# AIR MONITORING SUMMARY REPORT Time-Critical Removal Action for the Experimental Ship Shielding Range, Parcel E-2 Hunters Point Naval Shipyard San Francisco, California

Contract Number N62473-10-D-0807 Contract Task Order 0002

#### Prepared for:





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Table	e of Contents
1.0 2.0 3.0 4.0 5.0 6.0	Introduction  Monitoring Site Locations  Analytical Methods  Analysis of Air Monitoring Data  Air Monitoring Results  References
List	of Figures
Figure	1 Air Monitoring Locations
List	of Tables
Table <sup>2</sup>	1 Air Monitoring Threshold Criteria
List	of Attachments
Attachi	ment 1 Air Monitoring Results

### 1.0 Introduction

Shaw Environmental & Infrastructure, Inc. (herein after referred to as Shaw) is providing environmental remediation services to the U.S. Navy under the Radiological Environmental Multiple Award Contract, Contract Number N62473-10-D-0807, Contract Task Order (CTO) 0002. Shaw is performing air monitoring at Hunters Point Naval Shipyard (HNPS) in accordance with the Final Dust Mitigation Plan (DMP), included as Appendix D to the *Final Work Plan, Time-Critical Removal Action for the Experimental Ship Shielding Range, Parcel E-2, HPNS, San Francisco, California* (Shaw 2012). The DMP describes procedures that minimize dust during work activities, and requires air monitoring to ensure these procedures are effective. The DMP helps prevent exposure of residents and construction crews to potential airborne chemicals of concern, and dust from the work area.

This document summarizes the air monitoring data collected and analyzed to date for this project. This summary report describes the following:

- Where and how air monitoring samples are collected
- What test methods are used to analyze air monitoring samples
- How air monitoring data are evaluated

This summary report also presents the air monitoring test results and compares the results with the established threshold criteria included in the DMP.

# 2.0 Monitoring Site Locations

Air monitoring stations were mobilized to collect air samples upwind and downwind of work areas for the duration of the project. The predominant wind direction at HPNS is from the west. Locations of air monitoring stations and wind direction are shown on Figure 1. Air monitoring is being performed to help ensure effective dust control. The locations of the air monitoring stations were determined based on the prevailing wind direction and can be modified as needed. A windsock is used to show wind direction and weather forecasts are checked daily at www.noaa.gov. Monitoring stations remain stationary while sampling is being conducted. Each monitoring station includes three separate monitoring systems for:

- 1. Total suspended particulates (TSP) and for lead and manganese
- 2. Particulate matter larger than 10 microns in size (PM10)
- 3. Asbestos

# 3.0 Analytical Methods

**TSP**, **Lead**, **and Manganese**. TSP samples are collected with a high-volume (39 to 60 cubic feet per minute) air sampler in accordance with U.S. Environmental Protection Agency's (EPA's) reference sampling method for TSP, described in Title 40 Code of Federal Regulations (CFR), Part 50, Appendix B. Each sample is collected on a filter over an approximately 24-hour period; the filter is then weighed to determine the amount of TSP collected. Once the amount of TSP has been determined, the sample is analyzed for lead and manganese. Lead and manganese are analyzed using a modified EPA Method 12 (EPA 2007). The equipment specifications and sampling procedures used, including the sampling apparatus, filters, equipment accuracy, equipment calibration, and quality assurance checks, all conform to those specified in the analytical method.

**PM10.** Air samples are collected and analyzed for PM10 in accordance with EPA's reference sampling method for PM10, described in 40 CFR Part 50, Appendix J. Each sample is collected on a filter over an approximately 24-hour period; the filter is then weighed to evaluate the concentrations of PM10 in ambient air.

**Asbestos.** Air samples are collected and analyzed for asbestos in accordance with the National Institute for Occupational Safety and Health (NIOSH) Method 7400, in the *NIOSH Manual of Analytical Methods* (NIOSH 1994). Method 7400 requires that samples be collected on three-piece cellulose ester filters, which are fitted with conductive cowlings, at a sampling rate of between 0.5 liter per minute (L/min) and 16 L/min.

# 4.0 Analysis of Air Monitoring Data

Analytical results from air monitoring samples are compared with the threshold criteria listed in Table 1. If site activities cause exceedances of the threshold criteria, additional dust control measures will be considered and implemented.

Table 1 – Air Monitoring Threshold Criteria

Test Parameters	Threshold Criteria	Basis	
TSP	0.5 mg/m <sup>3</sup>	Calculated action level for general dust and particulates.	
Lead	50 μg/m³	Cal/OSHA PEL	
Manganese	200 µg/m³	Cal/OSHA PEL	
PM10	5,000 μg/m <sup>3</sup>	Cal/OSHA PEL <sup>a</sup>	
Asbestos	0.1 fiber/cm <sup>3</sup>	Cal/OSHA PEL	

<sup>a</sup> – Cal/OSHA PEL for particulates not otherwise regulated (respiratory) used for PM10.

μg/m³ – micrograms per cubic meter

Cal/OSHA - California Occupational Safety and Health Administration

EPA – U.S. Environmental Protection Agency

fiber/cm3 – fibers per cubic centimeter

mg/m³ – milligrams per cubic meter

PEL - permissible exposure limit

PM10 – particulate matter smaller than 10 microns in diameter

TSP – total suspended particulates

# 5.0 Air Monitoring Results

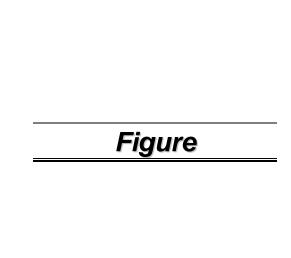
Weather information (including ambient pressure and temperature data) and air monitoring results are presented in the tables included as Attachment 1.

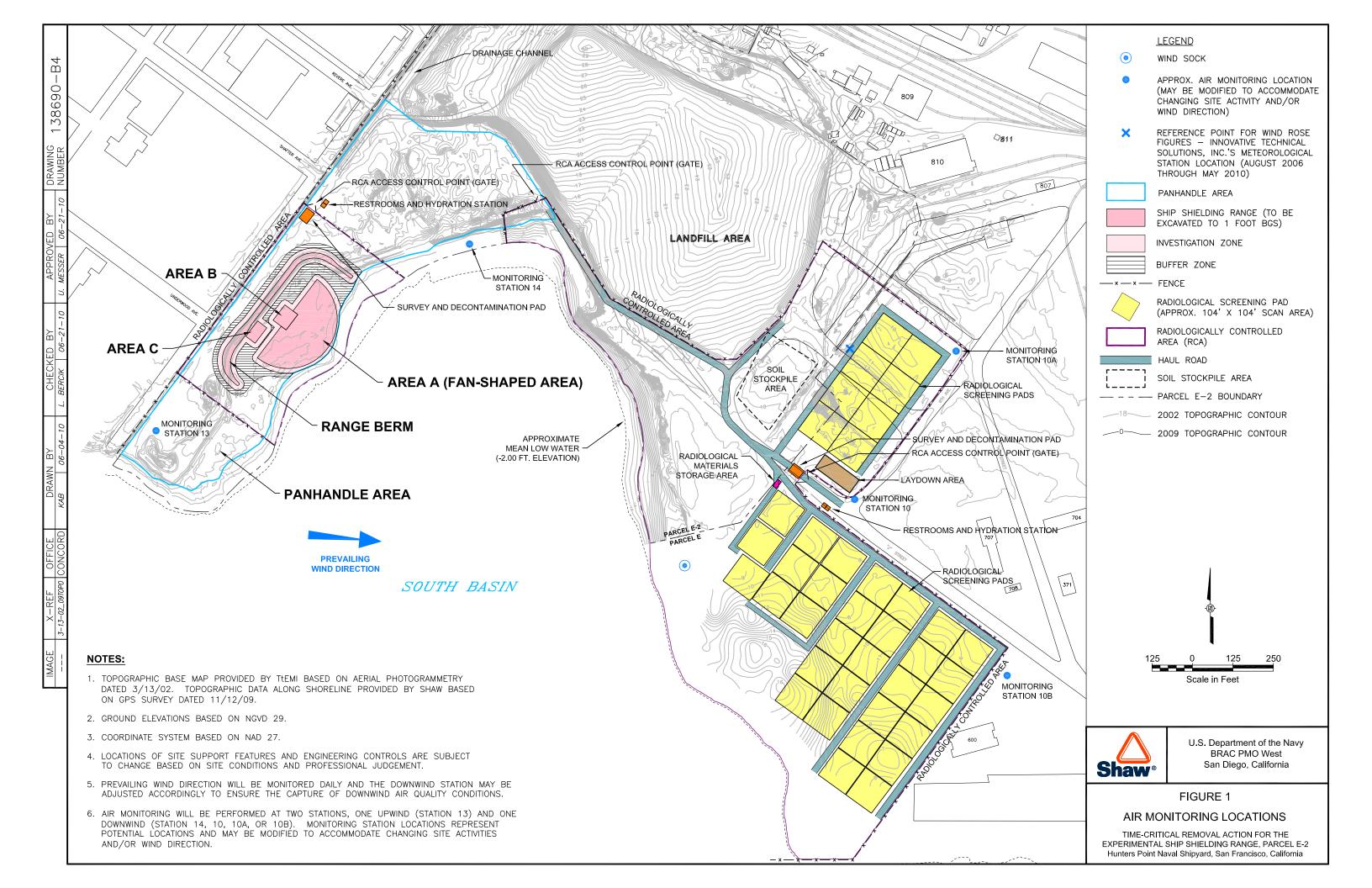
## 6.0 References

EPA. 2007. "Method 12 – Determination of Inorganic Lead Emissions from Stationary Sources. Available Online at: <a href="http://www.epa.gov/ttn/emc/methods/method12.html">http://www.epa.gov/ttn/emc/methods/method12.html</a>>.

NIOSH (National Institute for Occupational Safety and Health). 1994. NIOSH Manual of Analytical Methods, Method 7400. August.

Shaw (Shaw Environmental & Infrastructure, Inc.). 2012. Final Work Plan, Time-Critical Removal Action for the Experimental Ship Shielding Range, Parcel E-2, Hunters Point Naval Shipyard, San Francisco, California. July.





# Attachment 1 Air Monitoring Results

Table 1
Ambient Pressure and Temperature Monitoring Results

Sample Date	Ambient Pressure	Ambient Temperature
	(in Hg)	(°C)
25-Jun-12	30.09	18.2
26-Jun-12	30.04	18.2
27-Jun-12	29.93	20.4
28-Jun-12	30.07	17.6
29-Jun-12	30.12	17.7
2-Jul-12	29.91	16.9
3-Jul-12	29.91	21.2
9-Jul-12	36.06	14.4
10-Jul-12	29.93	20.0
11-Jul-12	29.89	18.3
12-Jul-12	29.86	19.2
13-Jul-12	29.95	12.8
16-Jul-12	29.92	15.6
17-Jul-12	29.99	16.9
18-Jul-12	30.02	17.3
19-Jul-12	30.04	19.4
20-Jul-12	30.08	20.0
23-Jul-12	29.93	19.3
24-Jul-12	29.96	18.7
25-Jul-12	30.00	17.4
26-Jul-12	30.00	15.6
27-Jul-12	30.04	17.0
3-Aug-12	29.91	15.8
6-Aug-12	30.13	18.1
7-Aug-12	30.07	17.1
8-Aug-12	30.00	21.2
9-Aug-12	29.94	19.9
4-Sep-12	30.03	16.7
5-Sep-12	29.99	16.9
24-Sep-12	29.97	18.7
25-Sep-12	29.93	17.0
26-Sep-12	29.91	15.3

°C - degrees Celsius

in Hg - inches of mercury

Ambient pressure and ambient temperature data were gathered from the wunderground weather website (www.wunderground.com). Data were collected from station KCASANFR58 at 1200.

Table 2
TSP and Metals Monitoring Results

Sample Date	Sample Location	Sampling Period (hours)	TSP (mg/m³)	TSP Exceedance? (Yes/No)	Lead (µg/m³)	Lead Exceedance? (Yes/No)	Manganese (µg/m³)	Manganese Exceedance <sup>2</sup> (Yes/No)
25-Jun-12	13	23.9	0.0240	No	<0.016	No	<0.016	No
25-Jun-12	14	24.1	0.0750	No	<0.018	No	0.0500	No
26-Jun-12	13	23.7	0.0490	No	< 0.016	No	0.0260	No
26-Jun-12	14	23.6	0.0610	No	< 0.019	No	0.0300	No
27-Jun-12	13	24.3	0.0390	No	< 0.015	No	0.0430	No
27-Jun-12	14	23.9	0.0820	No	<0.018	No	0.0160	No
28-Jun-12	13	24.1	0.0410	No	< 0.016	No	0.0840	No
28-Jun-12	14	23.5	0.1600	No	0.0270	No	0.0220	No
29-Jun-12	13	6.7	0.0170	No	< 0.057	No	<0.057	No
29-Jun-12	14	6.5	0.1200	No	<0.066	No	0.0750	No
2-Jul-12	13	24.4	0.0510	No	<0.015	No	0.0160	No
2-Jul-12	14	23.3	0.0940	No	< 0.019	No	0.0420	No
3-Jul-12	13	5.6	0.1300	No	< 0.065	No	0.0750	No
3-Jul-12	14	5.0	0.1900	No	<0.088	No	0.0990	No
9-Jul-12	13	23.1	0.0340	No	< 0.016	No	<0.016	No
9-Jul-12	14	22.7	0.0650	No	< 0.019	No	0.0350	No
10-Jul-12	13	24.2	0.0360	No	< 0.015	No	<0.015	No
10-Jul-12	14	23.8	0.0620	No	<0.018	No	0.0250	No
11-Jul-12	13	24.2	0.0160	No	< 0.016	No	<0.016	No
11-Jul-12	14	23.9	0.0760	No	<0.018	No	<0.018	No
12-Jul-12	13	24.3	0.0240	No	<0.016	No	<0.016	No
12-Jul-12	14	5.9	0.0970	No	0.0180	No	0.0500	No
13-Jul-12	13	6.2	0.0480	No	< 0.062	No	<0.062	No
13-Jul-12	14	5.9	0.2400	No	< 0.072	No	0.1500	No
16-Jul-12	13	18.3	0.0029	No	<0.0021	No	<0.0021	No
16-Jul-12	14	22.6	0.0830	No	<0.018	No	0.0500	No
17-Jul-12	13	24.2	0.0190	No	< 0.017	No	< 0.017	No
17-Jul-12	14	21.9	0.0410	No	< 0.019	No	0.0250	No
18-Jul-12	13	25.1	0.0130	No	<0.016	No	<0.016	No
18-Jul-12	14	Note 1	N/A	N/A	N/A	N/A	N/A	N/A
19-Jul-12	13	23.8	0.1000	No	0.9800	No	0.0850	No
19-Jul-12	14	23.3	0.0390	No	<0.018	No	0.0190	No
20-Jul-12	13	6.7	0.0330	No	< 0.055	No	< 0.055	No
20-Jul-12	14	6.1	0.0850	No	< 0.070	No	< 0.070	No
23-Jul-12	13	24.8	0.0650	No	<0.016	No	0.0290	No
23-Jul-12	14	26.8	0.0890	No	0.0190	No	0.0430	No
24-Jul-12	13	24.1	0.0590	No	< 0.017	No	0.0350	No
24-Jul-12	14	24.4	0.0570	No	< 0.017	No	0.0290	No
25-Jul-12	13	24.3	0.0260	No	< 0.017	No	<0.017	No

Table 2
TSP and Metals Monitoring Results

Sample Date	Sample Location	Sampling Period (hours)	TSP (mg/m³)	TSP Exceedance? (Yes/No)	Lead (µg/m³)	Lead Exceedance? (Yes/No)	Manganese (μg/m³)	Manganese Exceedance' (Yes/No)
25-Jul-12	14	23.4	0.0810	No	0.0200	No	0.0550	No
26-Jul-12	13	24.0	0.0190	No	<0.018	No	<0.018	No
26-Jul-12	14	24.1	0.0390	No	<0.018	No	0.0290	No
27-Jul-12	13	6.7	0.0300	No	<0.058	No	<0.058	No
27-Jul-12	14	6.3	0.1900	No	<0.067	No	0.1400	No
3-Aug-12	13	6.2	0.0120	No	<0.018	No	<0.018	No
3-Aug-12	14	6.6	0.1500	No	<0.064	No	0.1100	No
6-Aug-12	13	24.0	0.0230	No	<0.015	No	<0.015	No
6-Aug-12	14	23.8	0.0680	No	<0.018	No	0.0410	No
7-Aug-12	13	24.3	0.0340	No	<0.015	No	0.0150	No
7-Aug-12	14	23.8	0.0740	No	<0.018	No	0.0420	No
8-Aug-12	13	25.3	0.0450	No	<0.019	No	<0.019	No
8-Aug-12	14	25.0	0.0850	No	0.0340	No	0.0450	No
9-Aug-12	13	24.3	0.0350	No	<0.015	No	<0.015	No
9-Aug-12	14	23.9	0.0770	No	0.0370	No	0.0330	No
4-Sep-12	13	23.6	0.0190	No	<0.018	No	<0.018	No
4-Sep-12	14	24.0	0.0410	No	< 0.017	No	0.0240	No
5-Sep-12	13	Note 1	N/A	N/A	N/A	N/A	N/A	N/A
5-Sep-12	14	24.0	0.0580	No	<0.018	No	0.0320	No
24-Sep-12	13	24.1	0.0140	No	Note 2	N/A	Note 2	N/A
24-Sep-12	14	23.5	0.0520	No	Note 2	N/A	Note 2	N/A
25-Sep-12	13	23.4	0.0260	No	Note 2	N/A	Note 2	N/A
25-Sep-12	14	23.8	0.1100	No	Note 2	N/A	Note 2	N/A
26-Sep-12	13	23.9	0.0220	No	Note 2	N/A	Note 2	N/A
26-Sep-12	14	23.6	0.0700	No	Note 2	N/A	Note 2	N/A

Sample locations are shown on Figure 1.

The threshold criteria are as follows: TSP =  $0.5 \text{ mg/m}^3$ , lead =  $50 \mu\text{g/m}^3$ , manganese =  $200 \mu\text{g/m}^3$ .

The detection limit for TSP is 0.06 µg/m³ assuming a minimum sample volume of 1,600 m³. The detection limits for lead and manganese are 16 ng/m³ assuming minimum sample volumes of 1,600 m³.

μg/m<sup>3</sup> - micrograms per cubic meter

mg/m<sup>3</sup> - milligrams per cubic meter

N/A - not applicable

ng/m3 - nanograms per cubic meter

TSP - total suspended particulates

<sup>&</sup>lt;sup>1</sup> - Sample results are not available due to temporary equipment malfunction.

<sup>&</sup>lt;sup>2</sup> - Only TSP and PM10 samples were analyzed during placement of clean (verified by sampling) backfill material.

Table 3 PM10 Monitoring Results

Sample Date	Sample Location	Sampling Period (hours)	PM10 (μg/m³)	PM10 Exceedance? (Yes/No)
25-Jun-12	13	24.0	18.0	No
25-Jun-12	14	24.1	2.0	No
26-Jun-12	13	24.2	25.0	No
26-Jun-12	14	23.7	2.3	No
27-Jun-12	13	23.8	20.0	No
27-Jun-12	14	26.1	2.9	No
28-Jun-12	13	23.5	14.0	No
28-Jun-12	14	24.0	3.4	No
29-Jun-12	13	3.9	18.0	No
29-Jun-12	14	6.6	9.0	No
2-Jul-12	13	24.0	27.0	No
2-Jul-12	14	22.6	34.0	No
3-Jul-12	13	5.0	63.0	No
3-Jul-12	14	5.0	66	No
9-Jul-12	13	24.0	23	No
9-Jul-12	14	22.6	25	No
10-Jul-12	13	24.5	25	No
10-Jul-12	14	23.8	28	No
11-Jul-12	13	23.9	46	No
11-Jul-12	14	23.9	20	No
12-Jul-12	13	23.8	47	No
12-Jul-12	14	5.9	39	No
13-Jul-12	13	6.0	150	No
13-Jul-12	14	5.9	61	No
16-Jul-12	13	20.8	18	No
16-Jul-12	14	22.7	25	No
17-Jul-12	13	20.7	7	No
17-Jul-12	14	21.8	11	No
18-Jul-12	13	24.8	9	No
18-Jul-12	14	24.8	14	No
19-Jul-12	13	24.0	24	No
19-Jul-12	14	23.5	16	No
20-Jul-12	13	17.5	8	No
20-Jul-12	14	6.0	29	No
23-Jul-12	13	24.4	34	No
23-Jul-12	14	23.9	40	No

Table 3 PM10 Monitoring Results

Sample Date	Sample Location	Sampling Period (hours)	PM10 (μg/m³)	PM10 Exceedance? (Yes/No)
24-Jul-12	13	23.7	27	No
24-Jul-12	14	24.2	26	No
25-Jul-12	13	24.0	14	No
25-Jul-12	14	23.4	23	No
26-Jul-12	13	23.7	10	No
26-Jul-12	14	24.1	13	No
27-Jul-12	13	6.7	22	No
27-Jul-12	14	6.2	38	No
3-Aug-12	13	6.7	6	No
3-Aug-12	14	6.6	30	No
6-Aug-12	13	6.7	49	No
6-Aug-12	14	23.8	20	No
7-Aug-12	13	24.0	19	No
7-Aug-12	14	Note 1	N/A	N/A
8-Aug-12	13	24.9	2	No
8-Aug-12	14	Note 1	N/A	N/A
9-Aug-12	13	23.9	23	No
9-Aug-12	14	23.9	22	No
4-Sep-12	13	23.6	14	No
4-Sep-12	14	24.0	31	No
5-Sep-12	13	Note 1	N/A	N/A
5-Sep-12	14	24.0	44	No
24-Sep-12	13	24.1	15	No
24-Sep-12	14	23.4	15	No
25-Sep-12	13	23.4	34	No
25-Sep-12	14	23.7	28	No
26-Sep-12	13	23.9	22	No
26-Sep-12	14	23.6	43	No

Sample locations are shown on Figure 1.

The threshold value for PM10 is 5,000  $\mu g/m^3$ .

The detection limit for PM10 is  $0.06 \,\mu g/m^3$  assuming a minimum sample volume of 1,600 m<sup>3</sup>.

µg/m³ - micrograms per cubic meter

N/A - not applicable

PM10 - particulate matter smaller than 10 microns in diameter

<sup>&</sup>lt;sup>1</sup> - Sample results are not available due to temporary equipment malfunction.

Table 4
Asbestos Monitoring Results

Sample Date	Sample Location	Sampling Period (hours)	Asbestos (fibers/cm³)	Asbestos Exceedance? (Yes/No)
25-Jun-12	13	10.0	<0.0022	No
25-Jun-12	14	10.0	<0.0022	No
26-Jun-12	13	10.0	<0.0018	No
26-Jun-12	14	10.0	<0.0022	No
27-Jun-12	13	10.0	<0.0022	No
27-Jun-12	14	10.0	<0.0022	No
28-Jun-12	13	10.0	0.0023	No
28-Jun-12	14	10.0	0.0028	No
29-Jun-12	13	6.7	<0.0034	No
29-Jun-12	14	6.8	<0.0034	No
2-Jul-12	13	10.0	<0.0022	No
2-Jul-12	14	10.0	0.0031	No
3-Jul-12	13	5.0	<0.0045	No
3-Jul-12	14	5.0	<0.0045	No
9-Jul-12	13	10.0	<0.0022	No
9-Jul-12	14	10.0	<0.0022	No
10-Jul-12	13	10.0	<0.0015	No
10-Jul-12	14	10.0	<0.0022	No
11-Jul-12	13	10.0	<0.0018	No
11-Jul-12	14	10.0	<0.0022	No
12-Jul-12	13	10.0	<0.0022	No
12-Jul-12	14	5.9	<0.0022	No
13-Jul-12	13	10.0	<0.0019	No
13-Jul-12	14	5.9	<0.0039	No
16-Jul-12	13	10.0	<0.0022	No
16-Jul-12	14	10.0	<0.0022	No
17-Jul-12	13	10.0	<0.0018	No
17-Jul-12	14	10.0	<0.0022	No
18-Jul-12	13	10.0	<0.0019	No
18-Jul-12	14	10.0	<0.0022	No
19-Jul-12	13	10.0	<0.0019	No
19-Jul-12	14	10.0	<0.0022	No
20-Jul-12	13	10.0	<0.0015	No
20-Jul-12	14	6.1	<0.0039	No
23-Jul-12	13	10.0	<0.0022	No
23-Jul-12	14	10.0	<0.0022	No

Table 4
Asbestos Monitoring Results

Sample Date	Sample Location	Sampling Period (hours)	Asbestos (fibers/cm³)	Asbestos Exceedance? (Yes/No)
24-Jul-12	13	10.0	<0.0022	No
24-Jul-12	14	10.0	<0.0022	No
25-Jul-12	13	10.0	<0.0019	No
25-Jul-12	14	10.0	<0.0022	No
26-Jul-12	13	10.0	<0.0022	No
26-Jul-12	14	10.0	<0.0022	No
27-Jul-12	13	5.6	<0.0039	No
27-Jul-12	14	6.1	<0.0039	No
3-Aug-12	13	6.0	< 0.003	No
3-Aug-12	14	6.6	<0.0034	No
6-Aug-12	13	10.0	<0.0018	No
6-Aug-12	14	10.0	<0.0022	No
7-Aug-12	13	10.0	<0.0018	No
7-Aug-12	14	10.0	<0.0022	No
8-Aug-12	13	10.0	<0.0018	No
8-Aug-12	14	10.0	<0.0022	No
9-Aug-12	13	10.0	<0.0022	No
9-Aug-12	14	10.0	0.0035	No
4-Sep-12	13	10.0	<0.0022	No
4-Sep-12	14	10.0	<0.0022	No
5-Sep-12	13	Note 1	N/A	N/A
5-Sep-12	14	10.0	<0.0022	No

Sample locations are shown on Figure 1.

The threshold value for asbestos is 0.1 fibers/cm<sup>3</sup>.

The detection limit is 0.003 fibers/cm<sup>3</sup> assuming a minimum sample volume of 900 liters.

fibers/cm<sup>3</sup> - fibers per cubic centimeter

N/A - not applicable

<sup>&</sup>lt;sup>1</sup> - Sample results are not available due to temporary equipment malfunction.