Naval Facilities Engineering Command Southwest
BRAC PMO West
San Diego, CA

AIR MONITORING SUMMARY REPORT

DECEMBER 8 TO DECEMBER 21, 2018

Remedial Action/Non-Time-Critical Removal Action Installation Restoration Site 12

FORMER NAVAL STATION TREASURE ISLAND, SAN FRANCISCO, CA

January 2019

Approved for public release; distribution is unlimited

DCN: GLBN-0005-F4239-019

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Contract Number: N62473-17-D-0005; Task Order No. F4239
DCN: GLBN-0005-F4239-019

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LIST OF ABBREVIATIONS AND ACRONYMS

4,4'-DDD	4,4-dichlorodiphenyldichloroethane
AMP	Air Monitoring Plan
BAAQMD	Bay Area Air Quality Management District
BAP	benzo(a)pyrene
cfm	cubic feet per minute
CFR	Code of Federal Regulations
DAC	derived air concentration
DTSC	Department of Toxic Substances Control
HERO	Human and Ecological Risk Office
Gilbane	Gilbane Federal
DCP	Dust Control Plan
IR	Installation Restoration
mg/m^3	milligram per cubic meter
Navy	U.S. Department of the Navy
PAH	polycyclic aromatic hydrocarbon
PCB	polychlorinated biphenyl
PDR	personal data-logging real-time aerosol monitor
PM10	particulate matter less than 10 microns in diameter
PUF	polyurethane foam
Ra-226	radium-226
TCDD	2,3,7,8-tetrachlorodibenzo-p-dioxin
TLV	threshold limit value
TSP	total suspended particulates
$\mu g/m^3$	microgram per cubic meter
USEPA	United States Environmental Protection Agency
Work Plan	*Final Work Plan, Remedial Action/Non-Time Critical Removal Action, Installation Restoration Site 12, Former Naval Station Treasure Island, San Francisco, California*

1.0 INTRODUCTION

This Air Monitoring Report was prepared by Gilbane Federal (Gilbane) as requested by the United States Department of the Navy (Navy) under the Radiological Multiple Award Contract (RADMAC II) N62473-12-D-D005, Contract Task Order F4239. Gilbane is performing dust and air monitoring at Former Naval Station Treasure Island in accordance with the Final Dust Control Plan (DCP) and Air Monitoring Plan (AMP), included as appendices *to Remedial Action/Non-Time Critical Removal Action Work Plan, Installation Restoration Site 12, Former Naval Station Treasure Island, San Francisco, California* (Work Plan; Gilbane, 2018).

The DCP describes best management practices and procedures to be implemented to minimize dust generation during work activities. Dust monitoring is conducted to ensure that these procedures are effective. Dust monitoring is also conducted to verify that the working environment meets occupational health and safety standards and that workers are safe. The AMP outlines the requirements for prevention of exposure for construction workers to dust and potential airborne chemicals of concern from the work area. The AMP also establishes the conservative project action levels for dust at the work area boundary to protect residents.

This summary report describes the following:

- Dust and air monitoring sampling locations – **Section 2.0**;
- Dust and air monitoring sample collection and analytical methods – **Section 3.0**; and
- Dust and air monitoring data evaluation – **Section 4.0**.

This summary report presents the dust and air monitoring test results at Installation Restoration (IR) Site 32 from December 8th, 2018 through December 21st, 2018, and compares the results with the established action levels included in the Work Plan (Gilbane, 2018). As there were no earthmoving activities associated with the project on December 10th and 11th, 2018, no dust monitoring was performed on these days.

IR Site 32, located 600 yards to the east of IR Site 12, is being used as a radiological screening yard and staging yard for the IR Site 12 project activities. The screening criteria established for IR Site 12 will be applied to the air monitoring at IR Site 32.

During the reporting period, personal data-logging real-time aerosol monitoring (PDR) dust data was collected. Air samples were collected and analyzed for lead, chromium, polychlorinated biphenyls (PCBs), polycyclic aromatic hydrocarbons (PAHs), dioxin [2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD)], total suspended particulates (TSP), and particulate matter less than 10 microns in diameter (PM10). In addition, air samples were analyzed for radiological gross alpha and beta levels.

2.0 MONITORING SITE LOCATIONS

2.1 Dust Monitoring

During earthmoving activities, multiple PDR stations are set up to monitor real-time airborne dust concentrations. The purpose of the PDR stations is to act as a first line of defense in protecting workers' health, and ultimately the public's health, during field activities. Dust levels are monitored at, and immediately adjacent to, the work area at the locations that will most likely contain the greatest volume of airborne dust. The objective of this dust monitoring approach is to demonstrate that dust levels are below action levels.

The general locations for dust monitors in IR Site 32 are shown on Figure 1, and for IR Site 12 are shown on Figure 2. Specific locations of each PDR are described in the individual PDR daily data files. Field forms from each location are presented in Attachment 1 of this report. During earth moving activities (i.e. grading soil, loading trucks for transportation and disposal, managing radiological screening yard pads, etc.) at IR Site 32, one PDR serves as the upwind (background) location and two PDRs are placed in downwind perimeter locations. Correspondingly, during earth moving activities at IR Site 12 (i.e., excavation of a water line), one PDR serves as the upwind (background) location and two PDRs are placed in downwind perimeter locations. Weather forecasts including wind direction are checked daily with a weather station located at Building 572.

2.2 Air Monitoring

Air monitoring samples were collected at the upwind Perimeter Road location and at the downwind location at the gate to Site 32. Air monitoring samples collected using high volume samplers are collected to identify and quantify airborne contaminants and to confirm the results recorded during dust (PDR) monitoring. Air monitoring stations are mobilized to collect air monitoring samples upwind and downwind of work areas. General locations of air monitoring stations are shown on Figure 3. The locations of the air monitoring stations are determined based on the prevailing wind direction (typically

from the northwest) and are modified as needed. A weather station is erected to monitor the wind direction.

High volume air monitoring stations remain stationary while sampling is being conducted; however, locations may be adjusted when the wind direction changes and when overall excavation work areas change from one site to another. Each upwind and downwind high volume monitoring station includes separate monitoring systems for the following:

- TSP- collected daily
- PM10- collected daily
- Lead and chromium- collected daily
- PAHs, PCBs, and Dioxins- collected on alternating days

2.3 Radiological Air Monitoring

Radiological air samplers are positioned adjacent to excavation work activities for radiologically impacted soil at one upwind and one downwind location during earthmoving activities associated with radiologically impacted soil. The radiological air samplers may be co-located with PDRs or the high volume samplers.

3.0 SAMPLING AND ANALYTICAL METHODS

Dust and air samples are collected during earthmoving activities. However, during precipitation events, the dust and air monitoring units may not be operable. An attempt will be made to collect samples and readings regardless of the weather. If dust or air monitors are found to be malfunctioning or nonfunctional, earthmoving activities will stop until monitors can be repaired or replaced. The Site Health and Safety Officer is responsible for monitoring the air and dust monitoring sampling equipment. In rare cases, due to ancillary equipment malfunction such as generator failure during the night, a sample may be collected that represents a period of less than 24 hours. If this situation occurs, a note is added to the sample result data tables indicating why the full sampling period was not achieved.

3.1 Dust Samples

The PDR is a high sensitivity photometric monitor with a light-scattering sensing configuration that has been optimized for the measurement of the respirable fraction of airborne dust, smoke, fumes, and mists.

PDRs are used to evaluate real-time monitoring of airborne dust concentrations, to determine if there is a need for additional dust control or personal protection.

3.2 Air Samples

Air samples were sampled in accordance with the United States Environmental Protection Agency (USEPA) reference sampling method for PM10, described in 40 Code of Federal Regulations (CFR) 50, Subpart J. Each sample was collected on a filter over an approximately 24-hour period; the filter was then weighted to determine the amount of PM10 collected.

TSP samples were collected with a high-volume (39 to 60 cubic feet per minute [cfm]) air sampler in accordance with USEPA's reference sampling method for TSP, described in Title 40 CFR, Part 50, Subpart B. Each sample was collected on a filter over an approximately 24-hour period; the filter was then weighted to determine the amount of TSP collected. Once the filter weight was determined, the sample was analyzed for lead and chromium in in accordance with USEPA Method 6020 using inductively coupled mass spectrometry.

Air samples for PCBs, PAHs, and dioxins are collected and analyzed in accordance with USEPA Methods TO-4A, TO-13, TO-9A, respectively, using TISH polyurethane (PUF) samplers. The filter media collected from the air samplers is submitted to the analytical laboratory for appropriate analysis.

PCB, PAH, and dioxin samples are collected on alternating days at the downwind and upwind stations during earthmoving activities.

3.3 Radiological Air Samples

Radiological air monitoring is also conducted upwind and downwind on days of earthmoving activities. Radiological samples are collected with a LV-1 low volume air sampler. Air filters are counted on site following a decay period and are compared with public air concentration limits published in 10 CFR Part 20. Radiological air sampling methods and procedures are detailed in Gilbane Radiological Procedure PR-RP-150 *Radiological Survey and Sampling*.

The radiological air sample is counted on a Low Background Protean WPC-9950 and analyzed for gross alpha and beta activity. The calculated airborne concentration in microcuries is then compared to the effluent concentration (often but incorrectly refer to as a derived air concentration [DAC] which applies only to occupational exposures) limit specified in Table 2 of Appendix B to 10 CFR 20. The effluent

concentration is the concentration of a given radionuclide in air which, if inhaled continuously over the course of a year, results in an exposure equal to the annual regulatory limit specified in 10 CFR 20.1302. The threshold for radiological effluent air monitoring samples is 10 percent of the effluent concentration, which ensures work practices are evaluated and modified as necessary to ensure the limit is not reached.

4.0 DUST AND AIR MONITORING DATA

The Human and Ecological Risk Office (HERO) at the request of the California Department of Toxic Substances Control (DTSC) developed dust action levels for community air monitoring for IR Site 12. Subchronic and chronic dust action levels as PM10 were calculated for lead, chromium, dioxin, benzo(a)pyrene (BAP), 4,4-dichlorodiphenyldichloroethane (4,4'-DDD) and PCBs. As presented in the document *Dust Action Levels for Installation Restoration Site 12, Former Naval Station Treasure Island, San Francisco, California* (HERO, 2018), the action levels were calculated using the maximum chemicals of concern soil concentrations at IR Site 12. As noted in Section 1.0, IR Site 12 action levels will be implemented for project work at IR Site 32.

Based on HERO's recommendations, a PM10 dust action level of 50 microgram per cubic meter (ug/m^3) will be implemented for all excavations areas at IR Site 12 except at the area surrounding sampling location KCH-1217-1 which will have a limit of 8 ug/m^3 due to the elevated level of contaminants historically measured at this location. TSP is expected to be further controlled based on the limit employed for PM10, in accordance with guidance provided by the San Francisco Bay Area Air Quality Management District (BAAQMD), which estimates that PM10 makes up approximately 55 percent of TSP. If it is apparent that project activities are the cause of exceedances, additional control measures will be considered and implemented.

Dust monitoring action levels that are implemented on a real-time basis are listed in Table 1. PDR data are collected and reviewed each day by the Site Health and Safety Manager. PDR data are included in Attachment 1.

Analytical results from air monitoring samples are compared with the project screening criteria (threshold limit values [TLV]) listed in Table 2. Air monitoring results are included in Attachment 2. Radiological monitoring results are included in Attachment 3.

Table 1
Dust Monitoring Project Action Levels

Method	Monitoring Location	Monitoring Frequency [a]	Action Level [b]	Action
PDR	Near Workers' Breathing Zones (typically on equipment)	Periodically[c]	<2.5 mg/m^3	Continue work.
			>2.5 mg/m^3	Use Level D and increase dust control (i.e., apply water or other suppression method). Optionally upgrade to Level C until concentrations are reduced.
	Job Site Perimeter	Continuously	<1.0 mg/m^3	Continue work.
			>1.0 mg/m^3	Increase dust control and re- evaluate. Stop work if levels do not decrease.

Notes:

Only the Health and Safety Manager is authorized to downgrade levels of personal protective equipment.

a *Frequency of air monitoring may be adjusted by the project Certified Industrial Hygienist after sufficient characterization of site contaminants has been completed, tasks have been modified, or site controls have proven effective.*

b *Five readings exceeding the action level in any 15-minute period or a sustained reading exceeding the action level for five minutes will trigger a response. Action levels represent airborne particulate concentrations in excess of background particulate concentrations.*

c *PDR will be monitored a minimum of three times a day.*

< *less than*

> *greater than*

mg/m^3 *milligram per cubic meter*

PDR *personal data-logging real-time aerosol monitor*

Table 2
Air Monitoring Project Screening Criteria

Chemicals of Concern	Project Screening Criteria (Threshold Limit Value) µg/m^3	Basis
Lead	242	TI Site 12 Dust Action Level
Chromium	929	TI Site 12 Dust Action Level
TSP	50	TI Site 12 Dust Action Level
PM10	50	BAAQMD ambient air quality
BAP	50 (8)[b]	TI Site 12 Dust Action Level
PCBs[a]	NA	TI Site 12 Dust Action Level
4,4'-DDD	200	TI Site 12 Dust Action Level
Dioxin[a]	1E+07	TI Site 12 Dust Action Level
Radiological (Ra-226)	10% of DAC[c]	Occupational and public air concentration limits for Ra-226 published in 10 Code of Federal Regulations Part 20

Notes:

a *The dust action level was increased by a factor of 10 to account for the short-term duration of the project relative to the lifetime assumptions incorporated into the toxicity criteria and exposure assumption.*

b *BAP action levels will be 50* µg/m^3 *for all excavations except for the area surrounding sample locations KCH-1217-1 at which it will be 8* µg/m^3

c *Public air concentration limits are commonly referred to as DAC, but are in actuality Effluent Concentrations from Table 2 for 10 CFR Part 20.*

%	*percent*
4,4'-DDD	*dichlorodiphenyldichloroethane*
BAAQMD	*Bay Area Air Quality Management District*
BAP	*benzo(a)pyrene*
DAC	*derived air concentration*
PCBs	*polychlorinated biphenyls*
PM10	*particulate matter smaller than 10 microns in diameter*
Ra-226	*radium-226*
TSP	*total suspended particulates*
µg/m^3	*microgram per cubic meter*

5.0 AIR MONITORING RESULTS

If dust (PDR) monitoring equipment alarm, the source of exceedance will be determined by evaluating both upwind and downwind dust (PDR) sample locations. If the difference between upwind and downwind concentrations is greater than the action level for a sustained period of 15 minutes, then earthmoving activities will be halted until dust control measures are implemented. These may include, but are not limited to adding water to the work area during earth moving tasks, evaluation of alternate work procedures or equipment, and/or cessation of the activity that is creating the dust until the PDR readings are below the screening criteria.

PDR summary results are presented in Attachment 1. Weather information (including ambient pressure and temperature data) and high volume air monitoring sample results are presented in Attachment 2. Weather information was collected from the weather station at Building 572, Avenue M, Treasure Island, San Francisco, California. Radiological air monitoring results are presented in Attachment 3.

PM10 analytical results from December 8, 2018 to December 21, 2018 did not exceed the project-specific screening criteria presented in Table 2.

TSP analytical results from December 8, 2018 to December 21, 2018 did not exceed the project-specific screening criteria presented in Table 2.

Metals (chromium and lead), PAHs, total PCBs, and dioxin analytical results from December 8 2018 to December 21, 2018 did not exceed the project-specific screening criteria presented in Table 2.

Dust (PDR) delta action levels did not exceed during the reporting period. The data sheets are found in Attachment 1.

Radiological air monitoring action levels were not exceeded during the reporting period.

6.0 REFERENCES

Gilbane, 2016. Radiological Procedure PR-RP-150 Radiological Survey and Sampling. January.

Gilbane, 2018. *Remedial Action/Non-Time Critical Removal Action Work Plan, Installation Restoration Site 12, Former Naval Station Treasure Island, San Francisco, California*. September.

Gilbane, 2018. *Remedial Action/Non-Time Critical Removal Action Work Plan, Air Monitoring Report, Installation Restoration Site 12, Former Naval Station Treasure Island, San Francisco, California*. September.

Gilbane, 2018. *Remedial Action/Non-Time Critical Removal Action Work Plan, Dust Control Plan, Installation Restoration Site 12, Former Naval Station Treasure Island, San Francisco, California*. September.

HERO, 2018. *Dust Action Levels for Installation Restoration Site 12, Former Naval Station Treasure Island, San Francisco, California. September*.

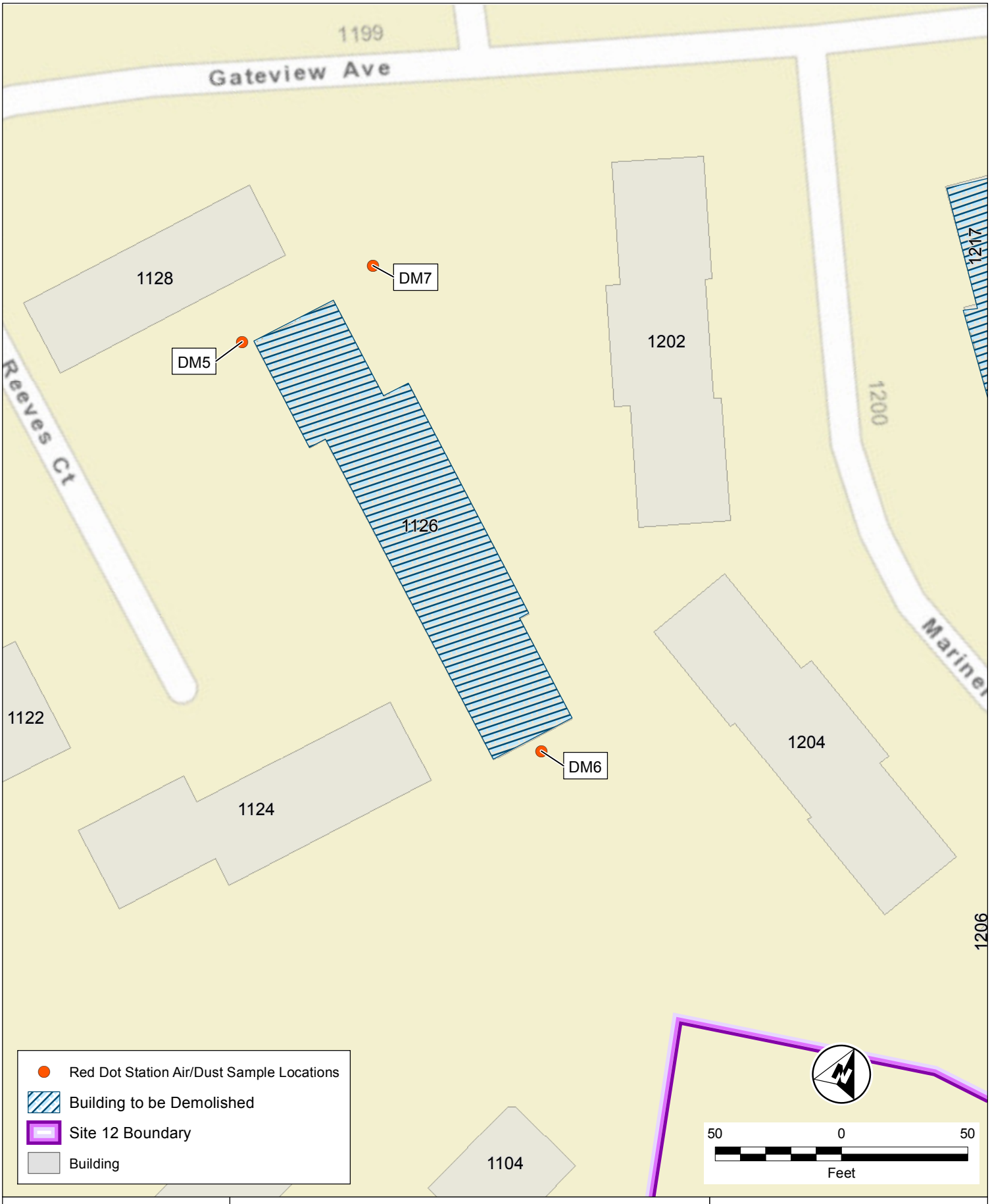
FIGURES

NAVFAC Naval Facilities Engineering Command

IR Site 12 Non-SWDA Remedial Action/
SWDA Removal Action
Former Naval Station Treasure Island
San Francisco, CA

Figure 1
PDR Monitoring Locations A

G:\ArcGIS\Navy\Treasure_Island\PROJECTS\Site12_SWDA_RA\TI_Site32_Monitoring_Locs_PDR.mxd 1/4/2019 [12:09 PM] EANDERSON, Gilbane



IR Site 12 Non-SWDA Remedial Action/ SWDA Removal Action
Former Naval Station Treasure Island
San Francisco, CA

Figure 2
PDR Monitoring Locations B

G:\ArcGIS\Navy\Treasure_Island\PROJECTS\Site12_SWDA_RA\TI_Site12_AirDust_Samples.mxd 1/4/2019 [12:10 PM] EANDERSON, Gilbane

IR Site 12 Non-SWDA Remedial Action/
SWDA Removal Action
Former Naval Station Treasure Island
San Francisco, CA

Figure 3
Air Monitoring Locations

G:\ArcGIS\Navy\Treasure_Island\PROJECTS\Site12_SWDA_RA\TI_Site32_Monitoring_Locs_Air.mxd 11/7/2018 [11:07 AM] EANDERSON, Gilbane

ATTACHMENTS

ATTACHMENT 1

PDR SUMMARY TABLE AND FIELD FORMS

Table 1-1
Personal Data-logging Real-time (PDR) Aerosol Monitoring Results
Remedial Action/NTCRA IR Site 12
Former Naval Station Treasure Island, San Francisco, California

DustTrak Unit	Date	Maximum (mg/m^3)	Average (mg/m^3)	Delta Between Upwind and Downwind stations (mg/m^3)	Below action level? (0.050 mg/m^3) (Yes/No)
DM1	12/12/2018	0.125	0.070	NA	NA
DM2		0.117	0.066	0.004	Yes
DM3		0.091	0.048	0.022	Yes
DM1	12/13/2018	0.044	0.025	NA	Yes
DM2		0.044	0.023	0.002	Yes
DM3		0.043	0.018	0.007	Yes
DM1	12/17/2018	0.021	0.017	NA	NA
DM2		0.035	0.028	0.011	Yes
DM3		0.030	0.025	0.008	Yes
DM4		0.470	0.132	NA	NA
DM5		0.520	0.146	0.014	Yes
DM6		0.480	0.136	0.004	Yes
DM1	12/18/2018	0.028	0.024	NA	NA
DM7		0.029	0.020	0.004	Yes
DM3		0.028	0.019	0.005	Yes
DM1	12/19/2018	0.029	0.017	NA	NA
DM2		0.032	0.018	0.001	Yes
DM7		0.030	0.017	0.000	Yes
DM1	12/20/2018	0.081	0.061	NA	NA
DM2		0.078	0.058	0.003	Yes
DM3		0.074	0.053	0.008	Yes

Notes:
bold = results above screening criteria
mg/m^3 = milligram per cubic meter
NA = not applicable

Gilbane

DUST MONITORING LOG

Client Name _ NAVFAC

Date Dec 12, 2018

Project No. J310000300

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Logged by Mark Blaisdell

Weather partly cloudy, E winds, smoggy (E. bay hills not v.s.)

Instrument Type: _Dust Trak II

Calibration Standards Used: Factory calibrated

Time	Location	Instrument Readings, (Units) mg/m³			Unit #	2-419 #SA	wind ~~PPE Used~~	Activities, Remarks
0715	office	0.022			3703			
	↓	0.023			2776			
	↓	0.021			1277			
0755	W side of site 32 gate / DM2	0.117			2776		W, moderate	No activity in yard. Soil wet. Smog?
	DM3	0.091			1227		↓	
0850	DM2 ↑ 1	0.125			3703		↓	wind off of bay
1028	W side of site 32 gate	0.084			2776		NW	Hills visable
↓	DM3	0.058						
1035	DM1	0.084					W - Very slight wind	
1140	Site 32 gate	0.047					Very light N-NE winds ↑	Soil deliveries for RSW pads
↓	DM3	0.030						
1157	DM1	0.052					↓	Berkely hills fairly visable, UC campanile
1455	Site 32 gate	0.014					Calm winds @ site 32	visable Berkley hills clear visibility
↓	DM3	0.011						↓
1505	DM1	0.019						

Gilbane

DUST MONITORING LOG

Client Name _ NAVFAC

Project No. J310000300

Logged by Mark Blaisdell

Weather Am Partly Cloudy Lt+var winds

Instrument Type: _Dust Trak II

Calibration Standards Used: Factory calibrated

Date 12-18-2018

Page 1 of 1

Time	Location	Instrument Readings, (Units) mg/m³			Unit #	KSA 2479	PPE Used	Activities, Remarks
0725	office con.	0.021			3703			
↓	check	0.017			2724			
↓	↓	0.018			2776			
0835	~~DM2 @ yard gate~~	0.027	DM 7 MM 12-20-18		2724		Winds very light, View of Bent hills smoggy, UC Campinia is visable	
↓	DM3	0.028			2776			
0900	DM1	0.028			3703			
1200	DM 1	0.027						
1210	~~DM 2 / yard gate~~	0.016	DM 7 MM 12-20-2018					
↓	DM3	0.019						
1435	* ~~DM 2 / yard gate~~	0.009	DM 7 MM 12-20-2018					Overcast, slight intermittent E wind
↓	DM3	0.009						Bent hills & UC campinia almost clear
1445	DM1	0.013						
1623	DM 1	0.026						
1632	DM 7 MM 12-20-18	0.029						
1635	DM 3	0.020						

* This location now called DM 7 MM 12-20-2018

DUST MONITORING LOG

Client Name _ NAVFAC

Project No. J310000300

Logged by Mark Brassley

Weather foggy, calm to v. light N winds

Instrument Type: _Dust Trak II

Calibration Standards Used: Factory calibrated, zero filter

Date Dec 20, 2018

Page 1 of 1

Time	Location	Instrument Readings, (Units) mg/m³			Unit #	KSA 2-4-19	PPE Used	Activities, Remarks
0710	office com check	0.031			2776			Bench ✓
↓	↓	0.028			2724			↓
↓	↓	0.034			3703			
0730	DM 2	0.030			2776			No work started in site fogg
↓	~~~20' W of site 32 entance gate~~	0.029 → DM 7			2724			No wind Vis < 1 mile
0745	DM 1	0.033			3703			
1040	DM 2	0.062						
↓	~~~20' W of gate~~ DM 7	0.050						
1045	DM 1	0.063						
1120	~~~20' W of gate~~ DM 7	0.054	During observation, meter bumped to 0.075 for					
			1 to 2 seconds, then rapidly fell to					0.054. Likely
			cause is truck exh					banks blowing dust from
			road surface about 25' up wind					
1120	DM 2	0.061						
1137	DM 1	0.062						
1340	~~~20' W of gate~~ DM 7	0.058						
↓	DM 2	0.063						
2 ~~1505~~	DM 1	0.064						
1505	DM 2	0.078						
↓	DM 7	0.074						
1520	DM 1	0.081						

ATTACHMENT 2

SUMMARY OF AIR MONITORING AND AIR SAMPLING RESULTS

ATTACHMENT 3

RADIOLOGICAL AIR MONITORING RESULTS