Section : 12.05
Site 20903-5640 (White Oak)
Doc. #: 0003
00406

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NSWC WHITE OAK
5090.3a

Addendum
Round 3 Groundwater Data
RCRA Facility Investigation
for
Site 11

Naval Surface Warfare Center
White Oak
Silver Spring, Maryland

Engineering Field Activity Chesapeake
Naval Facilities Engineering Command

Contract Number N62472-90-D-1298
Contract Task Order 0298

December 1999

TETRA TECH NUS, INC.

Section: 12.05
Site 20903-5640 (White Oak)
Doc. #: 0003

ADDENDUM
ROUND 3 GROUNDWATER DATA
RCRA FACILITY INVESTIGATION
FOR
SITE 11

NAVAL SURFACE WARFARE CENTER
WHITE OAK
SILVER SPRING, MARYLAND

COMPREHENSIVE LONG-TERM
ENVIRONMENTAL ACTION NAVY (CLEAN) CONTRACT

Submitted to:
Engineering Field Activity Chesapeake
Environmental Branch Code 18
Naval Facilities Engineering Command
Washington Navy Yard, Building 212
Washington, D.C. 20374-2121

Submitted by:
Tetra Tech NUS, Inc.
600 Clark Avenue, Suite 3
King of Prussia, Pennsylvania 19406-1433

CONTRACT NUMBER N62472-90-D-1298
CONTRACT TASK ORDER 0298

DECEMBER 1999

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SECTION A

COMPARISON OF ROUND 1 AND ROUND 3 GROUNDWATER RESULTS

COMPARISON OF ROUND 1 AND ROUND 3 GROUNDWATER RESULTS NSWC WHITE OAK SILVER SPRING, MARYLAND

This addendum presents the comparison of analytical results between Round 1 groundwater samples collected in January/February 1999 and Round 3 samples collected in July/August 1999. As summarized on Table 1 the maximum concentrations of detected compounds from the two data sets were compared. Highlighted analytes exceeded Region III Risked Based Concentrations (RBCs) for tap water in Round 2 and but did not exceed Region III RBCs in Round 1. Additionally, maximum concentrations that exceeded the Region III RBC for tap water are bolded.

SITE 11 – INDUSTRIAL DISPOSAL WASTEWATER AREA 100

At Site 11, four additional volatile organic compounds (VOCs) were detected during Round 3, but none exceeded their RBC values. 1,1,2-Trichloroethane and benzene exceeded RBC values in Round 1, but were not detected in the Round 3 ground water samples (Table 1). 1,3-Dichlorobenzene and methylene chloride were new exceedances in Round 3. However, both organic compounds exceeded the RBC value in only 1 of 36 samples, and therefore are not considered significant contaminants. Overall, VOC concentrations did not significantly change during Round 3.

One new semivolatile organic compound (SVOC), 4-methylphenol, was detected in Round 3. However, it was not detected at a concentration exceeding the RBC screening value.

In general, organic compound concentrations did not significantly change in Round 3 samples (Figure 1).

Of the metals, cadmium and silver were new detects and exceedances, while cobalt, selenium, and zinc were new exceedances in Round 3. Selenium and silver were not detected in filtered samples. Furthermore, zinc was not significantly different from background (based on screening done with the Wilcoxon Rank Sum Test). Additionally, cadmium and cobalt had UCL values (2.2 mg/L and 83 mg/L, respectively) below the RBC screening values. Therefore, no organic or inorganic compounds were retained as significant contributors to risk in Round 3 at Site 11.

SECTION B

COMPARISON OF ROUND 1 AND ROUND 3 DATA

TABLE 1
COMPARISON OF 1ST AND 3RD ROUND DATA
SITE 11
NSWC WHITE OAK
SILVER SPRINGS, MARYLAND

PARAMETER	FIRST ROUND MAXIMUM	THIRD ROUND MAXIMUM	CHANGE (+/-)	REGION III RBC FOR TAP WATER
VOLATILES				
1,1,1-Trichloroethane	ND	0.33	+	54
1,1,2-Trichloroethane	**1**	ND	-	0.19
1,2,4-Triclorobenzene	ND	0.37	+	19
1,1-Dichloroethane	21	19	-	80
1,1-Dichloroethene	**8.8**	**8.8**	NC	0.044
1,2-Dichloroethane	**65**	**59**	-	0.12
1,3-Dichlorobenzene	0.55	**0.57**	+	0.55
1,4-Dichlorobenzene	**0.79**	**1.1**	+	0.47
Acetone	3.1	5.3	+	61
Benzene	**1.2**	ND	-	0.36
Bromodichloromethane	0.38	ND	-	0.17
Bromomethane	ND	0.37	+	0.85
Carbon Tetrachloride	**5.2**	**4.6**	-	0.16
Chlorobenzene	1.8	3.8	+	11
Chloroform	**18**	**18**	NC	0.15
Chloromethane	ND	0.26	+	2.1
Methylene Chloride	0.5	**6.8**	+	4.1
Tetrachloroethene	**60**	**75**	+	1.1
Trans-1,2-dichloroethene	2.5	0.34	-	12
Trichloroethene	**390**	**370**	-	1.6
cis-1,2-dichloroethene	**330**	**280**	-	6.1
SEMIVOLATILES				
4-Methylphenol	ND	5.7	+	18
PESTICIDES/PCBs				
Alpha-Chlordane	0.12	0.15	+	0.19
Gamma-Chlordane	0.1	0.13	+	0.19
EXPLOSIVES				
2,4 Dinitrotoluene	0.29	ND	-	7.3
INORGANICS				
Aluminum	**60700**	**135000**	+	3700
Arsenic	**17.2**	**50.2**	+	0.045
Barium	**794**	**1130**	+	260
Beryllium	**13**	**91.1**	+	7.3
Cadmium	ND	**9.2**	+	3.7
Calcium	50800	35000	-	NA
Chromium	**617**	**556**	-	11
Cobalt	198	**289**	+	220
Copper	**4260**	**3540**	-	150
Iron	**160000**	**1550000**	+	1100
Lead	**53.1**	**183**	+	15
Magnesium	26400	608000	+	NA
Manganese	**17000**	**10900**	-	73
Mercury	**1.9**	**2**	+	1.1[a]
Nickel	**174**	**436**	+	73
Potassium	10700	40800	+	NA
Selenium	10.1	**28**	+	18
Silver	ND	**28.9**	+	18
Sodium	53300	425000	+	NA
Thallium	**5.5**	**7.6**	+	0.26
Vanadium	**140**	**225**	+	26
Zinc	463	**2110**	+	1100
MISCELLANEOUS PARAMETER				
Perchlorates	**84.7**	**190**	+	18[b]

(a) - Value shown for Mercury is based on Mercuric Chloride.
(b) - Health Based Action Level (Calif. Dept. of Health Services Jan. 99)
All Region III Tap Water RBC values have been divided by a factor of 10 for non-carcinogenic compunds.

NOTES:
ND - Non Detect
NC - No Change
NA - Not Applicable

Bolded first and third round maximums exceed Region III RBCs
Bolded parameters exceeded the Region III RBC in the first round only
Bolded and highlighted parameters exceeded the Region III RBC in the third round only

SECTION C

STATISTICAL SUMMARIES OF CHEMICALS DETECTED IN GROUNDWATER

SITE 11
NSWC WHITE OAK
SILVER SPRING, MARYLAND
STATISTICAL SUMMARY OF CHEMICALS DETECTED IN GROUNDWATER
ROUND 3 DATA - JULY 1999

CAS #	PARAMETER	FREQUENCY OF DETECTION	MINIMUM NON-DETECT	MAXIMUM NON-DETECT	MINIMUM DETECTION	MAXIMUM DETECTION	MINIMUM QUALIFIER	MAXIMUM QUALIFIER	RANGE OF POSITIVE DETECTIONS	RANGE OF NON-DETECTS	LOCATION OF MAXIMUM CONCENTRATION	AVERAGE OF POSITIVE DETECTIONS	AVERAGE OF ALL SAMPLES	FEDERAL MCL	REGION III RBC FOR TAP WATER	TAP WATER RBC BASIS
VOLATILES (µg/L)																
71-55-6	1,1,1-Trichloroethane	2/36	1	25	0.23	0.33	J	J	0.23 - 0.33	1 - 25	11GW620003	0.28	1.071111	200	54	N
75-34-3	1,1-Dichloroethane	5/36	1	15	0.35	19	J	J	0.35 - 19	1 - 15	11GW1100003	4.514	1.3075	N/A	80	N
75-35-4	1,1-Dichloroethene	3/36	1	15	0.18	8.8	J	J	0.18 - 8.8	1 - 15	11GW1100003	3.166667	0.972222	7	0.044	C
120-82-1	1,2,4-Trichlorobenzene	1/36	1	25	0.37	0.37	J	J	0.37	1 - 25	11GW290003	0.37	1.079722	70	19	N
107-06-2	1,2-Dichloroethane	5/36	1	15	1.2	59	J		1.2 - 59	1 - 15	11GW1100003	14.26	2.661111	5	0.12	C
541-73-1	1,3-Dichlorobenzene	1/36	1	25	0.57	0.57	J	J	0.57	1 - 25	11GW290003	0.57	1.085278	N/A	0.58	N
106-46-7	1,4-Dichlorobenzene	2/36	1	25	0.67	1.1	J		0.67 - 1.1	1 - 25	11GW290003	0.885	1.104722	75	0.47	C
67-64-1	Acetone	20/22	2.8	3.8	1.7	5.3	J	J	1.7 - 5.3	2.8 - 3.8	11GW710003	2.8575	2.747727	N/A	61	N
74-83-9	Bromomethane	4/36	1	25	0.22	0.37	J	J	0.22 - 0.37	1 - 25	11GW250003	0.305	1.061667	N/A	0.85	N
56-23-5	Carbon Tetrachloride	4/36	1	15	0.21	4.6	J	J	0.21 - 4.6	1 - 15	11GW1100003	1.4025	0.850278	5	0.16	C
108-90-7	Chlorobenzene	19/36	0.2	25	0.18	3.8	J		0.18 - 3.8	0.2 - 25	11GW290003	0.447895	1.033611	100	11	N
67-66-3	Chloroform	20/36	1	1	0.21	18	J	J	0.21 - 18	1	11GW1100003	2.1	1.388889	80	0.16	C
74-87-3	Chloromethane	1/36	0.29	25	0.26	0.26	J	J	0.26	0.29 - 25	11GW720003	0.26	1.040417	N/A	2.1	C
75-09-2	Methylene Chloride	1/36	2	30	6.8	6.8	J	J	6.8	2 - 30	11GW1100003	6.8	1.661111	5	4.1	C
127-18-4	Tetrachloroethene	9/36	1	1	0.29	75	J		0.29 - 75	1	11GW280003	11.33	3.2075	5	1.1	C
156-60-5	Trans-1,2-dichloroethene	1/36	1	25	0.34	0.34	J	J	0.34	1 - 25	11GW1080003	0.34	1.078889	100	12	N
79-01-6	Trichloroethene	17/36	1	1	0.25	370	J		0.25 - 370	1	11GW1100003	31.651176	15.210278	5	1.6	C
156-59-2	cis-1,2-dichloroethene	13/36	1	1	0.21	280	J		0.21 - 280	1	11GW1100003	41.088462	15.156944	70	6.1	N
SEMIVOLATILES (µg/L)																
106-44-5	4-Methylphenol	1/36	5	5	5.7	5.7			5.7	5	11GW240003	5.7	2.588889	N/A	18	N
PESTICIDES/PCBs (µg/L)																
5103-71-9	Alpha-Chlordane	1/36	0.05	0.05	0.15	0.15			0.15	0.05	11GW270003	0.15	0.028472	2	0.19	C
5103-74-2	Gamma-Chlordane	1/36	0.05	0.05	0.13	0.13			0.13	0.05	11GW270003	0.13	0.027917	2	0.19	C
INORGANICS (µg/L)																
7429-90-5	Aluminum	34/36	29.4	248	49.5	135000	J	J	49.5 - 135000	29.4 - 248	11GW630003	14571.74118	13766.05278	50-200	3700	N
7440-38-2	Arsenic	16/36	1.1	1.1	1.2	50.2		K	1.2 - 50.2	1.1	11GW630003	9.26875	4.425	50	0.045	C
7440-39-3	Barium	36/36	0	0	6.8	1130			6.8 - 1130	0	11GW630003	143.622222	143.622222	2000	260	N
7440-41-7	Beryllium	10/36	0.11	3.2	0.95	91.1			0.95 - 91.1	0.11 - 3.2	11GW630003	13.545	3.971875	4	7.3	N
7440-43-9	Cadmium	3/36	3	15	3.6	9.2	J	L	3.6 - 9.2	3 - 15	11GW270003	5.633333	2.011111	5	3.7	N
7440-70-2	Calcium	36/36	0	0	1480	35000			1480 - 35000	0	11GW630003	9466.527778	9466.527778	N/A	N/A	
7440-47-3	Chromium	25/36	2.4	2.4	2.8	556	J		2.8 - 556	2.4	11GW270003	67.322	47.118056	100	11	N
7440-48-4	Cobalt	29/36	3.8	3.8	6.1	289		K	6.1 - 289	3.8	11GW630003	45.443103	36.976389	N/A	220	N
7440-50-8	Copper	30/36	1.4	4.2	3.3	3540			3.3 - 3540	1.4 - 4.2	11GW270003	166.215	138.745833	1300	150	N
7439-89-6	Iron	36/36	0	0	22.3	1550000	J	J	22.3 - 1550000	0	11GW630003	65561.44444	65561.44444	300	1100	N
7439-92-1	Lead	19/36	1	1	1	183	L	K	1 - 183	1	11GW630003	22.676316	12.204167	15	15	
7439-95-4	Magnesium	36/36	0	0	1190	60800			1190 - 60800	0	11GW630003	8130.833333	8130.833333	N/A	N/A	
7439-96-5	Manganese	35/36	2.6	2.6	20.7	10900			20.7 - 10900	2.6	11GW860003	1428.96	1389.302778	50	73	N
7439-97-6	Mercury	4/36	0.1	0.73	0.12	2	J		0.12 - 2	0.1 - 0.73	11GW240003	1	0.168125	2	1.1 (a)	N
7440-02-0	Nickel	26/36	8.8	8.8	9.1	436	K	L	9.1 - 436	8.8	11GW630003	62.348077	46.251389	100	73	N
7440-09-7	Potassium	36/36	0	0	648	40800			648 - 40800	0	11GW630003	5136.916667	5136.916667	N/A	N/A	
7782-49-2	Selenium	1/36	2.7	5.4	28	28	K	K	28	2.7 - 5.4	11GW630003	28	2.202778	50	18	N
7440-22-4	Silver	4/36	2.2	2.2	2.4	28.9			2.4 - 28.9	2.2	11GW630003	9.625	2.047222	100	18	N
7440-23-5	Sodium	36/36	0	0	2220	425000	J	J	2220 - 425000	0	11GW710003-D	31187.63889	31187.63889	N/A	N/A	
7440-28-0	Thallium	1/36	3.7	18.5	7.6	7.6			7.6	3.7 - 18.5	11GW70D0003	7.6	3.292361	2	0.26	N
7440-62-2	Vanadium	21/36	2.4	2.4	2.4	255		K	2.4 - 255	2.4	11GW630003	45.864286	27.254167	N/A	26	N
7440-66-6	Zinc	28/36	4.6	26	22.1	2110			22.1 - 2110	4.6 - 26	11GW630003	176.159821	138.445139	5000	1100	N

SITE 11
NSWC WHITE OAK
SILVER SPRING, MARYLAND
STATISTICAL SUMMARY OF CHEMICALS DETECTED IN GROUNDWATER
ROUND 3 DATA - JULY 1999

CAS #	PARAMETER	FREQUENCY OF DETECTION	MINIMUM NON-DETECT	MAXIMUM NON-DETECT	MINIMUM DETECTION	MAXIMUM DETECTION	MINIMUM QUALIFIER	MAXIMUM QUALIFIER	RANGE OF POSITIVE DETECTIONS	RANGE OF NON-DETECTS	LOCATION OF MAXIMUM CONCENTRATION	AVERAGE OF POSITIVE DETECTIONS	AVERAGE OF ALL SAMPLES	FEDERAL MCL	REGION III RBC FOR TAP WATER	TAP WATER RBC BASIS
MISCELLANEOUS PARAMETERS (µg/L)																
	Perchlorates	9/36	4	8	6	190			6 - 190	4 - 8	11GW230003	47.611111	13.569444	N/A	N/A	

*True minimum and maximum concentrations are shown using both duplicate samples. However, the average of the duplicates is used in calculating the averages and tabulating the frequency of detection.

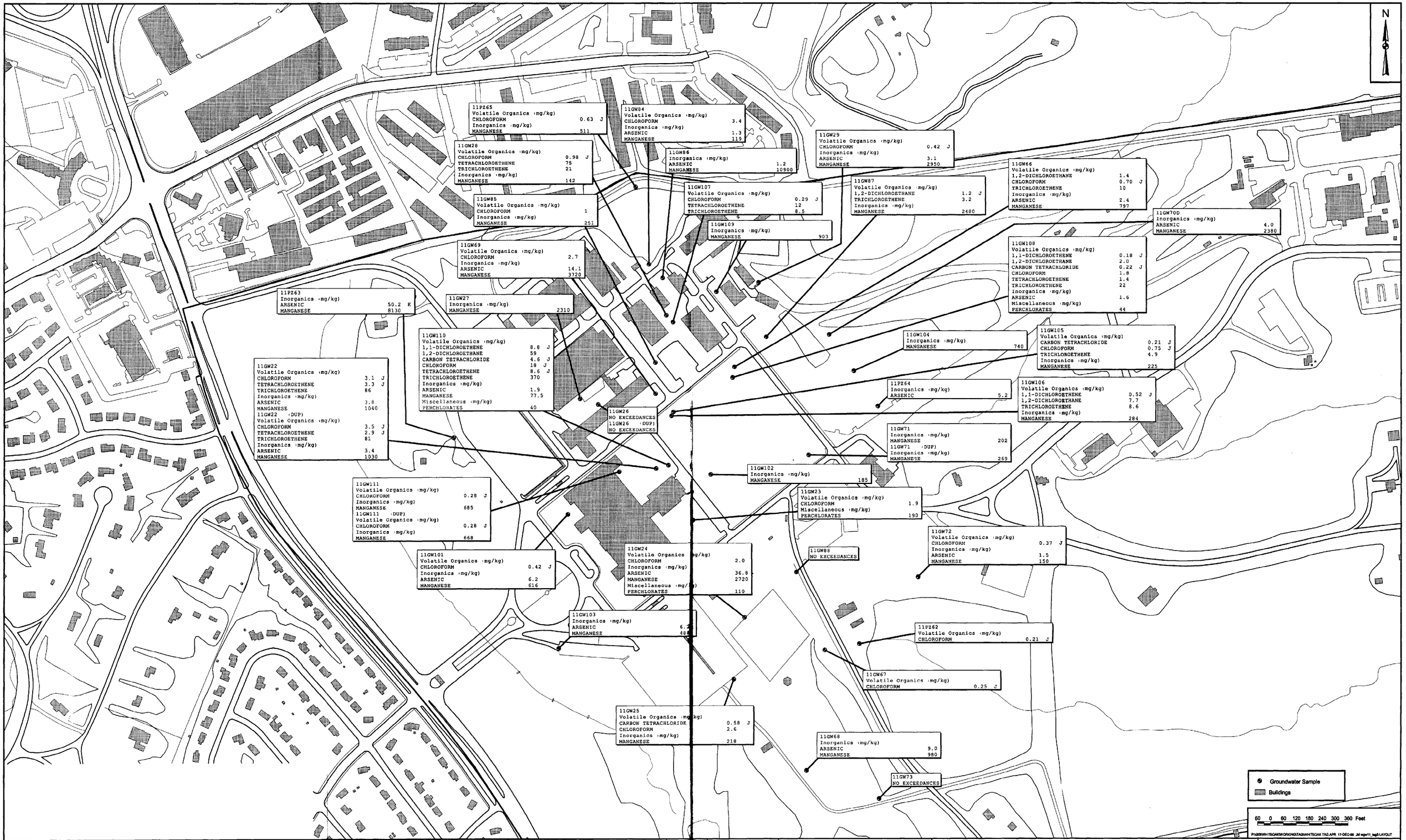
(a) - Value shown for Mercury is based on Mercuric Chloride.
All Region III Tap Water RBC values have been divided by a factor of 10 for non-carcinogenic compunds.

Associated Samples:

11GW1010003	11GW1110003-AVG	11GW270003	11GW70D0003
11GW1020003	11GW1110003-D	11GW280003	11GW710003
11GW1030003	11GW220003	11GW290003	11GW710003-AVG
11GW1040003	11GW220003-AVG	11GW620003	11GW710003-D
11GW1050003	11GW220003-D	11GW630003	11GW720003
11GW1060003	11GW230003	11GW640003	11GW730003
11GW1070003	11GW240003	11GW650003	11GW840003
11GW1080003	11GW250003	11GW660003	11GW850003
11GW1090003	11GW260003	11GW670003	11GW860003
11GW1100003	11GW260003-AVG	11GW680003	11GW870003
11GW1110003	11GW260003-D	11GW690003	11GW880003

SECTION D

SUMMARY OF EXCEEDANCES OF REGION 3 RBCs FOR CRITICAL CONSTITUENTS IN GROUNDWATER



NO.	DATE	REVISIONS	BY	CHKD	APPD	REFERENCES	NO.	RELEASED FOR	BY	DATE

DRAWN BY	DATE
JM	12/17/99
CHECKED BY	DATE
—	—
COST/SCHEDULE-AREA	
—	—
SCALE	
AS NOTED	

Tetra Tech NUS, Inc.

SUMMARY OF EXCEEDANCES OF REGION 3 RBCs FOR CRITICAL CONSTITUENTS IN GROUND WATER
SITE 11
INDUSTRIAL DISPOSAL WASTE WATER AREA 100
NSWC WHITE OAK
SILVER SPRING, MARYLAND
ROUND 3 DATA - AUGUST 1999

CONTRACT NO.	OWNER NO.
7687	—
APPROVED BY	DATE
—	—
APPROVED BY	DATE
—	—
DRAWING NO.	REV.
FIGURE 1	0

OC406E01X

SECTION E

ANALYTICAL DATA: POSITIVE DETECTIONS

SITE 11

GROUNDWATER DATA
JULY/AUGUST 1999

POSITIVE DETECTIONS

SITE 11
NSWC WHITE OAK
SILVER SPRING, MARYLAND
SUMMARY OF POSITIVE ANALYTICAL RESULTS FOR GROUNDWATER
ROUND 3 DATA - JULY 1999

SAMPLE I.D.:	11GW220003	11GW220003-D	11GW230003	11GW240003	11GW250003	11GW260003	11GW260003-D
LOCATION:	11GW22	11GW22	11GW23	11GW24	11GW25	11GW26	11GW26
SAMPLE DATE:	7/20/99	7/20/99	7/19/99	7/14/99	7/19/99	7/16/99	7/16/99
ASSOCIATED DUPLICATE:	11GW220003-D	11GW220003				11GW260003-D	11GW260003
VALIDATION STATUS:	VALIDATED	VALIDATED	VALIDATED	VALIDATED	VALIDATED	VALIDATED	VALIDATED
VOLATILES (µg/L)							
1,1,1-TRICHLOROETHANE	15 U	15 U	1 U	1 U	1 U	1 U	1 U
1,1-DICHLOROETHANE	15 U	15 U	1 U	1 U	1 U	1 U	1 U
1,1-DICHLOROETHENE	15 U	15 U	1 U	1 U	1 U	1 U	1 U
1,2,4-TRICHLOROBENZENE	15 U	15 U	1 U	1 U	1 U	1 U	1 U
1,2-DICHLOROETHANE	15 U	15 U	1 U	1 U	1 U	1 U	1 U
1,3-DICHLOROBENZENE	15 U	15 U	1 U	1 U	1 U	1 U	1 U
1,4-DICHLOROBENZENE	15 U	15 U	1 U	1 U	1 U	1 U	1 U
ACETONE	75 UR	75 UR	2.7 J	2.7 J	3 J	2.8 J	2.9 J
BROMOMETHANE	15 U	15 U	1 U	1 U	0.37 J	1 U	1 U
CARBON TETRACHLORIDE	15 U	15 U	1 U	1 U	0.58 J	1 U	1 U
CHLOROBENZENE	15 U	15 U	0.24 J	1 U	0.28 J	0.36 J	0.26 J
CHLOROFORM	3.1 J	3.5 J	1.9	2.0	2.6	1 U	1 U
CHLOROMETHANE	15 U	15 U	1 U	1 U	0.29 B	1 U	1 U
CIS-1,2-DICHLOROETHENE	170	170	1 U	1 U	1 U	1 U	1 U
METHYLENE CHLORIDE	30 U	30 U	2 U	2 U	2 U	2 U	2 U
TETRACHLOROETHENE	3.3 J	2.9 J	0.66 J	1 U	1 U	1 U	1 U
TRANS-1,2-DICHLOROETHENE	15 U	15 U	1 U	1 U	1 U	1 U	1 U
TRICHLOROETHENE	86	81	1.4	1 U	0.64 J	1 U	1 U
SEMIVOLATILES (µg/L)							
4-METHYLPHENOL	5 U	5 U	5 U	5.7	5 U	5 U	5 U
PESTICIDES/PCBs (µg/L)							
ALPHA-CHLORDANE	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U
GAMMA-CHLORDANE	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U
INORGANICS (µg/L)							
ALUMINUM	331 J	243 J	1220 J	108000 J	248 J	823 J	772 J
ARSENIC	3.8	3.4	1.1 U	36.8	1.1 U	1.1 U	1.1 U
BARIUM	44.3	42.4	39.1	329	36.6	82.8	83.1
BERYLLIUM	0.30 B	0.30 B	0.78 B	10.3	0.29 B	0.21 B	0.20 B
CADMIUM	3.0 UL	3.0 UL	3.0 UL	3.0 UL	3.0 UL	3.0 UL	3.0 UL
CALCIUM	3180	3040	2920	23000	4030	29200	29400
CHROMIUM	6.2	4.1	5.1	165 J	2.4 U	2.4 U	2.4 U
COBALT	28.4	27.5	3.8 U	99.7 K	3.8 U	9.1	9.4
COPPER	3.7	3.7	6.6	232	5.2	4.2	5.2
IRON	807 J	513 J	2480 J	190000 J	406 J	1460 J	1410 J
LEAD	1.0 UL	1.0 UL	1.6 L	71.0	1.0 L	1.2 L	1.0 UL
MAGNESIUM	1600	1540	1470	17700	2650	14500	14600
MANGANESE	1040	1030	62.4	2720	218	28.5	27.1
MERCURY	0.10 U	0.11 B	0.26 B	2.0	0.10 U	0.10 U	0.16 B
NICKEL	14.2 K	8.8 U	8.8 U	135 L	8.8 U	9.1 K	12.4 K

SITE 11
NSWC WHITE OAK
SILVER SPRING, MARYLAND
SUMMARY OF POSITIVE ANALYTICAL RESULTS FOR GROUNDWATER
ROUND 3 DATA - JULY 1999

SAMPLE I.D.:	**11GW220003**	**11GW220003-D**	**11GW230003**	**11GW240003**	**11GW250003**	**11GW260003**	**11GW260003-D**
LOCATION:	**11GW22**	**11GW22**	**11GW23**	**11GW24**	**11GW25**	**11GW26**	**11GW26**
SAMPLE DATE:	**7/20/99**	**7/20/99**	**7/19/99**	**7/14/99**	**7/19/99**	**7/16/99**	**7/16/99**
ASSOCIATED DUPLICATE:	**11GW220003-D**	**11GW220003**				**11GW260003-D**	**11GW260003**
VALIDATION STATUS:	**VALIDATED**	**VALIDATED**	**VALIDATED**	**VALIDATED**	**VALIDATED**	**VALIDATED**	**VALIDATED**
POTASSIUM	2420	2390	1140	12100	1310	3910	4240
SELENIUM	2.7 U	2.7 U	2.7 U	5.4 U	2.7 U	2.7 U	2.7 U
SILVER	2.2 U	2.2 U	2.2 U	3.5	2.2 U	2.2 U	2.2 U
SODIUM	24300 J	24000 J	5570 J	5930	10700 J	31100 J	31500 J
THALLIUM	3.7 U	4.8 B	5.2 B	13.1 B	4.4 B	7.0 B	4.4 B
VANADIUM	2.4 U	2.4 U	2.5	246	2.5	2.4 U	2.4
ZINC	22.1	35.0	18.4 B	531	19.6 B	18.4 B	24.7
MISCELLANEOUS PARAMETERS (µg/L)							
PERCHLORATES	6	7	190	110	7	8 U	8 U

SITE 11
NSWC WHITE OAK
SILVER SPRING, MARYLAND
SUMMARY OF POSITIVE ANALYTICAL RESULTS FOR GROUNDWATER
ROUND 3 DATA - JULY 1999

11GW270003 11GW27 7/16/99 VALIDATED	11GW280003 11GW28 7/16/99 VALIDATED	11GW290003 11GW29 7/14/99 VALIDATED	11GW620003 11PZ62 7/15/99 VALIDATED	11GW630003 11PZ63 7/19/99 VALIDATED	11GW640003 11PZ64 7/14/99 VALIDATED	11GW650003 11PZ65 7/15/99 VALIDATED	11GW660003 11GW66 7/14/99 VALIDATED	11GW670003 11GW67 7/16/99 VALIDATED	11GW680003 11GW68 7/14/99 VALIDATED	11GW690003 11GW69 7/13/99 VALIDATED
1 U	5 U	1 U	0.33 J	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1 U	5 U	1 U	1 U	1 U	1 U	1 U	0.62 J	1 U	1 U	1 U
1 U	5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1 U	5 U	0.37 J	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1 U	5 U	1 U	1 U	1 U	1 U	1 U	1.4	1 U	1 U	1 U
1 U	5 U	0.57 J	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1 U	5 U	1.1	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
2.9 J	25 UR	3.4 J	2.5 J	5 UR	1.7 J	3.8 J	3.5 J	5 UR	2.7 J	5 UR
1 U	5 U	1 U	1 U	0.29 J	1 U	1 U	1 U	0.22 J	1 U	1 U
1 U	5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
0.3 J	5 U	3.8	0.24 J	1 U	0.20 J	0.46 J	0.20 J	0.19 J	0.18 J	1 U
1 U	0.98 J	0.42 J	0.21 J	1 U	1 U	0.63 J	0.70 J	0.25 J	1 U	2.7
1 U	5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1 U	3.6 J	0.69 J	1 U	1 U	1 U	1 U	20	1 U	1 U	1 U
2 U	10 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
1 U	75	0.47 J	1 U	1 U	1 U	1 U	0.45 J	1 U	1 U	1 U
1 U	5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1 U	21	1.3	0.25 J	1 U	1 U	1 U	10	1 U	1 U	0.38 J
5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
0.15	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U
0.13	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U
1640 J	356 J	15500 J	265 J	135000 J	4550 J	85.7 J	15700 J	57.4 J	57100 J	44600 J
1.1 U	1.1 U	3.1	1.1 U	50.2 K	5.2	1.1 U	2.4	1.1 U	9.0	14.1
218	59.0	157	11.0	1130	106	31.0	138	17.8	204	754
1.8 B	0.60 B	2.5	0.11 B	91.1	0.95 B	0.72 B	1.7	0.12 B	4.1	13.2
9.2 L	3.0 UL	3.0 U	3.0 U	15.0 UL	3.0 U	3.0 UL	3.0 U	3.0 UL	3.0 U	4.1 J
16500	8660	7330	5000	35000	5330	3660	6960	1480	2490	26300
556	2.4 U	36.0 J	7.2 J	339	17.6 J	3.7	91.4 J	2.4 U	80.8 J	146
53.7	6.1	91.4	26.6	289 K	47.5	22.9	34.3	3.8 U	42.0	116
3540	11.9	26.9	8.1	445	40.5	5.2	47.5	5.0	185	119
520 J	569 J	30700 J	458 J	1550000 J	20800 J	3340 J	49800 J	30.6 J	99900 J	158000 J
1.2 L	1.4 L	13.4	1.0 UL	183 K	11.2	1.0 UL	9.9	1.0 UL	23.7	47.4
17900	6250	7570	1720	60800	4810	4170	9290	1560	9490	25800
2310	142	2950	40.2	8130	1110	511	797	35.3	980	3720
0.10 U	0.18 B	0.10 UJ	0.10 UJ	0.73 B	0.10 UJ	0.10 U	0.10 UJ	0.10 U	0.18 J	1.7
112	17.0 K	20.3	8.8 U	436 L	22.9	22.7 K	92.9	8.8 U	60.6	155 L

SITE 11
NSWC WHITE OAK
SILVER SPRING, MARYLAND
SUMMARY OF POSITIVE ANALYTICAL RESULTS FOR GROUNDWATER
ROUND 3 DATA - JULY 1999

11GW270003 11GW27 7/16/99 VALIDATED	11GW280003 11GW28 7/16/99 VALIDATED	11GW290003 11GW29 7/14/99 VALIDATED	11GW620003 11PZ62 7/15/99 VALIDATED	11GW630003 11PZ63 7/19/99 VALIDATED	11GW640003 11PZ64 7/14/99 VALIDATED	11GW650003 11PZ65 7/15/99 VALIDATED	11GW660003 11GW66 7/14/99 VALIDATED	11GW670003 11GW67 7/16/99 VALIDATED	11GW680003 11GW68 7/14/99 VALIDATED	11GW690003 11GW69 7/13/99 VALIDATED
4960	2510	3780	648	40800	2540	3880	9290	756	6990	6630
2.7 U	2.7 U	2.7 U	2.7 U	28.0 K	2.7 U	2.7 U	2.7 U	2.7 U	2.7 U	5.4 U
2.2 U	2.2 U	2.2 U	2.2 U	28.9	2.2 U	2.2 U	2.4	2.2 U	2.2 U	3.7
48600 J	12300 J	53100	15500	57100 J	3480	3920 J	8040	5070 J	3890	48200
3.7 U	6.3 B	5.2 B	4.8 B	18.5 UL	4.8 B	6.1 B	7.7 B	3.7 U	8.9 B	13.2 B
2.4 U	3.8	33.5	2.4 U	255 K	19.1	2.4 U	21.6	2.4 U	115	136
207	73.8	116	26.0 B	2110	83.0	52.0	103	43.1	188	301
9	4 U	4 U	4 U	8 U	4 U	4 U	14	4 U	4 U	4 U

SITE 11
NSWC WHITE OAK
SILVER SPRING, MARYLAND
SUMMARY OF POSITIVE ANALYTICAL RESULTS FOR GROUNDWATER
ROUND 3 DATA - JULY 1999

11GW70D0003 11GW70D 7/20/99 VALIDATED	11GW710003 11GW71 7/19/99 11GW710003-D VALIDATED	11GW710003-D 11GW71 7/19/99 11GW710003 VALIDATED	11GW720003 11GW72 7/15/99 VALIDATED	11GW730003 11GW73 7/16/99 VALIDATED	11GW840003 11GW84 7/15/99 VALIDATED	11GW850003 11GW85 7/20/99 VALIDATED	11GW860003 11GW86 7/14/99 VALIDATED	11GW870003 11GW87 7/21/99 VALIDATED	11GW880003 11GW88 7/19/99 VALIDATED
1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	0.35 J	1 U
1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1.2 J	1 U
1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
3.8 B	5.3 J	2.7 J	2.6 J	3.2 J	2.9 J	2.5 J	5 UR	2.8 B	5 UR
1 U	0.34 J	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
0.2 B	1 U	0.46 J	0.2 J	1 U	0.33 J	1 U	1 U	0.2 B	0.28 J
1 U	1 U	1 U	0.37 J	1 U	3.4	1	1 U	1 U	1 U
1 U	0.33 B	0.51 B	0.26 J	1 U	1 U	0.33 B	1 U	1 U	0.35 B
1 U	1 U	1 U	1 U	1 U	1 U	1 U	0.29 J	3.4	1 U
2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1 U	1 U	1 U	1 U	1 U	1 U	1 U	0.25 J	3.2	1 U
5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U
0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U
8900	149 J	1620 J	1760 J	333 J	13300 J	4250 J	9370 J	248 B	199 J
4.0	1.1 U	1.1 U	1.5	1.1 U	1.3	1.1 U	1.2	1.1 U	1.1 U
141	41.2	55.6	74.7	16.8	73.5	80.8	258	287	26.7
3.2 B	0.11 B	0.32 B	0.57 B	0.11 B	2.7	1.2 B	0.95	1.1 B	0.18 B
3.0 UL	3.0 UL	3.0 UL	3.0 U	3.0 UL	3.0 UL	3.0 UL	3.0 U	3.0 UL	3.0 UL
9800	4260	4240	10400	1940	3870	5170	11000	18800	3300
29.2	7.7	19.4	6.6	8.1	24.6	14.2	15.2	3.9	2.4 U
35.1	29.9	25.2	30.2	16.5	7.2	14.0	62.3	14.7	3.8 U
25.1	3.3	5.8	33.0	12.4	12.3	14.9	36.2	4.2 B	3.8
38200	779 J	5450 J	1890 J	1330 J	7090 J	6890 J	42600 J	33700	468 J
12.6	1.0 UL	1.0 UL	1.7 L	1.0 UL	13.3	3.4 L	2.0 L	1.0 U	1.0 UL
9490	1700	1840	8810	1460	2660	4510	11600	12600	2160
2380	202	269	150	35.4	119	251	10900	2480	66.3
0.10 U	0.10 U	0.10 U	0.12 J	0.10 B	0.10 U	0.10 U	0.10 UJ	0.10 U	0.10 U
61.1	14.3 K	24.7 K	16.7	11.7 K	27.3 K	21.0 K	44.9	65.6	8.8 U

SITE 11
NSWC WHITE OAK
SILVER SPRING, MARYLAND
SUMMARY OF POSITIVE ANALYTICAL RESULTS FOR GROUNDWATER
ROUND 3 DATA - JULY 1999

11GW70D0003 11GW70D 7/20/99 VALIDATED	11GW710003 11GW71 7/19/99 11GW710003-D VALIDATED	11GW710003-D 11GW71 7/19/99 11GW710003 VALIDATED	11GW720003 11GW72 7/15/99 VALIDATED	11GW730003 11GW73 7/16/99 VALIDATED	11GW840003 11GW84 7/15/99 VALIDATED	11GW850003 11GW85 7/20/99 VALIDATED	11GW860003 11GW86 7/14/99 VALIDATED	11GW870003 11GW87 7/21/99 VALIDATED	11GW880003 11GW88 7/19/99 VALIDATED
6900	2030	2270	2040	1050	2450	3260	7540	4770	1190
2.7 U	2.7 U	2.7 U	2.7 U	2.7 U	2.7 U	2.7 U	5.4 U	2.7 U	2.7 U
2.2 U	2.2 U	2.2 U	2.2 U	2.2 U	2.2 U	2.2 U	2.2 U	2.2 U	2.2 U
4660	7000 J	425000 J	5010	2220 J	5290 J	12300 J	20400	20200	9930 J
7.6	4.5 B	7.8 B	6.4 B	6.7 B	3.7 U	5.1 B	10.2 B	3.7 U	5.2 B
10.7	2.4 U	5.1	2.5	3.7	3.8	5.0	16.8	2.4 U	2.4 U
144	26.1	18.7 B	40.5	23.8	48.6	36.4	77.2	64.0	29.4

4 U	4 U	4 U	4 U	4 U	4 U	4 U	4 U	8 U	4 U

SITE 11
NSWC WHITE OAK
SILVER SPRING, MARYLAND
SUMMARY OF POSITIVE ANALYTICAL RESULTS FOR GROUNDWATER
ROUND 3 DATA - JULY 1999

11GW1010003 11GW101 7/13/99 VALIDATED	11GW1020003 11GW102 7/14/99 VALIDATED	11GW1030003 11GW103 7/14/99 VALIDATED	11GW1040003 11GW104 7/14/99 VALIDATED	11GW1050003 11GW105 7/14/99 VALIDATED	11GW1060003 11GW106 7/14/99 VALIDATED	11GW1070003 11GW107 7/16/99 VALIDATED	11GW1080003 11GW108 7/14/99 VALIDATED	11GW1090003 11GW109 7/13/99 VALIDATED	11GW1100003 11GW110 7/15/99 VALIDATED
1 U	1 U	1 U	1 U	1 U	1 U	0.23 J	1 U	1 U	25 U
1 U	1 U	1 U	1 U	1 U	1.8	1 U	0.80 J	1 U	19 J
1 U	1 U	1 U	1 U	1 U	0.52 J	1 U	0.18 J	1 U	8.8 J
1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	25 U
1 U	1 U	1 U	1 U	1 U	7.7	1 U	2.0	1 U	59
1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	25 U
1 U	0.67 J	1 U	1 U	1 U	1 U	1 U	1 U	1 U	25 U
5 UR	2.9 J	5 UR	5 UR	5 UR	5 UR	5 UR	2.8 J	2.6 J	120 UR
1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	25 U
1 U	1 U	1 U	1 U	0.21 J	1 U	1 U	0.22 J	1 U	4.6 J
1 U	0.18 J	1 U	1 U	1 U	1 U	1 U	0.28 J	0.18 J	25 U
0.42 J	1 U	1 U	1 U	0.75 J	1 U	0.29 J	1.8	1 U	18 J
1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	25 U
1 U	1 U	0.63 J	1 U	1.0	20	0.33 J	34	0.21 J	280
2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	6.8 J
1 U	1 U	1 U	1 U	0.29 J	1 U	12	1.4	1 U	8.6 J
1 U	1 U	1 U	1 U	1 U	1 U	1 U	0.34 J	1 U	25 U
1 U	1 U	1.0	1 U	4.9	8.6	8.5	22	1 U	370
5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U
0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U
28200 J	1280 J	39500 J	794 J	145 J	254 J	66.8 J	49.5 J	29.4 U	52.8 J
6.2	1.1 U	6.2	1.1 U	1.1 U	1.1 U	1.1 U	1.6	1.1 U	1.9
128	17.4	377	41.8	52.5	74.9	37.6	10.6	33.1	6.8
4.7	0.24 B	4.2	0.94 B	0.17 B	0.14 B	0.24 B	0.22 B	0.36 B	0.11 U
3.6 J	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 UL	3.0 U	3.0 U	3.0 U
6590	1630	6100	6950	7510	33800	6380	4220	8850	6300
33.0 J	2.4 U	73.4 J	2.8 J	3.1 J	2.4 U	2.4 U	2.4 U	2.4 U	2.4 U
32.9	7.8	127	17.5	24.1	3.8 U	7.3	11.0	3.8 U	3.8 U
66.5	10.1	60.0	8.3	2.4 B	1.4 U	3.4	3.7 B	1.4 U	3.7 B
43700 J	2200 J	52900 J	2520 J	258 J	3200 J	22.3 J	54.6 J	9240 J	146 J
9.6	1.0 UL	22.6	1.0 UL	1.0 UL	1.0 UL	1.0 UL	1.0 UL	1.0 UL	1.0 UL
9010	1390	10800	4300	4420	5080	4280	1190	5190	3140
616	185	4880	740	225	284	20.7	2.6 B	903	77.5
0.10 UJ	0.10 UJ	0.10 UJ	0.10 UJ	0.10 UJ	0.10 UJ	0.10 U	0.10 UJ	0.10 UJ	0.10 UJ
53.6	8.8 U	132	36.0	13.0	8.8 U	12.7 K	8.8 U	11.5	8.8 U

SITE 11
NSWC WHITE OAK
SILVER SPRING, MARYLAND
SUMMARY OF POSITIVE ANALYTICAL RESULTS FOR GROUNDWATER
ROUND 3 DATA - JULY 1999

11GW1010003 11GW101 7/13/99 VALIDATED	11GW1020003 11GW102 7/14/99 VALIDATED	11GW1030003 11GW103 7/14/99 VALIDATED	11GW1040003 11GW104 7/14/99 VALIDATED	11GW1050003 11GW105 7/14/99 VALIDATED	11GW1060003 11GW106 7/14/99 VALIDATED	11GW1070003 11GW107 7/16/99 VALIDATED	11GW1080003 11GW108 7/14/99 VALIDATED	11GW1090003 11GW109 7/13/99 VALIDATED	11GW1100003 11GW110 7/15/99 VALIDATED
10100	1870	15100	4290	2310	4110	2380	1090	3020	3150
2.7 U	2.7 U	2.7 U	2.7 U	2.7 U	2.7 U	2.7 U	2.7 U	2.7 U	2.7 U
2.2 U	2.2 U	2.2 U	2.2 U	2.2 U	2.2 U	2.2 U	2.2 U	2.2 U	2.2 U
405000	2660	6050	12800	15100	7920	12400 J	5510	6430	8080
10.2 B	3.7 U	8.8 B	3.7 U	6.4 B	3.7 U	5.6 B	4.0 B	3.7 U	4.6 B
30.2	2.4 U	43.6	2.4 U	2.4 U	6.9	2.4 U	2.4 U	2.4 U	2.4 U
255	28.3	164	77.3	40.7	5.4 B	17.0 B	4.6 B	6.2 B	5.9 B
4 U	4 U	8	4 U	4 U	4 U	4 U	44	4 U	40

SITE 11
NSWC WHITE OAK
SILVER SPRING, MARYLAND
SUMMARY OF POSITIVE ANALYTICAL RESULTS FOR GROUNDWATER
ROUND 3 DATA - JULY 1999

11GW1110003 11GW111 7/15/99 11GW1110003-D VALIDATED	11GW1110003-D 11GW111 7/15/99 11GW1110003 VALIDATED
1 U	1 U
1 U	1 U
1 U	1 U
1 U	1 U
1 U	1 U
1 U	1 U
1 U	1 U
1.9 J	5 UR
1 U	1 U
1 U	1 U
0.20 J	1 U
0.28 J	0.28 J
1 U	1 U
1 U	1 U
2 U	2 U
1 U	1 U
1 U	1 U
1.2	1.1
5 U	5 U
0.050 U	0.050 U
0.050 U	0.050 U
841 J	547 J
1.1 U	1.1 U
27.9	26.1
0.24 B	0.17 B
3.0 U	3.0 U
2830	2900
3.7 J	2.4 U
17.5	15.1
10.1	9.1
1950 J	1230 J
1.0 UL	1.0 UL
1590	1510
685	668
0.10 UJ	0.10 UJ
8.8 U	8.8 U

SITE 11
NSWC WHITE OAK
SILVER SPRING, MARYLAND
SUMMARY OF POSITIVE ANALYTICAL RESULTS FOR GROUNDWATER
ROUND 3 DATA - JULY 1999

11GW1110003 **11GW111** **7/15/99** **11GW1110003-D** **VALIDATED**	**11GW1110003-D** **11GW111** **7/15/99** **11GW1110003** **VALIDATED**
2470	2220
2.7 U	2.7 U
2.2 U	2.2 U
7900	7990
3.7 U	5.8 B
2.4 U	2.4 U
29.5	34.8

4 U	4 U

SITE 11

GROUNDWATER DATA
JULY/AUGUST 1999

FILTERED

POSITIVE DETECTIONS

SITE 11
NSWC WHITE OAK
SILVER SPRING, MARYLAND
SUMMARY OF POSITIVE ANALYTICAL RESULTS FOR FILTERED GROUNDWATER
ROUND 3 DATA - JULY 1999

SAMPLE I.D.:	11GW230003-F	11GW240003-F	11GW260003-F	11GW260003-F-D	11GW290003-F	11GW630003-F	11GW640003-F
LOCATION:	11GW23	11GW24	11GW26	11GW26	11GW29	11PZ63	11PZ64
SAMPLE DATE:	07/19/99	07/14/99	07/16/99	07/16/99	07/14/99	07/19/99	07/14/99
ASSOCIATED DUPLICATE:			11GW260003-F-D	11GW260003-F			
VALIDATION STATUS:	VALIDATED	VALIDATED	VALIDATED	VALIDATED	VALIDATED	VALIDATED	VALIDATED
DISSOLVED INORGANICS (µg/L)							
ALUMINUM	39.9 J	51.6 J	59.9 J	57.5 J	64.5 J	76.1 J	29.4 U
ARSENIC	1.1 U	1.1 U	1.1 U	1.1	1.1 U	1.1 U	1.1 U
BARIUM	31.6	14.8	79.9	81.4	45.7	91.3	7.3
CADMIUM	3.0 UL	3.0 U	3.0 UL	3.0 UL	3.0 U	3.0 UL	3.0 U
CALCIUM	2820	12300	30200	30600	5590	9870	3510
COBALT	3.8 U	3.8 U	8	7.3	54.9	29.3	22.0
COPPER	2.8	4.9 B	1.4 U	1.6	1.4 U	1.4 U	1.4 U
IRON	14.9 J	32.4 J	9.2 U	13.6 J	7360 J	14200 J	4470 J
MAGNESIUM	1310	3450	14400	14700	4550	10400	2690
MANGANESE	15.2	62.1	10.6	8.5	2420	2680	760
MERCURY	0.10 U	0.10 UJ	0.10 U	0.10 U	0.16 J	0.10 U	0.10 UJ
NICKEL	8.8 U	8.8 U	9.2 K	15.2 K	8.8 U	61.6 K	8.8 U
POTASSIUM	1190	1090	4010	4090	1950	6110	1040
SODIUM	5470 J	4680	31000 J	31500 J	50500	59500 J	2730
VANADIUM	2.4 U	2.4 U	2.4 U	2.4 U	2.4 U	2.4 U	2.4 U
ZINC	12.3 B	4.9 B	12.6 B	44.0	17.0 B	155	9.4 B

SITE 11
NSWC WHITE OAK
SILVER SPRING, MARYLAND
SUMMARY OF POSITIVE ANALYTICAL RESULTS FOR FILTERED GROUNDWATER
ROUND 3 DATA - JULY 1999

SAMPLE I.D.:	11GW660003-F	11GW680003-F	11GW690003-F	11GW70D0003-F	11GW720003-F	11GW730003-F	11GW840003-F
LOCATION:	11GW66	11GW68	11GW69	11GW70D	11GW72	11GW73	11GW84
SAMPLE DATE:	07/14/99	07/14/99	07/13/99	07/20/99	07/15/99	07/16/99	07/15/99
ASSOCIATED DUPLICATE:							
VALIDATION STATUS:	VALIDATED	VALIDATED	VALIDATED	VALIDATED	VALIDATED	VALIDATED	VALIDATED
DISSOLVED INORGANICS (µg/L)							
ALUMINUM	29.4 U	29.4 U	194 J	33.2 B	32.1 J	30.4 J	202 J
ARSENIC	1.4	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U
BARIUM	14.7	6.2	311	59.5	66.1	14.1	23.2
CADMIUM	3.0 U	3.0 U	3.7 J	3.0 UL	3.0 U	3.0 UL	3.0 UL
CALCIUM	4510	1070	21700	7710	9840	1670	2820
COBALT	10.7	3.8 U	3.8 U	13.5	13.7	19.5	4.9
COPPER	1.8 B	1.4 U	5.3 B	1.4 U	5.5 B	2.8	3.8
IRON	1280 J	10.2 J	9.2 U	4020	20.6 J	26.8 J	117 J
MAGNESIUM	2760	812	19500	5970	7170	1350	1620
MANGANESE	514	5.3	370	1720	50.8	19.1	22.6
MERCURY	0.10 UJ	0.10 UJ	0.10 UJ	0.10 U	0.10 UJ	0.10 U	0.10 U
NICKEL	29.6	8.8 U	45.2	21.3	8.8 U	8.8 U	8.8 U
POTASSIUM	3100	470 U	3080	4370	1790	1030	1620
SODIUM	6440	3040	49000	4800	4280	1900 J	4560 J
VANADIUM	2.4 U	2.5	2.4 U	2.4 U	2.4 U	2.4 U	2.4 U
ZINC	10.7 B	6.4 B	56.1	21.6	16.3 B	17.9 B	18.5 B

SITE 11
NSWC WHITE OAK
SILVER SPRING, MARYLAND
SUMMARY OF POSITIVE ANALYTICAL RESULTS FOR FILTERED GROUNDWATER
ROUND 3 DATA - JULY 1999

SAMPLE I.D.:	11GW850003-F	11GW860003-F	11GW870003-F	11GW1010003-F	11GW1020003-F	11GW1030003-F	11GW1040003-F
LOCATION:	11GW85	11GW86	11GW87	11GW101	11GW102	11GW103	11GW104
SAMPLE DATE:	07/20/99	07/14/99	07/21/99	07/13/99	07/14/99	07/14/99	07/14/99
ASSOCIATED DUPLICATE:							
VALIDATION STATUS:	VALIDATED	VALIDATED	VALIDATED	VALIDATED	VALIDATED	VALIDATED	VALIDATED
DISSOLVED INORGANICS (µg/L)							
ALUMINUM	73.4 J	29.4 U	29.4 B	29.4 U	29.4 U	29.4 U	29.4 U
ARSENIC	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U
BARIUM	60.3	143	308	20.6	6.5	28.0	21.9
CADMIUM	3.0 UL	3.0 U	3.0 UL	3.0 U	3.0 U	3.0 U	3.0 U
CALCIUM	5100	10200	18700	4460	1420	4310	6040
COBALT	8.2	48.6	15.9	9.0	6.3	28.5	17.0
COPPER	2.4	1.4 U	1.4 U	8.2	6.0 U	8.4	1.5 B
IRON	16.8 J	18200 J	31200	9.9 J	9.2 U	1440 J	216 J
MAGNESIUM	3800	7280	13400	2430	958	2860	3630
MANGANESE	91.5	10300	2560	236	146	3800	689
MERCURY	0.10 U	0.10 UJ	0.10 U	0.10 UJ	0.27 J	0.10 UJ	0.10 UJ
NICKEL	8.9 K	20.9	67.7	8.8 U	8.8 U	44.2	22.6
POTASSIUM	2480	2270	5930	1530	857	5590	3690
SODIUM	12100 J	19000	22700	9780	2160	5160	11700
VANADIUM	2.4	2.4 U	2.4 U	2.4 U	2.4 U	2.4 U	2.4 U
ZINC	23.7	15.2 B	57.0	19.8 B	9.4 B	11 B	58.6

SITE 11
NSWC WHITE OAK
SILVER SPRING, MARYLAND
SUMMARY OF POSITIVE ANALYTICAL RESULTS FOR FILTERED GROUNDWATER
ROUND 3 DATA - JULY 1999

SAMPLE I.D.:	**11GW1110003-F**	**11GW1110003-F-D**
LOCATION:	**11GW111**	**11GW111**
SAMPLE DATE:	**07/15/99**	**07/15/99**
ASSOCIATED DUPLICATE:	**11GW1110003-F-D**	**11GW1110003-F**
VALIDATION STATUS:	**VALIDATED**	**VALIDATED**
DISSOLVED INORGANICS (μg/L)		
ALUMINUM	36.6 J	40.4 J
ARSENIC	1.1 U	1.1 U
BARIUM	23.1	23.0
CADMIUM	3.0 U	3.0 U
CALCIUM	2830	2590
COBALT	14.3	14.0
COPPER	1.4 U	1.4 U
IRON	13.1 J	9.2 U
MAGNESIUM	1340	1330
MANGANESE	629	622
MERCURY	0.10 UJ	0.10 UJ
NICKEL	9.1	8.8 U
POTASSIUM	1970	2380
SODIUM	7110	6960
VANADIUM	2.4 U	2.4 U
ZINC	35.7	10.2 B

SECTION F

ANALYTICAL DATA

SITE 11

GROUNDWATER DATA
JULY/AUGUST 1999

SITE 11
NSWC WHITE OAK
SILVER SPRING, MARYLAND
SUMMARY OF ANALYTICAL RESULTS FOR GROUNDWATER
ROUND 3 DATA - JULY 1999

SAMPLE I.D.:	11GW220003	11GW220003-D	11GW230003	11GW240003	11GW250003	11GW260003	11GW260003-D
LOCATION:	11GW22	11GW22	11GW23	11GW24	11GW25	11GW26	11GW26
SAMPLE DATE:	7/20/99	7/20/99	7/19/99	7/14/99	7/19/99	7/16/99	7/16/99
ASSOCIATED DUPLICATE:	11GW220003-D	11GW220003				11GW260003-D	11GW260003
VALIDATION STATUS:	VALIDATED	VALIDATED	VALIDATED	VALIDATED	VALIDATED	VALIDATED	VALIDATED
VOLATILES (µg/L)							
1,1,1-TRICHLOROETHANE	15 U	15 U	1 U	1 U	1 U	1 U	1 U
1,1,2,2-TETRACHLOROETHANE	15 U	15 U	1 U	1 U	1 U	1 U	1 U
1,1,2-TRICHLOROETHANE	15 U	15 U	1 U	1 U	1 U	1 U	1 U
1,1-DICHLOROETHANE	15 U	15 U	1 U	1 U	1 U	1 U	1 U
1,1-DICHLOROETHENE	15 U	15 U	1 U	1 U	1 U	1 U	1 U
1,2,4-TRICHLOROBENZENE	15 U	15 U	1 U	1 U	1 U	1 U	1 U
1,2-DIBROMO-3-CHLOROPROPANE	15 UR	15 UR	1 UR	1 UR	1 UR	1 UR	1 UR
1,2-DIBROMOETHANE	15 U	15 U	1 U	1 U	1 U	1 U	1 U
1,2-DICHLOROBENZENE	15 U	15 U	1 U	1 U	1 U	1 U	1 U
1,2-DICHLOROETHANE	15 U	15 U	1 U	1 U	1 U	1 U	1 U
1,2-DICHLOROPROPANE	15 U	15 U	1 U	1 U	1 U	1 U	1 U
1,3-DICHLOROBENZENE	15 U	15 U	1 U	1 U	1 U	1 U	1 U
1,4-DICHLOROBENZENE	15 U	15 U	1 U	1 U	1 U	1 U	1 U
2-BUTANONE	75 UR	75 UR	5 UR	5 UR	5 UR	5 UR	5 UR
2-HEXANONE	75 U	75 U	5 U	5 U	5 U	5 U	5 U
4-METHYL-2-PENTANONE	75 U	75 U	5 U	5 U	5 U	5 U	5 U
ACETONE	75 UR	75 UR	2.7 J	2.7 J	3 J	2.8 J	2.9 J
BENZENE	15 U	15 U	1 U	1 U	1 U	1 U	1 U
BROMOCHLOROMETHANE	15 U	15 U	1 U	1 U	1 U	1 U	1 U
BROMODICHLOROMETHANE	15 U	15 U	1 U	1 U	1 U	1 U	1 U
BROMOFORM	15 U	15 U	1 U	1 U	1 U	1 U	1 U
BROMOMETHANE	15 U	15 U	1 U	1 U	0.37 J	1 U	1 U
CARBON DISULFIDE	15 U	15 U	1 U	1 U	1 U	1 U	1 U
CARBON TETRACHLORIDE	15 U	15 U	1 U	1 U	0.58 J	1 U	1 U
CHLOROBENZENE	15 U	15 U	0.24 J	1 U	0.28 J	0.36 J	0.26 J
CHLOROETHANE	15 U	15 U	1 U	1 U	1 U	1 U	1 U
CHLOROFORM	3.1 J	3.5 J	1.9	2.0	2.6	1 U	1 U
CHLOROMETHANE	15 U	15 U	1 U	1 U	0.29 B	1 U	1 U
CIS-1,2-DICHLOROETHENE	170	170	1 U	1 U	1 U	1 U	1 U
CIS-1,3-DICHLOROPROPENE	15 U	15 U	1 U	1 U	1 U	1 U	1 U
DIBROMOCHLOROMETHANE	15 U	15 U	1 U	1 U	1 U	1 U	1 U
ETHYLBENZENE	15 U	15 U	1 U	1 U	1 U	1 U	1 U
METHYLENE CHLORIDE	30 U	30 U	2 U	2 U	2 U	2 U	2 U
STYRENE	15 U	15 U	1 U	1 U	1 U	1 U	1 U
TETRACHLOROETHENE	3.3 J	2.9 J	0.66 J	1 U	1 U	1 U	1 U
TOLUENE	15 U	15 U	1 U	1 U	1 U	1 U	1 U
TRANS-1,2-DICHLOROETHENE	15 U	15 U	1 U	1 U	1 U	1 U	1 U
TRANS-1,3-DICHLOROPROPENE	15 U	15 U	1 U	1 U	1 U	1 U	1 U
TRICHLOROETHENE	86	81	1.4	1 U	0.64 J	1 U	1 U

SITE 11
NSWC WHITE OAK
SILVER SPRING, MARYLAND
SUMMARY OF ANALYTICAL RESULTS FOR GROUNDWATER
ROUND 3 DATA - JULY 1999

VINYL CHLORIDE	15 U	15 U	1 U	1 U	1 U	1 U	1 U
XYLENES, TOTAL	15 U	15 U	1 U	1 U	1 U	1 U	1 U
SEMIVOLATILES (µg/L)							
2,2'-OXYBIS(1-CHLOROPROPANE)	5 U	5 U	5 U	5 U	5 U	5 U	5 U
2,4,5-TRICHLOROPHENOL	20 U	20 U	20 U	20 U	20 U	20 U	20 U
2,4,6-TRICHLOROPHENOL	5 U	5 U	5 U	5 U	5 U	5 U	5 U
2,4-DICHLOROPHENOL	5 U	5 U	5 U	5 U	5 U	5 U	5 U
2,4-DIMETHYLPHENOL	5 U	5 U	5 U	5 U	5 U	5 U	5 U
2,4-DINITROPHENOL	20 U	20 U	20 U	20 U	20 U	20 U	20 U
2,4-DINITROTOLUENE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
2,6-DINITROTOLUENE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
2-CHLORONAPHTHALENE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
2-CHLOROPHENOL	5 U	5 U	5 U	5 U	5 U	5 U	5 U
2-METHYLNAPHTHALENE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
2-METHYLPHENOL	5 U	5 U	5 U	5 U	5 U	5 U	5 U
2-NITROANILINE	20 U	20 U	20 U	20 U	20 U	20 U	20 U
2-NITROPHENOL	5 U	5 U	5 U	5 U	5 U	5 U	5 U
3,3'-DICHLOROBENZIDINE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
3-NITROANILINE	20 U	20 U	20 U	20 U	20 U	20 U	20 U
4,6-DINITRO-2-METHYLPHENOL	20 U	20 U	20 U	20 U	20 U	20 U	20 U
4-BROMOPHENYL PHENYL ETHER	5 U	5 U	5 U	5 U	5 U	5 U	5 U
4-CHLORO-3-METHYLPHENOL	5 U	5 U	5 U	5 U	5 U	5 U	5 U
4-CHLOROANILINE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
4-CHLOROPHENYL PHENYL ETHER	5 U	5 U	5 U	5 U	5 U	5 U	5 U
4-METHYLPHENOL	5 U	5 U	5 U	5.7	5 U	5 U	5 U
4-NITROANILINE	20 U	20 U	20 U	20 U	20 U	20 U	20 U
4-NITROPHENOL	20 U	20 U	20 U	20 U	20 U	20 U	20 U
ACENAPHTHENE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
ACENAPHTHYLENE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
ANTHRACENE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
BENZO(A)ANTHRACENE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
BENZO(A)PYRENE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
BENZO(B)FLUORANTHENE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
BENZO(G,H,I)PERYLENE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
BENZO(K)FLUORANTHENE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
BIS(2-CHLOROETHOXY)METHANE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
BIS(2-CHLOROETHYL)ETHER	5 U	5 U	5 U	5 U	5 U	5 U	5 U
BIS(2-ETHYLHEXYL)PHTHALATE	1.4 B	1.9 B	5.2 B	3.7 B	4.4 B	4.7 B	5.2 B
BUTYLBENZYL PHTHALATE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
CHRYSENE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
DI-N-BUTYL PHTHALATE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
DI-N-OCTYL PHTHALATE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
DIBENZO(A,H)ANTHRACENE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
DIBENZOFURAN	5 U	5 U	5 U	5 U	5 U	5 U	5 U
DIETHYL PHTHALATE	5 U	5 U	5 U	5 U	5 U	5 U	5 U

SITE 11
NSWC WHITE OAK
SILVER SPRING, MARYLAND
SUMMARY OF ANALYTICAL RESULTS FOR GROUNDWATER
ROUND 3 DATA - JULY 1999

DIMETHYL PHTHALATE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
FLUORANTHENE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
FLUORENE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
HEXACHLOROBENZENE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
HEXACHLOROBUTADIENE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
HEXACHLOROCYCLOPENTADIENE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
HEXACHLOROETHANE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
INDENO(1,2,3-CD)PYRENE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
ISOPHORONE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
N-NITROSO-DI-N-PROPYLAMINE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
N-NITROSODIPHENYLAMINE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
NAPHTHALENE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
NITROBENZENE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
PENTACHLOROPHENOL	20 U	20 U	20 U	20 U	20 U	20 U	20 U
PHENANTHRENE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
PHENOL	5 U	5 U	5 U	5 U	5 U	5 U	5 U
PYRENE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
PESTICIDES/PCBs (µg/L)							
4,4'-DDD	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
4,4'-DDE	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
4,4'-DDT	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
ALDRIN	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U
ALPHA-BHC	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U
ALPHA-CHLORDANE	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U
AROCLOR-1016	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
AROCLOR-1221	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
AROCLOR-1232	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
AROCLOR-1242	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
AROCLOR-1248	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
AROCLOR-1254	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
AROCLOR-1260	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
BETA-BHC	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U
DELTA-BHC	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U
DIELDRIN	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
ENDOSULFAN I	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U
ENDOSULFAN II	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
ENDOSULFAN SULFATE	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
ENDRIN	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
ENDRIN ALDEHYDE	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
ENDRIN KETONE	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
GAMMA-BHC (LINDANE)	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U
GAMMA-CHLORDANE	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U
HEPTACHLOR	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U
HEPTACHLOR EPOXIDE	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U
METHOXYCHLOR	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U

SITE 11
NSWC WHITE OAK
SILVER SPRING, MARYLAND
SUMMARY OF ANALYTICAL RESULTS FOR GROUNDWATER
ROUND 3 DATA - JULY 1999

TOXAPHENE	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
EXPLOSIVES (µg/L)							
1,3,5-TRINITROBENZENE	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,3-DINITROBENZENE	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
2,4,6-TRINITROTOLUENE	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
2,4-DINITROTOLUENE	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
2,6-DINITROTOLUENE	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
2-AMINO-4,6-DINITROTOLUENE	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
2-NITROTOLUENE	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
3-NITROTOLUENE	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
4-AMINO-2,6-DINITROTOLUENE	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
4-NITROTOLUENE	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
HMX	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
NITROBENZENE	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
RDX	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
TETRYL	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
INORGANICS (µg/L)							
ALUMINUM	331 J	243 J	1220 J	108000 J	248 J	823 J	772 J
ANTIMONY	1.7 U	1.7 U	1.7 U	3.4 UL	1.7 U	1.7 U	1.7 U
ARSENIC	3.8	3.4	1.1 U	36.8	1.1 U	1.1 U	1.1 U
BARIUM	44.3	42.4	39.1	329	36.6	82.8	83.1
BERYLLIUM	0.30 B	0.30 B	0.78 B	10.3	0.29 B	0.21 B	0.20 B
CADMIUM	3.0 UL	3.0 UL	3.0 UL	3.0 UL	3.0 UL	3.0 UL	3.0 UL
CALCIUM	3180	3040	2920	23000	4030	29200	29400
CHROMIUM	6.2	4.1	5.1	165 J	2.4 U	2.4 U	2.4 U
COBALT	28.4	27.5	3.8 U	99.7 K	3.8 U	9.1	9.4
COPPER	3.7	3.7	6.6	232	5.2	4.2	5.2
CYANIDE	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U
IRON	807 J	513 J	2480 J	190000 J	406 J	1460 J	1410 J
LEAD	1.0 UL	1.0 UL	1.6 L	71.0	1.0 L	1.2 L	1.0 UL
MAGNESIUM	1600	1540	1470	17700	2650	14500	14600
MANGANESE	1040	1030	62.4	2720	218	28.5	27.1
MERCURY	0.10 U	0.11 B	0.26 B	2.0	0.10 U	0.10 U	0.16 B
NICKEL	14.2 K	8.8 U	8.8 U	135 L	8.8 U	9.1 K	12.4 K
POTASSIUM	2420	2390	1140	12100	1310	3910	4240
SELENIUM	2.7 U	2.7 U	2.7 U	5.4 U	2.7 U	2.7 U	2.7 U
SILVER	2.2 U	2.2 U	2.2 U	3.5	2.2 U	2.2 U	2.2 U
SODIUM	24300 J	24000 J	5570 J	5930	10700 J	31100 J	31500 J
THALLIUM	3.7 U	4.8 B	5.2 B	13.1 B	4.4 B	7.0 B	4.4 B
VANADIUM	2.4 U	2.4 U	2.5	246	2.5	2.4 U	2.4
ZINC	22.1	35.0	18.4 B	531	19.6 B	18.4 B	24.7
MISCELLANEOUS PARAMETERS (µg/L)							
PERCHLORATES	6	7	190	110	7	8 U	8 U

SITE 11
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ROUND 3 DATA - JULY 1999

11GW270003 11GW27 7/16/99 VALIDATED	11GW280003 11GW28 7/16/99 VALIDATED	11GW290003 11GW29 7/14/99 VALIDATED	11GW620003 11PZ62 7/15/99 VALIDATED	11GW630003 11PZ63 7/19/99 VALIDATED	11GW640003 11PZ64 7/14/99 VALIDATED	11GW650003 11PZ65 7/15/99 VALIDATED	11GW660003 11GW66 7/14/99 VALIDATED	11GW670003 11GW67 7/16/99 VALIDATED	11GW680003 11GW68 7/14/99 VALIDATED	11GW690003 11GW69 7/13/99 VALIDATED
1 U	5 U	1 U	0.33 J	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1 U	5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1 U	5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1 U	5 U	1 U	1 U	1 U	1 U	1 U	0.62 J	1 U	1 U	1 U
1 U	5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1 U	5 U	0.37 J	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1 UR	5 UR	1 UR	1 UR	1 UR	1 UR	1 UR	1 UR	1 UR	1 UR	1 UR
1 U	5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1 U	5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1 U	5 U	1 U	1 U	1 U	1 U	1 U	1.4	1 U	1 U	1 U
1 U	5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1 U	5 U	0.57 J	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1 U	5 U	1.1	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
5 UR	25 UR	5 UR	5 UR	5 UR	5 UR	5 UR	5 UR	5 UR	5 UR	5 UR
5 U	25 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
5 U	25 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
2.9 J	25 UR	3.4 J	2.5 J	5 UR	1.7 J	3.8 J	3.5 J	5 UR	2.7 J	5 UR
1 U	5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1 U	5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1 U	5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1 U	5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1 U	5 U	1 U	1 U	0.29 J	1 U	1 U	1 U	0.22 J	1 U	1 U
1 U	5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1 U	5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
0.3 J	5 U	3.8	0.24 J	1 U	0.20 J	0.46 J	0.20 J	0.19 J	0.18 J	1 U
1 U	5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1 U	0.98 J	0.42 J	0.21 J	1 U	1 U	0.63 J	0.70 J	0.25 J	1 U	2.7
1 U	5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1 U	3.6 J	0.69 J	1 U	1 U	1 U	1 U	20	1 U	1 U	1 U
1 U	5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1 U	5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1 U	5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
2 U	10 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
1 U	5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1 U	75	0.47 J	1 U	1 U	1 U	1 U	0.45 J	1 U	1 U	1 U
1 U	5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1 U	5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1 U	5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1 U	21	1.3	0.25 J	1 U	1 U	1 U	10	1 U	1 U	0.38 J

SITE 11
NSWC WHITE OAK
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1 U	5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1 U	5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U

5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U
5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U
5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U
5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U
20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U
5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U
20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U
5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
19 B	18 B	10 B	43 B	22 B	2.5 B	4.6 B	3.4 B	3.1 B	1.5 B	18 B
5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U

SITE 11
NSWC WHITE OAK
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5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U
5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U

0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U
0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U
0.15	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U
1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U
0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U
0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U
0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U
0.13	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U
0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U
0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U
0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U

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5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
0.2 U	0.2 U	0.2 U	0.2 U	0.56 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
0.2 U	0.2 U	0.2 U	0.2 U	0.56 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
0.2 U	0.2 U	0.2 U	0.2 U	0.56 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
0.2 U	0.2 U	0.2 U	0.2 U	0.56 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
0.2 U	0.2 U	0.2 U	0.2 U	0.56 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
0.2 U	0.2 U	0.2 U	0.2 U	0.56 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
0.2 U	0.2 U	0.2 U	0.2 U	0.56 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
0.2 U	0.2 U	0.2 U	0.2 U	0.56 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
0.2 U	0.2 U	0.2 U	0.2 U	0.56 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
0.5 U	0.5 U	0.5 U	0.5 U	1.4 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
0.2 U	0.2 U	0.2 U	0.2 U	0.56 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
0.5 U	0.5 U	0.5 U	0.5 U	1.4 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
0.2 U	0.2 U	0.2 U	0.2 U	0.56 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1640 J	356 J	15500 J	265 J	135000 J	4550 J	85.7 J	15700 J	57.4 J	57100 J	44600 J
1.7 U	1.7 U	1.7 UL	1.7 UL	8.5 U	1.7 UL	1.7 U	1.7 UL	1.7 U	1.7 UL	3.4 UL
1.1 U	1.1 U	3.1	1.1 U	50.2 K	5.2	1.1 U	2.4	1.1 U	9.0	14.1
218	59.0	157	11.0	1130	106	31.0	138	17.8	204	754
1.8 B	0.60 B	2.5	0.11 B	91.1	0.95 B	0.72 B	1.7	0.12 B	4.1	13.2
9.2 L	3.0 UL	3.0 U	3.0 U	15.0 UL	3.0 U	3.0 UL	3.0 U	3.0 UL	3.0 U	4.1 J
16500	8660	7330	5000	35000	5330	3660	6960	1480	2490	26300
556	2.4 U	36.0 J	7.2 J	339	17.6 J	3.7	91.4 J	2.4 U	80.8 J	146
53.7	6.1	91.4	26.6	289 K	47.5	22.9	34.3	3.8 U	42.0	116
3540	11.9	26.9	8.1	445	40.5	5.2	47.5	5.0	185	119
1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.5 B
520 J	569 J	30700 J	458 J	1550000 J	20800 J	3340 J	49800 J	30.6 J	99900 J	158000 J
1.2 L	1.4 L	13.4	1.0 UL	183 K	11.2	1.0 UL	9.9	1.0 UL	23.7	47.4
17900	6250	7570	1720	60800	4810	4170	9290	1560	9490	25800
2310	142	2950	40.2	8130	1110	511	797	35.3	980	3720
0.10 U	0.18 B	0.10 UJ	0.10 UJ	0.73 B	0.10 UJ	0.10 U	0.10 UJ	0.10 U	0.18 J	1.7
112	17.0 K	20.3	8.8 U	436 L	22.9	22.7 K	92.9	8.8 U	60.6	155 L
4960	2510	3780	648	40800	2540	3880	9290	756	6990	6630
2.7 U	2.7 U	2.7 U	2.7 U	28.0 K	2.7 U	2.7 U	2.7 U	2.7 U	2.7 U	5.4 U
2.2 U	2.2 U	2.2 U	2.2 U	28.9	2.2 U	2.2 U	2.4	2.2 U	2.2 U	3.7
48600 J	12300 J	53100	15500	57100 J	3480	3920 J	8040	5070 J	3890	48200
3.7 U	6.3 B	5.2 B	4.8 B	18.5 UL	4.8 B	6.1 B	7.7 B	3.7 U	8.9 B	13.2 B
2.4 U	3.8	33.5	2.4 U	255 K	19.1	2.4 U	21.6	2.4 U	115	136
207	73.8	116	26.0 B	2110	83.0	52.0	103	43.1	188	301
9	4 U	4 U	4 U	8 U	4 U	4 U	14	4 U	4 U	4 U

SITE 11
NSWC WHITE OAK
SILVER SPRING, MARYLAND
SUMMARY OF ANALYTICAL RESULTS FOR GROUNDWATER
ROUND 3 DATA - JULY 1999

11GW70D0003 11GW70D 7/20/99 VALIDATED	11GW710003 11GW71 7/19/99 11GW710003-D VALIDATED	11GW710003-D 11GW71 7/19/99 11GW710003 VALIDATED	11GW720003 11GW72 7/15/99 VALIDATED	11GW730003 11GW73 7/16/99 VALIDATED	11GW840003 11GW84 7/15/99 VALIDATED	11GW850003 11GW85 7/20/99 VALIDATED	11GW860003 11GW86 7/14/99 VALIDATED	11GW870003 11GW87 7/21/99 VALIDATED	11GW880003 11GW88 7/19/99 VALIDATED
1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	0.35 J	1 U
1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1 UR	1 UR	1 UR	1 UR	1 UR	1 UR	1 UR	1 UR	1 UR	1 UR
1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1.2 J	1 U
1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
5 UR	5 UR	5 UR	5 UR	5 UR	5 UR	5 UR	5 UR	5 UR	5 UR
5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
3.8 B	5.3 J	2.7 J	2.6 J	3.2 J	2.9 J	2.5 J	5 UR	2.8 B	5 UR
1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1 U	0.34 J	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
0.2 B	1 U	0.46 J	0.2 J	1 U	0.33 J	1 U	1 U	0.2 B	0.28 J
1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1 U	1 U	1 U	0.37 J	1 U	3.4	1	1 U	1 U	1 U
1 U	0.33 B	0.51 B	0.26 J	1 U	1 U	0.33 B	1 U	1 U	0.35 B
1 U	1 U	1 U	1 U	1 U	1 U	1 U	0.29 J	3.4	1 U
1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1 U	1 U	1 U	1 U	1 U	1 U	1 U	0.25 J	3.2	1 U

SITE 11
NSWC WHITE OAK
SILVER SPRING, MARYLAND
SUMMARY OF ANALYTICAL RESULTS FOR GROUNDWATER
ROUND 3 DATA - JULY 1999

1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U

5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U
5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U
5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U
5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U
20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U
5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U
20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U
5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
11 B	18 B	1.7 B	4.3 B	1 B	1.5 B	4.1 B	20 B	2.9 B	1.4 B
5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U

SITE 11
NSWC WHITE OAK
SILVER SPRING, MARYLAND
SUMMARY OF ANALYTICAL RESULTS FOR GROUNDWATER
ROUND 3 DATA - JULY 1999

5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U
5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U

0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U
0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U
0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U
1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U
0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U
0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U
0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U
0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U
0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U
0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U
0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U

SITE 11
NSWC WHITE OAK
SILVER SPRING, MARYLAND
SUMMARY OF ANALYTICAL RESULTS FOR GROUNDWATER
ROUND 3 DATA - JULY 1999

5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
8900	149 J	1620 J	1760 J	333 J	13300 J	4250 J	9370 J	248 B	199 J
1.7 U	1.7 U	1.7 U	1.7 UL	1.7 U	1.7 U	1.7 U	1.7 UL	1.7 U	1.7 U
4.0	1.1 U	1.1 U	1.5	1.1 U	1.3	1.1 U	1.2	1.1 U	1.1 U
141	41.2	55.6	74.7	16.8	73.5	80.8	258	287	26.7
3.2 B	0.11 B	0.32 B	0.57 B	0.11 B	2.7	1.2 B	0.95	1.1 B	0.18 B
3.0 UL	3.0 UL	3.0 UL	3.0 U	3.0 UL	3.0 UL	3.0 UL	3.0 U	3.0 UL	3.0 UL
9800	4260	4240	10400	1940	3870	5170	11000	18800	3300
29.2	7.7	19.4	6.6	8.1	24.6	14.2	15.2	3.9	2.4 U
35.1	29.9	25.2	30.2	16.5	7.2	14.0	62.3	14.7	3.8 U
25.1	3.3	5.8	33.0	12.4	12.3	14.9	36.2	4.2 B	3.8
1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U
38200	779 J	5450 J	1890 J	1330 J	7090 J	6890 J	42600 J	33700	468 J
12.6	1.0 UL	1.0 UL	1.7 L	1.0 UL	13.3	3.4 L	2.0 L	1.0 U	1.0 UL
9490	1700	1840	8810	1460	2660	4510	11600	12600	2160
2380	202	269	150	35.4	119	251	10900	2480	66.3
0.10 U	0.10 U	0.10 U	0.12 J	0.10 B	0.10 U	0.10 U	0.10 UJ	0.10 U	0.10 U
61.1	14.3 K	24.7 K	16.7	11.7 K	27.3 K	21.0 K	44.9	65.6	8.8 U
6900	2030	2270	2040	1050	2450	3260	7540	4770	1190
2.7 U	2.7 U	2.7 U	2.7 U	2.7 U	2.7 U	2.7 U	5.4 U	2.7 U	2.7 U
2.2 U	2.2 U	2.2 U	2.2 U	2.2 U	2.2 U	2.2 U	2.2 U	2.2 U	2.2 U
4660	7000 J	425000 J	5010	2220 J	5290 J	12300 J	20400	20200	9930 J
7.6	4.5 B	7.8 B	6.4 B	6.7 B	3.7 U	5.1 B	10.2 B	3.7 U	5.2 B
10.7	2.4 U	5.1	2.5	3.7	3.8	5.0	16.8	2.4 U	2.4 U
144	26.1	18.7 B	40.5	23.8	48.6	36.4	77.2	64.0	29.4
4 U	4 U	4 U	4 U	4 U	4 U	4 U	4 U	8 U	4 U

SITE 11
NSWC WHITE OAK
SILVER SPRING, MARYLAND
SUMMARY OF ANALYTICAL RESULTS FOR GROUNDWATER
ROUND 3 DATA - JULY 1999

11GW1010003 11GW101 7/13/99 VALIDATED	11GW1020003 11GW102 7/14/99 VALIDATED	11GW1030003 11GW103 7/14/99 VALIDATED	11GW1040003 11GW104 7/14/99 VALIDATED	11GW1050003 11GW105 7/14/99 VALIDATED	11GW1060003 11GW106 7/14/99 VALIDATED	11GW1070003 11GW107 7/16/99 VALIDATED	11GW1080003 11GW108 7/14/99 VALIDATED	11GW1090003 11GW109 7/13/99 VALIDATED	11GW1100003 11GW110 7/15/99 VALIDATED
1 U	1 U	1 U	1 U	1 U	1 U	0.23 J	1 U	1 U	25 U
1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	25 U
1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	25 U
1 U	1 U	1 U	1 U	1 U	1.8	1 U	0.80 J	1 U	19 J
1 U	1 U	1 U	1 U	1 U	0.52 J	1 U	0.18 J	1 U	8.8 J
1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	25 U
1 UR	1 UR	1 UR	1 UR	1 UR	1 UR	1 UR	1 UR	1 UR	25 UR
1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	25 U
1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	25 U
1 U	1 U	1 U	1 U	1 U	7.7	1 U	2.0	1 U	59
1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	25 U
1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	25 U
1 U	0.67 J	1 U	1 U	1 U	1 U	1 U	1 U	1 U	25 U
5 UR	5 UR	5 UR	5 UR	5 UR	5 UR	5 UR	5 UR	5 UR	120 UR
5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	120 U
5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	120 U
5 UR	2.9 J	5 UR	5 UR	5 UR	5 UR	5 UR	2.8 J	2.6 J	120 UR
1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	25 U
1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	25 U
1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	25 U
1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	25 U
1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	25 U
1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	25 U
1 U	1 U	1 U	1 U	0.21 J	1 U	1 U	0.22 J	1 U	4.6 J
1 U	0.18 J	1 U	1 U	1 U	1 U	1 U	0.28 J	0.18 J	25 U
1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	25 U
0.42 J	1 U	1 U	1 U	0.75 J	1 U	0.29 J	1.8	1 U	18 J
1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	25 U
1 U	1 U	0.63 J	1 U	1.0	20	0.33 J	34	0.21 J	280
1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	25 U
1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	25 U
1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	25 U
2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	6.8 J
1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	25 U
1 U	1 U	1 U	1 U	0.29 J	1 U	12	1.4	1 U	8.6 J
1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	25 U
1 U	1 U	1 U	1 U	1 U	1 U	1 U	0.34 J	1 U	25 U
1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	25 U
1 U	1 U	1.0	1 U	4.9	8.6	8.5	22	1 U	370

SITE 11
NSWC WHITE OAK
SILVER SPRING, MARYLAND
SUMMARY OF ANALYTICAL RESULTS FOR GROUNDWATER
ROUND 3 DATA - JULY 1999

1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	25 U
1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	25 U

5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U
5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U
5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U
5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U
20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U
5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U
20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U
5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
5.2 B	5.5 B	15 B	2.7 B	3.4 B	6.5 B	14 B	1.8 B	1.6 B	4.4 B
5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U

SITE 11
NSWC WHITE OAK
SILVER SPRING, MARYLAND
SUMMARY OF ANALYTICAL RESULTS FOR GROUNDWATER
ROUND 3 DATA - JULY 1999

5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U
5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U

0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U
0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U
0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U
1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U
0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U
0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U
0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U
0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U
0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U
0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U
0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U

SITE 11
NSWC WHITE OAK
SILVER SPRING, MARYLAND
SUMMARY OF ANALYTICAL RESULTS FOR GROUNDWATER
ROUND 3 DATA - JULY 1999

5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
28200 J	1280 J	39500 J	794 J	145 J	254 J	66.8 J	49.5 J	29.4 U	52.8 J
1.7 UL	1.7 UL	1.7 UL	1.7 UL	1.7 UL	1.7 UL	1.7 U	1.7 UL	1.7 UL	1.7 UL
6.2	1.1 U	6.2	1.1 U	1.1 U	1.1 U	1.1 U	1.6	1.1 U	1.9
128	17.4	377	41.8	52.5	74.9	37.6	10.6	33.1	6.8
4.7	0.24 B	4.2	0.94 B	0.17 B	0.14 B	0.24 B	0.22 B	0.36 B	0.11 U
3.6 J	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 UL	3.0 U	3.0 U	3.0 U
6590	1630	6100	6950	7510	33800	6380	4220	8850	6300
33.0 J	2.4 U	73.4 J	2.8 J	3.1 J	2.4 U	2.4 U	2.4 U	2.4 U	2.4 U
32.9	7.8	127	17.5	24.1	3.8 U	7.3	11.0	3.8 U	3.8 U
66.5	10.1	60.0	8.3	2.4 B	1.4 U	3.4	3.7 B	1.4 U	3.7 B
2.9 B	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	2.2 B	1.7 B	1.4 U
43700 J	2200 J	52900 J	2520 J	258 J	3200 J	22.3 J	54.6 J	9240 J	146 J
9.6	1.0 UL	22.6	1.0 UL	1.0 UL	1.0 UL	1.0 UL	1.0 UL	1.0 UL	1.0 UL
9010	1390	10800	4300	4420	5080	4280	1190	5190	3140
616	185	4880	740	225	284	20.7	2.6 B	903	77.5
0.10 UJ	0.10 UJ	0.10 UJ	0.10 UJ	0.10 UJ	0.10 UJ	0.10 U	0.10 UJ	0.10 UJ	0.10 UJ
53.6	8.8 U	132	36.0	13.0	8.8 U	12.7 K	8.8 U	11.5	8.8 U
10100	1870	15100	4290	2310	4110	2380	1090	3020	3150
2.7 U	2.7 U	2.7 U	2.7 U	2.7 U	2.7 U	2.7 U	2.7 U	2.7 U	2.7 U
2.2 U	2.2 U	2.2 U	2.2 U	2.2 U	2.2 U	2.2 U	2.2 U	2.2 U	2.2 U
405000	2660	6050	12800	15100	7920	12400 J	5510	6430	8080
10.2 B	3.7 U	8.8 B	3.7 U	6.4 B	3.7 U	5.6 B	4.0 B	3.7 U	4.6 B
30.2	2.4 U	43.6	2.4 U	2.4 U	6.9	2.4 U	2.4 U	2.4 U	2.4 U
255	28.3	164	77.3	40.7	5.4 B	17.0 B	4.6 B	6.2 B	5.9 B
4 U	4 U	8	4 U	4 U	4 U	4 U	44	4 U	40

SITE 11
NSWC WHITE OAK
SILVER SPRING, MARYLAND
SUMMARY OF ANALYTICAL RESULTS FOR GROUNDWATER
ROUND 3 DATA - JULY 1999

11GW1110003 11GW111 7/15/99 11GW1110003-D VALIDATED	11GW1110003-D 11GW111 7/15/99 11GW1110003 VALIDATED
1 U	1 U
1 U	1 U
1 U	1 U
1 U	1 U
1 U	1 U
1 U	1 U
1 UR	1 UR
1 U	1 U
1 U	1 U
1 U	1 U
1 U	1 U
1 U	1 U
1 U	1 U
5 UR	5 UR
5 U	5 U
5 U	5 U
1.9 J	5 UR
1 U	1 U
1 U	1 U
1 U	1 U
1 U	1 U
1 U	1 U
1 U	1 U
1 U	1 U
0.20 J	1 U
1 U	1 U
0.28 J	0.28 J
1 U	1 U
1 U	1 U
1 U	1 U
1 U	1 U
1 U	1 U
2 U	2 U
1 U	1 U
1 U	1 U
1 U	1 U
1 U	1 U
1 U	1 U
1.2	1.1

SITE 11
NSWC WHITE OAK
SILVER SPRING, MARYLAND
SUMMARY OF ANALYTICAL RESULTS FOR GROUNDWATER
ROUND 3 DATA - JULY 1999

1 U	1 U
1 U	1 U

5 U	5 U
20 U	20 U
5 U	5 U
5 U	5 U
5 U	5 U
20 U	20 U
5 U	5 U
5 U	5 U
5 U	5 U
5 U	5 U
5 U	5 U
5 U	5 U
20 U	20 U
5 U	5 U
5 U	5 U
20 U	20 U
20 U	20 U
5 U	5 U
5 U	5 U
5 U	5 U
5 U	5 U
5 U	5 U
20 U	20 U
20 U	20 U
5 U	5 U
5 U	5 U
5 U	5 U
5 U	5 U
5 U	5 U
5 U	5 U
5 U	5 U
5 U	5 U
5 U	5 U
5 U	5 U
21 B	52 B
5 U	5 U
5 U	5 U
5 U	5 U
5 U	5 U
5 U	5 U
5 U	5 U
5 U	5 U

SITE 11
NSWC WHITE OAK
SILVER SPRING, MARYLAND
SUMMARY OF ANALYTICAL RESULTS FOR GROUNDWATER
ROUND 3 DATA - JULY 1999

5 U	5 U
5 U	5 U
5 U	5 U
5 U	5 U
5 U	5 U
5 U	5 U
5 U	5 U
5 U	5 U
5 U	5 U
5 U	5 U
5 U	5 U
5 U	5 U
5 U	5 U
20 U	20 U
5 U	5 U
5 U	5 U
5 U	5 U

0.10 U	0.10 U
0.10 U	0.10 U
0.10 U	0.10 U
0.050 U	0.050 U
0.050 U	0.050 U
0.050 U	0.050 U
1.0 U	1.0 U
2.0 U	2.0 U
1.0 U	1.0 U
1.0 U	1.0 U
1.0 U	1.0 U
1.0 U	1.0 U
1.0 U	1.0 U
0.050 U	0.050 U
0.050 U	0.050 U
0.10 U	0.10 U
0.050 U	0.050 U
0.10 U	0.10 U
0.10 U	0.10 U
0.10 U	0.10 U
0.10 U	0.10 U
0.10 U	0.10 U
0.050 U	0.050 U
0.050 U	0.050 U
0.050 U	0.050 U
0.050 U	0.050 U
0.50 U	0.50 U

SITE 11
NSWC WHITE OAK
SILVER SPRING, MARYLAND
SUMMARY OF ANALYTICAL RESULTS FOR GROUNDWATER
ROUND 3 DATA - JULY 1999

5.0 U	5.0 U

0.2 U	0.2 U
0.2 U	0.2 U
0.2 U	0.2 U
0.2 U	0.2 U
0.2 U	0.2 U
0.2 U	0.2 U
0.2 U	0.2 U
0.2 U	0.2 U
0.2 U	0.2 U
0.2 U	0.2 U
0.5 U	0.5 U
0.2 U	0.2 U
0.5 U	0.5 U
0.2 U	0.2 U

841 J	547 J
1.7 UL	1.7 UL
1.1 U	1.1 U
27.9	26.1
0.24 B	0.17 B
3.0 U	3.0 U
2830	2900
3.7 J	2.4 U
17.5	15.1
10.1	9.1
1.4 U	1.4 U
1950 J	1230 J
1.0 UL	1.0 UL
1590	1510
685	668
0.10 UJ	0.10 UJ
8.8 U	8.8 U
2470	2220
2.7 U	2.7 U
2.2 U	2.2 U
7900	7990
3.7 U	5.8 B
2.4 U	2.4 U
29.5	34.8

4 U	4 U

SITE 11

GROUNDWATER DATA
JULY/AUGUST 1999

FILTERED

SITE 11
NSWC WHITE OAK
SILVER SPRING, MARYLAND
SUMMARY OF ANALYTICAL RESULTS FOR FILTERED GROUNDWATER
ROUND 3 DATA - JULY 1999

SAMPLE I.D.:	11GW230003-F	11GW240003-F	11GW260003-F	11GW260003-F-D	11GW290003-F	11GW630003-F	11GW640003-F
LOCATION:	11GW23	11GW24	11GW26	11GW26	11GW29	11PZ63	11PZ64
SAMPLE DATE:	07/19/99	07/14/99	07/16/99	07/16/99	07/14/99	07/19/99	07/14/99
ASSOCIATED DUPLICATE:			11GW260003-F-D	11GW260003-F			
VALIDATION STATUS:	VALIDATED	VALIDATED	VALIDATED	VALIDATED	VALIDATED	VALIDATED	VALIDATED
DISSOLVED INORGANICS (µg/L)							
ALUMINUM	39.9 J	51.6 J	59.9 J	57.5 J	64.5 J	76.1 J	29.4 U
ANTIMONY	1.7 U	1.7 UL	1.7 U	1.7 U	1.7 UL	1.7 U	1.7 UL
ARSENIC	1.1 U	1.1 U	1.1 U	1.1	1.1 U	1.1 U	1.1 U
BARIUM	31.6	14.8	79.9	81.4	45.7	91.3	7.3
BERYLLIUM	0.48 B	0.11 U	0.24 B	0.21 B	0.39 B	1.7 B	0.11 U
CADMIUM	3.0 UL	3.0 U	3.0 UL	3.0 UL	3.0 U	3.0 UL	3.0 U
CALCIUM	2820	12300	30200	30600	5590	9870	3510
CHROMIUM	2.4 U	2.4 U	2.4 U	2.4 U	2.4 U	2.4 U	2.4 U
COBALT	3.8 U	3.8 U	8	7.3	54.9	29.3	22.0
COPPER	2.8	4.9 B	1.4 U	1.6	1.4 U	1.4 U	1.4 U
IRON	14.9 J	32.4 J	9.2 U	13.6 J	7360 J	14200 J	4470 J
LEAD	1.0 UL	1.0 UL	1.0 UL	1.0 UL	1.0 UL	1.0 UL	1.0 UL
MAGNESIUM	1310	3450	14400	14700	4550	10400	2690
MANGANESE	15.2	62.1	10.6	8.5	2420	2680	760
MERCURY	0.10 U	0.10 UJ	0.10 U	0.10 U	0.16 J	0.10 U	0.10 UJ
NICKEL	8.8 U	8.8 U	9.2 K	15.2 K	8.8 U	61.6 K	8.8 U
POTASSIUM	1190	1090	4010	4090	1950	6110	1040
SELENIUM	2.7 U	2.7 U	2.7 U	2.7 U	2.7 U	2.7 U	2.7 U
SILVER	2.2 U	2.2 U	2.2 U	2.2 U	2.2 U	2.2 U	2.2 U
SODIUM	5470 J	4680	31000 J	31500 J	50500	59500 J	2730
THALLIUM	4.6 B	4.4 B	8.1 B	4.9 B	3.7 U	5.4 B	5.6 B
VANADIUM	2.4 U	2.4 U	2.4 U	2.4 U	2.4 U	2.4 U	2.4 U
ZINC	12.3 B	4.9 B	12.6 B	44.0	17.0 B	155	9.4 B

SITE 11
NSWC WHITE OAK
SILVER SPRING, MARYLAND
SUMMARY OF ANALYTICAL RESULTS FOR FILTERED GROUNDWATER
ROUND 3 DATA - JULY 1999

SAMPLE I.D.:	11GW660003-F	11GW680003-F	11GW690003-F	11GW70D0003-F	11GW720003-F	11GW730003-F	11GW840003-F
LOCATION:	11GW66	11GW68	11GW69	11GW70D	11GW72	11GW73	11GW84
SAMPLE DATE:	07/14/99	07/14/99	07/13/99	07/20/99	07/15/99	07/16/99	07/15/99
ASSOCIATED DUPLICATE:							
VALIDATION STATUS:	VALIDATED	VALIDATED	VALIDATED	VALIDATED	VALIDATED	VALIDATED	VALIDATED
DISSOLVED INORGANICS (µg/L)							
ALUMINUM	29.4 U	29.4 U	194 J	33.2 B	32.1 J	30.4 J	202 J
ANTIMONY	1.7 UL	1.7 UL	1.7 UL	1.7 U	1.7 UL	1.7 U	1.7 U
ARSENIC	1.4	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U
BARIUM	14.7	6.2	311	59.5	66.1	14.1	23.2
BERYLLIUM	0.11 B	0.11 U	0.94 B	0.32 B	0.17 B	0.15 B	0.24 B
CADMIUM	3.0 U	3.0 U	3.7 J	3.0 UL	3.0 U	3.0 UL	3.0 UL
CALCIUM	4510	1070	21700	7710	9840	1670	2820
CHROMIUM	2.4 U	2.4 U	2.4 U	2.4 U	2.4 U	2.4 U	2.4 U
COBALT	10.7	3.8 U	3.8 U	13.5	13.7	19.5	4.9
COPPER	1.8 B	1.4 U	5.3 B	1.4 U	5.5 B	2.8	3.8
IRON	1280 J	10.2 J	9.2 U	4020	20.6 J	26.8 J	117 J
LEAD	1.0 UL	1 UL	1.0 UL	1.0 U	1.0 UL	1.0 UL	1.0 UL
MAGNESIUM	2760	812	19500	5970	7170	1350	1620
MANGANESE	514	5.3	370	1720	50.8	19.1	22.6
MERCURY	0.10 UJ	0.10 UJ	0.10 UJ	0.10 U	0.10 UJ	0.10 U	0.10 U
NICKEL	29.6	8.8 U	45.2	21.3	8.8 U	8.8 U	8.8 U
POTASSIUM	3100	470 U	3080	4370	1790	1030	1620
SELENIUM	2.7 U	2.7 U	2.7 U	2.7 U	2.7 U	2.7 U	2.7 U
SILVER	2.2 U	2.2 U	2.2 U	2.2 U	2.2 U	2.2 U	2.2 U
SODIUM	6440	3040	49000	4800	4280	1900 J	4560 J
THALLIUM	6.0 B	4.3 B	5.2 B	3.7 U	4.2 B	5.5 B	4.5 B
VANADIUM	2.4 U	2.5	2.4 U	2.4 U	2.4 U	2.4 U	2.4 U
ZINC	10.7 B	6.4 B	56.1	21.6	16.3 B	17.9 B	18.5 B

SITE 11
NSWC WHITE OAK
SILVER SPRING, MARYLAND
SUMMARY OF ANALYTICAL RESULTS FOR FILTERED GROUNDWATER
ROUND 3 DATA - JULY 1999

SAMPLE I.D.:	**11GW850003-F**	**11GW860003-F**	**11GW870003-F**
LOCATION:	**11GW85**	**11GW86**	**11GW87**
SAMPLE DATE:	**07/20/99**	**07/14/99**	**07/21/99**
ASSOCIATED DUPLICATE:			
VALIDATION STATUS:	**VALIDATED**	**VALIDATED**	**VALIDATED**
DISSOLVED INORGANICS (µg/L)			
ALUMINUM	73.4 J	29.4 U	29.4 B
ANTIMONY	1.7 U	1.7 UL	1.7 U
ARSENIC	1.1 U	1.1 U	1.1 U
BARIUM	60.3	143	308
BERYLLIUM	0.48 B	0.11 U	1.0 B
CADMIUM	3.0 UL	3.0 U	3.0 UL
CALCIUM	5100	10200	18700
CHROMIUM	2.4 U	2.4 U	2.4 U
COBALT	8.2	48.6	15.9
COPPER	2.4	1.4 U	1.4 U
IRON	16.8 J	18200 J	31200
LEAD	1.0 UL	1.0 UL	1.0 U
MAGNESIUM	3800	7280	13400
MANGANESE	91.5	10300	2560
MERCURY	0.10 U	0.10 UJ	0.10 U
NICKEL	8.9 K	20.9	67.7
POTASSIUM	2480	2270	5930
SELENIUM	2.7 U	2.7 U	2.7 U
SILVER	2.2 U	2.2 U	2.2 U
SODIUM	12100 J	19000	22700
THALLIUM	6.4 B	8.4 B	3.7 U
VANADIUM	2.4	2.4 U	2.4 U
ZINC	23.7	15.2 B	57.0

SECTION G

DATA VALIDATION MEMORANDA

Tetra Tech NUS **INTERNAL CORRESPONDENCE**

PITT-10-9-030

TO :	**R. KOTUN**	**DATE:**	**DECEMBER 13, 1999**
FROM:	**GRETCHEN A. PHIPPS**	**COPIES:**	**DV FILE**

SUBJECT: **MISCELLANEOUS DATA VALIDATION –PERCHLORATE**
CTO 298 – NSWC WHITE OAK, MD
SAMPLE DELIVERY GROUP SDG – 994910

SAMPLES: 30/Aqueous/

11GW1020003	11GW1070003	11GW1100003
11GW1110003	11GW1119903	11GW220003
11GW229903	11GW230003	11GW240003
11GW250003	11GW260003	11GW269903
11GW270003	11GW280003	11GW620003
11GW630003	11GW650003	11GW660003
11GW670003	11GW70D0003	11GW710003
11GW719903	11GW720003	11GW730003
11GW840003	11GW850003	11GW880003
2GW760003	BGW1010003	BGW400003

Overview

The sample set for SDG 994910, NSWC White Oak, consists of thirty (30) aqueous environmental samples. Four (4) field duplicate pairs (11GW1110003 / 11GW1119903, 11GW220003 / 11GW229903, 11GW260003 / 11GW269903 and 11GW710003 / 11GW719903) were included within this SDG.

The samples were analyzed for perchlorate. The samples were collected by Tetra Tech NUS on July 14-16, 19 and 20, 1999 and analyzed by Applied Physics and Chemistry Laboratories under Naval Facilities Engineering Service Center (NFESC) Quality Assurance / Quality Control (QA/QC) criteria. Ammonium perchlorate analyses were conducted using Ion Chromatography.

Summary

All analytes were successfully analyzed. The findings offered in this report are based upon a general review of all available data. The data review was based on data completeness, holding times, calibration data, laboratory method/preparation blanks, matrix spike results, laboratory duplicate results, detection limits and analyte quantitation.

Areas of concern with respect to data quality are listed below.

Major Problems

- None

Minor Problems

- None.

Notes

The Form 1s were amended by the data reviewer per laboratory request to eliminate results reported below the established reporting limit. It was determined that a positive result below the reporting limit could be caused by background noise or interference and therefore, should be considered as a nondetect.

A comparison of field duplicate pairs (11GW1110003 / 11GW1119903, 11GW220003 / 11GW229903, 11GW260003 / 11GW269903 and 11GW710003 / 11GW719903) is included in Appendix C.

Executive Summary

Laboratory Performance: None.

Other Factors Affecting Data Quality: None.

The data for these analyses were reviewed with reference to the "National Functional Guidelines for Inorganic Data Validation", April 1993 Revision as amended for use within USEPA Region III, and the NFESC document entitled "Navy Installation Restoration Chemical Data Quality Manual" (NFESC 6/98).

The text of this report has been formulated to address only those problem areas affecting data quality.

"I attest that the data referenced herein were validated according to the agreed upon validation criteria as specified in the NFESC Guidelines and the Quality Assurance Project Plan (QAPP)."

Gretchen A. Phipps

Tetra Tech NUS
Gretchen A. Phipps
Chemist

Tetra Tech NUS
Joseph A. Samchuck
Quality Assurance Officer

Attachments:

1. Appendix A - Qualified Analytical Results
2. Appendix B - Results as reported by the Laboratory
3. Appendix C - Support Documentation

Data Qualifier Key:

U - Value is a nondetect as reported by the laboratory.

Tetra Tech NUS **INTERNAL CORRESPONDENCE**

PITT-11-9-035

TO :	**R. KOTUN**	**DATE:**	**DECEMBER 13, 1999**
FROM:	**GRETCHEN A. PHIPPS**	**COPIES:**	**DV FILE**

SUBJECT: **ORGANIC DATA VALIDATION –VOLATILES, SEMIVOLATILES, PESTICIDES/PCBs AND EXPLOSIVES**
CTO 298 – NSWC WHITE OAK, MD
SAMPLE DELIVERY GROUP SDG – WO062

SAMPLES: 24/Aqueous/

11GW70D0003	11GW870003	2GW1000003
2GW1010003	2GW1020003	2GW1029903
2GW1030003	2GW1040003	2GW1050003
2GW300003	2GW310003	2GW320003
2GW450003	2GW760003	3GW1070003
3GW170003	3GW179903	3GW470003
3GW770003	3GW78S0003	TB072199-00-03
TB072299-00-03	TB072699-00-03	TB072799-00-03

Overview

The sample set for CTO 298 SDG WO062, NSWC White Oak, consists of twenty (20) aqueous environmental samples and four (4) trip blanks (TB072199-00-03, TB072299-00-03, TB072699-00-03 and TB-072799-00-03). Two (2) field duplicate pairs (2GW1020003 / 2GW1029903 and 3GW170003 / 3GW179903) were included within this SDG.

All aqueous environmental samples were analyzed for target compound list (TCL) volatile organic, TCL semivolatile organics, pesticides/PCBs and explosives. The samples were collected by Tetra Tech NUS on July, 20-22, 26 and 27, 1999 and analyzed by Quanterra Laboratories under Naval Facilities Engineering Service Center (NFESC) Quality Assurance / Quality Control (QA/QC) criteria. Volatile and semivolatile analyses were conducted using CLP SOW method OLC02.1. Pesticide/PCB analyses were conducted using CLP SOW method OLM03.2. Explosive analyses were conducted using SW 846 method 8330.

Summary

All analytes, with exception to those results that were qualified as rejected, were successfully analyzed. The findings offered in this report are based upon a general review of all available data. The data review was based on data completeness, holding times, GC/MS tuning and system performance, initial/continuing calibration, laboratory method blanks, field quality control blanks, surrogate spike recoveries, matrix spike/ matrix spike duplicate results, blank spike/blank spike duplicate results, internal standard performance, field duplicate results, compound identification, compound quanitation and detection limits.

Areas of concern with respect to data quality are listed below.

Major Problems

The initial and continuing calibrations RRFs for acetone, 2-butanone and 1,2-dibromo-3-chloropropane were <0.05 quality control. The nondetected results reported for the above listed compounds were qualified as rejected, "UR". The positive results reported for acetone were qualified as estimated, "J".

Minor Problems

The continuing calibration %D for 1,2-dichloroethane was >25% quality control limit affecting the samples analyzed on July 26. The positive results reported for 1,2-dichloroethane in the affected samples were qualified as estimated, "J".

The continuing calibration %D for acetone was >25% quality control limit affecting the samples analyzed on July 28. The positive results reported for acetone in the affected samples were qualified as estimated, "J".

The following volatile contaminants were present in the trip blanks at the following maximum concentrations:

Compound	Maximum Concentration	Action Level
Acetone	5.5µg/L	55.0µg/L
Benzene	0.62µg/L	3.1µg/L
Chlorobenzene	0.31µg/L	1.55µg/L
Ethylbenzene	0.20µg/L	1.0µg/L
Methylene Chloride	0.42µg/L	4.2µg/L
Toluene	3.1µg/L	15.5µg/L
Xylenes	0.99µg/L	4.95µg/L

An action level of 5x or 10X the maximum concentration was used to evaluate the sample data for blank contamination. Sample aliquot and dilution factors were taken into consideration when evaluation for blank contamination. Positive results < the action levels for acetone, benzene, chlorobenzene and methylene chloride were qualified as, "B", as a result of blank contamination. No validation action was required for the remaining compounds as all results reported were nondetected. It should be noted that field quality control blanks are not qualified for field or laboratory blank contamination.

The following semivolatile contaminant was present in the laboratory method blanks at the following maximum concentration:

Compound	Maximum Concentration	Action Level
Bis(2-ethylhexyl)phthalate)	2.5µg/L	12.5µg/L

An action level of 5x the maximum concentration was used to evaluate the sample data for blank contamination. Sample aliquot and dilution factors were taken into consideration when evaluation for blank contamination. Positive results < the action levels for bis(2-ethylhexyl)phthalate were qualified as, "B", as a result of blank contamination.

Field duplicate imprecision (>30%) was noted for trichloroethene in field duplicate pair 3GW170003 / 3GW179903. The positive and nondetected results reported for trichloroethene in

the affected field duplicate pair were qualified as estimated, "J" and "UJ", respectively. The direction of bias could not be determined.

Field duplicate imprecision (>30%) was noted for bis(2-ethylhexyl)phthalate in field duplicate pair 2GW1020003 / 2GW1029903. The positive results reported for bis(2-ethylhexyl)phthalate in the affected field duplicate pair were qualified as estimated, "J". The direction of bias could not be determined.

All positive results reported at concentrations less than the Contract Required Quanitation Limit (CRQL) were qualified as estimated, "J".

Notes

The following compounds were analyzed as volatiles: 1,2,4-trichlorobenzene, 1,2-dichlorobenzene, 1,3-dichlorobenzene and 1,4-dichlorobenzene.

The following volatile compounds were analyzed in addition to those specified on the laboratory requirements: 1,2-dibromo-3-chloropropane, 1,2-dibromoethane and bromochloromethane.

Total 1,2-dichloroethene was reported as cis and trans.

Several continuing calibration %Ds were >25% quality control limit. However, no positive results were affected. Therefore, no validation action was required.

A continuing calibration %D for acetone was >25% quality control limit. However, all results reported for acetone were qualified based on initial calibration RRF noncompliances.

Several Tentatively Identified Compound (TIC) were reported in the volatile and semivolatile samples and blanks. No validation action was taken.

The Matrix Spike (MS) / Matrix Spike Duplicate (MSD) Percent Recoveries (%Rs) for benzo(a)pyrene, gamma-BHC (Lindane) and 4,4'-DDT affecting sample 2GW760003 were less than the lower quality control limit. However, no validation action was taken on this basis.

The surrogate tetrachloro-m-xylene was less than the lower control limit on both columns affecting sample 2GW1029903. No validation action was taken.

The Laboratory Control Sample (LCS) Percent Recovery (%R) for 2-amino-4,6-dinitrotoluene exceeded the upper quality control limit. No validation action was taken.

Comparisons of the positive results in the field duplicate pairs are included in Appendix C.

Sample 2GW320003 was analyzed for volatiles at a 3X dilution. Therefore, reporting limits are elevated.

Executive Summary

Laboratory Performance: Bis(2-ethylhexyl)phthalate was present in the laboratory method blanks. Several RRFs for acetone, 2-butanone and 1,2-dibromo-3-chloropropane were <0.05 quality control limit. A continuing calibration %D for 1,2-dichloroethane was >25% quality control limit.

Other Factors Affecting Data Quality: Several compounds were present in the trip blanks. Field duplicate imprecision was noted for trichloroethene and bis(2-ethylhexyl)phthalate.

The data for these analyses were reviewed with reference to the "National Functional Guidelines for Organic Data Validation", September 1994 Revision as amended for use within USEPA Region III, and the NFESC document entitled "Navy Installation Restoration Laboratory Quality Assurance Guide" (NFESC 2/96).

The text of this report has been formulated to address only those problem areas affecting data quality.

"I attest that the data referenced herein were validated according to the agreed upon validation criteria as specified in the NFESC Guidelines and the Quality Assurance Project Plan (QAPP)."

Gretchen A. Phipps

Tetra Tech NUS
Gretchen A. Phipps
Chemist

Tetra Tech NUS
Joseph A. Samchuck
Quality Assurance Officer

Attachments:

1. Appendix A - Qualified Analytical Results
2. Appendix B - Results as reported by the Laboratory
3. Appendix C - Support Documentation

Data Qualifier Key:

U	-	Value is a nondetect as reported by the laboratory.
B	-	Positive result is considered to be an artifact of blank contamination and should not be considered present.
J	-	Positive result is considered estimated, "J", as a result of technical noncompliances.
UR	-	Nondetected result is considered rejected, "UR", as a result of technical noncompliances.

Tetra Tech NUS INTERNAL CORRESPONDENCE

PITT-10-9-034

TO :	R. KOTUN	DATE:	DECEMBER 13, 1999
FROM:	GRETCHEN A. PHIPPS	COPIES:	DV FILE

SUBJECT: MISCELLANEOUS DATA VALIDATION – PERCHLORATE
CTO 298 – NSWC WHITE OAK, MD
SAMPLE DELIVERY GROUP SDG – 995049

SAMPLES: 24/Aqueous/

11GW870003	13GW030003	2GW1000003
2GW1010003	2GW1020003	2GW1029903
2GW1030003	2GW1040003	2GW1050003
2GW300003	2GW310003	2GW320003
2GW450003	3GW1040003	3GW1070003
3GW170003	3GW179903	3GW180003
3GW470003	3GW770003	3GW78D0003
3GW78S0003	4GW500003	BGW1020003

Overview

The sample set for SDG 995049, NSWC White Oak, consists of twenty-four (24) aqueous environmental samples. Two (2) field duplicate pairs (2GW1020003 / 2GW1029903 and 3GW170003 / 3GW179903) were included within this SDG.

The samples were analyzed for perchlorate. The samples were collected by Tetra Tech NUS on July 21, 22, 26-28, 1999 and analyzed by Applied Physics and Chemistry Laboratories under Naval Facilities Engineering Service Center (NFESC) Quality Assurance / Quality Control (QA/QC) criteria. Ammonium perchlorate analyses were conducted using Ion Chromatography.

Summary

All analytes were successfully analyzed. The findings offered in this report are based upon a general review of all available data. The data review was based on data completeness, holding times, calibration data, laboratory method/preparation blanks, matrix spike results, laboratory duplicate results, detection limits and analyte quantitation.

Areas of concern with respect to data quality are listed below.

Major Problems

- None

Minor Problems

- None.

Notes

Several samples were analyzed at a dilution. Therefore, the reporting limits were elevated. A summary with dilution factors is included in Appendix C.

A comparison of field duplicate pairs (2GW1020003 / 2GW1029903 and 3GW170003 / 3GW179903) is included in Appendix C.

Executive Summary

Laboratory Performance: None.

Other Factors Affecting Data Quality: None.

The data for these analyses were reviewed with reference to the "National Functional Guidelines for Inorganic Data Validation", April 1993 Revision as amended for use within USEPA Region III, and the NFESC document entitled "Navy Installation Restoration Chemical Data Quality Manual" (NFESC 6/98).

The text of this report has been formulated to address only those problem areas affecting data quality.

"I attest that the data referenced herein were validated according to the agreed upon validation criteria as specified in the NFESC Guidelines and the Quality Assurance Project Plan (QAPP)."

Gretchen A. Phipps

Tetra Tech NUS
Gretchen A. Phipps
Chemist

Tetra Tech NUS
Joseph A. Samchuck
Quality Assurance Officer

Attachments:

1. Appendix A - Qualified Analytical Results
2. Appendix B - Results as reported by the Laboratory
3. Appendix C - Support Documentation

Data Qualifier Key:

U - Value is a nondetect as reported by the laboratory.

Tetra Tech NUS **INTERNAL CORRESPONDENCE**

PITT-09-9-239

TO :	**R. KOTUN**	**DATE:**	**SEPTEMBER 27, 1999**
FROM:	**GRETCHEN A. PHIPPS**	**COPIES:**	**DV FILE**

SUBJECT: **INORGANIC DATA VALIDATION –TAL METALS, DISSOLVED TAL METALS AND CYANIDE**
CTO 298 – NSWC WHITE OAK, MD
SAMPLE DELIVERY GROUP SDG – WO062

SAMPLES: 32/Aqueous/

11GW70D0003	11GW70D0003-F	11GW870003
11GW870003-F	2GW1000003	2GW1010003
2GW1010003-F	2GW1020003	2GW1029903
2GW1030003	2GW1030003-F	2GW1040003
2GW1040003-F	2GW1050003	2GW1050003-F
2GW300003	2GW310003	2GW310003-F
2GW320003	2GW450003	2GW450003-F
2GW760003	2GW760003-F	3GW1070003
3GW1070003-F	3GW170003	3GW179903
3GW470003	3GW470003-F	3GW770003
3GW770003-F	3GW78S003	

Overview

The sample set for SDG WO035, NSWC White Oak, consists of thirty-two (3) aqueous environmental samples. Two (2) field duplicate (2GW1020003/ 2GW1029903 and 3GW170003 / 3GW179903) were included within this SDG.

All samples, with exception to those designated –F, were analyzed for target analyte list (TAL) metals and cyanide. The samples designated with –F were analyzed for dissolved target analyte list (TAL) metals. The samples were collected by Tetra Tech NUS on July 20-22, 26 and 27, 1999 and analyzed by Quanterra Laboratories under Naval Facilities Engineering Service Center (NFESC) Quality Assurance / Quality Control (QA/QC) criteria. Metals and cyanide analyses were conducted using CLP ILM03.0/4.0 methodology.

Summary

All analytes were successfully analyzed. The findings offered in this report are based upon a general review of all available data. The data review was based on data completeness, holding times, calibration data, laboratory method/preparation blanks, interference check sample (ICS) results, matrix spike results, post digestion spike recoveries, laboratory duplicate results, field duplicate results, laboratory control sample (LCS) results, ICP serial dilution results, detection limits and analyte quantitation.

All TAL metals analyses, with the exception of mercury, were conducted using Inductively Coupled Plasma (ICP) methodologies. Mercury analyses were conducted using cold vapor AA.

Areas of concern with respect to data quality are listed below.

Minor Problems

- The Contract Required Detection Limit (CRDL) Percent Recovery (%R) for cadmium was <90% quality control limit. The nondetected results reported for cadmium were qualified as biased low, "UL".

- The CRDL %R for lead was >110% quality control limit. The positive results <2X CRDL reported for lead were qualified as biased high, "K".

- The following contaminants were detected in the laboratory method / preparation blanks at the following maximum concentrations :

Samples Affected: All

Analyte	Maximum Concentration	Action Level(aqueous)
Aluminum	52.0µg/L	260µg/L
Barium	1.1µg/L	5.5µg/L
Beryllium	1.3µg/L	6.5µg/L
Calcium	42.5µg/L	212.5µg/L
Copper	2.0µg/L	10.0µg/L
Iron	24.1µg/L	120.5µg/L
Magnesium	44.2µg/L	221µg/L
Manganese	1.6µg/L	8.0µg/L
Sodium[1]	63.630µg/L	318.15µg/L

[1] Maximum concentration present in an aqueous preparation blank.

An action level of 5x the maximum contaminant level has been used to evaluate sample data for blank contamination. Sample aliquot and dilution factors were taken into consideration when evaluating for blank contamination. The positive results < the action level for aluminum, beryllium, copper and iron were qualified, "B", as a result of blank contamination. No validation action was required for the remaining analytes since either the results were greater than the action level or were nondetects.

- The interfering analyte iron was present is sample 3GW1070003 at a concentration which was comparable to the level iron In the Interference Check Sample (ICS) solution. Several analyte namely antimony, arsenic, barium, cadmium, chromium, cobalt, lead, manganese, nickel, selenium, silver, thallium, vanadium and zinc were present in the ICS solution at concentration which exceeded the Instrument Detection Limit (IDL). Interference affects exist antimony, cadmium, selenium, silver and thallium in the affected sample. The nondetected results reported for antimony and cadmium were qualified as biased low, "UL". The positive results reported for selenium and silver were qualified as biased high, "K". The positive result reported for thallium was qualified as biased low, "L".

- The interfering analyte calcium was present is sample 2GW32003 at a concentration which was comparable to the level calcium In the Interference Check Sample (ICS) solution.

Several analyte namely antimony, arsenic, barium, cadmium, chromium, cobalt, lead, manganese, nickel, selenium, silver, thallium, vanadium and zinc were present in the ICS solution at concentration which exceeded the Instrument Detection Limit (IDL). Interference affects exist antimony, cadmium, chromium, cobalt, lead, nickel and thallium in the affected sample. The nondetected results reported for antimony, cadmium and lead were qualified as biased low, "UL'. The positive results reported for chromium and cobalt were qualified as biased high, "K". The positive results reported for nickel and thallium were qualified as biased low, "L".

- The interfering analyte calcium was present is sample 2GW32003 at a concentration which was comparable to the level calcium In the Interference Check Sample (ICS) solution. Several analyte namely antimony, arsenic, barium, cadmium, chromium, cobalt, lead, manganese, nickel, selenium, silver, thallium, vanadium and zinc were present in the ICS solution at concentration which exceeded the Instrument Detection Limit (IDL). Interference affects exist antimony, cadmium, silver and thallium in the affected sample. The nondetected result reported for antimony was qualified as biased low, "UL'. The positive result reported for silver was qualified as biased high, "K". The positive results reported for cadmium and thallium were qualified as biased low, "L".

Notes

A comparison of field duplicate pairs (2GW1020003/ 2GW1029903 and 3GW170003 / 3GW179903) is included in Appendix C.

Executive Summary

Laboratory Performance: The CRDL %Rs for cadmium and lead were outside the 90-110% quality control limit. Several analytes were present in the laboratory method/preparation blanks.

Other Factors Affecting Data Quality: The interfering analytes calcium or iron were present in several samples.

The data for these analyses were reviewed with reference to the "National Functional Guidelines for Inorganic Data Validation", April 1993 Revision as amended for use within USEPA Region III, and the NFESC document entitled "Navy Installation Restoration Laboratory Quality Assurance Guide" (NFESC 2/96).

The text of this report has been formulated to address only those problem areas affecting data quality.

"I attest that the data referenced herein were validated according to the agreed upon validation criteria as specified in the NFESC Guidelines and the Quality Assurance Project Plan (QAPP)."

Gretchen A. Phipps

Tetra Tech NUS
Gretchen A. Phipps
Chemist

Tetra Tech NUS
Joseph A. Samchuck
Quality Assurance Officer

Attachments:

1. Appendix A - Qualified Analytical Results
2. Appendix B - Results as reported by the Laboratory
3. Appendix C - Support Documentation

Data Qualifier Key:

U	-	Value is a nondetect as reported by the laboratory.
B	-	Positive result is considered to be an artifact of blank contamination and should not be considered present.
UL	-	Nondetected result is considered biased low, "UL", as a result of technical noncompliances.
L	-	Positive result is considered biased low, "L", as a result of technical noncompliances.
K	-	Positive result is considered biased high, "K", as a result of technical noncompliances.

Tetra Tech NUS **INTERNAL CORRESPONDENCE**

PITT-10-9-184

TO :	**R. KOTUN**	**DATE:**	**OCTOBER 21, 1999**
FROM:	**JENNIFER M. MALLE**	**COPIES:**	**DV FILE**

SUBJECT: **INORGANIC DATA VALIDATION –TAL METALS, DISSOLVED TAL METALS AND CYANIDE**
CTO 298 – NSWC WHITE OAK, MD
SAMPLE DELIVERY GROUP SDG – WO060

SAMPLES: 34/Aqueous/

11GW1010003	11GW1010003-F	11GW1020003
11GW1020003-F	11GW1030003	11GW1030003-F
11GW1040003	11GW1040003-F	11GW1050003
11GW1060003	11GW1080003	11GW1090003
11GW1100003	11GW1110003	11GW1110003-F
11GW1119903	11GW1119903-F	11GW240003
11GW240003-F	11GW290003	11GW290003-F
11GW620003	11GW640003	11GW640003-F
11GW660003	11GW660003-F	11GW680003
11GW680003-F	11GW690003	11GW690003-F
11GW720003	11GW720003-F	11GW860003
11GW860003-F		

Overview

The sample set for SDG WO060, NSWC White Oak, consists of thirty-four (34) aqueous environmental samples.

All samples, with exception to those designated "–F", were analyzed for target analyte list (TAL) metals and cyanide. The samples designated with "–F" were analyzed for dissolved target analyte list (TAL) metals. The samples were collected by Tetra Tech NUS on July 13-15, 1999 and analyzed by Quanterra Laboratories under Naval Facilities Engineering Service Center (NFESC) Navy Installation Restoration Laboratory Quality Assurance Guide (February 1996). Metals and cyanide analyses were conducted using EPA method ILM03.0/4.0.

All TAL metals analyses, with the exception of mercury, were conducted using Inductively Coupled Plasma (ICP) methodologies. Mercury analyses were conducted using Cold Vapor AA.

Summary

All analytes were successfully analyzed. The findings offered in this report are based upon a general review of all available data. The data review was based on data completeness, holding times, calibration data, laboratory method/preparation blanks, interference check sample (ICS)

results, matrix spike results, laboratory duplicate results, field duplicate results, laboratory control sample (LCS) results, ICP serial dilution results, detection limits and analyte quantitation.

Areas of concern with respect to data quality are listed below.

Major Problems

- None.

Minor Problems

Calibration Data

- The Contract Required Detection Limit (CRDL) Percent Recoveries (%Rs) for lead were less than the 90% quality control limits. Positive results less than 2 times the CRDL value reported for lead were qualified as biased low, "L", and nondetect results for lead were qualified as biased low, "UL".

- The Contract Required Detection Limit (CRDL) Percent Recoveries (%Rs) for mercury were both above and below the 90-110% quality control limits. Since a direction of bias could not be determined, positive results less than 2 times the CRDL value reported for mercury were qualified as estimated "J", and nondetect results for lead were qualified as estimated "UJ".

Blank Analysis

- The following contaminants were detected in the laboratory method / preparation blanks at the following maximum concentrations :

Samples Affected: All

Analyte	Maximum Concentration	Action Level (aqueous)
Beryllium	0.3 ug/L	1.5 ug/L
Copper	1.5 ug/L	7.5 ug/L
Cyanide	3.3 ug/L	16.5 ug/L
Manganese	0.8 ug/L	4.0 ug/L
Sodium [1]	64.25 ug/L	321.25 ug/L
Thallium [1]	5.660 ug/L	28.30 ug/L
Zinc [1]	5.53 ug/L	27.65 ug/L

[1] Maximum concentration present in an aqueous preparation blank.

An action level of 5x the maximum contaminant level has been used to evaluate sample data for blank contamination. Sample aliquot and dilution factors were taken into consideration when evaluating for blank contamination. The positive results less than the action level for beryllium, copper, cyanide, manganese, thallium and zinc were qualified, "B", as a result of blank contamination. No validation action was required for the remaining analytes since either the results

were greater than the action level or were previously qualified nondetects, "U", by the laboratory.

Matrix Spike Results

- The Matrix Spike (MS) Percent Recoveries (%Rs) for antimony were less than the 75% quality control limits. Nondetect results reported for antimony were qualified as biased low, "UL", for MS noncompliance.

Laboratory Duplicate Analysis

- Laboratory duplicate imprecision greater than the 20% quality control limits was noted for aluminum and cadmium. Positive results reported for aluminum and cadmium were qualified as estimated, "J".

Field Duplicate Analysis

- Field duplicate imprecision greater than the 30% quality control limits was noted for chromium and iron. Positive results for chromium and iron have been qualified as estimated, "J", for field duplicate imprecision.

ICP Interference Check Sample

- The interfering analyte iron was present in sample 11GW690003 at a concentration which was comparable to the level of iron in the Interference Check Sample (ICS) solution. Several analytes, namely barium, cadmium, cobalt, copper, lead, manganese, nickel, thallium, vanadium, and zinc were present in the ICS solution at concentrations which exceeded the Instrument Detection Limits (IDLs). Interference affects exist for cadmium and nickel in the affected sample. The positive result reported for nickel was qualified as biased low, "L". The positive result for cadmium was qualified as estimated, "J", due to conflicting noncompliances.

- The interfering analyte iron was present in sample 11GW6240003 at a concentration which was comparable to the level of iron in the Interference Check Sample (ICS) solution. Several analytes, namely barium, cadmium, cobalt, copper, lead, manganese, nickel, thallium, vanadium, and zinc were present in the ICS solution at concentrations which exceeded the Instrument Detection Limits (IDLs). Interference affects exist for cadmium, cobalt and nickel in the affected sample. The positive result reported for nickel was qualified as biased low, "L" and the nondetect result reported for cadmium was qualfied as biased low, "UL". The positive result for cobalt was qualified as biased high, "K".

Notes

Field duplicate imprecision greater than the 30% quality control limits was noted for thallium. However, all results reported for thallium were either nondetected or qualified for blank contamination and therefore no action was taken.

A Contract Required Detection Limit (CRDL) Percent Recovery (%R) for potassium was less than the 90% quality control limits. The %R is reported as 0%. However, this does not effect any of the results for potassium. Samples bracketing this CRDL were not reported for potassium.

The Form 10 for cyanide was missing. The laboratory was contacted and the information was provided.

The laboratory does a 250/500 ml prep for cyanide. See appendix C for a sample calculation.

Executive Summary

Laboratory Performance: Several analytes were present in the laboratory method/preparation blanks. Lead and mercury were qualified for calibration noncompliances. Laboratory duplicate imprecision was noted for aluminum and cadmium.

Other Factors Affecting Data Quality: Field duplicate imprecision was noted for chromium, iron and thallium. Antimony was qualified for MS noncompliance. The Interfering analyte iron was present in two of the samples.

The data for these analyses were reviewed with reference to the "National Functional Guidelines for Inorganic Data Validation", April 1993 Revision as amended for use within USEPA Region III, and the NFESC document entitled "Navy Installation Restoration Laboratory Quality Assurance Guide" (NFESC 2/96).

The text of this report has been formulated to address only those problem areas affecting data quality.

"I attest that the data referenced herein were validated according to the agreed upon validation criteria as specified in the NFESC Guidelines and the Quality Assurance Project Plan (QAPP)."

Tetra Tech NUS
Jennifer M. Malle
Environmental Scientist

Tetra Tech NUS
Joseph A. Samchuck
Quality Assurance Officer

Attachments:

1. Appendix A - Qualified Analytical Results
2. Appendix B - Results as reported by the Laboratory
3. Appendix C - Support Documentation

Data Qualifier Key:

U - Value is a nondetect as reported by the laboratory.

B - Positive result is considered to be an artifact of blank contamination and should not be considered present.

UL - Nondetected result is considered biased low, "UL", as a result of technical noncompliances.

L - Positive result is considered biased low, "L", as a result of technical noncompliances.

K - Positive result is considered biased high, "K", as a result of technical noncompliances.

J - Positive result is considered estimated, "J", as a result of technical noncompliances.

APPENDIX A

Qualified Analytical Results

Qualifier Codes:

A = Lab Blank Contamination
B = Field Blank Contamination
C = Calibration (i.e., % RSDs, %Ds, ICVs, CCVs, RPDs, RRFs, etc.) Noncompliance
D = MS/MSD Noncompliance
E = LCS/LCSD Noncompliance
F = Lab Duplicate Imprecision
G = Field Duplicate Imprecision
H = Holding Time Exceedance
I = ICP Serial Dilution Noncompliance
J = GFAA PDS - GFAA MSA's $r < 0.995$
K = ICP Interference - include ICSAB % R's
L = Instrument Calibration Range Exceedance
M = Sample Preservation
N = Internal Standard Noncompliance
O = Poor Instrument Performance (i.e., base-time drifting)
P = Uncertainty near detection limit (< 2 x IDL for inorganics and <CRQL for organics)
Q = Other problems (can encompass a number of issues)
R = Surrogates Recovery Noncompliance
S = Pesticide/PCB Resolution
T = % Breakdown Noncompliance for DDT and Endrin
U = Pest/PCB D% between columns for positive results
V = Non-linear calibrations, tuning $r < 0.995$ (correlation coefficient)
W = EMPC result
X = Signal to noise response drop
Y = % Solid content is less than 30%

CTO298 - NSWC WHITE OAK
WATER DATA
QUANTERRA
SDG: WO060

SAMPLE NUMBER:	11GW1010003			11GW1010003-F			11GW1020003			11GW1020003-F		
SAMPLE DATE:	07/13/99			07/13/99			07/14/99			07/14/99		
LABORATORY ID:	C9G140153001			C9G140153001			C9G160174002			C9G160174002		
QC_TYPE:	NORMAL			NORMAL			NORMAL			NORMAL		
% SOLIDS:	0.0 %			0.0 %			0.0 %			0.0 %		
UNITS:	UG/L			UG/L			UG/L			UG/L		
FIELD DUPLICATE OF:												
	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
INORGANICS												
ALUMINUM	28200	J	F	29.4	U		1280	J	F	29.4	U	
ANTIMONY	1.7	UL	D	1.7	UL	D	1.7	UL	D	1.7	UL	D
ARSENIC	6.2			1.1	U		1.1	U		1.1	U	
BARIUM	128			20.6			17.4			6.5		
BERYLLIUM	4.7			0.19	B	A	0.24	B	A	0.11	B	A
CADMIUM	3.6	J	F	3.0	U		3.0	U		3.0	U	
CALCIUM	6590			4460			1630			1420		
CHROMIUM	33.0	J	G	2.4	U		2.4	U		2.4	U	
COBALT	32.9			9.0			7.8			6.3		
COPPER	66.5			8.2			10.1			6.0	U	A
CYANIDE	2.9	B	A				1.4	U				
IRON	43700	J	G	9.9	J	G	2200	J	G	9.2	U	
LEAD	9.6			1.0	UL	C	1.0	UL	C	1.0	UL	C
MAGNESIUM	9010			2430			1390			958		
MANGANESE	616			236			185			146		
MERCURY	0.10	UJ	C	0.10	UJ	C	0.10	UJ	C	0.27	J	C
NICKEL	53.6			8.8	U		8.8	U		8.8	U	
POTASSIUM	10100			1530			1870			857		
SELENIUM	2.7	U		2.7	U		2.7	U		2.7	U	
SILVER	2.2	U		2.2	U		2.2	U		2.2	U	
SODIUM	405000			9780			2660			2160		
THALLIUM	10.2	B	A	3.8	B	A	3.7	U		3.7	U	
VANADIUM	30.2			2.4	U		2.4	U		2.4	U	
ZINC	255			19.8	B	A	28.3			9.4	B	A

CTO298 - NSWC WHITE OAK
WATER DATA
QUANTERRA
SDG: WO060

SAMPLE NUMBER:	11GW1030003			11GW1030003-F			11GW1040003			11GW1040003-F		
SAMPLE DATE:	07/14/99			07/14/99			07/14/99			07/14/99		
LABORATORY ID:	C9G150234002			C9G150234002			C9G150234008			C9G150234008		
QC_TYPE:	NORMAL			NORMAL			NORMAL			NORMAL		
% SOLIDS:	0.0 %			0.0 %			0.0 %			0.0 %		
UNITS:	UG/L			UG/L			UG/L			UG/L		
FIELD DUPLICATE OF:												
	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
INORGANICS												
ALUMINUM	39500	J	F	29.4	U		794	J	F	29.4	U	
ANTIMONY	1.7	UL	D	1.7	UL	D	1.7	UL	D	1.7	UL	D
ARSENIC	6.2			1.1	U		1.1	U		1.1	U	
BARIUM	377			28.0			41.8			21.9		
BERYLLIUM	4.2			0.11	B	A	0.94	B	A	0.52	B	A
CADMIUM	3.0	U		3.0	U		3.0	U		3.0	U	
CALCIUM	6100			4310			6950			6040		
CHROMIUM	73.4	J	G	2.4	U		2.8	J	G	2.4	U	
COBALT	127			28.5			17.5			17.0		
COPPER	60.0			8.4			8.3			1.5	B	A
CYANIDE	1.4	U					1.4	U				
IRON	52900	J	G	1440	J	G	2520	J	G	216	J	G
LEAD	22.6			1.0	UL	C	1.0	UL	C	1.0	UL	C
MAGNESIUM	10800			2860			4300			3630		
MANGANESE	4880			3800			740			689		
MERCURY	0.10	UJ	C	0.10	UJ	C	0.10	UJ	C	0.10	UJ	C
NICKEL	132			44.2			36.0			22.6		
POTASSIUM	15100			5590			4290			3690		
SELENIUM	2.7	U		2.7	U		2.7	U		2.7	U	
SILVER	2.2	U		2.2	U		2.2	U		2.2	U	
SODIUM	6050			5160			12800			11700		
THALLIUM	8.8	B	A	4.8	B	A	3.7	U		3.7	U	
VANADIUM	43.6			2.4	U		2.4	U		2.4	U	
ZINC	164			11	B	A	77.3			58.6		

CTO298 - NSWC WHITE OAK
WATER DATA
QUANTERRA
SDG: WO060

SAMPLE NUMBER:	11GW1050003			11GW1060003			11GW1080003			11GW1090003		
SAMPLE DATE: -	07/14/99			07/14/99			07/14/99			07/13/99		
LABORATORY ID:	C9G150234004			C9G150234005			C9G150234009			C9G140153003		
QC_TYPE:	NORMAL			NORMAL			NORMAL			NORMAL		
% SOLIDS:	0.0 %			0.0 %			0.0 %			0.0 %		
UNITS:	UG/L			UG/L			UG/L			UG/L		
FIELD DUPLICATE OF:												
	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
INORGANICS												
ALUMINUM	145	J	F	254	J	F	49.5	J	F	29.4	U	
ANTIMONY	1.7	UL	D	1.7	UL	D	1.7	UL	D	1.7	UL	D
ARSENIC	1.1	U		1.1	U		1.6			1.1	U	
BARIUM	52.5			74.9			10.6			33.1		
BERYLLIUM	0.17	B	A	0.14	B	A	0.22	B	A	0.36	B	A
CADMIUM	3.0	U		3.0	U		3.0	U		3.0	U	
CALCIUM	7510			33800			4220			8850		
CHROMIUM	3.1	J	G	2.4	U		2.4	U		2.4	U	
COBALT	24.1			3.8	U		11.0			3.8	U	
COPPER	2.4	B	A	1.4	U		3.7	B	A	1.4	U	
CYANIDE	1.4	U		1.4	U		2.2	B	A	1.7	B	A
IRON	258	J	G	3200	J	G	54.6	J	G	9240	J	G
LEAD	1.0	UL	C	1.0	UL	C	1.0	UL	C	1.0	UL	C
MAGNESIUM	4420			5080			1190			5190		
MANGANESE	225			284			2.6	B	A	903		
MERCURY	0.10	UJ	C	0.10	UJ	C	0.10	UJ	C	0.10	UJ	C
NICKEL	13.0			8.8	U		8.8	U		11.5		
POTASSIUM	2310			4110			1090			3020		
SELENIUM	2.7	U		2.7	U		2.7	U		2.7	U	
SILVER	2.2	U		2.2	U		2.2	U		2.2	U	
SODIUM	15100			7920			5510			6430		
THALLIUM	6.4	B	A	3.7	U		4.0	B	A	3.7	U	
VANADIUM	2.4	U		6.9			2.4	U		2.4	U	
ZINC	40.7			5.4	B	A	4.6	B	A	6.2	B	A

CTO298 - NSWC WHITE OAK
WATER DATA
QUANTERRA
SDG: WO060

SAMPLE NUMBER:	11GW1100003			11GW1110003			11GW1110003-F			11GW1119903		
SAMPLE DATE:	07/15/99			07/15/99			07/15/99			07/15/99		
LABORATORY ID:	C9G160174004			C9G160174006			C9G160174006			C9G160174007		
QC_TYPE:	NORMAL			NORMAL			NORMAL			NORMAL		
% SOLIDS:	0.0 %			0.0 %			0.0 %			0.0 %		
UNITS:	UG/L			UG/L			UG/L			UG/L		
FIELD DUPLICATE OF:										11GW1110003		
	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
INORGANICS												
ALUMINUM	52.8	J	F	841	J	F	36.6	J	F	547	J	F
ANTIMONY	1.7	UL	D	1.7	UL	D	1.7	UL	D	1.7	UL	D
ARSENIC	1.9			1.1	U		1.1	U		1.1	U	
BARIUM	6.8			27.9			23.1			26.1		
BERYLLIUM	0.11	U		0.24	B	A	0.16	B	A	0.17	B	A
CADMIUM	3.0	U		3.0	U		3.0	U		3.0	U	
CALCIUM	6300			2830			2830			2900		
CHROMIUM	2.4	U		3.7	J	G	2.4	U		2.4	U	
COBALT	3.8	U		17.5			14.3			15.1		
COPPER	3.7	B	A	10.1			1.4	U		9.1		
CYANIDE	1.4	U		1.4	U					1.4	U	
IRON	146	J	G	1950	J	G	13.1	J	G	1230	J	G
LEAD	1.0	UL	C	1.0	UL	C	1.0	UL	C	1.0	UL	C
MAGNESIUM	3140			1590			1340			1510		
MANGANESE	77.5			685			629			668		
MERCURY	0.10	UJ	C	0.10	UJ	C	0.10	UJ	C	0.10	UJ	C
NICKEL	8.8	U		8.8	U		9.1			8.8	U	
POTASSIUM	3150			2470			1970			2220		
SELENIUM	2.7	U		2.7	U		2.7	U		2.7	U	
SILVER	2.2	U		2.2	U		2.2	U		2.2	U	
SODIUM	8080			7900			7110			7990		
THALLIUM	4.6	B	A	3.7	U		3.7	U		5.8	B	A
VANADIUM	2.4	U		2.4	U		2.4	U		2.4	U	
ZINC	5.9	B	A	29.5			35.7			34.8		

CTO298 - NSWC WHITE OAK
WATER DATA
QUANTERRA
SDG: WO060

SAMPLE NUMBER:	11GW1119903-F			11GW240003			11GW240003-F			11GW290003		
SAMPLE DATE:	07/15/99			07/14/99			07/14/99			07/14/99		
LABORATORY ID:	C9G160174007			C9G150234012			C9G150234012			C9G150234003		
QC_TYPE:	NORMAL			NORMAL			NORMAL			NORMAL		
% SOLIDS:	0.0 %			0.0 %			0.0 %			0.0 %		
UNITS:	UG/L			UG/L			UG/L			UG/L		
FIELD DUPLICATE OF:	11GW1110003-F											
	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
INORGANICS												
ALUMINUM	40.4	J	F	108000	J	F	51.6	J	F	15500	J	F
ANTIMONY	1.7	UL	D	3.4	UL	D	1.7	UL	D	1.7	UL	D
ARSENIC	1.1	U		36.8			1.1	U		3.1		
BARIUM	23.0			329			14.8			157		
BERYLLIUM	0.14	B	A	10.3			0.11	U		2.5		
CADMIUM	3.0	U		3.0	UL	K	3.0	U		3.0	U	
CALCIUM	2590			23000			12300			7330		
CHROMIUM	2.4	U		165	J	G	2.4	U		36.0	J	G
COBALT	14.0			99.7	K	K	3.8	U		91.4		
COPPER	1.4	U		232			4.9	B	A	26.9		
CYANIDE				1.4	U					1.4	U	
IRON	9.2	U		190000	J	G	32.4	J	G	30700	J	G
LEAD	1.0	UL	C	71.0			1.0	UL	C	13.4		
MAGNESIUM	1330			17700			3450			7570		
MANGANESE	622			2720			62.1			2950		
MERCURY	0.10	UJ	C	2.0			0.10	UJ	C	0.10	UJ	C
NICKEL	8.8	U		135	L	K	8.8	U		20.3		
POTASSIUM	2380			12100			1090			3780		
SELENIUM	2.7	U		5.4	U		2.7	U		2.7	U	
SILVER	2.2	U		3.5			2.2	U		2.2	U	
SODIUM	6960			5930			4680			53100		
THALLIUM	3.7	U		13.1	B	A	4.4	B	A	5.2	B	A
VANADIUM	2.4	U		246			2.4	U		33.5		
ZINC	10.2	B	A	531			4.9	B	A	116		

CTO298 - NSWC WHITE OAK
WATER DATA
QUANTERRA
SDG: WO060

SAMPLE NUMBER:	11GW290003-F			11GW620003			11GW640003			11GW640003-F		
SAMPLE DATE:	07/14/99			07/15/99			07/14/99			07/14/99		
LABORATORY ID:	C9G150234003			C9G160174005			C9G150234006			C9G150234006		
QC_TYPE:	NORMAL			NORMAL			NORMAL			NORMAL		
% SOLIDS:	0.0 %			0.0 %			0.0 %			0.0 %		
UNITS:	UG/L			UG/L			UG/L			UG/L		
FIELD DUPLICATE OF:												
	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
INORGANICS												
ALUMINUM	64.5	J	F	265	J	F	4550	J	F	29.4	U	
ANTIMONY	1.7	UL	D	1.7	UL	D	1.7	UL	D	1.7	UL	D
ARSENIC	1.1	U		1.1	U		5.2			1.1	U	
BARIUM	45.7			11.0			106			7.3		
BERYLLIUM	0.39	B	A	0.11	B	A	0.95	B	A	0.11	U	
CADMIUM	3.0	U		3.0	U		3.0	U		3.0	U	
CALCIUM	5590			5000			5330			3510		
CHROMIUM	2.4	U		7.2	J	G	17.6	J	G	2.4	U	
COBALT	54.9			26.6			47.5			22.0		
COPPER	1.4	U		8.1			40.5			1.4	U	
CYANIDE				1.4	U		1.4	U				
IRON	7360	J	G	458	J	G	20800	J	G	4470	J	G
LEAD	1.0	UL	C	1.0	UL	C	11.2			1.0	UL	C
MAGNESIUM	4550			1720			4810			2690		
MANGANESE	2420			40.2			1110			760		
MERCURY	0.16	J	C	0.10	UJ	C	0.10	UJ	C	0.10	UJ	C
NICKEL	8.8	U		8.8	U		22.9			8.8	U	
POTASSIUM	1950			648			2540			1040		
SELENIUM	2.7	U		2.7	U		2.7	U		2.7	U	
SILVER	2.2	U		2.2	U		2.2	U		2.2	U	
SODIUM	50500			15500			3480			2730		
THALLIUM	3.7	U		4.8	B	A	4.8	B	A	5.6	B	A
VANADIUM	2.4	U		2.4	U		19.1			2.4	U	
ZINC	17.0	B	A	26.0	B	A	83.0			9.4	B	A

CTO298 - NSWC WHITE OAK
WATER DATA
QUANTERRA
SDG: WO060

SAMPLE NUMBER:	11GW660003			11GW660003-F			11GW680003			11GW680003-F		
SAMPLE DATE:	07/14/99			07/14/99			07/14/99			07/14/99		
LABORATORY ID:	C9G150234011			C9G150234011			C9G150234010			C9G150234010		
QC_TYPE:	NORMAL			NORMAL			NORMAL			NORMAL		
% SOLIDS:	0.0 %			0.0 %			0.0 %			0.0 %		
UNITS:	UG/L			UG/L			UG/L			UG/L		
FIELD DUPLICATE OF:												
	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
INORGANICS												
ALUMINUM	15700	J	F	29.4	U		57100	J	F	29.4	U	
ANTIMONY	1.7	UL	D	1.7	UL	D	1.7	UL	D	1.7	UL	D
ARSENIC	2.4			1.4			9.0			1.1	U	
BARIUM	138			14.7			204			6.2		
BERYLLIUM	1.7			0.11	B	A	4.1			0.11	U	
CADMIUM	3.0	U		3.0	U		3.0	U		3.0	U	
CALCIUM	6960			4510			2490			1070		
CHROMIUM	91.4	J	G	2.4	U		80.8	J	G	2.4	U	
COBALT	34.3			10.7			42.0			3.8	U	
COPPER	47.5			1.8	B	A	185			1.4	U	
CYANIDE	1.4	U					1.4	U				
IRON	49800	J	G	1280	J	G	99900	J	G	10.2	J	G
LEAD	9.9			1.0	UL	C	23.7			1	UL	C
MAGNESIUM	9290			2760			9490			812		
MANGANESE	797			514			980			5.3		
MERCURY	0.10	UJ	C	0.10	UJ	C	0.18	J	C	0.10	UJ	C
NICKEL	92.9			29.6			60.6			8.8	U	
POTASSIUM	9290			3100			6990			470	U	
SELENIUM	2.7	U		2.7	U		2.7	U		2.7	U	
SILVER	2.4			2.2	U		2.2	U		2.2	U	
SODIUM	8040			6440			3890			3040		
THALLIUM	7.7	B	A	6.0	B	A	8.9	B	A	4.3	B	A
VANADIUM	21.6			2.4	U		115			2.5		
ZINC	103			10.7	B	A	188			6.4	B	A

CTO298 - NSWC WHITE OAK
WATER DATA
QUANTERRA
SDG: WO060

SAMPLE NUMBER:	11GW690003			11GW690003-F			11GW720003			11GW720003-F		
SAMPLE DATE:	07/13/99			07/13/99			07/15/99			07/15/99		
LABORATORY ID:	C9G140153002			C9G140153002			C9G160174003			C9G160174003		
QC_TYPE:	NORMAL			NORMAL			NORMAL			NORMAL		
% SOLIDS:	0.0 %			0.0 %			0.0 %			0.0 %		
UNITS:	UG/L			UG/L			UG/L			UG/L		
FIELD DUPLICATE OF:												
	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
INORGANICS												
ALUMINUM	44600	J	F	194	J	F	1760	J	F	32.1	J	F
ANTIMONY	3.4	UL	D	1.7	UL	D	1.7	UL	D	1.7	UL	D
ARSENIC	14.1			1.1	U		1.5			1.1	U	
BARIUM	754			311			74.7			66.1		
BERYLLIUM	13.2			0.94	B	A	0.57	B	A	0.17	B	A
CADMIUM	4.1	J	FK	3.7	J	F	3.0	U		3.0	U	
CALCIUM	26300			21700			10400			9840		
CHROMIUM	146			2.4	U		6.6			2.4	U	
COBALT	116			3.8	U		30.2			13.7		
COPPER	119			5.3	B	A	33.0			5.5	B	A
CYANIDE	1.5	B	A				1.4	U				
IRON	158000	J	G	9.2	U		1890	J	G	20.6	J	G
LEAD	47.4			1.0	UL	C	1.7	L	C	1.0	UL	C
MAGNESIUM	25800			19500			8810			7170		
MANGANESE	3720			370			150			50.8		
MERCURY	1.7			0.10	UJ	C	0.12	J	C	0.10	UJ	C
NICKEL	155	L	K	45.2			16.7			8.8	U	
POTASSIUM	6630			3080			2040			1790		
SELENIUM	5.4	U		2.7	U		2.7	U		2.7	U	
SILVER	3.7			2.2	U		2.2	U		2.2	U	
SODIUM	48200			49000			5010			4280		
THALLIUM	13.2	B	A	5.2	B	A	6.4	B	A	4.2	B	A
VANADIUM	136			2.4	U		2.5			2.4	U	
ZINC	301			56.1			40.5			16.3	B	A

CTO298 - NSWC WHITE OAK
WATER DATA
QUANTERRA
SDG: WO060

SAMPLE NUMBER:	11GW860003	11GW860003-F		
SAMPLE DATE:	07/14/99	07/14/99	/ /	/ /
LABORATORY ID:	C9G150234007	C9G150234007		
QC_TYPE:	NORMAL	NORMAL		
% SOLIDS:	0.0 %	0.0 %	100.0 %	100.0 %
UNITS:	UG/L	UG/L		
FIELD DUPLICATE OF:				

	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
INORGANICS												
ALUMINUM	9370	J	F	29.4	U							
ANTIMONY	1.7	UL	D	1.7	UL	D						
ARSENIC	1.2			1.1	U							
BARIUM	258			143								
BERYLLIUM	0.95			0.11	U							
CADMIUM	3.0	U		3.0	U							
CALCIUM	11000			10200								
CHROMIUM	15.2			2.4	U							
COBALT	62.3			48.6								
COPPER	36.2			1.4	U							
CYANIDE	1.4	U										
IRON	42600	J	G	18200	J	G						
LEAD	2.0	L	C	1.0	UL	C						
MAGNESIUM	11600			7280								
MANGANESE	10900			10300								
MERCURY	0.10	UJ	C	0.10	UJ	C						
NICKEL	44.9			20.9								
POTASSIUM	7540			2270								
SELENIUM	5.4	U		2.7	U							
SILVER	2.2	U		2.2	U							
SODIUM	20400			19000								
THALLIUM	10.2	B	A	8.4	B	A						
VANADIUM	16.8			2.4	U							
ZINC	77.2			15.2	B	A						

Tetra Tech NUS **INTERNAL CORRESPONDENCE**

PITT-10-9-021

TO : **R. KOTUN** **DATE:** **DECEMBER 13, 1999**

FROM: **JENNIFER M. MALLE** **COPIES:** **DV FILE**

SUBJECT: **INORGANIC DATA VALIDATION –TAL METALS, DISSOLVED TAL METALS AND CYANIDE**
CTO 298 – NSWC WHITE OAK, MD
SAMPLE DELIVERY GROUP SDG – WO061

SAMPLES: 29/Aqueous/

11GW107-00-03	11GW22-00-03	11GW22-99-03
11GW23-00-03	11GW23-00-03-F	11GW25-00-03
11GW26-00-03	11GW26-00-03-F	11GW26-99-03
11GW26-99-03-F	11GW27-00-03	11GW28-00-03
11GW63-00-03	11GW63-00-03-F	11GW65-00-03
11GW67-00-03	11GW71-00-03	11GW71-99-03
11GW73-00-03	11GW73-00-03-F	11GW84-00-03
11GW84-00-03-F	11GW85-00-03	11GW85-00-03-F
11GW88-00-03	BGW101-00-03	BGW101-00-03-F
BGW40-00-03	BGW40-00-03-F	

Overview

The sample set for SDG WO069, NSWC White Oak, consists of twenty-nine (29) aqueous environmental samples.

All samples, with exception to those designated "–F", were analyzed for target analyte list (TAL) metals and cyanide. The samples designated with "–F" were analyzed for dissolved target analyte list (TAL) metals. The samples were collected by Tetra Tech NUS on July 15, 16, 19, and 20, 1999 and analyzed by Quanterra Laboratories under Naval Facilities Engineering Service Center (NFESC) Navy Installation Restoration Laboratory Quality Assurance Guide (February 1996). Metals and cyanide analyses were conducted using EPA method ILM03.0/4.0.

All TAL metals analyses, with the exception of mercury, were conducted using Inductively Coupled Plasma (ICP) methodologies. Mercury analyses were conducted using Cold Vapor AA.

Summary

All analytes were successfully analyzed. The findings offered in this report are based upon a general review of all available data. The data review was based on data completeness, holding times, calibration data, laboratory method/preparation blanks, interference check sample (ICS) results, matrix spike results, laboratory duplicate results, field duplicate results, laboratory control sample (LCS) results, ICP serial dilution results, detection limits and analyte quantitation.

Areas of concern with respect to data quality are listed below.

Major Problems

- None.

Minor Problems

Calibration Data

- The Contract Required Detection Limit (CRDL) Percent Recoveries (%Rs) bracketing samples for nickel and selenium were greater than the 110% quality control limits. Positive results less than 2 times the CRDL value reported for nickel and selenium were qualified as biased high, "K", as a result of calibration noncompliances.

- The Contract Required Detection Limit (CRDL) Percent Recoveries (%Rs) bracketing samples for cadmium and lead were less than the 90% quality control limits. Positive results less than 2 times the CRDL value reported for cadmium and lead were qualified as biased low, "L" and nondetect results for cadmium and lead were qualified as biased low, "UL", as a result of calibration noncompliances.

Blank Analysis

- The following contaminants were detected in the laboratory method / preparation blanks at the following maximum concentrations :

Samples Affected: All

Analyte	Maximum Concentration	Action Level (aqueous)
Antimony	1.9 µg/L	9.5 µg/L
Barium	0.5 µg/L	2.5 µg/L
Beryllium	0.5 µg/L	2.5 µg/L
Mercury	0.2 µg/L	1.0 µg/L
Magnesium	21.6 µg/L	108 µg/L
Sodium [1]	53.97 µg/L	269.85 µg/L
Thallium	4.4 µg/L	22 µg/L
Zinc [1]	4.12 µg/L	20.6 µg/L

[1] Maximum concentration present in an aqueous preparation blank.

An action level of 5x the maximum contaminant level has been used to evaluate sample data for blank contamination. Sample aliquot and dilution factors were taken into consideration when evaluating for blank contamination. The positive results less than the action level for beryllium, mercury, thallium and zinc were qualified, "B", as a result of blank contamination. No validation action was required for the remaining analytes since either the results were greater than the action level or were previously qualified nondetects, "U", by the laboratory.

Field Duplicate Analysis

- Field duplicate imprecision greater than the 30% relative percent difference (RPD) was noted for aluminum, iron and sodium. Positive results for aluminum, iron and sodium have been qualified as estimated, "J", for field duplicate imprecision.

ICP Interference Check Sample

- The interfering analytes aluminum and iron were present in sample 11GW63-00-03 at concentrations which were comparable to the levels of aluminum and iron in the Interference Check Sample (ICS) solution. Several analytes, namely arsenic, barium, cadmium, cobalt, copper, lead, manganese, nickel, thallium vanadium and zinc were present in the ICS solution at concentrations which exceeded the Instrument Detection Limits (IDLs). Interference affects exist for arsenic, cadmium, cobalt, lead, nickel, thallium, and vanadium in the affected sample. The nondetect results reported for cadmium and thallium were qualified as biased low, "UL", and positive results reported for nickel were qualified as biased low, "L". Positive results reported for arsenic, cobalt, lead and vanadium were qualified as biased high, "K".

- The interfering analytes aluminum and iron were present in sample BGW-40-00-03 at concentrations which were comparable to the levels of aluminum and iron in the Interference Check Sample (ICS) solution. Several analytes, namely arsenic, barium, cadmium, cobalt, copper, lead, manganese, nickel, thallium vanadium and zinc were present in the ICS solution at concentrations which exceeded the Instrument Detection Limits (IDLs). Interference affects exist for arsenic, cadmium, and thallium in the affected sample. The nondetect results reported for cadmium and thallium were qualified as biased low, "UL". Positive results reported for arsenic were qualified as biased high, "K".

Notes

The Form 10 for cyanide was missing. The laboratory was contacted and the information was provided.

The laboratory does a 250/500 ml prep for cyanide. See appendix C for a sample calculation.

Executive Summary

Laboratory Performance: Several analytes were present in the laboratory method/preparation blanks. Cadmium, lead, nickel and selenium were qualified for calibration noncompliances. The Interfering analytes aluminum and iron were present in two of the samples. Field duplicate imprecision was noted for aluminum, iron and sodium.

Other Factors Affecting Data Quality: None

The data for these analyses were reviewed with reference to the "National Functional Guidelines for Inorganic Data Validation", April 1993 Revision as amended for use within USEPA Region III, and the NFESC document entitled "Navy Installation Restoration Laboratory Quality Assurance Guide" (NFESC 2/96).

The text of this report has been formulated to address only those problem areas affecting data quality.

"I attest that the data referenced herein were validated according to the agreed upon validation criteria as specified in the NFESC Guidelines and the Quality Assurance Project Plan (QAPP)."

Tetra Tech NUS
Jennifer M. Malle
Environmental Scientist

Tetra Tech NUS
Joseph A. Samchuck
Quality Assurance Officer

Attachments:

1. Appendix A - Qualified Analytical Results
2. Appendix B - Results as reported by the Laboratory
3. Appendix C - Support Documentation

Data Qualifier Key:

U	-	Value is a nondetect as reported by the laboratory.
B	-	Positive result is considered to be an artifact of blank contamination and should not be considered present.
UL	-	Nondetected result is considered biased low, "UL", as a result of technical noncompliances.
L	-	Positive result is considered biased low, "L", as a result of technical noncompliances.
K	-	Positive result is considered biased high, "K", as a result of technical noncompliances.
J	-	Positive result is considered estimated, "J", as a result of technical noncompliances.

APPENDIX A

Qualified Analytical Results

Qualifier Codes:

A = Lab Blank Contamination
B = Field Blank Contamination
C = Calibration (i.e., % RSDs, %Ds, ICVs, CCVs, RPDs, RRFs, etc.) Noncompliance
D = MS/MSD Noncompliance
E = LCS/LCSD Noncompliance
F = Lab Duplicate Imprecision
G = Field Duplicate Imprecision
H = Holding Time Exceedance
I = ICP Serial Dilution Noncompliance
J = GFAA PDS - GFAA MSA's $r < 0.995$
K = ICP Interference - include ICSAB % R's
L = Instrument Calibration Range Exceedance
M = Sample Preservation
N = Internal Standard Noncompliance
O = Poor Instrument Performance (i.e., base-time drifting)
P = Uncertainty near detection limit (< 2 x IDL for inorganics and <CRQL for organics)
Q = Other problems (can encompass a number of issues)
R = Surrogates Recovery Noncompliance
S = Pesticide/PCB Resolution
T = % Breakdown Noncompliance for DDT and Endrin
U = Pest/PCB D% between columns for positive results
V = Non-linear calibrations, tuning $r < 0.995$ (correlation coefficient)
W = EMPC result
X = Signal to noise response drop
Y = % Solid content is less than 30%

CTO298 - NSWC WHITE OAK
WATER DATA
QUANTERRA
SDG: WO061

SAMPLE NUMBER:	11GW1070003			11GW220003			11GW229903			11GW230003		
SAMPLE DATE:	07/16/99			07/20/99			07/20/99			07/19/99		
LABORATORY ID:	C9G180103003			C9G210144005			C9G210144004			C9G200195008		
QC_TYPE:	NORMAL			NORMAL			NORMAL			NORMAL		
% SOLIDS:	0.0 %			0.0 %			0.0 %			0.0 %		
UNITS:	UG/L			UG/L			UG/L			UG/L		
FIELD DUPLICATE OF:							11GW220003					
	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
INORGANICS												
ALUMINUM	66.8	J	G	331	J	G	243	J	G	1220	J	G
ANTIMONY	1.7	U		1.7	U		1.7	U		1.7	U	
ARSENIC	1.1	U		3.8			3.4			1.1	U	
BARIUM	37.6			44.3			42.4			39.1		
BERYLLIUM	0.24	B	A	0.30	B	A	0.30	B	A	0.78	B	A
CADMIUM	3.0	UL	C	3.0	UL	C	3.0	UL	C	3.0	UL	C
CALCIUM	6380			3180			3040			2920		
CHROMIUM	2.4	U		6.2			4.1			5.1		
COBALT	7.3			28.4			27.5			3.8	U	
COPPER	3.4			3.7			3.7			6.6		
CYANIDE	1.4	U		1.4	U		1.4	U		1.4	U	
IRON	22.3	J	G	807	J	G	513	J	G	2480	J	G
LEAD	1.0	UL	C	1.0	UL	C	1.0	UL	C	1.6	L	C
MAGNESIUM	4280			1600			1540			1470		
MANGANESE	20.7			1040			1030			62.4		
MERCURY	0.10	U		0.10	U		0.11	B	A	0.26	B	A
NICKEL	12.7	K	C	14.2	K	C	8.8	U		8.8	U	
POTASSIUM	2380			2420			2390			1140		
SELENIUM	2.7	U		2.7	U		2.7	U		2.7	U	
SILVER	2.2	U		2.2	U		2.2	U		2.2	U	
SODIUM	12400	J	G	24300	J	G	24000	J	G	5570	J	G
THALLIUM	5.6	B	A	3.7	U		4.8	B	A	5.2	B	A
VANADIUM	2.4	U		2.4	U		2.4	U		2.5		
ZINC	17.0	B	A	22.1			35.0			18.4	B	A

CTO298 - NSWC WHITE OAK
WATER DATA
QUANTERRA
SDG: WO061

SAMPLE NUMBER:	11GW230003-F			11GW250003			11GW260003			11GW260003-F		
SAMPLE DATE:	07/19/99			07/19/99			07/16/99			07/16/99		
LABORATORY ID:	C9G200195008			C9G200195006			C9G180103005			C9G180103005		
QC_TYPE:	NORMAL			NORMAL			NORMAL			NORMAL		
% SOLIDS:	0.0 %			0.0 %			0.0 %			0.0 %		
UNITS:	UG/L			UG/L			UG/L			UG/L		
FIELD DUPLICATE OF:												
	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
INORGANICS												
ALUMINUM	39.9	J	G	248	J	G	823	J	G	59.9	J	G
ANTIMONY	1.7	U		1.7	U		1.7	U		1.7	U	
ARSENIC	1.1	U		1.1	U		1.1	U		1.1	U	
BARIUM	31.6			36.6			82.8			79.9		
BERYLLIUM	0.48	B	A	0.29	B	A	0.21	B	A	0.24	B	A
CADMIUM	3.0	UL	C	3.0	UL	C	3.0	UL	C	3.0	UL	C
CALCIUM	2820			4030			29200			30200		
CHROMIUM	2.4	U		2.4	U		2.4	U		2.4	U	
COBALT	3.8	U		3.8	U		9.1			8		
COPPER	2.8			5.2			4.2			1.4	U	
CYANIDE				1.4	U		1.4	U				
IRON	14.9	J	G	406	J	G	1460	J	G	9.2	U	
LEAD	1.0	UL	C	1.0	L	C	1.2	L	C	1.0	UL	C
MAGNESIUM	1310			2650			14500			14400		
MANGANESE	15.2			218			28.5			10.6		
MERCURY	0.10	U		0.10	U		0.10	U		0.10	U	
NICKEL	8.8	U		8.8	U		9.1	K	C	9.2	K	C
POTASSIUM	1190			1310			3910			4010		
SELENIUM	2.7	U		2.7	U		2.7	U		2.7	U	
SILVER	2.2	U		2.2	U		2.2	U		2.2	U	
SODIUM	5470	J	G	10700	J	G	31100	J	G	31000	J	G
THALLIUM	4.6	B	A	4.4	B	A	7.0	B	A	8.1	B	A
VANADIUM	2.4	U		2.5			2.4	U		2.4	U	
ZINC	12.3	B	A	19.6	B	A	18.4	B	A	12.6	B	A

CTO298 - NSWC WHITE OAK
WATER DATA
QUANTERRA
SDG: WO061

SAMPLE NUMBER:	11GW269903			11GW269903-F			11GW270003			11GW280003		
SAMPLE DATE:	07/16/99			07/16/99			07/16/99			07/16/99		
LABORATORY ID:	C9G180103006			C9G180103006			C9G180103004			C9G180103002		
QC_TYPE:	NORMAL			NORMAL			NORMAL			NORMAL		
% SOLIDS:	0.0 %			0.0 %			0.0 %			0.0 %		
UNITS:	UG/L			UG/L			UG/L			UG/L		
FIELD DUPLICATE OF:	11GW260003			11GW260003-F								
	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
INORGANICS												
ALUMINUM	772	J	G	57.5	J	G	1640	J	G	356	J	G
ANTIMONY	1.7	U		1.7	U		1.7	U		1.7	U	
ARSENIC	1.1	U		1.1			1.1	U		1.1	U	
BARIUM	83.1			81.4			218			59.0		
BERYLLIUM	0.20	B	A	0.21	B	A	1.8	B	A	0.60	B	A
CADMIUM	3.0	UL	C	3.0	UL	C	9.2	L	C	3.0	UL	C
CALCIUM	29400			30600			16500			8660		
CHROMIUM	2.4	U		2.4	U		556			2.4	U	
COBALT	9.4			7.3			53.7			6.1		
COPPER	5.2			1.6			3540			11.9		
CYANIDE	1.4	U					1.4	U		1.4	U	
IRON	1410	J	G	13.6	J	G	520	J	G	569	J	G
LEAD	1.0	UL	C	1.0	UL	C	1.2	L	C	1.4	L	C
MAGNESIUM	14600			14700			17900			6250		
MANGANESE	27.1			8.5			2310			142		
MERCURY	0.16	B	A	0.10	U		0.10	U		0.18	B	A
NICKEL	12.4	K	C	15.2	K	C	112			17.0	K	C
POTASSIUM	4240			4090			4960			2510		
SELENIUM	2.7	U		2.7	U		2.7	U		2.7	U	
SILVER	2.2	U		2.2	U		2.2	U		2.2	U	
SODIUM	31500	J	G	31500	J	G	48600	J	G	12300	J	G
THALLIUM	4.4	B	A	4.9	B	A	3.7	U		6.3	B	A
VANADIUM	2.4			2.4	U		2.4	U		3.8		
ZINC	24.7			44.0			207			73.8		

CTO298 - NSWC WHITE OAK
WATER DATA
QUANTERRA
SDG: WO061

SAMPLE NUMBER:	11GW630003			11GW630003-F			11GW650003			11GW670003		
SAMPLE DATE:	07/19/99			07/19/99			07/15/99			07/16/99		
LABORATORY ID:	C9G200195003			C9G200195003			C9G160176001			C9G180103007		
QC_TYPE:	NORMAL			NORMAL			NORMAL			NORMAL		
% SOLIDS:	0.0 %			0.0 %			0.0 %			0.0 %		
UNITS:	UG/L			UG/L			UG/L			UG/L		
FIELD DUPLICATE OF:												
	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
INORGANICS												
ALUMINUM	135000	J	G	76.1	J	G	85.7	J	G	57.4	J	G
ANTIMONY	8.5	U		1.7	U		1.7	U		1.7	U	
ARSENIC	50.2	K	K	1.1	U		1.1	U		1.1	U	
BARIUM	1130			91.3			31.0			17.8		
BERYLLIUM	91.1			1.7	B	A	0.72	B	A	0.12	B	A
CADMIUM	15.0	UL	CK	3.0	UL	C	3.0	UL	C	3.0	UL	C
CALCIUM	35000			9870			3660			1480		
CHROMIUM	339			2.4	U		3.7			2.4	U	
COBALT	289	K	K	29.3			22.9			3.8	U	
COPPER	445			1.4	U		5.2			5.0		
CYANIDE	1.4	U					1.4	U		1.4	U	
IRON	1550000	J	G	14200	J	G	3340	J	G	30.6	J	G
LEAD	183	K	K	1.0	UL	C	1.0	UL	C	1.0	UL	C
MAGNESIUM	60800			10400			4170			1560		
MANGANESE	8130			2680			511			35.3		
MERCURY	0.73	B	A	0.10	U		0.10	U		0.10	U	
NICKEL	436	L	K	61.6	K	C	22.7	K	C	8.8	U	
POTASSIUM	40800			6110			3880			756		
SELENIUM	28.0	K	C	2.7	U		2.7	U		2.7	U	
SILVER	28.9			2.2	U		2.2	U		2.2	U	
SODIUM	57100	J	G	59500	J	G	3920	J	G	5070	J	G
THALLIUM	18.5	UL	K	5.4	B	A	6.1	B	A	3.7	U	
VANADIUM	255	K	K	2.4	U		2.4	U		2.4	U	
ZINC	2110			155			52.0			43.1		

CTO298 - NSWC WHITE OAK
WATER DATA
QUANTERRA
SDG: WO061

SAMPLE NUMBER:	11GW710003			11GW719903			11GW730003			11GW730003-F		
SAMPLE DATE:	07/19/99			07/19/99			07/16/99			07/16/99		
LABORATORY ID:	C9G200195004			C9G200195005			C9G180103008			C9G180103008		
QC_TYPE:	NORMAL			NORMAL			NORMAL			NORMAL		
% SOLIDS:	0.0 %			0.0 %			0.0 %			0.0 %		
UNITS:	UG/L			UG/L			UG/L			UG/L		
FIELD DUPLICATE OF:				11GW710003								
	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
INORGANICS												
ALUMINUM	149	J	G	1620	J	G	333	J	G	30.4	J	G
ANTIMONY	1.7	U		1.7	U		1.7	U		1.7	U	
ARSENIC	1.1	U		1.1	U		1.1	U		1.1	U	
BARIUM	41.2			55.6			16.8			14.1		
BERYLLIUM	0.11	B	A	0.32	B	A	0.11	B	A	0.15	B	A
CADMIUM	3.0	UL	C	3.0	UL	C	3.0	UL	C	3.0	UL	C
CALCIUM	4260			4240			1940			1670		
CHROMIUM	7.7			19.4			8.1			2.4	U	
COBALT	29.9			25.2			16.5			19.5		
COPPER	3.3			5.8			12.4			2.8		
CYANIDE	1.4	U		1.4	U		1.4	U				
IRON	779	J	G	5450	J	G	1330	J	G	26.8	J	G
LEAD	1.0	UL	C	1.0	UL	C	1.0	UL	C	1.0	UL	C
MAGNESIUM	1700			1840			1460			1350		
MANGANESE	202			269			35.4			19.1		
MERCURY	0.10	U		0.10	U		0.10	B	A	0.10	U	
NICKEL	14.3	K	C	24.7	K	C	11.7	K	C	8.8	U	
POTASSIUM	2030			2270			1050			1030		
SELENIUM	2.7	U		2.7	U		2.7	U		2.7	U	
SILVER	2.2	U		2.2	U		2.2	U		2.2	U	
SODIUM	7000	J	G	425000	J	G	2220	J	G	1900	J	G
THALLIUM	4.5	B	A	7.8	B	A	6.7	B	A	5.5	B	A
VANADIUM	2.4	U		5.1			3.7			2.4	U	
ZINC	26.1			18.7	B	A	23.8			17.9	B	A

CTO298 - NSWC WHITE OAK
WATER DATA
QUANTERRA
SDG: WO061

SAMPLE NUMBER:	11GW840003			11GW840003-F			11GW850003			11GW850003-F		
SAMPLE DATE:	07/15/99			07/15/99			07/20/99			07/20/99		
LABORATORY ID:	C9G160176002			C9G160176002			C9G210144002			C9G210144002		
QC_TYPE:	NORMAL			NORMAL			NORMAL			NORMAL		
% SOLIDS:	0.0 %			0.0 %			0.0 %			0.0 %		
UNITS:	UG/L			UG/L			UG/L			UG/L		
FIELD DUPLICATE OF:												
	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
INORGANICS												
ALUMINUM	13300	J	G	202	J	G	4250	J	G	73.4	J	G
ANTIMONY	1.7	U		1.7	U		1.7	U		1.7	U	
ARSENIC	1.3			1.1	U		1.1	U		1.1	U	
BARIUM	73.5			23.2			80.8			60.3		
BERYLLIUM	2.7			0.24	B	A	1.2	B	A	0.48	B	A
CADMIUM	3.0	UL	C	3.0	UL	C	3.0	UL	C	3.0	UL	C
CALCIUM	3870			2820			5170			5100		
CHROMIUM	24.6			2.4	U		14.2			2.4	U	
COBALT	7.2			4.9			14.0			8.2		
COPPER	12.3			3.8			14.9			2.4		
CYANIDE	1.4	U					1.4	U				
IRON	7090	J	G	117	J	G	6890	J	G	16.8	J	G
LEAD	13.3			1.0	UL	C	3.4	L	C	1.0	UL	C
MAGNESIUM	2660			1620			4510			3800		
MANGANESE	119			22.6			251			91.5		
MERCURY	0.10	U		0.10	U		0.10	U		0.10	U	
NICKEL	27.3	K	C	8.8	U		21.0	K	C	8.9	K	C
POTASSIUM	2450			1620			3260			2480		
SELENIUM	2.7	U		2.7	U		2.7	U		2.7	U	
SILVER	2.2	U		2.2	U		2.2	U		2.2	U	
SODIUM	5290	J	G	4560	J	G	12300	J	G	12100	J	G
THALLIUM	3.7	U		4.5	B	A	5.1	B	A	6.4	B	A
VANADIUM	3.8			2.4	U		5.0			2.4		
ZINC	48.6			18.5	B	A	36.4			23.7		

CTO298 - NSWC WHITE OAK
WATER DATA
QUANTERRA
SDG: WO061

SAMPLE NUMBER:	11GW880003			BGW1010003			BGW1010003-F			BGW400003		
SAMPLE DATE:	07/19/99			07/19/99			07/19/99			07/20/99		
LABORATORY ID:	C9G200195002			C9G200195007			C9G200195007			C9G210144003		
QC_TYPE:	NORMAL			NORMAL			NORMAL			NORMAL		
% SOLIDS:	0.0 %			0.0 %			0.0 %			0.0 %		
UNITS:	UG/L			UG/L			UG/L			UG/L		
FIELD DUPLICATE OF:												
	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
INORGANICS												
ALUMINUM	199	J	G	483	J	G	96.3	J	G	119000	J	G
ANTIMONY	1.7	U		1.7	U		1.7	U		8.5	U	
ARSENIC	1.1	U		1.1	U		1.1	U		17.2	K	K
BARIUM	26.7			39.3			36			854		
BERYLLIUM	0.18	B	A	0.29	B	A	0.27	B	A	14.5		
CADMIUM	3.0	UL	C	3.0	UL	C	3.0	UL	C	3.0	UL	CK
CALCIUM	3300			4510			4410			9740		
CHROMIUM	2.4	U		6.8			2.4	U		177		
COBALT	3.8	U		20.8			21.7			133		
COPPER	3.8			5.8			2.4			140		
CYANIDE	1.4	U		1.4	U					1.4	U	
IRON	468	J	G	1510	J	G	16.0	J	G	181000	J	G
LEAD	1.0	UL	C	1.6	L	C	1.0	UL	C	75.8		
MAGNESIUM	2160			4770			4910			37900		
MANGANESE	66.3			109			98.8			3340		
MERCURY	0.10	U		0.10	U		0.10	U		0.10	U	
NICKEL	8.8	U		16.1	K	C	11.9	K	C	207		
POTASSIUM	1190			2340			2150			39100		
SELENIUM	2.7	U		2.7	U		2.7	U		13.5	U	
SILVER	2.2	U		2.2	U		2.2	U		3.9		
SODIUM	9930	J	G	26600	J	G	28100	J	G	7710	J	G
THALLIUM	5.2	B	A	3.7	B	A	3.7	U		18.5	UL	K
VANADIUM	2.4	U		5.0			2.4	U		268		
ZINC	29.4			37.6			30.1			480		

CTO298 - NSWC WHITE OAK
WATER DATA
QUANTERRA
SDG: WO061

SAMPLE NUMBER:	BGW400003-F											
SAMPLE DATE:	07/20/99			/ /			/ /			/ /		
LABORATORY ID:	C9G210144003											
QC_TYPE:	NORMAL											
% SOLIDS:	0.0 %			100.0 %			100.0 %			100.0 %		
UNITS:	UG/L											
FIELD DUPLICATE OF:												
	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
INORGANICS												
ALUMINUM	46.4	J	G									
ANTIMONY	1.7	U										
ARSENIC	1.1	U										
BARIUM	35.8											
BERYLLIUM	0.48	B	A									
CADMIUM	3.0	UL	C									
CALCIUM	4650											
CHROMIUM	2.4	U										
COBALT	3.8	U										
COPPER	2.0											
IRON	9.4	J	G									
LEAD	1.0	UL	C									
MAGNESIUM	2840											
MANGANESE	63.4											
MERCURY	0.10	U										
NICKEL	10.5	K	C									
POTASSIUM	537											
SELENIUM	2.7	U										
SILVER	2.2	U										
SODIUM	7270	J	G									
THALLIUM	5.6	B	A									
VANADIUM	2.4	U										
ZINC	19.0	B	A									