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 Start Date:	8/12/10
Test Material:	Potassium Chloride	Test End Date:	8/14/10
Test ID #:	39733	Enumeration Date:	8/17/10
Project #:	17194	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	199	3	201	98.5
	C	202	3	205	98.5
	D	~~197~~ 197	7	204	96.6
0.5	A	~~184~~ 183	~~8~~ 3	186	98.4
	B	184	8	192	95.8
	C	207	5	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	113	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: SM
1	17.6	7.78	8.0	31.9	New WQ: SM
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: SM
Meter ID	45	ph12	RDO3	EC04	

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: 8/19/10
0.5	17.5	7.89	7.7	31.5	Termination Time: 1500
1	17.5	7.89	7.6	31.9	Termination Signoff: ST
2	17.5	7.90	7.6	33.0	Old WQ: SM
3	17.5	7.90	7.6	34.2	
4	17.5	7.91	7.7	35.1	
Meter ID	45	ph09	RDO4	EC04	

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.

EXHIBIT 7

From: Scott Sloan <ssloan@schn.com>
Sent: Friday, October 19, 2012 2:41 PM
To: Boschen, Christine@Waterboards
Cc: Pat Christopher; Michael Henderson; Tom Zelenka; John Hare; Luc Ong; Chris Orsolini; Rosegay, Margaret; Peter Zawislanski; Bruce Rieser
Subject: Submittal of Supplemental Comments to Tentative CAO - Schnitzer Steel Products Oakland Facility
Attachments: SSPC Supplemental Comment Letter - Tentative CAO - 10.19.2012.pdf
Importance: High

Dear Ms. Boschen,

Per your forwarded E-mail below, Schnitzer Steel Products Company submits the attached Supplemental Comments to the Regional Board's Tentative Cleanup and Abatement Order (CAO) for our Oakland facility. Please note that the attached letter is only a supplement to our previous letter transmitted on October 1, 2012. Both letters should be reviewed in their entirety.

As outlined in my October 1st transmittal, we would appreciate the opportunity to meet with Regional Board staff once you've have had a chance to fully review both of our comment letters. We will contact you in a week or two to discuss potential scheduling for a meeting.

We look forward to working with the Regional Board as we proceed with additional stormwater improvement projects at our Oakland facility. Please contact me at your earliest convenience if you have any questions or need additional information.

Thank you,

Scott B. Sloan, R.G., C.Hg.
National Environmental Director
Schnitzer Steel MRB
425-420-1863 – Office
253-279-4752 – Cell

From: Boschen, Christine@Waterboards [mailto:Christine.Boschen@waterboards.ca.gov]
Sent: Monday, October 01, 2012 2:22 PM
To: Scott Sloan
Cc: Pat Christopher; Michael Henderson; Tom Zelenka; John Hare; Luc Ong; Chris Orsolini; Rosegay, Margaret; Peter Zawislanski; Bruce Rieser; Benedict, AnnaKathryn@Waterboards
Subject: RE: Submittal of Comments to Tentative CAO - Schnitzer Steel Products Oakland Facility

Dear Mr. Sloan,
Thank you, this confirms that we received your submittal. We have been asked—and agreed--to extend the comment period until October 19, 2012. So, if you would like to amend your comments before the 19th, please do so.

Sincerely,
Christine Boschen
Sr. Environmental Scientist

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

510-622-2346
Christine.boschen@waterboards.ca.gov

From: Scott Sloan [mailto:ssloan@schn.com]
Sent: Monday, October 01, 2012 11:57 AM
To: Boschen, Christine@Waterboards
Cc: Pat Christopher; Michael Henderson; Tom Zelenka; John Hare; Luc Ong; Chris Orsolini; Rosegay, Margaret; Peter Zawislanski; Bruce Rieser
Subject: Submittal of Comments to Tentative CAO - Schnitzer Steel Products Oakland Facility
Importance: High

Dear Ms. Boschen,

Per the San Francisco Bay Regional Water Quality Control Board's (Regional Board's) August 27, 2012 transmittal, please find Schnitzer Steel Products Company's comment letter associated with the Tentative Cleanup and Abatement Order (CAO) for our Oakland facility attached.

We'd like to reiterate our thanks to Regional Board staff for meeting with us on September 14, 2012. We believe our discussions were beneficial and that additional discussion regarding the progress of improvements underway at the facility, our comments to the CAO, and potential alternative regulatory approaches would be productive. Once Regional Board staff have had a chance to fully review our comments we would like to schedule a meeting. We will contact you in a week or two to discuss potential scheduling for a meeting. It's our understanding, based on discussions during our previous meeting, that this matter is not likely to be presented to the Executive Officer before mid-November 2012.

We look forward to working with the Regional Board as we proceed with additional stormwater improvement projects at our Oakland facility. Please contact me at your earliest convenience if you have any questions or need additional information.

Thank you,

Scott B. Sloan, R.G., L.Hg.
National Environmental Director
Schnitzer Steel MRB
425-420-1863 – Office
253-279-4752 – Cell

Schnitzer Steel Products Company
1101 Embarcadero West
Oakland, CA 94607

October 19, 2012

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

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

Dear Ms. Boschen:

Schnitzer Steel Products Company hereby submits supplemental comments on the tentative Cleanup and Abatement Order (CAO) that was sent to us on August 27, 2012 by the San Francisco Bay Regional Water Quality Control Board (Regional Board), concerning our scrap metal recycling facility in Oakland, California. These comments are in addition to those documented in our original comment letter dated October 1, 2012. Given that three weeks has elapsed as a result of the Regional Board's extension of the comment period, we are submitting these supplemental comments to update you on the progress of work discussed during our September 14, 2012 meeting with Regional Board staff and documented in our October 1st comment letter. The contents of this letter should be considered in the context of the more detailed information contained within our October 1st comment letter. This letter should not be evaluated on a stand-alone basis as many important details included in our previous letter are not repeated here.

Preparation of New SWPPP:

In our October 1st comment letter, we briefly discussed our plans to prepare a new Stormwater Pollution Prevention Plan (SWPPP) for our Oakland facility. Near the close of our September 14, 2012 meeting Cecil Felix indicated that he had reviewed the Oakland facility's Stormwater Quality Management Plan (SQMP), and incorporated SWPPP, which were submitted to the Regional Board on August 14, 2012. Mr. Felix's comments, indicating that he had several questions regarding the adequacy of the SQMP/SWPPP, prompted us to undertake a thorough review of the SQMP/SWPPP in consideration of the contents of the tentative CAO. As a result of this review, we decided to retain a new consultant to prepare a comprehensive revision to the facility's previous SWPPP. We are currently working with Terraphase Engineering to complete the comprehensive SWPPP revision and expect to submit the new Plan to Mr. Felix in draft form

prior to the end of the month. It is our desire and intent to work cooperatively with Regional Board staff to reach consensus on the final content of the facility's new SWPPP in a timely manner. We agree that maintenance of the facility's SWPPP is an important component of our facility's stormwater compliance program. With the commencement of the rainy season, we intend to implement the new SWPPP as soon as possible, irrespective of the status of the tentative CAO. We trust that you agree with this approach, and that implementation of the new SWPPP need not await resolution of the many other issues raised by the tentative CAO.

As indicated in our October 1st comment letter, our new SWPPP will include the information requested in the Technical Reports described in Section C of the tentative CAO since these issues — 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. This information will be presented in technical appendices to the SWPPP, and there is no need for the Regional Board to issue a Section 13267 request (or a CAO) to obtain this information. Inclusion of this information in the facility's SWPPP has the added benefit of making these documents subject to required periodic review and revision requirements associated with all SWPPP components. We trust that staff has no objection to this approach, and that this particular issue can be considered resolved. Because we are submitting the SWPPP to you in draft form, staff will, of course, have an opportunity to comment on the appendices, and we will work with you to resolve any questions staff may have.

Update on Progress of BMP Enhancements

As described in our October 1st comment letter, we have undertaken or completed each of the following action items to improve storm water management and quality at the facility. The current status of each project is briefly discussed below. Please refer to our October 1st comment letter for additional details.

Dock and Pier Cleaning

This work was completed on September 14, 2012.

Track Out Controls

We are continuing the process of installing heavy duty commercial wheel washing systems at the exit from the facility and at the entrance to the concrete dock. Installation of the system at the facility exit is complete and this wheel wash has been operating in test mode since October 17, 2012. We expect to have the facility exit wheel wash in full operation by October 26, 2012. The very heavy duty wheel wash system for cargo trucks entering the dock has been fabricated and will be delivered to the facility within the next two weeks. Forming and pouring of footings and associated structures for the dock entrance system are underway. Full installation of the dock entrance wheel wash system remains scheduled for completion by December 1, 2012.

Concrete Dock Improvements

In order to minimize the potential for pollutants to be washed off the surface of the concrete dock, we are installing an Ertec™ perimeter storm water filtration system along the entire length

of the dock, on all sides of the structure. Installation of the Ertec™ system is now scheduled for completion by November 30, 2012.

Conveyor Pier Improvements

In order to provide more complete containment of the shiploading conveyor, a stainless steel catchment tray will be installed beneath the bottom two-thirds of the lower conveyor, up to the point where the conveyor is already enclosed. Additional containment structures will be 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) and to capture the small amount of water that "backflows" down the enclosed upper portion of the conveyor. Water collected by these containment structures will be pumped from the pier for appropriate on-site management. The conveyor pier improvements have been designed and their components are being fabricated. Installation of these improvements is currently scheduled for January 2013.

Improvements to Torch Cutting Area

This work was completed in July 2012.

Expansion of Covered Maintenance Area

The covered (tented) maintenance area is still 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. Footings and pavement have been poured to accommodate installation of a second tent structure. The new tent structure has been delivered to the facility and will be constructed within the next six weeks. This project is now scheduled for completion by November 30, 2012.

Installation of Drain in Non-ferrous Retail Area

This work was completed in May 2012.

Control of Light Fibrous Material

As noted in our October 1st comment letter, control of this material 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). Schnitzer continues to participate in both of these processes, most recently attending a meeting with DTSC representatives on October 12, 2012.

In addition to our participation in these regulatory development processes, we have completed preliminary design of an approximate 25 to 30-foot high windscreen/debris barrier to be installed along the eastern (predominantly downwind) property boundary that will help significantly to contain this fibrous material on-site. The recently completed preliminary design is currently under internal engineering review as a portion of our capital expenditure approval process.

We are also in continuing contact with SSA Terminals and are conducting 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.

Additional Boundary Containment.
A 600-foot extension of the facility's concrete containment structure was installed along the southern portion of the western site boundary in August 2012.

* * * * *

We appreciate the opportunity to submit these supplemental comments, and continue to hope 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 our letters. We would appreciate an opportunity to meet with you again to discuss our 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

EXHIBIT 8

Schnitzer Steel Products Company
1101 Embarcadero West
Oakland, CA 94607

November 15, 2012

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

Re: Tentative Cleanup and Abatement Order, Schnitzer Steel Products Facility
1101 Embarcadero West, Oakland, CA — Response to Comment Letters

Dear Ms. Boschen,

Thank you for forwarding copies of the comment letters received by the San Francisco Bay Regional Water Quality Control Board on the tentative Cleanup and Abatement Order (CAO) relating to Schnitzer's Oakland facility. We understand that the San Francisco Baykeeper, the Port of Oakland, and an individual named Len Keck are the only parties who submitted comments on the tentative order. Schnitzer Steel recognizes that the official comment period closed on October 19, 2012. Nevertheless, we believe it is necessary to respond to each of these comment letters, as they reflect an inaccurate or incomplete understanding of the facts. We also note that while Mr. Keck described himself as a resident of Richmond, California whose home is adjacent to San Francisco Bay, he is in fact a principal with Westfield Consulting LLC and the project manager for West Coast Recycling Group LLC's proposed metal recycling facility in the Port of West Sacramento. If and when the West Coast Recycling facility is able to commence operation, it will compete directly with Schnitzer's Oakland facility. Our concerns related to information contained in the comment letters are summarized below.

1. **"Airborne dust emissions" that are not conveyed via point source discharge to waters of the United States are not regulated as non-authorized non-storm water discharges under the Industrial Storm Water General Permit.**

The Industrial Storm Water General Permit ("IGP") prohibits the point source discharge of materials, other than storm water, to the waters of the United States, whether the discharge occurs directly (i.e., from a point source located at the facility directly into waters of the United States) or indirectly (via discharge into a municipal separate storm sewer system which, in turn, discharges to waters of the United States). Baykeeper's letter expressly acknowledges the necessity for the existence of a "point source" discharge before the requirements of the NPDES program are triggered. See Baykeeper Letter, at p.1 ("[t]he Clean Water Act, as amended in 1972, prohibited the discharge of pollutants to waters of the United States from all point sources

unless the discharge is in compliance with [an NPDES] permit"). A "point source" is defined as "any discernible, confined, and discrete conveyance, including but not limited to, any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, landfill leachate collection system, vessel or other floating craft from which pollutants are or may be discharged. ...." 40 C.F.R. § 122.2. There are many judicial decisions interpreting this term, and all of them require some type of systematic collection or channeling to occur before something can be described as a point source.

Pollutants that become entrained in storm water and that are conveyed into waters of the United States through storm drain systems are regulated as storm water discharges under the IGP. Similarly, based on apparent recent changes in Regional Board policy, pollutants that are conveyed into waters of the United States by rainfall that comes into contact with, and drips off of, structures that are built over water may also be regulated as point source discharges. However, contrary to what is claimed by Baykeeper, fugitive dust that is airborne, and that may or may not eventually settle out onto surface waters, is not a "point source" discharge within the meaning of the Clean Water Act. Rather, fugitive dust emissions are considered nonpoint source pollution because they are not contained or channelized in any manner, and are not regulated under the NPDES program, including the IGP.

Each of the examples cited by Baykeeper in its letter to support the argument that "airborne dust" is prohibited under the IGP refer specifically to dirt, process sediment and other materials that were located in areas where they were susceptible to becoming entrained in storm water and then conveyed into surface water through a point source discharge.[1] The airborne plumes of dust that Baykeeper claims to have observed during its surveillance of the facility are not "point source" discharges within the purview of the NPDES program.

2. The Delta Group Study commissioned by the Department of Toxic Substances Control (DTSC) is flawed in terms of its methodology, and its conclusions are not supported by, or are inconsistent with, the data presented in the Study.

Schnitzer does not dispute that particulate emissions associated with metal shredding and separation processes contain metals. However, we strongly dispute the implications in the Baykeeper letter that any such emissions associated with our operations in Oakland are adversely affecting human health and the environment. The Delta Group Study referenced in the Baykeeper comment letter was peer reviewed by two independent, highly reputable air quality engineering firms and was found to be scientifically flawed in numerous significant respects. The facility in question is located in the heart of the Port of Los Angeles, where hundreds of heavy duty diesel trucks come and go on a daily basis, and where there are literally hundreds of other emitting sources in the area, all of which contribute to local air quality conditions. The Delta Group's primary conclusions — that all downwind lead and iron concentrations were solely attributable to the shredder facility and that lead was present in concentrations that posed a threat to human health — were found to be inaccurate and lacking in scientific merit. Copies of these

[1] Each of these examples was taken from the Regional Board's Inspection Report attached to the tentative CAO.

peer reviews were posted by DTSC on its website (along with the original report), but were not mentioned by Baykeeper in its comment letter, Significantly, no action has ever been taken against the Terminal Island facility in response to the Delta Group study. Copies of these peer reviews are attached for your convenience and should be included in the record of this matter.

3. There is no evidence that impairment of the Oakland Inner Harbor is attributable to the Schnitzer facility.

Baykeeper's comment letter also strongly suggests that the Schnitzer facility is responsible for the impairment of the Oakland Inner Harbor and its listing under section 303(d) of the Clean Water Act. As the Regional Board is aware, there are no stormwater outfalls at the Schnitzer facility, and the only discharges that occur exist in the form of stormwater that falls directly onto and drips from the pier crane dock and the conveyor pier. The amount of water attributable to these sources is *de minimis*, particularly in comparison to the amount of stormwater that is contained on-site and re-used at the facility. Schnitzer has observed its operations on the Inner Harbor for decades and has not observed plumes of dust depositing on water as claimed by Baykeeper. The plumes of dust that were reportedly observed by Baykeeper were located within the boundaries of the facility and are effectively controlled by dust suppression activities, which will be appropriately described in the facility's forthcoming updated SWPPP.[2]

As in the case of the Terminal Island shredding facility, there are thousands of potential point and nonpoint sources that contribute to impairment of the Oakland Inner Harbor, not the least of which is urban stormwater runoff from the City of Oakland. In fact, large City of Oakland stormwater discharge pipes are located immediately adjacent to the facility's western and eastern boundaries and both discharge significant volumes of urban runoff right at the shoreline. Stormwater runoff from the City is an obvious source of the same pollutants that Baykeeper alleges are being discharged from our facility. Other obvious sources include ship and boat traffic, boat repair and maintenance, and wastewater discharges from industrial operations located along the east shore of the bay. For all the reasons explained in our prior comment letters, Schnitzer Steel is confident that its operations are not adversely affecting water quality in the Oakland Inner Harbor, including sediment quality. We are not aware of any "uncontroverted evidence of ongoing deposition of dust and debris" from our operations into the Oakland Inner Harbor (see Baykeeper Letter, p. 6), nor are we aware of any evidence that supports the conclusion that remediation of the shoreline adjacent to the facility is needed. See also Port of Oakland Letter, p. 2. Given the intensity of uses in and along the shore of the Oakland Inner Harbor, the tidal nature of the water body, the presence of MS4 outfalls including two immediately adjacent to the facility, the influx of contaminated sediments from creeks and

[2] Baykeeper's letter misstates the provisions of the Industrial Stormwater Permit that pertain to dust and particulate generating activities. See Description of Potential Pollutant Sources, ISWP, p. 15, Section A.6.a.iii. The permit refers specifically to dust or particulates that may be deposited "within the facility's boundaries." Baykeeper omits this key phrase from its citations to permit language. As discussed above, the omitted language is critical, since the purpose of the SWPPP is to minimize the potential for pollutants to become entrained in facility stormwater that is discharged to surface waters through outfalls or other point sources. SWPPP's are not required to address potential nonpoint sources of pollutants.

streams that flow into the bay, historical uses of the property predating Schnitzer's ownership, and other factors, it would be wholly unreasonable to expect Schnitzer Steel to undertake any such investigation or remediation, without the mandatory participation of other potentially responsible parties.

4. There is no "unauthorized stormwater runoff" from the Schnitzer facility.

Baykeeper asserts that the tentative CAO does not hold Schnitzer sufficiently accountable "for its failure to adequately monitor and prevent unauthorized stormwater runoff from the facility." See Baykeeper letter, p. 7. This claim is based on numerous erroneous assumptions. First, there is no such thing as "unauthorized stormwater runoff." The Industrial Stormwater Permit does not prohibit discharge of stormwater, but rather requires that steps be taken to reduce or prevent pollutants associated with industrial activity in such discharges. IGP, Finding 1. Thus, Schnitzer has gone far beyond the requirements of the permit by implementing structural BMPs that contain and facilitate re-use of all stormwater that falls on the site. With the exception of water that falls directly onto the conveyor pier and the pier crane dock during a rain event (and assuming those structures are classified as "point sources"), there are no stormwater discharges from the facility. For this reason, the Regional Board approved, and the facility operated under a Sampling and Analysis Reduction, for many years. The Regional Board has since required the facility to resume monitoring, and we have revised our SWPPP to include a Sampling and Analysis Plan that meets the requirements of the Industrial Stormwater Permit. Contrary to what Baykeeper urges, there is no need or basis for the Regional Board to dictate what the terms of that plan should be, as those requirements are already clearly set forth in the General Permit. Baykeeper's suggestion that Schnitzer should be required to monitor "each identified pollution source" for a specific list of pollutants, at particular locations and according to a particular sampling frequency and methodology, is unprecedented, especially in a case such as this where the vast majority of stormwater is fully contained on-site.

Putting aside the issue of stormwater that falls directly onto over-water structures, Schnitzer strongly disagrees with the findings of the March 29, 2012 Inspection Report which state that the Facility has not achieved full containment of stormwater. Even if there were minor sheet flow from the site's egress or along the western site perimeter (which Schnitzer disputes), this does not constitute a violation of the IGP. First, like airborne emissions, sheet flow is not a "point source" under the Clean Water Act. Second, there are no storm drains in the vicinity that could indirectly convey the runoff into waters of the United States. The presence of debris, sediment or other material that cannot reasonably be expected to ever reach surface water is not a violation of the IGP.

Similarly, as explained at length in our prior comment letters, Schnitzer disputes that it has violated Site Cleanup Requirements Order No. 88-023, and Baykeeper's comment letter does not offer any factual information that would support a finding of violation. As the Regional Board is aware, Schnitzer has removed the debris that had collected along the facility's western fence line, has completed a thorough cleaning of the conveyor pier and pier crane dock, has implemented or is in the process of implementing numerous additional or enhanced BMPs to prevent facility-related materials from being tracked or blown off-site, and is in the process of completing a

wholesale revision of its SWPPP. Issuance of an Administrative Civil Liability complaint as recommended by Baykeeper would be unjustified in the circumstances, and would be contested by Schnitzer.

5. **Baykeeper's request that Schnitzer be required to conduct an air monitoring and modeling study for all potential sources of fugitive dust emissions goes beyond the requirements of the IGP.**

The Regional Board does not have authority under the Clean Water Act to require air monitoring or air modeling studies, nor does it have the expertise to evaluate such studies if they were conducted. Regulation of "fugitive dust emissions" does not fall within the scope of the NPDES program, except to the extent that dust-generating activities at a facility can be addressed through BMPs incorporated into the facility's SWPPP. Schnitzer strongly believes that the BMPs that have been implemented at the Oakland facility are fully adequate to control dust and minimize the potential for off-site dispersion of process-related materials. If further measures beyond those already in place are determined to be necessary, we will evaluate whether additional BMPs can feasibly be implemented and proceed accordingly. As indicated in our prior comment letters, the Bay Area Air Quality Management District is also in the process of developing new regulations to control particulate emissions from metal shredding facilities (see BAAQMD Draft Rule 12, Regulation 14). These regulations are expected to be adopted by the BAAQMD Board of Directors in early 2013 and will apply to the facility.

6. **Schnitzer's operations have not adversely affected groundwater beneath the site, and Baykeeper's comments relating to management of standing water are misguided.**

As discussed at length in our original comment letter, facility operations have not affected groundwater quality beneath the site. This is demonstrated through over 20 years of groundwater monitoring data, collected in accordance with a monitoring program that was reviewed and approved by the Regional Board. Temporary ponding of stormwater following significant storm events has not caused groundwater impacts. Facility soils are heavily compacted due to the weight of the equipment and materials present at the site, and the rate of infiltration is very low. In addition, water is pumped from these low lying areas as quickly as possible for operational reasons and to preserve as much of the water as possible for beneficial reuse. Finally, the metals that are present in unprocessed and processed scrap, non-ferrous raw (or aggregate), and shredder residue are not mobilized by stormwater, and do not leach into underlying groundwater. Site groundwater monitoring data confirm this conclusion. Baykeeper's suggestion – that Schnitzer should be required to construct dedicated, lined stormwater impoundments so that "water is no longer in contact with truck traffic and metals piles" – is both lacking in technical justification and is infeasible, given the nature of the facility's operations.

7. **Since neither groundwater nor surface water has been adversely affected by Schnitzer's operations, comments regarding regulatory action levels for the site are academic.**

Based on the evidence available to date, Schnitzer Steel does not believe there is any need for cleanup of soil or groundwater at its facility. However, we have expressed our willingness to conduct additional investigation at the site in order to gain a more complete understanding of subsurface conditions, and will be guided by the results of that investigation. However, until data are in hand that confirm the need for corrective action; we believe it is unnecessary to engage in a debate over specific regulatory action levels.

In addition, we are in communication with the Port of Oakland and have assured the Port that if specific instances of damage to Port property attributable to our operations are brought to our attention, we will rectify the situation(s) at our sole cost and expense. We have already reached out to SSA Terminals and have agreed to conduct more frequent inspections of the terminal area that is adjacent to the Schnitzer facility and to remove facility-sourced material that is observed. Our facility has also implemented numerous additional BMPs to minimize the likelihood that light fibrous material can be carried off-site in the future. Based on the inert nature of the fibrous material, we do not believe its presence has caused contamination of the soil *per se*, and that simple removal of the material is sufficient corrective action.

8. Schnitzer Steel implements reasonable BMPs to control dispersion of facility-related material.

Comments submitted by the project manager for West Coast Recycling in the Port of West Sacramento suggest that the potential for pollution of the bay and adjacent properties could be significantly reduced by requiring the facility to transport shredder waste offsite within four hours of processing, before the waste has dried. Putting aside the excessive cost and logistic difficulty of what is suggested by this comment, the recommended operating procedure is incompatible with the treatment process that is required by the Department of Toxic Substances Control. After all non-ferrous metals have been removed from the "non-ferrous raw" (the mixture of non-ferrous metals and non-metallic materials that remains after ferrous metals have been removed from the shredder output), the remaining largely non-metallic material is treated through the addition of polysilicates, water and cement to chemically fix the trace residual heavy metals in the residue. The treatment process occurs in an enclosed pugmill, and the treated material, which has a high moisture content, is stockpiled pending shipment off-site. The facility has existing contracts with landfills which use the treated residue as alternative daily cover, and the material is shipped off-site on a regular basis. Dust control measures are employed to maintain adequate moisture levels in the material, and during loading operations. The trucks are tarped before they leave the site. Mr. Keck's speculation that shredder fluff is allowed to accumulate on site so that it will dry out and therefore reduce landfill charges is simply inaccurate. Moreover, treated residue is not the source of the material that was observed by the Regional Board on SSA Terminals property, and we have already advised the Regional board, SSA Terminals and the Port of Oakland of our intended steps to address this issue and prevent recurrence.

*****

We look forward to being able to meet with you to discuss these and other issues raised in our prior comment letters as soon as possible.

Thank you for your consideration.

Very truly yours,

Schnitzer Steel Products Company

Scott B. Sloan
National Environmental Director

Bruce Rieser
Regional Director

Enclosures

Cc: Pat Christopher
Michael Henderson
Tom Zelenka
John Hare
Chris Orsolini
Meg Rosegay
Peter Zawislanski

Yorke
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July 18, 2011

VIA ELECTRONIC & REGULAR MAIL
Becky.Linder@ventura.org

Ms. Becky Linder
County of Ventura, CA
Government Center
Administration Building
800 S. Victoria Ave.
Ventura, CA 93009-1740

Subject: **Simi Valley Landfill and Recycling Center Expansion: CUP Modification 3142 (LU07-0048):**

Dear Ms. Linder:

We are writing to you to respond to the comment submitted by Alice Sterling on July 11, 2011 concerning the above referenced project. Ms. Sterling asserts that the May 6, 2011 report prepared by the UC Davis DELTA Group entitled "Deposition of coarse toxic particles in Wilmington, CA for the Department of Toxic Substances Control: Summer, 2008, and Spring, 2009" is relevant to the County's consideration of the proposed modification of the Simi Valley Landfill's Conditional Use Permit. The report, prepared for the California Department of Toxic Substances Control (DTSC), purports to provide an assessment of particulate emissions from an SA Recycling scrap metal recycling facility on Terminal Island in the Port of Los Angeles. Yorke Engineering has reviewed the report, as well as an earlier version released in April 2009. Yorke Engineering's comments provided to DTSC in May 2009 (see Attachment B) regarding the April 2009 version of the DELTA Group's study are still relevant and apply to this current revision of the DELTA Group's study. Yorke's May 2009 comments detail significant deficiencies and inaccuracies in this report. These fundamental issues call into question the credibility, professionalism, and purpose of the study. Problems with the study and with the attempted use of the study in the subject proceeding are discussed in order of significance below:

SUMMARY OF OBSERVATIONS

1. **The DELTA Group study has no relationship to the Simi Valley Landfill and Recycling Center Expansion Project and does not provide any relevant data or information regarding the use of treated auto shredder residue as alternative daily cover.** Treated auto shredder residue, currently used as cover at the Simi Valley landfill and defined in the EIR (Section 2.3.5.2.3), "consists of glass, fiber, rubber, automobile fluids, dirt, and plastics. These materials are treated to nonhazardous levels using metal fixation treatment technologies prior to delivery to the landfill." Treated auto shredder

residue has been extensively processed to remove metals and toxics that may be present in auto bodies and appliances. Extensive testing has been performed, following government approved methodologies, to demonstrate that the material is nonhazardous. There is no relationship between the constituents of treated auto shredder residue and the operational air emissions the DELTA Group asserts are released from the Terminal Island metal shredding operations. Ms. Sterling's assertion that the DELTA Group report is relevant to the County's project is misleading and should be regarded as irrelevant to consideration of the landfill expansion.

2. **The DELTA Group study is grossly inaccurate. As proven by direct and highly accurate source testing performed during full operation of the shredder, the Terminal Island shredder's emissions of lead are less than 2 lbs/year, as compared to the 68.5 lbs/year purported in the DELTA Group's May 2011 Report (Appendix A).** The source testing performed measured shredder emissions following US Environmental Protection Agency (US EPA), California Air Resources Board (CARB), and South Coast Air Quality Management District (SCAQMD) approved methodologies for sampling and laboratory analysis. In comparison, the DELTA Group's report uses unapproved, unusual, unproven and unreliable (as demonstrated by the inconsistencies in the data collected) methods for measuring air contaminants.

3. **Ambient air monitoring performed at SA Recycling, using U.S. EPA sampling and testing standards, demonstrates that ambient lead levels within the facility and at the facility's property line are at least one order of magnitude below National Ambient Air Quality Standards for lead.** A study was performed at SA Recycling's Terminal Island facility during which thirty 24-hour ambient Total Suspended Particulate (TSP) air samples were collected within the facility and were chemically analyzed for metals using the U.S. EPA reference methods ("FRM") for sample collection and analysis (40 CFR 50, Appendix B). FRM are methods for sampling and analyzing the ambient air for a given pollutant accordance with the Code of Federal Regulations ("CFR") (40 CFR 53). These are the same methods used by the SCAQMD and CARB. 40 C.F.R. Part 50 Appendix G provides the specific Reference Method used for the "Determination of Lead in Suspended Particulate Matter Collected From Ambient Air."

   Measured results were compared to the National Ambient Air Quality Standards (NAAQS) and California Ambient Air Quality Standards (CAAQS) for lead. The NAAQS and CAAQS are thresholds that are designed to protect sensitive populations against an array of adverse health effects, most notably including neurological effects in children including neurocognitive and neurobehavioral effects and neurobehavioral effects.

   The TSP-Pb concentrations measured in the Terminal Island study on site at SA ranged from 0.01 - 0.17 $\mu g/m^3$. These results are well below the National Ambient Air Quality Standards (NAAQS) and California Ambient Air Quality Standards (CAAQS). The NAAQS for Pb is 0.15 µg/m3 averaged over a rolling three month period or 1.5 µg/m3

averaged over one calendar quarter (40 CFR §§ 50.12, 50.16). The CAAQS for Pb is 1.5 µg/m3, averaged over 30 days. Notwithstanding the differences in averaging times, the average ambient Pb concentrations measured during this study was approximately 0.3% of the NAAQS and CAAQS and approximately 3% of the NAAQS for an area designated as non-attainment for Pb.

Attachment A provides a Table of Ambient Pb Concentration Measurements within the South Coast Air Basin as measured by the SCAQMD, by the DELTA Group (per their April 2009 report), and within the SA Terminal Island facility. As demonstrated, the results collected by the DELTA Group at their Fire Station 49 location (0.055 µg/m^3) is slightly less than that measured by the SCAQMD at other basin locations, like that near the Santa Monica Airport (0.0852 µg/m^3 and 0.077 µg/m^3) . In comparison, the results of ambient testing within the SA Terminal Island facility during full shredder operations ranged from (0.03-0.04 µg/m^3 at the fence line). Since monitoring performed within the Terminal Island includes contaminants from the air surrounding the facility, these results demonstrate that the operations have little impact on ambient air concentrations as correlated to source testing results.

4. **An industrial hygiene (IH) evaluation for employee exposures during treated auto shredded residue (ASR) backfill operations demonstrates that ASR is nonhazardous and does not result in exposure to health risks as alleged by Ms. Sterling – even to employees working in close proximity to the material**. The IH evaluation performed measured exposures to total particulate, 22 metals. PCB's, and mercury vapor. IH samples were collected by way of a sampler that was attached to each employee and that used a teflon tube to collect a sample of the air in each employee's breathing zone. All results demonstrated levels below the established California's Occupational Safety and Health Administration (Cal/OSHA) Personal Exposure Limits-Time Weighted Averages (PEL-TWA) and the American Conference Governmental Industrial Hygienists Threshold Limit Values (ACGIH-TLV). For example, the exposure measured for the operator of a tractor moving ASR over two, eight hour days resulted in an exposure to lead of 0.000075 mg/m^3 (or 0.075 µg/m3) and 0.000063mg/m^3 (or 0.063 µg/m3) as compared to the PEL-TWA and ACGIH-TLV of 0.05 mg/m^3. These results demonstrate exposures that are 700-800 times lower than the health protective standards of Cal-OSHA and are also an order of magnitude less than the NAAQS and CAAQS for lead. If the lead concentrations measured at each employee's breathing zone over an 8-hour period are below the regulatory levels, lead concentrations a significant distance away are likely to be significantly lower.

5. **The current DELTA Group report used EPA emission factors that are neither applicable nor accurate to quantify emissions from the Terminal Island Facility (Appendix A).** The DELTA Group report relied upon "Uncontrolled PM10 Emission Factors from AP-42 Table 11.19.2-2". Using these factors, the authors calculated the "Terminal Island Annual Emission Summary" which claims that the facility emits 6.98

Tons/Year of PM_{10}. The EPA table[4] referenced provides "Emission Factors for Crushed Stone Processing Operations", not for metal shredding operations. Stone crushing emissions are entirely different than metal shredding emissions. In addition, the Emission Factor Rating, as provided by EPA is an "E", which is defined as: "E = Poor. Factor is developed from C and D rated test data from a very few number of facilities, and there may be reason to suspect that the facilities tested do not represent a random sample of the industry. There also may be evidence of variability within the source category population."

6. **The DELTA Group report exaggerated emissions from the Terminal Island Facility (Appendix A) by estimating emissions without considering the Air Pollution Control Systems used at the facility.** The shredder operations employed at Terminal Island uses state-of-the-art pollution control equipment which has no parallel as compared to shredder operations employed world-wide. As designed, the control efficiencies for the filters employed exceed 98% controls for particulate matter, including for metals (e.g., lead, iron, copper, mercury, etc.) Thus, the emissions from the facility are far lower than those purported in the report, demonstrating that the conclusions proposed by the report are flawed.

7. **The methods used for sample collection and analysis by the DELTA Group are not US EPA, CARB, nor SCAQMD approved, are unproven are unorthodox, and inaccurate.** For example, the DELTA Group study derived conclusion based upon samples that are "photographed twice, once against a black background which emphasizes scattering particles like soil and sea salt. once against a white background which emphasizes wood smoke and soot. ...The frames and the standards are then removed in Photoshop 7.0...." By comparison, the US EPA methods require rigorous protocols and standards for sampling and analysis.

   Critically, the DELTA Group introduced further error by mischaracterizing its aerosols as representative of deposited particles that are subject to DTSC's regulation as a hazardous waste. The DELTA Group acknowledges in the report's abstract that its testing equipment is designed to collect and measure aerosols. The error the DELTA Group introduced into its analysis through the use of unproven, unorthodox and inaccurate testing methods was then compounded by assuming a settling velocity and then asserting that deposition of the aerosols occurred in such a way as to render the deposition particles a hazardous waste – this is simply unreliable and supportable.

   The error inherent in characterizing aerosols as deposition particles is further reflected in the DELTA Group's report. The DELTA Group acknowledges in the report section describing its spring 2009 sampling, that its efforts to directly measure deposition "had a relatively high failure rate, with filters lost to winds, samplers missing, etc., but the method shows promise." The report further states that "[t]here were technical problems on all three parts of the study [imprecise language in the report renders it difficult to determine the three parts of the study referred to here, but this statement appears to refer

[4] AP-42 Table 11.19.2-2 is available at http://www.epa.gov/ttn/chief/ap42/ch11/final/c11s1902.pdf

to the deposition study]." As a result, there is simple no reliable data on which to base the conclusion that the measured aerosols are the result of emissions from the SA Recycling shredder or that the aerosols are a hazardous waste.

CONCLUSION

In summary, the DELTA Group's study has no relationship to the Simi Valley Landfill and Recycling Center Expansion Project and does not provide any relevant data or information regarding the use of treated auto shredder residue as alternative daily cover. In addition, the May 2011 DELTA Group report has myriad deficiencies and inaccuracies. The report wrongly implies that there is an imminent respirable health hazard from ambient lead and that there is a relationship between ambient measurements or aerosols, filter samples, and treated auto shredder residue. The report grossly overstates air emissions from SA Recycling and inaccurately attributes all ambient lead particulate to the Terminal Island shredder. In fact, the report actually establishes that the ambient levels of lead are well below EPA's NAAQS for lead and demonstrates that there are other sources of lead coming from other directions. We recommend that the report be further peer reviewed before any agency relies on it for any regulatory purpose.

Should you have any questions please contact me at (949) 248-8490 x225.

Sincerely,

Judy B. Yorke, P.E., C.P.P.
President
Yorke Engineering, LLC

cc: Mr. Elio Torrealba, SA Recycling
Ms. Debbie Raphael, DTSC Director
Ms. Odette Madriago, DTSC Chief Deputy Director
Mr. Scott Tignat, Simi Valley Landfill and Recycling Center

Attachment A: Ambient Pb Concentration Measurements within the South Coast Air Basin
Attachment B: May 14, 2009 Yorke Engineering, LLC Comments to UC Davis DELTA Group Report – Deposition of Coarse Toxic Particles in Wilmington, CA
Attachment C: Industrial Hygiene Survey Results for May 1, 2003, Shaw Environmental & Infrastructure, Inc. (Simi Valley Landfill and Recycling Center).

Attachment A

Ambient Pb Concentration Measurements within the South Coast Air Basin

Study (Reference)	Location	Pb Concentration ($\mu g/m^3$)	Comments
Delta Group Study (Cahill, 2009)	POLA Berth 194	0.055	Estimated within the 10-2.5 um range; Non-FRM method.
SCAQMD North Long Beach (California Air Resources Board)	3648 N Long Beach Blvd Long Beach, CA 90807	0.00765	Annual Average Concentration (2009); FRM Method
SCAQMD Basin-Wide (South Coast Air Quality Management District)	Various Locations within SCAB	0.03	Maximum Monthly Concentration (2008); FRM Method
SCAQMD Basin-Wide (South Coast Air Quality Management District)	Various Locations within SCAB	0.02	Maximum Quarterly Average Concentration (2008); FRM Method
SCAQMD USC Boathouse (South Coast Air Quality Management District)	POLA Berth 192	0.02	Average between 6/2009-4/2010; FRM Method
SCAQMD Study Quemetco (Bermudez, 2009)	720 South 7th Avenue City of Industry, CA 91746-3124	0.76	Highest monthly average between 2/2007-2/2009; FRM Method
SCAQMD Study Trojan Battery (Bermudez, 2009)	9440 Ann St. Santa Fe Springs, CA 90670	0.23	Highest monthly average since 2006-May 2007; FRM Method
SCAQMD Downtown LA ((South Coast Air Quality Management District)	1630 North Main Street, Los Angeles CA 90012	0.0131	Non-source Pb site; FRM Method
SCAQMD I-710 Study (Polidori 2010)	15 m from I-710 Freeway	0.0149	Winter Sampling (Feb. to March 2009); FRM Method
SA Recycling Terminal Island	San Pedro Station	0.03	Average between 2/2/2010 - 2/14/2010; FRM Method
SA Recycling Terminal Island	Long Beach Station	0.03	Average between 2/2/2010 - 2/14/2010; FRM Method
SA Recycling Terminal Island	Electrical Room Station	0.04	Average between 2/2/2010 - 2/14/2010; FRM Method
Site 2 - SCAQMD Santa Monica Airport Study (Fine, 2010)	3223 Donald Douglas Loop South Santa Monica, CA 90405	0.0852	Average between April-July 2006; FRM Method

Study (Reference)	Location	Pb Concentration ($\mu g/m^3$)	Comments
Site 2 - SCAQMD Santa Monica Airport Study (Fine, 2010)	3223 Donald Douglas Loop South Santa Monica, CA 90405	0.077	Average between October-February 2007; FRM Method

Attachment B

May 14, 2009 Response to
UC Davis DELTA Group Report – Deposition of Coarse Toxic Particles in Wilmington, CA

Yorke
ENGINEERING, LLC
www.YorkeEngr.com

May 14, 2009

Mr. Gale Filter
Deputy Director
Enforcement and Emergency Response Program
Department of Toxic Substances Control
1001 "I" Street
Sacramento, CA 95814

Subject: UC Davis DELTA Group Report – Deposition of Coarse Toxic Particles in Wilmington, CA

Dear Mr. Filter:

We have reviewed the April 21, 2009 report prepared by the UC Davis DELTA Group entitled "Deposition of coarse toxic particles in Wilmington, CA for the Department of Toxic Substances Control." The report, prepared for the California Department of Toxic Substances Control (DTSC) and published on the DTSC website, purports to provide an assessment of particulate emissions from the SA Recycling scrap metal recycling facility on Terminal Island in the Port of Los Angeles. We have identified several significant deficiencies and inaccuracies in the report. These fundamental issues, which call into question the credibility and utility of the report, are discussed in order of significance below:

SUMMARY OF OBSERVATIONS

1. **The lead concentrations collected for the DELTA Group study are well below levels that the US EPA has established as protective of human health and the environment.** The DELTA Group report clearly implies that the shredder is the source of lead deposition in Wilmington and that the lead poses an immediate health hazard. As discussed in detail below, the study's conclusions regarding the source of the lead are clearly wrong. However, it is very important to understand that the concentrations of lead reported in the study are well below the very stringent thresholds recently established by the US EPA as protective of human health and public welfare.

2. **Hazardous waste standards do not apply to air emissions and the DELTA Group study does not use approved methodologies.** The DELTA Group report compares the concentrations of lead found in the materials collected for the study with DTSC regulations defining hazardous waste. However, air emissions are expressly excluded from regulation as a waste. The California Legislature has determined that local air districts, like the South Coast Air Quality Management District, are the appropriate agencies to address particulate in the air. In addition, the study fails to use applicable US

EPA, California Air Resources Board, Occupational Health and Safety, or South Coast AQMD test methods to quantify air emissions or health risks and instead uses a little known academically developed sampling approach and then inexplicably applies hazardous waste criteria that are legally inapplicable to air samples.

3. **There are other well known and documented stationary sources of particulate, iron, and lead in close proximity.** In describing the source of particulate collected at a location in Wilmington, the DELTA Group report summarily concludes, "This proves that all the lead seen in any wind direction is caused by shredder operations, current and past." (page 40). To any informed observer, this conclusion is not credible given the well known and documented sources of lead emissions in close proximity to the sample location. For example, the SERRF municipal solid waste incinerator located on the same portion of Terminal Island has SCAQMD reported emissions of 50.67 tons per year of total suspended particulates, including 229 lbs/year of lead and 31 lbs/year of nickel, in 2005. (In fact, there are tons of metals retrieved from the ash of the SERRF incinerator and recycled each year.) In addition, contrary to the assumptions in the report, there are significant construction grading sites in the same vicinity of Terminal Island that were disturbed during the sampling period. The report fails to consider or even mention the potential impact of iron and lead from these sites.

4. **There are particulates, lead and other trace metals emitted by the ships, locomotives, and trucks in operation daily throughout the port area from residual oil (bunker fuel) and diesel fuel combustion.** The DELTA Group report bases its conclusions on "unambiguous tracers" asserted to be from the shredder (i.e., lead and iron) which "are confirmed by evidence of upwind aerosols from the harbor, including natural sea salt and the vanadium/nickel/sulfur pollution of ocean going ships using bunker oil as fuel." The report ignores the findings of the California Office of Environmental Health Hazard Assessment that document the presence of lead in diesel and residual oil which is used for marine fuel ("Used Oil in Bunker Fuel: A Review of Potential Human Health Implications", Dec. 2004), the AB 2588 Air Toxics emission factors for engine combustion of diesel fuels [Ventura County Air Pollution Control District (VCAPCD), May 17, 2001], and the monitoring efforts by the Ports of Los Angeles ("POLA") and Long Beach ("POLB"). According to the OEHHA report, diesel fuel (per mean values) contains 1.8 ppm lead and residual fuel contains 3.5 ppm lead (Table 4, page 23). The VCAPCD AB 2588 Emission Factors, based on engine emissions testing, document that lead is present in diesel fuel oil combustion at approximately two times the level of nickel by weight: 0.0083 lbs Pb/1000gal and 0.0039 lbs Ni/1000gal respectively. The data collected by the monitoring programs at both the POLA and POLB have been used by the SCAQMD to determine the risk of diesel particulate matter ("DPM") in the port area. Indeed, the DELTA Group fails to consider the diesel emissions (i.e, DPM), and resulting lead emissions from the large amount of diesel activity in the port area. Significantly, despite its hyperbole, the report includes absolutely no direct correlation of lead and/or iron to the shredder operations.

5. **The estimate of 28.3 tons of uncontrolled emissions over 120 days is unsubstantiated and inconsistent with actual data.** On page 41 of the DELTA Group report, there is an unsubstantiated assertion that the Terminal Island facility was the source of 28.3 tons of uncontrolled emissions over a 120-day period in 2008. This appears to be based on an estimate of 68.87 tons per year of controlled emissions. This estimate is clearly inaccurate as shown by the stack source test data reviewed and approved by the South Coast AQMD. Further, there was no 120-day period since the acquisition of the facility by SA Recycling in 2007 during which there were no particulate matter controls employed on the Terminal Island shredder.

6. **Particle size and content do not "prove" source of emissions.** On pages 39-40, the DELTA Group report attempts to use particulate size distributions and content to demonstrate that the samples collected definitively "prove" that all lead collected is "caused by shredder operations, current and past". However, the data provided is insufficient to "prove" any connection to the shredder given the other well known stationary and mobile sources in the port area.

7. **The sample data does not correlate with shredder operations.** Figures 24 and 25 in the DELTA Group report claim to demonstrate a clear correlation between samples collected and shredder operations. In fact, these claims are contradicted by the actual shredder operating records. The DELTA Group data show that there are particulate "peaks" on days where the wind was blowing from graded areas toward the Fire Station, peaks when there were no shredder operations, and elevated lead levels on days when the wind was blowing from the sample collection point toward the shredder.

DETAILED DISCUSSION

1. The Lead Concentrations Collected for the Study are Well Below Levels the US EPA has Established as Protective of Human Health and the Environment

The DELTA Group report clearly implies that the shredder is the only source of lead emissions in the vicinity and that these lead emissions represent an immediate health hazard. Notwithstanding the source of the lead collected for the study, the report fails to explain that the concentrations of lead reported are well below the concentrations the US EPA has established as protective of human health and public welfare. Using the data shown in Figure 31 on page 26, the average lead concentration during the August 14-19, 2008 time period was estimated to be 55.2 ng/m^3 (0.0552 µg/m3) for all size fractions. This particulate level is well below the US EPA's recently promulgated standard for sensitive receptors.

In November 2008, two months after the study was completed, the US EPA revised the National Ambient Air Quality Standard ("NAAQS") for lead.[1] The final rule tightened the NAAQS levels for lead from 1.5 µg/m3 to 0.15 µg/m3 as an arithmetic mean concentration over a 3-month

[1] National Ambient Air Quality Standards for Lead, 73 Federal Register 66964 (Nov. 12, 2008) (to be codified at 40 CFR Parts 50, 51, 53, and 58).

period. 40 CFR § 50.16. In establishing these more protective levels, US EPA explained that it was seeking to provide a significant increase in protection for children and other at-risk populations. 73 FR at 67006. The resultant NAAQS levels protect against an array of adverse health effects, most notably including neurological effects in children including neurocognitive and neurobehavioral effects. Further, the standard addresses physiological and demographic factors including providing protection to children that are particularly more sensitive to lead due to genetic polymorphisms, nutritional status (e.g., iron deficiency and calcium uptake), elevated exposures such as residing near sources of ambient lead, and socioeconomic factors such as reduced access to healthcare or lower socioeconomic status. 73 FR at 66976.

The DELTA Group report provides no data to suggest that the newly promulgated NAAQS for lead of 0.15 µg/m3 was exceeded at the sampling point during the reporting period. In fact, the levels of lead measured by the study appear to be an order of magnitude below the NAAQS. Thus, even though the report uses inflammatory language regarding health risk, the report actually confirms that lead levels at the sampling point are below those levels EPA has established as protective of the health of the most sensitive population group and the environment.

In addition to the report's data regarding lead at the sampling locations, onsite sampling at the shredder has found no evidence that shredder operations result in exposures to lead, or other chemical compounds or physical agents, above levels established by the California Department of Occupational Safety and Health ("CalOSHA") or those set by the American Conference of Governmental Industrial Hygienists ("ACGIH"). Industrial hygiene surveys conducted to evaluate the exposures experienced by individuals working near the shredder and shredder residue have found that exposures are either below laboratory detection limits or are orders of magnitude below permissible exposure limits ("PELs") or threshold limit values ("TLVs").

2. Hazardous Waste Standards Do Not Apply To Air Emissions

The DELTA Group report compares the lead fraction found in particulates collected from the air near Fire Station #49 (the sampling point) to the hazardous waste regulatory threshold for total lead. The implication is that air borne particulates with lead concentrations above 1000 ppm that settle to the Earth constitute a disposal of hazardous waste. This theory is fallacious and any conclusions drawn from this analysis are not the law in California for the following reasons.

First, by statute, air emissions are not a waste. Waste is specifically defined as "any solid, liquid, semisolid, or contained gaseous discarded material." Cal. H&S Code 25124(a). Contained Gaseous Material is statutorily defined as a "gas that is contained in an enclosed cylinder or other enclosed container" and expressly "does not include any exhaust gas...regardless of source, that is abated or controlled by an air pollution control device that is permitted by an air pollution control district." Cal. H & S Code 25110.11. In contrast, air emissions are uncontained gases, not solids, liquids, semisolids or contained gaseous discarded materials. Therefore, air emissions are not wastes. By law, a material that is not first a waste cannot be a hazardous waste. Cal. H&S Code 25117(a).

These definitions of waste and contained gaseous material are the result of revisions to the California Health and Safety Code expressly intended to "exclude uncontained gases from the DTSC's hazardous waste regulatory authority." Senate Committee on Toxic and Public Safety Management's Analysis of Senate Bill No. 2057 (1991-1992 Reg. Sess.) May 4, 1992, at 2, The revision to the definition of waste was made because the DTSC's "hazardous waste criteria [did] not appear to be appropriate for uncontained gases." *Id.* at 4. Specifically, the analysis observed that gases do not fit within the normal management, and handling practices that the hazardous waste regulations are designed to address. Thus, the Legislature determined that the Air Resources Board and local air quality districts are more appropriate agencies to address air emissions. Therefore, comparisons to the Department's regulations are inappropriate because the Legislature has clearly stated that these standards do not apply to air emissions.

Second, notwithstanding the jurisdictional defects, the samples utilized by the DELTA Group do not meet State or Federal standards for waste classification. Waste containing lead may be characterized as hazardous only where analysis of a representative sample of the waste finds lead concentrations above 1000 ppm. 22 CCR 66261.21. A representative sample is one collected in accordance with the protocols described in "Test Methods for Evaluating Solid Waste. Physical/Chemical Methods," SW-846, 3rd edition, 1986. 22 CCR 66261.20(c). SW-846 is the official compendium of analytical and sampling methods approved for use in applying hazardous waste regulations. The Study's sampling was not consistent with SW-846. Consequently, the resultant samples cannot be used in characterizing a material as a hazardous waste.

Third, DTSC regulations require analysis of eligible samples to be in accordance with SW-846. 22 CCR 66261.20(c). The samples The DELTA Group collected were analyzed using X-Ray Spectroscopy, which is not one of the methods approved in SW-846. Thus, even if the samples were legally acceptable, the analytical method used is not acceptable for purposes of waste characterization.

SW-846 also sets forth minimum requirements for quality assurance and quality control procedures. A quality assurance program is required to ensure that data collection and analysis is scientifically valid, defensible, and of known precision and accuracy. The data acquired from the procedures are used to estimate the quality of analytical data, to determine the need for corrective action in response to identified deficiencies, and to interpret results after corrective action procedures are implemented.

SW-846 provides that a program to generate data of acceptable quality should include certain fundamental elements including:

1. Design of a project plan to achieve data quality objectives;
2. Implementation of the project plan; and
3. Assessment of the data to ensure that the objectives are met.

The report is notable for the absence of required quality assurance and quality control procedures. This deficiency calls into question whether any of the data is valid at all.

3. Other Well Known and Documented Stationary Sources of Particulate, Iron, and Lead in Close Proximity

There are a number of other larger stationary emission sources in the vicinity of SA Recycling. Table 1 shows all South Coast AQMD-listed facilities within a 1 mile radius of SA Recycling. The table shows reported lead emissions data for 2005 and 2006. Of the 37 facilities listed six reported lead emissions from onsite stationary sources. Each of these 37 facilities are also likely to have mobile source emissions, which are not required to be included in these reports, but which are certain to include diesel combustion contaminants, which also emit lead (0.0083lbs/1000gal, per Ventura County Air Pollution Control District, AB 2588 Combustion Emission Factors, Diesel Fuel Combustion, May 17, 2001.)

Two of the facilities reported significant lead emissions: Long Beach City SERRF Project (ID 44577), and BP West Coast Products (ID 131249). In their 2005 and 2006 annual emission reports, the nearby SERRF municipal solid waste incinerator reported emissions of 50 and 18 tons per year of particulate matter (PM), and 229 and 66 lbs/year of lead, respectively. As part of their operations, after incineration, the facility collects burnt metal from the ash by mechanical separation, extracting thousands of tons of metal each year. The BP West Coast Products facility reported 69 and 42 tons/year of PM, and 92 and 97 lbs/year of lead in 2005 and 2006, respectively.

Moreover, besides these permitted stationary sources there are two large areas on Terminal Island where significant grading operations have been ongoing. These grading operations have the potential to emit substantial particulate, including iron and lead emissions from the filled soils. (Please refer to aerial photo in Figure 1.)

Table 1: Stationary Source SCAQMD Reported Emissions Within 1 mile Radius

Facility ID	Name	Address					City	State	Zip	Lead Emissions (lb/yr) 2005	Lead Emissions (lb/yr) 2006
2209	LA CITY, DWP, MARINE TANK FARM, UNIT 2	161		N	ISLAND	AVE	WILMINGTON	CA	90057	n/a	n/a
2983	US BORAX & CHEM CORP	300			FALCON	ST	WILMINGTON	CA	90744	n/a	n/a
6169	LA CITY, DEPT OF GEN SERVICES	400			YACHT	ST	WILMINGTON	CA	90744	n/a	n/a
6586	VOPAK TERMINAL LOS ANGELES, INC.	401			CANAL	ST	WILMINGTON	CA	90744	n/a	n/a
8066	US BORAX & CHEM CORP UNIT NO. 9	300			FALCON	ST	WILMINGTON	CA	90744	n/a	n/a
9638	US BORAX INC	300			FALCON	ST	WILMINGTON	CA	90744	n/a	n/a
10245	LA CITY, TERMINAL ISLAND TREATMENT PLANT	445			FERRY	ST	SAN PEDRO	CA	90731	0.001	0.001
10928	US BORAX INC	300			FALCON	ST	WILMINGTON	CA	90745	n/a	n/a
18636	US BORAX & CHEM CORP UNIT NO 2	300			FALCON	ST	WILMINGTON	CA	90744	n/a	n/a
22906	EXXONMOBIL OIL CORP	551			PILCHARD	ST	SAN PEDRO	CA	90731	n/a	n/a
23899	EXXONMOBIL OIL CORP	551			PILCHARD	ST	SAN PEDRO	CA	90731	n/a	n/a
44577	**LONG BEACH CITY, SERRF PROJECT**	**100 -**	**120**		**HENRY FORD**	**AVE**	**LONG BEACH**	**CA**	**90802**	**229.068**	**66.678**
54004	WILMINGTON LIQUID BULK TERM INC GNRL	401			CANAL	AVE	WILMINGTON	CA	90744	n/a	n/a
63736	ULTRAMAR INC	961			LA PALOMA	AVE	WILMINGTON	CA	90744	n/a	n/a
64908	CITY OF LA, BOS, WASTEWATER COLL SYS DIV	390		N	SEASIDE	AVE	SAN PEDRO	CA	90731	n/a	n/a
109759	UNITED STATES SEA LAUNCH LIMITED PARTNER	2700			NIMITZ	RD	LONG BEACH	CA	90802	n/a	n/a
112562	AMERICAN PRESIDENT LINES, LTD., TERML 300	614			TERMINAL	WAY	SAN PEDRO	CA	90731	n/a	n/a
117851	SHORE TERMINALS, LLC	841			LA PALOMA	AVE	WILMINGTON	CA	90744	n/a	n/a
128888	TRAYLOR PACIFIC	902			REEVES		TERMINAL ISLAND	CA	90731	n/a	n/a
129242	TUTOR SALIBA CORP	890			REEVES	AVE	TERMINAL ISLAND	CA	90731	n/a	n/a
131249	**BP West Coast Products, LLC**	**1176**			**Carrack**	**Ave**	**Wilmington**	**CA**	**90748**	**92.244**	**96.976**
132412	APM TERMINALS	2500-200			NAVY	WAY	SAN PEDRO	CA	90731	n/a	n/a
132415	APM TERMINALS	2500-100			NAVY	WAY	SAN PEDRO	CA	90731	n/a	n/a
132416	APM TERMINALS	2500-300			NAVY	WAY	SAN PEDRO	CA	90731	n/a	n/a
132969	APM TERMINALS - MPL	2500-430			NAVY	WAY	SAN PEDRO	CA	90731	n/a	n/a
137722	VOPAK TERMINAL LONG BEACH INC,A DELAWARE	3601			DOCK	ST	SAN PEDRO	CA	90731	0	0
136965	Tidelands Oil Production Company	975			Pier F	Ave	Long Beach	CA	90802	0	0
142493	MERIDIAN MANAGEMENT CORP	300		S	FERRY	ST	SAN PEDRO	CA	90731	n/a	n/a
144909	NEXTEL OF CALIFORNIA INC.	300			FERRY	ST	SAN PEDRO	CA	90731	n/a	n/a
146313	PACIFIC LA MARINE TERMINAL LLC	801			REEVES	AVE	SAN PEDRO	CA	90731	n/a	n/a
146546	PACIFIC LA MARINE TERMINAL LLC	3000			NAVY	WAY	TERMINAL ISLAND	CA	90731	n/a	n/a
148141	PORT OF LONG BEACH	306		N	HENRY FORD	AVE	LONG BEACH	CA	90802	n/a	n/a
149886	TIDELANDS OIL PRODUCTION CO/WEST DOW	3555			DOCK	ST	LONG BEACH	CA	90802	n/a	n/a
152033	Tesoro Ref. & Mktg. Co.	820			Carrack	Ave	Long Beach	CA	90813	n/a	0.001
800092	Exxon Mobil Corp.	799		S	Seaside	Ave	Terminal Island	CA	90731	0.002	0.008
800149	US BORAX INC	300			FALCON	ST	WILMINGTON	CA	90744	0.393	0.026
800198	ULTRAMAR INC (NSR USE ONLY)	961			LA PALOMA	AVE	WILMINGTON	CA	90744	0.074	0.003

Figure 1: Location of SA Recycling and Known Sources of Particulate and Lead

4. There are particulates, lead and other trace metals emitted by the ships, locomotives, and trucks in operation daily throughout the port area from residual oil (bunker fuel) and diesel fuel combustion

In December 2004, the California Environmental Protection Agency, Office of Environmental Health Hazard Assessment published a report: "Used Oil in Bunker Fuel: A Review of Potential Human Health Implications". This report documents the presence of lead and other contaminants in diesel and residual oil fuels commonly combusted in and around the ports of Los Angeles and Long Beach. Figure 2, below, shows Table 4 of this report which documents the concentrations (in ppm) expected of lead and other contaminants in diesel and residual oil. These contaminants are directly emitted in the products of combustion when burned in a ship, locomotive, or truck engine. None of these values were considered in the DELTA Group report.

Figure 2: OEHHA's Report Documenting Lead Concentrations in Port Fuels

Table 4. Concentrations of Regulated Chemicals in New Lubricating Oil, Used Oil, Distillate Fuel, and Residual Fuel (in ppm)
(Note: The single value shown is the mean of the data set; the range is shown in parenthesis. *ND* – Not detected; *NA* – Not available; *NR* - concentrations not reported due to "analytical difficulties")

	CA limits	New Lube Oil		Used Oil					Distillate Fuel*	Residual Fuel*	
		Meinz *et al.* 2004	Vermont 1996	Brinkman & Dickson 1995	Vermont 1996 Gasoline Engine	Vermont 1996 Diesel Engine	Sivia *et al.* 1998	Meinz *et al.* 2004	USEPA 1993	USEPA 1993	Lloyd's Register 1995
As	5	ND	NR		NR	NR	<2.5	0.12 (ND – 0.45)	0.8 (0.10-0.2)	0.8 (0.02-2.0)	(0.27 – 1.0)
Cd	2	ND	<0.25	ND (ND – 5)	<1.6 (ND –3.3)	2.4 (0.8 – 6.6)	1.03	0.17 (ND – 0.86)	0.3 (0.1-0.9)	2.3** (0.01-0.9)	ND
Cr	10	1.4	<2.0	10 (ND – 233)	3.2 (ND – 4.2)	3.9 (2.4 – 6.9)	<5	4.5 (2.0 – 17.6)	1.3 (0.5-2.8)	1.3 (0.1-1.7)	(ND – 0.39)
Pb	50	0.15	<20	29 (ND – 265)	47.2 (ND – 104)	57 (23.6 – 146)	42.5	13.2 (0.2 – 66.1)	(0.5-4.4)	(0.1 – 8.0)	(ND – 0.15)

To quantify toxic air emissions for the California Air Toxics "Hot Spots" Act, diesel combustion emission factors, as developed by the Ventura County Air Pollution Control District[2] from engine source testing, are commonly used and are published for use on the South Coast AQMD website. These emission factors, as shown in Figure 3, document that both lead and nickel are well known toxics from diesel/fuel oil combustion. In fact, this data shows that by weight, the lead emissions are approximately twice that of nickel (0.0083 lbs Pb/1000gal and 0.0039 lbs Ni/1000gal respectively). The Terminal Island shredder, in contrast, is powered by electricity.

Thus, the exaggerated claim in the DELTA Group report that...

> "Elemental and mass values from the UC Davis DELTA Group 8 DRUM impactor, with DTSC personnel, support, and execution, have delivered unambiguous tracers of the impact of the Terminal Island auto/appliance shredder on Wilmington. These tracers overlap known hours of shredder operation and transport on south winds, and are confirmed by evidence of upwind aerosols from the harbor, including natural sea salt and the vanadium/nickel/sulfur pollution of ocean going ships using bunker oil as fuel..." (Executive Summary)

...cannot be accurate, since the "pollution of ocean going ships" is also well known to include lead. (In addition, there are large storage piles from ship loads of salt maintained not far from the area in question, likely resulting in some of the "natural sea salt" measured).

[2] http://www.aqmd.gov/prdas/pdf/COMBEM2001.pdf, VCAPCD, May 17, 2001

Figure 3: VCAPCD Diesel Combustion Emission Factors

Diesel Combustion Factors

Diesel (#1, #2 fuel oil) combustion factors were developed for listed substances identified by the CARB as significant components of diesel fuel combustion emissions (2) and for federal HAPs for which data was available.

Diesel Combustion Factors

	external combustion	internal combustion
Pollutant	Emissions (lb/1000 gal)	
benzene	0.0044	0.1863
formaldehyde	0.3506	1.7261
PAH's (including naphthalene)	0.0498	0.0559
naphthalene	0.0053	0.0197
acetaldehyde	0.3506	0.7833
acrolein	0.3506	0.0339
1,3-butadiene	0.0148	0.2174
chlorobenzene	0.0002	0.0002
dioxins	ND	ND
furans	ND	ND
propylene	0.0100	0.4670
hexane	0.0035	0.0269
toluene	0.0044	0.1054
xylenes	0.0016	0.0424
ethyl benzene	0.0002	0.0109
hydrogen chloride	0.1863	0.1863
arsenic	0.0016	0.0016
beryllium	ND	ND
cadmium	0.0015	0.0015
total chromium	0.0006	0.0006
hexavalent chromium	0.0001	0.0001
copper	0.0041	0.0041
lead	0.0083	0.0083
manganese	0.0031	0.0031
mercury	0.0020	0.0020
nickel	0.0039	0.0039
selenium	0.0022	0.0022
zinc	0.0224	0.0224

ND - not detected

With all of the diesel activity that is evident in the port area, the DELTA Group's report fails to consider this distinct group of sources, in addition to other relevant air monitoring data from

stations operated by either the California Air Resources Board or by the Port Los Angeles ("POLA") and Long Beach ("POLB"). All of these monitoring programs (i.e., CARB, POLA and POLB) monitor particulate matter emissions and wind direction, at several stations that can be found either upwind or downwind of SA's Terminal Island facility.

The Multiple Air Toxics Exposure Study in the South Coast Air Basin (MATES III) study has already relied on some of these data to analyze diesel particulate matter ("DPM") contributions to PM concentrations in the ambient air in the port area. According to MATES III, DPM continues to dominate the risk from air toxics and, as discussed previously in this document, diesel fuel emissions are a recognized source of lead in PM. Inexplicably, the DELTA Group's report fails to account for DPM from POLA and POLB operations as sources of lead in the ambient air. Further, the wind data collected over years of CARB and POLA and POLB monitoring demonstrate that PM concentrations in the ambient air measured at the sampling point, whether from a stationary source or re-entrained from earlier surface deposition could be due to numerous other sources operating in the area.

5. Estimate of 28.3 Tons of Uncontrolled Emissions Over 120 Days is Unsubstantiated and Inconsistent with Actual Data

On page 41 of the DELTA Group report, the authors reference a Microsoft Excel document that was used to calculate annual emissions of some pollutant. It is not clear from the text if the pollutant in question is particulate matter or lead. In any case, the authors have apparently used a spreadsheet to calculate that the Terminal Island shredder operating with no control system would emit 86.08 tons per year (for some 120-day period the author quoted 28.3 tons). Assuming that the author is referring to particulate matter emissions, this calculation is in stark contrast to the emissions that were documented in the facility's Annual Emission Report to the South Coast AQMD. The particulate matter emissions that were reported to the South Coast AQMD were calculated using an emission factors from an approved shredder source test. For the year during which the samples were taken, controlled emissions are calculated to be approximately 5.69 tons of particulate matter. During that time period there were no periods of operation without particulate matter controls on the shredder. In fact, according to the South Coast AQMD, SA Recycling employs state-of-the-art particulate matter control methods.

6. Particle Size and Content Do Not "Prove" Source of Emissions

In items 2 and 3 on page 39 of the DELTA Group report, the authors claim that, when the shredder is not operating and the wind is blowing from the shredder to Fire Station 49, there is a high concentration of lead in the 10 to 5 µm size range. Additionally, the author claims that, when the shredder is operating there is a high concentration of lead in the 5 to 2.5 µm size range. This is used to attribute the high concentration of lead in the larger size range to the "Shredder product pile fugitive dust" and the high concentration of lead in the smaller size range to the "Shredder operations." The claim that there is an increase in lead emissions when the wind is blowing from the shredder to Fire Station 49 is not accurate. Indeed, when the wind is not blowing in the favorable direction (i.e., when the wind is blowing from Station 49 toward the shredder) as shown on Figure 33 (page 27) on August 24th, lead concentrations are between 30-

45 ng/m^3 (Figure 37, page 30), and are actually higher than the claimed 15 to 20 ng/m^3 background lead concentration (item 1 on page 39).

When these observations are considered together, no discernable evidence is provided that substantiates the notion that the increase in lead concentrations seen in the 10 to 5 µm size range is due to "Shredder product pile fugitive dust." That is, lead concentrations are actually higher than the background values when the wind is blowing in a direction that is away from Station 49.

The report includes two plots: one showing iron vs. lead in the 10 to 5 µm size range and one showing iron vs. lead in the 5 to 2.5 µm range. The relationship between the iron and lead concentrations in the linear portion of the plots and the apparent iron concentration with no lead present is used to make the assertion that "This proves that all the lead seen in any wind direction is caused by shredder operations, current and past". While these graphs do show a similar relationship between the iron and lead concentrations in the two size ranges, there is not a credible basis to make this claim.

The authors have not provided any evidence as to other significant combustion or process (industrial and mobile) sources of iron and lead in these size ranges that could have impacted Fire Station 49 in the same manner. Given the documented presence of lead in diesel and residual oil used in ship, locomotive, and truck engines, the author does not address the potential for possible adsorption or chelation with iron in products of combustion from engines. As documented by EPA ("Health Assessment Document For Diesel Engine Exhaust", May 2002), "The particles present in DE (i.e., diesel particulate matter [DPM]) are composed of a center core of elemental carbon [EC] and adsorbed organic compounds [OC], as well as small amounts of sulfate, nitrate, metals, and other trace elements." And while the fine and ultrafine particulates are well studied and associated with health risks due to this size range's impact on lungs, EO and OC are also documented in the size ranges of 2.5-10 microns. For example, "Measurements of OC and EC in Coarse Particulate Matter in the Southeastern United States"[3] documents, "On average, total carbon (OC+EC) comprised approximately 30% of $PM_{10-2.5}$ mass at these four sites [two urban and two rural]."

Further, the author has not allowed for the possibility that contaminated soil from the large construction areas of the port could have impacted Fire Station 49 and the reason for the similar relationship between the two size ranges is some form of adsorption or chelation of the lead in the contaminated soil by the form of iron that is present in the soil.

7. Sample Data Does Not Correlate with Shredder Operations

We analyzed the shredder's production data during the period of the DTSC study and identified frequent and significant discrepancies between reported lead measured and actual times of shredder operations.

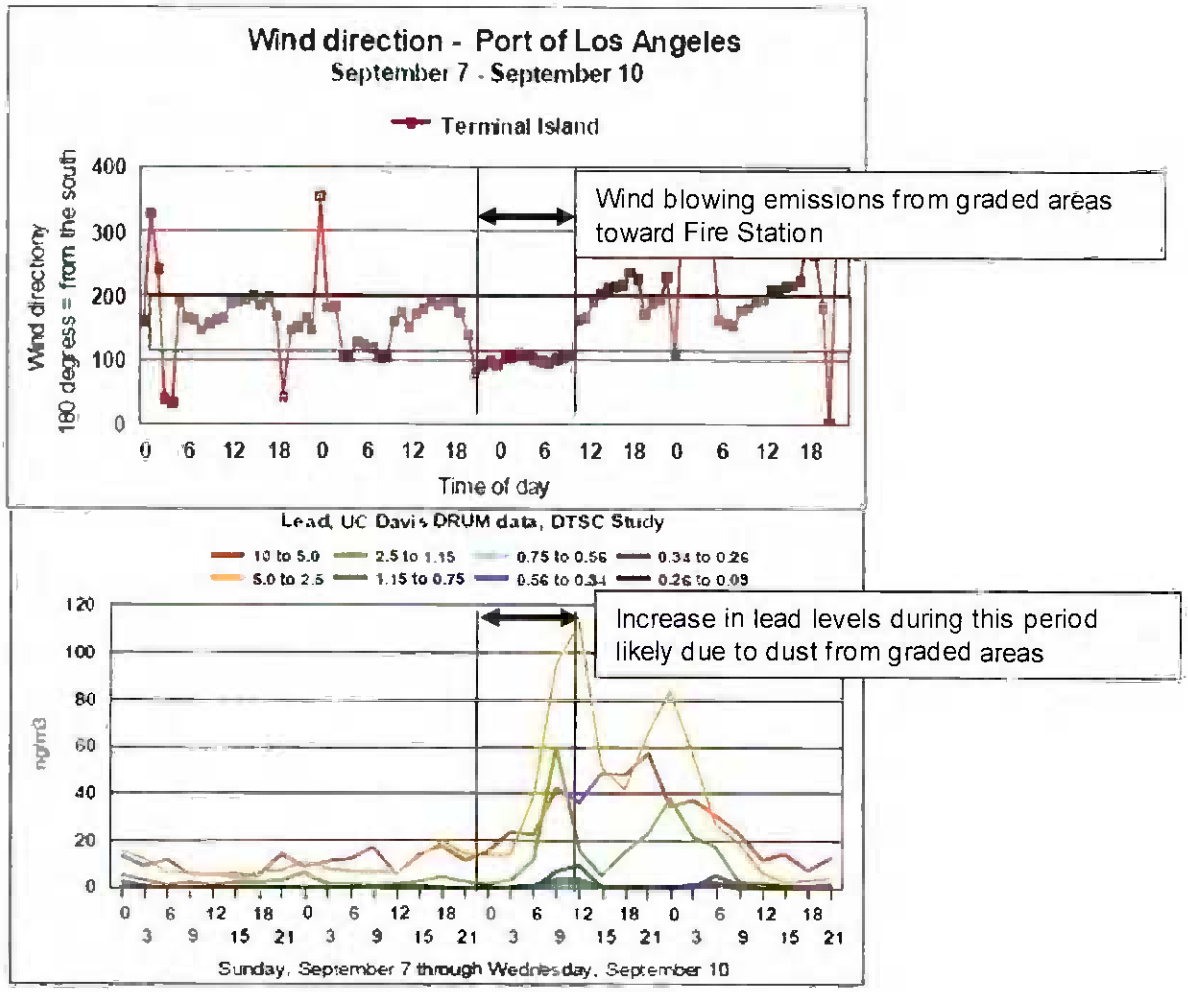
On page 33 of the DELTA Group report under Figure 43, the authors state that "This period is interesting because despite favorable meteorology, there was minimal shredder impact on Sunday and Monday." In fact, the shredder was shut down on Sunday, the 7th, but operational

[3] Edgerton, et. al., Journal of the Air & Waste Management Association. January 2009

the rest of the week. On Tuesday, September 9, the data shows a spike in lead levels. However, during hours of operation on that day (05:00 – 11:00) the wind was consistently blowing from 100 degrees; this is outside the range where emissions from the facility could impact the Fire Station. Note that this direction of wind would be expected to pick up particulate from the graded areas or the incinerator and carry them to the Fire Station monitoring station. However, the study fails to note the existence of these huge grading operations.

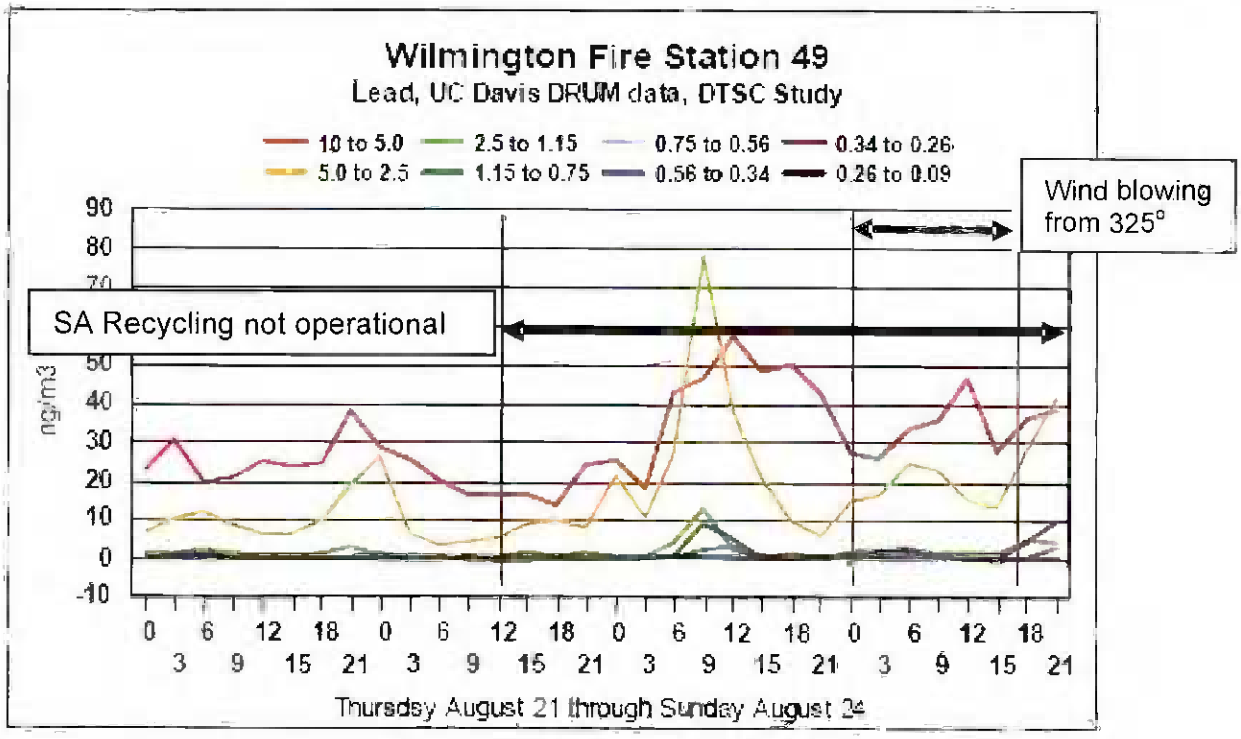
Figure 4: Wind Direction Favorable for Other Sources of Particulate Matter and Lead

Figure 5: Wind Direction Showing Transport from Other Sources of Particulate Matter and Lead



On page 39 of the report there is detailed lead data for the period from Thursday August 21 through Sunday August 24. There is a definite spike in emissions on Saturday, August 23. However, the shredder did not operate between 12:00 PM Friday August 22, and 05:00 AM Monday August 25. These obvious incongruities, easily ascertained by visual observation or a review of facility records, were not addressed in the report or accounted for in its conclusions.

Figure 6: Data Proving Emissions from Other Sources of Particulate Matter and Lead



As shown on page 27 of the report, Figure 33, on August 24 from 00:00 to 12:00, the wind is blowing from the Fire Station toward the shredder with an average heading of 325 degrees. As noted above, this period, corresponds to a period when the shredder was not operating. The elevated lead readings shown in Figure 6 above (Figure 36 in the report) could not be from the shredder but from another source entirely.

Figure 7: Wind Direction Blowing from Fire Station Toward Shredder

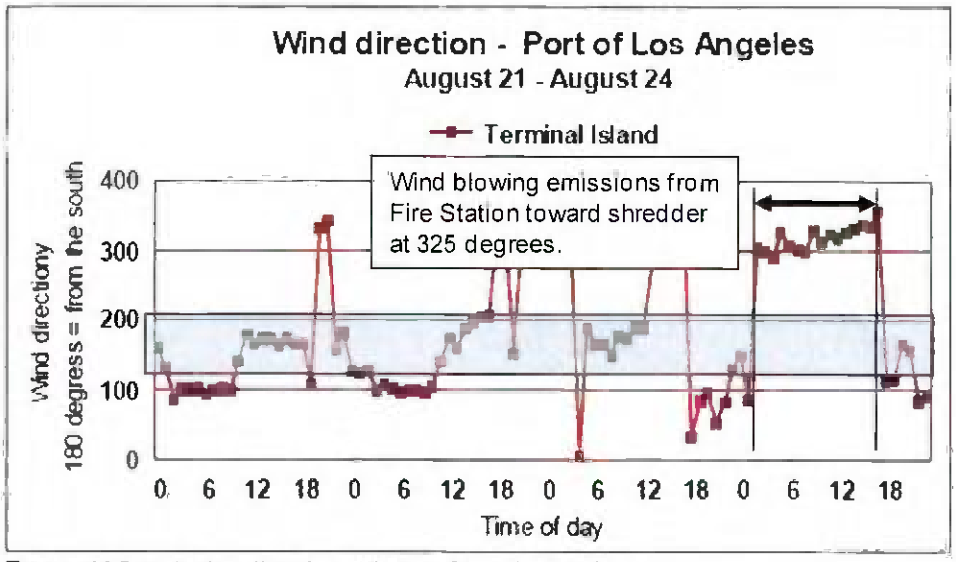


Figure 33 Local wind direction – August 21 to August 24

Figure 8: Wind Direction Blowing from Fire Station Toward Shredder

CONCLUSION

In summary, the DELTA Group report has myriad deficiencies and inaccuracies. The report wrongly implies that there is an imminent respirable health hazard from ambient lead. The report grossly overstates air emissions from SA Recycling and inaccurately attributes all ambient lead particulate to the Terminal Island shredder. In fact, the report actually establishes that the ambient levels of lead are well below EPA's NAAQS for lead and demonstrates that there are other sources of lead coming from other directions. We recommend that the report be further peer reviewed before the department relies on it for any regulatory purpose.

Should you have any questions please contact me at (949) 248-8490 x225.

Sincerely,

Judy B. Yorke

Judy B. Yorke, P.E., C.P.P.
President
Yorke Engineering, LLC

cc: Mr. Elio Torrealba, SA Recycling
Mr. Maziar Movassaghi, Acting Director
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Review and Evaluation of UC Davis Delta Group Study Entitled "Deposition of Coarse Toxic Particles in Wilmington, California"

prepared for:

Pacific Coast Chapter
Institute of Scrap Recycling Industries (ISRI)

June 17, 2009

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Review and Evaluation of UC Davis Delta Group Study Entitled "Deposition of Coarse Toxic Particles in Wilmington, California"

I. Introduction

The Pacific Coast Chapter, Institute of Scrap Recycling Industries (ISRI) retained Sierra Research to evaluate the conclusions and underlying analysis of a report entitled "Deposition of Coarse Toxic Particles in Wilmington, CA" prepared by the University of California at Davis-based Delta Group (Delta Group) for the Department of Toxic Substances Control (DTSC) (Delta Group Report). The report was issued by DTSC in April 2009.

According to the Delta Group Report, the UC Davis Delta Group obtained, analyzed, and drew conclusions from samples of ambient particulate matter collected at a sampling location at the Wilmington CA Fire Station, located across a waterway from the Terminal Island portion of the Port of Los Angeles (POLA). SA Recycling LLC owns and operates an automobile/appliance shredder (shredder) on Terminal Island, within the POLA.

There are numerous mobile emission sources in the surrounding POLA area, such as ocean going vessels, harbor craft, cargo handling equipment, rail locomotives, and heavy-duty vehicles. There are also several large stationary sources in the vicinity of Terminal Island and the Wilmington Fire Station. For example, the Long Beach SERRF municipal solid waste incinerator is located approximately 1.74 miles southeast of the Fire Station and 0.7 miles east of the Terminal Island automobile/appliance shredder, and the BP West Coast Products refinery is located approximately 2 miles northeast of the shredder. In addition, there are other source areas upwind or potentially upwind of the Fire Station not considered in the Delta Group Report, such as vehicle exhaust from the major roadways surrounding the Fire Station and legacy dust from the days when leaded gasoline was still in use.

In addition to the confounding effects of multiple potential sources, a significant factor in the analysis of the data and identification of originating sources is the particle size of the particulate matter (PM). This factor requires careful evaluation.

In 1987, the U.S. Environmental Protection Agency (EPA) replaced the earlier Total Suspended Particulate (TSP) air quality standard with a PM_{10} standard. The PM_{10} standard focuses on smaller particles that are likely responsible for adverse health effects because of their ability to reach the lower regions of the respiratory tract. In 1997, EPA issued the fine particle standards. The fine particle standard, or $PM_{2.5}$ standard, further focuses on the significant association between exposure to fine particles ($PM_{2.5}$) and adverse health effects.[1] In California, the California Air Resources Board (CARB)

[1] U.S. Environmental Protection Agency (EPA) Particulate Matter Standards (http://www.epa.gov/air/particlepollution/standards.html)

replaced the earlier suspended PM standards with a PM_{10} (or respirable PM) standard in 1983. In 2002, the CARB adopted new, revised PM standards for outdoor air, lowering the annual PM_{10} standard and establishing a new annual standard for $PM_{2.5}$[2]. As a result, particulate matter (PM) emissions are generally measured in these two size ranges: particles that are less than 10 µm diameter (PM_{10}) and particles that are less than 2.5 µm diameter ($PM_{2.5}$). The Delta Group Report described particles between 10 to 2.5 µm in size as "coarse" particles, particles less than 2.5 µm in size as "fine" particles, and particles less than 0.25 µm as "very fine" particles.

Typically, particles that are larger than $PM_{2.5}$ in size are largely derived from mechanically generated particulate matter (e.g., soil dust, or particles formed by abrasion, crushing and grinding actions such as occur in a shredder), while particles smaller than $PM_{2.5}$ in size are nearly always derived from chemically formed particles and condensing aerosols, generally created by combustion sources of emissions and atmospheric chemical reactions.[3] This distinction is critical to the analysis of potential sources impacting ambient air measurements at a given location.

The shredder is a mechanical device used to separate ferrous metal from automobiles, appliances, and other scrap metal items. There is no combustion associated with the operation of the shredder. As a result, we expect that the particulate emissions from the shredder would be dominated by particles larger than 10 µm in size, with decreasing fractions of coarse and fine particles, and virtually no particles in the very fine size range.

Our report identifies some key discrepancies between the data and the conclusions of the Delta Group Report. The main findings and conclusions of our evaluation are summarized below.

II. Summary

Assuming that the Delta Group[4] properly collected and analyzed samples taken from the Fire Station, we conclude from our evaluation described below in Section III that the Delta Group Report reaches a number of conclusions that are not supported by, or are inconsistent with, the data presented in that Report.

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[2] Ambient Air Quality Standards (AAQS) for Particulate Matter, CARB website (http://www.arb.ca.gov/research/aaqs/pm/pm.htm)

[3] See, e.g., 70 FR 65992 (Nov. 1, 2005)

[4] It is important to note that the techniques used by the Delta Group to measure ambient concentrations are not federal reference methods, nor are they traceable to federal reference methods. Consequently, these measurements cannot properly be compared with air quality standards that are based on these methods.

In particular, we find that:

- The Delta Group Report's conclusion that iron and lead are "unambiguous tracers" for emissions from the shredder is not supported by the measured data. First, the Delta Group Report failed to demonstrate why lead and/or iron would not be a tracer for other readily identifiable, nearby sources of lead and/or iron emissions in the area, and the Delta Group Report does not attempt to distinguish the impacts of the shredder from these other emission sources. Second, the particle size signatures measured by the Delta Group are not consistent with particulate matter generated from a mechanical process such as automobile/appliance shredding. Furthermore, some of the peak concentrations of these compounds were measured during times when the shredder was not in operation; and some of the peak concentrations of these compounds were measured during times when winds were not blowing from the shredder towards the monitor, or both. All of these facts indicate the presence in the area of other sources of lead and iron emissions in the measured particle size ranges. In short, the conclusion that all of the lead measured at the Wilmington Fire Station is attributable to the shredder, regardless of wind direction or whether the shredder was even operating, is absurd on its face from a meteorological and pollutant transport perspective; is not supported by any analysis contained in the Delta Group Report; and is inconsistent with the presence of numerous sources of lead in the vicinity of the Wilmington Fire Station.

- The Delta Group Report presents the concentrations of lead and other pollutants in units of parts per million, by weight, in the associated particulate matter (referred to as aerosols in the Delta Group Report). These units are meaningless from an air quality or public health perspective. The Delta Group Report did **not** present the necessary ambient particulate concentrations or the calculations needed to determine the concentrations of these pollutants that are inhalable, such that the appropriate ambient lead concentrations could be compared to the applicable state and federal ambient air quality standards for lead. Yet, the authors somehow, without presenting any ambient particulate concentration data, reach the conclusion that the lead concentrations measured exceeded certain allowable health standards.

Section III of this report presents a detailed discussion of these issues.

III. Discussion and Analysis

A. Delta Group Report Principal Conclusion #1

"Elemental and mass values from the UC Davis DELTA Group 8 DRUM impactor, with DTSC personnel, support, and execution, have delivered unambiguous tracers of the impact of the Terminal Island auto/appliance shredder on Wilmington. These tracers overlap known hours of shredder operation and transport on south winds, and are confirmed by evidence of upwind aerosols from the harbor, including natural sea salt and the vanadium/nickel/sulfur pollution of ocean going ships using bunker oil as fuel." (First paragraph, Executive Summary)

1. **The Delta Group Report authors claim to have identified iron and lead as the "unambiguous tracers of the impact of the Terminal Island auto/appliance shredder" based on:**

- **local meteorology**: "[t]wo sites were chosen for our analysis, the Terminal Island (TI) Source Dominated site and the Wilmington Community Center (SP) site. The aerosol sampling site at Fire Station 49 is almost exactly half way between these two sites, and thus falls on the wind trajectory. The shredder itself lies slightly to the east, and has a wind trajectory direction of roughly 160°, or from the SSE, to the sampling site and Wilmington Community Center." (Paragraph below Figure 4, p. 7) From the wind direction and wind speed data at those monitoring sites, the authors established that "[t]he overlap of the winds, with a typical 7 AM to 7 PM trajectory from the south in daytime, and Northwest at night, provides an overlap with shredder operations."
- **"lack of" open soil source**: "... coarse iron normally comes from soil, but there is almost no open soil upwind of the Wilmington Fire Station 49. The iron signature simply should not be there." (First paragraph, p. 15)
- **correlation between the lead and iron peaks with the optimum winds for transport (from the shredder) to Wilmington**: "The high lead values, as well as iron and other elements, peak when the wind is blowing from the shredder to Wilmington." (Last paragraph, p. 2) and "As shown below [Figures 30 and 31], both lead and iron were seen when winds were optimum for transport to Wilmington." (Last paragraph, p. 25)

a. **Local meteorology**

The Delta Group Report authors obtained the wind direction and wind speed data from a network of four air monitoring stations that are located within the Port of Los Angeles (POLA) and Port of Long Beach (POLB). These monitoring stations provide a comprehensive set of air pollutant and meteorological data to evaluate the air quality within the San Pedro Ports area.[5] In the POLA 3rd Annual Monitoring Report (May, 2007 – April, 2008),[6] wind roses were created for the 3rd year of meteorological data collected at each station, and they are presented in Figure 1, together with the locations of the

[5] The Port of Los Angeles, Air Quality Monitoring Program (http://www.portoflosangeles.org/environment/air_quality.asp)

[6] "Air Quality Monitoring Program at the Port of Los Angeles, Summary of Data Collected during the Third Year – May 2007 – April 2008", Feb 2009 (http://caap.airsis.com/Documents/POLA-Air-Quality-2009-Report-030309v2.pdf)

Wilmington Fire Station sampling site, the Terminal Island shredder (SA Recycling Facility), and other nearby stationary sources.

In Figure 1, the wind roses graphically show the frequency of occurrence of wind speed and direction at a site for the entire period from May 2007 to April 2008; they readily indicate the directions in which emissions are most frequently transported. They also show that the predominant wind patterns at each station were considerably different, indicating that the Port area experiences complex air flow patterns reflecting a combination of nearby terrain, inland mountains, and onshore/offshore diurnal patterns.

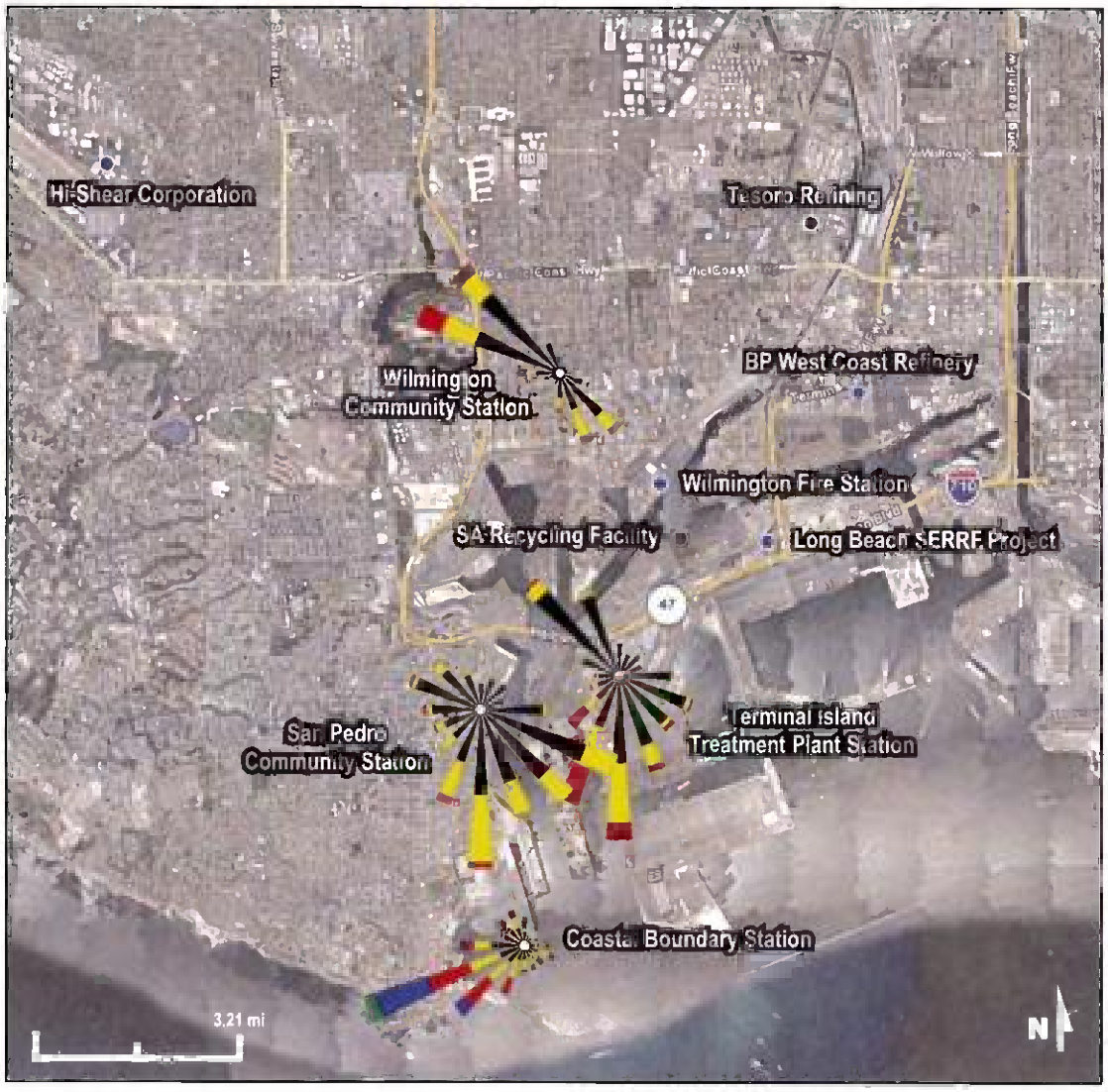

Figure 1. Wind Roses for the POLA Air Monitoring Network Stations. The locations of the Wilmington Fire Station Sampling Site, the SA Recycling Facility (Terminal Island Shredder), and other nearby stationary sources are also shown.

The Delta Group Report authors attempted to isolate the impact of shredder emissions using hourly wind direction data, claiming that measurements during the hours for which wind coming from a direction "roughly 160°, or from the SSE, to the sampling site" would be representative of shredder emissions. However, due to the complex wind patterns in the area, there are multiple sources in a variety of directions that could impact measurements made at the Wilmington Fire Station sampling site

b. **"Lack of" open soil sources**

The Wilmington Fire Station 49 sampling location is in an area that can be strongly affected by a diurnal sea breeze. Coarse iron can therefore come from soils derived from the Los Angeles area and blown out to sea the evening before. Coarse PM (2.5 – 10 μm in diameter) will deposit from air blown out to sea every night. Given an average residence time over the sea of 12 hours for a Southern California air mass, virtually all the coarse PM originally present in the air below a height of about 50 feet will deposit. The higher the original level, however, the more likely the particles will be brought onshore again. Particles can reach high levels above the ground due to turbulent mixing resulting from soil disturbance (e.g., vehicle traffic) or solar insolation. PM_{10} concentrations measured at Long Beach during the week of August 16, 2008,[7] when the Delta Group began its measurements, were approximately 24 $\mu g/m^3$; $PM_{2.5}$ levels were about half of that concentration – 12 $\mu g/m^3$. Thus, coarse PM concentrations during that week were approximately 12 $\mu g/m^3$ (the difference between the PM_{10} and $PM_{2.5}$). Because we assume release heights of at least 15 m above the ground, we use a slightly lower, uniformly mixed coarse PM concentration of 10 $\mu g/m^3$.

For a 5 mph wind speed (estimated average from Figure 2 of the Delta report), 12 hours at sea implies a 60 mile trajectory over the sea. i.e., 30 miles out to sea and 30 miles back from the sea. We also assume a particle with a typical soil density of 2.5 g/cm^3, and we assume that 2/3 (rough estimate from Table 2 of the Delta Group report) of the mass fraction is in the size range 2.5 to 10 $\mu g/m^3$.

To compute fractions of suspended particulate that would settle out of the air, an online deposition velocity model was used to perform this calculation.[8] The results are shown in Table 1.

The data show that coarse-mode particles can come onshore with the wind blowing from the sea, and these particles can contain a significant soil component.

Although there are few large soil sources "upwind of the Wilmington Fire Station 49" during predominant wind patterns (aside from open soil at the shredder site), it is unreasonable to neglect the

[7] Obtained from the California Air Resources Board, Air Quality Data Statistics database http://www.arb.ca.gov/adam/welcome.html

[8] http://www.filtration-and-separation.com/settling/settling.htm, *accessed on October 15, 2006. This simple gravitational settling model is based on equations favored by EPA Region 10 staff*

two large grading site areas on Terminal Island. One of the two grading sites is only approximately 0.4 miles

Table 1. Estimated Remaining Coarse Particulate Matter in the Wind Coming Back from the Ocean at Various Releasing Heights

Release Height (m)	Remaining Coarse PM (%)
15	3%
20	6%
25	10%
30	14%
35	17%
40	21%
45	24%
50	27%

All calculations started with coarse PM at 10 $\mu g/m^3$

east of the Wilmington Fire station; the other site is approximately one mile southeast of the Wilmington Fire Station. The on-going grading operations at these other nearby areas can be detectable sources for coarse mode iron measured at the Fire Station. Therefore, the shredder is not the only possible source for the coarse iron observed in the Delta Report.

c. Correlation between the lead and iron peaks with the optimum winds for transport (from the shredder) to Wilmington

The Delta Group Report presents data for three sets of dates when periods of "peak"[9] lead and iron concentrations were observed in support of its conclusion that the shredder is the "unambiguous" source of the "impacts" at the Fire Station. We examined the wind direction, lead, and iron data during the time of the Delta Group study for each of these "peak" periods, and identified frequent and significant inconsistencies between reported lead and iron measurements and times when the wind was blowing in the direction from the shredder toward the fire station, and periods of shredder operation.

In order for the shredder to be the "unambiguous" source for the high lead and iron levels observed at the Wilmington Fire Station, the lead and iron peaks should be observed when the wind is blowing from the shredder to Wilmington at the same time the shredder is operating, and should not be observed when winds are blowing from other directions. However, we have found that the peaks were seldom observed at times when both conditions were met, and were observed at times when neither condition was met.

In the figures presented in the following sections of this report, the coarse mode iron and lead peaks are denoted by the red dashed lines; the peaks for the finer modes (e.g. 5.0 to 2.5 µm) of iron and lead are

[9] It is important to note that the use of the word "peak" here, as well as in the Delta Report, simply denotes concentrations that are mathematically higher than others, and does not suggest any adverse health impacts.

denoted by black dashed lines. Though the Delta Group report indicates that the shredder operations are "typically 5 AM to circa 1 PM, then an evening shift" (p. 6), daytime shredder operating hours were obtained from SA Recycling production data[10], and these operating hours data, provided by SA Recycling, are highlighted in grey shadings in Figure 2 and Figure 3.

(1) Wind Direction, Lead and Iron Data for August 14 to August 18

Figure 2 contains excerpts of Figures 29 to 31 of the Delta Group Report, showing the wind direction at the Port of Los Angeles and the ambient iron and lead concentrations measured at the Wilmington Fire Station 49.

The peaks in coarse mode iron and lead on the evening of August 15, 18:00, occurred when winds were not blowing from the general direction of the shredder although the shredder was in operation. The other major peaks for coarse iron and coarse lead appear around midnight on August 17. Although the wind directions are generally in the direction of blowing from the shredder towards the fire station, these latter peaks occurred at a time when the shredder was not operating and therefore could not have impacted the sampler.

Peaks for the finer modes of iron and lead on August 15 appeared around noon. These peaks occurred at the time the shredder was in operation and the wind was optimal for transport. However, if these peaks were associated with the shredder, they should have been accompanied by corresponding coarse-mode peaks; they were not—the coarse and fine-mode peaks are shifted in time by several hours. In addition, the second set of observed peaks for the finer modes of iron and lead on this day appeared in the evening around 6 PM, when the shredder was not operating and therefore would not have impacted the sampler.

(2) Wind Direction, Lead and Iron Data for August 21 to August 24 and September 7 to September 10

Figure 3a contains excerpts of Figures 33, 36, and 37 from the Delta Report; it shows the wind direction at the Port of Los Angeles and the ambient iron and lead concentrations measured at the Wilmington Fire Station 49.

The sample data from August 21 to August 24 further illustrate the inconsistencies between the sample data and the authors' claim of identifying iron and lead as the "unambiguous tracers" for the Terminal Island Shredder. Only one set of iron and lead peaks (mainly in the size of 5.0 to 2.5 μm)—on August 23 around 9 AM— was observed but those peaks occurred neither when the wind direction was optimum nor the shredder was in operation. No significant peaks in the coarse iron and/or lead measurements were observed during this sampling period. Once again, if iron and lead were, in fact, tracers for emissions from the shredder, coincident peaks would have been expected for both larger and smaller particle size ranges.

[10] Production data is supplied by SA Recycling via private communication.

Also, no other prominent peaks of iron and lead in any size ranges were observed during these dates. Two "soft" peaks were observed, such as those in the evening of August 21 and the morning of August 24. One of these peaks appeared to occur when the shredder was in operation (evening of August 21) *and* the wind direction was optimum for transport from the shredder to the Wilmington Fire Station. The other "soft" peak (morning of August 24) occurred when the shredder was not in operation and the wind direction was unfavorable for transport (i.e. blowing from the Wilmington Fire Station sampling site to the shredder).

Figure 3b contains the excerpts of Figures 41 to 43 from the Delta Report, showing the wind direction[11] at the Port of Los Angeles and the ambient iron and lead[12] concentrations measured at the Wilmington Fire Station 49 from September 7 to September 10. Two sharp peaks of iron and lead in the 5.0 to 2.5 µm size range were observed on September 9—one at noon and one at midnight. The noon peaks on September 9 can, in theory, be attributed to shredder operations, as the wind direction was also favorable for transport. However, the midnight peaks on the same day occurred when the wind direction was unfavorable and the shredder was not operating.

[11]The caption of Figure 41 is believed to be mislabeled as "wind velocity." According to the title of the graph and presentation of the data, Figure 41 is indeed showing wind direction data from Sept. 7 to Sept. 10.

[12]The caption of Figure 43 indicates that those are iron data. However, the heading of the same figure indicates that the data are for lead. Also, the iron data are already presented in Figure 42. Therefore, we assume that there is a typographical error in the caption of Figure 43, and that Figure 43 indeed presents lead data.

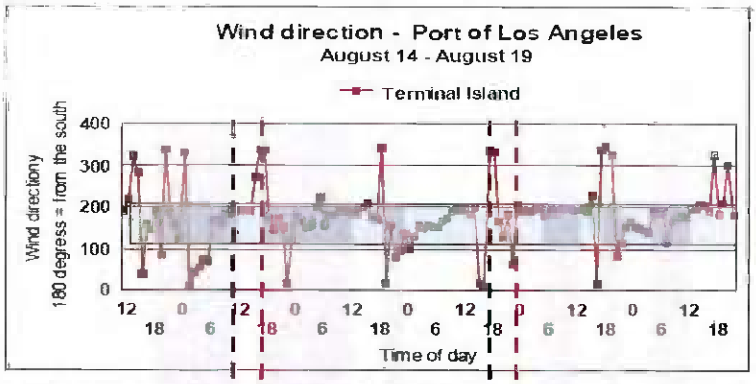

Figure 29 Local wind direction – August 14 to August 18. The shaded area is ± 45° from the direction of the shredder.

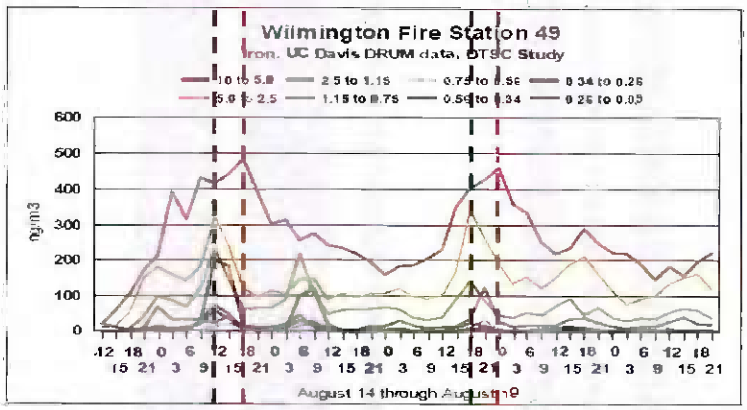

Figure 30 DRUM/S-XRF elemental data, iron. August 14 to August 18

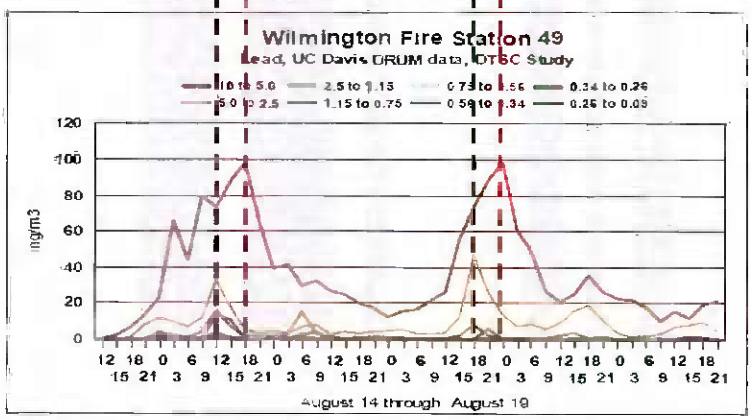

Figure 31 DRUM/S-XRF elemental data, lead. August 14 to August 18

Figure 2. Wind Direction data from the Port of LA (Figure 29); Lead (Figure 30) and Iron (Figure 31) data at the Wilmington Fire Station 49 from August 14 to August 18. Excerpts of Figures 29 to 31 are obtained from the UC Davis Delta Group report. Red dashed lines show periods of "peak" coarse-mode concentrations; black dashed lines show periods of "peak" finer mode concentrations. Gray bands indicate nominal periods of shredder operation; production data was supplied by SA Recycling.

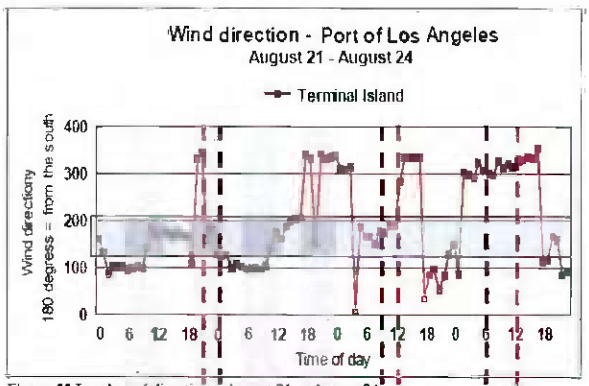

Figure 33 Local wind direction – August 21 to August 24

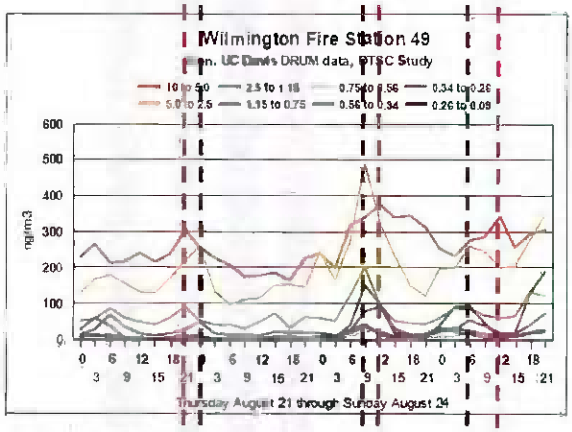

Figure 36 DRUM/S-XRF elemental data – iron

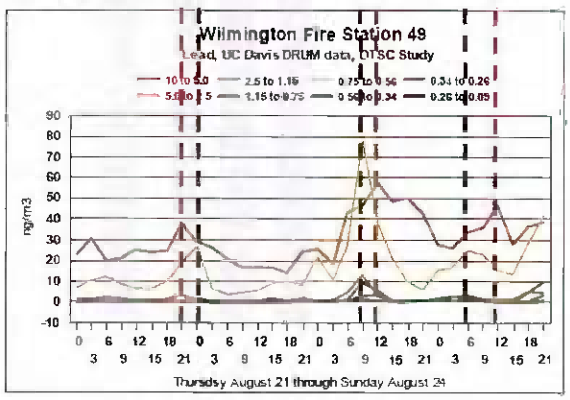

Figure 37 DRUM/S-XRF elemental data – lead

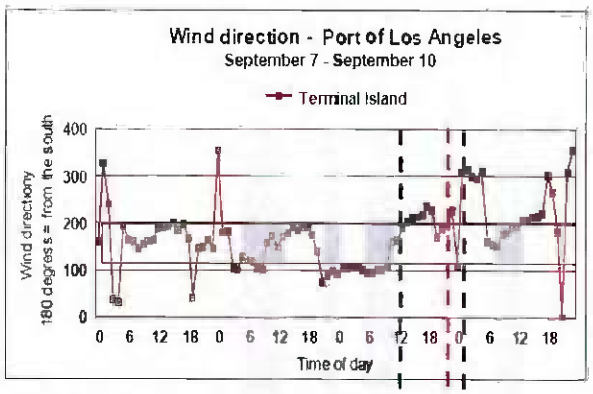

Figure 41 Local wind velocity – September 7 through September 10

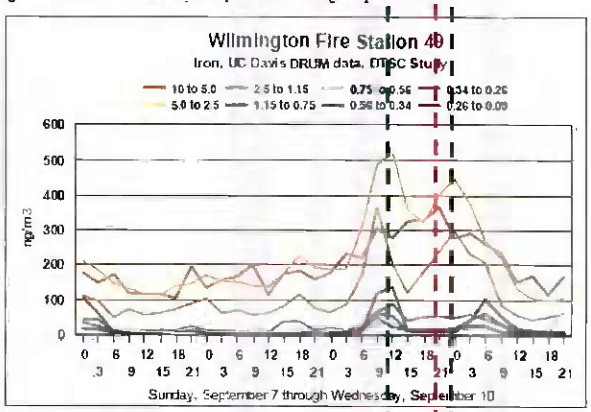

Figure 42 DRUM/S-XRF elemental data – iron

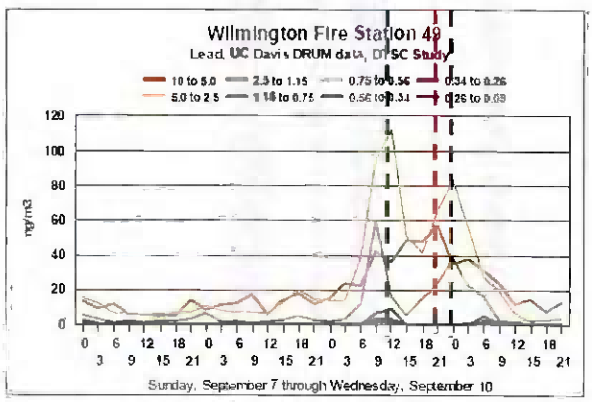

Figure 43 DRUM/S-XRF elemental data – iron

(a) Thursday, Aug. 21 through Sunday, Aug. 24 (b) Sunday, Sept. 7 through Wednesday, Sept. 10

Figure 3. Wind Direction data from the Port of LA; Iron and Lead data at the Wilmington Fire Station 49. (a) from Aug. 21 to Aug. 24 (Figures 33, 36 and 37); (b) from Sept. 7 to Sept 10 (Figures 41 to 43). Excerpts of all figures are obtained from the UC Davis Delta Group report. Red dashed lines show periods of "peak" coarse-mode concentrations; black dashed lines show periods of "peak" finer mode concentrations. Gray bands indicate nominal periods of shredder operation; production data was supplied by SA Recycling.

The report notes that "This period [Sept 7 to Sept 10] is interesting because despite favorable meteorology, there was minimal shredder source impact on Sunday and Monday," and further suggests that "[c]learly, details of shredder operations and feed stock are key to further analysis." (Last paragraph, p. 33) Since levels of lead and iron measured during the evening of Monday, September 8, when the shredder was in operation, are comparable to those measured on Sunday, September 7, when the shredder was shut down, the authors seem to suggest that the "feed stock" for the shredder operations on Monday, September 8 contained insignificant levels of iron and lead. However, the production data[10] provided by SA Recycling indicates that typical "feed stock" was used for the day (Sept 8). Regardless, if there is a certain "feed stock" that would produce lead and iron emission levels similar to those occurring when the shredder is shut down, iron and lead are then not unambiguously representative of shredder operation and therefore cannot be used as tracers for shredder emissions.

While it could be hypothesized that the lack of coincident peaks for coarser and finer particles containing lead and iron is simply a function of the differences in transport characteristics of differently sized particles, neither the data nor the science support this hypothesis. In the first place, the measured data indicate some time periods when the coarser particle peaks (red dashed lines) precede the finer particle peaks (black dashed lines), by several hours (see, e.g., the peaks at 20:00 on August 21 and at 21:00 on September 9). In contrast, the measured data indicate that during several periods the finer particle peaks (black dashed lines) precede the coarser particle peaks (red dashed lines) by several hours (see, e.g., the peaks on August 15, August 17, and August 23). If there was some mechanism through which either larger or smaller particles were lost from the transported air mass from the shredder to the fire station, such a pattern would have been observed consistently in the data; it was not.

In the second place, all of these particles are of a size of 10 microns and smaller; at this size, particles behave in much the same manner as gases, and would all move at the same speed and in the same direction.

In summary, if the lead/iron particles in both size categories had originated from the same emission source, they would have arrived at the fire station at the same time. The differences in the times when peaks have been observed for larger and smaller particles suggest that there are multiple sources for these particles, and not a single, "unambiguous" source. Furthermore, the fact that peaks in the concentrations for lead and iron are not consistently observed during periods of facility operation and meteorology conducive to transport to the fire station, combined with the fact that peaks are, in fact, observed during periods when neither the wind direction is optimal nor the shredder is in operation, confirms that there are sources of these metals other than the shredder facility.

In conclusion, the wind direction, lead, and iron data provided in the report are insufficient to support the connection between the shredder and the high iron and lead values. In fact, the data confirm that there are other, and likely multiple, emission sources that contribute to the values measured at the fire station.

2. The authors further assert the legitimacy of using iron and lead as tracers for the impact of the Terminal Island shredder because they are "*confirmed by the evidence of upwind aerosols from the harbor, including natural sea salt and the vanadium/nickel/sulfur pollution of ocean going ships using bunker oil as fuel.*"

The report states that vanadium, nickel, and sulfur are "a unique source [-] the combustion of heavy, sulfur rich bunker oil in ocean going ships," (first sentence, p. 20) and that these elements exhibit "highly correlated patterns on the daytime winds that blow across the shredder to the Wilmington sampling site" (2nd sentence, first paragraph, p. 18). Therefore, the report concludes, this data "provides an industrial tracer of sources upwind of the shredder, thus identifying trajectories that cross the shredder site before they arrive in Wilmington" (second paragraph, p. 20).

If we accept the authors' choice of vanadium, nickel, and sulfur as the signature for the combustion of heavy, sulfur-rich bunker oil in ocean going ships, and the ocean going ships are upwind of, and indicative of, other industrial sources (in addition to the Terminal Island shredder), the logical deduction would be that the samples collected at the Wilmington Fire Station originated from multiple emitting sources, and not from a single, "unambiguous" source. Thus, this hypothesis and argument by the authors of the Delta Group Report is inconsistent with, and undermines, their conclusion that there can be no other sources of the iron and lead observed at the Wilmington Fire Station.

Moreover, in order for iron and lead to be the "unambiguous tracers" for the shredder, with the ocean going ships shown to be contributing sources, the authors must assume that the emissions from the combustion of heavy, sulfur-rich bunker oil in ocean going ships do not contain any iron or lead. No data are provided to support this assumption.

Following the authors' assumption, the sulfur/vanadium/nickel results suggest that the samples collected at the Wilmington Fire Stations are affected by the port-related activities in the nearby Port of Los Angeles (POLA) and Port of Long Beach (POLB). Together, POLA and POLB comprise a significant source of air emissions in the region. In 2007, the estimated emissions of particulate matter (PM_{10}) and diesel particular matter (DPM) from the Port of Los Angeles were reported to be 944 and 860 tpy, respectively.[13] The port-related emissions of PM_{10} and DPM were estimated to be 925 and 824 tpy for the Port of Long Beach,[14] respectively.

The inventory data for both POLA and POLB are summarized in Table 2[13,14]; these data show that the port-related activities in POLA and POLB can be significant sources of particulate emissions in the area.

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[13] Summary of 2007 Emission Estimates obtained from Table ES.8 of "Port of Los Angeles Inventory of Air Emissions – 2007" http://www.portoflosangeles.org/DOC/REPORT_Air_Emissions_Inventory_2007.pdf

[14] Summary of 2007 Emission Estimates obtained from Table ES.8 of "The Port of Long Beach Air Emissions Inventory – 2007" http://www.polb.com/environment/air_quality/emissions.asp

Table 2. 2007 Port-Related Emissions by Category (tpy) for the Port of Los Angeles and the Port of Long Beach

	PM_{10}	$PM_{2.5}$	DPM	NOx	SOx	CO	HC
2007 Port-related Emissions by Category for the Port of Los Angeles[13], tpy							
Ocean-going vessels	416	333	333	6,142	3,718	587	267
Harbor craft	53	49	53	1,281	1	348	85
Cargo handling equipment	46	43	45	1,662	2	919	81
Rail locomotives	60	54	60	1,675	55	268	94
Heavy-duty vehicles	370	340	370	7,343	6	2,529	445
Total	**944**	**817**	**860**	**18,102**	**3,781**	**4,652**	**973**
2007 Port-related Emissions by Category for the Port of Long Beach[14], tpy							
Ocean-going vessels	492	394	391	7,072	4,460	676	301
Harbor craft	49	45	49	1,211	1	321	77
Cargo handling equipment	39	36	39	1,339	1	334	46
Rail locomotives	49	44	49	1,336	47	217	75
Heavy-duty vehicles	296	273	296	5,964	5	2,048	365
Total	**925**	**791**	**824**	**16,923**	**4,513**	**3,596**	**865**

Lead and/or iron, and other toxic air contaminants, can be found in the exhaust from the combustion of diesel and residual oil fuels in ocean going vessels, harbor craft, cargo handling equipment, locomotives, and heavy-duty trucks at the ports. Since iron is not a toxic or hazardous air pollutant, its emissions are not routinely reported. To examine the likelihood that port activities are iron- and/or lead-emitting sources, we obtained typical PM chemical profiles for some common combustion processes related to Port activities.[15] Table 3 shows three selected chemical profiles for particulate emissions: marine vessels that use liquid fuel, residual oil combustion, and distillate oil combustion. Though the profiles indicate that only trace amounts of lead and/or iron can be found, it is still incorrect to assume the shredder is the single source of lead and/or iron. Looking only at the lead associated with distillate (diesel) fuel combustion (0.55% of PM_{10} by mass), as shown in Table 3, and based on the estimated DPM emissions from POLA and POLB in 2007 presented in Table 2, lead emissions associated with diesel fuel combustion from port-related activities would be approximately 18,500 pounds per year.

[15] Particulate matter chemical profiles for source categories - PMPROF (Excel file), obtained from http://www.arb.ca.gov/ei/speciate/dnldopt.htm

Table 3. Selected Speciation Profile Used in ARB Modeling

	Marine Vessels-Liquid Fuel			Fuel Combustion-Residual			Fuel Combustion-Distillate		
Chemicals	Wt % of PM	Wt % of PM_{10}	Wt % of $PM_{2.5}$	Wt % of PM	Wt % of PM_{10}	Wt % of $PM_{2.5}$	Wt % of PM	Wt % of PM_{10}	Wt % of $PM_{2.5}$
Arsenic	--	--	--	0.03	0.04	0.05	0.53	0.54	0.55
Barium	--	--	--	0.05	0.05	0.05	--	--	--
Cadmium	--	--	--	--	--	--	0.05	0.05	0.05
Calcium	5	5	5	0.55	0.55	0.55	--	--	--
Chromium	--	--	--	0.55	0.55	0.55	0.53	0.54	0.55
Cobalt	--	--	--	0.05	0.05	0.05	--	--	--
Copper	--	--	--	0.05	0.05	0.05	--	--	--
Elem carbon	4	4	4	22.76	20.18	6	15	15	15
Lead	--	--	--	--	--	--	**0.55**	**0.55**	**0.55**
Iron	**0.55**	**0.55**	**0.55**	**2.83**	**3.17**	**4**	--	--	--
Manganese	--	--	--	0.05	0.05	0.05	--	--	--
Molybdenum	--	--	--	0.05	0.05	0.05	--	--	--
Nickel	--	--	--	0.55	0.55	0.55	0.05	0.05	0.05
Nitrates	--	--	--	0.05	0.05	0.05	3.86	3.94	4
Potassium	--	--	--	0.36	0.42	0.55	--	--	--
Selenium	--	--	--	0.04	0.05	0.05	0.05	0.05	0.05
Silicon	0.55	0.55	0.55	--	--	--	--	--	--
Strontium	--	--	--	0.05	0.05	0.05	--	--	--
Sulfates	15	15	15	44.12	50.26	65	25	25	25
Tin	--	--	--	--	--	--	0.05	0.05	0.05
Titanium	--	--	--	0.05	0.05	0.05	0.05	0.05	0.05
Vanadium	0.55	0.55	0.55	0.55	0.55	0.55	--	--	--
Zinc	--	--	--	--	--	--	0.55	0.55	0.55
Other	74.35	74.35	74.35	27.25	23.28	21.75	53.73	53.62	53.55

Source: Particulate matter chemical profiles for source categories - PMPROF (Excel file), obtained from http://www.arb.ca.gov/ei/speciate/dnldopt.htm

In fact, the correlation between vanadium, nickel, and sulfur concentrations is not established in the Delta Group report, indicating that, for these metals as well, there are multiple sources. Figure 4 below presents the joint vanadium-nickel plot (Figure 21[16]) presented in the Delta Group report. As shown in Figure 4, the authors of the Delta Group report failed to include sulfur to show the correlation between the three elements. It is unclear if the sulfur data follow or support the nickel and vanadium data.

[16] The label "Bunker Oil" in the heading of the Figure 21 can be misleading because the figure is not showing typical emissions from bunker oil combustion; rather, the figure is showing the ambient data for nickel and vanadium for particle sizes ranging from 0.26 to 0.09 μm

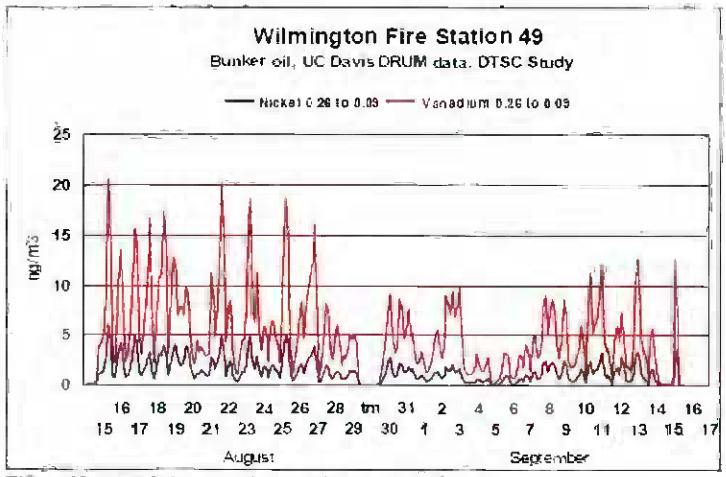


Figure 21 DRUM elemental data – nickel and vanadium

Figure 4. Ambient Levels of Nickel and Vanadium measured for particle sizes 0.26 to 0.09 µm at the Wilmington Fire Station 49 (Figure 21 in the Delta Group report)

Consequently, the vanadium/nickel/sulfur data do not support the use of lead as the "unambiguous tracers" for the Terminal Island shredder. On the contrary, they confirm that the samples collected at the Wilmington Fire Station are affected by additional, contributing emitting sources in the area, and to the extent that these other emitting sources result in emissions of iron and/or lead, these sources contribute to the "peak" concentrations measured at the Wilmington Fire Station.

B. Principal Conclusion #2 of the Delta Group Report

"This proves that all the lead seen in any wind direction is caused by shredder operations, current and past" (p. 40)

1. The Delta Group report claims that the shredder is the only source of lead emissions in the area despite the presence of other, known lead emission sources in the vicinity. The report fails to acknowledge or explore the contribution of lead emissions to the Wilmington sampling site from other nearby emitting sources.

As shown in Figure 5 below, there are a number of large stationary emission sources close to the SA Recycling facility on Terminal Island. For instance, a number of stationary facilities reported significant lead emissions: the Long Beach City SERRF Project (SCAQMD Facility ID 44577); the BP West Coast Products (SCAQMD Facility ID 131249); the Tesoro Refining and Marketing Company (SCAQMD Facility ID 800436); and the Hi-Shear Corporation (SCAQMD Facility ID 11192). Table 4 shows the facility emission inventory for the criteria pollutants and selected trace metals for these stationary sources.[17]

[17] Emission Inventory is obtained from the CARB database: http://www.arb.ca.gov/app/emsinv/facinfo/facinfo.php

Figure 5. Location of the Wilmington Fire Station, the SA Recycling Facility on the Terminal Island, and Other Nearby Sources for Lead and Particulate Emissions

According to annual emission inventory data reported by the California Air Resources Board, the nearby SERRF municipal solid waste incinerator reported lead emissions of 66 lbs/year; the BP West Coast Products Refinery reported 97 lbs/year; the Tesoro Refining and Marketing Company reported 309.4 lb/yr; and the Hi-Shear Corporation reported 170.3 lb/yr of lead emissions. These data clearly show that the report fails to consider the potential contributions from nearby lead emission sources to the Wilmington area, in addition to the mobile source emissions discussed in the preceding section. Furthermore, at least three of these emission sources (municipal solid waste incinerator and two oil refineries) produce these emissions from processes, such as combustion, that would result in the formation of relatively smaller particles containing lead, in contrast to the larger particles generated by the shredder. Thus, these other emission sources are more likely to be the origins of the fine and very fine lead particles measured by the Delta Group.

Table 4. Facility Emission Inventory for the Additional Emitting Sources in the Area

POLLUTANT	Long Beach City SERRF Project (ID 44577)	BP West Coast Products (ID 131249)	Tesoro Refining and Marketing Co (ID 800436)	Hi-Shear Corporation (ID 11192)
Data for 2007	Criteria Pollutant Emissions (Ton/yr)			
TOG	64.4	7.6	281.5	8.2
ROG	10.7	5.2	220.6	5.0
CO	83.4	0.9	205.7	1.9
NOx	328.2	209.8	855.4	7.8
SOx	14.3	168.0	351.7	0.1
PM	18.3	41.7	396.7	0.6
PM_{10}	5.7	39.6	318.4	0.6
$PM_{2.5}$	3.9	37.3	257.4	0.6
	Toxic Air Contaminant Emissions (lb/yr)[a]			
Arsenic	1.1	5.1	7.3	0.03
Cadmium	4.7	21.5	4.6	2.9
Copper	0.003	--	22.6	0.07
Cr(VI)	0.7	0.4	1	0.1
Lead	**65.7**	**97.0**	**309.4**	**170.3**
Manganese	0.002	--	368.2	0.05
Mercury	0.001	--	3.8	0.03
Nickel	71.3	39.4	131.2	0.1
Selenium	0.002	--	759.3	0.04

[a] The toxic emission inventory data provided here may have been developed over several years and are the most recent information available at ARB for this inventory year. Many facilities are only required to update their toxic emission data if there has been an increase in emissions. Therefore, the toxic emission data presented here should generally be viewed as maximum emission values which may have decreased since this information was reported.

In summary, the conclusion that all of the lead measured at the Wilmington Fire Station is attributable to the shredder, regardless of wind direction, is absurd on its face from a meteorological and pollutant transport perspective; is not supported by any analysis contained in the Delta Group Report; and is inconsistent with presence of numerous sources of lead in the close vicinity of the Wilmington Fire Station.

2. The authors claim to be able to "*distinguish diesel and auto emissions from Shredder emissions*" (Additional topic 4, p. 36)

The Delta Group Report authors reason that since diesel emission from trucks, trains, and forklifts in the area are widely distributed, diesel tracers—including zinc (Zn), phosphorous (P), and sulfur (S)—should show up in the record when the winds are in all directions other than from the shredder. The authors conclude that, due to a lack of such a signature, the impact of diesel emissions is an insignificant contributor to their measurements. (Second paragraph, p. 36)

First, it is incorrect to include sulfur as a signature element for diesel combustion. California diesel fuel regulations set a limit of 15 parts per million by weight, effective June 2006.[18] This means that the sulfur content of diesel fuel is now comparable to the sulfur content of natural gas.

Zinc and phosphorous can serve as tracers for some diesel emissions because they come from the additive in the lubricating oils used by some diesel engines.

However, diesel emission tracers such as zinc and phosphorous cannot represent all "diesel emission from trucks, train, and forklifts in the area." For instance, diesel truck and construction equipment engines do use lubricating oils with an additive that contains zinc and phosphorous, but locomotive engine lubricating oils do not include any additives containing zinc. Therefore, even if zinc (and phosphorous) can be used as the signatures for some diesel emissions, an absence of such signatures does not rule out other contributing sources of diesel emissions in the area, such as diesel emission from ships or locomotives.

The report's authors suggest (without presenting any supporting data) that shredder waste is known to contain "Lead (Pb), Copper (Cu), Zinc (Zn), Iron (Fe), Cadmium (Cd), Mercury (Hg), and Arsenic (As)." (Last paragraph, p. 36) The authors go on to suggest that since zinc is common to both diesel emission and shredder waste, the amount of zinc that is not associated with lead and iron (as they are the "unambiguous tracers" for shredder emissions) can be attributed to diesel emissions. The authors then report that every zinc peak but one (August 27) occurs with the "typical" shredder elements (i.e. lead and iron); therefore, the authors conclude, no impacts from diesel emissions are observed in the sample.

As discussed in an earlier section of this report, the validity of using lead and iron as the definitive tracers for the shredder is highly questionable, and is not supported by the data in the Delta Group Report. Moreover, the authors of the Delta Group Report do not provide an explanation for disregarding the zinc peak that occurred on August 27. If the August 27 zinc peak cannot be seen as an anomaly, the entire zinc profile may be an indication of additional, unknown emitting sources in the area. The authors did not provide sufficient data/reasoning to support the claim that all of the diesel emissions in the vicinity of Terminal Island and Wilmington can be distinguished from the shredder emissions.

[18] California Diesel Fuel Regulations (13 CCR 2281)

3. The conclusive evidence for *"all the lead seen in any wind direction is caused by shredder operations, current and past"* appears to be the strong iron-lead correlation in the coarse (10 to 5.0 µm) and intermediate (5.0 to 2.5 µm) aerosol modes.

The Delta Group Report authors hypothesize that the source of the coarse particles (10 to 5.0 µm) seen at Fire Station 49, even when the wind was blowing the shredder emissions away from the station, is fugitive or resuspended dust from years of contamination by the shredder. The authors did not provide any data to justify such a claim. It is unclear how the authors determined that the observed coarse mode particles were not recently generated by other lead-emitting sources in the area.

The authors then deduce that all of the lead seen in the area is caused by the shredder operation, current and past, since the iron-lead relationship of the coarse-mode particles from years of contamination is the same as that of the intermediate mode (5.0 to 2.5 µm), which the authors allege is only present when the shredder is running and the winds are from the south. Given the other well-documented sources of lead in the area, and the issues discussed above associated with claiming lead and iron as tracers for the shredder, the iron-lead relationship cannot serve as the definitive proof (or even any proof at all) for the shredder emissions. The same iron-lead relationships observed in the Delta Group Report can be, and in fact are more likely to be, the result of a combined impact of all lead and iron emitting sources in the area.

C. Principal Conclusion #3 of the Delta Group Report

"The presence of the very fine iron indicates a high energy and/or high temperature process, as iron from soil is essentially absent from aerosols below 1 µm in size. The fact that this tracks with very fine lead and occurs only on winds from the shredder identify the shredder as the source." [sic] (p. 31)

The Delta Group Report asserts, without presenting sufficient supporting data, that the very fine lead containing particles (< 0.25 µm) come from the shredder. As the authors mention that "[t]he fine mode lead has unknown sources, ..." (below Figure 16, p.17), it is unclear where the authors establish the fact that very fine lead originates from the shredder; we imagine that this assertion is tied to the implication (throughout the entire report) that the shredder is the unique source for lead. As we discussed earlier, this implication is not supported by the monitoring data presented in the report, and the authors neglect to mention various lead emitting sources in the area, as discussed in the previous section.

Since the shredder operations are mechanical, it is unlikely (if not impossible) for the shredder to be the dominant source for the very fine particles (< 0.25 µm) measured at the Wilmington Fire Station. The size range of the very fine particles (< 0.25 µm) suggests that these particles were created through a combustion process rather than through the mechanical generation of dust particles. Dust particles are typically much larger in size. Therefore, it is doubtful that the shredder is the main source of very fine lead. The fact that the very fine iron tracks very fine lead (without additional supporting data) is insufficient to prove that they are coming from the same, single source. Moreover, the fact that very fine lead and iron occur only when winds are from the direction of the shredder does not prove that the

shredder is the only source for them, as the report also suggests that the ocean going ships using bunker oil as fuel are an upwind emitting source, according to the vanadium/nickel/sulfur results; other port activities at the nearby locations upwind of the shredder may also impact the measurements at the Wilmington sampling site. As shown above in Tables 2 and 3, diesel fuel combustion from port-related activities is a non-trivial source of lead emissions in the area.

In summary, there is no evidence to suggest, and the physics of particle formation contradict, the idea that a mechanical process such as shredding can generate very fine lead containing particles. Rather, the presence of very fine lead containing particles is almost certainly indicative of a combustion source where lead is contained in the material being combusted. Municipal solid waste and distillate fuels are two such examples.

D. Principal Conclusion #4 of the Delta Group Report

"The data indicate the presence of many metals measured at the Wilmington Fire Station 49, including lead, that occur in coarse particles that will readily settle onto the ground. The concentrations routinely exceed the DTSC limit of 1,000 ppm for all of the 3 size modes of particles larger than 1 μm particle diameter." (Executive Summary, second paragraph, p. 1)"

The Delta Group report compares the lead concentration in particulates collected at the Wilmington Fire Station 49 sampling site to the hazardous waste regulatory threshold for total lead. The report implies that airborne particulates (such as the coarse mode lead in the size range of 10 to 5.0 μm) will readily settle to the ground, and the settling of these particles, containing hazardous material, can be regarded as a disposal of hazardous waste. This theory does not reflect the aerodynamic characteristics of particles of this size. Furthermore, the comparison of measured concentrations of lead within ambient particulates with DTSC limits is wholly inappropriate. A comparison of the measured concentrations with ambient air criteria demonstrate that unhealthful levels of lead were not observed.

The fact that air emissions are not regulated as a hazardous waste is not an oversight or a technicality. Rather, emissions of criteria pollutants (such as particulate matter) and toxic air contaminants (such as lead) are regulated by agencies such as the U.S. Environmental Protection Agency (EPA), Air Resources Board (ARB), and local air quality districts (such as the South Coast Air Quality Management District, SCAQMD). In addition, occupational air quality standards are established by the California Division of Occupational Safety and Health (Cal/OSHA) and the Occupational Safety and Health Administration (OSHA) to protect worker safety.

The Clean Air Act requires the EPA to set National Ambient Air Quality Standards (NAAQS) to protect public health; the State of California has also established ambient air quality standards. For particulate matter (PM_{10} and $PM_{2.5}$), the standards are listed in Table 5.

Table 5. National Ambient Air Quality Standards (NAAQS) and California Ambient Air Quality Standards for Particulate Matter

Pollutant	Federal EPA Standards[a]		CARB Standards[b]	Averaging Times
	Primary Standards[c]	Secondary Standards[d]		
Particulate Matter (PM_{10})	Revoked[e]		20 µg/m^3	Annual (Arithmetic Mean)
	150 µg/m^3		50 µg/m^3	24-hour
Particulate Matter ($PM_{2.5}$)	15.0 µg/m^3[g]	Same as Primary	12 µg/m^3	Annual (Arithmetic Mean)
	35.0 µg/m^3[h]		--	24-hour

[a] Obtained from EPA website: http://www.epa.gov/air/particlepollution/standards.html.

[b] Obtained from CARB website: http://www.arb.ca.gov/research/aaqs/pm/pm.htm

[c] Primary standards set limits to protect public health, including the health of "sensitive" populations such as asthmatics, children, and the elderly.

[d] Secondary standards set limits to protect public welfare, including protection against decreased visibility, damage to animals, crops, vegetation, and buildings.

[e] Due to a lack of evidence linking health problems to long-term exposure to coarse particle pollution, the agency revoked the annual PM_{10} standard in 2006 (effective December 17, 2006).

[f] Not to be exceeded more than once per year on average over 3 years.

[g] To attain this standard, the 3-year average of the weighted annual mean $PM_{2.5}$ concentrations from single or multiple community-oriented monitors must not exceed 15.0 µg/m^3.

[h] To attain this standard, the 3-year average of the 98th percentile of 24-hour concentrations at each population-oriented monitor within an area must not exceed 35 µg/m^3 (effective December 17, 2006).

The US EPA has also established National Ambient Air Quality Standards (NAAQS), pursuant to the federal Clean Air Act, for pollutants that are considered harmful to public health and the environment. The NAAQS for lead are presented in Table 6.[19]

[19] There is a California Ambient Air Quality Standard for lead—it is 1.5 µg/m^3 on a 30-day average basis, and hence is much less stringent than the NAAQS of 0.15 µg/m^3 on a rolling 3-month average basis.

Table 6. National Ambient Air Quality Standards (NAAQS) for Lead

	Primary Standards[a]		Secondary Standards[b]	
Pollutant	Level	Averaging Time	Level	Averaging Time
Lead	0.15 µg/m^3	Rolling 3-month Average	Same as Primary	
	1.5 µg/m^3	Quarterly Average	Same as Primary	

Source: Obtained from EPA website: http://www.epa.gov/air/criteria.html

[a] Primary standards set limits to protect public health, including the health of "sensitive" populations such as asthmatics, children, and the elderly.

[b] Secondary standards set limits to protect public welfare, including protection against decreased visibility, damage to animals, crops, vegetation, and buildings.

The average lead concentration in particulate matter collected over the entire Delta Group Study period was 1359 ppmw (parts per million, by weight) for particles of 10 µm and smaller. This concentration (as well as other, similar, concentrations presented in the Delta Group report), represents the ratio of the mass of lead (or other compounds of interest) to the mass of particulates in the size range specified. To translate these concentrations into values that can be compared with relevant air quality measures, these concentrations have to be multiplied by the average concentrations of particulate matter in ambient air for the same size range, and over the same time period.

Table 7 shows the 24-hour averaged PM_{10} measurements at the POLA Wilmington Monitoring Station[20]. This station is located at the Saints Peter and Paul Elementary School (SPPS) in the City of Wilmington. This is the closest air quality monitoring station to the Wilmington Fire Station Sampling site. The average PM_{10} concentration during the sampling period reported by the Delta Group was approximately 31.9 µg/m^3.

Combining the reported average lead concentration in PM_{10} (1359 ppmw) and the average PM_{10} concentration in the area (31.9 µg/m^3) results in an ambient concentration of 0.04 µg/m^3,[21] well below the NAAQS, which is applied on a 3-month average basis (recognizing that concentrations may be acceptably above the NAAQS for shorter time periods).

The California Division of Occupational Safety and Health (Cal/OSHA) Lead Standard[22] is largely identical to the Occupational Safety and Health Administration (OSHA) Lead Standard[23]. Both of them have set a

[20] 24-hr averaged PM_{10} measurements obtained from the San Pedro Bay Ports' Real-time Air Quality Monitoring Site (http://caap.airsis.com/) from August 14, 2008 to September 15, 2008.

[21] 31.9 µg/m^3 PM_{10} x 1359E-6 ppmw (lead in PM_{10}) = 0.043 µg/m^3 lead (PM_{10} size)

[22] California Code of Regulations, Title 8, Subchapter 7, 5198 (http://www.dir.ca.gov/title8/5198.html)

[23] Occupational Safety and Health Standards, Lead, 29 CFR Part 1910 subpart Z Standard Number 1910.1025 http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=STANDARDS&p_id=10030

Table 7. PM_{10} Concentrations at the POLA Wilmington Monitoring Station (8/15/2008 to 9/15/2008)

Date	PM_{10} ($\mu g/m^3$, 24-hr average)	Date	PM_{10} ($\mu g/m^3$, 24-hr average)
8/14/2008	38.2	9/1/2008	4.8
8/15/2008	33.3	9/2/2008	14.5
8/16/2008	28.7	9/3/2008	43.7
8/17/2008	28.8	9/4/2008	32.3
8/18/2008	28.3	9/5/2008	44.7
8/19/2008	27.6	9/6/2008	39.8
8/20/2008	28.8	9/7/2008	49.6
8/21/2008	25.7	9/8/2008	43.3
8/22/2008	22.5	9/9/2008	34.3
8/23/2008	34.9	9/10/2008	26.8
8/24/2008	29.7	9/11/2008	28.5
8/25/2008	31.2	9/12/2008	31.3
8/26/2008	38.8	9/13/2008	39.3
8/27/2008	34.0	9/14/2008	45.8
8/28/2008	49.7	9/15/2008	56.2
8/29/2008	31.2		
8/30/2008	3.4		
8/31/2008	4.6		

permissible exposure limit PEL (enforceable) of lead in workplace air at 50 $\mu g/m^3$ averaged over an 8-hour workday for workers in general industry, and an action level of lead at 30 $\mu g/m^3$ at 8-hour average. In contrast, the lead concentration in particulate matter reported by the Delta Group for "peak" periods was 3316 ppmw; this is equal to a nominal ambient concentration of 0.11 $\mu g/m^3$,[24] again well below the action level and the PEL of the Cal/OSHA and OSHA standards.

The data presented in the Delta Group Report do not support the conclusion that operation of the shredder facility constitutes a hazard to public health due to emissions of air pollutants from the facility. Rather, the data presented indicate ambient concentrations of lead measured at the Wilmington Fire Station are attributable to multiple emission sources that may or may not include the shredder facility and, nonetheless, are well within the state and federal ambient air quality standards, and are below all Cal/OSHA and OSHA action and exposure levels.

[24] 31.9 $\mu g/m^3$ PM_{10} x 3316E-6 ppmw (lead in PM_{10}) = 0.106 $\mu g/m^3$ lead (PM_{10} size).

EXHIBIT 9

Schnitzer

CALIFORNIA
Water Boards
STATE WATER RESOURCES CONTROL BOARD
REGIONAL WATER QUALITY CONTROL BOARDS

Schnitzer Steel Products Oakland Facility
1101 Embarcadero West; Oakland, CA

September 14, 2012

CONFIDENTIAL

Discussion Outline

Schnitzer

- *Introduction*
- *Overview of Operations*
- *Corporate Environmental Policy*
- *Historical Approach to Compliance at Oakland Facility*
- *Proactive Site Improvements (recent & planned)*
- *Main Components of Tentative CAO*
- *Possible Alternatives to CAO*
- *Next Steps*
- *Questions/Comments/Discussion*

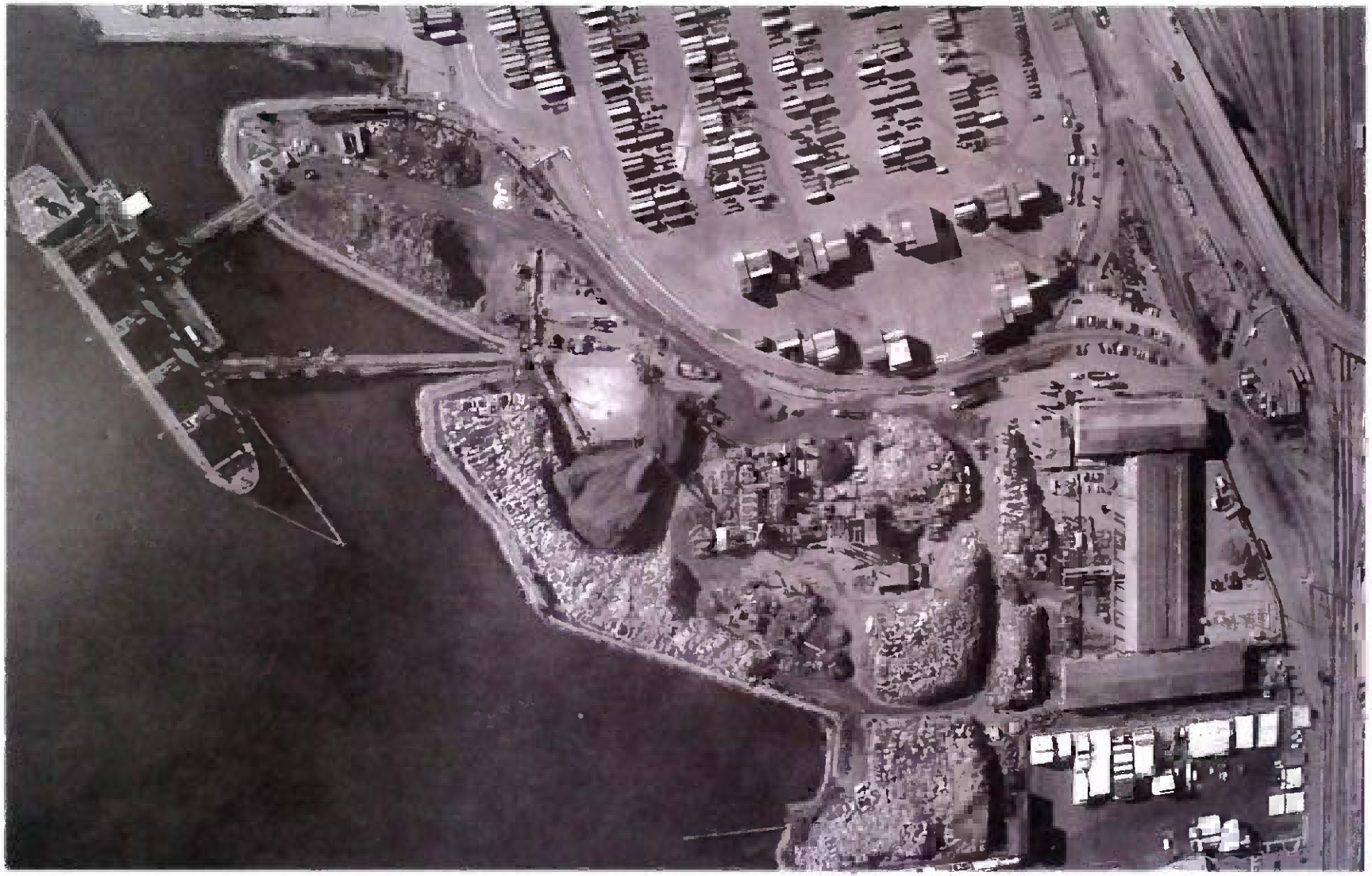
Facility Operational Summary

Schnitzer

- Metal Recycling = Heavy Industry
- Physical requirements
  - ✓ Outdoor operations are a necessity
  - ✓ Extreme wear and tear on pavement
  - ✓ Dock access required to bring product to market
- Source control efforts for incoming material
  - ✓ Scrap Acceptance Policy
  - ✓ Contractual agreements with suppliers
  - ✓ Specific certifications for Hg, PCB, Ozone Depleting Substances
  - ✓ Radiation detection
  - ✓ Incoming scrap inspections
  - ✓ Source control training

Facility Layout

Schnitzer



Environmental Compliance Policy

Schnitzer

Key Elements of Corporate Policy

- *Schnitzer embraces a culture of compliance as a core corporate value*
- *Environmental compliance is addressed in our Code of Conduct and routine communications*
- *All employees undergo Code of Conduct training upon hire, and annually thereafter*
- *Specific environmental training for employees whose job tasks include an environmental compliance component*
- *We seek to comply with regulatory requirements in all facets of our operations*
- *We prefer to partner with agencies to address concerns they may have*

Oakland Facility: Historical Approach to Compliance

Schnitzer

➢ Zero Discharge / On-site Water Recycling

- *Cornerstone of facility stormwater compliance is 100% on-site reuse and recycling*
- *Zero discharge accomplished through grading, storage, recycling and evaporation/infiltration*
- *No stormwater outfalls or other discharge points*
- *On-site operations consume approximately one million gallons per month*
- *Recycling rate and 1.1 million gallon storage tank provide for effective water management*
- *Temporary surface containment/storage occasionally needed following heavy precipitation*

Oakland Facility: Historical Approach to Compliance

Schnitzer

➢ Groundwater Monitoring – Beneficial Use Protection

- *Requirement of SCR 88-23*
- *Monitoring program in effect since 1992 – 4 wells*
- *Wells are monitored for typical metal recycling COCs:*
  - ✓ *PCBs, Cd, Cr, Cu, Pb, Hg, Ni, Zn*
- *No COCs detected in concentrations exceeding MCLs, or that would contribute to WQO exceedences, during 20-year monitoring program (all mostly ND)*
- *Substantial RWQCB precedent that beneficial uses of groundwater at bay margin are related to potential effects on surface water*

Oakland Facility: Historical Approach to Compliance

Schnitzer

➢ Periodic Dredging / Sediment Quality

- *Periodic maintenance dredging conducted to maintain proper draft in the shipping channel and facility berth*
- *Sediment sampling & analysis associated with dredge spoils disposal pre-qualification has determined:*
  - ✓ *Sediments adjacent to the facility are of higher quality than ambient sediment conditions throughout the S.F. Bay (SWRCB Part I SQO constituents)*
  - ✓ *Full SWRCB Part I SQO evaluation using most recent (2010) sediment data calculates CSI of 1.91 – Low Exposure Scenario*
  - ✓ *Facility sediments, elutriate and sediment pore water have passed all necessary toxicity tests for marine organisms*
  - ✓ *Dredged facility sediments have consistently qualified for beneficial reuse within the S.F. Bay (Unconfined Aquatic Disposal)*

Oakland Facility: Historical Approach to Compliance

Schnitzer

➢ Implementation of Best Management Practices

- *Despite zero-discharge, facility has a long history of voluntary compliance with SWPPP and proactive implementation of BMPs*
- *BMP enhancement implemented in response to RWQCB concerns identified during 2011/2012 inspections and follow-up internal facility review*
- *NOV/Order not necessary to bring about improvements*
- *Recent/On-going BMP Improvements Include:*

✓ *Update to SQMP/SWPPP*
✓ *Dock and Pier Cleaning*
✓ *Torch Cutting Station Improvements*
✓ *Additional Maintenance Cover*
✓ *Retail NF Area Drain Installation*
✓ *Track Out Control (Facility Exit)*
✓ *Concrete Dock Improvements*
✓ *Conveyor Pier Improvements*
✓ *Additional Boundary Containment*
✓ *Control of Light Fibrous Material*

Site Improvements Review

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Dock and Pier Cleaning (Accumulated Material)

Dock and pier cleaning underway since September 6, 2012, expected completion September 14, 2012 – all wash water contained

Site Improvements Review

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Facility Exit – Embarcadero West (Track Out Concern)

Installation of commercial wheel washing system underway
Expected completion – October 1, 2012

Site Improvements Review

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Concrete Pier Crane Dock (Track Out Concern)

Planned location for installation of additional wheel wash at entrance to concrete dock
Expected completion – December 1, 2012

Site Improvements Review

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Concrete Pier Crane Dock (Stormwater Quality Concerns)

Ertec perimeter stormwater filtration barriers to be installed at margins of dock
Expected completion – October 31, 2012

Site Improvements Review

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Wooden Conveyor Pier (Discharge Concern)

Planned installation of stainless steel tray & water collection system
Expected completion – January 2013

Site Improvements Review

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Western Site Boundary (Containment Concerns)

Extension of containment wall completed August 24, 2012

Site Improvements Review

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Retail Non-Ferrous Area (Containment Concerns)

Installation of strip drain at exit completed May 2012

Site Improvements Review

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Torch Cutting Station (Stormwater Exposure Concern)

Torch cutting station relocated to paved and contained area in June 2012

Site Improvements Review

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Maintenance Area (Exposed Repair Activity Concerns)

Additional tent structure has been purchased, fabrication underway.
Expected installation date – October 31, 2012

Site Improvements Review

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Light Fibrous Material (Non-Stormwater Discharge Concern)

- ***Existing BMPs***
  - ✓ *Operation of particulate emission control system on shredder*
  - ✓ *Regular vacuum sweeping of internal and external roadways*
  - ✓ *Utilization of water trucks to suppress dust and other light material*
  - ✓ *Use of turbine sprayers to suppress dust from scrap handling activities*
  - ✓ *Shrouding and misting of conveyor belts and transition points*
  - ✓ *Inspection and cleanup activities on neighboring properties*

- ***Future/Potential Enhancements***
  - ✓ *Continued cooperation with BAAQMD and DTSC rule making efforts in regards to forthcoming Emission Minimization Plan and SR Management Standards requirements*
  - ✓ *Installation of windscreen/debris barrier along eastern (downwind) property boundary (AFE submitted, in approval process)*
  - ✓ *Increased frequency of inspection and cleanup of neighboring properties if facility-sourced material found*

Main Components of Tentative CAO

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- **Discharge Concerns**
  - *Potential stormwater discharges from dock/pier and to off-site properties*
  - *Potential non-stormwater discharges / direct & indirect effects*
- **Soil and Groundwater Assessment Requirements**
  - *Previous SCR Order (88-23)*
  - *Additional data collection & potential corrective action work*
- **Stormwater and Process Water Management**
  - *Technical definitions vs. realistic evaluation*
  - *Operational plan for water management*
  - *Possible long term solutions (Facility Master Plan)*

Possible Alternatives to CAO

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- ***Cleanup and Abatement Order***
  - *Seems disproportionate given lack of direct stormwater discharge, no escalating record of non-compliance, overall responsiveness & desire to cooperate*
- ***Site Cleanup Requirements***
  - *Previous enforcement action (Order 88-23)*
  - *Alternative mechanism to address soil/groundwater concerns (e.g., amendment of Order No. 88-23)*
- ***Section 13267 Letter***
  - *Frequent references in Tentative CAO*
  - *Appropriate to develop greater understanding of site conditions before directing specific remedial actions*
- ***Time Schedule Order***
  - *Provides formal mechanism for implementation of additional BMPs (completed, underway & planned)*
  - *Best approach for addressing both short and long term stormwater concerns*
- ***Combination***
  - *Separate handling of stormwater and soil/groundwater concerns may better focus efforts to address each*

Next Steps

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- *Completion of Public Comment Period*
  - *Comments due October 1, 2012*
- *RWQCB Evaluation of Comments*
  - *Approximate timeframe for review and response?*
- *NGO Interest in Matter*
  - *Baykeeper counsel documented conducting facility surveillance*
  - *Regulatory approach to site improvement process preferred*
- *Final RWQCB Action*
  - *Approximate timeframe?*
  - *Opportunity for Board review?*
- *Additional Considerations?*

Questions, Comments & Discussion