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NSB KINGS BAY
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RCRA FACILITY INVESTIGATION/SITE INSPECTION GROUNDWATER MONITORING
SAMPLING EVENT 3 THROUGH 6 NSB KINGS BAY GA
7/1/1992
ABB ENVIRONMENTAL

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**RCRA FACILITY INVESTIGATION/SITE INSPECTION
GROUNDWATER MONITORING PROGRAM
SAMPLING EVENTS No. 3 THROUGH 6**

**NAVAL SUBMARINE BASE
KINGS BAY, GEORGIA**

Prepared for:

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Naval Submarine Base
Kings Bay, Georgia
RFI/SI Groundwater Monitoring Program
Sampling Events No. 3 through 6

Validated analytical data for the second groundwater sampling event have been received. The second round of groundwater samples were analyzed for Appendix IX constituents. The following paragraphs summarize comparison of the first and second rounds of groundwater analytical data and recommendations for analytes to be deleted from the monitoring list for future groundwater sampling events associated with the RCRA Facility Investigation/Site Inspection (RFI/SI) currently underway at three sites at Naval Submarine Base (NSB), Kings Bay, Georgia. The three sites are discussed separately below and are identified as follows:

- Site 5 - Army Reserve Disposal Area, Towhee Trail
- Site 11 - Old Camden County Landfill
- Site 16 - Army Reserve Disposal Area, Motor Missile Magazines

Site 5 Attachment A summarizes Appendix IX compounds detected in groundwater samples collected from Site 5 during the first and second groundwater sampling events.

Several volatile organic compounds (VOCs) were detected in groundwater samples collected in February 1992 (first sampling event), however, no VOCs were detected in samples collected in May 1992 (second sampling event). VOCs will continue to be monitored at this site. The VOC analytes will be limited to include Target Compound List (TCL) VOCs, plus trichlorofluoromethane, 1,2-dichlorobenzene, 1,3-dichlorobenzene, and 1,4-dichlorobenzene.

Second round groundwater samples confirmed the absence of semivolatile compounds (SVOCs), pesticides, herbicides, polychlorinated biphenyl (PCB) compounds, dioxins, and furans in groundwater at Site 5. With the exception of PCBs, these compounds will be deleted from future monitoring events at this site.

PCBs will continue to be monitored in groundwater at this site because one surface soil sample collected from the site contained 53 ug/kg Aroclor 1260. Additional soil samples will be collected to evaluate the site for higher concentrations of PCBs. No PCBs have been detected in groundwater samples collected from the site to date. If results of PCB analysis of the soil samples do not indicate higher levels are present, the Navy may consider deletion of PCBs from groundwater monitoring at that time.

Concentrations of inorganic constituents were markedly lower in groundwater samples collected in May 1992. Appendix IX inorganic constituents will continue to be monitored at Site 5 because decisions regarding whether a release of inorganic constituents has occurred require additional data collection.

Future groundwater sampling events at Site 5 will include collection of both filtered and non-filtered groundwater samples for analysis of Appendix IX inorganic constituents. Total dissolved solids and total suspended solids will also be analyzed during future groundwater monitoring events. The decision to analyze filtered groundwater samples, total dissolved solids, and total suspended

solids was prompted by the concentrations of inorganic constituents detected in both upgradient and downgradient groundwater samples associated with the first sampling event.

Site 11 Attachment B summarizes Appendix IX constituents detected in groundwater samples collected from Site 11 during the first and second groundwater sampling events.

VOCs detected in samples collected in February 1992 were also present in samples collected in May 1992. Several other VOCs not previously detected were present in groundwater samples collected in May 1992. VOCs will continue to be monitored at Site 11. The VOC analytes will be limited to include Target Compound List (TCL) VOCs, plus trichlorofluoromethane, 1,2-dichlorobenzene, 1,3-dichlorobenzene, and 1,4-dichlorobenzene.

SVOC analysis of groundwater samples collected in May 1992 confirmed previous results indicating that 1,4-dichlorobenzene is the only potentially site-related Appendix IX SVOC present in groundwater at Site 11. This compound is also listed as a VOC in Appendix IX, and can be monitored as such. SVOCs will be deleted from the monitoring list at Site 11.

Analytical results for the second groundwater sampling event confirmed the absence of Appendix IX pesticides, herbicides, PCBs, dioxins, and furans in groundwater samples from Site 11. These compounds will be deleted from future monitoring events at this site.

Concentrations of Appendix IX inorganic constituents decreased markedly in groundwater samples collected from Site 11 during the May 1992 sampling event. Appendix IX inorganic constituents will continue to be monitored at Site 11 because decisions regarding whether a release of inorganic constituents has occurred require additional data collection.

Future groundwater sampling events at Site 11 will include collection of both filtered and non-filtered groundwater samples for analysis of Appendix IX inorganic constituents. Total dissolved solids and total suspended solids will also be analyzed during future groundwater monitoring events. The decision to analyze filtered groundwater samples, total dissolved solids, and total suspended solids was prompted by the concentrations of inorganic constituents detected in both upgradient and downgradient groundwater samples associated with the first sampling event.

Site 16 Attachment C summarizes Appendix IX constituents detected in groundwater samples collected from Site 16 during the first and second groundwater sampling events.

Several volatile organic compounds (VOCs) were detected in groundwater samples collected in February 1992, however, no VOCs were detected in samples collected in May 1992. VOCs will continue to be monitored at this site. The VOC analytes will be limited to include Target Compound List (TCL) VOCs, plus trichlorofluoromethane, 1,2-dichlorobenzene, 1,3-dichlorobenzene, and 1,4-dichlorobenzene.

Second round groundwater samples confirmed the absence of SVOCs, pesticides, herbicides, PCBs, dioxins, and furans in groundwater at Site 16. With the

exception of the base/neutral fraction of SVOCs, these compounds will be deleted from future monitoring events at this site.

The base/neutral fraction of SVOCs will remain on the list of parameters to monitor at Site 16 because one subsurface soil sample from a downgradient monitoring well boring contained concentrations of polynuclear aromatic hydrocarbons (PAHs). No PAHs or other site-related SVOCs have been detected in groundwater samples collected from Site 16 to date. The analytes for SVOC analysis will be limited to TCL SVOCs included in the base/neutral fraction.

Concentrations of Appendix IX inorganic constituents decreased markedly in groundwater samples collected from Site 16 during the May 1992 sampling event. Appendix IX inorganic constituents will continue to be monitored at Site 16 because decisions regarding whether a release of inorganic constituents has occurred require additional data collection.

Future groundwater sampling events at Site 16 will include collection of both filtered and non-filtered groundwater samples for analysis of Appendix IX inorganic constituents. Total dissolved solids and total suspended solids will also be analyzed during future groundwater monitoring events. The decision to analyze filtered groundwater samples, total dissolved solids, and total suspended solids was prompted by the concentrations of inorganic constituents detected in both upgradient and downgradient groundwater samples associated with the first sampling event.

Summary Attachment D summarizes parameters for groundwater monitoring at each of the sites discussed above. All three sites will continue to be monitored for VOCs and inorganic constituents. The analytes included in the VOC analyses will be limited to include TCL VOCs, plus trichlorofluoromethane, 1,2-dichlorobenzene, 1,3-dichlorobenzene, and 1,4-dichlorobenzene. The analytes for inorganic analysis will include the 19 inorganic constituents included in Appendix IX. Filtered and non-filtered groundwater samples will be collected for inorganic analysis. Total dissolved solids and total suspended solids have been added to the monitoring program for all three sites.

At Site 5 PCBs will continue to be monitored until additional soil PCB data has been obtained that indicates that the site does not contain significant concentrations of PCBs. No PCBs have been detected in groundwater samples collected from the site to date.

At Site 16 the base/neutral fraction of TCL SVOCs will continue to be monitored because one subsurface soil sample from a downgradient monitoring well boring contained concentrations of PAHs. No PAHs have been detected in groundwater samples collected from the site to date.

Analytical methods for the RFI/SI groundwater monitoring program at NSB Kings Bay, Georgia, are summarized in Attachment E. With the exception of total dissolved solids and total suspended solids, which will be analyzed using methods presented in *Standard Methods for the Evaluation of Water and Wastewater*, 17th edition (APHA, AWWA, WPCF, 1989), all analytical methods will be in accordance with *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods* (SW-846) (USEPA, 1986).

ATTACHMENT A

SITE 5, ARMY RESERVE DISPOSAL AREA, TOWHEE TRAIL

COMPARISON OF APPENDIX IX CHEMICALS IN
GROUNDWATER FOR
SAMPLING EVENTS NO. 1 AND 2

SAMPLE EVENT NO. 1 (FEB. 1992)	SAMPLE EVENT NO. 2 (MAY 1992)
VOLATILE ORGANICS	VOLATILE ORGANICS
carbon disulfide	none detected
trichlorofluoromethane	
4-methyl-2-pentanone	
ethylbenzene	
xylene	
SEMIVOLATILE ORGANICS	SEMIVOLATILE ORGANICS
none detected	none detected
PESTICIDES, HERBICIDES, AND PCBS	PESTICIDES, HERBICIDES, AND PCBS
none detected	none detected
DIOXINS AND FURANS	DIOXINS AND FURANS
none detected	none detected
INORGANICS	INORGANICS
arsenic	cadmium
cadmium	lead
chromium	cyanide
lead	selenium
cyanide	sulfide
sulfide	

ATTACHMENT B

SITE 11, OLD CALDEN COUNTY LANDFILL

**COMPARISON OF APPENDIX IX CHEMICALS
IN GROUNDWATER FOR
SAMPLING EVENTS NO. 1 AND NO. 2**

SAMPLE EVENT NO. 1 (FEB. 1992)	SAMPLE EVENT NO. 2 (MAY 1992)
VOLATILE ORGANICS	VOLATILE ORGANICS
vinyl chloride	vinyl chloride
1,2-dichloroethene	1,2-dichloroethene
chlorobenzene	chlorobenzene
xylene	xylene
1,4-dichlorobenzene	1,4-dichlorobenzene
ethylbenzene	1,3-dichlorobenzene
4-methyl-2-pentanone	toluene
	chloroethane
	trichloroethene
	tetrachloroethene
SEMIVOLATILE ORGANICS	SEMIVOLATILE ORGANICS
1,4-dichlorobenzene	1,4-dichlorobenzene
PESTICIDES, HERBICIDES, AND PCBS	PESTICIDES, HERBICIDES, AND PCBS
none detected	none detected
DIOXINS AND FURANS	DIOXINS AND FURANS
none detected	none detected
INORGANICS	INORGANICS
arsenic beryllium	within background range
chromium cobalt	of upgradient wells
copper lead	
mercury nickel	
vanadium zinc	

ATTACHMENT C

SITE 16, ARMY RESERVE DISPOSAL AREA,
MOTOR MISSILE MAGAZINES

COMPARISON OF APPENDIX IX CHEMICALS
IN GROUNDWATER FOR
SAMPLING EVENTS NO. 1 AND 2

SAMPLE EVENT NO. 1 (FEB. 1992)	SAMPLE EVENT NO. 2 (MAY 1992)
VOLATILE ORGANICS	VOLATILE ORGANICS
4-methyl-2-pentanone	none detected
ethylbenzene	
xylene	
SEMIVOLATILE ORGANICS	SEMIVOLATILE ORGANICS
none detected	none detected
PESTICIDES, HERBICIDES, AND PCBS	PESTICIDES, HERBICIDES, AND PCBS
none detected	none detected
DIOXINS AND FURANS	DIOXINS AND FURANS
none detected	none detected
INORGANICS	INORGANICS
arsenic	beryllium
chromium	vanadium
zinc	sulfide
	arsenic
	beryllium
	chromium
	lead
	selenium
	vanadium
	zinc
	sulfide

ATTACHMENT D

**PROPOSED MONITORING PARAMETERS
FOR GROUNDWATER SAMPLE EVENTS
NO. 3 THROUGH 6**

SITE 5 - ARMY RESERVE DISPOSAL AREA, TOWHEE TRAIL

Volatile organic compounds
Polychlorinated biphenyl compounds (PCBs)
Inorganics (including sulfide and cyanide)
Total dissolved solids
Total suspended solids

SITE 11 - OLD CAMDEN COUNTY LANDFILL

Volatile organic compounds
Inorganics (including sulfide and cyanide)
Total dissolved solids
Total suspended solids

SITE 16 - ARMY RESERVE DISPOSAL AREA, MOTOR MISSILE MAGAZINES

Volatile organic compounds
Base/neutral semivolatile organic compounds
Inorganics (including sulfide and cyanide)
Total dissolved solids
Total suspended solids

ATTACHMENT E
ANALYTICAL PROGRAM

TCL VOLATILE ORGANIC COMPOUNDS, 1,2-DICHLOROBENZENE, 1,3-DICHLOROBENZENE, 1,4-DICHLOROBENZENE, AND TRICHLOROFLUOROMETHANE

SW-846 Method 8240 (gas chromatography/mass spectroscopy)

TCL BASE/NEUTRAL FRACTION SEMIVOLATILE COMPOUNDS

SW-846 Method 8270 (gas chromatography/mass spectroscopy)

APPENDIX IX POLYCHLORINATED BIPHENYL COMPOUNDS (PCBs)

SW-846 Method 8080

APPENDIX IX INORGANICS*

SW-846 Methods (as indicated below)

antimony 6010	nickel 6010
arsenic 7060	thallium 7841
barium 6010	tin 6010
beryllium 6010	silver 6010
cadmium 6010	selenium 7740
copper 6010	vanadium 6010
chromium 6010	sulfide 9030
lead 7421	cyanide 9010
mercury 7470	

TOTAL DISSOLVED SOLIDS AND TOTAL SUSPENDED SOLIDS

Standard Methods 2540 C and D

* 6010 = inductively couple plasma (ICP)
series 7000 = atomic adsorption (AA)
9010 = colorimetric spectroscopy
9030 = titration