.02210	5.50	3.338	33.37
		0.000732	0.01858	5.75	4.129	37.50
		0.000615	0.01562	6.00	4.935	42.44
		0.000517	0.01314	6.25	5.521	47.96
		0.000435	0.01105	6.50	5.681	53.64
		0.000366	0.00929	6.75	5.729	59.37
		0.000308	0.00781	7.00	5.414	64.78
		0.000259	0.00657	7.25	5.071	69.85
		0.000217	0.00552	7.50	4.621	74.47
		0.000183	0.00465	7.75	4.244	78.72
		0.000154	0.00391	8.00	3.784	82.50
Clay		0.000129	0.00328	8.25	3.318	85.82
		0.000109	0.00276	8.50	2.842	88.66
		0.000091	0.00232	8.75	2.390	91.05
		0.000077	0.00195	9.00	1.969	93.02
		0.000065	0.00164	9.25	1.598	94.62
		0.000054	0.00138	9.50	1.286	95.91
		0.000046	0.00116	9.75	1.048	96.95
		0.000038	0.00098	10.00	0.850	97.80
		0.000032	0.00082	10.25	0.700	98.50
		0.000027	0.00069	10.50	0.563	99.07
		0.000023	0.00058	10.75	0.433	99.50
		0.000019	0.00049	11.00	0.301	99.80
		0.000016	0.00041	11.25	0.152	99.95
		0.000015	0.00038	11.50	0.048	100.00

Sorting Statistics (Folk)

Parameter	Trask	Inman	Folk
Median		Silt sized	
(In)	0.0005	0.0005	0.0005
(mm)	0.0123	0.0123	0.0123
Mean		Silt sized	
(In)	**	0.0010	0.0008
(mm)	**	0.0245	0.0195
Sorting		V. Poor	
	**	0.148	2.563
Skewness		Coarse skewed	
	**	-0.337	-0.299
Kurtosis		**	
	**	0.416	**

Component Percentages

Gravel	Sand	Silt	Clay	Silt + Clay
0.00	21.64	60.86	17.50	78.36

Percentile [Weight, %]	Particle Diameter [in.]	[mm]	[phi]
5	0.0138	0.3515	1.5084
10	0.0102	0.2588	1.9501
16	0.0065	0.1659	2.5915
25	**	**	**
40	0.0007	0.0169	5.8873
50	0.0005	0.0123	6.3418
75	0.0002	0.0054	7.5285
84	0.0001	0.0036	8.1065
90	0.0001	0.0025	8.6342
95	0.0001	0.0016	9.3186

** Distribution pattern precludes calculation of these statistical parameters.

410650N

Calscience Environmental Laboratories, Inc.

7440 LINCOLN WAY
GARDEN GROVE, CA 92841-1427
TEL: (714) 895-5494 . FAX: (714) 894-7501

TO: CORE

CHAIN OF CUSTODY RECORD

DATE: 07/23/10
PAGE: 1 OF 1

LABORATORY CLIENT: Calscience Environmental Laboratories, Inc.	CLIENT PROJECT NAME / NUMBER: 10-07-1715
ADDRESS: 7440 Lincoln Way	P.O. NO.: 10-07-1715
CITY: Garden Grove, CA 92841-1427	PROJECT CONTACT: Danielle Gonsman
TEL: (714) 895-5494 / E-MAIL: dgonsman@calscience.com	QUOTE NO.:
TEMP BLANK:	

TURNAROUND TIME: ___SAME DAY ___24 HR ___48HR ___72 HR ___5 DAYS _X_NORMAL

SPECIAL REQUIREMENTS (ADDITIONAL COSTS MAY APPLY)

☐ RWQCB REPORTING ☐ ARCHIVE SAMPLES UNTIL ___/___/___

SPECIAL INSTRUCTIONS

—

REQUESTED ANALYSIS

LAB USE ONLY	SAMPLE ID	SAMPLING DATE	SAMPLING TIME	Matrix	Scont	Grain Size by ASTM D4464
	SSPC-DU1-COMP	07/21/10	0910	sed	1 ziploc	X

Relinquished by: (Signature) WCbatt (CALSCENCE)	Received by / Affiliation: (Signature) GSO5146158Z1	Date: 7/26/10	Time: 1430
Relinquished by: (Signature)	Received by / Affiliation: (Signature) THUH	Date: 7/27/10	Time: 1700
Relinquished by: (Signature)	Received by / Affiliation: (Signature)	Date:	Time:

410064, 65 66 & 67 EN

7/27/10

GSO
GOLDEN STATE OVERNIGHT

WebShip >>>>>
800-322-5555 www.gso.com

Ship From:
SAMPLE CONTROL
CAL SCIENCE
7440 LINCOLN WAY
GARDEN GROVE, CA 92841

Ship To:
LARRY KUNKUL
CORE LABORATORY
3437 LANDCO DRIVE
BAKERSFIELD, CA 93308

COD:
$0.00

Reference:
DG/10-07-1304/1715/1861/XD/10-07-1777

Delivery Instructions:

Signature Type:
SIGNATURE REQUIRED

Tracking #: 514615821

NPS

BFL

G

BAKERSFIELD

D93312A

83390173

Print Date : 07/26/10 14:21 PM

Package 1 of 1

CUSTODY SEAL

ENVIRONMENTAL SAMPLING SUPPLY
9601 San Leandro St. Oakland, CA 800-233-8425

410064, 65, 66 & 67
7/27/10

Date: 7/26/10

Signature: WCbath.ca

CHAIN OF CUSTODY RECORD

1715

PACIFIC ECORISK
2250 Cordelia Rd
Fairfield, CA 94534
Ph: (707) 207-7760
Fax: (707) 207-7916
www.pacificecorisk.com

RESULTS TO: Same
Attn: Jeff Cotsifas
Phone:
Email:

BILL TO: Same
Attn: Cynthia Garcia
Phone:
Email:

PROJECT: Schnitzer Steel

SAMPLE IDENTIFICATION	DATE	TIME	SAMPLE MATRIX	GRAB/ COMP.	# CONTAINERS/TYPE	ANALYSES REQUESTED: See ATTACHED LIST	ANALYSES REQUESTED: GRAIN Size	REMARKS
SSPC-DU1-COMP	7/21/10	09:10	Seal	Comp	2 1500ml Glass	✓		
SSPC-DU1-COMP	7/21/10	09:10	Seal	Comp	1 1 Ziploc Bag		✓	
					/			
					/			
					/			
					/			
					/			
					/			
					/			

METHOD OF SHIPMENT: FedEx: X UPS: HAND: OTHER:

COMMENTS: Please run duplicate analysis on SSPC-DU1-COMP for Chemistry

CODES:

RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RECEIVED BY: (SIGNATURE)	DATE	TIME	PAGE #
C Jenkins	7/22/10	16:00	CCL	7/23/10	1030	1 OF 1

WHITE - RETURN W/ SAMPLE YELLOW - KEEP FOR YOUR RECORDS

ANALYTE LIST

Pacific EcoRisk
2250 Cordelia Rd.
Fairfield, CA 94534

Project Proponent: **Pacific EcoRisk**

Project #: Schnitzer Steel

Site #: SSPC-DU1-COMP

Standard Ocean Disposal List

Solids, Total	SMEWW 2540 B	X
Total Organic Carbon	ASTM D4129-82M	X
Grain Size	Plumb 1981/ASTM	X
Arsenic	6020	X
Cadmium	6020	X
Chromium	6020	X
Copper	6020	X
Lead	6020	X
Nickel	6020	X
Silver	6020	X
Zinc	6020	X
Mercury	7471A	X
Selenium	7740 - GFAA	X
2,4'-DDD	8081A	X
2,4'-DDE	8081A	X
2,4'-DDT	8081A	X
4,4'-DDD	8081A	X
4,4'-DDE	8081A	X
4,4'-DDT	8081A	X
Aldrin	8081A	X
alpha-BHC	8081A	X
alpha-Chlordane	8081A	X
beta-BHC	8081A	X
Chlordane	8081A	X
delta-BHC	8081A	X
Dieldrin	8081A	X
Endosulfan I	8081A	X
Endosulfan II	8081A	X
Endosulfan Sulfate	8081A	X
Endrin	8081A	X
Endrin Aldehyde	8081A	X
gamma-BHC (Lindane)	8081A	X
gamma-Chlordane	8081A	X
Heptachlor	8081A	X
Heptachlor Epoxide	8081A	X
Toxaphene	8081A	X
PCBs 1016	8082 PCBs	X
PCBs 1221	8082 PCBs	X
PCBs 1232	8082 PCBs	X
PCBs1242	8082 PCBs	X
PCBs1248	8082 PCBs	X
PCBs1254	8082 PCBs	X
PCBs1260	8082 PCBs	X
PCBs1262	8082 PCBs	X
PCBs1268	8082 PCBs	X
Acenaphthene	8270C-SIM PAH	X

Acenaphthylene	8270C-SIM PAH	X
Anthracene	8270C-SIM PAH	X
Benz(a)anthracene	8270C-SIM PAH	X
Benzo(a)pyrene	8270C-SIM PAH	X
Benzo(b)fluoranthene	8270C-SIM PAH	X
Benzo(g,h,i)perylene	8270C-SIM PAH	X
Benzo(k)fluoranthene	8270C-SIM PAH	X
Chrysene	8270C-SIM PAH	X
Dibenz(a,h)anthracene	8270C-SIM PAH	X
Fluoranthene	8270C-SIM PAH	X
Fluorene	8270C-SIM PAH	X
Indeno(1,2,3-cd)pyrene	8270C-SIM PAH	X
Naphthalene	8270C-SIM PAH	X
Phenanthrene	8270C-SIM PAH	X
Pyrene	8270C-SIM PAH	X
Di-n-butyltin	Organotins	X
n-Butyltin	Organotins	X
Tetra-n-butyltin	Organotins	X
Tri-n-butyltin	Organotins	X
QA/QC		
Duplicate analysis - SSPC-DU1-COMP		X

If you have any questions regarding this request as checked, please call Jeff Cotsifas at (707)207-7760

Alternative Methods Approved as per conversation w/ Bob Sterns

Calscience Environmental Laboratories, Inc.

WORK ORDER #: 10-07-1715

SAMPLE RECEIPT FORM

Cooler 1 of 1

CLIENT: Pacific Ecorisk

DATE: 07/23/10

TEMPERATURE: Thermometer ID: SC1 (Criteria: 0.0 °C – 6.0 °C, not frozen)

Temperature 0.6 °C + 0.5 °C (CF) = 1.1 °C ☐ Blank ☑ Sample

☐ Sample(s) outside temperature criteria (PM/APM contacted by: _____).

☐ Sample(s) outside temperature criteria but received on ice/chilled on same day of sampling.

☐ **Received at ambient temperature, placed on ice for transport by Courier.**

Ambient Temperature: ☐ Air ☐ Filter ☐ Metals Only ☐ PCBs Only Initial: NC

CUSTODY SEALS INTACT:

☐ Cooler ☐_____ ☐ No (Not Intact) ☑ Not Present ☐ N/A Initial: NC

☐ Sample ☐_____ ☐ No (Not Intact) ☑ Not Present Initial: NC

SAMPLE CONDITION:	Yes	No	N/A
Chain-Of-Custody (COC) document(s) received with samples	☑	☐	☐
COC document(s) received complete	☑	☐	☐
☐ Collection date/time, matrix, and/or # of containers logged in based on sample labels.			
☐ No analysis requested. ☐ Not relinquished. ☐ No date/time relinquished.			
Sampler's name indicated on COC	☐	☐	☑
Sample container label(s) consistent with COC	☑	☐	☐
Sample container(s) intact and good condition	☑	☐	☐
Proper containers and sufficient volume for analyses requested	☑	☐	☐
Analyses received within holding time	☑	☐	☐
pH / Residual Chlorine / Dissolved Sulfide received within 24 hours	☐	☐	☑
Proper preservation noted on COC or sample container	☐	☐	☑
☐ Unpreserved vials received for Volatiles analysis			
Volatile analysis container(s) free of headspace	☐	☐	☑
Tedlar bag(s) free of condensation	☐	☐	☑

CONTAINER TYPE:

Solid: ☐4ozCGJ ☐8ozCGJ ☑16ozCGJ (2) ☐Sleeve (_____) ☐EnCores® ☐TerraCores® ☑2

Water: ☐VOA ☐VOAh ☐VOA**na$_2$** ☐125AGB ☐125AGB**h** ☐125AGB**p** ☐1AGB ☐1AGB**na$_2$** ☐1AGB**s** ☐500AGB ☐500AGJ ☐500AGJ**s** ☐250AGB ☐250CGB ☐250CGB**s** ☐1PB ☐500PB ☐500PB**na** ☐250PB ☐250PB**n** ☐125PB ☐125PB**znna** ☐100PJ ☐100PJ**na$_2$** ☐_____ ☐_____ ☐_____

Air: ☐Tedlar® ☐Summa® **Other:** ☐_____ **Trip Blank Lot#:**_____ **Labeled/Checked by:** (1)

Container: C: Clear A: Amber P: Plastic G: Glass J: Jar B: Bottle Z: Ziploc/Resealable Bag E: Envelope **Reviewed by:** NC

Preservative: h: HCL n: HNO_3 na$_2$: $Na_2S_2O_3$ na: NaOH p: H_3PO_4 s: H_2SO_4 znna: $ZnAc_2$+NaOH f: Field-filtered **Scanned by:** (2)

SOP T100_090 (05/10/10)

Calscience Environmental Laboratories, Inc.

Supplemental Report 1

August 09, 2010

Additional requested analyses are reported as a stand-alone report.

Jeff Cotsifas
Pacific Ecorisk
2250 Cordelia Road
Fairfield, CA 94534-1912

Subject: **Calscience Work Order No.: 10-07-1715**
Client Reference: Schnitzer Steel

Dear Client:

Enclosed is an analytical report for the above-referenced project. The samples included in this report were received 7/23/2010 and analyzed in accordance with the attached chain-of-custody.

Calscience Environmental Laboratories certifies that the test results provided in this report meet all NELAC requirements for parameters for which accreditation is required or available. Any exceptions to NELAC requirements are noted in the case narrative. The original report of subcontracted analysis, if any, is provided herein, and follows the standard Calscience data package. The results in this analytical report are limited to the samples tested and any reproduction thereof must be made in its entirety.

If you have any questions regarding this report, please do not hesitate to contact the undersigned.

Sincerely,

Calscience Environmental
Laboratories, Inc.
Danielle Gonsman
Project Manager

Calscience Environmental Laboratories, Inc.

Analytical Report

Pacific Ecorisk
2250 Cordelia Road
Fairfield, CA 94534-1912

Date Received: 07/23/10
Work Order No: 10-07-1715
Preparation: EPA 3050B
Method: EPA 6020

Project: Schnitzer Steel

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
SSPC-DUI-COMP	**10-07-1715-1-B**	**07/21/10 09:10**	**Sediment**	**ICP/MS 04**	**08/06/10**	**08/06/10 13:09**	**100806L01**

-Results are reported on a dry weight basis.

Parameter	Result	RL	DF	Qual	Units
Zinc	292	10.9	1		mg/kg

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
SSPC-DUI-COMP (DUPLICATE)	**10-07-1715-2-B**	**07/21/10 09:10**	**Sediment**	**ICP/MS 04**	**08/06/10**	**08/06/10 13:06**	**100806L01**

-Results are reported on a dry weight basis.

Parameter	Result	RL	DF	Qual	Units
Zinc	240	11.2	1		mg/kg

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
Method Blank	**096-10-002-1,798**	**N/A**	**Solid**	**ICP/MS 04**	**08/06/10**	**08/06/10 12:38**	**100806L01**

Parameter	Result	RL	DF	Qual	Units
Zinc	ND	5.00	1		mg/kg

RL - Reporting Limit , DF - Dilution Factor , Qual - Qualifiers

Calscience Environmental Laboratories, Inc.

Quality Control - Spike/Spike Duplicate

Pacific Ecorisk	Date Received: 07/23/10
2250 Cordelia Road	Work Order No: 10-07-1715
Fairfield, CA 94534-1912	Preparation: EPA 3050B
	Method: EPA 6020

Project Schnitzer Steel

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	MS/MSD Batch Number
SSPC-DUI-COMP (DUPLICATE)	**Sediment**	**ICP/MS 04**	**08/06/10**	**08/06/10**	**100806S01**

Parameter	MS %REC	MSD %REC	%REC CL	RPD	RPD CL	Qualifiers
Zinc	4X	4X	23-173	4X	0-18	Q

RPD - Relative Percent Difference , CL - Control Limit

Calscience Environmental Laboratories, Inc.

Quality Control - PDS / PDSD

Pacific Ecorisk
2250 Cordelia Road
Fairfield, CA 94534-1912

Date Received: 07/23/10
Work Order No: 10-07-1715
Preparation: EPA 3050B
Method: EPA 6020

Project: Schnitzer Steel

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	PDS / PDSD Batch Number
SSPC-DUI-COMP (DUPLICATE)	**Sediment**	**ICP/MS 04**	**08/06/10**	**08/06/10**	**100806S01**

Parameter	PDS %REC	PDSD %REC	%REC CL	RPD	RPD CL	Qualifiers
Zinc	4X	4X	75-125	4X	0-18	Q

RPD - Relative Percent Difference , CL - Control Limit

Calscience Environmental Laboratories, Inc.

Quality Control - LCS/LCS Duplicate

Pacific Ecorisk
2250 Cordelia Road
Fairfield, CA 94534-1912

Date Received: N/A
Work Order No: 10-07-1715
Preparation: EPA 3050B
Method: EPA 6020

Project: Schnitzer Steel

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number
096-10-002-1,798	**Solid**	**ICP/MS 04**	**08/06/10**	**08/06/10**	**100806L01**

Parameter	LCS %REC	LCSD %REC	%REC CL	RPD	RPD CL	Qualifiers
Zinc	102	104	80-120	2	0-20	

RPD - Relative Percent Difference , CL - Control Limit

CHAIN OF CUSTODY RECORD

1715

PACIFIC ECORISK
2250 Cordelia Rd
Fairfield, CA 94534
Ph: (707) 207-7760
Fax: (707) 207-7916
www.pacificecorisk.com

RESULTS TO: Same
Attn: Jeff Caltabiano
Phone:
Email:

BILL TO: Same
Attn: Cynthia Garcia
Phone:
Email:

PROJECT: Schnitzer Steel

SAMPLE IDENTIFICATION	DATE	TIME	SAMPLE MATRIX	GRAB/ COMP.	# CONTAINERS/TYPE	See ATTACHED LIST	GRAIN Size							REMARKS
SSPC-DUI-COMP	7/21/10	09:10	Soil	Comp	2 1500mL Glass	✓								
SSPC-DUI-COMP	7/21/10	09:10	Soil	Comp	1 1 Ziploc Bag		✓							
					/									
					/									
					/									
					/									
					/									
					/									
					/									

ANALYSES REQUESTED

METHOD OF SHIPMENT: FedEx: X UPS: HAND: OTHER:

COMMENTS: Please run duplicate analysis on SSPC-DUI-COMP for Chemistry

CODES:

RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RECEIVED BY: (SIGNATURE)	DATE	TIME	PAGE #
C Jenkins	7/22/10	16:00	[signature] COC	7/23/10	1030	1 OF 1

WHITE - RETURN W/ SAMPLE YELLOW - KEEP FOR YOUR RECORDS

ANALYTE LIST

Pacific EcoRisk
2250 Cordelia Rd.
Fairfield, CA 94534

Project Proponent: **Pacific EcoRisk**

Project #: Schnitzer Steel

Site #: SSPC-DU1-COMP

Standard Ocean Disposal List

Solids, Total	SMEWW 2540 B	X
Total Organic Carbon	ASTM D4129-82M	X
Grain Size	Plumb 1981/ASTM	X
Arsenic	6020	X
Cadmium	6020	X
Chromium	6020	X
Copper	6020	X
Lead	6020	X
Nickel	6020	X
Silver	6020	X
Zinc	6020	X
Mercury	7471A	X
Selenium	7740 - GFAA	X
2,4'-DDD	8081A	X
2,4'-DDE	8081A	X
2,4'-DDT	8081A	X
4,4'-DDD	8081A	X
4,4'-DDE	8081A	X
4,4'-DDT	8081A	X
Aldrin	8081A	X
alpha-BHC	8081A	X
alpha-Chlordane	8081A	X
beta-BHC	8081A	X
Chlordane	8081A	X
delta-BHC	8081A	X
Dieldrin	8081A	X
Endosulfan I	8081A	X
Endosulfan II	8081A	X
Endosulfan Sulfate	8081A	X
Endrin	8081A	X
Endrin Aldehyde	8081A	X
gamma-BHC (Lindane)	8081A	X
gamma-Chlordane	8081A	X
Heptachlor	8081A	X
Heptachlor Epoxide	8081A	X
Toxaphene	8081A	X
PCBs 1016	8082 PCBs	X
PCBs 1221	8082 PCBs	X
PCBs 1232	8082 PCBs	X
PCBs1242	8082 PCBs	X
PCBs1248	8082 PCBs	X
PCBs1254	8082 PCBs	X
PCBs1260	8082 PCBs	X
PCBs1262	8082 PCBs	X
PCBs1268	8082 PCBs	X
Acenaphthene	8270C-SIM PAH	X

Acenaphthylene	8270C-SIM PAH	X
Anthracene	8270C-SIM PAH	X
Benz(a)anthracene	8270C-SIM PAH	X
Benzo(a)pyrene	8270C-SIM PAH	X
Benzo(b)fluoranthene	8270C-SIM PAH	X
Benzo(g,h,i)perylene	8270C-SIM PAH	X
Benzo(k)fluoranthene	8270C-SIM PAH	X
Chrysene	8270C-SIM PAH	X
Dibenz(a,h)anthracene	8270C-SIM PAH	X
Fluoranthene	8270C-SIM PAH	X
Fluorene	8270C-SIM PAH	X
Indeno(1,2,3-cd)pyrene	8270C-SIM PAH	X
Naphthalene	8270C-SIM PAH	X
Phenanthrene	8270C-SIM PAH	X
Pyrene	8270C-SIM PAH	X
Di-n-butyltin	Organotins	X
n-Butyltin	Organotins	X
Tetra-n-butyltin	Organotins	X
Tri-n-butyltin	Organotins	X
QA/QC		
Duplicate analysis - SSPC-DU1-COMP		X

If you have any questions regarding this request as checked, please call Jeff Cotsifas at (707)207-7760

Alternative Methods Approved as per conversation w/ Bob Sterns

Calscience Environmental Laboratories, Inc.

WORK ORDER #: 10-07-1715

SAMPLE RECEIPT FORM

Cooler 1 of 1

CLIENT: Pacific Ecorisk

DATE: 07/23/10

TEMPERATURE: Thermometer ID: SC1 (Criteria: 0.0 °C – 6.0 °C, not frozen)

Temperature 0.6 °C + 0.5 °C (CF) = 1.1 °C ☐ Blank ☑ Sample

☐ Sample(s) outside temperature criteria (PM/APM contacted by: _____).

☐ Sample(s) outside temperature criteria but received on ice/chilled on same day of sampling.

☐ **Received at ambient temperature, placed on ice for transport by Courier.**

Ambient Temperature: ☐ Air ☐ Filter ☐ Metals Only ☐ PCBs Only Initial: NC

CUSTODY SEALS INTACT:

☐ Cooler ☐_____ ☐ No (Not Intact) ☑ Not Present ☐ N/A Initial: NC

☐ Sample ☐_____ ☐ No (Not Intact) ☑ Not Present Initial: NC

SAMPLE CONDITION:	Yes	No	N/A
Chain-Of-Custody (COC) document(s) received with samples	☑	☐	☐
COC document(s) received complete	☑	☐	☐
☐ Collection date/time, matrix, and/or # of containers logged in based on sample labels.			
☐ No analysis requested. ☐ Not relinquished. ☐ No date/time relinquished.			
Sampler's name indicated on COC	☐	☐	☑
Sample container label(s) consistent with COC	☑	☐	☐
Sample container(s) intact and good condition	☑	☐	☐
Proper containers and sufficient volume for analyses requested	☑	☐	☐
Analyses received within holding time	☑	☐	☐
pH / Residual Chlorine / Dissolved Sulfide received within 24 hours	☐	☐	☑
Proper preservation noted on COC or sample container	☐	☐	☑
☐ Unpreserved vials received for Volatiles analysis			
Volatile analysis container(s) free of headspace	☐	☐	☑
Tedlar bag(s) free of condensation	☐	☐	☑

CONTAINER TYPE:

Solid: ☐4ozCGJ ☐8ozCGJ ☑16ozCGJ (2) ☐Sleeve (_____) ☐EnCores® ☐TerraCores® ☑2

Water: ☐VOA ☐VOAh ☐VOAna_2 ☐125AGB ☐125AGBh ☐125AGBp ☐1AGB ☐1AGBna_2 ☐1AGBs ☐500AGB ☐500AGJ ☐500AGJs ☐250AGB ☐250CGB ☐250CGBs ☐1PB ☐500PB ☐500PBna ☐250PB ☐250PBn ☐125PB ☐125PBznna ☐100PJ ☐100PJna_2 ☐_____ ☐_____ ☐_____

Air: ☐Tedlar® ☐Summa® **Other:** ☐_____ **Trip Blank Lot#:**_____ **Labeled/Checked by:** IM

Container: C: Clear A: Amber P: Plastic G: Glass J: Jar B: Bottle Z: Ziploc/Resealable Bag E: Envelope **Reviewed by:** MC

Preservative: h: HCL n: HNO_3 na_2:$Na_2S_2O_3$ na: NaOH p: H_3PO_4 s: H_2SO_4 znna: $ZnAc_2$+NaOH f: Field-filtered **Scanned by:** [illegible]

SOP T100_090 (05/10/10)

Calscience
Environmental
Laboratories, Inc.

Supplemental Report 3

August 12, 2010

Additional requested analyses are reported as a stand-alone report.

Jeff Cotsifas
Pacific Ecorisk
2250 Cordelia Road
Fairfield, CA 94534-1912

Subject: **Calscience Work Order No.: 10-07-1715**
Client Reference: Schnitzer Steel

Dear Client:

Enclosed is an analytical report for the above-referenced project. The samples included in this report were received 7/23/2010 and analyzed in accordance with the attached chain-of-custody.

Calscience Environmental Laboratories certifies that the test results provided in this report meet all NELAC requirements for parameters for which accreditation is required or available. Any exceptions to NELAC requirements are noted in the case narrative. The original report of subcontracted analysis, if any, is provided herein, and follows the standard Calscience data package. The results in this analytical report are limited to the samples tested and any reproduction thereof must be made in its entirety.

If you have any questions regarding this report, please do not hesitate to contact the undersigned.

Sincerely,

Calscience Environmental
Laboratories, Inc.
Danielle Gonsman
Project Manager

Calscience Environmental Laboratories, Inc.

Analytical Report

Pacific Ecorisk
2250 Cordelia Road
Fairfield, CA 94534-1912

Date Received: 07/23/10
Work Order No: 10-07-1715
Preparation: EPA 3545
Method: EPA 8270C SIM PCB Congeners
Units: ug/kg

Project: Schnitzer Steel

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
SSPC-DUI-COMP	**10-07-1715-1-A**	**07/21/10 09:10**	**Sediment**	**GC/MS N**	**08/06/10**	**08/07/10 18:53**	**100806L12**

Comment(s): -Results were evaluated to the MDL, concentrations >= to the MDL but < RL, if found, are qualified with a "J" flag.
-Results are reported on a dry weight basis.

Parameter	Result	RL	MDL	DF	Qual	Parameter	Result	RL	MDL	DF	Qual
PCB008	ND	11	3.9	1		PCB184	ND	11	3.7	1	
PCB018	ND	11	3.8	1		PCB153	ND	11	3.6	1	
PCB028	ND	11	3.8	1		PCB168	ND	11	3.5	1	
PCB052	ND	11	4.4	1		PCB105	ND	11	4.2	1	
PCB049	ND	11	3.8	1		PCB138/158	ND	11	7.6	1	
PCB044	ND	11	3.8	1		PCB187	ND	11	3.8	1	
PCB037	ND	11	3.9	1		PCB183	ND	11	3.7	1	
PCB074	ND	11	3.8	1		PCB126	ND	11	3.6	1	
PCB070	ND	11	4.0	1		PCB128	ND	11	3.6	1	
PCB066	ND	11	3.8	1		PCB167	ND	11	3.8	1	
PCB101	ND	11	4.0	1		PCB177	ND	11	3.7	1	
PCB099	ND	11	3.8	1		PCB156	ND	11	4.1	1	
PCB119	ND	11	3.7	1		PCB157	ND	11	3.9	1	
PCB087	ND	11	3.9	1		PCB180	ND	11	3.8	1	
PCB081	ND	11	3.9	1		PCB170	ND	11	3.2	1	
PCB110	ND	11	3.6	1		PCB201	ND	11	7.1	1	
PCB151	ND	11	3.7	1		PCB169	ND	11	3.4	1	
PCB077	ND	11	3.8	1		PCB189	ND	11	3.6	1	
PCB149	ND	11	3.7	1		PCB195	ND	11	3.4	1	
PCB123	ND	11	3.6	1		PCB194	ND	11	3.0	1	
PCB118	ND	11	3.9	1		PCB206	ND	11	4.0	1	
PCB114	ND	11	3.7	1		PCB209	ND	11	3.8	1	

Surrogates:	REC (%)	Control Limits	Qual
2,4,5,6-Tetrachloro-m-Xylene	78	50-125	

RL - Reporting Limit , DF - Dilution Factor , Qual - Qualifiers

Calscience Environmental Laboratories, Inc.

Analytical Report

Pacific Ecorisk
2250 Cordelia Road
Fairfield, CA 94534-1912

Date Received: 07/23/10
Work Order No: 10-07-1715
Preparation: EPA 3545
Method: EPA 8270C SIM PCB Congeners
Units: ug/kg

Project: Schnitzer Steel

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
SSPC-DUI-COMP (DUPLICATE)	**10-07-1715-2-A**	**07/21/10 09:10**	**Sediment**	**GC/MS N**	**08/06/10**	**08/07/10 19:28**	**100806L12**

Comment(s): -Results were evaluated to the MDL, concentrations >= to the MDL but < RL, if found, are qualified with a "J" flag.
-Results are reported on a dry weight basis.

Parameter	Result	RL	MDL	DF	Qual	Parameter	Result	RL	MDL	DF	Qual
PCB008	ND	11	4.0	1		PCB184	ND	11	3.8	1	
PCB018	ND	11	3.9	1		PCB153	ND	11	3.7	1	
PCB028	ND	11	3.9	1		PCB168	ND	11	3.6	1	
PCB052	ND	11	4.6	1		PCB105	ND	11	4.3	1	
PCB049	ND	11	3.9	1		PCB138/158	ND	11	7.8	1	
PCB044	ND	11	3.9	1		PCB187	ND	11	3.9	1	
PCB037	ND	11	4.0	1		PCB183	ND	11	3.8	1	
PCB074	ND	11	4.0	1		PCB126	ND	11	3.7	1	
PCB070	ND	11	4.2	1		PCB128	ND	11	3.7	1	
PCB066	ND	11	3.9	1		PCB167	ND	11	3.9	1	
PCB101	5.3	11	4.2	1	J	PCB177	ND	11	3.9	1	
PCB099	ND	11	3.9	1		PCB156	ND	11	4.3	1	
PCB119	ND	11	3.9	1		PCB157	ND	11	4.0	1	
PCB087	ND	11	4.0	1		PCB180	ND	11	3.9	1	
PCB081	ND	11	4.0	1		PCB170	ND	11	3.3	1	
PCB110	5.5	11	3.7	1	J	PCB201	ND	11	7.3	1	
PCB151	ND	11	3.8	1		PCB169	ND	11	3.5	1	
PCB077	ND	11	3.9	1		PCB189	ND	11	3.7	1	
PCB149	ND	11	3.8	1		PCB195	ND	11	3.5	1	
PCB123	ND	11	3.7	1		PCB194	ND	11	3.1	1	
PCB118	4.3	11	4.0	1	J	PCB206	ND	11	4.2	1	
PCB114	ND	11	3.8	1		PCB209	ND	11	3.9	1	

Surrogates:	REC (%)	Control Limits	Qual
2,4,5,6-Tetrachloro-m-Xylene	78	50-125	

RL - Reporting Limit , DF - Dilution Factor , Qual - Qualifiers

Calscience Environmental Laboratories, Inc.

Analytical Report

Pacific Ecorisk
2250 Cordelia Road
Fairfield, CA 94534-1912

Date Received: 07/23/10
Work Order No: 10-07-1715
Preparation: EPA 3545
Method: EPA 8270C SIM PCB Congeners
Units: ug/kg

Project: Schnitzer Steel

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
Method Blank	**099-13-017-122**	**N/A**	**Solid**	**GC/MS N**	**08/06/10**	**08/07/10 15:29**	**100806L12**

Comment(s): -Results were evaluated to the MDL, concentrations >= to the MDL but < RL, if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qual	Parameter	Result	RL	MDL	DF	Qual
PCB008	ND	5.0	1.8	1		PCB184	ND	5.0	1.7	1	
PCB018	ND	5.0	1.7	1		PCB153	ND	5.0	1.7	1	
PCB028	ND	5.0	1.7	1		PCB168	ND	5.0	1.6	1	
PCB052	ND	5.0	2.0	1		PCB105	ND	5.0	1.9	1	
PCB049	ND	5.0	1.7	1		PCB138/158	ND	5.0	3.5	1	
PCB044	ND	5.0	1.8	1		PCB187	ND	5.0	1.7	1	
PCB037	ND	5.0	1.8	1		PCB183	ND	5.0	1.7	1	
PCB074	ND	5.0	1.8	1		PCB126	ND	5.0	1.6	1	
PCB070	ND	5.0	1.9	1		PCB128	ND	5.0	1.7	1	
PCB066	ND	5.0	1.7	1		PCB167	ND	5.0	1.7	1	
PCB101	ND	5.0	1.9	1		PCB177	ND	5.0	1.7	1	
PCB099	ND	5.0	1.8	1		PCB156	ND	5.0	1.9	1	
PCB119	ND	5.0	1.7	1		PCB157	ND	5.0	1.8	1	
PCB087	ND	5.0	1.8	1		PCB180	ND	5.0	1.7	1	
PCB081	ND	5.0	1.8	1		PCB170	ND	5.0	1.5	1	
PCB110	ND	5.0	1.7	1		PCB201	ND	5.0	3.3	1	
PCB151	ND	5.0	1.7	1		PCB169	ND	5.0	1.6	1	
PCB077	ND	5.0	1.7	1		PCB189	ND	5.0	1.7	1	
PCB149	ND	5.0	1.7	1		PCB195	ND	5.0	1.6	1	
PCB123	ND	5.0	1.7	1		PCB194	ND	5.0	1.4	1	
PCB118	ND	5.0	1.8	1		PCB206	ND	5.0	1.9	1	
PCB114	ND	5.0	1.7	1		PCB209	ND	5.0	1.8	1	

Surrogates:	REC (%)	Control Limits	Qual
2,4,5,6-Tetrachloro-m-Xylene	96	50-125	

RL - Reporting Limit , DF - Dilution Factor , Qual - Qualifiers

Calscience Environmental Laboratories, Inc.

Quality Control - Spike/Spike Duplicate

Pacific Ecorisk
2250 Cordelia Road
Fairfield, CA 94534-1912

Date Received: 07/23/10
Work Order No: 10-07-1715
Preparation: EPA 3545
Method: EPA 8270C SIM PCB Congeners

Project Schnitzer Steel

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	MS/MSD Batch Number
SSPC-DUI-COMP	**Sediment**	**GC/MS N**	**08/06/10**	**08/10/10**	**100806S12B**

Parameter	MS %REC	MSD %REC	%REC CL	RPD	RPD CL	Qualifiers
PCB008	93	91	50-125	2	0-30	
PCB018	97	97	50-125	0	0-30	
PCB028	106	106	50-125	0	0-30	
PCB052	100	99	50-125	1	0-30	
PCB044	102	101	50-125	1	0-30	
PCB066	113	113	50-125	0	0-30	
PCB101	106	105	50-125	1	0-30	
PCB077	111	112	50-125	0	0-30	
PCB118	117	115	50-125	1	0-30	
PCB153	109	108	50-125	1	0-30	
PCB105	110	109	50-125	1	0-30	
PCB187	109	107	50-125	1	0-30	
PCB126	108	107	50-125	1	0-30	
PCB128	108	106	50-125	1	0-30	
PCB180	111	110	50-125	1	0-30	
PCB170	99	99	50-125	0	0-30	
PCB195	99	100	50-125	1	0-30	
PCB206	103	103	50-125	0	0-30	
PCB209	96	95	50-125	1	0-30	

RPD - Relative Percent Difference , CL - Control Limit

Calscience Environmental Laboratories, Inc.

Quality Control - LCS/LCS Duplicate

Pacific Ecorisk
2250 Cordelia Road
Fairfield, CA 94534-1912

Date Received: N/A
Work Order No: 10-07-1715
Preparation: EPA 3545
Method: EPA 8270C SIM PCB Congeners

Project: Schnitzer Steel

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number
099-13-017-122	**Solid**	**GC/MS N**	**08/06/10**	**08/07/10**	**100806L12**

Parameter	LCS %REC	LCSD %REC	%REC CL	ME_CL	RPD	RPD CL	Qualifiers
PCB008	78	78	50-125	38-138	0	0-30	
PCB018	81	82	50-125	38-138	1	0-30	
PCB028	86	87	50-125	38-138	0	0-30	
PCB052	81	81	50-125	38-138	0	0-30	
PCB044	84	84	50-125	38-138	1	0-30	
PCB066	90	90	50-125	38-138	0	0-30	
PCB101	84	85	50-125	38-138	0	0-30	
PCB077	88	89	50-125	38-138	1	0-30	
PCB118	89	90	50-125	38-138	1	0-30	
PCB153	83	83	50-125	38-138	0	0-30	
PCB105	85	85	50-125	38-138	0	0-30	
PCB187	84	85	50-125	38-138	1	0-30	
PCB126	83	84	50-125	38-138	1	0-30	
PCB128	83	85	50-125	38-138	2	0-30	
PCB180	87	87	50-125	38-138	0	0-30	
PCB170	80	80	50-125	38-138	1	0-30	
PCB195	84	84	50-125	38-138	0	0-30	
PCB206	91	90	50-125	38-138	1	0-30	
PCB209	88	88	50-125	38-138	0	0-30	

Total number of LCS compounds : 19
Total number of ME compounds : 0
Total number of ME compounds allowed : 1
LCS ME CL validation result : Pass

RPD - Relative Percent Difference , CL - Control Limit

Calscience Environmental Laboratories, Inc.

Glossary of Terms and Qualifiers

Work Order Number: 10-07-1715

Qualifier	Definition
*	See applicable analysis comment.
<	Less than the indicated value.
>	Greater than the indicated value.
1	Surrogate compound recovery was out of control due to a required sample dilution, therefore, the sample data was reported without further clarification.
2	Surrogate compound recovery was out of control due to matrix interference. The associated method blank surrogate spike compound was in control and, therefore, the sample data was reported without further clarification.
3	Recovery of the Matrix Spike (MS) or Matrix Spike Duplicate (MSD) compound was out of control due to matrix interference. The associated LCS and/or LCSD was in control and, therefore, the sample data was reported without further clarification.
4	The MS/MSD RPD was out of control due to matrix interference. The LCS/LCSD RPD was in control and, therefore, the sample data was reported without further clarification.
5	The PDS/PDSD or PES/PESD associated with this batch of samples was out of control due to a matrix interference effect. The associated batch LCS/LCSD was in control and, hence, the associated sample data was reported without further clarification.
B	Analyte was present in the associated method blank.
E	Concentration exceeds the calibration range.
J	Analyte was detected at a concentration below the reporting limit and above the laboratory method detection limit. Reported value is estimated.
ME	LCS Recovery Percentage is within LCS ME Control Limit range.
ND	Parameter not detected at the indicated reporting limit.
Q	Spike recovery and RPD control limits do not apply resulting from the parameter concentration in the sample exceeding the spike concentration by a factor of four or greater.
X	% Recovery and/or RPD out-of-range.
Z	Analyte presence was not confirmed by second column or GC/MS analysis.
	Solid - Unless otherwise indicated, solid sample data is reported on a wet weight basis, not corrected for % moisture.

CHAIN OF CUSTODY RECORD

1715

PACIFIC ECORISK
2250 Cordelia Rd
Fairfield, CA 94534
Ph: (707) 207-7760
Fax: (707) 207-7916
www.pacificecorisk.com

RESULTS TO: Same

Attn: Jeff Cotsifas
Phone:
Email:

BILL TO: Same

Attn: Cynthia Garcia
Phone:
Email:

PROJECT: Schnitzer Steel

ANALYSES REQUESTED

SAMPLE IDENTIFICATION	DATE	TIME	SAMPLE MATRIX	GRAB/ COMP.	# CONTAINERS/TYPE	See ATTACHED LIST	GRAIN Size							REMARKS
SSPC-DU1-COMP	7/21/10	09:10	Soil	Comp	2 1500ml Glass	✓								
SSPC-DU1-COMP	7/21/10	09:10	Soil	Comp	1 1 Ziploc Bag		✓							
					/									
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1

METHOD OF SHIPMENT: FedEx: X UPS: HAND: OTHER:

COMMENTS: Please run duplicate analysis on SSPC-DU1-COMP for Chemistry

CODES:

RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RECEIVED BY: (SIGNATURE)	DATE	TIME	PAGE #
C Jenkins	7/22/10	16:00	Alan CCL	7/23/10	1030	1 OF 1

WHITE - RETURN W/ SAMPLE YELLOW - KEEP FOR YOUR RECORDS

ANALYTE LIST

Pacific EcoRisk
2250 Cordelia Rd.
Fairfield, CA 94534

Project Proponent: **Pacific EcoRisk**

Project #: Schnitzer Steel

Site #: SSPC-DU1-COMP

Standard Ocean Disposal List

Solids, Total	SMEWW 2540 B	X
Total Organic Carbon	ASTM D4129-82M	X
Grain Size	Plumb 1981/ASTM	X
Arsenic	6020	X
Cadmium	6020	X
Chromium	6020	X
Copper	6020	X
Lead	6020	X
Nickel	6020	X
Silver	6020	X
Zinc	6020	X
Mercury	7471A	X
Selenium	7740 - GFAA	X
2,4'-DDD	8081A	X
2,4'-DDE	8081A	X
2,4'-DDT	8081A	X
4,4'-DDD	8081A	X
4,4'-DDE	8081A	X
4,4'-DDT	8081A	X
Aldrin	8081A	X
alpha-BHC	8081A	X
alpha-Chlordane	8081A	X
beta-BHC	8081A	X
Chlordane	8081A	X
delta-BHC	8081A	X
Dieldrin	8081A	X
Endosulfan I	8081A	X
Endosulfan II	8081A	X
Endosulfan Sulfate	8081A	X
Endrin	8081A	X
Endrin Aldehyde	8081A	X
gamma-BHC (Lindane)	8081A	X
gamma-Chlordane	8081A	X
Heptachlor	8081A	X
Heptachlor Epoxide	8081A	X
Toxaphene	8081A	X
PCBs 1016	8082 PCBs	X
PCBs 1221	8082 PCBs	X
PCBs 1232	8082 PCBs	X
PCBs1242	8082 PCBs	X
PCBs1248	8082 PCBs	X
PCBs1254	8082 PCBs	X
PCBs1260	8082 PCBs	X
PCBs1262	8082 PCBs	X
PCBs1268	8082 PCBs	X
Acenaphthene	8270C-SIM PAH	X

Acenaphthylene	8270C-SIM PAH	X
Anthracene	8270C-SIM PAH	X
Benz(a)anthracene	8270C-SIM PAH	X
Benzo(a)pyrene	8270C-SIM PAH	X
Benzo(b)fluoranthene	8270C-SIM PAH	X
Benzo(g,h,i)perylene	8270C-SIM PAH	X
Benzo(k)fluoranthene	8270C-SIM PAH	X
Chrysene	8270C-SIM PAH	X
Dibenz(a,h)anthracene	8270C-SIM PAH	X
Fluoranthene	8270C-SIM PAH	X
Fluorene	8270C-SIM PAH	X
Indeno(1,2,3-cd)pyrene	8270C-SIM PAH	X
Naphthalene	8270C-SIM PAH	X
Phenanthrene	8270C-SIM PAH	X
Pyrene	8270C-SIM PAH	X
Di-n-butyltin	Organotins	X
n-Butyltin	Organotins	X
Tetra-n-butyltin	Organotins	X
Tri-n-butyltin	Organotins	X
QA/QC		
Duplicate analysis - SSPC-DU1-COMP		X

If you have any questions regarding this request as checked, please call Jeff Cotsifas at (707)207-7760

Alternative Methods Approved as per conversation w/ Bob Sterns

Calscience Environmental Laboratories, Inc.

WORK ORDER #: 10-07-1715

SAMPLE RECEIPT FORM

Cooler 1 of 1

CLIENT: Pacific Ecorisk DATE: 07/23/10

TEMPERATURE: Thermometer ID: SC1 (Criteria: 0.0 °C – 6.0 °C, not frozen)

Temperature 0.6 °C + 0.5 °C (CF) = 1.1 °C ☐ Blank ☑ Sample

☐ Sample(s) outside temperature criteria (PM/APM contacted by: _____).

☐ Sample(s) outside temperature criteria but received on ice/chilled on same day of sampling.

☐ **Received at ambient temperature, placed on ice for transport by Courier.**

Ambient Temperature: ☐ Air ☐ Filter ☐ Metals Only ☐ PCBs Only Initial: NC

CUSTODY SEALS INTACT:

☐ Cooler ☐_____ ☐ No (Not Intact) ☑ Not Present ☐ N/A Initial: NC

☐ Sample ☐_____ ☐ No (Not Intact) ☑ Not Present Initial: M

SAMPLE CONDITION:	Yes	No	N/A
Chain-Of-Custody (COC) document(s) received with samples	☑	☐	☐
COC document(s) received complete	☑	☐	☐
☐ Collection date/time, matrix, and/or # of containers logged in based on sample labels.			
☐ No analysis requested. ☐ Not relinquished. ☐ No date/time relinquished.			
Sampler's name indicated on COC	☐	☐	☑
Sample container label(s) consistent with COC	☑	☐	☐
Sample container(s) intact and good condition	☑	☐	☐
Proper containers and sufficient volume for analyses requested	☑	☐	☐
Analyses received within holding time	☑	☐	☐
pH / Residual Chlorine / Dissolved Sulfide received within 24 hours	☐	☐	☑
Proper preservation noted on COC or sample container	☐	☐	☑
☐ Unpreserved vials received for Volatiles analysis			
Volatile analysis container(s) free of headspace	☐	☐	☑
Tedlar bag(s) free of condensation	☐	☐	☑

CONTAINER TYPE:

Solid: ☐4ozCGJ ☐8ozCGJ ☑16ozCGJ (2) ☐Sleeve (____) ☐EnCores® ☐TerraCores® ☑2

Water: ☐VOA ☐VOAh ☐VOAna_2 ☐125AGB ☐125AGB**h** ☐125AGB**p** ☐1AGB ☐1AGBna_2 ☐1AGB**s** ☐500AGB ☐500AGJ ☐500AGJ**s** ☐250AGB ☐250CGB ☐250CGB**s** ☐1PB ☐500PB ☐500PB**na** ☐250PB ☐250PB**n** ☐125PB ☐125PB**znna** ☐100PJ ☐100PJna_2 ☐_____ ☐_____ ☐_____

Air: ☐Tedlar® ☐Summa® **Other:** ☐_____ **Trip Blank Lot#:**_____ **Labeled/Checked by:** W

Container: C: Clear A: Amber P: Plastic G: Glass J: Jar B: Bottle Z: Ziploc/Resealable Bag E: Envelope **Reviewed by:** MC

Preservative: h: HCL n: HNO_3 na_2:$Na_2S_2O_3$ na: NaOH p: H_3PO_4 s: H_2SO_4 znna: $ZnAc_2$+NaOH f: Field-filtered **Scanned by:** W

SOP T100_090 (05/10/10)

Appendix C

Ammonia and Sulfide Analyses Performed in Support of Bioassay Testing

Table C-1. Sediment porewater ammonia levels for *Ampelisca* bioassays at test initiation

Sample ID	pH	Salinity (ppt)	Total Ammonia (mg/L N)	Total Sulfide (mg/L)
Lab Control	7.22	29.0	22.0	0.099
Alcatraz (SF-11)	7.53	29.0	3.30	0.265
SSPC-DU1-Comp	7.40	28.8	9.80	0.051

Table C-2. Sediment porewater ammonia levels for *Ampelisca* bioassays at test termination

Sample ID	pH	Salinity (ppt)	Total Ammonia (mg/L N)	Total Sulfide (mg/L)
Lab Control	7.15	32.4	9.25	0.041
Alcatraz (SF-11)	7.50	32.5	1.28	0.096
SSPC-DU1-Comp	7.38	41.1	1.01	0.006

Table C-3. Sediment overlying water total ammonia levels for *Ampelisca* bioassays

Sample ID	Total Ammonia (mg/L N)	
	Test Initiation	Test Termination
Lab Control	3.07	4.34
Alcatraz (SF-11)	<1.0*	<1.0*
SSPC-DU1-Comp	1.72	<1.0*

*Below laboratory method detection limit.

Table C-4. Sediment porewater ammonia levels for *Neanthes* bioassays at test initiation

Sample ID	pH	Salinity (ppt)	Total Ammonia (mg/L N)	Total Sulfide (mg/L)
Lab Control	7.34	28.4	11.0	0.216
Alcatraz (SF-11)	7.57	29.8	<1.0*	0.288
SSPC-DU1-Comp	7.52	30.2	7.47	0.095

*Below laboratory method detection limit.

Table C-5. Sediment porewater ammonia levels for *Neanthes* bioassays at test termination

Sample ID	pH	Salinity (ppt)	Total Ammonia (mg/L N)	Total Sulfide (mg/L)
Lab Control	7.89	35.5	1.01	0.075
Alcatraz (SF-11)	7.59	37.4	<1.0*	0.039
SSPC-DU1-Comp	7.30	38.7	2.39	0.014

*Below laboratory method detection limit.

Table C-6. Sediment overlying water total ammonia levels for *Neanthes* bioassays tests

Sample ID	Total Ammonia (mg/L N)	
	Test Initiation	Test Termination
Lab Control	4.81	2.16
Alcatraz (SF-11)	<1.0*	<1.0*
SSPC-DU1-Comp	1.03	<1.0*

*Below laboratory method detection limit.

Appendix D

Test Data and Summary of Statistics for the Toxicity Evaluation of Schnitzer Steel Products Company, Inc. Sediments with the Amphipod, *Ampelisca abdita*

10 Day Marine/Estuarine Sediment Test — Pacific EcoRisk

Batch ID:	03-2834-3732	**Test Type:**	Survival	**Analyst:**	Mike McElroy
Start Date:	31 Jul-10 09:30	**Protocol:**	ASTM E1218-97a (1997)	**Diluent:**	Not Applicable
Ending Date:	10 Aug-10 08:40	**Species:**	Ampelisca abdita	**Brine:**	Not Applicable
Duration:	9d 23h	**Source:**	Aquatic Research Organisms, NH	**Age:**	NA

Sample ID:	20-0387-8490	**Code:**	Sediment	**Client:**	Schnitzer Steel
Sample Date:	15 Jun-10 09:30	**Material:**	Sediment	**Project:**	17105
Receive Date:	15 Jun-10 15:00	**Source:**	Schnitzer Steel		
Sample Age:	46d 0h (0.1 °C)	**Station:**	Alcatraz		

Comparison Summary

Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method
07-0582-9143	Survival Rate	<100	100	N/A	7.42%	>1	Equal Variance t Two-Sample Test

Survival Rate Summary

Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Control Sed	5	0.9	0.877	0.923	0.8	0.95	0.0112	0.0612	6.8%	0.0%
100		5	0.79	0.766	0.814	0.75	0.9	0.0119	0.0652	8.25%	12.2%

Survival Rate Detail

Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Control Sed	0.9	0.9	0.95	0.8	0.95
100		0.75	0.75	0.9	0.75	0.8

CETIS Analytical Report

Test Code: 02-6027-6904/39628

10 Day Marine/Estuarine Sediment Test — Pacific EcoRisk

Analysis ID:	07-0582-9143	**Endpoint:**	Survival Rate	**CETIS Version:**	CETISv1.7.0
Analyzed:	14 Aug-10 12:26	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Angular (Corrected)	0	C > T	Not Run	<100	100	N/A	>1	7.42%

Equal Variance t Two-Sample Test

Control	vs	Conc-%	Test Stat	Critical	MSD	P-Value	Decision(5%)
Control Sed		100*	2.72	1.86	0.109	0.0131	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.06368343	0.06368343	1	7.41	0.0262	Significant Effect
Error	0.0687754	0.008596925	8			
Total	0.1324588	0.07228035	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	1.25	23.2	0.8367	Equal Variances
Distribution	Shapiro-Wilk Normality	0.95		0.6655	Normal Distribution

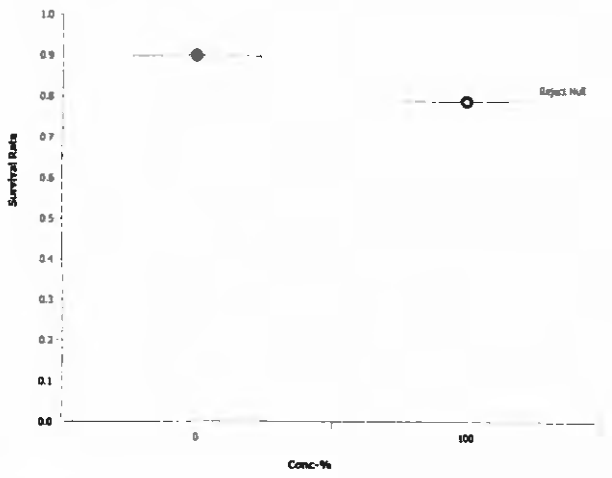
Survival Rate Summary

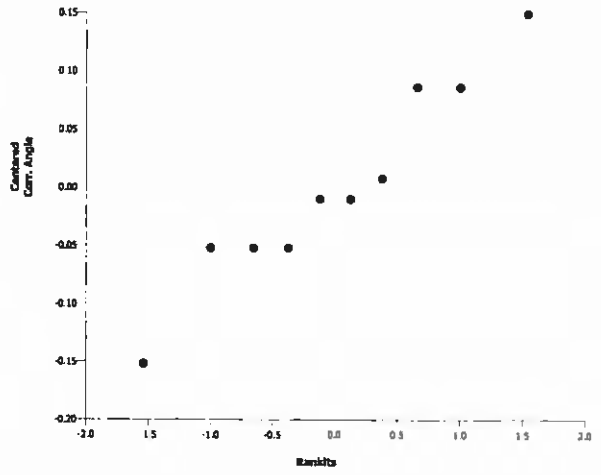
Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Control Sed	5	0.9	0.877	0.923	0.8	0.95	0.0114	0.0612	6.8%	0.0%
100		5	0.79	0.765	0.815	0.75	0.9	0.0121	0.0652	8.25%	12.2%

Angular (Corrected) Transformed Summary

Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Control Sed	5	1.26	1.22	1.3	1.11	1.35	0.0181	0.0977	7.76%	0.0%
100		5	1.1	1.07	1.13	1.05	1.25	0.0162	0.0875	7.96%	12.7%

Graphics





Analyst: _____ QA: _____

10-Day Estuarine/Marine Sediment Toxicity Test Data

Client: Schnitzer Steel | Test ID#: 39628-29 | Date (Day 0): 7/31/10

Species: *Ampelisca abdita* | Project #: 17105 | Organism Supplier: ARO

Organism Log # : 5332

Day of Test	Test Replicate	Sample ID: Control					Sign-Off
		Temp (°C)	pH	D.O. (mg/L)	Salinity (ppt)	# Alive	
Day 0	Rep A	19.8	7.95	7.3	29.0	20	Date: 7/31/10
	Rep B	19.8	7.99	7.4	29.0	20	Time: 930
	Rep C	19.8	8.00	7.4	28.6	20	WQ: MO
	Rep D	19.8	8.03	7.6	28.5	20	Scientist Initiation: KS
	Rep E	19.8	8.04	7.6	29.0	20	Scientist Confirmation: MM
Day 1	Rep A	19.7	7.98	7.6	29.3		Date: 8/1/10 Time: 12:00 WQ: SC
Day 2	Rep B	19.7	7.99	7.9	29.3		Date: 8/2/10 Time: 8:30 WQ: CB
Day 3	Rep C	20.2	8.12	7.5	28.0		Date: 8/3/10 Time: 900 WQ: CB
Day 4	Rep D	19.8	8.25	7.7	29.1		Date: 8/4/10 Time: 850 WQ: CB
Day 5	Rep E	20.2	8.24	7.7	29.6		Date: 8/5/10 Time: 0600 WQ: CB
Day 6	Rep A	20.1	8.28	7.5	28.9		Date: 8/6/10 Time: 0605 WQ: CB
Day 7	Rep B	20.2	8.29	7.7	28.1		Date: 8/7/10 Time: 0900 WQ: CB
Day 8	Rep C	20.2	8.33	7.5	28.6		Date: 8/8/10 Time: 10:00 WQ: SC
Day 9	Rep D	20.2	8.33	7.6	29.6		Date: 8/9/10 Time: 0945 WQ: CB
Day 10	Rep A	20.1	8.31	7.5	29.5	18	Date: 8/10/10
	Rep B	20.1	8.32	7.5	28.6	18	Time: 0840
	Rep C	20.1	8.28	7.4	28.5	19	WQ: CB
	Rep D	20.1	8.34	7.5	29.6	16	Scientist Counts: KOB
	Rep E	20.1	8.36	7.5	29.3	19	

Day of Test	Matrix	pH	D.O. (mg/L)	Salinity (ppt)	Total Sulfide (mg/L)	Total Ammonia (mg/L)	Sign-Off
Day 0	Porewater	7.22	2.0	29.0	0.099	~~3.07~~ 12.0 *	Date: 7/31/10 Time: 1500 WQ: MO
	Overlying Water					3.07	Date: 7/31/10 Time: 1428 WQ: OT
	Meter ID	PH09	RDO4	ECO5	DR4000	DR3900	
Day 10	Porewater	7.15	3.7	32.4	0.041	9.25	Date: 8/10/10 Time: 1320 WQ: WM
	Overlying Water					4.34	Date: 8/10/10 Time: 1100 WQ: CB
	Meter ID	pH14	RDO4	EC03	DR4000	DR3900	

* likely due to sample color

10-Day Estuarine/Marine Sediment Toxicity Test Data

Client: Schnitzer Steel | Test ID#: 39628 | Date (Day 0): 7/31/10

Species: *Ampelisca abdita* | Project #: 17105 | Organism Supplier: ARO

Organism Log # : 5332

Day of Test	Test Replicate	Sample ID: SF-11 (Alcatraz)					Sign-Off
		Temp (°C)	pH	D.O. (mg/L)	Salinity (ppt)	# Alive	
Day 0	Rep A	19.9	7.91	7.5	29.3	20	Date: 7/31/10 Time: 1080 WQ: MO Scientist Initiation: AB Scientist Confirmation: MM
	Rep B	19.9	7.91	7.6	29.4	20	
	Rep C	19.9	7.91	7.6	29.4	20	
	Rep D	19.9	7.90	7.6	29.4	20	
	Rep E	19.9	7.88	7.5	29.2	20	
Day 1	Rep A	19.7	7.90	7.4	29.6		Date: 8/1/10 Time: 12:00 WQ: SC
Day 2	Rep B	19.7	7.98	7.7	29.9		Date: 8/2/10 Time: 8:58 WQ: CG
Day 3	Rep C	20.2	8.07	7.8	30.0		Date: 8/3/10 Time: 900 WQ: CG
Day 4	Rep D	19.8	8.07	7.8	29.5		Date: 8/4/10 Time: 8:50 WQ: CG
Day 5	Rep E	20.2	8.04	7.7	28.2		Date: 8/5/10 Time: 0900 WQ: CG
Day 6	Rep A	20.1	8.04	7.6	28.1		Date: 8/6/10 Time: 0905 WQ: CG
Day 7	Rep B	20.2	7.98	7.7	28.0		Date: 8/7/10 Time: 0900 WQ: FOGS
Day 8	Rep C	20.2	8.01	7.7	28.4		Date: 8/8/10 Time: 10:00 WQ: SC
Day 9	Rep D	20.2	8.00	7.5	29.8		Date: 8/9/10 Time: 1006 WQ: CW
Day 10	Rep A	20.1	8.06	7.6	29.5	15	Date: 8/10/10 Time: 0840 WQ: CG Scientist Counts: RAB
	Rep B	20.1	8.07	7.6	28.6	15	
	Rep C	20.1	8.07	7.7	28.8	18	
	Rep D	20.1	8.07	7.8	29.9	15	
	Rep E	20.1	8.07	7.8	28.6	16	

Day of Test	Matrix	pH	D.O. (mg/L)	Salinity (ppt)	Total Sulfide (mg/L)	Total Ammonia (mg/L)	Sign-Off
Day 0	Porewater	7.53	5.5	29.0	0.265	3.30	Date: 7/31/10 Time: 1400 WQ: MO
	Overlying Water					<1.00	Date: 7/31/10 Time: 1150 WQ: MO
	Meter ID	PH09	RD04	EC05	DR4000	DR3800	
Day 10	Porewater	7.50	5.9	32.5	0.096	1.28	Date: 8/10/10 Time: 1320 WQ: MM
	Overlying Water					<1.0	Date: 8/10/10 Time: 1100 WQ: CG
	Meter ID	PH14	RD04	EC03	DR4000	DR3800	

10 Day Marine/Estuarine Sediment Test — Pacific EcoRisk

Batch ID:	04-9293-0310	**Test Type:**	Survival	**Analyst:**	Mike McElroy
Start Date:	31 Jul-10 09:30	**Protocol:**	ASTM E1218-97a (1997)	**Diluent:**	Not Applicable
Ending Date:	10 Aug-10 08:40	**Species:**	Ampelisca abdita	**Brine:**	Not Applicable
Duration:	9d 23h	**Source:**	Aquatic Research Organisms, NH	**Age:**	NA

Sample ID:	04-1548-7992	**Code:**	Sediment	**Client:**	Schnitzer Steel
Sample Date:	21 Jul-10 09:10	**Material:**	Sediment	**Project:**	17105
Receive Date:	21 Jul-10 19:00	**Source:**	Schnitzer Steel		
Sample Age:	10d 0h (0.1 °C)	**Station:**	SSPC-DU1-Comp		

Comparison Summary

Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method
01-2983-0786	Survival Rate	<100	100	N/A	8.55%	>1	Equal Variance t Two-Sample Test

Survival Rate Summary

Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Control Sed	5	0.9	0.877	0.923	0.8	0.95	0.0112	0.0612	6.8%	0.0%
100		5	0.79	0.757	0.823	0.65	0.9	0.0163	0.0894	11.3%	12.2%

Survival Rate Detail

Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Control Sed	0.9	0.9	0.95	0.8	0.95
100		0.65	0.8	0.8	0.8	0.9

CETIS Analytical Report

10 Day Marine/Estuarine Sediment Test — **Pacific EcoRisk**

Analysis ID:	01-2983-0786	**Endpoint:**	Survival Rate	**CETIS Version:**	CETISv1.7.0
Analyzed:	14 Aug-10 12:32	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Angular (Corrected)	0	C > T	Not Run	<100	100	N/A	>1	8.55%

Equal Variance t Two-Sample Test

Control	vs	Conc-%	Test Stat	Critical	MSD	P-Value	Decision(5%)
Control Sed		100*	2.39	1.86	0.123	0.0219	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.0620266	0.0620266	1	5.71	0.0438	Significant Effect
Error	0.08682758	0.01085345	8			
Total	0.1488542	0.07288004	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	1.28	23.2	0.8189	Equal Variances
Distribution	Shapiro-Wilk Normality	0.9		0.2169	Normal Distribution

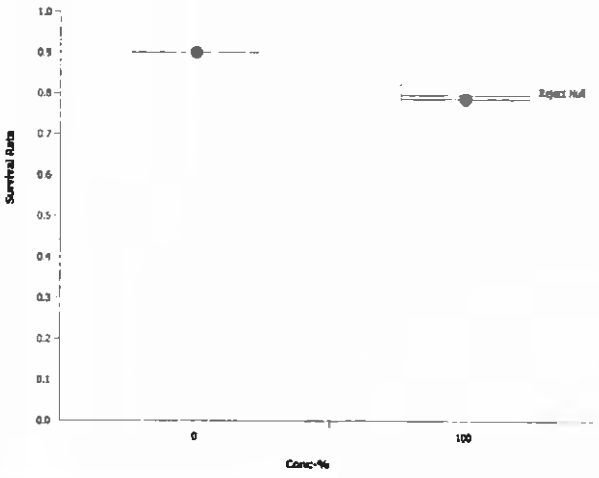
Survival Rate Summary

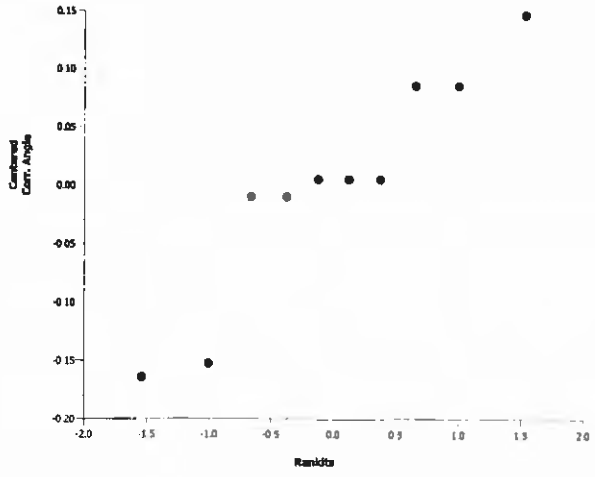
Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Control Sed	5	0.9	0.877	0.923	0.8	0.95	0.0114	0.0612	6.8%	0.0%
100		5	0.79	0.756	0.824	0.65	0.9	0.0166	0.0894	11.3%	12.2%

Angular (Corrected) Transformed Summary

Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Control Sed	5	1.26	1.22	1.3	1.11	1.35	0.0181	0.0977	7.76%	0.0%
100		5	1.1	1.06	1.14	0.938	1.25	0.0205	0.11	10.0%	12.5%

Graphics





10-Day Estuarine/Marine Sediment Toxicity Test Data

Client: Schnitzer Steel | Test ID#: 39629 | Date (Day 0): 7/31/10

Species: *Ampelisca abdita* | Project #: 17105 | Organism Supplier: APO

Organism Log # : 5332

Day of Test	Test Replicate	Sample ID: SSPC-DU1-Comp					Sign-Off
		Temp (°C)	pH	D.O. (mg/L)	Salinity (ppt)	# Alive	
Day 0	Rep A	19.8	8.03	7.6	28.4	20	Date: 07/31/2010
	Rep B	19.8	8.07	7.6	28.4	20	Time: 0930
	Rep C	19.8	8.05	7.6	28.5	20	WQ: DT
	Rep D	19.8	8.04	7.5	28.9	20	Scientist Initiation: AB
	Rep E	19.8	7.99	7.5	28.6	20	Scientist Confirmation:
Day 1	Rep A	19.7	7.90	7.6	28.9		Date: 8/1/10 Time: 12:00 WQ:
Day 2	Rep B	19.7	8.01	7.6	28.5		Date: 8/2/10 Time: 8:50 WQ: CG
Day 3	Rep C	20.2	8.12	7.7	27.3		Date: 8/3/10 Time: 900 WQ: CG
Day 4	Rep D	19.8	8.23	7.8	29.7		Date: 8/4/10 Time: 8:50 WQ: CG
Day 5	Rep E	20.2	8.22	7.4	28.9		Date: 8/5/10 Time: 0900 WQ: CG
Day 6	Rep A	20.1	8.27	7.6	28.8		Date: 8/6/10 Time: 0905 WQ: CG
Day 7	Rep B	20.2	8.35	7.8	28.9		Date: 8/7/10 Time: 0900 WQ: FOVS
Day 8	Rep C	20.2	8.40	7.6	28.5		Date: 8/8/10 Time: 10:00 WQ:
Day 9	Rep D	20.2	8.45	7.6	29.4		Date: 8/9/10 Time: 0941 WQ: CG
Day 10	Rep A	20.1	8.38	7.6	29.3	13	Date: 8/10/10
	Rep B	20.1	8.42	7.6	29.3	16	Time: CG 0940
	Rep C	20.1	8.43	7.6	28.5	16	WQ: CG
	Rep D	20.1	8.47	7.5	29.2	16	Scientist Counts: RPB
	Rep E	20.1	8.36	7.3	28.3	18	

Day of Test	Matrix	pH	D.O. (mg/L)	Salinity (ppt)	Total Sulfide (mg/L)	Total Ammonia (mg/L)	Sign-Off
Day 0	Porewater	7.40	4.3	28.8	0.051	9.80	Date: 7/31/10 Time: 1400 WQ: MD
	Overlying Water					1.72	Date: 7/31/10 Time: 1150 WQ: MD
	Meter ID	PH09	DO04	SC05	DR4000	DR3800	
Day 10	Porewater	7.35	3.4	41.1	0.006	1.01	Date: 8/10/10 Time: 1230 WQ: MM
	Overlying Water					21.0	Date: 8/10/10 Time: 1100 WQ: CG
	Meter ID	PH03	DO03	SC05	DR4000	DR3800	

Appendix E

Test Data and Summary of Statistics for the Reference Toxicant Evaluation of the Amphipod, *Ampelisca abdita*

Acute Amphipod Survival Test — Pacific EcoRisk

Batch ID:	03-1511-3452	**Test Type:**	Survival	**Analyst:**	Jeremy Laurin
Start Date:	31 Jul-10 16:45	**Protocol:**	ASTM E1367-99 (Amphipod)	**Diluent:**	Diluted Seawater
Ending Date:	04 Aug-10 14:50	**Species:**	Ampelisca abdita	**Brine:**	Not Applicable
Duration:	94h	**Source:**	Aquatic Research Organisms, NH	**Age:**	NA

Sample ID:	07-2564-9763	**Code:**	KCL	**Client:**	Reference Toxicant
Sample Date:	31 Jul-10 16:45	**Material:**	Potassium chloride	**Project:**	17164
Receive Date:	31 Jul-10 16:45	**Source:**	Reference Toxicant		
Sample Age:	N/A (19.9 °C)	**Station:**	In House		

Comparison Summary

Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method
06-0691-8520	Survival Rate	0.5	1	0.707	32.5%		Dunnett's Multiple Comparison Test

Point Estimate Summary

Analysis ID	Endpoint	Level	g/L	95% LCL	95% UCL	TU	Method
18-7496-9590	Survival Rate	EC50	0.926	0.796	1.08		Spearman-Kärber

Survival Rate Summary

Conc-g/L	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Lab Water Contr	2	0.8	0.747	0.853	0.7	0.9	0.0258	0.141	17.7%	0.0%
0.25		2	0.95	0.924	0.976	0.9	1	0.0129	0.0707	7.44%	-18.8%
0.5		2	0.95	0.924	0.976	0.9	1	0.0129	0.0707	7.44%	-18.8%
1		2	0.35	0.324	0.376	0.3	0.4	0.0129	0.0707	20.2%	56.3%
2		2	0	0	0	0	0	0	0		100.0%
4		2	0	0	0	0	0	0	0		100.0%

Survival Rate Detail

Conc-g/L	Control Type	Rep 1	Rep 2
0	Lab Water Contr	0.7	0.9
0.25		1	0.9
0.5		0.9	1
1		0.4	0.3
2		0	0
4		0	0

96 Hour Marine Reference Toxicant Test Data

Client: **Reference Toxicant** Organism Log #: 5332

Test Material: Potassium Chloride Organism Supplier: APD

Test ID#: 39625 Project # 17164 Species: *Ampelisca abdita*

Test Date: 7/31/10 Randomization: 2-6-2 Control/Diluent: 28 ppt Seawater

Treatment (g KCl /L)	Temp (°C)	pH new	pH old	D.O. (mg/L) new	D.O. (mg/L) old	Salinity (ppt) new	Salinity (ppt) old	# Live Organisms A	# Live Organisms B	SIGN-OFF
Control	19.9	7.68		7.5		27.9		10	10	Date: 7/31/10
0.25	19.9	7.72		7.7		28.4		10	10	Test Solution Prep: RPB
0.5	19.9	7.73		7.9		28.6		10	10	New WQ: JM
1	19.9	7.76		8.0		29.0		10	10	Initiation Time: 16:45
2	19.9	7.79		8.1		29.9		10	10	Initiation Signoff: AB
4	19.9	7.88		8.4		31.7		10	10	Ref Tox Stock Batch # 14
Meter ID:	48A	pH 14		RD03		EC03				
Control	19.7		7.78		7.5		28.3	10	10	Date: 8.1.10
0.25	19.7		7.76		7.4		28.2	10	10	Count Time: 0900
0.5	19.7		7.95		7.5		28.5	10	10	Count Signoff: RPB
1	19.7		7.81		7.4		29.0	9	6	Old WQ: 20
2	19.7		7.84		7.5		30.0	0	0	
4	19.7		7.90		7.6		31.6	0	0	
Meter ID:	48A		pH09		RD04		EC03			
Control	19.8		7.77		6.9		27.8	10	10	Date: 8/2/10
0.25	19.8		7.74		6.9		28.2	10	10	Count Time: 1330
0.5	19.8		7.75		7.0		28.6	10	10	Count Signoff: JH
1	19.8		7.75		7.0		29.2	8	4	Old WQ: ON
2	—		—		—		—	—	—	
4	—		—		—		—	—	—	
Meter ID:	48A		PH14		RD04		EC03			
Control	20.0		7.79		7.2		28.3	7	10	Date: 8/3/10
0.25	20.0		7.78		7.2		28.7	10	9	Count Time: 1000
0.5	20.0		7.80		7.2		28.7	10	10	Count Signoff: RPB
1	20.0		7.80		7.2		29.2	7	3	Old WQ: ON
2	—		—		—		—	—	—	
4	—		—		—		—	—	—	
Meter ID:	48A		PH09		RD03		EC06			
Control	20.7		7.82		7.3		27.8	7	9	Date: 8/4/10
0.25	20.7		7.83		7.3		28.3	10	9	Termination Time: 14:50
0.5	20.7		7.86		7.3		28.5	9	10	Termination Signoff: RPB
1	20.7		7.87		7.3		29.0	10 1/2 4	3	Old WQ: ON
2	—		—		—		—	—	—	
4	—		—		—		—	—	—	
Meter ID:	48A		PH09		RD04		EC03			

Appendix F

Test Data and Summary of Statistics for the Toxicity Evaluation of Schnitzer Steel Products Company, Inc. Sediments with the Polychaete, *Neanthes arenaceodentata*

CETIS Summary Report

10 Day Marine/Estuarine Sediment Test — **Pacific EcoRisk**

Batch ID:	03-0984-8228	**Test Type:**	Survival	**Analyst:**	Mike McElroy
Start Date:	01 Aug-10 10:00	**Protocol:**	ASTM E1611-00 (Polychaete)	**Diluent:**	Not Applicable
Ending Date:	11 Aug-10 10:00	**Species:**	Neanthes arenaceodentata	**Brine:**	Not Applicable
Duration:	10d 0h	**Source:**	Don Reisch	**Age:**	NA

Sample ID:	14-7842-1936	**Code:**	sediment	**Client:**	Schnitzer Steel
Sample Date:	15 Jun-10 09:30	**Material:**	Sediment/Elutriate	**Project:**	17105
Receive Date:	15 Jun-10 15:00	**Source:**	Schnitzer Steel		
Sample Age:	47d 0h (0.1 °C)	**Station:**	Alcatraz		

Comparison Summary

Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method
10-7851-5505	Survival Rate	100	>100	N/A	8.21%	1	Equal Variance t Two-Sample Test

Survival Rate Summary

Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Control Sed	5	0.84	0.807	0.873	0.7	0.9	0.0163	0.0894	10.6%	0.0%
100		5	0.9	0.9	0.9	0.9	0.9	0	0	0.0%	-7.14%

Survival Rate Detail

Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Control Sed	0.9	0.7	0.8	0.9	0.9
100		0.9	0.9	0.9	0.9	0.9

CETIS Analytical Report

10 Day Marine/Estuarine Sediment Test — **Pacific EcoRisk**

Analysis ID:	10-7851-5505	**Endpoint:**	Survival Rate	**CETIS Version:**	CETISv1.7.0
Analyzed:	14 Aug-10 12:37	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Angular (Corrected)	0	C > T	Not Run	100	>100	N/A	1	8.21%

Equal Variance t Two-Sample Test

Control	vs	Conc-%	Test Stat	Critical	MSD	P-Value	Decision(5%)
Control Sed		100	-1.53	1.86	0.0972	0.9176	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.0159829	0.0159829	1	2.34	0.1647	Non-Significant Effect
Error	0.0546758	0.006834475	8			
Total	0.0706587	0.02281738	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Mod Levene Equality of Variance	2.57	13.7	0.1602	Equal Variances
Distribution	Shapiro-Wilk Normality	0.82		0.0255	Normal Distribution

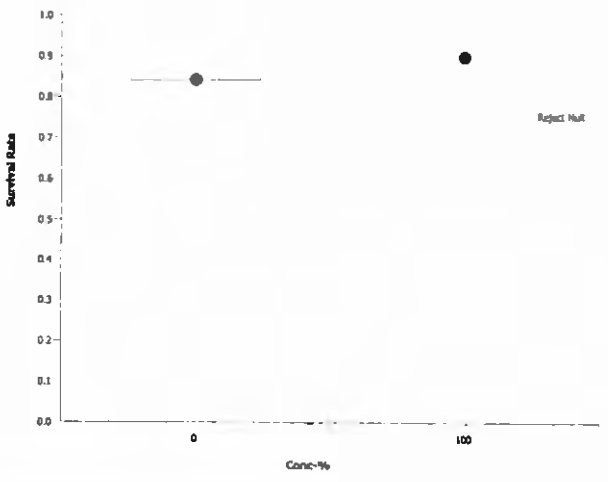
Survival Rate Summary

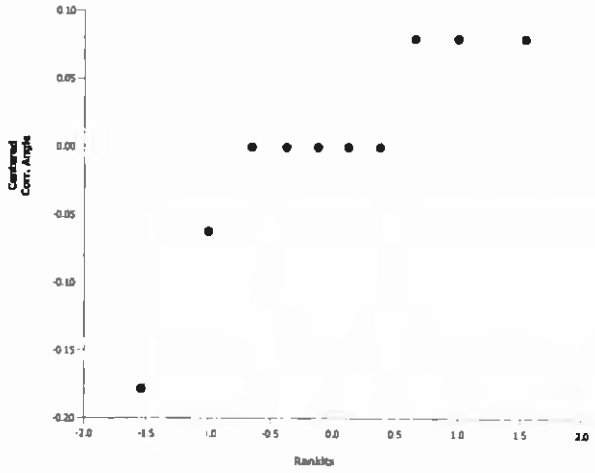
Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Control Sed	5	0.84	0.806	0.874	0.7	0.9	0.0166	0.0894	10.6%	0.0%
100		5	0.9	0.9	0.9	0.9	0.9	0	0	0.0%	-7.14%

Angular (Corrected) Transformed Summary

Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Control Sed	5	1.17	1.12	1.21	0.991	1.25	0.0217	0.117	10.0%	0.0%
100		5	1.25	1.25	1.25	1.25	1.25	0	0	0.0%	-6.84%

Graphics





10-Day Estuarine/Marine Sediment Toxicity Test Data

Client: Schnitzer Steel Test ID #: 39631 Date (Day 0): 8/1/10

Species: *Neanthes arenaceodentata* Project #: 17105 Organism Supplier: Don Reish

Organism Log # : 5334

Day of Test	Test Replicate	Sample ID: Control					Sign-Off
		Temp (°C)	pH	D.O. (mg/L)	Salinity (ppt)	# Alive	
Day 0	Rep A	19.7	8.01	7.7	29.3	10	Date: 08/01/10 Time: 10:00 WQ: SG Scientist Initiation: DG Scientist Confirmation:
	Rep B	19.7	8.03	7.7	29.1	10	
	Rep C	19.7	8.04	7.6	28.4	10	
	Rep D	19.7	8.02	7.7	28.9	10	
	Rep E	19.7	7.99	7.7	30.3	10	
Day 1	Rep A	19.7	7.98	7.6	29.8		Date: 8/2/10 Time: 9:20 WQ: CG
Day 2	Rep B	20.2	8.19	7.7	28.7		Date: 8/3/10 Time: 0930 WQ: CG
Day 3	Rep C	19.8	8.24	7.6	29.9		Date: 8/4/10 Time: 10:00 WQ: CG
Day 4	Rep D	20.2	9.24	7.5	32.9		Date: 8/5/10 Time: 0930 WQ: CG
Day 5	Rep E	20.1	8.34	7.5	31.6		Date: 8/6/10 Time: 0945 WQ: CG
Day 6	Rep A	20.2	8.30	7.6	31.1		Date: 8/7/10 Time: 0945 WQ: FWMS
Day 7	Rep B	20.2	~~8.42~~ 8.02 SG	7.6	~~30.7~~ 28.9 SG		Date: 8/8/10 Time: 10:00 WQ: SG
Day 8	Rep C	20.2	8.41	7.5	30.3		Date: 8/9/10 Time: 1012 WQ: CG
Day 9	Rep D	20.2	8.42	7.5	30.4		Date: 8/10/10 Time: 1100 WQ: CN
Day 10	Rep A	20.1	8.29	7.6	30.2	9	Date: ~~8/10/10~~ 8/11/10 Time: 1000 WQ: CG Scientist: RPM
	Rep B	20.1	8.37	7.5	30.5	7	
	Rep C	20.1	8.43	7.5	28.6	8	
	Rep D	20.1	8.39	7.5	31.5	9	
	Rep E	20.1	8.41	7.6	31.8	9	

Day of Test	Matrix	pH	D.O. (mg/L)	Salinity (ppt)	Total Sulfide (mg/L)	Total Ammonia (mg/L)	Sign-Off
Day 0	Porewater	7.94	4.3	28.4	0.216	11.0	Date: 8/1/10 Time: 1000 WQ: SG
	Overlying Water					4.81	Date: 8/1/10 Time: 10:00 WQ: SG
	Meter ID	pH12	RDO3	EC05	DR4000	DR3800	
Day 10	Porewater	7.86	~~4.8~~ 4.9	35.5	0.075	1.01	Date: 8/11/10 Time: 1230 WQ: UM
	Overlying Water					2.16	Date: 8/11/10 Time: 1100 WQ: CG
	Meter ID	pH03	RDO4	EC05	DR4000	DR3800	

10-Day Estuarine/Marine Sediment Toxicity Test Data

Client: Schnitzer Steel Test ID #: 39630 Date (Day 0): 8/1/10

Species: *Neanthes arenaceodentata* Project #: 17105 Organism Supplier: Don Reish

Organism Log # : 5334

Day of Test	Test Replicate	Sample ID: SF-11 (Alcatraz)					Sign-Off
		Temp (°C)	pH	D.O. (mg/L)	Salinity (ppt)	# Alive	
Day 0	Rep A	19.7	7.86	7.7	29.3	10	Date: 08/01/10 Time: 10:00 WQ: SG Scientist Initiation: DD Scientist Confirmation:
	Rep B	19.7	7.95	7.7	29.2	10	
	Rep C	19.7	7.89	7.7	29.4	10	
	Rep D	19.7	7.88	7.7	29.3	10	
	Rep E	19.7	7.86	7.7	30.6	10	
Day 1	Rep A	19.7	7.97	7.6	29.5		Date: 8/2/10 Time: 9:20 WQ: CG
Day 2	Rep B	20.2	8.04	7.7	29.6		Date: 8/3/10 Time: 0930 WQ: CG
Day 3	Rep C	19.8	8.07	7.6	29.8		Date: 8/4/10 Time: 1000 WQ: CG
Day 4	Rep D	20.2	8.01	7.6	30.0		Date: 8/5/10 Time: 0930 WQ: CG
Day 5	Rep E	20.1	8.03	7.7	31.5		Date: 8/6/10 Time: 0945 WQ: CG
Day 6	Rep A	20.2	8.06	7.6	29.5		Date: 8/7/10 Time: 0945 WQ: SG/CG
Day 7	Rep B	20.2	8.05	7.7	29.2		Date: 8/8/10 Time: 10:00 WQ: SG
Day 8	Rep C	20.2	8.01	7.7	29.3		Date: 8/9/10 Time: 1011 WQ: CG
Day 9	Rep D	20.2	8.00	7.5	28.2		Date: 8/10/10 Time: 1100 WQ: CG
Day 10	Rep A	20.1	8.08	7.6	30.0	9	Date: 8/11/10 Time: 1000 WQ: CG Scientist: KDR
	Rep B	20.1	8.06	7.7	28.5	9	
	Rep C	20.1	8.07	7.7	29.2	9	
	Rep D	20.1	8.09	7.7	28.8	9	
	Rep E	20.1	8.13	7.7	31.5	9	

Day of Test	Matrix	pH	D.O. (mg/L)	Salinity (ppt)	Total Sulfide (mg/L)	Total Ammonia (mg/L)	Sign-Off
Day 0	Porewater	7.57	6.0	29.8	0.288	0.547	Date: 8/1/10 Time: 10:00 WQ: SG
	Overlying Water					<1	Date: 8/1/10 Time: 1000 WQ: SG
	Meter ID	pH12	RDO3	EC05	DR4000	DR3800	
Day 10	Porewater	7.59	~~7.2~~ 20.4	37.4	0.039	<1.0	Date: 8/11/10 Time: 1230 WQ: JM
	Overlying Water					<1.0	Date: 8/11/10 Time: 1100 WQ: CG
	Meter ID	pH03	RDO4	EC05	DR4000	DR3800	

CETIS Summary Report

10 Day Marine/Estuarine Sediment Test — **Pacific EcoRisk**

Batch ID:	05-4966-1463	**Test Type:**	Survival	**Analyst:**	Mike McElroy
Start Date:	01 Aug-10 10:00	**Protocol:**	ASTM E1611-00 (Polychaele)	**Diluent:**	Not Applicable
Ending Date:	11 Aug-10 10:00	**Species:**	Neanthes arenaceodentata	**Brine:**	Not Applicable
Duration:	10d 0h	**Source:**	Don Reisch	**Age:**	NA

Sample ID:	11-7577-3801	**Code:**	sediment	**Client:**	Schnitzer Steel
Sample Date:	21 Jul-10 09:10	**Material:**	Sediment/Elutriate	**Project:**	17105
Receive Date:	21 Jul-10 19:00	**Source:**	Schnitzer Steel		
Sample Age:	11d 1h (0.1 °C)	**Station:**	SSPC-DU1-Comp		

Batch Note: Results compared to Alcatraz Reference Sediment

Comparison Summary

Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method
02-8028-2239	Survival Rate	<100	100	N/A	4.67%	>1	Equal Variance t Two-Sample Test

Survival Rate Summary

Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Reference Sed	5	0.9	0.9	0.9	0.9	0.9	0	0	0.0%	0.0%
100		5	0.84	0.82	0.86	0.8	0.9	0.01	0.0548	6.52%	6.67%

Survival Rate Detail

Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Reference Sed	0.9	0.9	0.9	0.9	0.9
100		0.8	0.8	0.9	0.8	0.9

10 Day Marine/Estuarine Sediment Test — Pacific EcoRisk

Analysis ID:	02-8028-2239	**Endpoint:**	Survival Rate	**CETIS Version:**	CETISv1.7.0
Analyzed:	14 Aug-10 12:48	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Angular (Corrected)	0	C > T	Not Run	<100	100	N/A	>1	4.67%

Equal Variance t Two-Sample Test

Control	vs	Conc-%	Test Stat	Critical	MSD	P-Value	Decision(5%)
Reference Sed		100*	2.45	1.86	0.0646	0.0200	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.0181213	0.0181213	1	6	0.0400	Significant Effect
Error	0.02416173	0.003020216	8			
Total	0.04228302	0.02114151	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Mod Levene Equality of Variance	3	13.7	0.1340	Equal Variances
Distribution	Shapiro-Wilk Normality	0.814		0.0215	Normal Distribution

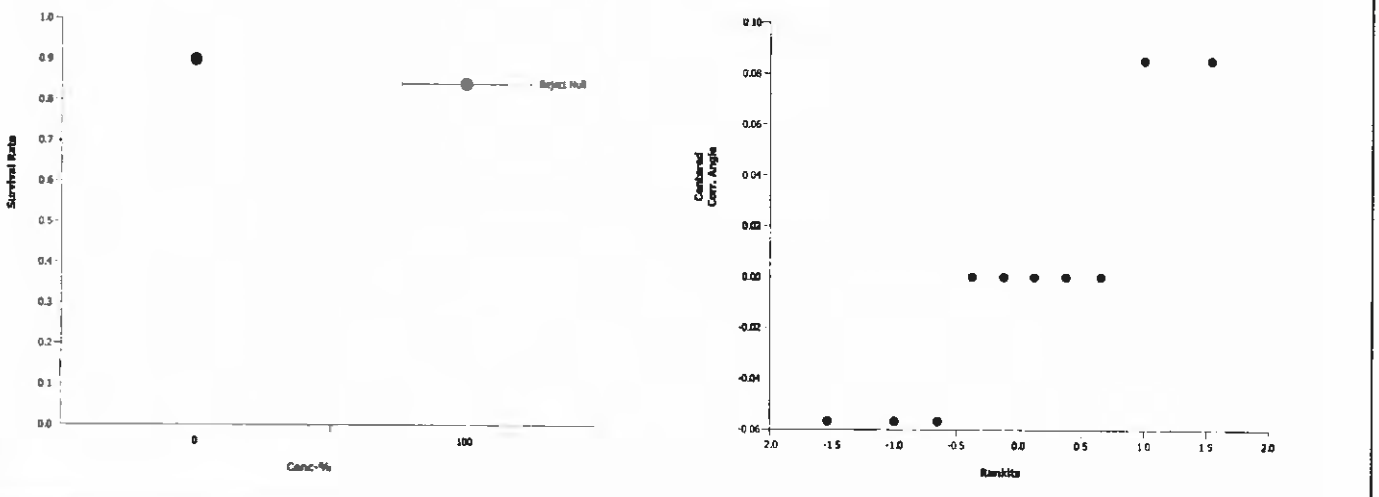
Survival Rate Summary

Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Reference Sed	5	0.9	0.9	0.9	0.9	0.9	0	0	0.0%	0.0%
100		5	0.84	0.819	0.861	0.8	0.9	0.0102	0.0548	6.52%	6.67%

Angular (Corrected) Transformed Summary

Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Reference Sed	5	1.25	1.25	1.25	1.25	1.25	0	0	0.0%	0.0%
100		5	1.16	1.13	1.19	1.11	1.25	0.0144	0.0777	6.68%	6.82%

Graphics



10-Day Estuarine/Marine Sediment Toxicity Test Data

Client: Schnitzer Steel Test ID #: 39631 Date (Day 0): 8/1/10

Species: *Neanthes arenaceodentata* Project #: 17105 Organism Supplier: Don Reish

Organism Log # : 5334

Day of Test	Test Replicate	Sample ID: SSPC-DU1-Comp					Sign-Off
		Temp (°C)	pH	D.O. (mg/L)	Salinity (ppt)	# Alive	
Day 0	Rep A	19.7	7.87	7.7	30.7	10	Date: 08/01/10 Time: 10:00 WQ: SC Scientist Initiation: SC Scientist Confirmation:
	Rep B	19.7	7.90	7.6	30.4	10	
	Rep C	19.7	7.94	7.7	30.9	10	
	Rep D	19.7	7.91	7.7	31.0	10	
	Rep E	19.7	7.94	7.7	31.0	10	
Day 1	Rep A	19.7	7.98	7.6	28.9		Date: 8/2/10 Time: 9:20 WQ: CG
Day 2	Rep B	20.2	8.10	7.7	30.8		Date: 8/3/10 Time: 0930 WQ: CG
Day 3	Rep C	19.8	8.09	7.1	29.6		Date: 8/4/10 Time: 1000 WQ: CG
Day 4	Rep D	20.2	8.23	7.5	31.9		Date: 8/5/10 Time: 0930 WQ: CG
Day 5	Rep E	20.1	8.33	7.5	29.6		Date: 8/6/10 Time: 0945 WQ: CG
Day 6	Rep A	20.2	8.26	7.6	29.0		Date: 8/7/10 Time: 0945 WQ: FOR
Day 7	Rep B	20.2	8.05	7.2	28.9		Date: 8/8/10 Time: 10:00 WQ: SC
Day 8	Rep C	20.2	8.20	7.4	28.8		Date: 8/9/10 Time: 1010 WQ: CG
Day 9	Rep D	20.2	8.41	7.4	29.5		Date: 8/10/10 Time: 1100 WQ: CG
Day 10	Rep A	20.1	8.34	7.6	28.9	8	Date: 8/11/10 Time: 1000 WQ: CG Scientist:
	Rep B	20.1	8.38	7.5	29.9	8	
	Rep C	20.1	8.33	7.6	28.8	9	
	Rep D	20.1	8.41	7.6	29.9	8	
	Rep E	20.1	8.37	7.5	31.5	9	

Day of Test	Matrix	pH	D.O. (mg/L)	Salinity (ppt)	Total Sulfide (mg/L)	Total Ammonia (mg/L)	Sign-Off
Day 0	Porewater	7.52	5.1	30.2	0.095	7.47	Date: 8/1/10 Time: 12:00 WQ: SC
	Overlying Water					1.03	Date: 8/1/10 Time: 12:00 WQ: SC
	Meter ID	pH12	RDO3	ECO5	DR4000	DR3800	
Day 10	Porewater	7.30	4.9 4.7	38.7	0.014	2.39	Date: 8/11/10 Time: 1230 WQ: WM
	Overlying Water					21.0	Date: 8/14/10 Time: 1400 WQ: CG
	Meter ID	pH03	RDO4	ECO5	DR4000	DR3800	

Appendix G

Test Data and Summary of Statistics for the Reference Toxicant Evaluation of the Polychaete, *Neanthes arenaceodentata*

Acute Polychaete Survival Test — Pacific EcoRisk

Batch ID:	13-8494-6954	**Test Type:**	Survival (96h)	**Analyst:**	Padrick Anderson
Start Date:	01 Aug-10 15:00	**Protocol:**	ASTM E1611-00 (Polychaete)	**Diluent:**	Diluted Seawater
Ending Date:	05 Aug-10 14:00	**Species:**	Neanthes arenaceodentata	**Brine:**	Not Applicable
Duration:	95h	**Source:**	Don Reisch	**Age:**	NA

Sample ID:	02-1591-1925	**Code:**	KCl	**Client:**	Reference Toxicant
Sample Date:	01 Aug-10 15:00	**Material:**	Potassium chloride	**Project:**	17166
Receive Date:	01 Aug-10 15:00	**Source:**	Reference Toxicant		
Sample Age:	N/A (19.7 °C)	**Station:**	In House		

Comparison Summary

Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method
14-0584-5624	96h Survival Rate	1	2	1.41	44.5%		Dunnett's Multiple Comparison Test

Point Estimate Summary

Analysis ID	Endpoint	Level	g/L	95% LCL	95% UCL	TU	Method
13-6116-5464	96h Survival Rate	EC50	1.89	1.52	2.35		Spearman-Kärber

96h Survival Rate Summary

Conc-g/L	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Lab Water Contr	2	0.9	0.847	0.953	0.8	1	0.0258	0.141	15.7%	0.0%
0.25		2	1	1	1	1	1	0	0	0.0%	-11.1%
0.5		2	0.9	0.847	0.953	0.8	1	0.0258	0.141	15.7%	0.0%
1		2	1	1	1	1	1	0	0	0.0%	-11.1%
2		2	0.4	0.294	0.506	0.2	0.6	0.0516	0.283	70.7%	55.6%
4		2	0	0	0	0	0	0	0		100.0%

96h Survival Rate Detail

Conc-g/L	Control Type	Rep 1	Rep 2
0	Lab Water Contr	1	0.8
0.25		1	1
0.5		1	0.8
1		1	1
2		0.2	0.6
4		0	0

96 Hour Marine Reference Toxicant Test Data

Client: **Reference Toxicant** Organism Log #: 5334

Test Material: Potassium Chloride Organism Supplier: Don Reish

Test ID#: 39627 Project # 17166 Species: *Neanthes arenaceodentata*

Test Date: 8/1/10 Randomization: ~~2-7-20~~ 2.6.2 Control/Diluent: 30 ppt Seawater

Treatment (g KCl /L)	Temp (°C)	pH new	pH old	D.O. (mg/L) new	D.O. (mg/L) old	Salinity (ppt) new	Salinity (ppt) old	# Live Organisms A	# Live Organisms B	SIGN-OFF
Control	19.7	7.89		7.1		30.7		5	5	Date: 8/1/10
0.25	19.7	7.90		7.1		33.7		5	5	Test Solution Prep:
0.5	19.7	7.91		7.1		29.3		5	5	New WQ: CN
1	19.7	7.91		7.2		29.7		5	5	Initiation Time: 1500
2	19.7	7.89		7.3		30.7		5	5	Initiation Signoff:
4	19.7	7.89		7.2		33.0		5	5	Ref Tox Stock Batch # 7/8
Meter ID.	15A	PH14		RD04		EC04				
Control	19.8		7.80		7.2		28.0	5	5	Date: 8/2/10
0.25	19.8		7.83		7.0		28.7	5	5	Count Time: 1345
0.5	19.8		7.83		7.4		28.8	5	5	Count Signoff:
1	19.8		7.83		7.4		29.2	5	5	Old WQ: CN
2	19.8		7.82		7.5		30.1	5	5	
4	19.8		7.81		7.5		32.4	0	0	
Meter ID:	48A		PH14		RD04		EC03			
Control	20.0		7.87		7.1		28.0	5	5	Date: 8/3/10
0.25	20.0		7.89		7.3		28.7	5	5	Count Time: 945
0.5	20.0		7.89		7.3		28.9	5	4	Count Signoff: RPB
1	20.0		7.89		7.3		29.2	5	5	Old WQ: YL
2	20.0		7.89		7.4		30.2	2	5	
4	—		—		—		—	—	—	
Meter ID:	48A		PH09		RD03		EC05			
Control	19.6		7.95		7.3		27.2	5	5	Date: 8/4/10
0.25	19.6		7.94		7.2		28.5	5	5	Count Time: 850
0.5	19.6		7.95		7.3		28.7	5	4	Count Signoff: RPB
1	19.6		7.95		7.3		29.1	5	5	Old WQ: CN
2	19.6		7.95		7.3		30.2	2	5	
4	—		—		—		—	—	—	
Meter ID:	48A		PH14		RD03		EC05			
Control	20.0		7.92		7.4		28.5	5	4	Date: 8/5/10
0.25	20.0		7.92		7.4		28.7	5	5	Termination Time: 1400
0.5	20.0		7.92		7.5		28.9	5	4	Termination Signoff:
1	20.0		7.91		7.5		30.4	5	5	Old WQ: JM
2	20.0		7.91		7.5		30.4	1	3	
4	—		—		—		—	—	—	
Meter ID:	48A		PH03		RD04		EC03			

Appendix H

Test Data and Summary of Statistics for the Toxicity Evaluation of Schnitzer Steel Products Company, Inc. Sediment Elutriate with Mussel *(Mytilus galloprovinciales)* Embryos

Bivalve Larval Survival and Development Test — **Pacific EcoRisk**

Batch ID:	13-7003-3579	**Test Type:**	Development-Survival	**Analyst:**	Jason Walker
Start Date:	12 Aug-10 15:15	**Protocol:**	EPA/600/R-95/136 (1995)	**Diluent:**	Diluted Seawater
Ending Date:	14 Aug-10 15:00	**Species:**	Mytilus galloprovincialis	**Brine:**	Crystal Sea
Duration:	48h	**Source:**	M-REP	**Age:**	NA

Sample ID:	04-2948-6615	**Code:**	Elutriate	**Client:**	Schnitzer Steel
Sample Date:	21 Jul-10 09:10	**Material:**	Sediment	**Project:**	17105
Receive Date:	21 Jul-10 19:00	**Source:**	Schnitzer Steel		
Sample Age:	22d 6h (0.1 °C)	**Station:**	SSPC-DU1-Comp		

Comparison Summary

Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method
07-1085-7636	Development Rate	50	100	70.7	2.95%	2	Steel Many-One Rank Test
05-1481-7145		0	>0		1.05%		Unequal Variance t Two-Sample Test
08-9091-0503		<0	0		13.0%		Unequal Variance t Two-Sample Test
08-3233-4525	Survival Rate	<0	0		14.0%		Equal Variance t Two-Sample Test
14-1882-4608		0	>0		13.3%		Equal Variance t Two-Sample Test
14-6593-4555		50	100	70.7	15.9%	2	Dunnett's Multiple Comparison Test

Point Estimate Summary

Analysis ID	Endpoint	Level	%	95% LCL	95% UCL	TU	Method
15-7066-9143	Development Rate	EC5	52.9	52.1	53.1	1.89	Linear Interpolation (ICPIN)
		EC10	55.9	55	56.3	1.79	
		EC15	58.8	57.9	59.7	1.7	
		EC20	61.8	60.7	63	1.62	
		EC25	64.7	63.5	66.3	1.55	
		EC40	73.5	71.9	76	1.36	
		EC50	79.4	77.4	82.7	1.26	
20-1837-8401	Survival Rate	EC50	71.5	70.7	72.3	1.4	Trimmed Spearman-Kärber

Development Rate Summary

Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Lab Water Contr	5	0.964	0.96	0.967	0.952	0.978	0.00182	0.00994	1.03%	0.0%
0	Salt Control	5	0.505	0.421	0.589	0.279	0.76	0.0409	0.224	44.4%	47.6%
0	Site Water	5	1	1	1	1	1	0	0	0.0%	-3.78%
1		5	0.966	0.965	0.966	0.964	0.968	0.000278	0.00153	0.16%	-0.24%
10		5	0.968	0.965	0.97	0.96	0.976	0.00126	0.00692	0.72%	-0.43%
25		5	0.975	0.972	0.978	0.965	0.982	0.00148	0.00809	0.83%	-1.2%
50		5	0.969	0.964	0.974	0.95	0.984	0.00243	0.0133	1.38%	-0.51%
100		5	0.142	0.116	0.168	0.0821	0.26	0.0126	0.0692	48.7%	85.2%

Survival Rate Summary

Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Lab Water Contr	5	0.868	0.855	0.88	0.821	0.913	0.00607	0.0332	3.83%	0.0%
0	Salt Control	5	0.374	0.31	0.438	0.188	0.565	0.0312	0.171	45.8%	56.9%
0	Site Water	5	0.745	0.69	0.799	0.56	0.913	0.0266	0.146	19.6%	14.1%
1		5	0.918	0.892	0.944	0.826	1	0.0128	0.0698	7.61%	-5.79%
10		5	0.954	0.934	0.974	0.874	1	0.00975	0.0534	5.6%	-9.91%
25		5	0.776	0.722	0.83	0.531	0.884	0.0263	0.144	18.6%	10.6%
50		5	0.885	0.87	0.901	0.816	0.923	0.00757	0.0415	4.69%	-2.0%
100		5	0.105	0.0847	0.126	0.0531	0.188	0.0101	0.0553	52.5%	87.9%

Bivalve Larval Survival and Development Test — **Pacific EcoRisk**

Analysis ID:	08-9091-0503	**Endpoint:** Development Rate	**CETIS Version:** CETISv1.7.0
Analyzed:	17 Aug-10 14:59	**Analysis:** Parametric-Two Sample	**Official Results:** Yes

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Angular (Corrected)	0	C > T	Not Run	<0	0			13.0%

Unequal Variance t Two-Sample Test

Control	vs	Control	Test Stat	Critical	MSD	P-Value	Decision(5%)
Lab Water Control		Salt Control	5.62	2.13	0.224	0.0025	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.8688502	0.8688502	1	31.6	0.0005	Significant Effect
Error	0.2199672	0.0274959	8			
Total	1.088817	0.8963461	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	69.7	23.2	0.0012	Unequal Variances
Distribution	Shapiro-Wilk Normality	0.907		0.2610	Normal Distribution

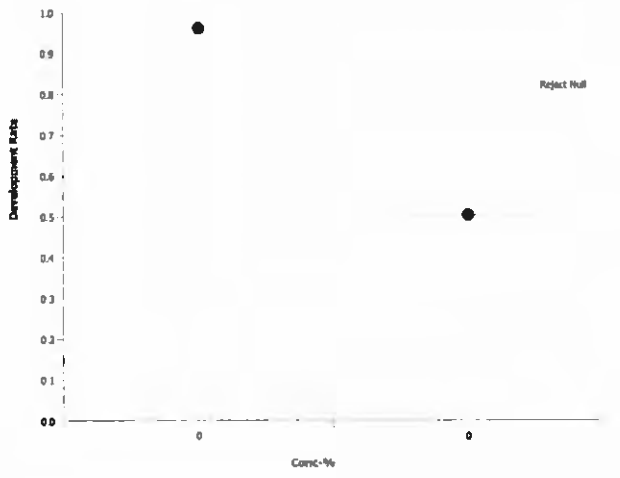
Development Rate Summary

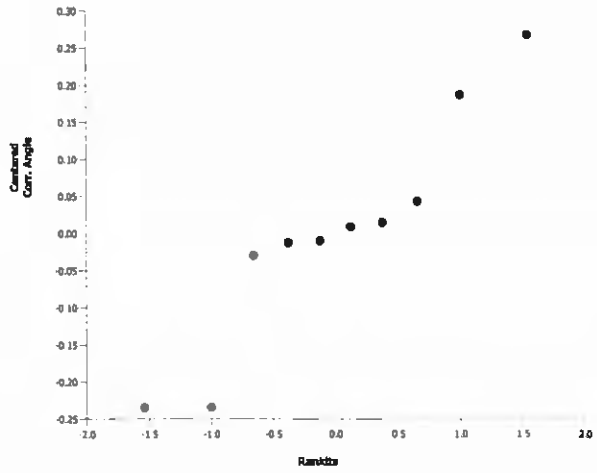
Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Salt Control	5	0.505	0.42	0.59	0.279	0.76	0.0416	0.224	44.4%	0.0%
0	Lab Water Contr	5	0.964	0.96	0.967	0.952	0.978	0.00185	0.00994	1.03%	-90.8%

Angular (Corrected) Transformed Summary

Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Salt Control	5	0.791	0.702	0.879	0.556	1.06	0.0432	0.233	29.4%	0.0%
0	Lab Water Cont	5	1.38	1.37	1.39	1.35	1.42	0.00518	0.0279	2.02%	-74.5%

Graphics





Bivalve Larval Survival and Development Test — **Pacific EcoRisk**

Analysis ID:	05-1481-7145	**Endpoint:**	Development Rate	**CETIS Version:**	CETISv1.7.0
Analyzed:	17 Aug-10 14:59	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Angular (Corrected)	0	C > T	Not Run	0	>0			1.05%

Unequal Variance t Two-Sample Test

Control	vs	Control	Test Stat	Critical	MSD	P-Value	Decision(5%)
Lab Water Control		Site Water	-11.9	2.13	0.0269	0.9999	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.05604343	0.05604343	1	141	<0.0001	Significant Effect
Error	0.003178264	0.000397283	8			
Total	0.05922169	0.05644071	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	45.2	23.2	0.0028	Unequal Variances
Distribution	Shapiro-Wilk Normality	0.896		0.1994	Normal Distribution

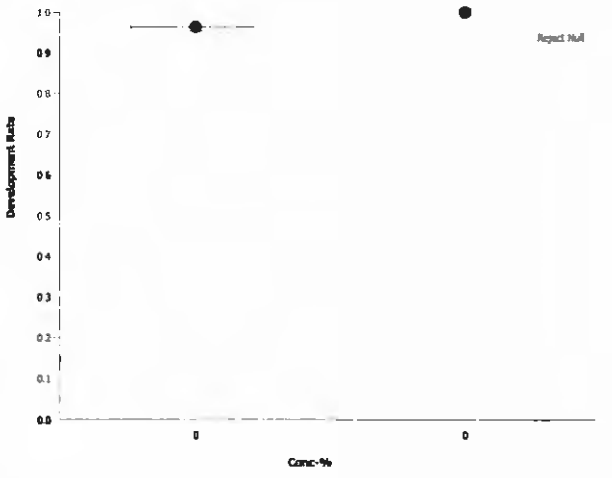
Development Rate Summary

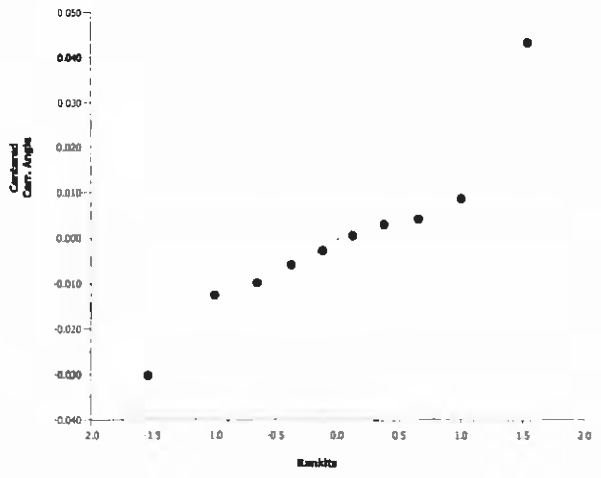
Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Site Water	5	1	1	1	1	1	0	0	0.0%	0.0%
0	Lab Water Contr	5	0.964	0.96	0.967	0.952	0.978	0.00185	0.00994	1.03%	3.64%

Angular (Corrected) Transformed Summary

Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Site Water	5	1.53	1.53	1.53	1.52	1.53	0.00077	0.00415	0.27%	0.0%
0	Lab Water Cont	5	1.38	1.37	1.39	1.35	1.42	0.00518	0.0279	2.02%	9.79%

Graphics





Bivalve Larval Survival and Development Test — **Pacific EcoRisk**

Analysis ID: 07-1085-7636 **Endpoint:** Development Rate **CETIS Version:** CETISv1.7.0
Analyzed: 17 Aug-10 14:59 **Analysis:** Nonparametric-Control vs Treatments **Official Results:** Yes

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Angular (Corrected)	0	C > T	Not Run	50	100	70.7	2	2.95%

Steel Many-One Rank Test

Control	vs	Conc-%	Test Stat	Critical	Ties	P-Value	Decision(5%)
Lab Water Control		1	31	16	0	0.9676	Non-Significant Effect
		10	31	16	0	0.9676	Non-Significant Effect
		25	37	16	0	0.9996	Non-Significant Effect
		50	31	16	0	0.9676	Non-Significant Effect
		100*	15	16	0	0.0191	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	4.28227	0.856454	5	426	<0.0001	Significant Effect
Error	0.0482187	0.002009113	24			
Total	4.330489	0.8584631	29			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Bartlett Equality of Variance	26.4	15.1	<0.0001	Unequal Variances
Distribution	Shapiro-Wilk Normality	0.858		0.0009	Non-normal Distribution

Development Rate Summary

Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Lab Water Contr	5	0.964	0.96	0.967	0.952	0.978	0.00185	0.00994	1.03%	0.0%
1		5	0.966	0.965	0.966	0.964	0.968	0.000283	0.00153	0.16%	-0.24%
10		5	0.968	0.965	0.97	0.96	0.976	0.00129	0.00692	0.72%	-0.43%
25		5	0.975	0.972	0.978	0.965	0.982	0.0015	0.00809	0.83%	-1.2%
50		5	0.969	0.963	0.974	0.95	0.984	0.00248	0.0133	1.38%	-0.51%
100		5	0.142	0.116	0.169	0.0821	0.26	0.0128	0.0692	48.7%	85.2%

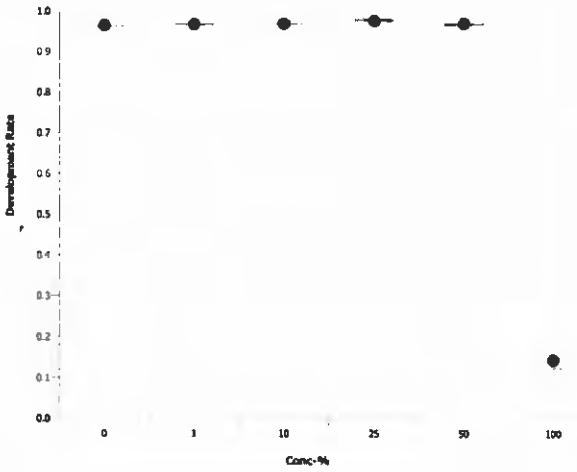
Angular (Corrected) Transformed Summary

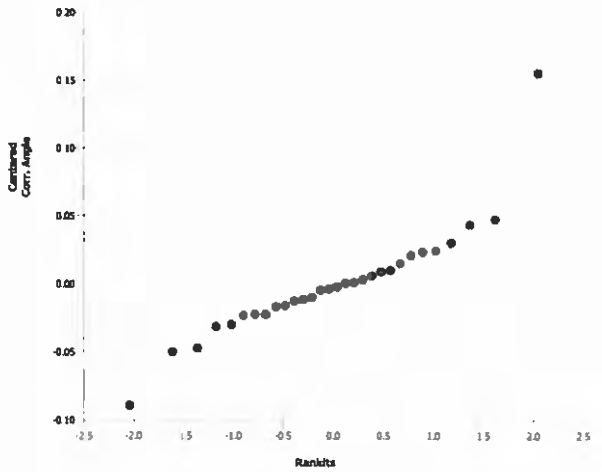
Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Lab Water Cont	5	1.38	1.37	1.39	1.35	1.42	0.00518	0.0279	2.02%	0.0%
1		5	1.39	1.38	1.39	1.38	1.39	0.000783	0.00421	0.3%	-0.34%
10		5	1.39	1.38	1.4	1.37	1.42	0.00367	0.0198	1.42%	-0.77%
25		5	1.41	1.4	1.42	1.38	1.44	0.00476	0.0256	1.81%	-2.44%
50		5	1.4	1.38	1.41	1.35	1.44	0.00722	0.0389	2.79%	-1.12%
100		5	0.38	0.344	0.415	0.291	0.535	0.0173	0.0933	24.6%	72.5%

Bivalve Larval Survival and Development Test — **Pacific EcoRisk**

Analysis ID:	07-1085-7636	**Endpoint:**	Development Rate	**CETIS Version:**	CETISv1.7.0
Analyzed:	17 Aug-10 14:59	**Analysis:**	Nonparametric-Control vs Treatments	**Official Results:**	Yes

Graphics





Bivalve Larval Survival and Development Test

Pacific EcoRisk

Analysis ID:	15-7066-9143	**Endpoint:**	Development Rate	**CETIS Version:**	CETISv1.7.0
Analyzed:	17 Aug-10 14:59	**Analysis:**	Linear Interpolation (ICPIN)	**Official Results:**	Yes

Linear Interpolation Options

X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Linear	Linear	57951	200	Yes	Two-Point Interpolation

Point Estimates

Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL
EC5	52.9	52.1	53.1	1.89	1.88	1.92
EC10	55.9	55	56.3	1.79	1.78	1.82
EC15	58.8	57.9	59.7	1.7	1.68	1.73
EC20	61.8	60.7	63	1.62	1.59	1.65
EC25	64.7	63.5	66.3	1.55	1.51	1.58
EC40	73.5	71.9	76	1.36	1.31	1.39
EC50	79.4	77.4	82.7	1.26	1.21	1.29

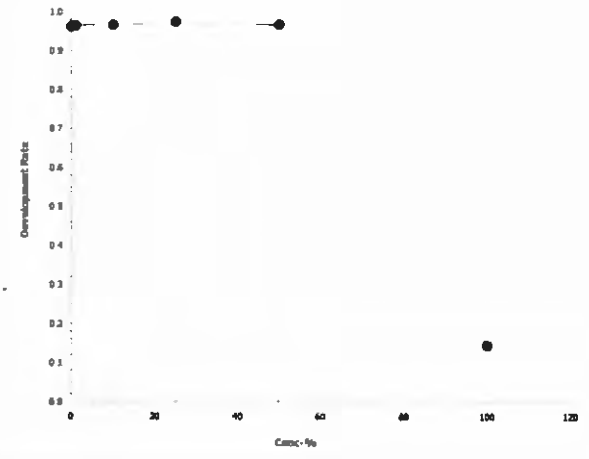
Development Rate Summary

			Calculated Variate(A/B)								
Conc-%	Control Type	Count	Mean	Min	Max	Std Err	Std Dev	CV%	Diff%	A	B
0	Lab Water Contr	5	0.964	0.952	0.978	0.00182	0.00994	1.03%	0.0%	898	932
1		5	0.966	0.964	0.968	0.000279	0.00153	0.16%	-0.24%	961	995
10		5	0.968	0.96	0.976	0.00126	0.00692	0.72%	-0.43%	987	1020
25		5	0.975	0.965	0.982	0.00148	0.00809	0.83%	-1.2%	803	823
50		5	0.969	0.95	0.984	0.00243	0.0133	1.38%	-0.51%	916	946
100		5	0.142	0.0821	0.26	0.0126	0.0692	48.7%	85.2%	109	754

Development Rate Detail

Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Lab Water Control	0.96	0.967	0.978	0.959	0.952
1		0.964	0.965	0.966	0.966	0.968
10		0.962	0.976	0.96	0.973	0.967
25		0.979	0.968	0.965	0.982	0.982
50		0.979	0.95	0.966	0.964	0.984
100		0.26	0.123	0.14	0.107	0.0821

Graphics



Bivalve Larval Survival and Development Test — **Pacific EcoRisk**

Analysis ID:	08-3233-4525	**Endpoint:**	Survival Rate	**CETIS Version:**	CETISv1.7.0
Analyzed:	17 Aug-10 14:58	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Angular (Corrected)	0	C > T	Not Run	<0	0			14.0%

Equal Variance t Two-Sample Test

Control	vs	Control	Test Stat	Critical	MSD	P-Value	Decision(5%)
Lab Water Control		Salt Control	6.47	1.86	0.158	<0.0001	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.7581249	0.7581249	1	41.9	0.0002	Significant Effect
Error	0.1447564	0.01809455	8			
Total	0.9028813	0.7762194	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	13.7	23.2	0.0266	Equal Variances
Distribution	Shapiro-Wilk Normality	0.953		0.7097	Normal Distribution

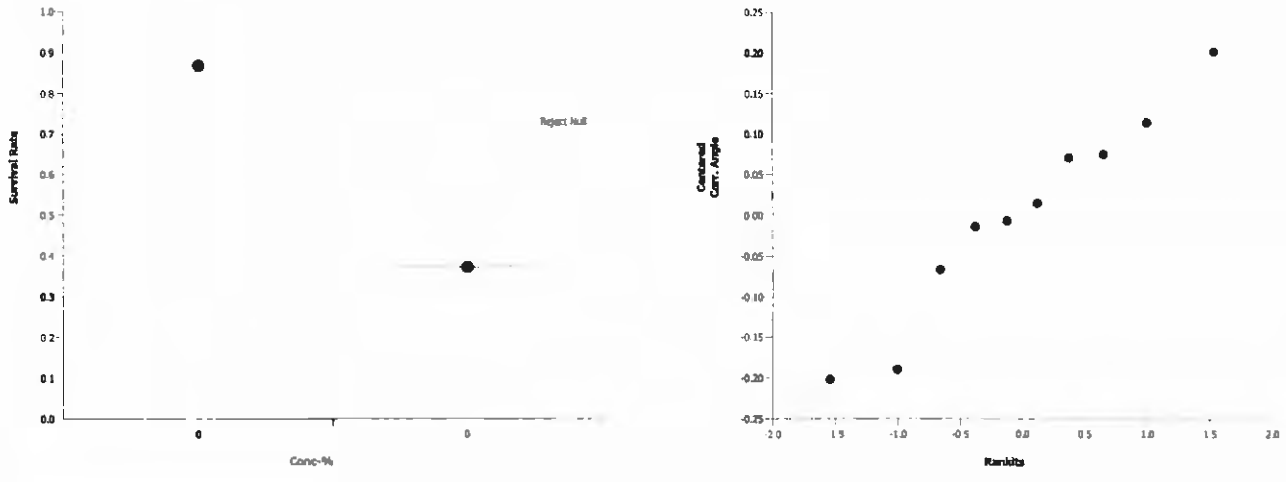
Survival Rate Summary

Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Salt Control	5	0.374	0.309	0.439	0.188	0.565	0.0318	0.171	45.8%	0.0%
0	Lab Water Contr	5	0.868	0.855	0.88	0.821	0.913	0.00617	0.0332	3.83%	-132.0%

Angular (Corrected) Transformed Summary

Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Salt Control	5	0.65	0.58	0.72	0.449	0.851	0.0341	0.184	28.3%	0.0%
0	Lab Water Cont	5	1.2	1.18	1.22	1.13	1.27	0.00923	0.0497	4.14%	-84.7%

Graphics



Bivalve Larval Survival and Development Test — **Pacific EcoRisk**

Analysis ID:	14-1882-4608	**Endpoint:**	Survival Rate	**CETIS Version:**	CETISv1.7.0
Analyzed:	17 Aug-10 14:58	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Angular (Corrected)	0	C > T	Not Run	0	>0			13.3%

Equal Variance t Two-Sample Test

Control	vs	Control	Test Stat	Critical	MSD	P-Value	Decision(5%)
Lab Water Control		Site Water	1.78	1.86	0.151	0.0561	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.05241672	0.05241672	1	3.18	0.1123	Non-Significant Effect
Error	0.1317835	0.01647294	8			
Total	0.1842002	0.06888966	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	12.3	23.2	0.0320	Equal Variances
Distribution	Shapiro-Wilk Normality	0.981		0.9687	Normal Distribution

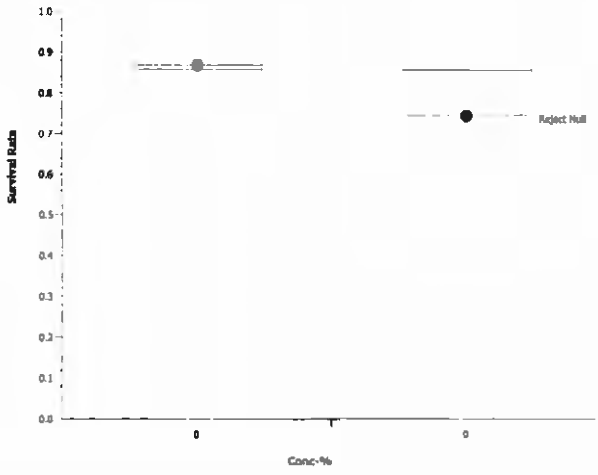
Survival Rate Summary

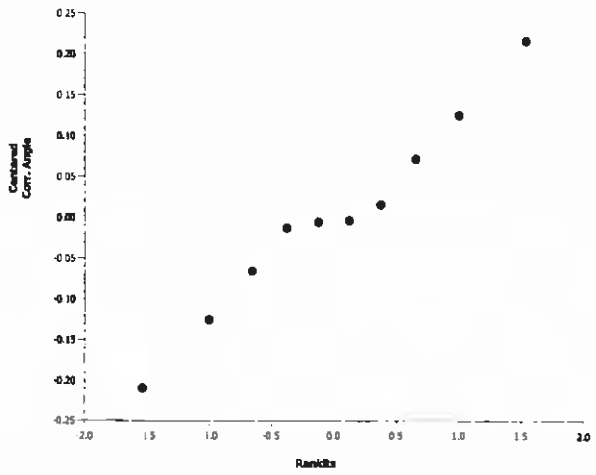
Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Site Water	5	0.745	0.689	0.8	0.56	0.913	0.0271	0.146	19.6%	0.0%
0	Lab Water Contr	5	0.868	0.855	0.88	0.821	0.913	0.00617	0.0332	3.83%	-16.5%

Angular (Corrected) Transformed Summary

Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Site Water	5	1.06	0.989	1.12	0.846	1.27	0.0324	0.175	16.5%	0.0%
0	Lab Water Cont	5	1.2	1.18	1.22	1.13	1.27	0.00923	0.0497	4.14%	-13.7%

Graphics





Bivalve Larval Survival and Development Test — Pacific EcoRisk

Analysis ID: 14-6593-4555 Endpoint: Survival Rate CETIS Version: CETISv1.7.0
Analyzed: 17 Aug-10 14:58 Analysis: Parametric-Control vs Treatments Official Results: Yes

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Angular (Corrected)	0	C > T	Not Run	50	100	70.7	2	15.9%

Dunnett's Multiple Comparison Test

Control	vs	Conc-%	Test Stat	Critical	MSD	P-Value	Decision(5%)
Lab Water Control		1	-1.5	2.36	0.177	0.9963	Non-Significant Effect
		10	-2.49	2.36	0.177	0.9999	Non-Significant Effect
		25	1.47	2.36	0.177	0.2322	Non-Significant Effect
		50	-0.374	2.36	0.177	0.9204	Non-Significant Effect
		100*	11.7	2.36	0.177	<0.0001	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	3.791224	0.7582449	5	54.3	<0.0001	Significant Effect
Error	0.3353878	0.01397449	24			
Total	4.126612	0.7722194	29			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Bartlett Equality of Variance	7.73	15.1	0.1716	Equal Variances
Distribution	Shapiro-Wilk Normality	0.983		0.8973	Normal Distribution

Survival Rate Summary

Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Lab Water Contr	5	0.868	0.855	0.88	0.821	0.913	0.00617	0.0332	3.83%	0.0%
1		5	0.918	0.891	0.944	0.826	1	0.013	0.0698	7.61%	-5.79%
10		5	0.954	0.933	0.974	0.874	1	0.00992	0.0534	5.6%	-9.91%
25		5	0.776	0.721	0.831	0.531	0.884	0.0268	0.144	18.6%	10.6%
50		5	0.885	0.869	0.901	0.816	0.923	0.0077	0.0415	4.69%	-2.0%
100		5	0.105	0.0843	0.126	0.0531	0.188	0.0103	0.0553	52.5%	87.9%

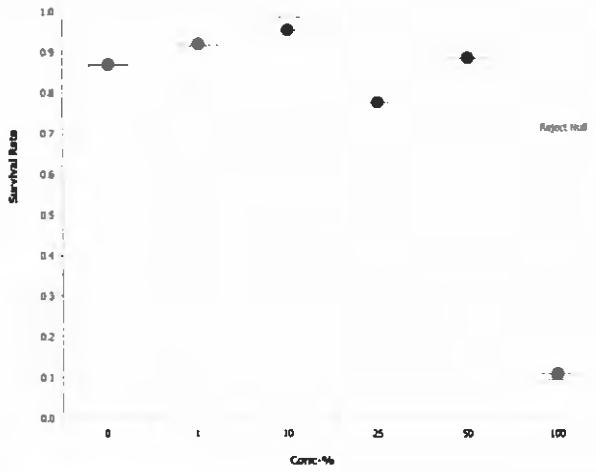
Angular (Corrected) Transformed Summary

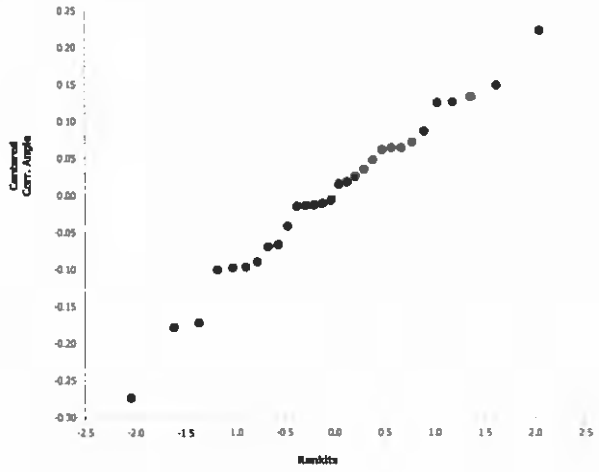
Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Lab Water Cont	5	1.2	1.18	1.22	1.13	1.27	0.00923	0.0497	4.14%	0.0%
1		5	1.31	1.25	1.37	1.14	1.54	0.0291	0.157	11.9%	-9.34%
10		5	1.39	1.34	1.44	1.21	1.54	0.0248	0.134	9.65%	-15.5%
25		5	1.09	1.03	1.15	0.817	1.22	0.0307	0.165	15.1%	9.18%
50		5	1.23	1.2	1.25	1.13	1.29	0.0115	0.0621	5.06%	-2.33%
100		5	0.322	0.289	0.356	0.233	0.449	0.0164	0.0885	27.4%	73.1%

Bivalve Larval Survival and Development Test — **Pacific EcoRisk**

Analysis ID:	14-6593-4555	**Endpoint:**	Survival Rate	**CETIS Version:**	CETISv1.7.0
Analyzed:	17 Aug-10 14:58	**Analysis:**	Parametric-Control vs Treatments	**Official Results:**	Yes

Graphics





CETIS Analytical Report

Bivalve Larval Survival and Development Test — **Pacific EcoRisk**

Analysis ID:	20-1837-8401	**Endpoint:**	Survival Rate	**CETIS Version:**	CETISv1.7.0
Analyzed:	17 Aug-10 14:58	**Analysis:**	Trimmed Spearman-Kärber	**Official Results:**	Yes

Trimmed Spearman-Kärber Estimates

Threshold Option	Threshold	Trim	Mu	Sigma	EC50	95% LCL	95% UCL
Control Threshold	0.132	11.53%	1.85	0.00254	71.5	70.7	72.3

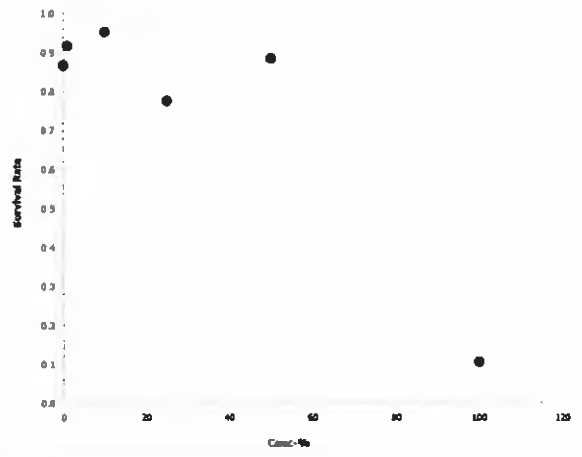
Survival Rate Summary

			Calculated Variate(A/B)								
Conc-%	Control Type	Count	Mean	Min	Max	Std Err	Std Dev	CV%	Diff%	A	B
0	Lab Water Contr	5	0.868	0.821	0.913	0.00607	0.0332	3.83%	0.0%	898	1035
1		5	0.918	0.826	1	0.0128	0.0698	7.61%	-5.79%	950	1035
10		5	0.954	0.874	1	0.00975	0.0534	5.6%	-9.91%	987	1035
25		5	0.776	0.531	0.884	0.0263	0.144	18.6%	10.6%	803	1035
50		5	0.885	0.816	0.923	0.00757	0.0415	4.69%	-2.0%	916	1035
100		5	0.105	0.0531	0.188	0.0101	0.0553	52.5%	87.9%	109	1035

Survival Rate Detail

Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Lab Water Control	0.821	0.86	0.879	0.913	0.865
1		0.913	1	0.826	0.971	0.879
10		0.986	0.986	0.923	0.874	1
25		0.884	0.879	0.531	0.807	0.778
50		0.908	0.923	0.816	0.899	0.879
100		0.188	0.0918	0.13	0.0628	0.0531

Graphics



Bivalve Larval Survival and Development Test — **Pacific EcoRisk**

Development Rate Detail

Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Lab Water Contr	0.96	0.967	0.978	0.959	0.952
0	Salt Control	0.279	0.279	0.76	0.688	0.52
0	Site Water	1	1	1	1	1
1		0.964	0.965	0.966	0.966	0.968
10		0.962	0.976	0.96	0.973	0.967
25		0.979	0.968	0.965	0.982	0.982
50		0.979	0.95	0.966	0.964	0.984
100		0.26	0.123	0.14	0.107	0.0821

Survival Rate Detail

Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Lab Water Contr	0.821	0.86	0.879	0.913	0.865
0	Salt Control	0.198	0.188	0.565	0.478	0.44
0	Site Water	0.913	0.754	0.643	0.855	0.56
1		0.913	1	0.826	0.971	0.879
10		0.986	0.986	0.923	0.874	1
25		0.884	0.879	0.531	0.807	0.778
50		0.908	0.923	0.816	0.899	0.879
100		0.188	0.0918	0.13	0.0628	0.0531

Mytilus sp. Development Toxicity Test Count Data

Client: Schnitzer Steel
Test Material: SSPC-DU1-Comp
Test ID #: 39765
Project #: 17105
Sample Salinity adjusted with : Crystal Sea

Test Start Date: 8/12/10
Test End Date: 8/14/10
Enumeration Date: 8/17/10
Investigator: JM
Inoculation Count: 207

Concentration	Replicate	Number of Normal Larvae	Number of Abnormal Larvae	Total Number Larvae	Percent Normal Development	Percent Survival
Control	A	170	7	177	96.0	84.2
	B	178	6	184	96.7	86.0
	C	182	4	186	97.8	87.9
	D	189	8	197	95.9	91.3
	E	179	9	188	95.2	86.5
1.0%	A	189	7	196	96.4	91.3
	B	218	8	226	96.5	100
	C	171	6	177	96.6	82.6
	D	201	7	208	96.6	97.1
	E	182	6	188	96.8	87.9
10%	A	204	8	212	96.2	98.6
	B	204	5	209	97.6	98.6
	C	191	8	199	96.0	92.3
	D	181	5	186	97.3	87.4
	E	207	7	214	96.7	100
25%	A	183	4	187	97.9	88.4
	B	182	6	188	96.8	87.9
	C	110	4	114	96.5	53.1
	D	167	3	170	98.2	80.7
	E	161	3	164	98.2	77.8
50%	A	188	4	192	97.9	90.8
	B	191	10	201	95.0	92.3
	C	169	6	175	96.6	81.6
	D	186	7	193	96.4	89.9
	E	182	3	185	98.4	87.9
100%	A	39	111	150	26.0	18.8
	B	19	136	155	12.3	9.18
	C	27	166	193	14.0	13.0
	D	13	109	122	10.7	6.28
	E	11	123	134	8.21	5.31

Mytilus sp. Development Toxicity Test Water Chemistry Data

Client: Schnitzer Steel
Test Material: SSPC-DU1-Comp
Test ID#: 39765 Project #: 17105
Test Date: _____ Randomization: _____
Sample Salinity adjusted with : Crystal Sea

Organism Log#: 5323 Age: N/A
Organism Supplier: M-Rep
Control/Diluent: 30ppt FSW

Day 0

Treatment	Temperature (°C)	pH	D.O. (mg/L)	Salinity (ppt)	Signoff
Control	15.6	7.77	7.8	30.5	Test Solution Prep: SM/JZ
1%	15.6	7.79	7.9	80.9	New WQ: JY
10%	15.6	7.82	7.9	30.7	Inoculation Date: 8/12/10
25%	15.6	7.88	8.0	30.4	Inoculation Time: 1515
50%	15.6	7.95	8.0	30.1	Inoculation Signoff: SM
100%	15.6	8.06	8.0	29.2	
Meter ID	53A	PH12	RDO3	EC04	

Day 1

Treatment	Temperature (°C)	pH	D.O. (mg/L)	Salinity (ppt)	Signoff
Control	15.5				Date: 8/13/10
1%	15.5				Signoff: JZ
10%	15.5				
25%	15.5				
50%	15.5				
100%	15.5				
Meter ID	53A				

Day 2

Treatment	Temperature (°C)	pH	D.O. (mg/L)	Salinity (ppt)	Signoff
Control	15.7	7.25	6.1	31.0	Termination Signoff: JT
1%	15.7	7.20	5.7	31.2	Termination Date: 8/14/10
10%	15.7	7.28	6.3	30.6	Termination Time: 1500
25%	15.7	7.36	6.7	30.7	Old WQ: JY
50%	15.7	7.47	6.7	30.6	
100%	15.7	7.62	6.1	29.8	
Meter ID	53A	ph01	RD04	EC04	

Mytilus sp. Development Toxicity Test Count Data

Client: **Schnitzer Steel**
Test Material: Salt Control/Site Water
Test ID #: 39765
Project #: 17105
Sample Salinity adjusted with : Crystal Sea

Test Start Date: 8/12/10
Test End Date: 8/14/10
Enumeration Date: 8/17/10
Investigator: JM
Innoculation Counts: 207

Concentration	Replicate	Number of Normal Larvae	Number of Abnormal Larvae	Total Number Larvae	Percent Normal Development	Percent Survival
Control	A	170	7	177	96.0	84.2
	B	178	6	184	96.7	86.0
	C	182	4	186	97.8	87.9
	D	189	8	197	95.9	91.3
	E	179	9	188	95.2	86.5
Salt Control	A	41	106	147	27.9	19.8
	B	39	101	140	27.9	18.8
	C	117	37	154	76.0	56.5
	D	99	45	144	68.8	47.8
	E	91	84	175	52.0	44.0
Site Water Control	A	189	0	189	100	91.3
	B	156	0	156	100	75.4
	C	133	0	133	100	64.3
	D	177	0	177	100	85.5
	E	116	0	116	100	56.0

Mytilus sp. Development Toxicity Test Water Chemistry Data

Client: **Schnitzer Steel**
Test Material: Salt Control/Site Water
Test ID#: 39765 Project #: 17105
Test Date: _____ Randomization: _____
Sample Salinity adjusted with : Crystal Sea Salts

Organism Log#: 5323 Age: N/A
Organism Supplier: M-Rep
Control/Diluent: 30 ppt FSW

Day 0

Treatment	Temperature (°C)	pH	D.O. (mg/L)	Salinity (ppt)	Signoff
Control	15.6	7.77	7.8	30.5	Date & Inoculation Time: 8/12/10 1515
Crystal Sea Salt Control	15.6	8.14	7.1	29.0	Test Solution Prep: SM / JL
Site Water Control	15.6	~~8.19~~ 8.04 ~~7.84~~	~~8.4~~ 8.3	30.0	Inoculation Signoff: SM
Meter ID	53A	ph 12	RDO3	EC04	New WQ: JL

Day 1

Treatment	Temperature (°C)	pH	D.O. (mg/L)	Salinity (ppt)	Signoff
Control	15.3				Date: 8/13/10
Crystal Sea Salt Control	15.3				Old WQ: JL
Site Water Control	15.3				
Meter ID	53A				

Day 2

Treatment	Temperature (°C)	pH	D.O. (mg/L)	Salinity (ppt)	Signoff
Control	15.7	7.25	6.1	31.0	Date: 8/14/10
Crystal Sea Salt Control	15.7	7.88	7.5	28.9	Termination: JT
Site Water Control	15.7	7.95	7.4	30.9	Old WQ: JL
Meter ID	53A	ph09	RDO4	EC04	

Appendix I

Test Data and Summary of Statistics for the Reference Toxicant Evaluation of the Mussel *(Mytilus galloprovinciales)* Embryos

Bivalve Larval Survival and Development Test — **Pacific EcoRisk**

Batch ID:	13-7003-3579	**Test Type:**	Development-Survival	**Analyst:**	Jason Walker
Start Date:	12 Aug-10 15:15	**Protocol:**	EPA/600/R-95/136 (1995)	**Diluent:**	Diluted Seawater
Ending Date:	14 Aug-10 15:00	**Species:**	Mytilus galloprovincialis	**Brine:**	Crystal Sea
Duration:	48h	**Source:**	M-REP	**Age:**	NA

Sample ID:	06-0707-7075	**Code:**	KCl	**Client:**	Reference Toxicant
Sample Date:	12 Aug-10 15:15	**Material:**	Potassium chloride	**Project:**	17194
Receive Date:	12 Aug-10 15:15	**Source:**	Reference Toxicant		
Sample Age:	N/A (17.6 °C)	**Station:**	In House		

Comparison Summary

Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method
07-9824-1693	Development Rate	0.5	1	0.707	2.16%		Dunnett's Multiple Comparison Test

Point Estimate Summary

Analysis ID	Endpoint	Level	g/L	95% LCL	95% UCL	TU	Method
15-6471-3417	Development Rate	EC5	1.01	0.709	1.75		Linear Interpolation (ICPIN)
		EC10	2.02	1.83	2.06		
		EC15	2.07	2.04	2.11		
		EC20	2.13	2.09	2.16		
		EC25	2.18	2.15	2.22		
		EC40	2.35	2.32	2.37		
		EC50	2.45	2.43	2.48		

Development Rate Summary

Conc-g/L	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Lab Water Contr	4	0.975	0.97	0.979	0.962	0.985	0.00224	0.0123	1.26%	0.0%
0.5		4	0.971	0.966	0.975	0.958	0.984	0.00221	0.0121	1.25%	0.41%
1		4	0.926	0.917	0.935	0.906	0.958	0.00449	0.0246	2.66%	5.0%
2		4	0.894	0.884	0.903	0.872	0.926	0.00454	0.0249	2.78%	8.31%
3		4	0	0	0	0	0	0	0		100.0%
4		4	0	0	0	0	0	0	0		100.0%

Development Rate Detail

Conc-g/L	Control Type	Rep 1	Rep 2	Rep 3	Rep 4
0	Lab Water Contr	0.962	0.985	0.985	0.966
0.5		0.984	0.958	0.963	0.978
1		0.958	0.907	0.933	0.906
2		0.901	0.872	0.926	0.876
3		0	0	0	0
4		0	0	0	0

Mytilus sp. Development Toxicity Test Count Data

Client: **Reference Toxicant**
Test Material: Potassium Chloride
Test ID #: 39733
Project #: 17194

Test Start Date: 8/12/10
Test End Date: 8/14/10
Enumeration Date: 8/17/10
Investigator: JM

Concentration	Replicate	Number of Normal Larvae	Number of Abnormal Larvae	Total Number Larvae	Percent Normal Development
Control	A	205	8	213	96.2
	B	198	3	201	98.5
	C	202	3	205	98.5
	D	~~JT~~ 197	7	204	96.6
0.5	A	JM ~~184~~ 183	JM ~~8~~ 3	186	98.4
	B	184	8	192	95.8
	C	207	8	215	96.3
	D	176	4	180	97.8
1	A	182	8	190	95.8
	B	166	17	183	90.7
	C	166	12	178	93.3
	D	164	17	181	90.6
2	A	155	17	172	90.1
	B	163	24	187	87.2
	C	174	14	188	92.6
	D	163	23	186	87.6
3	A	0	128	128	0
	B	0	123	128	0
	C	0	92	92	0
	D	0	113	118	0
4	A	0	20	20	0
	B	0	65	65	0
	C	0	48	48	0
	D	0	59	59	0

Mytilus sp. Development Toxicity Test Water Chemistry Data

Client: **Reference Toxicant**
Test Material: Potassium Chloride
Test ID#: 39733 Project #: 17194
Test Date: 8/12/10

Organism Log#: 5323 Age: N/A
Organism Supplier: M-Rep
Control/Diluent: Filtered Seawater @ 30ppt.

Day 0

Treatment (g/L)	Temperature (°C)	pH	D.O. (mg/L)	Salinity (ppt)	Signoff
Control	17.6	7.78	7.8	30.5	Ref Tox Stock # —
0.5	17.6	7.78	8.0	31.5	Test Solution Prep:
1	17.6	7.78	8.0	31.9	New WQ:
2	17.6	7.76	7.7	32.7	Innoculation Date: 8/12/10
3	17.6	7.78	7.9	33.9	Innoculation Time: 1515
4	17.6	7.79	8.0	35.0	Innoculation Signoff:
Meter ID	45	ph12	RDO3	ECO4	

Day 1

Treatment	Temperature (°C)	pH	D.O. (mg/L)	Salinity (ppt)	Signoff
Control	17.4				WQ JL
0.5	17.4				
1	17.4				
2	17.4				
3	17.4				
4	17.4				
Meter ID	45				

Day 2

Treatment	Temperature (°C)	pH	D.O. (mg/L)	Salinity (ppt)	Signoff
Control	17.5	7.87	7.8	30.5	Termination Date: 8/13/10
0.5	17.5	7.89	7.7	31.5	Termination Time: 1500
1	17.5	7.89	7.6	31.9	Termination Signoff:
2	17.5	7.90	7.6	33.0	Old WQ:
3	17.5	7.90	7.6	34.2	
4	17.5	7.91	7.7	35.1	
Meter ID	45	ph09	RDO4	ECO4	

Appendix J

Bioassay Standard Test Conditions

Summary of Test Conditions and Acceptability Criteria for the Amphipod (*Ampelisca abdita*) 10-Day Sediment Toxicity Test	
1. Test type	Static non-renewal
2. Test duration	10 d
3. Temperature	20 ± 1°C
4. Salinity	20 – 35 ppt
5. Light quality	Ambient Laboratory
6. Light intensity	50 – 100 ft c.
7. Photoperiod	Continuous
8. Test chamber size	1 L
9. Seawater volume	800 mL
10. Sediment depth	40 mm
11. Renewal of seawater	None
12. Age of test organisms	Wild population, immature juveniles
13. # of organisms per test chamber	20
14. # of replicate chambers/concentration	5
15. # of organisms per sediment type	100
16. Feeding regime	None
17. Test chamber cleaning	Lab washing prior to test
18. Test solution aeration	Low bubble (~100/minute)
19. Overlying water	0.45 µm-filtered seawater (at test salinity)
20. Test materials	Test sites, reference and control
21. Dilution series	None
22. Endpoint	% Survival
23. Sample holding requirements	< 8 weeks
24. Sample volume required	4 L
25. Test acceptability criteria	≥ 90% survival in the Control treatment
26. Reference toxicant results	Within 2 SD of laboratory mean

Summary of Test Conditions and Acceptability Criteria for the Polychaete (*Neanthes arenaceodentata*) 10-Day Sediment Toxicity Test		
1.	Test type	Static
2.	Test duration	10d
3.	Temperature	20 ± 1°C
4.	Salinity	20 – 35 ppt
5.	Light quality	Ambient Laboratory
6.	Light intensity	50 – 100 ft c.
7.	Photoperiod	12L/12D
8.	Test chamber size	1 L glass beakers
9.	Test solution volume	800 mL
10.	Sediment depth	25 mm (200 mL)
11.	Renewal of seawater	none
12.	Age of test organisms	2-3 weeks
13.	# of organisms per test chamber	10
14.	# of replicate chambers/concentration	5
15.	# of organisms per sediment type	50
16.	Feeding regime	None
17.	Test chamber cleaning	Lab washing prior to test
18.	Test solution aeration	Low bubble (~100/minute)
19.	Overlying water	Natural seawater
20.	Test concentrations	Test sites, reference and Lab Control
21.	Dilution series	None
22.	Endpoint	% survival
23.	Sample and sample holding requirements	< 8 weeks
24.	Sample volume required	4 L
25.	Test acceptability criteria	≥ 90% in the Lab Controls
26.	Reference toxicant results	Within 2 SD of laboratory mean

Summary of Test Conditions and Acceptability Criteria for the Mussel (*Mytilus galloprovinciales*) Acute Toxicity Water Column Test		
1.	Test type	Static non-renewal
2.	Test duration	48 hours
3.	Salinity	30 ± 2 ppt
4.	Temperature	16 ± 1°C
5.	Light quality	Ambient Laboratory
6.	Light intensity	50 – 100 ft c.
7.	Photoperiod	16L/8D
8.	Test chamber size	30 mL vials
9.	Test solution volume	10 mL
10.	Renewal of seawater	None
11.	Age of test organisms	Embryo ≤ 4h old
12.	# of organisms per test chamber	150 – 300
13.	# of replicate chambers per concentration	5
14.	# of organisms per concentration	750 – 1,500
15.	Feeding regime	None
16.	Test chamber cleaning	Lab washing prior to test
17.	Test chamber aeration	None
18.	Elutriate preparation water	Site water
19.	Test concentrations	Test sites, and Lab Control
20.	Dilution series	Four concentrations (1, 10, 50, 100%) and a Lab Control.
21.	Dilution water	Natural seawater
22.	Endpoints	% survival and % normal development
23.	Sampling holding requirements	< 8 weeks
24.	Sample volume required	2L
25.	Test acceptability criteria	≥70% survival and normal development in the Lab Controls.

Appendix K

Elutriate Suitability Calculations

Table K-1. Calculation of the Elutriate Suitability Concentration (ESC)

Site: **SSPC-DU1-Comp**
Species: ***Mytilus galloprovinciales***
Disposal Site: **SF-11**

Mixing Zone Estimation	**SSPC-DU1-Comp**
Depth of disposal site (m) =	15
Pi=	3.14159
Width of vessel (m) =	10
Length of vessel (m) =	25
Speed of vessel (m/sec) =	0.5
Time of discharge (sec) =	30
Depth of vessel (m) =	4
Mixing Zone Volume(cu.m) =	627239

Volume of Liquid Phase	
Bulk density (constant) =	1.3
Particle density (constant) =	2.6
Density of liquid phase (constant) =	1
Vol. of disposal vessel (cu.m) =	1000
Liquid phase volume (cu.m) =	813

Concentration of suspended phase	
Percent Silt =	60.9
Percent Clay =	17.5
Volume of Suspended Phase (cu.m) =	145

Projected Concentration (percent SP) =	0.0231
Lowest LC50 or EC50 from bioassay =	71.5
Factor LC50 or EC50 X 0.01 =	0.715

The factored LC50 or EC50 is higher than the projected concentration; therefore the Elutriate Suitability Concentration is not exceeded for dredged material from this site for the disposal site specified (SF-11). This assumes that sediment will be disposed of by barge at the disposal site, using a barge meeting the listed parameters.