CONSULTING ENGINEERS, INC.
Civil Infrastructure Preservation

03-063

August 26, 2004

Adam Harvey, P.E.
URS Corporation
2520 Venture Oaks Way, Suite 250
Sacramento, CA 95833

SUBJECT: Coating Inspection Report for US Filter EPA Carbon Filter Vessels in San Bernardino, CA

Dear Adam,

V&A Consulting Engineers (V&A) has completed the inspection per the current scope of work for the US Filter vessels at San Bernardino, CA. The vessels are configured in two banks, with 12 vessels in each bank. The naming convention for the vessels will include Bank 1 as the west bank, and Bank 2 as the east bank. Vessel numbers for each bank will increase from A to L from south to north, respectively. Visual inspection was conducted on Vessels A to L in Bank 2. Dry film thickness and holiday inspection was conducted on all 20 vessels at the project site. A copy of the field inspector's notes has been included with this report. The following is a summary of the coating inspection reports for the vessels.

The overall visual inspection of the vessels in Bank 2 showed similar areas of concern as from Bank 1 (conducted from a previous inspection, 7/7/04 through 7/9/04). Signs of rust were observed at random locations throughout the inspection, indicating a lack of coating at these locations. The most probable source of these defects could be from a lack of film thickness at these locations, damage during transportation, or damage during erection. All piping associated with the vessels showed various signs of erection damage. Coating on the flanges was damaged during the hardware installation. Weld slag is visible on the legs of the vessels where the welds have not been ground down. Rust was visible at many of these locations. Several gaps were evident at the top plate welded to the leg of the vessel. These locations are very susceptible to corrosion and rust staining is already evident.

Contamination was observed at random locations on many of the vessels. Some of the contamination observed depicted abrasive particles that were improperly removed from the vessel and embedded on

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CC:
PM_____ PA/SCM_____ File X

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the surface prior to coating. The abrasive can be seen as little bumps on the surface of the coating. This type of contamination has historically resulted in early failure of the coating at these locations.

The inspector observed the touch-up repairs and inspected the dry film thickness and tested for holidays on the interior surfaces of all 24 vessels (1A through 1L, and 2A through 2L). Three coats of Plasite 4110 were applied at the touch-up locations. It should be noted that the temperature inside the vessels reached 130 degrees Fahrenheit at various times during the application period. The manufacturer recommends that the coating should be allowed to air dry at 70 degrees Fahrenheit prior to exposure to elevated temperatures. An average of 2.3 holidays was observed in Bank 1. An average of 1 holiday was observed in Bank 2. Please refer to the inspector's field notes for further detail of the individual vessel inspections.

It is strongly recommended that an inspector be present on-site during all repairs of the exterior coating, as it will be very difficult to confirm if the repairs were done correctly. In addition, it is recommended that the repairs be inspected for holidays and dry film thickness once the repair process is complete.

Please call if you have any questions or comments.

Sincerely,
V&A CONSULTING ENGINEERS
Civil Infrastructure Preservation

Glenn Willson, P.E.
Engineering Services Manager

Enclosures: Photographs, Daily Reports, and Visual Inspection Reports

PAGE 1

5000
4 58203

ch1 2 (K)
2 34/07/20
be Model: FN
be S/N: 34127

Reading	Time
33.3mils	10:54:58
39.9mils	10:55:05
38.1mils	10:55:10
45.1mils	10:55:31
35.1mils	10:55:36
28.5mils	11:21:57

6
28.5mils
45.1mils
36.67mils
5.73mils

ch2 2 (K)
2 4/07/20
be Model: FN
be S/N: 34127

Reading	Time
.9mils	11:22:12
3.1mils	11:22:15
36.8mils	11:22:18
48.8mils	11:22:26
30.6mils	11:22:29
43.7mils	11:22:37
37.4mils	11:22:43
59.5mils	11:22:48
35.8mils	11:22:53
35.8mils	11:22:56
29.9mils	11:23:04
31.9mils	11:23:07
37.5mils	11:23:11
31.3mils	11:23:14
42.3mils	11:23:20

15
29.9mils
59.5mils
37.89mils
7.95mils

ch3 2 (H)
2 /07/20
e Model: FN
e S/N: 34127

Reading	Time
46.3mils	11:36:29
39.3mils	11:36:32
36.6mils	11:36:44
56.6mils	11:36:52
50.1mils	11:36:56
43.9mils	11:37:10
36.0mils	11:37:13
40.0mils	11:37:18
44.7mils	11:55:39
3mils	11:55:42

10
30.3mils
56.6mils
42.38mils
7.60mils

Batch4 2 (G)
Cal 2
2004/07/20
Probe Model: FN
Probe S/N: 34127

#	Reading	Time
1	58.1mils	11:56:37
2	43.4mils	11:56:40
3	36.1mils	11:56:46
4	43.7mils	11:56:49
5	49.3mils	11:56:56
6	40.8mils	11:57:04

#	6
↓	36.1mils
↑	58.1mils
x̄	45.23mils
σ	7.63mils

Batch5 2 (D)
Cal 2
2004/07/20
Probe Model: FN
Probe S/N: 34127

#	Reading	Time

#	0
↓	0.00mils
↑	0.00mils
x̄	0.00mils
σ	0.00mils

Batch6 2 (C)
Cal 2
2004/07/20
Probe Model: FN
Probe S/N: 34127

#	Reading	Time
1	37.7mils	12:21:39
2	36.7mils	12:21:42
3	42.4mils	12:21:45
4	39.1mils	12:21:47
5	44.7mils	12:21:54
6	46.9mils	12:21:57
7	58.4mils	12:22:09
8	33.9mils	12:22:34
9	33.1mils	12:22:42
10	46.6mils	12:22:56

#	10
↓	33.1mils
↑	58.4mils
x̄	41.95mils
σ	7.61mils

Batch7 2 (B)
Cal 2
2004/07/20
Probe Model: FN
Probe S/N: 34127

#	Reading	Time
1	46.1mils	12:30:17
2	38.3mils	12:30:22
3	43.0mils	12:30:25
4	31.6mils	12:30:33
5	38.8mils	12:30:36
6	41.8mils	12:30:38
7	33.4mils	12:30:41
8	39.1mils	12:30:49
9	37.2mils	12:30:53
10	46.1mils	12:30:57
11	41.2mils	12:31:1

#	11
↓	31.6mils
↑	46.1mils
x̄	39.69mils
σ	4.63mils

Batch8 2 (A)
Cal 2
2004/07/20
Probe Model: FN
Probe S/N: 34127

#	Reading	Time
1	30.8mils	13:07:50
2	47.7mils	13:07:55
3	61.3mils	13:08:00
4	60.8mils	13:08:03
5	35.4mils	13:08:17
6	33.8mils	13:08:25
7	31.6mils	13:08:28
8	40.8mils	13:08:31
9	32.0mils	13:08:41
10	41.8mils	13:08:44
11	34.8mils	13:08:47
12	42.4mils	13:08:50

#	12
↓	30.8mils
↑	61.3mils
x̄	41.10mils
σ	10.65mils

Batch9 1-A
Cal 2
2004/07/20
Probe Model: FN
Probe S/N: 34127

#	Reading	Time
1	38.9mils	13:21:39
2	33.7mils	13:21:42
3	37.1mils	13:21:45
4	38.3mils	13:21:48
5	27.5mils	13:21:59
6	31.0mils	13:22:02
7	37.5mils	13:22:06
8	34.4mils	13:22:09
9	32.7mils	13:22:12
10	37.9mils	13:22:20
11	37.8mils	13:22:24
12	57.4mils	13:22:30
13	40.2mils	13:22:34
14	35.3mils	06:58:17

#	14
↓	27.5mils
↑	57.4mils
x̄	37.12mils
σ	6.79mils

Batch10 1-B
Cal 2
2004/07/21
Probe Model: FN
Probe S/N: 34127

#	Reading	Time
1	34.5mils	06:58:35
2	34.1mils	06:58:39
3	47.8mils	06:58:45
4	25.9mils	06:59:05
5	27.4mils	06:59:10
6	32.4mils	06:59:32
7	29.9mils	06:59:36
8	38.7mils	06:59:40
9	35.8mils	06:59:51
10	54.7mils	07:00:06
11	33.3mils	07:00:18

#	11
↓	25.9mils
↑	54.7mils
x̄	35.86mils
σ	8.58mils

Batch11 1-C
Cal 2
2004/07/21
Probe Model: FN
Probe S/N: 34127

#	Reading	Time
1	49.6mils	07:17:06
2	50.0mils	07:17:18
3	38.9mils	07:17:22
4	43.0mils	07:17:30
5	41.0mils	07:17:43

#	5
↓	38.9mils
↑	50.0mils
x̄	44.50mils
σ	5.05mils

Batch12 1-D
Cal 2
2004/07/21
Probe Model: FN
Probe S/N: 34127

#	Reading	Time
1	51.7mils	07:17:58
2	39.8mils	07:18:03
3	48.3mils	07:18:12
4	51.2mils	07:18:20
5	40.4mils	07:18:24
6	49.9mils	07:18:28
7	38.3mils	07:18:35

#	7
↓	38.3mils
↑	51.7mils
x̄	45.66mils
σ	5.89mils

Batch13 1-E
Cal 2
2004/07/21
Probe Model: FN
Probe S/N: 34127

#	Reading	Time
1	38.9mils	07:29:47
2	53.6mils	07:29:52
3	41.5mils	07:29:56
4	44.5mils	07:30:03
5	30.9mils	07:30:09
6	38.3mils	07:30:12
7	44.9mils	07:30:22
8	45.2mils	07:30:28
9	29.9mils	07:30:34
10	62.9mils	07:30:57
11	55.2mils	07:31:05
12	53.3mils	07:46:13

#	12
↓	29.9mils
↑	62.9mils
x̄	44.93mils
σ	9.95mils

PAGE 2

Batch14
Cal 2
2004/07/21
Probe Model: FN
Probe S/N: 34127
1-F

#	Reading	Time
1	41.6mils	07:47:00
2	32.3mils	07:47:03
3	54.9mils	07:47:06
4	51.7mils	07:47:09
5	41.1mils	07:47:13
6	37.1mils	07:47:28
7	43.4mils	07:47:32
8	47.8mils	07:47:42
9	51.4mils	07:47:45
10	41.1mils	07:47:49

#	10
↓	32.3mils
↑	54.9mils
x̄	44.24mils
σ	7.10mils

Batch15
Cal 2
2004/07/21
Probe Model: FN
Probe S/N: 34127
1-G

#	Reading	Time
1	59.2mils	08:06:52
2	49.0mils	08:06:56
3	44.9mils	08:06:59
4	58.7mils	08:07:08
5	49.5mils	08:07:18
6	50.1mils	08:07:21
7	31.4mils	08:07:26
8	45.3mils	08:07:33
9	57.8mils	08:07:55
10	43.2mils	08:08:16

#	10
↓	31.4mils
↑	59.2mils
x̄	48.91mils
σ	8.50mils

Batch16
Cal 2
2004/07/21
Probe Model: FN
Probe S/N: 34127
1-H

#	Reading	Time
1	59.4mils	08:28:24
2	39.8mils	08:28:32
3	38.5mils	08:28:36
4	51.1mils	08:28:45
5	52.0mils	08:28:53
6	43.2mils	08:28:58
7	29.0mils	08:29:04
8	39.8mils	08:29:13
9	57.1mils	08:29:17
10	35.0mils	08:29:21
11	30.2mils	08:29:25

#	11
↓	29.0mils
↑	59.4mils
x̄	43.19mils
σ	10.39mils

Batch17
Cal 2
2004/07/21
Probe Model: FN
Probe S/N: 34127
1-I

#	Reading	Time
1	45.5mils	08:42:35
2	34.5mils	08:42:41
3	39.3mils	08:42:46
4	42.5mils	08:42:54
5	37.9mils	08:42:57
6	46.7mils	08:43:00
7	49.6mils	08:43:05
8	38.0mils	08:43:12
9	38.8mils	08:43:19
10	53.0mils	08:43:28

#	10
↓	34.5mils
↑	53.0mils
x̄	42.58mils
σ	5.93mils

Batch18
Cal 2
2004/07/21
Probe Model: FN
Probe S/N: 34127
1-J

#	Reading	Time
1	44.7mils	08:56:45
2	58.3mils	08:56:49
3	37.4mils	08:56:54
4	65.4mils	08:56:58
5	48.2mils	08:57:05
6	42.7mils	08:57:11
7	38.4mils	08:57:17
8	41.1mils	08:57:27
9	44.1mils	08:57:31
10	45.0mils	08:57:39

#	10
↓	37.4mils
↑	65.4mils
x̄	46.53mils
σ	8.84mils

Batch19
Cal 2
2004/07/21
Probe Model: FN
Probe S/N: 34127
1-K

#	Reading	Time
1	35.8mils	09:05:26
2	47.6mils	09:05:29
3	39.6mils	09:05:32
4	37.3mils	09:05:35
5	47.3mils	09:05:42
6	35.4mils	09:05:45
7	37.7mils	09:05:51
8	42.8mils	09:05:56
9	47.6mils	09:06:00
10	35.8mils	09:06:11

#	10
↓	35.4mils
↑	47.6mils
x̄	40.69mils
σ	5.18mils

Batch20
Cal 2
2004/07/21
Probe Model: FN
Probe S/N: 34127
1-L

#	Reading	Time
1	45.9mils	09:13:07
2	53.2mils	09:13:09
3	42.0mils	09:13:16
4	43.1mils	09:13:22
5	40.8mils	09:13:25
6	29.8mils	09:13:32
7	32.4mils	09:13:34
8	34.3mils	09:13:37
9	47.0mils	09:13:45
10	47.4mils	09:13:50

#	10
↓	29.8mils
↑	53.2mils
x̄	41.59mils
σ	7.42mils

Daily Quality Assurance Report

Report # 1-A			
Contractor Start Time: 1110	Lunch Break:	D/H Starting Hours	
Contractor Depart Time: 1530	Total of Crew: 2	D/H Ending Hours	
Inspector Hours: 0730 – 1540		Company:	MODERN FABRICATION
Project Name: SAN BERNARDINO WATER TREATMENT		Foreman:	JEFF
Project Location 1918 W. 19TH ST SAN BERNARDINO CA		Inspector:	NEELINGS

Time	DB	WB	R/H	D/P	Substrate	High	Low	Location
0800	76.7°	65.7°	55.7%	59.6°		86°	72°	OUTSIDE 2-E
1330	112° IN	THE SUN						

Outside Climatic Conditions:	Sunshine	Cloudy	Fog	Rain	Snow	Wind/MPH
SUNNY @ 0800						

Anchor Profile:	#1	#2	#3
		NO BLASTING	
Blast Hose P.S.I.:	#1 —	#2 —	#3 —
Air Cleanliness:	(AM) —	(PM) —	
Type of Prep:	Abrasive Blast	Water Blast	Vacuum Blast / SP# —
	Abrasive: —		Size: —

Product/Number	PLASITE	4100			
Base Batch #		4F879AB			
Activator Batch #		4A5714B			
Other Component:		3L436AB	NO COATING		
Thinner Batch # & %		Ø			
Dwell Time		Ø			
Paint Temp:		AMBIENT			
Amount Used:		1/5 GAL			

Mixing Procedure: Box ✓ — Drill — Mixing Time: —

WFT / DFT Mil Thickness	Area Recorded	Surface Type
SEE PRINT OUT	2A-B-C-D-G-H-K-L	COATED STEEL
TOUCH-UP HOLIDAYS 3 COATS		

Inspectors Signature Tom Neelings Date: 7/20/04 TUES.

TIME START - STOP	HOURS	REPORT OF OPERATIONS (CONTINUED)	MEMORY JOGGERS
7/19/04		TRAVEL DAY 258 MI FROM HANFORD —	SPECIFICATION REVIEW
7-20-04		ARRIVE SITE 0730 GATE LOCKED	AMBIENT CONDITIONS
		NICK TOLD ME IT OPENS @ 0730 BY —	CLEAN AIR SUPPLY
		EL-CO. —	CLEAN ABRASIVE
0745		EL-CO ARRIVES - MODERN SUPPOSED TO	SURFACE CONTAMINATION
		BE HERE @ NOON. AT ED'S DIRECTION I	NOZZLE SIZE
		AM TO WRITE REPORT ON VESSELS	SURFACE PROFILE
		EXTERIORS 2-A THRU 2L.	GROUNDED BLAST EQUIPMT
0750		ASK WATER TRUCK DRIVER NOT TO WET	
		DOWN AREA BETWEEN VESSELS. THIS	PROPER PAINT STORAGE
		WILL KEEP MUD OUTA VESSELS —	BATCH # RECORDED
		BEGIN REPORT.	PROPER MIXING
1110		MODERN ARRIVES.	PROPER THINNING
1120		BEGIN INSPECT —	AGITATORS
		VESSEL 2-L 4 HOLIDAYS. DFTS GOOD @ REPAIR	SWEAT IN TIME
		" 2-K 1 " " " " "	WFT MEASUREMENTS
		" 2-J SEALED @ SOLD	DFT MEASUREMENTS
		" 2-I " AND SOLD	STRIPE COAT
		VESSEL 2-H NO HOLIDAYS - DFTS OK @ REPAIR	SPRAY TIP SIZE
		VESSEL 2-G 1 HOLIDAY " " "	POT PRESSURE
		VESSEL 2-F SOLD & SEALED	POT SIZE
		VESSEL 2-E " "	AIRLESS PUMP PRESSURE
		VESSEL 2-D NO HOLIDAYS DFTS @ REPAIR OK	GROUNDED SPRAY EQUIPMT
		VESSEL 2-C " " " " " "	
		VESSEL 2-B NO HOLIDAYS DFTS @ REPAIR OK	RAISED FLANGE FACES
		VESSEL 2-A " " " " "	WELD DEFECTS
		EXCEPT 2 SANDED SPOTS NEED	PIPE UNDERSIDES
		COATING —	SPARK TESTING
1515		VERY HOT VESSELS IN THE WEST LINE	REJECTS DOCUMENTED
		WILL BE INSPECTED TOMORROW STARTING	CALIBRATION
		@ 0700 - THEN THE AREAS IN THE EAST	HOUSE KEEPING
		LINE THAT WERE REPAIRED TODAY WILL	DIAGRAMS - DRAWINGS
		BE RE-INSPECTED —	WASTE CONTAINMENT
		OBSERVATION REPORTS ON EXTERIORS	WASTE DISPOSAL
		COMPLETED THRU 2-G	
1540		LEAVE SITE —	

Daily Quality Assurance Report

Report # 2-A

Contractor Start Time: 0700	Lunch Break:	D/H Starting Hours	
Contractor Depart Time:	Total of Crew:	D/H Ending Hours	
Inspector Hours:	0700 - 1530	Company:	MODERN FABRICATION
Project Name:	SAN BERNARDINO WATER TREATMENT FACILITY	Foreman:	JEFF
Project Location		Inspector:	NEELINGS

Time	DB	WB	R/H	D/P	Substrate	High	Low	Location
0645	75	63.6°	57.8%	57.2°	STEEL	70	69	OUTSIDE -
1400	105	69.1°	14.5%	47		114	108	"

Outside Climatic Conditions:	Sunshine	Cloudy	Fog	Rain	Snow	Wind/MPH

Anchor Profile:	#1	#2	#3
	- NO BLASTING -		
Blast Hose P.S.I.:	#1 —	#2 —	#3 —
Air Cleanliness:	(AM) —	(PM) —	
Type of Prep:	Abrasive Blast	Water Blast	Vacuum Blast	SP# —
	Abrasive: —		Size: —	

Product/Number PLASITE	4100			
Base Batch #	4F 8740B			
Activator Batch #	4A 5714B			
Other Component:	3L 434AB			
Thinner Batch # & %	Ø			
Dwell Time	Ø			
Paint Temp:	AMBIENT			
Amount Used:	1/5 GAL			

Mixing Procedure: Box ELEC Drill Mixing Time: 20 MIN HAND 5 MIN C-

WFT / DFT Mil Thickness	Area Recorded	Surface Type
TOUCH-UP TO HOLIDAYS 2-A THRU 1-C		
	3 COATS	

Inspectors Signature Tom Neelings Date: 7/21/04 WED

TIME START - STOP	HOURS	REPORT OF OPERATIONS (CONTINUED)	MEMORY JOGGERS
0640		ARRIVE SITE WAIT FOR MODERN CREW	SPECIFICATION REVIEW
0730		EL-CO UNLOCKS GATE-	AMBIENT CONDITIONS
0735		MODERN ARRIVES	CLEAN AIR SUPPLY
		VESSEL- 1-A NO HOLIDAYS DFTS OK W/ REPAIR	CLEAN ABRASIVE
		VESSEL 1-B 1 HOLIDAY " " " "	SURFACE CONTAMINATION
		VESSEL 1-C NO HOLIDAYS DFTS @ LOW PLACES & REPAIR OK	NOZZLE SIZE
		VESSEL 1-D 3 HOLIDAYS " " " " "	SURFACE PROFILE
		VESSEL 1-E 3 HOLIDAYS " " " " "	GROUNDED BLAST EQUIPMT
		VESSEL 1-F 3 HOLIDAYS " " " " "	
		VESSEL 1-G 5 " " " " " " "	PROPER PAINT STORAGE
		VESSEL 1-H 7 HOLIDAYS " " " " "	BATCH # RECORDED
		VESSEL 1-I 0 " " " " " "	PROPER MIXING
		VESSEL 1-J 1 HOLIDAY	PROPER THINNING
		VESSEL 1-K 2 HOLIDAYS	AGITATORS
		VESSEL 1-L 3 HOLIDAYS	SWEAT IN TIME
1130		HOLIDAY TEST 1-A THRU 1-L COMPLETE	WFT MEASUREMENTS
		AND CHECK YESTERDAYS REPAIR-	DFT MEASUREMENTS
1200		CREW BEGINS TOUCH-UP	STRIPE COAT
1300		1ST COAT COMPLETE - BEGIN SETTING BOLTS	SPRAY TIP SIZE
		IN MANHOLE COVERS EAST SIDE-	POT PRESSURE
1400		BEGIN SECOND COAT TOUCH-UP	POT SIZE
1430		2ND COAT COMPLETE-	AIRLESS PUMP PRESSURE
1500		BEGIN 3RD COAT TOUCH-UP - NEEDS	GROUNDED SPRAY EQUIPMT
		TO BE NOTED TEMP INSIDE TANKS IS	
		130° VERY LOW HUMIDITY - DRYING OF	RAISED FLANGE FACES
		COATING IS VERY RAPID.	WELD DEFECTS
			PIPE UNDERSIDES
		NOTE: THE HOLIDAYS I DETECTED WERE	SPARK TESTING
		ON WELDS & AT WELD SPATTER, NEAR WELDS	REJECTS DOCUMENTED
		THIS WOULD SEEM TO INDICATE THAT A	CALIBRATION
		BRUSHED STRIPE COAT MAY NOT HAVE	HOUSE KEEPING
		BEEN UTILIZED-	DIAGRAMS - DRAWINGS
		ON THE EXTERIORS I DID NOT OBSERVE	WASTE CONTAINMENT
		ANY BRUSH MARKS ON WELDS OR SHARP	WASTE DISPOSAL
		EDGES.	
		Tom Heelamp	
		7/21/04	