

Craig Murray

From: joan@vbsi.com
Sent: Thursday, August 08, 2013 1:57 PM
To: Craig Murray
Cc: ewhitty@ebmud.com; paulcarman@comcast.net
Subject: Review of wet season groundwater monitoring report for 8/19/PMCAC meeting
Attachments: Summary- 2013 Wet Season Groundwater Monitoring Report 7-31-13.pdf

Hi Craig -

I'd like to request that an item be placed on the 8/18/13 PMCAC agenda under section 12a:

Summarization of wet season groundwater monitoring report covering period 1/1/13 to 6/30/13

The attached document is an extract of the full report and contains the summary data. It should be included in the agenda packet for this item with a note on the agenda that the complete document can be found at: <https://docs.google.com/file/d/0B9WXrZeb-72bkcydE5ib3hbbGM/edit?usp=sharing>

Thank You
Joan Garrett

3.0 ACTIVITIES COMPLETED DURING THE REPORTING PERIOD

The following section discusses the groundwater monitoring activities completed at the Site during the Reporting Period.

3.1 Groundwater Monitoring Well Network

The current groundwater monitoring well network is based on an evaluation of the monitoring conducted to date and historical data trends. Past data indicate that the spatial distribution and concentrations of COPCs in groundwater have been well-characterized through past groundwater monitoring activities (Terraphase 2011b). Groundwater quality trends have been documented over approximately a decade of groundwater monitoring in most parts of the Site. Therefore, the groundwater monitoring well network includes wells that were selected to monitor groundwater conditions along the perimeter of the Site along the San Francisco Bay, and additional groundwater monitoring wells in selected parts of the Site.

The current monitoring well network comprises four categories of wells:

- Perimeter wells: wells located near the San Francisco Bay shoreline and, in the case of IR Site 3, downgradient of the groundwater extraction trench;
- UST wells: wells near "open" underground storage tanks, i.e., tanks for which regulatory closure has not yet been obtained;
- Drainage area wells: wells located at the base of major drainages that contain an open tank site or other sites; and,
- Drum Lot 2 wells: wells located in the northern portion of former Drum Lot 2, where volatile organic compounds (VOCs) are present in groundwater

The groundwater monitoring well network is presented on Figure 3. Construction details for groundwater monitoring wells are presented in Table 2.

3.2 Groundwater Elevation and Fuel Product Thickness Measurements

Depth-to-groundwater and fuel product thickness measurements were made on May 6, 2013.

Depth-to-groundwater and fuel product thickness were measured using an oil-water interface probe. The data were collected to assess groundwater elevation and flow direction, and the potential presence of free product.

3.3 Groundwater Sampling

Groundwater samples were collected from the groundwater monitoring wells and piezometers listed in Table 2, with the exception of wells MWT03-02, MWT05-02,

MWT06-02, MWT13-02, MWT18-01, MWT19-01, and MW03-02, which had insufficient water for sampling. Groundwater samples were collected using low-flow purging techniques in all wells, except in wells MW13+27,, PZ11-76R, MW10-21, MW10-23, MWTC-01R, MW29-01, MW29-03, MW30-08, and MW04-04, which were sampled using disposable bailers, following either the three-well-volume purge method or the purge-and-recharge method (Table 4).

The field sampling methods and procedures used during groundwater sampling were consistent with the GWMP.

Equilibration parameters, including water temperature, pH, turbidity, conductivity, oxidation-reduction potential (ORP), and dissolved oxygen (DO) were measured during well purging. Observations were made regarding sample color, odor, and turbidity. Copies of the water-quality sampling log sheets completed during the Reporting Period are included in Appendix C.

Groundwater samples were collected in sample containers provided by the analytical laboratory and were stored in an ice-chilled cooler for transport to the laboratory. Sample containers were labeled with the collector's initials, sample identification number (well identification), time of sample collection, date, location, sample type, analytical method, and preservative used. Complete chain-of-custody (COC) forms accompanied the samples to Curtis & Tompkins, Ltd. (C&T), a California-certified analytical laboratory located in Berkeley, California.

3.4 Visual Inspection of Shoreline Area and Free Product Skimming

The shoreline area downgradient of wells containing free product was inspected at low tide for the potential presence of seeps and sheens. Neither seeps nor sheens were observed. After groundwater sampling was completed, free product was skimmed from wells which met the following criteria:

- contain more than 0.1 foot of free product;
- are within 150 feet of the shoreline; and
- are not in an area of active remediation, e.g., near the IR Site 3 extraction trench.

Monitoring well MW10-24 previously met the above criteria, although the well did not contain free product during the measurement on May 6, 2013. An absorbent sock was previously installed in well MW10-24 to skim the free product. The sock was slowly lowered into the well to maximize exposure to the product layer, and was set to accommodate seasonal water level fluctuations. The absorbent sock was inspected monthly and replaced as needed, i.e., until free product was no longer observed in

excess of 0.1 foot thickness. Monthly absorbent sock monitoring logs from the Reporting Period are presented in Appendix G.

3.5 Sample Analysis

Groundwater samples were tested for the following analytes:

- TPH compounds, using EPA Method 8015B:
 - o TPH as diesel (TPH-diesel)
 - o TPH as bunker fuel (TPH-bunker)
 - o TPH as jet fuel (TPH-jet-fuel)

- Selected chlorinated VOCs, using EPA Method 8260B:
 - o chlorobenzene
 - o 1,1-dichloroethane
 - o 1,1-dichloroethene
 - o 1,2-dichloroethane
 - o cis-1,2-dichloroethene
 - o trans-1,2-dichloroethene
 - o tetrachloroethene
 - o trichloroethene
 - o vinyl chloride

A settling/filtering process and silica-gel cleanup were used on samples prior to the analysis of TPH compounds. These steps were taken to reduce the effects of turbidity, which is relatively high in Site samples. These processes were described in the *Final Addendum #1 to the Final Sampling and Analysis Plan* (Jonas and Associates 2006) and approved by the RWQCB in a letter dated November 1, 2006.

3.6 Drum Lot 2 Interim Remedial Measure Performance Monitoring Wells

Seven groundwater monitoring wells were installed in the Drum Lot 2/Building 87 Area between April and October 2012, to provide performance monitoring data for the interim remedial measure (IRM) implemented in this area to reduce concentrations of VOCs in groundwater (Terraphase 2013). Well construction details for these

performance monitoring wells are presented in Table 2. These wells are not part of the RWQCB-approved groundwater monitoring network. The IRM performance monitoring wells were sampled during the Reporting Period (March and June 2013) to provide post-IRM groundwater data. The groundwater elevation and quality data collected at the Drum Lot 2 wells are not included in this SMR, and will be provided under separate cover.

4.0 GROUNDWATER MONITORING RESULTS FOR THE REPORTING PERIOD

This section provides a summary and discussion of the groundwater monitoring results for the Reporting Period, including groundwater elevations, groundwater flow direction, and groundwater analytical data.

4.1 Groundwater Elevations and Flow Direction

Site-wide groundwater elevation data are presented in Table 3 and on Figure 4. Table 3 also includes historical groundwater elevation data. Groundwater elevation data and contours for the Drum Lot 2 area are shown on Figure 5.

Groundwater elevation in the perimeter wells ranged from 2.45 to 16.59 feet AMSL. Groundwater elevation in other wells varied substantially (from 12.95 to 367.94 feet AMSL) and generally reflected the Site topography. Wet-season 2013 groundwater elevations were compared with wet-season 2012 groundwater elevations. Out of 44 wells for which wet-season groundwater elevation data are available from both 2012 and 2013, 16 wells exhibited a decrease in groundwater elevation of more than 0.5 foot while another 10 wells exhibited an increase of more than 0.5 foot. The groundwater elevation measurements in the remaining 19 wells were within 0.5 feet of the 2012 measurements. By far the largest relative changes in groundwater elevation were observed in well MW16+25, which is located along the groundwater extraction trench in IR Site 4 (Figure 3), and in well MW29-01. The relative decrease in groundwater elevation in well MW16+25 was 4.31 feet. The large decrease is the result of an increased rate of groundwater extraction from the trench, beginning in October 2011. The groundwater elevation in well MW29-01, located in Drum Lot 2, increased by 7.92 feet relative to May 2012. The reason for this change is unknown.

Based on the measured groundwater elevations, the predominant groundwater flow direction follows site topography, with groundwater moving from the hillside ridges, toward the axes of drainage areas, and ultimately toward the Bay. Groundwater gradients vary depending on the proximity to the Bay shoreline, with highest gradients between wells situated on hillside ridges and wells in the axis of the drainages (i.e., drainage wells).

4.2 Presence of Free Product

Free product was observed in five out of 47 wells (Table 4 and 5; Figure 6). The thickness of free product was measurable in wells MW13+27, MW11-88, MWT05-02, MWT08-01, and MWTB-01R. The greatest thickness of free product (1.21 feet) was observed in well MWT05-02, which is adjacent to former UST 5. The thickness of free product in well

MW11-88 was 0.21 foot, and the other three wells contained less than one inch of free product.

None of the five wells that contained free product met criteria for the installation of absorbent socks. However, an absorbent sock has been previously installed in well MW10-24 due to past presence of free product. Results of field monitoring and change-outs of absorbent socks in this well are presented in Appendix G.

4.3 Groundwater Analytical Results

Analytical results for groundwater samples collected during the Reporting Period are presented below, by well type. Data collected during the Reporting Period are presented on Figures 7, 8, and 9. Recent and historical analytical data for wells within the current monitoring network are summarized in Appendix A. Analytical data reports are presented in Appendix B.

4.3.1 Total Petroleum Hydrocarbons in Perimeter Wells

Total petroleum hydrocarbons were detected above reporting limits (RLs) in six out of 26 perimeter wells (Figure 7). The RLs for TPH-bunker, TPH-diesel, and TPH-jet fuel were 300, 50, and 50 ug/L, respectively.

Groundwater samples from the following six perimeter wells contained TPH-bunker, based on the chromatograms matching the bunker standard:

- MW13+27
- MW11-88
- MW10-23
- MW10-24
- MW11-104
- MW11-118

TPH-bunker concentrations in these wells ranged from 480 to 1,100 ug/L. These concentrations are all below FPALs for wells within 150 feet of the shoreline.

Groundwater samples from the following six perimeter wells contained TPH-diesel and potentially TPH-jet fuel, based on the chromatograms matching the respective standards:

- MW13+27
- MW11-88

- MW10-23
- MW10-24
- MW11-104
- MW11-118

TPH-diesel concentrations in wells MW13+27, MW11-88, MW10-23, MW10-24, MW-11-19, MW11-104, and MW11-118 ranged from 70 to 600 ug/L, well below the FPALs for wells within 150 feet of the shoreline. The TPH-jet fuel concentrations in wells MW13+27, MW11-88, MW10-23, MW10-24, MW11-104, and MW11-118 ranged from 52 to 650 ug/L, well below the FPALs for wells within 150 feet of the shoreline.

4.3.2 Total Petroleum Hydrocarbons in UST Wells

Groundwater samples were collected from five out of 11 UST wells. Six UST wells (MWT03-02, MWT05-02, MWT06-02, MWT13-02, MWT18-01, and MWT19-01) contained insufficient water for sampling. Total petroleum hydrocarbons were detected above RLs in three out of the six UST wells that were sampled (Figure 8).

Based on a comparison of chromatograms with the bunker standard, groundwater samples from the UST wells did not contain TPH-bunker, although TPH-bunker was quantified based on the analytical procedures set forth in the GWMP.

Groundwater samples from the following three UST wells contained TPH-diesel and potentially TPH-jet fuel, based on the chromatograms matching the respective standards:

- MWT08-01
- MWT15-02
- MWTB-01R

TPH-diesel and TPH-jet fuel concentrations in these wells ranged from 150 to 760 ug/L, well below the FPALs for wells that are located more than 150 feet from the shoreline.

4.3.3 Total Petroleum Hydrocarbons in Drainage Area Wells

Groundwater samples were collected from two out of three drainage area wells. Well MW03-02 was not sampled due to insufficient water. Total petroleum hydrocarbons were detected above RLs in one drainage area well, MW02-07 (Figure 8).

Based on a comparison of chromatograms with the TPH standards, groundwater samples from drainage area well MW02-07 contained TPH-jet fuel, rather than TPH-bunker or TPH-diesel.

TPH-jet fuel concentrations in the primary and duplicate samples from well MW02-07 were 440 ug/L and 650 ug/L, respectively. These concentrations are below the FPALs for wells located more than 150 feet from the shoreline.

4.3.4 Volatile Organic Compounds in Drum Lot 2 Area

VOCs were analyzed in samples collected from seven wells in the Drum Lot 2 area, including two perimeter wells (MW10-11 and MW10-12). VOCs were detected above RLs in three out of seven wells in the Drum Lot 2 area: MW01-03, MW29-01, and MW30-08 (Figure 9). The predominant VOC present in these wells was trichloroethene (TCE), with lower concentrations of TCE degradation products, including cis-1,2-dichloroethene (cis-1,2-DCE), 1,1-dichloroethene (1,1-DCE), and vinyl chloride (VC). The highest concentration of TCE (31 ug/L) was measured in the groundwater sample from well MW29-01. The highest concentrations of cis-1,2-DCE, 1,1-DCE, and VC were measured in groundwater from well MW30-08, which is approximately 150 feet downgradient from well MW29-01.

5.0 SUMMARY OF FINDINGS AND DISCUSSION OF TEMPORAL TRENDS

Data collected during the Reporting Period are summarized in the following sections and compared with historical data. A comprehensive summary of historical and Reporting Period data is presented in Appendix A.

5.1 Free Product

Historical and Reporting Period free product thickness data are presented in Table 5. This table only includes wells that (a) are part of the current monitoring network, and (b) contain, or have in the past contained, free product. Temporal graphs of free product thickness were prepared for wells which contained free product during the Reporting Period (Appendix E).

As presented in Section 4.2, free product was detected in five out of 47 wells during the Reporting Period.

- Free product was measured in well MW13+27 at a thickness of 0.05 foot during the reporting period. A trace of free product was measured in this well in October 2012. Measureable free product had not been detected in well MW13+27 since July 2011, when 0.01 foot was measured.
- Free product thickness measured in well MW11-88 during the Reporting Period (0.21 feet) was lower than was measured in October 2012 (0.22 feet) and May 2012 (0.27 feet). Free product thickness in this well has been steadily decreasing since 2011. There are no historical free product thickness measurements for this well prior to 2011.
- Free product has been detected in well MWT05-02 from 1999 onward. The minimum thickness detected was 0.005 feet in August 1999 and the maximum thickness detected was 1.37 feet measured in May 2012. A free product thickness of 1.21 feet was measured during the reporting period, which is greater than the thickness measured in October 2012 (1.08 feet). The average free product thickness detected in well MWT05-02 during the past 13 years is 0.43 feet.
- Free product thickness measured in well MWT08-01 during the Reporting Period (0.06 feet) is within the range of the measurements over the last few years. Free product has been detected in this well during most events from August 1999 onward, at thicknesses as low as 0.005 feet and as high as 0.34 feet in October 2000. The average thickness of free product detected during the past 12 years is 0.07 feet

- Free product was measured in well MWTB-01R at a thickness of 0.04 foot, which is slightly greater than the thicknesses measured during the last three reporting periods. Historical free product thicknesses in this well range from a trace to 0.15 feet.

Of the current monitoring network wells, wells MW11-100A, MW11-104, MW16+25, MW10-23, MW10-24, MWT03-02, MWT06-02, MWT13-02, MWT15-02, MWT18-01, MWT19-01, MWTB-01, MWTC-01R, MW02-07, and MW03-02 previously contained free product but did not contain free product during the Reporting Period. Overall, the number of wells that contained free product during the Reporting Period (5) was slightly higher than the number of wells containing free product during the previous wet-season monitoring event (4).

5.2 Total Petroleum Hydrocarbons

In total, 45 wells were scheduled to be sampled for TPH during the Reporting Period. Seven of those 45 wells contained insufficient water for sampling (MWT03-02, MWT05-02, MWT06-02, MWT13-02, MWT18-01, MWT19-01, and MW03-02). Therefore, 38 wells were sampled site-wide for TPH. TPH concentrations were below FPALs.

A qualitative evaluation of temporal trends in TPH concentrations is presented in Table 6. The evaluation is based on a comparison of TPH concentrations measured during the Reporting Period with TPH concentrations measured since 2011.

TPH concentrations either decreased or remained stable relative to 2012 sampling results, except for wells MW11-104, MW11-118, MW11-88, MW10-23, and MWTB-01R.

5.3 Volatile Organic Compounds

Seven wells in the Drum Lot 2 Area were sampled for VOCs during the Reporting Period. VOCs were detected in three of these wells, with TCE being the VOC present at highest concentrations, ranging from 0.2 J (J indicates analyte was detected at a concentration below the RL) to 31 ug/L. The TCE concentration in well MW29-01 was lower during the Reporting Period than during all previous monitoring events. The concentration measured during the Reporting Period is an order of magnitude lower than previous reported concentrations. TCE concentrations reported for this well indicate a long-term decreasing trend observed since 2001, when the TCE concentration was as high as 770 ug/L.

The TCE concentration in well MW30-08 (2.4 ug/L) was lower during the Reporting Period than during the previous wet-season event in 2012, when it was 77 ug/L. The concentration measured during the reporting Period is the lowest measured in this well since 1999.

The presence of TCE degradation products in Drum Lot 2 wells indicates that reductive dechlorination is taking place in the aquifer. The ratio of cis-1,2-DCE to TCE in well MW30-08 increased to 26.25 during the Reporting Period, as compared with a ratio of 0.1 during the previous wet-season sampling event.

The decreases in VOC concentrations in Drum Lot 2 Area wells and the large increase of the cis-1,2-DCE to TCE ratio are indicative of enhanced reductive dechlorination, resulting from the implementation of the IRM completed between November 5 and January 4, 2013 (Terraphase 2013).

Table 1
Comparison of Reporting Limits and Fuel Product Action Levels
2013 Wet Season Groundwater Monitoring, Former Naval Fuel Depot Point Molate

Analysis	RL (µg/L)	FPAL Greater than 150 feet from the shoreline (ug/L)	FPAL Less than 150 feet from the shoreline (ug/L)	RL at or below FPAL?
TPH (EPA Method 8015B)				
Diesel	50	15,000	2,200	yes
Bunker Fuel	300	21,000	2,200	yes
JP-5	50	21,000	2,200	yes
VOCs (EPA Method 8260B)				
1,1-Dichloroethane	0.5	NE	NE	NE
1,2-Dichloroethane	0.5	NE	NE	NE
1,1-Dichloroethene	0.5	NE	NE	NE
cis-1,2-Dichloroethene	0.5	NE	NE	NE
trans-1,2-Dichloroethene	0.5	NE	NE	NE
Tetrachloroethene	0.5	NE	NE	NE
Trichloroethene	0.5	NE	NE	NE
1,1,1-Trichloroethane	0.5	NE	NE	NE
1,1,2-Trichloroethane	0.5	NE	NE	NE
Vinyl chloride	0.5	NE	NE	NE

Notes:

FPAL = fuel product action level

TPH = total petroleum hydrocarbons

VOCs = volatile organic compounds

EPA = Environmental Protection Agency

ug/L = micrograms per liter

NE = not established

RL = Reporting Limit

Table 4

Summary of Water Level, Free Product Thickness, and Well Purging Data
2013 Wet Season Groundwater Monitoring, Former Naval Fuel Depot Point Molate

Well Number	Area	Date of Measurement	Top of Casing Elevation (feet amsl)	Depth to Water (feet below top of casing)	Groundwater Elevation (feet amsl)	Free Product Thickness (feet)	Volume Purged (liters)	Purge Method	Recharge	Flow Rate (milliliters/minute)
MW11-02	North Shoreline	5/6/2013	24.30	17.76	6.54	ND	4.1	low-flow	good	120
MW11-04	North Shoreline	5/6/2013	23.47	15.34	8.13	ND	2.5	low-flow	good	110
MW11-05	North Shoreline	5/6/2013	22.91	15.46	7.45	ND	4.6	low-flow	good	150
MW11-06	North Shoreline	5/6/2013	22.60	16.42	6.18	ND	8.5	low-flow	good	220
MW11-100A	IR Site 3	5/6/2013	21.04	16.82	4.22	ND	4.8	low-flow	good	200
MW11-104	IR Site 3	5/6/2013	19.27	16.50	2.77	ND	5.1	low-flow	good	160
MW11-118	IR Site 3	5/6/2013	19.69	14.87	4.82	ND	5.1	low-flow	good	110
MW13+27	IR Site 3	5/6/2013	19.64	15.70	3.94	0.05	8.5	three-well-volumes	poor	100
MW16+25	IR Site 3	5/6/2013	20.80	18.35	2.45	ND	3.6	low-flow	good	120
MW11-19	IRS4 Drum Lot 1 (Drainage Area 9)	5/6/2013	20.33	15.98	4.35	ND	5.8	low-flow	good	200
MW11-55R	IRS4 Drum Lot 1 (Drainage Area 9)	5/6/2013	16.16	11.97	4.19	ND	4.1	low-flow	good	100
MW11-85	IRS4 Drum Lot 1 (Drainage Area 9)	5/6/2013	16.23	11.52	4.71	ND	8.6	low-flow	good	270
MW11-88	IRS4 Drum Lot 1 (Drainage Area 9)	5/6/2013	19.30	15.17	4.13	0.21	5.5	low-flow	good	180
PZ11-74	IRS4 Drum Lot 1 (Drainage Area 9)	5/6/2013	14.99	10.59	4.40	ND	5.8	low-flow	good	190
PZ11-76R	IRS4 Drum Lot 1 (Drainage Area 9)	5/6/2013	17.40	13.25	4.15	ND	6.1	purge-and-recharge	poor	NA
MW10-04	South Shoreline Area	5/6/2013	21.43	15.99	5.44	ND	6.5	low-flow	good	200
MW10-05	South Shoreline Area	5/6/2013	21.79	16.36	5.43	ND	3.7	low-flow	good	85
MW10-08	South Shoreline Area	5/6/2013	21.98	11.55	10.43	ND	2.2	low-flow	good	95
MW10-09	South Shoreline Area	5/6/2013	22.24	8.70	13.54	ND	3.2	low-flow	good	90
MW10-10	South Shoreline Area	5/6/2013	20.56	12.92	7.64	ND	3.5	low-flow	good	90
MW10-21	South Shoreline Area	5/6/2013	23.62	18.21	5.41	ND	5.1	purge-and-recharge	poor	NA
MW10-23	South Shoreline Area	5/6/2013	23.18	6.59	16.59	ND	15.3	purge-and-recharge	poor	NA
MW10-24	South Shoreline Area	5/6/2013	19.24	16.24	3.00	ND	3.5	low-flow	good	85
MW10-25	South Shoreline Area	5/6/2013	19.13	16.30	2.83	ND	8.4	low-flow	good	340
MW10-11	IR Site 1 Drum Lot 2	5/6/2013	19.41	6.37	13.04	ND	3.9	low-flow	good	110
MW10-12	IR Site 1 Drum Lot 2	5/6/2013	16.90	3.95	12.95	ND	1.8	low-flow	good	85
MW10-03	Tank 2 (Drainage Area 10)	5/6/2013	140.63	26.83	113.80	ND	5.8	low-flow	good	200
MW10-02	Tank 3 (Drainage Area 10)	5/6/2013	146.53	dry	NM	ND	NS	NA	NA	NA
MW10-01	Tank 5 (Drainage Area 3)	5/6/2013	213.55	28.97	184.58	1.21	NS	NA	NA	NA
MW10-02	Tank 6 (Drainage Area 3)	5/6/2013	159.92	dry	NM	ND	NS	NA	NA	NA
MW10-01	Tank 8 (Drainage Area 3)	5/6/2013	188.78	20.77	168.01	0.06	5.3	low-flow	good	150
MW13-02	Tank 13 (Drainage Areas 2, 3, 4)	5/6/2013	399.72	31.78	367.94	ND	NS	NA	NA	NA
MW15-02	Tank 15 (Drainage Area 2)	5/6/2013	281.35	26.87	254.48	ND	7.1	low-flow	good	85
MW18-01	Tank 18 (Drainage Area 2)	5/6/2013	174.40	26.29	148.11	ND	NS	NA	NA	NA
MW19-01	Tank 19 (Drainage Area 2)	5/6/2013	126.68	27.41	99.27	ND	NS	NA	NA	NA
MW19-01R	Tank B (Drainage Area 3)	5/6/2013	93.45	16.26	77.19	0.04	4.2	low-flow	good	120
MW19-01R	Tank C (Drainage Area 3)	5/6/2013	50.07	19.54	30.53	ND	8.3	purge-and-recharge	NA	NA
MW01-03	IR Site 1 Drum Lot 2 / Bldg 87	5/6/2013	35.07	7.40	27.67	ND	3.8	low-flow	good	100
MW29-01	IR Site 1 Drum Lot 2 / Bldg 87	5/6/2013	32.15	12.30	19.85	ND	16.4	purge-and-recharge	poor	NA

12.4.15

Table 4

Summary of Water Level, Free Product Thickness, and Well Purging Data
2013 Wet Season Groundwater Monitoring, Former Naval Fuel Depot Point Molate

Well Number	Area	Date of Measurement	Top of Casing Elevation (feet amsl)	Depth to Water (feet below top of casing)	Groundwater Elevation (feet amsl)	Free Product Thickness (feet)	Volume Purged (liters)	Purge Method	Recharge	Flow Rate (milliliters/minute)
MW29-02	IR Site 1 Drum Lot 2 / Bldg 87	5/6/2013	29.62	5.23	24.39	ND	2.9	low-flow	good	110
MW29-03	IR Site 1 Drum Lot 2 / Bldg 87	5/6/2013	41.55	9.36	32.19	ND	32.2	purge-and-recharge	poor	NA
MW30-08	IR Site 1 Drum Lot 2 / Bldg 87	5/6/2013	23.60	1.38	22.22	ND	12.3	purge-and-recharge	poor	NA
MW02-07	Drainage Area 2	5/6/2013	50.89	19.00	31.89	ND	5.8	low-flow	good	180
MW03-02	Drainage Area 3	5/6/2013	74.96	18.70	56.26	ND	NS	NA	NA	NA
MW04-04	Drainage Area 4	5/6/2013	73.80	21.65	52.15	ND	12.0	three-well-volumes	good	NA

Notes:

- P = Free product was detected but thickness could not be quantified due to smearing on probe
- NM = not measurable
- ND = not detected
- NS = not sampled, due to the well being dry or containing insufficient water for sampling
- NA = not applicable
- amsl = above mean sea level
- * = Wells are not part of the current Groundwater Monitoring Network

Table 5
Historical Free Product Thickness
2013 Wet Season Groundwater Monitoring, Former Naval Fuel Depot Point Molate

Well Number	Jan-99	Mar-99	Aug-99	Sep-99	Oct-99	Nov-99	Dec-99	Jan-00	Feb-00	Mar-00	Apr-00	May-00	Jun-00	Jul-00	Aug-00	Sep-00	Oct-00	Nov-00	Dec-00	Jan-01	Feb-01	Mar-01
Perimeter Wells																						
MW11-100A	NM																					
MW11-104	NM																					
MW13-27	NM																					
MW16-25	NM																					
MW11-88	NM																					
MW10-23	NM																					
MW10-24	NM																					
Open UST Wells																						
MW102-03	NM	0	0	0	NM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
MW103-02	NM	0	0	0	0	0.02	0.01	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
MW105-02	NM	0.49	0.005	0.84	NM	1.29	0.37	0.26	0.39	0.49	0.28	0.22	0.32	0.22	0.25	0.21	0.25	0.1	0.13	0.04	0.08	0.13
MW106-02	NM	0.03	0.36	0.29	0.27	0.24	0.29	0.33	0.81	0.23	0.17	0.11	0.22	0.11	0.38	0.33	0.53	0.42	0.52	0.56	0	0
MW108-01	NM	0	0.04	0.21	NM	0.04	0.1	0.01	0.05	0.01	0.02	0.005	0.15	0.005	0.25	0.26	0.34	0.1	0.09	NM	0.01	NM
MW113-02	NM	NM	0.5	0.5	0.43	0.48	0.45	0.05	0.02	0.66	0.2	0.01	0.04	0.01	0.015	0.03	0.09	0.21	0.25	0.24	0.23	NM
MW115-02	NM	NM	0	0	NM	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
MW118-01	NM	0	0.01	0	NM	0.00	0.01	0.01	3.73	0.9	0.64	1.17	2.43	1.17	1.97	1.73	0.01	0.36	1.09	0.71	NM	0
MW119-01	NM	0.03	0.01	0.29	NM	0.10	0.01	NM	NM	0.01	NM	0.015	NM	0.015	0.005	0.01	NM	NM	0.035	0.01	0.01	NM
MW107-01	NM	NM	0.28	0.22	NM	0.00	0.01	0	NM	0.005	NM	0.01	0.14	0.01	0.02	0.43	0.61	0.55	0.54	0.47	0.25	0.2
MW108-01R	NM																					
MW107-01	NM	0	0	0	NM	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.01	0.01
Drainage Area Wells																						
MW102-07	0	0.02	0.02	0.02	NM	0.05	0.02	NM	0.005	NM	0	0	0	0	0	0	0	0	0	NM	0	0
MW103-02	0	0	0	0	NM	0	0	0	0	0	0	0	0	0	0	0	0.01	0	0	NM	0	0

Notes:
 NM = not measured
 P = Free product was detected but thickness could not be quantified
 bold = signifies the presence of free-product

124.17

Table 5
Historical Free Product Thickness
2013 Wet Season Groundwater Monitoring, Former Naval Fuel Depot Point Molate

Well Number	Apr-01	May-01	Jun-01	Jan-02	Oct-02	Jul-03	Jan-04	Jul-04	Jan-05	Jul-05	May-06	Sep-06	Sep-07	Mar-08	Sep-08	Apr-09	Jul-11	Oct-11	May-12	Oct-12
Perimeter Wells																				
MW11-100A	NM	0.01	0.00	0.00	0	0	0	0												
MW11-104	NM	0.01	0	0	0	0														
MW13-27	NM	0.01	0.01	0.02	0.01	0	0	0												
MW16-25	NM	0.01	0.01	0	0	0	P													
MW11-88	NM	0.64	0.44	0.27	0.22															
MW10-23	NM	NM	NM	NM	NM	NM	0.01	NM	NM	NM	NM	NM	14.27	NM	0.01	0.01	P	0	0	0
MW10-24	NM	0	P	0	0	P														
Open UST Wells																				
MW102-03	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
MW103-02	0	0	0	NM	0	0	0	0	0	NM	0	0	NM	0	NM	NM	0	0	0	0
MW105-02	0.13	0.23	0.21	NM	0.14	NM	0.86	0.86	NM	0.05	0.12	0.86	0.35	0.5	0.01	0.03	1.35	1.06	1.37	1.08
MW106-02	0	0	0	NM	0.01	0	0.02	0.14	0.01	0.06	0	0.03	0.08	0.04	0.02	0.20	0.01	0	0.03	0
MW108-01	0.01	0.03	0.1	NM	0.11	0.09	0.2	0.1	NM	0.01	0	0	0	0	0.02	0.01	P	0.01	0.01	0.01
MW113-02	0.52	0.18	0.15	NM	0.27	NM	NM	0.15	0.12	0.33	0	0.01	0.11	0.04	0.2	0.05	0	0	0	0
MW115-02	0	0	0	NM	0.01	0	0	0	0	0	0	0	0.01	0	0.01	0.01	0	0	0	0
MW118-01	NM	NM	NM	NM	NM	0.03	0.03	0.03	0.03	0.06	0.04	0.06	0.01	0	0.01	0.01	0	0	0	0
MW119-01	0.01	0.01	0.01	NM	0.005	0	0	0	0	0	0	0	0	0	0.00	0.00	0	0	0	0
MW119-01	0.34	0.39	0.33	NM	0.34	NM														
MW119-01R	NM	0.15	0.02	0	P	0.01	0.01													
MW119-01	0.01	0	0	NM	0	0	0	0	NM	0	0	0	0							
Drainage Area Wells																				
MW02-07	0	0	0	NM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
MW03-02	0	0	0	NM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Notes:
 NM = not measured
 P = Free product was detected but thickness could not be quantified
 bold = signifies the presence of free-product

12.4.18

Table 6

Evaluation of Qualitative Temporal Trends in Concentrations of TPH Compounds and TCE
2013 Wet Season Groundwater Monitoring, Former Naval Fuel Depot Point Molate

Well Number	Concentration Trends			
	TPH-bunker	TPH-diesel	TPH-jet-fuel	TCE
Perimeter Wells				
MW11-02	NC (ND) 2013	NC (ND) 2013	NC (ND) 2013	NA
MW11-04	NC (ND) 2011-2013	NC (ND) 2011-2013	NC (ND) 2011-2013	NA
MW11-05	NC (ND)	NC (ND)	NC (ND)	NA
MW11-06	NC (ND)	NC (ND)	NC (ND)	NA
MW11-100A	NC (ND) 2013	NC (ND) 2013	NC (ND) 2013	NA
MW11-104	Increase	< M 2012, > O 2012	< M 2012, > O 2012	NA
MW11-118	Increase	< M 2012, > O 2012	< M 2012, > O 2012	NA
MW13+27	> M 2012, < O 2012	> M 2012, < O 2012	> M 2012, < O 2012	NA
MW16+25	NC (ND) O 2012	NC (ND) O 2012	NC (ND) O 2012	NA
MW11-19	NC (ND) 2011-2013	NC (ND) O 2012	NC (ND) 2013	NA
MW11-55R	NC (ND) 2013	NC (ND) 2013	NC (ND) 2013	NA
MW11-85	NC (ND) 2013	NC (ND) 2013	NC (ND) 2013	NA
MW11-88	Increase	Increase	Increase	NA
PZ11-74	NC (ND)	NC (ND)	NC (ND)	NA
PZ11-76R	NC (ND)	NC (ND)	NC (ND)	NA
MW10-04	NC (ND) 2011-2013	NC (ND) 2011-2013	NC (ND) 2011-2013	NA
MW10-05	NC (ND) 2011-2013	NC (ND) 2011-2013	NC (ND) 2011-2013	NA
MW10-08	NC (ND) 2011-2013	NC (ND) 2011-2013	NC (ND) 2011-2013	NA
MW10-09	NC (ND)	NC (ND)	NC (ND)	NA
MW10-10	NC (ND)	NC (ND)	NC (ND)	NA
MW10-21	NC (ND) 2011-2013	NC (ND) 2011-2013	NC (ND) 2011-2013	NA
MW10-23	< M 2012, > O 2012	< O 2012	Increase	NA
MW10-24	< M 2012, > O 2012	Decrease	NC O 2012	NA
MW10-25	NC (ND) 2013	NC (ND) 2013	NC (ND) 2013	NA
MW10-11	NC (ND)	NC (ND)	NC (ND)	NC (ND)
MW10-12	NC (ND)	NC (ND)	NC (ND)	NC (ND)
Open UST Wells				
MWT02-03	NC (ND) 2011-2013	NC (ND) 2011-2013	NC (ND) 2011-2013	NA
MWT03-02	NS	NS	NS	NA
MWT05-02	NS	NS	NS	NA
MWT06-02	NS	NS	NS	NA
MWT08-01	> M 2012	> M 2012	> M 2012	NA
MWT13-02	NS	NS	NS	NA
MWT15-02	Decrease	Decrease	Decrease	NA
MWT18-01	NS	NS	NS	NA
MWT19-01	NS	NS	NS	NA
MWTB-01R	> M 2012	> M 2012	> M 2012	NA
MWTC-01R	NC (ND)	NC (ND)	NC (ND)	NA
Drum Lot 2 Wells				
MW01-03	NA	NA	NA	Decrease
MW29-01	NA	NA	NA	Decrease
MW29-02	NA	NA	NA	NC (ND)
MW29-03	NA	NA	NA	NC (ND)
MW30-08	NA	NA	NA	Decrease
MW10-11	NA	NA	NA	NC (ND)
MW10-12	NA	NA	NA	NC (ND)

Table 6

**Evaluation of Qualitative Temporal Trends in Concentrations of TPH Compounds and TCE
2013 Wet Season Groundwater Monitoring, Former Naval Fuel Depot Point Molate**

Well Number	Concentration Trends			
	TPH-bunker	TPH-diesel	TPH-jet-fuel	TCE
Drainage Area Wells				
MW02-07	> M 2012	< M 2012	NC M 2012	NA
MW03-02	NS	NS	NS	NA
MW04-04	NC (ND)	NC (ND)	NC (ND)	NA

Notes:

TPH = total petroleum hydrocarbons; analyzed with silica-gel cleanup

TCE = trichloroethene

UST = underground storage tank

NS = not sampled

ND = not detected

NC = no change

NC (ND) = no change, not detected above reporting limits in 2008, 2009, 2011, and 2012

NC N 2012 = no change relative to concentrations in October 2012

NC M 2012 = no change relative to concentrations in May 2012

NA = not analyzed

NC (ND) O 2012 = no change, not detected above reporting limits in October 2012 and May 2013

< M 2012 = decrease relative to concentrations in May 2012

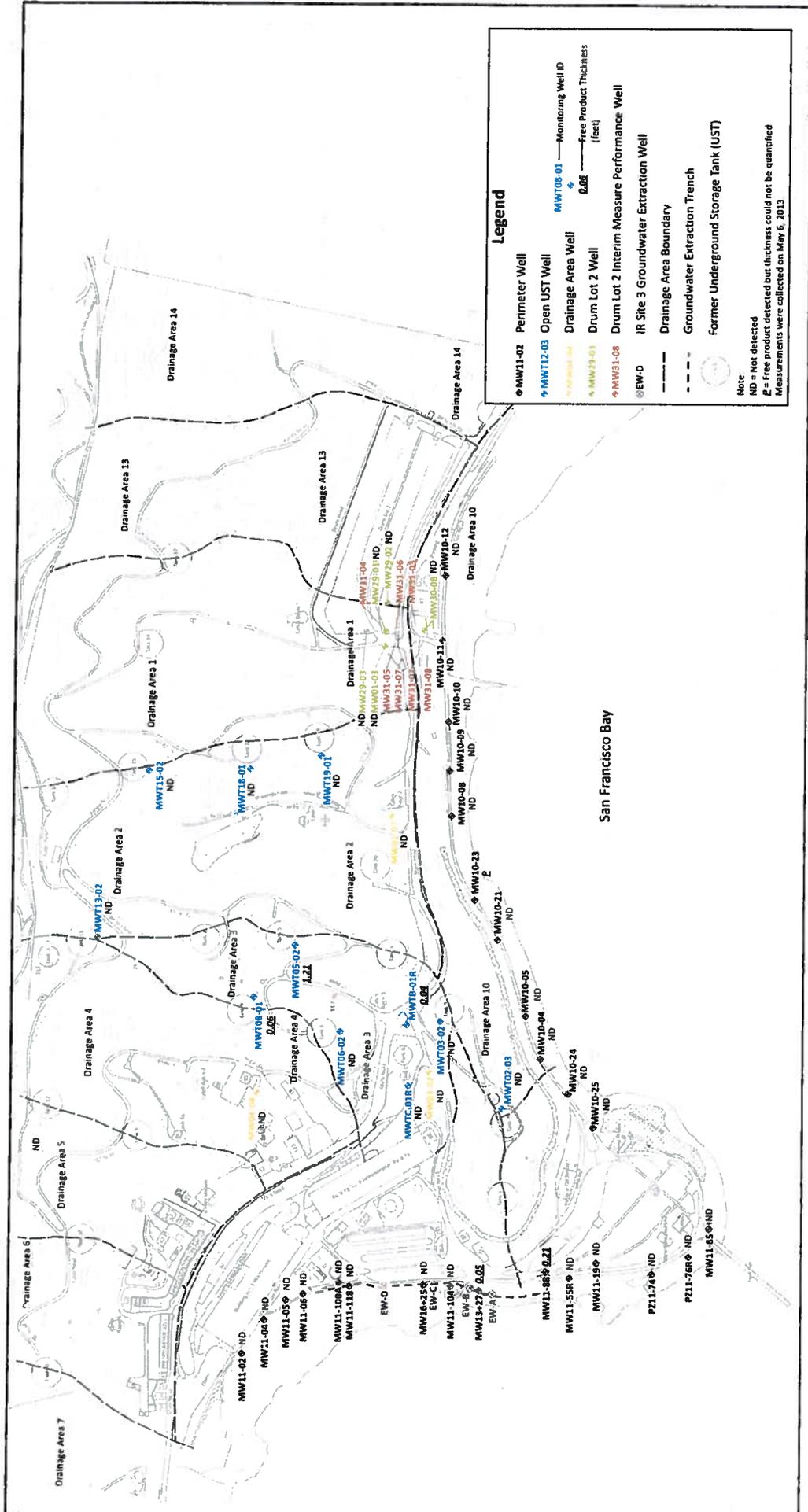
> M 2012 = increase relative to concentrations in May 2012

< O 2012 = decrease relative to concentrations in October 2012

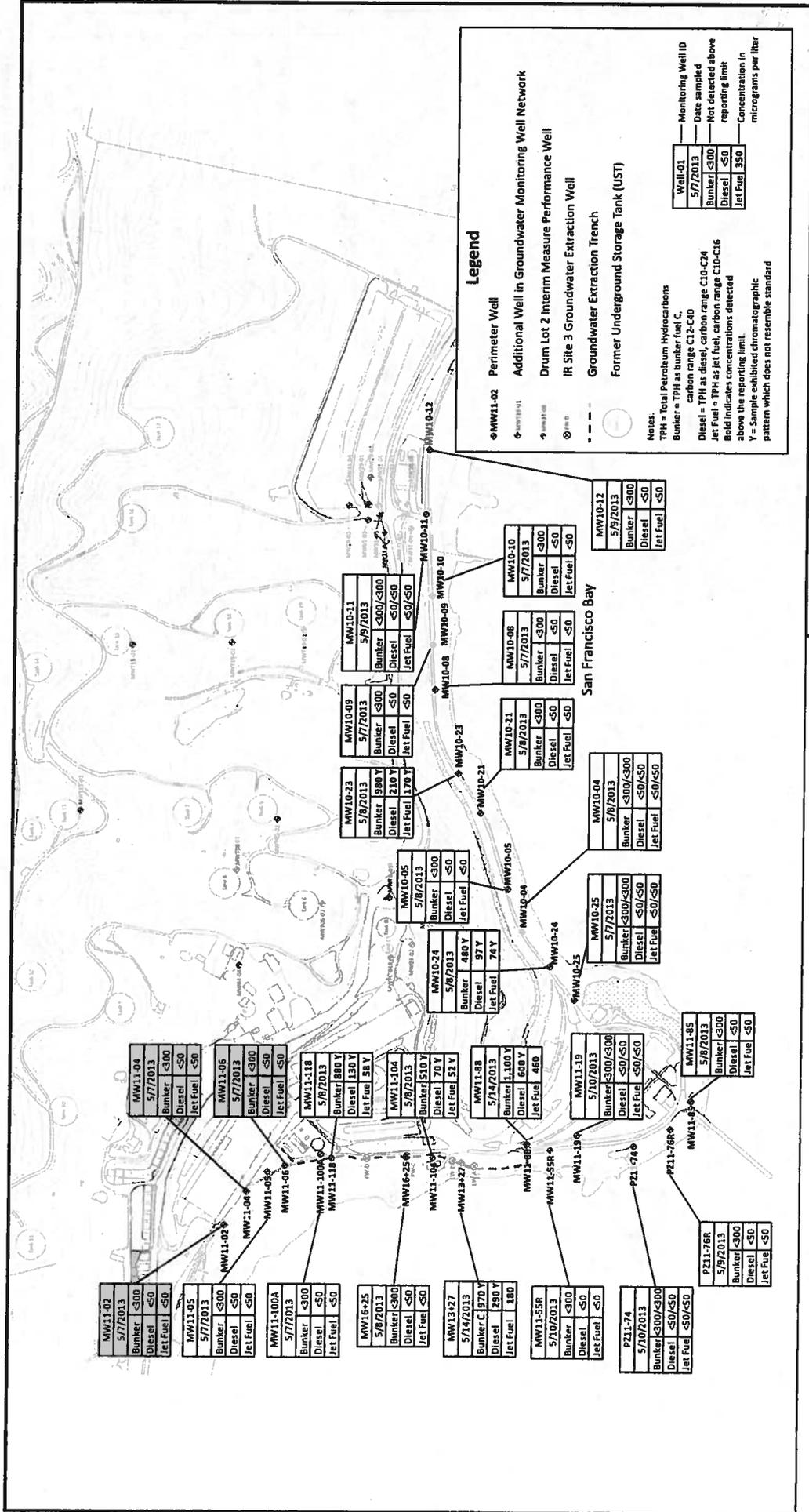
>O 2012 = increase relative to concentrations in October 2012

NC (ND) 2013 = not detected above reporting limits in 2012 or 2013

NC (ND) 2011-2013 = no change, not detected above reporting limits in 2011, 2012, and 2013



 SAFETY FIRST terraparse engineering	Free Product Thickness May 2013
	FIGURE 6
	0001.001.029



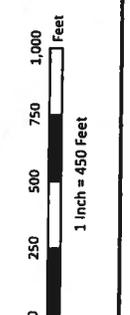
SAFETY FIRST

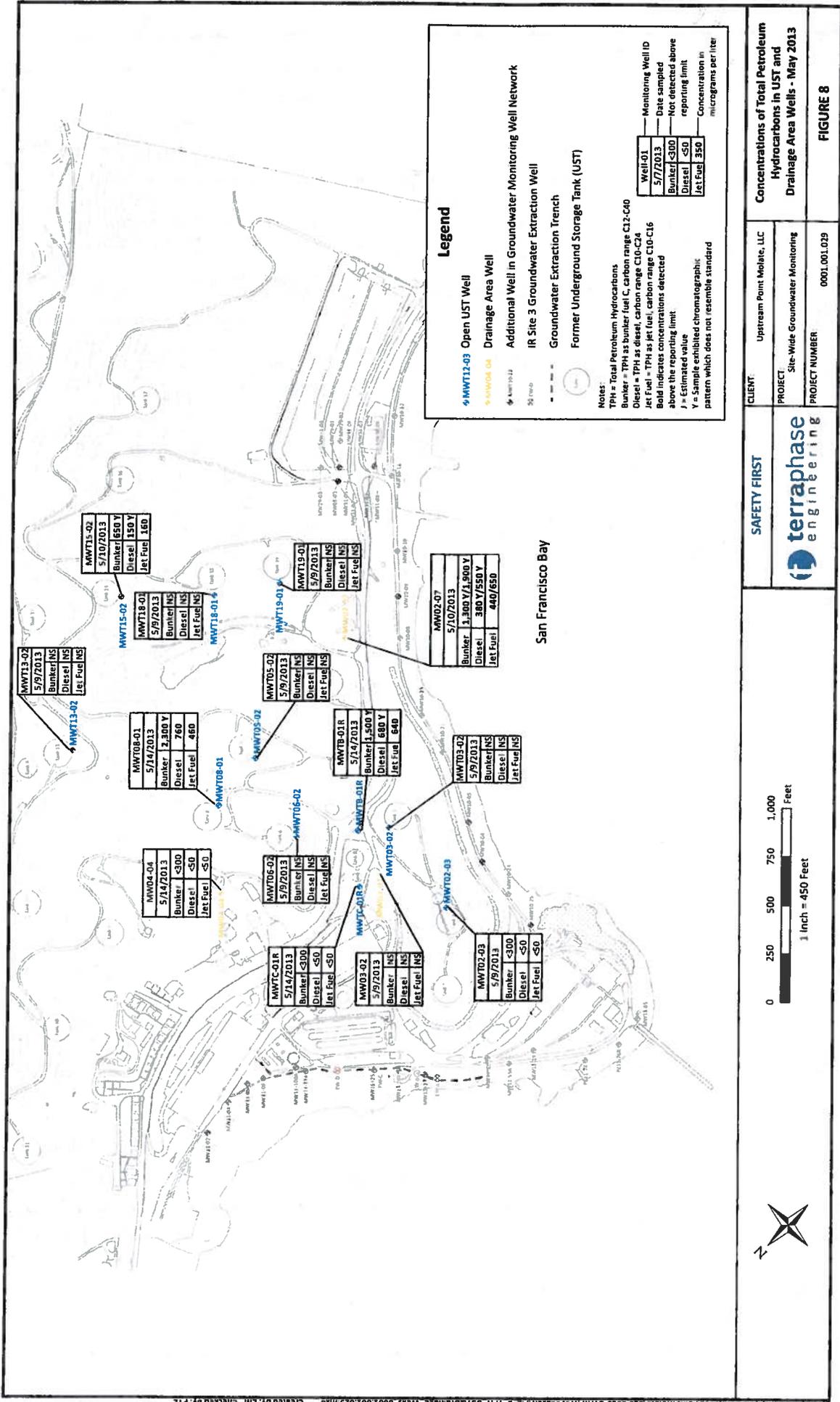
terrapphase
engineering

CLIENT: Upstream Point Mobile, LLC
 PROJECT: Site Wide Groundwater Monitoring
 PROJECT NUMBER: 0001.001.029

Concentrations of Total Petroleum Hydrocarbons in Perimeter Wells
 May 2013

FIGURE 7





Legend

- MW11-03 Open UST Well
- MW04-04 Drainage Area Well
- IR Site 3 Groundwater Extraction Well
- Groundwater Extraction Trench
- Former Underground Storage Tank (UST)

Notes:

- TPH = Total Petroleum Hydrocarbons
- Bunker = TPH as bunker fuel C, carbon range C12-C40
- Diesel = TPH as diesel, carbon range C10-C24
- Jet Fuel = TPH as jet fuel, carbon range C10-C16
- Bold indicates concentrations detected above the reporting limit.
- J = Estimated value
- Y = Sample exhibited chromatographic pattern which does not resemble standard

Well-01	Monitoring Well ID
5/7/2013	Date sampled
Bunker <300	Not detected above reporting limit
Diesel <50	Not detected above reporting limit
Jet Fuel 350	Concentration in micrograms per liter

CLIENT: Upstream Point Moleate, LLC

PROJECT: Site-Wide Groundwater Monitoring

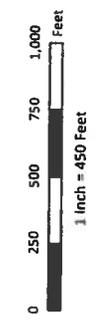
PROJECT NUMBER: 0001.001.0319

SAFETY FIRST

terraphase
engineering

Concentrations of Total Petroleum Hydrocarbons in UST and Drainage Area Wells - May 2013

FIGURE 8



124.23

File: J:\GIS Backup\GIS Data\0001 Point Molate\029 2013 GWM\Wet Season\Fig 9 VOCs DrumLot2_0001.001.029.mxd Created by: EM Checked by: PTZ

Legend

- ◆ MW29-03 Drum Lot 2 Well
- ◆ MW11-02 Perimeter Well
- ◆ MW29-03 Drum Lot 2 Interim Measure Performance Well

Notes:
 J = Estimated value
 9.3/9.1 = Primary and duplicate sample results
 <0.5 = Not detected above the indicated laboratory reporting limit
Bold font indicates concentrations detected above the reporting limit.

MW29-01		Monitoring Well ID
5/9/2013		Date sampled
1,1-Dichloroethene	1,1-DCE 0.5	Concentration in micrograms per liter
cis-1,2-Dichloroethene	cis-1,2-DCE 8	
Trichloroethene	TCE 31	
Vinyl Chloride	VC 0.6	

MW01-03	
5/9/2013	
1,1-DCE	<0.5/<0.5
cis-1,2-DCE	9.3/9.1
TCE	5/5.2
VC	0.2 J/0.1 J

MW29-03	
5/9/2013	
1,1-DCE	<0.5
cis-1,2-DCE	<0.5
TCE	<0.5
VC	<0.5

MW29-01	
5/9/2013	
1,1-DCE	0.5
cis-1,2-DCE	8
TCE	31
VC	0.6

MW29-02	
5/9/2013	
1,1-DCE	<0.5
cis-1,2-DCE	<0.5
TCE	<0.5
VC	<0.5

MW30-08	
5/9/2013	
1,1-DCE	0.5 J
cis-1,2-DCE	63
TCE	2.4
VC	2.7

MW10-11	
5/9/2013	
1,1-DCE	<0.5
cis-1,2-DCE	<0.5
TCE	0.2 J
VC	<0.5

MW10-12	
5/9/2013	
1,1-DCE	<0.5
cis-1,2-DCE	<0.5
TCE	<0.5
VC	<0.5

0 25 50 75 100
 1 Inch = 100 Feet Feet

 	SAFETY FIRST	CLIENT: Upstream Point Molate, LLC	Concentrations of Volatile Organic Compounds in Drum Lot 2 Wells May 2013 FIGURE 9
		PROJECT: Site-Wide Groundwater Monitoring	
		PROJECT NUMBER: 0001.001.029	

12.A.24

Point Molate IR Site 3 Engineer's Estimate

Agenda

- What We Have
 - Engineers estimates for two scenarios
 - Contractor's good faith estimate for thermal desorption for each scenario
- What is the Process
- Viability of Thermal Desorption
- Review of Critical Site Parameters
- Two Scenarios Evaluated
 - Waste management unit (WMU)
 - Unrestricted land use
- Time Lines
- Review of Engineers Estimates

Point Molate IR Site 3 Engineer's Estimate

What We Have

- Terraphase Developed an Engineers Estimate for Two Scenarios
- NER has Provided a Good Faith Estimate for LTTD to be used to Treat Class II Soils in each Scenario
- NER Good Faith Estimate for only a Portion (Class II Soil) of the Work in Each Scenario
- NER's Good Faith Estimate has Two Components:
 - Lump sum items (mob, demob, etc.)
 - Unit price (cost to treat, excavate and replace soil per ton) with assumptions that include (but limited to):
 - Moisture content
 - Salinity
 - Temperature range

Point Molate IR Site 3 Engineer's Estimate

What Is The Process

- ∞ Pre-Design/Design
 - Stage we are in today
 - Engineers estimates used to help define the direction of a project
 - Prepare bid package
 - Advertise
- ∞ Bids for the Selected Treatment Alternative
 - Contractors review bid package
 - Contractors prepare bids and submit
 - Select a contractor
- ∞ Construct

Point Molate IR Site 3 Engineer's Estimate

Viability of Thermal Desorption

- ☞ What We Know
 - Degraded Bunker C
 - PAH's with high boiling points and low clean up standards
- ☞ What's Been Said
 - NER has provided
 - Lab reports for samples represented to have been collected at various projects
 - Do not have signed Engineers reports
 - NER guarantees it will work
- ☞ Graphic from Navy's Application Guide for Thermal Desorption (next slide)

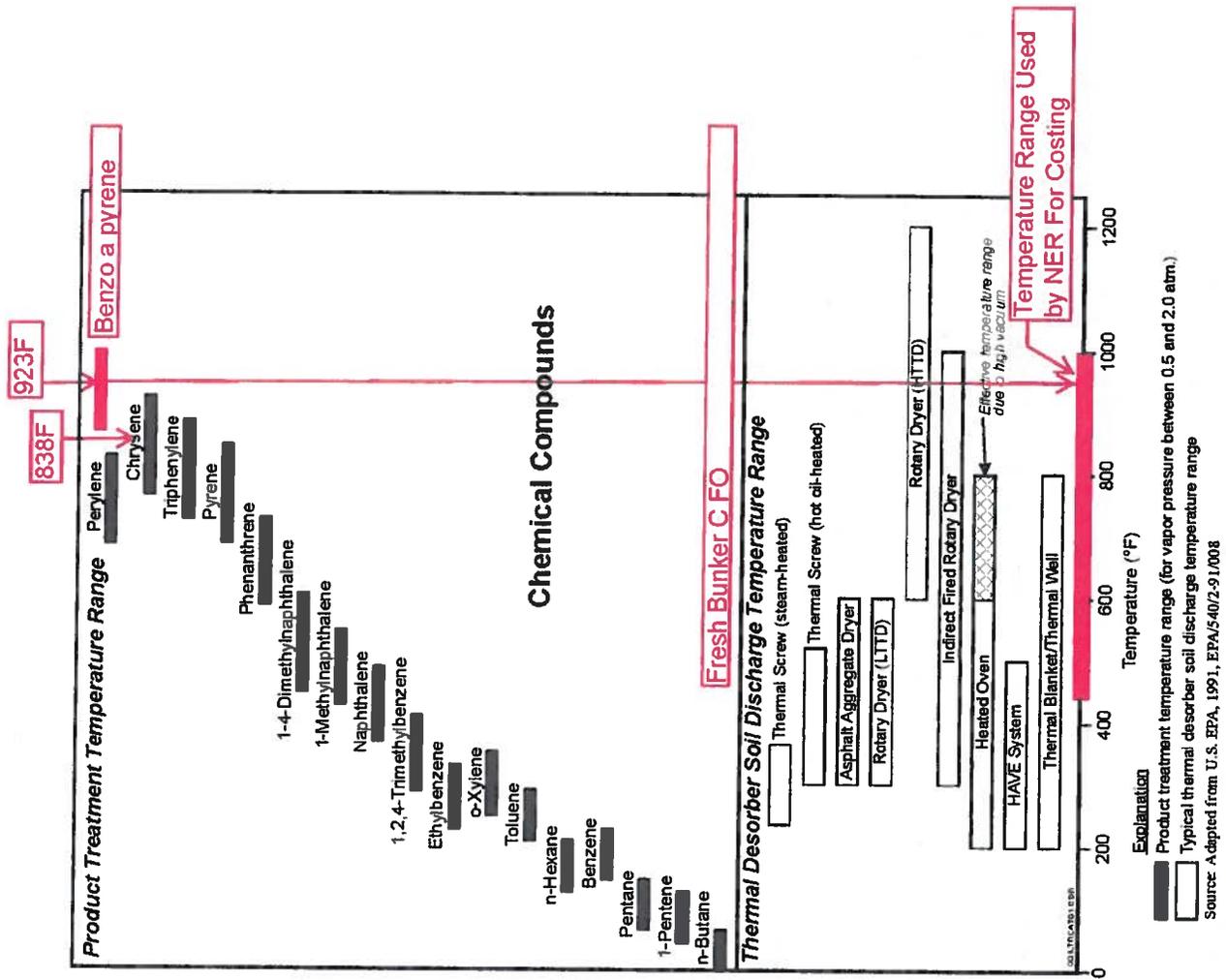


Figure 3-1. Soil Treatment Temperatures for Selected Chemical Compounds and Thermal Desorbers

Point Molate IR Site 3 Engineer's Estimate

Viability of Thermal Desorption

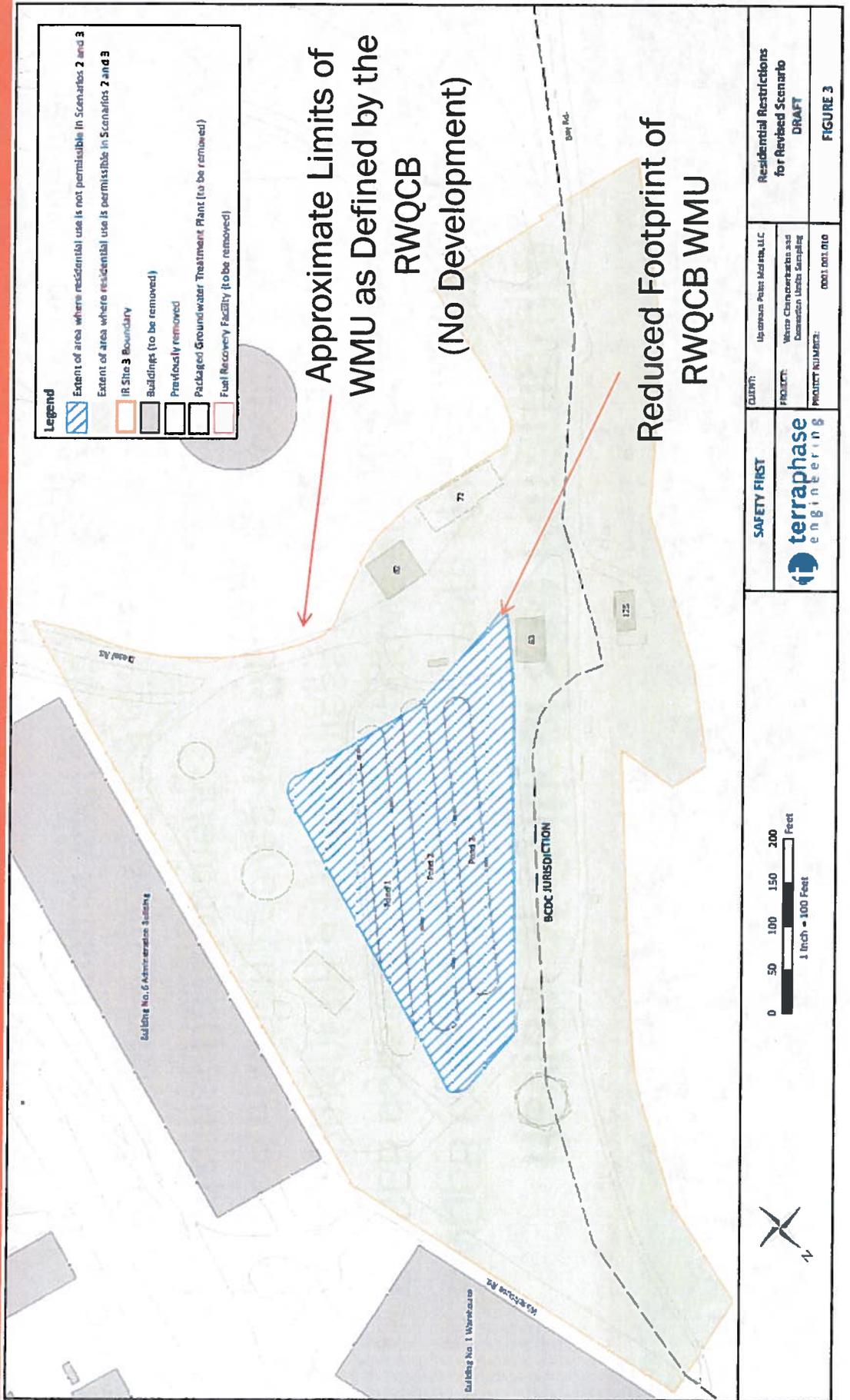
- ✎ NER Guarantee: Re-run soil through treatment again
- ✎ RWQCB Perspective
 - Previously treated soil can be re-treated
 - Previously treated soil cannot be mixed with new soil (is considered dilution)
- ✎ Suitability of Thermal Desorption
 - Cannot say it will work
 - Cannot say it will not work
- ✎ Appears Reasonable to Recommend a Treatability Study
- ✎ NER's Bid is only One Component of the Engineers Estimate for Both Scenarios

Point Molate IR Site 3 Engineer's Estimate

Review of Critical Site Parameters

- ✂ RWQCB Considers IR Site 3 a Waste Management Unit
- ✂ RWQCB does not Intend to Approve any Residential Development on a WMU Unless it is Clean Closed
- ✂ RWQCB Position Leaves Two Options to Accommodate Residential Development:
 - “Clean Closure” (unrestricted land use)
 - Reduced Footprint of WMU (some areas restricted to no residential development)

Point Molate IR Site 3 Engineer's Estimate

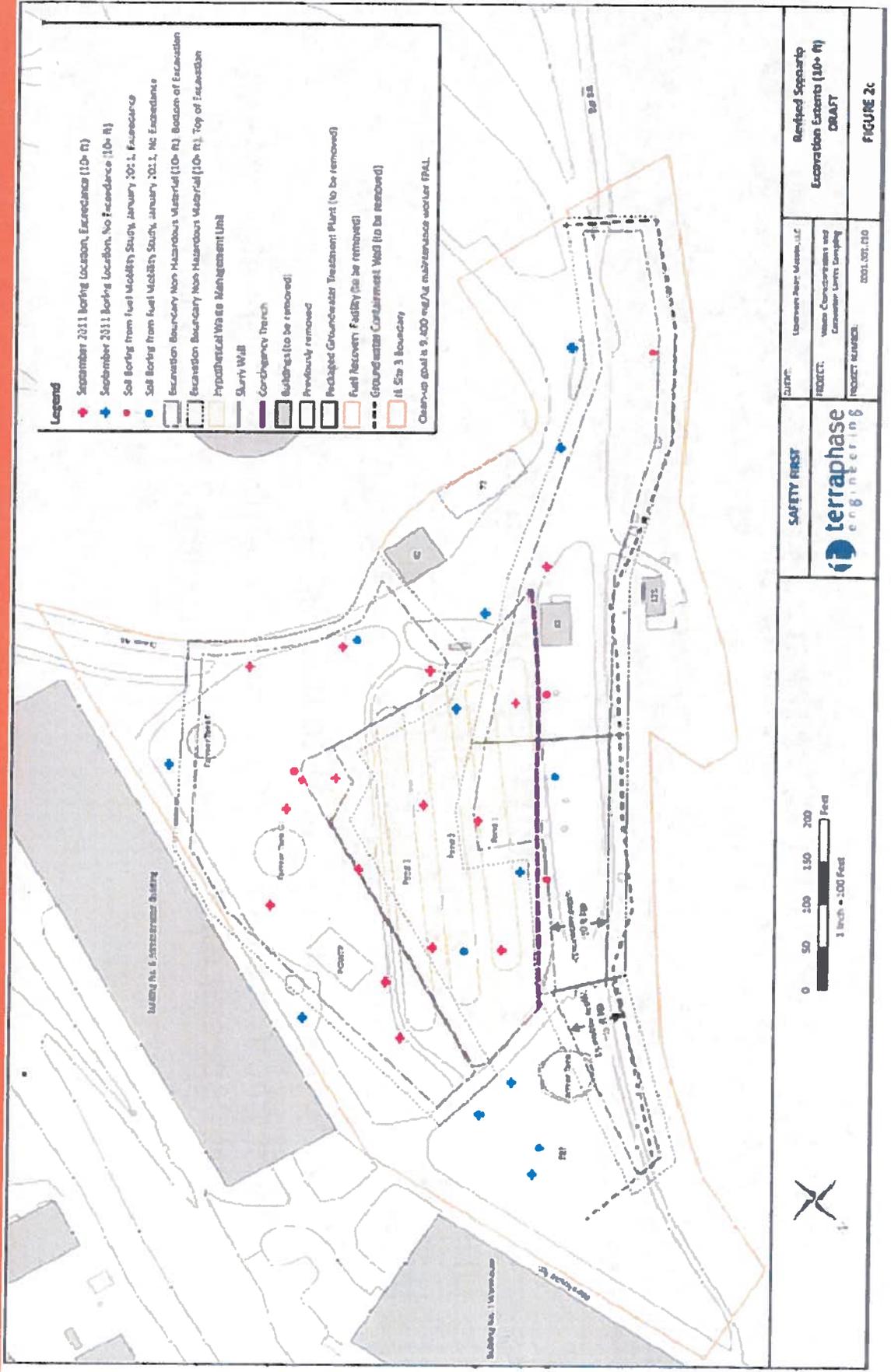


Point Molate IR Site 3 Engineer's Estimate

Scenarios Evaluated

- ∞ Unrestricted Land Use – Clean Closure
- ∞ WMU – Requires Additional Remediation Components
 - Construct a slurry wall around three sides of WMU
 - Construct a “Contingency Trench” on the downgradient side of WMU
 - Install “special material” in backfill material downgradient of WMU

Point Molate IR Site 3 Engineer's Estimate



12.A.2.10

Point Molate IR Site 3 Engineer's Estimate

Time Lines

- ∞ Time Lines Differ for Offsite Disposal vs. Thermal Desorption
- ∞ Increase in Time Line for Thermal Desorption Associated with:
 - CEQA being re-opened
 - Treatability study needed
 - Acquisition of an air permit
- ∞ The Time Lines:

Point Molate IR Site 3 Engineer's Estimate

Time Lines

- INSERT TIME LINE chart

Point Molate IR Site 3 Engineer's Estimate

Engineer's Estimate

- ∞ Two Estimates were Prepared
 - Unrestricted land use
 - WMU
- ∞ Unit Costs were Evaluated
 - Appear to be consistent with industry standards for estimating
 - Disposal and trucking costs were validated
- ∞ Where a Task did not Apply the Line Item was left in but Zeroed Out
 - Wanted everyone to see what costs remain depending upon land use alternative and remediation technology used

Point Molate IR Site 3 Engineer's Estimate

Engineers Estimate

∞ INSERT No Restrictions Estimate

12.A.2.14

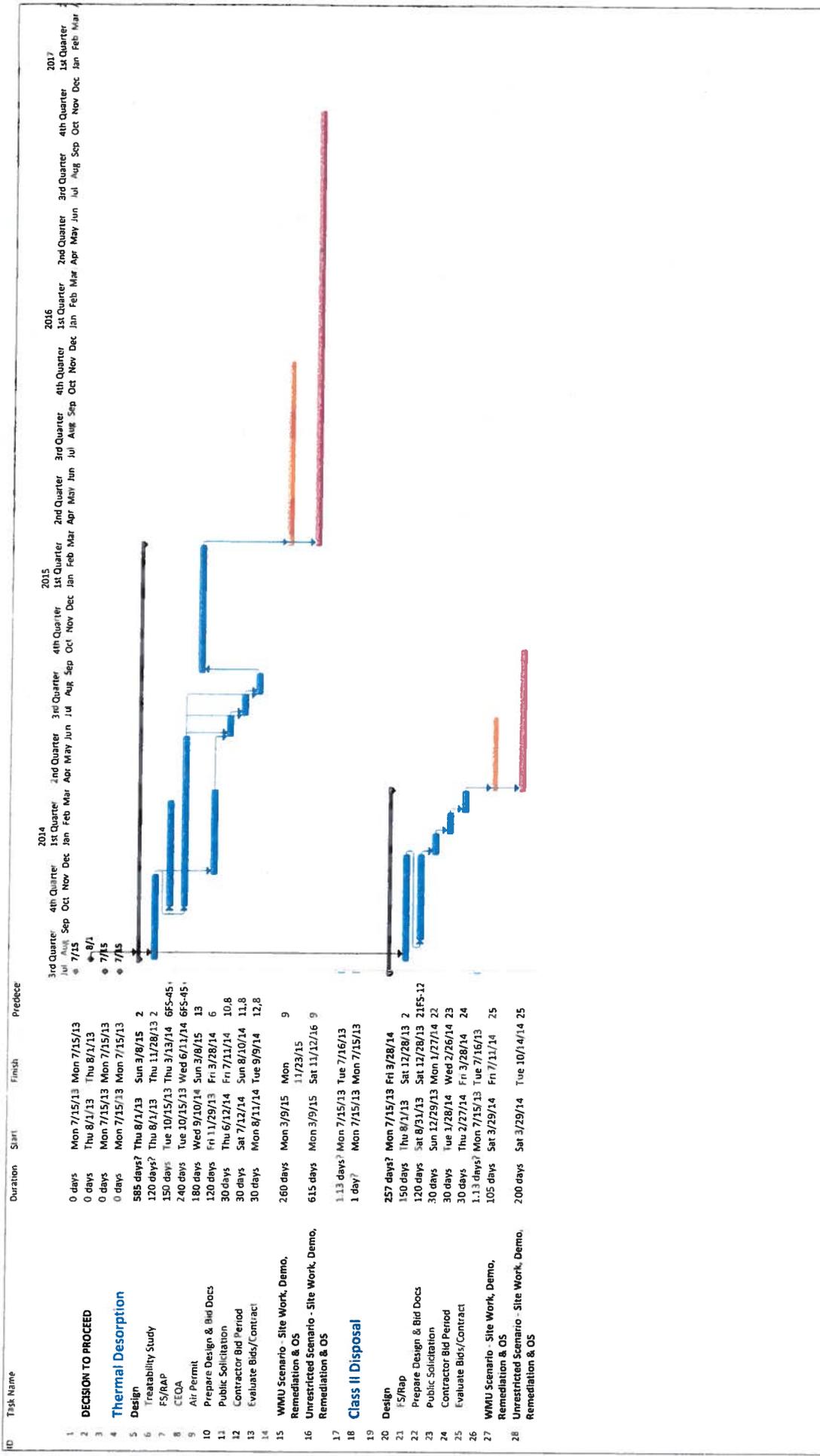
Point Molate IR Site 3 Engineer's Estimate

Engineers Estimate

∞ INSERT WMU Estimate

Point Molate IR Site 3 Engineer's Estimate

Questions/Discussion



ID	Task Name	Duration	Start	Finish	Predecessor
1	DECISION TO PROCEED	0 days	Mon 7/15/13	Mon 7/15/13	
2	Thermal Desorption	0 days	Thu 8/1/13	Thu 8/1/13	
3	Design	0 days	Mon 7/15/13	Mon 7/15/13	
4	FS/RAP	0 days	Mon 7/15/13	Mon 7/15/13	
5	Treatability Study	585 days?	Thu 8/1/13	Sun 3/8/15	2
6	CEQA	120 days	Thu 8/1/13	Thu 11/28/13	2
7	Air Permit	150 days	Tue 10/15/13	Thu 3/13/14	6FS-45+
8	Prepare Design & Bid Docs	240 days	Tue 10/15/13	Wed 6/11/14	6FS-45+
9	Public Solicitation	180 days	Wed 9/10/14	Sun 3/8/15	13
10	Contractor Bid Period	120 days	Fri 11/29/13	Fri 3/28/14	6
11	Evaluate Bids/Contract	30 days	Thu 6/12/14	Fri 7/11/14	10,8
12	WMU Scenario - Site Work, Demo, Remediation & OS	30 days	Sat 7/12/14	Sun 8/10/14	11,8
13	Unrestricted Scenario - Site Work, Demo, Remediation & OS	30 days	Mon 8/11/14	Tue 9/9/14	12,8
14	Class II Disposal	260 days	Mon 3/9/15	Mon 11/23/15	9
15	Design	615 days	Mon 3/9/15	Sat 11/12/16	9
16	FS/RAP	1.13 days?	Mon 7/15/13	Tue 7/16/13	
17	Prepare Design & Bid Docs	1 day?	Mon 7/15/13	Mon 7/15/13	
18	Public Solicitation	257 days?	Mon 7/15/13	Fri 3/28/14	
19	Contractor Bid Period	150 days	Thu 8/1/13	Sat 12/28/13	2
20	Evaluate Bids/Contract	120 days	Sat 8/31/13	Sat 12/28/13	21FS-12
21	WMU Scenario - Site Work, Demo, Remediation & OS	30 days	Sun 12/29/13	Mon 1/27/14	22
22	Unrestricted Scenario - Site Work, Demo, Remediation & OS	30 days	Tue 1/28/14	Wed 2/26/14	23
23	Class II Disposal	30 days	Thu 2/27/14	Fri 3/28/14	24
24	Design	1.13 days?	Mon 7/15/13	Tue 7/16/13	
25	FS/RAP	105 days	Sat 3/29/14	Fri 7/11/14	25
26	Prepare Design & Bid Docs	200 days	Sat 3/29/14	Tue 10/14/14	25
27	Public Solicitation				
28	Contractor Bid Period				
29	Evaluate Bids/Contract				
30	WMU Scenario - Site Work, Demo, Remediation & OS				
31	Unrestricted Scenario - Site Work, Demo, Remediation & OS				
32	Class II Disposal				

Project: Maste Project Time Line
 Date: Fri 7/19/13

Task Split Milestone

Summary Project Summary External Tasks

External Milestone Inactive Task Inactive Milestone

Inactive Summary Manual Task Duration-only

Manual Summary Rollup Manual Summary Start-only

Finish-only Deadline Progress

Page 1

12.A.2.17

12.A.2.18

12.A.2.20

Cost Comparison

Class II Disposal to Thermal Desorption Point Molate IR Site 3

2 - Reduced Footprint WMU And Unrestricted Land Use (Clean Close)

Description	WMU with Offsite Disposal	
	Quantity	Units
Design		
FS/RAP	1	LS
CEQA	0	LS
Treatability Study	0	LS
Air Permit	0	LS
Design Plan/Bid Documents/Bidding	1	LS
Subtotal		
Site Work and Demolition		
Temporary Fencing During Excavation	3,800	LF
Remove Fuel Reclamation Facility (FRF) and Berm	1	LS
Building Demolition	1	LS
Electrical Removal and Replacement	1	LS
LTTD Infrastructure (power)	0	LS
Clear and Grub	11	Acre
Subtotal		
Remediation Activities		
Mob/Demob	1	LS
Dewatering	1	LS
Overburden Excavation	73,400	BCY
Loading (Overburden)	91,750	LCY
RCRA Class I Trans & Disposal	504	Ton
Cal Haz Class I Excavation	2,200	BCY
Cal Haz Class I Disposal	3,693	Ton
Cal Haz Class I Transportation	3,693	Ton
Class I and Cal Haz Loading	2,750	LCY
Class II Excavation	73,422	BCY
Class II Loading	91,777	LCY
Class II Transportation	123,863	Ton
Class II Disposal	123,863	Ton
LTTD Treatment (Exc+Treat+Backfill)	0	Ton
Backfill (replace overburden)	73,400	LCY
Clean Fill Material to replace Class I & Cal Haz	2,200	Ton
Clean Fill Material to replace Class II	123,863	Ton
Special Material	340	Ton
Slurry Wall	25,000	SF
French Drain	15,000	SF
Aeration Contingency trench	10,000	SF
Aeration system	1	LS
Remove Existing Sheet Pile	1	LS
Reseeding	49,500	SY
Subtotal		
Oversight and Sampling		
Soil Profiling for Disposal/Treatment	680	Each
Confirmation Soil Sampling and Analysis Post-Excavation	414	Each
Construction Oversight and Sampling	1,000	Hour
Project Management	700	Hour
Excavation Report	250	Hour
Install Monitoring Wells	1	LS
Implement Land Use Controls (LUC) Mechanisms	1	LS
Regulatory Oversight	1	LS
Subtotal		

Total of Phases 1 through 4	\$11,181,300	
Contingency	15%	percent
Total Estimated Cost Without O&M Annual		
LUC Oversight	20	LS
Annual Groundwater Monitoring Annual Monitoring Reports	20	LS
O&M Subtotal	20	LS
Periodic Reporting Five Year Review Close Out Report		
	4	LS
	1	LS
Total With Ongoing Activities for 20 Years	\$13,968,300	

12.A.2.22

posal of Class II Soil

WMU with LTTD Treatment of Class II Soil

Unit Cost	Extended Cost	Quantity	Units	Unit Cost	Extended Cost
\$150,000	\$150,000	1	LS	\$150,000	\$150,000
\$100,000	\$0	1	LS	\$100,000	\$100,000
\$75,000	\$0	1	LS	\$75,000	\$75,000
	\$0	1	LS		\$0
\$100,000	\$100,000	1	LS	\$100,000	\$100,000
	\$250,000				\$425,000

\$6	\$22,800	3,800	LF	\$6	\$22,800
\$185,160	\$185,160	1	LS	\$185,160	\$185,160
\$99,983	\$99,983	1	LS	\$99,983	\$99,983
\$34,677	\$34,677	1	LS	\$34,677	\$34,677
\$25,000	\$0	1	LS	\$25,000	\$25,000
\$6,548	\$72,028	0	Acre	\$6,548	\$0
	\$414,648				\$367,620

\$50,000	\$50,000	1	LS	\$350,000	\$350,000
\$49,425	\$49,425	0	LS	\$49,425	\$0
\$3	\$190,840	73,400	BCY	\$3	\$190,840
\$1	\$91,750	91,750	LCY	\$1	\$91,750
\$200	\$100,800	504	Ton	\$200	\$100,800
\$3	\$6,600	2,200	BCY	\$3	\$6,600
\$70	\$258,510	3,693	Ton	\$70	\$258,510
\$60	\$221,580	3,693	Ton	\$60	\$221,580
\$2	\$5,500	2,750	LCY	\$2	\$5,500
\$3	\$220,266	0	BCY	\$3	\$0
\$1	\$91,777	0	LCY	\$3	\$0
\$20	\$2,477,260	0	Ton	\$20	\$0
\$20	\$2,477,260	0	Ton	\$20	\$0
\$0	\$0	123,863	Ton	\$65	\$8,051,063
\$4	\$266,442	73,400	LCY	\$4	\$266,442
\$10	\$22,000	2,200	Ton	\$10	\$22,000
\$10	\$1,238,630	0	Ton	\$10	\$0
\$1,500	\$510,000	340	Ton	\$1,500	\$510,000
\$10	\$250,000	25,000	SF	\$10	\$250,000
\$10	\$150,000	15,000	SF	\$10	\$150,000
\$15	\$150,000	10,000	SF	\$15	\$150,000
\$250,000	\$250,000	1	LS	\$250,000	\$250,000
\$210,500	\$210,500	1	LS	\$210,500	\$210,500
\$4	\$198,000	49,500	SY	\$4	\$198,000
	\$9,487,140				\$11,283,585

\$250	\$170,000	268	Each	\$250	\$67,000
\$250	\$103,500	414	Each	\$250	\$103,500
\$108	\$108,000	2,000	Hour	\$108	\$216,000
\$180	\$126,000	850	Hour	\$180	\$153,000
\$108	\$27,000	250	Hour	\$108	\$27,000
\$45,012	\$45,012	1	LS	\$45,012	\$45,012
\$50,000	\$50,000	1	LS	\$50,000	\$50,000
\$400,000	\$400,000	1	LS	\$400,000	\$400,000
	\$1,029,512				\$1,061,512

\$13,137,716						
\$10,931,300	\$1,640,000	15%	percent	\$12,937,000	\$1,941,000	
\$12,821,300				\$15,078,716		
\$10,000	\$200,000	20	LS	\$10,000	\$200,000	
\$15,480	\$310,000	20	LS	\$15,480	\$310,000	
\$19,508	\$391,000	20	LS	\$19,508	\$391,000	
\$901,000				\$901,000		
\$46,000	\$184,000	4	LS	\$46,000	\$184,000	
\$61,400	\$62,000	1	LS	\$61,400	\$62,000	
\$16,225,716						

Unrestricted with Offsite Disposal of Class II Soil				Unrestricted with LTT	
Quantity	Units	Unit Cost	Extended Cost	Quantity	Units
1	LS	\$150,000	\$150,000	1	LS
0	LS	\$100,000	\$0	1	LS
0	LS	\$75,000	\$0	1	LS
0	LS		\$0	1	LS
1	LS	\$100,000	\$100,000	1	LS
			\$250,000		
3,800	LF	\$6	\$22,800	3,800	LF
1	LS	\$185,160	\$185,160	1	LS
1	LS	\$99,983	\$99,983	1	LS
1	LS	\$34,677	\$34,677	1	LS
0	LS	\$25,000	\$0	1	LS
11	Acre	6548	\$72,028	0	Acre
			\$414,648		
1	LS	\$50,000	\$50,000	1	LS
1	LS	\$49,425	\$49,425	0	LS
175,200	BCY	\$3	\$455,520	175,200	BCY
219,000	LCY	\$1	\$219,000	219,000	LCY
504	Ton	\$200	\$100,800	504	Ton
2,200	BCY	\$3	\$5,720	2,200	BCY
3,693	Ton	\$70	\$258,510	3,693	Ton
3,693	Ton	\$60	\$221,580	3,693	Ton
2,750	LCY	\$2	\$5,500	2,750	LCY
177,030	BCY	\$3	\$460,278	0	BCY
221,287	LCY	\$1	\$221,287	0	LCY
295,650	Ton	\$20	\$5,913,000	0	Ton
295,650	Ton	\$20	\$5,913,000	0	Ton
0	Ton	\$0	\$0	295,650	Ton
175,200	LCY	\$4	\$635,976	175,200	LCY
2,200	Ton	\$10	\$22,000	2,200	Ton
295,650	Ton	\$10	\$2,956,500	0	Ton
0	Ton	\$1,500	\$0	0	Ton
0	SF	\$10	\$0	0	SF
0	SF	\$10	\$0	0	SF
10,000	SF	\$15	\$150,000	10,000	SF
0	LS	\$250,000	\$0	0	LS
1	LS	\$210,500	\$210,500	1	LS
49,500	SY	\$4	\$198,000	49,500	SY
			\$18,046,596		
1596	Each	\$250	\$399,000	610	Each
624	Each	\$250	\$156,000	624	Each
2,000	Hour	\$108	\$216,000	4,000	Hour
1,200	Hour	\$180	\$216,000	1,500	Hour
250	Hour	\$108	\$27,000	250	Hour
1	LS	\$45,012	\$45,012	1	LS
1	LS	\$50,000	\$50,000	1	LS
1	LS	\$400,000	\$400,000	1	LS
			\$1,509,012		

12.4.2.25

\$20,220,256			\$24,375,488		
15%	percent	\$20,220,256	\$3,034,000	15%	percent
		\$23,254,256			
5	LS	\$10,000	\$50,000	5	LS
5	LS	\$15,480	\$78,000	5	LS
5	LS	\$19,508	\$98,000	5	LS
		\$226,000			
1	LS	\$46,000	\$46,000	1	LS
1	LS	\$61,400	\$62,000	1	LS
\$23,588,256			\$28,366,488		

D Treatment of Class II Soil

Unit Cost	Extended Cost
\$150,000	\$150,000
\$100,000	\$100,000
\$75,000	\$75,000
	\$0
\$100,000	\$100,000
	\$425,000
\$6	\$22,800
\$185,160	\$185,160
\$99,983	\$99,983
\$34,677	\$34,677
\$25,000	\$25,000
\$6,548	\$0
	\$367,620
\$350,000	\$350,000
\$49,425	\$0
\$3	\$455,520
\$1	\$219,000
\$200	\$100,800
\$3	\$5,720
\$70	\$258,510
\$60	\$221,580
\$2	\$5,500
\$3	\$0
\$3	\$0
\$20	\$0
\$20	\$0
\$65	\$19,217,250
\$4	\$635,976
\$10	\$22,000
\$10	\$0
\$1,500	\$0
\$10	\$0
\$10	\$0
\$15	\$150,000
\$250,000	\$0
\$210,500	\$210,500
\$4	\$198,000
	\$22,050,356
\$250	\$152,500
\$250	\$156,000
\$108	\$432,000
\$180	\$270,000
\$108	\$27,000
\$45,012	\$45,012
\$50,000	\$50,000
\$400,000	\$400,000
	\$1,532,512

12A.2.27

nt	\$24,375,488	\$3,657,000
	\$28,032,488	
	\$10,000	\$50,000
	\$15,480	\$78,000
	\$19,508	\$98,000
	\$226,000	
	\$46,000	\$46,000
	\$61,400	\$62,000