N60087.AR.000481
NAS BRUNSWICK
5090.3a

MONTHLY PROGRESS REPORT
SOIL VAPOR EXTRACTION/AQUIFER AIR SPARGING
REMEDIAL SYSTEMS OPERATIONS

SITE NAME: Navy Exchange Service Station (Building 538)

SITE LOCATION: Naval Air Station, Brunswick, Maine

REPORT PERIOD: 1-31 December 1994

ACTIVITIES SUMMARY:

Soil Vapor Extraction (SVE) System: The SVE system component of the treatment plant has been operational since 15 November 1993. Figure 1 provides the configuration of the treatment plant. The system was active throughout this report period. The five vapor extraction trenches operated simultaneously for a total system flow of approximately 444 cubic feet per minute (cfm) (14 December) and 389 cfm (29 December). Flow rates at individual trenches on 29 December 1994 ranged from approximately 62 cfm (SVE-4) to 115 cfm (SVE-2). Field data collected during the two site visits is provided in Attachment A.

Quantitative estimates of total volatile hydrocarbon (TVH) removal rates at individual trenches were prepared based on monitoring data collected in the field using a Microtip Model HL-2000 photoionization detector (Table 1). To quantify the TVH removal rate, the flow rates for each vent trench were assumed to be constant. During the reporting period, the hydrocarbon removal rate ranged from 0.041 lb/day (SVE-5) to 1.44 lb/day (SVE-2). The composite TVH removal rate was calculated at 3.16 lb/day for 14 December 1994 and 3.18 lb/day for 29 December 1994. No exceedances of the State of Maine Department of Environmental Protection Air Discharge Limit of 100 lb/day of petroleum hydrocarbons were observed.

Aquifer Air Sparging System (AAS): The AAS system remained deactivated during this period and has not been in operation since June 1994. It is anticipated that AAS system operations will resume following the winter season.

Well Gauging: Gauging of monitoring wells and air sparging wells confirmed the absence of light, non-aqueous phase liquid (LNAPL) in the site wells during this period (Table 2). Depth to ground water ranged from 1.90 ft (MW-NASB-27) to 7.93 ft (Sparge Well AAS-3) during the 14 December 1994 monitoring visit. Depth to ground water decreased slightly at a majority of the monitoring and sparge wells gauged during the report period.

Michael S. Battle — 23 JAN 1995

Michael S. Battle, P.G., Project Manager — Date

TABLE 1 SUMMARY OF SVE/AAS PERFORMANCE DATA RECORDED AT THE NAVY EXCHANGE SERVICE STATION, NAVAL AIR STATION, BRUNSWICK, MAINE DECEMBER 1994

Sample Date	Total Volatile Hydrocarbons (ppm-v)[a]	Vacuum at Treatment Plant (in. H_2O)	Vacuum at Trench (in. H_2O)	Flow Rate (cfm)	Daily Total Volatile Hydrocarbon Removal Rate[b] (lb/day)
SVE-1 INTAKE					
14 DEC 1994	8.4	16.5	10.0	102	0.30
29 DEC 1994	5.2	20.0	10.0	75	0.14
SVE-2 INTAKE					
14 DEC 1994	36.5	15.0	15.0	102	1.30
29 DEC 1994	36.0	18.0	13.0	115	1.40
SVE-3 INTAKE					
14 DEC 1994	12.8	15.5	13.0	65	0.29
29 DEC 1994	8.9	18.0	13.0	72	0.22
SVE-4 INTAKE					
14 DEC 1994	24.0	18.0	8.0	84	0.70
29 DEC 1994	50.6	21.0	8.0	62	1.09
SVE-5 INTAKE					
14 DEC 1994	1.7	15.5	8.0	91	0.05
29 DEC 1994	1.8	No Data	9.0	65	0.04
SVE COMPOSITE INTAKE					
14 DEC 1994	20.4	60.0	NA	444	3.16
29 DEC 1994	28.1	62.0	NA	389	3.81
SVE COMPOSITE EMISSIONS[c]					
14 DEC 1994	20.4	NA	NA	444	3.16
29 DEC 1994	28.1	NA	NA	389	3.81

(a) Based on measurements taken with photoionization detector (PID). PID measurement considered a conservative approximation of total volatile hydrocarbon concentrations at sample location due to instrument response limitations.

(b) Loading rate calculated using formula provided by EPA (1989): $ER = Q * C * MW * 1.58x10^7 * 24$ Where: ER = Emissions rate (lb/day), Q = Flow rate (cfm), C = Total volatile hydrocarbon concentration in influent (ppm-v), MW = Molecular weight (average) of vapor phase weathered gasoline (92.14 lb/lb-mole).

(c) SVE system emissions equal to SVE system intake because granular activated carbon treatment not yet installed.

NOTE: cfm = Cubic feet per minute; NA = Not applicable; SVE = Soil vapor extraction. SVE composite removal rate taken as summation of removal rates of individual SVE trench lines.

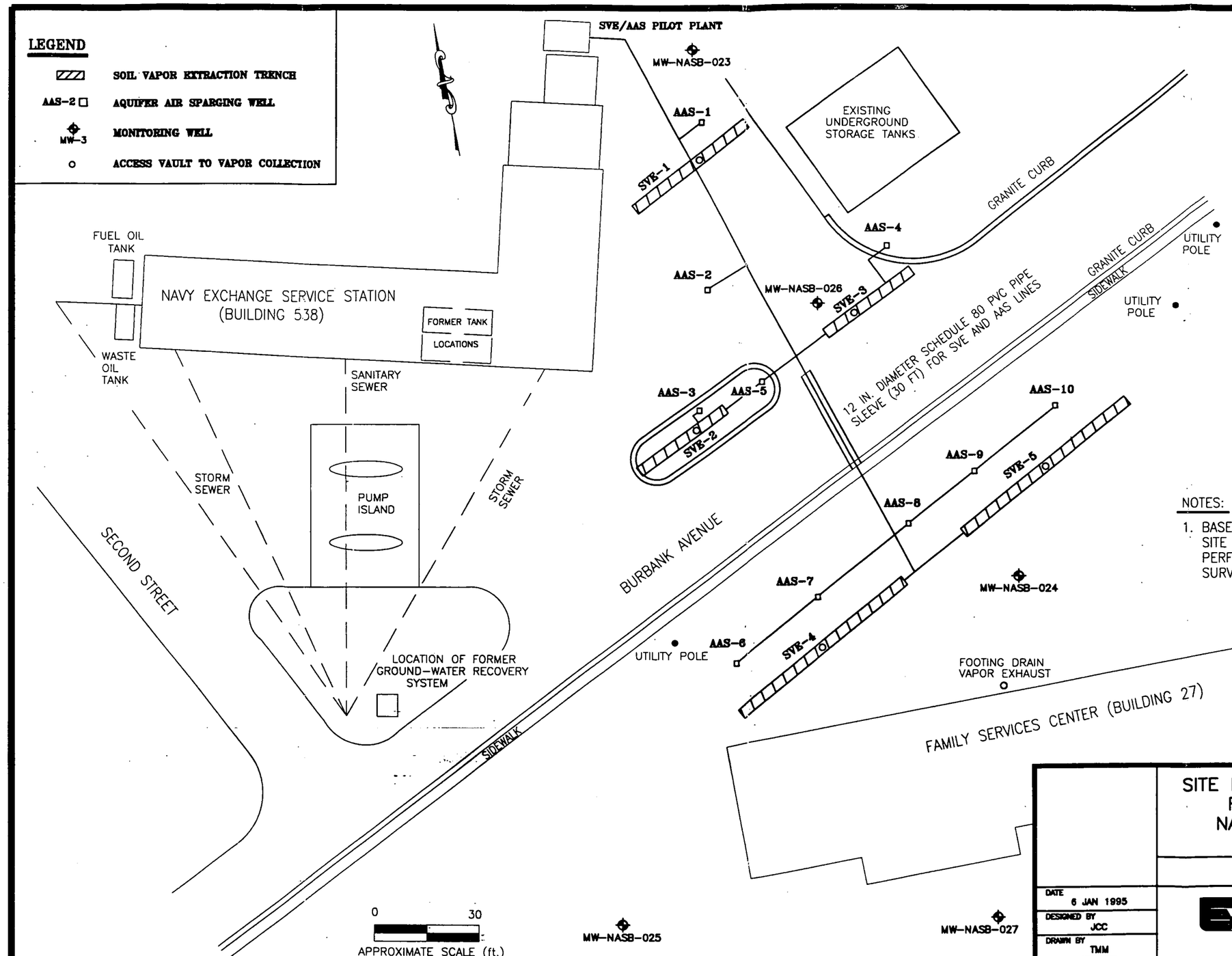
TABLE 2 SUMMARY OF WELL GAUGING DATA FOR MONITORING WELLS AND AIR SPARGING WELLS AT THE NAVY EXCHANGE SERVICE STATION, NAVAL AIR STATION, BRUNSWICK, MAINE DECEMBER 1994

Gauging Date	Well Elevation	Depth to Water	Depth to LNAPL	LNAPL Thickness	Corrected Water Table Elevation
MW-NASB-023					
14 DEC 1994	67.29	7.51	---	---	59.78
29 DEC 1994	67.29	7.24	---	---	60.05
MW-NASB-024					
14 DEC 1994	65.31	5.33	---	---	59.98
29 DEC 1994	65.31	5.15	---	---	60.16
MW-NASB-025					
14 DEC 1994	64.34	6.61	---	---	57.73
29 DEC 1994	64.34	6.56	---	---	57.78
MW-NASB-026					
14 DEC 1994	66.61	7.30	---	---	59.31
29 DEC 1994	66.61	7.50	---	---	59.11
MW-NASB-027					
14 DEC 1994	60.50	1.90	---	---	58.60
29 DEC 1994	60.50	2.09	---	---	58.41
Sparge Well AAS-1					
14 DEC 1994	66.99	7.30	---	---	59.69
29 DEC 1994	66.99	7.21	---	---	59.78
Sparge Well AAS-2					
14 DEC 1994	65.66	6.39	---	---	59.27
29 DEC 1994	65.66	6.28	---	---	59.38
Sparge Well AAS-3					
14 DEC 1994	66.63	7.93	---	---	58.70
29 DEC 1994	66.63	7.50	---	---	59.13

NOTE: Measurements in feet. Depth to water measurements recorded from marker on top of PVC well casing. LNAPL = Light, non-aqueous phase liquid; Dashes (---) indicate LNAPL not detected in well.

TABLE 2 (Continued)

Gauging Date	Well Elevation	Depth to Water	Depth to LNAPL	LNAPL Thickness	Corrected Water Table Elevation
Sparge Well AAS-4					
14 DEC 1994	67.17	7.46	---	---	59.71
29 DEC 1994	67.17	7.27	---	---	59.90
Sparge Well AAS-5					
14 DEC 1994	67.06	6.47	---	---	60.59
29 DEC 1994	67.06	7.79	---	---	59.27
Sparge Well AAS-6					
14 DEC 1994	65.33	6.90	---	---	58.43
29 DEC 1994	65.33	6.85	---	---	58.48
Sparge Well AAS-7					
14 DEC 1994	65.21	6.64	---	---	58.57
29 DEC 1994	65.21	6.46	---	---	58.75
Sparge Well AAS-8					
14 DEC 1994	65.65	6.42	---	---	59.23
29 DEC 1994	65.65	6.25	---	---	59.40
Sparge Well AAS-9					
14 DEC 1994	65.98	6.02	---	---	59.96
29 DEC 1994	65.98	5.75	---	---	60.23
Sparge Well AAS-10					
14 DEC 1994	66.26	6.95	---	---	59.31
29 DEC 1994	66.26	5.65	---	---	60.61



WELL	ELEVATION (FT.)
AAS-1	66.99
AAS-2	65.66
AAS-3	66.63
AAS-4	67.17
AAS-5	67.06
AAS-6	65.33
AAS-7	65.21
AAS-8	65.65
AAS-9	65.98
AAS-10	66.26
MW-NASB-023	67.29
MW-NASB-024	65.31
MW-NASB-025	64.34
MW-NASB-026	66.61
MW-NASB-027	60.50
SVE-1	67.21
SVE-2	67.07
SVE-3	67.15
SVE-4	65.78
SVE-5	66.24

NOTES:

1. BASEMAP DEVELOPED FROM ERM-NEW ENGLAND, INC. SITE PLAN DATED 24 JUNE 1992 AND SURVEY PERFORMED BY CORNERSTONE PROFESSIONAL LAND SURVEYING, INC., 20 MAY 1994.

DWG-FILE F:\CAD\12197\14\SVEAB PLOT SCALE:1=1

SITE PLAN SHOWING LAYOUT OF SVE/AAS REMEDIATION SYSTEM AS-BUILT NAVY EXCHANGE SERVICE STATION

NAVAL AIR STATION, BRUNSWICK, MAINE

FIGURE 1

DATE	6 JAN 1995
DESIGNED BY	JCC
DRAWN BY	TMM
CHECKED BY	MSB
PROJECT MANAGER	MSB

EA ENGINEERING, SCIENCE, AND TECHNOLOGY

3 WASHINGTON CENTER
THE MAPLE BUILDING
NEWBURGH, NEW YORK 12550
(914) 565-8100

PROJECT NUMBER	12197.14
SCALE	1"=30'
FILE NAME	SVEAB
DRAWING NUMBER	–
SHEET NUMBER	1 OF 1

Attachment A

Supporting Data
Field Monitoring
and Sampling Activities

EA ENGINEERING, SCIENCE AND TECHNOLOGY

SVE/AAS SYSTEM DATA SHEET

PROJECT NAME: NAS BRUNSWICK	PROJECT NUMBER: 2960035	DATE: 12/14/94
EA PERSONNEL ON SITE: A. Taylor		WEATHER: outside: 18° F + clear inside: 49° F + clear

Location	Time (0000 hrs)	Pressure/ Vacuum (in. H_2O)	Flow Velocity (fpm)	Flow Rate (cfm)	Influent Temperature (°F) Before Blower	Effluent Temperature (°f) After Blower	VOC Loading at SVE System (ppm)	VOC Emissions at SVE Effluent (ppm)
SVE-1	0800	16.50		102			8.40	
SVE-2	0810	15.00		102			36.50	
SVE-3	0820	15.50		65			12.80	
SVE-4	0830	18.00		84			24.00	
SVE-5	0840	15.50		91			1.80	
SVE Composite influent	1130	—		—			~~19.70~~ 20.40	
* SVE composite effluent	1135							19.70
Condensate tank	1136	37.5						
Total Vaccum pre blower	1136	60.00						
Family services bldg footing drain		1230 pm		594.0 ppm				

AIR SPARGING MONITORING SCHEDULE

Week 1: Minimum of daily at each AAS well and groundwater monitoring well. Frequency typically higher during system adjustment.

Weeks 2-4: Twice per week at each AAS well and groundwater monitoring well.

Weeks 5-26: Twice per month at each AAS well and groundwater monitoring well.

MSB.925

Ambient Air inside shed = 0.1 to 0 ppm (fluctuates)

~~tank~~

* Carbon not in cycle (gone)

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SVE/AAS SYSTEM DATA SHEET

PROJECT NAME:	PROJECT NUMBER:	DATE: 12/29
EA PERSONNEL ON SITE: A. Taylor		WEATHER:

Location	Time (0000 hrs)	Pressure/ Vacuum (in. H_2O)	Flow Velocity (fpm)	Flow Rate (cfm)	Influent Temperature (°F) Before Blower	Effluent Temperature (°f) After Blower	VOC Loading at SVE System (ppm)	VOC Emissions at SVE Effluent (ppm)
SVE 1	1130	20		75			5.20	
SVE 2		18		*115			36.0	
SVE 3		18		72			8.90	
SVE 4 *'		21		62			50.6	
SVE 5	1145	No gauge *		65			1.8	
composite influent	1155						28.1 (+/-)	
composite effluent	1156						30.0	
Condensate tank	1200	36.0						
Vac gauge	1200	62.0						

AIR SPARGING MONITORING SCHEDULE

Week 1: Minimum of daily at each AAS well and groundwater monitoring well. Frequency typically higher during system adjustment.

Weeks 2-4: Twice per week at each AAS well and groundwater monitoring well.

Weeks 5-26: Twice per month at each AAS well and groundwater monitoring well.

temp outside: 22°F
inside 40-42°F

MSB.925

* Need New gauge

*' possible water in pipe due to flow fluctuations

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VACUUM/PRESSURE DATA SHEET

PROJECT NAME: NAS BRUNS.	PROJECT NUMBER: 29600.35	DATE: 12/14/94
TEMPERATURE/BAROMETRIC PRESSURE:		EA PERSONNEL: AT

Time (0000 hrs)	Monitoring Point Vacuum/Pressure (in. H_2O) Check One: Vacuum_____ Pressure_____								
	SVE-1	SVE-2	SVE-3	SVE-4	SVE-5				
	10.0	15.0	13.0	8.0	8.0				
time	10:41	10:59	11:01	11:16	11:13				

MSB.931

EA ENGINEERING, SCIENCE AND TECHNOLOGY

VACUUM/PRESSURE DATA SHEET

PROJECT NAME:	PROJECT NUMBER: 29600.35	DATE: 12/29/94
TEMPERATURE/BAROMETRIC PRESSURE:		EA PERSONNEL: AT

Time (0000 hrs)	Monitoring Point Vacuum/Pressure (in. H_2O) Check One: Vacuum_____ Pressure_____								
	SVE-1	SVE-2	SVE-3	SVE-4	SVE-5				
	10.0	13.0	13.0	8.0	9.0				
time	1105	1110	1116	1121	1125				

MSB.931

EA ENGINEERING, SCIENCE AND TECHNOLOGY

AQUIFER AIR SPARGING DATA SHEET

PROJECT NAME: NAS Brunswick	PROJECT NUMBER: 29600 35	DATE: 12/14/94
TEMPERATURE/BAROMETRIC PRESSURE:		EA PERSONNEL: AO

Location	Time (0000 hrs)	Pressure (in. H_2O)	Depth To Water (ft.)	pH	Temperature (°F)	Dissolved Oxygen (mg/l)	Conductivity (uhmos)	Comments/ Notes
gauge OK AAS-10			6'11 3/8"	6.25				
MW-2			5'4"	5.33				
AAS-9			6'1/4"	6.02				
MW-3? (on hill)			6'7 3/8"	6.61	Missing lock	Hydrolab broken		
MW-1R			7.51					
~~AAW-3~~			~~6.50~~					
MW-4R			7.30					
MW-5			1.90					
AAS-1			7.30		Broken plug - needs new plug			
AAS-5			6.47					
AAS 6			6.90					
AAS-7			6.64					
AAS 8			6.42					

AIR SPARGING MONITORING SCHEDULE

Week 1: Minimum of daily at each AAS well and groundwater monitoring well. Frequency typically higher during system adjustment.

Weeks 2-4: Twice per week at each AAS well and groundwater monitoring well.

Weeks 5-26: Twice per month at each AAS well and groundwater monitoring well.

MSB.924

SVE at 18 in in field (in grass next to AAS 10)

other one is broken.

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AQUIFER AIR SPARGING DATA SHEET

PROJECT NAME: NAS Brun	PROJECT NUMBER: 2960035	DATE: 12/14 94
TEMPERATURE/BAROMETRIC PRESSURE: —		EA PERSONNEL: AT

Location	Time (0000 hrs)	Pressure (in. H_2O)	Depth To Water (ft.)	pH	Temperature (°F)	Dissolved Oxygen (mg/l)	Conductivity (uhmos)	Comments/ Notes
AAS-2			6' 4 5/8"		Hydrolab broken			
AAS-3			7' 11 1/8"					
AAS 4			7' 5 5/8"					

AIR SPARGING MONITORING SCHEDULE

Week 1: Minimum of daily at each AAS well and groundwater monitoring well. Frequency typically higher during system adjustment.

Weeks 2-4: Twice per week at each AAS well and groundwater monitoring well.

Weeks 5-26: Twice per month at each AAS well and groundwater monitoring well.

MSB.924

SITE NAME: NAS Brunswick

PROJECT NUMBER 2960035.362

EA PERSONNEL ON SITE: A. Taylor

DATE: 12/29/94

WEATHER: 20° F + clear

TIME ON/OFF SITE: 0730 / 1200

WELL NUMBER	WELL ELEVATION	DEPTH TO WATER	DEPTH TO PRODUCT	PRODUCT THICKNESS	CORRECTED WATER TABLE ELEVATION
MW023		7.24	N/D		
AAS-1		7.21	N/D		
AAS-2		6.78	N/D		
AAS-3		7.50	N/D		
AAS-5		7.79	N/D		
AAS-4		7.27	N/D		
MW-026		7.50	N/D		
AAS-10		5.65	N/D		
MW-024		5.15	N/D		
AAS-9		5.75	N/D		
AAS-8		6.25	N/D		
AAS-7		6.46	N/D		
AAS-6		6.85	N/D		
MW-025		6.56	N/D		
MW-027		2.09	N/D		
MW-06		6.80	N/D		
MW-07		6.06	N/D		
MW-08		2.41	N/D		
MW-09		3.52	N/D		
MW-10		6.38	N/D		
N/D	Non Detect				