

COMPREHENSIVE LONG-TERM ENVIRONMENTAL ACTION NAVE (CLEAN II)
Northern and Central California, Nevada, and Utah
Contract No. N62474-94-D-7609
Contract Task Order No. 284

Prepared for

DEPARTMENT OF THE NAVY
Ms. Ellen Casados
Remedial Project Manager
Southwest Division
Naval Facilities Engineering Command
San Diego, California

MEETING MINUTES – APRIL 16, 2001
QUALITY ASSURANCE PROJECT PLAN ADDENDUM
AND FIELD SAMPLING PLAN
FOR THE 2001 FACILITYWIDE GROUNDWATER MONITORING PROGRAM

NAVAL STATION TREASURE ISLAND
SAN FRANCISCO, CALIFORNIA

July 10, 2001

TC.0284.11076

Prepared by

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Craig Freeman, Project Manager

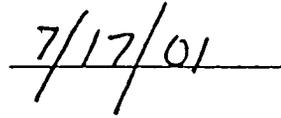
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REVIEW AND APPROVALS

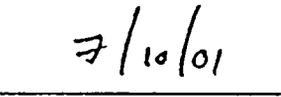

Ellen Casados
Remedial Project Manager, Southwest Division
Naval Facilities Engineering Command
San Diego, California

Date



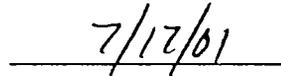

Craig Freeman
Project Manager
Tetra Tech EM Inc.
San Francisco, California

Date




Sarah Raker
Associate Engineering Geologist
California Regional Water Quality Control Board
San Francisco Bay Region
Oakland, California

Date



Phillip Ramsey
Remedial Project Manager
Region 9
U.S. Environmental Protection Agency
San Francisco, California

Date



TRANSMITTAL/DELIVERABLE RECEIPT

Contract No. N62474-94-D-7609

Document Control No. TC.0284.11076

TO: Mr. Ron Fuller, Code 02R1.RF
Contracting Officer
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1230 Columbia Street Suite 1100
San Diego, CA 92101-8517

DATE: 9/10/01
CTO: 0284
LOCATION: NAVSTA Treasure Island, San Francisco

FROM: Daniel Chow, Program Manager

DOCUMENT TITLE AND DATE:

Quality Assurance Project Plan Addendum and Field Sampling Plan, Meeting Minutes,
April 16, 2001

TYPE: [] Contractual Deliverable [] Technical Deliverable (DS) [x] Other (TC)

VERSION: NA REVISION #: NA
(e.g., Draft, Draft Final, Final)

ADMIN RECORD: Yes [x] No [] CATEGORY: Confidential []

SCHEDULED DELIVERY DATE: 8/16/01 ACTUAL DELIVERY DATE: 9/13/01

NUMBER OF COPIES SUBMITTED TO NAVY: O/4C/4E
O = original transmittal form
C = copy of transmittal form
E = enclosure

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**MEETING MINUTES – APRIL 16, 2001
QUALITY ASSURANCE PROJECT PLAN ADDENDUM
AND FIELD SAMPLING PLAN
FOR THE 2001 FACILITYWIDE GROUNDWATER MONITORING PROGRAM**

**NAVAL STATION TREASURE ISLAND
SAN FRANCISCO, CALIFORNIA**

These minutes summarize the discussions engaged in during a meeting held to discuss the Quality Assurance Project Plan (QAPP) Addendum and Field Sampling Plan (FSP) for the 2001 Facilitywide Groundwater Monitoring Program at Naval Station Treasure Island, San Francisco, California. Representatives of the U.S. Navy (Navy), the San Francisco Bay Regional Water Quality Control Board (RWQCB), the U.S. Environmental Protection Agency (EPA) Region 9, Tetra Tech EM Inc. (TtEMI), and The IT Group attended the meeting. The meeting was held on April 16, 2001 at the offices of the RWQCB in Oakland, California.

These minutes summarize general discussion and items that were agreed upon by the parties present at the meeting, as well as action items. The following individuals attended the meeting:

Ross Berman	TtEMI
Anne Cahn	The IT Group
Ellen Casados	Department of the Navy
Craig Freeman	TtEMI
Sarah Raker	San Francisco Bay RWQCB
Phillip Ramsey	EPA Region 9

1.0 Introductions

Following introductions, Ellen Casados and Craig Freeman outlined the format of the meeting, which included an overview of the program; an introduction to analytic results; a site-by-site review of data and the proposed approach for 2001 sampling, as detailed in the FSP and QAPP addendum; and a summary of post-meeting action items.

2.0 Overview of the Program

Craig Freeman of TtEMI presented two flow charts, both used in the 2000 monitoring program, that depict (1) an overview of the facilitywide groundwater monitoring program and (2) the sampling frequency for groundwater monitoring wells. Mr. Freeman also introduced the proposed schedule for groundwater monitoring events during 2001. The participants then discussed seasonal variation related to the fate and transport characteristics of individual analytes of concern (AOC). It was agreed that the Navy will conduct sampling events in May, August, October, and December 2001 and that seasonal coverage would be sufficient for monitoring during 2001. No action items resulted from the discussion.

On behalf of the Navy, Mr. Freeman also presented the proposed analytical methods for analysis of groundwater samples. The proposed methods were consistent with those of the 2000 monitoring program. Sarah Raker of the RWQCB commented that the method identified for volatile organic compounds (VOC) – Contract Laboratory Program (CLP), low level – should also refer to Method 8260. Mr. Freeman responded that the Navy would include a reference to Method 8260 in the groundwater

analytical protocol table if the CLP method was not distinct from Method 8260, which, he noted, he believed was the case.

Last, the Navy noted that, although verbal approval had been provided previously, formal written approval of the 2000 QAPP and FSP by the RWQCB remained outstanding. Ms. Raker indicated that written approval would be provided shortly (see the action items listed below).

3.0 Introduction to the Analytic Results

Mr. Freeman introduced three tables of preliminary analytical results: (1) the statistical summary analytical results table, (2) the detected AOC table (hereafter referred to as the detects table), and (3) the monitoring well sampling results table. Ms. Raker noted that the screening criteria used in the tables do not include criteria specific to the human health air inhalation pathway. The Navy noted that site-specific air monitoring data may be collected in the future, after the existing soil and groundwater data have been reviewed.

4.0 Site-by-Site Review

During this portion of the meeting, TtEMI and the Navy summarized the current status of the groundwater, as detailed in working draft analytical results tables provided to participants in the meeting, presented recommendations for groundwater monitoring during 2001, and highlighted the limited number of cases in which recommendations for the 2001 groundwater monitoring program vary from the practices pursued under the groundwater monitoring program for 2000. Attachment 1 to these minutes presents a copy of Table 4-1, which was presented at the meeting and which details the recommended data collection requirements for 2001 groundwater monitoring. Because the analytical results tables are voluminous (approximately 250 pages), that working draft information is not included in these minutes.

Site 01: As is consistent with analysis presented by Mr. Freeman in 2000, this groundwater site remains inactive because of the lack of detection of AOCs at elevated levels in groundwater. Accordingly, as recommended in 2000, Mr. Freeman proposed no sampling at this site in 2001. No disagreement with the recommendation was noted.

Site 04/19: As is consistent with analysis presented in 2000, this groundwater site remains inactive because of the lack of detection of AOCs at elevated levels in groundwater. However, two wells at Site 04/19 were proposed for downgradient monitoring for Site 24, as was conducted in 2000. No disagreement with the recommendation was noted.

Site 06: Mr. Freeman recommended no changes from the 2000 monitoring program. Ms. Raker asked about the Site 06 pilot interim action to be conducted by The IT Group and asked what monitoring would take place. Mr. Freeman replied that The IT Group's FSP calls for limited monitoring of AOCs, but that the remediation wells, because of their design, were not recommended for groundwater monitoring under the facilitywide groundwater monitoring program. No disagreement with the proposed approach was noted.

Site 07/10: As is consistent with analysis presented in 2000, this groundwater site remains inactive because of the lack of detection of AOCs at elevated levels in groundwater. Accordingly, as recommended in 2000, Mr. Freeman proposed no groundwater monitoring at this site in 2001. No disagreement with the recommendation was noted.

Site 09: As is consistent with tentative recommendations presented by TtEMI in 2000 and as supported by 2000 monitoring data (presented at the meeting), Mr. Freeman recommended the suspension of groundwater monitoring at this site. Ms. Raker asked whether a no-further-action letter had been issued for Site 09. Ms. Casados responded that the site is still open and that Navy-contracted Remedial Project Manager (Anteon), Mr. Paul Rosenfeld, is managing Site 09. No arguments against the suspension of sampling were presented.

Site 11: Mr. Freeman recommended no changes from the 2000 monitoring program. Ms. Raker asked whether monitoring at Site 11 will continue, in light of the proposed property transfer. Ms. Casados responded that monitoring will continue if the Navy retains access to the site. No disagreement with the proposed approach was noted.

Site 12: Mr. Freeman recommended that the sampling approach for 2001 be identical to that for 2000, with the addition of sampling of new monitoring wells 28 through 32. Phillip Ramsey of EPA Region 9 asked whether the Navy, in addition to the proposed monitoring for polychlorinated biphenyls (PCB) in well 12-MW32, should also monitor for semivolatile organic compounds (SVOC). Mr. Freeman indicated that he had been discussing that matter with the project manager for the site and that TtEMI would include sampling for SVOCs if the conceptual model for the site included the potential release of related contaminants. Excluding the resolution of the sampling suite for well 12-MW32, no disagreement with the proposed approach was noted.

Site 24: Mr. Freeman recommended that the sampling approach for 2001 be largely identical to that for 2000, with the addition of well-specific sampling for total petroleum hydrocarbons in support of the adjoining pipeline investigations and metals data from well 24-MW03, as detailed in Table 4-1. No dissent to the proposed approach was noted, although Mr. Ramsey repeated concerns about the need to assess potential impacts by the air inhalation pathway.

(NOTE: at this point in the meeting Mr. Ramsey departed and noted that Ms. Raker's input would suffice in his stead.)

Site 14/22: Mr. Freeman recommended the 2001 sampling program for this site (Table 4-1; see Attachment 1), which is virtually identical to that for the 2000 monitoring program. No disagreement with the proposed approach was noted.

Site 15: On the basis of review of 2000 monitoring results, which showed that AOCs were not detected at elevated levels, Mr. Freeman recommended the suspension of groundwater monitoring at this site. Ms. Raker noted concurrence but also expressed concern about the positioning of the four monitoring wells at the site, one of which was installed in 2000.

Site 17: Mr. Freeman recommended the 2001 sampling program for one well at this site, 17-MW01 (Table 4-1; see Attachment 1). No disagreement with the proposed approach was noted.

Site 1A: Mr. Freeman noted that no groundwater monitoring is proposed during 2001 for this inactive UST site. No disagreement with the proposed approach was noted.

Site 1E: Mr. Freeman noted that no groundwater monitoring is proposed during 2001 for this inactive UST site. No disagreement with the proposed approach was noted.

Site 180C: Mr. Freeman noted that this UST site, which was previously monitored by another Navy contractor, was new to the facilitywide groundwater monitoring program. Mr. Freeman identified the proposed approach and sample suite (Table 4-1), which Ms. Raker accepted.

Site 20: As is consistent with analysis Mr. Freeman presented in 2000, this groundwater site remains inactive because of the lack of detection of AOCs at elevated levels in groundwater. Accordingly, as recommended in 2000, Mr. Freeman proposed no sampling at this site in 2001. No arguments were presented against the continued suspension of sampling.

Site 201: Mr. Freeman noted that this UST site, which was previously monitored by another Navy contractor, was new to the facilitywide groundwater monitoring program. Mr. Freeman identified the proposed approach and sample suite (Table 4-1), which Ms. Raker accepted.

Site 21: Mr. Freeman identified the proposed sample suite for this site, which is identical to that for 2000 monitoring, with the addition of new wells. Mr. Freeman indicated that, because of their small diameter (1 inch), the wells proposed for installation in July 2001 would be sampled with a peristaltic pump. Ms. Raker concurred with the sampling approach.

Site 227: Mr. Freeman noted that this UST site, which was previously monitored by another Navy contractor, was new to the facilitywide groundwater monitoring program. Mr. Freeman identified the proposed approach and sample suite (Table 4-1), which Ms. Raker accepted.

Site 25: Mr. Freeman recommended a sampling approach identical to that for the 2000 monitoring program, with additional laboratory attention to the quantification of detections of isopropyl benzene. Ms. Raker accepted the proposed approach.

Site 368A: Mr. Freeman noted that no groundwater monitoring is proposed during 2001 for this inactive UST site. No disagreement with the proposed approach was noted.

Site 368B: Mr. Freeman noted that this UST site, which was previously monitored by another Navy contractor, was new to the facilitywide groundwater monitoring program. Mr. Freeman identified the proposed approach and sample suite (Table 4-1), which Ms. Raker accepted.

Site D4B: Mr. Freeman noted that this pipeline site was new to the facilitywide groundwater monitoring program. Mr. Freeman identified the proposed approach and sample suite (Table 4-1), which Ms. Raker accepted.

Site F2A/F2B: Mr. Freeman noted that this pipeline site was new to the facilitywide groundwater monitoring program. Mr. Freeman identified the proposed approach and sample suite (Table 4-1), which Ms. Raker accepted.

Site USCG: Mr. Freeman noted that this pipeline site was new to the facilitywide groundwater monitoring program. Mr. Freeman identified the proposed approach and sample suite (Table 4-1), which Ms. Raker accepted.

5.0 Action Items

The participants adopted the following action items:

- ✓ Ms. Raker will send a letter to the Navy to indicate the concurrence of the RWQCB with the year 2000 QAPP and FSP. (NOTE: Ms. Raker subsequently provided written concurrence in a letter dated April 16, 2001.)

- ✓ Ross Berman of TtEMI will send a hard copy of the revised Groundwater Screening Criteria for Naval Station Treasure Island to Ms. Raker; Mr. Ramsey; and Mr. Dave Rist, California Department of Toxic Substance Control (DTSC). (NOTE: TtEMI distributed working draft copies of the groundwater screening criteria on May 10, 2001.)
- ✓ Ms. Raker will send the Navy a letter that indicates the concurrence of the RWQCB with the revisions of the Groundwater Screening Criteria for Naval Station Treasure Island.
- ✓ TtEMI will prepare meeting minutes, including a signature approval page. The meeting minutes, combined with a signed approval page, will indicate concurrence by all parties in attendance with the proposed approach for the 2001 facilitywide groundwater monitoring program at Naval Station Treasure Island). (NOTE: Ms. Raker subsequently provided written concurrence in a letter dated April 16, 2001.)

ATTACHMENT 1

**TABLE 4-1
2001 DATA COLLECTION REQUIREMENTS
FACILITYWIDE GROUNDWATER MONITORING PROGRAM
NAVAL STATION TREASURE ISLAND**

TABLE 4-1
2001 DATA COLLECTION REQUIREMENTS
FACILITYWIDE GROUNDWATER MONITORING PROGRAM
NAVAL STATION TREASURE ISLAND

Well No	Monitoring Program	Well Type	Analytes of Concern (AOC) Data							Fate and Transport Data Monitored Natural Attenuation (MNA)										Maximum Sampling Frequency				Near-shore Well - Sample within 3 hours of onset of low tide	Comments						
			Laboratory Analyses							Laboratory Analyses				Field Test Kit Analyses			Field Measurement			Field Measurement	Field Measurement	Quarterly Sampling	Semi-Annual Sampling			Annual Sampling	Water Levels Only				
			Metals	PCBs	SVOCs	TPH-e	TPH-p	VOCs	Major Anions (Chloride & Sulfate)	Methane, Ethane, & Ethene	Nitrate/Nitrite	Sulfide (H ₂ S)	VOCs	Alkalinity	Iron (Fe ²⁺)	Manganese (Mn ²⁺)	Oxidation-Reduction Potential	Oxygen, dissolved	pH									Water Level	Oil/Water Interface		
Site 01 - Medical Clinic																							No analytes of concern (AOC).								
01-MW01	R	S							1	1	1	1	1	1	1	1	1	1	1	1	1	1	4			X		Alternative use, background well for MNA (MNA data only)			
Total:									1	1	1	1	1	1	1	1	1	1	1	1	1	1	4			1					
Site 4 - Hydraulic Training School / Site 19 Refuse Transfer Area																							No site-specific analytes of concern.								
4/19-MW01	P	U																					4			X		Downgradient VOC data for Site 24.			
4/19-MW02	P	D																					4			X		Downgradient VOC data for Site 24.			
4/19-MW03	P	D																					4			X		Site 24 downgradient data better obtained from 4/19-MW01			
Total:																							12			2		1			
Site 06 - Fire Training School																															
06-MW01	P	S	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	4			X					
06-MW02	P	S	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	4			X					
06-MW03	P	C	1	1	1	1	1	1															4			X					
06-MW07	P	U	1	1	1	1	1	1															4			X					
06-MW09	P	A	U																				4				X	Site 06 AOC data: use alternate upgradient well 06-MW07			
06-MW10	P	U	1	1	1	1	1	1															4			X					
06-MW14	P	U	1	1	1	1	1	1															4			X					
06-MW15	P	C	1	1	1	1	1	1															4			X					
06-MW16	P	D	2	2	2	2	2	2															4			X					
06-MW17	P	D	2	2	2	2	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	4			X		X			
06-MW18	P	D	2	2	2	2	2	2															4			X					
06-MW19	P	C	1	1	1	1	1	1															4			X					
06-MW20	P	A	U																				4				X	Site 06 AOC data: use alternate upgradient wells 06-MW07, 10 and 14			
06-MW21	P	C	1	1	1	1	1	1															4			X					
06-MW22	P	S	2	2	2	2	2	2															4			X					
06-MW23	P	N	D	4	4	4	4	4	2	2	2	2	2	2	2	2	2	2	2	2	2	2	4			X					
06-MW24	P	N	D	4	4	4	4	4															4			X					
Total:			27	27	27	27	27	27	7	7	7	7	7	7	7	7	7	7	7	7	7	7	68			2		6	7	2	1
Site 09 - Foundry																							Recommendation: suspend sampling--no analytes of concern.								
09-MW01	R	S																					4			X					
Total:																							4				1				

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Well No	Monitoring Program	Well Type	Analytes of Concern (AOC) Data							Fate and Transport Data													Maximum Sampling Frequency				Comments	
			Laboratory Analyses							Monitored Natural Attenuation (MNA)							Field Test Kit Analyses		Field Measurement		Field Measurement	Field Measurement	Quarterly Sampling	Semi-Annual Sampling	Annual Sampling	Water Levels Only		Near-shore Well - Sample within 3-hours of onset of low tide
			Metals	PCBs	SVOCs	TPH-e	TPH-p	VOCs	Major Anions (Chloride & Sulfate)	Methane, Ethane & Ethene	Nitrate/Nitrite	Sulfide (H ₂ S)	VOCs	Alkalinity	Iron (Fe ²⁺)	Manganese (Mn ²⁺)	Oxidation-Reduction Potential	Oxygen, dissolved	pH	Water Level								
Site 11 - Yerba Buena Island Landfill																								<i>Continuation of monitoring contingent upon resolution of property transfer.</i>				
11-MW02	R	D	2	2	2	2	2	1	1	1	1	*	1	1	1	1	1	1	1	4			X			X		
11-MW03	R	U	1	1	1	1	1													4			X					
11-MW04	R	S	2	2	2	2	2	1	1	1	1	*	1	1	1	1	1	1	1	4			X			X		
11-MW05	R	D	2	2	2	2	2	1	1	1	1	*	1	1	1	1	1	1	1	4			X			X		
11-MW06	R	C	1	1	1	1	1													4				X		X		
11-MW07	R	D	2	2	2	2	2													4			X			X		
Total:			10		10	10	10	10	3	3	3	3		3	3	3	3	3	3	24			4	2		5		
Site 12 - Old Bunker Area																												
12-MW01	R	S	2	2	2	2	2													4			X			X		
12-MW03	R	S	2	2	2	2	2													4			X					
12-MW05	R(p)	D	2	2	2	2	2	2	2	2	2	*	2	2	2	2	2	2	2	4			X			X		
12-MW06	R(p)	C	1	1	1	1	1	1	1	1	1	*	1	1	1	1	1	1	1	4				X				
12-MW07	R(p)	U	1	1	1	1	1	1	1	1	1	*	1	1	1	1	1	1	1	4				X				
12-MW08	R	S	2	2	2	2	2													4			X					
12-MW09	R	S	2	2	2	2	2													4			X					
12-MW11	R	S	2	2	2	2	2													4			X			X		
12-MW13	R	S	2	2	2	2	2													4			X					
12-MW14	R	S	2	2	2	2	2	2	2	2	2	*	2	2	2	2	2	2	2	4			X					
12-MW15	R	S	2	2	2	2	2	1	1	1	1	*	1	1	1	1	1	1	1	4			X					
12-MW16	R	S	2	2	2	2	2	1	1	1	1	*	1	1	1	1	1	1	1	4			X					
12-MW17	R	S	2	2	2	2	2	1	1	1	1	*	1	1	1	1	1	1	1	4			X			X		
12-MW18	R	S	2	2	2	2	2	1	1	1	1	*	1	1	1	1	1	1	1	4			X					
12-MW19	R	S	2	2	2	2	2	1	1	1	1	*	1	1	1	1	1	1	1	4			X					
12-MW20	R(p)	S	2	2	2	2	2	1	1	1	1	*	1	1	1	1	1	1	1	4			X					
12-MW21	R(p)	S	2	2	2	2	2	1	1	1	1	*	1	1	1	1	1	1	1	4			X					
12-MW22	R(p)	D	2	2	2	2	2	1	1	1	1	*	1	1	1	1	1	1	1	4			X			X		
12-MW23	R(p)	D	2	2	2	2	2	2	2	2	2	*	2	2	2	2	2	2	2	4			X			X		
12-MW24	R(p)	S	2	2	2	2	2	2	2	2	2	*	2	2	2	2	2	2	2	4			X					
12-MW25A1	NA	NA																									Piezometer installed for tidal mixing study; location does not require groundwater monitoring.	
12-MW25A2	NA	NA																									Piezometer installed for tidal mixing study; location does not require groundwater monitoring.	
12-MW25A3	NA	NA																									Piezometer installed for tidal mixing study; location does not require groundwater monitoring.	

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NAVAL STATION TREASURE ISLAND**

Well No	Monitoring Program	Well Type	Analytes of Concern (AOC) Data										Fate and Transport Data										Maximum Sampling Frequency				Near-shore Well--Sample within 3-hours of onset of low tide	Comments		
			Laboratory Analyses										Monitored Natural Attenuation (MNA)										Field Measurement	Field Measurement	Quarterly Sampling	Semi-Annual Sampling			Annual Sampling	Water Levels Only
			Metals	PCBs	SVOCs	TPH-e	TPH-p	VOCs	Major Anions (Chloride & Sulfate)	Methane, Ethane, & Ethene	Nitrate/Nitrite	Sulfide (H ₂ S)	VOCs	Alkalinity	Iron (Fe ²⁺)	Manganese (Mn ²⁺)	Oxidation-Reduction Potential	Oxygen, dissolved	pH	Water Level	Oil/Water Interface									
Site 17 Tanks 103/104																									No site-specific analytes of concern					
17-MW01	R	U	2															4							X			Metals data per request of Site 05 PM (downgradient position from Site 05)		
Total:			2															4							1					
UST Site 180C																									Waste oil					
180C-MW1	P	D	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	4									X			
180C-MW2	P	C	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	4									X			
180C-MW3	P	U	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	4									X			
180C-MW4	P	S																		2								X	Floating product--no sampling at this time; sampling to recommence subsequent to interim action	
Total:			4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	12	2							3	1			
UST Site 1A																									No analytes of concern.					
1A-MW1	P																													Site closure pending. Well to be abandoned in May 2001
1A-MW2	P																	4									X		Site closure pending.	
1A-MW3	P																													Site closure pending. Well to be abandoned in May 2001
Total:																		4								1				
UST Site 1E																									No analytes of concern.					
1E-MW1	P																													Site closure pending. Well to be abandoned in May 2001
1E-MW2	P																													Site closure pending. Well to be abandoned in May 2001
1E-MW3	P																	4									X		Site closure pending.	
Total:																		4								1				
Site 20 - Auto Hobby Shop / Transportation Center																									No analytes of concern.					
20-MW01	P	U																4											X	
20-MW04	P	D																4											X	
20-MW05	P	S																4										X		
Total:																		12								3				

**TABLE 4-1
2001 DATA COLLECTION REQUIREMENTS
FACILITYWIDE GROUNDWATER MONITORING PROGRAM
NAVAL STATION TREASURE ISLAND**

Well No	Monitoring Program	Well Type	Analytes of Concern (AOC) Data										Fate and Transport Data Monitored Natural Attenuation (MNA)										Maximum Sampling Frequency				Near-shore Well - Sample within 3-hours of low tide	Comments		
			Laboratory Analyses					Laboratory Analyses					Field Test Kit Analyses			Field Measurement		Field Measurement	Field Measurement	Quarterly Sampling	Semi-Annual Sampling	Annual Sampling	Water Levels Only							
			Metals	PCBs	SVOCs	TPH-e	TPH-p	VOCs	Major Anions (Chloride & Sulfate)	Methane, Ethane, & Ethene	Nitrate/Nitrite	Sulfide (H ₂ S)	VOCs	Alkalinity	Iron (Fe ²⁺)	Manganese (Mn ²⁺)	Oxidation-Reduction Potential							Oxygen, dissolved	pH	Water Level			Oil/Water Interface	
UST Site 201																											Diesel			
201-MW1	P	N,S				3	3	3	2	2	2	2	*	2	2	2	2	2	2	4		X				Site scheduled for Fall 2001 closure; sample first three quarters only Well to be sampled with peristaltic pump.				
201-MW2	P	N,S				3	3	3	2	2	2	2	*	2	2	2	2	2	2	4		X				Site scheduled for Fall 2001 closure; sample first three quarters only Well to be sampled with peristaltic pump.				
201-MW3	P	N,C				3	3	3												4		X				Site scheduled for Fall 2001 closure; sample first three quarters only Well to be sampled with peristaltic pump.				
201-MW4	P	N,D				3	3	3	1	1	1	1	*	1	1	1	1	1	1	4		X				Site scheduled for Fall 2001 closure; sample first three quarters only Well to be sampled with peristaltic pump.				
201-MW5	P	N,C				3	3	3	1	1	1	1	*	1	1	1	1	1	1	4		X				Site scheduled for Fall 2001 closure; sample first three quarters only Well to be sampled with peristaltic pump.				
Total:						15	15	15	6	6	6	6		6	6	6	6	6	6	20		5								
Site 21 - Vessel Waste Oil Recovery Area																											A solvent investigation area			
21-MW01	R	U				1			1	1	1	1	1	*	1	1	1	1	1	1	4			X						
21-MW01B	R	N,U				3			2	2	2	2	*	2	2	2	2	2	2	3		X				Well to be installed in Summer 2001. Integration with Facilitywide Program to be updated at that time. 1-inch diam. well to be sampled with peristaltic pump.				
21-MW02A	R	D				2			1	1	1	1	*	1	1	1	1	1	1	4			X							
21-MW02B	R	D				2			1	1	1	1	*	1	1	1	1	1	1	4			X							
21-MW03A	R	D				2			1	1	1	1	*	1	1	1	1	1	1	4			X							
21-MW03B	R	D				2			1	1	1	1	*	1	1	1	1	1	1	4			X							
21-MW04A	R	D				2			1	1	1	1	*	1	1	1	1	1	1	4			X		X					
21-MW04B	R	D				2			1	1	1	1	*	1	1	1	1	1	1	4			X		X					
21-MW05	R	D				2			1	1	1	1	*	1	1	1	1	1	1	4			X		X					
21-MW06	R	D				2			1	1	1	1	*	1	1	1	1	1	1	4			X		X					
21-MW07A1	R	N,D				2														4			X			Installed for tidal mixing study. Re-evaluate sampling frequency upon receipt of initial data.				
21-MW07A2	R	N,D				2																	X			Installed for tidal mixing study. Re-evaluate sampling frequency upon receipt of initial data.				
21-MW07A3	R	N,D				2																	X			Installed for tidal mixing study. Re-evaluate sampling frequency upon receipt of initial data.				
21-MW08A	R	N,S				3			2	2	2	2	*	2	2	2	2	2	2	3			X			Well to be installed in Summer 2001. Integration with Facilitywide Program to be updated at that time. 1-inch diam. well to be sampled with peristaltic pump.				
21-MW08B	R	N,S				3			2	2	2	2	*	2	2	2	2	2	2	3			X			Well to be installed in Summer 2001. Integration with Facilitywide Program to be updated at that time. 1-inch diam. well to be sampled with peristaltic pump.				
21-MW9A	R	N,D				3			2	2	2	2	*	2	2	2	2	2	2	3			X			Well to be installed in Summer 2001. Integration with Facilitywide Program to be updated at that time. 1-inch diam. well to be sampled with peristaltic pump.				
21-MW9B	R	N,D				3			2	2	2	2	*	2	2	2	2	2	2	3			X			Well to be installed in Summer 2001. Integration with Facilitywide Program to be updated at that time. 1-inch diam. well to be sampled with peristaltic pump.				

**TABLE 4-1
2001 DATA COLLECTION REQUIREMENTS
FACILITYWIDE GROUNDWATER MONITORING PROGRAM
NAVAL STATION TREASURE ISLAND**

Well No	Monitoring Program	Well Type	Analytes of Concern (AOC) Data													Fate and Transport Data										Maximum Sampling Frequency				Near-shore Well - Sample within 3-hours of onset of low tide	Comments
			Monitored Natural Attenuation (MNA)													Field Measurement		Field Measurement	Field Measurement	Quarterly Sampling	Semi-Annual Sampling	Annual Sampling	Water Levels Only								
			Laboratory Analyses						Laboratory Analyses							Field Test Kit Analyses								Field Measurement							
			Metals	PCBs	SVOCs	TPH-e	TPH-p	VOCs	Major Anions (Chloride & Sulfate)	Methane, Ethane, & Ethene	Nitrate/Nitrite	Sulfide (H ₂ S)	VOCs	Alkalinity	Iron (Fe ²⁺)	Manganese (Mn ²⁺)	Oxidation-Reduction Potential							Oxygen, dissolved	pH	Water Level	Oil/Water Interface				
21-MW10A	R	N,C					3	2	2	2	2	*	2	2	2	2	2	2	2	2	2	3	X					Well to be installed in Summer 2001; Integration with Facilitywide Program to be updated at that time. 1-inch diam. well to be sampled with peristaltic pump.			
21-MW10B	R	N,C					3	2	2	2	2	*	2	2	2	2	2	2	2	2	2	3	X					Well to be installed in Summer 2001; Integration with Facilitywide Program to be updated at that time. 1-inch diam. well to be sampled with peristaltic pump.			
21-MW11A	R	N,C					3	2	2	2	2	*	2	2	2	2	2	2	2	2	2	3	X					Well to be installed in Summer 2001; Integration with Facilitywide Program to be updated at that time. 1-inch diam. well to be sampled with peristaltic pump.			
21-MW11B	R	N,C					3	2	2	2	2	*	2	2	2	2	2	2	2	2	2	3	X					Well to be installed in Summer 2001; Integration with Facilitywide Program to be updated at that time. 1-inch diam. well to be sampled with peristaltic pump.			
21-MW12A	R	N,U					3	2	2	2	2	*	2	2	2	2	2	2	2	2	2	3	X					Well to be installed in Summer 2001; Integration with Facilitywide Program to be updated at that time. 1-inch diam. well to be sampled with peristaltic pump.			
21-MW13A	R	N,D					3	2	2	2	2	*	2	2	2	2	2	2	2	2	2	3	X					Well to be installed in Summer 2001; Integration with Facilitywide Program to be updated at that time. 1-inch diam. well to be sampled with peristaltic pump.			
21-MW14A	R	N,C					3	2	2	2	2	*	2	2	2	2	2	2	2	2	2	3	X					Well to be installed in Summer 2001; Integration with Facilitywide Program to be updated at that time. 1-inch diam. well to be sampled with peristaltic pump.			
21-MW15A	R	N,D					3	2	2	2	2	*	2	2	2	2	2	2	2	2	2	3	X					Well to be installed in Summer 2001; Integration with Facilitywide Program to be updated at that time. 1-inch diam. well to be sampled with peristaltic pump.			
Total:							62	35	35	35	35		35	35	35	35	35	35	79			13	11	1		4					
UST Site 227																				Diesel											
227-MW1	P	C					1	1	1																		X				
227-MW2	P	D					2	2	2	1	1	1	1	*	1	1	1	1	1	1	4				X						
227-MW3	P	C					1	1	1											4					X						
227-MW4	P	N,S					4	4	4	2	2	2	2	*	2	2	2	2	2	2	4	X									
227-MW5	P	N,D					4	4	4	2	2	2	2	*	2	2	2	2	2	2	4	X									
Total:							12	12	12	5	5	5	5		5	5	5	5	5	5	20				2	1	2				

**TABLE 4-1
2001 DATA COLLECTION REQUIREMENTS
FACILITYWIDE GROUNDWATER MONITORING PROGRAM
NAVAL STATION TREASURE ISLAND**

Well No.	Monitoring Program	Well Type	Analytes of Concern (AOC) Data													Fate and Transport Data										Maximum Sampling Frequency				Comments		
			Laboratory Analyses													Monitored Natural Attenuation (MNA)										Field Measurement	Field Measurement	Quarterly Sampling	Semi-Annual Sampling		Annual Sampling	Water Levels Only
			Metals	PCBs	SVOCs	TPH-e	TPH-p	VOCs	Major Anions (Chloride & Sulfate)	Methane, Ethane, & Ethene	Nitrate/Nitrite	Sulfide (H ₂ S)	VOCs	Alkalinity	Iron (Fe ²⁺)	Manganese (Mn ²⁺)	Oxidation-Reduction Potential	Oxygen, dissolved	pH	Water Level	Oil/Water Interface											
Pipeline Site D4B																							Diesel									
29-MW1	P	N,U				4	4	4	4	2	2	2	2	*	2	2	2	2	2	2	4		X				VOC data also to be used for Site 24.					
29-MW2	P	N,S				4	4	4	4	2	2	2	2	*	2	2	2	2	2	2	4		X				VOC data also to be used for Site 24.					
29-MW3	P	N,S				4	4	4	4	2	2	2	2	*	2	2	2	2	2	2	4		X				VOC data also to be used for Site 24.					
D4B-MW01	P	N,D				4	4	4	4	2	2	2	2	*	2	2	2	2	2	2	4		X				VOC data also to be used for Site 24.					
Total:						16	16	16	16	8	8	8	8		8	8	8	8	8	8	16		4									
Pipeline Sites F2A & F2B																							Bunker fuel.									
F2A-MW01	P	N,C				4	4	4	4												4		X				VOC data also to be used for Site 24.					
F2A-MW02	P	N,C				4	4	4	4												4		X				VOC data also to be used for Site 24.					
F2B-MW01	P	N,U				4	4	4	4												4		X				VOC data also to be used for Site 24.					
Total:						12	12	12	12												12		3									
Pipeline Site USCG																							Unknown fuel.									
270-MW1	P	S				2	2	2	2	2	2	2	2	*	2	2	2	2	2	2	4	2		X								
270-MW2	P	D				2	2	2	2	2	2	2	2	*	2	2	2	2	2	2	4		X									
270-MW3	P	S				2	2	2	2	2	2	2	2	*	2	2	2	2	2	2	4		X									
270-MW4	P	D				2	2	2	2	2	2	2	2	*	2	2	2	2	2	2	4		X			X						
270-MW5	P	D				2	2	2	2	2	2	2	2	*	2	2	2	2	2	2	4		X			X						
270-MW6	P	D				2	2	2	2	2	2	2	2	*	2	2	2	2	2	2	4		X			X						
Total:						12	12	12	12	12	12	12	12		12	12	12	12	12	12	24	2	6			2						

**TABLE 4-1
2001 DATA COLLECTION REQUIREMENTS
FACILITYWIDE GROUNDWATER MONITORING PROGRAM
NAVAL STATION TREASURE ISLAND**

Well No	Monitoring Program	Well Type	Analytes of Concern (AOC) Data													Fate and Transport Data										Maximum Sampling Frequency			Comments
			Laboratory Analyses													Monitored Natural Attenuation (MNA)										Quarterly Sampling	Semi-Annual Sampling	Annual Sampling	
			Metals	PCBs	SVOCs	TPH-e	TPH-p	VOCs	Major Anions (Chloride & Sulfate)	Methane, Ethane, & Ethene	Nitrate/Nitrite	Sulfide (H ₂ S)	VOCs	Alkalinity	Iron (Fe ²⁺)	Manganese (Mn ²⁺)	Oxidation-Reduction Potential	Oxygen, dissolved	pH	Field Measurement	Field Measurement								

2001 Facilitywide Total:	137	46	148	213	213	301	125	125	125	125	1	125	125	125	125	125	125	623	4	36	81	26	19	41
2000 Facilitywide Total:	127	28	120	148	148	194	123	123	123	123	4	123	123	123	123	123	123	564	6	41	56	13	32	37

Plus 104 Ambient Metals, 104 TSS, and 204 TDS samples.

Additional Changes: New sites to Facilitywide Program in 2001: 7 (180C, 201, 227, 368B, D4B, F2A/F2B, USCG)
 New monitoring wells to be sampled in 2001 Facilitywide Program 53
 Sites to be placed in sampling abeyance in 2001: 7 (01, 09, 15, 17, 1A, 1E, 368A) (2000: 3 [04/19, 07/10, 20]).
 Interim actions mobilized in 2001: D1B, F2A/F2B, Site 25, Site 14/22, Site 15, Site USCG, Site 180C

Notes:

Monitoring Program

P Corrective Action Plan (CAP) petroleum program site
 R CERCLA program site
 R(p) CERCLA program site, petroleum sub-area
 NA Not applicable

Comments Column

MNA Monitored Natural Attenuation
 AOC Analyte of concern
 Near-shore Monitoring well within 100 feet of shoreline

Well Type

A Alternate well of same well-type available for sampling
 C Cross-gradient well
 D Down-gradient well
 N New well (previously sampled less than four quarters).
 S Source area well
 U Up-gradient well
 NA Not applicable

Analyte Information

Metals Contract laboratory program (CLP) metals
 PCBs Polychlorinated biphenyls
 SVOCs Semivolatile organic compounds
 TPH-e Total petroleum hydrocarbons - extractable (diesel range/motor oil range)
 TPH-p Total petroleum hydrocarbons - purgeable (gasoline range)
 VOCs Volatile organic compounds
 Laboratory analytical methods defined in QAPP Table 2-1

Sampling Information

1 To be sampled/measured annually--October 2001.
 2 To be sampled/measured semi-annually--May and October 2001.
 4 To be sampled/measured quarterly-- May, August, October, and December 2001.
 * Monitored natural attenuation VOC data to be collected from sampling for analytes of concern.
 Inactive well--no sampling or water level data required.
 All wells to be sampled with bladder pumps unless noted otherwise in Comments field.

In accordance with standard groundwater sampling procedures, groundwater temperature, pH, and conductivity measurements will be made with field equipment to ensure that samples are collected from representative formation water. Turbidity will also be measured with field equipment to monitor for particulate interference.

QA/QC Samples:	Equipment Rinsate: If non-dedicated, disposable tubing is used, one rinseate per box of tubing used.	Matrix Spike/Matrix Spike Duplicate: One for every 20 wells sampled or portion thereof.	Trip Blank: One per transport container containing samples for TPH-p or VOC analysis.
	Field Duplicate: One for every 10 wells or portion thereof.	Source Water Blank: One per source per event, as necessary.	