Appendix A
Elizabeth River Documents

Elizabeth River Documents

BACK TO SEARCH

ID No.	Documents
007	**1990: Distribution and Management Implications of Contaminants in Elizabeth River Sediments: Compilation of Recent Research on Sediment Contamination in the Elizabeth River.** Final Report Submitted by Applied Marine Research Laboratory, College of Sciences, Old Dominion University, Norfolk, VA to Virginia Water Control Board, Richmond, VA. 262 pp.
006	**1990: Elizabeth River Long-term Monitoring Program: Water Quality Monitoring, Contaminants in Water and Sediments, and Toxicity Tests.** Final Report Submitted by Applied Marine Research Laboratory, College of Sciences, Old Dominion University, Norfolk, VA to Virginia State Water Control Board, Richmond, VA.
002	**1986: Comprehensive Elizabeth River Water Quality Management Plan: Preliminary Management Recommendations.**
005	**1990: Elizabeth River Long-Term Monitoring Program: Sediment Toxicity Assessments. Final Report for Phase I (Feb-June, 1989)**. Submitted by Old Dominion University Applied Marine Research Laboratory, College of Sciences, Old Dominion University, Norfolk, VA to Virginia Water Control Board, Richmond, VA.
001	**1972: The Chesapeake Bay Bibliography, Volume II: Virginia Waters.** Special Scientific Report No. 63 of the Virginia Institute of Marine Science. RANN Report No. 5.
003	**1987: Analysis of Effluents and Associated Sediments and Tissue For Toxic Organic Compounds and Metals in the James River Estuary, 1985-1986: Individual Plant Summaries, Volume 2.** Virginia Institute of Marine Science.
004	**1987: Analysis of Effluents and Associated Sediments and Tissue For Toxic Organic Compounds and Metals in the James River Estuary, 1985-1986: Individual Plant Summaries, Appendix A.** Virginia Institute of Marine Science.
011	**1997: Water Quality Monitoring Plan Design.** Prepared for Commonwealth of Virginia, Department of Environmental Quality (DEQ). Contract No. 989700265.
008	**1995: Defining the Problem: The Elizabeth River, a Region of Concern, Volume 1 of 2.** Final Report Submitted by Applied Marine Research Laboratory, College of Sciences, Old Dominion College, Norfolk, VA to Virginia Department of Environmental Quality (DEQ), Chesapeake Bay and Coastal Programs.
009	**1995: Defining the Problem: The Elizabeth River, a Region of Concern, Volume 2 of 2.** Final Report Submitted by Applied Marine Research Laboratory, College of Sciences, Old Dominion College, Norfolk, VA to Virginia Department of Environmental Quality (DEQ), Chesapeake Bay and Coastal Programs.
010	**1995: Technical Assessments in Support of the Elizabeth River Regional Action Plan Development.** Submitted to Commonwealth of Virginia, Department of Environmental Quality (DEQ), Richmond, VA. Contract No. 970500142.
012	**1998: Elizabeth River Monitoring Program: A Baseline Environmental Study for an Assessment of Trends in Contaminant Concentrations and Effects.** Final Report Submitted by Applied Marine Research Laboratory, College of Sciences, Old Dominion College, Norfolk, VA to Virginia Department of Environmental Quality (DEQ), Tidewater Regional Office, Virginia Beach, VA.

Appendix B
Geophysical Survey Report

Earth Resources Technology, Inc.

9134 Bridgewater St. College Park, MD 20740
Tel: (301) 935-5162 Fax: (301) 935-5443

August 12, 1997

David Schroeder
CDM Federal Prog Corp.
13135 Lee Jackson Memorial Hwy
Suite 200
Fairfax, VA 22033

Re Results of the Geophysical Surveys at St. Juliens Creek Annex, Norfolk, VA

Dear Mr. Schroeder:

Earth Resources Technology, Inc. (ERT) performed geophysical surveys at Site 2, Landfill B; Site 3, Landfill C; Site 4, Landfill D; and Site 5, the Burning Grounds and the Caged Pit in the week of June 16, 1997. Figure 1-1 and Figure 1-2 show the locations of each site, respectively. The geophysical surveys involved electromagnetic (EM), magnetic, and ground penetrating radar (GPR) techniques. The EM method was used for all four sites; the magnetic method was used for Site 2, Site 4, and the caged pit; and the GPR method was used for Site 4 only. The objective of the surveys was to delineate site boundaries, identify any buried metal such as steel drums and metallic construction debris, and characterize the soil profile above the water table.

1.0 PRINCIPLE AND INSTRUMENTATION

The Geonics EM31 was used for the electromagnetic survey. The EM31 measures the changes in the ground conductivity using a patented electromagnetic inductive technique that makes the measurements without electrodes or ground contact. The unit of conductivity used is millisiemens per meter (mS/m). The conductivity changes are used to infer the geological variations, or groundwater contamination. The EM31 has two analog meters which display both the quadrature-phase (conductivity) and inphase components, respectively. Inphase measurements are the ratio of the induced secondary magnetic field to the primary magnetic field in parts per thousand (ppt). The inphase component is especially useful for searching for buried metal drums, pipes, and other ferrous and non-ferrous metallic debris. The effective depth of exploration of the equipment is about twenty (20) ft and the equipment can be used to collect one electromagnetic reading every second when operating in its auto mode.

The Geometrics Portable Cesium Magnetometer, Model G-858, was used for the magnetic survey. Using self-oscillating split-beam Cesium Vapor (non-radioactive CS-133), this magnetometer measures the earth's total geomagnetic field at a particular location in units of gamma with an accuracy of ± 1.0 gamma (nt). The total field consists of three components: the main field, the external field, and local variations. The main field remains fixed over the period of time of a field investigation. The external field does not remain constant, but is accounted for if necessary by using a diurnal variation correction. Local variations are

attributable to anomalies near the surface such as buried metal objects. When operating in its auto mode, the equipment can be used to collect a maximum of 10 magnetic readings per second.

The Subsurface Interface Radar (SIR) System-3 from Geophysical Survey Systems, Inc. (GSSI) was used for the GPR survey. This device radiates a 500 MHz electromagnetic pulse from a transmitter antenna into the earth and receives at a receiving antenna the reflection of the pulse from subsurface interfaces at which changes in the electrical properties (dielectric constant) of the subsurface materials occur. For example, metallic objects usually exhibit strong subsurface reflection character due to their high electrical impedance or contrast versus surrounding soil or fill. Depth of penetration of the radar signal is reversely proportional to the conductivity of the soil. As a result, electrically resistive earth materials such as coarse-grained, unsaturated sediments allow a deeper radar penetration than the conductive finer-grained soils such as clay and silt. Similarly, reinforced concrete and shallow groundwater are conductive and thus attenuate the radar signals.

2.0 GEOPHYSICAL SURVEYS AT SITE 2 - LANDFILL B

2.1 Field Design & Operation

As shown in Figure 2-1, both EM and magnetic surveys were conducted on grid lines set up on both sides of the existing pond located at Site 2. The grid lines on the east side of the pond were laid out in reference to Building 130. The grid lines on the west side of the pond were laid out with reference to the roads nearby. Note that one of the EW grid lines on the east side extended westerly into the pond. In reality, the gentle sloping area between Building 130 and the pond as shown in the topographic map was flat and dropped off sharply to the pond water at the west ends of the three EW grid lines. Various debris were noticed present in the woods west of Building 130.

Prior to the data collection, each grid line was staked with orange plastic flags every 50 ft. During the field data collection, the EM31 was set at the auto mode with readings in both quadrature-phase and inphase collected every second. With such a setting, approximately one reading was collected at every 3 ft while the operator carried the EM31 and walked slowly along each grid line. The EM readings were downloaded to a laptop computer and contour maps of conductivity and inphase readings were created.

The magnetometer was set to collect one magnetic reading every 0.4 second. With a normal walking pace, approximately one reading was collected per foot while the operator carried the magnetometer and walked along each grid line. The magnetic measurements were recorded and stored in the magnetometer memory and transferred to a computer at the end of the survey. The positions of both the EM and magnetic readings were calibrated against the flags staked every 50 ft.

2.2 Results and Interpretations

Figure 2-2 and Figure 2-3 are the contour maps made of the conductivity and inphase readings collected on the east bank of the pond, respectively. In the either map, the EM anomalies are shown in red or blue; while the background readings are shown in grey. The background conductivity values range around 40 mS/m. The background inphase readings vary from 4 to 6 ppt. Note that the low or high conductivity values are not absolute but relative, reflecting a deviation from the background values. The positive or negative values reflect the change of the dipole orientation of the local electromagnetic field. And it is the deviation that we are using to locate the buried materials. Several anomalies were identified in both the contour maps. They generally agree in positions between the two contour maps. The anomalies occurred

along the west edge of the bank, near the southwest corner of Building 130, and in the southeast corner of the survey area.

Figure 2-4 shows the contour map of the magnetic readings collected on the east bank of the pond. The magnetic anomalies are shown in red or blue with the background readings in grey. The magnetic anomalies occurred in the northern portion and southeast corner of the survey area, generally agreeing in position with those of EM anomalies. The locations of the EM and magnetic anomalies also agree with those of the surface debris observed in the woods, suggesting that the anomaly areas might have been landfilled.

Figures, 2-5 to 2-9, show the EM and magnetic profiles acquired along grid line A-A', B-B', C-C', D-D', and E-E', respectively (see Figure 2-1 for location reference). On an EM profile, anomalies are represented by the sudden change of the conductivity or inphase readings with distance. On a magnetic profile, anomalies are indicated by the magnetic highs or lows above or below the background readings.

As shown in the lower half of Figure 2-5, there is a magnetic high near the starting point (A), followed by relatively flat magnetic readings, representing the background conditions. The EM profile shows a general increase of conductivity and inphase readings toward the end point (A'). It is likely that the magnetic high near Point A was caused by the subsurface magnetic objects and the high conductivity and inphase readings near Point A' were caused by the increase of salt contents in the soil and groundwater. However, the presence of overhead power lines along the nearby roads might also have contributed to the anomalies.

Figure 2-6 shows the increase of both conductivity and inphase readings toward the middle of the profile but no increase or decrease of magnetic readings. The increase of the conductivity and inphase readings is likely related to the increase of salt content in the subsurface soil and groundwater. Along the magnetic profile, the background readings stayed around 52,200 gamma with several anomalies occurring at the distances of 150 ft (a magnetic low), 200 to 240 ft (fluctuated readings), and 320 to 350 ft (a magnetic low between two highs). These anomalies are most likely caused by subsurface magnetic objects or utility lines.

A conductivity low occurred in the middle of EM Profile C-C' as shown in Figure 2-7, associated with no apparent change in inphase and magnetic readings. The variation of the conductivity readings is thus more likely related to the change in soil content than the occurrence of metallic objects. The EM profile shown in Figure 2-8 is similar to that shown in Figure 2-7. However, there is a magnetic high in the middle of the profile (D-D'), which is probably caused by subsurface magnetic objects.

The EM profile along E-E' (Figure 2-9) is similar to that along A-A' with the increase of conductivity and inphase readings toward the end of the profile. Two magnetic anomalies occurred along E-E' with one low at the beginning (E) and one high at the distance of 145 ft. The magnetic high at 145 ft also corresponds to a minor fluctuation in inphase readings at the same location. The high might have been created by subsurface magnetic objects.

In summary, most of the magnetic anomalies shown along the above five transects do not occur in association with any EM anomalies. Similarly, the rise or fall of the EM readings do not concur with the occurrence of the magnetic anomalies. It is likely that the absence of EM anomalies at the locations of magnetic anomalies was due to the potentially high concentration of salt content in the groundwater, which would mask the impact of any metallic objects on the EM readings. The rise or fall of the EM readings might simply be caused by the increase or decrease of salt or clay content in the soil or groundwater, which would not have any impact on magnetic readings.

3.0 EM SURVEYS AT SITE 3 - LANDFILL C

3.1 Field Design and Operations

Figure 3-1 shows the survey grid laid out parallel to the fence lines at Site 3, Landfill C. The grid lines were spaced every 100 ft in the majority of the survey area but spaced every 50 ft in the area along the fences (50 ft) and 200 ft in the southern area. There are a total of eight east-west grid lines and ten north-south grid lines. Only the EM survey was conducted at this site. The data acquisition procedure was the same as that described in Section 2.1.

3.2 Results and Interpretations

Figure 3-2 and Figure 3-3 show the contour maps made of the conductivity and inphase readings collected at the site, respectively. Both maps show the occurrence of the high EM readings in the eastern, southern, and northwestern portions of the site, as marked by the light purple color. The relatively low EM readings occurred in the areas surrounded by the areas of the high readings, as marked by the grey to light blue color. The highest conductivity and inphase readings occurred along the eastern fence line (purple) and are probably caused by the fence line. The EM readings in the light-blue to grey area vary slightly with little fluctuation and these readings may represent the background conditions. The change of the EM readings from the grey to light purple area is steep, reflecting the increase of conductive contents in the subsurface soil or groundwater. Within the light purple area, the EM readings fluctuate from 120 mS/m to 250 mS/m or from 12 ppt to 35 ppt but without erratic changes. Usually, the erratic changes suggest the presence of isolated metallic objects. The lack of the erratic changes indicates that the increase of the EM readings was primarily due to the increase of salt or clay content in the subsurface soil or groundwater. The light-purple areas might have been filled with soils with high salt or clay contents.

Both Figure 3-2 and Figure 3-3 show a linear anomaly originated near the two existing buildings at the coordinates of {900 E, 600 N} to {900 E, 700 N} and extended westerly to the coordinate of {100 E, 650 N}. The anomaly occurred as an EM low (dark blue) near one of the buildings at the coordinate of {900 E, 600 N} and an EM high (closed contour in purple) at the coordinate of {280 E, 600 N}. The anomaly is probably caused by a subsurface utility line.

4.0 GEOPHYSICAL SURVEYS AT SITE 4 - LANDFILL D

4.1 Field Design and Operations

Figure 4-1 shows the survey grid laid out in reference to the eastern fence line at Site 4, Landfill D. The majority of Landfill D was covered by heavy vegetation and brush, which limited the grid layout. The only open area occurred in the eastern portion of the landfill and measured approximately 250 ft by 400 ft. In this open area, the grid lines were laid out every 50 ft to 100 ft. One group of grid lines were parallel to the eastern fence line and the other group in the perpendicular direction. To get access to the other areas, one machete, two brush cutters, one chain saw, and one Bobcat were used to clear the brush and vegetation. A total of four long grid lines were laid out to cover the entire landfill with three in the approximate north-south direction (or parallel to the eastern fence line) and one in the approximate east-west direction. The three north-south grid lines (A-A', B-B', and C-C') were extended northerly beyond the landfill to join the grid laid out at Landfill C. Line D-D' changed its course in the western portion of the landfill due to the obstruction of an abandoned large machine or vehicle. Various debris including concrete, steel bars, bricks, tires, woods, cannon shells and other materials were observed along these four grid lines but primarily in

the western and southern portions of the landfill. Note that the locations of A-A', B-B', C-C', and D-D' were not surveyed and therefore might not be accurate.

EM, magnetic, and GPR surveys were conducted for Landfill D. The EM and magnetic data acquisition procedures were the same as those described in Section 2.1. The collection of the GPR data was through pulling the antenna along each grid line while the marker button was pushed at 10 ft intervals to scale the printout. Because the subject property is underlain by the artificial fill, the two way travel time (TWTT) for a radar signal is estimated around 7 nanoseconds (ns) per foot. The time range was thus selected as 70 ns and would allow a penetration depth of 10 ft. The GPR data were output real-time to a hardcopy graphics recorder as continuous, high-resolution subsurface profiles. In each profile, the horizontal axis represents the distance; while the vertical axis represents the TWTT in ns (see Figure 4-10 for reference). The top horizontal line represents the ground surface. With such a setup, the distance between two horizontal time lines is approximately equal to 1 ft.

4.2 Results and Interpretations

Figures, 4-2 to 4-5, show the EM and magnetic profiles acquired along grid line A-A', B-B', C-C', and D-D', respectively. On an EM profile, anomalies are represented by the sudden change of the conductivity or inphase readings with distance. On a magnetic profile, anomalies are indicated by the magnetic highs or lows above or below the background readings.

As shown in Figure 4-2, EM and magnetic anomalies occurred from the beginning (1,050 ft or A) of the line to the distance of about 1,520 ft. The EM anomalies include two conductivity highs from 1,050 ft to 1,150 ft and 1,380 ft to 1,440 ft, and one inphase high which is completely flat (saturated) from the beginning to 1,450 ft. The magnetic anomalies are represented by fluctuated highs and lows occurring throughout the section from 1,050 ft to 1,520 ft. The saturation of the inphase readings was caused by the limitation of the EM data logger which would record any readings above 46 ppt as 46 ppt. The consistently saturated inphase readings might have been caused by the nearly continuous deposit of metallic debris or conductive materials in the subsurface. The detection of the magnetic highs and lows throughout the inphase-reading saturated area suggests the presence of numerous magnetic debris in the subsurface. The rest of the line is characterized by the smooth variation of both EM and magnetic readings. The magnetic readings stayed around 52,500 gamma, very close to the background readings obtained in Landfill B.

The other two north-south profiles, B-B' and C-C' (Figure 4-3 and 4-4), are similar to those shown in Figure 4-2, characterized by fluctuated readings in the southern section and smooth readings in the northern section. These three north-south profiles clearly define the northern boundary of Landfill D at the locations where the fluctuated EM and magnetic readings were replaced by the smooth readings. The southern boundary of the landfill is less clear because the lines could not be extended further south due to the presence of steep cliff and limitation of wetland and fence line. However, our field observation suggests that the location of the steep cliff may represent the southern boundary of Landfill D.

The east-west profile, D-D' (Figure 4-5) is almost entirely filled with fluctuated EM and magnetic readings with the exception of the first 150 ft of the profile which was lack of fluctuated EM readings but contained fluctuated magnetic readings. This area may represent the western boundary of Landfill D. The eastern boundary of the landfill cannot be determined due to the limitation of the fence line. Figure 4-5A depicts the boundary (dotted line) of the landfill as determined with the geophysical surveys. However, please be cautious when using this figure because the locations of A-A', B-B', C-C', and D-D' were not surveyed.

Figures, 4-6 to 4-8, show the contour maps made of the conductivity, inphase, and magnetic readings, respectively. These readings were collected along the grid lines laid out in the open area in the eastern

portion of the landfill. The open area is located within the extent of the landfill. These contour maps reflected the similar features exhibited by the four profiles presented earlier. Figure 4-6 shows the high conductivity readings in the areas along the fence line and in the northern and western areas, and low conductivities in the middle. Figure 4-7 is characterized by saturated inphase readings almost in the entire survey area with the exception of the northeast and northwest corners. The magnetic contour map as shown in Figure 4-8 shows the occurrence of a number of closed magnetic highs and lows, suggesting the presence of numerous magnetic objects in the subsurface. A linear magnetic low occurred along the eastern fence line and the two may be related.

GPR surveys were conducted along some of the EM and magnetic grid lines in the open areas. Figure 4-9 shows the locations of six GPR profiles acquired along these grid lines. Figures, 4-10 to 4-12, show the representative sections of GPR profiles acquired along three grid lines, respectively. Figure 4-10 shows a portion of the GPR profile acquired along B-B'. The profile ends about 5 ft from the end point (B') of B-B'. The reflections along the profile are weak, suggesting the subsurface materials are clay rich or conductive. The GPR profiles shown in Figure 4-11 and 4-12 are similar and characterized by strong reflections. Each profile contains several reflections that might have been caused by subsurface objects such as concrete blocks, metal pipes, drums, or other materials. These reflections are located at the distances of 4 ft, 22 ft, 27 ft, and 34 ft along C'-C; and at the distances of 60 ft, 74 ft, 79 ft, 82 ft, and 88 ft along D-D', respectively. Among the six GPR profiles, the majority is represented by the two profiles shown in Figure 4-11 and 4-12 with some containing the features similar to those shown in Figure 4-10.

5.0 GEOPHYSICAL SURVEYS AT SITE 5 - BURNING GROUND & CAGED PIT

5.1 Field Design & Operation

Figure 5-1 shows the survey grids laid out at the burning grounds and the caged pit. The grid at the burning grounds was laid out in reference to Building 272; while the exact location of the grid for the caged pit was not determined. Two wooden stakes were placed at the northwest and southwest corners of the grid for the future survey reference. Only the EM survey was conducted at the burning grounds; while both EM and magnetic surveys were conducted at the caged pit. Most of the grid lines were spaced every 50 ft; although some were spaced every 100 ft or 10 ft. The EM and magnetic data acquisition procedures are the same as those described in Section 2.1.

5.2 Results and Interpretations

Figure 5-2 and Figure 5-3 are the contour maps made of the conductivity and inphase readings collected at the burning grounds. The two maps show a similar pattern with the occurrence of several EM highs and lows. Both high and low conductivity and inphase readings occurred in the areas surrounding Building 272. These highs and lows are probably caused by the building. High EM readings occurred in the northeast corner of the area. The magnitude of the EM highs is similar to that of the EM highs at Landfill C. The EM highs are thus likely related to filled material with salt or clay contents. The presence of two transformers in this area might also have contributed to the high readings.

One EM high occurred with its center at the coordinate of {150 E, 330 N}. An EM low occurred directly south of this high at the coordinate of {140 E, 300 N}. No surface metallic objects were present in association with these two anomalies. Therefore, subsurface objects or changes in the soil conditions might have contributed to these two anomalies. A linear EM low occurred from {250 E, 350 N} to {250 E, 150 N}, where wooden poles and other surface metallic objects were present. These surface debris might have created the linear anomaly.

In addition to above large-scale anomalies, several small-scale anomalies also occurred at the site (Figure 5-2 and 5-3). One EM high occurred at {175 E, 200 N} and appeared to be associated with an existing wire trailer at the location. Another EM was located at {300 E, 240 N}, where metallic equipments were present. One EM low occurred at {300 E, 300 N} and seemed to be caused by the surface metallic debris such as trailers and metal boxes.

Figures, 5-4 to 5-6, show the contour maps made of conductivity, inphase, and magnetic readings acquired in the caged pit area. The conductivity contour map (Figure 5-4) shows an isolated conductivity low centered at the coordinate of {160 E, 200 N}. The conductivity values increased from less than 70 mS/m in the western portion to greater than 120 mS/m in the eastern portion. A similar pattern was shown on the contour map of the inphase readings with an isolated inphase low associated with two inphase highs occurrent at the same location as the conductivity low (Figure 5-5). The magnetic contour map (Figure 5-7) revealed a magnetic anomaly with both high and low at the approximately same location as that of the conductivity low. This general area might represent the former caged pit. In addition to the above anomalies, magnetic highs and lows also occurred near the coordinate of {340 E, 200 N}, suggesting the presence of magnetic objects in the subsurface.

6.0 CLOSING

The field procedures and interpretative methodologies used in this project are consistent with standard, recognized practices in similar geophysical investigations. The correlation of geophysical responses with probable subsurface features is based on the past result of similar surveys although it is possible that some variation could exist at this site. This warranty is in lieu of all other warranties either implied or expressed. **ERT** assumes no responsibility for interpretations made by others based on work performed by or recommendations made by **ERT.**

Sincerely,
Earth Resources Technology, Inc.

Peter H. Li, Ph.D., P.G.
Principal Geophysicist

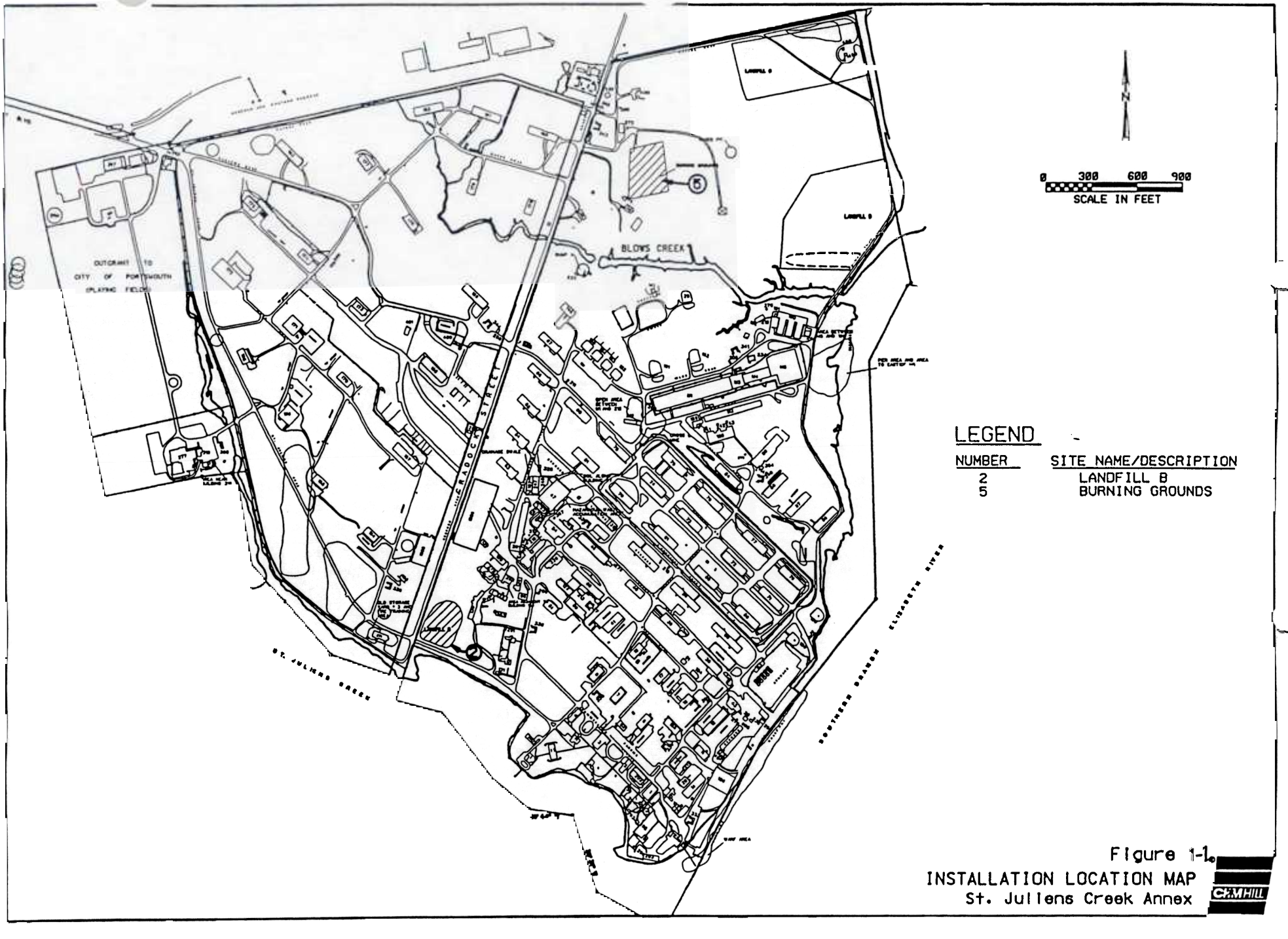
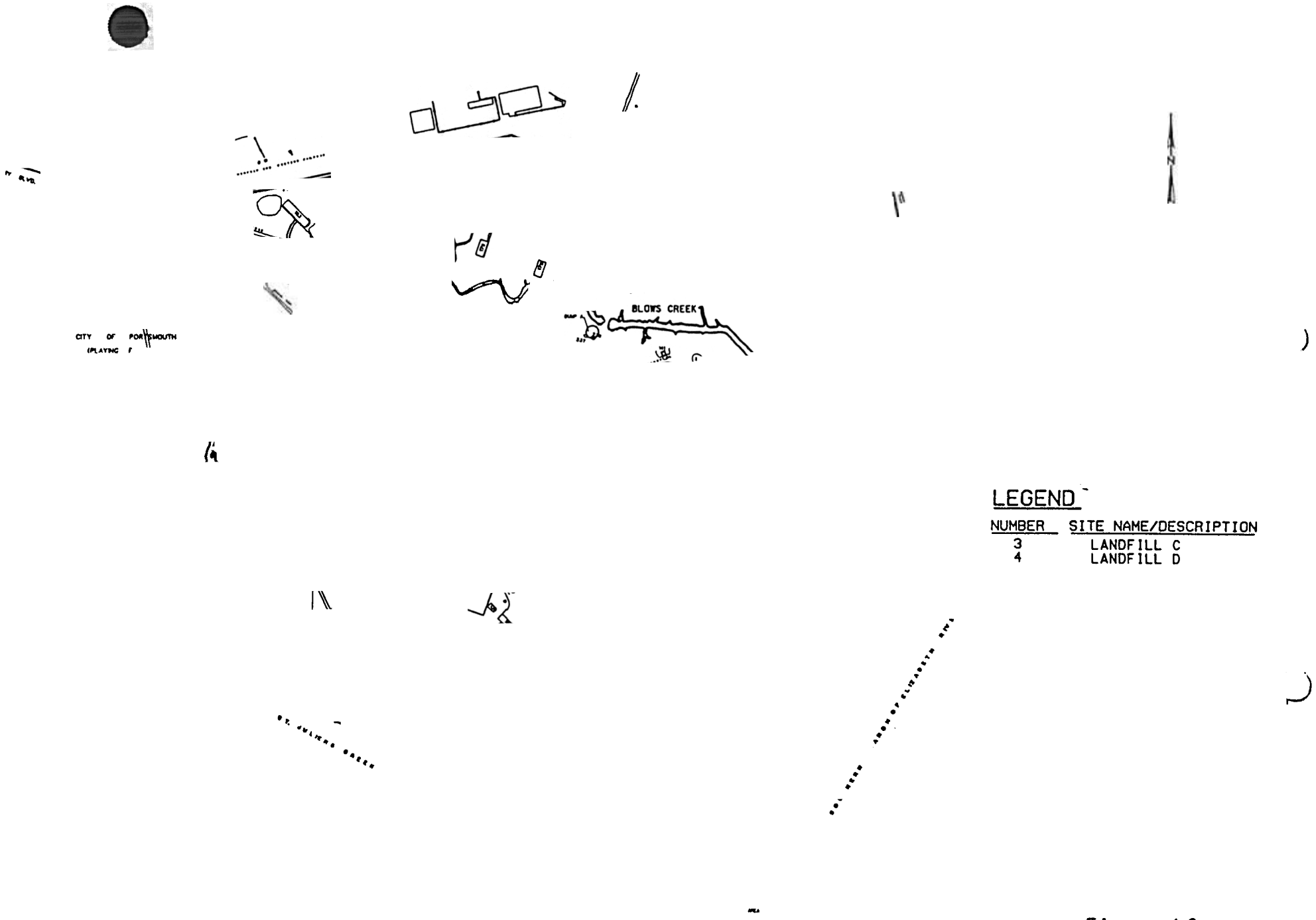


Figure 1-1.
INSTALLATION LOCATION MAP
St. Juliens Creek Annex

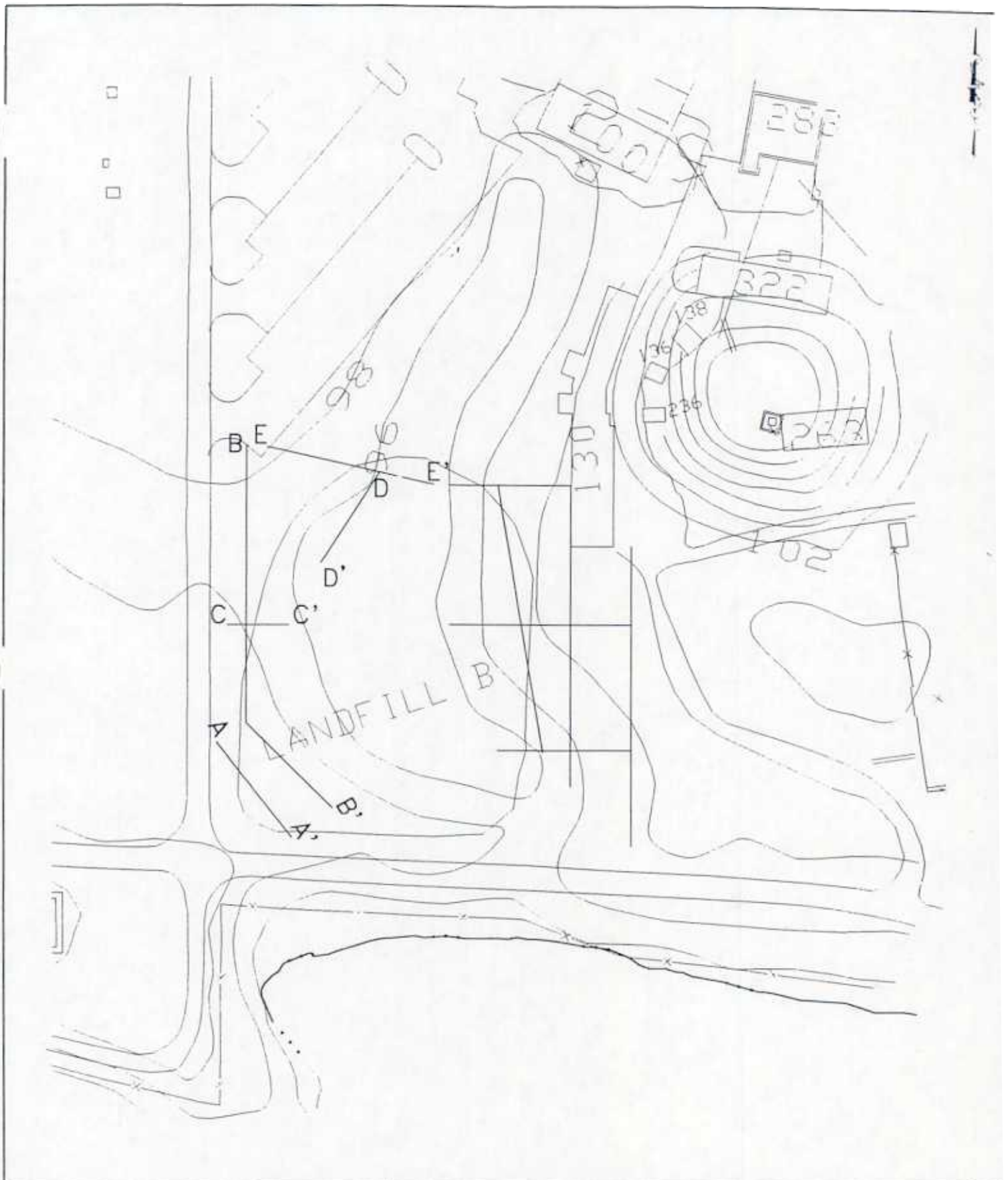
CH2M HILL



LEGEND

NUMBER	SITE NAME/DESCRIPTION
3	LANDFILL C
4	LANDFILL D

Figure 1-2
INSTALLATION LOCATION MAP
St. Juliens Creek Annex



EARTH RESOURCES TECHNOLOGY

FIGURE 2-1

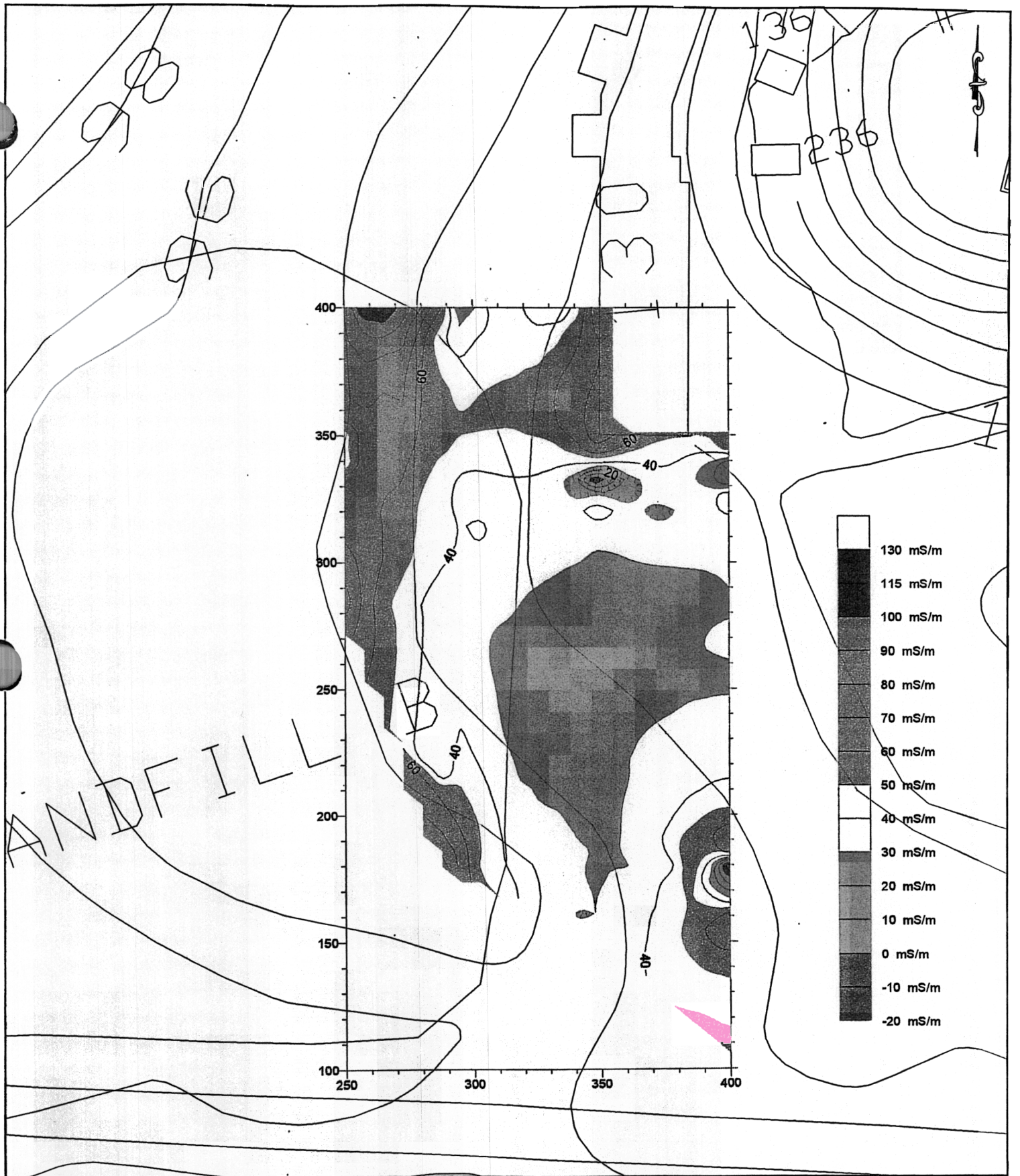
SCALE: 1" = 100'

JULY 17, 1997

EM SURVEY GRID

SITE 2 – LANDFILL B

ST. JULIENS CREEK ANNEX, NORFOLK, VA



EARTH RESOURCES TECHNOLOGY

FIGURE 2-2

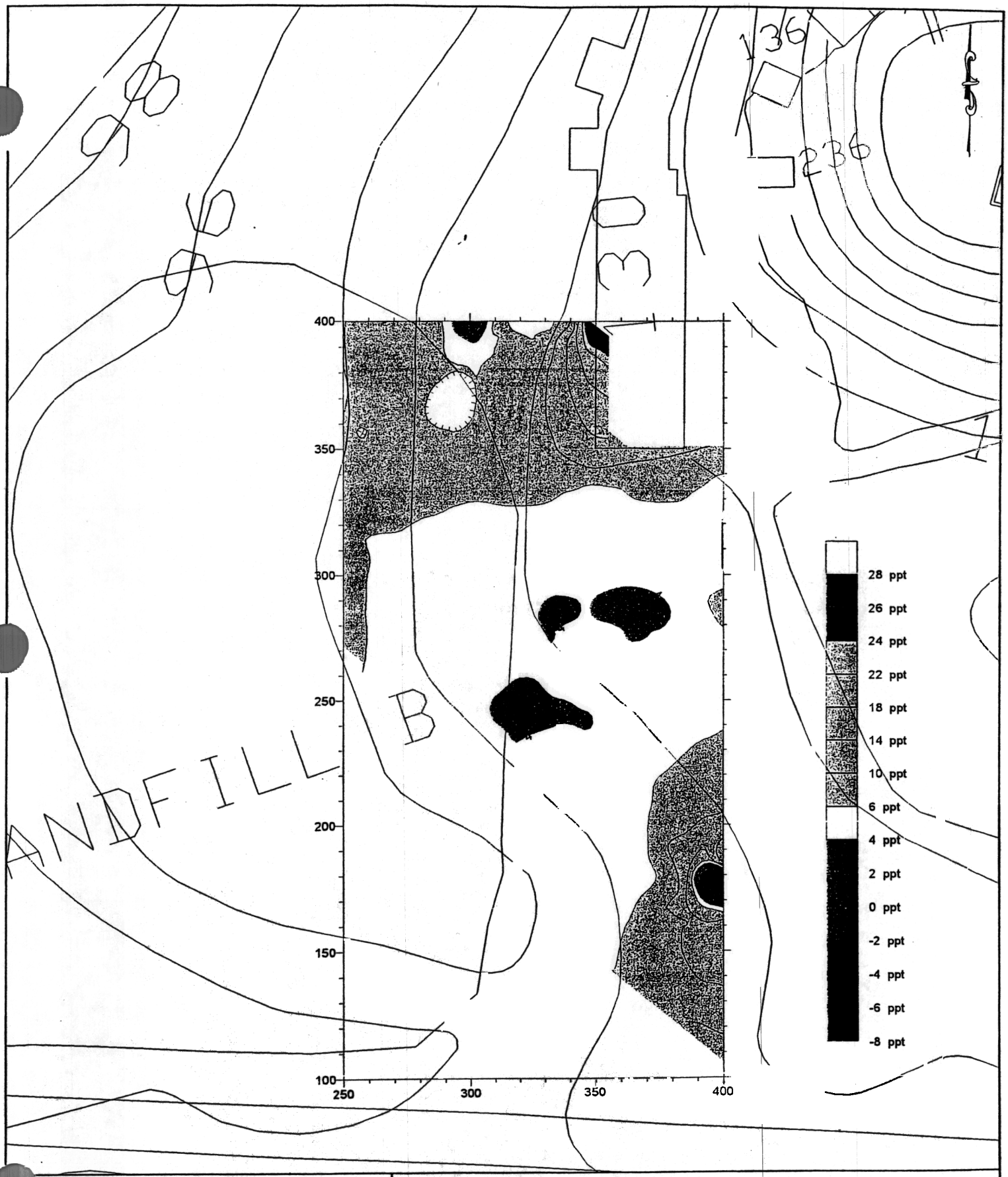
SCALE: 1" = 50'

JULY 17, 1997

CONTOUR MAP OF CONDUCTIVITY READINGS

SITE 2 – LANDFILL B

ST. JULIENS CREEK ANNEX, NORFOLK, VA



EARTH RESOURCES TECHNOLOGY

FIGURE 2-3

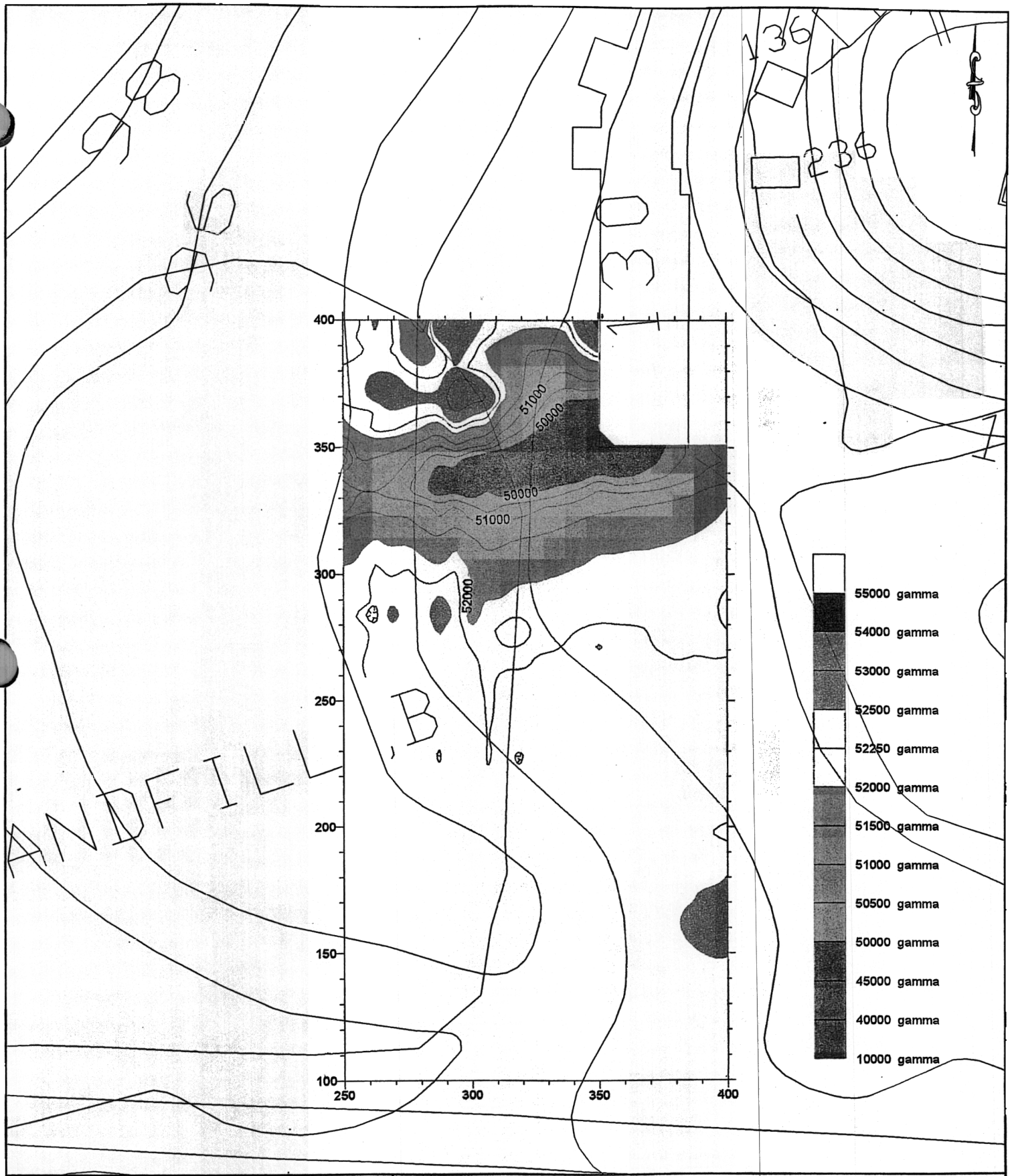
SCALE: 1" = 50'

JULY 17, 1997

CONTOUR MAP OF INPHASE READINGS

SITE 2 – LANDFILL B

ST. JULIENS CREEK ANNEX, NORFOLK, VA



EARTH RESOURCES TECHNOLOGY

FIGURE 2-4

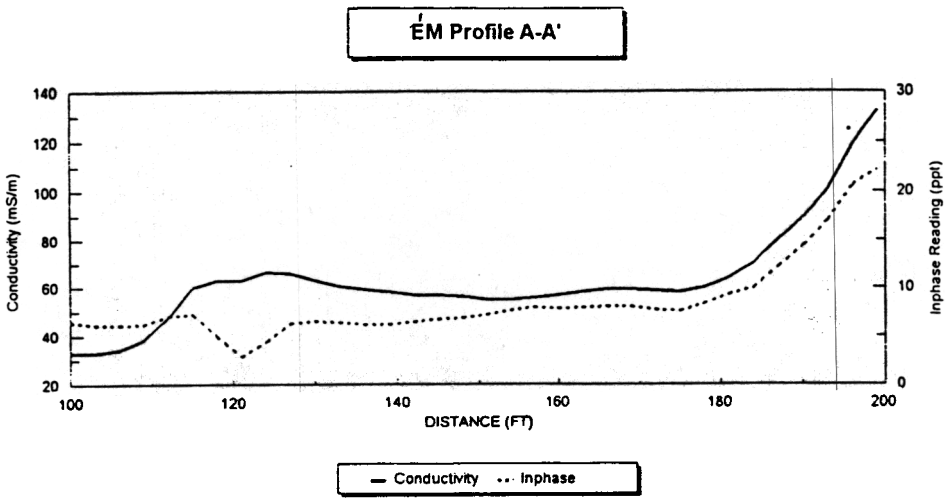
SCALE: 1" = 50'

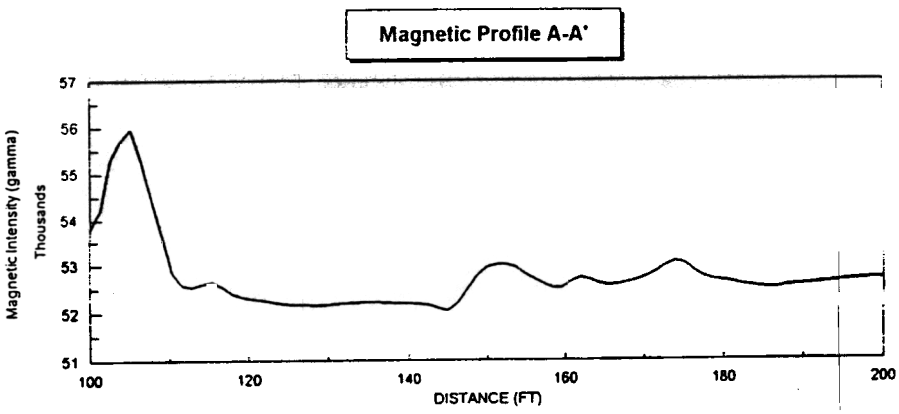
JULY 17, 1997

CONTOUR MAP OF MAGNETIC READINGS

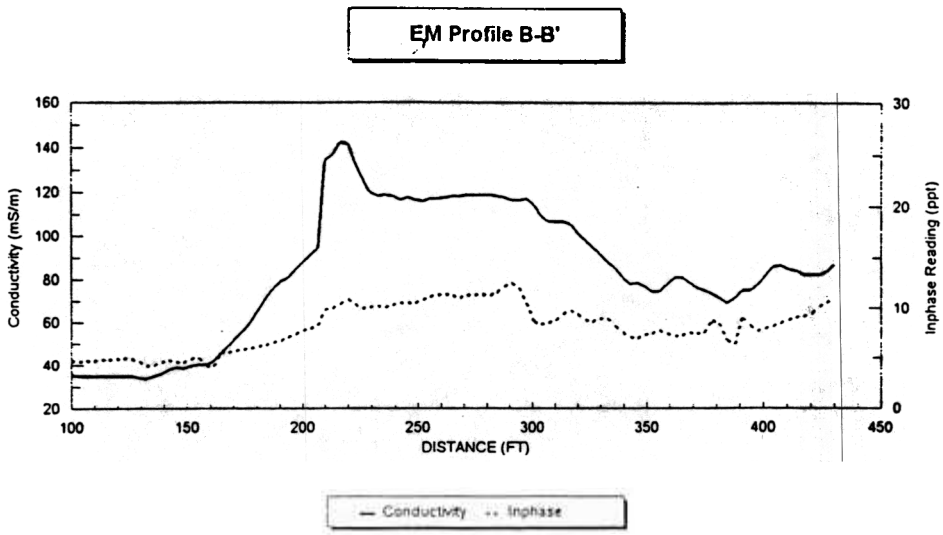
SITE 2 – LANDFILL B

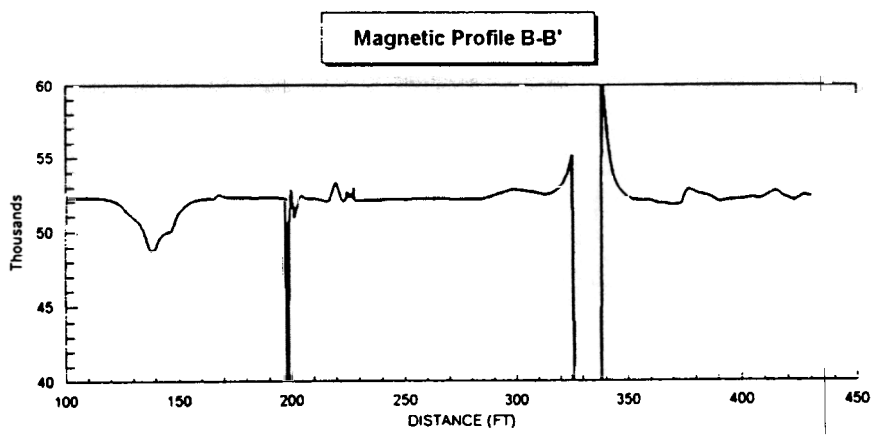
ST. JULIENS CREEK ANNEX, NORFOLK, VA



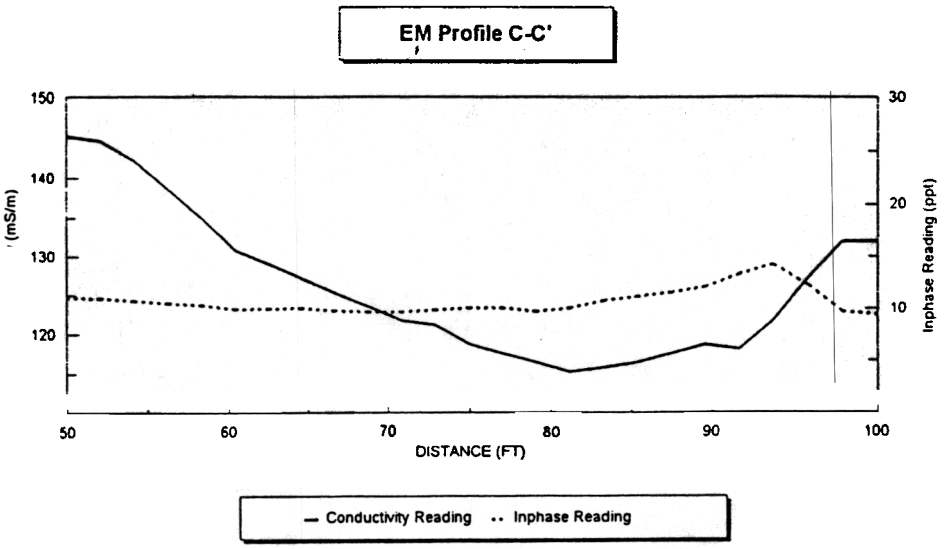


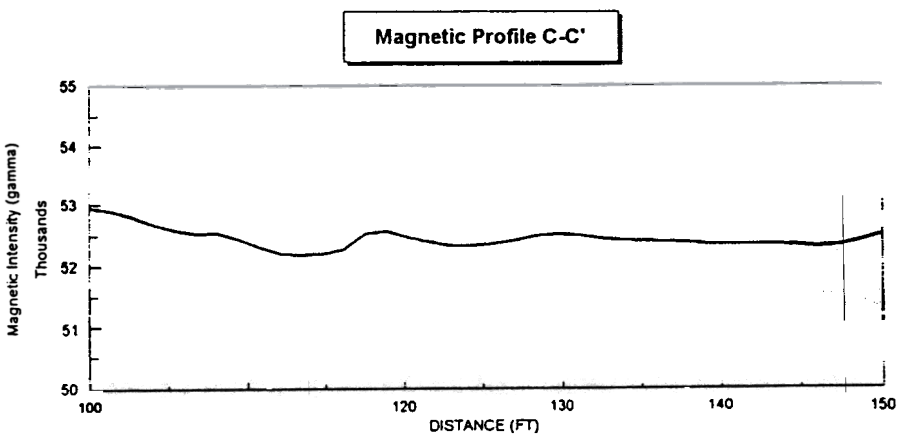
EARTH RESOURCES TECHNOLOGY		EM & MAGNETIC PROFILE: A A'
FIGURE 2-5		SITE 2 – LANDFILL B
SCALE AS SHOWN	JULY 17, 1997	ST. JULENS CREEK ANNEX, NORFOLK, VA



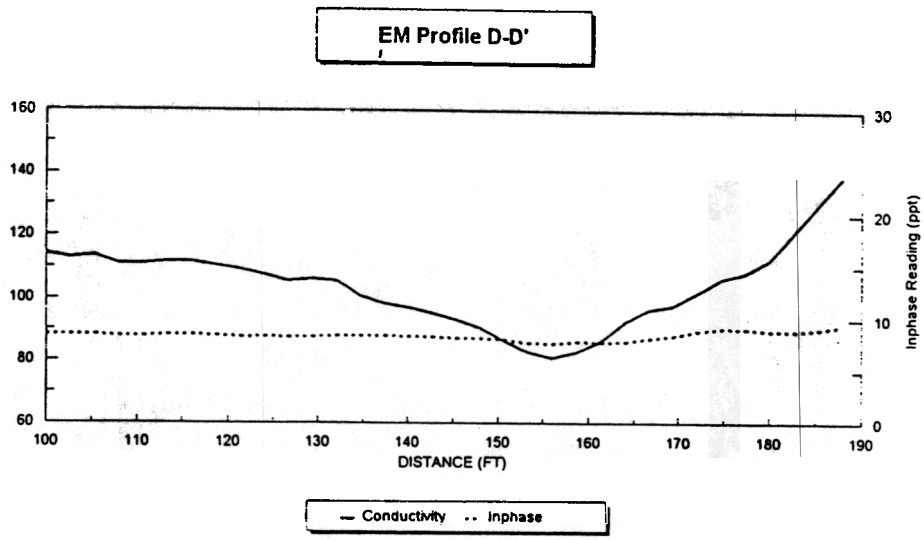


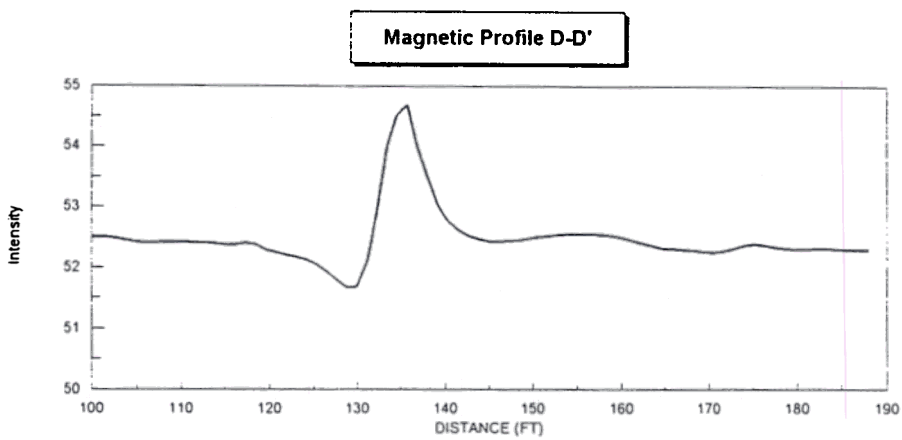
EARTH RESOURCES TECHNOLOGY		EM & MAGNETIC PROFILE: B – B'
FIGURE 2-6		SITE 2 – LANDFILL B
SCALE AS SHOWN	JULY 17, 1997	ST. JULENS CREEK ANNEX, NORFOLK, VA





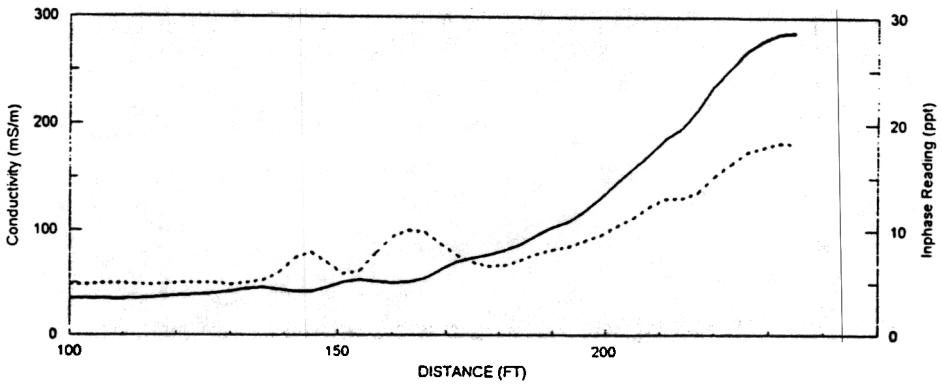
ERT EARTH RESOURCES TECHNOLOGY		EM & MAGNETIC PROFILE: C C'
FIGURE 2-7		SITE 2 – LANDFILL B
SCALE AS SHOWN	JULY 17, 1997	ST. JULENS CREEK ANNEX, NORFOLK VA





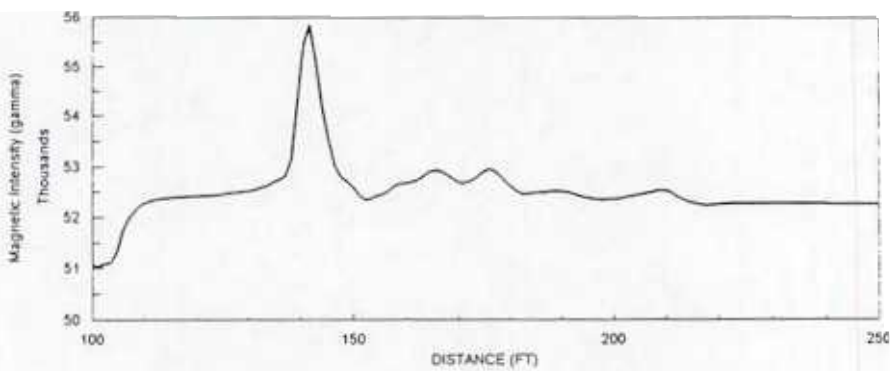
EARTH RESOURCES TECHNOLOGY		EM & MAGNETIC PROFILE: D D'
FIGURE 2-8		SITE 2 – LANDFILL B
SCALE AS SHOWN	JULY 17, 1997	ST. JULENS CREEK ANNEX, NORFOLK, VA

EM Profile E-E'

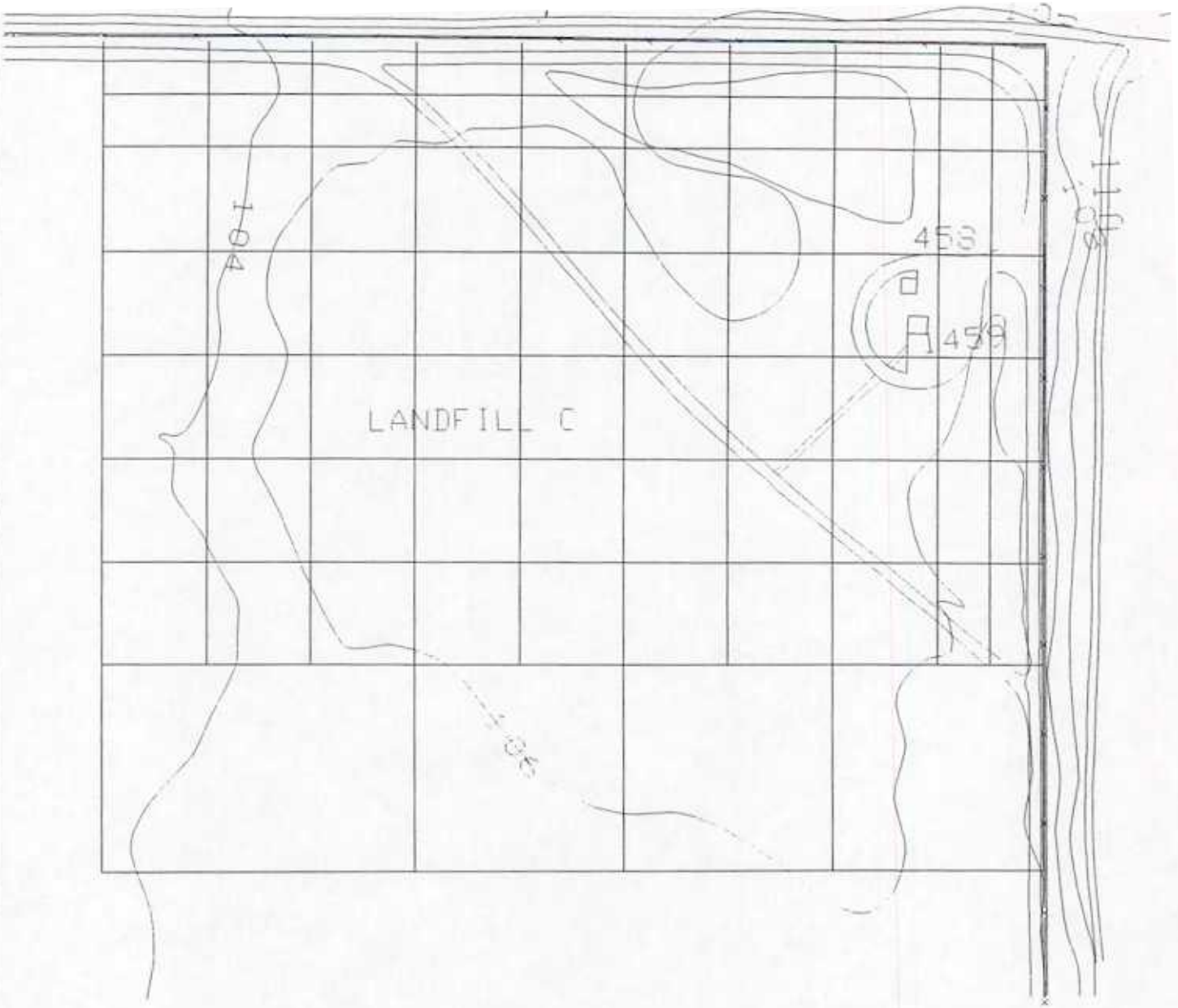


— Conductivity Reading ·· Inphase Reading

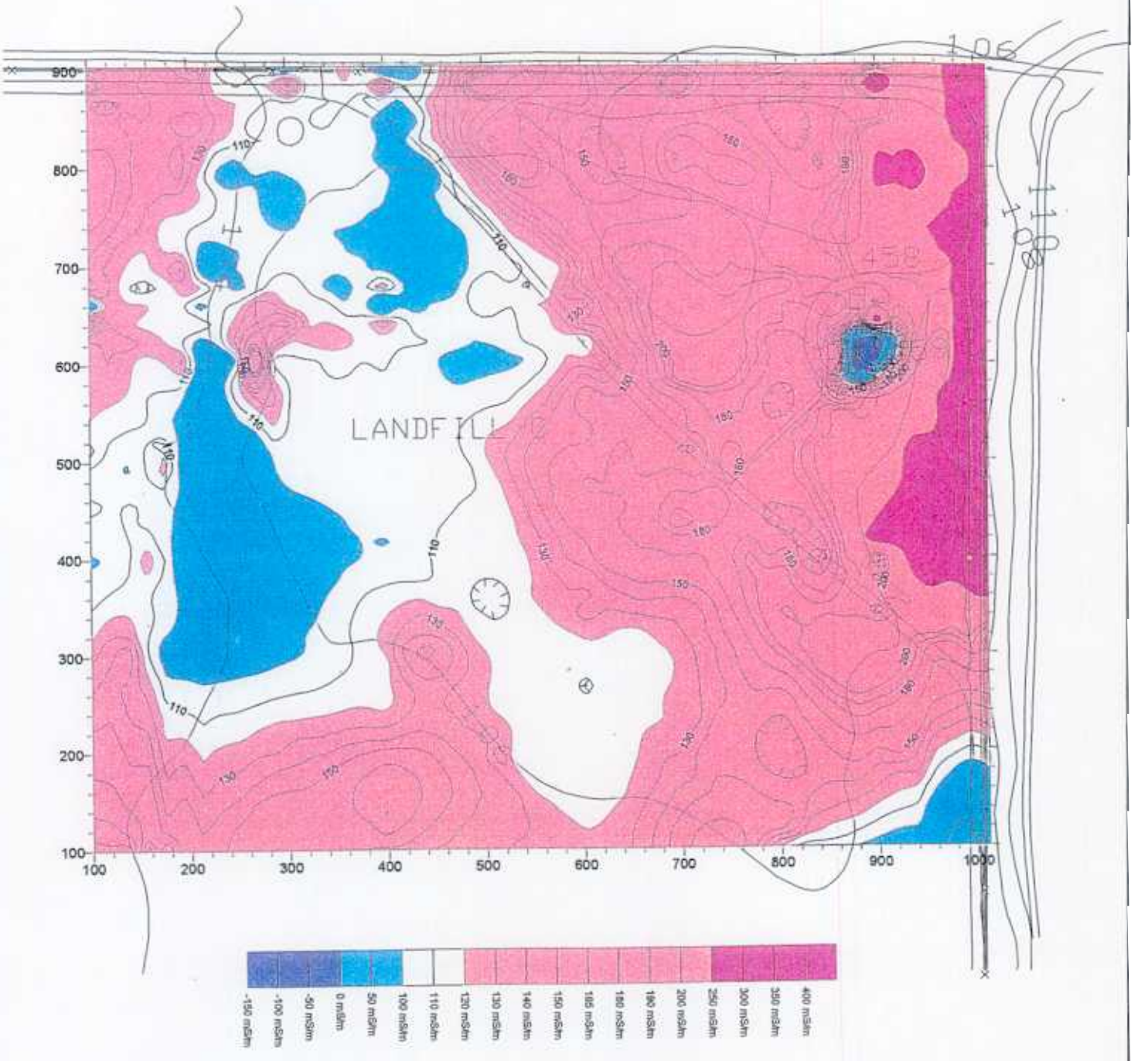
Magnetic Profile E-E'



ERT EARTH RESOURCES TECHNOLOGY		EM & MAGNETIC PROFILE: E – E'
FIGURE 2–9		SITE 2 – LANDFILL B
SCALE AS SHOWN	JULY 17, 1997	ST. JULENS CREEK ANNEX, NORFOLK, VA



EARTH RESOURCES TECHNOLOGY	EM SURVEY GRID
FIGURE 3-1	SITE 3 – LANDFILL C
SCALE: 1" = 150' / JULY 17, 1997	ST. JULIENS CREEK ANNEX, NORFOLK, VA



EARTH RESOURCES TECHNOLOGY

FIGURE 3-2

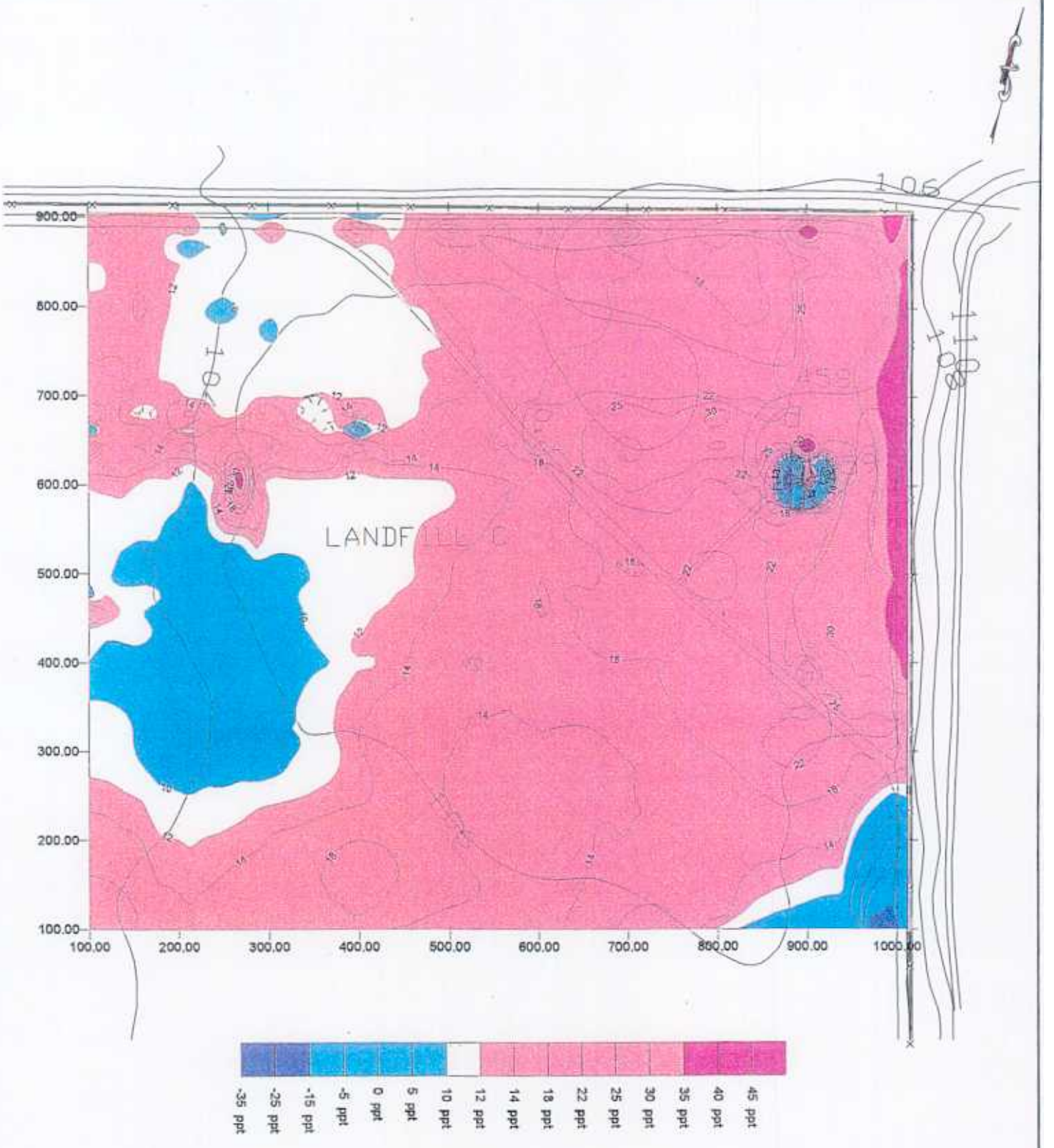
SCALE: 1" = 150'

JULY 17, 1997

CONTOUR MAP OF CONDUCTIVITY READINGS

SITE 3 – LANDFILL C

ST. JULIENS CREEK ANNEX, NORFOLK, VA



EARTH RESOURCES TECHNOLOGY

FIGURE 3-3

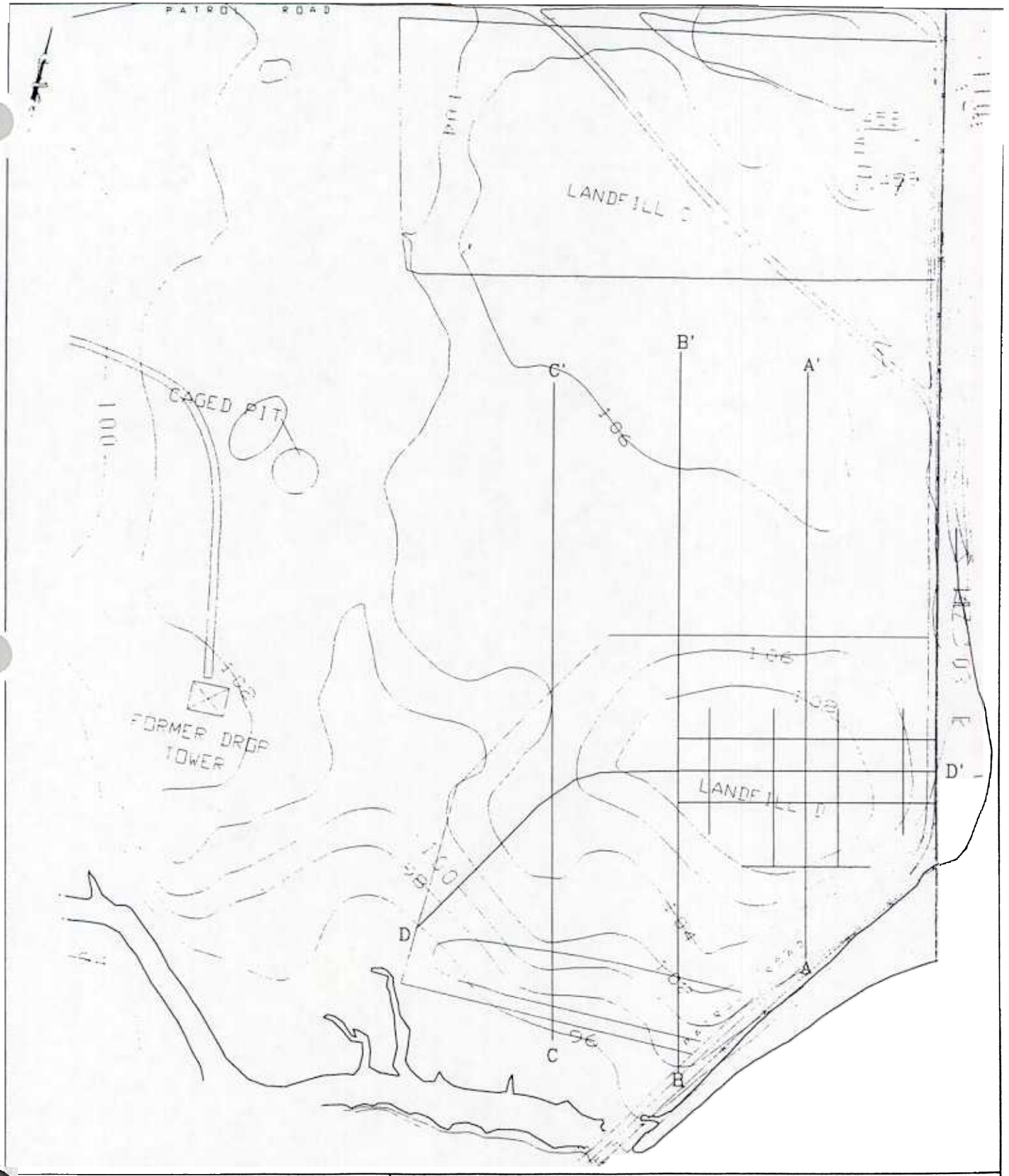
SCALE: 1" = 150'

JULY 17, 1997

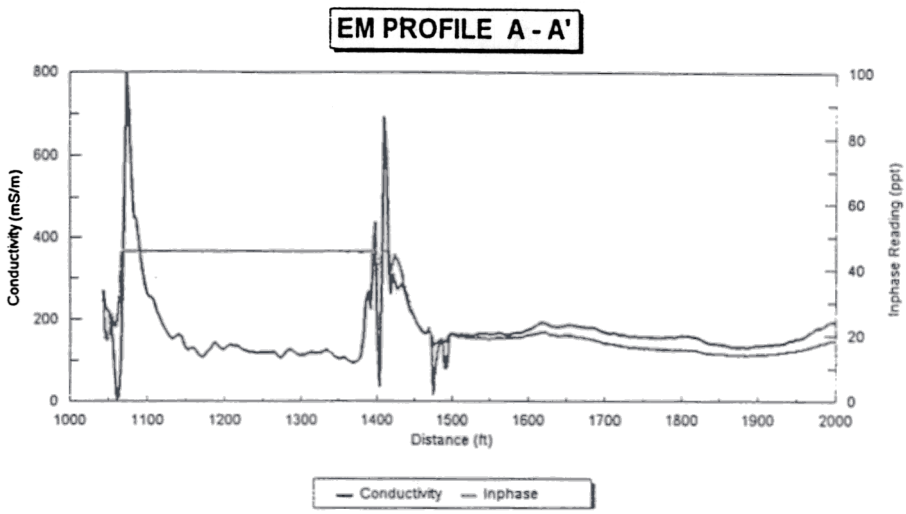
CONTOUR MAP OF INPHASE READINGS

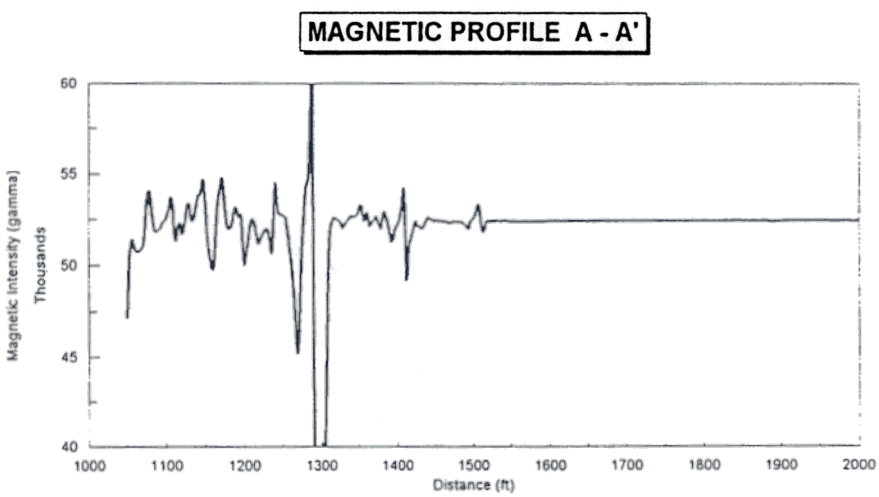
SITE 3 – LANDFILL C

ST. JULIENS CREEK ANNEX, NORFOLK, VA

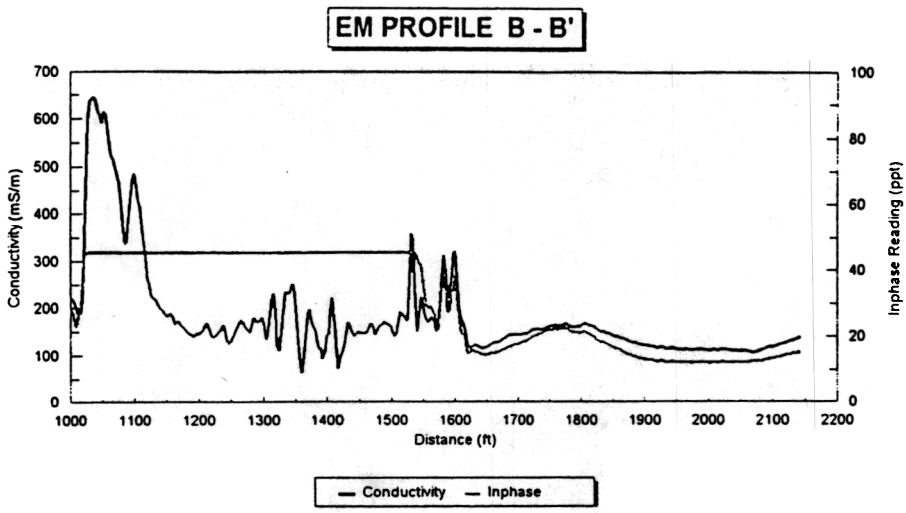


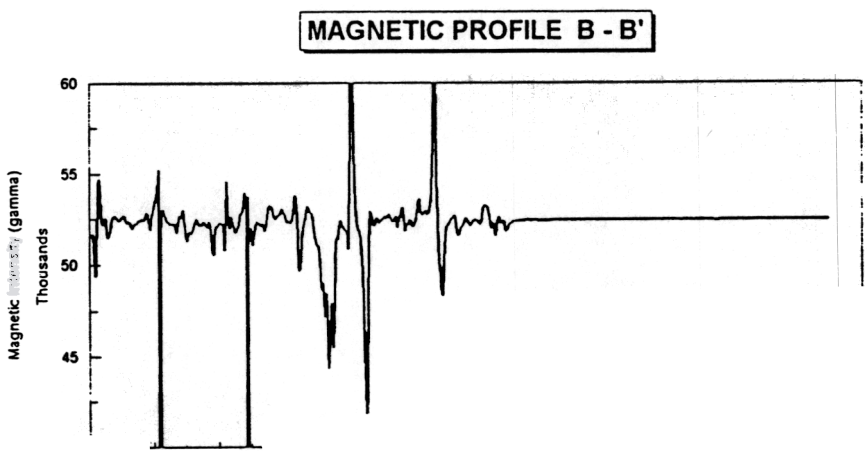
EARTH RESOURCES TECHNOLOGY	EM & MAGNETIC SURVEY GRID
FIGURE 4 1	SITE 4 – LANDFILL D
SCALE: 1" = 200' / JULY 17, 1997	ST. JULENS CREEK ANNEX, NORFOLK, VA



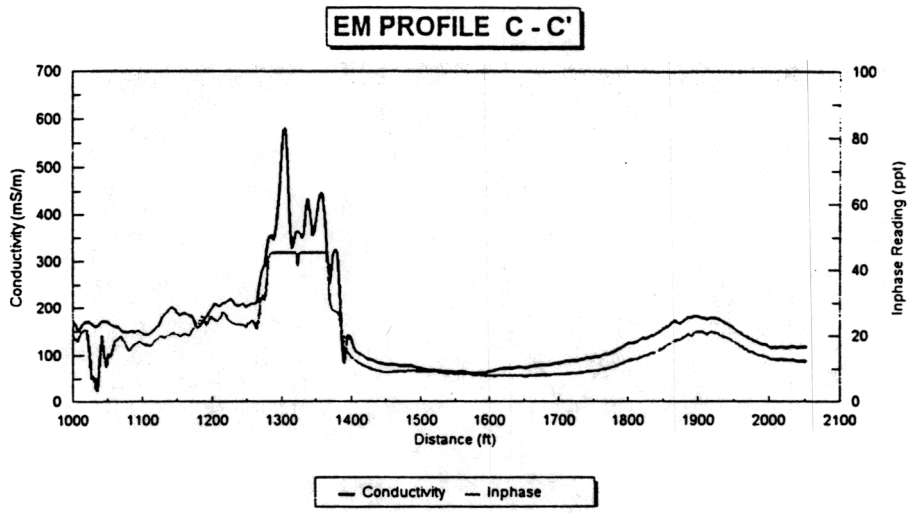


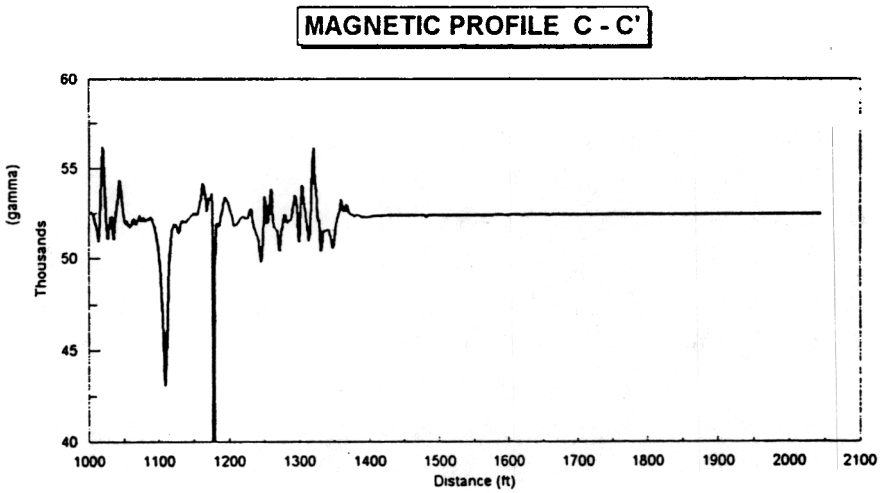
EARTH RESOURCES TECHNOLOGY	EM & MAGNETIC PROFILE: A – A'
FIGURE 4–2	SITE 4 – LANDFILL D
SCALE AS SHOWN / JULY 17, 1997	ST. JULENS CREEK ANNEX, NORFOLK, VA





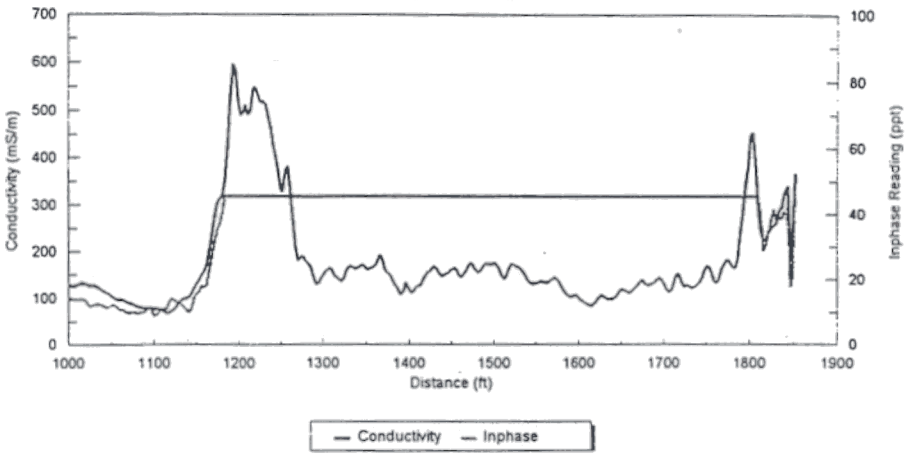
EARTH RESOURCES TECHNOLOGY	EM & MAGNETIC PROFILE: B – B'
FIGURE 4–3	SITE 4 – LANDFILL D
SCALE AS SHOWN / JULY 17, 1997	ST. JULENS CREEK ANNEX, NORFOLK, VA



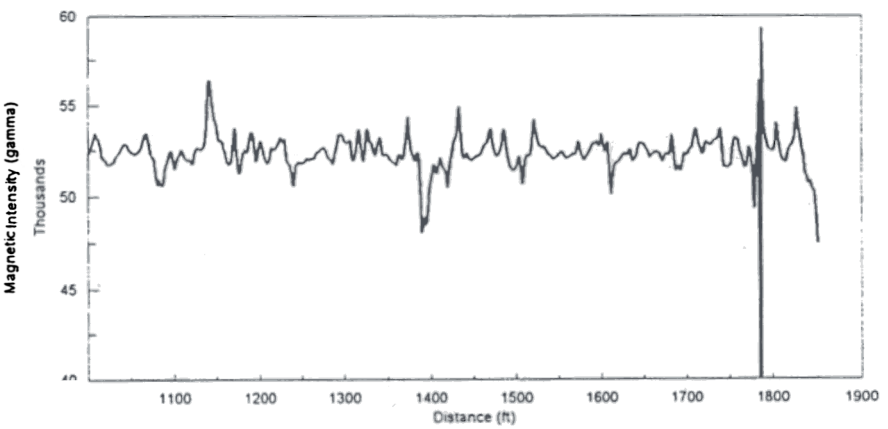


ERT EARTH RESOURCES TECHNOLOGY		EM & MAGNETIC PROFILE: C – C'
FIGURE 4–4		SITE 4 – LANDFILL D
SCALE AS SHOWN	JULY 17, 1997	ST. JULENS CREEK ANNEX, NORFOLK, VA

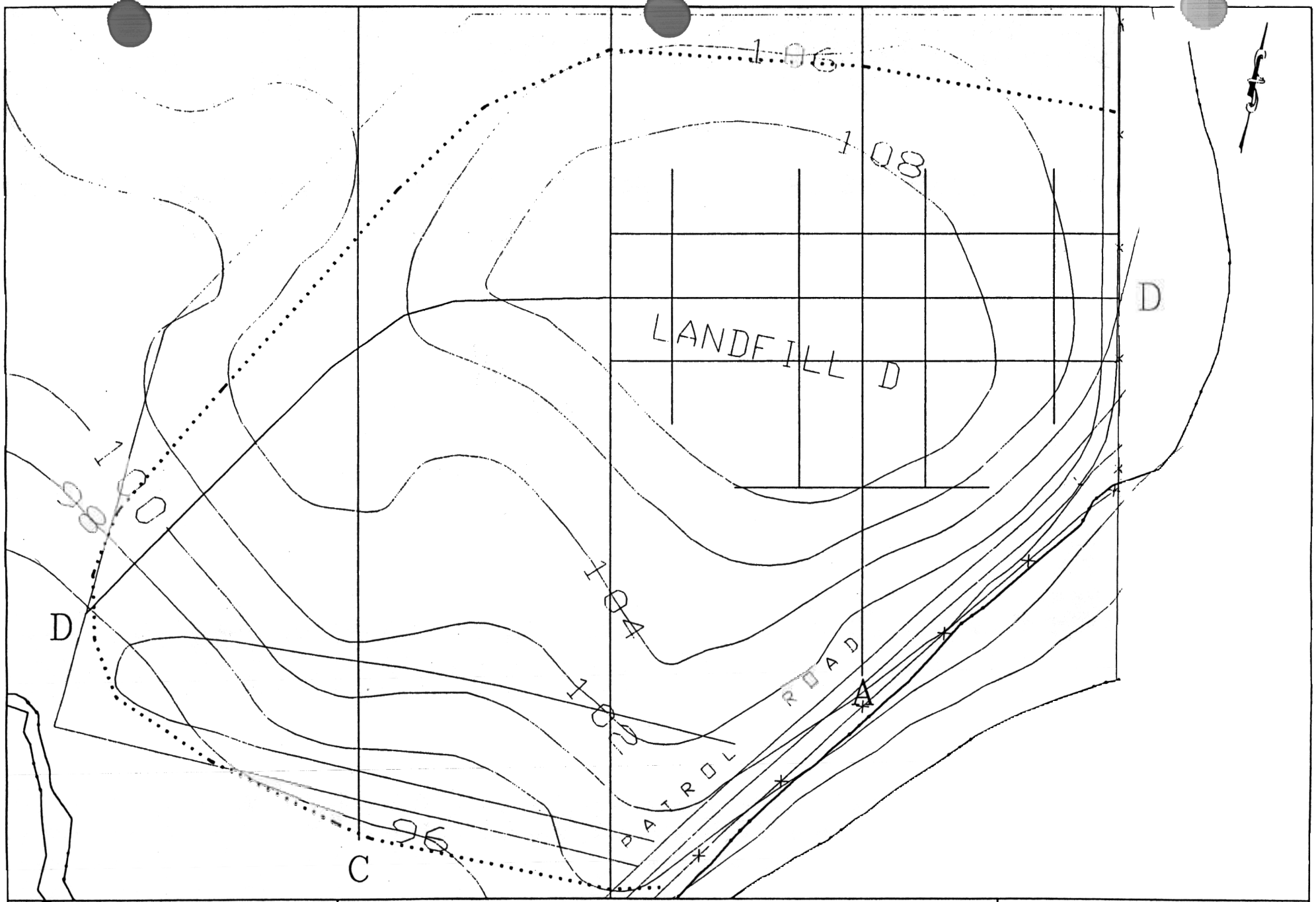
EM PROFILE D - D'



MAGNETIC PROFILE D - D'



EARTH RESOURCES TECHNOLOGY	EM & MAGNETIC PROFILE: D – D'
FIGURE 4–5	SITE 4 – LANDFILL D ST. JULENS CREEK ANNEX, NORFOLK, VA
SCALE AS SHOWN / JULY 17, 1997	



EARTH RESOURCES TECHNOLOGY

SCALE: 1" = 100'

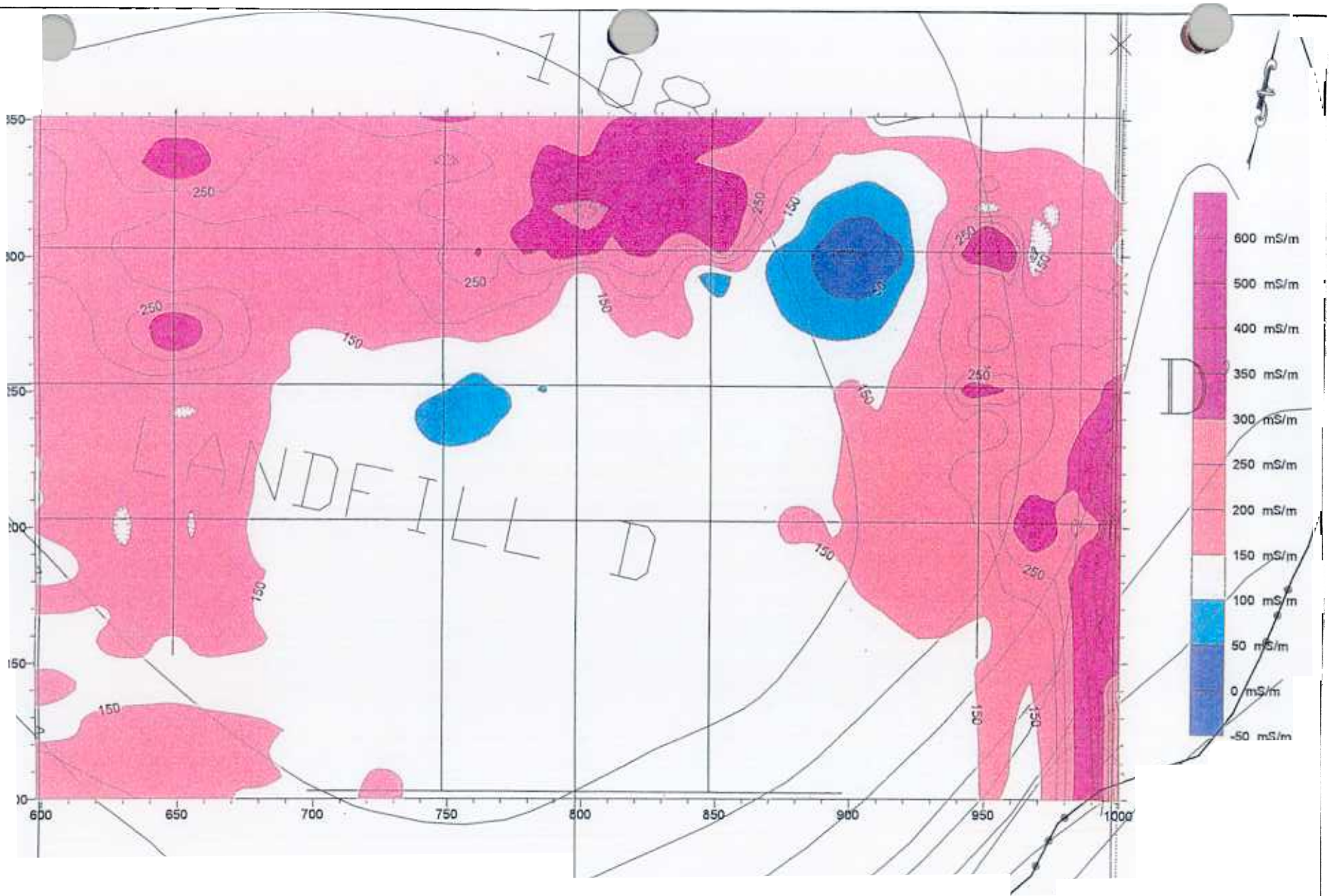
EXTENT OF LANDFILL D

SITE 4 – LANDFILL D

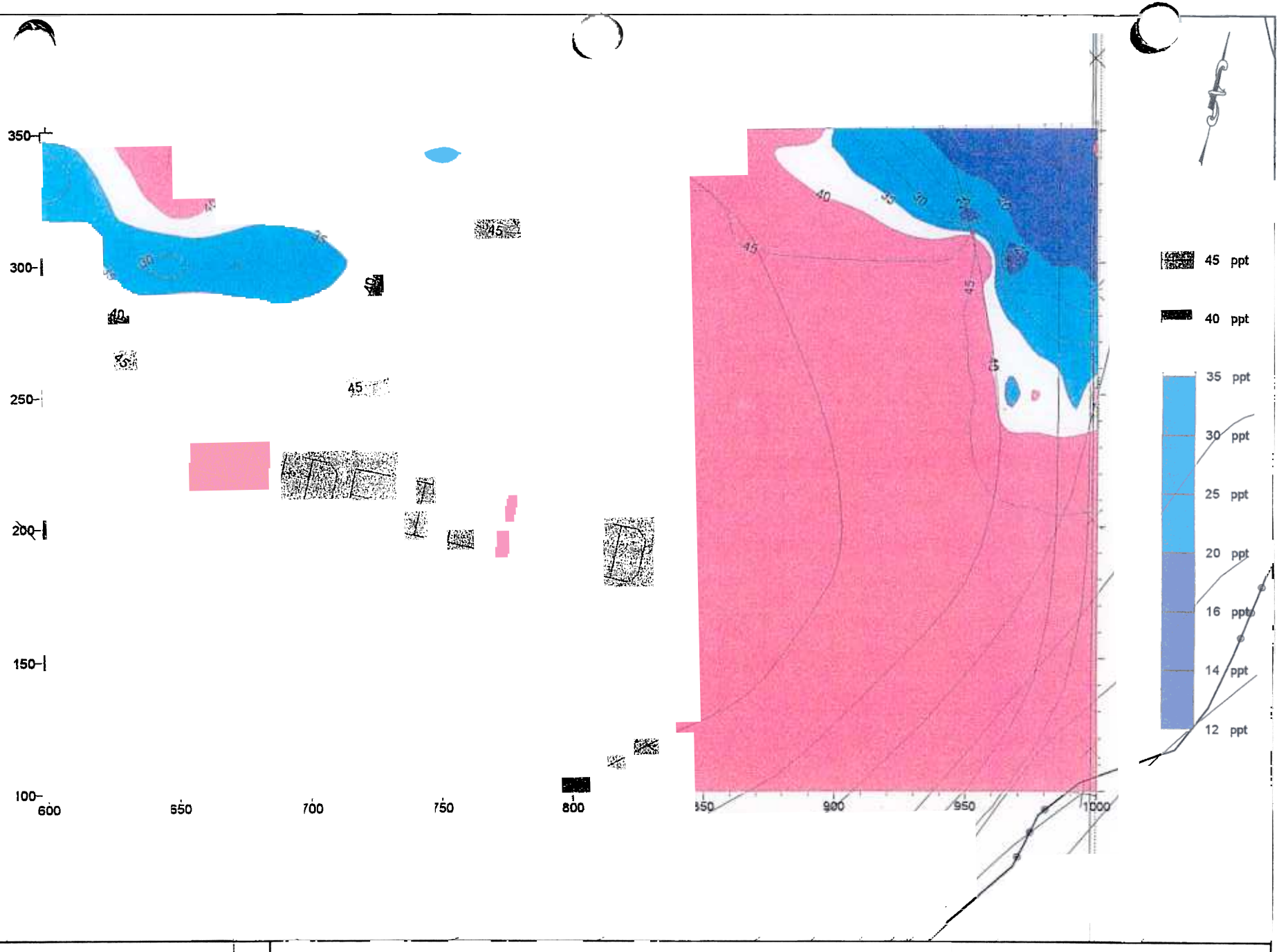
ST. JULIENS CREEK ANNEX, NORFOLK, VA

FIGURE 4-5A

JULY 17, 1997



ERT EARTH RESOURCES TECHNOLOGY	CONTOUR MAP OF CONDUCTIVITY READINGS SITE 4 – LANDFILL D ST. JULIENS CREEK ANNEX, NORFOLK, VA	FIGURE 4–6
SCALE: 1" 50		ULY 7, 1997



EARTH RESOURCES TECHNOLOGY

SCALE: 1" = 50'

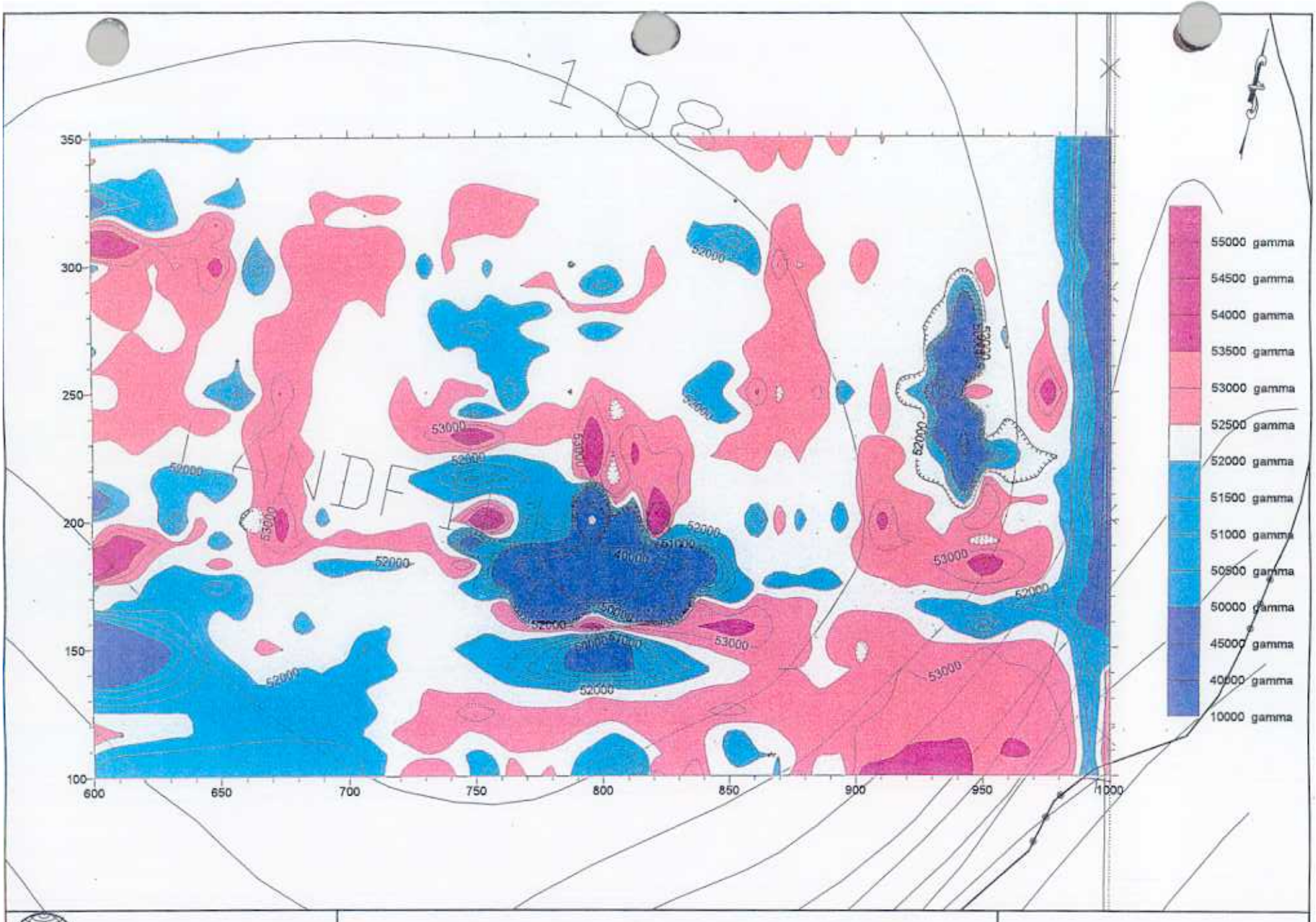
CONTOUR MAP OF INPHASE READINGS

SITE 4 – LANDFILL D

ST. JULIENS CREEK ANNEX, NORFOLK, VA

FIGURE 4–7

JULY 17, 1997



EARTH RESOURCES TECHNOLOGY

SCALE: 1" = 50'

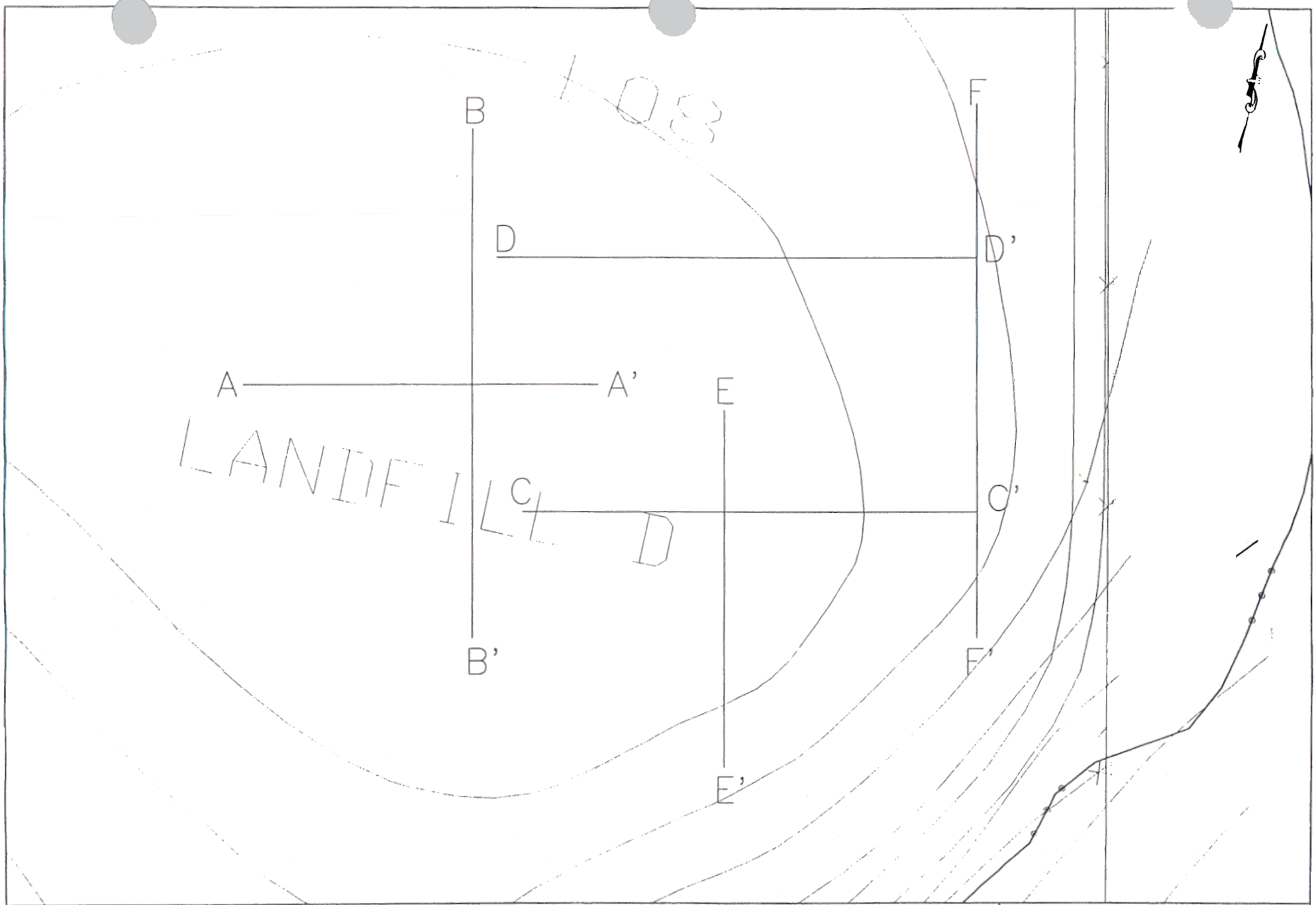
CONTOUR MAP OF MAGNETIC READINGS

SITE 4 – LANDFILL D

ST. JULIENS CREEK ANNEX, NORFOLK, VA

FIGURE 4–8

JULY 17, 1997



EARTH RESOURCES TECHNOLOGY

SCALE: 1" = 50'

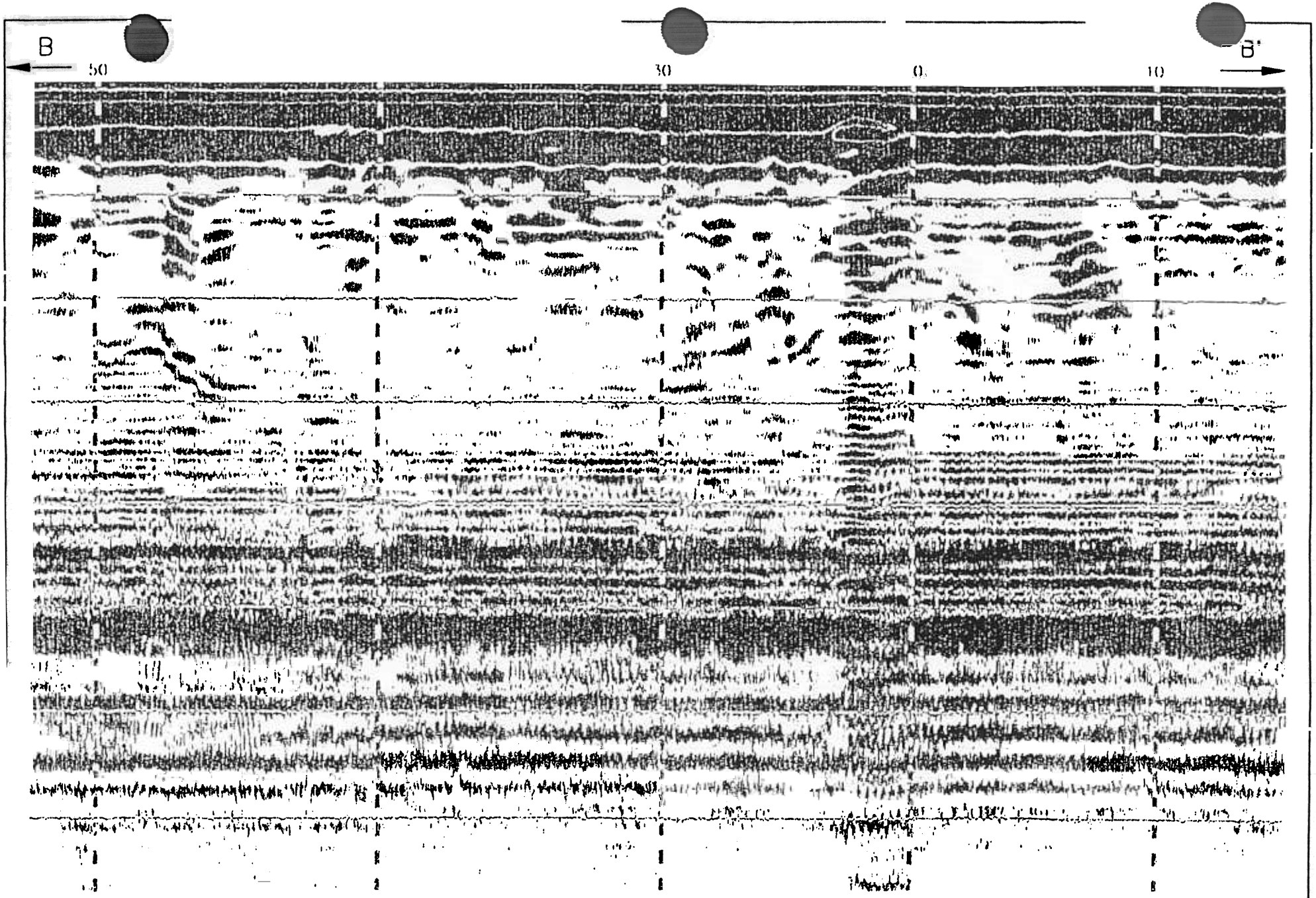
GPR SURVEY GRID

SITE 4 – LANDFILL D

ST. JULIENS CREEK ANNEX, NORFOLK, VA

FIGURE 4-9

JULY 17, 1997



EARTH RESOURCES TECHNOLOGY

HORIZONTAL DISTANCE B/W TWO VERTICAL LINES 10 FT

VERTICAL DISTANCE B/W TWO HORIZONTAL LINES [illegible]

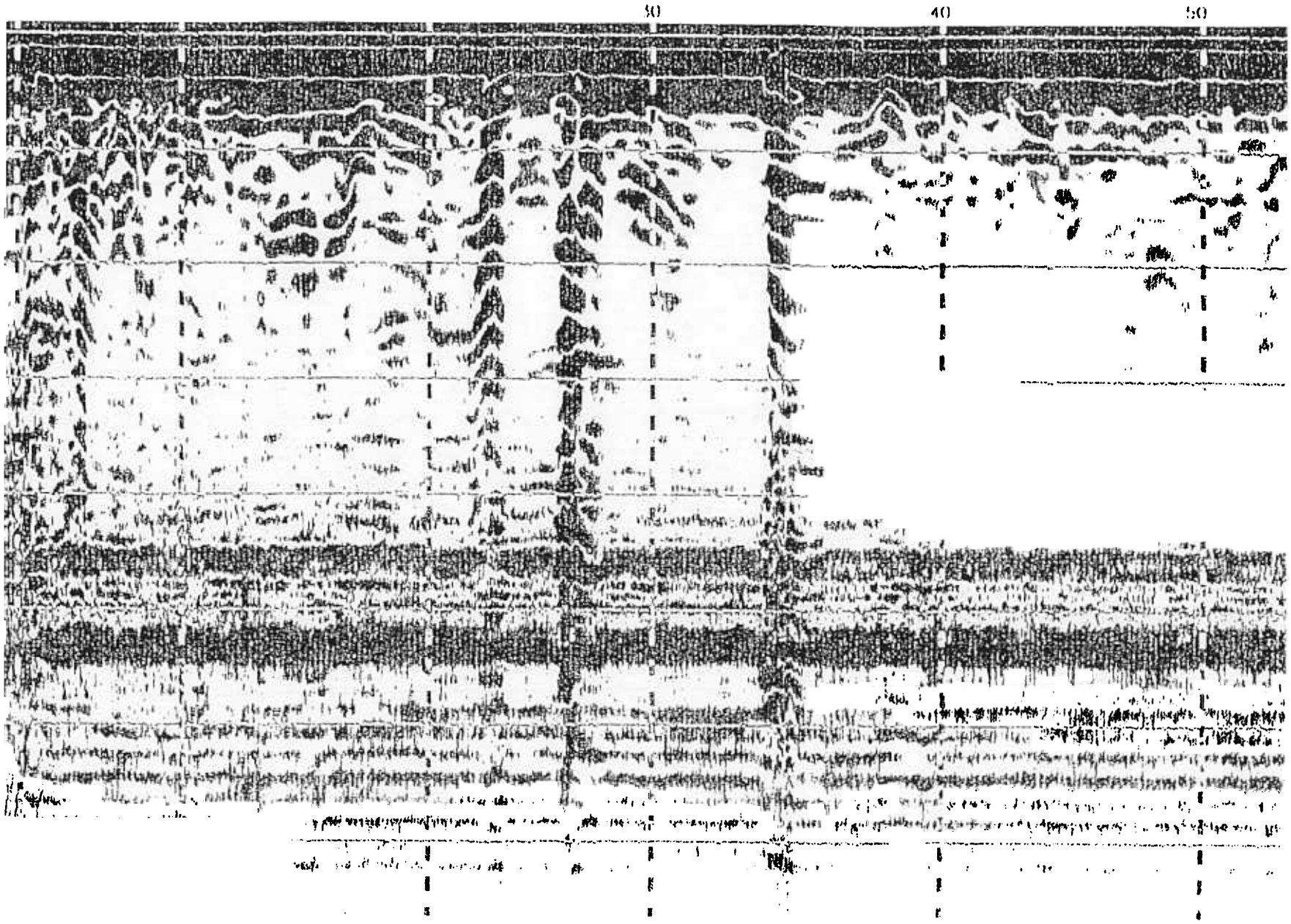
GPR PROFILE B B'

SITE 4 LANDFILL D

NS CREEK ANNE NOR VA

FIGURE 4-10

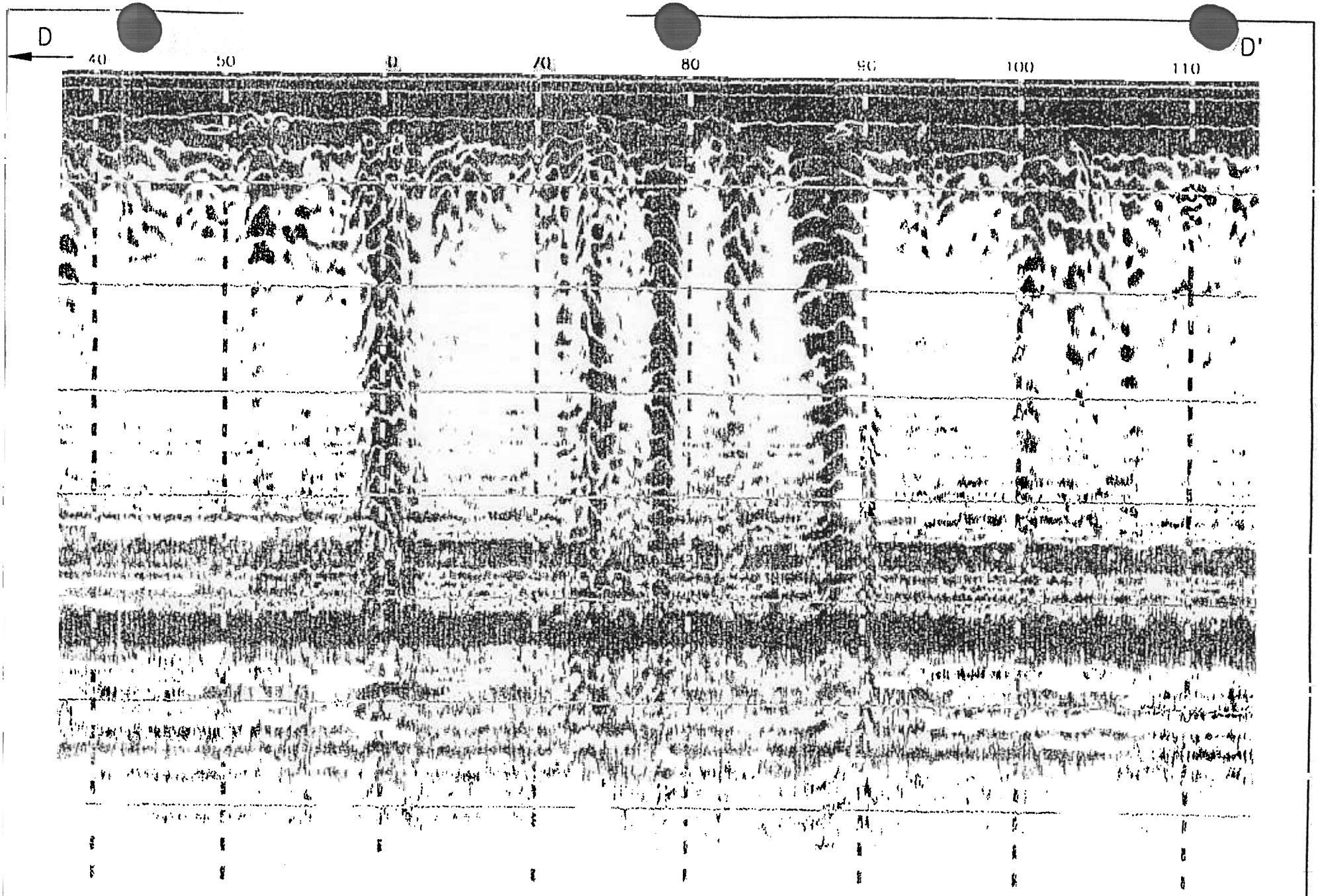
JULY 17,



EARTH RESOURCES TECHNOLOGY

GPR PROFILE C' C

11



EARTH RESOURCES TECHNOLOGY

HORIZONTAL DISTANCE B/W TWO VERTICAL LINES

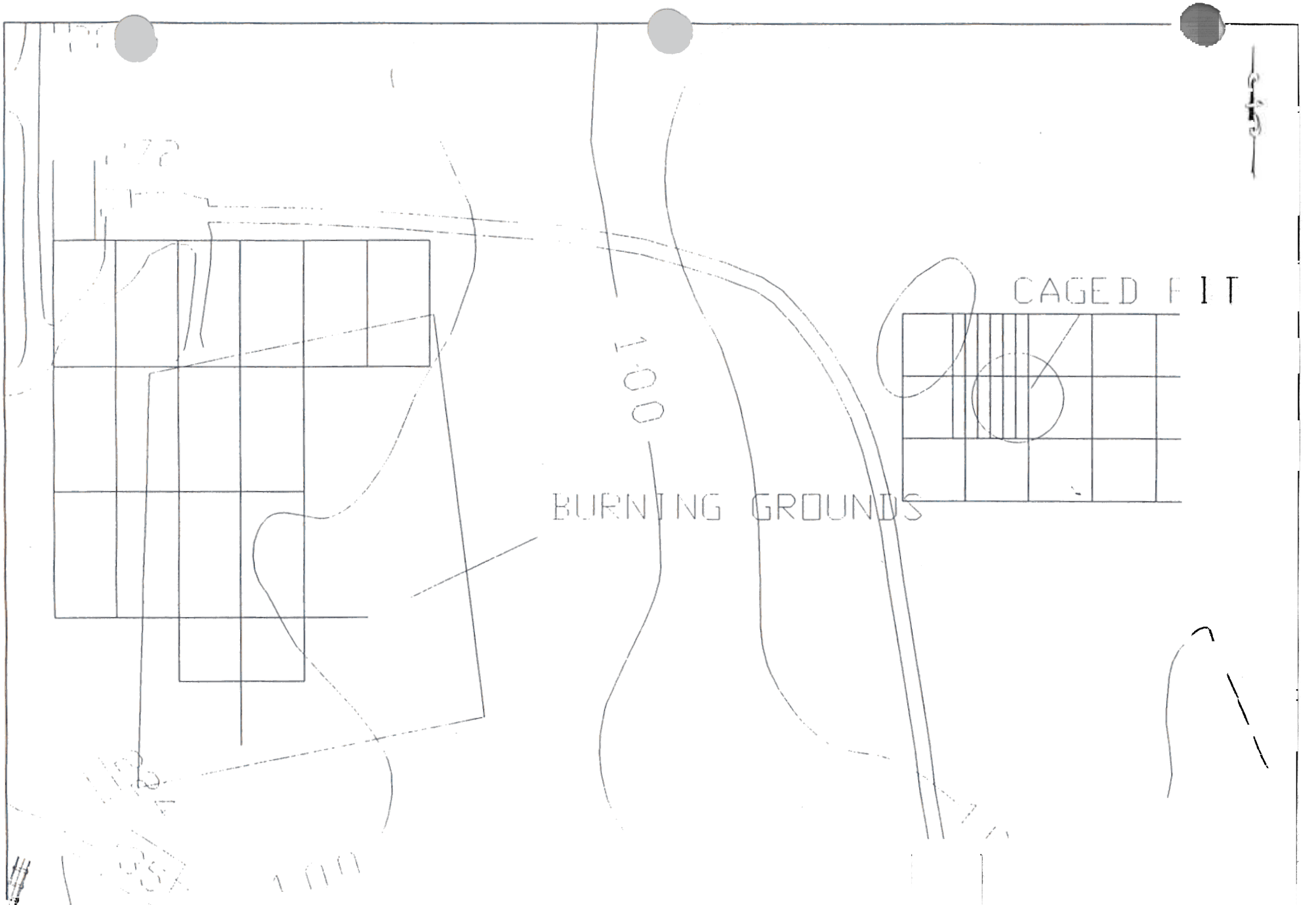
VERTICAL DISTANCE B/W TWO HORIZONTAL LINES

GPR PROFILE D D'

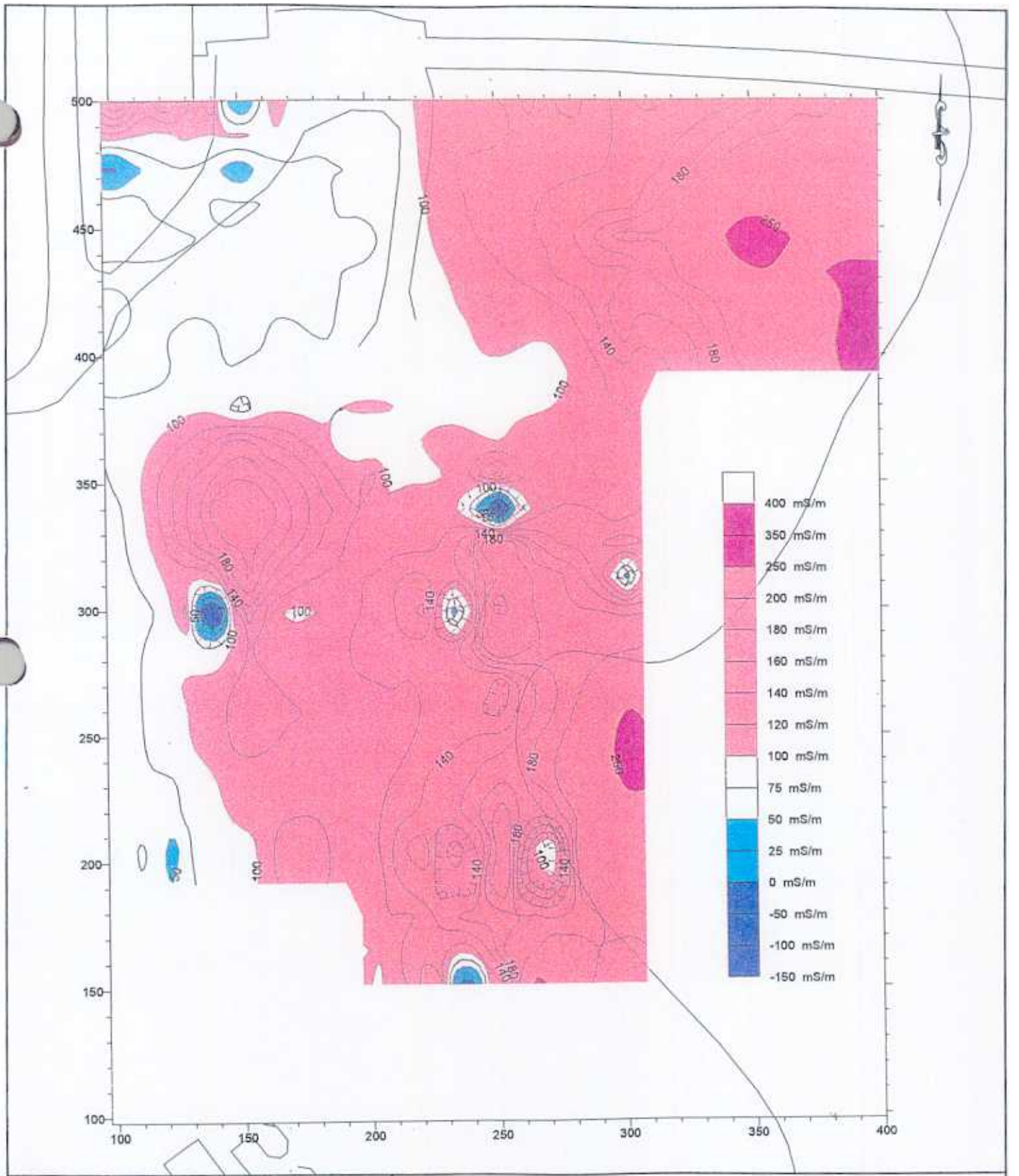
II 4 LANDFI

[illegible] CREEK ANNEX, NOR[illegible]

FIGURE 4- 12



EARTH RESOURCES TECHNOLOGY	EM SURVEY GRID	FIGURE 5-1
SCALE: 1" = 100'	SITE 5 – BURNING GROUNDS & CAGED PIT ST. JULIENS CREEK ANNEX, NORFOLK, VA	JULY 17, 1997



EARTH RESOURCES TECHNOLOGY

FIGURE 5-2

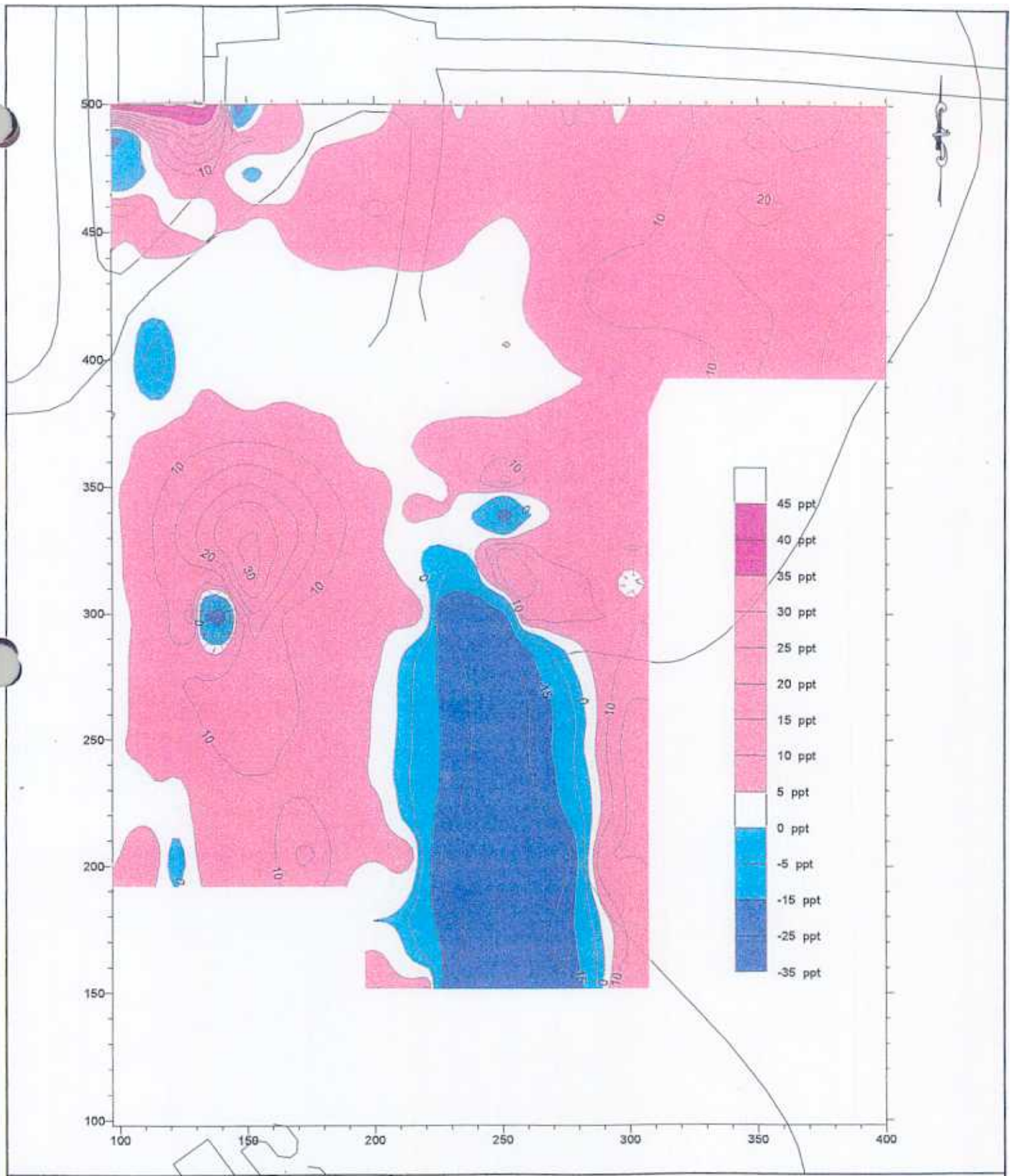
SCALE: 1" = 50'

JULY 17, 1997

CONTOUR MAP OF CONDUCTIVITY READINGS

SITE 5 – BURNING GROUNDS

ST. JULIENS CREEK ANNEX, NORFOLK, VA



EARTH RESOURCES TECHNOLOGY

FIGURE 5-3

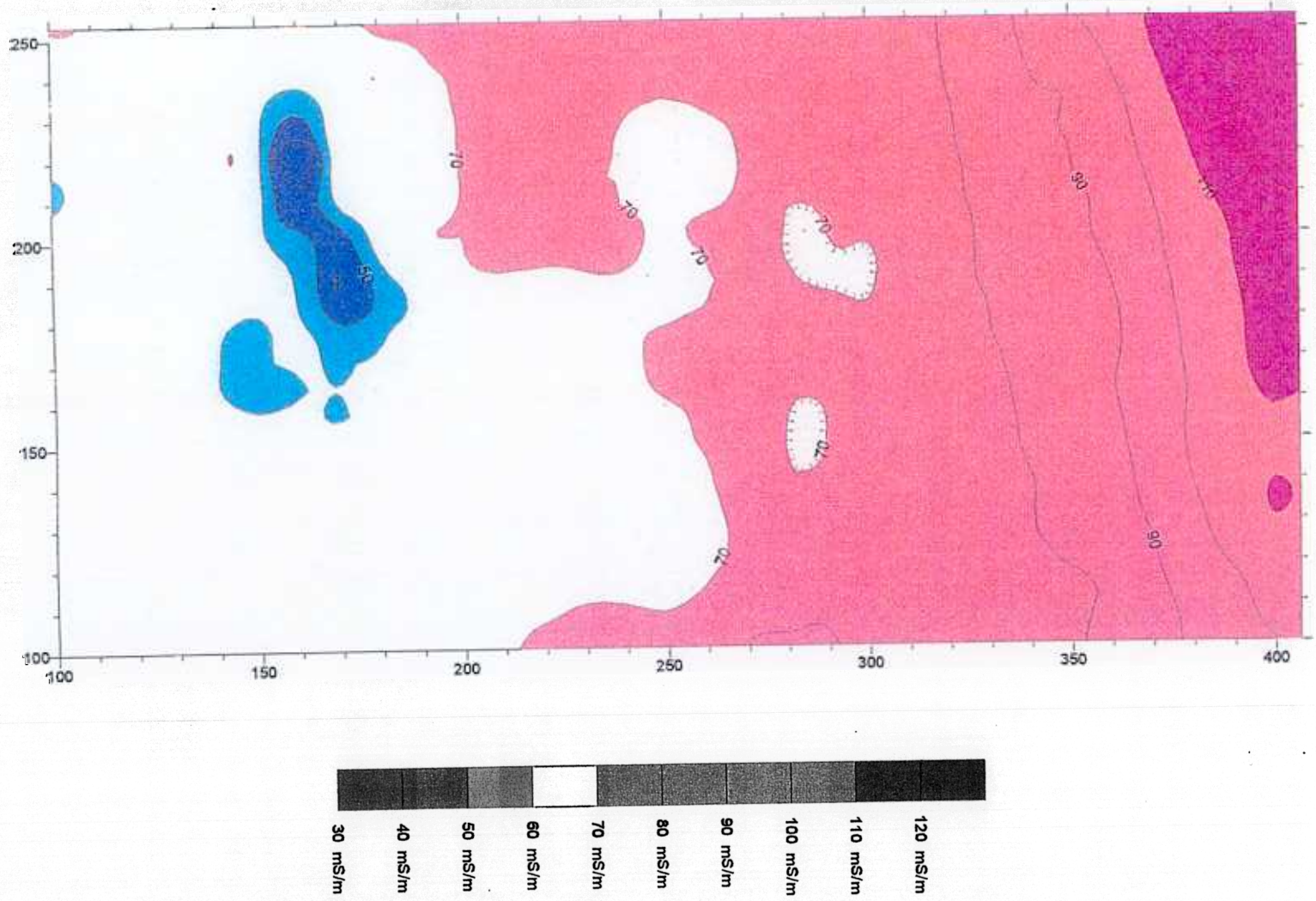
SCALE: 1" = 50'

JULY 17, 1997

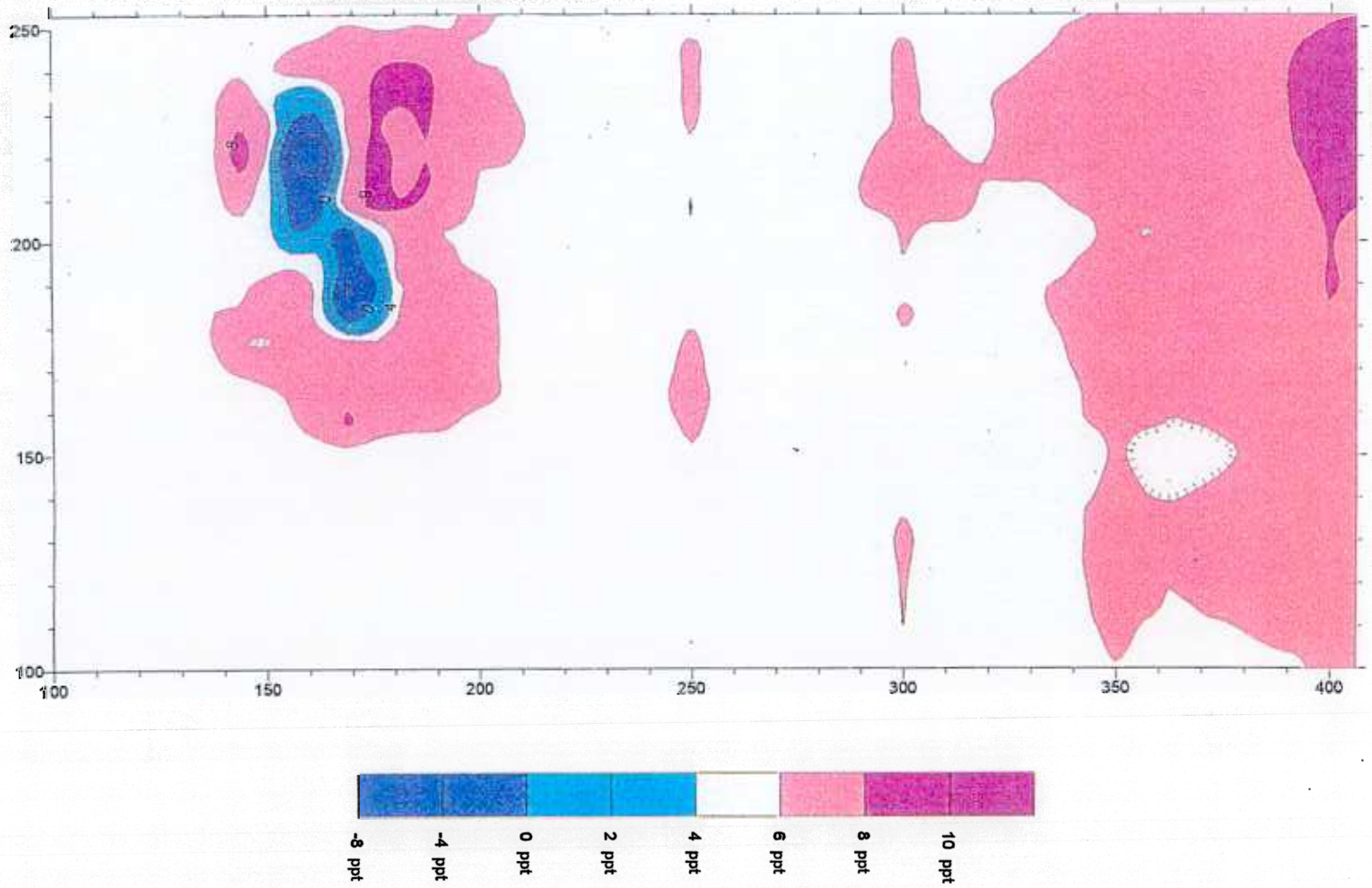
CONTOUR MAP OF INPHASE READINGS

SITE 5 – BURNING GROUNDS

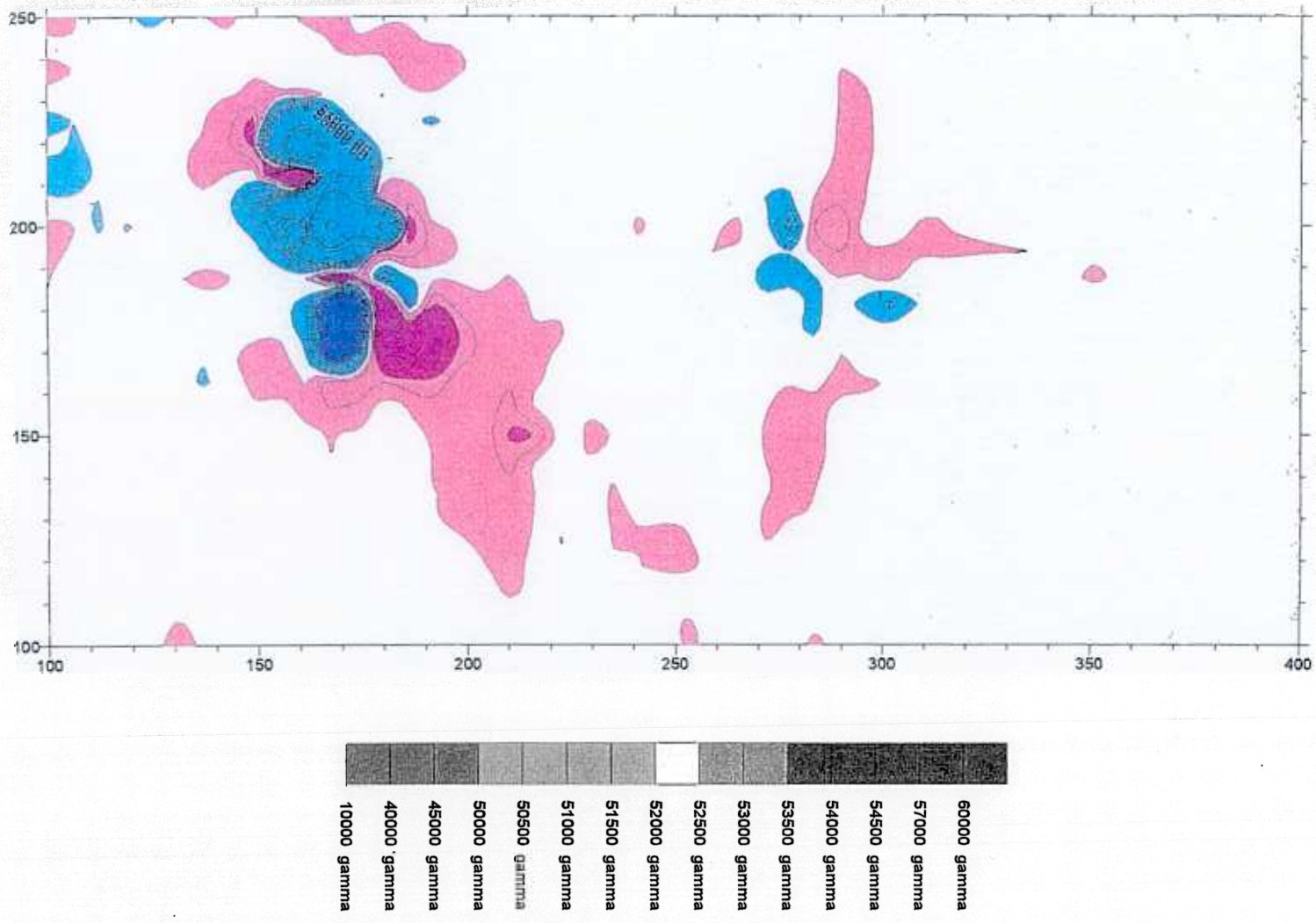
ST. JULIENS CREEK ANNEX, NORFOLK, VA



EARTH RESOURCES TECHNOLOGY	CONTOUR MAP OF CONDUCTIVITY READINGS SITE 5 – CAGED PIT ST. JULIENS CREEK ANNEX, NORFOLK, VA	FIGURE 5–4
SCALE: 1" = 40'		JULY 17, 1997



EARTH RESOURCES TECHNOLOGY	CONTOUR MAP OF INPHASE READINGS SITE 5 – CAGED PIT ST. JULIENS CREEK ANNEX, NORFOLK, VA	FIGURE 5–5
SCALE: 1" = 40'		JULY 17, 1997



EARTH RESOURCES TECHNOLOGY	CONTOUR MAP OF MAGNETIC READINGS SITE 5 – CAGED PIT ST. JULIENS CREEK ANNEX, NORFOLK, VA	FIGURE 5–6
SCALE: 1" = 40'		JULY 17, 1997

Appendix C
Test Pit Lithologic Logs

PROJECT NUMBER	TEST PIT NUMBER	
138804.FI.TR	SJS02-TRENCH 1	SHEET 1 OF 1

TEST PIT LOG

PROJECT : St. Juliens Creek Annex - Site 2 LOCATION : Chesapeake, Virginia

ELEVATION : N/A TRENCHING CONTRACTOR : IMS Environmental

DRILLING METHOD AND EQUIPMENT USED : N/A

WATER LEVELS : N/A START : 6/28/01 11:50 END : 6/28/01 12:10 LOGGER : P. Landin

Depth (inches)	Interval (inches)	CORE DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. OVM (ppm): Breathing Zone Above Hole
2	0-6"	Top soil, roots.	
4			
6			
8	6"-12"	Organic sandy SILT, dark gray, wet.	Near water line.
10			
12			Trench excavated from just inside water line approx 10'. Removed large chunks of concrete. USA reports metal hits-likely rebar in concrete. Concrete up to 8" thickx2'x3". Surface-phragmites.
14			
16			
18			8' in from trench - 0-2' - All organic topsoil, brown, moist, no staining or debris other than concrete and brick piece. Photo 26(7)
20			
22			
24			
26			
28			
30			
32			
34			
36			
38			
40			
42			
44			
46			
48			
50			
52			
54			

PROJECT NUMBER	TEST PIT NUMBER	
138804.FI.TR	SJS02-TRENCH 2	SHEET 1 OF 1

TEST PIT LOG

PROJECT : St. Juliens Creek Annex - Site 2 LOCATION : Chesapeake, Virginia

ELEVATION : N/A TRENCHING CONTRACTOR : IMS Environmental

DRILLING METHOD AND EQUIPMENT USED : N/A

WATER LEVELS : N/A START : 6/28/01 12:10 END : 6/28/01 13:00 LOGGER : P. Landin

Depth (inches)	Interval (inches)	CORE DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. OVM (ppm): Breathing Zone Above Hole
2, 4, 6, 8	0-8"	Top soil, light brown, organic, roots	Brick pieces. Photo 26(8)
10, 12, 14, 16, 18, 20, 22, 24	8-24"	Fine to medium grained SAND, light gray with brown and orange staining, moist.	Photo 25(9) Culvert
26, 28, 30, 32, 34, 36, 38, 40, 42, 44, 46, 48, 50, 52, 54	24-72"	Organic SILT with trace sand, gray.	No water visible in excavation. No signs of staining or debris.

PROJECT NUMBER	TEST PIT NUMBER	
138804.FI.TR	SJS02-TRENCH 3	SHEET 1 OF 1

TEST PIT LOG

PROJECT : St. Juliens Creek Annex - Site 2 LOCATION : Chesapeake, Virginia

ELEVATION : N/A TRENCHING CONTRACTOR : IMS Environmental

DRILLING METHOD AND EQUIPMENT USED : N/A

WATER LEVELS : N/A START : 6/28/01 13:00 END : 6/28/01 14:10 LOGGER : P. Landin

Depth (inches)	Interval (inches)	CORE DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. OVM (ppm): Breathing Zone Above Hole
2, 4, 6	0-6"	Organics and roots	Heavy blast grit - only in top 6".
8, 10, 12, 14, 16, 18	6-18"	Organic SILT, abundant roots up to 1".	
20, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40, 42, 44, 46, 48, 50, 52, 54	18-53"	SILT with heavy organics, gray, wet, soft.	Water in bottom 6" of hole. Small amounts of misc. debris, bottle, well cap. No signs of staining. Photo 23(10) Photo 22(11) of trench
			Total Depth 4'6"

PROJECT NUMBER	TEST PIT NUMBER	
138804.FI.TR	SJS02-TRENCH 4	SHEET 1 OF 1

TEST PIT LOG

PROJECT : St. Juliens Creek Annex - Site 2 LOCATION : Chesapeake, Virginia

ELEVATION : N/A TRENCHING CONTRACTOR : IMS Environmental

DRILLING METHOD AND EQUIPMENT USED : N/A

WATER LEVELS : N/A START : 6/28/01 14:20 END : 6/28/01 14:30 LOGGER : P. Landin

Depth (inches)	Interval (inches)	CORE DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. OVM (ppm): Breathing Zone Above Hole
2	0-4"	Top soil, light brown to tan, roots.	
4			
6			
8			
10	4-18"	Medium grained SAND, light brown to tan.	Blast grit/soil mix 20% to 100% grit.
12			
14			
16			
18			
20	18-54"	Sandy CLAY, grading more sandy with depth, brown to light brown.	Water coming in at bottom of hole. No other signs of debris or staining other than blast grit mix in top 18".
22			
24			
26			
28			
30			
32			
34			
36			
38			
40			
42			
44			
46			
48			
50			
52			
54			Total Depth 4'6" Approx. 20' behind Trench 3

PROJECT NUMBER	TEST PIT NUMBER	
138804.FI.TR	SJS02-TRENCH 5	SHEET 1 OF 1

TEST PIT LOG

PROJECT : St. Juliens Creek Annex - Site 2 LOCATION : Chesapeake, Virginia

ELEVATION : N/A TRENCHING CONTRACTOR : IMS Environmental

DRILLING METHOD AND EQUIPMENT USED : N/A

WATER LEVELS : N/A START : 6/29/01 08:25 END : 6/29/01 08:50 LOGGER : P. Landin

Depth (inches)	Interval (inches)	CORE DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. OVM (ppm): Breathing Zone Above Hole
2			
4	0-12"	Top soil with some gravel, heavy roots.	
6			
8			
10			
12			
14			
16			
18			
20	12-36"	Organic top soil, brown.	Concrete and brick chunks present.
22			
24			
26			
28			
30			
32			
34			
36		Silt, gray.	Some large concrete chunks.
38			Total Depth 3' Photo 35(1) No sign of staining or debris other than concrete.
40			
42			
44			
46			
48			
50			
52			
54			

PROJECT NUMBER	TEST PIT NUMBER	
138804.FI.TR	SJS02-TRENCH 6	SHEET 1 OF 1

TEST PIT LOG

PROJECT : St. Juliens Creek Annex - Site 2 LOCATION : Chesapeake, Virginia

ELEVATION : N/A TRENCHING CONTRACTOR : IMS Environmental

DRILLING METHOD AND EQUIPMENT USED : N/A

WATER LEVELS : N/A START : 6/29/01 08:50 END : 6/29/01 09:25 LOGGER : P. Landin

Depth (inches)	Interval (inches)	CORE DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. OVM (ppm): Breathing Zone Above Hole
		BERM- 2' high, 8" wide:	No sign of debris in 2'.
2		Medium to fine grained SAND, tan, roots, organic.	
4			
6			
8			
10			
12			
14			
16			
18			
20			
22			
24			
		From Grade (Excluding Berm):	
26		Organic SILT, brown, moist, roots.	Small concrete chunks (1 large embedded in east side of trench), some small metal straps. No staining, blast grit or other debris
28			
30			
32			
34			
36			
38			
40			
42			
44			
46			
48			
50			
52			Total Depth 6'
54			Photo 34,33(2)

PROJECT NUMBER	TEST PIT NUMBER	
138804.FI.TR	SJS02-TRENCH 7	SHEET 1 OF 1

TEST PIT LOG

PROJECT : St. Juliens Creek Annex - Site 2 LOCATION : Chesapeake, Virginia

ELEVATION : N/A TRENCHING CONTRACTOR : IMS Environmental

DRILLING METHOD AND EQUIPMENT USED : N/A

WATER LEVELS : N/A START : 6/29/01 09:25 END : 6/29/01 09:50 LOGGER : P. Landin

Depth (inches)	Interval (inches)	CORE DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. OVM (ppm): Breathing Zone Above Hole
2	0-4"	Top soil with organics and roots.	
4			
6			
8			
10	4-24"	Organic silty SAND with some gravel, brown.	Small metal wires, trace blast grit mixed in soil.
12			
14			
16			
18			
20			
22			
24			
26			
28			
30			
32			
34	24-48"	Sandy CLAY, gray, moist to wet, plastic, trace organics.	
36			
38			
40			
42			
44			
46			
48			
50			Total Depth 4' Hole appears pretty clean except for trace blast grit and some metal and asphalt chunks.
52			Photo 32(3)
54			

PROJECT NUMBER	TEST PIT NUMBER	
138804.FI.TR	SJS02-TRENCH 8	SHEET 1 OF 1

TEST PIT LOG

PROJECT : St. Juliens Creek Annex - Site 2 LOCATION : Chesapeake, Virginia

ELEVATION : N/A TRENCHING CONTRACTOR : IMS Environmental

DRILLING METHOD AND EQUIPMENT USED : N/A

WATER LEVELS : N/A START : 6/29/01 09:50 END : 6/29/01 10:25 LOGGER : P. Landin

Depth (inches)	Interval (inches)	CORE DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. OVM (ppm): Breathing Zone Above Hole
	0-4"	Top soil, brown, organics.	Trace blast grit mix in topsoil. 1 piece of burnt wood.
2			
4			
6			
8			
10			
12			
14			
16			
	4"-48"	Clayey SAND, light brown to tan, semi-plastic.	No metal hits. No signs of debris or staining.
18			
20			
22			
24			
26			
28			
30			
32			
34			
36			
38			
40			
42			
44			
46			
48			
50			Total Depth 4' Photo 30(4)
52			
54			

PROJECT NUMBER	TEST PIT NUMBER	
138804.FI.TR	SJS02-TRENCH 9	SHEET 1 OF 1

TEST PIT LOG

PROJECT : St. Juliens Creek Annex - Site 2 LOCATION : Chesapeake, Virginia

ELEVATION : N/A TRENCHING CONTRACTOR : IMS Environmental

DRILLING METHOD AND EQUIPMENT USED : N/A

WATER LEVELS : N/A START : 6/29/01 10:25 END : 6/29/01 10:55 LOGGER : P. Landin

Depth (inches)	Interval (inches)	CORE DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. OVM (ppm): Breathing Zone Above Hole
2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24	0-24"	Top soil, heavy rooted.	Abundant blast grit on north side of trench, no sign on south side.
26, 28, 30, 32, 34, 36	24-36"	Silty fine SAND, tan to light brown, poorly graded.	No signs of debris
38, 40, 42, 44, 46, 48, 50, 52, 54			Total Depth 3' Photo 30(5) of south wall without grit. Photo 29,28(6) of north wall with grit.

PROJECT NUMBER	TEST PIT NUMBER
138804.FI.TR	SJS02-TRENCH 10 SHEET 1 OF 1

TEST PIT LOG

PROJECT : St. Juliens Creek Annex - Site 2 LOCATION : Chesapeake, Virginia

ELEVATION : N/A TRENCHING CONTRACTOR : IMS Environmental

DRILLING METHOD AND EQUIPMENT USED : N/A

WATER LEVELS : N/A START : 6/29/01 10:55 END : 6/29/01 11:35 LOGGER : P. Landin

Depth (inches)	Interval (inches)	CORE DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. OVM (ppm): Breathing Zone Above Hole
2, 4, 6, 8	0-8"	Organic top soil, sand, brown to dark brown, abundant roots.	Small percentage (10%) of blast grit mix.
10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40, 42, 44	8-45"	Clayey SAND or sandy CLAY, light brown to tan, moist, slightly plastic.	Small piece of metal found at 18" bgs. Water slowly coming in at bottom of hole. No signs of staining, debris, or blast grit.
46, 48, 50, 52, 54			Total Depth 3'9" Photo 27(7)

PROJECT NUMBER	TEST PIT NUMBER
138804.FI.TR	SJS02-TRENCH 11 SHEET 1 OF 1

TEST PIT LOG

PROJECT : St. Juliens Creek Annex - Site 2 LOCATION : Chesapeake, Virginia

ELEVATION : N/A TRENCHING CONTRACTOR : IMS Environmental

DRILLING METHOD AND EQUIPMENT USED : N/A

WATER LEVELS : N/A START : 6/29/01 11:35 END : 6/29/01 12:00 LOGGER : P. Landin

Depth (inches)	Interval (inches)	CORE DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. OVM (ppm): Breathing Zone Above Hole
2	0-8"	Organic top soil, dark brown, abundant roots.	Small trace of blast grit.
4			
6			
8			
10			
12			
14			
16			
18			
20	8-42"	Gravel and cobbles, FILL in a gray silty sand.	Some small pieces of metal. Large concrete piece in bottom. No signs of blast grit.
22			
24			
26			
28			
30			
32			
34			
36			
38			
40			
42			Total Depth 3'5"
44			Photo 26(8) of trench
46			Photo 25(9) of surface debris located just north of trench, appears to be empty.
48			Cans, bottles, wood, and misc. steel.
50			
52			
54			

PROJECT NUMBER	TEST PIT NUMBER	
138804.FI.TR	SJS02-TRENCH 12	SHEET 1 OF 1

TEST PIT LOG

PROJECT : St. Juliens Creek Annex - Site 2 LOCATION : Chesapeake, Virginia

ELEVATION : N/A TRENCHING CONTRACTOR : IMS Environmental

DRILLING METHOD AND EQUIPMENT USED : N/A

WATER LEVELS : N/A START : 6/29/01 12:50 END : 6/29/01 13:20 LOGGER : P. Landin

Depth (inches)	Interval (inches)	CORE DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. OVM (ppm): Breathing Zone Above Hole
2			
4	0-12"	Sandy top soil with heavy organics.	No visible blast grit.
6			
8			
10			
12			
14			
16			
18			
20			
22	12-48"	Clayey SAND, brown to tan, moist, semi-plastic	No trace blast grits, no metal hits, and no signs of disposal.
24			
26			
28			
30			
32			
34			
36			
38			
40			
42			
44			
46			
48			
50			Total Depth 4' Photo 24(10)
52			
54			

PROJECT NUMBER	TEST PIT NUMBER	
138804.FI.TR	SJS02-TRENCH 13	SHEET 1 OF 1

TEST PIT LOG

PROJECT : St. Juliens Creek Annex - Site 2 LOCATION : Chesapeake, Virginia

ELEVATION : N/A TRENCHING CONTRACTOR : IMS Environmental

DRILLING METHOD AND EQUIPMENT USED : N/A

WATER LEVELS : N/A START : 6/29/01 13:20 END : 6/29/01 13:55 LOGGER : P. Landin

Depth (inches)	Interval (inches)	CORE DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. OVM (ppm): Breathing Zone Above Hole
2	0-4"	Top soil, light brown to brown, roots and organics.	
4			
6			
8			
10	4-18"	Medium to fine grained SAND, tan to light brown, poorly graded.	
12			
14			
16			
18	18-20"	Small lense of SILT, dark brown, organics.	Evidence of broken glass and gravel.
20			
22			
24			
26			
28	20-48"	Sandy CLAY, tan to brown, slightly plastic.	No signs of debris, staining, or blast grit.
30			
32			
34			
36			
38			
40			
42			
44			
46			
48			
50			Total Depth 4' Photo 23,22(11)
52			
54			

PROJECT NUMBER	TEST PIT NUMBER	
138804.FI.TR	SJS02-TRENCH 14	SHEET 1 OF 1

TEST PIT LOG

PROJECT : St. Juliens Creek Annex - Site 2 LOCATION : Chesapeake, Virginia

ELEVATION : N/A TRENCHING CONTRACTOR : IMS Environmental

DRILLING METHOD AND EQUIPMENT USED : N/A

WATER LEVELS : N/A START : 6/29/01 13:55 END : 6/29/01 15:15 LOGGER : P. Landin

Depth (inches)	Interval (inches)	CORE DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. OVM (ppm): Breathing Zone Above Hole
2			
4	0-12"	**From edge of wetlands, 10' to east:** Organic top soil with roots.	Very heavy (phragmites) water in hole at 12" 20% blast grit.
6	0-12"	**UPLAND SLOPE:** Top soil, brown to black, roots, organics.	Gravel up to 2" intermixed with many tree pieces - 1' diameter x 4' length at most. 2 metal pipes - 6" diameter x 4' length.
8		**Bottom of trench:** SILT with gravel, black, wet. Also silty SAND, iron stained at to slope.	
10	0-12"	**MIDSLOPE:** Top soil with roots	
12			
14			
16	12-30"	**MIDSLOPE:** Organic soil.	Heavy blast grit %. Too much gravel and wood in bottom.
18			
20			
22			
24			
26			
28			
30			
32			**TOP OF SLOPE:** Total Depth 5' Showing lots of grit in sidewall at 5' bgs. Bottom of hole very wet black silt with heavy organics. Caving in of loose blast grit/soil mix 50/50 split. Picture 21(12) looking along trench towards wetlands. Collected sample SJS02-SB13-002. May have been faint petroleum odor near bottom of trench when collecting sample - very faint but organic. Put a piece of soil in groundwater and no sheen developed. Assume organic decay.
34			
36			
38			
40			
42			
44			
46			
48			
50			
52			
54			

PROJECT NUMBER	TEST PIT NUMBER	
138804.FI.TR	SJS02-TRENCH 15	SHEET 1 OF 1

TEST PIT LOG

PROJECT : St. Juliens Creek Annex - Site 2 LOCATION : Chesapeake, Virginia

ELEVATION : N/A TRENCHING CONTRACTOR : IMS Environmental

DRILLING METHOD AND EQUIPMENT USED : N/A

WATER LEVELS : N/A START : 6/29/01 15:15 END : 6/29/01 15:45 LOGGER : P. Landin

Depth (inches)	Interval (inches)	CORE DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. OVM (ppm): Breathing Zone Above Hole
2			Some small pockets of blast grit in top 6". None appears below small gravel areas in top 18".
4			
6	0-18"	Topsoil with abundant roots.	GRAVEL, obvious fill.
8			
10			
12			
14			
16			
18			
20			
22			
24	18-36"	Fine grained SAND, gray with tan mottles, roots.	No signs of blast grit.
26			
28			
30			
32			
34		Grading to SILT, dark gray to black, soft.	Bottom of hole is wet at 36" bgs. Less gravel.
36			
38			Total Depth 3' Same as Trench 14 from lower level of wetlands. Approx 10-12' upland/inland.
40			
42			Photo 21(13), standing water in most of the bottom of excavation and stadia rod on righthand side in middle of trench.
44			
46			
48			
50			
52			
54			

PROJECT NUMBER	TEST PIT NUMBER	
138804.FI.TR	SJS02-TRENCH 16	SHEET 1 OF 1

TEST PIT LOG

PROJECT : St. Juliens Creek Annex - Site 2 LOCATION : Chesapeake, Virginia

ELEVATION : N/A TRENCHING CONTRACTOR : IMS Environmental

DRILLING METHOD AND EQUIPMENT USED : N/A

WATER LEVELS : N/A START : 6/29/01 15:45 END : 6/29/01 16:10 LOGGER : P. Landin

Depth (inches)	Interval (inches)	CORE DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. OVM (ppm): Breathing Zone Above Hole
2, 4, 6	0-6"	Top soil, organics, roots.	No sign of blast grit
8, 10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40, 42	6-42"	Fine grained SAND, tan to gray with orange and brown mottles, dry to moist, poorly graded.	No sign of blast grit or debris.
44, 46, 48, 50, 52, 54	42-54"	Sandy clayey SILT, gray to dark gray, trace organics, semi-plastic.	
			Total Depth 4' 6"

PROJECT NUMBER	TEST PIT NUMBER	
138804.FI.TR	SJS02-TRENCH 17	SHEET 1 OF 1

TEST PIT LOG

PROJECT : St. Juliens Creek Annex - Site 2 LOCATION : Chesapeake, Virginia

ELEVATION : N/A TRENCHING CONTRACTOR : IMS Environmental

DRILLING METHOD AND EQUIPMENT USED : N/A

WATER LEVELS : N/A START : 6/30/01 08:25 END : 6/30/01 09:10 LOGGER : P. Landin

Depth (inches)	Interval (inches)	CORE DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. OVM (ppm): Breathing Zone Above Hole
2, 4, 6, 8, 10, 12	0-12"	Top soil with trace sand, dark brown to black, abundant roots and organics.	
14, 16, 18, 20, 22, 24	12-24"	Silty SAND, dark brown, moist.	Concrete and brick rubble intermixed. Perhaps trace blast grit - not large fraction.
26, 28, 30, 32, 34, 36, 38, 40, 42, 44, 46, 48, 50, 52, 54			Total Depth 2' Photo 35(1) Oil/Petroleum leaking into trench from north side. Dark black areas with sheen on water. Mild odor at bottom of trench. Collect SJS02-SB14-001 sample for TPH. Photo 30(4)

PROJECT NUMBER	TEST PIT NUMBER	
138804.FI.TR	SJS02-TRENCH 18	SHEET 1 OF 1

TEST PIT LOG

PROJECT : St. Juliens Creek Annex - Site 2 LOCATION : Chesapeake, Virginia

ELEVATION : N/A TRENCHING CONTRACTOR : IMS Environmental

DRILLING METHOD AND EQUIPMENT USED : N/A

WATER LEVELS : N/A START : 6/30/01 09:10 END : 6/30/01 09:50 LOGGER : P. Landin

Depth (inches)	Interval (inches)	CORE DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. OVM (ppm): Breathing Zone Above Hole
2			
4	0-12"	Top soil, dark brown to black, organics.	Some sign of black stained (burning). Contains trace blast grit (<15%)
6			
8			
10			
12			
14			
16			
18			
20			
22			
24	12-48"	Sandy CLAY to clayey SAND, tan to light brown, semi-plastic.	Some cobbles. No sign of blast grit, debris, or staining.
26			
28			
30			
32			
34			
36			
38			
40			
42			
44			
46			
48			
50			Total Depth 4' Photo 34,33(2)
52			
54			

PROJECT NUMBER	TEST PIT NUMBER
138804.FI.TR	SJS02-TRENCH 19 SHEET 1 OF 1

TEST PIT LOG

PROJECT : St. Juliens Creek Annex - Site 2 LOCATION : Chesapeake, Virginia

ELEVATION : N/A TRENCHING CONTRACTOR : IMS Environmental

DRILLING METHOD AND EQUIPMENT USED : N/A

WATER LEVELS : N/A START : 6/30/01 14:30 END : 6/30/01 14:40 LOGGER : P. Landin

Depth (inches)	Interval (inches)	CORE DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. OVM (ppm): Breathing Zone Above Hole
2	0-4"	Silty, organic top soil, light brown, abundant roots.	
4			
6			
8			
10	4-24"	General debris FILL.	Debris, concrete chunks, metal strapping, small pipes, etc. Appears to have been there awhile all very rusted. Mixed in with assortment of soil including dark black soil, blast grit in pockets but not consistent down to 24".
12			
14			
16			
18			
20			
22			
24			
26	24-48"	Medium to fine grained SAND with trace clay/silt, gray with orange mottles.	
28			
30			
32			
34			
36			
38			
40			
42			
44			
46			
48			
50			Total Depth 4' Photo 29,28(5)
52			
54			

PROJECT NUMBER	TEST PIT NUMBER	
138804.FI.TR	SJS02-TRENCH 20	SHEET 1 OF 1

TEST PIT LOG

PROJECT : St. Juliens Creek Annex - Site 2 LOCATION : Chesapeake, Virginia

ELEVATION : N/A TRENCHING CONTRACTOR : IMS Environmental

DRILLING METHOD AND EQUIPMENT USED : N/A

WATER LEVELS : N/A START : 6/30/01 10:45 END : 6/30/01 11:25 LOGGER : P. Landin

Depth (inches)	Interval (inches)	CORE DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. OVM (ppm): Breathing Zone Above Hole
2			
4			
6	0-18"	Organic SILT, abundant roots.	Typical "marsh mud".
8			
10			
12			
14			
16			
18			
20	18-24"	SILT, dark gray, very soft, roots, organics.	No signs of metal or debris. Dark-stained throughout with organic (decay) odor. Water in bottom, filling slowly.
22			
24			
26			Total Depth 2' Photo 32(3)
28			
30			
32			
34			
36			
38			
40			
42			
44			
46			
48			
50			
52			
54			

PROJECT NUMBER	TEST PIT NUMBER	
138804.FI.TR	SJS02-TRENCH 21	SHEET 1 OF 1

TEST PIT LOG

PROJECT : St. Juliens Creek Annex - Site 2 LOCATION : Chesapeake, Virginia

ELEVATION : N/A TRENCHING CONTRACTOR : IMS Environmental

DRILLING METHOD AND EQUIPMENT USED : N/A

WATER LEVELS : N/A START : 6/30/01 11:25 END : 6/30/01 11:35 LOGGER : P. Landin

Depth (inches)	Interval (inches)	CORE DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. OVM (ppm): Breathing Zone Above Hole
2			
4			
6	0-18"	FILL from sand and gravel to clay and silt.	Small pieces of debris, plastic.
8			
10			
12			
14			
16			Lense of white material? Collected small bag sample.
18			
20			
22			
24	18-36"	Clayey SILT, soft gray, very soft, organics.	
26			
28			
30			
32			
34			
36			
38			Total Depth 3'
40			
42			
44			
46			
48			
50			
52			
54			

PROJECT NUMBER	TEST PIT NUMBER	
138804.FI.TR	SJS02-TRENCH 22	SHEET 1 OF 1

TEST PIT LOG

PROJECT : St. Juliens Creek Annex - Site 2 LOCATION : Chesapeake, Virginia

ELEVATION : N/A TRENCHING CONTRACTOR : IMS Environmental

DRILLING METHOD AND EQUIPMENT USED : N/A

WATER LEVELS : N/A START : 6/30/01 15:25 END : 6/30/01 15:50 LOGGER : P. Landin

Depth (inches)	Interval (inches)	CORE DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. OVM (ppm): Breathing Zone Above Hole
	0-4"	Top soil with trace gravel, gray to light brown, dry, roots.	
2			
4			
6			
8			
10			
12			
14			
	4-36"	Gravel to cobble, boulder FILL with some silt and sand.	Some large pieces of asphalt up to 4". Some dark organic silt in bottom. No obvious signs of debris, metal, soil staining, or blast grit.
16			
18			
20			
22			
24			
26			
28			
30			
32			
34			
36			
38			Total Depth 3' Photo 27(6) looking into marsh.
40			
42			
44			
46			
48			
50			
52			
54			

PROJECT NUMBER	TEST PIT NUMBER	
138804.FI.TR	SJS02-TRENCH 23	SHEET 1 OF 1

TEST PIT LOG

PROJECT : St. Juliens Creek Annex - Site 2 LOCATION : Chesapeake, Virginia

ELEVATION : N/A TRENCHING CONTRACTOR : IMS Environmental

DRILLING METHOD AND EQUIPMENT USED : N/A

WATER LEVELS : N/A START : 6/30/01 15:50 END : 6/30/01 16:00 LOGGER : P. Landin

Depth (inches)	Interval (inches)	CORE DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. OVM (ppm): Breathing Zone Above Hole
2	0-4"	Rich, organic top soil.	
4			
6			
8			
10			
12			
14			
16	4-30"	Gravel to cobble FILL, loose.	Some larger concrete chuncks, up to 1' square and asphalt. No signs of blast grit or soil staining.
18			
20			
22			
24			
26			
28			
30			
32			Total Depth 2'6" Photo 26(7)
34			
36			
38			
40			
42			
44			
46			
48			
50			
52			
54			

PROJECT NUMBER	TEST PIT NUMBER	
138804.FI.TR	SJS02-TRENCH 24	SHEET 1 OF 1

TEST PIT LOG

PROJECT : St. Juliens Creek Annex - Site 2 LOCATION : Chesapeake, Virginia

ELEVATION : N/A TRENCHING CONTRACTOR : IMS Environmental

DRILLING METHOD AND EQUIPMENT USED : N/A

WATER LEVELS : N/A START : 6/30/01 16:00 END : 6/30/01 16:15 LOGGER : P. Landin

Depth (inches)	Interval (inches)	CORE DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. OVM (ppm): Breathing Zone Above Hole
	0-4"	Top soil.	Blast grit is abundant in top 6". Any below seems to have fallen in during excavation.
2			
4			
6			
8			
10			
12			
14			
	4-36"	Gravel to cobble FILL.	Asphalt and concrete.
16			
18			
20			
22			
24			
26			
28			
30			
32			
34			
36		Sandy SILT with organics, gray.	
38			Total Depth 3' Very similar to Trench 23.
40			
42			
44			
46			
48			
50			
52			
54			

PROJECT NUMBER	TEST PIT NUMBER	
138804.FI.TR	SJS02-TRENCH 25	SHEET 1 OF 1

TEST PIT LOG

PROJECT : St. Juliens Creek Annex - Site 2 LOCATION : Chesapeake, Virginia

ELEVATION : N/A TRENCHING CONTRACTOR : IMS Environmental

DRILLING METHOD AND EQUIPMENT USED : N/A

WATER LEVELS : N/A START : 6/30/01 16:30 END : 6/30/01 16:45 LOGGER : P. Landin

Depth (inches)	Interval (inches)	CORE DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. OVM (ppm): Breathing Zone Above Hole
2, 4, 6	0-6"	Top soil.	Root structure for phragmites.
8, 10, 12, 14, 16, 18, 20, 22, 24	6-24"	Gravel to cobble FILL with some silt.	Concrete and asphalt chunks.
26, 28, 30, 32, 34, 36, 38, 40, 42, 44, 46, 48, 50, 52, 54			Total Depth 2' Photo 25(8) Blast grit not observed except for dusting on surface.

PROJECT NUMBER	TEST PIT NUMBER	
138804.FI.TR	SJS02-TRENCH 26	SHEET 1 OF 1

TEST PIT LOG

PROJECT : St. Juliens Creek Annex - Site 2 LOCATION : Chesapeake, Virginia

ELEVATION : N/A TRENCHING CONTRACTOR : IMS Environmental

DRILLING METHOD AND EQUIPMENT USED : N/A

WATER LEVELS : N/A START : 6/30/01 16:45 END : 6/30/01 17:00 LOGGER : P. Landin

Depth (inches)	Interval (inches)	CORE DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. OVM (ppm): Breathing Zone Above Hole
2			
4	0-12"	Gravel to cobble FILL.	Chunks of asphalt and concrete. Blast grit only on surface. Assume this location similar to others in area with fill present.
6			
8			
10			
12			Total Depth 1'
14			
16			
18			
20			
22			
24			
26			
28			
30			
32			
34			
36			
38			
40			
42			
44			
46			
48			
50			
52			
54			

PROJECT NUMBER	TEST PIT NUMBER	
138804.FI.TR	SJS02-TRENCH 27	SHEET 1 OF 1

TEST PIT LOG

PROJECT : St. Juliens Creek Annex - Site 2 LOCATION : Chesapeake, Virginia

ELEVATION : N/A TRENCHING CONTRACTOR : IMS Environmental

DRILLING METHOD AND EQUIPMENT USED : N/A

WATER LEVELS : N/A START : 7/2/01 09:50 END : 7/2/01 10:30 LOGGER : B. Friedmann

Depth (inches)	Interval (inches)	CORE DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. OVM (ppm): Breathing Zone Above Hole
2			
4	0-14"	GRAVEL and SAND, black.	Blast grit on surface, black.
6			
8			
10			
12			
14			
16			
18			
20	14-42"	SAND and GRAVEL, brown.	Bricks
22			
24			
26			
28			
30			
32			
34			
36			Water at 3' bgs.
38			
40			
42			
44	42-50"		Asphalt pieces, black, odor.
46			
48			
50			
52	50-54"		Wood
54			
			Collected sample SJS02-SB15-001 for Metals

PROJECT NUMBER	TEST PIT NUMBER	
138804.FI.TR	SJS02-TRENCH 31	SHEET 1 OF 1

TEST PIT LOG

PROJECT : St. Juliens Creek Annex - Site 2 LOCATION : Chesapeake, Virginia

ELEVATION : N/A TRENCHING CONTRACTOR : IMS Environmental

DRILLING METHOD AND EQUIPMENT USED : N/A

WATER LEVELS : N/A START : 7/2/01 12:20 END : 7/2/01 12:50 LOGGER : B. Friedmann

Depth (inches)	Interval (inches)	CORE DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. OVM (ppm): Breathing Zone Above Hole
2			
4	0-10"	Top soil and silty SAND, dry, roots.	
6			
8			
10			
12			
14			
16			
18			
20	10-34"	Silty SAND, gray to dark gray, wet, sticky, non plastic.	
22			
24			
26			
28			
30			
32			
34			
36			Total Depth 2'10" Length 10' Photo 24 Looks natural, high root content.
38			
40			
42			
44			
46			
48			
50			
52			
54			

PROJECT NUMBER	TEST PIT NUMBER	
138804.FI.TR	SJS02-TRENCH 32	SHEET 1 OF 1

TEST PIT LOG

PROJECT : St. Juliens Creek Annex - Site 2 LOCATION : Chesapeake, Virginia

ELEVATION : N/A TRENCHING CONTRACTOR : IMS Environmental

DRILLING METHOD AND EQUIPMENT USED : N/A

WATER LEVELS : N/A START : 7/2/01 12:50 END : 7/2/01 13:34 LOGGER : B. Friedmann

Depth (inches)	Interval (inches)	CORE DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. OVM (ppm): Breathing Zone Above Hole
2	0-4"	Silty SAND, brown, dry, abundant roots.	No blast grit. Pieces of concrete at surface.
4			
6			
8			
10			
12			
14	4-36"	Sandy SILT, brown, cohesive, non plastic, roots.	
16			
18			
20			
22			
24			
26			
28			
30			
32			
34			
36			
38			
40	36-52"	Silty SAND, black, abundant tree limbs.	No odor or indication of burnt material. Wood is not burnt.
42			
44			
46			
48		SILT layer, gray.	Just above silt is abundance of tree limbs several inches in diameter. Photo 23 & 22 Water filling in at 4' bgs.
50			
52			
54	52-72"	SAND, gray to dark gray	No asphalt seen

PROJECT NUMBER	TEST PIT NUMBER	
138804.FI.TR	SJS02-TRENCH 33	SHEET 1 OF 1

TEST PIT LOG

PROJECT : St. Juliens Creek Annex - Site 2 LOCATION : Chesapeake, Virginia

ELEVATION : N/A TRENCHING CONTRACTOR : IMS Environmental

DRILLING METHOD AND EQUIPMENT USED : N/A

WATER LEVELS : N/A START : 7/2/01 12:50 END : 7/2/01 13:34 LOGGER : B. Friedmann

Depth (inches)	Interval (inches)	CORE DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. OVM (ppm): Breathing Zone Above Hole
2, 4, 6, 8, 10, 12	0-12"	Sandy SILT, brown to tan, dry, loose, roots.	
14, 16, 18, 20, 22, 24, 26, 28, 30, 32, 34, 36	12-36"	Debris.	Wood, paper, cans, bottles, metal spikes, plywood. No indication of blast grit.
38, 40, 42, 44, 46, 48	36-48"	Silty SAND, gray, moist, cohesive, non plastic.	
50, 52, 54	48-60"	SAND with some silt, natural, tan to brown, moist.	Total Depth 5'

PROJECT NUMBER	TEST PIT NUMBER	
138804.FI.TR	SJS02-TRENCH 34	SHEET 1 OF 1

TEST PIT LOG

PROJECT : St. Juliens Creek Annex - Site 2 LOCATION : Chesapeake, Virginia

ELEVATION : N/A TRENCHING CONTRACTOR : IMS Environmental

DRILLING METHOD AND EQUIPMENT USED : N/A

WATER LEVELS : N/A START : 7/2/01 14:27 END : 7/2/01 14:50 LOGGER : B. Friedmann

Depth (inches)	Interval (inches)	CORE DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. OVM (ppm): Breathing Zone Above Hole
2			
4			
6			
8			
10			
12	0-30"	Silty SAND, brown to tan, dry, loose to slightly cohesive.	
14			
16			
18			
20			
22			
24			
26			
28			
30			
32			
34	30-42"	Dark stained horizon.	Collected sample SJS02-SB17-001.
36			
38			
40			
42			
44			
46	42-66"	Silty SAND, black.	
48			Abundant wood, tree branches to 1" x 4"
50			
52			Water at 5' bgs.
54			Collapsing, could not reach bottom. Total Depth 5' 6"

PROJECT NUMBER	TEST PIT NUMBER	
138804.FI.TR	SJS02-TRENCH 35	SHEET 1 OF 1

TEST PIT LOG

PROJECT : St. Juliens Creek Annex - Site 2 LOCATION : Chesapeake, Virginia

ELEVATION : N/A TRENCHING CONTRACTOR : IMS Environmental

DRILLING METHOD AND EQUIPMENT USED : N/A

WATER LEVELS : N/A START : 7/2/01 15:40 END : 7/2/01 16:56 LOGGER : B. Friedmann

Depth (inches)	Interval (inches)	CORE DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. OVM (ppm): Breathing Zone Above Hole
2, 4, 6, 8, 10, 12	0-12"	Gravel and brick in a silty SAND matrix, gray, dry, loose.	
14, 16, 18, 20, 22, 24	12-24"	Same as above with more SILT, slightly more cohesive.	
26, 28, 30, 32, 34, 36, 38, 40, 42, 44, 46, 48	24-48"	Brick, SAND, and SILT.	Petroleum odor. Collapsing, could not reach bottom. Water at 3'6" bgs.
50, 52, 54			Total Depth 4' Photos 18-16 No indication of blast grit.

PROJECT NUMBER	TEST PIT NUMBER	
138804.FI.TR	SJS02-TRENCH 36	SHEET 1 OF 1

TEST PIT LOG

PROJECT : St. Juliens Creek Annex - Site 2 LOCATION : Chesapeake, Virginia

ELEVATION : N/A TRENCHING CONTRACTOR : IMS Environmental

DRILLING METHOD AND EQUIPMENT USED : N/A

WATER LEVELS : N/A START : 7/2/01 16:56 END : 7/2/01 17:00 LOGGER : B. Friedmann

Depth (inches)	Interval (inches)	CORE DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. OVM (ppm): Breathing Zone Above Hole
2, 4, 6	0-6"	Top soil and silty CLAY, brown, moist to wet, sticky, non plastic.	
8, 10, 12, 14, 16, 18, 20, 22, 24	6-24"	Black organic layer.	Petroleum odor.
26, 28, 30	24-30"	SILT, brown, sticky, non plastic.	Slight sheen on water. Collected sample SJS02-SB18-001 for TPH
32, 34, 36, 38, 40, 42, 44, 46, 48, 50, 52, 54			Total Depth 2'6"

PROJECT NUMBER	TEST PIT NUMBER	
138804.FI.TR	SJS02-TRENCH 37	SHEET 1 OF 1

TEST PIT LOG

PROJECT : St. Juliens Creek Annex - Site 2 LOCATION : Chesapeake, Virginia

ELEVATION : N/A TRENCHING CONTRACTOR : IMS Environmental

DRILLING METHOD AND EQUIPMENT USED : N/A

WATER LEVELS : N/A START : 7/3/01 08:00 END : 7/3/01 10:00 LOGGER : B. Friedmann

Depth (inches)	Interval (inches)	CORE DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. OVM (ppm): Breathing Zone Above Hole
2			
4			
6			
8			
10	0-24"	Small top soil horizon then fine to medium grained silty SAND, dry, loose.	Piece of brick and pipe.
12			
14			
16			
18			
20			
22			
24			Collected sample SJS02-SB19-001.
26			
28			
30			
32			
34			
36			
38	24-60"	Sandy SILT, wet, cohesive, nonfriable.	No odor.
40			Tarpaper, black soils, wood, may have been burned.
42			
44			
46			
48			
50			
52		**At 60":** Silty SAND, brown.	Bail of hay.
54		**At 60-84":** SAND with silt, brown	Some wood

PROJECT NUMBER	TEST PIT NUMBER	
138804.FI.TR	SJS02-TRENCH 38	SHEET 1 OF 1

TEST PIT LOG

PROJECT : St. Juliens Creek Annex - Site 2 LOCATION : Chesapeake, Virginia

ELEVATION : N/A TRENCHING CONTRACTOR : IMS Environmental

DRILLING METHOD AND EQUIPMENT USED : N/A

WATER LEVELS : N/A START : 7/3/01 13:35 END : 7/3/01 14:15 LOGGER : B. Francisco

Depth (inches)	Interval (inches)	CORE DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. OVM (ppm): Breathing Zone Above Hole
2			
4	0-12"	Organic SAND with silt, brown, moist, roots.	
6			
8			
10			
12			
14			
16			
18			
20	12-60"	Silty SAND, black, wet.	Wood fragments observed. Black staining- signs of petroleum contamination.
22			
24			
26			
28			
30			
32			
34			
36			Water table at 3' bgs.
38			
40			
42			
44			
46			
48			
50			
52			Appears to be natural.
54	60-84"	SILT, gray, saturated, roots in top 1'	Total Depth 7'

PROJECT NUMBER	TEST PIT NUMBER	
138804.FI.TR	SJS02-TRENCH 39	SHEET 1 OF 1

TEST PIT LOG

PROJECT : St. Juliens Creek Annex - Site 2 LOCATION : Chesapeake, Virginia

ELEVATION : N/A TRENCHING CONTRACTOR : IMS Environmental

DRILLING METHOD AND EQUIPMENT USED : N/A

WATER LEVELS : N/A START : 7/3/01 14:15 END : 7/3/01 14:45 LOGGER : B. Francisco

Depth (inches)	Interval (inches)	CORE DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. OVM (ppm): Breathing Zone Above Hole
2	0-4"	Silty SAND-top soil, brown, very moist.	
4			
6			
8			
10	4-24"	SAND with trace fines, mottled tan and gray.	Gravel from a drain or pipe bed approx. 6" bgs on side of excavation closest to culvert. Water table at 1'6" bgs.
12			
14			
16			
18			
20			
22			
24			
26			Total Depth 2'1" Photo 22 No apparent contamination.
28			
30			
32			
34			
36			
38			
40			
42			
44			
46			
48			
50			
52			
54			

PROJECT NUMBER	TEST PIT NUMBER	
138804.FI.TR	SJS02-TRENCH 40	SHEET 1 OF 1

TEST PIT LOG

PROJECT : St. Juliens Creek Annex - Site 2 LOCATION : Chesapeake, Virginia

ELEVATION : N/A TRENCHING CONTRACTOR : IMS Environmental

DRILLING METHOD AND EQUIPMENT USED : N/A

WATER LEVELS : N/A START : 7/3/01 14:45 END : 7/3/01 15:30 LOGGER : B. Francisco

Depth (inches)	Interval (inches)	CORE DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. OVM (ppm): Breathing Zone Above Hole
2			
4	0-18"	SAND with some silt, moist.	Possible fill - plastic and gravel pieces visible.
6			
8			
10			
12			
14			
16			
18			
20			There is a 1" layer of dark brown silty sand at 19" bgs. Contains porcelain fragments. No unusual odor.
22			
24			
26			
28			
30	18-60"	Silty SAND, brown and orange, moist to very moist.	Appears to be natural soil.
32			
34			
36			
38			
40			
42			
44			
46			
48			
50			
52			
54			Total Depth 5'

PROJECT NUMBER	TEST PIT NUMBER	
138804.FI.TR	SJS02-TRENCH 41	SHEET 1 OF 1

TEST PIT LOG

PROJECT : St. Juliens Creek Annex - Site 2 LOCATION : Chesapeake, Virginia

ELEVATION : N/A TRENCHING CONTRACTOR : IMS Environmental

DRILLING METHOD AND EQUIPMENT USED : N/A

WATER LEVELS : N/A START : 7/3/01 15:30 END : 7/3/01 16:15 LOGGER : B. Francisco

Depth (inches)	Interval (inches)	CORE DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. OVM (ppm): Breathing Zone Above Hole
	0-4"	Sandy SILT, brown, moist.	Brick, clay, and concrete fragments.
2			
4			
6			
8			
10			
	4"-54"	Silt, gray, wet. Black statining observed at top of silt layer.	Petroleum odor.
12			
14			
16			
18			
20			
22			
24			
26			
28			
30			
32			
34			
36			
38			
40			
42			
44			
46			
48			
50			
52			
54			Total Depth 4'6"

PROJECT NUMBER	TEST PIT NUMBER	
138804.FI.TR	SJS02-TRENCH 42	SHEET 1 OF 1

TEST PIT LOG

PROJECT : St. Juliens Creek Annex - Site 2 LOCATION : Chesapeake, Virginia

ELEVATION : N/A TRENCHING CONTRACTOR : IMS Environmental

DRILLING METHOD AND EQUIPMENT USED : N/A

WATER LEVELS : N/A START : 7/3/01 16:15 END : 7/3/01 16:45 LOGGER : B. Francisco

Depth (inches)	Interval (inches)	CORE DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. OVM (ppm): Breathing Zone Above Hole
2			
4			
6			
8			
10			
12			
14			
16			
18	0-42"	Sandy SILT, brown, damp.	Concrete, brick fragments visible.
20			
22			
24			
26			
28			
30			
32			
34			
36			
38			
40			
42			
44	42-60"	Organic SILT, gray, saturated.	Decayed vegetation and oyster shell fragments visible at 5' bgs. This is the probable boundary between natural wetland soil and fill.
46			
48			
50			
52			Water table at 4.5' bgs.
54			Total Depth 5'3"

PROJECT NUMBER	TEST PIT NUMBER	
138804.FI.TR	SJS02-TRENCH 43	SHEET 1 OF 1

TEST PIT LOG

PROJECT : St. Juliens Creek Annex - Site 2 LOCATION : Chesapeake, Virginia

ELEVATION : N/A TRENCHING CONTRACTOR : IMS Environmental

DRILLING METHOD AND EQUIPMENT USED : N/A

WATER LEVELS : N/A START : 7/3/01 16:45 END : 7/3/01 17:15 LOGGER : B. Francisco

Depth (inches)	Interval (inches)	CORE DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. OVM (ppm): Breathing Zone Above Hole
2			
4	0-12"	Silty SAND, brown, moist.	40mm cartridge casing observed. Asphalt observed in top 1'.
6			
8			
10			
12			
14			
16			
18			
20			
22			
24			
26			
28			
30	12-60"	Silty sand FILL, dark gray to dark brown.	Concrete and metal fragments.
32			
34			
36			
38			
40			
42			
44			
46			
48			
50			
52			Water table at 4.5' bgs.
54			Total Depth 5'

PROJECT NUMBER	TEST PIT NUMBER	
138804.FI.TR	SJS02-TRENCH 44	SHEET 1 OF 1

TEST PIT LOG

PROJECT : St. Juliens Creek Annex - Site 2 LOCATION : Chesapeake, Virginia

ELEVATION : N/A TRENCHING CONTRACTOR : IMS Environmental

DRILLING METHOD AND EQUIPMENT USED : N/A

WATER LEVELS : N/A START : 7/5/01 07:55 END : 7/5/01 08:25 LOGGER : B. Francisco

Depth (inches)	Interval (inches)	CORE DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. OVM (ppm): Breathing Zone Above Hole
2			
4	0-18"	Sandy SILT, brown, damp.	Asphalt and concrete fragments observed.
6			
8			
10			
12			
14			
16			
18	18-21.6"	Sandy SILT with organic matter, black, moist.	Organic odor.
20			
22			
24			
26			
28			
30	21.6-66"	SAND with some fines, brown, very moist.	Appears to be natural soil.
32			
34			
36			
38			
40			
42			
44			
46			
48			
50			
52			
54			Total Depth 5'6"

PROJECT NUMBER	TEST PIT NUMBER	
138804.FI.TR	SJS02-TRENCH 45	SHEET 1 OF 1

TEST PIT LOG

PROJECT : St. Juliens Creek Annex - Site 2 LOCATION : Chesapeake, Virginia

ELEVATION : N/A TRENCHING CONTRACTOR : IMS Environmental

DRILLING METHOD AND EQUIPMENT USED : N/A

WATER LEVELS : N/A START : 7/5/01 08:25 END : 7/5/01 09:00 LOGGER : B. Francisco

Depth (inches)	Interval (inches)	CORE DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. OVM (ppm): Breathing Zone Above Hole
2			
4	0-18"	Sandy SILT, brown, damp.	
6			
8			
10			
12			
14			
16			
18	18-19"	Sandy SILT, black, moist.	
20			
22			
24			
26			
28	19-54"	Sand with some fines, brown, moist.	
30			
32			
34			
36			
38			
40			
42			
44			
46			
48			
50			
52			
54	54-66"	Sandy SILT, gray, very moist, organic layer	Total Depth 5'4"

PROJECT NUMBER	TEST PIT NUMBER	
138804.FI.TR	SJS02-TRENCH 46	SHEET 1 OF 1

TEST PIT LOG

PROJECT : St. Juliens Creek Annex - Site 2 LOCATION : Chesapeake, Virginia

ELEVATION : N/A TRENCHING CONTRACTOR : IMS Environmental

DRILLING METHOD AND EQUIPMENT USED : N/A

WATER LEVELS : N/A START : 7/5/01 09:00 END : 7/5/01 09:50 LOGGER : B. Francisco

Depth (inches)	Interval (inches)	CORE DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. OVM (ppm): Breathing Zone Above Hole
2			
4			
6			
8			
10			
12	0-30"	Sandy SILT, brown, damp.	Concrete, brick and metal pipe fragments observed.
14			
16			
18			
20			
22			
24			
26			
28			
30			
32			
34			
36			Water table at 3' bgs.
38			
40	30-60"	SILT, gray, saturated.	
42			Appears to be natural soil.
44			
46			
48			
50			
52			
54			Total Depth 5'2"

PROJECT NUMBER	TEST PIT NUMBER	
138804.FI.TR	SJS02-TRENCH 47	SHEET 1 OF 1

TEST PIT LOG

PROJECT : St. Juliens Creek Annex - Site 2 LOCATION : Chesapeake, Virginia

ELEVATION : N/A TRENCHING CONTRACTOR : IMS Environmental

DRILLING METHOD AND EQUIPMENT USED : N/A

WATER LEVELS : N/A START : 7/5/01 09:50 END : 7/5/01 10:20 LOGGER : B. Francisco

Depth (inches)	Interval (inches)	CORE DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. OVM (ppm): Breathing Zone Above Hole
2			
4			
6			
8			
10	0-33"	Sandy SILT, brown, damp.	Brick, concrete, and wood fragments present.
12			
14			
16			
18			
20			
22			
24			
26			
28			
30			
32			
34			
36			Water table at 3'.
38			
40	33-48"	SILT, gray with some black staining, saturated.	Staining probably due to organic material at surface of silt layer.
42			
44			
46			
48			
50			Total Depth 4' Photo 31
52			
54			

PROJECT NUMBER	TEST PIT NUMBER	
138804.FI.TR	SJS02-TRENCH 48	SHEET 1 OF 1

TEST PIT LOG

PROJECT : St. Juliens Creek Annex - Site 2 LOCATION : Chesapeake, Virginia

ELEVATION : N/A TRENCHING CONTRACTOR : IMS Environmental

DRILLING METHOD AND EQUIPMENT USED : N/A

WATER LEVELS : N/A START : 7/5/01 10:20 END : 7/5/01 10:40 LOGGER : B. Francisco

Depth (inches)	Interval (inches)	CORE DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. OVM (ppm): Breathing Zone Above Hole
2			
4			
6			
8			
10			
12			
14			
16	0-42"	Sandy SILT, brown, damp.	Brick, concrete, and metal fragments observed.
18			
20			
22			
24			
26			
28			
30			
32			
34			
36			
38			
40			
42			
44	42-78"	SILT, gray, saturated.	Brick, concrete, and wood fragments observed.
46			
48			Burned paper and insulating material observed at 4' bgs.
50			Encountered what appears to be an abandoned pipe at 4' bgs.
52			Collected sample SBS02-SB20-001 for diox
54			Total Depth 4'4" Photo 30-29 Extended to 6'7"

PROJECT NUMBER	TEST PIT NUMBER	
138804.FI.TR	SJS02-TRENCH 49	SHEET 1 OF 1

TEST PIT LOG

PROJECT : St. Juliens Creek Annex - Site 2 LOCATION : Chesapeake, Virginia

ELEVATION : N/A TRENCHING CONTRACTOR : IMS Environmental

DRILLING METHOD AND EQUIPMENT USED : N/A

WATER LEVELS : N/A START : 7/5/01 11:20 END : 7/5/01 12:05 LOGGER : B. Francisco

Depth (inches)	Interval (inches)	CORE DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. OVM (ppm): Breathing Zone Above Hole
2			
4			
6			
8			
10	0-24"	Sandy SILT, brown, damp.	Brick, timber and concrete fragments present.
12			
14			
16			
18			
20			
22			
24			
26	24-30"	Sandy SILT, gray, damp.	
28			
30			
32			
34			
36	24-66"	Silty SAND, gray with black staining from 4' down.	
38			
40			
42			
44			
46			
48			
50			
52			Water table at 5' bgs.
54	66-72"	SILT, gray, saturated	Total Depth 6', Photo 27

PROJECT NUMBER	TEST PIT NUMBER	
138804.FI.TR	SJS02-TRENCH 50	SHEET 1 OF 1

TEST PIT LOG

PROJECT : St. Juliens Creek Annex - Site 2 LOCATION : Chesapeake, Virginia

ELEVATION : N/A TRENCHING CONTRACTOR : IMS Environmental

DRILLING METHOD AND EQUIPMENT USED : N/A

WATER LEVELS : N/A START : 7/5/01 12:05 END : 7/5/01 12:30 LOGGER : B. Francisco

Depth (inches)	Interval (inches)	CORE DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. OVM (ppm): Breathing Zone Above Hole
2			
4			
6			
8			
10			
12	0-42"	Sandy SILT, brown, moist.	Concrete fragments observed.
14			
16			
18			
20			
22			
24			
26			
28			
30			
32			
34			
36			
38			
40			
42			
44			
46			
48			
50			
	42-79"	Gravelly SILT with some sand, gray, very moist.	Wood and brick fragments observed.
52			
54			Total Depth 6'7"

PROJECT NUMBER	TEST PIT NUMBER	
138804.FI.TR	SJS02-TRENCH 51	SHEET 1 OF 1

TEST PIT LOG

PROJECT : St. Juliens Creek Annex - Site 2 LOCATION : Chesapeake, Virginia

ELEVATION : N/A TRENCHING CONTRACTOR : IMS Environmental

DRILLING METHOD AND EQUIPMENT USED : N/A

WATER LEVELS : N/A START : 7/5/01 12:30 END : 7/5/01 13:15 LOGGER : B. Francisco

Depth (inches)	Interval (inches)	CORE DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. OVM (ppm): Breathing Zone Above Hole
2			
4			
6			
8			
10			
12	0-36"	Sandy SILT, brown, damp.	Concrete, wood, and metal fragments observed.
14			
16			
18			
20			
22			
24			
26			
28			
30			
32			
34			
36			
38			
40			
42			
44	36-72"	Sandy SILT, mottled blue gray, saturated.	Wood fragments and organic material present. Strong organic odor. Water table at 6' bgs.
46			
48			
50			
52			
54			Total Depth 6'

PROJECT NUMBER	TEST PIT NUMBER	
138804.FI.TR	SJS02-TRENCH 52	SHEET 1 OF 1

TEST PIT LOG

PROJECT : St. Juliens Creek Annex - Site 2 LOCATION : Chesapeake, Virginia

ELEVATION : N/A TRENCHING CONTRACTOR : IMS Environmental

DRILLING METHOD AND EQUIPMENT USED : N/A

WATER LEVELS : N/A START : 7/5/01 13:15 END : 7/5/01 13:45 LOGGER : B. Francisco

Depth (inches)	Interval (inches)	CORE DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. OVM (ppm): Breathing Zone Above Hole
2	0-4"	Top soil.	
4			
6			
8	4-18"	Sandy SILT, brown, damp.	Brick, plastic, concrete and metal fragments observed.
10			
12			
14			
16			
18			
20			
22			
24			
26			
28			
30	18-78"	Silty SAND, brown, moist to saturated.	Appears to be natural material.
32			
34			
36			
38			
40			
42			
44			
46			
48			
50			
52			Water table at 6.5' bgs.
54			Total Depth 6'6"

PROJECT NUMBER	TEST PIT NUMBER	
138804.FI.TR	SJS02-TRENCH 53	SHEET 1 OF 1

TEST PIT LOG

PROJECT : St. Juliens Creek Annex - Site 2 LOCATION : Chesapeake, Virginia

ELEVATION : N/A TRENCHING CONTRACTOR : IMS Environmental

DRILLING METHOD AND EQUIPMENT USED : N/A

WATER LEVELS : N/A START : 7/5/01 13:45 END : 7/5/01 14:10 LOGGER : B. Francisco

Depth (inches)	Interval (inches)	CORE DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. OVM (ppm): Breathing Zone Above Hole
2			
4	0-12"	Top soil, dark brown, damp.	Brick and concrete fragments observed.
6			
8			
10			
12			
14			
16			
18			
20			
22			
24			
26	12-78"	Silty SAND, mottled tan and gray, moist to saturated.	Appears to be natural soil.
28			
30			
32			
34			
36			
38			
40			
42			
44			
46			
48			
50			
52			Water table at 5.5' bgs.
54			Total Depth 6'5"

PROJECT NUMBER	TEST PIT NUMBER	
138804.FI.TR	SJS02-TRENCH 54	SHEET 1 OF 1

TEST PIT LOG

PROJECT : St. Juliens Creek Annex - Site 2 LOCATION : Chesapeake, Virginia

ELEVATION : N/A TRENCHING CONTRACTOR : IMS Environmental

DRILLING METHOD AND EQUIPMENT USED : N/A

WATER LEVELS : N/A START : 7/5/01 13:45 END : 7/5/01 14:10 LOGGER : B. Francisco

Depth (inches)	Interval (inches)	CORE DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. OVM (ppm): Breathing Zone Above Hole
	0-5"	Top soil, dark brown, damp.	Brick and gravel fragments observed.
2			
4			
6			
8			
10			
12			
14			
16			
18			
20			
	5-72"	Silty SAND, tan, moist to saturated.	Appears to be natural material.
22			
24			
26			
28			
30			
32			
34			
36			
38			
40			
42			
44			
46			
48			
50			
52			Water table at 5.5' bgs.
54			Total Depth 6'1"

PROJECT NUMBER	TEST PIT NUMBER	
138804.FI.TR	SJS02-TRENCH 55	SHEET 1 OF 1

TEST PIT LOG

PROJECT : St. Juliens Creek Annex - Site 2 LOCATION : Chesapeake, Virginia

ELEVATION : N/A TRENCHING CONTRACTOR : IMS Environmental

DRILLING METHOD AND EQUIPMENT USED : N/A

WATER LEVELS : N/A START : 7/5/01 14:35 END : 7/5/01 15:05 LOGGER : B. Francisco

Depth (inches)	Interval (inches)	CORE DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. OVM (ppm): Breathing Zone Above Hole
2			
4			
6			
8			
10			
12			
14			
16			
18			
20			
	0-54"	Sandy SILT, brown, damp.	Brick, metal sheeting and large 1-2' concrete blocks observed.
22			
24			
26			
28			
30			
32			
34			
36			
38			
40			
42			
44			
46			
48			
50			
52			
54			
	54-66"	Gravelly SILT with some ssand, gray	Total Depth 5'6". Water table at 5.5' bgs

PROJECT NUMBER	TEST PIT NUMBER	
138804.FI.TR	SJS02-TRENCH 56	SHEET 1 OF 1

TEST PIT LOG

PROJECT : St. Juliens Creek Annex - Site 2 LOCATION : Chesapeake, Virginia

ELEVATION : N/A TRENCHING CONTRACTOR : IMS Environmental

DRILLING METHOD AND EQUIPMENT USED : N/A

WATER LEVELS : N/A START : 7/5/01 15:05 END : 7/5/01 15:30 LOGGER : B. Francisco

Depth (inches)	Interval (inches)	CORE DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. OVM (ppm): Breathing Zone Above Hole
2	0-3"	Top soil with organics, mottled tan, black, and brown.	Wood fragments observed.
4			
6			
8			
10			
12			
14			
16			
18			
20	3-72"	Silty SAND, tan, moist to saturated.	Appears to be natural soil.
22			
24			
26			
28			
30			
32			
34			
36			
38			
40			
42			
44			
46			
48			
50			
52			Water table at 5.5' bgs.
54			Total Depth 5'9"

PROJECT NUMBER	TEST PIT NUMBER	
138804.FI.TR	SJS02-TRENCH 57	SHEET 1 OF 1

TEST PIT LOG

PROJECT : St. Juliens Creek Annex - Site 2 LOCATION : Chesapeake, Virginia

ELEVATION : N/A TRENCHING CONTRACTOR : IMS Environmental

DRILLING METHOD AND EQUIPMENT USED : N/A

WATER LEVELS : N/A START : 7/5/01 15:30 END : 7/5/01 16:15 LOGGER : B. Francisco

Depth (inches)	Interval (inches)	CORE DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. OVM (ppm): Breathing Zone Above Hole
2	0-2"	Silty SAND and top soil with rounded quartz gravel, brown.	Brick and glass fragments observed.
4			
6			
8			
10			
12			
14			
16			
18			
20	2-48"	Organic silty SAND, orange brown, moist.	Appears to be natural soil.
22			
24			
26			
28			
30			
32			
34			
36			
38			
40			
42			
44			
46			
48			
50			Total Depth 4'1" Photo 17 No apparent contamination or blast grit observed.
52			
54			

PROJECT NUMBER	TEST PIT NUMBER	
138804.FI.TR	SJS02-TRENCH 58	SHEET 1 OF 1

TEST PIT LOG

PROJECT : St. Juliens Creek Annex - Site 2 LOCATION : Chesapeake, Virginia

ELEVATION : N/A TRENCHING CONTRACTOR : IMS Environmental

DRILLING METHOD AND EQUIPMENT USED : N/A

WATER LEVELS : N/A START : 7/6/01 08:10 END : 7/6/01 08:35 LOGGER : B. Francisco

Depth (inches)	Interval (inches)	CORE DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. OVM (ppm): Breathing Zone Above Hole
2			
4			
6			
8			
10	0-54"	Silty SAND with gravel, brown.	Large concrete blocks and metal pipe observed.
12			
14			
16			
18			
20			
22			
24			
26			
28			
30			
32			
34			
36			
38			
40			
42			
44			
46			
48			
50			
52			
54			
	54-72"	Gravelly SAND with some silt, organic	Total Depth 6'2" Water table at 5' bgs

PROJECT NUMBER	TEST PIT NUMBER	
138804.FI.TR	SJS02-TRENCH 59	SHEET 1 OF 1

TEST PIT LOG

PROJECT : St. Juliens Creek Annex - Site 2 LOCATION : Chesapeake, Virginia

ELEVATION : N/A TRENCHING CONTRACTOR : IMS Environmental

DRILLING METHOD AND EQUIPMENT USED : N/A

WATER LEVELS : N/A START : 7/6/01 08:35 END : 7/6/01 09:10 LOGGER : B. Francisco

Depth (inches)	Interval (inches)	CORE DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. OVM (ppm): Breathing Zone Above Hole
2			
4			
6			
8			
10	0-24"	Sandy SILT, brown, damp.	Brick and concrete fragments observed.
12			
14			
16			
18			
20			
22			
24			
26			
28			
30	24-72"	Silty SAND, dark brown.	Blast grit observed.
32			
34			
36			
38			
40			
42			
44			
46			
48			
50			
52			
54	72-90"	Silty SAND with organic material, brown	Total Depth 6'6" Photo 34-33 Extended Total Depth 8'3" Photo 32

PROJECT NUMBER	TEST PIT NUMBER	
138804.FI.TR	SJS02-TRENCH 60	SHEET 1 OF 1

TEST PIT LOG

PROJECT : St. Juliens Creek Annex - Site 2 LOCATION : Chesapeake, Virginia

ELEVATION : N/A TRENCHING CONTRACTOR : IMS Environmental

DRILLING METHOD AND EQUIPMENT USED : N/A

WATER LEVELS : N/A START : 7/6/01 09:10 END : 7/6/01 09:50 LOGGER : B. Francisco

Depth (inches)	Interval (inches)	CORE DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. OVM (ppm): Breathing Zone Above Hole
2			
4			
6	0-15"	Sandy SILT, brown, damp.	Brick, concrete, and wood fragments observed.
8			
10			
12			
14			
16	15-19"	Silty SAND, black, damp.	No blast grit present.
18			
20			
22			
24			
26			
28			
30	19-90"	Silty SAND, mottled tan and gray, moist to saturated.	Appears to be natural soil.
32			
34			
36			
38			
40			
42			
44			
46			
48			
50			
52			Water table at 5' bgs.
54			Total Depth 7'6" Photo 29-28

PROJECT NUMBER	TEST PIT NUMBER	
138804.FI.TR	SJS02-TRENCH 61	SHEET 1 OF 1

TEST PIT LOG

PROJECT : St. Juliens Creek Annex - Site 2 LOCATION : Chesapeake, Virginia

ELEVATION : N/A TRENCHING CONTRACTOR : IMS Environmental

DRILLING METHOD AND EQUIPMENT USED : N/A

WATER LEVELS : N/A START : 7/6/01 09:50 END : 7/6/01 10:00 LOGGER : B. Francisco

Depth (inches)	Interval (inches)	CORE DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. OVM (ppm): Breathing Zone Above Hole
2			
4			
6			
8			
10	0-36"	Sandy SILT with rounded quartz gravel, brown, damp.	Concrete blocks and glass bottles observed.
12			
14			
16			
18			
20			
22			
24			
26			
28			
30			
32			
34			
36			
38			
40	36-54"	Gravelly SILT with some sand, black, damp.	Slag and brick fragments observed.
42			
44			
46			
48			Collect sample SJS02-SB23-001 for metals
50			
52			
54			
	54-84"	Silty SAND, mottled tan and gray, saturated	Total Depth 7'2"

PROJECT NUMBER	TEST PIT NUMBER	
138804.FI.TR	SJS02-TRENCH 62	SHEET 1 OF 1

TEST PIT LOG

PROJECT : St. Juliens Creek Annex - Site 2 LOCATION : Chesapeake, Virginia

ELEVATION : N/A TRENCHING CONTRACTOR : IMS Environmental

DRILLING METHOD AND EQUIPMENT USED : N/A

WATER LEVELS : N/A START : 7/6/01 10:25 END : 7/6/01 11:20 LOGGER : B. Francisco

Depth (inches)	Interval (inches)	CORE DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. OVM (ppm): Breathing Zone Above Hole
2	0-6"	Sandy SILT, brown, damp.	Small concrete blocks observed.
4			
6			
8			
10			
12			
14			
16			
18			
20			
22			
24			
26			
28			
30	6"-84"	Silty SAND, mottled tan and gray, moist.	Appears to be natural soil.
32			
34			
36			
38			
40			
42			
44			
46			
48			
50			
52			
54			Total Depth 7'3" Photo 25

PROJECT NUMBER	TEST PIT NUMBER	
138804.FI.TR	SJS02-TRENCH 63	SHEET 1 OF 1

TEST PIT LOG

PROJECT : St. Juliens Creek Annex - Site 2 LOCATION : Chesapeake, Virginia

ELEVATION : N/A TRENCHING CONTRACTOR : IMS Environmental

DRILLING METHOD AND EQUIPMENT USED : N/A

WATER LEVELS : N/A START : 7/6/01 11:20 END : 7/6/01 12:00 LOGGER : B. Francisco

Depth (inches)	Interval (inches)	CORE DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. OVM (ppm): Breathing Zone Above Hole
2			
4			
6			
8			
10	0-36"	Sandy SILT, brown, damp.	Large concrete blocks, intact wood boards, and brick fragments present.
12			
14			
16			
18			
20			
22			
24			
26			
28			
30			
32			
34			
36			
38			
40	36-81"	Sandy SILT slightly mixed with organic material and stained black, gray, moist.	
42			
44			
46			
48			
50			
52			
54			Total Depth 6'9" Photo 24-23

PROJECT NUMBER	TEST PIT NUMBER	
138804.FI.TR	SJS02-TRENCH 64	SHEET 1 OF 1

TEST PIT LOG

PROJECT : St. Juliens Creek Annex - Site 2 LOCATION : Chesapeake, Virginia

ELEVATION : N/A TRENCHING CONTRACTOR : IMS Environmental

DRILLING METHOD AND EQUIPMENT USED : N/A

WATER LEVELS : N/A START : 7/6/01 12:00 END : 7/6/01 12:30 LOGGER : B. Francisco

Depth (inches)	Interval (inches)	CORE DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. OVM (ppm): Breathing Zone Above Hole
2			
4			
6			
8			
10	0-30"	Sandy SILT, brown, damp.	Large concrete blocks, bricks, metal, pipe pieces observed.
12			
14			
16			
18			
20			
22			
24			
26			
28			
30			
32			
34			
36			
38			
40	30-84"	Coarse to medium grained SAND, black.	Probable fill.
42			
44			
46			
48			
50			
52			Water table at 6.5' bgs.
54	84-87"	SILT, gray with some black staining	Total Depth 7'3" Photo 22

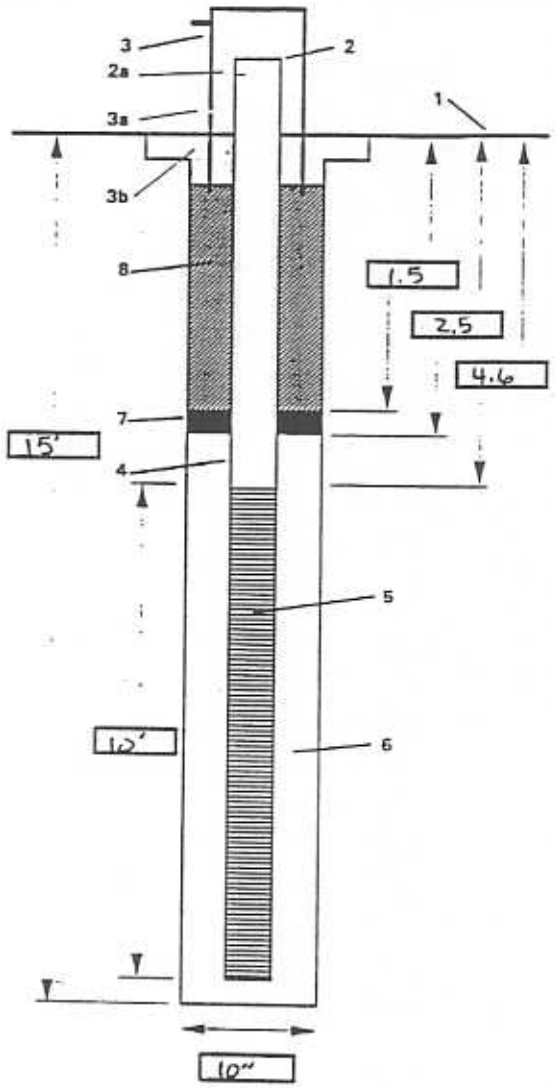
Appendix D
Soil Boring Logs and Well Construction Diagrams

CH2M HILL

PROJECT NUMBER	BORING NUMBER	SHEET	OF
6207-028	MW-15 SJS02	1	1

WELL COMPLETION DIAGRAM

PROJECT: St Juliens Creek Annex LOCATION: Landfill B - Site 2
ELEVATION: TOC: 7.72 ft DRILLING CONTRACTOR: American Environmental Drilling Services
DRILLING METHOD AND EQUIPMENT USED: 6 1/4" I.D. Hollow Stem Augers Ingersoll Rand A-300 Drill Rig
WATER LEVELS: START: 7/01/97 END: 7/12/97 LOGGER: S. Budney (CDM Federal)



1- Ground elevation at well 5.19 ft msl

2- Top of casing elevation 7.72 ft msl
a) vent hole? YES

3- Wellhead protection cover type Steel Stick up
a) weep hole? Yes
b) concrete pad dimensions 3' x 3'

4- Diameter/type of well casing 2" Dia PVC

5- Type/slot size of screen 0.010 Slot 2" Dia PVC
Screen - 4.6 - 14.6

6- Type screen filter
a) Quantity used Med. Sand 4.5 cubic ft

7- Type of seal
a) Quantity used Bentonite 1.5' - 2.5' BGS

8- Grout
a) Grout mix used Concrete
b) Method of placement NA
c) Quantity of well casing grout NA

Development method Purge / Surge

Development time 4 hrs on 7/12/97

Estimated purge volume 55 gal

Comments Bottom of well 15.1' BGS

ABOVDIAG.XLS

CH2M HILL

PROJECT NUMBER	BORING NUMBER	SHEET	OF
6207-028	MW-15 SJS02	1	1

SOIL BORING LOG

PROJECT St. Juliens Creek Annex LOCATION Land Fill B Site 2

ELEVATION GROUND 5.19 / TOC 7.72 msl (ft) DRILLING CONTRACTOR American Environmental Drilling Services

DRILLING METHOD AND EQUIPMENT 6 1/4" ID Hollow Stem Augers - Ingersoll Rand - A-300 Drill Rig

WATER LEVELS START 7/01/97 FINISH 7/01/97 LOGGER S. Budney (CDM Federal)

DEPTH BELOW SURFACE (FT)	SAMPLE INTERVAL	SAMPLE NUMBER AND TYPE	SAMPLE RECOVERY (FT)	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
		SR				Began Drilling 0800
	3-5	S-1	24/24"	1-2-2-1	3-4.4' Sandy silt trace gravel (ML) + organics interbedded with the Clay trace sand (ML) 4.4-5' Silty F. Sand with organics (SM) (roots) moist very dark greyish brown 10YR 3/2	color { greenish grey 10Y 5/1 trace light olive brown 2.5Y 5/6 OVM - 0 ppm 5' Hit water very wet
5	5-7	S-2	9/24"	2-2-3-3	Silty F. Sand wet subrounded well sorted trace organics (SM) greyish brown 2.5Y 5/2	OVM - 0 ppm
	10-12	S-3	24/24	2-3-4-1	Silty F. Sand wet subrounded (SM) Color bands - olive yellow 2.5Y 6/6 reddish yellow 7.5YR 6/8 11.8-12' Soft silty Clay (CL) grey N 5/1 Bottom of augers v. soft wet silty clay w/ F sand grey N 5/ (CL)	OVM - 0 ppm Driller reports - Material got soft at 11.5' BGS
15					Bottom of Boring 15' BGS	0925 finished Drilling

Figure 1
SOIL BORING LOG, FORM D1586

REV 11/89 FORM

PROJECT NUMBER	BORING NUMBER	SHEET	OF
6207-028	MW-25 SJS02	1	1

CH2M HILL

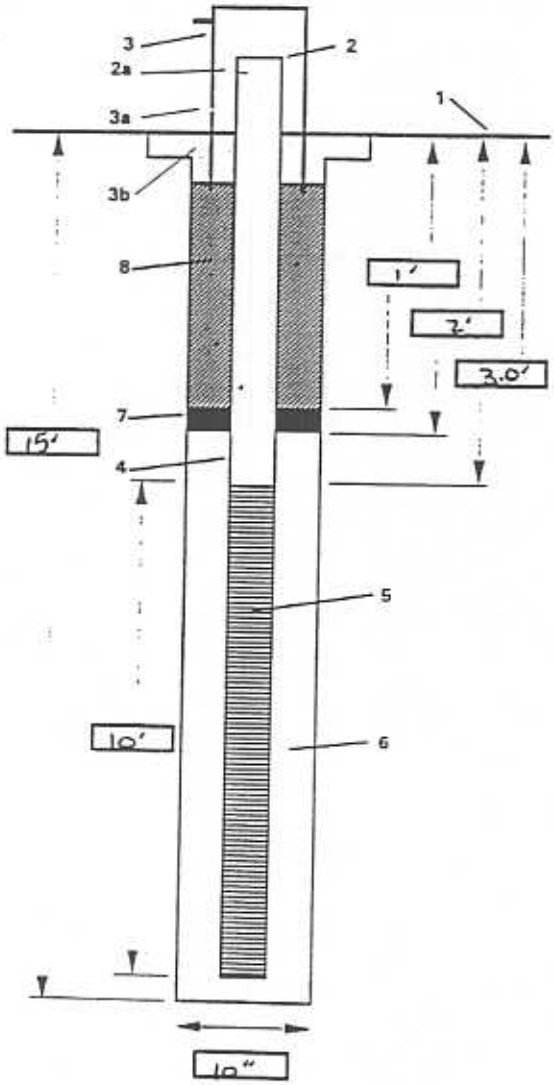
WELL COMPLETION DIAGRAM

PROJECT: St Julians Creek Annex LOCATION: Landfill B Site 2

ELEVATION: TOC ~~4.59 ft msl~~ 6.98 ft msl DRILLING CONTRACTOR: American Environmental Drilling Services

DRILLING METHOD AND EQUIPMENT USED: 6 1/4" ID Hollow Stem Auger - Ingersoll Rand A-300 Drill Rig

WATER LEVELS: START: 6/30/97 END: LOGGER: S Burney (CH2M Federal)



1- Ground elevation at well: 4.59 ft msl

2- Top of casing elevation: 6.98 ft msl
a) vent hole? Yes

3- Wellhead protection cover type: Steel - Stick up
a) weep hole? Yes
b) concrete pad dimensions: 3' x 3'

4- Diameter/type of well casing: 2" PVC

5- Type/slot size of screen: 0.010 slot 2" Dia PVC
Screen 3.0' - 13.0'

6- Type screen filter
a) Quantity used: Med. Sand ~6 cubic Ft.

7- Type of seal
a) Quantity used: Bentonite 1'-2' BGS

8- Grout
a) Grout mix used: Concrete to Surface
b) Method of placement: NA
c) Quantity of well casing grout: NA

Development method: Purge / Surge

Development time: 1 hour 7/14/97 + ½ hour 7/16/97

Estimated purge volume: 13½ gal

Comments: Bottom of well 13.5'

CH2M HILL

PROJECT NUMBER	BORING NUMBER	SHEET
6207-028	SJS02 MW-25	1 OF 1

SOIL BORING LOG

PROJECT St Juliens Creek Annex LOCATION Landfill B Site 2

ELEVATION GROUND 4.59 TOC 6.48 ft MSL DRILLING CONTRACTOR American Environmental Drilling Services

DRILLING METHOD AND EQUIPMENT 6"/4" ID Hollow Stem Augers - Ingersoll Rand A-300 Drill Rig

WATER LEVELS _____ START 6/30/97 FINISH 6/30/97 LOGGER S. Bussey (CH2M Hill)

DEPTH BELOW SURFACE (FT)	SAMPLE INTERVAL	SAMPLE NUMBER AND TYPE	SAMPLE RECOVERY (FT)	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
						1045 Begin drilling
	3-5'	S-1	17/24	1-2-2-1	Silty v. fine - fine sand trace clay (SM) trace shells + organics moist mottled dark greenish gray 10Y 4/1 light yellowish brown 2.5Y 6/4 + gray 2.5Y 6/1	OVM 0 ppm
5						
	5-7'	S-2	24/24	3-3-1-3	Same as above moist	OVM 0 ppm
10						
	10-12'	S-3	10"/24"	3-3-4-5	Silty Clay with F. Sand (CL) trace organics soft greenish gray 10Y 6/1 wet	Slight petroleum Smell OVM 0 ppm
15						1140 Complete drilling install well material
					Bottom of Boring 15' BGS	

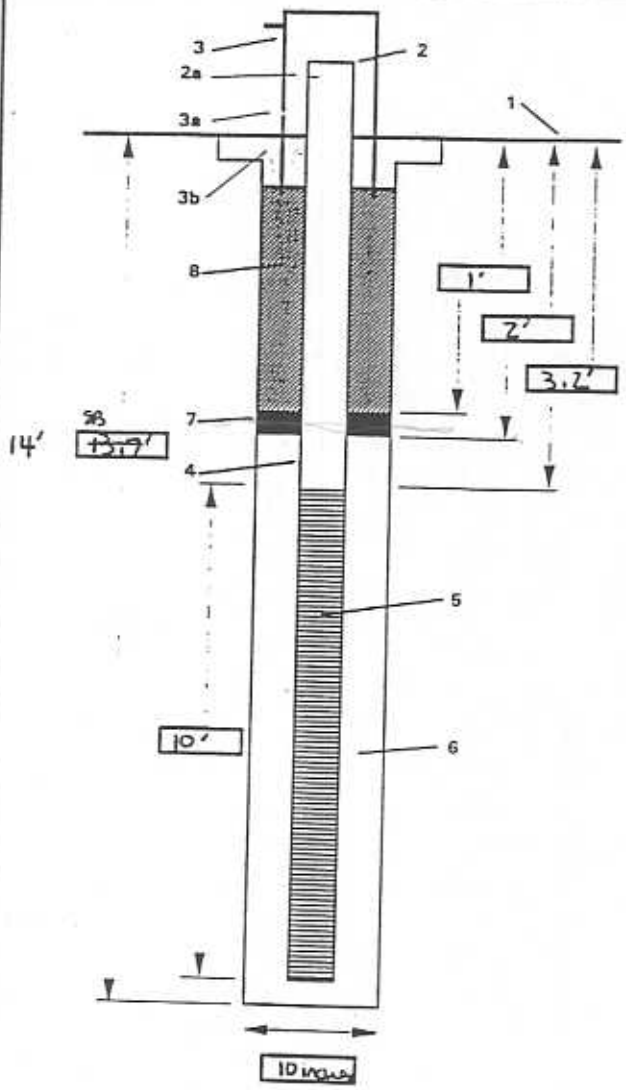
Figure 1
SOIL BORING LOG, FORM D1586

PROJECT NUMBER	BORING NUMBER	SHEET	OF
6207-028	MW-3S STS02	1	1

CH2M HILL

WELL COMPLETION DIAGRAM

PROJECT: St Juliens Creek Annex
LOCATION: Landfill B Site 2
ELEVATION: TOC 7.29 ft msl
DRILLING CONTRACTOR: American Environmental Drilling Services
DRILLING METHOD AND EQUIPMENT USED: 6 1/4" ID Hollow Stem Auger - Ingersoll Rand A-300 Drill Rig
WATER LEVELS:
START: 6/30/97 END: 7/7/97 LOGGER: S Bowen (CDM Federal)



1- Ground elevation at well: 4.69 ft msl

2- Top of casing elevation: 7.27 ft msl
a) vent hole? Yes

3- Wellhead protection cover type: Steel Stick up
a) weep hole? Yes
b) concrete pad dimensions: 3' x 3'

4- Diameter/type of well casing: 2" Dia. PVC

5- Type/slot size of screen: 0.010 Slot - 2" Dia. PVC
3.2' - 13.2' BGS

6- Type screen filter
a) Quantity used: ~5 cubic feet med sand

7- Type of seal
a) Quantity used: Bentonite 1'-2' BGS

8- Grout
a) Grout mix used: Concrete from 1' BGS
b) Method of placement: NA
c) Quantity of well casing grout: NA

Development method: Pump + Surge

Development time: 4 hours on 7/07/97

Estimated purge volume: 165 gal.

Comments: Bottom of well 13.7' BGS

ABOVDIAG.XLS

CH2M HILL

PROJECT NUMBER	BORING NUMBER	SHEET
6207-028	MW-35 SJ502	1 OF 1

SOIL BORING LOG

PROJECT St Juliens Creek Annex LOCATION LandFill B Site 2

ELEVATION GROUND: 4.69 TOC: 7.27 ft msl DRILLING CONTRACTOR American Environmental Drilling Services

DRILLING METHOD AND EQUIPMENT 6 1/4" ID Hollow Stem Auger - Ingersoll Rand A-300 Drill Rig

WATER LEVELS _____ START 6/30/97 FINISH 6/30/97 LOGGER S. Bowley (CH2M Hill)

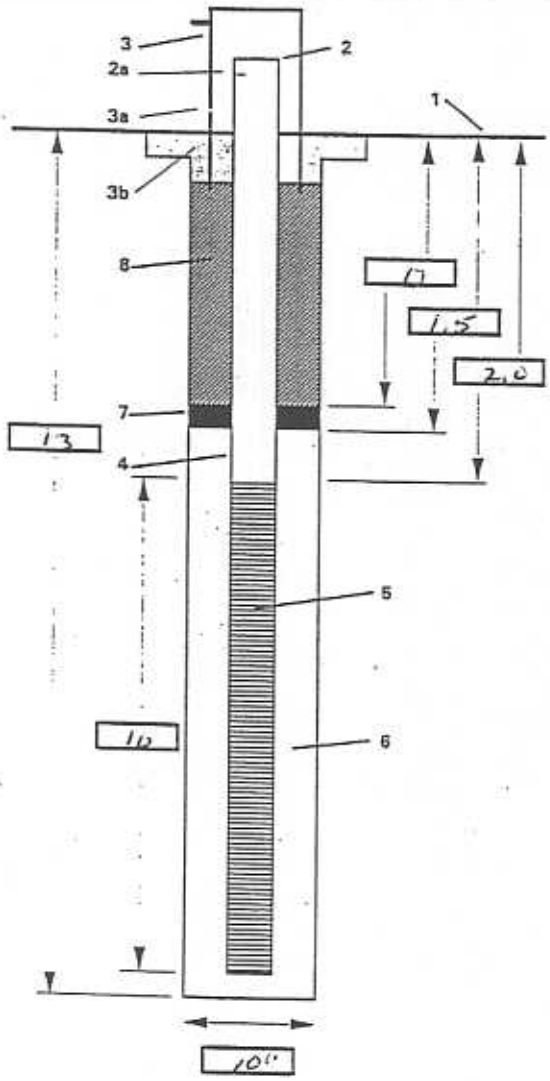
DEPTH BELOW SURFACE (FT)	SAMPLE INTERVAL	SAMPLE NUMBER AND TYPE	SAMPLE RECOVERY (FT)	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
						Began drilling 0820
2	2-4	S-1	24"/24"	2-3-3-2	2.-2.8 Fill Silty gravel + Sand (GM) dry Black 2.5Y 2.5/1 2.8-4' Silty F. Sand (SM) moist light olive Brown 2.5Y 5/4	Fill Material ended 2.8' BG OVM - 0ppm
4					4: Silty Clay w/ F. Sand (CL) wet dark gray (N4/)	
5	4-6	S-2	16"/24"	1-3-3-4	Silty F - Med. Sand (SM) Color bands wet greenish gray 5GY 5/1, light yellowish brown 2.5Y 6/4 Olive yellow 2.5Y 6/6	
6						OVM - 0ppm
10						
	10-12	S-3	23"/24"	3/2/5/4	Silty F. Sand (SM) wet well sorted Stranded Color bands gray N5/ + light yellowish brown 2.5Y 6/4	
12.						OVM 0ppm
14						
15					Bottom of Boring 14' BGS	0930 finished drilling

Figure 1
SOIL BORING LOG, FORM D1586

PROJECT NUMBER	BORING NUMBER	
6207-02E	SJS02 MW2S	SHEET 1 OF 1

WELL COMPLETION DIAGRAM

PROJECT: ST. Juliens Creek Annex LOCATION: Landfill B (Site 2)
ELEVATION: DRILLING CONTRACTOR: Groundwater Systems
DRILLING METHOD AND EQUIPMENT USED: HSA 6 1/4" ID
WATER LEVELS: START: 4/27/99 END: 4/27/99 LOGGER: L. Campbell



1- Ground elevation at well 4.60' msl

2- Top of casing elevation 5.53' msl
a) vent hole?

3- Wellhead protection cover type 4" Steel casing / concrete pad
a) weep hole?
b) concrete pad dimensions

4- Diameter/type of well casing 2" PVC Sch. 40

5- Type/slot size of screen 2" PVC 010-slot, Sch. 40

6- Type screen filter
a) Quantity used #1 Silica Sand

7- Type of seal
a) Quantity used bentonite chips (3/8")

8- Grout
a) Grout mix used N/A No grout used due to shallow water table
b) Method of placement
c) Quantity of well casing grout

Development method Pump + Surge

Development time ~3 HOURS

Estimated purge volume 5.5 gal (3x well casing vol)

Comments

ABOVDIAG.XLS

CH2MHILL

PROJECT NUMBER	BORING NUMBER	SHEET	OF
6207-028	SJS02-MW4S	1	

SOIL BORING LOG

PROJECT CT028, ST. JULIENS CREEK LOCATION SITE 2 MW4S

ELEVATION DRILLING CONTRACTOR GROUNDWATER SYSTEMS

DRILLING METHOD AND EQUIPMENT PACKER AD-2 RIG, SPLITSPOON (2'), 3 1/4" ID HSA

WATER LEVELS START 0915 4/21/99 FINISH LOGGER L. FRANCIS

DEPTH BELOW SURFACE (FT)	SAMPLE INTERVAL	SAMPLE NUMBER AND TYPE	SAMPLE RECOVERY (FT)	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
		1	15"	4-5-4-6	SAND, fine, and SILT (SM), very dk grey (2.5Y 3/1), Roots to 3". V. fine sand trace clay, slightly moist (2.5Y 4/4)	Start drilling 0915 4/21/99 Cleaning for UXO at 2-ft intervals.
		2	18"	5-5-5-5	SAND, v. fine (SM) light yellowish brown (2.5Y 6/4), WET, little silt	WATER TABLE @ ~2.5'
5		3	24"	4-4-5-6	Same as above	
		4	24"	4-4-5-6	Same as above, some orange mottling.	
		5	14"	5-7-16-13	Same as above, coarsening to fine sand, orange mottling.	Finish sampling 4/21/99 1010
10						
15						

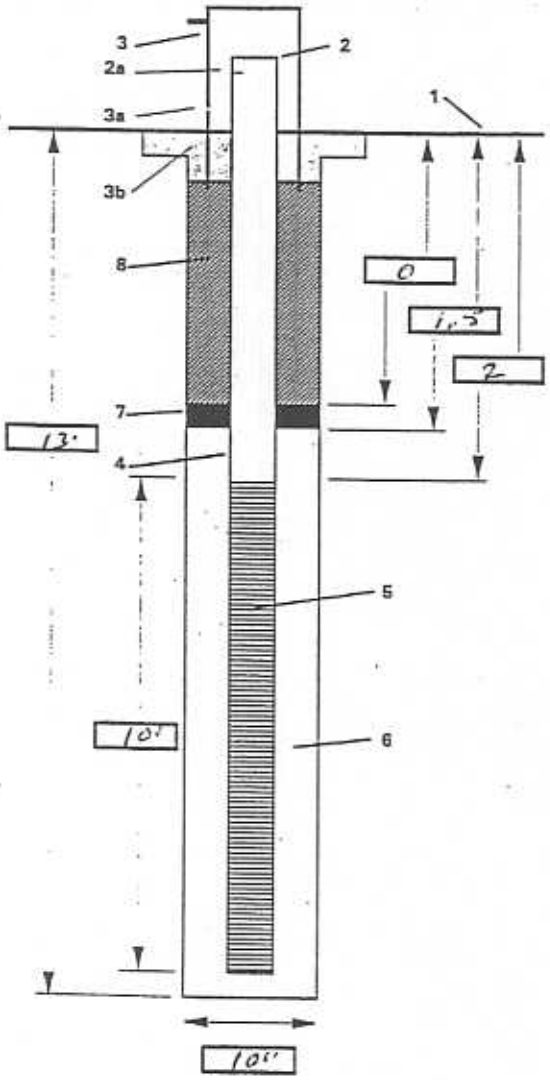
Figure 1
SOIL BORING LOG, FORM D1586

PROJECT NUMBER	BORING NUMBER	
6207-02E	SJS02-MW-5S	SHEET 1 OF 1

CH2M HILL

WELL COMPLETION DIAGRAM

PROJECT: St. Juliens Creek LOCATION: Landfill B (Site 2)
ELEVATION: DRILLING CONTRACTOR: Groundwater Systems Inc.
DRILLING METHOD AND EQUIPMENT USED: 6 1/4" ID HSA
WATER LEVELS: START: 4/27/99 END: 4/27/99 LOGGER:



1- Ground elevation at well: 5.87 ft msl

2- Top of casing elevation: 8.52 ft msl
a) vent hole?

3- Wellhead protection cover type: 4" steel casing / concrete pad
a) weep hole?
b) concrete pad dimensions

4- Diameter/type of well casing: 2" PVC Sch. 40

5- Type/slot size of screen: 2" PVC 010-slot Sch. 40

6- Type screen filter
a) Quantity used: #1 Silica sand

7- Type of seal
a) Quantity used: bentonite chips (3/8")

8- Grout
a) Grout mix used: None due to shallow water table
b) Method of placement
c) Quantity of well casing grout

Development method: pump & surge

Development time: 3.5 HOURS

Estimated purge volume: ~5.4 gallons (3 x casing vol).

Comments

ABOVDIAG.XLS

CH2MHILL

PROJECT NUMBER	BORING NUMBER	SHEET	OF
0207-02E	SJS02-MW5S	1	1

SOIL BORING LOG

PROJECT CTO 2E - ST. JULIENS CREEK LOCATION SITE 2, MWST
ELEVATION DRILLING CONTRACTOR GROUNDWATER SYSTEMS
DRILLING METHOD AND EQUIPMENT Acker AD-2 Rig, 2' splitspoon, 3¼" ID HSA
WATER LEVELS START 1050 4/21/99 FINISH LOGGER L. FRANCE

DEPTH BELOW SURFACE (FT)	SAMPLE INTERVAL	SAMPLE NUMBER AND TYPE	SAMPLE RECOVERY (FT)	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
		1	16"	6-6-9-7	0-2" SILT (SM), roots. Dk brown (2.5Y 3/1), Moist. more sand 2-10".	Start drilling 1050 4/21/99 Clearing for UXO in 2-ft intervals as we drill.
		2	19"	4-4-6-3	SAND (SM), fine, light yellowish-brown. Wet, (2.5Y 6/4), trace clay in 2" layer, little silt.	Water table @ ~2.5'
5		3	12"	3-3-2-3	Same as above. Pale yellow (2.5Y 7/3)	
		4	18"	2-3-3-4	Same as above	Drillers note an "oily" odor @ 8'. No response from OVM.
		5	18"	NO DATA	Same as above	Stopped sampling @ 10' 1145 4/21/99
10						
15						

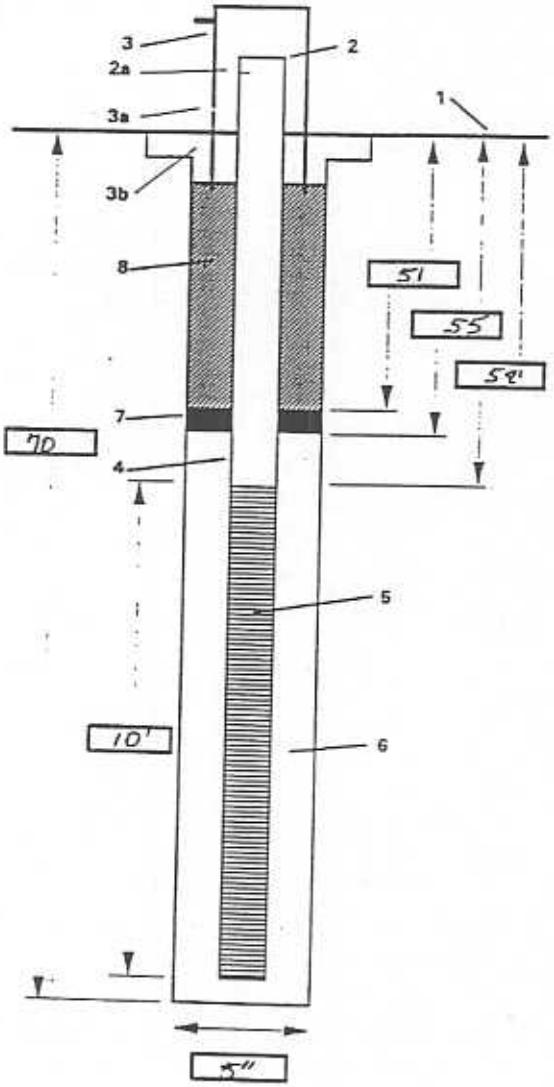
Figure 1
SOIL BORING LOG, FORM D1586

PROJECT NUMBER	BORING NUMBER	
6207-028	SJS02-MW1D	SHEET 1 OF

CH2MHILL

WELL COMPLETION DIAGRAM

PROJECT: St Juliens Creek Annex LOCATION: Landfill B/Site 2
ELEVATION: TOC 7.99 ft msl DRILLING CONTRACTOR: AEDS
DRILLING METHOD AND EQUIPMENT USED: HSA - 8¼" ID / MUD ROTARY - 5" R.T
WATER LEVELS: START: END: LOGGER: L. FRANCE



1- Ground elevation at well: 5.27 ft msl

2- Top of casing elevation: 7.94 ft msl
a) vent hole? YES

3- Wellhead protection cover type: Stick-up
a) weep hole?
b) concrete pad dimensions

4- Diameter/type of well casing: 2" PVC, Sch. 40

5- Type/slot size of screen: 2" PVC, Sch40, .010-Slot

6- Type screen filter: Medium Sand (primary) 70 to 56.5'. Fine Sand 56.5 to 55'
a) Quantity used

7- Type of seal
a) Quantity used: Bentonite Pellet

8- Grout
a) Grout mix used: Cement/Bentonite
b) Method of placement: Pump/tremmie
c) Quantity of well casing grout

Development method: Purge/Surge

Development time

Estimated purge volume: 210 gallons

Comments: 6" PVC isolation casing to 49' BGS. ~~Also~~ 0.4" PVC Plug at bottom

ABOVDIAG.XLS

CH2M HILL

PROJECT NUMBER	BORING NUMBER	SHEET	OF
CT02E	SJS02 MW01D	1	3

SOIL BORING LOG

PROJECT NAVY CLEAN II / ST. JULIENS CREEK ANNEX LOCATION SITE 2 MW01D

ELEVATION GROUND: 5.27 TOC: 7.94 DRILLING CONTRACTOR AEDS

DRILLING METHOD AND EQUIPMENT INGERSOLL RAND A300 RIG / 8 1/4" and 4 1/4" HSA / 6" Mud Rotary

WATER LEVELS _____ START _____ FINISH _____ LOGGER L. FRANCE

DEPTH BELOW SURFACE (FT)	SAMPLE INTERVAL	SAMPLE NUMBER AND TYPE	SAMPLE RECOVERY (FT)	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
					SEE LOG FOR SITE 2 MW01S FOR 0-12' INTERVAL	
5						
10						
		SP / CL	1.4	2-2-1-2	SAND, f-med (SP). Strong brown (7.5YR 5/8). Wet. to 14.0'	
					CLAY (CL) Bluish grey (GLEY 5/1). Sand in end of spoon.	
15		SP / CL	1.5	2-1-1-2	SAND, med-fine. Same as @12'.	
					CLAY. DK. Greenish grey (GLEY 4/1)	
			0.6	2-3-2-2	SAND and CLAY as above. Poor sample recovery.	
			.2	7-7-8-8		
20		SP	1.6	4-4-3-4	SAND (SP) fine. Dk. bluish grey (GLEY 4/1). Wet. Little clay in thin (<0.5") layers. Increasing clay content to 22.8'	
		CL	2.0	4-3-3-4	22.8 CLAY (CL) Dk greenish grey (GLEY 4/1) Blocky.	
25		SP / CL	1.7	5-4-4-5	SAND (SP)	
					CLAY, sandy to 27.2'	
		SP	2.0	5-6-6-7	27.2' SAND, fine (SP) shell fragments. Little med. sand	
30			NOT RECVD.	4-5-5-5	SAND, as above. Tr. organics and shells little clay.	

CH2M HILL

PROJECT NUMBER	BORING NUMBER	SHEET
CTO 25	SJS02 MW01D	2 OF 3

SOIL BORING LOG

PROJECT NAVYCLEAN II / ST JULIENS CREEK LOCATION SITE 2 MW01D

ELEVATION . DRILLING CONTRACTOR AEPS

DRILLING METHOD AND EQUIPMENT SEE p. 1

WATER LEVELS START FINISH LOGGER L. FRANCIS

DEPTH BELOW SURFACE (FT)	SAMPLE INTERVAL	SAMPLE NUMBER AND TYPE	SAMPLE RECOVERY (FT)	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
30		SP	2.0	5-4-45	SAND, as above	
					31. CLAY little to no sand.	
		CL	2.0	4-3-3-5	CLAY, (CL) with 0.25-3.0" thick layers of fine sand. Greenish gray (5GY 5/1)	
35			2.0	5-4-4-5		
		SW	2.0	3-3-5-5	SAND, (SW) med - coarse. Sand, (SW) fining downward to silt and clay (CL) at 38', tr. organics and shell fragments	
			2.0	3-2-2-3		Stopped drilling 7/9/97. Set 6" PVC isolation casing to 44'. Start sampling at 46' 7/11/97
40		CL	2.0	3-3-2-3	CLAY, greenish grey (GLEY 5/1) Sandy to 40.5' Little organics and mica	
			2.0	3-3-4-5	clay, as above, tr v. fine sand. Few shell fragments	
45			2.0	3-2-2-2		
			2.0	3-3-4-3	Some brown organics. Clay is DK. greenish gray (GLEY 3/1). Little mica.	
			2.0	4-3-3-3		
50			2.0	3-3-2-3		
			2.0	3-2-2-3	clay, as above	
55			1.0	3-3-2-3		
		SP	0.7	5-5-6-6	SAND, (SP), v. fine to fine DK greenish grey (GLEY 3/1)	Losing water to fm. at 56'.
60			0.6	6-5-5-6	Fine sand, as above, Little mica	

CH2M HILL

PROJECT NUMBER	BORING NUMBER	SHEET
CT02E	MW01D SJS02	3 OF 3

SOIL BORING LOG

PROJECT NAVY CLEAN II / ST. JULIENS CREEK ANNEX LOCATION SITE 2 MW01D

ELEVATION . DRILLING CONTRACTOR AEDS

DRILLING METHOD AND EQUIPMENT See p. 1

WATER LEVELS START FINISH LOGGER L. FRANCO

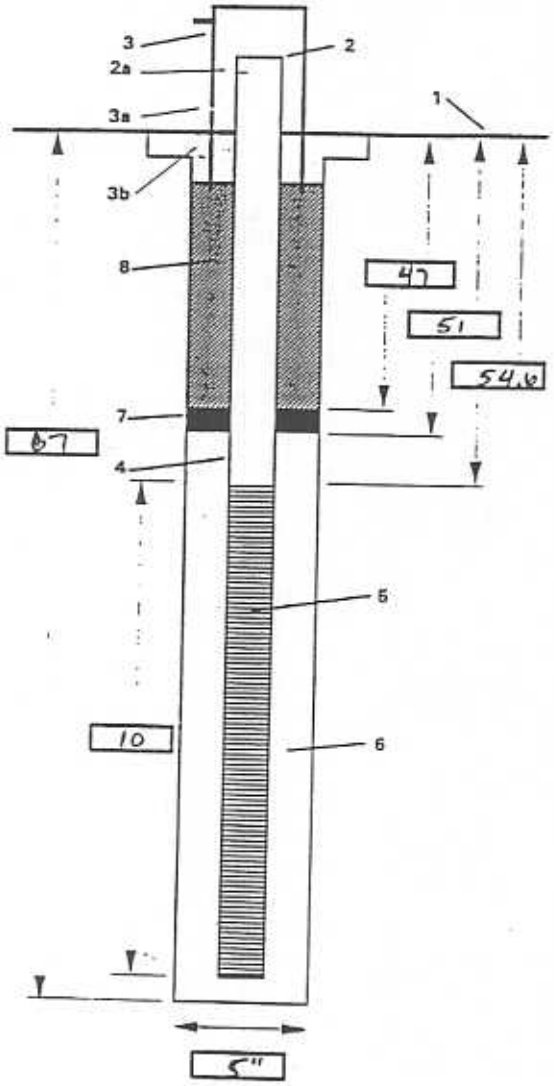
DEPTH BELOW SURFACE (FT)	SAMPLE INTERVAL	SAMPLE NUMBER AND TYPE	SAMPLE RECOVERY (FT)	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
60			1.0	6-6-5-6	SAND, as above, with trace med. sand	
		SP	0.5	6-6-6-5	SAND, as above, Same med. Sand	
65			1.5	7-7-6-7		
			1.5	7-6-6-7		END SAMPLING at 65!
					BORING TERMINATED 68'	
70						
75						

PROJECT NUMBER	BORING NUMBER	
6207 028	SJS02-MW2D	SHEET 1 OF 1

CH2MHILL

WELL COMPLETION DIAGRAM

PROJECT: NAVY CLEAN ST. JULIENS CREEK LOCATION: SITE 2 MW2D
ELEVATION: TOP OF PVC 7.04 DRILLING CONTRACTOR: AEDS
DRILLING METHOD AND EQUIPMENT USED: 1+SA - 8¼" ID / Mud rotary - 5" Bit
WATER LEVELS: START: END: LOGGER: L. FRANCK



1- Ground elevation at well: 4.71 ft. msl

2- Top of casing elevation: 7.04 ft msl
a) vent hole? yes

3- Wellhead protection cover type: stick up
a) weep hole? yes
b) concrete pad dimensions:

4- Diameter/type of well casing: 2" PVC Sch. 40

5- Type/slot size of screen: 2" PVC 010- slot

6- Type screen filter
a) Quantity used: medium sand (primary) 67-~~64.6~~ 52'
fine sand (Secondary) 52-51'

7- Type of seal
a) Quantity used: Bentonite Pellet 51-47'

8- Grout
a) Grout mix used: Cement/Bentonite
b) Method of placement: Pump/tremmie
c) Quantity of well casing grout:

Development method: Purge/Surge

Development time: 3½ Hrs

Estimated purge volume: ~145 gallons

Comments: 6" PVC isolation casing to 45'
0.4" bottom plug.

ABOVDIAG XLS

CH2M HILL

PROJECT NUMBER	BORING NUMBER		
CT028	SJS02-MW2D	SHEET 1	OF 3

SOIL BORING LOG

PROJECT NAVYCLEAN II/ST. JULIENS CREEK LOCATION SITE 2 MW02D

ELEVATION GROUND: 4.71/TOC: 7.04 DRILLING CONTRACTOR AFDS

DRILLING METHOD AND EQUIPMENT INGERSO A300 RIG/8 1/4" ID HSA / 4 1/4" HSA / 6" MUD ROTARY

WATER LEVELS START 1230 7/12/97 FINISH LOGGER L. FRANCE

DEPTH BELOW SURFACE (FT)	SAMPLE INTERVAL	SAMPLE NUMBER AND TYPE	SAMPLE RECOVERY (FT)	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
					SEE LOG FOR SITE 2 MW02S FOR 0-12' INTERVAL	START DRILLING 1230 7/
5						
10						
			1.9	4-4-5-5	CLAY (CL) and SAND (SP) 50%, moist. Greenish grey (GLEY 5/1) sand is med-fine grained. Some orang mottling	
15		CL	1.4	3-3-4-4		
			2.0	3-4-4-5		
		ML	1.25	3-5-5-7	SILT (ML) clayey. DK greenish grey (GLEY 3/1) Some organics, Rubbery texture.	
20		SM	2.0	3-5-5-7	SAND (SM). some sandy silt.	
		ML	2.0	4-5-5-5	SILT. Some to little fine sand. One 1"-layer of fine sand at 23.8'.	
25		SC			SAND (SC) clayey 25.3'	
		SM	1.7	4-5-5-5	SAND (SM) silty, fine DK Greenish Grey (GLEY 3/1)	
			2.0	1-1-2-4	Abundant wood fragments. 4" layer of sandy silt. 28.5'	
30		SP	NOT Recvd.	3-3-2-3	SAND, (SP) fine. Light greenish Grey (GLEY 7/1)	

CH2M HILL

PROJECT NUMBER	BORING NUMBER	SHEET	OF
9025	SJS02-MW02D	2	3

SOIL BORING LOG

PROJECT NAVY CLEAN II/ST. JULIENS CREEK ANNEX LOCATION SITE 2 MW02D

ELEVATION _____ DRILLING CONTRACTOR AEDS

DRILLING METHOD AND EQUIPMENT See p. 1

WATER LEVELS _____ START _____ FINISH _____ LOGGER L FRANCE

DEPTH BELOW SURFACE (FT)	SAMPLE INTERVAL	SAMPLE NUMBER AND TYPE	SAMPLE RECOVERY (FT)	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
30		SP	2.0	2-1-1-2	SAND (SP) f. v. wet little med sand	
			Not record	1-1/12"-1	33.0	
		CL			CLAY (CL) Shell fragment	
35		SP	2.0	2-2-1-2	SAND, as at 30'. Loose	
			Not Rec.	2-2-3-2		
			Not Rec	2-2-1-2	clay in nose of split spoon at 40'	
40		CL	1.0	2-2-1-2	CLAY, DK greenish (GLEY 4/1) soft	Will set PVC 6" isolation cas @ 45'.
				2-2-3-2	clay, as above, med. stiff. organics	stopped drilling at 1,91 1800 7/7
45			1.0	2-2-3-2		start drilling with 8 1/4" HSA 0720 7/8/97. with PVC plug. charged augers with water prevent find sand from comm into augers.
			0.3	Not Recorded		
			2.0	3-4-4-5	Clay, as above, stiff	Start drilling at 50' 6" mud rotary. 7/12/97
50			2.0	3-3-2-2	tr. fine sand 50-51' Inc. sand to 51.5'	OVM headspace 4.2 ppm
		SP	1.5	2-3-3-2	SAND (SP) fine with little med. Some shell fragments, DK greenish grey (GLEY 4/1). Loose.	Losing water to fm. at 54'
55			1.0	3-2-2-3	abundant shell fragments 55.7	
		CL	0.6	5-5-4-5	CLAY (CL) DK greenish grey (GLEY 3/1). Little shell sand organics. Stiff.	
		SP			SAND, f-v. fine tr mica. DK greenish grey (GLEY 3/1) 58.0	
		CL	1.6	6-6-5-4	CLAY 59.5	
60		ML			SILT and fin SAND, some m. sand	

CH2M HILL

PROJECT NUMBER	BORING NUMBER	
CT025	ST502-MW02D	SHEET 3 OF 3

SOIL BORING LOG

PROJECT NAVY CLEAN II/ST. JULIENS CREEK ANNEX LOCATION SITE 2 MW02D

ELEVATION . DRILLING CONTRACTOR AEDS

DRILLING METHOD AND EQUIPMENT Sup. 1

WATER LEVELS START FINISH LOGGER L France

DEPTH BELOW SURFACE (FT)	SAMPLE INTERVAL	SAMPLE NUMBER AND TYPE	SAMPLE RECOVERY (FT)	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
60		SP	0.6	5-6-6-5	SAND (SP) as above. Dk greenish grey (GLEY 3/1).	Drillers add bentonite to w. at 60'.
			0.5	7-7-6-7	Some med. sand. Little shell fragments	
					BORING TERMINATED @ 64'	Stopped Drilling and sam @64' 7/12/97 1245
65						
70						

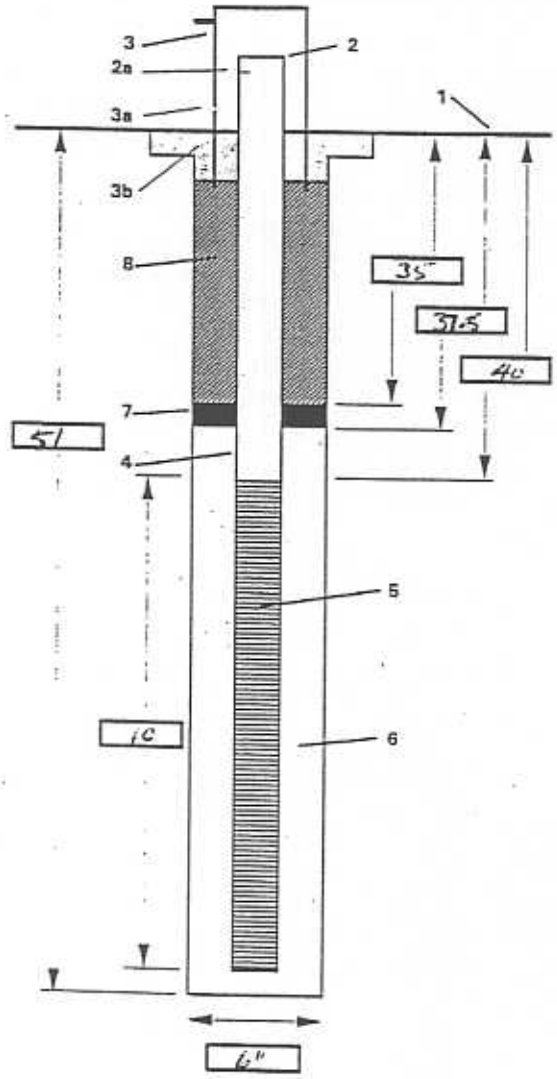
REV 11/89 FORM

PROJECT NUMBER	BORING NUMBER	
6207-02E	SJSO2-MW5D	SHEET 1 OF 1

CH2M HILL

WELL COMPLETION DIAGRAM

PROJECT: St. Juliens Creek Annex LOCATION: Landfill B (Site 2)
ELEVATION: DRILLING CONTRACTOR: Groundwater Systems
DRILLING METHOD AND EQUIPMENT USED: 8 1/4" ID HSA / 6" Water Rotary
WATER LEVELS: START: 4/26/99 END: 4/27/99 LOGGER: L. France



1- Ground elevation at well: 6.04 ft msl

2- Top of casing elevation: 8.66 ft. msl
a) vent hole?

3- Wellhead protection cover type: 4" steel casing / concrete pad
a) weep hole?
b) concrete pad dimensions

4- Diameter/type of well casing: 2" PVC Sch. 40
6" PVC isolation casing to 35.5 ft ~~mbl~~ bgs

5- Type/slot size of screen: 2" 010-slot PVC, Sch. 40

6- Type screen filter
a) Quantity used: #1 silica sand

7- Type of seal
a) Quantity used: bentonite Sureseal chips (3/8")

8- Grout
a) Grout mix used: Cement - 5% bentonite
b) Method of placement: Tremie / Pressure
c) Quantity of well casing grout: ~ 50 gals.

Development method: pump + surge

Development time: 1.75 Hours

Estimated purge volume: 23.5 gal (3x casing Vol)

Comments: 6" PVC isolation casing pressure grouted into place at 35.5 bgs. Isolation casing was pressure grouted into a 13" borehole with bentonite/cement grout.

ABOVDIAG.XLS

CH2M HILL

PROJECT NUMBER	BORING NUMBER	SHEET 12 OF 13
6207-028	SJS02MW5D	

SOIL BORING LOG

PROJECT ST Juliens Creek Annex LOCATION Landfill B (Site 2)
ELEVATION . DRILLING CONTRACTOR GROUNDWATER S/V STAFF
DRILLING METHOD AND EQUIPMENT Acker AD-2 rig, 8 1/4" HSA to 35', 6" water/mud rotary to 51
WATER LEVELS START 1155 4/21/99 FINISH LOGGER L. FRANCE

DEPTH BELOW SURFACE (FT)	SAMPLE INTERVAL	SAMPLE NUMBER AND TYPE	SAMPLE RECOVERY (FT)	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
		1	22"	4-6-6-7	0-5": SILTY (SM) FINE SAND, Dk brown (2.5Y 3/1), roots: 0-1". 5"-2' SAND, v. fine, little clay, moist light yellowish brown (2.5Y 6/4)	Start sampling and drilling 1155 4/21/99. Clearing for UXO at 2-ft intervals. 8 1/4" HSA
		2	14"	4-4-5-6	CLAY (CL), some sand, light olive brown (2.5Y 5/3) Grades to fi sand @ 3.5'	Water table ~2.5 ft based on adjacent holes drilled earlier today
5		3	19"	9-6-7-10	SAND (SM) fine, little silt. Saturated light yellowish brown (2.5Y 6/4)	
		4	14"	4-6-9-9	same as above	
		5	22"	5-2-8-7	same as above	Stopped drilling @ 10' bgs at 1300. Resumed sampling at 10' with 5'-long CME sampler.
10		6	2.5'	—	same as above	OVM = 0ppm
15					SAND (SP) fine to med. qtz	Checked borehole with OVM - @ 15': 0ppm
		7	6"	—	— — — — — — — —	Soft drilling at 17'
20					silt on end of sampler. Dk greenish grey (10GY 4/1)	Stopped using CME sampler. Used 2' split spoon for remainder of sampling.
		8			CLAY (CL). dk greenish grey (10GY 4/1), trace sand.	1515 4/21/99 Start drilling with 8 1/4" HSA to 22.5' to install 6" sch. 40 PVC isolation casing. 1630 4/21/99 - Place casing 1700 grouted with cement/bentonite grout. Pressure grouted through tremie.
		9			same as above	
25		10			CLAY (SC) some med sand to 25' SAND LSC (SM) little clay	1245 4/23/99 Start mud/water rotary sampling 24.5-26.5'
		11			SAND + CLAY	

Figure 1
SOIL BORING LOG, FORM D1586

CH2MHILL

PROJECT NUMBER	BORING NUMBER	SHEET	OF
62017-028	SJS02MW5D	2	3

SOIL BORING LOG

PROJECT SJ. Juliens Creek Annex LOCATION Landfill B (Site 2)

ELEVATION DRILLING CONTRACTOR

DRILLING METHOD AND EQUIPMENT See page 1

WATER LEVELS START FINISH LOGGER

DEPTH BELOW SURFACE (FT)	SAMPLE INTERVAL	SAMPLE NUMBER AND TYPE	SAMPLE RECOVERY (FT)	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
30		12	1	27-29	SAND (SW) med to fine. Dk greenish grey. clay in nose of spoon.	Sample 12 is from 29.5 - 31.5' bgs Clay at ~~35'~~ 30.5'
		13		2-3-35	CLAY (CL) dk greenish grey. Occ. shell fragment.	
35		14		2-2-2-4	Same as above, 3" sand layer (v. fine sand)	
		15		2-2-3-3	CLAY, as above. No sand.	
40		16		6-12-15-19	CLAY as above to 40.5'	
					SAND (SW) and shell frag. little clay. Light greenish grey GLEY 7/1. (Yorktown Fm)	Stopped sampling @ 41.5' ~~Constructed well (screen & casing).~~ Moved ~18' E and redrilled to set casing deeper on 4/26/99
45						
50						
55						
60						

Figure 1
SOIL BORING LOG,
FORM D1586

CH2MHILL

PROJECT NUMBER	BORING NUMBER	SHEET	OF
6207-028	SJ502 MW5D	3	3

SOIL BORING LOG

PROJECT St. Juliens Creek Annex LOCATION Site 2 Landfill B

ELEVATION DRILLING CONTRACTOR

DRILLING METHOD AND EQUIPMENT See p. 1

WATER LEVELS START FINISH LOGGER

DEPTH BELOW SURFACE (FT)	SAMPLE INTERVAL	SAMPLE NUMBER AND TYPE	SAMPLE RECOVERY (FT)	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
30		1	19"	WOH-1-1	SAND (SW) to 30.75', Dk greenish grey m ~f. ; At 31.8 - sandy CLAY (SC)	4/26/99: Start drilling at 7:30 am. at new location 18' E of original and downgradient of MW5S. 8" of fill at surface. Drill with 8 1/4" HSA. Change with water @ 10', Hit clay @ 14'. Start sampling at 30-32'.
		2	24"	1-1-2-1	Sandy CLAY (SC) Dk. greenish grey 2" shell + sand layer, 33.2-34' - CLAY (CL) tr. silt.	
35		3	24"	WOH-1-1-2	CLAY (CL) Soft. Little silt to 34.5	4/26/99 1100. Set isolation casing @ 35'. Push to 35.5'
		4	24"	1-5-10-15	CLAY (CL) to 38'. Dk. greenish grey (GLEY 4/1)	4/27/99 1110: Start drilling
40		5	15"	11-15-14-10	Coarse Shell fragments, trace silt. Light greenish gray (GLEY 7/1)	Yorktown fm at 38'
		6	9"	8-10-12-8	Shells, as above. One large (3/4") Qtz pebble, subangular	
45		7	8"	15-14-14-15	Shells as above, tr. gravel.	@ 44 ft had to add bentonite to water
		8	11"	25-27-17-22	Shells as above.	
50		9	NR	11-23-17-22		Finish sampling @ 51.5' 1155
					Boring Terminated @ 51.5'.	
55						

Figure 1
SOIL BORING LOG, FORM D1586

Appendix E
Monitoring Well and Surface Water Field Parameters

Table E-1
Groundwater Field Parameters Measured in July 1997, November 1997, and May 1999
Site 2 RI/HHRA/ERA
St. Juliens Creek Annex
Chesapeake, Virginia

Monitoring Well	pH			Specific Conductance (umhos/cm2)			Temperature (^{0}C)		
	Jul-1997	Nov-1997	May-1999	Jul-1997	Nov-1997	May-1999	Jul-1997	Nov-1997	May-1999
Site 2 Landfill B									
SJS02-MW01S	7.12	6.01	6.46	600	778	0.762	18.6	19.3	16.6
SJS02-MW02S	5.43	6.77	5.88	6900	4150	8.2	22.2	20.7	18.2
SJS02-MW03S	6.67	6.2	6.83	24000	1200	1.1	21.1	19.7	17.5
SJS02-MW04S	-----	-----	5.07	-----	-----	0.322	-----	-----	16.6
SJS02-MW05S	-----	-----	5.55	-----	-----	0.314	-----	-----	16.5
SJS02-MW01D	9.35	9.76	8.59	300	0.264	0.332	19	17.1	17.3
SJS02-MW02D	8.31	7.2	7.43	-----	390	0.368	20.1	17	19.2
SJS02-MW05D	-----	-----	7.28	-----	-----	0.358	-----	-----	18.8

Monitoring Well	Dissolved Oxygen (%)			Oxidation/Reduction Potential (mV)			Turbidity (NTU)		
	Jul-1997	Nov-1997	May-1999	Jul-1997	Nov-1997	May-1999	Jul-1997	Nov-1997	May-1999
Site 2 Landfill B									
SJS02-MW01S	24.7	8.77	-----	-----	-----	-----	62	7	-10
SJS02-MW02S	16.9	3.28	-----	-----	-----	-48	127	16	27
SJS02-MW03S	15.5	2.4	-----	-----	-----	94	176	0	10
SJS02-MW04S	-----	-----	-----	-----	-----	200	-----	-----	3
SJS02-MW05S	-----	-----	-----	-----	-----	109	-----	-----	9
SJS02-MW01D	5.6	9.1	-----	-----	-----	124	100	10	-10
SJS02-MW02D	6.2	2.2	-----	-----	-----	-25	0.6	0	4
SJS02-MW05D	-----	-----	-----	-----	-----	98	-----	-----	23

----- indicates parameter not measured

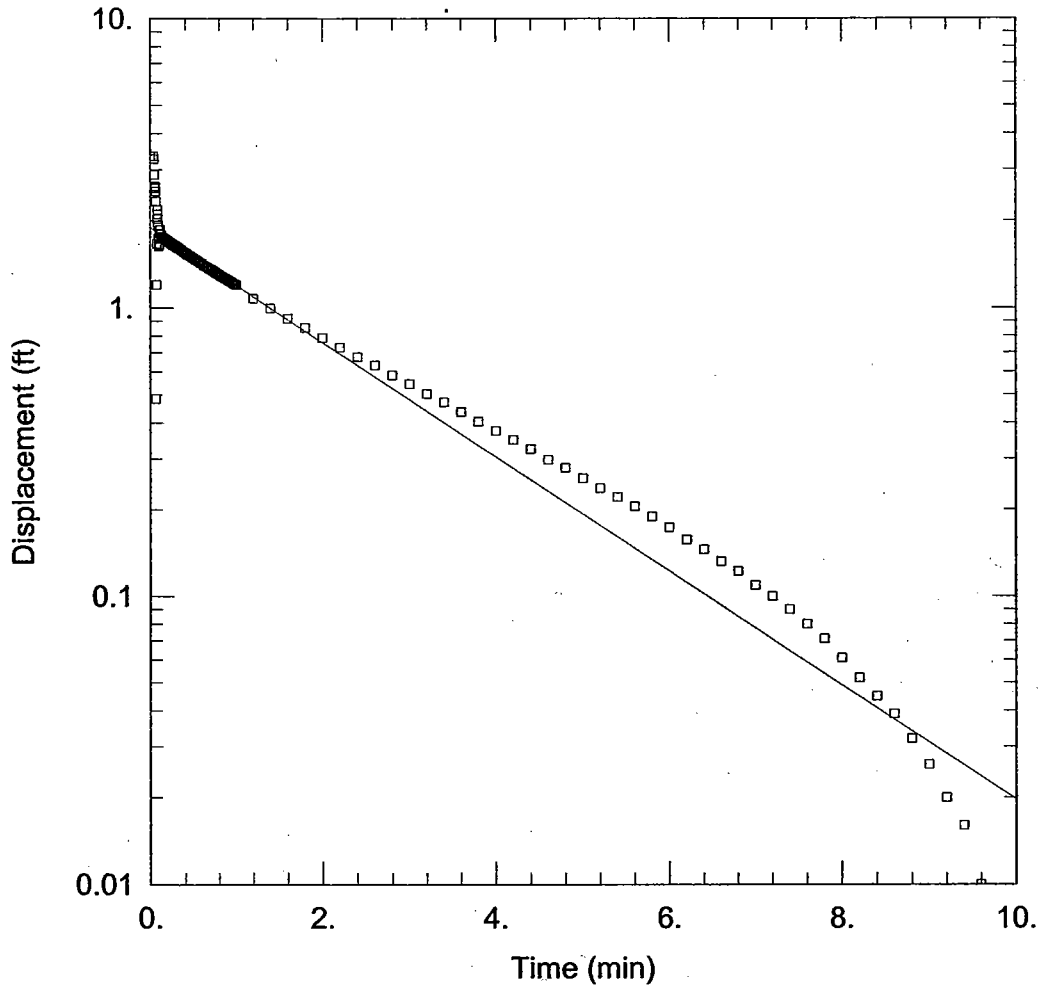
Table E-2
Surface Water Field Parameters Measured in July 1997, April 1999, and July 2001
Site 2 RI/HHRA/ERA
St. Juliens Creek Annex
Chesapeake, Virginia

Surface Water Location	pH			Specific Conductance (umhos/cm2)			Temperature (^{0}C)			Salinity (%)		
	Jul-1997	Apr-1999	Jul-2001	Jul-1997	Apr-1999	Jul-2001	Jul-1997	Apr-1999	Jul-2001	Jul-1997	Apr-1999	Jul-2001
Site 2 Landfill B												
SJS02-SW02	5.79	-----	-----	26.4	-----	-----	25.4	-----	-----	-----	-----	-----
SJS02-SW03	-----	6.69	-----	-----	17.5	-----	-----	15.4	-----	-----	1.06	-----
SJS02-SW04	-----	7	-----	-----	7.81	-----	-----	22.4	-----	-----	42	-----
SJS02-SW05	-----	6.9	-----	-----	6.86	-----	-----	21.4	-----	-----	0.36	-----
SJS02-SW06	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
SJS02-SW07	-----	7.29	-----	-----	18.6	-----	-----	22.5	-----	-----	1.11	-----
SJS02-SW08	-----	7.07	-----	-----	19.2	-----	-----	16.9	-----	-----	1.13	-----
SJS02-SW09	-----	-----	7.18	-----	-----	0.636	-----	-----	27	-----	-----	0.02

Surface Water Location	Dissolved Oxygen (mg/L)			Turbidity (NTU)			Oxidation Reduction Potential (mV)		
	Jul-1997	Apr-1999	Jul-2001	Jul-1997	Apr-1999	Jul-2001	Jul-1997	Apr-1999	Jul-2001
Site 2 Landfill B									
SJS02-SW02	88-103	-----	-----	-----	-----	-----	269.5	-----	-----
SJS02-SW03	-----	7.62	-----	-----	20	-----	-----	-----	-----
SJS02-SW04	-----	8.47	-----	-----	27	-----	-----	-----	-----
SJS02-SW05	-----	7.32	-----	-----	21	-----	-----	-----	-----
SJS02-SW06	-----	-----	-----	-----	-----	-----	-----	-----	-----
SJS02-SW07	-----	5.86	-----	-----	5	-----	-----	-----	-----
SJS02-SW08	-----	7.01	-----	-----	36	-----	-----	-----	-----
SJS02-SW09	-----	-----	4.01	-----	-----	-----	-----	-----	-----

----- indicates parameter not measured

Appendix F
Slug Test Data



SJS02-MW01S-FH-BR

Data Set: C:\DOCUME~1\ST.JS\SITE2R~1\SLUGTE~1\MW01S_F.AQT
Date: 03/21/02 Time: 15:00:56

AQUIFER DATA

Saturated Thickness: 22.27 ft Anisotropy Ratio (Kz/Kr): 1.

WELL DATA

Initial Displacement: 3.338 ft Water Column Height: 11.87 ft
Casing Radius: 0.083 ft Wellbore Radius: 0.42 ft
Screen Length: 10. ft Gravel Pack Porosity: 0.3

SOLUTION

Aquifer Model: Unconfined K = 0.001415 cm/sec
Solution Method: Bouwer-Rice y0 = 1.888 ft

Data Set: C:\DOCUME~1\ST.JS\SITE2R~1\SLUGTE~1\MW01S_F.AQT
Title: SJS02-MW01S-FH-BR
Date: 04/01/02
Time: 10:22:09

AQUIFER DATA

Saturated Thickness: 22.27 ft
Anisotropy Ratio (Kz/Kr): 1

OBSERVATION WELL DATA

Number of observation wells: 1

Observation Well No. 1: MW01S

X Location: 0 ft
Y Location: 0 ft

Observation Data

Time (min)	Displacement (ft)
0.04	3.338
0.0433	3.261
0.0466	2.877
0.05	2.617
0.0533	2.585
0.0566	2.624
0.06	2.521
0.0633	2.332
0.0666	0.484
0.07	1.201
0.0733	1.201
0.0766	1.662
0.08	2.024
0.0833	2.181
0.0866	2.104
0.09	1.925
0.0933	1.73
0.0966	1.627
0.1	1.646
0.1033	1.733
0.1066	1.803
0.11	1.855
0.1133	1.653
0.1166	1.858
0.12	1.784
0.1233	1.755
0.1266	1.784
0.13	1.762
0.1333	1.755
0.1366	1.752
0.14	1.749

0.1433	1.749
0.1466	1.746
0.15	1.746
0.1533	1.743
0.1566	1.739
0.16	1.733
0.1633	1.73
0.1666	1.73
0.17	1.726
0.1733	1.723
0.1766	1.72
0.18	1.717
0.1833	1.714
0.1866	1.711
0.19	1.711
0.1933	1.707
0.1966	1.704
0.2	1.701
0.2033	1.698
0.2066	1.694
0.21	1.694
0.2133	1.691
0.2166	1.688
0.22	1.685
0.2233	1.682
0.2266	1.682
0.23	1.678
0.2333	1.675
0.2366	1.672
0.24	1.669
0.2433	1.666
0.2466	1.662
0.25	1.662
0.2533	1.659
0.2566	1.656
0.26	1.653
0.2633	1.65
0.2666	1.646
0.27	1.646
0.2733	1.643
0.2766	1.64
0.28	1.637
0.2833	1.637
0.2866	1.634
0.29	1.63
0.2933	1.627
0.2966	1.627
0.3	1.624
0.3033	1.621
0.3066	1.618
0.31	1.614
0.3133	1.614

0.3166	1.611
0.32	1.608
0.3233	1.605
0.3266	1.605
0.33	1.602
0.3333	1.598
0.35	1.586
0.3666	1.573
0.3833	1.56
0.4	1.547
0.4166	1.534
0.4333	1.525
0.45	1.512
0.4666	1.502
0.4833	1.489
0.5	1.48
0.5166	1.467
0.5333	1.461
0.55	1.448
0.5666	1.441
0.5833	1.425
0.6	1.419
0.6166	1.4
0.6333	1.393
0.65	1.384
0.6666	1.377
0.6833	1.365
0.7	1.358
0.7166	1.349
0.7333	1.339
0.75	1.329
0.7666	1.32
0.7833	1.31
0.8	1.3
0.8166	1.291
0.8333	1.281
0.85	1.275
0.8666	1.265
0.8833	1.259
0.9	1.249
0.9166	1.24
0.9333	1.233
0.95	1.224
0.9666	1.214
0.9833	1.208
1.	1.198
1.2	1.076
1.4	0.996
1.6	0.919
1.8	0.852
2.	0.788
2.2	0.73

2.4	0.676
2.6	0.631
2.8	0.583
3.	0.545
3.2	0.503
3.4	0.471
3.6	0.436
3.8	0.404
4.	0.375
4.2	0.349
4.4	0.324
4.6	0.298
4.8	0.279
5.	0.257
5.2	0.237
5.4	0.221
5.6	0.205
5.8	0.189
6.	0.173
6.2	0.157
6.4	0.145
6.6	0.132
6.8	0.122
7.	0.109
7.2	0.1
7.4	0.09
7.6	0.08
7.8	0.071
8.	0.061
8.2	0.052
8.4	0.045
8.6	0.039
8.8	0.032
9.	0.026
9.2	0.02
9.4	0.016
9.6	0.01
9.8	0.004
10.	0.

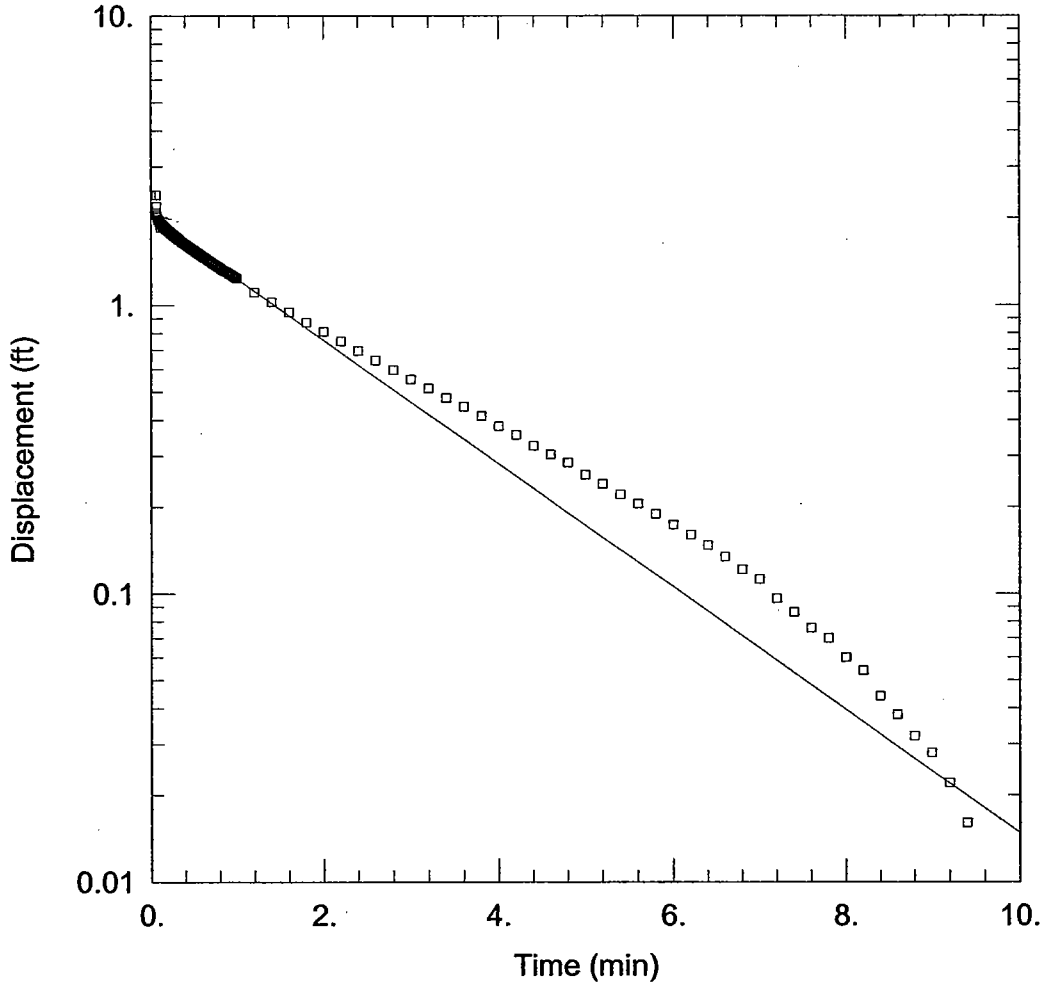
SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice

VISUAL ESTIMATION RESULTS

Estimated Parameters

Parameter	Estimate	
K	0.001415	cm/sec
y0	1.888	ft



SJS02-MW01S-RH-BR

Data Set: C:\DOCUME~1\ST.JS\SITE2R~1\SLUGTE~1\MW01S_R.AQT
Date: 03/21/02 Time: 14:23:19

AQUIFER DATA

Saturated Thickness: 22.27 ft Anisotropy Ratio (Kz/Kr): 1.

WELL DATA

Initial Displacement: 2.393 ft Water Column Height: 11.87 ft
Casing Radius: 0.083 ft Wellbore Radius: 0.42 ft
Screen Length: 10. ft Gravel Pack Porosity: 0.3

SOLUTION

Aquifer Model: Unconfined K = 0.001525 cm/sec
Solution Method: Bouwer-Rice y0 = 2.018 ft

Data Set: C:\DOCUME~1\ST.JS\SITE2R~1\SLUGTE~1\MW01S_R.AQT
Title: SJS02-MW01S-RH-BR
Date: 04/01/02
Time: 10:22:22

AQUIFER DATA

Saturated Thickness: 22.27 ft
Anisotropy Ratio (Kz/Kr): 1

OBSERVATION WELL DATA

Number of observation wells: 1

Observation Well No. 1: MW01S

X Location: 0 ft
Y Location: 0 ft

Observation Data

Time (min)	Displacement (ft)
0.06	2.393
0.0633	2.192
0.0666	2.083
0.07	2.025
0.0733	2.009
0.0766	2.025
0.08	1.977
0.0833	1.974
0.0866	1.961
0.09	1.964
0.0933	1.955
0.0966	1.945
0.1	1.936
0.1033	1.923
0.1066	1.926
0.11	1.91
0.1133	1.853
0.1166	1.907
0.12	1.904
0.1233	1.897
0.1266	1.897
0.13	1.888
0.1333	1.888
0.1366	1.881
0.14	1.875
0.1433	1.875
0.1466	1.865
0.15	1.865
0.1533	1.859
0.1566	1.856
0.16	1.853

0.1633	1.849
0.1666	1.846
0.17	1.837
0.1733	1.84
0.1766	1.833
0.18	1.827
0.1833	1.824
0.1866	1.821
0.19	1.817
0.1933	1.811
0.1966	1.811
0.2	1.808
0.2033	1.805
0.2066	1.801
0.21	1.798
0.2133	1.792
0.2166	1.789
0.22	1.789
0.2233	1.782
0.2266	1.779
0.23	1.776
0.2333	1.773
0.2366	1.769
0.24	1.769
0.2433	1.763
0.2466	1.76
0.25	1.76
0.2533	1.753
0.2566	1.75
0.26	1.747
0.2633	1.744
0.2666	1.741
0.27	1.737
0.2733	1.734
0.2766	1.731
0.28	1.728
0.2833	1.725
0.2866	1.721
0.29	1.721
0.2933	1.715
0.2966	1.715
0.3	1.712
0.3033	1.709
0.3066	1.705
0.31	1.702
0.3133	1.699
0.3166	1.696
0.32	1.693
0.3233	1.689
0.3266	1.689
0.33	1.686
0.3333	1.683

0.35	1.667
0.3666	1.651
0.3833	1.638
0.4	1.625
0.4166	1.613
0.4333	1.6
0.45	1.587
0.4666	1.574
0.4833	1.558
0.5	1.549
0.5166	1.536
0.5333	1.523
0.55	1.513
0.5666	1.501
0.5833	1.488
0.6	1.475
0.6166	1.465
0.6333	1.453
0.65	1.443
0.6666	1.43
0.6833	1.421
0.7	1.411
0.7166	1.398
0.7333	1.389
0.75	1.379
0.7666	1.369
0.7833	1.357
0.8	1.35
0.8166	1.337
0.8333	1.328
0.85	1.318
0.8666	1.309
0.8833	1.302
0.9	1.293
0.9166	1.283
0.9333	1.277
0.95	1.267
0.9666	1.257
0.9833	1.248
1.	1.238
1.2	1.11
1.4	1.024
1.6	0.947
1.8	0.873
2.	0.809
2.2	0.749
2.4	0.694
2.6	0.643
2.8	0.595
3.	0.553
3.2	0.515
3.4	0.477

3.6	0.445
3.8	0.413
4.	0.381
4.2	0.355
4.4	0.326
4.6	0.304
4.8	0.285
5.	0.259
5.2	0.24
5.4	0.221
5.6	0.205
5.8	0.189
6.	0.173
6.2	0.16
6.4	0.147
6.6	0.134
6.8	0.121
7.	0.112
7.2	0.096
7.4	0.086
7.6	0.076
7.8	0.07
8.	0.06
8.2	0.054
8.4	0.044
8.6	0.038
8.8	0.032
9.	0.028
9.2	0.022
9.4	0.016
9.6	0.006
9.8	0.003
10.	0.

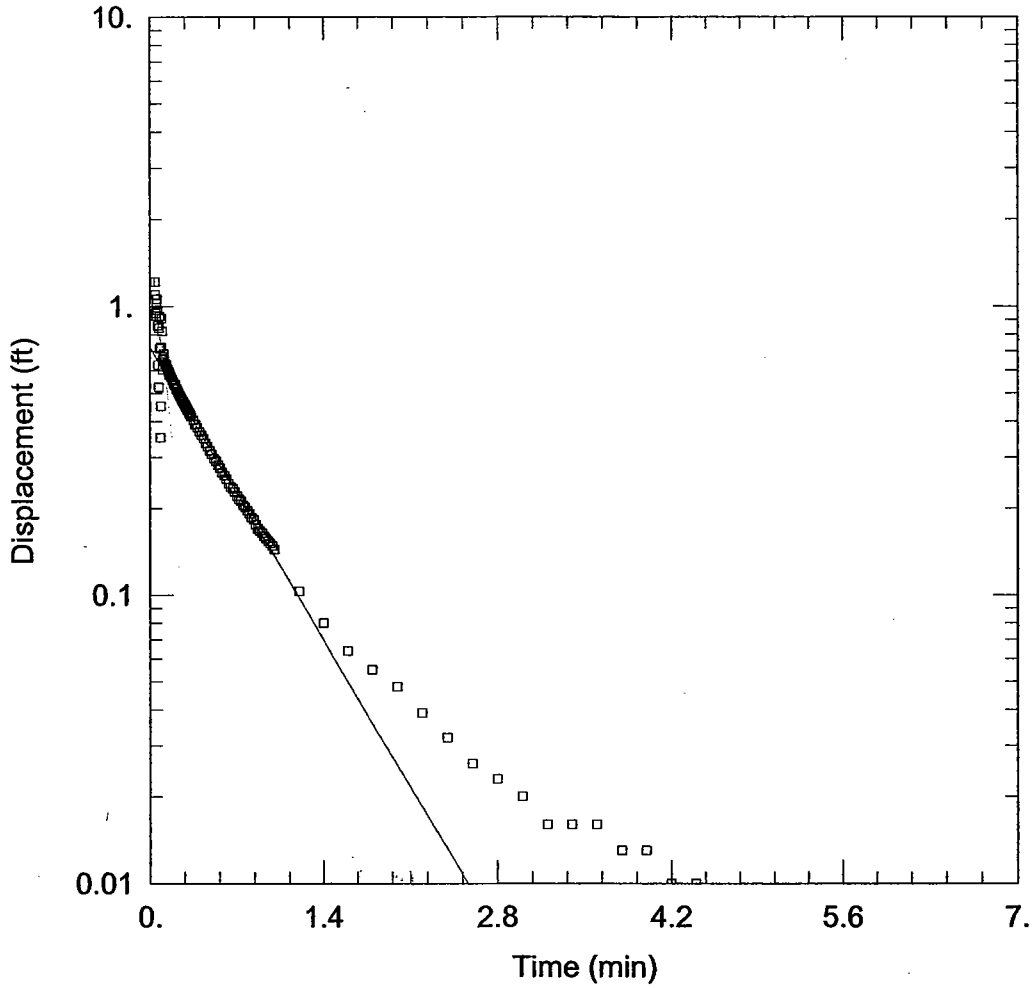
SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice

VISUAL ESTIMATION RESULTS

Estimated Parameters

Parameter	Estimate	
K	0.001525	cm/sec
y0	2.018	ft



SJS02-MW03S-FH-BR

Data Set: C:\DOCUME~1\ST.JS\SITE2R~1\SLUGTE~1\MW03S_F.AQT
Date: 03/21/02 Time: 15:04:42

AQUIFER DATA

Saturated Thickness: 21.08 ft Anisotropy Ratio (Kz/Kr): 1.

WELL DATA

Initial Displacement: 1.217 ft Water Column Height: 11.28 ft
Casing Radius: 0.083 ft Wellbore Radius: 0.42 ft
Screen Length: 10. ft Gravel Pack Porosity: 0.3

SOLUTION

Aquifer Model: Unconfined K = 0.3079 cm/min
Solution Method: Bouwer-Rice y0 = 0.7231 ft

Data Set: C:\DOCUME~1\ST.JS\SITE2R~1\SLUGTE~1\MW03S_F.AQT
Title: SJS02-MW03S-FH-BR
Date: 04/01/02
Time: 10:24:18

AQUIFER DATA

Saturated Thickness: 21.08 ft
Anisotropy Ratio (Kz/Kr): 1

OBSERVATION WELL DATA

Number of observation wells: 1

Observation Well No. 1: MW03S

X Location: 0 ft
Y Location: 0 ft

Observation Data

Time (min)	Displacement (ft)
0.04	1.217
0.0433	1.098
0.0466	0.948
0.05	0.929
0.0533	1.021
0.0566	1.063
0.06	0.97
0.0633	0.858
0.0666	0.628
0.07	0.525
0.0733	0.842
0.0766	0.925
0.08	0.717
0.0833	0.352
0.0866	0.452
0.09	0.724
0.0933	0.909
0.0966	0.823
0.1	0.653
0.1033	0.605
0.1066	0.66
0.11	0.685
0.1133	0.669
0.1166	0.656
0.12	0.634
0.1233	0.631
0.1266	0.634
0.13	0.631
0.1333	0.621
0.1366	0.615
0.14	0.608

0.1433	0.605
0.1466	0.602
0.15	0.596
0.1533	0.592
0.1566	0.586
0.16	0.583
0.1633	0.58
0.1666	0.573
0.17	0.57
0.1733	0.567
0.1766	0.56
0.18	0.557
0.1833	0.554
0.1866	0.551
0.19	0.544
0.1933	0.541
0.1966	0.538
0.2	0.535
0.2033	0.532
0.2066	0.538
0.21	0.519
0.2133	0.516
0.2166	0.519
0.22	0.516
0.2233	0.509
0.2266	0.506
0.23	0.503
0.2333	0.5
0.2366	0.496
0.24	0.493
0.2433	0.49
0.2466	0.487
0.25	0.484
0.2533	0.48
0.2566	0.477
0.26	0.474
0.2633	0.471
0.2666	0.468
0.27	0.468
0.2733	0.464
0.2766	0.461
0.28	0.458
0.2833	0.455
0.2866	0.455
0.29	0.448
0.2933	0.448
0.2966	0.445
0.3	0.442
0.3033	0.439
0.3066	0.436
0.31	0.436
0.3133	0.432

0.3166	0.429
0.32	0.426
0.3233	0.423
0.3266	0.423
0.33	0.42
0.3333	0.416
0.35	0.404
0.3666	0.391
0.3833	0.381
0.4	0.368
0.4166	0.359
0.4333	0.349
0.45	0.336
0.4666	0.327
0.4833	0.317
0.5	0.308
0.5166	0.298
0.5333	0.292
0.55	0.282
0.5666	0.276
0.5833	0.266
0.6	0.26
0.6166	0.253
0.6333	0.244
0.65	0.237
0.6666	0.234
0.6833	0.228
0.7	0.221
0.7166	0.215
0.7333	0.212
0.75	0.205
0.7666	0.202
0.7833	0.196
0.8	0.192
0.8166	0.186
0.8333	0.183
0.85	0.176
0.8666	0.17
0.8833	0.167
0.9	0.164
0.9166	0.16
0.9333	0.157
0.95	0.154
0.9666	0.151
0.9833	0.148
1.	0.144
1.2	0.103
1.4	0.08
1.6	0.064
1.8	0.055
2.	0.048
2.2	0.039

2.4	0.032
2.6	0.026
2.8	0.023
3.	0.02
3.2	0.016
3.4	0.016
3.6	0.016
3.8	0.013
4.	0.013
4.2	0.01
4.4	0.01
4.6	0.007
4.8	0.007
5.	0.007
5.2	0.004
5.4	0.004
5.6	0.004
5.8	0.
6.	0.
6.2	0.
6.4	0.
6.6	0.
6.8	0.

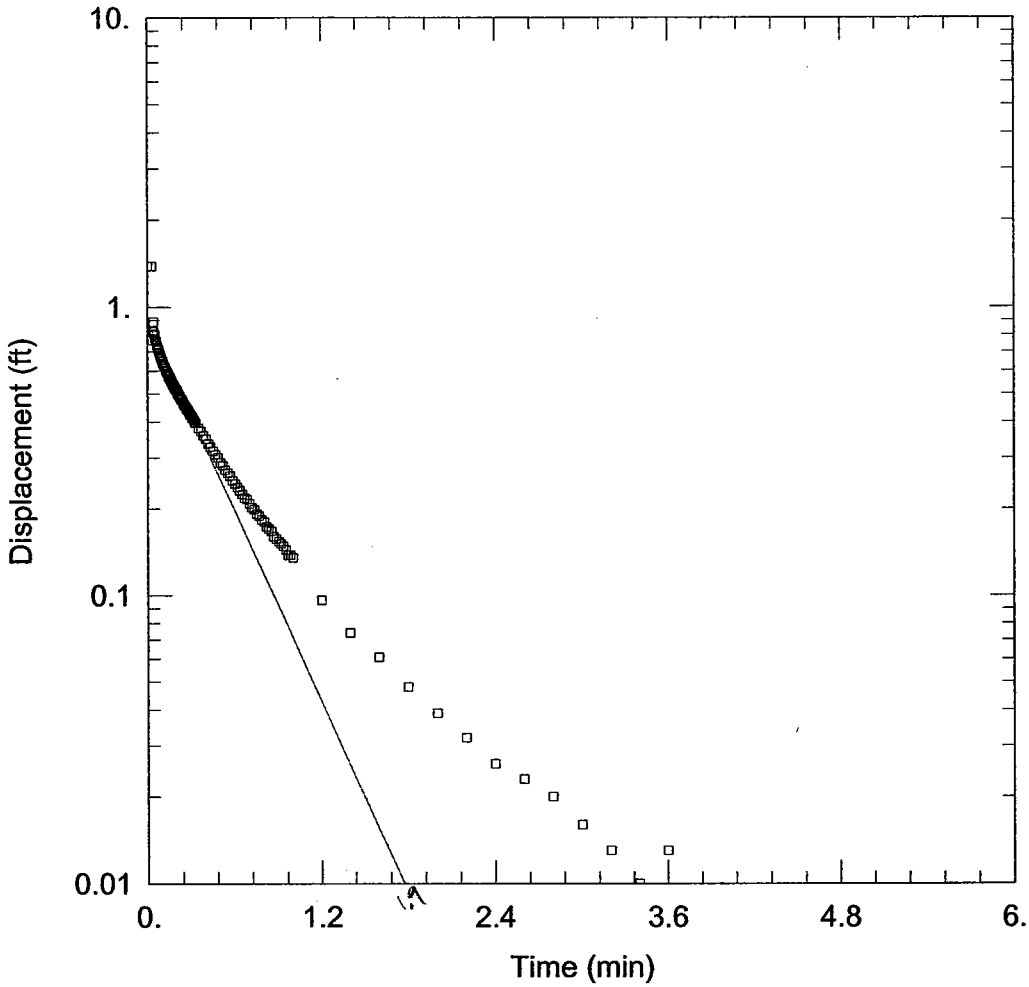
SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice

VISUAL ESTIMATION RESULTS

Estimated Parameters

Parameter	Estimate	
K	0.3079	cm/min
y0	0.7231	ft



SJS02-MW03S-RH-BR

Data Set: C:\DOCUME~1\ST.JS\SITE2R~1\SLUGTE~1\MW03S_R.AQT
Date: 03/21/02 Time: 08:46:18

AQUIFER DATA

Saturated Thickness: 21.08 ft Anisotropy Ratio (Kz/Kr): 1.

WELL DATA

Initial Displacement: 1.383 ft Water Column Height: 11.28 ft
Casing Radius: 0.083 ft Wellbore Radius: 0.42 ft
Screen Length: 10. ft Gravel Pack Porosity: 0.3

SOLUTION

Aquifer Model: Unconfined K = 0.00779 cm/sec
Solution Method: Bouwer-Rice y0 = 0.8939 ft

Data Set: C:\DOCUME~1\ST.JS\SITE2R~1\SLUGTE~1\MW03S_R.AQT
Title: SJS02-MW03S-RH-BR
Date: 04/01/02
Time: 10:24:28

AQUIFER DATA

Saturated Thickness: 21.08 ft
Anisotropy Ratio (Kz/Kr): 1

OBSERVATION WELL DATA

Number of observation wells: 1

Observation Well No. 1: MW03S

X Location: 0 ft
Y Location: 0 ft

Observation Data

Time (min)	Displacement (ft)
0.03	1.383
0.0333	0.768
0.0366	0.826
0.04	0.887
0.0433	0.82
0.0466	0.807
0.05	0.8
0.0533	0.778
0.0566	0.768
0.06	0.759
0.0633	0.74
0.0666	0.736
0.07	0.724
0.0733	0.717
0.0766	0.708
0.08	0.698
0.0833	0.692
0.0866	0.682
0.09	0.676
0.0933	0.669
0.0966	0.66
0.1	0.653
0.1033	0.647
0.1066	0.64
0.11	0.634
0.1133	0.628
0.1166	0.624
0.12	0.618
0.1233	0.612
0.1266	0.605
0.13	0.602

0.1333	0.599
0.1366	0.592
0.14	0.586
0.1433	0.58
0.1466	0.576
0.15	0.573
0.1533	0.567
0.1566	0.564
0.16	0.557
0.1633	0.554
0.1666	0.551
0.17	0.544
0.1733	0.541
0.1766	0.538
0.18	0.532
0.1833	0.528
0.1866	0.525
0.19	0.522
0.1933	0.519
0.1966	0.516
0.2	0.512
0.2033	0.509
0.2066	0.503
0.21	0.5
0.2133	0.496
0.2166	0.493
0.22	0.49
0.2233	0.487
0.2266	0.484
0.23	0.48
0.2333	0.477
0.2366	0.477
0.24	0.471
0.2433	0.468
0.2466	0.464
0.25	0.461
0.2533	0.458
0.2566	0.455
0.26	0.452
0.2633	0.452
0.2666	0.445
0.27	0.445
0.2733	0.442
0.2766	0.439
0.28	0.436
0.2833	0.432
0.2866	0.429
0.29	0.429
0.2933	0.423
0.2966	0.423
0.3	0.42
0.3033	0.416

0.3066	0.413
0.31	0.413
0.3133	0.41
0.3166	0.407
0.32	0.404
0.3233	0.4
0.3266	0.4
0.33	0.397
0.3333	0.397
0.35	0.381
0.3666	0.372
0.3833	0.359
0.4	0.349
0.4166	0.336
0.4333	0.327
0.45	0.317
0.4666	0.308
0.4833	0.301
0.5	0.288
0.5166	0.282
0.5333	0.272
0.55	0.266
0.5666	0.26
0.5833	0.25
0.6	0.244
0.6166	0.237
0.6333	0.231
0.65	0.224
0.6666	0.218
0.6833	0.215
0.7	0.208
0.7166	0.202
0.7333	0.199
0.75	0.192
0.7666	0.189
0.7833	0.183
0.8	0.18
0.8166	0.173
0.8333	0.17
0.85	0.167
0.8666	0.16
0.8833	0.157
0.9	0.154
0.9166	0.151
0.9333	0.148
0.95	0.144
0.9666	0.138
0.9833	0.138
1.	0.135
1.2	0.096
1.4	0.074
1.6	0.061

1.8	0.048
2.	0.039
2.2	0.032
2.4	0.026
2.6	0.023
2.8	0.02
3.	0.016
3.2	0.013
3.4	0.01
3.6	0.013
3.8	0.007
4.	0.007
4.2	0.004
4.4	0.004
4.6	0.004
4.8	0.004
5.	0.
5.2	0.

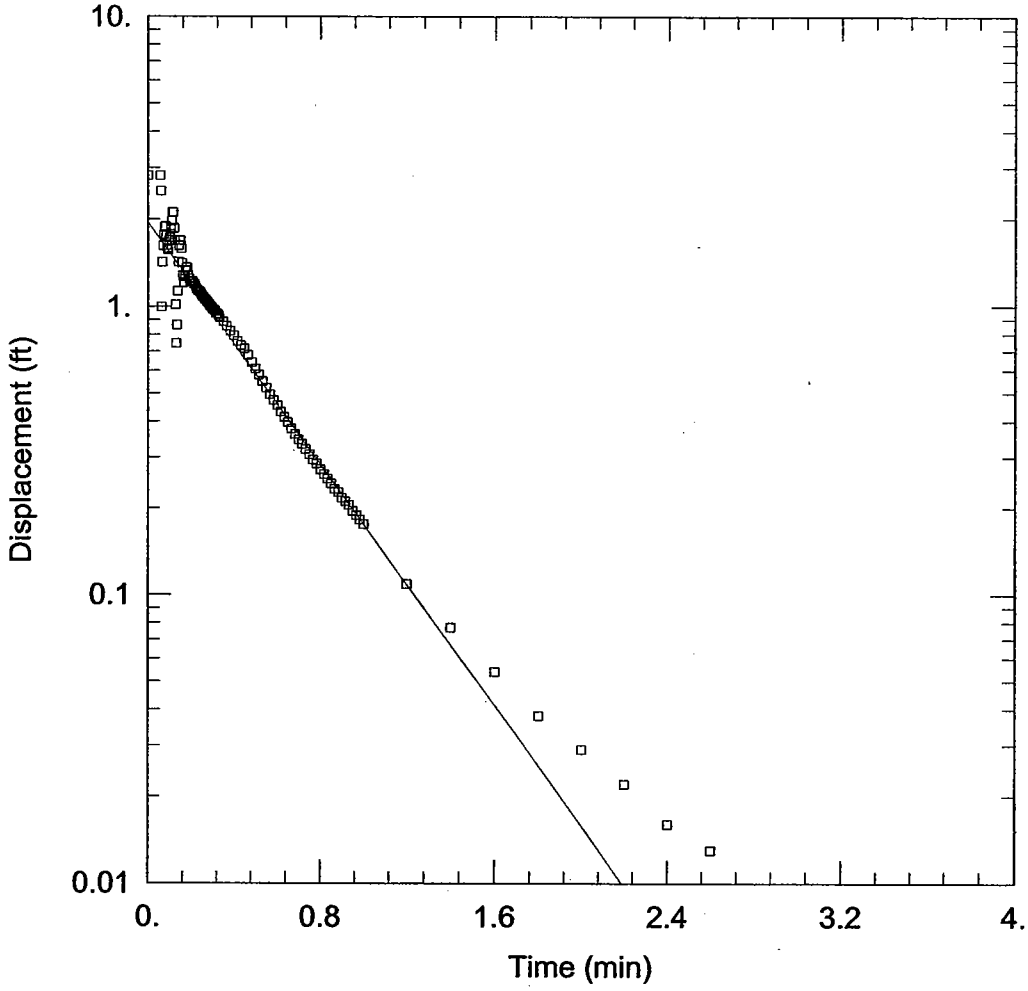
SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice

VISUAL ESTIMATION RESULTS

Estimated Parameters

Parameter	Estimate	
K	0.00779	cm/sec
y0	0.8939	ft



SJS02-MW05S-FH-BR

Data Set: C:\DOCUME~1\ST.JS\SITE2R~1\SLUGTE~1\MW05S_F.AQT
Date: 03/21/02 Time: 15:08:31

AQUIFER DATA

Saturated Thickness: 14.7 ft Anisotropy Ratio (Kz/Kr): 1.

WELL DATA

Initial Displacement: 2.821 ft Water Column Height: 9.7 ft
Casing Radius: 0.083 ft Wellbore Radius: 0.42 ft
Screen Length: 10. ft Gravel Pack Porosity: 0.3

SOLUTION

Aquifer Model: Unconfined K = 0.007311 cm/sec
Solution Method: Bouwer-Rice y0 = 1.945 ft

Data Set: C:\DOCUME~1\ST.JS\SITE2R~1\SLUGTE~1\MW05S_F.AQT
Title: SJS02-MW05S-FH-BR
Date: 04/01/02
Time: 10:25:21

AQUIFER DATA

Saturated Thickness: 14.7 ft
Anisotropy Ratio (Kz/Kr): 1

OBSERVATION WELL DATA

Number of observation wells: 1

Observation Well No. 1: MW05S

X Location: 0 ft
Y Location: 0 ft

Observation Data

Time (min)	Displacement (ft)
0.0566	2.821
0.06	2.497
0.0633	0.995
0.0666	1.421
0.07	1.62
0.0733	1.767
0.0766	1.876
0.08	1.889
0.0833	1.751
0.0866	1.623
0.09	1.588
0.0933	1.565
0.0966	1.69
0.1	1.722
0.1033	1.77
0.1066	1.866
0.11	1.969
0.1133	2.11
0.1166	2.11
0.12	1.86
0.1233	1.681
0.1266	1.015
0.13	0.746
0.1333	0.864
0.1366	1.13
0.14	1.424
0.1433	1.62
0.1466	1.69
0.15	1.687
0.1533	1.581
0.1566	1.412

0.16	1.277
0.1633	1.203
0.1666	1.21
0.17	1.264
0.1733	1.328
0.1766	1.357
0.18	1.364
0.1833	1.335
0.1866	1.28
0.19	1.248
0.1933	1.226
0.1966	1.216
0.2	1.223
0.2033	1.226
0.2066	1.223
0.21	1.213
0.2133	1.197
0.2166	1.191
0.22	1.175
0.2233	1.155
0.2266	1.146
0.23	1.139
0.2333	1.133
0.2366	1.13
0.24	1.123
0.2433	1.114
0.2466	1.104
0.25	1.095
0.2533	1.085
0.2566	1.079
0.26	1.069
0.2633	1.063
0.2666	1.056
0.27	1.05
0.2733	1.04
0.2766	1.034
0.28	1.027
0.2833	1.018
0.2866	1.011
0.29	1.005
0.2933	0.999
0.2966	0.989
0.3	0.982
0.3033	0.976
0.3066	0.973
0.31	0.966
0.3133	0.96
0.3166	0.944
0.32	0.947
0.3233	0.944
0.3266	0.938
0.33	0.925

0.3333	0.915
0.35	0.886
0.3666	0.854
0.3833	0.822
0.4	0.794
0.4166	0.758
0.4333	0.733
0.45	0.714
0.4666	0.678
0.4833	0.64
0.5	0.608
0.5166	0.579
0.5333	0.55
0.55	0.522
0.5666	0.496
0.5833	0.473
0.6	0.454
0.6166	0.432
0.6333	0.413
0.65	0.397
0.6666	0.377
0.6833	0.361
0.7	0.345
0.7166	0.333
0.7333	0.32
0.75	0.307
0.7666	0.294
0.7833	0.285
0.8	0.272
0.8166	0.262
0.8333	0.253
0.85	0.243
0.8666	0.233
0.8833	0.227
0.9	0.217
0.9166	0.211
0.9333	0.205
0.95	0.195
0.9666	0.189
0.9833	0.182
1.	0.176
1.2	0.109
1.4	0.077
1.6	0.054
1.8	0.038
2.	0.029
2.2	0.022
2.4	0.016
2.6	0.013
2.8	0.009
3.	0.006
3.2	0.003

3.4	0.003
3.6	0.
3.8	0.
4.	0.

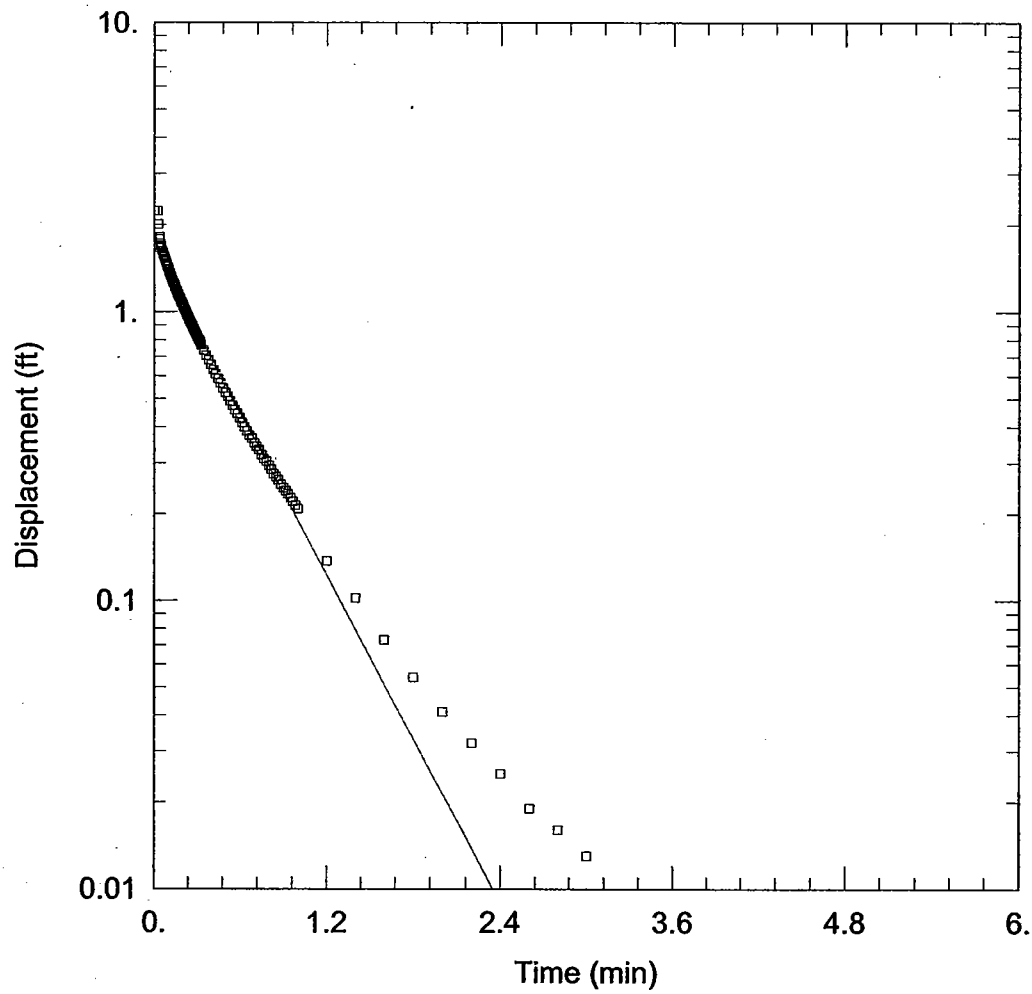
SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice

VISUAL ESTIMATION RESULTS

Estimated Parameters

Parameter	Estimate	
K	0.007311	cm/sec
y0	1.945	ft



SJS02-MW05S-RH-BR

Data Set: C:\DOCUME~1\ST.JS\SITE2R~1\SLUGTE~1\MW05S_R.AQT
Date: 03/21/02 Time: 14:32:52

AQUIFER DATA

Saturated Thickness: 14.7 ft Anisotropy Ratio (Kz/Kr): 1.

WELL DATA

Initial Displacement: 2.23 ft Water Column Height: 9.7 ft
Casing Radius: 0.083 ft Wellbore Radius: 0.42 ft
Screen Length: 10. ft Gravel Pack Porosity: 0.3

SOLUTION

Aquifer Model: Unconfined K = 0.006619 cm/sec
Solution Method: Bouwer-Rice y0 = 1.675 ft

Data Set: C:\DOCUME~1\ST.JS\SITE2R~1\SLUGTE~1\MW05S_R.AQT
Title: SJS02-MW05S-RH-BR
Date: 04/01/02
Time: 10:25:31

AQUIFER DATA

Saturated Thickness: 14.7 ft
Anisotropy Ratio (Kz/Kr): 1

OBSERVATION WELL DATA

Number of observation wells: 1

Observation Well No. 1: MW05S

X Location: 0 ft
Y Location: 0 ft

Observation Data

Time (min)	Displacement (ft)
0.0266	2.23
0.03	2.009
0.0333	1.67
0.0366	1.779
0.04	1.814
0.0433	1.721
0.0466	1.696
0.05	1.686
0.0533	1.657
0.0566	1.625
0.06	1.613
0.0633	1.597
0.0666	1.574
0.07	1.558
0.0733	1.542
0.0766	1.523
0.08	1.504
0.0833	1.488
0.0866	1.469
0.09	1.453
0.0933	1.437
0.0966	1.424
0.1	1.408
0.1033	1.392
0.1066	1.379
0.11	1.363
0.1133	1.35
0.1166	1.334
0.12	1.325
0.1233	1.309
0.1266	1.296

0.13	1.28
0.1333	1.27
0.1366	1.258
0.14	1.248
0.1433	1.235
0.1466	1.222
0.15	1.213
0.1533	1.2
0.1566	1.19
0.16	1.178
0.1633	1.168
0.1666	1.155
0.17	1.146
0.1733	1.136
0.1766	1.126
0.18	1.117
0.1833	1.107
0.1866	1.094
0.19	1.085
0.1933	1.075
0.1966	1.069
0.2	1.059
0.2033	1.05
0.2066	1.04
0.21	1.03
0.2133	1.024
0.2166	1.014
0.22	1.005
0.2233	0.995
0.2266	0.989
0.23	0.982
0.2333	0.973
0.2366	0.966
0.24	0.957
0.2433	0.947
0.2466	0.941
0.25	0.934
0.2533	0.925
0.2566	0.918
0.26	0.909
0.2633	0.902
0.2666	0.896
0.27	0.89
0.2733	0.883
0.2766	0.874
0.28	0.867
0.2833	0.861
0.2866	0.854
0.29	0.848
0.2933	0.842
0.2966	0.835
0.3	0.829

0.3033	0.822
0.3066	0.816
0.31	0.81
0.3133	0.803
0.3166	0.797
0.32	0.794
0.3233	0.787
0.3266	0.781
0.33	0.774
0.3333	0.768
0.35	0.736
0.3666	0.707
0.3833	0.682
0.4	0.656
0.4166	0.63
0.4333	0.608
0.45	0.586
0.4666	0.566
0.4833	0.544
0.5	0.525
0.5166	0.509
0.5333	0.49
0.55	0.474
0.5666	0.458
0.5833	0.445
0.6	0.429
0.6166	0.413
0.6333	0.4
0.65	0.387
0.6666	0.374
0.6833	0.365
0.7	0.352
0.7166	0.342
0.7333	0.333
0.75	0.32
0.7666	0.31
0.7833	0.304
0.8	0.294
0.8166	0.285
0.8333	0.275
0.85	0.269
0.8666	0.262
0.8833	0.253
0.9	0.246
0.9166	0.24
0.9333	0.234
0.95	0.227
0.9666	0.221
0.9833	0.214
1.	0.208
1.2	0.137
1.4	0.102

1.6	0.073
1.8	0.054
2.	0.041
2.2	0.032
2.4	0.025
2.6	0.019
2.8	0.016
3.	0.013
3.2	0.009
3.4	0.009
3.6	0.006
3.8	0.006
4.	0.003
4.2	0.003
4.4	0.
4.6	0.
4.8	0.
5.	0.
5.2	0.
5.4	0.
5.6	0.
5.8	0.

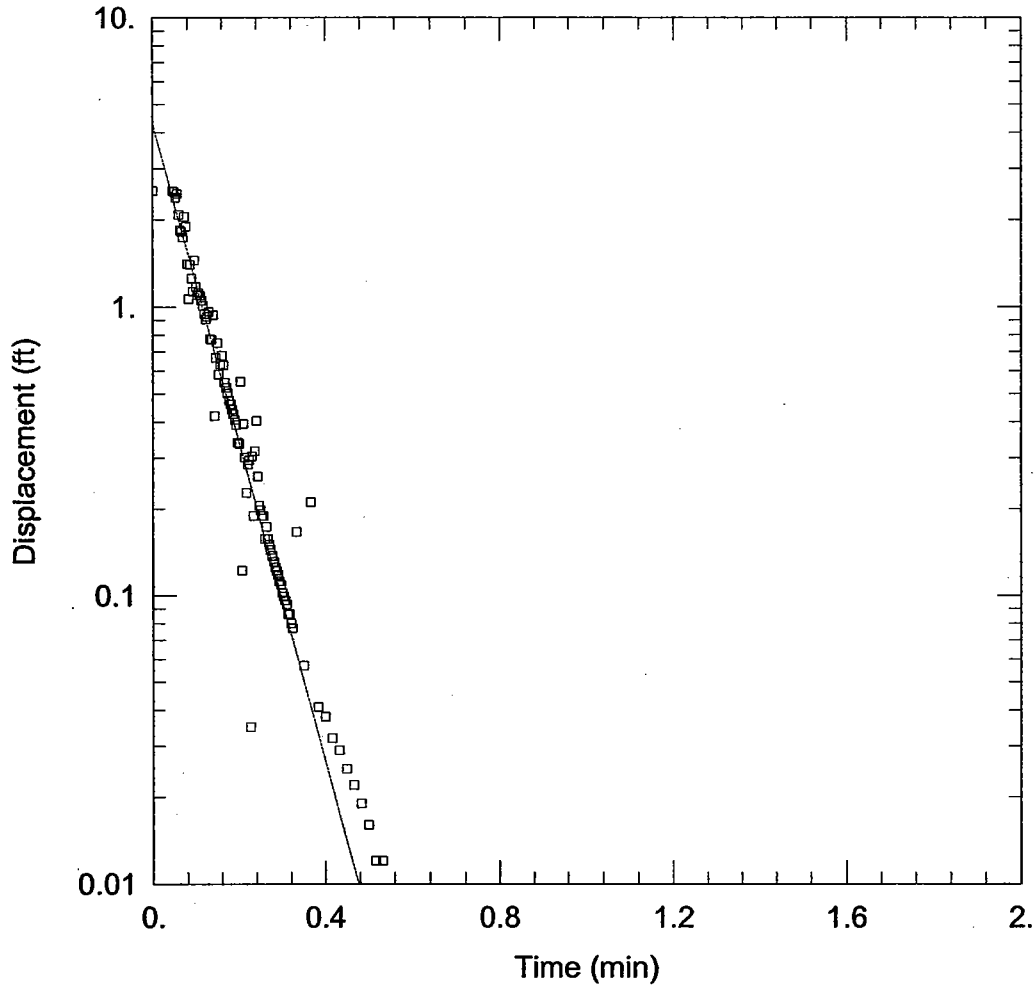
SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice

VISUAL ESTIMATION RESULTS

Estimated Parameters

Parameter	Estimate	
K	0.006619	cm/sec
y0	1.675	ft



SJS02-MW01D-FH-BR

Data Set: C:\DOCUME~1\ST.JS\SITE2R~1\SLUGTE~1\MW01D_FB.AQT
Date: 03/21/02 Time: 15:12:52

AQUIFER DATA

Saturated Thickness: 22.14 ft Anisotropy Ratio (Kz/Kr): 1.

WELL DATA

Initial Displacement: 2.514 ft Water Column Height: 65.14 ft
Casing Radius: 0.083 ft Wellbore Radius: 0.42 ft
Screen Length: 10. ft Gravel Pack Porosity: 0.3

SOLUTION

Aquifer Model: Confined K = 0.06367 cm/sec
Solution Method: Bouwer-Rice y0 = 4.299 ft

Data Set: C:\DOCUME~1\ST.JS\SITE2R~1\SLUGTE~1\MW01D_FB.AQT
Title: SJS02-MW01D-FH-BR
Date: 04/01/02
Time: 10:20:00

AQUIFER DATA

Saturated Thickness: 22.14 ft
Anisotropy Ratio (Kz/Kr): 1

OBSERVATION WELL DATA

Number of observation wells: 1

Observation Well No. 1: MW01D

X Location: 0 ft
Y Location: 0 ft

Observation Data

Time (min)	Displacement (ft)
0.0466	2.514
0.05	2.495
0.0533	2.383
0.0566	2.456
0.06	2.081
0.0633	1.84
0.0666	1.818
0.07	1.741
0.0733	2.052
0.0766	1.892
0.08	1.407
0.0833	1.064
0.0866	1.401
0.09	1.253
0.0933	1.128
0.0966	1.446
0.1	1.173
0.1033	1.1
0.1066	1.119
0.11	1.096
0.1133	1.055
0.1166	1.01
0.12	0.946
0.1233	0.907
0.1266	0.926
0.13	0.962
0.1333	0.776
0.1366	0.769
0.14	0.936
0.1433	0.42
0.1466	0.667

0.15	0.75
0.1533	0.583
0.1566	0.634
0.16	0.679
0.1633	0.628
0.1666	0.548
0.17	0.525
0.1733	0.503
0.1766	0.474
0.18	0.461
0.1833	0.442
0.1866	0.426
0.19	0.407
0.1933	0.391
0.1966	0.339
0.2	0.336
0.2033	0.551
0.2066	0.122
0.21	0.394
0.2133	0.301
0.2166	0.227
0.22	0.285
0.2233	0.295
0.2266	0.035
0.23	0.304
0.2333	0.189
0.2366	0.317
0.24	0.404
0.2433	0.259
0.2466	0.205
0.25	0.198
0.2533	0.189
0.2566	0.189
0.26	0.157
0.2633	0.173
0.2666	0.157
0.27	0.15
0.2733	0.144
0.2766	0.137
0.28	0.131
0.2833	0.125
0.2866	0.122
0.29	0.118
0.2933	0.112
0.2966	0.109
0.3	0.102
0.3033	0.099
0.3066	0.096
0.31	0.093
0.3133	0.086
0.3166	0.086
0.32	0.08

0.3233	0.077
0.3266	-0.209
0.33	-0.545
0.3333	0.166
0.35	0.057
0.3666	0.211
0.3833	0.041
0.4	0.038
0.4166	0.032
0.4333	0.029
0.45	0.025
0.4666	0.022
0.4833	0.019
0.5	0.016
0.5166	0.012
0.5333	0.012
0.55	0.009
0.5666	0.009
0.5833	0.009
0.6	0.006
0.6166	0.006
0.6333	0.006
0.65	0.006
0.6666	0.006
0.6833	0.006
0.7	0.006
0.7166	0.006
0.7333	0.006
0.75	0.006
0.7666	0.006
0.7833	0.006
0.8	0.006
0.8166	0.006
0.8333	0.006
0.85	0.006
0.8666	0.006
0.8833	0.006
0.9	0.006
0.9166	0.003
0.9333	0.006
0.95	0.003
0.9666	0.003
0.9833	0.003
1.	0.003
1.2	0.003
1.4	0.003
1.6	0.
1.8	0.
2.	0.

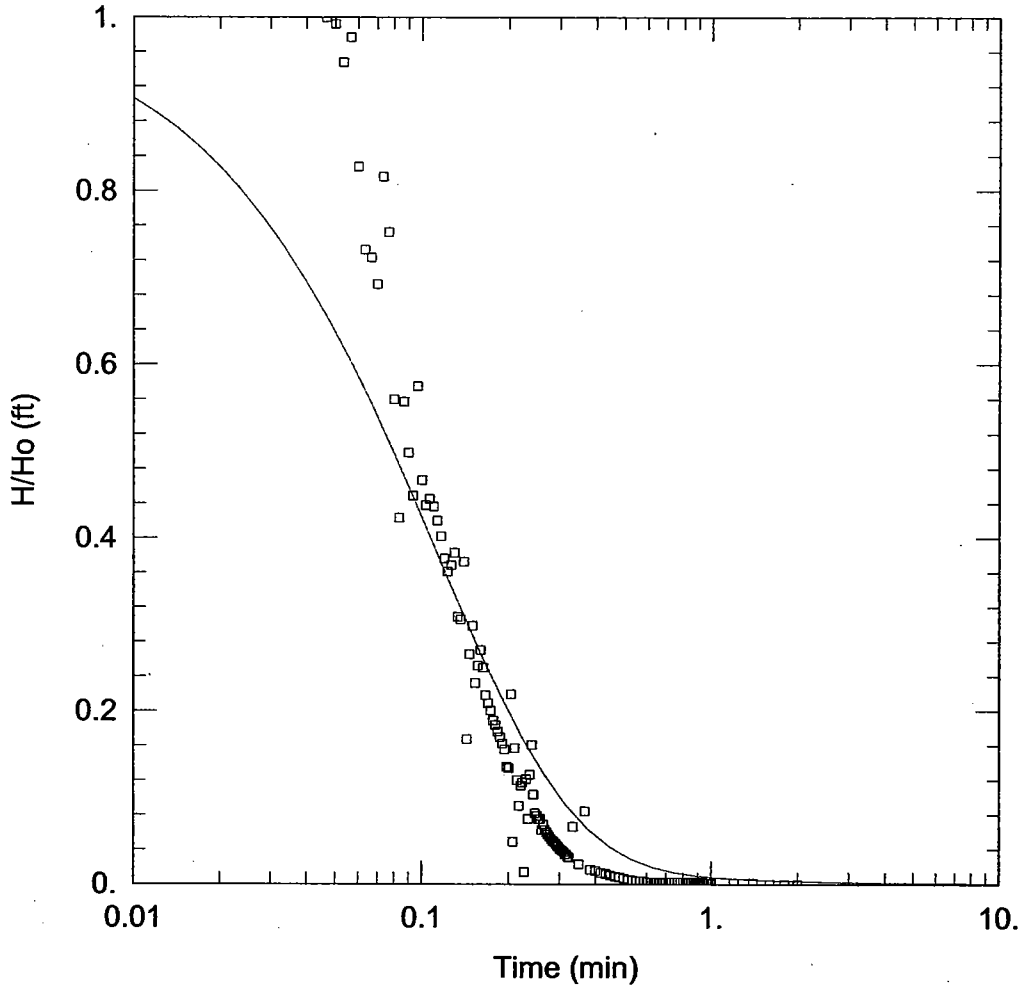
SOLUTION

Aquifer Model: Confined
Solution Method: Bouwer-Rice

VISUAL ESTIMATION RESULTS

Estimated Parameters

Parameter	Estimate	
K	0.06367	cm/sec
y0	4.299	ft



SJS02-MW01D-FH-C

Data Set: C:\DOCUME~1\ST.JS\SITE2R~1\SLUGTE~1\MW01D_FC.AQT
Date: 03/25/02 Time: 09:49:36

AQUIFER DATA

Saturated Thickness: 22.14 ft Anisotropy Ratio (Kz/Kr): 1.

WELL DATA

Initial Displacement: 2.514 ft Water Column Height: 65.14 ft
Casing Radius: 0.083 ft Wellbore Radius: 0.42 ft
Screen Length: 10. ft Gravel Pack Porosity: 0.3

SOLUTION

Aquifer Model: Confined T = 4.963 cm^2/sec
Solution Method: Cooper-Bredehoeft-Papadopulos S = 1.E-10

Data Set: C:\DOCUME~1\ST.JS\SITE2R~1\SLUGTE~1\MW01D_FC.AQT
Title: SJS02-MW01D-FH-C
Date: 04/01/02
Time: 10:20:48

AQUIFER DATA

Saturated Thickness: 22.14 ft
Anisotropy Ratio (Kz/Kr): 1

OBSERVATION WELL DATA

Number of observation wells: 1

Observation Well No. 1: MW01D

X Location: 0 ft
Y Location: 0 ft

Observation Data

Time (min)	Displacement (ft)
0.0466	2.514
0.05	2.495
0.0533	2.383
0.0566	2.456
0.06	2.081
0.0633	1.84
0.0666	1.818
0.07	1.741
0.0733	2.052
0.0766	1.892
0.08	1.407
0.0833	1.064
0.0866	1.401
0.09	1.253
0.0933	1.128
0.0966	1.446
0.1	1.173
0.1033	1.1
0.1066	1.119
0.11	1.096
0.1133	1.055
0.1166	1.01
0.12	0.946
0.1233	0.907
0.1266	0.926
0.13	0.962
0.1333	0.776
0.1366	0.769
0.14	0.936
0.1433	0.42
0.1466	0.667

0.15	0.75
0.1533	0.583
0.1566	0.634
0.16	0.679
0.1633	0.628
0.1666	0.548
0.17	0.525
0.1733	0.503
0.1766	0.474
0.18	0.461
0.1833	0.442
0.1866	0.426
0.19	0.407
0.1933	0.391
0.1966	0.339
0.2	0.336
0.2033	0.551
0.2066	0.122
0.21	0.394
0.2133	0.301
0.2166	0.227
0.22	0.285
0.2233	0.295
0.2266	0.035
0.23	0.304
0.2333	0.189
0.2366	0.317
0.24	0.404
0.2433	0.259
0.2466	0.205
0.25	0.198
0.2533	0.189
0.2566	0.189
0.26	0.157
0.2633	0.173
0.2666	0.157
0.27	0.15
0.2733	0.144
0.2766	0.137
0.28	0.131
0.2833	0.125
0.2866	0.122
0.29	0.118
0.2933	0.112
0.2966	0.109
0.3	0.102
0.3033	0.099
0.3066	0.096
0.31	0.093
0.3133	0.086
0.3166	0.086
0.32	0.08

0.3233	0.077
0.3266	-0.209
0.33	-0.545
0.3333	0.166
0.35	0.057
0.3666	0.211
0.3833	0.041
0.4	0.038
0.4166	0.032
0.4333	0.029
0.45	0.025
0.4666	0.022
0.4833	0.019
0.5	0.016
0.5166	0.012
0.5333	0.012
0.55	0.009
0.5666	0.009
0.5833	0.009
0.6	0.006
0.6166	0.006
0.6333	0.006
0.65	0.006
0.6666	0.006
0.6833	0.006
0.7	0.006
0.7166	0.006
0.7333	0.006
0.75	0.006
0.7666	0.006
0.7833	0.006
0.8	0.006
0.8166	0.006
0.8333	0.006
0.85	0.006
0.8666	0.006
0.8833	0.006
0.9	0.006
0.9166	0.003
0.9333	0.006
0.95	0.003
0.9666	0.003
0.9833	0.003
1.	0.003
1.2	0.003
1.4	0.003
1.6	0.
1.8	0.
2.	0.

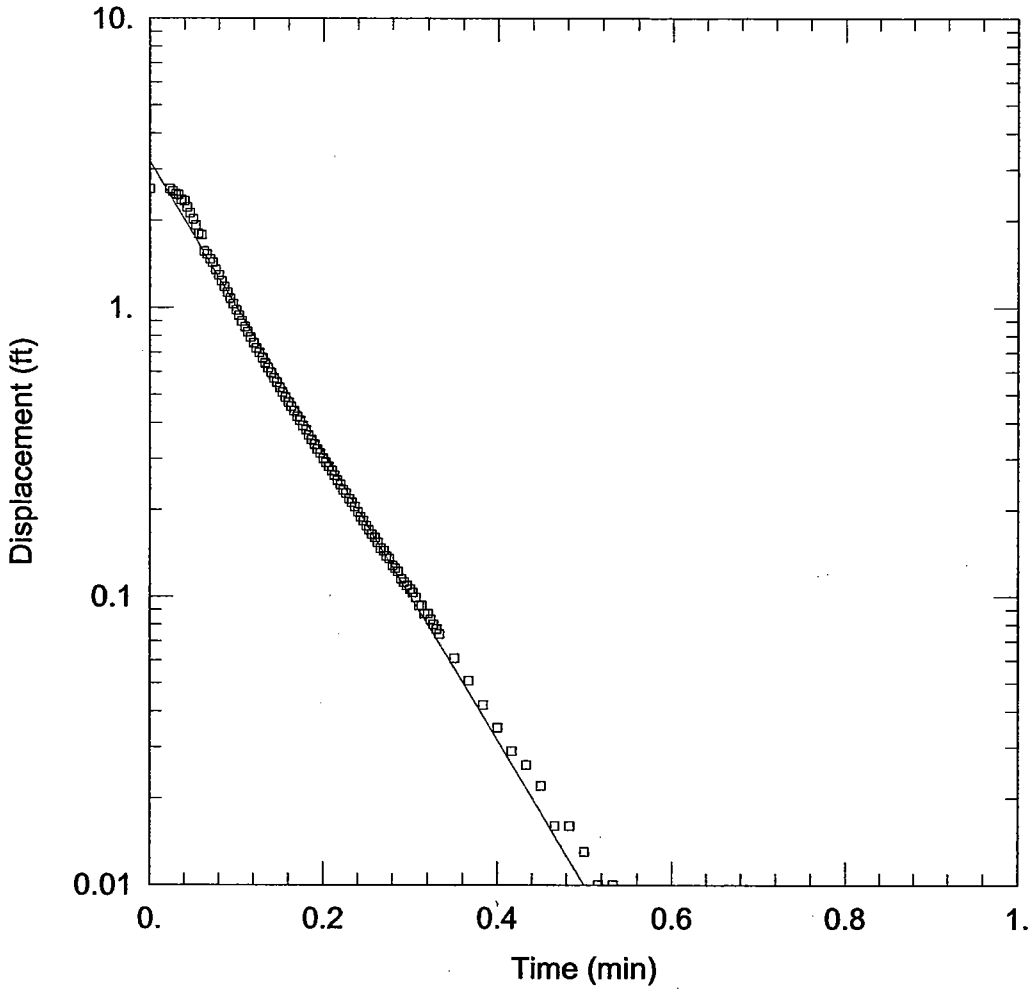
SOLUTION

Aquifer Model: Confined
Solution Method: Cooper-Bredehoeft-Papadopulos

VISUAL ESTIMATION RESULTS

Estimated Parameters

Parameter	Estimate	
T	4.963	cm^2/sec
S	1.E-10	



SJS02-MW01D-RH-BR

Data Set: C:\DOCUME~1\ST.JS\SITE2R~1\SLUGTE~1\MW01D_RB.AQT
Date: 04/01/02 Time: 10:39:06

AQUIFER DATA

Saturated Thickness: 22.14 ft Anisotropy Ratio (Kz/Kr): 1.

WELL DATA

Initial Displacement: 2.57 ft Water Column Height: 65.14 ft
Casing Radius: 0.083 ft Wellbore Radius: 0.42 ft
Screen Length: 10. ft Gravel Pack Porosity: 0.3

SOLUTION

Aquifer Model: Confined K = 0.0578 cm/sec
Solution Method: Bouwer-Rice y0 = 3.195 ft

Data Set: C:\DOCUME~1\ST.JS\SITE2R~1\SLUGTE~1\MW01D_RB.AQT
Title: SJS02-MW01D-RH-BR
Date: 04/01/02
Time: 10:21:42

AQUIFER DATA

Saturated Thickness: 22.14 ft
Anisotropy Ratio (Kz/Kr): 1

OBSERVATION WELL DATA

Number of observation wells: 1

Observation Well No. 1: MW01D

X Location: 0 ft
Y Location: 0 ft

Observation Data

Time (min)	Displacement (ft)
0.0233	2.57
0.0266	2.522
0.03	2.461
0.0333	2.445
0.0366	2.352
0.04	2.33
0.0433	2.221
0.0466	2.118
0.05	2.019
0.0533	1.923
0.0566	1.801
0.06	1.779
0.0633	1.561
0.0666	1.526
0.07	1.471
0.0733	1.43
0.0766	1.35
0.08	1.292
0.0833	1.234
0.0866	1.18
0.09	1.125
0.0933	1.077
0.0966	1.029
0.1	0.981
0.1033	0.939
0.1066	0.898
0.11	0.859
0.1133	0.824
0.1166	0.789
0.12	0.756
0.1233	0.724

0.1266	0.699
0.13	0.67
0.1333	0.644
0.1366	0.619
0.14	0.596
0.1433	0.571
0.1466	0.551
0.15	0.529
0.1533	0.51
0.1566	0.491
0.16	0.471
0.1633	0.455
0.1666	0.439
0.17	0.42
0.1733	0.407
0.1766	0.391
0.18	0.378
0.1833	0.362
0.1866	0.349
0.19	0.337
0.1933	0.324
0.1966	0.314
0.2	0.301
0.2033	0.292
0.2066	0.282
0.21	0.273
0.2133	0.263
0.2166	0.253
0.22	0.244
0.2233	0.234
0.2266	0.228
0.23	0.218
0.2333	0.212
0.2366	0.205
0.24	0.196
0.2433	0.189
0.2466	0.183
0.25	0.176
0.2533	0.17
0.2566	0.164
0.26	0.16
0.2633	0.154
0.2666	0.147
0.27	0.144
0.2733	0.138
0.2766	0.135
0.28	0.128
0.2833	0.125
0.2866	0.122
0.29	0.115
0.2933	0.112
0.2966	0.109

0.3	0.106
0.3033	0.103
0.3066	0.099
0.31	0.093
0.3133	0.093
0.3166	0.087
0.32	0.087
0.3233	0.083
0.3266	0.08
0.33	0.077
0.3333	0.074
0.35	0.061
0.3666	0.051
0.3833	0.042
0.4	0.035
0.4166	0.029
0.4333	0.026
0.45	0.022
0.4666	0.016
0.4833	0.016
0.5	0.013
0.5166	0.01
0.5333	0.01
0.55	0.006
0.5666	0.006
0.5833	0.006
0.6	0.006
0.6166	0.003
0.6333	0.003
0.65	0.003
0.6666	0.003
0.6833	0.003
0.7	0.003
0.7166	0.003
0.7333	0.003
0.75	0.
0.7666	0.
0.7833	0.
0.8	0.
0.8166	0.003
0.8333	0.
0.85	0.
0.8666	0.
0.8833	0.
0.9	0.
0.9166	0.
0.9333	0.
0.95	0.
0.9666	0.
0.9833	0.
1.	0.

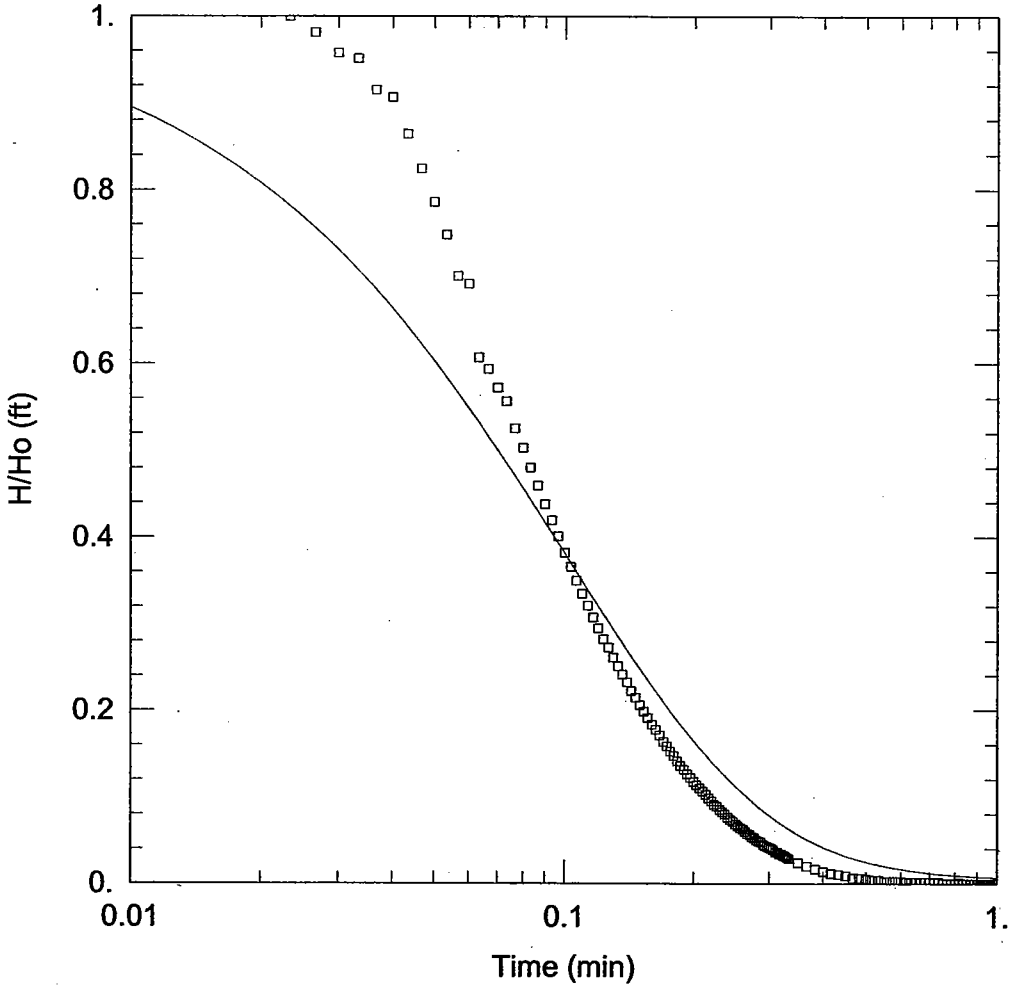
SOLUTION

Aquifer Model: Confined
Solution Method: Bouwer-Rice

VISUAL ESTIMATION RESULTS

Estimated Parameters

Parameter	Estimate	
K	0.0578	cm/sec
y0	3.195	ft



SJS02-MW01D-RH-C

Data Set: C:\DOCUME~1\ST.JS\SITE2R~1\SLUGTE~1\MW01D_RC.AQT
Date: 03/25/02 Time: 09:51:38

AQUIFER DATA

Saturated Thickness: 22.14 ft Anisotropy Ratio (Kz/Kr): 1.

WELL DATA

Initial Displacement: 2.57 ft Water Column Height: 65.14 ft
Casing Radius: 0.083 ft Wellbore Radius: 0.42 ft
Screen Length: 10. ft Gravel Pack Porosity: 0.3

SOLUTION

Aquifer Model: Confined T = 5.632 cm^2/sec
Solution Method: Cooper-Bredehoeft-Papadopulos S = 1.E-10

Data Set: C:\DOCUME~1\ST.JS\SITE2R~1\SLUGTE~1\MW01D_RC.AQT
Title: SJS02-MW01D-RH-C
Date: 04/01/02
Time: 10:21:58

AQUIFER DATA

Saturated Thickness: 22.14 ft
Anisotropy Ratio (Kz/Kr): 1

OBSERVATION WELL DATA

Number of observation wells: 1

Observation Well No. 1: MW01D

X Location: 0 ft
Y Location: 0 ft

Observation Data

Time (min)	Displacement (ft)
0.0233	2.57
0.0266	2.522
0.03	2.461
0.0333	2.445
0.0366	2.352
0.04	2.33
0.0433	2.221
0.0466	2.118
0.05	2.019
0.0533	1.923
0.0566	1.801
0.06	1.779
0.0633	1.561
0.0666	1.526
0.07	1.471
0.0733	1.43
0.0766	1.35
0.08	1.292
0.0833	1.234
0.0866	1.18
0.09	1.125
0.0933	1.077
0.0966	1.029
0.1	0.981
0.1033	0.939
0.1066	0.898
0.11	0.859
0.1133	0.824
0.1166	0.789
0.12	0.756
0.1233	0.724

0.1266	0.699
0.13	0.67
0.1333	0.644
0.1366	0.619
0.14	0.596
0.1433	0.571
0.1466	0.551
0.15	0.529
0.1533	0.51
0.1566	0.491
0.16	0.471
0.1633	0.455
0.1666	0.439
0.17	0.42
0.1733	0.407
0.1766	0.391
0.18	0.378
0.1833	0.362
0.1866	0.349
0.19	0.337
0.1933	0.324
0.1966	0.314
0.2	0.301
0.2033	0.292
0.2066	0.282
0.21	0.273
0.2133	0.263
0.2166	0.253
0.22	0.244
0.2233	0.234
0.2266	0.228
0.23	0.218
0.2333	0.212
0.2366	0.205
0.24	0.196
0.2433	0.189
0.2466	0.183
0.25	0.176
0.2533	0.17
0.2566	0.164
0.26	0.16
0.2633	0.154
0.2666	0.147
0.27	0.144
0.2733	0.138
0.2766	0.135
0.28	0.128
0.2833	0.125
0.2866	0.122
0.29	0.115
0.2933	0.112
0.2966	0.109

0.3	0.106
0.3033	0.103
0.3066	0.099
0.31	0.093
0.3133	0.093
0.3166	0.087
0.32	0.087
0.3233	0.083
0.3266	0.08
0.33	0.077
0.3333	0.074
0.35	0.061
0.3666	0.051
0.3833	0.042
0.4	0.035
0.4166	0.029
0.4333	0.026
0.45	0.022
0.4666	0.016
0.4833	0.016
0.5	0.013
0.5166	0.01
0.5333	0.01
0.55	0.006
0.5666	0.006
0.5833	0.006
0.6	0.006
0.6166	0.003
0.6333	0.003
0.65	0.003
0.6666	0.003
0.6833	0.003
0.7	0.003
0.7166	0.003
0.7333	0.003
0.75	0.
0.7666	0.
0.7833	0.
0.8	0.
0.8166	0.003
0.8333	0.
0.85	0.
0.8666	0.
0.8833	0.
0.9	0.
0.9166	0.
0.9333	0.
0.95	0.
0.9666	0.
0.9833	0.
1.	0.

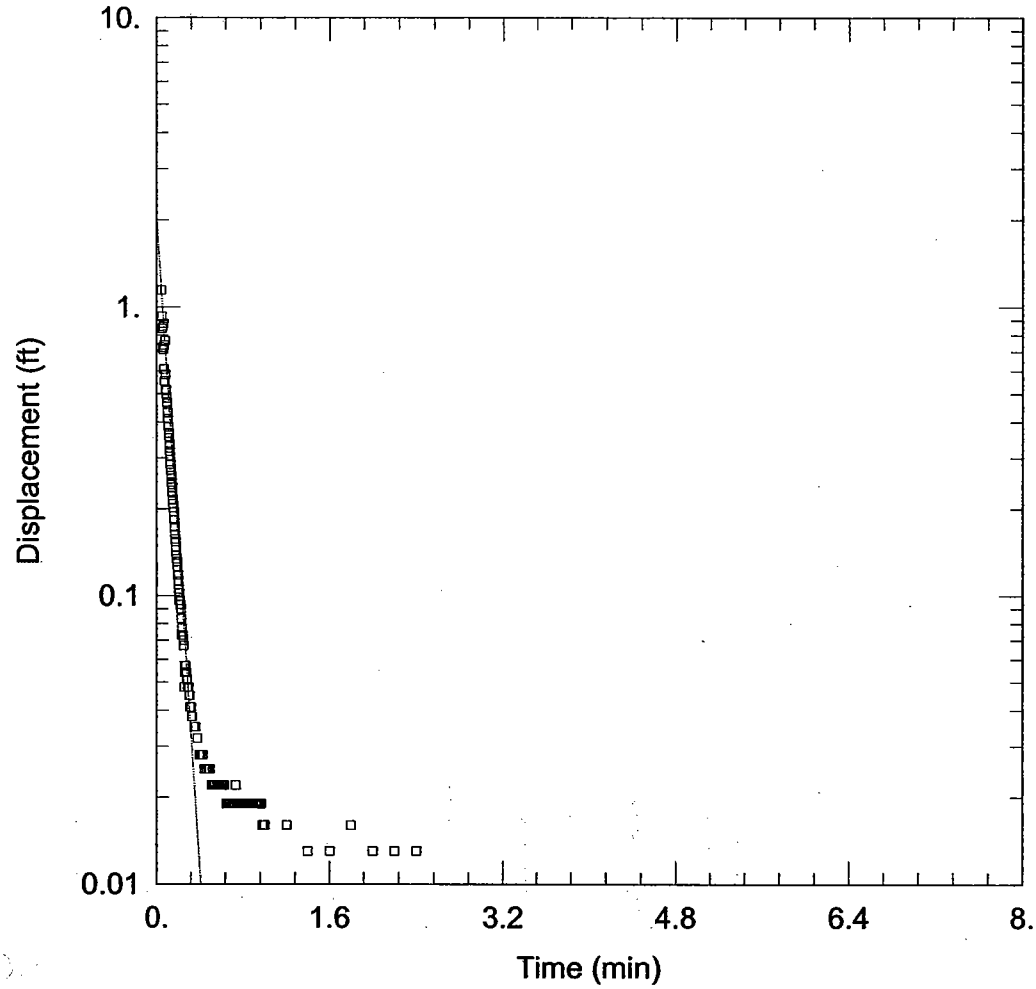
SOLUTION

Aquifer Model: Confined
Solution Method: Cooper-Bredehoeft-Papadopulos

VISUAL ESTIMATION RESULTS

Estimated Parameters

Parameter	Estimate	
T	5.632	cm^2/sec
S	1.E-10	



SJS02-MW02D-FH-BR

Data Set: C:\DOCUME~1\ST.JS\SITE2R~1\SLUGTE~1\MW02D_FB.AQT
Date: 03/21/02 Time: 15:15:34

AQUIFER DATA

Saturated Thickness: 20.67 ft Anisotropy Ratio (Kz/Kr): 1.

WELL DATA

Initial Displacement: 1.145 ft Water Column Height: 64.27 ft
Casing Radius: 0.83 ft Wellbore Radius: 0.42 ft
Screen Length: 10. ft Gravel Pack Porosity: 0.3

SOLUTION

Aquifer Model: Confined K = 0.5937 cm/sec
Solution Method: Bouwer-Rice y0 = 2.046 ft

Data Set: C:\DOCUME~1\ST.JS\SITE2R~1\SLUGTE~1\MW02D_FB.AQT
Title: SJS02-MW02D-FH-BR
Date: 04/01/02
Time: 10:22:36

AQUIFER DATA

Saturated Thickness: 20.67 ft
Anisotropy Ratio (Kz/Kr): 1

OBSERVATION WELL DATA

Number of observation wells: 1

Observation Well No. 1: MW02D

X Location: 0 ft
Y Location: 0 ft

Observation Data

Time (min)	Displacement (ft)
0.0466	1.145
0.05	0.927
0.0533	0.844
0.0566	0.725
0.06	0.856
0.0633	0.712
0.0666	0.876
0.07	0.609
0.0733	0.738
0.0766	0.555
0.08	0.763
0.0833	0.584
0.0866	0.519
0.09	0.513
0.0933	0.484
0.0966	0.468
0.1	0.462
0.1033	0.43
0.1066	0.41
0.11	0.385
0.1133	0.365
0.1166	0.352
0.12	0.333
0.1233	0.317
0.1266	0.304
0.13	0.285
0.1333	0.272
0.1366	0.26
0.14	0.247
0.1433	0.237
0.1466	0.227

0.15	0.215
0.1533	0.208
0.1566	0.202
0.16	0.195
0.1633	0.183
0.1666	0.173
0.17	0.163
0.1733	0.157
0.1766	0.154
0.18	0.147
0.1833	0.138
0.1866	0.134
0.19	0.131
0.1933	0.125
0.1966	0.118
0.2	0.118
0.2033	0.112
0.2066	0.105
0.21	0.096
0.2133	0.102
0.2166	0.093
0.22	0.096
0.2233	0.093
0.2266	0.09
0.23	0.083
0.2333	0.073
0.2366	0.077
0.24	0.073
0.2433	0.073
0.2466	0.07
0.25	0.067
0.2533	0.067
0.2566	0.048
0.26	0.057
0.2633	0.054
0.2666	0.057
0.27	0.057
0.2733	0.054
0.2766	0.054
0.28	0.054
0.2833	0.051
0.2866	0.051
0.29	0.048
0.2933	0.048
0.2966	0.048
0.3	0.048
0.3033	0.045
0.3066	0.045
0.31	0.045
0.3133	0.041
0.3166	0.041
0.32	0.041

0.3233	0.041
0.3266	0.038
0.33	0.038
0.3333	0.038
0.35	0.035
0.3666	0.035
0.3833	0.032
0.4	0.028
0.4166	0.028
0.4333	0.028
0.45	0.025
0.4666	0.025
0.4833	0.025
0.5	0.025
0.5166	0.022
0.5333	0.022
0.55	0.022
0.5666	0.022
0.5833	0.022
0.6	0.022
0.6166	0.022
0.6333	0.022
0.65	0.019
0.6666	0.019
0.6833	0.019
0.7	0.019
0.7166	0.019
0.7333	0.022
0.75	0.019
0.7666	0.019
0.7833	0.019
0.8	0.019
0.8166	0.019
0.8333	0.019
0.85	0.019
0.8666	0.019
0.8833	0.019
0.9	0.019
0.9166	0.019
0.9333	0.019
0.95	0.019
0.9666	0.019
0.9833	0.016
1.	0.016
1.2	0.016
1.4	0.013
1.6	0.013
1.8	0.016
2.	0.013
2.2	0.013
2.4	0.013
2.6	0.009

2.8	0.006
3.	0.006
3.2	0.009
3.4	0.006
3.6	0.006
3.8	0.006
4.	0.006
4.2	0.006
4.4	0.006
4.6	0.003
4.8	0.003
5.	0.
5.2	0.
5.4	0.003
5.6	0.003
5.8	0.003
6.	0.
6.2	0.
6.4	0.
6.6	-0.004
6.8	-0.004
7.	0.003
7.2	0.
7.4	0.
7.6	0.

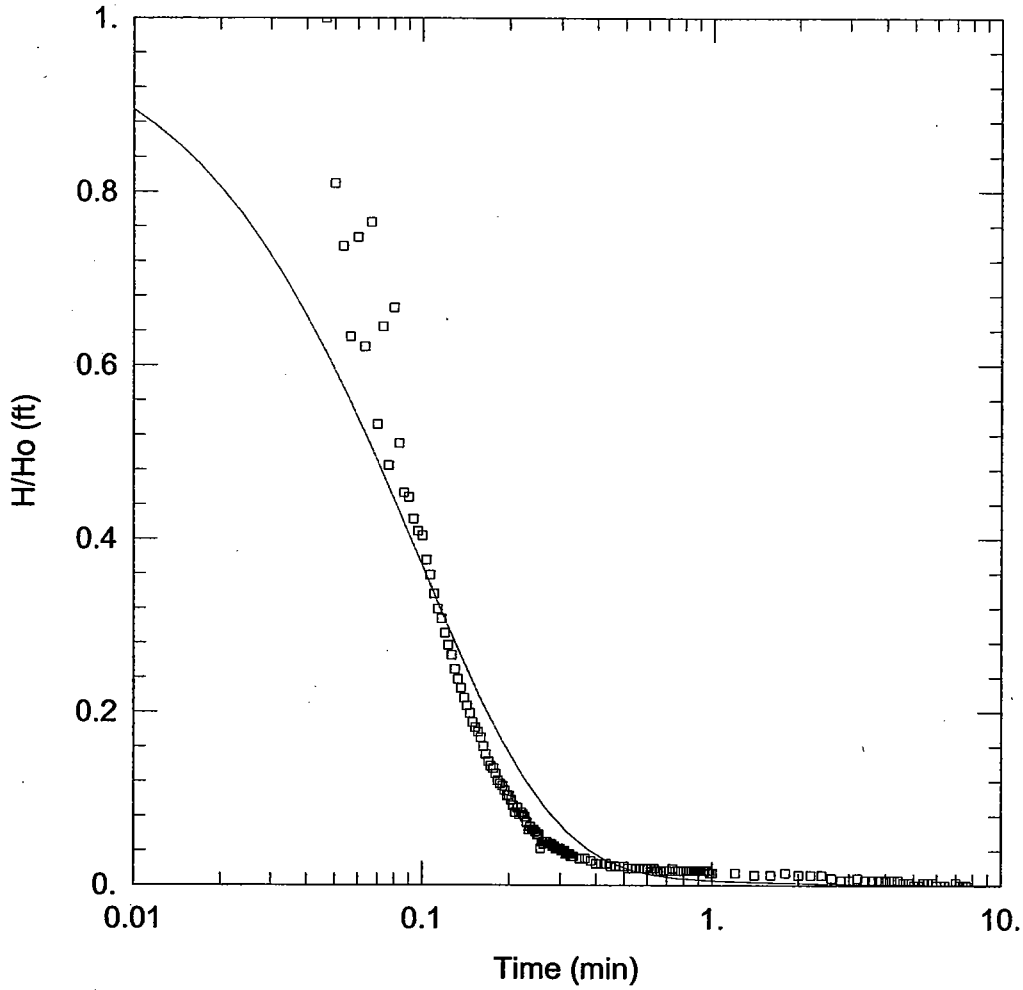
SOLUTION

Aquifer Model: Confined
Solution Method: Bouwer-Rice

VISUAL ESTIMATION RESULTS

Estimated Parameters

Parameter	Estimate	
K	0.5937	cm/sec
y0	2.046	ft



SJS02-MW02D-FH-C

Data Set: C:\DOCUME~1\ST.JS\SITE2R~1\SLUGTE~1\MW02D_FC.AQT
Date: 03/25/02 Time: 09:49:45

AQUIFER DATA

Saturated Thickness: 20.67 ft Anisotropy Ratio (Kz/Kr): 1.

WELL DATA

Initial Displacement: 1.145 ft Water Column Height: 64.27 ft
Casing Radius: 0.83 ft Wellbore Radius: 0.42 ft
Screen Length: 10. ft Gravel Pack Porosity: 0.3

SOLUTION

Aquifer Model: Confined T = 710.3 cm^2/sec
Solution Method: Cooper-Bredehoeft-Papadopulos S = 1.E-10

Data Set: C:\DOCUME~1\ST.JS\SITE2R~1\SLUGTE~1\MW02D_FC.AQT
Title: SJS02-MW02D-FH-C
Date: 04/01/02
Time: 10:22:48

AQUIFER DATA

Saturated Thickness: 20.67 ft
Anisotropy Ratio (Kz/Kr): 1

OBSERVATION WELL DATA

Number of observation wells: 1

Observation Well No. 1: MW02D

X Location: 0 ft
Y Location: 0 ft

Observation Data

Time (min)	Displacement (ft)
0.0466	1.145
0.05	0.927
0.0533	0.844
0.0566	0.725
0.06	0.856
0.0633	0.712
0.0666	0.876
0.07	0.609
0.0733	0.738
0.0766	0.555
0.08	0.763
0.0833	0.584
0.0866	0.519
0.09	0.513
0.0933	0.484
0.0966	0.468
0.1	0.462
0.1033	0.43
0.1066	0.41
0.11	0.385
0.1133	0.365
0.1166	0.352
0.12	0.333
0.1233	0.317
0.1266	0.304
0.13	0.285
0.1333	0.272
0.1366	0.26
0.14	0.247
0.1433	0.237
0.1466	0.227

0.15	0.215
0.1533	0.208
0.1566	0.202
0.16	0.195
0.1633	0.183
0.1666	0.173
0.17	0.163
0.1733	0.157
0.1766	0.154
0.18	0.147
0.1833	0.138
0.1866	0.134
0.19	0.131
0.1933	0.125
0.1966	0.118
0.2	0.118
0.2033	0.112
0.2066	0.105
0.21	0.096
0.2133	0.102
0.2166	0.093
0.22	0.096
0.2233	0.093
0.2266	0.09
0.23	0.083
0.2333	0.073
0.2366	0.077
0.24	0.073
0.2433	0.073
0.2466	0.07
0.25	0.067
0.2533	0.067
0.2566	0.048
0.26	0.057
0.2633	0.054
0.2666	0.057
0.27	0.057
0.2733	0.054
0.2766	0.054
0.28	0.054
0.2833	0.051
0.2866	0.051
0.29	0.048
0.2933	0.048
0.2966	0.048
0.3	0.048
0.3033	0.045
0.3066	0.045
0.31	0.045
0.3133	0.041
0.3166	0.041
0.32	0.041

0.3233	0.041
0.3266	0.038
0.33	0.038
0.3333	0.038
0.35	0.035
0.3666	0.035
0.3833	0.032
0.4	0.028
0.4166	0.028
0.4333	0.028
0.45	0.025
0.4666	0.025
0.4833	0.025
0.5	0.025
0.5166	0.022
0.5333	0.022
0.55	0.022
0.5666	0.022
0.5833	0.022
0.6	0.022
0.6166	0.022
0.6333	0.022
0.65	0.019
0.6666	0.019
0.6833	0.019
0.7	0.019
0.7166	0.019
0.7333	0.022
0.75	0.019
0.7666	0.019
0.7833	0.019
0.8	0.019
0.8166	0.019
0.8333	0.019
0.85	0.019
0.8666	0.019
0.8833	0.019
0.9	0.019
0.9166	0.019
0.9333	0.019
0.95	0.019
0.9666	0.019
0.9833	0.016
1.	0.016
1.2	0.016
1.4	0.013
1.6	0.013
1.8	0.016
2.	0.013
2.2	0.013
2.4	0.013
2.6	0.009

2.8	0.006
3.	0.006
3.2	0.009
3.4	0.006
3.6	0.006
3.8	0.006
4.	0.006
4.2	0.006
4.4	0.006
4.6	0.003
4.8	0.003
5.	0.
5.2	0.
5.4	0.003
5.6	0.003
5.8	0.003
6.	0.
6.2	0.
6.4	0.
6.6	-0.004
6.8	-0.004
7.	0.003
7.2	0.
7.4	0.
7.6	0.

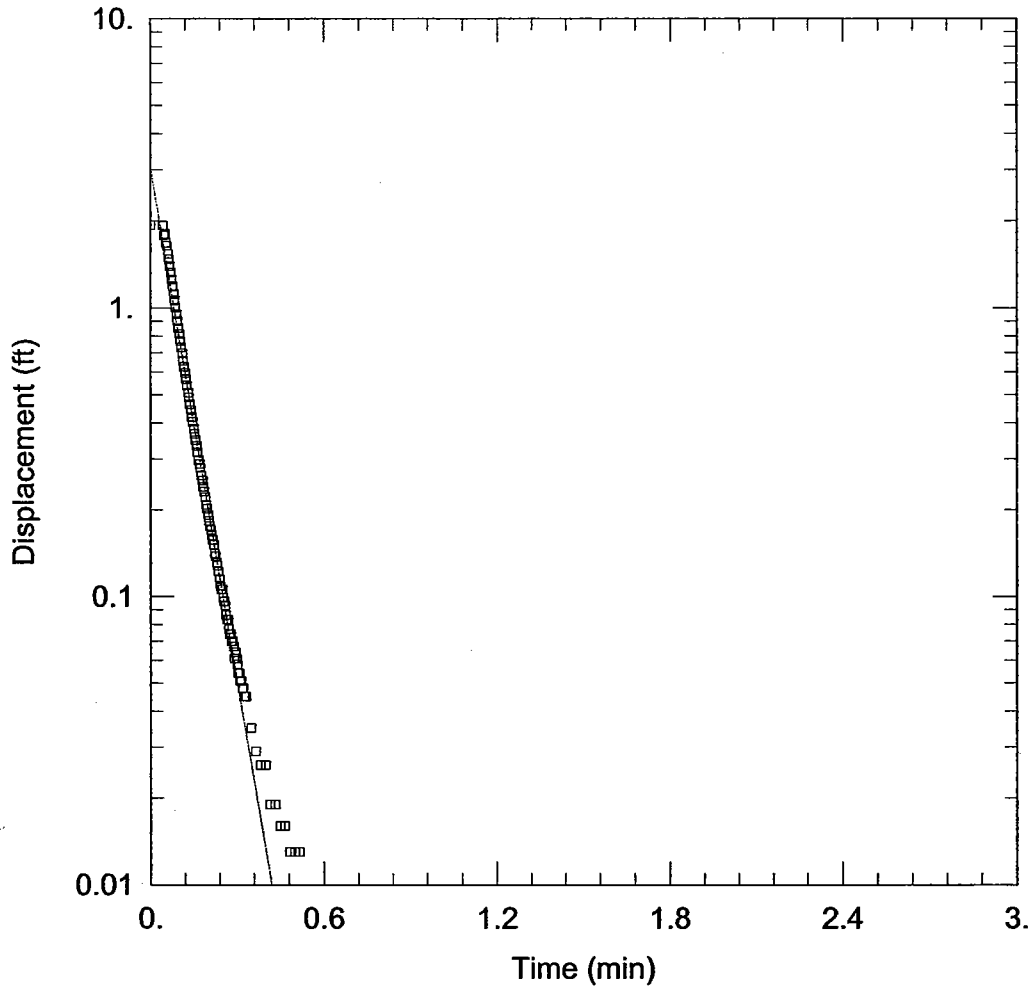
SOLUTION

Aquifer Model: Confined
Solution Method: Cooper-Bredehoeft-Papadopulos

VISUAL ESTIMATION RESULTS

Estimated Parameters

Parameter	Estimate	
T	710.3	cm^2/sec
S	1.E-10	



SJS02-MW02D-RH-BR

Data Set: C:\DOCUME~1\ST.JS\SITE2R~1\SLUGTE~1\MW02D_RB.AQT
Date: 03/21/02 Time: 14:55:45

AQUIFER DATA

Saturated Thickness: 20.67 ft Anisotropy Ratio (Kz/Kr): 1.

WELL DATA

Initial Displacement: 1.927 ft Water Column Height: 64.27 ft
Casing Radius: 0.083 ft Wellbore Radius: 0.42 ft
Screen Length: 10. ft Gravel Pack Porosity: 0.3

SOLUTION

Aquifer Model: Confined K = 0.0677 cm/sec
Solution Method: Bouwer-Rice y0 = 3.026 ft

Data Set: C:\DOCUME~1\ST.JS\SITE2R~1\SLUGTE~1\MW02D_RB.AQT
Title: SJS02-MW02D-RH-BR
Date: 04/01/02
Time: 10:23:21

AQUIFER DATA

Saturated Thickness: 20.67 ft
Anisotropy Ratio (Kz/Kr): 1

OBSERVATION WELL DATA

Number of observation wells: 1

Observation Well No. 1: MW02D

X Location: 0 ft
Y Location: 0 ft

Observation Data

Time (min)	Displacement (ft)
0.0433	1.927
0.0466	1.78
0.05	1.802
0.0533	1.68
0.0566	1.639
0.06	1.539
0.0633	1.472
0.0666	1.395
0.07	1.328
0.0733	1.254
0.0766	1.187
0.08	1.119
0.0833	1.062
0.0866	1.004
0.09	0.952
0.0933	0.901
0.0966	0.853
0.1	0.811
0.1033	0.77
0.1066	0.731
0.11	0.696
0.1133	0.657
0.1166	0.625
0.12	0.596
0.1233	0.568
0.1266	0.539
0.13	0.51
0.1333	0.491
0.1366	0.465
0.14	0.443
0.1433	0.42

0.1466	0.404
0.15	0.382
0.1533	0.366
0.1566	0.349
0.16	0.333
0.1633	0.317
0.1666	0.298
0.17	0.288
0.1733	0.279
0.1766	0.263
0.18	0.253
0.1833	0.24
0.1866	0.231
0.19	0.221
0.1933	0.208
0.1966	0.202
0.2	0.192
0.2033	0.183
0.2066	0.176
0.21	0.17
0.2133	0.163
0.2166	0.157
0.22	0.151
0.2233	0.141
0.2266	0.138
0.23	0.131
0.2333	0.128
0.2366	0.122
0.24	0.115
0.2433	0.109
0.2466	0.106
0.25	0.106
0.2533	0.099
0.2566	0.096
0.26	0.093
0.2633	0.086
0.2666	0.083
0.27	0.083
0.2733	0.077
0.2766	0.074
0.28	0.074
0.2833	0.07
0.2866	0.07
0.29	0.067
0.2933	0.061
0.2966	0.064
0.3	0.061
0.3033	0.058
0.3066	0.054
0.31	0.054
0.3133	0.051
0.3166	0.051

0.32	0.048
0.3233	0.048
0.3266	0.045
0.33	0.045
0.3333	0.045
0.35	0.035
0.3666	0.029
0.3833	0.026
0.4	0.026
0.4166	0.019
0.4333	0.019
0.45	0.016
0.4666	0.016
0.4833	0.013
0.5	0.013
0.5166	0.013
0.5333	0.009
0.55	0.009
0.5666	0.009
0.5833	0.006
0.6	0.006
0.6166	0.006
0.6333	0.006
0.65	0.006
0.6666	0.006
0.6833	0.006
0.7	0.006
0.7166	0.006
0.7333	0.006
0.75	0.003
0.7666	0.003
0.7833	0.003
0.8	0.003
0.8166	0.003
0.8333	0.003
0.85	0.003
0.8666	0.003
0.8833	0.006
0.9	0.003
0.9166	0.
0.9333	0.003
0.95	0.003
0.9666	0.003
0.9833	0.006
1.	0.
1.2	0.003
1.4	0.
1.6	0.
1.8	0.
2.	0.
2.2	0.
2.4	0.

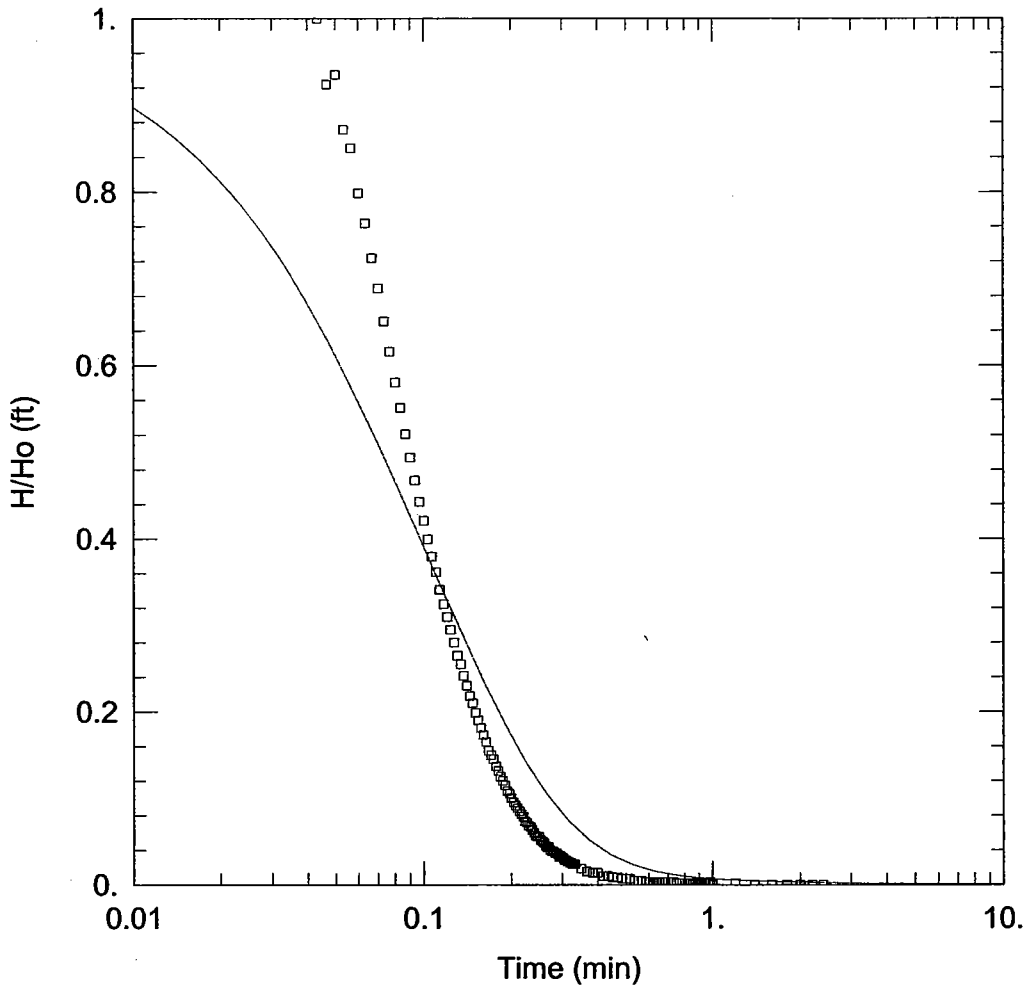
SOLUTION

Aquifer Model: Confined
Solution Method: Bouwer-Rice

VISUAL ESTIMATION RESULTS

Estimated Parameters

Parameter	Estimate	
K	0.0677	cm/sec
y0	3.026	ft



SJS02-MW02D-RH-C

Data Set: C:\DOCUME~1\ST.JS\SITE2R~1\SLUGTE~1\MW02D_RC.AQT
Date: 03/25/02 Time: 09:49:53

AQUIFER DATA

Saturated Thickness: 20.67 ft Anisotropy Ratio (Kz/Kr): 1.

WELL DATA

Initial Displacement: 1.927 ft Water Column Height: 64.27 ft
Casing Radius: 0.083 ft Wellbore Radius: 0.42 ft
Screen Length: 10. ft Gravel Pack Porosity: 0.3

SOLUTION

Aquifer Model: Confined T = 5.474 cm^2/sec
Solution Method: Cooper-Bredehoeft-Papadopulos S = 1.E-10

Data Set: C:\DOCUME~1\ST.JS\SITE2R~1\SLUGTE~1\MW02D_RC.AQT
Title: SJS02-MW02D-RH-C
Date: 04/01/02
Time: 10:23:52

AQUIFER DATA

Saturated Thickness: 20.67 ft
Anisotropy Ratio (Kz/Kr): 1

OBSERVATION WELL DATA

Number of observation wells: 1

Observation Well No. 1: MW02D

X Location: 0 ft
Y Location: 0 ft

Observation Data

Time (min)	Displacement (ft)
0.0433	1.927
0.0466	1.78
0.05	1.802
0.0533	1.68
0.0566	1.639
0.06	1.539
0.0633	1.472
0.0666	1.395
0.07	1.328
0.0733	1.254
0.0766	1.187
0.08	1.119
0.0833	1.062
0.0866	1.004
0.09	0.952
0.0933	0.901
0.0966	0.853
0.1	0.811
0.1033	0.77
0.1066	0.731
0.11	0.696
0.1133	0.657
0.1166	0.625
0.12	0.596
0.1233	0.568
0.1266	0.539
0.13	0.51
0.1333	0.491
0.1366	0.465
0.14	0.443
0.1433	0.42

0.1466	0.404
0.15	0.382
0.1533	0.366
0.1566	0.349
0.16	0.333
0.1633	0.317
0.1666	0.298
0.17	0.288
0.1733	0.279
0.1766	0.263
0.18	0.253
0.1833	0.24
0.1866	0.231
0.19	0.221
0.1933	0.208
0.1966	0.202
0.2	0.192
0.2033	0.183
0.2066	0.176
0.21	0.17
0.2133	0.163
0.2166	0.157
0.22	0.151
0.2233	0.141
0.2266	0.138
0.23	0.131
0.2333	0.128
0.2366	0.122
0.24	0.115
0.2433	0.109
0.2466	0.106
0.25	0.106
0.2533	0.099
0.2566	0.096
0.26	0.093
0.2633	0.086
0.2666	0.083
0.27	0.083
0.2733	0.077
0.2766	0.074
0.28	0.074
0.2833	0.07
0.2866	0.07
0.29	0.067
0.2933	0.061
0.2966	0.064
0.3	0.061
0.3033	0.058
0.3066	0.054
0.31	0.054
0.3133	0.051
0.3166	0.051

0.32	0.048
0.3233	0.048
0.3266	0.045
0.33	0.045
0.3333	0.045
0.35	0.035
0.3666	0.029
0.3833	0.026
0.4	0.026
0.4166	0.019
0.4333	0.019
0.45	0.016
0.4666	0.016
0.4833	0.013
0.5	0.013
0.5166	0.013
0.5333	0.009
0.55	0.009
0.5666	0.009
0.5833	0.006
0.6	0.006
0.6166	0.006
0.6333	0.006
0.65	0.006
0.6666	0.006
0.6833	0.006
0.7	0.006
0.7166	0.006
0.7333	0.006
0.75	0.003
0.7666	0.003
0.7833	0.003
0.8	0.003
0.8166	0.003
0.8333	0.003
0.85	0.003
0.8666	0.003
0.8833	0.006
0.9	0.003
0.9166	0.
0.9333	0.003
0.95	0.003
0.9666	0.003
0.9833	0.006
1.	0.
1.2	0.003
1.4	0.
1.6	0.
1.8	0.
2.	0.
2.2	0.
2.4	0.

SOLUTION

Aquifer Model: Confined
Solution Method: Cooper-Bredehoeft-Papadopulos

VISUAL ESTIMATION RESULTS

Estimated Parameters

Parameter	Estimate	
T	5.474	cm^2/sec
S	1.E-10	

AUTOMATIC ESTIMATION RESULTS

Estimated Parameters

Parameter	Estimate	Std. Error	
T	5.474	3.269	cm^2/sec
S	1.E-10	1.293E-09	

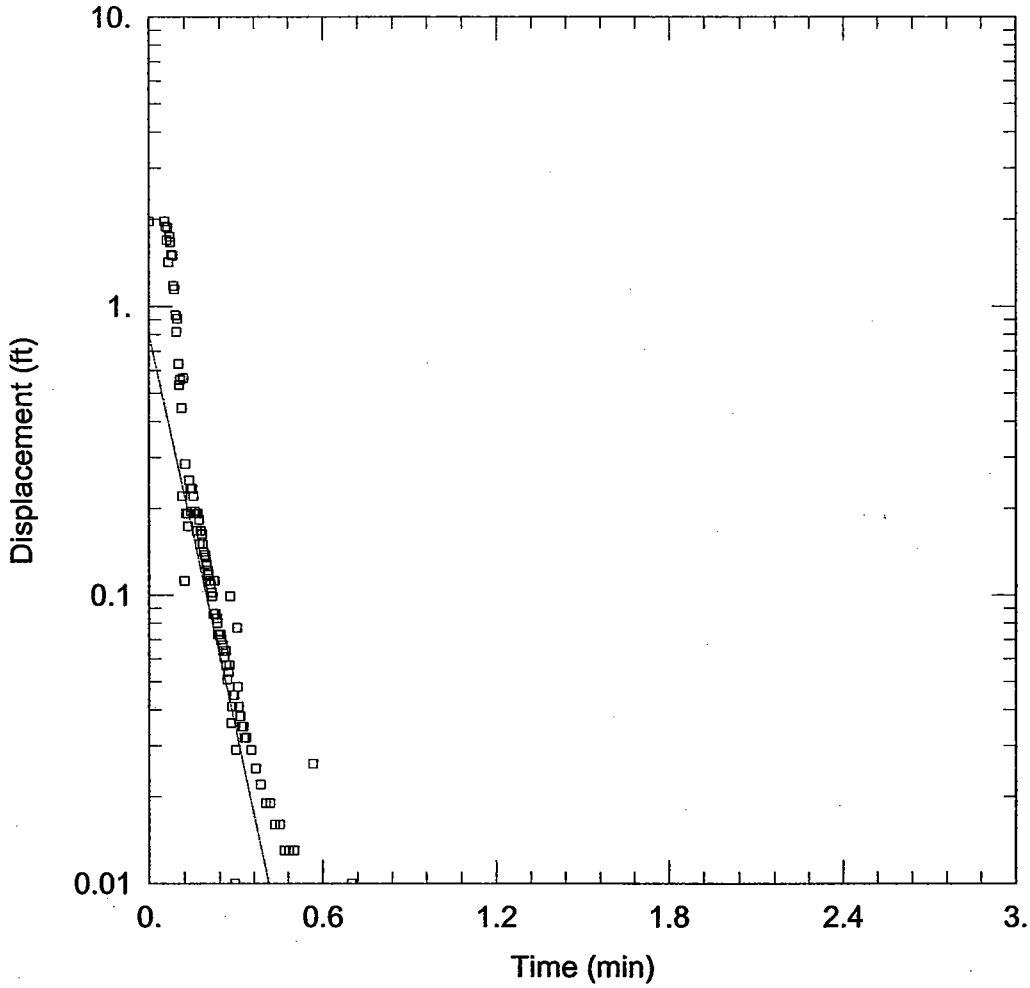
Parameter Correlations

	T	S
T	1.00	-1.00
S	-1.00	1.00

Residual Statistics

for weighted residuals

Sum of Squares ... 3.611 ft^2
Variance..... 0.02715 ft^2
Std. Deviation ..... 0.1648 ft
Mean..... -0.01783 ft
No. of Residuals... 135
No. of Estimates... 2



SJS02-MW05D-FH-BR

Data Set: C:\DOCUME~1\ST.JS\SITE2R~1\SLUGTE~1\MW05D_FB.AQT
Date: 03/21/02 Time: 15:17:51

AQUIFER DATA

Saturated Thickness: 13.02 ft Anisotropy Ratio (Kz/Kr): 1.

WELL DATA

Initial Displacement: 1.969 ft Water Column Height: 46.02 ft
Casing Radius: 0.083 ft Wellbore Radius: 0.5 ft
Screen Length: 10. ft Gravel Pack Porosity: 0.3

SOLUTION

Aquifer Model: Confined K = 0.0661 cm/sec
Solution Method: Bouwer-Rice y0 = 0.7983 ft

Data Set: C:\DOCUME~1\ST.JS\SITE2R~1\SLUGTE~1\MW05D_FB.AQT
Title: SJS02-MW05D-FH-BR
Date: 04/01/02
Time: 10:24:38

AQUIFER DATA

Saturated Thickness: 13.02 ft
Anisotropy Ratio (Kz/Kr): 1

OBSERVATION WELL DATA

Number of observation wells: 1

Observation Well No. 1: MW05D

X Location: 0 ft
Y Location: 0 ft

Observation Data

Time (min)	Displacement (ft)
0.0533	1.969
0.0566	1.889
0.06	1.693
0.0633	1.87
0.0666	1.42
0.07	1.741
0.0733	1.667
0.0766	1.507
0.08	1.498
0.0833	1.177
0.0866	1.148
0.09	0.933
0.0933	0.817
0.0966	0.907
0.1	0.632
0.1033	0.535
0.1066	0.558
0.11	0.445
0.1133	0.221
0.1166	0.564
0.12	0.112
0.1233	0.285
0.1266	0.192
0.13	0.192
0.1333	0.173
0.1366	0.25
0.14	0.234
0.1433	0.195
0.1466	0.234
0.15	0.221
0.1533	0.192

0.1566	0.195
0.16	0.192
0.1633	0.167
0.1666	0.192
0.17	0.182
0.1733	0.15
0.1766	0.167
0.18	0.163
0.1833	0.15
0.1866	0.141
0.19	0.138
0.1933	0.135
0.1966	0.128
0.2	0.122
0.2033	0.118
0.2066	0.112
0.21	0.109
0.2133	0.102
0.2166	0.099
0.22	0.086
0.2233	0.112
0.2266	0.086
0.23	0.083
0.2333	0.08
0.2366	0.073
0.24	0.073
0.2433	0.073
0.2466	0.07
0.25	0.067
0.2533	0.064
0.2566	0.061
0.26	0.064
0.2633	0.057
0.2666	0.051
0.27	0.054
0.2733	0.057
0.2766	0.099
0.28	0.036
0.2833	0.041
0.2866	0.045
0.29	0.045
0.2933	0.01
0.2966	0.029
0.3	0.077
0.3033	0.048
0.3066	0.041
0.31	0.038
0.3133	0.038
0.3166	0.035
0.32	0.035
0.3233	0.035
0.3266	0.032

0.33	0.032
0.3333	0.032
0.35	0.029
0.3666	0.025
0.3833	0.022
0.4	0.019
0.4166	0.019
0.4333	0.016
0.45	0.016
0.4666	0.013
0.4833	0.013
0.5	0.013
0.5166	0.009
0.5333	0.007
0.55	0.009
0.5666	0.026
0.5833	0.009
0.6	0.009
0.6166	0.009
0.6333	0.006
0.65	0.006
0.6666	0.006
0.6833	0.006
0.7	0.01
0.7166	0.006
0.7333	0.006
0.75	0.006
0.7666	0.003
0.7833	0.003
0.8	0.003
0.8166	0.003
0.8333	0.003
0.85	0.003
0.8666	0.003
0.8833	0.003
0.9	0.003
0.9166	0.003
0.9333	0.003
0.95	0.003
0.9666	0.003
0.9833	0.003
1.	0.003
1.2	0.
1.4	0.
1.6	0.
1.8	0.003
2.	0.
2.2	0.

SOLUTION

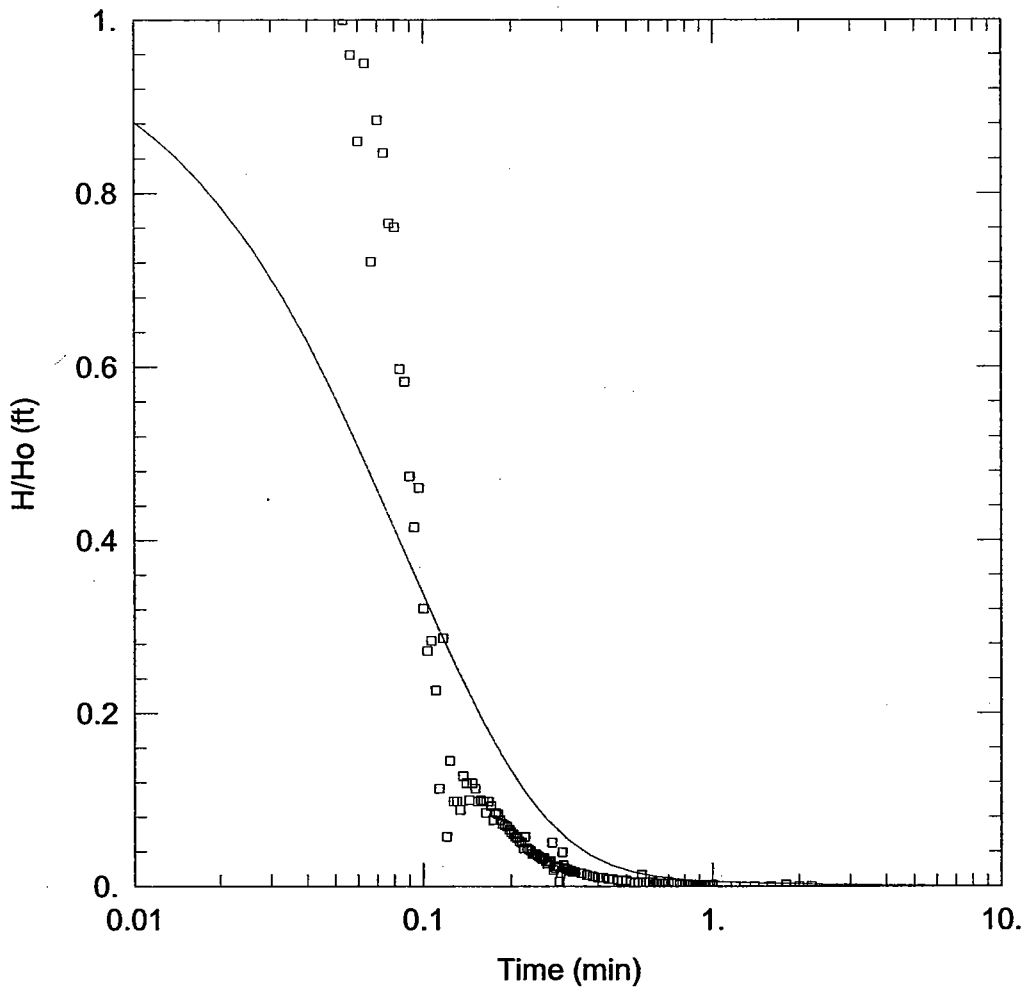
Aquifer Model: Confined

Solution Method: Bouwer-Rice

VISUAL ESTIMATION RESULTS

Estimated Parameters

Parameter	Estimate	
K	0.0661	cm/sec
y0	0.7983	ft



SJS02-MW05D-FH-C

Data Set: C:\DOCUME~1\ST.JS\SITE2R~1\SLUGTE~1\MW05D_FC.AQT
Date: 03/25/02 Time: 09:50:03

AQUIFER DATA

Saturated Thickness: 13.02 ft Anisotropy Ratio (Kz/Kr): 1.

WELL DATA

Initial Displacement: 1.969 ft Water Column Height: 46.02 ft
Casing Radius: 0.083 ft Wellbore Radius: 0.5 ft
Screen Length: 10. ft Gravel Pack Porosity: 0.3

SOLUTION

Aquifer Model: Confined T = 6.293 cm^2/sec
Solution Method: Cooper-Bredehoeft-Papadopulos S = 1.E-10

Data Set: C:\DOCUME~1\ST.JS\SITE2R~1\SLUGTE~1\MW05D_FC.AQT
Title: SJS02-MW05D-FH-C
Date: 04/01/02
Time: 10:24:51

AQUIFER DATA

Saturated Thickness: 13.02 ft
Anisotropy Ratio (Kz/Kr): 1

OBSERVATION WELL DATA

Number of observation wells: 1

Observation Well No. 1: MW05D

X Location: 0 ft
Y Location: 0 ft

Observation Data

Time (min)	Displacement (ft)
0.0533	1.969
0.0566	1.889
0.06	1.693
0.0633	1.87
0.0666	1.42
0.07	1.741
0.0733	1.667
0.0766	1.507
0.08	1.498
0.0833	1.177
0.0866	1.148
0.09	0.933
0.0933	0.817
0.0966	0.907
0.1	0.632
0.1033	0.535
0.1066	0.558
0.11	0.445
0.1133	0.221
0.1166	0.564
0.12	0.112
0.1233	0.285
0.1266	0.192
0.13	0.192
0.1333	0.173
0.1366	0.25
0.14	0.234
0.1433	0.195
0.1466	0.234
0.15	0.221
0.1533	0.192

0.1566	0.195
0.16	0.192
0.1633	0.167
0.1666	0.192
0.17	0.182
0.1733	0.15
0.1766	0.167
0.18	0.163
0.1833	0.15
0.1866	0.141
0.19	0.138
0.1933	0.135
0.1966	0.128
0.2	0.122
0.2033	0.118
0.2066	0.112
0.21	0.109
0.2133	0.102
0.2166	0.099
0.22	0.086
0.2233	0.112
0.2266	0.086
0.23	0.083
0.2333	0.08
0.2366	0.073
0.24	0.073
0.2433	0.073
0.2466	0.07
0.25	0.067
0.2533	0.064
0.2566	0.061
0.26	0.064
0.2633	0.057
0.2666	0.051
0.27	0.054
0.2733	0.057
0.2766	0.099
0.28	0.036
0.2833	0.041
0.2866	0.045
0.29	0.045
0.2933	0.01
0.2966	0.029
0.3	0.077
0.3033	0.048
0.3066	0.041
0.31	0.038
0.3133	0.038
0.3166	0.035
0.32	0.035
0.3233	0.035
0.3266	0.032

0.33	0.032
0.3333	0.032
0.35	0.029
0.3666	0.025
0.3833	0.022
0.4	0.019
0.4166	0.019
0.4333	0.016
0.45	0.016
0.4666	0.013
0.4833	0.013
0.5	0.013
0.5166	0.009
0.5333	0.007
0.55	0.009
0.5666	0.026
0.5833	0.009
0.6	0.009
0.6166	0.009
0.6333	0.006
0.65	0.006
0.6666	0.006
0.6833	0.006
0.7	0.01
0.7166	0.006
0.7333	0.006
0.75	0.006
0.7666	0.003
0.7833	0.003
0.8	0.003
0.8166	0.003
0.8333	0.003
0.85	0.003
0.8666	0.003
0.8833	0.003
0.9	0.003
0.9166	0.003
0.9333	0.003
0.95	0.003
0.9666	0.003
0.9833	0.003
1.	0.003
1.2	0.
1.4	0.
1.6	0.
1.8	0.003
2.	0.
2.2	0.

SOLUTION

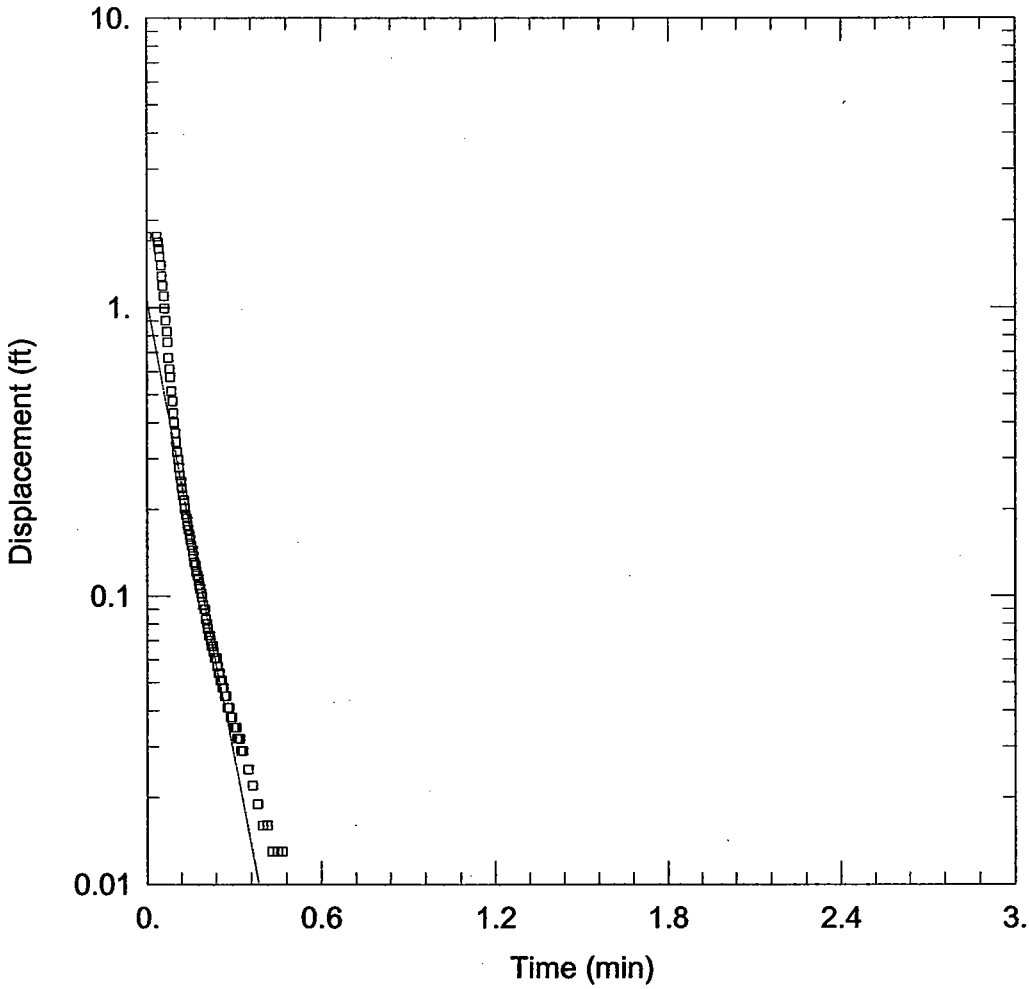
Aquifer Model: Confined

Solution Method: Cooper-Bredehoeft-Papadopulos

VISUAL ESTIMATION RESULTS

Estimated Parameters

Parameter	Estimate	
T	6.293	cm^2/sec
S	1.E-10	



SJS02-MW05D-RH-BR

Data Set: C:\DOCUME~1\ST.JS\SITE2R~1\SLUGTE~1\MW05D_RB.AQT
Date: 04/01/02 Time: 14:22:07

AQUIFER DATA

Saturated Thickness: 13.02 ft Anisotropy Ratio (Kz/Kr): 1.

WELL DATA

Initial Displacement: 1.753 ft Water Column Height: 46.02 ft
Casing Radius: 0.083 ft Wellbore Radius: 0.5 ft
Screen Length: 10. ft Gravel Pack Porosity: 0.3

SOLUTION

Aquifer Model: Confined K = 0.07481 cm/sec
Solution Method: Bouwer-Rice y0 = 1.061 ft

Data Set: C:\DOCUME~1\ST.JS\SITE2R~1\SLUGTE~1\MW05D_RB.AQT
Title: SJS02-MW05D-RH-BR
Date: 04/01/02
Time: 14:22:21

AQUIFER DATA

Saturated Thickness: 13.02 ft
Anisotropy Ratio (Kz/Kr): 1

OBSERVATION WELL DATA

Number of observation wells: 1

Observation Well No. 1: MW05D

X Location: 0 ft
Y Location: 0 ft

Observation Data

Time (min)	Displacement (ft)
0.0366	1.753
0.04	1.679
0.0433	1.593
0.0466	1.497
0.05	1.397
0.0533	1.282
0.0566	1.189
0.06	1.096
0.0633	0.994
0.0666	0.901
0.07	0.827
0.0733	0.76
0.0766	0.67
0.08	0.612
0.0833	0.574
0.0866	0.513
0.09	0.474
0.0933	0.432
0.0966	0.4
0.1	0.368
0.1033	0.343
0.1066	0.317
0.11	0.298
0.1133	0.279
0.1166	0.263
0.12	0.25
0.1233	0.237
0.1266	0.224
0.13	0.215
0.1333	0.202
0.1366	0.192

0.14	0.186
0.1433	0.176
0.1466	0.17
0.15	0.163
0.1533	0.157
0.1566	0.15
0.16	0.144
0.1633	0.138
0.1666	0.131
0.17	0.128
0.1733	0.122
0.1766	0.118
0.18	0.115
0.1833	0.109
0.1866	0.106
0.19	0.102
0.1933	0.099
0.1966	0.093
0.2	0.09
0.2033	0.09
0.2066	0.083
0.21	0.08
0.2133	0.077
0.2166	0.073
0.22	0.073
0.2233	0.07
0.2266	0.067
0.23	0.067
0.2333	0.064
0.2366	0.061
0.24	0.061
0.2433	0.061
0.2466	0.057
0.25	0.054
0.2533	0.054
0.2566	0.051
0.26	0.051
0.2633	0.048
0.2666	0.048
0.27	0.045
0.2733	0.045
0.2766	0.045
0.28	0.041
0.2833	0.041
0.2866	0.041
0.29	0.038
0.2933	0.038
0.2966	0.038
0.3	0.035
0.3033	0.035
0.3066	0.035
0.31	0.035

0.3133	0.032
0.3166	0.032
0.32	0.032
0.3233	0.032
0.3266	0.029
0.33	0.029
0.3333	0.029
0.35	0.025
0.3666	0.022
0.3833	0.019
0.4	0.016
0.4166	0.016
0.4333	0.013
0.45	0.013
0.4666	0.013
0.4833	0.009
0.5	0.009
0.5166	0.009
0.5333	0.006
0.55	0.006
0.5666	0.006
0.5833	0.006
0.6	0.006
0.6166	0.003
0.6333	0.003
0.65	0.003
0.6666	0.003
0.6833	0.003
0.7	0.003
0.7166	0.003
0.7333	0.003
0.75	0.003
0.7666	0.003
0.7833	0.003
0.8	0.003
0.8166	0.003
0.8333	0.003
0.85	0.003
0.8666	0.003
0.8833	0.003
0.9	0.003
0.9166	0.
0.9333	0.
0.95	0.
0.9666	0.
0.9833	0.
1.	0.
1.2	0.
1.4	0.
1.6	0.
1.8	0.
2.	0.

2.2	0.
2.4	0.
2.6	0.

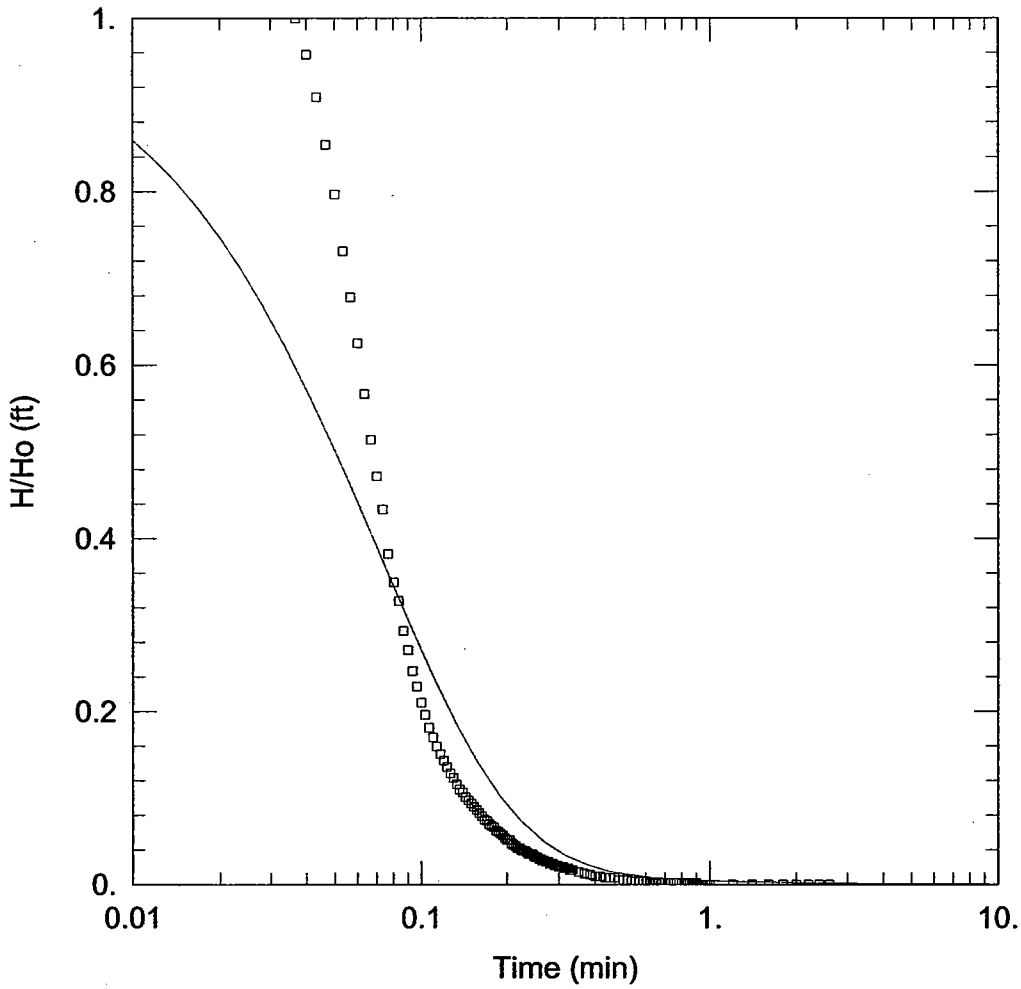
SOLUTION

Aquifer Model: Confined
Solution Method: Bouwer-Rice

VISUAL ESTIMATION RESULTS

Estimated Parameters

Parameter	Estimate	
K	0.07481	cm/sec
y0	1.061	ft



SJS02-MW05D-RH-C

Data Set: C:\DOCUME~1\ST.JS\SITE2R~1\SLUGTE~1\MW05D_RC.AQT
Date: 03/25/02 Time: 09:50:12

AQUIFER DATA

Saturated Thickness: 13.02 ft Anisotropy Ratio (Kz/Kr): 1.

WELL DATA

Initial Displacement: 1.753 ft Water Column Height: 46.02 ft
Casing Radius: 0.083 ft Wellbore Radius: 0.5 ft
Screen Length: 10. ft Gravel Pack Porosity: 0.3

SOLUTION

Aquifer Model: Confined T = 7.703 cm^2/sec
Solution Method: Cooper-Bredehoeft-Papadopulos S = 1.E-10

Data Set: C:\DOCUME~1\ST.JS\SITE2R~1\SLUGTE~1\MW05D_RC.AQT
Title: SJS02-MW05D-RH-C
Date: 04/01/02
Time: 10:25:13

AQUIFER DATA

Saturated Thickness: 13.02 ft
Anisotropy Ratio (Kz/Kr): 1

OBSERVATION WELL DATA

Number of observation wells: 1

Observation Well No. 1: MW05D

X Location: 0 ft
Y Location: 0 ft

Observation Data

Time (min)	Displacement (ft)
0.0366	1.753
0.04	1.679
0.0433	1.593
0.0466	1.497
0.05	1.397
0.0533	1.282
0.0566	1.189
0.06	1.096
0.0633	0.994
0.0666	0.901
0.07	0.827
0.0733	0.76
0.0766	0.67
0.08	0.612
0.0833	0.574
0.0866	0.513
0.09	0.474
0.0933	0.432
0.0966	0.4
0.1	0.368
0.1033	0.343
0.1066	0.317
0.11	0.298
0.1133	0.279
0.1166	0.263
0.12	0.25
0.1233	0.237
0.1266	0.224
0.13	0.215
0.1333	0.202
0.1366	0.192

0.14	0.186
0.1433	0.176
0.1466	0.17
0.15	0.163
0.1533	0.157
0.1566	0.15
0.16	0.144
0.1633	0.138
0.1666	0.131
0.17	0.128
0.1733	0.122
0.1766	0.118
0.18	0.115
0.1833	0.109
0.1866	0.106
0.19	0.102
0.1933	0.099
0.1966	0.093
0.2	0.09
0.2033	0.09
0.2066	0.083
0.21	0.08
0.2133	0.077
0.2166	0.073
0.22	0.073
0.2233	0.07
0.2266	0.067
0.23	0.067
0.2333	0.064
0.2366	0.061
0.24	0.061
0.2433	0.061
0.2466	0.057
0.25	0.054
0.2533	0.054
0.2566	0.051
0.26	0.051
0.2633	0.048
0.2666	0.048
0.27	0.045
0.2733	0.045
0.2766	0.045
0.28	0.041
0.2833	0.041
0.2866	0.041
0.29	0.038
0.2933	0.038
0.2966	0.038
0.3	0.035
0.3033	0.035
0.3066	0.035
0.31	0.035

0.3133	0.032
0.3166	0.032
0.32	0.032
0.3233	0.032
0.3266	0.029
0.33	0.029
0.3333	0.029
0.35	0.025
0.3666	0.022
0.3833	0.019
0.4	0.016
0.4166	0.016
0.4333	0.013
0.45	0.013
0.4666	0.013
0.4833	0.009
0.5	0.009
0.5166	0.009
0.5333	0.006
0.55	0.006
0.5666	0.006
0.5833	0.006
0.6	0.006
0.6166	0.003
0.6333	0.003
0.65	0.003
0.6666	0.003
0.6833	0.003
0.7	0.003
0.7166	0.003
0.7333	0.003
0.75	0.003
0.7666	0.003
0.7833	0.003
0.8	0.003
0.8166	0.003
0.8333	0.003
0.85	0.003
0.8666	0.003
0.8833	0.003
0.9	0.003
0.9166	0.
0.9333	0.
0.95	0.
0.9666	0.
0.9833	0.
1.	0.
1.2	0.
1.4	0.
1.6	0.
1.8	0.
2.	0.

2.2	0.
2.4	0.
2.6	0.

SOLUTION

Aquifer Model: Confined
Solution Method: Cooper-Bredehoeft-Papadopulos

VISUAL ESTIMATION RESULTS

Estimated Parameters

Parameter	Estimate	
T	7.703	cm^2/sec
S	1.E-10	

Appendix G
Analytical Data

Table G-1
Surface Soil Analytical Results at Site 2
St. Juliens Creek Annex
Chesapeake, Virginia

Station ID	SJS02-SS01	SJS02-SS02	SJS02-SS03	SJS02-SS04	SJS02-SS05		SJS02-SS06	SJS02-SS07	SJS02-SS08	SJS02-SS09
Sample ID	SJS02-SS01-000	SJS02-SS02-000	SJS02-SS03-000	SJS02-SS04-000	SJS02-SS05-000	SJS02-SS05-000P	SJS02-SS06-000	SJS02-SS07-000	SJS02-SS08-000	SJS02-SS09-000
Sample Date	06/25/97	06/25/97	06/25/97	06/25/97	06/25/97	06/25/97	06/25/97	06/25/97	06/25/97	06/25/97
Chemical Name										
Volatile Organic Compounds (UG/KG)										
1,1,1-Trichloroethane	11 U	11 U	10 U	10 U	11 U	11 UJ	10 U	10 U	11 U	11 U
1,1,2,2-Tetrachloroethane	11 U	11 U	10 U	10 U	11 U	11 UJ	10 U	10 U	11 UJ	11 U
1,1,2-Trichloroethane	11 U	11 U	10 U	10 U	11 U	11 UJ	10 U	10 U	11 U	11 U
1,1-Dichloroethane	11 U	11 U	10 U	10 U	11 U	11 UJ	10 U	10 U	11 U	11 U
1,1-Dichloroethene	11 U	11 U	10 U	10 U	11 U	11 UJ	10 U	10 U	11 U	11 U
1,2-Dichloroethane	11 U	11 U	10 U	10 U	11 U	11 UJ	10 U	10 U	11 U	11 U
1,2-Dichloroethene (total)	11 U	11 U	10 U	10 U	11 U	11 UJ	10 U	10 U	11 U	11 U
1,2-Dichloropropane	11 U	11 U	10 U	10 U	11 U	11 UJ	10 U	10 U	11 U	11 U
2-Butanone	11 U	11 U	10 U	10 U	11 U	11 UJ	10 U	10 U	11 U	11 U
2-Hexanone	11 U	11 U	10 U	10 U	11 U	11 UJ	10 U	10 U	11 UJ	11 U
4-Methyl-2-pentanone	11 U	11 U	10 U	10 U	11 U	11 UJ	10 U	10 U	11 UJ	11 U
Acetone	11 U	11 B	3 B	9 B	11 U	9 B	12 B	10 U	7 B	7 J
Benzene	11 U	11 U	10 U	10 U	11 U	11 UJ	10 U	10 U	11 U	11 U
Bromodichloromethane	11 U	11 U	10 U	10 U	11 U	11 UJ	10 U	10 U	11 U	11 U
Bromoform	11 U	11 U	10 U	10 U	11 U	11 UJ	10 U	10 U	11 U	11 U
Bromomethane	11 U	11 U	10 U	10 U	11 U	11 UJ	10 U	10 U	11 U	11 U
Carbon disulfide	11 U	11 U	10 U	10 U	11 U	11 UJ	10 U	10 U	11 U	11 U
Carbon tetrachloride	11 U	11 U	10 U	10 U	11 U	11 UJ	10 U	10 U	11 U	11 U
Chlorobenzene	11 U	11 U	10 U	10 U	11 U	11 UJ	10 U	10 U	11 UJ	11 U
Chloroethane	11 U	11 U	10 U	10 U	11 U	11 UJ	10 U	10 U	11 U	11 U
Chloroform	11 U	11 U	10 U	10 U	11 U	11 UJ	10 U	10 U	11 U	11 U
Chloromethane	11 U	11 U	10 U	10 U	11 U	11 UJ	10 U	10 U	11 U	11 U
Dibromochloromethane	11 U	11 U	10 U	10 U	11 U	11 UJ	10 U	10 U	11 U	11 U
Ethylbenzene	11 U	11 U	10 U	10 U	11 U	11 UJ	10 U	10 U	11 UJ	11 U
Methylene chloride	5 B	26 B	17 B	25 B	24 B	5 B	23 B	39 B	65 B	33 B
Styrene	11 U	11 U	10 U	10 U	11 U	11 UJ	10 U	10 U	11 UJ	11 U
Tetrachloroethene	11 U	11 U	10 U	10 U	11 U	11 UJ	10 U	10 U	11 UJ	11 U
Toluene	11 U	11 U	10 U	10 U	11 U	11 UJ	1 J	10 U	2 J	11 U
Trichloroethene	11 U	11 U	10 U	10 U	11 U	11 UJ	10 U	10 U	11 U	11 U
Vinyl chloride	11 U	11 U	10 U	10 U	11 U	11 UJ	10 U	10 U	11 U	11 U
Xylene, total	11 U	11 U	10 U	10 U	11 U	11 UJ	10 U	10 U	11 UJ	11 U
cis-1,3-Dichloropropene	11 U	11 U	10 U	10 U	11 U	11 UJ	10 U	10 U	11 U	11 U
trans-1,3-Dichloropropene	11 U	11 U	10 U	10 U	11 U	11 UJ	10 U	10 U	11 U	11 U
Semi-volatile Organic Compounds (UG/KG)										
1,2,4-Trichlorobenzene	370 U	350 U	1,700 U	1,700 U	700 U	1,700 U	1,600 U	1,600 U	1,700 U	360 U
1,2-Dichlorobenzene	370 U	350 U	1,700 U	1,700 U	700 U	1,700 U	1,600 U	1,600 U	1,700 U	360 U
1,3-Dichlorobenzene	370 U	350 U	1,700 U	1,700 U	700 U	1,700 U	1,600 U	1,600 U	1,700 U	360 U

B - Not detected above associated blank
J - Estimated
K - May be biased high
L - May be biased low
NA - Not Analyzed
U - Not detected

Table G-1
Surface Soil Analytical Results at Site 2
St. Juliens Creek Annex
Chesapeake, Virginia

Station ID	SJS02-SS01	SJS02-SS02	SJS02-SS03	SJS02-SS04	SJS02-SS05		SJS02-SS06	SJS02-SS07	SJS02-SS08	SJS02-SS09
Sample ID	SJS02-SS01-000	SJS02-SS02-000	SJS02-SS03-000	SJS02-SS04-000	SJS02-SS05-000	SJS02-SS05-000P	SJS02-SS06-000	SJS02-SS07-000	SJS02-SS08-000	SJS02-SS09-000
Sample Date	06/25/97	06/25/97	06/25/97	06/25/97	06/25/97	06/25/97	06/25/97	06/25/97	06/25/97	06/25/97
Chemical Name										
1,4-Dichlorobenzene	370 U	350 U	1,700 U	1,700 U	700 U	1,700 U	1,600 U	1,600 U	1,700 U	360 U
2,2'-Oxybis(1-chloropropane)	370 U	350 U	1,700 U	1,700 U	700 U	1,700 U	1,600 U	1,600 U	1,700 U	360 U
2,4,5-Trichlorophenol	920 U	890 U	4,300 U	4,300 U	1,800 U	4,400 U	4,100 U	4,200 U	4,300 U	900 U
2,4,6-Trichlorophenol	370 U	350 U	1,700 U	1,700 U	700 U	1,700 U	1,600 U	1,600 U	1,700 U	360 U
2,4-Dichlorophenol	370 U	350 U	1,700 U	1,700 U	700 U	1,700 U	1,600 U	1,600 U	1,700 U	360 U
2,4-Dimethylphenol	370 U	350 U	1,700 U	1,700 U	700 U	1,700 U	1,600 U	1,600 U	1,700 U	360 U
2,4-Dinitrophenol	920 U	890 U	4,300 U	4,300 U	1,800 U	4,400 U	4,100 U	4,200 U	4,300 U	900 U
2,4-Dinitrotoluene	370 U	350 U	1,700 U	1,700 U	700 U	1,700 U	1,600 U	1,600 U	1,700 U	360 U
2,6-Dinitrotoluene	370 U	350 U	1,700 U	1,700 U	700 U	1,700 U	1,600 U	1,600 U	1,700 U	360 U
2-Chloronaphthalene	370 U	350 U	1,700 U	1,700 U	700 U	1,700 U	1,600 U	1,600 U	1,700 U	360 U
2-Chlorophenol	370 U	350 U	1,700 U	1,700 U	700 U	1,700 U	1,600 U	1,600 U	1,700 U	360 U
2-Methylnaphthalene	370 U	350 U	310 J	1,700 U	700 U	1,700 U	1,600 U	1,600 U	1,700 U	360 U
2-Methylphenol	370 U	350 U	1,700 U	1,700 U	700 U	1,700 U	1,600 U	1,600 U	1,700 U	360 U
2-Nitroaniline	920 U	890 U	4,300 U	4,300 U	1,800 U	4,400 U	4,100 U	4,200 U	4,300 U	900 U
2-Nitrophenol	370 U	350 U	1,700 U	1,700 U	700 U	1,700 U	1,600 U	1,600 U	1,700 U	360 U
3,3'-Dichlorobenzidine	370 U	350 U	1,700 U	1,700 U	700 U	1,700 U	1,600 U	1,600 U	1,700 U	360 U
3-Nitroaniline	920 UJ	890 U	4,300 U	4,300 U	1,800 U	4,400 U	4,100 U	4,200 U	4,300 U	900 U
4,6-Dinitro-2-methylphenol	920 U	890 U	4,300 U	4,300 U	1,800 U	4,400 U	4,100 U	4,200 U	4,300 U	900 U
4-Bromophenyl-phenylether	370 U	350 U	1,700 U	1,700 U	700 U	1,700 U	1,600 U	1,600 U	1,700 U	360 U
4-Chloro-3-methylphenol	370 U	350 U	1,700 U	1,700 U	700 U	1,700 U	1,600 U	1,600 U	1,700 U	360 U
4-Chloroaniline	370 U	350 U	1,700 U	1,700 U	700 U	1,700 U	1,600 U	1,600 U	1,700 U	360 U
4-Chlorophenyl-phenylether	370 U	350 U	1,700 U	1,700 U	700 U	1,700 U	1,600 U	1,600 U	1,700 U	360 U
4-Methylphenol	370 U	350 U	1,700 U	1,700 U	700 U	1,700 U	1,600 U	1,600 U	1,700 U	360 U
4-Nitroaniline	920 U	890 U	4,300 U	4,300 U	1,800 U	4,400 U	4,100 U	4,200 U	4,300 U	900 U
4-Nitrophenol	920 U	890 U	4,300 U	4,300 U	1,800 U	4,400 U	4,100 U	4,200 U	4,300 U	900 U
Acenaphthene	370 U	100 J	170 J	1,700 U	700 U	1,700 U	1,600 U	1,600 U	1,700 U	360 U
Acenaphthylene	370 U	350 U	820 J	1,700 U	700 U	1,700 U	1,600 U	1,600 U	1,700 U	37 J
Anthracene	370 U	150 J	590 J	1,700 U	700 U	1,700 U	1,600 U	1,600 U	1,700 U	360 U
Benzo(a)anthracene	370 U	430	2,300	290 J	180 J	220 J	1,600 U	390 J	1,700 U	140 J
Benzo(a)pyrene	370 U	360	1,400 J	370 J	160 J	190 J	1,600 U	340 J	1,700 U	130 J
Benzo(b)fluoranthene	370 U	580	1,700 J	660 J	220 J	270 J	1,600 U	440 J	1,700 U	280 J
Benzo(g,h,i)perylene	370 U	160 J	890 J	280 J	78 J	1,700 U	1,600 U	1,600 U	1,700 U	76 J
Benzo(k)fluoranthene	370 U	290 J	1,100 J	320 J	150 J	1,700 U	1,600 U	270 J	1,700 U	87 J
Butylbenzylphthalate	370 U	350 U	1,700 U	1,700 U	700 U	1,700 U	280 J	1,600 U	1,700 U	360 U
Carbazole	370 U	120 J	300 J	1,700 U	700 U	1,700 U	1,600 U	1,600 U	1,700 U	360 U
Chrysene	370 U	470	2,700	400 J	160 J	210 J	1,600 U	370 J	1,700 U	150 J
Di-n-butylphthalate	370 U	350 U	210 J	1,700 U	700 U	1,700 U	1,600 U	1,600 U	1,700 U	360 U
Di-n-octylphthalate	370 U	350 U	1,700 U	1,700 U	700 U	1,700 U	1,600 U	1,600 U	1,700 U	360 U
Dibenz(a,h)anthracene	370 U	54 J	1,700 U	1,700 U	700 U	1,700 U	1,600 U	1,600 U	1,700 U	360 U
Dibenzofuran	370 U	70 J	1,700 U	1,700 U	700 U	1,700 U	1,600 U	1,600 U	1,700 U	360 U

B - Not detected above associated blank
J - Estimated
K - May be biased high
L - May be biased low
NA - Not Analyzed
U - Not detected

Table G-1
Surface Soil Analytical Results at Site 2
St. Juliens Creek Annex
Chesapeake, Virginia

Station ID	SJS02-SS01	SJS02-SS02	SJS02-SS03	SJS02-SS04	SJS02-SS05		SJS02-SS06	SJS02-SS07	SJS02-SS08	SJS02-SS09
Sample ID	SJS02-SS01-000	SJS02-SS02-000	SJS02-SS03-000	SJS02-SS04-000	SJS02-SS05-000	SJS02-SS05-000P	SJS02-SS06-000	SJS02-SS07-000	SJS02-SS08-000	SJS02-SS09-000
Sample Date	06/25/97	06/25/97	06/25/97	06/25/97	06/25/97	06/25/97	06/25/97	06/25/97	06/25/97	06/25/97
Chemical Name										
Diethylphthalate	370 U	350 U	1,700 U	1,700 U	700 U	1,700 U	1,600 U	1,600 U	1,700 U	360 U
Dimethyl phthalate	370 U	350 U	1,700 U	1,700 U	700 U	1,700 U	1,600 U	1,600 U	1,700 U	360 U
Fluoranthene	370 U	910	5,000	460 J	250 J	340 J	1,600 U	650 J	1,700 U	200 J
Fluorene	370 U	110 J	380 J	1,700 U	700 U	1,700 U	1,600 U	1,600 U	1,700 U	360 U
Hexachlorobenzene	370 U	350 U	1,700 U	1,700 U	700 U	1,700 U	1,600 U	1,600 U	1,700 U	360 U
Hexachlorobutadiene	370 U	350 U	1,700 U	1,700 U	700 U	1,700 U	1,600 U	1,600 U	1,700 U	360 U
Hexachlorocyclopentadiene	370 U	350 U	1,700 U	1,700 U	700 U	1,700 U	1,600 U	1,600 U	1,700 U	360 U
Hexachloroethane	370 U	350 U	1,700 U	1,700 U	700 U	1,700 U	1,600 U	1,600 U	1,700 U	360 U
Indeno(1,2,3-cd)pyrene	370 U	180 J	800 J	310 J	86 J	1,700 U	1,600 U	210 J	1,700 U	88 J
Isophorone	370 U	350 U	1,700 U	1,700 U	700 U	1,700 U	1,600 U	1,600 U	1,700 U	360 U
Naphthalene	370 U	52 J	1,700 U	1,700 U	700 U	1,700 U	1,600 U	1,600 U	1,700 U	360 U
Nitrobenzene	370 U	350 U	1,700 U	1,700 U	700 U	1,700 U	1,600 U	1,600 U	1,700 U	360 U
Pentachlorophenol	920 U	890 U	4,300 U	4,300 U	1,800 U	4,400 U	4,100 U	4,200 U	4,300 U	900 U
Phenanthrene	370 U	850	4,400	1,700 U	94 J	1,700 U	1,600 U	310 J	1,700 U	53 J
Phenol	370 U	350 U	1,700 U	1,700 U	700 U	1,700 U	1,600 U	1,600 U	1,700 U	360 U
Pyrene	370 U	350 U	7,200	550 J	260 J	320 J	1,600 U	590 J	220 J	240 J
bis(2-Chloroethoxy)methane	370 U	350 U	1,700 U	1,700 U	700 U	1,700 U	1,600 U	1,600 U	1,700 U	360 U
bis(2-Chloroethyl)ether	370 U	350 U	1,700 U	1,700 U	700 U	1,700 U	1,600 U	1,600 U	1,700 U	360 U
bis(2-Ethylhexyl)phthalate	49 B	140 B	1,700 U	1,700 U	72 B	1,700 U	570 B	1,600 U	1,700 U	54 J
n-Nitroso-di-n-propylamine	370 U	350 U	1,700 U	1,700 U	700 U	1,700 U	1,600 U	1,600 U	1,700 U	360 U
n-Nitrosodiphenylamine	370 U	350 U	1,700 U	1,700 U	700 U	1,700 U	1,600 U	1,600 U	1,700 U	360 U
Pesticide/Polychlorinated Biphenyls (UG/KG)										
4,4'-DDD	19	2.8 J	84 J	30 J	13 J	10	8.9 J	24	5.7 J	4,200
4,4'-DDE	82 J	19	260 J	210	110	94	3.3 U	120	25	460
4,4'-DDT	54	9.2 J	NA	170 J	30	27	12 J	23	13 J	900
Aldrin	3.8 U	1.8 U	8.9 U	8.8 U	8.9 U	3.6 U	1.7 U	8.4 U	1.8 U	18 U
Aroclor-1016	74 U	36 U	170 U	170 U	170 U	70 U	33 U	160 U	35 U	350 U
Aroclor-1221	150 U	72 U	350 U	350 U	350 U	140 U	66 U	330 U	71 U	720 U
Aroclor-1232	74 U	36 U	170 U	170 U	170 U	70 U	33 U	160 U	35 U	350 U
Aroclor-1242	74 U	36 U	170 U	170 U	170 U	70 U	33 U	160 U	35 U	350 U
Aroclor-1248	74 U	36 U	170 U	170 U	170 U	70 U	33 U	160 U	35 U	350 U
Aroclor-1254	74 U	36 U	170 U	170 U	170 U	70 U	33 U	160 U	35 U	350 U
Aroclor-1260	74 U	15 J	110 J	110 J	170 U	70 U	54 J	160 U	17 J	350 U
Dieldrin	7.4 U	3.8 J	17 U	17 U	17 U	7 U	3.3 U	16 U	3.5 U	35 U
Endosulfan I	3.8 U	1.8 U	8.9 U	8.8 U	8.9 U	3.6 U	1.7 U	8.4 U	1.8 U	18 U
Endosulfan II	7.4 U	3.6 U	17 U	17 U	17 U	7 U	3.3 U	16 U	3.5 U	35 U
Endosulfan sulfate	7.4 U	3.6 U	17 U	17 U	17 U	7 U	3.3 U	16 U	3.5 U	35 U
Endrin	7.4 U	3.6 U	17 U	17 U	17 U	7 U	3.3 U	16 U	3.5 U	35 U
Endrin aldehyde	7.4 U	3.6 U	17 U	17 U	17 U	7 U	3.3 U	16 U	3.5 U	35 U

B - Not detected above associated blank
J - Estimated
K - May be biased high
L - May be biased low
NA - Not Analyzed
U - Not detected

Table G-1
Surface Soil Analytical Results at Site 2
St. Juliens Creek Annex
Chesapeake, Virginia

Station ID	SJS02-SS01	SJS02-SS02	SJS02-SS03	SJS02-SS04	SJS02-SS05		SJS02-SS06	SJS02-SS07	SJS02-SS08	SJS02-SS09
Sample ID	SJS02-SS01-000	SJS02-SS02-000	SJS02-SS03-000	SJS02-SS04-000	SJS02-SS05-000	SJS02-SS05-000P	SJS02-SS06-000	SJS02-SS07-000	SJS02-SS08-000	SJS02-SS09-000
Sample Date	06/25/97	06/25/97	06/25/97	06/25/97	06/25/97	06/25/97	06/25/97	06/25/97	06/25/97	06/25/97
Chemical Name										
Endrin ketone	7.4 U	3.6 U	17 U	17 U	17 U	7 U	3.3 U	16 U	3.5 U	35 U
Heptachlor	3.8 U	1.8 U	8.9 U	8.8 U	8.9 U	3.6 U	1.7 U	8.4 U	1.8 U	18 U
Heptachlor epoxide	3.8 U	1.8 U	8.9 U	8.8 U	8.9 U	3.6 U	1.7 U	8.4 U	1.8 U	18 U
Methoxychlor	38 U	18 U	89 U	88 U	89 U	36 U	17 U	84 U	18 U	180 U
Toxaphene	380 U	180 U	890 U	880 U	890 U	360 U	170 U	840 U	180 U	1,800 U
alpha-BHC	3.8 U	1.8 U	8.9 U	8.8 U	8.9 U	3.6 U	1.7 U	8.4 U	1.8 U	18 U
alpha-Chlordane	3.8 U	1.8 U	8.9 U	8.8 U	8.9 U	3.6 U	1.7 U	8.4 U	1.8 U	18 U
beta-BHC	3.8 U	1.8 U	8.9 U	8.8 U	8.9 U	3.6 U	1.7 U	8.4 U	1.8 U	18 U
delta-BHC	3.8 U	1.8 U	8.9 U	8.8 U	8.9 U	3.6 U	1.7 U	8.4 U	1.8 U	18 U
gamma-BHC (Lindane)	3.8 U	1.8 U	8.9 U	8.8 U	8.9 U	3.6 U	1.7 U	8.4 U	1.8 U	18 U
gamma-Chlordane	3.8 U	1.8 U	8.9 U	8.8 U	8.9 U	3.6 U	1.7 U	8.4 U	1.8 U	18 U
Nitramines (UG/KG)										
1,3,5-Trinitrobenzene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,3-Dinitrobenzene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4,6-Trinitrotoluene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4-Dinitrotoluene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,6-Dinitrotoluene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Amino-4,6-dinitrotoluene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Nitrotoluene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3-Nitrotoluene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Amino-2,6-dinitrotoluene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Nitrotoluene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
HMX	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nitrobenzene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RDX	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Tetryl	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Metals (MG/KG)										
Aluminum	5,120	8,810	6,590	3,470	3,080	3,110	18,600	4,350	4,920	6,160
Antimony	0.38 U	0.35 U	7 J	0.41 B	0.48 B	0.5 B	4.1 B	0.9 B	0.4 U	NA
Arsenic	3.4	2.2	12	7.7	1.9 J	2.3	0.52 U	3.6	5.1	5.3 K
Barium	14.6 J	59.6	306	37.4	26.4 J	27.2 J	245	47.3	40.8	35.9 J
Beryllium	0.19 U	0.23 J	2.5	0.17 U	0.18 U	0.2 U	13.4	0.19 U	0.2 U	0.34 J
Cadmium	0.1 U	0.25 J	0.1 U	0.68 J	0.23 J	0.27 J	0.65 J	0.29 J	0.33 J	0.09 U
Calcium	541 J	1,060	2,450	1,800	1,220	1,310	8,980	4,730	3,670	646 J
Chromium	10.4	10.7	232	12.1	13.5	11.4	246	10.8	12.8	23.2
Cobalt	1.7 J	1.41 U	20.4	1.35 U	1.43 U	2.1 J	62.6	1.52 U	2.3 J	1.5 J
Copper	5.1	8.4	421	30.4	27.4	27.9	4,260	46.9	64.9	25.6
Cyanide	0.53 U	0.51 U	0.85 J	0.52 U	0.53 U	0.53 U	0.5 U	0.51 U	0.52 U	0.53 U

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Table G-1
Surface Soil Analytical Results at Site 2
St. Juliens Creek Annex
Chesapeake, Virginia

Station ID	SJS02-SS01	SJS02-SS02	SJS02-SS03	SJS02-SS04	SJS02-SS05		SJS02-SS06	SJS02-SS07	SJS02-SS08	SJS02-SS09
Sample ID	SJS02-SS01-000	SJS02-SS02-000	SJS02-SS03-000	SJS02-SS04-000	SJS02-SS05-000	SJS02-SS05-000P	SJS02-SS06-000	SJS02-SS07-000	SJS02-SS08-000	SJS02-SS09-000
Sample Date	06/25/97	06/25/97	06/25/97	06/25/97	06/25/97	06/25/97	06/25/97	06/25/97	06/25/97	06/25/97
Chemical Name										
Iron	6,120	2,560	106,000	5,460	5,690	5,850	106,000	6,170	7,630	7,280
Lead	8.8	23.8	450	82.6	96	96.3	2,370	97.8	87.1	49.3
Magnesium	496 J	478 J	869 J	433 J	459 J	520 J	2,570	719 J	841 J	734 J
Manganese	18.1	27.2	688	49.8	54.6	59.6	470	50.3	77.9	61.8 K
Mercury	0.07 J	0.23	0.24	0.17	0.42	0.37	0.11	0.56	0.4	0.19 L
Nickel	3.4 J	3.6 J	158	5.6 J	8.4	11.7	246	4.5 J	9	3.5 J
Potassium	398 J	562 J	426 J	367 J	360 J	407 J	1,900	417 J	539 J	901 J
Selenium	0.58 U	1	0.58 U	0.51 U	0.54 U	0.59 U	0.52 U	0.57 U	0.6 U	0.55 U
Silver	0.9 B	0.71 B	2.1 B	0.74 B	0.69 B	0.99 B	2.9 B	0.98 B	1.5 B	0.97 B
Sodium	42.4 B	76.1 B	166 B	37.9 B	34 B	46.5 B	533 J	82.2 B	54.6 B	82.3 B
Thallium	0.38 U	0.35 U	6.2	0.34 U	0.36 U	0.39 U	5.5	0.38 U	0.4 U	0.76 J
Vanadium	15.6	12.5	66.1	20.9	21.1	22.2	40.2	12.9	23.9	19.7
Zinc	13.2 B	54.6	2,020	127	110	118	7,560	185	147	41.5
Wet Chemistry										
% Solids	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Phosphorus (MG/KG)	1.5	2.3	26.5	11.7	3.7	10.3	153	7	3.1	32
pH	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Shaded cells indicate analyte detections

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Surface Soil Analytical Results at Site 2
St. Juliens Creek Annex
Chesapeake, Virginia

Station ID	SJS02-SS10	SJS02-SS11	SJS02-SS12	SJS02-SS13	SJS02-SS14	SJS02-SS15	SJS02-SS16		SJS02-SS17	SJS02-SS18
Sample ID	SJS02-SS10-000	SJS02-SS11-000	SJS02-SS12-000	SJS02-SS13-000	SJS02-SS14-000	SJS02-SS15-000	SJS02-SS16-000	SJS02-SS16-000P	SJS02-SS17-000	SJS02-SS18-000
Sample Date	06/25/97	04/21/99	04/21/99	04/21/99	04/21/99	04/21/99	04/21/99	04/21/99	04/21/99	04/21/99
Chemical Name										
Volatile Organic Compounds (UG/KG)										
1,1,1-Trichloroethane	10 U	10 U	12 U	11 U	12 U	12 U	12 U	12 U	12 U	11 U
1,1,2,2-Tetrachloroethane	10 U	10 U	12 U	11 U	12 U	12 U	12 U	12 U	12 U	11 U
1,1,2-Trichloroethane	10 U	10 U	12 U	11 U	12 U	12 U	12 U	12 U	12 U	11 U
1,1-Dichloroethane	10 U	10 U	12 U	11 U	12 U	12 U	12 U	12 U	12 U	11 U
1,1-Dichloroethene	10 U	10 U	12 U	11 U	12 U	12 U	12 U	12 U	12 U	11 U
1,2-Dichloroethane	10 U	10 U	12 U	11 U	12 U	12 U	12 U	12 U	12 U	11 U
1,2-Dichloroethene (total)	10 U	10 U	12 U	11 U	12 U	12 U	12 U	12 U	12 U	11 U
1,2-Dichloropropane	10 U	10 U	12 U	11 U	12 U	12 U	12 U	12 U	12 U	11 U
2-Butanone	10 U	200	12 U	11 U	12 U	12 U	12 U	12 U	12 U	11 U
2-Hexanone	10 U	10 U	12 U	11 U	12 U	12 U	12 U	12 U	12 U	11 U
4-Methyl-2-pentanone	10 U	10 U	12 U	11 U	12 U	12 U	12 U	12 U	12 U	11 U
Acetone	35	23	12 U	11 U	12 U	12 U	12 U	12 U	12 U	11 U
Benzene	10 U	10 U	12 U	11 U	12 U	12 U	12 U	12 U	12 U	11 U
Bromodichloromethane	10 U	10 U	12 U	11 U	12 U	12 U	12 U	12 U	12 U	11 U
Bromoform	10 U	10 U	12 U	11 U	12 U	12 U	12 U	12 U	12 U	11 U
Bromomethane	10 U	10 U	12 U	11 U	12 U	12 U	12 U	12 U	12 U	11 U
Carbon disulfide	10 U	10 U	12 U	11 U	12 U	12 U	12 U	12 U	12 U	11 U
Carbon tetrachloride	10 U	10 U	12 U	11 U	12 U	12 U	12 U	12 U	12 U	11 U
Chlorobenzene	10 U	10 U	12 U	11 U	12 U	12 U	12 U	12 U	12 U	11 U
Chloroethane	10 U	10 U	12 U	11 U	12 U	12 U	12 U	12 U	12 U	11 U
Chloroform	10 U	10 U	12 U	11 U	12 U	12 U	12 U	12 U	12 U	11 U
Chloromethane	10 U	10 U	12 U	11 U	12 U	12 U	12 U	12 U	12 U	11 U
Dibromochloromethane	10 U	10 U	12 U	11 U	12 U	12 U	12 U	12 U	12 U	11 U
Ethylbenzene	10 U	10 U	12 U	11 U	12 U	12 U	12 U	12 U	12 U	11 U
Methylene chloride	20 B	8 B	5 B	8 B	7 B	2 B	7 B	11 B	8 B	7 B
Styrene	10 U	10 U	12 U	11 U	12 U	12 U	12 U	12 U	12 U	11 U
Tetrachloroethene	10 U	10 U	12 U	11 U	12 U	12 U	12 U	12 U	12 U	11 U
Toluene	10 U	10 U	12 U	11 U	12 U	12 U	12 U	12 U	12 U	11 U
Trichloroethene	10 U	10 U	12 U	11 U	12 U	12 U	12 U	12 U	12 U	11 U
Vinyl chloride	10 U	10 U	12 U	11 U	12 U	12 U	12 U	12 U	12 U	11 U
Xylene, total	10 U	10 U	12 U	11 U	12 U	12 U	12 U	12 U	12 U	11 U
cis-1,3-Dichloropropene	10 U	10 U	12 U	11 U	12 U	12 U	12 U	12 U	12 U	11 U
trans-1,3-Dichloropropene	10 U	10 U	12 U	11 U	12 U	12 U	12 U	12 U	12 U	11 U
Semi-volatile Organic Compounds (UG/KG)										
1,2,4-Trichlorobenzene	330 U	350 UJ	410 UJ	380 UJ	390 UJ	400 UJ	420 UJ	410 UJ	390 UJ	360 UJ
1,2-Dichlorobenzene	330 U	350 UJ	410 UJ	380 UJ	390 UJ	400 UJ	420 UJ	410 UJ	390 UJ	360 UJ
1,3-Dichlorobenzene	330 U	350 UJ	410 UJ	380 UJ	390 UJ	400 UJ	420 UJ	410 UJ	390 UJ	360 UJ

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Surface Soil Analytical Results at Site 2
St. Juliens Creek Annex
Chesapeake, Virginia

Station ID	SJS02-SS10	SJS02-SS11	SJS02-SS12	SJS02-SS13	SJS02-SS14	SJS02-SS15	SJS02-SS16		SJS02-SS17	SJS02-SS18
Sample ID	SJS02-SS10-000	SJS02-SS11-000	SJS02-SS12-000	SJS02-SS13-000	SJS02-SS14-000	SJS02-SS15-000	SJS02-SS16-000	SJS02-SS16-000P	SJS02-SS17-000	SJS02-SS18-000
Sample Date	06/25/97	04/21/99	04/21/99	04/21/99	04/21/99	04/21/99	04/21/99	04/21/99	04/21/99	04/21/99
Chemical Name										
1,4-Dichlorobenzene	330 U	350 UJ	410 UJ	380 UJ	390 UJ	400 UJ	420 UJ	410 UJ	390 UJ	360 UJ
2,2'-Oxybis(1-chloropropane)	330 U	350 UJ	410 UJ	380 UJ	390 UJ	400 UJ	420 UJ	410 UJ	390 UJ	360 UJ
2,4,5-Trichlorophenol	830 U	870 UJ	1,000 UJ	950 UJ	970 UJ	1,000 UJ	1,000 UJ	1,000 UJ	980 UJ	900 UJ
2,4,6-Trichlorophenol	330 U	350 UJ	410 UJ	380 UJ	390 UJ	400 UJ	420 UJ	410 UJ	390 UJ	360 UJ
2,4-Dichlorophenol	330 U	350 UJ	410 UJ	380 UJ	390 UJ	400 UJ	420 UJ	410 UJ	390 UJ	360 UJ
2,4-Dimethylphenol	330 U	350 UJ	410 UJ	380 UJ	390 UJ	400 UJ	420 UJ	410 UJ	390 UJ	360 UJ
2,4-Dinitrophenol	830 U	870 UJ	1,000 UJ	950 UJ	970 UJ	1,000 UJ	1,000 UJ	1,000 UJ	980 UJ	900 UJ
2,4-Dinitrotoluene	330 U	350 UJ	410 UJ	380 UJ	390 UJ	400 UJ	420 UJ	410 UJ	390 UJ	360 UJ
2,6-Dinitrotoluene	330 U	350 UJ	410 UJ	380 UJ	390 UJ	400 UJ	420 UJ	410 UJ	390 UJ	360 UJ
2-Chloronaphthalene	330 U	350 UJ	410 UJ	380 UJ	390 UJ	400 UJ	420 UJ	410 UJ	390 UJ	360 UJ
2-Chlorophenol	330 U	350 UJ	410 UJ	380 UJ	390 UJ	400 UJ	420 UJ	410 UJ	390 UJ	360 UJ
2-Methylnaphthalene	330 U	350 UJ	410 UJ	380 UJ	390 UJ	400 UJ	420 UJ	410 UJ	390 UJ	360 UJ
2-Methylphenol	330 U	350 UJ	410 UJ	380 UJ	390 UJ	400 UJ	420 UJ	410 UJ	390 UJ	360 UJ
2-Nitroaniline	830 U	870 UJ	1,000 UJ	950 UJ	970 UJ	1,000 UJ	1,000 UJ	1,000 UJ	980 UJ	900 UJ
2-Nitrophenol	330 U	350 UJ	410 UJ	380 UJ	390 UJ	400 UJ	420 UJ	410 UJ	390 UJ	360 UJ
3,3'-Dichlorobenzidine	330 U	350 UJ	410 UJ	380 UJ	390 UJ	400 UJ	420 UJ	410 UJ	390 UJ	360 UJ
3-Nitroaniline	830 U	870 UJ	1,000 UJ	950 UJ	970 UJ	1,000 UJ	1,000 UJ	1,000 UJ	980 UJ	900 UJ
4,6-Dinitro-2-methylphenol	830 U	870 UJ	1,000 UJ	950 UJ	970 UJ	1,000 UJ	1,000 UJ	1,000 UJ	980 UJ	900 UJ
4-Bromophenyl-phenylether	330 U	350 UJ	410 UJ	380 UJ	390 UJ	400 UJ	420 UJ	410 UJ	390 UJ	360 UJ
4-Chloro-3-methylphenol	330 U	350 UJ	410 UJ	380 UJ	390 UJ	400 UJ	420 UJ	410 UJ	390 UJ	360 UJ
4-Chloroaniline	330 U	350 UJ	410 UJ	380 UJ	390 UJ	400 UJ	420 UJ	410 UJ	390 UJ	360 UJ
4-Chlorophenyl-phenylether	330 U	350 UJ	410 UJ	380 UJ	390 UJ	400 UJ	420 UJ	410 UJ	390 UJ	360 UJ
4-Methylphenol	330 U	350 UJ	410 UJ	380 UJ	390 UJ	400 UJ	420 UJ	410 UJ	390 UJ	360 UJ
4-Nitroaniline	830 U	870 UJ	1,000 UJ	950 UJ	970 UJ	1,000 UJ	1,000 UJ	1,000 UJ	980 UJ	900 UJ
4-Nitrophenol	830 U	870 UJ	1,000 UJ	950 UJ	970 UJ	1,000 UJ	1,000 UJ	1,000 UJ	980 UJ	900 UJ
Acenaphthene	330 U	350 UJ	410 UJ	380 UJ	390 UJ	400 UJ	420 UJ	410 UJ	390 UJ	360 UJ
Acenaphthylene	89 J	350 UJ	76 J	130 J	390 UJ	110 J	420 UJ	410 UJ	390 UJ	78 J
Anthracene	330 U	350 UJ	410 UJ	92 J	390 UJ	43 J	420 UJ	410 UJ	65 J	360 UJ
Benzo(a)anthracene	120 J	350 UJ	160 J	440 J	390 UJ	200 J	140 J	91 J	530 J	220 J
Benzo(a)pyrene	130 J	350 UJ	270 J	450 J	390 UJ	270 J	140 J	99 J	500 J	280 J
Benzo(b)fluoranthene	240 J	350 UJ	310 J	670 J	390 UJ	350 J	210 J	150 J	570 J	400 J
Benzo(g,h,i)perylene	160 J	350 UJ	250 J	400 J	390 UJ	250 J	120 J	91 J	330 J	270 J
Benzo(k)fluoranthene	120 J	350 UJ	89 J	220 J	390 UJ	110 J	62 J	45 J	170 J	140 J
Butylbenzylphthalate	330 U	350 UJ	410 UJ	380 UJ	390 UJ	400 UJ	55 J	57 J	390 UJ	360 UJ
Carbazole	330 U	350 UJ	410 UJ	380 UJ	390 UJ	400 UJ	420 UJ	410 UJ	390 UJ	360 UJ
Chrysene	150 J	350 UJ	170 J	420 J	390 UJ	220 J	130 J	93 J	550 J	210 J
Di-n-butylphthalate	330 U	120 J	47 J	380 UJ	390 UJ	400 UJ	420 UJ	410 UJ	390 UJ	360 UJ
Di-n-octylphthalate	330 UJ	350 UJ	410 UJ	380 UJ	390 UJ	400 UJ	420 UJ	410 UJ	390 UJ	360 UJ
Dibenz(a,h)anthracene	330 UJ	350 UJ	410 UJ	380 UJ	390 UJ	400 UJ	420 UJ	410 UJ	390 UJ	360 UJ
Dibenzofuran	330 U	350 UJ	410 UJ	380 UJ	390 UJ	400 UJ	420 UJ	410 UJ	390 UJ	360 UJ

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Surface Soil Analytical Results at Site 2
St. Juliens Creek Annex
Chesapeake, Virginia

Station ID	SJS02-SS10	SJS02-SS11	SJS02-SS12	SJS02-SS13	SJS02-SS14	SJS02-SS15	SJS02-SS16		SJS02-SS17	SJS02-SS18
Sample ID	SJS02-SS10-000	SJS02-SS11-000	SJS02-SS12-000	SJS02-SS13-000	SJS02-SS14-000	SJS02-SS15-000	SJS02-SS16-000	SJS02-SS16-000P	SJS02-SS17-000	SJS02-SS18-000
Sample Date	06/25/97	04/21/99	04/21/99	04/21/99	04/21/99	04/21/99	04/21/99	04/21/99	04/21/99	04/21/99
Chemical Name										
Diethylphthalate	330 U	350 UJ	410 UJ	380 UJ	390 UJ	400 UJ	420 UJ	410 UJ	390 UJ	360 UJ
Dimethyl phthalate	330 U	350 UJ	410 UJ	380 UJ	390 UJ	400 UJ	420 UJ	410 UJ	390 UJ	360 UJ
Fluoranthene	140 J	350 UJ	130 J	530 J	390 UJ	250 J	160 J	90 J	920 J	230 J
Fluorene	330 U	350 UJ	410 UJ	380 UJ	390 UJ	400 UJ	420 UJ	410 UJ	390 UJ	360 UJ
Hexachlorobenzene	330 U	350 UJ	410 UJ	380 UJ	390 UJ	400 UJ	420 UJ	410 UJ	390 UJ	360 UJ
Hexachlorobutadiene	330 U	350 UJ	410 UJ	380 UJ	390 UJ	400 UJ	420 UJ	410 UJ	390 UJ	360 UJ
Hexachlorocyclopentadiene	330 U	350 UJ	410 UJ	380 UJ	390 UJ	400 UJ	420 UJ	410 UJ	390 UJ	360 UJ
Hexachloroethane	330 U	350 UJ	410 UJ	380 UJ	390 UJ	400 UJ	420 UJ	410 UJ	390 UJ	360 UJ
Indeno(1,2,3-cd)pyrene	110 J	350 UJ	200 J	320 J	390 UJ	200 J	96 J	67 J	250 J	210 J
Isophorone	330 U	350 UJ	410 UJ	380 UJ	390 UJ	400 UJ	420 UJ	410 UJ	390 UJ	360 UJ
Naphthalene	330 U	350 UJ	410 UJ	380 UJ	390 UJ	400 UJ	420 UJ	410 UJ	390 UJ	360 UJ
Nitrobenzene	330 U	350 UJ	410 UJ	380 UJ	390 UJ	400 UJ	420 UJ	410 UJ	390 UJ	360 UJ
Pentachlorophenol	830 U	870 UJ	1,000 UJ	950 UJ	970 UJ	1,000 UJ	1,000 UJ	1,000 UJ	980 UJ	900 UJ
Phenanthrene	41 J	350 UJ	56 J	160 J	390 UJ	110 J	87 J	410 UJ	610 J	45 J
Phenol	330 U	350 UJ	410 UJ	380 UJ	390 UJ	400 UJ	420 UJ	410 UJ	390 UJ	360 UJ
Pyrene	230 J	350 UJ	210 J	100 J	390 UJ	420 J	170 J	120 J	1,200 J	460 J
bis(2-Chloroethoxy)methane	330 U	350 UJ	410 UJ	380 UJ	390 UJ	400 UJ	420 UJ	410 UJ	390 UJ	360 UJ
bis(2-Chloroethyl)ether	330 U	350 UJ	410 UJ	380 UJ	390 UJ	400 UJ	420 UJ	410 UJ	390 UJ	360 UJ
bis(2-Ethylhexyl)phthalate	35	350 UJ	410 UJ	380 UJ	390 UJ	400 UJ	420 UJ	410 UJ	390 UJ	39 J
n-Nitroso-di-n-propylamine	330 U	350 UJ	410 UJ	380 UJ	390 UJ	400 UJ	420 UJ	410 UJ	390 UJ	360 UJ
n-Nitrosodiphenylamine	330 U	350 UJ	410 UJ	380 UJ	390 UJ	400 UJ	420 UJ	410 UJ	390 UJ	360 UJ
Pesticide/Polychlorinated Biphenyls (UG/KG)										
4,4'-DDD	7 J	1.60 J	4.10 UJ	230 J	3.90 UJ	5.5 J	4.10 UJ	3.20 J	20 J	30 J
4,4'-DDE	37	1.60 J	1,400 J	1,200 J	12 J	120 J	42 J	37 J	110 J	510 J
4,4'-DDT	79	3 J	2,100 J	2,100 J	4.90 J	110 J	34 J	22 J	49 J	150 J
Aldrin	1.7 U	1.70 UJ	2 UJ	1.90 UJ	1.90 UJ	2 UJ	2.10 UJ	2 UJ	2 UJ	1.80 UJ
Aroclor-1016	33 U	35 UJ	41 UJ	38 UJ	39 UJ	40 UJ	41 UJ	41 UJ	39 UJ	36 UJ
Aroclor-1221	67 U	69 UJ	82 UJ	75 UJ	77 UJ	80 UJ	83 UJ	82 UJ	79 UJ	71 UJ
Aroclor-1232	33 U	35 UJ	41 UJ	38 UJ	39 UJ	40 UJ	41 UJ	41 UJ	39 UJ	36 UJ
Aroclor-1242	33 U	35 UJ	41 UJ	38 UJ	39 UJ	40 UJ	41 UJ	41 UJ	39 UJ	36 UJ
Aroclor-1248	33 U	35 UJ	41 UJ	38 UJ	39 UJ	40 UJ	41 UJ	41 UJ	39 UJ	36 UJ
Aroclor-1254	33 U	35 UJ	41 UJ	38 UJ	39 UJ	40 UJ	41 UJ	41 UJ	39 UJ	36 UJ
Aroclor-1260	33 U	35 UJ	41 UJ	38 UJ	39 UJ	40 UJ	41 UJ	41 UJ	39 UJ	36 UJ
Dieldrin	3.3 U	3.5 UJ	4.10 UJ	3.80 UJ	3.90 UJ	4 UJ	4.10 UJ	4.10 UJ	0.790 J	1.10 J
Endosulfan I	1.7 U	1.70 UJ	2 UJ	1.90 UJ	1.90 UJ	2 UJ	2.10 UJ	2 UJ	2 UJ	1.80 UJ
Endosulfan II	3.3 U	3.5 UJ	4.10 UJ	3.80 UJ	3.90 UJ	4 UJ	4.10 UJ	4.10 UJ	3.90 UJ	3.60 UJ
Endosulfan sulfate	3.3 U	3.5 UJ	4.10 UJ	3.80 UJ	3.90 UJ	4 UJ	4.10 UJ	4.10 UJ	3.90 UJ	3.60 UJ
Endrin	3.3 U	3.5 UJ	4.10 UJ	3.80 UJ	3.90 UJ	4 UJ	4.10 UJ	4.10 UJ	3.90 UJ	3.60 UJ
Endrin aldehyde	3.3 U	3.5 UJ	4.10 UJ	3.80 UJ	3.90 UJ	4 UJ	4.10 UJ	4.10 UJ	3.90 UJ	3.60 UJ

B - Not detected above associated blank
J - Estimated
K - May be biased high
L - May be biased low
NA - Not Analyzed
U - Not detected

Table G-1
Surface Soil Analytical Results at Site 2
St. Juliens Creek Annex
Chesapeake, Virginia

Station ID	SJS02-SS10	SJS02-SS11	SJS02-SS12	SJS02-SS13	SJS02-SS14	SJS02-SS15	SJS02-SS16		SJS02-SS17	SJS02-SS18
Sample ID	SJS02-SS10-000	SJS02-SS11-000	SJS02-SS12-000	SJS02-SS13-000	SJS02-SS14-000	SJS02-SS15-000	SJS02-SS16-000	SJS02-SS16-000P	SJS02-SS17-000	SJS02-SS18-000
Sample Date	06/25/97	04/21/99	04/21/99	04/21/99	04/21/99	04/21/99	04/21/99	04/21/99	04/21/99	04/21/99
Chemical Name										
Endrin ketone	3.3 U	3.5 UJ	4.10 UJ	3.80 UJ	3.90 UJ	4 UJ	4.10 UJ	4.10 UJ	3.90 UJ	3.60 UJ
Heptachlor	1.7 U	1.70 UJ	2.20 J	1.90 UJ	1.90 UJ	2 UJ	2.10 UJ	2 UJ	2 UJ	1.80 UJ
Heptachlor epoxide	1.7 U	1.70 UJ	2 UJ	1.90 UJ	1.90 UJ	2 UJ	2.10 UJ	2 UJ	2 UJ	1.80 UJ
Methoxychlor	17 U	17 UJ	20 UJ	19 UJ	19 UJ	20 UJ	21 UJ	20 UJ	20 UJ	18 UJ
Toxaphene	170 U	170 UJ	200 UJ	190 UJ	190 UJ	200 UJ	210 UJ	200 UJ	200 UJ	180 UJ
alpha-BHC	1.7 U	1.70 UJ	2 UJ	1.90 UJ	1.90 UJ	2 UJ	2.10 UJ	2 UJ	2 UJ	1.80 UJ
alpha-Chlordane	1.7 U	1.70 UJ	50 J	5 J	1.90 UJ	0.810 J	1.80 J	1.60 J	2.40 J	6.60 J
beta-BHC	1.7 U	1.70 UJ	2 UJ	1.90 UJ	1.90 UJ	2 UJ	2.10 UJ	2 UJ	2 UJ	1.80 UJ
delta-BHC	1.7 U	1.70 UJ	2 UJ	1.90 UJ	1.90 UJ	2 UJ	2.10 UJ	2 UJ	2 UJ	1.80 UJ
gamma-BHC (Lindane)	1.7 U	1.70 UJ	2 UJ	1.90 UJ	1.90 UJ	2 UJ	2.10 UJ	2 UJ	2 UJ	1.80 UJ
gamma-Chlordane	1.7 U	1.70 UJ	29 J	1.90 UJ	1.90 UJ	2 UJ	2 J	1.80 J	2.80 J	7.90 J
Nitramines (UG/KG)										
1,3,5-Trinitrobenzene	500 U	250 U	250 U	238 U	250 U	250 U	250 U	238 U	250 U	250 U
1,3-Dinitrobenzene	500 U	250 U	250 U	238 U	250 U	250 U	250 U	238 U	250 U	250 U
2,4,6-Trinitrotoluene	500 U	250 U	250 U	238 U	250 U	250 U	250 U	238 U	250 U	250 U
2,4-Dinitrotoluene	NA	250 U	250 U	238 U	250 U	250 U	250 U	238 U	250 U	250 U
2,6-Dinitrotoluene	NA	250 U	250 U	238 U	250 U	250 U	250 U	238 U	250 U	250 U
2-Amino-4,6-dinitrotoluene	500 U	250 U	250 U	238 U	250 U	250 U	250 U	238 U	250 U	250 U
2-Nitrotoluene	500 U	500 U	500 U	477 U	500 U	500 U	500 U	477 U	500 U	500 U
3-Nitrotoluene	500 U	500 U	500 U	477 U	500 U	500 U	500 U	477 U	500 U	500 U
4-Amino-2,6-dinitrotoluene	500 U	250 U	250 U	238 U	250 U	250 U	250 U	238 U	250 U	250 U
4-Nitrotoluene	500 U	500 U	500 U	477 U	500 U	500 U	500 U	477 U	500 U	500 U
HMX	500 U	500 U	500 U	477 U	500 U	500 U	500 U	477 U	500 U	500 U
Nitrobenzene	NA	250 U	250 U	238 U	250 U	250 U	250 U	238 U	250 U	250 U
RDX	500 U	500 U	500 U	477 U	500 U	500 U	500 U	477 U	500 U	500 U
Tetryl	500 U	500 U	500 U	477 U	500 U	500 U	500 U	477 U	500 U	500 U
Total Metals (MG/KG)										
Aluminum	2,680	1,960	4,400	5,960	2,750	6,400	7,500	6,600	4,530	2,300
Antimony	NA	0.540 U	0.520 U	1.5 J	0.570 U	0.570 U	1.10 J	1.40 J	0.530 J	2 J
Arsenic	2.5 K	1.40 J	3	18	1.30 J	2.40	6.40	5.90	3.10	4.60
Barium	22.5 J	9.80 J	83.6	101	12 J	50.6	104	109	146	49.8
Beryllium	0.34 J	0.170 J	0.200 J	0.690 J	0.240 J	0.220 J	0.5 J	0.320 J	0.230 J	0.420 J
Cadmium	0.15 B	0.200 J	0.680 J	0.920 J	0.100 J	0.380 J	0.740 J	0.590 J	1.30	0.630 J
Calcium	702 J	2,270	479 J	1,880	15,900	1,560	6,090	5,270	2,410	886 J
Chromium	9.1	2.5	13.7	48.8	6.10	9.20	20.2	17	11.3	28.9
Cobalt	2.3 J	0.570 J	1.5 J	4.5 J	2.60 J	0.990 J	5.70 J	3.30 J	1.30 J	2.80 J
Copper	54.6	5.70	28.5	99.4	5.90	17.4	113	70	56.5	90.7
Cyanide	0.5 U	0.176 U	0.208 U	0.203	0.265 U	0.344	0.232 U	0.201 U	0.184 U	0.213 U

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J - Estimated
K - May be biased high
L - May be biased low
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U - Not detected

Table G-1
Surface Soil Analytical Results at Site 2
St. Juliens Creek Annex
Chesapeake, Virginia

Station ID	SJS02-SS10	SJS02-SS11	SJS02-SS12	SJS02-SS13	SJS02-SS14	SJS02-SS15	SJS02-SS16		SJS02-SS17	SJS02-SS18
Sample ID	SJS02-SS10-000	SJS02-SS11-000	SJS02-SS12-000	SJS02-SS13-000	SJS02-SS14-000	SJS02-SS15-000	SJS02-SS16-000	SJS02-SS16-000P	SJS02-SS17-000	SJS02-SS18-000
Sample Date	06/25/97	04/21/99	04/21/99	04/21/99	04/21/99	04/21/99	04/21/99	04/21/99	04/21/99	04/21/99
Chemical Name										
Iron	6,060	2,600	4,000	16,200	5,740	3,750	11,700	10,000	5,580	8,910
Lead	84.6	17.9	305	203	13.1	60.2	282	239	87.9	159
Magnesium	470 J	331 J	229 J	1,040	751 J	563 J	1,630	1,440	980	498 J
Manganese	42.6 K	53.4	36.3	157	353	45.8	126	107	83.7	91.1
Mercury	0.36 L	0.01000 U	0.0800	0.110	0.0400	0.0800	0.700	0.710	0.130	0.0800
Nickel	5 J	0.890 J	10.6	32.6	5 J	7 J	32.7	11	7.20	16.3
Potassium	391 J	265 J	216 J	488 J	498 J	370 J	855 J	831 J	506 J	333 J
Selenium	0.55 U	0.520 UL	0.760 L	0.540 L	0.550 UL	0.900 L	0.580 UL	0.720 L	0.590 L	0.560 UL
Silver	0.64 B	0.180 U	0.170 U	0.180 U	0.190 U	0.190 U	2.5	3.5	0.150 U	0.190 U
Sodium	59.8 B	29.4 U	28.3 U	126 J	83.3 J	31.5 U	157 J	92.3 J	54.7 J	58.6 J
Thallium	0.94 J	0.640 U	0.610 U	0.640 U	0.670 U	0.680 U	0.710 U	0.700 U	0.540 U	0.690 U
Vanadium	19.9	3.80 J	57.4	25.7	7.80 J	23.3	27.5	25.5	18.7	24.7
Zinc	164	36.3	273	626	31.7	76.1	508	257	126	445
Wet Chemistry										
% Solids	NA	95.9	81.7	88.4	85.9	83.3	80.5	81.7	84.9	93.1
Phosphorus (MG/KG)	18.6	3.36 UL	2.99 UL	2.26 UL	3.88 UL	2.73 UL	2.26 UL	3.60 UL	2.40 UL	2.62 UL
pH	NA	8.35	5.40	6.67	7.91	5.74	7.99	7.98	6.49	6.38

Shaded cells indicate analyte detections

B - Not detected above associated blank
J - Estimated
K - May be biased high
L - May be biased low
NA - Not Analyzed
U - Not detected

Table G-1
Surface Soil Analytical Results at Site 2
St. Juliens Creek Annex
Chesapeake, Virginia

Station ID	SJS02-SS19	SJS02-SS20
Sample ID	SJS02-SS19-000	SJS02-SS20-000
Sample Date	04/21/99	04/21/99
Chemical Name		
Volatile Organic Compounds (UG/KG)		
1,1,1-Trichloroethane	11 U	10 U
1,1,2,2-Tetrachloroethane	11 U	10 U
1,1,2-Trichloroethane	11 U	10 U
1,1-Dichloroethane	11 U	10 U
1,1-Dichloroethene	11 U	10 U
1,2-Dichloroethane	11 U	10 U
1,2-Dichloroethene (total)	11 U	10 U
1,2-Dichloropropane	11 U	10 U
2-Butanone	11 U	10 U
2-Hexanone	11 U	10 U
4-Methyl-2-pentanone	11 U	10 U
Acetone	11 U	10 U
Benzene	11 U	10 U
Bromodichloromethane	11 U	10 U
Bromoform	11 U	10 U
Bromomethane	11 U	10 U
Carbon disulfide	11 U	10 U
Carbon tetrachloride	11 U	10 U
Chlorobenzene	11 U	10 U
Chloroethane	11 U	10 U
Chloroform	11 U	10 U
Chloromethane	11 U	10 U
Dibromochloromethane	11 U	10 U
Ethylbenzene	11 U	10 U
Methylene chloride	6 B	5 B
Styrene	11 U	10 U
Tetrachloroethene	11 U	10 U
Toluene	11 U	10 U
Trichloroethene	11 U	10 U
Vinyl chloride	11 U	10 U
Xylene, total	11 U	10 U
cis-1,3-Dichloropropene	11 U	10 U
trans-1,3-Dichloropropene	11 U	10 U
Semi-volatile Organic Compounds (UG/KG)		
1,2,4-Trichlorobenzene	380 UJ	410 UJ
1,2-Dichlorobenzene	380 UJ	410 UJ
1,3-Dichlorobenzene	380 UJ	410 UJ

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NA - Not Analyzed
U - Not detected

Table G-1
Surface Soil Analytical Results at Site 2
St. Juliens Creek Annex
Chesapeake, Virginia

Station ID	SJS02-SS19	SJS02-SS20
Sample ID	SJS02-SS19-000	SJS02-SS20-000
Sample Date	04/21/99	04/21/99
Chemical Name		
1,4-Dichlorobenzene	380 UJ	410 UJ
2,2'-Oxybis(1-chloropropane)	380 UJ	410 UJ
2,4,5-Trichlorophenol	950 UJ	1,000 UJ
2,4,6-Trichlorophenol	380 UJ	410 UJ
2,4-Dichlorophenol	380 UJ	410 UJ
2,4-Dimethylphenol	380 UJ	410 UJ
2,4-Dinitrophenol	950 UJ	1,000 UJ
2,4-Dinitrotoluene	380 UJ	410 UJ
2,6-Dinitrotoluene	380 UJ	410 UJ
2-Chloronaphthalene	380 UJ	410 UJ
2-Chlorophenol	380 UJ	410 UJ
2-Methylnaphthalene	380 UJ	410 UJ
2-Methylphenol	380 UJ	410 UJ
2-Nitroaniline	950 UJ	1,000 UJ
2-Nitrophenol	380 UJ	410 UJ
3,3'-Dichlorobenzidine	380 UJ	410 UJ
3-Nitroaniline	950 UJ	1,000 UJ
4,6-Dinitro-2-methylphenol	950 UJ	1,000 UJ
4-Bromophenyl-phenylether	380 UJ	410 UJ
4-Chloro-3-methylphenol	380 UJ	410 UJ
4-Chloroaniline	380 UJ	410 UJ
4-Chlorophenyl-phenylether	380 UJ	410 UJ
4-Methylphenol	380 UJ	410 UJ
4-Nitroaniline	950 UJ	1,000 UJ
4-Nitrophenol	950 UJ	1,000 UJ
Acenaphthene	380 UJ	410 UJ
Acenaphthylene	380 UJ	74 J
Anthracene	380 UJ	52 J
Benzo(a)anthracene	380 UJ	360 J
Benzo(a)pyrene	380 UJ	380 J
Benzo(b)fluoranthene	57 J	590 J
Benzo(g,h,i)perylene	380 UJ	340 J
Benzo(k)fluoranthene	380 UJ	200 J
Butylbenzylphthalate	380 UJ	410 UJ
Carbazole	380 UJ	410 UJ
Chrysene	380 UJ	390 J
Di-n-butylphthalate	380 UJ	510 J
Di-n-octylphthalate	380 UJ	410 UJ
Dibenz(a,h)anthracene	380 UJ	410 UJ
Dibenzofuran	380 UJ	410 UJ

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Table G-1
Surface Soil Analytical Results at Site 2
St. Juliens Creek Annex
Chesapeake, Virginia

Station ID	SJS02-SS19	SJS02-SS20
Sample ID	SJS02-SS19-000	SJS02-SS20-000
Sample Date	04/21/99	04/21/99
Chemical Name		
Diethylphthalate	380 UJ	410 UJ
Dimethyl phthalate	380 UJ	410 UJ
Fluoranthene	45 J	510 J
Fluorene	380 UJ	410 UJ
Hexachlorobenzene	380 UJ	410 UJ
Hexachlorobutadiene	380 UJ	410 UJ
Hexachlorocyclopentadiene	380 UJ	410 UJ
Hexachloroethane	380 UJ	410 UJ
Indeno(1,2,3-cd)pyrene	380 UJ	290 J
Isophorone	380 UJ	410 UJ
Naphthalene	380 UJ	410 UJ
Nitrobenzene	380 UJ	410 UJ
Pentachlorophenol	950 UJ	1,000 UJ
Phenanthrene	380 UJ	180 J
Phenol	380 UJ	410 UJ
Pyrene	48 J	740 J
bis(2-Chloroethoxy)methane	380 UJ	410 UJ
bis(2-Chloroethyl)ether	380 UJ	410 UJ
bis(2-Ethylhexyl)phthalate	380 UJ	70 J
n-Nitroso-di-n-propylamine	380 UJ	410 UJ
n-Nitrosodiphenylamine	380 UJ	410 UJ
Pesticide/Polychlorinated Biphenyls (UG/KG)		
4,4'-DDD	3.80 UJ	4.10 UJ
4,4'-DDE	560 J	7,200 J
4,4'-DDT	230 J	12,000 J
Aldrin	1.90 UJ	2 UJ
Aroclor-1016	38 UJ	41 UJ
Aroclor-1221	76 UJ	82 UJ
Aroclor-1232	38 UJ	41 UJ
Aroclor-1242	38 UJ	41 UJ
Aroclor-1248	38 UJ	41 UJ
Aroclor-1254	38 UJ	41 UJ
Aroclor-1260	38 UJ	41 UJ
Dieldrin	3.80 UJ	4.10 UJ
Endosulfan I	1.90 UJ	2 UJ
Endosulfan II	3.80 UJ	4.10 UJ
Endosulfan sulfate	3.80 UJ	4.10 UJ
Endrin	3.80 UJ	4.10 UJ
Endrin aldehyde	3.80 UJ	4.10 UJ

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Table G-1
Surface Soil Analytical Results at Site 2
St. Juliens Creek Annex
Chesapeake, Virginia

Station ID	SJS02-SS19	SJS02-SS20
Sample ID	SJS02-SS19-000	SJS02-SS20-000
Sample Date	04/21/99	04/21/99
Chemical Name		
Endrin ketone	3.80 UJ	4.10 UJ
Heptachlor	1.90 UJ	2 UJ
Heptachlor epoxide	1.90 UJ	2 UJ
Methoxychlor	19 UJ	20 UJ
Toxaphene	190 UJ	200 UJ
alpha-BHC	1.90 UJ	2 UJ
alpha-Chlordane	1.90 UJ	13 J
beta-BHC	1.90 UJ	2 UJ
delta-BHC	1.90 UJ	2 UJ
gamma-BHC (Lindane)	1.90 UJ	2 UJ
gamma-Chlordane	1.90 UJ	8.90 J
Nitramines (UG/KG)		
1,3,5-Trinitrobenzene	238 U	250 U
1,3-Dinitrobenzene	238 U	250 U
2,4,6-Trinitrotoluene	238 U	250 U
2,4-Dinitrotoluene	238 U	250 U
2,6-Dinitrotoluene	238 U	250 U
2-Amino-4,6-dinitrotoluene	238 U	250 U
2-Nitrotoluene	477 U	500 U
3-Nitrotoluene	477 U	500 U
4-Amino-2,6-dinitrotoluene	238 U	250 U
4-Nitrotoluene	477 U	500 U
HMX	477 U	500 U
Nitrobenzene	238 U	250 U
RDX	477 U	500 U
Tetryl	477 U	500 U
Total Metals (MG/KG)		
Aluminum	4,620	8,710
Antimony	0.580 U	2.40 J
Arsenic	2.90	9.70
Barium	27.6 J	469
Beryllium	0.150 J	0.480 J
Cadmium	0.180 J	3.10
Calcium	808 J	1,430
Chromium	6	139
Cobalt	0.550 J	9 J
Copper	7.10	87.2
Cyanide	0.186 U	0.25 U

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Table G-1
Surface Soil Analytical Results at Site 2
St. Juliens Creek Annex
Chesapeake, Virginia

Station ID	SJS02-SS19	SJS02-SS20
Sample ID	SJS02-SS19-000	SJS02-SS20-000
Sample Date	04/21/99	04/21/99
Chemical Name		
Iron	2,800	15,000
Lead	24.4	793
Magnesium	274 J	606 J
Manganese	34.8	274
Mercury	0.0500	0.240
Nickel	3.60 J	31.2
Potassium	236 J	360 J
Selenium	0.560 UL	0.75 L
Silver	0.190 U	0.200 J
Sodium	31.9 U	147 J
Thallium	0.690 U	0.690 U
Vanadium	16.9	138
Zinc	45.9	1,020
Wet Chemistry		
% Solids	87.5	81.9
Phosphorus (MG/KG)	2.60 UL	2.39 UL
pH	6.37	6.03

Shaded cells indicate analyte detections

B - Not detected above associated blank
J - Estimated
K - May be biased high
L - May be biased low
NA - Not Analyzed
U - Not detected

Table G-2
Subsurface Soil Analytical Results at Site 2
St. Juliens Creek Annex
Chesapeake, Virginia

Station ID	SJS02-SB01	SJS02-SB02	SJS02-SB03	SJS02-SB04		SJS02-SB05	SJS02-SB06	SJS02-SB07	SJS02-SB08	SJS02-SB09	SJS02-SB10	SJS02
Sample ID	SJS02-SB01-003	SJS02-SB02-002	SJS02-SB03-000	SJS02-SB04-004	SJS02-SB04-004P	SJS02-SB05-002	SJS02-SB06-001	SJS02-SB07-001	SJS02-SB08-001	SJS02-SB09-001	SJS02-SB10-001	SJS02-SB11-001
Sample Date	06/25/97	06/25/97	06/25/97	06/25/97	06/25/97	06/25/97	04/21/99	04/21/99	04/21/99	04/21/99	04/21/99	04/21/99
Chemical Name												
Volatile Organic Compounds (UG/KG)												
1,1,1-Trichloroethane	14 U	11 U	11 U	16 U	12 U	11 U	11 U	12 UJ	11 UJ	12 U	11 U	12 U
1,1,2,2-Tetrachloroethane	14 U	11 U	11 U	16 U	12 U	11 U	11 U	12 UJ	11 UJ	12 U	11 U	12 U
1,1,2-Trichloroethane	14 U	11 U	11 U	16 U	12 U	11 U	11 U	12 UJ	11 UJ	12 U	11 U	12 U
1,1-Dichloroethane	14 U	11 U	11 U	16 U	12 U	11 U	11 U	12 UJ	11 UJ	12 U	11 U	12 U
1,1-Dichloroethene	14 U	11 U	11 U	16 U	12 U	11 U	11 U	12 UJ	11 UJ	12 U	11 U	12 U
1,2-Dichloroethane	14 U	11 U	11 U	16 U	12 U	11 U	11 U	12 UJ	11 UJ	12 U	11 U	12 U
1,2-Dichloroethene (total)	14 U	11 U	11 U	16 U	12 U	11 U	11 U	12 UJ	11 UJ	12 U	11 U	12 U
1,2-Dichloropropane	14 U	11 U	11 U	16 U	12 U	11 U	11 U	12 UJ	11 UJ	12 U	11 U	12 U
2-Butanone	14 U	11 U	11 U	43 J	31 J	11 U	14	12 UJ	11 UJ	12 U	11 U	12 U
2-Hexanone	14 U	11 U	11 U	16 U	12 U	11 U	11 U	12 UJ	11 UJ	12 U	11 U	12 U
4-Methyl-2-pentanone	14 U	11 U	11 U	16 U	12 U	11 U	11 U	12 UJ	11 UJ	12 U	11 U	12 U
Acetone	28 B	11 U	6 J	210	160	6 B	11 U	12 UJ	11 UJ	12 U	11 U	12 U
Benzene	14 U	11 U	11 U	16 U	12 U	11 U	11 U	12 UJ	11 UJ	12 U	11 U	12 U
Bromodichloromethane	14 U	11 U	11 U	16 U	12 U	11 U	11 U	12 UJ	11 UJ	12 U	11 U	12 U
Bromoform	14 U	11 U	11 U	16 U	12 U	11 U	11 U	12 UJ	11 UJ	12 U	11 U	12 U
Bromomethane	14 U	11 U	11 U	16 U	12 U	11 U	11 U	12 UJ	11 UJ	12 U	11 U	12 U
Carbon disulfide	14 U	11 U	11 U	16 U	12 U	11 U	11 U	33	11 UJ	12 U	11 U	12 U
Carbon tetrachloride	14 U	11 U	11 U	16 U	12 U	11 U	11 U	12 UJ	11 UJ	12 U	11 U	12 U
Chlorobenzene	14 U	11 U	11 U	16 U	12 U	11 U	11 U	12 UJ	11 UJ	12 U	11 U	12 U
Chloroethane	14 U	11 U	11 U	16 U	12 U	11 U	11 U	12 UJ	11 UJ	12 U	11 U	12 U
Chloroform	14 U	11 U	11 U	16 U	12 U	11 U	1 B	12 UJ	11 UJ	12 U	11 U	12 U
Chloromethane	14 U	11 U	11 U	16 U	12 U	11 U	11 U	12 UJ	11 UJ	12 U	11 U	12 U
Dibromochloromethane	14 U	11 U	11 U	16 U	12 U	11 U	11 U	12 UJ	11 UJ	12 U	11 U	12 U
Ethylbenzene	14 U	11 U	11 U	16 U	12 U	11 U	11 U	12 UJ	11 UJ	12 U	11 U	12 U
Methylene chloride	43 B	10 B	7 B	12 B	6 B	4 B	18 B	10 B	9 B	10 B	11 B	6 B
Styrene	14 U	11 U	11 U	16 U	12 U	11 U	11 U	12 UJ	11 UJ	12 U	11 U	12 U
Tetrachloroethene	14 U	11 U	11 U	16 U	12 U	11 U	11 U	12 UJ	11 UJ	12 U	11 U	12 U
Toluene	14 U	11 U	11 U	16 U	12 U	11 U	11 U	12 UJ	11 UJ	12 U	11 U	12 U
Trichloroethene	14 U	11 U	11 U	16 U	12 U	11 U	12	12 UJ	11 UJ	12 U	11 U	12 U
Vinyl chloride	14 U	11 U	11 U	16 U	12 U	11 U	11 U	12 UJ	11 UJ	12 U	11 U	12 U
Xylene, total	14 U	11 U	11 U	16 U	12 U	11 U	11 U	12 UJ	11 UJ	12 U	11 U	12 U
cis-1,3-Dichloropropene	14 U	11 U	11 U	16 U	12 U	11 U	11 U	12 UJ	11 UJ	12 U	11 U	12 U
trans-1,3-Dichloropropene	14 U	11 U	11 U	16 U	12 U	11 U	11 U	12 UJ	11 UJ	12 U	11 U	12 U
Semi-volatile Organic Compounds (UG/KG)												
1,2,4-Trichlorobenzene	460 U	360 U	350 U	370 U	370 U	350 U	380 UJ	390 UJ	380 UJ	390 UJ	380 UJ	410 UJ
1,2-Dichlorobenzene	460 U	360 U	350 U	370 U	370 U	350 U	380 UJ	390 UJ	380 UJ	390 UJ	380 UJ	410 UJ
1,3-Dichlorobenzene	460 U	360 U	350 U	370 U	370 U	350 U	380 UJ	390 UJ	380 UJ	390 UJ	380 UJ	410 UJ
1,4-Dichlorobenzene	460 U	360 U	350 U	370 U	370 U	350 U	380 UJ	390 UJ	380 UJ	390 UJ	380 UJ	410 UJ
2,2'-Oxybis(1-chloropropane)	460 U	360 U	350 U	370 U	370 U	350 U	380 UJ	390 UJ	380 UJ	390 UJ	380 UJ	410 UJ
2,4,5-Trichlorophenol	1,100 U	900 U	870 U	930 U	920 U	880 U	950 UJ	980 UJ	950 UJ	970 UJ	960 UJ	1,000 UJ
2,4,6-Trichlorophenol	460 U	360 U	350 U	370 U	370 U	350 U	380 UJ	390 UJ	380 UJ	390 UJ	380 UJ	410 UJ

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Table G-2
Subsurface Soil Analytical Results at Site 2
St. Juliens Creek Annex
Chesapeake, Virginia

Station ID	SJS02-SB01	SJS02-SB02	SJS02-SB03	SJS02-SB04		SJS02-SB05	SJS02-SB06	SJS02-SB07	SJS02-SB08	SJS02-SB09	SJS02-SB10	SJS0
Sample ID	SJS02-SB01-003	SJS02-SB02-002	SJS02-SB03-000	SJS02-SB04-004	SJS02-SB04-004P	SJS02-SB05-002	SJS02-SB06-001	SJS02-SB07-001	SJS02-SB08-001	SJS02-SB09-001	SJS02-SB10-001	SJS02-SB11-001
Sample Date	06/25/97	06/25/97	06/25/97	06/25/97	06/25/97	06/25/97	04/21/99	04/21/99	04/21/99	04/21/99	04/21/99	04/21/99
Chemical Name												
2,4-Dichlorophenol	460 U	360 U	350 U	370 U	370 U	350 U	380 UJ	390 UJ	380 UJ	390 UJ	380 UJ	410 UJ
2,4-Dimethylphenol	460 U	360 U	350 U	370 U	370 U	350 U	380 UJ	390 UJ	380 UJ	390 UJ	380 UJ	410 UJ
2,4-Dinitrophenol	1,100 U	900 U	870 U	930 U	920 U	880 U	950 UJ	980 UJ	950 UJ	970 UJ	960 UJ	1,000 UJ
2,4-Dinitrotoluene	460 U	360 U	350 U	370 U	370 U	350 U	380 UJ	390 UJ	380 UJ	390 UJ	380 UJ	410 UJ
2,6-Dinitrotoluene	460 U	360 U	350 U	370 U	370 U	350 U	380 UJ	390 UJ	380 UJ	390 UJ	380 UJ	410 UJ
2-Chloronaphthalene	460 U	360 U	350 U	370 U	370 U	350 U	380 UJ	390 UJ	380 UJ	390 UJ	380 UJ	410 UJ
2-Chlorophenol	460 U	360 U	350 U	370 U	370 U	350 U	380 UJ	390 UJ	380 UJ	390 UJ	380 UJ	410 UJ
2-Methylnaphthalene	460 U	360 U	350 U	370 U	370 U	350 U	380 UJ	390 UJ	380 UJ	390 UJ	380 UJ	410 UJ
2-Methylphenol	460 U	360 U	350 U	370 U	370 U	350 U	380 UJ	390 UJ	380 UJ	390 UJ	380 UJ	410 UJ
2-Nitroaniline	1,100 U	900 U	870 U	930 U	920 U	880 U	950 UJ	980 UJ	950 UJ	970 UJ	960 UJ	1,000 UJ
2-Nitrophenol	460 U	360 U	350 U	370 U	370 U	350 U	380 UJ	390 UJ	380 UJ	390 UJ	380 UJ	410 UJ
3,3'-Dichlorobenzidine	460 U	360 U	350 U	370 U	370 U	350 U	380 UJ	390 UJ	380 UJ	390 UJ	380 UJ	410 UJ
3-Nitroaniline	1,100 U	900 U	870 U	930 UJ	920 U	880 UJ	950 UJ	980 UJ	950 UJ	970 UJ	960 UJ	1,000 UJ
4,6-Dinitro-2-methylphenol	1,100 U	900 U	870 U	930 U	920 U	880 U	950 UJ	980 UJ	950 UJ	970 UJ	960 UJ	1,000 UJ
4-Bromophenyl-phenylether	460 U	360 U	350 U	370 U	370 U	350 U	380 UJ	390 UJ	380 UJ	390 UJ	380 UJ	410 UJ
4-Chloro-3-methylphenol	460 U	360 U	350 U	370 U	370 U	350 U	380 UJ	390 UJ	380 UJ	390 UJ	380 UJ	410 UJ
4-Chloroaniline	460 U	360 U	350 U	370 U	370 U	350 U	380 UJ	390 UJ	380 UJ	390 UJ	380 UJ	410 UJ
4-Chlorophenyl-phenylether	460 U	360 U	350 U	370 U	370 U	350 U	380 UJ	390 UJ	380 UJ	390 UJ	380 UJ	410 UJ
4-Methylphenol	460 U	360 U	350 U	370 U	370 U	350 U	380 UJ	390 UJ	380 UJ	390 UJ	380 UJ	410 UJ
4-Nitroaniline	1,100 U	900 U	870 U	930 U	920 U	880 U	950 UJ	980 UJ	950 UJ	970 UJ	960 UJ	1,000 UJ
4-Nitrophenol	1,100 U	900 U	870 U	930 U	920 U	880 U	950 UJ	980 UJ	950 UJ	970 UJ	960 UJ	1,000 UJ
Acenaphthene	460 U	360 U	350 U	370 U	370 U	350 U	380 UJ	390 UJ	380 UJ	390 UJ	380 UJ	410 UJ
Acenaphthylene	460 U	360 U	350 U	370 U	370 U	350 U	380 UJ	390 UJ	380 UJ	390 UJ	380 UJ	150 J
Anthracene	460 U	360 U	45 J	370 U	370 U	350 U	380 UJ	390 UJ	380 UJ	390 UJ	380 UJ	62 J
Benzo(a)anthracene	460 U	360 U	290 J	370 U	370 U	350 U	380 UJ	390 UJ	380 UJ	390 UJ	380 UJ	370 J
Benzo(a)pyrene	460 U	360 U	290 J	370 U	370 U	350 U	380 UJ	48 J	380 UJ	390 UJ	380 UJ	220 J
Benzo(b)fluoranthene	460 U	360 U	530	370 U	370 U	350 U	380 UJ	88 J	380 UJ	390 UJ	48 J	1,100 J
Benzo(g,h,i)perylene	460 U	360 U	170 J	370 U	370 U	350 U	380 UJ	390 UJ	380 UJ	390 UJ	380 UJ	580 J
Benzo(k)fluoranthene	460 U	360 U	210 J	370 U	370 U	350 U	380 UJ	390 UJ	380 UJ	390 UJ	380 UJ	280 J
Butylbenzylphthalate	460 U	360 U	350 U	370 U	370 U	350 U	380 UJ	390 UJ	380 UJ	390 UJ	380 UJ	410 UJ
Carbazole	460 U	360 U	350 U	370 U	370 U	350 U	380 UJ	390 UJ	380 UJ	390 UJ	380 UJ	410 UJ
Chrysene	460 U	360 U	360	370 U	370 U	350 U	380 UJ	65 J	380 UJ	390 UJ	380 UJ	450 J
Di-n-butylphthalate	460 U	360 U	350 U	370 U	370 U	350 U	380 UJ	390 UJ	380 UJ	390 UJ	380 UJ	410 UJ
Di-n-octylphthalate	460 U	360 U	350 U	370 U	370 U	350 U	380 UJ	390 UJ	380 UJ	390 UJ	380 UJ	410 UJ
Dibenz(a,h)anthracene	460 U	360 U	55 J	370 U	370 U	350 U	380 UJ	390 UJ	380 UJ	390 UJ	380 UJ	120 J
Dibenzofuran	460 U	360 U	350 U	370 U	370 U	350 U	380 UJ	390 UJ	380 UJ	390 UJ	380 UJ	410 UJ
Diethylphthalate	460 U	360 U	350 U	370 U	370 U	350 U	380 UJ	390 UJ	380 UJ	390 UJ	380 UJ	410 UJ
Dimethyl phthalate	460 U	360 U	350 U	370 U	370 U	350 U	380 UJ	390 UJ	380 UJ	390 UJ	380 UJ	410 UJ
Fluoranthene	460 U	360 U	640	370 U	51 J	350 U	380 UJ	390 UJ	380 UJ	390 UJ	52 J	570 J
Fluorene	460 U	360 U	350 U	370 U	370 U	350 U	380 UJ	390 UJ	380 UJ	390 UJ	380 UJ	410 UJ
Hexachlorobenzene	460 U	360 U	350 U	370 U	370 U	350 U	380 UJ	390 UJ	380 UJ	390 UJ	380 UJ	410 UJ
Hexachlorobutadiene	460 U	360 U	350 U	370 U	370 U	350 U	380 UJ	390 UJ	380 UJ	390 UJ	380 UJ	410 UJ
Hexachlorocyclopentadiene	460 U	360 U	350 U	370 U	370 U	350 U	380 UJ	390 UJ	380 UJ	390 UJ	380 UJ	410 UJ
Hexachloroethane	460 U	360 U	350 U	370 U	370 U	350 U	380 UJ	390 UJ	380 UJ	390 UJ	380 UJ	410 UJ

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St. Juliens Creek Annex
Chesapeake, Virginia

Station ID	SJS02-SB01	SJS02-SB02	SJS02-SB03	SJS02-SB04		SJS02-SB05	SJS02-SB06	SJS02-SB07	SJS02-SB08	SJS02-SB09	SJS02-SB10	SJS02
Sample ID	SJS02-SB01-003	SJS02-SB02-002	SJS02-SB03-000	SJS02-SB04-004	SJS02-SB04-004P	SJS02-SB05-002	SJS02-SB06-001	SJS02-SB07-001	SJS02-SB08-001	SJS02-SB09-001	SJS02-SB10-001	SJS02-SB11-001
Sample Date	06/25/97	06/25/97	06/25/97	06/25/97	06/25/97	06/25/97	04/21/99	04/21/99	04/21/99	04/21/99	04/21/99	04/21/99
Chemical Name												
Indeno(1,2,3-cd)pyrene	460 U	360 U	200 J	370 U	370 U	350 U	380 UJ	390 UJ	380 UJ	390 UJ	380 UJ	440 J
Isophorone	460 U	360 U	350 U	370 U	370 U	350 U	380 UJ	390 UJ	380 UJ	390 UJ	380 UJ	410 UJ
Naphthalene	460 U	360 U	350 U	370 U	370 U	350 U	380 UJ	390 UJ	380 UJ	390 UJ	380 UJ	410 UJ
Nitrobenzene	460 U	360 U	350 U	370 U	370 U	350 U	380 UJ	390 UJ	380 UJ	390 UJ	380 UJ	410 UJ
Pentachlorophenol	1,100 U	900 U	870 U	930 U	920 U	880 U	950 UJ	980 UJ	950 UJ	970 UJ	960 UJ	1,000 UJ
Phenanthrene	460 U	360 U	410	370 U	38 J	350 U	380 UJ	390 UJ	380 UJ	390 UJ	380 UJ	150 J
Phenol	460 U	360 U	350 U	370 U	370 U	350 U	380 UJ	390 UJ	380 UJ	390 UJ	380 UJ	410 UJ
Pyrene	460 U	360 U	590	370 U	67 J	350 U	380 UJ	390 UJ	380 UJ	390 UJ	63 J	720 J
bis(2-Chloroethoxy)methane	460 U	360 U	350 U	370 U	370 U	350 U	380 UJ	390 UJ	380 UJ	390 UJ	380 UJ	410 UJ
bis(2-Chloroethyl)ether	460 U	360 U	350 U	370 U	370 U	350 U	380 UJ	390 UJ	380 UJ	390 UJ	380 UJ	410 UJ
bis(2-Ethylhexyl)phthalate	94 B	39	49 J	91 B	53 B	39 B	380 UJ	390 UJ	380 UJ	390 UJ	380 UJ	410 UJ
n-Nitroso-di-n-propylamine	460 U	360 U	350 U	370 U	370 U	350 U	380 UJ	390 UJ	380 UJ	390 UJ	380 UJ	410 UJ
n-Nitrosodiphenylamine	460 U	360 U	350 U	370 U	370 U	350 U	380 UJ	390 UJ	380 UJ	390 UJ	380 UJ	410 UJ
Pesticide/Polychlorinated Biphenyls (UG/KG)												
4,4'-DDD	3 J	22	5.6	83	62	3.5 U	3.80 UJ	3.90 UJ	2,100 J	1 J	7.10 J	38 J
4,4'-DDE	32	40	110	33 J	26	31	0.440 J	6.90 J	4,600 J	26 J	46 J	4 UJ
4,4'-DDT	4.4 J	6.3	20 J	6.9 J	4.8 J	36 J	0.690 J	5.5 J	290,000 J	48 J	27 J	18 J
Aldrin	2.3 U	1.9 U	1.8 U	3.9 U	3.8 U	1.8 U	1.90 UJ	1.90 UJ	1.90 UJ	1.90 UJ	1.90 UJ	2 UJ
Aroclor-1016	46 U	36 U	35 U	75 U	73 U	35 U	38 UJ	39 UJ	38 UJ	39 UJ	39 UJ	40 UJ
Aroclor-1221	92 U	74 U	71 U	150 U	150 U	71 U	75 UJ	78 UJ	75 UJ	77 UJ	77 UJ	81 UJ
Aroclor-1232	46 U	36 U	35 U	75 U	73 U	35 U	38 UJ	39 UJ	38 UJ	39 UJ	39 UJ	40 UJ
Aroclor-1242	46 U	36 U	35 U	75 U	73 U	35 U	38 UJ	39 UJ	38 UJ	39 UJ	39 UJ	40 UJ
Aroclor-1248	46 U	36 U	35 U	75 U	73 U	35 U	38 UJ	39 UJ	38 UJ	39 UJ	39 UJ	40 UJ
Aroclor-1254	46 U	36 U	35 U	75 U	73 U	35 U	38 UJ	39 UJ	38 UJ	39 UJ	39 UJ	40 UJ
Aroclor-1260	46 U	36 U	21 J	75 U	73 U	35 U	38 UJ	39 UJ	38 UJ	39 UJ	39 UJ	40 UJ
Dieldrin	4.6 U	3.6 U	3.5 U	7.5 U	7.3 U	3.5 U	0.840 J	3.90 UJ	3.80 UJ	3.90 UJ	3.90 UJ	4 UJ
Endosulfan I	2.3 U	1.9 U	1.8 U	3.9 U	3.8 U	1.8 U	1.90 UJ	1.90 UJ	1.90 UJ	1.90 UJ	1.90 UJ	2 UJ
Endosulfan II	4.6 U	3.6 U	3.5 U	7.5 U	7.3 U	3.5 U	3.80 UJ	3.90 UJ	3.80 UJ	3.90 UJ	3.90 UJ	4 UJ
Endosulfan sulfate	4.6 U	3.6 U	3.5 U	7.5 U	7.3 U	3.5 U	3.80 UJ	3.90 UJ	3.80 UJ	3.90 UJ	3.90 UJ	4 UJ
Endrin	4.6 U	3.6 U	3.5 U	7.5 U	7.3 U	3.5 U	3.80 UJ	3.90 UJ	3.80 UJ	3.90 UJ	3.90 UJ	4 UJ
Endrin aldehyde	4.6 U	3.6 U	3.5 U	7.5 U	7.3 U	3.5 U	3.80 UJ	3.90 UJ	3.80 UJ	3.90 UJ	3.90 UJ	4 UJ
Endrin ketone	4.6 U	3.6 U	3.5 U	7.5 U	7.3 U	3.5 U	3.80 UJ	3.90 UJ	3.80 UJ	3.90 UJ	3.90 UJ	4 UJ
Heptachlor	2.3 U	1.9 U	1.8 U	3.9 U	3.8 U	1.8 U	1.90 UJ	1.90 UJ	1.90 UJ	1.90 UJ	1.90 UJ	2 UJ
Heptachlor epoxide	2.3 U	1.9 U	1.8 U	3.9 U	3.8 U	1.8 U	1.90 UJ	1.90 UJ	1.90 UJ	1.90 UJ	1.90 UJ	2 UJ
Methoxychlor	23 U	19 U	18 U	39 U	38 U	18 U	19 UJ	19 UJ	19 UJ	19 UJ	19 UJ	20 UJ
Toxaphene	230 U	190 U	180 U	390 U	380 U	180 U	190 UJ	190 UJ	190 UJ	190 UJ	190 UJ	200 UJ
alpha-BHC	2.3 U	1.9 U	1.8 U	3.9 U	3.8 U	1.8 U	1.90 UJ	1.90 UJ	1.90 UJ	1.90 UJ	1.90 UJ	2 UJ
alpha-Chlordane	2.3 U	1.9 U	1.8 U	3.9 U	3.8 U	1.8 U	1.90 UJ	1.90 UJ	1.90 UJ	1.90 UJ	1.90 UJ	2 UJ
beta-BHC	2.3 U	1.9 U	1.8 U	3.9 U	3.8 U	1.8 U	1.90 UJ	1.90 UJ	1.90 UJ	1.90 UJ	1.90 UJ	2 UJ
delta-BHC	2.3 U	1.9 U	1.8 U	3.9 U	3.8 U	1.8 U	1.90 UJ	1.90 UJ	1.90 UJ	1.90 UJ	1.90 UJ	2 UJ
gamma-BHC (Lindane)	2.3 U	1.9 U	1.8 U	3.9 U	3.8 U	1.8 U	1.90 UJ	1.90 UJ	1.90 UJ	1.90 UJ	1.90 UJ	2 UJ
gamma-Chlordane	2.3 U	1.9 U	1.8 U	3.9 U	3.8 U	1.8 U	1.90 UJ	1.90 UJ	38 J	1.90 UJ	1.90 UJ	2 UJ

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Sample Date	06/25/97	06/25/97	06/25/97	06/25/97	06/25/97	06/25/97	04/21/99	04/21/99	04/21/99	04/21/99	04/21/99	04/21/99
Chemical Name												
Dioxin/Furans (UG/KG)												
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,6,7,8-Heptachlorodibenzofuran	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,7,8,9-Heptachlorodibenzofuran	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,7,8-Hexachlorodibenzofuran	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,6,7,8-Hexachlorodibenzofuran	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,7,8,9-Hexachlorodibenzofuran	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,7,8-Pentachlorodibenzofuran	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,3,4,6,7,8-Hexachlorodibenzofuran	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,3,4,7,8-Pentachlorodibenzofuran	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,3,7,8-TCDD (dioxin)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,3,7,8-Tetrachlorodibenzofuran	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total heptachlorodibenzo-p-dioxin	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total heptachlorodibenzofuran	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total hexachlorodibenzo-p-dioxin	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total hexachlorodibenzofuran	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total octachlorodibenzo-p-dioxin	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total octachlorodibenzofuran	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total pentachlorodibenzo-p-dioxin	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total pentachlorodibenzofuran	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total tetrachlorodibenzo-p-dioxin	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total tetrachlorodibenzofuran	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nitramines (UG/KG)												
1,3,5-Trinitrobenzene	NA	NA	NA	NA	NA	NA	250 U	250 U	250 U	250 U	250 U	250 U
1,3-Dinitrobenzene	NA	NA	NA	NA	NA	NA	250 U	250 U	250 U	250 U	250 U	250 U
2,4,6-Trinitrotoluene	NA	NA	NA	NA	NA	NA	250 U	250 U	250 U	250 U	250 U	250 U
2,4-Dinitrotoluene	NA	NA	NA	NA	NA	NA	250 U	250 U	250 U	250 U	250 U	250 U
2,6-Dinitrotoluene	NA	NA	NA	NA	NA	NA	250 U	250 U	250 U	250 U	250 U	250 U
2-Amino-4,6-dinitrotoluene	NA	NA	NA	NA	NA	NA	250 U	250 U	250 U	250 U	250 U	250 U
2-Nitrotoluene	NA	NA	NA	NA	NA	NA	500 U	500 U	500 U	500 U	500 U	500 U
3-Nitrotoluene	NA	NA	NA	NA	NA	NA	500 U	500 U	500 U	500 U	500 U	500 U
4-Amino-2,6-dinitrotoluene	NA	NA	NA	NA	NA	NA	250 U	250 U	250 U	250 U	250 U	250 U
4-Nitrotoluene	NA	NA	NA	NA	NA	NA	500 U	500 U	500 U	500 U	500 U	500 U
HMX	NA	NA	NA	NA	NA	NA	500 U	500 U	500 U	500 U	500 U	500 U
Nitrobenzene	NA	NA	NA	NA	NA	NA	250 U	250 U	250 U	250 U	250 U	250 U
RDX	NA	NA	NA	NA	NA	NA	500 U	500 U	500 U	500 U	500 U	500 U
Tetryl	NA	NA	NA	NA	NA	NA	500 U	500 U	500 U	500 U	500 U	500 U
Total Metals (MG/KG)												

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Table G-2
Subsurface Soil Analytical Results at Site 2
St. Juliens Creek Annex
Chesapeake, Virginia

Station ID	SJS02-SB01	SJS02-SB02	SJS02-SB03	SJS02-SB04		SJS02-SB05	SJS02-SB06	SJS02-SB07	SJS02-SB08	SJS02-SB09	SJS02-SB10	SJS0
Sample ID	SJS02-SB01-003	SJS02-SB02-002	SJS02-SB03-000	SJS02-SB04-004	SJS02-SB04-004P	SJS02-SB05-002	SJS02-SB06-001	SJS02-SB07-001	SJS02-SB08-001	SJS02-SB09-001	SJS02-SB10-001	SJS02-SB11-001
Sample Date	06/25/97	06/25/97	06/25/97	06/25/97	06/25/97	06/25/97	04/21/99	04/21/99	04/21/99	04/21/99	04/21/99	04/21/99
Chemical Name												
Aluminum	7,220	2,260	5,510	11,900	11,800	2,000	2,670	21,700	16,400	10,700	21,000	10,700
Antimony	0.37 U	NA	NA	0.63 J	0.43 J	0.33 U	0.600 UL	0.540 UL	0.450 UL	0.580 UL	0.560 UL	0.530 L
Arsenic	2.4	1.2 K	4.5 K	6.3	3.9	1.2 J	2 J	2.90	5.60	2.20	3	4.80
Barium	41.3	8.7 J	291	44.4 J	55.3	8.4 J	12.3 J	41.4	36	38.7 J	49.7	60.4
Beryllium	0.24 J	0.18 U	0.35 J	0.32 J	0.34 J	0.17 U	0.100 J	0.180 J	0.170 J	0.220 J	0.270 J	0.5 J
Cadmium	0.09 U	0.09 U	4.4	0.47 B	0.11 U	0.43 J	0.0700 U	0.0600 U	0.170 J	0.0600 U	0.0600 U	0.190 J
Calcium	2,540	569 J	1,720 J	2,970	2,050	346 B	269 J	332 J	1,100	2,270	1,720	4,500
Chromium	16.7	5.3	30.8	21.6	19.3	4.6	3.70	21.3	17.6	12	24.2	23.6
Cobalt	2.9 J	1.43 U	3.6 J	4 J	2.6 J	1.32 U	0.5 J	1.60 J	1.60 J	1.30 J	6.5 J	4.5 J
Copper	33.7	3.8 J	433	60.5	9.7	7.1	2.5 J	5.10	7.20	8.70	46.5	173
Cyanide	0.6 U	0.55 U	0.52 U	0.68 U	0.59 U	0.54 U	0.238 U	0.180 U	0.230 U	0.25 U	0.220 U	0.290
Iron	15,000	2,360	16,700	11,700	7,190	1,850	2,230	8,950	7,890	7,030	10,100	14,600
Lead	74.3	10.3	885	55.8	20.5	5.3	3.10	13	31.7	23.8	50.1	185
Magnesium	876 J	243 B	711 J	1,610	800 J	250 J	126 J	772 J	638 J	751 J	1,050	2,120
Manganese	114	11.9 K	134 K	70.7	28	8.2	5.90	13.1 L	22.1 L	67.9 L	39.8 L	129 L
Mercury	0.28	0.06 L	0.55 L	0.24	0.19	0.08 J	0.0200 U	0.0700	0.0400	0.0300 J	0.270	0.860
Nickel	20.9	1.25 U	31.8	9 J	8 J	1.9 J	1 J	5.90 J	6.70	5.40 J	9.30	12.8
Potassium	479 J	196 J	289 J	968 J	565 J	229 J	149 J	582 J	502 J	526 J	648 J	1,510
Selenium	0.55 U	0.54 U	0.57 U	0.75 U	0.63 U	0.5 U	0.580 U	0.520 U	0.530 J	0.560 U	0.640 J	0.440 U
Silver	1.1 B	0.18 U	0.9 B	1.5 B	1 B	0.87 B	0.200 U	0.180 U	0.150 U	0.190 U	0.190 U	0.150 U
Sodium	77.2 B	27.9 B	48.5 B	657 J	373 J	95 B	32.8 U	49.2 J	77.8 J	129 J	107 J	134 J
Thallium	0.5 J	0.36 U	1.1 J	0.5 U	0.42 U	0.33 U	0.710 U	0.640 U	0.530 U	0.690 U	0.660 U	0.540 U
Vanadium	24	6.5 J	27.5	20.5	21.5	5.3 J	6 J	29.5	26.6	17.8	29.8	31.3
Zinc	136	14.7 B	2,420	95.7	23.9 B	44.9	4.20 J	27.7 L	140 L	29.4 L	157 L	158 L
Wet Chemistry												
% Solids	NA	NA	NA	NA	NA	NA	88.4	85.1	88.4	86.4	87.1	82.2
Phosphorus (MG/KG)	4.5	19.9	11.6	7.6	2.8	4.1	3.23 UL	25.7	18.4	39	48.8	62.3
pH	NA	NA	NA	NA	NA	NA	7.71	5.34	6.80	7.94	7.72	8.15
Total Petroleum Hydrocarbons (MG/KG)												
TPH-diesel range	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TPH-gas range	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Shaded cells indicate analyte detections

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St. Juliens Creek Annex
Chesapeake, Virginia

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Sample ID	SJS02-SB11-001P	SJS02-SB12-001	SJS02-SB13-001	SJS02-SB14-001	SJS02-SB15-001	SJS02-SB17-001	SJS02-SB18-001	SJS02-SB19-001	SJS02-SB20-001
Sample Date	04/21/99	06/28/01	06/29/01	06/30/01	06/30/01	07/02/01	07/02/01	07/03/01	07/06/01
Chemical Name									
Volatile Organic Compounds (UG/KG)									
1,1,1-Trichloroethane	12 U	NA	NA	NA	NA	NA	NA	NA	NA
1,1,2,2-Tetrachloroethane	12 U	NA	NA	NA	NA	NA	NA	NA	NA
1,1,2-Trichloroethane	12 U	NA	NA	NA	NA	NA	NA	NA	NA
1,1-Dichloroethane	12 U	NA	NA	NA	NA	NA	NA	NA	NA
1,1-Dichloroethene	12 U	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloroethane	12 U	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloroethene (total)	12 U	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloropropane	12 U	NA	NA	NA	NA	NA	NA	NA	NA
2-Butanone	12 U	NA	NA	NA	NA	NA	NA	NA	NA
2-Hexanone	12 U	NA	NA	NA	NA	NA	NA	NA	NA
4-Methyl-2-pentanone	12 U	NA	NA	NA	NA	NA	NA	NA	NA
Acetone	12 U	NA	NA	NA	NA	NA	NA	NA	NA
Benzene	12 U	NA	NA	NA	NA	NA	NA	NA	NA
Bromodichloromethane	12 U	NA	NA	NA	NA	NA	NA	NA	NA
Bromoform	12 U	NA	NA	NA	NA	NA	NA	NA	NA
Bromomethane	12 U	NA	NA	NA	NA	NA	NA	NA	NA
Carbon disulfide	12 U	NA	NA	NA	NA	NA	NA	NA	NA
Carbon tetrachloride	12 U	NA	NA	NA	NA	NA	NA	NA	NA
Chlorobenzene	12 U	NA	NA	NA	NA	NA	NA	NA	NA
Chloroethane	12 U	NA	NA	NA	NA	NA	NA	NA	NA
Chloroform	12 U	NA	NA	NA	NA	NA	NA	NA	NA
Chloromethane	12 U	NA	NA	NA	NA	NA	NA	NA	NA
Dibromochloromethane	12 U	NA	NA	NA	NA	NA	NA	NA	NA
Ethylbenzene	12 U	NA	NA	NA	NA	NA	NA	NA	NA
Methylene chloride	6 B	NA	NA	NA	NA	NA	NA	NA	NA
Styrene	12 U	NA	NA	NA	NA	NA	NA	NA	NA
Tetrachloroethene	12 U	NA	NA	NA	NA	NA	NA	NA	NA
Toluene	12 U	NA	NA	NA	NA	NA	NA	NA	NA
Trichloroethene	12 U	NA	NA	NA	NA	NA	NA	NA	NA
Vinyl chloride	12 U	NA	NA	NA	NA	NA	NA	NA	NA
Xylene, total	12 U	NA	NA	NA	NA	NA	NA	NA	NA
cis-1,3-Dichloropropene	12 U	NA	NA	NA	NA	NA	NA	NA	NA
trans-1,3-Dichloropropene	12 U	NA	NA	NA	NA	NA	NA	NA	NA
Semi-volatile Organic Compounds (UG/KG)									
1,2,4-Trichlorobenzene	410 UJ	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichlorobenzene	410 UJ	NA	NA	NA	NA	NA	NA	NA	NA
1,3-Dichlorobenzene	410 UJ	NA	NA	NA	NA	NA	NA	NA	NA
1,4-Dichlorobenzene	410 UJ	NA	NA	NA	NA	NA	NA	NA	NA
2,2'-Oxybis(1-chloropropane)	410 UJ	NA	NA	NA	NA	NA	NA	NA	NA
2,4,5-Trichlorophenol	1,000 UJ	NA	NA	NA	NA	NA	NA	NA	NA
2,4,6-Trichlorophenol	410 UJ	NA	NA	NA	NA	NA	NA	NA	NA

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St. Juliens Creek Annex
Chesapeake, Virginia

Station ID	2-SB11	SJS02-SB12	SJS02-SB13	SJS02-SB14	SJS02-SB15	SJS02-SB17	SJS02-SB18	SJS02-SB19	SJS02-SB20
Sample ID	SJS02-SB11-001P	SJS02-SB12-001	SJS02-SB13-001	SJS02-SB14-001	SJS02-SB15-001	SJS02-SB17-001	SJS02-SB18-001	SJS02-SB19-001	SJS02-SB20-001
Sample Date	04/21/99	06/28/01	06/29/01	06/30/01	06/30/01	07/02/01	07/02/01	07/03/01	07/06/01
Chemical Name									
2,4-Dichlorophenol	410 UJ	NA	NA	NA	NA	NA	NA	NA	NA
2,4-Dimethylphenol	410 UJ	NA	NA	NA	NA	NA	NA	NA	NA
2,4-Dinitrophenol	1,000 UJ	NA	NA	NA	NA	NA	NA	NA	NA
2,4-Dinitrotoluene	410 UJ	NA	NA	NA	NA	NA	NA	NA	NA
2,6-Dinitrotoluene	410 UJ	NA	NA	NA	NA	NA	NA	NA	NA
2-Chloronaphthalene	410 UJ	NA	NA	NA	NA	NA	NA	NA	NA
2-Chlorophenol	410 UJ	NA	NA	NA	NA	NA	NA	NA	NA
2-Methylnaphthalene	410 UJ	NA	NA	NA	NA	NA	NA	NA	NA
2-Methylphenol	410 UJ	NA	NA	NA	NA	NA	NA	NA	NA
2-Nitroaniline	1,000 UJ	NA	NA	NA	NA	NA	NA	NA	NA
2-Nitrophenol	410 UJ	NA	NA	NA	NA	NA	NA	NA	NA
3,3'-Dichlorobenzidine	410 UJ	NA	NA	NA	NA	NA	NA	NA	NA
3-Nitroaniline	1,000 UJ	NA	NA	NA	NA	NA	NA	NA	NA
4,6-Dinitro-2-methylphenol	1,000 UJ	NA	NA	NA	NA	NA	NA	NA	NA
4-Bromophenyl-phenylether	410 UJ	NA	NA	NA	NA	NA	NA	NA	NA
4-Chloro-3-methylphenol	410 UJ	NA	NA	NA	NA	NA	NA	NA	NA
4-Chloroaniline	410 UJ	NA	NA	NA	NA	NA	NA	NA	NA
4-Chlorophenyl-phenylether	410 UJ	NA	NA	NA	NA	NA	NA	NA	NA
4-Methylphenol	410 UJ	NA	NA	NA	NA	NA	NA	NA	NA
4-Nitroaniline	1,000 UJ	NA	NA	NA	NA	NA	NA	NA	NA
4-Nitrophenol	1,000 UJ	NA	NA	NA	NA	NA	NA	NA	NA
Acenaphthene	410 UJ	NA	NA	NA	NA	NA	NA	NA	NA
Acenaphthylene	130 J	NA	NA	NA	NA	NA	NA	NA	NA
Anthracene	48 J	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)anthracene	410 J	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	270 J	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	900 J	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(g,h,i)perylene	560 J	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(k)fluoranthene	290 J	NA	NA	NA	NA	NA	NA	NA	NA
Butylbenzylphthalate	410 UJ	NA	NA	NA	NA	NA	NA	NA	NA
Carbazole	410 UJ	NA	NA	NA	NA	NA	NA	NA	NA
Chrysene	470 J	NA	NA	NA	NA	NA	NA	NA	NA
Di-n-butylphthalate	410 UJ	NA	NA	NA	NA	NA	NA	NA	NA
Di-n-octylphthalate	410 UJ	NA	NA	NA	NA	NA	NA	NA	NA
Dibenz(a,h)anthracene	130 J	NA	NA	NA	NA	NA	NA	NA	NA
Dibenzofuran	410 UJ	NA	NA	NA	NA	NA	NA	NA	NA
Diethylphthalate	410 UJ	NA	NA	NA	NA	NA	NA	NA	NA
Dimethyl phthalate	410 UJ	NA	NA	NA	NA	NA	NA	NA	NA
Fluoranthene	580 J	NA	NA	NA	NA	NA	NA	NA	NA
Fluorene	410 UJ	NA	NA	NA	NA	NA	NA	NA	NA
Hexachlorobenzene	410 UJ	NA	NA	NA	NA	NA	NA	NA	NA
Hexachlorobutadiene	410 UJ	NA	NA	NA	NA	NA	NA	NA	NA
Hexachlorocyclopentadiene	410 UJ	NA	NA	NA	NA	NA	NA	NA	NA
Hexachloroethane	410 UJ	NA	NA	NA	NA	NA	NA	NA	NA

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Station ID	2-SB11	SJS02-SB12	SJS02-SB13	SJS02-SB14	SJS02-SB15	SJS02-SB17	SJS02-SB18	SJS02-SB19	SJS02-SB20
Sample ID	SJS02-SB11-001P	SJS02-SB12-001	SJS02-SB13-001	SJS02-SB14-001	SJS02-SB15-001	SJS02-SB17-001	SJS02-SB18-001	SJS02-SB19-001	SJS02-SB20-001
Sample Date	04/21/99	06/28/01	06/29/01	06/30/01	06/30/01	07/02/01	07/02/01	07/03/01	07/06/01
Chemical Name									
Indeno(1,2,3-cd)pyrene	430 J	NA	NA	NA	NA	NA	NA	NA	NA
Isophorone	410 UJ	NA	NA	NA	NA	NA	NA	NA	NA
Naphthalene	410 UJ	NA	NA	NA	NA	NA	NA	NA	NA
Nitrobenzene	410 UJ	NA	NA	NA	NA	NA	NA	NA	NA
Pentachlorophenol	1,000 UJ	NA	NA	NA	NA	NA	NA	NA	NA
Phenanthrene	170 J	NA	NA	NA	NA	NA	NA	NA	NA
Phenol	410 UJ	NA	NA	NA	NA	NA	NA	NA	NA
Pyrene	760 J	NA	NA	NA	NA	NA	NA	NA	NA
bis(2-Chloroethoxy)methane	410 UJ	NA	NA	NA	NA	NA	NA	NA	NA
bis(2-Chloroethyl)ether	410 UJ	NA	NA	NA	NA	NA	NA	NA	NA
bis(2-Ethylhexyl)phthalate	410 UJ	NA	NA	NA	NA	NA	NA	NA	NA
n-Nitroso-di-n-propylamine	410 UJ	NA	NA	NA	NA	NA	NA	NA	NA
n-Nitrosodiphenylamine	410 UJ	NA	NA	NA	NA	NA	NA	NA	NA
Pesticide/Polychlorinated Biphenyls (UG/KG)									
4,4'-DDD	21 J	NA	NA	NA	NA	NA	NA	NA	NA
4,4'-DDE	6.20 J	NA	NA	NA	NA	NA	NA	NA	NA
4,4'-DDT	17 J	NA	NA	NA	NA	NA	NA	NA	NA
Aldrin	2 UJ	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1016	40 UJ	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1221	80 UJ	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1232	40 UJ	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1242	40 UJ	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1248	40 UJ	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1254	40 UJ	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1260	40 UJ	NA	NA	NA	NA	NA	NA	NA	NA
Dieldrin	4 UJ	NA	NA	NA	NA	NA	NA	NA	NA
Endosulfan I	2 UJ	NA	NA	NA	NA	NA	NA	NA	NA
Endosulfan II	4 UJ	NA	NA	NA	NA	NA	NA	NA	NA
Endosulfan sulfate	4 UJ	NA	NA	NA	NA	NA	NA	NA	NA
Endrin	4 UJ	NA	NA	NA	NA	NA	NA	NA	NA
Endrin aldehyde	4 UJ	NA	NA	NA	NA	NA	NA	NA	NA
Endrin ketone	4 UJ	NA	NA	NA	NA	NA	NA	NA	NA
Heptachlor	2 UJ	NA	NA	NA	NA	NA	NA	NA	NA
Heptachlor epoxide	2 UJ	NA	NA	NA	NA	NA	NA	NA	NA
Methoxychlor	20 UJ	NA	NA	NA	NA	NA	NA	NA	NA
Toxaphene	200 UJ	NA	NA	NA	NA	NA	NA	NA	NA
alpha-BHC	2 UJ	NA	NA	NA	NA	NA	NA	NA	NA
alpha-Chlordane	2 UJ	NA	NA	NA	NA	NA	NA	NA	NA
beta-BHC	2 UJ	NA	NA	NA	NA	NA	NA	NA	NA
delta-BHC	2 UJ	NA	NA	NA	NA	NA	NA	NA	NA
gamma-BHC (Lindane)	2 UJ	NA	NA	NA	NA	NA	NA	NA	NA
gamma-Chlordane	2 UJ	NA	NA	NA	NA	NA	NA	NA	NA

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Sample ID	SJS02-SB11-001P	SJS02-SB12-001	SJS02-SB13-001	SJS02-SB14-001	SJS02-SB15-001	SJS02-SB17-001	SJS02-SB18-001	SJS02-SB19-001	SJS02-SB20-001
Sample Date	04/21/99	06/28/01	06/29/01	06/30/01	06/30/01	07/02/01	07/02/01	07/03/01	07/06/01
Chemical Name									
Dioxin/Furans (UG/KG)									
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	NA	0.00795 J	NA	NA	0.118 J	0.0359 J	NA	0.0250 J	0.03 J
1,2,3,4,6,7,8-Heptachlorodibenzofuran	NA	1.02E-04 UJ	NA	NA	0.0435 J	0.00806 J	NA	0.00251 J	3.00E-04 NJ
1,2,3,4,7,8,9-Heptachlorodibenzofuran	NA	1.50E-04 UJ	NA	NA	0.00322 J	2.00E-04 UJ	NA	3.45E-04 UJ	6.40E-05 UJ
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	NA	1.46E-04 UJ	NA	NA	0.00202 J	6.06E-04 J	NA	2.35E-04 UJ	4.00E-04 NJ
1,2,3,4,7,8-Hexachlorodibenzofuran	NA	1.19E-04 UJ	NA	NA	0.0087 J	0.00127 J	NA	0.00112 J	5.30E-05 UJ
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	NA	1.27E-04 UJ	NA	NA	0.00449 J	0.00299 J	NA	7.11E-04 J	5.60E-04 J
1,2,3,6,7,8-Hexachlorodibenzofuran	NA	1.15E-04 UJ	NA	NA	0.00388 NJ	0.00161 I	NA	2.91E-04 UJ	5.10E-05 UJ
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	NA	6.23E-04 J	NA	NA	0.00534 J	0.00274 J	NA	0.00148 J	1.00E-03 J
1,2,3,7,8,9-Hexachlorodibenzofuran	NA	1.60E-04 UJ	NA	NA	0.00221 UJ	2.39E-04 UJ	NA	4.07E-04 UJ	7.10E-05 UJ
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	NA	1.04E-04 UJ	NA	NA	0.00146 J	1.02E-04 UJ	NA	1.92E-04 UJ	9.40E-05 UJ
1,2,3,7,8-Pentachlorodibenzofuran	NA	1.29E-04 UJ	NA	NA	0.00440 J	1.56E-04 UJ	NA	2.68E-04 UJ	7.10E-05 UJ
2,3,4,6,7,8-Hexachlorodibenzofuran	NA	1.28E-04 U	NA	NA	0.00370 J	5.06E-04 J	NA	3.25E-04 UJ	5.70E-05 UJ
2,3,4,7,8-Pentachlorodibenzofuran	NA	1.24E-04 UJ	NA	NA	0.00435 J	4.77E-04 J	NA	5.37E-04 NJ	6.80E-05 UJ
2,3,7,8-TCDD (dioxin)	NA	8.80E-05 UJ	NA	NA	3.28E-04 NJ	8.70E-05 UJ	NA	1.58E-04 UJ	8.00E-05 UJ
2,3,7,8-Tetrachlorodibenzofuran	NA	1.06E-04 UJ	NA	NA	0.00636 J	8.48E-04 NJ	NA	7.75E-04 NJ	8.60E-05 UJ
Total heptachlorodibenzo-p-dioxin	NA	0.0211 J	NA	NA	0.281 J	0.0772 J	NA	0.0752 J	0.065 J
Total heptachlorodibenzofuran	NA	1.02E-04 UJ	NA	NA	0.0467 J	0.00806 J	NA	0.00460 J	4.30E-04
Total hexachlorodibenzo-p-dioxin	NA	0.00476 J	NA	NA	0.0392 J	0.0221 J	NA	0.0244 J	0.011 J
Total hexachlorodibenzofuran	NA	1.15E-04 UJ	NA	NA	0.0745 J	0.00938 J	NA	0.00279 J	5.10E-05 UJ
Total octachlorodibenzo-p-dioxin	NA	0.219 J	NA	NA	1.40 J	0.261 J	NA	1.5 J	0.98 J
Total octachlorodibenzofuran	NA	8.16E-04 B	NA	NA	0.0794 J	0.00505 J	NA	0.00313 J	6.80E-04 J
Total pentachlorodibenzo-p-dioxin	NA	1.04E-04 UJ	NA	NA	0.00315 J	5.36E-04 J	NA	1.92E-04 UJ	9.40E-05 UJ
Total pentachlorodibenzofuran	NA	1.24E-04 UJ	NA	NA	0.0290 J	0.00271 J	NA	0.00408 J	6.80E-05 UJ
Total tetrachlorodibenzo-p-dioxin	NA	8.80E-05 UJ	NA	NA	0.00328 J	2.99E-04 J	NA	1.58E-04 UJ	8.00E-05 UJ
Total tetrachlorodibenzofuran	NA	1.06E-04 UJ	NA	NA	0.0306 J	0.00383 J	NA	0.00194 J	8.60E-05 UJ
Nitramines (UG/KG)									
1,3,5-Trinitrobenzene	238 U	NA	NA	NA	NA	NA	NA	NA	NA
1,3-Dinitrobenzene	238 U	NA	NA	NA	NA	NA	NA	NA	NA
2,4,6-Trinitrotoluene	238 U	NA	NA	NA	NA	NA	NA	NA	NA
2,4-Dinitrotoluene	238 U	NA	NA	NA	NA	NA	NA	NA	NA
2,6-Dinitrotoluene	238 U	NA	NA	NA	NA	NA	NA	NA	NA
2-Amino-4,6-dinitrotoluene	238 U	NA	NA	NA	NA	NA	NA	NA	NA
2-Nitrotoluene	476 U	NA	NA	NA	NA	NA	NA	NA	NA
3-Nitrotoluene	476 U	NA	NA	NA	NA	NA	NA	NA	NA
4-Amino-2,6-dinitrotoluene	238 U	NA	NA	NA	NA	NA	NA	NA	NA
4-Nitrotoluene	476 U	NA	NA	NA	NA	NA	NA	NA	NA
HMX	476 U	NA	NA	NA	NA	NA	NA	NA	NA
Nitrobenzene	238 U	NA	NA	NA	NA	NA	NA	NA	NA
RDX	476 U	NA	NA	NA	NA	NA	NA	NA	NA
Tetryl	476 U	NA	NA	NA	NA	NA	NA	NA	NA
Total Metals (MG/KG)									

B - Not detected above associated blank
I - Ether interference
J - Estimated
K - May be biased high
L - May be biased low
N - Tentative identification
NA - Not analyzed
U - Not detected

Table G-2
Subsurface Soil Analytical Results at Site 2
St. Juliens Creek Annex
Chesapeake, Virginia

Station ID	2-SB11	SJS02-SB12	SJS02-SB13	SJS02-SB14	SJS02-SB15	SJS02-SB17	SJS02-SB18	SJS02-SB19	SJS02-SB20
Sample ID	SJS02-SB11-001P	SJS02-SB12-001	SJS02-SB13-001	SJS02-SB14-001	SJS02-SB15-001	SJS02-SB17-001	SJS02-SB18-001	SJS02-SB19-001	SJS02-SB20-001
Sample Date	04/21/99	06/28/01	06/29/01	06/30/01	06/30/01	07/02/01	07/02/01	07/03/01	07/06/01
Chemical Name									
Aluminum	14,100	8,990	10,100	NA	10,900	NA	NA	NA	NA
Antimony	0.680 L	77.7	53.1	NA	2.2	NA	NA	NA	NA
Arsenic	6.10	41.7	25.2	NA	6.9	NA	NA	NA	NA
Barium	88.4	459	335	NA	134	NA	NA	NA	NA
Beryllium	0.630 J	1.1	8	NA	4.6	NA	NA	NA	NA
Cadmium	0.180 J	11.2	2.5	NA	3	NA	NA	NA	NA
Calcium	6,010	15,900	4,880	NA	4,730	NA	NA	NA	NA
Chromium	29.9	110	335	NA	95.2	NA	NA	NA	NA
Cobalt	7.90 J	27.6	95.3	NA	27.2	NA	NA	NA	NA
Copper	153	926	3,100	NA	1,470	NA	NA	NA	NA
Cyanide	0.360	NA	NA	NA	NA	NA	NA	NA	NA
Iron	21,000	210,000	66,400	NA	48,700	NA	NA	NA	NA
Lead	144	8,850	1,670	NA	1,210	NA	NA	NA	NA
Magnesium	3,220	12,300	1,930	NA	2,330	NA	NA	NA	NA
Manganese	203 L	1,260	409	NA	368	NA	NA	NA	NA
Mercury	1	0.7	6.3	NA	0.75	NA	NA	NA	NA
Nickel	13.9	106	243	NA	107	NA	NA	NA	NA
Potassium	2,020	1,660	988	NA	2,270	NA	NA	NA	NA
Selenium	0.440 U	1.7 U	0.53 U	NA	0.34 U	NA	NA	NA	NA
Silver	0.150 U	1.7	1.5	NA	0.36 U	NA	NA	NA	NA
Sodium	216 J	1,780	1,770	NA	451	NA	NA	NA	NA
Thallium	0.550 U	1.9 U	1.4 U	NA	0.91 U	NA	NA	NA	NA
Vanadium	38.6	21.8	73	NA	34.2	NA	NA	NA	NA
Zinc	208 L	2,410	9,070	NA	2,940	NA	NA	NA	NA
Wet Chemistry									
% Solids	82.4	NA	NA	NA	NA	NA	NA	NA	NA
Phosphorus (MG/KG)	63.6	NA	NA	NA	NA	NA	NA	NA	NA
pH	7.83	NA	NA	NA	NA	NA	NA	NA	NA
Total Petroleum Hydrocarbons (MG/KG)									
TPH-diesel range	NA	NA	NA	275	NA	NA	28 U	NA	NA
TPH-gas range	NA	NA	NA	0.8	NA	NA	0.11	NA	NA

Shaded cells indicate analyte detections

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Table G-3
Shallow Groundwater Analytical Results at Site 2
St. Juliens Creek Annex
Chesapeake, Virginia

Station ID	SJS02-MW01S			SJS02-MW02S			SJS02-MW03S			
Sample ID	SJS02-GW1S-001	SJS02-GW1S-002	SJS02-GW1S-003	SJS02-GW2S-001	SJS02-GW2S-002	SJS02-GW2S-003	SJS02-GW3S-001	SJS02-GW3S-001P	SJS02-GW3S-002	SJS02-GW3S-003
Sample Date	07/16/97	11/06/97	05/18/99	07/23/97	11/06/97	05/18/99	07/17/97	07/31/97	11/06/97	05/19/99
Chemical Name										
Volatile Organic Compounds (UG/L)										
1,1,1-Trichloroethane	1 U	1 U	1 U	1 U	1 U	1 U	1 U	NA	1 U	1 U
1,1,2,2-Tetrachloroethane	1 U	1 U	1 U	1 U	1 U	1 U	1 U	NA	1 U	1 U
1,1,2-Trichloroethane	1 U	1 U	1 U	1 U	1 U	1 U	1 U	NA	1 U	1 U
1,1-Dichloroethane	1 U	1 U	1 U	1 U	1 U	1 U	1 U	NA	1 U	1 U
1,1-Dichloroethene	1 U	1 U	1 U	1 U	1 U	1 U	1 U	NA	1 U	1 U
1,2,4-Trichlorobenzene	1 U	1 U	1 U	1 U	1 U	1 U	1 U	NA	1 U	1 U
1,2-Dibromo-3-chloropropane	1 U	1 U	1 U	1 U	1 U	1 U	1 U	NA	1 U	1 U
1,2-Dibromoethane	1 U	1 U	1 U	1 U	1 U	1 U	1 U	NA	1 U	1 U
1,2-Dichlorobenzene	1 U	1 U	1 U	1 U	1 U	1 U	1 U	NA	1 U	1 U
1,2-Dichloroethane	1 U	1 U	1 U	1 U	1 U	1 U	1 U	NA	1 U	1 U
1,2-Dichloropropane	1 U	1 U	1 U	1 U	1 U	1 U	1 U	NA	1 U	1 U
1,3-Dichlorobenzene	1 U	1 U	1 U	1 U	1 U	1 U	1 U	NA	1 U	1 U
1,4-Dichlorobenzene	1 U	1 U	1 U	1 U	1 U	1 U	1 U	NA	1 U	1 U
2-Hexanone	5 U	5 U	5 U	5 U	5 U	5 U	5 U	NA	5 U	5 U
4-Methyl-2-pentanone	5 U	5 U	5 U	5 U	5 U	5 U	5 U	NA	5 U	5 U
Acetone	7 B	NA	NA	10 B	6 B	NA	5 B	NA	22 B	NA
Benzene	1 U	1 U	1 U	1 U	1 U	1 U	1 U	NA	1 U	1 U
Bromochloromethane	1 U	1 U	1 U	1 U	1 U	1 U	1 U	NA	1 U	1 U
Bromodichloromethane	1 U	1 U	1 U	1 U	1 U	1 U	1 U	NA	1 U	1 U
Bromoform	1 U	1 U	1 U	1 U	1 U	1 U	1 U	NA	1 U	1 U
Bromomethane	1 U	1 U	1 U	1 U	1 U	1 U	1 U	NA	1 U	1 U
Carbon disulfide	1 U	1 U	1 U	1 U	1 U	1 U	1 U	NA	1 U	4.10
Carbon tetrachloride	1 U	1 U	1 U	1 U	1 U	1 U	1 U	NA	1 U	1 U
Chlorobenzene	1 U	1 U	1 U	1 U	1 U	1 U	1 U	NA	1 U	1 U
Chloroethane	1 U	1 U	1 U	1 U	1 U	1 U	1 U	NA	1 U	1 U
Chloroform	1 U	1 U	1 U	1 U	1 U	1 U	1 U	NA	1 U	1 U
Chloromethane	1 U	1 U	1 U	1 U	1 U	1 U	1 U	NA	1 U	1 U
Dibromochloromethane	1 U	1 U	1 U	1 U	1 U	1 U	1 U	NA	1 U	1 U
Ethylbenzene	1 U	1 U	1 U	1 U	1 U	1 U	1 U	NA	1 U	1 U
Methylene chloride	2 B	2 B	2 U	1 B	2 B	2 U	2 B	NA	2 B	0.5 B
Styrene	1 U	1 U	1 U	1 U	1 U	1 U	1 U	NA	1 U	1 U
Tetrachloroethene	1 U	1 U	1 U	1 U	1 U	1 U	1 U	NA	1 U	1 U
Toluene	1 U	1 U	1 U	1 U	1 U	1 U	1 U	NA	1 U	1 U
Trichloroethene	1 U	1 U	1 U	1 U	1 U	1 U	1 U	NA	1 U	1 U
Vinyl chloride	1 U	1 U	1 U	1 U	1 U	1 U	1 U	NA	1 U	1 U
Xylene, total	1 U	1 U	1 U	1 U	1 U	1 U	1 U	NA	1 U	1 U
cis-1,2-Dichloroethene	1 U	1 U	1 U	1 U	1 U	1 U	1 U	NA	1 U	1 U
cis-1,3-Dichloropropene	1 U	1 U	1 U	1 U	1 U	1 U	1 U	NA	1 U	1 U
trans-1,2-Dichloroethene	1 U	1 U	1 U	1 U	1 U	1 U	1 U	NA	1 U	1 U
trans-1,3-Dichloropropene	1 U	1 U	1 U	1 U	1 U	1 U	1 U	NA	1 U	1 U

B - Not detected above associated blank
J - Estimated
K - May be biased high
L - May be biased low
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U - Not detected

Table G-3
Shallow Groundwater Analytical Results at Site 2
St. Juliens Creek Annex
Chesapeake, Virginia

Station ID	SJS02-MW01S			SJS02-MW02S			SJS02-MW03S			
Sample ID	SJS02-GW1S-001	SJS02-GW1S-002	SJS02-GW1S-003	SJS02-GW2S-001	SJS02-GW2S-002	SJS02-GW2S-003	SJS02-GW3S-001	SJS02-GW3S-001P	SJS02-GW3S-002	SJS02-GW3S-003
Sample Date	07/16/97	11/06/97	05/18/99	07/23/97	11/06/97	05/18/99	07/17/97	07/31/97	11/06/97	05/19/99
Chemical Name										
Semi-volatile Organic Compounds (UG/L)										
1,2,4-Trichlorobenzene	NA	NA	11 U	NA	NA	10 U	NA	NA	NA	11 U
1,2-Dichlorobenzene	NA	NA	11 U	NA	NA	10 U	NA	NA	NA	11 U
1,3-Dichlorobenzene	NA	NA	11 U	NA	NA	10 U	NA	NA	NA	11 U
1,4-Dichlorobenzene	NA	NA	11 U	NA	NA	10 U	NA	NA	NA	11 U
2,2'-Oxybis(1-chloropropane)	10 U	10 U	11 U	10 U	10 U	10 U	10 U	NA	10 U	11 U
2,4,5-Trichlorophenol	25 U	25 U	27 U	25 U	25 U	26 U	25 U	NA	25 U	29 U
2,4,6-Trichlorophenol	10 U	10 U	11 U	10 U	10 U	10 U	10 U	NA	10 U	11 U
2,4-Dichlorophenol	10 U	10 U	11 U	10 U	10 U	10 U	10 U	NA	10 U	11 U
2,4-Dimethylphenol	10 U	10 U	11 U	10 U	10 U	10 U	10 U	NA	10 U	11 U
2,4-Dinitrophenol	25 U	25 U	27 U	25 U	25 U	26 U	25 U	NA	25 U	29 U
2,4-Dinitrotoluene	10 U	10 U	11 U	10 U	10 U	10 U	10 U	NA	10 U	11 U
2,6-Dinitrotoluene	10 U	10 U	11 U	10 U	10 U	10 U	10 U	NA	10 U	11 U
2-Chloronaphthalene	10 U	10 U	11 U	10 U	10 U	10 U	10 U	NA	10 U	11 U
2-Chlorophenol	10 U	10 U	11 U	10 U	10 U	10 U	10 U	NA	10 U	11 U
2-Methylnaphthalene	10 U	10 U	11 U	10 U	10 U	10 U	10 U	NA	10 U	11 U
2-Methylphenol	10 U	10 U	11 U	10 U	10 U	10 U	10 U	NA	10 U	11 U
2-Nitroaniline	25 U	25 U	27 U	25 U	25 U	26 U	25 U	NA	25 U	29 U
2-Nitrophenol	10 U	10 U	11 U	10 U	10 U	10 U	10 U	NA	10 U	11 U
3,3'-Dichlorobenzidine	10 U	10 U	11 U	10 U	10 U	10 U	10 U	NA	10 U	11 U
3-Nitroaniline	25 U	25 U	27 U	25 U	25 U	26 U	25 U	NA	25 U	29 U
4,6-Dinitro-2-methylphenol	25 U	25 U	27 U	25 U	25 U	26 U	25 U	NA	25 U	29 U
4-Bromophenyl-phenylether	10 U	10 U	11 U	10 U	10 U	10 U	10 U	NA	10 U	11 U
4-Chloro-3-methylphenol	10 U	10 U	11 U	10 U	10 U	10 U	10 U	NA	10 U	11 U
4-Chloroaniline	10 U	10 U	11 U	10 U	10 U	10 U	10 U	NA	10 U	11 U
4-Chlorophenyl-phenylether	10 U	10 U	11 U	10 U	10 U	10 U	10 U	NA	10 U	11 U
4-Methylphenol	10 U	10 U	11 U	10 U	10 U	10 U	10 U	NA	10 U	11 U
4-Nitroaniline	25 U	25 U	27 U	25 U	25 U	26 U	25 U	NA	25 U	29 U
4-Nitrophenol	25 U	25 U	27 U	25 U	25 U	26 U	25 U	NA	25 U	29 U
Acenaphthene	10 U	10 U	11 U	10 U	10 U	10 U	10 U	NA	10 U	11 U
Acenaphthylene	10 U	10 U	11 U	10 U	10 U	10 U	10 U	NA	10 U	11 U
Anthracene	10 U	10 U	11 U	10 U	10 U	10 U	10 U	NA	10 U	11 U
Benzo(a)anthracene	10 U	10 U	11 U	10 U	10 U	10 U	10 U	NA	10 U	11 U
Benzo(a)pyrene	10 U	10 U	11 U	10 U	10 U	10 U	10 U	NA	10 U	11 U
Benzo(b)fluoranthene	10 U	10 U	11 U	10 U	10 U	10 U	10 U	NA	10 U	11 U
Benzo(g,h,i)perylene	10 U	10 U	11 U	10 U	10 U	10 U	10 U	NA	10 U	11 U
Benzo(k)fluoranthene	10 U	10 U	11 U	10 U	10 U	10 U	10 U	NA	10 U	11 U
Butylbenzylphthalate	10 U	10 U	11 U	10 U	10 U	10 U	10 U	NA	10 U	11 U
Carbazole	10 U	10 U	11 U	10 U	10 U	10 U	10 U	NA	10 U	11 U
Chrysene	10 U	10 U	11 U	10 U	10 U	10 U	10 U	NA	10 U	11 U
Di-n-butylphthalate	10 U	10 U	1 B	10 U	10 U	1 B	10 U	NA	10 U	11 U

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Table G-3
Shallow Groundwater Analytical Results at Site 2
St. Juliens Creek Annex
Chesapeake, Virginia

Station ID	SJS02-MW01S			SJS02-MW02S			SJS02-MW03S			
Sample ID	SJS02-GW1S-001	SJS02-GW1S-002	SJS02-GW1S-003	SJS02-GW2S-001	SJS02-GW2S-002	SJS02-GW2S-003	SJS02-GW3S-001	SJS02-GW3S-001P	SJS02-GW3S-002	SJS02-GW3S-003
Sample Date	07/16/97	11/06/97	05/18/99	07/23/97	11/06/97	05/18/99	07/17/97	07/31/97	11/06/97	05/19/99
Chemical Name										
Di-n-octylphthalate	10 U	10 U	11 U	10 U	10 U	10 U	10 U	NA	10 U	11 U
Dibenz(a,h)anthracene	10 U	10 U	11 U	10 U	10 U	10 U	10 U	NA	10 U	11 U
Dibenzofuran	10 U	10 U	11 U	10 U	10 U	10 U	10 U	NA	10 U	11 U
Diethylphthalate	10 U	10 U	11 U	10 U	10 U	10 U	10 U	NA	10 U	11 U
Dimethyl phthalate	10 U	10 U	11 U	10 U	10 U	10 U	10 U	NA	10 U	11 U
Fluoranthene	10 U	10 U	11 U	10 U	10 U	10 U	10 U	NA	10 U	11 U
Fluorene	10 U	10 U	11 U	10 U	10 U	10 U	10 U	NA	10 U	11 U
Hexachlorobenzene	10 U	10 U	11 U	10 U	10 U	10 U	10 U	NA	10 U	11 U
Hexachlorobutadiene	10 U	10 U	11 U	10 U	10 U	10 U	10 U	NA	10 U	11 U
Hexachlorocyclopentadiene	10 U	10 U	11 U	10 U	10 U	10 U	10 U	NA	10 U	11 U
Hexachloroethane	10 U	10 U	11 U	10 U	10 U	10 U	10 U	NA	10 U	11 U
Indeno(1,2,3-cd)pyrene	10 U	10 U	11 U	10 U	10 U	10 U	10 U	NA	10 U	11 U
Isophorone	10 U	10 U	11 U	10 U	10 U	10 U	10 U	NA	10 U	11 U
Naphthalene	10 U	10 U	11 U	10 U	10 U	10 U	10 U	NA	10 U	11 U
Nitrobenzene	10 U	10 U	11 U	10 U	10 U	10 U	10 U	NA	10 U	11 U
Pentachlorophenol	25 U	25 U	27 U	25 U	25 U	26 U	25 U	NA	25 U	29 U
Phenanthrene	10 U	10 U	11 U	10 U	10 U	10 U	10 U	NA	10 U	11 U
Phenol	10 U	10 U	11 U	10 U	10 U	10 U	10 U	NA	10 U	11 U
Pyrene	10 U	10 U	11 U	10 U	10 U	10 U	10 U	NA	10 U	11 U
bis(2-Chloroethoxy)methane	10 U	10 U	11 U	10 U	10 U	10 U	10 U	NA	10 U	11 U
bis(2-Chloroethyl)ether	10 U	10 U	11 U	10 U	10 U	10 U	10 U	NA	10 U	11 U
bis(2-Ethylhexyl)phthalate	10 U	10 U	2 B	10 U	10 U	2 B	10 U	NA	10 U	11 U
n-Nitroso-di-n-propylamine	10 U	10 U	11 U	10 U	10 U	10 U	10 U	NA	10 U	11 U
n-Nitrosodiphenylamine	10 U	10 U	11 U	10 U	10 U	10 U	10 U	NA	10 U	11 U
Pesticide/Polychlorinated Biphenyls (UG/L)										
4,4'-DDD	0.1 U	0.1 U	0.120 U	0.1 U	0.1 U	0.130 U	0.1 U	NA	0.1 U	0.110 U
4,4'-DDE	0.1 U	0.1 U	0.00510 J	0.1 U	0.1 U	0.130 U	0.1 U	NA	0.1 U	0.110 U
4,4'-DDT	0.1 U	0.1 U	0.120 U	0.1 U	0.1 U	0.130 U	0.1 U	NA	0.1 U	0.110 U
Aldrin	0.05 U	0.05 U	0.0580 U	0.05 U	0.05 U	0.0660 U	0.05 U	NA	0.05 U	0.0570 U
Aroclor-1016	1 U	1 U	1.20 U	1 U	1 U	1.30 U	1 U	NA	1 U	1.10 U
Aroclor-1221	2 U	2 U	2.30 U	2 U	2 U	2.60 U	2 U	NA	2 U	2.30 U
Aroclor-1232	1 U	1 U	1.20 U	1 U	1 U	1.30 U	1 U	NA	1 U	1.10 U
Aroclor-1242	1 U	1 U	1.20 U	1 U	1 U	1.30 U	1 U	NA	1 U	1.10 U
Aroclor-1248	1 U	1 U	1.20 U	1 U	1 U	1.30 U	1 U	NA	1 U	1.10 U
Aroclor-1254	1 U	1 U	1.20 U	1 U	1 U	1.30 U	1 U	NA	1 U	1.10 U
Aroclor-1260	1 U	1 U	1.20 U	1 U	1 U	1.30 U	1 U	NA	1 U	1.10 U
Dieldrin	0.1 U	0.1 U	0.120 U	0.1 U	0.1 U	0.130 U	0.1 U	NA	0.1 U	0.110 U
Endosulfan I	0.05 U	0.05 U	0.0580 U	0.05 U	0.05 U	0.0660 U	0.05 U	NA	0.05 U	0.0570 U
Endosulfan II	0.1 U	0.1 U	0.120 U	0.1 U	0.1 U	0.130 U	0.1 U	NA	0.1 U	0.110 U
Endosulfan sulfate	0.1 U	0.1 U	0.120 U	0.1 U	0.1 U	0.0110 J	0.1 U	NA	0.1 U	0.110 U
Endrin	0.1 U	0.1 U	0.120 U	0.1 U	0.1 U	0.130 U	0.1 U	NA	0.1 U	0.110 U

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U - Not detected

Table G-3
Shallow Groundwater Analytical Results at Site 2
St. Juliens Creek Annex
Chesapeake, Virginia

Station ID	SJS02-MW01S			SJS02-MW02S			SJS02-MW03S			
Sample ID	SJS02-GW1S-001	SJS02-GW1S-002	SJS02-GW1S-003	SJS02-GW2S-001	SJS02-GW2S-002	SJS02-GW2S-003	SJS02-GW3S-001	SJS02-GW3S-001P	SJS02-GW3S-002	SJS02-GW3S-003
Sample Date	07/16/97	11/06/97	05/18/99	07/23/97	11/06/97	05/18/99	07/17/97	07/31/97	11/06/97	05/19/99
Chemical Name										
Endrin aldehyde	0.1 U	0.1 U	0.120 U	0.1 U	0.1 U	0.130 U	0.1 U	NA	0.1 U	0.110 U
Endrin ketone	0.1 U	0.1 U	0.120 U	0.1 U	0.1 U	0.130 U	0.1 U	NA	0.1 U	0.110 U
Heptachlor	0.05 U	0.05 U	0.0580 U	0.05 U	0.05 U	0.0660 U	0.05 U	NA	0.05 U	0.0570 U
Heptachlor epoxide	0.05 U	0.05 U	0.0580 U	0.05 U	0.05 U	0.0660 U	0.05 U	NA	0.05 U	0.0570 U
Methoxychlor	0.5 U	0.5 U	0.580 U	0.5 U	0.5 U	0.660 U	0.5 U	NA	0.5 U	0.570 U
Toxaphene	5 U	5 U	5.80 U	5 U	5 U	6.60 U	5 U	NA	5 U	5.70 U
alpha-BHC	0.05 U	0.05 U	0.0580 U	0.05 U	0.05 U	0.0660 U	0.05 U	NA	0.05 U	0.0570 U
alpha-Chlordane	0.05 U	0.05 U	0.0580 U	0.05 U	0.05 U	0.0660 U	0.05 U	NA	0.05 U	0.0570 U
beta-BHC	0.05 U	0.05 U	0.0580 U	0.05 U	0.05 U	0.0660 U	0.05 U	NA	0.05 U	0.0570 U
delta-BHC	0.05 U	0.05 U	0.0580 U	0.05 U	0.05 U	0.0660 U	0.05 U	NA	0.05 U	0.0570 U
gamma-BHC (Lindane)	0.05 U	0.05 U	0.0580 U	0.05 U	0.05 U	0.0660 U	0.05 U	NA	0.05 U	0.0570 U
gamma-Chlordane	0.05 U	0.05 U	0.0580 U	0.05 U	0.05 U	0.0660 U	0.05 U	NA	0.05 U	0.0570 U
Nitramines (UG/L)										
1,3,5-Trinitrobenzene	NA	NA	1.20 U	NA	NA	1.20 U	25 U	25 U	25 U	1.20 U
1,3-Dinitrobenzene	NA	NA	1.20 U	NA	NA	1.20 U	25 U	25 U	25 U	1.20 U
2,4,6-Trinitrotoluene	NA	NA	1.20 U	NA	NA	1.20 U	25 U	25 U	25 U	1.20 U
2,4-Dinitrotoluene	NA	NA	1.20 U	NA	NA	1.20 U	NA	25 U	NA	1.20 U
2,6-Dinitrotoluene	NA	NA	1.20 U	NA	NA	1.20 U	NA	25 U	NA	1.20 U
2-Amino-4,6-dinitrotoluene	NA	NA	1.20 U	NA	NA	1.20 U	25 U	25 U	25 U	1.20 U
2-Nitrotoluene	NA	NA	2.60 U	NA	NA	2.60 U	25 U	25 U	25 U	2.60 U
3-Nitrotoluene	NA	NA	2.60 U	NA	NA	2.60 U	25 U	25 U	25 U	2.60 U
4-Amino-2,6-dinitrotoluene	NA	NA	1.20 U	NA	NA	1.20 U	25 U	25 U	25 U	1.20 U
4-Nitrotoluene	NA	NA	2.60 U	NA	NA	2.60 U	25 U	25 U	25 U	2.60 U
HMX	NA	NA	2.60 U	NA	NA	2.60 U	25 U	25 U	25 U	2.60 U
Nitrobenzene	NA	NA	1.20 U	NA	NA	1.20 U	NA	25 U	NA	1.20 U
RDX	NA	NA	2.60 U	NA	NA	2.60 U	25 U	25 U	25 U	2.60 U
Tetryl	NA	NA	2.60 U	NA	NA	2.60 U	25 U	25 U	25 U	2.60 U
Total Metals (UG/L)										
Aluminum	4,400	365	1,370 K	35,500 J	1,170	211 K	6,890	NA	130 J	38.2 U
Antimony	2 U	1.7 U	2.70 U	NA	1.7 U	2.70 U	2 U	NA	1.7 U	2.70 U
Arsenic	3.8 J	5.1 B	3.20 B	3 U	3.2 U	12.2 B	10.5 B	NA	6.2 J	8.10 B
Barium	54.5 J	39.6 J	35 J	726	575	568	127 B	NA	55.1 J	75.5 J
Beryllium	1 U	0.58 J	0.100 U	1.4 B	0.77 J	0.100 U	1 U	NA	0.58 J	0.100 U
Cadmium	0.5 U	0.4 U	0.300 U	0.5 UL	2 U	0.440 B	0.5 U	NA	0.4 U	0.870 B
Calcium	75,600	149,000	162,000	110,000 J	169,000	225,000	86,300	NA	217,000	207,000
Chromium	13.2 K	23	7.10 J	56.3 J	14.3	3.20 J	12 K	NA	4.6 U	1.10 U
Cobalt	13.2 J	12.4 J	1.40 B	8 U	15.4 J	0.5 U	8 U	NA	6 U	3.20 J
Copper	6 U	5.8 U	5.5 B	21.4 B	5.8 U	5.10 B	6 U	NA	6.3 J	35.9
Cyanide	5 U	5 U	5 U	5 U	5 U	5 U	5 UL	NA	5 U	5 U
Iron	8,870	5,990	5,510	377,000 J	203,000	115,000	26,700	NA	1,240	1,290

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J - Estimated
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U - Not detected

Table G-3
Shallow Groundwater Analytical Results at Site 2
St. Juliens Creek Annex
Chesapeake, Virginia

Station ID	SJS02-MW01S			SJS02-MW02S			SJS02-MW03S			
Sample ID	SJS02-GW1S-001	SJS02-GW1S-002	SJS02-GW1S-003	SJS02-GW2S-001	SJS02-GW2S-002	SJS02-GW2S-003	SJS02-GW3S-001	SJS02-GW3S-001P	SJS02-GW3S-002	SJS02-GW3S-003
Sample Date	07/16/97	11/06/97	05/18/99	07/23/97	11/06/97	05/18/99	07/17/97	07/31/97	11/06/97	05/19/99
Chemical Name										
Lead	3.6	1.9 J	2.70 J	36.7 L	8.2	1 U	4.8 B	NA	1.3 U	17.1
Magnesium	21,400	16,200	14,000	123,000 J	125,000	126,000	67,600	NA	25,300	19,300
Manganese	988	405	442	797 L	843	978	1,380	NA	197	272
Mercury	0.13 U	0.13 U	0.100 U	0.64 B	0.12 U	0.100 U	0.14 B	NA	0.13 U	0.100 U
Nickel	14.8 K	16.5 J	4.90 J	9.3 J	8.2 J	1.5 B	7 U	NA	11.2 J	29.8 J
Potassium	4,720 J	3,880 J	3,550 J	14,100	18,500	23,600	21,900	NA	6,970	8,400
Selenium	3 UL	3.3 U	2.60 U	NA	16.5 U	2.60 U	3 UL	NA	3.3 U	2.60 U
Silver	4.7 B	1.1 U	0.900 U	1.5 J	2.5 B	0.900 U	4.6 B	NA	1.2 B	0.900 U
Sodium	44,600	20,900	18,800	883,000 J	691,000	619,000	295,000	NA	23,800	37,800
Thallium	2 U	2.6 B	2 UL	6.9 J	5.8 B	10 UL	2 U	NA	4.3 B	2 U
Vanadium	14.1 J	6.8 U	3.90 J	79.6	12.3 J	0.600 U	19.4 J	NA	6.8 U	0.920 J
Zinc	28 B	18 B	11.8 B	74.9 B	15.3 J	14.2 B	23.4 B	NA	319	638
Dissolved Metals (UG/L)										
Aluminum	44 U	38.1 U	38.2 U	44 U	38.1 U	114 J	44 U	NA	38.1 U	50.4 J
Antimony	2 U	1.7 U	2.70 U	2 UL	1.7 U	2.70 U	2 U	NA	1.7 U	2.70 U
Arsenic	3 U	3.4 B	6.40 B	3 UL	32 U	9.90 B	5.6 J	NA	6 J	4.5 B
Barium	42.1 J	40.2 J	36.4 J	495	697	519	110 B	NA	54.8 J	74.3 J
Beryllium	1 U	0.58 J	0.100 U	1 U	0.58 J	0.100 U	1 U	NA	0.58 U	0.100 U
Cadmium	0.5 U	0.4 U	0.300 U	0.5 UL	4 U	0.310 B	0.5 U	NA	0.4 U	0.770 B
Calcium	67,700	152,000	148,000	90,200 J	135,000	242,000	90,800	NA	211,000	204,000
Chromium	7 U	4.8 J	1.30 J	7 U	9.9 J	1.40 J	7 U	NA	4.6 U	1.10 U
Cobalt	8.1 J	48 J	0.770 B	8 U	67.9	0.5 U	9.1 J	NA	11.3 J	3.30 J
Copper	6 U	5.8 U	3.80 B	6 U	5.8 U	7.5 B	6 U	NA	5.8 U	29.7
Iron	2,530	5,460	5,360	267,000 J	367,000	64,600	32,000	NA	689	736
Lead	1 U	1.3 U	1 U	1 U	15.5	1 U	1 U	NA	1.3 U	2.10 J
Magnesium	21,000	16,600	11,600	99,800 J	128,000	127,000	83,100	NA	23,700	18,900
Manganese	1,020	416	509	612 J	807	1,010	1,720	NA	174	247
Mercury	0.12 U	0.12 U	0.100 U	0.38 B	0.13 U	0.100 U	0.13 B	NA	0.13 U	0.100 U
Nickel	16.8 K	11.2 J	2 J	7 U	7.1 J	0.900 U	7 U	NA	11.6 J	30 J
Potassium	4,170 J	3,980 J	2,930 J	9,980	14,500	25,100 J	25,400	NA	6,330	8,190
Selenium	3 U	3.3 U	2.60 U	NA	33 U	2.60 U	3 U	NA	3.3 U	2.60 U
Silver	2.8 J	1.8 B	0.900 U	2 J	4.3 B	0.900 U	3.1 B	NA	1.1 U	1 J
Sodium	43,900	21,600	29,700	720,000 J	876,000	556,000	375,000	NA	22,200	37,400
Thallium	2 U	2.5 B	2 UL	9.6 J	1.5 U	10 UL	2 U	NA	3.2 B	2 U
Vanadium	9 U	6.8 U	1 J	9 U	14.2 J	0.600 U	9 U	NA	6.8 U	0.600 U
Zinc	17.8 B	21.9 B	5.60 B	33.8 B	33.5 B	4.20 B	8.7 B	NA	330	642
Wet Chemistry (MG/L)										
Phosphorus	0.146	0.073	0.0320	0.338	0.082	0.0200 U	0.105	NA	0.05 U	0.0200 U

Note:
*1,2-Dichlorobezene was also analyzed as SVOC

B - Not detected above associated blank
J - Estimated
K - May be biased high
L - May be biased low
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U - Not detected

Table G-3
Shallow Groundwater Analytical Results at Site 2
St. Juliens Creek Annex
Chesapeake, Virginia

Station ID	SJS02-MW01S			SJS02-MW02S			SJS02-MW03S			
Sample ID	SJS02-GW1S-001	SJS02-GW1S-002	SJS02-GW1S-003	SJS02-GW2S-001	SJS02-GW2S-002	SJS02-GW2S-003	SJS02-GW3S-001	SJS02-GW3S-001P	SJS02-GW3S-002	SJS02-GW3S-003
Sample Date	07/16/97	11/06/97	05/18/99	07/23/97	11/06/97	05/18/99	07/17/97	07/31/97	11/06/97	05/19/99
Chemical Name										

Shaded cells indicate analyte detections

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U - Not detected

Table G-3
Shallow Groundwater Analytical Results at Site 2
St. Juliens Creek Annex
Chesapeake, Virginia

Station ID	SJS02-MW04S		SJS02-MW05S
Sample ID	SJS02-GW4S-001	SJS02-GW4S-001P	SJS02-GW5S-001
Sample Date	05/19/99	05/19/99	05/18/99
Chemical Name			
Volatile Organic Compounds (UG/L)			
1,1,1-Trichloroethane	1 U	1 U	1 U
1,1,2,2-Tetrachloroethane	1 U	1 U	1 U
1,1,2-Trichloroethane	1 U	1 U	1 U
1,1-Dichloroethane	1 U	1 U	1 U
1,1-Dichloroethene	1 U	1 U	1 U
1,2,4-Trichlorobenzene	1 U	1 U	1 U
1,2-Dibromo-3-chloropropane	1 U	1 U	1 U
1,2-Dibromoethane	1 U	1 U	1 U
1,2-Dichlorobenzene	0.300 J	0.300 J	7.80
1,2-Dichloroethane	1 U	1 U	1 U
1,2-Dichloropropane	1 U	1 U	1 U
1,3-Dichlorobenzene	1 U	1 U	1 U
1,4-Dichlorobenzene	1 U	1 U	0.800 J
2-Hexanone	5 U	5 U	5 U
4-Methyl-2-pentanone	5 U	5 U	5 U
Acetone	NA	NA	NA
Benzene	1 U	1 U	1 U
Bromochloromethane	1 U	1 U	1 U
Bromodichloromethane	1 U	1 U	1 U
Bromoform	1 U	1 U	1 U
Bromomethane	1 U	1 U	1 U
Carbon disulfide	3.40	2.80	1 U
Carbon tetrachloride	1 U	1 U	1 U
Chlorobenzene	1 U	1 U	2.40
Chloroethane	1 U	1 U	1 U
Chloroform	0.200 B	1 U	0.600 B
Chloromethane	1 U	1 U	1 U
Dibromochloromethane	1 U	1 U	1 U
Ethylbenzene	1 U	1 U	1 U
Methylene chloride	0.700 B	0.700 B	2 U
Styrene	1 U	1 U	1 U
Tetrachloroethene	1 U	1 U	1 U
Toluene	1 U	1 U	1 U
Trichloroethene	0.600 J	0.800 J	0.800 J
Vinyl chloride	1 U	1 U	1 U
Xylene, total	1 U	1 U	1 U
cis-1,2-Dichloroethene	0.300 J	0.300 J	1 U
cis-1,3-Dichloropropene	1 U	1 U	1 U
trans-1,2-Dichloroethene	1 U	1 U	1 U
trans-1,3-Dichloropropene	1 U	1 U	1 U

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Table G-3
Shallow Groundwater Analytical Results at Site 2
St. Juliens Creek Annex
Chesapeake, Virginia

Station ID	SJS02-MW04S		SJS02-MW05S
Sample ID	SJS02-GW4S-001	SJS02-GW4S-001P	SJS02-GW5S-001
Sample Date	05/19/99	05/19/99	05/18/99
Chemical Name			
Semi-volatile Organic Compounds (UG/L)			
1,2,4-Trichlorobenzene	12 U	11 U	11 U
1,2-Dichlorobenzene	12 U	11 U	6 J
1,3-Dichlorobenzene	12 U	11 U	11 U
1,4-Dichlorobenzene	12 U	11 U	11 U
2,2'-Oxybis(1-chloropropane)	12 U	11 U	11 U
2,4,5-Trichlorophenol	29 U	28 U	27 U
2,4,6-Trichlorophenol	12 U	11 U	11 U
2,4-Dichlorophenol	12 U	11 U	11 U
2,4-Dimethylphenol	12 U	11 U	11 U
2,4-Dinitrophenol	29 U	28 U	27 U
2,4-Dinitrotoluene	12 U	11 U	11 U
2,6-Dinitrotoluene	12 U	11 U	11 U
2-Chloronaphthalene	12 U	11 U	11 U
2-Chlorophenol	12 U	11 U	11 U
2-Methylnaphthalene	12 U	11 U	11 U
2-Methylphenol	12 U	11 U	11 U
2-Nitroaniline	29 U	28 U	27 U
2-Nitrophenol	12 U	11 U	11 U
3,3'-Dichlorobenzidine	12 U	11 U	11 U
3-Nitroaniline	29 U	28 U	27 U
4,6-Dinitro-2-methylphenol	29 U	28 U	27 U
4-Bromophenyl-phenylether	12 U	11 U	11 U
4-Chloro-3-methylphenol	12 U	11 U	11 U
4-Chloroaniline	12 U	11 U	11 U
4-Chlorophenyl-phenylether	12 U	11 U	11 U
4-Methylphenol	12 U	11 U	11 U
4-Nitroaniline	29 U	28 U	27 U
4-Nitrophenol	29 U	28 U	27 U
Acenaphthene	12 U	11 U	11 U
Acenaphthylene	12 U	11 U	11 U
Anthracene	12 U	11 U	11 U
Benzo(a)anthracene	12 U	11 U	11 U
Benzo(a)pyrene	12 U	11 U	11 U
Benzo(b)fluoranthene	12 U	11 U	11 U
Benzo(g,h,i)perylene	12 U	11 U	11 U
Benzo(k)fluoranthene	12 U	11 U	11 U
Butylbenzylphthalate	12 U	11 U	11 U
Carbazole	12 U	11 U	11 U
Chrysene	12 U	11 U	11 U
Di-n-butylphthalate	12 U	4 J	1 B

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Table G-3
Shallow Groundwater Analytical Results at Site 2
St. Juliens Creek Annex
Chesapeake, Virginia

Station ID	SJS02-MW04S		SJS02-MW05S
Sample ID	SJS02-GW4S-001	SJS02-GW4S-001P	SJS02-GW5S-001
Sample Date	05/19/99	05/19/99	05/18/99
Chemical Name			
Di-n-octylphthalate	12 U	11 U	11 U
Dibenz(a,h)anthracene	12 U	11 U	11 U
Dibenzofuran	12 U	11 U	11 U
Diethylphthalate	12 U	11 U	11 U
Dimethyl phthalate	12 U	11 U	11 U
Fluoranthene	12 U	11 U	11 U
Fluorene	12 U	11 U	11 U
Hexachlorobenzene	12 U	11 U	11 U
Hexachlorobutadiene	12 U	11 U	11 U
Hexachlorocyclopentadiene	12 U	11 U	11 U
Hexachloroethane	12 U	11 U	11 U
Indeno(1,2,3-cd)pyrene	12 U	11 U	11 U
Isophorone	12 U	11 U	11 U
Naphthalene	12 U	11 U	11 U
Nitrobenzene	12 U	11 U	11 U
Pentachlorophenol	29 U	28 U	27 U
Phenanthrene	12 U	11 U	11 U
Phenol	12 U	11 U	11 U
Pyrene	12 U	11 U	11 U
bis(2-Chloroethoxy)methane	12 U	11 U	11 U
bis(2-Chloroethyl)ether	12 U	11 U	11 U
bis(2-Ethylhexyl)phthalate	12 U	1 J	2 B
n-Nitroso-di-n-propylamine	12 U	11 U	11 U
n-Nitrosodiphenylamine	12 U	11 U	11 U
Pesticide/Polychlorinated Biphenyls (UG/L)			
4,4'-DDD	0.120 U	0.120 U	0.110 U
4,4'-DDE	0.120 U	0.120 U	0.110 U
4,4'-DDT	0.120 U	0.120 U	0.110 U
Aldrin	0.0590 U	0.0580 U	0.0550 U
Aroclor-1016	1.20 U	1.20 U	1.10 U
Aroclor-1221	2.40 U	2.30 U	2.20 U
Aroclor-1232	1.20 U	1.20 U	1.10 U
Aroclor-1242	1.20 U	1.20 U	1.10 U
Aroclor-1248	1.20 U	1.20 U	1.10 U
Aroclor-1254	1.20 U	1.20 U	1.10 U
Aroclor-1260	1.20 U	1.20 U	1.10 U
Dieldrin	0.120 U	0.120 U	0.110 U
Endosulfan I	0.0590 U	0.0580 U	0.0550 U
Endosulfan II	0.120 U	0.120 U	0.110 U
Endosulfan sulfate	0.120 U	0.120 U	0.00860 J
Endrin	0.120 U	0.120 U	0.110 U

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Table G-3
Shallow Groundwater Analytical Results at Site 2
St. Juliens Creek Annex
Chesapeake, Virginia

Station ID	SJS02-MW04S		SJS02-MW05S
Sample ID	SJS02-GW4S-001	SJS02-GW4S-001P	SJS02-GW5S-001
Sample Date	05/19/99	05/19/99	05/18/99
Chemical Name			
Endrin aldehyde	0.120 U	0.120 U	0.110 U
Endrin ketone	0.120 U	0.120 U	0.110 U
Heptachlor	0.0900	0.0920	0.0550 U
Heptachlor epoxide	0.0590 U	0.0580 U	0.0550 U
Methoxychlor	0.590 U	0.580 U	0.550 U
Toxaphene	5.90 U	5.80 U	5.5 U
alpha-BHC	0.0590 U	0.0580 U	0.0550 U
alpha-Chlordane	0.0590 U	0.0580 U	0.0550 U
beta-BHC	0.0590 U	0.0580 U	0.0550 U
delta-BHC	0.0590 U	0.0580 U	0.0550 U
gamma-BHC (Lindane)	0.0590 U	0.0580 U	0.0550 U
gamma-Chlordane	0.0590 U	0.0580 U	0.0550 U
Nitramines (UG/L)			
1,3,5-Trinitrobenzene	1.20 U	1.20 U	1.20 U
1,3-Dinitrobenzene	1.20 U	1.20 U	1.20 U
2,4,6-Trinitrotoluene	1.20 U	1.20 U	1.20 U
2,4-Dinitrotoluene	1.20 U	1.20 U	1.20 U
2,6-Dinitrotoluene	1.20 U	1.20 U	1.20 U
2-Amino-4,6-dinitrotoluene	1.20 U	1.20 U	1.20 U
2-Nitrotoluene	2.60 U	2.60 U	2.60 U
3-Nitrotoluene	2.60 U	2.60 U	2.60 U
4-Amino-2,6-dinitrotoluene	1.20 U	1.20 U	1.20 U
4-Nitrotoluene	2.60 U	2.60 U	2.60 U
HMX	2.60 U	0.400 J	2.60 U
Nitrobenzene	1.20 U	1.20 U	1.20 U
RDX	2.60 U	2.70	2.60 U
Tetryl	2.60 U	2.60 U	2.60 U
Total Metals (UG/L)			
Aluminum	303	227	304
Antimony	2.70 U	2.70 U	2.70 U
Arsenic	2.20 B	2.60 B	2.80 B
Barium	63.7 J	62.7 J	56.5 J
Beryllium	0.190 J	0.200 J	0.100 U
Cadmium	1 B	1.10 B	0.440 B
Calcium	20,900	20,500	25,100
Chromium	1.10 U	1.70 J	1.10 U
Cobalt	34.1 J	35.9 J	13.6 J
Copper	10.3 B	5.60 B	4.30 B
Cyanide	5 U	5 U	5 U
Iron	55.4 J	54.9 J	314

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Table G-3
Shallow Groundwater Analytical Results at Site 2
St. Juliens Creek Annex
Chesapeake, Virginia

Station ID	SJS02-MW04S		SJS02-MW05S
Sample ID	SJS02-GW4S-001	SJS02-GW4S-001P	SJS02-GW5S-001
Sample Date	05/19/99	05/19/99	05/18/99
Chemical Name			
Lead	1 U	1 U	1 U
Magnesium	8,890	9,110	9,360
Manganese	593	625	723
Mercury	0.100 U	0.100 U	0.100 U
Nickel	8.10 B	7.80 B	3.80 B
Potassium	4,750 J	4,880 J	2,790 J
Selenium	2.60 U	2.60 U	2.60 U
Silver	0.900 U	0.900 U	0.900 U
Sodium	35,200	36,500	34,400
Thallium	2 U	2 U	2 UL
Vanadium	0.600 U	0.600 U	0.600 U
Zinc	207	222	52.1
Dissolved Metals (UG/L)			
Aluminum	132 J	202	52.4 J
Antimony	2.70 U	2.70 U	2.70 U
Arsenic	3.10 B	2.30 B	2.70 B
Barium	64.9 J	60.9 J	52.7 J
Beryllium	0.210 J	0.160 J	0.100 U
Cadmium	0.990 J	0.850 B	0.320 B
Calcium	20,000	19,100	20,000
Chromium	1.10 U	1.10 U	2.40 J
Cobalt	38.3 J	35.8 J	13.7 J
Copper	5.5 J	6.90 B	8 B
Iron	36 J	38.6 J	944
Lead	1 U	1 U	1 U
Magnesium	9,350	8,820	9,280
Manganese	697	645	751
Mercury	0.100 U	0.100 U	0.100 U
Nickel	8.70 J	8.20 B	6.60 J
Potassium	4,730 J	4,570 J	2,630 J
Selenium	2.60 U	2.60 U	2.60 U
Silver	0.900 U	0.900 U	0.900 U
Sodium	37,600	35,800	33,400
Thallium	2 U	2 U	2 UL
Vanadium	0.600 U	0.600 U	0.600 U
Zinc	213	208	64.9
Wet Chemistry (MG/L)			
Phosphorus	0.0200 U	0.0200 U	0.0200 U

Note:
*1,2-Dichlorobezene was also analyzed as SVOC

B - Not detected above associated blank
J - Estimated
K - May be biased high
L - May be biased low
NA - Not Analyzed
U - Not detected

Table G-3
Shallow Groundwater Analytical Results at Site 2
St. Juliens Creek Annex
Chesapeake, Virginia

Station ID	SJS02-MW04S		SJS02-MW05S
Sample ID	SJS02-GW4S-001	SJS02-GW4S-001P	SJS02-GW5S-001
Sample Date	05/19/99	05/19/99	05/18/99
Chemical Name			

Shaded cells indicate analyte detections

B - Not detected above associated blank
J - Estimated
K - May be biased high
L - May be biased low
NA - Not Analyzed
U - Not detected

Table G-4
Deep Groundwater Analytical Results at Site 2
St. Juliens Creek Annex
Chesapeake, Virginia

Station ID	SJS02-MW01D			SJS02-MW02D				SJS02-MW05D
Sample ID	SJS02-GW1D-001	SJS02-GW1D-002	SJS02-GW1D-003	SJS02-GW2D-001	SJS02-GW2D-002	SJS02-GW2D-002P	SJS02-GW2D-003	SJS02-GW5D-001
Sample Date	07/31/97	11/06/97	05/18/99	07/17/97	11/06/97	11/06/97	05/18/99	05/18/99
Chemical Name								
Volatile Organic Compounds (UG/L)								
1,1,1-Trichloroethane	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,1,2,2-Tetrachloroethane	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,1,2-Trichloroethane	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,1-Dichloroethane	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,1-Dichloroethene	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,2,4-Trichlorobenzene	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,2-Dibromo-3-chloropropane	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,2-Dibromoethane	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,2-Dichlorobenzene	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,2-Dichloroethane	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,2-Dichloropropane	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,3-Dichlorobenzene	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,4-Dichlorobenzene	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
2-Hexanone	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
4-Methyl-2-pentanone	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Acetone	5 U	7 B	NA	NA	NA	NA	NA	NA
Benzene	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Bromochloromethane	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Bromodichloromethane	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Bromoform	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Bromomethane	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Carbon disulfide	1 U	0.2 J	1 U	1 U	1 U	1 U	1 U	1 J
Carbon tetrachloride	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Chlorobenzene	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Chloroethane	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Chloroform	0.6 J	1 U	1 U	6	1 U	1 U	1 U	2.40 B
Chloromethane	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Dibromochloromethane	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Ethylbenzene	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Methylene chloride	3 B	2 B	2 U	3 B	2 B	2 B	2 U	2 U
Styrene	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Tetrachloroethene	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Toluene	0.3 J	0.7 B	1 U	1 U	1 U	1 U	1 U	1 U
Trichloroethene	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Vinyl chloride	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Xylene, total	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U

B - Not detected above associated blank
J - Estimated
K - May be biased high
NA - Not analyzed
U - Not detected

Table G-4
Deep Groundwater Analytical Results at Site 2
St. Juliens Creek Annex
Chesapeake, Virginia

Station ID	SJS02-MW01D			SJS02-MW02D				SJS02-MW05D
Sample ID	SJS02-GW1D-001	SJS02-GW1D-002	SJS02-GW1D-003	SJS02-GW2D-001	SJS02-GW2D-002	SJS02-GW2D-002P	SJS02-GW2D-003	SJS02-GW5D-001
Sample Date	07/31/97	11/06/97	05/18/99	07/17/97	11/06/97	11/06/97	05/18/99	05/18/99
Chemical Name								
cis-1,2-Dichloroethene	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
cis-1,3-Dichloropropene	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
trans-1,2-Dichloroethene	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
trans-1,3-Dichloropropene	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Semi-volatile Organic Compounds (UG/L)								
1,2,4-Trichlorobenzene	NA	NA	11 U	NA	NA	NA	11 U	11 U
1,2-Dichlorobenzene	NA	NA	11 U	NA	NA	NA	11 U	11 U
1,3-Dichlorobenzene	NA	NA	11 U	NA	NA	NA	11 U	11 U
1,4-Dichlorobenzene	NA	NA	11 U	NA	NA	NA	11 U	11 U
2,2'-Oxybis(1-chloropropane)	10 U	10 U	11 U	10 U	10 U	10 U	11 U	11 U
2,4,5-Trichlorophenol	25 U	25 U	27 U	25 U	25 U	25 U	28 U	28 U
2,4,6-Trichlorophenol	10 U	10 U	11 U	10 U	10 U	10 U	11 U	11 U
2,4-Dichlorophenol	10 U	10 U	11 U	10 U	10 U	10 U	11 U	11 U
2,4-Dimethylphenol	10 U	10 U	11 U	10 U	10 U	10 U	11 U	11 U
2,4-Dinitrophenol	25 UJ	25 U	27 U	25 U	25 U	25 U	28 U	28 U
2,4-Dinitrotoluene	10 U	10 U	11 U	10 U	10 U	10 U	11 U	11 U
2,6-Dinitrotoluene	10 U	10 U	11 U	10 U	10 U	10 U	11 U	11 U
2-Chloronaphthalene	10 U	10 U	11 U	10 U	10 U	10 U	11 U	11 U
2-Chlorophenol	10 U	10 U	11 U	10 U	10 U	10 U	11 U	11 U
2-Methylnaphthalene	10 U	10 U	11 U	10 U	10 U	10 U	11 U	11 U
2-Methylphenol	10 U	10 U	11 U	10 U	10 U	10 U	11 U	11 U
2-Nitroaniline	25 U	25 U	27 U	25 U	25 U	25 U	28 U	28 U
2-Nitrophenol	10 U	10 U	11 U	10 U	10 U	10 U	11 U	11 U
3,3'-Dichlorobenzidine	10 U	10 U	11 U	10 U	10 U	10 U	11 U	11 U
3-Nitroaniline	25 U	25 U	27 U	25 U	25 U	25 U	28 U	28 U
4,6-Dinitro-2-methylphenol	25 U	25 U	27 U	25 U	25 U	25 U	28 U	28 U
4-Bromophenyl-phenylether	10 U	10 U	11 U	10 U	10 U	10 U	11 U	11 U
4-Chloro-3-methylphenol	10 U	10 U	11 U	10 U	10 U	10 U	11 U	11 U
4-Chloroaniline	10 U	10 U	11 U	10 U	10 U	10 U	11 U	11 U
4-Chlorophenyl-phenylether	10 U	10 U	11 U	10 U	10 U	10 U	11 U	11 U
4-Methylphenol	10 U	10 U	11 U	10 U	10 U	10 U	11 U	11 U
4-Nitroaniline	25 U	25 U	27 U	25 U	25 U	25 U	28 U	28 U
4-Nitrophenol	25 U	25 U	27 U	25 U	25 U	25 U	28 U	28 U
Acenaphthene	10 U	10 U	11 U	10 U	10 U	10 U	11 U	11 U
Acenaphthylene	10 U	10 U	11 U	10 U	10 U	10 U	11 U	11 U
Anthracene	10 U	10 U	11 U	10 U	10 U	10 U	11 U	11 U
Benzo(a)anthracene	10 U	10 U	11 U	10 U	10 U	10 U	11 U	11 U

B - Not detected above associated blank
J - Estimated
K - May be biased high
NA - Not analyzed
U - Not detected

Table G-4
Deep Groundwater Analytical Results at Site 2
St. Juliens Creek Annex
Chesapeake, Virginia

Station ID	SJS02-MW01D			SJS02-MW02D				SJS02-MW05D
Sample ID	SJS02-GW1D-001	SJS02-GW1D-002	SJS02-GW1D-003	SJS02-GW2D-001	SJS02-GW2D-002	SJS02-GW2D-002P	SJS02-GW2D-003	SJS02-GW5D-001
Sample Date	07/31/97	11/06/97	05/18/99	07/17/97	11/06/97	11/06/97	05/18/99	05/18/99
Chemical Name								
Benzo(a)pyrene	10 U	10 U	11 U	10 U	10 U	10 U	11 U	11 U
Benzo(b)fluoranthene	10 U	10 U	11 U	10 U	10 U	10 U	11 U	11 U
Benzo(g,h,i)perylene	10 U	10 U	11 U	10 U	10 U	10 U	11 U	11 U
Benzo(k)fluoranthene	10 U	10 U	11 U	10 U	10 U	10 U	11 U	11 U
Butylbenzylphthalate	10 U	10 U	11 U	10 U	10 U	10 U	11 U	11 U
Carbazole	10 U	10 U	11 U	10 U	10 U	10 U	11 U	11 U
Chrysene	10 U	10 U	11 U	10 U	10 U	10 U	11 U	11 U
Di-n-butylphthalate	10 U	10 U	1 B	10 U	10 U	10 U	11 U	2 B
Di-n-octylphthalate	10 U	10 U	11 U	10 U	10 U	10 U	11 U	11 U
Dibenz(a,h)anthracene	10 U	10 U	11 U	10 U	10 U	10 U	11 U	11 U
Dibenzofuran	10 U	10 U	11 U	10 U	10 U	10 U	11 U	11 U
Diethylphthalate	10 U	10 U	11 U	10 U	10 U	10 U	11 U	11 U
Dimethyl phthalate	10 U	10 U	11 U	10 U	10 U	10 U	11 U	11 U
Fluoranthene	10 U	10 U	11 U	10 U	10 U	10 U	11 U	11 U
Fluorene	10 U	10 U	11 U	10 U	10 U	10 U	11 U	11 U
Hexachlorobenzene	10 U	10 U	11 U	10 U	10 U	10 U	11 U	11 U
Hexachlorobutadiene	10 U	10 U	11 U	10 U	10 U	10 U	11 U	11 U
Hexachlorocyclopentadiene	10 U	10 U	11 U	10 U	10 U	10 U	11 U	11 U
Hexachloroethane	10 U	10 U	11 U	10 U	10 U	10 U	11 U	11 U
Indeno(1,2,3-cd)pyrene	10 U	10 U	11 U	10 U	10 U	10 U	11 U	11 U
Isophorone	10 U	10 U	11 U	10 U	10 U	10 U	11 U	11 U
Naphthalene	10 U	10 U	11 U	10 U	10 U	10 U	11 U	11 U
Nitrobenzene	10 U	10 U	11 U	10 U	10 U	10 U	11 U	11 U
Pentachlorophenol	25 U	25 U	27 U	25 U	25 U	25 U	28 U	28 U
Phenanthrene	10 U	10 U	11 U	10 U	10 U	10 U	11 U	11 U
Phenol	10 U	5 J	11 U	10 U	10 U	10 U	11 U	11 U
Pyrene	10 U	10 U	11 U	10 U	10 U	10 U	11 U	11 U
bis(2-Chloroethoxy)methane	10 U	10 U	11 U	10 U	10 U	10 U	11 U	11 U
bis(2-Chloroethyl)ether	10 U	10 U	11 U	10 U	10 U	10 U	11 U	11 U
bis(2-Ethylhexyl)phthalate	10 U	10 U	2 B	10 U	5 B	10 U	2 B	1 B
n-Nitroso-di-n-propylamine	10 U	10 U	11 U	10 U	10 U	10 U	11 U	11 U
n-Nitrosodiphenylamine	10 U	10 U	11 U	10 U	10 U	10 U	11 U	11 U
Pesticide/Polychlorinated Biphenyls (UG/L)								
4,4'-DDD	0.1 U	0.1 U	0.110 U	0.1 U	0.1 U	0.1 U	0.120 U	0.110 U
4,4'-DDE	0.1 U	0.1 U	0.110 U	0.1 U	0.1 U	0.1 U	0.120 U	0.110 U
4,4'-DDT	0.1 U	0.1 U	0.110 U	0.1 U	0.1 U	0.1 U	0.120 U	0.110 U
Aldrin	0.05 U	0.05 U	0.0530 U	0.05 U	0.05 U	0.05 U	0.0590 U	0.0540 U

B - Not detected above associated blank
J - Estimated
K - May be biased high
NA - Not analyzed
U - Not detected

Table G-4
Deep Groundwater Analytical Results at Site 2
St. Juliens Creek Annex
Chesapeake, Virginia

Station ID	SJS02-MW01D			SJS02-MW02D				SJS02-MW05D
Sample ID	SJS02-GW1D-001	SJS02-GW1D-002	SJS02-GW1D-003	SJS02-GW2D-001	SJS02-GW2D-002	SJS02-GW2D-002P	SJS02-GW2D-003	SJS02-GW5D-001
Sample Date	07/31/97	11/06/97	05/18/99	07/17/97	11/06/97	11/06/97	05/18/99	05/18/99
Chemical Name								
Aroclor-1016	1 U	1 U	1.10 U	1 U	1 U	1 U	1.20 U	1.10 U
Aroclor-1221	2 U	2 U	2.10 U	2 U	2 U	2 U	2.40 U	2.20 U
Aroclor-1232	1 U	1 U	1.10 U	1 U	1 U	1 U	1.20 U	1.10 U
Aroclor-1242	1 U	1 U	1.10 U	1 U	1 U	1 U	1.20 U	1.10 U
Aroclor-1248	1 U	1 U	1.10 U	1 U	1 U	1 U	1.20 U	1.10 U
Aroclor-1254	1 U	1 U	1.10 U	1 U	1 U	1 U	1.20 U	1.10 U
Aroclor-1260	1 U	1 U	1.10 U	1 U	1 U	1 U	1.20 U	1.10 U
Dieldrin	0.1 U	0.1 U	0.110 U	0.1 U	0.1 U	0.1 U	0.120 U	0.110 U
Endosulfan I	0.05 U	0.05 U	0.0530 U	0.05 U	0.05 U	0.05 U	0.0590 U	0.0540 U
Endosulfan II	0.1 U	0.1 U	0.110 U	0.1 U	0.1 U	0.1 U	0.120 U	0.110 U
Endosulfan sulfate	0.1 U	0.1 U	0.110 U	0.1 U	0.1 U	0.1 U	0.00960 J	0.00980 J
Endrin	0.1 U	0.1 U	0.110 U	0.1 U	0.1 U	0.1 U	0.120 U	0.110 U
Endrin aldehyde	0.1 U	0.1 U	0.110 U	0.1 U	0.1 U	0.1 U	0.120 U	0.110 U
Endrin ketone	0.1 U	0.1 U	0.110 U	0.1 U	0.1 U	0.1 U	0.120 U	0.110 U
Heptachlor	0.05 U	0.05 U	0.0530 U	0.05 U	0.05 U	0.05 U	0.0590 U	0.0540 U
Heptachlor epoxide	0.05 U	0.05 U	0.0530 U	0.05 U	0.05 U	0.05 U	0.0590 U	0.0540 U
Methoxychlor	0.5 U	0.5 U	0.530 U	0.5 U	0.5 U	0.5 U	0.590 U	0.540 U
Toxaphene	5 U	5 U	5.30 U	5 U	5 U	5 U	5.90 U	5.40 U
alpha-BHC	0.05 U	0.05 U	0.0530 U	0.05 U	0.05 U	0.05 U	0.0590 U	0.0540 U
alpha-Chlordane	0.05 U	0.05 U	0.0530 U	0.05 U	0.05 U	0.05 U	0.0590 U	0.0540 U
beta-BHC	0.05 U	0.05 U	0.0530 U	0.05 U	0.05 U	0.05 U	0.0590 U	0.0540 U
delta-BHC	0.05 U	0.05 U	0.0530 U	0.05 U	0.05 U	0.05 U	0.0590 U	0.0540 U
gamma-BHC (Lindane)	0.05 U	0.05 U	0.0530 U	0.05 U	0.05 U	0.05 U	0.0590 U	0.0540 U
gamma-Chlordane	0.05 U	0.05 U	0.0530 U	0.05 U	0.05 U	0.05 U	0.0590 U	0.0540 U
Nitramines (UG/L)								
1,3,5-Trinitrobenzene	25 U	NA	1.20 U	NA	NA	NA	1.20 U	1.20 U
1,3-Dinitrobenzene	25 U	NA	1.20 U	NA	NA	NA	1.20 U	1.20 U
2,4,6-Trinitrotoluene	25 U	NA	1.20 U	NA	NA	NA	1.20 U	1.20 U
2,4-Dinitrotoluene	NA	NA	1.20 U	NA	NA	NA	1.20 U	1.20 U
2,6-Dinitrotoluene	NA	NA	1.20 U	NA	NA	NA	1.20 U	1.20 U
2-Amino-4,6-dinitrotoluene	25 U	NA	1.20 U	NA	NA	NA	1.20 U	1.20 U
2-Nitrotoluene	25 U	NA	2.60 U	NA	NA	NA	2.60 U	2.60 U
3-Nitrotoluene	25 U	NA	2.60 U	NA	NA	NA	2.60 U	2.60 U
4-Amino-2,6-dinitrotoluene	25 U	NA	1.20 U	NA	NA	NA	1.20 U	1.20 U
4-Nitrotoluene	25 U	NA	2.60 U	NA	NA	NA	2.60 U	2.60 U
HMX	25 U	NA	2.60 U	NA	NA	NA	2.60 U	2.60 U
Nitrobenzene	NA	NA	1.20 U	NA	NA	NA	1.20 U	1.20 U

B - Not detected above associated blank
J - Estimated
K - May be biased high
NA - Not analyzed
U - Not detected

Table G-4
Deep Groundwater Analytical Results at Site 2
St. Juliens Creek Annex
Chesapeake, Virginia

Station ID	SJS02-MW01D			SJS02-MW02D				SJS02-MW05D
Sample ID	SJS02-GW1D-001	SJS02-GW1D-002	SJS02-GW1D-003	SJS02-GW2D-001	SJS02-GW2D-002	SJS02-GW2D-002P	SJS02-GW2D-003	SJS02-GW5D-001
Sample Date	07/31/97	11/06/97	05/18/99	07/17/97	11/06/97	11/06/97	05/18/99	05/18/99
Chemical Name								
RDX	25 U	NA	2.60 U	NA	NA	NA	2.60 U	2.60 U
Tetryl	25 U	NA	2.60 U	NA	NA	NA	2.60 U	2.60 U
Total Metals (UG/L)								
Aluminum	2,000	42.4 J	200 K	45.8 B	38.1 U	38.1 U	304 K	321 K
Antimony	2 U	1.7 U	2.70 U	2 U	1.7 U	1.7 U	2.70 U	2.70 U
Arsenic	3.7 J	3.2 U	2.40 B	4.5 B	3.2 U	3.2 U	2 U	9.20 B
Barium	18.2 B	9.3 B	14.4 J	18.3 B	22.7 B	23 B	16.4 J	39.8 J
Beryllium	1 U	0.58 U	0.100 U	1 U	0.58 U	0.58 U	0.100 U	0.100 U
Cadmium	0.5 U	0.4 U	0.300 U	0.5 U	0.4 U	0.4 U	0.300 U	0.300 U
Calcium	57,900	53,600	60,100	49,500	49,900	47,900	57,800	55,600
Chromium	11.8 B	4.6 U	1.90 J	7 U	4.6 U	4.6 U	1.5 J	1.30 J
Cobalt	8 U	6 U	0.5 U	8 U	6 U	6 U	0.5 U	0.770 B
Copper	6 U	5.8 U	4.80 B	6 U	5.8 U	5.8 U	3.40 B	4.60 B
Cyanide	5 U	5 U	5 U	5 UL	5 U	5 U	5 U	5 U
Iron	3,820 K	59 B	138	87.4 B	876	786	1,050	398
Lead	2.7 B	1.3 U	1 U	1 U	1.3 U	1.3 U	1 U	1.5 J
Magnesium	5,200	3,720 J	6,850	13,600	20,200	19,900	15,300	8,450
Manganese	45.5	5.6 B	36.1	49.4 B	228	221	229	120
Mercury	0.13 U	0.12 U	0.100 U	0.12 U	0.13 U	0.13 U	0.100 U	0.100 U
Nickel	7 U	6.3 U	2.20 J	7 U	6.3 U	6.3 U	1.10 J	2.80 B
Potassium	5,520	5,300	5,810	8,800 B	11,600	11,300	8,240	5,850
Selenium	3 U	3.3 U	2.60 U	3 UL	3.3 U	3.3 U	2.60 U	2.60 U
Silver	3.6 B	2 B	0.900 U	2.9 B	2 B	3.1 B	0.900 U	0.900 U
Sodium	11,400	12,600	13,300	19,100	18,300	17,800	15,800	23,300
Thallium	2 U	1.5 U	2 UL	2 U	1.5 U	2.3 B	2 UL	2 UL
Vanadium	9.6 K	6.8 U	0.600 U	9 U	6.8 U	6.8 U	0.600 U	1 J
Zinc	18.9 B	10.8 B	17.6 J	5 U	23.6 B	18.8 B	3.5 B	7 B
Dissolved Metals (UG/L)								
Aluminum	79.2 B	38.1 U	60.2 J	44 U	38.1 U	38.1 U	38.2 U	46.4 J
Antimony	3.1 J	1.7 U	2.70 U	3 J	1.7 U	1.7 U	2.70 U	2.70 U
Arsenic	3 U	3.4 J	2 U	4.4 J	3.2 U	3.2 U	2 U	6.20 B
Barium	11.7 B	6.7 B	15.1 J	18.3 B	19.2 B	19.5 B	14.6 J	39 J
Beryllium	1 U	0.58 U	0.100 U	1 U	0.58 U	0.58 U	0.100 U	0.100 U
Cadmium	0.5 U	0.4 U	0.300 U	0.5 U	0.4 U	0.4 U	0.300 U	0.300 U
Calcium	55,900	48,700	62,700	49,300	45,600	44,100	52,300	54,700
Chromium	7 U	4.6 U	1.10 U	7 U	4.6 U	4.6 U	1.10 U	1.10 U

B - Not detected above associated blank
J - Estimated
K - May be biased high
NA - Not analyzed
U - Not detected

Table G-4
Deep Groundwater Analytical Results at Site 2
St. Juliens Creek Annex
Chesapeake, Virginia

Station ID	SJS02-MW01D			SJS02-MW02D				SJS02-MW05D
Sample ID	SJS02-GW1D-001	SJS02-GW1D-002	SJS02-GW1D-003	SJS02-GW2D-001	SJS02-GW2D-002	SJS02-GW2D-002P	SJS02-GW2D-003	SJS02-GW5D-001
Sample Date	07/31/97	11/06/97	05/18/99	07/17/97	11/06/97	11/06/97	05/18/99	05/18/99
Chemical Name								
Cobalt	8 U	6 U	0.5 U	8 U	6 U	6 U	0.5 U	0.5 U
Copper	6 U	5.8 U	3.70 B	6 U	5.8 U	5.8 U	5.30 B	10.4 B
Iron	30.4 B	34.6 B	94.3 J	45.3 B	715	599	855	203
Lead	1 U	1.3 U	1 U	1.5 B	1.3 U	1.3 U	1 U	1 U
Magnesium	4,790 J	3,420 J	7,000	13,200	18,100	18,500	13,700	8,480
Manganese	3.3 B	4.8 B	35.5	43.9 B	207	200	206	112
Mercury	0.12 U	0.12 U	0.100 U	0.12 U	0.13 U	0.13 U	0.100 U	0.100 U
Nickel	7 U	6.3 U	1.90 J	7 U	6.3 U	6.3 U	1.30 J	1.30 B
Potassium	5,330	4,730 J	6,190	8,800 B	10,300	10,400	7,520 J	5,880 J
Selenium	3 U	3.3 U	2.60 U	3 U	3.3 U	3.3 U	2.60 U	2.60 U
Silver	3.4 B	1.4 B	0.900 U	3.2 B	2.6 B	1.1 B	0.900 U	0.900 U
Sodium	11,800	11,400	14,000	19,600	16,600	16,200	14,500	23,700
Thallium	2 U	2.3 B	2 U	2 U	1.5 U	2.2 B	2 UL	2 U
Vanadium	9 U	6.8 U	0.600 U	9 U	6.8 U	6.8 U	0.600 U	0.600 U
Zinc	9 B	7.5 B	1.90 U	11.1 B	10.7 B	20.4 B	4.70 B	6.70 B
Wet Chemistry (MG/L)								
Phosphorus	0.18	0.87	0.0750	0.862	1.8	2.14	0.208	0.0410

Shaded cells indicate analyte detections

B - Not detected above associated blank
J - Estimated
K - May be biased high
NA - Not analyzed
U - Not detected

Table G-5
Sediment Analytical Results at Site 2
St. Juliens Annex
Chesapeake, Virginia

Station ID	SJS02-SD01	SJS02-SD02	SJS02-SD03		SJS02-SD04	SJS02-SD05	SJS02-SD06	SJS02-SD07	SJS02-SD08	
Sample ID	SJS02-SD01-000	SJS02-SD02-000	SJS02-SD03-000	SJS02-SD03-000P	SJS02-SD04-001	SJS02-SD05-001	SJS02-SD06-001	SJS02-SD07-001	SJS02-SD08-001	SJS02-SD08-00
Sample Date	07/14/97	07/14/97	06/26/97	06/26/97	04/16/99	04/16/99	04/16/99	04/16/99	04/14/99	10/27/99
Chemical Name										
Volatile Organic Compounds (UG/KG)										
1,1,1-Trichloroethane	11 U	31 U	32 U	37 U	14 U	20 U	7 J	28 UJ	16 U	18
1,1,2,2-Tetrachloroethane	11 U	31 U	32 U	37 U	14 U	20 U	23 U	28 UJ	16 U	18
1,1,2-Trichloro-1,2,2-trifluoroethane(Freon-113)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1,2-Trichloroethane	11 U	31 U	32 U	37 U	14 U	20 U	23 U	28 UJ	16 U	18
1,1-Dichloroethane	11 U	31 U	32 U	37 U	14 U	20 U	23 U	28 UJ	16 U	18
1,1-Dichloroethene	11 U	31 U	32 U	37 U	14 U	20 U	23 U	28 UJ	16 U	18
1,2,4-Trichlorobenzene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dibromo-3-chloropropane	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dibromoethane	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichlorobenzene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloroethane	11 U	31 U	32 U	37 U	14 U	20 U	23 U	28 UJ	16 U	18
1,2-Dichloroethene (total)	11 U	31 U	32 U	9 J	14 U	20 U	23 U	3 J	16 U	18
1,2-Dichloropropane	11 U	31 U	32 U	37 U	14 U	20 U	23 U	28 UJ	16 U	18
1,3-Dichlorobenzene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,4-Dichlorobenzene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Butanone	11 U	31 U	32 U	37 U	14 U	20 U	23 U	28 UJ	16 U	18
2-Hexanone	11 U	31 U	32 U	37 U	14 UJ	20 U	23 U	28 UJ	16 U	18
4-Methyl-2-pentanone	11 U	5 J	32 U	37 U	14 UJ	20 U	23 U	28 UJ	16 U	18
Acetone	11 U	92 J	120	450	NA	21 J	37 J	28 UJ	16 U	NA
Benzene	11 U	31 U	32 U	37 U	14 U	20 U	23 U	28 UJ	16 U	18
Bromodichloromethane	11 U	31 U	32 U	37 U	14 U	20 U	23 U	28 UJ	16 U	18
Bromoform	11 U	31 U	32 U	37 U	14 U	20 U	23 U	28 UJ	16 U	18
Bromomethane	11 U	31 U	32 U	37 U	14 U	20 U	23 U	28 UJ	16 U	18
Carbon disulfide	11 U	31 U	24 J	81	14 U	8 B	3 B	12 B	16 UJ	4
Carbon tetrachloride	11 U	31 U	32 U	37 U	14 U	20 U	23 U	28 UJ	16 U	18
Chlorobenzene	11 U	31 U	32 U	37 U	14 U	20 U	23 U	28 UJ	16 U	18
Chloroethane	11 U	31 U	32 U	37 U	14 U	20 U	23 U	28 UJ	16 U	18
Chloroform	11 U	31 U	32 U	37 U	14 U	20 U	23 U	3 J	16 U	18
Chloromethane	11 U	31 U	32 U	37 U	14 U	20 U	23 U	28 UJ	16 U	18
Cumene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cyclohexane	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibromochloromethane	11 U	31 U	32 U	37 U	14 U	20 U	23 U	28 UJ	16 U	18
Dichlorodifluoromethane(Freon-12)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ethylbenzene	11 U	31 U	32 U	37 U	14 U	20 U	23 U	28 UJ	16 U	18
Methyl acetate	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methyl-tert-butyl ether (MTBE)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methylcyclohexane	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methylene chloride	22 B	69 B	93 B	140 B	4 B	26 B	52 B	6 B	17 B	81

B - Not detected above associated blank
I - Ether interference
J - Estimated
K - May be biased high
L - May be biased low
N - Tentative identification
NA - Not analyzed
R - Unreliable result
U - Not detected

Table G-5
Sediment Analytical Results at Site 2
St. Juliens Annex
Chesapeake, Virginia

Station ID	SJS02-SD01	SJS02-SD02	SJS02-SD03		SJS02-SD04	SJS02-SD05	SJS02-SD06	SJS02-SD07	SJS02-SD08	
Sample ID	SJS02-SD01-000	SJS02-SD02-000	SJS02-SD03-000	SJS02-SD03-000P	SJS02-SD04-001	SJS02-SD05-001	SJS02-SD06-001	SJS02-SD07-001	SJS02-SD08-001	SJS02-SD08-00
Sample Date	07/14/97	07/14/97	06/26/97	06/26/97	04/16/99	04/16/99	04/16/99	04/16/99	04/14/99	10/27/99
Chemical Name										
Styrene	11 U	31 U	32 U	37 U	14 U	20 U	23 U	28 UJ	16 U	18
Tetrachloroethene	11 U	31 U	32 U	37 U	14 U	20 U	23 U	28 UJ	16 U	18
Toluene	11 U	31 U	32 U	37 U	4 J	20 U	23 U	28 UJ	16 U	18
Trichloroethene	11 U	31 U	32 U	37 U	4 J	4 J	23 U	28 UJ	10 J	18
Trichlorofluoromethane(Freon-11)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vinyl chloride	11 U	31 U	32 U	37 U	14 U	20 U	23 U	28 UJ	16 U	18
Xylene, total	11 U	31 U	32 U	37 U	14 U	20 U	23 U	28 UJ	16 U	18
cis-1,2-Dichloroethene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
cis-1,3-Dichloropropene	11 U	31 U	32 U	37 U	14 U	20 U	23 U	28 UJ	16 U	18
o-Xylene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
trans-1,2-Dichloroethene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
trans-1,3-Dichloropropene	11 U	31 U	32 U	37 U	14 U	20 U	23 U	28 UJ	16 U	18
Semi-volatile Organic Compounds (UG/KG)										
1,1-Biphenyl	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,4-Trichlorobenzene	330 U	9,100 UJ	1,300 UL	1,400 U	480 UJ	670 UJ	760 UJ	930 UJ	550 UJ	NA
1,2-Dichlorobenzene	330 U	9,100 UJ	1,300 UL	1,400 U	480 UJ	670 UJ	760 UJ	930 UJ	550 UJ	NA
1,3-Dichlorobenzene	330 U	9,100 UJ	1,300 UL	1,400 U	480 UJ	670 UJ	760 UJ	930 UJ	550 UJ	NA
1,4-Dichlorobenzene	330 U	9,100 UJ	1,300 UL	1,400 U	480 UJ	670 UJ	760 UJ	930 UJ	550 UJ	NA
2,2'-Oxybis(1-chloropropane)	330 U	9,100 UJ	1,300 UL	1,400 U	480 UJ	670 UJ	760 UJ	930 UJ	550 UJ	NA
2,4,5-Trichlorophenol	840 U	23,000 UJ	3,300 UL	3,600 UL	1,200 UJ	1,700 UJ	1,900 UJ	2,300 UJ	1,400 UJ	NA
2,4,6-Trichlorophenol	330 U	9,100 UJ	1,300 UL	1,400 UL	480 UJ	670 UJ	760 UJ	930 UJ	550 UJ	NA
2,4-Dichlorophenol	330 U	9,100 UJ	1,300 UL	1,400 UL	480 UJ	670 UJ	760 UJ	930 UJ	550 UJ	NA
2,4-Dimethylphenol	330 U	9,100 UJ	1,300 UL	1,400 UL	480 UJ	670 UJ	760 UJ	930 UJ	550 UJ	NA
2,4-Dinitrophenol	840 UJ	23,000 UJ	NA	3,600 UL	1,200 UJ	1,700 UJ	1,900 UJ	2,300 UJ	1,400 UJ	NA
2,4-Dinitrotoluene	330 U	9,100 UJ	1,300 UL	1,400 U	480 UJ	670 UJ	760 UJ	930 UJ	550 UJ	NA
2,6-Dinitrotoluene	330 U	9,100 UJ	1,300 UL	1,400 U	480 UJ	670 UJ	760 UJ	930 UJ	550 UJ	NA
2-Chloronaphthalene	330 U	9,100 UJ	1,300 UL	1,400 U	480 UJ	670 UJ	760 UJ	930 UJ	550 UJ	NA
2-Chlorophenol	330 U	9,100 UJ	1,300 UL	1,400 UL	480 UJ	670 UJ	760 UJ	930 UJ	550 UJ	NA
2-Methylnaphthalene	330 U	9,100 UJ	1,300 UL	1,400 U	480 UJ	670 UJ	760 UJ	930 UJ	550 UJ	NA
2-Methylphenol	330 U	9,100 UJ	1,300 UL	1,400 UL	480 UJ	670 UJ	760 UJ	930 UJ	550 UJ	NA
2-Nitroaniline	840 U	23,000 UJ	3,300 UL	3,600 U	1,200 UJ	1,700 UJ	1,900 UJ	2,300 UJ	1,400 UJ	NA
2-Nitrophenol	330 U	9,100 UJ	1,300 UL	1,400 UL	480 UJ	670 UJ	760 UJ	930 UJ	550 UJ	NA
3,3'-Dichlorobenzidine	330 U	9,100 UJ	1,300 UL	1,400 U	480 UJ	670 UJ	760 UJ	930 UJ	550 UJ	NA
3- and 4-Methylphenol	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3-Nitroaniline	840 U	23,000 UJ	3,300 UL	3,600 U	1,200 UJ	1,700 UJ	1,900 UJ	2,300 UJ	1,400 UJ	NA
4,6-Dinitro-2-methylphenol	840 U	23,000 UJ	3,300 UL	3,600 UL	1,200 UJ	1,700 UJ	1,900 UJ	2,300 UJ	1,400 UJ	NA
4-Bromophenyl-phenylether	330 U	9,100 UJ	1,300 UL	1,400 U	480 UJ	670 UJ	760 UJ	930 UJ	550 UJ	NA
4-Chloro-3-methylphenol	330 U	9,100 UJ	1,300 UL	1,400 UL	480 UJ	670 UJ	760 UJ	930 UJ	550 UJ	NA
4-Chloroaniline	330 U	9,100 UJ	1,300 UL	1,400 U	480 UJ	670 UJ	760 UJ	930 UJ	550 UJ	NA

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N - Tentative identification
NA - Not analyzed
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Table G-5
Sediment Analytical Results at Site 2
St. Juliens Annex
Chesapeake, Virginia

Station ID	SJS02-SD01	SJS02-SD02	SJS02-SD03		SJS02-SD04	SJS02-SD05	SJS02-SD06	SJS02-SD07	SJS02-SD08	
Sample ID	SJS02-SD01-000	SJS02-SD02-000	SJS02-SD03-000	SJS02-SD03-000P	SJS02-SD04-001	SJS02-SD05-001	SJS02-SD06-001	SJS02-SD07-001	SJS02-SD08-001	SJS02-SD08-00
Sample Date	07/14/97	07/14/97	06/26/97	06/26/97	04/16/99	04/16/99	04/16/99	04/16/99	04/14/99	10/27/99
Chemical Name										
4-Chlorophenyl-phenylether	330 U	9,100 UJ	1,300 UL	1,400 U	480 UJ	670 UJ	760 UJ	930 UJ	550 UJ	NA
4-Methylphenol	330 U	9,100 UJ	1,300 UL	1,400 UL	480 UJ	670 UJ	760 UJ	930 UJ	550 UJ	NA
4-Nitroaniline	840 U	23,000 UJ	3,300 UL	3,600 U	1,200 UJ	1,700 UJ	1,900 UJ	2,300 UJ	1,400 UJ	NA
4-Nitrophenol	840 U	23,000 UJ	3,300 UL	3,600 UL	1,200 UJ	1,700 UJ	1,900 UJ	2,300 UJ	1,400 UJ	NA
Acenaphthene	330 U	9,100 UJ	1,300 UL	1,400 U	480 UJ	670 UJ	760 UJ	930 UJ	550 UJ	NA
Acenaphthylene	330 U	9,100 UJ	1,300 UL	1,400 U	480 UJ	670 UJ	760 UJ	930 UJ	550 UJ	NA
Acetophenone	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Anthracene	330 U	9,100 UJ	130 L	1,400 U	480 UJ	170 J	100 J	930 UJ	550 UJ	NA
Atrazine	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzaldehyde	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)anthracene	87 J	9,100 UJ	440 L	240 J	480 UJ	1,300 J	380 J	930 UJ	86 J	160
Benzo(a)pyrene	79 J	9,100 UJ	660 L	370 J	480 UJ	910 J	360 J	930 UJ	91 J	100
Benzo(b)fluoranthene	160 J	1,200 J	1,300 L	740 J	480 UJ	1,200 J	460 J	930 UJ	170 J	260
Benzo(g,h,i)perylene	86 J	9,100 UJ	580 L	310 J	480 UJ	690 J	230 J	930 UJ	83 J	130
Benzo(k)fluoranthene	59 J	9,100 UJ	440 L	470 J	480 UJ	420 J	170 J	930 UJ	77 J	130
Butylbenzylphthalate	47 J	9,100 UJ	1,300 UL	1,400 U	480 UJ	670 UJ	760 UJ	930 UJ	550 UJ	NA
Caprolactam	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Carbazole	330 U	9,100 UJ	1,300 UL	1,400 U	480 UJ	670 UJ	760 UJ	930 UJ	550 UJ	NA
Chrysene	130 J	9,100 UJ	680 L	330 J	480 UJ	1,400 J	360 J	930 UJ	120 J	550
Di-n-butylphthalate	41 B	9,100 UJ	1,300 UL	1,400 U	480 UJ	89 J	94 J	930 UJ	550 UJ	NA
Di-n-octylphthalate	330 U	9,100 UJ	1,300 UL	1,400 U	480 UJ	670 UJ	760 UJ	930 UJ	550 UJ	NA
Dibenz(a,h)anthracene	330 U	9,100 UJ	1,300 UL	1,400 U	480 UJ	670 UJ	760 UJ	930 UJ	550 UJ	NA
Dibenzofuran	330 U	9,100 UJ	1,300 UL	1,400 U	480 UJ	670 UJ	760 UJ	930 UJ	550 UJ	NA
Diethylphthalate	330 U	9,100 UJ	250 L	1,400 U	480 UJ	670 UJ	760 UJ	930 UJ	550 UJ	100
Dimethyl phthalate	330 U	9,100 UJ	1,300 UL	1,400 U	480 UJ	670 UJ	760 UJ	930 UJ	550 UJ	NA
Fluoranthene	330 U	930 J	850 L	510 J	480 UJ	2,200 J	880 J	930 UJ	150 J	240
Fluorene	330 U	9,100 UJ	1,300 UL	1,400 U	480 UJ	79 J	760 UJ	930 UJ	550 UJ	NA
Hexachlorobenzene	330 U	9,100 UJ	1,300 UL	1,400 U	480 UJ	670 UJ	760 UJ	930 UJ	550 UJ	NA
Hexachlorobutadiene	330 U	9,100 UJ	1,300 UL	1,400 U	480 UJ	670 UJ	760 UJ	930 UJ	550 UJ	NA
Hexachlorocyclopentadiene	330 UJ	9,100 UJ	1,300 UL	1,400 U	480 UJ	670 UJ	760 UJ	930 UJ	550 UJ	NA
Hexachloroethane	330 U	9,100 UJ	1,300 UL	1,400 U	480 UJ	670 UJ	760 UJ	930 UJ	550 UJ	NA
Indeno(1,2,3-cd)pyrene	84 J	9,100 UJ	530 L	260 J	480 UJ	500 J	180 J	930 UJ	78 J	100
Isophorone	330 U	9,100 UJ	1,300 UL	1,400 U	480 UJ	670 UJ	760 UJ	930 UJ	550 UJ	NA
Naphthalene	330 U	9,100 UJ	1,300 UL	1,400 U	480 UJ	670 UJ	760 UJ	930 UJ	550 UJ	NA
Nitrobenzene	330 U	9,100 UJ	1,300 UL	1,400 U	480 UJ	670 UJ	760 UJ	930 UJ	550 UJ	NA
Pentachlorophenol	840 U	23,000 UJ	3,300 UL	3,600 UL	1,200 UJ	1,700 UJ	1,900 UJ	2,300 UJ	1,400 UJ	NA
Phenanthrene	47 J	9,100 UJ	190 L	1,400 U	480 UJ	1,100 J	530 J	930 UJ	550 UJ	160
Phenol	330 U	9,100 UJ	1,300 UL	1,400 UL	480 UJ	670 UJ	760 UJ	930 UJ	550 UJ	NA
Pyrene	230 J	1,200 J	1,100 L	600 J	48 J	3,100 J	850 J	930 UJ	130 J	230
bis(2-Chloroethoxy)methane	330 U	9,100 UJ	1,300 UL	1,400 U	480 UJ	670 UJ	760 UJ	930 UJ	550 UJ	NA

B - Not detected above associated blank
I - Ether interference
J - Estimated
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L - May be biased low

N - Tentative identification
NA - Not analyzed
R - Unreliable result
U - Not detected

Table G-5
Sediment Analytical Results at Site 2
St. Juliens Annex
Chesapeake, Virginia

Station ID	SJS02-SD01	SJS02-SD02	SJS02-SD03		SJS02-SD04	SJS02-SD05	SJS02-SD06	SJS02-SD07	SJS02-SD08	
Sample ID	SJS02-SD01-000	SJS02-SD02-000	SJS02-SD03-000	SJS02-SD03-000P	SJS02-SD04-001	SJS02-SD05-001	SJS02-SD06-001	SJS02-SD07-001	SJS02-SD08-001	SJS02-SD08-00
Sample Date	07/14/97	07/14/97	06/26/97	06/26/97	04/16/99	04/16/99	04/16/99	04/16/99	04/14/99	10/27/99
Chemical Name										
bis(2-Chloroethyl)ether	330 U	9,100 UJ	1,300 UL	1,400 U	480 UJ	670 UJ	760 UJ	930 UJ	550 UJ	NA
bis(2-Ethylhexyl)phthalate	49 B	9,100 UJ	360 B	230 B	480 UJ	160 J	170 J	930 UJ	550 UJ	110
n-Nitroso-di-n-propylamine	330 U	9,100 UJ	1,300 UL	1,400 U	480 UJ	670 UJ	760 UJ	930 UJ	550 UJ	NA
n-Nitrosodiphenylamine	330 U	9,100 UJ	1,300 UL	1,400 U	480 UJ	670 UJ	760 UJ	930 UJ	550 UJ	NA
Pesticide/Polychlorinated Biphenyls (UG/KG)										
4,4'-DDD	3.7 J	310 J	NA	210	110 R	620 J	980 J	NA	12 J	91
4,4'-DDE	7.5 J	71 J	130 J	110 J	13 J	61 J	70 J	34 J	3.80 J	NA
4,4'-DDT	9.3	28 J	12 U	8.8 J	25 J	73 J	3,200 J	12 J	3.40 J	NA
Aldrin	1.7 U	5.4 UJ	6 U	6.8 U	2.40 UJ	3.30 UJ	3.70 UJ	4.60 UJ	2.70 UJ	NA
Aroclor-1016	33 U	110 UJ	120 U	130 U	47 UJ	65 UJ	75 UJ	93 UJ	54 UJ	NA
Aroclor-1221	67 U	210 UJ	240 U	270 U	95 UJ	130 UJ	150 UJ	190 UJ	110 UJ	NA
Aroclor-1232	33 U	110 UJ	120 U	130 U	47 UJ	65 UJ	75 UJ	93 UJ	54 UJ	NA
Aroclor-1242	33 U	110 UJ	120 U	130 U	47 UJ	65 UJ	75 UJ	93 UJ	54 UJ	NA
Aroclor-1248	33 U	110 UJ	120 U	130 U	47 UJ	65 UJ	75 UJ	93 UJ	54 UJ	NA
Aroclor-1254	33 U	110 J	120 U	130 U	47 UJ	65 UJ	75 UJ	93 UJ	54 UJ	NA
Aroclor-1260	33 U	110 UJ	120 U	69 J	47 UJ	65 UJ	75 UJ	93 UJ	54 UJ	NA
Dieldrin	3.3 U	11 UJ	36	30 J	4.70 UJ	6.5 UJ	7.5 UJ	9.30 UJ	5.40 UJ	NA
Endosulfan I	1.7 U	5.4 UJ	6 U	6.8 U	2.40 UJ	3.30 UJ	3.70 UJ	4.60 UJ	2.70 UJ	NA
Endosulfan II	3.3 U	11 UJ	12 U	13 U	4.70 UJ	6.5 UJ	7.5 UJ	9.30 UJ	5.40 UJ	NA
Endosulfan sulfate	3.3 U	11 UJ	12 U	13 U	4.70 UJ	6.5 UJ	7.5 UJ	9.30 UJ	5.40 UJ	NA
Endrin	3.3 U	11 UJ	12 U	13 U	4.70 UJ	6.5 UJ	7.5 UJ	9.30 UJ	5.40 UJ	NA
Endrin aldehyde	3.3 U	11 UJ	12 U	13 U	4.70 UJ	6.5 UJ	7.5 UJ	9.30 UJ	5.40 UJ	NA
Endrin ketone	3.3 U	11 UJ	12 U	13 U	4.70 UJ	6.5 UJ	7.5 UJ	9.30 UJ	5.40 UJ	NA
Heptachlor	1.7 U	5.4 UJ	6 U	6.8 U	2.40 UJ	3.30 UJ	3.70 UJ	4.60 UJ	2.70 UJ	NA
Heptachlor epoxide	1.7 U	5.4 UJ	6 U	6.8 U	2.40 UJ	3.30 UJ	3.70 UJ	4.60 UJ	2.70 UJ	NA
Methoxychlor	17 U	54 UJ	60 U	68 U	24 UJ	33 UJ	37 UJ	46 UJ	27 UJ	NA
Toxaphene	170 U	540 UJ	600 U	680 U	240 UJ	330 UJ	370 UJ	460 UJ	270 UJ	NA
alpha-BHC	1.7 U	5.4 UJ	6 U	6.8 U	2.40 UJ	3.30 UJ	3.70 UJ	4.60 UJ	2.70 UJ	NA
alpha-Chlordane	1.7 U	7.3 J	28	18	2.40 UJ	79 J	40 J	7.70 J	0.820 J	NA
beta-BHC	1.7 U	5.4 UJ	6 U	6.8 U	2.40 UJ	3.30 UJ	3.70 UJ	4.60 UJ	2.70 UJ	NA
delta-BHC	1.7 U	5.4 UJ	6 U	6.8 U	2.40 UJ	3.30 UJ	3.70 UJ	4.60 UJ	2.70 UJ	NA
gamma-BHC (Lindane)	1.7 U	5.4 UJ	6 U	6.8 U	2.40 UJ	3.30 UJ	3.70 UJ	4.60 UJ	2.70 UJ	NA
gamma-Chlordane	1.7 U	9.8 J	29 J	21 J	2.40 UJ	96 J	58 J	12 J	1.5 J	NA
Dioxin/Furans (UG/KG)										
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,6,7,8-Heptachlorodibenzofuran	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,7,8,9-Heptachlorodibenzofuran	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

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Table G-5
Sediment Analytical Results at Site 2
St. Juliens Annex
Chesapeake, Virginia

Station ID	SJS02-SD01	SJS02-SD02	SJS02-SD03		SJS02-SD04	SJS02-SD05	SJS02-SD06	SJS02-SD07	SJS02-SD08	
Sample ID	SJS02-SD01-000	SJS02-SD02-000	SJS02-SD03-000	SJS02-SD03-000P	SJS02-SD04-001	SJS02-SD05-001	SJS02-SD06-001	SJS02-SD07-001	SJS02-SD08-001	SJS02-SD08-00
Sample Date	07/14/97	07/14/97	06/26/97	06/26/97	04/16/99	04/16/99	04/16/99	04/16/99	04/14/99	10/27/99
Chemical Name										
1,2,3,4,7,8-Hexachlorodibenzofuran	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,6,7,8-Hexachlorodibenzofuran	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,7,8,9-Hexachlorodibenzofuran	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,7,8-Pentachlorodibenzofuran	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,3,4,6,7,8-Hexachlorodibenzofuran	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,3,4,7,8-Pentachlorodibenzofuran	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,3,7,8-TCDD (dioxin)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,3,7,8-Tetrachlorodibenzofuran	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total heptachlorodibenzo-p-dioxin	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total heptachlorodibenzofuran	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total hexachlorodibenzo-p-dioxin	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total hexachlorodibenzofuran	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total octachlorodibenzo-p-dioxin	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total octachlorodibenzofuran	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total pentachlorodibenzo-p-dioxin	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total pentachlorodibenzofuran	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total tetrachlorodibenzo-p-dioxin	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total tetrachlorodibenzofuran	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nitramines (UG/KG)										
1,3,5-Trinitrobenzene	540 U	NA	2,000 U	2,200 U	250 U	238 U	238 U	250 U	250 U	240
1,3-Dinitrobenzene	540 U	NA	2,000 U	2,200 U	250 U	238 U	238 U	250 U	250 U	240
2,4,6-Trinitrotoluene	540 U	NA	2,000 U	2,200 U	250 U	238 U	238 U	250 U	250 U	240
2,4-Dinitrotoluene	NA	NA	NA	NA	250 U	238 U	238 U	250 U	250 U	240
2,6-Dinitrotoluene	NA	NA	NA	NA	250 U	238 U	238 U	250 U	250 U	240
2-Amino-4,6-dinitrotoluene	540 U	NA	2,000 U	2,200 U	250 U	238 U	238 U	250 U	250 U	240
2-Nitrotoluene	540 U	NA	2,000 U	2,200 U	500 U	476 U	476 U	500 U	500 U	480
3-Nitrotoluene	540 U	NA	2,000 U	2,200 U	500 U	476 U	476 U	500 U	500 U	480
4-Amino-2,6-dinitrotoluene	540 U	NA	2,000 U	2,200 U	250 U	238 U	238 U	250 U	250 U	240
4-Nitrotoluene	540 U	NA	2,000 U	2,200 U	500 U	476 U	476 U	500 U	500 U	480
HMX	540 U	NA	2,000 U	2,200 U	500 U	476 U	476 U	500 U	500 U	480
Nitrobenzene	NA	NA	NA	NA	250 U	238 U	238 U	250 U	250 U	240
RDX	540 U	NA	2,000 U	2,200 U	500 U	476 U	476 U	500 U	500 U	480
Tetryl	540 U	NA	2,000 U	2,200 U	500 U	476 U	476 U	500 U	500 U	480
Total Metals (MG/KG)										
Aluminum	3,100	10,900	27,200	25,900	1,500	9,360	9,600	20,200	4,100	5,020

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Sediment Analytical Results at Site 2
St. Juliens Annex
Chesapeake, Virginia

Station ID	SJS02-SD01	SJS02-SD02	SJS02-SD03		SJS02-SD04	SJS02-SD05	SJS02-SD06	SJS02-SD07	SJS02-SD08	
Sample ID	SJS02-SD01-000	SJS02-SD02-000	SJS02-SD03-000	SJS02-SD03-000P	SJS02-SD04-001	SJS02-SD05-001	SJS02-SD06-001	SJS02-SD07-001	SJS02-SD08-001	SJS02-SD08-00
Sample Date	07/14/97	07/14/97	06/26/97	06/26/97	04/16/99	04/16/99	04/16/99	04/16/99	04/14/99	10/27/99
Chemical Name										
Antimony	0.42 UL	3.3 B	16.3 L	27.6 L	0.400 UL	1.20 L	1.80 L	1.70 L	0.650 U	0.75
Arsenic	2.3	5.4 K	13.1	19.4	1.60 K	7.5 K	9.60 K	12 K	3.5	4.7
Barium	15.4 J	55.7 J	84.7 J	109 J	4.10 J	102	89.3	79.4 J	15.2 J	26
Beryllium	0.21 U	1.1 B	0.87 J	1.1 J	0.0700 J	0.590 J	0.620 J	0.900 J	0.300 J	0.370
Cadmium	0.14 J	4	2.5 J	2.1 J	0.530 J	8.20	7.30	4.60	1.10 J	1.5
Calcium	393 J	2,300 J	24,300 J	11,600 J	207 J	6,230	4,300	2,390 J	1,640	1,100
Chromium	6.5	277	1,640	2,630	11.6	1,180	1,900	392	67.1	84.1
Cobalt	1.67 U	4.06 U	9.1 J	10.7 J	0.660 J	5.10 J	6 J	7.80 J	2.40 J	2.80
Copper	4.4 J	344	1,700	2,620	18.2	1,200	2,030	494	94.8	115
Cyanide	0.54 U	1.4 U	2.1 U	2 U	0.584	0.417 U	0.524 U	0.549 U	1.80 L	0.400
Iron	3,150	18,500	31,100	30,700	2,050	12,700	18,100	28,000	8,630	9,520
Lead	15.5	161	396	545	14.9	312	366	250	54.2	64.8
Magnesium	309 J	4,710	6,890 J	6,480 J	364 J	3,710	2,950	4,970	1,680	2,090
Manganese	16 K	105	235	224	8.30 K	174 K	204 K	148 K	51.6	58.2
Mercury	0.05 U	0.45	0.72	0.79	0.0400 J	0.620	0.470	0.690	0.220	0.25
Nickel	1.8 B	16.4 K	41.5	40.9	2 J	32.6	35.9	29.1	7.10 J	8.60
Potassium	228 J	2,000 J	3,830	3,380 J	207 J	1,270 J	1,280	3,050	734 J	744
Selenium	0.63 UL	1.52 U	2.27 U	2.22 U	0.390 U	0.770 U	0.710 K	1.5 K	0.630 U	0.840
Silver	0.21 U	0.51 U	1.8 B	1.5 B	0.130 U	0.680 J	0.770 J	0.870 J	0.220 U	0.25
Sodium	33.7 B	11,800	17,800	16,300	1,040	3,830	4,820	9,550	3,280	2,320
Thallium	0.42 U	1.02 U	1.52 U	2.2 K	0.480 U	0.950 U	0.760 U	1.70 U	0.770 U	1.40
Vanadium	7.2 J	28.8	115	97.9	5 J	53	96.5	62.7	12.4	14.4
Zinc	19.2	416	1,140 L	1,400 L	42.8	888	1,120	539	173	203
Wet Chemistry										
% Solids	NA	NA	NA	NA	70.5	50.4	44.2	35.6	61.2	NA
Phosphorus (MG/KG)	10.5	13.5	19.1	20.2	102	370	177	164	NA	NA
Total organic carbon (TOC) (MG/KG)	2,050	44,000	71,000 L	64,600 L	2,270	41,900	35,000	57,200	24,400	NA
pH	NA	NA	NA	NA	7.49	7.45	7.39	7.20	7.37	NA

Shaded cells indicate analyte detections

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Sediment Analytical Results at Site 2
St. Juliens Annex
Chesapeake, Virginia

Station ID		SJS02-SD09	SJS02-SD10	SJS02-SD11	SJS02-SD12	SJS02-SD13	SJS02-SD14
Sample ID	2	SJS02-SD09	SJS02-SD10	SJS02-SD11	SJS02-SD12	SJS02-SD13	SJS02-SD14
Sample Date		07/18/01	07/18/01	07/18/01	07/18/01	07/18/01	07/18/01
Chemical Name							
Volatile Organic Compounds (UG/KG)							
1,1,1-Trichloroethane	U	3.6 B	NA	NA	NA	NA	NA
1,1,2,2-Tetrachloroethane	U	13 U	NA	NA	NA	NA	NA
1,1,2-Trichloro-1,2,2-trifluoroethane(Freon-113)		13 U	NA	NA	NA	NA	NA
1,1,2-Trichloroethane	U	13 U	NA	NA	NA	NA	NA
1,1-Dichloroethane	U	13 U	NA	NA	NA	NA	NA
1,1-Dichloroethene	U	13 U	NA	NA	NA	NA	NA
1,2,4-Trichlorobenzene		13 U	NA	NA	NA	NA	NA
1,2-Dibromo-3-chloropropane		13 U	NA	NA	NA	NA	NA
1,2-Dibromoethane		13 U	NA	NA	NA	NA	NA
1,2-Dichlorobenzene		13 U	NA	NA	NA	NA	NA
1,2-Dichloroethane	U	13 U	NA	NA	NA	NA	NA
1,2-Dichloroethene (total)	U	NA	NA	NA	NA	NA	NA
1,2-Dichloropropane	U	13 U	NA	NA	NA	NA	NA
1,3-Dichlorobenzene		13 U	NA	NA	NA	NA	NA
1,4-Dichlorobenzene		13 U	NA	NA	NA	NA	NA
2-Butanone	U	13 U	NA	NA	NA	NA	NA
2-Hexanone	U	13 U	NA	NA	NA	NA	NA
4-Methyl-2-pentanone	U	13 U	NA	NA	NA	NA	NA
Acetone		13 U	NA	NA	NA	NA	NA
Benzene	U	13 U	NA	NA	NA	NA	NA
Bromodichloromethane	U	13 U	NA	NA	NA	NA	NA
Bromoform	U	13 U	NA	NA	NA	NA	NA
Bromomethane	U	6.3 J	NA	NA	NA	NA	NA
Carbon disulfide	J	13 U	NA	NA	NA	NA	NA
Carbon tetrachloride	U	13 U	NA	NA	NA	NA	NA
Chlorobenzene	U	13 U	NA	NA	NA	NA	NA
Chloroethane	U	13 U	NA	NA	NA	NA	NA
Chloroform	U	13 U	NA	NA	NA	NA	NA
Chloromethane	U	13 U	NA	NA	NA	NA	NA
Cumene		13 U	NA	NA	NA	NA	NA
Cyclohexane		13 U	NA	NA	NA	NA	NA
Dibromochloromethane	U	13 U	NA	NA	NA	NA	NA
Dichlorodifluoromethane(Freon-12)		13 UJ	NA	NA	NA	NA	NA
Ethylbenzene	U	13 U	NA	NA	NA	NA	NA
Methyl acetate		13 U	NA	NA	NA	NA	NA
Methyl-tert-butyl ether (MTBE)		13 U	NA	NA	NA	NA	NA
Methylcyclohexane		13 U	NA	NA	NA	NA	NA
Methylene chloride	B	6.3 B	NA	NA	NA	NA	NA

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Station ID		SJS02-SD09	SJS02-SD10	SJS02-SD11	SJS02-SD12	SJS02-SD13	SJS02-SD14
Sample ID	2	SJS02-SD09	SJS02-SD10	SJS02-SD11	SJS02-SD12	SJS02-SD13	SJS02-SD14
Sample Date		07/18/01	07/18/01	07/18/01	07/18/01	07/18/01	07/18/01
Chemical Name							
Styrene	U	13 U	NA	NA	NA	NA	NA
Tetrachloroethene	U	13 U	NA	NA	NA	NA	NA
Toluene	U	13 U	NA	NA	NA	NA	NA
Trichloroethene	U	13 U	NA	NA	NA	NA	NA
Trichlorofluoromethane(Freon-11)		13 UJ	NA	NA	NA	NA	NA
Vinyl chloride	U	13 U	NA	NA	NA	NA	NA
Xylene, total	U	13 U	NA	NA	NA	NA	NA
cis-1,2-Dichloroethene		13 U	NA	NA	NA	NA	NA
cis-1,3-Dichloropropene	U	13 U	NA	NA	NA	NA	NA
o-Xylene		13 U	NA	NA	NA	NA	NA
trans-1,2-Dichloroethene		13 U	NA	NA	NA	NA	NA
trans-1,3-Dichloropropene	U	13 U	NA	NA	NA	NA	NA
Semi-volatile Organic Compounds (UG/KG)							
1,1-Biphenyl		440 U	NA	NA	NA	NA	NA
1,2,4-Trichlorobenzene		NA	NA	NA	NA	NA	NA
1,2-Dichlorobenzene		NA	NA	NA	NA	NA	NA
1,3-Dichlorobenzene		NA	NA	NA	NA	NA	NA
1,4-Dichlorobenzene		NA	NA	NA	NA	NA	NA
2,2'-Oxybis(1-chloropropane)		440 U	NA	NA	NA	NA	NA
2,4,5-Trichlorophenol		1,100 U	NA	NA	NA	NA	NA
2,4,6-Trichlorophenol		440 U	NA	NA	NA	NA	NA
2,4-Dichlorophenol		440 U	NA	NA	NA	NA	NA
2,4-Dimethylphenol		440 U	NA	NA	NA	NA	NA
2,4-Dinitrophenol		1,100 U	NA	NA	NA	NA	NA
2,4-Dinitrotoluene		440 U	NA	NA	NA	NA	NA
2,6-Dinitrotoluene		440 U	NA	NA	NA	NA	NA
2-Chloronaphthalene		440 U	NA	NA	NA	NA	NA
2-Chlorophenol		440 U	NA	NA	NA	NA	NA
2-Methylnaphthalene		440 U	NA	NA	NA	NA	NA
2-Methylphenol		440 U	NA	NA	NA	NA	NA
2-Nitroaniline		1,100 U	NA	NA	NA	NA	NA
2-Nitrophenol		440 U	NA	NA	NA	NA	NA
3,3'-Dichlorobenzidine		440 U	NA	NA	NA	NA	NA
3- and 4-Methylphenol		440 U	NA	NA	NA	NA	NA
3-Nitroaniline		1,100 U	NA	NA	NA	NA	NA
4,6-Dinitro-2-methylphenol		1,100 U	NA	NA	NA	NA	NA
4-Bromophenyl-phenylether		440 U	NA	NA	NA	NA	NA
4-Chloro-3-methylphenol		440 U	NA	NA	NA	NA	NA
4-Chloroaniline		440 U	NA	NA	NA	NA	NA

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Station ID		SJS02-SD09	SJS02-SD10	SJS02-SD11	SJS02-SD12	SJS02-SD13	SJS02-SD14
Sample ID	2	SJS02-SD09	SJS02-SD10	SJS02-SD11	SJS02-SD12	SJS02-SD13	SJS02-SD14
Sample Date		07/18/01	07/18/01	07/18/01	07/18/01	07/18/01	07/18/01
Chemical Name							
4-Chlorophenyl-phenylether		440 U	NA	NA	NA	NA	NA
4-Methylphenol		NA	NA	NA	NA	NA	NA
4-Nitroaniline		1,100 U	NA	NA	NA	NA	NA
4-Nitrophenol		1,100 U	NA	NA	NA	NA	NA
Acenaphthene		440 U	NA	NA	NA	NA	NA
Acenaphthylene		440 U	NA	NA	NA	NA	NA
Acetophenone		440 U	NA	NA	NA	NA	NA
Anthracene		440 U	NA	NA	NA	NA	NA
Atrazine		440 U	NA	NA	NA	NA	NA
Benzaldehyde		440 U	NA	NA	NA	NA	NA
Benzo(a)anthracene	L	100 J	NA	NA	NA	NA	NA
Benzo(a)pyrene	L	100 J	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	L	110 J	NA	NA	NA	NA	NA
Benzo(g,h,i)perylene	L	440 U	NA	NA	NA	NA	NA
Benzo(k)fluoranthene	L	60 J	NA	NA	NA	NA	NA
Butylbenzylphthalate		440 U	NA	NA	NA	NA	NA
Caprolactam		440 U	NA	NA	NA	NA	NA
Carbazole		440 U	NA	NA	NA	NA	NA
Chrysene	L	120 J	NA	NA	NA	NA	NA
Di-n-butylphthalate		440 U	NA	NA	NA	NA	NA
Di-n-octylphthalate		440 U	NA	NA	NA	NA	NA
Dibenz(a,h)anthracene		440 U	NA	NA	NA	NA	NA
Dibenzofuran		440 U	NA	NA	NA	NA	NA
Diethylphthalate	L	440 U	NA	NA	NA	NA	NA
Dimethyl phthalate		440 U	NA	NA	NA	NA	NA
Fluoranthene	L	190 J	NA	NA	NA	NA	NA
Fluorene		440 U	NA	NA	NA	NA	NA
Hexachlorobenzene		440 U	NA	NA	NA	NA	NA
Hexachlorobutadiene		440 U	NA	NA	NA	NA	NA
Hexachlorocyclopentadiene		440 U	NA	NA	NA	NA	NA
Hexachloroethane		440 U	NA	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene	L	440 U	NA	NA	NA	NA	NA
Isophorone		440 U	NA	NA	NA	NA	NA
Naphthalene		440 U	NA	NA	NA	NA	NA
Nitrobenzene		440 U	NA	NA	NA	NA	NA
Pentachlorophenol		1,100 U	NA	NA	NA	NA	NA
Phenanthrene	L	150 J	NA	NA	NA	NA	NA
Phenol		440 U	NA	NA	NA	NA	NA
Pyrene	L	220 J	NA	NA	NA	NA	NA
bis(2-Chloroethoxy)methane		440 U	NA	NA	NA	NA	NA

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Station ID		SJS02-SD09	SJS02-SD10	SJS02-SD11	SJS02-SD12	SJS02-SD13	SJS02-SD14
Sample ID	2	SJS02-SD09	SJS02-SD10	SJS02-SD11	SJS02-SD12	SJS02-SD13	SJS02-SD14
Sample Date		07/18/01	07/18/01	07/18/01	07/18/01	07/18/01	07/18/01
Chemical Name							
bis(2-Chloroethyl)ether		440 U	NA	NA	NA	NA	NA
bis(2-Ethylhexyl)phthalate	L	660	NA	NA	NA	NA	NA
n-Nitroso-di-n-propylamine		440 U	NA	NA	NA	NA	NA
n-Nitrosodiphenylamine		440 U	NA	NA	NA	NA	NA
Pesticide/Polychlorinated Biphenyls (UG/KG)							
4,4'-DDD	L	57	NA	NA	NA	NA	NA
4,4'-DDE		5.7 J	NA	NA	NA	NA	NA
4,4'-DDT		23	NA	NA	NA	NA	NA
Aldrin		2.2 U	NA	NA	NA	NA	NA
Aroclor-1016		44 U	NA	NA	NA	NA	NA
Aroclor-1221		88 U	NA	NA	NA	NA	NA
Aroclor-1232		44 U	NA	NA	NA	NA	NA
Aroclor-1242		44 U	NA	NA	NA	NA	NA
Aroclor-1248		44 U	NA	NA	NA	NA	NA
Aroclor-1254		44 U	NA	NA	NA	NA	NA
Aroclor-1260		44 U	NA	NA	NA	NA	NA
Dieldrin		4.4 U	NA	NA	NA	NA	NA
Endosulfan I		2.2 U	NA	NA	NA	NA	NA
Endosulfan II		4.4 U	NA	NA	NA	NA	NA
Endosulfan sulfate		4.4 U	NA	NA	NA	NA	NA
Endrin		4.4 U	NA	NA	NA	NA	NA
Endrin aldehyde		4.4 U	NA	NA	NA	NA	NA
Endrin ketone		4.4 U	NA	NA	NA	NA	NA
Heptachlor		2.2 U	NA	NA	NA	NA	NA
Heptachlor epoxide		2.2 U	NA	NA	NA	NA	NA
Methoxychlor		22 U	NA	NA	NA	NA	NA
Toxaphene		220 U	NA	NA	NA	NA	NA
alpha-BHC		2.2 U	NA	NA	NA	NA	NA
alpha-Chlordane		2.2 U	NA	NA	NA	NA	NA
beta-BHC		2.2 U	NA	NA	NA	NA	NA
delta-BHC		2.2 U	NA	NA	NA	NA	NA
gamma-BHC (Lindane)		2.2 U	NA	NA	NA	NA	NA
gamma-Chlordane		2.2 U	NA	NA	NA	NA	NA
Dioxin/Furans (UG/KG)							
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin		0.42 J	0.13 J	0.34 J	0.016 J	0.19 J	0.094 J
1,2,3,4,6,7,8-Heptachlorodibenzofuran		0.23 J	0.056 J	0.087 J	0.0025 J	0.048 J	0.014 J
1,2,3,4,7,8,9-Heptachlorodibenzofuran		0.021 J	0.0044 J	0.0063 J	1.30E-04 UJ	0.0036 J	7.70E-04 J
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin		0.0085 J	0.0023 J	0.0051 J	3.00E-04 J	0.0029 J	0.0024 J

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N - Tentative identification
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U - Not detected

Table G-5
Sediment Analytical Results at Site 2
St. Juliens Annex
Chesapeake, Virginia

Station ID		SJS02-SD09	SJS02-SD10	SJS02-SD11	SJS02-SD12	SJS02-SD13	SJS02-SD14
Sample ID	2	SJS02-SD09	SJS02-SD10	SJS02-SD11	SJS02-SD12	SJS02-SD13	SJS02-SD14
Sample Date		07/18/01	07/18/01	07/18/01	07/18/01	07/18/01	07/18/01
Chemical Name							
1,2,3,4,7,8-Hexachlorodibenzofuran		0.025 J	0.0099 J	0.019 J	7.40E-04 J	0.0082 J	0.0049 I
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin		0.018 J	0.0058 J	0.015 J	6.00E-04 J	0.008 J	0.004 J
1,2,3,6,7,8-Hexachlorodibenzofuran		0.06 J	0.0064 I	0.0094 J	5.00E-04 J	0.0044 J	7.60E-04 J
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin		0.016 J	0.0047 J	0.013 J	0.0011 J	0.008 J	0.0047 J
1,2,3,7,8,9-Hexachlorodibenzofuran		0.002 J	1.00E-03 J	0.0023 J	1.50E-04 UJ	2.50E-04 UJ	4.00E-04 J
1,2,3,7,8-Pentachlorodibenzo-p-dioxin		0.0036 J	0.0012 J	0.0028 J	1.70E-04 UJ	0.0012 J	0.0012 J
1,2,3,7,8-Pentachlorodibenzofuran		0.0043 J	0.0011 J	0.0027 J	2.40E-04 UJ	0.0014 J	0.0011 J
2,3,4,6,7,8-Hexachlorodibenzofuran		0.0093 J	0.0033 J	0.0068 J	3.60E-04 J	0.0024 J	1.00E-03 J
2,3,4,7,8-Pentachlorodibenzofuran		0.007 J	0.003 J	0.0061 J	4.30E-04 J	0.002 J	0.0016 J
2,3,7,8-TCDD (dioxin)		5.80E-04 J	3.40E-04 J	9.60E-04 J	1.30E-04 UJ	4.30E-04 J	3.20E-04 J
2,3,7,8-Tetrachlorodibenzofuran		0.0082 NJ	0.0034 J	0.0097 J	7.10E-04 NJ	0.0032 J	0.0037 J
Total heptachlorodibenzo-p-dioxin		0.75 J	0.26 J	0.9 J	0.051 J	0.52 J	0.28 J
Total heptachlorodibenzofuran		0.25 J	0.15 J	0.26 J	0.0046 J	0.13 J	0.014 J
Total hexachlorodibenzo-p-dioxin		0.14 J	0.046 J	0.17 J	0.015 J	0.11 J	0.07 J
Total hexachlorodibenzofuran		0.3 J	0.091 J	0.19 J	0.0047 J	0.078 J	0.035 J
Total octachlorodibenzo-p-dioxin		3.2 J	1.6 J	4.4 J	0.66 J	1.9 J	1.1 J
Total octachlorodibenzofuran		0.58 J	0.074 J	0.12 J	0.003 B	0.058 J	0.021 J
Total pentachlorodibenzo-p-dioxin		0.011 J	0.0048 J	0.02 J	1.70E-04 UJ	0.0091 J	0.0097 J
Total pentachlorodibenzofuran		0.08 J	0.031 J	0.091 J	0.002 J	0.023 J	0.02 J
Total tetrachlorodibenzo-p-dioxin		0.0067 J	0.0032 J	0.0066 J	3.70E-04 J	0.005 J	0.0029 J
Total tetrachlorodibenzofuran		0.036 J	0.0056 J	0.024 J	0.0021 J	0.016 J	0.013 J
Nitramines (UG/KG)							
1,3,5-Trinitrobenzene	U	630 U	NA	NA	NA	NA	NA
1,3-Dinitrobenzene	U	630 U	NA	NA	NA	NA	NA
2,4,6-Trinitrotoluene	U	630 U	NA	NA	NA	NA	NA
2,4-Dinitrotoluene	U	630 U	NA	NA	NA	NA	NA
2,6-Dinitrotoluene	U	630 U	NA	NA	NA	NA	NA
2-Amino-4,6-dinitrotoluene	U	630 U	NA	NA	NA	NA	NA
2-Nitrotoluene	U	630 U	NA	NA	NA	NA	NA
3-Nitrotoluene	U	630 U	NA	NA	NA	NA	NA
4-Amino-2,6-dinitrotoluene	U	630 U	NA	NA	NA	NA	NA
4-Nitrotoluene	U	630 U	NA	NA	NA	NA	NA
HMX	U	630 U	NA	NA	NA	NA	NA
Nitrobenzene	U	630 U	NA	NA	NA	NA	NA
RDX	U	630 U	NA	NA	NA	NA	NA
Tetryl	U	630 U	NA	NA	NA	NA	NA
Total Metals (MG/KG)							
Aluminum		2,850	NA	NA	NA	NA	NA

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Table G-5
Sediment Analytical Results at Site 2
St. Juliens Annex
Chesapeake, Virginia

Station ID		SJS02-SD09	SJS02-SD10	SJS02-SD11	SJS02-SD12	SJS02-SD13	SJS02-SD14
Sample ID	2	SJS02-SD09	SJS02-SD10	SJS02-SD11	SJS02-SD12	SJS02-SD13	SJS02-SD14
Sample Date		07/18/01	07/18/01	07/18/01	07/18/01	07/18/01	07/18/01
Chemical Name							
Antimony	U	2.4	NA	NA	NA	NA	NA
Arsenic		4	NA	NA	NA	NA	NA
Barium	J	81.2	NA	NA	NA	NA	NA
Beryllium	J	0.3	NA	NA	NA	NA	NA
Cadmium		9.2	NA	NA	NA	NA	NA
Calcium	J	4,580	NA	NA	NA	NA	NA
Chromium		55.9	NA	NA	NA	NA	NA
Cobalt	J	4.3	NA	NA	NA	NA	NA
Copper		160	NA	NA	NA	NA	NA
Cyanide	U	NA	NA	NA	NA	NA	NA
Iron		6,470	NA	NA	NA	NA	NA
Lead		211	NA	NA	NA	NA	NA
Magnesium		1,370	NA	NA	NA	NA	NA
Manganese		125	NA	NA	NA	NA	NA
Mercury		0.39	NA	NA	NA	NA	NA
Nickel	J	8.3	NA	NA	NA	NA	NA
Potassium	J	403	NA	NA	NA	NA	NA
Selenium	U	1.3 U	NA	NA	NA	NA	NA
Silver	J	1.3 U	NA	NA	NA	NA	NA
Sodium		144	NA	NA	NA	NA	NA
Thallium	U	1.5 U	NA	NA	NA	NA	NA
Vanadium		14.9	NA	NA	NA	NA	NA
Zinc		405	NA	NA	NA	NA	NA
Wet Chemistry							
% Solids		NA	NA	NA	NA	NA	NA
Phosphorus (MG/KG)		NA	NA	NA	NA	NA	NA
Total organic carbon (TOC) (MG/KG)		NA	NA	NA	NA	NA	NA
pH		NA	NA	NA	NA	NA	NA

Shaded cells indicate analyte detections

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Table G-5
Surface Water Analytical Results at Site 2
St. Juliens Creek Annex
Chesapeake, Virginia

Station ID	SJS02-SW02		SJS02-SW03	SJS02-SW04	SJS02-SW05	SJS02-SW06	SJS02-SW07		SJS02-SW08
Sample ID	SJS02-SW02-000	SJS02-SW02-000P	SJS02-SW03-001	SJS02-SW04-001	SJS02-SW05-001	SJS02-SW06-001	SJS02-SW07-001	SJS02-SW08-001	SJS02-SW08-001P
Sample Date	07/14/97	07/14/97	04/13/99	04/16/99	04/16/99	04/16/99	04/16/99	04/14/99	04/14/99
Chemical Name									
Volatile Organic Compounds (UG/L)									
1,1,1-Trichloroethane	10 U	10 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,1,2,2-Tetrachloroethane	10 U	10 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,1,2-Trichloro-1,2,2-trifluoroethane(Freon-113)	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1,2-Trichloroethane	10 U	10 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,1-Dichloroethane	10 U	10 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,1-Dichloroethene	10 U	10 U	0.300 J	0.700 J	1 U	1 U	1 U	1 U	1 U
1,2,4-Trichlorobenzene	NA	NA	1 U	0.100 J	1 U	1 U	1 U	1 U	0.400 J
1,2-Dibromo-3-chloropropane	NA	NA	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,2-Dibromoethane	NA	NA	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,2-Dichlorobenzene	NA	NA	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,2-Dichloroethane	10 U	10 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,2-Dichloroethene (total)	10 U	10 U	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloropropane	10 U	10 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,3-Dichlorobenzene	NA	NA	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,4-Dichlorobenzene	NA	NA	1 U	1 U	1 U	1 U	1 U	1 U	1 U
2-Butanone	10 U	10 U	5 U	NA	NA	NA	NA	5 U	5 U
2-Hexanone	10 U	10 U	5 UJ	5 UJ	5 UJ	5 UJ	5 UJ	5 UJ	5 UJ
4-Methyl-2-pentanone	10 U	10 U	5 UJ	5 UJ	5 UJ	5 UJ	5 UJ	5 UJ	5 UJ
Acetone	10 U	10 U	NA	5 U	NA	NA	NA	NA	NA
Benzene	10 U	10 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Bromochloromethane	NA	NA	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Bromodichloromethane	10 U	10 U	1 U	1 U	0.800 J	1.30	1 U	1 U	1 U
Bromoform	10 U	10 U	1 U	1 U	1 U	1 U	0.400 J	0.800 J	0.800 J
Bromomethane	10 U	10 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Carbon disulfide	10 U	10 U	2.30 J	1.20 B	0.700 B	1.60 B	2.60 B	9.30	10.3
Carbon tetrachloride	10 U	10 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Chlorobenzene	10 U	10 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Chloroethane	10 U	10 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Chloroform	10 U	10 U	1 U	1 U	3.5	5.40	1 U	1 U	1 U
Chloromethane	10 U	10 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Cumene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cyclohexane	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibromochloromethane	10 U	10 U	1 U	1 U	0.200 J	0.300 J	1 U	1 U	1 U
Dichlorodifluoromethane(Freon-12)	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ethylbenzene	10 U	10 U	1 U	1 U	1 U	1 U	1 U	0.100 J	0.200 J
Methyl acetate	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methyl-tert-butyl ether (MTBE)	NA	NA	NA	NA	NA	NA	NA	NA	NA

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Table G-5
Surface Water Analytical Results at Site 2
St. Juliens Creek Annex
Chesapeake, Virginia

Station ID	SJS02-SW02		SJS02-SW03	SJS02-SW04	SJS02-SW05	SJS02-SW06	SJS02-SW07		SJS02-SW08
Sample ID	SJS02-SW02-000	SJS02-SW02-000P	SJS02-SW03-001	SJS02-SW04-001	SJS02-SW05-001	SJS02-SW06-001	SJS02-SW07-001	SJS02-SW08-001	SJS02-SW08-001P
Sample Date	07/14/97	07/14/97	04/13/99	04/16/99	04/16/99	04/16/99	04/16/99	04/14/99	04/14/99
Chemical Name									
Methylcyclohexane	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methylene chloride	8 B	9 B	0.5 B	1 B	1 B	1.10 B	1 B	2 U	2 U
Styrene	10 U	10 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Tetrachloroethene	10 U	10 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Toluene	10 U	10 U	1 U	0.300 B	1 U	0.300 B	0.300 B	1.20 B	0.800 B
Trichloroethene	10 U	10 U	5.60	23.5	38.2	59.2	0.300 B	1 U	0.300 J
Trichlorofluoromethane(Freon-11)	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vinyl chloride	10 U	10 U	7.5	21.9	1.40	1.80	1 U	1 U	1 U
Xylene, total	10 U	10 U	1 U	1 U	1 U	1 U	1 U	0.5 J	0.800 J
cis-1,2-Dichloroethene	NA	NA	18.4	78.6	10.7	16.1	0.200 J	1 U	1 U
cis-1,3-Dichloropropene	10 U	10 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
o-Xylene	NA	NA	NA	NA	NA	NA	NA	NA	NA
trans-1,2-Dichloroethene	NA	NA	0.300 J	0.5 J	0.200 J	0.200 J	1 U	1 U	1 U
trans-1,3-Dichloropropene	10 U	10 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Semi-volatile Organic Compounds (UG/L)									
1,1-Biphenyl	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,4-Trichlorobenzene	10 U	10 U	11 U	11 U	11 U	11 U	11 U	10 U	11 U
1,2-Dichlorobenzene	10 U	10 U	11 U	11 U	11 U	11 U	11 U	10 U	11 U
1,3-Dichlorobenzene	10 U	10 U	11 U	11 U	11 U	11 U	11 U	10 U	11 U
1,4-Dichlorobenzene	10 U	10 U	11 U	11 U	11 U	11 U	11 U	10 U	11 U
2,2'-Oxybis(1-chloropropane)	10 U	10 U	11 U	11 U	11 U	11 U	11 U	10 U	11 U
2,4,5-Trichlorophenol	25 U	25 U	28 U	28 U	28 U	29 U	28 U	26 U	27 U
2,4,6-Trichlorophenol	10 U	10 U	11 U	11 U	11 U	11 U	11 U	10 U	11 U
2,4-Dichlorophenol	10 U	10 U	11 U	11 U	11 U	11 U	11 U	10 U	11 U
2,4-Dimethylphenol	10 U	10 U	11 U	11 U	11 U	11 U	11 U	10 U	11 U
2,4-Dinitrophenol	NA	25 U	28 U	28 U	28 U	29 U	28 U	26 U	27 U
2,4-Dinitrotoluene	10 U	10 U	11 U	11 U	11 U	11 U	11 U	10 U	11 U
2,6-Dinitrotoluene	10 U	10 U	11 U	11 U	11 U	11 U	11 U	10 U	11 U
2-Chloronaphthalene	10 U	10 U	11 U	11 U	11 U	11 U	11 U	10 U	11 U
2-Chlorophenol	10 U	10 U	11 U	11 U	11 U	11 U	11 U	10 U	11 U
2-Methylnaphthalene	10 U	10 U	11 U	11 U	11 U	11 U	11 U	10 U	11 U
2-Methylphenol	10 U	10 U	11 U	11 U	11 U	11 U	11 U	10 U	11 U
2-Nitroaniline	25 U	25 U	28 U	28 U	28 U	29 U	28 U	26 U	27 U
2-Nitrophenol	10 U	10 U	11 U	11 U	11 U	11 U	11 U	10 U	11 U
3,3'-Dichlorobenzidine	10 U	10 U	11 U	11 U	11 U	11 U	11 U	10 U	11 U
3- and 4-Methylphenol	NA	NA	NA	NA	NA	NA	NA	NA	NA
3-Nitroaniline	25 U	25 U	28 U	28 U	28 U	29 U	28 U	26 U	27 U
4,6-Dinitro-2-methylphenol	25 U	25 U	28 U	28 U	28 U	29 U	28 U	26 U	27 U

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Surface Water Analytical Results at Site 2
St. Juliens Creek Annex
Chesapeake, Virginia

Station ID	SJS02-SW02		SJS02-SW03	SJS02-SW04	SJS02-SW05	SJS02-SW06	SJS02-SW07		SJS02-SW08
Sample ID	SJS02-SW02-000	SJS02-SW02-000P	SJS02-SW03-001	SJS02-SW04-001	SJS02-SW05-001	SJS02-SW06-001	SJS02-SW07-001	SJS02-SW08-001	SJS02-SW08-001P
Sample Date	07/14/97	07/14/97	04/13/99	04/16/99	04/16/99	04/16/99	04/16/99	04/14/99	04/14/99
Chemical Name									
4-Bromophenyl-phenylether	10 U	10 U	11 U	11 U	11 U	11 U	11 U	10 U	11 U
4-Chloro-3-methylphenol	10 U	10 U	11 U	11 U	11 U	11 U	11 U	10 U	11 U
4-Chloroaniline	10 U	10 U	11 U	11 U	11 U	11 U	11 U	10 U	11 U
4-Chlorophenyl-phenylether	10 U	10 U	11 U	11 U	11 U	11 U	11 U	10 U	11 U
4-Methylphenol	10 U	10 U	11 U	11 U	11 U	11 U	11 U	10 U	11 U
4-Nitroaniline	25 U	25 U	28 U	28 U	28 U	29 U	28 U	26 U	27 U
4-Nitrophenol	25 U	25 U	28 U	28 U	28 U	29 U	28 U	26 U	27 U
Acenaphthene	10 U	10 U	11 U	11 U	11 U	11 U	11 U	10 U	11 U
Acenaphthylene	10 U	10 U	11 U	11 U	11 U	11 U	11 U	10 U	11 U
Acetophenone	NA	NA	NA	NA	NA	NA	NA	NA	NA
Anthracene	10 U	10 U	11 U	11 U	11 U	11 U	11 U	10 U	11 U
Atrazine	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzaldehyde	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)anthracene	10 U	10 U	11 U	11 U	11 U	11 U	11 U	10 U	11 U
Benzo(a)pyrene	10 U	10 U	11 U	11 U	11 U	11 U	11 U	10 U	11 U
Benzo(b)fluoranthene	10 U	10 U	11 U	11 U	11 U	11 U	11 U	10 U	11 U
Benzo(g,h,i)perylene	10 U	10 U	11 U	11 U	11 U	11 U	11 U	10 U	11 U
Benzo(k)fluoranthene	10 U	10 U	11 U	11 U	11 U	11 U	11 U	10 U	11 U
Butylbenzylphthalate	10 U	10 U	11 U	11 U	11 U	11 U	11 U	10 U	11 U
Caprolactam	NA	NA	NA	NA	NA	NA	NA	NA	NA
Carbazole	10 U	10 U	11 U	11 U	11 U	11 U	11 U	10 U	11 U
Chrysene	10 U	10 U	11 U	11 U	11 U	11 U	11 U	10 U	11 U
Di-n-butylphthalate	10 U	10 U	11 U	2 B	5 B	2 B	2 B	10 U	11 U
Di-n-octylphthalate	10 U	10 U	11 U	11 U	11 U	11 U	11 U	10 U	11 U
Dibenz(a,h)anthracene	10 U	10 U	11 U	11 U	11 U	11 U	11 U	10 U	11 U
Dibenzofuran	10 U	10 U	11 U	11 U	11 U	11 U	11 U	10 U	11 U
Diethylphthalate	10 U	10 U	11 U	11 U	11 U	11 U	11 U	10 U	11 U
Dimethyl phthalate	10 U	10 U	11 U	11 U	11 U	11 U	11 U	10 U	11 U
Fluoranthene	10 U	10 U	11 U	11 U	11 U	11 U	11 U	10 U	11 U
Fluorene	10 U	10 U	11 U	11 U	11 U	11 U	11 U	10 U	11 U
Hexachlorobenzene	10 U	10 U	11 U	11 U	11 U	11 U	11 U	10 U	11 U
Hexachlorobutadiene	10 U	10 U	11 U	11 U	11 U	11 U	11 U	10 U	11 U
Hexachlorocyclopentadiene	10 U	10 U	11 U	11 UJ	11 U	11 UJ	11 UJ	10 U	11 U
Hexachloroethane	10 U	10 U	11 U	11 U	11 U	11 U	11 U	10 U	11 U
Indeno(1,2,3-cd)pyrene	10 U	10 U	11 U	11 U	11 U	11 U	11 U	10 U	11 U
Isophorone	10 U	10 U	11 U	11 U	11 U	11 U	11 U	10 U	11 U
Naphthalene	10 U	10 U	11 U	11 U	11 U	11 U	11 U	10 U	11 U
Nitrobenzene	10 U	10 U	11 U	11 U	11 U	11 U	11 U	10 U	11 U
Pentachlorophenol	25 U	25 U	28 U	28 U	28 U	29 U	28 U	26 U	27 U

B - Not detected above associated blank
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Table G-5
Surface Water Analytical Results at Site 2
St. Juliens Creek Annex
Chesapeake, Virginia

Station ID	SJS02-SW02		SJS02-SW03	SJS02-SW04	SJS02-SW05	SJS02-SW06	SJS02-SW07		SJS02-SW08
Sample ID	SJS02-SW02-000	SJS02-SW02-000P	SJS02-SW03-001	SJS02-SW04-001	SJS02-SW05-001	SJS02-SW06-001	SJS02-SW07-001	SJS02-SW08-001	SJS02-SW08-001P
Sample Date	07/14/97	07/14/97	04/13/99	04/16/99	04/16/99	04/16/99	04/16/99	04/14/99	04/14/99
Chemical Name									
Phenanthrene	10 U	10 U	11 U	11 U	11 U	11 U	11 U	10 U	11 U
Phenol	10 U	10 U	11 U	11 U	11 U	11 U	11 U	10 U	11 U
Pyrene	10 U	10 U	11 U	11 U	11 U	11 U	11 U	10 U	11 U
bis(2-Chloroethoxy)methane	10 U	10 U	11 U	11 U	11 U	11 U	11 U	10 U	11 U
bis(2-Chloroethyl)ether	10 U	10 U	11 U	11 U	11 U	11 U	11 U	10 U	11 U
bis(2-Ethylhexyl)phthalate	3 J	1 J	11 U	11 U	1 B	11 U	84	10 U	11 U
n-Nitroso-di-n-propylamine	10 U	10 U	11 U	11 U	11 U	11 U	11 U	10 U	11 U
n-Nitrosodiphenylamine	10 U	10 U	11 U	11 U	11 U	11 U	11 U	10 U	11 U
Pesticide/Polychlorinated Biphenyls (UG/L)									
4,4'-DDD	0.1 U	0.1 U	0.0180 J	0.200	0.0570 J	0.0200 J	0.0130 J	0.110 U	0.110 U
4,4'-DDE	0.1 U	0.1 U	0.100 U	0.110 U	0.110 U	0.110 U	0.120 U	0.110 U	0.110 U
4,4'-DDT	0.1 U	0.1 U	0.100 U	0.110 U	0.110 U	0.110 U	0.120 U	0.110 U	0.110 U
Aldrin	0.05 U	0.05 U	0.0520 U	0.0560 U	0.0570 U	0.0570 U	0.0600 U	0.0540 U	0.0560 U
Aroclor-1016	1 U	1 U	1 U	1.10 U	1.10 U	1.10 U	1.20 U	1.10 U	1.10 U
Aroclor-1221	2 U	2 U	2.10 U	2.20 U	2.30 U	2.30 U	2.40 U	2.20 U	2.20 U
Aroclor-1232	1 U	1 U	1 U	1.10 U	1.10 U	1.10 U	1.20 U	1.10 U	1.10 U
Aroclor-1242	1 U	1 U	1 U	1.10 U	1.10 U	1.10 U	1.20 U	1.10 U	1.10 U
Aroclor-1248	1 U	1 U	1 U	1.10 U	1.10 U	1.10 U	1.20 U	1.10 U	1.10 U
Aroclor-1254	1 U	1 U	1 U	1.10 U	1.10 U	1.10 U	1.20 U	1.10 U	1.10 U
Aroclor-1260	1 U	1 U	1 U	1.10 U	1.10 U	1.10 U	1.20 U	1.10 U	1.10 U
Dieldrin	0.1 U	0.1 U	0.100 U	0.110 U	0.110 U	0.110 U	0.120 U	0.110 U	0.110 U
Endosulfan I	0.05 U	0.05 U	0.0520 U	0.0560 U	0.0570 U	0.0570 U	0.0600 U	0.0540 U	0.0560 U
Endosulfan II	0.1 U	0.1 U	0.100 U	0.110 U	0.110 U	0.110 U	0.120 U	0.110 U	0.110 U
Endosulfan sulfate	0.1 U	0.1 U	0.100 U	0.110 U	0.110 U	0.110 U	0.120 U	0.110 U	0.110 U
Endrin	0.1 U	0.1 U	0.100 U	0.110 U	0.110 U	0.110 U	0.120 U	0.110 U	0.110 U
Endrin aldehyde	0.1 U	0.1 U	0.100 U	0.110 U	0.110 U	0.110 U	0.120 U	0.110 U	0.110 U
Endrin ketone	0.1 U	0.1 U	0.100 U	0.110 U	0.110 U	0.110 U	0.120 U	0.110 U	0.110 U
Heptachlor	0.05 U	0.05 U	0.0520 U	0.0560 U	0.0570 U	0.0570 U	0.0600 U	0.0540 U	0.0560 U
Heptachlor epoxide	0.05 U	0.05 U	0.0520 U	0.0560 U	0.0570 U	0.0570 U	0.0600 U	0.0540 U	0.0560 U
Methoxychlor	0.5 U	0.5 U	0.520 U	0.560 U	0.570 U	0.570 U	0.600 U	0.540 U	0.560 U
Toxaphene	5 U	5 U	5.20 U	5.60 U	5.70 U	5.70 U	6 U	5.40 U	5.60 U
alpha-BHC	0.05 U	0.05 U	0.0520 U	0.0560 U	0.0570 U	0.0570 U	0.0600 U	0.0540 U	0.0560 U
alpha-Chlordane	0.05 U	0.05 U	0.0520 U	0.0560 U	0.0570 U	0.0570 U	0.0600 U	0.0540 U	0.0560 U
beta-BHC	0.05 U	0.05 U	0.0520 U	0.0560 U	0.0570 U	0.0570 U	0.0600 U	0.0540 U	0.0560 U
delta-BHC	0.05 U	0.05 U	0.0520 U	0.0560 U	0.0570 U	0.0570 U	0.0600 U	0.0540 U	0.0560 U
gamma-BHC (Lindane)	0.05 U	0.05 U	0.0520 U	0.0560 U	0.0570 U	0.0570 U	0.0600 U	0.0540 U	0.0560 U
gamma-Chlordane	0.05 U	0.05 U	0.0520 U	0.0560 U	0.0570 U	0.0570 U	0.0600 U	0.0540 U	0.0560 U

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Table G-5
Surface Water Analytical Results at Site 2
St. Juliens Creek Annex
Chesapeake, Virginia

Station ID	SJS02-SW02		SJS02-SW03	SJS02-SW04	SJS02-SW05	SJS02-SW06	SJS02-SW07		SJS02-SW08
Sample ID	SJS02-SW02-000	SJS02-SW02-000P	SJS02-SW03-001	SJS02-SW04-001	SJS02-SW05-001	SJS02-SW06-001	SJS02-SW07-001	SJS02-SW08-001	SJS02-SW08-001P
Sample Date	07/14/97	07/14/97	04/13/99	04/16/99	04/16/99	04/16/99	04/16/99	04/14/99	04/14/99
Chemical Name									
Nitramines (UG/L)									
1,3,5-Trinitrobenzene	25 U	25 U	1.20 U	1 U	1.20 U	1.20 U	1.20 U	1 U	0.900 U
1,3-Dinitrobenzene	25 U	25 U	1.20 U	1 U	1.20 U	1.20 U	1.20 U	1 U	0.900 U
2,4,6-Trinitrotoluene	25 U	25 U	1.20 U	1 U	1.20 U	1.20 U	1.20 U	1 U	0.900 U
2,4-Dinitrotoluene	NA	NA	1.20 U	1 U	1.20 U	1.20 U	1.20 U	1 U	0.900 U
2,6-Dinitrotoluene	NA	NA	1.20 U	1 U	1.20 U	1.20 U	1.20 U	1 U	0.900 U
2-Amino-4,6-dinitrotoluene	25 U	25 U	1.20 U	1 U	1.20 U	1.20 U	1.20 U	1 U	0.900 U
2-Nitrotoluene	25 U	25 U	2.60 U	2.10 U	2.60 U	2.60 U	2.60 U	2.10 U	2.10 U
3-Nitrotoluene	25 U	25 U	2.60 U	3.5	0.5 J	0.5 J	0.800 J	2.10 U	2.10 U
4-Amino-2,6-dinitrotoluene	25 U	25 U	1.20 U	1 U	1.20 U	1.20 U	1.20 U	1 U	0.900 U
4-Nitrotoluene	25 U	25 U	2.60 U	2.10 U	2.60 U	2.60 U	2.60 U	2.10 U	2.10 U
HMX	25 U	25 U	2.60 U	2.10 U	2.60 U	2.60 U	2.60 U	2.10 U	2.10 U
Nitrobenzene	NA	NA	1.20 U	1 U	1.20 U	1.20 U	1.20 U	1 U	0.900 U
RDX	25 U	25 U	2.60 U	2.10 U	2.60 U	2.60 U	2.60 U	2.10 U	2.10 U
Tetryl	25 U	25 U	2.60 U	2.10 U	2.60 U	2.60 U	2.60 U	2.10 U	2.10 U
Total Metals (UG/L)									
Aluminum	4,210	7,870	353	470	2,150	9,390	310	535	533
Antimony	2 J	2 U	2.70 U	2.70 U	2.70 U	2.70 U	2.70 U	2.70 U	3.70 B
Arsenic	3 U	3.1 J	2 U	4.40 J	4.40 B	2 U	4.40 B	2.70 B	2.70 B
Barium	58 J	70.7 J	27.9 J	35.2 B	59.7 J	16.5 J	30.4 J	32.2 J	32.9 J
Beryllium	1 U	1 U	0.100 U	0.100 U	0.100 U	3.5 J	0.100 U	0.100 U	0.100 U
Cadmium	1.2 L	1.9 L	0.890 J	0.440 J	2.5 J	1.5 J	0.450 J	0.350 J	0.530 J
Calcium	197,000	214,000	35,700	72,400	58,200	92,600	134,000	179,000	184,000
Chromium	104	166	4 J	2.20 J	83.6	2.10 J	3.40 J	4.90 J	4.5 J
Cobalt	8 U	8 U	1.20 B	0.560 B	1.10 B	55	0.900 B	0.730 B	0.5 U
Copper	132	203	13.8 J	12.1 J	107	17.9 J	20.9 J	17.5 J	15.3 J
Cyanide	5 U	5 U	18.9 L	5 U	5 U	5 U	5 U	7.5 L	18 L
Iron	6,470	10,700	1,520	1,170	5,330	18,800	716	871	684
Lead	47.8 L	77.9 L	2.80 J	4.90 B	44.4	13.5	5.5 B	8	4.5
Magnesium	606,000	665,000	56,300	166,000	102,000	74,600	376,000	576,000	569,000
Manganese	85.8	120	78.1	61.9	148	2,490	86.9	92.1	87.8
Mercury	0.23 B	0.33 B	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U
Nickel	7 U	7 U	4 J	3.10 J	5.30 J	81.4	2.60 J	2.60 J	2.60 J
Potassium	214,000 J	237,000 J	22,200	61,600	40,500	28,200	148,000	205,000	201,000
Selenium	3 U	3 U	2.60 U	2.60 U	2.60 U	2.60 U	2.60 U	2.60 U	2.60 U
Silver	1 U	2 B	0.900 U	0.900 U	0.900 U	0.900 U	0.900 U	0.900 U	0.900 U
Sodium	5,240,000	5,640,000	461,000	1,590,000 J	989,000 J	320,000 J	3,670,000 J	4,930,000	4,870,000
Thallium	2 U	2 U	3.20 U	3.20 U	3.20 U	3.20 U	3.20 U	3.20 U	3.20 U

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Table G-5
Surface Water Analytical Results at Site 2
St. Juliens Creek Annex
Chesapeake, Virginia

Station ID	SJS02-SW02		SJS02-SW03	SJS02-SW04	SJS02-SW05	SJS02-SW06	SJS02-SW07		SJS02-SW08
Sample ID	SJS02-SW02-000	SJS02-SW02-000P	SJS02-SW03-001	SJS02-SW04-001	SJS02-SW05-001	SJS02-SW06-001	SJS02-SW07-001	SJS02-SW08-001	SJS02-SW08-001P
Sample Date	07/14/97	07/14/97	04/13/99	04/16/99	04/16/99	04/16/99	04/16/99	04/14/99	04/14/99
Chemical Name									
Vanadium	27.8 J	32.8 J	2.20 B	3.20 B	15.8 J	1.30 B	3.20 B	4.40 B	3.70 B
Zinc	175	268	44.1	23.4	131	1,310	30.8	35.4	14.4 J
Dissolved Metals (UG/L)									
Aluminum	NA	NA	NA	NA	NA	NA	NA	NA	NA
Antimony	NA	NA	NA	NA	NA	NA	NA	NA	NA
Arsenic	NA	NA	NA	NA	NA	NA	NA	NA	NA
Barium	NA	NA	NA	NA	NA	NA	NA	NA	NA
Beryllium	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cadmium	NA	NA	NA	NA	NA	NA	NA	NA	NA
Calcium	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cobalt	NA	NA	NA	NA	NA	NA	NA	NA	NA
Copper	NA	NA	NA	NA	NA	NA	NA	NA	NA
Iron	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead	NA	NA	NA	NA	NA	NA	NA	NA	NA
Magnesium	NA	NA	NA	NA	NA	NA	NA	NA	NA
Manganese	NA	NA	NA	NA	NA	NA	NA	NA	NA
Mercury	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nickel	NA	NA	NA	NA	NA	NA	NA	NA	NA
Potassium	NA	NA	NA	NA	NA	NA	NA	NA	NA
Selenium	NA	NA	NA	NA	NA	NA	NA	NA	NA
Silver	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sodium	NA	NA	NA	NA	NA	NA	NA	NA	NA
Thallium	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vanadium	NA	NA	NA	NA	NA	NA	NA	NA	NA
Zinc	NA	NA	NA	NA	NA	NA	NA	NA	NA
Wet Chemistry (MG/L)									
Alkalinity	107	105	NA	NA	NA	NA	NA	NA	NA
Biological oxygen demand	5 U	5 U	NA	NA	NA	NA	NA	NA	NA
Chemical oxygen demand	154	154	NA	NA	NA	NA	NA	NA	NA
Hardness	NA	NA	338	706	405	430	1,960	2,090	2,180
Phosphorus	0.202	0.153	0.0200 U	0.0650	0.0850	0.169	0.184	0.0200 U	0.0200 U
Total dissolved solids (TDS)	19,100	26,800	NA	NA	NA	NA	NA	NA	NA
Total organic carbon (TOC)	16.4	24.4	NA	NA	NA	NA	NA	NA	NA
Total suspended solids (TSS)	124	98	NA	NA	NA	NA	NA	NA	NA

Shaded cells indicate analyte detections

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Table G-5
Surface Water Analytical Results at Site 2
St. Juliens Creek Annex
Chesapeake, Virginia

Station ID		SJS02-SW09
Sample ID	SJS02-SW08-002	SJS02-SW09
Sample Date	10/27/99	07/18/01
Chemical Name		
Volatile Organic Compounds (UG/L)		
1,1,1-Trichloroethane	1 U	3 B
1,1,2,2-Tetrachloroethane	1 U	10 U
1,1,2-Trichloro-1,2,2-trifluoroethane(Freon-113)	NA	10 U
1,1,2-Trichloroethane	1 U	10 U
1,1-Dichloroethane	1 U	10 U
1,1-Dichloroethene	1 U	10 U
1,2,4-Trichlorobenzene	1 U	10 U
1,2-Dibromo-3-chloropropane	1 U	10 U
1,2-Dibromoethane	1 U	10 U
1,2-Dichlorobenzene	1 U	10 U
1,2-Dichloroethane	1 U	10 U
1,2-Dichloroethene (total)	NA	NA
1,2-Dichloropropane	1 U	10 U
1,3-Dichlorobenzene	1 U	10 U
1,4-Dichlorobenzene	1 U	10 U
2-Butanone	5 U	10 U
2-Hexanone	5 U	10 U
4-Methyl-2-pentanone	5 U	10 U
Acetone	1.60 J	10 U
Benzene	1 U	10 U
Bromochloromethane	1 U	NA
Bromodichloromethane	1 U	10 U
Bromoform	1 U	10 U
Bromomethane	1 U	10 U
Carbon disulfide	0.300 J	10 U
Carbon tetrachloride	1 U	10 U
Chlorobenzene	1 U	10 U
Chloroethane	1 U	10 U
Chloroform	0.200 J	10 U
Chloromethane	1 U	10 U
Cumene	NA	10 U
Cyclohexane	NA	10 U
Dibromochloromethane	1 U	10 U
Dichlorodifluoromethane(Freon-12)	NA	10 U
Ethylbenzene	1 U	10 U
Methyl acetate	NA	10 U
Methyl-tert-butyl ether (MTBE)	NA	10 U

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Table G-5
Surface Water Analytical Results at Site 2
St. Juliens Creek Annex
Chesapeake, Virginia

Station ID		SJS02-SW09
Sample ID	SJS02-SW08-002	SJS02-SW09
Sample Date	10/27/99	07/18/01
Chemical Name		
Methylcyclohexane	NA	10 U
Methylene chloride	0.5 B	2.6 B
Styrene	1 U	10 U
Tetrachloroethene	1 U	10 U
Toluene	1 U	10 U
Trichloroethene	0.800 J	130
Trichlorofluoromethane(Freon-11)	NA	10 U
Vinyl chloride	1 U	5.7 J
Xylene, total	1 U	10 U
cis-1,2-Dichloroethene	0.300 J	84
cis-1,3-Dichloropropene	1 U	10 U
o-Xylene	NA	10 U
trans-1,2-Dichloroethene	1 U	10 U
trans-1,3-Dichloropropene	1 U	10 U
Semi-volatile Organic Compounds (UG/L)		
1,1-Biphenyl	NA	10 U
1,2,4-Trichlorobenzene	10 U	NA
1,2-Dichlorobenzene	10 U	NA
1,3-Dichlorobenzene	10 U	NA
1,4-Dichlorobenzene	10 U	NA
2,2'-Oxybis(1-chloropropane)	10 U	10 U
2,4,5-Trichlorophenol	26 U	25 U
2,4,6-Trichlorophenol	10 U	10 U
2,4-Dichlorophenol	10 U	10 U
2,4-Dimethylphenol	10 U	10 U
2,4-Dinitrophenol	26 U	25 U
2,4-Dinitrotoluene	10 U	10 U
2,6-Dinitrotoluene	10 U	10 U
2-Chloronaphthalene	10 U	10 U
2-Chlorophenol	10 U	10 U
2-Methylnaphthalene	10 U	10 U
2-Methylphenol	10 U	10 U
2-Nitroaniline	26 U	25 U
2-Nitrophenol	10 U	10 U
3,3'-Dichlorobenzidine	10 U	10 U
3- and 4-Methylphenol	NA	10 U
3-Nitroaniline	26 U	25 U
4,6-Dinitro-2-methylphenol	26 U	25 U

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Surface Water Analytical Results at Site 2
St. Juliens Creek Annex
Chesapeake, Virginia

Station ID		SJS02-SW09
Sample ID	SJS02-SW08-002	SJS02-SW09
Sample Date	10/27/99	07/18/01
Chemical Name		
4-Bromophenyl-phenylether	10 U	10 U
4-Chloro-3-methylphenol	10 U	10 U
4-Chloroaniline	10 U	10 U
4-Chlorophenyl-phenylether	10 U	10 U
4-Methylphenol	10 U	NA
4-Nitroaniline	26 U	25 U
4-Nitrophenol	26 U	25 U
Acenaphthene	10 U	10 U
Acenaphthylene	10 U	10 U
Acetophenone	NA	10 U
Anthracene	10 U	10 U
Atrazine	NA	10 U
Benzaldehyde	NA	3.6 J
Benzo(a)anthracene	10 U	10 U
Benzo(a)pyrene	10 U	10 U
Benzo(b)fluoranthene	10 U	10 U
Benzo(g,h,i)perylene	10 U	10 U
Benzo(k)fluoranthene	10 U	10 U
Butylbenzylphthalate	10 U	10 U
Caprolactam	NA	10 U
Carbazole	10 U	10 U
Chrysene	10 U	10 U
Di-n-butylphthalate	2 B	10 U
Di-n-octylphthalate	10 U	10 U
Dibenz(a,h)anthracene	10 U	10 U
Dibenzofuran	10 U	10 U
Diethylphthalate	10 U	10 U
Dimethyl phthalate	10 U	10 U
Fluoranthene	10 U	10 U
Fluorene	10 U	10 U
Hexachlorobenzene	10 U	10 U
Hexachlorobutadiene	10 U	10 U
Hexachlorocyclopentadiene	10 U	10 U
Hexachloroethane	10 U	10 U
Indeno(1,2,3-cd)pyrene	10 U	10 U
Isophorone	10 U	10 U
Naphthalene	10 U	10 U
Nitrobenzene	10 U	10 U
Pentachlorophenol	26 U	25 U

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Surface Water Analytical Results at Site 2
St. Juliens Creek Annex
Chesapeake, Virginia

Station ID		SJS02-SW09
Sample ID	SJS02-SW08-002	SJS02-SW09
Sample Date	10/27/99	07/18/01
Chemical Name		
Phenanthrene	10 U	10 U
Phenol	10 U	10 U
Pyrene	10 U	10 U
bis(2-Chloroethoxy)methane	10 U	10 U
bis(2-Chloroethyl)ether	10 U	10 U
bis(2-Ethylhexyl)phthalate	10 U	10 U
n-Nitroso-di-n-propylamine	10 U	10 U
n-Nitrosodiphenylamine	10 U	10 U
Pesticide/Polychlorinated Biphenyls (UG/L)		
4,4'-DDD	0.100 U	0.1 U
4,4'-DDE	0.100 U	0.1 U
4,4'-DDT	0.100 U	0.1 U
Aldrin	0.0520 U	0.05 U
Aroclor-1016	1 U	1 U
Aroclor-1221	2.10 U	2 U
Aroclor-1232	1 U	1 U
Aroclor-1242	1 U	1 U
Aroclor-1248	1 U	1 U
Aroclor-1254	1 U	1 U
Aroclor-1260	1 U	1 U
Dieldrin	0.100 U	0.1 U
Endosulfan I	0.0520 U	0.05 U
Endosulfan II	0.100 U	0.1 U
Endosulfan sulfate	0.100 U	0.1 U
Endrin	0.100 U	0.1 U
Endrin aldehyde	0.100 U	0.1 U
Endrin ketone	0.100 U	0.1 U
Heptachlor	0.0520 U	0.05 U
Heptachlor epoxide	0.0520 U	0.05 U
Methoxychlor	0.520 U	0.5 U
Toxaphene	5.20 U	5 U
alpha-BHC	0.0520 U	0.05 U
alpha-Chlordane	0.0520 U	0.05 U
beta-BHC	0.0520 U	0.05 U
delta-BHC	0.0520 U	0.05 U
gamma-BHC (Lindane)	0.0520 U	0.05 U
gamma-Chlordane	0.0520 U	0.05 U

B - Not detected above associated blank
J - Estimated
L - May be biased low
NA - Not analyzed
U - Not detected

Table G-5
Surface Water Analytical Results at Site 2
St. Juliens Creek Annex
Chesapeake, Virginia

Station ID		SJS02-SW09
Sample ID	SJS02-SW08-002	SJS02-SW09
Sample Date	10/27/99	07/18/01
Chemical Name		
Nitramines (UG/L)		
1,3,5-Trinitrobenzene	1.20 U	1.3 U
1,3-Dinitrobenzene	1.20 U	1.3 U
2,4,6-Trinitrotoluene	1.20 U	1.3 U
2,4-Dinitrotoluene	1.20 U	1.3 U
2,6-Dinitrotoluene	1.20 U	1.3 U
2-Amino-4,6-dinitrotoluene	1.20 U	1.3 U
2-Nitrotoluene	2.60 U	1.3 U
3-Nitrotoluene	2.60 U	1.3 U
4-Amino-2,6-dinitrotoluene	1.20 U	1.3 U
4-Nitrotoluene	2.60 U	1.3 U
HMX	2.60 U	1.3 U
Nitrobenzene	1.20 U	1.3 U
RDX	2.60 U	1.3 U
Tetryl	2.60 U	1.3 U
Total Metals (UG/L)		
Aluminum	1,060	49.1
Antimony	3.30 J	3.7 U
Arsenic	3.60 U	5 U
Barium	40.7 J	61.4
Beryllium	0.200 U	0.1 U
Cadmium	0.330 J	3 U
Calcium	92,100	38,700
Chromium	2.80 J	5 U
Cobalt	1.10 J	1.8 U
Copper	12 J	6.5
Cyanide	5 U	NA
Iron	1,560	916
Lead	5.4	3 U
Magnesium	274,000	6,230
Manganese	71.9	339
Mercury	0.100 UL	0.2 U
Nickel	2.70 J	4 U
Potassium	101,000	4,420
Selenium	3.10 U	5 U
Silver	0.700 U	5 U
Sodium	2,380,000	28,200
Thallium	5.20 U	5.7 U

B - Not detected above associated blank
J - Estimated
L - May be biased low
NA - Not analyzed
U - Not detected

Table G-5
Surface Water Analytical Results at Site 2
St. Juliens Creek Annex
Chesapeake, Virginia

Station ID		SJS02-SW09
Sample ID	SJS02-SW08-002	SJS02-SW09
Sample Date	10/27/99	07/18/01
Chemical Name		
Vanadium	4.60 J	3.2 U
Zinc	46.4	68.6
Dissolved Metals (UG/L)		
Aluminum	NA	45.7 U
Antimony	NA	3.7 U
Arsenic	NA	5 U
Barium	NA	62.3
Beryllium	NA	0.1 U
Cadmium	NA	3 U
Calcium	NA	39,500
Chromium	NA	5 U
Cobalt	NA	1.8 U
Copper	NA	2.6
Iron	NA	35.6
Lead	NA	3 U
Magnesium	NA	6,460
Manganese	NA	376
Mercury	NA	0.2 U
Nickel	NA	4 U
Potassium	NA	4,470
Selenium	NA	5 U
Silver	NA	5 U
Sodium	NA	29,900
Thallium	NA	5.7 U
Vanadium	NA	3.2 U
Zinc	NA	58.6
Wet Chemistry (MG/L)		
Alkalinity	NA	NA
Biological oxygen demand	NA	NA
Chemical oxygen demand	NA	NA
Hardness	NA	NA
Phosphorus	NA	NA
Total dissolved solids (TDS)	NA	NA
Total organic carbon (TOC)	NA	NA
Total suspended solids (TSS)	NA	NA

Shaded cells indicate analyte detections

B - Not detected above associated blank
J - Estimated
L - May be biased low
NA - Not analyzed
U - Not detected

Appendix H
Background Data and Soil Types

Table H-1
Soil Sample Data Summary
Background Investigation
St. Juliens Creek Annex
Chesapeake, Virginia

Chemical Name	Number of Detects	Number of Non Detects	Total Number of Samples	Frequency of Detection	~L = Log Normal	~N = Normal	Assumed Distribution	Mean (Conc.)	Lower Confidence Interval (Conc.)	Upper Confidence Interval (Conc.)	~ Conf = 95% Confidence Level	Upper Tolerance Level (UTL) (Conc.)	Lower Bound UTL (Conc.)	Upper Bound UTL (Conc.)	~Conf = Associated Confidence
Munden-Tetotum/Dragston-Augusta Surface and Subsurface															
Arsenic (MG/KG)	31	9	40	77.5	0.18	E-6	L	2.6	2.2	3.3	95%	5.7	4.5	7.9	95%
Benzo(a)anthracence (UG/KG)	12	28	40	30.0	E-6	E-6	NP	2	1.8	2.6	94%	6.9	4.7	9.4	82%
Benzo(a)pyrene (UG/KG)	10	30	40	25.0	E-7	E-6	NP	77	76	79	94%	91	84	150	82%
Benzo(b)fluoranthene (UG/KG)	7	33	40	17.5	E-8	E-6	NP	78	77	80	94%	91	86	120	86%
Benzo(g,h,I)perlyene (UG/KG)	9	31	40	22.5	E-8	E-6	NP	77	76	79	94%	91	84	120	82%
Benzo(k)fluoranthene (UG/KG)	9	31	40	22.5	E-8	E-6	NP	77	76	79	94%	91	84	130	82%
Beryllium (MG/KG)	2	38	40	5.0	0.78	0.09	L	0.15	0.13	0.18	95%	0.28	0.24	0.36	95%
Calcium (MG/KG)	38	2	40	95.0	E-4	E-13	NP	194	146	282	94%	1225	504	9060	82%
Chrysene (UG/KG)	13	27	40	32.5	E-6	E-8	NP	77	76	78	94%	102	84	230	82%
Fluoranthene (UG/KG)	12	28	40	30.0	E-7	e-10	NP	77	76	79	94%	103	85	300	82%
Indeno(1,2,3-cd)pyrene (UG/KG)	9	31	40	22.5	E-8	E-7	NP	77	76	79	94%	91	84	99	82%
Nickel (MG/KG)	11	29	40	27.5	0.004	0.001	NP	4.2	3	5.1	94%	6.9	5.8	9.5	82%
Phenanthrene (UG/KG)	6	34	40	15.0	E-8	E-7	NP	78	77	80	94%	91	85	99	82%
Potassium (MG/KG)	10	30	40	25.0	0.002	E-5	NP	172	135	204	94%	368	308	409	82%
Pyrene (UG/KG)	12	28	40	30.0	E-7	E-11	NP	77	76	79	94%	125	85	420	82%
Sodium (MG/KG)	26	14	40	65.0	E-5	E-8	NP	44	40	51	94%	174	112	290	82%
Vanadium (MG/KG)	39	1	40	97.5	0.007	0.2	N	16.3	14.2	18.3	95%	26.6	24.1	30.3	95%
Munden-Tetotum/Dragston-Augusta Surface															
4,4'-DDT (UG/KG)	17	2	19	89.5	0.002	E-9	NP	7.2	4	19	94%	237	28	1600	56%
4,4'-DDT (UG/KG)	5	14	19	26.3	E-4	E-6	NP	4.2	3.9	4.3	94%	10.6	7.8	16	56%
4,4'-DDE (UG/KG)	16	3	19	84.2	0.03	E-8	NP	11	5	41	94%	532	350	1900	56%
Acenaphthene (UG/KG)		20	20	0.0	0.06	0.02	L	82	80	85	95%	92	88	97	95%
Acenaphthylene (UG/KG)	3	17	20	15.0	E-7	E-6	NP	82	79	86	92%	95	91	99	57%
Aldrin (UG/KG)		19	19	0.0	E-7	E-8	NP	2.1	2	2.2	94%	2.7	2.2	5.9	56%
alpha-Chlordane (UG/KG)	3	16	19	15.8	E-7	E-8	NP	2.1	2	2.2	94%	9.8	2.3	45	56%
Aluminum (MG/KG)	20		20	100.0	0.02	0.28	N	4610	3739	5480	95%	7669	6647	9401	95%
Anthracene (UG/KG)	1	19	20	5.0	E-7	E-6	NP	81	79	85	92%	91	87	99	57%
Antimony (MG/KG)	1	19	20	5.0	0.002	E-4	NP	0.5	0.5	0.6	94%	0.7	0.7	0.7	57%
Barium (MG/KG)	20		20	100.0	0.11	0.69	N	25	21	30	95%	40	35	49	95%
beta -BHC (UG/KG)		19	19	0.0	E-7	E-8	NP	2.1	2	2.2	94%	2.7	2.2	5.9	56%
Copper (MG/KG)	20		20	100.0	0.99	0.02	L	8.4	6.7	11.3	95%	17.1	13	27.5	95%
delta - BHC (UG/KG)		19	19	0.0	E-7	E-8	NP	2.1	2	2.2	94%	2.7	2.2	5.9	56%
Dibenz(a,h)anthracene (UG/KG)	2	18	20	10.0	E-6	E-5	NP	81	79	85	92%	91	87	99	57%
Dieldrin (UG/KG)	1	18	19	5.3	E-7	E-7	NP	4.1	4	4.2	94%	11.5	4.5	16	56%
Endosulfan I (UG/KG)		19	19	0.0	E-7	E-8	NP	2.1	2	2.2	94%	2.7	2.2	5.9	56%
Endosulfan II (UG/KG)	1	18	19	5.3	E-7	E-8	NP	4.1	4	4.2	94%	13.5	4.5	36	56%
Endrin (UG/KG)	2	17	19	10.5	E-7	E-8	NP	4.1	3.9	4.2	94%	13.4	4.5	35	56%
Endrin aldehyde (UG/KG)	2	17	19	10.5	E-6	E-7	NP	4	3.9	4.2	94$	11.6	4.5	17	56%
Fluorene (UG/KG)		20	20	0.0	0.06	0.02	L	82	80	85	95%	92	88	97	95%
gamma-Chlordane (UG/KG)	1	18	19	5.3	E-7	E-7	NP	2.1	2	2.2	94%	6.1	2.3	8.1	56%
Lead (MG/KG)	20		20	100.0	0.29	0.17	L	31	25	41	95%	61	47	95	95%
Manganese (MG/KG)	20		20	100.0	0.74	E-5	L	16	12	27	95%	42	28	84	95%
Mercury (MG/KG)	9	11	20	45.0	0.26	0.08	L	0.14	0.11	0.19	95%	0.3	0.23	0.5	95%
Magnesium (MG/KG)	20		20	100.0	0.47	0.06	L	251	200	344	95%	527	393	865	95%
Naphthalene (UG/KG)		20	20	0.0	0.06	0.02	L	82	80	85	95%	92	88	97	95%
Selenium (MG/KG)	3	17	20	15.0	E-4	E-4	NP	0.7	0.7	0.7	92%	1	1	1.2	57%

Table H-1
Soil Sample Data Summary
Background Investigation
St. Juliens Creek Annex
Chesapeake, Virginia

Chemical Name	Number of Detects	Number of Non Detects	Total Number of Samples	Frequency of Detection	~L = Log Normal	~N = Normal	Assumed Distribution	Mean (Conc.)	Lower Confidence Interval (Conc.)	Upper Confidence Interval (Conc.)	~ Conf = 95% Confidence Level	Upper Tolerance Level (UTL) (Conc.)	Lower Bound UTL (Conc.)	Upper Bound UTL (Conc.)	~Conf = Associated Confidence
Silver (MG/KG)		20	20	0.0	0.02	0.007	NP	0.52	0.5	0.54	92%	0.62	0.58	0.63	57%
Zinc (MG/KG)	20		20	100.0	0.83	0.17	L	19	15	25	95%	38	29	62	95%
Munden-Tetotum/Dragston-Augusta Subsurface															
4,4'-DDT (UG/KG)	2	18	20	10.0	E-8	E-8	NP	3.8	3.8	3.9	92%	7.8	4.9	19	57%
4,4'-DDT (UG/KG)		20	20	0.0	E-6	E-6	NP	3.8	3.8	3.9	92%	4	4	4.9	57%
4,4'-DDE (UG/KG)	5	15	20	25.0	E-6	E-7	NP	3.9	3.8	4	92%	18	12	18	57%
Acenaphthene (UG/KG)		20	20	0.0	E-6	E-6	NP	77	76	78	92%	81	80	99	57%
Acenaphthylene (UG/KG)		20	20	0.0	E-6	E-6	NP	77	76	78	92%	81	80	99	57%
Aldrin (UG/KG)		20	20	0.0	E-7	E-7	NP	2	1.9	2	92%	2	2	2.5	57%
alpha-Chlordane (UG/KG)	1	19	20	5.0	E-8	E-9	NP	2	1.9	2	92%	2.8	2	8.4	57%
Aluminum (MG/KG)	20		20	100.0	E-4	0.97	N	9361	7586	11136	95%	15599	13516	19131	95%
Anthracene (UG/KG)		20	20	0.0	E-6	E-6	NP	77	76	78	92%	81	80	99	57%
Antimony (MG/KG)		20	20	0.0	E-7	E-8	NP	0.5	0.5	0.5	92%	0.6	0.5	1.2	57%
Barium (MG/KG)	20		20	100.0	E-5	0.33	N	39	33	45	95%	61	54	74	95%
beta -BHC (UG/KG)	1	19	20	5.0	E-6	E-6	NP	2	1.9	2	92%	2	2	2.5	57%
Copper (MG/KG)	17	3	20	85.0	0.009	0.81	N	3	2.4	3.6	95%	5.1	4.4	6.3	95%
delta - BHC (UG/KG)		20	20	0.0	E-7	E-7	NP	2	1.9	2	92%	2	2	2.5	57%
Dibenz(a,h)anthracene (UG/KG)		20	20	0.0	E-6	E-6	NP	77	76	78	92%	81	80	99	57%
Dieldrin (UG/KG)	1	19	20	5.0	E-6	E-6	NP	3.8	3.8	3.9	92%	4	4	4.9	57%
Endosulfan I (UG/KG)		20	20	0.0	E-7	E-7	NP	2	1.9	2	92%	2	2	2.5	57%
Endosulfan II (UG/KG)	1	19	20	5.0	E-7	E-8	NP	3.8	3.8	3.9	92%	5	4	7.4	57%
Endrin (UG/KG)	2	18	20	10.0	E-6	E-7	NP	3.8	3.8	3.9	92%	5.1	4	8.9	57%
Endrin aldehyde (UG/KG)	1	19	20	5.0	E-5	E-6	NP	3.8	3.8	3.9	92%	4.2	4	4.9	57%
Fluorene (UG/KG)		20	20	0.0	E-6	E-6	NP	77	76	78	92%	81	80	99	57%
gamma-Chlordane (UG/KG)	1	19	20	5.0	E-5	E-6	NP	2	1.9	2	92%	2	2	2.5	57%
Lead (MG/KG)	20		20	100.0	0.97	0.13	L	7.3	6.4	8.6	95%	12	10	15	95%
Manganese (MG/KG)	20		20	100.0	0.68	0.1	L	8.9	7.7	10.5	95%	14	12	19	95%
Mercury (MG/KG)	6	14	20	30.0	0.02	0.047	NP	0.08	0.06	0.09	92%	0.1	0.1	0.13	57%
Magnesium (MG/KG)	20		20	100.0	0.52	0.63	N	372	311	433	95%	587	515	709	95%
Naphthalene (UG/KG)		20	20	0.0	E-6	E-6	NP	77	76	78	92%	81	80	99	57%
Selenium (MG/KG)		20	20	0.0	E-6	E-7	NP	0.6	0.6	0.6	92%	0.7	0.7	0.8	57%
Silver (MG/KG)		20	20	0.0	E-6	E-7	NP	0.49	0.48	0.49	92%	0.52	0.5	0.63	57%
Zinc (MG/KG)	20		20	100.0	0.03	E-6	NP	7.9	6.2	8.6	92%	13	10	30	57%
Munden-Tetotum Surface and Subsurface															
Cobalt (MG/KG)	11	10	21	52.4	0.03	0.002	NP	1.2	1	1.5	95%	2.2	2	2.6	57%
Munden-Tetotum Surface															
Chromium (MG/KG)	9	1	10	90.0	--	0.43	N	4.8	3.8	5.8	95%	7	6	9	95%
Iron (MG/KG)	10		10	100.0	--	0.79	N	2501	1993	3009	95%	3669	3151	4815	95%
Munden-Tetotum Subsurface															
Chromium (MG/KG)	10	1	11	90.9	--	0.63	N	9.5	6.1	12.8	95%	18	14	25	95%
Iron (MG/KG)	11		11	100.0	--	0.71	N	4614	3062	6165	95%	8412	6791	11838	95%
Dragston-Augusta Surface and Subsurface															
Cobalt (MG/KG)	14	5	19	73.7	--	0.16	N	1.8	1.5	2	95%	2.7	2.4	3.2	95%
Dragston-Augusta Surface															
Chromium (MG/KG)	9	1	10	90.0	0.31	0.63	N	6.7	5.4	7.9	95%	9.6	8.3	12.4	95%
Iron (MG/KG)	10		10	100.0	0.11	0.81	N	3366	2547	4185	95%	5249	4414	7097	95%

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Background Investigation
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Chemical Name	Number of Detects	Number of Non Detects	Total Number of Samples	Frequency of Detection	~L = Log Normal	~N = Normal	Assumed Distribution	Mean (Conc.)	Lower Confidence Interval (Conc.)	Upper Confidence Interval (Conc.)	~ Conf = 95% Confidence Level	Upper Tolerance Level (UTL) (Conc.)	Lower Bound UTL (Conc.)	Upper Bound UTL (Conc.)	~Conf = Associated Confidence
Dragston-Augusta Subsurface															
Chromium (MG/KG)	9	0	9	100.0	--	0.03	NP	14	12	14	89%	15	14	15	30%
Iron (MG/KG)	9	0	9	100.0	--	E-4	NP	6550	5120	7310	89%	13664	7310	17900	30%

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Background Investigation
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Chesapeake, Virginia

Chemical Name	Number of Detects	Number of Non Detects	Total Number of Samples	Frequency of Detection	~L = Log Normal	~N = Normal	Assumed Distribution	Mean (Conc.)	Lower Confidence Interval (Conc.)	Upper Confidence Interval (Conc.)	~ Conf = 95% Confidence Level	Upper Tolerance Level (UTL) (Conc.)	Lower Bound UTL (Conc.)	Upper Bound UTL (Conc.)	~Conf = Associated Confidence
Bohicket Surface and Subsurface															
4,4'-DDT (UG/KG)	7	13	20	35	E-4	E-7	NP	6	5.4	13	92%	34	26	81	57%
4,4'-DDE (UG/KG)	10	10	20	50	E-5	E-8	NP	6.3	5.5	11	92%	308	36	840	57%
Acenaphthene (UG/KG)	2	18	20	10	0.02	E-4	NP	110	110	130	92%	292	240	320	57%
Acenaphthylene (UG/KG)	3	17	20	15	0.002	E-4	NP	120	110	150	92%	292	240	320	57%
Aldrin (UG/KG)	1	19	20	5	0.001	E-6	NP	3.1	2.8	5.1	92%	8.7	7.4	17	57%
alpha-Chlordane (UG/KG)	2	18	20	10	E-5	E-7	NP	3.1	2.8	3.8	92%	9.1	7.4	25	57%
Aluminum (MG/KG)	20		20	100	0.77	E-4	L	10777	7617	18937	95%	30002	19241	63698	95%
Anthracene (UG/KG)	4	16	20	20	0.03	E-4	NP	125	110	170	92%	332	290	550	57%
Antimony (MG/KG)	20		20	100	0.11	E-5	L	7.4	5.1	13.4	95%	21	13	46	95%
Barium (MG/KG)	20		20	100	0.22	0.03	L	30	21	53	95%	83	53	179	95%
Benzo(a)anthracence (UG/KG)	12	8	20	60	0.047	E-6	NP	96	68	120	92%	749	650	910	57%
Benzo(a)pyrene (UG/KG)	13	7	20	65	0.047	E-6	NP	96	79	120	92%	732	550	770	57%
Benzo(b)fluoranthene (UG/KG)	9	11	20	45	0.001	E-6	NP	125	110	140	92%	825	610	910	57%
Benzo(g,h,I)perlyene (UG/KG)	10	10	20	50	0.11	E-5	L	181	128	316	95%	501	322	1060	95%
Benzo(k)fluoranthene (UG/KG)	11	9	20	55	0.05	E-5	L	160	111	297	95%	467	291	1039	95%
Beryllium (MG/KG)	2	18	20	10	0.85	E-5	L	0.74	0.48	1.6	95%	2.3	1.4	5.8	95%
beta -BHC (UG/KG)		20	20	0	0.002	E-4	NP	3.1	2.8	3.8	92%	7.5	6.2	8.3	57%
Calcium (MG/KG)	20		20	100	0.59	0.13	L	1395	1031	2218	95%	3530	2394	6818	95%
Chromium (MG/KG)	20		20	100	0.12	0.002	L	19	13	33	95%	53	34	111	95%
Chrysene (UG/KG)	16	4	20	80	0.009	E-7	NP	103	83	130	92%	986	930	1100	57%
Cobalt (MG/KG)	11	9	20	55	0.06	E-5	L	8.5	5.2	22	95%	30	16	85	95%
delta - BHC (UG/KG)	1	19	20	5	0.005	E-4	NP	3.1	2.8	5.1	92%	7.5	6.2	8.3	57%
Dibenz(a,h)anthracene (UG/KG)	4	16	20	20	0.047	0.004	NP	125	110	150	92%	292	260	320	57%
Dieldrin (UG/KG)	1	19	20	5	0.005	E-4	NP	5.8	5.4	7.3	92%	14	12	16	57%
Endosulfan I (UG/KG)	1	19	20	5	E-4	E-5	NP	3.1	2.8	3.8	92%	8.3	7.4	8.4	57%
Endosulfan II (UG/KG)		20	20	0	0.004	E-4	NP	6	5.5	7.3	92%	14	12	16	57%
Endrin (UG/KG)	1	19	20	5	0.008	E-4	NP	6	5.5	9	92%	14	12	16	57%
Endrin aldehyde (UG/KG)	2	18	20	10	0.004	E-4	NP	6	5.5	9.1	92%	15	14	16	57%
Fluoranthene (UG/KG)	16	4	20	80	0.003	E-7	NP	110	93	160	92%	2500	1400	2400	57%
Fluorene (UG/KG)	2	18	20	10	0.01	E-5	NP	110	110	130	92%	292	240	320	57%
gamma-Chlordane (UG/KG)	2	18	20	10	E-4	E-7	NP	3.1	2.8	3.8	92%	9.7	8.3	24	57%
Indeno(1,2,3-cd)pyrene (UG/KG)	10	10	20	50	0.18	E-5	L	164	114	300	95%	472	297	1035	95%
Iron (MG/KG)	20		20	100	0.16	0.003	L	15220	9795	34042	95%	50142	28682	129228	95%
Manganese (MG/KG)	20		20	100	0.055	E-4	L	93	55	270	95%	345	178	1059	95%
Mercury (MG/KG)	16	4	20	80	0.18	E-4	L	0.21	0.15	0.38	95%	0.6	0.4	1.3	95%
Magnesium (MG/KG)	20		20	100	0.35	0.005	L	3191	2110	6630	95%	10058	5944	24534	95%
Naphthalene (UG/KG)	3	17	20	15	0.001	E-4	NP	110	100	130	92%	292	240	320	57%
Nickel (MG/KG)	18	2	20	90	0.06	0.004	L	15	10	29	95%	44	27	102	95%
Phenanthrene (UG/KG)	5	15	20	25	0.25	E-4	L	158	120	238	95%	376	264	687	95%
Potassium (MG/KG)	13	7	20	65	0.26	0.003	L	1702	1039	4428	95%	6046	3252	17299	95%
Pyrene (UG/KG)	13	7	20	65	E-4	E-7	NP	115	95	150	92%	1905	1400	2000	57%
Selenium (MG/KG)	7	13	20	35	0.004	E-4	NP	1	0.9	1.7	92%	2.6	2.4	3	57%
Silver (MG/KG)	3	17	20	15	0.002	E-4	NP	0.76	0.7	1.3	92%	1.8	1.5	2.1	57%
Sodium (MG/KG)	19	1	20	95	0.84	E-4	L	6199	4024	13584	95%	20145	11643	51017	95%
Vanadium (MG/KG)	20		20	100	0.053	E-4	L	28	20	45	95%	72	48	143	95%
Zinc (MG/KG)	20		20	100	0.12	0.002	L	108	67	264	95%	372	205	1024	95%

Table H-1
Soil Sample Data Summary
Background Investigation
St. Juliens Creek Annex
Chesapeake, Virginia

Chemical Name	Number of Detects	Number of Non Detects	Total Number of Samples	Frequency of Detection	~L = Log Normal	~N = Normal	Assumed Distribution	Mean (Conc.)	Lower Confidence Interval (Conc.)	Upper Confidence Interval (Conc.)	~ Conf = 95% Confidence Level	Upper Tolerance Level (UTL) (Conc.)	Lower Bound UTL (Conc.)	Upper Bound UTL (Conc.)	~Conf = Associated Confidence
Bohicket Surface															
4,4'-DDE (UG/KG)	8	1	9	88.9	--	E-6	NP	20	16	28	89%	269	28	430	30%
Antimony (MG/KG)		9	9	0.0	--	0.47	N	1.4	0.9	1.8	95%	2.4	1.9	3.4	95%
Copper (MG/KG)	9		9	100.0	--	0.06	N	36	15	57	95%	81	60	129	95%
Lead (MG/KG)	9		9	100.0	--	0.05	N	82	29	136	95%	198	144	322	95%
Bohicket Subsurface															
4,4'-DDE (UG/KG)	6	5	11	54.5	--	E-6	NP	6.4	5	17	93%	99	58	140	33%
Antimony (MG/KG)		11	11	0.0	--	0.01	NP	0.7	0.6	1.1	93%	1.2	1.2	1.2	33%
Copper (MG/KG)	11		11	100.0	--	E-5	NP	11	7	21	93%	64	64	64	33%
Lead (MG/KG)	11		11	100.0	--	E-4	NP	23	14	37	93%	145	116	174	33%
Urban-Udorthent Surface and Subsurface															
4,4'-DDT (UG/KG)	6	13	19	31.6	E-5	E-7	NP	3.9	3.9	4.1	94%	22.1	6	32	56%
Acenaphthene (UG/KG)	2	18	20	10.0	E-7	E-6	NP	79	79	82	92%	88	88	91	57%
Acenaphthylene (UG/KG)	4	16	20	20.0	E-6	E-5	NP	79	78	82	92%	88	88	91	57%
Aldrin (UG/KG)		19	19	0.0	E-8	E-8	NP	2	2	2.1	94%	2.9	2.2	8.1	56%
alpha-Chlordane (UG/KG)	1	18	19	5.3	E-8	E-8	NP	2.1	2	2.1	94%	9.6	2.3	23	56%
Aluminum (MG/KG)	20		20	100.0	0.49	0.07	L	8389	6206	13297	95%	21155	14371	40741	95%
Anthracene (UG/KG)	4	16	20	20.0	E-7	E-6	NP	79	78	82	92%	88	88	91	57%
Antimony (MG/KG)	1	19	20	5.0	E-4	E-4	NP	0.52	0.49	0.65	92%	0.91	0.86	1	57%
Arsenic (MG/KG)	20		20	100.0	0.08	0.67	N	3	2.3	3.7	95%	5.5	4.6	6.9	95%
Barium (MG/KG)	20		20	100.0	0.11	0.79	N	33	25	41	95%	61	51	77	95%
Benzo(a)anthracence (UG/KG)	9	11	20	45.0	0.13	E-5	L	88	65	139	95%	221	151	423	95%
Benzo(a)pyrene (UG/KG)	10	10	20	50.0	0.03	E-5	NP	79	78	84	92%	253	170	300	57%
Benzo(b)fluoranthene (UG/KG)	9	11	20	45.0	0.009	E-6	NP	80	78	91	92%	316	200	420	57%
Benzo(g,h,I)perlyene (UG/KG)	11	9	20	55.0	0.1	E-4	L	88	65	138	95%	219	150	418	95%
Benzo(k)fluoranthene (UG/KG)	10	10	20	50.0	0.04	E-4	NP	79	78	84	92%	241	180	270	57%
Beryllium (MG/KG)		20	20	0.0	E-8	0.001	NP	0.2	0.2	0.3	92%	0.6	0.3	0.7	57%
beta -BHC (UG/KG)		19	19	0.0	E-8	E-8	NP	78	63	84	92%	252	180	290	57%
Calcium (MG/KG)	20		20	100.0	E-4	E-8	NP	741	585	1100	92%	57405	9490	105000	57%
Chromium (MG/KG)	19	1	20	95.0	0.86	0.005	L	12.5	9.7	17.9	95%	28	20	48	95%
Chrysene (UG/KG)	12	8	20	60.0	0.08	E-5	L	106	77	174	95%	277	184	553	95%
Cobalt (MG/KG)	14	6	20	70.0	0.25	0.002	L	2.7	2.1	4	95%	6.3	4.5	11.3	95%
delta - BHC (UG/KG)		19	19	0.0	E-8	E-8	NP	2	2	2.1	94%	2.9	2.2	8.1	56%
Dibenz(a,h)anthracene (UG/KG)	4	16	20	20.0	E-6	E-4	NP	81	79	84	92%	98	91	110	57%
Dieldrin (UG/KG)		19	19	0.0	E-8	E-8	NP	3.9	3.9	4	94%	5.7	4.3	16	56%
Endosulfan I (UG/KG)		19	19	0.0	E-8	E-8	NP	2	2	2.1	94%	2.9	2.2	8.1	56%
Endosulfan II (UG/KG)		19	19	0.0	E-8	E-8	NP	3.9	3.9	4	94%	5.7	4.3	16	56%
Endrin (UG/KG)		19	19	0.0	E-8	E-8	NP	3.9	3.9	4	94%	5.7	4.3	16	56%
Endrin aldehyde (UG/KG)		19	19	0.0	E-8	E-8	NP	3.9	3.9	4	94%	5.7	4.3	16	56%
Fluorene (UG/KG)	1	19	20	5.0	E-8	E-7	NP	80	79	82	92%	88	88	91	57%
gamma-Chlordane (UG/KG)	1	18	19	5.3	E-7	E-8	NP	2.1	2	2.1	94%	5.6	2.3	8.1	56%
Indeno(1,2,3-cd)pyrene (UG/KG)	9	11	20	45.0	0.05	E-4	L	89	68	129	95%	202	145	356	95%
Iron (MG/KG)	20		20	100.0	0.3	0.01	L	8023	6295	11288	95%	17494	12822	29624	95%
Magnesium (MG/KG)	20		20	100.0	0.74	E-4	L	777	588	1172	95%	1853	1297	3392	95%
Manganese (MG/KG)	20		20	100.0	0.02	E-6	L	44	30	86	95%	133	81	312	95%
Naphthalene (UG/KG)	4	16	20	20.0	E-6	E-5	NP	79	78	82	92%	88	88	91	57%
Nickel (MG/KG)	19	1	20	95.0	0.05	E-6	L	5.3	4.3	7.1	95%	11	8	17	95%

Table H-1
Soil Sample Data Summary
Background Investigation
St. Juliens Creek Annex
Chesapeake, Virginia

Chemical Name	Number of Detects	Number of Non Detects	Total Number of Samples	Frequency of Detection	~L = Log Normal	~N = Normal	Assumed Distribution	Mean (Conc.)	Lower Confidence Interval (Conc.)	Upper Confidence Interval (Conc.)	~ Conf = 95% Confidence Level	Upper Tolerance Level (UTL) (Conc.)	Lower Bound UTL (Conc.)	Upper Bound UTL (Conc.)	~Conf = Associated Confidence
Phenanthrene (UG/KG)	9	11	20	45.0	0.03	E-5	NP	79	78	84	92%	149	140	310	57%
Potassium (MG/KG)	5	15	20	25.0	0.34	E-4	L	415	304	670	95%	1067	717	2094	95%
Selenium (MG/KG)		20	20	0.0	E-6	E-7	NP	0.66	0.64	0.72	92%	0.82	0.79	1.3	57%
Silver (MG/KG)		20	20	0.0	0.001	E-4	NP	0.5	0.5	0.51	92%	0.56	0.55	0.57	57%
Sodium (MG/KG)	15	5	20	75.0	E-5	E-7	NP	47	39	64	92%	574	308	1260	57%
Vanadium (MG/KG)	20		20	100.0	0.08	0.08	N	21	16	26	95%	39	33	49	95%
Urban-Udorthent Surface															
4,4'-DDE (UG/KG)	6	3	9	66.7	--	E-6	NP	15	4	240	89%	1116	240	1700	30%
4,4'-DDT (UG/KG)	7	2	9	77.8	--	E-7	NP	13	4	36	89%	566	36	920	30%
Copper (MG/KG)	10		10	100.0	--	E-4	NP	9	8	27	93%	38	27	47	32%
Fluoranthene (UG/KG)	8	2	10	80.0	--	0.002	NP	93	78	430	93%	469	430	500	32%
Lead (MG/KG)	10		10	100.0	--	0.08	N	46	26	66	95%	92	72	138	95%
Mercury (MG/KG)	1	9	10	10.0	--	0.002	NP	0.14	0.13	0.25	93%	0.34	0.25	0.42	32%
Pyrene (UG/KG)	8	2	10	80.0	--	0.002	NP	100	88	430	93%	480	430	520	32%
Zinc (MG/KG)	10		10	100.0	--	0.004	NP	48	32	91	93%	131	91	164	32%
Urban-Udorthent Subsurface															
4,4'-DDE (UG/KG)	1	9	10	10.0	--	E-7	NP	4	4	4.5	93%	41	4.5	79	32%
4,4'-DDT (UG/KG)	1	9	10	10.0	--	E-7	NP	4	4	4.5	93%	9	4.5	12	32%
Copper (MG/KG)	8	2	10	80.0	--	0.59	N	4.3	2.2	6.4	95%	9.1	7	14	95%
Fluoranthene (UG/KG)	3	7	10	30.0	--	0.002	NP	79	64	81	93%	83	81	84	32%
Lead (MG/KG)	10		10	100.0	--	0.006	NP	7.3	5.5	21	93%	27	21	31	32%
Mercury (MG/KG)		10	10	0.0	--	0.51	N	0.1	0.08	0.11	95%	0.12	0.11	0.15	95%
Pyrene (UG/KG)	3	7	10	30.0	--	E-4	NP	79	69	81	93%	83	81	84	32%
Zinc (MG/KG)	9	1	10	90.0	--	0.001	NP	12	10	31	93%	46	31	59	32%
Dredge Fill Surface and Subsurface															
4,4'-DDT (UG/KG)	1	19	20	5.0	E-4	0.002	NP	4.7	4.7	5	92%	5.3	5.2	5.5	57%
4,4'-DDE (UG/KG)	7	13	20	35.0	0.08	0.002	L	5.2	4.5	6.4	95%	9	7.3	13	95%
Acenaphthene (UG/KG)	5	15	20	25.0	0.04	E-6	NP	96	87	110	92%	592	480	1200	57%
Aldrin (UG/KG)		20	20	0.0	0.1	0.23	N	2.4	2.3	2.5	95%	2.8	2.7	3	95%
alpha-Chlordane (UG/KG)		20	20	0.0	0.1	0.23	N	2.4	2.3	2.5	95%	2.8	2.7	3	95%
Anthracene (UG/KG)	18	2	20	90.0	0.007	E-8	NP	78	69	130	92%	462	340	2400	57%
Antimony (MG/KG)	11	9	20	55.0	0.38	0.003	L	0.86	0.73	1.05	95%	1.47	1.2	2.06	95%
Benzo(a)anthracence (UG/KG)	20		20	100.0	0.99	E-7	L	578	356	1462	95%	2027	1102	5692	95%
Benzo(a)pyrene (UG/KG)	20		20	100.0	0.91	E-7	L	525	331	1244	95%	1785	997	4792	95%
Benzo(k)fluoranthene (UG/KG)	20		20	100.0	0.76	E-5	L	594	372	1434	95%	2038	1130	5542	95%
beta -BHC (UG/KG)		20	20	0.0	0.1	0.23	N	2.4	2.3	2.5	95%	2.8	2.7	3	95%
Calcium (MG/KG)	20		20	100.0	0.16	E-4	L	1217	877	2043	95%	3251	2137	6617	95%
Chrysene (UG/KG)	20		20	100.0	0.66	E-5	L	992	610	2521	95%	3487	1893	9823	95%
Cobalt (MG/KG)	17	3	20	85.0	0.15	0.82	N	7	5.4	8.6	95%	13	11	16	95%
delta - BHC (UG/KG)		20	20	0.0	0.1	0.23	N	2.4	2.3	2.5	95%	2.8	2.7	3	95%
Dieldrin (UG/KG)	2	18	20	10.0	E-4	0.005	NP	4.7	4.7	5	92%	5.3	5.2	5.5	57%
Endosulfan I (UG/KG)		20	20	0.0	0.1	0.23	N	2.4	2.3	2.5	95%	2.8	2.7	3	95%
Endosulfan II (UG/KG)		20	20	0.0	0.02	0.06	N	4.7	4.5	4.9	95%	5.4	5.2	5.8	95%
Endrin (UG/KG)		20	20	0.0	0.02	0.06	N	4.7	4.5	4.9	95%	5.4	5.2	5.8	95%
Endrin aldehyde (UG/KG)		20	20	0.0	0.02	0.06	N	4.7	4.5	4.9	95%	5.4	5.2	5.8	95%
Fluoranthene (UG/KG)	20		20	100.0	0.22	E-8	L	758	453	2101	95%	2766	1453	8242	95%

Table H-1
Soil Sample Data Summary
Background Investigation
St. Juliens Creek Annex
Chesapeake, Virginia

Chemical Name	Number of Detects	Number of Non Detects	Total Number of Samples	Frequency of Detection	~L = Log Normal	~N = Normal	Assumed Distribution	Mean (Conc.)	Lower Confidence Interval (Conc.)	Upper Confidence Interval (Conc.)	~ Conf = 95% Confidence Level	Upper Tolerance Level (UTL) (Conc.)	Lower Bound UTL (Conc.)	Upper Bound UTL (Conc.)	~Conf = Associated Confidence
Fluorene (UG/KG)	4	16	20	20.0	0.02	E-6	NP	96	94	110	92%	602	480	1400	57%
gamma-Chlordane (UG/KG)		20	20	0.0	0.1	0.23	N	2.4	2.3	2.5	95%	2.8	2.7	3	95%
Naphthalene (UG/KG)	14	6	20	70.0	0.02	E-6	NP	59	32	87	92%	485	480	570	57%
Phenanthrene (UG/KG)	19	1	20	95.0	E-4	E-9	NP	84	68	140	92%	913	260	9700	57%
Pyrene (UG/KG)	20		20	100.0	0.4	E-8	L	696	410	2026	95%	2590	1336	7953	95%
Silver (MG/KG)	2	18	20	10.0	E-4	E-4	NP	0.6	0.55	0.61	92%	0.67	0.64	0.67	57%
Dredge Fill Surface															
4,4'-DDT (UG/KG)	9	1	10	90.0	0.87	0.73	N	11	6.2	15	95%	21	16	31	95%
Acenaphthylene (UG/KG)	10		10	100.0	0.08	0.04	NP	144	64	240	93%	246	240	250	32%
Aluminum (MG/KG)	10		10	100.0	0.01	0.15	N	17083	14603	19563	95%	22786	20256	28382	95%
Arsenic (MG/KG)	10		10	100.0	0.69	0.99	N	17	14	20	95%	24	21	32	95%
Barium (MG/KG)	10		10	100.0	0.24	0.05	N	77	68	86	95%	98	88	118	95%
Benzo(b)fluoranthene (UG/KG)	10		10	100.0	0.59	0.12	N	1431	663	2199	95%	3197	2413	4931	95%
Benzo(g,h,I)perlyene (UG/KG)	10		10	100.0	0.4	0.38	N	811	444	1178	95%	1655	1280	2483	95%
Beryllium (MG/KG)	4	6	10	40.0	0.02	E-4	NP	0.62	0.53	0.71	93%	1	0.7	1.3	32%
Chromium (MG/KG)	10		10	100.0	0.004	0.04	NP	39	35	45	93%	45	45	45	32%
Copper (MG/KG)	10		10	100.0	0.45	0.95	N	43	36	49	95%	58	51	72	95%
Dibenz(a,h)anthracene (UG/KG)	6	4	10	60.0	0.004	0.05	N	401	264	537	95%	714	575	1022	95%
Indeno(1,2,3-cd)pyrene (UG/KG)	10		10	100.0	0.53	0.27	N	847	420	1274	95%	1829	1393	2792	95%
Iron (MG/KG)	10		10	100.0	0.02	0.11	N	35570	31119	40021	95%	45805	41265	55850	95%
Lead (MG/KG)	10		10	100.0	0.22	0.69	N	105	87	123	95%	147	128	188	95%
Magnesium (MG/KG)	10		10	100.0	0.39	0.77	N	3446	2984	3908	95%	4507	4037	5549	95%
Manganese (MG/KG)	10		10	100.0	0.06	0.01	NP	131	124	166	93%	198	166	224	32%
Mercury (MG/KG)	10		10	100.0	0.42	0.35	N	0.8	0.6	1	95%	1.3	1.1	1.7	95%
Nickel (MG/KG)	10		10	100.0	0.01	E-4	NP	13	12	14	93%	19	14	24	32%
Potassium (MG/KG)	10		10	100.0	0.59	0.79	N	3276	2710	3842	95%	4577	4000	5854	95%
Selenium (MG/KG)	8	2	10	80.0	0.37	0.57	N	1.5	1.2	1.8	95%	2.2	1.9	2.9	95%
Sodium (MG/KG)	10		10	100.0	0.05	E-4	NP	187	151	392	93%	620	392	806	32%
Vanadium (MG/KG)	10		10	100.0	0.01	0.08	N	55	49	62	95%	70	64	85	95%
Zinc (MG/KG)	10		10	100.0	0.01	E-4	NP	91	83	107	93%	137	107	162	32%
Dredge Fill Subsurface															
4,4'-DDT (UG/KG)	1	9	10	10.0	E-4	E-5	NP	4.7	4.5	5.3	93%	9	5.3	12	32%
Acenaphthene (UG/KG)	9	1	10	90.0	0.63	0.06	N	69	41	96	95%	131	103	192	95%
Aluminum (MG/KG)	10		10	100.0	0.08	0.27	N	9150	4936	13364	95%	18839	14541	28347	95%
Arsenic (MG/KG)	10		10	100.0	0.11	0.1	N	7.8	5.2	10	95%	14	11	20	95%
Barium (MG/KG)	10		10	100.0	0.41	0.43	N	27	17	37	95%	50	40	72	95%
Benzo(b)fluoranthene (UG/KG)	10		10	100.0	0.36	E-5	NP	375	260	910	93%	2335	910	3500	32%
Benzo(g,h,I)perlyene (UG/KG)	10		10	100.0	0.59	E-6	NP	245	100	630	93%	2099	630	3300	32%
Beryllium (MG/KG)		10	10	0.0	0.99	0.42	N	0.42	0.25	0.59	95%	0.81	0.64	1.18	95%
Chromium (MG/KG)	10		10	100.0	0.03	0.09	N	20	12	28	95%	39	30	57	95%
Copper (MG/KG)	10		10	100.0	0.94	0.55	N	22	14	30	95%	40	32	57	95%
Dibenz(a,h)anthracene (UG/KG)	9	1	10	90.0	0.71	E-5	NP	111	67	350	93%	708	350	1000	32%
Indeno(1,2,3-cd)pyrene (UG/KG)	10		10	100.0	0.67	E-5	NP	230	120	630	93%	1769	630	2700	32%
Iron (MG/KG)	10		10	100.0	0.05	0.08	N	18829	11107	26551	95%	36585	28709	54009	95%
Lead (MG/KG)	10		10	100.0	0.52	0.11	N	46	28	63	95%	86	68	125	95%
Magnesium (MG/KG)	10		10	100.0	0.08	0.47	N	1923	1086	2760	95%	3847	2994	5736	95%
Manganese (MG/KG)	10		10	100.0	0.83	0.15	N	79	47	110	95%	151	119	223	95%

Table H-1
Soil Sample Data Summary
Background Investigation
St. Juliens Creek Annex
Chesapeake, Virginia

Chemical Name	Number of Detects	Number of Non Detects	Total Number of Samples	Frequency of Detection	~L = Log Normal	~N = Normal	Assumed Distribution	Mean (Conc.)	Lower Confidence Interval (Conc.)	Upper Confidence Interval (Conc.)	~ Conf = 95% Confidence Level	Upper Tolerance Level (UTL) (Conc.)	Lower Bound UTL (Conc.)	Upper Bound UTL (Conc.)	~Conf = Associated Confidence
Mercury (MG/KG)	10		10	100.0	0.46	0.6	N	0.37	0.26	0.48	95%	0.62	0.51	0.86	95%
Nickel (MG/KG)	9	1	10	90.0	0.05	0.14	N	8.2	5.1	11	95%	15	12	23	95%
Potassium (MG/KG)	10		10	100.0	0.09	0.33	N	1626	827	2426	95%	3465	2649	5269	95%
Selenium (MG/KG)	5	5	10	50.0	0.48	0.24	N	1	0.8	1.2	95%	1.5	1.3	1.9	95%
Sodium (MG/KG)	9	1	10	90.0	0.01	0.05	N	92	43	140	95%	203	153	312	95%
Vanadium (MG/KG)	10		10	100.0	0.08	0.08	N	22	13	31	95%	42	33	62	95%
Zinc (MG/KG)	10		10	100.0	0.46	0.39	N	47	29	65	95%	87	70	127	95%

Table H-2
Columbia Aquifer Background Groundwater Quality Summary
Background Investigation
St. Juliens Creek Annex
Chesapeake, Virginia

Chemical Name	Number of Detects	Total Number of Samples	Frequency of Detection	Reporting Limit Minimum	Reporting Limit Maximum	Minimum Detected Conc.	Maximum Detected Conc.	Average Conc.	Median Conc.	Standard Deviation	Coefficient of Variation	Upper Confidence Limit
Dissolved Metals (UG/L)												
Barium	4	4	1.00			24	63.2	50.5	57.5	18.2	0.4	72.0
Calcium	4	4	1.00			21400	141000	56800.0	32400.0	56406.4	1.0	123186.0
Iron	4	4	1.00			65	21100	7513.8	4445.0	9941.3	1.3	19213.9
Magnesium	4	4	1.00			4890	22400	11692.5	9740.0	8163.2	0.7	21299.9
Manganese	4	4	1.00			120	1040	442.8	305.5	411.8	0.9	927.4
Nickel	4	4	1.00			2.2	14.3	7.7	7.1	5.0	0.7	13.5
Potassium	4	4	1.00			1600	5620	3185.0	2760.0	1953.4	0.6	5484.0
Sodium	4	4	1.00			18400	57700	39675.0	41300.0	17363.6	0.4	60110.7
Cobalt	3	4	0.75	0.5	0.5	4.6	14.4	6.8	6.3	6.0	0.9	13.8
Aluminum	2	4	0.50	38.2	38.2	69.9	399	126.8	54.1	183.1	1.4	342.2
Arsenic	2	4	0.50	2	2	2.1	2.2	1.6	2.1	0.7	0.4	2.4
Lead	2	4	0.50	1	1	1.1	2.1	1.1	1.1	0.8	0.7	1.9
Beryllium	1	4	0.25	0.1	0.1	0.31	0.31	0.1	0.1	0.1	1.1	0.3
Antimony		4	0.00	2.7	2.7			1.4	2.7			1.4
Cadmium		4	0.00	0.3	0.3			0.2	0.3			0.2
Chromium		4	0.00	1.1	1.1			0.6	1.1			0.6
Copper		4	0.00	2.2	3.3			1.5	3.1	0.2	0.2	1.8
Mercury		4	0.00	0.1	0.1			0.1	0.1			0.1
Selenium		4	0.00	2.6	2.6			1.3	2.6			1.3
Silver		4	0.00	0.9	0.9			0.5	0.9			0.5
Thallium		4	0.00	3.2	3.2			1.6	3.2			1.6
Vanadium		4	0.00	0.6	0.6			0.3	0.6			0.3
Zinc	4	4	1.00			9.1	109	47.3	35.6	43.7	0.9	98.8
Total Metals (UG/L)												
Aluminum	4	4	1.00			181	357	232.3	195.5	84.0	0.4	331.1
Barium	4	4	1.00			26.1	63.5	52.8	60.9	18.0	0.3	74.0
Calcium	4	4	1.00			21300	142000	56075.0	30500.0	57486.5	1.0	123732.2
Cobalt	4	4	1.00			0.84	13.9	7.1	6.8	5.5	0.8	13.6
Iron	4	4	1.00			374	18000	6927.3	4667.5	8306.8	1.2	16703.7
Magnesium	4	4	1.00			4860	19600	11337.5	10445.0	7106.7	0.6	19701.5
Manganese	4	4	1.00			121	912	415.8	315.0	347.8	0.8	825.1
Nickel	4	4	1.00			2.7	15.1	8.3	7.8	5.1	0.6	14.3
Potassium	4	4	1.00			1620	5010	3027.5	2740.0	1678.6	0.6	5003.1
Sodium	4	4	1.00			18600	53900	39850.0	43450.0	16793.0	0.4	59614.0
Vanadium	4	4	1.00			0.79	1	0.9	0.9	0.1	0.1	1.0
Zinc	4	4	1.00			9.5	89.7	46.9	44.2	32.9	0.7	85.6
Lead	2	4	0.50	1	1	1.1	1.9	1.0	1.1	0.7	0.7	1.8
Arsenic	1	4	0.25	2	2	2	2	1.3	2.0	0.5	0.4	1.8
Beryllium	1	4	0.25	0.1	0.1	0.27	0.27	0.1	0.1	0.1	1.0	0.2
Antimony		4	0.00	2.7	2.7			1.4	2.7			1.4
Cadmium		4	0.00	0.3	0.3			0.2	0.3			0.2

Table H-2
Columbia Aquifer Background Groundwater Quality Summary
Background Investigation
St. Juliens Creek Annex
Chesapeake, Virginia

Chemical Name	Number of Detects	Total Number of Samples	Frequency of Detection	Reporting Limit Minimum	Reporting Limit Maximum	Minimum Detected Conc.	Maximum Detected Conc.	Average Conc.	Median Conc.	Standard Deviation	Coefficient of Variation	Upper Confidence Limit
Chromium		4	0.00	1.1	1.1			0.6	1.1			0.6
Copper		4	0.00	2.7	4.2			1.7	3.5	0.3	0.2	2.1
Cyanide		4	0.00	5	5			2.5	5.0			2.5
Mercury		4	0.00	0.1	0.1			0.1	0.1			0.1
Selenium		4	0.00	2.6	2.6			1.3	2.6			1.3
Silver		4	0.00	0.9	0.9			0.5	0.9			0.5
Thallium		4	0.00	3.2	3.2			1.6	3.2			1.6
Semivolatile Organic (UG/L)												
2,2'-oxybis(1-Chloropropane)		4	0.00	11	12			5.6	11.0	0.3	0.0	5.9
2,4,5-Trichlorophenol		4	0.00	26	29			13.5	26.5	0.7	0.1	14.3
2,4,6-Trichlorophenol		4	0.00	11	12			5.6	11.0	0.3	0.0	5.9
2,4-Dichlorophenol		4	0.00	11	12			5.6	11.0	0.3	0.0	5.9
2,4-Dimethylphenol		4	0.00	11	12			5.6	11.0	0.3	0.0	5.9
2,4-Dinitrophenol		4	0.00	26	29			13.5	26.5	0.7	0.1	14.3
2,4-Dinitrotoluene		4	0.00	11	12			5.6	11.0	0.3	0.0	5.9
2,6-Dinitrotoluene		4	0.00	11	12			5.6	11.0	0.3	0.0	5.9
2-Chloronaphthalene		4	0.00	11	12			5.6	11.0	0.3	0.0	5.9
2-Chlorophenol		4	0.00	11	12			5.6	11.0	0.3	0.0	5.9
2-Methylnaphthalene		4	0.00	11	12			5.6	11.0	0.3	0.0	5.9
2-Methylphenol		4	0.00	11	12			5.6	11.0	0.3	0.0	5.9
2-Nitroaniline		4	0.00	26	29			13.5	26.5	0.7	0.1	14.3
2-Nitrophenol		4	0.00	11	12			5.6	11.0	0.3	0.0	5.9
3,3'-Dichlorobenzidine		4	0.00	11	12			5.6	11.0	0.3	0.0	5.9
3-Nitroaniline		4	0.00	26	29			13.5	26.5	0.7	0.1	14.3
4,6-Dinitro-2-methylphenol		4	0.00	26	29			13.5	26.5	0.7	0.1	14.3
4-Bromophenyl-phenylether		4	0.00	11	12			5.6	11.0	0.3	0.0	5.9
4-Chloro-3-methylphenol		4	0.00	11	12			5.6	11.0	0.3	0.0	5.9
4-Chloroaniline		4	0.00	11	12			5.6	11.0	0.3	0.0	5.9
4-Chlorophenyl-phenylether		4	0.00	11	12			5.6	11.0	0.3	0.0	5.9
4-Methylphenol		4	0.00	11	12			5.6	11.0	0.3	0.0	5.9
4-Nitroaniline		4	0.00	26	29			13.5	26.5	0.7	0.1	14.3
4-Nitrophenol		4	0.00	26	29			13.5	26.5	0.7	0.1	14.3
Acenaphthene		4	0.00	11	12			5.6	11.0	0.3	0.0	5.9
Acenaphthylene		4	0.00	11	12			5.6	11.0	0.3	0.0	5.9
Anthracene		4	0.00	11	12			5.6	11.0	0.3	0.0	5.9
Benzo(a)anthracene		4	0.00	11	12			5.6	11.0	0.3	0.0	5.9
Benzo(a)pyrene		4	0.00	11	12			5.6	11.0	0.3	0.0	5.9
Benzo(b)fluoranthene		4	0.00	11	12			5.6	11.0	0.3	0.0	5.9
Benzo(g,h,i)perylene		4	0.00	11	12			5.6	11.0	0.3	0.0	5.9
Benzo(k)fluoranthene		4	0.00	11	12			5.6	11.0	0.3	0.0	5.9
bis(2-Chloroethoxy)methane		4	0.00	11	12			5.6	11.0	0.3	0.0	5.9
bis(2-Chloroethyl)ether		4	0.00	11	12			5.6	11.0	0.3	0.0	5.9

Table H-2
Columbia Aquifer Background Groundwater Quality Summary
Background Investigation
St. Juliens Creek Annex
Chesapeake, Virginia

Chemical Name	Number of Detects	Total Number of Samples	Frequency of Detection	Reporting Limit Minimum	Reporting Limit Maximum	Minimum Detected Conc.	Maximum Detected Conc.	Average Conc.	Median Conc.	Standard Deviation	Coefficient of Variation	Upper Confidence Limit
bis(2-Ethylhexyl)phthalate		4	0.00	11	12			5.6	11.0	0.3	0.0	5.9
Butylbenzylphthalate		4	0.00	11	12			5.6	11.0	0.3	0.0	5.9
Carbazole		4	0.00	11	12			5.6	11.0	0.3	0.0	5.9
Chrysene		4	0.00	11	12			5.6	11.0	0.3	0.0	5.9
Di-n-butylphthalate		4	0.00	11	12			5.6	11.0	0.3	0.0	5.9
Di-n-octylphthalate		4	0.00	11	12			5.6	11.0	0.3	0.0	5.9
Dibenz(a,h)anthracene		4	0.00	11	12			5.6	11.0	0.3	0.0	5.9
Dibenzofuran		4	0.00	11	12			5.6	11.0	0.3	0.0	5.9
Diethylphthalate		4	0.00	11	12			5.6	11.0	0.3	0.0	5.9
Dimethylphthalate		4	0.00	11	12			5.6	11.0	0.3	0.0	5.9
Fluoranthene		4	0.00	11	12			5.6	11.0	0.3	0.0	5.9
Fluorene		4	0.00	11	12			5.6	11.0	0.3	0.0	5.9
Hexachlorobenzene		4	0.00	11	12			5.6	11.0	0.3	0.0	5.9
Hexachlorobutadiene		4	0.00	11	12			5.6	11.0	0.3	0.0	5.9
Hexachlorocyclopentadiene		4	0.00	11	12			5.6	11.0	0.3	0.0	5.9
Hexachloroethane		4	0.00	11	12			5.6	11.0	0.3	0.0	5.9
Indeno(1,2,3-cd)pyrene		4	0.00	11	12			5.6	11.0	0.3	0.0	5.9
Isophorone		4	0.00	11	12			5.6	11.0	0.3	0.0	5.9
n-Nitroso-di-n-propylamine		4	0.00	11	12			5.6	11.0	0.3	0.0	5.9
n-Nitrosodiphenylamine		4	0.00	11	12			5.6	11.0	0.3	0.0	5.9
Naphthalene		4	0.00	11	12			5.6	11.0	0.3	0.0	5.9
Nitrobenzene		4	0.00	11	12			5.6	11.0	0.3	0.0	5.9
Pentachlorophenol		4	0.00	26	29			13.5	26.5	0.7	0.1	14.3
Phenanthrene		4	0.00	11	12			5.6	11.0	0.3	0.0	5.9
Phenol		4	0.00	11	12			5.6	11.0	0.3	0.0	5.9
Pyrene		4	0.00	11	12			5.6	11.0	0.3	0.0	5.9
Volatile Organic (UG/L)												
Acetone	1	4	0.25	5	5	30.5	30.5	9.5	5.0	14.0	1.5	26.0
cis-1,2-Dichloroethene	1	4	0.25	1	1	0.2	0.2	0.4	1.0	0.2	0.4	0.6
Trichloroethene	1	4	0.25	1	1	0.8	0.8	0.6	1.0	0.2	0.3	0.8
1,1,1-Trichloroethane		4	0.00	1	1			0.5	1.0			0.5
1,1,2,2-Tetrachloroethane		4	0.00	1	1			0.5	1.0			0.5
1,1,2-Trichloroethane		4	0.00	1	1			0.5	1.0			0.5
1,1-Dichloroethane		4	0.00	1	1			0.5	1.0			0.5
1,1-Dichloroethene		4	0.00	1	1			0.5	1.0			0.5
1,2,4-Trichlorobenzene		8	0.00	1	12			3.1	6.0	2.7	0.9	4.9
1,2-Dibromo-3-chloropropane		4	0.00	1	1			0.5	1.0			0.5
1,2-Dibromoethane		4	0.00	1	1			0.5	1.0			0.5
1,2-Dichlorobenzene		8	0.00	1	12			3.1	6.0	2.7	0.9	4.9
1,2-Dichloroethane		4	0.00	1	1			0.5	1.0			0.5
1,2-Dichloropropane		4	0.00	1	1			0.5	1.0			0.5
1,3-Dichlorobenzene		8	0.00	1	12			3.1	6.0	2.7	0.9	4.9

Table H-2
Columbia Aquifer Background Groundwater Quality Summary
Background Investigation
St. Juliens Creek Annex
Chesapeake, Virginia

Chemical Name	Number of Detects	Total Number of Samples	Frequency of Detection	Reporting Limit Minimum	Reporting Limit Maximum	Minimum Detected Conc.	Maximum Detected Conc.	Average Conc.	Median Conc.	Standard Deviation	Coefficient of Variation	Upper Confidence Limit
1,4-Dichlorobenzene		8	0.00	1	12			3.1	6.0	2.7	0.9	4.9
2-Butanone		4	0.00	5	5			2.5	5.0			2.5
2-Hexanone		4	0.00	5	5			2.5	5.0			2.5
4-Methyl-2-pentanone		4	0.00	5	5			2.5	5.0			2.5
Benzene		4	0.00	1	1			0.5	1.0			0.5
Bromochloromethane		4	0.00	1	1			0.5	1.0			0.5
Bromodichloromethane		4	0.00	1	1			0.5	1.0			0.5
Bromoform		4	0.00	1	1			0.5	1.0			0.5
Bromomethane		4	0.00	1	1			0.5	1.0			0.5
Carbon disulfide		4	0.00	1	2.1			0.8	1.5	0.2	0.3	1.0
Carbon tetrachloride		4	0.00	1	1			0.5	1.0			0.5
Chlorobenzene		4	0.00	1	1			0.5	1.0			0.5
Chloroethane		4	0.00	1	1			0.5	1.0			0.5
Chloroform		4	0.00	0.2	1			0.3	0.5	0.2	0.8	0.5
Chloromethane		4	0.00	1	1			0.5	1.0			0.5
cis-1,3-Dichloropropene		4	0.00	1	1			0.5	1.0			0.5
Dibromochloromethane		4	0.00	1	1			0.5	1.0			0.5
Ethylbenzene		4	0.00	1	1			0.5	1.0			0.5
Methylene chloride		4	0.00	1	1.2			0.6	1.1	0.0	0.1	0.6
Styrene		4	0.00	1	1			0.5	1.0			0.5
Tetrachloroethene		4	0.00	1	1			0.5	1.0			0.5
Toluene		4	0.00	1	1			0.5	1.0			0.5
Xylene, total		4	0.00	1	1			0.5	1.0			0.5
trans-1,2-Dichloroethene		4	0.00	1	1			0.5	1.0			0.5
trans-1,3-Dichloropropene		4	0.00	1	1			0.5	1.0			0.5
Vinyl chloride		4	0.00	1	1			0.5	1.0			0.5
Water Chemistry												
Total Phosphorous (as P) (MG/L)		4	0.00	0.02	0.02			0.0	0.0			0.0

Table H-3
Yorktown Aquifer Background Groundwater Quality Summary
St. Juliens Creek Annex
Chesapeake, Virginia

Yorktown Aquifer Parameters	Number of Detects	Total Number of Samples	Frequency of Detection	Reporting Limit Minimum	Reporting Limit Maximum	Minimum Detected Conc.	Maximum Detected Conc.	Average Conc.	Median Conc.	Standard Deviation	Coefficient of Variation	Upper Confidence Limit
Dissolved Metals (UG/L)												
Barium	3	3	1.00			10.1	31.2	23.0	27.8	11.3	0.5	42.1
Calcium	3	3	1.00			34600	77700	57666.7	60700.0	21709.5	0.4	94265.5
Iron	3	3	1.00			390	1360	788.7	616.0	507.5	0.6	1644.3
Magnesium	3	3	1.00			2000	10000	5966.7	5900.0	4000.4	0.7	12710.7
Manganese	3	3	1.00			122	188	161.3	174.0	34.8	0.2	220.0
Potassium	3	3	1.00			1480	7200	4406.7	4540.0	2862.3	0.6	9232.1
Sodium	3	3	1.00			13600	37900	28400.0	33700.0	12988.1	0.5	50295.8
Zinc	3	3	1.00			3.4	10.5	6.1	4.3	3.9	0.6	12.6
Nickel	2	3	0.67	0.9	0.9	1.1	2.3	1.3	1.1	0.9	0.7	2.9
Aluminum	1	3	0.33	38.2	38.2	63.1	63.1	33.8	38.2	25.4	0.8	76.6
Chromium	1	3	0.33	1.1	1.1	2.1	2.1	1.1	1.1	0.9	0.8	2.6
Antimony		3	0.00	2.7	2.7			1.4	2.7			
Arsenic		3	0.00	2	2			1.0	2.0			1.0
Beryllium		3	0.00	0.1	0.1			0.1	0.1			0.1
Cadmium		3	0.00	0.3	0.3			0.2	0.3	0.0	0.0	0.2
Cobalt		3	0.00	0.5	0.5			0.3	0.5			0.3
Copper		3	0.00	3	3.7			1.7	3.6	0.2	0.1	2.0
Lead		3	0.00	1	1			0.5	1.0			0.5
Mercury		3	0.00	0.1	0.1			0.1	0.1			0.1
Selenium		3	0.00	2.6	2.6			1.3	2.6			
Silver		3	0.00	0.9	0.9			0.5	0.9			0.5
Thallium		3	0.00	3.2	3.2			1.6	3.2			1.6
Vanadium		3	0.00	0.6	0.6			0.3	0.6	0.0	0.0	0.3
Total Metals (UG/L)												
Barium	3	3	1.00			11.8	32.7	24.7	29.6	11.3	0.5	43.7
Calcium	3	3	1.00			38600	75200	61933.3	72000.0	20270.5	0.3	96106.2
Iron	3	3	1.00			419	1670	907.7	634.0	668.9	0.7	2035.3
Magnesium	3	3	1.00			2240	12000	6630.0	5650.0	4953.3	0.7	14980.4
Manganese	3	3	1.00			117	226	177.7	190.0	55.5	0.3	271.3
Potassium	3	3	1.00			1620	8490	4816.7	4340.0	3459.7	0.7	10649.2
Sodium	3	3	1.00			14900	39900	30233.3	35900.0	13428.8	0.4	52872.2
Zinc	3	3	1.00			2.2	4.8	3.5	3.5	1.3	0.4	5.7
Aluminum	2	3	0.67	38.2	38.2	51.7	133	67.9	51.7	58.7	0.9	166.8
Nickel	1	3	0.33	0.9	0.9	1.1	1.1	0.7	0.9	0.4	0.6	1.3
Vanadium	1	3	0.33	0.6	0.6	0.68	0.68	0.4	0.6	0.2	0.5	0.8
Antimony		3	0.00	2.7	2.7			1.4	2.7			
Arsenic		3	0.00	2	2			1.0	2.0			1.0
Beryllium		3	0.00	0.1	0.1			0.1	0.1			0.1
Cadmium		3	0.00	0.3	0.3			0.2	0.3	0.0	0.0	0.2
Chromium		3	0.00	1.1	1.1			0.6	1.1			0.6
Cobalt		3	0.00	0.5	0.5			0.3	0.5			0.3

Table H-3
Yorktown Aquifer Background Groundwater Quality Summary
St. Juliens Creek Annex
Chesapeake, Virginia

Yorktown Aquifer Parameters	Number of Detects	Total Number of Samples	Frequency of Detection	Reporting Limit Minimum	Reporting Limit Maximum	Minimum Detected Conc.	Maximum Detected Conc.	Average Conc.	Median Conc.	Standard Deviation	Coefficient of Variation	Upper Confidence Limit
Copper		3	0.00	2.7	3.3			1.5	2.8	0.2	0.1	1.7
Cyanide		3	0.00	5	5			2.5	5.0			2.5
Lead		3	0.00	1	1			0.5	1.0			0.5
Mercury		3	0.00	0.1	0.1			0.1	0.1			0.1
Selenium		3	0.00	2.6	2.6			1.3	2.6			
Silver		3	0.00	0.9	0.9			0.5	0.9			0.5
Thallium		3	0.00	3.2	3.2			1.6	3.2			1.6
Semivolatile Organic (UG/L)												
bis(2-Ethylhexyl)phthalate	1	3	0.33	11	11	1	1	4.0	11.0	2.6	0.6	8.4
2,2'-oxybis(1-Chloropropane)		3	0.00	10	11			5.3	11.0	0.3	0.1	5.8
2,4,5-Trichlorophenol		3	0.00	26	28			13.5	27.0	0.5	0.0	14.3
2,4,6-Trichlorophenol		3	0.00	10	11			5.3	11.0	0.3	0.1	5.8
2,4-Dichlorophenol		3	0.00	10	11			5.3	11.0	0.3	0.1	5.8
2,4-Dimethylphenol		3	0.00	10	11			5.3	11.0	0.3	0.1	5.8
2,4-Dinitrophenol		3	0.00	26	28			13.5	27.0	0.5	0.0	14.3
2,4-Dinitrotoluene		3	0.00	10	11			5.3	11.0	0.3	0.1	5.8
2,6-Dinitrotoluene		3	0.00	10	11			5.3	11.0	0.3	0.1	5.8
2-Chloronaphthalene		3	0.00	10	11			5.3	11.0	0.3	0.1	5.8
2-Chlorophenol		3	0.00	10	11			5.3	11.0	0.3	0.1	5.8
2-Methylnaphthalene		3	0.00	10	11			5.3	11.0	0.3	0.1	5.8
2-Methylphenol		3	0.00	10	11			5.3	11.0	0.3	0.1	5.8
2-Nitroaniline		3	0.00	26	28			13.5	27.0	0.5	0.0	14.3
2-Nitrophenol		3	0.00	10	11			5.3	11.0	0.3	0.1	5.8
3,3'-Dichlorobenzidine		3	0.00	10	11			5.3	11.0	0.3	0.1	5.8
3-Nitroaniline		3	0.00	26	28			13.5	27.0	0.5	0.0	14.3
4,6-Dinitro-2-methylphenol		3	0.00	26	28			13.5	27.0	0.5	0.0	14.3
4-Bromophenyl-phenylether		3	0.00	10	11			5.3	11.0	0.3	0.1	5.8
4-Chloro-3-methylphenol		3	0.00	10	11			5.3	11.0	0.3	0.1	5.8
4-Chloroaniline		3	0.00	10	11			5.3	11.0	0.3	0.1	5.8
4-Chlorophenyl-phenylether		3	0.00	10	11			5.3	11.0	0.3	0.1	5.8
4-Methylphenol		3	0.00	10	11			5.3	11.0	0.3	0.1	5.8
4-Nitroaniline		3	0.00	26	28			13.5	27.0	0.5	0.0	14.3
4-Nitrophenol		3	0.00	26	28			13.5	27.0	0.5	0.0	14.3
Acenaphthene		3	0.00	10	11			5.3	11.0	0.3	0.1	5.8
Acenaphthylene		3	0.00	10	11			5.3	11.0	0.3	0.1	5.8
Anthracene		3	0.00	10	11			5.3	11.0	0.3	0.1	5.8
Benzo(a)anthracene		3	0.00	10	11			5.3	11.0	0.3	0.1	5.8
Benzo(a)pyrene		3	0.00	10	11			5.3	11.0	0.3	0.1	5.8
Benzo(b)fluoranthene		3	0.00	10	11			5.3	11.0	0.3	0.1	5.8
Benzo(g,h,i)perylene		3	0.00	10	11			5.3	11.0	0.3	0.1	5.8
Benzo(k)fluoranthene		3	0.00	10	11			5.3	11.0	0.3	0.1	5.8
bis(2-Chloroethoxy)methane		3	0.00	10	11			5.3	11.0	0.3	0.1	5.8

Table H-3
Yorktown Aquifer Background Groundwater Quality Summary
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Chesapeake, Virginia

Yorktown Aquifer Parameters	Number of Detects	Total Number of Samples	Frequency of Detection	Reporting Limit Minimum	Reporting Limit Maximum	Minimum Detected Conc.	Maximum Detected Conc.	Average Conc.	Median Conc.	Standard Deviation	Coefficient of Variation	Upper Confidence Limit
bis(2-Chloroethyl)ether		3	0.00	10	11			5.3	11.0	0.3	0.1	5.8
Butylbenzylphthalate		3	0.00	10	11			5.3	11.0	0.3	0.1	5.8
Carbazole		3	0.00	10	11			5.3	11.0	0.3	0.1	5.8
Chrysene		3	0.00	10	11			5.3	11.0	0.3	0.1	5.8
Dibenz(a,h)anthracene		3	0.00	10	11			5.3	11.0	0.3	0.1	5.8
Dibenzofuran		3	0.00	10	11			5.3	11.0	0.3	0.1	5.8
Diethylphthalate		3	0.00	10	11			5.3	11.0	0.3	0.1	5.8
Dimethylphthalate		3	0.00	10	11			5.3	11.0	0.3	0.1	5.8
Di-n-butylphthalate		3	0.00	10	11			5.3	11.0	0.3	0.1	5.8
Di-n-octylphthalate		3	0.00	10	11			5.3	11.0	0.3	0.1	5.8
Fluoranthene		3	0.00	10	11			5.3	11.0	0.3	0.1	5.8
Fluorene		3	0.00	10	11			5.3	11.0	0.3	0.1	5.8
Hexachlorobenzene		3	0.00	10	11			5.3	11.0	0.3	0.1	5.8
Hexachlorobutadiene		3	0.00	10	11			5.3	11.0	0.3	0.1	5.8
Hexachlorocyclopentadiene		3	0.00	10	11			5.3	11.0	0.3	0.1	5.8
Hexachloroethane		3	0.00	10	11			5.3	11.0	0.3	0.1	5.8
Indeno(1,2,3-cd)pyrene		3	0.00	10	11			5.3	11.0	0.3	0.1	5.8
Isophorone		3	0.00	10	11			5.3	11.0	0.3	0.1	5.8
Naphthalene		3	0.00	10	11			5.3	11.0	0.3	0.1	5.8
Nitrobenzene		3	0.00	10	11			5.3	11.0	0.3	0.1	5.8
n-Nitroso-di-n-propylamine		3	0.00	10	11			5.3	11.0	0.3	0.1	5.8
n-Nitrosodiphenylamine		3	0.00	10	11			5.3	11.0	0.3	0.1	5.8
Pentachlorophenol		3	0.00	26	28			13.5	27.0	0.5	0.0	14.3
Phenanthrene		3	0.00	10	11			5.3	11.0	0.3	0.1	5.8
Phenol		3	0.00	10	11			5.3	11.0	0.3	0.1	5.8
Pyrene		3	0.00	10	11			5.3	11.0	0.3	0.1	5.8
Volatile Organic (UG/L)												
1,1,1-Trichloroethane		3	0.00	1	1			0.5	1.0			0.5
1,1,2,2-Tetrachloroethane		3	0.00	1	1			0.5	1.0			0.5
1,1,2-Trichloroethane		3	0.00	1	1			0.5	1.0			0.5
1,1-Dichloroethane		3	0.00	1	1			0.5	1.0			0.5
1,1-Dichloroethene		3	0.00	1	1			0.5	1.0			0.5
1,2,4-Trichlorobenzene		6	0.00	1	11			2.9	5.5	2.7	0.9	5.1
1,2-Dibromo-3-chloropropane		3	0.00	1	1			0.5	1.0			0.5
1,2-Dibromoethane		3	0.00	1	1			0.5	1.0			0.5
1,2-Dichlorobenzene		6	0.00	1	11			2.9	5.5	2.7	0.9	5.1
1,2-Dichloroethane		3	0.00	1	1			0.5	1.0			0.5
1,2-Dichloropropane		3	0.00	1	1			0.5	1.0			0.5
1,3-Dichlorobenzene		6	0.00	1	11			2.9	5.5	2.7	0.9	5.1
1,4-Dichlorobenzene		6	0.00	1	11			2.9	5.5	2.7	0.9	5.1
2-Butanone		3	0.00	5	5			2.5	5.0			2.5
2-Hexanone		3	0.00	5	5			2.5	5.0			2.5

Table H-3
Yorktown Aquifer Background Groundwater Quality Summary
St. Juliens Creek Annex
Chesapeake, Virginia

Yorktown Aquifer Parameters	Number of Detects	Total Number of Samples	Frequency of Detection	Reporting Limit Minimum	Reporting Limit Maximum	Minimum Detected Conc.	Maximum Detected Conc.	Average Conc.	Median Conc.	Standard Deviation	Coefficient of Variation	Upper Confidence Limit
4-Methyl-2-pentanone		3	0.00	5	5			2.5	5.0			2.5
Acetone		3	0.00	5	5			2.5	5.0			2.5
Benzene		3	0.00	1	1			0.5	1.0			0.5
Bromochloromethane		3	0.00	1	1			0.5	1.0			0.5
Bromodichloromethane		3	0.00	1	1			0.5	1.0			0.5
Bromoform		3	0.00	1	1			0.5	1.0			0.5
Bromomethane		3	0.00	1	1			0.5	1.0			0.5
Carbon disulfide		3	0.00	0.4	1.8			0.6	1.1	0.4	0.6	1.1
Carbon tetrachloride		3	0.00	1	1			0.5	1.0			0.5
Chlorobenzene		3	0.00	1	1			0.5	1.0			0.5
Chloroethane		3	0.00	1	1			0.5	1.0			0.5
Chloroform		3	0.00	0.3	1.6			0.4	0.6	0.3	0.8	1.0
Chloromethane		3	0.00	1	1			0.5	1.0			0.5
cis-1,2-Dichloroethene		3	0.00	1	1			0.5	1.0			0.5
cis-1,3-Dichloropropene		3	0.00	1	1			0.5	1.0			0.5
Dibromochloromethane		3	0.00	1	1			0.5	1.0			0.5
Ethylbenzene		3	0.00	1	1			0.5	1.0			0.5
Methylene chloride		3	0.00	1	1.3			0.6	1.3	0.1	0.1	0.7
Styrene		3	0.00	1	1			0.5	1.0			0.5
Tetrachloroethene		3	0.00	1	1			0.5	1.0			0.5
Toluene		3	0.00	1	1			0.5	1.0			0.5
Xylene, total		3	0.00	1	1			0.5	1.0			0.5
trans-1,2-Dichloroethene		3	0.00	1	1			0.5	1.0			0.5
trans-1,3-Dichloropropene		3	0.00	1	1			0.5	1.0			0.5
Trichloroethene		3	0.00	1	1			0.5	1.0			0.5
Vinyl chloride		3	0.00	1	1			0.5	1.0			0.5
Water Chemistry												
Total Phosphorous (as P) (MG/L)	2	3	0.67	0.02	0.02	0.051	0.095	0.1	0.1	0.0	0.8	0.1

Table H-4
Sediment Background Data
St. Juliens Creek Annex
Chesapeake, Virginia

Station ID	SJSBK-SD01		SJSBK-SD02		SJSBK-SD03		SJSBK-SD04			SJSBK-SD05		SJSBK-SD06		SJSBK-SD07		SJSBK-SD08	
Sample ID	SJSBK-SD01-001	SJSBK-SD01-002	SJSBK-SD02-001	SJSBK-SD02-002	SJSBK-SD03-001	SJSBK-SD03-002	SJSBK-SD04-001	SJSBK-SD04-002	SJSBK-SD04-002P	SJSBK-SD05-001	SJSBK-SD05-002	SJSBK-SD06-001	SJSBK-SD06-002	SJSBK-SD07-001	SJSBK-SD07-002	SJSBK-SD08-001	SJSBK-SD08-002
Sample Date	04/14/99	10/27/99	04/14/99	10/27/99	04/14/99	10/27/99	04/14/99	12/05/99	12/05/99	04/14/99	10/26/99	04/14/99	10/26/99	04/15/99	10/28/99	04/15/99	10/26/99
Volatile Organic Compounds (UG/KG)																	
2-Butanone	15 U	10 J	18 U	10 J	14 U	15 U	13 U	NA	NA	32 UJ	93 J	15 U	5 J	18 U	47	33 R	14 J
4-Methyl-2-pentanone	3 J	15 U	4 J	27 U	14 U	15 U	5 J	NA	NA	8 J	26 U	7 J	13 U	18 U	36 U	33 R	16 U
Acetone	15 U	15 B	18 U	27 B	14 U	157	13 U	340 J	340 J	32 J	240 J	15 U	13 B	18 U	1,100 J	46 R	16 B
Carbon disulfide	15 B	2 J	18 B	6 J	14 U	15 U	13 U	5 J	5 J	32 UJ	5 J	15 U	13 U	18 U	12 J	12 R	16 B
Chloromethane	15 U	15 U	18 U	27 U	14 U	15 U	13 U	NA	NA	32 U	9 J	15 U	2 J	18 U	36 U	33 R	16 U
Toluene	15 U	3 J	18 U	27 U	14 U	15 U	13 U	NA	NA	32 UJ	5 J	15 UJ	2 J	18 U	36 U	33 R	2 J
Semi-volatile Organic Compounds (UG/KG)																	
Acenaphthene	490 U	NA	610 U	NA	480 U	NA	880 R	71 J	71 J	5,400 R	NA	490 U	NA	600 U	NA	1,100 U	NA
Acenaphthylene	490 U	NA	610 U	NA	480 U	NA	880 R	NA	NA	5,400 R	NA	490 U	61 L	600 U	NA	1,100 U	NA
Anthracene	490 U	NA	610 U	170 L	480 U	NA	880 R	120 J	120 J	5,400 R	NA	490 U	45 L	600 U	NA	1,100 U	NA
Benzo(a)anthracene	490 U	NA	300 J	1,300 L	54 J	92 L	130 R	800	800	5,400 R	NA	67 J	210 L	220 J	280 L	360 J	NA
Benzo(a)pyrene	490 U	NA	270 J	1,100 L	480 U	69 L	91 R	480 J	480 J	5,400 R	NA	50 J	110 L	210 J	210 L	320 J	NA
Benzo(b)fluoranthene	490 U	100 L	500 J	NA	77 J	130 L	160 R	870	870	5,400 R	NA	74 J	260 L	320 J	280 L	520 J	87 L
Benzo(g,h,i)perylene	490 U	NA	190 J	550 L	480 U	NA	880 R	290 J	290 J	5,400 R	NA	490 U	170 L	150 J	NA	190 J	NA
Benzo(k)fluoranthene	490 U	NA	160 J	580 L	480 U	59 L	880 R	210 J	210 J	5,400 R	NA	490 U	130 L	160 J	170 L	210 J	NA
Carbazole	490 U	NA	610 U	NA	480 U	NA	880 R	79 J	79 J	5,400 R	NA	490 U	48 L	600 U	NA	1,100 U	NA
Chrysene	490 U	71 L	360 J	1,500 L	67 J	120 L	110 R	880	880	5,400 R	NA	62 J	210 L	250 J	290 L	430 J	79 L
Dibenz(a,h)anthracene	490 U	NA	67 J	NA	480 U	NA	880 R	NA	NA	5,400 R	NA	490 U	50 L	60 J	NA	1,100 U	NA
Diethylphthalate	490 U	NA	610 U	NA	480 U	NA	4,700 R	NA	NA	17,000 R	NA	490 U	50 L	86 J	NA	1,100 U	NA
Fluoranthene	490 U	69 L	560 J	2,600 L	91 J	190 L	170 R	1,600	1,600	5,400 R	NA	160 J	450 L	280 J	310 L	470 J	64 L
Indeno(1,2,3-cd)pyrene	490 U	NA	170 J	510 L	480 U	53 L	880 R	260 J	260 J	5,400 R	NA	490 U	150 L	140 J	NA	190 J	NA
Phenanthrene	490 U	NA	220 J	420 L	480 U	NA	880 R	920	920	5,400 R	NA	110 J	310 L	600 U	NA	1,100 U	NA
Pyrene	490 U	65 L	440 J	1,900 L	76 J	190 L	130 R	1,500	1,500	5,400 R	NA	110 J	340 L	240 J	380 L	380 J	62 L
bis(2-Chloroethoxy)methane	490 U	NA	610 U	NA	480 U	NA	880 R	NA	NA	5,400 R	NA	490 U	NA	600 U	NA	1,100 U	NA
bis(2-Ethylhexyl)phthalate	490 U	NA	610 U	120 L	480 U	NA	880 R	NA	NA	5,400 R	NA	150 J	44 J	600 U	NA	1,100 U	NA
Pesticide/Polychlorinated Biphenyls (UG/KG)																	
4,4'-DDD	4.90 B	7.20 L	6 B	39 L	4.70 B	3.20 L	4.40 B	12	12	92	8.80 L	4.90 B	2.60 L	6 U	7.40 J	5.90 J	4.70 L
4,4'-DDE	4.90 B	16 L	6 B	12 L	4.70 B	4.5 L	6.40	20	20	100	60 L	29	9 L	6 U	17	3.30 J	7.80 L
4,4'-DDT	4.90 UJ	12 L	6 UJ	13 L	4.70 UJ	1.80 L	1.30 J	9 J	9 J	6.40 J	9.10 L	5	5.60 L	6 UJ	2.40 J	11 UJ	1.70 L
Total Metals (MG/KG)																	
Aluminum	4,660 K	2,310	7,890 K	7,380	1,620 K	2,670	1,400 K	2,550	2,400	14,100 K	6,020	1,520 K	469	9,470	16,800	17,400 *	5,450
Antimony	0.470 U	0.430 B	0.700 U	0.770 UL	0.75 U	0.670 UL	0.5 U	0.73 UL	NA	1.20 B	0.890 B	0.440 U	0.610 B	0.800 U	1.10 U	1.5 U	0.630 UL
Arsenic	3.70	2.10	6.20	7.80	1.10 J	3.10	1.40 J	2.40 J	2.20 J	30.4	9.30	2.5	0.960 J	6.80	14.7	13.7 N	6.40
Barium	15.4 J	6.5 J	27.1 J	34.6 J	4.60 J	7.30 J	4.70 J	8.3 B	9.30 B	58.9 J	34.4 J	14.3 J	4 J	24.4 J	57.5 J	51.5 J	23.8 J
Beryllium	0.310 J	0.150 J	0.440 J	0.550 J	0.100 J	0.180 J	0.0900 J	0.210 J	0.210 J	2.10	0.5 J	0.160 J	0.0400 U	0.690 J	1.30 J	1.40 J	0.510 J
Cadmium	0.410 J	0.170 J	1 J	1.10 J	0.220 J	0.190 J	0.130 J	0.270 J	0.230 J	1.40 J	0.170 J	0.210 J	0.0800 J	0.5 J	0.880 J	2.30 J	0.350 J
Calcium	879	446 J	1,520	1,820	304 L	513 J	281 J	950 J	950 J	2,320	2,190	648 J	6.80 B	1,300 J	2,300	2,770 J	954 J
Chromium	14	8.20 K	42.4	43.2 K	4.60	6.90 K	3.10	7.40	6.80	20.2	9.90 K	3.10	0.990 K	19.1	32.4	35.6 *	13 K
Cobalt	2.5 J	1.10 J	3.80 J	4 J	0.960 J	1.20 J	0.75 J	0.880 J	0.840 J	9.5 J	1.40 J	0.0800 B	0.170 U	6.30 J	9.5 J	10 J	4.10 J
Copper	29.3	15.7	86.2	122	11.9	18.8	5.5	14.7	14.7	38.5	20.2	6.20	0.800 J	27.6	85.4	112 *	50.2
Cyanide	0.360 B	0.330 U	0.400 B	0.610 U	0.240 B	0.370 U	0.25 B	0.28 U	NA	0.670 B	0.630 U	0.300 B	0.320 U	0.990 L	0.890 U	0.650 UL	0.370 U
Iron	8,140 K	3,860	14,800 K	16,700	3,050	4,850	2,200	3,640	3,330	18,500 K	4,720	1,660	599	19,000	28,300	29,700 *	14,900
Lead	37 K	20.6 K	60.6 K	75.9 K	13.9 K	19 K	8.20 K	23.2	23.2	104 K	73.8 K	12.8 K	3.70 K	37.4	96.7	115 *	59.2 K
Magnesium	1,510	758 J	2,390	2,920	562 J	934 J	319 J	739 J	739 J	1,630 J	1,200 J	108 J	5.70 B	3,230	5,470	5,290	2,640 K
Manganese	48.1	20.8 K	84.6	89.8 K	15.5	25.1 K	11.3	20.3	19.4	38.2	31.3 K	6.70	2.40 K	187	203	191 N	86.4 K
Mercury	0.0300 L	0.0600	0.270 L	0.370	0.0400 L	0.0900	0.0700	1.40 L	0.990 L	0.270 L	0.160	0.0400 L	0.0200 U	0.190	0.540	0.650	0.550
Nickel	6 J	2.70 J	10.4	11.3	1.90 J	2.80 J	1.70 J	2.60 J	2.5 J	19.9	5.40 J	1.5 J	0.200 U	11.5 J	20.4	25.1	10.2
Potassium	795 L	341 J	1,180 L	1,210 J	297 L	419 J	170 L	261 J	250 J	684 L	467 J	104 L	44.9 J	1,810	2,820	2,910	944 J
Selenium	0.450 U	0.470 U	0.740 J	1.30 J	0.720 U	0.740 U	0.540 J	0.81 U	NA	1.5 J	1 J	0.430 U	0.670 U	0.960 J	1.5 J	2.30 J	0.710 J
Silver	0.160 U	0.110 U	0.230 U	0.190 U	0.25 U	0.170 U	0.170 U	0.18 U	NA	0.380 U	0.220 U	0.150 U	0.150 U	0.270 U	0.270 U	0.630 J	0.190 J
Sodium	4,720	1,390 K	5,450	4,910	1,550 L	1,670 K	652 J	1,050 B	1,310 B	1,930 J	893 J	36.7 J	44.3 B	4,840	9,890	11,500	2,640
Vanadium	13.3	6.20 J	21.2	19.9	5 J	7.10 J	5 J	10 J	8.60 J	55.9	23.2	6.10 J	1.80 J	21.5 *	40	48.5 *	14.2
Zinc	125	65.2 K	195	281 K	45.7	66.9 K	30.3	54.2	48.7	422	96.2 K	38.8	0.150 B	112 *	290	378 *	141 K
Wet Chemistry (MG/KG)																	
% Solids	67.6	68.4	55.2	37.5	70	67.3	76.1	69.1	64.6	31	39.5	68	78	56.3	28.2	30.3	60.7
Total organic carbon (TOC)	2,860	12,300	2,340	63,300	8,380	20,900	11,500	12,000	4,880	16,000	89,900	9,940	1,820	21,600	130,000	67,400	35,000
pH	7.11	7.17	7.19	7.17	7.45	6.77	7.35	7.65	7.65	6.97	6.60	6.03	6.5	7.70	7.07	7.5	7.31

Notes:

Analyte detected

* - Lab duplicate analysis was not within control limits

B - Not detected above associated blank

J - Estimated

K - May be biased high

L - May be biased low

N - Tentative identification

NA - Not analyzed

R - Unreliable result

Table H-4
Sediment Background Data
St. Juliens Creek Annex
Chesapeake, Virginia

Station ID	SJSBK-SD01		SJSBK-SD02		SJSBK-SD03		SJSBK-SD04			SJSBK-SD05		SJSBK-SD06		SJSBK-SD07		SJSBK-SD08	
Sample ID	SJSBK-SD01-001	SJSBK-SD01-002	SJSBK-SD02-001	SJSBK-SD02-002	SJSBK-SD03-001	SJSBK-SD03-002	SJSBK-SD04-001	SJSBK-SD04-002	SJSBK-SD04-002P	SJSBK-SD05-001	SJSBK-SD05-002	SJSBK-SD06-001	SJSBK-SD06-002	SJSBK-SD07-001	SJSBK-SD07-002	SJSBK-SD08-001	SJSBK-SD08-002
Sample Date	04/14/99	10/27/99	04/14/99	10/27/99	04/14/99	10/27/99	04/14/99	12/05/99	12/05/99	04/14/99	10/26/99	04/14/99	10/26/99	04/15/99	10/28/99	04/15/99	10/26/99

U - Not detected

Table H-4
Sediment Background Data
St. Juliens Creek Annex
Chesapeake, Virginia

Station ID	SJSBK-SD09				SJSBK-SD10		SJSBK-SD11		SJSBK-SD12
Sample ID	SJSBK-SD09-001	SJSBK-SD09-001P	SJSBK-SD09-002	SJSBK-SD09-002P	SJSBK-SD10-001	SJSBK-SD10-002	SJSBK-SD11-001	SJSBK-SD11-001P	SJSBK-SD12-001
Sample Date	04/16/99	04/16/99	10/26/99	10/26/99	04/16/99	10/26/99	10/28/99	10/28/99	10/27/99
Volatile Organic Compounds (UG/KG)									
2-Butanone	NA	NA	NA	31 J	30 U	20 J	NA	NA	12 J
4-Methyl-2-pentanone	NA	NA	NA	NA	30 U	19 UJ	NA	NA	16 U
Acetone	NA	NA	168 J	115 B	30 U	19 B	NA	80	16 B
Carbon disulfide	5 J	5 J	NA	45 J	9 J	29 J	NA	NA	3 J
Chloromethane	NA	NA	NA	NA	30 U	19 UJ	NA	NA	16 U
Toluene	NA	NA	5 J	4 J	30 U	2 J	NA	NA	2 J
Semi-volatile Organic Compounds (UG/KG)									
Acenaphthene	NA	NA	NA	NA	1,000 UL	NA	140 L	NA	NA
Acenaphthylene	NA	NA	NA	NA	1,000 UL	NA	NA	NA	NA
Anthracene	NA	NA	NA	NA	1,000 UL	NA	NA	NA	NA
Benzo(a)anthracene	NA	NA	NA	NA	1,000 UL	NA	NA	NA	130 L
Benzo(a)pyrene	NA	NA	NA	NA	1,000 UL	NA	NA	NA	80 L
Benzo(b)fluoranthene	NA	NA	160 L	160 L	1,000 UL	120 L	NA	NA	320 L
Benzo(g,h,i)perylene	NA	NA	NA	NA	1,000 UL	64 L	NA	NA	130 L
Benzo(k)fluoranthene	NA	NA	NA	NA	1,000 UL	NA	NA	NA	120 L
Carbazole	NA	NA	NA	NA	1,000 UL	NA	NA	NA	NA
Chrysene	NA	NA	NA	NA	1,000 UL	89 L	NA	NA	210 L
Dibenz(a,h)anthracene	NA	NA	NA	NA	1,000 UL	NA	NA	NA	NA
Diethylphthalate	NA	NA	NA	NA	1,000 UL	NA	170 L	170 L	220 L
Fluoranthene	150 J	NA	280 L	280 L	1,000 UL	110 L	44 L	44 L	300 L
Indeno(1,2,3-cd)pyrene	NA	NA	NA	NA	1,000 UL	NA	NA	NA	120 L
Phenanthrene	NA	NA	NA	NA	1,000 UL	NA	NA	NA	62 L
Pyrene	NA	NA	210 L	210 L	1,000 UL	98 L	49 L	49 L	260 L
bis(2-Chloroethoxy)methane	NA	NA	NA	NA	1,000	NA	NA	NA	NA
bis(2-Ethylhexyl)phthalate	NA	NA	NA	NA	1,000 UL	NA	NA	NA	NA
Pesticide/Polychlorinated Biphenyls (UG/KG)									
4,4'-DDD	1.5 J	1.5 J	4.70 L	4.70 L	51	27 L	0.450 J	0.450 J	16 L
4,4'-DDE	1.60 J	1.60 J	8.40 L	8.40 L	12	37 L	0.900 J	0.780 J	46 L
4,4'-DDT	NA	NA	1.10 L	NA	7.20 J	4.70 L	1.60 J	1.60 J	NA
Total Metals (MG/KG)									
Aluminum	25,600	25,600	23,200	27,400	22,500	9,440	1,270	1,090	5,510
Antimony	NA	NA	1.4 UL	NA	1.20 U	0.610 B	1.40 J	1.20 J	0.570 B
Arsenic	15.2	15.2	18.9	22.5	15.5	8.90	5.1	3.20	6.20
Barium	54.1 J	54.1 J	59.1 J	59.1 J	50.3 J	25.6 J	45.8	37.4	24.9 J
Beryllium	1.70 J	1.70 J	1.90 J	1.90 J	1.90 J	0.910 J	0.240 J	0.240 J	0.450 J
Cadmium	1.70 J	1.40 J	0.440 J	0.390 J	1.70 J	0.530 J	0.210 J	0.210 J	0.390 J
Calcium	3,870 J	3,690	2,730	2,550	2,560	1,260	518 J	3,940	5,200
Chromium	47.9	47.9	49.2 K	49.2 K	38.2	17.7 K	8.4	7.40	20.7 K
Cobalt	14.9 J	14.9 J	17.7 J	17.7 J	13.9 J	6.5 J	2.10 J	2.10 J	3.60 J
Copper	97	89.9	64.4	63.5	109	54.9	41.4	47.9	55.4
Cyanide	NA	NA	0.72 U	NA	0.650 UL	0.430 U	0.32 U	NA	0.370 U
Iron	34,100	34,100	43,800	50,400	31,600	15,600	18,400	5,480	12,000
Lead	139	139	99.9 K	99.9 K	165	69.5 K	77.9	57.2	66.5 K
Magnesium	6,770	6,770	7,920	8,880	5,170	2,690	476 J	458 J	2,840
Manganese	286 *N	286 *N	403 K	403 K	258 *N	119 K	62.9	37.3	91.1 K
Mercury	0.510	0.490	0.69	0.600	0.530	0.290	0.0300 J	0.0300 J	0.200
Nickel	33.9	33.9	27.9	35.4	28.1	12.5	7.5	6.5 J	8.20
Potassium	4,220	4,220	4,330	5,030	3,170	1,450	192 J	175 J	846 J
Selenium	1.80 J	1.80 J	1.90 J	1.90 J	1.80 J	1 J	0.43 U	NA	0.630 U
Silver	NA	NA	0.35 U	NA	0.390 U	0.200 J	0.260 J	0.210 J	0.220 J
Sodium	18,400	15,300	11,500	10,400	8,960	3,220	1,120	843 J	2,640
Vanadium	86	86	49.6	57.5	51.8	20.7	5.40 J	4 J	15.3
Zinc	364 N	346 N	289 K	289 K	383 N	166 K	274	216	191 K
Wet Chemistry (MG/KG)									
% Solids	26	26	NA	29.2	33	52.9	NA	78.6	61.9
Total organic carbon (TOC)	84,900	73,400	NA	84,900	62,600	35,000	NA	7,800	26,200
pH	7.65	7.57	NA	7.01	7.55	7.41	NA	7.83	7.82

Notes:

Analyte detected

* - Lab duplicate analysis was not within control limits

B - Not detected above associated blank

J - Estimated

K - May be biased high

L - May be biased low

N - Tentative identification

NA - Not analyzed

R - Unreliable result

Table H-4
Sediment Background Data
St. Juliens Creek Annex
Chesapeake, Virginia

Station ID	SJSBK-SD09				SJSBK-SD10		SJSBK-SD11		SJSBK-SD12
Sample ID	SJSBK-SD09-001	SJSBK-SD09-001P	SJSBK-SD09-002	SJSBK-SD09-002P	SJSBK-SD10-001	SJSBK-SD10-002	SJSBK-SD11-001	SJSBK-SD11-001P	SJSBK-SD12-001
Sample Date	04/16/99	04/16/99	10/26/99	10/26/99	04/16/99	10/26/99	10/28/99	10/28/99	10/27/99

U - Not detected

Table H-5
Surface Water Background Data
St. Juliens Creek Annex
Chesapeake, Virginia

Station ID	SJSBK-SW01		SJSBK-SW02		SJSBK-SW03		SJSBK-SW04			SJSBK-SW05		SJSBK-SW06		SJSBK-SW07		SJSBK-SW08	
Sample ID	SJSBK-SW01-001	SJSBK-SW01-002	SJSBK-SW02-001	SJSBK-SW02-002	SJSBK-SW03-001	SJSBK-SW03-002	SJSBK-SW04-001	SJSBK-SW04-002	SJSBK-SW04-002P	SJSBK-SW05-001	SJSBK-SW05-002	SJSBK-SW06-001	SJSBK-SW06-002	SJSBK-SW07-001	SJSBK-SW07-002	SJSBK-SW08-001	SJSBK-SW08-002
Sample Date	04/14/99	10/27/99	04/14/99	10/27/99	04/14/99	10/27/99	04/14/99	12/05/99	12/05/99	04/14/99	10/26/99	04/14/99	10/26/99	04/15/99	10/28/99	04/15/99	10/26/99
Semi-volatile Organic Compounds (UG/L)																	
Di-n-butylphthalate	11 U	11 U	10 U	10 B	10 U	10 B	10 U	11 U	NA	11 U	11 U	11 U	11 U	11 U	11 B	11 U	10 U
bis(2-Ethylhexyl)phthalate	11 U	11 U	10 U	10 B	10 U	10 U	10 U	11 U	NA	11 U	11 U	11 U	11 U	11 U	11 U	11 U	10 U
Total Metals (UG/L)																	
Aluminum	526	1,110 K	403	1,360 K	876	1,050 K	432	1,510	1,510	324	260 K	690	18.7 B	869 K	969	797 K	1,510 K
Antimony	2.70 U	4 J	2.70 U	2.80 U	2.70 U	2.80 U	2.70 U	2.80 U	NA	2.70 U	2.80 U	2.70 U	2.80 U	2.70 U	2.80 U	2.70 U	2.80 U
Arsenic	2 U	3.60 U	2 U	4.60 J	2.60 J	3.60 U	2 U	5.20 J	NA	2 U	3.60 U	11.8	3.90 J	2.40 J	5.5 J	2 U	3.60 U
Barium	31.7 J	38.1 J	30.5 J	38 J	32.3 J	37.8 J	20.7 J	26.5 J	26.5 J	30.8 J	36.8 J	50.6 J	44.4 J	36.2 J	36.8 J	38 J	40.1 J
Beryllium	0.100 U	0.200 U	0.100 U	0.200 U	0.100 U	0.200 U	0.100 U	0.200 U	NA	0.100 U	0.200 U	0.170 J	0.200 U	0.100 U	0.200 U	0.110 J	0.200 U
Cadmium	0.300 U	0.300 U	0.300 U	0.300 U	0.300 U	0.300 U	0.300 U	0.300 B	NA	0.300 U	0.300 B	0.300 U	0.300 B	0.300 U	0.300 U	0.300 U	0.300 B
Calcium	167,000	90,800	178,000	95,200	165,000	81,800	22,900	96,600	94,800	21,000	29,800	28,900	32,600	163,000	124,000	141,000	90,700
Chromium	1.10 U	0.600 U	1.10 U	1.10 J	1.80 J	0.600 U	1.10 U	3 J	3 J	1.10 U	0.600 U	1.30 J	0.600 U	1.20 J	0.600 U	1.20 J	1.5 J
Cobalt	0.680 J	1.60 J	0.5 U	1.10 J	0.780 J	1.20 J	0.5 U	0.800 U	NA	0.880 J	0.910 J	2.20 J	1.10 J	3.60 J	1.10 J	5 J	1.80 J
Copper	8 J	6.40 J	1.10 B	10.2 J	9.10 J	7 J	1.10 B	0.800 B	9.5 B	1.10 B	3.60 J	8.60 J	0.800 B	9.80 J	7.10 J	12.2 J	9.90 J
Cyanide	5 UL	5 U	5 UL	5 U	5 UL	5 U	5 UL	5 U	NA	12.7 L	5 U	14.5 L	5 U	5 UL	5 U	5 UL	5 U
Iron	703	1,820 K	401	2,110 K	997	1,810 K	846	1,510 J	1,510 J	1,350	1,510 K	5,490	1,540 K	815	1,400	1,150	1,820 K
Lead	1 B	2.70 J	1 B	5.6	1 B	3.5	2.70 K	4.80	4.40	2 K	1.5 J	5.60 K	1.90 J	7.60	2.30 J	9.90	9.2
Magnesium	488,000	269,000	521,000	285,000	484,000	235,000	17,800	271,000	266,000	3,130 J	4,780 J	2,990 J	2,540 J	445,000	378,000	351,000	209,000
Manganese	104	75.1	91.8	77	99.4	79.6	39.5	46.1	46.1	60.8	71.7	81.6	67.4	306	87.9	415	142
Mercury	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	NA	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U
Nickel	2 J	1.40 J	1.30 J	1.70 J	2.40 J	1.90 J	1.5 J	0.900 B	3 B	1.20 J	0.900 U	3.20 J	0.900 U	6.5 J	1.40 J	7.90 J	3.30 J
Potassium	178,000	99,300	194,000	95,300	176,000	87,400	8,460 L	99,300	99,300	2,110 L	3,050 J	2,100 L	2,140 J	160,000 J	129,000	130,000 J	76,700 J
Silver	0.900 U	0.700 U	0.900 U	0.700 U	0.900 U	0.700 U	0.900 U	0.700 U	NA	0.900 U	0.940 J	0.900 U	0.700 U	0.900 U	0.700 U	0.900 U	0.700 U
Sodium	4,140,000	2,310,000	4,440,000	2,420,000	4,100,000	1,990,000	163,000	2,280,000	2,280,000	20,500	25,200	29,700	18,700	3,730,000	3,220,000	3,030,000	1,680,000
Vanadium	2.40 J	4.5 J	1.70 J	4.80 J	3 J	4.30 J	3.90 J	4.90 J	4.90 J	1.30 J	2 J	4.40 J	1.10 J	3.30 J	3.20 J	2.80 J	5.5 J
Zinc	10.7 J	29.3	1.90 B	51	18.7 J	33.2	16.7 J	32.9	32.9	27.9	27.3 J	72.8	32.1 J	58.3	0.700 B	63.5	46.4 J

Notes:
Analyte detected
B - Not detected above associated blank
E - Estimated concentration due to interference
J - Estimated
K - May be biased high
L - May be biased low
NA - Not analyzed
U - Not detected

Table H-5
Surface Water Background Data
St. Juliens Creek Annex
Chesapeake, Virginia

Station ID	SJSBK-SW09				SJSBK-SW10		SJSBK-SW11		SJSBK-SW12
Sample ID	SJSBK-SW09-001	SJSBK-SW09-001P	SJSBK-SW09-002	SJSBK-SW09-002P	SJSBK-SW10-001	SJSBK-SW10-002	SJSBK-SW11-001	SJSBK-SW11-001P	SJSBK-SW12-001
Sample Date	04/16/99	04/16/99	10/26/99	10/26/99	04/16/99	10/26/99	10/28/99	10/28/99	10/27/99
Semi-volatile Organic Compounds (UG/L)									
Di-n-butylphthalate	10 B	2 B	1 J	1 J	11 B	10 U	11 B	3 B	10 B
bis(2-Ethylhexyl)phthalate	10 B	1 B	10 U	NA	11 B	10 U	6 J	NA	10 B
Total Metals (UG/L)									
Aluminum	471	471	2,530 K	1,210 K	463	1,490 K	1,040	2,090	1,240 K
Antimony	2.70 U	NA	2.80 U	NA	2.70 U	2.80 U	3.5 J	NA	2.80 U
Arsenic	2 U	NA	3.60 U	NA	2.40 J	3.60 U	3.60 J	NA	3.60 U
Barium	33.3 J	33.3 J	40.8 J	39.3 J	44.2 J	39.1 J	46 J	46 J	40.3 J
Beryllium	0.100 U	NA	0.200 U	NA	0.100 U	0.200 U	0.200 U	NA	0.200 U
Cadmium	0.300 U	NA	0.300 B	0.700 B	0.320 J	0.300 U	0.300 B	NA	0.300 U
Calcium	185,000	185,000	77,000	82,100	162,000	52,100	94,300	100,000	97,400
Chromium	1.10 U	NA	2.5 J	0.980 J	1.10 U	1.70 J	1.80 J	1.80 J	1.30 J
Cobalt	0.970 J	0.600 J	2 J	1.5 J	1.40 J	1.5 J	1.60 J	1.60 J	1.30 J
Copper	7 J	7 J	11.3 J	10 J	8 J	6.70 J	10.9 J	10.9 J	7 J
Cyanide	5 UL	NA	5 U	NA	7.70 L	5 U	5 U	NA	5 U
Iron	386	386	2,400 K	1,680 K	642	2,070 K	1,630	2,420	2,040 K
Lead	1.70 J	1.70 J	12.7	12.1	4.40	16.8	8.3	9.70	1.90 J
Magnesium	579,000	573,000	138,000	146,000	431,000	69,400	254,000	270,000	290,000
Manganese	150	150	150	155	214	162	126	143	81.2
Mercury	0.100 U	NA	0.110 J	0.110 J	0.100 U	0.100 U	0.100 U	NA	0.100 U
Nickel	3 J	3 J	4.40 J	3.70 J	3.90 J	1.80 J	3.70 J	3.70 J	1.60 J
Potassium	210,000 J	207,000 J	55,200 J	55,200 J	165,000 J	26,600 J	92,600	98,500	94,000
Silver	0.900 U	NA	0.700 B	NA	0.900 U	0.700 U	0.730 J	NA	0.700 U
Sodium	4,990,000 E	4,930,000 E	1,110,000	1,170,000	4,050,000 E	556,000	2,190,000	2,290,000	2,390,000
Vanadium	2.40 J	1.5 J	7.70 J	6.20 J	3.30 J	7.5 J	6.20 J	6.20 J	4.30 J
Zinc	8.70 J	8.70 J	46.1 J	44.4 J	21.4	35.7 J	53.9 J	53.9 J	32

Notes:
Analyte detected
B - Not detected above associated blank
E - Estimated concentration due to interference
J - Estimated
K - May be biased high
L - May be biased low
NA - Not analyzed
U - Not detected

Table H-6
Summary Statistics
Reference Sediment Samples
SJSBK-SD01 through SJSBK-SD06
in St. Juliens Creek
St. Juliens Creek Annex
Chesapeake, Virginia

AnalyteName	Frequency of Detection	Maximum Detected Concentration	SampleID of Maximum Detected Value	Mean Value[1]	Standard Deviation
Volatile Organic Compounds (UG/KG)					
2-Butanone	4 - 11	93	SJSBK-SD05-002	16.3	25.6
4-Methyl-2-pentanone	5 - 11	8	SJSBK-SD05-001	7.45	3.27
Acetone	4 - 12	340	SJSBK-SD04-002	69.5	113
Carbon disulfide	4 - 12	6	SJSBK-SD02-002	7.13	3.30
Chloromethane	2 - 11	9	SJSBK-SD05-002	8.45	3.66
Toluene	3 - 11	5	SJSBK-SD05-002	7.68	4.10
Semivolatile Organic Compounds (UG/KG)					
Acenaphthene	1 - 5	71	SJSBK-SD04-002	221	88.1
Acenaphthylene	1 - 5	61	SJSBK-SD06-002	219	92.4
Anthracene	3 - 7	170	SJSBK-SD02-002	196	89.3
Benzo(a)anthracene	7 - 8	1,300	SJSBK-SD02-002	384	441
Benzo(a)pyrene	6 - 8	1,100	SJSBK-SD02-002	321	344
Benzo(b)fluoranthene	7 - 8	870	SJSBK-SD04-002	282	277
Benzo(g,h,i)perylene	4 - 7	550	SJSBK-SD02-002	276	127
Benzo(k)fluoranthene	5 - 8	580	SJSBK-SD02-002	234	155
Carbazole	2 - 6	79	SJSBK-SD04-002	194	104
Chrysene	8 - 9	1,500	SJSBK-SD02-002	391	489
Dibenz(a,h)anthracene	2 - 5	67	SJSBK-SD02-001	169	101
Diethylphthalate	1 - 5	50	SJSBK-SD06-002	217	97.1
Fluoranthene	8 - 9	2,600	SJSBK-SD02-002	663	867
Indeno(1,2,3-cd)pyrene	5 - 8	510	SJSBK-SD02-002	234	131
Phenanthrene	5 - 7	920	SJSBK-SD04-002	352	267
Pyrene	8 - 9	1,900	SJSBK-SD02-002	541	676
bis(2-Ethylhexyl)phthalate	3 - 6	150	SJSBK-SD06-001	184	96.3
Pesticide/Polychlorinated Biphenyls (UG/KG)					
4,4'-DDD	7 - 12	92	SJSBK-SD05-001	14.8	26.4
4,4'-DDE	9 - 12	100	SJSBK-SD05-001	22.1	29.5
4,4'-DDT	9 - 12	13	SJSBK-SD02-002	5.92	4.04
Total Metals (MG/KG)					
Aluminum	12 - 12	14,100	SJSBK-SD05-001	4,382	3,921
Arsenic	12 - 12	30.4	SJSBK-SD05-001	5.91	8.17
Barium	11 - 12	58.9	SJSBK-SD05-001	18.0	17.3
Beryllium	11 - 12	2.10	SJSBK-SD05-001	0.40	0.56
Cadmium	12 - 12	1.40	SJSBK-SD05-001	0.45	0.45
Calcium	11 - 12	2,320	SJSBK-SD05-001	990	785
Chromium	12 - 12	43.2	SJSBK-SD02-002	13.7	14.6
Cobalt	10 - 12	9.5	SJSBK-SD05-001	2.18	2.64
Copper	12 - 12	122	SJSBK-SD02-002	30.8	36.5
Iron	12 - 12	18,500	SJSBK-SD05-001	6,893	6,234
Lead	12 - 12	104	SJSBK-SD05-001	37.7	32.7
Magnesium	11 - 12	2,920	SJSBK-SD02-002	1,089	894
Manganese	12 - 12	89.8	SJSBK-SD02-002	32.8	28.5
Mercury	11 - 12	1.40	SJSBK-SD04-002	0.23	0.39
Nickel	11 - 12	19.9	SJSBK-SD05-001	5.52	5.73
Potassium	12 - 12	1,210	SJSBK-SD02-002	498	392
Selenium	5 - 12	1.5	SJSBK-SD05-001	0.60	0.44
Sodium	10 - 12	5,450	SJSBK-SD02-001	1,990	1,932
Vanadium	12 - 12	55.9	SJSBK-SD05-001	14.6	14.8
Zinc	11 - 12	422	SJSBK-SD05-001	118	124

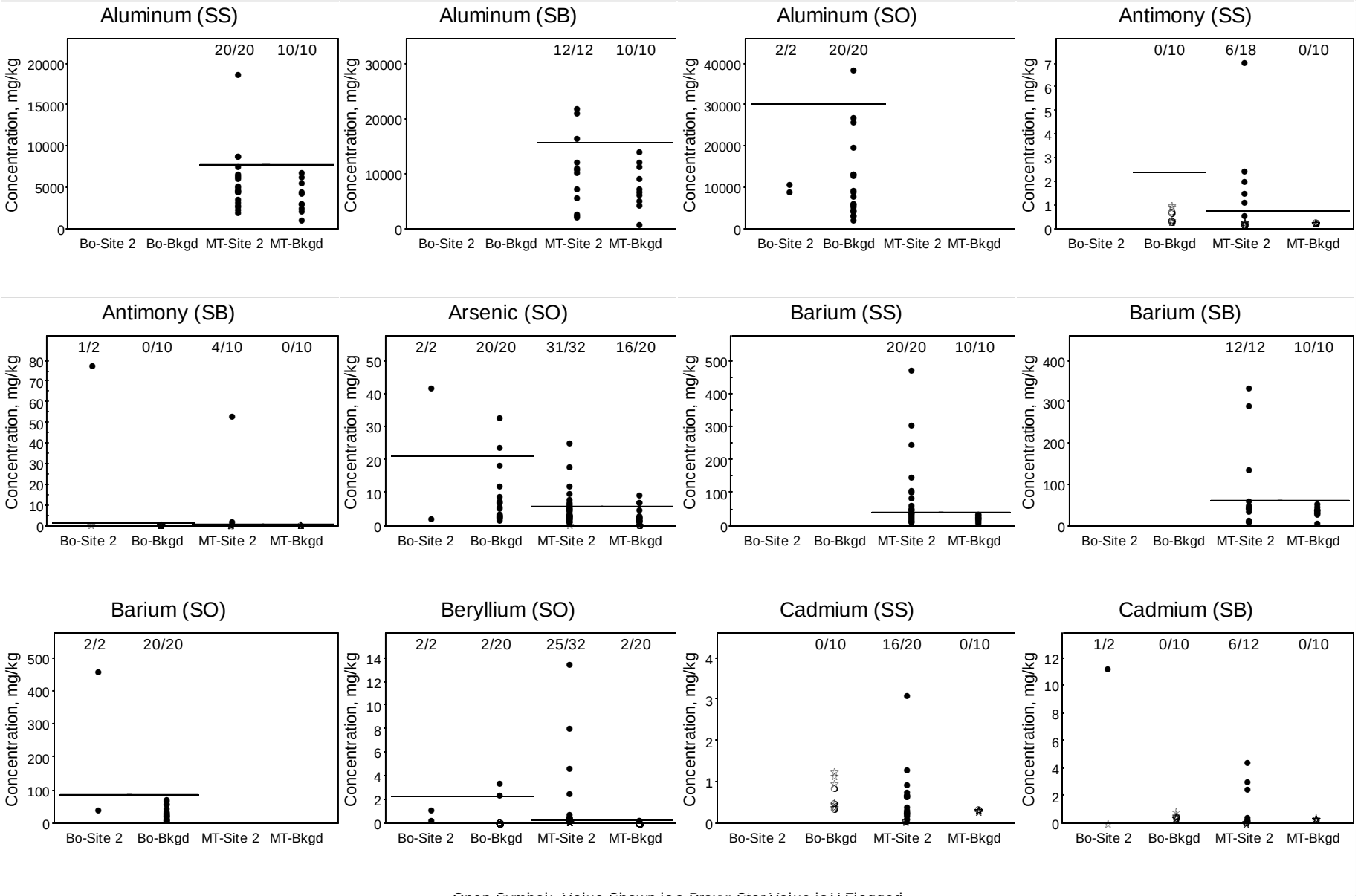
[1]- One-half of the reporting limit was used for non-detected samples when calculating the mean.

Table H-7
Summary Statistics
Reference Surface Water Samples
SJSBK-SW01 through SJSBK-SW06
in St. Juliens Creek
St. Juliens Creek Annex
Chesapeake, Virginia

AnalyteName	Detection Frequency	Maximum Detected Concentration	SampleID of Maximum Detected Value	Mean Value[1]	Standard Deviation
Total Metals (UG/L)					
Aluminum	11 - 12	1,510	SJSBK-SW04-002	713	468
Antimony	1 - 12	4	SJSBK-SW01-002	1.59	0.76
Arsenic	5 - 12	11.8	SJSBK-SW06-001	3.12	3.10
Barium	12 - 12	50.6	SJSBK-SW06-001	34.8	7.94
Beryllium	1 - 12	0.17	SJSBK-SW06-001	0.09	0.04
Calcium	12 - 12	178,000	SJSBK-SW02-001	84,133	59,497
Chromium	4 - 12	3	SJSBK-SW04-002	0.88	0.82
Cobalt	9 - 12	2.20	SJSBK-SW06-001	0.95	0.56
Copper	7 - 12	10.2	SJSBK-SW02-002	4.98	3.75
Cyanide	2 - 12	14.5	SJSBK-SW06-001	4.35	4.34
Iron	12 - 12	5,490	SJSBK-SW06-001	1,674	1,303
Lead	9 - 12	5.6	SJSBK-SW02-002	2.65	1.88
Magnesium	12 - 12	521,000	SJSBK-SW02-001	215,353	206,691
Manganese	12 - 12	104	SJSBK-SW01-001	74.5	19.4
Nickel	9 - 12	3.20	SJSBK-SW06-001	1.58	0.76
Potassium	12 - 12	194,000	SJSBK-SW02-001	78,930	75,120
Silver	1 - 12	0.94	SJSBK-SW05-002	0.45	0.16
Sodium	12 - 12	4,440,000	SJSBK-SW02-001	1,828,092	1,756,547
Vanadium	12 - 12	4.90	SJSBK-SW04-002	3.19	1.44
Zinc	11 - 12	72.8	SJSBK-SW06-001	29.5	18.6

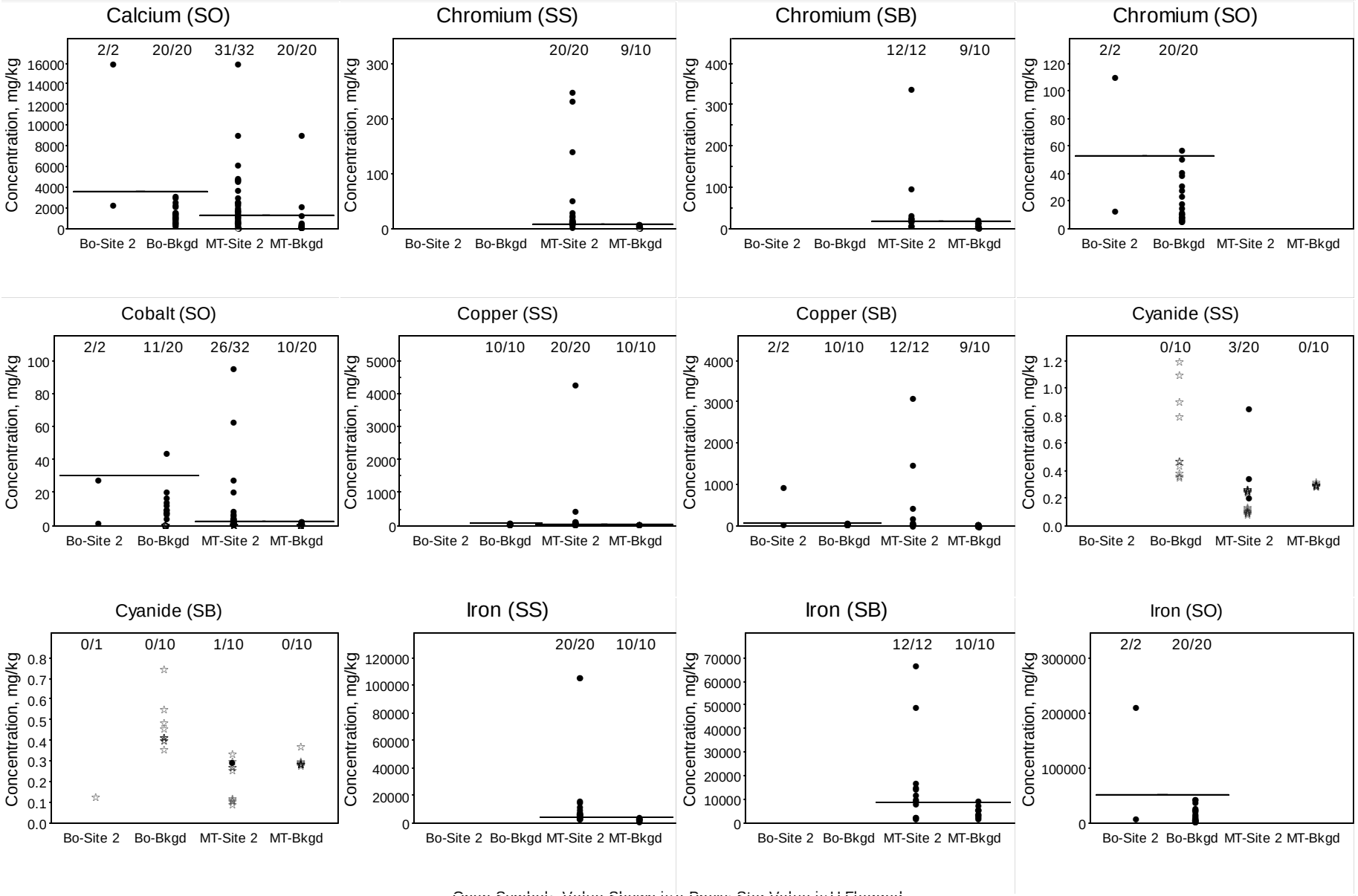
[1]- One-half of the reporting limit was used for non-detected samples when calculating the mean.

Figure 1: Comparison of Site 2 Data to Background Data - All Samples



Open Symbol: Value Shown is a Proxy; Star Value is U-Flagged
Horizontal Line at Background UTL (When Applicable)
Bo = Bohicket; MT = Munden-Tetotum

Figure 1: Comparison of Site 2 Data to Background Data - All Samples



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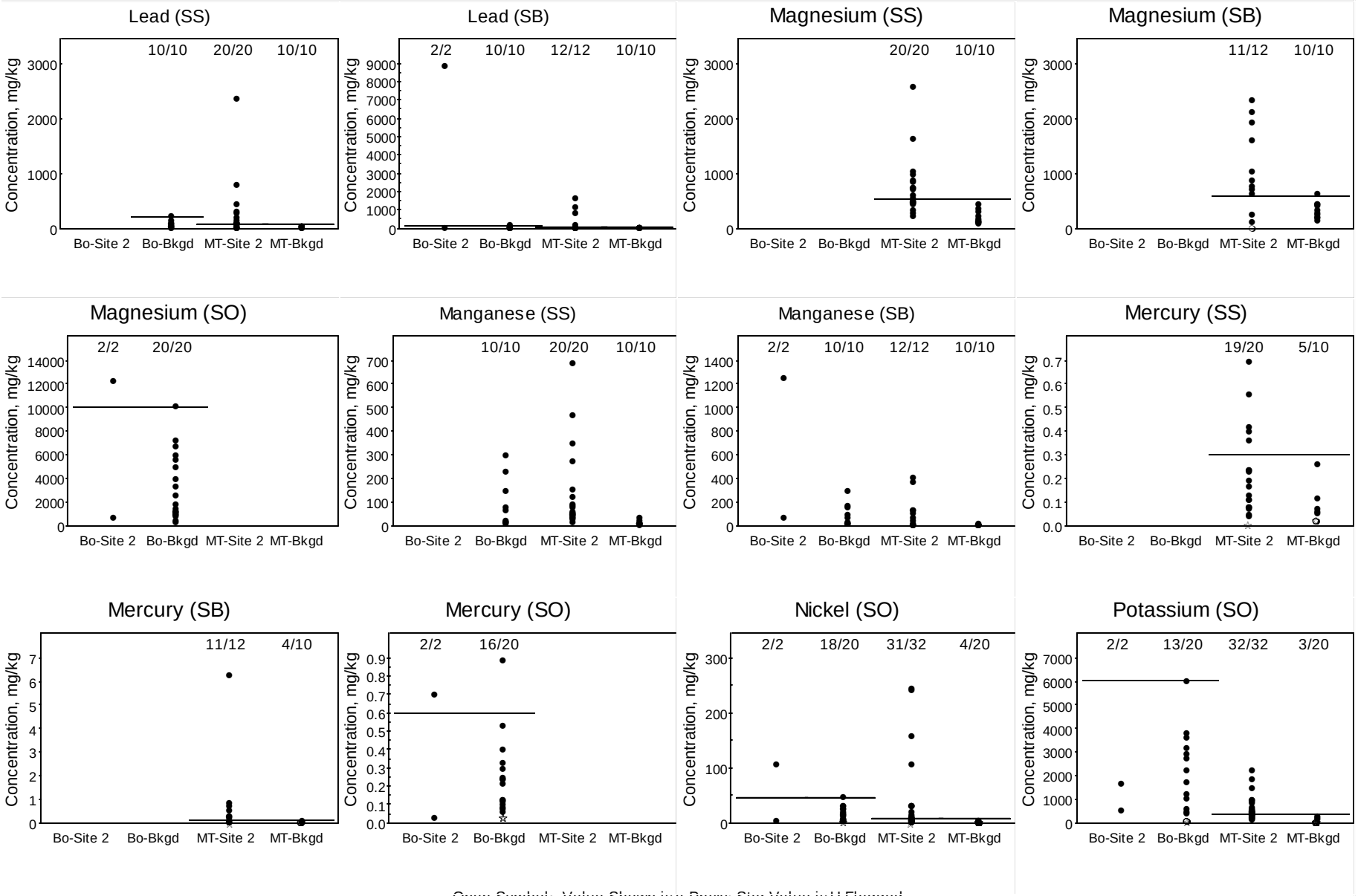

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Figure 1: Comparison of Site 2 Data to Background Data - All Samples

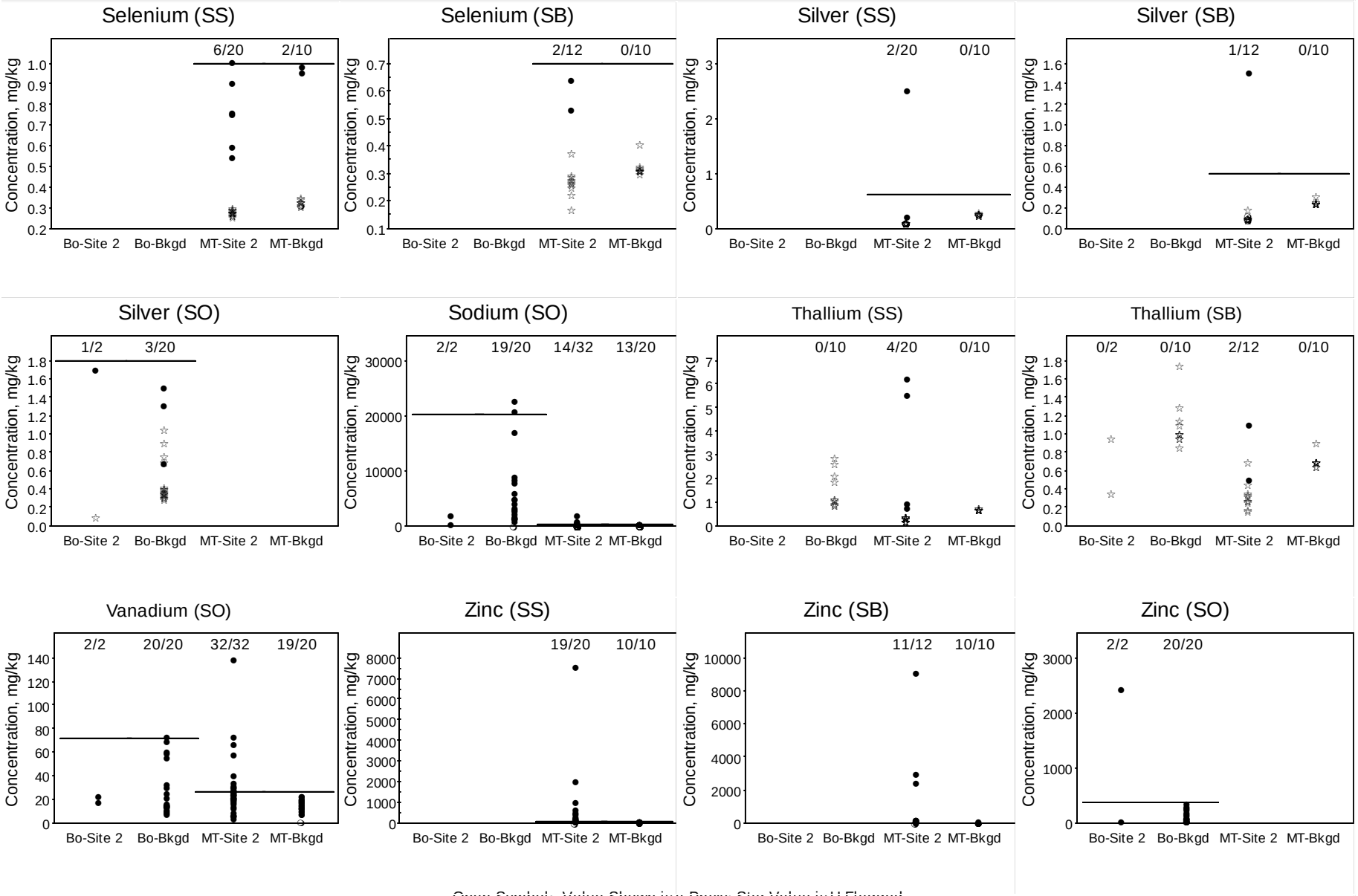

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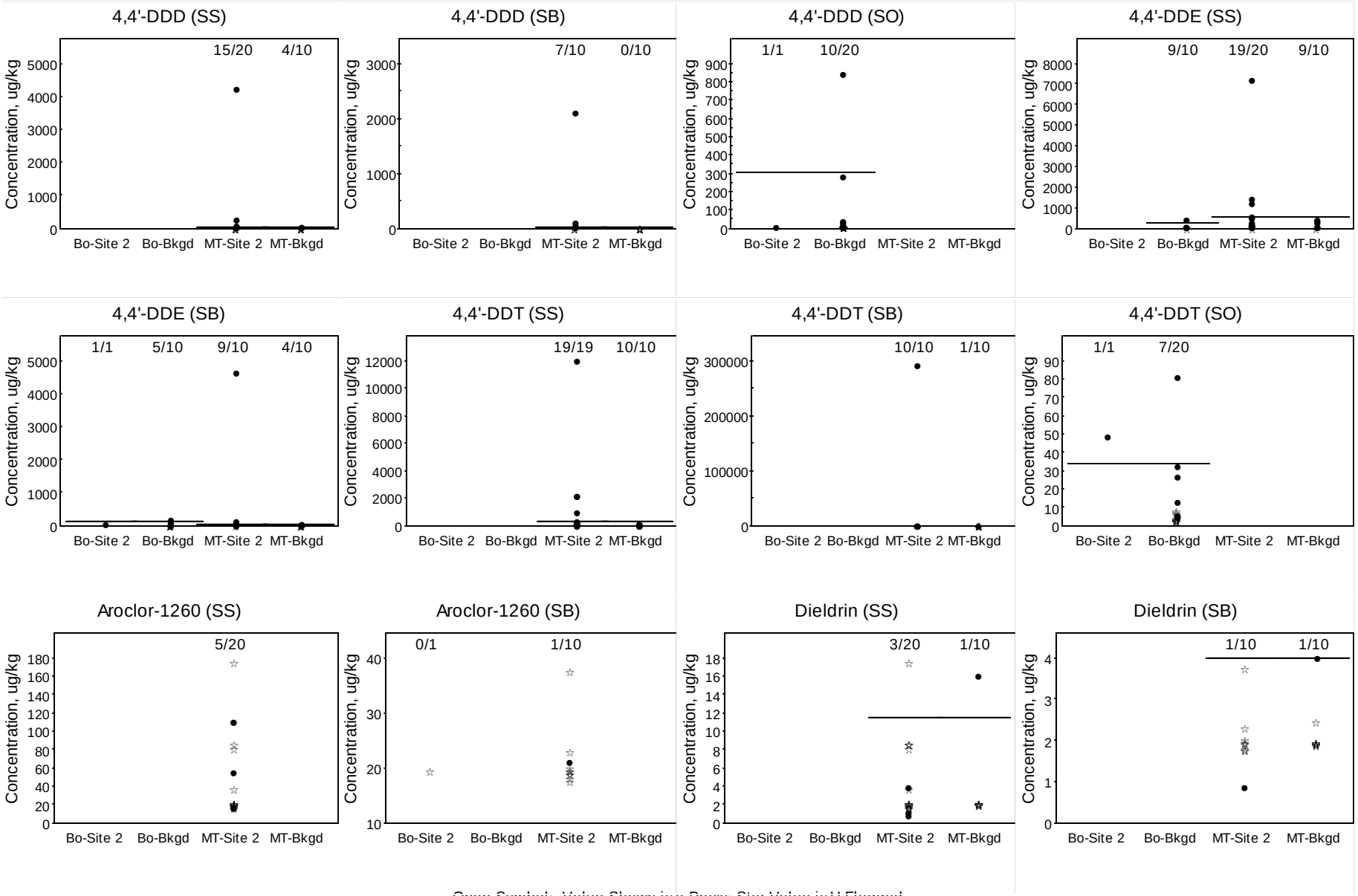
Figure 1: Comparison of Site 2 Data to Background Data - All Samples



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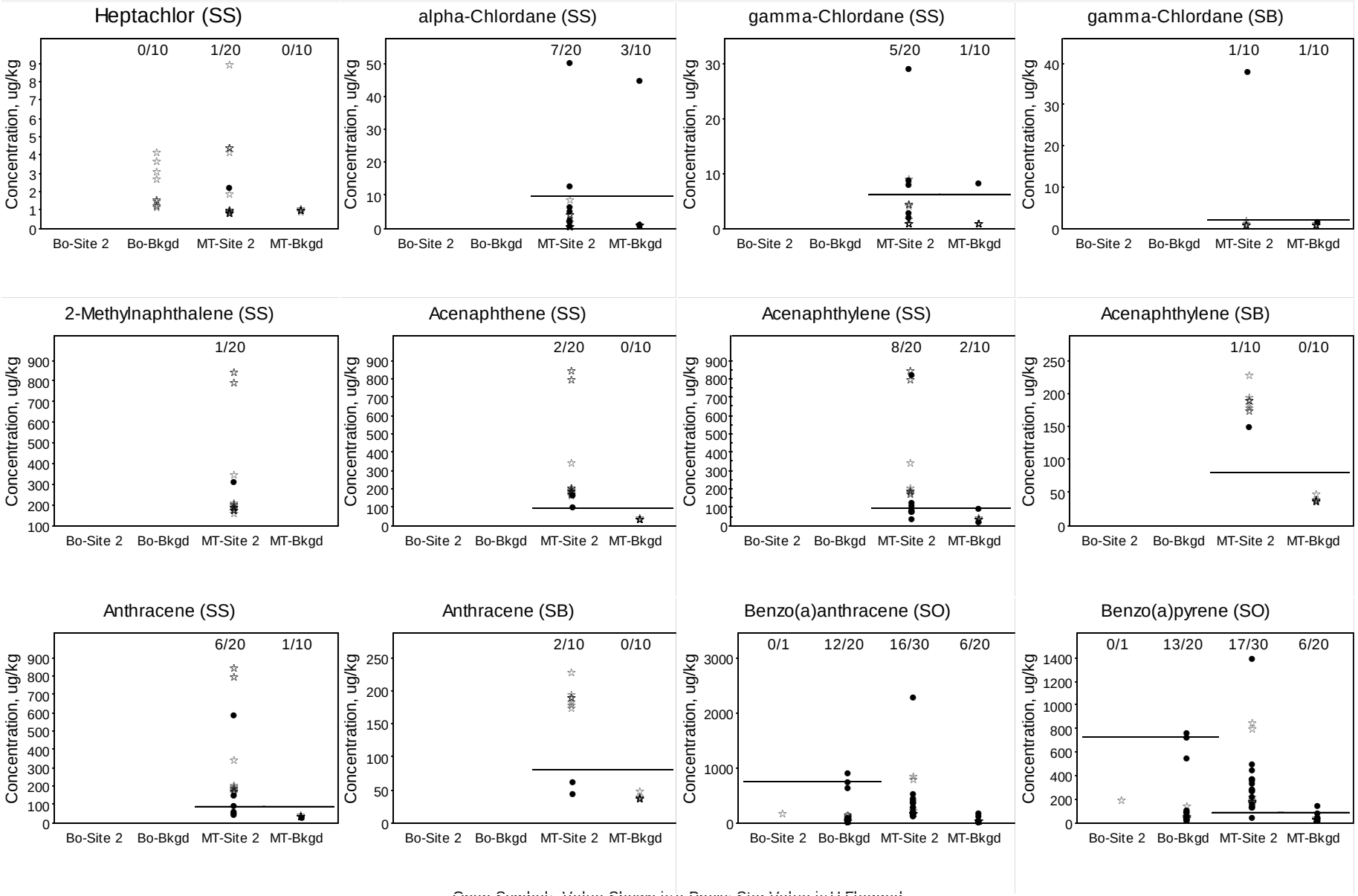
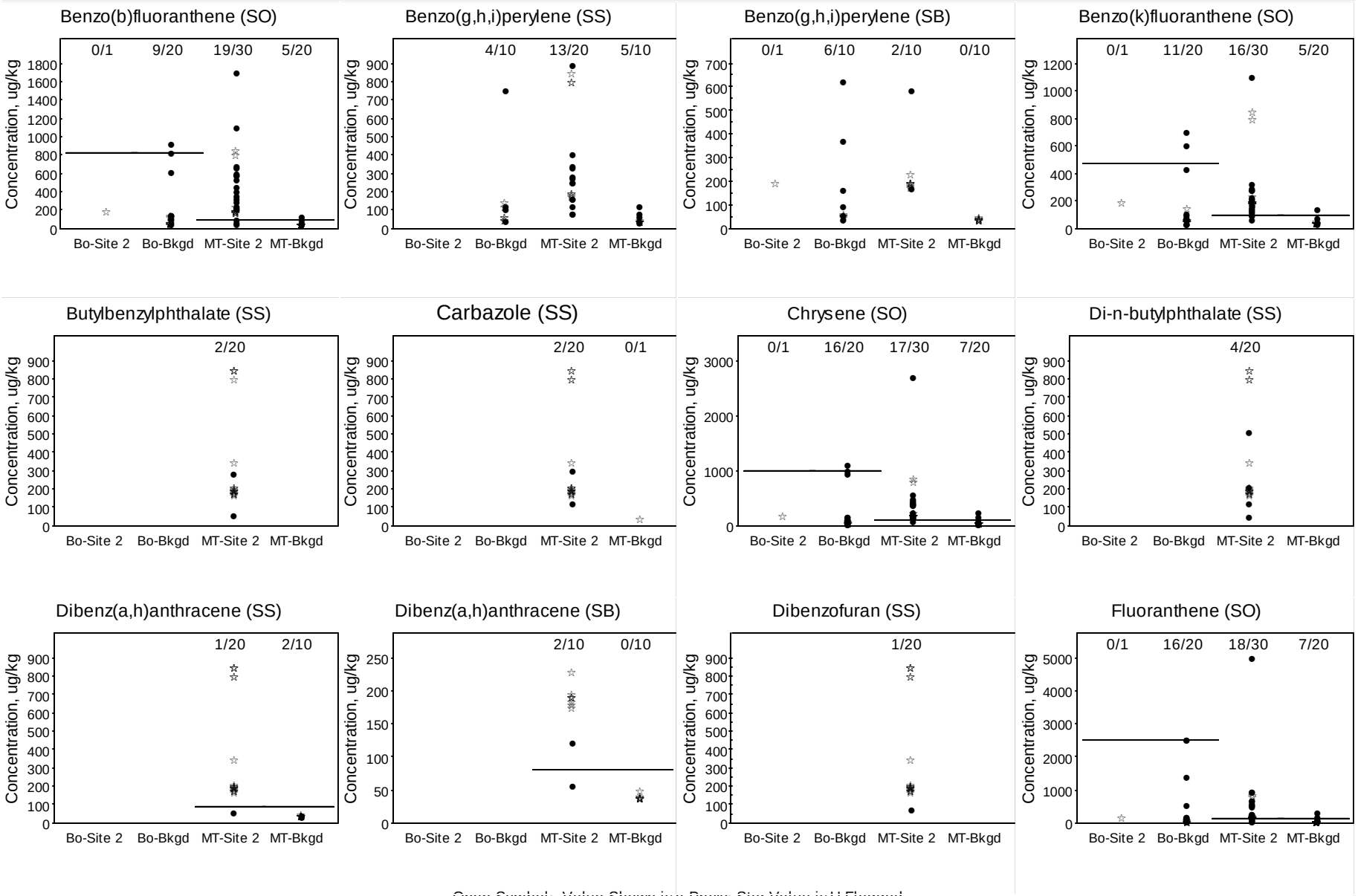
Horizontal Line at Background UTL (When Applicable)
Bo = Bohicket; MT = Munden-Tetotum

Figure 1: Comparison of Site 2 Data to Background Data - All Samples



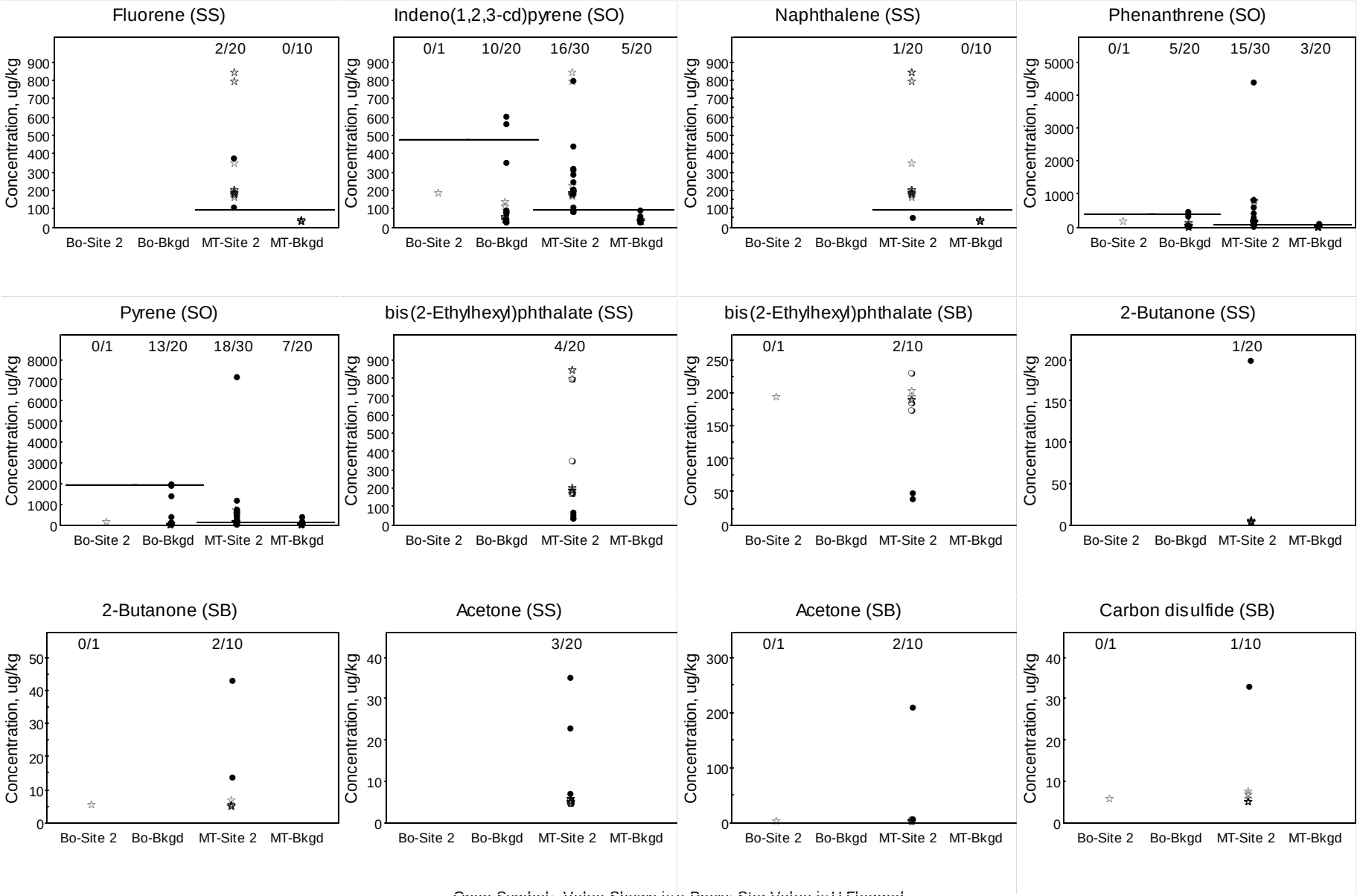
Open Symbol: Value Shown is a Proxy, Star Value is U-Flagged
Horizontal Line at Background UTL (When Applicable)
Bo = Bohicket; MT = Munden-Tetotum

Figure 1: Comparison of Site 2 Data to Background Data - All Samples



Open Symbol: Value Shown is a Proxy, Star Value is U-Flagged
Horizontal Line at Background UTL (When Applicable)
Bo = Bohicket; MT = Munden-Tetotum

Figure 1: Comparison of Site 2 Data to Background Data - All Samples



Open Symbol: Value Shown is a Proxy, Star Value is U-Flagged
Horizontal Line at Background UTL (When Applicable)
Bo = Bohicket; MT = Munden-Tetotum

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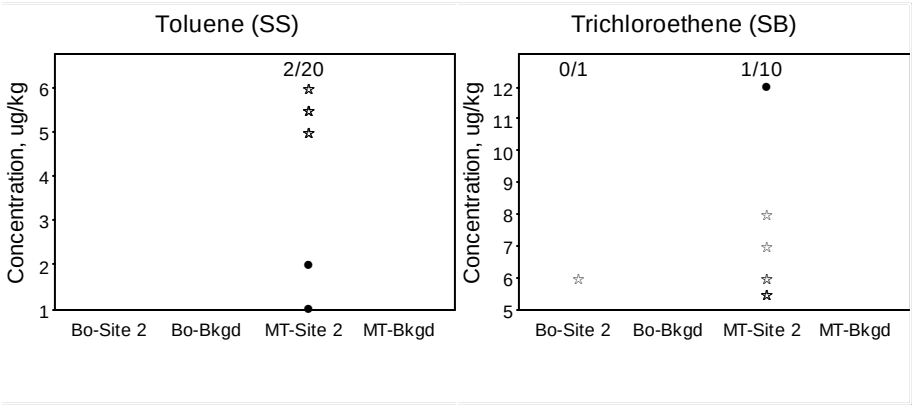

Open Symbol: Value Shown is a Proxy; Star Value is U-Flagged
Horizontal Line at Background UTL (When Applicable)
Bo = Bohicket; MT = Munden-Tetotum

Figure 2: Comparison of Site 2 Data to Background Data - All Samples

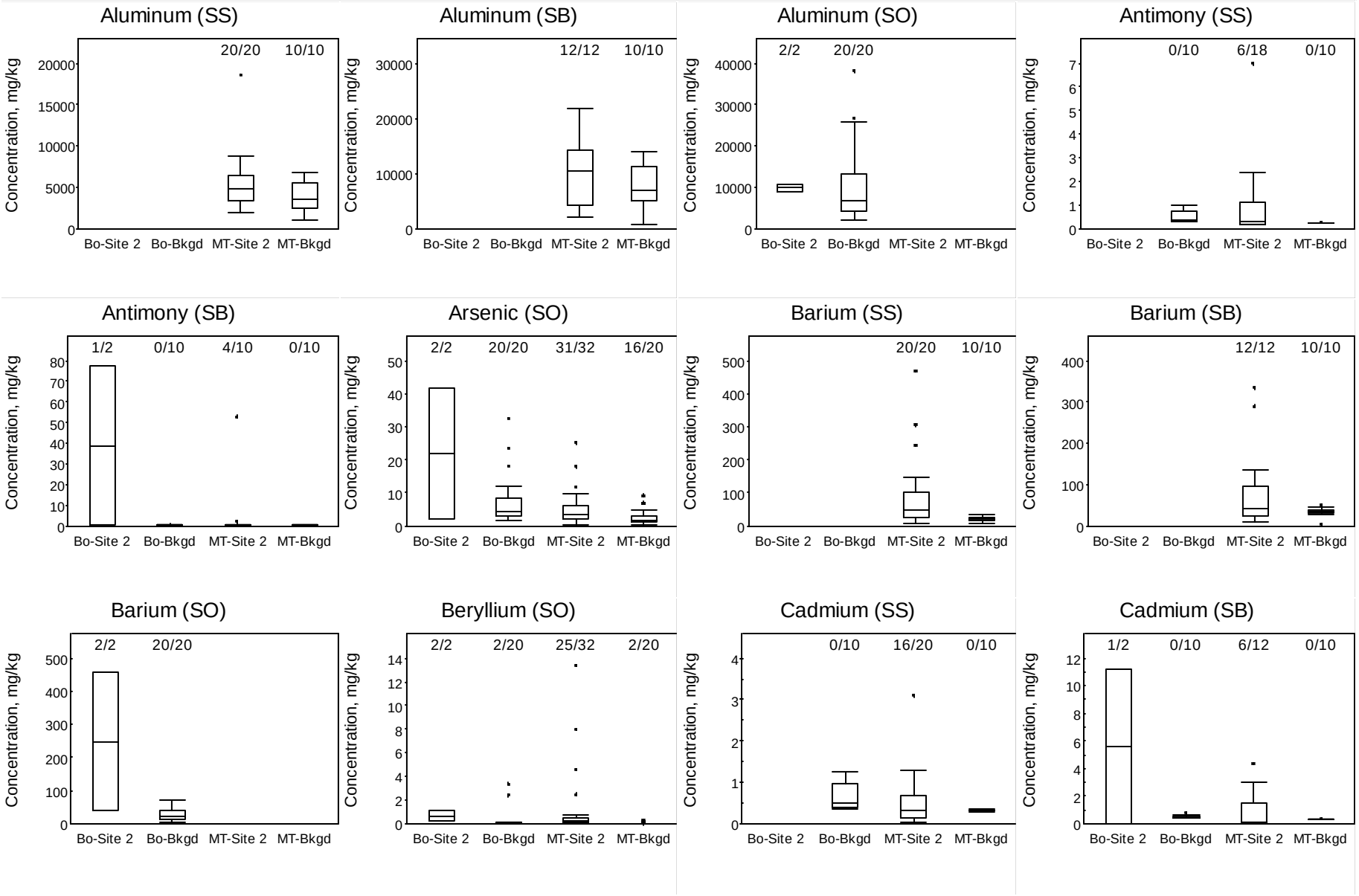

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Figure 2: Comparison of Site 2 Data to Background Data - All Samples

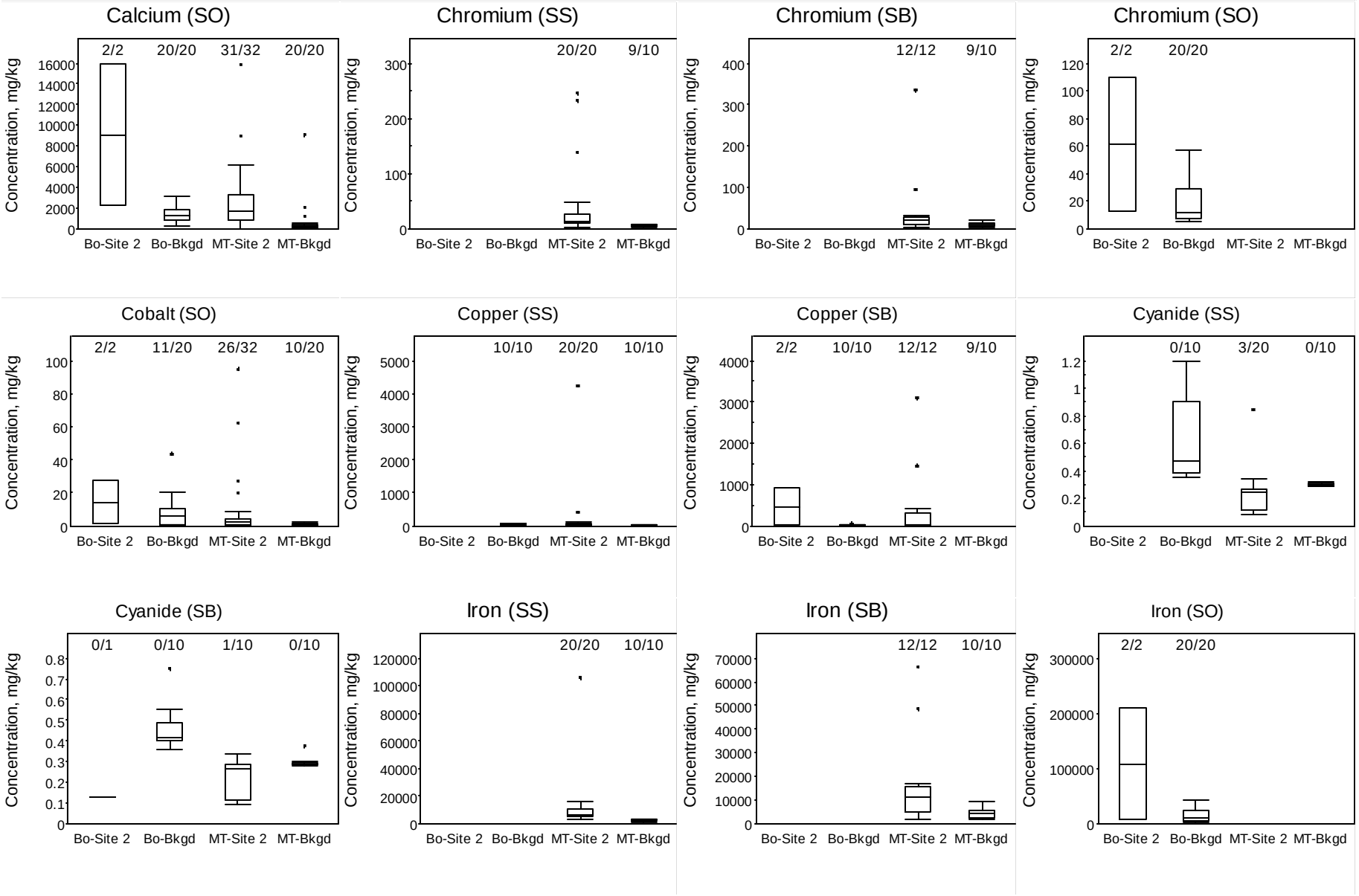

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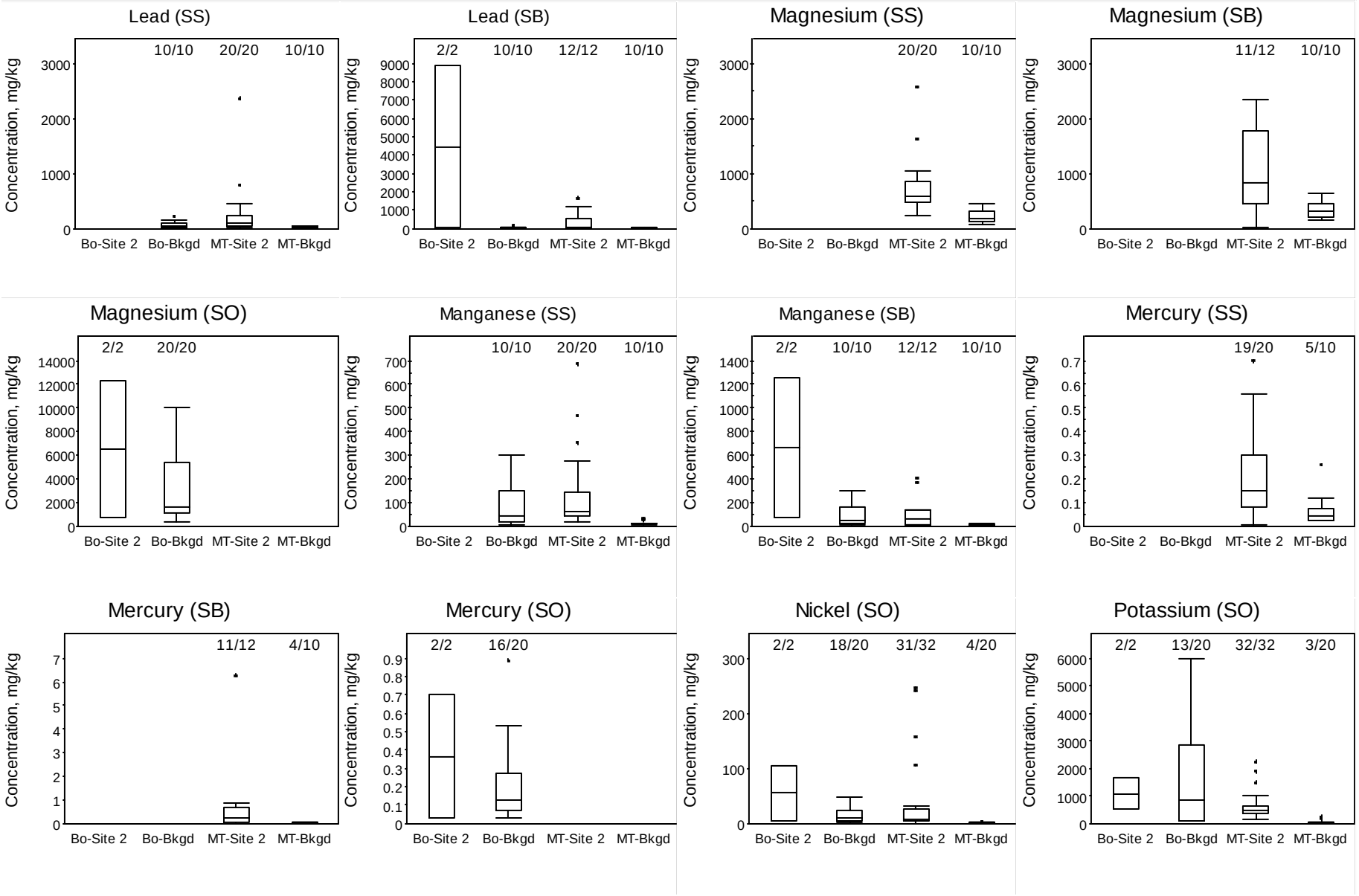
Figure 2: Comparison of Site 2 Data to Background Data - All Samples



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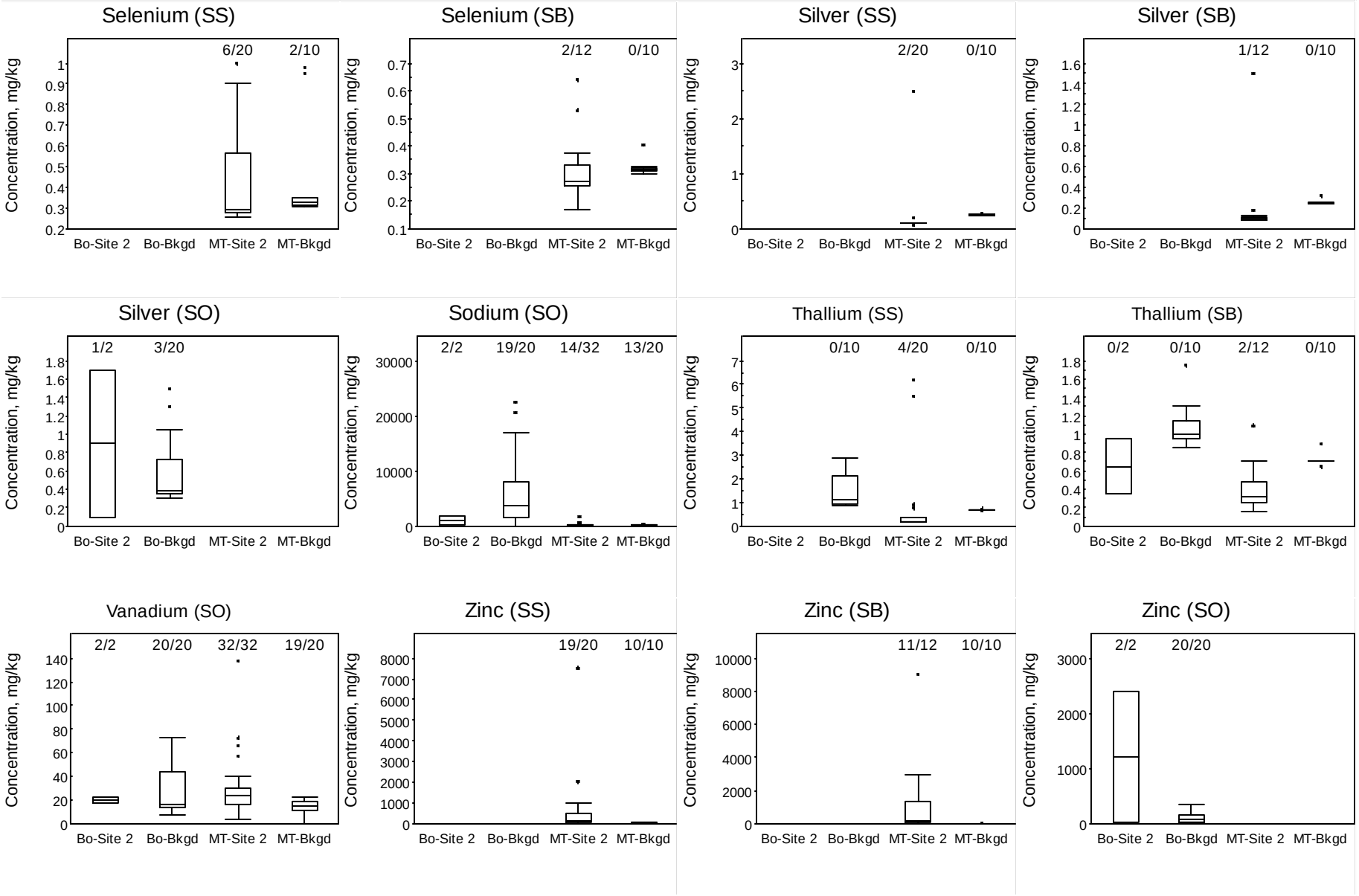

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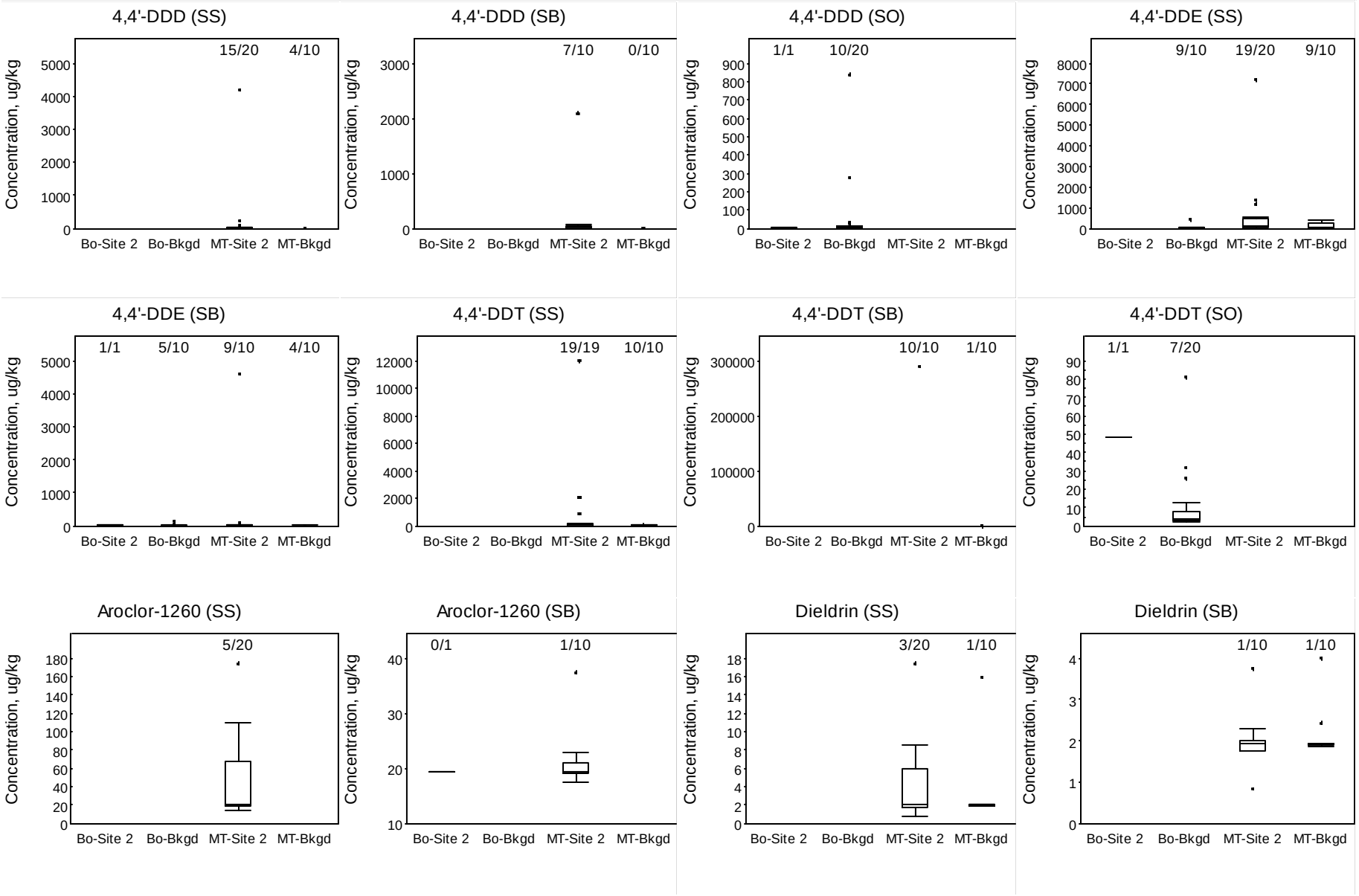

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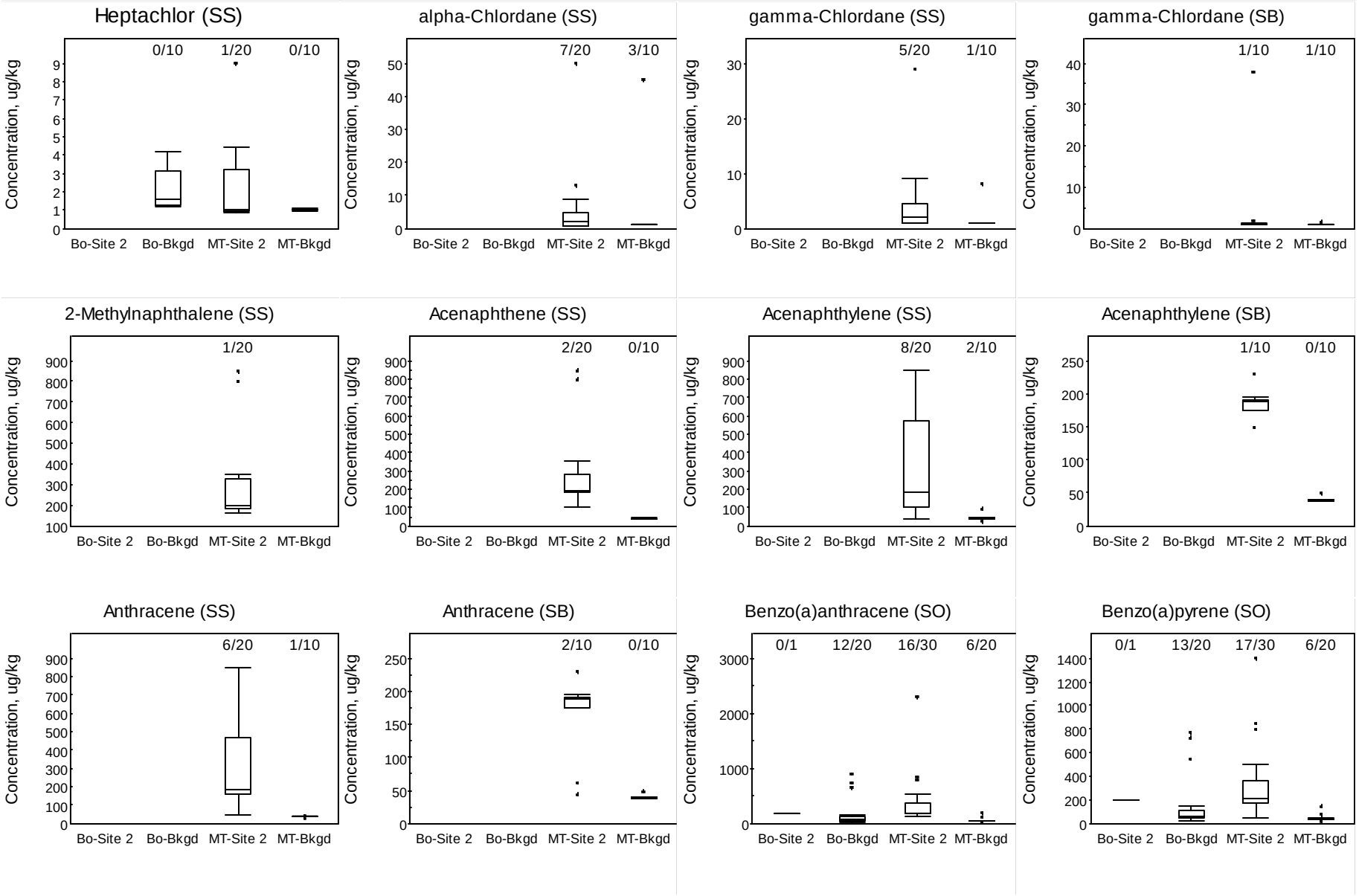

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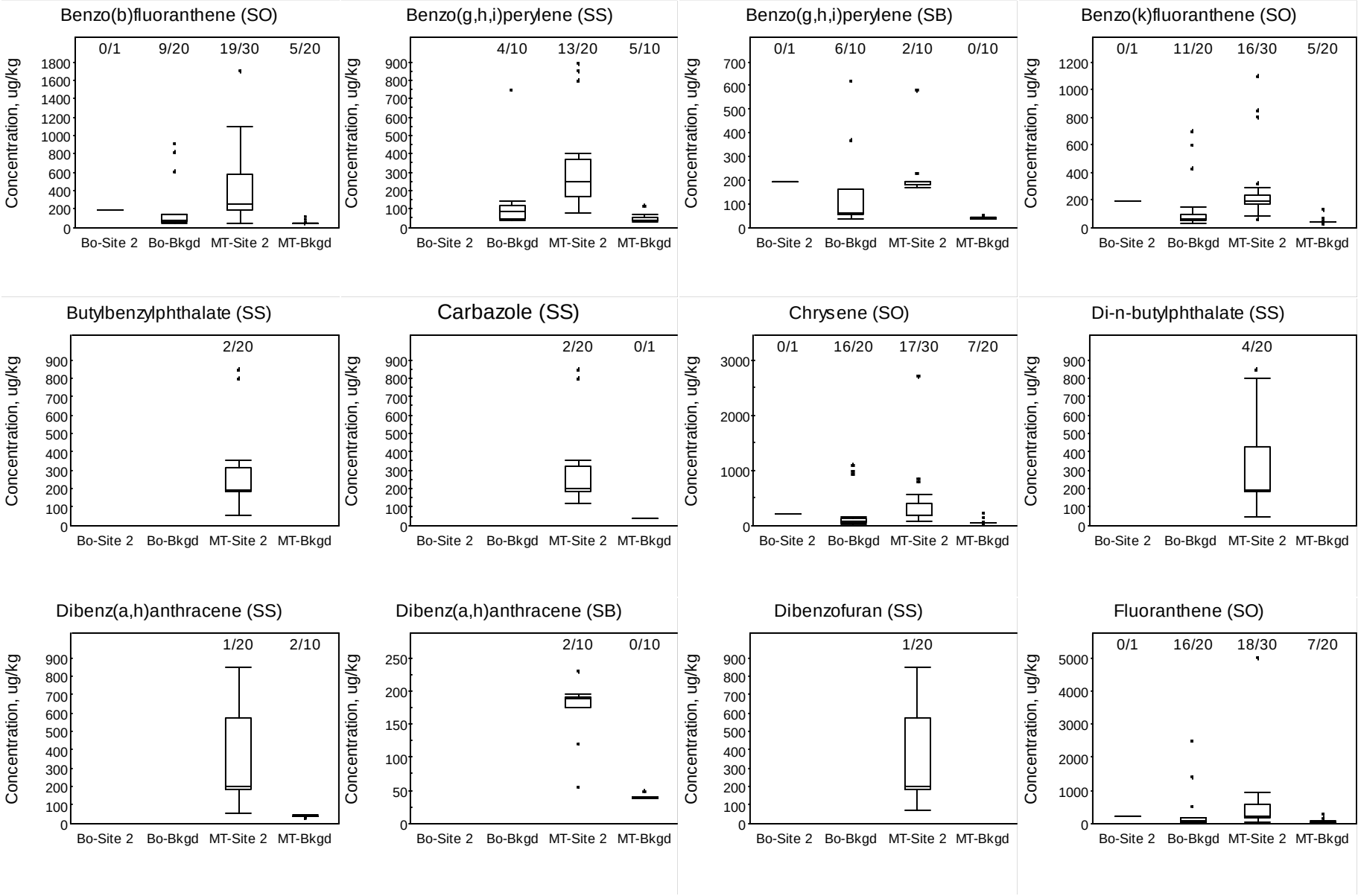
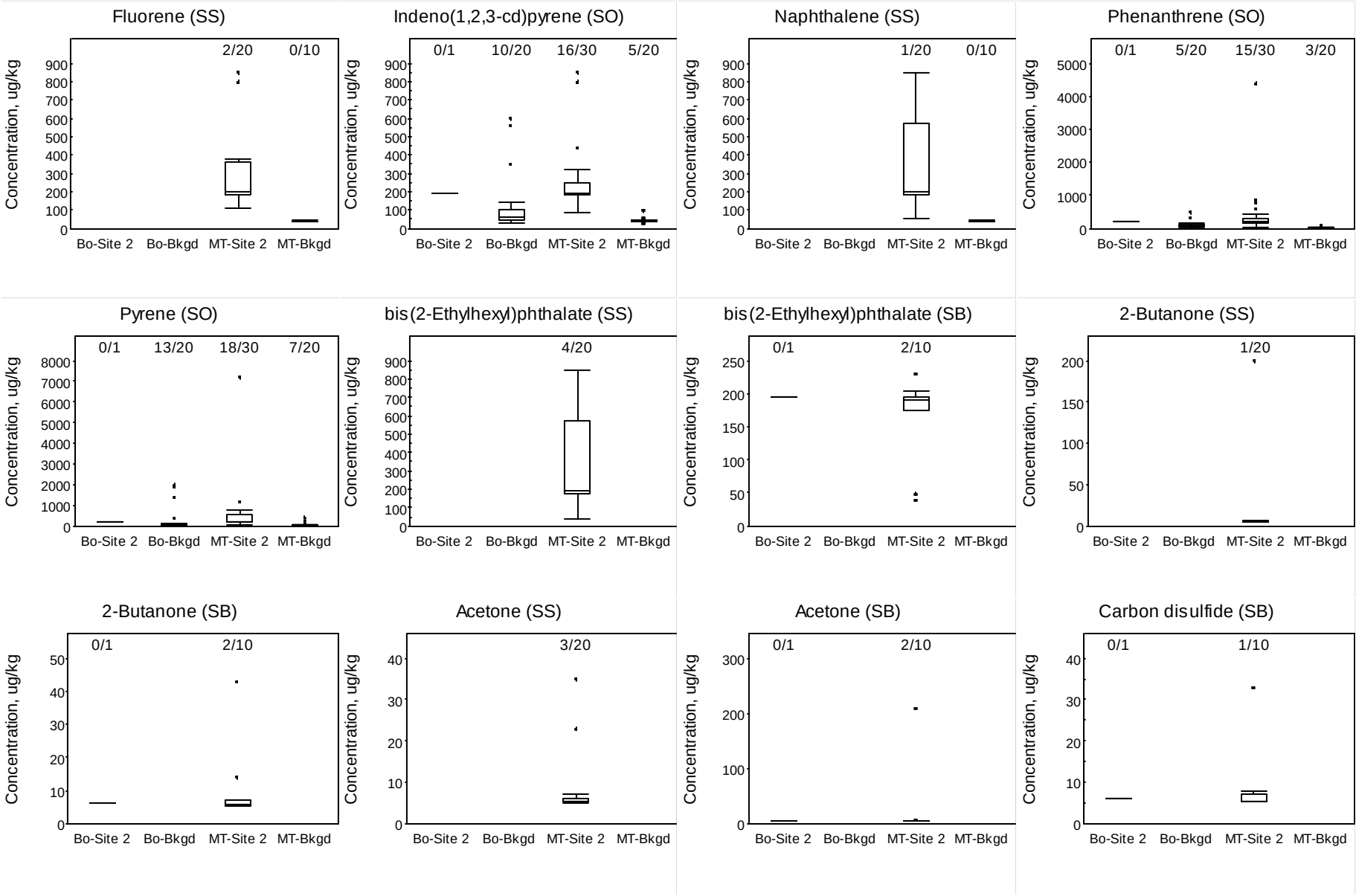


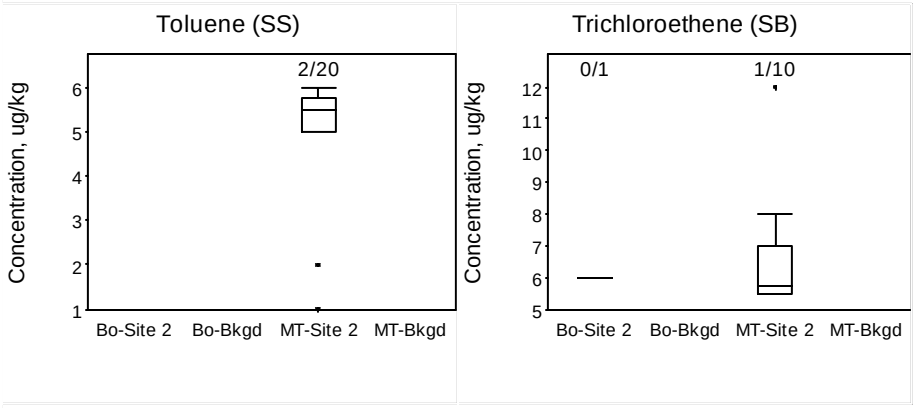
Open Symbol: Value Shown is a Proxy; Star Value is U-Flagged
Bo = Bohicket; MT = Munden-Tetotum

Figure 2: Comparison of Site 2 Data to Background Data - All Samples



Open Symbol: Value Shown is a Proxy; Star Value is U-Flagged
Bo = Bohicket; MT = Munden-Tetotum

Figure 2: Comparison of Site 2 Data to Background Data - All Samples



Open Symbol: Value Shown is a Proxy; Star Value is U-Flagged
Bo = Bohicket; MT = Munden-Tetotum

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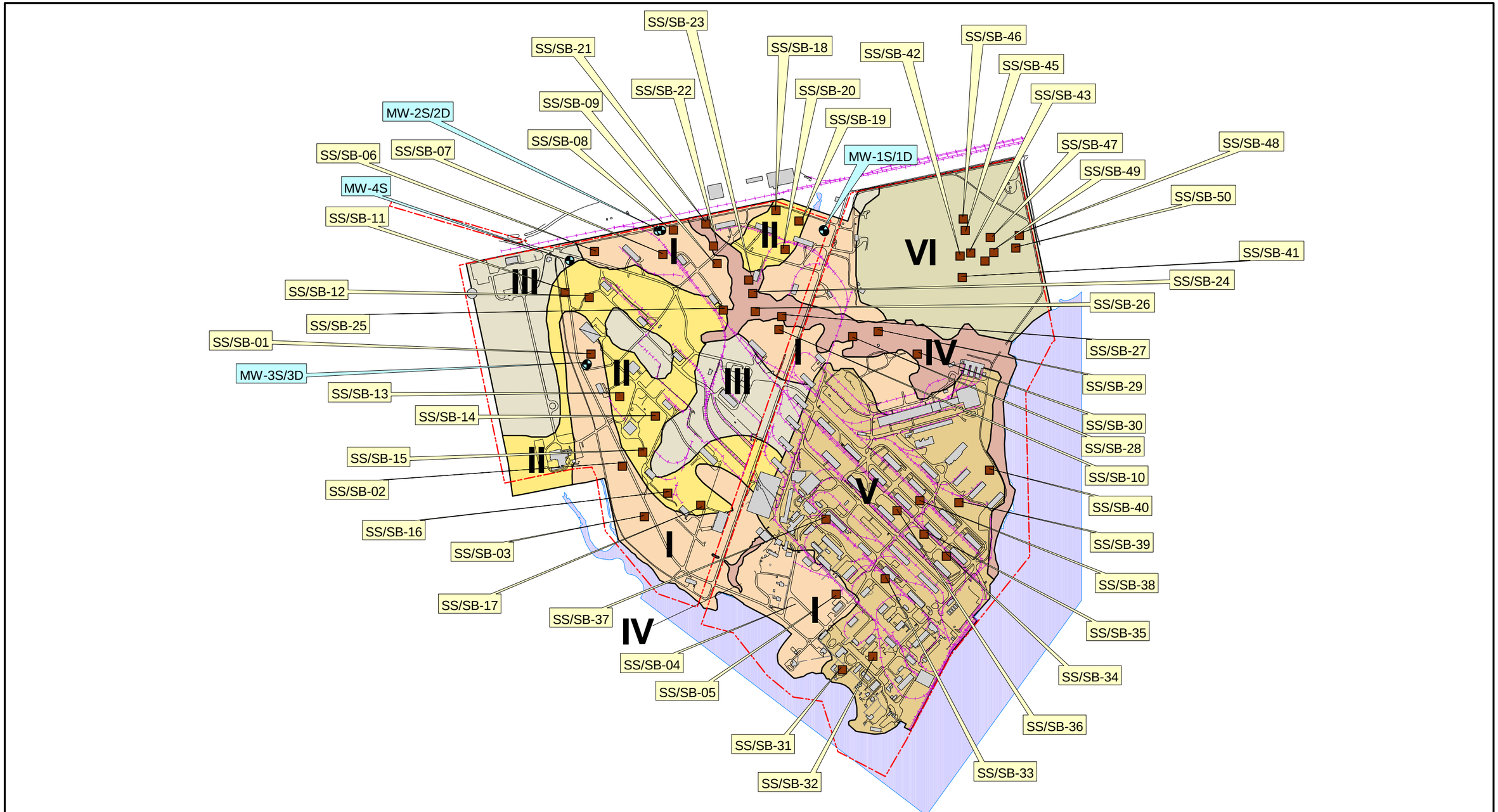

LEGEND

- Soil Sample Locations
- Monitoring Well Locations
- I - Munden-Tetotum
- II - Dragston-Augusta Association
- III - Nimmo
- IV - Bohicket
- V - Urban-Udorthents
- VI - Dredge Fill

N

0 500 1000 Feet

Figure H-1
Soil and Groundwater
Background Sampling Locations
Site 2 RI/ERA/HHRA
St. Juliens Creek Annex
Chesapeake, Virginia

CH2MHILL

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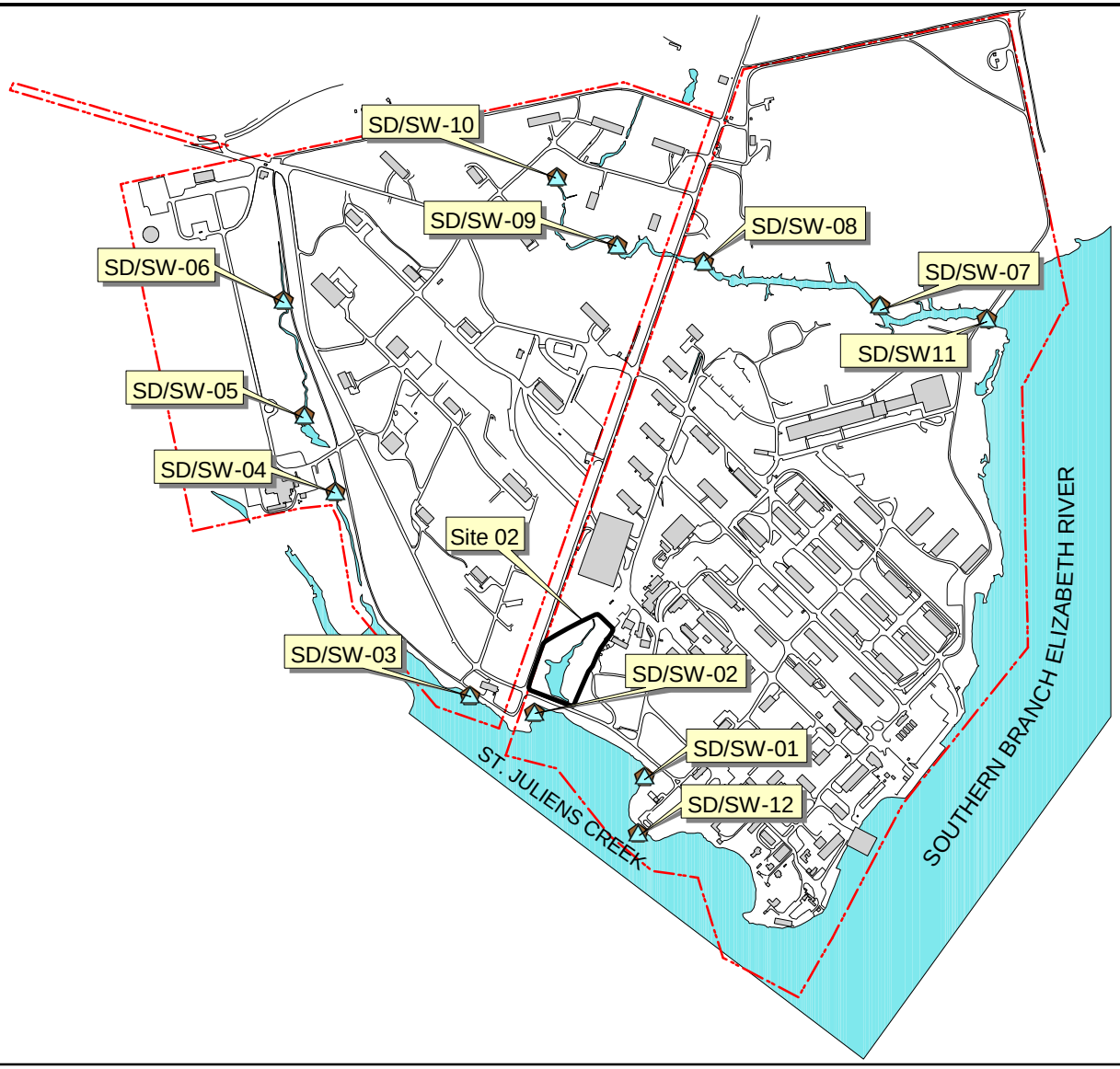

LEGEND

- Surface Water Sample Locations
- Sediment Sample Locations
- Buildings
- Site Boundary

N

0 500 1000 Feet

Figure H-2
Sediment and Surface Water
Background Sampling Locations
Site 2 RI/ERA/HHRA
St. Juliens Creek Annex
Chesapeake, Virginia

CH2MHILL

Appendix I
Human Health Risk Assessment Tables

TABLE 1

SELECTION OF EXPOSURE PATHWAYS

St. Juliens Creek Annex - Site 2

Scenario Timeframe	Medium	Exposure Medium	Exposure Point	Receptor Population	Receptor Age	Exposure Route	On-Site/ Off-Site	Type of Analysis	Rationale for Selection or Exclusion of Exposure Pathway
Current / Future	Surface Soil	Surface Soil	At Site 2	Trespasser	Adult	Dermal	On-Site	Quant	Trespassers may have exposed skin surfaces come into contact with soil
						Ingestion	On-Site	Quant	Trespassers may incidentally ingest soil
					Adolescent	Dermal	On-Site	Quant	Trespassers may have exposed skin surfaces come into contact with soil
						Ingestion	On-Site	Quant	Trespassers may incidentally ingest soil
		Air	Emissions from Surface Soil at Site 2	Trespasser	Adult	Inhalation	On-Site	Quant	Trespassers may inhale volatiles/particulates
					Adolescent	Inhalation	On-Site	Quant	Trespassers may inhale volatiles/particulates
	Groundwater	Deep Groundwater	Tap Water	Resident	Adult	Dermal	Off-Site	Quant	Local municipality currently has some uses for groundwater from deep aquifer
						Ingestion	Off-Site	Quant	Local municipality currently has some uses for groundwater from deep aquifer
					Child	Dermal	Off-Site	Quant	Local municipality currently has some uses for groundwater from deep aquifer
						Ingestion	Off-Site	Quant	Local municipality currently has some uses for groundwater from deep aquifer
					Adult/Child	Dermal	Off-Site	Quant	Local municipality currently has some uses for groundwater from deep aquifer
						Ingestion	Off-Site	Quant	Local municipality currently has some uses for groundwater from deep aquifer
		Air	Deep Groundwater - Water Vapors at Showerhead	Resident	Adult	Inhalation	Off-Site	Quant	Local municipality currently has some uses for groundwater from deep aquifer
	Surface Water [2]	Surface Water [2]	Drainage Features and Ponded Area	Trespasser	Adult	Dermal	On-Site	Quant	Trespassers may have exposed skin surfaces come into contact with surface water
						Ingestion	On-Site	None	Ingestion of surface water not expected to be a significant exposure pathway during wading
					Adolescent	Dermal	On-Site	Quant	Trespassers may have exposed skin surfaces come into contact with surface water
						Ingestion	On-Site	None	Ingestion of surface water not expected to be a significant exposure pathway during wading
	Sediment [2]	Sediment [2]	Drainage Features and Ponded Area	Trespasser	Adult	Dermal	On-Site	Quant	Trespassers may have exposed skin surfaces come into contact with sediment
						Ingestion	On-Site	Quant	Trespassers may incidentally ingest sediment
					Adolescent	Dermal	On-Site	Quant	Trespassers may have exposed skin surfaces come into contact with sediment
						Ingestion	On-Site	Quant	Trespassers may incidentally ingest sediment
Future	Soil[1]	Soil[1]	At Site 2	Resident	Adult	Dermal	On-Site	Quant	Residents may have exposed skin surfaces come into contact with soil
						Ingestion	On-Site	Quant	Residents may incidentally ingest soil
					Child	Dermal	On-Site	Quant	Residents may have exposed skin surfaces come into contact with soil
						Ingestion	On-Site	Quant	Residents may incidentally ingest soil
					Adult/Child	Dermal	On-Site	Quant	Residents may have exposed skin surfaces come into contact with soil
						Ingestion	On-Site	Quant	Residents may incidentally ingest soil

TABLE 1

SELECTION OF EXPOSURE PATHWAYS

St. Juliens Creek Annex - Site 2

Scenario Timeframe	Medium	Exposure Medium	Exposure Point	Receptor Population	Receptor Age	Exposure Route	On-Site/ Off-Site	Type of Analysis	Rationale for Selection or Exclusion of Exposure Pathway
Future	Soil[1]	Soil[1]	At Site 2	Construction Worker	Adult	Dermal	On-Site	Quant	Workers may have exposed skin surfaces come into contact with soil
						Ingestion	On-Site	Quant	Workers may incidentally ingest soil
				Other Worker	Adult	Dermal	On-Site	Quant	Workers may have exposed skin surfaces come into contact with soil
						Ingestion	On-Site	Quant	Workers may incidentally ingest soil
		Air	Emissions from Soil at Site 2	Construction Worker	Adult	Inhalation	On-Site	Quant	Workers may inhale volatiles/particulates
	Surface Water [2]	Surface Water [2]	Drainage Features and Ponded Area	Resident	Adult	Dermal	On-Site	Quant	Residents may have exposed skin surfaces come into contact with surface water
						Ingestion	On-Site	None	Ingestion of surface water not expected to be a significant exposure pathway during wading
					Child	Dermal	On-Site	Quant	Residents may have exposed skin surfaces come into contact with surface water
						Ingestion	On-Site	None	Ingestion of surface water not expected to be a significant exposure pathway during wading
					Adult/Child	Dermal	On-Site	Quant	Residents may have exposed skin surfaces come into contact with surface water
						Ingestion	On-Site	None	Ingestion of surface water not expected to be a significant exposure pathway during wading
	Sediment [2]	Sediment [2]	Drainage Features and Ponded Area	Resident	Adult	Dermal	On-Site	Quant	Residents may have exposed skin surfaces come into contact with sediment
						Ingestion	On-Site	Quant	Residents may incidentally ingest sediment
					Child	Dermal	On-Site	Quant	Residents may have exposed skin surfaces come into contact with sediment
						Ingestion	On-Site	Quant	Residents may incidentally ingest sediment
					Adult/Child	Dermal	On-Site	Quant	Residents may have exposed skin surfaces come into contact with sediment
						Ingestion	On-Site	Quant	Residents may incidentally ingest sediment
	Groundwater	Shallow Groundwater	Water Table	Construction Worker	Adult	Dermal	On-Site	Quant	Workers may have exposed skin surfaces come into contact with groundwater

[1] Includes both surface soil and subsurface soil.

2 Surface water and sediment exposure scenarios are for exposure during wading.

Table 2.1

OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN

St. Juliens Creek Annex - Site 2

Scenario Timeframe: Current/Future
Medium: Surface Soil
Exposure Medium: Surface Soil

Exposure Point	CAS Number	Chemical	Minimum [1] Concentration Qualifier	Maximum [1] Concentration Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration [2] Used for Screening	Background [3] Value	Screening [4] Toxicity Value	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for [5] Contaminant Deletion or Selection
At Site 2	78-93-3	2-Butanone	0.2	0.2	MG/KG	SJS02-SS11-000	1/19	0.01 - 0.012	0.2	ND	61,320 N	NA	NA	NO	BSL
	67-64-1	Acetone	0.007 J	0.035	MG/KG	SJS02-SS10-000	3/19	0.01 - 0.012	0.035	ND	91,980 N	NA	NA	NO	BSL
	108-88-3	Toluene	0.001 J	0.002 J	MG/KG	SJS02-SS08-000	2/19	0.01 - 0.012	0.002	ND	20,440 N	NA	NA	NO	BSL
	91-57-6	2-Methylnaphthalene	0.31 J	0.31 J	MG/KG	SJS02-SS03-000	1/19	0.33 - 1.7	0.31	ND	2,044 N	NA	NA	NO	BSL
	83-32-9	Acenaphthene	0.1 J	0.17 J	MG/KG	SJS02-SS03-000	2/19	0.33 - 1.7	0.17	92	6,132 N	NA	NA	NO	BSL
	208-96-8	Acenaphthylene	0.037 J	0.82 J	MG/KG	SJS02-SS03-000	8/19	0.33 - 1.7	0.82	95	2,044 N	NA	NA	NO	BSL
	120-12-7	Anthracene	0.043 J	0.59 J	MG/KG	SJS02-SS03-000	6/19	0.33 - 1.7	0.59	91	30,660 N	NA	NA	NO	BSL
	56-55-3	Benzo(a)anthracene	0.12 J	2.3	MG/KG	SJS02-SS03-000	14/19	0.33 - 1.7	2.3	6.9	3.92 C	NA	NA	NO	BSL
	50-32-8	Benzo(a)pyrene	0.13 J	1.4 J	MG/KG	SJS02-SS03-000	14/19	0.33 - 1.7	1.4	91	0.392 C	NA	NA	YES	ASL
	205-99-2	Benzo(b)fluoranthene	0.057 J	1.7 J	MG/KG	SJS02-SS03-000	15/19	0.33 - 1.7	1.7	91	3.92 C	NA	NA	NO	BSL
	191-24-2	Benzo(g,h,i)perylene	0.076 J	0.89 J	MG/KG	SJS02-SS03-000	13/19	0.33 - 1.7	0.89	91	3,066 N	NA	NA	NO	BSL
	207-08-9	Benzo(k)fluoranthene	0.062 J	1.1 J	MG/KG	SJS02-SS03-000	14/19	0.33 - 1.7	1.1	91	39.2 C	NA	NA	NO	BSL
	85-68-7	Butylbenzylphthalate	0.057 J	0.28 J	MG/KG	SJS02-SS06-000	2/19	0.33 - 1.7	0.28	ND	20,440 N	NA	NA	NO	BSL
	86-74-8	Carbazole	0.12 J	0.3 J	MG/KG	SJS02-SS03-000	2/19	0.33 - 1.7	0.3	ND	143 C	NA	NA	NO	BSL
	218-01-9	Chrysene	0.13 J	2.7	MG/KG	SJS02-SS03-000	14/19	0.33 - 1.7	2.7	102	392 C	NA	NA	NO	BSL
	84-74-2	Di-n-butylphthalate	0.047 J	0.51 J	MG/KG	SJS02-SS20-000	4/19	0.33 - 1.7	0.51	ND	10,220 N	NA	NA	NO	BSL
	53-70-3	Dibenz(a,h)anthracene	0.054 J	0.054 J	MG/KG	SJS02-SS02-000	1/19	0.33 - 1.7	0.054	91	0.392 C	NA	NA	NO	BSL
	132-64-9	Dibenzofuran	0.07 J	0.07 J	MG/KG	SJS02-SS02-000	1/19	0.33 - 1.7	0.07	ND	204 N	NA	NA	NO	BSL
	206-44-0	Fluoranthene	0.045 J	5	MG/KG	SJS02-SS03-000	15/19	0.33 - 1.7	5	103	4,088 N	NA	NA	NO	BSL
	86-73-7	Fluorene	0.11 J	0.38 UJ	MG/KG	SJS02-SS03-000, SJS02-SS19-000	2/19	0.33 - 1.7	0.38	92	4,088 N	NA	NA	NO	BSL
	193-39-5	Indeno(1,2,3-cd)pyrene	0.086 J	0.8 J	MG/KG	SJS02-SS03-000	14/19	0.33 - 1.7	0.8	91	3.92 C	NA	NA	NO	BSL
	91-20-3	Naphthalene	0.052 J	0.052 J	MG/KG	SJS02-SS02-000	1/19	0.33 - 1.7	0.052	92	2,044 N	NA	NA	NO	BSL
	85-01-8	Phenanthrene	0.041 J	4.4	MG/KG	SJS02-SS03-000	13/19	0.33 - 1.7	4.4	91	3,066 N	NA	NA	NO	BSL
	129-00-0	Pyrene	0.048 J	7.2	MG/KG	SJS02-SS03-000	15/19	0.33 - 1.7	7.2	125	3,066 N	NA	NA	NO	BSL
	117-81-7	bis(2-Ethylhexyl)phthalate	0.035	0.07 J	MG/KG	SJS02-SS20-000	4/19	0.33 - 1.7	0.07	ND	204 C	NA	NA	NO	BSL
	72-54-8	4,4'-DDD	0.00160 J	4.2	MG/KG	SJS02-SS09-000	15/19	0.0033 - 0.38	4.2	10.6	11.9 C	NA	NA	NO	BSL
	72-55-9	4,4'-DDE	0.00160 J	7.2 J	MG/KG	SJS02-SS20-000	18/19	0.0033 - 2	7.2	269	8.42 C	NA	NA	NO	BSL
	50-29-3	4,4'-DDT	0.003 J	12 J	MG/KG	SJS02-SS20-000	18/18	0.0033 - 2	12	34	8.42 C	NA	NA	YES	ASL
	11096-82-5	Aroclor-1260	0.015 J	0.11 J	MG/KG	SJS02-SS03-000, SJS02-SS04-000	5/19	0.033 - 0.35	0.11	ND	1.43 C	NA	NA	NO	BSL
	60-57-1	Dieldrin	7.90E-04 J	0.0038 J	MG/KG	SJS02-SS02-000	3/19	0.0033 - 0.035	0.0038	11.5	0.179 C	NA	NA	NO	BSL
	76-44-8	Heptachlor	0.00220 J	0.00220 J	MG/KG	SJS02-SS12-000	1/19	0.0017 - 0.018	0.00220	ND	0.636 C	NA	NA	NO	BSL
	5103-71-9	alpha-Chlordane	8.10E-04 J	0.05 J	MG/KG	SJS02-SS12-000	7/19	0.0017 - 0.2	0.05	9.1	8.18 C	NA	NA	NO	BSL
	5103-74-2	gamma-Chlordane	0.002 UJ	0.029 J	MG/KG	SJS02-SS12-000	5/19	0.0017 - 0.018	0.029	6.1	8.18 C	NA	NA	NO	BSL
	7429-90-5	Aluminum	1,960	18,600	MG/KG	SJS02-SS06-000	19/19	6.5 - 8.79	18,600	7669	102,200 N	NA	NA	NO	BSL
	7440-36-0	Antimony	0.530 J	7 J	MG/KG	SJS02-SS03-000	6/17	0.34 - 0.6	7	0.7	40.9 N	NA	NA	NO	BSL
	7440-38-2	Arsenic	1.30 J	18	MG/KG	SJS02-SS13-000	18/19	0.34 - 0.6	18	5.7	1.91 C	NA	NA	YES	ASL
	7440-39-3	Barium	9.80 J	469	MG/KG	SJS02-SS20-000	19/19	0.03 - 0.4	469	40	7,154 N	NA	NA	NO	BSL

Table 2.1

OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN

St. Juliens Creek Annex - Site 2

Scenario Timeframe: Current/Future
Medium: Surface Soil
Exposure Medium: Surface Soil

Exposure Point	CAS Number	Chemical	Minimum [1] Concentration Qualifier	Maximum [1] Concentration Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration [2] Used for Screening	Background [3] Value	Screening [4] Toxicity Value	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for [5] Contaminant Deletion or Selection
	7440-41-7	Beryllium	0.150 J	13.4	MG/KG	SJS02-SS06-000	15/19	0.02 - 0.2	13.4	0.28	204 N	NA	NA	NO	BSL
	7440-43-9	Cadmium	0.100 J	3.10	MG/KG	SJS02-SS20-000	16/19	.05 - 0.1	3.10	ND	102 N	NA	NA	NO	BSL
	7440-70-2	Calcium	479 J	15,900	MG/KG	SJS02-SS14-000	19/19	9.8 - 17.37	15,900	1225	NA	NA	NA	NO	NUT
	7440-47-3	Chromium	2.5	246	MG/KG	SJS02-SS06-000	19/19	0.19 - 1.4	246	7	307 N	NA	NA	NO	BSL
	7440-48-4	Cobalt	0.550 J	62.6	MG/KG	SJS02-SS06-000	16/19	.08 - 1.6	62.6	22	2,044 N	NA	NA	NO	BSL
	7440-50-8	Copper	5.70	4,260	MG/KG	SJS02-SS06-000	19/19	0.19 - 1.2	4,260	17.1	4,088 N	NA	NA	YES	ASL
	57-12-5	Cyanide	0.203	0.85 J	MG/KG	SJS02-SS03-000	3/19	0.18 - 0.53	0.85	ND	2,044 N	NA	NA	NO	BSL
	7439-89-6	Iron	2,560	106,000	MG/KG	SJS02-SS03-000, SJS02-SS06-000	19/19	2.87 - 6.8	106,000	3669	30,660 N	NA	NA	YES	ASL
	7439-92-1	Lead	13.1	2,370	MG/KG	SJS02-SS06-000	19/19	0.17 - 0.22	2,370	61	1,000	NA	NA	YES	ASL
	7439-95-4	Magnesium	229 J	2,570	MG/KG	SJS02-SS06-000	19/19	4.1 - 36.14	2,570	527	NA	NA	NA	NO	NUT
	7439-96-5	Manganese	27.2	688	MG/KG	SJS02-SS03-000	19/19	0 .05 - 0.4	688	42	2,044 N	NA	NA	NO	BSL
	7439-97-6	Mercury	0.0400	0.710	MG/KG	SJS02-SS16-000P	18/19	.01 - 0.05	0.710	0.3	31 N	NA	NA	NO	BSL
	7440-02-0	Nickel	0.890 J	246	MG/KG	SJS02-SS06-000	19/19	0.15 - 1.4	246	6.9	2,044 N	NA	NA	NO	BSL
	7440-09-7	Potassium	216 J	1,900	MG/KG	SJS02-SS06-000	19/19	2.23 - 44.32	1,900	368	NA	NA	NA	NO	NUT
	7782-49-2	Selenium	0.540 L	1	MG/KG	SJS02-SS02-000	7/19	0.44 - 0.6	1	1	511 N	NA	NA	NO	BSL
	7440-22-4	Silver	0.200 J	3.5	MG/KG	SJS02-SS16-000P	2/19	0.15 - 0.20	3.5	0.62	511 N	NA	NA	NO	BSL
	7440-23-5	Sodium	54.7 J	533 J	MG/KG	SJS02-SS06-000	7/19	9.78 - 32.8	533	174	NA	NA	NA	NO	NUT
	7440-28-0	Thallium	0.76 J	6.2	MG/KG	SJS02-SS03-000	4/19	0.34 - 0.71	6.2	ND	7.15 N	NA	NA	NO	BSL
	7440-62-2	Vanadium	3.80 J	138	MG/KG	SJS02-SS20-000	19/19	0.10 - 1.8	138	26.6	31 N	NA	NA	YES	ASL
	7440-66-6	Zinc	31.7	7,560	MG/KG	SJS02-SS06-000	19/19	0.32 - 1	7,560	38	30,660 N	NA	NA	NO	BSL
	7723-14-0	Phosphorus	2.3	153	MG/KG	SJS02-SS06-000	9/19	1.3 - 63	153	ND	NA	NA	NA	NO	NTX

[1] Minimum/Maximum detected concentrations.

[2] Maximum concentration is used for screening.

[3] Background data is lower of UCL for Bohicket or Munden-Tetotum background soil type from St. Julliens Creek Background Investigation.

[4] Tier II screening: With the exception of lead, all compounds are screened against the Risk-Based Concentration (RBC) Table, U.S. EPA Region III, October 15, 2003 for industrial soil (cancer benchmark value = 1e-06; HQ = 0.1). Lead is screened against the EPA screening value of 1000 mg/kg.
RBC value for naphthalene used as surrogate for acenaphthlyene.
RBC value for pyrene used as surrogate for phenanthrene and benzo(g,h,i)perylene.
RBC value for chlordane used as surrogate for alpha-chlordane and gamma-chlordane.
RBC value for chromium VI used for total chromium.
RBC value for manganese-nonfood used as surrogate for manganese.
RBC value for mercuric chloride used as surrogate for mercury.

[5] Rationale Codes

Selection Reason: Above Screening Levels (ASL)

Deletion Reason: No Toxicity Information (NTX)
Essential Nutrient (NUT)
Below Screening Level (BSL)

SQL = Sample Quantification Limit
COPC = Chemical of Potential Concern
ARAR/TBC = Applicable or Relevant and Appropriate Requirement/ To Be Considered

J = Estimated Value
K = Biased High
L = Biased Low
C = Carcinogenic
N = Noncarcinogenic
ND = Not detected

Surface Soil Samples: Phase I - SS02 through SS10; Phase II -SS11 through SS20

Table 2.2

OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN

St. Juliens Creek Annex - Site 2

Scenario Timeframe: Current/Future
Medium: Surface Soil
Exposure Medium: Air

Exposure Point	CAS Number	Chemical	Minimum [1] Concentration Qualifier	Maximum [1] Concentration Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration [2] Used for Screening	Background [3] Value	Screening [4] Toxicity Value	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for [5] Contaminant Deletion or Selection
Emissions from Surface Soil at Site 2	78-93-3	2-Butanone	1.8E-03	1.8E-03	ug/m^3	SJS02-SS11-000	1/19	NA	1.8E-03	NA	5.1E+02 N	NA	NA	NO	BSL
	67-64-1	Acetone	4.3E-04 J	2.2E-03	ug/m^3	SJS02-SS10-000	3/19	NA	2.2E-03	NA	3.3E+02 N	NA	NA	NO	BSL
	108-88-3	Toluene	3.9E-02 J	3.9E-04 J	ug/m^3	SJS02-SS08-000	2/19	NA	3.9E-04	NA	4.2E+01 N	NA	NA	NO	BSL
	91-57-6	2-Methylnaphthalene	4.1E-03 J	4.1E-03 J	ug/m^3	SJS02-SS03-000	1/19	NA	4.1E-03	NA	7.3E+00 N	NA	NA	NO	BSL
	83-32-9	Acenaphthene	3.5E-04 J	6.0E-04 J	ug/m^3	SJS02-SS03-000	2/19	NA	6.0E-04	NA	2.2E+01 N	NA	NA	NO	BSL
	208-96-8	Acenaphthylene	2.8E-08 J	6.21E-07 J	ug/m^3	SJS02-SS03-000	8/19	NA	6.2E-07	NA	3.3E-01 N	NA	NA	NO	BSL
	120-12-7	Anthracene	4.2E-05 J	5.8E-04 J	ug/m^3	SJS02-SS03-000	6/19	NA	5.8E-04	NA	1.1E+02 N	NA	NA	NO	BSL
	56-55-3	Benzo(a)anthracene	9.1E-08 J	1.7E-06	ug/m^3	SJS02-SS03-000	14/19	NA	1.7E-06	NA	8.6E-03 C	NA	NA	NO	BSL
	50-32-8	Benzo(a)pyrene	9.8E-08 J	1.1E-06 J	ug/m^3	SJS02-SS03-000	14/19	NA	1.1E-06	NA	2.0E-03 C	NA	NA	NO	BSL
	205-99-2	Benzo(b)fluoranthene	4.3E-08 J	1.3E-06 J	ug/m^3	SJS02-SS03-000	15/19	NA	1.3E-06	NA	8.6E-03 C	NA	NA	NO	BSL
	191-24-2	Benzo(g,h,i)perylene	5.8E-08 J	6.7E-07 J	ug/m^3	SJS02-SS03-000	13/19	NA	6.7E-07	NA	1.1E+01 N	NA	NA	NO	BSL
	207-08-9	Benzo(k)fluoranthene	4.7E-08 J	8.3E-07 J	ug/m^3	SJS02-SS03-000	14/19	NA	8.3E-07	NA	8.6E-02 C	NA	NA	NO	BSL
	85-68-7	Butylbenzylphthalate	4.3E-08 J	2.1E-07 J	ug/m^3	SJS02-SS06-000	2/19	NA	2.1E-07	NA	7.3E+01 N	NA	NA	NO	BSL
	86-74-8	Carbazole	9.1E-08 J	2.3E-07 J	ug/m^3	SJS02-SS03-000	2/19	NA	2.3E-07	NA	3.1E-01 C	NA	NA	NO	BSL
	218-01-9	Chrysene	9.8E-08 J	2.0E-06	ug/m^3	SJS02-SS03-000	14/19	NA	2.0E-06	NA	8.6E-01 C	NA	NA	NO	BSL
	84-74-2	Di-n-butylphthalate	3.6E-08 J	3.9E-07 J	ug/m^3	SJS02-SS20-000	4/19	NA	3.9E-07	NA	3.7E+01 N	NA	NA	NO	BSL
	53-70-3	Dibenz(a,h)anthracene	4.1E-08 J	4.1E-08 J	ug/m^3	SJS02-SS02-000	1/19	NA	4.1E-08	NA	8.6E-04 C	NA	NA	NO	BSL
	132-64-9	Dibenzofuran	2.7E-04 J	2.7E-04 J	ug/m^3	SJS02-SS02-000	1/19	NA	2.7E-04	NA	7.3E-01 N	NA	NA	NO	BSL
	206-44-0	Fluoranthene	3.4E-08 J	3.79E-06	ug/m^3	SJS02-SS03-000	15/19	NA	3.8E-06	NA	1.5E+01 N	NA	NA	NO	BSL
	86-73-7	Fluorene	1.7E-04 J	5.7E-04 UJ	ug/m^3	SJS02-SS03-000 SJS02-SS19-000	2/19	NA	5.7E-04	NA	1.5E+01 N	NA	NA	NO	BSL
	193-39-5	Indeno(1,2,3-cd)pyrene	6.5E-08 J	6.06E-07 J	ug/m^3	SJS02-SS03-000	14/19	NA	6.1E-07	NA	8.6E-03 C	NA	NA	NO	BSL
	91-20-3	Naphthalene	7.2E-04 J	7.2E-04 J	ug/m^3	SJS02-SS02-000	1/19	NA	7.2E-04	NA	3.3E-01 N	NA	NA	NO	BSL
	85-01-8	Phenanthrene	3.1E-08 J	3.33E-06	ug/m^3	SJS02-SS03-000	13/19	NA	3.3E-06	NA	1.1E+01 N	NA	NA	NO	BSL
	129-00-0	Pyrene	9.8E-06 J	1.5E-03	ug/m^3	SJS02-SS03-000	15/19	NA	1.5E-03	NA	1.1E+01 N	NA	NA	NO	BSL
	117-81-7	bis(2-Ethylhexyl)phthalate	1.5E-07	3.0E-07 J	ug/m^3	SJS02-SS20-000	4/19	NA	3.0E-07	NA	4.5E-01 C	NA	NA	NO	BSL
	72-54-8	4,4'-DDD	1.2E-09 J	3.2E-06	ug/m^3	SJS02-SS09-000	15/19	NA	3.2E-06	NA	2.6E-02 C	NA	NA	NO	BSL
	72-55-9	4,4'-DDE	1.2E-09 J	5.5E-06 J	ug/m^3	SJS02-SS20-000	18/19	NA	5.5E-06	NA	1.8E-02 C	NA	NA	NO	BSL
	50-29-3	4,4'-DDT	2.3E-09 J	9.1E-06 J	ug/m^3	SJS02-SS20-000	18/18	NA	9.1E-06	NA	1.8E-02 C	NA	NA	NO	BSL
	11096-82-5	Aroclor-1260	1.1E-08 J	8.3E-08 J	ug/m^3	SJS02-SS03-000 SJS02-SS04-000	5/19	NA	8.3E-08	NA	3.1E-03 C	NA	NA	NO	BSL
	60-57-1	Dieldrin	6.0E-10 J	2.9E-09 J	ug/m^3	SJS02-SS02-000	3/19	NA	2.9E-09	NA	3.9E-04 C	NA	NA	NO	BSL
	76-44-8	Heptachlor	1.7E-09 J	1.7E-09 J	ug/m^3	SJS02-SS12-000	1/19	NA	1.7E-09	NA	1.4E-03 C	NA	NA	NO	BSL
	5103-71-9	alpha-Chlordane	6.1E-10 J	3.8E-08 J	ug/m^3	SJS02-SS12-000	7/19	NA	3.8E-08	NA	1.8E-02 C	NA	NA	NO	BSL
	5103-74-2	gamma-Chlordane	1.5E-09 UJ	2.2E-08 J	ug/m^3	SJS02-SS12-000	5/19	NA	2.2E-08	NA	1.8E-02 C	NA	NA	NO	BSL
	7429-90-5	Aluminum	1.5E-03	1.4E-02	ug/m^3	SJS02-SS06-000	19/19	NA	1.4E-02	NA	3.7E-01 N	NA	NA	NO	BSL
	7440-36-0	Antimony	4.0E-07 J	5.3E-06 J	ug/m^3	SJS02-SS03-000	6/17	NA	5.3E-06	NA	1.5E-01 N	NA	NA	NO	BSL
	7440-38-2	Arsenic	9.8E-07 J	1.4E-05	ug/m^3	SJS02-SS13-000	18/19	NA	1.4E-05	NA	4.1E-04 C	NA	NA	NO	BSL

TABLE 7.1.RME

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS

REASONABLE MAXIMUM EXPOSURE

St.Juliens Creek Annex - Site 2

Scenario Timeframe: Current/Future
Receptor Population: Trespasser
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Surface Soil	Surface Soil	At Site 2	Ingestion	Benzo(a)pyrene	5.4E-01	mg/kg	3.8E-08	mg/kg/day	7.3E+00	1/(mg/kg-day)	2.8E-07	1.1E-07	mg/kg/day	NA	mg/kg/day	NA
				4,4'-DDT	5.6E+00	mg/kg	3.9E-07	mg/kg/day	3.4E-01	1/(mg/kg-day)	1.3E-07	1.1E-06	mg/kg/day	5.0E-04	mg/kg/day	2.3E-03
				Arsenic	9.5E+00	mg/kg	6.6E-07	mg/kg/day	1.5E+00	1/(mg/kg-day)	9.9E-07	1.9E-06	mg/kg/day	3.0E-04	mg/kg/day	6.4E-03
				Copper	1.7E+03	mg/kg	1.2E-04	mg/kg/day	NA	1/(mg/kg-day)	NA	3.4E-04	mg/kg/day	4.0E-02	mg/kg/day	8.5E-03
				Iron	6.2E+04	mg/kg	4.4E-03	mg/kg/day	NA	1/(mg/kg-day)	NA	1.3E-02	mg/kg/day	3.0E-01	mg/kg/day	4.2E-02
				Vanadium	4.7E+01	mg/kg	3.3E-06	mg/kg/day	NA	1/(mg/kg-day)	NA	9.5E-06	mg/kg/day	1.0E-03	mg/kg/day	9.5E-03
			Exp. Route Total								1.4E-06					6.9E-02
			Dermal Absorption	Benzo(a)pyrene	5.4E-01	mg/kg	3.3E-08	mg/kg/day	7.3E+00	1/(mg/kg-day)	2.4E-07	9.5E-08	mg/kg/day	NA	mg/kg/day	NA
				4,4'-DDT	5.6E+00	mg/kg	7.7E-08	mg/kg/day	3.4E-01	1/(mg/kg-day)	2.6E-08	2.2E-07	mg/kg/day	5.0E-04	mg/kg/day	4.5E-04
				Arsenic	9.5E+00	mg/kg	1.3E-07	mg/kg/day	1.5E+00	1/(mg/kg-day)	2.0E-07	3.8E-07	mg/kg/day	3.0E-04	mg/kg/day	1.3E-03
				Copper	1.7E+03	mg/kg	7.7E-06	mg/kg/day	NA	1/(mg/kg-day)	NA	2.2E-05	mg/kg/day	4.0E-02	mg/kg/day	5.6E-04
				Iron	6.2E+04	mg/kg	2.9E-04	mg/kg/day	NA	1/(mg/kg-day)	NA	8.4E-04	mg/kg/day	3.0E-01	mg/kg/day	2.8E-03
				Vanadium	4.7E+01	mg/kg	2.2E-07	mg/kg/day	NA	1/(mg/kg-day)	NA	6.3E-07	mg/kg/day	2.6E-05	mg/kg/day	2.4E-02
			Exp. Route Total								4.6E-07					2.9E-02
		Exposure Point Total									1.9E-06					9.8E-02
	Exposure Medium Total										1.9E-06					9.8E-02
	Air	Emissions from Surface Soil at Site 2	Inhalation	Chromium	1.2E-07	mg/m3	1.3E-10	mg/kg/day	4.1E+01	1/(mg/kg-day)	5.5E-09	3.9E-10	mg/kg/day	3.0E-05	mg/kg/day	1.3E-05
			Exp. Route Total								5.5E-09					1.3E-05
		Exposure Point Total									5.5E-09					1.3E-05
	Exposure Medium Total										5.5E-09					1.3E-05
Medium Total											1.9E-06					9.8E-02
Surface Water	Surface Water	Drainage Features and Ponded Area	Dermal	Chloroform	5.4E+00	ug/L	2.8E-07	mg/kg/day	8.1E-02	1/mg/kg/day	2.3E-08	8.3E-07	mg/kg/day	1.0E-02	mg/kg/day	8.3E-05
				Trichloroethene	1.3E+02	ug/L	1.3E-05	mg/kg/day	4.0E-01	1/mg/kg/day	5.2E-06	3.8E-05	mg/kg/day	3.0E-04	mg/kg/day	1.3E-01
				Vinyl chloride	1.5E+01	ug/L	1.0E-06	mg/kg/day	7.2E-01	1/mg/kg/day	7.3E-07	2.9E-06	mg/kg/day	3.0E-03	mg/kg/day	9.8E-04
				cis-1,2-Dichloroethene	8.4E+01	ug/L	7.8E-06	mg/kg/day	NA	1/mg/kg/day	NA	2.3E-05	mg/kg/day	1.0E-02	mg/kg/day	2.3E-03
				bis(2-Ethylhexyl)phthalate	6.9E+01	ug/L	6.2E-05	mg/kg/day	1.4E-02	1/mg/kg/day	8.6E-07	1.8E-04	mg/kg/day	2.0E-02	mg/kg/day	9.0E-03
				Arsenic	3.8E+00	ug/L	1.5E-08	mg/kg/day	1.5E+00	1/mg/kg/day	2.3E-08	4.4E-08	mg/kg/day	3.0E-04	mg/kg/day	1.5E-04
				Chromium	1.5E+02	ug/L	5.9E-07	mg/kg/day	NA	1/mg/kg/day	NA	1.7E-06	mg/kg/day	7.5E-05	mg/kg/day	2.3E-02
				Iron	1.2E+04	ug/L	4.6E-05	mg/kg/day	NA	1/mg/kg/day	NA	1.3E-04	mg/kg/day	3.0E-01	mg/kg/day	4.5E-04
				Manganese	2.0E+03	ug/L	8.1E-06	mg/kg/day	NA	1/mg/kg/day	NA	2.4E-05	mg/kg/day	8.0E-04	mg/kg/day	2.9E-02
				Vanadium	1.7E+01	ug/L	6.8E-08	mg/kg/day	NA	1/mg/kg/day	NA	2.0E-07	mg/kg/day	2.6E-05	mg/kg/day	7.6E-03
			Exp. Route Total								6.8E-06					2.0E-01

TABLE 7.1.RME

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS

REASONABLE MAXIMUM EXPOSURE

St.Juliens Creek Annex - Site 2

Scenario Timeframe: Current/Future
Receptor Population: Trespasser
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
		Exposure Point Total									6.8E-06					2.0E-01
	Exposure Medium Total										6.8E-06					2.0E-01
Sediment	Sediment	Drainage Features and Ponded Area	Ingestion	Arsenic	1.4E+01	mg/kg	4.9E-07	mg/kg/day	1.5E+00	1/mg/kg/day	7.4E-07	1.4E-06	mg/kg/day	3.0E-04	mg/kg/day	4.8E-03
			Exp. Route Total								7.4E-07					4.8E-03
			Dermal	Arsenic	1.4E+01	mg/kg	3.4E-07	mg/kg/day	1.5E+00	1/mg/kg/day	5.0E-07	9.8E-07	mg/kg/day	3.0E-04	mg/kg/day	3.3E-03
			Exp. Route Total								5.0E-07					3.3E-03
		Exposure Point Total									1.2E-06					8.1E-03
	Exposure Medium Total										1.2E-06					8.1E-03
Medium Total											1.2E-06					8.1E-03
										Total of Receptor Risks Across All Media	9.9E-06				Total of Receptor Hazards Across All Media	3.1E-01

Table 2.2

OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN

St. Juliens Creek Annex - Site 2

Scenario Timeframe: Current/Future
Medium: Surface Soil
Exposure Medium: Air

Exposure Point	CAS Number	Chemical	Minimum [1] Concentration Qualifier	Maximum [1] Concentration Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration [2] Used for Screening	Background [3] Value	Screening [4] Toxicity Value	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for [5] Contaminant Deletion or Selection
	7440-39-3	Barium	7.4E-06 J	3.6E-04	ug/m^3	SJS02-SS20-000	19/19	NA	3.6E-04	NA	5.1E-02 N	NA	NA	NO	BSL
	7440-41-7	Beryllium	1.1E-07 J	1.0E-05	ug/m^3	SJS02-SS06-000	15/19	NA	1.0E-05	NA	7.5E-04 C	NA	NA	NO	BSL
	7440-43-9	Cadmium	7.6E-08 J	2.3E-06	ug/m^3	SJS02-SS20-000	16/19	NA	2.3E-06	NA	9.9E-04 C	NA	NA	NO	BSL
	7440-70-2	Calcium	3.6E-04 J	1.2E-02	ug/m^3	SJS02-SS14-000	19/19	NA	1.2E-02	NA	NA	NA	NA	NO	NUT
	7440-47-3	Chromium	1.9E-06	1.9E-04	ug/m^3	SJS02-SS06-000	19/19	NA	1.9E-04	NA	1.5E-04 C	NA	NA	YES	ASL
	7440-48-4	Cobalt	4.2E-07 J	4.7E-05	ug/m^3	SJS02-SS06-000	16/19	NA	4.7E-05	NA	6.4E-04 C	NA	NA	NO	BSL
	7440-50-8	Copper	4.3E-06	3.2E-03	ug/m^3	SJS02-SS06-000	19/19	NA	3.2E-03	NA	1.5E+01 N	NA	NA	NO	BSL
	57-12-5	Cyanide	1.5E-07	6.4E-07 J	ug/m^3	SJS02-SS03-000	3/19	NA	6.4E-07	NA	7.3E+00 N	NA	NA	NO	BSL
	7439-89-6	Iron	1.9E-03	8.0E-02	ug/m^3	SJS02-SS03-000 SJS02-SS06-000	19/19	NA	8.0E-02	NA	1.1E+02 N	NA	NA	NO	BSL
	7439-92-1	Lead	9.9E-06	1.8E-03	ug/m^3	SJS02-SS06-000	19/19	NA	1.8E-03	NA	4.0E+02 N	NA	NA	NO	BSL
	7439-95-4	Magnesium	1.7E-04 J	1.9E-03	ug/m^3	SJS02-SS06-000	19/19	NA	1.9E-03	NA	NA	NA	NA	NO	NUT
	7439-96-5	Manganese	2.1E-05	5.2E-04	ug/m^3	SJS02-SS03-000	19/19	NA	5.2E-04	NA	5.2E-03 N	NA	NA	NO	BSL
	7439-97-6	Mercury	1.5E-06	2.7E-05	ug/m^3	SJS02-SS16-000P	18/19	NA	2.7E-05	NA	3.1E-02 N	NA	NA	NO	BSL
	7440-02-0	Nickel	6.7E-07 J	1.9E-04	ug/m^3	SJS02-SS06-000	19/19	NA	1.9E-04	NA	7.3E+00 N	NA	NA	NO	BSL
	7440-09-7	Potassium	1.6E-04 J	1.4E-03	ug/m^3	SJS02-SS06-000	19/19	NA	1.4E-03	NA	NA	NA	NA	NO	NUT
	7782-49-2	Selenium	4.1E-07 L	7.6E-07	ug/m^3	SJS02-SS02-000	7/19	NA	7.6E-07	NA	1.8E+00 N	NA	NA	NO	BSL
	7440-22-4	Silver	1.5E-07 J	2.7E-06	ug/m^3	SJS02-SS16-000P	2/19	NA	2.7E-06	NA	1.8E+00 N	NA	NA	NO	BSL
	7440-23-5	Sodium	4.1E-05 J	4.0E-04 J	ug/m^3	SJS02-SS06-000	7/19	NA	4.0E-04	NA	NA	NA	NA	NO	NUT
	7440-28-0	Thallium	5.8E-07 J	4.7E-06	ug/m^3	SJS02-SS03-000	4/19	NA	4.7E-06	NA	2.6E-02 N	NA	NA	NO	BSL
	7440-62-2	Vanadium	2.9E-06 J	1.0E-04	ug/m^3	SJS02-SS20-000	19/19	NA	1.0E-04	NA	1.1E-01 N	NA	NA	NO	BSL
	7440-66-6	Zinc	2.4E-05	5.7E-03	ug/m^3	SJS02-SS06-000	19/19	NA	5.7E-03	NA	1.1E+02 N	NA	NA	NO	BSL

[1] Minimum/Maximum calculated air concentrations from soil concentrations. Air concentrations calculated as Cair = Csoil*1000*(1/PEF+1/VF)
VF only included in calculation for VOCs. VF calculated on Table 2.2A. PEF = 1.32E+09 m3/kg.

[2] Maximum concentration is used for screening.

[3] Background values not available.

[4] Risk-Based Concentration Table, Ambient Air, April 25, 2003, U.S. EPA Region III, Jennifer Hubbard.
RBC value for pyrene used as surrogate for phenanthrene and benzo(g,h,i)perylene.
RBC value for naphthalene used as surrogate for acenaphthlyene.
RBC value for Chromium VI used for total chromium.
Lead screening toxicity value is 400 mg/kg, the EPA residential soil screening level for lead.
RBC value for manganese-nonfood used as surrogate for manganese.

[5] Rationale Codes

Selection Reason: Above Screening Levels (ASL)
Deletion Reason: No Toxicity Information (NTX)
Essential Nutrient (NUT)
Below Screening Level (BSL)

SQL = Sample Quantification Limit
COPC = Chemical of Potential Concern
ARAR/TBC = Applicable or Relevant and Appropriate Requirement/ To Be Considered
J = Estimated Value
K = Biased High
L = Biased Low
C = Carcinogenic
N = Noncarcinogenic

Table 2.2A

Calculation of Volatilization Factor - Surface Soil

St. Julien's Creek Annex - Site 2

Chemical	Diffusivity in Air (D_i) (cm^2/s)	Henry's Law Constant (H') (unitless)	Diffusivity in Water (D_w) (cm^2/s)	Soil Organic Carbon Partition Coeff. (K_{oc}) (cm^3/g)	Soil Water Partition Coeff. ($K_d = K_{oc} \times F_{oc}$) ($g/cm^3$)	Solubility in Water (S) (mg/L)	Apparent Diffusivity (D_A) (cm^2/s)	Volatilization Factor (VF) (m^3/kg)	Soil S Conc (r
Volatile Organics									
2-Butanone	4.05E-02	1.05E-05	3.80E-05	4.50E+00	2.70E-02	2.39E+05	2.08E-06	1.14E+05	3.(
Acetone	1.24E-01	1.59E-03	1.14E-05	5.75E-01	3.45E-03	1.00E+06	1.02E-04	1.63E+04	1.(
Toluene	8.70E-02	2.72E-01	8.60E-06	1.82E+02	1.09E+00	5.26E+02	1.01E-03	5.16E+03	6.!
Semivolatile Organics									
2-Methylnaphthalene	5.60E-02	2.07E-02	7.84E-06	2.13E+03	1.28E+01	2.54E+01	4.80E-06	7.50E+04	3.:
Acenaphthene	4.21E-02	6.36E-03	7.69E-06	7.08E+03	4.25E+01	4.24E+00	3.36E-07	2.83E+05	1.!
Anthracene	3.24E-02	2.67E-03	7.74E-06	2.95E+04	1.77E+02	4.34E-02	2.63E-08	1.01E+06	7.(
Dibenzofuran	6.19E-02	3.98E-03	1.00E-05	5.48E+03	3.29E+01	5.65E+00	4.00E-07	2.60E+05	1.!
Fluorene	3.63E-02	2.61E-03	7.88E-06	1.38E+04	8.28E+01	1.98E+00	6.15E-08	6.63E+05	1.(
Napthalene	5.90E-02	1.98E-02	7.50E-06	2.00E+03	1.20E+01	3.10E+01	5.15E-06	7.24E+04	3.'
Pyrene	2.72E-02	4.51E-04	7.24E-06	1.05E+05	6.30E+02	1.35E-01	1.11E-09	4.93E+06	8.!
bis(2-Ethylhexyl)phthalate	3.51E-02	4.18E-06	3.66E-06	1.51E+07	9.06E+04	3.40E-01	3.43E-13	2.81E+08	3.(
Mercury	3.07E-02	4.67E-01	6.30E-06		5.2E+01		1.46E-05	2.70E+07	

Volatilization factor (VF) = (m^3/kg)

$$\frac{Q/C * (3.14 * D_A * T)^{1/2} * 10^{-4}\ m^2/cm^2}{2 * r_b * D_A}$$

Apparent Diffusivity (D_A) = (cm^2/s)

$$\frac{[(Q_a^{10/3} * D_i * H' + Q_w^{10/3} * D_w)/n^2]}{(r_b * K_d + Q_w + Q_a * H')}$$

Soil Saturation Concentration (C_{sat}) =

$$S/r_b * (K_d * r_b + Q_w + H' * Q_a)$$

Parameters	**Values**
Q/C - Inverse of the mean concentration at the center of a 0.5-acre-square source located in Philadelphia, PA (g/m^2-s per kg/m^3)	90.24
T - Exposure interval(s)	9.5E+08
r_b - Soil bulk density (g/cm^3)	1.5
Q_a - Air-filled soil porosity (L_{air}/L_{water}) = n - Q_w	0.28
n - Total soil porosity (Lpore/Lsoil) = 1 - (r_b/r_s)	0.43
Q_w - Water-filled soil porosity (Lwater/Lsoil)	0.15
r_s - Soil particle density (g/cm^3)	2.65
f_{oc} - fraction organic carbon in soil (g/g)	0.006

Equations and chemical properties from USEPA, 1996. *Soil Screening Guidance: User's Guide.* EPA/540/R-96/018.
Physical/chemical properties not listed in USEPA, 1996 obtained from USEPA Region 9 Preliminary Remediation Goal support tables, 2002.

Table 2.3

OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN

St. Juliens Creek Annex - Site 2

Scenario Timeframe: Current/Future
Medium: Groundwater
Exposure Medium: Deep Groundwater

Exposure Point	CAS Number	Chemical	Minimum [1] Concentration Qualifier	Maximum [1] Concentration Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration [2] Used for Screening	Background [3] Value	Screening [4] Toxicity Value	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for [5] Contaminant Deletion or Selection
Tap Water	75-15-0	Carbon disulfide	0.2 J	1 J	UG/L	SJS02-GW5D-001	2/7	1 - 1	1	ND	104 N	--		NO	BSL
	67-66-3	Chloroform	0.6 J	6	UG/L	SJS02-GW2D-001	2/7	1 - 1	6	ND	0.155 C	80	MCL	YES	ASL
	108-88-3	Toluene	0.3 J	0.3 J	UG/L	SJS02-GW1D-001	1/7	1 - 1	0.3	ND	74.7 N	1,000	MCL	NO	BSL
	108-95-2	Phenol	5 J	5 J	UG/L	SJS02-GW1D-002	1/7	10 - 11	5	ND	1,095 N	--		NO	BSL
	1031-07-8	Endosulfan sulfate	0.0096 J	0.0098 J	UG/L	SJS02-GW5D-001	2/7	0.1 - 0.12	0.0098	NA	21.9 N	--		NO	BSL
	7429-90-5	Aluminum	42.4 J	2,000 J	UG/L	SJS02-GW1D-001	5/7	29 - 38.2	2,000	166.8	3,650 N	50 - 200	SMCL	NO	BSL
	7440-38-2	Arsenic	3.7 J	3.7 J	UG/L	SJS02-GW1D-001	1/7	2 - 3.2	3.7	ND	0.0446 C	10	MCL	YES	ASL
	7440-39-3	Barium	14.4 J	39.8 J	UG/L	SJS02-GW5D-001	3/7	0.20 - 1	39.8	43.7	256 N	2,000	MCL	NO	BSL
	7440-70-2	Calcium	49,500 J	60,100 J	UG/L	SJS02-GW1D-003	7/7	46 - 57.9	60,100	96106	NA	--		NO	NUT
	7440-47-3	Chromium	1.30 J	1.90 J	UG/L	SJS02-GW1D-003	3/7	1.1 - 7	1.90	ND	11.0 N	100	MCL	NO	BSL
	7439-89-6	Iron	138 J	3,820 J	UG/L	SJS02-GW1D-001	5/7	5 - 30.8	3,820	2035	1,100 N	300	SMCL	YES	ASL
	7439-92-1	Lead	1.5 J	1.5 J	UG/L	SJS02-GW5D-001	1/7	1 - 1.3	1.5	ND	15	15	MCL	NO	BSL
	7439-95-4	Magnesium	3,720 J	20,200 J	UG/L	SJS02-GW2D-002	7/7	24.3 - 45	20,200	14980	NA	--		NO	NUT
	7439-96-5	Manganese	36.1 J	229 J	UG/L	SJS02-GW2D-003	5/7	0.30 - 1	229	271	73 N	50	SMCL	YES	ASL
	7440-02-0	Nickel	1.10 J	2.20 J	UG/L	SJS02-GW1D-003	2/7	0.9 - 7	2.20	1.3	73 N	--		NO	BSL
	7440-09-7	Potassium	5,300 J	11,600 J	UG/L	SJS02-GW2D-002	6/7	13.5 - 97	11,600	10649	NA	--		NO	NUT
	7440-23-5	Sodium	11,400	23,300 J	UG/L	SJS02-GW5D-001	7/7	28 - 148	23,300	52872	NA	--		NO	NUT
	7440-62-2	Vanadium	1 J	9.6 K	UG/L	SJS02-GW1D-001	2/7	0.60 - 9	9.6	0.80	1.1 N	--		YES	ASL
	7440-66-6	Zinc	17.6 J	17.6 J	UG/L	SJS02-GW1D-003	1/7	1.9 - 5	17.6	5.7	1,095 N	5,000	SMCL	NO	BSL
	7723-14-0	Phosphorus	41.0	2,140	UG/L	SJS02-GW2D-002P	7/7	20 - 420	2,140	0.12	NA N	--		NO	NTX

[1] Minimum/Maximum detected concentrations.

[2] Maximum concentration is used for screening.

[3] Background data is UCL for Yorktown Aquifer from St. Julliens Creek Background Investigation.

[4] Tier I screening: With the exception of lead, all compounds are screened against the Risk-Based Concentration (RBC) Table, U.S. EPA Region III, Oct. 15, 2003 for tap water (cancer benchmark value = 1e-06; HQ = 0.1). Lead is screened against the MCL value of 15 ug/l.
RBC value for endosulfan used as surrogate for endosulfan sulfate.
RBC value for chromium VI used for total chromium.
RBC value for manganese-nonfood used as surrogate for manganese.

[5] Rationale Codes

Selection Reason: Above Screening Levels (ASL)

Deletion Reason: No Toxicity Information (NTX)
Essential Nutrient (NUT)
Below Screening Level (BSL)

Deep Groundwater Samples: GW1D, GW2D - Phase I, Rounds 1 and 2 and Phase II; GW5D - Phase II.

SQL = Sample Quantification Limit
COPC = Chemical of Potential Concern
ARAR/TBC = Applicable or Relevant and Appropriate Requirement/ To Be Considered
J = Estimated Value
K = Biased High
L = Biased Low
C = Carcinogenic
N = Noncarcinogenic
MCL = Federal Maximum Contaminant Level
SMCL = Secondary Maximum Contaminant Level
ND = Not detected

Table 2.4

OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN

St. Juliens Creek Annex - Site 2

Scenario Timeframe: Current/Future
Medium: Deep Groundwater
Exposure Medium: Air

Exposure Point	CAS Number	Chemical	Minimum [1] Concentration Qualifier	Maximum [1] Concentration Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration [2] Used for Screening	Background [3] Value	Screening [4] Toxicity Value	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for [5] Contaminant Deletion or Selection
Deep Groundwater - Water Vapors at Showerhead	75-15-0	Carbon disulfide	0.2 J	1 J	UG/L	SJS02-GW5D-001	2/7	1 - 1	1	ND	104 N	--		NO	BSL
	67-66-3	Chloroform	0.6 J	6	UG/L	SJS02-GW2D-001	2/7	1 - 1	6	ND	0.155 C	80	MCL	YES	ASL
	108-88-3	Toluene	0.3 J	0.3 J	UG/L	SJS02-GW1D-001	1/7	1 - 1	0.3	ND	74.7 N	1,000	MCL	NO	BSL

[1] Minimum/Maximum detected concentrations.

[2] Maximum concentration is used for screening.

[3] Background data is UCL for Yorktown Aquifer from St. Julliens Creek Background Investigation.

[4] Tier I screening: With the exception of lead, all compounds are screened against the Risk-Based Concentration (RBC) Table, U.S. EPA Region III, Oct. 15, 2003 for tap water (cancer benchmark value = 1e-06; HQ = 0.1). Lead is screened against the MCL value of 15 ug/l.

[5] Rationale Codes

Selection Reason: Above Screening Levels (ASL)

Deletion Reason: No Toxicity Information (NTX)
Essential Nutrient (NUT)
Below Screening Level (BSL)

Deep Groundwater Samples: GW1D, GW2D - Phase I, Rounds 1 and 2 and Phase II; GW5D - Phase II.

SQL = Sample Quantification Limit
COPC = Chemical of Potential Concern
ARAR/TBC = Applicable or Relevant and Appropriate Requirement/ To Be Considered
J = Estimated Value
K = Biased High
L = Biased Low
C = Carcinogenic
N = Noncarcinogenic
MCL = Federal Maximum Contaminant Level
SMCL = Secondary Maximum Contaminant Level
ND = Not detected

Table 2.5

OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN

Scenario Timeframe: Current/Future
Medium: Surface Water
Exposure Medium: Surface Water

Exposure Point	CAS Number	Chemical	Minimum [1] Concentration	Qualifier	Maximum [1] Concentration	Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration [2] Used for Screening	Background [3] Value	Screening [4] Toxicity Value		Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for [5] Contaminant Deletion or Selection
Drainage Features and Ponded Area	75-35-4	1,1-Dichloroethene	0.300	J	0.700	J	UG/L	SJS02-SW04-001	2/9	1 - 10	0.700	NA	353	N	17,000	VAWQS	NO	BSL
	120-82-1	1,2,4-Trichlorobenzene	0.100	J	0.400	J	UG/L	SJS02-SW08-001P	2/8	1 - 10	0.400	NA	7.16	N	950	VAWQS	NO	BSL
	67-64-1	Acetone	1.60	J	1.60	J	UG/L	SJS02-SW08-002	1/4	5 - 10	1.60	NA	5,475	N	--		NO	BSL
	75-27-4	Bromodichloromethane	0.800	J	1.30		UG/L	SJS02-SW06-001	2/9	1 - 10	1.30	NA	1.70	C	460	VAWQS	NO	BSL
	75-25-2	Bromoform	0.400	J	0.800	J	UG/L	SJS02-SW08-001, SJS02-SW08-001P	2/9	1 - 10	0.800	NA	84.8	C	3,600	VAWQS	NO	BSL
	75-15-0	Carbon disulfide	0.300	J	10.3		UG/L	SJS02-SW08-001P	3/9	1 - 10	10.3	NA	1,043	N	--		NO	BSL
	67-66-3	Chloroform	0.200	J	5.40		UG/L	SJS02-SW06-001	3/9	1 - 10	5.40	NA	1.55	C	4,700	VAWQS	YES	ASL
	124-48-1	Dibromochloromethane	0.200	J	0.300	J	UG/L	SJS02-SW06-001	2/9	1 - 10	0.300	NA	1.26	C	57,000	VAWQS	NO	BSL
	100-41-4	Ethylbenzene	0.200	J	0.200	J	UG/L	SJS02-SW08-001P	1/9	1 - 10	0.200	NA	1,340	N	29,000	VAWQS	NO	BSL
	79-01-6	Trichloroethene	0.300	J	130		UG/L	SJS02-SW09	7/9	1 - 10	130	NA	0.26	C	810	VAWQS	YES	ASL
	75-01-4	Vinyl chloride	1.40		21.9		UG/L	SJS02-SW04-001	5/9	1 - 10	21.9	NA	0.15	C	5,300	VAWQS	YES	ASL
	1330-20-7	Xylene, total	0.800	J	0.800	J	UG/L	SJS02-SW08-001P	1/9	1 - 10	0.800	NA	213	N	--		NO	BSL
	156-59-2	cis-1,2-Dichloroethene	0.200	J	84		UG/L	SJS02-SW09	7/8	1 - 10	84	NA	60.8	N	--		YES	ASL
	156-60-5	trans-1,2-Dichloroethene	0.200	J	0.5	J	UG/L	SJS02-SW04-001	4/8	1 - 10	0.5	NA	122	N	--		NO	BSL
	100-52-7	Benzaldehyde	3.6	J	3.6	J	UG/L	SJS02-SW09	1/1	10 - 10	3.6	NA	3,650	N	--		NO	BSL
	117-81-7	bis(2-Ethylhexyl)phthalate	3	J	84		UG/L	SJS02-SW07-001	2/9	10 - 11	84	NA	47.8	C	59	VAWQS	YES	ASL
	72-54-8	4,4'-DDD	0.0130	J	0.200		UG/L	SJS02-SW04-001	5/9	0.1 - 0.12	0.200	NA	2.79	C	0.0084	VAWQS	NO	BSL
	99-08-1	3-Nitrotoluene	0.5	J	3.5		UG/L	SJS02-SW04-001	4/9	1.3 - 25	3.5	NA	122	N	--		NO	BSL
	7429-90-5	Aluminum	49.1		9,390		UG/L	SJS02-SW06-001	9/9	18.7 - 45.7	9,390	NA	36,500	N	--		NO	BSL
	7440-36-0	Antimony	2	J	3.30	J	UG/L	SJS02-SW08-002	2/9	2 - 3.7	3.30	NA	14.6	N	4,300	VAWQS	NO	BSL
	7440-38-2	Arsenic	3.1	J	4.40	J	UG/L	SJS02-SW04-001	2/9	2 - 5	4.40	NA	0.446	C	--		YES	ASL
	7440-39-3	Barium	16.5	J	70.7	J	UG/L	SJS02-SW02-000	8/9	0.20 - 2	70.7	NA	2,555	N	--		NO	BSL
	7440-41-7	Beryllium	3.5	J	3.5	J	UG/L	SJS02-SW06-001	1/9	0.1 - 1	3.5	NA	73	N	--		NO	BSL
	7440-43-9	Cadmium	0.330	J	2.5	J	UG/L	SJS02-SW05-001	8/9	0.3 - 3	2.5	NA	18.3	N	--		NO	BSL
	7440-70-2	Calcium	35,700	J	214,000	J	UG/L	SJS02-SW02-000	9/9	10.7 - 57.9	214,000	NA	NA		--		NO	NUT
	7440-47-3	Chromium	2.10	J	166		UG/L	SJS02-SW02-000P	8/9	0.60 - 5	166	NA	110	N	--		YES	ASL
	7440-48-4	Cobalt	1.10	J	55		UG/L	SJS02-SW06-001	2/9	0.5 - 8	55	NA	730	N	--		NO	BSL
	7440-50-8	Copper	6.5	J	203		UG/L	SJS02-SW02-000	9/9	0.80 - 2.2	203	NA	1,460	N	--		NO	BSL
	57-12-5	Cyanide	18	L	18.9	L	UG/L	SJS02-SW03-001	2/8	5 - 5	18.9	NA	730	N	215,000	VAWQS	NO	BSL
	7439-89-6	Iron	716	L	18,800	L	UG/L	SJS02-SW06-001	9/9	5 - 30.8	18,800	NA	11,000	N	--		YES	ASL
	7439-92-1	Lead	2.8	J	78	L	UG/L	SJS02-SW02-000P	6/9	1 - 3	77.9	NA	15		--		YES	ASL
	7439-95-4	Magnesium	6,230	J	665,000	L	UG/L	SJS02-SW02-000	9/9	24.3 - 243	665,000	NA	NA		--		NO	NUT
	7439-96-5	Manganese	61.9	J	2,490	L	UG/L	SJS02-SW06-001	9/9	0.30 - 1.2	2,490	NA	730	N	--		YES	ASL
	7440-02-0	Nickel	2.60	J	81.4		UG/L	SJS02-SW06-001	7/9	0.9 - 7	81.4	NA	730	N	4,600	VAWQS	NO	BSL
	7440-09-7	Potassium	4,420	J	237,000		UG/L	SJS02-SW02-000	9/9	13.5 - 135	237,000	NA	NA		--		NO	NUT
	7440-23-5	Sodium	28,200	J	5,640,000		UG/L	SJS02-SW02-000	9/9	28 - 2040	5,640,000	NA	NA		--		NO	NUT

Table 2.5

OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN

Scenario Timeframe: Current/Future
Medium: Surface Water
Exposure Medium: Surface Water

Exposure Point	CAS Number	Chemical	Minimum [1] Concentration Qualifier	Maximum [1] Concentration Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration [2] Used for Screening	Background [3] Value	Screening [4] Toxicity Value	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for [5] Contaminant Deletion or Selection
	7440-62-2	Vanadium	4.60 J	32.8 J	UG/L	SJS02-SW02-000P	3/9	0.60 - 4	32.8	NA	11 N	--		YES	ASL
	7440-66-6	Zinc	23.4 J	1,310 J	UG/L	SJS02-SW06-001	9/9	0.7 - 8.5	1,310	NA	10,950 N	--		NO	BSL
	7723-14-0	Phosphorus	65.0	202	UG/L	SJS02-SW02-000	5/7	20 - 50	202	NA	NA	--		NO	BSL

[1] Minimum/Maximum detected concentrations.

[2] Maximum concentration is used for screening.

[3] No background study has been completed for the St. Juliens Creek Annex surface water.

[4] Tier I screening: With the exception of lead, all compounds are screened against 10 times the Risk-Based Concentration (RBC) Table, U.S. EPA Region III, Oct.15, 2003 for tap water (10 times the cancer benchmark value = 1e-06; 10 times the HQ = 0.1). Lead is screened against the MCL value of a value of 15 ug/l.
RBC value for chromium VI used for total chromium.
Lead screening toxicity value is 15 ug/L, the Safe Drinking Water Act action level.
RBC value for manganese-nonfood used as surrogate for manganese.

[5] Rationale Codes

Selection Reason: Above Screening Levels (ASL)

Deletion Reason: No Toxicity Information (NTX)
Essential Nutrient (NUT)
Below Screening Level (BSL)

Surface Water Samples: SW-02 - Phase I; SW-03 through SW-08 -Phase II; and SW-08 - 2 - Phase II; and SW-09 in 2001.

SQL = Sample Quantification Limit
COPC = Chemical of Potential Concern
ARAR/TBC = Applicable or Relevant and Appropriate Requirement/ To Be Considered
J = Estimated Value
K = Biased High
L = Biased Low
C = Carcinogenic
N = Noncarcinogenic
VAWQS = Virginia Water Quality Standard
ND = Not detected

Table 2.6

OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN

St. Juliens Creek Annex - Site 2

Scenario Timeframe: Current/Future
Medium: Sediment
Exposure Medium: Sediment

Exposure Point	CAS Number	Chemical	Minimum [1] Concentration Qualifier	Maximum [1] Concentration Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration [2] Used for Screening	Background [3] Value	Screening [4] Toxicity Value	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for [5] Contaminant Deletion or Selection
Drainage Features and Ponded Area	71-55-6	1,1,1-Trichloroethane	0.007 J	0.007 J	MG/KG	SJS02-SD06-001	1/10	0.011 - 0.037	0.007	NA	286,160 N	NA	NA	NO	BSL
	540-59-0	1,2-Dichloroethene (total)	0.003 J	0.009 J	MG/KG	SJS02-SD03-000P	2/9	0.011 - 0.037	0.009	NA	9,198 N	NA	NA	NO	BSL
	108-10-1	4-Methyl-2-pentanone	0.005 J	0.005 J	MG/KG	SJS02-SD02-000	1/10	0.011 - 0.037	0.005	NA	NA	NA	NA	NO	NTX
	67-64-1	Acetone	0.021 J	0.45	MG/KG	SJS02-SD03-000P	4/8	0.011 - 0.037	0.45	NA	919,800 N	NA	NA	NO	BSL
	74-83-9	Bromomethane	0.0063 J	0.0063 J	MG/KG	SJS02-SD09	1/10	0.011 - 0.037	0.0063	NA	1,431 N	NA	NA	NO	BSL
	75-15-0	Carbon disulfide	0.004 J	0.081	MG/KG	SJS02-SD03-000P	2/10	0.011 - 0.037	0.081	NA	102,200 N	NA	NA	NO	BSL
	67-66-3	Chloroform	0.003 J	0.003 J	MG/KG	SJS02-SD07-001	1/10	0.011 - 0.037	0.003	NA	10,220 N	NA	NA	NO	BSL
	108-88-3	Toluene	0.004 J	0.004 J	MG/KG	SJS02-SD04-001	1/10	0.011 - 0.037	0.004	NA	204,400 N	NA	NA	NO	BSL
	79-01-6	Trichloroethene	0.004 J	0.01 J	MG/KG	SJS02-SD08-001	3/10	0.011 - 0.037	0.01	NA	71.5 C	NA	NA	NO	BSL
	120-12-7	Anthracene	0.1 J	0.17 J	MG/KG	SJS02-SD05-001	3/9	0.33 - 9.1	0.17	NA	306,600 N	NA	NA	NO	BSL
	56-55-3	Benzo(a)anthracene	0.086 J	1.3 J	MG/KG	SJS02-SD05-001	7/10	0.33 - 9.1	1.3	NA	39.2 C	NA	NA	NO	BSL
	50-32-8	Benzo(a)pyrene	0.079 J	0.91 J	MG/KG	SJS02-SD05-001	7/10	0.33 - 9.1	0.91	NA	3.92 C	NA	NA	NO	BSL
	205-99-2	Benzo(b)fluoranthene	0.11 J	1.3 L	MG/KG	SJS02-SD03-000	8/10	0.33 - 9.1	1.3	NA	39.2 C	NA	NA	NO	BSL
	191-24-2	Benzo(g,h,i)perylene	0.083 J	0.69 J	MG/KG	SJS02-SD05-001	6/10	0.33 - 9.1	0.69	NA	30,700 N	NA	NA	NO	BSL
	207-08-9	Benzo(k)fluoranthene	0.059 J	0.47 J	MG/KG	SJS02-SD03-000P	7/10	0.33 - 9.1	0.47	NA	392 C	NA	NA	NO	BSL
	85-68-7	Butylbenzylphthalate	0.047 J	0.047 J	MG/KG	SJS02-SD01-000	1/9	0.33 - 9.1	0.047	NA	204,400 N	NA	NA	NO	BSL
	218-01-9	Chrysene	0.12 J	1.4 J	MG/KG	SJS02-SD05-001	7/10	0.33 - 9.1	1.4	NA	3,920 C	NA	NA	NO	BSL
	84-74-2	Di-n-butylphthalate	0.089 J	0.094 J	MG/KG	SJS02-SD06-001	2/9	0.33 - 9.1	0.094	NA	102,200 N	NA	NA	NO	BSL
	84-66-2	Diethylphthalate	0.1 L	0.25 L	MG/KG	SJS02-SD03-000	2/10	0.33 - 9.1	0.25	NA	817,600 N	NA	NA	NO	BSL
	206-44-0	Fluoranthene	0.15 J	2.2 J	MG/KG	SJS02-SD05-001	7/10	0.33 - 9.1	2.2	NA	40,880 N	NA	NA	NO	BSL
	86-73-7	Fluorene	0.079 J	0.079 J	MG/KG	SJS02-SD05-001	1/9	0.33 - 9.1	0.079	NA	40,880 N	NA	NA	NO	BSL
	193-39-5	Indeno(1,2,3-cd)pyrene	0.078 J	0.53 L	MG/KG	SJS02-SD03-000	6/10	0.33 - 9.1	0.53	NA	39.2 C	NA	NA	NO	BSL
	85-01-8	Phenanthrene	0.047 J	1.1 J	MG/KG	SJS02-SD05-001	6/10	0.33 - 9.1	1.1	NA	30,700 N	NA	NA	NO	BSL
	129-00-0	Pyrene	0.048 J	3.1 J	MG/KG	SJS02-SD05-001	9/10	0.33 - 9.1	3.1	NA	30,660 N	NA	NA	NO	BSL
	117-81-7	bis(2-Ethylhexyl)phthalate	0.11 L	0.66	MG/KG	SJS02-SD09	4/10	0.13 - 9.1	0.66	NA	2,044 C	NA	NA	NO	BSL
	72-54-8	4,4'-DDD	0.0037 J	0.98 J	MG/KG	SJS02-SD06-001	8/8	0.0033 - 0.75	0.98	NA	119 C	NA	NA	NO	BSL
	72-55-9	4,4'-DDE	0.00380 J	0.13 J	MG/KG	SJS02-SD03-000	9/9	0.0033 - 0.013	0.13	NA	84.2 C	NA	NA	NO	BSL
	50-29-3	4,4'-DDT	0.00340 J	3.2 J	MG/KG	SJS02-SD06-001	9/9	0.0033 - 0.75	3.2	NA	84.2 C	NA	NA	NO	BSL
	11097-69-1	Aroclor-1254	0.11 J	0.11 J	MG/KG	SJS02-SD02-000	1/9	0.033 - 0.13	0.11	NA	14.3 C	NA	NA	NO	BSL
	11096-82-5	Aroclor-1260	0.069 J	0.069 J	MG/KG	SJS02-SD03-000P	1/9	0.033 - 0.13	0.069	NA	14.3 C	NA	NA	NO	BSL
	60-57-1	Dieldrin	0.036	0.036	MG/KG	SJS02-SD03-000	1/9	0.0033 - 0.013	0.036	NA	1.79 C	NA	NA	NO	BSL
	5103-71-9	alpha-Chlordane	8.20E-04 J	0.079 J	MG/KG	SJS02-SD05-001	6/9	0.0017 - 0.033	0.079	NA	81.8 C	NA	NA	NO	BSL
	5103-74-2	gamma-Chlordane	0.0015 J	0.096 J	MG/KG	SJS02-SD05-001	6/9	0.0017 - 0.033	0.096	NA	81.8 C	NA	NA	NO	BSL
	35822-46-9	1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxi	1.60E-05 J	4.20E-04 J	MG/KG	SJS02-SD09	6/6	0.00000014 - 0.00000029	4.20E-04	NA	1.91E-02 C	NA	NA	NO	BSL
	67562-39-4	1,2,3,4,6,7,8-Heptachlorodibenzofuran	2.50E-06 J	2.30E-04 J	MG/KG	SJS02-SD09	6/6	0.000000089 - 0.00000023	2.30E-04	NA	1.91E-02 C	NA	NA	NO	BSL
	55673-89-7	1,2,3,4,7,8,9-Heptachlorodibenzofuran	7.70E-07 J	2.10E-05 J	MG/KG	SJS02-SD09	5/6	0.00000013 - 0.00000033	2.10E-05	NA	1.91E-02 C	NA	NA	NO	BSL

Table 2.6

OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN

St. Juliens Creek Annex - Site 2

Scenario Timeframe: Current/Future
Medium: Sediment
Exposure Medium: Sediment

Exposure Point	CAS Number	Chemical	Minimum [1] Concentration Qualifier	Maximum [1] Concentration Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration [2] Used for Screening	Background [3] Value	Screening [4] Toxicity Value	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for [5] Contaminant Deletion or Selection
	39227-28-6	1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	3.00E-07 J	8.50E-06 J	MG/KG	SJS02-SD09	6/6	0.00000019 - 0.00000076	8.50E-06	NA	1.91E-03 C	NA	NA	NO	BSL
	70648-26-9	1,2,3,4,7,8-Hexachlorodibenzofuran	7.40E-07 J	2.50E-05 J	MG/KG	SJS02-SD09	6/6	0.00000011 - 0.00000026	2.50E-05	NA	1.91E-03 C	NA	NA	NO	BSL
	57653-85-7	1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	6.00E-07 J	1.80E-05 J	MG/KG	SJS02-SD09	6/6	0.00000016 - 0.00000066	1.80E-05	NA	1.91E-03 C	NA	NA	NO	BSL
	57117-44-9	1,2,3,6,7,8-Hexachlorodibenzofuran	5.00E-07 J	6.00E-05 J	MG/KG	SJS02-SD09	6/6	0.00000011 - 0.00000025	6.00E-05	NA	1.91E-03 C	NA	NA	NO	BSL
	19408-74-3	1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	1.10E-06 J	1.60E-05 J	MG/KG	SJS02-SD09	6/6	0.00000016 - 0.00000067	1.60E-05	NA	1.91E-03 C	NA	NA	NO	BSL
	72918-21-9	1,2,3,7,8,9-Hexachlorodibenzofuran	4.00E-07 J	2.30E-06 J	MG/KG	SJS02-SD11	4/6	0.00000015 - 0.00000034	2.30E-06	NA	1.91E-03 C	NA	NA	NO	BSL
	40321-76-4	1,2,3,7,8-Pentachlorodibenzo-p-dioxin	1.20E-06 J	3.60E-06 J	MG/KG	SJS02-SD09	5/6	0.00000017 - 0.00000026	3.60E-06	NA	3.82E-04 C	NA	NA	NO	BSL
	57117-41-6	1,2,3,7,8-Pentachlorodibenzofuran	1.10E-06 J	4.30E-06 J	MG/KG	SJS02-SD09	5/6	0.00000016 - 0.00000024	4.30E-06	NA	3.82E-03 C	NA	NA	NO	BSL
	60851-34-5	2,3,4,6,7,8-Hexachlorodibenzofuran	3.60E-07 J	9.30E-06 J	MG/KG	SJS02-SD09	6/6	0.00000012 - 0.00000027	9.30E-06	NA	1.91E-03 C	NA	NA	NO	BSL
	57117-31-4	2,3,4,7,8-Pentachlorodibenzofuran	4.30E-07 J	7.00E-06 J	MG/KG	SJS02-SD09	6/6	0.00000015 - 0.00000023	7.00E-06	NA	3.82E-04 C	NA	NA	NO	BSL
	1746-01-6	2,3,7,8-TCDD (dioxin)	3.20E-07 J	9.60E-07 J	MG/KG	SJS02-SD11	5/6	0.00000013 - 0.00000027	9.60E-07	NA	1.91E-04 C	NA	NA	NO	BSL
	51207-31-9	2,3,7,8-Tetrachlorodibenzofuran	7.10E-07 NJ	9.70E-06 J	MG/KG	SJS02-SD11	6/6	0.00000014 - 0.00000086	9.70E-06	NA	3.82E-03 C	NA	NA	NO	BSL
	3286-87-9	Octachlorodibenzo-p-dioxin	6.60E-04 J	0.0044 J	MG/KG	SJS02-SD11	6/6	0.0000002 - 0.00000053	0.0044	NA	1.90E-01	NA	NA	NO	BSL
	39001-02-0	Octachlorodibenzofuran	2.10E-05 J	5.80E-04 J	MG/KG	SJS02-SD09	5/6	0.00000013 - 0.00000053	5.80E-04	NA	1.90E-01	NA	NA	NO	BSL
	37871-00-4	Total heptachlorodibenzo-p-dioxin	5.10E-05 J	9.00E-04 J	MG/KG	SJS02-SD11	6/6	0.00000014 - 0.00000029	9.00E-04	NA	NA	NA	NA	NO	NTX
	38998-75-3	Total heptachlorodibenzofuran	4.60E-06 J	2.60E-04 J	MG/KG	SJS02-SD11	6/6	0.000000089 - 0.00000023	2.60E-04	NA	NA	NA	NA	NO	NTX
	34465-46-8	Total hexachlorodibenzo-p-dioxin	1.50E-05 J	1.70E-04 J	MG/KG	SJS02-SD11	6/6	0.00000016 - 0.00000066	1.70E-04	NA	NA	NA	NA	NO	NTX
	55684-94-1	Total hexachlorodibenzofuran	4.70E-06 J	3.00E-04 J	MG/KG	SJS02-SD09	6/6	0.00000011 - 0.00000025	3.00E-04	NA	NA	NA	NA	NO	NTX
	36088-22-9	Total pentachlorodibenzo-p-dioxin	4.80E-06 J	2.00E-05 J	MG/KG	SJS02-SD11	5/6	0.00000017 - 0.00000026	2.00E-05	NA	NA	NA	NA	NO	NTX
	30402-15-4	Total pentachlorodibenzofuran	2.00E-06 J	9.10E-05 J	MG/KG	SJS02-SD11	6/6	0.00000015 - 0.00000023	9.10E-05	NA	NA	NA	NA	NO	NTX
	41903-57-5	Total tetrachlorodibenzo-p-dioxin	3.70E-07 J	6.70E-06 J	MG/KG	SJS02-SD09	6/6	0.00000013 - 0.00000027	6.70E-06	NA	NA	NA	NA	NO	NTX
	55722-27-5	Total tetrachlorodibenzofuran	2.10E-06 J	3.60E-05 J	MG/KG	SJS02-SD09	6/6	0.00000014 - 0.00000086	3.60E-05	NA	NA	NA	NA	NO	NTX
	7429-90-5	Aluminum	1,500	27,200	MG/KG	SJS02-SD03-000	10/10	5 - 33.36	27,200	NA	1,022,000 N	NA	NA	NO	BSL
	7440-36-0	Antimony	1.20 L	27.6 L	MG/KG	SJS02-SD03-000P	5/10	0.40 - 1.52	27.6	NA	409 N	NA	NA	NO	BSL
	7440-38-2	Arsenic	1.60 K	19.4	MG/KG	SJS02-SD03-000P	10/10	0.30 - 2.27	19.4	NA	19.1 C	NA	NA	YES	ASL
	7440-39-3	Barium	4.10 J	109 J	MG/KG	SJS02-SD03-000P	10/10	0 .03 - 1.52	109	NA	71,540 N	NA	NA	NO	BSL
	7440-41-7	Beryllium	0.0700 J	1.1 J	MG/KG	SJS02-SD03-000P	8/10	0.01 - 0.76	1.1	NA	2,044 N	NA	NA	NO	BSL
	7440-43-9	Cadmium	0.14 J	9.2	MG/KG	SJS02-SD09	10/10	0.04 - 0.79	9.2	NA	1,022 N	NA	NA	NO	BSL
	7440-70-2	Calcium	207 J	24,300 J	MG/KG	SJS02-SD03-000	10/10	2.8 - 65.96	24,300	NA	NA	NA	NA	NO	NUT
	7440-47-3	Chromium	6.5	2,630	MG/KG	SJS02-SD03-000P	10/10	0.16 - 5.31	2,630	NA	3,070 N	NA	NA	NO	BSL
	7440-48-4	Cobalt	0.660 J	10.7 J	MG/KG	SJS02-SD03-000P	8/10	.07 - 6.07	10.7	NA	20,440 N	NA	NA	NO	BSL
	7440-50-8	Copper	4.4 J	2,620	MG/KG	SJS02-SD03-000P	10/10	0.16 - 4.55	2,620	NA	40,880 N	NA	NA	NO	BSL
	57-12-5	Cyanide	0.584	1.80 L	MG/KG	SJS02-SD08-001	2/9	0.286 - 2.1	1.80	NA	20,440 N	NA	NA	NO	BSL
	7439-89-6	Iron	2,050	31,100	MG/KG	SJS02-SD03-000	10/10	1.83 - 16.3	31,100	NA	306,600 N	NA	NA	NO	BSL
	7439-92-1	Lead	14.9	545	MG/KG	SJS02-SD03-000P	10/10	0.15 - 0.79	545	NA	1,000	NA	NA	NO	BSL
	7439-95-4	Magnesium	309 J	6,890 J	MG/KG	SJS02-SD03-000	10/10	3.6 - 137.24	6,890	NA	NA	NA	NA	NO	NUT
	7439-96-5	Manganese	8.30 K	235	MG/KG	SJS02-SD03-000	10/10	0.04 - 1.52	235	NA	20,440 N	NA	NA	NO	BSL

Table 2.6

OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN

St. Juliens Creek Annex - Site 2

Scenario Timeframe: Current/Future
Medium: Sediment
Exposure Medium: Sediment

Exposure Point	CAS Number	Chemical	Minimum [1] Concentration Qualifier	Maximum [1] Concentration Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration [2] Used for Screening	Background [3] Value	Screening [4] Toxicity Value	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for [5] Contaminant Deletion or Selection
	7439-97-6	Mercury	0.0400 J	0.79	MG/KG	SJS02-SD03-000P	9/10	0.02 - 0.19	0.79	NA	306.6 N	NA	NA	NO	BSL
	7440-02-0	Nickel	2 J	41.5	MG/KG	SJS02-SD03-000	9/10	0.13 - 5.31	41.5	NA	20,440 N	NA	NA	NO	BSL
	7440-09-7	Potassium	207 J	3,830	MG/KG	SJS02-SD03-000	10/10	2 - 168.32	3,830	NA	NA	NA	NA	NO	NUT
	7782-49-2	Selenium	0.710 K	1.5 K	MG/KG	SJS02-SD07-001	2/10	0.39 - 2.27	1.5	NA	5,110 N	NA	NA	NO	BSL
	7440-22-4	Silver	0.25 J	0.870 J	MG/KG	SJS02-SD07-001	4/10	0.13 - 1.3	0.870	NA	5,110 N	NA	NA	NO	BSL
	7440-23-5	Sodium	144	17,800	MG/KG	SJS02-SD03-000	9/10	12.11 - 128.49	17,800	NA	NA	NA	NA	NO	NUT
	7440-28-0	Thallium	2.2 K	2.2 K	MG/KG	SJS02-SD03-000P	1/10	0.42 - 1.7	2.2	NA	71.5 N	NA	NA	NO	BSL
	7440-62-2	Vanadium	5 J	115	MG/KG	SJS02-SD03-000	10/10	0 .09 - 6.82	115	NA	307 N	NA	NA	NO	BSL
	7440-66-6	Zinc	19.2	1,400 L	MG/KG	SJS02-SD03-000P	10/10	0.19 - 3.79	1,400	NA	306,600 N	NA	NA	NO	BSL
	7723-14-0	Phosphorus	10.5	370	MG/KG	SJS02-SD05-001	7/7	1.4 - 29.2	370	NA	NA N	NA	NA	NO	NTX

[1] Minimum/Maximum detected concentrations.

[2] Maximum concentration is used for screening.

[3] No background study has been completed for the St. Juliens Creek Annex sediment.

[4] Tier II screening: With the exception of lead, all compounds are screened against 10 times the Risk-Based Concentration (RBC) Table, U.S. EPA Region III, Oct. 15, 2003 for industrial soil (10 times the cancer benchmark value = 1e-06; 10 times the HQ = 0.1). Lead is screened against the EPA screening value of 1000 mg/kg.
RBC value for pyrene used as surrogate for phenanthrene and benzo(g,h,i)perylene.
RBC value for chlordane used as surrogate for alpha-chlordane and gamma-chlordane.
RBC value for chromium VI used for total chromium.
RBC value for manganese-nonfood used as surrogate for manganese.
RBC value for mercuric chloride used as surrogate for mercury.

[5] Rationale Codes

Selection Reason: Above Screening Levels (ASL)
Deletion Reason: No Toxicity Information (NTX)
Essential Nutrient (NUT)

SQL = Sample Quantification Limit
COPC = Chemical of Potential Concern
ARAR/TBC = Applicable or Relevant and Appropriate Requirement/ To Be Considered
J = Estimated Value
K = Biased High
L = Biased Low
C = Carcinogenic
N = Noncarcinogenic
ND = Not detected

Table 2.7

OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN

St. Juliens Creek Annex - Site 2

Scenario Timeframe: Future
Medium: Soil*
Exposure Medium: Soil*

Exposure Point	CAS Number	Chemical	Minimum [1] Concentration Qualifier	Maximum [1] Concentration Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration [2] Used for Screening	Background [3] Value	Screening [4] Toxicity Value	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for [5] Contaminant Deletion or Selection
At Site 2	78-93-3	2-Butanone	0.014	0.2	MG/KG	SJS02-SS11-000	3/29	0.01 - 0.016	0.2	ND	4,693 N	NA	NA	NO	BSL
	67-64-1	Acetone	0.006 J	0.21	MG/KG	SJS02-SB04-004	5/29	0.01 - 0.016	0.21	ND	782 N	NA	NA	NO	BSL
	75-15-0	Carbon disulfide	0.033	0.033	MG/KG	SJS02-SB07-001	1/29	0.01 - 0.016	0.033	ND	782 N	NA	NA	NO	BSL
	108-88-3	Toluene	1.00E-03 J	0.002 J	MG/KG	SJS02-SS08-000	2/29	0.01 - 0.016	0.002	ND	1,564 N	NA	NA	NO	BSL
	79-01-6	Trichloroethene	0.012	0.012 UJ	MG/KG	602-SB06-001 SJS02-SB07-	1/29	0.01 - 0.016	0.012	ND	1.6 C	NA	NA	NO	BSL
	91-57-6	2-Methylnaphthalene	0.31 J	0.31 J	MG/KG	SJS02-SS03-000	1/29	0.33 - 1.7	0.31	ND	156 N	NA	NA	NO	BSL
	83-32-9	Acenaphthene	0.1 J	0.17 J	MG/KG	SJS02-SS03-000	2/29	0.33 - 1.7	0.17	81	469 N	NA	NA	NO	BSL
	208-96-8	Acenaphthylene	0.037 J	0.82 J	MG/KG	SJS02-SS03-000	9/29	0.33 - 1.7	0.82	81	156 N	NA	NA	NO	BSL
	120-12-7	Anthracene	0.043 J	0.59 J	MG/KG	SJS02-SS03-000	8/29	0.33 - 1.7	0.59	81	2,346 N	NA	NA	NO	BSL
	56-55-3	Benzo(a)anthracene	0.12 J	2.3	MG/KG	SJS02-SS03-000	16/29	0.33 - 1.7	2.3	6.9	0.875 C	NA	NA	YES	ASL
	50-32-8	Benzo(a)pyrene	0.048 J	1.4 J	MG/KG	SJS02-SS03-000	17/29	0.33 - 1.7	1.4	91	0.0875 C	NA	NA	YES	ASL
	205-99-2	Benzo(b)fluoranthene	0.048 J	1.7 J	MG/KG	SJS02-SS03-000	19/29	0.33 - 1.7	1.7	91	0.875 C	NA	NA	YES	ASL
	191-24-2	Benzo(g,h,i)perylene	0.076 J	0.89 J	MG/KG	SJS02-SS03-000	15/29	0.33 - 1.7	0.89	91	235 N	NA	NA	NO	BSL
	207-08-9	Benzo(k)fluoranthene	0.062 J	1.1 J	MG/KG	SJS02-SS03-000	16/29	0.33 - 1.7	1.1	91	8.75 C	NA	NA	NO	BSL
	85-68-7	Butylbenzylphthalate	0.057 J	0.28 J	MG/KG	SJS02-SS06-000	2/29	0.33 - 1.7	0.28	ND	1,564 N	NA	NA	NO	BSL
	86-74-8	Carbazole	0.12 J	0.3 J	MG/KG	SJS02-SS03-000	2/29	0.33 - 1.7	0.3	ND	31.9 C	NA	NA	NO	BSL
	218-01-9	Chrysene	0.065 J	2.7	MG/KG	SJS02-SS03-000	17/29	0.33 - 1.7	2.7	102	87.5 C	NA	NA	NO	BSL
	84-74-2	Di-n-butylphthalate	0.047 J	0.51 J	MG/KG	SJS02-SS20-000	4/29	0.33 - 1.7	0.51	ND	782 N	NA	NA	NO	BSL
	53-70-3	Dibenz(a,h)anthracene	0.054 J	0.13 J	MG/KG	SJS02-SB11-001P	3/29	0.33 - 1.7	0.13	81	0.0875 C	NA	NA	YES	ASL
	132-64-9	Dibenzofuran	0.07 J	0.07 J	MG/KG	SJS02-SS02-000	1/29	0.33 - 1.7	0.07	ND	15.6 N	NA	NA	NO	BSL
	206-44-0	Fluoranthene	0.045 J	5.0	MG/KG	SJS02-SS03-000	19/29	0.33 - 1.7	5	103	313 N	NA	NA	NO	BSL
	86-73-7	Fluorene	0.11 J	0.38 UJ	MG/KG	602-SS03-000 SJS02-SB10-	2/29	0.33 - 1.7	0.38	81	313 N	NA	NA	NO	BSL
	193-39-5	Indeno(1,2,3-cd)pyrene	0.086 J	0.8 J	MG/KG	SJS02-SS03-000	16/29	0.33 - 1.7	0.8	91	0.875 C	NA	NA	NO	BSL
	91-20-3	Naphthalene	0.052 J	0.052 J	MG/KG	SJS02-SS02-000	1/29	0.33 - 1.7	0.052	81	156 N	NA	NA	NO	BSL
	85-01-8	Phenanthrene	0.038 J	4.4	MG/KG	SJS02-SS03-000	16/29	0.33 - 1.7	4.4	91	235 N	NA	NA	NO	BSL
	129-00-0	Pyrene	0.048 J	7.2	MG/KG	SJS02-SS03-000	19/29	0.33 - 1.7	7.2	125	235 N	NA	NA	NO	BSL
	117-81-7	bis(2-Ethylhexyl)phthalate	0.035	0.07 J	MG/KG	SJS02-SS20-000	6/29	0.33 - 1.7	0.07	ND	45.6 C	NA	NA	NO	BSL
	72-54-8	4,4'-DDD	1.00E-03 J	4.2	MG/KG	SJS02-SS09-000	21/29	0.0033 - 1.9	4.2	4	2.66 C	NA	NA	YES	ASL
	72-55-9	4,4'-DDE	4.40E-04 J	7.2 J	MG/KG	SJS02-SS20-000	28/29	0.0033 - 2	7.2	18	1.88 C	NA	NA	YES	ASL
	50-29-3	4,4'-DDT	6.90E-04 J	290 J	MG/KG	SJS02-SB08-001	28/28	0.0033 - 38	290	7.8	1.88 C	NA	NA	YES	ASL
	11096-82-5	Aroclor-1260	0.015 J	0.11 J	MG/KG	602-SS03-000 SJS02-SS04-	6/29	0.033 - 0.35	0.11	ND	0.319 C	NA	NA	NO	BSL
	60-57-1	Dieldrin	7.90E-04 J	0.0038 J	MG/KG	SJS02-SS02-000	4/29	0.0033 - 0.035	0.0038	4	0.0399 C	NA	NA	NO	BSL
	76-44-8	Heptachlor	0.00220 J	0.00220 J	MG/KG	SJS02-SS12-000	1/29	0.0017 - 0.018	0.0022	ND	0.142 C	NA	NA	NO	BSL
	5103-71-9	alpha-Chlordane	8.10E-04 J	0.05 J	MG/KG	SJS02-SS12-000	7/29	0.0017 - 0.2	0.05	2.8	1.82 C	NA	NA	NO	BSL
	5103-74-2	gamma-Chlordane	0.002 UJ	0.038 J	MG/KG	SJS02-SB08-001	6/29	0.0017 - 0.94	0.038	2	1.82 C	NA	NA	NO	BSL
	35822-46-9	1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	7.95E-06 J	1.18E-04 J	MG/KG	SJS02-SB15-001	5/5	0.00000011 - 0.000000869	0.0001176	NA	4.26E-04 C	NA	NA	NO	BSL

Table 2.7

OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN

St. Juliens Creek Annex - Site 2

Scenario Timeframe: Future
Medium: Soil*
Exposure Medium: Soil*

Exposure Point	CAS Number	Chemical	Minimum [1] Concentration Qualifier	Maximum [1] Concentration Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration [2] Used for Screening	Background [3] Value	Screening [4] Toxicity Value	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for [5] Contaminant Deletion or Selection
	67562-39-4	1,2,3,4,6,7,8-Heptachlorodibenzofuran	3.00E-07 NJ	4.35E-05 J	MG/KG	SJS02-SB15-001	4/5	0.000000044 - 0.000000407	0.00004352	NA	4.26E-04 C	NA	NA	NO	BSL
	55673-89-7	1,2,3,4,7,8,9-Heptachlorodibenzofuran	3.22E-06 J	3.22E-06 J	MG/KG	SJS02-SB15-001	1/5	0.000000064 - 0.000000599	0.000003215	NA	4.26E-04 C	NA	NA	NO	BSL
	39227-28-6	1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	4.00E-07 NJ	2.02E-06 J	MG/KG	SJS02-SB15-001	3/5	0.000000086 - 0.000000287	0.000002024	NA	4.26E-05 C	NA	NA	NO	BSL
	70648-26-9	1,2,3,4,7,8-Hexachlorodibenzofuran	1.12E-06 J	8.70E-06 J	MG/KG	SJS02-SB15-001	3/5	0.000000053 - 0.000001651	0.0000087	NA	4.26E-05 C	NA	NA	NO	BSL
	57653-85-7	1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	5.60E-07 J	4.49E-06 J	MG/KG	SJS02-SB15-001	4/5	0.000000075 - 0.00000025	0.000004485	NA	4.26E-05 C	NA	NA	NO	BSL
	57117-44-9	1,2,3,6,7,8-Hexachlorodibenzofuran	1.61E-06 I	3.88E-06 NJ	MG/KG	SJS02-SB15-001	2/5	0.000000051 - 0.000001585	0.00000388	NA	4.26E-05 C	NA	NA	NO	BSL
	19408-74-3	1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	6.23E-07 J	5.34E-06 J	MG/KG	SJS02-SB15-001	5/5	0.000000076 - 0.000000255	0.000005338	NA	4.26E-05 C	NA	NA	NO	BSL
	40321-76-4	1,2,3,7,8-Pentachlorodibenzo-p-dioxin	1.46E-06 J	1.46E-06 J	MG/KG	SJS02-SB15-001	1/5	0.000000094 - 0.000000236	0.000001457	NA	8.52E-06 C	NA	NA	NO	BSL
	57117-41-6	1,2,3,7,8-Pentachlorodibenzofuran	4.40E-06 J	4.40E-06 J	MG/KG	SJS02-SB15-001	1/5	0.000000071 - 0.000000528	0.000004395	NA	8.52E-05 C	NA	NA	NO	BSL
	60851-34-5	2,3,4,6,7,8-Hexachlorodibenzofuran	5.06E-07 J	3.70E-06 J	MG/KG	SJS02-SB15-001	2/5	0.000000057 - 0.000001769	0.000003701	NA	4.26E-05 C	NA	NA	NO	BSL
	57117-31-4	2,3,4,7,8-Pentachlorodibenzofuran	4.77E-07 J	4.35E-06 J	MG/KG	SJS02-SB15-001	3/5	0.000000068 - 0.000000507	0.000004353	NA	8.52E-06 C	NA	NA	NO	BSL
	1746-01-6	2,3,7,8-TCDD (dioxin)	3.28E-07 NJ	3.28E-07 NJ	MG/KG	SJS02-SB15-001	1/5	0.00000008 - 0.000000158	0.000000328	NA	4.26E-06 C	NA	NA	NO	BSL
	51207-31-9	2,3,7,8-Tetrachlorodibenzofuran	7.75E-07 NJ	6.36E-06 J	MG/KG	SJS02-SB15-001	3/5	0.000000086 - 0.00000034	0.000006361	NA	4.26E-05 C	NA	NA	NO	BSL
	3286-87-9	Octachlorodibenzo-p-dioxin	2.19E-04 J	0.0015 J	MG/KG	SJS02-SB19-001	5/5	0.000000079 - 0.000000542	0.0015	NA	4.30E-03 C	NA	NA	NO	BSL
	39001-02-0	Octachlorodibenzofuran	6.80E-07 J	7.94E-05 J	MG/KG	SJS02-SB15-001	4/5	0.000000076 - 0.00000032	0.00007939	NA	4.30E-03 C	NA	NA	NO	BSL
	37871-00-4	Total heptachlorodibenzo-p-dioxin	2.11E-05 J	2.81E-04 J	MG/KG	SJS02-SB15-001	5/5	0.00000011 - 0.000000869	0.0002809	NA	NA	NA	NA	NO	NTX
	38998-75-3	Total heptachlorodibenzofuran	4.30E-07	4.67E-05 J	MG/KG	SJS02-SB15-001	4/5	0.000000044 - 0.000000407	0.00004673	NA	NA	NA	NA	NO	NTX
	34465-46-8	Total hexachlorodibenzo-p-dioxin	4.76E-06 J	3.92E-05 J	MG/KG	SJS02-SB15-001	5/5	0.000000075 - 0.00000025	0.00003924	NA	NA	NA	NA	NO	NTX
	55684-94-1	Total hexachlorodibenzofuran	2.79E-06 J	7.45E-05 J	MG/KG	SJS02-SB15-001	3/5	0.000000051 - 0.000001585	0.00007446	NA	NA	NA	NA	NO	NTX
	36088-22-9	Total pentachlorodibenzo-p-dioxin	5.36E-07 J	3.15E-06 J	MG/KG	SJS02-SB15-001	2/5	0.000000094 - 0.000000236	0.000003151	NA	NA	NA	NA	NO	NTX
	30402-15-4	Total pentachlorodibenzofuran	2.71E-06 J	2.90E-05 J	MG/KG	SJS02-SB15-001	3/5	0.000000068 - 0.000000507	0.00002895	NA	NA	NA	NA	NO	NTX
	41903-57-5	Total tetrachlorodibenzo-p-dioxin	2.99E-07 J	3.28E-06 J	MG/KG	SJS02-SB15-001	2/5	0.00000008 - 0.000000158	0.000003284	NA	NA	NA	NA	NO	NTX
	55722-27-5	Total tetrachlorodibenzofuran	1.94E-06 J	3.06E-05 J	MG/KG	SJS02-SB15-001	3/5	0.000000086 - 0.00000034	0.00003058	NA	NA	NA	NA	NO	NTX
	7429-90-5	Aluminum	1,960	21,700	MG/KG	SJS02-SB07-001	31/31	3.56 - 15.54	21700	7669	7,821 N	NA	NA	YES	ASL
	7440-36-0	Antimony	0.530 J	77.7	MG/KG	SJS02-SB12-001	10/27	0.33 - 1.88	77.7	0.6	3.13 N	NA	NA	YES	ASL
	7440-38-2	Arsenic	1.2 K	41.7	MG/KG	SJS02-SB12-001	30/31	0.33 - 1.7	41.7	5.7	0.426 C	NA	NA	YES	ASL
	7440-39-3	Barium	8.4 J	469	MG/KG	SJS02-SS20-000	31/31	0.03 - 0.68	469	61	548 N	NA	NA	NO	BSL
	7440-41-7	Beryllium	0.100 J	13.4	MG/KG	SJS02-SS06-000	25/31	0.02 - 0.25	13.4	0.28	15.6 N	NA	NA	NO	BSL
	7440-43-9	Cadmium	0.100 J	11.2	MG/KG	SJS02-SB12-001	22/31	0.05 - 1.02	11.2	ND	7.8 N	NA	NA	YES	ASL
	7440-70-2	Calcium	269 J	15,900	MG/KG	SJS02-SB12-001 SJS02-SS14-000	30/31	0.72 - 21.84	15900	1225	NA	NA	NA	NO	NUT
	7440-47-3	Chromium	2.5	246	MG/KG	SJS02-SS06-000	31/31	0.13 - 1.76	246	7	23.5 N	NA	NA	YES	ASL
	7440-48-4	Cobalt	0.5 J	62.6	MG/KG	SJS02-SS06-000	26/31	0.082 - 2.01	62.6	2.2	160 N	NA	NA	NO	BSL
	7440-50-8	Copper	2.5 J	4,260	MG/KG	SJS02-SS06-000	31/31	0.18 - 1.51	4260	5.1	313 N	NA	NA	YES	ASL
	57-12-5	Cyanide	0.203	0.85 J	MG/KG	SJS02-SS03-000	4/29	0.18 - 0.68	0.85	ND	156 N	NA	NA	NO	BSL
	7439-89-6	Iron	1,850	210,000	MG/KG	SJS02-SB12-001	31/31	0.24 - 6.8	210000	3669	2,300 N	NA	NA	YES	ASL
	7439-92-1	Lead	3.10	8,850	MG/KG	SJS02-SB12-001	31/31	0.17 - 1.02	8850	12	400	NA	NA	YES	ASL
	7439-95-4	Magnesium	126 J	12,300	MG/KG	SJS02-SB12-001	30/31	3.41 - 45.43	12300	527	NA	NA	NA	NO	NUT

Table 2.7

OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN

St. Juliens Creek Annex - Site 2

Scenario Timeframe: Future
Medium: Soil*
Exposure Medium: Soil*

Exposure Point	CAS Number	Chemical	Minimum [1] Concentration Qualifier	Maximum [1] Concentration Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration [2] Used for Screening	Background [3] Value	Screening [4] Toxicity Value	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for [5] Contaminant Deletion or Selection
	7439-96-5	Manganese	5.90	1,260	MG/KG	SJS02-SB12-001	31/31	0.04 - 0.5	1260	14	156 N	NA	NA	YES	ASL
	7439-97-6	Mercury	0.0300 J	1	MG/KG	SJS02-SB11-001P	29/31	0.01 - 0.17	1	0.1	2.35 N	NA	NA	NO	BSL
	7440-02-0	Nickel	0.890 J	246	MG/KG	SJS02-SS06-000	30/31	0.15 - 1.76	246	6.9	156 N	NA	NA	YES	ASL
	7440-09-7	Potassium	149 J	2,270	MG/KG	SJS02-SB15-001	31/31	2.2 - 55.72	2270	368	NA	NA	NA	NO	NUT
	7782-49-2	Selenium	0.530 J	1	MG/KG	SJS02-SS02-000	8/31	0.34 - 1.7	1	0.7	39.1 N	NA	NA	NO	BSL
	7440-22-4	Silver	0.200 J	3.5	MG/KG	SJS02-SS16-000P	3/31	0.15 - 1.7	3.5	0.52	39.1 N	NA	NA	NO	BSL
	7440-23-5	Sodium	49.2 J	1,780	MG/KG	SJS02-SB12-001	15/31	9.59 - 166.73	1780	174	NA	NA	NA	NO	NUT
	7440-28-0	Thallium	0.76 J	6.2	MG/KG	SJS02-SS03-000	5/31	0.33 - 1.9	6.2	ND	0.548 N	NA	NA	YES	ASL
	7440-62-2	Vanadium	3.80 J	138	MG/KG	SJS02-SS20-000	31/31	0.1 - 2.26	138	26.6	2.3 N	NA	NA	YES	ASL
	7440-66-6	Zinc	4.20 J	7,560	MG/KG	SJS02-SS06-000	30/31	0.23 - 2.89	7560	13	2,346 N	NA	NA	YES	ASL
	7723-14-0	Phosphorus	2.3	153	MG/KG	SJS02-SS06-000	18/29	0.73 - 63	153	ND	NA N	NA	NA	NO	NTX

* Surface soil & subsurface soil combined

[1] Minimum/Maximum detected concentrations.

[2] Maximum concentration is used for screening.

[3] Background data is lower of UCL for Bohicket or Munden-Tetotum background soil type from St. Julliens Creek Background Investigation.

[4] Tier I screening: With the exception of lead, all compounds are screened against the Risk-Based Concentration (RBC) Table, U.S. EPA Region III, Oct. 15, 2003 for residential soil (cancer benchmark value = 1e-06; HQ = 0.1). Lead is screened against the EPA screening value of a value of 400 mg/kg.
RBC value for naphthalene used as surrogate for acenaphthylene.
RBC value for pyrene used as surrogate for phenanthrene and benzo(g,h,i)perylene.
RBC value for chlordane used as surrogate for alpha-chlordane and gamma-chlordane.
RBC value for chromium VI used for total chromium.
RBC value for manganese-nonfood used as surrogate for manganese.
RBC value for mercuric chloride used as surrogate for mercury.

[5] Rationale Codes

Selection Reason: Above Screening Levels (ASL)
Deletion Reason: No Toxicity Information (NTX)
Essential Nutrient (NUT)
Below Screening Level (BSL)

Surface and Subsurface Soil Samples: Phase I - SS02 to SS10, SB02 to SB05; Phase II - SS11 to SS20, SB06 to SB11

SQL = Sample Quantification Limit
COPC = Chemical of Potential Concern
ARAR/TBC = Applicable or Relevant and Appropriate Requirement/ To Be Considered
J = Estimated Value
K = Biased High
L = Biased Low
C = Carcinogenic
N = Noncarcinogenic
ND = Not detected

Table 2.8

OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN

St. Juliens Creek Annex - Site 2

Scenario Timeframe: Future
Medium: Soil*
Exposure Medium: Soil*

Exposure Point	CAS Number	Chemical	Minimum [1] Concentration Qualifier	Maximum [1] Concentration Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration [2] Used for Screening	Background [3] Value	Screening [4] Toxicity Value	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for [5] Contaminant Deletion or Selection
At Site 2	78-93-3	2-Butanone	0.014	0.2	MG/KG	SJS02-SS11-000	3/29	0.01 - 0.016	0.2	ND	61,320 N	NA	NA	NO	BSL
	67-64-1	Acetone	0.006 J	0.21	MG/KG	SJS02-SB04-004	5/29	0.01 - 0.016	0.21	ND	91,980 N	NA	NA	NO	BSL
	75-15-0	Carbon disulfide	0.033	0.033	MG/KG	SJS02-SB07-001	1/29	0.01 - 0.016	0.033	ND	10,220 N	NA	NA	NO	BSL
	108-88-3	Toluene	1.00E-03 J	0.002 J	MG/KG	SJS02-SS08-000	2/29	0.01 - 0.016	0.002	ND	20,440 N	NA	NA	NO	BSL
	79-01-6	Trichloroethene	0.012	0.012 UJ	MG/KG	SJS02-SB06-001 SJS02-SB07-001	1/29	0.01 - 0.016	0.012	ND	7.15 C	NA	NA	NO	BSL
	91-57-6	2-Methylnaphthalene	0.31 J	0.31 J	MG/KG	SJS02-SS03-000	1/29	0.33 - 1.7	0.31	ND	2,044 N	NA	NA	NO	BSL
	83-32-9	Acenaphthene	0.1 J	0.17 J	MG/KG	SJS02-SS03-000	2/29	0.33 - 1.7	0.17	81	6,132 N	NA	NA	NO	BSL
	208-96-8	Acenaphthylene	0.037 J	0.82 J	MG/KG	SJS02-SS03-000	9/29	0.33 - 1.7	0.82	81	2,044 N	NA	NA	NO	BSL
	120-12-7	Anthracene	0.043 J	0.59 J	MG/KG	SJS02-SS03-000	8/29	0.33 - 1.7	0.59	81	30,660 N	NA	NA	NO	BSL
	56-55-3	Benzo(a)anthracene	0.12 J	2.3	MG/KG	SJS02-SS03-000	16/29	0.33 - 1.7	2.3	6.9	3.92 C	NA	NA	NO	BSL
	50-32-8	Benzo(a)pyrene	0.048 J	1.4 J	MG/KG	SJS02-SS03-000	17/29	0.33 - 1.7	1.4	91	0.392 C	NA	NA	YES	ASL
	205-99-2	Benzo(b)fluoranthene	0.048 J	1.7 J	MG/KG	SJS02-SS03-000	19/29	0.33 - 1.7	1.7	91	3.92 C	NA	NA	NO	BSL
	191-24-2	Benzo(g,h,i)perylene	0.076 J	0.89 J	MG/KG	SJS02-SS03-000	15/29	0.33 - 1.7	0.89	91	3,070 N	NA	NA	NO	BSL
	207-08-9	Benzo(k)fluoranthene	0.062 J	1.1 J	MG/KG	SJS02-SS03-000	16/29	0.33 - 1.7	1.1	91	39.2 C	NA	NA	NO	BSL
	85-68-7	Butylbenzylphthalate	0.057 J	0.28 J	MG/KG	SJS02-SS06-000	2/29	0.33 - 1.7	0.28	ND	20,440 N	NA	NA	NO	BSL
	86-74-8	Carbazole	0.12 J	0.3 J	MG/KG	SJS02-SS03-000	2/29	0.33 - 1.7	0.3	ND	143 C	NA	NA	NO	BSL
	218-01-9	Chrysene	0.065 J	2.7	MG/KG	SJS02-SS03-000	17/29	0.33 - 1.7	2.7	102	392 C	NA	NA	NO	BSL
	84-74-2	Di-n-butylphthalate	0.047 J	0.51 J	MG/KG	SJS02-SS20-000	4/29	0.33 - 1.7	0.51	ND	10,220 N	NA	NA	NO	BSL
	53-70-3	Dibenz(a,h)anthracene	0.054 J	0.13 J	MG/KG	SJS02-SB11-001P	3/29	0.33 - 1.7	0.13	81	0.392 C	NA	NA	NO	BSL
	132-64-9	Dibenzofuran	0.07 J	0.07 J	MG/KG	SJS02-SS02-000	1/29	0.33 - 1.7	0.07	ND	204 N	NA	NA	NO	BSL
	206-44-0	Fluoranthene	0.045 J	5.0	MG/KG	SJS02-SS03-000	19/29	0.33 - 1.7	5	103	4,088 N	NA	NA	NO	BSL
	86-73-7	Fluorene	0.11 J	0.38 UJ	MG/KG	SJS02-SS03-000 SJS02-SB10-001	2/29	0.33 - 1.7	0.38	81	4,088 N	NA	NA	NO	BSL
	193-39-5	Indeno(1,2,3-cd)pyrene	0.086 J	0.8 J	MG/KG	SJS02-SS03-000	16/29	0.33 - 1.7	0.8	91	3.92 C	NA	NA	NO	BSL
	91-20-3	Naphthalene	0.052 J	0.052 J	MG/KG	SJS02-SS02-000	1/29	0.33 - 1.7	0.052	81	2,044 N	NA	NA	NO	BSL
	85-01-8	Phenanthrene	0.038 J	4.4	MG/KG	SJS02-SS03-000	16/29	0.33 - 1.7	4.4	91	3,070 N	NA	NA	NO	BSL
	129-00-0	Pyrene	0.048 J	7.2	MG/KG	SJS02-SS03-000	19/29	0.33 - 1.7	7.2	125	3,066 N	NA	NA	NO	BSL
	117-81-7	bis(2-Ethylhexyl)phthalate	0.035	0.07 J	MG/KG	SJS02-SS20-000	6/29	0.33 - 1.7	0.07	ND	204 C	NA	NA	NO	BSL
	72-54-8	4,4'-DDD	1.00E-03 J	4.2	MG/KG	SJS02-SS09-000	21/29	0.0033 - 1.9	4.2	4	11.9 C	NA	NA	NO	BSL
	72-55-9	4,4'-DDE	4.40E-04 J	7.2 J	MG/KG	SJS02-SS20-000	28/29	0.0033 - 2	7.2	18	8.42 C	NA	NA	NO	BSL
	50-29-3	4,4'-DDT	6.90E-04 J	290 J	MG/KG	SJS02-SB08-001	28/28	0.0033 - 38	290	7.8	8.42 C	NA	NA	YES	ASL
	11096-82-5	Aroclor-1260	0.015 J	0.11 J	MG/KG	SJS02-SS03-000 SJS02-SS04-000	6/29	0.033 - 0.35	0.11	ND	1.43 C	NA	NA	NO	BSL
	60-57-1	Dieldrin	7.90E-04 J	0.0038 J	MG/KG	SJS02-SS02-000	4/29	0.0033 - 0.035	0.0038	4	0.179 C	NA	NA	NO	BSL
	76-44-8	Heptachlor	0.00220 J	0.00220 J	MG/KG	SJS02-SS12-000	1/29	0.0017 - 0.018	0.0022	ND	0.636 C	NA	NA	NO	BSL
	5103-71-9	alpha-Chlordane	8.10E-04 J	0.05 J	MG/KG	SJS02-SS12-000	7/29	0.0017 - 0.2	0.05	2.8	0.818 N	NA	NA	NO	BSL
	5103-74-2	gamma-Chlordane	0.002 UJ	0.038 J	MG/KG	SJS02-SB08-001	6/29	0.0017 - 0.94	0.038	2	0.818 N	NA	NA	NO	BSL
	35822-46-9	1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	7.95E-06 J	1.18E-04 J	MG/KG	SJS02-SB15-001	5/5	0.00000011 - 0.000000869	0.0001176	NA	1.91E-03 C	NA	NA	NO	BSL

Table 2.8

OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN

St. Juliens Creek Annex - Site 2

Scenario Timeframe: Future
Medium: Soil*
Exposure Medium: Soil*

Exposure Point	CAS Number	Chemical	Minimum [1] Concentration Qualifier	Maximum [1] Concentration Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration [2] Used for Screening	Background [3] Value	Screening [4] Toxicity Value	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for [5] Contaminant Deletion or Selection
	67562-39-4	1,2,3,4,6,7,8-Heptachlorodibenzofuran	3.00E-07 NJ	4.35E-05 J	MG/KG	SJS02-SB15-001	4/5	0.000000044 - 0.000000407	0.00004352	NA	1.91E-03 C	NA	NA	NO	BSL
	55673-89-7	1,2,3,4,7,8,9-Heptachlorodibenzofuran	3.22E-06 J	3.22E-06 J	MG/KG	SJS02-SB15-001	1/5	0.000000064 - 0.000000599	0.000003215	NA	1.91E-03 C	NA	NA	NO	BSL
	39227-28-6	1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	4.00E-07 NJ	2.02E-06 J	MG/KG	SJS02-SB15-001	3/5	0.000000086 - 0.000000287	0.000002024	NA	1.91E-04 C	NA	NA	NO	BSL
	70648-26-9	1,2,3,4,7,8-Hexachlorodibenzofuran	1.12E-06 J	8.70E-06 J	MG/KG	SJS02-SB15-001	3/5	0.000000053 - 0.000001651	0.0000087	NA	1.91E-04 C	NA	NA	NO	BSL
	57653-85-7	1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	5.60E-07 J	4.49E-06 J	MG/KG	SJS02-SB15-001	4/5	0.000000075 - 0.00000025	0.000004485	NA	1.91E-04 C	NA	NA	NO	BSL
	57117-44-9	1,2,3,6,7,8-Hexachlorodibenzofuran	1.61E-06 I	3.88E-06 NJ	MG/KG	SJS02-SB15-001	2/5	0.000000051 - 0.000001585	0.00000388	NA	1.91E-04 C	NA	NA	NO	BSL
	19408-74-3	1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	6.23E-07 J	5.34E-06 J	MG/KG	SJS02-SB15-001	5/5	0.000000076 - 0.000000255	0.000005338	NA	1.91E-04 C	NA	NA	NO	BSL
	40321-76-4	1,2,3,7,8-Pentachlorodibenzo-p-dioxin	1.46E-06 J	1.46E-06 J	MG/KG	SJS02-SB15-001	1/5	0.000000094 - 0.000000236	0.000001457	NA	1.91E-04 C	NA	NA	NO	BSL
	57117-41-6	1,2,3,7,8-Pentachlorodibenzofuran	4.40E-06 J	4.40E-06 J	MG/KG	SJS02-SB15-001	1/5	0.000000071 - 0.000000528	0.000004395	NA	3.82E-05 C	NA	NA	NO	BSL
	60851-34-5	2,3,4,6,7,8-Hexachlorodibenzofuran	5.06E-07 J	3.70E-06 J	MG/KG	SJS02-SB15-001	2/5	0.000000057 - 0.000001769	0.000003701	NA	3.82E-04 C	NA	NA	NO	BSL
	57117-31-4	2,3,4,7,8-Pentachlorodibenzofuran	4.77E-07 J	4.35E-06 J	MG/KG	SJS02-SB15-001	3/5	0.000000068 - 0.000000507	0.000004353	NA	1.91E-04 C	NA	NA	NO	BSL
	1746-01-6	2,3,7,8-TCDD (dioxin)	3.28E-07 NJ	3.28E-07 NJ	MG/KG	SJS02-SB15-001	1/5	0.00000008 - 0.000000158	0.000000328	NA	3.82E-05 C	NA	NA	NO	BSL
	51207-31-9	2,3,7,8-Tetrachlorodibenzofuran	7.75E-07 NJ	6.36E-06 J	MG/KG	SJS02-SB15-001	3/5	0.000000086 - 0.00000034	0.000006361	NA	1.91E-05 C	NA	NA	NO	BSL
	3286-87-9	Octachlorodibenzo-p-dioxin	2.19E-04 J	0.0015 J	MG/KG	SJS02-SB19-001	5/5	0.000000079 - 0.000000542	0.0015	NA	1.90E-02 C	NA	NA	NO	BSL
	39001-02-0	Octachlorodibenzofuran	6.80E-07 J	7.94E-05 J	MG/KG	SJS02-SB15-001	4/5	0.000000076 - 0.00000032	0.00007939	NA	1.90E-02 C	NA	NA	NO	BSL
	37871-00-4	Total heptachlorodibenzo-p-dioxin	2.11E-05 J	2.81E-04 J	MG/KG	SJS02-SB15-001	5/5	0.00000011 - 0.000000869	0.0002809	NA	NA	NA	NA	NO	NTX
	38998-75-3	Total heptachlorodibenzofuran	4.30E-07	4.67E-05 J	MG/KG	SJS02-SB15-001	4/5	0.000000044 - 0.000000407	0.00004673	NA	NA	NA	NA	NO	NTX
	34465-46-8	Total hexachlorodibenzo-p-dioxin	4.76E-06 J	3.92E-05 J	MG/KG	SJS02-SB15-001	5/5	0.000000075 - 0.00000025	0.00003924	NA	NA	NA	NA	NO	NTX
	55684-94-1	Total hexachlorodibenzofuran	2.79E-06 J	7.45E-05 J	MG/KG	SJS02-SB15-001	3/5	0.000000051 - 0.000001585	0.00007446	NA	NA	NA	NA	NO	NTX
	36088-22-9	Total pentachlorodibenzo-p-dioxin	5.36E-07 J	3.15E-06 J	MG/KG	SJS02-SB15-001	2/5	0.000000094 - 0.000000236	0.000003151	NA	NA	NA	NA	NO	NTX
	30402-15-4	Total pentachlorodibenzofuran	2.71E-06 J	2.90E-05 J	MG/KG	SJS02-SB15-001	3/5	0.000000068 - 0.000000507	0.00002895	NA	NA	NA	NA	NO	NTX
	41903-57-5	Total tetrachlorodibenzo-p-dioxin	2.99E-07 J	3.28E-06 J	MG/KG	SJS02-SB15-001	2/5	0.00000008 - 0.000000158	0.000003284	NA	NA	NA	NA	NO	NTX
	55722-27-5	Total tetrachlorodibenzofuran	1.94E-06 J	3.06E-05 J	MG/KG	SJS02-SB15-001	3/5	0.000000086 - 0.00000034	0.00003058	NA	NA	NA	NA	NO	NTX
	7429-90-5	Aluminum	1,960	21,700	MG/KG	SJS02-SB07-001	31/31	3.56 - 15.54	21700	7669	102,200 N	NA	NA	NO	BSL
	7440-36-0	Antimony	0.530 J	77.7	MG/KG	SJS02-SB12-001	10/27	0.33 - 1.88	77.7	0.6	40.9 N	NA	NA	YES	ASL
	7440-38-2	Arsenic	1.2 K	41.7	MG/KG	SJS02-SB12-001	30/31	0.33 - 1.7	41.7	5.7	1.91 C	NA	NA	YES	ASL
	7440-39-3	Barium	8.4 J	469	MG/KG	SJS02-SS20-000	31/31	0.03 - 0.68	469	61	7,154 N	NA	NA	NO	BSL
	7440-41-7	Beryllium	0.100 J	13.4	MG/KG	SJS02-SS06-000	25/31	0.02 - 0.25	13.4	0.28	204 N	NA	NA	NO	BSL
	7440-43-9	Cadmium	0.100 J	11.2	MG/KG	SJS02-SB12-001	22/31	0.05 - 1.02	11.2	ND	102 N	NA	NA	NO	BSL
	7440-70-2	Calcium	269 J	15,900	MG/KG	SJS02-SB12-001 SJS02-SS14-000	30/31	0.72 - 21.84	15900	1225	NA	NA	NA	NO	NUT
	7440-47-3	Chromium	2.5	246	MG/KG	SJS02-SS06-000	31/31	0.13 - 1.76	246	7	307 N	NA	NA	NO	BSL
	7440-48-4	Cobalt	0.5 J	62.6	MG/KG	SJS02-SS06-000	26/31	0.082 - 2.01	62.6	2.2	2,044 N	NA	NA	NO	BSL
	7440-50-8	Copper	2.5 J	4,260	MG/KG	SJS02-SS06-000	31/31	0.18 - 1.51	4260	5.1	4,088 N	NA	NA	YES	ASL
	57-12-5	Cyanide	0.203	0.85 J	MG/KG	SJS02-SS03-000	4/29	0.18 - 0.68	0.85	ND	2,044 N	NA	NA	NO	BSL
	7439-89-6	Iron	1,850	210,000	MG/KG	SJS02-SB12-001	31/31	0.24 - 6.8	210000	3669	30,660 N	NA	NA	YES	ASL
	7439-92-1	Lead	3.10	8,850	MG/KG	SJS02-SB12-001	31/31	0.17 - 1.02	8850	12	1,000	NA	NA	YES	ASL
	7439-95-4	Magnesium	126 J	12,300	MG/KG	SJS02-SB12-001	30/31	3.41 - 45.43	12300	527	NA	NA	NA	NO	NUT

Table 2.8

OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN

St. Juliens Creek Annex - Site 2

Scenario Timeframe: Future
Medium: Soil*
Exposure Medium: Soil*

Exposure Point	CAS Number	Chemical	Minimum [1] Concentration	Qualifier	Maximum [1] Concentration	Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration [2] Used for Screening	Background [3] Value	Screening [4] Toxicity Value		Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for [5] Contaminant Deletion or Selection
	7439-96-5	Manganese	5.90		1,260		MG/KG	SJS02-SB12-001	31/31	0.04 - 0.5	1260	14	2,044	N	NA	NA	NO	BSL
	7439-97-6	Mercury	0.0300	J	1		MG/KG	SJS02-SB11-001P	29/31	0.01 - 0.17	1	0.1	30.7	N	NA	NA	NO	BSL
	7440-02-0	Nickel	0.890	J	246		MG/KG	SJS02-SS06-000	30/31	0.15 - 1.76	246	6.9	2,044	N	NA	NA	NO	BSL
	7440-09-7	Potassium	149	J	2,270		MG/KG	SJS02-SB15-001	31/31	2.2 - 55.72	2270	368	NA		NA	NA	NO	NUT
	7782-49-2	Selenium	0.530	J	1		MG/KG	SJS02-SS02-000	8/31	0.34 - 1.7	1	0.7	511	N	NA	NA	NO	BSL
	7440-22-4	Silver	0.200	J	3.5		MG/KG	SJS02-SS16-000P	3/31	0.15 - 1.7	3.5	0.52	511	N	NA	NA	NO	BSL
	7440-23-5	Sodium	49.2	J	1,780		MG/KG	SJS02-SB12-001	15/31	9.59 - 166.73	1780	174	NA		NA	NA	NO	NUT
	7440-28-0	Thallium	0.76	J	6.2		MG/KG	SJS02-SS03-000	5/31	0.33 - 1.9	6.2	ND	7.15	N	NA	NA	NO	BSL
	7440-62-2	Vanadium	3.80	J	138		MG/KG	SJS02-SS20-000	31/31	0.1 - 2.26	138	26.6	31	N	NA	NA	YES	ASL
	7440-66-6	Zinc	4.20	J	7,560		MG/KG	SJS02-SS06-000	30/31	0.23 - 2.89	7560	13	30,660	N	NA	NA	NO	BSL
	7723-14-0	Phosphorus	2.3		153		MG/KG	SJS02-SS06-000	18/29	0.73 - 63	153	ND	NA	N	NA	NA	NO	NTX

* Surface soil & subsurface soil combined

[1] Minimum/Maximum detected concentrations.

[2] Maximum concentration is used for screening.

[3] Background data is lower of UCL for Bohicket or Munden-Tetotum background soil type from St. Julliens Creek Background Investigation.

[4] Tier II screening: With the exception of lead, all compounds are screened against the Risk-Based Concentration (RBC) Table, U.S. EPA Region III, Oct. 15, 2003 for industrial soil (cancer benchmark value = 1e-06; HQ = 0.1). Lead is screened against the EPA screening value of a value of 1000 mg/kg.
RBC value for napthalene used as surrogate for acenaphthylene.
RBC value for pyrene used as surrogate for phenanthrene and benzo(g,h,i)perylene.
RBC value for chlordane used as surrogate for alpha-chlordane and gamma-chlordane.
RBC value for chromium VI used for total chromium.
RBC value for manganese-nonfood used as surrogate for manganese.
RBC value for mercuric chloride used as surrogate for mercury.

[5] Rationale Codes

Selection Reason: Above Screening Levels (ASL)

Deletion Reason: No Toxicity Information (NTX)
Essential Nutrient (NUT)
Below Screening Level (BSL)

SQL = Sample Quantification Limit
COPC = Chemical of Potential Concern
ARAR/TBC = Applicable or Relevant and Appropriate Requirement/ To Be Considered
J = Estimated Value
K = Biased High
L = Biased Low
C = Carcinogenic
N = Noncarcinogenic
ND = Not detected

Table 2.9

OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN

St. Juliens Creek Annex - Site 2

Scenario Timeframe: Future
Medium: Soil*
Exposure Medium: Air

Exposure Point	CAS Number	Chemical	Minimum [1] Concentration Qualifier	Maximum [1] Concentration Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration [2] Used for Screening	Background [3] Value	Screening [4] Toxicity Value	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for [5] Contaminant Deletion or Selection
At Site 2	78-93-3	2-Butanone	1.2E-04	1.8E-03	MG/KG	SJS02-SS11-000	3/29	NA	1.8E-03	NA	5.1E+02 N	NA	NA	NO	BSL
	67-64-1	Acetone	3.7E-04 J	1.3E-02	MG/KG	SJS02-SB04-004	5/29	NA	1.3E-02	NA	3.3E+02 N	NA	NA	NO	BSL
	75-15-0	Carbon disulfide	2.1E-02	2.1E-02	MG/KG	SJS02-SB07-001	1/29	NA	2.1E-02	NA	7.3E+01 N	NA	NA	NO	BSL
	108-88-3	Toluene	1.9E-04 J	3.9E-04 J	MG/KG	SJS02-SS08-000	2/29	NA	3.9E-04	NA	4.2E+01 N	NA	NA	NO	BSL
	79-01-6	Trichloroethene	2.8E-03	2.8E-03 UJ	MG/KG	SJS02-SB06-001 SJS02-SB07-001	1/29	NA	2.8E-03	NA	1.6E-02 C	NA	NA	NO	BSL
	91-57-6	2-Methylnaphthalene	4.1E-03 J	4.1E-03 J	MG/KG	SJS02-SS03-000	1/29	NA	4.1E-03	NA	7.3E+00 N	NA	NA	NO	BSL
	83-32-9	Acenaphthene	3.5E-04 J	6.0E-04 J	MG/KG	SJS02-SS03-000	2/29	NA	6.0E-04	NA	2.2E+01 N	NA	NA	NO	BSL
	208-96-8	Acenaphthylene	2.8E-08 J	6.2E-07 J	MG/KG	SJS02-SS03-000	9/29	NA	6.2E-07	NA	3.3E-01 N	NA	NA	NO	BSL
	120-12-7	Anthracene	4.2E-05 J	5.8E-04 J	MG/KG	SJS02-SS03-000	8/29	NA	5.8E-04	NA	1.1E+02 N	NA	NA	NO	BSL
	56-55-3	Benzo(a)anthracene	9.1E-08 J	1.7E-06	MG/KG	SJS02-SS03-000	16/29	NA	1.7E-06	NA	8.6E-03 C	NA	NA	NO	BSL
	50-32-8	Benzo(a)pyrene	3.6E-08 J	1.1E-06 J	MG/KG	SJS02-SS03-000	17/29	NA	1.1E-06	NA	2.0E-03 C	NA	NA	NO	BSL
	205-99-2	Benzo(b)fluoranthene	3.6E-08 J	1.3E-06 J	MG/KG	SJS02-SS03-000	19/29	NA	1.3E-06	NA	8.6E-03 C	NA	NA	NO	BSL
	191-24-2	Benzo(g,h,i)perylene	5.8E-08 J	6.7E-07 J	MG/KG	SJS02-SS03-000	15/29	NA	6.7E-07	NA	1.1E+01 N	NA	NA	NO	BSL
	207-08-9	Benzo(k)fluoranthene	4.7E-08 J	8.3E-07 J	MG/KG	SJS02-SS03-000	16/29	NA	8.3E-07	NA	8.6E-02 C	NA	NA	NO	BSL
	85-68-7	Butylbenzylphthalate	4.3E-08 J	2.1E-07 J	MG/KG	SJS02-SS06-000	2/29	NA	2.1E-07	NA	7.3E+01 N	NA	NA	NO	BSL
	86-74-8	Carbazole	9.1E-08 J	2.3E-07 J	MG/KG	SJS02-SS03-000	2/29	NA	2.3E-07	NA	3.1E-01 C	NA	NA	NO	BSL
	218-01-9	Chrysene	4.9E-08 J	2.0E-06	MG/KG	SJS02-SS03-000	17/29	NA	2.0E-06	NA	8.6E-01 C	NA	NA	NO	BSL
	84-74-2	Di-n-butylphthalate	3.6E-08 J	3.9E-07 J	MG/KG	SJS02-SS20-000	4/29	NA	3.9E-07	NA	3.7E+01 N	NA	NA	NO	BSL
	53-70-3	Dibenz(a,h)anthracene	4.1E-08 J	9.8E-08 J	MG/KG	SJS02-SB11-001P	3/29	NA	9.8E-08	NA	8.6E-04 C	NA	NA	NO	BSL
	132-64-9	Dibenzofuran	2.7E-04 J	2.7E-04 J	MG/KG	SJS02-SS02-000	1/29	NA	2.7E-04	NA	7.3E-01 N	NA	NA	NO	BSL
	206-44-0	Fluoranthene	3.4E-08 J	3.8E-06	MG/KG	SJS02-SS03-000	19/29	NA	3.8E-06	NA	1.5E+01 N	NA	NA	NO	BSL
	86-73-7	Fluorene	1.7E-04 J	5.7E-04 UJ	MG/KG	SJS02-SS03-000 SJS02-SB10-001	2/29	NA	5.7E-04	NA	1.5E+01 N	NA	NA	NO	BSL
	193-39-5	Indeno(1,2,3-cd)pyrene	6.5E-08 J	6.1E-07 J	MG/KG	SJS02-SS03-000	16/29	NA	6.1E-07	NA	8.6E-03 C	NA	NA	NO	BSL
	91-20-3	Naphthalene	7.2E-04 J	7.2E-04 J	MG/KG	SJS02-SS02-000	1/29	NA	7.2E-04	NA	3.3E-01 N	NA	NA	NO	BSL
	85-01-8	Phenanthrene	2.9E-08 J	3.3E-06	MG/KG	SJS02-SS03-000	16/29	NA	3.3E-06	NA	1.1E+01 N	NA	NA	NO	BSL
	129-00-0	Pyrene	9.8E-06 J	1.5E-03	MG/KG	SJS02-SS03-000	19/29	NA	1.5E-03	NA	1.1E+01 N	NA	NA	NO	BSL
	117-81-7	bis(2-Ethylhexyl)phthalate	1.5E-07	3.0E-07 J	MG/KG	SJS02-SS20-000	6/29	NA	3.0E-07	NA	4.5E-01 C	NA	NA	NO	BSL
	72-54-8	4,4'-DDD	7.6E-10 J	3.2E-06	MG/KG	SJS02-SS09-000	21/29	NA	3.2E-06	NA	2.6E-02 C	NA	NA	NO	BSL
	72-55-9	4,4'-DDE	3.3E-10 J	5.5E-06 J	MG/KG	SJS02-SS20-000	28/29	NA	5.5E-06	NA	1.8E-02 C	NA	NA	NO	BSL
	50-29-3	4,4'-DDT	5.2E-10 J	2.2E-04 J	MG/KG	SJS02-SB08-001	28/28	NA	2.2E-04	NA	1.8E-02 C	NA	NA	NO	BSL
	11096-82-5	Aroclor-1260	1.1E-08 J	8.3E-08 J	MG/KG	SJS02-SS03-000 SJS02-SS04-000	6/29	NA	8.3E-08	NA	3.1E-03 C	NA	NA	NO	BSL
	60-57-1	Dieldrin	6.0E-10 J	2.9E-09 J	MG/KG	SJS02-SS02-000	4/29	NA	2.9E-09	NA	3.9E-04 C	NA	NA	NO	BSL
	76-44-8	Heptachlor	1.7E-09 J	1.7E-09 J	MG/KG	SJS02-SS12-000	1/29	NA	1.7E-09	NA	1.4E-03 C	NA	NA	NO	BSL
	5103-71-9	alpha-Chlordane	6.1E-10 J	3.8E-08 J	MG/KG	SJS02-SS12-000	7/29	NA	3.8E-08	NA	1.8E-02 C	NA	NA	NO	BSL
	5103-74-2	gamma-Chlordane	1.5E-09 UJ	2.9E-08 J	MG/KG	SJS02-SB08-001	6/29	NA	2.9E-08	NA	1.8E-02 C	NA	NA	NO	BSL
	35822-46-9	1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	6.0E-12 J	8.9E-11 J	MG/KG	SJS02-SB15-001	5/5	NA	8.9E-11	NA	1.9E-03 C	NA	NA	NO	BSL

Table 2.9

OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN

St. Juliens Creek Annex - Site 2

Scenario Timeframe: Future
Medium: Soil*
Exposure Medium: Air

Exposure Point	CAS Number	Chemical	Minimum [1] Concentration Qualifier	Maximum [1] Concentration Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration [2] Used for Screening	Background [3] Value	Screening [4] Toxicity Value	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for [5] Contaminant Deletion or Selection
	67562-39-4	1,2,3,4,6,7,8-Heptachlorodibenzofuran	2.3E-13 NJ	3.3E-11 J	MG/KG	SJS02-SB15-001	4/5	NA	3.3E-11	NA	1.9E-03 C	NA	NA	NO	BSL
	55673-89-7	1,2,3,4,7,8,9-Heptachlorodibenzofuran	2.4E-12 J	2.4E-12 J	MG/KG	SJS02-SB15-001	1/5	NA	2.4E-12	NA	1.9E-03 C	NA	NA	NO	BSL
	39227-28-6	1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	3.0E-13 NJ	1.5E-12 J	MG/KG	SJS02-SB15-001	3/5	NA	1.5E-12	NA	1.9E-04 C	NA	NA	NO	BSL
	70648-26-9	1,2,3,4,7,8-Hexachlorodibenzofuran	8.4E-13 J	6.6E-12 J	MG/KG	SJS02-SB15-001	3/5	NA	6.6E-12	NA	1.9E-04 C	NA	NA	NO	BSL
	57653-85-7	1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	4.2E-13 J	3.4E-12 J	MG/KG	SJS02-SB15-001	4/5	NA	3.4E-12	NA	1.9E-04 C	NA	NA	NO	BSL
	57117-44-9	1,2,3,6,7,8-Hexachlorodibenzofuran	1.2E-12 I	2.9E-12 NJ	MG/KG	SJS02-SB15-001	2/5	NA	2.9E-12	NA	1.9E-04 C	NA	NA	NO	BSL
	19408-74-3	1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	4.7E-13 J	4.0E-12 J	MG/KG	SJS02-SB15-001	5/5	NA	4.0E-12	NA	1.9E-04 C	NA	NA	NO	BSL
	40321-76-4	1,2,3,7,8-Pentachlorodibenzo-p-dioxin	1.1E-12 J	1.1E-12 J	MG/KG	SJS02-SB15-001	1/5	NA	1.1E-12	NA	1.9E-04 C	NA	NA	NO	BSL
	57117-41-6	1,2,3,7,8-Pentachlorodibenzofuran	3.3E-12 J	3.3E-12 J	MG/KG	SJS02-SB15-001	1/5	NA	3.3E-12	NA	3.8E-05 C	NA	NA	NO	BSL
	60851-34-5	2,3,4,6,7,8-Hexachlorodibenzofuran	3.8E-13 J	2.8E-12 J	MG/KG	SJS02-SB15-001	2/5	NA	2.8E-12	NA	3.8E-04 C	NA	NA	NO	BSL
	57117-31-4	2,3,4,7,8-Pentachlorodibenzofuran	3.6E-13 J	3.3E-12 J	MG/KG	SJS02-SB15-001	3/5	NA	3.3E-12	NA	1.9E-04 C	NA	NA	NO	BSL
	1746-01-6	2,3,7,8-TCDD (dioxin)	2.5E-13 NJ	2.5E-13 NJ	MG/KG	SJS02-SB15-001	1/5	NA	2.5E-13	NA	3.8E-05 C	NA	NA	NO	BSL
	51207-31-9	2,3,7,8-Tetrachlorodibenzofuran	5.9E-13 NJ	4.8E-12 J	MG/KG	SJS02-SB15-001	3/5	NA	4.8E-12	NA	1.9E-05 C	NA	NA	NO	BSL
	3286-87-9	Octachlorodibenzo-p-dioxin	1.7E-10 J	1.1E-09 J	MG/KG	SJS02-SB19-001	5/5	NA	1.1E-09	NA	1.9E-02 C	NA	NA	NO	BSL
	39001-02-0	Octachlorodibenzofuran	5.2E-13 J	6.0E-11 J	MG/KG	SJS02-SB15-001	4/5	NA	6.0E-11	NA	1.9E-02 C	NA	NA	NO	BSL
	37871-00-4	Total heptachlorodibenzo-p-dioxin	1.6E-11 J	2.1E-10 J	MG/KG	SJS02-SB15-001	5/5	NA	2.1E-10	NA	NA	NA	NA	NO	NTX
	38998-75-3	Total heptachlorodibenzofuran	3.3E-13	3.5E-11 J	MG/KG	SJS02-SB15-001	4/5	NA	3.5E-11	NA	NA	NA	NA	NO	NTX
	34465-46-8	Total hexachlorodibenzo-p-dioxin	3.6E-12 J	3.0E-11 J	MG/KG	SJS02-SB15-001	5/5	NA	3.0E-11	NA	NA	NA	NA	NO	NTX
	55684-94-1	Total hexachlorodibenzofuran	2.1E-12 J	5.6E-11 J	MG/KG	SJS02-SB15-001	3/5	NA	5.6E-11	NA	NA	NA	NA	NO	NTX
	36088-22-9	Total pentachlorodibenzo-p-dioxin	4.1E-13 J	2.4E-12 J	MG/KG	SJS02-SB15-001	2/5	NA	2.4E-12	NA	NA	NA	NA	NO	NTX
	30402-15-4	Total pentachlorodibenzofuran	2.1E-12 J	2.2E-11 J	MG/KG	SJS02-SB15-001	3/5	NA	2.2E-11	NA	NA	NA	NA	NO	NTX
	41903-57-5	Total tetrachlorodibenzo-p-dioxin	2.3E-13 J	2.5E-12 J	MG/KG	SJS02-SB15-001	2/5	NA	2.5E-12	NA	NA	NA	NA	NO	NTX
	55722-27-5	Total tetrachlorodibenzofuran	1.5E-12 J	2.3E-11 J	MG/KG	SJS02-SB15-001	3/5	NA	2.3E-11	NA	NA	NA	NA	NO	NTX
	7429-90-5	Aluminum	1.5E-03	1.6E-02	MG/KG	SJS02-SB07-001	31/31	NA	1.6E-02	NA	3.7E-01 N	NA	NA	NO	BSL
	7440-36-0	Antimony	4.0E-07 J	5.9E-05	MG/KG	SJS02-SB12-001	10/27	NA	5.9E-05	NA	1.5E-01 N	NA	NA	NO	BSL
	7440-38-2	Arsenic	9.1E-07 K	3.2E-05	MG/KG	SJS02-SB12-001	30/31	NA	3.2E-05	NA	4.1E-04 C	NA	NA	NO	BSL
	7440-39-3	Barium	6.4E-06 J	3.6E-04	MG/KG	SJS02-SS20-000	31/31	NA	3.6E-04	NA	5.1E-02 N	NA	NA	NO	BSL
	7440-41-7	Beryllium	7.6E-08 J	1.0E-05	MG/KG	SJS02-SS06-000	25/31	NA	1.0E-05	NA	7.5E-04 C	NA	NA	NO	BSL
	7440-43-9	Cadmium	7.6E-08 J	8.5E-06	MG/KG	SJS02-SB12-001	22/31	NA	8.5E-06	NA	9.9E-04 C	NA	NA	NO	BSL
	7440-70-2	Calcium	2.0E-04 J	1.2E-02	MG/KG	SJS02-SB12-001 SJS02-SS14-000	30/31	NA	1.2E-02	NA	NA	NA	NA	NO	NUT
	7440-47-3	Chromium	1.9E-06	1.9E-04	MG/KG	SJS02-SS06-000	31/31	NA	1.9E-04	NA	1.5E-04 C	NA	NA	YES	ASL
	7440-48-4	Cobalt	3.8E-07 J	4.7E-05	MG/KG	SJS02-SS06-000	26/31	NA	4.7E-05	NA	6.4E-04 C	NA	NA	NO	BSL
	7440-50-8	Copper	1.9E-06 J	3.2E-03	MG/KG	SJS02-SS06-000	31/31	NA	3.2E-03	NA	1.5E+01 N	NA	NA	NO	BSL
	57-12-5	Cyanide	1.5E-07	6.4E-07 J	MG/KG	SJS02-SS03-000	4/29	NA	6.4E-07	NA	7.3E+00 N	NA	NA	NO	BSL
	7439-89-6	Iron	1.4E-03	1.6E-01	MG/KG	SJS02-SB12-001	31/31	NA	1.6E-01	NA	1.1E+02 N	NA	NA	NO	BSL
	7439-92-1	Lead	2.3E-06	6.7E-03	MG/KG	SJS02-SB12-001	31/31	NA	6.7E-03	NA	4.0E+02 N	NA	NA	NO	BSL
	7439-95-4	Magnesium	9.5E-05 J	9.3E-03	MG/KG	SJS02-SB12-001	30/31	NA	9.3E-03	NA	NA	NA	NA	NO	NUT

Table 2.9

OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN

St. Juliens Creek Annex - Site 2

Scenario Timeframe: Future
Medium: Soil*
Exposure Medium: Air

Exposure Point	CAS Number	Chemical	Minimum [1] Concentration	Qualifier	Maximum [1] Concentration	Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration [2] Used for Screening	Background [3] Value	Screening [4] Toxicity Value		Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for [5] Contaminant Deletion or Selection
	7439-96-5	Manganese	4.5E-06		9.5E-04		MG/KG	SJS02-SB12-001	31/31	NA	9.5E-04	NA	5.2E-03	N	NA	NA	NO	BSL
	7439-97-6	Mercury	7.0E-04	J	2.3E-02		MG/KG	SJS02-SB11-001P	29/31	NA	2.3E-02	NA	3.1E-02	N	NA	NA	NO	BSL
	7440-02-0	Nickel	6.7E-07	J	1.9E-04		MG/KG	SJS02-SS06-000	30/31	NA	1.9E-04	NA	7.3E+00	N	NA	NA	NO	BSL
	7440-09-7	Potassium	1.1E-04	J	1.7E-03		MG/KG	SJS02-SB15-001	31/31	NA	1.7E-03	NA	NA		NA	NA	NO	NUT
	7782-49-2	Selenium	4.0E-07	J	7.6E-07		MG/KG	SJS02-SS02-000	8/31	NA	7.6E-07	NA	1.8E+00	N	NA	NA	NO	BSL
	7440-22-4	Silver	1.5E-07	J	2.7E-06		MG/KG	SJS02-SS16-000	3/31	NA	2.7E-06	NA	1.8E+00	N	NA	NA	NO	BSL
	7440-23-5	Sodium	3.7E-05	J	1.3E-03		MG/KG	SJS02-SB12-001	15/31	NA	1.3E-03	NA	NA		NA	NA	NO	NUT
	7440-28-0	Thallium	5.8E-07	J	4.7E-06		MG/KG	SJS02-SS03-000	5/31	NA	4.7E-06	NA	2.6E-02	N	NA	NA	NO	BSL
	7440-62-2	Vanadium	2.9E-06	J	1.0E-04		MG/KG	SJS02-SS20-000	31/31	NA	1.0E-04	NA	1.1E-01	N	NA	NA	NO	BSL
	7440-66-6	Zinc	3.2E-06	J	5.7E-03		MG/KG	SJS02-SS06-000	30/31	NA	5.7E-03	NA	1.1E+02	N	NA	NA	NO	BSL
	7723-14-0	Phosphorus	1.7E-06		1.2E-04		MG/KG	SJS02-SS06-000	18/29	NA	1.2E-04	NA	NA	N	NA	NA	NO	NTX

* Surface soil & subsurface soil combined

[1] Minimum/Maximum calculated air concentrations from soil concentrations. Air concentrations calculated as Cair = Csoil*1000*(1/PEF+1/VF)
VF only included in calculation for VOCs. VF calculated on Table 2.2A. PEF = 1.32E+09 m3/kg.

[2] Maximum concentration is used for screening.

[3] Background values not available.

[4] Risk-Based Concentration Table, Ambient Air, April 25, 2003, U.S. EPA Region III, Jennifer Hubbard.
RBC value for napthalene used as surrogate for acenaphthylene.
RBC value for pyrene used as surrogate for phenanthrene and benzo(g,h,i)perylene.
RBC value for chlordane used as surrogate for alpha-chlordane and gamma-chlordane.
RBC value for chromium VI used for total chromium.
RBC value for manganese-nonfood used as surrogate for manganese.

[5] Rationale Codes

Selection Reason: Above Screening Levels (ASL)
Deletion Reason: No Toxicity Information (NTX)
Essential Nutrient (NUT)
Below Screening Level (BSL)

SQL = Sample Quantification Limit
COPC = Chemical of Potential Concern
ARAR/TBC = Applicable or Relevant and Appropriate Requirement/ To Be Considered
J = Estimated Value
K = Biased High
L = Biased Low
C = Carcinogenic
N = Noncarcinogenic
ND = Not detected

Table 2.9A

Calculation of Volatilization Factor - Combined Subsurface and Surface Soil

St. Julien's Creek Annex - Site 2

Chemical	Diffusivity in Air (D_i) (cm^2/s)	Henry's Law Constant (H') (unitless)	Diffusivity in Water (D_w) (cm^2/s)	Soil Organic Carbon Partition Coeff. (K_{oc}) (cm^3/g)	Soil Water Partition Coeff. ($K_d = K_{oc} \times F_{oc}$) ($g/cm^3$)	Solubility in Water (S) (mg/L)	Apparent Diffusivity (D_A) (cm^2/s)	Volatilization Factor (VF) (m^3/kg)	Soil S Conc (r
Volatile Organics									
2-Butanone	4.05E-02	1.05E-05	3.80E-05	4.50E+00	2.70E-02	2.39E+05	2.08E-06	1.14E+05	3.(
Acetone	1.24E-01	1.59E-03	1.14E-05	5.75E-01	3.45E-03	1.00E+06	1.02E-04	1.63E+04	1.(
Carbon Disulfide	1.04E-01	1.24E+00	1.00E-05	4.57E+01	2.74E-01	1.19E+03	1.13E-02	1.55E+03	7.:
Toluene	8.70E-02	2.72E-01	8.60E-06	1.82E+02	1.09E+00	5.26E+02	1.01E-03	5.16E+03	6.!
Trichloroethene	7.90E-02	4.22E-01	9.10E-06	1.66E+02	9.96E-01	1.10E+03	1.51E-03	4.23E+03	1.:
Semivolatile Organics									
2-Methylnaphthalene	5.60E-02	2.07E-02	7.84E-06	2.13E+03	1.28E+01	2.54E+01	4.80E-06	7.50E+04	3.:
Acenaphthene	4.21E-02	6.36E-03	7.69E-06	7.08E+03	4.25E+01	4.24E+00	3.36E-07	2.83E+05	1.!
Anthracene	3.24E-02	2.67E-03	7.74E-06	2.95E+04	1.77E+02	4.34E-02	2.63E-08	1.01E+06	7.(
Dibenzofuran	6.19E-02	3.98E-03	1.00E-05	5.48E+03	3.29E+01	5.65E+00	4.00E-07	2.60E+05	1.!
Fluorene	3.63E-02	2.61E-03	7.88E-06	1.38E+04	8.28E+01	1.98E+00	6.15E-08	6.63E+05	1.(
Napthalene	5.90E-02	1.98E-02	7.50E-06	2.00E+03	1.20E+01	3.10E+01	5.15E-06	7.24E+04	3.'
Pyrene	2.72E-02	4.51E-04	7.24E-06	1.05E+05	6.30E+02	1.35E-01	1.11E-09	4.93E+06	8.!
bis(2-Ethylhexyl)phthalate	3.51E-02	4.18E-06	3.66E-06	1.51E+07	9.06E+04	3.40E-01	3.43E-13	2.81E+08	3.(
Mercury	3.07E-02	4.67E-01	6.30E-06		52		1.46E-05	4.29E+04	

Volatilization factor (VF) = (m^3/kg)

$$\frac{Q/C * (3.14 * D_A * T)^{1/2} * 10^{-4}\ m^2/cm^2}{2 * r_b * D_A}$$

Apparent Diffusivity (D_A) = (cm^2/s)

$$\frac{[(Q_a^{10/3} * D_i * H' + Q_w^{10/3} * D_w)/n^2]}{(r_b * K_d + Q_w + Q_a * H')}$$

Soil Saturation Concentration (C_{sat}) =

$$S/r_b * (K_d * r_b + Q_w + H' * Q_a)$$

Parameters	Values
Q/C - Inverse of the mean concentration at the center of a 0.5-acre-square source located in Philadelphia, PA (g/m^2-s per kg/m^3)	90.24
T - Exposure interval(s)	9.5E+08
r_b - Soil bulk density (g/cm^3)	1.5
Q_a - Air-filled soil porosity (L_{air}/L_{water}) = n - Q_w	0.28
n - Total soil porosity (Lpore/Lsoil) = 1 - (r_b/r_s)	0.43
Q_w - Water-filled soil porosity (Lwater/Lsoil)	0.15
r_s - Soil particle density (g/cm^3)	2.65
f_{oc} - fraction organic carbon in soil (g/g)	0.006

Equations and chemical properties from USEPA, 1996. *Soil Screening Guidance: User's Guide.* EPA/540/R-96/018.
Physical/chemical properties not listed in USEPA, 1996 obtained from USEPA Region 9 Preliminary Remediation Goal support tables, 2002.

Table 2.10

OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN

St. Juliens Creek Annex - Site 2

Scenario Timeframe: Future
Medium: Surface Water
Exposure Medium: Surface Water

Exposure Point	CAS Number	Chemical	Minimum [1] Concentration Qualifier	Maximum [1] Concentration Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration [2] Used for Screening	Background [3] Value	Screening [4] Toxicity Value	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for [5] Contaminant Deletion or Selection
Drainage Features and Ponded Area	75-35-4	1,1-Dichloroethene	0.300 J	0.700 J	UG/L	SJS02-SW04-001	2/9	1 - 10	0.7	NA	353 N	17,000	VAWQS	NO	BSL
	120-82-1	1,2,4-Trichlorobenzene	0.100 J	0.400 J	UG/L	SJS02-SW08-001P	2/8	1 - 10	0.4	NA	7.16 N	950	VAWQS	NO	BSL
	67-64-1	Acetone	1.60 J	1.60 J	UG/L	SJS02-SW08-002	1/4	5 - 10	1.6	NA	5,475 N	--		NO	BSL
	75-27-4	Bromodichloromethane	0.800 J	1.30	UG/L	SJS02-SW06-001	2/9	1 - 10	1.3	NA	1.70 C	460	VAWQS	NO	BSL
	75-25-2	Bromoform	0.400 J	0.800 J	UG/L	SJS02-SW08-001, SJS02-SW08-001P	2/9	1 - 10	0.8	NA	84.8 C	3,600	VAWQS	NO	BSL
	75-15-0	Carbon disulfide	0.300 J	10.3	UG/L	SJS02-SW08-001P	3/9	1 - 10	10.3	NA	1,043 N	--		NO	BSL
	67-66-3	Chloroform	0.200 J	5.40	UG/L	SJS02-SW06-001	3/9	1 - 10	5.4	NA	1.55 C	4,700	VAWQS	YES	ASL
	124-48-1	Dibromochloromethane	0.200 J	0.300 J	UG/L	SJS02-SW06-001	2/9	1 - 10	0.3	NA	1.26 C	57,000	VAWQS	NO	BSL
	100-41-4	Ethylbenzene	0.200 J	0.200 J	UG/L	SJS02-SW08-001P	1/9	1 - 10	0.2	NA	1,340 N	29,000	VAWQS	NO	BSL
	79-01-6	Trichloroethene	0.300 J	130	UG/L	SJS02-SW09	7/9	1 - 10	130	NA	0.26 C	810	VAWQS	YES	ASL
	75-01-4	Vinyl chloride	1.40	21.9	UG/L	SJS02-SW04-001	5/9	1 - 10	21.9	NA	0.15 C	5,300	VAWQS	YES	ASL
	1330-20-7	Xylene, total	0.800 J	0.800 J	UG/L	SJS02-SW08-001P	1/9	1 - 10	0.8	NA	213 N	--		NO	BSL
	156-59-2	cis-1,2-Dichloroethene	0.200 J	84	UG/L	SJS02-SW09	7/8	1 - 10	84	NA	60.8 N	--		YES	ASL
	156-60-5	trans-1,2-Dichloroethene	0.200 J	0.5 J	UG/L	SJS02-SW04-001	4/8	1 - 10	0.5	NA	122 N	--		NO	BSL
	100-52-7	Benzaldehyde	3.6 J	3.6 J	UG/L	SJS02-SW09	1/1	10 - 10	3.6	NA	3,650 N	--		NO	BSL
	117-81-7	bis(2-Ethylhexyl)phthalate	3 J	84	UG/L	SJS02-SW07-001	2/9	10 - 11	84	NA	47.8 C	59	VAWQS	YES	ASL
	72-54-8	4,4'-DDD	0.0130 J	0.200	UG/L	SJS02-SW04-001	5/9	0.1 - 0.12	0.2	NA	2.79 C	0.0084	VAWQS	NO	BSL
	99-08-1	3-Nitrotoluene	0.5 J	3.5	UG/L	SJS02-SW04-001	4/9	1.3 - 25	3.5	NA	122 N	--		NO	BSL
	7429-90-5	Aluminum	49.1	9,390	UG/L	SJS02-SW06-001	9/9	18.7 - 45.7	9390	NA	36,500 N	--		NO	BSL
	7440-36-0	Antimony	2 J	3.30 J	UG/L	SJS02-SW08-002	2/9	2 - 3.7	3.3	NA	14.6 N	4,300	VAWQS	NO	BSL
	7440-38-2	Arsenic	3.1 J	4.40 J	UG/L	SJS02-SW04-001	2/9	2 - 5	4.4	NA	0.446 C	--		YES	ASL
	7440-39-3	Barium	16.5 J	70.7 J	UG/L	SJS02-SW02-000	8/9	0.20 - 2	70.7	NA	2,555 N	--		NO	BSL
	7440-41-7	Beryllium	3.5 J	3.5 J	UG/L	SJS02-SW06-001	1/9	0.1 - 1	3.5	NA	73 N	--		NO	BSL
	7440-43-9	Cadmium	0.330 J	2.5 J	UG/L	SJS02-SW05-001	8/9	0.3 - 3	2.5	NA	18.3 N	--		NO	BSL
	7440-70-2	Calcium	35,700 J	214,000 J	UG/L	SJS02-SW02-000	9/9	10.7 - 57.9	214000	NA	NA	--		NO	NUT
	7440-47-3	Chromium	2.10 J	166	UG/L	SJS02-SW02-000P	8/9	0.60 - 5	166	NA	110 N	--		YES	ASL
	7440-48-4	Cobalt	1.10 J	55	UG/L	SJS02-SW06-001	2/9	0.5 - 8	55	NA	730 N	--		NO	BSL
	7440-50-8	Copper	6.5 J	203	UG/L	SJS02-SW02-000	9/9	0.80 - 2.2	203	NA	1,460 N	--		NO	BSL
	57-12-5	Cyanide	18 L	18.9 L	UG/L	SJS02-SW03-001	2/8	5 - 5	18.9	NA	730 N	215,000	VAWQS	NO	BSL
	7439-89-6	Iron	716 L	18,800 L	UG/L	SJS02-SW06-001	9/9	5 - 30.8	18800	NA	11,000 N	--		YES	ASL
	7439-92-1	Lead	2.80 J	77.9 L	UG/L	SJS02-SW02-000P	6/9	1 - 3	77.9	NA	15	--		YES	ASL
	7439-95-4	Magnesium	6,230 J	665,000 L	UG/L	SJS02-SW02-000	9/9	24.3 - 243	665000	NA	NA	--		NO	NUT
	7439-96-5	Manganese	61.9 J	2,490 L	UG/L	SJS02-SW06-001	9/9	0.30 - 1.2	2490	NA	730 N	--		YES	ASL
	7440-02-0	Nickel	2.60 J	81.4	UG/L	SJS02-SW06-001	7/9	0.9 - 7	81.4	NA	730 N	4,600	VAWQS	NO	BSL
	7440-09-7	Potassium	4,420 J	237,000	UG/L	SJS02-SW02-000	9/9	13.5 - 135	237000	NA	NA	--		NO	NUT

Table 2.10

OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN

St. Juliens Creek Annex - Site 2

Scenario Timeframe: Future
Medium: Surface Water
Exposure Medium: Surface Water

Exposure Point	CAS Number	Chemical	Minimum [1] Concentration Qualifier	Maximum [1] Concentration Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration [2] Used for Screening	Background [3] Value	Screening [4] Toxicity Value	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for [5] Contaminant Deletion or Selection
	7440-23-5	Sodium	28,200 J	5,640,000	UG/L	SJS02-SW02-000	9/9	28 - 2040	5640000	NA	NA	--		NO	NUT

Table 2.10

OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN

St. Juliens Creek Annex - Site 2

Scenario Timeframe: Future
Medium: Surface Water
Exposure Medium: Surface Water

Exposure Point	CAS Number	Chemical	Minimum [1] Concentration Qualifier	Maximum [1] Concentration Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration [2] Used for Screening	Background [3] Value	Screening [4] Toxicity Value	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for [5] Contaminant Deletion or Selection
	7440-62-2	Vanadium	4.60 J	32.8 J	UG/L	SJS02-SW02-000P	3/9	0.60 - 4	32.8	NA	11 N	--		YES	ASL
	7440-66-6	Zinc	23.4 J	1,310 J	UG/L	SJS02-SW06-001	9/9	0.7 - 8.5	1310	NA	10,950 N	--		NO	BSL
	7723-14-0	Phosphorus	65.0	202	UG/L	SJS02-SW02-000	5/7	20 - 50	202	NA	NA	--		NO	NTX

[1] Minimum/Maximum detected concentrations.

[2] Maximum concentration is used for screening.

[3] No background study has been completed for the St. Juliens Creek Annex surface water.

[4] Tier I screening: With the exception of lead, all compounds are screened against 10 times the Risk-Based Concentration (RBC) Table, U.S. EPA Region III, Oct. 15, 2003 for tap water (10 times the cancer benchmark value = 1e-06; 10 times the HQ = 0.1). Lead is screened against the MCL value of a value of 15 ug/l.
RBC value for chromium VI used for total chromium.
Lead screening toxicity value is 15 ug/L, the Safe Drinking Water Act action level.
RBC value for manganese-nonfood used as surrogate for manganese.

[5] Rationale Codes

Selection Reason: Above Screening Levels (ASL)

Deletion Reason: No Toxicity Information (NTX)
Essential Nutrient (NUT)
Below Screening Level (BSL)

Surface Water Samples: SW-02 - Phase I; SW-03 through SW-08 -Phase II; and SW-08 - 2 - Phase II; and SW-09 in 2001.

SQL = Sample Quantification Limit
COPC = Chemical of Potential Concern
ARAR/TBC = Applicable or Relevant and Appropriate Requirement/ To Be Considered
J = Estimated Value
K = Biased High
L = Biased Low
C = Carcinogenic
N = Noncarcinogenic
VAWQS = Virginia Water Quality Standard
ND = Not detected

Table 2.11

OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN

St. Juliens Creek Annex - Site 2

Scenario Timeframe: Future
Medium: Sediment
Exposure Medium: Sediment

Exposure Point	CAS Number	Chemical	Minimum [1] Concentration Qualifier	Maximum [1] Concentration Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration [2] Used for Screening	Background [3] Value	Screening [4] Toxicity Value	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for [5] Contaminant Deletion or Selection
Drainage Features and Ponded Area	71-55-6	1,1,1-Trichloroethane	0.007 J	0.007 J	MG/KG	SJS02-SD06-001	1/10	0.011 - 0.037	0.007	NA	21,900 N	NA	NA	NO	BSL
	540-59-0	1,2-Dichloroethene (total)	0.003 J	0.009 J	MG/KG	SJS02-SD03-000P	2/9	0.011 - 0.037	0.009	NA	704 N	NA	NA	NO	BSL
	108-10-1	4-Methyl-2-pentanone	0.005 J	0.005 J	MG/KG	SJS02-SD02-000	1/10	0.011 - 0.037	0.005	NA	NA	NA	NA	NO	NTX
	67-64-1	Acetone	0.021 J	0.45	MG/KG	SJS02-SD03-000P	4/8	0.011 - 0.037	0.45	NA	919,800 N	NA	NA	NO	BSL
	74-83-9	Bromomethane	0.0063 J	0.0063 J	MG/KG	SJS02-SD09	1/10	0.011 - 0.037	0.0063	NA	110 N	NA	NA	NO	BSL
	75-15-0	Carbon disulfide	0.004 J	0.081	MG/KG	SJS02-SD03-000P	2/10	0.011 - 0.037	0.081	NA	7,821 N	NA	NA	NO	BSL
	67-66-3	Chloroform	0.003 J	0.003 J	MG/KG	SJS02-SD07-001	1/10	0.011 - 0.037	0.003	NA	782 N	NA	NA	NO	BSL
	108-88-3	Toluene	0.004 J	0.004 J	MG/KG	SJS02-SD04-001	1/10	0.011 - 0.037	0.004	NA	15,643 N	NA	NA	NO	BSL
	79-01-6	Trichloroethene	0.004 J	0.01 J	MG/KG	SJS02-SD08-001	3/10	0.011 - 0.037	0.01	NA	16 C	NA	NA	NO	BSL
	120-12-7	Anthracene	0.1 J	0.17 J	MG/KG	SJS02-SD05-001	3/9	0.33 - 9.1	0.17	NA	23,464 N	NA	NA	NO	BSL
	56-55-3	Benzo(a)anthracene	0.086 J	1.3 J	MG/KG	SJS02-SD05-001	7/10	0.33 - 9.1	1.3	NA	8.75 C	NA	NA	NO	BSL
	50-32-8	Benzo(a)pyrene	0.079 J	0.91 J	MG/KG	SJS02-SD05-001	7/10	0.33 - 9.1	0.91	NA	0.875 C	NA	NA	YES	ASL
	205-99-2	Benzo(b)fluoranthene	0.11 J	1.3 L	MG/KG	SJS02-SD03-000	8/10	0.33 - 9.1	1.3	NA	8.75 C	NA	NA	NO	BSL
	191-24-2	Benzo(g,h,i)perylene	0.083 J	0.69 J	MG/KG	SJS02-SD05-001	6/10	0.33 - 9.1	0.69	NA	2,346 N	NA	NA	NO	BSL
	207-08-9	Benzo(k)fluoranthene	0.059 J	0.47 J	MG/KG	SJS02-SD03-000P	7/10	0.33 - 9.1	0.47	NA	87.5 C	NA	NA	NO	BSL
	85-68-7	Butylbenzylphthalate	0.047 J	0.047 J	MG/KG	SJS02-SD01-000	1/9	0.33 - 9.1	0.047	NA	15,643 N	NA	NA	NO	BSL
	218-01-9	Chrysene	0.12 J	1.4 J	MG/KG	SJS02-SD05-001	7/10	0.33 - 9.1	1.4	NA	875 C	NA	NA	NO	BSL
	84-74-2	Di-n-butylphthalate	0.089 J	0.094 J	MG/KG	SJS02-SD06-001	2/9	0.33 - 9.1	0.094	NA	7,821 N	NA	NA	NO	BSL
	84-66-2	Diethylphthalate	0.1 L	0.25 L	MG/KG	SJS02-SD03-000	2/10	0.33 - 9.1	0.25	NA	62,571 N	NA	NA	NO	BSL
	206-44-0	Fluoranthene	0.15 J	2.2 J	MG/KG	SJS02-SD05-001	7/10	0.33 - 9.1	2.2	NA	3,129 N	NA	NA	NO	BSL
	86-73-7	Fluorene	0.079 J	0.079 J	MG/KG	SJS02-SD05-001	1/9	0.33 - 9.1	0.079	NA	3,129 N	NA	NA	NO	BSL
	193-39-5	Indeno(1,2,3-cd)pyrene	0.078 J	0.53 L	MG/KG	SJS02-SD03-000	6/10	0.33 - 9.1	0.53	NA	8.75 C	NA	NA	NO	BSL
	85-01-8	Phenanthrene	0.047 J	1.1 J	MG/KG	SJS02-SD05-001	6/10	0.33 - 9.1	1.1	NA	2,346 N	NA	NA	NO	BSL
	129-00-0	Pyrene	0.048 J	3.1 J	MG/KG	SJS02-SD05-001	9/10	0.33 - 9.1	3.1	NA	2,346 N	NA	NA	NO	BSL
	117-81-7	bis(2-Ethylhexyl)phthalate	0.11 L	0.66	MG/KG	SJS02-SD09	4/10	0.13 - 9.1	0.66	NA	456 C	NA	NA	NO	BSL
	72-54-8	4,4'-DDD	0.0037 J	0.98 J	MG/KG	SJS02-SD06-001	8/8	0.0033 - 0.75	0.98	NA	26.6 C	NA	NA	NO	BSL
	72-55-9	4,4'-DDE	0.00380 J	0.13 J	MG/KG	SJS02-SD03-000	9/9	0.0033 - 0.013	0.13	NA	18.8 C	NA	NA	NO	BSL
	50-29-3	4,4'-DDT	0.00340 J	3.2 J	MG/KG	SJS02-SD06-001	9/9	0.0033 - 0.75	3.2	NA	18.8 C	NA	NA	NO	BSL
	11097-69-1	Aroclor-1254	0.11 J	0.11 J	MG/KG	SJS02-SD02-000	1/9	0.033 - 0.13	0.11	NA	1.56 C	NA	NA	NO	BSL
	11096-82-5	Aroclor-1260	0.069 J	0.069 J	MG/KG	SJS02-SD03-000P	1/9	0.033 - 0.13	0.069	NA	3.19 C	NA	NA	NO	BSL
	60-57-1	Dieldrin	0.036	0.036	MG/KG	SJS02-SD03-000	1/9	0.0033 - 0.013	0.036	NA	0.399 C	NA	NA	NO	BSL
	5103-71-9	alpha-Chlordane	8.20E-04 J	0.079 J	MG/KG	SJS02-SD05-001	6/9	0.0017 - 0.033	0.079	NA	18.2 C	NA	NA	NO	BSL
	5103-74-2	gamma-Chlordane	0.0015 J	0.096 J	MG/KG	SJS02-SD05-001	6/9	0.0017 - 0.033	0.096	NA	18.2 C	NA	NA	NO	BSL
	35822-46-9	1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxi	1.60E-05 J	4.20E-04 J	MG/KG	SJS02-SD09	6/6	0.00000014 - 0.00000029	4.20E-04	NA	0.00426 C	NA	NA	NO	BSL
	67562-39-4	1,2,3,4,6,7,8-Heptachlorodibenzofuran	2.50E-06 J	2.30E-04 J	MG/KG	SJS02-SD09	6/6	0.000000089 - 0.00000023	2.30E-04	NA	0.00426 C	NA	NA	NO	BSL
	55673-89-7	1,2,3,4,7,8,9-Heptachlorodibenzofuran	7.70E-07 J	2.10E-05 J	MG/KG	SJS02-SD09	5/6	0.00000013 - 0.00000033	2.10E-05	NA	0.00426 C	NA	NA	NO	BSL

Table 2.11

OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN

St. Juliens Creek Annex - Site 2

Scenario Timeframe: Future
Medium: Sediment
Exposure Medium: Sediment

Exposure Point	CAS Number	Chemical	Minimum [1] Concentration Qualifier	Maximum [1] Concentration Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration [2] Used for Screening	Background [3] Value	Screening [4] Toxicity Value	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for [5] Contaminant Deletion or Selection
	39227-28-6	1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	3.00E-07 J	8.50E-06 J	MG/KG	SJS02-SD09	6/6	0.00000019 - 0.00000076	8.50E-06	NA	4.26E-04 C	NA	NA	NO	BSL
	70648-26-9	1,2,3,4,7,8-Hexachlorodibenzofuran	7.40E-07 J	2.50E-05 J	MG/KG	SJS02-SD09	6/6	0.00000011 - 0.00000026	2.50E-05	NA	4.26E-04 C	NA	NA	NO	BSL
	57653-85-7	1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	6.00E-07 J	1.80E-05 J	MG/KG	SJS02-SD09	6/6	0.00000016 - 0.00000066	1.80E-05	NA	4.26E-04 C	NA	NA	NO	BSL
	57117-44-9	1,2,3,6,7,8-Hexachlorodibenzofuran	5.00E-07 J	6.00E-05 J	MG/KG	SJS02-SD09	6/6	0.00000011 - 0.00000025	6.00E-05	NA	4.26E-04 C	NA	NA	NO	BSL
	19408-74-3	1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	1.10E-06 J	1.60E-05 J	MG/KG	SJS02-SD09	6/6	0.00000016 - 0.00000067	1.60E-05	NA	4.26E-04 C	NA	NA	NO	BSL
	72918-21-9	1,2,3,7,8,9-Hexachlorodibenzofuran	4.00E-07 J	2.30E-06 J	MG/KG	SJS02-SD11	4/6	0.00000015 - 0.00000034	2.30E-06	NA	4.26E-04 C	NA	NA	NO	BSL
	40321-76-4	1,2,3,7,8-Pentachlorodibenzo-p-dioxin	1.20E-06 J	3.60E-06 J	MG/KG	SJS02-SD09	5/6	0.00000017 - 0.00000026	3.60E-06	NA	8.52E-05 C	NA	NA	NO	BSL
	57117-41-6	1,2,3,7,8-Pentachlorodibenzofuran	1.10E-06 J	4.30E-06 J	MG/KG	SJS02-SD09	5/6	0.00000016 - 0.00000024	4.30E-06	NA	8.52E-04 C	NA	NA	NO	BSL
	60851-34-5	2,3,4,6,7,8-Hexachlorodibenzofuran	3.60E-07 J	9.30E-06 J	MG/KG	SJS02-SD09	6/6	0.00000012 - 0.00000027	9.30E-06	NA	4.26E-04 C	NA	NA	NO	BSL
	57117-31-4	2,3,4,7,8-Pentachlorodibenzofuran	4.30E-07 J	7.00E-06 J	MG/KG	SJS02-SD09	6/6	0.00000015 - 0.00000023	7.00E-06	NA	8.52E-05 C	NA	NA	NO	BSL
	1746-01-6	2,3,7,8-TCDD (dioxin)	3.20E-07 J	9.60E-07 J	MG/KG	SJS02-SD11	5/6	0.00000013 - 0.00000027	9.60E-07	NA	4.26E-05 C	NA	NA	NO	BSL
	51207-31-9	2,3,7,8-Tetrachlorodibenzofuran	7.10E-07 NJ	9.70E-06 J	MG/KG	SJS02-SD11	6/6	0.00000014 - 0.00000086	9.70E-06	NA	4.26E-04 C	NA	NA	NO	BSL
	3286-87-9	Octachlorodibenzo-p-dioxin	6.60E-04 J	0.0044 J	MG/KG	SJS02-SD11	6/6	0.0000002 - 0.00000053	0.0044	NA	4.30E-02 C	NA	NA	NO	BSL
	39001-02-0	Octachlorodibenzofuran	2.10E-05 J	5.80E-04 J	MG/KG	SJS02-SD09	5/6	0.00000013 - 0.00000053	5.80E-04	NA	4.30E-02 C	NA	NA	NO	BSL
	37871-00-4	Total heptachlorodibenzo-p-dioxin	5.10E-05 J	9.00E-04 J	MG/KG	SJS02-SD11	6/6	0.00000014 - 0.00000029	9.00E-04	NA	NA	NA	NA	NO	NTX
	38998-75-3	Total heptachlorodibenzofuran	4.60E-06 J	2.60E-04 J	MG/KG	SJS02-SD11	6/6	0.000000089 - 0.00000023	2.60E-04	NA	NA	NA	NA	NO	NTX
	34465-46-8	Total hexachlorodibenzo-p-dioxin	1.50E-05 J	1.70E-04 J	MG/KG	SJS02-SD11	6/6	0.00000016 - 0.00000066	1.70E-04	NA	NA	NA	NA	NO	NTX
	55684-94-1	Total hexachlorodibenzofuran	4.70E-06 J	3.00E-04 J	MG/KG	SJS02-SD09	6/6	0.00000011 - 0.00000025	3.00E-04	NA	NA	NA	NA	NO	NTX
	36088-22-9	Total pentachlorodibenzo-p-dioxin	4.80E-06 J	2.00E-05 J	MG/KG	SJS02-SD11	5/6	0.00000017 - 0.00000026	2.00E-05	NA	NA	NA	NA	NO	NTX
	30402-15-4	Total pentachlorodibenzofuran	2.00E-06 J	9.10E-05 J	MG/KG	SJS02-SD11	6/6	0.00000015 - 0.00000023	9.10E-05	NA	NA	NA	NA	NO	NTX
	41903-57-5	Total tetrachlorodibenzo-p-dioxin	3.70E-07 J	6.70E-06 J	MG/KG	SJS02-SD09	6/6	0.00000013 - 0.00000027	6.70E-06	NA	NA	NA	NA	NO	NTX
	55722-27-5	Total tetrachlorodibenzofuran	2.10E-06 J	3.60E-05 J	MG/KG	SJS02-SD09	6/6	0.00000014 - 0.00000086	3.60E-05	NA	NA	NA	NA	NO	NTX
	7429-90-5	Aluminum	1,500	27,200	MG/KG	SJS02-SD03-000	10/10	5 - 33.36	27,200	NA	78,214 N	NA	NA	NO	BSL
	7440-36-0	Antimony	1.20 L	27.6 L	MG/KG	SJS02-SD03-000P	5/10	0.40 - 1.52	27.6	NA	31.3 N	NA	NA	NO	BSL
	7440-38-2	Arsenic	1.60 K	19.4	MG/KG	SJS02-SD03-000P	10/10	0.30 - 2.27	19.4	NA	4.26 C	NA	NA	YES	ASL
	7440-39-3	Barium	4.10 J	109 J	MG/KG	SJS02-SD03-000P	10/10	0 .03 - 1.52	109	NA	5,475 N	NA	NA	NO	BSL
	7440-41-7	Beryllium	0.0700 J	1.1 J	MG/KG	SJS02-SD03-000P	8/10	0.01 - 0.76	1.1	NA	156 N	NA	NA	NO	BSL
	7440-43-9	Cadmium	0.14 J	9.2	MG/KG	SJS02-SD09	10/10	0.04 - 0.79	9.2	NA	78 N	NA	NA	NO	BSL
	7440-70-2	Calcium	207 J	24,300 J	MG/KG	SJS02-SD03-000	10/10	2.8 - 65.96	24,300	NA	NA	NA	NA	NO	NUT
	7440-47-3	Chromium	6.5	2,630	MG/KG	SJS02-SD03-000P	10/10	0.16 - 5.31	2,630	NA	235 N	NA	NA	YES	ASL
	7440-48-4	Cobalt	0.660 J	10.7 J	MG/KG	SJS02-SD03-000P	8/10	.07 - 6.07	10.7	NA	1,600 N	NA	NA	NO	BSL
	7440-50-8	Copper	4.4 J	2,620	MG/KG	SJS02-SD03-000P	10/10	0.16 - 4.55	2,620	NA	3,129 N	NA	NA	NO	BSL
	57-12-5	Cyanide	0.584	1.80 L	MG/KG	SJS02-SD08-001	2/9	0.286 - 2.1	1.80	NA	1,564 N	NA	NA	NO	BSL
	7439-89-6	Iron	2,050	31,100	MG/KG	SJS02-SD03-000	10/10	1.83 - 16.3	31,100	NA	23,000 N	NA	NA	YES	ASL
	7439-92-1	Lead	14.9	545	MG/KG	SJS02-SD03-000P	10/10	0.15 - 0.79	545	NA	400	NA	NA	YES	ASL
	7439-95-4	Magnesium	309 J	6,890 J	MG/KG	SJS02-SD03-000	10/10	3.6 - 137.24	6,890	NA	NA	NA	NA	NO	NUT
	7439-96-5	Manganese	8.30 K	235	MG/KG	SJS02-SD03-000	10/10	0.04 - 1.52	235	NA	1,564 N	NA	NA	NO	BSL

Table 2.11

OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN

St. Juliens Creek Annex - Site 2

Scenario Timeframe: Future
Medium: Sediment
Exposure Medium: Sediment

Exposure Point	CAS Number	Chemical	Minimum [1] Concentration Qualifier	Maximum [1] Concentration Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration [2] Used for Screening	Background [3] Value	Screening [4] Toxicity Value	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for [5] Contaminant Deletion or Selection
	7439-97-6	Mercury	0.0400 J	0.79	MG/KG	SJS02-SD03-000P	9/10	0.02 - 0.19	0.79	NA	23.5 N	NA	NA	NO	BSL
	7440-02-0	Nickel	2 J	41.5	MG/KG	SJS02-SD03-000	9/10	0.13 - 5.31	41.5	NA	1,564 N	NA	NA	NO	BSL
	7440-09-7	Potassium	207 J	3,830	MG/KG	SJS02-SD03-000	10/10	2 - 168.32	3,830	NA	NA	NA	NA	NO	NUT
	7782-49-2	Selenium	0.710 K	1.5 K	MG/KG	SJS02-SD07-001	2/10	0.39 - 2.27	1.5	NA	391 N	NA	NA	NO	BSL
	7440-22-4	Silver	0.25 J	0.870 J	MG/KG	SJS02-SD07-001	4/10	0.13 - 1.3	0.870	NA	391 N	NA	NA	NO	BSL
	7440-23-5	Sodium	144	17,800	MG/KG	SJS02-SD03-000	9/10	12.11 - 128.49	17,800	NA	NA	NA	NA	NO	NUT
	7440-28-0	Thallium	2.2 K	2.2 K	MG/KG	SJS02-SD03-000P	1/10	0.42 - 1.7	2.2	NA	5.48 N	NA	NA	NO	BSL
	7440-62-2	Vanadium	5 J	115	MG/KG	SJS02-SD03-000	10/10	0 .09 - 6.82	115	NA	307 N	NA	NA	NO	BSL
	7440-66-6	Zinc	19.2	1,400 L	MG/KG	SJS02-SD03-000P	10/10	0.19 - 3.79	1,400	NA	23,464 N	NA	NA	NO	BSL
	7723-14-0	Phosphorus	10.5	370	MG/KG	SJS02-SD05-001	7/7	1.4 - 29.2	370	NA	NA	NA	NA	NO	NTX

[1] Minimum/Maximum detected concentrations.

[2] Maximum concentration is used for screening.

[3] No background study has been completed for the St. Juliens Creek Annex sediment.

[4] Tier I screening: With the exception of lead, all compounds are screened against 10 times the Risk-Based Concentration (RBC) Table, U.S. EPA Region III, Oct. 15, 2003 for residential soil (10 times the cancer benchmark value = 1e-06; 10 times the HQ = 0.1). Lead is screened against the EPA screening value of 400 mg/kg.
RBC value for pyrene used as surrogate for phenanthrene and benzo(g,h,i)perylene.
RBC value for chlordane used as surrogate for alpha-chlordane and gamma-chlordane.
RBC value for chromium VI used for total chromium.
RBC value for manganese-nonfood used as surrogate for manganese.
RBC value for mercuric chloride used as surrogate for mercury.

[5] Rationale Codes

Selection Reason: Above Screening Levels (ASL)

Deletion Reason: No Toxicity Information (NTX)
Essential Nutrient (NUT)

SQL = Sample Quantification Limit
COPC = Chemical of Potential Concern
ARAR/TBC = Applicable or Relevant and Appropriate Requirement/ To Be Considered
J = Estimated Value
K = Biased High
L = Biased Low
C = Carcinogenic
N = Noncarcinogenic
ND = Not detected

Table 2.12

OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN

St. Juliens Creek Annex - Site 2

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Shallow Groundwater

Exposure Point	CAS Number	Chemical	Minimum [1] Concentration Qualifier	Maximum [1] Concentration Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration [2] Used for Screening	Background [3] Value	Screening [4] Toxicity Value	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for [5] Contaminant Deletion or Selection
Water Table	95-50-1	1,2-Dichlorobenzene	0.300	7.80	UG/L	SJS02-GW5S-001	2/11	1 - 1	7.80	ND	27 N	600	MCL	NO	BSL
	106-46-7	1,4-Dichlorobenzene	0.800 J	0.800 J	UG/L	SJS02-GW5S-001	1/11	1 - 1	0.800	ND	0.473 C	75	MCL	YES	ASL
	75-15-0	Carbon disulfide	3.40	4.10	UG/L	SJS02-GW3S-003	2/11	1 - 1	4.10	ND	104 N	--		NO	BSL
	108-90-7	Chlorobenzene	2.40	2.40	UG/L	SJS02-GW5S-001	1/11	1 - 1	2.40	ND	10.6 N	100	MCL	NO	BSL
	79-01-6	Trichloroethene	0.800 J	0.800 J	UG/L	SJS02-GW5S-001	2/11	1 - 1	0.800	0.75	0.026 C	5	MCL	YES	ASL
	156-59-2	cis-1,2-Dichloroethene	0.300 J	0.300 J	UG/L	SJS02-GW4S-001, SJS02-GW4S-001P	1/11	1 - 1	0.300	0.6	6.08 N	70	MCL	NO	BSL
	84-74-2	Di-n-butylphthalate	4 J	4 J	UG/L	SJS02-GW4S-001P	1/11	10 - 12	4	ND	365 N	--		NO	BSL
	117-81-7	bis(2-Ethylhexyl)phthalate	1 J	1 J	UG/L	SJS02-GW4S-001P	1/11	10 - 12	1	ND	4.78 C	6	MCL	NO	BSL
	72-55-9	4,4'-DDE	0.00510 J	0.00510 J	UG/L	SJS02-GW1S-003	1/11	0.1 - 0.13	0.00510	NA	0.197 C	--		NO	BSL
	1031-07-8	Endosulfan sulfate	0.00860 J	0.0110 J	UG/L	SJS02-GW2S-003	2/11	0.1 - 0.13	0.0110	NA	21.9 N	--		NO	BSL
	76-44-8	Heptachlor	0.0920	0.0920	UG/L	SJS02-GW4S-001P	1/11	0.05 - 6.6	0.0920	NA	0.0149 C	0.4	MCL	YES	ASL
	2691-41-0	HMX	0.400 J	0.400 J	UG/L	SJS02-GW4S-001P	1/7	2.6 - 25	0.400	NA	183 N	--		NO	BSL
	121-82-4	RDX	2.70	2.70	UG/L	SJS02-GW4S-001P	1/7	2.6 - 25	2.70	NA	0.609 C	--		YES	ASL
	7429-90-5	Aluminum	130	35,500	UG/L	SJS02-GW2S-001	10/11	29 - 38.2	35,500	331	3,650 N	50 TO 200	SMCL	YES	ASL
	7440-38-2	Arsenic	3.8	6.2	UG/L	SJS02-GW3S-002	2/11	2 - 3.2	6.2	1.8	0.0446 C	10	MCL	YES	ASL
	7440-39-3	Barium	35	726	UG/L	SJS02-GW2S-001	10/11	0.2 - 1	726	74	256 N	2000	MCL	YES	ASL
	7440-41-7	Beryllium	0.200	0.77	UG/L	SJS02-GW2S-002	4/11	0.1 - 1	0.77	0.23	7.3 N	4	MCL	NO	BSL
	7440-70-2	Calcium	20,900	225,000	UG/L	SJS02-GW2S-003	11/11	46 - 57.9	225,000	123732	NA	--		NO	NUT
	7440-47-3	Chromium	1.70	56.3	UG/L	SJS02-GW2S-001	8/11	1.1 - 4.6	56.3	ND	11.0 N	100	MCL	YES	ASL
	7440-48-4	Cobalt	3.20	35.9	UG/L	SJS02-GW4S-001	6/11	0.5 - 8	35.9	14	73 N	--		NO	BSL
	7440-50-8	Copper	6.3	35.9	UG/L	SJS02-GW3S-003	2/11	1.1 - 6	35.9	ND	146 N	1300	MCL	NO	BSL
	7439-89-6	Iron	55.4	377,000	UG/L	SJS02-GW2S-001	11/11	5 - 30.8	377,000	16704	1,100 N	300	SMCL	YES	ASL
	7439-92-1	Lead	1.9	36.7	UG/L	SJS02-GW2S-001	6/11	1 - 1.3	36.7	1.8	15	15	MCL	YES	ASL
	7439-95-4	Magnesium	9,110	126,000	UG/L	SJS02-GW2S-003	11/11	24.3 - 45	126,000	19702	NA	--		NO	NUT
	7439-96-5	Manganese	197	1,380	UG/L	SJS02-GW3S-001	11/11	0.3 - 1	1,380	825	73 N	50	SMCL	YES	ASL
	7440-02-0	Nickel	4.90	29.8	UG/L	SJS02-GW3S-003	7/11	0.9 - 7	29.8	14	73 N	--		NO	BSL
	7440-09-7	Potassium	2,790	23,600	UG/L	SJS02-GW2S-003	11/11	13.5 - 97	23,600	5003	NA	--		NO	NUT
	7440-22-4	Silver	1.5	1.5	UG/L	SJS02-GW2S-001	1/11	0.9 - 3	1.5	ND	18.3 N	100	SMCL	NO	BSL
	7440-23-5	Sodium	18,800	883,000	UG/L	SJS02-GW2S-001	11/11	28 - 148	883,000	59614	NA	--		NO	NUT
	7440-28-0	Thallium	6.9	6.9	UG/L	SJS02-GW2S-001	1/11	2 - 10	6.9	ND	0.256 N	--		YES	ASL
	7440-62-2	Vanadium	0.920	79.6	UG/L	SJS02-GW2S-001	6/11	0.6 - 6.8	79.6	0.99	1.1 N	--		YES	ASL
	7440-66-6	Zinc	15.3	638	UG/L	SJS02-GW3S-003	5/11	1.9 - 3	638	86	1,095 N	500	SMCL	NO	BSL
	7723-14-0	Phosphorus	32.0	338	UG/L	SJS02-GW2S-001	6/11	20 - 50	338	ND	NA	--		NO	NTX

[1] Minimum/Maximum detected concentrations.

SQL = Sample Quantification Limit

Table 2.12

OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN

St. Juliens Creek Annex - Site 2

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Shallow Groundwater

Exposure Point	CAS Number	Chemical	Minimum [1] Concentration Qualifier	Maximum [1] Concentration Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration [2] Used for Screening	Background [3] Value	Screening [4] Toxicity Value	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for [5] Contaminant Deletion or Selection

[2] Maximum concentration is used for screening.

[3] Background data is UCL for Columbia Aquifer from St. Julliens Creek Background Investigation.

[4] Tier I screening: With the exception of lead, all compounds are screened against the Risk-Based Concentration (RBC) Table, U.S. EPA Region III, Oct. 15, 2003 for tap water (cancer benchmark value = 1e-06; HQ = 0.1). Lead is screened against the MCL value of 15 ug/l.
RBC value for endosulfan used as surrogate for endosulfan sulfate.
RBC value for chromium VI used for total chromium.
RBC value for manganese-nonfood used as surrogate for manganese.

[5] Rationale Codes

Selection Reason: Above Screening Levels (ASL)

Deletion Reason: No Toxicity Information (NTX)
Essential Nutrient (NUT)
Below Screening Level (BSL)

Shallow Groundwater Samples: GW1S, GW2S, and GW3S - Phase I, Rounds 1 and 2 and Phase II; GW4S and GW5S - Phase II

COPC = Chemical of Potential Concern
ARAR/TBC = Applicable or Relevant and Appropriate Requirement/ To Be Considered
MCL = Federal Maximum Contaminant Level
SMCL = Secondary Maximum Contaminant Level
J = Estimated Value
K = Biased High
L = Biased Low
C = Carcinogenic
N = Noncarcinogenic
ND = Not detected

Table 3.1.RME

MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY

St. Juliens Creek Annex - Site 2

Scenario Timeframe: Current/Future
Medium: Surface Soil
Exposure Medium: Surface Soil

Exposure Point	Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL of (N/T/NP)		Maximum Concentration (Qualifier)		Exposure Point Concentration			
								Value	Units	Statistic	Rationale
At Site 2											
	Benzo(a)pyrene	MG/KG	0.391	0.543	T	1.40	J	0.543	MG/KG	95% UCL-T	(1)
	4,4'-DDT	MG/KG	1.00	5.6	NP	12.0	J	5.6	MG/KG	99% Cheb	(1)
	Arsenic	MG/KG	4.93	9.5	T	18.0		9.5	MG/KG	95% UCL-T	(1)
	Copper	MG/KG	287	1,672	NP	4,260		1,672	MG/KG	97.5% Cheb-m	(3)
	Iron	MG/KG	17,331	62,428	NP	106,000		62,428	MG/KG	97.5% Cheb-m	(3)
	Lead	MG/KG	278	0.612	T	2,370		109	MG/KG	Mean-T	(1)
	Vanadium	MG/KG	30.6	46.8	T	138		46.8	MG/KG	95% UCL-T	(1)

For non-detects, 1/2 sample quantitation limit was used as a proxy concentration; for duplicate sample results, the maximum of the two samples was used.

ProUCL, Version 2.1 used to determine distribution of data using the Shapiro-Wilk W Test. ProUCL used to calculate RME EPC, following recommendations based on distribution and standard deviation in users guide.

Statistics: Maximum Detected Value (Max); 95% UCL of Normal Data (95% UCL-N); 95% UCL of Log-transformed Data, H-Statistic (95% UCL-T); 95% Chebyshev (MVUE) UCL (95% Cheb); 99% Chebyshev (MVUE) UCL (99% Cheb); 95% Chebyshev (mean,std) UCL (95% Cheb-m); 97.5% Chebyshev (mean,std) UCL (97.5% Cheb-m); 99% Chebyshev (mean,std) UCL (99% Cheb-m); Mean of Normal Data (Mean-N).

(1) Shapiro-Wilk W Test indicates data are log-normally distributed.

(2) Shapiro-Wilks W Test indicates data are normally distributed.

(3) Shapiro-Wilks W Test indicates data neither log-normally or normally distributed. Use non-parametric RME EPC.

(4) 95% UCL (or mean) exceeds maximum detected concentration. Therefore, maximum concentration used for EPC.

(5) Shapiro-Wilks W Test indicated data are normally and lognormally distributed. Distribution with the highest W-Value used to select EPC.

N = Normal

T = Transformed

NP = Non-parametric

J = Estimated Value

Table 3.2.RME

MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY

St. Juliens Creek Annex - Site 2

Scenario Timeframe: Current/Future
Medium: Surface Soil
Exposure Medium: Air

Exposure Point	Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL of (N/T/NP)	Maximum Concentration (Qualifier)	Exposure Point Concentration			
						Value	Units	Statistic	Rationale
Emissions from Surface Soil at Site 2	Chromium	ug/m^3	3.4E-05	1.2E-04 NP	1.9E-04	1.2E-04	ug/m^3	97.5% Cheb-m	(3)

For non-detects, 1/2 sample quantitation limit was used as a proxy concentration; for duplicate sample results, the maximum of the two samples was used.

ProUCL, Version 2.1 used to determine distribution of data using the Shapiro-Wilk W Test. ProUCL used to calculate RME EPC, following recommendations based on distribution and standard deviation in users guide.

Statistics: Maximum Detected Value (Max); 95% UCL of Normal Data (95% UCL-N); 95% UCL of Log-transformed Data, H-Statistic (95% UCL-T); 95% Chebyshev (MVUE) UCL (95% Cheb); 99% Chebyshev (MVUE) UCL (99% Cheb); 95% Chebyshev (mean,std) UCL (95% Cheb-m); 97.5% Chebyshev (mean,std) UCL (97.5% Cheb-m); 99% Chebyshev (mean,std) UCL (99% Cheb-m); Mean of Normal Data (Mean-N).

(1) Shapiro-Wilk W Test indicates data are log-normally distributed.

(2) Shapiro-Wilks W Test indicates data are normally distributed.

(3) Shapiro-Wilks W Test indicates data neither log-normally or normally distributed. Use non-parametric RME EPC.

(4) 95% UCL (or mean) exceeds maximum detected concentration. Therefore, maximum concentration used for EPC.

(5) Shapiro-Wilks W Test indicated data are normally and lognormally distributed. Distribution with the highest W-Value used to select EPC.

N = Normal

T = Transformed

NP = Non-parametric

J = Estimated Value

Table 3.3.RME
MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY
St. Juliens Creek Annex - Site 2

Scenario Timeframe: Current/Future
Medium: Groundwater
Exposure Medium: Deep Groundwater

Exposure Point	Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL of (N/T/NP)		Maximum Concentration (Qualifier)		Exposure Point Concentration			
								Value	Units	Statistic	Rationale
Tap Water											
	Chloroform	UG/L	1.40	4.77	NP	6.00		4.77	UG/L	95% Cheb-m	(3)
	Arsenic	UG/L	2.28	4.22	T	3.70	J	3.70	UG/L	Max	(4)
	Iron	UG/L	908	7,322	T	3,820	J	3,820	UG/L	Max	(4)
	Manganese	UG/L	98.0	821	T	229	J	229	UG/L	Max	(4)
	Vanadium	UG/L	3.21	11.6	NP	9.60	K	9.6	UG/L	Max	(4)

For non-detects, 1/2 sample quantitation limit was used as a proxy concentration; for duplicate sample results, the maximum of the two samples was used.

ProUCL, Version 2.1 used to determine distribution of data using the Shapiro-Wilk W Test. ProUCL used to calculate RME EPC, following recommendations based on distribution and standard deviation in users guide.

Statistics: Maximum Detected Value (Max); 95% UCL of Normal Data (95% UCL-N); 95% UCL of Log-transformed Data, H-Statistic (95% UCL-T); 95% Chebyshev (MVUE) UCL (95% Cheb); 99% Chebyshev (MVUE) UCL (99% Cheb); 95% Chebyshev (mean,std) UCL (95% Cheb-m); 97.5% Chebyshev (mean,std) UCL (97.5% Cheb-m); 99% Chebyshev (mean,std) UCL (99% Cheb-m); Mean of Normal Data (Mean-N).

(1) Shapiro-Wilk W Test indicates data are log-normally distributed.
(2) Shapiro-Wilks W Test indicates data are normally distributed.
(3) Shapiro-Wilks W Test indicates data neither log-normally or normally distributed. Use non-parametric RME EPC.
(4) 95% UCL (or mean) exceeds maximum detected concentration. Therefore, maximum concentration used for EPC.
(5) Shapiro-Wilks W Test indicated data are normally and lognormally distributed. Distribution with the highest W-Value used to select EPC.

N = Normal
T = Transformed
NP = Non-parametric
J = Estimated Value

Table 3.4.RME

MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY

St. Juliens Creek Annex - Site 2

Scenario Timeframe: Current/Future
Medium: Groundwater
Exposure Medium: Deep Groundwater

Exposure Point	Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL of (N/T/NP)	Maximum Concentration (Qualifier)	Exposure Point Concentration			
						Value	Units	Statistic	Rationale
Tap Water	Chloroform	UG/L	1.40	4.77 NP	6.00	4.77	UG/L	95% Cheb-m	(3)

For non-detects, 1/2 sample quantitation limit was used as a proxy concentration; for duplicate sample results, the maximum of the two samples was used.

ProUCL, Version 2.1 used to determine distribution of data using the Shapiro-Wilk W Test. ProUCL used to calculate RME EPC, following recommendations based on distribution and standard deviation in users guide.

Statistics: Maximum Detected Value (Max); 95% UCL of Normal Data (95% UCL-N); 95% UCL of Log-transformed Data, H-Statistic (95% UCL-T); 95% Chebyshev (MVUE) UCL (95% Cheb); 99% Chebyshev (MVUE) UCL (99% Cheb); 95% Chebyshev (mean,std) UCL (95% Cheb-m); 97.5% Chebyshev (mean,std) UCL (97.5% Cheb-m); 99% Chebyshev (mean,std) UCL (99% Cheb-m); Mean of Normal Data (Mean-N).

(1) Shapiro-Wilk W Test indicates data are log-normally distributed.

(2) Shapiro-Wilks W Test indicates data are normally distributed.

(3) Shapiro-Wilks W Test indicates data neither log-normally or normally distributed. Use non-parametric RME EPC.

(4) 95% UCL (or mean) exceeds maximum detected concentration. Therefore, maximum concentration used for EPC.

(5) Shapiro-Wilks W Test indicated data are normally and lognormally distributed. Distribution with the highest W-Value used to select EPC.

N = Normal

T = Transformed

NP = Non-parametric

J = Estimated Value

Table 3.5.RME
MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY
St. Juliens Creek Annex - Site 2

Scenario Timeframe: Current/Future
Medium: Surface Water
Exposure Medium: Surface Water

Exposure Point	Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL of (N/T/NP)		Maximum Concentration (Qualifier)		Exposure Point Concentration			
								Value	Units	Statistic	Rationale
Drainage Features and Ponded Area	Chloroform	UG/L	2.34	7.17	NP	5.40		5.40	UG/L	Max	(4)
	Trichloroethene	UG/L	29.2	394	T	130		130	UG/L	Max	(4)
	Vinyl chloride	UG/L	4.98	15.1	NP	21.9		15.1	UG/L	95% Cheb	(1)
	cis-1,2-Dichloroethene	UG/L	26.1	409	T	84.0		84.0	UG/L	Max	(4)
	bis(2-Ethylhexyl)phthalate	UG/L	13.3	69	NP	84.0		69	UG/L	97.5% Cheb-m	(3)
	Arsenic	UG/L	2.17	3.8	NP	4.40	J	3.8	UG/L	95% Cheb-m	(3)
	Chromium	UG/L	30.2	150	NP	166		150	UG/L	97.5% Cheb-m	(3)
	Iron	UG/L	4,620	11,656	NP	18,800	L	11,656	UG/L	95% Cheb	(1)
	Lead	UG/L	18	48	T	78	L	7.11	UG/L	Mean-T	(1)
	Manganese	UG/L	388	2,038	NP	2,490	L	2,038	UG/L	97.5% Cheb-m	(3)
	Vanadium	UG/L	6.9	17.1	T	32.8	J	17.1	UG/L	95% UCL-T	(1)

For non-detects, 1/2 sample quantitation limit was used as a proxy concentration; for duplicate sample results, the maximum of the two samples was used.

ProUCL, Version 2.1 used to determine distribution of data using the Shapiro-Wilk W Test. ProUCL used to calculate RME EPC, following recommendations based on distribution and standard deviation in users guide.

Statistics: Maximum Detected Value (Max); 95% UCL of Normal Data (95% UCL-N); 95% UCL of Log-transformed Data, H-Statistic (95% UCL-T); 95% Chebyshev (MVUE) UCL (95% Cheb); 99% Chebyshev (MVUE) UCL (99% Cheb); 95% Chebyshev (mean,std) UCL (95% Cheb-m); 97.5% Chebyshev (mean,std) UCL (97.5% Cheb-m); 99% Chebyshev (mean,std) UCL (99% Cheb-m); Mean of Normal Data (Mean-N).

(1) Shapiro-Wilk W Test indicates data are log-normally distributed.
(2) Shapiro-Wilks W Test indicates data are normally distributed.
(3) Shapiro-Wilks W Test indicates data neither log-normally or normally distributed. Use non-parametric RME EPC.
(4) 95% UCL (or mean) exceeds maximum detected concentration. Therefore, maximum concentration used for EPC.

N = Normal
T = Transformed
NP = Non-parametric
J = Estimated Value

Table 3.5.RME
MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY
St. Juliens Creek Annex - Site 2

Scenario Timeframe: Current/Future
Medium: Surface Water
Exposure Medium: Surface Water

Exposure Point	Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL of (N/T/NP)	Maximum Concentration (Qualifier)	Exposure Point Concentration			
						Value	Units	Statistic	Rationale

(5) Shapiro-Wilks W Test indicated data are normally and lognormally distributed. Distribution with the highest W-Value used to select EPC.

Table 3.6.RME

MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY

St. Juliens Creek Annex - Site 2

Scenario Timeframe: Current/Future
Medium: Sediment
Exposure Medium: Sediment

Exposure Point	Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL of (N/T/NP)	Maximum Concentration (Qualifier)	Exposure Point Concentration			
						Value	Units	Statistic	Rationale
Drainage Features and Ponded Area	Arsenic	MG/KG	7.00	14.2 T	19.4	14.2	MG/KG	95% UCL-T	(5)

For non-detects, 1/2 sample quantitation limit was used as a proxy concentration; for duplicate sample results, the maximum of the two samples was used.

ProUCL, Version 2.1 used to determine distribution of data using the Shapiro-Wilk W Test. ProUCL used to calculate RME EPC, following recommendations based on distribution and standard deviation in users guide.

Statistics: Maximum Detected Value (Max); 95% UCL of Normal Data (95% UCL-N); 95% UCL of Log-transformed Data, H-Statistic (95% UCL-T); 95% Chebyshev (MVUE) UCL (95% Cheb); 99% Chebyshev (MVUE) UCL (99% Cheb); 95% Chebyshev (mean,std) UCL (95% Cheb-m); 97.5% Chebyshev (mean,std) UCL (97.5% Cheb-m); 99% Chebyshev (mean,std) UCL (99% Cheb-m); Mean of Normal Data (Mean-N).

(1) Shapiro-Wilk W Test indicates data are log-normally distributed.

(2) Shapiro-Wilks W Test indicates data are normally distributed.

(3) Shapiro-Wilks W Test indicates data neither log-normally or normally distributed. Use non-parametric RME EPC.

(4) 95% UCL (or mean) exceeds maximum detected concentration. Therefore, maximum concentration used for EPC.

(5) Shapiro-Wilks W Test indicated data are normally and lognormally distributed. Distribution with the highest W-Value used to select EPC.

N = Normal

T = Transformed

NP = Non-parametric

J = Estimated Value

Table 3.7.RME
MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY
St. Juliens Creek Annex - Site 2

Scenario Timeframe: Future
Medium: Soil*
Exposure Medium: Soil*

Exposure Point	Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL of (N/T/NP)		Maximum Concentration (Qualifier)		Exposure Point Concentration			
								Value	Units	Statistic	Rationale
At Site 2											
	Benzo(a)anthracene	MG/KG	0.357	0.69	NP	2.30		0.69	MG/KG	95% Cheb-m	(3)
	Benzo(a)pyrene	MG/KG	0.322	0.41	T	1.40	J	0.41	MG/KG	95% UCL-T	(1)
	Benzo(b)fluoranthene	MG/KG	0.422	0.62	T	1.70	J	0.62	MG/KG	95% UCL-T	(1)
	Dibenz(a,h)anthracene	MG/KG	0.311	0.53	NP	0.130	J	0.53	MG/KG	95% Cheb-m	(3)
	4,4'-DDD	MG/KG	0.239	1.8	NP	4.20		1.8	MG/KG	99% Cheb-m	(3)
	4,4'-DDE	MG/KG	0.596	2.5	NP	7.20	J	2.5	MG/KG	95% Cheb	(1)
	4,4'-DDT	MG/KG	11.0	114	NP	290	J	114	MG/KG	99% Cheb-m	(3)
	Aluminum	MG/KG	7,611	10,113	T	21,700		10,113	MG/KG	95% UCL-T	(1)
	Antimony	MG/KG	3.78	21.6	NP	77.7		21.6	MG/KG	97.5% Cheb-m	(3)
	Arsenic	MG/KG	5.72	8.46	T	41.7		8.46	MG/KG	95% UCL-T	(1)
	Cadmium	MG/KG	0.989	2.30	NP	11.2		2.30	MG/KG	95% Cheb	(1)
	Chromium	MG/KG	39.7	63.3	T	246		63.3	MG/KG	95% UCL-T	(1)
	Copper	MG/KG	277	584	NP	4,260		584	MG/KG	95% Cheb	(1)
	Iron	MG/KG	21,865	70,479	NP	210,000		70,479	MG/KG	97.5% Cheb-m	(3)
	Lead	MG/KG	536	1,149	T	8,850		90	MG/KG	Mean-T	(1)
	Manganese	MG/KG	161	305	T	1,260		305	MG/KG	95% UCL-T	(1)
	Nickel	MG/KG	28.8	60.4	T	246		60.4	MG/KG	95% UCL-T	(1)
	Thallium	MG/KG	0.729	1.82	NP	6.20		1.82	MG/KG	95% Cheb-m	(3)
	Vanadium	MG/KG	27.3	37.0	T	138		37.0	MG/KG	95% UCL-T	(1)
	Zinc	MG/KG	713	1,941	NP	7,560		1,941	MG/KG	95% Cheb	(1)

* Surface soil & subsurface soil combined.

For non-detects, 1/2 sample quantitation limit was used as a proxy concentration; for duplicate sample results, the maximum of the two samples was used.

ProUCL, Version 2.1 used to determine distribution of data using the Shapiro-Wilk W Test. ProUCL used to calculate RME EPC, following recommendations

Table 3.7.RME

MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY

St. Juliens Creek Annex - Site 2

Scenario Timeframe: Future
Medium: Soil*
Exposure Medium: Soil*

Exposure Point	Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL of (N/T/NP)	Maximum Concentration (Qualifier)	Exposure Point Concentration			
						Value	Units	Statistic	Rationale

based on distribution and standard deviation in users guide.

Statistics: Maximum Detected Value (Max); 95% UCL of Normal Data (95% UCL-N); 95% UCL of Log-transformed Data, H-Statistic (95% UCL-T); 95% Chebyshev (MVUE) UCL (95% Cheb); 99% Chebyshev (MVUE) UCL (99% Cheb); 95% Chebyshev (mean,std) UCL (95% Cheb-m); 97.5% Chebyshev (mean,std) UCL (97.5% Cheb-m); 99% Chebyshev (mean,std) UCL (99% Cheb-m); Mean of Normal Data (Mean-N).

(1) Shapiro-Wilk W Test indicates data are log-normally distributed.
(2) Shapiro-Wilks W Test indicates data are normally distributed.
(3) Shapiro-Wilks W Test indicates data neither log-normally or normally distributed. Use non-parametric RME EPC.
(4) 95% UCL (or mean) exceeds maximum detected concentration. Therefore, maximum concentration used for EPC.

N = Normal
T = Transformed
NP = Non-parametric
J = Estimated Value

Table 3.8.RME

MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY

St. Juliens Creek Annex - Site 2

Scenario Timeframe: Future
Medium: Soil*
Exposure Medium: Soil*

Exposure Point	Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL of (N/T/NP)		Maximum Concentration (Qualifier)		Exposure Point Concentration			
								Value	Units	Statistic	Rationale
At Site 2											
	Benzo(a)pyrene	MG/KG	0.322	0.41	T	1.40	J	0.41	MG/KG	95% UCL-T	(1)
	4,4'-DDT	MG/KG	11.0	114	NP	290	J	114	MG/KG	99% Cheb-m	(3)
	Antimony	MG/KG	3.78	21.6	NP	77.7		21.6	MG/KG	97.5% Cheb-m	(3)
	Arsenic	MG/KG	5.72	8.46	T	41.7		8.46	MG/KG	95% UCL-T	(1)
	Copper	MG/KG	277	584	T	4,260		584	MG/KG	95% Cheb	(1)
	Iron	MG/KG	21,865	70,479	NP	210,000		70,479	MG/KG	97.5% Cheb-m	(3)
	Lead	MG/KG	536	1,149	T	8,850		90	MG/KG	Mean-T	(1)
	Vanadium	MG/KG	27.3	37.0	T	138		37.0	MG/KG	95% UCL-T	(1)

* Surface soil & subsurface soil combined.

For non-detects, 1/2 sample quantitation limit was used as a proxy concentration; for duplicate sample results, the maximum of the two samples was used.

ProUCL, Version 2.1 used to determine distribution of data using the Shapiro-Wilk W Test. ProUCL used to calculate RME EPC, following recommendations based on distribution and standard deviation in users guide.

Statistics: Maximum Detected Value (Max); 95% UCL of Normal Data (95% UCL-N); 95% UCL of Log-transformed Data, H-Statistic (95% UCL-T); 95% Chebyshev (MVUE) UCL (95% Cheb); 99% Chebyshev (MVUE) UCL (99% Cheb); 95% Chebyshev (mean,std) UCL (95% Cheb-m); 97.5% Chebyshev (mean,std) UCL (97.5% Cheb-m); 99% Chebyshev (mean,std) UCL (99% Cheb-m); Mean of Normal Data (Mean-N).

(1) Shapiro-Wilk W Test indicates data are log-normally distributed.
(2) Shapiro-Wilks W Test indicates data are normally distributed.
(3) Shapiro-Wilks W Test indicates data neither log-normally or normally distributed. Use non-parametric RME EPC.
(4) 95% UCL (or mean) exceeds maximum detected concentration. Therefore, maximum concentration used for EPC.

N = Normal
T = Transformed
NP = Non-parametric
J = Estimated Value

Table 3.9.RME

MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY

St. Juliens Creek Annex - Site 2

Scenario Timeframe: Future
Medium: Soil*
Exposure Medium: Air

Exposure Point	Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL of (N/T/NP)	Maximum Concentration (Qualifier)	Exposure Point Concentration			
						Value	Units	Statistic	Rationale
At Site 2	Chromium	ug/m^3	3.0E-05	6.8E-05 T	1.9E-04 J	6.8E-05	ug/m^3	95% UCL-T	(1)

* Surface soil & subsurface soil combined.

For non-detects, 1/2 sample quantitation limit was used as a proxy concentration; for duplicate sample results, the maximum of the two samples was used.

ProUCL, Version 2.1 used to determine distribution of data using the Shapiro-Wilk W Test. ProUCL used to calculate RME EPC, following recommendations based on distribution and standard deviation in users guide.

Statistics: Maximum Detected Value (Max); 95% UCL of Normal Data (95% UCL-N); 95% UCL of Log-transformed Data, H-Statistic (95% UCL-T); 95% Chebyshev (MVUE) UCL (95% Cheb); 99% Chebyshev (MVUE) UCL (99% Cheb); 95% Chebyshev (mean,std) UCL (95% Cheb-m); 97.5% Chebyshev (mean,std) UCL (97.5% Cheb-m); 99% Chebyshev (mean,std) UCL (99% Cheb-m); Mean of Normal Data (Mean-N).

(1) Shapiro-Wilk W Test indicates data are log-normally distributed.
(2) Shapiro-Wilks W Test indicates data are normally distributed.
(3) Shapiro-Wilks W Test indicates data neither log-normally or normally distributed. Use non-parametric RME EPC.
(4) 95% UCL (or mean) exceeds maximum detected concentration. Therefore, maximum concentration used for EPC.
(6) Maximum detected concentration used because sample size is less than 5.
(7) Mean value used because sample size is less than 5.

N = Normal
T = Transformed
NP = Non-paramet
J = Estimated Valu

Table 3.10.RME
MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY
St. Juliens Creek Annex - Site 2

Scenario Timeframe: Future
Medium: Surface Water
Exposure Medium: Surface Water

Exposure Point	Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL of (N/T/NP)		Maximum Concentration (Qualifier)		Exposure Point Concentration			
								Value	Units	Statistic	Rationale
Drainage Features and Ponded Area	Chloroform	UG/L	2.34	7.17	NP	5.40		5.40	UG/L	Max	(4)
	Trichloroethene	UG/L	29.2	394	T	130		130	UG/L	Max	(4)
	Vinyl chloride	UG/L	4.98	15.1	NP	21.9		15.1	UG/L	95% Cheb	(1)
	cis-1,2-Dichloroethene	UG/L	26.1	409	T	84.0		84.0	UG/L	Max	(4)
	bis(2-Ethylhexyl)phthalate	UG/L	13.3	69	NP	84.0		69	UG/L	97.5% Cheb-m	(3)
	Arsenic	UG/L	2.17	3.8	NP	4.40	J	3.8	UG/L	95% Cheb-m	(3)
	Chromium	UG/L	30.2	150	NP	166		150	UG/L	97.5% Cheb-m	(3)
	Iron	UG/L	4,620	11,656	NP	18,800	L	11,656	UG/L	95% Cheb	(1)
	Lead	UG/L	18	48	NP	78	L	7.11	UG/L	Mean-T	(1)
	Manganese	UG/L	388	2,038	NP	2,490	L	2,038	UG/L	97.5% Cheb-m	(3)
	Vanadium	UG/L	6.9	17.1	T	32.8	J	17.1	UG/L	95% UCL-T	(1)

For non-detects, 1/2 sample quantitation limit was used as a proxy concentration; for duplicate sample results, the maximum of the two samples was used.

ProUCL, Version 2.1 used to determine distribution of data using the Shapiro-Wilk W Test. ProUCL used to calculate RME EPC, following recommendations based on distribution and standard deviation in users guide.

Statistics: Maximum Detected Value (Max); 95% UCL of Normal Data (95% UCL-N); 95% UCL of Log-transformed Data, H-Statistic (95% UCL-T); 95% Chebyshev (MVUE) UCL (95% Cheb); 99% Chebyshev (MVUE) UCL (99% Cheb); 95% Chebyshev (mean,std) UCL (95% Cheb-m); 97.5% Chebyshev (mean,std) UCL (97.5% Cheb-m); 99% Chebyshev (mean,std) UCL (99% Cheb-m); Mean of Normal Data (Mean-N).

(1) Shapiro-Wilk W Test indicates data are log-normally distributed.
(2) Shapiro-Wilks W Test indicates data are normally distributed.
(3) Shapiro-Wilks W Test indicates data neither log-normally or normally distributed. Use non-parametric RME EPC.
(4) 95% UCL (or mean) exceeds maximum detected concentration. Therefore, maximum concentration used for EPC.

N = Normal
T = Transformed
NP = Non-parametric
J = Estimated Value

Table 3.11.RME

MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY

St. Juliens Creek Annex - Site 2

Scenario Timeframe: Future
Medium: Sediment
Exposure Medium: Sediment

Exposure Point	Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL of (N/T/NP)		Maximum Concentration (Qualifier)		Exposure Point Concentration			
								Value	Units	Statistic	Rationale
Drainage Features											
	Benzo(a)pyrene	MG/KG	0.756	1.82	T	0.910	J	0.910	MG/KG	Max	(4)
	Arsenic	MG/KG	7.00	14.2	T	19.4		14.2	MG/KG	95% UCL-T	(5)
	Chromium	MG/KG	660	6,759	T	2,630		2,630	MG/KG	Max	(4)
	Iron	MG/KG	13,822	36,118	T	31,100		31,100	MG/KG	Max	(4)
	Lead	MG/KG	199	300	N	545		199	MG/KG	Mean-N	(2)

For non-detects, 1/2 sample quantitation limit was used as a proxy concentration; for duplicate sample results, the maximum of the two samples was used.

ProUCL, Version 2.1 used to determine distribution of data using the Shapiro-Wilk W Test. ProUCL used to calculate RME EPC, following recommendations based on distribution and standard deviation in users guide.

Statistics: Maximum Detected Value (Max); 95% UCL of Normal Data (95% UCL-N); 95% UCL of Log-transformed Data, H-Statistic (95% UCL-T); 95% Chebyshev (MVUE) UCL (95% Cheb); 99% Chebyshev (MVUE) UCL (99% Cheb); 95% Chebyshev (mean,std) UCL (95% Cheb-m); 97.5% Chebyshev (mean,std) UCL (97.5% Cheb-m); 99% Chebyshev (mean,std) UCL (99% Cheb-m); Mean of Normal Data (Mean-N).

(1) Shapiro-Wilk W Test indicates data are log-normally distributed.

(2) Shapiro-Wilks W Test indicates data are normally distributed.

(3) Shapiro-Wilks W Test indicates data neither log-normally or normally distributed. Use non-parametric RME EPC.

(4) 95% UCL (or mean) exceeds maximum detected concentration. Therefore, maximum concentration used for EPC.

(5) Shapiro-Wilks W Test indicated data are normally and lognormally distributed. Distribution with the highest W-Value used to select EPC.

N = Normal

T = Transformed

NP = Non-parametric

J = Estimated Value

Table 3.12.RME

MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY

St. Juliens Creek Annex - Site 2

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Shallow Groundwater

Exposure Point	Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL of (N/T/NP)		Maximum Concentration (Qualifier)		Exposure Point Concentration			
								Value	Units	Statistic	Rationale
Water Table											
	1,4-Dichlorobenzene	UG/L	0.527	0.634	NP	0.800	J	0.634	UG/L	95% Cheb-m	(3)
	Trichloroethene	UG/L	0.555	0.714	NP	0.800	J	0.714	UG/L	95% Cheb-m	(3)
	Heptachlor	UG/L	0.0327	0.0588	NP	0.0920		0.0588	UG/L	95% Cheb-m	(3)
	RDX	UG/L	4.70	17.33	NP	2.70		2.70	UG/L	Max	(4)
	Aluminum	UG/L	4,606	31,636	NP	35,500		31,636	UG/L	99% Cheb	(1)
	Arsenic	UG/L	3.21	5.24	T	6.20		5.24	UG/L	95% UCL-T	(1)
	Barium	UG/L	210	715	NP	726		715	UG/L	97.5% Cheb-m	(3)
	Chromium	UG/L	12.2	80.3	T	56.3		56.3	UG/L	Max	(4)
	Iron	UG/L	67,724	1,060,117	T	377,000		377,000	UG/L	Max	(4)
	Lead	UG/L	6.8	17.4	T	36.7		2.42	UG/L	Mean-T	(1)
	Manganese	UG/L	695	889	N	1,380		889	UG/L	95% UCL-N	(5)
	Thallium	UG/L	2.20	4.83	NP	6.90		4.83	UG/L	95% Cheb-m	(3)
	Vanadium	UG/L	12.5	95.9	T	79.6		79.6	UG/L	Max	(4)

For non-detects, 1/2 sample quantitation limit was used as a proxy concentration; for duplicate sample results, the maximum of the two samples was used.

ProUCL, Version 2.1 used to determine distribution of data using the Shapiro-Wilk W Test. ProUCL used to calculate RME EPC, following recommendations based on distribution and standard deviation in users guide.

Statistics: Maximum Detected Value (Max); 95% UCL of Normal Data (95% UCL-N); 95% UCL of Log-transformed Data, H-Statistic (95% UCL-T); 95% Chebyshev (MVUE) UCL (95% Cheb); 99% Chebyshev (MVUE) UCL (99% Cheb); 95% Chebyshev (mean,std) UCL (95% Cheb-m); 97.5% Chebyshev (mean,std) UCL (97.5% Cheb-m); 99% Chebyshev (mean,std) UCL (99% Cheb-m); Mean of Normal Data (Mean-N).

(1) Shapiro-Wilk W Test indicates data are log-normally distributed.

(2) Shapiro-Wilks W Test indicates data are normally distributed.

(3) Shapiro-Wilks W Test indicates data neither log-normally or normally distributed. Use non-parametric RME EPC.

(4) 95% UCL (or mean) exceeds maximum detected concentration. Therefore, maximum concentration used for EPC.

(5) Shapiro-Wilks W Test indicated data are normally and lognormally distributed. Distribution with the highest W-Value used to select EPC.

N = Normal
T = Transformed
NP = Non-parametric
J = Estimated Value

Table 3.1.CT
MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY
St. Juliens Creek Annex - Site 2

Scenario Timeframe: Current/Future
Medium: Surface Soil
Exposure Medium: Surface Soil

Exposure Point	Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL of (N/T/NP)		Maximum Concentration (Qualifier)		Exposure Point Concentration			
								Value	Units	Statistic	Rationale
At Site 2											
	Benzo(a)pyrene	MG/KG	0.391	0.543	T	1.40	J	1.01	MG/KG	Mean-T	(1)
	4,4'-DDT	MG/KG	1.00	5.6	T	12.0	J	1.00	MG/KG	Mean-T	(1)
	Arsenic	MG/KG	4.93	9.5	T	18.0		3.46	MG/KG	Mean-T	(1)
	Copper	MG/KG	287	1,672	NP	4,260		45.5	MG/KG	Mean-T	(3)
	Iron	MG/KG	17,331	62,428	NP	106,000		8,068	MG/KG	Mean-T	(3)
	Lead	MG/KG	278	0.612	T	2,370		109	MG/KG	Mean-T	(1)
	Vanadium	MG/KG	30.6	46.8	T	138		22.7	MG/KG	Mean-T	(1)

For non-detects, 1/2 sample quantitation limit was used as a proxy concentration; for duplicate sample results, the maximum of the two samples was used.

ProUCL, Version 2.1 used to determine distribution of data using the Shapiro-Wilk W Test. ProUCL used to calculate RME EPC, following recommendations based on distribution and standard deviation in users guide.

Statistics: Maximum Detected Value (Max); 95% UCL of Normal Data (95% UCL-N); 95% UCL of Log-transformed Data, H-Statistic (95% UCL-T); 95% Chebyshev (MVUE) UCL (95% Cheb); 99% Chebyshev (MVUE) UCL (99% Cheb); 95% Chebyshev (mean,std) UCL (95% Cheb-m); 97.5% Chebyshev (mean,std) UCL (97.5% Cheb-m); 99% Chebyshev (mean,std) UCL (99% Cheb-m); Mean of Normal Data (Mean-N); Mean of Log-transformed data (Mean-T).

(1) Shapiro-Wilk W Test indicates data are log-normally distributed.
(2) Shapiro-Wilks W Test indicates data are normally distributed.
(3) Shapiro-Wilks W Test indicates data neither log-normally or normally distributed, or both log-normally and normally distributed. Use distribution based on highest W-test.
(4) 95% UCL (or mean) exceeds maximum detected concentration. Therefore, maximum concentration used for EPC.

N = Normal
T = Transformed
NP = Non-parametric
J = Estimated Value

Table 3.2.CT
MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY
St. Juliens Creek Annex - Site 2

Scenario Timeframe: Current/Future
Medium: Surface Soil
Exposure Medium: Surface Soil

Exposure Point	Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL of (N/T/NP)		Maximum Concentration (Qualifier)	Exposure Point Concentration			
							Value	Units	Statistic	Rationale
At Site 2	Chromium	ug/m^3	3.4E-05	1.2E-04	NP	1.9E-04	1.4E-05	MG/KG	Mean-T	(1)

For non-detects, 1/2 sample quantitation limit was used as a proxy concentration; for duplicate sample results, the maximum of the two samples was used.

ProUCL, Version 2.1 used to determine distribution of data using the Shapiro-Wilk W Test. ProUCL used to calculate RME EPC, following recommendations based on distribution and standard deviation in users guide.

Statistics: Maximum Detected Value (Max); 95% UCL of Normal Data (95% UCL-N); 95% UCL of Log-transformed Data, H-Statistic (95% UCL-T); 95% Chebyshev (MVUE) UCL (95% Cheb); 99% Chebyshev (MVUE) UCL (99% Cheb); 95% Chebyshev (mean,std) UCL (95% Cheb-m); 97.5% Chebyshev (mean,std) UCL (97.5% Cheb-m); 99% Chebyshev (mean,std) UCL (99% Cheb-m); Mean of Normal Data (Mean-N); Mean of Log-transformed data (Mean-T).

(1) Shapiro-Wilk W Test indicates data are log-normally distributed.
(2) Shapiro-Wilks W Test indicates data are normally distributed.
(3) Shapiro-Wilks W Test indicates data neither log-normally or normally distributed, or both log-normally and normally distributed. Use distribution based on highest W-test.
(4) 95% UCL (or mean) exceeds maximum detected concentration. Therefore, maximum concentration used for EPC.

N = Normal
T = Transformed
NP = Non-parametric
J = Estimated Value

Table 3.3.CT
MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY
St. Juliens Creek Annex - Site 2

Scenario Timeframe: Current/Future
Medium: Groundwater
Exposure Medium: Deep Groundwater

Exposure Point	Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL of (N/T/NP)		Maximum Concentration (Qualifier)		Exposure Point Concentration			
								Value	Units	Statistic	Rationale
Tap Water											
	Chloroform	UG/L	1.40	4.77	NP	6.00		0.83	UG/L	Mean-T	(3)
	Arsenic	UG/L	2.28	4.22	T	3.70	J	1.98	UG/L	Mean-T	(3)
	Iron	UG/L	908	7,322	T	3,820	J	306	UG/L	Mean-T	(1)
	Manganese	UG/L	98.0	821	T	229	J	49	UG/L	Mean-T	(3)
	Vanadium	UG/L	3.21	11.6	NP	9.60	K	1.7	UG/L	Mean-T	(3)

For non-detects, 1/2 sample quantitation limit was used as a proxy concentration; for duplicate sample results, the maximum of the two samples was used.

ProUCL, Version 2.1 used to determine distribution of data using the Shapiro-Wilk W Test. ProUCL used to calculate RME EPC, following recommendations based on distribution and standard deviation in users guide.

Statistics: Maximum Detected Value (Max); 95% UCL of Normal Data (95% UCL-N); 95% UCL of Log-transformed Data, H-Statistic (95% UCL-T); 95% Chebyshev (MVUE) UCL (95% Cheb); 99% Chebyshev (MVUE) UCL (99% Cheb); 95% Chebyshev (mean,std) UCL (95% Cheb-m); 97.5% Chebyshev (mean,std) UCL (97.5% Cheb-m); 99% Chebyshev (mean,std) UCL (99% Cheb-m); Mean of Normal Data (Mean-N); Mean of Log-transformed data (Mean-T).

(1) Shapiro-Wilk W Test indicates data are log-normally distributed.
(2) Shapiro-Wilks W Test indicates data are normally distributed.
(3) Shapiro-Wilks W Test indicates data neither log-normally or normally distributed, or both log-normally and normally distributed. Use distribution based on highest W-test.
(4) 95% UCL (or mean) exceeds maximum detected concentration. Therefore, maximum concentration used for EPC.

N = Normal
T = Transformed
NP = Non-parametric
J = Estimated Value

Table 3.4.CT
MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY
St. Juliens Creek Annex - Site 2

Scenario Timeframe: Current/Future
Medium: Groundwater
Exposure Medium: Deep Groundwater

Exposure Point	Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL of (N/T/NP)	Maximum Concentration (Qualifier)	Exposure Point Concentration			
						Value	Units	Statistic	Rationale
Tap Water	Chloroform	UG/L	1.40	4.77 NP	6.00	0.83	UG/L	Mean-T	(3)

For non-detects, 1/2 sample quantitation limit was used as a proxy concentration; for duplicate sample results, the maximum of the two samples was used.

ProUCL, Version 2.1 used to determine distribution of data using the Shapiro-Wilk W Test. ProUCL used to calculate RME EPC, following recommendations based on distribution and standard deviation in users guide.

Statistics: Maximum Detected Value (Max); 95% UCL of Normal Data (95% UCL-N); 95% UCL of Log-transformed Data, H-Statistic (95% UCL-T); 95% Chebyshev (MVUE) UCL (95% Cheb); 99% Chebyshev (MVUE) UCL (99% Cheb); 95% Chebyshev (mean,std) UCL (95% Cheb-m); 97.5% Chebyshev (mean,std) UCL (97.5% Cheb-m); 99% Chebyshev (mean,std) UCL (99% Cheb-m); Mean of Normal Data (Mean-N); Mean of Log-transformed data (Mean-T).

(1) Shapiro-Wilk W Test indicates data are log-normally distributed.
(2) Shapiro-Wilks W Test indicates data are normally distributed.
(3) Shapiro-Wilks W Test indicates data neither log-normally or normally distributed, or both log-normally and normally distributed. Use distribution based on highest W-test.
(4) 95% UCL (or mean) exceeds maximum detected concentration. Therefore, maximum concentration used for EPC.

N = Normal
T = Transformed
NP = Non-parametric
J = Estimated Value

Table 3.5.CT
MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY
St. Juliens Creek Annex - Site 2

Scenario Timeframe: Current/Future
Medium: Surface Water
Exposure Medium: Surface Water

Exposure Point	Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL of (N/T/NP)		Maximum Concentration (Qualifier)		Exposure Point Concentration			
								Value	Units	Statistic	Rationale
Drainage Features and Ponded Area	Chloroform	UG/L	2.34	7.17	NP	5.40		1.22	UG/L	Mean-T	(3)
	Trichloroethene	UG/L	29.2	394	T	130		5.76	UG/L	Mean-T	(1)
	Vinyl chloride	UG/L	4.98	15.1	NP	21.9		2.25	UG/L	Mean-T	(1)
	cis-1,2-Dichloroethene	UG/L	26.1	409	T	84.0		5.31	UG/L	Mean-T	(1)
	bis(2-Ethylhexyl)phthalate	UG/L	13.3	69	NP	84.0		5.22	UG/L	Mean-T	(3)
	Arsenic	UG/L	2.17	3.8	NP	4.40	J	1.95	UG/L	Mean-T	(3)
	Chromium	UG/L	30.2	150	NP	166		6.77	UG/L	Mean-T	(3)
	Iron	UG/L	4,620	11,656	NP	18,800	L	2,285	UG/L	Mean-T	(1)
	Lead	UG/L	18	48		78	L	7.11	UG/L	Mean-T	(1)
	Manganese	UG/L	388	2,038	NP	2,490	L	151	UG/L	Mean-T	(3)
	Vanadium	UG/L	6.9	17.1	T	32.8	J	2.9	UG/L	Mean-T	(1)

For non-detects, 1/2 sample quantitation limit was used as a proxy concentration; for duplicate sample results, the maximum of the two samples was used.

ProUCL, Version 2.1 used to determine distribution of data using the Shapiro-Wilk W Test. ProUCL used to calculate RME EPC, following recommendations based on distribution and standard deviation in users guide.

Statistics: Maximum Detected Value (Max); 95% UCL of Normal Data (95% UCL-N); 95% UCL of Log-transformed Data, H-Statistic (95% UCL-T); 95% Chebyshev (MVUE) UCL (95% Cheb); 99% Chebyshev (MVUE) UCL (99% Cheb); 95% Chebyshev (mean,std) UCL (95% Cheb-m); 97.5% Chebyshev (mean,std) UCL (97.5% Cheb-m); 99% Chebyshev (mean,std) UCL (99% Cheb-m); Mean of Normal Data (Mean-N); Mean of Log-transformed data (Mean-T).

(1) Shapiro-Wilk W Test indicates data are log-normally distributed.

(2) Shapiro-Wilks W Test indicates data are normally distributed.

(3) Shapiro-Wilks W Test indicates data neither log-normally or normally distributed, or both log-normally and normally distributed. Use distribution based on highest W-test.

N = Normal
T = Transformed
NP = Non-parametric
J = Estimated Value

Table 3.5.CT
MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY
St. Juliens Creek Annex - Site 2

Scenario Timeframe: Current/Future
Medium: Surface Water
Exposure Medium: Surface Water

Exposure Point	Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL of (N/T/NP)	Maximum Concentration (Qualifier)	Exposure Point Concentration			
						Value	Units	Statistic	Rationale

(4) 95% UCL (or mean) exceeds maximum detected concentration. Therefore, maximum concentration used for EPC.

Table 3.6.CT
MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY
St. Juliens Creek Annex - Site 2

Scenario Timeframe: Current/Future
Medium: Sediment
Exposure Medium: Sediment

Exposure Point	Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL of (N/T/NP)	Maximum Concentration (Qualifier)	Exposure Point Concentration			
						Value	Units	Statistic	Rationale
Drainage Features and Ponded Area	Arsenic	MG/KG	7.00	14.2 T	19.4	5.42	MG/KG	Mean-T	(3)

For non-detects, 1/2 sample quantitation limit was used as a proxy concentration; for duplicate sample results, the maximum of the two samples was used.

ProUCL, Version 2.1 used to determine distribution of data using the Shapiro-Wilk W Test. ProUCL used to calculate RME EPC, following recommendations based on distribution and standard deviation in users guide.

Statistics: Maximum Detected Value (Max); 95% UCL of Normal Data (95% UCL-N); 95% UCL of Log-transformed Data, H-Statistic (95% UCL-T); 95% Chebyshev (MVUE) UCL (95% Cheb); 99% Chebyshev (MVUE) UCL (99% Cheb); 95% Chebyshev (mean,std) UCL (95% Cheb-m); 97.5% Chebyshev (mean,std) UCL (97.5% Cheb-m); 99% Chebyshev (mean,std) UCL (99% Cheb-m); Mean of Normal Data (Mean-N); Mean of Log-transformed data (Mean-T).

(1) Shapiro-Wilk W Test indicates data are log-normally distributed.

(2) Shapiro-Wilks W Test indicates data are normally distributed.

(3) Shapiro-Wilks W Test indicates data neither log-normally or normally distributed, or both log-normally and normally distributed. Use distribution based on highest W-test.

(4) 95% UCL (or mean) exceeds maximum detected concentration. Therefore, maximum concentration used for EPC.

N = Normal
T = Transformed
NP = Non-parametric
J = Estimated Value

Table 3.7.CT
MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY
St. Juliens Creek Annex - Site 2

Scenario Timeframe: Future
Medium: Soil*
Exposure Medium: Soil*

Exposure Point	Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL of (N/T/NP)		Maximum Concentration (Qualifier)		Exposure Point Concentration			
								Value	Units	Statistic	Rationale
At Site 2											
	Benzo(a)anthracene	MG/KG	0.357	0.69	NP	2.30		0.27	MG/KG	Mean-T	(3)
	Benzo(a)pyrene	MG/KG	0.322	0.41	T	1.40	J	0.26	MG/KG	Mean-T	(1)
	Benzo(b)fluoranthene	MG/KG	0.422	0.62	T	1.70	J	0.31	MG/KG	Mean-T	(1)
	Dibenz(a,h)anthracene	MG/KG	0.311	0.53	NP	0.130	J	0.23	MG/KG	Mean-T	(3)
	4,4'-DDD	MG/KG	0.239	1.8	NP	4.20		0.011	MG/KG	Mean-T	(3)
	4,4'-DDE	MG/KG	0.596	2.5	T	7.20	J	0.07	MG/KG	Mean-T	(1)
	4,4'-DDT	MG/KG	11.0	114	NP	290	J	0.06	MG/KG	Mean-T	(3)
	Aluminum	MG/KG	7,611	10,113	T	21,700		5,950	MG/KG	Mean-T	(1)
	Antimony	MG/KG	3.78	21.6	NP	77.7		0.61	MG/KG	Mean-T	(3)
	Arsenic	MG/KG	5.72	8.46	T	41.7		3.65	MG/KG	Mean-T	(1)
	Cadmium	MG/KG	0.989	2.30	T	11.2		0.29	MG/KG	Mean-T	(1)
	Chromium	MG/KG	39.7	63.3	T	246		18.8	MG/KG	Mean-T	(1)
	Copper	MG/KG	277	584	T	4,260		41.9	MG/KG	Mean-T	(1)
	Iron	MG/KG	21,865	70,479	NP	210,000		8,972	MG/KG	Mean-T	(3)
	Lead	MG/KG	536	1,149	T	8,850		90	MG/KG	Mean-T	(1)
	Manganese	MG/KG	161	305	T	1,260		73	MG/KG	Mean-T	(1)
	Nickel	MG/KG	28.8	60.4	T	246		9.6	MG/KG	Mean-T	(1)
	Thallium	MG/KG	0.729	1.82	NP	6.20		0.39	MG/KG	Mean-T	(3)
	Vanadium	MG/KG	27.3	37.0	T	138		20.9	MG/KG	Mean-T	(1)
	Zinc	MG/KG	713	1,941	T	7,560		163	MG/KG	Mean-T	(1)

* Surface soil & subsurface soil combined.

For non-detects, 1/2 sample quantitation limit was used as a proxy concentration; for duplicate sample results, the maximum of the two samples was used.

ProUCL, Version 2.1 used to determine distribution of data using the Shapiro-Wilk W Test. ProUCL used to calculate RME EPC, following recommendations

Table 3.7.CT

MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY

St. Juliens Creek Annex - Site 2

Scenario Timeframe: Future
Medium: Soil*
Exposure Medium: Soil*

Exposure Point	Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL of (N/T/NP)	Maximum Concentration (Qualifier)	Exposure Point Concentration			
						Value	Units	Statistic	Rationale

based on distribution and standard deviation in users guide.

Statistics: Maximum Detected Value (Max); 95% UCL of Normal Data (95% UCL-N); 95% UCL of Log-transformed Data, H-Statistic (95% UCL-T); 95% Chebyshev (MVUE) UCL (95% Cheb); 99% Chebyshev (MVUE) UCL (99% Cheb); 95% Chebyshev (mean,std) UCL (95% Cheb-m); 97.5% Chebyshev (mean,std) UCL (97.5% Cheb-m); 99% Chebyshev (mean,std) UCL (99% Cheb-m); Mean of Normal Data (Mean-N); Mean of Log-transformed data (Mean-T).

(1) Shapiro-Wilk W Test indicates data are log-normally distributed.

(2) Shapiro-Wilks W Test indicates data are normally distributed.

(3) Shapiro-Wilks W Test indicates data neither log-normally or normally distributed, or both log-normally and normally distributed. Use distribution based on highest W-test.

(4) 95% UCL (or mean) exceeds maximum detected concentration. Therefore, maximum concentration used for EPC.

N = Normal
T = Transformed
NP = Non-parametric
J = Estimated Value

Table 3.8.CT

MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY

St. Juliens Creek Annex - Site 2

Scenario Timeframe: Future
Medium: Soil*
Exposure Medium: Soil*

Exposure Point	Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL of (N/T/NP)		Maximum Concentration (Qualifier)		Exposure Point Concentration			
								Value	Units	Statistic	Rationale
At Site 2											
	Benzo(a)pyrene	MG/KG	0.322	0.41	T	1.40	J	0.26	MG/KG	Mean-T	(1)
	4,4'-DDT	MG/KG	11.0	114	NP	290	J	0.06	MG/KG	Mean-T	(3)
	Antimony	MG/KG	3.78	21.6	NP	77.7		0.61	MG/KG	Mean-T	(3)
	Arsenic	MG/KG	5.72	8.46	T	41.7		3.65	MG/KG	Mean-T	(1)
	Copper	MG/KG	277	584	T	4,260		41.9	MG/KG	Mean-T	(1)
	Iron	MG/KG	21,865	70,479	NP	210,000		8,972	MG/KG	Mean-T	(3)
	Lead	MG/KG	536	1,149	T	8,850		90	MG/KG	Mean-T	(1)
	Vanadium	MG/KG	27.3	37.0	T	138		20.9	MG/KG	Mean-T	(1)

* Surface soil & subsurface soil combined.

For non-detects, 1/2 sample quantitation limit was used as a proxy concentration; for duplicate sample results, the maximum of the two samples was used.

ProUCL, Version 2.1 used to determine distribution of data using the Shapiro-Wilk W Test. ProUCL used to calculate RME EPC, following recommendations based on distribution and standard deviation in users guide.

Statistics: Maximum Detected Value (Max); 95% UCL of Normal Data (95% UCL-N); 95% UCL of Log-transformed Data, H-Statistic (95% UCL-T); 95% Chebyshev (MVUE) UCL (95% Cheb); 99% Chebyshev (MVUE) UCL (99% Cheb); 95% Chebyshev (mean,std) UCL (95% Cheb-m); 97.5% Chebyshev (mean,std) UCL (97.5% Cheb-m); 99% Chebyshev (mean,std) UCL (99% Cheb-m); Mean of Normal Data (Mean-N); Mean of Log-transformed data (Mean-T).

(1) Shapiro-Wilk W Test indicates data are log-normally distributed.

(2) Shapiro-Wilks W Test indicates data are normally distributed.

(3) Shapiro-Wilks W Test indicates data neither log-normally or normally distributed, or both log-normally and normally distributed. Use distribution based on highest W-test.

(4) 95% UCL (or mean) exceeds maximum detected concentration. Therefore, maximum concentration used for EPC.

N = Normal
T = Transformed
NP = Non-parametric
J = Estimated Value

Table 3.9.CT
MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY
St. Juliens Creek Annex - Site 2

Scenario Timeframe: Future
Medium: Soil*
Exposure Medium: Air

Exposure Point	Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL of (N/T/NP)	Maximum Concentration (Qualifier)	Exposure Point Concentration			
						Value	Units	Statistic	Rationale
At Site 2	Chromium	ug/m^3	3.0E-05	6.8E-05 T	1.9E-04 J	1.4E-05	MG/KG	Mean-T	(1)

* Surface soil & subsurface soil combined.

For non-detects, 1/2 sample quantitation limit was used as a proxy concentration; for duplicate sample results, the maximum of the two samples was used.

ProUCL, Version 2.1 used to determine distribution of data using the Shapiro-Wilk W Test. ProUCL used to calculate RME EPC, following recommendations based on distribution and standard deviation in users guide.

Statistics: Maximum Detected Value (Max); 95% UCL of Normal Data (95% UCL-N); 95% UCL of Log-transformed Data, H-Statistic (95% UCL-T); 95% Chebyshev (MVUE) UCL (95% Cheb); 99% Chebyshev (MVUE) UCL (99% Cheb); 95% Chebyshev (mean,std) UCL (95% Cheb-m); 97.5% Chebyshev (mean,std) UCL (97.5% Cheb-m); 99% Chebyshev (mean,std) UCL (99% Cheb-m); Mean of Normal Data (Mean-N); Mean of Log-transformed data (Mean-T).

(1) Shapiro-Wilk W Test indicates data are log-normally distributed.
(2) Shapiro-Wilks W Test indicates data are normally distributed.
(3) Shapiro-Wilks W Test indicates data neither log-normally or normally distributed, or both log-normally and normally distributed. Use distribution based on highest W-test.
(4) 95% UCL (or mean) exceeds maximum detected concentration. Therefore, maximum concentration used for EPC.

N = Normal
T = Transformed
NP = Non-parametric
J = Estimated Value

Table 3.10.CT

MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY

St. Juliens Creek Annex - Site 2

Scenario Timeframe: Future
Medium: Surface Water
Exposure Medium: Surface Water

Exposure Point	Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL of (N/T/NP)		Maximum Concentration (Qualifier)		Exposure Point Concentration			
								Value	Units	Statistic	Rationale
Drainage Features and Ponded Area	Chloroform	UG/L	2.34	7.17	NP	5.40		1.22	UG/L	Mean-T	(3)
	Trichloroethene	UG/L	29.2	394	T	130		5.76	UG/L	Mean-T	(1)
	Vinyl chloride	UG/L	4.98	15.1	T	21.9		2.25	UG/L	Mean-T	(1)
	cis-1,2-Dichloroethene	UG/L	26.1	409	T	84.0		5.31	UG/L	Mean-T	(1)
	bis(2-Ethylhexyl)phthalate	UG/L	13.3	69	NP	84.0		5.22	UG/L	Mean-T	(3)
	Arsenic	UG/L	2.17	3.8	NP	4.40	J	1.95	UG/L	Mean-T	(3)
	Chromium	UG/L	30.2	150	NP	166		6.77	UG/L	Mean-T	(3)
	Iron	UG/L	4,620	11,656	T	18,800	L	2,285	UG/L	Mean-T	(1)
	Lead	UG/L	18	48		78	L	7.11	UG/L	Mean-T	(1)
	Manganese	UG/L	388	2,038	NP	2,490	L	151	UG/L	Mean-T	(3)
	Vanadium	UG/L	6.9	17.1	T	32.8	J	2.9	UG/L	Mean-T	(1)

For non-detects, 1/2 sample quantitation limit was used as a proxy concentration; for duplicate sample results, the maximum of the two samples was used.

ProUCL, Version 2.1 used to determine distribution of data using the Shapiro-Wilk W Test. ProUCL used to calculate RME EPC, following recommendations based on distribution and standard deviation in users guide.

Statistics: Maximum Detected Value (Max); 95% UCL of Normal Data (95% UCL-N); 95% UCL of Log-transformed Data, H-Statistic (95% UCL-T); 95% Chebyshev (MVUE) UCL (95% Cheb); 99% Chebyshev (MVUE) UCL (99% Cheb); 95% Chebyshev (mean,std) UCL (95% Cheb-m); 97.5% Chebyshev (mean,std) UCL (97.5% Cheb-m); 99% Chebyshev (mean,std) UCL (99% Cheb-m); Mean of Normal Data (Mean-N); Mean of Log-transformed data (Mean-T).

(1) Shapiro-Wilk W Test indicates data are log-normally distributed.

(2) Shapiro-Wilks W Test indicates data are normally distributed.

(3) Shapiro-Wilks W Test indicates data neither log-normally or normally distributed, or both log-normally and normally distributed. Use distribution based on highest W-test.

(4) 95% UCL (or mean) exceeds maximum detected concentration. Therefore, maximum concentration used for EPC.

N = Normal
T = Transformed
NP = Non-parametric
J = Estimated Value

Table 3.11.CT

MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY

St. Juliens Creek Annex - Site 2

Scenario Timeframe: Future
Medium: Sediment
Exposure Medium: Sediment

Exposure Point	Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL of (N/T/NP)		Maximum Concentration (Qualifier)		Exposure Point Concentration			
								Value	Units	Statistic	Rationale
Drainage Features											
	Benzo(a)pyrene	MG/KG	0.756	1.82	T	0.910	J	0.31	MG/KG	Mean-T	(1)
	Arsenic	MG/KG	7.00	14.2	T	19.4		5.42	MG/KG	Mean-T	(3)
	Chromium	MG/KG	660	6,759	T	2,630		165	MG/KG	Mean-T	(1)
	Iron	MG/KG	13,822	36,118	T	31,100		10,243	MG/KG	Mean-T	(3)
	Lead	MG/KG	199	300	N	545		199	MG/KG	Mean-N	(2)

For non-detects, 1/2 sample quantitation limit was used as a proxy concentration; for duplicate sample results, the maximum of the two samples was used.

ProUCL, Version 2.1 used to determine distribution of data using the Shapiro-Wilk W Test. ProUCL used to calculate RME EPC, following recommendations based on distribution and standard deviation in users guide.

Statistics: Maximum Detected Value (Max); 95% UCL of Normal Data (95% UCL-N); 95% UCL of Log-transformed Data, H-Statistic (95% UCL-T); 95% Chebyshev (MVUE) UCL (95% Cheb); 99% Chebyshev (MVUE) UCL (99% Cheb); 95% Chebyshev (mean,std) UCL (95% Cheb-m); 97.5% Chebyshev (mean,std) UCL (97.5% Cheb-m); 99% Chebyshev (mean,std) UCL (99% Cheb-m); Mean of Normal Data (Mean-N); Mean of Log-transformed data (Mean-T).

(1) Shapiro-Wilk W Test indicates data are log-normally distributed.

(2) Shapiro-Wilks W Test indicates data are normally distributed.

(3) Shapiro-Wilks W Test indicates data neither log-normally or normally distributed, or both log-normally and normally distributed. Use distribution based on highest W-test.

(4) 95% UCL (or mean) exceeds maximum detected concentration. Therefore, maximum concentration used for EPC.

N = Normal
T = Transformed
NP = Non-parametric
J = Estimated Value

Table 3.12.CT
MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY
St. Juliens Creek Annex - Site 2

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Shallow Groundwater

Exposure Point	Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL of (N/T/NP)		Maximum Concentration (Qualifier)		Exposure Point Concentration			
								Value	Units	Statistic	Rationale
Water Table											
	1,4-Dichlorobenzene	UG/L	0.527	0.634	NP	0.800	J	0.527	UG/L	Mean-N	(3)
	Trichloroethene	UG/L	0.555	0.714	NP	0.800	J	0.555	UG/L	Mean-N	(3)
	Heptachlor	UG/L	0.0327	0.0588	NP	0.0920		0.030	UG/L	Mean-T	(3)
	RDX	UG/L	4.70	17.33	NP	2.70		2.76	UG/L	Mean-T	(3)
	Aluminum	UG/L	4,606	31,636	T	35,500		728	UG/L	Mean-T	(1)
	Arsenic	UG/L	3.21	5.24	T	6.20		2.69	UG/L	Mean-T	(1)
	Barium	UG/L	210	715	NP	726		105	UG/L	Mean-T	(3)
	Chromium	UG/L	12.2	80.3	T	56.3		5.22	UG/L	Mean-T	(1)
	Iron	UG/L	67,724	1,060,117	T	377,000		6,979	UG/L	Mean-T	(1)
	Lead	UG/L	6.8	17.4	T	36.7	L	2.42	UG/L	Mean-T	(1)
	Manganese	UG/L	695	889	N	1,380		695	UG/L	Mean-N	(3)
	Thallium	UG/L	2.20	4.83	NP	6.90		1.67	UG/L	Mean-T	(3)
	Vanadium	UG/L	12.5	95.9	T	79.6		3.1	UG/L	Mean-T	(1)

For non-detects, 1/2 sample quantitation limit was used as a proxy concentration; for duplicate sample results, the maximum of the two samples was used.

ProUCL, Version 2.1 used to determine distribution of data using the Shapiro-Wilk W Test. ProUCL used to calculate RME EPC, following recommendations based on distribution and standard deviation in users guide.

Statistics: Maximum Detected Value (Max); 95% UCL of Normal Data (95% UCL-N); 95% UCL of Log-transformed Data, H-Statistic (95% UCL-T); 95% Chebyshev (MVUE) UCL (95% Cheb); 99% Chebyshev (MVUE) UCL (99% Cheb); 95% Chebyshev (mean,std) UCL (95% Cheb-m); 97.5% Chebyshev (mean,std) UCL (97.5% Cheb-m); 99% Chebyshev (mean,std) UCL (99% Cheb-m); Mean of Normal Data (Mean-N); Mean of Log-transformed data (Mean-T).

(1) Shapiro-Wilk W Test indicates data are log-normally distributed.
(2) Shapiro-Wilks W Test indicates data are normally distributed.
(3) Shapiro-Wilks W Test indicates data neither log-normally or normally distributed, or both log-normally and normally distributed. Use distribution based on highest W-test.
(4) 95% UCL (or mean) exceeds maximum detected concentration. Therefore, maximum concentration used for EPC.

N = Normal
T = Transformed
NP = Non-parametric
J = Estimated Value

TABLE 4.1.RME

VALUES USED FOR DAILY INTAKE CALCULATIONS

REASONABLE MAXIMUM EXPOSURE

St. Juliens Creek Annex - Site 2

Scenario Timeframe: Current/Future
Medium: Surface Soil
Exposure Medium: Surface Soil

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Ingestion	Trespasser	Adult	At Site 2	CS	Chemical Concentration in Soil	See Table 3.1.RME	mg/kg	- -	CDI (mg/kg-day) =
				IR-S	Ingestion Rate of Soil	100	mg/day	EPA, 1991	CS x IR-S x EF x ED x CF1 x 1/BW x 1/AT
				EF	Exposure Frequency	52	days/year	(1)	
				ED	Exposure Duration	24	years	EPA, 1991	
				CF1	Conversion Factor 1	0.000001	kg/mg	- -	
				BW	Body Weight	70	kg	EPA, 1991	
				AT-C	Averaging Time (Cancer)	25,550	days	EPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	8,760	days	EPA, 1989	
	Trespasser	Adolescent	At Site 2	CS	Chemical Concentration in Soil	See Table 3.1.RME	mg/kg	- -	CDI (mg/kg-day) =
				IR-S	Ingestion Rate of Soil	100	mg/day	EPA, 1991	CS x IR-S x EF x ED x CF1 x 1/BW x 1/AT
				EF	Exposure Frequency	52	days/year	(1)	
				ED	Exposure Duration	9	years	(2)	
				CF1	Conversion Factor 1	0.000001	kg/mg	- -	
				BW	Body Weight	51	kg	EPA, 1997, (3)	
				AT-C	Averaging Time (Cancer)	25,550	days	EPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	3,285	days	EPA, 1989	
Dermal	Trespasser	Adult	At Site 2	CS	Chemical Concentration in Soil	See Table 3.1.RME	mg/kg	- -	CDI (mg/kg-day) =
				SA	Skin Surface Area Available for Contact	3,300	cm^2	EPA, 2001, (4)	CS x SA x SSAF x DABS x CF1 x EF x
				SSAF	Soil to Skin Adherence Factor	0.2	mg/cm^2-day	EPA, 2001, (5)	ED x 1/BW x 1/AT
				DABS	Dermal Absorption Factor Solids	chem specific	--	EPA, 2001	
				CF1	Conversion Factor 1	0.000001	kg/mg	- -	
				EF	Exposure Frequency	52	days/year	(1)	
				ED	Exposure Duration	24	years	EPA, 1991	
				BW	Body Weight	70	kg	EPA, 1991	
				AT-C	Averaging Time (Cancer)	25,550	days	EPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	8,760	days	EPA, 1989	

TABLE 4.1.RME

VALUES USED FOR DAILY INTAKE CALCULATIONS

REASONABLE MAXIMUM EXPOSURE

St. Juliens Creek Annex - Site 2

Scenario Timeframe: Current/Future
Medium: Surface Soil
Exposure Medium: Surface Soil

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Dermal (continued)	Trespasser	Adolescent	At Site 2	CS	Chemical Concentration in Soil	See Table 3.1.RME	mg/kg	- -	CDI (mg/kg-day) =
				SA	Skin Surface Area Available for Contact	4,600	cm^2	EPA, 1997, (6)	CS x SA x SSAF x DABS x CF1 x EF x
				SSAF	Soil to Skin Adherence Factor	0.2	mg/cm^2-day	EPA, 2001, (7)	ED x 1/BW x 1/AT
				DABS	Dermal Absorption Factor Solids	chem specific	--	EPA, 2001	
				CF1	Conversion Factor 1	0.000001	kg/mg	- -	
				EF	Exposure Frequency	52	days/year	(1)	
				ED	Exposure Duration	9	years	(2)	
				BW	Body Weight	51	kg	EPA, 1997,(3)	
				AT-C	Averaging Time (Cancer)	25,550	days	EPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	3,285	days	EPA, 1989	

Notes:

(1) Professional Judgement assuming 2 days per week for 26 weeks per year.

(2) Professional Judgement assuming adolescents from 9 to 18 years of age.

(3) Body weight is average value for the 9 year old and 18 year old male body weight.

(4) RME SA includes head, hands, forearms, and lower legs.

(5) RME SSAF is soil adherence to hands for Groundskeeper No. 1.

(6) Surface area is 25% of total surface area for 12-15 year old male. 95th percentile for total surface area is 1.85 m^2.

(7) SSAF for children playing in wet soil (geometric mean for a high end contact activity).

Sources:

EPA, 1989: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual, Part A. OERR. EPA/540/1-89/002.

EPA, 1991: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual - Supplemental Guidance, Standard Default Exposure Factors. Interim Final. OSWER Directive 9285.6-03.

EPA, 1997: Exposure Factors Handbook. EPA/600/P-95/002Fa.

EPA, 2001: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment) Interim. EPA/540/R/99/005.

TABLE 4.2.RME

VALUES USED FOR DAILY INTAKE CALCULATIONS

REASONABLE MAXIMUM EXPOSURE

St. Juliens Creek Annex - Site 2

Scenario Timeframe: Current/Future
Medium: Surface Soil
Exposure Medium: Air

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Inhalation	Trespasser	Adult	Emissions from Surface Soil at Site 2	CS	Chemical Concentration in Soil	See Table 3.2.RME	mg/kg	- -	CDI (mg/kg-day) =
				CA	Chemical Concentration in Air	calculated	mg/m^3	calculated	CA x IN x ET x EF x ED x 1/BW x 1/AT
				PEF	Particulate Emission Factor	1.32E+09	m^3/kg	EPA, 1996	
				VF	Volatilization Factor for volatile constituents	calc	m^3/kg	EPA, 1996	CA (mg/m^3) = CS (1/PEF + 1/VF)
				IN	Inhalation Rate	0.83	$m^3/hour$	EPA, 1991	
				ET	Exposure Time	2	hr/day	(1)	
				EF	Exposure Frequency	52	days/year	(2)	
				ED	Exposure Duration	24	years	EPA, 1991	
				BW	Body Weight	70	kg	EPA, 1991	
				AT-C	Averaging Time (Cancer)	25,550	days	EPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	8,760	days	EPA, 1989	
	Trespasser	Adolescent	Emissions from Surface Soil at Site 2	CS	Chemical Concentration in Soil	See Table 3.2.RME	mg/kg	- -	CDI (mg/kg-day) =
				CA	Chemical Concentration in Air	calculated	mg/m^3	calculated	CA x IN x ET x EF x ED x 1/BW x 1/AT
				PEF	Particulate Emission Factor	1.32E+09	m^3/kg	EPA, 1996	
				VF	Volatilization Factor for volatile constituents	calc	m^3/kg	EPA, 1996	CA (mg/m^3) = CS (1/PEF + 1/VF)
				IN	Inhalation Rate	0.83	$m^3/hour$	EPA, 1991	
				ET	Exposure Time	2	hr/day	(1)	
				EF	Exposure Frequency	52	days/year	(2)	
				ED	Exposure Duration	9	years	(3)	
				BW	Body Weight	51	kg	EPA, 1997,(4)	
				AT-C	Averaging Time (Cancer)	25,550	days	EPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	3,285	days	EPA, 1989	

Notes:

(1) Professional judgement assuming trespasser would spend a maximum of 2 hours at the site.

(2) Professional Judgement assuming 2 days per week for 26 weeks per year.

(3) Professional Judgement assuming adolescents from 9 to 18 years of age.

(4) Body weight is average value for the 9 year old and 18 year old male body weight.

Sources:

EPA, 1989: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual, Part A. OERR. EPA/540/1-89/002.

EPA, 1991: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual - Supplemental Guidance, Standard Default Exposure Factors. Interim Final. OSWER Directive 9285.6-03.

EPA, 1996: Soil Screening Guidance: User's Guide. OSWER. EPA/540/R-96/018.

EPA, 1997: Exposure Factors Handbook. EPA/600/P-95/002Fa.

TABLE 4.3.RME
VALUES USED FOR DAILY INTAKE CALCULATIONS
REASONABLE MAXIMUM EXPOSURE
St. Juliens Creek Annex - Site 2

Scenario Timeframe: Current/Future
Medium: Groundwater
Exposure Medium: Deep Groundwater

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Ingestion	Resident	Adult	Tap Water	CW	Chemical Concentration in Water	See Table 3.3.RME	µg/l	- -	Chronic Daily Intake (CDI) (mg/kg-day) =
				IR-W	Ingestion Rate of Water	2	liters/day	EPA, 1997	CW x IR-W x EF x ED x CF1 x 1/BW x 1/AT
				EF	Exposure Frequency	350	days/year	EPA, 1991	
				ED	Exposure Duration	24	years	EPA, 1991	
				CF1	Conversion Factor 1	0.001	mg/µg	- -	
				BW	Body Weight	70	kg	EPA, 1991	
				AT-C	Averaging Time (Cancer)	25,550	days	EPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	8,760	days	EPA, 1989	
		Child	Tap Water	CW	Chemical Concentration in Water	See Table 3.3.RME	µg/l	- -	CDI (mg/kg-day) =
				IR-W	Ingestion Rate of Water	1	liters/day	EPA, 1997	CW x IR-W x EF x ED x CF1 x 1/BW x 1/AT
				EF	Exposure Frequency	350	days/year	EPA, 1991	
				ED	Exposure Duration	6	years	EPA, 1991	
				CF1	Conversion Factor 1	0.001	mg/µg	- -	
				BW	Body Weight	15	kg	EPA, 1991	
				AT-C	Averaging Time (Cancer)	25,550	days	EPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	2,190	days	EPA, 1989	
		Child/Adult	Tap Water	CW	Chemical Concentration in Water	See Table 3.3.RME	µg/l	- -	CDI (mg/kg-day) =
				IR-W-A	Ingestion Rate of Water, Adult	2	liters/day	EPA, 1997	CW x IR-W-Adj x EF x CF1 x 1/AT
				IR-W-C	Ingestion Rate of Water, Child	1	liters/day	EPA, 1997	
				IR-W-Adj	Ingestion Rate of Water, Age-adjusted	1.09	liter-year/kg-day	calculated	IR-W-Adj (liter-year/kd-day) =
				EF	Exposure Frequency	350	days/year	EPA, 1991	(ED-C x IR-W-C / BW-C) +
				ED-A	Exposure Duration, Adult	24	years	EPA, 1991	(ED-A x IR-W-A / BW-A)
				ED-C	Exposure Duration, Child	6	years	EPA, 1991	
				CF1	Conversion Factor 1	0.001	mg/µg	- -	
				BW-A	Body Weight , Adult	70	kg	EPA, 1991	
				BW-C	Body Weight, Child	15	kg	EPA, 1991	
				AT-C	Averaging Time (Cancer)	25,550	days	EPA, 1989	

TABLE 4.3.RME
VALUES USED FOR DAILY INTAKE CALCULATIONS
REASONABLE MAXIMUM EXPOSURE
St. Juliens Creek Annex - Site 2

Scenario Timeframe: Current/Future
Medium: Groundwater
Exposure Medium: Deep Groundwater

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Dermal	Resident	Adult	Tap Water	CW	Chemical Concentration in Water	See Table 3.3.RME	µg/l	- -	CDI (mg/kg-day) =
				DAevent	Dermally Absorbed Dose per Event	calculated	mg/cm^2-event	calculated	DAevent x SA x EV x EF x ED x 1/BW x 1/AT
				FA	Fraction absorbed water	chemical specific	dimensionless	EPA, 2001	
				Kp	Permeability Coefficient	chemical specific	cm/hr	EPA, 2001	Inorganics: DAevent (mg/cm^2-event) =
				τ	Lag Time	chemical specific	hr/event	EPA, 2001	Kp x CW x t_{event} x CF1 x CF2
				t*	Time to Reach Steady-state	chemical specific	hours	EPA, 2001	
				B	Ratio of Permeability of Stratum Corneum to Epidermis	chemical specific	dimensionless	EPA, 2001	Organics :
				t_{event}	Event Time	0.58	hr/event	EPA, 2001	t_{event}<t*: DAevent (mg/cm^2-event) =
				SA	Skin Surface Area Available for Contact	18,000	cm^2	EPA, 2001	2 x FA x Kp x CW x (sqrt((6 x τ x t_{event})/π))
				EV	Event Frequency	1	events/day	EPA, 2001	x CF1 x CF2
				EF	Exposure Frequency	350	days/year	EPA, 2001	
				ED	Exposure Duration	24	years	EPA, 2001	t_{event}>t*: DAevent (mg/cm^2-event) =
				BW	Body Weight	70	kg	EPA, 1991	FA x Kp x CW x (t_{event}/(1+B) + 2 x τ x
				AT-C	Averaging Time (Cancer)	25,550	days	EPA, 1989	((1 + 3B + 3B^2)/(1+B)^2)) x CF1 x CF2
				AT-N	Averaging Time (Non-Cancer)	8,760	days	EPA, 1989	
				CF1	Conversion Factor 1	0.001	mg/µg	- -	
				CF2	Conversion Factor 2	0.001	l/cm^3	- -	
		Child	Tap Water	CW	Chemical Concentration in Water	See Table 3.3.RME	µg/l	- -	CDI (mg/kg-day) =
				DAevent	Dermally Absorbed Dose per Event	calculated	mg/cm^2-event	calculated	DAevent x SA x EV x EF x ED x 1/BW x 1/AT
				FA	Fraction absorbed water	chemical specific	dimensionless	EPA, 2001	
				Kp	Permeability Coefficient	chemical specific	cm/hr	EPA, 2001	Inorganics: DAevent (mg/cm^2-event) =
				τ	Lag Time	chemical specific	hr/event	EPA, 2001	Kp x CW x t_{event} x CF1 x CF2
				t*	Time to Reach Steady-state	chemical specific	hours	EPA, 2001	
				B	Ratio of Permeability of Stratum Corneum to Epidermis	chemical specific	dimensionless	EPA, 2001	Organics :
				t_{event}	Event Time	1.0	hr/event		t_{event}<t*: DAevent (mg/cm^2-event) =
				SA	Skin Surface Area Available for Contact	6,600	cm^2	EPA, 2001	2 x FA x Kp x CW x (sqrt((6 x τ x t_{event})/π))
				EV	Event Frequency	1	events/day	EPA, 2001	x CF1 x CF2
				EF	Exposure Frequency	350	days/year	EPA, 2001	
				ED	Exposure Duration	6	years	EPA, 2001	t_{event}>t*: DAevent (mg/cm^2-event) =
				BW	Body Weight	15	kg	EPA, 1991	FA x Kp x CW x (t_{event}/(1+B) + 2 x τ x
				AT-C	Averaging Time (Cancer)	25,550	days	EPA, 1989	((1 + 3B + 3B^2)/(1+B)^2)) x CF1 x CF2
				AT-N	Averaging Time (Non-Cancer)	2190	days	EPA, 1989	
				CF1	Conversion Factor 1	0.001	mg/µg	- -	
				CF2	Conversion Factor 2	0.001	l/cm^3	- -	

TABLE 4.3.RME

VALUES USED FOR DAILY INTAKE CALCULATIONS

REASONABLE MAXIMUM EXPOSURE

St. Juliens Creek Annex - Site 2

Scenario Timeframe: Current/Future
Medium: Groundwater
Exposure Medium: Deep Groundwater

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Dermal	Resident	Child/Adult	Tap Water	CW	Chemical Concentration in Water	See Table 3.3.RME	µg/l	- -	CDI (mg/kg-day) = DA-Adj x EF x 1/AT
				DAevent-A	Dermally Absorbed Dose per Event, Adult	calculated	mg/cm^2-event	calculated	
				DAevent-C	Dermally Absorbed Dose per Event, Child	calculated	mg/cm^2-event	calculated	DA-Adj = (Daevent-A x SA-A x ED-A x 1/BW-A)
				DA-Adj	Dermally Absorbed Dose, Age-adjusted	calculated	mg-year/event-kg	calculated	+ (Daevent-C x SA-C x ED-C x 1/BW-C)
				FA	Fraction absorbed water	chemical specific	dimensionless	EPA, 2001	
				Kp	Permeability Coefficient	chemical specific	cm/hr	EPA, 2001	Inorganics: DAevent (mg/cm^2-event) =
				τ	Lag Time	chemical specific	hr/event	EPA, 2001	Kp x CW x t_{event} x CF1 x CF2
				t*	Time to Reach Steady-state	chemical specific	hours	EPA, 2001	
				B	Ratio of Permeability of Stratum Corneum to Epidermis	chemical specific	dimensionless	EPA, 2001	Organics :
				t_{event}-A	Event Time, Adult	0.58	hr/event	EPA, 2001	t_{event}<t*: DAevent (mg/cm^2-event) =
				t_{event}-C	Event Time, Child	1.0	hr/event	EPA, 2001	2 x FA x Kp x CW x (sqrt((6 x τ x t_{event})/π))
				SA-A	Skin Surface Area, Adult	18,000	cm^2	EPA, 2001	x CF1 x CF2
				SA-C	Skin Surface Area, Child	6,600	cm^2	EPA, 2001	
				EV	Event Frequency	1	events/day	EPA, 2001	t_{event}>t*: DAevent (mg/cm^2-event) =
				EF	Exposure Frequency	350	days/year	EPA, 2001	FA x Kp x CW x (t_{event}/(1+B) + 2 x τ x
				ED-A	Exposure Duration, Adult	24	years	EPA, 2001	((1 + 3B + $3B^2$)/$(1+B)^2$)) x CF1 x CF2
				ED-C	Exposure Duration, Child	6	years	EPA, 2001	
				BW-A	Body Weight, Adult	70	kg	EPA, 1991	
				BW-C	Body Weight, Child	15	ke	EPA, 1991	
				AT-C	Averaging Time (Cancer)	25,550	days	EPA, 1989	
				CF1	Conversion Factor 1	0.001	mg/µg	- -	
				CF2	Conversion Factor 2	0.001	l/cm^3	- -	

Sources:

EPA, 1989: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual, Part A. OERR. EPA/540/1-89/002.

EPA, 1991: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual - Supplemental Guidance, Standard Default Exposure Factors. Interim Final. OSWER Directive 9285.6-03.

EPA, 1997: Exposure Factors Handbook. EPA/600/P-95/002Fa.

EPA, 2001: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment) Interim. EPA/540/R/99/005.

TABLE 4.4.RME

VALUES USED FOR DAILY INTAKE CALCULATIONS

REASONABLE MAXIMUM EXPOSURE

St. Juliens Creek Annex - Site 2

Scenario Timeframe: Current/Future
Medium: Groundwater
Exposure Medium: Air

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Inhalation	Resident	Adult	Deep Groundwater - Water Vapors at Showerhead	CW	Chemical Concentration in Water	See Table 3.4.RME	µg/l	- -	Chronic Daily Intake (CDI) (mg/kg-day) =
				InhExp	Inhalation Exposure per Shower	calculated	mg/kg-shower	- -	InhExp x EF x ED x 1/AT
				EF	Exposure Frequency	350	days/year	EPA, 1991	Foster & Chrostowski Shower Inhalation Model
				ED	Exposure Duration	24	years	EPA, 1991	for InhExp
				AT-C	Averaging Time (Cancer)	25,550	days	EPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	8,760	days	EPA, 1989	

Sources:

EPA, 1989: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual, Part A. OERR. EPA/540/1-89/002.

EPA, 1991: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual - Supplemental Guidance, Standard Default Exposure Factors. Interim Final. OSWER Directive 9285.6-03.

TABLE 4.5.RME

VALUES USED FOR DAILY INTAKE CALCULATIONS

REASONABLE MAXIMUM EXPOSURE

St. Juliens Creek Annex - Site 2

Scenario Timeframe: Current/Future
Medium: Surface Water
Exposure Medium: Surface Water

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Dermal	Trespasser	Adult	Drainage Features and Ponded Area	CW	Chemical Concentration in Water	See Table 3.5.RME	µg/l	- -	CDI (mg/kg-day) =
				DAevent	Dermally Absorbed Dose per Event	calculated	mg/cm^2-event	calculated	DAevent x SA x EV x EF x ED x 1/BW x 1/AT
				FA	Fraction absorbed water	chemical specific	dimensionless	EPA, 2001	
				Kp	Permeability Coefficient	chemical specific	cm/hr	EPA, 2001	Inorganics: DAevent (mg/cm^2-event) =
				τ	Lag Time	chemical specific	hr/event	EPA, 2001	Kp x CW x t_{event} x CF1 x CF2
				t*	Time to Reach Steady-state	chemical specific	hours	EPA, 2001	
				B	Ratio of Permeability of Stratum Corneum to Epidermis	chemical specific	dimensionless	EPA, 2001	Organics :
				t_{event}	Event Time	1	hr/event	(1)	t_{event}<t*: DAevent (mg/cm^2-event) =
				SA	Skin Surface Area Available for Contact	5,672	cm^2	EPA,2001, (2)	2 x FA x Kp x CW x (sqrt((6 x τ x t_{event})/π))
				EV	Event Frequency	1	events/day	EPA, 2001	x CF1 x CF2
				EF	Exposure Frequency	52	days/year	(1)	
				ED	Exposure Duration	24	years	EPA, 1989	t_{event}>t*: DAevent (mg/cm^2-event) =
				BW	Body Weight	70	kg	EPA, 1991	FA x Kp x CW x (t_{event}/(1+B) + 2 x τ x
				AT-C	Averaging Time (Cancer)	25550	days	EPA, 1989	((1 + 3B + $3B^2$)/$(1+B)^2$)) x CF1 x CF2
				AT-N	Averaging Time (Non-Cancer)	8760	days	EPA, 1989	
				CF1	Conversion Factor 1	0.001	mg/µg	- -	
				CF2	Conversion Factor 2	0.001	l/cm^3	- -	

TABLE 4.5.RME

VALUES USED FOR DAILY INTAKE CALCULATIONS

REASONABLE MAXIMUM EXPOSURE

St. Juliens Creek Annex - Site 2

Scenario Timeframe: Current/Future
Medium: Surface Water
Exposure Medium: Surface Water

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Dermal	Trespasser	Adolescent	Drainage Features and Ponded Area	CW	Chemical Concentration in Water	See Table 3.5.RME	µg/l	- -	CDI (mg/kg-day) =
				DAevent	Dermally Absorbed Dose per Event	calculated	mg/cm^2-event	calculated	DAevent x SA x EV x EF x ED x 1/BW x 1/AT
				FA	Fraction absorbed water	chemical specific	dimensionless	EPA, 2001	
				Kp	Permeability Coefficient	chemical specific	cm/hr	EPA, 2001	Inorganics: DAevent (mg/cm^2-event) =
				τ	Lag Time	chemical specific	hr/event	EPA, 2001	Kp x CW x t_{event} x CF1 x CF2
				t*	Time to Reach Steady-state	chemical specific	hours	EPA, 2001	
				B	Ratio of Permeability of Stratum Corneum to Epidermis	chemical specific	dimensionless	EPA, 2001	Organics :
				t_{event}	Event Time	1	hr/event	(1)	t_{event}<t*: DAevent (mg/cm^2-event) =
				SA	Skin Surface Area Available for Contact	4,046	cm^2	EPA, 2001 (3)	2 x FA x Kp x CW x (sqrt((6 x τ x t_{event})/π))
				EV	Event Frequency	1	events/day	EPA, 2001	x CF1 x CF2
				EF	Exposure Frequency	52	days/year	(1)	
				ED	Exposure Duration	9	years	(4)	t_{event}>t*: DAevent (mg/cm^2-event) =
				BW	Body Weight	51	kg	EPA, 1997,(3)	FA x Kp x CW x (t_{event}/(1+B) + 2 x τ x
				AT-C	Averaging Time (Cancer)	25550	days	EPA, 1989	((1 + 3B + $3B^2$)/$(1+B)^2$)) x CF1 x CF2
				AT-N	Averaging Time (Non-Cancer)	3285	days	EPA, 1989	
				CF1	Conversion Factor 1	0.001	mg/µg	- -	
				CF2	Conversion Factor 2	0.001	l/cm^3	- -	

Notes:

(1) Professional Judgement assuming 2 days per week for 26 weeks per year.

(2) The skin surface area includes hands, forearms, lower legs, and feet for adults.

(3) The skin surface area includes hands, forearms, lower legs, and feet for adolescents.

(4) Professional Judgement assuming adolescents from 9 to 18 years of age.

(5) Body weight is average value for the 9 year old and 18 year old male body weight.

Sources:

EPA, 1989: Risk Assessment Guidance for Superfund. Vol. 1: Human Health Evaluation Manual, Part A. OERR. EPA/540/1-89/002.

EPA, 1991: Risk Assessment Guidance for Superfund. Vol. 1: Human Health Evaluation Manual - Supplemental Guidance, Standard Default Exposure Factors. Interim Final. OSWER Directive 9285.6-03,

EPA, 1992: Dermal Exposure Assessment: Principles and Applications. EPA/600/8-91/011B.

EPA, 1997: Exposure Factors Handbook, Vol. 1. EPA/600/P-95/002Fa. The RME skin surface area assumes 25% of total surface area of 20,000.

EPA, 2001: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment) Interim. EPA/540/R/99/005.

TABLE 4.6.RME
VALUES USED FOR DAILY INTAKE CALCULATIONS
REASONABLE MAXIMUM EXPOSURE
St. Juliens Creek Annex - Site 2

Scenario Timeframe: Current/Future
Medium: Sediment
Exposure Medium: Sediment

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Ingestion	Trespasser/Visitor	Adult	Drainage Features and Ponded Area	CSed	Chemical Concentration in Sediment	See Table 3.11.RME	mg/kg	- -	Chronic Daily Intake (CDI) (mg/kg-day) =
				IR-Sed	Ingestion Rate of Sediment	50	mg/day	(1)	CSed x IR-Sed x EF x ED x CF3 x 1/BW x 1/AT
				EF	Exposure Frequency	52	days/year	(2)	
				ED	Exposure Duration	24	years	EPA, 1991	
				CF3	Conversion Factor 3	0.000001	kg/mg	- -	
				BW	Body Weight	70	kg	EPA, 1991	
				AT-C	Averaging Time (Cancer)	25,550	days	EPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	8,760	days	EPA, 1989	
	Trespasser/Visitor	Adolescent	Drainage Features and Ponded Area	CSed	Chemical Concentration in Sediment	See Table 3.11.RME	mg/kg	- -	Chronic Daily Intake (CDI) (mg/kg-day) =
				IR-Sed	Ingestion Rate of Sediment	50	mg/day	(1)	CSed x IR-Sed x EF x ED x CF3 x 1/BW x 1/AT
				EF	Exposure Frequency	52	days/year	(2)	
				ED	Exposure Duration	9	years	(3)	
				CF3	Conversion Factor 3	0.000001	kg/mg	- -	
				BW	Body Weight	51	kg	EPA, 1997, (8)	
				AT-C	Averaging Time (Cancer)	25,550	days	EPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	3,285	days	EPA, 1989	
Dermal	Trespasser/Visitor	Adult	Drainage Features and Ponded Area	CSed	Chemical Concentration in Sediment	See Table 3.11.RME	mg/kg	- -	CDI (mg/kg-day) =
				SA	Skin Surface Area Available for Contact	5,672	cm^2	EPA, 2001, (4)	CSed x SA x SSAF x DABS x CF3 x EF x
				SSAF	Soil to Skin Adherence Factor	0.2	mg/cm^2-day	EPA, 2001, (6)	ED x 1/BW x 1/AT
				DABS	Dermal Absorption Factor Solids	chem specific	--	EPA, 2001	
				CF3	Conversion Factor 3	0.000001	kg/mg	- -	
				EF	Exposure Frequency	52	days/year	(2)	
				ED	Exposure Duration	24	years	EPA, 1991	
				BW	Body Weight	70	kg	EPA, 1991	
				AT-C	Averaging Time (Cancer)	25,550	days	EPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	8,760	days	EPA, 1989	

TABLE 4.6.RME

VALUES USED FOR DAILY INTAKE CALCULATIONS

REASONABLE MAXIMUM EXPOSURE

St. Juliens Creek Annex - Site 2

Scenario Timeframe: Current/Future
Medium: Sediment
Exposure Medium: Sediment

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Dermal (cont)	Trespasser/Visitor	Adolescents	Drainage Features and Ponded Area	CSed	Chemical Concentration in Sediment	See Table 3.11.RME	mg/kg	- -	CDI (mg/kg-day) =
				SA	Skin Surface Area Available for Contact	4,046	cm^2	EPA, 2001, (5)	CSed x SA x SSAF x DABS x CF3 x EF x
				SSAF	Soil to Skin Adherence Factor	0.2	mg/cm^2-day	EPA, 2001, (7)	ED x 1/BW x 1/AT
				DABS	Dermal Absorption Factor Solids	chem specific	--	EPA, 2001	
				CF3	Conversion Factor 3	0.000001	kg/mg	- -	
				EF	Exposure Frequency	52	days/year	(2)	
				ED	Exposure Duration	9	years	(3)	
				BW	Body Weight	51	kg	EPA, 1997, (8)	
				AT-C	Averaging Time (Cancer)	25,550	days	EPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	3,285	days	EPA, 1989	

Notes:

(1) Professional Judgement assuming 1/2 soil ingestion rate.

(2) Professional Judgement assuming 2 days per week for 26 weeks per year.

(3) Professional Judgment assuming adolescents from 9 to 18 years of age.

(4) The skin surface area includes hands, forearms, lower legs, and feet for adults.

(5) The skin surface area includes hands, forearms, lower legs, and feet for adolescents.

(6) RME SSAF is soil adherence to hands for Gardeners No. 1 from EPA, 1997, Table 6-12.

(7) SSAF for children playing in wet soil (geometric mean for a high end contact activity).

(8) Body weight is average value for the 9 year old and 18 year old male body weight.

Sources:

EPA, 1989: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual, Part A. OERR. EPA/540/1-89/002.

EPA, 1991: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual - Supplemental Guidance, Standard Default Exposure Factors. Interim Final. OSWER Directive 9285.6-03.

EPA, 1997: Exposure Factors Handbook. EPA/600/P-95/002Fa.

TABLE 4.7.RME
VALUES USED FOR DAILY INTAKE CALCULATIONS
REASONABLE MAXIMUM EXPOSURE
St. Juliens Creek Annex - Site 2

Scenario Timeframe: Future
Medium: Soil*
Exposure Medium: Soil*

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Ingestion	Construction Worker	Adult	At Site 2	CS	Chemical Concentration in Soil	see Table 3.8	mg/kg	- -	Chronic Daily Intake (CDI) (mg/kg-day) =
				IR-S	Ingestion Rate of Soil	480	mg/day	EPA, 1991	CS x IR-S x EF x ED x CF3 x 1/BW x 1/AT
				EF	Exposure Frequency	125	days/year	(1)	
				ED	Exposure Duration	1	years	EPA, 1991	
				CF3	Conversion Factor 3	0.000001	kg/mg	- -	
				BW	Body Weight	70	kg	EPA, 1991	
				AT-C	Averaging Time (Cancer)	25,550	days	EPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	365	days	EPA, 1989	
	Other Worker	Adult	At Site 2	CS	Chemical Concentration in Soil	see Table 3.8	mg/kg	- -	Chronic Daily Intake (CDI) (mg/kg-day) =
				IR-S	Ingestion Rate of Soil	100	mg/day	EPA, 1991	CS x IR-S x EF x ED x CF3 x 1/BW x 1/AT
				EF	Exposure Frequency	250	days/year	EPA, 1991	
				ED	Exposure Duration	25	years	EPA, 1991	
				CF3	Conversion Factor 3	0.000001	kg/mg	- -	
				BW	Body Weight	70	kg	EPA, 1991	
				AT-C	Averaging Time (Cancer)	25,550	days	EPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	9,125	days	EPA, 1989	
	Resident	Adult	At Site 2	CS	Chemical Concentration in Soil	see Table 3.7	mg/kg	- -	Chronic Daily Intake (CDI) (mg/kg-day) =
				IR-S	Ingestion Rate of Soil	100	mg/day	EPA, 1991	CS x IR-S x EF x ED x CF3 x 1/BW x 1/AT
				EF	Exposure Frequency	350	days/year	EPA, 1991	
				ED	Exposure Duration	24	years	EPA, 1991	
				CF3	Conversion Factor 3	0.000001	kg/mg	- -	
				BW	Body Weight	70	kg	EPA, 1991	
				AT-C	Averaging Time (Cancer)	25,550	days	EPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	8,760	days	EPA, 1989	

TABLE 4.7.RME

VALUES USED FOR DAILY INTAKE CALCULATIONS

REASONABLE MAXIMUM EXPOSURE

St. Juliens Creek Annex - Site 2

Scenario Timeframe: Future
Medium: Soil*
Exposure Medium: Soil*

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Ingestion	Resident	Child	At Site 2	CS	Chemical Concentration in Soil	see Table 3.7	mg/kg	- -	Chronic Daily Intake (CDI) (mg/kg-day) =
				IR-S	Ingestion Rate of Soil	200	mg/day	EPA, 1991	CS x IR-S x EF x ED x CF3 x 1/BW x 1/AT
				EF	Exposure Frequency	350	days/year	EPA, 1991	
				ED	Exposure Duration	6	years	EPA, 1991	
				CF3	Conversion Factor 3	0.000001	kg/mg	- -	
				BW	Body Weight	15	kg	EPA, 1991	
				AT-C	Averaging Time (Cancer)	25,550	days	EPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	2,190	days	EPA, 1989	
		Child/Adult	At Site 2	CS	Chemical Concentration in Soil	see Table 3.7	mg/kg	- -	Chronic Daily Intake (CDI) (mg/kg-day) =
				IR-S-A	Ingestion Rate of Soil, Adult	100	mg/day	EPA, 1991	CS x IR-S-Adj x EF x CF3 x 1/AT
				IR-S-C	Ingestion Rate of Soil, Child	200	mg/day	EPA, 1991	
				IR-S-Adj	Ingestion Rate of Soil, Age-adjusted	114.29	mg-year/kg-day	calculated	IR-S-Adj (mg-year/kd-day) =
				EF	Exposure Frequency	350	days/year	EPA, 1991	(ED-C x IR-S-C / BW-C) + (ED-A x IR-S-A / BW-A)
				ED-A	Exposure Duration, Adult	24	years	EPA, 1991	
				ED-C	Exposure Duration, Child	6	years	EPA, 1991	
				CF3	Conversion Factor 3	0.000001	kg/mg	- -	
				BW-A	Body Weight , Adult	70	kg	EPA, 1991	
				BW-C	Body Weight, Child	15	kg	EPA, 1991	
				AT-C	Averaging Time (Cancer)	25,550	days	EPA, 1989	
Dermal	Construction Worker	Adult	At Site 2	CS	Chemical Concentration in Soil	see Table 3.8	mg/kg	- -	CDI (mg/kg-day) =
				SA	Skin Surface Area Available for Contact	4,849	cm^2	EPA, 2001, (2)	CS x SA x SSAF x DABS x CF3 x EF x
				SSAF	Soil to Skin Adherence Factor	0.24	mg/cm^2-day	EPA, 2001, (3)	ED x 1/BW x 1/AT
				DABS	Dermal Absorption Factor Solids	chem specific	--	EPA, 2001	
				CF3	Conversion Factor 3	0.000001	kg/mg	- -	
				EF	Exposure Frequency	125	days/year	(1)	
				ED	Exposure Duration	1	years	EPA, 1991	
				BW	Body Weight	70	kg	EPA, 1991	
				AT-C	Averaging Time (Cancer)	25,550	days	EPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	365	days	EPA, 1989	

TABLE 4.7.RME
VALUES USED FOR DAILY INTAKE CALCULATIONS
REASONABLE MAXIMUM EXPOSURE
St. Juliens Creek Annex - Site 2

Scenario Timeframe: Future
Medium: Soil*
Exposure Medium: Soil*

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Dermal	Other Worker	Adult	At Site 2	CS	Chemical Concentration in Soil	see Table 3.8	mg/kg	- -	CDI (mg/kg-day) =
				SA	Skin Surface Area Available for Contact	4,849	cm^2	EPA, 2001, (2)	CS x SA x SSAF x DABS x CF3 x EF x
				SSAF	Soil to Skin Adherence Factor	0.32	mg/cm^2-day	EPA, 2001, (4)	ED x 1/BW x 1/AT
				DABS	Dermal Absorption Factor Solids	chem specific	--	EPA, 2001	
				CF3	Conversion Factor 3	0.000001	kg/mg	- -	
				EF	Exposure Frequency	250	days/year	EPA, 1991	
				ED	Exposure Duration	25	years	EPA, 1991	
				BW	Body Weight	70	kg	EPA, 1991	
				AT-C	Averaging Time (Cancer)	25,550	days	EPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	9,125	days	EPA, 1989	
	Resident	Adult	SWMU 3	CS	Chemical Concentration in Soil	see Table 3.7	mg/kg	- -	CDI (mg/kg-day) =
				SA	Skin Surface Area Available for Contact	6,600	cm^2	EPA, 1997, (5)	CS x SA x SSAF x DABS x CF3 x EF x
				SSAF	Soil to Skin Adherence Factor	0.2	mg/cm^2-day	EPA, 1997, (6)	ED x 1/BW x 1/AT
				DABS	Dermal Absorption Factor Solids	chem specific	--	EPA, 2001	
				CF3	Conversion Factor 3	0.000001	kg/mg	- -	
				EF	Exposure Frequency	350	days/year	EPA, 1991	
				ED	Exposure Duration	24	years	EPA, 1991	
				BW	Body Weight	70	kg	EPA, 1991	
				AT-C	Averaging Time (Cancer)	25,550	days	EPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	8,760	days	EPA, 1989	
		Child	SWMU 3	CS	Chemical Concentration in Soil	see Table 3.7	mg/kg	- -	CDI (mg/kg-day) =
				SA	Skin Surface Area Available for Contact	3,400	cm^2	EPA, 1997, (5)	CS x SA x SSAF x DABS x CF3 x EF x
				SSAF	Soil to Skin Adherence Factor	0.11	mg/cm^2-day	EPA, 1997, (7)	ED x 1/BW x 1/AT
				DABS	Dermal Absorption Factor Solids	chem specific	--	EPA, 2001	
				CF3	Conversion Factor 3	0.000001	kg/mg	- -	
				EF	Exposure Frequency	350	days/year	EPA, 1991	
				ED	Exposure Duration	6	years	EPA, 1991	
				BW	Body Weight	15	kg	EPA, 1991	
				AT-C	Averaging Time (Cancer)	25,550	days	EPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	2,190	days	EPA, 1989	

TABLE 4.7.RME

VALUES USED FOR DAILY INTAKE CALCULATIONS

REASONABLE MAXIMUM EXPOSURE

St. Juliens Creek Annex - Site 2

Scenario Timeframe: Future
Medium: Soil*
Exposure Medium: Soil*

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Dermal									
	Resident	Child/Adult	SWMU 3	CS	Chemical Concentration in Soil	see Table 3.7	mg/kg	- -	CDI (mg/kg-day) =
				SA-A	Skin Surface Area Available for Contact, Ad	6,600	cm^2	EPA, 1997	CS x DA-Adj x DABS x CF3 x EF x 1/AT
				SA-C	Skin Surface Area Available for Contact, Ch	3,400	cm^2	EPA, 1997	
				SSAF-A	Soil to Skin Adherence Factor, Adult	0.2	mg/cm^2-day	EPA, 1997	DA-Adj (mg-year/kd-day) =
				SSAF-C	Soil to Skin Adherence Factor, Child	0.11	mg/cm^2-day	EPA, 1997	
				DA-Adj	Dermal Absorption, Age-adjusted	602	mg-year/kg-day	calculated	(ED-C x SA-C x SSAF-C / BW-C) + (ED-A x SA-A / BW-A)]
				DABS	Dermal Absorption Factor Solids	chem specific	--	EPA, 2001	(ED-A x SA-A x SSAF-A / BW-A)
				CF3	Conversion Factor 3	0.000001	kg/mg	- -	
				EF	Exposure Frequency	350	days/year	EPA, 1991	
				ED-A	Exposure Duration, Adult	24	years	EPA, 1991	
				ED-C	Exposure Duration, Child	6	years	EPA, 1991	
				BW-A	Body Weight , Adult	70	kg	EPA, 1991	
				BW-C	Body Weight, Child	15	kg	EPA, 1991	
				AT-C	Averaging Time (Cancer)	25,550	days	EPA, 1989	

Notes:

(1) Assumed duration of construction project may be 1/2 a year.

(2) RME SA includes face, hands, forearms, and lower legs.

(3) Soil to skin adherence factor is based on maximum adherence factor for construction workers.

(4) SSAF based on maximum adherence factor for utility workers.

(5) Surface area based on resident wearing shorts, short sleeve shirt, and shoes. RME value is 95th percentile.

(6) Soil to skin adherence factor is based on maximum adherence factor for gardeners.

(7) Soil to skin adherence factor is based on maximum adherence factor for soccer players.

Sources:

EPA, 1989: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual, Part A. OERR. EPA/540/1-89/002.

EPA, 1991: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual - Supplemental Guidance, Standard Default Exposure Factors. Interim Final. OSWER Directive 9285.6-03.

EPA, 1997: Exposure Factors Handbook. EPA/600/P-95/002Fa.

EPA, 2001: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment) Interim. EPA/540/R/99/005.

Soil*-includes surface and subsurface soil

TABLE 4.8.RME

VALUES USED FOR DAILY INTAKE CALCULATIONS

REASONABLE MAXIMUM EXPOSURE

St. Juliens Creek Annex - Site 2

Scenario Timeframe: Future
Medium: Soil*
Exposure Medium: Air

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Inhalation	Construction Worker	Adult	Emissions from Soil at Site 2	CS	Chemical Concentration in Soil	see Table 3.9	mg/kg	- -	Chronic Daily Intake (CDI) (mg/kg-day) =
				CA	Chemical Concentration in Air	calc	mg/m^3	EPA, 1997	CA x IN x ET x EF x ED x 1/BW x 1/AT
				PEF	Particulate Emission Factor	1.32E+09	m^3/kg	EPA, 1997	
				VF	Volatilization Factor for volatile constituents	calc	m^3/kg	EPA, 1997	CA (mg/m^3) = CS (1/PEF + 1/VF)
				IN	Inhalation Rate	2.5	$m^3/hour$	EPA, 1991	
				ET	Exposure Time	8	hr/day	EPA, 1991	
				EF	Exposure Frequency	125	days/year	(1)	
				ED	Exposure Duration	1	years	EPA, 1991	
				BW	Body Weight	70	kg	EPA, 1991	
				AT-C	Averaging Time (Cancer)	25,550	days	EPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	365	days	EPA, 1989	

Notes:

(1) Assumed duration of construction project may be 1/2 a year.

Sources:

EPA, 1989: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual, Part A. OERR. EPA/540/1-89/002.

EPA, 1991: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual - Supplemental Guidance, Standard Default Exposure Factors. Interim Final. OSWER Directive 9285.6-03.

EPA, 1997: Exposure Factors Handbook. EPA/600/P-95/002Fa.

Soil*-includes surface and subsurface soil

TABLE 4.9.RME

VALUES USED FOR DAILY INTAKE CALCULATIONS

REASONABLE MAXIMUM EXPOSURE

St. Juliens Creek Annex - Site 2

Scenario Timeframe: Future
Medium: Surface Water
Exposure Medium: Surface Water

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Dermal	Resident	Adult	Drainage Features and Ponded Area	CW	Chemical Concentration in Water	See Table 3.10.RME	µg/l	- -	CDI (mg/kg-day) =
				DAevent	Dermally Absorbed Dose per Event	calculated	mg/cm^2-event	calculated	DAevent x SA x EV x EF x ED x 1/BW x 1/AT
				FA	Fraction absorbed water	chemical specific	dimensionless	EPA, 2001	
				Kp	Permeability Coefficient	chemical specific	cm/hr	EPA, 2001	Inorganics: DAevent (mg/cm^2-event) =
				τ	Lag Time	chemical specific	hr/event	EPA, 2001	Kp x CW x t_{event} x CF1 x CF2
				t*	Time to Reach Steady-state	chemical specific	hours	EPA, 2001	
				B	Ratio of Permeability of Stratum Corneum to Epidermis	chemical specific	dimensionless	EPA, 2001	Organics :
				t_{event}	Event Time	1	hr/event	(1)	t_{event}<t*: DAevent (mg/cm^2-event) =
				SA	Skin Surface Area Available for Contact	5,672	cm^2	EPA, 2001 (2)	2 x FA x Kp x CW x (sqrt((6 x τ x t_{event})/π))
				EV	Event Frequency	1	events/day	(1)	x CF1 x CF2
				EF	Exposure Frequency	52	days/year	(1)	
				ED	Exposure Duration	24	years	EPA, 2001	t_{event}>t*: DAevent (mg/cm^2-event) =
				BW	Body Weight	70	kg	EPA, 1991	FA x Kp x CW x (t_{event}/(1+B) + 2 x τ x
				AT-C	Averaging Time (Cancer)	25550	days	EPA, 1989	((1 + 3B + $3B^2$)/$(1+B)^2$)) x CF1 x CF2
				AT-N	Averaging Time (Non-Cancer)	8760	days	EPA, 1989	
				CF1	Conversion Factor 1	0.001	mg/µg	- -	
				CF2	Conversion Factor 2	0.001	l/cm^3	- -	

TABLE 4.9.RME

VALUES USED FOR DAILY INTAKE CALCULATIONS

REASONABLE MAXIMUM EXPOSURE

St. Juliens Creek Annex - Site 2

Scenario Timeframe: Future
Medium: Surface Water
Exposure Medium: Surface Water

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Dermal	Resident	Child	Drainage Features and Ponded Area	CW	Chemical Concentration in Water	See Table 3.10.RME	µg/l	- -	CDI (mg/kg-day) =
				DAevent	Dermally Absorbed Dose per Event	calculated	mg/cm^2-event	calculated	DAevent x SA x EV x EF x ED x 1/BW x 1/AT
				FA	Fraction absorbed water	chemical specific	dimensionless	EPA, 2001	
				Kp	Permeability Coefficient	chemical specific	cm/hr	EPA, 2001	Inorganics: DAevent (mg/cm^2-event) =
				τ	Lag Time	chemical specific	hr/event	EPA, 2001	Kp x CW x t_{event} x CF1 x CF2
				t*	Time to Reach Steady-state	chemical specific	hours	EPA, 2001	
				B	Ratio of Permeability of Stratum Corneum to Epidermis	chemical specific	dimensionless	EPA, 2001	Organics :
				t_{event}	Event Time	1	hr/event	(1)	t_{event}<t*: DAevent (mg/cm^2-event) =
				SA	Skin Surface Area Available for Contact	1,852	cm^2	EPA, 2001 (2)	2 x FA x Kp x CW x (sqrt((6 x τ x t_{event})/π))
				EV	Event Frequency	1	events/day	(1)	x CF1 x CF2
				EF	Exposure Frequency	52	days/year	(1)	
				ED	Exposure Duration	6	years	EPA, 2001	t_{event}>t*: DAevent (mg/cm^2-event) =
				BW	Body Weight	15	kg	EPA, 1991	FA x Kp x CW x (t_{event}/(1+B) + 2 x τ x
				AT-C	Averaging Time (Cancer)	25550	days	EPA, 1989	((1 + 3B + $3B^2$)/$(1+B)^2$)) x CF1 x CF2
				AT-N	Averaging Time (Non-Cancer)	2190	days	EPA, 1989	
				CF1	Conversion Factor 1	0.001	mg/µg	- -	
				CF2	Conversion Factor 2	0.001	l/cm^3	- -	

TABLE 4.9.RME

VALUES USED FOR DAILY INTAKE CALCULATIONS

REASONABLE MAXIMUM EXPOSURE

St. Juliens Creek Annex - Site 2

Scenario Timeframe: Future
Medium: Surface Water
Exposure Medium: Surface Water

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
	Resident	Child/Adult	Upper Aquifer-Tap Water	CW	Chemical Concentration in Water	See Table 3.10.RME	µg/l	- -	CDI (mg/kg-day) = DA-Adj x EF x 1/AT
				DAevent-A	Dermally Absorbed Dose per Event, Adult	calculated	mg/cm^2-event	calculated	
				DAevent-C	Dermally Absorbed Dose per Event, Child	calculated	mg/cm^2-event	calculated	DA-Adj = (Daevent-A x SA-A x ED-A x 1/BW-A)
				DA-Adj	Dermally Absorbed Dose, Age-adjusted	calculated	mg-year/event-kg	calculated	+ (Daevent-C x SA-C x ED-C x 1/BW-C)
				FA	Fraction absorbed water	chemical specific	dimensionless	EPA, 2001	
				Kp	Permeability Coefficient	chemical specific	cm/hr	EPA, 2001	Inorganics: DAevent (mg/cm^2-event) =
				τ	Lag Time	chemical specific	hr/event	EPA, 2001	Kp x CW x t_{event} x CF1 x CF2
				t*	Time to Reach Steady-state	chemical specific	hours	EPA, 2001	
				B	Ratio of Permeability of Stratum Corneum to Epidermis	chemical specific	dimensionless	EPA, 2001	Organics :
				t_{event}-A	Event Time, Adult	1	hr/event	(1)	t_{event}<t*: DAevent (mg/cm^2-event) =
				t_{event}-C	Event Time, Child	1	hr/event	(1)	2 x FA x Kp x CW x (sqrt((6 x τ x t_{event})/π))
				SA-A	Skin Surface Area, Adult	5,672	cm^2	EPA, 2001	x CF1 x CF2
				SA-C	Skin Surface Area, Child	1,852	cm^2	EPA, 2001	
				EV	Event Frequency	1	events/day	(1)	t_{event}>t*: DAevent (mg/cm^2-event) =
				EF	Exposure Frequency	52	days/year	(1)	FA x Kp x CW x (t_{event}/(1+B) + 2 x τ x
				ED-A	Exposure Duration, Adult	24	years	EPA, 2001	((1 + 3B + $3B^2$)/$(1+B)^2$)) x CF1 x CF2
				ED-C	Exposure Duration, Child	6	years	EPA, 2001	
				BW-A	Body Weight, Adult	70	kg	EPA, 1991	
				BW-C	Body Weight, Child	15	ke	EPA, 1991	
				AT-C	Averaging Time (Cancer)	25,550	days	EPA, 1989	
				CF1	Conversion Factor 1	0.001	mg/µg	- -	
				CF2	Conversion Factor 2	0.001	l/cm^3	- -	

Notes:

(1) Assumes trespassing one hour per day, one day per week for 52 weeks per year.

(2) The skin surface area includes hands, forearms, lower legs, and feet (Exhibit C-1 in EPA 2001).

Sources:

EPA, 1989: Risk Assessment Guidance for Superfund. Vol. 1: Human Health Evaluation Manual, Part A. OERR. EPA/540/1-89/002.

EPA, 1991: Risk Assessment Guidance for Superfund. Vol. 1: Human Health Evaluation Manual - Supplemental Guidance, Standard Default Exposure Factors. Interim Final. OSWER Directive 9285.6-03,

EPA, 1997: Exposure Factors Handbook, Vol. 1. EPA/600/P-95/002Fa. The RME skin surface area assumes 25% of total surface area of 20,000.

EPA, 2001: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment) Interim. EPA/540/R/99/005.

TABLE 4.10.RME
VALUES USED FOR DAILY INTAKE CALCULATIONS
REASONABLE MAXIMUM EXPOSURE
St. Juliens Creek Annex - Site 2

Scenario Timeframe: Future
Medium: Sediment
Exposure Medium: Sediment

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference
Ingestion	Resident	Adult	Drainage Features and Ponded Area	CSed	Chemical Concentration in Sediment	See Table 3.11.RME	mg/kg	- -
				IR-Sed	Ingestion Rate of Sediment	50	mg/day	(1)
				EF	Exposure Frequency	52	days/year	(2)
				ED	Exposure Duration	24	years	EPA, 1991
				CF3	Conversion Factor 3	0.000001	kg/mg	- -
				BW	Body Weight	70	kg	EPA, 1991
				AT-C	Averaging Time (Cancer)	25,550	days	EPA, 1989
				AT-N	Averaging Time (Non-Cancer)	8,760	days	EPA, 1989
	Resident	Child	Drainage Features and Ponded Area	CSed	Chemical Concentration in Sediment	See Table 3.11.RME	mg/kg	- -
				IR-Sed	Ingestion Rate of Sediment	100	mg/day	EPA, 1997
				EF	Exposure Frequency	52	days/year	(2)
				ED	Exposure Duration	6	years	EPA, 1989
				CF3	Conversion Factor 3	0.000001	kg/mg	- -
				BW	Body Weight	15	kg	EPA, 1997
				AT-C	Averaging Time (Cancer)	25,550	days	EPA, 1989
				AT-N	Averaging Time (Non-Cancer)	2,190	days	EPA, 1989
	Resident	Adult/Child	Drainage Features and Ponded Area	CSed	Chemical Concentration in Sediment	See Table 3.11.RME	mg/kg	- -
				IR-Sed-A	Ingestion Rate of Sediment, Adult	50	mg/day	EPA, 1997
				IR-Sed-C	Ingestion Rate of Sediment, Child	100	mg/day	EPA, 1997
				EF	Exposure Frequency	52	days/year	(2)
				ED-A	Exposure Duration	24	years	EPA, 1989
				ED-C	Exposure Duration	6	years	EPA, 1989
				CF3	Conversion Factor 3	0.000001	kg/mg	- -
				BW-A	Body Weight, Adult	70	kg	EPA, 1997
				BW-C	Body Weight, Child	15	kg	EPA, 1997
				AT-C	Averaging Time (Cancer)	25,550	days	EPA, 1989

TABLE 4.10.RME

VALUES USED FOR DAILY INTAKE CALCULATIONS

REASONABLE MAXIMUM EXPOSURE

St. Juliens Creek Annex - Site 2

Scenario Timeframe: Future
Medium: Sediment
Exposure Medium: Sediment

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference
Dermal	Resident	Adult	Drainage Features and Ponded Area	CSed	Chemical Concentration in Sediment	See Table 3.11.RME	mg/kg	- -
				SA	Skin Surface Area Available for Contact	5,672	cm^2	EPA, 2001 (3)
				SSAF	Soil to Skin Adherence Factor	0.63	mg/cm^2-day	EPA, 2001 (4)
				DABS	Dermal Absorption Factor Solids	chem specific	--	EPA, 1995; 2001
				CF3	Conversion Factor 3	0.000001	kg/mg	- -
				EF	Exposure Frequency	52	days/year	(3)
				ED	Exposure Duration	24	years	EPA, 1991
				BW	Body Weight	70	kg	EPA, 1991
				AT-C	Averaging Time (Cancer)	25,550	days	EPA, 1989
				AT-N	Averaging Time (Non-Cancer)	8,760	days	EPA, 1989
	Resident	Child	Drainage Features and Ponded Area	CSed	Chemical Concentration in Sediment	See Table 3.11.RME	mg/kg	- -
				SA	Skin Surface Area Available for Contact	1,852	cm^2	EPA, 2001 (3)
				SSAF	Soil to Skin Adherence Factor	20.601	mg/cm^2-day	EPA, 2001 (4)
				DABS	Dermal Absorption Factor Solids	chem specific	--	EPA, 1995; 2001
				CF3	Conversion Factor 3	0.000001	kg/mg	- -
				EF	Exposure Frequency	52	days/year	(3)
				ED	Exposure Duration	6	years	EPA, 1991
				BW	Body Weight	15	kg	EPA, 1991
				AT-C	Averaging Time (Cancer)	25,550	days	EPA, 1989
				AT-N	Averaging Time (Non-Cancer)	2,190	days	EPA, 1989

TABLE 4.10.RME

VALUES USED FOR DAILY INTAKE CALCULATIONS

REASONABLE MAXIMUM EXPOSURE

St. Juliens Creek Annex - Site 2

Scenario Timeframe: Future
Medium: Sediment
Exposure Medium: Sediment

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference
	Resident	Child/Adult	Drainage Features and Ponded Area	CSed	Chemical Concentration in Sediment	See Table 3.11.RME	mg/kg	- -
				SA - A	Skin Surface Area Available for Contact, Adul	5,672	cm^2	EPA, 2001 (3)
				SA - C	Skin Surface Area Available for Contact, Chilc	1,852	cm^2	EPA, 2001 (3)
				SSAF - A	Soil to Skin Adherence Factor, Adult	0.63	mg/cm^2-day	EPA, 2001 (4)
				SSAF - C	Soil to Skin Adherence Factor, Child	20.601	mg/cm^2-day	EPA, 2001 (4)
				DABS	Dermal Absorption Factor Solids	chem specific	--	EPA, 1995; 2001
				CF3	Conversion Factor 3	0.000001	kg/mg	- -
				EF	Exposure Frequency	52	days/year	(3)
				ED - A	Exposure Duration, Adult	24	years	EPA, 1991
				ED -C	Exposure Duration, Child	6	years	EPA, 1991
				BW - A	Body Weight - Adult	70	kg	EPA, 1991
				BW - C	Body Weight - Child	15	kg	EPA, 1991
				AT-C	Averaging Time (Cancer)	25,550	days	EPA, 1989

Notes:

(1) Professional Judgement assuming 1/2 soil ingestion rate.

(2) Assumes trespassing one hour per day, one day per week for 52 weeks per year.

(3) The skin surface area includes hands, forearms, lower legs, and feet (Exhibit C-1 in EPA 2001).

(4) Geometric mean of a high end contact activity was selected; Pipe layers in wet soil and children playing in mud (Exhibit C-2 in EPA 2001).

Sources:

EPA, 1989: Risk Assessment Guidance for Superfund. Vol. 1: Human Health Evaluation Manual, Part A. OERR. EPA/540/1-89/002.

EPA, 1991: Risk Assessment Guidance for Superfund. Vol. 1: Human Health Evaluation Manual - Supplemental Guidance, Standard Default Exposure Factors. Interim Final. OSWER Directive 9285.6-03,

EPA, 1992: Dermal Exposure Assessment: Principles and Applications. EPA/600/8-91/011B.

EPA, 1997: Exposure Factors Handbook, Vol. 1. EPA/600/P-95/002Fa. The RME skin surface area assumes 25% of total surface area of 20,000.

EPA, 2001: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment) Interim. EPA/540/R/99/005.

Intake Equation/ Model Name
Chronic Daily Intake (CDI) (mg/kg-day) = CSed x IR-Sed x EF x ED x CF3 x 1/BW x 1/AT
Chronic Daily Intake (CDI) (mg/kg-day) = CSed x IR-Sed x EF x ED x CF3 x 1/BW x 1/AT
Chronic Daily Intake (CDI) (mg/kg-day) = CSed x IR-S-Adj x EF x CF3 x 1/AT-C IR-S-Adj (mg-year/kd-day) = (ED-C x IR-S-C / BW-C) + (ED-A x IR-S-A / BW-A)

Intake Equation/ Model Name
CDI (mg/kg-day) = CSed x SA x SSAF x DABS x CF3 x EF x ED x 1/BW x 1/AT
CDI (mg/kg-day) = CSed x SA x SSAF x DABS x CF3 x EF x ED x 1/BW x 1/AT

Intake Equation/
Model Name

CDI (mg/kg-day) =

CS x DA-Adj x DABS x CF3 x EF x 1/AT-C

DA-Adj (mg-year/kd-day) =

(ED-C x SA-C x SSAF-C / BW-C) + (ED-A x SA-A / BW-A)]

(ED-A x SA-A x SSAF-A / BW-A)

TABLE 4.11.RME

VALUES USED FOR DAILY INTAKE CALCULATIONS

REASONABLE MAXIMUM EXPOSURE

St. Juliens Creek Annex - Site 2

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Shallow Groundwater

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Dermal	Construction Worker	Adult	Water Table	CW	Chemical Concentration in Water	See Table 3.12.RME	µg/l	- -	CDI (mg/kg-day) =
				DAevent	Dermally Absorbed Dose per Event	calculated	mg/cm^2-event	calculated	DAevent x SA x EV x EF x ED x 1/BW x 1/AT
				FA	Fraction absorbed water	chemical specific	dimensionless	EPA, 2001	
				Kp	Permeability Coefficient	chemical specific	cm/hr	EPA, 2001	Inorganics: DAevent (mg/cm^2-event) =
				τ	Lag Time	chemical specific	hr/event	EPA, 2001	Kp x CW x t_{event} x CF1 x CF2
				t*	Time to Reach Steady-state	chemical specific	hours	EPA, 2001	
				B	Ratio of Permeability of Stratum Corneum to Epidermis	chemical specific	dimensionless	EPA, 2001	Organics :
				t_{event}	Event Time	8.0	hr/event	EPA, 2001	t_{event}<t*: DAevent (mg/cm^2-event) =
				SA	Skin Surface Area Available for Contact	4,849	cm2	EPA, 2001, (1)	2 x FA x Kp x CW x (sqrt((6 x τ x t_{event})/π))
				EV	Event Frequency	1	events/day	EPA, 2001	x CF1 x CF2
				EF	Exposure Frequency	125	days/year	EPA, 2001	
				ED	Exposure Duration	1	years	EPA, 2001	t_{event}>t*: DAevent (mg/cm^2-event) =
				BW	Body Weight	70	kg	EPA, 1991	FA x Kp x CW x (t_{event}/(1+B) + 2 x τ x
				AT-C	Averaging Time (Cancer)	25,550	days	EPA, 1989	((1 + 3B + $3B^2$)/$(1+B)^2$)) x CF1 x CF2
				AT-N	Averaging Time (Non-Cancer)	365	days	EPA, 1989	
				CF1	Conversion Factor 1	0.001	mg/µg	- -	
				CF2	Conversion Factor 2	0.001	l/cm^3	- -	

Notes:

(1) RME SA includes face, hands, forearms, and lower legs.

Sources:

EPA, 1989: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual, Part A. OERR. EPA/540/1-89/002.

EPA, 1991: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual - Supplemental Guidance, Standard Default Exposure Factors. Interim Final. OSWER Directive 9285.6-03.

EPA, 1997: Exposure Factors Handbook. EPA/600/P-95/002Fa.

EPA, 2001: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment) Interim. EPA/540/R/99/005.

TABLE 4.1.CT

VALUES USED FOR DAILY INTAKE CALCULATIONS

CENTRAL TENDENCY EXPOSURE

St. Juliens Creek Annex - Site 2

Scenario Timeframe: Current/Future
Medium: Surface Soil
Exposure Medium: Surface Soil

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Ingestion	Trespasser	Adult	At Site 2	CS	Chemical Concentration in Soil	see Table 3.1.CT	mg/kg	- -	CDI (mg/kg-day) =
				IR-S	Ingestion Rate of Soil	50	mg/day	EPA, 1993	CS x IR-S x EF x ED x CF1 x 1/BW x 1/AT
				EF	Exposure Frequency	26	days/year	(1)	
				ED	Exposure Duration	9	years	EPA, 1993	
				CF1	Conversion Factor 1	0.000001	kg/mg	- -	
				BW	Body Weight	70	kg	EPA, 1991	
				AT-C	Averaging Time (Cancer)	25,550	days	EPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	3,285	days	EPA, 1989	
	Trespasser	Adolescent	At Site 2	CS	Chemical Concentration in Soil	see Table 3.1.CT	mg/kg	- -	CDI (mg/kg-day) =
				IR-S	Ingestion Rate of Soil	50	mg/day	EPA, 1991	CS x IR-S x EF x ED x CF1 x 1/BW x 1/AT
				EF	Exposure Frequency	26	days/year	(1)	
				ED	Exposure Duration	9	years	(2)	
				CF1	Conversion Factor 1	0.000001	kg/mg	- -	
				BW	Body Weight	51	kg	EPA, 1997, (3)	
				AT-C	Averaging Time (Cancer)	25,550	days	EPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	3,285	days	EPA, 1989	
Dermal	Trespasser	Adult	At Site 2	CS	Chemical Concentration in Soil	See Table 3.1.RME	mg/kg	See Table 3.2.RME	CDI (mg/kg-day) =
				SA	Skin Surface Area Available for Contact	1,306	cm^2	EPA, 2001 (4)	CS x SA x SSAF x DABS x CF1 x EF x
				SSAF	Soil to Skin Adherence Factor	0.021	mg/cm^2-day	EPA, 2001, (5)	ED x 1/BW x 1/AT
				DABS	Dermal Absorption Factor Solids	chem specific	--	EPA, 2001	
				CF1	Conversion Factor 1	0.000001	kg/mg	- -	
				EF	Exposure Frequency	26	days/year	(1)	
				ED	Exposure Duration	9	years	EPA, 1993	
				BW	Body Weight	70	kg	EPA, 1991	
				AT-C	Averaging Time (Cancer)	25,550	days	EPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	3,285	days	EPA, 1989	

TABLE 4.1.CT

VALUES USED FOR DAILY INTAKE CALCULATIONS

CENTRAL TENDENCY EXPOSURE

St. Juliens Creek Annex - Site 2

Scenario Timeframe: Current/Future
Medium: Surface Soil
Exposure Medium: Surface Soil

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
	Trespasser	Adolescent	At Site 2	CS	Chemical Concentration in Soil	See Table 3.1.	mg/kg	See Table 3.2.RME	CDI (mg/kg-day) =
				SA	Skin Surface Area Available for Contact	1,212	cm^2	EPA, 2001 (4)	CS x SA x SSAF x DABS x CF1 x EF x
				SSAF	Soil to Skin Adherence Factor	0.021	mg/cm^2-day	EPA, 2001, (5)	ED x 1/BW x 1/AT
				DABS	Dermal Absorption Factor Solids	chem specific	--	EPA, 2001	
				CF1	Conversion Factor 1	0.000001	kg/mg	- -	
				EF	Exposure Frequency	26	days/year	(1)	
				ED	Exposure Duration	9	years	(2)	
				BW	Body Weight	51	kg	EPA, 1997(3)	
				AT-C	Averaging Time (Cancer)	25,550	days	EPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	3,285	days	EPA, 1989	

Notes:

(1) Professional Judgement assuming 1 day per week for 26 weeks per year (one-half the RME scenario).

(2) Professional Judgement assuming adolescents from 9 to 18 years of age.

(3) Body weight is average value for the 9 year old and 18 year old male body weight.

(4) CT SA includes head and hands.

(5) CT SSAF is geometric mean soil adherence to face, forearms, and hands for Groundskeepers.

(6) SA is 25% of total surface area for 12-15 year old male. 50th percentile for total surface area is 1.49 m2.

Sources:

EPA, 1989: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual, Part A. OERR. EPA/540/1-89/002.

EPA, 1991: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual - Supplemental Guidance, Standard Default Exposure Factors. Interim Final. OSWER Directive 9285.6-03.

EPA, 1993: Superfund's Standard Default Exposure Factors for the Central Tendency and Reasonable Maximum Exposure.

EPA, 1997: Exposure Factors Handbook. EPA/600/P-95/002Fa.

EPA, 2001: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment) Interim. EPA/540/R/99/005.

TABLE 4.2.CT

VALUES USED FOR DAILY INTAKE CALCULATIONS

CENTRAL TENDENCY EXPOSURE

St. Juliens Creek Annex - Site 2

Scenario Timeframe: Current/Future
Medium: Surface Soil
Exposure Medium: Air

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Inhalation	Trespasser	Adult	Emissions from Surface Soil at Site 2	CS	Chemical Concentration in Soil	See Table 3.2.CT	mg/kg	- -	CDI (mg/kg-day) =
				CA	Chemical Concentration in Air	calculated	mg/m^3	calculated	CA x IN x ET x EF x ED x 1/BW x 1/AT
				PEF	Particulate Emission Factor	1.32E+09	m^3/kg	EPA, 1996	
				VF	Volatilization Factor for volatile constituents	calc	m^3/kg	EPA, 1996	CA (mg/m^3) = CS (1/PEF + 1/VF)
				IN	Inhalation Rate	0.83	$m^3/hour$	EPA, 1991	
				ET	Exposure Time	2	hr/day	(1)	
				EF	Exposure Frequency	26	days/year	(2)	
				ED	Exposure Duration	9	years	EPA, 1993	
				BW	Body Weight	70	kg	EPA, 1991	
				AT-C	Averaging Time (Cancer)	25,550	days	EPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	3,285	days	EPA, 1989	
	Trespasser	Adolescent	Emissions from Surface Soil at Site 2	CS	Chemical Concentration in Soil	See Table 3.2.CT	mg/kg	- -	CDI (mg/kg-day) =
				CA	Chemical Concentration in Air	calculated	mg/m^3	calculated	CA x IN x ET x EF x ED x 1/BW x 1/AT
				PEF	Particulate Emission Factor	1.32E+09	m^3/kg	EPA, 1996	
				VF	Volatilization Factor for volatile constituents	calc	m^3/kg	EPA, 1996	CA (mg/m^3) = CS (1/PEF + 1/VF)
				IN	Inhalation Rate	0.83	$m^3/hour$	EPA, 1991	
				ET	Exposure Time	2	hr/day	(1)	
				EF	Exposure Frequency	26	days/year	(2)	
				ED	Exposure Duration	9	years	(3)	
				BW	Body Weight	51	kg	EPA, 1997,(4)	
				AT-C	Averaging Time (Cancer)	25,550	days	EPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	3,285	days	EPA, 1989	

Notes:

(1) Professional judgement assuming trespasser would spend 2 hours at the site.

(2) Professional Judgement assuming 1 day per week for 26 weeks per year (one-half the RME estimate).

(3) Professional Judgement assuming adolescents from 9 to 18 years of age.

(4) Body weight is average value for the 9 year old and 18 year old male body weight.

Sources:

EPA, 1989: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual, Part A. OERR. EPA/540/1-89/002.

EPA, 1991: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual - Supplemental Guidance, Standard Default Exposure Factors. Interim Final. OSWER Directive 9285.6-03.

EPA, 1993: Superfund's Standard Default Exposure Factors for the Central Tendency and Reasonable Maximum Exposure.

EPA, 1996: Soil Screening Guidance: User's Guide. OSWER. EPA/540/R-96/018.

EPA, 1997: Exposure Factors Handbook. EPA/600/P-95/002Fa.

TABLE 4.3.CT
VALUES USED FOR DAILY INTAKE CALCULATIONS
CENTRAL TENDENCY EXPOSURE
St. Juliens Creek Annex - Site 2

Scenario Timeframe: Current/Future
Medium: Groundwater
Exposure Medium: Deep Groundwater

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Ingestion	Resident	Adult	Tap Water	CW	Chemical Concentration in Water	See Table 3.3.CT	µg/l	- -	Chronic Daily Intake (CDI) (mg/kg-day) =
				IR-W	Ingestion Rate of Water	1.4	liters/day	EPA, 1993	CW x IR-W x EF x ED x CF1 x 1/BW x 1/AT
				EF	Exposure Frequency	234	days/year	EPA, 1993	
				ED	Exposure Duration	9	years	EPA, 1993	
				CF1	Conversion Factor 1	0.001	mg/µg	- -	
				BW	Body Weight	70	kg	EPA, 1991	
				AT-C	Averaging Time (Cancer)	25,550	days	EPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	3,285	days	EPA, 1989	
		Child	Tap Water	CW	Chemical Concentration in Water	See Table 3.3.CT	µg/l	- -	CDI (mg/kg-day) =
				IR-W	Ingestion Rate of Water	1	liters/day	EPA, 1997	CW x IR-W x EF x ED x CF1 x 1/BW x 1/AT
				EF	Exposure Frequency	234	days/year	EPA, 1993	
				ED	Exposure Duration	6	years	EPA, 1991	
				CF1	Conversion Factor 1	0.001	mg/µg	- -	
				BW	Body Weight	15	kg	EPA, 1991	
				AT-C	Averaging Time (Cancer)	25,550	days	EPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	2,190	days	EPA, 1989	
		Child/Adult	Tap Water	CW	Chemical Concentration in Water	See Table 3.3.CT	µg/l	- -	CDI (mg/kg-day) =
				IR-W-A	Ingestion Rate of Water, Adult	1.4	liters/day	EPA, 1997	CW x IR-W-Adj x EF x CF1 x 1/AT
				IR-W-C	Ingestion Rate of Water, Child	1	liters/day	EPA, 1997	
				IR-W-Adj	Ingestion Rate of Water, Age-adjusted	0.58	liter-year/kg-day	calculated	IR-W-Adj (liter-year/kd-day) =
				EF	Exposure Frequency	234	days/year	EPA, 1993	(ED-C x IR-W-C / BW-C) +
				ED-A	Exposure Duration, Adult	9	years	EPA, 1991	(ED-A x IR-W-A / BW-A)
				ED-C	Exposure Duration, Child	6	years	EPA, 1991	
				CF1	Conversion Factor 1	0.001	mg/µg	- -	
				BW-A	Body Weight , Adult	70	kg	EPA, 1991	
				BW-C	Body Weight, Child	15	kg	EPA, 1991	
				AT-C	Averaging Time (Cancer)	25,550	days	EPA, 1989	

TABLE 4.3.CT
VALUES USED FOR DAILY INTAKE CALCULATIONS
CENTRAL TENDENCY EXPOSURE
St. Juliens Creek Annex - Site 2

Scenario Timeframe: Current/Future
Medium: Groundwater
Exposure Medium: Deep Groundwater

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Dermal	Resident	Adult	Tap Water	CW	Chemical Concentration in Water	See Table 3.3.CT	µg/l	- -	CDI (mg/kg-day) =
				DAevent	Dermally Absorbed Dose per Event	calculated	mg/cm^2-event	calculated	DAevent x SA x EV x EF x ED x 1/BW x 1/AT
				FA	Fraction absorbed water	chemical specific	dimensionless	EPA, 2001	
				Kp	Permeability Coefficient	chemical specific	cm/hr	EPA, 2001	Inorganics: DAevent (mg/cm^2-event) =
				τ	Lag Time	chemical specific	hr/event	EPA, 2001	Kp x CW x t_{event} x CF1 x CF2
				t*	Time to Reach Steady-state	chemical specific	hours	EPA, 2001	
				B	Ratio of Permeability of Stratum Corneum to Epidermis	chemical specific	dimensionless	EPA, 2001	Organics :
				t_{event}	Event Time	0.25	hr/event	EPA, 2001	t_{event}<t*: DAevent (mg/cm^2-event) =
				SA	Skin Surface Area Available for Contact	18,000	cm^2	EPA, 2001	2 x FA x Kp x CW x (sqrt((6 x τ x t_{event})/π))
				EV	Event Frequency	1	events/day	EPA, 2001	x CF1 x CF2
				EF	Exposure Frequency	234	days/year	EPA, 1993	
				ED	Exposure Duration	9	years	EPA, 1993	t_{event}>t*: DAevent (mg/cm^2-event) =
				BW	Body Weight	70	kg	EPA, 1991	FA x Kp x CW x (t_{event}/(1+B) + 2 x τ x
				AT-C	Averaging Time (Cancer)	25,550	days	EPA, 1989	((1 + 3B + 3B^2)/(1+B)^2)) x CF1 x CF2
				AT-N	Averaging Time (Non-Cancer)	3,285	days	EPA, 1989	
				CF1	Conversion Factor 1	0.001	mg/µg	- -	
				CF2	Conversion Factor 2	0.001	l/cm^3	- -	
		Child	Tap Water	CW	Chemical Concentration in Water	See Table 3.3.CT	µg/l	- -	CDI (mg/kg-day) =
				DAevent	Dermally Absorbed Dose per Event	calculated	mg/cm^2-event	calculated	DAevent x SA x EV x EF x ED x 1/BW x 1/AT
				FA	Fraction absorbed water	chemical specific	dimensionless	EPA, 2001	
				Kp	Permeability Coefficient	chemical specific	cm/hr	EPA, 2001	Inorganics: DAevent (mg/cm^2-event) =
				τ	Lag Time	chemical specific	hr/event	EPA, 2001	Kp x CW x t_{event} x CF1 x CF2
				t*	Time to Reach Steady-state	chemical specific	hours	EPA, 2001	
				B	Ratio of Permeability of Stratum Corneum to Epidermis	chemical specific	dimensionless	EPA, 2001	Organics :
				t_{event}	Event Time	0.33	hr/event	EPA, 2001	t_{event}<t*: DAevent (mg/cm^2-event) =
				SA	Skin Surface Area Available for Contact	6,600	cm^2	EPA, 2001	2 x FA x Kp x CW x (sqrt((6 x τ x t_{event})/π))
				EV	Event Frequency	1	events/day	EPA, 2001	x CF1 x CF2
				EF	Exposure Frequency	234	days/year	EPA, 1993	
				ED	Exposure Duration	6	years	EPA, 2001	t_{event}>t*: DAevent (mg/cm^2-event) =
				BW	Body Weight	15	kg	EPA, 1991	FA x Kp x CW x (t_{event}/(1+B) + 2 x τ x
				AT-C	Averaging Time (Cancer)	25,550	days	EPA, 1989	((1 + 3B + 3B^2)/(1+B)^2)) x CF1 x CF2
				AT-N	Averaging Time (Non-Cancer)	2190	days	EPA, 1989	
				CF1	Conversion Factor 1	0.001	mg/µg	- -	
				CF2	Conversion Factor 2	0.001	l/cm^3	- -	

TABLE 4.3.CT

VALUES USED FOR DAILY INTAKE CALCULATIONS

CENTRAL TENDENCY EXPOSURE

St. Juliens Creek Annex - Site 2

Scenario Timeframe: Current/Future
Medium: Groundwater
Exposure Medium: Deep Groundwater

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Dermal	Resident	Child/Adult	Tap Water	CW	Chemical Concentration in Water	See Table 3.3.CT	µg/l	- -	CDI (mg/kg-day) = DA-Adj x EF x 1/AT
				DAevent-A	Dermally Absorbed Dose per Event, Adult	calculated	mg/cm^2-event	calculated	
				DAevent-C	Dermally Absorbed Dose per Event, Child	calculated	mg/cm^2-event	calculated	DA-Adj = (Daevent-A x SA-A x ED-A x 1/BW-A)
				DA-Adj	Dermally Absorbed Dose, Age-adjusted	calculated	mg-year/event-kg	calculated	+ (Daevent-C x SA-C x ED-C x 1/BW-C)
				FA	Fraction absorbed water	chemical specific	dimensionless	EPA, 2001	
				Kp	Permeability Coefficient	chemical specific	cm/hr	EPA, 2001	Inorganics: DAevent (mg/cm^2-event) =
				τ	Lag Time	chemical specific	hr/event	EPA, 2001	Kp x CW x t_{event} x CF1 x CF2
				t*	Time to Reach Steady-state	chemical specific	hours	EPA, 2001	
				B	Ratio of Permeability of Stratum Corneum to Epidermis	chemical specific	dimensionless	EPA, 2001	Organics :
				t_{event}-A	Event Time, Adult	0.25	hr/event	EPA, 2001	t_{event}<t*: DAevent (mg/cm^2-event) =
				t_{event}-C	Event Time, Child	0.33	hr/event	EPA, 2001	2 x FA x Kp x CW x (sqrt((6 x τ x t_{event})/π))
				SA-A	Skin Surface Area, Adult	18,000	cm^2	EPA, 2001	x CF1 x CF2
				SA-C	Skin Surface Area, Child	6,600	cm^2	EPA, 2001	
				EV	Event Frequency	1	events/day	EPA, 2001	t_{event}>t*: DAevent (mg/cm^2-event) =
				EF	Exposure Frequency	234	days/year	EPA, 1993	FA x Kp x CW x (t_{event}/(1+B) + 2 x τ x
				ED-A	Exposure Duration, Adult	9	years	EPA, 2001	((1 + 3B + $3B^2$)/$(1+B)^2$)) x CF1 x CF2
				ED-C	Exposure Duration, Child	6	years	EPA, 2001	
				BW-A	Body Weight, Adult	70	kg	EPA, 1991	
				BW-C	Body Weight, Child	15	ke	EPA, 1991	
				AT-C	Averaging Time (Cancer)	25,550	days	EPA, 1989	
				CF1	Conversion Factor 1	0.001	mg/µg	- -	
				CF2	Conversion Factor 2	0.001	l/cm^3	- -	

Sources:

EPA, 1989: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual, Part A. OERR. EPA/540/1-89/002.

EPA, 1991: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual - Supplemental Guidance, Standard Default Exposure Factors. Interim Final. OSWER Directive 9285.6-03.

EPA, 1993: Superfund's Standard Default Exposure Factors for the Central Tendency and Reasonable Maximum Exposure.

EPA, 1997: Exposure Factors Handbook. EPA/600/P-95/002Fa.

EPA, 2001: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment) Interim. EPA/540/R/99/005.

TABLE 4.4.CT

VALUES USED FOR DAILY INTAKE CALCULATIONS

CENTRAL TENDENCY EXPOSURE

St. Juliens Creek Annex - Site 2

Scenario Timeframe: Current/Future
Medium: Groundwater
Exposure Medium: Air

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Inhalation	Resident	Adult	Deep Groundwater - Water Vapors at Showerhead	CW	Chemical Concentration in Water	See Table 3.4.CT	µg/l	- -	Chronic Daily Intake (CDI) (mg/kg-day) =
				InhExp	Inhalation Exposure per Shower	calculated	mg/kg-shower		InhExp x EF x ED x 1/AT
				EF	Exposure Frequency	234	days/year	EPA, 1993	Foster & Chrostowski Shower Inhalation Model
				ED	Exposure Duration	9	years	EPA, 1993	for InhExp
				AT-C	Averaging Time (Cancer)	25,550	days	EPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	3,285	days	EPA, 1989	

Sources:

EPA, 1989: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual, Part A. OERR. EPA/540/1-89/002.

EPA, 1993: Superfund's Standard Default Exposure Factors for the Central Tendency and Reasonable Maximum Exposure.

TABLE 4.5.CT

VALUES USED FOR DAILY INTAKE CALCULATIONS

CENTRAL TENDENCY EXPOSURE

St. Juliens Creek Annex - Site 2

Scenario Timeframe: Current/Future
Medium: Surface Water
Exposure Medium: Surface Water

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Dermal	Trespasser	Adult	Drainage Features and Ponded Area	CW	Chemical Concentration in Water	See Table 3.5.CT	µg/l	- -	CDI (mg/kg-day) =
				DAevent	Dermally Absorbed Dose per Event	calculated	mg/cm^2-event	calculated	DAevent x SA x EV x EF x ED x 1/BW x 1/AT
				FA	Fraction absorbed water	chemical specific	dimensionless	EPA, 2001	
				Kp	Permeability Coefficient	chemical specific	cm/hr	EPA, 2001	Inorganics: DAevent (mg/cm^2-event) =
				τ	Lag Time	chemical specific	hr/event	EPA, 2001	Kp x CW x t_{event} x CF1 x CF2
				t*	Time to Reach Steady-state	chemical specific	hours	EPA, 2001	
				B	Ratio of Permeability of Stratum Corneum to Epidermis	chemical specific	dimensionless	EPA, 2001	Organics :
				t_{event}	Event Time	1	hr/event	(1)	t_{event}<t*: DAevent (mg/cm^2-event) =
				SA	Skin Surface Area Available for Contact	5,672	cm^2	EPA, 2001 (3)	2 x FA x Kp x CW x (sqrt((6 x τ x t_{event})/π))
				EV	Event Frequency	1	events/day	EPA, 2001	x CF1 x CF2
				EF	Exposure Frequency	26	days/year	(1)	
				ED	Exposure Duration	9	years	EPA, 1993	t_{event}>t*: DAevent (mg/cm^2-event) =
				BW	Body Weight	70	kg	EPA, 1991	FA x Kp x CW x (t_{event}/(1+B) + 2 x τ x
				AT-C	Averaging Time (Cancer)	25550	days	EPA, 1989	((1 + 3B + $3B^2$)/$(1+B)^2$)) x CF1 x CF2
				AT-N	Averaging Time (Non-Cancer)	3285	days	EPA, 1989	
				CF1	Conversion Factor 1	0.001	mg/µg	- -	
				CF2	Conversion Factor 2	0.001	l/cm^3	- -	

TABLE 4.5.CT

VALUES USED FOR DAILY INTAKE CALCULATIONS

CENTRAL TENDENCY EXPOSURE

St. Juliens Creek Annex - Site 2

Scenario Timeframe: Current/Future
Medium: Surface Water
Exposure Medium: Surface Water

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Dermal	Trespasser	Adolescent	Drainage Features and Ponded Area	CW	Chemical Concentration in Water	See Table 3.5.CT	µg/l	- -	CDI (mg/kg-day) =
				DAevent	Dermally Absorbed Dose per Event	calculated	mg/cm^2-event	calculated	DAevent x SA x EV x EF x ED x 1/BW x 1/AT
				FA	Fraction absorbed water	chemical specific	dimensionless	EPA, 2001	
				Kp	Permeability Coefficient	chemical specific	cm/hr	EPA, 2001	Inorganics: DAevent (mg/cm^2-event) =
				τ	Lag Time	chemical specific	hr/event	EPA, 2001	Kp x CW x t_{event} x CF1 x CF2
				t*	Time to Reach Steady-state	chemical specific	hours	EPA, 2001	
				B	Ratio of Permeability of Stratum Corneum to Epidermis	chemical specific	dimensionless	EPA, 2001	Organics :
				t_{event}	Event Time	1	hr/event	(1)	t_{event}<t*: DAevent (mg/cm^2-event) =
				SA	Skin Surface Area Available for Contact	4,046	cm^2	EPA, 2001 (3)	2 x FA x Kp x CW x (sqrt((6 x τ x t_{event})/π))
				EV	Event Frequency	1	events/day	EPA, 2001	x CF1 x CF2
				EF	Exposure Frequency	26	days/year	(1)	
				ED	Exposure Duration	9	years	(4)	t_{event}>t*: DAevent (mg/cm^2-event) =
				BW	Body Weight	51	kg	EPA, 1991	FA x Kp x CW x (t_{event}/(1+B) + 2 x τ x
				AT-C	Averaging Time (Cancer)	25,550	days	EPA, 1989	((1 + 3B + $3B^2$)/$(1+B)^2$)) x CF1 x CF2
				AT-N	Averaging Time (Non-Cancer)	3,285	days	EPA, 1989	
				CF1	Conversion Factor 1	0.001	mg/µg	- -	
				CF2	Conversion Factor 2	0.001	l/cm^3	- -	

Notes:

(1) Assumes trespassing one hour per day, one day per week for 26 weeks per year.

(2) The skin surface area assumes 25% of total surface area of 20,000 in contact with surface water.

(3) The skin surface area includes hands, forearms, lower legs, and feet (Exhibit C-1).

(4) Professional Judgement assuming adolescents from 9 to 18 years of age.

Sources:

EPA, 1989: Risk Assessment Guidance for Superfund. Vol. 1: Human Health Evaluation Manual, Part A. OERR. EPA/540/1-89/002.

EPA, 1991: Risk Assessment Guidance for Superfund. Vol. 1: Human Health Evaluation Manual - Supplemental Guidance, Standard Default Exposure Factors. Interim Final. OSWER Directive 9285.6-03,

EPA, 1992: Dermal Exposure Assessment: Principles and Applications. EPA/600/8-91/011B.

EPA, 1993: Superfund's Standard Default Exposure Factors for the Central Tendency and Reasonable Maximum Exposure.

EPA, 1997: Exposure Factors Handbook, Vol. 1. EPA/600/P-95/002Fa. The RME skin surface area assumes 25% of total surface area of 20,000.

EPA, 2001: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment) Interim. EPA/540/R/99/005.

TABLE 4.6.CT
VALUES USED FOR DAILY INTAKE CALCULATIONS
CENTRAL TENDENCY EXPOSURE
St. Juliens Creek Annex - Site 2

Scenario Timeframe: Current/Future
Medium: Sediment
Exposure Medium: Sediment

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Ingestion	Trespasser/Visitor	Adult	Drainage Features and Ponded Area	CSed	Chemical Concentration in Sediment	See Table 3.6.CT	mg/kg	- -	Chronic Daily Intake (CDI) (mg/kg-day) =
				IR-Sed	Ingestion Rate of Sediment	50	mg/day	(1)	CSed x IR-Sed x EF x ED x CF3 x 1/BW x 1/AT
				EF	Exposure Frequency	26	days/year	(2)	
				ED	Exposure Duration	9	years	EPA, 1993	
				CF3	Conversion Factor 3	0.000001	kg/mg	- -	
				BW	Body Weight	70	kg	EPA, 1991	
				AT-C	Averaging Time (Cancer)	25,550	days	EPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	3,285	days	EPA, 1989	
	Trespasser/Visitor	Adolescent	Drainage Features and Ponded Area	CSed	Chemical Concentration in Sediment	See Table 3.6.CT	mg/kg	- -	Chronic Daily Intake (CDI) (mg/kg-day) =
				IR-Sed	Ingestion Rate of Sediment	50	mg/day	(1)	CSed x IR-Sed x EF x ED x CF3 x 1/BW x 1/AT
				EF	Exposure Frequency	26	days/year	(2)	
				ED	Exposure Duration	9	years	(3)	
				CF3	Conversion Factor 3	0.000001	kg/mg	- -	
				BW	Body Weight	51	kg	EPA, 1997	
				AT-C	Averaging Time (Cancer)	25,550	days	EPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	3,285	days	EPA, 1989	
Dermal	Trespasser/Visitor	Adult	Drainage Features and Ponded Area	CSed	Chemical Concentration in Sediment	See Table 3.6.CT	mg/kg	- -	CDI (mg/kg-day) =
				SA	Skin Surface Area Available for Contact	5,672	cm^2	EPA, 2001 (4)	CSed x SA x SSAF x DABS x CF3 x EF x
				SSAF	Soil to Skin Adherence Factor	0.2	mg/cm^2-day	EPA,1997, (6)	ED x 1/BW x 1/AT
				DABS	Dermal Absorption Factor Solids	chem specific	--	EPA, 1995	
				CF3	Conversion Factor 3	0.000001	kg/mg	- -	
				EF	Exposure Frequency	26	days/year	(2)	
				ED	Exposure Duration	9	years	EPA, 1993	
				BW	Body Weight	70	kg	EPA, 1991	
				AT-C	Averaging Time (Cancer)	25,550	days	EPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	3,285	days	EPA, 1989	

TABLE 4.6.CT

VALUES USED FOR DAILY INTAKE CALCULATIONS

CENTRAL TENDENCY EXPOSURE

St. Juliens Creek Annex - Site 2

Scenario Timeframe: Current/Future
Medium: Sediment
Exposure Medium: Sediment

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Dermal	Trespasser/Visitor	Adolescents	Drainage Features and Ponded Area	CSed	Chemical Concentration in Sediment	See Table 3.6.CT	mg/kg	- -	CDI (mg/kg-day) =
				SA	Skin Surface Area Available for Contact	4,046	cm^2	EPA, 2001 (4)	CSed x SA x SSAF x DABS x CF3 x EF x
				SSAF	Soil to Skin Adherence Factor	0.2	mg/cm^2-day	EPA,1997, (6)	ED x 1/BW x 1/AT
				DABS	Dermal Absorption Factor Solids	chem specific	--	EPA, 1995	
				CF3	Conversion Factor 3	0.000001	kg/mg	- -	
				EF	Exposure Frequency	26	days/year	(2)	
				ED	Exposure Duration	9	years	EPA, 1991	
				BW	Body Weight	70	kg	EPA, 1991	
				AT-C	Averaging Time (Cancer)	25,550	days	EPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	3,285	days	EPA, 1989	

Notes:

(1) Professional Judgement assuming 1/2 soil ingestion rate.

(2) Professional Judgement assuming one day per week for 26 weeks per year.

(3) Professional Judgment assuming adolescents from 9 to 18 years of age.

(4) The skin surface area assumes 25% of total surface area of 20,000 in contact with surface water.

(5) The skin surface area includes hands, forearms, lower legs, and feet (assumes 25% of total surface area).

(6) RME SSAF is soil adherence to hands for Gardeners No. 1 from EPA, 1997, Table 6-12.

Sources:

EPA, 1989: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual, Part A. OERR. EPA/540/1-89/002.

EPA, 1991: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual - Supplemental Guidance, Standard Default Exposure Factors. Interim Final. OSWER Directive 9285.6-03.

EPA, 1993: Superfund's Standard Default Exposure Factors for the Central Tendency and Reasonable Maximum Exposure.

EPA, 1997: Exposure Factors Handbook. EPA/600/P-95/002Fa.

TABLE 4.7.CT

VALUES USED FOR DAILY INTAKE CALCULATIONS

CENTRAL TENDENCY EXPOSURE

St. Juliens Creek Annex - Site 2

Scenario Timeframe: Future
Medium: Soil*
Exposure Medium: Soil*

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Ingestion	Construction Worker	Adult	At Site 2	CS	Chemical Concentration in Soil	see Table 3.8 CT	mg/kg	- -	Chronic Daily Intake (CDI) (mg/kg-day) =
				IR-S	Ingestion Rate of Soil	200	mg/day	(1)	CS x IR-S x EF x ED x CF3 x 1/BW x 1/AT
				EF	Exposure Frequency	125	days/year	(2)	
				ED	Exposure Duration	1	years	EPA, 1991	
				CF3	Conversion Factor 3	0.000001	kg/mg	- -	
				BW	Body Weight	70	kg	EPA, 1991	
				AT-C	Averaging Time (Cancer)	25,550	days	EPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	365	days	EPA, 1989	
	Other Worker	Adult	At Site 2	CS	Chemical Concentration in Soil	see Table 3.8 CT	mg/kg	- -	Chronic Daily Intake (CDI) (mg/kg-day) =
				IR-S	Ingestion Rate of Soil	50	mg/day	EPA, 1993	CS x IR-S x EF x ED x CF3 x 1/BW x 1/AT
				EF	Exposure Frequency	219	days/year	EPA, 1993	
				ED	Exposure Duration	6.6	years	EPA, 1993	
				CF3	Conversion Factor 3	0.000001	kg/mg	- -	
				BW	Body Weight	70	kg	EPA, 1991	
				AT-C	Averaging Time (Cancer)	25,550	days	EPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	2,409	days	EPA, 1989	
	Resident	Adult	At Site 2	CS	Chemical Concentration in Soil	see Table 3.7 CT	mg/kg	- -	Chronic Daily Intake (CDI) (mg/kg-day) =
				IR-S	Ingestion Rate of Soil	50	mg/day	EPA, 1993	CS x IR-S x EF x ED x CF3 x 1/BW x 1/AT
				EF	Exposure Frequency	234	days/year	EPA, 1993	
				ED	Exposure Duration	9	years	EPA, 1993	
				CF3	Conversion Factor 3	0.000001	kg/mg	- -	
				BW	Body Weight	70	kg	EPA, 1991	
				AT-C	Averaging Time (Cancer)	25,550	days	EPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	3,285	days	EPA, 1989	

TABLE 4.7.CT

VALUES USED FOR DAILY INTAKE CALCULATIONS

CENTRAL TENDENCY EXPOSURE

St. Juliens Creek Annex - Site 2

Scenario Timeframe: Future
Medium: Soil*
Exposure Medium: Soil*

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Ingestion	Resident	Child	At Site 2	CS	Chemical Concentration in Soil	see Table 3.7 CT	mg/kg	- -	Chronic Daily Intake (CDI) (mg/kg-day) =
				IR-S	Ingestion Rate of Soil	100	mg/day	EPA, 1993	CS x IR-S x EF x ED x CF3 x 1/BW x 1/AT
				EF	Exposure Frequency	234	days/year	EPA, 1993	
				ED	Exposure Duration	6	years	EPA, 1991	
				CF3	Conversion Factor 3	0.000001	kg/mg	- -	
				BW	Body Weight	15	kg	EPA, 1991	
				AT-C	Averaging Time (Cancer)	25,550	days	EPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	2,190	days	EPA, 1989	
		Child/Adult	At Site 2	CS	Chemical Concentration in Soil	see Table 3.7 CT	mg/kg	- -	Chronic Daily Intake (CDI) (mg/kg-day) =
				IR-S-A	Ingestion Rate of Soil, Adult	50	mg/day	EPA, 1991	CS x IR-S-Adj x EF x CF3 x 1/AT
				IR-S-C	Ingestion Rate of Soil, Child	100	mg/day	EPA, 1991	
				IR-S-Adj	Ingestion Rate of Soil, Age-adjusted	46.43	mg-year/kg-day	calculated	IR-S-Adj (mg-year/kd-day) =
				EF	Exposure Frequency	234	days/year	EPA, 1991	(ED-C x IR-S-C / BW-C) + (ED-A x IR-S-A / BW-A)
				ED-A	Exposure Duration, Adult	9	years	EPA, 1991	
				ED-C	Exposure Duration, Child	6	years	EPA, 1991	
				CF3	Conversion Factor 3	0.000001	kg/mg	- -	
				BW-A	Body Weight , Adult	70	kg	EPA, 1991	
				BW-C	Body Weight, Child	15	kg	EPA, 1991	
				AT-C	Averaging Time (Cancer)	25,550	days	EPA, 1989	
Dermal	Construction Worker	Adult	At Site 2	CS	Chemical Concentration in Soil	see Table 3.8 CT	mg/kg	- -	CDI (mg/kg-day) =
				SA	Skin Surface Area Available for Contact	1,306	cm^2	EPA, 2001 (3)	CS x SA x SSAF x DABS x CF3 x EF x
				SSAF	Soil to Skin Adherence Factor	0.2	mg/cm^2-day	EPA, 2001 (4)	ED x 1/BW x 1/AT
				DABS	Dermal Absorption Factor Solids	chem specific	--	EPA, 2001	
				CF3	Conversion Factor 3	0.000001	kg/mg	- -	
				EF	Exposure Frequency	125	days/year	(1)	
				ED	Exposure Duration	1	years	EPA, 1991	
				BW	Body Weight	70	kg	EPA, 1991	
				AT-C	Averaging Time (Cancer)	25,550	days	EPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	365	days	EPA, 1989	

TABLE 4.7.CT

VALUES USED FOR DAILY INTAKE CALCULATIONS

CENTRAL TENDENCY EXPOSURE

St. Juliens Creek Annex - Site 2

Scenario Timeframe: Future
Medium: Soil*
Exposure Medium: Soil*

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Dermal	Other Worker	Adult	At Site 2	CS	Chemical Concentration in Soil	see Table 3.8 CT	mg/kg	- -	CDI (mg/kg-day) =
				SA	Skin Surface Area Available for Contact	1,306	cm^2	EPA, 2001 (3)	CS x SA x SSAF x DABS x CF3 x EF x
				SSAF	Soil to Skin Adherence Factor	0.2	mg/cm^2-day	EPA, 2001 (4)	ED x 1/BW x 1/AT
				DABS	Dermal Absorption Factor Solids	chem specific	--	EPA, 2001	
				CF3	Conversion Factor 3	0.000001	kg/mg	- -	
				EF	Exposure Frequency	219	days/year	EPA, 1993	
				ED	Exposure Duration	6.6	years	EPA, 1993	
				BW	Body Weight	70	kg	EPA, 1991	
				AT-C	Averaging Time (Cancer)	25,550	days	EPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	2,409	days	EPA, 1989	
	Resident	Adult	SWMU 3	CS	Chemical Concentration in Soil	see Table 3.7 CT	mg/kg	- -	CDI (mg/kg-day) =
				SA	Skin Surface Area Available for Contact	4,849	cm^2	EPA, 2001 (6)	CS x SA x SSAF x DABS x CF3 x EF x
				SSAF	Soil to Skin Adherence Factor	0.2	mg/cm^2-day	EPA, 2001 (4)	ED x 1/BW x 1/AT
				DABS	Dermal Absorption Factor Solids	chem specific	--	EPA, 2001; 1995	
				CF3	Conversion Factor 3	0.000001	kg/mg	- -	
				EF	Exposure Frequency	234	days/year	EPA, 1993	
				ED	Exposure Duration	9	years	EPA, 1993	
				BW	Body Weight	70	kg	EPA, 1991	
				AT-C	Averaging Time (Cancer)	25,550	days	EPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	3,285	days	EPA, 1989	
		Child	SWMU 3	CS	Chemical Concentration in Soil	see Table 3.7 CT	mg/kg	- -	CDI (mg/kg-day) =
				SA	Skin Surface Area Available for Contact	1,727	cm^2	EPA, 2001 (6)	CS x SA x SSAF x DABS x CF3 x EF x
				SSAF	Soil to Skin Adherence Factor	0.2	mg/cm^2-day	EPA, 2001 (5)	ED x 1/BW x 1/AT
				DABS	Dermal Absorption Factor Solids	chem specific	--	EPA, 2001	
				CF3	Conversion Factor 3	0.000001	kg/mg	- -	
				EF	Exposure Frequency	234	days/year	EPA, 1993	
				ED	Exposure Duration	6	years	EPA, 1991	
				BW	Body Weight	15	kg	EPA, 1991	
				AT-C	Averaging Time (Cancer)	25,550	days	EPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	2,190	days	EPA, 1989	

TABLE 4.7.CT

VALUES USED FOR DAILY INTAKE CALCULATIONS

CENTRAL TENDENCY EXPOSURE

St. Juliens Creek Annex - Site 2

Scenario Timeframe: Future
Medium: Soil*
Exposure Medium: Soil*

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Dermal									
	Resident	Child/Adult	SWMU 3	CS	Chemical Concentration in Soil	see Table 3.7 CT	mg/kg	- -	CDI (mg/kg-day) =
				SA-A	Skin Surface Area Available for Contact, Ad	4,849	cm^2	EPA, 2001 (6)	CS x DA-Adj x DABS x CF3 x EF x 1/AT
				SA-C	Skin Surface Area Available for Contact, Ch	1,727	cm^2	EPA, 2001 (6)	
				SSAF-A	Soil to Skin Adherence Factor, Adult	0.2	mg/cm^2-day	EPA, 2001 (4)	DA-Adj (mg-year/kd-day) =
				SSAF-C	Soil to Skin Adherence Factor, Child	0.2	mg/cm^2-day	EPA, 2001 (5)	
				DA-Adj	Dermal Absorption, Age-adjusted	263	mg-year/kg-day	calculated	(ED-C x SA-C x SSAF-C / BW-C) + (ED-A x SA-A / BW-A)]
				DABS	Dermal Absorption Factor Solids	chem specific	--	EPA, 2001	(ED-A x SA-A x SSAF-A / BW-A)
				CF3	Conversion Factor 3	0.000001	kg/mg	- -	
				EF	Exposure Frequency	234	days/year	EPA, 1993	
				ED-A	Exposure Duration, Adult	9	years	EPA, 1993	
				ED-C	Exposure Duration, Child	6	years	EPA, 1991	
				BW-A	Body Weight , Adult	70	kg	EPA, 1991	
				BW-C	Body Weight, Child	15	kg	EPA, 1991	
				AT-C	Averaging Time (Cancer)	25,550	days	EPA, 1989	

Notes:

(1) Recommendation from EPA Region III Risk Assessor.
(2) Assumed duration of construction project may be 1/2 a year.
(3) CT exposed skin surface area for construction workers and other workers includes head and hands.
(4) Geometric mean for a high end contact activity (utility wokers) was used.
(5) Geometric mean for a high end contact activity (children playing in wet soil).
(6) CT exposed skin surface area for residents includes face, forearms, hands, and lower legs (Exhibit C-1).

Sources:

EPA, 1989: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual, Part A. OERR. EPA/540/1-89/002.
EPA, 1991: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual - Supplemental Guidance, Standard Default Exposure Factors. Interim Final. OSWER Directive 9285.6-03.
EPA, 1993: Superfund's Standard Default Exposure Factors for the Central Tendency and Reasonable Maximum Exposure.
EPA, 1997: Exposure Factors Handbook. EPA/600/P-95/002Fa.
EPA, 2001: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment) Interim. EPA/540/R/99/005.

Soil*-includes surface and subsurface soil

TABLE 4.8.CT

VALUES USED FOR DAILY INTAKE CALCULATIONS

CENTRAL TENDENCY EXPOSURE

St. Juliens Creek Annex - Site 2

Scenario Timeframe: Future
Medium: Soil*
Exposure Medium: Air

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Inhalation	Construction Worker	Adult	Emissions from Soil at Site 2	CS	Chemical Concentration in Soil	see Table 3.9 CT	mg/kg	- -	Chronic Daily Intake (CDI) (mg/kg-day) =
				CA	Chemical Concentration in Air	calc	mg/m^3	EPA, 1997	CA x IN x ET x EF x ED x 1/BW x 1/AT
				PEF	Particulate Emission Factor	1.32E+09	m^3/kg	EPA, 1997	
				VF	Volatilization Factor for volatile constituents	calc	m^3/kg	EPA, 1997	CA (mg/m^3) = CS (1/PEF + 1/VF)
				IN	Inhalation Rate	2.5	$m^3/hour$	EPA, 1991	
				ET	Exposure Time	4	hr/day	EPA, 1991	
				EF	Exposure Frequency	125	days/year	(1)	
				ED	Exposure Duration	1	years	EPA, 1991	
				BW	Body Weight	70	kg	EPA, 1991	
				AT-C	Averaging Time (Cancer)	25,550	days	EPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	365	days	EPA, 1989	

Notes:

(1) Assumed duration of construction project may be 1/2 a year.

Sources:

EPA, 1989: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual, Part A. OERR. EPA/540/1-89/002.

EPA, 1991: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual - Supplemental Guidance, Standard Default Exposure Factors. Interim Final. OSWER Directive 9285.6-03.

EPA, 1997: Exposure Factors Handbook. EPA/600/P-95/002Fa.

Soil*-includes surface and subsurface soil

TABLE 4.9.CT

VALUES USED FOR DAILY INTAKE CALCULATIONS

CENTRAL TENDENCY EXPOSURE

St. Juliens Creek Annex - Site 2

Scenario Timeframe: Future
Medium: Surface Water
Exposure Medium: Surface Water

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Dermal	Resident	Adult	Drainage Features and Ponded Area	CW	Chemical Concentration in Water	See Table 3.10.CT	µg/l	- -	CDI (mg/kg-day) =
				DAevent	Dermally Absorbed Dose per Event	calculated	mg/cm^2-event	calculated	DAevent x SA x EV x EF x ED x 1/BW x 1/AT
				FA	Fraction absorbed water	chemical specific	dimensionless	EPA, 2001	
				Kp	Permeability Coefficient	chemical specific	cm/hr	EPA, 2001	Inorganics: DAevent (mg/cm^2-event) =
				τ	Lag Time	chemical specific	hr/event	EPA, 2001	Kp x CW x t_{event} x CF1 x CF2
				t*	Time to Reach Steady-state	chemical specific	hours	EPA, 2001	
				B	Ratio of Permeability of Stratum Corneum to Epidermis	chemical specific	dimensionless	EPA, 2001	Organics :
				t_{event}	Event Time	1	hr/event	(1)	t_{event}<t*: DAevent (mg/cm^2-event) =
				SA	Skin Surface Area Available for Contact	5,672	cm^2	EPA, 2001 (2)	2 x FA x Kp x CW x (sqrt((6 x τ x t_{event})/π))
				EV	Event Frequency	1	events/day	(1)	x CF1 x CF2
				EF	Exposure Frequency	26	days/year	(1)	
				ED	Exposure Duration	9	years	EPA, 1993	t_{event}>t*: DAevent (mg/cm^2-event) =
				BW	Body Weight	70	kg	EPA, 1991	FA x Kp x CW x (t_{event}/(1+B) + 2 x τ x
				AT-C	Averaging Time (Cancer)	25550	days	EPA, 1989	((1 + 3B + $3B^2$)/$(1+B)^2$)) x CF1 x CF2
				AT-N	Averaging Time (Non-Cancer)	3285	days	EPA, 1989	
				CF1	Conversion Factor 1	0.001	mg/µg	- -	
				CF2	Conversion Factor 2	0.001	l/cm^3	- -	

TABLE 4.9.CT

VALUES USED FOR DAILY INTAKE CALCULATIONS

CENTRAL TENDENCY EXPOSURE

St. Juliens Creek Annex - Site 2

Scenario Timeframe: Future
Medium: Surface Water
Exposure Medium: Surface Water

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Dermal	Resident	Child	Drainage Features and Ponded Area	CW	Chemical Concentration in Water	See Table 3.10.CT	µg/l	- -	CDI (mg/kg-day) =
				DAevent	Dermally Absorbed Dose per Event	calculated	mg/cm^2-event	calculated	DAevent x SA x EV x EF x ED x 1/BW x 1/AT
				FA	Fraction absorbed water	chemical specific	dimensionless	EPA, 2001	
				Kp	Permeability Coefficient	chemical specific	cm/hr	EPA, 2001	Inorganics: DAevent (mg/cm^2-event) =
				τ	Lag Time	chemical specific	hr/event	EPA, 2001	Kp x CW x t_{event} x CF1 x CF2
				t*	Time to Reach Steady-state	chemical specific	hours	EPA, 2001	
				B	Ratio of Permeability of Stratum Corneum to Epidermis	chemical specific	dimensionless	EPA, 2001	Organics :
				t_{event}	Event Time	1	hr/event	(1)	t_{event}<t*: DAevent (mg/cm^2-event) =
				SA	Skin Surface Area Available for Contact	1,852	cm^2	EPA, 2001 (2)	2 x FA x Kp x CW x (sqrt((6 x τ x t_{event})/π))
				EV	Event Frequency	1	events/day	(1)	x CF1 x CF2
				EF	Exposure Frequency	26	days/year	(1)	
				ED	Exposure Duration	6	years	EPA, 2001	t_{event}>t*: DAevent (mg/cm^2-event) =
				BW	Body Weight	15	kg	EPA, 1991	FA x Kp x CW x (t_{event}/(1+B) + 2 x τ x
				AT-C	Averaging Time (Cancer)	25550	days	EPA, 1989	((1 + 3B + $3B^2$)/$(1+B)^2$)) x CF1 x CF2
				AT-N	Averaging Time (Non-Cancer)	2190	days	EPA, 1989	
				CF1	Conversion Factor 1	0.001	mg/µg	- -	
				CF2	Conversion Factor 2	0.001	l/cm^3	- -	

TABLE 4.9.CT

VALUES USED FOR DAILY INTAKE CALCULATIONS

CENTRAL TENDENCY EXPOSURE

St. Juliens Creek Annex - Site 2

Scenario Timeframe: Future
Medium: Surface Water
Exposure Medium: Surface Water

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
	Resident	Child/Adult	Upper Aquifer-Tap Water	CW	Chemical Concentration in Water	See Table 3.10.CT	µg/l	- -	CDI (mg/kg-day) = DA-Adj x EF x 1/AT
				DAevent-A	Dermally Absorbed Dose per Event, Adult	calculated	mg/cm^2-event	calculated	
				DAevent-C	Dermally Absorbed Dose per Event, Child	calculated	mg/cm^2-event	calculated	DA-Adj = (Daevent-A x SA-A x ED-A x 1/BW-A)
				DA-Adj	Dermally Absorbed Dose, Age-adjusted	calculated	mg-year/event-kg	calculated	+ (Daevent-C x SA-C x ED-C x 1/BW-C)
				FA	Fraction absorbed water	chemical specific	dimensionless	EPA, 2001	
				Kp	Permeability Coefficient	chemical specific	cm/hr	EPA, 2001	Inorganics: DAevent (mg/cm^2-event) =
				τ	Lag Time	chemical specific	hr/event	EPA, 2001	Kp x CW x t_{event} x CF1 x CF2
				t*	Time to Reach Steady-state	chemical specific	hours	EPA, 2001	
				B	Ratio of Permeability of Stratum Corneum to Epidermis	chemical specific	dimensionless	EPA, 2001	Organics :
				t_{event}-A	Event Time, Adult	1	hr/event	(1)	t_{event}<t*: DAevent (mg/cm^2-event) =
				t_{event}-C	Event Time, Child	1	hr/event	(1)	2 x FA x Kp x CW x (sqrt((6 x τ x t_{event})/π))
				SA-A	Skin Surface Area, Adult	5,672	cm^2	EPA, 2001	x CF1 x CF2
				SA-C	Skin Surface Area, Child	1,852	cm^2	EPA, 2001	
				EV	Event Frequency	1	events/day	(1)	t_{event}>t*: DAevent (mg/cm^2-event) =
				EF	Exposure Frequency	26	days/year	(1)	FA x Kp x CW x (t_{event}/(1+B) + 2 x τ x
				ED-A	Exposure Duration, Adult	9	years	EPA, 2001	((1 + 3B + $3B^2$)/$(1+B)^2$)) x CF1 x CF2
				ED-C	Exposure Duration, Child	6	years	EPA, 2001	
				BW-A	Body Weight, Adult	70	kg	EPA, 1991	
				BW-C	Body Weight, Child	15	ke	EPA, 1991	
				AT-C	Averaging Time (Cancer)	25,550	days	EPA, 1989	
				CF1	Conversion Factor 1	0.001	mg/µg	- -	
				CF2	Conversion Factor 2	0.001	l/cm^3	- -	

Notes:

(1) Assumes trespassing one hour per day, one day per week for 52 weeks per year.

(2) The skin surface area includes hands, forearms, lower legs, and feet (Exhibit C-1 in EPA 2001).

Sources:

EPA, 1989: Risk Assessment Guidance for Superfund. Vol. 1: Human Health Evaluation Manual, Part A. OERR. EPA/540/1-89/002.

EPA, 1991: Risk Assessment Guidance for Superfund. Vol. 1: Human Health Evaluation Manual - Supplemental Guidance, Standard Default Exposure Factors. Interim Final. OSWER Directive 9285.6-03,

EPA, 1993: Superfund's Standard Default Exposure Factors for the Central Tendency and Reasonable Maximum Exposure.

EPA, 1997: Exposure Factors Handbook, Vol. 1. EPA/600/P-95/002Fa. The RME skin surface area assumes 25% of total surface area of 20,000.

EPA, 2001: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment) Interim. EPA/540/R/99/005.

TABLE 4.10.CT

VALUES USED FOR DAILY INTAKE CALCULATIONS

CENTRAL TENDENCY EXPOSURE

St. Juliens Creek Annex - Site 2

Scenario Timeframe: Future
Medium: Sediment
Exposure Medium: Sediment

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Ingestion	Resident	Adult	Drainage Features and Ponded Area	CSed	Chemical Concentration in Sediment	See Table 3.11.CT	mg/kg	- -	Chronic Daily Intake (CDI) (mg/kg-day) =
				IR-Sed	Ingestion Rate of Sediment	50	mg/day	EPA, 1997	CSed x IR-Sed x EF x ED x CF3 x 1/BW x 1/AT
				EF	Exposure Frequency	26	days/year	(1)	
				ED	Exposure Duration	9	years	EPA, 1993	
				CF3	Conversion Factor 3	0.000001	kg/mg	- -	
				BW	Body Weight	70	kg	EPA, 1991	
				AT-C	Averaging Time (Cancer)	25,550	days	EPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	3,285	days	EPA, 1989	
	Resident	Child	Drainage Features and Ponded Area	CSed	Chemical Concentration in Sediment	See Table 3.11.CT	mg/kg	- -	Chronic Daily Intake (CDI) (mg/kg-day) =
				IR-Sed	Ingestion Rate of Sediment	100	mg/day	EPA, 1997	CSed x IR-Sed x EF x ED x CF3 x 1/BW x 1/AT
				EF	Exposure Frequency	26	days/year	(1)	
				ED	Exposure Duration	6	years	EPA, 1989	
				CF3	Conversion Factor 3	0.000001	kg/mg	- -	
				BW	Body Weight	51	kg	EPA, 1997	
				AT-C	Averaging Time (Cancer)	25,550	days	EPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	2,190	days	EPA, 1989	
	Resident	Adult/Child	Drainage Features and Ponded Area	CSed	Chemical Concentration in Sediment	See Table 3.11.CT	mg/kg	- -	Chronic Daily Intake (CDI) (mg/kg-day) =
				IR-Sed-A	Ingestion Rate of Sediment, Adult	50	mg/day	EPA, 1997	CSed x IR-S-Adj x EF x CF3 x 1/AT-C
				IR-Sed-C	Ingestion Rate of Sediment, Child	100	mg/day	EPA, 1997	IR-S-Adj (mg-year/kd-day) =
				EF	Exposure Frequency	26	days/year	(1)	(ED-C x IR-S-C / BW-C) + (ED-A x IR-S-A / BW-A)
				ED-A	Exposure Duration	9	years	EPA, 1989	
				ED-C	Exposure Duration	6	years	EPA, 1989	
				CF3	Conversion Factor 3	0.000001	kg/mg	- -	
				BW-A	Body Weight, Adult	70	kg	EPA, 1997	
				BW-C	Body Weight, Child	15	kg	EPA, 1997	
				AT-C	Averaging Time (Cancer)	25,550	days	EPA, 1989	

TABLE 4.10.CT

VALUES USED FOR DAILY INTAKE CALCULATIONS

CENTRAL TENDENCY EXPOSURE

St. Juliens Creek Annex - Site 2

Scenario Timeframe: Future
Medium: Sediment
Exposure Medium: Sediment

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Dermal	Resident	Adult	Drainage Features and Ponded Area	CSed	Chemical Concentration in Sediment	See Table 3.11.CT	mg/kg	- -	CDI (mg/kg-day) =
				SA	Skin Surface Area Available for Contact	5,672	cm^2	EPA, 2001 (2)	CSed x SA x SSAF x DABS x CF3 x EF x
				SSAF	Soil to Skin Adherence Factor	0.3	mg/cm^2-day	EPA, 2001 (3)	ED x 1/BW x 1/AT
				DABS	Dermal Absorption Factor Solids	chem specific	--	EPA, 1995; 2001	
				CF3	Conversion Factor 3	0.000001	kg/mg	- -	
				EF	Exposure Frequency	26	days/year	(2)	
				ED	Exposure Duration	9	years	EPA, 1993	
				BW	Body Weight	70	kg	EPA, 1991	
				AT-C	Averaging Time (Cancer)	25,550	days	EPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	3,285	days	EPA, 1989	
	Resident	Child	Drainage Features and Ponded Area	CSed	Chemical Concentration in Sediment	See Table 3.11.CT	mg/kg	- -	CDI (mg/kg-day) =
				SA	Skin Surface Area Available for Contact	1,852	cm^2	EPA, 2001 (2)	CSed x SA x SSAF x DABS x CF3 x EF x
				SSAF	Soil to Skin Adherence Factor	3.3	mg/cm^2-day	EPA, 2001 (3)	ED x 1/BW x 1/AT
				DABS	Dermal Absorption Factor Solids	chem specific	--	EPA, 1995; 2001	
				CF3	Conversion Factor 3	0.000001	kg/mg	- -	
				EF	Exposure Frequency	26	days/year	(2)	
				ED	Exposure Duration	6	years	EPA, 1991	
				BW	Body Weight	15	kg	EPA, 1991	
				AT-C	Averaging Time (Cancer)	25,550	days	EPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	2,190	days	EPA, 1989	

TABLE 4.10.CT

VALUES USED FOR DAILY INTAKE CALCULATIONS

CENTRAL TENDENCY EXPOSURE

St. Juliens Creek Annex - Site 2

Scenario Timeframe: Future
Medium: Sediment
Exposure Medium: Sediment

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
	Resident	Child/Adult	Drainage Features and Ponded Area	CSed	Chemical Concentration in Sediment	See Table 3.11.CT	mg/kg	- -	CDI (mg/kg-day) =
				SA - A	Skin Surface Area Available for Contact, Adu	5,672	cm^2	EPA, 2001 (2)	CS x DA-Adj x DABS x CF3 x EF x 1/AT-C
				SA - C	Skin Surface Area Available for Contact, Chil	1,852	cm^2	EPA, 2001 (2)	
				SSAF - A	Soil to Skin Adherence Factor, Adult	0.3	mg/cm^2-day	EPA, 2001 (3)	DA-Adj (mg-year/kd-day) =
				SSAF - C	Soil to Skin Adherence Factor, Child	3.3	mg/cm^2-day	EPA, 2001 (3)	
				DABS	Dermal Absorption Factor Solids	chem specific	--	EPA, 1995; 2001	(ED-C x SA-C x SSAF-C / BW-C) + (ED-A x SA-A / BW-A)]
				CF3	Conversion Factor 3	0.000001	kg/mg	- -	(ED-A x SA-A x SSAF-A / BW-A)
				EF	Exposure Frequency	26	days/year	(2)	
				ED - A	Exposure Duration, Adult	9	years	EPA, 1991	
				ED -C	Exposure Duration, Child	6	years	EPA, 1991	
				BW - A	Body Weight - Adult	70	kg	EPA, 1991	
				BW - C	Body Weight - Child	15	kg	EPA, 1991	
				AT-C	Averaging Time (Cancer)	25,550	days	EPA, 1989	

Notes:

(1) Assumes trespassing one hour per day, one day per week for 52 weeks per year.

(2) The skin surface area includes hands, forearms, lower legs, and feet (Exhibit C-1 in EPA 2001).

(3) 95th percentile of a median contact activity was selected; construction workers and children playing in wet soil (Exhibit C-2 in EPA 2001).

Sources:

EPA, 1989: Risk Assessment Guidance for Superfund. Vol. 1: Human Health Evaluation Manual, Part A. OERR. EPA/540/1-89/002.

EPA, 1991: Risk Assessment Guidance for Superfund. Vol. 1: Human Health Evaluation Manual - Supplemental Guidance, Standard Default Exposure Factors. Interim Final. OSWER Directive 9285.6-03,

EPA, 1992: Dermal Exposure Assessment: Principles and Applications. EPA/600/8-91/011B.

EPA, 1993: Superfund's Standard Default Exposure Factors for the Central Tendency and Reasonable Maximum Exposure.

EPA, 1997: Exposure Factors Handbook, Vol. 1. EPA/600/P-95/002Fa. The RME skin surface area assumes 25% of total surface area of 20,000.

EPA, 2001: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment) Interim. EPA/540/R/99/005.

TABLE 4.11.CT

VALUES USED FOR DAILY INTAKE CALCULATIONS

CENTRAL TENDENCY EXPOSURE

St. Juliens Creek Annex - Site 2

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Shallow Groundwater

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Dermal	Construction Worker	Adult	Water Table	CW	Chemical Concentration in Water	See Table 3.12.CT	µg/l	- -	CDI (mg/kg-day) =
				DAevent	Dermally Absorbed Dose per Event	calculated	mg/cm^2-event	calculated	DAevent x SA x EV x EF x ED x 1/BW x 1/AT
				FA	Fraction absorbed water	chemical specific	dimensionless	EPA, 2001	
				Kp	Permeability Coefficient	chemical specific	cm/hr	EPA, 2001	Inorganics: DAevent (mg/cm^2-event) =
				τ	Lag Time	chemical specific	hr/event	EPA, 2001	Kp x CW x t_{event} x CF1 x CF2
				t*	Time to Reach Steady-state	chemical specific	hours	EPA, 2001	
				B	Ratio of Permeability of Stratum Corneum to Epidermis	chemical specific	dimensionless	EPA, 2001	Organics :
				t_{event}	Event Time	4.0	hr/event	(1)	t_{event}<t*: DAevent (mg/cm^2-event) =
				SA	Skin Surface Area Available for Contact	4,447	cm^2	EPA, 2001 (2)	2 x FA x Kp x CW x (sqrt((6 x τ x t_{event})/π))
				EV	Event Frequency	1	events/day	EPA, 2001	x CF1 x CF2
				EF	Exposure Frequency	125	days/year	EPA, 2001	
				ED	Exposure Duration	1	years	EPA, 2001	t_{event}>t*: DAevent (mg/cm^2-event) =
				BW	Body Weight	70	kg	EPA, 1991	FA x Kp x CW x (t_{event}/(1+B) + 2 x τ x
				AT-C	Averaging Time (Cancer)	25,550	days	EPA, 1989	((1 + 3B + $3B^2$)/$(1+B)^2$)) x CF1 x CF2
				AT-N	Averaging Time (Non-Cancer)	365	days	EPA, 1989	
				CF1	Conversion Factor 1	0.001	mg/µg	- -	
				CF2	Conversion Factor 2	0.001	l/cm^3	- -	

Notes:

(1) Assumes construction worker would be exposed to groundwater for 1/2 a day.

(2) CT SA includes hands, forearms, and lower legs.

Sources:

EPA, 1989: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual, Part A. OERR. EPA/540/1-89/002.

EPA, 1991: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual - Supplemental Guidance, Standard Default Exposure Factors. Interim Final. OSWER Directive 9285.6-03.

EPA, 1997: Exposure Factors Handbook. EPA/600/P-95/002Fa.

EPA, 2001: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment) Interim. EPA/540/R/99/005.

TABLE 5.1

NON-CANCER TOXICITY DATA -- ORAL/DERMAL

St. Juliens Creek Annex - Site 2

Chemical of Potential Concern	Chronic/ Subchronic	Oral RfD		Oral Absorption Efficiency for Dermal (1)	Absorbed RfD for Dermal (2)		Primary Target Organ(s)	Combined Uncertainty/Modifying Factors	RfD:Target Organ(s)	
		Value	Units		Value	Units			Source(s)	Date(s) (MM/DD/YYYY)
Aluminum	Chronic	1.0E+00	mg/kg-day	1	1.0E+00	mg/kg-day	CNS	100	NCEA	06/21/2001
Antimony	Chronic	4.0E-04	mg/kg-day	0.15	6.0E-05	mg/kg-day	Blood	1000/1	IRIS	06/16/2003
Antimony	Subchronic	4.0E-04	mg/kg-day	0.15	6.0E-05	mg/kg-day	Blood	1000	HEAST	07/01/1997
Arsenic*	Chronic	3.0E-04	mg/kg-day	0.95	3.0E-04	mg/kg-day	Skin, Vascular	3/1	IRIS	06/16/2003
Arsenic*	Subchronic	3.0E-04	mg/kg-day	0.95	3.0E-04	mg/kg-day	Skin, Vascular	3	HEAST	07/01/1997
Barium	Chronic	7.0E-02	mg/kg-day	0.07	4.9E-03	mg/kg-day	Kidney	3/1	IRIS	06/16/2003
Barium	Subchronic	7.0E-02	mg/kg-day	0.07	4.9E-03	mg/kg-day	Cardiovascular	3	HEAST	07/01/1997
Benzo(a)anthracene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bis(2-Ethylhexyl)phthalate	Chronic	2.0E-02	mg/kg-day	1	2.0E-02	mg/kg-day	Liver	1000/1	IRIS	06/16/2003
Cadmium (water)	Chronic	5.0E-04	mg/kg-day	0.025	1.3E-05	mg/kg-day	Kidney	10/1	IRIS	06/16/2003
Cadmium (food)	Chronic	1.0E-03	mg/kg-day	0.025	2.5E-05	mg/kg-day	Kidney	10/1	IRIS	06/16/2003
Chloroform	Chronic	1.0E-02	mg/kg-day	1	1.0E-02	mg/kg-day	Liver	1000/1	IRIS	06/16/2003
Chloroform	Subchronic	1.0E-02	mg/kg-day	1	1.0E-02	mg/kg-day	Liver	1000	HEAST	07/01/1997
Chromium (VI)	Chronic	3.0E-03	mg/kg-day	0.025	7.5E-05	mg/kg-day	NOAEL	300/3	IRIS	06/16/2003
Chromium (VI)	Subchronic	2.0E-02	mg/kg-day	0.025	5.0E-04	mg/kg-day	NOAEL	100	HEAST	07/01/1997
Copper	Chronic	4.0E-02	mg/kg-day	1	4.0E-02	mg/kg-day	Gastrointestinal	NA	HEAST	07/01/1997
DDD-4,4'	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
DDE-4,4'	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
DDT-4,4'*	Chronic	5.0E-04	mg/kg-day	0.9	5.0E-04	mg/kg-day	Liver	100/1	IRIS	06/16/2003
DDT-4,4'*	Subchronic	5.0E-04	mg/kg-day	0.9	5.0E-04	mg/kg-day	Liver	100	HEAST	07/01/1997
Dibenzo(a,h)anthracene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,4-Dichlorobenzene	Chronic	3.0E-02	mg/kg-day	1	3.0E-02	mg/kg-day	Liver	1000	NCEA	04/29/97
cis-1,2-Dichloroethene	Chronic	1.0E-02	mg/kg-day	1	1.0E-02	mg/kg-day	Blood	3000	HEAST	07/01/1997
Heptachlor	Chronic	5.0E-04	mg/kg-day	1	5.0E-04	mg/kg-day	Liver	300/1	IRIS	06/16/2003
Heptachlor	Subchronic	5.0E-04	mg/kg-day	1	5.0E-04	mg/kg-day	Liver	300	HEAST	07/01/1997
Iron	Chronic	3.0E-01	mg/kg-day	1	3.0E-01	mg/kg-day	Gastrointestinal	NA	NCEA	07/23/1996

TABLE 5.1

NON-CANCER TOXICITY DATA -- ORAL/DERMAL

St. Juliens Creek Annex - Site 2

Chemical of Potential Concern	Chronic/ Subchronic	Oral RfD		Oral Absorption Efficiency for Dermal (1)	Absorbed RfD for Dermal (2)		Primary Target Organ(s)	Combined Uncertainty/Modifying Factors	RfD:Target Organ(s)	
		Value	Units		Value	Units			Source(s)	Date(s) (MM/DD/YYYY)
Lead	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Manganese (non-food)	Chronic	2.0E-02	mg/kg-day	0.04	8.0E-04	mg/kg-day	CNS	1/1	IRIS	06/16/2003
Manganese (food)	Chronic	1.4E-01	mg/kg-day	0.04	5.6E-03	mg/kg-day	CNS	1/1	IRIS	06/16/2003
Nickel, Soluble Salts	Chronic	2.0E-02	mg/kg-day	0.04	8.0E-04	mg/kg-day	Decreased Weight	300/1	IRIS	06/16/2003
Nickel, Soluble Salts	Subchronic	2.0E-02	mg/kg-day	0.04	8.0E-04	mg/kg-day	Decreased Weight	300	HEAST	07/01/1997
RDX	Chronic	3.0E-03	mg/kg-day	1	3.0E-03	mg/kg-day	Prostate	100	IRIS	06/16/2003
RDX	Subchronic	3.0E-03	mg/kg-day	1	3.0E-03	mg/kg-day	Prostate	100	HEAST	07/01/1997
Thallium	Chronic	7.0E-05	mg/kg-day	1	7.0E-05	mg/kg-day	Liver, Blood, Hair	3000/1	HEAST	07/01/1997
Trichloroethene	Chronic	3.0E-04	mg/kg-day	1	3.0E-04	mg/kg-day	Liver, Kidney, Fetus	3000	NCEA	08/01/2001
Vanadium	Chronic	7.0E-03	mg/kg-day	0.026	1.8E-04	mg/kg-day	Lifetime	100	HEAST	07/01/1997
Vanadium	Subchronic	7.0E-03	mg/kg-day	0.026	1.8E-04	mg/kg-day	Lifetime	100	HEAST	07/01/1997
Vinyl Chloride	Chronic	3.0E-03	mg/kg-day	1	3.0E-03	mg/kg-day	Liver	30/1	IRIS	06/16/2003
Zinc	Chronic	3.0E-01	mg/kg-day	1	3.0E-01	mg/kg-day	Blood	3/1	IRIS	06/16/2003

Footnote Instructions:

(1) Source: Risk Assessment Guidance for Superfund. Volume 1: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment (Interim). Section 4.2 and Exhibit 4-1.

(2) See Risk Assessment text for the derivation of the "Absorbed RfD for Dermal"

* USEPA recommends the adjustment for dermal toxicity is not performed for this constituent.

Definitions:

NA = Not Available

IRIS = Integrated Risk Information System

HEAST = Health Effects Assessment Summary Tables

NCEA = National Center for Environmental Assessment

USEPA R3 = Region 3 Risk-Based Concentration Table.

CNS = Central Nervous System

TABLE 5.2

NON-CANCER TOXICITY DATA -- INHALATION

St. Juliens Creek Annex - Site 2

Chemical of Potential Concern	Chronic/ Subchronic	Inhalation RfC		Extrapolated RfD (1)		Primary Target Organ(s)	Combined Uncertainty/Modifying Factors	RfC : Target Organ(s)	
		Value	Units	Value	Units			Source(s)	Date(s) (MM/DD/YYYY)
Aluminum	Chronic	3.5E-03	mg/m3	1.0E-03	mg/kg/day	CNS	300	NCEA	08/13/1999
Antimony	NA	NA	NA	NA	NA	NA	NA	NA	NA
Arsenic	NA	NA	NA	NA	NA	NA	NA	NA	NA
Barium	Chronic	5.0E-04	mg/m3	1.4E-04	mg/kg/day	Fetus	1000	HEAST	07/01/1997
Barium	Subchronic	5.0E-03	mg/m3	1.4E-03	mg/kg/day	Fetus	100	HEAST	07/01/1997
Benzo(a)anthracene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bis(2-Ethylhexyl)phthalate	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cadmium	Chronic	2.0E-04	mg/m3	5.7E-05	mg/kg/day	Kidney	NA	NCEA	NA
Cadmium	Subchronic	9.0E-04	mg/m3	2.6E-04	mg/kg-day	Kidney	N/A	NCEA	NA
Chloroform	Chronic	4.9E-02	mg/m3	1.4E-02	mg/kg/day	Liver, Kidney	10	NCEA	NA
Chromium (VI)	Chronic	8.0E-06	mg/m3	3.0E-05	mg/kg/day	Nasal	90/1	IRIS	06/16/2003
Copper	NA	NA	NA	NA	NA	NA	NA	NA	NA
DDD-4,4'	NA	NA	NA	NA	NA	NA	NA	NA	NA
DDE-4,4'	NA	NA	NA	NA	NA	NA	NA	NA	NA
DDT-4,4'	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,4-Dichlorobenzene	Chronic	8.0E-01	mg/m3	2.3E-01	mg/kg/day	Liver, Reproduction	100/1	IRIS	05/18/2003
cis-1,2-Dichloroethene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Heptachlor	NA	NA	NA	NA	NA	NA	NA	NA	NA
Iron	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead	NA	NA	NA	NA	NA	NA	NA	NA	NA
Manganese (non-food)	Chronic	5.0E-05	mg/m3	1.4E-05	mg/kg/day	CNS	1000/1	IRIS	06/16/2003
Nickel	NA	NA	NA	NA	NA	NA	NA	NA	NA
RDX	NA	NA	NA	NA	NA	NA	NA	NA	NA
Thallium	NA	NA	NA	NA	NA	NA	NA	NA	NA
Trichloroethylene	Chronic	4.0E-02	mg/m3	1.0E-02	mg/kg/day	CNS, Liver, Endocrine system	1000	NCEA	08/01/2001

TABLE 5.2

NON-CANCER TOXICITY DATA -- INHALATION

St. Juliens Creek Annex - Site 2

Chemical of Potential Concern	Chronic/ Subchronic	Inhalation RfC		Extrapolated RfD (1)		Primary Target Organ(s)	Combined Uncertainty/Modifying Factors	RfC : Target Organ(s)	
		Value	Units	Value	Units			Source(s)	Date(s) (MM/DD/YYYY)
Vanadium	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vinyl chloride	Chronic	9.8E-02	mg/m3	2.8E-02	mg/kg/day	Liver	30/1	IRIS	06/16/2003
Zinc	NA	NA	NA	NA	NA	NA	NA	NA	NA

(1) See Risk Assessment text for the derivation of the "Extrapolated RfD".

Definitions: NA = Not Available

IRIS = Integrated Risk Information System

HEAST = Health Effects Assessment Summary Tables

NCEA = National Center for Environmental Assessment

CNS = Central Nervous System

TABLE 6.1

CANCER TOXICITY DATA -- ORAL/DERMAL

St. Juliens Creek Annex - Site 2

Chemical of Potential Concern	Oral Cancer Slope Factor		Oral Absorption Efficiency for Dermal (1)	Absorbed Cancer Slope Factor for Dermal		Weight of Evidence/ Cancer Guideline Description	Oral CSF	
	Value	Units		Value	Units		Source(s)	Date(s) (MM/DD/YYYY)
Aluminum	NA	NA	NA	NA	NA	NA	NA	NA
Antimony	NA	NA	NA	NA	NA	NA	NA	NA
Arsenic	1.5E+00	1/mg/kg-day	NA	1.5E+00	1/mg/kg-day	A	IRIS	06/16/2003
Barium	NA	NA	NA	NA	NA	D	NA	NA
Benzo(a)anthracene*	7.3E-01	1/mg/kg-day	0.89	7.3E-01	1/mg/kg-day	B2	NCEA	07/01/1993
Benzo(a)pyrene*	7.3E+00	1/mg/kg-day	0.89	7.3E+00	1/mg/kg-day	B2	IRIS	06/16/2003
Benzo(b)fluoranthene*	7.3E-01	1/mg/kg-day	0.89	7.3E-01	1/mg/kg-day	B2	NCEA	07/01/1993
Bis(2-Ethylhexyl)phthalate	1.4E-02	1/mg/kg-day	1	1.4E-02	1/mg/kg-day	B2	IRIS	06/16/2003
Cadmium	NA	1/mg/kg-day	NA	NA	1/mg/kg-day	NA	NA	NA
Chloroform	NA	1/mg/kg-day	NA	NA	1/mg/kg-day	B2	IRIS	06/16/2003
Chromium (VI)	NA	NA	NA	NA	NA	D	NA	NA
Copper	NA	NA	NA	NA	NA	D	NA	NA
DDD-4,4'	2.4E-01	1/mg/kg-day	1	2.4E-01	1/mg/kg-day	B2	IRIS	06/16/2003
DDE-4,4'	3.4E-01	1/mg/kg-day	1	3.4E-01	1/mg/kg-day	B2	IRIS	06/16/2003
DDT-4,4'*	3.4E-01	1/mg/kg-day	0.9	3.4E-01	1/mg/kg-day	B2	IRIS	06/16/2003
Dibenzo(a,h)anthracene*	7.3E+00	1/mg/kg-day	0.89	7.3E+00	1/mg/kg-day	B2	NCEA	07/01/1993
1,4-Dichlorobenzene	2.4E-02	1/mg/kg-day	1	2.4E-02	1/mg/kg-day	NA	HEAST	07/01/1997
cis-1,2-Dichloroethene	NA	NA	NA	NA	NA	D	NA	NA
Heptachlor	4.5E+00	1/mg/kg-day	1	4.5E+00	1/mg/kg-day	B2	IRIS	06/16/2003
Iron	NA	NA	NA	NA	NA	NA	NA	NA
Lead	NA	NA	NA	NA	NA	NA	NA	NA
Manganese	NA	NA	NA	NA	NA	D	NA	NA
Nickel	NA	NA	NA	NA	NA	NA	NA	NA

TABLE 6.1

CANCER TOXICITY DATA -- ORAL/DERMAL

St. Juliens Creek Annex - Site 2

Chemical of Potential Concern	Oral Cancer Slope Factor		Oral Absorption Efficiency for Dermal (1)	Absorbed Cancer Slope Factor for Dermal		Weight of Evidence/ Cancer Guideline Description	Oral CSF	
	Value	Units		Value	Units		Source(s)	Date(s) (MM/DD/YYYY)
RDX	1.1E-01	1/mg/kg-day	NA	1.1E-01	1/mg/kg-day	C	IRIS	06/16/2003
Thallium	NA	NA	NA	NA	NA	NA	NA	NA
Trichloroethene	4.0E-01	1/mg/kg-day	1	4.0E-01	1/mg/kg-day	B2	NCEA	08/01/2001
Vanadium	NA	NA	NA	NA	NA	NA	NA	NA
Vinyl Chloride (adult)	7.2E-01	1/mg/kg-day	1	7.2E-01	1/mg/kg-day	A	IRIS	06/16/2003
Vinyl Chloride (incl early life	1.4E+00	1/mg/kg-day	1	1.4E+00	1/mg/kg-day	A	IRIS	06/16/2003
Zinc	NA	NA	NA	NA	NA	NA	NA	NA

(1) Source: Risk Assessment Guidance for Superfund: Volume 1: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment) Interim. Section 4.2 and Exhibit 4-1.

(2) See Risk Assessment text for derivation of the "Absorbed Cancer Slope Factor for Dermal".

* USEPA recommends the adjustment for dermal toxicity is not performed for this constituent.

Definitions:

NA = Not Available

IRIS = Integrated Risk Information System

HEAST = Health Effects Assessment Summary Tables

NCEA = National Center for Environmental Assessment

TABLE 6.2

CANCER TOXICITY DATA -- INHALATION

St. Juliens Creek Annex - Site 2

Chemical of Potential Concern	Unit Risk		Inhalation Cancer Slope Factor		Weight of Evidence/ Cancer Guideline Description	Unit Risk : Inhalation CSF	
	Value	Units	Value	Units		Source(s)	Date(s) (MM/DD/YYYY)
Aluminum	NA	NA	NA	NA	NA	NA	NA
Antimony	NA	NA	NA	NA	NA	NA	NA
Arsenic	4.3E-03	1/ug/m3	1.5E+01	1/mg/kg-day	A	IRIS	06/16/2003
Barium	NA	NA	NA	NA	D	NA	NA
Benz(a)anthracene	NA	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	8.86E-04	1/ug/m3	3.1E+00	1/mg/kg-day	B2	NCEA	1997
Benzo(b)fluoranthene	NA	NA	NA	NA	NA	NA	NA
Bis(2-Ethylhexyl)phthalate	4.00E-06	1/ug/m3	1.4E-02	1/mg/kg-day	B2	NCEA	08/30/2000
Cadmium	1.8E-03	1/ug/m3	6.3E+00	1/mg/kg-day	B1	IRIS	05/18/2003
Chloroform	2.3E-05	1/ug/m3	8.1E-02	1/mg/kg-day	B2	IRIS	06/16/2003
Chromium VI	1.2E-02	1/ug/m3	4.1E+01	1/mg/kg-day	A	IRIS	07/01/2003
Copper	NA	NA	NA	NA	D	NA	NA
4,4'-DDD	NA	NA	NA	NA	NA	NA	NA
4,4'-DDE	NA	NA	NA	NA	NA	NA	NA
4,4'-DDT	9.7E-05	1/ug/m3	3.4E-01	1/mg/kg-day	B2	IRIS	06/16/2003
Dibenzo(a,h)anthracene	NA	NA	NA	NA	NA	NA	NA
1,4-Dichlorobenzene	6.3E-06	1/ug/m3	2.2E-02	1/mg/kg-day	C	NCEA	1998
cis-1,2-Dichloroethene	NA	NA	NA	NA	D	NA	NA
Heptachlor	1.3E-03	1/ug/m3	4.5E+00	1/mg/kg-day	B2	IRIS	05/18/2003
Iron	NA	NA	NA	NA	NA	NA	NA
Lead	NA	NA	NA	NA	NA	NA	NA
Manganese	NA	NA	NA	NA	NA	NA	NA
Nickel	0.00024	1/ug/m3	8.4E-01	1/mg/kg-day	A	IRIS	05/18/2003
RDX	NA	NA	NA	NA	NA	NA	NA
Thallium	NA	NA	NA	NA	NA	NA	NA

TABLE 6.2

CANCER TOXICITY DATA -- INHALATION

St. Juliens Creek Annex - Site 2

Chemical of Potential Concern	Unit Risk		Inhalation Cancer Slope Factor		Weight of Evidence/ Cancer Guideline Description	Unit Risk : Inhalation CSF	
	Value	Units	Value	Units		Source(s)	Date(s) (MM/DD/YYYY)
Trichloroethene	1.1E-04	1/ug/m3	4.0E-01	1/mg/kg-day	NA	NCEA	08/01/2001
Vanadium	NA	NA	NA	NA	NA	NA	NA
Vinyl Chloride (adult)	4.40E-06	1/ug/m3	1.5E-02	1/mg/kg-day	A	IRIS	05/18/2003
Vinyl Chloride (incl early life)	8.80E-06	1/ug/m3	3.0E-02	1/mg/kg-day	A	IRIS	05/18/2003
Zinc	NA	NA	NA	NA	NA	NA	NA

Definitions:

NA = Not Available

IRIS = Integrated Risk Information System

HEAST = Health Effects Assessment Summary Tables

NCEA = National Center for Environmental Assessment

Table 7.1RME and Table 7.2.RME Supplement A
Calculation of DAevent
Trespasser Adult/Adolescent, Surface Water
St. Juliens Creen Annex - Site 2

Chemical of Potential Concern	Surface Water Concentration (CW) (µg/L)	Permeability Coefficient (Kp) (cm/hr)	B (unitless)	Lag Time (τ_{event}) (hr)	t* (hr)	Fraction Absorbed Water (FA) (dimensionless)	Duration of Event (tevent) (hr)	DAevent (mg/cm^2-event)	Eq
Chloroform	5.40E+00	6.8E-03	2.9E-02	5.0E-01	1.2E+00	1.0E+00	1	7.2E-08	2
Trichloroethene	1.30E+02	1.2E-02	1.0E-01	5.8E-01	1.4E+00	1.0E+00	1	3.3E-06	2
Vinyl chloride	1.51E+01	5.6E-03	1.7E-02	2.4E-01	5.7E-01	1.0E+00	1	2.6E-07	3
cis-1,2-Dichloroethene	8.40E+01	7.7E-03	2.9E-02	3.7E-01	8.9E-01	1.0E+00	1	2.0E-06	3
bis(2-Ethylhexyl)phthalate	6.90E+01	2.5E-02	2.0E-01	1.7E+01	4.0E+01	8.0E-01	1	1.6E-05	2
Arsenic	3.80E+00	1.0E-03	NA	NA	NA	NA	1	3.8E-09	1
Chromium	1.50E+02	1.0E-03	NA	NA	NA	NA	1	1.5E-07	1
Iron	1.17E+04	1.0E-03	NA	NA	NA	NA	1	1.2E-05	1
Manganese	2.04E+03	1.0E-03	NA	NA	NA	NA	1	2.0E-06	1
Vanadium	1.71E+01	1.0E-03	NA	NA	NA	NA	1	1.7E-08	1

Inorganics: DAevent (mg/cm2-event) =
Kp x CW x tevent x 0.001 mg/ug x 0.001 l/cm^3 (eq 1)

Organics: DAevent (mg/cm2-event) =
tevent<t*: DAevent (mg/cm2-event) =
2 x FA x Kp x CW x (sqrt((6 x τ_{event} x tevent)/π)) x 0.001 mg/ug x 0.001 l/cm^3 (eq 2)

tevent>t*: DAevent (mg/cm2-event) =
FA x Kp x CW x (tevent/(1+B) + 2 x τ_{event} x ((1 + 3xB + $3xB^2$)/$(1+B)^2$) x 0.001 mg/ug x 0.001 l/cm3 (eq 3)

Notes:
Permeability constants from EPA 2001, Risk Assessment Guidance for Superfund Volume I: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment). EPA/540/R/99/005.
NA - not applicable.

TABLE 7.2.RME

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS

REASONABLE MAXIMUM EXPOSURE

St.Juliens Creek Annex - Site 2

e: Current/Future
n: Trespasser
lescent

Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
				Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
						Value	Units	Value	Units		Value	Units	Value	Units	
Surface Soil	At Site 2	Ingestion	Benzo(a)pyrene	5.4E-01	mg/kg	2.0E-08	mg/kg/day	7.3E+00	1/(mg/kg-day)	1.4E-07	1.5E-07	mg/kg/day	NA	NA	NA
			4,4'-DDT	5.6E+00	mg/kg	2.0E-07	mg/kg/day	3.4E-01	1/(mg/kg-day)	6.8E-08	1.6E-06	mg/kg/day	5.0E-04	mg/kg/day	3.1E-03
			Arsenic	9.5E+00	mg/kg	3.4E-07	mg/kg/day	1.5E+00	1/(mg/kg-day)	5.1E-07	2.7E-06	mg/kg/day	3.0E-04	mg/kg/day	8.8E-03
			Copper	1.7E+03	mg/kg	6.0E-05	mg/kg/day	NA	NA	NA	4.7E-04	mg/kg/day	4.0E-02	mg/kg/day	1.2E-02
			Iron	6.2E+04	mg/kg	2.2E-03	mg/kg/day	NA	NA	NA	1.7E-02	mg/kg/day	3.0E-01	mg/kg/day	5.8E-02
			Vanadium	4.7E+01	mg/kg	1.7E-06	mg/kg/day	NA	NA	NA	1.3E-05	mg/kg/day	1.0E-03	mg/kg/day	1.3E-02
		Exp. Route Total								7.2E-07					9.5E-02
		Dermal Absorption	Benzo(a)pyrene	5.4E-01	mg/kg	2.3E-08	mg/kg/day	8.2E+00	1/(mg/kg-day)	1.9E-07	1.8E-07	mg/kg/day	NA	NA	NA
			4,4'-DDT	5.6E+00	mg/kg	5.5E-08	mg/kg/day	3.4E-01	1/(mg/kg-day)	1.9E-08	4.3E-07	mg/kg/day	5.0E-04	mg/kg/day	8.6E-04
			Arsenic	9.5E+00	mg/kg	9.4E-08	mg/kg/day	1.5E+00	1/(mg/kg-day)	1.4E-07	7.3E-07	mg/kg/day	3.0E-04	mg/kg/day	2.4E-03
			Copper	1.7E+03	mg/kg	5.5E-06	mg/kg/day	NA	NA	NA	4.3E-05	mg/kg/day	4.0E-02	mg/kg/day	1.1E-03
			Iron	6.2E+04	mg/kg	2.1E-04	mg/kg/day	NA	NA	NA	1.6E-03	mg/kg/day	3.0E-01	mg/kg/day	5.3E-03
			Vanadium	4.7E+01	mg/kg	1.5E-07	mg/kg/day	NA	NA	NA	1.2E-06	mg/kg/day	2.6E-05	mg/kg/day	4.6E-02
		Exp. Route Total								3.5E-07					5.6E-02
	Exposure Point Total									1.1E-06					1.5E-01
Exposure Medium Total										1.1E-06					1.5E-01
Air	Emissions from Surface Soil at Site 2	Inhalation	Chromium	1.2E-07	mg/m3	6.9E-11	mg/kg/day	4.1E+01	1/(mg/kg-day)	2.8E-09	5.3E-10	mg/kg/day	3.0E-05	mg/kg/day	1.8E-05
		Exp. Route Total								2.8E-09					1.8E-05
	Exposure Point Total									2.8E-09					1.8E-05
Exposure Medium Total										2.8E-09					1.8E-05
										1.1E-06					1.5E-01
Surface Water	Drainage Features and Ponded Area	Dermal	Chloroform	5.4E+00	ug/L	1.0E-07	mg/kg/day	8.1E-02	1/mg/kg/day	8.4E-09	8.1E-07	mg/kg/day	1.0E-02	mg/kg/day	8.1E-05
			Trichloroethene	1.3E+02	ug/L	4.8E-06	mg/kg/day	4.0E-01	1/mg/kg/day	1.9E-06	3.7E-05	mg/kg/day	3.0E-04	mg/kg/day	1.2E-01
			Vinyl chloride	1.5E+01	ug/L	3.7E-07	mg/kg/day	7.2E-01	1/mg/kg/day	2.7E-07	2.9E-06	mg/kg/day	3.0E-03	mg/kg/day	9.6E-04

TABLE 7.2.RME

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS

REASONABLE MAXIMUM EXPOSURE

St.Juliens Creek Annex - Site 2

e: Current/Future
n: Trespasser
lescent

Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
				Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
						Value	Units	Value	Units		Value	Units	Value	Units	
			cis-1,2-Dichloroethene	8.4E+01	ug/L	2.8E-06	mg/kg/day	NA	1/mg/kg/day	NA	2.2E-05	mg/kg/day	1.0E-02	mg/kg/day	2.2E-03
			bis(2-Ethylhexyl)phthalate	6.9E+01	ug/L	2.3E-05	mg/kg/day	1.4E-02	1/mg/kg/day	3.2E-07	1.8E-04	mg/kg/day	2.0E-02	mg/kg/day	8.8E-03
			Arsenic	3.8E+00	ug/L	5.5E-09	mg/kg/day	1.5E+00	1/mg/kg/day	8.3E-09	4.3E-08	mg/kg/day	3.0E-04	mg/kg/day	1.4E-04
			Chromium	1.5E+02	ug/L	2.2E-07	mg/kg/day	NA	1/mg/kg/day	NA	1.7E-06	mg/kg/day	7.5E-05	mg/kg/day	2.3E-02
			Iron	1.2E+04	ug/L	1.7E-05	mg/kg/day	NA	1/mg/kg/day	NA	1.3E-04	mg/kg/day	3.0E-01	mg/kg/day	4.4E-04
			Manganese	2.0E+03	ug/L	3.0E-06	mg/kg/day	NA	1/mg/kg/day	NA	2.3E-05	mg/kg/day	8.0E-04	mg/kg/day	2.9E-02
			Vanadium	1.7E+01	ug/L	2.5E-08	mg/kg/day	NA	1/mg/kg/day	NA	1.9E-07	mg/kg/day	2.6E-05	mg/kg/day	7.5E-03
		Exp. Route Total								2.5E-06					2.0E-01
	Exposure Point Total									2.5E-06					2.0E-01
Exposure Medium Total										2.5E-06					2.0E-01
Sediment	Drainage Features and Ponded Area	Ingestion	Arsenic	1.4E+01	mg/kg	2.5E-07	mg/kg/day	1.5E+00	1/mg/kg/day	3.8E-07	2.0E-06	mg/kg/day	3.0E-04	mg/kg/day	6.6E-03
		Exp. Route Total								3.8E-07					6.6E-03
		Dermal	Arsenic	1.4E+01	mg/kg	1.2E-07	mg/kg/day	1.5E+00	1/mg/kg/day	1.9E-07	9.6E-07	mg/kg/day	3.0E-04	mg/kg/day	3.2E-03
		Exp. Route Total								1.9E-07					3.2E-03
	Exposure Point Total									5.7E-07					9.8E-03
Exposure Medium Total										5.7E-07					9.8E-03
										5.7E-07					9.8E-03
									Total of Receptor Risks Across All Media	4.2E-06				Total of Receptor Hazards Across All Media	3.6E-01

TABLE 7.3.RME

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS

REASONABLE MAXIMUM EXPOSURE

St.Juliens Creek Annex - Site 2

Scenario Timeframe: Current/Future
Receptor Population: Resident
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Groundwater	Deep Groundwater	Tap Water	Ingestion	Chloroform	4.8E+00	ug/L	NA	NA	NA	NA	NA	1.3E-04	mg/kg/day	1.0E-02	mg/kg/day	1.3E-02
				Arsenic	3.7E+00	ug/L	NA	NA	NA	NA	NA	1.0E-04	mg/kg/day	3.0E-04	mg/kg/day	3.4E-01
				Iron	3.8E+03	ug/L	NA	NA	NA	NA	NA	1.0E-01	mg/kg/day	3.0E-01	mg/kg/day	3.5E-01
				Manganese	2.3E+02	ug/L	NA	NA	NA	NA	NA	6.3E-03	mg/kg/day	2.0E-02	mg/kg/day	3.1E-01
				Vanadium	9.6E+00	ug/L	NA	NA	NA	NA	NA	2.6E-04	mg/kg/day	1.0E-03	mg/kg/day	2.6E-01
			Exp. Route Total								0.0E+00					1.3E+00
			Dermal	Chloroform	4.8E+00	ug/L	NA	NA	NA	NA	NA	1.2E-05	mg/kg/day	1.0E-02	mg/kg/day	1.2E-03
				Arsenic	3.7E+00	ug/L	NA	NA	NA	NA	NA	5.3E-07	mg/kg/day	3.0E-04	mg/kg/day	1.8E-03
				Iron	3.8E+03	ug/L	NA	NA	NA	NA	NA	5.5E-04	mg/kg/day	3.0E-01	mg/kg/day	1.8E-03
				Manganese	2.3E+02	ug/L	NA	NA	NA	NA	NA	3.3E-05	mg/kg/day	8.0E-04	mg/kg/day	4.1E-02
				Vanadium	9.6E+00	ug/L	NA	NA	NA	NA	NA	1.4E-06	mg/kg/day	2.6E-05	mg/kg/day	5.3E-02
			Exp. Route Total								0.0E+00					9.9E-02
		Exposure Point Total									0.0E+00					1.4E+00
	Exposure Medium Total										0.0E+00					1.4E+00
Groundwater	Air	Deep groundwater - Water Vapors at Showerhead	Inhalation	Chloroform	4.8E+00	ug/L	NA	NA	NA	NA	NA	2.5E-04	mg/kg/day	1.4E-02	mg/kg/day	1.8E-02
			Exp. Route Total								0.0E+00					1.8E-02
		Exposure Point Total									0.0E+00					1.8E-02
	Exposure Medium Total										0.0E+00					1.8E-02
Groundwater											0.0E+00					1.4E+00
Total of Receptor Risks Across All Media											0.0E+00	Total of Receptor Hazards Across All Media				1.4E+00

Notes-
DAevent for exposure to groundwater while bathing calculated on Table 7.3.RME Supplement A.
Inhalation of volatiles from groundwater from shower calculated on Table 7.3.RME Supplement B.

Table 7.3.RME Supplement A
Calculation of DAevent
Adult Resident, Deep Groundwater, Tap Water
St. Juliens Creek Annex - Site 2

Chemical of Potential Concern	Groundwater Water Concentration (CW) (µg/L)	Permeability Coefficient (Kp) (cm/hr)	B (dimensionless)	Lag Time (τ_{event}) (hr)	t* (hr)	Fraction Absorbed Water (FA) (dimensionless)	Duration of Event (tevent) (hr)	DAevent (mg/cm^2-event)	Eq
Chloroform	4.8E+00	6.8E-03	2.9E-02	5.0E-01	1.2E+00	1.0E+00	0.58	4.8E-08	2
Arsenic	3.7E+00	1.0E-03	NA	NA	NA	NA	0.58	2.1E-09	1
Iron	3.8E+03	1.0E-03	NA	NA	NA	NA	0.58	2.2E-06	1
Manganese	2.3E+02	1.0E-03	NA	NA	NA	NA	0.58	1.3E-07	1
Vanadium	9.6E+00	1.0E-03	NA	NA	NA	NA	0.58	5.6E-09	1

Inorganics: DAevent (mg/cm2-event) =
Kp x CW x tevent x 0.001 mg/ug x 0.001 l/cm^3 (eq 1)

Organics: DAevent (mg/cm2-event) =
tevent<t*: DAevent (mg/cm2-event) =
2 x FA x Kp x CW x (sqrt((6 x τ_{event} x tevent)/π)) x 0.001 mg/ug x 0.001 l/cm^3 (eq 2)

tevent>t*: DAevent (mg/cm2-event) =
FA x Kp x CW x (tevent/(1+B) + 2 x τ_{event} x ((1 + 3xB + $3xB^2$)/$(1+B)^2$) x 0.001 mg/ug x 0.001 l/cm3 (eq 3)

Notes:
Permeability constants from EPA 2001, Risk Assessment Guidance for Superfund Volume I: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment). EPA/540/R/99/005.
NA - not applicable.

Table 7.3 RME Supplement B
Inhalation Exposure Concentrations from Foster and Chrostowski Shower Model
St. Juliens Creek Annex - Site 2

Chemical	Exposure Point Concentration Cwo (mg/l)	Molecular weight (HH) (g/mole)	Henry's Law Constant (H) (atm-m^3/mole)	Kg (VOC) (cm/hr)	Kl(VOC) (cm/hr)	KL (cm/hr)	Kal (cm/hr)	Cwd (mg/l)	S (mg/m^3-min)	Calculated Inhalation Exposure (Einh) (mg/kg/shower)
Chloroform	4.8E+00	1.2E+02	2.87E-03	1.2E+03	1.2E+01	1.1E+01	1.5E+01	1.9E+00	1.3E+01	**2.6E-04**

Variables	Units	Exposure Assumptions
Kg(VOC) = gas-film mass transfer coefficient	cm/hr	Solved by Eq 1
Kl(VOC) = liquid-film mass transfer coefficient	cm/hr	Solved by Eq 2
KL = overall mass transfer coefficient	cm/hr	Solved by Eq 3
Kal = adjusted overall mass transfer coeff.	cm/hr	Solved by Eq 4
Tl = Calibration temp. of water	K (20C +273)	293
Ts = Shower water temperature	k (45C)	318
Us = water viscosity at Ts	centipoise	0.596
Ul = water viscosity at Tl	cp	1.002
Cwd = conc. leaving droplets after time sdt	ug/l	Solved by Eq 5
sdt = shower droplet drop time	sec	2
d = shower droplet diameter	mm	1
FR = shower water flow rate	l/min	20
SV = shower room air volume	m^3	3
S = indoor VOC generation rate	ug/m^3-min	Solved by Eq 6
VR = ventilation rate	l/min	13.8
Variables	**Units**	**Exposure Assumptions**
BW = body weight	kg	70
Ds = duration of shower	min	12
Dt = total duration in shower room	min	15
R = air exchange rate	min^{-1}	0.0083
Ca = indoor air concentration of VOCs	ug/m^3	Solved by Eq 7
Einh = inhalation exposure per shower	mg/kg/shower	Solved by Eq 8

Equation 1:	Kg(VOC) =	3000 * (18 / HH)$^{0.5}$	
Equation 2:	Kl(VOC) =	20 * (44 / HH)$^{0.5}$	
Equation 3:	KL =	((1 / Kl(VOC)) + (0.024 / (Kg (VOC) * H)))$^{-1}$	
Equation 4:	Kal =	(KL * (((Tl * Us) / (Ts * Ul))$^{-0.5}$))	
Equation 5:	Cwd =	(Cwo * (1-EXP((-1 * Kal * sdt)/(60 * d))))	
Equation 6:	S =	(Cwd * FR / SV)	
Equation 7:	see time series example on Table I-GW-5		
Equation 8:	**Einh =**	**If t>Ds**	(((VR * S) / (BW * R * 1000000)) * ((Ds + (EXP(-R * Dt) / R)-(EXP(R * (Ds - Dt))) / R)))

Henry's Law Constant from USEPA's *Superfund Public Health Evaluation Manual.* USEPA/540/1-86/060, October 1986.

TABLE 7.4.RME

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS

REASONABLE MAXIMUM EXPOSURE

St.Juliens Creek Annex - Site 2

Scenario Timeframe: Current/Future
Receptor Population: Resident
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Groundwater	Deep Groundwater	Tap Water	Ingestion	Chloroform	4.8E+00	ug/L	NA	mg/kg/day	NA	NA	NA	3.0E-04	mg/kg/day	1.0E-02	mg/kg/day	3.0E-02
				Arsenic	3.7E+00	ug/L	NA	mg/kg/day	NA	NA	NA	2.4E-04	mg/kg/day	3.0E-04	mg/kg/day	7.9E-01
				Iron	3.8E+03	ug/L	NA	mg/kg/day	NA	NA	NA	2.4E-01	mg/kg/day	3.0E-01	mg/kg/day	8.1E-01
				Manganese	2.3E+02	ug/L	NA	mg/kg/day	NA	NA	NA	1.5E-02	mg/kg/day	2.0E-02	mg/kg/day	7.3E-01
				Vanadium	9.6E+00	ug/L	NA	mg/kg/day	NA	NA	NA	6.1E-04	mg/kg/day	1.0E-03	mg/kg/day	6.1E-01
			Exp. Route Total								0.0E+00					3.0E+00
			Dermal	Chloroform	4.8E+00	ug/L	NA	NA	NA	NA	NA	2.7E-05	mg/kg/day	1.0E-02	mg/kg/day	2.7E-03
				Arsenic	3.7E+00	ug/L	NA	NA	NA	NA	NA	1.6E-06	mg/kg/day	3.0E-04	mg/kg/day	5.2E-03
				Iron	3.8E+03	ug/L	NA	NA	NA	NA	NA	1.6E-03	mg/kg/day	3.0E-01	mg/kg/day	5.4E-03
				Manganese	2.3E+02	ug/L	NA	NA	NA	NA	NA	9.7E-05	mg/kg/day	8.0E-04	mg/kg/day	1.2E-01
				Vanadium	9.6E+00	ug/L	NA	NA	NA	NA	NA	4.1E-06	mg/kg/day	2.6E-05	mg/kg/day	1.6E-01
			Exp. Route Total								0.0E+00					2.9E-01
		Exposure Point Total									0.0E+00					3.3E+00
	Exposure Medium Total										0.0E+00					3.3E+00
Groundwater											0.0E+00					3.3E+00
										Total of Receptor Risks Across All Media	0.0E+00				Total of Receptor Hazards Across All Media	3.3E+00

Notes-
DAevent for exposure to groundwater while bathing calculated on Table 7.4.RME Supplement A.

Table 7.4.RME Supplement A
Calculation of DAevent
Child Resident, Deep Groundwater, Tap Water
St. Juliens Creek Annex - Site 2

Chemical of Potential Concern	Groundwater Water Concentration (CW) (µg/L)	Permeability Coefficient (Kp) (cm/hr)	B (dimensionless)	Lag Time (τ_{event}) (hr)	t* (hr)	Fraction Absorbed Water (FA) (dimensionless)	Duration of Event (tevent) (hr)	DAevent (mg/cm^2-event)	Eq
Chloroform	4.8E+00	6.8E-03	2.9E-02	5.0E-01	1.2E+00	1.0E+00	1	6.3E-08	2
Arsenic	3.7E+00	1.0E-03	NA	NA	NA	NA	1	3.7E-09	1
Iron	3.8E+03	1.0E-03	NA	NA	NA	NA	1	3.8E-06	1
Manganese	2.3E+02	1.0E-03	NA	NA	NA	NA	1	2.3E-07	1
Vanadium	9.6E+00	1.0E-03	NA	NA	NA	NA	1	9.6E-09	1

Inorganics: DAevent (mg/cm2-event) =
Kp x CW x tevent x 0.001 mg/ug x 0.001 l/cm^3 (eq 1)

Organics: DAevent (mg/cm2-event) =
tevent<t*: DAevent (mg/cm2-event) =
2 x FA x Kp x CW x (sqrt((6 x τ_{event} x tevent)/π)) x 0.001 mg/ug x 0.001 l/cm^3 (eq 2)

tevent>t*: DAevent (mg/cm2-event) =
FA x Kp x CW x (tevent/(1+B) + 2 x τ_{event} x ((1 + 3xB + $3xB^2$)/$(1+B)^2$) x 0.001 mg/ug x 0.001 l/cm3 (eq 3)

Notes:
Permeability constants from EPA 2001, Risk Assessment Guidance for Superfund Volume I: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment). EPA/540/R/99/005.
NA - not applicable.

TABLE 7.5.RME

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS

REASONABLE MAXIMUM EXPOSURE

St.Juliens Creek Annex - Site 2

Scenario Timeframe: Current/Future
Receptor Population: Resident
Receptor Age: Adult/Child

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Groundwater	Deep Groundwater	Tap Water	Ingestion	Chloroform	4.8E+00	ug/L	7.1E-05	mg/kg/day	NA	NA	NA	NA	mg/kg/day	NA	mg/kg/day	NA
				Arsenic	3.7E+00	ug/L	5.5E-05	mg/kg/day	1.5E+00	1/mg/kg-day	8.3E-05	NA	mg/kg/day	NA	mg/kg/day	NA
				Iron	3.8E+03	ug/L	5.7E-02	mg/kg/day	NA	NA	NA	NA	mg/kg/day	NA	mg/kg/day	NA
				Manganese	2.3E+02	ug/L	3.4E-03	mg/kg/day	NA	NA	NA	NA	mg/kg/day	NA	mg/kg/day	NA
				Vanadium	9.6E+00	ug/L	1.4E-04	mg/kg/day	NA	NA	NA	NA	mg/kg/day	NA	mg/kg/day	NA
			Exp. Route Total								8.3E-05					0.0E+00
			Dermal	Chloroform	4.8E+00	ug/L	6.4E-06	mg/kg/day	NA	1/mg/kg-day	NA	NA	mg/kg/day	NA	mg/kg/day	NA
				Arsenic	3.7E+00	ug/L	3.2E-07	mg/kg/day	1.5E+00	1/mg/kg-day	4.7E-07	NA	mg/kg/day	NA	mg/kg/day	NA
				Iron	3.8E+03	ug/L	3.3E-04	mg/kg/day	NA	1/mg/kg-day	NA	NA	mg/kg/day	NA	mg/kg/day	NA
				Manganese	2.3E+02	ug/L	2.0E-05	mg/kg/day	NA	1/mg/kg-day	NA	NA	mg/kg/day	NA	mg/kg/day	NA
				Vanadium	9.6E+00	ug/L	8.2E-07	mg/kg/day	NA	1/mg/kg-day	NA	NA	mg/kg/day	NA	mg/kg/day	NA
			Exp. Route Total								4.7E-07					0.0E+00
		Exposure Point Total									8.3E-05					0.0E+00
	Exposure Medium Total										8.3E-05					0.0E+00
	Air*	Deep groundwater - Water Vapors at Showerhead	Inhalation	Chloroform	3.7E+00	ug/L	8.4E-05	mg/kg/day	8.1E-02	1/mg/kg-day	6.8E-06	NA	mg/kg/day	NA	mg/kg/day	NA
			Exp. Route Total								6.8E-06					0.0E+00
		Exposure Point Total									6.8E-06					0.0E+00
	Exposure Medium Total										6.8E-06					0.0E+00
Groundwater											9.0E-05					0.0E+00
									Total of Receptor Risks Across All Media		9.0E-05			Total of Receptor Hazards Across All Media		0.0E+00

Notes-
DAevent for exposure to groundwater while bathing calculated on Table 7.3.RME Supplement A.
Inhalation of volatiles from groundwater from shower calculated on Table 7.3.RME Supplement B.
* Based on adult exposure only, adults have greater inhalation of volatiles while showering then children do while bathing.

TABLE 7.6.RME

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS

REASONABLE MAXIMUM EXPOSURE

St.Juliens Creek Annex - Site 2

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Soil*	Soil*	At Site 2	Ingestion	Benzo(a)anthracene	6.9E-01	mg/kg	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	9.5E-07	mg/kg/day	NA	NA	NA
				Benzo(a)pyrene	4.1E-01	mg/kg	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	5.6E-07	mg/kg/day	NA	NA	NA
				Benzo(b)fluoranthene	6.2E-01	mg/kg	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	8.5E-07	mg/kg/day	NA	NA	NA
				Dibenz(a,h)anthracene	5.3E-01	mg/kg	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	7.3E-07	mg/kg/day	NA	NA	NA
				4,4'-DDD	1.8E+00	mg/kg	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	2.5E-06	mg/kg/day	NA	NA	NA
				4,4'-DDE	2.5E+00	mg/kg	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	3.4E-06	mg/kg/day	NA	NA	NA
				4,4'-DDT	1.1E+02	mg/kg	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	1.6E-04	mg/kg/day	5.0E-04	mg/kg/day	3.1E-01
				Aluminum	1.0E+04	mg/kg	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	1.4E-02	mg/kg/day	1.0E+00	mg/kg/day	1.4E-02
				Antimony	2.2E+01	mg/kg	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	3.0E-05	mg/kg/day	4.0E-04	mg/kg/day	7.4E-02
				Arsenic	8.5E+00	mg/kg	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	1.2E-05	mg/kg/day	3.0E-04	mg/kg/day	3.9E-02
				Cadmium	2.3E+00	mg/kg	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	3.1E-06	mg/kg/day	1.0E-03	mg/kg/day	3.1E-03
				Chromium	6.3E+01	mg/kg	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	8.7E-05	mg/kg/day	3.0E-03	mg/kg/day	2.9E-02
				Copper	5.8E+02	mg/kg	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	8.0E-04	mg/kg/day	4.0E-02	mg/kg/day	2.0E-02
				Iron	7.0E+04	mg/kg	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	9.7E-02	mg/kg/day	3.0E-01	mg/kg/day	3.2E-01
				Manganese	3.0E+02	mg/kg	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	4.2E-04	mg/kg/day	2.0E-02	mg/kg/day	2.1E-02
				Nickel	6.0E+01	mg/kg	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	8.3E-05	mg/kg/day	2.0E-02	mg/kg/day	4.1E-03
				Thallium	1.8E+00	mg/kg	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	2.5E-06	mg/kg/day	7.0E-05	mg/kg/day	3.6E-02
				Vanadium	3.7E+01	mg/kg	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	5.1E-05	mg/kg/day	7.0E-03	mg/kg/day	7.3E-03
				Zinc	1.9E+03	mg/kg	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	2.7E-03	mg/kg/day	3.0E-01	mg/kg/day	8.9E-03
			Exp. Route Total								0.0E+00					8.9E-01
Soil*	Soil*	At Site 2	Dermal Absorption	Benzo(a)anthracene	6.9E-01	mg/kg	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	1.6E-06	mg/kg/day	NA	NA	NA
				Benzo(a)pyrene	4.1E-01	mg/kg	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	9.6E-07	mg/kg/day	NA	NA	NA
				Benzo(b)fluoranthene	6.2E-01	mg/kg	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	1.5E-06	mg/kg/day	NA	NA	NA
				Dibenz(a,h)anthracene	5.3E-01	mg/kg	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	1.3E-06	mg/kg/day	NA	NA	NA
				4,4'-DDD	1.8E+00	mg/kg	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	9.9E-07	mg/kg/day	NA	NA	NA
				4,4'-DDE	2.5E+00	mg/kg	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	1.4E-06	mg/kg/day	NA	NA	NA
				4,4'-DDT	1.1E+02	mg/kg	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	6.2E-05	mg/kg/day	5.0E-04	mg/kg/day	1.2E-01
				Aluminum	1.0E+04	mg/kg	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	1.8E-03	mg/kg/day	1.0E+00	mg/kg/day	1.8E-03
				Antimony	2.2E+01	mg/kg	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	3.9E-06	mg/kg/day	6.0E-05	mg/kg/day	6.5E-02
				Arsenic	8.5E+00	mg/kg	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	4.6E-06	mg/kg/day	3.0E-04	mg/kg/day	1.5E-02
				Cadmium	2.3E+00	mg/kg	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	4.2E-08	mg/kg/day	2.5E-05	mg/kg/day	1.7E-03
				Chromium	6.3E+01	mg/kg	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	1.1E-05	mg/kg/day	7.5E-05	mg/kg/day	1.5E-01
				Copper	5.8E+02	mg/kg	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	1.1E-04	mg/kg/day	4.0E-02	mg/kg/day	2.6E-03
				Iron	7.0E+04	mg/kg	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	1.3E-02	mg/kg/day	3.0E-01	mg/kg/day	4.2E-02
				Manganese	3.0E+02	mg/kg	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	5.5E-05	mg/kg/day	8.0E-04	mg/kg/day	6.9E-02
				Nickel	6.0E+01	mg/kg	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	1.1E-05	mg/kg/day	8.0E-04	mg/kg/day	1.4E-02
				Thallium	1.8E+00	mg/kg	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	3.3E-07	mg/kg/day	7.0E-05	mg/kg/day	4.7E-03
				Vanadium	3.7E+01	mg/kg	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	6.7E-06	mg/kg/day	1.8E-04	mg/kg/day	3.7E-02
				Zinc	1.9E+03	mg/kg	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	3.5E-04	mg/kg/day	3.0E-01	mg/kg/day	1.2E-03
			Exp. Route Total								0.0E+00					5.3E-01
		Exposure Point Total									0.0E+00					1.4E+00
	Exposure Medium Total										0.0E+00					1.4E+00
Medium Total											0.0E+00					1.4E+00

TABLE 7.6.RME

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS

REASONABLE MAXIMUM EXPOSURE

St.Juliens Creek Annex - Site 2

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Surface Water	Surface Water	Drainage Features and Ponded Area	Dermal	Chloroform	5.4E+00	UG/L	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	8.3E-07	mg/kg/day	1.0E-02	mg/kg/day	8.3E-05
				Trichloroethene	1.3E+02	UG/L	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	3.8E-05	mg/kg/day	3.0E-04	mg/kg/day	1.3E-01
				Vinyl chloride	1.5E+01	UG/L	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	2.9E-06	mg/kg/day	3.0E-03	mg/kg/day	9.8E-04
				cis-1,2-Dichloroethene	8.4E+01	UG/L	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	2.3E-05	mg/kg/day	1.0E-02	mg/kg/day	2.3E-03
				bis(2-Ethylhexyl)phthalate	6.9E+01	UG/L	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	1.8E-04	mg/kg/day	2.0E-02	mg/kg/day	9.0E-03
				Arsenic	3.8E+00	UG/L	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	4.4E-08	mg/kg/day	3.0E-04	mg/kg/day	1.5E-04
				Chromium	1.5E+02	UG/L	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	3.5E-06	mg/kg/day	7.5E-05	mg/kg/day	4.6E-02
				Iron	1.2E+04	UG/L	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	1.3E-04	mg/kg/day	3.0E-01	mg/kg/day	4.5E-04
				Lead	4.8E+01	UG/L	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	8.2E-08	mg/kg/day	NA	mg/kg/day	NA
				Manganese	2.0E+03	UG/L	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	2.4E-05	mg/kg/day	8.0E-04	mg/kg/day	2.9E-02
				Vanadium	1.7E+01	UG/L	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	2.0E-07	mg/kg/day	2.6E-05	mg/kg/day	7.6E-03
			Exp. Route Total								0.0E+00					2.2E-01
		Exposure Point Total									0.0E+00					2.2E-01
	Exposure Medium Total										0.0E+00					2.2E-01
Medium Total											0.0E+00					2.2E-01
Sediment	Sediment	Drainage Features and Ponded Area	Ingestion	Benzo(a)pyrene	9.1E-01	mg/kg	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	9.3E-08	mg/kg/day	NA	mg/kg/day	NA
				Arsenic	1.4E+01	mg/kg	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	1.4E-06	mg/kg/day	3.0E-04	mg/kg/day	4.8E-03
				Chromium	2.6E+03	mg/kg	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	2.7E-04	mg/kg/day	3.0E-03	mg/kg/day	8.9E-02
				Iron	3.1E+04	mg/kg	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	3.2E-03	mg/kg/day	3.0E-01	mg/kg/day	1.1E-02
			Exp. Route Total								0.0E+00					1.0E-01
			Dermal	Benzo(a)pyrene	9.1E-01	mg/kg	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	8.6E-07	mg/kg/day	NA	mg/kg/day	NA
				Arsenic	1.4E+01	mg/kg	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	3.1E-06	mg/kg/day	3.0E-04	mg/kg/day	1.0E-02
				Chromium	2.6E+03	mg/kg	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	1.9E-04	mg/kg/day	7.5E-05	mg/kg/day	2.6E+00
				Iron	3.1E+04	mg/kg	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	2.3E-03	mg/kg/day	3.0E-01	mg/kg/day	7.5E-03
			Exp. Route Total								0.0E+00					2.6E+00
		Exposure Point Total									0.0E+00					2.7E+00
	Exposure Medium Total										0.0E+00					2.7E+00
Medium Total											0.0E+00					2.7E+00

TABLE 7.6.RME

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS

REASONABLE MAXIMUM EXPOSURE

St.Juliens Creek Annex - Site 2

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Groundwater	Deep Groundwater	Tap Water	Ingestion	Chloroform	4.8E+00	ug/L	NA	NA	NA	NA	NA	1.3E-04	mg/kg/day	1.0E-02	mg/kg/day	1.3E-02
				Arsenic	3.7E+00	ug/L	NA	NA	NA	NA	NA	1.0E-04	mg/kg/day	3.0E-04	mg/kg/day	3.4E-01
				Iron	3.8E+03	ug/L	NA	NA	NA	NA	NA	1.0E-01	mg/kg/day	3.0E-01	mg/kg/day	3.5E-01
				Manganese	2.3E+02	ug/L	NA	NA	NA	NA	NA	6.3E-03	mg/kg/day	2.0E-02	mg/kg/day	3.1E-01
				Vanadium	9.6E+00	ug/L	NA	NA	NA	NA	NA	2.6E-04	mg/kg/day	1.0E-03	mg/kg/day	2.6E-01
			Exp. Route Total								0.0E+00					1.3E+00
			Dermal	Chloroform	4.8E+00	ug/L	NA	NA	NA	NA	NA	1.2E-05	mg/kg/day	1.0E-02	mg/kg/day	1.2E-03
				Arsenic	3.7E+00	ug/L	NA	NA	NA	NA	NA	5.3E-07	mg/kg/day	3.0E-04	mg/kg/day	1.8E-03
				Iron	3.8E+03	ug/L	NA	NA	NA	NA	NA	5.5E-04	mg/kg/day	3.0E-01	mg/kg/day	1.8E-03
				Manganese	2.3E+02	ug/L	NA	NA	NA	NA	NA	3.3E-05	mg/kg/day	8.0E-04	mg/kg/day	4.1E-02
				Vanadium	9.6E+00	ug/L	NA	NA	NA	NA	NA	1.4E-06	mg/kg/day	2.6E-05	mg/kg/day	5.3E-02
			Exposure Point Tota								0.0E+00					9.9E-02
		Exposure Medium Tota									0.0E+00					1.4E+00
	Exposure Medium Total										0.0E+00					1.4E+00
Groundwater	Air	Deep groundwater - Water Vapors at Showerhead	Inhalation	Chloroform	4.8E+00	ug/L	NA	NA	NA	NA	NA	2.5E-04	mg/kg/day	1.4E-02	mg/kg/day	1.8E-02
			Exp. Route Total								0.0E+00					1.8E-02
		Exposure Point Total									0.0E+00					1.8E-02
	Exposure Medium Total										0.0E+00					1.8E-02
Medium Total											0.0E+00					1.4E+00
										Total of Receptor Risks Across All Media	0.0E+00				Total of Receptor Hazards Across All Media	5.7E+00

* Surface soil & subsurface soil combined.

Notes-

DAevent for exposure to groundwater while bathing calculated on Table 7.3.RME Supplement A.

Inhalation of volatiles from groundwater from shower calculated on Table 7.3.RME Supplement B.

Table 7.6.RME Supplement B
Calculation of DAevent
Resident Adult/Child, Surface Water
St. Juliens Creen Annex - Site 2

Chemical of Potential Concern	Surface Water Concentration (CW) (μg/L)	Permeability Coefficient (Kp) (cm/hr)	B (unitless)	Lag Time (τ_{event}) (hr)	t* (hr)	Fraction Absorbed Water (FA) (dimensionless)	Duration of Event (tevent) (hr)	DAevent (mg/cm^2-event)	Eq
Chloroform	5.40E+00	6.8E-03	2.9E-02	5.0E-01	1.2E+00	1.0E+00	1	7.2E-08	2
Trichloroethene	1.30E+02	1.2E-02	1.0E-01	5.8E-01	1.4E+00	1.0E+00	1	3.3E-06	2
Vinyl chloride	1.51E+01	5.6E-03	1.7E-02	2.4E-01	5.7E-01	1.0E+00	1	2.6E-07	3
cis-1,2-Dichloroethene	8.40E+01	7.7E-03	2.9E-02	3.7E-01	8.9E-01	1.0E+00	1	2.0E-06	3
bis(2-Ethylhexyl)phthalate	6.90E+01	2.5E-02	2.0E-01	1.7E+01	4.0E+01	8.0E-01	1	1.6E-05	2
Arsenic	3.80E+00	1.0E-03	NA	NA	NA	NA	1	3.8E-09	1
Chromium	1.50E+02	2.0E-03	NA	NA	NA	NA	1	3.0E-07	1
Iron	1.17E+04	1.0E-03	NA	NA	NA	NA	1	1.2E-05	1
Lead	7.11E+00	1.0E-03	NA	NA	NA	NA	1	7.1E-09	1
Manganese	2.04E+03	1.0E-03	NA	NA	NA	NA	1	2.0E-06	1
Vanadium	1.71E+01	1.0E-03	NA	NA	NA	NA	1	1.7E-08	1

Values for trans-1,2-dichloroethene applied as surrogates for cis-1,2-dichloroethene.

Inorganics: DAevent (mg/cm2-event) =

Kp x CW x tevent x 0.001 mg/ug x 0.001 l/cm^3 (eq 1)

Organics: DAevent (mg/cm2-event) =

tevent<t*: DAevent (mg/cm2-event) =

2 x FA x Kp x CW x (sqrt((6 x τ_{event} x tevent)/π)) x 0.001 mg/ug x 0.001 l/cm^3 (eq 2)

tevent>t*: DAevent (mg/cm2-event) =

FA x Kp x CW x (tevent/(1+B) + 2 x τ_{event} x ((1 + 3xB + $3xB^2$)/$(1+B)^2$) x 0.001 mg/ug x 0.001 l/cm3 (eq 3)

Notes:

Permeability constants from EPA 2001, Risk Assessment Guidance for Superfund Volume I: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment). EPA/540/R/99/005.

NA - not applicable.

TABLE 7.7.RME

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS

REASONABLE MAXIMUM EXPOSURE

St.Juliens Creek Annex - Site 2

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Soil*	Soil*	At Site 2	Ingestion	Benzo(a)anthracene	6.9E-01	mg/kg	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	8.9E-06	mg/kg/day	NA	NA	NA
				Benzo(a)pyrene	4.1E-01	mg/kg	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	5.2E-06	mg/kg/day	NA	NA	NA
				Benzo(b)fluoranthene	6.2E-01	mg/kg	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	8.0E-06	mg/kg/day	NA	NA	NA
				Dibenz(a,h)anthracene	5.3E-01	mg/kg	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	6.8E-06	mg/kg/day	NA	NA	NA
				4,4'-DDD	1.8E+00	mg/kg	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	2.3E-05	mg/kg/day	NA	NA	NA
				4,4'-DDE	2.5E+00	mg/kg	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	3.2E-05	mg/kg/day	NA	NA	NA
				4,4'-DDT	1.1E+02	mg/kg	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	1.5E-03	mg/kg/day	5.0E-04	mg/kg/day	2.9E+00
				Aluminum	1.0E+04	mg/kg	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	1.3E-01	mg/kg/day	1.0E+00	mg/kg/day	1.3E-01
				Antimony	2.2E+01	mg/kg	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	2.8E-04	mg/kg/day	4.0E-04	mg/kg/day	6.9E-01
				Arsenic	8.5E+00	mg/kg	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	1.1E-04	mg/kg/day	3.0E-04	mg/kg/day	3.6E-01
				Cadmium	2.3E+00	mg/kg	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	2.9E-05	mg/kg/day	1.0E-03	mg/kg/day	2.9E-02
				Chromium	6.3E+01	mg/kg	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	8.1E-04	mg/kg/day	3.0E-03	mg/kg/day	2.7E-01
				Copper	5.8E+02	mg/kg	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	7.5E-03	mg/kg/day	4.0E-02	mg/kg/day	1.9E-01
				Iron	7.0E+04	mg/kg	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	9.0E-01	mg/kg/day	3.0E-01	mg/kg/day	3.0E+00
				Manganese	3.0E+02	mg/kg	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	3.9E-03	mg/kg/day	2.0E-02	mg/kg/day	1.9E-01
				Nickel	6.0E+01	mg/kg	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	7.7E-04	mg/kg/day	2.0E-02	mg/kg/day	3.9E-02
				Thallium	1.8E+00	mg/kg	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	2.3E-05	mg/kg/day	7.0E-05	mg/kg/day	3.3E-01
				Vanadium	3.7E+01	mg/kg	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	4.7E-04	mg/kg/day	7.0E-03	mg/kg/day	6.8E-02
				Zinc	1.9E+03	mg/kg	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	2.5E-02	mg/kg/day	3.0E-01	mg/kg/day	8.3E-02
			Exp. Route Total								0.0E+00					8.3E+00
			Dermal Absorption	Benzo(a)anthracene	6.9E-01	mg/kg	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	2.2E-06	mg/kg/day	NA	NA	NA
				Benzo(a)pyrene	4.1E-01	mg/kg	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	1.3E-06	mg/kg/day	NA	NA	NA
				Benzo(b)fluoranthene	6.2E-01	mg/kg	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	1.9E-06	mg/kg/day	NA	NA	NA
				Dibenz(a,h)anthracene	5.3E-01	mg/kg	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	1.7E-06	mg/kg/day	NA	NA	NA
				4,4'-DDD	1.8E+00	mg/kg	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	1.3E-06	mg/kg/day	NA	NA	NA
				4,4'-DDE	2.5E+00	mg/kg	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	1.8E-06	mg/kg/day	NA	NA	NA
				4,4'-DDT	1.1E+02	mg/kg	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	8.2E-05	mg/kg/day	5.0E-04	mg/kg/day	1.6E-01
				Aluminum	1.0E+04	mg/kg	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	2.4E-03	mg/kg/day	1.0E+00	mg/kg/day	2.4E-03
				Antimony	2.2E+01	mg/kg	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	5.2E-06	mg/kg/day	6.0E-05	mg/kg/day	8.6E-02
				Arsenic	8.5E+00	mg/kg	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	6.1E-06	mg/kg/day	3.0E-04	mg/kg/day	2.0E-02
				Cadmium	2.3E+00	mg/kg	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	5.5E-08	mg/kg/day	2.5E-05	mg/kg/day	2.2E-03
				Chromium	6.3E+01	mg/kg	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	1.5E-05	mg/kg/day	7.5E-05	mg/kg/day	2.0E-01
				Copper	5.8E+02	mg/kg	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	1.4E-04	mg/kg/day	4.0E-02	mg/kg/day	3.5E-03
				Iron	7.0E+04	mg/kg	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	1.7E-02	mg/kg/day	3.0E-01	mg/kg/day	5.6E-02
				Manganese	3.0E+02	mg/kg	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	7.3E-05	mg/kg/day	8.0E-04	mg/kg/day	9.1E-02
				Nickel	6.0E+01	mg/kg	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	1.4E-05	mg/kg/day	8.0E-04	mg/kg/day	1.8E-02
				Thallium	1.8E+00	mg/kg	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	4.3E-07	mg/kg/day	7.0E-05	mg/kg/day	6.2E-03
				Vanadium	3.7E+01	mg/kg	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	8.9E-06	mg/kg/day	1.8E-04	mg/kg/day	4.9E-02
				Zinc	1.9E+03	mg/kg	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	4.6E-04	mg/kg/day	3.0E-01	mg/kg/day	1.5E-03
			Exp. Route Total								0.0E+00					7.0E-01
		Exposure Point Total									0.0E+00					9.0E+00
	Exposure Medium Total										0.0E+00					9.0E+00
Medium Total											0.0E+00					9.0E+00

TABLE 7.7.RME

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS

REASONABLE MAXIMUM EXPOSURE

St.Juliens Creek Annex - Site 2

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Surface Water	Surface Water	Drainage Features and Ponded Area	Dermal	Chloroform	5.4E+00	UG/L	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	1.3E-06	mg/kg/day	1.0E-02	mg/kg/day	1.3E-04
				Trichloroethene	1.3E+02	UG/L	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	5.8E-05	mg/kg/day	3.0E-04	mg/kg/day	1.9E-01
				Vinyl chloride	1.5E+01	UG/L	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	4.5E-06	mg/kg/day	3.0E-03	mg/kg/day	1.5E-03
				cis-1,2-Dichloroethene	8.4E+01	UG/L	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	3.4E-05	mg/kg/day	1.0E-02	mg/kg/day	3.4E-03
				bis(2-Ethylhexyl)phthalate	6.9E+01	UG/L	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	2.7E-04	mg/kg/day	2.0E-02	mg/kg/day	1.4E-02
				Arsenic	3.8E+00	UG/L	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	6.7E-08	mg/kg/day	3.0E-04	mg/kg/day	2.2E-04
				Chromium	1.5E+02	UG/L	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	5.3E-06	mg/kg/day	7.5E-05	mg/kg/day	7.0E-02
				Iron	1.2E+04	UG/L	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	2.1E-04	mg/kg/day	3.0E-01	mg/kg/day	6.8E-04
				Lead	4.8E+01	UG/L	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	1.3E-07	mg/kg/day	NA	NA	NA
				Manganese	2.0E+03	UG/L	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	3.6E-05	mg/kg/day	8.0E-04	mg/kg/day	4.5E-02
				Vanadium	1.7E+01	UG/L	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	3.0E-07	mg/kg/day	2.6E-05	mg/kg/day	1.2E-02
			Exp. Route Total								0.0E+00					3.4E-01
		Exposure Point Total									0.0E+00					3.4E-01
	Exposure Medium Total										0.0E+00					3.4E-01
Medium Total											0.0E+00					3.4E-01
Sediment	Sediment	Drainage Features and Ponded Area	Ingestion	Benzo(a)pyrene	9.1E-01	mg/kg	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	8.6E-07	mg/kg/day	NA	NA	NA
				Arsenic	1.4E+01	mg/kg	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	1.3E-05	mg/kg/day	3.0E-04	mg/kg/day	4.5E-02
				Chromium	2.6E+03	mg/kg	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	2.5E-03	mg/kg/day	3.0E-03	mg/kg/day	8.3E-01
				Iron	3.1E+04	mg/kg	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	3.0E-02	mg/kg/day	3.0E-01	mg/kg/day	9.8E-02
			Exp. Route Total								0.0E+00					9.8E-01
			Dermal	Benzo(a)pyrene	9.1E-01	mg/kg	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	4.3E-05	mg/kg/day	NA	NA	NA
				Arsenic	1.4E+01	mg/kg	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	1.5E-04	mg/kg/day	3.0E-04	mg/kg/day	5.1E-01
				Chromium	2.6E+03	mg/kg	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	9.5E-03	mg/kg/day	7.5E-05	mg/kg/day	1.3E+02
				Iron	3.1E+04	mg/kg	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	1.1E-01	mg/kg/day	3.0E-01	mg/kg/day	3.8E-01
			Exp. Route Total								0.0E+00					1.3E+02
		Exposure Point Total									0.0E+00					1.3E+02
	Exposure Medium Total										0.0E+00					1.3E+02
Medium Total											0.0E+00					1.3E+02

TABLE 7.7.RME

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS

REASONABLE MAXIMUM EXPOSURE

St.Juliens Creek Annex - Site 2

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Groundwater	Deep Groundwater	Tap Water	Ingestion	Chloroform	4.8E+00	ug/L	NA	mg/kg/day	NA	NA	NA	3.0E-04	mg/kg/day	1.0E-02	mg/kg/day	3.0E-02
				Arsenic	3.7E+00	ug/L	NA	mg/kg/day	NA	NA	NA	2.4E-04	mg/kg/day	3.0E-04	mg/kg/day	7.9E-01
				Iron	3.8E+03	ug/L	NA	mg/kg/day	NA	NA	NA	2.4E-01	mg/kg/day	3.0E-01	mg/kg/day	8.1E-01
				Manganese	2.3E+02	ug/L	NA	mg/kg/day	NA	NA	NA	1.5E-02	mg/kg/day	2.0E-02	mg/kg/day	7.3E-01
				Vanadium	9.6E+00	ug/L	NA	mg/kg/day	NA	NA	NA	6.1E-04	mg/kg/day	1.0E-03	mg/kg/day	6.1E-01
			Exp. Route Total								0.0E+00					3.0E+00
			Dermal	Chloroform	4.8E+00	ug/L	NA	NA	NA	NA	NA	2.7E-05	mg/kg/day	1.0E-02	mg/kg/day	2.7E-03
				Arsenic	3.7E+00	ug/L	NA	NA	NA	NA	NA	1.6E-06	mg/kg/day	3.0E-04	mg/kg/day	5.2E-03
				Iron	3.8E+03	ug/L	NA	NA	NA	NA	NA	1.6E-03	mg/kg/day	3.0E-01	mg/kg/day	5.4E-03
				Manganese	2.3E+02	ug/L	NA	NA	NA	NA	NA	9.7E-05	mg/kg/day	8.0E-04	mg/kg/day	1.2E-01
				Vanadium	9.6E+00	ug/L	NA	NA	NA	NA	NA	4.1E-06	mg/kg/day	2.6E-05	mg/kg/day	1.6E-01
			Exp. Route Total								0.0E+00					2.9E-01
		Exposure Point Total									0.0E+00					3.3E+00
	Exposure Medium Total										0.0E+00					3.3E+00
Medium Total											0.0E+00					3.3E+00
										Total of Receptor Risks Across All Media	0.0E+00				Total of Receptor Hazards Across All Media	1.4E+02

* Surface soil & subsurface soil combined.

Notes-

DAevent for exposure to groundwater while bathing calculated on Table 7.4.RME Supplement A.

Table 7.7.RME Supplement B
Calculation of DAevent
Resident Child Surface Water
St. Juliens Creek Annex - Site 2

Chemical of Potential Concern	Surface Water Concentration (CW) (μg/L)	Permeability Coefficient (Kp) (cm/hr)	B (unitless)	Lag Time (τ_{event}) (hr)	t* (hr)	Fraction Absorbed Water (FA) (dimensionless)	Duration of Event (tevent) (hr)	DAevent (mg/cm^2-event)	Eq
Chloroform	5.40E+00	6.8E-03	2.9E-02	5.0E-01	1.2E+00	1.0E+00	1	7.2E-08	2
Trichloroethene	1.30E+02	1.2E-02	1.0E-01	5.8E-01	1.4E+00	1.0E+00	1	3.3E-06	2
Vinyl chloride	1.51E+01	5.6E-03	1.7E-02	2.4E-01	5.7E-01	1.0E+00	1	2.6E-07	3
cis-1,2-Dichloroethene	8.40E+01	7.7E-03	2.9E-02	3.7E-01	8.9E-01	1.0E+00	1	2.0E-06	3
bis(2-Ethylhexyl)phthalate	6.90E+01	2.5E-02	2.0E-01	1.7E+01	4.0E+01	8.0E-01	1	1.6E-05	2
Arsenic	3.80E+00	1.0E-03	NA	NA	NA	NA	1	3.8E-09	1
Chromium	1.50E+02	2.0E-03	NA	NA	NA	NA	1	3.0E-07	1
Iron	1.17E+04	1.0E-03	NA	NA	NA	NA	1	1.2E-05	1
Lead	7.11E+00	1.0E-03	NA	NA	NA	NA	1	7.1E-09	1
Manganese	2.04E+03	1.0E-03	NA	NA	NA	NA	1	2.0E-06	1
Vanadium	1.71E+01	1.0E-03	NA	NA	NA	NA	1	1.7E-08	1

Values for trans-1,2-dichloroethene applied as surrogates for cis-1,2-dichloroethene.

Inorganics: DAevent (mg/cm2-event) =

Kp x CW x tevent x 0.001 mg/ug x 0.001 l/cm^3 (eq 1)

Organics: DAevent (mg/cm2-event) =

tevent<t*: DAevent (mg/cm2-event) =

2 x FA x Kp x CW x (sqrt((6 x τ_{event} x tevent)/π)) x 0.001 mg/ug x 0.001 l/cm^3 (eq 2)

tevent>t*: DAevent (mg/cm2-event) =

FA x Kp x CW x (tevent/(1+B) + 2 x τ_{event} x ((1 + 3xB + $3xB^2$)/$(1+B)^2$) x 0.001 mg/ug x 0.001 l/cm3 (eq 3)

Notes:

Permeability constants from EPA 2001, Risk Assessment Guidance for Superfund Volume I: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment). EPA/540/R/99/005.

NA - not applicable.

TABLE 7.8.RME

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS

REASONABLE MAXIMUM EXPOSURE

St.Juliens Creek Annex - Site 2

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult/Child

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentratio		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentratio		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Soil*	Soil*	At Site 2	Ingestion	Benzo(a)anthracene	6.9E-01	mg/kg	1.1E-06	mg/kg/day	7.3E-01	1/(mg/kg-day)	7.9E-07	NA	mg/kg/day	NA	NA	NA
				Benzo(a)pyrene	4.1E-01	mg/kg	6.4E-07	mg/kg/day	7.3E+00	1/(mg/kg-day)	4.7E-06	NA	mg/kg/day	NA	NA	NA
				Benzo(b)fluoranthene	6.2E-01	mg/kg	9.8E-07	mg/kg/day	7.3E-01	1/(mg/kg-day)	7.1E-07	NA	mg/kg/day	NA	NA	NA
				Dibenz(a,h)anthracene	5.3E-01	mg/kg	8.3E-07	mg/kg/day	7.3E+00	1/(mg/kg-day)	6.1E-06	NA	mg/kg/day	NA	NA	NA
				4,4'-DDD	1.8E+00	mg/kg	2.8E-06	mg/kg/day	2.4E-01	1/(mg/kg-day)	6.8E-07	NA	mg/kg/day	NA	NA	NA
				4,4'-DDE	2.5E+00	mg/kg	3.9E-06	mg/kg/day	3.4E-01	1/(mg/kg-day)	1.3E-06	NA	mg/kg/day	NA	NA	NA
				4,4'-DDT	1.1E+02	mg/kg	1.8E-04	mg/kg/day	3.4E-01	1/(mg/kg-day)	6.1E-05	NA	mg/kg/day	NA	NA	NA
				Aluminum	1.0E+04	mg/kg	1.6E-02	mg/kg/day	NA	NA	NA	NA	mg/kg/day	NA	NA	NA
				Antimony	2.2E+01	mg/kg	3.4E-05	mg/kg/day	NA	NA	NA	NA	mg/kg/day	NA	NA	NA
				Arsenic	8.5E+00	mg/kg	1.3E-05	mg/kg/day	1.5E+00	1/(mg/kg-day)	2.0E-05	NA	mg/kg/day	NA	NA	NA
				Cadmium	2.3E+00	mg/kg	3.6E-06	mg/kg/day	NA	NA	NA	NA	mg/kg/day	NA	NA	NA
				Chromium	6.3E+01	mg/kg	9.9E-05	mg/kg/day	NA	NA	NA	NA	mg/kg/day	NA	NA	NA
				Copper	5.8E+02	mg/kg	9.1E-04	mg/kg/day	NA	NA	NA	NA	mg/kg/day	NA	NA	NA
				Iron	7.0E+04	mg/kg	1.1E-01	mg/kg/day	NA	NA	NA	NA	mg/kg/day	NA	NA	NA
				Manganese	3.0E+02	mg/kg	4.8E-04	mg/kg/day	NA	NA	NA	NA	mg/kg/day	NA	NA	NA
				Nickel	6.0E+01	mg/kg	9.5E-05	mg/kg/day	NA	NA	NA	NA	mg/kg/day	NA	NA	NA
				Thallium	1.8E+00	mg/kg	2.8E-06	mg/kg/day	NA	NA	NA	NA	mg/kg/day	NA	NA	NA
				Vanadium	3.7E+01	mg/kg	5.8E-05	mg/kg/day	NA	NA	NA	NA	mg/kg/day	NA	NA	NA
				Zinc	1.9E+03	mg/kg	3.0E-03	mg/kg/day	NA	NA	NA	NA	mg/kg/day	NA	NA	NA
			Exp. Route Total								9.5E-05					0.0E+00
			Dermal Absorption	Benzo(a)anthracene	6.9E-01	mg/kg	7.4E-07	mg/kg/day	7.3E-01	1/(mg/kg-day)	5.4E-07	NA	mg/kg/day	NA	NA	NA
				Benzo(a)pyrene	4.1E-01	mg/kg	4.4E-07	mg/kg/day	7.3E+00	1/(mg/kg-day)	3.2E-06	NA	mg/kg/day	NA	NA	NA
				Benzo(b)fluoranthene	6.2E-01	mg/kg	6.7E-07	mg/kg/day	7.3E-01	1/(mg/kg-day)	4.9E-07	NA	mg/kg/day	NA	NA	NA
				Dibenz(a,h)anthracene	5.3E-01	mg/kg	5.7E-07	mg/kg/day	7.3E+00	1/(mg/kg-day)	4.2E-06	NA	mg/kg/day	NA	NA	NA
				4,4'-DDD	1.8E+00	mg/kg	4.5E-07	mg/kg/day	2.4E-01	1/(mg/kg-day)	1.1E-07	NA	mg/kg/day	NA	NA	NA
				4,4'-DDE	2.5E+00	mg/kg	6.2E-07	mg/kg/day	3.4E-01	1/(mg/kg-day)	2.1E-07	NA	mg/kg/day	NA	NA	NA
				4,4'-DDT	1.1E+02	mg/kg	2.8E-05	mg/kg/day	3.4E-01	1/(mg/kg-day)	9.6E-06	NA	mg/kg/day	NA	NA	NA
				Aluminum	1.0E+04	mg/kg	8.3E-04	mg/kg/day	NA	NA	NA	NA	mg/kg/day	NA	NA	NA
				Antimony	2.2E+01	mg/kg	1.8E-06	mg/kg/day	NA	NA	NA	NA	mg/kg/day	NA	NA	NA
				Arsenic	8.5E+00	mg/kg	2.1E-06	mg/kg/day	1.5E+00	1/(mg/kg-day)	3.1E-06	NA	mg/kg/day	NA	NA	NA
				Cadmium	2.3E+00	mg/kg	1.9E-08	mg/kg/day	NA	NA	NA	NA	mg/kg/day	NA	NA	NA
				Chromium	6.3E+01	mg/kg	5.2E-06	mg/kg/day	NA	NA	NA	NA	mg/kg/day	NA	NA	NA
				Copper	5.8E+02	mg/kg	4.8E-05	mg/kg/day	NA	NA	NA	NA	mg/kg/day	NA	NA	NA
				Iron	7.0E+04	mg/kg	5.8E-03	mg/kg/day	NA	NA	NA	NA	mg/kg/day	NA	NA	NA
				Manganese	3.0E+02	mg/kg	2.5E-05	mg/kg/day	NA	NA	NA	NA	mg/kg/day	NA	NA	NA
				Nickel	6.0E+01	mg/kg	5.0E-06	mg/kg/day	NA	NA	NA	NA	mg/kg/day	NA	NA	NA
				Thallium	1.8E+00	mg/kg	1.5E-07	mg/kg/day	NA	NA	NA	NA	mg/kg/day	NA	NA	NA
				Vanadium	3.7E+01	mg/kg	3.1E-06	mg/kg/day	NA	NA	NA	NA	mg/kg/day	NA	NA	NA
				Zinc	1.9E+03	mg/kg	1.6E-04	mg/kg/day	NA	NA	NA	NA	mg/kg/day	NA	NA	NA
			Exp. Route Total								2.1E-05					0.0E+00
		Exposure Point Total									1.2E-04					0.0E+00
	Exposure Medium Total										1.2E-04					0.0E+00
Medium Total											1.2E-04					0.0E+00

TABLE 7.8.RME

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS

REASONABLE MAXIMUM EXPOSURE

St.Juliens Creek Annex - Site 2

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult/Child

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentratio		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentratio		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Surface Water	Surface Water	Drainage Features and Ponded Area	Dermal	Chloroform	5.4E+00	UG/L	3.9E-07	mg/kg/day	NA	NA	NA	NA	mg/kg/day	NA	NA	NA
				Trichloroethene	1.3E+02	UG/L	1.8E-05	mg/kg/day	4.0E-01	1/(mg/kg-day)	7.2E-06	NA	mg/kg/day	NA	NA	NA
				Vinyl chloride	1.5E+01	UG/L	1.4E-06	mg/kg/day	1.4E+00	1/(mg/kg-day)	2.0E-06	NA	mg/kg/day	NA	NA	NA
				cis-1,2-Dichloroethene	8.4E+01	UG/L	1.1E-05	mg/kg/day	NA	NA	NA	NA	mg/kg/day	NA	NA	NA
				bis(2-Ethylhexyl)phthalate	6.9E+01	UG/L	8.5E-05	mg/kg/day	1.4E-02	1/(mg/kg-day)	1.2E-06	NA	mg/kg/day	NA	NA	NA
				Arsenic	3.8E+00	UG/L	2.1E-08	mg/kg/day	1.5E+00	1/(mg/kg-day)	3.1E-08	NA	mg/kg/day	NA	NA	NA
				Chromium	1.5E+02	UG/L	1.6E-06	mg/kg/day	NA	NA	NA	NA	mg/kg/day	NA	NA	NA
				Iron	1.2E+04	UG/L	6.4E-05	mg/kg/day	NA	NA	NA	NA	mg/kg/day	NA	NA	NA
				Lead	4.8E+01	UG/L	3.9E-08	mg/kg/day	NA	NA	NA	NA	mg/kg/day	NA	NA	NA
				Manganese	2.0E+03	UG/L	1.1E-05	mg/kg/day	NA	NA	NA	NA	mg/kg/day	NA	NA	NA
				Vanadium	1.7E+01	UG/L	9.4E-08	mg/kg/day	NA	NA	NA	NA	mg/kg/day	NA	NA	NA
			Exp. Route Total								1.0E-05					0.0E+00
		Exposure Point Total									1.0E-05					0.0E+00
	Exposure Medium Total										1.0E-05					0.0E+00
Medium Total											1.0E-05					0.0E+00
Sediment	Sediment	Drainage Features and Ponded Area	Ingestion	Benzo(a)pyrene	9.1E-01	mg/kg	1.1E-07	mg/kg/day	7.3E+00	1/(mg/kg-day)	7.7E-07	NA	mg/kg/day	NA	NA	NA
				Arsenic	1.4E+01	mg/kg	1.6E-06	mg/kg/day	1.5E+00	1/(mg/kg-day)	2.5E-06	NA	mg/kg/day	NA	NA	NA
				Chromium	2.6E+03	mg/kg	3.1E-04	mg/kg/day	NA	NA	NA	NA	mg/kg/day	NA	NA	NA
				Iron	3.1E+04	mg/kg	3.6E-03	mg/kg/day	NA	NA	NA	NA	mg/kg/day	NA	NA	NA
			Exp. Route Total								3.2E-06					0.0E+00
			Dermal	Benzo(a)pyrene	9.1E-01	mg/kg	4.0E-06	mg/kg/day	7.3E+00	1/(mg/kg-day)	2.9E-05	NA	mg/kg/day	NA	NA	NA
				Arsenic	1.4E+01	mg/kg	1.4E-05	mg/kg/day	1.5E+00	1/(mg/kg-day)	2.1E-05	NA	mg/kg/day	NA	NA	NA
				Chromium	2.6E+03	mg/kg	8.8E-04	mg/kg/day	NA	NA	NA	NA	mg/kg/day	NA	NA	NA
				Iron	3.1E+04	mg/kg	1.0E-02	mg/kg/day	NA	NA	NA	NA	mg/kg/day	NA	NA	NA
			Exp. Route Total								5.0E-05					0.0E+00
		Exposure Point Total									5.0E-05					0.0E+00
	Exposure Medium Total										5.0E-05					0.0E+00
Medium Total											5.0E-05					0.0E+00

TABLE 7.8.RME

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS

REASONABLE MAXIMUM EXPOSURE

St.Juliens Creek Annex - Site 2

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult/Child

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentratio		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentratio		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Groundwater	Deep Groundwater	Tap Water	Ingestion	Chloroform	4.8E+00	ug/L	7.1E-05	mg/kg/day	NA	NA	NA	NA	mg/kg/day	NA	mg/kg/day	NA
				Arsenic	3.7E+00	ug/L	5.5E-05	mg/kg/day	1.5E+00	1/mg/kg-day	8.3E-05	NA	mg/kg/day	NA	mg/kg/day	NA
				Iron	3.8E+03	ug/L	5.7E-02	mg/kg/day	NA	NA	NA	NA	mg/kg/day	NA	mg/kg/day	NA
				Manganese	2.3E+02	ug/L	3.4E-03	mg/kg/day	NA	NA	NA	NA	mg/kg/day	NA	mg/kg/day	NA
				Vanadium	9.6E+00	ug/L	1.4E-04	mg/kg/day	NA	NA	NA	NA	mg/kg/day	NA	mg/kg/day	NA
			Exp. Route Total								8.3E-05					0.0E+00
			Dermal	Chloroform	4.8E+00	ug/L	6.4E-06	mg/kg/day	NA	1/mg/kg-day	NA	NA	mg/kg/day	NA	mg/kg/day	NA
				Arsenic	3.7E+00	ug/L	3.2E-07	mg/kg/day	1.5E+00	1/mg/kg-day	4.7E-07	NA	mg/kg/day	NA	mg/kg/day	NA
				Iron	3.8E+03	ug/L	3.3E-04	mg/kg/day	NA	1/mg/kg-day	NA	NA	mg/kg/day	NA	mg/kg/day	NA
				Manganese	2.3E+02	ug/L	2.0E-05	mg/kg/day	NA	1/mg/kg-day	NA	NA	mg/kg/day	NA	mg/kg/day	NA
				Vanadium	9.6E+00	ug/L	8.2E-07	mg/kg/day	NA	1/mg/kg-day	NA	NA	mg/kg/day	NA	mg/kg/day	NA
			Exp. Route Total								4.7E-07					0.0E+00
		Exposure Point Total									8.3E-05					0.0E+00
	Exposure Medium Total										8.3E-05					0.0E+00
	Air*	groundwater - Water Vapors at Showerhead	Inhalation	Chloroform	3.7E+00	ug/L	8.4E-05	mg/kg/day	8.1E-02	1/mg/kg-day	6.8E-06	NA	mg/kg/day	NA	mg/kg/day	NA
			Exp. Route Total								6.8E-06					0.0E+00
		Exposure Point Total									6.8E-06					0.0E+00
	Exposure Medium Total										6.8E-06					0.0E+00
Medium Total											9.0E-05					0.0E+00
									Total of Receptor Risks Across All Media		2.7E-04	Total of Receptor Hazards Across All Media				0.0E+00

* Surface soil & subsurface soil combined.

Notes-

DAevent for exposure to groundwater while bathing calculated on Table 7.3.RME Supplement A.

Inhalation of volatiles from groundwater from shower calculated on Table 7.3.RME Supplement B.

* Based on adult exposure only, adults have greater inhalation of volatiles while showering then children do while bathing.

TABLE 7.9.RME

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS

REASONABLE MAXIMUM EXPOSURE

St.Juliens Creek Annex - Site 2

Scenario Timeframe: Future
Receptor Population: Construction worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Soil*	Soil*	At Site 2	Ingestion	Benzo(a)pyrene	4.1E-01	mg/kg	1.4E-08	mg/kg/day	7.3E+00	1/(mg/kg-day)	1.0E-07	9.6E-07	mg/kg/day	NA	NA	NA
				4,4'-DDT	1.1E+02	mg/kg	3.8E-06	mg/kg/day	3.4E-01	1/(mg/kg-day)	1.3E-06	2.7E-04	mg/kg/day	5.0E-04	mg/kg/day	5.3E-01
				Antimony	2.2E+01	mg/kg	7.3E-07	mg/kg/day	NA	NA	NA	5.1E-05	mg/kg/day	4.0E-04	mg/kg/day	1.3E-01
				Arsenic	8.5E+00	mg/kg	2.8E-07	mg/kg/day	1.5E+00	1/(mg/kg-day)	4.3E-07	2.0E-05	mg/kg/day	3.0E-04	mg/kg/day	6.6E-02
				Copper	5.8E+02	mg/kg	2.0E-05	mg/kg/day	NA	NA	NA	1.4E-03	mg/kg/day	4.0E-02	mg/kg/day	3.4E-02
				Iron	7.0E+04	mg/kg	2.4E-03	mg/kg/day	NA	NA	NA	1.7E-01	mg/kg/day	3.0E-01	mg/kg/day	5.5E-01
				Vanadium	3.7E+01	mg/kg	1.2E-06	mg/kg/day	NA	NA	NA	8.7E-05	mg/kg/day	7.0E-03	mg/kg/day	1.2E-02
			Exp. Route Total								1.8E-06					1.3E+00
			Dermal Absorption	Benzo(a)pyrene	4.1E-01	mg/kg	4.3E-09	mg/kg/day	7.3E+00	1/(mg/kg-day)	3.2E-08	3.0E-07	mg/kg/day	NA	NA	NA
				4,4'-DDT	1.1E+02	mg/kg	2.8E-07	mg/kg/day	3.4E-01	1/(mg/kg-day)	9.5E-08	1.9E-05	mg/kg/day	5.0E-04	mg/kg/day	3.9E-02
				Antimony	2.2E+01	mg/kg	1.8E-08	mg/kg/day	NA	NA	NA	1.2E-06	mg/kg/day	6.0E-05	mg/kg/day	2.1E-02
				Arsenic	8.5E+00	mg/kg	2.1E-08	mg/kg/day	1.5E+00	1/(mg/kg-day)	3.1E-08	1.4E-06	mg/kg/day	3.0E-04	mg/kg/day	4.8E-03
				Copper	5.8E+02	mg/kg	4.8E-07	mg/kg/day	NA	NA	NA	3.3E-05	mg/kg/day	4.0E-02	mg/kg/day	8.3E-04
				Iron	7.0E+04	mg/kg	5.7E-05	mg/kg/day	NA	NA	NA	4.0E-03	mg/kg/day	3.0E-01	mg/kg/day	1.3E-02
				Vanadium	3.7E+01	mg/kg	3.0E-08	mg/kg/day	NA	NA	NA	2.1E-06	mg/kg/day	1.8E-04	mg/kg/day	1.2E-02
			Exp. Route Total								1.6E-07					9.0E-02
		Exposure Point Total									2.0E-06					1.4E+00
	Exposure Medium Total										2.0E-06					1.4E+00
	Air	Emission from Soil at Site 2	Inhalation	Chromium	6.8E-08	mg/m3	9.5E-11	mg/kg/day	4.1E+01	1/(mg/kg-day)	3.9E-09	6.6E-09	mg/kg/day	3.0E-05	NA	2.2E-04
			Exp. Route Total								3.9E-09					2.2E-04
		Exposure Point Total									3.9E-09					2.2E-04
	Exposure Medium Total										3.9E-09					2.2E-04
Medium Total											2.0E-06					1.4E+00

TABLE 7.9.RME

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS

REASONABLE MAXIMUM EXPOSURE

St.Juliens Creek Annex - Site 2

Scenario Timeframe: Future
Receptor Population: Construction worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Groundwater	Shallow Groundwater	Water Table	Dermal	1,4-Dichlorobenzene	6.3E-01	UG/L	2.3E-07	mg/kg/day	2.4E-02	1/(mg/kg-day)	5.6E-09	1.6E-05	mg/kg/day	3.0E-02	mg/kg/day	5.4E-04
				Trichloroethene	7.1E-01	UG/L	7.2E-08	mg/kg/day	4.0E-01	1/(mg/kg-day)	2.9E-08	5.1E-06	mg/kg/day	3.0E-04	mg/kg/day	1.7E-02
				Heptachlor	5.9E-02	UG/L	3.9E-09	mg/kg/day	4.5E+00	1/(mg/kg-day)	1.8E-08	2.7E-07	mg/kg/day	5.0E-04	mg/kg/day	5.5E-04
				RDX	2.7E+00	UG/L	2.5E-09	mg/kg/day	1.1E-01	1/(mg/kg-day)	2.8E-10	1.8E-07	mg/kg/day	3.0E-03	mg/kg/day	5.9E-05
				Aluminum	3.2E+04	UG/L	8.6E-05	mg/kg/day	NA	NA	NA	6.0E-03	mg/kg/day	1.0E+00	mg/kg/day	6.0E-03
				Arsenic	5.2E+00	UG/L	1.4E-08	mg/kg/day	1.5E+00	1/(mg/kg-day)	2.1E-08	1.0E-06	mg/kg/day	3.0E-04	mg/kg/day	3.3E-03
				Barium	7.2E+02	UG/L	1.9E-06	mg/kg/day	NA	NA	NA	1.4E-04	mg/kg/day	4.9E-03	mg/kg/day	2.8E-02
				Chromium	5.6E+01	UG/L	3.1E-07	mg/kg/day	NA	NA	NA	2.1E-05	mg/kg/day	5.0E-04	mg/kg/day	4.3E-02
				Iron	3.8E+05	UG/L	1.0E-03	mg/kg/day	NA	NA	NA	7.2E-02	mg/kg/day	3.0E-01	mg/kg/day	2.4E-01
				Lead	1.7E+01	UG/L	4.7E-09	mg/kg/day	NA	NA	NA	3.3E-07	mg/kg/day	NA	NA	NA
				Manganese	8.9E+02	UG/L	2.4E-06	mg/kg/day	NA	NA	NA	1.7E-04	mg/kg/day	8.0E-04	mg/kg/day	2.1E-01
				Thallium	4.8E+00	UG/L	1.3E-08	mg/kg/day	NA	NA	NA	9.2E-07	mg/kg/day	7.0E-05	mg/kg/day	1.3E-02
				Vanadium	8.0E+01	UG/L	2.2E-07	mg/kg/day	NA	NA	NA	1.5E-05	mg/kg/day	1.8E-04	mg/kg/day	8.3E-02
			Exp. Route Total								7.4E-08					6.4E-01
		Exposure Point Total									7.4E-08					6.4E-01
	Exposure Medium Total										7.4E-08					6.4E-01
Medium Total											7.4E-08					6.4E-01
Total of Receptor Risks Across All Media											2.1E-06	Total of Receptor Hazards Across All Media				2.1E+00

* Surface soil & subsurface soil combined.

Table 7.9.RME Supplement A
Calculation of DAevent (Construction Worker)
Shallow Aquifer
St.Juliens Creek Annex - Site 2

Chemical of Potential Concern	Medium EPC Value (μg/L)	Permeability Constant (PC) (cm/hr)	B (unitless)	Lag Time (τ_{event}) (hr)	t* (hr)	Fraction Absorbed Water (FA) (dimensionless)	Duration of Event (tevent) (hr)	DAevent (mg/cm^2-event)	Eq
1,4-Dichlorobenzene	6.34E-01	4.20E-02	2.00E-01	7.10E-01	1.71E+00	1.00E+00	8	6.86E-07	3
Trichloroethene	7.14E-01	1.20E-02	1.00E-01	5.80E-01	1.39E+00	1.00E+00	8	2.13E-07	3
Heptachlor	5.88E-02	8.60E-03	1.00E-01	1.33E+01	3.19E+01	8.00E-01	8	1.2E-08	2
RDX[1]	2.70E+00	3.48E-04	NA	NA	NA	NA	8	7.52E-09	1
Aluminum	3.16E+04	1.00E-03	NA	NA	NA	NA	8	2.53E-04	1
Arsenic	5.24E+00	1.00E-03	NA	NA	NA	NA	8	4.19E-08	1
Barium	7.15E+02	1.00E-03	NA	NA	NA	NA	8	5.72E-06	1
Chromium	5.63E+01	2.00E-03	NA	NA	NA	NA	8	9.01E-07	1
Iron	3.77E+05	1.00E-03	NA	NA	NA	NA	8	3.02E-03	1
Lead	1.74E+01	1.00E-04	NA	NA	NA	NA	8	1.39E-08	1
Manganese	8.89E+02	1.00E-03	NA	NA	NA	NA	8	7.11E-06	1
Thallium	4.83E+00	1.00E-03	NA	NA	NA	NA	8	3.86E-08	1
Vanadium	7.96E+01	1.00E-03	NA	NA	NA	NA	8	6.37E-07	1

1. Since values for parameters were not available for RDX, the inorganic equation was applied.

Inorganics: DAevent (mg/cm2-event) =

PC x EPC x ET x 0.001 mg/ug x 0.001 l/cm^3

Organics: DAevent (mg/cm2-event) =

2 x PC x EPC x (sqrt((6 x t x ET)/3.1415)) x 0.001 mg/ug x 0.001 l/cm^3

Notes:

1. Permeability constant and lag time calculated on Table 7.17b.RME Supplement.
2. Used permeability constant and lag time values for 2,6-Dinitrotoluene.

Permeability constants and lag time from EPA 1992, Dermal Exposure Assessment: Principals and Applications. ORD, EPA/600/8-91/001B. Default value of 0.001 cm/hour used for inorganics without published values.

N/A - not available or not applicable.

TABLE 7.10.RME

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS

REASONABLE MAXIMUM EXPOSURE

St.Juliens Creek Annex - Site 2

Scenario Timeframe: Future
Receptor Population: Other worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Soil*	Soil*	At Site 2	Ingestion	Benzo(a)pyrene	4.1E-01	mg/kg	1.4E-07	mg/kg/day	7.3E+00	1/(mg/kg-day)	1.0E-06	4.0E-07	mg/kg/day	NA	NA	NA
				4,4'-DDT	1.1E+02	mg/kg	4.0E-05	mg/kg/day	3.4E-01	1/(mg/kg-day)	1.4E-05	1.1E-04	mg/kg/day	5.0E-04	mg/kg/day	2.2E-01
				Antimony	2.2E+01	mg/kg	7.6E-06	mg/kg/day	NA	NA	NA	2.1E-05	mg/kg/day	4.0E-04	mg/kg/day	5.3E-02
				Arsenic	8.5E+00	mg/kg	3.0E-06	mg/kg/day	1.5E+00	1/(mg/kg-day)	4.4E-06	8.3E-06	mg/kg/day	3.0E-04	mg/kg/day	2.8E-02
				Copper	5.8E+02	mg/kg	2.0E-04	mg/kg/day	NA	NA	NA	5.7E-04	mg/kg/day	4.0E-02	mg/kg/day	1.4E-02
				Iron	7.0E+04	mg/kg	2.5E-02	mg/kg/day	NA	NA	NA	6.9E-02	mg/kg/day	3.0E-01	mg/kg/day	2.3E-01
				Vanadium	3.7E+01	mg/kg	1.3E-05	mg/kg/day	NA	NA	NA	3.6E-05	mg/kg/day	1.0E-03	mg/kg/day	3.6E-02
			Exp. Route Total								1.9E-05					5.8E-01
			Dermal Absorption	Benzo(a)pyrene	4.1E-01	mg/kg	2.9E-07	mg/kg/day	7.3E+00	1/(mg/kg-day)	2.1E-06	8.1E-07	mg/kg/day	NA	NA	NA
				4,4'-DDT	1.1E+02	mg/kg	1.9E-05	mg/kg/day	3.4E-01	1/(mg/kg-day)	6.3E-06	5.2E-05	mg/kg/day	5.0E-04	mg/kg/day	1.0E-01
				Antimony	2.2E+01	mg/kg	1.2E-06	mg/kg/day	NA	NA	NA	3.3E-06	mg/kg/day	6.0E-05	mg/kg/day	5.5E-02
				Arsenic	8.5E+00	mg/kg	1.4E-06	mg/kg/day	1.5E+00	1/(mg/kg-day)	2.1E-06	3.9E-06	mg/kg/day	3.0E-04	mg/kg/day	1.3E-02
				Copper	5.8E+02	mg/kg	3.2E-05	mg/kg/day	NA	NA	NA	8.9E-05	mg/kg/day	4.0E-02	mg/kg/day	2.2E-03
				Iron	7.0E+04	mg/kg	3.8E-03	mg/kg/day	NA	NA	NA	1.1E-02	mg/kg/day	3.0E-01	mg/kg/day	3.6E-02
				Vanadium	3.7E+01	mg/kg	2.0E-06	mg/kg/day	NA	NA	NA	5.6E-06	mg/kg/day	2.6E-05	mg/kg/day	2.2E-01
			Exp. Route Total								1.0E-05					4.3E-01
		Exposure Point Total									2.9E-05					1.0E+00
	Exposure Medium Total										2.9E-05					1.0E+00
Medium Total											2.9E-05					1.0E+00
									Total of Receptor Risks Across All Media		2.9E-05			Total of Receptor Hazards Across All Media		1.0E+00

* Surface soil & subsurface soil combined.

TABLE 7.11.CT

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS

CENTRAL TENDENCY EXPOSURE

St.Juliens Creek Annex - Site 2

Scenario Timeframe: Current/Future
Receptor Population: Resident
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Groundwater	Deep Groundwater	Tap Water	Ingestion	Chloroform	8.3E-01	ug/L	NA	NA	NA	NA	NA	1.1E-05	mg/kg/day	1.0E-02	mg/kg/day	1.1E-03
				Arsenic	2.0E+00	ug/L	NA	NA	NA	NA	NA	2.5E-05	mg/kg/day	3.0E-04	mg/kg/day	8.4E-02
				Iron	3.1E+02	ug/L	NA	NA	NA	NA	NA	3.9E-03	mg/kg/day	3.0E-01	mg/kg/day	1.3E-02
				Manganese	4.9E+01	ug/L	NA	NA	NA	NA	NA	6.3E-04	mg/kg/day	2.0E-02	mg/kg/day	3.2E-02
				Vanadium	1.7E+00	ug/L	NA	NA	NA	NA	NA	2.2E-05	mg/kg/day	1.0E-03	mg/kg/day	2.2E-02
			Exp. Route Total								0.0E+00					1.5E-01
			Dermal	Chloroform	8.3E-01	ug/L	NA	NA	NA	NA	NA	9.1E-07	mg/kg/day	1.0E-02	mg/kg/day	9.1E-05
				Arsenic	2.0E+00	ug/L	NA	NA	NA	NA	NA	8.1E-08	mg/kg/day	3.0E-04	mg/kg/day	2.7E-04
				Iron	3.1E+02	ug/L	NA	NA	NA	NA	NA	1.3E-05	mg/kg/day	3.0E-01	mg/kg/day	4.2E-05
				Manganese	4.9E+01	ug/L	NA	NA	NA	NA	NA	2.0E-06	mg/kg/day	8.0E-04	mg/kg/day	2.5E-03
				Vanadium	1.7E+00	ug/L	NA	NA	NA	NA	NA	7.1E-08	mg/kg/day	2.6E-05	mg/kg/day	2.7E-03
			Exp. Route Total								0.0E+00					5.7E-03
		Exposure Point Total									0.0E+00					1.6E-01
	Exposure Medium Total										0.0E+00					1.6E-01
Groundwater	Air	Deep groundwater - Water Vapors at Showerhead	Inhalation	Chloroform	8.3E-01	ug/L	NA	NA	NA	NA	NA	2.9E-05	mg/kg/day	1.4E-02	mg/kg/day	2.0E-03
			Exp. Route Total								0.0E+00					2.0E-03
		Exposure Point Total									0.0E+00					2.0E-03
	Exposure Medium Total										0.0E+00					2.0E-03
Groundwater											0.0E+00					1.6E-01
									Total of Receptor Risks Across All Media		0.0E+00			Total of Receptor Hazards Across All Media		1.6E-01

Notes-
DAevent for exposure to groundwater while bathing calculated on Table 7.3.CT Supplement A.
EPC for inhalation of volatiles from groundwater from shower calculated on Table 7.3.CT Supplement B.

Table 7.11.CT Supplement A
Calculation of DAevent
Adult Resident, Deep Groundwater, Tap Water
St. Juliens Creek Annex - Site 2

Chemical of Potential Concern	Groundwater Water Concentration (CW) (µg/L)	Permeability Coefficient (Kp) (cm/hr)	B (dimensionless)	Lag Time (τ_{event}) (hr)	t* (hr)	Fraction Absorbed Water (FA) (dimensionless)	Duration of Event (tevent) (hr)	DAevent (mg/cm^2-event)	Eq
Chloroform	8.3E-01	6.8E-03	2.9E-02	5.0E-01	1.2E+00	1.0E+00	0.25	5.5E-09	2
Arsenic	2.0E+00	1.0E-03	NA	NA	NA	NA	0.25	4.9E-10	1
Iron	3.1E+02	1.0E-03	NA	NA	NA	NA	0.25	7.6E-08	1
Manganese	4.9E+01	1.0E-03	NA	NA	NA	NA	0.25	1.2E-08	1
Vanadium	1.7E+00	1.0E-03	NA	NA	NA	NA	0.25	4.3E-10	1

Inorganics: DAevent (mg/cm2-event) =
Kp x CW x tevent x 0.001 mg/ug x 0.001 l/cm^3 (eq 1)

Organics: DAevent (mg/cm2-event) =
tevent<t*: DAevent (mg/cm2-event) =
2 x FA x Kp x CW x (sqrt((6 x τ_{event} x tevent)/π)) x 0.001 mg/ug x 0.001 l/cm^3 (eq 2)

tevent>t*: DAevent (mg/cm2-event) =
FA x Kp x CW x (tevent/(1+B) + 2 x τ_{event} x ((1 + 3xB + $3xB^2$)/$(1+B)^2$) x 0.001 mg/ug x 0.001 l/cm3 (eq 3)

Notes:
Permeability constants from EPA 2001, Risk Assessment Guidance for Superfund Volume I: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment). EPA/540/R/99/005.
NA - not applicable.

Table 7.11.CT Supplement B
Inhalation Exposure Concentrations from Foster and Chrostowski Shower Model
St. Juliens Creek Annex - Site 2

Chemical	Exposure Point Concentration Cwo (mg/l)	Molecular weight (HH) (g/mole)	Henry's Law Constant (H) (atm-m^3/mole)	Kg (VOC) (cm/hr)	Kl(VOC) (cm/hr)	KL (cm/hr)	Kal (cm/hr)	Cwd (mg/l)	S (mg/m^3-min)	Calculated Inhalation Exposure (Einh) (mg/kg/shower)
Chloroform	8.3E-01	1.2E+02	2.87E-03	1.2E+03	1.2E+01	1.1E+01	1.5E+01	3.3E-01	2.2E+00	**4.5E-05**

Variables	Units	Exposure Assumptions
Kg(VOC) = gas-film mass transfer coefficient	cm/hr	Solved by Eq 1
Kl(VOC) = liquid-film mass transfer coefficient	cm/hr	Solved by Eq 2
KL = overall mass transfer coefficient	cm/hr	Solved by Eq 3
Kal = adjusted overall mass transfer coeff.	cm/hr	Solved by Eq 4
Tl = Calibration temp. of water	K (20C +273)	293
Ts = Shower water temperature	k (45C)	318
Us = water viscosity at Ts	centipoise	0.596
Ul = water viscosity at Tl	cp	1.002
Cwd = conc. leaving droplets after time sdt	ug/l	Solved by Eq 5
sdt = shower droplet drop time	sec	2
d = shower droplet diameter	mm	1
FR = shower water flow rate	l/min	20
SV = shower room air volume	m^3	3
S = indoor VOC generation rate	ug/m^3-min	Solved by Eq 6
VR = ventilation rate	l/min	13.8
Variables	**Units**	**Exposure Assumptions**
BW = body weight	kg	70
Ds = duration of shower	min	12
Dt = total duration in shower room	min	15
R = air exchange rate	min^{-1}	0.0083
Ca = indoor air concentration of VOCs	ug/m^3	Solved by Eq 7
Einh = inhalation exposure per shower	mg/kg/shower	Solved by Eq 8

Equation 1:	Kg(VOC) =	3000 * (18 / HH)$^{0.5}$	
Equation 2:	Kl(VOC) =	20 * (44 / HH)$^{0.5}$	
Equation 3:	KL =	((1 / Kl(VOC)) + (0.024 / (Kg (VOC) * H)))$^{-1}$	
Equation 4:	Kal =	(KL * (((Tl * Us) / (Ts * Ul))$^{-0.5}$))	
Equation 5:	Cwd =	(Cwo * (1-EXP((-1 * Kal * sdt)/(60 * d))))	
Equation 6:	S =	(Cwd * FR / SV)	
Equation 7:	see time series example on Table I-GW-5		
Equation 8:	**Einh =**	**If t>Ds**	(((VR * S) / (BW * R * 1000000)) * ((Ds + (EXP(-R * Dt) / R)-(EXP(R * (Ds - Dt))) / R)))

Henry's Law Constant from USEPA's *Superfund Public Health Evaluation Manual.* USEPA/540/1-86/060, October 1986.

TABLE 7.12.CT

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS

CENTRAL TENDENCY EXPOSURE

St.Juliens Creek Annex - Site 2

Scenario Timeframe: Current/Future
Receptor Population: Resident
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Groundwater	Deep Groundwater	Tap Water	Ingestion	Chloroform	8.3E-01	ug/L	NA	NA	NA	NA	NA	3.5E-05	mg/kg/day	1.0E-02	mg/kg/day	3.5E-03
				Arsenic	2.0E+00	ug/L	NA	NA	NA	NA	NA	8.4E-05	mg/kg/day	3.0E-04	mg/kg/day	2.8E-01
				Iron	3.1E+02	ug/L	NA	NA	NA	NA	NA	1.3E-02	mg/kg/day	3.0E-01	mg/kg/day	4.4E-02
				Manganese	4.9E+01	ug/L	NA	NA	NA	NA	NA	2.1E-03	mg/kg/day	2.0E-02	mg/kg/day	1.1E-01
				Vanadium	1.7E+00	ug/L	NA	NA	NA	NA	NA	7.4E-05	mg/kg/day	1.0E-03	mg/kg/day	7.4E-02
			Exp. Route Total								0.0E+00					5.1E-01
			Dermal	Chloroform	8.3E-01	ug/L	NA	NA	NA	NA	NA	1.8E-06	mg/kg/day	1.0E-02	mg/kg/day	1.8E-04
				Arsenic	2.0E+00	ug/L	NA	NA	NA	NA	NA	1.8E-07	mg/kg/day	3.0E-04	mg/kg/day	6.1E-04
				Iron	3.1E+02	ug/L	NA	NA	NA	NA	NA	2.8E-05	mg/kg/day	3.0E-01	mg/kg/day	9.5E-05
				Manganese	4.9E+01	ug/L	NA	NA	NA	NA	NA	4.6E-06	mg/kg/day	8.0E-04	mg/kg/day	5.7E-03
				Vanadium	1.7E+00	ug/L	NA	NA	NA	NA	NA	1.6E-07	mg/kg/day	2.6E-05	mg/kg/day	6.2E-03
			Exp. Route Total								0.0E+00					1.3E-02
		Exposure Point Total									0.0E+00					5.2E-01
	Exposure Medium Total										0.0E+00					5.2E-01
Groundwater											0.0E+00					5.2E-01
										Total of Receptor Risks Across All Media	0.0E+00			Total of Receptor Hazards Across All Media		5.2E-01

Notes-
DAevent for exposure to groundwater while bathing calculated on Table 7.4.CT Supplement A.

Table 7.12.CT Supplement A
Calculation of DAevent
Child Resident, Deep Groundwater, Tap Water
St. Juliens Creek Annex - Site 2

Chemical of Potential Concern	Groundwater Water Concentration (CW) (µg/L)	Permeability Coefficient (Kp) (cm/hr)	B (dimensionless)	Lag Time (τ_{event}) (hr)	t* (hr)	Fraction Absorbed Water (FA) (dimensionless)	Duration of Event (tevent) (hr)	DAevent (mg/cm^2-event)	Eq
Chloroform	8.3E-01	6.8E-03	2.9E-02	5.0E-01	1.2E+00	1.0E+00	0.33	6.3E-09	2
Arsenic	2.0E+00	1.0E-03	NA	NA	NA	NA	0.33	6.5E-10	1
Iron	3.1E+02	1.0E-03	NA	NA	NA	NA	0.33	1.0E-07	1
Manganese	4.9E+01	1.0E-03	NA	NA	NA	NA	0.33	1.6E-08	1
Vanadium	1.7E+00	1.0E-03	NA	NA	NA	NA	0.33	5.7E-10	1

Inorganics: DAevent (mg/cm2-event) =
Kp x CW x tevent x 0.001 mg/ug x 0.001 l/cm^3 (eq 1)

Organics: DAevent (mg/cm2-event) =
tevent<t*: DAevent (mg/cm2-event) =
2 x FA x Kp x CW x (sqrt((6 x τ_{event} x tevent)/π)) x 0.001 mg/ug x 0.001 l/cm^3 (eq 2)

tevent>t*: DAevent (mg/cm2-event) =
FA x Kp x CW x (tevent/(1+B) + 2 x τ_{event} x ((1 + 3xB + $3xB^2$)/$(1+B)^2$) x 0.001 mg/ug x 0.001 l/cm3 (eq 3)

Notes:
Permeability constants from EPA 2001, Risk Assessment Guidance for Superfund Volume I: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment). EPA/540/R/99/005.
NA - not applicable.

TABLE 7.13.CT

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS

CENTRAL TENDENCY EXPOSURE

St.Juliens Creek Annex - Site 2

Scenario Timeframe: Current/Future
Receptor Population: Resident
Receptor Age: Adult/Child

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Groundwater	Deep Groundwater	Tap Water	Ingestion	Chloroform	8.3E-01	ug/L	4.4E-06	mg/kg/day	NA	NA	NA	NA	mg/kg/day	NA	mg/kg/day	NA
				Arsenic	2.0E+00	ug/L	1.0E-05	mg/kg/day	1.5E+00	1/mg/kg-day	1.6E-05	NA	mg/kg/day	NA	mg/kg/day	NA
				Iron	3.1E+02	ug/L	1.6E-03	mg/kg/day	NA	NA	NA	NA	mg/kg/day	NA	mg/kg/day	NA
				Manganese	4.9E+01	ug/L	2.6E-04	mg/kg/day	NA	NA	NA	NA	mg/kg/day	NA	mg/kg/day	NA
				Vanadium	1.7E+00	ug/L	9.1E-06	mg/kg/day	NA	NA	NA	NA	mg/kg/day	NA	mg/kg/day	NA
			Exp. Route Total								1.6E-05					0.0E+00
			Dermal	Chloroform	8.3E-01	ug/L	2.7E-07	mg/kg/day	NA	1/mg/kg-day	NA	NA	mg/kg/day	NA	mg/kg/day	NA
				Arsenic	2.0E+00	ug/L	2.6E-08	mg/kg/day	1.5E+00	1/mg/kg-day	3.9E-08	NA	mg/kg/day	NA	mg/kg/day	NA
				Iron	3.1E+02	ug/L	4.1E-06	mg/kg/day	NA	1/mg/kg-day	NA	NA	mg/kg/day	NA	mg/kg/day	NA
				Manganese	4.9E+01	ug/L	6.6E-07	mg/kg/day	NA	1/mg/kg-day	NA	NA	mg/kg/day	NA	mg/kg/day	NA
				Vanadium	1.7E+00	ug/L	2.3E-08	mg/kg/day	NA	1/mg/kg-day	NA	NA	mg/kg/day	NA	mg/kg/day	NA
			Exp. Route Total								3.9E-08					0.0E+00
		Exposure Point Total									1.6E-05					0.0E+00
	Exposure Medium Total										1.6E-05					0.0E+00
	Air	Deep groundwater - Water Vapors at Showerhead	Inhalation	Chloroform	3.1E+02	ug/L	3.7E-06	mg/kg/day	8.1E-02	1/mg/kg-day	3.0E-07	NA	mg/kg/day	NA	mg/kg/day	NA
			Exp. Route Total								3.0E-07					0.0E+00
		Exposure Point Total									3.0E-07					0.0E+00
	Exposure Medium Total										3.0E-07					0.0E+00
Groundwater											1.6E-05					0.0E+00
Total of Receptor Risks Across All Media											1.6E-05	Total of Receptor Hazards Across All Media				0.0E+00

Notes-
DAevent for exposure to groundwater while bathing calculated on Table 7.3.CT Supplement A and 7.4.CT Supplement A.
EPC for inhalation of volatiles from groundwater from shower calculated on Table 7.3.CT Supplement B.

TABLE 7.174.CT

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS

CENTRAL TENDENCY EXPOSURE

St.Juliens Creek Annex - Site 2

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Soil*	Soil*	At Site 2	Ingestion	Benzo(a)anthracene	2.7E-01	mg/kg	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	1.2E-07	mg/kg/day	NA	NA	NA
				Benzo(a)pyrene	2.6E-01	mg/kg	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	1.2E-07	mg/kg/day	NA	NA	NA
				Benzo(b)fluoranthene	3.1E-01	mg/kg	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	1.4E-07	mg/kg/day	NA	NA	NA
				Dibenz(a,h)anthracene	2.3E-01	mg/kg	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	1.1E-07	mg/kg/day	NA	NA	NA
				4,4'-DDD	1.1E-02	mg/kg	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	5.2E-09	mg/kg/day	NA	NA	NA
				4,4'-DDE	6.8E-02	mg/kg	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	3.1E-08	mg/kg/day	NA	NA	NA
				4,4'-DDT	5.9E-02	mg/kg	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	2.7E-08	mg/kg/day	5.0E-04	mg/kg/day	5.4E-05
				Aluminum	6.0E+03	mg/kg	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	2.7E-03	mg/kg/day	1.0E+00	mg/kg/day	2.7E-03
				Antimony	6.1E-01	mg/kg	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	2.8E-07	mg/kg/day	4.0E-04	mg/kg/day	7.0E-04
				Arsenic	3.7E+00	mg/kg	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	1.7E-06	mg/kg/day	3.0E-04	mg/kg/day	5.6E-03
				Cadmium	2.9E-01	mg/kg	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	1.3E-07	mg/kg/day	1.0E-03	mg/kg/day	1.3E-04
				Chromium	1.9E+01	mg/kg	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	8.6E-06	mg/kg/day	3.0E-03	mg/kg/day	2.9E-03
				Copper	4.2E+01	mg/kg	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	1.9E-05	mg/kg/day	4.0E-02	mg/kg/day	4.8E-04
				Iron	9.0E+03	mg/kg	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	4.1E-03	mg/kg/day	3.0E-01	mg/kg/day	1.4E-02
				Manganese	7.3E+01	mg/kg	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	3.3E-05	mg/kg/day	2.0E-02	mg/kg/day	1.7E-03
				Nickel	9.6E+00	mg/kg	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	4.4E-06	mg/kg/day	2.0E-02	mg/kg/day	2.2E-04
				Thallium	3.9E-01	mg/kg	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	1.8E-07	mg/kg/day	7.0E-05	mg/kg/day	2.6E-03
				Vanadium	2.1E+01	mg/kg	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	9.6E-06	mg/kg/day	7.0E-03	mg/kg/day	1.4E-03
				Zinc	1.6E+02	mg/kg	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	7.5E-05	mg/kg/day	3.0E-01	mg/kg/day	2.5E-04
			Exp. Route Total								0.0E+00					3.2E-02
			Dermal Absorption	Benzo(a)anthracene	2.7E-01	mg/kg	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	3.1E-07	mg/kg/day	NA	NA	NA
				Benzo(a)pyrene	2.6E-01	mg/kg	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	2.9E-07	mg/kg/day	NA	NA	NA
				Benzo(b)fluoranthene	3.1E-01	mg/kg	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	3.6E-07	mg/kg/day	NA	NA	NA
				Dibenz(a,h)anthracene	2.3E-01	mg/kg	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	2.7E-07	mg/kg/day	NA	NA	NA
				4,4'-DDD	1.1E-02	mg/kg	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	3.0E-09	mg/kg/day	NA	NA	NA
				4,4'-DDE	6.8E-02	mg/kg	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	1.8E-08	mg/kg/day	NA	NA	NA
				4,4'-DDT	5.9E-02	mg/kg	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	1.6E-08	mg/kg/day	5.0E-04	mg/kg/day	3.2E-05
				Aluminum	6.0E+03	mg/kg	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	5.3E-04	mg/kg/day	1.0E+00	mg/kg/day	5.3E-04
				Antimony	6.1E-01	mg/kg	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	5.4E-08	mg/kg/day	6.0E-05	mg/kg/day	9.0E-04
				Arsenic	3.7E+00	mg/kg	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	9.7E-07	mg/kg/day	3.0E-04	mg/kg/day	3.2E-03
				Cadmium	2.9E-01	mg/kg	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	2.6E-09	mg/kg/day	2.5E-05	mg/kg/day	1.0E-04
				Chromium	1.9E+01	mg/kg	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	1.7E-06	mg/kg/day	7.5E-05	mg/kg/day	2.2E-02
				Copper	4.2E+01	mg/kg	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	3.7E-06	mg/kg/day	4.0E-02	mg/kg/day	9.3E-05
				Iron	9.0E+03	mg/kg	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	8.0E-04	mg/kg/day	3.0E-01	mg/kg/day	2.7E-03
				Manganese	7.3E+01	mg/kg	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	6.4E-06	mg/kg/day	8.0E-04	mg/kg/day	8.1E-03
				Nickel	9.6E+00	mg/kg	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	8.6E-07	mg/kg/day	8.0E-04	mg/kg/day	1.1E-03
				Thallium	3.9E-01	mg/kg	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	3.5E-08	mg/kg/day	7.0E-05	mg/kg/day	5.0E-04
				Vanadium	2.1E+01	mg/kg	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	1.9E-06	mg/kg/day	1.8E-04	mg/kg/day	1.0E-02
				Zinc	1.6E+02	mg/kg	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	1.4E-05	mg/kg/day	3.0E-01	mg/kg/day	4.8E-05
			Exp. Route Total								0.0E+00					5.0E-02
		Exposure Point Total									0.0E+00					8.2E-02
	Exposure Medium Total										0.0E+00					8.2E-02

TABLE 7.174.CT

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS

CENTRAL TENDENCY EXPOSURE

St.Juliens Creek Annex - Site 2

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Medium Total											0.0E+00					8.2E-02
Surface Water	Surface Water	Drainage Features and Ponded Area	Dermal													
				Chloroform	1.2E+00	UG/L	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	9.3E-08	mg/kg/day	1.0E-02	mg/kg/day	9.3E-06
				Trichloroethene	5.8E+00	UG/L	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	8.4E-07	mg/kg/day	3.0E-04	mg/kg/day	2.8E-03
				Vinyl chloride	2.2E+00	UG/L	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	2.2E-07	mg/kg/day	3.0E-03	mg/kg/day	7.3E-05
				cis-1,2-Dichloroethene	5.3E+00	UG/L	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	7.1E-07	mg/kg/day	1.0E-02	mg/kg/day	7.1E-05
				bis(2-Ethylhexyl)phthalate	5.2E+00	UG/L	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	6.8E-06	mg/kg/day	2.0E-02	mg/kg/day	3.4E-04
				Arsenic	1.9E+00	UG/L	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	1.1E-08	mg/kg/day	3.0E-04	mg/kg/day	3.7E-05
				Chromium	6.8E+00	UG/L	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	7.8E-08	mg/kg/day	7.5E-05	mg/kg/day	1.0E-03
				Iron	2.3E+03	UG/L	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	1.3E-05	mg/kg/day	3.0E-01	mg/kg/day	4.4E-05
				Lead	7.3E+00	UG/L	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	4.2E-08	mg/kg/day	NA	mg/kg/day	NA
				Manganese	1.5E+02	UG/L	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	8.7E-07	mg/kg/day	8.0E-04	mg/kg/day	1.1E-03
				Vanadium	2.9E+00	UG/L	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	1.7E-08	mg/kg/day	2.6E-05	mg/kg/day	6.5E-04
			Exp. Route Total								0.0E+00					6.2E-03
		Exposure Point Total									0.0E+00					6.2E-03
	Exposure Medium Total										0.0E+00					6.2E-03
Medium Total											0.0E+00					6.2E-03
Sediment	Sediment	Drainage Features and Ponded Area	Ingestion													
				Benzo(a)pyrene	3.1E-01	mg/kg	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	1.6E-08	mg/kg/day	NA	mg/kg/day	NA
				Arsenic	5.4E+00	mg/kg	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	2.8E-07	mg/kg/day	3.0E-04	mg/kg/day	9.2E-04
				Chromium	1.7E+02	mg/kg	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	8.4E-06	mg/kg/day	3.0E-03	mg/kg/day	2.8E-03
				Iron	1.0E+04	mg/kg	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	5.2E-04	mg/kg/day	3.0E-01	mg/kg/day	1.7E-03
			Exp. Route Total								0.0E+00					5.5E-03
			Dermal	Benzo(a)pyrene	3.1E-01	mg/kg	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	7.0E-08	mg/kg/day	NA	mg/kg/day	NA
				Arsenic	5.4E+00	mg/kg	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	2.8E-07	mg/kg/day	3.0E-04	mg/kg/day	9.4E-04
				Chromium	1.7E+02	mg/kg	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	2.9E-06	mg/kg/day	7.5E-05	mg/kg/day	3.8E-02
				Iron	1.0E+04	mg/kg	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	1.8E-04	mg/kg/day	3.0E-01	mg/kg/day	5.9E-04
			Exp. Route Total								0.0E+00					4.0E-02
		Exposure Point Total									0.0E+00					4.5E-02
	Exposure Medium Total										0.0E+00					4.5E-02
Medium Total											0.0E+00					4.5E-02

TABLE 7.174.CT

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS

CENTRAL TENDENCY EXPOSURE

St.Juliens Creek Annex - Site 2

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Groundwater	Deep Groundwater	Tap Water	Ingestion	Chloroform	8.3E-01	ug/L	NA	NA	NA	NA	NA	1.1E-05	mg/kg/day	1.0E-02	mg/kg/day	1.1E-03
				Arsenic	2.0E+00	ug/L	NA	NA	NA	NA	NA	2.5E-05	mg/kg/day	3.0E-04	mg/kg/day	8.4E-02
				Iron	3.1E+02	ug/L	NA	NA	NA	NA	NA	3.9E-03	mg/kg/day	3.0E-01	mg/kg/day	1.3E-02
				Manganese	4.9E+01	ug/L	NA	NA	NA	NA	NA	6.3E-04	mg/kg/day	2.0E-02	mg/kg/day	3.2E-02
				Vanadium	1.7E+00	ug/L	NA	NA	NA	NA	NA	2.2E-05	mg/kg/day	1.0E-03	mg/kg/day	2.2E-02
			Exp. Route Total								0.0E+00					1.5E-01
			Dermal	Chloroform	8.3E-01	ug/L	NA	NA	NA	NA	NA	9.1E-07	mg/kg/day	1.0E-02	mg/kg/day	9.1E-05
				Arsenic	2.0E+00	ug/L	NA	NA	NA	NA	NA	8.1E-08	mg/kg/day	3.0E-04	mg/kg/day	2.7E-04
				Iron	3.1E+02	ug/L	NA	NA	NA	NA	NA	1.3E-05	mg/kg/day	3.0E-01	mg/kg/day	4.2E-05
				Manganese	4.9E+01	ug/L	NA	NA	NA	NA	NA	2.0E-06	mg/kg/day	8.0E-04	mg/kg/day	2.5E-03
				Vanadium	1.7E+00	ug/L	NA	NA	NA	NA	NA	7.1E-08	mg/kg/day	2.6E-05	mg/kg/day	2.7E-03
			Exp. Route Total								0.0E+00					5.7E-03
		Exposure Point Total									0.0E+00					1.6E-01
	Exposure Medium Total										0.0E+00					1.6E-01
Groundwater	Air	Deep groundwater - Water Vapors at Showerhead	Inhalation	Chloroform	8.3E-01	ug/L	NA	NA	NA	NA	NA	2.9E-05	mg/kg/day	1.4E-02	mg/kg/day	2.0E-03
			Exp. Route Total								0.0E+00					2.0E-03
		Exposure Point Total									0.0E+00					2.0E-03
	Exposure Medium Total										0.0E+00					2.0E-03
Medium Total											0.0E+00					1.6E-01
									Total of Receptor Risks Across All Media		0.0E+00			Total of Receptor Hazards Across All Media		2.9E-01

* Surface soil & subsurface soil combined.

Notes-

DAevent for exposure to groundwater while bathing calculated on Table 7.3.CT Supplement A.

EPC for inhalation of volatiles from groundwater from shower calculated on Table 7.3.CT Supplement B.

Table 7.14.CT Supplement A
Calculation of DAevent
Resident Adult/Child, Surface Water
St. Juliens Creek Annex - Site 2

Chemical of Potential Concern	Surface Water Concentration (CW) (µg/L)	Permeability Coefficient (Kp) (cm/hr)	B (unitless)	Lag Time (τ_{event}) (hr)	t* (hr)	Fraction Absorbed Water (FA) (dimensionless)	Duration of Event (tevent) (hr)	DAevent (mg/cm^2-event)	Eq
Chloroform	1.2E+00	6.8E-03	2.9E-02	5.0E-01	1.2E+00	1.0E+00	1	1.6E-08	2
Trichloroethene	5.8E+00	1.2E-02	1.0E-01	5.8E-01	1.4E+00	1.0E+00	1	1.5E-07	2
Vinyl chloride	2.2E+00	5.6E-03	1.7E-02	2.4E-01	5.7E-01	1.0E+00	1	3.8E-08	3
cis-1,2-Dichloroethene	5.3E+00	7.7E-03	2.9E-02	3.7E-01	8.9E-01	1.0E+00	1	1.2E-07	3
bis(2-Ethylhexyl)phthalate	5.2E+00	2.5E-02	2.0E-01	1.7E+01	4.0E+01	8.0E-01	1	1.2E-06	2
Arsenic	1.9E+00	1.0E-03	NA	NA	NA	NA	1	1.9E-09	1
Chromium	6.8E+00	2.0E-03	NA	NA	NA	NA	1	1.4E-08	1
Iron	2.3E+03	1.0E-03	NA	NA	NA	NA	1	2.3E-06	1
Lead	7.3E+00	1.0E-03	NA	NA	NA	NA	1	7.3E-09	1
Manganese	1.5E+02	1.0E-03	NA	NA	NA	NA	1	1.5E-07	1
Vanadium	2.9E+00	1.0E-03	NA	NA	NA	NA	1	2.9E-09	1

Values for trans-1,2-dichloroethene applied as surrogates for cis-1,2-dichloroethene.

Inorganics: DAevent (mg/cm2-event) =

Kp x CW x tevent x 0.001 mg/ug x 0.001 l/cm^3 (eq 1)

Organics: DAevent (mg/cm2-event) =

tevent<t*: DAevent (mg/cm2-event) =

2 x FA x Kp x CW x (sqrt((6 x τ_{event} x tevent)/π)) x 0.001 mg/ug x 0.001 l/cm^3 (eq 2)

tevent>t*: DAevent (mg/cm2-event) =

FA x Kp x CW x (tevent/(1+B) + 2 x τ_{event} x ((1 + 3xB + $3xB^2$)/$(1+B)^2$) x 0.001 mg/ug x 0.001 l/cm3 (eq 3)

Notes:

Permeability constants from EPA 2001, Risk Assessment Guidance for Superfund Volume I: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment). EPA/540/R/99/005.

NA - not applicable.

TABLE 7.15.CT

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS

CENTRAL TENDENCY EXPOSURE

St.Juliens Creek Annex - Site 2

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Soil*	Soil*	At Site 2	Ingestion	Benzo(a)anthracene	2.7E-01	mg/kg	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	1.1E-06	mg/kg/day	NA	NA	NA
				Benzo(a)pyrene	2.6E-01	mg/kg	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	1.1E-06	mg/kg/day	NA	NA	NA
				Benzo(b)fluoranthene	3.1E-01	mg/kg	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	1.3E-06	mg/kg/day	NA	NA	NA
				Dibenz(a,h)anthracene	2.3E-01	mg/kg	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	1.0E-06	mg/kg/day	NA	NA	NA
				4,4'-DDD	1.1E-02	mg/kg	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	4.9E-08	mg/kg/day	NA	NA	NA
				4,4'-DDE	6.8E-02	mg/kg	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	2.9E-07	mg/kg/day	NA	NA	NA
				4,4'-DDT	5.9E-02	mg/kg	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	2.5E-07	mg/kg/day	5.0E-04	mg/kg/day	5.1E-04
				Aluminum	6.0E+03	mg/kg	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	2.5E-02	mg/kg/day	1.0E+00	mg/kg/day	2.5E-02
				Antimony	6.1E-01	mg/kg	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	2.6E-06	mg/kg/day	4.0E-04	mg/kg/day	6.5E-03
				Arsenic	3.7E+00	mg/kg	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	1.6E-05	mg/kg/day	3.0E-04	mg/kg/day	5.2E-02
				Cadmium	2.9E-01	mg/kg	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	1.2E-06	mg/kg/day	5.0E-04	mg/kg/day	2.5E-03
				Chromium	1.9E+01	mg/kg	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	8.0E-05	mg/kg/day	3.0E-03	mg/kg/day	2.7E-02
				Copper	4.2E+01	mg/kg	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	1.8E-04	mg/kg/day	4.0E-02	mg/kg/day	4.5E-03
				Iron	9.0E+03	mg/kg	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	3.8E-02	mg/kg/day	3.0E-01	mg/kg/day	1.3E-01
				Manganese	7.3E+01	mg/kg	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	3.1E-04	mg/kg/day	2.0E-02	mg/kg/day	1.6E-02
				Nickel	9.6E+00	mg/kg	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	4.1E-05	mg/kg/day	2.0E-02	mg/kg/day	2.1E-03
				Thallium	3.9E-01	mg/kg	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	1.7E-06	mg/kg/day	7.0E-05	mg/kg/day	2.4E-02
				Vanadium	2.1E+01	mg/kg	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	8.9E-05	mg/kg/day	7.0E-03	mg/kg/day	1.3E-02
				Zinc	1.6E+02	mg/kg	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	7.0E-04	mg/kg/day	3.0E-01	mg/kg/day	2.3E-03
			Exp. Route Total								0.0E+00					3.0E-01
			Dermal Absorption	Benzo(a)anthracene	2.7E-01	mg/kg	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	5.2E-07	mg/kg/day	NA	NA	NA
				Benzo(a)pyrene	2.6E-01	mg/kg	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	4.9E-07	mg/kg/day	NA	NA	NA
				Benzo(b)fluoranthene	3.1E-01	mg/kg	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	5.9E-07	mg/kg/day	NA	NA	NA
				Dibenz(a,h)anthracene	2.3E-01	mg/kg	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	4.5E-07	mg/kg/day	NA	NA	NA
				4,4'-DDD	1.1E-02	mg/kg	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	5.1E-09	mg/kg/day	NA	NA	NA
				4,4'-DDE	6.8E-02	mg/kg	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	3.0E-08	mg/kg/day	NA	NA	NA
				4,4'-DDT	5.9E-02	mg/kg	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	2.6E-08	mg/kg/day	5.0E-04	mg/kg/day	5.3E-05
				Aluminum	6.0E+03	mg/kg	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	8.8E-04	mg/kg/day	1.0E+00	mg/kg/day	8.8E-04
				Antimony	6.1E-01	mg/kg	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	9.0E-08	mg/kg/day	6.0E-05	mg/kg/day	1.5E-03
				Arsenic	3.7E+00	mg/kg	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	1.6E-06	mg/kg/day	3.0E-04	mg/kg/day	5.4E-03
				Cadmium	2.9E-01	mg/kg	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	4.2E-09	mg/kg/day	5.0E-05	mg/kg/day	8.5E-05
				Chromium	1.9E+01	mg/kg	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	2.8E-06	mg/kg/day	7.5E-05	mg/kg/day	3.7E-02
				Copper	4.2E+01	mg/kg	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	6.2E-06	mg/kg/day	4.0E-02	mg/kg/day	1.5E-04
				Iron	9.0E+03	mg/kg	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	1.3E-03	mg/kg/day	3.0E-01	mg/kg/day	4.4E-03
				Manganese	7.3E+01	mg/kg	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	1.1E-05	mg/kg/day	8.0E-04	mg/kg/day	1.3E-02
				Nickel	9.6E+00	mg/kg	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	1.4E-06	mg/kg/day	8.0E-04	mg/kg/day	1.8E-03
				Thallium	3.9E-01	mg/kg	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	5.8E-08	mg/kg/day	7.0E-05	mg/kg/day	8.3E-04
				Vanadium	2.1E+01	mg/kg	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	3.1E-06	mg/kg/day	1.8E-04	mg/kg/day	1.7E-02
				Zinc	1.6E+02	mg/kg	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	2.4E-05	mg/kg/day	3.0E-01	mg/kg/day	8.0E-05
			Exp. Route Total								0.0E+00					8.2E-02
		Exposure Point Total									0.0E+00					3.9E-01
	Exposure Medium Total										0.0E+00					3.9E-01
Medium Total											0.0E+00					3.9E-01

TABLE 7.15.CT

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS

CENTRAL TENDENCY EXPOSURE

St.Juliens Creek Annex - Site 2

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Surface Water	Surface Water	Drainage Features and Ponded Area	Dermal	Chloroform	1.2E+00	UG/L	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	1.4E-07	mg/kg/day	1.0E-02	mg/kg/day	1.4E-05
				Trichloroethene	5.8E+00	UG/L	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	1.3E-06	mg/kg/day	3.0E-04	mg/kg/day	4.3E-03
				Vinyl chloride	2.2E+00	UG/L	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	3.3E-07	mg/kg/day	3.0E-03	mg/kg/day	1.1E-04
				cis-1,2-Dichloroethene	5.3E+00	UG/L	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	1.1E-06	mg/kg/day	1.0E-02	mg/kg/day	1.1E-04
				bis(2-Ethylhexyl)phthalate	5.2E+00	UG/L	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	1.0E-05	mg/kg/day	2.0E-02	mg/kg/day	5.2E-04
				Arsenic	1.9E+00	UG/L	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	1.7E-08	mg/kg/day	3.0E-04	mg/kg/day	5.7E-05
				Chromium	6.8E+00	UG/L	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	1.2E-07	mg/kg/day	7.5E-05	mg/kg/day	1.6E-03
				Iron	2.3E+03	UG/L	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	2.0E-05	mg/kg/day	3.0E-01	mg/kg/day	6.7E-05
				Lead	7.3E+00	UG/L	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	6.4E-08	mg/kg/day	NA	NA	NA
				Manganese	1.5E+02	UG/L	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	1.3E-06	mg/kg/day	8.0E-04	mg/kg/day	1.7E-03
				Vanadium	2.9E+00	UG/L	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	2.6E-08	mg/kg/day	2.6E-05	mg/kg/day	9.9E-04
			Exp. Route Total								0.0E+00					9.4E-03
		Exposure Point Total									0.0E+00					9.4E-03
	Exposure Medium Total										0.0E+00					9.4E-03
Medium Total											0.0E+00					9.4E-03
Sediment	Sediment	Drainage Features and Ponded Area	Ingestion	Benzo(a)pyrene	3.1E-01	mg/kg	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	1.5E-07	mg/kg/day	NA	NA	NA
				Arsenic	5.4E+00	mg/kg	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	2.6E-06	mg/kg/day	3.0E-04	mg/kg/day	8.6E-03
				Chromium	1.7E+02	mg/kg	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	7.8E-05	mg/kg/day	3.0E-03	mg/kg/day	2.6E-02
				Iron	1.0E+04	mg/kg	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	4.9E-03	mg/kg/day	3.0E-01	mg/kg/day	1.6E-02
			Exp. Route Total								0.0E+00					5.1E-02
			Dermal	Benzo(a)pyrene	3.1E-01	mg/kg	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	1.2E-06	mg/kg/day	NA	NA	NA
				Arsenic	5.4E+00	mg/kg	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	4.7E-06	mg/kg/day	3.0E-04	mg/kg/day	1.6E-02
				Chromium	1.7E+02	mg/kg	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	4.8E-05	mg/kg/day	7.5E-05	mg/kg/day	6.4E-01
				Iron	1.0E+04	mg/kg	NA	mg/kg/day	NA	1/(mg/kg-day)	NA	3.0E-03	mg/kg/day	3.0E-01	mg/kg/day	9.9E-03
			Exp. Route Total								0.0E+00					6.7E-01
		Exposure Point Total									0.0E+00					7.2E-01
	Exposure Medium Total										0.0E+00					7.2E-01
Medium Total											0.0E+00					7.2E-01

TABLE 7.15.CT

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS

CENTRAL TENDENCY EXPOSURE

St.Juliens Creek Annex - Site 2

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Groundwater	Deep Groundwater	Tap Water	Ingestion	Chloroform	8.3E-01	ug/L	NA	NA	NA	NA	NA	3.5E-05	mg/kg/day	1.0E-02	mg/kg/day	3.5E-03
				Arsenic	2.0E+00	ug/L	NA	NA	NA	NA	NA	8.4E-05	mg/kg/day	3.0E-04	mg/kg/day	2.8E-01
				Iron	3.1E+02	ug/L	NA	NA	NA	NA	NA	1.3E-02	mg/kg/day	3.0E-01	mg/kg/day	4.4E-02
				Manganese	4.9E+01	ug/L	NA	NA	NA	NA	NA	2.1E-03	mg/kg/day	2.0E-02	mg/kg/day	1.1E-01
				Vanadium	1.7E+00	ug/L	NA	NA	NA	NA	NA	7.4E-05	mg/kg/day	1.0E-03	mg/kg/day	7.4E-02
			Exp. Route Total								0.0E+00					5.1E-01
			Dermal	Chloroform	8.3E-01	ug/L	NA	NA	NA	NA	NA	1.8E-06	mg/kg/day	1.0E-02	mg/kg/day	1.8E-04
				Arsenic	2.0E+00	ug/L	NA	NA	NA	NA	NA	1.8E-07	mg/kg/day	3.0E-04	mg/kg/day	6.1E-04
				Iron	3.1E+02	ug/L	NA	NA	NA	NA	NA	2.8E-05	mg/kg/day	3.0E-01	mg/kg/day	9.5E-05
				Manganese	4.9E+01	ug/L	NA	NA	NA	NA	NA	4.6E-06	mg/kg/day	8.0E-04	mg/kg/day	5.7E-03
				Vanadium	1.7E+00	ug/L	NA	NA	NA	NA	NA	1.6E-07	mg/kg/day	2.6E-05	mg/kg/day	6.2E-03
			Exp. Route Total								0.0E+00					1.3E-02
		Exposure Point Total									0.0E+00					5.2E-01
	Exposure Medium Total										0.0E+00					5.2E-01
Medium Total											0.0E+00					5.2E-01
										Total of Receptor Risks Across All Media	0.0E+00				Total of Receptor Hazards Across All Media	1.6E+00

* Surface soil & subsurface soil combined.

Notes-

DAevent for exposure to groundwater while bathing calculated on Table 7.4.CT Supplement A.

Table 7.15.CT Supplement
Calculation of DAevent
Resident Child Surface Water
St. Juliens Creek Annex - Site 2

Chemical of Potential Concern	Surface Water Concentration (CW) (μg/L)	Permeability Coefficient (Kp) (cm/hr)	B (unitless)	Lag Time (τ_{event}) (hr)	t* (hr)	Fraction Absorbed Water (FA) (dimensionless)	Duration of Event (tevent) (hr)	DAevent (mg/cm^2-event)	Eq
Chloroform	1.22E+00	6.8E-03	2.9E-02	5.0E-01	1.2E+00	1.0E+00	1	1.6E-08	2
Trichloroethene	5.76E+00	1.2E-02	1.0E-01	5.8E-01	1.4E+00	1.0E+00	1	1.5E-07	2
Vinyl chloride	2.25E+00	5.6E-03	1.7E-02	2.4E-01	5.7E-01	1.0E+00	1	3.8E-08	3
cis-1,2-Dichloroethene	5.31E+00	7.7E-03	2.9E-02	3.7E-01	8.9E-01	1.0E+00	1	1.2E-07	3
bis(2-Ethylhexyl)phthalate	5.22E+00	2.5E-02	2.0E-01	1.7E+01	4.0E+01	8.0E-01	1	1.2E-06	2
Arsenic	1.95E+00	1.0E-03	NA	NA	NA	NA	1	1.9E-09	1
Chromium	6.77E+00	2.0E-03	NA	NA	NA	NA	1	1.4E-08	1
Iron	2.29E+03	1.0E-03	NA	NA	NA	NA	1	2.3E-06	1
Lead	7.27E+00	1.0E-03	NA	NA	NA	NA	1	7.3E-09	1
Manganese	1.51E+02	1.0E-03	NA	NA	NA	NA	1	1.5E-07	1
Vanadium	2.9E+00	1.0E-03	NA	NA	NA	NA	1	2.9E-09	1

Values for trans-1,2-dichloroethene applied as surrogates for cis-1,2-dichloroethene.

Inorganics: DAevent (mg/cm2-event) =

Kp x CW x tevent x 0.001 mg/ug x 0.001 l/cm^3 (eq 1)

Organics: DAevent (mg/cm2-event) =

tevent<t*: DAevent (mg/cm2-event) =

2 x FA x Kp x CW x (sqrt((6 x τ_{event} x tevent)/π)) x 0.001 mg/ug x 0.001 l/cm^3 (eq 2)

tevent>t*: DAevent (mg/cm2-event) =

FA x Kp x CW x (tevent/(1+B) + 2 x τ_{event} x ((1 + 3xB + $3xB^2$)/$(1+B)^2$) x 0.001 mg/ug x 0.001 l/cm3 (eq 3)

Notes:

Permeability constants from EPA 2001, Risk Assessment Guidance for Superfund Volume I: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment). EPA/540/R/99/005.

NA - not applicable.

TABLE 7.16.CT

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS

CENTRAL TENDENCY EXPOSURE

St.Juliens Creek Annex - Site 2

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult/Child

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Soil*	Soil*	At Site 2	Ingestion	Benzo(a)anthracene	2.7E-01	mg/kg	1.1E-07	mg/kg/day	7.3E-01	1/(mg/kg-day)	8.3E-08	NA	mg/kg/day	NA	NA	NA
				Benzo(a)pyrene	2.6E-01	mg/kg	1.1E-07	mg/kg/day	7.3E+00	1/(mg/kg-day)	7.9E-07	NA	mg/kg/day	NA	NA	NA
				Benzo(b)fluoranthene	3.1E-01	mg/kg	1.3E-07	mg/kg/day	7.3E-01	1/(mg/kg-day)	9.6E-08	NA	mg/kg/day	NA	NA	NA
				Dibenz(a,h)anthracene	2.3E-01	mg/kg	9.9E-08	mg/kg/day	7.3E+00	1/(mg/kg-day)	7.2E-07	NA	mg/kg/day	NA	NA	NA
				4,4'-DDD	1.1E-02	mg/kg	4.9E-09	mg/kg/day	2.4E-01	1/(mg/kg-day)	1.2E-09	NA	mg/kg/day	NA	NA	NA
				4,4'-DDE	6.8E-02	mg/kg	2.9E-08	mg/kg/day	3.4E-01	1/(mg/kg-day)	9.9E-09	NA	mg/kg/day	NA	NA	NA
				4,4'-DDT	5.9E-02	mg/kg	2.5E-08	mg/kg/day	3.4E-01	1/(mg/kg-day)	8.6E-09	NA	mg/kg/day	NA	NA	NA
				Aluminum	6.0E+03	mg/kg	2.5E-03	mg/kg/day	NA	NA	NA	NA	mg/kg/day	NA	NA	NA
				Antimony	6.1E-01	mg/kg	2.6E-07	mg/kg/day	NA	NA	NA	NA	mg/kg/day	NA	NA	NA
				Arsenic	3.7E+00	mg/kg	1.6E-06	mg/kg/day	1.5E+00	1/(mg/kg-day)	2.3E-06	NA	mg/kg/day	NA	NA	NA
				Cadmium	2.9E-01	mg/kg	1.2E-07	mg/kg/day	NA	NA	NA	NA	mg/kg/day	NA	NA	NA
				Chromium	1.9E+01	mg/kg	8.0E-06	mg/kg/day	NA	NA	NA	NA	mg/kg/day	NA	NA	NA
				Copper	4.2E+01	mg/kg	1.8E-05	mg/kg/day	NA	NA	NA	NA	mg/kg/day	NA	NA	NA
				Iron	9.0E+03	mg/kg	3.8E-03	mg/kg/day	NA	NA	NA	NA	mg/kg/day	NA	NA	NA
				Manganese	7.3E+01	mg/kg	3.1E-05	mg/kg/day	NA	NA	NA	NA	mg/kg/day	NA	NA	NA
				Nickel	9.6E+00	mg/kg	4.1E-06	mg/kg/day	NA	NA	NA	NA	mg/kg/day	NA	NA	NA
				Thallium	3.9E-01	mg/kg	1.7E-07	mg/kg/day	NA	NA	NA	NA	mg/kg/day	NA	NA	NA
				Vanadium	2.1E+01	mg/kg	8.9E-06	mg/kg/day	NA	NA	NA	NA	mg/kg/day	NA	NA	NA
				Zinc	1.6E+02	mg/kg	6.9E-05	mg/kg/day	NA	NA	NA	NA	mg/kg/day	NA	NA	NA
			Exp. Route Total								4.0E-06					0.0E+00
			Dermal Absorption	Benzo(a)anthracene	2.7E-01	mg/kg	8.4E-08	mg/kg/day	7.3E-01	1/(mg/kg-day)	6.1E-08	NA	mg/kg/day	NA	NA	NA
				Benzo(a)pyrene	2.6E-01	mg/kg	8.0E-08	mg/kg/day	7.3E+00	1/(mg/kg-day)	5.8E-07	NA	mg/kg/day	NA	NA	NA
				Benzo(b)fluoranthene	3.1E-01	mg/kg	9.6E-08	mg/kg/day	7.3E-01	1/(mg/kg-day)	7.0E-08	NA	mg/kg/day	NA	NA	NA
				Dibenz(a,h)anthracene	2.3E-01	mg/kg	7.3E-08	mg/kg/day	7.3E+00	1/(mg/kg-day)	5.3E-07	NA	mg/kg/day	NA	NA	NA
				4,4'-DDD	1.1E-02	mg/kg	8.3E-10	mg/kg/day	2.4E-01	1/(mg/kg-day)	2.0E-10	NA	mg/kg/day	NA	NA	NA
				4,4'-DDE	6.8E-02	mg/kg	4.9E-09	mg/kg/day	3.4E-01	1/(mg/kg-day)	1.7E-09	NA	mg/kg/day	NA	NA	NA
				4,4'-DDT	5.9E-02	mg/kg	4.3E-09	mg/kg/day	3.4E-01	1/(mg/kg-day)	1.5E-09	NA	mg/kg/day	NA	NA	NA
				Aluminum	6.0E+03	mg/kg	1.4E-04	mg/kg/day	NA	NA	NA	NA	mg/kg/day	NA	NA	NA
				Antimony	6.1E-01	mg/kg	1.5E-08	mg/kg/day	NA	NA	NA	NA	mg/kg/day	NA	NA	NA
				Arsenic	3.7E+00	mg/kg	2.6E-07	mg/kg/day	1.5E+00	1/(mg/kg-day)	4.0E-07	NA	mg/kg/day	NA	NA	NA
				Cadmium	2.9E-01	mg/kg	6.9E-10	mg/kg/day	NA	NA	NA	NA	mg/kg/day	NA	NA	NA
				Chromium	1.9E+01	mg/kg	4.5E-07	mg/kg/day	NA	NA	NA	NA	mg/kg/day	NA	NA	NA
				Copper	4.2E+01	mg/kg	1.0E-06	mg/kg/day	NA	NA	NA	NA	mg/kg/day	NA	NA	NA
				Iron	9.0E+03	mg/kg	2.2E-04	mg/kg/day	NA	NA	NA	NA	mg/kg/day	NA	NA	NA
				Manganese	7.3E+01	mg/kg	1.7E-06	mg/kg/day	NA	NA	NA	NA	mg/kg/day	NA	NA	NA
				Nickel	9.6E+00	mg/kg	2.3E-07	mg/kg/day	NA	NA	NA	NA	mg/kg/day	NA	NA	NA
				Thallium	3.9E-01	mg/kg	9.4E-09	mg/kg/day	NA	NA	NA	NA	mg/kg/day	NA	NA	NA
				Vanadium	2.1E+01	mg/kg	5.0E-07	mg/kg/day	NA	NA	NA	NA	mg/kg/day	NA	NA	NA
				Zinc	1.6E+02	mg/kg	3.9E-06	mg/kg/day	NA	NA	NA	NA	mg/kg/day	NA	NA	NA
			Exp. Route Total								1.6E-06					0.0E+00
		Exposure Point Total									5.7E-06					0.0E+00
	Exposure Medium Total										5.7E-06					0.0E+00
Medium Total											5.7E-06					0.0E+00

TABLE 7.16.CT

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS

CENTRAL TENDENCY EXPOSURE

St.Juliens Creek Annex - Site 2

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult/Child

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Surface Water	Surface Water	Drainage Features and Ponded Area	Dermal	Chloroform	1.2E+00	UG/L	2.4E-08	mg/kg/day	NA	NA	NA	NA	mg/kg/day	NA	mg/kg/day	NA
				Trichloroethene	5.8E+00	UG/L	2.2E-07	mg/kg/day	4.0E-01	1/(mg/kg-day)	8.7E-08	NA	mg/kg/day	NA	mg/kg/day	NA
				Vinyl chloride	2.2E+00	UG/L	5.7E-08	mg/kg/day	1.4E+00	1/(mg/kg-day)	8.0E-08	NA	mg/kg/day	NA	mg/kg/day	NA
				cis-1,2-Dichloroethene	5.3E+00	UG/L	1.9E-07	mg/kg/day	NA	NA	NA	NA	mg/kg/day	NA	mg/kg/day	NA
				bis(2-Ethylhexyl)phthalate	5.2E+00	UG/L	1.8E-06	mg/kg/day	1.4E-02	1/(mg/kg-day)	2.5E-08	NA	mg/kg/day	NA	mg/kg/day	NA
				Arsenic	1.9E+00	UG/L	2.9E-09	mg/kg/day	1.5E+00	1/(mg/kg-day)	4.4E-09	NA	mg/kg/day	NA	mg/kg/day	NA
				Chromium	6.8E+00	UG/L	2.0E-08	mg/kg/day	NA	NA	NA	NA	mg/kg/day	NA	mg/kg/day	NA
				Iron	2.3E+03	UG/L	3.4E-06	mg/kg/day	NA	NA	NA	NA	mg/kg/day	NA	mg/kg/day	NA
				Lead	7.3E+00	UG/L	1.1E-08	mg/kg/day	NA	NA	NA	NA	mg/kg/day	NA	NA	NA
				Manganese	1.5E+02	UG/L	2.3E-07	mg/kg/day	NA	NA	NA	NA	mg/kg/day	NA	mg/kg/day	NA
				Manganese	2.9E+00	UG/L	4.4E-09	mg/kg/day	NA	NA	NA	NA	mg/kg/day	NA	mg/kg/day	NA
			Exp. Route Total								2.0E-07					0.0E+00
		Exposure Point Total									2.0E-07					0.0E+00
	Exposure Medium Total										2.0E-07					0.0E+00
Medium Total											2.0E-07					0.0E+00
Sediment	Sediment	Drainage Features and Ponded Area	Ingestion	Benzo(a)pyrene	3.1E-01	mg/kg	1.5E-08	mg/kg/day	7.3E+00	1/(mg/kg-day)	1.1E-07	NA	mg/kg/day	NA	mg/kg/day	NA
				Arsenic	5.4E+00	mg/kg	2.6E-07	mg/kg/day	1.5E+00	1/(mg/kg-day)	3.8E-07	NA	mg/kg/day	NA	mg/kg/day	NA
				Chromium	1.7E+02	mg/kg	7.8E-06	mg/kg/day	NA	NA	NA	NA	mg/kg/day	NA	mg/kg/day	NA
				Iron	1.0E+04	mg/kg	4.8E-04	mg/kg/day	NA	NA	NA	NA	mg/kg/day	NA	mg/kg/day	NA
			Exp. Route Total								4.9E-07					0.0E+00
			Dermal	Benzo(a)pyrene	3.1E-01	mg/kg	1.1E-07	mg/kg/day	7.3E+00	1/(mg/kg-day)	7.9E-07	NA	mg/kg/day	NA	mg/kg/day	NA
				Arsenic	5.4E+00	mg/kg	4.4E-07	mg/kg/day	1.5E+00	1/(mg/kg-day)	6.6E-07	NA	mg/kg/day	NA	mg/kg/day	NA
				Chromium	1.7E+02	mg/kg	4.5E-06	mg/kg/day	NA	NA	NA	NA	mg/kg/day	NA	mg/kg/day	NA
				Iron	1.0E+04	mg/kg	2.8E-04	mg/kg/day	NA	NA	NA	NA	mg/kg/day	NA	mg/kg/day	NA
			Exp. Route Total								1.5E-06					0.0E+00
		Exposure Point Total									1.9E-06					0.0E+00
	Exposure Medium Total										1.9E-06					0.0E+00
Medium Total											1.9E-06					0.0E+00

TABLE 7.16.CT

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS

CENTRAL TENDENCY EXPOSURE

St.Juliens Creek Annex - Site 2

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult/Child

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Groundwater	Deep Groundwater	Tap Water	Ingestion	Chloroform	8.3E-01	ug/L	4.4E-06	mg/kg/day	NA	NA	NA	NA	mg/kg/day	NA	mg/kg/day	NA
				Arsenic	2.0E+00	ug/L	1.0E-05	mg/kg/day	1.5E+00	1/mg/kg-day	1.6E-05	NA	mg/kg/day	NA	mg/kg/day	NA
				Iron	3.1E+02	ug/L	1.6E-03	mg/kg/day	NA	NA	NA	NA	mg/kg/day	NA	mg/kg/day	NA
				Manganese	4.9E+01	ug/L	2.6E-04	mg/kg/day	NA	NA	NA	NA	mg/kg/day	NA	mg/kg/day	NA
				Vanadium	1.7E+00	ug/L	9.1E-06	mg/kg/day	NA	NA	NA	NA	mg/kg/day	NA	mg/kg/day	NA
			Exp. Route Total								1.6E-05					0.0E+00
			Dermal	Chloroform	8.3E-01	ug/L	2.7E-07	mg/kg/day	NA	1/mg/kg-day	NA	NA	mg/kg/day	NA	mg/kg/day	NA
				Arsenic	2.0E+00	ug/L	2.6E-08	mg/kg/day	1.5E+00	1/mg/kg-day	3.9E-08	NA	mg/kg/day	NA	mg/kg/day	NA
				Iron	3.1E+02	ug/L	4.1E-06	mg/kg/day	NA	1/mg/kg-day	NA	NA	mg/kg/day	NA	mg/kg/day	NA
				Manganese	4.9E+01	ug/L	6.6E-07	mg/kg/day	NA	1/mg/kg-day	NA	NA	mg/kg/day	NA	mg/kg/day	NA
				Vanadium	1.7E+00	ug/L	2.3E-08	mg/kg/day	NA	1/mg/kg-day	NA	NA	mg/kg/day	NA	mg/kg/day	NA
			Exp. Route Total								3.9E-08					0.0E+00
		Exposure Point Total									1.6E-05					0.0E+00
	Exposure Medium Total										1.6E-05					0.0E+00
	Air	Deep groundwater - Water Vapors at Showerhead	Inhalation	Chloroform	3.1E+02	ug/L	3.7E-06	mg/kg/day	8.1E-02	1/mg/kg-day	3.0E-07	NA	mg/kg/day	NA	mg/kg/day	NA
			Exp. Route Total								3.0E-07					0.0E+00
		Exposure Point Total									3.0E-07					0.0E+00
	Exposure Medium Total										3.0E-07					0.0E+00
Medium Total											1.6E-05					0.0E+00
									Total of Receptor Risks Across All Media		2.4E-05	Total of Receptor Hazards Across All Media				0.0E+00

* Surface soil & subsurface soil combined.

Notes-

DAevent for exposure to groundwater while bathing calculated on Table 7.3.CT Supplement A and 7.4.CT Supplement A.

EPC for inhalation of volatiles from groundwater from shower calculated on Table 7.3.CT Supplement B.

TABLE 7.17.CT

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS

CENTRAL TENDENCY EXPOSURE

St.Juliens Creek Annex - Site 2

Scenario Timeframe: Future
Receptor Population: Construction worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Soil*	Soil*	At Site 2	Ingestion	Benzo(a)pyrene	2.6E-01	mg/kg	3.6E-09	mg/kg/day	7.3E+00	1/(mg/kg-day)	2.6E-08	2.5E-07	mg/kg/day	NA	NA	NA
				4,4'-DDT	5.9E-02	mg/kg	8.3E-10	mg/kg/day	3.4E-01	1/(mg/kg-day)	2.8E-10	5.8E-08	mg/kg/day	5.0E-04	mg/kg/day	1.2E-04
				Antimony	6.1E-01	mg/kg	8.5E-09	mg/kg/day	NA	NA	NA	5.9E-07	mg/kg/day	4.0E-04	mg/kg/day	1.5E-03
				Arsenic	3.7E+00	mg/kg	5.1E-08	mg/kg/day	1.5E+00	1/(mg/kg-day)	7.7E-08	3.6E-06	mg/kg/day	3.0E-04	mg/kg/day	1.2E-02
				Copper	4.2E+01	mg/kg	5.9E-07	mg/kg/day	NA	NA	NA	4.1E-05	mg/kg/day	4.0E-02	mg/kg/day	1.0E-03
				Iron	9.0E+03	mg/kg	1.3E-04	mg/kg/day	NA	NA	NA	8.8E-03	mg/kg/day	3.0E-01	mg/kg/day	2.9E-02
				Vanadium	2.1E+01	mg/kg	2.9E-07	mg/kg/day	NA	NA	NA	2.0E-05	mg/kg/day	7.0E-03	mg/kg/day	2.9E-03
			Exp. Route Total								1.0E-07					4.7E-02
Soil*	Soil*	At Site 2	Dermal Absorption	Benzo(a)pyrene	2.6E-01	mg/kg	6.1E-10	mg/kg/day	7.3E+00	1/(mg/kg-day)	4.4E-09	4.2E-08	mg/kg/day	NA	NA	NA
				4,4'-DDT	5.9E-02	mg/kg	3.3E-11	mg/kg/day	3.4E-01	1/(mg/kg-day)	1.1E-11	2.3E-09	mg/kg/day	5.0E-04	mg/kg/day	4.6E-06
				Antimony	6.1E-01	mg/kg	1.1E-10	mg/kg/day	NA	NA	NA	7.8E-09	mg/kg/day	6.0E-05	mg/kg/day	1.3E-04
				Arsenic	3.7E+00	mg/kg	2.0E-09	mg/kg/day	1.5E+00	1/(mg/kg-day)	3.0E-09	1.4E-07	mg/kg/day	3.0E-04	mg/kg/day	4.7E-04
				Copper	4.2E+01	mg/kg	7.7E-09	mg/kg/day	NA	NA	NA	5.4E-07	mg/kg/day	4.0E-02	mg/kg/day	1.3E-05
				Iron	9.0E+03	mg/kg	1.6E-06	mg/kg/day	NA	NA	NA	1.1E-04	mg/kg/day	3.0E-01	mg/kg/day	3.8E-04
				Vanadium	2.1E+01	mg/kg	3.8E-09	mg/kg/day	NA	NA	NA	2.7E-07	mg/kg/day	1.8E-04	mg/kg/day	1.5E-03
			Exp. Route Total								7.4E-09					2.5E-03
		Exposure Point Total									1.1E-07					4.9E-02
	Exposure Medium Total										1.1E-07					4.9E-02
	Air	Emission from Soil at Site 2	Inhalation	Chromium	1.4E-08	mg/m3	9.9E-12	mg/kg/day	4.1E+01	1/(mg/kg-day)	4.1E-10	6.9E-10	mg/kg/day	3.0E-05	NA	2.3E-05
			Exp. Route Total								4.1E-10					2.3E-05
		Exposure Point Total									4.1E-10					2.3E-05
	Exposure Medium Total										4.1E-10					2.3E-05
Medium Total											1.1E-07					4.9E-02

TABLE 7.17.CT

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS

CENTRAL TENDENCY EXPOSURE

St.Juliens Creek Annex - Site 2

Scenario Timeframe: Future
Receptor Population: Construction worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Groundwater	Shallow Groundwater	Water Table	Dermal	1,4-Dichlorobenzene	5.3E-01	UG/L	8.9E-08	mg/kg/day	2.4E-02	1/(mg/kg-day)	2.1E-09	6.2E-06	mg/kg/day	3.0E-02	mg/kg/day	2.1E-04
				Trichloroethene	5.5E-01	UG/L	2.6E-08	mg/kg/day	4.0E-01	1/(mg/kg-day)	1.0E-08	1.8E-06	mg/kg/day	3.0E-04	mg/kg/day	6.0E-03
				Heptachlor	3.0E-02	UG/L	1.3E-09	mg/kg/day	4.5E+00	1/(mg/kg-day)	5.8E-09	9.0E-08	mg/kg/day	5.0E-04	mg/kg/day	1.8E-04
				RDX	2.8E+00	UG/L	1.2E-09	mg/kg/day	1.1E-01	1/(mg/kg-day)	1.3E-10	8.4E-08	mg/kg/day	3.0E-03	mg/kg/day	2.8E-05
				Aluminum	7.3E+02	UG/L	9.0E-07	mg/kg/day	NA	NA	NA	6.3E-05	mg/kg/day	1.0E+00	mg/kg/day	6.3E-05
				Arsenic	2.7E+00	UG/L	3.4E-09	mg/kg/day	1.5E+00	1/(mg/kg-day)	5.0E-09	2.3E-07	mg/kg/day	3.0E-04	mg/kg/day	7.8E-04
				Barium	1.0E+02	UG/L	1.3E-07	mg/kg/day	NA	NA	NA	9.1E-06	mg/kg/day	4.9E-03	mg/kg/day	1.9E-03
				Chromium	5.2E+00	UG/L	1.3E-08	mg/kg/day	NA	NA	NA	9.1E-07	mg/kg/day	5.0E-04	mg/kg/day	1.8E-03
				Iron	7.0E+03	UG/L	8.7E-06	mg/kg/day	NA	NA	NA	6.1E-04	mg/kg/day	3.0E-01	mg/kg/day	2.0E-03
				Lead	2.4E+00	UG/L	3.0E-10	mg/kg/day	NA	NA	NA	2.1E-08	mg/kg/day	NA	NA	NA
				Manganese	7.0E+02	UG/L	8.6E-07	mg/kg/day	NA	NA	NA	6.1E-05	mg/kg/day	8.0E-04	mg/kg/day	7.6E-02
				Thallium	1.7E+00	UG/L	2.1E-09	mg/kg/day	NA	NA	NA	1.5E-07	mg/kg/day	7.0E-05	mg/kg/day	2.1E-03
				Vanadium	3.1E+00	UG/L	3.9E-09	mg/kg/day	NA	NA	NA	2.7E-07	mg/kg/day	1.8E-04	mg/kg/day	1.5E-03
			Exp. Route Total								2.3E-08					9.2E-02
		Exposure Point Total									2.3E-08					9.2E-02
	Exposure Medium Total										2.3E-08					9.2E-02
Medium Total											2.3E-08					9.2E-02
									Total of Receptor Risks Across All Media		1.3E-07	Total of Receptor Hazards Across All Media				1.4E-01

* Surface soil & subsurface soil combined.

TABLE 7.17.CT

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS

CENTRAL TENDENCY EXPOSURE

St.Juliens Creek Annex - Site 2

Scenario Timeframe: Future
Receptor Population: Construction worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	

Table 7.17.CT Supplement
Calculation of DAevent (Construction Worker)
Shallow Aquifer
St.Juliens Creek Annex - Site 2

Chemical of Potential Concern	Medium EPC Value (μg/L)	Permeability Constant (PC) (cm/hr)	B (unitless)	Lag Time (τ_{event}) (hr)	t* (hr)	Fraction Absorbed Water (FA) (dimensionless)	Duration of Event (tevent) (hr)	DAevent (mg/cm^2-event)	Eq
1,4-Dichlorobenzene	5.27E-01	4.20E-02	2.00E-01	7.10E-01	1.71E+00	1.00E+00	4	2.85E-07	3
Trichloroethene	5.55E-01	1.20E-02	1.00E-01	5.80E-01	1.39E+00	1.00E+00	4	8.27E-08	3
Heptachlor	2.99E-02	8.60E-03	1.00E-01	1.33E+01	3.19E+01	8.00E-01	4	4.1E-09	2
RDX[1]	2.76E+00	3.48E-04	NA	NA	NA	NA	4	3.84E-09	1
Aluminum	7.28E+02	1.00E-03	NA	NA	NA	NA	4	2.91E-06	1
Arsenic	2.69E+00	1.00E-03	NA	NA	NA	NA	4	1.08E-08	1
Barium	1.05E+02	1.00E-03	NA	NA	NA	NA	4	4.20E-07	1
Chromium	5.22E+00	2.00E-03	NA	NA	NA	NA	4	4.18E-08	1
Iron	6.98E+03	1.00E-03	NA	NA	NA	NA	4	2.79E-05	1
Lead	2.44E+00	1.00E-04	NA	NA	NA	NA	4	9.77E-10	1
Manganese	6.95E+02	1.00E-03	NA	NA	NA	NA	4	2.78E-06	1
Thallium	1.67E+00	1.00E-03	NA	NA	NA	NA	4	6.68E-09	1
Vanadium	3.15E+00	1.00E-03	NA	NA	NA	NA	4	1.26E-08	1

1. Since values for parameters were not available for RDX, the inorganic equation was applied.

Inorganics: DAevent (mg/cm2-event) =

PC x EPC x ET x 0.001 mg/ug x 0.001 l/cm^3

Organics: DAevent (mg/cm2-event) =

2 x PC x EPC x (sqrt((6 x t x ET)/3.1415)) x 0.001 mg/ug x 0.001 l/cm^3

Notes:

1. Permeability constant and lag time calculated on Table 7.17b.RME Supplement.
2. Used permeability constant and lag time values for 2,6-Dinitrotoluene.

Permeability constants and lag time from EPA 1992, Dermal Exposure Assessment: Principals and Applications. ORD, EPA/600/8-91/001B. Default value of 0.001 cm/hour used for inorganics without published values.

N/A - not available or not applicable.

TABLE 7.18.CT

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS

CENTRAL TENDENCY EXPOSURE

St.Juliens Creek Annex - Site 2

Scenario Timeframe: Future
Receptor Population: Other worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Soil*	Soil*	At Site 2	Ingestion	Benzo(a)pyrene	2.6E-01	mg/kg	1.0E-08	mg/kg/day	7.3E+00	1/(mg/kg-day)	7.5E-08	1.1E-07	mg/kg/day	NA	NA	NA
				4,4'-DDT	5.9E-02	mg/kg	2.4E-09	mg/kg/day	3.4E-01	1/(mg/kg-day)	8.2E-10	2.5E-08	mg/kg/day	5.0E-04	mg/kg/day	5.1E-05
				Antimony	6.1E-01	mg/kg	2.5E-08	mg/kg/day	NA	NA	NA	2.6E-07	mg/kg/day	4.0E-04	mg/kg/day	6.5E-04
				Arsenic	3.7E+00	mg/kg	1.5E-07	mg/kg/day	1.5E+00	1/(mg/kg-day)	2.2E-07	1.6E-06	mg/kg/day	3.0E-04	mg/kg/day	5.2E-03
				Copper	4.2E+01	mg/kg	1.7E-06	mg/kg/day	NA	NA	NA	1.8E-05	mg/kg/day	4.0E-02	mg/kg/day	4.5E-04
				Iron	9.0E+03	mg/kg	3.6E-04	mg/kg/day	NA	NA	NA	3.8E-03	mg/kg/day	3.0E-01	mg/kg/day	1.3E-02
				Vanadium	2.1E+01	mg/kg	8.4E-07	mg/kg/day	NA	NA	NA	9.0E-06	mg/kg/day	1.0E-03	mg/kg/day	9.0E-03
			Exp. Route Total								3.0E-07					2.8E-02
			Dermal Absorption	Benzo(a)pyrene	2.6E-01	mg/kg	7.0E-09	mg/kg/day	7.3E+00	1/(mg/kg-day)	5.1E-08	7.4E-08	mg/kg/day	NA	NA	NA
				4,4'-DDT	5.9E-02	mg/kg	3.8E-10	mg/kg/day	3.4E-01	1/(mg/kg-day)	1.3E-10	4.0E-09	mg/kg/day	5.0E-04	mg/kg/day	8.0E-06
				Antimony	6.1E-01	mg/kg	1.3E-09	mg/kg/day	NA	NA	NA	1.4E-08	mg/kg/day	6.0E-05	mg/kg/day	2.3E-04
				Arsenic	3.7E+00	mg/kg	2.3E-08	mg/kg/day	1.5E+00	1/(mg/kg-day)	3.5E-08	2.5E-07	mg/kg/day	3.0E-04	mg/kg/day	8.2E-04
				Copper	4.2E+01	mg/kg	8.9E-08	mg/kg/day	NA	NA	NA	9.4E-07	mg/kg/day	4.0E-02	mg/kg/day	2.3E-05
				Iron	9.0E+03	mg/kg	1.9E-05	mg/kg/day	NA	NA	NA	2.0E-04	mg/kg/day	3.0E-01	mg/kg/day	6.7E-04
				Vanadium	2.1E+01	mg/kg	4.4E-08	mg/kg/day	NA	NA	NA	4.7E-07	mg/kg/day	1.8E-04	mg/kg/day	2.6E-03
			Exp. Route Total								8.6E-08					4.3E-03
		Exposure Point Total									3.8E-07					3.2E-02
	Exposure Medium Total										3.8E-07					3.2E-02
Medium Total											3.8E-07					3.2E-02
Total of Receptor Risks Across All Media											3.8E-07	Total of Receptor Hazards Across All Media				3.2E-02

* Surface soil & subsurface soil combined.

TABLE 9.1.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURE
St.Juliens Creek Annex - Site 2

Scenario Timeframe: Current/Future
Receptor Population: Trespasser
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	At Site 2	Benzo(a)pyrene	2.8E-07	NA	2.4E-07	5.1E-07	NA	NA	NA	NA	0.0E+00
			4,4'-DDT	1.3E-07	NA	2.6E-08	1.6E-07	Liver	2.3E-03	NA	4.5E-04	2.7E-03
			Arsenic	9.9E-07	NA	2.0E-07	1.2E-06	Skin, Vascular	6.4E-03	NA	1.3E-03	7.7E-03
			Copper	NA	NA	NA	0.0E+00	Gastrointestinal	8.5E-03	NA	5.6E-04	9.1E-03
			Iron	NA	NA	NA	0.0E+00	Gastrointestinal	4.2E-02	NA	2.8E-03	4.5E-02
			Vanadium	NA	NA	NA	0.0E+00	Kidney	9.5E-03	NA	2.4E-02	3.4E-02
			Chemical Total	1.4E-06	0.0E+00	4.6E-07	1.9E-06		6.9E-02	0.0E+00	2.9E-02	9.8E-02
		Exposure Point Total					1.9E-06					9.8E-02
	Exposure Medium Total						1.9E-06					9.8E-02
	Air	Emissions from Surface Soil at Site 2	Chromium	NA	5.5E-09	NA	5.5E-09	Respiratory System	NA	1.3E-05	NA	1.3E-05
			Chemical Total	0.0E+00	5.5E-09	0.0E+00	5.5E-09		0.0E+00	1.3E-05	0.0E+00	1.3E-05
		Exposure Point Total					5.5E-09					1.3E-05
	Exposure Medium Total						5.5E-09					1.3E-05
Medium Total							1.9E-06					9.8E-02
Surface Water	Surface Water	Drainage Features and Ponded Area	Chloroform	NA	NA	2.3E-08	2.3E-08	Liver	NA	NA	8.3E-05	8.3E-05
			Trichloroethene	NA	NA	5.2E-06	5.2E-06	Liver, Kidney, Fetus	NA	NA	1.3E-01	1.3E-01
			Vinyl chloride	NA	NA	7.3E-07	7.3E-07	Liver	NA	NA	9.8E-04	9.8E-04
			cis-1,2-Dichloroethene	NA	NA	NA	0.0E+00	Blood	NA	NA	2.3E-03	2.3E-03
			bis(2-Ethylhexyl)phthalate	NA	NA	8.6E-07	8.6E-07	Liver	NA	NA	9.0E-03	9.0E-03
			Arsenic	NA	NA	2.3E-08	2.3E-08	Skin, Vascular	NA	NA	1.5E-04	1.5E-04
			Chromium	NA	NA	NA	0.0E+00	NOAEL	NA	NA	2.3E-02	2.3E-02
			Iron	NA	NA	NA	0.0E+00	Gastrointestinal	NA	NA	4.5E-04	4.5E-04
			Manganese	NA	NA	NA	0.0E+00	CNS	NA	NA	2.9E-02	2.9E-02
			Vanadium	NA	NA	NA	0.0E+00	Kidney	NA	NA	7.6E-03	7.6E-03
			Chemical Total	0.0E+00	0.0E+00	6.8E-06	6.8E-06		0.0E+00	0.0E+00	2.0E-01	2.0E-01
		Exposure Point Total					6.8E-06					2.0E-01
	Exposure Medium Total						6.8E-06					2.0E-01
Medium Total							6.8E-06					2.0E-01

TABLE 9.1.RME

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs

REASONABLE MAXIMUM EXPOSURE

St.Juliens Creek Annex - Site 2

Scenario Timeframe: Current/Future
Receptor Population: Trespasser
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Sediment	Sediment	Drainage Features and Ponded Area	Arsenic	7.4E-07	NA	5.0E-07	1.2E-06	Skin, Vascular	4.8E-03	NA	3.3E-03	8.1E-03
			Chemical Total	7.4E-07		5.0E-07	1.2E-06		4.8E-03	0.0E+00	3.3E-03	8.1E-03
		Exposure Point Total					1.2E-06					8.1E-03
	Exposure Medium Total						1.2E-06					8.1E-03
Medium Total							1.2E-06					8.1E-03
Receptor Total							9.9E-06				Receptor HI Total	3.1E-01

Total Liver HI Across All Media =	1.4E-01
Total Skin HI Across All Media =	1.6E-02
Total Vascular HI Across All Media =	1.6E-02
Total Gastrointestinal HI Across All Media =	5.5E-02
Total Fetus HI Across All Media =	1.3E-01
Total NOAEL HI Across All Media =	2.3E-02
Total Blood HI Across All Media =	2.3E-03
Total CNS HI Across All Media =	2.9E-02
Total Kidney HI Across All Media =	1.7E-01
Total Respiratory System HI Across All Media =	1.3E-05

TABLE 9.2.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURE
St.Juliens Creek Annex - Site 2

Scenario Timeframe: Current/Future
Receptor Population: Trespasser
Receptor Age: Adolescent

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	At Site 2	Benzo(a)pyrene	1.4E-07	NA	1.9E-07	3.3E-07	NA	NA	NA	NA	0.0E+00
			4,4'-DDT	6.8E-08	NA	1.9E-08	8.7E-08	Liver	3.1E-03	NA	8.6E-04	4.0E-03
			Arsenic	5.1E-07	NA	1.4E-07	6.5E-07	Skin, Vascular	8.8E-03	NA	2.4E-03	1.1E-02
			Copper	NA	NA	NA	0.0E+00	Gastrointestinal	1.2E-02	NA	1.1E-03	1.3E-02
			Iron	NA	NA	NA	0.0E+00	Gastrointestinal	5.8E-02	NA	5.3E-03	6.3E-02
			Vanadium	NA	NA	NA	0.0E+00	Kidney	1.3E-02	NA	4.6E-02	5.9E-02
			Chemical Total	7.2E-07	0.0E+00	3.5E-07	1.1E-06		9.5E-02	0.0E+00	5.6E-02	1.5E-01
		Exposure Point Total					1.1E-06					1.5E-01
	Exposure Medium Total						1.1E-06					1.5E-01
	Air	Emissions from Surface Soil at Site 2	Chromium	NA	2.8E-09	NA	2.8E-09	Respiratory System	NA	1.8E-05	NA	1.8E-05
			Chemical Total	0.0E+00	2.8E-09	0.0E+00	2.8E-09		0.0E+00	1.8E-05	0.0E+00	1.8E-05
		Exposure Point Total					2.8E-09					1.8E-05
	Exposure Medium Total						2.8E-09					1.8E-05
Medium Total							1.1E-06					1.5E-01
Surface Water	Surface Water	Drainage Features and Ponded Area	Chloroform	NA	NA	8.4E-09	8.4E-09	Liver	NA	NA	8.1E-05	8.1E-05
			Trichloroethene	NA	NA	1.9E-06	1.9E-06	Liver, Kidney, Fetus	NA	NA	1.2E-01	1.2E-01
			Vinyl chloride	NA	NA	2.7E-07	2.7E-07	Liver	NA	NA	9.6E-04	9.6E-04
			cis-1,2-Dichloroethene	NA	NA	NA	0.0E+00	Blood	NA	NA	2.2E-03	2.2E-03
			bis(2-Ethylhexyl)phthalate	NA	NA	3.2E-07	3.2E-07	Liver	NA	NA	8.8E-03	8.8E-03
			Arsenic	NA	NA	8.3E-09	8.3E-09	Skin, Vascular	NA	NA	1.4E-04	1.4E-04
			Chromium	NA	NA	NA	0.0E+00	NOAEL	NA	NA	2.3E-02	2.3E-02
			Iron	NA	NA	NA	0.0E+00	Gastrointestinal	NA	NA	4.4E-04	4.4E-04
			Manganese	NA	NA	NA	0.0E+00	CNS	NA	NA	2.9E-02	2.9E-02
			Vanadium	NA	NA	NA	0.0E+00	Kidney	NA	NA	7.5E-03	7.5E-03
			Chemical Total	0.0E+00	0.0E+00	2.5E-06	2.5E-06		0.0E+00	0.0E+00	2.0E-01	2.0E-01
		Exposure Point Total					2.5E-06					2.0E-01
	Exposure Medium Total						2.5E-06					2.0E-01
Medium Total							2.5E-06					2.0E-01

TABLE 9.2.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURE
St.Juliens Creek Annex - Site 2

Scenario Timeframe: Current/Future
Receptor Population: Trespasser
Receptor Age: Adolescent

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Sediment	Sediment	Drainage Features and Ponded Area	Arsenic	3.8E-07	NA	1.9E-07	5.7E-07	Skin, Vascular	6.6E-03	NA	3.2E-03	9.8E-03
			Chemical Total	3.8E-07	0.0E+00	1.9E-07	5.7E-07		6.6E-03	0.0E+00	3.2E-03	9.8E-03
		Exposure Point Total					5.7E-07					9.8E-03
	Exposure Medium Total						5.7E-07					9.8E-03
Medium Total							5.7E-07					9.8E-03
Receptor Total							4.2E-06				Receptor HI Total	3.6E-01

Total Liver HI Across All Media =	1.4E-01
Total Skin HI Across All Media =	2.1E-02
Total Vascular HI Across All Media =	2.1E-02
Total Gastrointestinal HI Across All Media =	7.7E-02
Total Fetus HI Across All Media =	1.2E-01
Total NOAEL HI Across All Media =	2.3E-02
Total Blood HI Across All Media =	2.2E-03
Total CNS HI Across All Media =	2.9E-02
Total Kidney HI Across All Media =	1.9E-01
Total Respiratory System HI Across All Media =	1.8E-05

TABLE 9.3.RME

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs

REASONABLE MAXIMUM EXPOSURE

St.Juliens Creek Annex - Site 2

Scenario Timeframe: Current/Future
Receptor Population: Resident
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Deep Groundwater	Tap Water	Chloroform	NA	NA	NA	0.0E+00	Liver	1.3E-02	NA	1.2E-03	1.4E-02
			Arsenic	NA	NA	NA	0.0E+00	Skin, Vascular	3.4E-01	NA	1.8E-03	3.4E-01
			Iron	NA	NA	NA	0.0E+00	Gastrointestinal	3.5E-01	NA	1.8E-03	3.5E-01
			Manganese	NA	NA	NA	0.0E+00	CNS	3.1E-01	NA	4.1E-02	3.5E-01
			Vanadium	NA	NA	NA	0.0E+00	Kidney	2.6E-01	NA	5.3E-02	3.2E-01
			Chemical Total	0.0E+00	0.0E+00	0.0E+00	0.0E+00		1.3E+00	0.0E+00	9.9E-02	1.4E+00
		Exposure Point Total					0.0E+00					1.4E+00
	Exposure Medium Total						0.0E+00					1.4E+00
	Air	Deep groundwater - Water Vapors at Showerhead	Chloroform	NA	NA	NA	0.0E+00	Liver, Kidney	NA	1.8E-02	NA	1.8E-02
			Chemical Total	0.0E+00	0.0E+00	0.0E+00	0.0E+00		0.0E+00	1.8E-02	0.0E+00	1.8E-02
		Exposure Point Total					0.0E+00					1.8E-02
	Exposure Medium Total						0.0E+00					1.8E-02
Medium Total							0.0E+00					1.8E-02
Receptor Total							0.0E+00				Receptor HI Total	1.4E+00

Total Liver HI Across All Media =	3.2E-02
Total Skin HI Across All Media =	3.4E-01
Total Vascular HI Across All Media =	3.4E-01
Total Gastrointestinal HI Across All Media =	3.5E-01
Total CNS HI Across All Media =	3.5E-01
Total Kidney HI Across All Media =	3.3E-01

TABLE 9.4.RME

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs

REASONABLE MAXIMUM EXPOSURE

St.Juliens Creek Annex - Site 2

Scenario Timeframe: Current/Future
Receptor Population: Resident
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Deep Groundwater	Tap Water	Chloroform	NA	NA	NA	0.0E+00	Liver	3.0E-02	NA	2.7E-03	3.3E-02
			Arsenic	NA	NA	NA	0.0E+00	Skin, Vascular	7.9E-01	NA	5.2E-03	7.9E-01
			Iron	NA	NA	NA	0.0E+00	Gastrointestinal	8.1E-01	NA	5.4E-03	8.2E-01
			Manganese	NA	NA	NA	0.0E+00	CNS	7.3E-01	NA	1.2E-01	8.5E-01
			Vanadium	NA	NA	NA	0.0E+00	Kidney	6.1E-01	NA	1.6E-01	7.7E-01
			Chemical Total	0.0E+00	0.0E+00	0.0E+00	0.0E+00		3.0E+00	0.0E+00	2.9E-01	3.3E+00
		Exposure Point Total					0.0E+00					3.3E+00
	Exposure Medium Total						0.0E+00					3.3E+00
Medium Total							0.0E+00					3.3E+00
Receptor Total							0.0E+00				Receptor HI Total	3.3E+00

Total Liver HI Across All Media =	3.3E-02
Total Skin HI Across All Media =	7.9E-01
Total Vascular HI Across All Media =	7.9E-01
Total Gastrointestinal HI Across All Media =	8.2E-01
Total CNS HI Across All Media =	8.5E-01
Total Kidney HI Across All Media =	7.7E-01

TABLE 9.5.RME

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs

REASONABLE MAXIMUM EXPOSURE

St.Juliens Creek Annex - Site 2

Scenario Timeframe: Current/Future
Receptor Population: Resident
Receptor Age: Adult/Child

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Deep Groundwater	Tap Water	Chloroform	NA	NA	NA	0.0E+00	Liver	NA	NA	NA	0.0E+00
			Arsenic	8.3E-05	NA	4.7E-07	8.3E-05	Skin, Vascular	NA	NA	NA	0.0E+00
			Iron	NA	NA	NA	0.0E+00	Gastrointestinal	NA	NA	NA	0.0E+00
			Manganese	NA	NA	NA	0.0E+00	CNS	NA	NA	NA	0.0E+00
			Vanadium	NA	NA	NA	0.0E+00	Kidney	NA	NA	NA	0.0E+00
			Chemical Total	8.3E-05	0.0E+00	4.7E-07	8.3E-05		0.0E+00	0.0E+00	0.0E+00	0.0E+00
		Exposure Point Total					8.3E-05					0.0E+00
	Exposure Medium Total						8.3E-05					0.0E+00
	Air*		Chloroform	NA	6.8E-06	NA	6.8E-06	Liver	NA	NA	NA	0.0E+00
			Chemical Total	0.0E+00	6.8E-06	0.0E+00	6.8E-06		0.0E+00	0.0E+00	0.0E+00	0.0E+00
		Exposure Point Total					6.8E-06					0.0E+00
	Exposure Medium Total						6.8E-06					0.0E+00
Medium Total							9.0E-05					0.0E+00
Receptor Total							9.0E-05				Receptor HI Total	0.0E+00

* Based on adult exposure only, adults have greater inhalation of volatiles while showering then children do while bathing.

TABLE 9.6.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURE
St.Juliens Creek Annex - Site 2

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil*	Soil*	At Site 2	Benzo(a)anthracene	NA	NA	NA	0.0E+00	NA	NA	NA	NA	0.0E+00
			Benzo(a)pyrene	NA	NA	NA	0.0E+00	NA	NA	NA	NA	0.0E+00
			Benzo(b)fluoranthene	NA	NA	NA	0.0E+00	NA	NA	NA	NA	0.0E+00
			Dibenz(a,h)anthracene	NA	NA	NA	0.0E+00	NA	NA	NA	NA	0.0E+00
			4,4'-DDD	NA	NA	NA	0.0E+00	NA	NA	NA	NA	0.0E+00
			4,4'-DDE	NA	NA	NA	0.0E+00	NA	NA	NA	NA	0.0E+00
			4,4'-DDT	NA	NA	NA	0.0E+00	Liver	3.1E-01	NA	1.2E-01	4.4E-01
			Aluminum	NA	NA	NA	0.0E+00	CNS	1.4E-02	NA	1.8E-03	1.6E-02
			Antimony	NA	NA	NA	0.0E+00	Blood	7.4E-02	NA	6.5E-02	1.4E-01
			Arsenic	NA	NA	NA	0.0E+00	Skin, Vascular	3.9E-02	NA	1.5E-02	5.4E-02
			Cadmium	NA	NA	NA	0.0E+00	Kidney	3.1E-03	NA	1.7E-03	4.8E-03
			Chromium	NA	NA	NA	0.0E+00	NOAEL	2.9E-02	NA	1.5E-01	1.8E-01
			Copper	NA	NA	NA	0.0E+00	Gastrointestinal	2.0E-02	NA	2.6E-03	2.3E-02
			Iron	NA	NA	NA	0.0E+00	Gastrointestinal	3.2E-01	NA	4.2E-02	3.6E-01
			Manganese	NA	NA	NA	0.0E+00	CNS	2.1E-02	NA	6.9E-02	9.0E-02
			Nickel	NA	NA	NA	0.0E+00	Decreased Weight	4.1E-03	NA	1.4E-02	1.8E-02
			Thallium	NA	NA	NA	0.0E+00	Liver, Blood, Hair	3.6E-02	NA	4.7E-03	4.0E-02
			Vanadium	NA	NA	NA	0.0E+00	Lifetime	7.3E-03	NA	3.7E-02	4.4E-02
			Zinc	NA	NA	NA	0.0E+00	Blood	8.9E-03	NA	1.2E-03	1.0E-02
			Chemical Total	0.0E+00	0.0E+00	0.0E+00	0.0E+00		8.9E-01	0.0E+00	5.3E-01	1.4E+00
		Exposure Point Total					0.0E+00					1.4E+00
	Exposure Medium Total						0.0E+00					1.4E+00
Medium Total							0.0E+00					1.4E+00

TABLE 9.6.RME

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs

REASONABLE MAXIMUM EXPOSURE

St.Juliens Creek Annex - Site 2

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Water	Surface Water	Drainage Features and Ponded Area	Chloroform	NA	NA	NA	0.0E+00	Liver	NA	NA	8.3E-05	8.3E-05
			Trichloroethene	NA	NA	NA	0.0E+00	Liver, Kidney, Fetus	NA	NA	1.3E-01	1.3E-01
			Vinyl chloride	NA	NA	NA	0.0E+00	Liver	NA	NA	9.8E-04	9.8E-04
			cis-1,2-Dichloroethene	NA	NA	NA	0.0E+00	Blood	NA	NA	2.3E-03	2.3E-03
			bis(2-Ethylhexyl)phthalate	NA	NA	NA	0.0E+00	Liver	NA	NA	9.0E-03	9.0E-03
			Arsenic	NA	NA	NA	0.0E+00	Skin, Vascular	NA	NA	1.5E-04	1.5E-04
			Chromium	NA	NA	NA	0.0E+00	NOAEL	NA	NA	4.6E-02	4.6E-02
			Iron	NA	NA	NA	0.0E+00	Gastrointestinal	NA	NA	4.5E-04	4.5E-04
			Lead	NA	NA	NA	0.0E+00	NA	NA	NA	NA	0.0E+00
			Manganese	NA	NA	NA	0.0E+00	CNS	NA	NA	2.9E-02	2.9E-02
			Vanadium	NA	NA	NA	0.0E+00	Kidney	NA	NA	7.6E-03	7.6E-03
			Chemical Total	0.0E+00	0.0E+00	0.0E+00	0.0E+00		0.0E+00	0.0E+00	2.2E-01	2.2E-01
		Exposure Point Total					0.0E+00					2.2E-01
	Exposure Medium Total						0.0E+00					2.2E-01
Medium Total							0.0E+00					2.2E-01
Sediment	Sediment	Drainage Features and Ponded Area	Benzo(a)pyrene	NA	NA	NA	0.0E+00	NA	NA	NA	NA	0.0E+00
			Arsenic	NA	NA	NA	0.0E+00	Skin, Vascular	4.8E-03	NA	1.0E-02	1.5E-02
			Chromium	NA	NA	NA	0.0E+00	NOAEL	8.9E-02	NA	2.6E+00	2.6E+00
			Iron	NA	NA	NA	0.0E+00	Gastrointestinal	1.1E-02	NA	7.5E-03	1.8E-02
			Chemical Total	0.0E+00	0.0E+00	0.0E+00	0.0E+00		1.0E-01	0.0E+00	2.6E+00	2.7E+00
		Exposure Point Total					0.0E+00					2.7E+00
	Exposure Medium Total						0.0E+00					2.7E+00
Medium Total							0.0E+00					2.7E+00

TABLE 9.6.RME

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs

REASONABLE MAXIMUM EXPOSURE

St.Juliens Creek Annex - Site 2

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Deep Groundwater	Tap Water	Chloroform	NA	NA	NA	0.0E+00	Liver	1.3E-02	NA	1.2E-03	1.4E-02
			Arsenic	NA	NA	NA	0.0E+00	Skin, Vascular	3.4E-01	NA	1.8E-03	3.4E-01
			Iron	NA	NA	NA	0.0E+00	Gastrointestinal	3.5E-01	NA	1.8E-03	3.5E-01
			Manganese	NA	NA	NA	0.0E+00	CNS	3.1E-01	NA	4.1E-02	3.5E-01
			Vanadium	NA	NA	NA	0.0E+00	Kidney	2.6E-01	NA	5.3E-02	3.2E-01
			Chemical Total	0.0E+00	0.0E+00	0.0E+00	0.0E+00		1.3E+00	0.0E+00	9.9E-02	1.4E+00
		Exposure Point Total					0.0E+00					1.4E+00
	Exposure Medium Total						0.0E+00					1.4E+00
	Air	Deep groundwater - Water Vapors at Showerhead	Chloroform	NA	NA	NA	0.0E+00	Liver, Kidney	NA	1.8E-02	NA	1.8E-02
			Chemical Total	0.0E+00	0.0E+00	0.0E+00	0.0E+00		0.0E+00	1.8E-02	0.0E+00	1.8E-02
		Exposure Point Total					0.0E+00					1.8E-02
	Exposure Medium Total						0.0E+00					1.8E-02
Medium Total							0.0E+00					1.4E+00
Receptor Total							0.0E+00				Receptor HI Total	5.7E+00

* Surface soil & subsurface soil combined.

Total Liver HI Across All Media =	6.4E-01
Total Skin HI Across All Media =	4.1E-01
Total Vascular HI Across All Media =	4.1E-01
Total Gastrointestinal HI Across All Media =	7.6E-01
Total Fetus HI Across All Media =	1.3E-01
Total NOAEL HI Across All Media =	2.9E+00
Total Blood HI Across All Media =	1.5E-01
Total CNS HI Across All Media =	4.9E-01
Total Kidney HI Across All Media =	4.7E-01
Total Decreased Weight HI Across All Media =	1.8E-02
Total Lifetime HI Across All Media =	4.4E-02
Total Hair HI Across All Media =	4.0E-02

TABLE 9.7.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURE
St.Juliens Creek Annex - Site 2

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil*	Soil*	At Site 2	Benzo(a)anthracene	NA	NA	NA	0.0E+00	NA	NA	NA	NA	0.0E+00
			Benzo(a)pyrene	NA	NA	NA	0.0E+00	NA	NA	NA	NA	0.0E+00
			Benzo(b)fluoranthene	NA	NA	NA	0.0E+00	NA	NA	NA	NA	0.0E+00
			Dibenz(a,h)anthracene	NA	NA	NA	0.0E+00	NA	NA	NA	NA	0.0E+00
			4,4'-DDD	NA	NA	NA	0.0E+00	NA	NA	NA	NA	0.0E+00
			4,4'-DDE	NA	NA	NA	0.0E+00	NA	NA	NA	NA	0.0E+00
			4,4'-DDT	NA	NA	NA	0.0E+00	Liver	2.9E+00	NA	1.6E-01	3.1E+00
			Aluminum	NA	NA	NA	0.0E+00	CNS	1.3E-01	NA	2.4E-03	1.3E-01
			Antimony	NA	NA	NA	0.0E+00	Blood	6.9E-01	NA	8.6E-02	7.8E-01
			Arsenic	NA	NA	NA	0.0E+00	Skin, Vascular	3.6E-01	NA	2.0E-02	3.8E-01
			Cadmium	NA	NA	NA	0.0E+00	Kidney	2.9E-02	NA	2.2E-03	3.2E-02
			Chromium	NA	NA	NA	0.0E+00	NOAEL	2.7E-01	NA	2.0E-01	4.7E-01
			Copper	NA	NA	NA	0.0E+00	Gastrointestinal	1.9E-01	NA	3.5E-03	1.9E-01
			Iron	NA	NA	NA	0.0E+00	Gastrointestinal	3.0E+00	NA	5.6E-02	3.1E+00
			Manganese	NA	NA	NA	0.0E+00	CNS	1.9E-01	NA	9.1E-02	2.9E-01
			Nickel	NA	NA	NA	0.0E+00	Decreased Weight	3.9E-02	NA	1.8E-02	5.7E-02
			Thallium	NA	NA	NA	0.0E+00	Liver, Blood, Hair	3.3E-01	NA	6.2E-03	3.4E-01
			Vanadium	NA	NA	NA	0.0E+00	Lifetime	6.8E-02	NA	4.9E-02	1.2E-01
			Zinc	NA	NA	NA	0.0E+00	Blood	8.3E-02	NA	1.5E-03	8.4E-02
			Chemical Total	0.0E+00	0.0E+00	0.0E+00	0.0E+00		8.3E+00	0.0E+00	7.0E-01	9.0E+00
		Exposure Point Total					0.0E+00					9.0E+00
	Exposure Medium Total						0.0E+00					9.0E+00
Medium Total							0.0E+00					9.0E+00

TABLE 9.7.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURE
St.Juliens Creek Annex - Site 2

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Water	Surface Water	Drainage Features and Ponded Area	Chloroform	NA	NA	NA	0.0E+00	Liver	NA	NA	1.3E-04	1.3E-04
			Trichloroethene	NA	NA	NA	0.0E+00	Liver, Kidney, Fetus	NA	NA	1.9E-01	1.9E-01
			Vinyl chloride	NA	NA	NA	0.0E+00	Liver	NA	NA	1.5E-03	1.5E-03
			cis-1,2-Dichloroethene	NA	NA	NA	0.0E+00	Blood	NA	NA	3.4E-03	3.4E-03
			bis(2-Ethylhexyl)phthalate	NA	NA	NA	0.0E+00	Liver	NA	NA	1.4E-02	1.4E-02
			Arsenic	NA	NA	NA	0.0E+00	Skin, Vascular	NA	NA	2.2E-04	2.2E-04
			Chromium	NA	NA	NA	0.0E+00	NOAEL	NA	NA	7.0E-02	7.0E-02
			Iron	NA	NA	NA	0.0E+00	Gastrointestinal	NA	NA	6.8E-04	6.8E-04
			Lead	NA	NA	NA	0.0E+00	NA	NA	NA	NA	0.0E+00
			Manganese	NA	NA	NA	0.0E+00	CNS	NA	NA	4.5E-02	4.5E-02
			Vanadium	NA	NA	NA	0.0E+00	Kidney	NA	NA	3.4E-01	3.4E-01
			Chemical Total	0.0E+00	0.0E+00	0.0E+00	0.0E+00		0.0E+00	0.0E+00	6.7E-01	6.7E-01
		Exposure Point Total					0.0E+00					6.7E-01
	Exposure Medium Total						0.0E+00					6.7E-01
Medium Total							0.0E+00					6.7E-01
Sediment	Sediment	Drainage Features and Ponded Area	Benzo(a)pyrene	NA	NA	NA	0.0E+00	NA	NA	NA	NA	0.0E+00
			Arsenic	NA	NA	NA	0.0E+00	Skin, Vascular	4.5E-02	NA	5.1E-01	5.6E-01
			Chromium	NA	NA	NA	0.0E+00	NOAEL	8.3E-01	NA	1.3E+02	1.3E+02
			Iron	NA	NA	NA	0.0E+00	Gastrointestinal	9.8E-02	NA	3.8E-01	4.7E-01
			Chemical Total	0.0E+00	0.0E+00	0.0E+00	0.0E+00		9.8E-01	0.0E+00	1.3E+02	1.3E+02
		Exposure Point Total					0.0E+00					1.3E+02
	Exposure Medium Total						0.0E+00					1.3E+02
Medium Total							0.0E+00					1.3E+02
Groundwater	Deep Groundwater	Tap Water	Chloroform	NA	NA	NA	0.0E+00	Liver	3.0E-02	NA	2.7E-03	3.3E-02
			Arsenic	NA	NA	NA	0.0E+00	Skin, Vascular	7.9E-01	NA	5.2E-03	7.9E-01
			Iron	NA	NA	NA	0.0E+00	Gastrointestinal	8.1E-01	NA	5.4E-03	8.2E-01
			Manganese	NA	NA	NA	0.0E+00	CNS	7.3E-01	NA	1.2E-01	8.5E-01
			Vanadium	NA	NA	NA	0.0E+00	Kidney	6.1E-01	NA	1.6E-01	7.7E-01
			Chemical Total	0.0E+00	0.0E+00	0.0E+00	0.0E+00		3.0E+00	0.0E+00	2.9E-01	3.3E+00
		Exposure Point Total					0.0E+00					3.3E+00
	Exposure Medium Total						0.0E+00					3.3E+00
Medium Total							0.0E+00					3.3E+00
Receptor Total							0.0E+00				Receptor HI Total	1.4E+02

TABLE 9.7.RME

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs

REASONABLE MAXIMUM EXPOSURE

St.Juliens Creek Annex - Site 2

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total

* Surface soil & subsurface soil combined.

Total Liver HI Across All Media =	3.7E+00
Total Skin HI Across All Media =	1.7E+00
Total Vascular HI Across All Media =	1.7E+00
Total Gastrointestinal HI Across All Media =	4.5E+00
Total Fetus HI Across All Media =	1.9E-01
Total NOAEL HI Across All Media =	1.3E+02
Total Blood HI Across All Media =	8.6E-01
Total CNS HI Across All Media =	1.3E+00
Total Kidney HI Across All Media =	1.3E+00
Total Decreased Weight HI Across All Media =	5.7E-02
Total Lifetime HI Across All Media =	1.2E-01
Total Hair HI Across All Media =	3.4E-01

TABLE 9.8.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURE
St.Juliens Creek Annex - Site 2

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult/Child

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil*	Soil*	At Site 2	Benzo(a)anthracene	7.9E-07	NA	5.4E-07	1.3E-06	NA	NA	NA	NA	0.0E+00
			Benzo(a)pyrene	4.7E-06	NA	3.2E-06	7.9E-06	NA	NA	NA	NA	0.0E+00
			Benzo(b)fluoranthene	7.1E-07	NA	4.9E-07	1.2E-06	NA	NA	NA	NA	0.0E+00
			Dibenz(a,h)anthracene	6.1E-06	NA	4.2E-06	1.0E-05	NA	NA	NA	NA	0.0E+00
			4,4'-DDD	6.8E-07	NA	1.1E-07	7.9E-07	NA	NA	NA	NA	0.0E+00
			4,4'-DDE	1.3E-06	NA	2.1E-07	1.5E-06	NA	NA	NA	NA	0.0E+00
			4,4'-DDT	6.1E-05	NA	9.6E-06	7.0E-05	NA	NA	NA	NA	0.0E+00
			Aluminum	NA	NA	NA	0.0E+00	NA	NA	NA	NA	0.0E+00
			Antimony	NA	NA	NA	0.0E+00	NA	NA	NA	NA	0.0E+00
			Arsenic	2.0E-05	NA	3.1E-06	2.3E-05	NA	NA	NA	NA	0.0E+00
			Cadmium	NA	NA	NA	0.0E+00	NA	NA	NA	NA	0.0E+00
			Chromium	NA	NA	NA	0.0E+00	NA	NA	NA	NA	0.0E+00
			Copper	NA	NA	NA	0.0E+00	NA	NA	NA	NA	0.0E+00
			Iron	NA	NA	NA	0.0E+00	NA	NA	NA	NA	0.0E+00
			Manganese	NA	NA	NA	0.0E+00	NA	NA	NA	NA	0.0E+00
			Nickel	NA	NA	NA	0.0E+00	NA	NA	NA	NA	0.0E+00
			Thallium	NA	NA	NA	0.0E+00	NA	NA	NA	NA	0.0E+00
			Vanadium	NA	NA	NA	0.0E+00	NA	NA	NA	NA	0.0E+00
			Zinc	NA	NA	NA	0.0E+00	NA	NA	NA	NA	0.0E+00
			Chemical Total	9.5E-05	0.0E+00	2.1E-05	1.2E-04		0.0E+00	0.0E+00	0.0E+00	0.0E+00
		Exposure Point Total					1.2E-04					0.0E+00
	Exposure Medium Total						1.2E-04					0.0E+00
Medium Total							1.2E-04					0.0E+00
Surface Water	Surface Water	Drainage Features and Ponded Area	Chloroform	NA	NA	NA	0.0E+00	NA	NA	NA	NA	0.0E+00
			Trichloroethene	NA	NA	7.2E-06	7.2E-06	NA	NA	NA	NA	0.0E+00
			Vinyl chloride	NA	NA	2.0E-06	2.0E-06	NA	NA	NA	NA	0.0E+00
			cis-1,2-Dichloroethene	NA	NA	NA	0.0E+00	NA	NA	NA	NA	0.0E+00
			bis(2-Ethylhexyl)phthalate	NA	NA	1.2E-06	1.2E-06	NA	NA	NA	NA	0.0E+00
			Arsenic	NA	NA	3.1E-08	3.1E-08	NA	NA	NA	NA	0.0E+00
			Chromium	NA	NA	NA	0.0E+00	NA	NA	NA	NA	0.0E+00
			Iron	NA	NA	NA	0.0E+00	NA	NA	NA	NA	0.0E+00
			Lead	NA	NA	NA	0.0E+00	NA	NA	NA	NA	0.0E+00
			Manganese	NA	NA	NA	0.0E+00	NA	NA	NA	NA	0.0E+00
			Chemical Total	0.0E+00	0.0E+00	1.0E-05	1.0E-05		0.0E+00	0.0E+00	0.0E+00	0.0E+00
		Exposure Point Total					1.0E-05					0.0E+00
	Exposure Medium Total						1.0E-05					0.0E+00
Medium Total							1.0E-05					0.0E+00

TABLE 9.8.RME

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs

REASONABLE MAXIMUM EXPOSURE

St.Juliens Creek Annex - Site 2

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult/Child

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Sediment	Sediment	Drainage Features and Ponded Area	Benzo(a)pyrene	7.7E-07	NA	2.9E-05	3.0E-05	NA	NA	NA	NA	0.0E+00
			Arsenic	2.5E-06	NA	2.1E-05	2.4E-05	NA	NA	NA	NA	0.0E+00
			Chromium	NA	NA	NA	0.0E+00	NA	NA	NA	NA	0.0E+00
			Iron	NA	NA	NA	0.0E+00	NA	NA	NA	NA	0.0E+00
			Chemical Total	3.2E-06	0.0E+00	5.0E-05	5.4E-05		0.0E+00	0.0E+00	0.0E+00	0.0E+00
		Exposure Point Total					5.4E-05					0.0E+00
	Exposure Medium Total						5.4E-05					0.0E+00
Medium Total							5.4E-05					0.0E+00
Groundwater	Deep Groundwater	Tap Water	Chloroform	NA	NA	NA	0.0E+00	Liver	NA	NA	NA	0.0E+00
			Arsenic	8.3E-05	NA	4.7E-07	8.3E-05	Skin, Vascular	NA	NA	NA	0.0E+00
			Iron	NA	NA	NA	0.0E+00	Gastrointestinal	NA	NA	NA	0.0E+00
			Manganese	NA	NA	NA	0.0E+00	CNS	NA	NA	NA	0.0E+00
			Vanadium	NA	NA	NA	0.0E+00	Kidney	NA	NA	NA	0.0E+00
			Chemical Total	8.3E-05	0.0E+00	4.7E-07	8.3E-05		0.0E+00	0.0E+00	0.0E+00	0.0E+00
		Exposure Point Total					8.3E-05					0.0E+00
	Exposure Medium Total						8.3E-05					0.0E+00
	Air*		Chloroform	NA	6.8E-06	NA	6.8E-06	Liver	NA	NA	NA	0.0E+00
			Chemical Total	0.0E+00	6.8E-06	0.0E+00	6.8E-06		0.0E+00	0.0E+00	0.0E+00	0.0E+00
		Exposure Point Total					6.8E-06					0.0E+00
	Exposure Medium Total						6.8E-06					0.0E+00
Medium Total							9.0E-05					0.0E+00
Receptor Total							2.7E-04				Receptor HI Total	0.0E+00

* Surface soil & subsurface soil combined.

TABLE 9.9.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURE
St.Juliens Creek Annex - Site 2

Scenario Timeframe: Future
Receptor Population: Construction worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil*	Soil*	At Site 2	Benzo(a)pyrene	1.0E-07	NA	3.2E-08	1.3E-07	NA	NA	NA	NA	0.0E+00
			4,4'-DDT	1.3E-06	NA	9.5E-08	1.4E-06	Liver	5.3E-01	NA	3.9E-02	5.7E-01
			Antimony	NA	NA	NA	0.0E+00	Blood	1.3E-01	NA	2.1E-02	1.5E-01
			Arsenic	4.3E-07	NA	3.1E-08	4.6E-07	Skin, Vascular	6.6E-02	NA	4.8E-03	7.1E-02
			Copper	NA	NA	NA	0.0E+00	Gastrointestinal	3.4E-02	NA	8.3E-04	3.5E-02
			Iron	NA	NA	NA	0.0E+00	Gastrointestinal	5.5E-01	NA	1.3E-02	5.7E-01
			Vanadium	NA	NA	NA	0.0E+00	Lifetime	1.2E-02	NA	1.2E-02	2.4E-02
			Chemical Total	1.8E-06	0.0E+00	1.6E-07	2.0E-06		1.3E+00	0.0E+00	9.0E-02	1.4E+00
		Exposure Point Total					2.0E-06					1.4E+00
	Exposure Medium Total						2.0E-06					1.4E+00
	Air	Site 2	Chromium	NA	3.9E-09	NA	3.9E-09	Respiratory System	NA	2.2E-04	NA	2.2E-04
			Chemical Total	0.0E+00	3.9E-09	0.0E+00	3.9E-09		0.0E+00	2.2E-04	0.0E+00	2.2E-04
		Exposure Point Total					3.9E-09					2.2E-04
	Exposure Medium Total						3.9E-09					2.2E-04
Medium Total							2.0E-06					1.4E+00
Groundwater	Shallow Groundwater	Water Table	1,4-Dichlorobenzene	NA	NA	5.6E-09	5.6E-09	Liver	NA	NA	5.4E-04	5.4E-04
			Trichloroethene	NA	NA	2.9E-08	2.9E-08	Liver, Kidney, Fetus	NA	NA	1.7E-02	1.7E-02
			Heptachlor	NA	NA	1.8E-08	1.8E-08	Liver	NA	NA	5.5E-04	5.5E-04
			RDX	NA	NA	2.8E-10	2.8E-10	Prostate	NA	NA	5.9E-05	5.9E-05
			Aluminum	NA	NA	NA	0.0E+00	CNS	NA	NA	6.0E-03	6.0E-03
			Arsenic	NA	NA	2.1E-08	2.1E-08	Skin, Vascular	NA	NA	3.3E-03	3.3E-03
			Barium	NA	NA	NA	0.0E+00	Cardiovascular	NA	NA	2.8E-02	2.8E-02
			Chromium	NA	NA	NA	0.0E+00	NOAEL	NA	NA	4.3E-02	4.3E-02
			Iron	NA	NA	NA	0.0E+00	Gastrointestinal	NA	NA	2.4E-01	2.4E-01
			Lead	NA	NA	NA	0.0E+00	NA	NA	NA	NA	0.0E+00
			Manganese	NA	NA	NA	0.0E+00	CNS	NA	NA	2.1E-01	2.1E-01
			Thallium	NA	NA	NA	0.0E+00	Liver, Blood, Hair	NA	NA	1.3E-02	1.3E-02
			Vanadium	NA	NA	NA	0.0E+00	Lifetime	NA	NA	8.3E-02	8.3E-02
			Chemical Total	0.0E+00	0.0E+00	7.4E-08	7.4E-08		0.0E+00	0.0E+00	6.4E-01	6.4E-01
		Exposure Point Total					7.4E-08					6.4E-01
	Exposure Medium Total						7.4E-08					6.4E-01
Medium Total							7.4E-08					6.4E-01
Receptor Total							2.1E-06				Receptor HI Total	2.1E+00

TABLE 9.9.RME

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs

REASONABLE MAXIMUM EXPOSURE

St.Juliens Creek Annex - Site 2

Scenario Timeframe: Future
Receptor Population: Construction worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
* Surface soil & subsurface soil combined.											Total Liver HI Across All Media =	6.0E-01
											Total Skin HI Across All Media =	7.4E-02
											Total Vascular HI Across All Media =	1.0E-01
											Total Gastrointestinal HI Across All Media =	8.4E-01
											Total Fetus HI Across All Media =	1.7E-02
											Total NOAEL HI Across All Media =	4.3E-02
											Total Blood HI Across All Media =	1.6E-01
											Total CNS HI Across All Media =	2.2E-01
											Total Kidney HI Across All Media =	1.7E-02
											Total Lifetime HI Across All Media =	1.1E-01
											Total Hair HI Across All Media =	1.3E-02
											Total Prostate HI Across All Media =	5.9E-05
											Total Respiratory System Across All Media =	2.2E-04

TABLE 9.10.RME

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs

REASONABLE MAXIMUM EXPOSURE

St.Juliens Creek Annex - Site 2

Scenario Timeframe: Future
Receptor Population: Other worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil*	Soil*	At Site 2	Benzo(a)pyrene	1.0E-06	NA	2.1E-06	3.2E-06	NA	NA	NA	NA	0.0E+00
			4,4'-DDT	1.4E-05	NA	6.3E-06	2.0E-05	Liver	2.2E-01	NA	1.0E-01	3.3E-01
			Antimony	NA	NA	NA	0.0E+00	Blood	5.3E-02	NA	5.5E-02	1.1E-01
			Arsenic	4.4E-06	NA	2.1E-06	6.5E-06	Skin, Vascular	2.8E-02	NA	1.3E-02	4.0E-02
			Copper	NA	NA	NA	0.0E+00	Gastrointestinal	1.4E-02	NA	2.2E-03	1.7E-02
			Iron	NA	NA	NA	0.0E+00	Gastrointestinal	2.3E-01	NA	3.6E-02	2.7E-01
			Vanadium	NA	NA	NA	0.0E+00	Lifetime	3.6E-02	NA	2.2E-01	2.5E-01
			Chemical Total	1.9E-05	0.0E+00	1.0E-05	2.9E-05		5.8E-01	0.0E+00	4.3E-01	1.0E+00
		Exposure Point Total					2.9E-05					1.0E+00
	Exposure Medium Total						2.9E-05					1.0E+00
Medium Total							2.9E-05					1.0E+00
Receptor Total							2.9E-05				Receptor HI Total	1.0E+00

* Surface soil & subsurface soil combined.

Total Liver HI Across All Media =	3.3E-01
Total Skin HI Across All Media =	4.0E-02
Total Vascular HI Across All Media =	4.0E-02
Total Gastrointestinal HI Across All Media =	2.8E-01
Total Blood HI Across All Media =	1.1E-01
Total Lifetime HI Across All Media =	2.5E-01

TABLE 9.11.CT

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs

CENTRAL TENDENCY EXPOSURE

St.Juliens Creek Annex - Site 2

Scenario Timeframe: Current/Future
Receptor Population: Resident
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Deep Groundwater	Tap Water	Chloroform	NA	NA	NA	0.0E+00	Liver	1.1E-03	NA	9.1E-05	1.2E-03
			Arsenic	NA	NA	NA	0.0E+00	Skin, Vascular	8.4E-02	NA	2.7E-04	8.5E-02
			Iron	NA	NA	NA	0.0E+00	Gastrointestinal	1.3E-02	NA	4.2E-05	1.3E-02
			Manganese	NA	NA	NA	0.0E+00	CNS	3.2E-02	NA	2.5E-03	3.4E-02
			Vanadium	NA	NA	NA	0.0E+00	Kidney	2.2E-02	NA	2.7E-03	2.5E-02
			Chemical Total	0.0E+00	0.0E+00	0.0E+00	0.0E+00		1.5E-01	0.0E+00	5.7E-03	1.6E-01
		Exposure Point Total					0.0E+00					1.6E-01
	Exposure Medium Total						0.0E+00					1.6E-01
	Air	Deep groundwater - Water Vapors at Showerhead	Chloroform	NA	NA	NA	0.0E+00	Liver, Kidney	NA	2.0E-03	NA	2.0E-03
			Chemical Total	0.0E+00	0.0E+00	0.0E+00	0.0E+00		0.0E+00	2.0E-03	0.0E+00	2.0E-03
		Exposure Point Total					0.0E+00					2.0E-03
	Exposure Medium Total						0.0E+00					2.0E-03
Medium Total							0.0E+00					1.6E-01
Receptor Total							0.0E+00				Receptor HI Total	1.6E-01

Total Liver HI Across All Media =	3.2E-03
Total Skin HI Across All Media =	8.5E-02
Total Vascular HI Across All Media =	8.5E-02
Total Gastrointestinal HI Across All Media =	1.3E-02
Total CNS HI Across All Media =	3.4E-02
Total Kidney HI Across All Media =	2.7E-02

TABLE 9.12.CT

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs

CENTRAL TENDENCY EXPOSURE

St.Juliens Creek Annex - Site 2

Scenario Timeframe: Current/Future
Receptor Population: Resident
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Deep Groundwater	Tap Water	Chloroform	NA	NA	NA	0.0E+00	Liver	3.5E-03	NA	1.8E-04	3.7E-03
			Arsenic	NA	NA	NA	0.0E+00	Skin, Vascular	2.8E-01	NA	6.1E-04	2.8E-01
			Iron	NA	NA	NA	0.0E+00	Gastrointestinal	4.4E-02	NA	9.5E-05	4.4E-02
			Manganese	NA	NA	NA	0.0E+00	CNS	1.1E-01	NA	5.7E-03	1.1E-01
			Kidney	NA	NA	NA	0.0E+00	Kidney	7.4E-02	NA	6.2E-03	8.0E-02
			Chemical Total	0.0E+00	0.0E+00	0.0E+00	0.0E+00		5.1E-01	0.0E+00	1.3E-02	5.2E-01
		Exposure Point Total					0.0E+00					5.2E-01
	Exposure Medium Total						0.0E+00					5.2E-01
Medium Total							0.0E+00					5.2E-01
Receptor Total							0.0E+00				Receptor HI Total	5.2E-01

Total Liver HI Across All Media =	3.7E-03
Total Skin HI Across All Media =	2.8E-01
Total Vascular HI Across All Media =	2.8E-01
Total Gastrointestinal HI Across All Media =	4.4E-02
Total CNS HI Across All Media =	1.1E-01

TABLE 9.13.CT

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs

CENTRAL TENDENCY EXPOSURE

St.Juliens Creek Annex - Site 2

Scenario Timeframe: Current/Future
Receptor Population: Resident
Receptor Age: Adult/Child

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Deep Groundwater	Tap Water	Chloroform	NA	NA	NA	0.0E+00	Liver	NA	NA	NA	0.0E+00
			Arsenic	1.6E-05	NA	3.9E-08	1.6E-05	Skin, Vascular	NA	NA	NA	0.0E+00
			Iron	NA	NA	NA	0.0E+00	Gastrointestinal	NA	NA	NA	0.0E+00
			Manganese	NA	NA	NA	0.0E+00	CNS	NA	NA	NA	0.0E+00
			Vanadium	NA	NA	NA	0.0E+00	Kidney	NA	NA	NA	0.0E+00
			Chemical Total	1.6E-05	0.0E+00	3.9E-08	1.6E-05		0.0E+00	0.0E+00	0.0E+00	0.0E+00
		Exposure Point Total					1.6E-05					0.0E+00
	Exposure Medium Total						1.6E-05					0.0E+00
	Air*		Chloroform	NA	3.0E-07	NA	3.0E-07	Liver	NA	NA	NA	0.0E+00
			Chemical Total	0.0E+00	3.0E-07	0.0E+00	3.0E-07		0.0E+00	0.0E+00	0.0E+00	0.0E+00
		Exposure Point Total					3.0E-07					0.0E+00
	Exposure Medium Total						3.0E-07					0.0E+00
Medium Total							1.6E-05					0.0E+00
Receptor Total							1.6E-05				Receptor HI Total	0.0E+00

* Based on adult exposure only, adults have greater inhalation of volatiles while showering then children do while bathing.

TABLE 9.14.CT
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
CENTRAL TENDENCY EXPOSURE
St.Juliens Creek Annex - Site 2

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil*	Soil*	At Site 2	Benzo(a)anthracene	NA	NA	NA	0.0E+00	NA	NA	NA	NA	0.0E+00
			Benzo(a)pyrene	NA	NA	NA	0.0E+00	NA	NA	NA	NA	0.0E+00
			Benzo(b)fluoranthene	NA	NA	NA	0.0E+00	NA	NA	NA	NA	0.0E+00
			Dibenz(a,h)anthracene	NA	NA	NA	0.0E+00	NA	NA	NA	NA	0.0E+00
			4,4'-DDD	NA	NA	NA	0.0E+00	NA	NA	NA	NA	0.0E+00
			4,4'-DDE	NA	NA	NA	0.0E+00	NA	NA	NA	NA	0.0E+00
			4,4'-DDT	NA	NA	NA	0.0E+00	Liver	5.4E-05	NA	3.2E-05	8.6E-05
			Aluminum	NA	NA	NA	0.0E+00	CNS	2.7E-03	NA	5.3E-04	3.3E-03
			Antimony	NA	NA	NA	0.0E+00	Blood	7.0E-04	NA	9.0E-04	1.6E-03
			Arsenic	NA	NA	NA	0.0E+00	Skin, Vascular	5.6E-03	NA	3.2E-03	8.8E-03
			Cadmium	NA	NA	NA	0.0E+00	Kidney	1.3E-04	NA	1.0E-04	2.3E-04
			Chromium	NA	NA	NA	0.0E+00	NOAEL	2.9E-03	NA	2.2E-02	2.5E-02
			Copper	NA	NA	NA	0.0E+00	Gastrointestinal	4.8E-04	NA	9.3E-05	5.7E-04
			Iron	NA	NA	NA	0.0E+00	Gastrointestinal	1.4E-02	NA	2.7E-03	1.6E-02
			Manganese	NA	NA	NA	0.0E+00	CNS	1.7E-03	NA	8.1E-03	9.7E-03
			Nickel	NA	NA	NA	0.0E+00	Decreased Weight	2.2E-04	NA	1.1E-03	1.3E-03
			Thallium	NA	NA	NA	0.0E+00	Liver, Blood, Hair	2.6E-03	NA	5.0E-04	3.1E-03
			Vanadium	NA	NA	NA	0.0E+00	Lifetime	1.4E-03	NA	1.0E-02	1.2E-02
			Zinc	NA	NA	NA	0.0E+00	Blood	2.5E-04	NA	4.8E-05	3.0E-04
			Chemical Total	0.0E+00	0.0E+00	0.0E+00	0.0E+00		3.2E-02	0.0E+00	5.0E-02	8.2E-02
		Exposure Point Total					0.0E+00					8.2E-02
	Exposure Medium Total						0.0E+00					8.2E-02
Medium Total							0.0E+00					8.2E-02
Surface Water	Surface Water	Drainage Features and Ponded Area	Chloroform	NA	NA	NA	0.0E+00	Liver	NA	NA	9.3E-06	9.3E-06
			Trichloroethene	NA	NA	NA	0.0E+00	Liver, Kidney, Fetus	NA	NA	2.8E-03	2.8E-03
			Vinyl chloride	NA	NA	NA	0.0E+00	Liver	NA	NA	7.3E-05	7.3E-05
			cis-1,2-Dichloroethene	NA	NA	NA	0.0E+00	Blood	NA	NA	7.1E-05	7.1E-05
			bis(2-Ethylhexyl)phthalate	NA	NA	NA	0.0E+00	Liver	NA	NA	3.4E-04	3.4E-04
			Arsenic	NA	NA	NA	0.0E+00	Skin, Vascular	NA	NA	3.7E-05	3.7E-05
			Chromium	NA	NA	NA	0.0E+00	NOAEL	NA	NA	1.0E-03	1.0E-03
			Iron	NA	NA	NA	0.0E+00	Gastrointestinal	NA	NA	4.4E-05	4.4E-05
			Lead	NA	NA	NA	0.0E+00	NA	NA	NA	NA	0.0E+00
			Manganese	NA	NA	NA	0.0E+00	CNS	NA	NA	1.1E-03	1.1E-03
			Vanadium	NA	NA	NA	0.0E+00	Kidney	NA	NA	6.5E-04	6.5E-04
			Chemical Total	0.0E+00	0.0E+00	0.0E+00	0.0E+00		0.0E+00	0.0E+00	6.2E-03	6.2E-03
		Exposure Point Total					0.0E+00					6.2E-03
	Exposure Medium Total						0.0E+00					6.2E-03
Medium Total							0.0E+00					6.2E-03

TABLE 9.14.CT

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs

CENTRAL TENDENCY EXPOSURE

St.Juliens Creek Annex - Site 2

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Sediment	Sediment	Drainage Features and Ponded Area	Benzo(a)pyrene	NA	NA	NA	0.0E+00	NA	NA	NA	NA	0.0E+00
			Arsenic	NA	NA	NA	0.0E+00	Skin, Vascular	9.2E-04	NA	9.4E-04	1.9E-03
			Chromium	NA	NA	NA	0.0E+00	NOAEL	2.8E-03	NA	3.8E-02	4.1E-02
			Iron	NA	NA	NA	0.0E+00	Gastrointestinal	1.7E-03	NA	5.9E-04	2.3E-03
			Chemical Total	0.0E+00	0.0E+00	0.0E+00	0.0E+00		5.5E-03	0.0E+00	4.0E-02	4.5E-02
		Exposure Point Total					0.0E+00					4.5E-02
	Exposure Medium Total						0.0E+00					4.5E-02
Medium Total							0.0E+00					4.5E-02
Groundwater	Deep Groundwater	Tap Water	Chloroform	0.0E+00	NA	0.0E+00	0.0E+00	Liver	1.1E-03	NA	9.1E-05	1.2E-03
			Arsenic	0.0E+00	NA	0.0E+00	0.0E+00	Skin, Vascular	8.4E-02	NA	2.7E-04	8.5E-02
			Iron	0.0E+00	NA	0.0E+00	0.0E+00	Gastrointestinal	1.3E-02	NA	4.2E-05	1.3E-02
			Manganese	0.0E+00	NA	0.0E+00	0.0E+00	CNS	3.2E-02	NA	2.5E-03	3.4E-02
			Vanadium	0.0E+00	NA	0.0E+00	0.0E+00	Kidney	2.2E-02	NA	2.7E-03	2.5E-02
			Chemical Total	0.0E+00	0.0E+00	0.0E+00	0.0E+00		1.5E-01	0.0E+00	5.7E-03	1.3E-01
		Exposure Point Total					0.0E+00					1.3E-01
	Exposure Medium Total						0.0E+00					1.3E-01
	Air	Deep groundwater - Water Vapors at Showerhead	Chloroform	NA	NA	NA	0.0E+00	Liver, Kidney	NA	2.0E-03	NA	2.0E-03
			Chemical Total	0.0E+00	0.0E+00	0.0E+00	0.0E+00		0.0E+00	2.0E-03	0.0E+00	2.0E-03
		Exposure Point Total					0.0E+00					2.0E-03
	Exposure Medium Total						0.0E+00					2.0E-03
Medium Total							0.0E+00					1.4E-01
Receptor Total							0.0E+00				Receptor HI Total	2.7E-01

* Surface soil & subsurface soil combined.

Total Liver HI Across All Media =	9.6E-03
Total Skin HI Across All Media =	9.5E-02
Total Vascular HI Across All Media =	9.5E-02
Total Gastrointestinal HI Across All Media =	3.2E-02
Total Fetus HI Across All Media =	2.8E-03
Total NOAEL HI Across All Media =	6.7E-02
Total Blood HI Across All Media =	2.0E-03
Total CNS HI Across All Media =	4.8E-02
Total Kidney HI Across All Media =	3.1E-02
Total Decreased Weight HI Across All Media =	1.3E-03
Total Lifetime HI Across All Media =	1.2E-02
Total Hair HI Across All Media =	3.1E-03

TABLE 9.15.CT

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs

CENTRAL TENDENCY EXPOSURE

St.Juliens Creek Annex - Site 2

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil*	Soil*	At Site 2	Benzo(a)anthracene	NA	NA	NA	0.0E+00	NA	NA	NA	NA	0.0E+00
			Benzo(a)pyrene	NA	NA	NA	0.0E+00	NA	NA	NA	NA	0.0E+00
			Benzo(b)fluoranthene	NA	NA	NA	0.0E+00	NA	NA	NA	NA	0.0E+00
			Dibenz(a,h)anthracene	NA	NA	NA	0.0E+00	NA	NA	NA	NA	0.0E+00
			4,4'-DDD	NA	NA	NA	0.0E+00	NA	NA	NA	NA	0.0E+00
			4,4'-DDE	NA	NA	NA	0.0E+00	NA	NA	NA	NA	0.0E+00
			4,4'-DDT	NA	NA	NA	0.0E+00	Liver	5.1E-04	NA	5.3E-05	5.6E-04
			Aluminum	NA	NA	NA	0.0E+00	CNS	2.5E-02	NA	8.8E-04	2.6E-02
			Antimony	NA	NA	NA	0.0E+00	Blood	6.5E-03	NA	1.5E-03	8.0E-03
			Arsenic	NA	NA	NA	0.0E+00	Skin, Vascular	5.2E-02	NA	5.4E-03	5.7E-02
			Cadmium	NA	NA	NA	0.0E+00	Kidney	2.5E-03	NA	8.5E-05	2.5E-03
			Chromium	NA	NA	NA	0.0E+00	NOAEL	2.7E-02	NA	3.7E-02	6.4E-02
			Copper	NA	NA	NA	0.0E+00	Gastrointestinal	4.5E-03	NA	1.5E-04	4.6E-03
			Iron	NA	NA	NA	0.0E+00	Gastrointestinal	1.3E-01	NA	4.4E-03	1.3E-01
			Manganese	NA	NA	NA	0.0E+00	CNS	1.6E-02	NA	1.3E-02	2.9E-02
			Nickel	NA	NA	NA	0.0E+00	Decreased Weight	2.1E-03	NA	1.8E-03	3.8E-03
			Thallium	NA	NA	NA	0.0E+00	Liver, Blood, Hair	2.4E-02	NA	8.3E-04	2.5E-02
			Vanadium	NA	NA	NA	0.0E+00	Lifetime	1.3E-02	NA	1.7E-02	3.0E-02
			Zinc	NA	NA	NA	0.0E+00	Blood	2.3E-03	NA	8.0E-05	2.4E-03
			Chemical Total	0.0E+00	0.0E+00	0.0E+00	0.0E+00		3.0E-01	0.0E+00	8.2E-02	3.9E-01
		Exposure Point Total					0.0E+00					3.9E-01
	Exposure Medium Total						0.0E+00					3.9E-01
Medium Total							0.0E+00					3.9E-01

TABLE 9.15.CT

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs

CENTRAL TENDENCY EXPOSURE

St.Juliens Creek Annex - Site 2

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Water	Surface Water	Drainage Features and Ponded Area	Chloroform	NA	NA	NA	0.0E+00	Liver	NA	NA	1.4E-05	1.4E-05
			Trichloroethene	NA	NA	NA	0.0E+00	Liver, Kidney, Fetus	NA	NA	4.3E-03	4.3E-03
			Vinyl chloride	NA	NA	NA	0.0E+00	Liver	NA	NA	1.1E-04	1.1E-04
			cis-1,2-Dichloroethene	NA	NA	NA	0.0E+00	Blood	NA	NA	1.1E-04	1.1E-04
			bis(2-Ethylhexyl)phthalate	NA	NA	NA	0.0E+00	Liver	NA	NA	5.2E-04	5.2E-04
			Arsenic	NA	NA	NA	0.0E+00	Skin, Vascular	NA	NA	5.7E-05	5.7E-05
			Chromium	NA	NA	NA	0.0E+00	NOAEL	NA	NA	1.6E-03	1.6E-03
			Iron	NA	NA	NA	0.0E+00	Gastrointestinal	NA	NA	6.7E-05	6.7E-05
			Lead	NA	NA	NA	0.0E+00	NA	NA	NA	NA	0.0E+00
			Manganese	NA	NA	NA	0.0E+00	CNS	NA	NA	1.7E-03	1.7E-03
			Vanadium	NA	NA	NA	0.0E+00	Kidney	NA	NA	9.9E-04	9.9E-04
			Chemical Total	0.0E+00	0.0E+00	0.0E+00	0.0E+00		0.0E+00	0.0E+00	9.4E-03	9.4E-03
		Exposure Point Total					0.0E+00					9.4E-03
	Exposure Medium Total						0.0E+00					9.4E-03
Medium Total							0.0E+00					9.4E-03
Sediment	Sediment	Drainage Features and Ponded Area	Benzo(a)pyrene	NA	NA	NA	0.0E+00	NA	NA	NA	NA	0.0E+00
			Arsenic	NA	NA	NA	0.0E+00	Skin, Vascular	8.6E-03	NA	1.6E-02	2.4E-02
			Chromium	NA	NA	NA	0.0E+00	NOAEL	2.6E-02	NA	6.4E-01	6.7E-01
			Iron	NA	NA	NA	0.0E+00	Gastrointestinal	1.6E-02	NA	9.9E-03	2.6E-02
			Chemical Total	0.0E+00	0.0E+00	0.0E+00	0.0E+00		5.1E-02	0.0E+00	6.7E-01	7.2E-01
		Exposure Point Total					0.0E+00					7.2E-01
	Exposure Medium Total						0.0E+00					7.2E-01
Medium Total							0.0E+00					7.2E-01
Groundwater	Deep Groundwater	Tap Water	Chloroform	NA	NA	NA	0.0E+00	Liver	3.5E-03	NA	1.8E-04	3.7E-03
			Arsenic	NA	NA	NA	0.0E+00	Skin, Vascular	2.8E-01	NA	6.1E-04	2.8E-01
			Iron	NA	NA	NA	0.0E+00	Gastrointestinal	4.4E-02	NA	9.5E-05	4.4E-02
			Manganese	NA	NA	NA	0.0E+00	CNS	1.1E-01	NA	5.7E-03	1.1E-01
			Kidney	NA	NA	NA	0.0E+00	Kidney	7.4E-02	NA	6.2E-03	8.0E-02
			Chemical Total	0.0E+00	0.0E+00	0.0E+00	0.0E+00		5.1E-01	0.0E+00	1.3E-02	5.2E-01
		Exposure Point Total					0.0E+00					5.2E-01
	Exposure Medium Total						0.0E+00					5.2E-01
Medium Total							0.0E+00					5.2E-01
Receptor Total							0.0E+00				Receptor HI Total	1.6E+00

TABLE 9.15.CT

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs

CENTRAL TENDENCY EXPOSURE

St.Juliens Creek Annex - Site 2

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total

* Surface soil & subsurface soil combined.

Total Liver HI Across All Media =	3.4E-02
Total Skin HI Across All Media =	3.6E-01
Total Vascular HI Across All Media =	3.6E-01
Total Gastrointestinal HI Across All Media =	2.1E-01
Total Fetus HI Across All Media =	4.3E-03
Total NOAEL HI Across All Media =	7.3E-01
Total Blood HI Across All Media =	1.1E-02
Total CNS HI Across All Media =	1.7E-01
Total Kidney HI Across All Media =	8.8E-02
Total Decreased Weight HI Across All Media =	3.8E-03
Total Lifetime HI Across All Media =	3.0E-02
Total Hair HI Across All Media =	2.5E-02

TABLE 9.16.CT

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs

CENTRAL TENDENCY EXPOSURE

St.Juliens Creek Annex - Site 2

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult/Child

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil*	Soil*	At Site 2	Benzo(a)anthracene	8.3E-08	NA	6.1E-08	1.4E-07	NA	NA	NA	NA	0.0E+00
			Benzo(a)pyrene	7.9E-07	NA	5.8E-07	1.4E-06	NA	NA	NA	NA	0.0E+00
			Benzo(b)fluoranthene	9.6E-08	NA	7.0E-08	1.7E-07	NA	NA	NA	NA	0.0E+00
			Dibenz(a,h)anthracene	7.2E-07	NA	5.3E-07	1.3E-06	NA	NA	NA	NA	0.0E+00
			4,4'-DDD	1.2E-09	NA	2.0E-10	1.4E-09	NA	NA	NA	NA	0.0E+00
			4,4'-DDE	9.9E-09	NA	1.7E-09	1.2E-08	NA	NA	NA	NA	0.0E+00
			4,4'-DDT	8.6E-09	NA	1.5E-09	1.0E-08	NA	NA	NA	NA	0.0E+00
			Aluminum	NA	NA	NA	0.0E+00	NA	NA	NA	NA	0.0E+00
			Antimony	NA	NA	NA	0.0E+00	NA	NA	NA	NA	0.0E+00
			Arsenic	2.3E-06	NA	4.0E-07	2.7E-06	NA	NA	NA	NA	0.0E+00
			Cadmium	NA	NA	NA	0.0E+00	NA	NA	NA	NA	0.0E+00
			Chromium	NA	NA	NA	0.0E+00	NA	NA	NA	NA	0.0E+00
			Copper	NA	NA	NA	0.0E+00	NA	NA	NA	NA	0.0E+00
			Iron	NA	NA	NA	0.0E+00	NA	NA	NA	NA	0.0E+00
			Manganese	NA	NA	NA	0.0E+00	NA	NA	NA	NA	0.0E+00
			Nickel	NA	NA	NA	0.0E+00	NA	NA	NA	NA	0.0E+00
			Thallium	NA	NA	NA	0.0E+00	NA	NA	NA	NA	0.0E+00
			Vanadium	NA	NA	NA	0.0E+00	NA	NA	NA	NA	0.0E+00
			Zinc	NA	NA	NA	0.0E+00	NA	NA	NA	NA	0.0E+00
			Chemical Total	4.0E-06	0.0E+00	1.6E-06	5.7E-06		0.0E+00	0.0E+00	0.0E+00	0.0E+00
		Exposure Point Total					5.7E-06					0.0E+00
	Exposure Medium Total						5.7E-06					0.0E+00
Medium Total							5.7E-06					0.0E+00

TABLE 9.16.CT

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs

CENTRAL TENDENCY EXPOSURE

St.Juliens Creek Annex - Site 2

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult/Child

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Water	Surface Water	Drainage Features and Ponded Area	Chloroform	NA	NA	NA	0.0E+00	NA	NA	NA	NA	0.0E+00
			Trichloroethene	NA	NA	8.7E-08	8.7E-08	NA	NA	NA	NA	0.0E+00
			Vinyl chloride	NA	NA	8.0E-08	8.0E-08	NA	NA	NA	NA	0.0E+00
			cis-1,2-Dichloroethene	NA	NA	NA	0.0E+00	NA	NA	NA	NA	0.0E+00
			bis(2-Ethylhexyl)phthalate	NA	NA	2.5E-08	2.5E-08	NA	NA	NA	NA	0.0E+00
			Arsenic	NA	NA	4.4E-09	4.4E-09	NA	NA	NA	NA	0.0E+00
			Chromium	NA	NA	NA	0.0E+00	NA	NA	NA	NA	0.0E+00
			Iron	NA	NA	NA	0.0E+00	NA	NA	NA	NA	0.0E+00
			Lead	NA	NA	NA	0.0E+00	NA	NA	NA	NA	0.0E+00
			Manganese	NA	NA	NA	0.0E+00	NA	NA	NA	NA	0.0E+00
			Vanadium	NA	NA	2.0E-07	2.0E-07					
			Chemical Total	0.0E+00	0.0E+00	2.0E-07	2.0E-07		0.0E+00	0.0E+00	0.0E+00	0.0E+00
		Exposure Point Total					2.0E-07					0.0E+00
	Exposure Medium Total						2.0E-07					0.0E+00
Medium Total							2.0E-07					0.0E+00
Sediment	Sediment	Drainage Features and Ponded Area	Benzo(a)pyrene	1.1E-07	NA	7.9E-07	9.0E-07	NA	NA	NA	NA	0.0E+00
			Arsenic	3.8E-07	NA	6.6E-07	1.0E-06	NA	NA	NA	NA	0.0E+00
			Chromium	NA	NA	NA	0.0E+00	NA	NA	NA	NA	0.0E+00
			Iron	NA	NA	NA	0.0E+00	NA	NA	NA	NA	0.0E+00
			Chemical Total	4.9E-07	0.0E+00	1.5E-06	1.9E-06		0.0E+00	0.0E+00	0.0E+00	0.0E+00
		Exposure Point Total					1.9E-06					0.0E+00
	Exposure Medium Total						1.9E-06					0.0E+00
Medium Total							1.9E-06					0.0E+00
Groundwater	Deep Groundwater	Tap Water	Chloroform	NA	NA	NA	0.0E+00	Liver	NA	NA	NA	0.0E+00
			Arsenic	1.6E-05	NA	3.9E-08	1.6E-05	Skin, Vascular	NA	NA	NA	0.0E+00
			Iron	NA	NA	NA	0.0E+00	Gastrointestinal	NA	NA	NA	0.0E+00
			Manganese	NA	NA	NA	0.0E+00	CNS	NA	NA	NA	0.0E+00
			Vanadium	NA	NA	NA	0.0E+00	Kidney	NA	NA	NA	0.0E+00
			Chemical Total	1.6E-05	0.0E+00	3.9E-08	1.6E-05		0.0E+00	0.0E+00	0.0E+00	0.0E+00
		Exposure Point Total					1.6E-05					0.0E+00
	Exposure Medium Total						1.6E-05					0.0E+00
	Air*		Chloroform	NA	3.0E-07	NA	3.0E-07	Liver	NA	NA	NA	0.0E+00
			Chemical Total	0.0E+00	3.0E-07	0.0E+00	3.0E-07		0.0E+00	0.0E+00	0.0E+00	0.0E+00
		Exposure Point Total					3.0E-07					0.0E+00
	Exposure Medium Total						3.0E-07					0.0E+00
Medium Total							1.6E-05					0.0E+00
Receptor Total							2.4E-05				Receptor HI Total	0.0E+00

TABLE 9.17.CT

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs

CENTRAL TENDENCY EXPOSURE

St.Juliens Creek Annex - Site 2

Scenario Timeframe: Future
Receptor Population: Construction worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil*	Soil*	At Site 2	Benzo(a)pyrene	2.6E-08	NA	4.4E-09	3.0E-08	NA	NA	NA	NA	0.0E+00
			4,4'-DDT	2.8E-10	NA	1.1E-11	2.9E-10	Liver	1.2E-04	NA	4.6E-06	1.2E-04
			Antimony	NA	NA	NA	0.0E+00	Blood	1.5E-03	NA	1.3E-04	1.6E-03
			Arsenic	7.7E-08	NA	3.0E-09	8.0E-08	Skin, Vascular	1.2E-02	NA	4.7E-04	1.2E-02
			Copper	NA	NA	NA	0.0E+00	Gastrointestinal	1.0E-03	NA	1.3E-05	1.0E-03
			Iron	NA	NA	NA	0.0E+00	Gastrointestinal	2.9E-02	NA	3.8E-04	3.0E-02
			Vanadium	NA	NA	NA	0.0E+00	Lifetime	2.9E-03	NA	1.5E-03	4.4E-03
			Chemical Total	1.0E-07	0.0E+00	7.4E-09	1.1E-07		4.7E-02	0.0E+00	2.5E-03	4.9E-02
		Exposure Point Total					1.1E-07					4.9E-02
	Exposure Medium Total						1.1E-07					4.9E-02
	Air	Site 2	Chromium	NA	4.1E-10	NA	4.1E-10	Respiratory System	NA	2.3E-05	NA	2.3E-05
			Chemical Total	0.0E+00	4.1E-10	0.0E+00	4.1E-10		0.0E+00	2.3E-05	0.0E+00	2.3E-05
		Exposure Point Total					4.1E-10					2.3E-05
	Exposure Medium Total						4.1E-10					2.3E-05
Medium Total							1.1E-07					4.9E-02
Groundwater	Shallow Groundwater	Water Table	1,4-Dichlorobenzene	NA	NA	2.1E-09	2.1E-09	Liver	NA	NA	2.1E-04	2.1E-04
			Trichloroethene	NA	NA	1.0E-08	1.0E-08	Liver, Kidney, Fetus	NA	NA	6.0E-03	6.0E-03
			Heptachlor	NA	NA	5.8E-09	5.8E-09	Liver	NA	NA	1.8E-04	1.8E-04
			RDX	NA	NA	1.3E-10	1.3E-10	Prostate	NA	NA	2.8E-05	2.8E-05
			Aluminum	NA	NA	NA	0.0E+00	CNS	NA	NA	6.3E-05	6.3E-05
			Arsenic	NA	NA	5.0E-09	5.0E-09	Skin, Vascular	NA	NA	7.8E-04	7.8E-04
			Barium	NA	NA	NA	0.0E+00	Cardiovascular	NA	NA	1.9E-03	1.9E-03
			Chromium	NA	NA	NA	0.0E+00	NOAEL	NA	NA	1.8E-03	1.8E-03
			Iron	NA	NA	NA	0.0E+00	Gastrointestinal	NA	NA	2.0E-03	2.0E-03
			Lead	NA	NA	NA	0.0E+00	NA	NA	NA	NA	0.0E+00
			Manganese	NA	NA	NA	0.0E+00	CNS	NA	NA	7.6E-02	7.6E-02
			Thallium	NA	NA	NA	0.0E+00	Liver, Blood, Hair	NA	NA	2.1E-03	2.1E-03
			Vanadium	NA	NA	NA	0.0E+00	Lifetime	NA	NA	1.5E-03	1.5E-03
			Chemical Total	0.0E+00	0.0E+00	2.3E-08	2.3E-08		0.0E+00	0.0E+00	9.2E-02	9.2E-02
		Exposure Point Total					2.3E-08					9.2E-02
	Exposure Medium Total						2.3E-08					9.2E-02
Medium Total							2.3E-08					9.2E-02
Receptor Total							1.3E-07				Receptor HI Total	1.4E-01

TABLE 9.17.CT

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs

CENTRAL TENDENCY EXPOSURE

St.Juliens Creek Annex - Site 2

Scenario Timeframe: Future
Receptor Population: Construction worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total

* Surface soil & subsurface soil combined.

Total Liver HI Across All Media =	8.6E-03
Total Skin HI Across All Media =	1.3E-02
Total Vascular HI Across All Media =	1.5E-02
Total Gastrointestinal HI Across All Media =	3.3E-02
Total Fetus HI Across All Media =	6.0E-03
Total NOAEL HI Across All Media =	1.8E-03
Total Blood HI Across All Media =	3.7E-03
Total CNS HI Across All Media =	7.6E-02
Total Kidney HI Across All Media =	6.0E-03
Total Lifetime HI Across All Media =	5.9E-03
Total Hair HI Across All Media =	2.1E-03
Total Prostate HI Across All Media =	2.8E-05
Total Respiratory System HI Across All Media =	2.3E-05

TABLE 9.18.CTE

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs

CENTRAL TENDENCY EXPOSURE

St.Juliens Creek Annex - Site 2

Scenario Timeframe: Future
Receptor Population: Other worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil*	Soil*	At Site 2	Benzo(a)pyrene	7.5E-08	NA	5.1E-08	1.3E-07	NA	NA	NA	NA	0.0E+00
			4,4'-DDT	8.2E-10	NA	1.3E-10	9.4E-10	Liver	5.1E-05	NA	8.0E-06	5.9E-05
			Antimony	NA	NA	NA	0.0E+00	Blood	6.5E-04	NA	2.3E-04	8.8E-04
			Arsenic	2.2E-07	NA	3.5E-08	2.6E-07	Skin, Vascular	5.2E-03	NA	8.2E-04	6.0E-03
			Copper	NA	NA	NA	0.0E+00	Gastrointestinal	4.5E-04	NA	2.3E-05	4.7E-04
			Iron	NA	NA	NA	0.0E+00	Gastrointestinal	1.3E-02	NA	6.7E-04	1.3E-02
			Vanadium	NA	NA	NA	0.0E+00	Lifetime	9.0E-03	NA	2.6E-03	1.2E-02
			Chemical Total	3.0E-07	0.0E+00	8.6E-08	3.8E-07		2.8E-02	0.0E+00	4.3E-03	3.2E-02
		Exposure Point Total					3.8E-07					3.2E-02
	Exposure Medium Total						3.8E-07					3.2E-02
Medium Total							3.8E-07					3.2E-02
Receptor Total							3.8E-07				Receptor HI Total	3.2E-02

* Surface soil & subsurface soil combined.

Total Liver HI Across All Media =	5.9E-05
Total Skin HI Across All Media =	6.0E-03
Total Vascular HI Across All Media =	6.0E-03
Total Gastrointestinal HI Across All Media =	1.4E-02
Total Blood HI Across All Media =	8.8E-04
Total Lifetime HI Across All Media =	1.2E-02

Appendix J
Ecological Risk Assessment Species Lists, Correspondence, and Regressions

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Ecological Services
P.O. Box 99
6669 Short Lane
Gloucester, Virginia 23061

December 17, 1997

Ms. Nancy Zygmont
CDM Federal Programs Corporation
107-F Corporate Boulevard
South Plainfield, New Jersey 07080

Greetings:

The U.S. Fish and Wildlife Service has received your request to review the attached project for potential impacts to federally listed or proposed endangered and threatened species and designated critical habitat in Virginia pursuant to the Endangered Species Act (87 Stat. 884, as amended; 16 U.S.C. 1531 et seq.). Attached are lists of species with federal status and species of concern know to occur in the county(s) where your project is located. These lists were prepared by our office and are based on information obtained from previous surveys for rare and endangered species. Species of concern are those that have been identified as potentially imperiled or vulnerable throughout their range or a portion of their range. While these species are not legally protected under the Endangered Species Act, the Service provides this information for consideration in your environmental review process and to encourage efforts to avoid adverse impacts to these species. Protection of these species now may preclude them from becoming candidates for federal listing in the future.

Due to the limited staff in this office, we have had increasing difficulty in reviewing projects in a timely manner. Therefore, we request that you send the attached project to the following state agencies for review:

Plant Protection
Virginia Department of Agriculture & Consumer Services
P.O. Box 1163
Richmond, VA 23209
(804) 786-3515

Virginia Department of Game and Inland Fisheries
Environmental Services Section
P.O. Box 11104
Richmond, VA 23230
(804) 367-1000

Virginia Department of Conservation and Recreation
Division of Natural Heritage
1500 East Main Street, Suite 312
Richmond, VA 23219
(804) 786-7951

It is recommended that all of the agencies named above review the project because each maintains a different database and has differing expertise and/or regulatory responsibility. If any of these agencies determines that your project may impact a federally listed or proposed species or critical habitat, please contact this office. If you have any questions or need further assistance, please contact Cindy Schulz of this office at (804) 693-6694, extension 127.

Sincerely,

Karen L. Mayne

Karen L. Mayne
Supervisor
Virginia Field Office

Enclosures

CDM Federal Programs Corporation

A Subsidiary of Camp Dresser & McKee Inc.

107-F Corporate Boulevard
South Plainfield, New Jersey 07080
Tel: 908 757-9500 Fax: 908 757-9606

DEC 1997
RECEIVED
GLOUCESTER

December 10, 1997

Ms. Cindy Schulz
Virginia Field Office
U.S. Fish & Wildlife Service
Post Office Box 99
Gloucester, VA 23061

PROJECT: Contract No.:N62470-95-D-6007
Work Assignment No.s CTO-0027/CTO-0028

SUBJECT: Information request - informal consultation

Dear Ms. Schulz:

As a subcontractor of work for the Department of the Navy, CDM Federal Programs Corporation (CDM Federal) is conducting an ecological investigation as part of a Remedial Investigation at the St. Juliens Creek Annex sites, located at the confluence of St. Juliens Creek with the southern branch of the Elizabeth River, Chesapeake, Virginia (see enclosed U.S.G.S. topographic map, Norfolk South quadrangle). This request for information concerns the presence of threatened/endangered species in the vicinity of the indicated sites.

The location of the site study area is highlighted on the enclosed map. The information requested is a description of any Federal and/or State-listed threatened and/or endangered species at or within three miles of the study area.

If you have any questions, please contact me at (908) 757-9500. Thank you in advance for your prompt assistance in providing the requested information. Any related information would also be greatly appreciated.

Sincerely,

CDM FEDERAL PROGRAMS CORPORATION

Nancy Zygmont

Nancy Zygmont

Att: Site map

cc: D. Schroeder, CDM Federal WAM, FFX

N7277-1rwp.wp/mjz

KEY

LE - listed endangered.

LT - listed threatened.

PE - proposed endangered.

PT - proposed threatened.

EX - believed to be extirpated in Virginia.

E(S/A) - endangered due to similarity of appearance to a federally listed species.

C - CANDIDATE. The service has enough information to list the species as threatened or endangered, but this action is precluded by other listing activities.

SPECIES OF CONCERN - those species that have been identified as potentially imperiled or vulnerable throughout their range or a portion of their range.

GLOBAL RANK - the species rarity throughout its total range.

G1 - extremely rare and critically imperiled with 5 or fewer occurrences or very few remaining individuals; or because of some factor(s) making it especially vulnerable to extinction.

G2 - very rare and imperiled with 6 to 20 occurrences or few remaining individuals; or because of some factor(s) making it vulnerable to extinction.

G3 - either very rare and local throughout its range or found locally (abundantly at some of its locations) in a restricted range; or vulnerable to extinction because of other factors. Usually fewer than 100 occurrences are documented.

G_T_ - signifies the rank of a subspecies or variety. For example, a G5T1 would apply to a subspecies of a species that is demonstrably secure globally (G5) but the subspecies warrants a rank of T1, critically imperiled.

CITY OF CHESAPEAKE, VIRGINIA
Federally Listed, Proposed, and Candidate Species

SCIENTIFIC NAME	COMMON NAME	STATUS
MAMMALS		
Sorex longirostris fisheri	Dismal Swamp southeastern shrew	LT

Last Updated: February 13, 1997
Prepared by U.S. Fish and Wildlife Service, Virginia Field Office

CITY OF CHESAPEAKE, VIRGINIA
Species of Concern

SCIENTIFIC NAME	COMMON NAME	GLOBAL RANK
INVERTEBRATES		
Euphyes dukesi	Scarce swamp skipper	G3
Pseudopolydesmus paludicolous	A millipede	G1
Stygobromus araeus	Tidewater interstitial amphipod	G2
NON-VASCULAR PLANTS		
Sphagnum macrophyllum var macrophyllum	Large-leaf peatmoss	G3T3
VASCULAR PLANTS		
Trillium pusillum var. virginianum	Virginia least trillium	G3T2

Last Updated: February 20, 1997
Prepared by U.S. Fish and Wildlife Service, Virginia Field Office

COMMONWEALTH of VIRGINIA

George Allen
Governor
Becky Norton Dunlop
Secretary of Natural Resources

Department of Game and Inland Fisheries

William L. Woodfin, Jr.
Director

November 26, 1997

Ms. Nancy Zygmont
CDM Federal Programs Corporation
107-F Corporate Boulevard
South Plainfield, NJ 07080

REF: ESS LOG# 10763

Dear Ms Zygmont:

This letter is in response to your November 6, 1997 letter regarding listed species within 3 miles of the ST. Juliens Creek Annex. Information about fish and wildlife species was generated from our agency's computerized Fish and Wildlife Information System, which describes animals that are known or may occur in a particular geographic area. Field surveys may be necessary to determine the presence or absence of some of these species on or near the proposed area. Also, additional sensitive animal species may be present, but their presence has not been documented in our information system.

There are no documented occurrences of threatened or endangered species at the immediate project site. Attached is a listing of species that may occur within the 3 mile radius specified in your letter. Each of the species have specific habitat requirements and could be found in the project area if habitat conditions are appropriate.

Endangered plants and insects are under the jurisdiction of the Virginia Department of Agriculture and Consumer Services, Bureau of Plant Protection. Questions concerning sensitive plant and insect species which may be found at the project site should be directed to John Tate at (804) 786-3515.

There is a processing charge of $26.00 for our response. Please remit a check, made payable to **TREASURER OF VIRGINIA**, within 30 days to MaryBeth Murr at the address listed on the first page. Include a copy of this letter with your payment to ensure that your account is properly credited.

This letter summarizes the likelihood of the occurrence of endangered or threatened animal species at the project site. If you have additional questions in this regard, please contact me. Please note

that this response does not address any other environmental concerns. These issues are analyzed by our Environmental Services Section, in conjunction with interagency review of applications for state and federal permits. If you have any questions in this regard, please contact Ray Fernald at (804) 367-8999.

The Wildlife Information Online Service (Service) is now available for access via modem and includes many query and reporting features such as those used to generate the information in this letter. The Service has numerous features that enhance the user's session, including current and comprehensive information about all of Virginia's fish and wildlife resources. Queries and reports can be completed for trout streams, anadromous fish, colonial birds, waterfowl, and species listed as threatened, endangered, candidate, or of special concern, as well as all wildlife. General locations of listed plant species are also provided through an arrangement with the Virginia Department of Agriculture and Consumer Services. System documentation and online help are also available. For more information, or to schedule a demonstration of the Service, please contact Kathy Quindlen, Online Service Coordinator, at (804) 367-9717.

Thank you for your interest in the wildlife resources of Virginia.

Sincerely,

Lisa P. Sausville
FWIS Wildlife Analyst

cc: R.T. Fernald

(Point search BROADMOOR. PPL; 36,46,28 76,19,16 (917678 4079871)
Distance 3 miles) <AND> (Designated species by status rank by common name)
Selection of 42 on 26 NOV 1997

Code..	ST	Common Name.....	Scientific Name.....
)30074	FE	Turtle, Kemp's Ridley sea	Lepidochelys kempii
)40096	FE	Falcon, peregrine	Falco peregrinus
)30071	FT	Turtle, loggerhead sea	Caretta caretta caretta
)40093	FT	Eagle, bald	Haliaeetus leucocephalus leucoc
)40120	FT	Plover, piping	Charadrius melodus melodus
)50008	FT	Shrew, Dismal Swamp southeaste	Sorex longirostris fisheri
)30013	SE	Rattlesnake, canebrake	Crotalus horridus atricaudatus
)40129	ST	Sandpiper, upland	Bartramia longicauda
)40293	ST	Shrike, loggerhead	Lanius ludovicianus ludovicianu
)10032	SS	Sturgeon, Atlantic	Acipenser oxyrhynchus
)20005	SS	Frog, carpenter	Rana virgatipes
)20063	SS	Toad, oak	Bufo quercicus
)30067	FS	Terrapin, northern diamondback	Malaclemys terrapin terrapin
)40264	SS	Creeper, brown	Certhia americana
)40364	SS	Dickcissel	Spiza americana
)40032	SS	Egret, great	Ardea alba egretta
)40366	SS	Finch, purple	Carpodacus purpureus
)40094	SS	Harrier, northern	Circus cyaneus
)40029	SS	Heron, little blue	Egretta caerulea caerulea
)40034	SS	Heron, tricolored	Egretta tricolor
)40040	SS	Ibis, glossy	Plegadis falcinellus
)40285	SS	Kinglet, golden-crowned	Regulus satrapa
)40112	SS	Moorhen, common	Gallinula chloropus cachinnans
)40036	SS	Night-heron, yellow-crowned	Nyctanassa violacea violacea
)40262	SS	Nuthatch, red-breasted	Sitta canadensis
)40204	SS	Owl, barn	Tyto alba pratincola
)40020	SS	Pelican, brown	Pelecanus occidentalis caroline
)40110	FS	Rail, black	Laterallus jamaicensis
)40292	FS	Shrike, migrant loggerhead	Lanius ludovicianus migrans
)40189	SS	Tern, Caspian	Sterna caspia
)40180	SS	Tern, Forster's	Sterna forsteri
)40186	SS	Tern, least	Sterna antillarum
)40278	SS	Thrush, hermit	Catharus guttatus
)40320	FS	Warbler, cerulean	Dendroica cerulea
)40314	SS	Warbler, magnolia	Dendroica magnolia
)40304	SS	Warbler, Swainson's	Limnothlypis swainsonii
)40270	SS	Wren, sedge	Cistothorus platensis
)40266	SS	Wren, winter	Troglodytes troglodytes
)50034	FS	Bat, eastern big-eared	Plecotus rafinesquii macrotis
)50110	SS	Mole, small star-nosed	Condylura cristata parva
)50045	SS	Otter, river	Lontra canadensis lataxina
)50107	SS	Rabbit, marsh	Sylvilagus palustris palustris

J. Carlton Courter, III
Commissioner

COMMONWEALTH *of* VIRGINIA
Department of Agriculture and Consumer Services
Division of Consumer Protection
Office of Plant & Pest Services
PO Box 1163, Richmond, Virginia 23218
Phone: 804/786-3515 • Fax: 804/371-7793 • Hearing Impaired: 800/828-1120
http://www.state.va.us/~vdacs/vdacs.htm

November 10, 1997

Ms. Nancy Zygmont
CDM Federal Programs Corporation
107-F Corporate Boulevard
South Plainfield, New Jersey 07080

RE: Contract No. N62470-95-6007

Dear Ms Zygmont:

This letter is in response to your request for information on listed threatened or endangered plant or insect species in the vicinity of the confluence of St. Juliens Creek with the southern Branch of the Elizabeth River in Chesapeake, VA. To date, Virginia Department of Agriculture and Consumer Services records indicate that no threatened or endangered plant or insect species have been documented in the area outlined on the map that you provided. The absence of data does not necessarily mean that no listed species occur in the area, but that our files do not currently contain information to document their presence.

The Virginia Department of Agriculture and Consumer Services has jurisdiction over listed plant and insect species only. The Virginia Department of Game and Inland Fisheries has jurisdiction over all other listed threatened or endangered species. Additional information on unique geologic formations, rare or critical habitat, rare and candidate species can be obtained from the Virginia Department of Conservation and Recreation, Division of Natural Heritage.

Thank you for your interest in the endangered or threatened plant and insect species in Virginia. If you have any questions or need any additional information, please contact me.

Sincerely,

John R. Tate
Endangered Species Coordinator

George Allen
Governor

Becky Norton Dunlop
Secretary of Natural
Resources

Kathleen W. Lawrence
Director

COMMONWEALTH of VIRGINIA

DEPARTMENT OF CONSERVATION AND RECREATION

Main Street Station, 1500 East Main Street Suite 312
TDD (804) 786-2121 Richmond, Virginia 23219 (804) 786-7951 FAX (804) 371-2674
http://www.state.va.us/~dcr/vaher.html

November 10, 1997

Nancy Zigmont
CDM Federal Programs Corporation
107-F Corporate Boulevard
South Plainfield, New Jersey 07080

Re: Contract No. N62470-95-D-6007
Work Assignment No.s CTO-0027/CTO-0028

Dear Ms. Zygmont:

The Department of Conservation and Recreation's Division of Natural Heritage (DCR) has searched its Biological and Conservation Data System (BCD) for occurrences of natural heritage resources from the area outlined on the submitted map. Natural heritage resources are defined as the habitat of rare, threatened, or endangered plant and animal species, unique or exemplary natural communities, and significant geologic formations.

According to the information currently in our files, natural heritage resources have not been documented within a two mile radius of the project site. However, the absence of data may indicate that the project area has not been surveyed, rather than confirm that the area lacks natural heritage resources.

Outside of the two mile radius, several natural heritage resources have been documented on the Norfolk South quad. These natural heritage resources include the Great Egret (*Ardea alba*, G5/S2B, S4N/NF/SC), the Peregrine Falcon (*Falco peregrinus*, G4/S1/LE/LE), the Tidewater interstitial amphipod (*Stygobromus araeus*, G2/S2/SOC/SC), and the bay-gail holly (*Ilex coriacea*, G5/S2/NF/NS). I have also included a list of natural heritage resources for the cities of Norfolk, Portsmouth, and Chesapeake for your information.

DCR's Biological and Conservation Data System is constantly growing and revised. Please contact DCR for an update on this natural heritage information if a significant amount of time passes before it is utilized.

A fee of $65.00 has been assessed for the service of providing this information. Please find

enclosed an invoice for that amount. Please return one copy of the invoice along with your remittance made payable to the Treasurer of Virginia, Department of Conservation and Recreation, Post Office Box 721, Richmond, VA 23206-0721, ATTN: Financial Services. Payment is due within thirty days of the invoice date.

Thank you for the opportunity to comment on this project.

Sincerely,

Lesa S. Berlinghoff
Project Review Coordinator

DEPARTMENT OF CONSERVATION & RECREATION
DIVISION OF NATURAL HERITAGE

NATURAL HERITAGE RESOURCES OF
CHESAPEAKE, NORFOLK & PORTSMOUTH CITIES

SCIENTIFIC NAME	COMMON NAME	GLOBAL RANK	STATE RANK	FEDERAL STATUS	STATE STATUS	*LAST SEEN IN CC SINCE 1980?
*CHESAPEAKE						
BIRDS						
ARDEA ALBA	GREAT EGRET	G5	S2B,S4		SC	Y
IXOBRYCHUS EXILIS	LEAST BITTERN	G5	S2			Y
COMMUNITIES						
EUTROPHIC SEMIPERMANENTLY FLOODED FOREST						Y
MID-HEIGHT HERBACEOUS WETLAND						Y
OLIGOTROPHIC SATURATED FOREST						N
OLIGOTROPHIC SATURATED WOODLAND						Y
OLIGOTROPHIC SEMIPERMANENTLY FLOODED WOODLAND						Y
SUBMESOTROPHIC FOREST						Y
* INVERTEBRATES						
ATLIDES HALESUS	GREAT PURPLE HAIRSTREAK	G5	S2S3			Y
ENALLAGMA PALLIDUM	PALE BLUET	G4	S1			Y
EUPHYES DUKESI	SCARCE SWAMP SKIPPER	G3	S2			Y
* MAMMALS						
CORYNORHINUS RAFINESQUII	EASTERN BIG-EARED BAT	G3G4	S1	SOC	LE	Y
SOREX LONGIROSTRIS FISHERI	DISMAL SWAMP SOUTHEASTERN SHREW	G5T2	S2	LT	LT	Y
* NON-VASCULAR PLANTS						
SPHAGNUM TRINITENSE	TRINIDAD PEATMOSS	G4	S2S3			N
* REPTILES						
CROTALUS HORRIDUS ATRICAUDATUS	CANEBRAKE RATTLESNAKE	G5TUQ	S1		LE	N
* VASCULAR PLANTS						
CAREX DECOMPOSITA	EPIPHYTIC SEDGE	G4	S2			Y
CLADIUM JAMAICENSE	SAWGRASS	G5T5	S1			Y
COREOPSIS FALCATA	POOL COREOPSIS	G4G5	S1			N
CUSCUTA INDECORA	PRETTY DODDER	G5	S2?			Y
DICHANTHELIUM CONSANGUINEUM	BLOOD WITCHGRASS	G5	S1?			Y
ERIOCAULON DECANGULARE	TEN-ANGLE PIPEWORT	G5	S2			N
ILEX CORIACEA	BAY-GALL HOLLY	G5	S2			Y
LOBELIA ELONGATA	ELONGATED LOBELIA	G4G5	S1			Y
LUDWIGIA ALATA	WINGED SEEDBOX	G3G4	S1			Y
LUDWIGIA RAVENII	RAVEN'S SEEDBOX	G2?	S1			Y
PANICUM HEMITOMON	MAIDENCANE	G5?	S2			Y
PASPALUM DISSECTUM	WALTER PASPALUM	G4?	S1			Y
PYCNANTHEMUM SETOSUM	AWNED MOUNTAIN-MINT	G3?	S1			N
RHYNCHOSPORA SCIRPOIDES	LONG-BEAKED BALDRUSH	G4	S1			N
SOLIDAGO LATISSIMIFOLIA	ELLIOTT GOLDENROD	G5	S2			Y
STACHYS ASPERA	ROUGH HEDGE-NETTLE	G4	S2			Y
TILLANDSIA USNEOIDES	SPANISH MOSS	G5	S2			Y
TRILLIUM PUSILLUM VAR VIRGINIANUM	VIRGINIA LEAST TRILLIUM	G3T2	S2	SOC		Y
UTRICULARIA PURPUREA	PURPLE BLADDERWORT	G5	S2			Y
XYRIS FIMBRIATA	FRINGED YELLOW-EYED-GRASS	G5	S1			Y
XYRIS IRIDIFOLIA	IRISLEAF YELLOW-EYED-GRASS	G4G5T4T5	S1			Y

36 Records Processed

DEPARTMENT OF CONSERVATION & RECREATION
DIVISION OF NATURAL HERITAGE

NATURAL HERITAGE RESOURCES OF
CHESAPEAKE, NORFOLK & PORTSMOUTH CITIES

SCIENTIFIC NAME	COMMON NAME	GLOBAL RANK	STATE RANK	FEDERAL STATUS	STATE STATUS	*LAST SEEN IN C SINCE 1980?
**CITY OF NORFOLK						
* BIRDS						
FALCO PEREGRINUS	PEREGRINE FALCON	G4	S1	LE	LE	Y
NYCTANASSA VIOLACEA	YELLOW-CROWNED NIGHT-HERON	G5	S2		SC	Y
RYNCHOPS NIGER	BLACK SKIMMER	G5	S2			Y
STERNA ANTILLARUM	LEAST TERN	G4	S2		SC	Y
* VASCULAR PLANTS						
SOLIDAGO TORTIFOLIA	A GOLDENROD	G4G5	S1			N
TILLANDSIA USNEOIDES	SPANISH MOSS	G5	S2			N

6 Records Processed

**CITY OF PORTSMOUTH

* BIRDS						
ARDEA ALBA	GREAT EGRET	G5	S2B,S4		SC	Y
CHARADRIUS MELODUS	PIPING PLOVER	G3	S2	LT	LT	Y
HIMANTOPUS MEXICANUS	BLACK-NECKED STILT	G5	S1			Y
STERNA ANTILLARUM	LEAST TERN	G4	S2		SC	Y

records Processed

*Indicates at least one occurrence in the county seen since 1980

Definition of Abbreviations Used on Natural Heritage Resource Lists
of the
Virginia Department of Conservation and Recreation

Natural Heritage Ranks

The following ranks are used by the Virginia Department of Conservation and Recreation to set protection priorities for natural heritage resources. Natural Heritage Resources, or "NHR's," are rare plant and animal species, rare and exemplary natural communities, and significant geologic features. The primary criterion for ranking NHR's is the number of populations or occurrences, i.e. the number of known distinct localities. Also of great importance is the number of individuals in existence at each locality or, if a highly mobile organism (e.g., sea turtles, many birds, and butterflies), the total number of individuals. Other considerations may include the quality of the occurrences, the number of protected occurrences, and threats. However, the emphasis remains on the number of populations or occurrences such that ranks will be an index of known biological rarity.

S1 Extremely rare; usually 5 or fewer populations or occurrences in the state; or may be a few remaining individuals; often especially vulnerable to extirpation.

S2 Very rare; usually between 5 and 20 populations or occurrences; or with many individuals in fewer occurrences; often susceptible to becoming extirpated.

S3 Rare to uncommon; usually between 20 and 100 populations or occurrences; may have fewer occurrences, but with a large number of individuals in some populations; may be susceptible to large-scale disturbances.

S4 Common; usually >100 populations or occurrences, but may be fewer with many large populations; may be restricted to only a portion of the state; usually not susceptible to immediate threats.

S5 Very common; demonstrably secure under present conditions.

SA Accidental in the state.

S#B Breeding status of an organism within the state.

SH Historically known from the state, but not verified for an extended period, usually > 15 years; this rank is used primarily when inventory has been attempted recently.

S#N Non-breeding status within the state. Usually applied to winter resident species.

SU Status uncertain, often because of low search effort or cryptic nature of the element.

SX Apparently extirpated from the state.

SZ Long distance migrant whose occurrences during migration are too irregular, transitory and/or dispersed to be reliably identified, mapped and protected.

Global ranks are similar, but refer to a species' rarity throughout its total range. Global ranks are denoted with a "G" followed by a character. Note that GA and GN are not used and GX means apparently extinct. A "Q" in a rank indicates that a taxonomic question concerning that species exists. Ranks for subspecies are denoted with a "T". The global and state ranks combined (e.g. G2/S1) give an instant grasp of a species' known rarity.

These ranks should not be interpreted as legal designations.

Federal Legal Status

The Division of Natural Heritage uses the standard abbreviations for Federal endangerment developed by the U.S. Fish and Wildlife Service, Division of Endangered Species and Habitat Conservation.

LE - Listed Endangered
LT - Listed Threatened
PE - Proposed Endangered
PT - Proposed Threatened
C - Candidate (formerly C1-Candidate, category 1)
SOC - Species of concern (formerly C2-Candidate, category 2)
NF - no federal legal status

State Legal Status

The Division of Natural Heritage uses similar abbreviations for State endangerment.

LE - Listed Endangered
LT - Listed Threatened
C - Candidate
PE - Proposed Endangered
PT - Proposed Threatened
NS - no state legal status

For information on the laws pertaining to threatened or endangered species, contact:

U.S. Fish and Wildlife Service for all FEDERALLY listed species
Department of Agriculture and Consumer Services Plant Protection Bureau for STATE listed plants and insects
Department of Game and Inland Fisheries for all other STATE listed animals

5/96

Definitions of Abbreviations Used on Natural Heritage Resource Lists

State Rank

The following ranks are used by the Virginia Department of Conservation and Recreation to set protection priorities for natural heritage resources. Natural Heritage Resources, or "NHR's," are rare plant and animal species, rare and exemplary natural communities, and significant geologic features. The criterion for ranking NHR's is the number of populations or occurrences, i.e. the number of known distinct localities; the number of individuals in existence at each locality or, if a highly mobile organism (e.g., sea turtles, many birds, and butterflies), the total number of individuals; the quality of the occurrences, the number of protected occurrences; and threats.

- **S1** - Extremely rare; usually 5 or fewer populations or occurrences in the state; or may be a few remaining individuals; often especially vulnerable to extirpation.
- **S2** - Very rare; usually between 5 and 20 populations or occurrences; or with many individuals in fewer occurrences; often susceptible to becoming extirpated.
- **S3** - Rare to uncommon; usually between 20 and 100 populations or occurrences; may have fewer occurrences, but with a large number of individuals in some populations; may be susceptible to large-scale disturbances.
- **S4** - Common; usually >100 populations or occurrences, but may be fewer with many large populations; may be restricted to only a portion of the state; usually not susceptible to immediate threats.
- **S5** - Very common; demonstrably secure under present conditions.
- **SA** - Accidental in the state.
- **S#B** - Breeding status of an organism within the state.
- **SH** - Historically known from the state, but not verified for an extended period, usually > 15 years; this rank is used primarily when inventory has been attempted recently.
- **S#N** - Non-breeding status within the state. Usually applied to winter resident species.
- **SU** - Status uncertain, often because of low search effort or cryptic nature of the element.
- **SX** - Apparently extirpated from the state.
- **SZ** - Long distance migrant whose occurrences during migration are too irregular, transitory and/or dispersed to be reliably identified, mapped and protected.

Global ranks are similar, but refer to a species' rarity throughout its total range. Global ranks are denoted with a "G" followed by a character. Note that GA and GN are not used and GX means apparently extinct. A "Q" in a rank indicates that a taxonomic question concerning that species exists. Ranks for subspecies are denoted with a "T". The global and state ranks combined (e.g. G2/S1) give an instant grasp of a species' known rarity.

These ranks should not be interpreted as legal designations.

FEDERAL STATUS

The Division of Natural Heritage uses the standard abbreviations for Federal endangerment developed by the U.S. Fish and Wildlife Service, Division of Endangered Species and Habitat Conservation.

LE - Listed Endangered	**LT** - Listed Threatened	**PE** - Proposed Endangered	**PT** - Proposed Threatened
C - Candidate (formerly C1 - Candidate category 1)	**E(S/A)** - treat as endangered because of similarity of appearance	**T(S/A)** - treat as threatened because of similarity of appearance	

STATE STATUS

The Division of Natural Heritage uses similar abbreviations for State endangerment.

LE - Listed Endangered	**PE** - Proposed Endangered	**SC** - Special Concern - animals that merit special concern according to VDGIF (not a regulatory category)
LT - Listed Threatened	**PT** - Proposed Threatened	**C** - Candidate

For information on the laws pertaining to threatened or endangered species, please contact:

U.S. Fish and Wildlife Service for all **FEDERALLY** listed species;
Department of Agriculture and Consumer Services, Plant Protection Bureau for **STATE listed plants and insects**
Department of Game and Inland Fisheries for all other **STATE listed animals**

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2.1.2.3 Rare, Threatened, and Endangered Species

An inventory of rare, threatened, and endangered vertebrate and plant species was conducted on NAS Oceana in 1989 by the Virginia Department of Conservation and Recreation, Division of Natural Heritage (DNH), and was published in a Natural Heritage Technical Report (DNH 1990). These results were updated and verified by checking the DNH, VA Department of Game and Inland Fisheries, and USFWS web sites for rare and endangered species (http://www.dcr.state.va.us/dnh/rare.htm, http://www.dgif.state.va.us/wildlife/index.cfm, and http://endangered.fws.gov/). The updated information, in conjunction with the earlier DNH report (DNH 1990) suggests that ~~According to this report, and correspondence with DNH,~~ no rare, threatened, or endangered wildlife species are known to occur at NAS Oceana, with the possible exception of occasional transient species (CH2M HILL 1993). These species are discussed below. Several rare plant species have been found on the station (see below).

Wildlife. The following three listed species reside or migrate through southeastern Virginia and could be found at the station:

- Peregrine falcon (*Falco peregrinus*). Listed as endangered in the commonwealth of Virginia, the peregrine falcon can be found in coastal areas during migration, particularly in September and October. In addition, hacking stations (release areas) have been established for the peregrine falcon on the Eastern Shore and in Back Bay National Wildlife Refuge (RGH 1984).

- Bald eagle (*Haliaeetus leucocephalus*). This species is listed as endangered in the commonwealth of Virginia and threatened in portions of the lower 48 United States. The bald eagle was proposed for removal from the federal list in July 1999. Virginia provides prime habitat for the bald eagle. In 1978, 37 active nests were located in the state (RGH 1984). There are currently no known bald eagles nesting in the immediate area of NAS Oceana. Some birds, however, do winter along area beaches or pass through the region during migration.

- Swainson's warbler (*Limnothlypis swainsonii*). This species is known to inhabit areas with abundant giant cane. This habitat was once common in Virginia Beach and is found on NAS Oceana. The findings of the DNH technical report (DNH 1990) are that only marginally suitable habitat was found at the station for this species.

Natural Heritage Resources of the City of Chesapeake, Virginia

For an explanation of the rank and status codes click *here*

last updated: FEBRUARY 2000

SCIENTIFIC NAME	COMMON NAME	GLOBAL RANK	ST RA
** AMPHIBIANS			
BUFO QUERCICUS	OAK TOAD	G5	S1
SIREN LACERTINA	GREATER SIREN	G5	S2
** BIRDS			
ARDEA ALBA	GREAT EGRET	G5	S2
IXOBRYCHUS EXILIS	LEAST BITTERN	G5	S2
** COMMUNITIES			
	BALDCYPRESS-TUPELO SWAMP		
	HIGH POCOSIN		
	POND PINE FOREST/WOODLAND		
	PEATLAND ATLANTIC WHITE CEDAR FOREST		
	TIDAL BALDCYPRESS WOODLAND/SAVANNA		
	TIDAL OLIGOHALINE MARSH		
	MESIC MIXED HARDWOOD FOREST		
** INVERTEBRATES			
ATLIDES HALESUS	GREAT PURPLE HAIRSTREAK	G5	S2
CALEPHELIS VIRGINIENSIS	LITTLE METALMARK	G4	S2
ENALLAGMA PALLIDUM	PALE BLUET	G4	S1

EUPHYES DUKESI	SCARCE SWAMP SKIPPER	G3	S2
PSEUDOPOLYDESMUS PALUDICOLOUS	A MILLIPEDE	G1	S1
STYGOBROMUS ARAEUS	TIDEWATER INTERSTITIAL AMPHIPOD	G2G3	S2

** MAMMALS

CORYNORHINUS RAFINESQUII	EASTERN BIG-EARED BAT	G3G4	S1
MYOTIS AUSTRORIPARIUS	SOUTHEASTERN MYOTIS	G3G4	S1
SOREX LONGIROSTRIS FISHERI	DISMAL SWAMP SOUTHEASTERN SHREW	G5T2T3	S2

** NON-VASCULAR PLANTS

SPHAGNUM FLAVICOMANS		G3?	S?
SPHAGNUM MACROPHYLLUM VAR MACROPHYLLUM	LARGE-LEAF PEATMOSS	G3T3	S2
SPHAGNUM TRINITENSE	TRINIDAD PEATMOSS	G4	S2

** REPTILES

CROTALUS HORRIDUS ATRICAUDATUS	CANEBRAKE RATTLESNAKE	G4TUQ	S1

** VASCULAR PLANTS

ASTER PUNICEUS VAR ELLIOTTII	ELLIOTT'S ASTER	G5T3T4	S1
CAREX DECOMPOSITA	EPIPHYTIC SEDGE	G3	S2
CLADIUM JAMAICENSE	SAWGRASS	G5T5	S1
COREOPSIS FALCATA	POOL COREOPSIS	G4G5	S1
CUSCUTA INDECORA	PRETTY DODDER	G5	S2
DICHANTHELIUM CONSANGUINEUM	BLOOD WITCHGRASS	G5	S1
ERIGERON VERNUS	WHITE-TOP FLEABANE	G5	S2
ERIOCAULON DECANGULARE	TEN-ANGLE PIPEWORT	G5	S2
ILEX CORIACEA	BAY-GAIL HOLLY	G5	S2
KALMIA CAROLINA	CAROLINA SHEEP-LAUREL	G4	S2
LACHNANTHES CAROLIANA	CAROLINA REDROOT	G4	SH
LOBELIA ELONGATA	ELONGATED LOBELIA	G4G5	S1
LUDWIGIA ALATA	WINGED SEEDBOX	G4	S1

LUDWIGIA RAVENII	RAVEN'S SEEDBOX	G2?	S1
MITREOLA PETIOLATA	LAX HORNPOD	G5	S1
PANICUM HEMITOMON	MAIDENCANE	G5?	S2
PASPALUM DISSECTUM	WALTER PASPALUM	G4?	S2
PHYSOSTEGIA LEPTOPHYLLA	SLENDER-LEAVED DRAGON-HEAD	G4?	S2
PYCNANTHEMUM SETOSUM	AWNED MOUNTAIN-MINT	G3?	S1
RHYNCHOSPORA SCIRPOIDES	LONG-BEAKED BALDRUSH	G4	S1
SAGITTARIA ENGELMANNIANA	ENGELMANN ARROWHEAD	G5?	SH
SOLIDAGO LATISSIMIFOLIA	ELLIOTT GOLDENROD	G5	S2
SOLIDAGO TORTIFOLIA	A GOLDENROD	G4G5	S1
STACHYS ASPERA	ROUGH HEDGE-NETTLE	G4?	S2
TILLANDSIA USNEOIDES	SPANISH MOSS	G5	S2
TRILLIUM PUSILLUM VAR VIRGINIANUM	VIRGINIA LEAST TRILLIUM	G3T2	S2
UTRICULARIA PURPUREA	PURPLE BLADDERWORT	G5	S2
XYRIS FIMBRIATA	FRINGED YELLOW-EYED-GRASS	G5	S1
XYRIS IRIDIFOLIA	IRISLEAF YELLOW-EYED-GRASS	G4G5T4T5	S1

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The Virginia Fish and Wildlife Information Service

Point Search Site Location Map

Nearest Cultural Names
Species List

Area description within 3 miles of location point 36,47,01 76,19,39

Report compiled 13 April 2001

^23 Geographic Names within 3000 meters

Distance (meters)	Location	Name
413	36,47,14 76,19,43	Brentwood (ppl)
793	36,46,45 76,20,04	Treakle School (school)
851	36,46,51 76,20,11	Geneva Park (ppl)
1102	36,46,31 76,20,03	Loxley Gardens (ppl)
1168	36,46,28 76,19,16	Broadmoor (ppl)
1483	36,47,45 76,19,15	Cradock (ppl)
1584	36,46,46 76,18,38	Saint Julian Creek (stream)
1672	36,47,55 76,19,44	Williams Court (ppl)
1701	36,47,52 76,19,13	Hurst School (school)
1904	36,47,55 76,20,16	Loxley Place (ppl)
1912	36,46,47 76,18,24	Money Point (cape)
1970	36,46,15 76,18,44	Gilmerton (ppl)
2039	36,47,26 76,18,23	Blows Creek (stream)
2056	36,48,07 76,19,28	Cradock High School (school)
2193	36,45,51 76,19,24	Gilmerton Deep Creek Canal (canal)

2250	36,46,38 76,18,13	Upper Reach (channel)
2423	36,46,40 76,18,05	Elizabeth River Terminals (locale)
2424	36,47,35 76,21,07	Victory Park (ppl)
2520	36,48,16 76,18,59	Cradock School (school)
2749	36,48,30 76,19,41	Lincoln Memorial Cemetery (cemetery)
2751	36,48,28 76,19,15	Town and Country Shopping Center (locale)
2953	36,46,40 76,17,43	Milldam Creek (stream)
2987	36,48,37 76,19,24	Gosport (ppl)

^

^528 Species

Code	Status	Confirmed	Common Name	Scientific Name
030074	FE	No	Turtle, Kemp's Ridley sea	*Lepidochelys kempii*
040228	FE	Yes	Woodpecker, red-cockaded	*Picoides borealis borealis*
040093	FTSE	Yes	Eagle, bald	*Haliaeetus leucocephalus leucocephalus*
030071	FT	No	Turtle, loggerhead sea	*Caretta caretta caretta*
040120	FT	Yes	Plover, piping	*Charadrius melodus melodus*
050034	FSSE	No	Bat, eastern big-eared	*Plecotus (Corynorhinus) rafinesquii macrotis*
040292	FSST	No	Shrike, migrant loggerhead	*Lanius ludovicianus migrans*
030067	FS	No	Terrapin, northern diamond-backed	*Malaclemys terrapin terrapin*
040110	FS	Yes	Rail, black	*Laterallus jamaicensis*
040320	FS	No	Warbler, cerulean	*Dendroica cerulea*
030013	SE	No	Rattlesnake, canebrake	*Crotalus horridus atricaudatus*
040096	SE	No	Falcon, peregrine	*Falco peregrinus*
040129	ST	No	Sandpiper, upland	*Bartramia longicauda*
040293	ST	Yes	Shrike, loggerhead	*Lanius ludovicianus ludovicianus*
050008	ST	No	Shrew, Dismal Swamp southeastern	*Sorex longirostris fisheri*
010032	SS	No	Sturgeon, Atlantic	*Acipenser oxyrhynchus*

020005	SS	No	Frog, carpenter	*Rana virgatipes*
020063	SS	No	Toad, oak	*Bufo quercicus*
040264	SS	Yes	Creeper, brown	*Certhia americana*
040364	SS	No	Dickcissel	*Spiza americana*
040032	SS	Yes	Egret, great	*Ardea alba egretta*
040366	SS	Yes	Finch, purple	*Carpodacus purpureus*
040094	SS	Yes	Harrier, northern	*Circus cyaneus*
040029	SS	No	Heron, little blue	*Egretta caerulea caerulea*
040034	SS	No	Heron, tricolored	*Egretta tricolor*
040040	SS	No	Ibis, glossy	*Plegadis falcinellus*
040285	SS	Yes	Kinglet, golden-crowned	*Regulus satrapa*
040112	SS	No	Moorhen, common	*Gallinula chloropus cachinnans*
040036	SS	Yes	Night-heron, yellow-crowned	*Nyctanassa violacea violacea*
040262	SS	Yes	Nuthatch, red-breasted	*Sitta canadensis*
040204	SS	No	Owl, barn	*Tyto alba pratincola*
040020	SS	No	Pelican, brown	*Pelecanus occidentalis carolinensis*
040381	SS	Yes	Sparrow, saltmarsh sharp-tailed	*Ammodramus caudacutus diversus*
040189	SS	No	Tern, Caspian	*Sterna caspia*
040180	SS	Yes	Tern, Forster's	*Sterna forsteri*
040186	SS	No	Tern, least	*Sterna antillarum*
040278	SS	Yes	Thrush, hermit	*Catharus guttatus*
040304	SS	No	Warbler, Swainson's	*Limnothlypis swainsonii*
040270	SS	Yes	Wren, sedge	*Cistothorus platensis*
040266	SS	Yes	Wren, winter	*Troglodytes troglodytes*
050110	SS	No	Mole, small star-nosed	*Condylura cristata parva*
050045	SS	No	Otter, river	*Lontra canadensis lataxina*
050107	SS	No	Rabbit, marsh	*Sylvilagus palustris palustris*

010038	Yes	Alewife	*Alosa pseudoharengus*
010188	No	Bass, largemouth	*Micropterus salmoides*
010183	Yes	Bluegill	*Lepomis macrochirus*
010034	No	Bowfin	*Amia calva*
010123	Yes	Bullhead, brown	*Ameiurus nebulosus*
010122	Yes	Bullhead, yellow	*Ameiurus natalis*
010062	Yes	Carp, common	*Cyprinus carpio*
010125	Yes	Catfish, channel	*Ictalurus punctatus*
010120	Yes	Catfish, white	*Ameiurus catus*
010106	No	Chubsucker, creek	*Erimyzon oblongus*
010107	No	Chubsucker, lake	*Erimyzon sucetta*
010190	Yes	Crappie, black	*Pomoxis nigromaculatus*
010366	No	Dace, rosyside	*Clinostomus funduloides*
010194	Yes	Darter, swamp	*Etheostoma fusiforme*
010131	Yes	Eel, American	*Anguilla rostrata*
010176	Yes	Flier	*Centrarchus macropterus*
010033	No	Gar, longnose	*Lepisosteus osseus*
010045	Yes	Herring, blueback	*Alosa aestivalis*
010143	Yes	Killifish, banded	*Fundulus diaphanus*
010002	No	Lamprey, sea	*Petromyzon marinus*
010128	No	Madtom, tadpole	*Noturus gyrinus*
010408	No	Minnow, eastern silvery	*Hybognathus regius*
010148	Yes	Mosquitofish, eastern	*Gambusia holbrooki*
010054	No	Mudminnow, eastern	*Umbra pygmaea*
010144	Yes	Mummichog	*Fundulus heteroclitus*
010163	Yes	Perch, pirate	*Aphredoderus sayanus sayanus*

010166	Yes	Perch, white	*Morone americana*
010206	Yes	Perch, yellow	*Perca flavescens*
010056	Yes	Pickerel, chain	*Esox niger*
010055	Yes	Pickerel, redfin	*Esox americanus americanus*
010182	Yes	Pumpkinseed	*Lepomis gibbosus*
010040	Yes	Shad, American	*Alosa sapidissima*
010041	Yes	Shad, gizzard	*Dorosoma cepedianum*
010042	Yes	Shad, threadfin	*Dorosoma petenense*
010068	Yes	Shiner, golden	*Notemigonus crysoleucas*
010179	Yes	Sunfish, banded	*Enneacanthus obesus*
010178	Yes	Sunfish, bluespotted	*Enneacanthus gloriosus*
010173	Yes	Sunfish, mud	*Acantharchus pomotis*
010149	No	Swampfish	*Chologaster cornuta*
010177	No	Warmouth	*Lepomis gulosus*
020001	No	Amphiuma, two-toed	*Amphiuma means*
020004	No	Bullfrog	*Rana catesbeiana*
020003	Yes	Frog, Brimley's chorus	*Pseudacris brimleyi*
020015	No	Frog, coastal plain cricket	*Acris gryllus gryllus*
020010	No	Frog, little grass	*Pseudacris ocularis*
020008	No	Frog, southern green	*Rana clamitans melanota*
020016	Yes	Frog, southern leopard	*Rana sphenocephala*
020065	No	Newt, red-spotted	*Notophthalmus viridescens viridescens*
020071	Yes	Peeper, northern spring	*Pseudacris crucifer crucifer*
020084	Yes	Salamander, Atlantic Coast Slimy	*Plethodon chlorobryonis*
020069	No	Salamander, eastern mud	*Pseudotriton montanus montanus*
020029	No	Salamander, four-toed	*Hemidactylium scutatum*
020034	Yes	Salamander, many-lined	*Stereochilus marginatus*
020035	No	Salamander, marbled	*Ambystoma opacum*
020038	No	Salamander, northern dusky	*Desmognathus fuscus*
020043	Yes	Salamander, northern red-backed	*Plethodon cinereus*

020048	No	Salamander, southern dusky	*Desmognathus auriculatus*
020050	No	Salamander, southern two-lined	*Eurycea cirrigera*
020051	No	Salamander, three-lined	*Eurycea guttolineata*
020058	No	Siren, greater	*Siren lacertina*
020061	No	Spadefoot, eastern	*Scaphiopus holbrooki*
020062	No	Toad, Fowler's	*Bufo fowleri*
020060	No	Toad, eastern narrow-mouthed	*Gastrophryne carolinensis*
020064	No	Toad, southern	*Bufo terrestris*
020006	Yes	Treefrog, Cope's gray	*Hyla chrysoscelis*
020009	Yes	Treefrog, green	*Hyla cinerea*
020014	No	Treefrog, pine woods	*Hyla femoralis*
020017	Yes	Treefrog, squirrel	*Hyla squirrela*
030055	No	Cooter, Coastal Plain	*Pseudemys concinna floridana*
030057	No	Cooter, northern red-bellied	*Pseudemys rubriventris rubriventris*
030016	No	Copperhead, northern	*Agkistrodon contortrix mokasen*
030015	No	Cottonmouth, eastern	*Agkistrodon piscivorus piscivorus*
030026	Yes	Kingsnake, eastern	*Lampropeltis getula getula*
030009	No	Lizard, eastern slender glass	*Ophisaurus attenuatus longicaudus*
030002	No	Lizard, northern fence	*Sceloporus undulatus hyacinthinus*
030018	No	Racer, northern black	*Coluber constrictor constrictor*
030008	No	Racerunner, six-lined	*Cnemidophorus sexlineatus sexlineatus*
030006	No	Skink, broadhead	*Eumeces laticeps*
030004	No	Skink, five-lined	*Eumeces fasciatus*
030007	No	Skink, little brown	*Scincella lateralis*
030005	No	Skink, southeastern five-lined	*Eumeces inexpectatus*
030058	No	Slider, yellowbellied	*Trachemys scripta scripta*

030023	Yes	Snake, black rat	*Elaphe obsoleta obsoleta*
030037	No	Snake, brown water	*Nerodia taxispilota*
030044	No	Snake, eastern garter	*Thamnophis sirtalis sirtalis*
030024	No	Snake, eastern hognose	*Heterodon platirhinos*
030029	No	Snake, eastern milk	*Lampropeltis triangulum triangulum*
030025	No	Snake, eastern mud	*Farancia abacura abacura*
030045	No	Snake, eastern ribbon	*Thamnophis sauritus sauritus*
030049	No	Snake, eastern smooth earth	*Virginia valeriae valeriae*
030019	No	Snake, eastern worm	*Carphophis amoenus amoenus*
030041	No	Snake, northern brown	*Storeria dekayi dekayi*
030042	No	Snake, northern red-bellied	*Storeria occipitomaculata occipitomaculata*
030020	No	Snake, northern ringneck	*Diadophis punctatus edwardsii*
030017	No	Snake, northern scarlet	*Cemophora coccinea copei*
030034	No	Snake, northern water	*Nerodia sipedon sipedon*
030046	No	Snake, rainbow	*Farancia erytrogramma erytrogramma*
030036	No	Snake, red-bellied water	*Nerodia erythrogaster erythrogaster*
030047	No	Snake, rough earth	*Virginia striatula*
030038	No	Snake, rough green	*Opheodrys aestivus aestivus*
030021	No	Snake, southern ringneck	*Diadophis punctatus punctatus*
030068	Yes	Turtle, eastern box	*Terrapene carolina carolina*
030051	No	Turtle, eastern mud	*Kinosternon subrubrum subrubrum*
030052	No	Turtle, eastern musk (= stinkpot)	*Sternotherus odoratus*
030060	No	Turtle, eastern painted	*Chrysemys picta picta*
030050	Yes	Turtle, eastern snapping	*Chelydra serpentina serpentina*
030063	No	Turtle, spotted	*Clemmys guttata*
030076	No	Turtle, striped mud	*Kinosternon baurii*

040116	No	Avocet, American	*Recurvirostra americana*
040038	Yes	Bittern, American	*Botaurus lentiginosus*
040037	Yes	Bittern, least	*Ixobrychus exilis exilis*
040350	Yes	Blackbird, Brewer's	*Euphagus cyanocephalus*
040346	Yes	Blackbird, red-winged	*Agelaius phoeniceus*
040349	Yes	Blackbird, rusty	*Euphagus carolinus*
040282	Yes	Bluebird, eastern	*Sialia sialis*
040343	No	Bobolink	*Dolichonyx oryzivorus*
040100	Yes	Bobwhite, northern	*Colinus virginianus*
040068	Yes	Bufflehead	*Bucephala albeola*
040361	Yes	Bunting, indigo	*Passerina cyanea*
040401	Yes	Bunting, snow	*Plectrophenax nivalis nivalis*
040064	Yes	Canvasback	*Aythya valisineria*
040357	Yes	Cardinal, northern	*Cardinalis cardinalis*
040272	Yes	Catbird, gray	*Dumetella carolinensis*
040337	Yes	Chat, yellow-breasted	*Icteria virens virens*
040258	Yes	Chickadee, Carolina	*Poecile carolinensis*
040214	No	Chuck-will's-widow	*Caprimulgus carolinensis*
040113	Yes	Coot, American	*Fulica americana*
040024	Yes	Cormorant, double-crested	*Phalacrocorax auritus*
040023	Yes	Cormorant, great	*Phalacrocorax carbo*
040353	Yes	Cowbird, brown-headed	*Molothrus ater*
040373	No	Crossbill, white-winged	*Loxia leucoptera*
040255	Yes	Crow, American	*Corvus brachyrhynchos*
040256	Yes	Crow, fish	*Corvus ossifragus*
040203	No	Cuckoo, black-billed	*Coccyzus erythropthalmus*

040202	Yes	Cuckoo, yellow-billed	*Coccyzus americanus*
040198	Yes	Dove, mourning	*Zenaida macroura carolinensis*
040197	Yes	Dove, rock	*Columba livia*
040143	No	Dowitcher, long-billed	*Limnodromus scolopaceus*
040142	No	Dowitcher, short-billed	*Limnodromus griseus*
040052	Yes	Duck, American black	*Anas rubripes*
040063	Yes	Duck, ring-necked	*Aythya collaris*
040076	Yes	Duck, ruddy	*Oxyura jamaicensis*
040061	Yes	Duck, wood	*Aix sponsa*
040154	Yes	Dunlin	*Calidris alpina hudsonia*
040030	No	Egret, cattle	*Bubulcus ibis*
040033	Yes	Egret, snowy	*Egretta thula*
040367	No	Finch, house	*Carpodacus mexicanus*
040221	Yes	Flicker, northern	*Colaptes auratus*
040239	Yes	Flycatcher, Acadian	*Empidonax virescens*
040234	Yes	Flycatcher, great crested	*Myiarchus crinitus*
040053	Yes	Gadwall	*Anas strepera*
040022	Yes	Gannet, northern	*Morus bassanus*
040284	Yes	Gnatcatcher, blue-gray	*Polioptila caerulea*
040126	No	Godwit, marbled	*Limosa fedoa*
040067	Yes	Goldeneye, common	*Bucephala clangula americana*
040371	Yes	Goldfinch, American	*Carduelis tristis*
040045	Yes	Goose, Canada	*Branta canadensis*
040049	No	Goose, lesser snow	*Chen caerulescens caerulescens*
040410	No	Goose, snow	*Chen caerulescens atlanticus*
040351	Yes	Grackle, boat-tailed	*Quiscalus major*

040352	Yes	Grackle, common	*Quiscalus quiscula*
040006	Yes	Grebe, eared	*Podiceps nigricollis*
040005	Yes	Grebe, horned	*Podiceps auritus*
040008	Yes	Grebe, pied-billed	*Podilymbus podiceps*
040004	Yes	Grebe, red-necked	*Podiceps grisegena*
040360	Yes	Grosbeak, blue	*Guiraca caerulea caerulea*
040365	Yes	Grosbeak, evening	*Coccothraustes vespertinus*
040175	Yes	Gull, Bonaparte's	*Larus philadelphia*
040165	Yes	Gull, great black-backed	*Larus marinus*
040167	Yes	Gull, herring	*Larus argentatus*
040173	Yes	Gull, laughing	*Larus atricilla*
040176	Yes	Gull, little	*Larus minutus*
040170	Yes	Gull, ring-billed	*Larus delawarensis*
040086	Yes	Hawk, Cooper's	*Accipiter cooperii*
040088	Yes	Hawk, red-shouldered	*Buteo lineatus lineatus*
040087	Yes	Hawk, red-tailed	*Buteo jamaicensis*
040090	No	Hawk, rough-legged	*Buteo lagopus johannis*
040085	Yes	Hawk, sharp-shinned	*Accipiter striatus velox*
040027	Yes	Heron, great blue	*Ardea herodias herodias*
040028	Yes	Heron, green	*Butorides virescens*
040218	Yes	Hummingbird, ruby-throated	*Archilochus colubris*
040041	No	Ibis, white	*Eudocimus albus*
040160	No	Jaeger, parasitic	*Stercorarius parasiticus*
040159	No	Jaeger, pomarine	*Stercorarius pomarinus*
040252	Yes	Jay, blue	*Cyanocitta cristata*
040387	Yes	Junco, dark-eyed	*Junco hyemalis*

040098	Yes	Kestrel, American	*Falco sparverius sparverius*
040119	Yes	Killdeer	*Charadrius vociferus*
040229	Yes	Kingbird, eastern	*Tyrannus tyrannus*
040231	Yes	Kingbird, western	*Tyrannus verticalis*
040220	Yes	Kingfisher, belted	*Ceryle alcyon*
040286	Yes	Kinglet, ruby-crowned	*Regulus calendula*
040177	No	Kittiwake, black-legged	*Rissa tridactyla*
040144	No	Knot, red	*Calidris canutus rufus*
040245	Yes	Lark, horned	*Eremophila alpestris*
040399	Yes	Longspur, Lapland	*Calcarius lapponicus*
040001	Yes	Loon, common	*Gavia immer*
040003	Yes	Loon, red-throated	*Gavia stellata*
040051	Yes	Mallard	*Anas platyrhynchos*
040251	Yes	Martin, purple	*Progne subis*
040344	Yes	Meadowlark, eastern	*Sturnella magna*
040078	Yes	Merganser, common	*Mergus merganser americanus*
040077	Yes	Merganser, hooded	*Lophodytes cucullatus*
040079	Yes	Merganser, red-breasted	*Mergus serrator serrator*
040097	Yes	Merlin	*Falco columbarius*
040271	Yes	Mockingbird, northern	*Mimus polyglottos*
040035	No	Night-heron, black-crowned	*Nycticorax nycticorax hoactii*
040216	No	Nighthawk, common	*Chordeiles minor*
040263	Yes	Nuthatch, brown-headed	*Sitta pusilla*
040261	Yes	Nuthatch, white-breasted	*Sitta carolinensis*
040069	Yes	Oldsquaw	*Clangula hyemalis*
040348	Yes	Oriole, Baltimore	*Icterus galbula*

040347	Yes	Oriole, orchard	*Icterus spurius*
040095	No	Osprey	*Pandion haliaetus carolinensis*
040330	Yes	Ovenbird	*Seiurus aurocapillus*
040209	Yes	Owl, barred	*Strix varia*
040206	Yes	Owl, great horned	*Bubo virginianus*
040211	No	Owl, short-eared	*Asio flammeus*
040312	No	Parula, northern	*Parula americana*
040243	Yes	Pewee, eastern wood	*Contopus virens*
040136	No	Phalarope, Wilson's	*Phalaropus tricolor*
040236	Yes	Phoebe, eastern	*Sayornis phoebe*
040054	Yes	Pintail, northern	*Anas acuta acuta*
040287	Yes	Pipit, American	*Anthus rubescens*
040123	Yes	Plover, black-bellied	*Pluvialis squatarola*
040117	Yes	Plover, semipalmated	*Charadrius semipalmatus*
040107	Yes	Rail, Virginia	*Rallus limicola*
040106	Yes	Rail, clapper	*Rallus longirostris crepitans*
040105	Yes	Rail, king	*Rallus elegans*
040062	Yes	Redhead	*Aythya americana*
040369	Yes	Redpoll, common	*Carduelis flammea*
040341	No	Redstart, American	*Setophaga ruticilla*
040275	Yes	Robin, American	*Turdus migratorius*
040145	Yes	Sanderling	*Calidris alba*
040149	Yes	Sandpiper, least	*Calidris minutilla*
040153	Yes	Sandpiper, purple	*Calidris maritima*
040146	Yes	Sandpiper, semipalmated	*Calidris pusilla*
040134	No	Sandpiper, spotted	*Actitis macularia*

040147	Yes	Sandpiper, western	*Calidris mauri*
040225	Yes	Sapsucker, yellow-bellied	*Sphyrapicus varius*
040065	Yes	Scaup, greater	*Aythya marila*
040066	Yes	Scaup, lesser	*Aythya affinis*
040075	Yes	Scoter, black	*Melanitta nigra americana*
040074	Yes	Scoter, surf	*Melanitta perspicillata*
040073	Yes	Scoter, white-winged	*Melanitta fusca deglandi*
040205	Yes	Screech-owl, eastern	*Otus asio*
040060	Yes	Shoveler, northern	*Anas clypeata*
040370	Yes	Siskin, pine	*Carduelis pinus*
040192	Yes	Skimmer, black	*Rynchops niger*
040141	Yes	Snipe, common	*Gallinago gallinago*
040108	Yes	Sora	*Porzana carolina*
040388	Yes	Sparrow, American tree	*Spizella arborea*
040396	Yes	Sparrow, Lincoln's	*Melospiza lincolnii*
040389	Yes	Sparrow, chipping	*Spizella passerina*
040391	Yes	Sparrow, field	*Spizella pusilla*
040395	Yes	Sparrow, fox	*Passerella iliaca*
040378	No	Sparrow, grasshopper	*Ammodramus savannarum pratensis*
040342	Yes	Sparrow, house	*Passer domesticus*
040377	Yes	Sparrow, savannah	*Passerculus sandwichensis*
040382	No	Sparrow, seaside	*Ammodramus maritimus*
040398	Yes	Sparrow, song	*Melospiza melodia*
040397	Yes	Sparrow, swamp	*Melospiza georgiana*
040383	No	Sparrow, vesper	*Pooecetes gramineus*
040393	No	Sparrow, white-crowned	*Zonotrichia leucophrys*

040394	Yes	Sparrow, white-throated	*Zonotrichia albicollis*
040294	Yes	Starling, European	*Sturnus vulgaris*
040148	No	Stint, Temminck's	*Calidris temminckii*
040249	Yes	Swallow, barn	*Hirundo rustica*
040248	Yes	Swallow, northern rough-winged	*Stelgidopteryx serripennis*
040246	No	Swallow, tree	*Tachycineta bicolor*
040044	No	Swan, tundra	*Cygnus columbianus columbianus*
040217	Yes	Swift, chimney	*Chaetura pelagica*
040355	No	Tanager, scarlet	*Piranga olivacea*
040356	No	Tanager, summer	*Piranga rubra*
040057	Yes	Teal, blue-winged	*Anas discors orphna*
040056	Yes	Teal, green-winged	*Anas crecca carolinensis*
040181	Yes	Tern, common	*Sterna hirundo*
040187	Yes	Tern, royal	*Sterna maxima maximus*
040273	Yes	Thrasher, brown	*Toxostoma rufum*
040279	Yes	Thrush, Swainson's	*Catharus ustulatus*
040280	Yes	Thrush, gray-cheeked	*Catharus minimus*
040277	Yes	Thrush, wood	*Hylocichla mustelina*
040260	Yes	Titmouse, tufted	*Baeolophus bicolor*
040375	Yes	Towhee, eastern	*Pipilo erythrophthalmus*
040374	No	Towhee, green-tailed	*Pipilo chlorurus*
040102	No	Turkey, wild	*Meleagris gallopavo silvestris*
040135	Yes	Turnstone, ruddy	*Arenaria interpres morinella*
040281	No	Veery	*Catharus fuscescens*
040298	Yes	Vireo, blue-headed	*Vireo solitarius*
040299	Yes	Vireo, red-eyed	*Vireo olivaceus*

040295	Yes	Vireo, white-eyed	*Vireo griseus*
040297	No	Vireo, yellow-throated	*Vireo flavifrons*
040081	Yes	Vulture, black	*Coragyps atratus*
040080	Yes	Vulture, turkey	*Cathartes aura*
040333	No	Warbler, Kentucky	*Oporornis formosus*
040302	Yes	Warbler, black-and-white	*Mniotilta varia*
040319	No	Warbler, black-throated green	*Dendroica virens waynei*
040325	No	Warbler, blackpoll	*Dendroica striata*
040307	No	Warbler, blue-winged	*Vermivora pinus*
040323	No	Warbler, chestnut-sided	*Dendroica pensylvanica*
040338	Yes	Warbler, hooded	*Wilsonia citrina*
040329	Yes	Warbler, palm	*Dendroica palmarum*
040326	Yes	Warbler, pine	*Dendroica pinus*
040328	Yes	Warbler, prairie	*Dendroica discolor*
040303	Yes	Warbler, prothonotary	*Protonotaria citrea*
040305	No	Warbler, worm-eating	*Helmitheros vermivorus*
040317	No	Warbler, yellow-rumped	*Dendroica coronata cornata*
040322	No	Warbler, yellow-throated	*Dendroica dominica*
040313	No	Warbler, yellow	*Dendroica petechia*
040332	No	Waterthrush, Louisiana	*Seiurus motacilla*
040331	No	Waterthrush, northern	*Seiurus noveboracensis*
040290	Yes	Waxwing, cedar	*Bombycilla cedrorum*
040215	No	Whip-poor-will	*Caprimulgus vociferus*
040059	Yes	Wigeon, American	*Anas americana*
040058	No	Wigeon, Eurasian	*Anas penelope*
040133	No	Willet	*Catoptrophorus semipalmatus semipalmatus*

040140	Yes	Woodcock, American	*Scolopax minor*
040227	Yes	Woodpecker, downy	*Picoides pubescens medianus*
040226	Yes	Woodpecker, hairy	*Picoides villosus*
040222	Yes	Woodpecker, pileated	*Dryocopus pileatus*
040223	Yes	Woodpecker, red-bellied	*Melanerpes carolinus*
040224	Yes	Woodpecker, red-headed	*Melanerpes erythrocephalus*
040268	Yes	Wren, Carolina	*Thryothorus ludovicianus*
040265	Yes	Wren, house	*Troglodytes aedon*
040269	Yes	Wren, marsh	*Cistothorus palustris*
040131	No	Yellowlegs, lesser	*Tringa flavipes*
040336	Yes	Yellowthroat, common	*Geothlypis trichas brachidactylus*
050028	No	Bat, big brown	*Eptesicus fuscus fuscus*
050029	No	Bat, eastern red	*Lasiurus borealis borealis*
050033	No	Bat, evening	*Nycticeius humeralis humeralis*
050030	No	Bat, hoary	*Lasiurus cinereus cinereus*
050031	No	Bat, seminole	*Lasiurus seminolus*
050025	No	Bat, silver-haired	*Lasionycteris noctivagans*
050037	No	Bear, black	*Ursus americanus americanus*
050069	No	Beaver	*Castor canadensis*
050052	No	Bobcat, Florida	*Lynx rufus floridanus*
050055	No	Chipmunk, Fisher's eastern	*Tamias striatus fisheri*
050103	No	Cottontail, eastern	*Sylvilagus floridanus mallurus*
050108	No	Deer, white-tailed	*Odocoileus virginianus*
050050	No	Fox, eastern gray	*Urocyon cinereoargenteus cinereoargenteus*
050086	No	Lemming, southern bog	*Synaptomys cooperi helaletes*
050042	No	Mink, common	*Mustela vison mink*

050017	No	Mole, eastern	*Scalopus aquaticus aquaticus*
050076	No	Mouse, common golden	*Ochrotomys nuttalli nuttalli*
050074	No	Mouse, common white-footed	*Peromyscus leucopus leucopus*
050075	No	Mouse, cotton	*Peromyscus gossypinus gossypinus*
050070	Yes	Mouse, eastern harvest	*Reithrodontomys humulis humulis*
050098	No	Mouse, house	*Mus musculus musculus*
050099	No	Mouse, meadow jumping	*Zapus hudsonius americanus*
050093	No	Muskrat, large-toothed	*Ondatra zibethicus macrodon*
050022	No	Myotis, northern long-eared	*Myotis septentrionalis septentrionalis*
050131	No	Myotis, southeastern	*Myotis austroriparius*
050053	No	Nutria	*Myocastor coypus*
050001	No	Opossum, Virginia	*Didelphis virginiana virginiana*
050027	No	Pipistrelle, eastern	*Pipistrellus subflavus subflavus*
050038	No	Raccoon	*Procyon lotor lotor*
050095	No	Rat, Norway	*Rattus norvegicus norvegicus*
050094	No	Rat, black	*Rattus rattus rattus*
050079	No	Rat, hispid cotton	*Sigmodon hispidus virginianus*
050078	No	Rat, marsh rice	*Oryzomys palustris palustris*
050014	Yes	Shrew, Dismal Swamp short-tailed	*Blarina brevicauda telmalestes*
050015	No	Shrew, least	*Cryptotis parva parva*
050010	No	Shrew, pygmy	*Sorex hoyi winnemana*
050007	No	Shrew, southeastern	*Sorex longirostris longirostris*
050011	No	Shrew, southern short-tailed	*Blarina carolinensis carolinensis*
050047	No	Skunk, striped	*Mephitis mephitis nigra*
050057	No	Squirrel, gray	*Sciurus carolinensis carolinensis*
050065	No	Squirrel, southern flying	*Glaucomys volans volans*

050083	No	Vole, dark meadow	*Microtus pennsylvanicus nigrans*
050091	No	Vole, pine	*Microtus pinetorum scalapsoides*
050041	No	Weasel, long-tailed	*Mustela frenata noveboracensis*
060025	No	Mussel, eastern elliptio	*Elliptio complanata*
070095	No	Crayfish, no common name	*Cambarus diogenes diogenes*
070102	No	Crayfish	*Cambarus bartonii bartonii*
070088	No	Crayfish	*Cambarus robustus*
070099	No	Crayfish	*Fallicambarus uhleri*
070097	No	Crayfish	*Orconectes immunis*
100043	No	Armyworm	*Pseudaletia unipuncta*
100041	No	Borer, European corn	*Ostrinia nubilatis*
100181	No	Butterfly, Aaron's skipper	*Poanes aaroni*
100262	No	Butterfly, American lady	*Vanessa virginiensis*
100245	No	Butterfly, American snout	*Libytheana carinenta*
100196	No	Butterfly, Brazilian skipper	*Calpodes ethlius*
100189	No	Butterfly, Carolina road-skipper	*Amblyscirtes carolina*
100278	No	Butterfly, Carolina satyr	*Hermeuptychia sosybius*
100177	No	Butterfly, Delaware skipper	*Anatrytone logan*
100184	No	Butterfly, Dion skipper	*Euphyes dion*
100002	No	Butterfly, Duke's skipper	*Euphyes dukesi*
100185	No	Butterfly, Dun skipper	*Euphyes vestris*
100195	No	Butterfly, Eufala skipper	*Lerodea eufala*
100145	No	Butterfly, Hayhurst's scallopwing	*Staphylus hayhurstii*
100224	No	Butterfly, Henry's elfin	*Callophrys henrici*
100237	No	Butterfly, Hessel's hairstreak	*Callophrys hesseli*
100178	No	Butterfly, Hobomok skipper	*Poanes hobomok*

100149	No	Butterfly, Horace's duskywing	*Erynnis horatius*
100148	No	Butterfly, Juvenal's duskywing	*Erynnis juvenalis*
100004	No	Butterfly, King's hairstreak	*Satyrium kingi*
100197	No	Butterfly, Ocola skipper	*Panoquina ocola*
100203	No	Butterfly, Palamedes swallowtail	*Papilio palamedes*
100183	No	Butterfly, Palatka skipper	*Euphyes pilatka*
100182	No	Butterfly, Yehl skipper	*Poanes yehl*
100180	No	Butterfly, Zabulon skipper	*Poanes zabulon*
100151	No	Butterfly, Zarucco duskywing	*Erynnis zarucco*
100232	No	Butterfly, banded hairstreak	*Satyrium calanus*
100092	No	Butterfly, black swallowtail	*Papilio polyxenes asterius*
100179	No	Butterfly, broad-winged skipper	*Poanes viator*
100137	No	Butterfly, brown elfin	*Callophrys augustinus*
100205	No	Butterfly, cabbage white	*Pieris rapae*
100206	No	Butterfly, checkered white	*Pontia protodice*
100159	No	Butterfly, clouded skipper	*Lerema accius*
100094	No	Butterfly, clouded sulphur	*Colias philodice*
100213	No	Butterfly, cloudless sulphur	*Phoebis sennae eubule*
100265	No	Butterfly, common buckeye	*Junonia coenia*
100156	No	Butterfly, common checkered-skipper	*Pyrgus communis*
100157	No	Butterfly, common sootywing	*Pholisora catullus*
100277	No	Butterfly, common wood-nymph	*Cercyonis pegala*
100144	No	Butterfly, confused cloudywing	*Thorybes confusis*
100271	No	Butterfly, creole pearly-eye	*Enodia creola*
100168	No	Butterfly, crossline skipper	*Polites origenes*
100188	No	Butterfly, dusted skipper	*Atrytonopsis hianna*

100258	No	Butterfly, eastern comma	*Polygonia comma*
100238	No	Butterfly, eastern tailed-blue	*Everes comyntas*
100093	No	Butterfly, eastern tiger swallowtail	*Papilio glaucus*
100209	No	Butterfly, falcate orangetip	*Anthocharis midea*
100162	No	Butterfly, fiery skipper	*Hylephila phyleus*
100276	No	Butterfly, gemmed satyr	*Cyllopsis gemma*
100201	No	Butterfly, giant swallowtail	*Papilio cresphontes*
100228	No	Butterfly, gray hairstreak	*Strymon melinus*
100222	No	Butterfly, great purple hairstreak	*Atlides halesus*
100249	No	Butterfly, great spangled fritillary	*Speyeria cybele*
100246	No	Butterfly, gulf fritillary	*Agraulis vanillae nigrior*
100141	No	Butterfly, hoary edge	*Achalarus lyciades*
100191	No	Butterfly, lace-winged road-skipper	*Amblyscirtes aesculapius*
100160	No	Butterfly, least skipper	*Ancyloxypha numitor*
100175	No	Butterfly, little glassywing	*Pompeius verna*
100244	No	Butterfly, little metalmark	*Calephelis virginiensis*
100279	No	Butterfly, little wood-satyr	*Megisto cymela*
100217	No	Butterfly, little yellow	*Eurema lisa*
100140	No	Butterfly, long-tailed skipper	*Urbanus proteus*
100079	No	Butterfly, monarch	*Danaus plexippus*
100150	No	Butterfly, mottled duskywing	*Erynnis martialis*
100090	No	Butterfly, mourning cloak	*Nymphalis antiopa*
100173	No	Butterfly, northern broken dash	*Wallengrenia egeremet*
100143	No	Butterfly, northern cloudywing	*Thorybes pylades*
100236	No	Butterfly, olive juniper hairstreak	*Callophrys gryneus gryneus*
100211	No	Butterfly, orange sulphur	*Colias eurytheme*

100263	No	Butterfly, painted lady	*Vanessa cardui*
100257	No	Butterfly, pearl crescent	*Phyciodes tharos*
100200	No	Butterfly, pipevine swallowtail	*Battus philenor*
100259	No	Butterfly, question mark	*Polygonia interrogationis*
100264	No	Butterfly, red admiral	*Vanessa atalanta*
100235	No	Butterfly, red-banded hairstreak	*Calycopis cecrops*
100268	No	Butterfly, red-spotted purple	*Limenitis arthemis astyanax*
100190	No	Butterfly, reversed road-skipper	*Amblyscirtes reversa*
100174	No	Butterfly, sachem	*Atalopedes campestris*
100198	No	Butterfly, salt marsh skipper	*Panoquina panoquin*
100082	No	Butterfly, silver-spotted skipper	*Epargyreus clarus*
100146	No	Butterfly, sleepy duskywing	*Erynnis brizo*
100216	No	Butterfly, sleepy orange	*Eurema nicippe*
100172	No	Butterfly, southern broken dash	*Wallengrenia otho*
100142	No	Butterfly, southern cloudywing	*Thorybes bathyllus*
100226	No	Butterfly, southern hairstreak	*Satyrium favonius*
100273	No	Butterfly, southern pearly-eye	*Enodia portlandia*
100202	No	Butterfly, spicebush swallowtail	*Papilio troilus*
100239	No	Butterfly, spring azure	*Celastrina ladon*
100234	No	Butterfly, striped hairstreak	*Satyrium liparops*
100158	No	Butterfly, swarthy skipper	*Nastra lherminier*
100247	No	Butterfly, variegated fritillary	*Euptoieta claudia*
100266	No	Butterfly, viceroy	*Limenitis archippus*
100227	No	Butterfly, white M hairstreak	*Parrhasius m-album*
100199	No	Butterfly, yucca giant-skipper	*Megathymus yuccae*
100204	No	Butterfly, zebra swallowtail	*Eurytides marcellus*

100026	No	Deerfly	*Chrysops vittatus vittatus*
100042	No	Earworm, corn	*Heliathis zea*
100035	No	Gnat	*Culicoides debipalpis*
100016	No	Gnat	*Culicoides stellifer*
100040	No	Moth, codling	*Cydia pomonella*
100047	No	Moth, gypsy	*Lymantria dispar*
100289	No	Moth, pinkstriped oakworm	*Anisota virginiensis*
100291	No	Moth, sweetbay silk	*Callosamia securifera*
110230	No	Tick, American dog	*Dermacentor variabilis*
110232	No	Tick, brown dog	*Rhipicephalus sanguineus*
110228	No	Tick, lone star	*Amblyomma americanum*
110231	No	Tick, rabbit	*Haemaphysalis leporispalustris*
110229	No	Tick, winter	*Dermacentor albipictus*

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The Virginia Fish and Wildlife Information Service

Species list

- **within (550) Chesapeake City**

564 Species

To review a species booklet activate a Species Code link.

Code	Status	Common Name	Scientific Name
040228	FE	Woodpecker, red-cockaded	*Picoides borealis borealis*
040093	FTSE	Eagle, bald	*Haliaeetus leucocephalus leucocephalus*
030071	FT	Turtle, loggerhead sea	*Caretta caretta caretta*
040120	FT	Plover, piping	*Charadrius melodus melodus*
050034	FSSE	Bat, eastern big-eared	*Plecotus (Corynorhinus) rafinesquii macrotis*
040292	FSST	Shrike, migrant loggerhead	*Lanius ludovicianus migrans*
040379	FSST	Sparrow, Henslow's	*Ammodramus henslowii susurrans*
030067	FS	Terrapin, northern diamond-backed	*Malaclemys terrapin terrapin*
040110	FS	Rail, black	*Laterallus jamaicensis*
040320	FS	Warbler, cerulean	*Dendroica cerulea*
030013	SE	Rattlesnake, canebrake	*Crotalus horridus atricaudatus*
040096	SE	Falcon, peregrine	*Falco peregrinus*
040129	ST	Sandpiper, upland	*Bartramia longicauda*
040293	ST	Shrike, loggerhead	*Lanius ludovicianus ludovicianus*

050008	ST	Shrew, Dismal Swamp southeastern	*Sorex longirostris fisheri*
010032	SS	Sturgeon, Atlantic	*Acipenser oxyrhynchus*
020005	SS	Frog, carpenter	*Rana virgatipes*
020063	SS	Toad, oak	*Bufo quercicus*
040264	SS	Creeper, brown	*Certhia americana*
040372	SS	Crossbill, red	*Loxia curvirostra*
040364	SS	Dickcissel	*Spiza americana*
040032	SS	Egret, great	*Ardea alba egretta*
040366	SS	Finch, purple	*Carpodacus purpureus*
040094	SS	Harrier, northern	*Circus cyaneus*
040029	SS	Heron, little blue	*Egretta caerulea caerulea*
040034	SS	Heron, tricolored	*Egretta tricolor*
040040	SS	Ibis, glossy	*Plegadis falcinellus*
040285	SS	Kinglet, golden-crowned	*Regulus satrapa*
040112	SS	Moorhen, common	*Gallinula chloropus cachinnans*
040036	SS	Night-heron, yellow-crowned	*Nyctanassa violacea violacea*
040262	SS	Nuthatch, red-breasted	*Sitta canadensis*
040204	SS	Owl, barn	*Tyto alba pratincola*
040210	SS	Owl, long-eared	*Asio otus*
040213	SS	Owl, northern saw-whet	*Aegolius acadicus*
040020	SS	Pelican, brown	*Pelecanus occidentalis carolinensis*
040381	SS	Sparrow, saltmarsh sharp-tailed	*Ammodramus caudacutus diversus*
040189	SS	Tern, Caspian	*Sterna caspia*
040180	SS	Tern, Forster's	*Sterna forsteri*
040186	SS	Tern, least	*Sterna antillarum*
040278	SS	Thrush, hermit	*Catharus guttatus*
040304	SS	Warbler, Swainson's	*Limnothlypis swainsonii*
040270	SS	Wren, sedge	*Cistothorus platensis*
040266	SS	Wren, winter	*Troglodytes troglodytes*

050110	SS	Mole, small star-nosed	*Condylura cristata parva*
050045	SS	Otter, river	*Lontra canadensis lataxina*
050107	SS	Rabbit, marsh	*Sylvilagus palustris palustris*
010038		Alewife	*Alosa pseudoharengus*
010188		Bass, largemouth	*Micropterus salmoides*
010183		Bluegill	*Lepomis macrochirus*
010034		Bowfin	*Amia calva*
010123		Bullhead, brown	*Ameiurus nebulosus*
010122		Bullhead, yellow	*Ameiurus natalis*
010062		Carp, common	*Cyprinus carpio*
010125		Catfish, channel	*Ictalurus punctatus*
010120		Catfish, white	*Ameiurus catus*
010106		Chubsucker, creek	*Erimyzon oblongus*
010107		Chubsucker, lake	*Erimyzon sucetta*
010190		Crappie, black	*Pomoxis nigromaculatus*
010250		Croaker, Atlantic	*Micropogonias undulatus*
010398		Darter, sawcheek	*Etheostoma serrifer*
010194		Darter, swamp	*Etheostoma fusiforme*
010131		Eel, American	*Anguilla rostrata*
010176		Flier	*Centrarchus macropterus*
010033		Gar, longnose	*Lepisosteus osseus*
010045		Herring, blueback	*Alosa aestivalis*
010143		Killifish, banded	*Fundulus diaphanus*
010128		Madtom, tadpole	*Noturus gyrinus*
010148		Mosquitofish, eastern	*Gambusia holbrooki*
010054		Mudminnow, eastern	*Umbra pygmaea*

010299	Mullet, striped	*Mugil cephalus*
010144	Mummichog	*Fundulus heteroclitus*
010163	Perch, pirate	*Aphredoderus sayanus sayanus*
010166	Perch, white	*Morone americana*
010206	Perch, yellow	*Perca flavescens*
010056	Pickerel, chain	*Esox niger*
010055	Pickerel, redfin	*Esox americanus americanus*
010182	Pumpkinseed	*Lepomis gibbosus*
010040	Shad, American	*Alosa sapidissima*
010041	Shad, gizzard	*Dorosoma cepedianum*
010042	Shad, threadfin	*Dorosoma petenense*
010068	Shiner, golden	*Notemigonus crysoleucas*
010303	Silverside, Atlantic	*Menidia menidia*
010179	Sunfish, banded	*Enneacanthus obesus*
010178	Sunfish, bluespotted	*Enneacanthus gloriosus*
010173	Sunfish, mud	*Acantharchus pomotis*
010180	Sunfish, redbreast	*Lepomis auritus*
010185	Sunfish, redear	*Lepomis microlophus*
010149	Swampfish	*Chologaster cornuta*
010177	Warmouth	*Lepomis gulosus*
020001	Amphiuma, two-toed	*Amphiuma means*
020004	Bullfrog	*Rana catesbeiana*
020003	Frog, Brimley's chorus	*Pseudacris brimleyi*
020015	Frog, coastal plain cricket	*Acris gryllus gryllus*
020010	Frog, little grass	*Pseudacris ocularis*
020008	Frog, southern green	*Rana clamitans melanota*
020016	Frog, southern leopard	*Rana sphenocephala*
020065	Newt, red-spotted	*Notophthalmus viridescens viridescens*
020071	Peeper, northern spring	*Pseudacris crucifer crucifer*
020084	Salamander, Atlantic Coast Slimy	*Plethodon chlorobryonis*

020069	Salamander, eastern mud	*Pseudotriton montanus montanus*
020029	Salamander, four-toed	*Hemidactylium scutatum*
020034	Salamander, many-lined	*Stereochilus marginatus*
020035	Salamander, marbled	*Ambystoma opacum*
020038	Salamander, northern dusky	*Desmognathus fuscus*
020043	Salamander, northern red-backed	*Plethodon cinereus*
020047	Salamander, northern slimy	*Plethodon glutinosus*
020048	Salamander, southern dusky	*Desmognathus auriculatus*
020050	Salamander, southern two-lined	*Eurycea cirrigera*
020051	Salamander, three-lined	*Eurycea guttolineata*
020058	Siren, greater	*Siren lacertina*
020062	Toad, Fowler's	*Bufo fowleri*
020060	Toad, eastern narrow-mouthed	*Gastrophryne carolinensis*
020064	Toad, southern	*Bufo terrestris*
020006	Treefrog, Cope's gray	*Hyla chrysoscelis*
020009	Treefrog, green	*Hyla cinerea*
020014	Treefrog, pine woods	*Hyla femoralis*
020017	Treefrog, squirrel	*Hyla squirrela*
030055	Cooter, Coastal Plain	*Pseudemys concinna floridana*
030057	Cooter, northern red-bellied	*Pseudemys rubriventris rubriventris*
030016	Copperhead, northern	*Agkistrodon contortrix mokasen*
030015	Cottonmouth, eastern	*Agkistrodon piscivorus piscivorus*
030030	Kingsnake, black	*Lampropeltis getula nigra*
030026	Kingsnake, eastern	*Lampropeltis getula getula*
030009	Lizard, eastern slender glass	*Ophisaurus attenuatus longicaudus*
030002	Lizard, northern fence	*Sceloporus undulatus hyacinthinus*

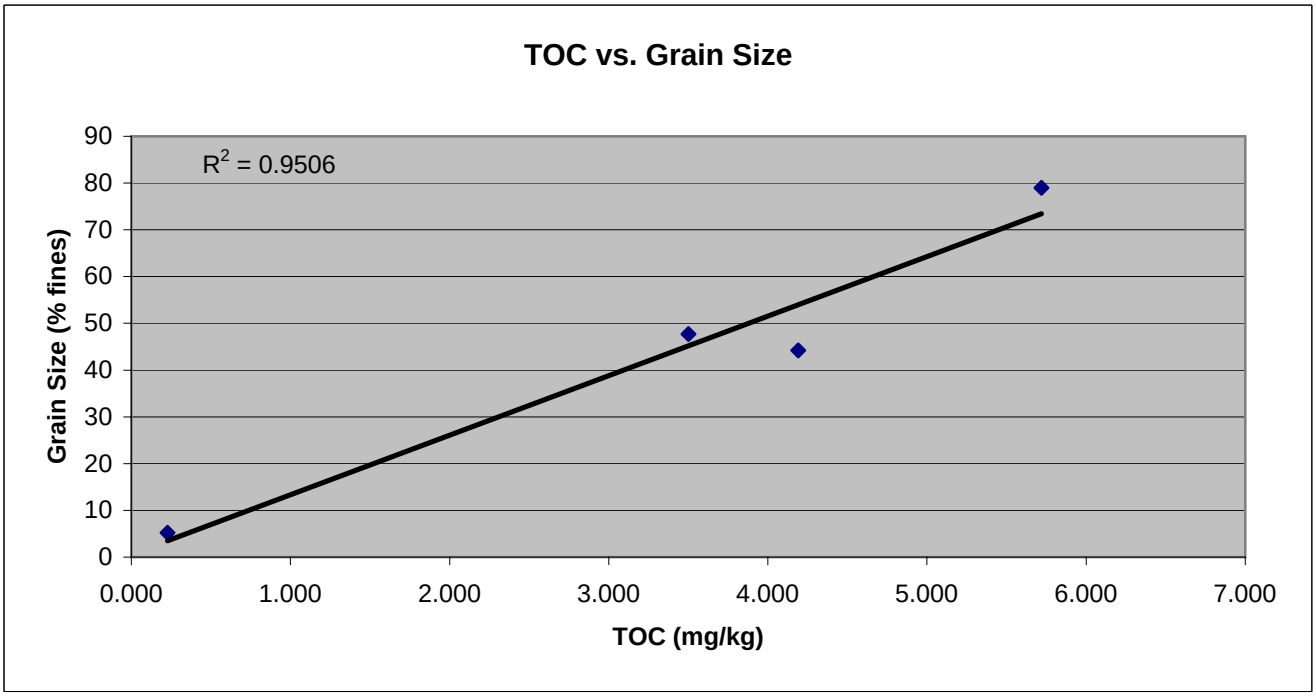
030018	Racer, northern black	*Coluber constrictor constrictor*
030008	Racerunner, six-lined	*Cnemidophorus sexlineatus sexlineatus*
030006	Skink, broadhead	*Eumeces laticeps*
030004	Skink, five-lined	*Eumeces fasciatus*
030007	Skink, little brown	*Scincella lateralis*
030005	Skink, southeastern five-lined	*Eumeces inexpectatus*
030058	Slider, yellowbellied	*Trachemys scripta scripta*
030023	Snake, black rat	*Elaphe obsoleta obsoleta*
030037	Snake, brown water	*Nerodia taxispilota*
030044	Snake, eastern garter	*Thamnophis sirtalis sirtalis*
030024	Snake, eastern hognose	*Heterodon platirhinos*
030029	Snake, eastern milk	*Lampropeltis triangulum triangulum*
030025	Snake, eastern mud	*Farancia abacura abacura*
030045	Snake, eastern ribbon	*Thamnophis sauritus sauritus*
030049	Snake, eastern smooth earth	*Virginia valeriae valeriae*
030019	Snake, eastern worm	*Carphophis amoenus amoenus*
030041	Snake, northern brown	*Storeria dekayi dekayi*
030042	Snake, northern red-bellied	*Storeria occipitomaculata occipitomaculata*
030020	Snake, northern ringneck	*Diadophis punctatus edwardsii*
030017	Snake, northern scarlet	*Cemophora coccinea copei*
030034	Snake, northern water	*Nerodia sipedon sipedon*
030046	Snake, rainbow	*Farancia erytrogramma erytrogramma*
030036	Snake, red-bellied water	*Nerodia erythrogaster erythrogaster*
030047	Snake, rough earth	*Virginia striatula*
030038	Snake, rough green	*Opheodrys aestivus aestivus*
030021	Snake, southern ringneck	*Diadophis punctatus punctatus*

030068	Turtle, eastern box	*Terrapene carolina carolina*
030051	Turtle, eastern mud	*Kinosternon subrubrum subrubrum*
030052	Turtle, eastern musk (= stinkpot)	*Sternotherus odoratus*
030060	Turtle, eastern painted	*Chrysemys picta picta*
030050	Turtle, eastern snapping	*Chelydra serpentina serpentina*
030063	Turtle, spotted	*Clemmys guttata*
040025	Anhinga	*Anhinga anhinga*
040116	Avocet, American	*Recurvirostra americana*
040038	Bittern, American	*Botaurus lentiginosus*
040037	Bittern, least	*Ixobrychus exilis exilis*
040350	Blackbird, Brewer's	*Euphagus cyanocephalus*
040346	Blackbird, red-winged	*Agelaius phoeniceus*
040349	Blackbird, rusty	*Euphagus carolinus*
040345	Blackbird, yellow-headed	*Xanthocephalus xanthocephalus*
040282	Bluebird, eastern	*Sialia sialis*
040343	Bobolink	*Dolichonyx oryzivorus*
040100	Bobwhite, northern	*Colinus virginianus*
040046	Brant	*Branta bernicla brota*
040068	Bufflehead	*Bucephala albeola*
040361	Bunting, indigo	*Passerina cyanea*
040363	Bunting, painted	*Passerina ciris ciris*
040401	Bunting, snow	*Plectrophenax nivalis nivalis*
040064	Canvasback	*Aythya valisineria*
040357	Cardinal, northern	*Cardinalis cardinalis*
040272	Catbird, gray	*Dumetella carolinensis*
040337	Chat, yellow-breasted	*Icteria virens virens*

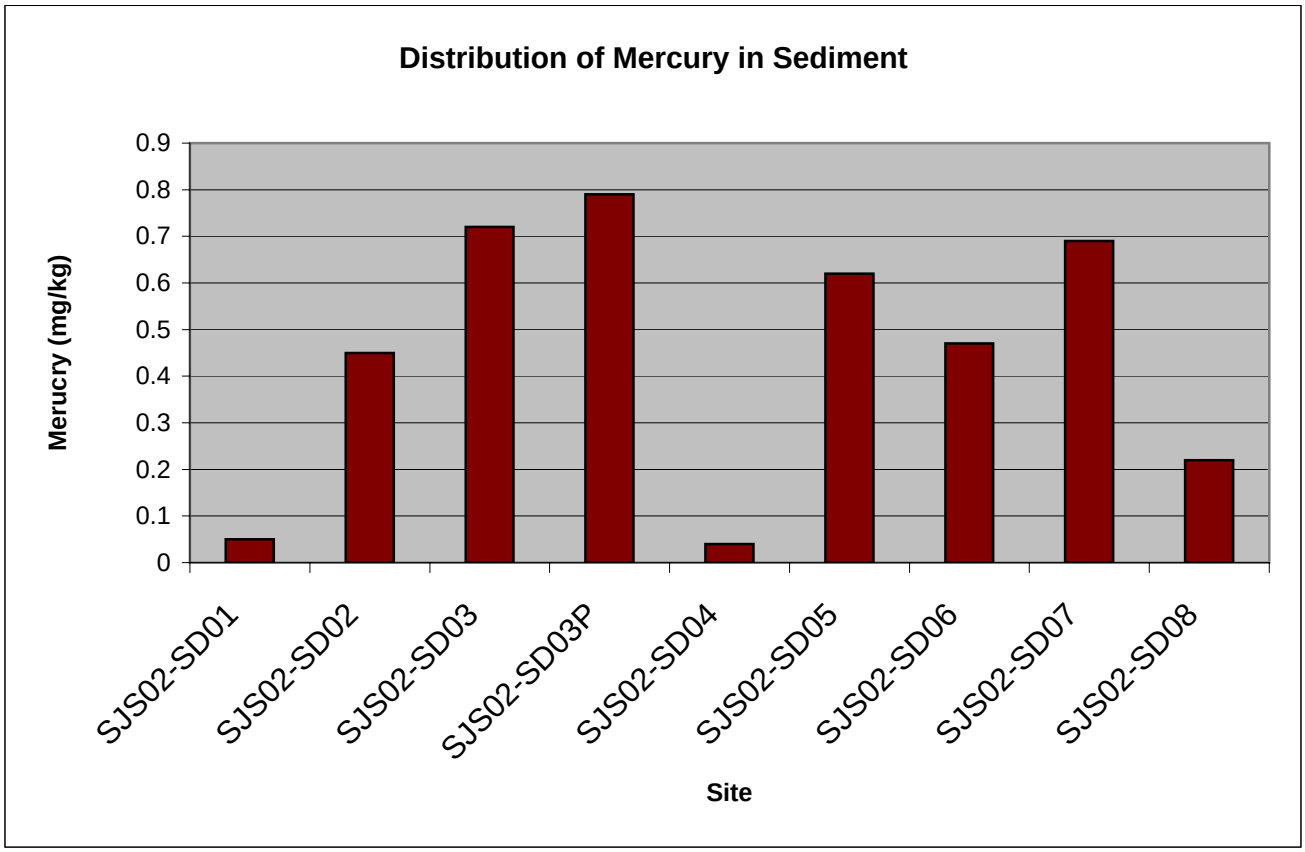
040258	Chickadee, Carolina	*Poecile carolinensis*
040214	Chuck-will's-widow	*Caprimulgus carolinensis*
040113	Coot, American	*Fulica americana*
040024	Cormorant, double-crested	*Phalacrocorax auritus*
040023	Cormorant, great	*Phalacrocorax carbo*
040353	Cowbird, brown-headed	*Molothrus ater*
040373	Crossbill, white-winged	*Loxia leucoptera*
040255	Crow, American	*Corvus brachyrhynchos*
040256	Crow, fish	*Corvus ossifragus*
040203	Cuckoo, black-billed	*Coccyzus erythropthalmus*
040202	Cuckoo, yellow-billed	*Coccyzus americanus*
040198	Dove, mourning	*Zenaida macroura carolinensis*
040197	Dove, rock	*Columba livia*
040195	Dovekie	*Alle alle*
040143	Dowitcher, long-billed	*Limnodromus scolopaceus*
040142	Dowitcher, short-billed	*Limnodromus griseus*
040052	Duck, American black	*Anas rubripes*
040070	Duck, Harlequin	*Histrionicus histrionicus*
040063	Duck, ring-necked	*Aythya collaris*
040076	Duck, ruddy	*Oxyura jamaicensis*
040061	Duck, wood	*Aix sponsa*
040154	Dunlin	*Calidris alpina hudsonia*
040092	Eagle, golden	*Aquila chrysaetos*
040030	Egret, cattle	*Bubulcus ibis*
040033	Egret, snowy	*Egretta thula*
040071	Eider, common	*Somateria mollissima*

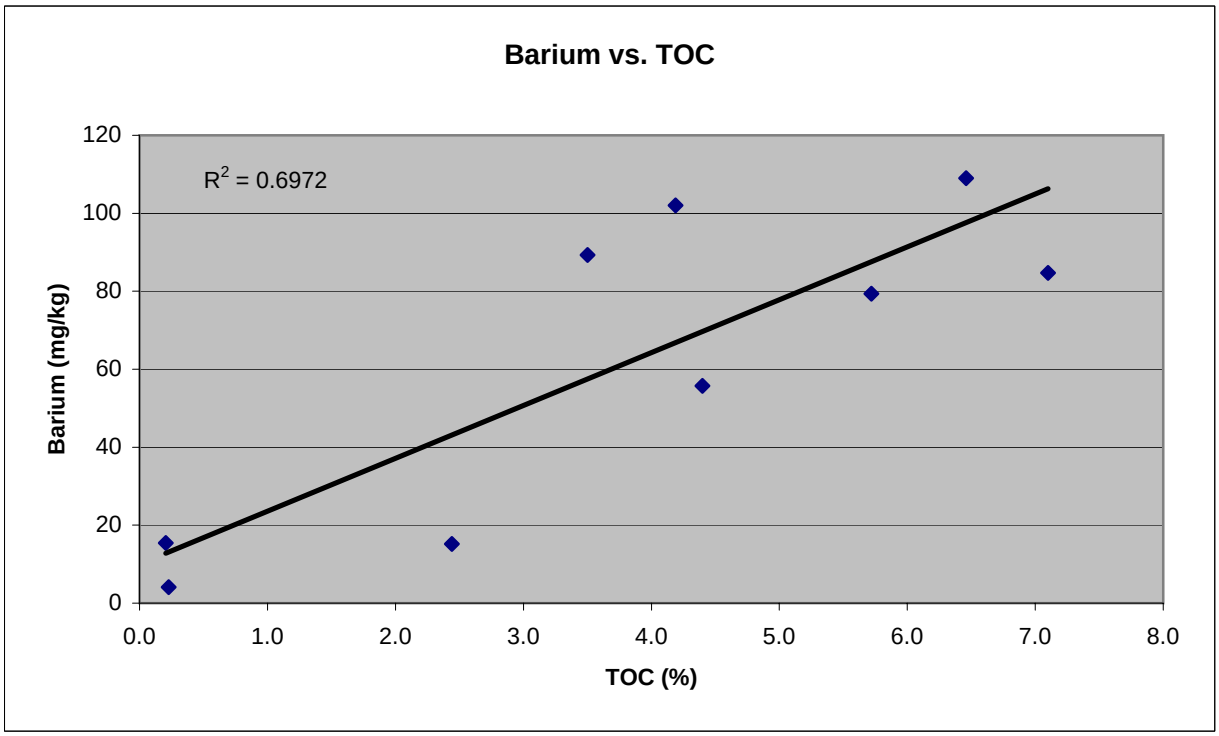
040072	Eider, king	*Somateria spectabilis*
040367	Finch, house	*Carpodacus mexicanus*
040042	Flamingo, greater	*Phoenicopterus ruber*
040221	Flicker, northern	*Colaptes auratus*
040239	Flycatcher, Acadian	*Empidonax virescens*
040234	Flycatcher, great crested	*Myiarchus crinitus*
040053	Gadwall	*Anas strepera*
040022	Gannet, northern	*Morus bassanus*
040284	Gnatcatcher, blue-gray	*Polioptila caerulea*
040126	Godwit, marbled	*Limosa fedoa*
040067	Goldeneye, common	*Bucephala clangula americana*
040371	Goldfinch, American	*Carduelis tristis*
040045	Goose, Canada	*Branta canadensis*
040416	Goose, Ross'	*Chen rossii*
040049	Goose, lesser snow	*Chen caerulescens caerulescens*
040410	Goose, snow	*Chen caerulescens atlanticus*
040351	Grackle, boat-tailed	*Quiscalus major*
040352	Grackle, common	*Quiscalus quiscula*
040006	Grebe, eared	*Podiceps nigricollis*
040005	Grebe, horned	*Podiceps auritus*
040008	Grebe, pied-billed	*Podilymbus podiceps*
040004	Grebe, red-necked	*Podiceps grisegena*
040007	Grebe, western	*Aechmophorus occidentalis*
040360	Grosbeak, blue	*Guiraca caerulea caerulea*
040365	Grosbeak, evening	*Coccothraustes vespertinus*
040175	Gull, Bonaparte's	*Larus philadelphia*

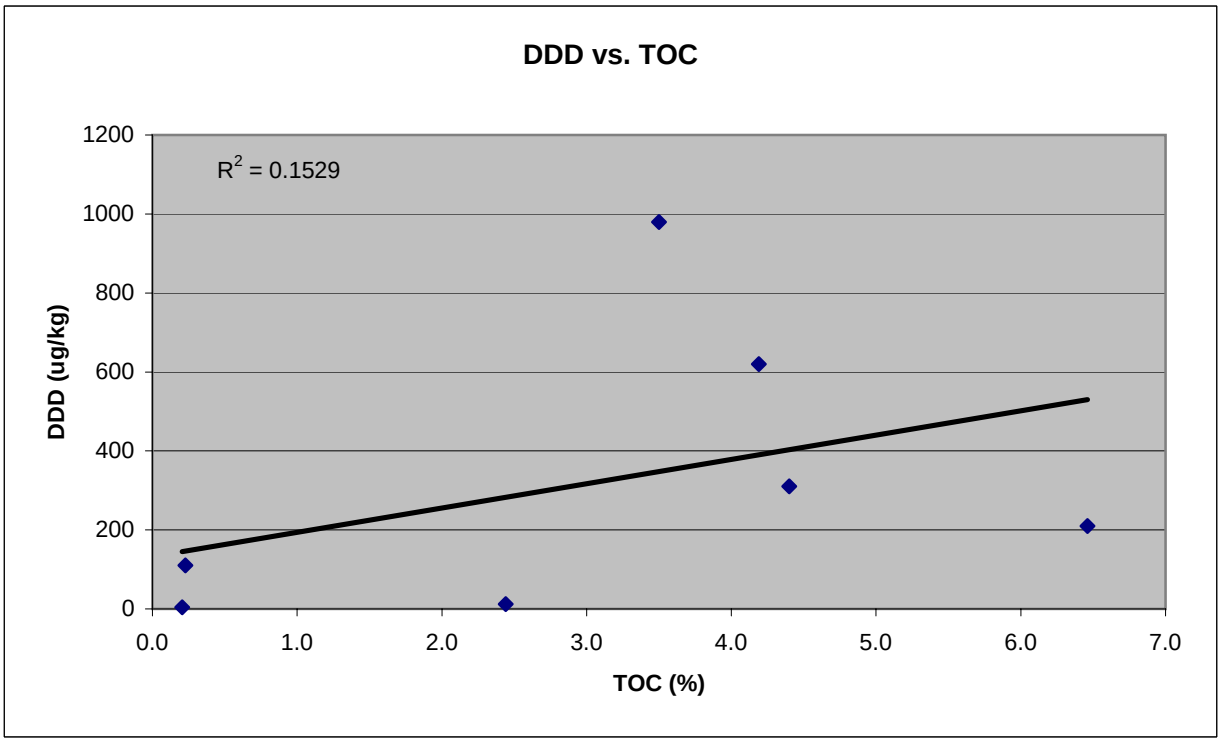
SampleID	Total organic carbon (TOC) mg/kg	Total organic carbon (TOC) %	Grain Size (% fines)	Barium	Cadmium	Chromium	Copper	Lead	Mercury	Zinc	DDD
SJS02-SD01	2050	0.205		15.4	0.14	6.5	4.4	15.5	0.05	19.2	3.7
SJS02-SD02	44000	4.400		55.7	4	277	344	161	0.45	416	310
SJS02-SD03	71000	7.100		84.7	2.5	1640	1700	396	0.72	1140	NA
SJS02-SD03P	64600	6.460		109	2.1	2630	2620	545	0.79	1400	210
SJS02-SD04	2270	0.227	5.2	4.1	0.53	11.6	18.2	14.9	0.04	42.8	110
SJS02-SD05	41900	4.190	44.2	102	8.2	1180	1200	312	0.62	888	620
SJS02-SD06	35000	3.500	47.7	89.3	7.3	1900	2030	366	0.47	1120	980
SJS02-SD07	57200	5.720	79	79.4	4.6	392	494	250	0.69	539	NA
SJS02-SD08	24400	2.440		15.2	1.1	67.1	94.8	54.2	0.22	173	12

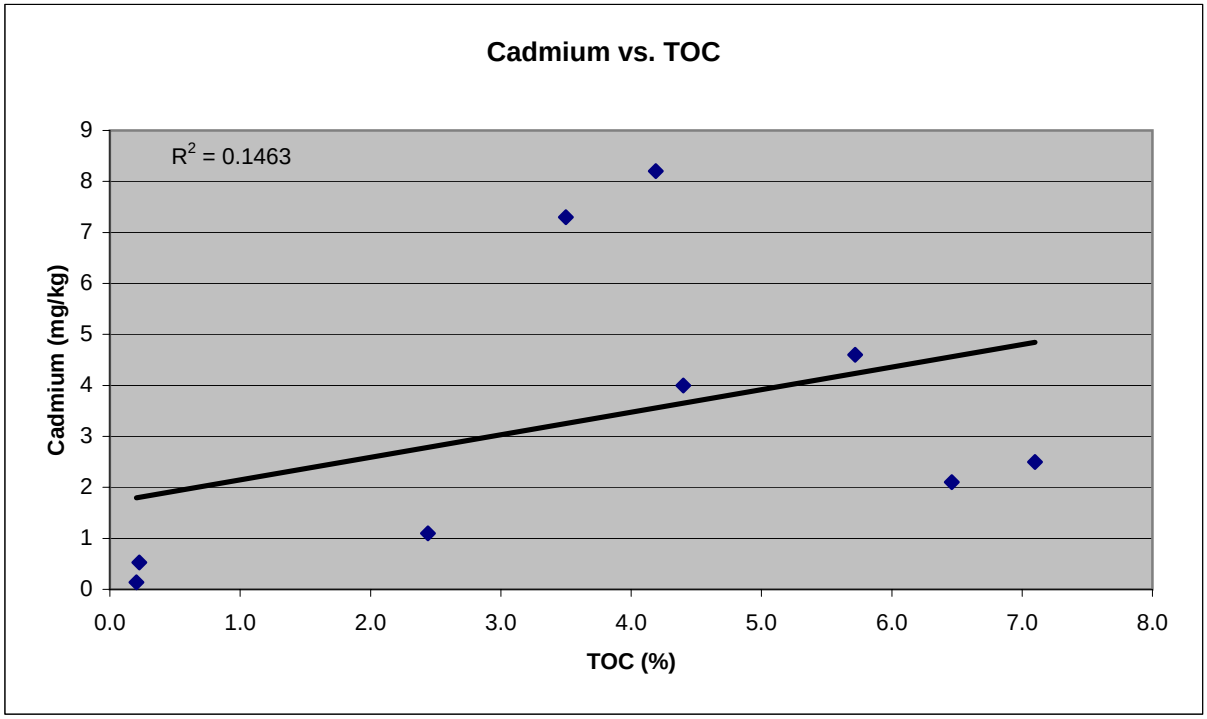


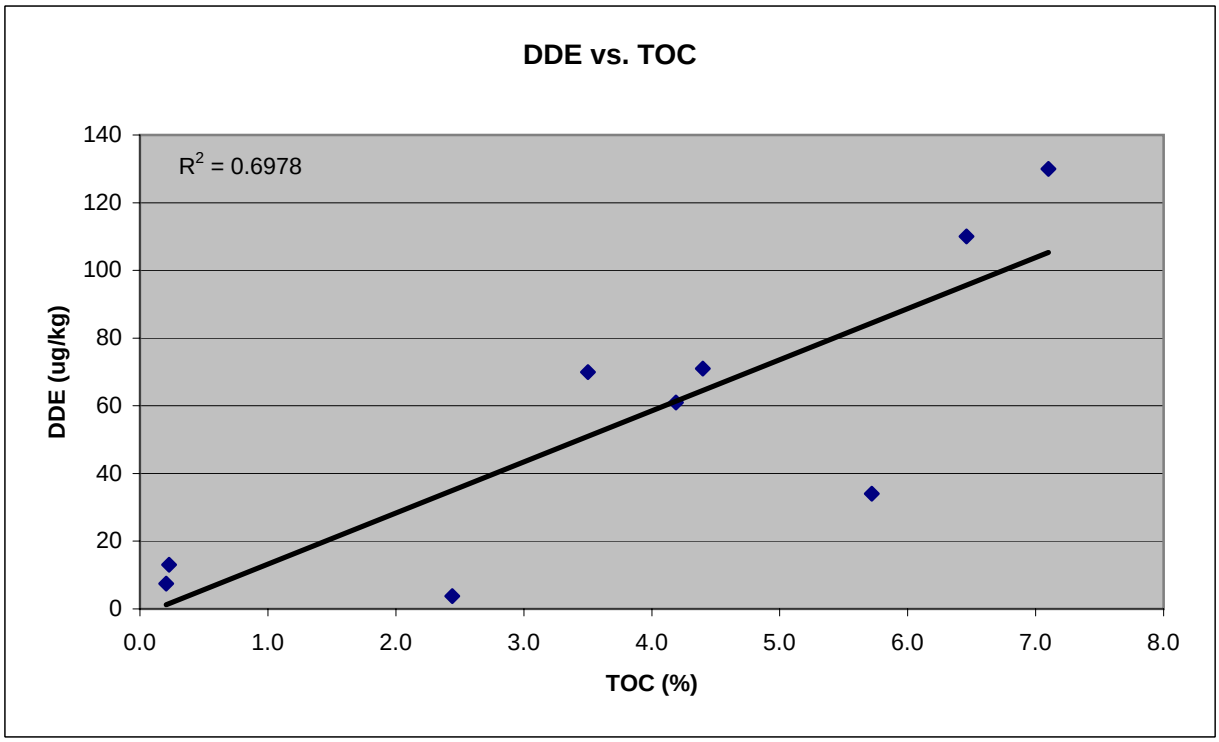
DDE	DDT	Alpha-Chlordane	Gamme-Chlordane	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(g,h,I)perylene	Chrysene	Flouranthene	Phenanthrene	Pyrene
7.5	9.3	1.7	1.7	87	79	86	130	330	47	230
71	28	7.3	9.8	9100	9100	9100	9100	930	9100	1200
130	12	28	29	440	660	580	680	850	190	1100
110	8.8	18	21	240	370	310	330	510	1400	600
13	25	2.4	2.4	480	480	480	480	480	480	48
61	73	79	96	1300	910	690	1400	2200	1100	3100
70	3200	40	58	380	360	230	360	880	530	850
34	12	7.7	12	930	930	930	930	930	930	930
3.8	3.4	0.82	1.5	86	91	83	120	150	550	130

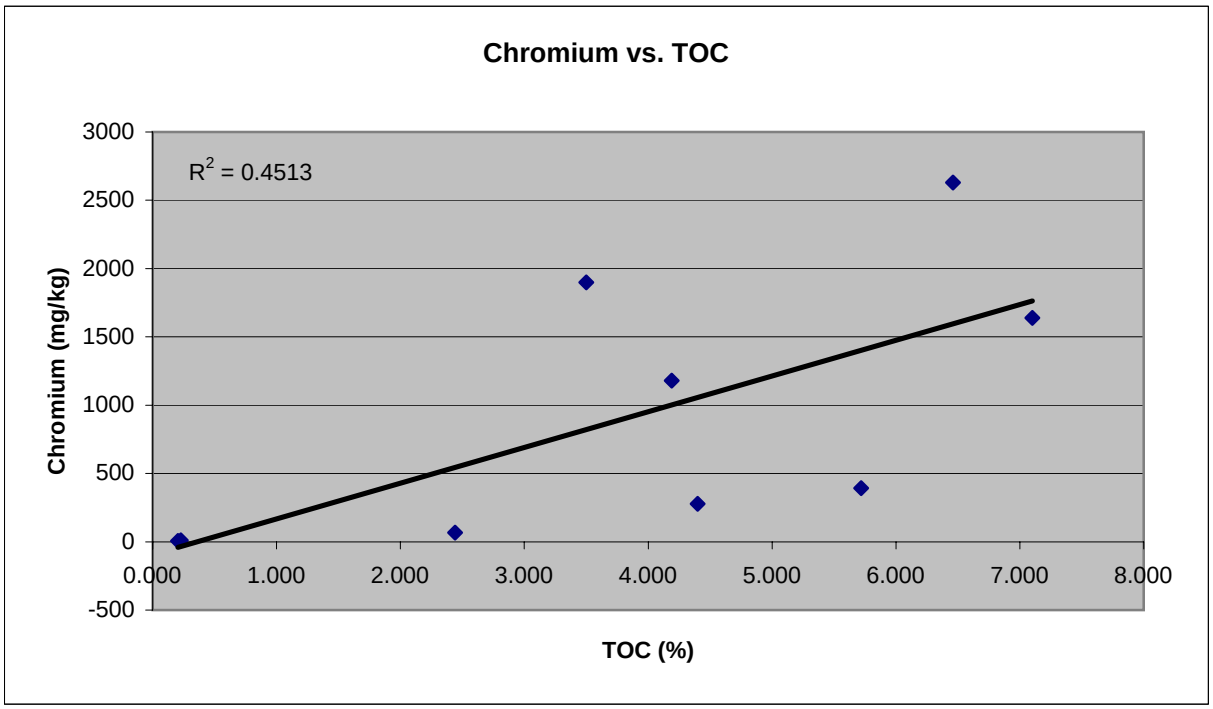


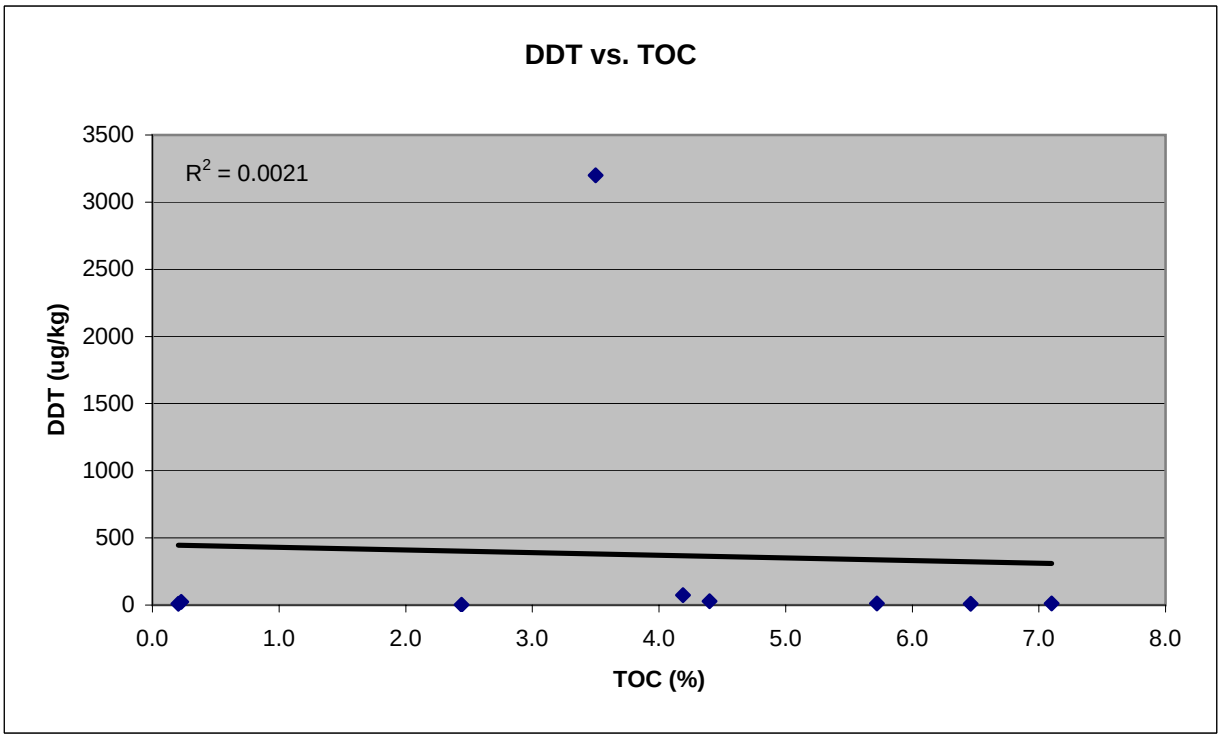

Barium vs. TOC
R2 = 0.6972
Barium (mg/kg)
120
100
80
60
40
20
0
0.0
1.0
2.0
3.0
4.0
5.0
6.0
7.0
8.0
TOC (%)

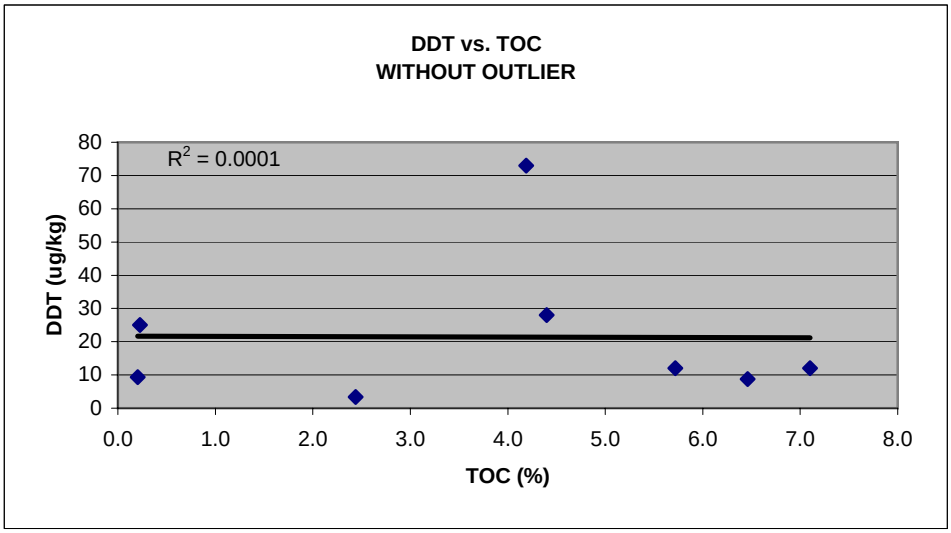

DDD vs. TOC
R2 = 0.1529
DDD (ug/kg)
1200
1000
800
600
400
200
0
0.0
1.0
2.0
3.0
4.0
5.0
6.0
7.0
TOC (%)

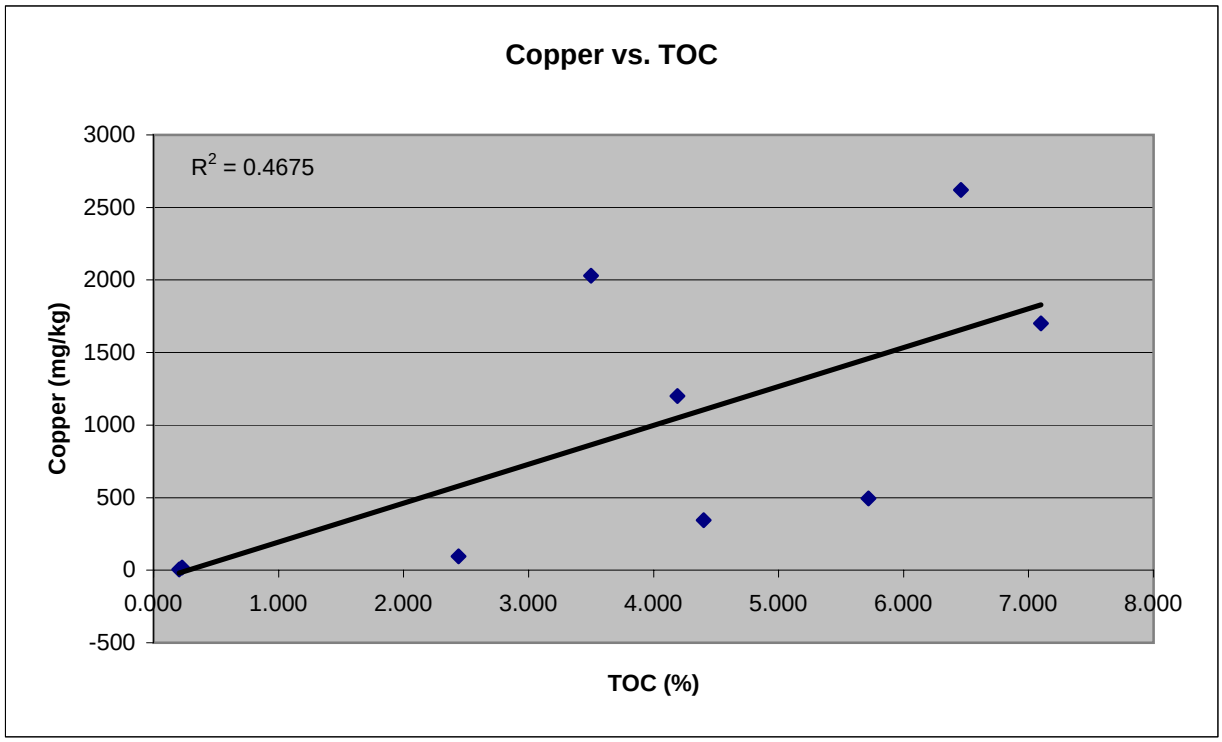

Cadmium vs. TOC
R2 = 0.1463
Cadmium (mg/kg)
0
1
2
3
4
5
6
7
8
9
0.0
1.0
2.0
3.0
4.0
5.0
6.0
7.0
8.0
TOC (%)

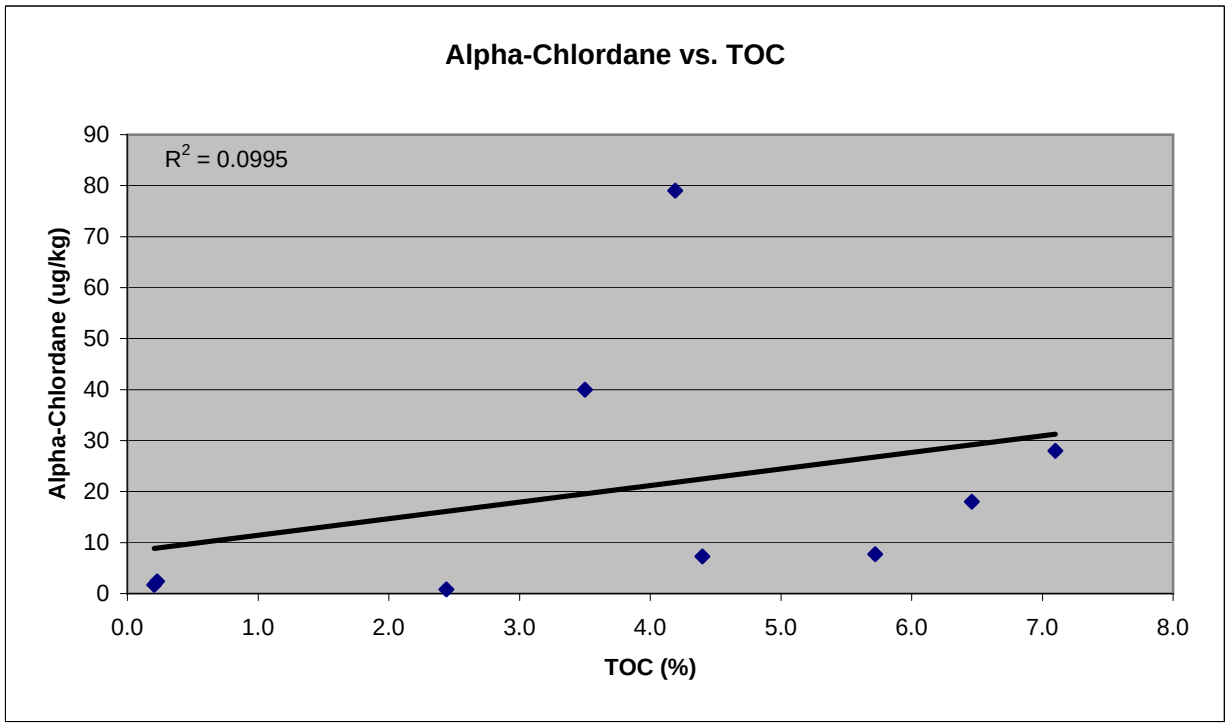

DDE vs. TOC
R2 = 0.6978
DDE (ug/kg)
0
20
40
60
80
100
120
140
0.0
1.0
2.0
3.0
4.0
5.0
6.0
7.0
8.0
TOC (%)

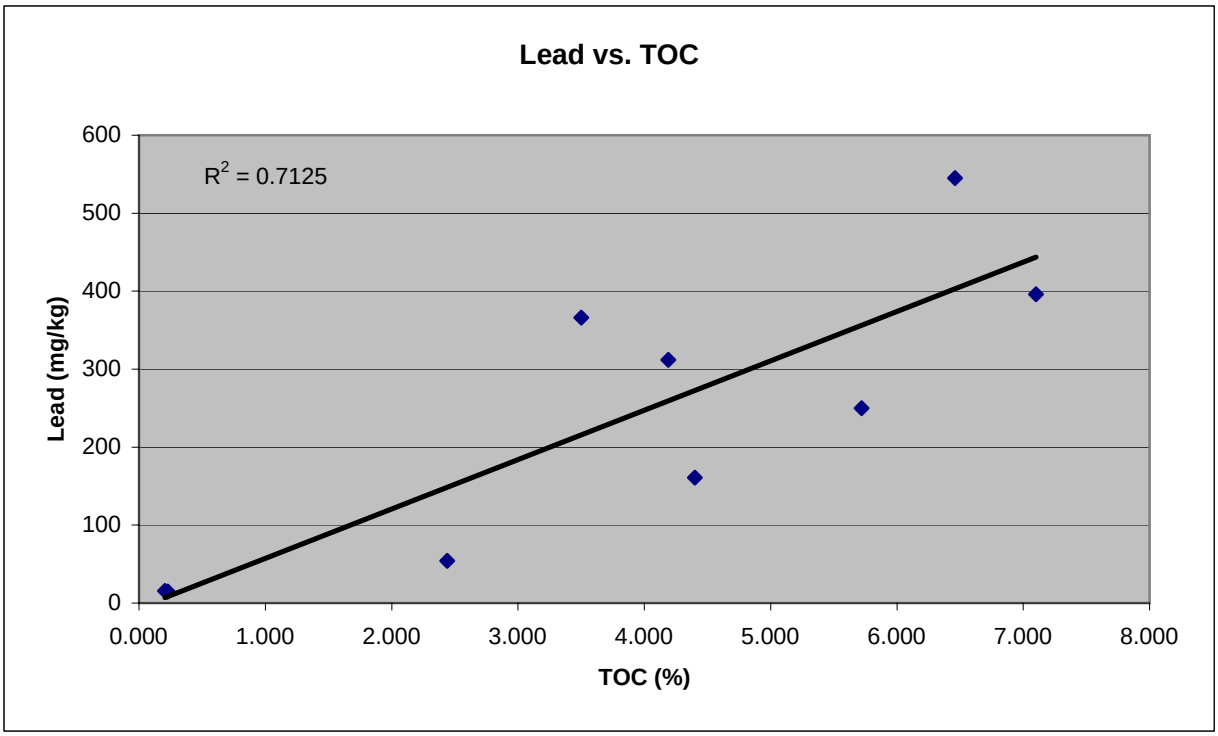

Chromium vs. TOC
R2 = 0.4513
Chromium (mg/kg)
3000
2500
2000
1500
1000
500
0
-500
0.000
1.000
2.000
3.000
4.000
5.000
6.000
7.000
8.000
TOC (%)

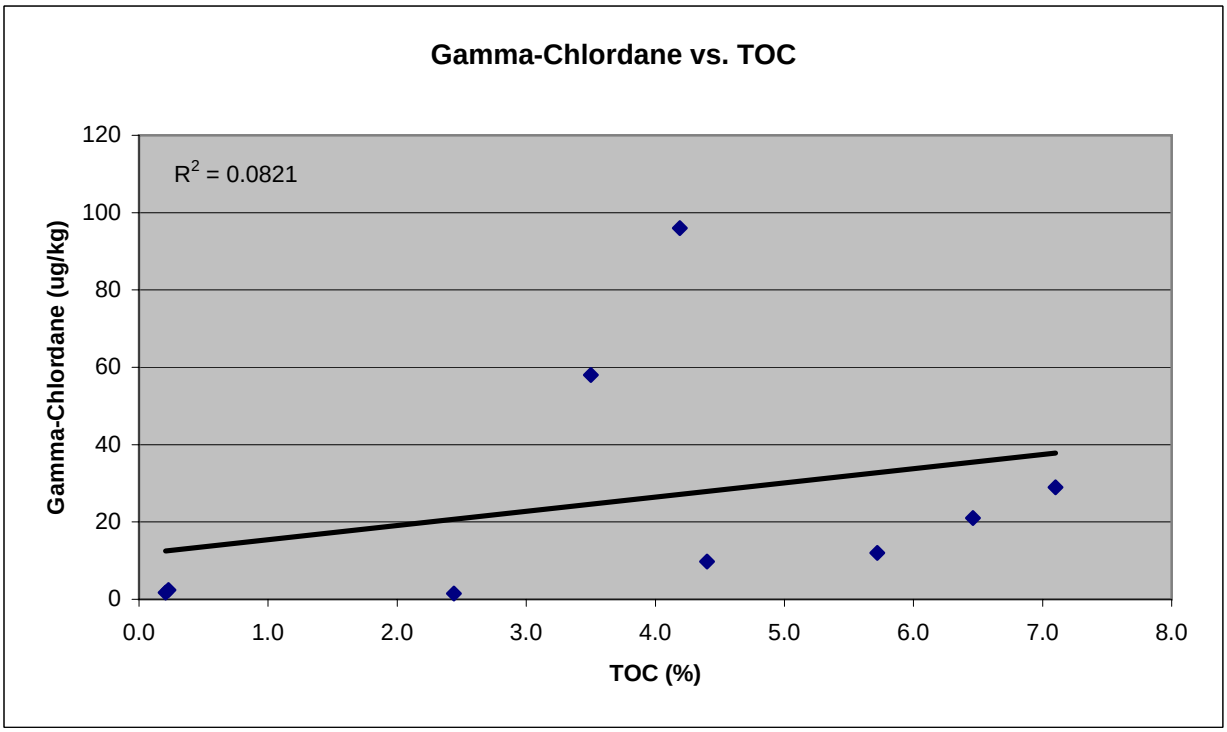

DDT vs. TOC
R2 = 0.0021
DDT (ug/kg)
3500
3000
2500
2000
1500
1000
500
0
0.0
1.0
2.0
3.0
4.0
5.0
6.0
7.0
8.0
TOC (%)

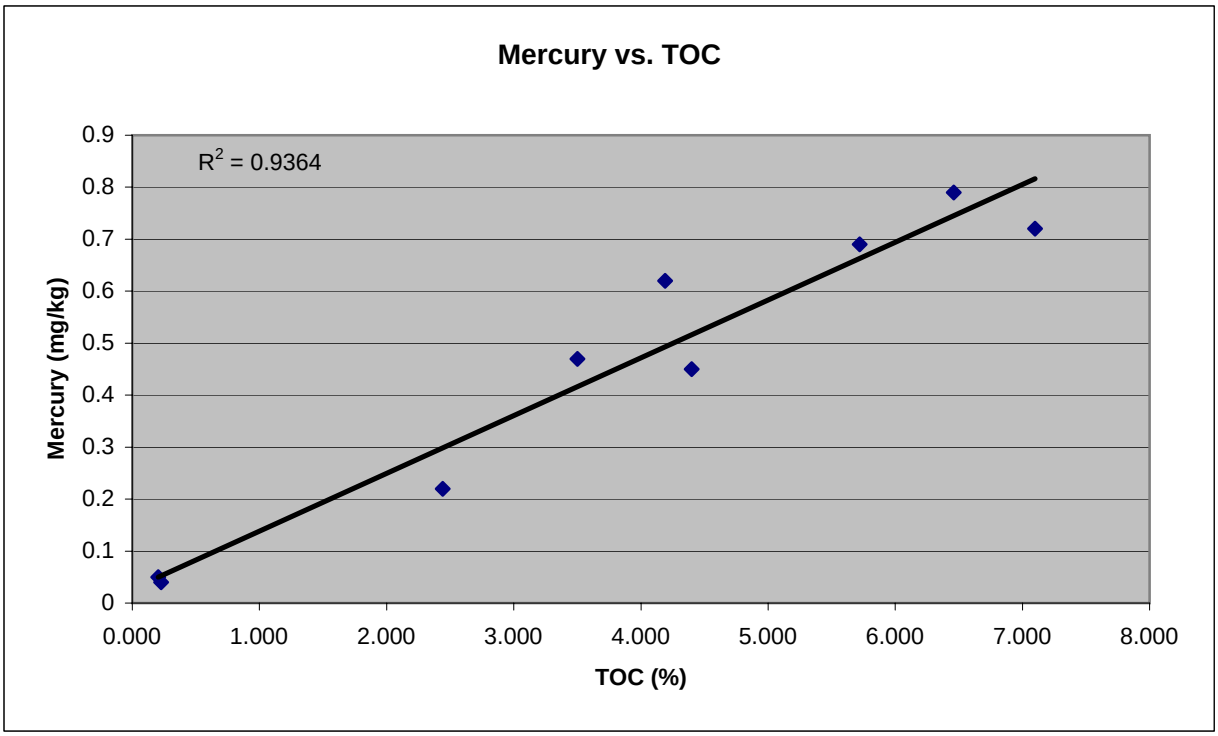

DDT vs. TOC
WITHOUT OUTLIER
R2 = 0.0001
DDT (ug/kg)
80
70
60
50
40
30
20
10
0
0.0
1.0
2.0
3.0
4.0
5.0
6.0
7.0
8.0
TOC (%)

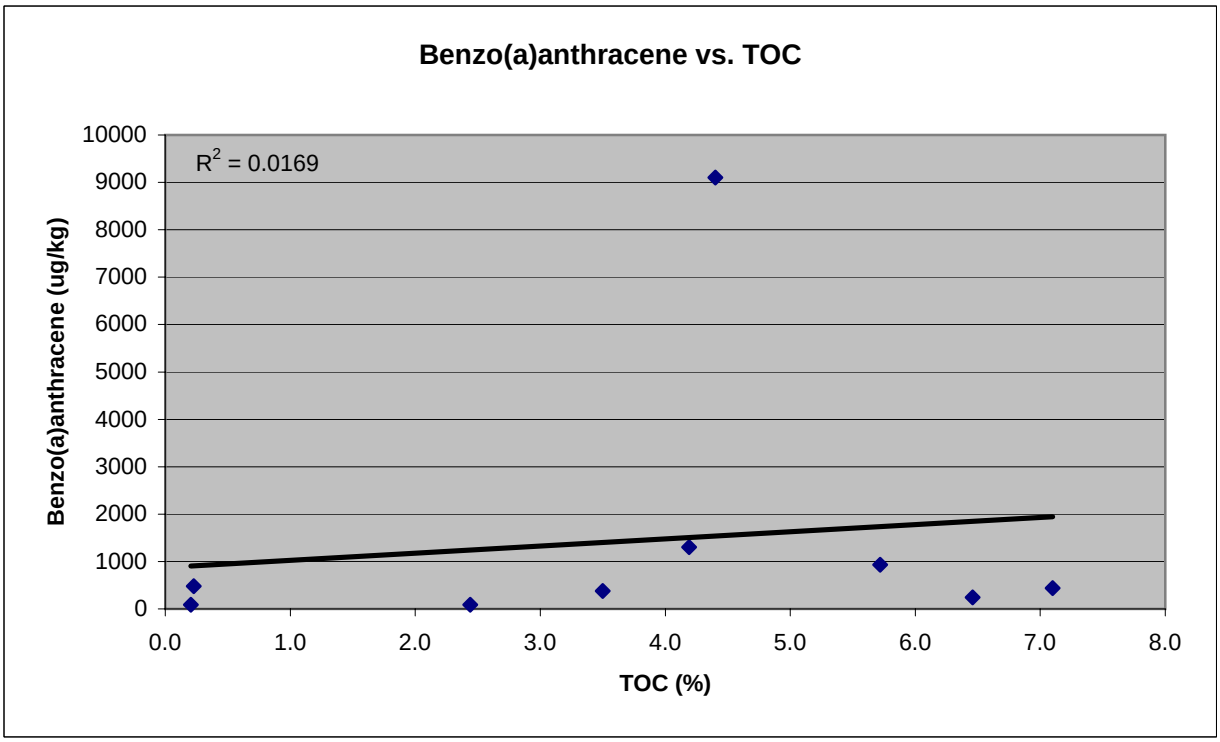

Copper vs. TOC
R2 = 0.4675
Copper (mg/kg)
3000
2500
2000
1500
1000
500
0
-500
0.000
1.000
2.000
3.000
4.000
5.000
6.000
7.000
8.000
TOC (%)

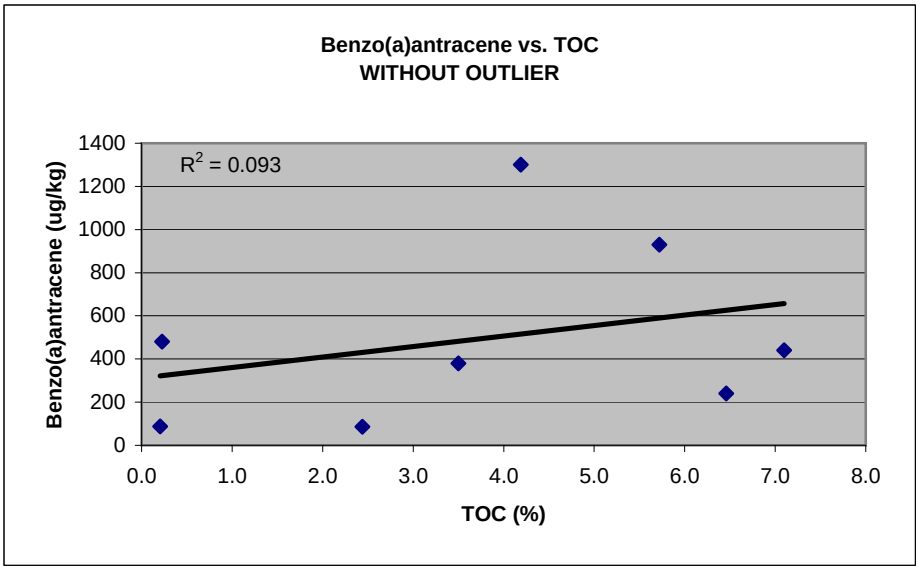

Alpha-Chlordane vs. TOC
R2 = 0.0995
Alpha-Chlordane (ug/kg)
90
80
70
60
50
40
30
20
10
0
0.0
1.0
2.0
3.0
4.0
5.0
6.0
7.0
8.0
TOC (%)

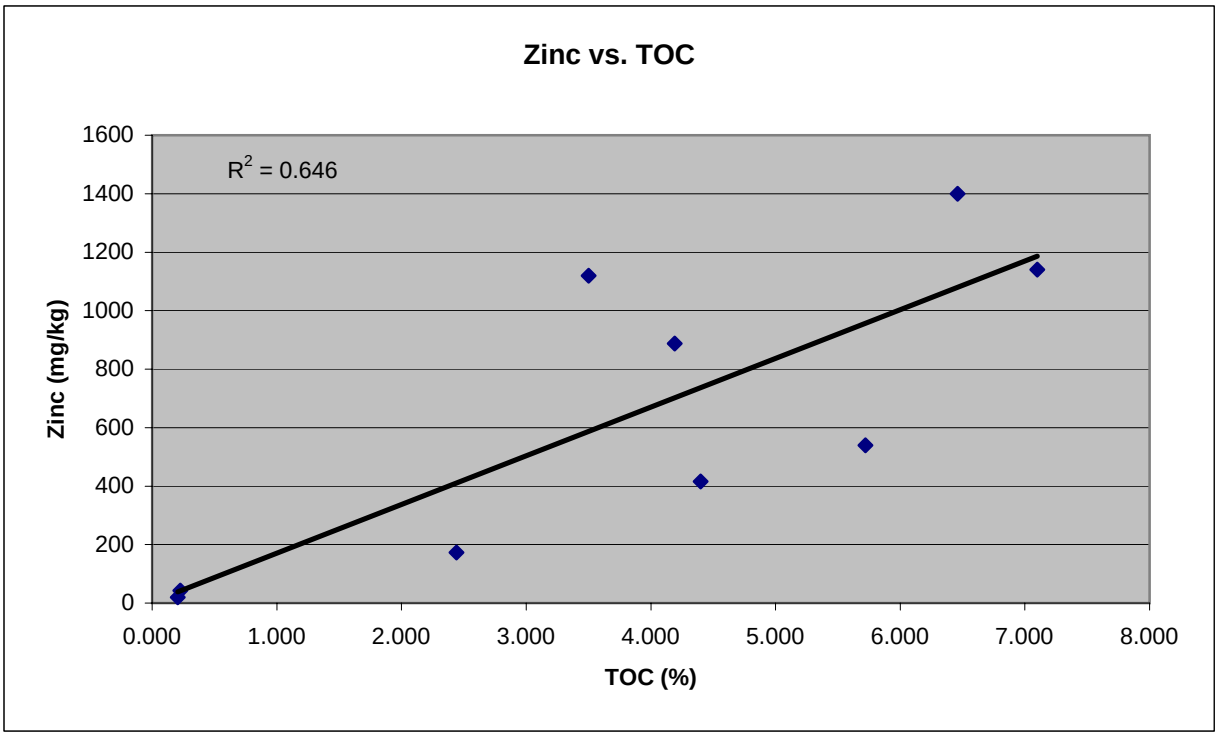

Lead vs. TOC
R2 = 0.7125
Lead (mg/kg)
600
500
400
300
200
100
0
0.000
1.000
2.000
3.000
4.000
5.000
6.000
7.000
8.000
TOC (%)

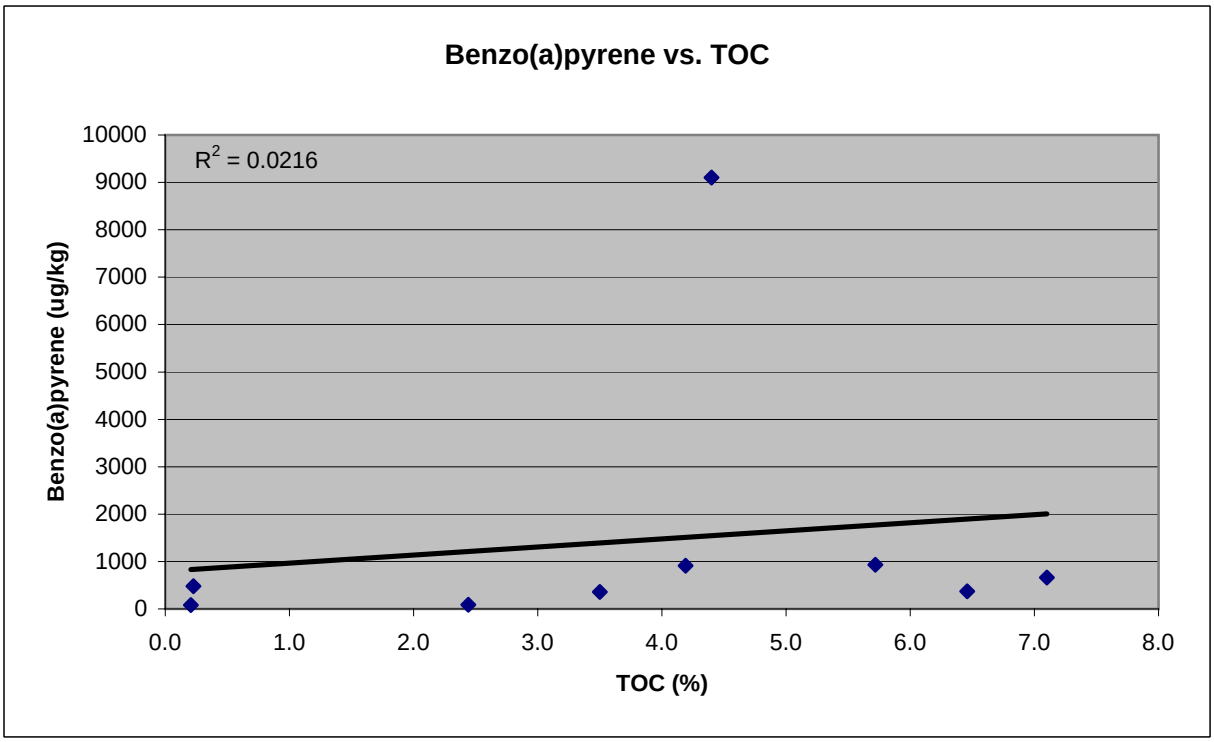

Gamma-Chlordane vs. TOC
R2 = 0.0821
Gamma-Chlordane (ug/kg)
120
100
80
60
40
20
0
0.0
1.0
2.0
3.0
4.0
5.0
6.0
7.0
8.0
TOC (%)

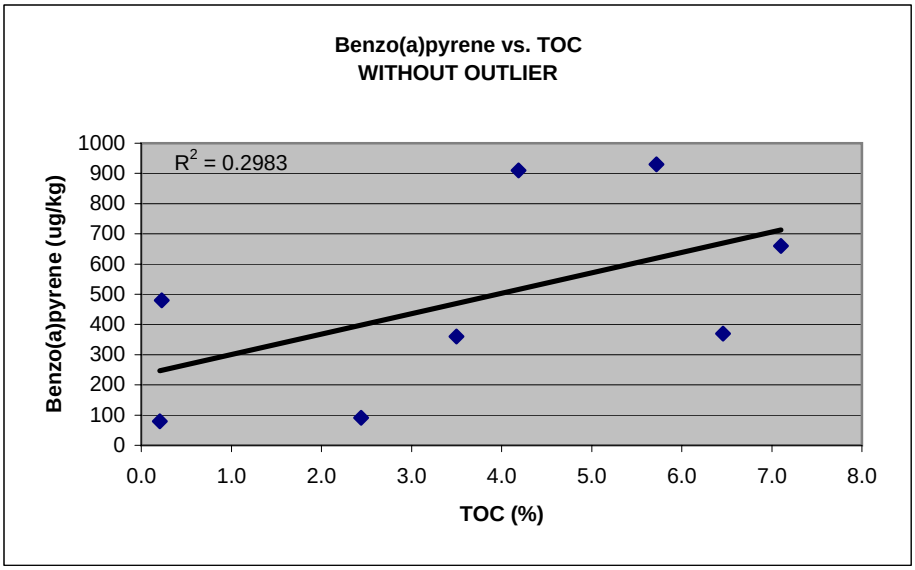

Mercury vs. TOC
R2 = 0.9364
Mercury (mg/kg)
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
0.000
1.000
2.000
3.000
4.000
5.000
6.000
7.000
8.000
TOC (%)

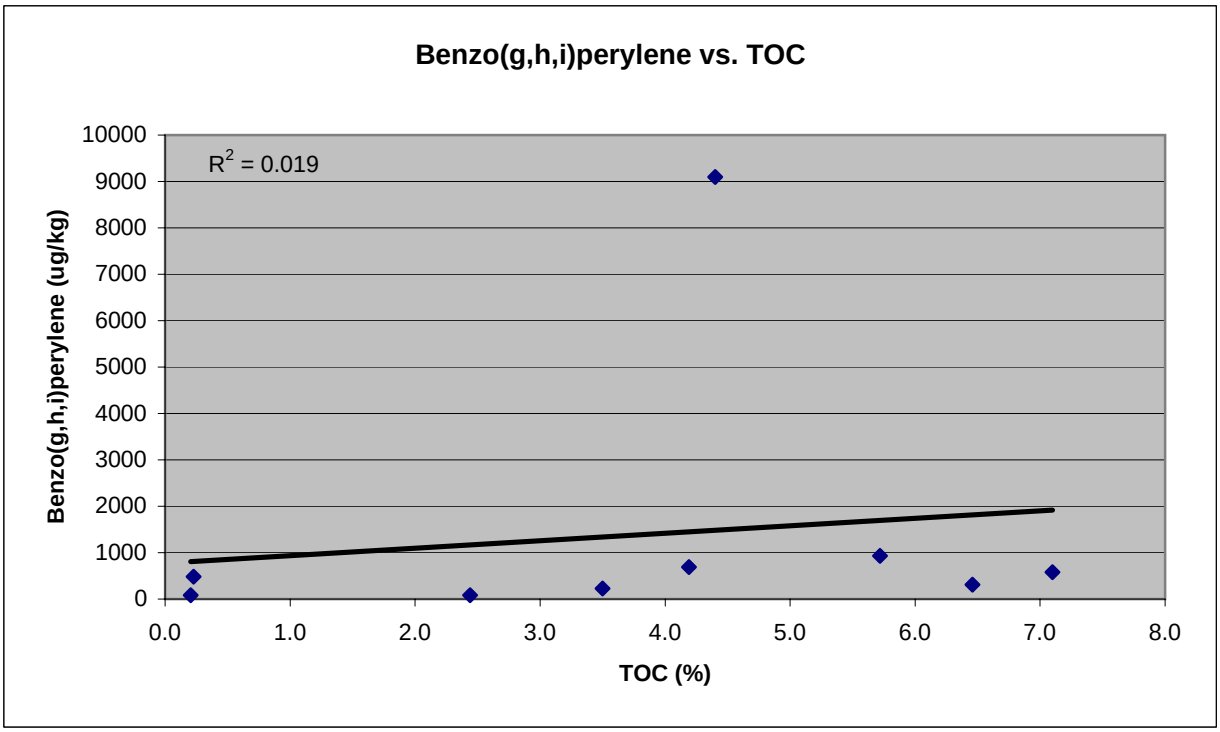

Benzo(a)anthracene vs. TOC
R2 = 0.0169
Benzo(a)anthracene (ug/kg)
10000
9000
8000
7000
6000
5000
4000
3000
2000
1000
0
0.0
1.0
2.0
3.0
4.0
5.0
6.0
7.0
8.0
TOC (%)

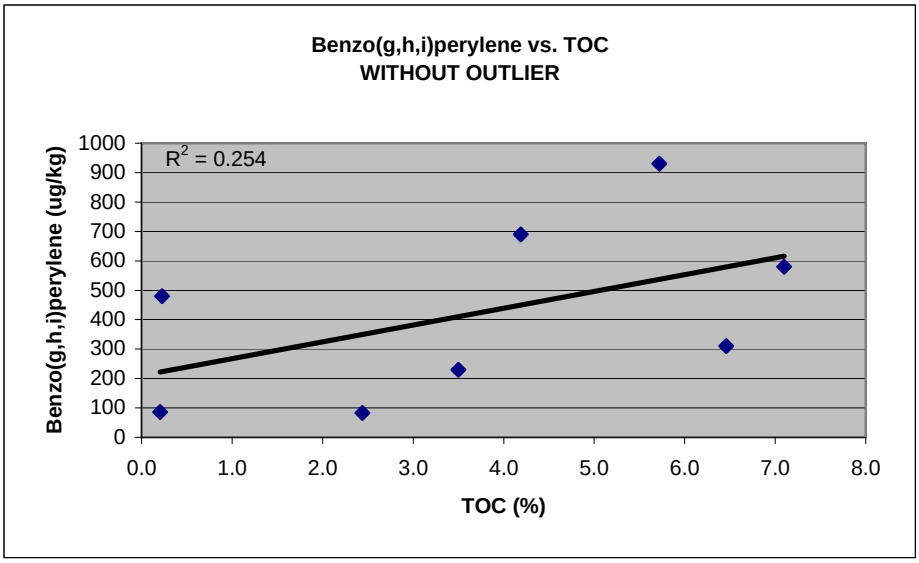

Benzo(a)antracene vs. TOC
WITHOUT OUTLIER
R2 = 0.093
Benzo(a)antracene (ug/kg)
1400
1200
1000
800
600
400
200
0
0.0
1.0
2.0
3.0
4.0
5.0
6.0
7.0
8.0
TOC (%)

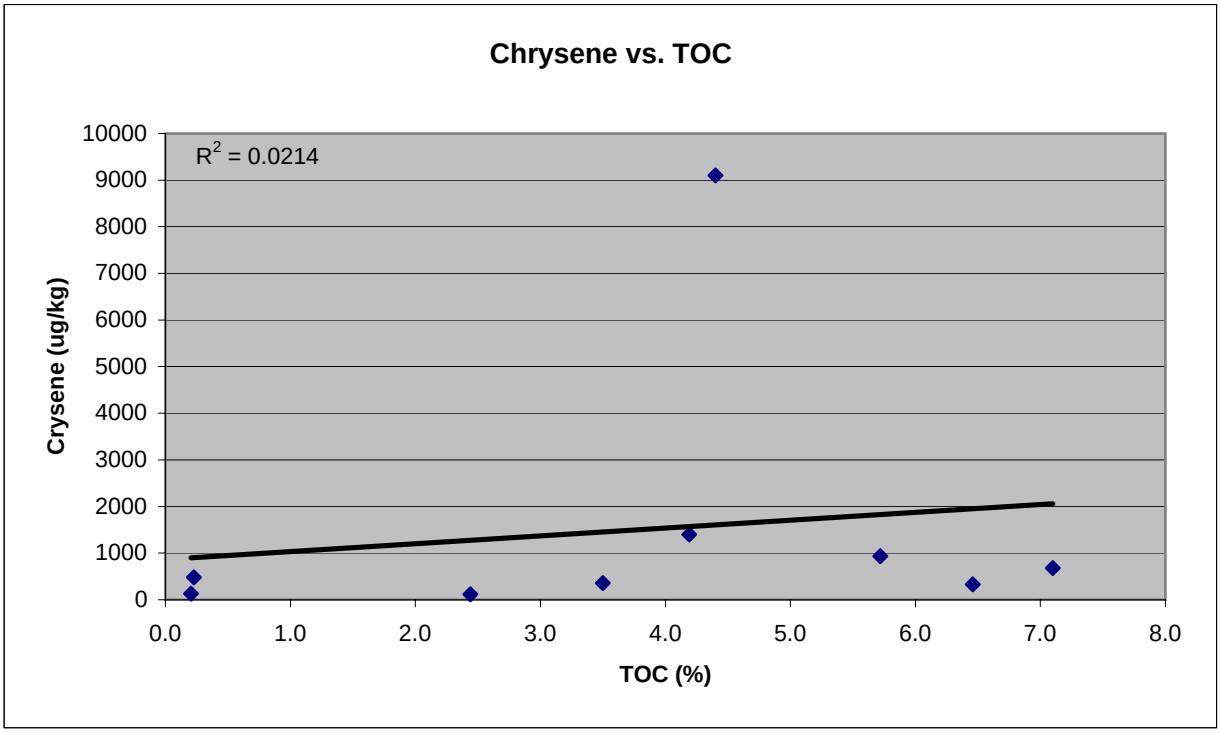

Zinc vs. TOC
R2 = 0.646
Zinc (mg/kg)
1600
1400
1200
1000
800
600
400
200
0
0.000
1.000
2.000
3.000
4.000
5.000
6.000
7.000
8.000
TOC (%)

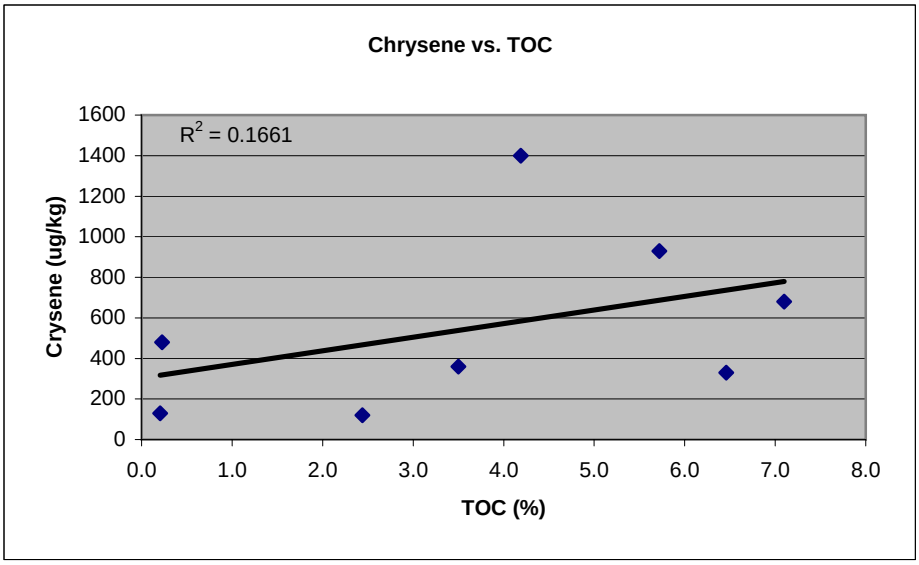

Benzo(a)pyrene vs. TOC
R2 = 0.0216
Benzo(a)pyrene (ug/kg)
10000
9000
8000
7000
6000
5000
4000
3000
2000
1000
0
0.0
1.0
2.0
3.0
4.0
5.0
6.0
7.0
8.0
TOC (%)

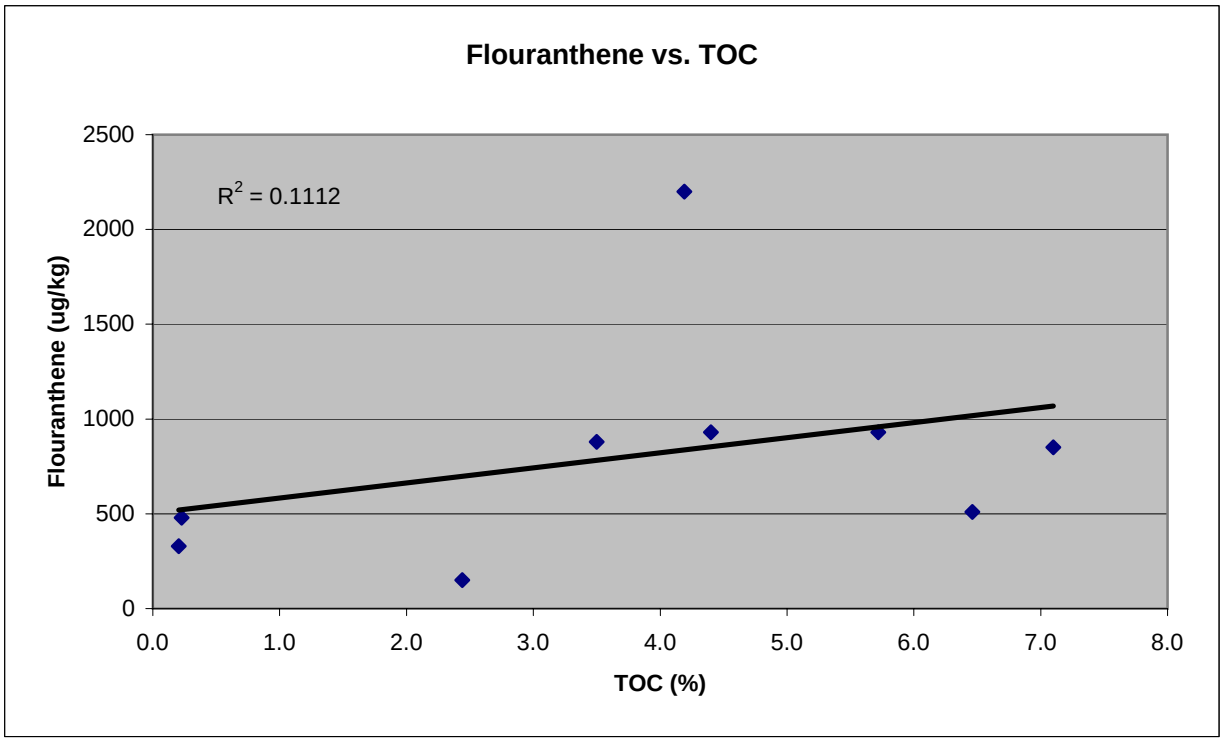

Benzo(a)pyrene vs. TOC
WITHOUT OUTLIER
R2 = 0.2983
Benzo(a)pyrene (ug/kg)
1000
900
800
700
600
500
400
300
200
100
0
0.0
1.0
2.0
3.0
4.0
5.0
6.0
7.0
8.0
TOC (%)

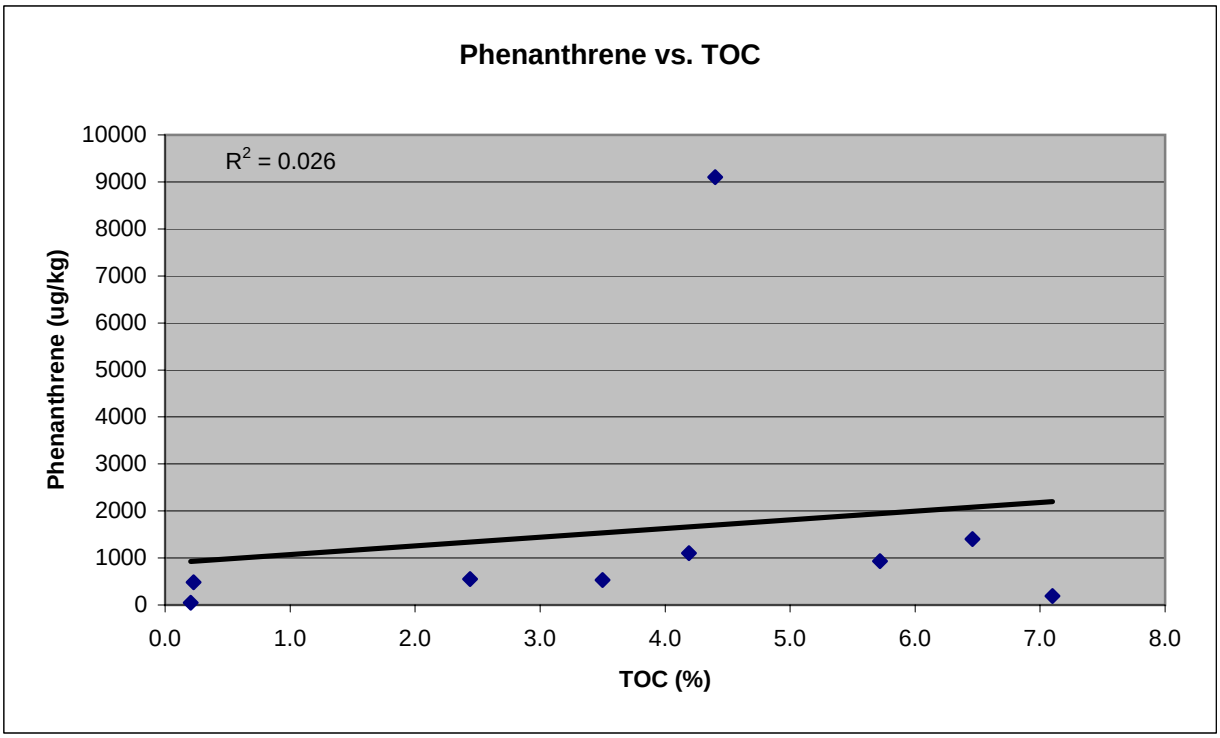

Benzo(g,h,i)perylene vs. TOC
R2 = 0.019
Benzo(g,h,i)perylene (ug/kg)
10000
9000
8000
7000
6000
5000
4000
3000
2000
1000
0
0.0
1.0
2.0
3.0
4.0
5.0
6.0
7.0
8.0
TOC (%)

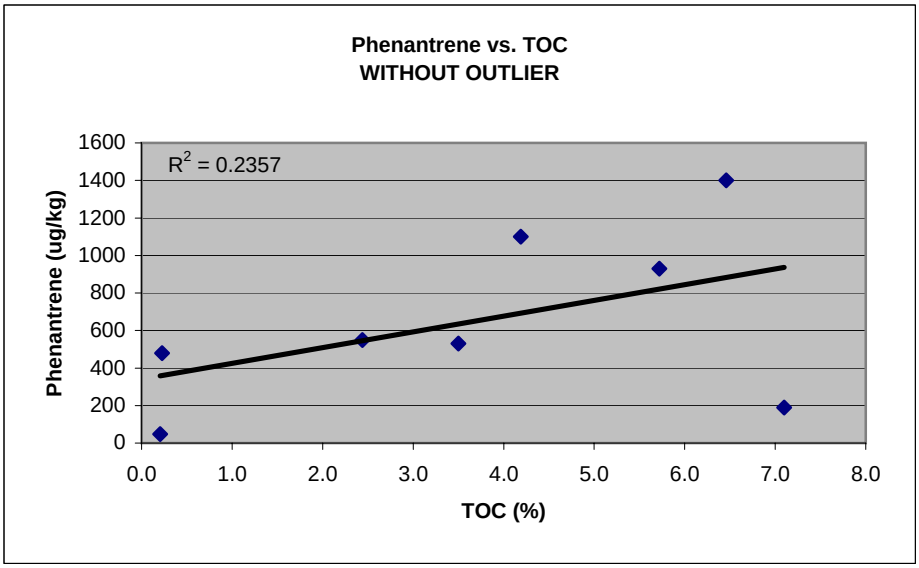

Benzo(g,h,i)perylene vs. TOC
WITHOUT OUTLIER
R2 = 0.254
Benzo(g,h,i)perylene (ug/kg)
1000
900
800
700
600
500
400
300
200
100
0
0.0
1.0
2.0
3.0
4.0
5.0
6.0
7.0
8.0
TOC (%)

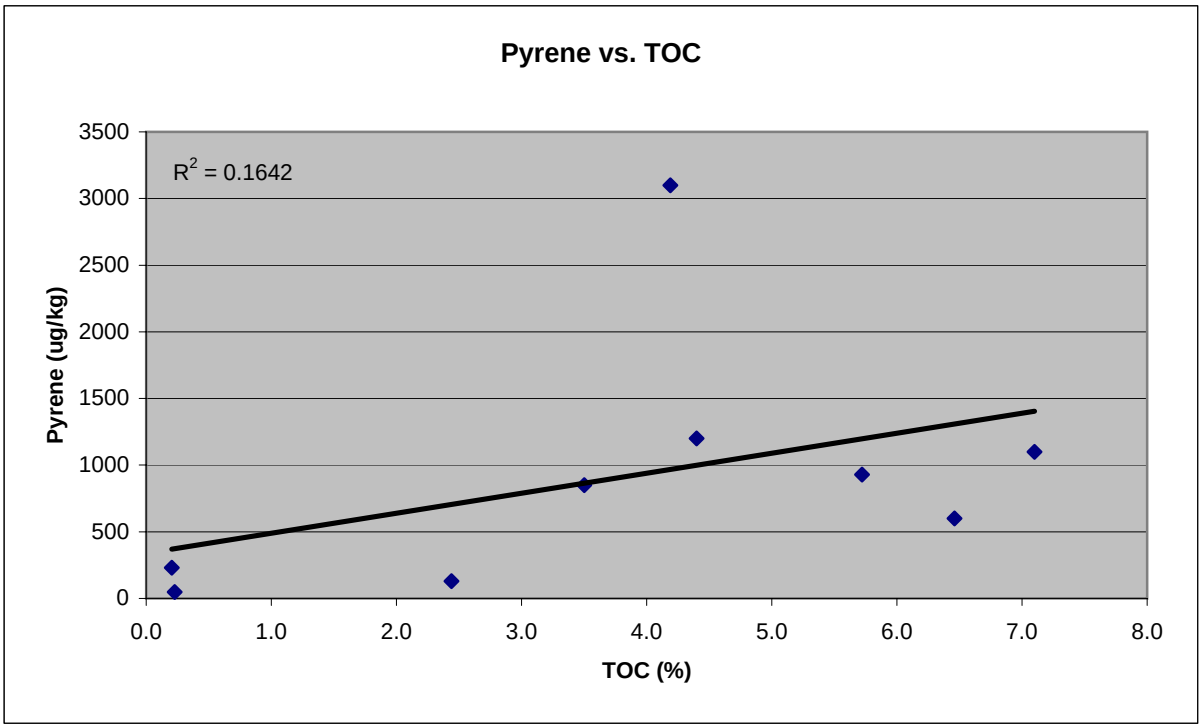

Chrysene vs. TOC
R2 = 0.0214
Crysene (ug/kg)
10000
9000
8000
7000
6000
5000
4000
3000
2000
1000
0
0.0
1.0
2.0
3.0
4.0
5.0
6.0
7.0
8.0
TOC (%)

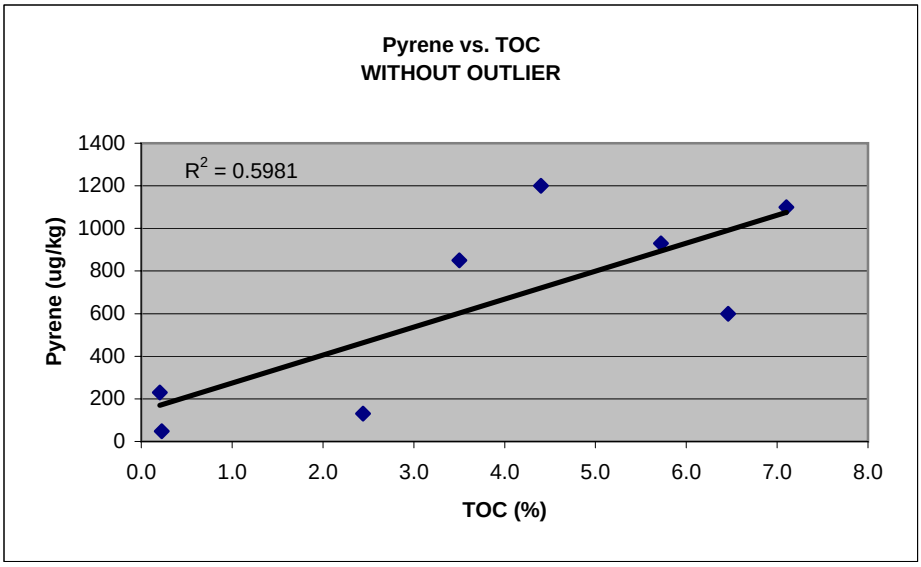

Chrysene vs. TOC
R2 = 0.1661
Crysene (ug/kg)
1600
1400
1200
1000
800
600
400
200
0
0.0
1.0
2.0
3.0
4.0
5.0
6.0
7.0
8.0
TOC (%)

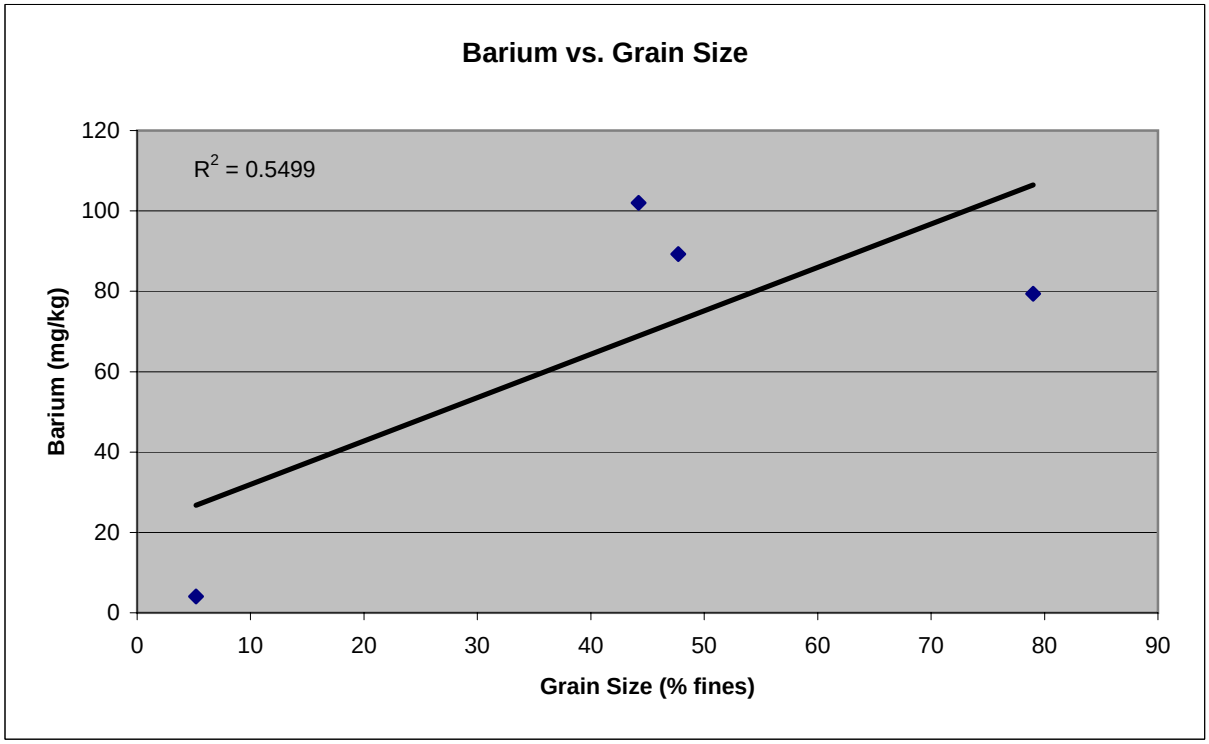

Flouranthene vs. TOC
R2 = 0.1112
Flouranthene (ug/kg)
2500
2000
1500
1000
500
0
0.0
1.0
2.0
3.0
4.0
5.0
6.0
7.0
8.0
TOC (%)

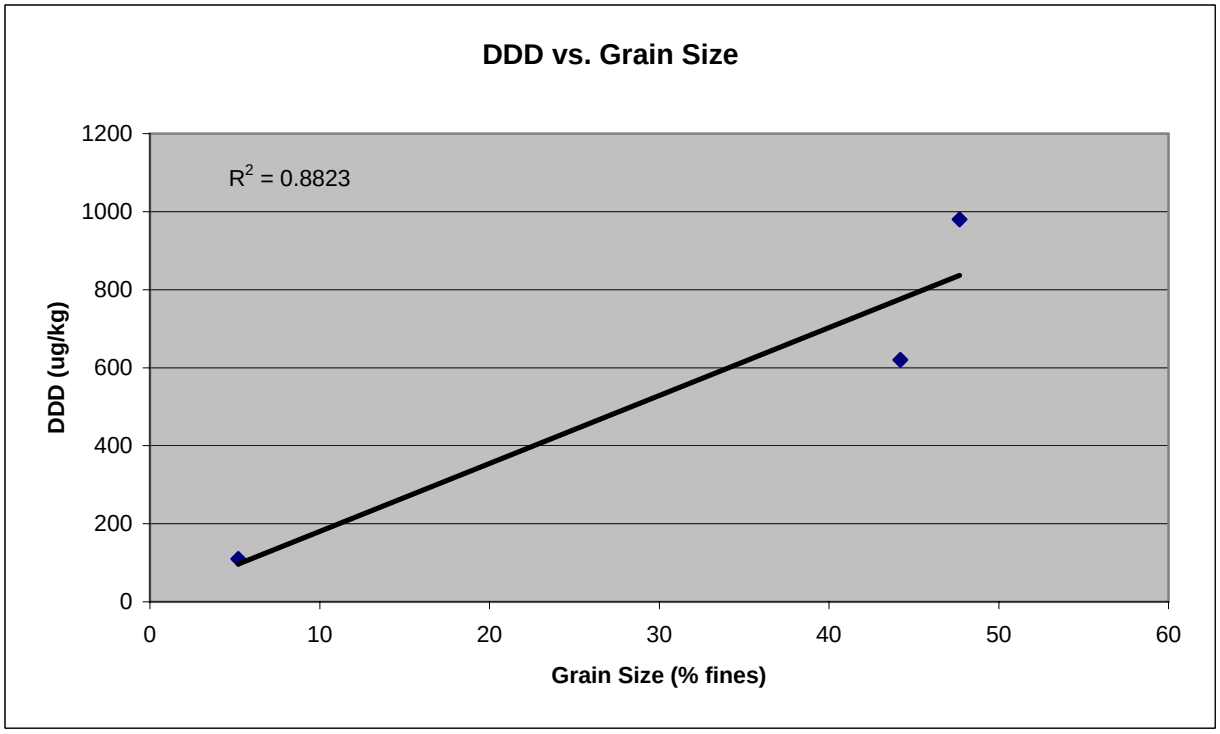

Phenanthrene vs. TOC
R2 = 0.026
Phenanthrene (ug/kg)
10000
9000
8000
7000
6000
5000
4000
3000
2000
1000
0
0.0
1.0
2.0
3.0
4.0
5.0
6.0
7.0
8.0
TOC (%)

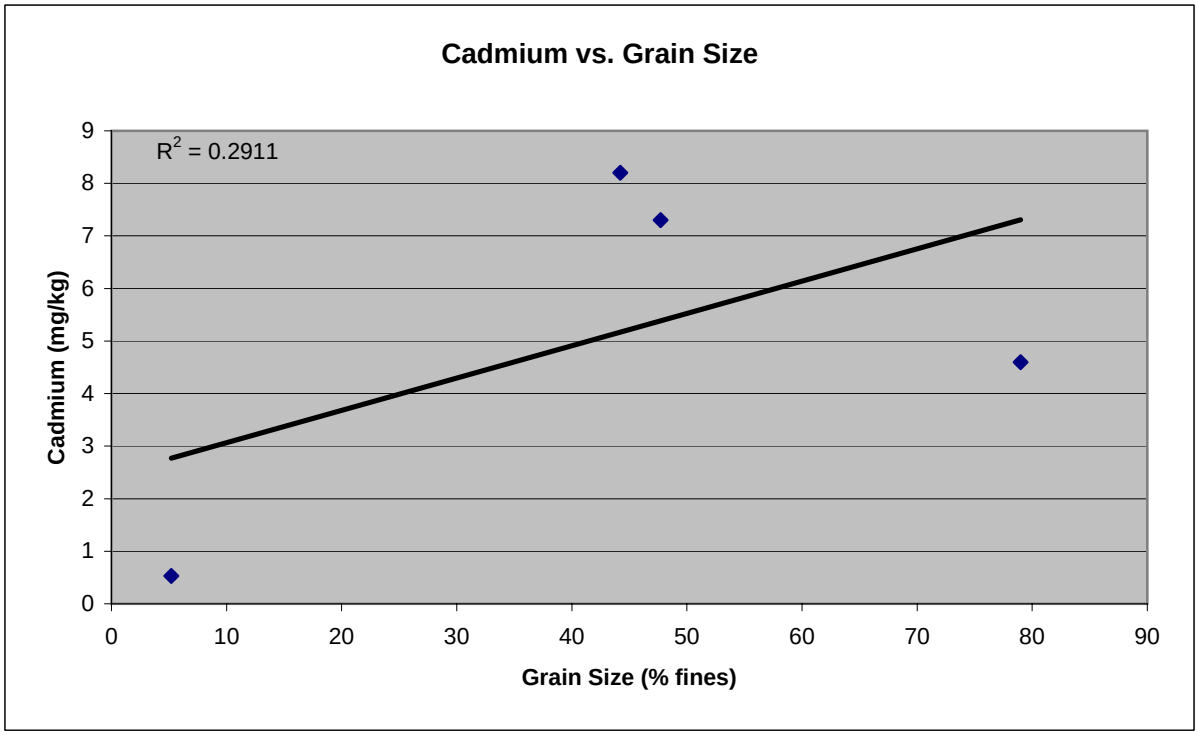

Phenantrene vs. TOC
WITHOUT OUTLIER
R2 = 0.2357
Phenantrene (ug/kg)
1600
1400
1200
1000
800
600
400
200
0
0.0
1.0
2.0
3.0
4.0
5.0
6.0
7.0
8.0
TOC (%)

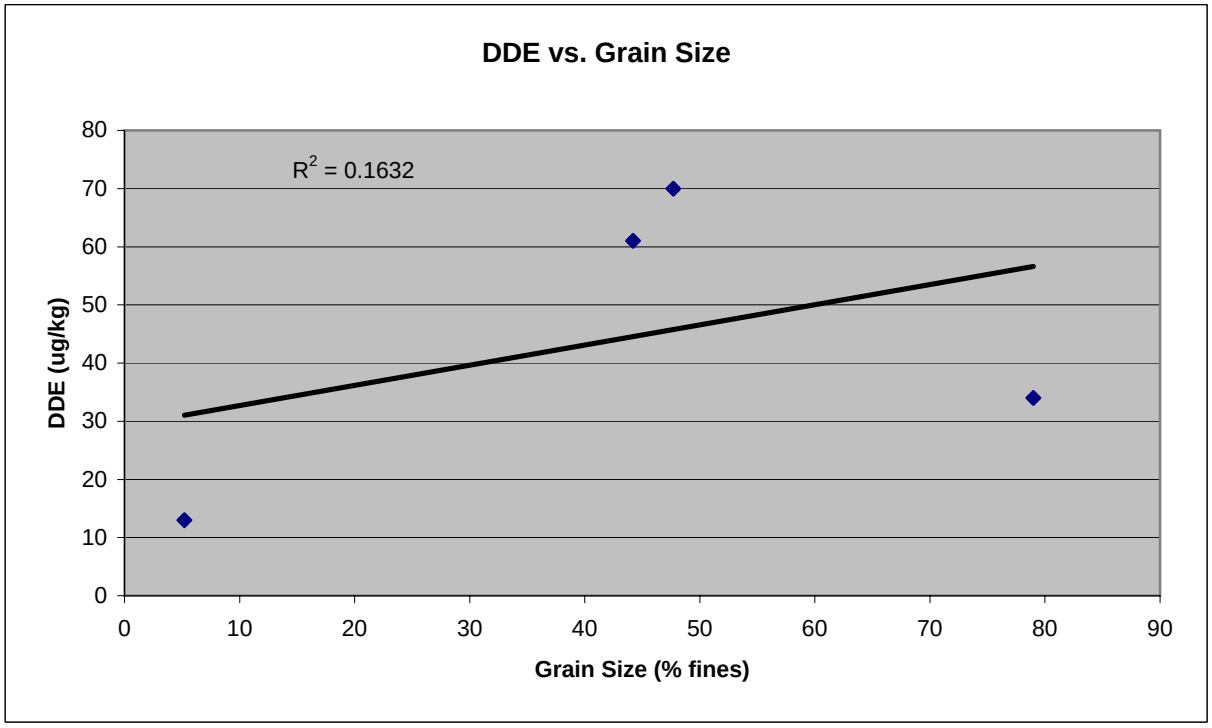

Pyrene vs. TOC
R2 = 0.1642
Pyrene (ug/kg)
3500
3000
2500
2000
1500
1000
500
0
0.0
1.0
2.0
3.0
4.0
5.0
6.0
7.0
8.0
TOC (%)

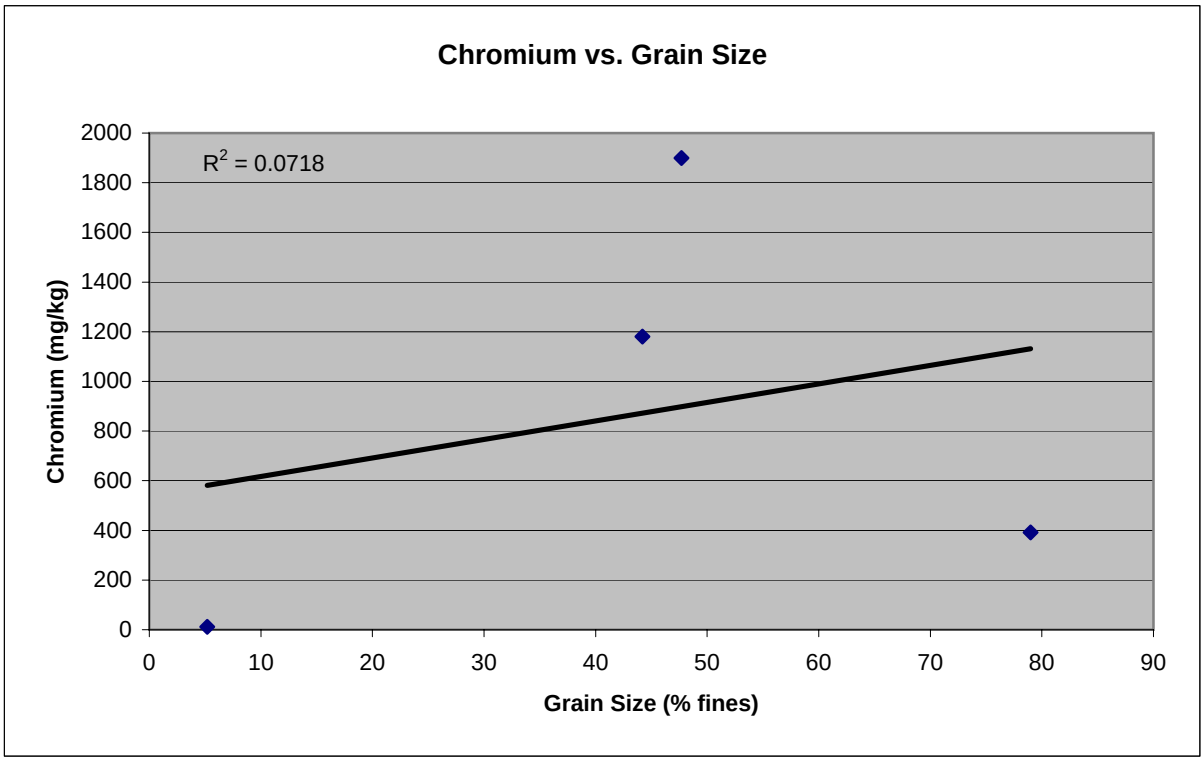

Pyrene vs. TOC
WITHOUT OUTLIER
R2 = 0.5981
Pyrene (ug/kg)
1400
1200
1000
800
600
400
200
0
0.0
1.0
2.0
3.0
4.0
5.0
6.0
7.0
8.0
TOC (%)

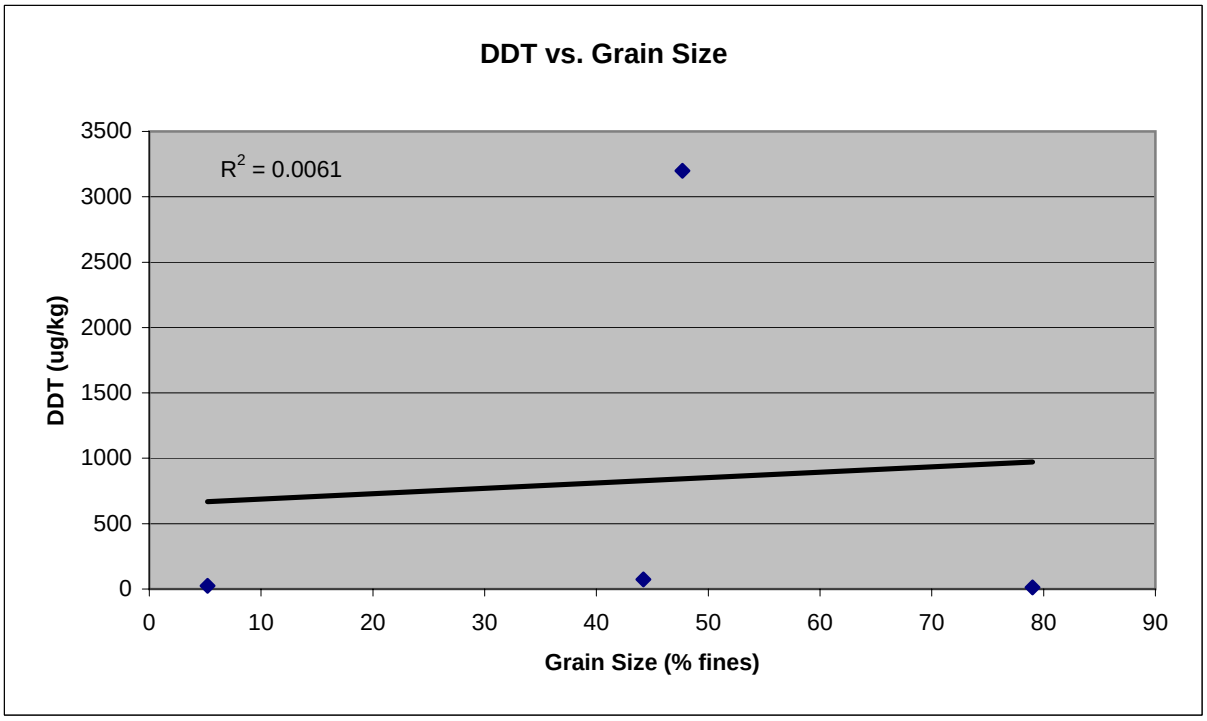

Barium vs. Grain Size
R2 = 0.5499
Barium (mg/kg)
0
20
40
60
80
100
120
0
10
20
30
40
50
60
70
80
90
Grain Size (% fines)

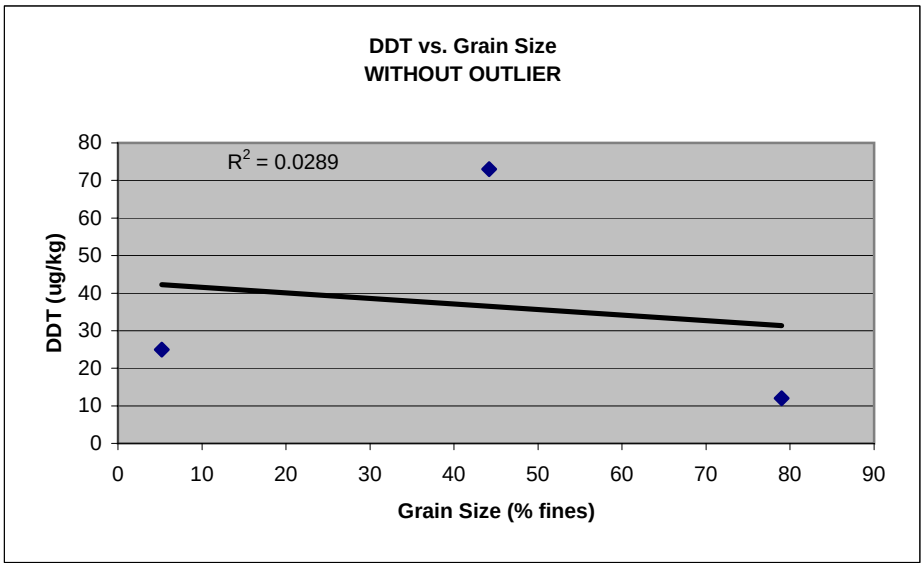

DDD vs. Grain Size
R2 = 0.8823
DDD (ug/kg)
0
200
400
600
800
1000
1200
0
10
20
30
40
50
60
Grain Size (% fines)

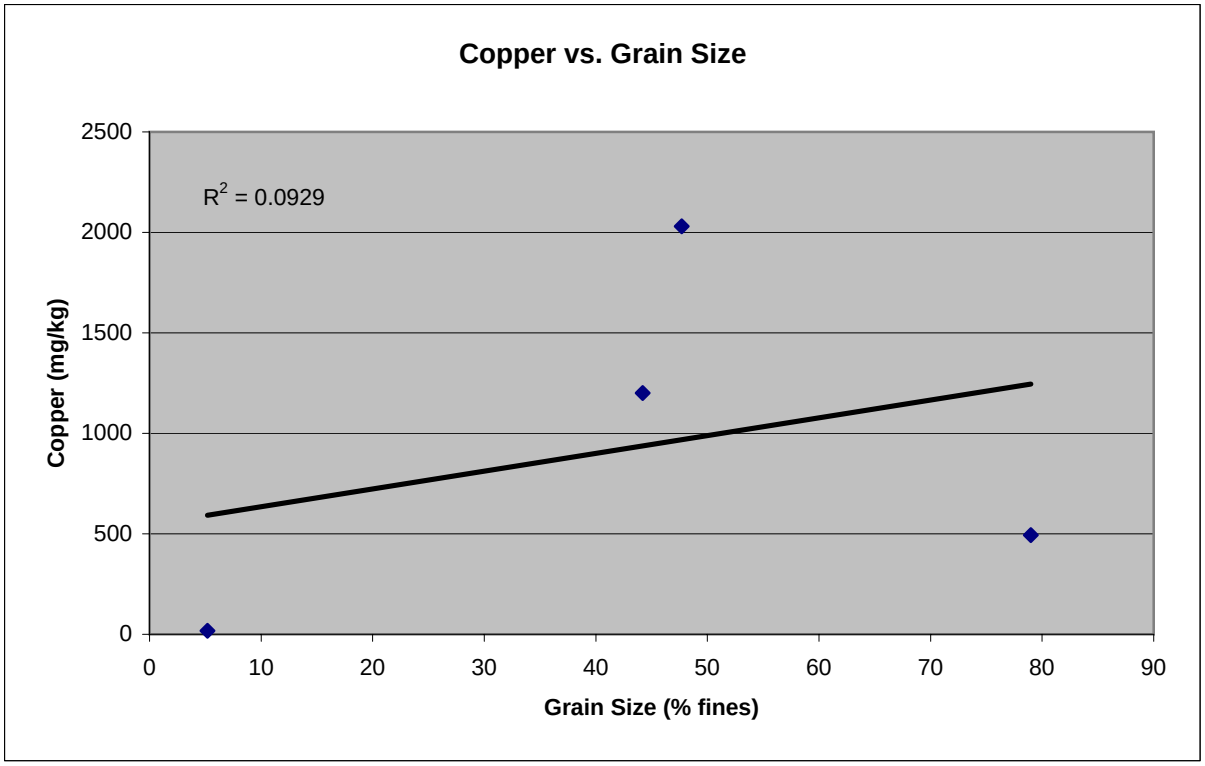

Cadmium vs. Grain Size
R2 = 0.2911
Cadmium (mg/kg)
0
1
2
3
4
5
6
7
8
9
0
10
20
30
40
50
60
70
80
90
Grain Size (% fines)

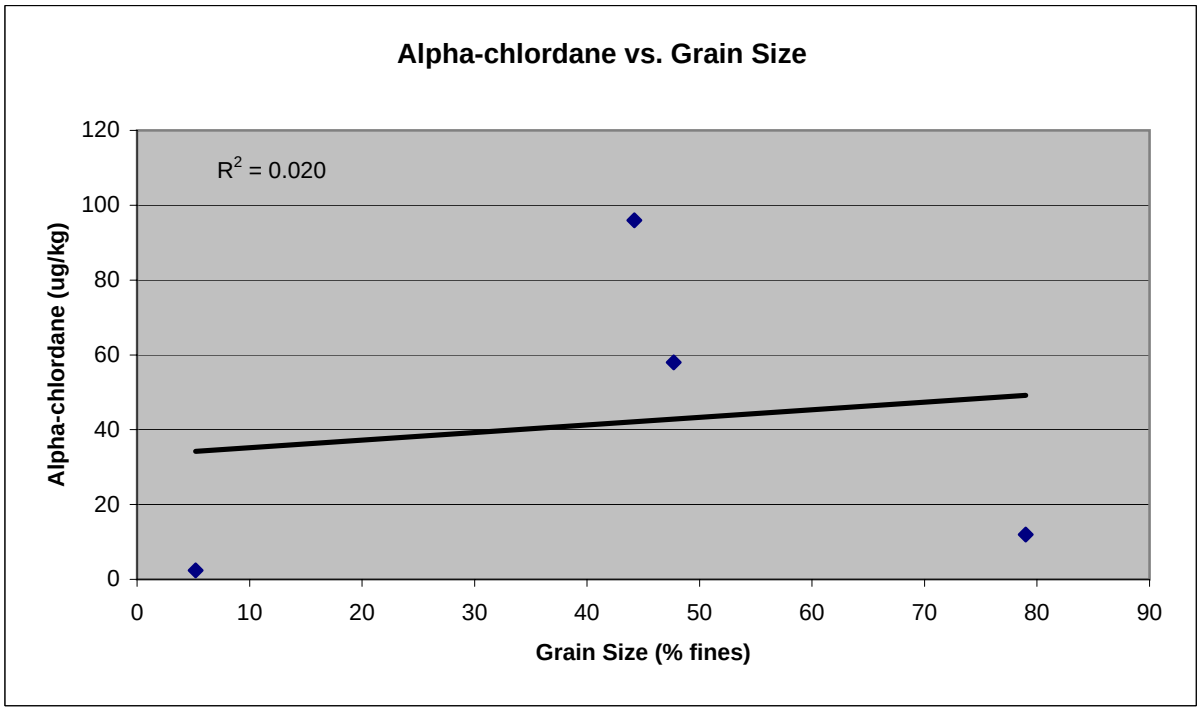

DDE vs. Grain Size
R2 = 0.1632
DDE (ug/kg)
0
10
20
30
40
50
60
70
80
0
10
20
30
40
50
60
70
80
90
Grain Size (% fines)

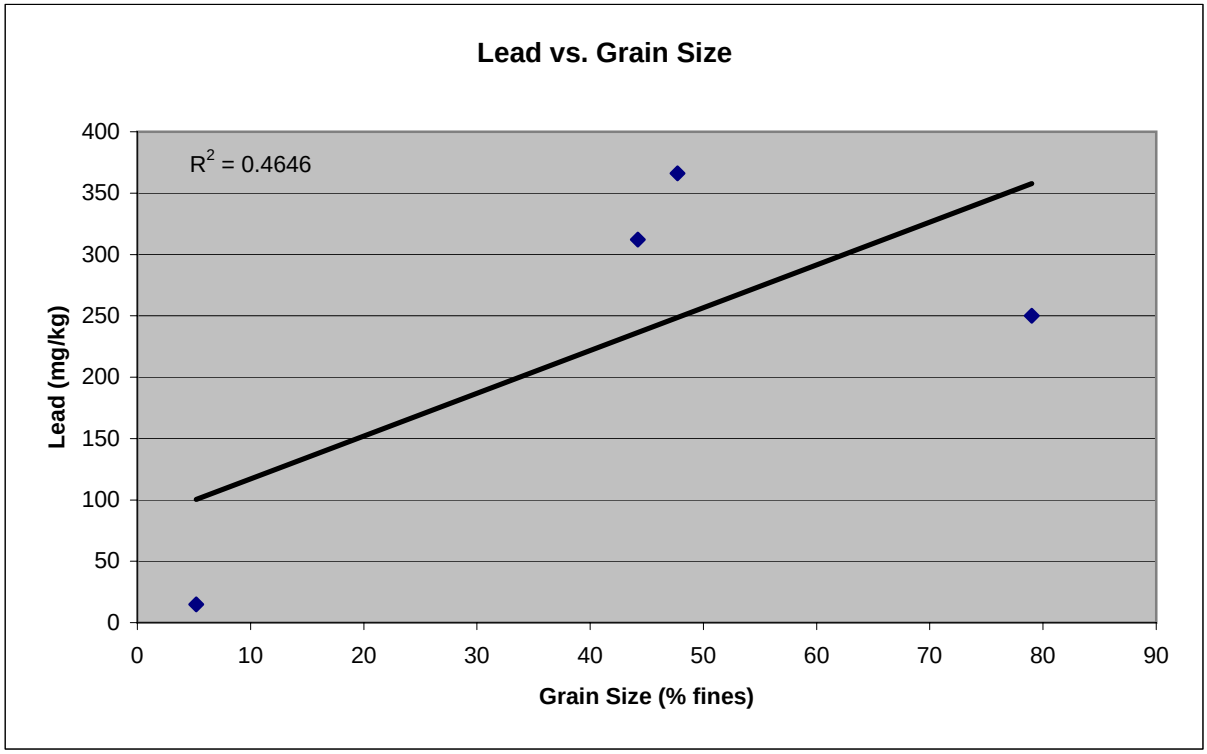

Chromium vs. Grain Size
R2 = 0.0718
Chromium (mg/kg)
2000
1800
1600
1400
1200
1000
800
600
400
200
0
0
10
20
30
40
50
60
70
80
90
Grain Size (% fines)

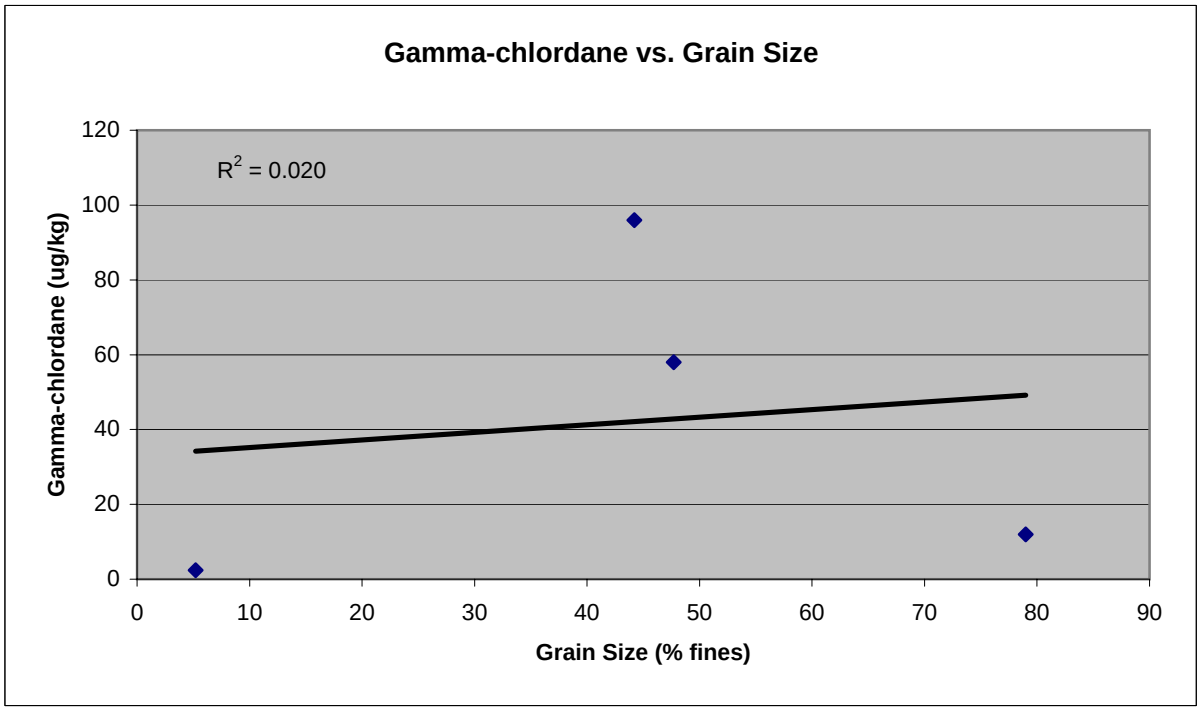

DDT vs. Grain Size
R2 = 0.0061
DDT (ug/kg)
3500
3000
2500
2000
1500
1000
500
0
0
10
20
30
40
50
60
70
80
90
Grain Size (% fines)

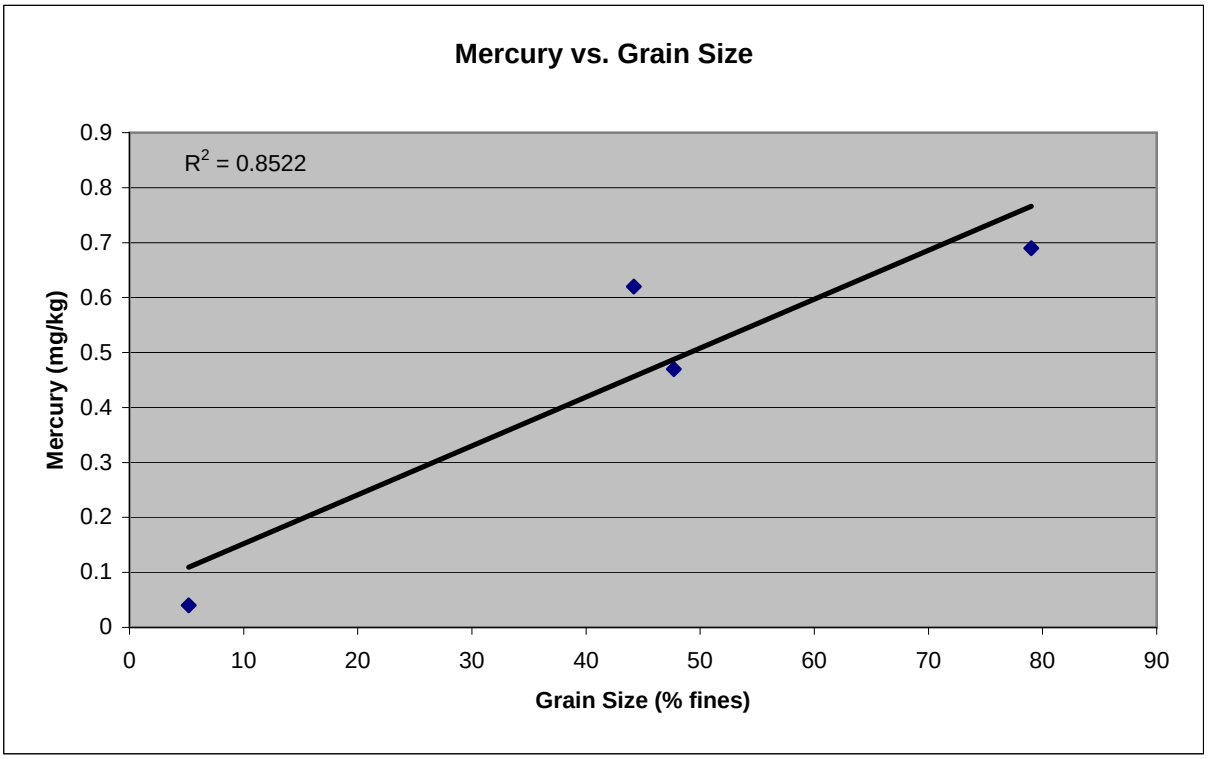

DDT vs. Grain Size
WITHOUT OUTLIER
R2 = 0.0289
DDT (ug/kg)
80
70
60
50
40
30
20
10
0
0
10
20
30
40
50
60
70
80
90
Grain Size (% fines)

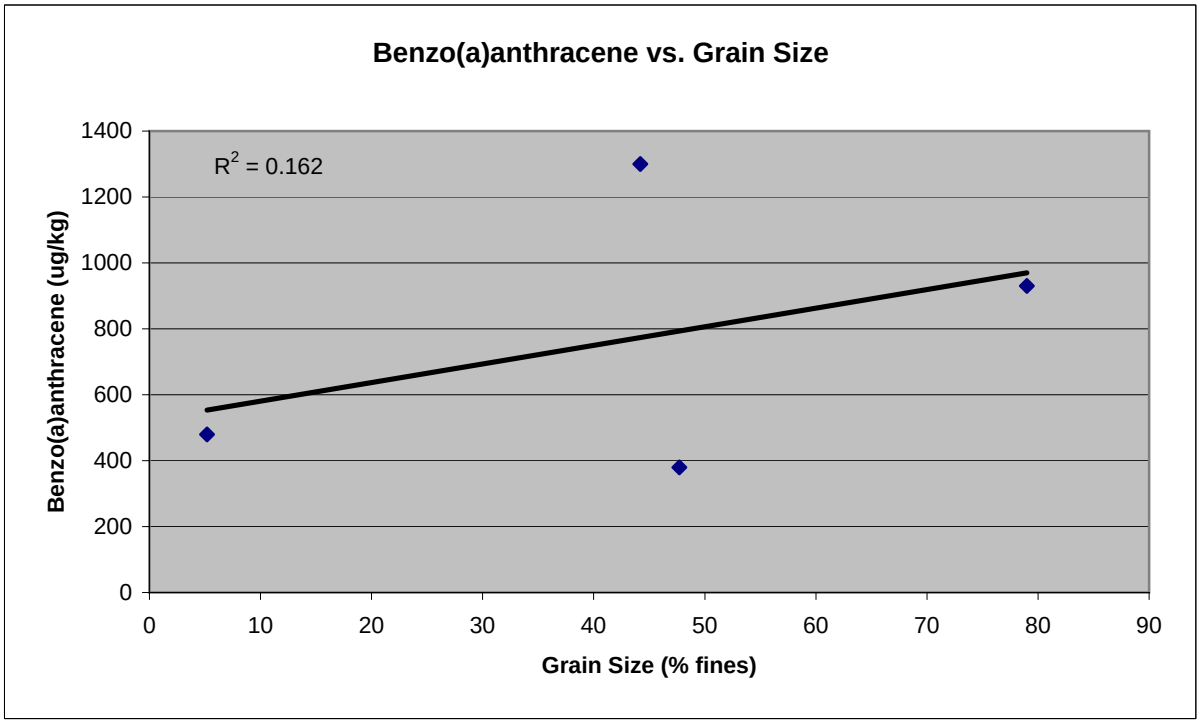

Copper vs. Grain Size
R2 = 0.0929
Copper (mg/kg)
2500
2000
1500
1000
500
0
0
10
20
30
40
50
60
70
80
90
Grain Size (% fines)

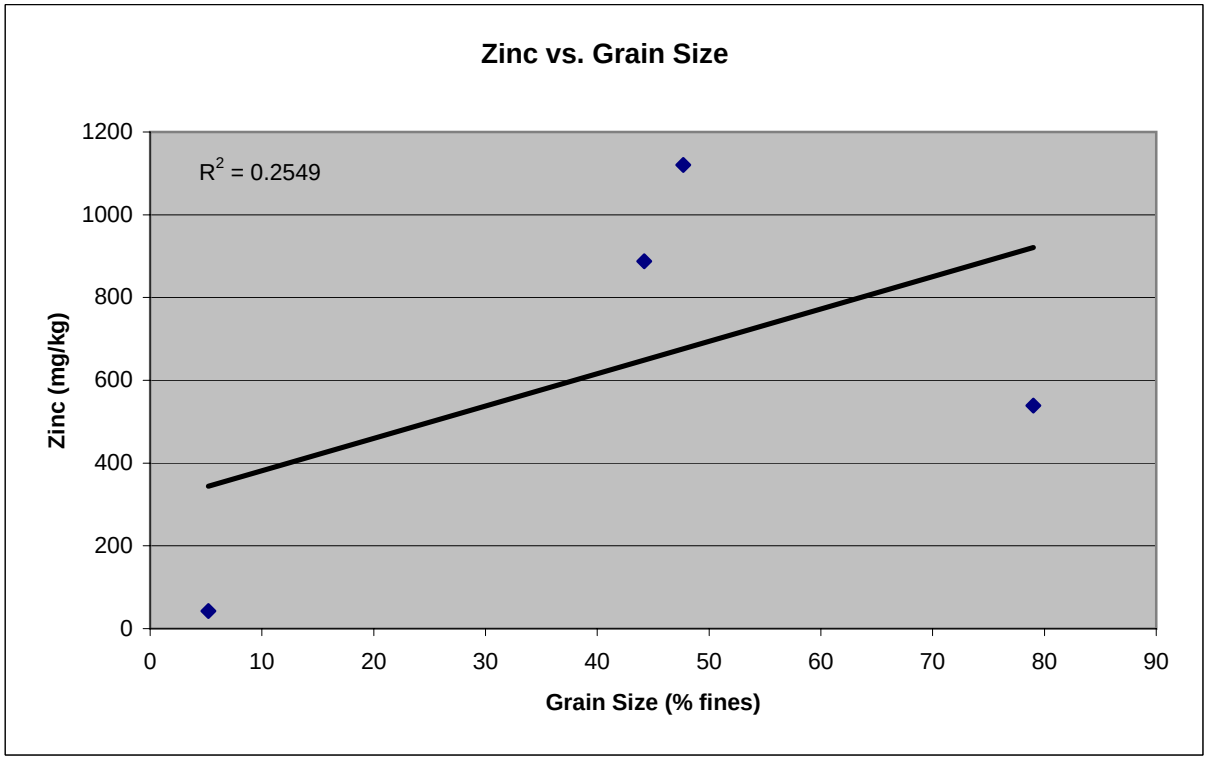

Alpha-chlordane vs. Grain Size
R2 = 0.020
Alpha-chlordane (ug/kg)
120
100
80
60
40
20
0
0
10
20
30
40
50
60
70
80
90
Grain Size (% fines)

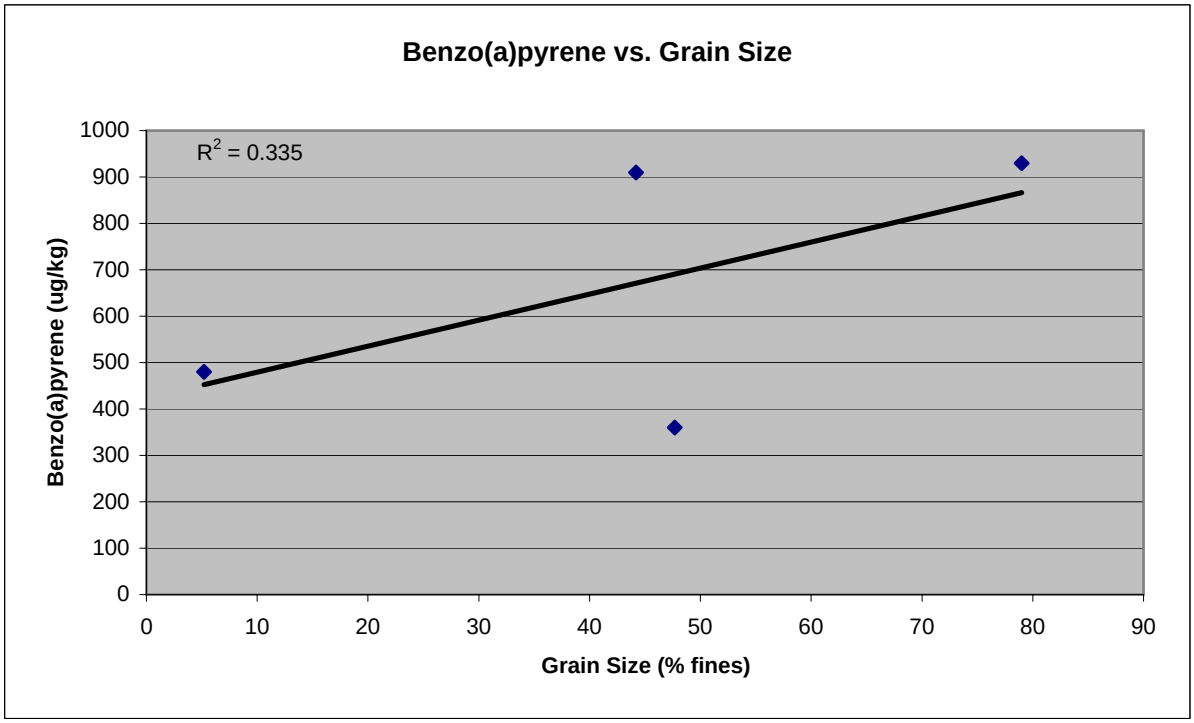

Lead vs. Grain Size
R2 = 0.4646
Lead (mg/kg)
400
350
300
250
200
150
100
50
0
0
10
20
30
40
50
60
70
80
90
Grain Size (% fines)

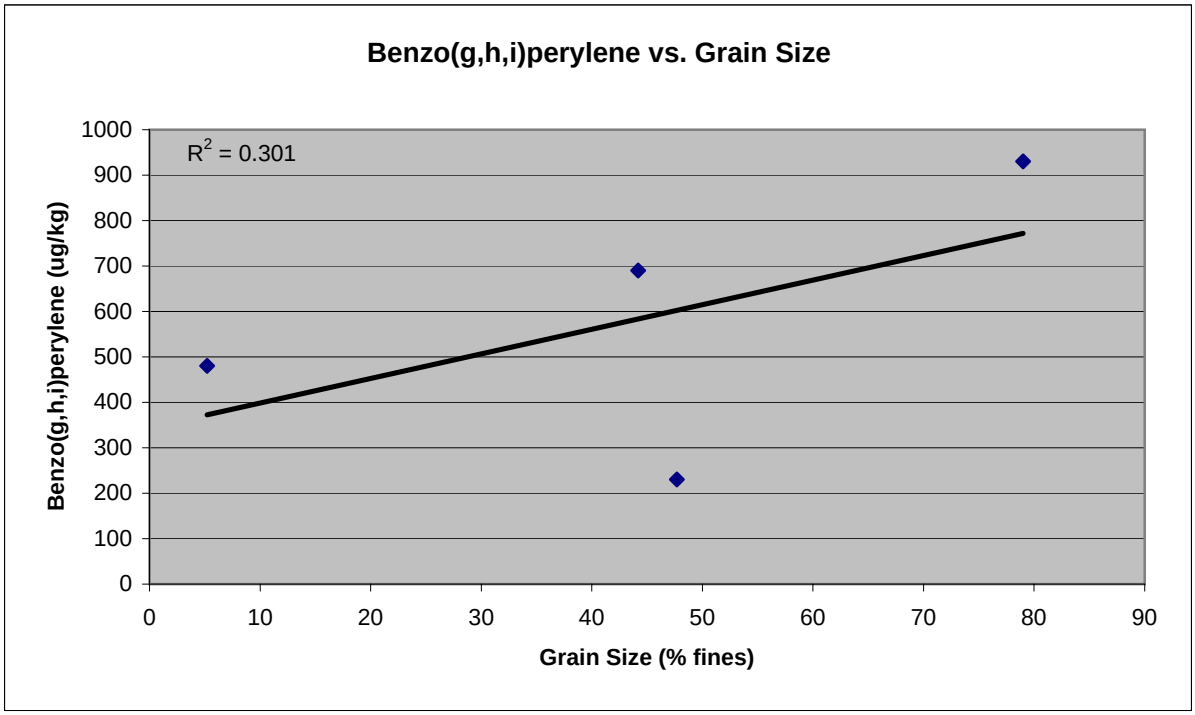

Gamma-chlordane vs. Grain Size
R2 = 0.020
Gamma-chlordane (ug/kg)
120
100
80
60
40
20
0
0
10
20
30
40
50
60
70
80
90
Grain Size (% fines)

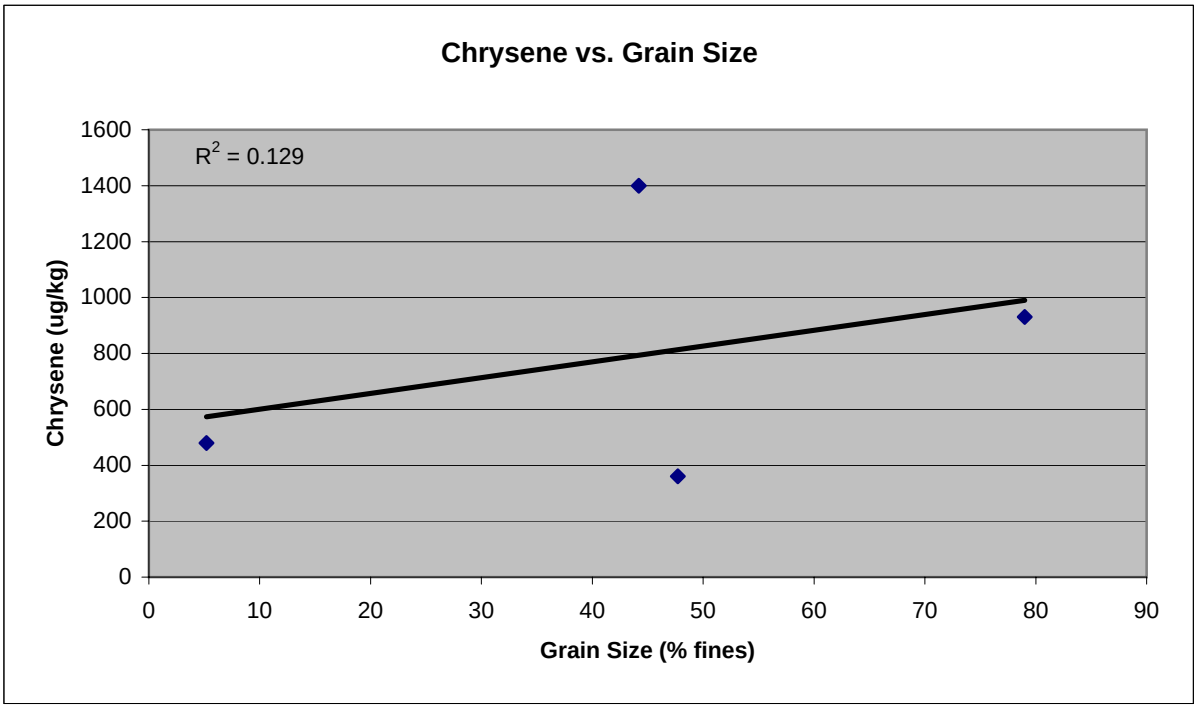

Mercury vs. Grain Size
R2 = 0.8522
Mercury (mg/kg)
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
0
10
20
30
40
50
60
70
80
90
Grain Size (% fines)

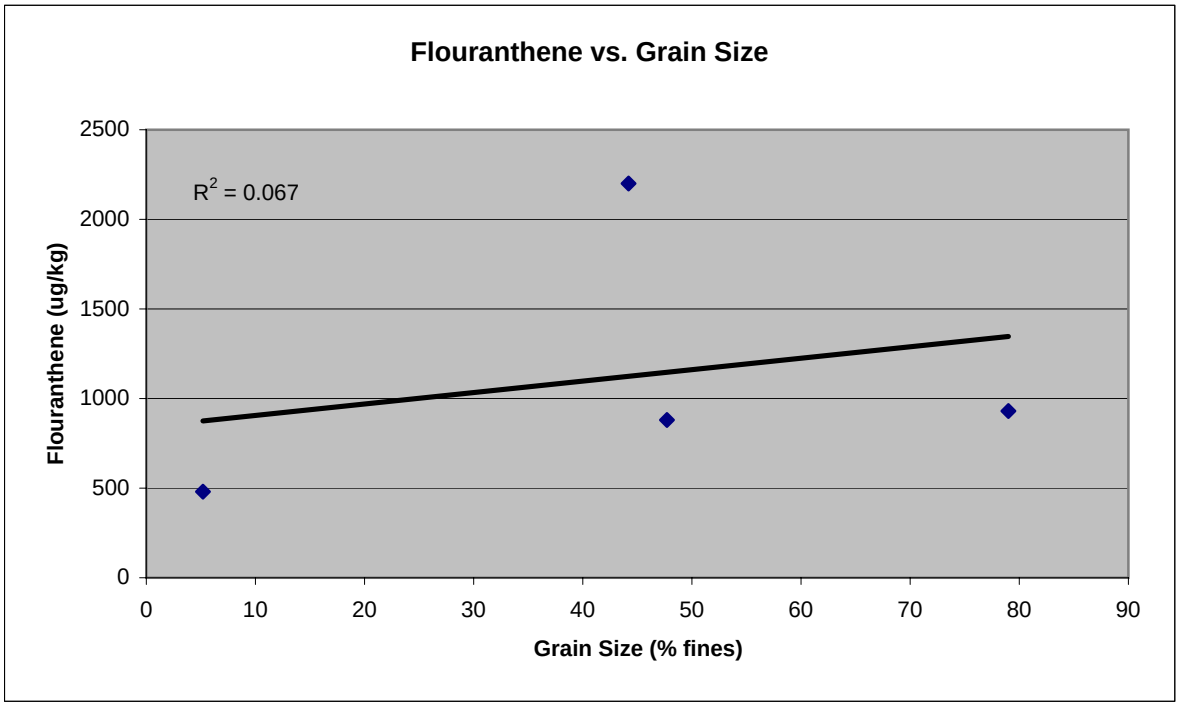

Benzo(a)anthracene vs. Grain Size
R2 = 0.162
Benzo(a)anthracene (ug/kg)
1400
1200
1000
800
600
400
200
0
0
10
20
30
40
50
60
70
80
90
Grain Size (% fines)

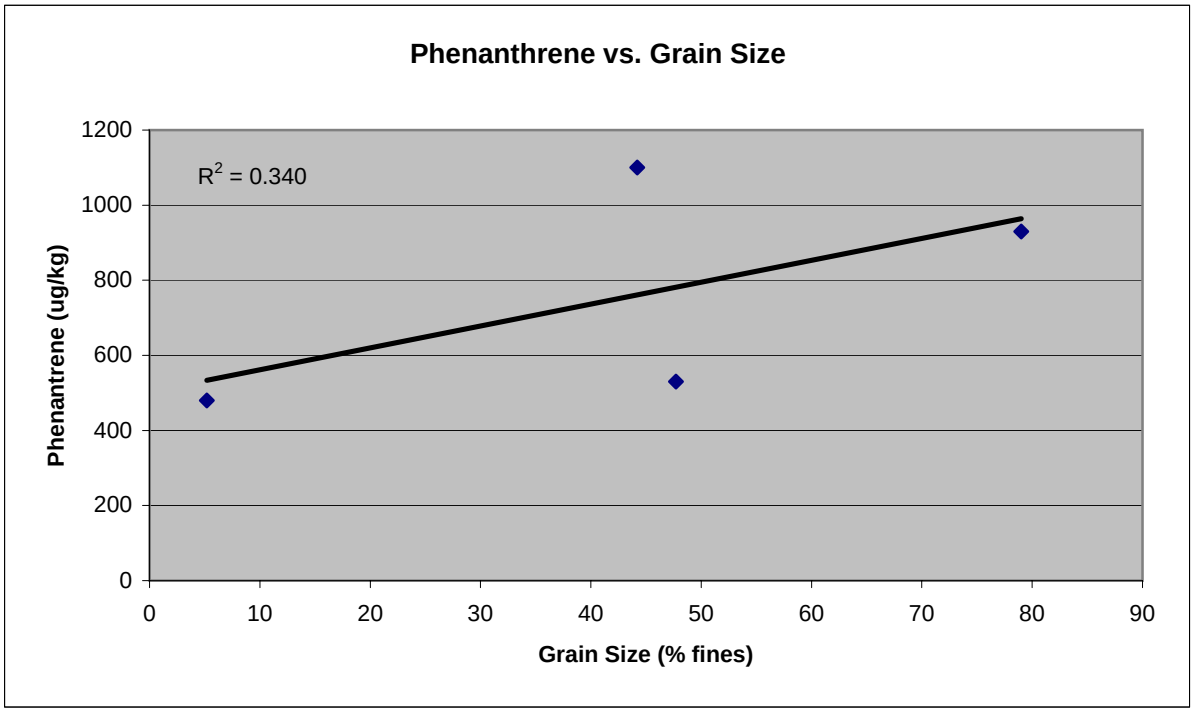

Zinc vs. Grain Size
R2 = 0.2549
Zinc (mg/kg)
1200
1000
800
600
400
200
0
0
10
20
30
40
50
60
70
80
90
Grain Size (% fines)

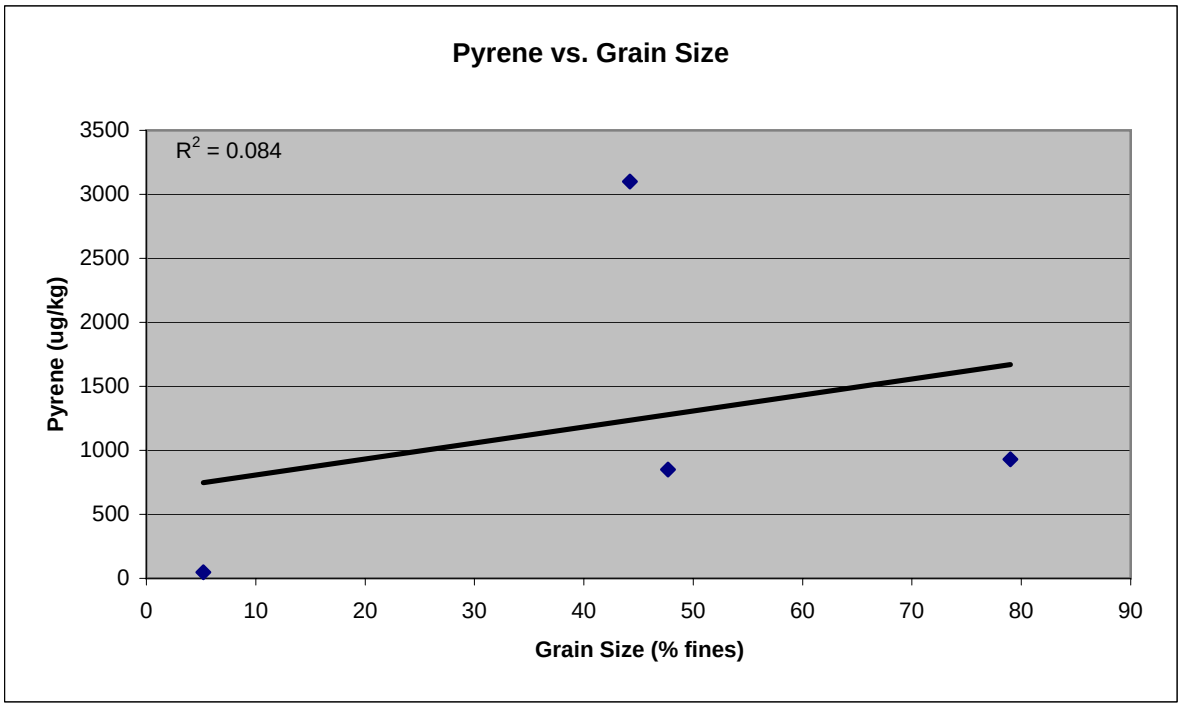

Benzo(a)pyrene vs. Grain Size
R2 = 0.335
Benzo(a)pyrene (ug/kg)
1000
900
800
700
600
500
400
300
200
100
0
0
10
20
30
40
50
60
70
80
90
Grain Size (% fines)


Benzo(g,h,i)perylene vs. Grain Size
R2 = 0.301
Benzo(g,h,i)perylene (ug/kg)
1000
900
800
700
600
500
400
300
200
100
0
0
10
20
30
40
50
60
70
80
90
Grain Size (% fines)


Chrysene vs. Grain Size
R2 = 0.129
Chrysene (ug/kg)
1600
1400
1200
1000
800
600
400
200
0
0
10
20
30
40
50
60
70
80
90
Grain Size (% fines)


Flouranthene vs. Grain Size
R2 = 0.067
Flouranthene (ug/kg)
2500
2000
1500
1000
500
0
0
10
20
30
40
50
60
70
80
90
Grain Size (% fines)


Phenanthrene vs. Grain Size
R2 = 0.340
Phenantrene (ug/kg)
1200
1000
800
600
400
200
0
0
10
20
30
40
50
60
70
80
90
Grain Size (% fines)


Pyrene vs. Grain Size
R2 = 0.084
Pyrene (ug/kg)
3500
3000
2500
2000
1500
1000
500
0
0
10
20
30
40
50
60
70
80
90
Grain Size (% fines)