CO₂ SPARGING PHASE 3 FULL-SCALE IMPLEMENTATION AND MONITORING REPORT

LCP CHEMICALS SITE, BRUNSWICK, GA

Prepared for Honeywell

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EXECUTIVE SUMMARY

In-situ carbon dioxide (CO_2) sparging was designed and implemented to treat a subsurface caustic brine pool (CBP) formed as a result of releases from historical production of industrial chemicals at the LCP Chemicals Site, Brunswick, GA (Site). The CBP is being addressed under an Administrative Settlement Agreement and Order on Consent (AOC), which was entered into between Honeywell and EPA on April 18, 2007. The remedial action objectives (RAOs) that are defined in the AOC include: 1) reducing the pH of the CBP to between 10 and 10.5 and 2) reducing the density of the CBP.

This report describes the implementation and monitoring results related to Phase 3 of CO_2 sparging and summarizes the effect of all three phases of sparging on groundwater quality within the deep Satilla aquifer beneath the Site. These three CO_2 sparging phases were as follows:

- Phase 1 conducted between October 2013 and February 2014;
- Phase 2 conducted between October 2014 and April 2015; and
- Phase 3 conducted between October 2015 and May 2016.

The technical objectives of Phase 3 sparging were to build upon the success of the first two phases and achieve compliance with the RAOs within the deep Satilla aquifer. Specifically, Phase 3 addressed two areas within the Phase 1 footprint and completed treatment in the southern area of the Site.

Sparging Activity

A total of 64 sparge wells were installed at the Site during Phase 3, bringing the total number of sparge wells to 209. Phase 3 sparging was initiated on October 10, 2015 and continued through April 7, 2016. After the post-sparge sampling event, remaining CO_2 in storage was sparged into select sparge wells from May 11, 2016 through May 17, 2016. As was performed in Phases 1 and 2, the target mass for each sparge well was calculated from interpolated groundwater alkalinity mappings. The targeted CO_2 per sparge well varied from 8,000 to 36,000 lb. All Phase 3 sparge wells received their target mass.

Reduction in pH

Prior to the start of Phase 1 CO_2 sparging, the average pH of the CBP was 11.3. After Phase 3, nearly all (28 out of 30; 93%) of deep Satilla monitoring points (monitoring wells and extraction wells) had a pH of less than 10.5. Most of these monitoring points had pH less than 7.5 (24 out of 30; 80%). The mean pH in the deep Satilla monitoring points decreased from 11.32 (2011-2012) to 7.11 as a result of CO_2 sparging. The median pH decreased from 11.44 to 6.57.

Reduction in Specific Gravity

The effect of CO_2 sparging on the density of groundwater was evaluated by two methods. First, pre-Phase 1 and post-Phase 3 measurements of groundwater specific gravity (SG) were compared for deep Satilla monitoring points where data was available. Second, pre-Phase 1 and post-Phase 3 SG was computed for all deep Satilla monitoring points using measured total dissolved solids (TDS) concentrations. In both cases, the SG decreased from pre-Phase 1 baseline conditions. Computed SG decreased in 20 out of 30 deep Satilla monitoring locations. The decrease in median computed SG was significant at the 95% confidence level, supporting the conclusion that CO_2 sparging decreased the density of the CBP. The decrease in SG was largely the result of the reductions in dissolved silica concentrations when the pH was decreased to circumneutral.

Reduction in Mercury (Hg) Concentrations

Prior to the start of CO₂ sparging, the total mercury concentration in the CBP ranged from 35.7 to 2,530 μ g/L, with a mean of 270 μ g/L and median of 128 μ g/L. By the end of Phase 3, almost every monitoring point (28 out of 30) in the deep Satilla had lower total Hg when compared to pre-sparge levels. The majority (23 out of 30; 77%) of monitoring points had total Hg concentrations less than 20 μ g/L. About one-third of all monitoring points (11 out of 30; 37%) had Hg concentrations less than 2.0 μ g/L. At the end of Phase 3, the average total Hg concentration decreased 87% from 270 to 36 μ g/L. The median Hg concentration decreased 97% from 128 to 4 μ g/L.

Conclusions

In summary, for the Phase 3 sparging:

- Nearly all (28 out of 30; 93%) of the deep Satilla monitoring and extraction wells had a pH of less than 10.5. Most of these monitoring points had pH less than 7.5 (23 out of 30; 77%). In the southern area, the majority of post-Phase 3 discrete groundwater samples collected by Geoprobe from the base of the Satilla aquifer were less than 10.5; and
- The majority (23 out of 30; 77%) of the deep Satilla monitoring and extraction wells had total Hg concentrations less than 20 µg/L. About one-third of these monitoring points (11 out of 30; 37%) had total Hg concentrations less than 2.0 µg/L.

A summary of the overall effect of Phase 1 - 3 sparging on the CBP is presented below:

- CO₂ sparging has been extremely effective at lowering the pH in the deep Satilla aquifer. The mean pH in the deep Satilla monitoring points has decreased from 11.32 (2011-2012) to 7.11 as a result of CO₂ sparging (Table 4-1). The median pH decreased from 11.44 to 6.57 (Table 4-1).
- The SG (and therefore the density) of groundwater within the deep Satilla has decreased as a result of CO₂ sparging. Computed SG decreased in 20 out of 30 deep Satilla monitoring locations. The median computed SG decrease from 1.009 to 1.007 from pre-Phase 1 to post-Phase 3 was statistically significant at the 95% confidence level.
- CO₂ sparging has also been extremely effective at lowering concentrations of Hg in the deep Satilla. Almost every deep Satilla monitoring point (28 out of 30) has lower total Hg when compared to 2011-2012 levels as a result of CO₂ sparging. The mean Hg concentration in all monitoring points was lowered from 270 to 36 µg/L, a percent decrease of 87%. The median Hg concentration in all monitoring points was lowered from 128 to 4 µg/L, a percent decrease of 97%.

Recommendations

The AOC for the caustic brine plume requires that the pH be reduced to 10 to 10.5 and that density be reduced. The three Phase CO_2 sparging effort has clearly met both of these RAOs. To date, rebound of pH to values greater than 10.5 has been minimal during the rest period in-between phases. Therefore, extensive rebound is not expected within the treated area, with the exception of the eastern edge of the northern area, which will be addressed as part of a separate regulatory process for the soils beneath the former cell building. No additional sparging at the Site is recommended as the CO_2 treatment has achieved the RAOs.

Table of Contents

1	Introductio)n	
	1.1	Site Description	1-1
	1.2	Summary of Proof of Concept Test	
	1.3	Summary of Phase 1 of Full-Scale Sparging	
	1.4	Summary of Phase 2 of Full-Scale Sparging	
	1.4.1	Technical Objectives of Phase 3.	
	1.4.2	Reporting	
2	System Cor	nstruction	
	2.1	Sparge Well Construction	
	2.1.1	Sparge Well Locations within the Phase 1 Footprint	
	2.1.2	Sparge Well Locations in Southern Area	
	2.1.3	Sparge Well Installation and Development	
	2.1.4	Monitoring Well Completions	
	2.1.5	Top of Sandstone and Clay Isopach Mappings	
	2.2	CO ₂ Storage, Vaporization, and Distribution System	
3	Procedures	s and Protocols	
	3.1	Groundwater Sampling	3_1
	3.1.1	Monitoring Wells and Extraction Wells	
	3.2	Monitoring During Sparging	
	3.3	Sparge Operations	
	3.3.1	Sparge Regimens	
	3.3.2	Required CO ₂ Mass Per Well	
	3.3.3	Maximum Wellhead Pressures	
	3.3.4	Sequence of Operations	
	3.3.5	Sparge Well and Monitoring Well Maintenance	
	3.4	Field Measurements During Sparging	
	3.5	Measurement and Calculation of Flowrates and CO ₂ Mass	
	3.6	Piezometric Surface and Groundwater Table	
	3.7	Geoprobe Sampling	
	3.8	Air Monitoring	
4	Results of I	Phase 3 Sparging	
	4.1	Sparge Well Flow Rates and Total CO ₂ Mass	
	4.1.1	CO_2 Flow Rates	
	4.1.2	CO ₂ Total Mass	
	4.1.3	CO ₂ Mass Balance	
	4.2	Effect of Sparging on pH	
	4.2.1	Pre-sparge pH	
	4.2.2	pH Monitoring Results During Sparging	
	4.2.3	Post-sparge pH Results	
	4.2.4	Effect of Sparging on Coosawhatchie pH	
	4.3	Effect of Sparging on Silica, TDS and Specific Gravity	
	4.3.1	Effect of Sparging on Silica	
	4.3.2	Effect of Sparging on Total Dissolved Solids	
	4.3.3	Effect of Sparging on Specific Gravity	
	4.4	Effect of Sparging on Mercury	

	4.4.1	Pre-Sparge Mercury	
	4.4.2	Post-Sparge Mercury	
	4.4.3	Historical pH and Mercury Concentrations Versus Time	
	4.5	Effect of Sparging on Piezometric Surfaces	
5	Conclusior	ns and Recommendations	
	5.1	Conclusions	
	5.2	Recommendations	
6	References	5	6-1

- Appendix A. Boring Logs/Well Construction Diagrams
- Appendix B. Well Development Logs
- Appendix C. Purge Logs
- Appendix D. Laboratory Analytical Data
- Appendix E. Sparging Flow Rates and Masses
- Appendix F. Air Quality Data
- Appendix G. Hydrographs

LIST OF TABLES

Table 3-1	Monitoring Points for Phase 3 CO ₂ Sparging
Table 3-2	Water Quality Analytes and Associated Laboratory Methods
Table 3-3	Alklainity-CO2 Dose Relationship
Table 3-4	Calculated Minimum Pneumatic Fracture Initiation Pressure for Phase 1 Sparge Wells
Table 3-5	Calculated Minimum Pneumatic Fracture Initiation Pressure for Phase 2 Sparge Wells
Table 3-6	Calculated Minimum Pneumatic Fracture Initiation Pressure for Phase 3 Sparge Wells
Table 3-7	Summary of Air Monitoring Results
Table 4-1	Summary of Pre- and Post-Sparge pH in Deep Satilla Monitoring Points within the Phase 1 Sparging Footprint
Table 4-2	Summary of Post-Sparge Geoprobe Sampling of Deep Satilla Groundwater in the Southern Area
Table 4-3	Summary of pH Data Collected in Monitoring Wells Screened in the Coosawhatchie A/B Aquifer
Table 4-4	Summary Statistics for Constituents in Deep Satilla Monitoring Points
Table 4-5	Pre- and Post-Sparge Specific Gravity
Table 4-6	Summary of Pre- and Post-Sparge Total Hg in Deep Satilla Monitoring Wells Within the Sparging Footprint
Table 4-7	Summary of Pre- and Post-Sparge Dissolved Hg in Deep Satilla Sparge Wells within the Sparging Footprint
Table 4-8	Summary of Pre- and Post-Sparge Dissolved Hg in Co-located Pairs of Geoprobe Points within the Sparging Footprint
Table 4-9	Summary of Mercury Concentrations in the Deep Satilla
Table 4-10	Difference in Water Levels in Selected Well Pairs

LIST OF FIGURES

- Figure 1-1: Site location map
- Figure 1-2: Map showing location of CBP footprint
- Figure 1-3: Conceptual model of CO₂ sparging
- Figure 2-1: Locations of Phase 3 sparge wells
- Figure 2-2: Locations of northern Phase 3 sparge wells
- Figure 2-3: Locations of southern Phase 3 sparge wells
- Figure 2-4: Locations of piezometers utilized in monitoring Phase 3 CO₂ sparging
- Figure 2-5: Monitoring well network used to evaluate Phase 3 CO₂ sparging
- Figure 2-6: Structural contours of the top of the variably-cemented sandstone
- Figure 2-7: Clay isopach map
- Figure 2-8: Site operations plan
- Figure 2-9: Process and instrumentation diagram
- Figure 3-1: Locations of deep Satilla monitoring and extraction wells
- Figure 3-2: Locations of mid and shallow Satilla monitoring wells
- Figure 3-3: Locations of Coosawhatchie A/B monitoring wells
- Figure 3-4: Interpolated alkalinity in the deep Satilla using data from monitoring locations
- Figure 3-5: Supplemental Geoprobe sampling locations and results for pH
- Figure 4-1: Average flow rates for Phase 3 sparge wells
- Figure 4-2: Average flow rates for Phase 1 and 2 sparge wells
- Figure 4-3: Total CO₂ mass for Phase 3 sparge wells
- Figure 4-4: Total CO₂ mass for Phase 1 and 2 sparge wells
- Figure 4-5: Pre-sparge (2011-2012) pH in deep Satilla monitoring and extraction wells
- Figure 4-6: Pre-sparge (Phase 3) pH in deep Satilla monitoring and extraction wells
- Figure 4-7: Pre-sparge (Phase 3) pH in sparge wells
- Figure 4-8: Pre-sparge (Phase 3) pH in deep Satilla monitoring, extraction, and sparge wells
- Figure 4-9: Pre-sparge (2012) pH in mid Satilla monitoring wells
- Figure 4-10: Pre-sparge (Phase 3) pH in mid Satilla monitoring wells
- Figure 4-11: pH as a function of time for MW-105C, EW-2, and MW-502B during 2012 and Phase 1-3 sparging
- Figure 4-12: pH as a function of time for MW-501B, EW-1, and MW-352B during 2012 and Phase 1-3 sparging
- Figure 4-13: pH as a function of time for MW-514B, EW-4, and MW-513B during 2012 and Phase 1-3 sparging

Figure 4-14:	pH as a function of time for MW-505B, EW-3, and MW-504B during 2012 and Phase 1- 3 sparging
Figure 4-15:	pH as a function of time for EW-5, MW-511B, and EW-6 during 2012 and Phase 1-3 sparging
Figure 4-16:	pH as a function of time for MW-512B, EW-8, and MW-515B during 2012 and Phase 1- 3 sparging
Figure 4-17:	pH as a function of time for MW-357A, MW-357B, and EW-9 during 2012 and Phase 1- 3 sparging
Figure 4-18:	pH as a function of time for MW-518B, MW-516B, and EW-10 during 2012 and Phase 1-3 sparging
Figure 4-19:	pH as a function of time for MW-517B, EW-11, and MW-519B during 2012 and Phase 1-3 sparging
Figure 4-20:	pH as a function of time for MW-1C, MW-2C, and MW-115C during 2012 and Phase 1- 3 sparging
Figure 4-21:	pH as a function of time for MW-510B during 2012 and Phase 1-3 sparging
Figure 4-22:	pH as a function of time for MW-503B, MW-353B, and MW-508B during 2012 and Phase 1-3 sparging
Figure 4-23:	pH as a function of time for MW-507B and MW-358B during 2012 and Phase 1-3 sparging
Figure 4-24:	pH as a function of time for MW-112C and MW-113C during 2012 and Phase 1-3 sparging
Figure 4-25:	Post-sparge (Phase 3) pH in deep Satilla monitoring and extraction wells
Figure 4-26:	Post-sparge (Phase 3) pH in sparge wells
Figure 4-27:	Post-sparge (Phase 3) pH in deep Satilla monitoring, extraction, and sparge wells
Figure 4-28:	Post-sparge (Phase 3) pH in southern Geoprobe locations
Figure 4-29:	Post-sparge (Phase 3) pH in mid Satilla monitoring wells
Figure 4-30:	Changes in deep Satilla specific gravity after sparging
Figure 4-31:	Relationship between specific gravity and TDS for deep Satilla groundwater
Figure 4-32:	Changes in deep Satilla computed specific gravity after sparging
Figure 4-33:	Pre-sparge (2011-2012) total mercury in deep Satilla monitoring and extraction wells
Figure 4-34:	Pre-sparge (Phase 3) total mercury in deep Satilla monitoring and extraction wells
Figure 4-35:	Pre-sparge (Phase 3) dissolved mercury in Phase 2 and Phase 3 sparge wells
Figure 4-36:	Pre-sparge (2011-2012) total mercury in mid Satilla monitoring wells
Figure 4-37:	Post-sparge (Phase 3) total mercury in deep Satilla monitoring and extraction wells
Figure 4-38:	Box plot of mercury concentrations in deep Satilla monitoring locations
Figure 4-39:	Post-sparge (Phase 3) dissolved mercury in sparge wells
Figure 4-40:	Post-sparge (Phase 3) total and dissolved mercury in deep Satilla monitoring, extraction and sparge wells
Figure 4-41:	Post-sparge (Phase 3) dissolved mercury in southern Geoprobe locations

- Figure 4-42: Relationship between Hg and pH in deep Satilla monitoring locations
- Figure 4-43: Post-sparge (Phase 3) total mercury in mid Satilla monitoring wells
- Figure 4-44: Historical pH and Hg in MW-519B and MW-115C
- Figure 4-45: Historical pH and Hg in EW-6 and EW-11
- Figure 4-46: PZ-63 hydrograph and daily precipitation data
- Figure 4-47: MW-515B and MW-112C hydrographs

LIST OF ACRONYMS

AOC	Agreement and Order on Consent
ARCO	Atlantic Refining Company
As	Arsenic
bgs	Below ground surface
CBP	Caustic brine pool
CaCO ₃	Calcium carbonate
CO_2	Carbon dioxide
CO_2^2	Carbonate ion
Cr	Chromium
Cr(III)	Trivalent chromium
Cr(VI)	Hexavalent chromium
CPT	Cone Penetrometer Test
DOM	Dissolved organic matter
DP	Distribution Panel
EPA	Environmental Protection Agency
EW	Extraction Well
ft	Feet
ft/d	Feet per day
	Gallons per minute
gpm Hg	Mercury
HDPE	High-density polyethylene
kW	Kilowatt
lb	Pounds
LCP	Linden Chemicals and Plastics
MW	Monitoring well
n	Sample size
n NAVD	North American Vertical Datum
NAVD	Not available
NA NM	Not available
NTU	Nephelometric turbidity unit
ORP	Oxidation reduction potential
P&ID	Process and instrumentation drawing
	Part per million by volume
ppmv psi	Pounds per square inch (gauge)
psia	Pounds per square inch – absolute
PVC	Poly vinyl chloride
PZ	Piezometer
RAO	Remedial Action Objective
RI	Remedial Investigation
ROI	Radius of influence
scfm	Standard cubic feet per minute
Si	Silica
SG	Specific gravity
SW	Sparge well
TDS	Total dissolved solids
μg/L	Microgram per liter
μe	Merogram per mer

1 INTRODUCTION

Mutch Associates, LLC (Mutch), in collaboration with Parsons Environment & Infrastructure Group, Inc. (Parsons), have prepared this report of Phase 3 of carbon dioxide (CO_2) sparging at the LCP Chemicals Site in Brunswick, Georgia (Site). Phase 3 of CO_2 sparging was conducted in accordance with the CO_2 Sparging Work Plan, LCP Chemicals Site, Brunswick, GA dated April 24, 2013 (Sparging Work Plan) (Mutch Associates and Parsons, 2013a) and the Technical Approach for Phase 3 CO_2 Sparging, LCP Chemicals Site, Brunswick GA (Revision 1) dated September 1, 2015 (Phase 3 Memo) (Mutch Associates, 2015b). Formal approval of the Sparging Work Plan and Phase 3 Memo were granted by the U.S. Environmental Protection Agency, Region 4 (EPA) on May 1, 2013 and January 7, 2016, respectively. The CBP is being addressed under an Administrative Settlement Agreement and Order on Consent (AOC) entered into between EPA and Honeywell on April 18, 2007. The remedial action objectives (RAO) were defined in the AOC and included reducing the pH of the CBP to between 10 and 10.5 and reducing the density of the CBP.

This report describes the implementation and monitoring results related to Phase 3 of CO_2 sparging and summarizes the effect of all three phases of sparging on groundwater quality within the deep Satilla aquifer beneath the Site. This report is organized in the following manner:

- Section 1 Introduction and background;
- Section 2 Describes the sparge well installation and sparge system construction;
- Section 3 Describes the specific procedures and protocols employed during sparging;
- Section 4 Presents the results of sparging on pH, specific gravity, mercury (Hg), other geochemical parameters, and groundwater levels; and
- Section 5 Conclusions and recommendations.

1.1 Site Description

The Site is located at 4125 Ross Road,¹ in the City of Brunswick, in Glynn County, Georgia, and is bordered by the Turtle River marshes to the west and south and urban areas of Brunswick to the north and east. The Site encompasses approximately 813 acres, of which 684 acres are tidally influenced salt marsh. A Site location map is provided in Figure 1-1.

During chemical production activities at the Site, a portion of the shallow aquifer was contaminated by releases from the chlor-alkali-manufacturing operations and a subsurface CBP formed. The CBP is

¹ A site address was developed as part of the County's upgrade to its 911-emergency system.

defined in the AOC as groundwater with a pH above 10.5. The dashed line on Figure 1-2 shows the location and extent of the CBP based on pH data collected in 2012.² The area within the 10.5 contour was 8.6 acres.

In July and August of 2014, Honeywell performed groundwater sampling via Geoprobe at the base of the Satilla aquifer along the southern boundary of the CBP as mapped in 2012. The purpose of this sampling was to improve delineation of the extent of the high pH (> 10.5) plume. Further details on this sampling are provided in the Phase 2 final report. Results of the re-mapping of the pH > 10.5 plume are shown as the solid line in Figure 1-2. Addition of the southern area increased the area of the CBP to 13.9 acres.

1.2 Summary of Proof of Concept Test

Full-scale CO₂ sparging was preceded by a Proof of Concept Test. The Proof of Concept Test was conducted from October 29, 2012 to November 17, 2012 in accordance with the *Final Work Plan for CO₂* Sparging Proof of Concept Test, LCP Chemicals Site, Brunswick, GA (Proof of Concept Test Work Plan) dated September 11, 2012 (Mutch Associates, 2012). EPA approved the Proof of Concept Test Work Plan in a letter dated September 10, 2012. The Proof of Concept Test was designed to evaluate the feasibility of CO₂ sparging to remediate the CBP (Figure 1-3).

Key observations from the Proof of Concept Test that are relevant to the design and implementation of full-scale sparging, as described in the CO_2 Sparging Proof of Concept Test Report (Mutch Associates and Parsons, 2013b) are:

- 1. Significant pH reductions from pH 11-12 in the deep Satilla were achievable in 5 to 7 days sparging at circa 50 standard cubic feet per minute (scfm).
- 2. A radius of influence (ROI) of at least 20 feet was achieved in the deep Satilla and greater than 60 feet (ft) at the water table surface.
- Hg levels in the high pH CBP waters fully-impacted by the sparging declined from 110-120 μg/L to 11-33 μg/L (70 to 90% reductions).
- 4. During sparging, significant mounding of the potentiometric surface was observed. Shallow Satilla wells within the 20-ft radius of sparge wells increased to within 1 ft of the ground surface.

² The mapping of the CBP (Figure 1-2) was created by kriging pH data from deep Satilla monitoring wells (MW series) from the May/June 2012 monitoring event, supplemented with data from September 2011 for extraction wells (EW series). For most wells, field pH values were used for the mapping. The only exceptions were MW-357A, MW-357B, MW-512B and MW-516B, where laboratory pH was conservatively used because field pH was considerably lower than historic values. Well MW-113C was not included in kriging because of poor resolution in this area of the site.

5. Significant rebound of pH or Hg was not observed based on results from groundwater monitoring conducted three months after completion of sparging.

The Proof of Concept Test demonstrated that CO_2 sparging is an effective, innovative technology, suitable for full-scale implementation at the Site (Figure 1-3). Observations made during testing further demonstrated that full-scale implementation of CO_2 sparging should be conducted over a multiple-year, sequential effort. The principal drivers for this sequential implementation were:

- Management of groundwater mounding caused by superposition of multiple, closely-spaced sparge wells; and
- Maximization of sparging efficiency.

The Proof of Concept Test indicated that managing groundwater mounding during full-scale implementation would be critical. The groundwater table rose to within 1 ft of the ground surface during the testing. This potential for mounding could be exacerbated by superposition of mounding from multiple nearby sparging wells and by seasonal rises of the groundwater table. Moreover, in some areas of the CBP, the water table is even closer to the surface than at the test site. These factors could impose a practical limit on the spacing of wells and the number of wells that could be sparged simultaneously. Conducting the implementation over multiple years would allow active sparge wells to be further apart, thereby reducing the superposition of groundwater mounding.

The Proof of Concept Test suggested that CO_2 sparge efficiency could be enhanced by a sparge regimen that emphasizes short bursts of sparging (anywhere from $\frac{1}{2}$ to 4 hr) followed by rest periods. The rest periods would allow CO_2 gas residual saturation remaining in the formation to both dissolve and diffuse into the surrounding CBP waters. The Proof of Concept Test Report concluded that different sparge regimens should be tested during the first year of sparging in an effort to optimize sparge efficiency.

The Proof of Concept Test results also showed that the pH reached target levels in the deep Satilla at least 20 ft away from sparge well MW-1C (Mutch Associates and Parsons, 2013b). This indicated an effective ROI of at least 20 ft in the deep Satilla. Modest decreases in pH in deep Satilla wells were observed at radial distances greater than 20 ft, indicating some consumption of CO₂ demand. The ROI in the intermediate and shallow Satilla was significantly larger than 20 ft. For example, gas channels extended all the way from MW-1C to MW-517A, which is a distance of approximately 100 ft. As a result, there was some uncertainty regarding the ROI that would be achieved during full-scale implementation. The Proof of Concept Test Report indicated that further evaluation of ROI could be achieved by using an initial coarse grid spacing for sparge wells during the first year of sparging, followed by filling-in with a denser well spacing in future efforts based on observed results.

Although Hg concentrations are not a component of the AOC, the performance of the CO_2 sparging with respect to its impact on Hg concentrations was monitored. The Proof of Concept Test results showed a clear trend of decreasing Hg concentrations with decreasing pH as a result of CO_2 sparging. Furthermore, monitoring in these same wells showed a gradual lowering of dissolved Hg concentrations over time at a given pH (Mutch Associates and Parsons, 2013c). This effect appeared after 3 months and was sustained through 6 months after sparging was completed.

1.3 Summary of Phase 1 of Full-Scale Sparging

As described in the EPA-approved Sparging Work Plan (Mutch Associates and Parsons, 2013a), the technical objectives of Phase 1 of full-scale sparging were the following:

- Reduce pH as determined by measurements in deep Satilla monitoring wells and extraction wells;
- Determine the average ROI of sparging to develop a technical approach for Phase 2 of CO₂ sparging;
- Determine the optimal sparging regimen to maximize CO₂ utilization efficiency; and
- Reduce Hg concentrations as determined by comparison of pre- and post-sparging concentrations in mid and deep Satilla monitoring wells.

Phase 1 of CO_2 sparging at the Site is described in detail in the CO_2 Sparging Phase 1 Full-scale Implementation and Monitoring Report, Revision 1 (Phase 1 Report), dated June 20, 2014 (Mutch Associates and Parsons, 2014). Phase 1 sparge wells were placed approximately 80 ft apart on a coarse, semi-regular, hexagonal grid pattern (Mutch Associates and Parsons, 2013a). This layout provided flexibility for various final sparge well spacings by placing additional sparge wells on the grid. Sparging was performed from November 8, 2013 to February 13, 2014. A total of 783,000 lb of CO_2 was sparged during Phase 1.

A summary of the key results from Phase 1 is presented below:

- All of the technical objectives of Phase 1 of CO₂ sparging were met.
- Sparging was effective in reducing the pH of the CBP groundwater. Following Phase 1 of sparging, 14 out of 15 deep Satilla monitoring points within a radial distance of 30 ft from a sparge well had a post-sparge pH < 10.0, and 13 out of 15 monitoring points had a post-sparge pH < 7.5. Many wells at distances greater than 30 ft showed significant decreases in pH.
- An average ROI of 32.9 ft was estimated from the pH versus distance data. This is considerably larger than the approximate 20 ft ROI measured in the Proof of Concept Test.

- The optimal sparging regimen was Regimen A (once per week). Some sparge wells required longer sparge durations of 8 to 24 hr to provide adequate flow.
- The efficiency of CO₂ sparging was evaluated by comparing the CO₂ demand of the CBP with the amount of CO₂ mass required to lower the pH to circumneutral and found to be 29%. This efficiency was approximately three times larger than the efficiency estimated from the Proof of Concept Test (9.7%).
- CO₂ sparging resulted in a significant decline in aqueous-phase Hg concentrations. In monitoring points where post-sparge pH was less than 7.5, the mean Hg concentration decreased from 94 µg/L to 21 µg/L (n = 22), a decrease of 78%.
- The pre-and post-sparging aquifer testing showed no sharp loss of aquifer transmissivity. The mean of six pre-sparge well specific capacities was 0.011 gpm/ft. The mean of ten post-sparge specific capacities measured approximately 2 weeks after sparging was 0.035 gpm/ft.
- The pre-sparge aquifer testing indicated that the basal Satilla varies in hydraulic conductivity within the CBP from 2 to 17 ft/d, with a mean value of 9.9 ft/d. The Proof of Concept pre-sparging aquifer test had previously measured a hydraulic conductivity of 8.9 ft/d in that area of the Site.
- A significant fraction of the injected CO₂ remained in the formation as residual CO₂ saturation and was not vented to the atmosphere. The emplacement of CO₂ residual saturation into the Satilla provides a long-term source of pH-neutralization and Hg immobilization for water flowing from upgradient locations. This may also serve as protection against pH rebound.
- As the CO₂ residual saturation dissolves into the surrounding groundwater, a process that could take months or years, aquifer properties such as hydraulic conductivity and storativity should concomitantly approach pre-sparge levels, except for whatever impact the minimal reduction in porosity may have on these properties. Experience during the Proof of Concept Test and Phase 1 suggested that these latter impacts were not of particular concern.

1.4 Summary of Phase 2 of Full-Scale Sparging

The technical objectives of Phase 2 sparging was to continue to make progress in meeting the RAOs in the deep Satilla groundwater. Phase 2 of CO_2 sparging at the Site is described in detail in the CO_2 Sparging Phase 2 Full-scale Implementation and Monitoring Report, Revision 1 (Phase 2 Report), dated September 1, 2015 (Mutch Associates and Parsons, 2015). Based on the average radius of influence (ROI) observed during Phase 1 of 33 feet (ft), the final layout of Phase 2 sparge wells within the Phase 1 sparging footprint was designed to form sparge "columns," with consideration given to overlap. A total of 58 Phase 2 sparge wells were installed within the Phase 1 footprint (SW-66 through SW-123).

Prior to the Phase 2 sparging, the southern boundary of the CBP was further defined via a Geoprobe sampling program that delineated the extent of the high pH plume to the south. This newly delineated "southern area" was added to the sparging program, bringing the total area to 13.9 acres. This southern area was treated for the first time as part of Phase 2 sparging, utilizing 22 new wells. Phase 2 sparge wells in the southern area were placed approximately 114 ft apart on a coarse, semi-regular, hexagonal grid pattern. This was done so that a final spacing of 66 ft (consistent with a 33 ft ROI) could be achieved by placing additional sparge wells in Phase 3 at the geometric center of triangles formed by the Phase 2 wells.

Sparging was performed from October 17, 2014 to April 28, 2015. The total amount of CO₂ injected during Phase 2 was 1,521,000 lb. Phase 2 sparge wells received 1,199,000 lb while Phase 1 sparge wells received additional 321,000 lb.

A summary of the key results from Phase 2 is presented below:

- Only four deep Satilla monitoring points within the sparging footprint had a pH above 10.5 after Phase 2 sparging.
- Post-sparge Geoprobe groundwater sampling of pH in the southern area supported the selected ROI of 33 ft within the Phase 1 footprint.
- The mean Hg concentration in Phase 2 monitoring points where the pH was less than 10.5 was 12.4 µg/L, an 89% reduction from pre-Phase 1 levels.
- Hg measurements throughout the entire sparging program showed that additional reductions in Hg should occur over time as groundwater remains at neutral pH.

1.4.1 Technical Objectives of Phase 3

The technical objectives of Phase 3 sparging were to build upon the success of the first two phases and to finally achieve the RAOs within the deep Satilla aquifer. Specifically, Phase 3 addressed two areas within the Phase 1 footprint and completed treatment in the southern area. These are discussed in more detail below.

By the end of Phase 2, treatment within the Phase 1 footprint was largely complete. However, at the end of Phase 2, two monitoring points along the eastern edge (MW-352B and MW-513B) and two monitoring point along the western edge (EW-5) of the sparging footprint did not achieve a circumneutral final pH (Phase 2 Report). In addition, the pH increased above 10.5 in one monitoring well just outside the sparging footprint (MW-510B). To address these areas, a total of 14 wells were installed within the Phase 1 footprint. Two wells were installed near EW-5 and MW-510B. The remaining twelve wells were installed along the eastern edge of the sparging footprint to address high pH groundwater near MW-352B

and MW-513B. Ten of these wells form a "sparge column" to treat groundwater that may be entering the sparging footprint from the east

The conceptual layout for the southern area, first presented in the Phase 2 technical memo (Mutch Associates, 2014), featured a coarse hexagonal grid pattern where Phase 2 sparge wells are 114.3 ft apart. Post-Phase 2 Geoprobe sampling of groundwater in the southern area demonstrated sparging influence that was consistent with the 33 ft ROI observed during Phase 1. Therefore, a final spacing of 66 ft (consistent with a 33 ft ROI) was achieved by placing additional sparge wells at the geometric center of triangles formed by the Phase 2 wells.

1.4.2 Reporting

Data collected during Phase 3 sparging is compiled and evaluated in this report. Specifically, this report contains the following information:

- Borings / well construction logs for sparge wells installed prior to Phase 3 sparging;
- A tabular summary of injection activities at each well, including mass of CO₂ injected per event;
- Changes in pH and specific gravity observed in the monitoring well network;
- Pre- and post-sparge groundwater monitoring results of other constituents such as Hg, total dissolved solids (TDS), silica (Si), arsenic (As) and chromium (Cr);
- A description of supplemental Geoprobe sampling of deep Satilla groundwater along the western edge of the sparging footprint to delineate the extent of the pH 10.5 plume;
- Recommendations for future activities relating to groundwater at the Site.

2 SYSTEM CONSTRUCTION

2.1 Sparge Well Construction

2.1.1 Sparge Well Locations within the Phase 1 Footprint

To address the identified high pH areas within the Phase 1 footprint, 14 new sparge wells (SW-196 through SW-209) were installed (Figure 2-1 and Figure 2-2). Two of these sparge wells (SW-196 and SW-197) were installed north of SW-23 to treat areas near EW-5 and MW-510B. Twelve sparge wells (SW-198, SW-199, SW-200 through SW-209) were placed along the eastern edge of the Phase 1 footprint near the existing infiltration galleries. Two of these twelve sparge wells were located west of the galleries, to fill a small gap in sparging coverage south of SW-121. The remaining ten sparge wells form a "sparge column" to treat groundwater that may be entering the sparging footprint from the east. The wells that form the sparge column were spaced approximately 50 ft apart so that there is significant overlap between adjacent ROI.

2.1.2 Sparge Well Locations in Southern Area

The conceptual layout for the southern area was first presented in the Phase 2 technical memo (Mutch Associates, 2014). This layout featured a coarse hexagonal grid pattern where Phase 2 sparge wells are 114.3 ft apart. Post-Phase 2 Geoprobe sampling of groundwater in the southern area demonstrated sparging influence that was consistent with the 33 ft ROI observed during Phase 1. Based on this result, a total of 50 sparge wells were installed in the southern area during Phase 3 (SW-146 through SW-195). Consistent with the conceptual layout, Phase 3 sparge wells completed the grid in the southern area with a final spacing of 66 ft on center. The as-built locations of the Phase 3 wells are shown on Figure 2-1 and Figure 2-3. Sparge wells SW-180 through SW-182 are located outside the pH 10.5 contour in the southern area, but were installed and sparged to lower dissolved Hg concentrations in this area which ranged from 31 to 76 µg/L (Mutch Associates and Parsons, 2015). Slight alterations to the regular grid were needed for SW-177 and SW-178, due to an existing concrete wall on the Site.

2.1.3 Sparge Well Installation and Development

Sparge wells were constructed with 2 ft of 2-inch diameter, 0.010-inch slotted Schedule 40 PVC screen with a 2-inch Schedule 40 PVC riser. At most locations, permeable aquifer material (i.e. fine to medium sand) was encountered directly above the variably-cemented sandstone. At these locations, the well screen was set at the top of the variably-cemented sandstone. When less permeable aquifer material unsuitable for sparging was present at the base of the Satilla aquifer (i.e. silt, very fine sand, sand with little to some silt), the screen was set at the deepest interval where the more permeable aquifer material (i.e. fine

to medium sand) was encountered. When a clay stratum was encountered directly above the variablycemented sandstone, the well screen was set in permeable aquifer material at the base of the clay stratum, after grouting the boring to the top of the clay with 95% Type 2 Portland / 5% bentonite if the clay had been penetrated greater than 6 in. Well construction was completed with a 20/30 sand pack to 2 ft above the top of screen, followed by a 2-ft bentonite seal, and cement grout to the surface. Boring logs / well construction diagrams are provided in Appendix A in a standardized form and for all three phases of sparge well installation.

Following installation, sparge wells were developed by removing an average of 70 gallons of water with the goal of achieving a turbidity of 50 Nephelometric Turbidity Units (NTU). During well development, yields less than 0.5 gallons per minute (gpm) were observed in a number of sparge wells; these wells were surged with a surge block to improve yield. Final yields and water quality data (i.e. pH, specific conductance) obtained during well development are included in the summary table provided in Appendix B.

No additional shallow piezometers were installed during Phase 3 since there were already 35 piezometers to monitor shallow groundwater rise. The locations of the piezometers installed during Phases 1 and 2 are provided in Figure 2-4.

2.1.4 Monitoring Well Completions

The monitoring well network used to evaluate Phase 3 CO_2 sparging is shown on Figure 2-5. To reduce the potential for groundwater surfacing, threaded plugs were installed on all monitoring wells within the sparging footprint to contain the possible rise of water. Similar to Phases 1 and 2, the monitoring wells were outfitted with fittings and ports to allow for instrumentation cables and manual pressure measurements (Mutch Associates and Parsons, 2014).

2.1.5 Top of Sandstone and Clay Isopach Mappings

The mapping of the top of the variably-cemented sandstone was updated prior to Phase 3 sparge well installation. This map was used to estimate depth of the variably-cemented sandstone from ground surface at planned Phase 3 sparge well locations (Figure 2-1 through Figure 2-3). Field data for the elevation of the top of the variably-cemented sandstone was gathered from Phase 1 and 2 sparge well boring logs, boring logs from Site monitoring wells and extraction wells, Geoprobe drilling reports, Cone Penetrometer Tests (CPTs), and exploratory borings from the Remedial Investigation (RI). The elevation data was catalogued and consolidated into a master database and used as the basis for interpolation of the top of variably-cemented sandstone elevation over the entire Site. The interpolation was accomplished

using Ordinary Kriging with 2^{nd} order trend removal with the Geostatistical Analyst package of ArcGIS (ESRI).³ The map (Figure 2-6) shows the variably-cemented sandstone as a continuous unit at elevations varying from -39.5 to -43.0 ft (NAVD 88). The variably-cemented sandstone surface generally deepens moving north-northwest (NNW) across the sparging footprint.

A clay isopach map was prepared in order to estimate the location and thickness of clay deposition to assist in well screen placement (Figure 2-7). Data used for the clay isopach map was obtained from the same sources as the top elevation of the variably-cemented sandstone described above. Clay thickness was interpolated over the entire sparging footprint using inverse-distance weighting interpolation with the Geostatistical Analyst package of ArcGIS. Clay is not pervasive in the subsurface, and is typically thicker in the northern portion of the sparging footprint.

2.2 CO₂ Storage, Vaporization, and Distribution System

Equipment to store, vaporize, and distribute CO_2 to the sparge wells was installed at the Site in October and November 2013, as summarized below.

- Storage and vaporization equipment included two 50-ton refrigerated bulk tanks for liquid CO₂ storage, two 105-kW process vaporizers to convert liquid CO₂ to gaseous form, pressure regulators to reduce CO₂ line pressure from 300 pounds per square inch (psi) to a field delivery pressure of approximately 50 psi, a trim heater to adjust the final temperature of the gaseous CO₂, a flow meter, and other instrumentation and controls.
- Distribution system equipment included distribution piping, eight distribution panels (DPs), portable hoses, and instrumentation. The distribution panels included three 1-inch branch lines following the upstream pressure regulator; each branch line included a downstream pressure regulator and a flow meter (rotameter). A temperature gauge also was provided at each distribution panel. Temperature measurements, together with the flow and pressure measurements, were used to estimate CO₂ mass sparged into each sparge well.

Further detail regarding the equipment installed to support sparging is described in the Phase 1 Report (Mutch Associates and Parsons, 2014). Various system components installed during Phase 1 are also illustrated below.

³ Ordinary Kriging was performed using an experimental semivariogram (lag size: 43.3 ft, number of lags: 12) modeled with a Gaussian function optimized to reduce root mean square error (nugget: 1.84, major range: 346.6, partial sill: 0.453). Kriging was performed using a search neighborhood of 4 sectors with 45 degree offset (min/max neighbors: 10/15).

Based on the investigations described in the Phase 2 report, the sparging footprint was expanded to the south. To accommodate Phase 2 and Phase 3 sparging in this area, three additional distribution panel locations were established (DP-9, DP-10, and DP-11), and approximately 800 ft of additional distribution piping was installed at the Site in September and October 2014, as shown on Figure 2-8. On January 7, 2015, distribution panels were shifted from locations DP-1, DP-5, and DP-8 (following substantial completion of sparging at these locations), to locations DP-11, DP-10, and DP-9, respectively, to allow for sparging in the south and southwest. A process and instrumentation drawing (P&ID) illustrating the additional piping and distribution panels is provided as Figure 2-9.



Left: 105-kW process vaporizers.



Right: 50-ton CO2 storage tanks



Above: Typical distribution panel. Below: Typical sparge wellhead installation

Rotameter for Flow Downstream Measurement (with Pressure Regulator Upstream Pressure Regulator Temperature Gauge

3 PROCEDURES AND PROTOCOLS

3.1 Groundwater Sampling

3.1.1 Monitoring Wells and Extraction Wells

Prior to and following CO_2 sparging, specific monitoring and extraction wells were sampled to provide baseline and post-sparge groundwater quality data. Post-sparge sampling of Satilla monitoring wells occurred approximately 2 weeks after the end of Phase 3 sparging. The monitoring wells and extraction wells that were sampled are presented on Table 3-1. The locations of deep Satilla monitoring wells are shown in Figure 3-1; mid Satilla monitoring wells are shown in Figure 3-2.

Deep Satilla Monitori	ng Wells		1200 1200
MW-105C ^(b)	MW-357B	MW-507B ^(a)	MW-515B
MW-112C ^(a,b)	MW-358B ^(a)	MW-508B ^(a)	MW-516B ^(b)
MW-113C ^(a,b)	MW-501B ^(b)	MW-510B ^(a)	MW-517B
MW-115C ^(b)	MW-502B ^(b)	MW-511B ^(b)	MW-518B ^(b)
MW-352B	MW-503B ^(a,b)	MW-512B ^(b)	MW-519B
MW-353B ^(a)	MW-504B ^(b)	MW-513B ^(b)	MW-1C
MW-357A	MW-505B	MW-514B ^(b)	MW-2C
Deep Satilla Extractio	on Wells		
EW-1	EW-4	EW-8	EW-11
EW-2	EW-5	EW-9	
EW-3	EW-6	EW-10	
Mid Satilla Monitorin	g Wells		100 million (100 m
MW-352A	MW-504A	MW-513A	MW-517A
MW-502A	MW-505A	MW-514A	

Table 3-1: Monitoring Points for Phase 3 CO₂ Sparging

^(a) Indicates a well outside of the sparging area which served as a background monitoring well.

(b) Indicates well was selected for measurement of specific gravity in the field pre-and post-sparging.

Wells were purged and sampled using the low flow "Tubing-in-Screened-Interval" method, pursuant to the groundwater sampling operating procedure (effective date March 2013) contained in the *Field Branches Quality System and Technical Procedures* (http://www.epa.gov/region4/sesd/fbqstp/ index.html) (USEPA Region 4 Science and Ecosystem Support Division, 2013). The guidance document *Groundwater Sampling Guidelines for Superfund and RCRA Project Managers* (Yeskis and Zavala, 2002) was also referenced for additional technical support. Per the method, the tubing intake was lowered to the middle of the screened interval of the well, and a peristaltic pump was used to purge the groundwater at a low flow rate. Throughout the purge process, depth-to-water measurements were collected to assess and maintain stable drawdown. A minimum one equipment volume was purged prior to stabilization parameters (pH, specific conductivity, dissolved oxygen, and turbidity). Although not considered stabilization

parameters, temperature and oxidation reduction potential were also recorded. Once the required parameters were stable for three consecutive readings, and goals for turbidity had been reached,⁴ groundwater samples were collected for laboratory analysis as described in Table 3-2.

Analyte	Method	Description
pH	EPA SW-846 9040B	Ion selective electrode
Alkalinity	SM 2320B	Potentiometric titration
Total Hg Filtered/dissolved Hg ^(a)	EPA SW-846 7470A	Cold-vapor atomic absorption spectrophotometry
Total dissolved solids	SM 2540C	Gravimetric
Total metals & silica ^(b)	EPA SW-846 6010B	Inductively Coupled Plasma – Atomic Emission Spectroscopy

Table 3-2: Water Quality Analytes and Associated Laboratory Method	Table 3-2: Wate	r Ouality	Analytes and	Associated	Laboratory	Methods
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(a) If after 2 hours of purging or 5 well volumes had been purged, and turbidity was still greater than 50 NTUs, a filtered sample for Hg was also collected.

(b) Total metals included aluminum, arsenic, barium, beryllium, calcium, cobalt, chromium, iron, potassium, magnesium, manganese, sodium, nickel, selenium, vanadium, zinc.

The groundwater samples were preserved on ice and submitted to TestAmerica Laboratories in Savannah, GA for analysis. Once the groundwater samples had been collected, approximately 900 mL of groundwater were pumped into a graduated cylinder and the specific gravity was determined using a hydrometer for those wells indicated on Table 3-1. Purge logs, including a summary of stabilization parameters and specific gravity measurements, are provided in Appendix C. All of the water quality data collected as part of Phase 3 sampling is presented in Appendix D.

A subset of groundwater samples collected from extraction wells (EWs) during this and previous monitoring events had sodium concentrations and specific conductance values much lower than historical values. The well casings of extraction wells are located in subsurface valuts that are susceptible to infiltration from rainwater or shallow groundwater when there is a high groundwater table. This infiltration of rain water or shallow groundwater likely resulted in some samples from extraction wells that are not entirely representative of the CBP. For the purpose of this assessment, when measured sodium concentration or specific conductance values from Phase 3 sampling were less than 40% of historical averages, the groundwater samples were considered non-representative of deep Satilla groundwater. The only extraction well sampled during Phase 3 monitoring that was affected by dilution was EW-10 (post-Phase 3). As a result, the post-Phase 3 sample from this well was not submitted to the laboratory for analysis of other parameters. Water quality measurements (i.e. Hg, Si and TDS, etc.) from extraction wells that were suspected to be affected by dilution throughout Phases 1 – 3 are not displayed on figures or used to

⁴ Goals for turbidity were: less than 10 NTUs or a minimum 1-hr purge with turbidity less than 50 NTUs and with turbidity measurements within 10%; or a minimum 5-well volume purge or 2-hr purge, whichever occurred first.

calculate averages or percent removals. It should be noted that pH values collected in these extraction wells were considered to be not significantly affected by this dilution because of the logarithmic scale of pH. A 10:1 dilution of deep Satilla is required to bias measured pH values low by one standard unit. The pH measured in the extraction wells described above were included in figures and included in summary tables of this report.

3.2 Monitoring During Sparging

Groundwater pH and conductivity were measured throughout the sparging program in all monitoring points within the sparging footprint. A portable peristaltic pump was used to pump water to the surface. Tubing was lowered to the mid-point of the screen and water was pumped with a flow rate that ranged from 0.25 to 2.50 L/min. The water passed through a flow cell equipped with a YSI Professional Plus multi-parameter probe that measured pH, specific conductance, barometric pressure, and temperature. The probe was set to take readings every 30 seconds. Wells were pumped until all parameters were stabilized over three consecutive readings. The final stabilized reading was used as the data point of record. The data was recorded on the internal memory of the meter and was reported at the end the day.

Field measurements of pH and conductivity occurred at a frequency of approximately once per week in deep Satilla monitoring points within the sparging footprint. Several wells to the west of the sparging footprint were sampled approximately once per month to assess lateral migration of the CBP. A few deep Satilla monitoring wells to the east of the sparging footprint were sampled at the end of Phase 3. In addition, wells screened in the Coosawhatchie A/B formation (HWEast2, HWEast3, HWEast5, MW-352D, MW-115, and MW-360D) were sampled at the end of Phase 3 operations to assess effect of sparging on pH (Figure 3-3). Shallow Satilla monitoring wells were not monitored as part of Phase 3 sparing effort.

All pH electrodes were calibrated daily to ensure accuracy of results. A three-point standard curve using pH 4.01, 7.00, and 10.01 was used. A valid pH calibration curve was obtained only when the slope was within 5% of the theoretical value of -59 mV/pH. Specific conductance was also calibrated daily. A calibration check was performed at least once per day to ensure electrode stability.

3.3 Sparge Operations

3.3.1 Sparge Regimens

Phase 1 of CO_2 sparging tested four sparging regimens to optimize CO_2 efficiency (Mutch Associates and Parsons, 2014). The Phase 1 Report recommended a once per week regimen with a 4-hr duration to start, with adaptive management to optimize well-specific performance. Phase 1 sparging also indicated that specific wells needed longer sparging intervals (e.g. 8 or 24 hr) to provide adequate mass

flows of CO_2 . Since this approach was successful in Phases 1 and 2, the same procedures were applied throughout Phase 3 of CO_2 sparging.

3.3.2 Required CO₂ Mass Per Well

During Phase 1 sparging, an overall mass of at least 8,000 to 9,000 lb of CO_2 per sparge well was estimated to treat moderate alkalinity groundwater (< 4,000 mg/L CaCO₃). Areas of higher alkalinity were sparged at approximately 1.5-times (12,000 lb) to 2-times (16,000 lb) this amount to account for the increased demand. To prepare for Phase 2, alkalinity was measured in select sparge wells and Geoprobe locations. This information was combined with deep Satilla alkalinity data collected prior to Phase 1 to interpolate alkalinity across the entire sparging footprint. This alkalinity map was further updated with additional information from Phase 3 sparge wells in the northern area of the Site (Figure 3-4).⁵ The interpolated alkalinity map shows high alkalinity areas in the northern portion of the Site near the elevated pad, and in the southwestern area of the Site.

To refine the estimate of CO_2 dosing in high alkalinity areas, the total mass of CO_2 was scaled from the 8,000 lb baseline established in Phase 1 using the following procedure. First, the average alkalinity within a 33-ft radius of each sparge well was estimated using the interpolated alkalinity map (Figure 3-4) and the zonal statistics toolbox of ArcGIS (version 10.3). Second, an alkalinity multiplier was calculated for each sparge well by dividing the average alkalinity by 4,000 mg/L as CaCO₃ (the baseline alkalinity from Phase 1). Finally, the required CO_2 dose was determined by scaling up the baseline in a linear fashion according to Table 3-3.

This method of calculating required CO_2 mass was also retroactively applied to Phase 1 and 2 sparge wells. In light of the new alkalinity data, a small number of Phase 1 and 2 sparge wells had less than the required CO_2 mass using the linear scale-up method described above. Therefore, these wells were sparged during Phase 3 to achieve the revised target. In addition, Phase 2 sparge wells in the southern area that had already met the new mass requirements received approximately 2,000 lb of CO_2 during Phase 3. The purpose of the additional sparging was to treat high pH groundwater that may have moved into the zone of influence of a Phase 2 well during sparging of Phase 3 sparge wells. A secondary benefit of sparging

⁵ This map was created using the radial basis function interpolator in ArcGIS Geostatistical Analyst. Data used for the interpolation are indicated on Figure 3-4. Phase 2 sparge wells with a pH <10.5 were excluded from the interpolation data set because they were assumed to have been influenced by Phase 1 sparging. MW-105C was replaced with March 2014 data because of an error in reporting of alkalinity from the lab. The data set was supplemented with alkalinity values from 2010 (MW-101C, MW-106C, MW-304C, MW-306B, MW-351B, MW-355B), 2006 (MW-307B), and 2003 (MW-114C and MW-116C).

these wells was the replenishment of the residual saturation of CO_2 which helps protect against long-term rebound of pH.

Average Alkalinity within ROI (mg/L as CaCO ₃)	Alkalinity Multiplier	CO ₂ dose (lb)
Less than 4,000	Less than 1.00	8,000
4,001 to 6,000	1.01 to 1.50	12,000
6,001 to 8,000	1.51 to 2.00	16,000
8,001 to 10,000	2.01 to 2.50	20,000
10,001 to 12,000	2.51 to 3.00	24,000
12,001 to 14,000	3.01 to 3.50	28,000
14,001 to 16,000	3.51 to 4.00	32,000
16,001 to 18,000	4.01 to 4.50	36,000
18,001 to 20,000	4.51 to 5.00	40,000

Table 3-3: Alkalinity-CO2 Dose Relationship

The only sparge well that was an exception to the CO_2 dosing described above was SW-124. Prior to the start of Phase 2, pre-sparge sampling of SW-124 indicated pH < 10.5 (9.82) and low Hg (8 µg/L), indicating this area is not part of the CBP. Therefore, this well was not sparged during Phase 2 and its target CO₂ was effectively set to zero.

3.3.3 Maximum Wellhead Pressures

Fractures can be generated in geologic formations if air or any other gas is injected at a pressure that exceeds the sum of the natural strength of the formation and the in-situ stresses present (Suthersan, 1997). The pressure required to fracture a consolidated geologic formation is a function of the cohesive or tensile strength of the formation and the pressure exerted by the weight of soil and water. Because the Satilla aquifer is primarily composed of non-cohesive sands, cohesive strength was conservatively assumed to be zero. Therefore, considering only the weight of the water and soil, the minimum pneumatic fracture initiation pressure, P_i is:

$$P_{i} > d_{w}(\gamma_{w}\phi + \gamma_{soil}(1-\phi)) + (d_{tot} - d_{w})\gamma_{soil}(1-\phi)$$
(3-1)

where d_w is the depth of water (saturated thickness), d_{tot} is the total depth of soil, ϕ is the soil porosity, γ_w is the specific weight of water (62.4 lb/ft³) and γ_{soil} is the specific weight of soil.

Sparge wells (enumerated below in the tables as SWs) at the Site were screened at different intervals and therefore would have their own unique minimum pneumatic fracture initiation pressures. Table 3-4 through Table 3-6 provides calculated minimum pneumatic fracture initiation pressures for all sparge wells (Phase 1 through 3).

The calculations of P_i presented in Table 3-4 through Table 3-6 assumed a 5-ft unsaturated zone, porosity of 0.30, and a specific gravity of soil equal to 2.65 (specific weight of soil equal to 116 lb/ft³). The 5 ft of unsaturated zone provides a conservative estimate of P_i (the actual depth of the unsaturated zone varies from approximately 3 to 4 ft). There is also additional head loss from the well head to the base of the sparge well screen, resulting in lower effective pressures at the well screen. Therefore, actual field conditions at a particular sparge well would yield a slightly larger value of P_i , which could allow for slightly higher sparging pressures at the well head. During sparging implementation, pressure applied to individual sparge wells was gradually increased until a satisfactory flow was achieved or until pressures were no more than 2 to 3 psi of P_i .

 Table 3-4: Calculated Minimum Pneumatic Fracture Initiation Pressure for Phase 1 Sparge

 Wells

Sparge Well	Top of Screen, d _{tot} (ft bgs)	Depth of water, dw (ft)	Pi (psi)	Sparge Well	Top of Screen, d _{tot} (ft bgs)	Depth of water, dw (ft)	Pi (psi)
SW-2	47.5	42.5	32.3	SW-34	42.0	37.0	28.4
SW-3	46.0	41.0	31.2	SW-35	42.0	37.0	28.4
SW-4	48.5	43.5	32.9	SW-36	47.0	42.0	31.9
SW-5	48.5	43.5	32.9	SW-37	49.0	44.0	33.3
SW-6	48.5	43.5	32.9	SW-38	49.5	44.5	33.6
SW-7	48.0	43.0	32.6	SW-39	49.5	44.5	33.6
SW-8	48.0	43.0	32.6	SW-40	50.0	45.0	34.0
SW-9	47.5	42.5	32.3	SW-41	48.5	43.5	32.9
SW-10	47.5	42.5	32.3	SW-42	49.5	44.5	33.6
SW-11	49.5	44.5	33.6	SW-43	46.0	41.0	31.2
SW-12	49.0	44.0	33.3	SW-44	47.0	42.0	31.9
SW-13	49.5	44.5	33.6	SW-45	42.0	37.0	28.4
SW-14	47.0	42.0	31.9	SW-46	42.0	37.0	28.4
SW-15	47.0	42.0	31.9	SW-47	44.0	39.0	29.8
SW-16	49.0	44.0	33.3	SW-48	45.0	40.0	30.5
SW-17	48.5	43.5	32.9	SW-49	50.5	45.5	34.3
SW-18	50.5	45.5	34.3	SW-50	49.0	44.0	33.3
SW-19	44.0	39.0	29.8	SW-51	50.0	45.0	34.0
SW-20	49.0	44.0	33.3	SW-52	49.5	44.5	33.6
SW-21	44.0	39.0	29.8	SW-53	46.5	41.5	31.6
SW-22	48.0	43.0	32.6	SW-54	42.0	37.0	28.4
SW-23	48.0	43.0	32.6	SW-55	40.5	35.5	27.4
SW-24	48.5	43.5	32.9	SW-56	45.5	40.5	30.9
SW-25	51.0	46.0	34.7	SW-57	46.0	41.0	31.2
SW-26	50.0	45.0	34.0	SW-58	49.0	44.0	33.3
SW-27	49.5	44.5	33.6	SW-59	49.5	44.5	33.6
SW-28	49.5	44.5	33.6	SW-60	45.5	40.5	30.9
SW-29	50.0	45.0	34.0	SW-61	47.0	42.0	31.9
SW-30	50.0	45.0	34.0	SW-62	45.0	40.0	30.5
SW-31	47.0	42.0	31.9	SW-63	47.6	42.6	32.3
SW-32	47.5	42.5	32.3	SW-64	50.5	45.5	34.3
SW-33	46.0	41.0	31.2	SW-65	48.0	43.0	32.6

Sparge Well	Top of Screen, d _{tot} (ft bgs)	Depth of water, dw (ft)	Pi (psi)	Sparge Well	Top of Screen, d _{tot} (ft bgs)	Depth of water, dw (ft)	Pi (psi)
SW-66	48	43	32.6	SW-106	49	44	33.3
SW-67	46.5	41.5	31.6	SW-107	51	46	34.7
SW-68	49	44	33.3	SW-108	48.75	43.75	33.1
SW-69	49	44	33.3	SW-109	49	44	33.3
SW-70	46.5	41.5	31.6	SW-110	49	44	33.3
SW-71	47.5	42.5	32.3	SW-111	46	41	31.2
SW-72	47	42	31.9	SW-112	43	38	29.1
SW-73	48	43	32.6	SW-113	42	37	28.4
SW-74	49	44	33.3	SW-114	45	40	30.5
SW-75	48	43	32.6	SW-115	47	42	31.9
SW-76	45.7	40.7	31.0	SW-116	46	41	31.2
SW-77	46	41	31.2	SW-117	45.5	40.5	30.9
SW-78	48	43	32.6	SW-118	44	39	29.8
SW-79	49.5	44.5	33.6	SW-119	45	40	30.5
SW-80	49.5	44.5	33.6	SW-120	50	45	34.0
SW-81	48.5	43.5	32.9	SW-121	48	43	32.6
SW-82	49	44	33.3	SW-122	50	45	34.0
SW-83	43.5	38.5	29.5	SW-123	43	38	29.1
SW-84	46.5	41.5	31.6	SW-124	44.5	39.5	30.2
SW-85	47.5	42.5	32.3	SW-125	46	41	31.2
SW-86	45	40	30.5	SW-126	46	41	31.2
SW-87	50	45	34.0	SW-127	48.5	43.5	32.9
SW-88	48	43	32.6	SW-128	47	42	31.9
SW-89	49	44	33.3	SW-129	46.5	41.5	31.6
SW-90	49	44	33.3	SW-130	47	42	31.9
SW-91	48.5	43.5	32.9	SW-131	48.5	43.5	32.9
SW-92	43	38	29.1	SW-132	48.5	43.5	32.9
SW-93	46	41	31.2	SW-133	49	44	33.3
SW-94	44	39	29.8	SW-134	47.5	42.5	32.3
SW-95	42.5	37.5	28.8	SW-135	46	41	31.2
SW-96	41	36	27.8	SW-136	46	41	31.2
SW-97	49	44	33.3	SW-137	48	43	32.6
SW-98	49	44	33.3	SW-138	48	43	32.6
SW-99	50	45	34.0	SW-139	48.5	43.5	32.9
SW-100	49	44	33.3	SW-140	49.5	44.5	33.6
SW-101	42.5	37.5	28.8	SW-141	49	44	33.3
SW-102	43	38	29.1	SW-142	49	44	33.3
SW-103	42	37	28.4	SW-143	48	43	32.6
SW-104	41.5	36.5	28.1	SW-144	47	42	31.9
SW-105	44	39	29.8	SW-145	48	43	32.6

 Table 3-5: Calculated Minimum Pneumatic Fracture Initiation Pressure for Phase 2 Sparge

 Wells

Sparge Well	Top of Screen, dtot (ft bgs)	Depth of water, dw (ft)	Pi (psi)	Sparge Well	Top of Screen, d _{tot} (ft bgs)	Depth of water, dw (ft)	Pi (psi)
SW-146	46.5	41.5	31.6	SW-178	50	45	34.0
SW-147	46	41	31.2	SW-179	47	42	31.9
SW-148	46	41	31.2	SW-180	47	42	31.9
SW-149	47.4	42.4	32.2	SW-181	48.5	43.5	32.9
SW-150	46.5	41.5	31.6	SW-182	50	45	34.0
SW-151	44.5	39.5	30.2	SW-183	50	45	34.0
SW-152	45.5	40.5	30.9	SW-184	52	47	35.4
SW-153	47.5	42.5	32.3	SW-185	49.5	44.5	33.6
SW-154	45.5	40.5	30.9	SW-186	51.25	46.25	34.9
SW-155	47	42	31.9	SW-187	50	45	34.0
SW-156	47	42	31.9	SW-188	50	45	34.0
SW-157	46.5	41.5	31.6	SW-189	46	41	31.2
SW-158	47.5	42.5	32.3	SW-190	49	44	33.3
SW-159	46.5	41.5	31.6	SW-191	50	45	34.0
SW-160	47	42	31.9	SW-192	48.5	43.5	32.9
SW-161	48	43	32.6	SW-193	52.5	47.5	35.7
SW-162	47.5	42.5	32.3	SW-194	47	42	31.9
SW-163	47	42	31.9	SW-195	48.5	43.5	32.9
SW-164	49.5	44.5	33.6	SW-196	47.5	42.5	32.3
SW-165	47.5	42.5	32.3	SW-197	45	40	30.5
SW-166	47	42	31.9	SW-198	46	41	31.2
SW-167	48.5	43.5	32.9	SW-199	47	42	31.9
SW-168	46	41	31.2	SW-200	51	46	34.7
SW-169	46.5	41.5	31.6	SW-201	53	48	36.1
SW-170	48.5	43.5	32.9	SW-202	45.5	40.5	30.9
SW-171	47.5	42.5	32.3	SW-203	46	41	31.2
SW-172	47	42	31.9	SW-204	45.5	40.5	30.9
SW-173	47	42	31.9	SW-205	46	41	31.2
SW-174	47	42	31.9	SW-206	45.5	40.5	30.9
SW-175	48	43	32.6	SW-207	50	45	34.0
SW-176	45	40	30.5	SW-208	50	45	34.0
SW-177	50	45	34.0	SW-209	48	43	32.6

 Table 3-6: Calculated Minimum Pneumatic Fracture Initiation Pressure for Phase 3 Sparge

 Wells

3.3.4 Sequence of Operations

Phase 3 sparging was initiated on October 10, 2015 and continued through April 7, 2016, with sparge operations suspended over the 2-week holiday period between December 23, 2015 and January 4, 2016. After the post-sparge sampling event, remaining CO₂ in storage was sparged into select sparge wells from May 11, 2016 through May 17, 2016.

Newly installed sparge wells were commissioned prior to Phase 3 sparging operations commenced. The sparge well commissioning process entailed gradually applying pressure to individual wells to understand well-specific pressure / flow relationships, while at the same time making observations and collecting shallow groundwater elevations to understand the potential for groundwater mounding and surfacing. Initial guidelines for sparge well sequencing included the following:

- Two sparge wells per distribution panel would be sparged simultaneously, initially for approximately 4-hr periods.
- Extended duration sparging would be applied to areas with high alkalinity.
- During sparging, water levels were monitored in piezometers. Superposition of mounding was not significant and groundwater levels generally never rose to within 1 ft of the ground surface.

3.3.5 Sparge Well and Monitoring Well Maintenance

Basic maintenance was required on sparge wells and monitoring wells. Notably, two sparge wells (SW-36 and SW-141) were damaged while clearing vegetation and were repaired using a PVC coupling.

3.4 Field Measurements During Sparging

During sparging of a well, measurements of temperature, flow rate and pressure were made at the distribution panel. Pressure was measured at a gauge just downstream of the rotameter. These measurements were collected at periodic intervals, typically every half hour during normal sparging operations. The collected measurements were recorded in electronic spreadsheets stored on waterproof tablets and copied to a master spreadsheet for calculation of total mass sparged (see Section 3.5). A summary of these measurements for each sparge well is provided in Appendix E.

3.5 Measurement and Calculation of Flowrates and CO₂ Mass

The flow rate of gas to the sparge well was read from a distribution panel rotameter upstream of the well head. Rotameters report accurate flow rates only when the operating conditions (temperature and pressure) are the same as the conditions under which the rotameter was calibrated. When operating and calibration conditions differ, flow readings from a rotameter must be corrected. The rotameter correction equation for gases is:

$$Q^{*}(scfm) = Q_{rotameter} \sqrt{\left(\frac{T_{std}}{T_{act}}\right) \left(\frac{P_{act}}{P_{std}}\right)}$$
(3-2)

where $Q_{rotameter}$ is the flow reading from the rotameter, Q^* is the gas volumetric flow rate (in scfm), P_{act} is the actual pressure (in psia), T_{act} is the actual temperature (in °R), P_{std} is the standard pressure (in psia), T_{std} is the standard temperature (530 °R) of the rotameter correction. Rotameters installed on the permanent

system were calibrated for carbon dioxide, so an additional specific gravity correction was not required. For CO₂ sparging, Equation 3-2 becomes:

Q*(scfm CO₂) = Q_{rotameter}
$$\sqrt{\left(\frac{530^{\circ} R}{T_{act} + 460}\right) \left(\frac{P_{act} + 14.7}{14.7 \text{ psi}}\right)}$$
 (3-3)

The rotameter used for the portable system was not calibrated for CO₂. Therefore, a specific gravity correction was also required:

$$Q * (\text{scfm CO}_2) = Q_{\text{rotameter}} \sqrt{\left(\frac{530^{\circ} \text{R}}{\text{T}_{\text{act}} + 460}\right) \left(\frac{\text{P}_{\text{act}} + 14.7}{14.7 \text{ psi}}\right) \left(\frac{1}{\text{SG}}\right)}$$
(3-4)

The mass of CO_2 injected into sparge wells was calculated by numerically integrating the flow versus time data for each sparge well (Appendix E). The trapezoidal method of integration was employed and the equation used to calculate the mass for each well is shown below:

$$M_{sparged} = \rho_{gas}^* \int Q^* dt \approx \rho_{gas}^* \sum \overline{Q}^* \Delta t$$
(3-5)

where ρ^*_{gas} represents the density of carbon dioxide equal to 0.1144 lb/ft³ at standard temperature and pressure (70 °F and 14.7 psi). A correction factor (C_F) of 1.136 was used to modify Equation 3-4 to more accurately account for the mass to each sparge well (Mutch Associates and Parsons, 2014):

$$Q^*(\text{scfm CO}_2) = C_F Q_{\text{rotameter}} \sqrt{\left(\frac{530^{\circ} R}{T_{\text{act}} + 460}\right) \left(\frac{P_{\text{act}} + 14.7}{14.7 \text{ psi}}\right)}$$
 (3-6)

3.6 Piezometric Surface and Groundwater Table

The 20 shallow piezometers installed prior to Phase 2, the 15 piezometers installed prior to Phase 1, and the shallow Satilla monitoring wells were checked for water level rise via manual measurement with an electronic water level meter.

A total of ten pressure transducers (Solinst, Levelogger) were installed in Satilla monitoring wells. The transducers were used to obtain information on piezometric surface rise in the deep Satilla and shallow groundwater level rise throughout the sparging program. Five transducers were placed within the sparging footprint: MW-352B, MW-501B, MW-513B, MW-515B and MW-519A. Five transducers were placed to the west of the sparging footprint: MW-112C, MW-353B, MW-503B, MW-507B and MW-508B. Each transducer was set to a designated depth within the well and securely affixed to prevent any movement.

Automatic data loggers connected to each transducer were synchronized for time and programmed to record water levels at 5-minute intervals during the CO_2 sparging period. All transducers were installed by October 30th, 2015. Transducers installed in MW-508B and MW-513B failed about a month into Phase 3 therefore and data was available only through November 29, 2015. The remaining eight transducers collected data through March 16, 2016.

3.7 Geoprobe Sampling

Geoprobe sampling of deep Satilla groundwater was performed in January 2016 to delineate the extent of high pH groundwater northwest of SW-152 and SW-159. The details of this work are described in the Technical memorandum entitled *Supplemental Geoprobe Investigation, LCP Chemicals Site, Brunswick GA* (Mutch Associates, 2015a) dated December 22, 2015. The work was approved by EPA on January 15, 2016. The memo proposed a minimum of two samples and a maximum of four samples (at locations denoted TL-01 through TL-04 on Figure 3-5) in cleared areas as determined by a 2015 tree-line survey, accessible with a Geoprobe rig. As per the memo, one additional sample would be collected beyond the initial sample if the pH measured in the field was above 10.5. The results for the first two locations GP-36 and GP-37 were 10.44 and 10.48, respectively (Figure 3-5). Since these were less than 10.5, additional sampling was not performed. The groundwater sampling purge logs for these samples are provided in Appendix C.

Post-sparge Geoprobe sampling was performed to provide groundwater quality data after sparging in the southern area. The sampling program consisted of 18 locations along the pre-sparge Geoprobe transects to allow for pre-sparge and post-sparge comparisons of water quality. Also, the locations were placed at varying distances from sparge wells to provide information on the radius of influence in the southern area. Each location was sampled using a 4-ft screen set approximately 1 ft above the estimated depth to sandstone, with the exception of GP-50a and GP-51a, where the screen was set approximately 3 ft above the estimated depth to sandstone. Samples were measured for pH in the field and field-filtered using a 0.45 µm filter. The samples were then sent to TestAmerica Laboratories in Savannah, GA for analysis of dissolved Hg using EPA method SW-846 7470A.

3.8 Air Monitoring

Ambient air monitoring during sparging consisted of grab sample monitoring for carbon dioxide, oxygen, and hydrogen sulfide using a MultiRae IR Plus multi-gas meter, and for Hg using a Jerome Model 431X meter. The air space near representative sparge wells was sampled over the course of the program. Typically, measurements were collected at the sparge well heads and approximately 10 ft north, south, east, and west of the sparge wells (i.e., five locations per sparge well).

Approximately 174 sampling events (five locations each) were conducted over the course of the program; sample results are reported on the forms provided in Appendix F; a summary of the results is provided below (Table 3-7). No exceedances of action levels for the four air constituents monitored were observed.

Air Constituent	Units	Action Level	Minimum Observed Level	Maximum Observed Level	Notes
CO ₂	ppmv	2,500	440	800	
O ₂	% by volume	> 19.5% and < 22.0%	20.9	20.9	
H ₂ S	ppmv	10	0.0	3.8	Only 1 sample above 0.0
Hg	mg/m ³	0.05	0.000	0.004	Only 7 samples above 0.000

Table 3-7: Summary of Air Monitoring Results

4 RESULTS OF PHASE 3 SPARGING

4.1 Sparge Well Flow Rates and Total CO₂ Mass

4.1.1 CO₂ Flow Rates

The first two weeks of sparging operations involved a "break-in" period where CO_2 was injected into each Phase 3 sparge well for the first time. The initial injections provided critical information on injection pressures required to achieve flow. All Phase 3 wells had measureable flow at moderate pressures (30 to 35 psi gauge) indicating that they were functional sparge wells.

The average flow rates for each Phase 3 sparge well varied from 10.8 scfm (SW-193) to 46.8 scfm (SW-205) (Figure 4-1). The average flow rate for all Phase 3 sparge wells was 24.1 scfm. Average flow rates for Phase 1 and Phase 2 wells sparged during Phase 3 were similar (Figure 4-2).

4.1.2 CO₂ Total Mass

The total amount of CO_2 injected during Phase 3 was 1,156,000 lb. By comparison, 783,000 lb was sparged during Phase 1 and 1,521,000 lb was sparged during Phase 2. The sparged mass and target mass of CO_2 for each of the Phase 3 sparge wells are shown on Figure 4-3. As described earlier in Section 3.2.2, sparge well target masses ranged from 8,000 to 32,000 lb of CO_2 . All Phase 3 sparge wells received their target mass. The sparged mass and target mass of CO_2 for each Phase 3 are shown in Figure 4-4. All Phase 1 and Phase 2 sparge wells received their target mass. As described earlier, all Phase 2 sparge wells in the southern area (SW-126 through SW-145) received at least 2,000 lb during Phase 3 of CO_2 to treat high pH groundwater that may have moved into the zone of influence of a Phase 2 well during sparging of Phase 3 sparge wells and to replenish residual saturation of CO_2 .

4.1.3 CO₂ Mass Balance

A system-wide mass balance was performed for Phase 3 to determine the total mass of CO_2 injected and to verify the masses injected into each sparge well. The total mass delivered to the Site must be equal to the sum of the CO_2 mass sparged, the CO_2 left in inventory and any major losses during start-up:

$$M_{delivered} = M_{sparged} + M_{inventory} + M_{major \, losses}$$
(4-1)

The total mass delivered to the Site by Airgas was 1,208,000 lb (604 tons). The storage tanks had approximately 5,000 lb (2.5 tons) remaining in inventory at conclusion of sparging. During system startup, the tank telemetry system indicated that approximately 15,000 lb (7.5 tons) was used, effectively setting $M_{major losses}$. The mass of CO₂ sparged, calculated using numerical integration of the flow versus time data (Equation 3-5), was 1,156,000 (578 tons). The mass balance error was calculated according to:

$$\operatorname{Error} \% = \frac{(M_{\text{sp arg ed}} + M_{\text{inventory}} + M_{\text{m ajor losses}}) - M_{\text{delivered}}}{M_{\text{delivered}}} \times 100\%$$
(4-2)

The mass balance error calculated using this approach was -2.6%:

Error
$$\% = \frac{(1,156,000+15,000+5,000)-1,208,000}{1,208,000} \times 100\% = -2.6\%$$
 (4-3)

This is an acceptable level of error for this type of system mass balance.

4.2 Effect of Sparging on pH

4.2.1 Pre-sparge pH

Deep Satilla Monitoring and Extraction Wells

Groundwater monitoring results from deep Satilla monitoring and extraction wells from 2011-2012 (Figure 4-5) serve as an appropriate pre-sparge baseline for the CBP. The CBP during this period was characterized as consistently having pH between 10.5 and 12.0 (Table 4-1). As described in Section 2.1, the Phase 1 sparging footprint was determined via interpolation of these pH values.

The pH in groundwater sampled from deep Satilla monitoring locations prior to the start of Phase 3 sparging is shown in Figure 4-6. In general, pH within the sparging footprint varied from 6.18 (MW-357B) to 11.71 (MW-516B).

Sparge Wells

Pre-sparge pH in Phase 3 sparge wells (Figure 4-7) varied from 5.94 (SW-173) to 11.98 (SW-205). Many of the Phase 3 sparge wells in the southern area had a pre-sparge pH less than 10.5 as a result of the Phase 2 effort. A composite map showing pH in deep Satilla monitoring locations (monitoring wells, extraction wells, sparge wells) is provided as Figure 4-8. This map displays all information that was known about the pH of deep Satilla groundwater prior to the start of Phase 3 sparging.

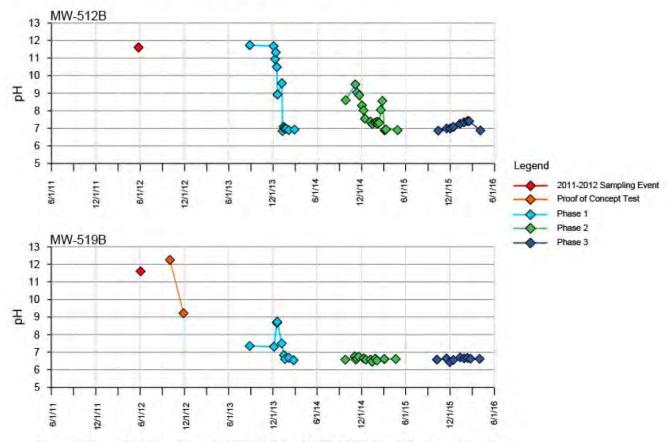
Mid Satilla Monitoring Wells

The pH in the mid Satilla aquifer beneath the Site is generally lower than the deep Satilla, consistent with the conceptual model of the CBP as a dense plume at the base of the aquifer. Mid Satilla pH within the sparging footprint from 2011-2012 (Figure 4-9) varied from 6.38 (MW-501A) to 11.60 (MW-514A).

Only MW-512A and MW-514A had pH greater than 10.5, indicating that these wells are screened at elevations that is representative of the CBP. After Phase 1, the pH in MW-512A and MW-514A had decreased to 8.59 and 6.86, respectively (Mutch Associates and Parsons, 2014). Prior to Phase 3, mid Satilla wells had pH ranging from 5.77 (MW-513A) to 8.53 (MW-517A) (Figure 4-10).

4.2.2 pH Monitoring Results During Sparging

As described earlier, pH was measured in various monitoring wells and extraction wells throughout the sparging footprint during all phases of CO₂ sparging. Field pH measurements versus time for all 31 deep Satilla monitoring points within 50 ft of a sparge well are shown in Figures 4-11 through 4-21. As illustrated below for MW-512B and MW-519B, each chart shows the 2011-2012 pre-sparge pH. The first point for each phase represents the pre-sparge baseline for that particular phase. Likewise, the last point for each phase represents the post-sparge monitoring for that phase.



Above: pH as a function of time in MW-512B and MW-519B for all three sparging phases.

The pH versus time for all 31 deep Satilla monitoring points generally show that pH has decreased in the deep Satilla aquifer during CO₂ sparging with minimal rebound. For example, MW-501B (Figure 412) decreased from pH 11.7 to pH 6.8 during Phase 1 of sparging and has stayed between 6.7 and 7.0 through all of the subsequent sparging phases. Approximately half of deep Satilla monitoring points (14 out of 31) have exhibited similar behavior: EW-1, EW-2, EW-9, EW-11, MW-1C, MW-2C, MW-357A, MW-501B, MW-502B, MW-504B, MW-505B, MW-517B, MW-518B and MW-519B. A few monitoring points have shown gradual decreases in pH throughout all three phases: EW-3, EW-8 and MW-511B. A relatively small number of monitoring points have shown evidence of rebound, but the pH decreased again during subsequent sparging phases. Examples of monitoring points exhibiting this behavior include EW-4, EW-6, EW-10, MW-105C, MW-115C, MW-352B, MW-357B, MW-512B and MW-515B. MW-513B and MW-516B are the only deep Satilla monitoring points that have not exhibited a decrease in pH as a result of CO₂ sparging. MW-513B and MW-516B had post-Phase 3 sparging pH values of 10.62 and 11.83, respectively.

SW-196 and SW-197 were installed specifically to address high pH water on the northwestern edge of the Phase 1 sparging footprint near MW-510B and EW-5 (Figure 2-2). Therefore, MW-510B and EW-5 were useful monitoring points for assessing the effectiveness of sparging in this area. The pH versus time for MW-510B (Figure 4-21) shows a decreased in pH from 10.9 to approximately 7.0 within a few weeks of sparging during Phase 3. Likewise, the pH in EW-5 decreased toward the end of Phase 3, finishing with a pH of 9.41 (Figure 4-15).

The pH of MW-352B (Figure 4-12) decreased from pH 12.00 to 9.55 during Phase 2, only to rebound back to pH 11.39 at the end of Phase 2. The nearest sparge well to MW-352B is SW-123, which was sparged during Phase 2 and was located on the edge of the Phase 2 sparge well network. The pH rebound observed in MW-352B was likely caused by westward movement of untreated groundwater east of SW-123. As discussed in Section 2.1.1, a "sparge column" of ten sparge wells (SW-200 to SW-209) was installed and sparged during Phase 3 to address the area along the eastern edge of the sparging footprint. In addition, SW-123 was sparged during Phase 3 to re-treat the area near MW-352B. This approach proved to be successful, as the pH in MW-352B slowly decreased throughout Phase 3 to a final value of 8.68.

The pH of MW-513B (Figure 4-13) decreased from 11.34 to 6.51 after Phase 1, with a rebound to pH 9.30 by the start of Phase 2. During Phase 2, the pH was highly variable ranging from 7.42 to 11.69. During Phase 3, the pH of MW-513B dropped below 10.5 on numerous occasions with a final pH of 10.62 at the end of Phase 3.

Field pH versus time for deep Satilla monitoring wells west of the sparging footprint are provided in Figures 4-22 through 4-24. The pH in these wells has been relatively stable over time with MW-508B as the only exception. The pH in MW-508B varied from 9.0 to 10.0 from June 2012 through June 2015 (the end of Phase 2). However, at the start of Phase 3, the pH was substantially lower (7.83) and decreased even lower by the end of Phase 3 (7.10). This well is reasonably close (approximately 70 ft) to the edge of the sparging footprint, however there were no sparge wells running in the vicinity of MW-508B during Phase 3. It is likely that water treated via CO_2 sparging has travelled west towards MW-508B since the end of Phase 2.

4.2.3 Post-sparge pH Results

As discussed in Section 3.1, pH was measured in the field in all deep monitoring and extraction wells, and select mid Satilla monitoring wells within the sparging footprint at the end of Phase 3. In addition, field pH was measured in select sparge wells and in discrete groundwater samples collected from the deep Satilla aquifer via Geoprobe in the southern area of the Site.

Deep Satilla Monitoring and Extraction Wells

A summary of the changes in pH in deep Satilla monitoring and extraction wells within the Phase 1 footprint is provided in Table 4-1. Post-Phase 3 pH results are also shown below and on Figure 4-25 in plan view for deep Satilla monitoring and extraction wells. After Phase 3, nearly all (28 out of 30; 93%) of deep Satilla monitoring and extraction wells within the sparging footprint had a pH of less than 10.5. Most of these monitoring points had pH less than 7.5 (24 out of 30; 80%). The mean pH in these same deep Satilla monitoring points decreased from 11.32 (2011-2012) to 7.11 as a result of CO_2 sparging (Table 4-1). The median pH decreased from 11.44 to 6.57.

As mentioned in the previous section, the only deep Satilla monitoring points within the sparging footprint above pH 10.5 at the end of Phase 3 were MW-516B (pH 11.83) and MW-513B (pH 10.62). MW-513B has had its pH driven down to near-neutral at various points during sparging, but the final pH was marginally above 10.5 at the end of Phase 3.

 Table 4-1: Summary of Pre- and Post-Sparge pH in Deep Satilla Monitoring Points

 within the Phase 1 Sparging Footprint

Monitoring Point	Pre- sparge 2011-2012	Pre- Phase 1	Post- Phase 1	Pre- Phase 2	Post- Phase 2	Pre- Phase 3	Post- Phase 3	Δ pH ^(e)
EW-1	11.33 ^(a)	11.28	6.27	6.50	6.32	6.29	6.22	-5.11
EW-2	11.20 ^(a)	10.50	6.57	7.26	6.47	6.35	6.39	-4.81
EW-3	11.78 ^(a)	11.01	9.84	9.79	7.01	6.65	6.53	-5.25
EW-4	11.73 ^(a)	11.53	7.01	8.50	9.69	6.81	6.74	-4.99
EW-5	11.02 ^(a)	11.21	10.74	9.06	11.22	10.73	9.41	-1.61
EW-6	11.49 ^(a)	11.75	7.41	6.96	6.78	8.68	6.97	-4.52
EW-8	10.88 ^(a)	10.91	9.09	7.52	6.59	6.49	6.61	-4.27
EW-9	11.44 ^(a)	11.14	6.73	7.30	6.68	6.55	6.60	-4.84
EW-10	11.23 (a)	11.42	7.34	7.41	7.67	8.92	NS	
EW-11	11.72 ^(a)	8.20	6.49	6.85 ^(d)	6.39	6.41	6.53	-5.19
MW-105C	11.35	11.08	6.68	10.4	6.38	6.19	6.38	-4.97
MW-115C	12.00 ^(c)	10.70 ^(c)	6.68	9.83	8.63	8.91	8.44	-3.56
MW-1C	12.24 ^(b)	8.98	6.64	6.61	6.55	6.64	6.46	-5.78
MW-2C	11.10 ^(b)	8.71	6.49	6.70	6.65	6.63	6.57	-4.53
MW-352B	11.96	11.53	12.89	12.00	11.39	11.48	8.68	-3.28
MW-357A	11.20 (c)	10.20	6.54	6.79	6.46	6.48	6.51	-4.69
MW-357B	11.60 (c)	11.08	8.82	8.78	6.20	6.18	6.37	-5.23
MW-501B	11.64	11.30 (c)	6.81	6.79	6.73	6.63	6.80	-4.84
MW-502B	11.53	10.90 (c)	6.45	6.44	6.50	6.37	6.40	-5.13
MW-504B	11.18	11.20	6.49	6.62	6.40	6.60	6.47	-4.71
MW-505B	10.94	10.04	6.85	6.91	6.59	6.53	6.57	-4.37
MW-510B	9.57	11.33	10.20	9.28	10.90	10.62	6.56	-3.01
MW-511B	11.93	12.20	9.81	8.66	6.58	6.45	6.55	-5.38
MW-512B	11.60 ^(c)	11.73	6.93	8.60	6.90	6.87	6.88	-4.72
MW-513B	11.52	11.34	6.51	9.30	11.69	11.62	10.62	-0.90
MW-514B	11.62	10.37	6.31	6.77	6.11	7.00	6.05	-5.57
MW-515B	10.15	11.24	8.80	9.39	8.66	8.56	7.54	-2.61
MW-516B	11.20 ^(c)	11.30 (c)	11.48	11.62	11.60	11.71	11.83	0.63
MW-517B	10.65	9.81	6.48	6.57	6.54	6.49	6.38	-4.27
MW-518B	10.60	10.87	6.39	6.82	6.53	6.36	6.50	-4.10
MW-519B	11.60	7.35	6.54	6.57	6.61	6.57	6.62	-4.98
Mean: Median:	11.32 11.44	10.72 11.08	7.69 6.73	8.02 7.30	7.59 6.61	7.57 6.63	7.11 6.57	-4.22 -4.88

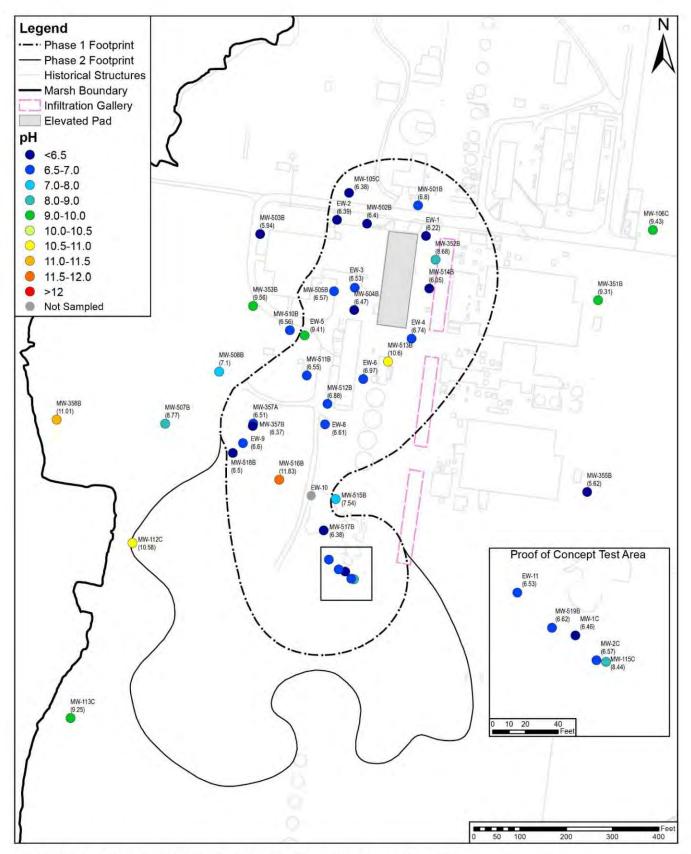
(a) Extraction well pH from Aug/Sept 2011

(b) Indicates pH value was measured in September 2012 prior to the Proof of Concept Test

(c) Lab pH was more consistent with historical data therefore it was substituted for field pH

(d) Indicates value was collected shortly after the start of Phase 2 sparging

(e) ApH calculated using Pre-sparge (2011-2012) and Post-Phase 3 pH data



Above: Post-Phase 3 pH for deep Satilla monitoring wells and extraction wells.

Sparge Wells

Post-Phase 3 pH values in all 209 sparge wells are shown in Figure 4-26. The mean and median pH in these wells were 6.89 and 6.71, respectively. A large majority (191 out of 209 or 91%) of these wells showed pH less than 7.5. A small number of sparge wells had a pH greater than 7.5 (e.g. SW-6, SW-18, SW-73, SW-106). The sparge well with the highest pH (10.05) was measured in SW-49, a Phase 1 sparge well on the southeastern edge of the sparging footprint. SW-49 is in close proximity to the former pH 10.5 contour, and thus the pH of groundwater near SW-49 is expected to increase as the natural westward hydraulic gradient in the Satilla aquifer brings slightly-alkaline, non-sparged groundwater into the area.

Since there was an inventory of CO_2 (approximately 79,000 lb) in storage following planned Phase 3 sparging, sparge wells with pH greater than 8.5 received a relatively small amount (2,000 to 6,000 lb) of supplemental CO_2 . SW-113 and SW-73 were resampled for pH one week after the conclusion of supplemental sparging. The pH was less than 7.0 in both sparge wells (SW-113: pH 6.68, SW-73: pH 6.89). Based on previous experience at this Site, the pH in all of the other sparge wells that received supplemental CO_2 is also expected to be between 6.5 to 7.0.

The pH in all deep Satilla monitoring locations (monitoring wells, extraction wells, and sparge wells) is shown in Figure 4-27. The two monitoring locations with pH greater than 10.5 (MW-513B and MW-516B) are isolated areas with neutral pH water on all sides. MW-513B (pH 10.62) is located within a triangle formed by SW-52, SW-59 and SW-110, all of which had neutral pH at the end of Phase 3 (pH 7.07 to 7.39). Likewise, MW-516B (pH 11.83) is located within a rectangle formed by SW-11, SW-20, SW-75 and SW-82, all which had neutral pH at the end of Phase 3 (pH 6.65 to 6.82).

Groundwater Sampled via Geoprobe

As described in Section 3.1.2, a total of 18 discrete groundwater samples were collected via Geoprobe from the base of the Satilla aquifer in the southern area of the Site at the end of Phase 3. The pH and dissolved Hg concentrations from these samples are summarized in Table 4-2, along with groundwater pH and Hg results from Geoprobe sampling performed at the end of Phase 2. Note that the data in Table 4-2 is sorted by distance from Geoprobe sampling location to the nearest sparge well. The pH at these Geoprobe locations are shown in Figure 4-28 along with 33-ft radii extended outward from southern area Phase 2 and 3 sparge wells. Post-Phase 2 results showed that the pH was between 6.86 and 7.82 at distances between 15 and 25 ft. At distances 30 ft or greater, pH was between 7.14 and 11.67, with several locations with pH less than 10.0. These results were consistent with the observed average ROI of 33 ft within the Phase 1 footprint.

Geoprobe ID	Distance from GP to nearest SW (ft)	Nearest SW	pH ^(a)	Hg (µg/L) ^(b)
Post-Phase 2		Incarest SW	1 but	11g (µg/1) **
GP-26	14.9	SW-129	6.86	13
GP-22	15.0	SW-129	7.82	33
GP-31	20.0	SW-130	7.09	17
GP-23	20.0	SW-130	7.04	7
GP-21	25.1	SW-131 SW-133	6.77	21
GP-25	29.9	SW-133	7.14	26
GP-35	30.0	SW-127 SW-143	10.69	5.7
GP-27A	30.0	SW-126	10.56	45
GP-27 GP-27	34.9	SW-120	11.54	41
GP-28	35.1	SW-120 SW-139	10.39	13
GP-34	53.6	SW-143	11.49	14
GP-29	54.7	SW-140	11.27	37
GP-24	56.0	SW-127	9.32	62
GP-30	61.9	SW-140	11.67	170
GP-20	68.4	SW-7	9.13	75
GP-32	69.2	SW-48	9.46	2.9
Post-Phase 3	and the second se		27.10	
GP-39	15.0	SW-190	8.43	25
GP-42	15.2	SW-185	6.60	15
GP-40	19.0	SW-188	6.91	4
GP-48	19.8	SW-155	7.16	33
GP-43	20.0	SW-138	5.91	0.43
GP-44	24.6	SW-176	9.92	79
GP-52	25.0	SW-166	8.54	3.1
GP-51	26.0	SW-129	11.85	120
GP-51A	26.4	SW-129	9.60	32
GP-49	26.6	SW-131	9.25	42
GP-46	29.4	SW-160	9.73	60
GP-41	29.6	SW-188	9.08	33
GP-45	34.3	SW-169	9.50	75
GP-47	35.0	SW-150	9.80	55
GP-50A	38.5	SW-151	9.28	120
GP-50	39.8	SW-151	11.18	45
GP-38	39.9	SW-189	10.62	46

Table 4-2: Summary of Post-Sparge Geoprobe Sampling of Deep Satilla Groundwater in the Southern Area

(b) Results are for dissolved Hg

Post-Phase 3 results show that pH in groundwater collected by Geoprobe was generally less than 10.5. The only exceptions were GP-38, GP-50, and GP-51. Near the GP-50 (pH 11.18) and GP-51 (pH 11.85) sampling locations, additional Geoprobe samples were collected with a screen elevation that was 2 ft higher. These groundwater samples, denoted GP-50A and GP-51A, had a considerably lower pH of 9.28 and 9.60, respectively. These results indicate that there is a sharp vertical pH gradient at these locations and that most of the water above the base of the Satilla aquifer near GP-50 and GP-51 was treated by sparging.

Mid Satilla Monitoring Wells

Results for post-sparge pH in mid Satilla monitoring points are shown in Figure 4-29. The pH in mid Satilla wells within the sparging footprint varied from 6.18 (MW-513A) to 9.13 (MW-517A). Mid Satilla wells have generally decreased in pH throughout all three phases. Most notably, MW-514A decreased from pH 11.6 in 2012 (Figure 4-9) to 6.37 after Phase 3 (Figure 4-29). Groundwater in the mid and shallow Satilla is easier to treat than the deep Satilla with CO_2 sparging because of inverted cone that originates at the well screen of a sparge well.

 Table 4-3: Summary of pH Data Collected in Monitoring Wells Screened in the Coosawhatchie

 A/B Aquifer

Monitoring Well	May 31, 2012	Jan 15, 2014	Feb 21-22, 2014	Dec 11, 2014	Apr 8-9, 2015	Apr 13-14, 2016
MW-115D	10.22	10.10	10.14	10.17	9.99	10.13
MW-352D	6.35	6.80	6.84	6.81	6.78	8.00
MW-360D	9.92	10.09	10.15	10.46	10.34	10.28
HW-East2	6.58	-	6.38	6.44	6.44	6.45
HW-East3	6.63		6.32	6.65	6.50	6.98
HW-East5	9.00	- 18 ¹	7.13	7.18	7.29	7.51

4.2.4 Effect of Sparging on Coosawhatchie pH

The effect of sparging on pH in the Coosawhatchie A/B aquifer was assessed by monitoring six wells screened in this aquifer. MW-352D, MW-115D, MW-360D, HW-East2, HW-East3, HW-East5 were sampled near the end of the Phase 3 sparging effort on April 13-14, 2016. This data, along with measurements made prior to the start of sparging (May 31, 2012), which serve as a pre-sparge baseline, and measurements made during Phase 1 and 2 sparging, are summarized in Table 4-3. Most of the Coosawhatchie monitoring wells have been relatively stable since the start of sparging. The only monitoring well to increase is MW-352D which increased from 6.35 to 8.00 from May 2012 to April 2016. However, this is only marginally higher than the pH 7.27 measured in May 2010. HW-East5 decreased from 9.00 to 7.51. The relatively small changes in pH in Coosawhatchie wells indicate that sparging in the deep Satilla has not had a significant effect on water quality in the Coosawhatchie A/B aquifer. This is an expected result given the separation of these units by the variably-cemented sandstone.

4.3 Effect of Sparging on Silica, TDS and Specific Gravity

The effect of sparging on silica, TDS and specific gravity is discussed in following subsections using pre- and post-sparging concentration summary statistics (Table 4-4) and demonstrating discussion of the changes in concentration within the deep Satilla aquifer before and after sparging.

4.3.1 Effect of Sparging on Silica

Silica concentrations in the deep Satilla measured through all phases of CO₂ sparging are summarized in Table 4-4. Prior to Phase 1 sparging, silica values within the sparging footprint ranged from 30 mg/L (MW-357A) to 17,000 mg/L (MW-352B). High silica areas generally greater than 1,000 mg/L were on the eastern edge of the sparging footprint. A low silica area existed near the Proof of Concept Test, as a result of prior sparging in this area. After Phase 1, most deep Satilla monitoring points showed a decrease in silica to less than 200 mg/L as a result of the lower pH. As discussed in the Phase 1 Report, dissolved silica concentrations decrease with decreasing pH to maintain equilibrium with amorphous SiO₂. Pre-and post-sparging aquifer testing during Phase 1 showed no sharp loss of aquifer transmissivity. Therefore, silica precipitation does not appear to cause a loss in aquifer permeability.

Chemical Constituent	Sample Period	Sample Size (n)	Mean ^(a)	Median	Standard Deviation ^(b)
	Pre-Phase 1	28	16,000	12,000	13,000
T . 1 . 1 . 1	Post-Phase 1	29	13,000	11,000	8,100
Total Dissolved	Pre-Phase 2	24	13,000	11,000	8,100
Solids, TDS	Post-Phase 2	27	14,000	9,700	12,000
(mg/L)	Pre-Phase 3	29	16,000	12,000	13,000
	Post-Phase 3	30	13,000	9,800	9,400
	Pre-Phase 1	28	1,400	400	3,300
	Post-Phase 1	29	760	75	2,600
Silica, Si	Pre-Phase 2	24	720	120	2,400
(mg/L as SiO ₂)	Post-Phase 2	27	930	93	2,400
	Pre-Phase 3	29	1,000	130	2,400
	Post-Phase 3	30	310	120	830

Table 4-4: Summary Statistics for Constituents in Deep Satilla Monitoring Points

(a) When measured values were below the MDL (i.e. "U" qualified), half the MDL was used in calculation of the mean.
(b) In several cases the standard deviation is greater than the median and mean of the dataset. A standard deviation calculated from the data can be larger than the mean or median when the distribution of observations covers a wide-range of values and follows a skew-positive probability distribution. This was the case for all of the Si datasets.

Silica concentrations in most deep Satilla monitoring points that were low at the end of the Phase 1 were relatively unchanged at the start of Phase 3. The largest decreases in silica over the course of Phase 3 were observed for EW-5 (2,000 to 250 mg/L) and MW-352B (10,000 to 280 mg/L). Overall, changes in silica concentrations parallel changes in pH measured in deep Satilla monitoring points. At the end of Phase 3, the only two wells that had silica concentrations greater than 1,000 mg/L (MW-513B and MW-516B) had pH greater than 10.5. Overall, mean silica has decreased from 1,400 to 310 mg/L from pre-Phase 1 to post-Phase 3 (Table 4-4). Median silica decreased from 400 to 120 mg/L.

4.3.2 Effect of Sparging on Total Dissolved Solids

TDS measured in deep Satilla monitoring points throughout all phases of CO_2 sparging are summarized in Table 4-4. Prior to Phase 1 sparging, TDS in deep Satilla monitoring points within the sparging footprint ranged from 2,600 mg/L (MW-105C) to 56,000 mg/L (MW-352B), with a mean of 16,000 mg/L (n = 28) and median of 12,000 mg/L. Note that MW-352B had the highest TDS and silica prior to Phase 1 (see Section 4.3.1). TDS concentrations appear to have large spatial variability; monitoring points showing the highest concentrations are often near points with relatively low concentrations. For example, MW-352B (56,000 mg/L) is neighbored by EW-1 (3,500 mg/L) and MW-514B (5,300 mg/L).

Pre-Phase 3 TDS in deep Satilla monitoring points ranged from 3,800 mg/L (MW-514B) to 59,000 mg/L (MW-352B), with a mean of 16,000 mg/L (n = 29) and median of 12,000 mg/L. Post-Phase 3 TDS in deep Satilla monitoring points ranged from 3,000 mg/L (EW-4) to 41,000 mg/L (EW-5). Overall, mean and median TDS in deep Satilla monitoring points within the sparging footprint decreased from pre-Phase 1 to post-Phase 3. The mean TDS decreased from 16,000 mg/L to 13,000 mg/L, for a percent decrease of 19%. The median TDS decreased from 12,000 mg/L to 9,800 mg/L, for a percent decrease of 18%.

There are numerous geochemical reactions occurring during CO_2 sparging which can affect TDS. The reaction which appears to have the largest effect on TDS is precipitation of amorphous silica. As discussed in Section 4.3.1, mean silica concentrations decreased from 1,400 to 300 mg/L, resulting in a decrease of 1,100 mg/L. Silica results from the laboratory were reported in units of "mg/L as SiO₂." Since dissolved silica exists in natural waters predominantly as silicic acid (Si(OH)₄), the decrease in dissolved solids due to loss of silica is even larger (1,800 mg/L), and accounts for more than 50% of the mean decrease in TDS (3,000 mg/L). Amorphous silica is also capable of adsorbing and co-precipitating other cations such as iron, aluminum, manganese, and magnesium. Thus, most of the loss in TDS is probably the result of silica precipitation. CO_2 sparging is not expected to have a large effect on sodium and chloride which are the major components of TDS within the CBP, and these ions generally behave conservatively (i.e. do not precipitate or adsorb). CO_2 sparging is expected to increase the concentrations of bicarbonate ion which is produced when high pH water is neutralized by CO_2 .

4.3.3 Effect of Sparging on Specific Gravity

Specific gravity (SG) of a liquid is defined as the ratio of density of the liquid (ρ) to a reference density (ρ_{ref}), usually taken to be the density of pure water at 4°C ($\rho_{ref} = 1.0000 \text{ g/mL}$):

$$SG = \frac{\rho}{\rho_{ref}}$$
(4-4)

As a result of this definition, the density of a liquid is linearly proportional to its specific gravity. The presence of dissolved solids in water has the effect of increasing its density. Since all groundwaters possess some level of dissolved solids, groundwater samples collected from the Site would be expected to have a specific gravity greater than 1.0000.

Measured specific gravity values from Phases 1, 2 and 3 are summarized in Table 4-5. The majority of specific gravity measurements recorded during Phase 1 were between 1.01 and 1.02. A more precise field hydrometer was used to record specific gravity during Phase 2 and Phase 3 sparging. The effect of CO_2 sparging on SG is shown graphically in Figure 4-30 where the change in specific gravity (Δ SG) from pre-Phase 1 to post-Phase 3 is plotted against the change in pH (Δ pH) over the same time period. Negative Δ SG values indicate a decrease in specific gravity over the course of CO_2 sparging. The Δ SG value was negative for 6 out of 7 monitoring wells which showed a decrease in pH of more than 2 units. This supports the conclusion that CO_2 sparging decreased the measured SG.

Measuring accurate SG in the field after CO_2 sparging is difficult because of the presence of CO_2 in the water. CO_2 exsolvates creating a flow of gas which partially fluidizes the field hydrometer. The gas flow pushes the hydrometer upward creating a slight positive bias (i.e. larger SG) and can prevent the hydrometer from reaching a stable level in the water. In addition, dissolved CO_2 nucleates as small gas bubbles on the outer wall of the hydrometer glass proving an artificial buoyancy which can create a positive bias.

To address this potential bias and to expand the number of wells used to evaluate changes in groundwater SG, measured TDS values were used to estimate SG for all deep Satilla monitoring points within the sparging footprint. Figure 4-31 shows a linear relationship between the TDS and SG (plotted as SG – 1) for deep Satilla groundwater using data collected in 1995-1996 as part of the RI (blue circles) and data collected during Phase 3 (green circles). Both the RI and Phase 3 data fall on a straight line, but there is larger variation in the Phase 3 data, likely due to the complications of measuring SG in the presence of CO₂. The dashed blue line on Figure 4-31 represents a linear regression using the 1995-1996 RI data only, to avoid influence from CO₂ sparging on measured SG. The slope of this relationship (7.54×10^{-7}) matches very closely a published relationship from Kohfahl et al. (2015) for NaCl-dominated natural waters (6.4×10^{-7}). Therefore, the site-specific pre-sparge slope (7.54×10^{-7}) was used to calculate SG from TDS for all deep Satilla monitoring points within the sparging footprint.

Monitoring Point	Pre- Phase 1	Post- Phase 1	Pre- Phase 2	Post- Phase 2	Pre- Phase 3	Post- Phase 3	ΔSG ^(e)
MW-105C	NM ^(a)	1.01	1.0045	1.0050	1.0055	1.0065	6
MW-112C	NM	NM ^(b)	1.0225	1.0280	1.0225	1.0205	1
MW-113C	NM	NM ^(b)	1.0240	1.0250	1.0250	1.0245	.÷
MW-115C	1.03	1.045	1.0240	1.0220	1.0220	1.0215	-0.01
MW-501B	NM ^(a)	1.02	1.0105	1.0160	1.0110	1.0115	1.14
MW-502B	1.02	1.023	1.0050	1.0075	1.0048	1.0065	-0.01
MW-503B	1.00	1.01	1.0005	1.0025	1.0025	1.0060	0.01
MW-504B	1.02	1.02	1.0155	1.0070	1.0050	1.0060	-0.01
MW-511B	1.02	1.02	1.0150	1.0110	1.0125	1.0075	-0.01
MW-512B	1.025	1.01	1.0130	1.0180	1.0175	1.0160	-0.009
MW-513B	1.01	1.02	1.0120	1.0165	1.0175	1.0290	+0.02
MW-514B	1.00	1.01	1.0040	1.0045	1.0015	1.0040	0.00
MW-516B	1.02	1.02	1.0180	1.0180	1.0155	1.0165	0.00
MW-518B	1.03	1.02	1.0085	1.0050	1.0070	1.0070	-0.02
Mean:	1.02	1.02	1.0126	1.0133	1.0121	1.0131	
Median:	1.02	1.02	1.0125	1.0135	1.0118	1.0095	

Table 4-5: Pre- and Post-Sparge Specific Gravity

(a) MW-105C and MW-501B were inadvertently not measured (NM) in the field for the Pre-Phase 1 sample period.

(b) MW-112C and MW-113C were not measured in the field for Phase 1.

(c) Δ SG was calculated from Pre-Phase 1 to Post-Phase 3.

The effect of CO₂ sparging on the computed SG is shown graphically in Figure 4-32 where the change in specific gravity (Δ SG) from pre-Phase 1 to post-Phase 3 is plotted against the change in pH (Δ pH) over the same time period. The majority of points (20 out of 30) have a negative Δ SG value indicating a decrease in computed SG over the course of CO₂ sparging. The mean computed SG decreased from 1.013 to 1.010 (n = 30) and the median computed SG decreased from 1.009 to 1.007 (n = 30).

The decrease in median computed SG from pre-Phase 1 to post-Phase 3 was statistically significant at the 95% confidence level. Since neither the pre-Phase 1 or post-Phase 3 computed SG data were normally distributed, the non-parametric Wilcoxon signed-rank test was used to test for differences in median SG between pre-Phase 1 and post-Phase 3. The assumptions of this test are that the data are paired and that each pair is chosen randomly and independently. Both of these assumptions are met. The null hypothesis of this test is that the median SG values of the pre-Phase 1 and post-Phase 3 are equal. The alternative hypothesis is that the post-Phase 3 median is less than the pre-Phase 1 median. The p-value resulting from the Wilcoxon signed-rank test was 0.026 which is less than the criteria for rejecting the null hypothesis at 95% confidence for a one-tailed hypothesis test (0.050). We can therefore state with greater than 95% confidence that the median post-Phase 3 computed SG is lower than the median pre-Phase 1 computed SG.

4.4 Effect of Sparging on Mercury

4.4.1 Pre-Sparge Mercury

Deep Satilla Monitoring and Extraction Wells

Groundwater monitoring results for total Hg in the deep Satilla from 2011-2012 (Figure 4-33) serve as an appropriate pre-sparge baseline for the CBP because sparging began in late 2013 as part of the Proof of Concept Test. During this period, deep Satilla groundwater within the Phase 1 sparging footprint exhibited total Hg concentrations between 36 (MW-516B) and 2,530 μ g/L (EW-6) with a mean of 270 μ g/L (Table 4-6). In general, groundwater in the northern part of the Phase 1 footprint had the highest Hg concentrations, typically greater than 200 μ g/L. Concentrations in the southern part of the Phase 1 footprint typically had concentrations approximately between 100 and 200 μ g/L.

Pre-Phase 3 results for total Hg in deep Satilla monitoring locations are shown in Figure 4-34. Deep Satilla total Hg concentrations within the entire sparging footprint ranged from 0.68 μ g/L (J-qualified, EW-11) to 500 μ g/L (MW-352B). Many monitoring locations (21 out of 30) had mercury concentrations below 20 μ g/L reflective of reductions in Hg concentrations as a result of Phase 1 and 2 sparging.

Sparge Wells

Pre-Phase 3 dissolved Hg measurements for Phase 2 and Phase 3 sparge wells are shown on Figure 4-35 and summarized in Table 4-7. Dissolved Hg in Phase 2 sparge wells are generally low as a result of prior treatment, ranging from $< 0.2 \ \mu g/L$ (SW-141) to 71 $\mu g/L$ (SW-118). Dissolved Hg in Phase 3 sparge wells ranged from 2.0 $\mu g/L$ (SW-165) to 830 $\mu g/L$ (SW-198) with many locations along the eastern edge of the northern area (e.g. SW-198, SW-203, SW-205, SW-207 and SW-209) at concentrations greater than 400 $\mu g/L$. These wells had not been sparged in prior phases. The dissolved Hg concentrations are consistent with those measured in nearby deep Satilla monitoring points (e.g. MW-352B and EW-6) prior to the start of Phase 1.

Table 4-6: Summary of Pre- and Post-Sparge Hg in Deep Satilla Monitoring Wells Within	n
the Sparging Footprint	

Monitoring Point	Pre- Sparge 2011- 2012 ^(a)	Pre- Phase 1	Post- Phase 1	Pre- Phase 2	Post- Phase 2	Pre- Phase 3	Post- Phase 3	Hg Change (µg/L)	Hg % Change from 2011-2012
EW-1	68	50	0.53	3.8	2.1	3.3	1.1	-67	-98.4%
EW-2	119	60	6.7	NA (b)	2.7	3.6	3.2	-116	-97.3%
EW-3	384	NA (b)	71	170	40	23	15	-369	-96.1%
EW-4	219	NA (b)	20	NA (b)	36	25	7	-212	-96.8%
EW-5	433	300	180	NA (b)	75 ^(a)	350	140	-293	-67.7%
EW-6	2,530	430	180	NA (b)	41	78	84	-2446	-96.7%
EW-8	92	48	2.7	1.6	NA (b)	1.3	1.7	-90	-98.2%
EW-9	160	120	NA (b)	NA (b)	NA (b)	16	4.7	-155	-97.1%
EW-10	101	68	35	32	NA (b)	NA (b)	NA (b)	NA	NA
EW-11	160	48	3	NA (b)	0.95	0.68 J	0.72	-159	-99.6%
MW-105C	60	58	2.4	1.6	0.95	1.1	1.1	-59	-98.2%
MW-115C	98	62	19	26	24	13	5.9	-92	-94.0%
MW-1C	110 ^(c)	43	11	3.7	2.9	1.2	1.2	-109	-98.9%
MW-2C	110 ^(c)	49	34	5.3	6.4	3.8	1	-109	-99.1%
MW-352B	1,080	690	260	390	470 ^(a)	500	90	-990	-91.7%
MW-357A	111	71	4.1	50	13	12	1	-110	-99.1%
MW-357B	178	180	5.7	45	2.2	1.1	1.9	-176	-98.9%
MW-501B	39	48	13	25	28	17	3.3	-36	-91.5%
MW-502B	98	120	4.4	18	2.9	2.2	0.91	-109	-99.1%
MW-504B	392	320	7.7	6	2.4	1.1	1.1	-391	-99.7%
MW-505B	301	53	32	32	14	17	33	-268	-89.0%
MW-510B(d)	135	97	72	130	40	96 ^(e)	18	-117	-86.7%
MW-511B	280	160	82	31	1.9	12	3	-277	-98.9%
MW-512B	202	85	30	120	17	12	11	-191	-94.6%
MW-513B	342	12	11	78	270 ^(a)	270	460	118	34.5%
MW-514B	77	40	4.1	26	3.7	98	1.9	-75	-97.5%
MW-515B	56	30	10	30	10	11	9.5	-47	-83.0%
MW-516B	36	34	37	64	55 ^(a)	50	160	124	344%
MW-517B	128	92	-14	6.9	16	13	22	-106	-82.8%
MW-518B	124	53	4.8	4.5	13	12	7.4	-117	-94.0%
MW-519B	152	31	15	7.7	4.1	2.9	3.1	-149	-98.0%
Mean:	270	119	39	52	43	55	36	-234	-86.7%
Median:	128	60	14	26	13	12	4.0	-124	-96.9%

(a) EW data from September 2011 sampling event, MW data from May/June 2012 sampling event unless indicated otherwise(b) Sample result not representative of deep Satilla groundwater (see Section 3.1.1)

(c) Indicates Hg value was measured in September 2012 prior to the Proof of Concept Test

(d) MW-510B was added to this list as part of Phase 3 since it is now within the sparging footprint

(e) MW-510B Pre-Phase 3 measured dissolved (field filtered) Mercury

 Table 4-7: Summary of Pre- and Post-Sparge Dissolved Hg in Deep Satilla Sparge Wells

 within the Sparging Footprint

Phase 2 Sparge Wells								
Sparge Well	Pre- Phase 2	Post- Phase 2	Pre- Phase 3	Post- Phase 3	Hg Change (µg/L)	Hg % Change		
SW-68	54	0.59	1.0	3.3	-51	-93.9%		
SW-71	110	63	29	6.5	-104	-94.1%		
SW-73	120	20	53	1.7	-118	-98.6%		
SW-87	13	7.3	5.5	5.5	-7.5	-57.7%		
SW-106	150	4.6	4.1	3.0	-147	-98.0%		
SW-108	790	56	73	91	-699	-88.5%		
SW-113	620	12	40	10	-610	-98.4%		
SW-115	240	2.9	6.0	0.41	-240	-99.8%		
SW-124	7.5	4.8	8.8	27	20	260%		
SW-128	28	11	25	9.1	-19	-67.5%		
SW-134	66	23	30	12	-54	-81.8%		
SW-135	31	23	16	10	-21	-67.7%		
SW-136	76	23	21	21	-55	-72.4%		
SW-137	63	17	8.0	3.2	-60	-94.9%		
SW-141	1.7	0.2 U	0.2 U	4.6	2.9	171%		
SW-145	24	0.28	1.0 U	0.58	-23	-97.6%		
Mean ^(a) :	150	17	20	13	-137	-91.3%		

Phase 3 Sparge Wells

Sparge Well	Pre- Phase 2	Post- Phase 2	Pre- Phase 3	Post- Phase 3	Hg Change (µg/L)	Hg % Change
SW-154		10 m 7 <u>4</u>	59	5.8	-53	-90.2%
SW-165	-		2.0	0.52	-1.5	-74.0%
SW-172	1000	G.	78	8.0	-70	-89.7%
SW-191	- 2	1.4	7.0	0.2 U	-6.8	-97.1%
SW-198			830	11	-819	-98.7%
SW-201		1 <u></u>	48	38	-10	-20.8%
SW-203		1	670	5.2	-665	-99.2%
SW-205	-		500	0.64	-499	-99.9%
SW-207			410	20	390	-95.1%
SW-209	2	11 - Q	730	1.0 U	-729	-99.9%
Mean ^(a) :	1.1.19		333	9	-324	-97.3%

(a) When measured values were below the MDL (i.e. "U" qualified), half the MDL was used in calculation of the mean.

Mid Satilla Monitoring Wells

Total Hg concentrations in mid Satilla monitoring wells from 2011-2012 (Figure 4-36) had concentrations between 0.64 μ g/L and 522 μ g/L. Hg concentrations in mid Satilla monitoring wells are generally lower than in the deep Satilla. The highest concentrations were observed in MW-352A (522 μ g/L) and MW-514A (503 μ g/L), located west of the former cell buildings and east of the elevated pad. These wells are in the same area as MW-352B, which had very high Hg concentrations in the deep Satilla (discussed above).

4.4.2 Post-Sparge Mercury

As discussed in Section 3.1, total Hg was measured in all deep monitoring and extraction wells, and select mid Satilla monitoring wells within the sparging footprint at the end of Phase 3. In addition, dissolved Hg was measured in select sparge wells and in groundwater samples collected from the deep Satilla aquifer via Geoprobe in the southern area of the Site.

Deep Satilla Monitoring and Extraction Wells

Post-sparge (Phase 3) total Hg concentrations for deep Satilla monitoring wells and extraction wells are shown in Figure 4-37. The majority (23 out of 30)⁶ of monitoring points within the Phase 1 footprint showed Hg concentrations less than 20 μ g/L. About one-third of all points (11 out of 30) had Hg concentrations less than 2.0 μ g/L. Deep Satilla monitoring and extraction well Hg results are summarized in Table 4-6. Overall, nearly all monitoring points (28 out of 30) in the deep Satilla has lower total Hg when compared to 2011-2012 levels as a result of CO₂ sparging. The mean Hg concentration in all monitoring points was lowered from 270 to 36 μ g/L, a percent decrease of 87%. The median Hg concentration in all monitoring points was lowered from 128 to 4.0 μ g/L, a percent decrease of 97%.

The decrease in Hg in deep Satilla monitoring points is shown graphically in Figure 4-38 in the form of box plot using the data from Table 4-6. The boundary of the box closest to zero indicates the 25th percentile, a line within the box marks the median, and the boundary of the box farthest from zero indicates the 75th percentile. The error bars above and below the box indicate the 95th and 5th percentiles values, respectively. The box plot illustrates the decreasing trend of median Hg concentrations from pre-Phase 1 through post-Phase 3.

Sparge Wells

Post-Phase 3 dissolved Hg concentrations in Phase 2 and Phase 3 sparge wells are shown on Figure 4-39 and are summarized in Table 4-7. The mean dissolved Hg in Phase 2 sparge wells has decreased from 150 μ g/L (Pre-Phase 2) to 13 μ g/L (Post-Phase 3). There are many examples of continued and sustained decreases in dissolved Hg with time (e.g. SW-71, SW-115, SW-136, SW-134, SW-137). Many Phase 2 sparge wells (11 out of 16) were less than or equal to 20 μ g/L at the end of Phase 3 sparging. Dissolved Hg concentrations decreased in all ten Phase 3 sparge wells that were sampled (Table 4-7). The mean Hg

⁶ As discussed in Section 3.1.1, groundwater collected from EW-10 at the end of Phase 3 had a lower specific conductance than historical values for the CBP and was considered non-representative of deep Satilla groundwater. Hence, the number of deep Satilla monitoring points considered within the sparging footprint decreased from 31 to 30.

concentration in Phase 3 sparge wells was lowered from 333 to 9 μ g/L, a percent decrease of 97%. Percent decreases of greater than 90% were observed in 7 out of 10 Phase 3 sparge wells. The mean dissolved Hg concentration in the Phase 2 and 3 sparge wells (taken collectively) after Phase 3 was 11 μ g/L. A summary of post-Phase 3 Hg in all deep Satilla monitoring wells, extraction wells and sparge wells is shown below and in Figure 4-40.

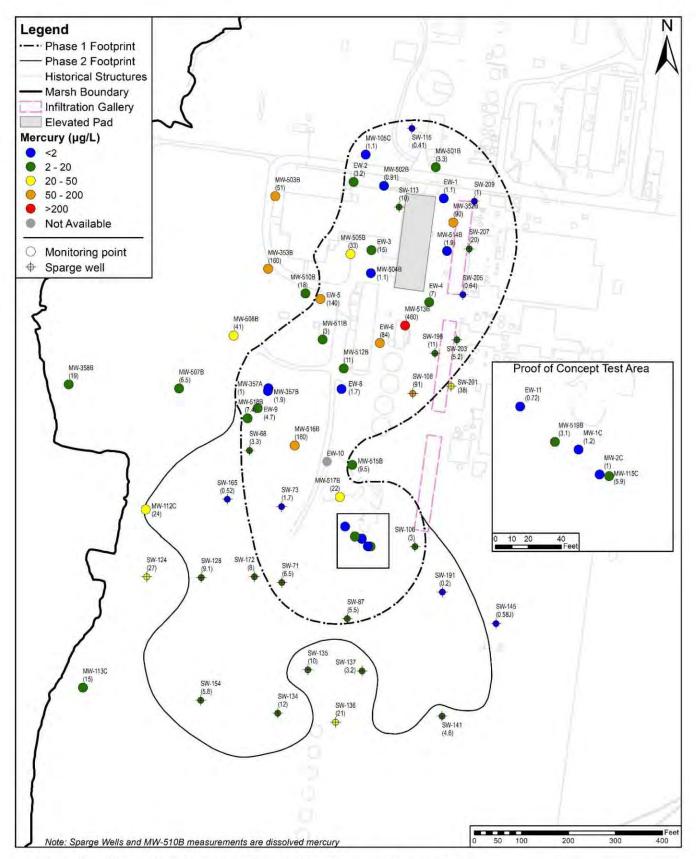
Groundwater Sampled via Geoprobe

Post-phase 3 dissolved Hg results for discrete groundwater samples collected via Geoprobe in the southern area of the Site are shown on Figure 4-41 and summarized on Table 4-8 and Table 4-9. Concentrations ranged from 0.43 μ g/L (GP-43) to 120 μ g/L (GP-51 and GP-50a). The mean and median dissolved Hg concentrations were 46 and 42 μ g/L, respectively. Pre-Phase 2 Geoprobe results serve as an appropriate baseline for comparison since sparging in the southern area began during Phase 2. The average dissolved Hg concentrations in groundwater collected via Geoprobe decreased from 99 μ g/L to 45 μ g/L as a result of sparging in the southern area, a decrease of 55%.

Dissolved Hg results from pre-Phase 2 and post-Phase 2 are also shown on Figure 4-41 (grey symbols) to examine the effect of CO_2 sparging on Hg concentrations at co-located Geoprobe pairs. This information is also summarized in Table 4-8 for clarity. In general, specific locations that showed improvement in pH to near-neutral (e.g. GP-06/GP-25, GP-12/GP-42) levels also showed a substantial decrease in dissolved Hg.

Relationship Between pH and Hg in Deep Satilla Groundwater

As discussed earlier, Hg concentrations generally decreased as the pH was lowered to near-neutral as a result of CO₂ sparging. The Proof of Concept Test showed that Hg concentrations decreased sharply when the pH was lowered below pH 8.0 (Mutch Associates and Parsons, 2013b). A similar dependence was present in the Phase 1 data except that there was inherently more variability because the entire CBP was represented (top panel of Figure 4-42). The post-sparge Phase 3 relationship between Hg and pH for deep Satilla monitoring locations is shown in the bottom panel of Figure 4-42. The Hg versus pH relationship is not as evident in the Phase 3 data as it was in the Phase 1 data. This is because most of the Phase 3 groundwater samples were between pH 6.0 and 7.5 as a result of sparging whereas the Phase 1 pre-and post-sparging data covered a much wider pH range (6 to 12). Overall, Hg concentrations are expected to continue to decrease at recently-sparged locations because of the kinetic effect of Hg immobilization after sparging has ended (Mutch Associates and Parsons, 2013c).



Above: Post-Phase 3 Hg for deep Satilla monitoring, extraction and sparge wells.

	Phase 2							
Geoprobe pair	Pre-Phase 2	Post-Phase 2	Hg Change (µg/L)					
GP-01/GP-20	N/A	75	N/A					
GP-02/GP-21	180	21	-159					
GP-03/GP-22	110	33	-77					
GP-04/GP-23	160	7.0	-153					
GP-05/GP-24	220	62	-158					
GP-06/GP-25	78	26	-52					
GP-09/GP-26	74	13	-61					
GP-10/GP-27	42	41 ^(a)	-1					
GP-12/GP-29	160	37 ^(a)	-123					
GP-13/GP-30	25	170 ^(a)	+145					
GP-14/GP-31	33	17	-16					
GP-17/GP-35	5.0	5.7 ^(a)	+0.7					
Mean:	99	42	-57					

Table 4-8: Summary of Pre- and Post-Sparge Dissolved Hg in Co-located Pairs of Geoprobe Points within the Sparging Footprint

Phase 3 Pre-Phase 3 **Post-Phase 3** Geoprobe pair Hg Change (µg/L) GP-12/GP-42 15 -135 150 46^(b) GP-17/GP-38 5.0 +41GP-14/GP-43 0.43 -33 33 GP-6/GP-47 -23 78 55 GP-10/GP-50Ac 42 120^(b) (45) +7832^(b) (120) GP-9/GP-51Ad -42 74 -19 Mean: 64 45

(a) Indicates pH was above 10.5 at the end of Phase 2

(b) Indicates pH was above 10.5 at the end of Phase 3

(c) GP-50 value shown in parenthesis (base of Satilla)

(d) GP-51 value shown in parenthesis (base of Satilla)

			Monit	oring Points				
		Sample Size (n)	Mean	Standard Deviation	Median	Average Difference ^(a)	Average % Change ^(a)	
	2011-2012	31	270	463	128			
Tatal II.	Pre-Phase 1	29	119	150	60			
Total Hg	Post-Phase 1	30	39	63	14	1		
(µg/L)	Pre-Phase 2	25	52	83	26	-234	-87%	
	Post-Phase 2	27	43	100	13			
	Pre-Phase 3	30	55	115	12	1		
	Post-Phase 3	30	36	90	4.0			
			Selected	Sparge Wells	12.2			
		Sample Size (n)	Mean	Standard Deviation	Median	Average Difference ^(b)	Average % Change ^(b)	
	Pre-Phase 2	16	150	230	64			
Dissolved	Post-Phase 2	16	17	19	12	-324	070/	
Hg (µg/L)	Pre-Phase 3	10	333	332	244	-324	-97%	
	Post-Phase 3	10	9.0	11	5,5			
			Geopro	be Locations	·			
	in the second	Sample Size (n)	Mean	Standard Deviation	Median	Average Difference ^(b)	Average % Change ^(b)	
Dischard	Pre-Phase 2	15	83	68	74			
Dissolved	Post-Phase 2	16	36	41	24	-37	-44%	
$Hg(\mu g/L)$	Post-Phase 3	17	46	36	42		1.0.7	

Table 4-9: Summary of Mercury Concentrations in the Deep Satilla

(a) Average difference and average percent change for monitoring points was calculated using mean value from 2011-2012 and mean value from post-Phase 3.

(b) Average difference and average percent change for sparge wells and Geoprobe locations was calculated using mean value from pre-Phase 2 and mean value from post-Phase 3.

The CBP is generally a sulfide-rich, reducing environment. Dissolved Hg speciation in the presence of sulfide is dominated by: complexes with sulfide such as $HgHS^-$, $HgS_2^{2^-}$; complexes with polysulfides such as $Hg(S_x)_2^{2^-}$ and HgS_xOH^- ; complexes with thiol groups present on dissolved organic matter (DOM); and HgS(s) precipitated as metacinnabar or cinnabar (Skyllberg, 2008). The geochemical conceptual model for Hg within the CBP is discussed in the RI (GeoSyntee Consultants, 1997) and in the Proof of Concept Test Final Report (Mutch Associates and Parsons, 2013b). Solubility of Hg in the presence of sulfide generally decreases with decreasing pH as a result of precipitation of Hg sulfide, HgS(s) (Jay et al., 2000).

Mid Satilla Monitoring Wells

Post-sparge total Hg concentrations for the mid Satilla are shown in plan view in Figure 4-43. Concentrations ranged from 2.3 μ g/L to 550 μ g/L with more than half of concentrations less than 20 μ g/L. In general, Hg concentrations in the mid Satilla continue to decrease with each sparging event. For example, MW-352A and MW-514A, the two mid Satilla monitoring wells with the highest pre-Phase 1 Hg

concentrations (both were $\geq 300 \ \mu g/L$), showed large decreases after Phase 1 to 11 $\mu g/L$ and 47 $\mu g/L$, respectively. After Phase 2, these two wells had concentrations of 3.3 $\mu g/L$ and 3.2 $\mu g/L$, respectively. At the end of Phase 3, Hg at these locations are even lower at 2.2 $\mu g/L$ and 2.3 $\mu g/L$, respectively. Since, water collected from MW-513A during low-flow sampling had a turbidity greater than 50 NTU, a filtered and unfiltered sample were collected for Hg in accordance with the work plan (Mutch Associates and Parsons, 2013a). The filtered sample showed a dissolved Hg of 29 $\mu g/L$, consistent with the low pH of 6.18 measured at this location. The unfiltered sample had a total Hg of 550 $\mu g/L$, indicating that a large fraction of the total Hg has been immobilized on the soil solids.

4.4.3 Historical pH and Mercury Concentrations Versus Time

The historical pH Hg concentrations values for wells MW-519B and MW-115C, and EW-6 and EW-11 are shown in Figures 4-44 and 4-45, respectively. As discussed above, a significant reduction in Hg concentration is expected when groundwater reaches a neutral pH. The plots show that Hg concentrations continue to decline or remain stable over time as groundwater maintains a neutral pH. For example, MW-519B (Figure 4-44) shows a steady linear decrease in Hg concentration from the Proof of Concept Test through to the end of Phase 2. Hg concentrations in MW-519B have now stabilized at approximately 3 μ g/L. The historical plot of MW-115C (Figure 4-44) shows that the reduction in Hg concentration due to lowering the pH is not immediately reversible when a slight rise in pH occurs. The Proof of Concept Test, Phase 1 and Phase 2 sparging influenced the pH of groundwater near MW-115C. As expected, Hg concentrations decreased. However, when the pH increased slightly after Phase 2, the Hg concentrations remained at lower levels and did not rebound. This suggests that Hg reductions are not quickly reversible. Similarly, EW-6 (84 μ g/L) and EW-11 (0.72 μ g/L) (Figure 4-45) show sustained reductions in Hg concentrations were at or above 1,000 μ g/L for a long time and as high as 2,530 μ g/L in September 2011.

4.5 Effect of Sparging on Piezometric Surfaces

Similar to the Proof of Concept Test and the previous two phases of sparging, the piezometric surface in the deep Satilla Aquifer and the groundwater table in the Satilla Aquifer were influenced during sparging. The mounding of the groundwater table in the Satilla, as observed in the hydrograph of PZ-63, is shown in Figure 4-46. The water elevation in PZ-63 represents the piezometric surface 5 to 7 ft below the water table, not the water table itself. As expected, the water elevation in PZ-63 fluctuated as a function of flow rate and radial distance to nearby operating sparge wells. After a sparge event was initiated, the water level in the piezometer increased quickly, reaching a peak of 1 to 3 ft above the original water elevation approximately 4 hours after the start of sparging. Once sparging concludes, it takes approximately 8 hours

for the water level to return to the pre-sparge water elevation. A detailed description of this process accompanied with figures is available in the Phase 1 Report (Mutch Associates and Parsons, 2014).

The water levels in the 35 shallow piezometers on site were checked periodically while sparging into the accompanying sparge wells. The northern portion of the Site adjacent to the access road has been particularly sensitive to daylighting of shallow groundwater because the elevation of the road was low relative to the ground, and the high density of the sparge network in the northern area. The sparging procedures were adjusted throughout Phase 3 to shorten sparging durations in the northern portion of the Site in an effort to minimize or preclude additional instances of the groundwater table surfacing on the road. The long-term effect of sparging on the groundwater table was an increase in water level elevation during sparging, followed by a gradual return to pre-sparge levels (e.g. PZ-63).

As was the case during the previous phases, the piezometric surface in the deep Satilla monitoring wells within the sparge footprint was strongly influenced by sparging. The piezometric surface changed as a function of sparge well flow rates and radial distance from the sparge well. During Phase 3, five monitoring wells within the Phase 1 footprint were outfitted with transducers (MW-352B, MW-501B, MW-513B, MW-515B, and MW-519B) and five monitoring wells (MW-353B, MW-503B, MW-507B, MW-508B, MW-112C) outside the sparging footprint recorded the piezometric surface throughout the sparging program. Hydrographs for MW-515B and MW-112C are provided in Figure 4-47, and all hydrographs for these monitoring wells are provided in Appendix G. The general behavior of the piezometric surface increased in a matter of minutes after sparging began and steadily increased with the sparge flow rate throughout the sparging event. Near the end of the sparge period, the piezometric surface reached a maximum value. The piezometric surface declined immediately after sparging ended, often to a lower elevation then pre-sparge. The water level then returned to pre-sparge conditions approximately 8 hours after sparging ended. A detailed description of this process accompanied with figures is available in the Phase 1 Report (Mutch Associates and Parsons, 2014).

	North End of Site	Center of Site	South End of Site
Historical Period	MW-501B to MW-503B (347 feet apart)	MW-513B to MW-508B (366 feet apart)	MW-516B to MW-112C (346 feet apart)
Jul-07	1.4	2.3	1.4
Oct-09	1.4	4.3	1.2
Historical Average:	1.4	3,3	1.3
Phase 1	MW-501B to MW-503B (347 feet apart)	MW-513B to MW-508B (366 feet apart)	MW-516B to MW-112C (346 feet apart)
Beginning of Sparging	1.3	2.5	1.9
Winter Rest Period	1.3	3.1	1.6
End of Sparging	1.3	3.9	1.2
Average During Sparging:	1.3	3.1	1.5
Phase 2	MW-501B to MW-503B (347 feet apart)	MW-513B to MW-508B (366 feet apart)	MW-516B to MW-112C (346 feet apart)
Beginning of Sparging	1.5	4.3	1.8
Winter Rest Period	1.4	4.2	1.6
End of Sparging	1.2	4.0	1.3
Average During Sparging:	1.3	4.1	1.6

Table 4-10: Difference in Water Levels in Selected Well Pairs

Notes:

1. All values in units of feet (ft)

2. A positive number indicates the well within the sparging footprint had a higher water level than the well west of the sparging footprint

3. The first well in each pair is the well within the sparging footprint and the second well is located west of the sparging footprint. i.e. MW-501B is within the sparging footprint

As discussed in Section 2.1.5, monitoring wells and piezometers within the sparging footprint were fitted with threaded caps prior to sparging. These threaded caps were extremely effective in containing the rising waters in monitoring wells and piezometers. There were no apparent long term effects of sparging on the piezometric surface in the deep Satilla. The piezometric surface elevation rose and fell during sparge operations but gradually returned to pre-sparge levels during rest periods.

During Phase 1 and 2, water levels in three pairs of monitoring wells were measured with transducers to evaluate change in head differences sparging efforts to assess migration of deep Satilla water outside the sparging footprint. One well within each pair was located within the sparging footprint and one well was located west of the sparging footprint, adjacent to the marsh. The selected well pairs were MW-501B and MW-503B, MW-513B and MW-508B, and MW-516B and MW-112C. Available groundwater levels from July 2007 and October 2009 (provided by EPS Planning Specialists, Inc.) and data from Phase 1 operations were used to calculate the historical averages of pre-sparge head differences in each monitoring well pair, as shown in Table 4-10. Hydrographs of these paired water levels (in ft NAVD 88) are provided in the Phase 2 report (Mutch Associates and Parsons, 2015). A least squares regression, linear trend line

was fit to water levels obtained from monitoring well transducer data and the difference between the trend lines was taken at three points during the sparging period and then averaged. For each monitoring pair, the average head difference during sparging was not significantly different from the historical average as shown in Table 4-10. Therefore, CO_2 sparging had an insignificant impact on deep Satilla groundwater migration as the average westerly hydraulic gradient did not appreciably change during the sparging activities.

5 CONCLUSIONS AND RECOMMENDATIONS

5.1 Conclusions

In summary, for the Phase 3 sparging:

- Nearly all (28 out of 30; 93%) of the deep Satilla monitoring and extraction wells had a pH of less than 10.5. Most of these monitoring points had pH less than 7.5 (23 out of 30; 77%). In the southern area, the majority of post-Phase 3 discrete groundwater samples collected by Geoprobe from the base of the Satilla aquifer were less than 10.5; and
- The majority (23 out of 30; 77%) of the deep Satilla monitoring and extraction wells had total Hg concentrations less than 20 µg/L. About one-third of these monitoring points (11 out of 30; 37%) had total Hg concentrations less than 2.0 µg/L.

A summary of the overall effect of Phase 1 - 3 sparging on the CBP is presented below:

- CO₂ sparging has been extremely effective at lowering the pH in the deep Satilla aquifer. The mean pH in the deep Satilla monitoring points has decreased from 11.32 (2011-2012) to 7.11 as a result of CO₂ sparging (Table 4-1). The median pH decreased from 11.49 to 6.57 (Table 4-1).
- The SG (and therefore the density) of groundwater within the deep Satilla has decreased as a result of CO₂ sparging. Computed SG decreased in 20 out of 30 deep Satilla monitoring locations. The median computed SG decrease from 1.009 to 1.007 from pre-Phase 1 to post-Phase 3 was statistically significant at the 95% confidence level.
- CO₂ sparging has also been extremely effective at lowering concentrations of Hg in the deep Satilla. Almost every deep Satilla monitoring point (28 out of 30) has lower total Hg when compared to 2011-2012 levels as a result of CO₂ sparging. The mean Hg concentration in all monitoring points was lowered from 270 to 36 µg/L, a percent decrease of 87%. The median Hg concentration in all monitoring points was lowered from 128 to 4 µg/L, a percent decrease of 97%.

5.2 Recommendations

The AOC for the caustic brine plume requires that the pH be reduced to 10 to 10.5 and that density be reduced. The three Phase CO_2 sparging effort has clearly met both of these RAOs. To date, rebound of pH to values greater than 10.5 has been minimal during the rest period in-between phases. Therefore, extensive rebound is not expected within the treated area, with the exception of the eastern edge of the northern area, which will be addressed as part of a separate regulatory process for the soils beneath the

former cell building. No additional sparging at the Site is recommended as the $\rm CO_2$ treatment has achieved the RAOs.

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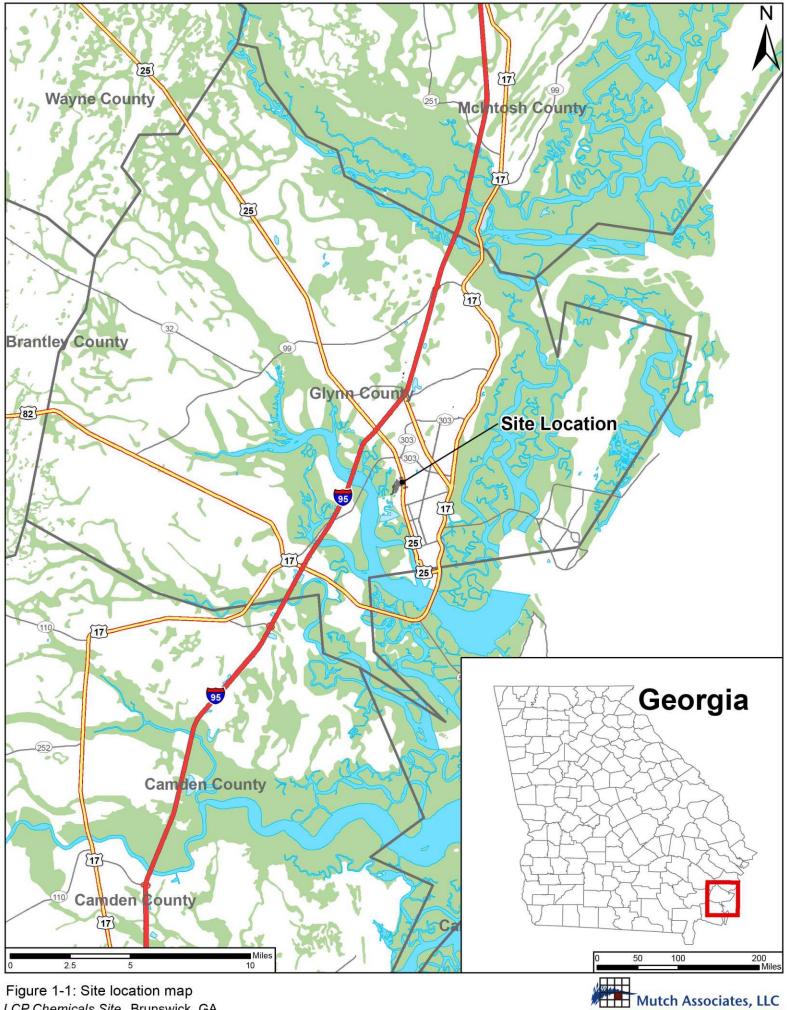
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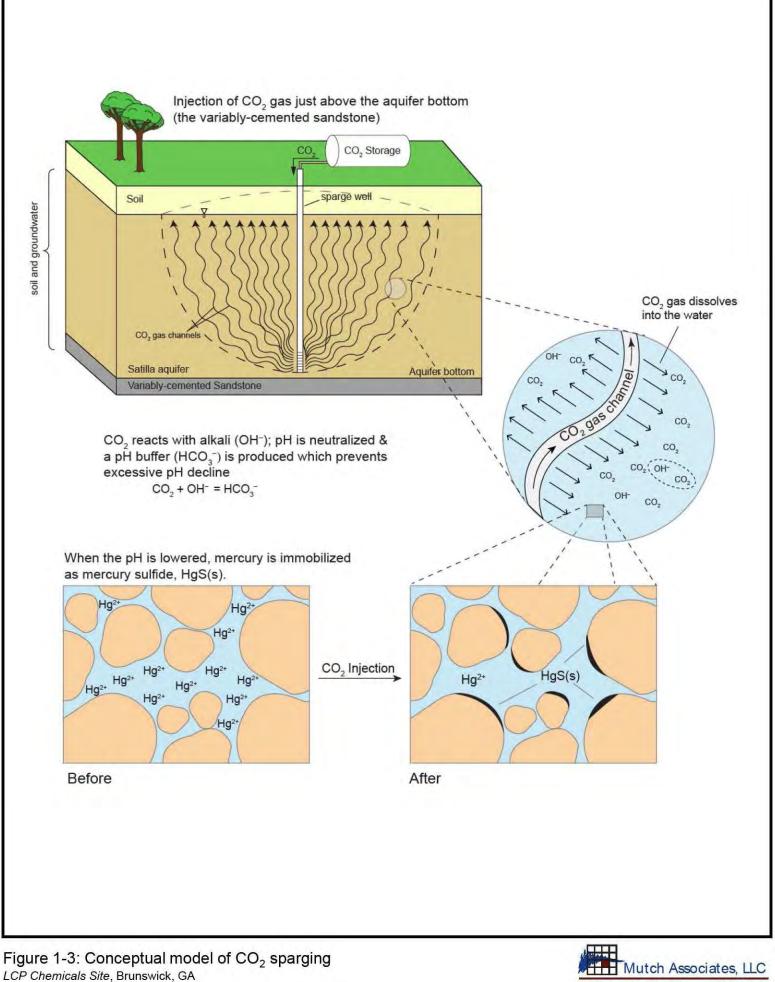
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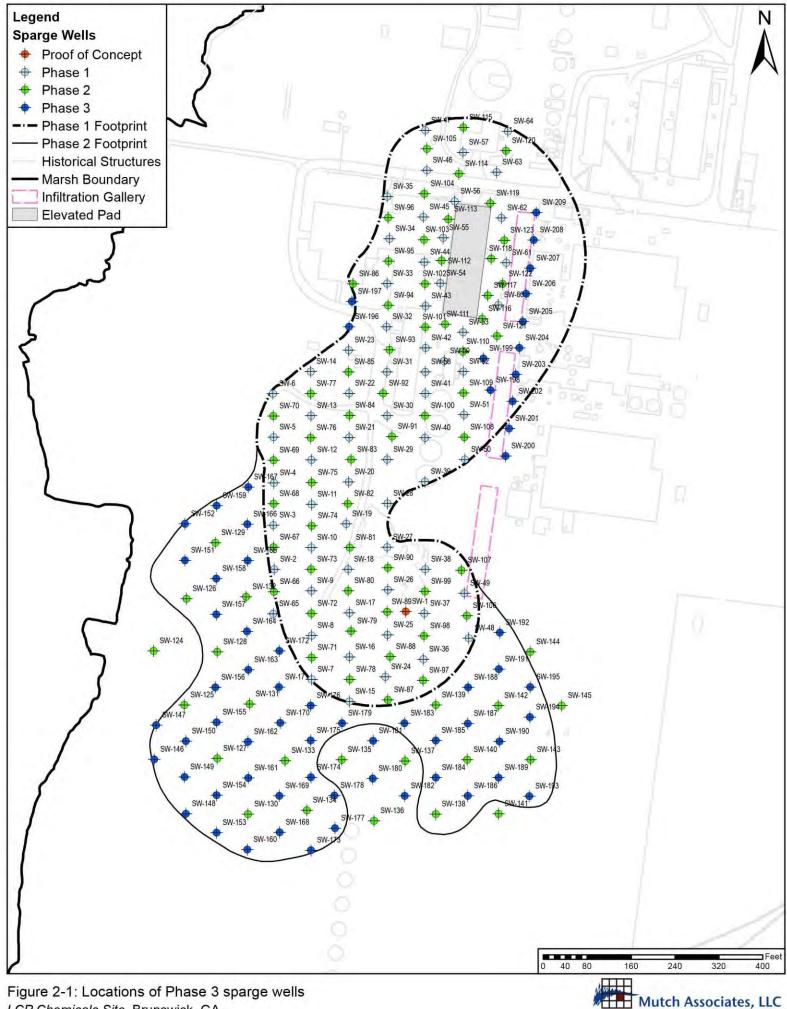


LCP Chemicals Site, Brunswick, GA

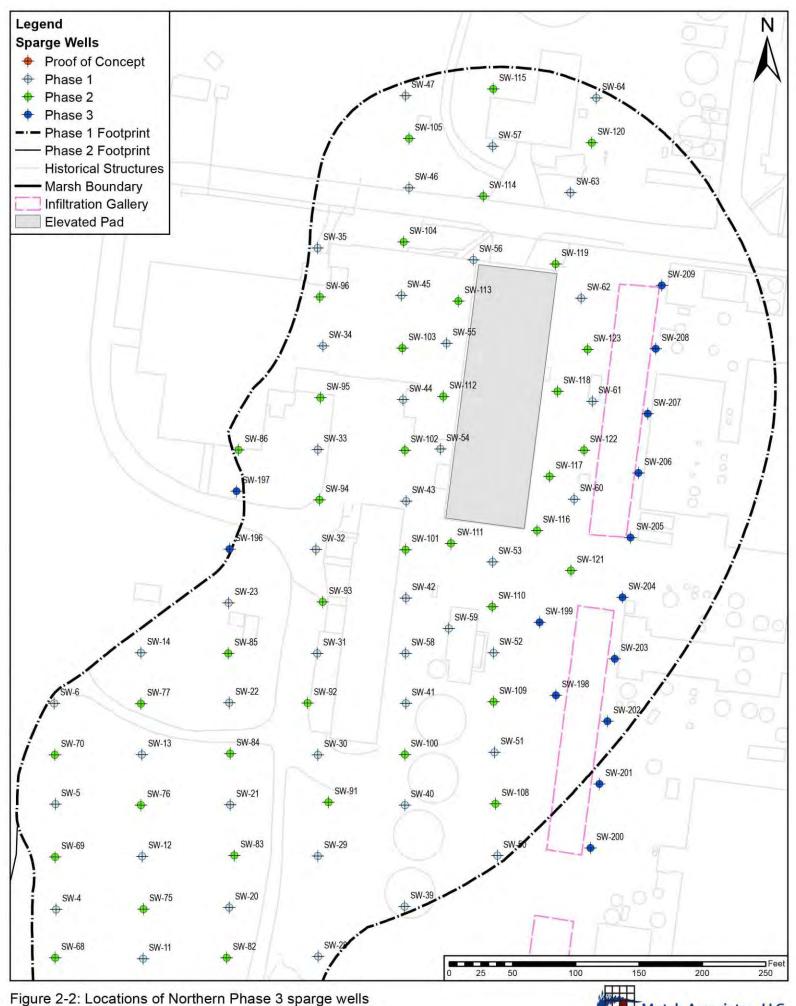


Figure 1-2: Map showing location of CBP footprint *LCP Chemicals Site*, Brunswick, GA



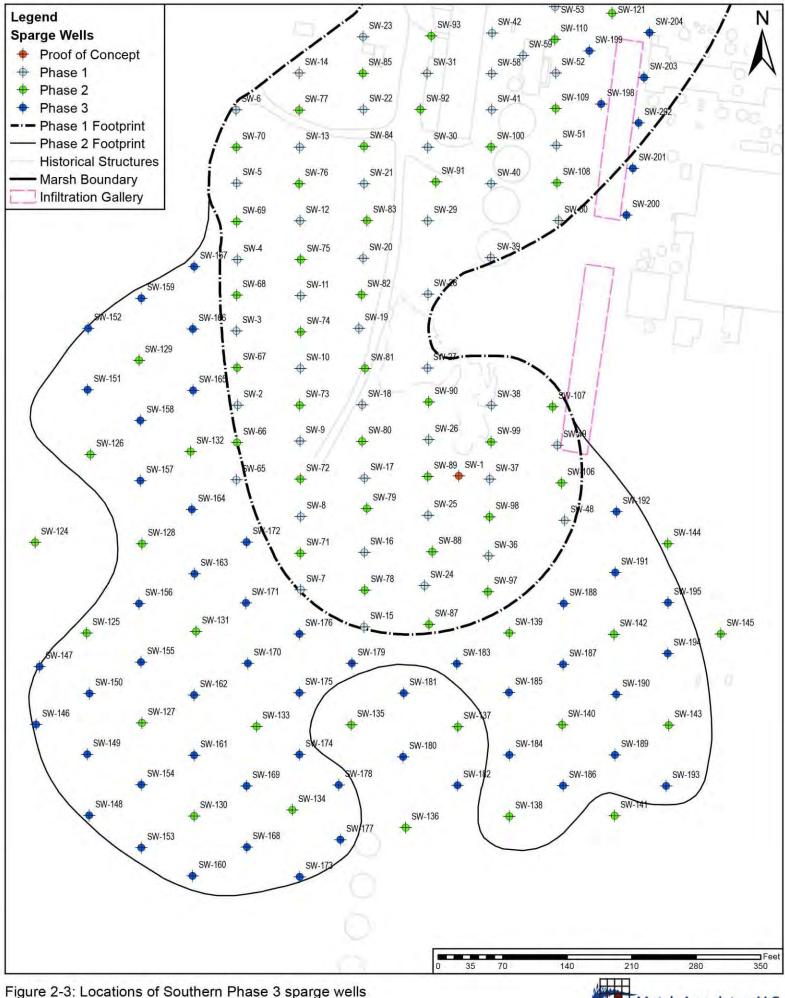


LCP Chemicals Site, Brunswick, GA



LCP Chemicals Site, Brunswick, GA

Mutch Associates, LLC Environmental Engineers and Scientists



LCP Chemicals Site, Brunswick, GA

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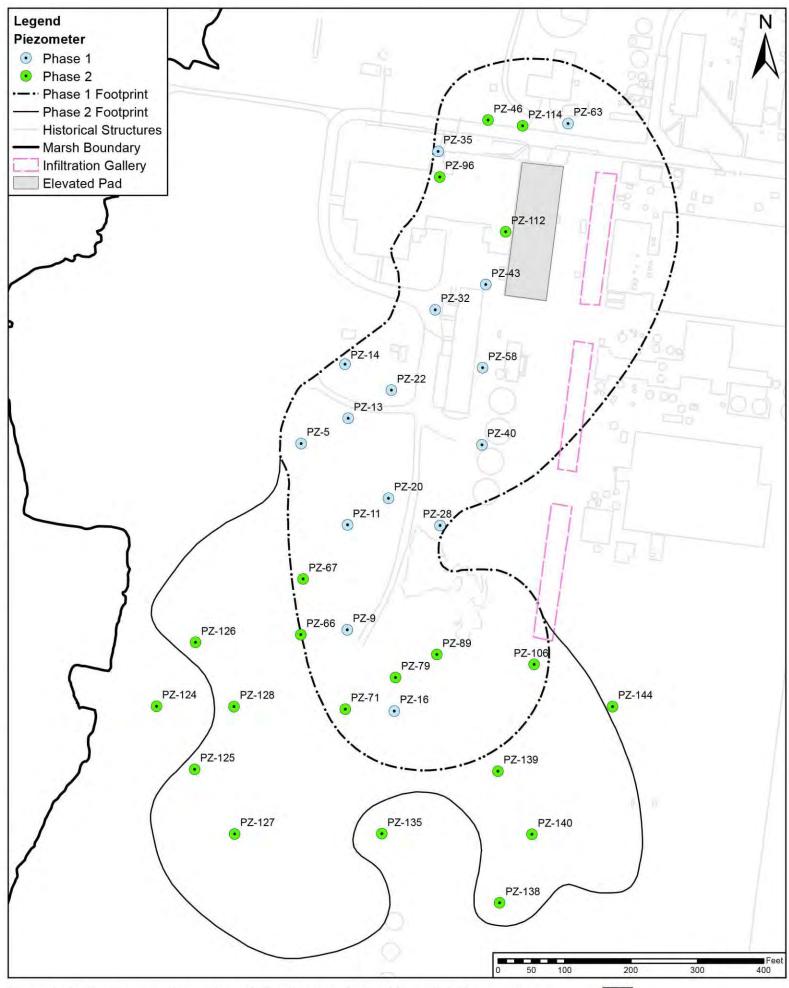


Figure 2-4: Location of piezometers utilitized in monitoring Phase 3 CO₂ sparging *LCP Chemicals Site*, Brunswick, GA

Mutch Associates, LLC Environmental Engineers and Scientists

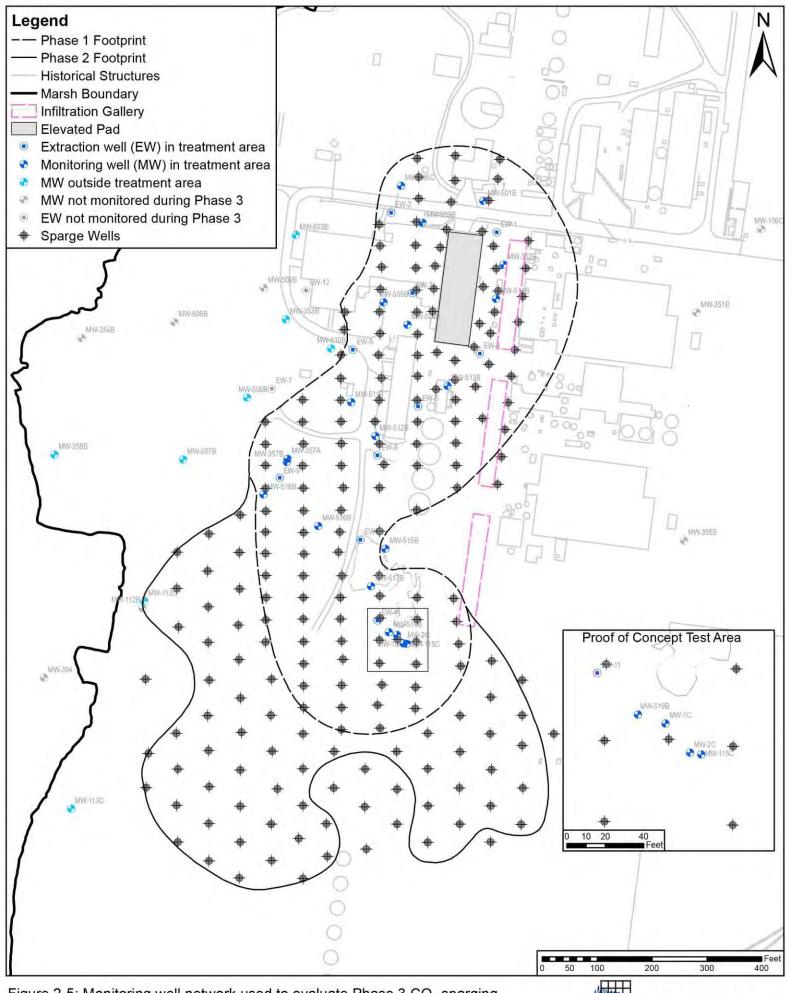


Figure 2-5: Monitoring well network used to evaluate Phase 3 CO₂ sparging *LCP Chemicals Site*, Brunswick, GA

Mutch Associates, LLC Environmental Engineers and Scientists

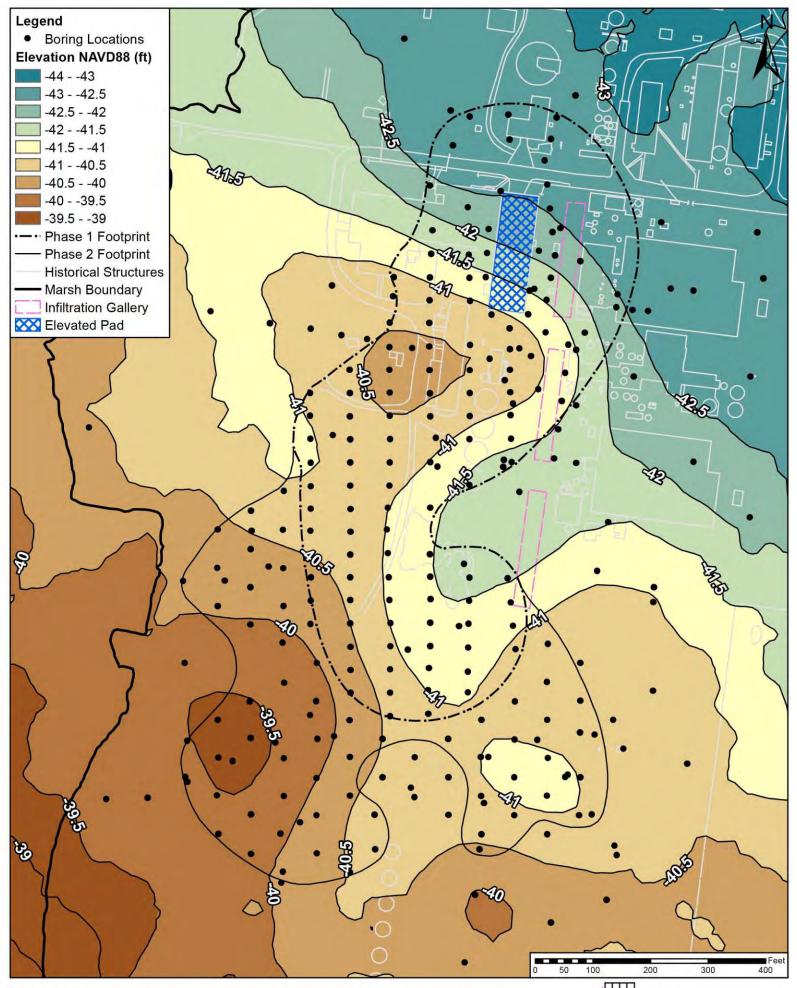


Figure 2-6: Structural contours of the top of the variably-cemented sandstone *LCP Chemicals Site*, Brunswick, GA

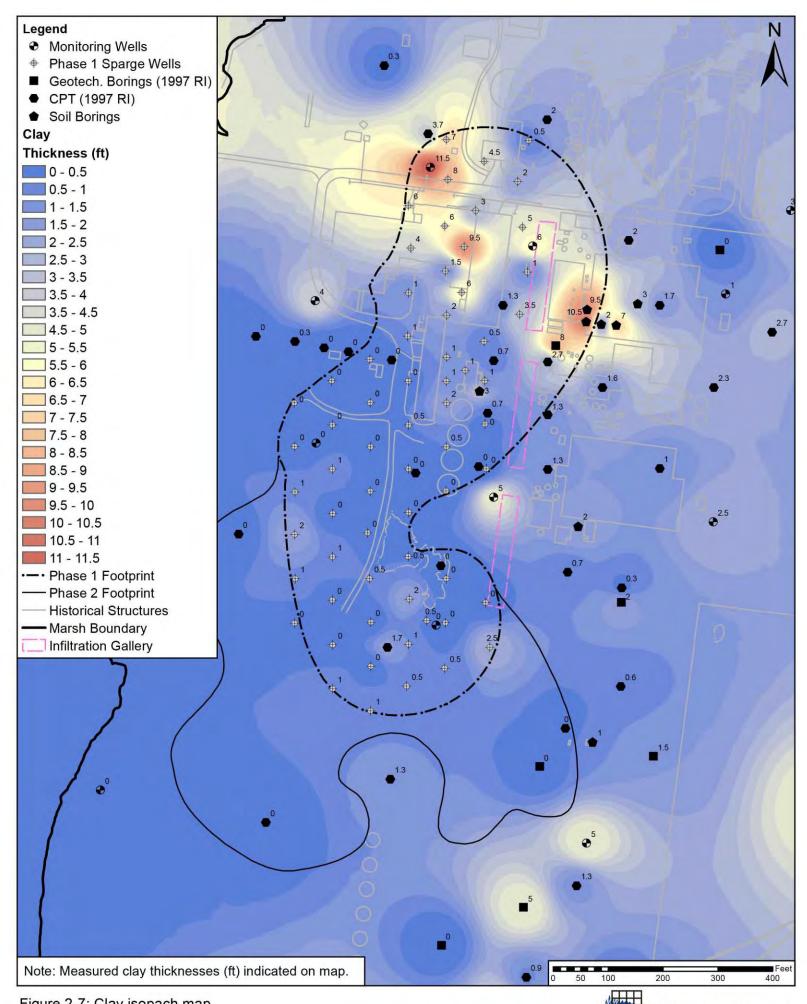
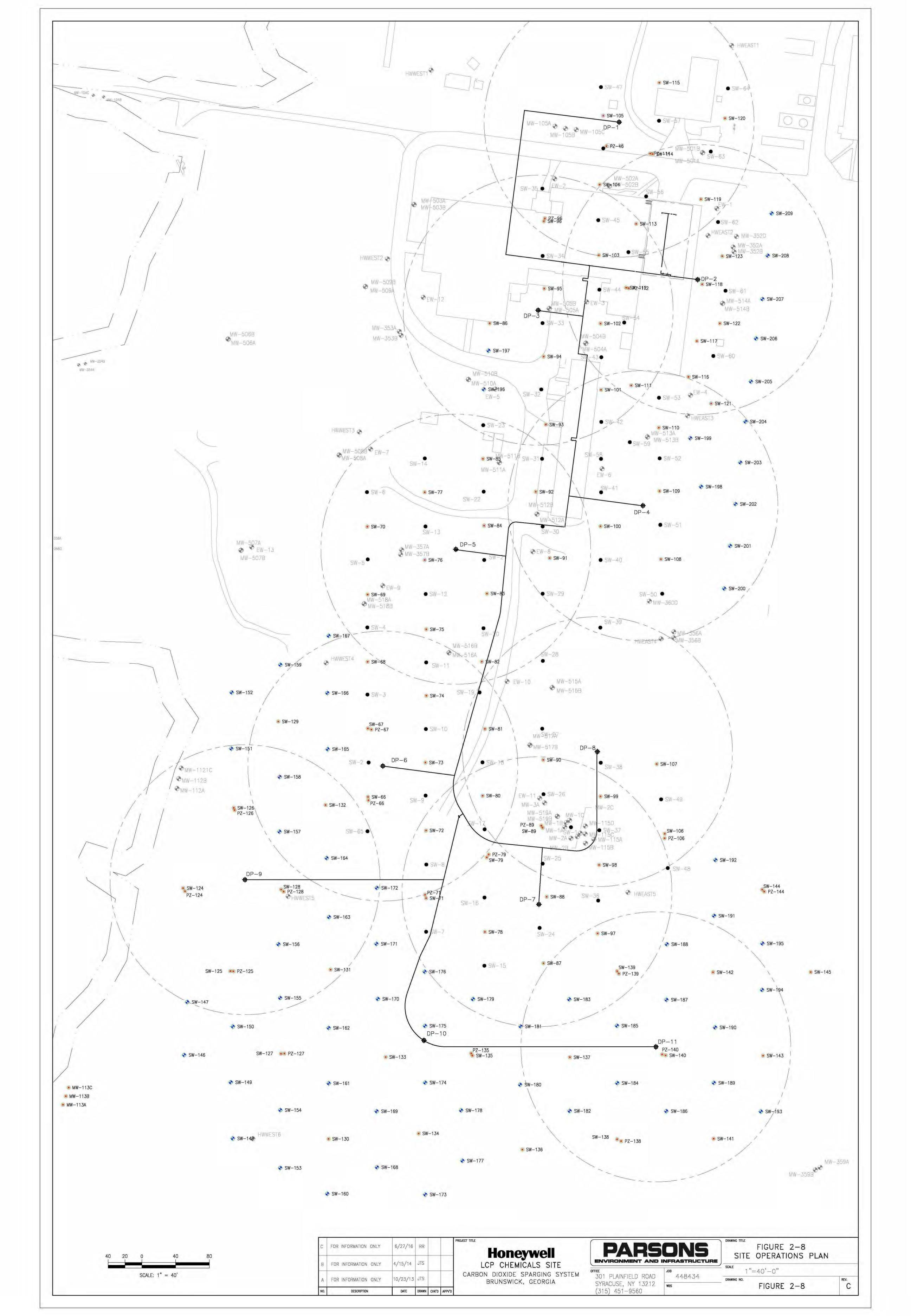
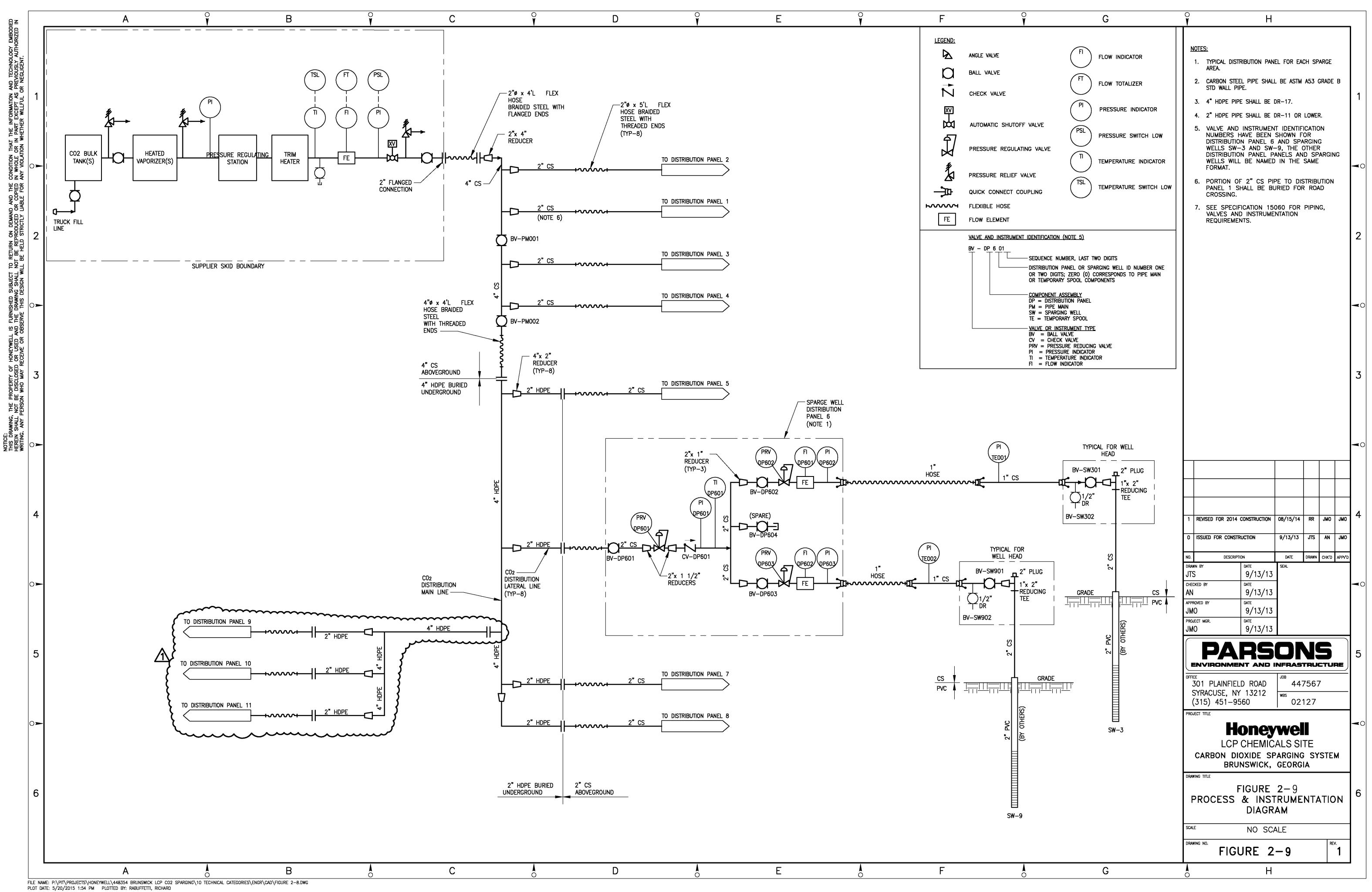
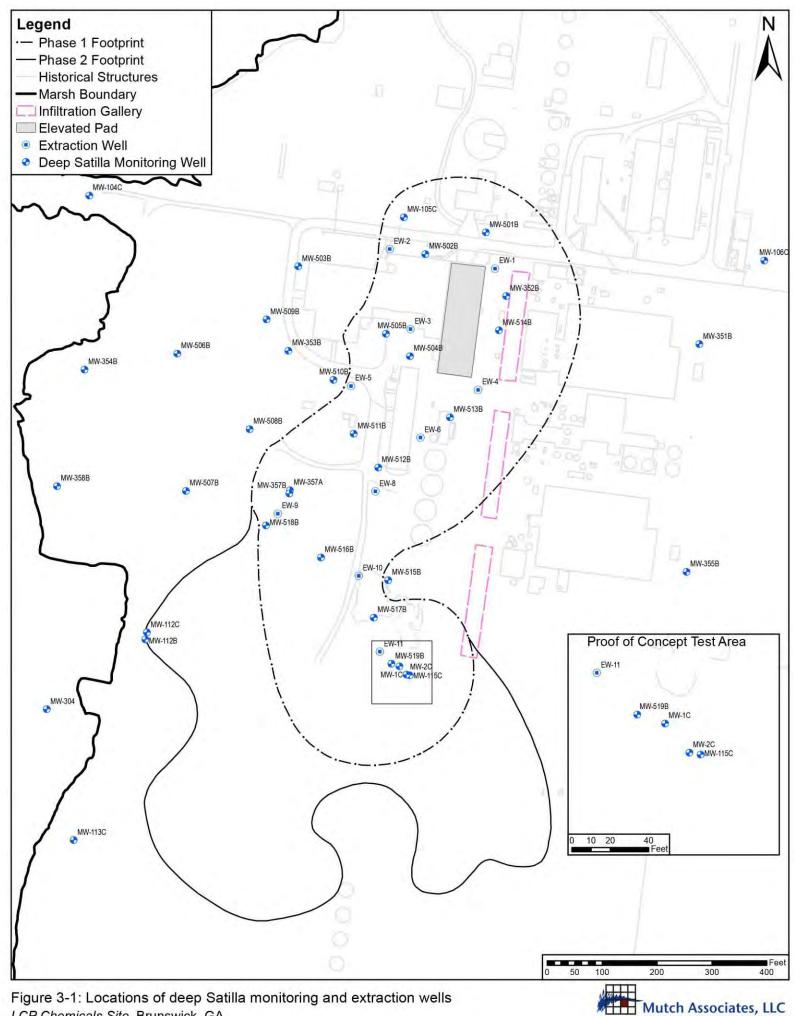


Figure 2-7: Clay isopach map *LCP Chemicals Site*, Brunswick, GA





|--|



LCP Chemicals Site, Brunswick, GA

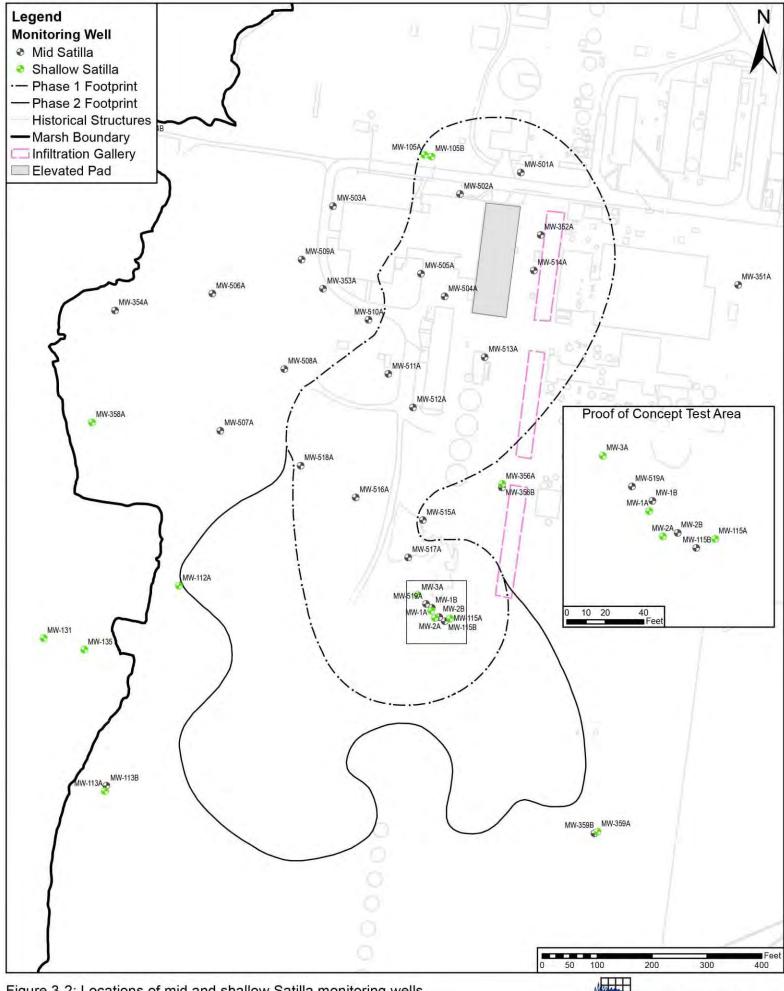


Figure 3-2: Locations of mid and shallow Satilla monitoring wells *LCP Chemicals Site*, Brunswick, GA

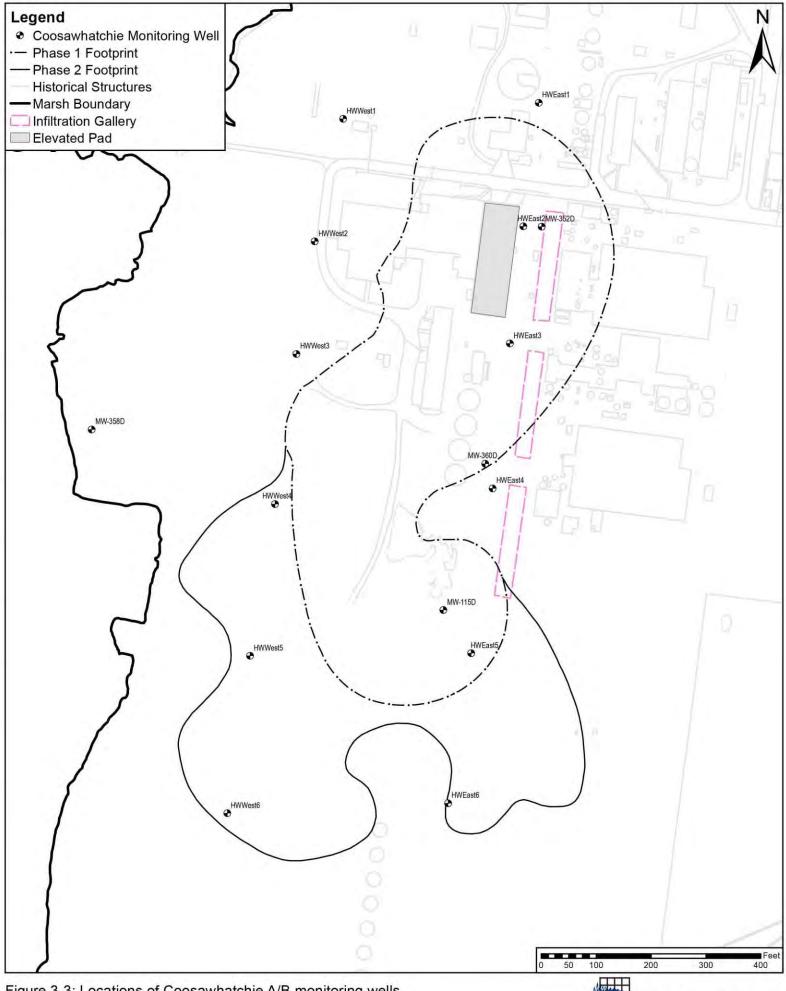


Figure 3-3: Locations of Coosawhatchie A/B monitoring wells *LCP Chemicals Site*, Brunswick, GA

Environmental Engineers and Scientists

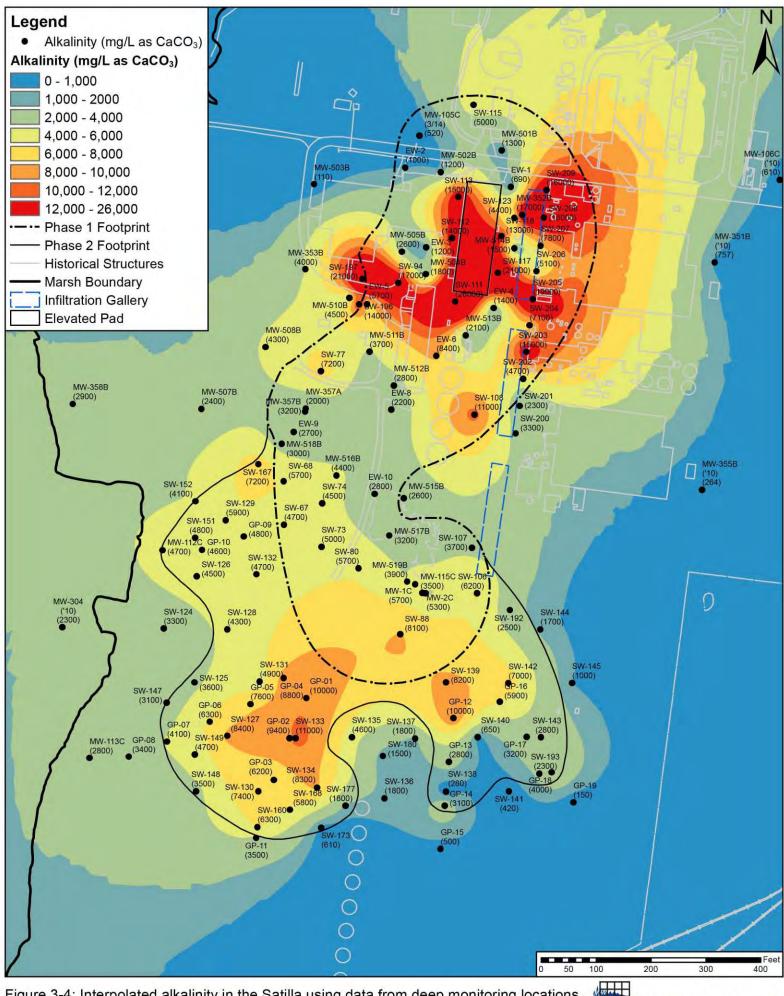
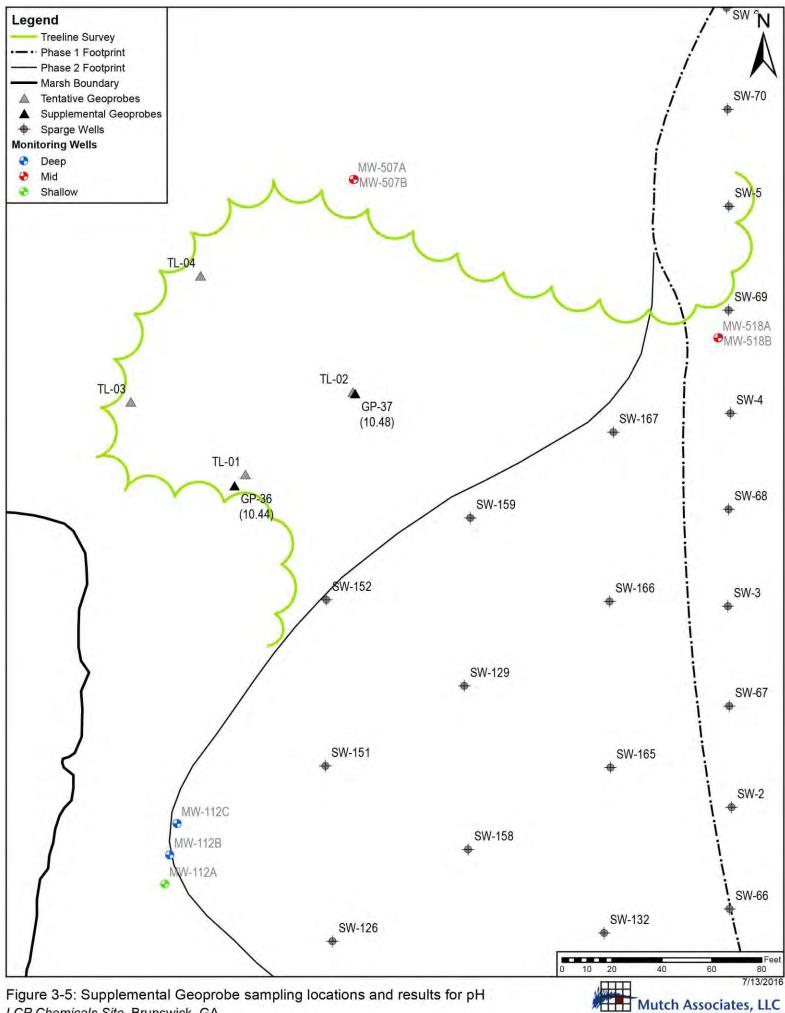
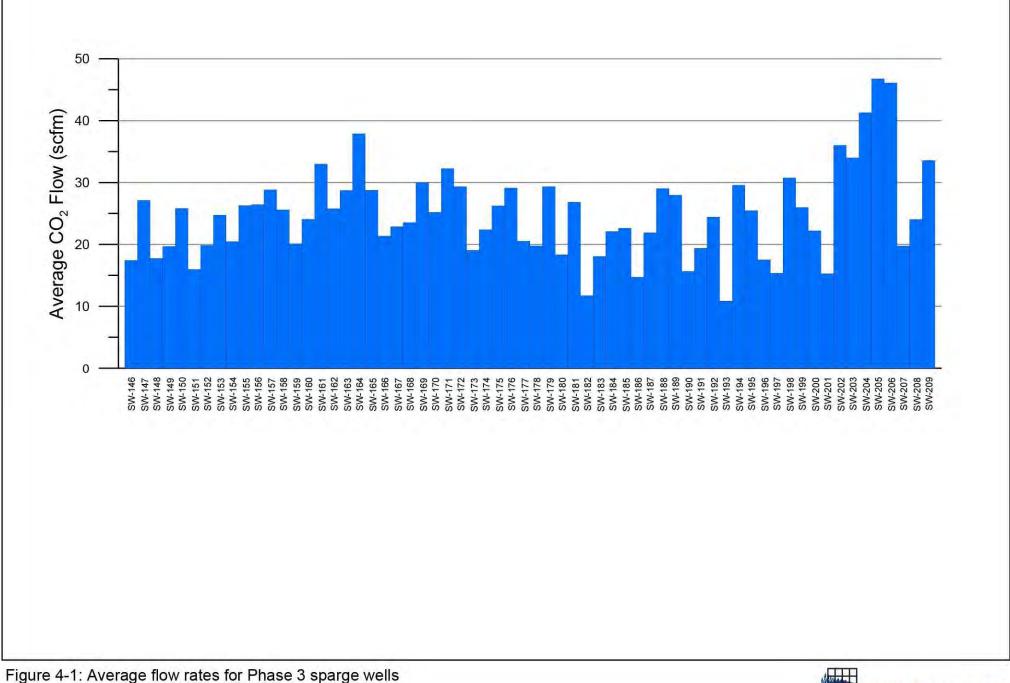


Figure 3-4: Interpolated alkalinity in the Satilla using data from deep monitoring locations *LCP Chemicals Site*, Brunswick, GA





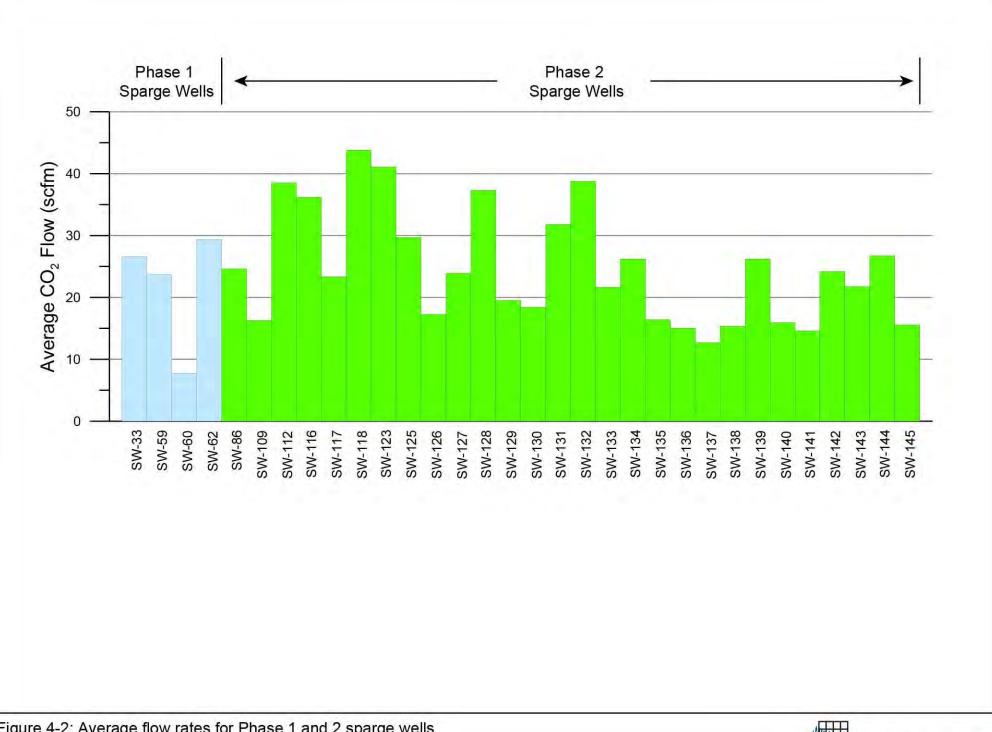
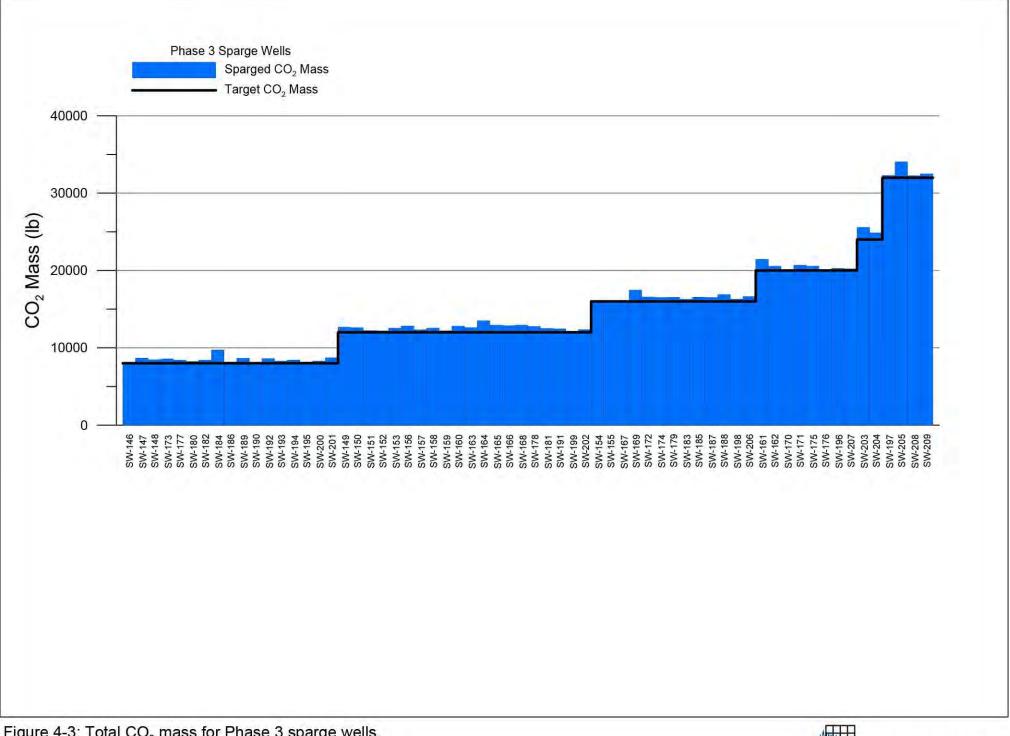
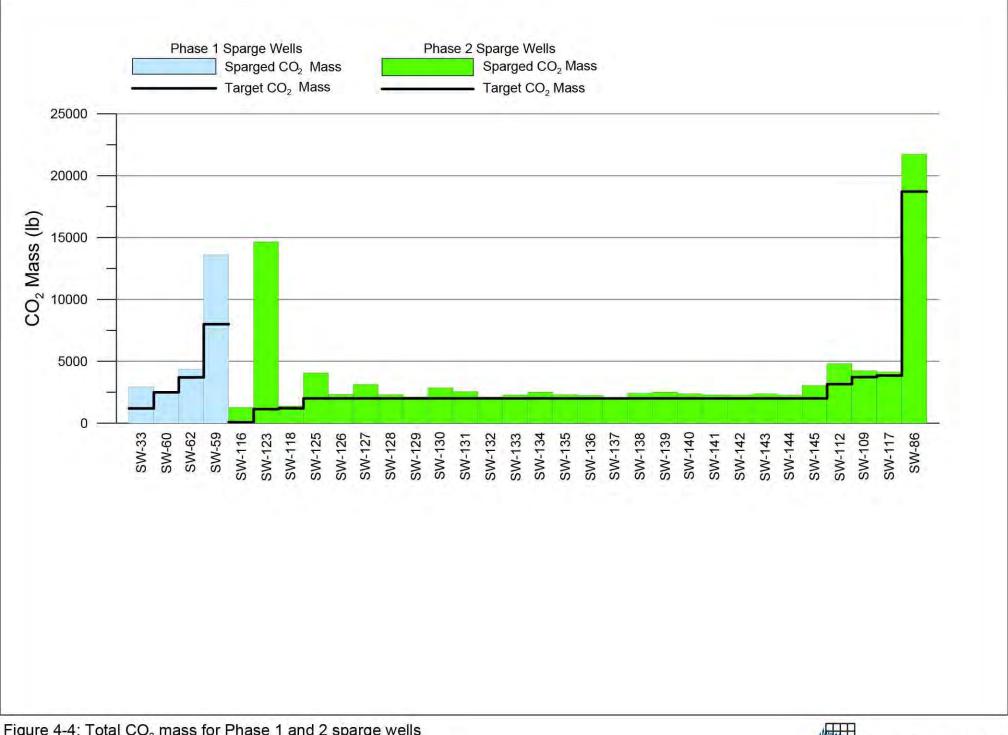


Figure 4-2: Average flow rates for Phase 1 and 2 sparge wells *LCP Chemicals Site*, Brunswick, GA











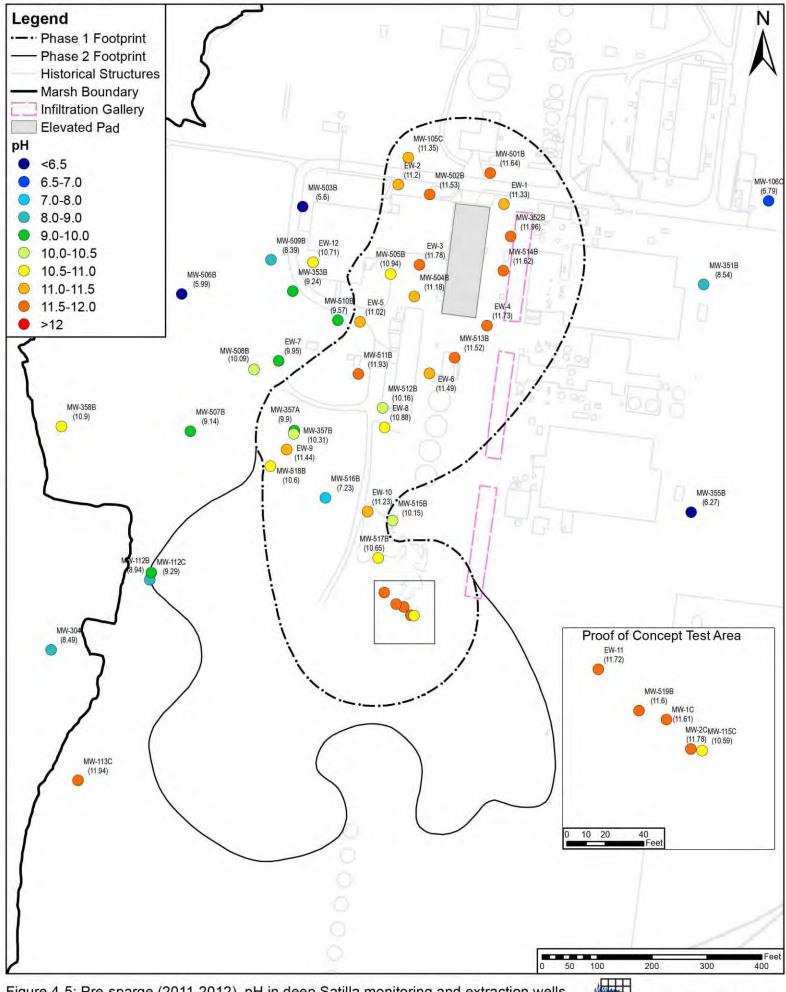


Figure 4-5: Pre-sparge (2011-2012) pH in deep Satilla monitoring and extraction wells *LCP Chemicals Site*, Brunswick, GA

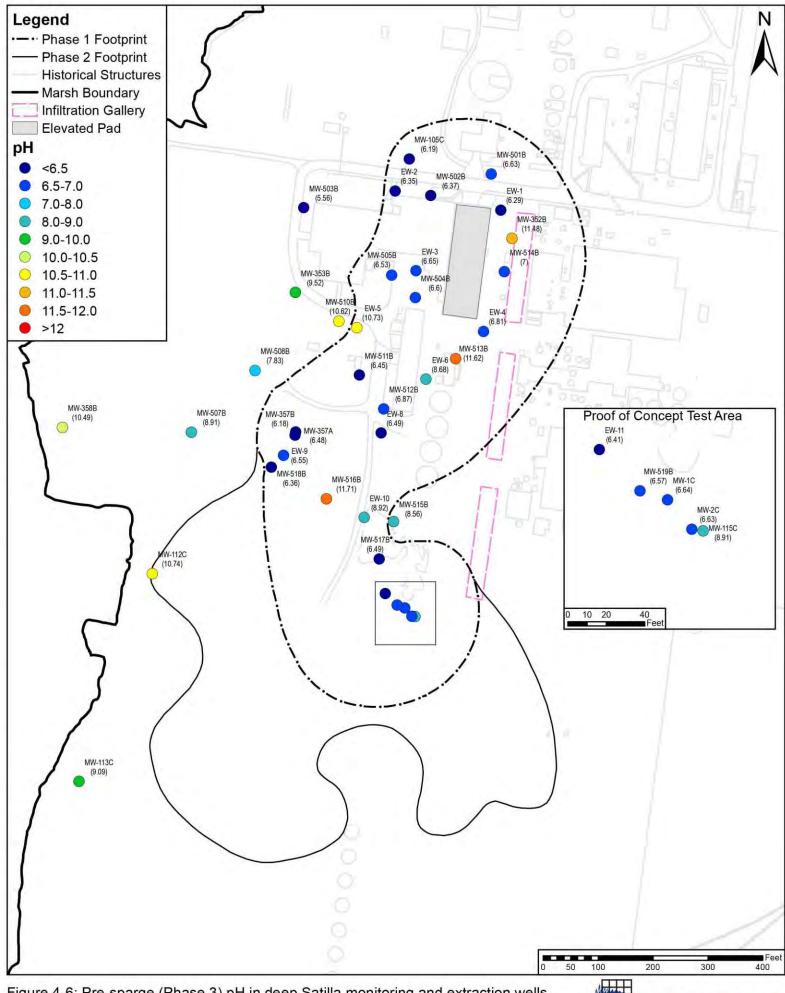
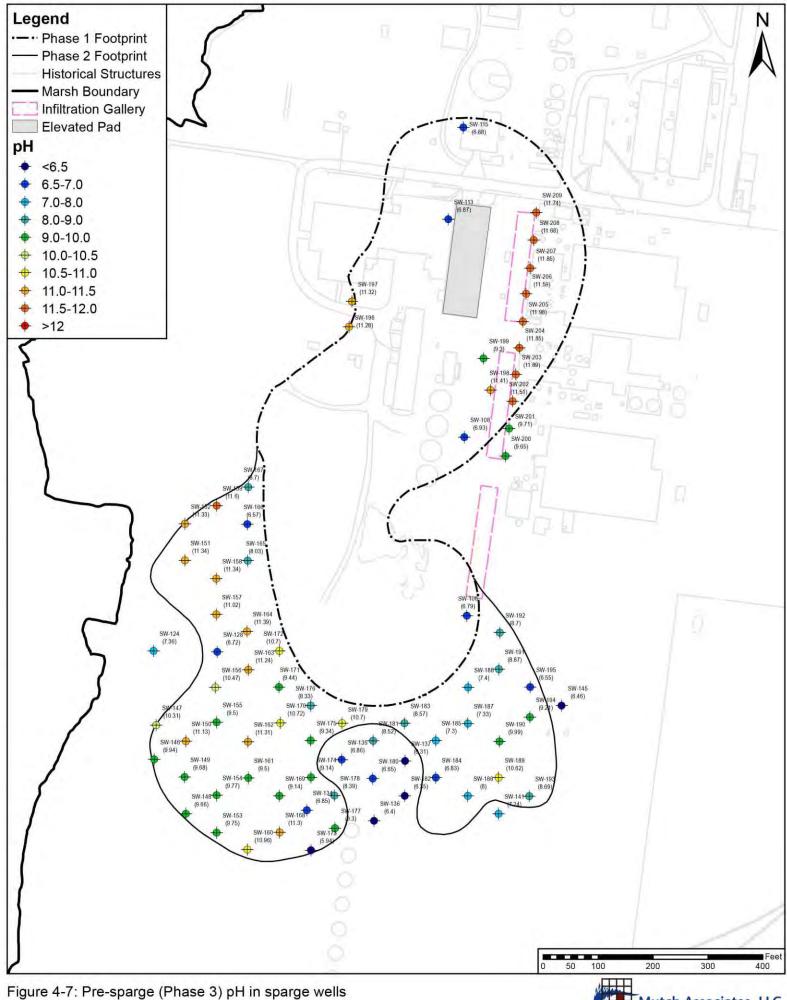
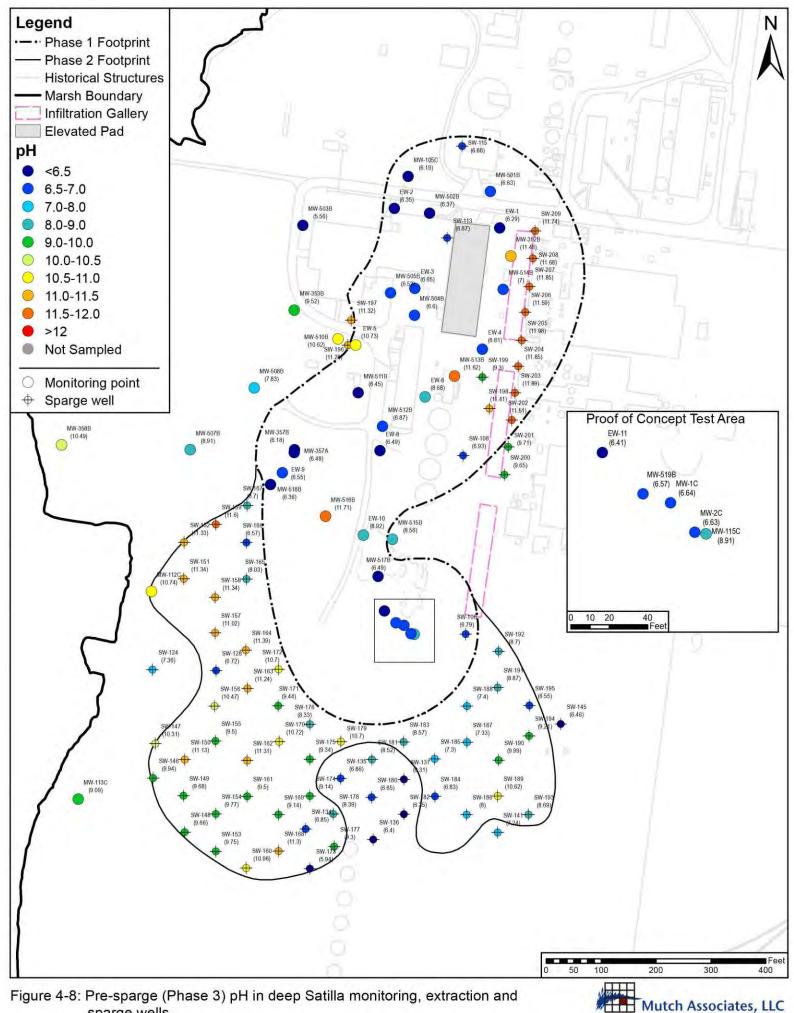


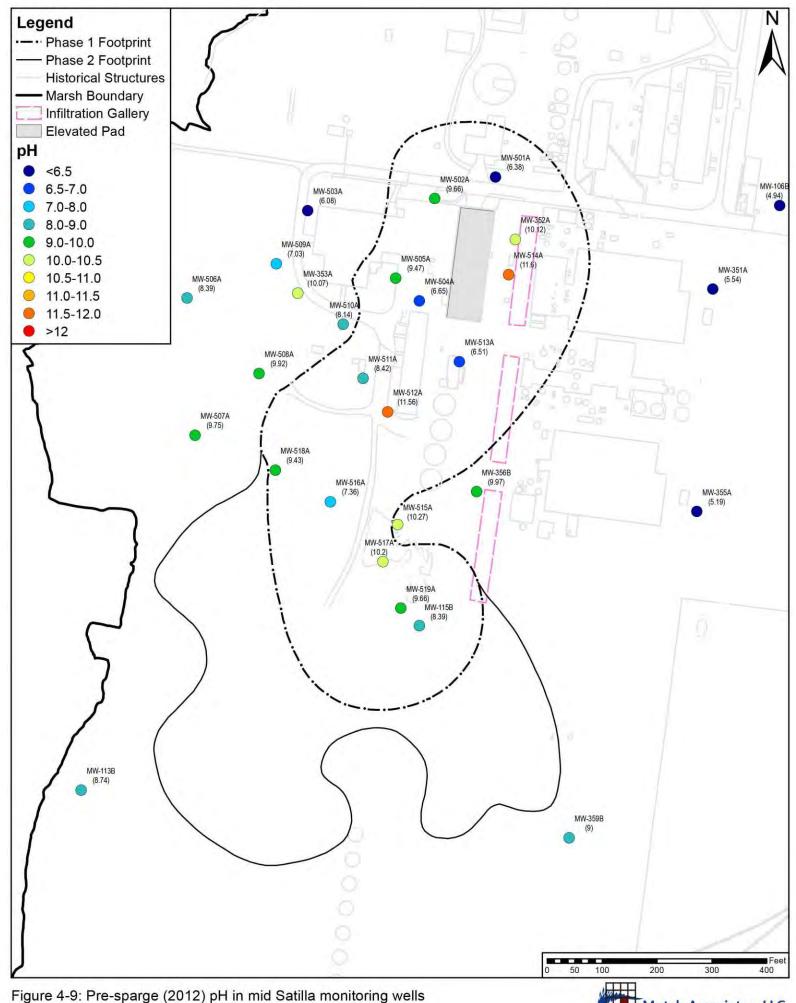
Figure 4-6: Pre-sparge (Phase 3) pH in deep Satilla monitoring and extraction wells *LCP Chemicals Site*, Brunswick, GA

Mutch Associates, LLC Environmental Engineers and Scientists





sparge wells LCP Chemicals Site, Brunswick, GA



LCP Chemicals Site, Brunswick, GA

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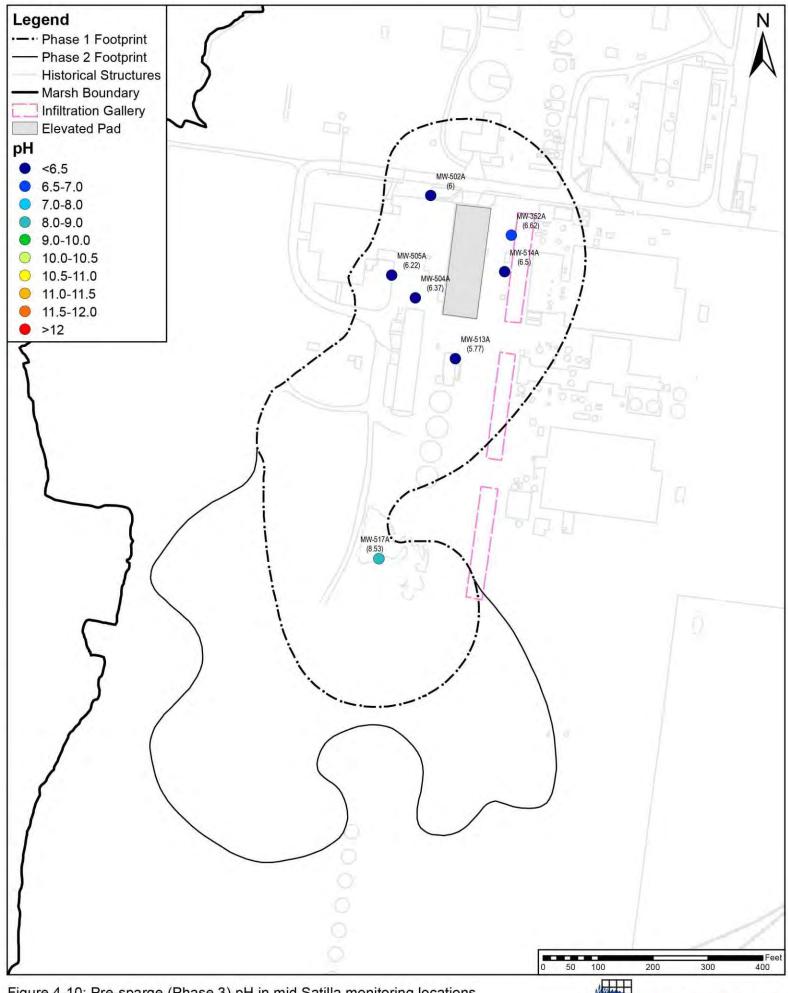
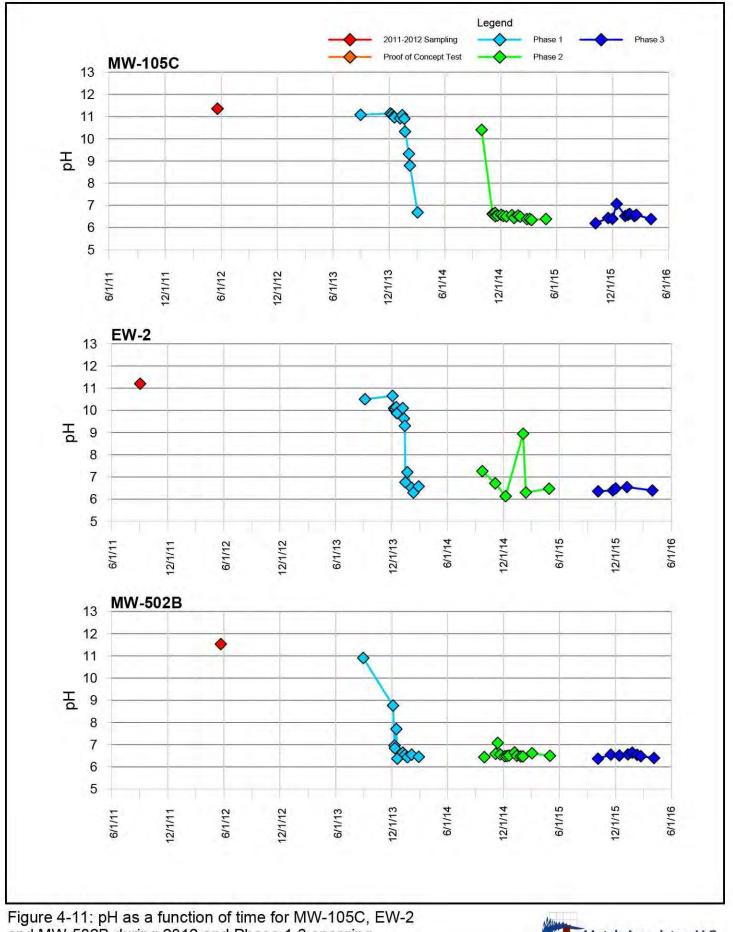
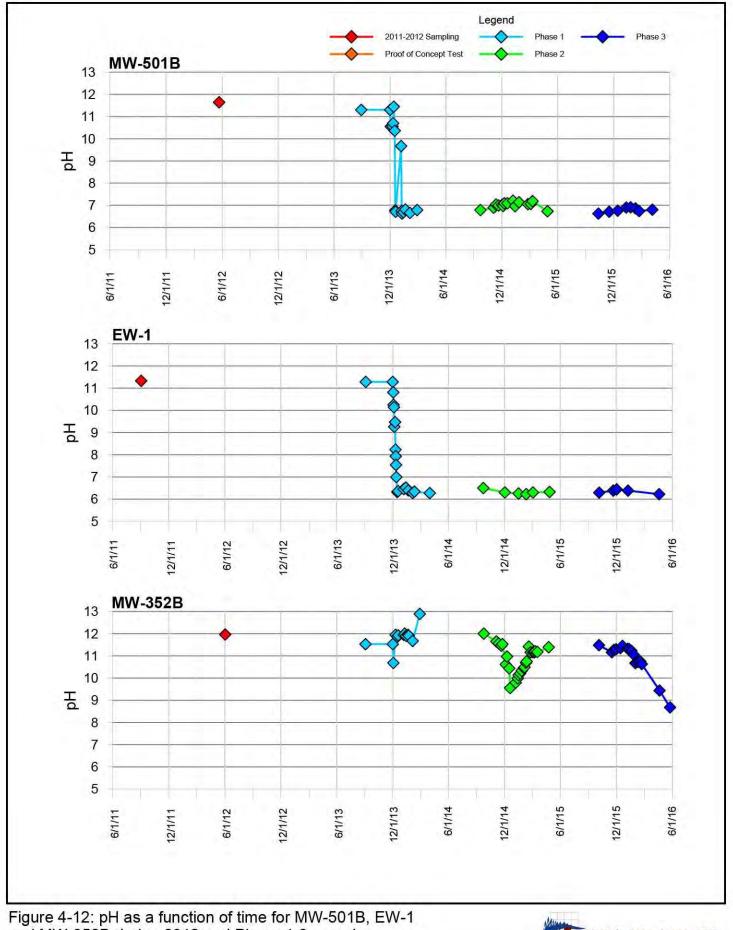


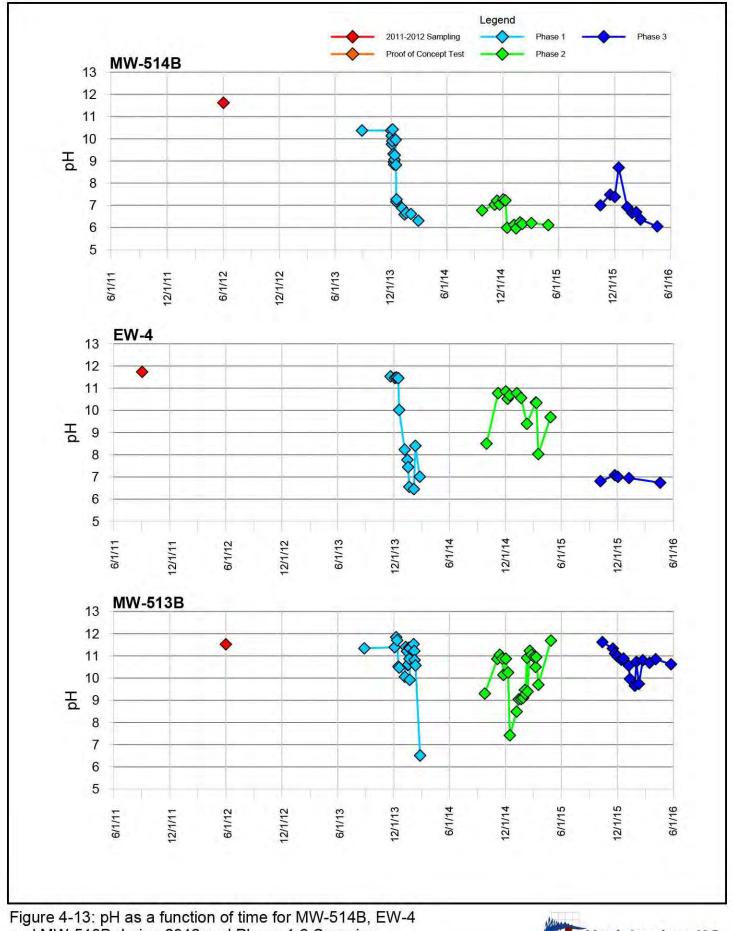
Figure 4-10: Pre-sparge (Phase 3) pH in mid Satilla monitoring locations *LCP Chemicals Site*, Brunswick, GA



and MW-502B during 2012 and Phase 1-3 sparging LCP Chemicals Site, Brunswick, GA

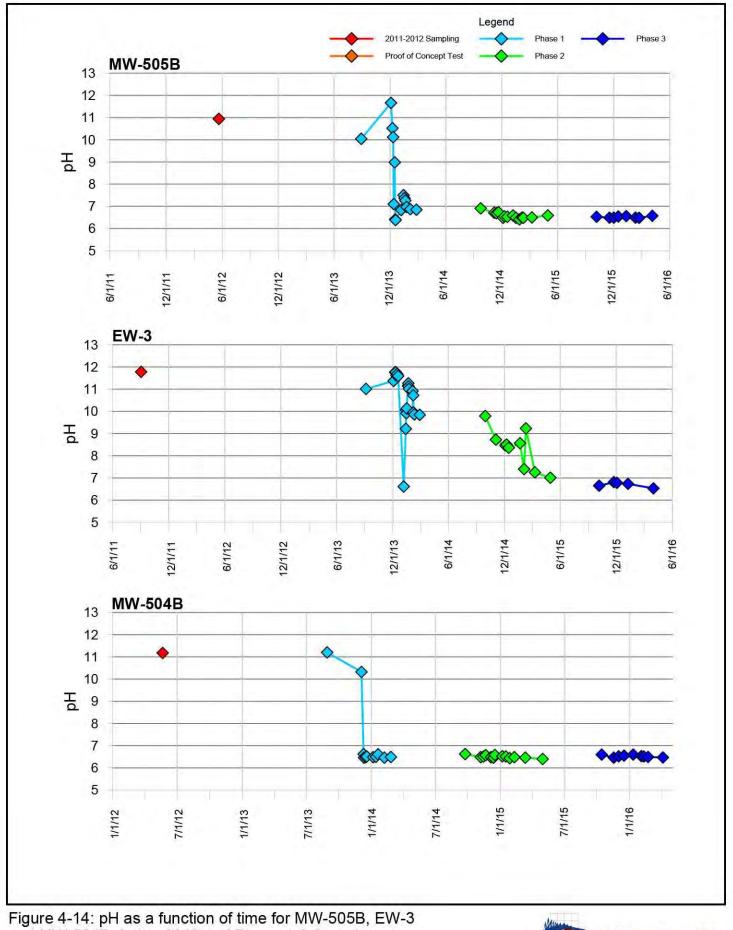


and MW-352B during 2012 and Phase 1-3 sparging LCP Chemicals Site, Brunswick, GA

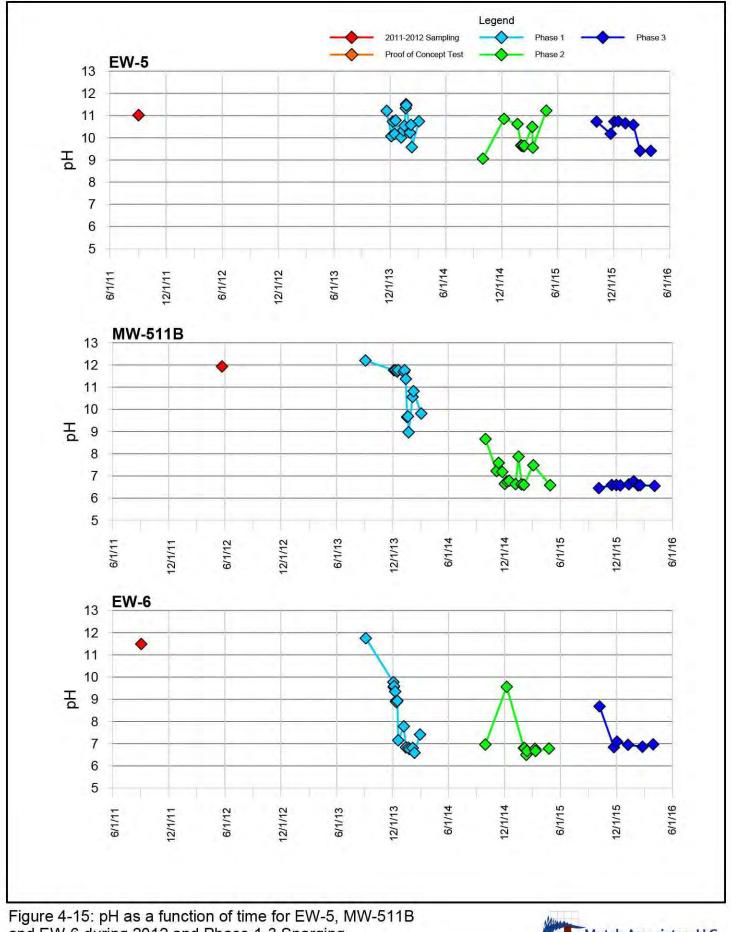


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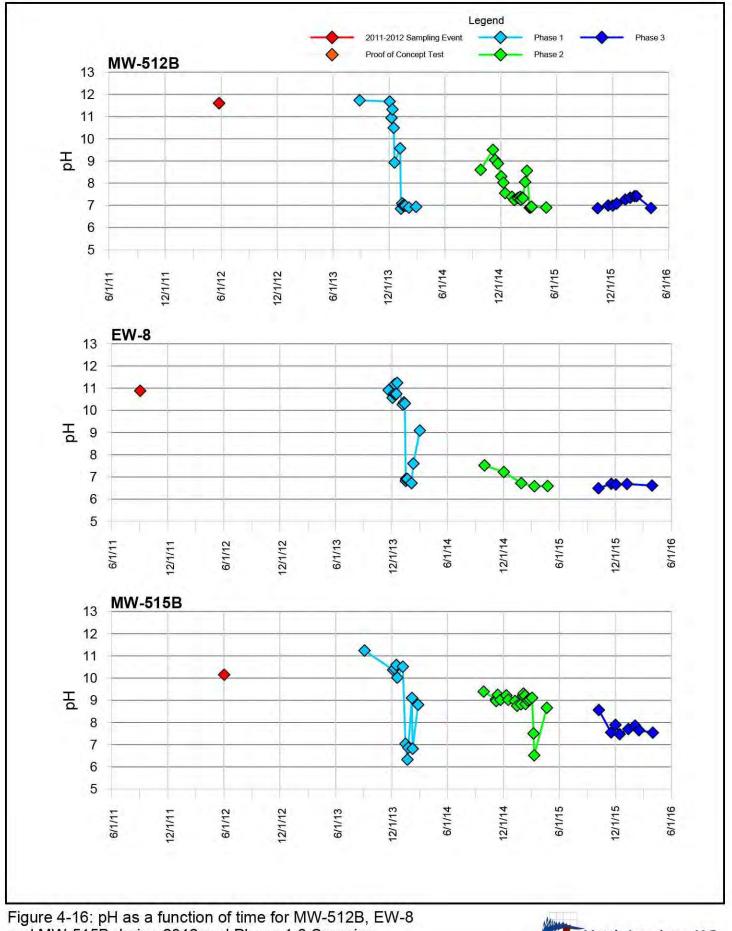
Mutch Associates, LLC



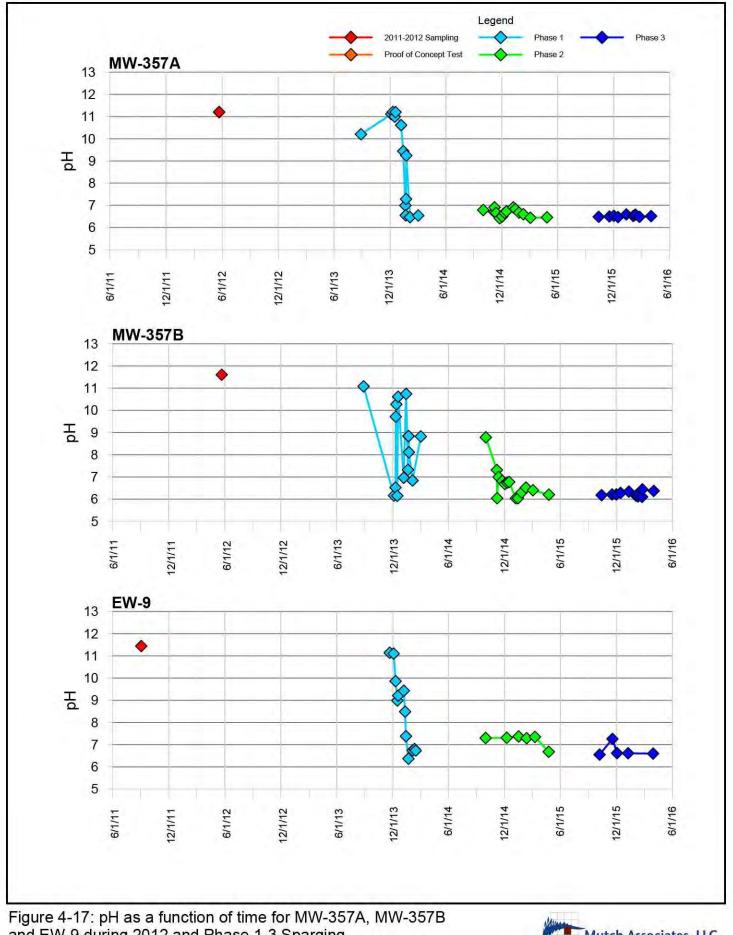
and MW-504B during 2012 and Phase 1-3 Sparging LCP Chemicals Site, Brunswick, GA Mutch Associates, LLC



and EW-6 during 2012 and Phase 1-3 Sparging LCP Chemicals Site, Brunswick, GA

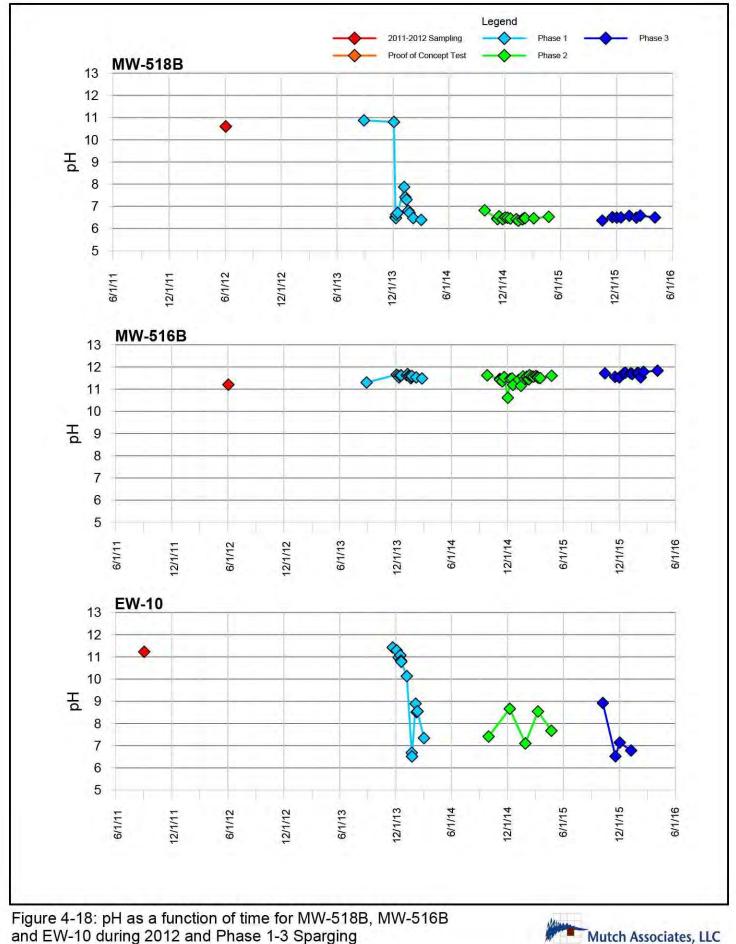


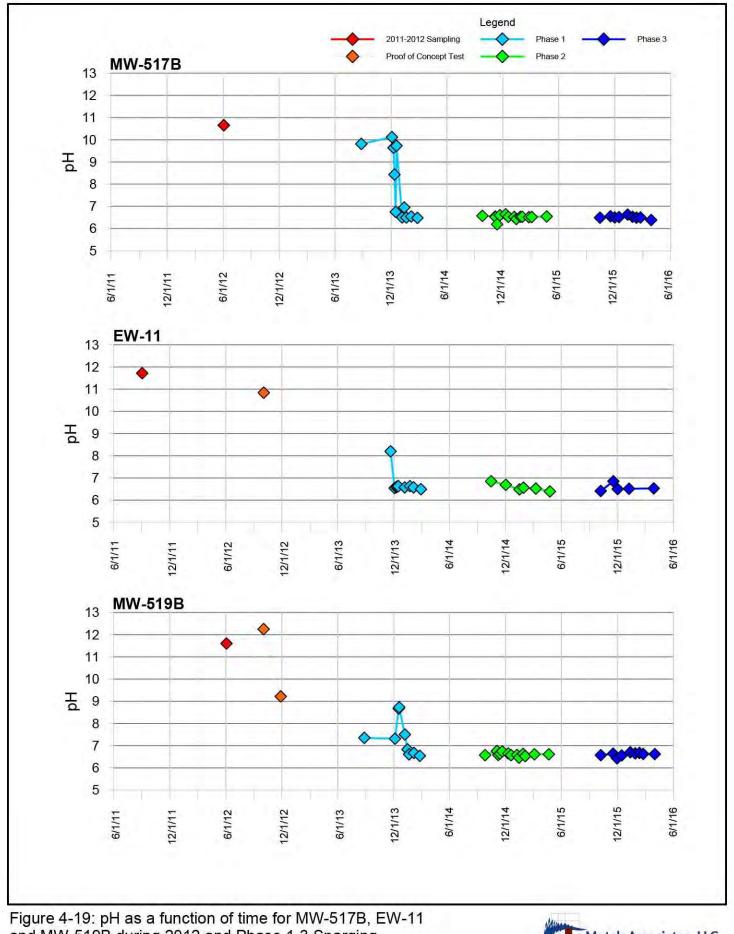
and MW-515B during 2012 and Phase 1-3 Sparging LCP Chemicals Site, Brunswick, GA



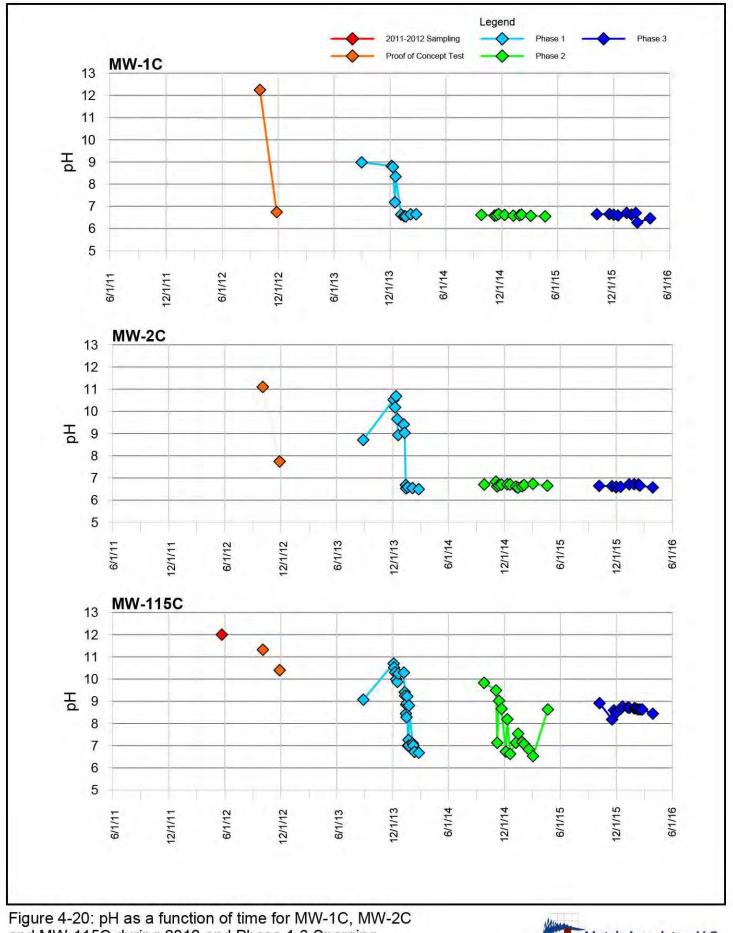
and EW-9 during 2012 and Phase 1-3 Sparging

LCP Chemicals Site, Brunswick, GA

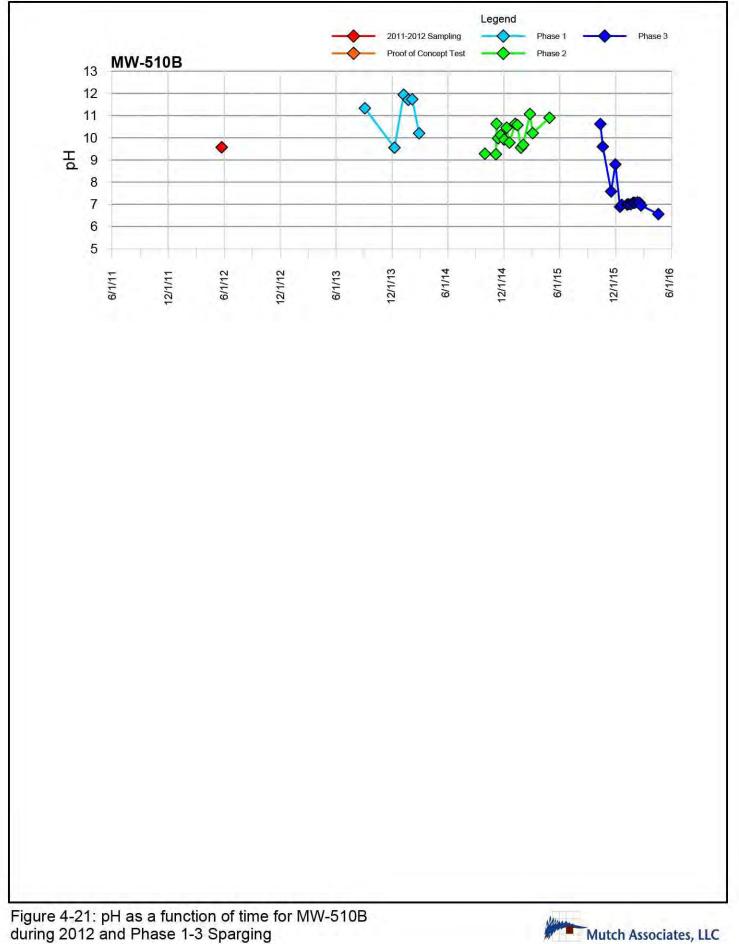


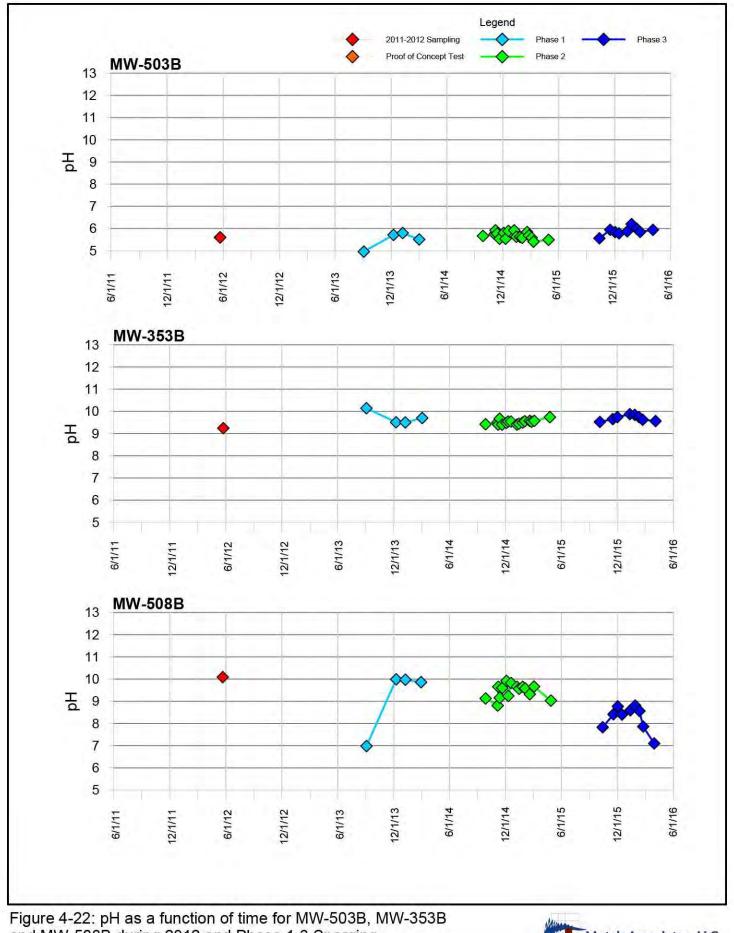


and MW-519B during 2012 and Phase 1-3 Sparging LCP Chemicals Site, Brunswick, GA

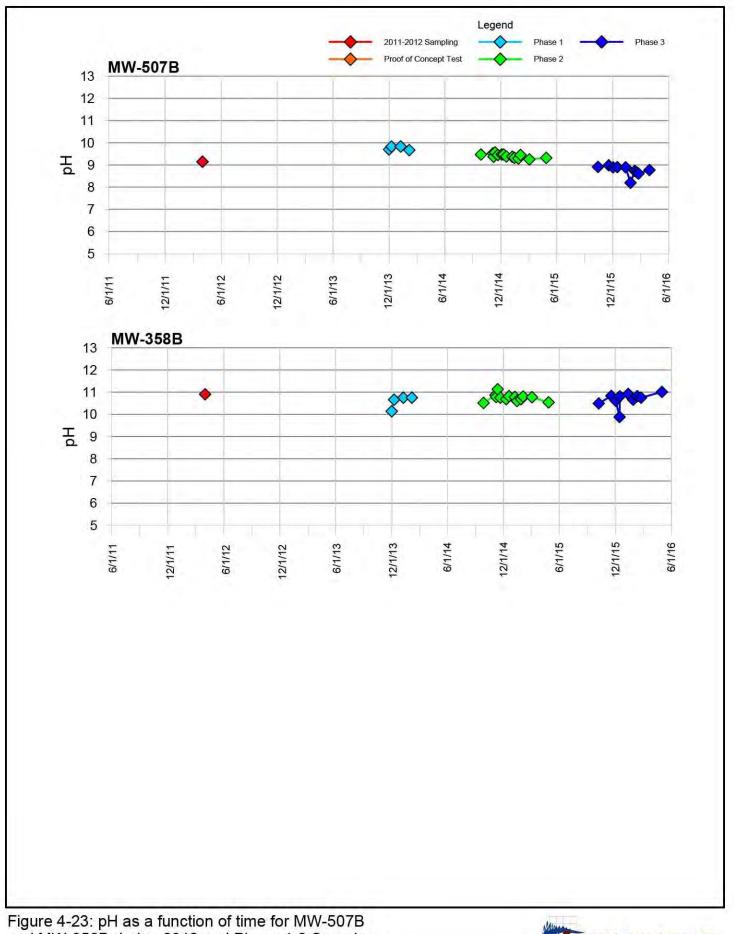


and MW-115C during 2012 and Phase 1-3 Sparging LCP Chemicals Site, Brunswick, GA Mutch Associates, LLC

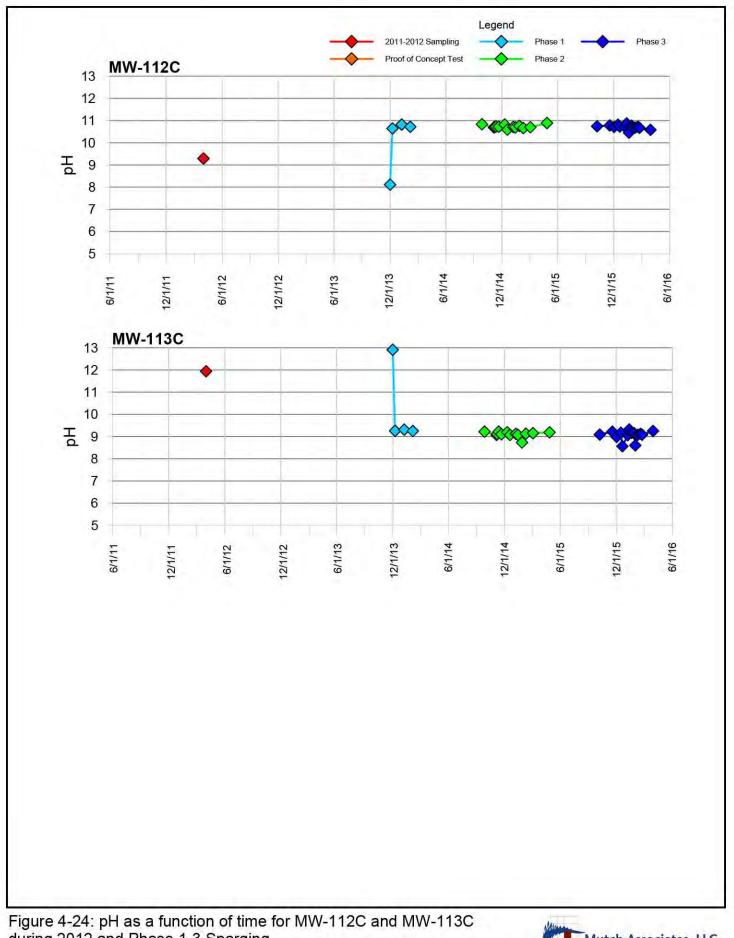




and MW-508B during 2012 and Phase 1-3 Sparging LCP Chemicals Site, Brunswick, GA









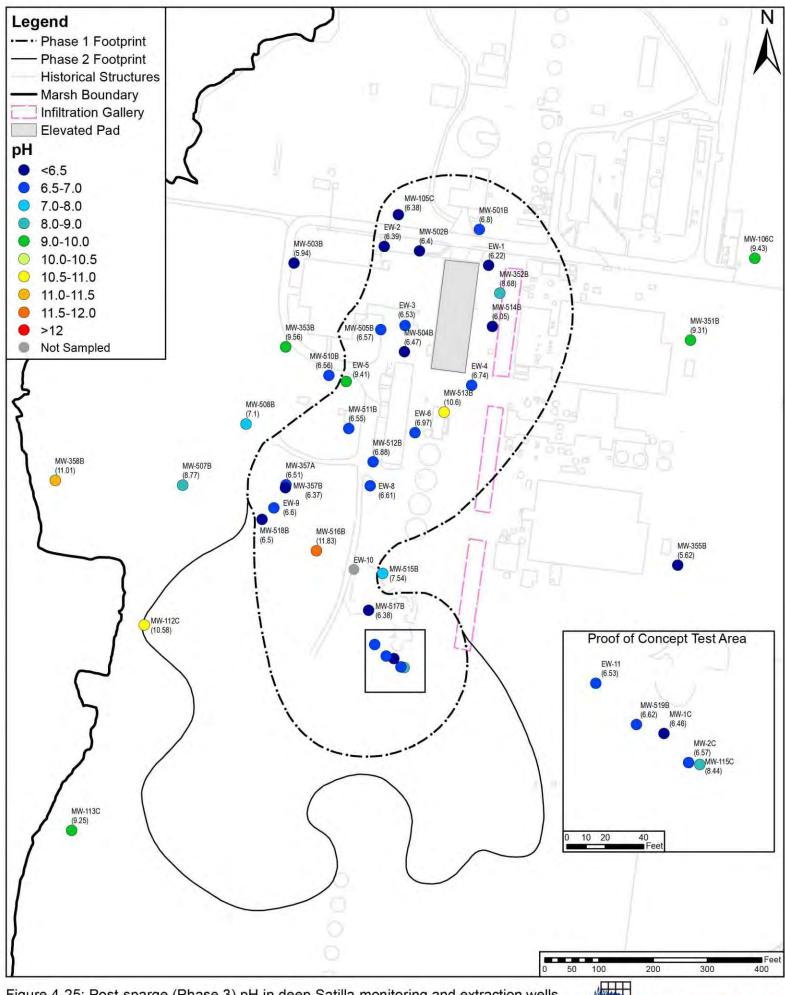
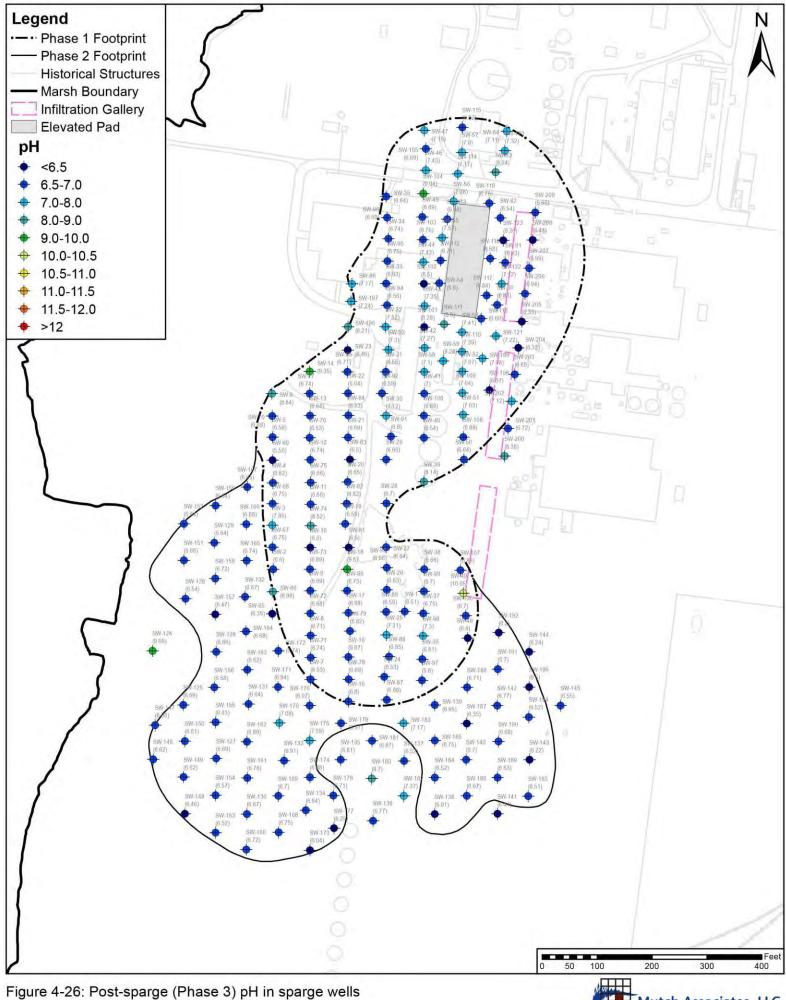


Figure 4-25: Post-sparge (Phase 3) pH in deep Satilla monitoring and extraction wells *LCP Chemicals Site*, Brunswick, GA



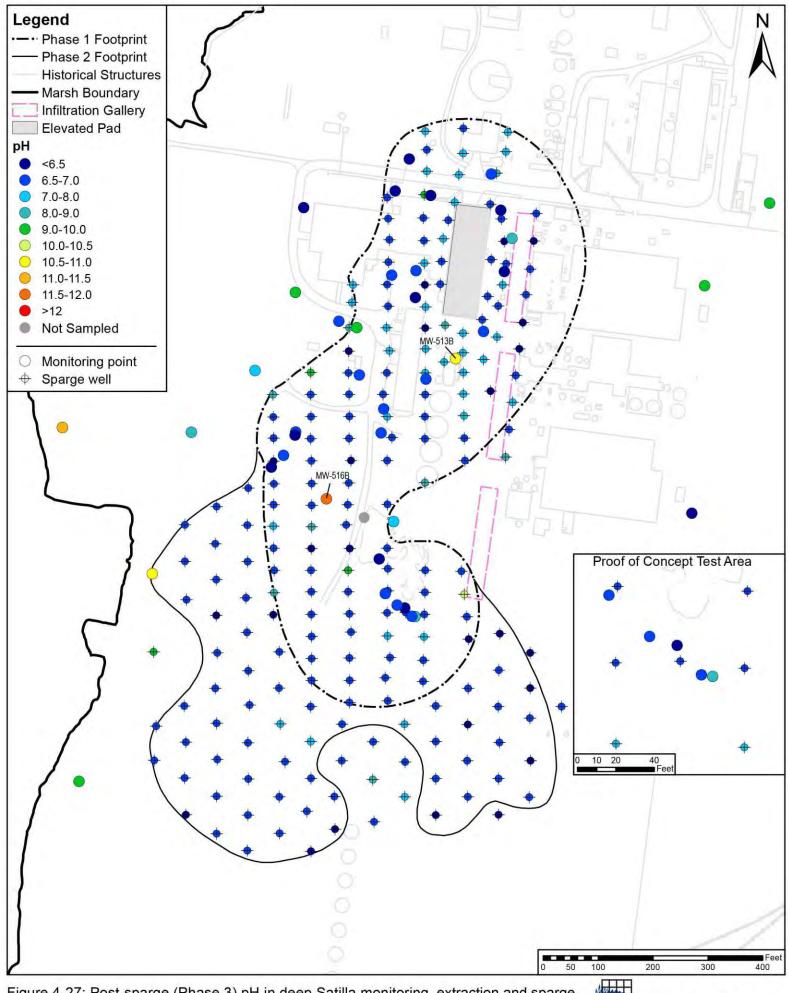
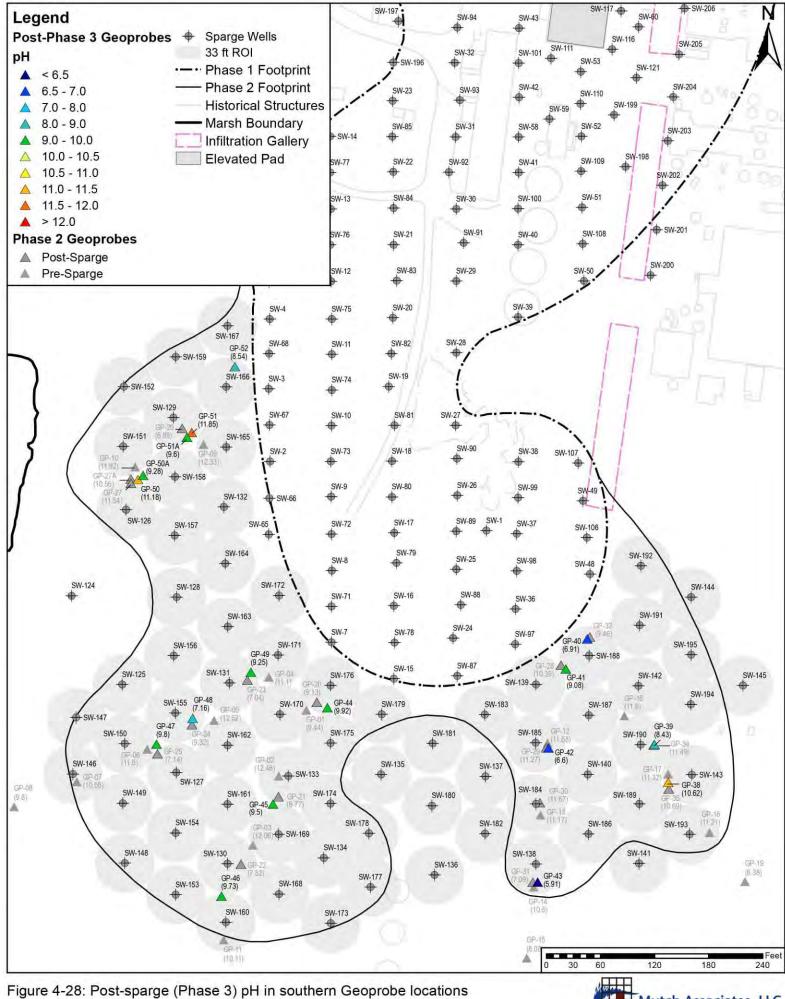


Figure 4-27: Post-sparge (Phase 3) pH in deep Satilla monitoring, extraction and sparge wells LCP Chemicals Site, Brunswick, GA



LCP Chemicals Site, Brunswick, GA

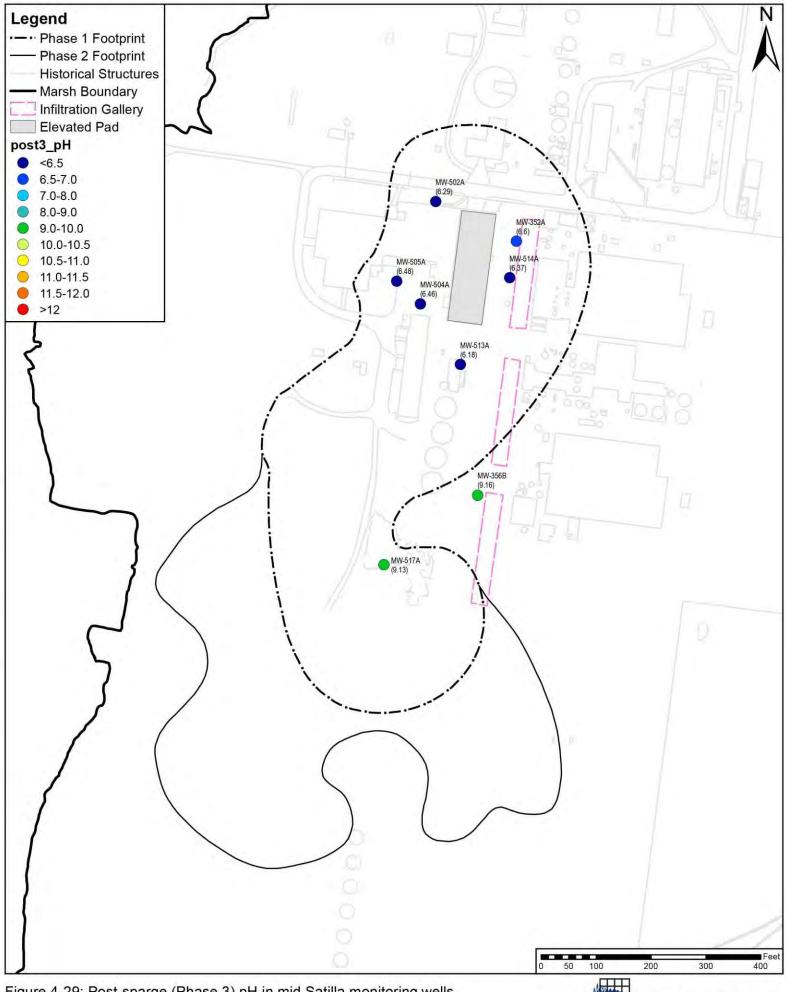


Figure 4-29: Post-sparge (Phase 3) pH in mid Satilla monitoring wells *LCP Chemicals Site*, Brunswick, GA

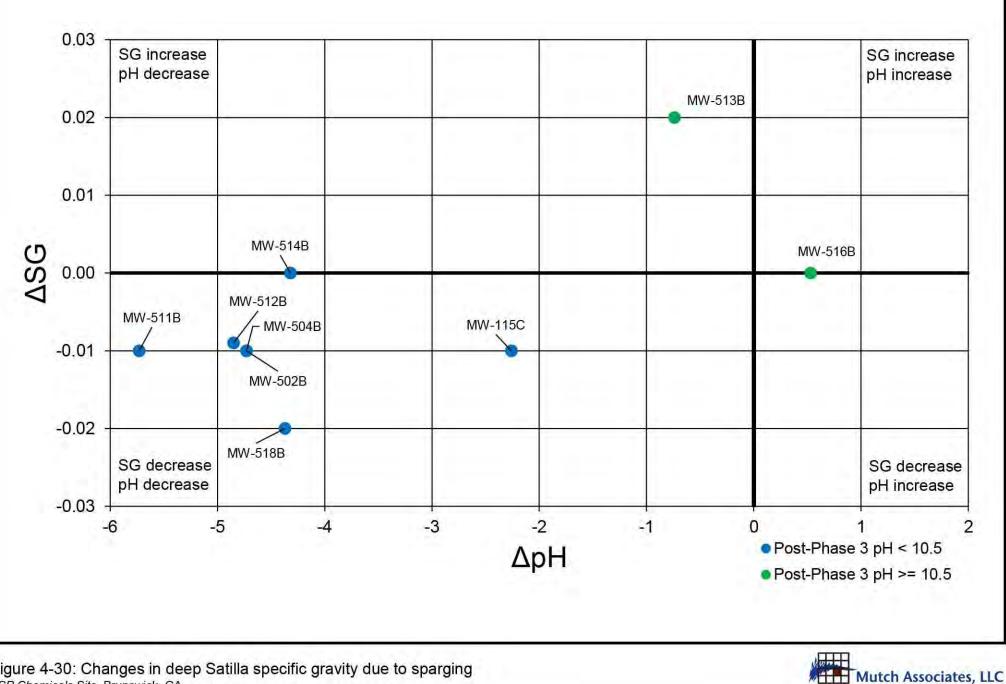


Figure 4-30: Changes in deep Satilla specific gravity due to sparging LCP Chemicals Site, Brunswick, GA

Environmental Engineers and Scientists

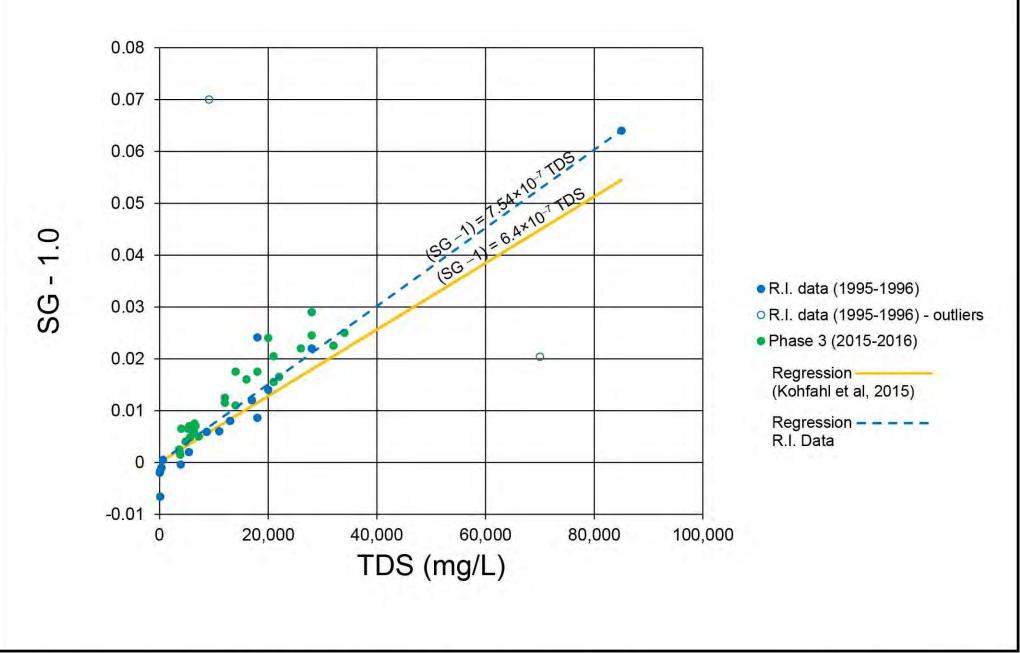


Figure 4-31: Relationship between specific gravity and TDS for deep Satilla groundwater *LCP Chemicals Site,* Brunswick, GA



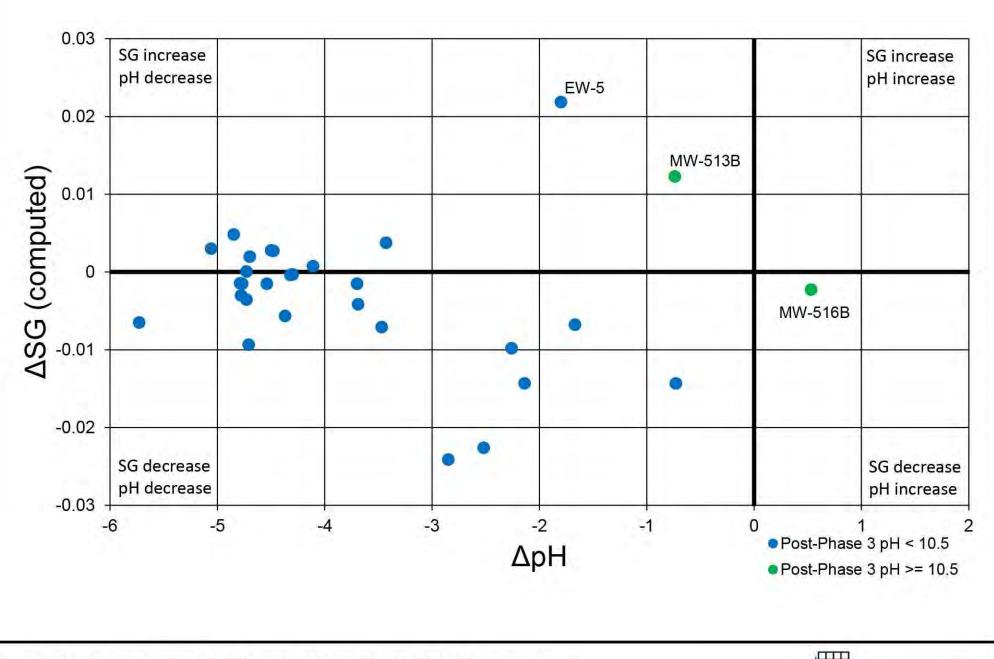


Figure 4-32: Changes in deep Satilla computed specific gravity due to sparging *LCP Chemicals Site*, Brunswick, GA



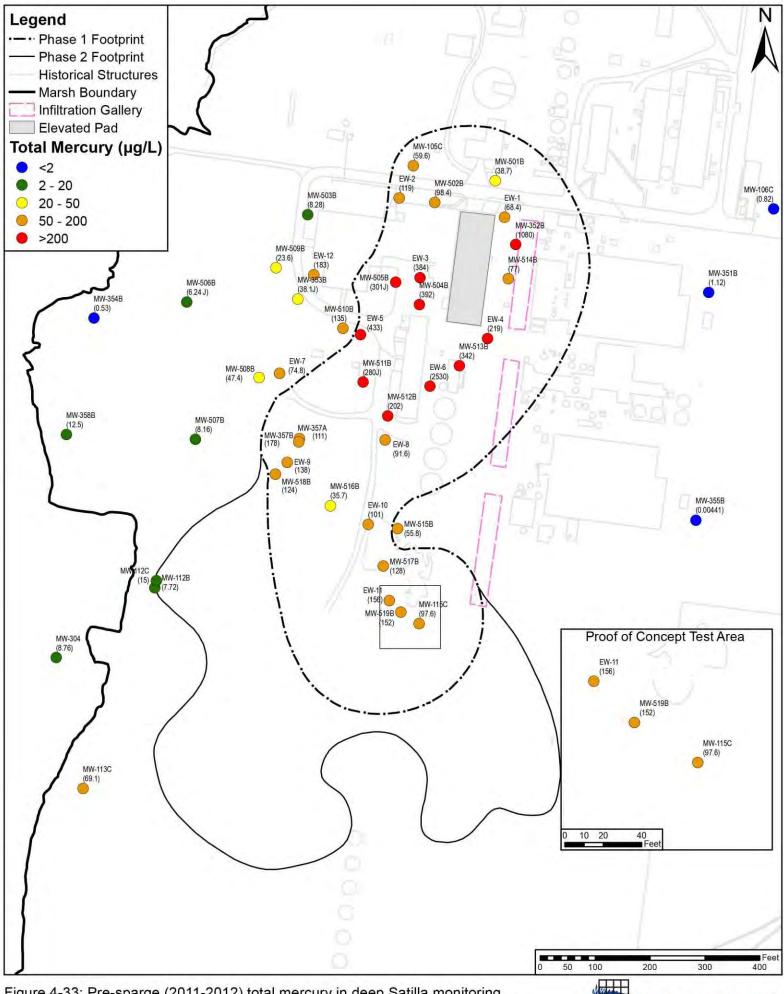


Figure 4-33: Pre-sparge (2011-2012) total mercury in deep Satilla monitoring and extraction wells *LCP Chemicals Site*, Brunswick, GA



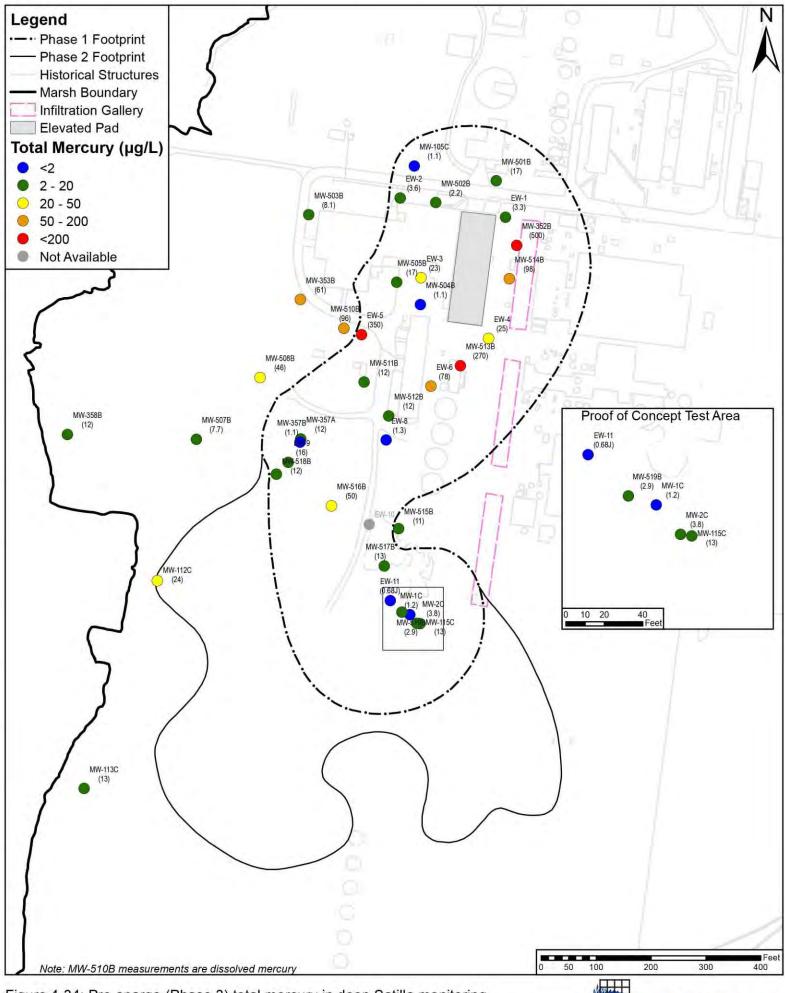


Figure 4-34: Pre-sparge (Phase 3) total mercury in deep Satilla monitoring and extraction wells *LCP Chemicals Site*, Brunswick, GA

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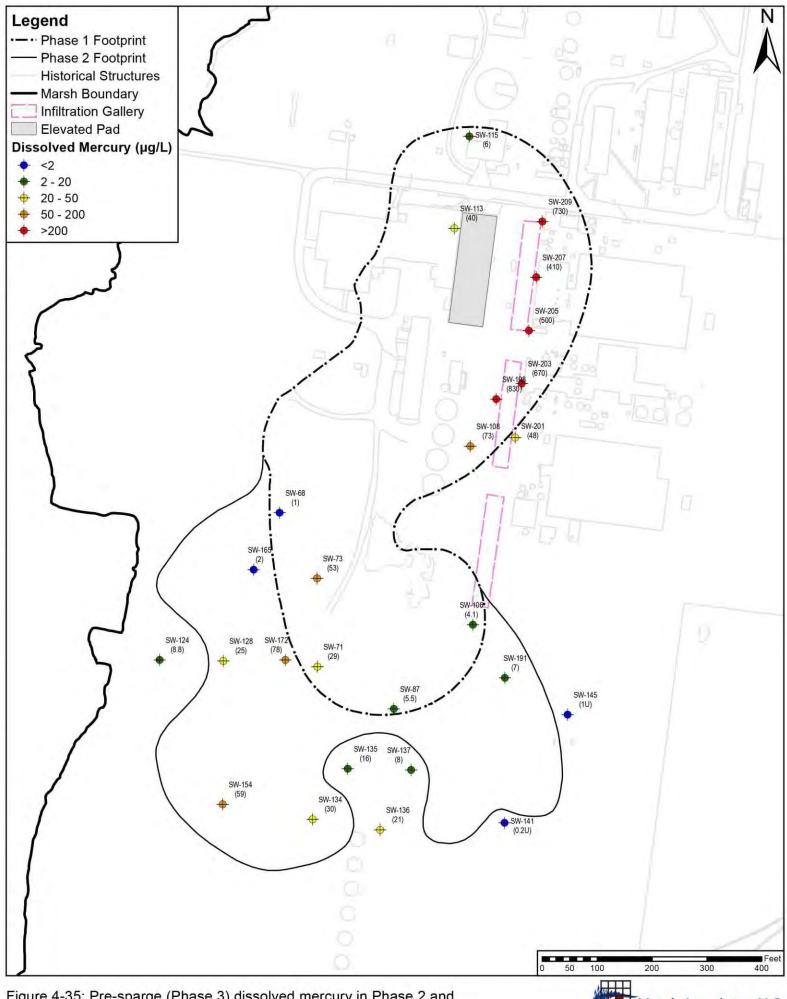


Figure 4-35: Pre-sparge (Phase 3) dissolved mercury in Phase 2 and Phase 3 sparge wells *LCP Chemicals Site*, Brunswick, GA

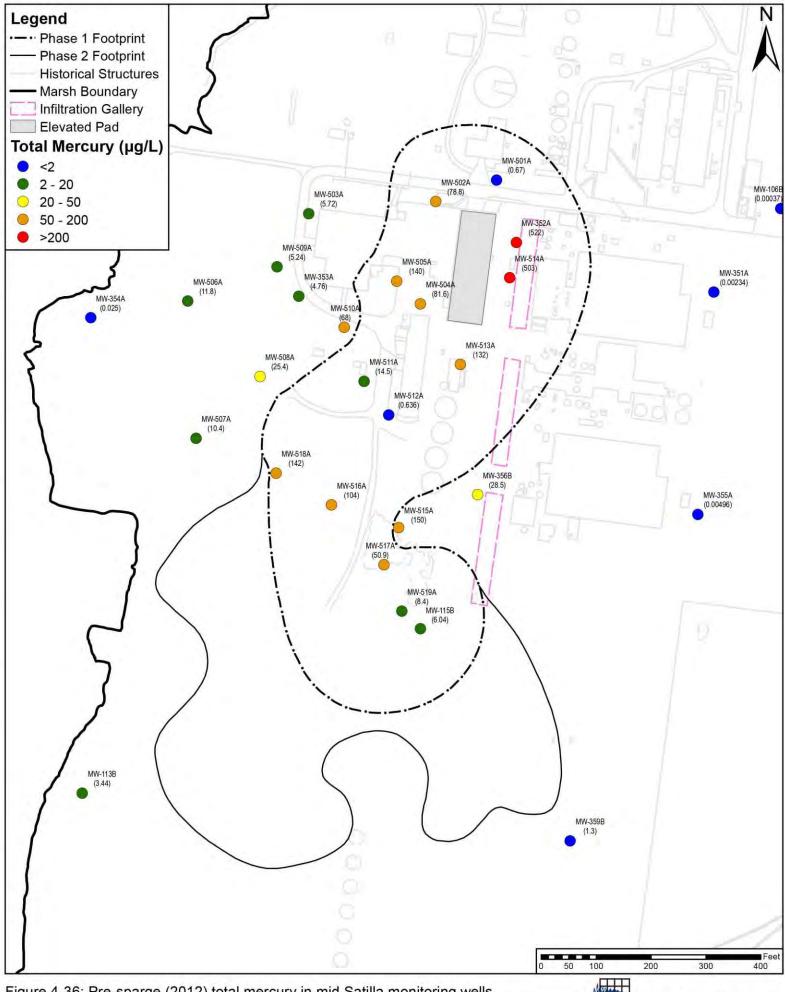


Figure 4-36: Pre-sparge (2012) total mercury in mid Satilla monitoring wells *LCP Chemicals Site*, Brunswick, GA

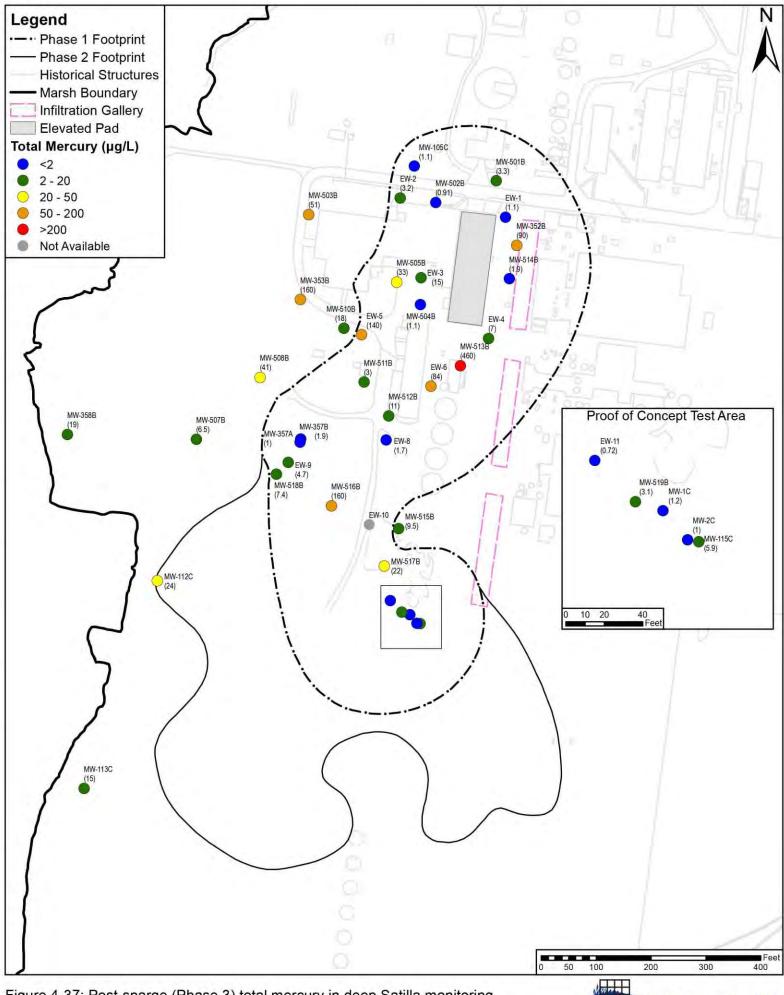


Figure 4-37: Post-sparge (Phase 3) total mercury in deep Satilla monitoring and extraction wells *LCP Chemicals Site*, Brunswick, GA

Environmental Engineers and Scientists

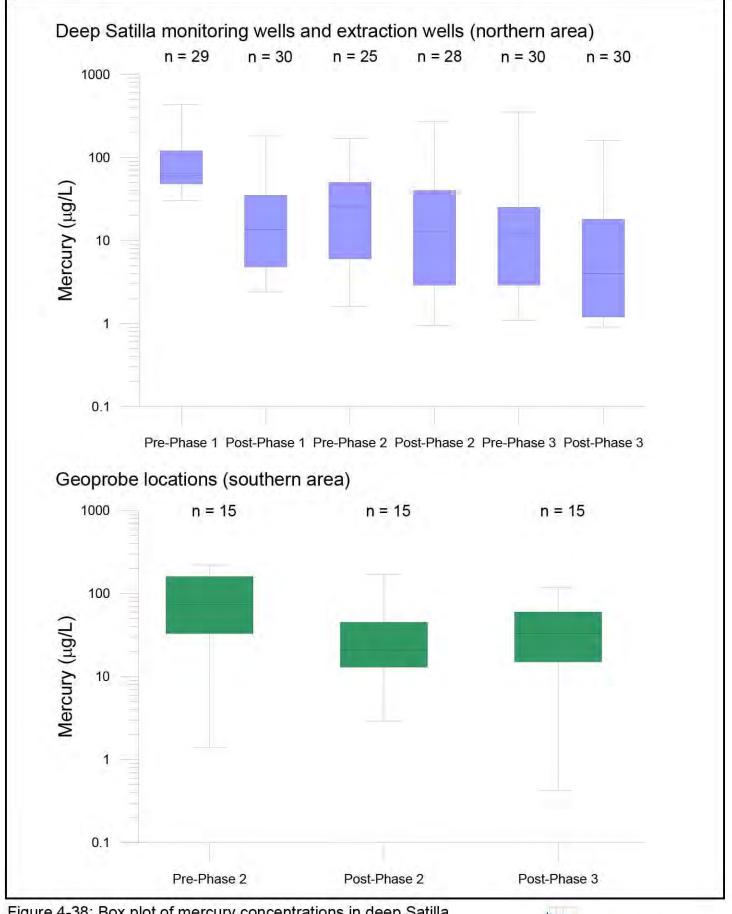


Figure 4-38: Box plot of mercury concentrations in deep Satilla monitoring locations *LCP Chemicals Site*, Brunswick, GA



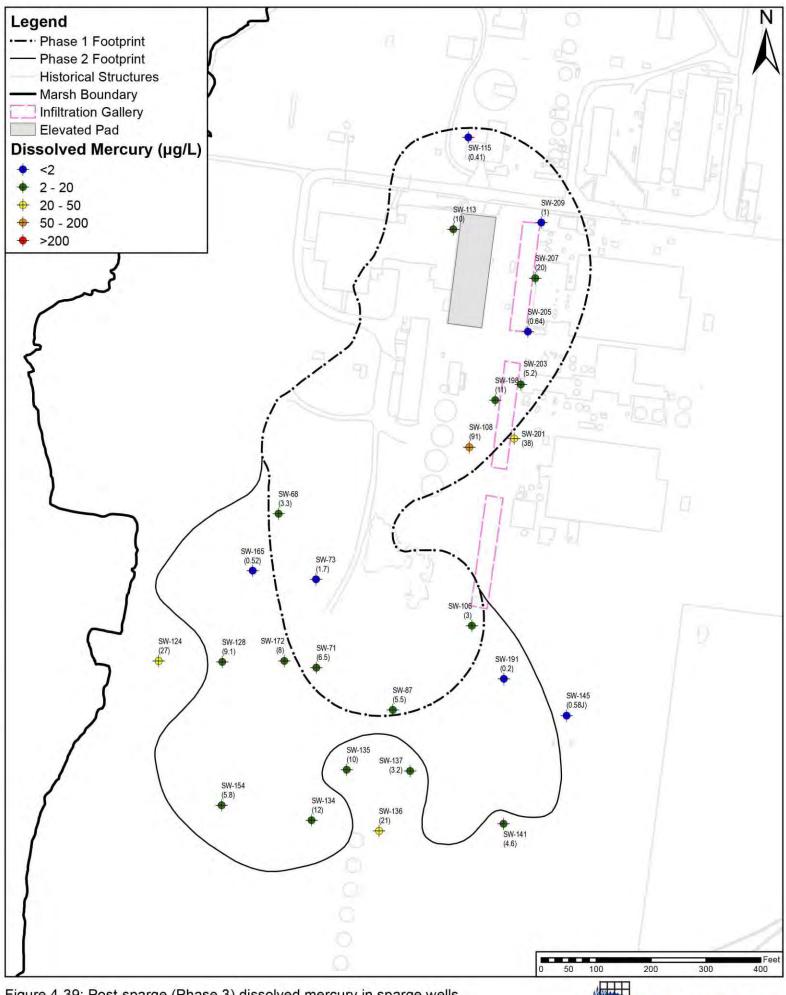


Figure 4-39: Post-sparge (Phase 3) dissolved mercury in sparge wells *LCP Chemicals Site*, Brunswick, GA

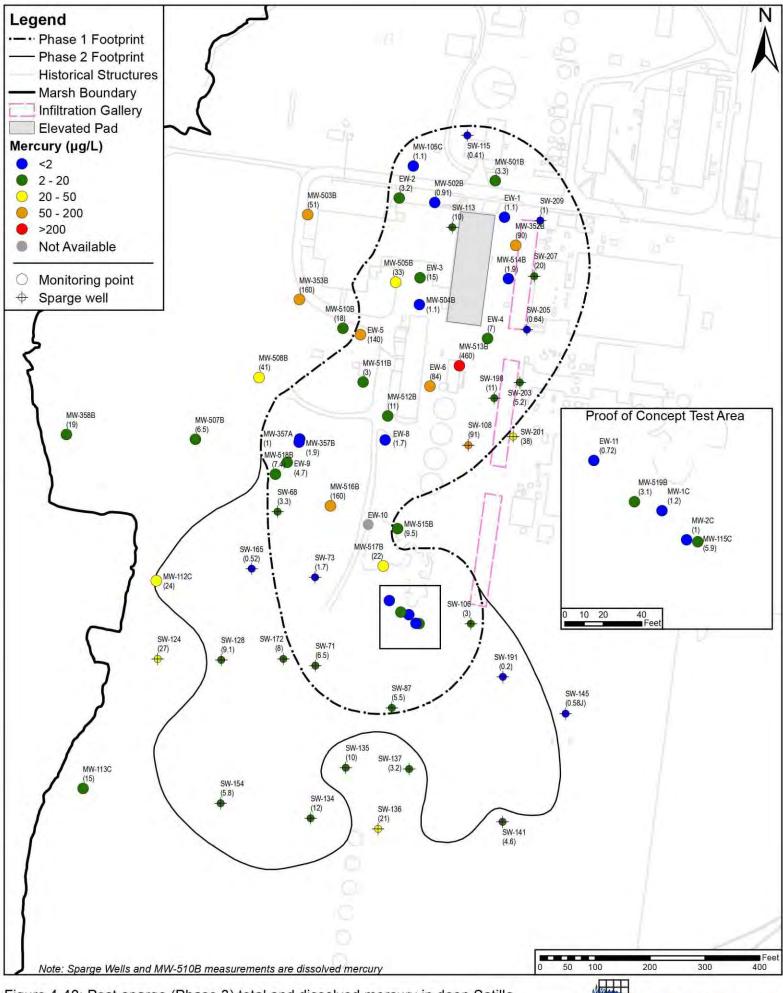
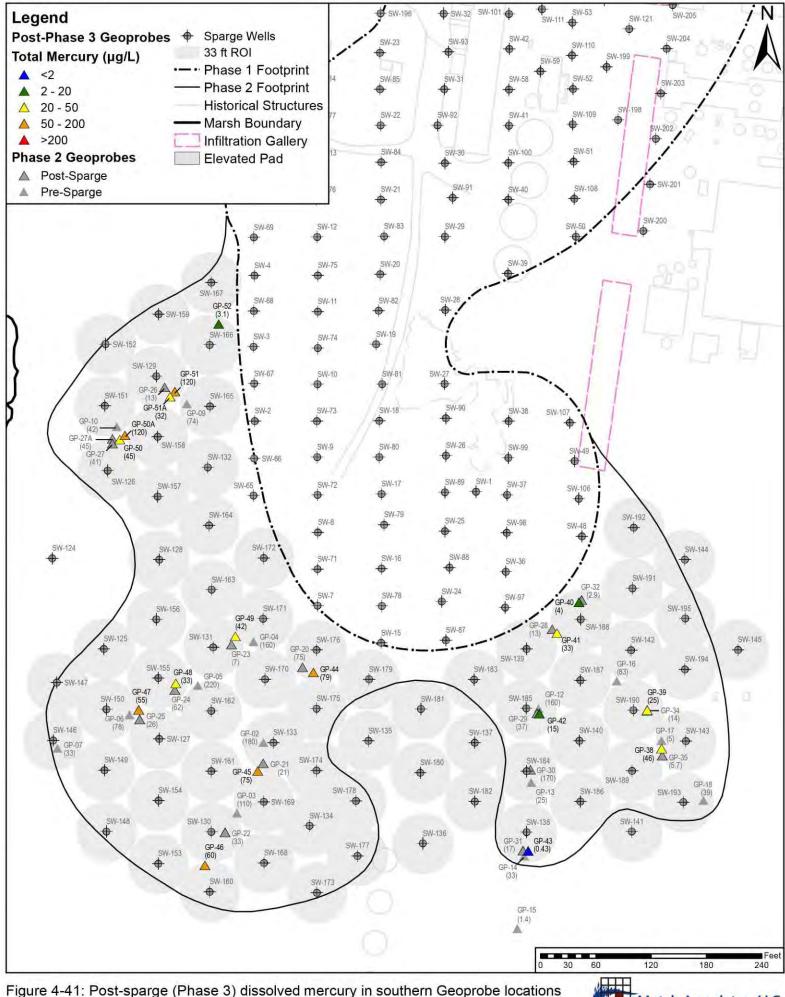


Figure 4-40: Post-sparge (Phase 3) total and dissolved mercury in deep Satilla monitoring, extraction and sparge wells *LCP Chemicals Site*, Brunswick, GA

Mutch Associates, LLC Environmental Engineers and Scientists



LCP Chemicals Site, Brunswick, GA

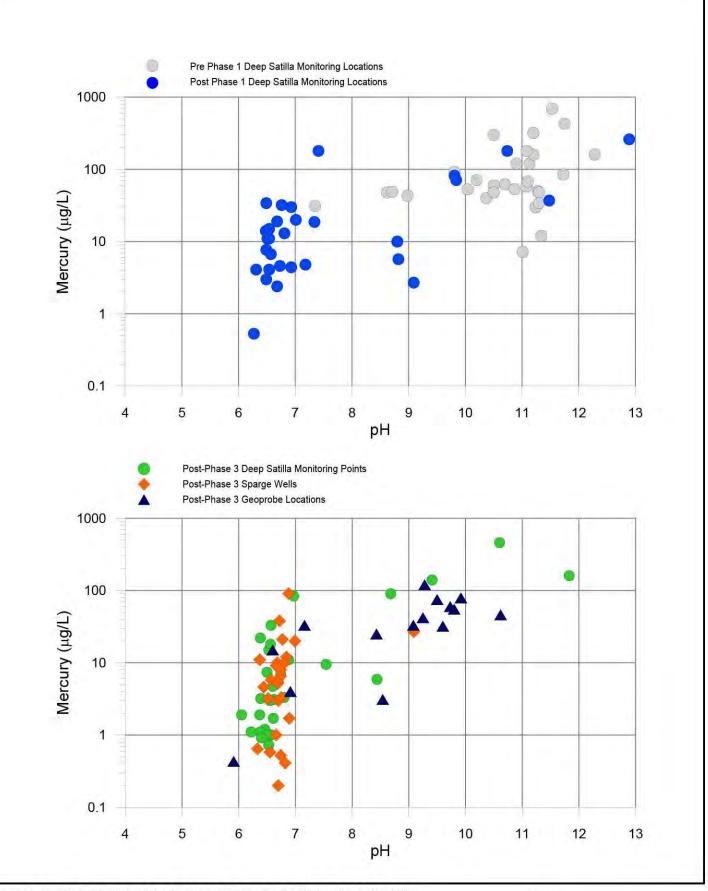


Figure 4-42: Relationship between Hg and pH in deep Satilla monitoring locations *LCP Chemicals Site*, Brunswick, GA



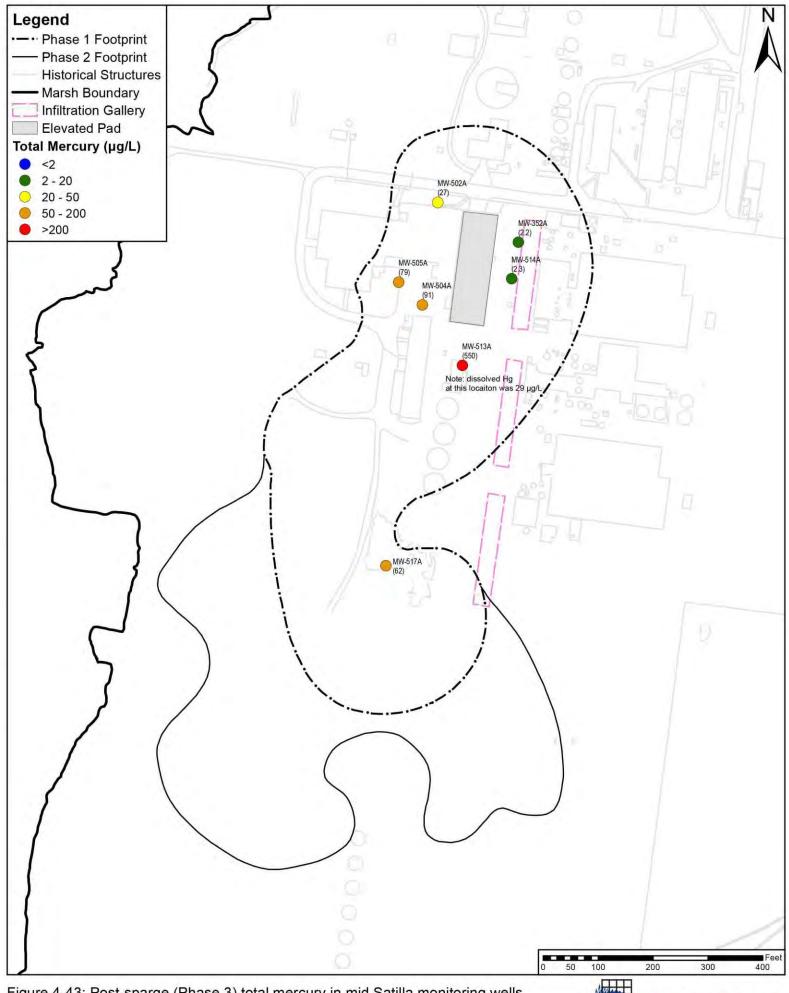
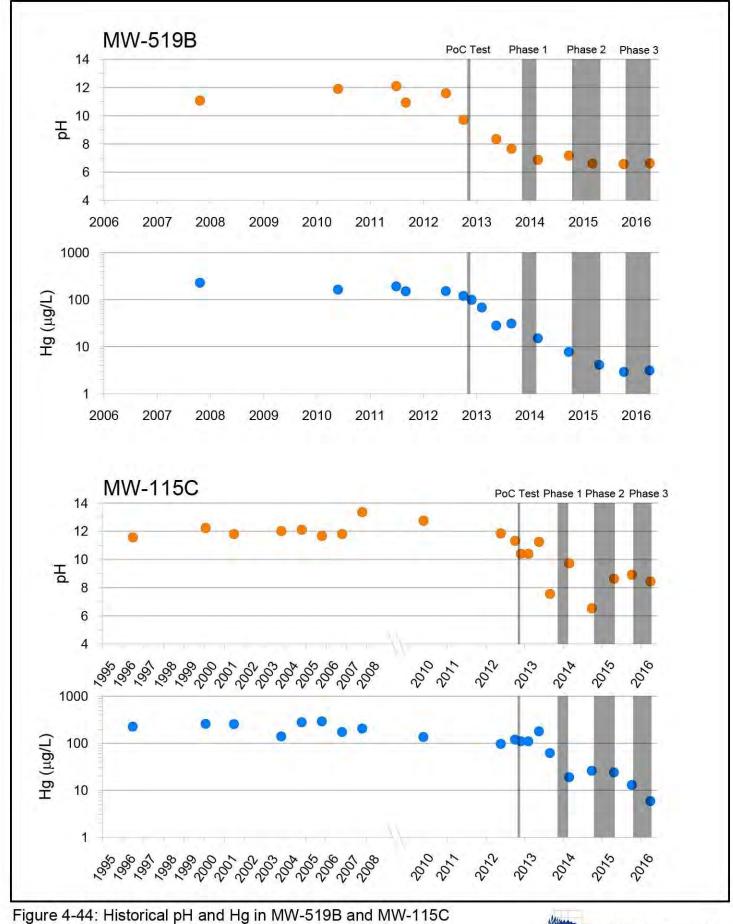


Figure 4-43: Post-sparge (Phase 3) total mercury in mid Satilla monitoring wells *LCP Chemicals Site*, Brunswick, GA

Environmental Engineers and Scientists



LCP Chemicals Site, Brunswick, GA

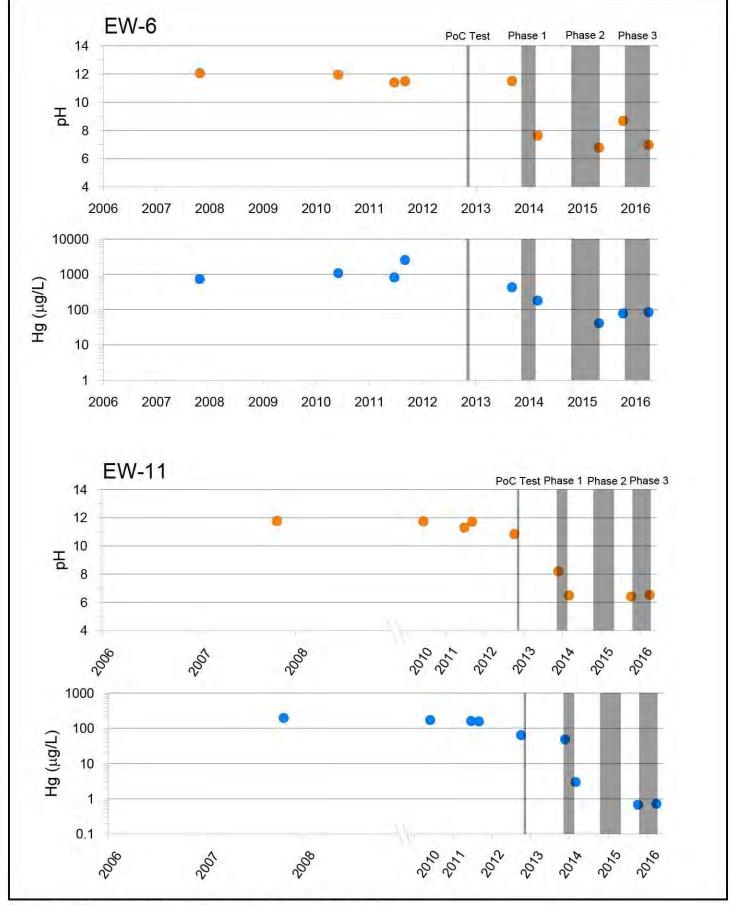
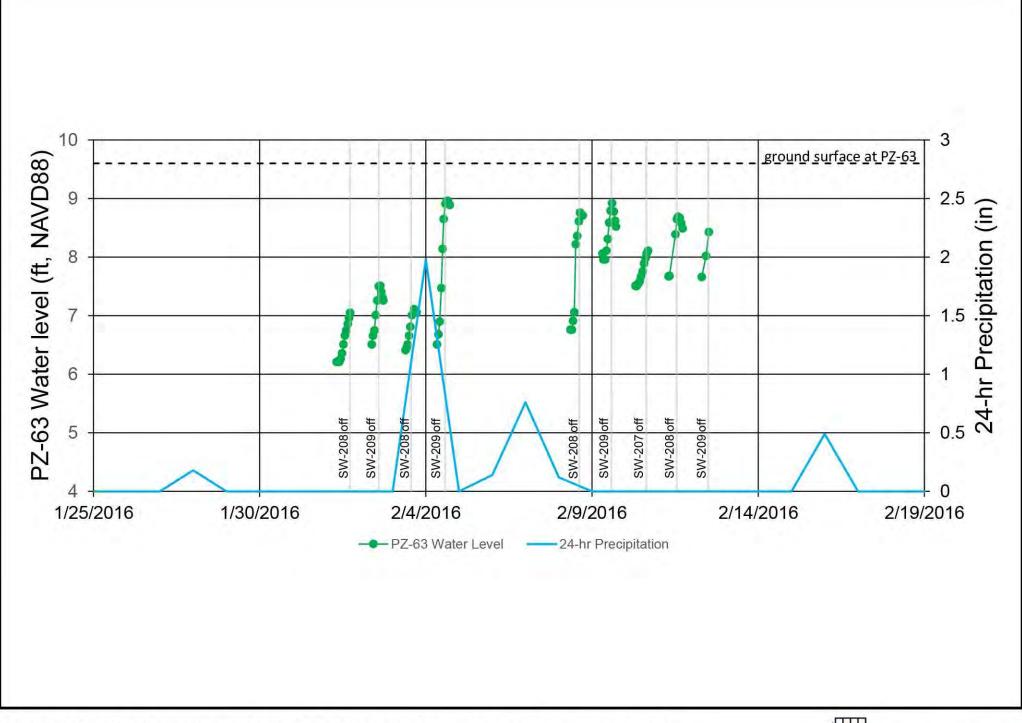
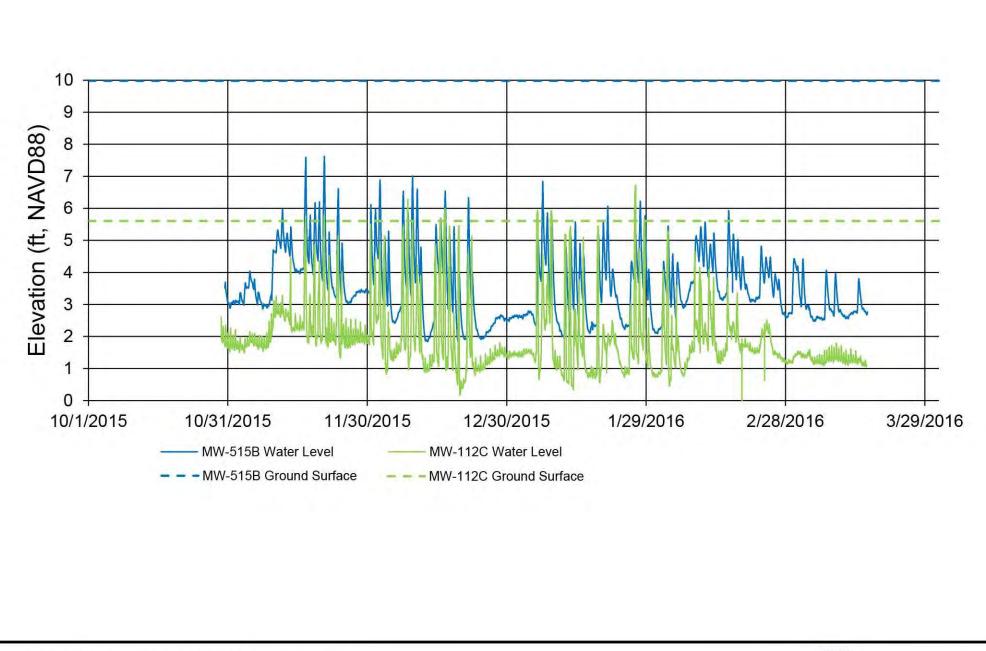


Figure 4-45: Historical pH and Hg in EW-6 and EW-11





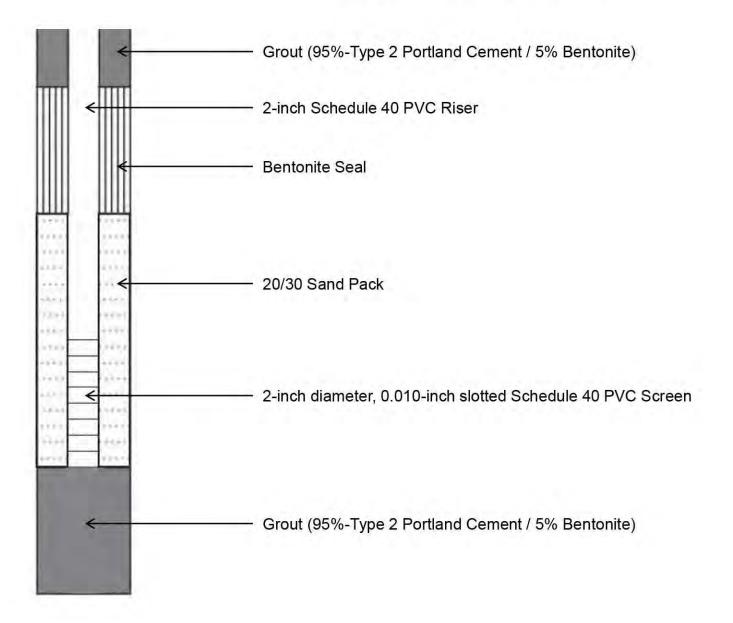






Appendix A: Boring Logs/Well Construction Diagrams

Well Construction Diagram Legend



Phase 1 Sparge Well Boring Logs

Easting Elevati	ig (ft): 4: g (ft): 86 lon (ft): 9 loptic 49	1479.13 9.75		Meth	od: Mud R	totary tch Aee	Associates 7		Datum: NAVD88 Coordinate System: NAD 1983 State Plane Georgia East / FIPS 100	
Depth Ft	Recov	ampie ID	Blow Count	PID (ppm)	Mercury (mg/m3)	USCS Code	Soli Description		Well Construction Diagram	
0 						ЗМ	Hand cleared to 5 feet, Inelailed with a slick up above ground aurises. Gray brown fine to medium SAND, trace sit.			
-										
- 0				1.8	0					
-										
-										
-										
-										

Easting Elevation	g (ft): 431 g (ft): 8614 on (ft): 9.7 pepth: 49.5	79.17 5		Meth Cons	r: Groundv od: Mud R sultant: Mu oct No: 448	totary tch Asso	otection Inc	Coor NAD	m: NAVD88 dinate Syster 1983 State Plane jia East / FIPS 10	
Depth Ft		nple	Blow Count	PID Mercury USCS (ppm) (mg/m3) Code Soil Description Brown gray drilling MUD, pH 7 to 8.					Well Construction Diagram	
20 +				1.6	0					

BORI			le	yw	Page 3 of 4	E	Site Name: _{LCP} Chemicals Site, Brunswick GA Boring No: SW-2 Diameter: 8 in Date: 08/08/2013				
Easting Elevati	g (ft): on (ft	: 431594.8 861479.1): 9.75 : 49.5 Ft		Meth Cons	er: Ground od: Mud R sultant: Mu ect No: 448	Rotary Itch Ass	rotection Inc Datum: NAVD88 Coordinate System NAD 1983 State Plane Georgia East / FIPS 10				
Depth Ft	Recov	Sample ID	Blow Count	PID (ppm)	Mercury (mg/m3)	10.00	Construction				
+											
35				1.6	O						
35			9 12 13	1.6	0	SM SM/ML	Gray fine to coarse SAND, trace silt. Gray fine to coarse SAND, trace silt, layer 2 inch clay and silt.				
-			12				Gray fine to coarse SAND, trace silt, layer 2 inch clay and silt. Gray fine to coarse SAND, trace silt.				
-			12 13 14 11	0	0	SM/ML	Gray fine to coarse SAND, trace silt, layer 2 inch clay and silt.				

BORI			le	yw	Page 4 of 4	Site Name: _{LCP} Chemicals Site, Br Boring No: SW-2 Diameter: 8 in Date: 08/08/2013	runswick GA		
Easting Elevati	g (ft): ion (ft): 431594.8 861479.1 1): 9.75 : 49.5 Ft		Meth Cons	r: Groundv od: Mud R sultant: Mu ect No: 448	otary tch Ass	rotection Inc ociates	Datum: NAVD88 Coordinate System: NAD 1983 State Plane Georgia East / FIPS 1001	
Depth Ft	Recov	Sample ID	Blow Count	PID (ppm)	Mercury (mg/m3)		Soil Description	Well Construc Diagrar	tion
45			19 23			SM	Gray fine to medium SAND, little silt, little white shell fragments.		Ш
Ť			14 19	0	o	SM	Gray fine to medium SAND, trace silt, trace white shell fragments.	e	
Ŧ		1.1	20				Gray fine to medium SAND, trace silt, trace white shell fragments.	e	****
			23			SM	and nayments.		- 1+
÷		10			SM	Gray fine to medium SAND, trace silt.		***	
		10		0	CM	Gray line to medium SAND, trace silt.			
+			17	0	U	SIVI	the second second second		101

Easting Elevatio	(ft): 2n (ft;	: 431675.4 861477.7): 9.10 49.0 Ft		Meth	r: Groundh od: Mud R ultani: Mu ct No: 448	totary tch Aee	ociation linc	Coo NAD	Datum: NAVD88 Coordinate System: AD 1983 State Plane Georgia East / FIPS 100	
Depth	Recov	Sample ID	Blow Gount	PID	Mercury (mg/m3)		Soli Description		Well Construction Diagram	
s						3M	Hand cleaned to 5 feet, inelaidd with a sild: up silone ground surface. Gaty brown fine is medium SAND, trace all.			
10				73	0					

orthing (ft) asting (ft): levation (ft otal Depth:	861477.79): 9.10		Meth Cons	r: Groundv od: Mud R sultant: Mu oct No: 448	otary tch Ass	rotection Inc	Coor NAD 1	m: NAVD88 rdinate System 1983 State Plane jia East / FIPS 100
epth open ft and		Blow Count	PID (ppm)	Mercury (mg/m3)		Soil Description	Well Construction Diagram	
-								
+			7.7	D				

BORING LC	DG	

Page 3 of 4

Site Name: LCP Chemicals Site, Brunswick GA Boring No: SW-3 Diameter: 8 in Date: 08/08/2013

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U		C,		en	

Eastin Elevat	ig (ft): tion (fl	: 431675. 861477.7 :): 9.10 : 49.0 Ft		Meth Cons	er: Ground od: Mud R sultant: Mu ect No: 448	totary	otection Inc	Datum: NAVD88 Coordinate System: NAD 1983 State Plane Georgia East / FIPS 100		
Depth Ft 30	Recov	Sample ID	Blow Count	PID (ppm)	Mercury (mg/m3)	USCS Code	Soil Description Brown gray drilling MUD, pH 7 to 8.	Well Construction Diagram		
*										
				7.7	D					
+			11 10	0	0	SC	Gray fine to medium SAND, and silt and clay.			
		- 54	10 13			sc	Gray fine to medium SAND, and silt and clay.			
			12	0	D.	SM	Gray fine to medium SAND, trace silt, trace wh shell fragments.	ite		
-		1	13							
+		2				SM	Gray fine to medium SAND, trace silt, trace wh shell fragments.	ite		

BORIN			le	yw	Page 4 of 4	E	Site Name: _{LCP} Chemicals Site, Bi Boring No: SW-3 Diameter: 8 in Date: 08/08/2013	runswi	ck GA	
Northing (ft): 431675.46 Easting (ft): 861477.79 Elevation (ft): 9.10 Total Depth: 49.0 Ft Depth & Sample Blow				Meth Cons	er: Groundv od: Mud R sultant: Mu ect No: 448	totary			Datum: NAVD88 Coordinate System: NAD 1983 State Plane Georgia East / FIPS 100	
Depth	Recov	Sample	Blow	PID	Mercury	USCS			Well Construction	
Ft 45	Å	ID	Count 24	(ppm)	(mg/m3)	Code	Soil Description Gray fine to medium SAND, trace silt, trace whit	6	Diagram	
			30	-		SM	shell fragments.		ana ana	
+			17			-	Gray fine to medium SAND, trace silt, trace whit	te	1000 - 1000 1000 - 1000	
-			26	0	0	SM	shell fragments.	- I		
			37			Gray fine to medium SAND, trace silt, trace white shell fragments.		1111		
13			42			SM	snell tragments.	1	4	
Ť			14		1.01	and a borne	Gray fine to medium SAND, some silt, trace whi shell fragments, cemented sandstone in tip.	te	Test Tree	
201			32	0	0	SM/R	shen nagments, cemented sandstone in up.	(m)		
49.0			v	Vell Set at 4	8 ft.	-				

Easting Elevatio	g (ft): 431752 (ft): 861476.7 en (ft): 9.01 aptin: 50.42 Fi	76	Meth	r: Ground Iod: Mud R Iultani: Mu Iot: No: 446	totary tch A ee	otection inc oclatee	Coordi NAD 19	Datum: NAVD88 Coordinate System: IAD 1983 State Plane Seorgia East / FIPS 100	
Depth Ft	Sample	Blow	PID (ppm)	Mercury (mg/m3)	1.0.000	Soli Description		Well Construction Diagram	
0 - - - - - -					SM	Hand cleared to 3 feet, installed with a slick up ground surface. Gasy brown fine to medium BA trace elit.	ND,		
10 -			0.5	0					
-									
-									
-									

Easting Elevation	(ft): on (ft	: 431752.0 861478.7): 9.01 50.42 Ft	6	Driller: Groundwater Method: Mud Rotary Consultant: Mutch A Project No: 448517				Coor NAD 1	Datum: NAVD88 Coordinate System: NAD 1983 State Plane Georgia East / FIPS 1001	
Depth Ft	Recov	Sample ID	Blow Count	PID (ppm)	Mercury (mg/m3)		Soil Description	Well Construction Diagram		
20				0.5	D					

	-	.og O	le	yw	Page 3 of 4	E	Site Name: _{LCP} Chemicals Site, Brunswick GA Boring No: SW-4 Diameter: 8 in Date: 07/31/2013			
Northing (ft): 431752.69 Easting (ft): 861478.76 Elevation (ft): 9.01 Total Depth: 50.42 Ft				Driller: Groundwater F Method: Mud Rotary Consultant: Mutch Ass Project No: 448517					Datum: NAVD88 Coordinate System NAD 1983 State Plane Georgia East / FIPS 10	
Depth	Recov	Sample	Blow	PID	Mercury	USCS			Well Construction Diagram	
Ft 30	Re	ID	Count	(ppm)	(mg/m3)	Code	Soil Description Brown gray drilling MUD, pH is 7.		Diagram	
-										
35				0.5	0					
35			17	0.5	0	CL	Gray CLAY, medium plasticity.			
			15			CL				
			15 11			CL	Gray CLAY, medium plasticity. Gray fine to coarse SAND, trace silt.			
			15 11 11			-	Gray fine to coarse SAND, trace silt. Gray fine to coarse SAND, trace silt, trace gra	vel,		
			15 11 11 11			-	Gray fine to coarse SAND, trace silt.	vel,		
			15 11 11	0	0	SM	Gray fine to coarse SAND, trace silt. Gray fine to coarse SAND, trace silt, trace gra trace white shell fragments. Gray fine to coarse SAND, trace silt, trace gra			
			15 11 11 11 11 17	0	0	SM	Gray fine to coarse SAND, trace silt. Gray fine to coarse SAND, trace silt, trace gra trace white shell fragments.			
			15 11 11 11 17 25	0	0	SM SM	Gray fine to coarse SAND, trace silt. Gray fine to coarse SAND, trace silt, trace gra trace white shell fragments. Gray fine to coarse SAND, trace silt, trace gra	vel,		

BORING LOG

Page 4 of 4

Site Name: LCP Chemicals Site, Brunswick GA Boring No: SW-4 Diameter: 8 in Date: 07/31/2013

Honeywell Diameter Date: 07/

Northing (ft): 431752.69 Easting (ft): 861478.76 Elevation (ft): 9.01 Total Depth: 50.42 Ft			Meth Cons	er: Groundv od: Mud R sultant: Mu ect No: 448	otection Inc	Datum: NAVD88 Coordinate System: NAD 1983 State Plane Georgia East / FIPS 1001		
Depth Ft	Recov	Sample ID	Blow Count	PID (ppm)	Mercury (mg/m3)		Soil Description	Well Construction Diagram
45			27	- 0	0	SM	Gray fine to coarse SAND, trace silt, trace white shell fragments.	9
			29					
			13			SM	Gray fine to medium SAND, trace silt, trace whi shell fragments.	ite
			22					++++ (417
			28			SM	Gray fine to medium SAND, trace silt, trace w shell fragments.	te
			31					1444 (A-6) 1481 (A-6)
			15			SM	Gray fine to medium SAND, trace silt, trace whit shell fragments.	te contra contra
			22				show negmonal	
+			14				Gray fine to medium SAND, trace silt, trace whi shell fragments, pH 10.	te
		1.1	14			SM	ana nagnana, pri tai	
50 + 50.42			50	0	0	SM	Gray fine to coarse SAND, trace gravel, weakly comented sandstone.	1044

Easting Elevation	g (ft): on (ft	: 431835. 861478.1): 9.00 : 50.9 Ft		Meth Cons	r: Groundv od: Mud R sultant: PA oct No: 448	totary RSONS	rotection Inc	Datum: NAVD88 Coordinate System: NAD 1983 State Plane Georgia East / FIPS 100		
Depth Ft	Recov	Sample ID	Blow Count	PID (ppm)	Mercury (mg/m3)	USCS Code	Soil Description		Well Construction Diagram	
5 + +				0.0	0.000					
10 +										

BORING		le	yw	Page 2 of 4	Boring	ame: _{LCP} Chemicals Site 9 No: SW-5 eter: 8 in 07/30/2013	e, Brunsw	ick GA
Northing (ft Easting (ft) Elevation (f Total Depth	: 861478.1 ft): 9.00		Meth Cons	er: Ground od: Mud R sultant: PA ect No: 448	RSONS	on Inc	Coo	m: NAVD88 rdinate Sys 1983 State Pla gia East / FIPS
Depth o	Sample ID	Blow Count	PID (ppm)	Mercury (mg/m3)	USCS Code	Soil Description		Well Construc Diagrar
20			0.0	0.000				

		.og O	ıe,	yw	Page 3 of 4	E	Site Name: _{LCP} Chemicals Site, Boring No: SW-5 Diameter: 8 in Date: 07/30/2013	Brunsw	ick GA
Easting Elevation	g (ft): on (ft	: 431835. 861478.1): 9.00 : 50.9 Ft		Meth Cons	r: Groundv od: Mud R sultant: PA oct No: 448	otary RSONS	rotection Inc	Cool	m: NAVD88 rdinate Syster 1983 State Plane gia East / FIPS 10
Depth Ft	Recov	Sample ID	Blow Count	PID (ppm)	Mercury (mg/m3)		Call Decedeties		Well Constructior Diagram
35 +				0.0	0.000				
+									
40 -			6	0.0	0.000		Medium to coarse SAND, trace fine sand, fin medium sand at bottom of sample, little silt of	le trace	
40 -			6	0.0	0.000	SM	Medium to coarse SAND, trace fine sand, fin medium sand at bottom of sample, little silt, t shells, wet.	ne trace	
40 -			7 8	0.0	0.000	SM	medium sand at bottom of sample, little silt, t	le trace	
40 -			7 8 5			SM	medium sand at bottom of sample, little silt, f shells, wet.	le trace	
40 +			7 8 5 3	0.0	0.000	SM	medium sand at bottom of sample, little silt, t	ne trace	
40			7 8 5 3 3			SM	medium sand at bottom of sample, little silt, f shells, wet.	ie Irace	
40 -			7 8 5 3 3 6				medium sand at bottom of sample, little silt, f shells, wet.	ne trace	
40 +			7 8 5 3 3 6 6	0.0	0.000		medium sand at bottom of sample, little silt, f shells, wet. Gray fine to medium SAND, soft, wet.	trace	
40 -			7 8 5 3 3 6				medium sand at bottom of sample, little silt, f shells, wet.	dium	

BORING LO	G
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Page 4 of 4

Site Name: LCP Chemicals Site, Brunswick GA Boring No: SW-5 Diameter: 8 in Date: 07/30/2013

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Ho	no	VAA/	
Ho	IIC)		

Easting Elevation) (ft): on (ft	: 431835. 861478.1): 9.00 : 50.9 Ft		Meth Cons	od: Mud R od: Mud R sultant: PA oct No: 448		Datum: NAVD88 Coordinate System: NAD 1983 State Plane Georgia East / FIPS 1001		
Depth Ft	Recov	Sample ID	Blow Count	PID (ppm)	Mercury (mg/m3)	0.000	Soil Description	Well Construction Diagram	
45			4			SM	Coarse SAND over greenish gray fine to medium sand, little silt, trace clay in lenses, soft, wet.		
+			3 17 8 14	0.0	0.000	SM	Fine to medium SAND, trace silt, soft, wet.		
Ť	1		22	0.0	0.000	SM	Trace white carbonate rocks in shoe.	1 (1) (1) (1) (1) (1) (1) (1) (1) (1) (1	
			32	0.0	0.000	SM	Gray fine to medium SAND, trace shells, trace silt, soft, wet.		
÷			50	0.0	0.000	SM	Same as above, noted slight sheen on mud.		
			25	0.0	0.000	SM	Same as above.		
50 -		100	20	0.0	0.000	SM	Gray fine SAND, some silt, trace shells, wet.	1144	
51.0	/		50	0.0 Vell Set at 5	0.000	SM	Same as above over trace sandstone, poor recover in top, hard refusal.	ery	

Northing (ft): 431915.23 Easting (ft): 861477.25 Elevation (ft): 7.95 Total Depth: 51.0 Ft				Meth Cons	r: Groundv od: Mud R sultant: PA	totary RSONS			Datum: NAVD88 Coordinate System NAD 1983 State Plane Georgia East / FIPS 10	
Depth Sample Blow Ft 2 ID Count				PID (ppm)	Mercury (mg/m3)	USCS Code	0.11 0	_	Well Constructior Diagram	
5				0.0	0.000		up above ground surface. pH is 7.			
10				0.0	0.000		Mud rotary 5-40 feet, no samples. pH is 7.			

BORI			le	yw	Page 2 of 4	E	Site Name: _{LCP} Chemicals Site, Boring No: SW-6 Diameter: 8 in Date: 07/30/2013	Brunsw	ick GA		
Northing (ft): 431915.23 Easting (ft): 861477.25 Elevation (ft): 7.95 Total Depth: 51.0 Ft				Meth Cons	r: Groundv od: Mud R sultant: PA set No: 448	totary RSONS	rotection Inc	Coo NAD	Datum: NAVD88 Coordinate System NAD 1983 State Plane Georgia East / FIPS 10		
Depth	Recov	Sample	Blow	PID	Mercury	USCS		-	Well Constructior Diagram		
Ft 15	Re	ID	Count	(ppm)	(mg/m3)	Code	Soil Description Mud rotary 5-40 feet, no samples. pH is 7.		Diagram		
20 -				0.0	0.000						

Page 3 of 4	Site Name: _{LCP} Chemicals Site, Brunswick GA Boring No: SW-6 Diameter: 8 in Date: 07/30/2013					
r: Groundwater od: Mud Rotary ultant: PARSO ct No: 448517		Datum: NAVD88 Coordinate System NAD 1983 State Plane Georgia East / FIPS 100				
Mercury USC		Well Construction Diagram				
(mg/m3) Coo	Soil Description	Diagram				
0.000						
0.000	Gray medium to coarse SAND, bottom 3 inches fi	ne				
0.000	Gray medium to coarse SAND, bottom 3 inches fit to medium sand, little silt, little clay, wet.					
SM						
0.000	Gray medium to coarse SAND, over medium gray	SAND,				
	thin lenses of silty clay, wet.					
SM						
0.000	Gray fine to medium SAND, wet.					
	A the state of grad					
	SM	SM Gray fine to medium SAND, wet.				

BORING	LOG
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Page 4 of 4

Site Name: LCP Chemicals Site, Brunswick GA Boring No: SW-6 Diameter: 8 in Date: 07/30/2013

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Honeywell

Northing (ft): 431915.23 Easting (ft): 861477.25 Elevation (ft): 7.95 Total Depth: 51.0 Ft			Meth Cons	er: Ground od: Mud R sultant: PA ect No: 448	otection Inc	Datum: NAVD88 Coordinate System: NAD 1983 State Plane Georgia East / FIPS 100			
Depth Ft	Recov	Sample ID	Blow Count	PID (ppm)	Mercury (mg/m3)		Soil Description		Well onstruction Diagram
45	5 10				SM	Gray fine to medium SAND, wet.			
+	/		9	1.2.2	1.25		Gray fine to medium SAND, little silt, trace shells		
			8	0.0	0.000		trace carbonate rock pebble, wet.	,	
÷	-		9			SM		1 #	
18	1		11			-			191 (A.L.)
Ť			20	0.0	0.000		Gray fine to medium SAND, little silt, trace shells trace carbonate rock pebble, wet.	5,	
			15	0.0	0.000	SM			
Ĩ			18	0.0	0.000				
			40	0.0	0.000	SM	Same as above, trace bedrock pebbles in bottor of sample sandstone.	n	
50 -	_		18	0.0	0.000	SM	Same as above, trace bedrock pebbles in botton of sample sandstone.	n	144
51.0			50/2	0.0	0.000	3141		9	+++ +++

Well Set at 51 ft.

Northin Easting Elevatio	ig (ft): g (ft): on (ft)	: 431394.: 861547.3	30	Drille Meth Cons	r: Groundy od: Mud R sultant: Mu oct No: 448	water Pr totary tch Asse	rotection Inc	Cool	m: NAVD88 rdinate System: 1983 State Plane gia East / FIPS 100
Depth Ft	Recov	Sample ID	Blow Count	PID (ppm)	Mercury (mg/m3)	USCS Code	Soil Description		Well Construction Diagram
5				80	Ō	SM	up above ground surface. Gray brown fine SAND, trace silt. Brown gray drilling MUD, pH 7 to 8.	to medium	
15									

Easting Elevation	(ft): on (ft	: 431394.3 861547.3): 9.64 50.5 Ft		Meth Cons	r: Ground od: Mud R sultant: Mu oct No: 448	otary tch Asso	otection Inc	Coord NAD 1	n: NAVD88 Jinate System: 983 State Plane a East / FIPS 100
Depth Ft	Recov	Sample ID	Blow Count	PID (ppm)	Mercury (mg/m3)	USCS	Soil Description		Well Construction Diagram
20 +				80	D				

		.og O	le,	yw	Page 3 of 4	E	Site Name: _{LCP} Chemicals Site, Boring No: SW-7 Diameter: 8 in Date: 08/09/2013	Brunsw	ick GA
Easting Elevation) (ft): on (ft	: 431394.3 861547.3): 9.64 50.5 Ft		Meth Cons	er: Groundv od: Mud R sultant: Mu ect No: 448	totary	rotection Inc ociates	Coo	ım: NAVD88 rdinate Syster 1983 State Plane gia East / FIPS 10
Depth	1.0	Sample	Blow	PID	Mercury	USCS		_	Well Construction Diagram
Ft	Recov	ID	Count	(ppm)	(mg/m3)	Code	Out Development		Diagram
35 -				80	D				
40 -			5	0	0	SM	Gray fine to coarse SAND, trace silt.		
			7 6				Gray fine to coarse SAND, trace silt.		
-			6	re-		SM			
ŧ	1		4	0	o	SM	Gray fine to coarse SAND, trace silt.		
+			6			Add	Crow CLAV and site little act-d		
*							Gray CLAY and silt, little sand.		
*			10			CL			
+			10 12			CL	Grav fine to coarse SAND trace eilt		
*			10	0	0	SM	Gray fine to coarse SAND, trace silt.		

			le	yw		B	Site Name: _{LCP} Chemicals Site, Bi Boring No: SW-7 Diameter: 8 in Date: 08/09/2013	runswid	ck GA
East Eleva	ing (ft): ation (ft	: 431394.: 861547.3): 9.64 : 50.5 Ft		Meth Cons	r: Ground od: Mud R sultant: Mu ect No: 448	totary	otection Inc	Coor NAD 1	n: NAVD88 dinate System 983 State Plane ia East / FIPS 100
Dept Ft	Recov	Sample ID	Blow Count	PID (ppm)	Mercury (mg/m3)		Soil Description		Well Construction Diagram
45			11 17			SM	Gray fine to coarse SAND, trace silt.		
	÷		3				Gray brown fine to medium SAND, trace silt, tra white shell fragments.	ce	
			4	0	0	SM	white shell hagments.	-	- 101 (101)
		- 0	7			SM	Gray brown fine to medium SAND, trace silt, tra white shell fragments.	ce	55 F.A
			11			OW		_	
			8	0	0	SM	Gray brown fine to medium SAND, trace silt.		
-	-	10	15				Gray brown fine to medium SAND, trace silt.		
			13			SM	oray brown line to mediam on tab, trace sit.		
50 -	FK	$u \in \mathfrak{g}$	10 50		1.1	SM	3 in Gray brown fine to medium SAND, little silt, 3 in weakly cemented sandstone.		

BORI			le,	yM	Page 1 of 4	E	Site Name: LCP Chemicals Site, B Boring No: SW-8 Diameter: 8 in Date: 08/05/2013	runswid	ck ga
Easting Elevati	g (ft): on (ft	: 431473.! 861547.5): 9.53 : 50.25 Ft		Meth Cons	er: Ground od: Mud F sultant: Mu ect No: 448	Rotary Itch Ass	rotection Inc ociates	Coord NAD 1	n: NAVD88 dinate System: 983 State Plane ia East / FIPS 1001
Depth Ft	Recov	Sample ID	Blow Count	PID (ppm)	Mercury (mg/m3)	10.010.00	Soil Description		Well Construction Diagram
5						GM/SM	Hand cleared to 5 feet. Installed with a stick up above ground surface. 0 ft to 3 ft White pack GRAVEL, 3 ft to 5 ft Brown fine to medium SAN silt. Brown gray drilling MUD, pH 7.	ed road D, trace	
10				0	0				

15 -

BORIN			le,	yw	Page 2 of 4	В	ite Name: _{LCP} Chemicals Site oring No: SW-8 biameter: 8 in bate: 08/05/2013	, Brunswi	ck GA
Easting (Elevation	(ft): 8 n (ft)	431473.9 361547.59 : 9.53 50.25 Ft		Meth Cons	er: Ground od: Mud R sultant: Mu ect No: 448	totary tch Asso	otection Inc ociates	Coor NAD	m: NAVD88 dinate System: 1983 State Plane jia East / FIPS 100
Depth Ft	Recov	Sample ID	Blow Count	PID (ppm)	Mercury (mg/m3)		Soil Description		Well Construction Diagram
20				0	0				

			le	yw	Page 3 of 4	E	Site Name: _{LCP} Chemicals Site, E Boring No: SW-8 Diameter: 8 in Date: 08/05/2013	Brunswid	ck GA
Easting Elevation	g (ft): on (ft)	431473.9 861547.5 : 9.53 50.25 Ft	9	Meth Cons	r: Groundv od: Mud R sultant: Mu ect No: 448	totary tch Ass	rotection Inc	Coord NAD 1	m: NAVD88 dinate Syster 1983 State Plane ia East / FIPS 1
Depth	Recov	Sample	Blow	PID	Mercury	USCS	Call Decedering		Well Construction Diagram
Ft 30	R	ID	Count	(ppm)	(mg/m3)	Code	Soil Description Brown gray drilling MUD, pH 7.		Diagram
35 -									
-				0	Ō				
40 -			8	0	0	SM	Gray fine to coarse SAND, trace silt.		
-						SM	Gray fine to medium SAND, little silt.		
-			8 12 13 4						
-			8 12 13 4 4 5	0	0	SM	Gray fine to medium SAND, little silt.		
-			8 12 13 4 4	0	0	SM SM	Gray fine to medium SAND, little silt. Gray fine to medium SAND, little silt.	IFS	

2005.007	lon		-			oring No: SW-8 Diameter: 8 in Date: 08/05/2013		um: NAVD88	
Northing (ft Easting (ft) Elevation (f Total Depth	: 861547.59 t): 9.53		Meth Cons	r: Groundy od: Mud R sultant: Mu oct No: 448	tch Asso	otection Inc	Coordinate System: NAD 1983 State Plane Georgia East / FIPS 100		
Depth og Ft 2	Sample	Blow	PID	Mercury	USCS			Well Construction	
Ft 22	ID	Count	(ppm)	(mg/m3)	Code	Soil Description Gray fine to medium SAND, little silt, little laye	ore	Diagram	
		15 50		· · · · ·	SC	of shells, occasional lens clay.			
		18			-	Gray fine to medium SAND, trace silt, trace w	hite	i i i i i i i i i i i i i i i i i i i	
		18	0	0	SM	shell fragments.		100	
+		20			-	Gray fine to medium SAND, trace silt, trace w shell fragments.	hite	and the	
		22			SM				
		12	0	0	SM	Gray fine to medium SAND, trace silt, trace w shell fragments.	hite		
-		18				49 ft to 49 ft 6 in Gray fine to medium SAND,	trace		
		11 9			SM	silt, trace white shell fragments, 49 ft 6 in to 5 ft Gray fine to coarse SAND, little silt, trace gr	0		
50 + 50.25		50	0 ell Set at 5	0	SM/R	Gray weakly cemented SANDSTONE, some sand.		rse	

Easting Elevatio	(ft): on (ft)	431555.7 861546.7 : 9.27 49.75 Ft		Meth Cons	r: Groundv od: Mud R sultant: Mu oct No: 448	otary tch Ass	octates	Coor NAD 1	Datum: NAVD88 Coordinate System NAD 1983 State Plane Georgia East / FIPS 100	
Depth Ft	Recov	Sample ID	Blow Count	PID (ppm)	Mercury (mg/m3)	USCS Code	Soil Description		Well Construction Diagram	
5				0	0	SM	up above ground surface. Brown fine to med trace slit. Brown gray drilling MUD, pH is 7.			
15										

Easting Elevation	(ft): on (ft)	: 431555.7 861546.7): 9.27 49.75 Ft		Meth Cons	er: Groundv od: Mud R sultant: Mu ect No: 448	totary tch Asso	otection Inc	Cool	m: NAVD88 rdinate System: 1983 State Plane jia East / FIPS 100
Depth Ft	Recov	Sample ID	Blow Count	PID (ppm)	Mercury (mg/m3)		Soil Description		Well Construction Diagram
20 -				0	0				

	H	.og O	le	yw	Page 3 of 4	E	Site Name: _{LCP} Chemicals Site, Boring No: SW-9 Diameter: 8 in Date: 08/06/2013	, Brunsw	vick GA
Easting Elevati	g (ft): ion (ft			Meth Cons	r: Groundv od: Mud R sultant: Mu oct No: 448	otary tch Ass	rotection Inc	Coo	um: NAVD88 ordinate Syste 1983 State Plan rgia East / FIPS 1
Depth		49.75 Ft Sample	Blow	PID	Mercury	USCS	1		
Ft	Recov	ID	Count	(ppm)	(mg/m3)	Code	Out Development		Well Constructio Diagram
**									
35				0	D				
35			8			514	Gray fine to coarse SAND, trace silt.		
			8	0	0	SM			
			7 8			SM	Gray fine to coarse SAND, trace silt. Gray fine to coarse SAND, trace silt.		
			7 8 15				Gray fine to coarse SAND, trace silt.		
			7 8 15 11						
			7 8 15 11 15	0	0	SM	Gray fine to coarse SAND, trace silt. Gray fine to coarse SAND, trace silt. Gray fine to medium SAND, little silt, little wi	hite	
			7 8 15 11 15 16	0	0	SM	Gray fine to coarse SAND, trace silt. Gray fine to coarse SAND, trace silt.	hite	
			7 8 15 11 15	0	0	SM SM	Gray fine to coarse SAND, trace silt. Gray fine to coarse SAND, trace silt. Gray fine to medium SAND, little silt, little wi		

Northin Easting Elevatio	g (ft): (ft): (ft) (ft)	431555. 861546.7	73 1	Drille Meth Cons	r: Groundwood: Mud R sultant: Mu ect No: 448	water Pr totary tch Ass	rotection Inc ociates	Coc	um: NAVD88 ordinate System) 1983 State Plane rgia East / FIPS 10
Depth	Recov	Sample	Blow	PID	Mercury	USCS			Well Construction
Ft	Re	ID	Count	(ppm)	(mg/m3)	Code	Soil Description		Diagram
45			20			SM	Gray fine to medium SAND, trace silt, trac of shells.	e layers	
+			26			- 494 	Gray fine to medium SAND, trace silt, trac	e white	
			11	0	0	SM	shell fragments, pH 10.	e white	
+		2	15		1.1		Gray fine to medium SAND, trace silt, trac	e white	
			17				shell fragments, pH 10.		and a second second
÷			15 8		1.00		Gray fine to coarse SAND, trace silt.		
			12	0	0	SM			
÷=-		1.0	12				49 ft to 49 ft 6 in Gray fine to coarse SANI), trace	
49.75			50			SM/R	silt, 49 ft 6 in to 9 in 2 in fine to coarse SAI silt, 1 in weakly cemented sandstone.	ND, trace	

BORING LOG	
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Page 1 of 4

Honeywell

Site Name: LCP Chemicals Site, Brunswick GA Boring No: SW-10 Diameter: 8 in Date: 08/06/2013

Easting Elevation	ı (ft): on (ft epth:	49.67 Ft	6	Meth Cons	r: Groundv od: Mud R sultant: Mu ect No: 448	otary tch Asso	otection Inc	Coordi NAD 198	NAVD88 nate System: 33 State Plane East / FIPS 1001
Depth Ft	Recov	Sample ID	Blow Count	PID	Mercury	USCS Code	Soil Description		Well Construction Diagram
0 + +	E		Count	(ppm)	(mg/m3)	SM	Hand cleared to 5 feet. Installed with a stick up above ground surface. Brown fine to medium 5 trace silt.	SAND,	
5							Brown gray drilling MUD, pH 7.		
10				0	D.				
15									

Easting Elevation	(ft): on (ft	: 431634. 861547.0): 9.27 49.67 Ft	6	Meth Cons	r: Groundv od: Mud R sultant: Mu oct No: 448	otary tch Asso	otection Inc	Coor NAD 1	n: NAVD88 dinate System: 983 State Plane ia East / FIPS 100
Depth Ft	Recov	Sample ID	Blow Count	PID (ppm)	Mercury (mg/m3)	USCS	Soil Description		Well Construction Diagram
20 +				0	O				
25 —									

BORI			le	yM	Page 3 of 4	E	Site Name: _{LCP} Chemicals Site, Boring No: SW-10 Diameter: 8 in Date: 08/06/2013	Brunsw	ick GA
Easting Elevati	g (ft): on (ft	: 431634.5 861547.00): 9.27 : 49.67 Ft	6	Meth Cons	er: Groundv od: Mud R sultant: Mut ect No: 448	totary	rotection Inc ociates	Coo	ım: NAVD88 rdinate Syst 1983 State Pla gia East / FIPS
Depth Ft	Recov	Sample ID	Blow Count	PID (ppm)	Mercury (mg/m3)	USCS Code	Out Development		Well Constructi Diagram
30				de le construction de la constru	1		Brown gray drilling MUD, pH 7.		
35 —				0	Q				
35 -			5	0	D	SC	Gray fine to coarse SAND, trace silt, 2 in laye of Gray clay.		
-						SC			
-			6 18	0			of Gray clay. Gray fine to coarse SAND, some silty clay, tra	ace	
-			6 18 24 11 11		0	SC	of Gray clay. Gray fine to coarse SAND, some silty clay, tra white shell fragments. Gray fine to coarse SAND, little clayey silt, tra white shell fragments.	ace	
-			6 18 24 11 11 15	0	0	SC	of Gray clay. Gray fine to coarse SAND, some silty clay, tra white shell fragments. Gray fine to coarse SAND, little clayey silt, tra	ace	
-			6 18 24 11 11	0	0	sc sc	of Gray clay. Gray fine to coarse SAND, some silty clay, tra white shell fragments. Gray fine to coarse SAND, little clayey silt, tra white shell fragments. Gray fine to coarse SAND, little clayey silt, tra	ace ace ace	

Easting Elevation	g (ft): on (fl	: 431634. 861547.0 :): 9.27 : 49.67 Ft	6	Meth Cons	od: Mud R sultant: Mu ect No: 448	totary tch Ass	rotection Inc	Coore NAD 1	n: NAVD88 dinate Syster 983 State Plane ia East / FIPS 10
Depth Ft	Recov	Sample ID	Blow	PID	Mercury		Call Department		Well Constructior Diagram
45	E.		Count 26	(ppm)	(mg/m3)	Code	Gray brown fine to medium SAND, trace silt, little white shell fragments.		
-			31			SM			((())
			13 21	0	0	SM	Gray fine to medium SAND, trace silt, trace white shell fragments.		
÷			20				Gray fine to medium SAND, trace silt, trace white	•	1001) (411) 0110 (311)
			19			SM	shell fragments.		
Ī			8	0	0	SM	Gray fine to medium SAND, trace silt, trace white shell fragments.	9	1000 - 1444 1444 - 1444
+			9				49 ft to 49 ft 6 in Gray fine to coarse SAND, little		
49.75			8 50			SM/R	silt, pH over 10, 49 ft 6 in to 49 ft 8 in weakly cerr SANDSTONE.	nented	****

Easting Elevatio	(ft): on (ft	: 431713.5 861547.45): 8.80 51.5 Ft		Meth Cons	r: Groundv od: Mud R sultant: Mu ect No: 448	totary tch Asso	otection Inc	Coord NAD 19	i: NAVD88 linate System 983 State Plane a East / FIPS 100
Depth Ft	Recov	Sample ID	Blow Count	PID (ppm)	Mercury (mg/m3)		Soil Description		Well Construction Diagram
5						SM	SAND, trace silt. Brown gray drilling MUD, pH is 7.		
10				0	D				

15 Brown gray drilling MUD, pH is 7.	Easting (f	(ft): 431713. ft): 861547.4 a (ft): 8.80 pth: 51.5 Ft		Meth Cons	er: Ground od: Mud R sultant: Mu ect No: 448	totary	otection Inc	Cool	m: NAVD88 rdinate System 1983 State Plane gia East / FIPS 10
20	Depth	Sample	and the second se	1.100011	1.	1.			Well Construction Diagram
	20			0	D				
25	25								

Northir Easting Elevati	ng (ft): g (ft): ion (ft)	431713.9 861547.4	54	Drille Meth Cons	r: Groundy od: Mud R sultant: Mu	water Pr totary tch Asse	rotection Inc ociates	Cool	im: NAVD88 rdinate System 1983 State Plane gia East / FIPS 100
Depth	Recov	Sample	Blow	PID	Mercury		Soil Description		Well Construction Diagram
÷.									
35				0	0				
35			9	0	0	SM	Gray fine to coarse SAND, trace silt.		
			5 7			SM	Gray fine to coarse SAND, trace silt. Gray fine to coarse SAND, little clayey silt, la 2 in gray clay.	iyer	
			5				Gray fine to coarse SAND, little clayey silt, la		
			5 7 10 11	0	0	SC	Gray fine to coarse SAND, little clayey silt, la 2 in gray clay. Gray fine to medium SAND, trace silt, trace w	white	

		y M	ve		Boring No: SW-11 Diameter: 8 in Date: 07/31/2013 - 08/05/2013		
Northing (ft): 4317 Easting (ft): 86154 Elevation (ft): 8.80 Total Depth: 51.5	17.45)	Meth Cons	er: Groundv od: Mud R sultant: Mu ect No: 448	totary tch Ass	rotection Inc ociates	Coord NAD 1	n: NAVD88 dinate System 983 State Plane la East / FIPS 10
Depth o Sam	and a second second	PID (ppm)	Mercury (mg/m3)	USCS Code	Soil Description		Well Construction Diagram
45	17	(ppin)	(ing/inc/	0000	Gray fine to medium SAND, trace silt, trace white		
	23			SM	shell fragments.		
-	10				Gray fine to medium SAND, trace silt, trace white	9	
	17	0	0	SM	shell fragments.	-	
*	19				Gray fine to medium SAND, trace silt, trace white shell fragments.	•	
	20	1		SM	anon negmonta.		
Ť	12	1			Gray fine to medium SAND, trace silt, trace white shell fragments.	9	viae porte
	17	0	0	SM			1000 0000 1000 0000
-	7	1		SM	Gray fine to medium SAND, trace silt, trace white shell fragments.	9	1911 - 2015 1914 - 1915
-	14			SIVI			1 × 3 ()
50 +	14	0	0	SM	Gray fine to medium SAND, trace silt, trace white shell fragments, note 50 ft 6 in to 51 ft little silt.	9	1000
	13		U	SIVI			() () () () () () () () () () () () () (
	50			SM/R	Gray fine to coarse SAND, little silt, trace white shell fragments, pieces weakly cemented stone i	n tip,	4+5-
51.6		Well Set at 5	1.5 ft.				

BORING I	LOG
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Page 1 of 4

Honeywell

Site Name: LCP Chemicals Site, Brunswick GA Boring No: SW-12 Diameter: 8 in Date: 07/27/2013

Easting Elevation	(ft): on (ft	: 431794.6 861546.8): 9.18 : 51.25 Ft		Meth Cons	r: Groundv od: Mud R sultant: Mu ect No: 448	totary tch Asso	otection Inc	Coor NAD 1	n: NAVD88 dinate System: 1983 State Plane ia East / FIPS 1001
Depth Ft	Recov	Sample ID	Blow Count	PID (ppm)	Mercury (mg/m3)		Soil Description		Well Construction Diagram
•						OL/SM	Hand cleared to 5 ft. Installed with a stick up ab ground surface. 0 ft to 2 ft Brown TOP SOIL org little Gray coarse gravel, 2 ft to 5 ft Brown fine to medium SAND, trace silt.	anic	
5 +							Brown drilling MUD, pH 7 to 8.		
10				28.5	D				
15									

		.og O	le	yw	Page 2 of 4		Site Name: _{LCP} Chemicals Site Boring No: SW-12 Diameter: 8 in Date: 07/27/2013	e, Brunswi	ck GA
Easting Elevation	(ft): on (ft	: 431794.6 861546.8): 9.18 : 51.25 Ft	4	Meth Cons	r: Ground od: Mud F sultant: Mu ect No: 448	Rotary Itch As	Protection Inc sociates	Coor	m: NAVD88 rdinate Syste 1983 State Plan gia East / FIPS
Depth Ft	Recov	Sample ID	Blow Count	PID (ppm)	Mercury (mg/m3)	10.0.10	O 11 O 1 1 11		Well Constructio Diagram
									Ш
20 +				28.5	D				

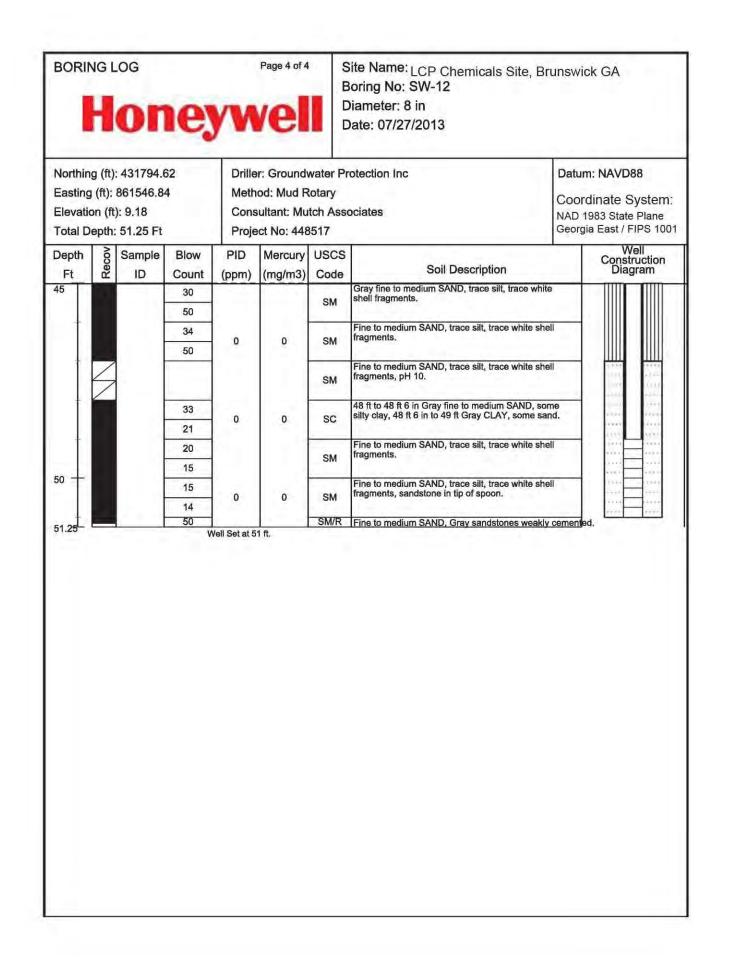
BORIN			le	yw	Page 3 of 4	В	ite Name: _{LCP} Chemicals Site, B oring No: SW-12 Diameter: 8 in Date: 07/27/2013	runswick GA
Easting Elevatio	(ft): on (ft	: 431794.6 861546.8): 9.18 : 51.25 Ft		Meth Cons	r: Groundv od: Mud R sultant: Mu oct No: 448	totary	otection Inc	Datum: NAV Coordinate NAD 1983 St Georgia East
Depth Ft	Recov	Sample ID	Blow Count	PID (ppm)	Mercury (mg/m3)	USCS Code	Soil Description	Cor
30				28.5	D		Brown drilling MUD, pH 7 to 8.	

40 Gray brown fine to coarse SAND, trace silt, occasional 6 lens clay. 0 0 SC 10 41 ft to 41 ft 6 in Gray brown fine to coarse SAND, trace silt, occasional lens clay, 41 ft 6 in to 42 ft graduated fine to medium SAND, some clay and silt. 12 SC 14 Gray brown fine coarse SAND, trace silt. 5 0 0 SM 9 43 ft to 43 ft 6 in Gray brown fine to coarse SAND, trace silt, 43 ft 6 in to 44 ft Gray fine to medium SAND, trace silt and clay. 11 SM 10 44 ft 6 in to 45 ft Gray fine to medium SAND, trace silt, trace white shell fragments. 4 0 0 SM 4 45

Datum: NAVD88

Coordinate System: NAD 1983 State Plane Georgia East / FIPS 1001

Well Construction Diagram



BORING LOG	
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Page 1 of 4

Honeywell

Site Name: LCP Chemicals Site, Brunswick GA Boring No: SW-13 Diameter: 8 in Date: 07/27/2013

Easting Elevation	(ft): on (ft	: 431874.7 861546.5): 8.69 50.5 Ft		Meth Cons	r: Ground od: Mud R sultant: Mu ect No: 448	totary tch Asso	Datum: NAVD88 Coordinate System: NAD 1983 State Plane Georgia East / FIPS 1001		
Depth Ft	Recov	Sample ID	Blow Count	PID (ppm)	Mercury (mg/m3)	10.010.001	Soil Description		Well Construction Diagram
0						ol/sm	Hand cleared to 5 ft. Installed with a stick up ab ground surface. 0 ft to 2 ft Brown TOP SOIL org 2 ft to 5 ft Brown fine to medium SAND, trace si	ove janic, lt.	
5							Brown drilling MUD, pH 7 to 8.		
10				0.5	D				
15									

Northing (ft): 431874.76 Easting (ft): 861546.56 Elevation (ft): 8.69 Total Depth: 50.5 Ft				Driller: Groundwater F Method: Mud Rotary Consultant: Mutch As Project No: 448517				Datum: NAVD88 Coordinate System NAD 1983 State Plane Georgia East / FIPS 100	
Depth Ft	Recov	Sample ID	Blow Count	PID (ppm)	Mercury (mg/m3)	USCS Code	Soil Description Brown drilling MUD, pH 7 to 8.		Well Construction Diagram
20				0.5	0				

BORING LOG	
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Page 3 of 4

Site Name: _{LCP} Chemicals Site, Brunswick GA Boring No: SW-13 Diameter: 8 in Date: 07/27/2013

Easting Elevation	g (ft): on (ft epth:	50.5 Ft		Meth Cons	er: Groundv od: Mud R sultant: Mu ect No: 448	Datum: NAVD88 Coordinate System: NAD 1983 State Plane Georgia East / FIPS 100		
Depth Ft	Recov	Sample ID	Blow Count	PID (ppm)	Mercury (mg/m3)	USCS Code	Soil Description	Well Construction Diagram
30				0.5	D		Brown drilling MUD, pH 7 to 8.	
40								
40			6 13	0	0	SC	Gray brown fine to coarse SAND, trace silt, occ lens clay.	
			13			sc	Gray brown fine to coarse SAND, trace silt, occ lens clay.	asional
-			6 6	0	o	SC	Gray brown fine to coarse SAND, trace silt, occ lens clay.	asional
+			8 7			SC	Gray brown fine to coarse SAND, trace silt, occ lens clay.	asional
Ť			4	0	0	SM	Gray fine to medium SAND, trace silt.	

Honeywell Diame Date: (

BORING LOG

Page 4 of 4

Site Name: LCP Chemicals Site, Brunswick GA Boring No: SW-13 Diameter: 8 in Date: 07/27/2013

Honeywell

Easting (ft): 861546.5 Elevation (ft): 8.69 Total Depth: 50.5 Ft	Cons	od: Mud R sultant: Mu oct No: 448	Datum: NAVD88 Coordinate System: NAD 1983 State Plane Georgia East / FIPS 1007			
Depth Sample Ft 2 ID	Blow Count	PID (ppm)	Mercury (mg/m3)		Soil Description	Well Construction Diagram
45	8			Gray fine to medium SAND, trace silt.	Gray fine to medium SAND, trace silt.	
	8		0 0			
Ĩ	5	0		SM	Gray fine to medium SAND, trace silt.	
	13					
	50			SM	Gray fine to medium SAND, trace silt.	1000 0000 (1)1 1244) 7344 6400
÷	6		1.2	1.00	Gray fine to medium SAND, trace silt, trace white shell fragments.	
	34	0	0	SM	and nagmente.	
+	16	100			49 ft to 49 ft 6 in Gray fine to medium SAND, little clayey silt, trace white shell fragments, 49 ft 6 in	
	13			SM	to 50 ft Gray fine to medium SAND, little silt, 1/8 linch layers of white shell fragments	
50 —	50	0	0	SM	Gray fine to coarse SAND, trace silt, sandstone fragments in tip of spoon.	(194)

BORING LOG	Page 1 of 4	Boring No: SW-14	ls Site, Brunswick GA
Northing (ft): 431955.20 Easting (ft): 861545.79 Elevation (ft): 8.25 Total Depth: 48.9 Ft	Driller: Groundy Method: Mud R Consultant: PA Project No: 448	RSONS	Datum: NAVD88 Coordinate System: NAD 1983 State Plane Georgia East / FIPS 1001
	PID Mercury	USCS	Well Construction
Ft 🗹 ID Count	(ppm) (mg/m3)	Code Soil Descripti	on Diagram
	0.4 0.0	Hand cleared to 5 ft. Installed with above ground surface. pH is 7.	

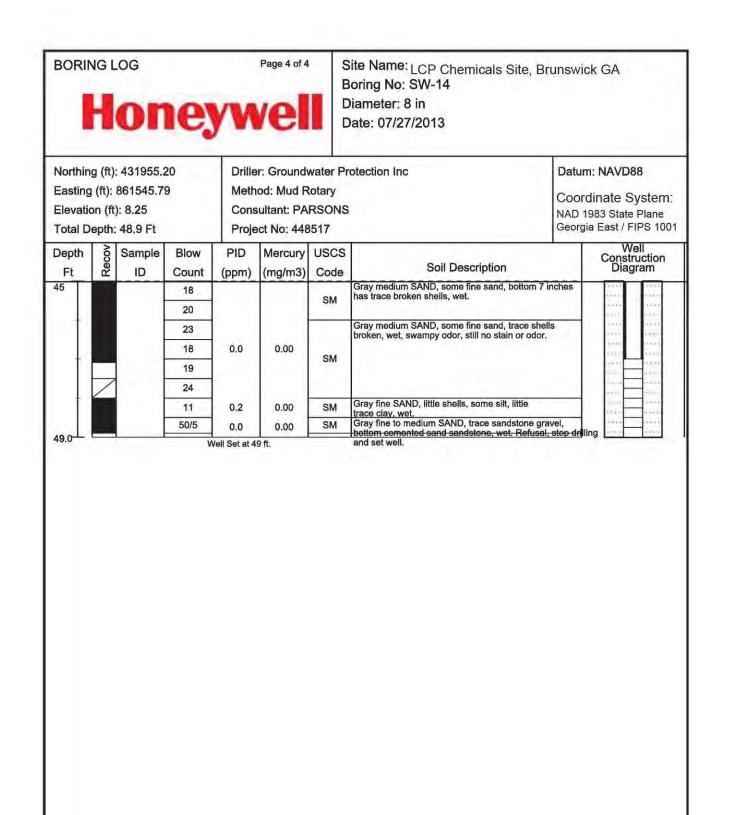
15 I I

BORING LOG

Site Name: LCP Chemicals Site, Brunswick GA Boring No: SW-14 Honeywell Diameter: 8 in Date: 07/27/2013

Easting (ft): 861545.79Method: Mud RotaryCElevation (ft): 8.25Consultant: PARSONSN/Total Depth: 48.9 FtProject No: 448517G						Coor NAD 1	atum: NAVD88 oordinate System: AD 1983 State Plane eorgia East / FIPS 1001		
Depth Ft 15	Recov	Sample ID	Blow Count	PID (ppm)	Mercury (mg/m3)	1.	Soil Description pH is 7,		Well Construction Diagram
20				0.5	0.0				
30 -									

		.og O	Ie,	yw	Page 3 of 4	E	Site Name: _{LCP} Chemicals Site, B Boring No: SW-14 Diameter: 8 in Date: 07/27/2013	runswick GA
Easting Elevation	(ft): on (ft	: 431955.2 861545.7): 8.25 : 48.9 Ft		Meth Cons	or: Groundv od: Mud R sultant: PA oct No: 448	totary RSONS	rotection Inc	Datum: NAVD88 Coordinate Syst NAD 1983 State Pla Georgia East / FIPS
Depth	Recov	Sample	Blow	PID	Mercury	USCS		Well Constructi Diagram
Ft	Re	ID	Count	(ppm)	(mg/m3)	Code	Soil Description Drilled to 40 ft with mud rotary, no sampling	Diagram
35 +	e De			0.4	0.0			
-								
40 —			10	0.0	0.00		Light medium gray medium to coarse SAND, lit	tle
40 —			10	0.0	0.00		Light medium gray medium to coarse SAND, lit fine sand, 1 inch lense of fine to medium sand, clay, wet, swampy odor, no stain or sheen.	tie little
40	7			0.0	0.00	SM	fine sand, 1 inch lense of fine to medium sand,	tle little
40 +	7		14	0.0	0.00	SM	fine sand, 1 inch lense of fine to medium sand,	tle little
40 +	Z		14 13	0.0	0.00	SM	fine sand, 1 inch lense of fine to medium sand, clay, wet, swampy odor, no stain or sheen. Light gray and gray medium to coarse SAND, 2	little
40 +	7		14 13 8	0.0	0.00		fine sand, 1 inch lense of fine to medium sand, clay, wet, swampy odor, no stain or sheen.	little
40 +	7		14 13 8 7			SM	fine sand, 1 inch lense of fine to medium sand, clay, wet, swampy odor, no stain or sheen. Light gray and gray medium to coarse SAND, 2 lense of clay, little silt, bottom 5 inches gray fine	little
40 +	7		14 13 8 7 6				fine sand, 1 inch lense of fine to medium sand, clay, wet, swampy odor, no stain or sheen. Light gray and gray medium to coarse SAND, 2 lense of clay, little silt, bottom 5 inches gray fine	little
40 +	4		14 13 8 7 6 4				fine sand, 1 inch lense of fine to medium sand, clay, wet, swampy odor, no stain or sheen. Light gray and gray medium to coarse SAND, 2 lense of clay, little silt, bottom 5 inches gray fine	little ! inch



BOR	NG	LOG	
0011			

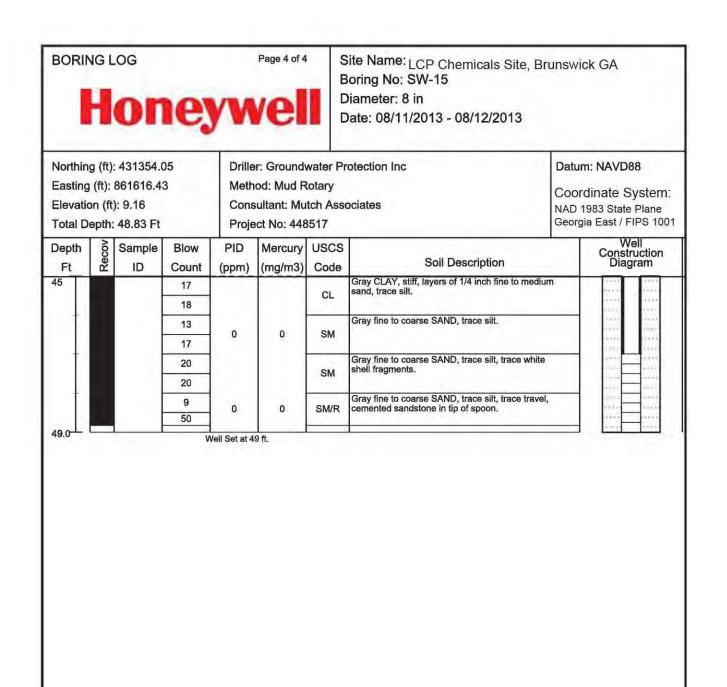
Honeywell

Site Name: LCP Chemicals Site, Brunswick GA Boring No: SW-15 Diameter: 8 in Date: 08/11/2013 - 08/12/2013

Easting Elevation	(ft): on (ft epth:	: 431354.(861616.4:): 9.16 : 48.83 Ft		Meth Cons	er: Groundwod: Mud R sultant: Mu ect No: 448	totary tch Asso	otection Inc	Datum: NAVD88 Coordinate System: NAD 1983 State Plane Georgia East / FIPS 1001		
Depth Ft	Recov	Sample ID	Blow Count	PID (ppm)	Mercury (mg/m3)	USCS Code	Soil Description		Well Construction Diagram	
•						SM	Hand cleared to 5 feet. Installed with a stick up above ground surface. Brown fine to medium t trace silt.	SAND,		
5 -							Brown gray drilling MUD, pH 7. While over drilling the initial pilot hole, hard debris (cement footer?) was encountered by the 8 in. bit around 7 ft bgs. pipe walked slightly east but got down.) The		
10				25	D					
15										

			Ie,	yw	Page 2 of 4	E	Site Name: _{LCP} Chemicals Site, Boring No: SW-15 Diameter: 8 in Date: 08/11/2013 - 08/12/2013	Brunswi	ck GA
Easti Eleva	ng (ft): ntion (f): 431354. 861616.4 t): 9.16 : 48.83 Ft	3	Meth Cons	er: Ground od: Mud R sultant: Mu ect No: 448	totary	rotection Inc ociates	Coor	m: NAVD88 rdinate System 1983 State Plane gia East / FIPS 10
Depth	Recov	Sample	Blow	PID	Mercury	USCS	Soil Description		Well Construction Diagram
20 -				25	D		Brown gray drilling MUD, pH 7. While over dr the initial pilot hole, hard debris (cement foot was encountered by the 8 in. bit around 7 ft b pipe walked slightly east but got down.	er?) ogs. The	
25 -	31.								

BORI			le	yw	Page 3 of 4	E	Site Name: _{LCP} Chemicals Site, I Boring No: SW-15 Diameter: 8 in Date: 08/11/2013 - 08/12/2013	Brunsw	ick GA
Easting Elevation	g (ft): on (ft)		3	Meth Cons	od: Mud R ultant: Mu	otary tch Ass	rotection Inc ociates	Coo NAD	ım: NAVD88 rdinate Syster 1983 State Plane gia East / FIPS 10
		48.83 Ft	-	_	ct No: 448	-	1	Geor	Well
Depth Ft	Recov	Sample ID	Blow Count	PID (ppm)	Mercury (mg/m3)	USCS Code	Out Develotion		Construction
*		ľ					the initial pilot hole, hard debris (cement foote was encountered by the 8 in, bit around 7 ft by pipe walked slightly east but got down.	r?) gs. The	
35 +				25	D				
35 + + + + + + + + + + + + + + + + + + +			3 4 7	25	0	SM	Gray fine to medium SAND, trace silt. Gray fine to medium SAND, trace silt.		
+			4			SM	Gray fine to medium SAND, trace silt.		
+			4 7 12 7						
+			4 7 12 7 12	0	D	SM	Gray fine to medium SAND, trace silt. Gray fine to medium SAND, trace silt.		
+			4 7 12 7 12 12 12	0	D	SM	Gray fine to medium SAND, trace silt.	of	
+			4 7 12 7 12	0	D	SM SM	Gray fine to medium SAND, trace silt. Gray fine to medium SAND, trace silt. Gray fine to medium SAND, trace silt, layers of		



BORING LOG	Page 1 of 4
Hone	ywell

Site Name: LCP Chemicals Site, Brunswick GA Boring No: SW-16 Diameter: 8 in Date: 08/07/2013

Eastin Elevati	g (ft): ion (ft	: 431434.8 861616.5): 9.84 : 51.5 Ft		Meth Cons	r: Groundv od: Mud R sultant: Mu ect No: 448	totary tch Asso	otection Inc	Cool NAD	m: NAVD88 rdinate System: 1983 State Plane gia East / FIPS 100 ⁻
Depth Ft	Recov	Sample ID	Blow Count	PID (ppm)	Mercury (mg/m3)	USCS Code	Soil Description		Well Construction Diagram
			Count			GW	Hand cleared to 5 ft. Installed with a stick up above ground surface. 0 ft to 4 ft Coarse comp GRAVEL road bed material, 4 ft to 5 ft Brown medium SAND, trace silt.	pacted fine to	
5 +	5						Brown gray drilling MUD, pH 7.		
10 -				2.3	D				
15									

Northin Easting Elevatio	g (ft): (ft): on (ft;	0 : 431434.8 861616.5): 9.84 51.5 Ft	89	Drille Meth Cons		water Prototary tch Asso	otection Inc	Coor NAD 1	n: NAVD88 dinate System: 1983 State Plane ia East / FIPS 100′
Depth Ft	Recov	Sample ID	Blow Count	PID (ppm)	Mercury (mg/m3)	USCS	Soil Description		Well Construction Diagram
20 +				2.3	0				

			le,	yw	Page 3 of 4	E	Site Name: _{LCP} Chemicals Site, Boring No: SW-16 Diameter: 8 in Date: 08/07/2013	Brunswick GA	ľ	
Easting Elevati	g (ft): ion (ft	: 431434.8 861616.5): 9.84 : 51.5 Ft		Meth Cons	r: Groundv od: Mud R sultant: Mu oct No: 448	otary tch Ass	rotection Inc	Datum: NAVD88 Coordinate System NAD 1983 State Plane Georgia East / FIPS 100		
Depth		Sample	Blow	PID	Mercury	USCS	Contraction of the	Wel Construe Diagra	tion	
Ft	Recov	ID	Count	(ppm)	(mg/m3)		Call Desadation	Diagra	m	
35				2.3	D					
40 -			8	Ō	o	SM	Gray fine to medium SAND, trace silt.			
40			8 8 9	O	0.		Gray fine to medium SAND, trace silt. Gray fine to medium SAND, trace silt.			
40 -			8	0	0	SM SM	Gray fine to medium SAND, trace silt.			
40 -			8	0	0			ional		
40			8 9 9 6 8			SM	Gray fine to medium SAND, trace silt. Gray fine to medium SAND, trace silt, occasi piece of 1/2 inch white jagged rock.			
40			8 9 9 6 8 9			SM	Gray fine to medium SAND, trace silt. Gray fine to medium SAND, trace silt, occas			
40			8 9 6 8 9 13			SM SM	Gray fine to medium SAND, trace silt. Gray fine to medium SAND, trace silt, occass piece of 1/2 inch white jagged rock. Gray fine to medium SAND, trace silt, occass piece of 1/2 inch white jagged rock.	ional		
40			8 9 9 6 8 9			SM SM	Gray fine to medium SAND, trace silt. Gray fine to medium SAND, trace silt, occass piece of 1/2 inch white jagged rock. Gray fine to medium SAND, trace silt, occass	ional		

BORING LOG	
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Page 4 of 4

Site Name: LCP Chemicals Site, Brunswick GA Boring No: SW-16 Honeywell Diameter: 8 in Date: 08/07/2013

Easting Elevatio	(ft): on (ft	: 431434.8 861616.5): 9.84 : 51.5 Ft		Meth Cons	Driller: Groundwater Protection Inc Datum Method: Mud Rotary Coor Consultant: Mutch Associates NAD Project No: 448517 Georg					
Depth Ft	Recov	Sample ID	Blow Count	PID (ppm)	Mercury (mg/m3)		Soil Description		Well Constructio Diagram	
45			15			SC	Gray fine SAND, little silt, layer 2 inch Gray silty clay, stiff.			
			17			00				
			5	0	0	SC	Gray brown fine to coarse SAND, little silt, trac white shell fragments, layer 2 inch Gray silty cl	e ay.		
			4	U	U.	50				
Ť			9	1.10		SM	Gray brown fine to coarse SAND, little silt, trac white shell fragments.	e	1000 0111	
			20			OW			1000 0000	
Ť			17	o	0	SM	Gray brown fine to coarse SAND, trace silt, tra white shell fragments.	ce	1000 (1000) 1000 (1000)	
			20	U		SIM			1000 1000	
Ť			24	11		SM	Gray brown fine to medium SAND, trace silt, tr white shell fragments.	ace		
			24			SM	a submer a second second			
50 -			8				Gray fine to coarse SAND, little silt.		(1)+++ (1)+++ (1)+++ (1)+++	
		- 1	11	0	0	SM			++++ FCCF FCCF	
51.5L			50			SM/R	3 in Gray fine to coarse SAND, little silt, 3 in w cemented Sandstone.	eakly		

Easting Elevatio	(ft): on (ft	431515.7 861616.7(): 9.85 50.75 Ft		Meth Cons	er: Groundv od: Mud R sultant: Mu ect No: 448	totary tch Ass	otection Inc	Cool NAD	Datum: NAVD88 Coordinate System: NAD 1983 State Plane Georgia East / FIPS 100	
Depth Ft	Recov	Sample ID	Blow Count	PID (ppm)	Mercury (mg/m3)		Soil Description	-	Well Construction Diagram	
5						SM	Hand cleared to 5 ft. Installed with a stick u ground surface. Brown fine to medium SAI silt, 10 pieces of 2 inch diameter stones or gravel. Brown gray drilling MUD, pH 7.	VD. trace		
10				0.2	D					
*					_					

Easting Elevati	g (ft): on (ft	: 431515. 861616.7): 9.85 : 50.75 Ft	0	Meth Cons	r: Groundv od: Mud R ultant: Mu ct No: 448	Datum: NAVD88 Coordinate System NAD 1983 State Plane Georgia East / FIPS 100		
Depth Ft	Recov	Sample ID	Blow Count	PID (ppm)	Mercury (mg/m3)	Soil Description		Well Construction Diagram
20				0.2	Ō			
-								

BORIN			le	yw	Page 3 of 4	E	Site Name: _{LCP} Chemicals Site, E Boring No: SW-17 Diameter: 8 in Date: 08/06/2013 - 08/07/2013	3runsw	vick GA	
Easting Elevation	(ft): on (ft)	: 431515.7 861616.7): 9.85 50.75 Ft	0	Meth Cons	er: Groundv lod: Mud R sultant: Mu ect No: 448	otary tch Ass	rotection Inc ociates	Coc	Datum: NAVD88 Coordinate Syste NAD 1983 State Plan Georgia East / FIPS	
Depth Ft	Recov	Sample ID	Blow Count	PID (ppm)	Mercury (mg/m3)	USCS Code	Soil Description		Well Construc Diagra	
-										
35 -				0.2	O					
35 -			6	0.2	0	SM	Gray fine to coarse SAND, trace silt.			
+			6 10			SM	Gray fine to coarse SAND, trace silt. Gray fine to coarse SAND, trace silt.			
-			6 10 11 4							
-			6 10 11	0	0	SM	Gray fine to coarse SAND, trace silt.			

BORIN			le,	M	Page 4 of 4		Site Name: _{LCP} Chemicals Site, Brunswick GA Boring No: SW-17 Diameter: 8 in Date: 08/06/2013 - 08/07/2013				
Easting Elevation	g (ft): 4 on (ft)	431515.7 861616.70 : 9.85 50.75 Ft		Meth Cons	od: Mud R	otary tch Ass	Associates		Datum: NAVD88 Coordinate System NAD 1983 State Plane Georgia East / FIPS 10		
Depth	Recov	Sample	Blow	PID	Mercury	USCS	0.10		Well Construction Diagram		
Ft 45	~	ID	Count 6	(ppm)	(mg/m3)		Gray fine to coarse SAND, trace silt, occasion lens clay and silt.	nal			
			6			SC	I show a start a second	- 1			
			4	0	o	SM	Gray fine to coarse SAND, trace silt.				
Ŧ			8				Gray fine to medium SAND, trace silt.				
			11			SM			antin attin		
			7	0	0	SM	Gray fine to medium SAND, trace silt.		and a second		
÷			13 17				Gray fine to medium SAND, trace silt.		1012 Million		
			18			SM					
50 -			9 50	o	0	SM/R	50 ft to 50 ft 6 in Gray fine to medium SAND, silt, 50 ft 6 in to 50 ft 8 in Gray cemented sand	little dstone.	(1)+++ (1)+++ (1)+++ (1)+++ (1)+++ (1)+++ (1)+++ (1)+++ (1)+++ (1)+++ (1)+++ (1)+++ (1)+++ (1)+++ (1)+++ (1)+++ (1)+++ (1)++++ (1)++++++++++++++++++++++++++++++++++++		
51.0L				/ell Set at 5	0.5 ft.	-			100 100		

BORING I	LOG
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Honeywell

Site Name: LCP Chemicals Site, Brunswick GA Boring No: SW-18 Diameter: 8 in Date: 07/24/2013

Easting Elevation	(ft): on (ft) epth:	: 431595.1 861614.10): 10.04 : 53.0 Ft	Method: Mud Rotary Coordinate System 04 Consultant: PARSONS NAD 1983 State Plane Ft Project No: 448517 Georgia East / FIPS 10						
Depth Ft	Recov	Sample ID	Blow Count	PID (ppm)	Mercury (mg/m3)	USCS Code	Soil Description		Well Construction Diagram
0	4		Count	0.0	0.000	SM	Hand cleared to 5 ft. Installed with a stick up above ground surface. Brown black fine to ve SAND, and silt, trace rock fragments, dry.	ry fine	
5							Mud rotary drilling, mud ph 7.		
10									
15									

BORIN			ıe,	yM	Page 2 of 4	E	ite Name: _{LCP} Chemicals Site Foring No: SW-18 Diameter: 8 in Date: 07/24/2013	e, Brunswi	ck GA
	(ft): 8 n (ft)			Meth Cons	er: Groundv od: Mud R sultant: PA ect No: 448	totary RSONS	otection Inc	Cool	m: NAVD88 dinate Syste 1983 State Plan jia East / FIPS
Depth Ft	Recov	Sample ID	Blow Count	PID (ppm)	Mercury (mg/m3)	10.000	Soil Description		Well Constructio Diagram
20									
30 _ [-				

		.og O	le	yM	Page 3 of 4	E	Site Name: _{LCP} Chemicals Site, Boring No: SW-18 Diameter: 8 in Date: 07/24/2013	Brunswie	ck GA
Easting Elevation	g (ft): on (ft	: 431595. 861614.1): 10.04 : 53.0 Ft		Meth Cons	er: Ground nod: Mud R sultant: PA ect No: 448	Rotary RSONS	rotection Inc	Coor NAD 1	n: NAVD88 dinate Sys 983 State Pl ia East / FIP
Depth	Recov	Sample	Blow	PID	Mercury		Soil Description		Well Construc Diagra
35 +									
40 -			11		1.0		Gray medium to coarse SAND.		
			11	0.0	0.000	SM			
	6		9 13	0.0	0.000	CL/SM	Black CLAY and fine SAND lense, then gray to coarse sand.	medium	
Ŧ	V		8	0.0	0.000	SM	Gray medium to coarse SAND, trace silt, wet		
1			1		0.000	SM	Gray medium to coarse SAND, trace silt, wet	2 1	
-	4		8	0.0	0.000				

BORING LOG	
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Page 4 of 4

Site Name: LCP Chemicals Site, Brunswick GA Boring No: SW-18 Honeywell Diameter: 8 in Date: 07/24/2013

Easting Elevatio	(ft): on (ft)	: 431595.1 861614.16): 10.04 53.0 Ft		Meth Cons	r: Groundv od: Mud R sultant: PA oct No: 448	totary RSONS	otection Inc	Datum: NAVD88 Coordinate System NAD 1983 State Plane Georgia East / FIPS 100
Depth Ft	Recov	Sample ID	Blow Count	PID (ppm)	Mercury (mg/m3)		Soil Description	Well Construction Diagram
45			9	0.0	0.000	SM	Gray medium to coarse SAND, trace silt, trace gr wet.	avel,
	/		10	0.0	0.000	910		
			2	0.0	0.000	SM	Gray to black fine to medium SAND, little silt, wet.	
ļ			3					
	4		10	0.0	0.000	SM	Gray to black fine to medium SAND, little silt, wet.	
	/		7					
			8	0.0	0.000	SM	Gray fine to medium SAND, little silt, wet.	
			7					
			9	0.0	0.000	SM	Gray fine to medium SAND, little silt, wet.	1000
50	/		8	0.0	0.000	J IWI		
50 -			7	0.0	0.000	SM	Gray fine to medium SAND, trace silt, wet.	1000
			4	0.0	0.000	SM	Gray fine to medium SAND, trace silt, wet.	
			5	0.0	0.000	SM	Gray fine to medium SAND, trace silt, wet.	
			6	0.0	0,000	SM	Gray fine to medium SAND, trace silt, trace grave wet.	əl,
Ť			6	0.0	0.000	SM	Gray fine to medium SAND, trace silt, trace grave cemented material in spoon tip.	əl,
			50/1	0.0	0.000	CL	Gray CLAY and sandstone, dry to moist.	

Well set at 52.5 ft, ground elevation 9.59 ft.

BORING L	OG
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Honeywell

Site Name: LCP Chemicals Site, Brunswick GA Boring No: SW-19 Diameter: 8 in Date: 07/24/2013

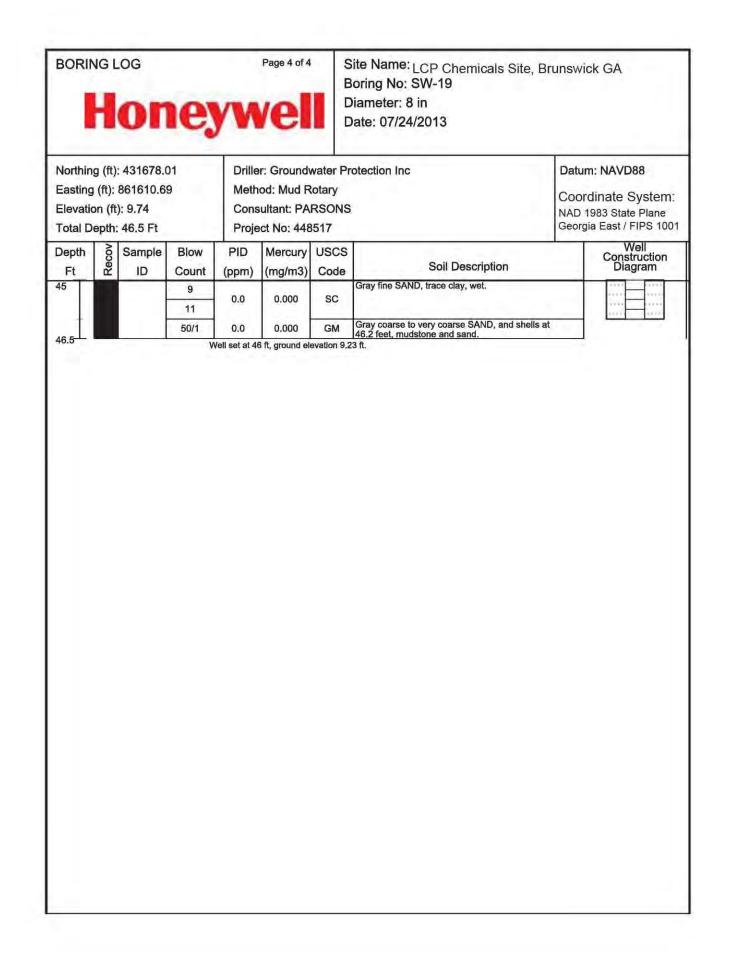
Easting Elevation	(ft): on (ft)	: 431678.0 861610.69): 9.74 : 46.5 Ft		Meth Cons	r: Groundv od: Mud R sultant: PA ect No: 448	totary RSONS	otection Inc	Coore	n: NAVD88 dinate System: 983 State Plane la East / FIPS 1001
Depth Ft	Recov	Sample ID	Blow Count	PID (ppm)	Mercury (mg/m3)		Soil Description		Well Construction Diagram
0	H		Count	0.0	0.000	GM/SM	Hand cleared to 5 ft. Installed with a stick up above ground surface. Limerock road base mate 2 feet then black very fine to fine sand, some silt dry.	rial to	
5 +							Mud rotary drilling, mud ph 7.		
10									
15									

BORING LOG

Site Name: LCP Chemicals Site, Brunswick GA Boring No: SW-19 Honeywell Diameter: 8 in Date: 07/24/2013

Easting Elevatio	(ft): on (ft)	: 431678.0 861610.69): 9.74 : 46.5 Ft		Meth Cons	er: Ground od: Mud R sultant: PA ect No: 448	totary RSONS	otection Inc	Coor NAD	n: NAVD88 dinate System: 1983 State Plane ia East / FIPS 1001
Depth Sample Blow Ft ID Count 15 ID ID			PID (ppm)	Mercury (mg/m3)		Soil Description Mud rotary drilling, mud ph 7.		Well Construction Diagram	
20									
30					_				

BORING LOG	ne	yw	Page 3 of 4	E	Site Name: _{LCP} Chemicals Site, E Boring No: SW-19 Diameter: 8 in Date: 07/24/2013	3runswi	ck GA		
Northing (ft): 43167 Easting (ft): 861610 Elevation (ft): 9.74 Total Depth: 46.5 Ft	69	Meth Cons	er: Ground od: Mud R sultant: PA ect No: 448	totary RSONS	Protection Inc	Coor	Datum: NAVD88 Coordinate System NAD 1983 State Plane Georgia East / FIPS 1		
Depth o Sample	Blow Count	PID (ppm)	Mercury (mg/m3)	10.000	Out Development		Well Construct Diagran		
-									
35									
35	8				Black and gray medium to coarse SAND, trace	e silt,			
	11	0.0	0,000	SM	wet. Black and gray medium to coarse SAND, trace				
	11 16 14	0.0	0.000	SM	wet. Black and gray medium to coarse SAND, trace wet.	ə silt,			
	11 16				wet. Black and gray medium to coarse SAND, trace	ə silt,			
	11 16 14 12 11 9	0.0	0.000	SM	wet. Black and gray medium to coarse SAND, trace wet. Black and gray medium to coarse SAND, trace	ə silt, ə silt,			
	11 16 14 12 11	0.0 0.0	0.000 0.000	SM SM	wet. Black and gray medium to coarse SAND, trace wet. Black and gray medium to coarse SAND, trace wet. Black and gray medium to coarse SAND, trace	ə silt, ə silt, ə silt,	1000)		



BORING LOG

Honeywell

Site Name: LCP Chemicals Site, Brunswick GA Boring No: SW-20 Diameter: 8 in Date: 07/25/2013

Easting Elevation	ı (ft): on (ft	: 431754.(861615.3)): 8.98 : 51.5 Ft		Meth Cons	r: Ground od: Mud R sultant: PA ect No: 448	totary RSONS	otection Inc	Coor NAD	m: NAVD88 dinate System: 1983 State Plane jia East / FIPS 1001
Depth Ft	Recov	Sample ID	Blow Count	PID (ppm)	Mercury (mg/m3)	10.11.11.1	Soil Description		Well Construction Diagram
0			Count			GM/SM	Hand cleared to 5 ft. Installed with a stick up a ground surface. Limerock road base material, debris, brick to 2 feet, then brown fine sand a dry.	above , rock nd silt,	
5 +							Mud rotary drilling, mud pH 7.		
10									
15									

BORING LOG	
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Site Name: LCP Chemicals Site, Brunswick GA Boring No: SW-20 Honeywell Diameter: 8 in Date: 07/25/2013

			Meth Cons	er: Ground od: Mud R sultant: PA ect No: 448	totary RSONS	otection Inc	Coor NAD 1	n: NAVD88 dinate System: 983 State Plane ia East / FIPS 1001
Depth Sample Blow Ft Prince ID Count 15 ID ID ID			PID (ppm)	Mercury (mg/m3)	11.00.000	Soil Description Mud rotary drilling, mud pH 7.		Well Construction Diagram
20								
30		_		_				

BORING L		ie	yM	Page 3 of 4	E	Site Name: _{LCP} Chemicals Site, Brunswick GA Boring No: SW-20 Diameter: 8 in Date: 07/25/2013					
Northing (ft) Easting (ft): Elevation (ft Total Depth:	861615.30): 8.98		Meth Cons	er: Groundv od: Mud R sultant: PA ect No: 448	totary RSONS	rotection Inc	Coor NAD	Datum: NAVD88 Coordinate Syster NAD 1983 State Plane Georgia East / FIPS 10			
Depth So Price Pri	Sample	Blow	PID	Mercury	1.1.1.1.1.1.1.1.1	Soil Description		Well Constructio Diagram			
Ft 🗠	ID	Count	(ppm)	(mg/m3)	Code	Mud rotary drilling, mud pH 7.		Diagram			
Ĩ	I			1 1							
35											
35		11	0.0	0.000	SW	Gray coarse to very coarse SAND, wet.					
-		11 12 11				Gray coarse to very coarse SAND, wet. Gray coarse to very coarse SAND, wet.					
-		12	0.0	0,000	SW	Gray coarse to very coarse SAND, wet.					
-		12 11 11 8									
-		12 11 11	0.0 0.0	0.000 0.000	sw sw	Gray coarse to very coarse SAND, wet.					
-		12 11 11 8 7	0.0	0.000	sw	Gray coarse to very coarse SAND, wet. Gray coarse to very coarse SAND, wet. Black medium to coarse SAND, trace silt.					
-		12 11 11 8 7 7 7	0.0 0.0	0.000 0.000	sw sw	Gray coarse to very coarse SAND, wet. Gray coarse to very coarse SAND, wet.					

BORING LOG

Page 4 of 4

Site Name: LCP Chemicals Site, Brunswick GA Boring No: SW-20 Honeywell Diameter: 8 in Date: 07/25/2013

Northing (ft): 431754.07 Easting (ft): 861615.36 Elevation (ft): 8.98 Total Depth: 51.5 Ft			Meth Cons	r: Ground od: Mud R sultant: PA oct No: 448	totary RSONS	otection Inc	Coord NAD 1	n: NAVD88 dinate System 983 State Plane ia East / FIPS 100	
Depth Ft	Recov	Sample ID	Blow Count	PID (ppm)	Mercury (mg/m3)		Soil Description		Well Construction Diagram
45			15 50	0.0	0.000	SC	Gray fine SAND, some clay, moist.		
*			27 30	0.0	0.000	SC	Gray fine SAND, some shells, trace clay, moist.		
÷			37 30	0.0	0.000	SC	Gray fine SAND, some shells, trace clay, moist.		10.000 (0.000 (0.000) (0.000) (0.000) (0.000)
Ŧ			24	0.0	0.000	SC	Gray fine SAND, some shells, trace clay, moist.		
			16	0.0	0.000	SC	Gray fine SAND, some shells, trace clay, moist.		
+			18	0.0	0.000	SC	Gray fine SAND, trace shells, trace clay, moist.		
			16	0.0	0.000	SC	Gray fine SAND, trace shells, trace clay, moist.		
50 +			24	0.0	0.000	SC	Gray fine SAND, trace shells, trace clay, moist.		(()++ 2000 - 1000 - 1000
			20	0.0	0.000	SM	Gray fine SAND, some shells, laminated, moist.		++++ ****
51.5			44	0.0	0.000	SM	Gray fine sand, some shells, laminated, moist, cemented sandstone at 51.3 feet.		

et at 51 ft, ground elevation 8.42

BORING	LOG

Honeywell

Site Name: LCP Chemicals Site, Brunswick GA Boring No: SW-21 Diameter: 8 in Date: 07/25/2013

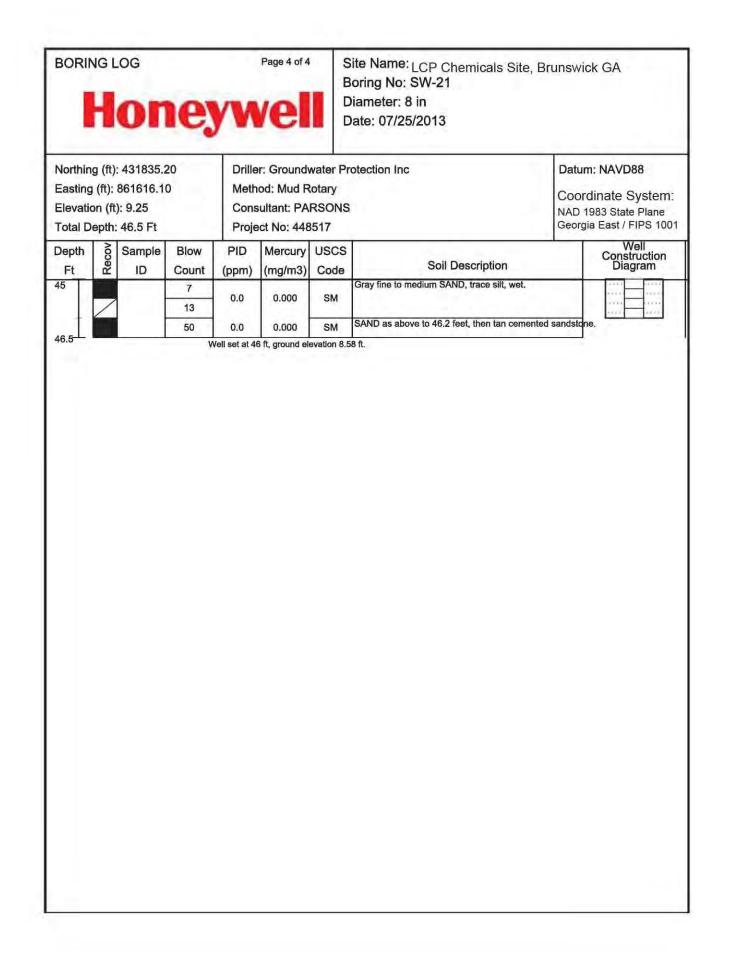
Easting Elevatio	(ft): on (ft	: 431835.2 861616.1(): 9.25 : 46.5 Ft		Meth Cons	Driller: Groundwater Protection IncDatuMethod: Mud RotaryCooConsultant: PARSONSNADProject No: 448517Geor							
Depth S Sample Blow Ft 22 ID Count				PID (ppm)	Mercury (mg/m3)	USCS Code	Soil Description		Well Construction Diagram			
0				0.0	0.000	GM/SM	Hand cleared to 5 ft. Installed with a stick up ground surface. Limerock road base materia gravel to 2 feet, then brown fine to medium s silt, dry.	above I, debris, and and				
5 +							Mud rotary drilling, mud ph 7.					
10												
15												

BORING LOG	
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Site Name: LCP Chemicals Site, Brunswick GA Boring No: SW-21 Honeywell Diameter: 8 in Date: 07/25/2013

Easting Elevatio	(ft): on (ft	: 431835.2 861616.1): 9.25 : 46.5 Ft		Meth Cons	er: Ground od: Mud R sultant: PA ect No: 448	otary RSONS	Datum: NAVD88 Coordinate System: NAD 1983 State Plane Georgia East / FIPS 100			
Depth Ft	Recov	Sample ID	Blow Count	PID (ppm)	Mercury (mg/m3)		Soil Description Mud rotary drilling, mud ph 7.		Well Construction Diagram	
20										
25 +										
30										

H	.og O N	le,	yw	Page 3 of 4	E	Site Name: _{LCP} Chemicals Site, Brunswick GA Boring No: SW-21 Diameter: 8 in Date: 07/25/2013				
Northing (ft) Easting (ft): Elevation (ft Total Depth:	861616.1(): 9.25		Meth Cons	er: Ground od: Mud R sultant: PA ect No: 448	totary RSONS	rotection Inc	Coor NAD	m: NAVD88 dinate Syste 1983 State Pla jia East / FIPS		
Depth og Ft 22	Sample ID	Blow Count	PID (ppm)	Mercury (mg/m3)	10.000	Soil Description		Well Constructi Diagram		
35 —										
+										
40 -		6	0.0	0.000	SW	Gray medium to coarse SAND, trace gravel, w	et.			
40		6 9 12				Gray medium to coarse SAND, trace gravel, we Gray medium to coarse SAND, trace gravel, we				
40		9 12 12 8	0.0 0.0 0.0	0.000 0.000 0.000	SW SW SW		et.			
40		9 12 12 8 10 10	0.0	0.000	sw	Gray medium to coarse SAND, trace gravel, w	et.			
40		9 12 12 8 10	0.0 0.0	0.000 0.000	sw	Gray medium to coarse SAND, trace gravel, w Gray medium to coarse SAND, trace gravel, w	et.	1999 - 1999 1999 - 1999		



BORI			le,	yw	Page 1 of 4	E	Site Name: LCP Chemicals Site, Brunswick GA Boring No: SW-22 Diameter: 8 in Date: 07/27/2013				
Northing (ft): 431915.78 Easting (ft): 861615.57 Elevation (ft): 8.95 Total Depth: 50.25 Ft			Meth Cons	r: Groundv od: Mud R ultant: PA ct No: 448	otary RSONS	rotection Inc	Coor NAD	Datum: NAVD88 Coordinate System: NAD 1983 State Plane Georgia East / FIPS 100			
Depth Ft	Recov	Sample ID	Blow Count	PID (ppm)	Mercury (mg/m3)	USCS Code	Soil Description		Well Construction Diagram		
5				0.0	0.000		Hand cleared to 5 ft. Installed with a stick up above ground surface. pH is 7.5.				
+				0.0	0.000						

BORING LOG					yw	Page 2 of 4	E	Site Name: LCP Chemicals Site, Brunswick GA Boring No: SW-22 Diameter: 8 in Date: 07/27/2013				
Northing (ft): 431915.78 Easting (ft): 861615.57 Elevation (ft): 8.95 Total Depth: 50.25 Ft					Meth Cons	or: Ground od: Mud R sultant: PA oct No: 448	totary RSONS	otection Inc	Coor NAD	Datum: NAVD88 Coordinate System NAD 1983 State Plane Georgia East / FIPS 10		
Dept Ft		Recov	Sample ID	Blow Count	PID (ppm)	Mercury (mg/m3)	10.000	Soil Description		Well Construction Diagram		
20 -					0.0	0.000		Drilled to 40 ft with mud rotary. No sampling to 40 ft. pH is 7.5				
25 -	-				0.0	0,000						
	+											

		O	le	yw	Page 3 of 4	E	Site Name: _{LCP} Chemicals Site, Brunswick GA Boring No: SW-22 Diameter: 8 in Date: 07/27/2013				
Northing (ft): 431915.78 Easting (ft): 861615.57 Elevation (ft): 8.95 Total Depth: 50.25 Ft				Meth Cons	er: Groundv od: Mud R sultant: PA ect No: 448	lotary RSONS	rotection Inc	Coor NAD 1	Datum: NAVD88 Coordinate Syster NAD 1983 State Plane Georgia East / FIPS 10		
Depth		Sample	Blow	PID	Mercury		and the second second	-	Well Constructio Diagram		
Ft	Recov	ID	Count	(ppm)	(mg/m3)	Code	Soil Description		Diagram		
35				0.0	0.000						
40 -	-	1.00			0.000		Light gray coarse SAND, 1/4 inch silty clay laye	ers wet			
			7	0.0	0.000	62	upper 6 inches. Bottom 6 inches, gray medium SAND, little fine sand and silt, wet, no stain or	coarse			
÷	1		11			SM	pH is 7.0 to 7.5.				
	1		10					-			
Ť			7	0.0	0.000		Same as above, lense of gray clay, little silt, swampy odor.				
			8			SM	NAME COM				
	1]	12			SIVI					
~		1	11								
Ĩ	/				0.000		Gray medium to coarse SAND over fine to medium				
*			8	0.0	0.000	SP	SAND, over gray brown silt, fine sand, trace sh broken, wet.	nells			

BORIN			le,	yM		B	ite Name: _{LCP} Chemicals Site, I Boring No: SW-22 Diameter: 8 in Date: 07/27/2013	Brunswi	ick GA		
Easting Elevation) (ft): on (ft	: 431915.7 861615.5): 8.95 : 50.25 Ft		Meth Cons	or: Ground od: Mud R sultant: PA oct No: 448	totary RSONS	otection Inc	Cool	Datum: NAVD88 Coordinate System NAD 1983 State Plane Georgia East / FIPS 100		
Depth Ft	Recov	Sample ID	Blow Count	PID (ppm)	Mercury (mg/m3)	USCS Code	Soil Description		Well Construction Diagram		
45	/		11 18			SP	Gray medium to coarse SAND over fine to me SAND, over gray brown silt, fine sand, trace s broken, wet.				
+			8 8 21	0.0	0.000	SM	Brown gray fine to medium SAND, little shells broken, trace clay, wet.		- 100 - 100		
Ŧ	4		31	0.0	0.000	SM	Gray fine to medium SAND, trace shells, wet.				
			21	0.0	0.000	SM	Gray brown fine to medium SAND, little shells trace clay, wet.				
			22	0.0	0.000	SM	Gray brown fine to medium SAND, little shells trace clay, wet.		1010		
50 -			50/2	0.0	0.000	SM	Gray brown fine to medium SAND, little shells trace clay, with little mudstone clasts, wet.				
50.25			50/3	/ell Set at 5	0.000	SM	Sandstone with mudstone clasts in upper, ver	V	and the second		

BORING LOG	Page 1 of 4
Hone	well

Site Name: LCP Chemicals Site, Brunswick GA Boring No: SW-23 Diameter: 8 in Date: 07/29/2013

Easting Elevatio	(ft): n (ft)	: 431994.(861615.0): 8.94 50.0 Ft		Meth Cons	r: Groundv od: Mud R sultant: PA sct No: 448	totary RSONS	otection Inc	Cool	m: NAVD88 rdinate System: 1983 State Plane gia East / FIPS 1001
Depth Ft	Recov	Sample ID	Blow Count	PID (ppm)	Mercury (mg/m3)		Soil Description		Well Construction Diagram
5	H			0.0	0.000		Hand cleared to 5 ft. Installed with a stick up above ground surface. pH is 7.		
10 -				2.0	0.000		Volatile organic compounds from rig exhaus Mud rotary drilling to 40 ft. No sampling to 40 pH is 7.	Ĵft.	
15									

Easting Elevation	g (ft): on (ft	: 431994.! 861615.0): 8.94 50.0 Ft		Meth Cons	r: Groundv od: Mud R sultant: PA oct No: 448	otary RSONS	rotection Inc	Coor NAD	m: NAVD88 dinate System 1983 State Plane gia East / FIPS 10
Depth Ft	Recov	Sample ID	Blow Count	PID (ppm)	Mercury (mg/m3)		Soil Description		Well Construction Diagram
20 +				2.0	0.000				
+									

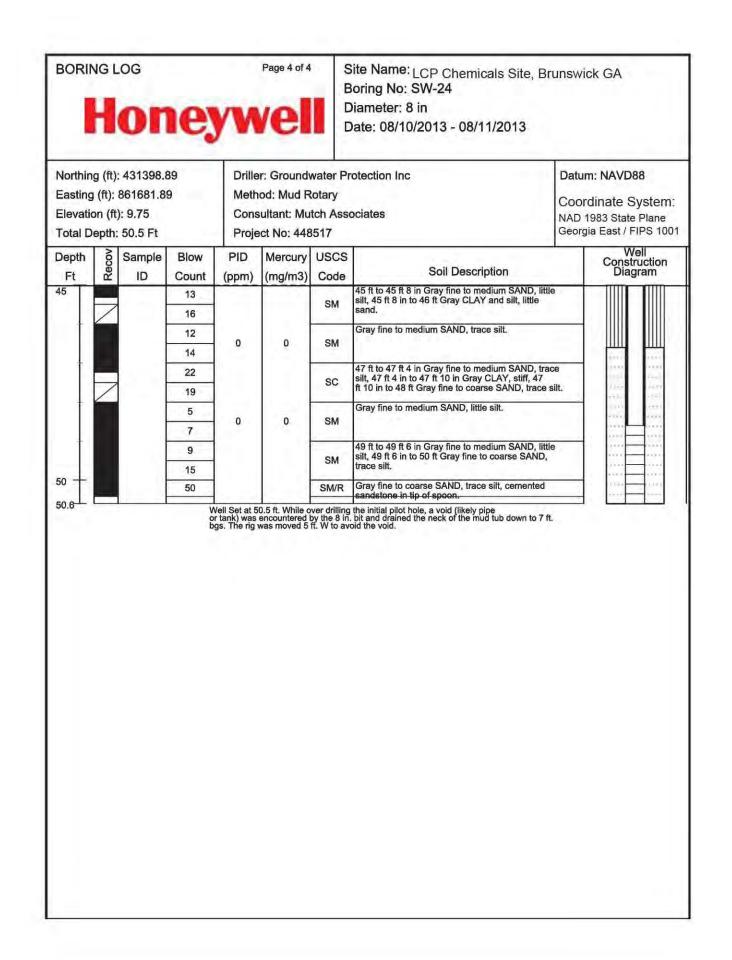
BOR			le	yw	Page 3 of 4	E	Site Name: _{LCP} Chemicals Site, I Boring No: SW-23 Diameter: 8 in Date: 07/29/2013	Brunsw	ick GA
Eastin Elevat	ng (ft): tion (ft	: 431994. 861615.0 :): 8.94 : 50.0 Ft		Meth Cons	er: Groundv ood: Mud R sultant: PA ect No: 448	totary RSONS	rotection Inc	Coo NAD	m: NAVD88 rdinate Syste 1983 State Plar gia East / FIPS
Depth	Recov	Sample ID	Blow Count	PID	Mercury (mg/m3)	USCS	Soil Description		Well Constructio Diagram
30 +				2.0	0.000		Volatile organic compounds from rig exhaust. Mud rotary drilling to 40 ft. No sampling to 40 pH is 7.	ft.	
40 -			8 12 11 13	0.0	0.000	SM	Gray medium to coarse SAND, little fine sand pH is 7.		
-			7 8 10 12	0.0	0.000	SM	sand and silt, little clay, wet.		
			8 7	0.0	0.000	SM	Gray medium to coarse SAND, bottom 3 inche to medium sand, darker gray, wet.	es fine	

	Hone Northing (ft): 431994.55 Easting (ft): 861615.07 Elevation (ft): 8.94 Total Depth: 50.0 Ft			M	vel		Boring No: SW-23 Diameter: 8 in Date: 07/29/2013			
Easting Elevation	g (ft): on (ft	861615.0): 8.94		Meth Cons	r: Groundv od: Mud R sultant: PA ect No: 448	otary RSONS	rotection Inc	Coor	Datum: NAVD88 Coordinate System: IAD 1983 State Plane Georgia East / FIPS 100	
Depth	Recov	Sample	Blow	PID	Mercury	USCS		_	Well Construction	
Ft 45	Re	ID	Count	(ppm)	(mg/m3)	Code	Soil Description Gray medium to coarse SAND, bottom 3 incl	os fino	Diagram	
40			6			SM	to medium sand, darker gray, wet.	100 1110		
+			6	0.0	0.000		Same as above, darker gray SAND, bottom 8	3 inches		
		1	8	0.0	0.000		gray fine SAND and SILT, clay lenses 1/4 inc shells bottom 3 inches.	h, trace	100 000	
÷			12			SM	and the second sec			
			11							
T			12	0.0	0.000		Fine SAND, little silt, trace shells, soft, wet. E inch top of rock, sandstone lighter gray, ceme		10 <u>> -</u> 411	
Ļ			17	0.0	0.000	SM				
	-		10	0.0	0.000					
50.0		F = F	50/5	0.0 Vell Set at 50	0.000					

BORIN			e	ym	Page 1 of 4	E	Site Name: ^{LCP} Chemicals Site Boring No: SW-24 Diameter: 8 in Date: 08/10/2013 - 08/11/2013	, Brunswi	ck GA
Easting Elevatio	(ft): on (ft)	431398.8 861681.8 9: 9.75 50.5 Ft		Meth Cons	r: Ground od: Mud R sultant: Mu oct No: 448	Rotary Itch Ass	rotection Inc ociates	Cool	m: NAVD88 rdinate System 1983 State Plane gia East / FIPS 100
Depth	Recov	Sample	Blow	PID	Mercury	USCS	Soil Description		Well Construction Diagram
0						GP/SM	Hand cleared to 5 ft. Installed with a stick u above ground surface. 0 ft to 4 ft road GRA ballast, black sand, 4 ft to 5 ft Brown fine to SAND, trace silt.	VEL, railroad	
5 +							Brown gray drilling mud, pH 7.		
10				19.6	0				
15									

			Ie,	yw	Page 2 of 4	E	Site Name: _{LCP} Chemicals Site Boring No: SW-24 Diameter: 8 in Date: 08/10/2013 - 08/11/2013	, Brunswi	ick GA
Easti Eleva	ng (ft): ation (f): 431398. : 861681.8 it): 9.75 n: 50.5 Ft		Meth Cons	er: Ground od: Mud R sultant: Mu ect No: 448	totary	rotection Inc	Cool	m: NAVD88 rdinate System 1983 State Plane gia East / FIPS 10
Depti Ft	Recov	Sample	Blow Count	PID (ppm)	Mercury (mg/m3)	11.1.1.1.1.1.1.1	Soil Description		Well Construction Diagram
20 -				19.6	D				
25 -									

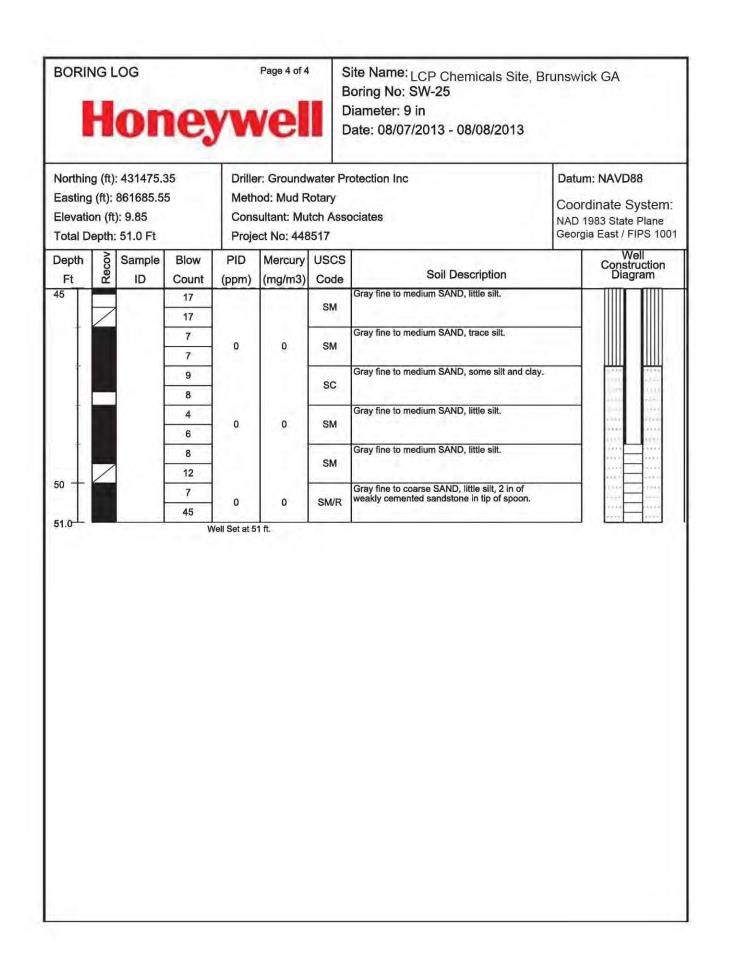
			Ie,	yw	Page 3 of 4	E	Site Name: _{LCP} Chemicals Site, Boring No: SW-24 Diameter: 8 in Date: 08/10/2013 - 08/11/2013	Brunswic	k GA
Easting Elevatio	(ft): on (ft)	431398.8 861681.8 9.75 50.5 Ft		Meth Cons	er: Groundv od: Mud R sultant: Mu ect No: 448	otary tch Ass	rotection Inc ociates	Coord NAD 19	: NAVD88 inate Syst 983 State Pla East / FIPS
Depth Ft	Recov	Sample ID	Blow Count	PID (ppm)	Mercury (mg/m3)	USCS Code	Soil Description		Well Constructi Diagram
35 -				19.6	Ō				
40 —	R		7	0	0	SM	Gray fine to coarse SAND, trace silt.		ш
+			11 18			SM	41 ft to 41 ft 4 in Gray fine to coarse SAND, i silt, 41 ft 4 in to 42 ft Gray fine to medium SA some silt. Gray fine to coarse SAND, trace silt.	trace ND,	ш
			12 16 16	0	D	SM	Gray fine to coarse SAND, trace sit.		
Ŧ			19 9	0	o	SM SM	Gray fine to medium SAND, trace silt.		
+				0	0	SM			and the second second



BORIN			le,	yM	Page 1 of 4	E	Site Name: LCP Chemicals Site, Boring No: SW-25 Diameter: 9 in Date: 08/07/2013 - 08/08/2013	, Brunswi	ck GA
Easting Elevatio	(ft): n (ft)	: 431475.: 861685.5): 9.85 51.0 Ft		Meth Cons	er: Groundv od: Mud R sultant: Mu ect No: 448	totary tch Ass	rotection Inc ociates	Cool	m: NAVD88 rdinate Syster 1983 State Plane gia East / FIPS 10
Depth	Recov	Sample ID	Blow	PID	Mercury (mg/m3)	USCS Code	Soil Description		Well Construction Diagram
•						SM	Hand cleared to 5 ft. Installed with a stick up ground surface. Gray brown fine to medium trace silt, 2 in layer of organic top soil.	SAND,	
5 +							Brown gray drilling mud, pH 7.		
10				0	D				

			le	yM	Page 2 of 4	E	Site Name: _{LCP} Chemicals Site Boring No: SW-25 Diameter: 9 in Date: 08/07/2013 - 08/08/2013	e, Brunsw	vick GA
Easting Elevation	(ft): on (ft)	431475.3 861685.5 9.85 51.0 Ft		Meth Cons	er: Ground od: Mud R sultant: Mu ect No: 448	Rotary Itch Ass	rotection Inc	Coc	um: NAVD88 ordinate Syster 0 1983 State Plane rgia East / FIPS 10
Depth Ft	Recov	Sample ID	Blow Count	PID (ppm)	Mercury (mg/m3)	1.	0.10 1.0		Well Constructior Diagram
20 +				O	D				

H		16	yw	Page 3 of 4	E	Site Name: _{LCP} Chemicals Site, Boring No: SW-25 Diameter: 9 in Date: 08/07/2013 - 08/08/2013	Brunswi	ick GA
Easting (fi Elevation	ft): 431475 t): 861685.4 (ft): 9.85 th: 51.0 Ft		Meth Cons	er: Groundv ood: Mud R sultant: Mu ect No: 448	otary tch Ass	rotection Inc ociates	Cool NAD	ım: NAVD88 rdinate Sys 1983 State Pla gia East / FIPS
Depth Ft d	Sample	Blow Count	PID	Mercury (mg/m3)		Soil Description		Well Construc Diagrar
30			(ppm)			Brown gray drilling mud, pH 7.		
35			0	O				
35		11	0	0	SM	Gray fine to coarse SAND, trace silt.		
-		11 12 12 13			SM	Gray fine to coarse SAND, trace silt. Gray fine to coarse SAND, trace silt.		
-		12 12				Gray fine to coarse SAND, trace silt. Gray fine to coarse SAND, trace silt.		
-		12 12 13 10	0	0	SM	Gray fine to coarse SAND, trace silt.		



BORING LOG	Page 1 of 4
Hone	wel

Site Name: LCP Chemicals Site, Brunswick GA Boring No: SW-26 Diameter: 8 in Date: 07/23/2013

Northing (ft): 431557.34 Easting (ft): 861686.52 Elevation (ft): 10.65 Total Depth: 52.5 Ft				Meth Cons	r: Groundv od: Mud R sultant: PA ect No: 448	Coord	Datum: NAVD88 Coordinate System: NAD 1983 State Plane Georgia East / FIPS 1001			
Depth Ft	Recov	Sample ID	Blow Count	PID (ppm)	Mercury (mg/m3)	1.	Soil Description		Well Construction Diagram	
0	-			0.0	0.000	SM	Hand cleared to 5 ft. Installed with a stick up above ground surface. Brown fine to medium	n SAND, dry.		
5							Mud rotary drilling, mud ph 7.			
- 10										
15										

Northing (ft): 431557.34 Easting (ft): 681686.52 Elevation (ft): 10.65 Total Depth: 52.5 Ft Driller: Groundwater Protection Inc Method: Mud Rotary Consultant: PARSONS Project No: 448517 Datum: NAVD88 Coordinate Syste NAD 1983 State Para Georgia East / FIPS Depth § 20 Sample Blow ID P1D Mercury (mg/m3) USCS Soil Description Construction Data for the para Georgia East / FIPS 20 - - - - - - - - 20 - - - - - - - - 20 - - - - - - - - 25 - - - - - - - -	BORIN			le	ym	Page 2 of 4	В	ite Name: _{LCP} Chemicals Site oring No: SW-26 biameter: 8 in bate: 07/23/2013	e, Brunswi	ck GA
15 14 15 14 15 15 15 15 15 15 15 15 15 15 15 15 15	Easting Elevatio	(ft): 8 n (ft)	861686.52 10.65		Meth Cons	od: Mud R sultant: PA	totary RSONS		Coor	dinate System 1983 State Plane
15 4 4 4 4 4 4 4 4 4 4 4 4 4	2012 C	Recov		1.000		1.	10.000	Soil Description		Well Construction Diagram
	-									

BORI			Ie,	yw	Page 3 of 4	В	Bite Name: _{LCP} Chemicals Site, Boring No: SW-26 Diameter: 8 in Date: 07/23/2013	Brunswi	ck GA
Easting Elevation	g (ft): on (ft	: 431557.3 861686.5): 10.65 : 52.5 Ft		Meth Cons	er: Ground od: Mud R sultant: PA ect No: 448	lotary RSONS	rotection Inc	Coor NAD 1	n: NAVD88 dinate Syster 1983 State Plane ia East / FIPS 10
Depth Ft	Recov	Sample ID	Blow Count	PID (ppm)	Mercury (mg/m3)	USCS Code	Soil Description		Well Construction Diagram
35 -									
40 —			9 11 8			SM	Gray fine to medium SAND, trace silt, wet. Gray fine to medium SAND, trace silt, wet.		
+	2		11 4			SM	Gray CLAY to 42.5 feet, then gray medium to SAND, wet.	coarse	
		-0	11 9 3			CL/SW	Gray medium to coarse SAND, wet.		
-		1. J.	7	1					

			le	yM	Page 4 of 4	E	Site Name: _{LCP} Chemicals Site, B Boring No: SW-26 Diameter: 8 in Date: 07/23/2013	runswi	ck GA
Eastin Eleva	ng (ft): ition (ft	: 431557.: 861686.5): 10.65 : 52.5 Ft		Meth Cons	r: Groundv od: Mud R sultant: PA oct No: 448	totary RSONS	rotection Inc	Coor	m: NAVD88 rdinate Systen 1983 State Plane gia East / FIPS 10
Depth Ft	Recov	Sample ID	Blow Count	PID (ppm)	Mercury (mg/m3)	USCS Code	Soil Description		Well Construction Diagram
45	1		6						
	\square		8				and the second second		1.32
			10	0.0	0.000	SW	Gray medium to coarse SAND.		
ļ			4	0.0	0.000				
		0	5	0.0	0.000	CL/SC	Gray CLAY, soft to 47.4 feet then gray SAND, s clay.	iome	
ļ			5				Gray CLAY and shells, very soft.	-	
			1	0.0	0.000	CL	Only OLAT and shous, very solt.		1000
+	K	-1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1	2		1.00		Gray fine to medium SAND, little silt.	-	1715 (199) 2003
	K	(1	3	0.0	0.000	SM			()))) ())) ()))) ()))
50 -	-		3	0.0	0.000	SM	Gray fine to medium SAND, little to some silt,	-	1000 - 1000
1.00	1		5				trace shell fragments, trace gravel. No Recovery in split spoon.	3	1 + + + + + + + + + + + + + + + + + + +
ł			1	0.0	0.000	SM	Gray fine to coarse SAND, trace silt, trace grave wet.	el,	1010
			1	0.0	0.000	SM	Gray fine to coarse SAND, trace silt, trace grave wet.	əl,	
	_		50/1	0.0	0.000	SM	Partially lithified fine to coarse SAND, trace gravel, trace silt, dry.		
52.5			S	Set well at 52	? ft, ground el	evation 10	.10 ft.		

BORI			le,	yw	Page 1 of 4	E	Site Name: LCP Chemicals Site, Brunswick GA Boring No: SW-27 Diameter: 8 in Date: 07/22/2013 - 07/23/2013				
Easting Elevati	g (ft): ion (ft	: 431635.0 861685.0): 10.57 52.5 Ft		Meth Cons	r: Ground od: Mud R sultant: PA oct No: 448	totary RSONS	NAD 1983 State Georgia East / FI				
Depth Ft	Recov	Sample ID	Blow Count	PID (ppm)	Mercury (mg/m3)	USCS Code	Soil Description		Well Construction Diagram		
-				0.0	0.000	SM	Hand cleared to 5 ft. Installed with a stick above ground surface. Brown fine to med little silt, dry.	lium SAND,			
5							Mud rotary drilling, mud pH 7-8.				
10											
15											

BORIN			Ie,	yM	Page 2 of 4	B	ite Name: _{LCP} Chemicals Site oring No: SW-27 biameter: 8 in bate: 07/22/2013 - 07/23/2013		ck GA
Easting Elevatio	(ft): 8 on (ft)	431635.0 861685.01 : 10.57 52.5 Ft		Meth Cons	er: Groundv od: Mud R sultant: PA ect No: 448	totary RSONS	otection Inc	Coor	m: NAVD88 dinate System 1983 State Plane jia East / FIPS 100
Depth	Recov	Sample	Blow	PID	Mercury	USCS	0.10		Well Construction Diagram
Ft 15	Re	ID	Count	(ppm)	(mg/m3)	Code	Soil Description Mud rotary drilling, mud pH 7-8.		Diagram
20									
25									
Ļ									

DOMINOLOO	BOR	NG	LOG	
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Page 3 of 4

Site Name: LCP Chemicals Site, Brunswick GA Boring No: SW-27 Diameter: 8 in Date: 07/22/2013 - 07/23/2013

Honeywell Datum: NAVD88 Northing (ft): 431635.01 **Driller: Groundwater Protection Inc** Easting (ft): 861685.01 Method: Mud Rotary Coordinate System: Elevation (ft): 10.57 **Consultant: PARSONS** NAD 1983 State Plane Georgia East / FIPS 1001 Total Depth: 52.5 Ft Project No: 448517 Well Recov PID USCS Depth Sample Blow Mercury Construction Diagram Soil Description (ppm) Ft ID Count (mg/m3) Code Gray coarse to very coarse SAND, trace gravel, 30 4 wet. 0.000 SW 0.0 8 Black very fine to fine SAND, trace silt, wet. 11 0.0 0.000 SM 11 Gray coarse to very coarse SAND, trace gravel. 9 0.0 0.000 SW 10 Black fine to medium SAND, trace silt. 12 0.000 0.0 SM 14 Gray very coarse to coarse SAND, trace gravel, 10 wet. 0.000 0.0 SW 10 35 Gray very fine to medium SAND, wet. 12 0.0 0.000 SM 13 Gray very coarse SAND, trace silt, wet. 16 0.0 0.000 SW 14 Gray fine SAND, wet. 14 0.0 0.000 SM 15 Gray fine SAND, wet. 14 0.000 0.0 SM 14 Gray fine SAND, little black clay, laminated. 11 0.000 SC 0.0 12 40 Gray coarse SAND, with 3 inch clay lense, wet. 8 0.000 0.0 SC 7 Gray fine to coarse SAND, wet. 10 0.0 0.000 SM 14 Gray fine to coarse SAND, wet. 4 0.0 0.000 SM 4 Gray medium to coarse SAND, wet. 4 0.000 SW 0.0 7 Gray coarse to very coarse SAND, wet. 10 0.000 SW 0.0 10 45

BORIN			le	yw	Page 4 of 4	E	Site Name: _{LCP} Chemicals Site, Bi Boring No: SW-27 Diameter: 8 in Date: 07/22/2013 - 07/23/2013	runswi	ick GA
Easting Elevatio	(ft): on (ft)	431635.0 861685.0): 10.57 52.5 Ft		Meth Cons	r: Groundv od: Mud R sultant: PA oct No: 448	totary RSONS	rotection Inc	Cool	m: NAVD88 rdinate System 1983 State Plane gia East / FIPS 100
Depth Ft	Recov	Sample ID	Blow Count	PID (ppm)	Mercury (mg/m3)	USCS Code	Soil Description		Well Construction Diagram
45			7	0.0	0.000	SP	Black very coarse SAND, trace silt.		
+			10				Gray coarse to very coarse SAND.		
			9	0.3	0.000	SW	Gray coarse to very coarse on very		
÷			15			-	Black fine to medium SAND, trace silt, wet.	-	
			24	0.3	0.000	SM			1
÷			5			Lask	Gray coarse to very coarse SAND and gravel, w	vet,	
			8	0.0	0.000	SW			
-			9	0.0	0.000	SM	Black fine to medium SAND, little silt.		init one
50 -	/		13	0.0	0.000	SIVI			1
50		~ -0	9	0.0	0.000	SM	Gray fine to medium SAND, little silt, wet.		
+		- 1	4	0.0	0.000	-	No Recovery in split spoon.		
			5	0.0	0.000	SM	Gray fine to medium SAND, trace clay.		44.64 Pro 44
+		1.00	22	0.0	0,000	CL	Clay lenses and shell fragments, dry to moist. Gray coarse SAND and gravel.		
52.5			40	0.0	0.000 1.5 ft, gound e	SW	Gray coarse SAND and graver.		1.6 (2)

Easting Elevation	Northing (ft): 431715.38 Easting (ft): 861685.72 Elevation (ft): 10.27 Total Depth: 52.5 Ft			Meth Cons	r: Groundv od: Mud R sultant: Mu ect No: 448	otary tch Ass	rotection Inc ociates	Datum: NAVD88 Coordinate System NAD 1983 State Plane Georgia East / FIPS 100
Depth Ft	Recov	Sample ID	Blow Count	PID (ppm)	Mercury (mg/m3)		Soil Description	Well Construction Diagram
*						SM	above ground surface. Brown medium to coarse S trace silt.	
5 +						Province of the second se	Brown drilling MUD, pH 7 to 8.	
10 -								

BORIN			Ie,	yM	Page 2 of 4	B	ite Name: _{LCP Chemicals Sit} oring No: SW-28 liameter: 8 in pate: 07/22/2013 - 07/23/2013		ick GA
Easting Elevatio	(ft): on (ft)	431715.3 861685.72 10.27 52.5 Ft		Meth Cons	er: Ground od: Mud R sultant: Mu ect No: 448	totary tch Asso	otection Inc	Cool	m: NAVD88 rdinate System 1983 State Plane gia East / FIPS 100
Depth	Recov	Sample	Blow	PID	Mercury	USCS			Well Construction Diagram
Ft 15	Re	ID	Count	(ppm)	(mg/m3)	Code	Soil Description Brown drilling MUD, pH 7 to 8.		Diagram
20 -									
25 +									
*									

BORIN			le	yw	Page 3 of 4	E	Site Name: _{LCP} Chemicals Site, Boring No: SW-28 Diameter: 8 in Date: 07/22/2013 - 07/23/2013	Brunsw	vick GA
Northing (ft): 431715.38 Easting (ft): 861685.72 Elevation (ft): 10.27 Total Depth: 52.5 Ft			Meth Cons	od: Mud R	Rotary Itch Ass	Associates NAD 1983			
Depth Ft	Recov	Sample ID	Blow Count	PID (ppm)	Mercury (mg/m3)	USCS Code	Soil Description		Well Construction Diagram
30			7	0	0	SM	Brown fine to medium SAND, some silt.		
			7	, U	U	Sivi			
T.			7			SM	Gray fine to coarse SAND, little silt, pH 7.		
	/		9			OIVI			
			5	0	0	SM	Gray fine to coarse SAND, little silt.		
			7						
			6			SM	Gray fine to coarse SAND, little silt.		
	1		12						
			9	0.0	0	SM	Gray fine to medium SAND, trace silt.		
35 -			8					_	
55			13			SM	Gray fine to medium SAND, some silt.		
-			14	-	1.1.1				
			7	0.0	0	SM	Gray fine to medium SAND, trace silt.		
		1.0	7				Brown fine SAND, trace silt.		
			7			SM	Brown line SAND, trace sitt.		
+	/		6		1.1	0.7710	38 ft to 38 ft 6 in Brown fine SAND, trace silt,		
			6	o	0	SM	38 ft 6 in to 38 ft 9 in Gray CLAY, some sand 9 in to 40 ft Gray fine to coarse SAND, trace	, 38 ft	
+			12		1 - 1	-	Gray fine to coarse SAND, trace silt.	5111.	
			7			SM			
40 -			6		1.0	_	Gray medium to coarse SAND, trace silt.		
			15	0	0	SM	And a second sec		
ŧ			12 14				Gray fine to coarse SAND, little silt.		
			14			SM	and a start of the second s		
+			15		1.5		Gray medium to coarse SAND, trace silt, occ		
			14	0	0	SM	1/2 inch beds medium to coarse sand, little si		
+			14				Gray medium to coarse SAND, trace silt, occ		-
			15			SM	1/2 inch beds medium to coarse sand, little si	lt.	
ŧ			5			- 64	Gray medium to coarse SAND, trace silt.		
			6	0	0	SM			

Northir Easting Elevati	Hor ng (ft): 431715. g (ft): 861685.7 on (ft): 10.27	38	Drille Meth Cons	er: Groundv od: Mud R sultant: Mu	water P totary tch Ass	rotection Inc sociates	Coor NAD	m: NAVD88 dinate Syster 1983 State Plane jia East / FIPS 1
Depth	Sample	and the second sec	PID	Mercury	USCS	Coll Departation		Well Construction Diagram
45	a id	Count 6 5	(ppm)	(mg/m3)	Code sc	45 ft to 45 ft 3 in Gray CLAY stiff, 45 ft 3 in to 46 ft fine to medium SAND, little silt.		
*		5	o	o	SM	Gray brown fine to coarse SAND, trace silt.		
÷		7			SM	Gray brown fine to coarse SAND, trace silt.		
÷		24 SM white shell layers. 25 Gray fine to medium SAND, little silt, 1/4 18 SM	Gray fine to medium SAND, little silt, 1/4 inch white shell layers.		1997) (1997) Video (1997) 1997) (1997)			
				SM	Gray fine to medium SAND, little silt, 1/4 inch white shell layers.			
50 +		16 27			SM	Gray fine to medium SAND, little silt, 1/4 inch white shell layers.		
Ť		16 13			SM	51 ft to 51 ft 6 in no recovery, 51 ft 6 in to 52 ft Gray fine to medium SAND, some silt, 1/4 ind shell layers.	ch white	4+1+ ((+)
52.5		50		1.5 ft.	SM/R	silt, 1/4 inch white shells, 52 ft 5 in refusal.	ome	

BORING LOG	
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Page 1 of 4

Honeywell

Site Name: LCP Chemicals Site, Brunswick GA Boring No: SW-29 Diameter: 8 in Date: 07/24/2013

Northing (ft): 431794.84 Easting (ft): 861685.51 Elevation (ft): 10.02 Total Depth: 52.75 Ft			Meth Cons	r: Ground od: Mud R sultant: Mu oct No: 448	totary tch Asso	otection Inc	Datum: NAVD88 Coordinate System: NAD 1983 State Plane Georgia East / FIPS 1001			
Depth Ft	Recov	Sample ID	Blow Count	PID (ppm)	Mercury (mg/m3)		Soil Description		Well Construction Diagram	
0			Count		(ingrino)	SM	Hand cleared to 5 ft. Installed with a stick up above ground surface. Brown medium to coarse trace silt.	SAND,		
5 +							Brown drilling MUD, pH 7 to 8.			
10										
15										

BORIN			le	yM	Page 2 of 4	E	Site Name: _{LCP} Chemicals Site Boring No: SW-29 Diameter: 8 in Date: 07/24/2013	e, Brunsw	ick GA	
Northing (ft): 431794.84 Easting (ft): 861685.51 Elevation (ft): 10.02 Total Depth: 52.75 Ft			Meth Cons	er: Groundv od: Mud R sultant: Mu ect No: 448	totary tch Ass	rotection Inc	Coo	Datum: NAVD88 Coordinate System: NAD 1983 State Plane Georgia East / FIPS 100		
Depth Ft	Recov	Sample ID	Blow Count	PID (ppm)	Mercury (mg/m3)		0.10		Well Construction Diagram	
20										

		.og O	le	yM	Page 3 of 4	E	Site Name: _{LCP} Chemicals Site, Brunswick GA Boring No: SW-29 Diameter: 8 in Date: 07/24/2013				
Northing (ft): 431794.84 Easting (ft): 861685.51 Elevation (ft): 10.02 Total Depth: 52.75 Ft			Meth Cons	er: Ground od: Mud R sultant: Mu ect No: 448	totary	rotection Inc	Datum: NAVD88 Coordinate System: NAD 1983 State Plane Georgia East / FIPS 1001				
Depth	Recov	Sample	Blow	PID	Mercury	USCS		Well Construction Diagram			
Ft	Rec	ID	Count	(ppm)	(mg/m3)	Code	Soil Description Brown drilling MUD, pH 7 to 8.	Diagram			
35 -											
+											
40 -			12		1.2.4		Brown medium to coarse SAND, trace silt.				
40 -			12	٥	0	SM	Brown medium to coarse SAND, trace silt.	- 11			
40				O	0		Brown medium to coarse SAND, trace silt. Brown medium to coarse SAND, trace silt.				
40			15	0	0	SM					
40 +			15 22			SM					
40			15 22 23	0	0.		Brown medium to coarse SAND, trace silt.				
40			15 22 23 11			SM SM	Brown medium to coarse SAND, trace silt. Brown medium to coarse SAND, trace silt. 43 ft to 43 ft 3 in Gray CLAY dense, 43 ft 3 in to				
40			15 22 23 11 15			SM	Brown medium to coarse SAND, trace silt. Brown medium to coarse SAND, trace silt.	H 10.			
40			15 22 23 11 15 16			SM SM	Brown medium to coarse SAND, trace silt. Brown medium to coarse SAND, trace silt. 43 ft to 43 ft 3 in Gray CLAY dense, 43 ft 3 in to	H 10.			

BORING LOG			yw	Page 4 of 4	E	Site Name: _{LCP} Chemicals Site, Brunswick GA Boring No: SW-29 Diameter: 8 in Date: 07/24/2013			
Northing (ft): 431794.84 Easting (ft): 861685.51 Elevation (ft): 10.02 Total Depth: 52.75 Ft			Meth Cons	r: Ground od: Mud R ultant: Mu ct No: 448	totary	sociates Coo		m: NAVD88 rdinate System: 1983 State Plane gia East / FIPS 1001	
Depth	Recov	Sample	Blow	PID	Mercury	USCS		- T	Well Construction
Ft	Re	ID	Count	(ppm)	(mg/m3)	Code	Soil Description		Diagram
45			13			SM	Gray medium to coarse SAND, trace silt, trace pH 10.	gravel,	
-		_	20			67.767	Crow fina to modium CAND town of	_	
			5	0.0	o	SM	Gray fine to medium SAND, trace silt.		
+			6				Gray fine to medium SAND, trace silt.		
			11			SM	Gray line to medium SAND, trace sitt.		
+			13				48 ft to 48 ft 6 in Gray fine to medium SAND, tra	200	2+64 (11)
			8			SC/SM	silt, clay lenses, 48 ft 6 in to 49 ft Gray fine to medium SAND, trace silt.	ace	
			12		1.1	-	Gray fine to medium SAND, trace silt.	-	1716 1910
		1.5	15			SM			
50 +			16 1	-	1.1.1.1		Gray fine to medium SAND, trace silt, thin clay	-	1004 - 11044
1			1			SC	lenses.		++++
4		1.27	7		1.1		Gray fine to medium SAND, trace silt,		1434 - 4877
3	/	1.1	16			SM			terit - resis
+			35		1.1.1		52 ft to 52 ft 6 in Gray fine to medium SAND, litt	tle	++++
52.75	/		50			SM/R	silt, trace white shell fragments, 52 ft 6 in to 52 ft 9 in Gray fine to medium SAND, little silt, wea	akly	
01.10			v	Vell Set at 5	2 ft.		cemented sandstone, refusal.		

BORING LOG	Page 1 of 4	Site Name: LCP Chemical Boring No: SW-30	s Site, Brunswick GA
Hone	ywell	Diameter: 8 in Date: 07/25/2013	
Northing (ft): 431874.71	Driller: Groundwate	er Protection Inc	Datum: NAV
Easting (ft): 861685.50	Method: Mud Rota	ry	Coordinate
Elevation (ft): 9.57	Consultant: Mutch	Associates	NAD 1983 Sta
Total Depth: 52.33 Ft	Project No: 448517	1	Georgia East

Elevatio	on (ft	861685.5): 9.57 : 52.33 Ft	Consultant: Mutch Associates Project No: 448517				NAD	Coordinate System: NAD 1983 State Plane Georgia East / FIPS 1001		
Depth	Recov	Sample	Blow	PID	Mercury	10.00	Soil Description		Well Construction Diagram	
Ft 0 + +	2	ID	Count	(ppm)	(mg/m3)	Code OL/AS/SM	Hand cleared to 5 ft. Installed with a stick up ground surface. 0 ft to 2 ft Brown TOP SOIL little gravel, 2 ft to 4 ft ASPHALT, little coarse 4 steel flanges, 4 ft to 5 ft Gray SAND.	above organic, a gravel,		
5							Brown drilling MUD, pH 7.			
10				0.5						
15										

Datum: NAVD88

		.og O	le	ум	Page 2 of 4		Site Name: _{LCP} Chemicals Sit Boring No: SW-30 Diameter: 8 in Date: 07/25/2013	te, Brunsw	ick GA	
Northing (ft): 431874.71 Easting (ft): 861685.50 Elevation (ft): 9.57 Total Depth: 52.33 Ft			Meth Cons	er: Ground od: Mud R sultant: Mu ect No: 448	Rotary Itch Ass	rotection Inc	Coo	Datum: NAVD88 Coordinate System NAD 1983 State Plane Georgia East / FIPS 100		
Depth Ft	Recov	Sample ID	Blow Count	PID (ppm)	Mercury (mg/m3)	10.0.10	0.10		Well Construction Diagram	
20				0.5						
1 1										

BORIN			le	yw	Page 3 of 4	E	Site Name: _{LCP} Chemicals Site, Boring No: SW-30 Diameter: 8 in Date: 07/25/2013	Brunswic	ck GA	
Easting Elevatio	(ft): 8 on (ft)	431874.3 861685.5 : 9.57 52.33 Ft		Meth Cons	r: Groundv od: Mud R sultant: Mu ect No: 448	totary tch Ass	rotection Inc ociates	Coord NAD 1	Datum: NAVD88 Coordinate Syste NAD 1983 State Plar Georgia East / FIPS	
Depth Ft	Recov	Sample ID	Blow Count	PID (ppm)	Mercury (mg/m3)		Soil Description		Well Constructio Diagram	
35 +				0.5						
*										
40 +			6 12	0	O	SM	Brown coarse SAND, trace silt. Gray fine to medium SAND, trace silt.			
40				0	D	SM	Gray fine to medium SAND, trace silt.			
40 +			12 16	0	0		Gray fine to medium SAND, trace silt. 42 ft 6 in to 43 ft Gray fine to medium SAND silt.	, trace		
40 +			12 16 18 6			SM	Gray fine to medium SAND, trace silt. 42 ft 6 in to 43 ft Gray fine to medium SAND	and clay.		

BORING LOG				yM	Page 4 of 4	E	Site Name: _{LCP} Chemicals Site, Brunswick GA Boring No: SW-30 Diameter: 8 in Date: 07/25/2013			
Northing (ft): 431874.71 Easting (ft): 861685.50 Elevation (ft): 9.57 Total Depth: 52.33 Ft				Meth Cons	r: Groundv od: Mud R sultant: Mu oct No: 448	totary		Datum: NAVD88 Coordinate System NAD 1983 State Plane Georgia East / FIPS 100		
Depth Ft	Recov	Sample ID	Blow Count	PID (ppm)	Mercury (mg/m3)	USCS Code	Soil Description	Well Construction Diagram		
45	4	10	oount	(ppin)	(ing/ino)	0000	Note Due to refusal of spoon to layer white shells this was drilled through.			
-			11				Gray fine to medium SAND, trace silt, little white			
			17	0	0	SM	shell fragments.			
÷			27				Gray fine to medium SAND, trace silt, little white			
			50			SM	shell fragments.			
Ť			21		1.941	1000	Gray fine to medium SAND, trace silt, little white shell fragments.	2+44 (2127)		
			34	0	0	SM	sher hagments.			
+			41	100			Gray fine to medium SAND, trace silt, little white shell fragments.			
			50			SM	sher neghens.	inter from		
50 -			13			~	Gray fine to medium SAND, trace silt, little white shell fragments.	1044 C		
			19	0	0	SM	one nagriera.	1111 - 1111 		
Ť			16				Gray fine to medium SAND, trace silt, little white shell fragments.	and a merel		
		1.00	20			SM		4 4 4 4 7		
FOR	_	1	50	0 Vell Set at 5	0	SM/R	Black SANDSTONE weakly cemented, some Gra to medium sand, trace slit.	y fine		

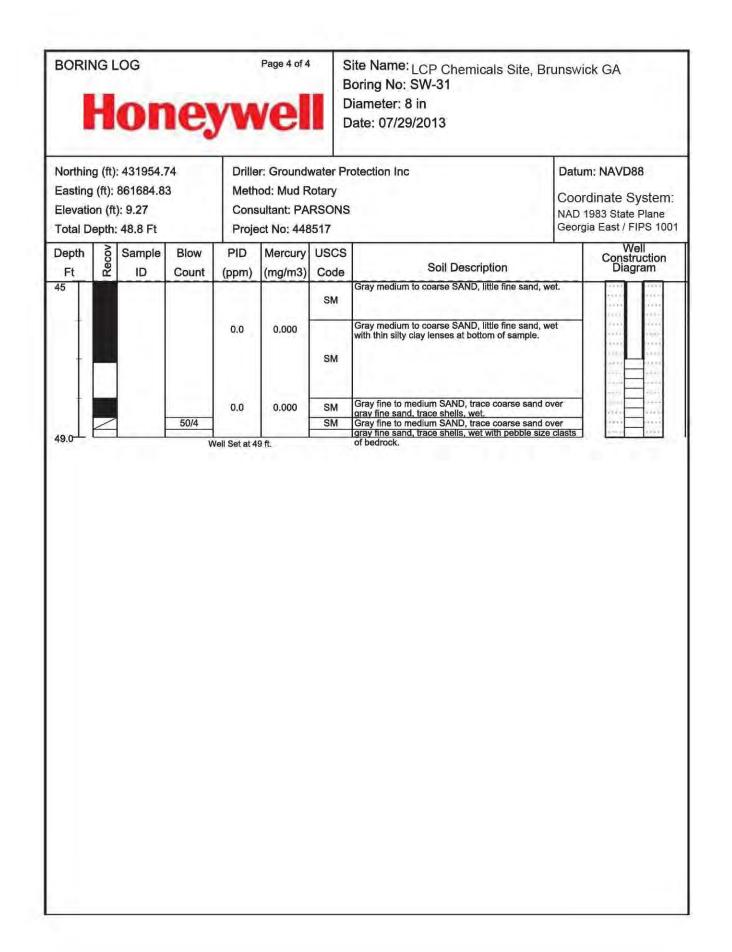
BORING LOG	Page 1 of 4
Hone	ywell

Site Name: LCP Chemicals Site, Brunswick GA Boring No: SW-31 Diameter: 8 in Date: 07/29/2013

Northing (ft): 431954.74 Easting (ft): 861684.83 Elevation (ft): 9.27 Total Depth: 48.8 Ft	Driller: Groundy Method: Mud R Consultant: PA Project No: 448	Datum: NAVD88 Coordinate System: NAD 1983 State Plane Georgia East / FIPS 1001		
Depth ਨ੍ਹੇ Sample Blow Ft 앞 ID Count	PID Mercury (ppm) (mg/m3)	USCS Code Soil Description	Well Construction Diagram	
0	0.00 0.000	Hand cleared to 5 ft. Installed with a stick u above ground surface. pH is 7.		
15				

BOF				le	yM	Page 2 of 4	E	Site Name: _{LCP} Chemicals Site, Boring No: SW-31 Diameter: 8 in Date: 07/29/2013	Brunswi	ck GA
East Eleva	ing (f	t): 8 (ft):	431954. 861684.8 9.27 48.8 Ft		Meth Cons	er: Ground od: Mud R sultant: PA ect No: 448	totary RSONS	rotection Inc	Coor NAD	m: NAVD88 dinate Syste 1983 State Plan jia East / FIPS
Dept	h	Kecov	Sample	Blow	PID	Mercury	USCS	Soil Description		Well Constructio Diagram
20 -					0.00	0.000		Pand cleared to 5 ft. Installed with a stick up above ground surface. pH is 7.		
25 -					0.000	0.000				
30 -										

BORIN			le,	yw	Page 3 of 4	E	Site Name: _{LCP} Chemicals Site, E Boring No: SW-31 Diameter: 8 in Date: 07/29/2013	Brunsw	vick GA
	(ft): 8 on (ft)			Meth Cons	r: Ground od: Mud R sultant: PA ect No: 448	totary RSONS	Protection Inc	Coo	um: NAVD88 ordinate Syster 1983 State Plane rgia East / FIPS 10
Depth	Recov	Sample	Blow	PID	Mercury	1.	Out Development		Well Construction Diagram
Ft 30	Re	ID	Count	(ppm)	(mg/m3)	Code	Soil Description		Diagram
.35				0.000	0.000				
35 -				0.000	0.000	SM	Gray medium to coarse SAND, little fine sand,	wet.	
						SM	Gray medium to coarse SAND, little fine sand, Gray medium to coarse SAND, little fine sand,		
				0.0	0.000	SM			



Northin Easting Elevatio	g (ft): (ft): on (ft;	: 432036.9 861683.8	94	Drille Meth Cons	r: Groundv od: Mud R ultant: PA ct No: 448	water Pr totary RSONS	Date: 07/26/2013	Coc	um: NAVD88 ordinate System 1983 State Plane rgia East / FIPS 100
Depth Ft	Recov	Sample ID	Blow Count	PID (ppm)	Mercury (mg/m3)	USCS Code	Soil Description		Well Construction Diagram
0 				0.0	0.00		Hand cleared to 5 feet, concrete 4 inches tan sand, wet at 4-5 feet. Installed with a s above ground surface. pH is 7 to 8. Drilled from 5 to 40 feet with mud rotary, r sampling. pH is 7.	stick up	
15					1				

BORIN			le,	yM	Page 2 of 4	E	Site Name: _{LCP} Chemicals Site Boring No: SW-32 Diameter: 8 in Date: 07/26/2013	, Brunswi	ck GA
Easting Elevatio	(ft): on (ft)	432036.9 861683.8 : 8.78 49.5 Ft		Meth Cons	r: Ground od: Mud R sultant: PA ect No: 448	totary RSONS	rotection Inc	Cooi NAD	m: NAVD88 rdinate System 1983 State Plane gia East / FIPS 100
Depth Ft	Recov	Sample ID	Blow Count	PID (ppm)	Mercury (mg/m3)	10.000	Soil Description		Well Construction Diagram
20									
25									

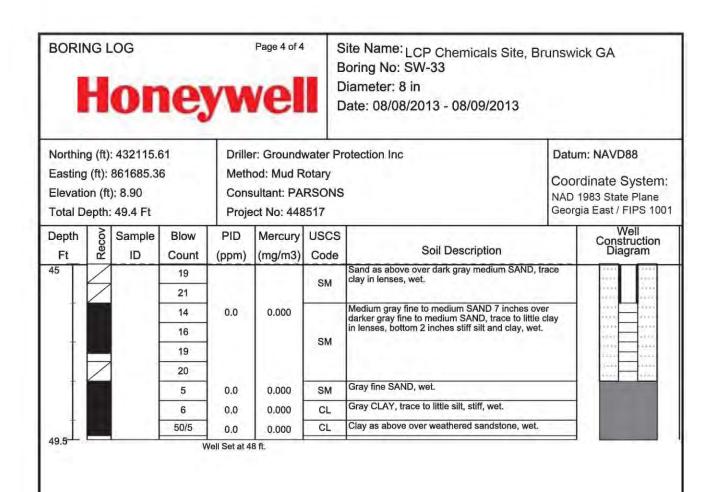
H		le	ym	Page 3 of 4	E	Site Name: _{LCP} Chemicals Site, B Boring No: SW-32 Diameter: 8 in Date: 07/26/2013	Irunswie	ck GA
Northing (ft Easting (ft): Elevation (f Total Depth	: 861683.8 t): 8.78		Meth Cons	er: Groundv od: Mud R sultant: PA ect No: 448	Rotary RSONS	rotection Inc	Coor NAD 1	m: NAVD88 dinate Syst 1983 State Pla jia East / FIPS
Depth og		Blow	PID	Mercury	USCS			Well Construct
Ft 🕰	ID	Count	(ppm)	(mg/m3)	Code	Soil Description Drilled from 5 to 40 feet with mud rotary, no		Diagran
35 -								
40		10	0.0	0.00		Light gray to gray coarse to medium SAND, little fine sand, little silt, wet, swampy odor, no stain	e or	
		9	0.0	0.00	SM	Light gray to gray coarse to medium SAND, little fine sand, little silt, wet, swampy odor, no stain sheen.	e or	
		9 9	0.0	0.00	SM	fine sand, little silt, wet, swampy odor, no stain	e or	
		9 9 12			SM	fine sand, little silt, wet, swampy odor, no stain	e or	
		9 9 12 6	0.0	0.00	SM	fine sand, little silt, wet, swampy odor, no stain sheen.	e or	
		9 9 12			SM	fine sand, little silt, wet, swampy odor, no stain sheen.	e or	
		9 9 12 6 7				fine sand, little silt, wet, swampy odor, no stain sheen.	e or	
		9 9 12 6 7 7				fine sand, little silt, wet, swampy odor, no stain sheen.	or s dark	

BORIN			le	yM	Page 4 of 4	E	Site Name: _{LCP} Chemicals Site, E Boring No: SW-32 Diameter: 8 in Date: 07/26/2013	runswi	ck GA
Easting Elevation	(ft): on (ft	: 432036.9 861683.8): 8.78 : 49.5 Ft		Meth Cons	er: Ground od: Mud R sultant: PA ect No: 448	Rotary RSONS	rotection Inc	Coor	m: NAVD88 rdinate System 1983 State Plane gia East / FIPS 100
Depth Ft	Recov	Sample ID	Blow Count	PID (ppm)	Mercury (mg/m3)	USCS Code	Soil Description		Well Construction Diagram
45			7		<u> </u>	SM	Top 18 inches same as above, bottom 6 inches gray fine to medium SAND, some coarse sand	dark silty	****
+			9		1.000	10380	sand, trace clay in end of sample, wet.	and and	1.001
			6	0.0	0.000	1.1	Gray medium to coarse SAND as above top 4 wet, over dark gray medium to coarse SAND, b inches dark gray CLAY stiff, little silt, fine to me	ottom 8	····
+			6			ML	sand lenses	aum	+ 6.6.6 ································
			8						
-			13				Brown fine to medium SAND, little shells fragm	onte	
			5	0.0	0.00	SM	wet. Brown fine to medium SAND, more shells, wet.		
-			3	0.0	0.00	SM	Brown fine to medium SAND, hore shells, trace	-	
49.5	_		50/5	0.0	0.00	SM	silt and clay, wet.	1	

BORIN			Ie,	yw	Page 1 of 4	E	Bite Name: LCP Chemicals Site Boring No: SW-33 Diameter: 8 in Date: 08/08/2013 - 08/09/2013	, Brunswi	ck GA
Easting Elevatio	g (ft): on (ft	: 432115.0 861685.3): 8.90 : 49.4 Ft		Meth Cons	er: Groundv ood: Mud R sultant: PA ect No: 448	totary RSONS	rotection Inc	Cool	m: NAVD88 rdinate Syste 1983 State Plar gia East / FIPS
Depth Ft	Recov	Sample ID	Blow	PID	Mercury (mg/m3)	USCS Code	Soil Description		Well Constructio Diagram
5							Hand cleared to 5 ft. Installed with a stick up above ground surface. pH is 7.		
10 -				0.0	0.000				
-									

			le	yM	Page 2 of 4	E	Site Name: _{LCP} Chemicals Site, Boring No: SW-33 Diameter: 8 in Date: 08/08/2013 - 08/09/2013	Brunswi	ck GA
Eastir Eleva	ng (ft): ition (fl	: 432115.0 861685.3 :): 8.90 : 49.4 Ft		Meth Cons	er: Ground od: Mud R sultant: PA ect No: 448	Rotary RSONS	rotection Inc	Cool	m: NAVD88 rdinate Systen 1983 State Plane gia East / FIPS 10
Depth Ft	Recov	Sample ID	Blow Count	PID (ppm)	Mercury (mg/m3)	1.	Out Develotion		Well Construction Diagram
20				0.0	0.000		pH is 7.5.		
25				0.0	0,000				
30									

HO	ne	ум	Page 3 of 4	E	Site Name: _{LCP} Chemicals Site, B Boring No: SW-33 Diameter: 8 in Date: 08/08/2013 - 08/09/2013	3runswi	ck GA
Northing (ft): 432 Easting (ft): 861 Elevation (ft): 8.3 Total Depth: 49.	685.36 90	Meth	er: Groundv lod: Mud R sultant: PA lect No: 448	otary RSONS	rotection Inc	Coor NAD	m: NAVD88 dinate Syste 1983 State Plar jia East / FIPS
	mple Blow D Count	PID (ppm)	Mercury (mg/m3)		Soil Description		Well Constructio Diagram
35 -		0.0	0.000				
	8	0.0	0.000		Dark gray medium to coarse SAND, trace clay thin lenses, wet.	In	
40	14 13 21			SM			
40	14 13	0.0	0.000	SM SM	Medium gray medium SAND, trace clay in lens wet. Sand as above over dark gray medium SAND		



BORING L	OG
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Page 1 of 4

Honeywell

Site Name: LCP Chemicals Site, Brunswick GA Boring No: SW-34 Diameter: 8 in Date: 08/12/2013

Northing (ft): 432197.50 Easting (ft): 861689.45 Elevation (ft): 9.48 Total Depth: 50.8 Ft	Driller: Groundwater Protection Inc Method: Mud Rotary Consultant: PARSONS Project No: 448517	Cool	Datum: NAVD88 Coordinate System: NAD 1983 State Plane Georgia East / FIPS 1001		
Depth S Sample Blow Ft ☆ ID Count	PID Mercury USCS (ppm) (mg/m3) Code	Soil Description	Well Construction Diagram		
5	Hand cleared	I to 5 ft. Installed with a stick up d surface. pH is 7.			
10					
15					

BORI			le,	yM	Page 2 of 4		ite Name: _{LCP} Chemicals Site, I Foring No: SW-34 Diameter: 8 in Date: 08/12/2013	Brunswic	ck GA
Eastin Elevat	g (ft): ion (fl	: 432197. 861689.4 t): 9.48 : 50.8 Ft		Meth Cons	er: Ground od: Mud R sultant: PA ect No: 448	totary RSONS	otection Inc	Coord NAD 1	n: NAVD88 dinate Syste 983 State Pla ia East / FIPS
Depth	1.5		Blow	PID	Mercury		Soil Description		Well Constructi Diagram
20							pH is 7.5.		
25									

	ion (fi	: 432197.(861689.4): 9.48 : 50.8 Ft		Meth Cons	er: Groundv od: Mud R sultant: PA ect No: 448	totary RSONS	rotection Inc	Coord NAD 19	n: NAVD88 dinate Syst 983 State Pla a East / FIPS
Depth Ft	Recov	Sample ID	Blow Count	PID (ppm)	Mercury (mg/m3)	USCS Code	Out! Description		Well Construct Diagran
35 +									
40			11 17 17 19	0.0	0.000	SM	Tan and gray medium to coarse SAND, wet.		
40			17	0.0	0.000	SM	Tan and gray medium to coarse SAND, wet. Tan medium SAND over 4 inches gray coarse m SAND, wet.	nedium	

BORING LOG

Page 4 of 4

Site Name: LCP Chemicals Site, Brunswick GA Boring No: SW-34 Honeywell Diameter: 8 in Date: 08/12/2013

Northing (ft): 432197.50 Easting (ft): 861689.45 Elevation (ft): 9.48 Total Depth: 50.8 Ft			Meth Cons	r: Ground od: Mud R sultant: PA ect No: 448	otary RSONS	otection Inc	Coord NAD 1	um: NAVD88 ordinate System:) 1983 State Plane rgia East / FIPS 100	
Depth Ft	Recov	Sample ID	Blow Count	PID (ppm)	Mercury (mg/m3)	USCS Code	Soil Description		Well Construction Diagram
45			5		1	CL	Greenish gray CLAY, semi stiff over 4 inches fine medium sand, some clay.		
			7		12 1.1				
Ť			7	0.0	0.000		Clay as above 4 inches over fine to medium SAI little clay in lenses 4 inches over more clay, thin	ND,	
			12			CL	lenses of fine sand scattered.		
Ť			13			CL			
	_		12					_	
Ť			12	0.0	0.000	100	Fine medium SAND, trace shells, some clay upp 4 inches, wet. Greenish gray clay with thin lense		
			15				fine sand bottom 4 inches.		
Ť			12			SM			
			8						
50 -			11	0.0	0.000		Same as bottom of last sample, trace weathered sandstone in bottom.	1	
50.8 L			50/4	0.0	0.000		Gray weathered sandstone, trace quartz, pebble	S,	

BORI			le,	yM	Page 1 of 4	E	Site Name: LCP Chemicals Site, Brunswick GA Boring No: SW-35 Diameter: 8 in Date: 08/09/2013 - 08/11/2013				
Easting Elevation	g (ft): on (ft	: 432274.8 861685.10): 9.00 51.5 Ft		Driller: Groundwater Method: Mud Rotary Consultant: PARSON Project No: 448517				Coo	Datum: NAVD88 Coordinate System: NAD 1983 State Plane Georgia East / FIPS 100		
Depth	Recov	Sample	Blow	PID	Mercury	USCS	Soil Description		Well Construction Diagram		
5 +							Hand cleared to 5 ft. Installed with a stick above ground surface. pH is 7.	c up			
10 +											

BORIN			le,	yM	Page 2 of 4		Site Name: _{LCP} Chemicals Site, Brunswick GA Boring No: SW-35 Diameter: 8 in Date: 08/09/2013 - 08/11/2013				
Easting Elevation	(ft): on (ft	: 432274.8 861685.1): 9.00 : 51.5 Ft		Driller: Groundwater F Method: Mud Rotary Consultant: PARSON Project No: 448517					Datum: NAVD88 Coordinate Syste NAD 1983 State Plan Georgia East / FIPS 1		
Depth Ft	Recov	Sample ID	Blow	PID	Mercury (mg/m3)		Soil Description		Well Constructic Diagram		
20							pH is 7.				
25											

		.og Or	le	yw	Page 3 of 4	E	Site Name: LCP Chemicals Site, Brunswick GA Boring No: SW-35 Diameter: 8 in Date: 08/09/2013 - 08/11/2013				
Easting Elevatio	(ft): on (ft)	: 432274. 861685.1): 9.00 51.5 Ft		Meth Cons	er: Groundwood: Mud R od: Mud R sultant: PA ect No: 448	totary RSONS	rotection Inc	Coord NAD 19	Datum: NAVD88 Coordinate System NAD 1983 State Plane Georgia East / FIPS 10		
Depth	Recov	Sample	Blow	PID	Mercury	1	Call Description		Well Constructio		
Ft 30	Ř	ID	Count	(ppm)	(mg/m3)	Code	Soil Description		Diagram		
35 +											
35 +			10	0.0	0.000		Medium gray medium to coarse SAND, trace cla	Ry			
			<u>10</u> 15	0.0	0.000		Medium gray medium to coarse SAND, trace cla in thin lenses, scattered, wet.	ły			
				0.0	0.000	SM	Medium gray medium to coarse SAND, trace cla in thin lenses, scattered, wet.	ły			
			15	0.0	0.000	SM	in thin lenses, scattered, wet.	Ry	12344 (11) 12344 (11) 1234 (11) 1234 (11) 1234 (11)		
			15 20 22 5	0.0	0.000	SM	Medium gray medium to coarse SAND, trace cla in thin lenses, scattered, wet. Tan medium to coarse SAND, wet.	Ry			
			15 20 22 5 6			SM	in thin lenses, scattered, wet.	iy	120-0 120-0 120-0 120-0 120-0 120-0 120-0 100-00		
			15 20 22 5 6 25				in thin lenses, scattered, wet.	Ry			
			15 20 22 5 6 25 11				in thin lenses, scattered, wet.	iy			
			15 20 22 5 6 25				in thin lenses, scattered, wet.				

Northing (ft)	BORING LOG			/el		Boring No: SW-35 Diameter: 8 in Date: 08/09/2013 - 08/11/2013			
Northing (ft): 432274.82 Easting (ft): 861685.16 Elevation (ft): 9.00 Total Depth: 51.5 Ft			Driller: Groundwater I Method: Mud Rotary Consultant: PARSON Project No: 448517			NS		Datum: NAVD88 Coordinate System NAD 1983 State Plane Georgia East / FIPS 100	
Depth Son	Sample	Blow	PID	Mercury	USCS			Well Construction	
Ft 🗹	ID	Count	(ppm)	(mg/m3)	Code	Soil Description Greenish gray CLAY, trace sand in thin lenses		Diagram	
		14 12			CL	semi stiff, wet, bottom 4 inches fine medium si clay in thin lense.	and, trace		
+		5	0.0	0.000		Clay 7 inches over fine to medium SAND 10 ir	iches,		
		14				over gray clay, trace sand in lenses 7 inches, stiff, wet.	semi		
Ť		10			CL/SM				
			0.0						
	5	0.000			Greenish gray CLAY, trace sand 3 inch lense, over more clay, bottom 2 inches fine medium				
		10			CL	shells, wet.			
		11 10							
50 -						Weathered sandstone, hard.			
		1				na meneroka 13 kini pering pina p			
- +		50/3					-		
51.5		18.29518	/ell Set at 4	1 4 ft.					

Easting Elevatio	Northing (ft): 431431.32 Easting (ft): 861751.31 Elevation (ft): 9.74 Total Depth: 50.5 Ft Depth Sample Blow			Meth Cons	r: Ground od: Mud R sultant: Mu oct No: 448	Rotary Itch Asso	otection Inc	Datum: NAVD88 Coordinate System NAD 1983 State Plane Georgia East / FIPS 100	
	Ft & ID Count			PID (ppm)	Mercury (mg/m3)	USCS Code	Soil Description		Well Construction Diagram
- +						GP/SM	Hand cleared to 5 feet. Installed with a stick up ground surface. 0 ft to 3 ft Road GRAVEL, railro ballast, Black sand, 3 ft to 5 ft Brown fine to me SAND, trace silt.	bad	
5							Brown gray drilling MUD, pH 7.		
10				0	0				
15									

			le,	M	Page 2 of 4	В	Site Name: _{LCP} Chemicals Site, Brunswick GA Boring No: SW-36 Diameter: 8 in Date: 08/10/2013				
Northing Easting (Elevatior Total De	(ft): 8617 n (ft): 9.7	'51.31 '4		Meth Cons	r: Groundv od: Mud R sultant: Mu oct No: 448	totary tch Asso	otection Inc	Datum: NAVD88 Coordinate System: NAD 1983 State Plane Georgia East / FIPS 100			
Depth Sample Blow Ft 2 ID Count			PID Mercury USCS					Well Construction Diagram			
20				O	0						

			Ie,	yw	Page 3 of 4	E	Site Name: _{LCP} Chemicals Site, Boring No: SW-36 Diameter: 8 in Date: 08/10/2013	Brunsw	rick GA	
Northing (ft): 431431.32 Easting (ft): 861751.31 Elevation (ft): 9.74 Total Depth: 50.5 Ft				Meth Cons	r: Groundv od: Mud R sultant: Mu oct No: 448	totary	rotection Inc	Coo NAD	Datum: NAVD88 Coordinate System NAD 1983 State Plane Georgia East / FIPS 10	
Depth Ft	Recov	Sample ID	Blow Count	PID (ppm)	Mercury (mg/m3)	1.	Out Development		Well Constructior Diagram	
*										
35				0	Q					
35			5	0	0	SC	Gray fine to coarse SAND, trace silt, two 1 in layers of silty clay.	ch		
			5 8 11				Gray fine to coarse SAND, trace silt, two 1 in layers of silty clay. Gray fine to coarse SAND, trace silt.	ch		
			8		0	SC	layers of silty clay.	ch		
			8 11 15 11 12				Gray fine to coarse SAND, trace silt. Gray fine to coarse SAND, trace silt.	ch		
			8 11 15 11	0	0	SM	layers of silty clay. Gray fine to coarse SAND, trace silt.	ch		
			8 11 15 11 12 11	0	0	SM SM	Gray fine to coarse SAND, trace silt. Gray fine to coarse SAND, trace silt.	ch		

2.20			le	yM		В	Site Name: LCP Chemicals Site, Brunswick GA Boring No: SW-36 Diameter: 8 in Date: 08/10/2013				
Easti Eleva	ing (ft): ation (ff			Meth Cons	od: Mud R	otary tch Asso	Associates		n: NAVD88 dinate Syster 983 State Plane ia East / FIPS 10		
Total Depth: 50.5 Ft Depth & Sample Blow Ft & ID Count				PID (ppm)	Mercury (mg/m3)	USCS Code	Soil Description		Well Constructior Diagram		
45	1		12				No recovery, rock blocked front of spoon.				
			16								
			3 9	0	0	SC	46 ft to 46 ft 2 in Gray fine to medium SAND, 46 ft 2 in to 46 ft 8 in Gray silty CLAY, 46 ft 8 in to 47 ft Gray fine to coarse SAND, trace silt.				
1			13			-	Gray fine to coarse SAND, trace silt, occasional lens silt and clay.				
			13			SC	lens sitt and day.				
1			11		1.21	100	Gray fine to coarse SAND, trace silt, occasional lens silt and clay,				
			10	0	0	SC	in o sit and day.	_			
			13			SC	Gray fine to medium SAND, some clayey silt, tra white shell fragments.	ice			
			20			50					
50 -			50			SM/R	50 ft to 50 ft 6 in Gray fine to coarse SAND, little silt, cemented sandstone in tip of spoon.				
50.5	2	· · · · · ·	V	Vell Set at 4	9 ft.						

BORING LOC	3
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Page 1 of 4

Honeywell

Site Name: LCP Chemicals Site, Brunswick GA Boring No: SW-37 Diameter: 8 in Date: 08/09/2013

Easting Elevation	(ft): on (ft epth:	: 431514.5 861752.65): 10.05 : 51.25 Ft	5	Meth Cons	r: Ground od: Mud R sultant: Mu oct No: 448	totary tch Asso	otection Inc	Datum: NAVD88 Coordinate System: NAD 1983 State Plane Georgia East / FIPS 1001		
Depth Ft	Recov	Sample ID	Blow Count	PID (ppm)	Mercury (mg/m3)		Soil Description		Well Construction Diagram	
0						SM	Hand cleared to 5 ft. Installed with a stick up at ground surface. Gray brown fine to medium SA trace silt.	oove ND,		
5							Brown gray drilling MUD, pH 7 to 8.			
10				0	D					
15										

BORING		le,	yw	Page 2 of 4	В	Site Name: _{LCP} Chemicals Site, Brunswick GA Boring No: SW-37 Diameter: 8 in Date: 08/09/2013			
Northing (fi Easting (ft) Elevation (Total Depti	: 861752.6 ft): 10.05	5	Meth Cons	er: Ground od: Mud R sultant: Mu ect No: 448	totary tch Asso	otection Inc	Datum: NAVD88 Coordinate System: NAD 1983 State Plane Georgia East / FIPS 100		
Depth Sample Blow Ft 2 ID Count			PID Mercury USCS (ppm) (mg/m3) Code Soil Description					Well Construction Diagram	
20			0	D					

1		.og O	le,	ym	Page 3 of 4	E	Site Name: _{LCP} Chemicals Site, E Boring No: SW-37 Diameter: 8 in Date: 08/09/2013	3runswid	ck GA	
Easting Elevatio	(ft): m (ft	: 431514. 861752.6): 10.05 51.25 Ft	5	Meth Cons	er: Groundv od: Mud R sultant: Mu ect No: 448	otary tch Ass	rotection Inc ociates	Coor NAD 1	n: NAVD88 dinate Sys 1983 State Pl ia East / FIPS	
Depth	Recov	Sample	Blow	PID	1				Well Constructi Diagram	
Ft 30	Re	ID	Count	(ppm)	(mg/m3)	Code	Soil Description Brown gray drilling MUD, pH 7 to 8.		Diagram	
-										
35				Ō	Ō					
35			4				Gray fine to coarse SAND, trace silt, occasiona	al		
			5	0	0	SC	lens clay and silt.			
			5 8			SC	Gray fine to coarse SAND, trace silt, occasiona lens clay and silt. Gray fine to coarse SAND, trace silt, occasiona lens clay and silt.			
			5	0	0	SC	lens clay and silt. Gray fine to coarse SAND, trace silt, occasiona			
			5 8 8 5 6				lens clay and silt. Gray fine to coarse SAND, trace silt, occasiona lens clay and silt. Gray fine to coarse SAND, trace silt.	al		
			5 8 8 5	0	0	SC	lens clay and silt. Gray fine to coarse SAND, trace silt, occasiona lens clay and silt.	al		
			5 8 5 6 9	0	0	SC SM	lens clay and silt. Gray fine to coarse SAND, trace silt, occasiona lens clay and silt. Gray fine to coarse SAND, trace silt. Gray fine to coarse SAND, trace silt, 2 inch lay	al		

		le	yM	Page 4 of 4	B	Site Name: _{LCP} Chemicals Site, E Boring No: SW-37 Diameter: 8 in Date: 08/09/2013	3runsw	ick GA
Northing (ft): 431514.59 Easting (ft): 861752.65 Elevation (ft): 10.05 Total Depth: 51.25 Ft			Meth Cons	er: Groundv od: Mud R sultant: Mu ect No: 448	totary tch Asso	rotection Inc	Coo NAD	im: NAVD88 rdinate System 1983 State Plane gia East / FIPS 10
Recov	Sample	Blow	PID	Mercury		Coll Decodellar	_	Well Construction
Å	ID	Count 12	(ppm)	(mg/m3)	Code	Soil Description Gray fine to coarse SAND, trace silt.	_	Diagram
		12	-		SM			
		8				Gray fine to medium SAND, trace silt.		
		12	0	0	SM			
		9	-12		SM	Gray fine to medium SAND, trace silt.		1000
		11 5	1	1.00	and the second s	Gray fine to medium SAND, trace silt.		and the second s
		5	0	0	SM			1000 00000 000000000000000000000000000
		11	11		SM	Gray fine to medium SAND, trace silt.		
2		15			SIVI		_	
		5			SM	50 ft to 50 ft 6 in Gray fine to medium SAND, th silt, 50 ft 6 in to 51 ft Gray, fine to coarse SANI little silt.	race D,	1044 10444 + 5 - 5 - 5 - 5 - 5 - 5 - 5 - 5 - 5 - 5
		5 50	é	194	SM/R	Gray fine to medium SAND, little silt, cemented		F665 F665
1		V	Vell Set at 5	1 ft.		sandstone in tip of spoon.		

BORING L	OG
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Page 1 of 4

Honeywell

Site Name: LCP Chemicals Site, Brunswick GA Boring No: SW-38 Diameter: 8 in Date: 08/10/2013

Easting Elevation) (ft): on (ft epth:	: 431594.6 861754.3): 10.26 51.5 Ft		Meth Cons	er: Groundv od: Mud R sultant: Mu ect No: 448	totary tch Asso	otection Inc	Datum: NAVD88 Coordinate Syste NAD 1983 State Plan Georgia East / FIPS	ne
Depth Ft	Recov	Sample ID	Blow Count	PID (ppm)	Mercury (mg/m3)		Soil Description	Well Construction Diagram	on
0						SM	Hand cleared to 5 ft. Installed with a stick up abo ground surface. Gray brown fine to medium SAN trace silt.	ove	
5							Brown gray drilling MUD, pH 7.		
10 +				0	D				
15									

Northin Easting	g (ft): (ft): 1	431594.6 361754.3	67	Drille Meth	od: Mud R	vater Pr otary	Diameter: 8 in Date: 08/10/2013 Totection Inc	Coor	m: NAVD88 rdinate System
Elevatio Total D		51.5 Ft		10.00	Consultant: Mutch Associates NAD 1983			1983 State Plane gia East / FIPS 100	
Depth Ft		Sample ID	Blow Count	PID (ppm)	Mercury (mg/m3)	USCS Code	Soil Description		Well Construction Diagram
20 +				0	0				

East Eleva	ing (ft): ation (f): 431594.(861754.3 t): 10.26 i: 51.5 Ft		Meth Cons	r: Groundv od: Mud R sultant: Mu oct No: 448	totary tch Asso	rotection Inc ociates	Coo	um: NAVD88 ordinate Systen 1983 State Plane gia East / FIPS 10
Dept	Recov	Sample	Blow	PID	Mercury		Out Development		Well Construction Diagram
Ft 30	Ř	ID	Count	(ppm)	(mg/m3)	Code	Brown gray drilling MUD, pH 7.		Diagram
35 -				0	0		Grav fine to cogree SAND, trace sit		
			11	0	0	SM	Gray fine to coarse SAND, trace silt.		
			11 15 17				Gray fine to coarse SAND, trace silt. Gray fine to coarse SAND, trace silt.		
			15			SM			
			15 17	0	0	SM			
			15 17 17				Gray fine to coarse SAND, trace silt. Gray fine to coarse SAND, trace silt.		
			15 17 17 9	0	0	SM	Gray fine to coarse SAND, trace silt.		
			15 17 17 9 11	0	0	SM SM	Gray fine to coarse SAND, trace silt. Gray fine to coarse SAND, trace silt.		

ft): 431594.6 t): 861754.3 (ft): 10.26 th: 51.5 Ft Sample ID		Meth			otection Inc	Datu	m: NAVD88	
Sample		10.30	Driller: Groundwater Protection Inc Method: Mud Rotary Consultant: Mutch Associates Project No: 448517			Coordinate System NAD 1983 State Plane Georgia East / FIPS 100 Well Construction		
Ϋ́ ID	Blow	PID	Mercury	USCS			Construction	
	Count	(ppm)	(mg/m3)	Code	Soil Description		Diagram	
	26		1	SM	Gray fine to coarse SAND, trace silt.	_		
	22				Gray fine to medium SAND, trace silt.			
	7	0	0	SM	and a measure of the total		Ш	
	-				Gray fine to medium SAND, trace silt.		834 C 244 C	
	13			SM			11-+ 5100	
	9		1.241	1.2.5	Gray fine to medium SAND, trace silt.		100 0 00 1	
	12	0	0	SM				
	16	14		SM	Gray fine to medium SAND, trace silt.			
	18			OW				
	7			SM	50 ft to 50 ft 6 in Gray fine to medium SAND, tr silt, 50 ft 6 in to 51 ft Gray, fine to coarse SAND	ace D,	11144	
	1. A. A.	1.1.1				be		
		Vall Cat at E	0.5.4	SM/R	sandstone in tip of spoon.	JU		
		9 12 16 18 7 7 50	7 9 13 9 12 16 18 7 7 50	7 9 13 9 0 12 16 18 7 7 7	7 9 9 3 9 0 0 12 0 0 16 3 3 7 7 3 7 50 3	7 9 9 13 9 0 12 0 16 18 7 50 50 SM/R Gray fine to medium SAND, trace silt. SM Gray fine to medium SAND, trace silt. 18 SM 7 SM 50 SM/R Gray fine to medium SAND, trace silt.	7 9 13 9 13 9 12 0 16 18 7 50 50 SM/R Gray fine to medium SAND, trace silt. SM Gray fine to medium SAND, trace silt. SM Gray fine to medium SAND, trace silt. SM SM Gray fine to medium SAND, trace silt. SM SM file to 50 ft 6 in Gray fine to medium SAND, trace silt. SM SM/R Gray fine to medium SAND, some silt, cemented sandstone in tip of spoon.	

Depth Ft Sample Depth D Blow ID PID (ppm) Mercury (mg/m3) USCS Code Soil Description We Constru- Diagr 0 ID ID ID Mercury (ppm) USCS Soil Description Distruction 1 ID ID ID Mercury (ppm) USCS Soil Description Distruction 0 ID ID ID ID ID Mercury (mg/m3) USCS Soil Description Distruction 1 ID ID ID ID ID ID ID ID 0 ID ID ID ID ID ID ID ID 1 ID ID ID ID ID ID ID ID 1 ID ID ID ID ID ID ID ID 1 ID ID ID ID ID ID ID ID 1 ID ID ID ID ID ID ID ID 1 ID ID ID ID ID ID ID ID 5 ID ID ID ID ID ID ID ID <th>Sample Blow D ID Count</th> <th>PID Mercury US</th> <th>7</th> <th>NAD 1983 State Plane Georgia East / FIPS 100</th>	Sample Blow D ID Count	PID Mercury US	7	NAD 1983 State Plane Georgia East / FIPS 100
0 Hand cleared to 5 ft. Installed with a stick up above ground surface. Gray brown fine to coarse SAND, trace silt, dense. 1 SM	2 ID Count		0.11 0	Well Construction Diagram
			SM	

BORIN			le,	yM	Page 2 of 4		Site Name: _{LCP} Chemicals Sit Boring No: SW-39 Diameter: 8 in Date: 07/24/2013	re, Brunsw	ick GA
Northing (ft): 431754.86 Easting (ft): 861753.89 Elevation (ft): 10.43 Total Depth: 52.92 Ft				Meth Cons	er: Ground od: Mud R sultant: Mu ect No: 448	totary tch Ass	Coo	im: NAVD88 rdinate System: 1983 State Plane gia East / FIPS 100	
Depth Ft	Recov	Sample ID	Blow Count	PID (ppm)	Mercury (mg/m3)	11.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1	0.10		Well Construction Diagram
20				0.5					
25 +									
30									

1		.og O	le,	yw	Page 3 of 4	E	Site Name: _{LCP} Chemicals Site, I Boring No: SW-39 Diameter: 8 in Date: 07/24/2013	Brunswie	ck GA
Easting Elevation	g (ft): on (ft	: 431754.8 861753.8): 10.43 : 52.92 Ft	9	Meth Cons	er: Groundv od: Mud R sultant: Mu ect No: 448	totary tch Ass	rotection Inc ociates	Coor NAD 1	n: NAVD88 dinate Syster 1983 State Plane ia East / FIPS 10
Depth		Sample	Blow	PID	Mercury	-			Well Construction Diagram
Ft	Recov	ID	Count	(ppm)	(mg/m3)		Soil Description		Diagram
35 +				0.5					
			12	0	0	SM	Gray medium to coarse SAND, trace silt.		
40 -			14	1.					
40 +					1 1		Dark Grav fine to medium SAND trace silt	-	
40			18			SM	Dark Gray fine to medium SAND, trace silt.		
40 +			18 16			SM			
40 +			18 16 12	0	0	SM SM	Dark Gray fine to medium SAND, trace silt. Dark Gray fine to medium SAND, trace silt.		
40 +			18 16 12 11	0	D		Dark Gray fine to medium SAND, trace silt.		
40 +			18 16 12 11 19	0	D				
40 +			18 16 12 11 19 19	0	0	SM	Dark Gray fine to medium SAND, trace silt. Dark Gray fine to medium SAND, trace silt. 44 ft to 44 ft 5 in Gray fine to medium SAND, 1	trace	
40 +			18 16 12 11 19	0	0	SM	Dark Gray fine to medium SAND, trace silt.	SAND.	

Northin Easting	g (ft): (ft):	: 431754.8 861753.8): 10.43	86	Drille Meth	r: Groundword: Mud R sultant: Mu	water P Rotary	Date: 07/24/2013 Protection Inc	Co	tum: NAVD88 oordinate Syster D 1983 State Plane	
		52.92 Ft			ect No: 448		Ĩ	Georgia East / FIPS 100 Well Construction		
Depth Ft	Recov	Sample ID	Blow Count	PID (ppm)	Mercury (mg/m3)	USCS Code	Call Department		Construction Diagram	
45	L.	10	8	(ppm)	(mg/ms)	Code	Gray fine to medium SAND, little silt, occasion	al		
		- 1 h	13			SC	lens clay.			
+		3	1				Gray fine to medium SAND, some silt.		- 1111 1111	
			2	0	0	SM				
÷			4				Gray fine to medium SAND, trace silt.	-	- 1111 1111	
	_	the difference	8			SM				
÷		17.1.4	5	1.00	102	-	48 ft to 48 ft 6 in Gray fine GRAVEL, trace san	d,		
			7	0	0	GM	trace silt, 48 ft 6 in to 49 ft Gray fine to medium SAND, trace salt.	1	1000 1000	
÷		1.0	11			-	Gray fine to medium SAND, trace silt.		- 100 - 200	
	-	1.6	14			SM				
50 +			4	1.1	1.53		Gray fine to medium SAND, trace silt.	-	(0)	
100			8	0	0	SM	The other than to the the two		1111	
-			9		1618		Gray fine to medium SAND, trace silt, trace wh	ite		
		1		·. · ·		SM	shell fragments, note from 51 ft 6 in to 52 ft tra silt.	ce	(++) (C++)	
÷)	11	1.00		-	52 ft to 52 ft 6 in Gray fine to medium SAND, li	ttle		
			12 50	0	0	SM	silt, 1/4 inch white shell fragments, 52 ft 6 in to 11 in Gray fine to medium SAND, little silt, occ	52 ft		
52.92		<u> </u>	1	Vell Set at 5	1.5 ft.		medium gravel, refusal.	actorial		

Easting (ft): 861754.21Method: Mud RotaryCoordElevation (ft): 10.50Consultant: Mutch AssociatesNAD 19	/ick GA	iicals Site, Bruns	ite Name: ^{LCP} Chemicals oring No: SW-40 iameter: 8 in pate: 07/25/2013	В	Page 1 of 4	ym	le,			BOR
0 Hand cleared to 5 ft. Installed with a stick up above ground surface. Gray brown medium to coarse SAND,	um: NAV ordinate) 1983 Sta rgia East /	Co		otary tch Asso	od: Mud R ultant: Mu	Meth Cons		861754.2 [.]): 10.50	g (ft): ion (ft	Eastir Eleva
0 Hand cleared to 5 ft. Installed with a stick up above ground surface. Gray brown medium to coarse SAND,	Con	cription	Soil Descriptio					1.00.0	Recov	
SM		with a stick up above nedium to coarse SAND	ground surface. Gray brown medium	SM						0 +

	 	 (Pprint)	(
0				SM	Hand cleared to 5 ft. Installed with a stick up above ground surface. Gray brown medium to coarse SAND, trace silt.	
5 +					Brown drilling MUD, pH 7 to 8.	
10		0.5				
15						

Datum: NAVD88

Coordinate System: NAD 1983 State Plane Georgia East / FIPS 1001

Well Construction Diagram

	H	on	le	yM	vel		oring No: SW-40 biameter: 8 in bate: 07/25/2013			
Northing (ft): 431835.00 Easting (ft): 861754.21 Elevation (ft): 10.50 Total Depth: 52.33 Ft				Driller: Groundwater Method: Mud Rotary Consultant: Mutch As Project No: 448517			y Associates		Datum: NAVD88 Coordinate System NAD 1983 State Plane Georgia East / FIPS 100	
Depth of Sample Blow Ft 22 ID Count				PID Mercury USC (ppm) (mg/m3) Coc			Soil Description Brown drilling MUD, pH 7 to 8.	Well Construction Diagram		
20				0.5						
25 +										

BORI			le,	yw	Page 3 of 4	E	Site Name: _{LCP} Chemicals Site, Brunswick GA Boring No: SW-40 Diameter: 8 in Date: 07/25/2013			
Easting Elevation	g (ft): on (ft	: 431835.0 861754.2): 10.50	1	Driller: Groundwater F Method: Mud Rotary Consultant: Mutch As Project No: 448517					Datum: NAVD88 Coordinate System NAD 1983 State Plane Georgia East / FIPS 1	
Total Depth: 52.33 Ft Depth & Sample Blow				PID Mercury USCS						
Ft	Recov	ID	Count	(ppm)	(mg/m3)		Out Development		Well Construction Diagram	
35 +				0.5						
40 -			12	0	0	SM	Gray fine to coarse SAND, trace silt.			
ŧ			15				Dark Gray medium to fine SAND, trace silt.			
			22			SM	and endy monant to the endy, trave site			
÷			14				Gray brown medium to coarse SAND, trace si	ilt.		
			20	0	0	SM	A CONTRACT OF A CO			
			20				Gray fine to coarse SAND, trace silt.			
Ť			31			SM				
Ť			12				44 ft to 44 ft 6 in Gray brown medium coarse	SAND,		
Ì			12	0	0	SC	trace silt, 44 ft 6 in to 45 ft Gray fine to coarse	6.01628		
Ť			18	U		00	SAND, trace silt, occasional lens clay.	1		

BORING LOG	yw	Page 4 of 4	E	Site Name: _{LCP} Chemicals Site, Brunswick GA Boring No: SW-40 Diameter: 8 in Date: 07/25/2013			
Northing (ft): 43183 Easting (ft): 861754 Elevation (ft): 10.50 Total Depth: 52.33 I	Meth Cons	r: Groundv od: Mud R sultant: Mu ect No: 448	otary tch Ass	ociates	atum: NAVD88 pordinate Systen AD 1983 State Plane eorgia East / FIPS 10		
Depth Sampl	e Blow Count	PID (ppm)	Mercury (mg/m3)	USCS Code	Soil Description	Well Constructior Diagram	
45	17	0	0	SC	45 ft to 45 ft 4 in Gray fine to coarse SAND, trace silt, occasional lens clay, 45 ft 4 in to 45 ft 8 in		
	18			30	Gray CLAY, stiff, 45 ft 8 in to 46 ft Gray fine to med SAND, some clavey silt.	the second se	
	13			SM	46 ft to 46 ft 6 in Gray medium to coarse SAND, tra silt, 46 ft 6 in to 47 ft Gray fine to coarse SAND,	ice	
+	19			OW	trace silt.		
	22			SM	Gray brown fine to medium SAND, little silt.		
+	23				On Frank SAND 1991 - 19		
	4	0	0	SM	Gray fine to coarse SAND, little silt.	1000	
	6	100			49 ft to 49 ft 4 in Gray fine to medium SAND, trace	- 17 (b) 1991	
	13			SM	silt, pH 10, 49 ft 4 in to 50 ft Gray fine to medium SAND, trace silt, trace white shell fragments.		
50 +	27		100		Gray fine to medium SAND, trace silt, trace white	1000 - 10000 1000 - 10000	
	33 23	0	0	SM	shell fragments.	1111 - 11	
÷	17				Gray fine to medium SAND, trace silt, trace white	and a second sec	
	12			SM	shell fragments.	inter interior	
52.33	50	0	0	SM/R	Black SANDSTONE weakly cemented, some Gray	fine	
	V	Vell Set at 5	2 ft.		to medium sand, trace slit.		

Easting Elevatio	(ft): on (ft)	431915.2 861754.8 9.99 51.4 Ft		Meth Cons	r: Groundv od: Mud R sultant: PA	otary RSONS	otection Inc	Coord NAD 1	n: NAVD88 dinate System 983 State Plane a East / FIPS 100
Depth Ft	Recov	Sample ID	Blow Count	PID (ppm)	Mercury (mg/m3)	USCS Code	Soil Description		Well Construction Diagram
5				0.0	0.000		above ground surface. Drilled to 40 feet with no sampling to 40 feet. pH is 7.5.		

Northing (ft): 431915.25 Easting (ft): 861754.85 Elevation (ft): 9.99 Total Depth: 51.4 Ft Depth <u>2</u> Sample <u>Blow</u> <u>PID</u> <u>Mercury</u> <u>USCS</u> <u>Soil Description</u> <u>Constitutes</u> <u>10</u> <u>Count</u> (ppm) <u>(mg/m3)</u> <u>Code</u> <u>Soil Description</u> <u>Constitutes</u> <u>Hand cleared to 5 ft. Installed with a stick up</u> <u>no sampling to 40 feet, pH is 7.5</u> .				Ie,	yw	Page 2 of 4	E	Site Name: _{LCP} Chemicals Site, I Boring No: SW-41 Diameter: 8 in Date: 07/28/2013	Brunswic	k GA
Ft 20 ID Count (ppm) (mg/m3) Code Soil Description Constru 15 ID Count (ppm) (mg/m3) Code Soil Description Diago 15 ID Count (ppm) (mg/m3) Code Soil Description Diago 15 ID Count (ppm) (mg/m3) Code Soil Description Diago 15 ID ID Count ID ID ID ID ID 16 ID ID ID ID ID ID ID ID 16 ID ID ID ID ID ID ID ID 17 ID ID ID ID ID ID ID ID 18 ID ID ID ID ID ID ID ID 19 ID ID ID ID ID ID ID ID 20 ID ID ID ID ID ID ID ID 10 ID ID ID ID ID ID ID ID 20 ID ID	Easting Elevation	(ft): 8 on (ft)	861754.8 : 9.99		Meth Cons	od: Mud R sultant: PA	totary RSONS		Coord NAD 1	linate Systen 983 State Plane
15 Hand cleared to 5 ft. Installed with a stick up above ground surface. Drilled to 40 feet with mud rotary, no sampling to 40 feet, pH is 7.5. 20				Blow	PID	Mercury	USCS			Well Construction
25 -	20 -				0.0	0.000				
	*									

H	ос ОП	le	M	Page 3 of 4	E	Site Name: _{LCP} Chemicals Site, Bru Boring No: SW-41 Diameter: 8 in Date: 07/28/2013	unswick GA
Northing (ft): Easting (ft): 8 Elevation (ft) Total Depth:	861754.85 : 9.99		Meth Cons	er: Groundv od: Mud R sultant: PA	otary RSONS	rotection Inc	Datum: NAVD88 Coordinate System NAD 1983 State Plane Georgia East / FIPS 10
Depth og Ft 22	Sample ID	Blow Count	PID (ppm)	Mercury (mg/m3)		Soil Description	Well Construction Diagram
.35 -			0.0	0.000		no sampling to 40 feet, pH is 7.5.	
40 -	-	10 18 25	0.0	0.000	SM	Gray medium to coarse SAND, little fine to mediu sand, wet, swampy odor.	m
	-	19 9 11 16	0.0	0.000	SM	Gray medium to coarse SAND, little fine to mediu sand, wet, swampy odor, clay lenses at 43.2-43.8 little silt, soft, can roll in fingers, wet.	
	Ļ	20 5	0.0	0.000	CL	Greenish gray CLAY, lenses of fine to medium sand 1/2-1 inch, little silt in clay, soft, wet.	-

BORI			le	yw	Page 4 of 4	E	Site Name: _{LCP} Chemicals Site, B Boring No: SW-41 Diameter: 8 in Date: 07/28/2013	runswi	ck GA
Eastin Elevat	g (ft): tion (ft	: 431915.; 861754.8 :): 9.99 : 51.4 Ft		Meth Cons	r: Groundv od: Mud R sultant: PA oct No: 448	otary RSONS	rotection Inc	Coor NAD	m: NAVD88 rdinate System 1983 State Plane gia East / FIPS 10
Depth Ft	Recov	Sample ID	Blow Count	PID (ppm)	Mercury (mg/m3)	USCS Code	Call Departmention		Well Construction Diagram
45			7			CL	Greenish gray CLAY, lenses of fine to medium sand 1/2-1 inch, little silt in clay, soft, wet.		
			8			CL.			
			3	0.0	0.000		Fine to medium SAND, trace silt over fine sand, little clay, trace shells, low yield, wet.		
+			7			SM			
			12						
÷		1	10			_	Fine to medium SAND, trace silt, trace shells,	-	
			9	0.0	0.000		no clay, wet, mud pH 7.5-8.		1946 - 1946 - 1946 - 1946 - 1946 - 1946 - 1946 - 1946 - 1946 - 1946 - 1946 - 1946 - 1946 - 1946 - 1946 - 1946 -
÷	F		8			SM			erel (and)
	K		14						·····
50 +			15	0.0	0.000		Fine to medium SAND, trace silt, trace shells,		(Y+)+++++
			14	0.0	0.007	SM	no clay, wet, mud.		4444 (1544)
t			50/5	0.0	0.000	SM	Fine to medium SAND, trace silt, trace shells, no clay, wet, mud, sandstone pebbles in sample	hard	
51.5		ļi	V	Vell Set at 5	1.5 ft.		refusal on bottom.	, naiu, j	

BORING LOG	Page 1 of 4	Site Name
		Boring No
Hono	MANO	Diameter:
none	ywen	Date: 07/2

Site Name: LCP Chemicals Site, Brunswick GA Boring No: SW-42 Diameter: 8 in Date: 07/26/2013

Northing Easting Elevation Total De	(ft): 861 n (ft): 9	1755.04 .87		Meth Cons	r: Ground od: Mud R sultant: Mu oct No: 448	totary tch Asso	otection Inc	Coord NAD 1	n: NAVD88 dinate System: 983 State Plane a East / FIPS 1001
Depth Ft	× I	ample ID	Blow Count	PID (ppm)	Mercury (mg/m3)		Soil Description		Well Construction Diagram
0			Count			GM/SM	Hand cleared to 5 ft. Installed with a stick up above ground surface. 0 ft to 2 ft Gray coarse (little sand, trace silt, 2 ft to 5 ft Brown fine to coarse SAND, little silt.	GRAVEL,	
5							Brown drilling MUD, pH 7 to 8.		
10				542	D.				
15									

Easting Elevation	g (ft): on (ft	: 431998. 861755.0): 9.87 51.75 Ft	4	Meth Cons	er: Ground od: Mud R sultant: Mu ect No: 448	totary	otection Inc	Coo	im: NAVD88 rdinate System 1983 State Plane gia East / FIPS 100
Depth Ft	Recov	Sample ID	Blow Count	PID (ppm)	Mercury (mg/m3)		Soil Description		Well Construction Diagram
20 +				542	0				
25 -									

BORI			le	yw	Page 3 of 4	E	Site Name: _{LCP} Chemicals Site, I Boring No: SW-42 Diameter: 8 in Date: 07/26/2013	Brunswi	ick GA
Easting Elevation	g (ft): ion (ft	: 431998.4 861755.04): 9.87 : 51.75 Ft		Meth Cons	er: Groundv od: Mud R sultant: Mu ect No: 448	totary tch Ass	rotection Inc	Cool	m: NAVD88 rdinate Syste 1983 State Plan gia East / FIPS 1
Depth Ft	Recov	Sample ID	Blow	PID	Mercury (mg/m3)	10.000	Soil Description		Well Constructio Diagram
30							Brown drilling MUD, pH 7 to 8.		
35 -				542	Ō				
35 +			14			244	40 ft 6 in to 41 ft Gray fine to coarse SAND, tr	ace	
			14	542	0	SM	silt.	ace	
			14 16			SM		ace	
			14			SM	silt. Gray fine to coarse SAND, trace silt. Gray fine to coarse SAND, trace silt, occasion	nal	
			14 16 16				silt. Gray fine to coarse SAND, trace silt.	nal	
			14 16 16 8	0	0	SM SC	silt. Gray fine to coarse SAND, trace silt. Gray fine to coarse SAND, trace silt, occasion layer fine to medium sand, occasional lens cla 10 to 11. Gray fine to coarse SAND, trace silt, occasion	nal ay, pH nal	
			14 16 16 8 12	0	0	SM	silt. Gray fine to coarse SAND, trace silt. Gray fine to coarse SAND, trace silt, occasion layer fine to medium sand, occasional lens cla 10 to 11.	nal ay, pH nal	
			14 16 16 8 12 14	0	0	SM SC	silt. Gray fine to coarse SAND, trace silt. Gray fine to coarse SAND, trace silt, occasion layer fine to medium sand, occasional lens cla 10 to 11. Gray fine to coarse SAND, trace silt, occasion layer fine to medium sand, occasional lens cla	nal ay, pH nal ay, pH ay, pH race	

BORIN			le	yw	Page 4 of 4	E	Site Name: _{LCP} Chemicals Site, Br Boring No: SW-42 Diameter: 8 in Date: 07/26/2013	runswick GA
Easting Elevation) (ft): on (ft	: 431998.4 861755.04): 9.87 51.75 Ft		Meth Cons	r: Groundv od: Mud R sultant: Mut ect No: 448	otary tch Ass	rotection Inc ociates	Datum: NAVD88 Coordinate System NAD 1983 State Plane Georgia East / FIPS 100
Depth Ft	Recov	Sample ID	Blow Count	PID (ppm)	Mercury (mg/m3)		Soil Description	Well Construction Diagram
45			12 13			CL	Gray CLAY and silt, medium plasticity, occasion, layer clay and sand.	
Ť			16 20	O	0	SM	Gray fine to medium SAND, trace silt.	
Ť			48 23			ML	Gray clayey SILT, trace sand, trace white shell fragments.	1.11
÷			12	0	0	SC	Gray fine to coarse SAND, some silty clay, little white shell fragments, brown sheen.	
-			20 19			SC	Gray fine to coarse SAND, some silty clay, little white shell fragments, brown sheen.	
50 +			8 27	0	0	SC	50 ft to 50 ft 6 in Gray clayey SILT, trace sand, trace white shell fragments, wet, 50 ft 6 in to 51 t fine to medium SAND, little silt, trace white shell	ft
-			17			SM/R	fragments. 51 ft to 51 ft 6 in fine to medium SAND, little silt, mudstone in tip, 51 ft 6 in to 51 ft 8 in bouncing s	

Northing (ft): 432075.11 Driller: Groundwater Protection Inc Easting (ft): 861755.08 Method: Mud Rotary Elevation (ft): 9.18 Consultant: Mutch Associates Total Depth: 50.33 Ft Project No: 448517 Depth Sample Blow PID Mercury USCS Ft D Count (ppm) (mg/m3) Code Soil Description	Datum: NAVD88 Coordinate System
Depth Sample Blow PID Mercury USCS Ft D Count (ppm) (mg/m3) Code Soil Description	NAD 1983 State Plane Georgia East / FIPS 1
	Well Constructio Diagram
0 Hand cleared to 5 ft. Installed with a stick above ground surface. 0 ft to 1 ft CONCR augur used), 1 ft o 5 ft. Brown fine to meet trace silt, little asphalt. 5 SM 5 Brown drilling MUD, pH 8 to 9.	RETE (saw and

Easting Elevati	g (ft): on (ft	: 432075. 861755.0): 9.18 : 50.33 Ft	8	Meth Cons	r: Groundv od: Mud R ultant: Mu ct No: 448	otary tch Asso	otection Inc	Cool	m: NAVD88 rdinate System 1983 State Plane jia East / FIPS 10
Depth Ft	Recov	Sample ID	Blow Count	PID (ppm)	Mercury (mg/m3)		Soil Description		Well Construction Diagram
20 +				17	D				
-									

Northing (ft): 432075.11 Driller: Groundwater Protection Inc Datum: Nu Easting (ft): 861755.08 Method: Mud Rotary Coordinal NAD 1983 Elevation (ft): 9.18 Consultant: Mutch Associates NAD 1983 Total Depth: 50.33 Ft Project No: 448517 Coerdinal NAD 1983 Depth Sample Blow PID Mercury USCS Ft 2 ID Count (ppm) (mg/m3) Code Soil Description 30 1 1 1 1 1 1 1 1 1
SU Brown draining MUD, pH 8 to 9.
40 - Gray brown fine to coarse SAND, trace silt, occasional lens clay.
7 0 0 SC Gray brown fine to coarse SAND, trace silt, occasional 9 11 Gray brown fine to coarse SAND, trace silt, occasional
7 0 0 SC Gray brown fine to coarse SAND, trace slit, occasional lens clay. 9 11 SC Gray brown fine to coarse SAND, trace slit, occasional lens clay. 14 SC Ins clay.
7 0 0 Sc Gray brown fine to coarse SAND, trace silt, occasional lens clay. 9 11 Sc Gray brown fine to coarse SAND, trace silt, occasional lens clay. 14 8 0 0 Sc 8 0 0 Sc Gray brown fine to coarse SAND, trace silt, occasional lens clay.
7 0 0 SC Gray brown fine to coarse SAND, trace silt, occasional lens clay. 9 11 SC Gray brown fine to coarse SAND, trace silt, occasional lens clay. 14 SC Gray brown fine to coarse SAND, trace silt, occasional lens clay. 10 0 0
7 0 0 Sc Gray brown fine to coarse SAND, trace silt, occasional lens clay. 9 11 Sc Gray brown fine to coarse SAND, trace silt, occasional lens clay. 14 Sc Gray brown fine to coarse SAND, trace silt, occasional lens clay. 10 0 Sc 11 SM SM Gray fine to coarse SAND, trace silt.
7 0 0 Sc Gray brown fine to coarse SAND, trace silt, occasional lens clay. 9 11 Sc Gray brown fine to coarse SAND, trace silt, occasional lens clay. 14 Sc Gray brown fine to coarse SAND, trace silt, occasional lens clay. 10 0 Sc 11 Gray fine to coarse SAND, trace silt.

BORING LOG	ıe,	yM	Page 4 of 4	В	Site Name: _{LCP} Chemicals Site, Brunswick GA Boring No: SW-43 Diameter: 8 in Date: 07/29/2013				
Northing (ft): 432075. Easting (ft): 861755.0 Elevation (ft): 9.18 Fotal Depth: 50.33 Ft	8	Meth Cons	r: Groundv od: Mud R sultant: Mu oct No: 448	otary tch Asso	otection Inc	Coc	um: NAVD88 ordinate System: 1983 State Plane gia East / FIPS 100		
Depth & Sample	Blow	PID	Mercury	USCS		-	Well		
Depth of Sample Ft & ID	Count	(ppm)	(mg/m3)	Code	Soil Description		Construction Diagram		
45	9			ou/oc	Gray fine to coarse SAND, trace silt, 2 inch la of Gray clay.	yer			
	12			SM/SC			inin inin		
	8				Gray fine to coarse SAND, trace silt.				
	12	0	0	SM					
÷.	27	1.0			Gray fine to medium SAND, lenses Gray clay sulfur like.	, odor			
	28	14		SC	Sundi IING.		+		
6 5 8	6				Gray CLAY and silt, stiff, 3 layers 1/4 inch Gra	ау	Tend Trees		
	0	0	CL	fine to coarse sand.					
	8				Gray CLAY and silt, stiff, 3 layers 1/4 inch Gra	ay			
	7			CL	fine to coarse sand.				
50 +	50	0	0	CL	Gray CLAY, drove 3 inches on 15 blows, ther	over			

BORI			e	yw	Page 1 of 4	В	ite Name: LCP Chemicals Site oring No: SW-44 Diameter: 8 in Date: 07/31/2013	, Brunsw	ick GA
Easting Elevati	g (ft): on (ft	: 432155.2 861752.7): 9.48 : 52.0 Ft		Meth Cons	er: Groundv ood: Mud R sultant: PA ect No: 448	otary RSONS	otection Inc	Coo NAD	im: NAVD88 rdinate System: 1983 State Plane gia East / FIPS 100 ⁻
Depth Ft	Recov	Sample ID	Blow Count	PID (ppm)	Mercury (mg/m3)	USCS Code	Soil Description		Well Construction Diagram
*				75			hole. Installed with a stick up above ground Fluctuating in breathing zone 0.5 to 3.	surface.	
5 +							Mud rotary 5-40 feet, no samples. pH is 7.		

0.000

0.000

3

3

10 -

15 -

BORING LOG

Page 2 of 4

Site Name: LCP Chemicals Site, Brunswick GA Boring No: SW-44 Honeywell Diameter: 8 in Date: 07/31/2013

Easting Elevatio	(ft): on (ft epth:	52.0 Ft		Meth Cons	r: Groundv od: Mud R sultant: PA oct No: 448	Datum: NAVD88 Coordinate System: NAD 1983 State Plane Georgia East / FIPS 1007		
Depth Ft	Recov	Sample ID	Blow Count	PID (ppm)	Mercury (mg/m3)	Soil Description		Well Construction Diagram
20 -				3	0.000	Mud rotary 5-40 feet, no samples. pH is 7.		
25				3	0.000			
30						 		

		.og O	le,	yw	Page 3 of 4	E	Site Name: _{LCP} Chemicals Site, E Boring No: SW-44 Diameter: 8 in Date: 07/31/2013	Brunswi	ck GA		
Northing	(ft):	432155.2	21	Drille	r: Ground	water Pi	rotection Inc	Datur	m: NAVD88		
Easting Elevation Total De	n (ft)		5	Cons	od: Mud R sultant: PA ect No: 448	RSONS		NAD 1	Coordinate Syste NAD 1983 State Plan Georgia East / FIPS 1		
Depth Ft	Recov	Sample ID	Blow Count	PID (ppm)	Mercury (mg/m3)		Soil Description		Well Construc Diagrar		
-											
35				3	0.000						
40 - 4			8 9 13 11	3	0.000	SM	Gray medium coarse SAND, trace fine sand, w	vet.			
			9 13			SM	Gray medium coarse SAND, trace fine sand, w Gray dark gray medium to coarse SAND, fine t bottom 8 inches, trace silt and clay at bottom in wet.	to medium			
							Gray medium coarse SAND, trace fine sand, w	vet.			

BORING LOG			yw	Page 4 of 4		Site Name: _{LCP} Chemicals Site, Bi Boring No: SW-44 Diameter: 8 in Date: 07/31/2013	runswi	ck GA	
Northing (ft): 432155.21 Easting (ft): 861752.75 Elevation (ft): 9.48 Total Depth: 52.0 Ft				Meth Cons	r: Groundv od: Mud R sultant: PA ect No: 448	otary RSON	Protection Inc	Coor	m: NAVD88 rdinate System 1983 State Plane gia East / FIPS 100
Depth Ft	Recov	Sample ID	Blow Count	PID (ppm)	Mercury (mg/m3)	USCS	Sail Description		Well Construction Diagram
45			5	(ppin)	(ing/ine/	1000	Greenish gray fine to medium SAND, 1 inch clay lense over dense fine sand, little silt, trace shells		
			10			SM	wet.	5,	in in
Ť		1.1.1	6	0.0	0.000	-	SAND as above upper 10 inches over greenish CLAY, some to little silt, trace shells in lenses, to	gray	
			9			SM/CL	fine sand in lenses.	ase	
Ť			16			SIVI/GL			11111
			12					_	+
T			6	0.0	0.000		Gray SILT and fine SAND, little clay, clay lenses wet.	5,	
-			8			ML			
	K		7						
50 -	1		9		and a state of		Greenish gray CLAY, little silt, trace shells,	-	
AT.			3	0.0	0.000	-	silt in thin lenses, bottom 6 inches all clay, med	stiff.	
+			3	0.0	0.000	CL			
			4	0.0	0.000		Gray fine to medium SAND, some silt, little coar	0.00	
52.0		·	50/6	0.0 Vell Set at 4	0,000		sand, gravel, bedrock pebbles, wet. Hard refusa	lat	

Easting Elevation) (ft): on (ft	: 432237. 861751.4): 9.12 : 50.4 Ft		Meth Cons	er: Groundv od: Mud R sultant: PA ect No: 448	totary RSONS	otection Inc	Coord NAD 1	n: NAVD88 dinate System 983 State Plane a East / FIPS 10
Depth Ft	Recov	Sample ID	Blow Count	PID (ppm)	Mercury (mg/m3)	USCS	Soil Description		Well Construction Diagram
5 + + + + + + + + + + + + + + + + + + +				0.0	0.000				

Easting Elevation) (ft): 8 on (ft):	432237.4 61751.4 9.12 50.4 Ft		Meth Cons	er: Ground od: Mud R sultant: PA ect No: 448	RSONS	n Inc	Datum: NAVD88 Coordinate System NAD 1983 State Plane Georgia East / FIPS 10	
Depth Ft		Sample ID	Blow Count	PID (ppm)	Mercury (mg/m3)	USCS	Soil Description	Cor	Well struction iagram
20				0.0	0.000				
25 -				0.0	0.000				

			ıe,	yM	Page 3 of 4	E	Site Name: _{LCP} Chemicals Site, Brunswick GA Boring No: SW-45 Diameter: 8 in Date: 08/09/2013 - 08/11/2013				
East Eleva	ing (ft): ation (ft)	: 432237.4 861751.4): 9.12 50.4 Ft		Meth Cons	er: Groundv od: Mud R sultant: PA ect No: 448	otary RSONS	rotection Inc	Coor	Datum: NAVD88 Coordinate System NAD 1983 State Plane Georgia East / FIPS 10		
Dept	Recov	Sample	Blow	PID	Mercury		Soil Description		Well Construction Diagram		
Ft 30	E E	ID	Count	(ppm)	(mg/m3)	Code			Diagram		
35 -				0.0	0.000						
40 -	-						Light grov modium SAND, over engree coord	01/05			
40 -			10	0.0	0.000		Light gray medium SAND, over coarse sand, medium sand, wet.	over	cup (0)1 (0)1		
40 -			10 16 21	0.0	0.000	SM	Light gray medium SAND, over coarse sand, medium sand, wet.	over			
40 —			16	0.0	0.000	SM	Light gray medium SAND, over coarse sand, medium sand, wet.	over			
40 —			16 21	0.0	0.000	SM	Light gray medium SAND, over coarse sand, medium sand, wet. SAND as above, trace clay in thin lense near of sample, greenish gray clay in shoe, wet.		1204		
40 —			16 21 23				medium sand, wet.		1794 (191) 1794 (191) 1794 (191) 1794 (191) 1794 (191) 1914 (191)		
40 —			16 21 23 6			SM	medium sand, wet.		1999 (1997) 1999 (1997) 1999 (1997) 1999 (1997) 1999 (1997) 1999 (1997)		
40 -			16 21 23 6 13 15 19	0.0	0.000		medium sand, wet. SAND as above, trace clay in thin lense near of sample, greenish gray clay in shoe, wet.	bottom	1999 (1997) 1999 (1997) 1999 (1997) 1999 (1997) 1999 (1997) 1999 (1997)		
40 =			16 21 23 6 13 15				medium sand, wet.	bottom			

_	Π	OI	Ie,	yw	vel		Diameter: 8 in Date: 08/09/2013 - 08/11/2013	_	
Easting Elevation	g (ft): on (ft	: 432237.4 861751.4): 9.12 : 50.4 Ft		Meth Cons	r: Groundv od: Mud R sultant: PA oct No: 448	otary RSONS	rotection Inc	Datum: NAVD88 Coordinate System NAD 1983 State Plane Georgia East / FIPS 10	
Depth	Recov	Sample	Blow	PID	Mercury	USCS	Soil Description		Well Construction Diagram
Ft 45	R	ID	Count 7	(ppm)	(mg/m3)	Code	Greenish gray CLAY, some silt in bottom 4 inch	es,	Diagram
			10		1-1	CL	stiff, moist.		
			10	0.0	0.000		CLAY 2 inches as above over fine coarse SAND	0 10	
			19				inches, trace small shells, over dark gray silt and clay with thin interbedded sand layers.	rk gray silt and /ers.	
Ť	_		18			SM/CL			
1			13	1,~					
			3	0.0	0.000		Greenish gray CLAY, trace sand in thin layers, scattered.		
-			3	1		CL			
			5						
50 +			10 50/5	0.0	0.000		Gray weathered sandstone bedrock, wet. Hard		
50.4			v	Vell Set at 4			pieces of broken rock in lower sample.	retusal,	
30.4			v				pieces of broken rock in lower sample.	refusal,	

1			Ie,	yM	Page 1 of 4	E	Site Name: LCP Chemicals Site, Boring No: SW-46 Diameter: 8 in Date: 08/06/2013 - 08/07/2013	Brunsw	/ick GA	
Easting Elevati	g (ft): 8 on (ft):	432322.4 61757.4 8.65 52.0 Ft		Meth Cons	er: Ground od: Mud R sultant: PA ect No: 448	totary RSONS	NS		Datum: NAVD88 Coordinate System: NAD 1983 State Plane Georgia East / FIPS 100 ⁻	
Depth Ft	Recov	Sample ID	Blow Count	PID (ppm)	Mercury (mg/m3)		Soil Description	1	Well Construction Diagram	
5 -							above ground surface. pH is 7.			
10				0.0	0.000					

			le	yM	Page 2 of 4	E	Site Name: _{LCP} Chemicals Site, Brunswick GA Boring No: SW-46 Diameter: 8 in Date: 08/06/2013 - 08/07/2013			
Eastir Eleva	ng (ft): tion (ft	: 432322.4 861757.4): 8.65 : 52.0 Ft		Meth Cons	er: Ground od: Mud R sultant: PA ect No: 448	Rotary RSONS			Datum: NAVD88 Coordinate Syster NAD 1983 State Plane Georgia East / FIPS 10	
Depth Ft	Recov	Sample ID	Blow Count	PID (ppm)	Mercury (mg/m3)	1.	Out Develotion		Well Construction Diagram	
20				0.0	0.000		pH is 7.			
25 +				0.0	0.000					
30										

		og	le	yw	Page 3 of 4	E	Site Name: _{LCP} Chemicals Site, E Boring No: SW-46 Diameter: 8 in Date: 08/06/2013 - 08/07/2013	Brunswi	ick GA	
	(ft): n (ft)			Meth Cons	er: Ground od: Mud R sultant: PA ect No: 448	totary RSONS	rotection Inc	Cool	Datum: NAVD88 Coordinate Syster NAD 1983 State Plane Georgia East / FIPS 10	
Depth	Recov	Sample	Blow	PID	Mercury	USCS			Well Construction	
Ft 30	Re	ID	Count	(ppm)	(mg/m3)	Code	Soil Description		Diagram	
35 —				0.0	0.000					
-										
40			12 15 11 12	0.0	0.000	SM	Gray medium to coarse SAND, trace clay in lea at bottom of sample, wet.	nse		
40			15 11	0.0	0.000	SM SM/CL	Gray medium to coarse SAND, trace clay in lea at bottom of sample, wet. Gray SAND as above grading to fine to mediur layer of silty clay near bottom 5 inches, bottom sand, wet.	n sand,	1744 (R)	
40			15 11 12 4 9 19				at bottom of sample, wet. Gray SAND as above grading to fine to mediur layer of silty clay near bottom 5 inches, bottom	n sand, fine		

Depth g Sample Blow PTD Mercury USCS Ft Q ID Count (ppm) (mg/m3) Code Soil Description 45 17 15 17 Tan gray SAND, over 8 inches of greenish gray CLAY, semi stiff, wet. Same as above, fine SAND over greenish gray CLAY, semi stiff, wet. Same as above, fine SAND over greenish gray CLAY & Sinches, very thin sand layers in clay, thin clay layers in upper sand. 9 11 10 0.000 Sm/CL Greenish gray CLAY, scattered thin sand lenses, semi stiff, moist. 50 13 0.0 0.000 Light gray fine SAND, over 10 inches of semi stiff gray CLAY, thin sand lenses scattered in clay.	BORI			Ie,	yw	Page 4 of 4	E	Site Name: LCP Chemicals Site, Brunswick GA Boring No: SW-46 Diameter: 8 in Date: 08/06/2013 - 08/07/2013				
Depth g Sample Blow PTD Mercury USCS Ft Q ID Count (ppm) (mg/m3) Code Soil Description 45 17 15 17 Tan gray SAND, over 8 inches of greenish gray CLAY, semi stiff, wet. Same as above, fine SAND over greenish gray CLAY, semi stiff, wet. Same as above, fine SAND over greenish gray CLAY & Sinches, very thin sand layers in clay, thin clay layers in upper sand. 9 11 10 0.000 Sm/CL Greenish gray CLAY, scattered thin sand lenses, semi stiff, moist. 50 13 0.0 0.000 Light gray fine SAND, over 10 inches of semi stiff gray CLAY, thin sand lenses scattered in clay.	Easting Elevati	g (ft): ion (fl	861757.4 :): 8.65		Meth Cons	od: Mud R sultant: PA	lotary RSONS		Coor NAD	dinate Systen 1983 State Plane		
45 17 Tan gray SAND, over 8 inches of greenish gray CLAY, semi stiff, wet. 15 0.0 0.000 9 0.0 0.000 11 10 10 0.0 7 0.0 8 14 13 0.0 10 0.000 Light gray fine SAND, over 10 inches of semi stiff gray CLAY, thin sand lenses, semi stiff gray CLAY, thin sand lenses scattered in clay.		Recov	100 March 100	10000		1.	0.000			Well Construction Diagram		
15 0.0 0.000 Same as above, fine SAND over greenish gray CLAY 8 inches, very thin sand layers in clay, thin clay layers in upper sand. 9 11 Same as above, fine SAND over greenish gray CLAY 8 inches, very thin sand layers in clay, thin clay layers in upper sand. 10 0.000 Greenish gray CLAY, scattered thin sand lenses, semi stiff, moist. 50 10 0.000 Light gray fine SAND, over 10 inches of semi stiff gray CLAY, thin sand lenses scattered in clay.			10		(ppin)	(ing/ine/	1.11.1		ray CLAY,			
12 0.0 0.000 8 inches, very thin sand layers in clay, thin clay layers in upper sand. 9 11 10 10 7 0.0 0.000 7 0.0 0.000 8 14 13 0.0 0.000 10 0.000 Light gray fine SAND, over 10 inches of semi stiff gray CLAY, thin sand lenses scattered in clay.		7		15			SM/CL	semi sun, wet.				
9 11 10 0.0 7 0.0 8 14 13 10 0.000 Light gray fine SAND, over 10 inches of semi stiff gray CLAY, thin sand lenses scattered in clay.	1			12	0.0	0.000						
11 10 7 0.0 7 0.0 8 14 13 10 0.000 Light gray fine SAND, over 10 inches of semi stiff gray CLAY, thin sand lenses scattered in clay.				9				in upper sand.	ay layers			
7 0.0 0.000 Greenish gray CLAY, scattered thin sand lenses, semi stiff, moist. 8 14 13 10 0.0 0.000 Light gray fine SAND, over 10 inches of semi stiff gray CLAY, thin sand lenses scattered in clay.	Ť			11			SM/CL					
14 13 10 0.0 10 0.000 Light gray fine SAND, over 10 inches of semi stiff gray CLAY, thin sand lenses scattered in clay.		1		10								
8 14 13 0.0 10 0.000 Light gray fine SAND, over 10 inches of semi stiff gray CLAY, thin sand lenses scattered in clay.	Ť			7	0.0	0.000			ses,			
50 14 13 10 10 0.00 Light gray fine SAND, over 10 inches of semi stiff gray CLAY, thin sand lenses scattered in clay.			1.4.1	8			C 1		-			
50 10 0.0 Light gray fine SAND, over 10 inches of semi stiff gray CLAY, thin sand lenses scattered in clay.	Ĩ			14			CL.					
10 0.0 0.000 gray CLAY, thin sand lenses scattered in clay.			1	13		1		the second second second second				
	50			10	0.0	0.000		Light gray fine SAND, over 10 inches of sem gray CLAY, thin sand lenses scattered in cla	i stiff y.			
12 SM/CL				12	1		SM/CI					
21			4.11	21			ONNOL					
52.0 15 Well Set at 44 ft.	520			- 23:								

Easting Elevatio) (ft): on (ft	: 432395. 861754.6): 9.82 : 53.3 Ft		Driller: Groundwater Method: Mud Rotary Consultant: PARSOI Project No: 448517				Datum: NAVD88 Coordinate Sys NAD 1983 State PI Georgia East / FIPS
Depth Ft	Recov	Sample ID	Blow Count	PID (ppm)	Mercury (mg/m3)	USCS Code	Soil Description	Well Construc Diagrat
5							pH is 7.5.	
-				0.0	0.000			

BOF				le	yw	Page 2 of 4		bite Name: _{LCP} Chemicals Site Foring No: SW-47 Diameter: 8 in Date: 08/05/2013	e, Brunswi	ick GA
East Elev	ing (ation	ft): 8 (ft)	432395. 861754.6 : 9.82 53.3 Ft		Meth Cons	er: Ground od: Mud R sultant: PA ect No: 448	totary RSONS	otection Inc	Cool	m: NAVD88 rdinate Syst 1983 State Pla gia East / FIPS
Dept Ft	h	Recov	Sample ID	Blow Count	PID (ppm)	Mercury (mg/m3)	1.1.1.1.1.1.1	Soil Description		Well Construct Diagran
20 -	-				0.0	0.000		pH is 7.		
25 -					0.0	0,000				
30 -										

Hor	ley	M	Page 3 of 4	E	Site Name: _{LCP} Chemicals Site, E Boring No: SW-47 Diameter: 8 in Date: 08/05/2013	3runswid	ck GA
Northing (ft): 432395. Easting (ft): 861754.6 Elevation (ft): 9.82 Total Depth: 53.3 Ft		Meth Cons	er: Ground od: Mud R sultant: PA ect No: 448	totary RSONS	rotection Inc	Coor NAD 1	n: NAVD88 dinate Syst 983 State Pla ia East / FIPS
Depth o Sample Ft 2 ID	Blow Count	PID (ppm)	Mercury (mg/m3)		Soil Description		Well Constructi Diagram
35		0.0	0.000				
40 +	17 22 21 20	0.0	0.000	SM	Gray medium to coarse SAND, lenses of fine to sand and silty clay lenses, thin layers sparse, w pH is 7 to 7.5.	o medium wet.	
	7	0.0	0.000	SM	Gray medium to coarse SAND, bottom 3 inche gray fine to medium sand, little silt, trace clay, pebbles, wet.	s greenish trace	1054 (000) 6914 6914
	12 13 20						

	H	on	Ie,	yM	/el		Diameter: 8 in Date: 08/05/2013		
Easting Elevation	(ft): on (ft)	: 432395. 861754.6): 9.82 53.3 Ft		Meth Cons	r: Groundv od: Mud R ultant: PAI ct No: 448	otary RSONS	rotection Inc	Coo NAD	im: NAVD88 rdinate Syster 1983 State Plane gia East / FIPS 10
Depth	Recov	Sample	Blow	PID	Mercury	USCS		_	Well Construction Diagram
Ft	Re	ID	Count	(ppm)	(mg/m3)	Code	Soil Description Gray medium to coarse SAND, fine to medium		Diagram
45			20		1.11	SM	bottom 1/2, wet.	n sand	****
+	/		23				Gray CLAY, trace silt, thin sand lenses, semi	stiff	40
			7	0.0	0.000		moist to wet.	oun,	
÷			11 10			CL			
			7				11.1 March 11. Start		
ŧ			4	0.0	0.000		Gray CLAY, thin fine sand lenses 1/2 inch at I	bottom	
			5	010			of sample, wet.		
÷	/		8			CL			
- 1	1	- II)	6						
50 +			4	0.0	0.000	_	Gray CLAY, thin fine sand lenses, thin and so wet.	attered,	
			4		_		wet.		
Ť			3			CL			
							the second second second second		
			12	0.0	0.000	CL	Gray CLAY, thin fine sand lenses, thin and so wet.	attered,	
			8	0.0	0.000	CL	Clay as above, alternating with fine to medium SAND 1-1.5 inch layers.		
53.3L			54/4 V	0.0 /ell Set at 4	0.000	SM	Gray fine to medium SAND, trace silt, sandsto at bottom of sample, wet.	one	

Easting Elevatio	(ft): on (ft	: 431469.8 861833.8): 10.29 50.33 Ft		Meth Cons	r: Groundv od: Mud R sultant: Mu	otary tch Ass	otection Inc	Cool NAD	m: NAVD88 rdinate System 1983 State Plane gia East / FIPS 100
Depth Ft	Recov	Sample ID	Blow Count	PID (ppm)	Mercury (mg/m3)	USCS	Soil Description	_	Well Construction Diagram
5						SM	silt. Brown gray drilling MUD, pH is 7 to 8.		
10				0.5	Ō				

				le	yw	Page 2 of 4	E	Site Name: _{LCP} Chemicals Site, Boring No: SW-48 Diameter: 8 in Date: 08/12/2013 - 08/13/2013	, Brunswi	ck GA	
East Elev	ting (ation	ft): 8 (ft):	431469.8 61833.8 10.29 50.33 Ft	4	Meth Cons	er: Ground od: Mud R sultant: Mu ect No: 448	totary	rotection Inc ociates	Cool	Datum: NAVD88 Coordinate Syster NAD 1983 State Plane Georgia East / FIPS 10	
Dept Ft	th	Recov	Sample ID	Blow Count	PID (ppm)	Mercury (mg/m3)	1.	Soil Description		Well Construction Diagram	
20 -					0.5	0					
25 -	-										
	-										

		.og O	le,		Page 3 of 4	E	Site Name: _{LCP} Chemicals Site, Boring No: SW-48 Diameter: 8 in Date: 08/12/2013 - 08/13/2013	Brunswi	ick GA	
Easting Elevatio	(ft): m (ft	: 431469.8 861833.8): 10.29 50.33 Ft		Meth Cons	r: Groundv od: Mud R sultant: Mu oct No: 448	otary tch Ass	rotection Inc ociates	Coor	Datum: NAVD88 Coordinate Syst NAD 1983 State Pla Georgia East / FIPS	
Depth	Recov	Sample	Blow	PID	Mercury		Soil Description		Well Constructi Diagram	
Ft 30	Ř	ID	Count	(ppm)	(mg/m3)	Code	Brown gray drilling MUD, pH is 7 to 8.		Diagram	
35. —				0.5	0					
-										
40 -			6	0	0	SM	Gray fine to coarse SAND, trace silt.			
40 -			9	0	0	SM	Gray fine to coarse SAND, trace silt. Gray fine to coarse SAND, trace silt.			
40 -				0	0	SM	Gray fine to coarse SAND, trace silt.			
40			9 12 12 13	0	0			nal		
40 -			9 12 12			SM SC	Gray fine to coarse SAND, trace silt. Gray fine to coarse SAND, trace silt, occasio lens clay . Gray fine to coarse SAND, trace silt, occasio			
40			9 12 12 13 5			SM	Gray fine to coarse SAND, trace silt. Gray fine to coarse SAND, trace silt, occasio lens clay . Gray fine to coarse SAND, trace silt, occasio lens clay .			
40			9 12 12 13 5 7			SM SC	Gray fine to coarse SAND, trace silt. Gray fine to coarse SAND, trace silt, occasio lens clay . Gray fine to coarse SAND, trace silt, occasio			

BORIN			le	yM	vel	E	Site Name: _{LCP} Chemicals Site, Boring No: SW-48 Diameter: 8 in Date: 08/12/2013 - 08/13/2013	Dianav	
	(ft): 8 n (ft):			Meth Cons	r: Groundv od: Mud R sultant: Mu ect No: 448	totary tch Ass	rotection Inc ociates	Coo	um: NAVD88 ordinate System) 1983 State Plane rgia East / FIPS 10
Depth Ft	Recov	Sample ID	Blow Count	PID	Mercury		Soil Description		Well Construction Diagram
45	ur.		11	(ppm)	(mg/m3)	1 (S. 19	Gray fine to medium SAND, trace silt, 3 inch clay, stiff.	layer	
			15			SC		-	and the second
			7	0	0	SM	Gray fine to coarse SAND, trace silt.		
÷			13				Gray fine to medium SAND, some clayey sil	t.	ALA (
			22			SC			
Ť			12	0	0	SM/SC	48 ft to 48 ft 6 in Gray fine to coarse SAND, silt, 48 ft 6 in to 49 ft Gray fine to medium S/	trace AND and	
			18	, i i	Ů	00000	clayey silt.	and	_
			20			SM/SC	49 ft to 49 ft 6 in Gray fine to medium SAND clayey silt, 49 ft 6 in to 50 ft fine to coarse S, little silt.	AND,	
50 + 50.33			20 50	100		SM/R	Gray fine to coarse SAND, little silt, 2 inch w	eakly	+

BORING LOG	
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Page 1 of 4

Honeywell

Site Name: LCP Chemicals Site, Brunswick GA Boring No: SW-49 Diameter: 8 in Date: 08/13/2013

Easting Elevation	(ft): on (ft	: 431551.2 861825.9): 13.30 : 54.33 Ft	5	Meth Cons	er: Groundv od: Mud R sultant: Mu ect No: 448	totary tch Asso	otection Inc	Datum: NAVD88 Coordinate System: NAD 1983 State Plane Georgia East / FIPS 1001		
Depth Ft	Recov	Sample ID	Blow Count	PID	Mercury (mg/m3)		Soil Description		Well Construction Diagram	
0			Count	(ppm)	(inginity)	SM	Hand cleared to 5 ft. Installed with a stick up ab ground surface. Brown fine to medium SAND, t silt.	iove race		
5 +							Brown gray drilling MUD, pH 7 to 8.			
10				0.5	0					
15										

		N. 7 7	-	well			Diameter: 8 in Date: 08/13/2013			
Northing (ft): 431551.26 Easting (ft): 861825.95 Elevation (ft): 13.30 Total Depth: 54.33 Ft				Driller: Groundwater Method: Mud Rotary Consultant: Mutch As Project No: 448517				Datum: NAVD88 Coordinate System: NAD 1983 State Plane Georgia East / FIPS 100		
DepthSampleBlowFt2IDCount15			PID Mercury USC (ppm) (mg/m3) Code			Soil Description Brown gray drilling MUD, pH 7 to 8.	Well Construction Diagram			
20 —										
4 4				0.5	D					

BORING LOG				yw	Page 3 of 4	E	Site Name: _{LCP} Chemicals Site, Brunswick GA Boring No: SW-49 Diameter: 8 in Date: 08/13/2013				
Easting Elevati	g (ft): on (ft	: 431551.2 861825.9): 13.30 54.33 Ft	5	Driller: Groundwater F Method: Mud Rotary Consultant: Mutch Ass Project No: 448517					Datum: NAVD88 Coordinate Systen NAD 1983 State Plane Georgia East / FIPS 10		
Depth	Recov	Sample	Blow	PID	Mercury	USCS			Well Construction Diagram		
Ft 30	Re	ID	Count	(ppm)	(mg/m3)	Code	Soil Description Brown gray drilling MUD, pH 7 to 8.		Diagram		
35 -				0.5	0						
-											
40 -			12	٥	0	SM	Gray fine to medium SAND, trace silt.				
40 -			12 17 17	٥	0		Gray fine to medium SAND, trace silt. Gray fine to medium SAND, trace silt.				
40			17	O	Ō	SM	Gray fine to medium SAND, trace silt.				
40			17 17	0	0	SM					
40			17 17 12 5 5				Gray fine to medium SAND, trace silt. Gray fine to medium SAND, trace silt.				
40 -			17 17 12 5 5 8			SM	Gray fine to medium SAND, trace silt.				
40			17 17 12 5 5 8 8 8			SM SM	Gray fine to medium SAND, trace silt. Gray fine to medium SAND, trace silt. Gray fine to medium SAND, trace silt.				
40			17 17 12 5 5 8			SM SM	Gray fine to medium SAND, trace silt. Gray fine to medium SAND, trace silt.				

Northing (ft): 431551.26 Easting (ft): 861825.95 Elevation (ft): 13.30 Total Depth: 54.33 Ft				Driller: Groundwater Method: Mud Rotary Consultant: Mutch As Project No: 448517					Datum: NAVD88 Coordinate System NAD 1983 State Plane Georgia East / FIPS 100	
Depth		Sample	Blow	PID	Mercury	-		Georg	Well	
Ft	Recov	ID	Count	(ppm)	(mg/m3)		Soil Description		Construction Diagram	
45			15	<u><u><u>u</u></u><u>r</u><u>r</u><u>r</u><u>r</u><u>r</u><u>r</u><u>r</u><u>r</u><u>r</u><u>r</u><u>r</u><u>r</u><u>r</u></u>	1.0	5.057	Gray fine to coarse SAND, trace silt, occasiona piece of coarse gravel.	al		
7	_		16			SM	piece of coalse gravel.			
Ť			8				Gray fine to coarse SAND, trace silt.			
			13	0	0	SM				
Ť			13	line I		~	Gray fine to coarse SAND, trace silt.			
			19			SM				
T		- 1	7	0	0	SM	Gray fine to coarse SAND, trace silt.			
			11	U	U	SIM				
			13	Mar.		SM	Gray fine to coarse SAND, trace silt.			
50 -			17			OM			in the second	
50			4			SM	Gray fine to coarse SAND, trace silt.		ing - ma	
4			8							
			11			SM	Gray fine to coarse SAND, trace silt.		1.1.1. 1.1.1.	
+			20							
			25			SM	52 ft to 52 ft 6 in Gray fine to medium SAND, 5 ft 6 in to 53 ft Gray fine to coarse SAND, trace	2 white	4.4.4.1	
+			26				shell fragments, little clayey silt.			
			8			SM	Gray fine to medium SAND, little silt.			
+			12 50			SM/R	54 ft to 54 ft 4 in fine to medium SAND, some s	silt		
54.7		1 S	50			SWIT	1/4 inch layer Gray cemented stone.	-114		

BORIN			le,	yM	Page 1 of 4	E	Site Name: ^{LCP} Chemicals Sit Boring No: SW-50 Diameter: 8 in Date: 07/31/2013 - 08/05/2013		ick GA
Easting Elevatio	(ft): on (ft	: 431794.9 861827.2): 10.19 : 52.0 Ft		Meth Cons	er: Groundv od: Mud R sultant: PA ect No: 448	otary RSONS	rotection Inc	Coo	im: NAVD88 rdinate Syste 1983 State Plan gia East / FIPS 1
Depth Ft	Recov	Sample ID	Blow Count	PID	Mercury (mg/m3)	USCS Code	Soil Description		Well Constructio Diagram
5				0.0	0.000		above ground surface. pH is 7.0.		
1									

			le	yM	Page 2 of 4	E	Site Name: _{LCP} Chemicals Site, Brunswick GA Boring No: SW-50 Diameter: 8 in Date: 07/31/2013 - 08/05/2013				
Northing (ft): 431794.98 Easting (ft): 861827.26 Elevation (ft): 10.19 Total Depth: 52.0 Ft Depth group (Sample) Blow				Meth Cons	er: Ground od: Mud R sultant: PA ect No: 448	Rotary RSONS			Datum: NAVD88 Coordinate System NAD 1983 State Plane Georgia East / FIPS 10		
Depth Ft	Recov	Sample ID	Blow Count	PID (ppm)	Mercury (mg/m3)	1.	O-II D		Well Construction Diagram		
15				0.0	0.000		above ground surface. pH is 7.0.				
25	-			0.0	0.000						
30											

He	og D M	le	ym	Page 3 of 4	E	Site Name: _{LCP} Chemicals Site, Br Boring No: SW-50 Diameter: 8 in Date: 07/31/2013 - 08/05/2013	runswic	sk ga	
Northing (ft): 4 Easting (ft): 8 Elevation (ft): Total Depth: 5	61827.26 10.19		Meth Cons	er: Groundv od: Mud R sultant: PA	Rotary RSONS	rotection Inc	Datum: NAVD88 Coordinate System NAD 1983 State Plane Georgia East / FIPS 100		
	Sample	Blow	PID	Mercury			<u> </u>	Well Construction Diagram	
Ft 🖉	ID	Count	(ppm)	(mg/m3)	Code	Soil Description		Diagram	
35 —			0.0	0.000					
-									
40		11	0.0	0.000		Gray medium to coarse SAND, fine to medium s	sand,		
40 -	-	11	0.0	0.000		Gray medium to coarse SAND, fine to medium s darker gray at bottom, wet. pH is 7.0 to 8.	sand,		
40 -			0.0	0.000	SM	Gray medium to coarse SAND, fine to medium s darker gray at bottom, wet. pH is 7.0 to 8.	and,		
40	-	14	0.0	0.000	SM	Gray medium to coarse SAND, fine to medium s darker gray at bottom, wet. pH is 7.0 to 8.	and,		
40	-	14 18	0.0	0.000	SM	darker gray at bottom, wet. pH is 7.0 to 8.			
40	-	14 18 28		2014		darker gray at bottom, wet. pH is 7.0 to 8.			
40	-	14 18 28 20		2014	SM	darker gray at bottom, wet. pH is 7.0 to 8.			
40		14 18 28 20 25		2014		darker gray at bottom, wet. pH is 7.0 to 8.			
40		14 18 28 20 25 20		2014	SM	darker gray at bottom, wet. pH is 7.0 to 8. Gray medium to coarse SAND, bottom 2 inches and clay lense, semi stiff, wet. Gray medium to coarse SAND, thin silt and clay	silt		
40		14 18 28 20 25 20 19	0.0	0.000		darker gray at bottom, wet. pH is 7.0 to 8. Gray medium to coarse SAND, bottom 2 inches and clay lense, semi stiff, wet.	silt		

			le	yM	Page 4 of 4	1	Site Name: _{LCP} Chemicals Site, B Boring No: SW-50 Diameter: 8 in Date: 07/31/2013 - 08/05/2013	runswi	ck GA
Eastin Eleva	ng (ft): ation (ft	: 431794.9 861827.2): 10.19 : 52.0 Ft		Meth Cons	r: Groundv od: Mud R sultant: PA oct No: 448	otary RSON	Protection Inc	Coor NAD 1	n: NAVD88 dinate System 1983 State Plane ia East / FIPS 100
Depth Ft	Recov	Sample ID	Blow Count	PID (ppm)	Mercury (mg/m3)	USCS	Sail Departmention		Well Construction Diagram
45	1		11			SM	Gray medium to coarse SAND, thin silt and clay lense 1/4 inch, wet.	/	
	∇		13			SM			
Ĩ			3	0.0	0.000	-	Same as above, grading to fine to medium SAN	ID.	
			4			SM			
		1.1	9			Sim			and the
1			16	123					+1010 -0.00
		1.6	9	0.0	0.000		Same as above, grading to fine SAND, trace sill trace shells, trace thin lenses of silt and clay, up	t, oper	and seen
+		1.6	36			SM	sample.		1915
			50/5						·····
50 -	-		29	0.0	0.000		Gray fine SAND, some silt, trace clay, wet.		+ 10.14 (1)+++ = = = (1)+++
	1		50/6	0.0	0.000	SM			++++ ++++
-	17		35	0.0	0.000	SM	Gray fine SAND, some silt, trace shells, more d trace pebbles, wet.	ense,	heis hes
	F		50/5				Same as above over dark gray hard sandstone refusal.	, hard	

BORING LOG	
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Honeywell

Site Name: LCP Chemicals Site, Brunswick GA Boring No: SW-51 Diameter: 8 in Date: 07/28/2013

Easting Elevatio	(ft): on (ft epth:	: 431876. 861825.0): 10.16 53.0 Ft		Meth Cons	er: Groundv od: Mud R sultant: PA ect No: 448	totary RSONS	otection Inc	Coord NAD 1	n: NAVD88 dinate System: 983 State Plane ia East / FIPS 100 ⁻
Depth Ft	Recov	Sample ID	Blow Count	PID (ppm)	Mercury (mg/m3)		Soil Description		Well Construction Diagram
5				0.0	0.000		Hand cleared to 5 ft. Installed with a stick up above ground surface. pH is 7.		
10				0.0	0.000		pH is 7.		
15									

			le	M	Page 2 of 4		Site Name: _{LCP Ct} Boring No: SW-51 Diameter: 8 in Date: 07/28/2013	nemicals Site, Bru	nswick GA	
Easting Elevatio	g (ft): 431 (ft): 8618 on (ft): 10. opth: 53.0	25.02 16		Meth Cons	r: Groundv od: Mud R ultant: PA ct No: 448	Rotary RSON	rotection Inc		Datum: NAVD88 Coordinate System NAD 1983 State Plane Georgia East / FIPS 10	
Depth Ft	× I	nple D	Blow Count	PID (ppm)	Mercury (mg/m3)	11.11.11.11.1	0.11	Description	Well Constructio Diagram	
20 -				0.0	0.000		pH is 7. PID fluctuating.			
25 -				1.0	0.000					
1 30										

BORI			le	yM	Page 3 of 4	E	Site Name: _{LCP} Chemicals Site, B Boring No: SW-51 Diameter: 8 in Date: 07/28/2013	runswi	ck GA	
Northing (ft): 431876.55 Easting (ft): 861825.02 Elevation (ft): 10.16 Total Depth: 53.0 Ft Depth § Sample Blow				Meth Cons	r: Groundv od: Mud R sultant: PA oct No: 448	totary RSONS	rotection Inc	Coor NAD	Datum: NAVD88 Coordinate System NAD 1983 State Plane Georgia East / FIPS 10	
Depth	Recov		Blow	PID	Mercury	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1			Well Constructior Diagram	
Ft 30	Re	ID	Count	(ppm)	(mg/m3)	Code	Soil Description		Diagram	
35				0.5	0.000					
35			15	0.5	0.000		Gray medium to coarse SAND, trace fine sand, lense silty clay at base of sample, wet, swampy	thin codor,		
			15 24			SW	Gray medium to coarse SAND, trace fine sand, lense silty clay at base of sample, wet, swampy no stain or sheen.	thin odor,		
						SM	lense silty clay at base of sample, wet, swampy	thin odor,		
			24			SM	lense silty clay at base of sample, wet, swampy no stain or sheen.	v odor,		
			24 21			SM	Iense silty clay at base of sample, wet, swampy no stain or sheen. Gray medium to coarse SAND, bottom 6 inches to medium sand, little silt, little clay, wet, swamp	v odor, s fine		
			24 21 24	0.0	0.000		lense silty clay at base of sample, wet, swampy no stain or sheen. Gray medium to coarse SAND, bottom 6 inches	v odor, s fine		
			24 21 24 10	0.0	0.000	SM	Iense silty clay at base of sample, wet, swampy no stain or sheen. Gray medium to coarse SAND, bottom 6 inches to medium sand, little silt, little clay, wet, swamp	v odor, s fine		
			24 21 24 10 15	0.0	0.000		Iense silty clay at base of sample, wet, swampy no stain or sheen. Gray medium to coarse SAND, bottom 6 inches to medium sand, little silt, little clay, wet, swamp odor, no stain or sheen.	v odor, s fine by		
			24 21 24 10 15 21	0.0	0.000		Iense silty clay at base of sample, wet, swampy no stain or sheen. Gray medium to coarse SAND, bottom 6 inches to medium sand, little silt, little clay, wet, swamp	v odor, s fine by		

BOR			le	yw	Page 4 of 4	E	Site Name: _{LCP} Chemicals Site, Br Boring No: SW-51 Diameter: 8 in Date: 07/28/2013	unswick GA	
Northing (ft): 431876.55 Easting (ft): 861825.02 Elevation (ft): 10.16 Total Depth: 53.0 Ft				Meth Cons	er: Ground od: Mud R sultant: PA ect No: 448	totary RSONS	rotection Inc	Datum: NAVD88 Coordinate System: NAD 1983 State Plane Georgia East / FIPS 100 ⁻	
Depth Ft	Recov	Sample ID	Blow Count	PID (ppm)	Mercury (mg/m3)		Soil Description	Well Construction Diagram	
45			10		<u> </u>	1.00	Gray medium to coarse SAND, little fine sand, tra- silt, wet, swampy odor, no stain or sheen.	ace	
	1	1	7			ML	and they are manyly added to stand of all and	1000	
T			6	0.1	0.008		Same as above top 14 inches, bottom 6 inches f SAND, some silt, lenses of gray clay, little silt.	ine	
			10			SM			
		. = 0	13			CIVI			
1			12	14					
- 1			7	0.1	0.000		Gray medium to coarse SAND, lenses of fine to sand, bottom 6 inches gray silt, fine SAND, trace		
+			21			SM	trace shells broken, wet.	trib. trive	
			25					(x)===	
50 +	-		21				Brown fine SAND, little silt, trace broken shells,	1756 C 1997	
			20	0.00	0.004	SM	Brown fine SAND, little silt, trace broken shells, Brown fine SAND, little silt, trace broken shells,		
+			20	0.2	0.009	SM	wet.		
			18	0.1	0.000	014	Same as above, trace mudstone, rock clast in bo	attom.	
÷			18	0.1	0.003	SM	Brown SILT, some fine sand, trace shells, wet.	+4.4.1	
			50/4	0.1	0.005				
53.0		A Barriel Ba		0.0 Vell Set at 5	1000000				

BORING LOG	
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Honeywell

Site Name: LCP Chemicals Site, Brunswick GA Boring No: SW-52 Diameter: 8 in Date: 07/29/2013

Easting Elevation	(ft): on (ft	: 431955.2 861824.23): 10.12 : 51.5 Ft		Meth Cons	r: Ground od: Mud R sultant: Mu ect No: 448	totary tch Asso	otection Inc	Coor NAD 1	n: NAVD88 dinate System: 1983 State Plane ia East / FIPS 1001
Depth Ft	Recov	Sample ID	Blow Count	PID (ppm)	Mercury (mg/m3)		Soil Description		Well Construction Diagram
0						ol/sm	Hand cleared to 5 ft. Installed with a stick up at ground surface. 0 ft to 1 ft Brown TOP SOIL, ro 1 ft to 5 ft Brown fine to medium SAND, trace s	oove ots, lit.	
5							Brown drilling MUD, pH 8 to 9.	in a second	
10				328	D				
15									

5.0. T 1	-	Kender		1	vel		Diameter: 8 in Date: 07/29/2013	Detre	NAVD22
Easting Elevation) (ft): on (ft)	: 431955.2 861824.2): 10.12 51.5 Ft		Meth Cons	od: Mud R sultant: Mu ect No: 448	otary tch Asso	otection Inc	Datum: NAVD88 Coordinate System: NAD 1983 State Plane Georgia East / FIPS 1001	
Depth Ft	Recov	Sample ID	Blow Count	PID (ppm)	Mercury (mg/m3)	USCS Code	Soil Description Brown drilling MUD, pH 8 to 9.		Well Construction Diagram
20 -				328	D				
-									

1		.og O	le	yw	Page 3 of 4	E	Site Name: _{LCP} Chemicals Site, Brunswick GA Boring No: SW-52 Diameter: 8 in Date: 07/29/2013				
Easting Elevation	g (ft): on (ft	: 431955.; 861824.2): 10.12 : 51.5 Ft		Meth Cons	r: Groundv od: Mud R sultant: Mu ect No: 448	totary tch Ass	rotection Inc	Cool	Datum: NAVD88 Coordinate System NAD 1983 State Plane Georgia East / FIPS 100		
Depth	Recov	Sample	Blow	PID	Mercury	USCS			Well Construction Diagram		
Ft 30	Re	ID	Count	(ppm)	(mg/m3)	Code	Soil Description Brown drilling MUD, pH 8 to 9.		Diagram		
35 —				328	O						
*											
40 -			12	0	0	SM	Gray fine to coarse SAND, trace silt.				
40 +			15	0	0	SM	Gray fine to coarse SAND, trace silt. Gray fine to coarse SAND, trace silt.				
40 +				O	0	SM					
40 -	_		15 15			SM	Gray fine to coarse SAND, trace silt. Gray fine to coarse SAND, trace silt, occasic	onal			
40 +			15 15 16	0	O.	<u></u>	Gray fine to coarse SAND, trace silt. Gray fine to coarse SAND, trace silt, occasio lens clay.				
40 +			15 15 16 8			SM	Gray fine to coarse SAND, trace silt. Gray fine to coarse SAND, trace silt, occasic				
40 +			15 15 16 8 11 13 11			SM SC	Gray fine to coarse SAND, trace silt. Gray fine to coarse SAND, trace silt, occasio lens clay. Gray fine to coarse SAND, trace silt, occasio lens clay.				
40 +			15 15 16 8 11 13			SM SC	Gray fine to coarse SAND, trace silt. Gray fine to coarse SAND, trace silt, occasio lens clay. Gray fine to coarse SAND, trace silt, occasio				

BORI			le	yM		В	Site Name: _{LCP} Chemicals Site, E Boring No: SW-52 Diameter: 8 in Date: 07/29/2013	Brunswi	ck GA
Easting Elevati	g (ft): ion (ft	: 431955.2 861824.2): 10.12 : 51.5 Ft		Meth Cons	r: Ground od: Mud R sultant: Mu ect No: 448	totary	otection Inc	Coor NAD	m: NAVD88 dinate System 1983 State Plane jia East / FIPS 100
Depth Ft	Recov	Sample ID	Blow Count	PID (ppm)	Mercury (mg/m3)	12.10.10	Soil Description		Well Construction Diagram
45			6			CL	Gray CLAY, little sand.		
	1		7					-	
			5	0	0	SM/SC	46 ft to 46 ft 6 in Gray fine to coarse SAND, tra silt, 46 ft 6 in to 47 ft Gray brown fine to medium	m	
			12			Childe	SAND, trace silt, occasional lens clay, a 1 inch clay, odor sulfur like.		
			28			SC	Gray brown fine to medium SAND, occasional clay, odor sulfur like.	lens	
			35			00			***** (134)
1			7	0	0	SC	Gray SAND, some clay and silt, 3 inch layer of clay, stiff, odor sulfur like.		analis analysis
			5	Ŭ	Ů	00			and the second
			8			SC	Gray SAND, some clay and silt, trace white she fragments.	ell	20
50 +			12						in a set of the set of
50			14	0	0	SC	Gray brown fine to medium SAND, occasional clay, little silt, trace white shell fragments, odor		(/1)
			7		Ŭ		sulfur like.		
T			50	1.00	1.00	SM/R	Gray brown fine to medium SAND, some silt, fi 4 inches 7 blows, last 2 inches over 43, refusal	rst	and the second

BORING LOG	
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Honeywell

Site Name: LCP Chemicals Site, Brunswick GA Boring No: SW-53 Diameter: NA Date: 07/28/2013

Easting Elevation	(ft): on (ft epth:	51.0 Ft		Meth Cons	er: Groundwood: Mud R sultant: Mu act No: 448	totary tch Asso	otection Inc	Coord NAD 19	: NAVD88 inate System: 83 State Plane East / FIPS 1001
Depth Ft	Recov	Sample ID	Blow Count	PID (ppm)	Mercury (mg/m3)	10.01	Soil Description		Well Construction Diagram
0				(bbu)		OL/SM	Hand cleared to 5 ft. Installed with a stick up ab ground surface. 0 ft to 1 ft Brown TOP SOIL, roo 1 ft to 5 ft Brown fine to medium SAND, trace si	ove ots, lt.	
5 +							Brown drilling MUD, pH 7 to 8.		
10				147	D				
15									

	-	111.27	-	1	e		Boring No: SW-53 Diameter: NA Date: 07/28/2013			
Easting Elevatio	(ft): (on (ft)	432027.0 861823.4 : 9.36 51.0 Ft		Meth Cons	r: Groundv od: Mud R sultant: Mu ect No: 448	totary tch Ass	rotection Inc ociates	Coo	Datum: NAVD88 Coordinate System NAD 1983 State Plane Georgia East / FIPS 100	
Depth Ft	Recov	Sample ID	Blow Count	PID (ppm)	Mercury (mg/m3)		0.10		Well Construction Diagram	
20 +				147	D					

BORIN			le	yw	Page 3 of 4	E	Site Name: _{LCP} Chemicals Site, E Boring No: SW-53 Diameter: NA Date: 07/28/2013	Brunswi	ck GA
Easting Elevatio	(ft): on (ft	: 432027.0 861823.4): 9.36 51.0 Ft		Meth Cons	er: Groundv ood: Mud R sultant: Mu ect No: 448	totary tch Ass	rotection Inc ociates	Coor NAD	m: NAVD88 dinate Syste 1983 State Plar jia East / FIPS
Depth Ft	Recov	Sample ID	Blow Count	PID (ppm)	Mercury (mg/m3)		and as well as the second of a		Well Constructio Diagram
35 -				147	0				
40			9 11 15 20	0	D	SM	Gray brown fine to coarse SAND, trace silt. Gray brown fine to coarse SAND, trace silt.		
Ť.			11 14	0	0	SM	Gray brown fine to coarse SAND, trace silt. Gray brown fine to coarse SAND, trace silt.		
-	/		17 22 10	0	0	SM SM	Gray brown fine to coarse SAND, trace silt.		
45			12						in the second second

BORIN			le	yw	Page 4 of 4	B	Site Name: _{LCP} Chemicals Site, B Boring No: SW-53 Diameter: NA Date: 07/28/2013	runswi	ck GA
Easting Elevation	(ft): on (ft	: 432027.0 861823.4): 9.36 : 51.0 Ft		Meth Cons	r: Ground od: Mud R sultant: Mu oct No: 448	totary tch Asso	rotection Inc	Coor	m: NAVD88 rdinate Systen 1983 State Plane jia East / FIPS 10
Depth Ft	Recov	Sample ID	Blow Count	PID (ppm)	Mercury (mg/m3)	USCS Code	Soil Description		Well Construction Diagram
45			16 19			SM/CL	45 ft to 45 ft 6 in Gray fine to coarse SAND, trac silt, 45 ft 6 in to 46 ft Gray CLAY, stiff, occasion 1/2 inch layers of clayey sand, trace silt.		
Ť			12 14	o	o	SM	Gray fine to coarse SAND, trace silt.		inni nati anti este
÷			18			SM	47 ft to 47 ft 6 in Gray fine to coarse SAND, trac silt, 47 ft 6 in to 48 ft Gray brown fine to medium SAND, trace silt, brown liquid, sulfur like odor.	2e 1	- (1) - (1)
Ť			30 13	0	0	sc	48 ft to 48 ft 10 in Gray brown fine to medium S trace silt, occasional lens clay, 48 ft 10 in to 49 ft Gray CLAY, stiff.	AND,	1997)
			15 15 18			SC/SM	49 ft to 49 ft 6 in Gray fine to medium SAND, litt clayey silt, trace white shell fragments, 49 ft 6 ir to 50 ft Gray fine to medium SAND, little silt, 1/8	1	
50 +			11	0	0	sc	inch layers of white shell fragments. Gray SILT, little fine to medium sand, occasiona lens clay.	al	
-			6 50			SC/R	51 ft to 51 ft 6 in Gray fine to medium SAND, so silt, occasional lens of clay, 51 ft 6 in to 52 ft Gr CLAY, stiff, dry, piece of stone in tip of spoon.		
52.0			25. 1	Vell Set at 4	8.5 ft.	_			

		e	yw	Page 1 of 4	E	Site Name: LCP Chemicals Site, I Boring No: SW-54 Diameter: 8 in Date: 08/10/2013 - 08/11/2013	Brunswi	ick GA	
Northing (ft): 432116.27 Easting (ft): 861782.23 Elevation (ft): 9.24 Total Depth: 51.5 Ft			Meth Cons	er: Ground od: Mud R sultant: PA ect No: 448	totary RSONS	rotection Inc	Datum: NAVD88 Coordinate System: NAD 1983 State Plane Georgia East / FIPS 1001		
Depth og t	Sample	Blow	PID	Mercury	USCS			Well Construction	
Ft 🖉	ID	Count	(ppm)	(mg/m3)	Code	Soil Description		Diagram	
5									

		le	yM	Page 2 of 4		Site Name: _{LCP} Chemicals Site, Brunswick GA Boring No: SW-54 Diameter: 8 in Date: 08/10/2013 - 08/11/2013			
Northing (ft) Easting (ft): Elevation (ft Total Depth:	Meth Cons	er: Ground od: Mud R sultant: PA ect No: 448	Rotary RSON	rotection Inc	Co	Datum: NAVD88 Coordinate System NAD 1983 State Plane Georgia East / FIPS 100			
Depth og Ft 22	Sample ID	Blow Count	PID (ppm)	Mercury (mg/m3)	10.001	Soil Descriptio	on I	Well Construction Diagram	
20									

1		og	le	yM	Page 3 of 4	E	Site Name: _{LCP} Chemicals Site, Brunswick GA Boring No: SW-54 Diameter: 8 in Date: 08/10/2013 - 08/11/2013				
Easting Elevation	g (ft): on (ft	: 432116.2 861782.2): 9.24 : 51.5 Ft		Meth Cons	er: Ground nod: Mud R sultant: PA ect No: 448	totary RSONS	rotection Inc	Coor	m: NAVD88 rdinate Systen 1983 State Plane gia East / FIPS 10		
Depth	Recov	Sample	Blow	PID	Mercury	1	Soil Description		Well Construction Diagram		
50 50	Ľ.	ID	Count	(ppm)	(mg/m3)	Code					
Ť											
40 +			11	0.5	0.000		Gray medium to coarse SAND, trace clay in thi lenses, wet, slight odor.	n			
40 +			11 13 16 17 6	0.5	0.000	SM	Ienses, wet, slight odor. Gray coarse SAND, grading to medium sand, to		1.000 1.0000 1.00000 1.0000 1.0000 1.0000 1.0000 1.00000 1.0000 1.00000 1.000000 1.00000000		
40 +			13 16 17			SM	Ienses, wet, slight odor. Gray coarse SAND, grading to medium sand, to gravel in upper, wet.	race	120-1 100-1 100-1 100-10		
40 + + + + + + + + + + + + + + + + + + +			13 16 17 6 10 13				Ienses, wet, slight odor. Gray coarse SAND, grading to medium sand, to	race			

BORI			le	yw	Page 4 of 4	В	Site Name: _{LCP} Chemicals Site, Br Boring No: SW-54 Diameter: 8 in Date: 08/10/2013 - 08/11/2013	unswie	ck GA
Easting Elevati	g (ft): ion (ft	: 432116.2 861782.2): 9.24 : 51.5 Ft		Meth Cons	er: Groundv od: Mud R sultant: PA ect No: 448	lotary RSONS	rotection Inc	Coor NAD 1	n: NAVD88 dinate System: 1983 State Plane ia East / FIPS 100
Depth Ft	Recov	Sample ID	Blow Count	PID (ppm)	Mercury (mg/m3)		Soil Description		Well Construction Diagram
45			13 7			CL	Greenish gray CLAY, interbedded with thin fine sand lenses, coarse sand, fine gravel in top, wet	9	
-	-		9			-	Medium to coarse SAND, mixed with silt and cla	у	
			7				over greenish gray CLAY, little silt, wet.		
Ť		- C	8			SM/CL			
			9	1.1				-	
Ť			5	0.0	0.000	CL	Greenish gray CLAY, little silt, moist.		
			8		1	OL.			
			3	0.0	0.000	CL	Greenish gray CLAY, little silt, moist.		
50 +			3	0.0	0.000				· .
			5	0.0	0.000	-	Upper 5 inches same as above, bottom gray were sandstone, chunks of sandstone in sample.	and the second states of the	
4			4	0.0	0.000		Weathered SANDSTONE, fine to medium sand, little silt and clay, chunks of sandstone in sample	ə	
	1		50/1	Concerned in	1		Weathered sandstone, dense, hard refusal.		

Easting Elevatio	(ft): on (ft)	432199.5 861787.10): 9.10 52.25 Ft	6	Meth Cons	r: Groundv od: Mud R ultant: PA ct No: 448	otary RSON	Protection Inc S	Coo	um: NAVD88 ordinate System 1983 State Plane gia East / FIPS 100
Depth Ft	Recov	Sample ID	Blow Count	PID (ppm)	Mercury (mg/m3)	USCS	0.11 0		Well Construction Diagram
5 -									
* t T									

l

		.og O	le	yw	Page 2 of 4	E	e Name: _{LCP} Chemicals Site ring No: SW-55 ameter: 8 in ite: 08/12/2013	e, Brunsw	ick GA
Easting Elevation	(ft): on (ft	: 432199. 861787.1): 9.10 : 52.25 Ft	6	Meth Cons	er: Groundv lod: Mud R sultant: PA loct No: 448	otary RSONS	ection Inc	Coo	m: NAVD88 rdinate Sys 1983 State Pl gia East / FIP3
Depth Ft	Recov	Sample ID	Blow Count	PID (ppm)	Mercury (mg/m3)		Soil Description		Well Construc Diagra
20				0.0	0.000				
Ť				1					

			Ie,	yw	Page 3 of 4	E	Bite Name: _{LCP} Chemicals Site, B Boring No: SW-55 Diameter: 8 in Date: 08/12/2013	runswick	GA
Eastin Elevat	g (ft): ion (ft	: 432199. 861787.1): 9.10 52.25 Ft	6	Meth Cons	r: Groundv od: Mud R sultant: PA	totary RSONS	rotection Inc	Coordin NAD 198	NAVD88 nate Syster 33 State Plane East / FIPS 10
Depth Ft	Recov	Sample ID	Blow Count	PID (ppm)	Mercury (mg/m3)	100000	Soil Description		Well Construction Diagram
35 -				0.0	0.000				
40 -							Grav fine to medium SAND, trace silt and clavy	at	
40 -			5 11 15 11	0.00	0.000	SM/CL	Gray fine to medium SAND, trace silt and clay a bottom of sand, greenish gray CLAY semi stiff,	wet.	11114 (1111) +(+1) (1111) (1111) (1111) (1111) (1111) (1111) (1111) (1111) (1111) (1111) (1111)

Northin	g (ft): (ft):	: 432199.5 861787.10	50	Drille Meth	r: Groundy od: Mud R sultant: PA	water Pr	Date: 08/12/2013	Coor	n: NAVD88 dinate Syste 983 State Plan
	10.00	52.25 Ft Sample	Dieu	Proje	ect No: 448			Georg	ia East / FIPS 1 Well
Depth Ft	Recov	Sample ID	Blow Count	(ppm)	Mercury (mg/m3)	Code	Soil Description		Constructio Diagram
45			7	M. P. C.Y		CL	Greenish gray CLAY, semi stiff, wet.		
-			6			OL.			
			4	0.0	0.000		Tan fine to medium SAND 6 inches over clay a 5 inches, over fine medium SAND, little clay in lenses, wet.	thin	
ŧ			7	6 - C		SM/CL	101303, WOL	_	
			16				A Part Trans March		
÷			4	0.0	0.000		Sand as above 3 inches over greenish gray Cl	LAY.	
			6			SM/CL			
Ĩ			8	1-1-1					
50 -	\angle		8				Clay as above 4 inches over gray fine to medi	100	
2212,	01		7	0.0	0.000	1.1	SAND, grading to weathered sandstone.	utu -	
+			14			CL			
			17	1.00				_	
52.25			50/3	Vell Set at 4	25#		Drove 3 inches, weathered sandstone as abov hard refusal.	re,	

			le,	yM	Page 1 of 4	E	Site Name: LCP Chemicals Site, Boring No: SW-56 Diameter: 8 in Date: 08/08/2013 - 08/09/2013	, Brunswi	ck GA
Easting Elevation	(ft): on (ft)	432265. 861808.2): 8.70 52.5 Ft		Meth Cons	er: Groundv od: Mud R sultant: PA ect No: 448	otary RSONS	rotection Inc	Coor NAD	m: NAVD88 rdinate Syster 1983 State Plane jia East / FIPS 10
Depth Ft	Recov	Sample ID	Blow Count	PID (ppm)	Mercury (mg/m3)	USCS Code	Soil Description		Well Construction Diagram
5 -									
10				0.0	0.000				

			le	yM	Page 2 of 4	E	Site Name: _{LCP} Chemicals Site Boring No: SW-56 Diameter: 8 in Date: 08/08/2013 - 08/09/2013	, Brunsw	ick GA
Eastir Eleva	ng (ft): tion (ft	: 432265.9 861808.2): 8.70 : 52.5 Ft		Meth Cons	r: Ground od: Mud R sultant: PA oct No: 448	Rotary RSONS	rotection Inc	Coo	im: NAVD88 rdinate Systen 1983 State Plane gia East / FIPS 10
Depth Ft	Recov	Sample ID	Blow Count	PID (ppm)	Mercury (mg/m3)	1.	Soil Description		Well Construction Diagram
20	-			0.0	0.000		above ground surface. pH is 7.5.		
25	-			0.0	0.000				
30									

Но	ne	yw	Page 3 of 4	E	Site Name: _{LCP} Chemicals Site, E Boring No: SW-56 Diameter: 8 in Date: 08/08/2013 - 08/09/2013	3runswi	ck GA
Northing (ft): 4322 Easting (ft): 86180 Elevation (ft): 8.70 Total Depth: 52.5	8.22	Meth	er: Groundv nod: Mud R sultant: PA ect No: 448	totary RSONS	rotection Inc	Coor NAD 1	m: NAVD88 dinate Syst 1983 State Pla jia East / FIPS
Depth Sam	Contraction of the second second second	PID (ppm)	Mercury (mg/m3)	10.10.05	Out Description		Well Constructi Diagram
35 —		0.0	0.000				
-							
40	11 20 15 13	0.0	0.000	SM	Gray medium to coarse SAND, trace clay at bo trace fine sand, wet.	ottorn,	
40	20 15	0.0	0.000	SM		edium les, wet.	

2.20			le	yw	Page 4 of 4		Site Name: _{LCP Chemicals Site Boring No: SW-56 Diameter: 8 in Date: 08/08/2013 - 08/09/2013}	, Brunswic	sk GA
Easti Eleva	ing (ft): ation (ff	: 432265. 861808.2 :): 8.70 : 52.5 Ft		Meth	er: Ground od: Mud R sultant: PA ect No: 448	totary RSON	Protection Inc S	Coord NAD 1	n: NAVD88 dinate System 983 State Plane ia East / FIPS 100
Depti Ft	Recov	Sample ID	Blow Count	PID (ppm)	Mercury (mg/m3)	USCS	Call Decedetion		Well Construction Diagram
45		10	9	(ppm)	(ing/ino/	1	Gray medium SAND 2 inches, trace clay ov greenish gray CLAY, some silt grading to cl		
			11		1.1	CL	sand, little clay at bottom, wet.	ay, 2 mones	
1	-		5	0.0	0.000		Gray GRAVEL, little sand, trace clay 10 incl over greenish gray CLAY, bottom 2 inches		
			6			014/01	wet.	a doo one,	1110
Î			6			GM/CL			12.13 4.44
			11			-		_	
		101	4	0.0	0.000		Greenish gray CLAY, trace silt in lenses, se stiff, wet.	imi	
			6						
	4		6			CL			
50 -	- 1		11						
			4	0.0	0.000	-	Greenish grou SILT and CLAX wet		
-			5	0.0	0.000	ML/CL	Greenish gray SILT and CLAY, wet.	ot	
			10	0.0	0.000		Light gray line SAND, neavily weathered, w	et.	
-			4	0.0	0.000	10	Same as above, stiffening to condutore, ba	rd rofueal	
	-		50/3	0.0	0.000	1.1	Same as above, stiffening to sandstone, ha	ru reiusal.	

Northing (ft): 432355.26 Easting (ft): 861823.47 Elevation (ft): 10.20 Total Depth: 53.6 Ft Depth § Sample Blow				Meth Cons	r: Groundv od: Mud R sultant: PA oct No: 448	otary RSONS	otection Inc	Coor	Datum: NAVD88 Coordinate System: NAD 1983 State Plane Georgia East / FIPS 100 Well	
Depth Ft	Recov	Sample ID	Blow Count	PID (ppm)	Mercury (mg/m3)		Soil Description	1	Well Construction Diagram	
5				0.0	0.000					
10				0.0	0.000		pH is 7.			

BORI			Ie,	ум	Page 2 of 4		Bite Name: _{LCP} Chemicals Site Boring No: SW-57 Diameter: 8 in Date: 08/06/2013	e, Brunswi	ck GA
Eastin Elevat	g (ft): ion (fl): 432355.2 861823.4 t): 10.20 : 53.6 Ft		Meth Cons	er: Ground od: Mud R sultant: PA ect No: 448	lotary RSONS	rotection Inc	Coor NAD 1	m: NAVD88 dinate Syst 1983 State Pla ia East / FIPS
Depth Ft	Recov	Sample ID	Blow Count	PID (ppm)	Mercury (mg/m3)	1.	Soil Description		Well Construct Diagran
20 -				0.0	0.000		pH is 7.		
25 -				0.0	0.000				
30									

Н	O	le,	yw	Page 3 of 4	E	Site Name: _{LCP} Chemicals Site, I Boring No: SW-57 Diameter: 8 in Date: 08/06/2013	Brunswi	ck GA
Northing (ft) Easting (ft): Elevation (ft Total Depth	861823.4 :): 10.20		Meth Cons	er: Groundv Iod: Mud R Sultant: PAI Pact No: 448	totary RSONS	rotection Inc	Coor NAD	m: NAVD88 rdinate Syst 1983 State Pla gia East / FIPS
Depth Son	Sample ID	Blow Count	PID (ppm)	Mercury (mg/m3)	10.10.00	0.10		Well Construct Diagran
35 —			0.0	0.000				
-				0.000				
40		12 14 18 19	0.0	0.000	SM	Gray medium to coarse SAND, wet.		
40		14 18			SM	Gray medium to coarse SAND, wet. Same as above, trace silt and clay in thin lens Gray medium to coarse SAND, some silt and		

Datum: NAVD88 Coordinate System NAD 1983 State Plane Georgia East / FIPS 100 Well Construction Diagram
oil Description Construction Diagram
the CANID sectors with good along
rse SAND, some silt and clay
SAND, little silt and clay
1.1.1.1 Adda (1.1.1.1 Adda)
, bottom 5 inches fine to silt and clay, medium stiff.
sit and day, medium sun.
, lense of fine to medium thinner lenses of similar sand
tes to modium accidents
hoe, fine to medium sand above, sh sand?
t. me silt, little clay.
The sin, inter day.
i i i i i i i i i i i i i i i i i i i

BORING L	OG
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Honeywell

Site Name: LCP Chemicals Site, Brunswick GA Boring No: SW-58 Diameter: 8 in Date: 07/26/2013

Northing (ft): 431954.66 Easting (ft): 861754.70 Elevation (ft): 10.11 Total Depth: 51.5 Ft				Meth Cons	r: Groundv od: Mud R sultant: PA ect No: 448	totary RSONS	otection Inc	Datum: NAVD88 Coordinate System: NAD 1983 State Plane Georgia East / FIPS 1001		
Depth of Sample Blow Ft 2 ID Count				PID (ppm)	Mercury (mg/m3)		Soil Description		Well Construction Diagram	
0 + +	4		Count	0.0	0.000	sc	Hand cleared to 5 ft. Installed with a stick up above ground surface. Black fine to medium SA silt, clay.	ND, and		
5							Mud rotary drilling, mud pH is 7.			
10										
15										

BORING LOG	
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Page 2 of 4

Site Name: LCP Chemicals Site, Brunswick GA Boring No: SW-58 Honeywell Diameter: 8 in Date: 07/26/2013

Northing (ft): 431954.66 Easting (ft): 861754.70 Elevation (ft): 10.11 Total Depth: 51.5 Ft				Meth Cons	er: Groundv od: Mud R sultant: PA ect No: 448	totary RSONS	Datum: NAVD88 Coordinate System: NAD 1983 State Plane Georgia East / FIPS 100		
Depth Ft ¹⁵	Recov	Sample ID	Blow Count	PID (ppm)	Mercury (mg/m3)		Soil Description Mud rotary drilling, mud pH is 7.		Well Construction Diagram
20									
25									
30									

Ho	10	yw	Page 3 of 4	E	Site Name: _{LCP} Chemicals Site, B Boring No: SW-58 Diameter: 8 in Date: 07/26/2013	runswick GA		
Northing (ft): 431954 Easting (ft): 861754. Elevation (ft): 10.11		Meth Cons	od: Mud R sultant: PA	totary RSONS	rotection Inc	Datum: NAVD88 Coordinate Syst		
Total Depth: 51.5 Ft Depth & Sample	Blow	Proje	Mercury	-		Georgia East / FIPS		
Depth Sample Ft ₩ ID	Count	(ppm)	(mg/m3)		Soil Description	Well Construc Diagra		
35								
40 —	9				Gray medium to coarse SAND, trace silt, wet.			
	23	0.0	0.000	SM	Gray medium to coarse SAND, trace silt, wet.			
1H	26 24	0.0	0.000	SM	Gray meulum to coarse SAIND, trace sit, Wet.			
	15	0.0	0.000	SM	Gray medium to coarse SAND, trace silt, wet.			
+	20	0.0	0.000	SIVI	Black fine to medium SAND, little silt, trace			
	22 20	0.0	0.000	SM	clay laminations.			
	18	100		CL	Gray CLAY, dense, dry.			
÷	10	0.0	0.000	1.1				

BORING LOG

Page 4 of 4

Site Name: LCP Chemicals Site, Brunswick GA Boring No: SW-58 Diameter: 8 in Date: 07/26/2013

He	no	ywe	
	IIC,	ync	

Northing (ft): 431954.66 Easting (ft): 861754.70 Elevation (ft): 10.11 Total Depth: 51.5 Ft				Meth Cons	er: Groundv od: Mud R sultant: PA ect No: 448	totary RSONS	otection Inc	Datum: NAVD88 Coordinate System: NAD 1983 State Plane Georgia East / FIPS 1001		
Depth Sample Ft 2 ID		Blow Count	PID (ppm)	Mercury (mg/m3)	10.00	Soil Description		Well Construction Diagram		
45			21	0.0	0.000	SC	Gray fine SAND, and clay, dry.			
-			20 14 36	0.0	0.000	SM	Gray fine to medium SAND, moist.	T		
÷			20	0.0	0.000	CL	Gray CLAY, trace sand, dense, dry.			
÷			5	0.0	0.000	SC	Gray fine SAND, some shells, laminated, trace c moist.	lay,		
			21 29	0.0	0.000	SC	Gray fine SAND, some shells, laminated, trace c moist.	lay,		
50 +			20	0.0	0.000	SM	Gray fine to medium SAND, some shells, lamina trace silt, moist.	ted,	(044 5	
			15	0.0	0.000	SM	Gray fine to medium SAND, little shells, laminate trace silt, moist.	ed,	+++++ #CCF = #CCF	
51.5			50	0.0	0.000	SM	Gray fine to medium SAND, sandstone fragment top of spoon.	is in		

Well set at 51 ft, ground elevation 9.36 ft.

BORING LOG	
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Honeywell

Site Name: LCP Chemicals Site, Brunswick GA Boring No: SW-59 Diameter: 8 in Date: 07/28/2013

Easting Elevation	(ft): on (ft	: 431974.4 861788.8): 10.47 : 50.75 Ft	5	Meth Cons	r: Groundv od: Mud R sultant: Mu ect No: 448	totary tch Asso	otection Inc	Datum: NAVD88 Coordinate System: NAD 1983 State Plane Georgia East / FIPS 1001		
Depth Ft	Recov	Sample ID	Blow Count	PID (ppm)	Mercury (mg/m3)		Soil Description		Well Construction Diagram	
0	<u> </u>		Count		(ingrino)	OL/SM	Hand cleared to 5 ft. Installed with a stick up ab ground surface. 0 ft to 1 ft Brown TOP SOIL, ro 1 ft to 5 ft Brown fine to medium SAND, trace si	ove ots, lt.		
5 +							Brown drilling MUD, pH 9 to 11, at 8 ft hit brick and other fill material, use different cutter head.			
10 +				30	0					
15										

Easting Elevation	g (ft): on (ft	431974.4 861788.8): 10.47 50.75 Ft	5	Meth Cons	r: Groundv od: Mud R sultant: Mu ect No: 448	totary	rotection Inc ociates	Cool	Datum: NAVD88 Coordinate System: NAD 1983 State Plane Georgia East / FIPS 100	
Depth Ft	Recov	Sample ID	Blow Count	PID (ppm)	Mercury (mg/m3)		Soil Description		Well Construction Diagram	
20 +				30	D					
*										
25 +										

BORI			le,	yw	Page 3 of 4	E	Site Name: LCP Chemicals Site, Brunswick G/ Boring No: SW-59 Diameter: 8 in Date: 07/28/2013				
Easting Elevation	g (ft): on (ft	: 431974.4 861788.8): 10.47	5	Meth Cons	od: Mud R sultant: Mu	tch Ass	rotection Inc ociates	Cooi NAD	Datum: NAVD88 Coordinate System NAD 1983 State Plane Georgia East / FIPS 100		
		50.75 Ft	10 mm	_	ect No: 448		1	Georg			
Depth Ft	Recov	Sample ID	Blow Count	PID (ppm)	Mercury (mg/m3)		Soil Description		Well Construction Diagram		
35 +				30	D						
40 -			10 11	0	o	SM	Gray brown fine to coarse SAND, trace silt.				
ŧ			11			014	Gray brown fine to coarse SAND, trace silt.				
	/		15			SM					
			9	0	0	SM	Gray brown fine to coarse SAND, trace silt.				
			11	_			43 ft to 43 ft 6 in Gray brown fine to coarse SA	ND.			
+			10			SC	trace silt, 43 ft 6 in to 44 ft Gray fine to medium SAND, trace silt, occasional lens clay.	n			
Ť	1		11 4				44 ft to 44 ft 6 in Gray fine to coarse SAND, tra	ace	100		
			-	0	0	SC/CL	silt occasional lens clay 44 ft 6 in to 45 ft Gra	V			
Î			4		- 22		CLAY and silt, occasional layer of 1/2 inch Bro to coarse SAND, trace silt, wet.	own fine			

Northin Easting Elevatio	g (ft) I (ft): on (ft	: 431974.4 861788.8): 10.47	14	Drille Meth Cons	od: Mud R sultant: Mu	water Pr Rotary tch Asse	rotection Inc	Coore	Datum: NAVD88 Coordinate System: NAD 1983 State Plane		
	10.00	50.75 Ft			ect No: 448		1	Georg	ia East / FIPS 10		
Depth	Recov	Sample	Blow	PID	Mercury		Soil Description		Construction		
Ft 45	2	ID	Count 6	(ppm)	(mg/m3)	Code	Gray CLAY and silt, occasional layer 0.5 inch B	rown			
			9	_		CL	fine to coarse sand, trace silt, wet.				
+			6				Gray brown fine to medium SAND, trace silt, or	casional			
			15	0	0	SC	lens clay.				
ŧ			14		1.2.3		47 ft to 47 ft 4 in Gray fine to medium SAND, tra	ace	2444 (11) 2444 (11)		
			15			SC	silt, occasional lens clay, 47 ft 4 in to 48 ft Gray fine to medium SAND, trace silt, trace white sho	əll			
÷			10	100	101		fragments, 4 inch layer Gray silt and clay. Gray clayey SILT, trace fine to medium sand, tr	ace	(a)() ((1))		
			15	0	0	ML	white shell fragments.				
+			17				49 ft to 49 ft 6 in Gray clayey SILT, trace fine	557			
			17	-		ML/SM	to medium sand, trace white shell fragments, 4 in to 50 ft Gray brown fine to medium SAND, lit	9 ft 6 tle silt,			
50 +			27	o	0	SM/R	trace white shell fragments. Gray brown fine to medium SAND, little silt, trac white shell fragments, refusal.	e	(1144		
50.75		-	50	Vell Set at 5		OWIN	white shell hagments, relusal.				

BORING LOG	
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Honeywell

Site Name: LCP Chemicals Site, Brunswick GA Boring No: SW-60 Diameter: 8 in Date: 07/26/2013

Easting Elevation	(ft): on (ft	: 432076.6 861887.8): 11.53 : 52.83 Ft		Meth Cons	r: Groundv od: Mud R sultant: Mu ect No: 448	totary tch Asso	otection Inc	Datum: NAVD88 Coordinate System: NAD 1983 State Plane Georgia East / FIPS 1001		
Depth Ft	Recov	Sample ID	Blow Count	PID (ppm)	Mercury (mg/m3)		Soil Description		Well Construction Diagram	
0			Count			OL/SM	Hand cleared to 5 ft. Installed with a stick up ab ground surface. 0 ft to 2 ft Brown TOP SOIL or Gray silt, 2 ft to 5 ft Brown red fine to medium S trace silt .	ove janic, AND,		
5 +							Brown drilling MUD, pH 7 to 8.			
10				30	0					
15										

Northin Easting Elevati	ng (ft): g (ft): on (ft)	432076.6 861887.8 11.53 52.83 Ft	62 7	Drille Meth Cons	r: Groundy od: Mud R sultant: Mu oct No: 448	water Pr totary tch Asse	rotection Inc ociates	Coor	Datum: NAVD88 Coordinate System: NAD 1983 State Plane Georgia East / FIPS 100 ⁻		
Depth Ft	Recov	Sample ID	Blow Count	PID (ppm)	Mercury (mg/m3)	10.00.000	Soil Description		Well Construction Diagram		
20 -											
-				30	0						

H		le,	yw	Page 3 of 4	E	Site Name: _{LCP} Chemicals Site, Boring No: SW-60 Diameter: 8 in Date: 07/26/2013	Brunswi	ck GA
Easting (f Elevation	(ft): 432076.(t): 861887.8 (ft): 11.53 th: 52.83 Ft		Meth Cons	er: Groundv ood: Mud R sultant: Mu ect No: 448	otary tch Ass	rotection Inc ociates	Coor NAD	m: NAVD88 dinate Syste 1983 State Plan jia East / FIPS
Depth Ft	Sample	Blow Count	PID (ppm)	Mercury (mg/m3)		Soil Description		Well Constructio Diagram
35 +			30	ņ				
40 —		12	0	0				
		18 18				Gray brown fine to coarse SAND, trace silt.		
	7	19	0	o	SM	Gray brown fine to coarse SAND, little silt, or lens clay.	ccasional	
		11						
		11 14 14 14			SM	Gray fine to coarse SAND, trace silt.		

Easting (ft): Elevation (ft				/el		Diameter: 8 in Date: 07/26/2013			
Northing (ft): 432076.62 Easting (ft): 861887.87 Elevation (ft): 11.53 Total Depth: 52.83 Ft			Meth Cons	r: Groundv od: Mud R sultant: Mu oct No: 448	totary	sociates Coo		um: NAVD88 ordinate System: 1983 State Plane gia East / FIPS 1001	
Depth Son Price Pr	Sample ID	Blow Count	PID (ppm)	Mercury (mg/m3)	USCS Code	Call Departmention		Well Construction Diagram	
45		15			SM	Gray fine to coarse SAND, trace silt.		****	
+		14 10		1.65		Gray fine to coarse SAND, trace silt.		****	
		10	0	0	SM				
÷.		16			1	47 ft to 47 ft 8 in Gray fine to coarse SAND, trace	9	1111	
		21			SM/CL	silt, 47 ft 8 in to 48 ft silty CLAY, trace sand.			
ŧ		7				48 ft to 48 ft 6 in Gray SAND, some silty clay, 48 ft 6 in to 49 ft Gray silty clay.	1		
		9	0	0	SC	n o in to so in Oray sing oray.	_		
		8	11		CL	Gray silty CLAY.			
50 -		11			UL				
50		8	0	0	CL	Gray CLAY, stiff, occasional layer fine to medium sand, some silt.			
+		6		122		Gray coarse SAND, some silt and clay, wet.			
		7			SC	Gray coarse SAND, some silt and day, wet.			
		9		1.00		Gray fine to coarse SAND, trace shell fragments,	14		
52.833		50			SM/R	dark Gray pieces of weakly cemented sandstone of spoon.			

BORING LO	G
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Honeywell

Site Name: LCP Chemicals Site, Brunswick GA Boring No: SW-61 Diameter: 8 in Date: 07/30/2013

Easting Elevatio	(ft): on (ft epth:	: 432153.9 861902.30): 11.86 : 53.33 Ft		Meth Cons	r: Ground od: Mud R sultant: Mu ect No: 448	totary tch Asso	otection Inc	Datum: NAVD88 Coordinate System: NAD 1983 State Plane Georgia East / FIPS 100		
Depth Ft	Recov	Sample ID	Blow Count	PID (ppm)	Mercury (mg/m3)		Soil Description		Well Construction Diagram	
0			Count	(ppm)		SM	Hand cleared to 5 ft. Installed with a stick up abo ground surface. Gray brown fine to medium SAt trace silt.	ove ND,		
5 +							Brown gray drilling MUD, pH 11 to 12, at 8 ft bgs hit concrete and dense fill used 8 inch drill b for 2 1/2 hours, moved hole 5 ft East.	Dit		
10				0.5	D					
15										

Easting Elevation) (ft): on (ft)	432153.9 861902.30 11.86 53.33 Ft	0	Meth Cons	Driller: Groundwater Protection Inc Datum Method: Mud Rotary Coord Consultant: Mutch Associates NAD 1 Project No: 448517 Georgi					
Depth Ft	Recov	Sample ID	Blow Count	PID (ppm)	Mercury (mg/m3)		Soil Description		Well Construction Diagram	
20 -										
25 -				0.5	0					

			le	yM	Page 3 of 4	E	Site Name: _{LCP} Chemicals Site, Br Boring No: SW-61 Diameter: 8 in Date: 07/30/2013	runswick GA
Easting Elevatio	(ft): 8 n (ft)	432153.9 361902.30 : 11.86 53.33 Ft		Meth Cons	er: Groundv od: Mud R sultant: Mu ect No: 448	totary tch Ass	rotection Inc ociates	Datum: NAVD88 Coordinate System NAD 1983 State Plane Georgia East / FIPS 10
Depth Ft	Recov	Sample ID	Blow Count	PID (ppm)	Mercury (mg/m3)		Soil Description	Well Construction Diagram
30				0.5	0		Brown gray drilling MUD, pH 11 to 12, at 8 ft bgs hit concrete and dense fill used 8 inch drill b for 2 1/2 hours, moved hole 5 ft East.	it
			14				Gray brown fine to coarse SAND, trace silt.	_
40 —			16 17	0	0	SM	Gray brown fine to coarse SAND, trace silt.	
40 —			17			SM		
40 —	/				o	SM	Gray brown fine to coarse SAND, trace silt.	
40	/		8	0	- C - 1		a second s	
40				0		SM	Gray brown fine to coarse SAND, trace silt.	
40			14	0	0	SM SM	Gray brown fine to coarse SAND, trace silt. Gray brown fine to medium SAND, trace silt.	

): 11.86 53.33 Ft			sultant: Mu ect No: 448		ociates	NAD	ordinate Systen) 1983 State Plane rgia East / FIPS 10
Depth Ft	Recov	Sample ID	Blow Count	PID (ppm)	Mercury (mg/m3)	10.101	Soil Description		Well Construction Diagram
45			14	(ppin)	(ingrite)	CL	Gray CLAY, stiff, 1/2 inch layer fine to coarse sand, dry.		
ł			7 10	0	o	SC	Gray brown fine to medium SAND, lens clay.		····
Ť			10 11			sc	Gray fine to coarse SAND, trace silt, 2 inch la of Gray clay and silt.	ayer	
*			9	o	0	SM	Gray fine to coarse SAND, trace silt.		
			9			SM/SC	49 ft to 49 ft 4 in Gray fine to coarse SAND, t silt, 49 ft 4 in to 50 ft SILT and clay.	race	<u> </u>
50 —			15	0	0	SM	Gray fine to coarse SAND, trace silt.		
			18 18			sc	51 ft to 51 ft 6 in Gray fine to coarse SAND, t silt, occasional lens of clay, 51 ft 6 in to 52 ft CLAY, little sand.	race Gray	
			22 4			SM	Gray fine to medium SAND, some silt, trace to shell fragments, 2 inch layer of clay.	white	
53.33			14 47 V	Vell Set at 4	9 ft.	SM/R	Gray fine to medium SAND, little silt, layers or white shells, layers of weakly cemented store 3 inches then started bouncing.		1

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		le		Page 1 of 4	E	Site Name: LCP Chemicals Sit Boring No: SW-62 Diameter: 8 in Date: 08/10/2013 - 08/11/2013		vick GA		
Northing (ft): Easting (ft): Elevation (ft Total Depth:	861893.4): 10.58		Meth Cons	or: Ground od: Mud R sultant: PA oct No: 448	lotary RSONS	rotection Inc	Datum: NAVD88 Coordinate System NAD 1983 State Plane Georgia East / FIPS 10			
Depth So Price Pri	Sample	Blow	PID	Mercury	USCS			Well Construction		
Ft 🖉	ID	Count	(ppm)	(mg/m3)	Code	Soil Description Hand clear to 5 feet. Installed with stick up		Diagram		
5			0.0	0.000						

	(π): 861 on (ft): 10 epth: 53.		20 5	Meth Cons	od: Mud R sultant: PA	RSONS	ction Inc	Coo	Datum: NAVD88 Coordinate Syster NAD 1983 State Plane Georgia East / FIPS 10				
Depth Ft	o Sa	mple ID	Blow Count	PID (ppm)	Mercury (mg/m3)	USCS	Soil Description		Well Construction Diagram				
20 +				0.0	0.000								
25 +				0.0	0.000								

			le,	yw	Page 3 of 4	E	Site Name: _{LCP} Chemicals Site, E Boring No: SW-62 Diameter: 8 in Date: 08/10/2013 - 08/11/2013	3runswick GA	
Easting Elevation) (ft): 86 on (ft):	32235.2 31893.4 10.58 3.25 Ft		Meth Cons	er: Ground od: Mud R sultant: PA ect No: 448	totary RSONS	rotection Inc	Datum: NAVD8 Coordinate Sy NAD 1983 State Georgia East / FI	/ste Plan
Depth Ft	Recov	ample ID	Blow Count	PID (ppm)	Mercury (mg/m3)	USCS Code	Soil Description	We Constru Diagr	all Lictic ram
35 -				0.0	0.000				
Ť									
40			9 17 15 13	0.0	0.000	SM	Gray medium to coarse SAND, wet.		
40			17 15	0.0	0.000	SM	Gray medium to coarse SAND, wet. Gray medium to coarse SAND, trace clay in up lenses, wet.	oper	

BORI			le,	yM	Page 4 of 4	E	Site Name: _{LCP} Chemicals Site, Brunswick GA Boring No: SW-62 Diameter: 8 in Date: 08/10/2013 - 08/11/2013				
Easting Elevation	g (ft): on (ft	: 432235.; 861893.4): 10.58 : 53.25 Ft	5	Meth Cons	r: Groundv od: Mud R sultant: PA oct No: 448	totary RSONS	rotection Inc	Cool	m: NAVD88 rdinate Systen 1983 State Plane gia East / FIPS 10		
Depth Ft	Recov	Sample ID	Blow Count	PID (ppm)	Mercury (mg/m3)	USCS Code	Soil Description		Well Construction Diagram		
45			13	UPP-11/	1		Gray fine to medium SAND, trace clay in thin lea upper sample, wet.	nses	***** ****		
11			11			SM	apper campion non	-	and the second		
Î			4	0.0	0.000	1.1	SAND as above over 7 inches greenish gray CL little silt, semi stiff.	.AY,			
			9			SM/CL					
Ť			13			SM/CL					
			13								
Ē	1.0		5				Fine to medium SAND, trace rounded pebbles, sand over 6 inches greenish gray clay, trace fine	coarse e sand			
			7			SM/CL	in lenses, wet.				
Ĩ			7			SIMUCL					
50 -		1.0	10	1.5	11.01						
50			3	0.0	0.000		Same as above 6 inches.	1			
		11	1/2	0.0	0.000	CL					
			1/2	0.0	0.000						
			3	0.0	0.000	CL	Greenish gray CLAY, trace fine sand in thin lenses, semi stiff.	11			
			19	0.0	0.000	CL	Clay as above, bottom inch fine SAND.				
		1 1	5	0.0	0.000	SM	Gray fine SAND, wet.				
53.25			50/3	0.0 Vell Set at 4	0.000			-			

BORING L	OG
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Honeywell

Site Name: LCP Chemicals Site, Brunswick GA Boring No: SW-63 Diameter: 8 in Date: 08/07/2013

Easting Elevatio	(ft): on (ft	: 432318.7 861884.8): 9.86 : 53.0 Ft		Meth Cons	er: Ground od: Mud R sultant: PA ect No: 448	totary RSONS	otection Inc	Coor NAD 1	n: NAVD88 dinate System: 983 State Plane ia East / FIPS 1001
Depth Ft	Recov	Sample ID	Blow Count	PID (ppm)	Mercury (mg/m3)		Soil Description		Well Construction Diagram
5							Hand cleared to 5 ft. Installed with a stick up above ground surface. pH is 7.		
10									
15									

BORIN			le	yM	Page 2 of 4	E	Site Name: _{LCP} Chemicals Boring No: SW-63 Diameter: 8 in Date: 08/07/2013	Site, Brunsw	vick GA
	(ft): 1 n (ft)			Meth Cons	r: Groundv od: Mud R sultant: PA oct No: 448	otary RSONS	rotection Inc	Coo	um: NAVD88 ordinate System) 1983 State Plane rgia East / FIPS 100
Depth Ft	Recov	Sample ID	Blow Count	PID (ppm)	Mercury (mg/m3)		0.10 1.4		Well Construction Diagram
20							pH is 7.		
30 I					-	ior o			

BORIN			le	yw	Page 3 of 4	E	Site Name: _{LCP} Chemicals Site, E Boring No: SW-63 Diameter: 8 in Date: 08/07/2013	3runswi	ck GA
	(ft): n (ft)			Meth Cons	er: Ground od: Mud R sultant: PA ect No: 448	totary RSONS	rotection Inc	Coor NAD	m: NAVD88 rdinate Syste 1983 State Plan gia East / FIPS 1
Depth	Recov	Sample	Blow	PID	Mercury	USCS			Well Constructio Diagram
Ft 30	Re	ID	Count	(ppm)	(mg/m3)	Code	Soil Description pH is 7.		Diagram
35									
35 -			10	0.0	0.000		Gray medium to coarse SAND, over darker gra	ıy medium	
			10 15	0.0	0.000	SM	Gray medium to coarse SAND, over darker gra	ıy medium	
			15 19	0.0	0.000	SM	Gray medium to coarse SAND, over darker gra	ıy medium	
			15 19 16			SM	sand, wet.		
			15 19 16 13	0.0	0.000	SM	Gray medium to coarse SAND, over darker gra sand, wet. Gray fine to medium SAND, little clay in 2 inch lense, wet.		
			15 19 16 13 16			SM	sand, wet. Gray fine to medium SAND, little clay in 2 inch		
			15 19 16 13 16 14				sand, wet. Gray fine to medium SAND, little clay in 2 inch		
			15 19 16 13 16 14 10	0.0	0.000		Sand, wet. Gray fine to medium SAND, little clay in 2 inch lense, wet.		
			15 19 16 13 16 14				sand, wet. Gray fine to medium SAND, little clay in 2 inch		

H	0	10	yw	vel		Boring No: SW-63 Diameter: 8 in Date: 08/07/2013			
Northing (ft): 432318.74 Easting (ft): 861884.81 Elevation (ft): 9.86 Total Depth: 53.0 Ft			Driller: Groundwater Protection Inc Method: Mud Rotary Consultant: PARSONS Project No: 448517				Datum: NAVD88 Coordinate Syster NAD 1983 State Plane Georgia East / FIPS 10		
Depth Control of the second se	Sample	Blow	PID	Mercury	USCS	12 ···· 15+2. + 2.*··		Well	
	ID	Count	(ppm)	(mg/m3)	Code	Soil Description	_	Diagram	
45		9			SM	Same as above, trace silt near bottom.			
		13		1.2		Same as above, thin clay lenses in lower sand,			
		7	0.0	0.000		bottom 6 inches greenish gray CLAY, stiff, mois wet.	t to		
÷		9			SM/CL		- 1		
		8				Part and states	_		
		7	0.0	0.000		Same as in the bottom of last spoon.	-		
		6	0.0		CL			Ш	
		2	0.0	0.000		Fine SAND 12 inches, over 12 inches of greenis gray CLAY, very thin sand lenses scattered, ser	sh		
		3			and share	wet.	m sun,		
50 -		4			SM/CL			0.00	
		6		1.000	1.1	and all an all and the set		and an	
Ť		5	0.0	0.000	*	Upper 3 inches fine SAND, some clay over 14 in fine tan SAND, little medium sand, over 6 inche	nches s semi		
		8			SM/CI	stiff greenish gray clay. Shoe had gray weather dense, trace coarse sand, pebbles, hard refusal	ed sandsto	one,	
		11			001			11.1.1	
53.0		50/4	1					tond to	
53.0		11 50/4	Vell Set at 5	2.75 ft.	SM/CL	stiff greenish gray clay. Shoe had gray weather	ed sandsto	one,	

BORING L	OG
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Honeywell

Site Name: LCP Chemicals Site, Brunswick GA Boring No: SW-64 Diameter: 8 in Date: 08/07/2013 - 08/08/2013

Easting Elevation	(ft): on (ft	: 432393.8 861905.2): 10.42 : 53.5 Ft		Meth Cons	er: Groundv od: Mud R sultant: PA ect No: 448	totary RSONS	otection Inc	Datum: NAVD88 Coordinate System: NAD 1983 State Plane Georgia East / FIPS 1001		
Depth Ft	Recov	Sample ID	Blow Count	PID (ppm)	Mercury (mg/m3)		Soil Description		Well Construction Diagram	
5 -							Hand cleared to 5 ft. Installed with a stick up above ground surface. pH is 7			
10										
15										

Easting (ft): 861905.21Method: Mud RotaryCoordinate SElevation (ft): 10.42Consultant: PARSONSNAD 1983 StateTotal Depth: 53.5 FtProject No: 448517Georgia East / IDepthSampleBlowPIDMercuryUSCSFtZIDCount(ppm)(mg/m3)CodeSoil Description	ł		ne	ум	Page 2 of 4		Site Name: _{LCP} Chemicals Site, E Boring No: SW-64 Diameter: 8 in Date: 08/07/2013 - 08/08/2013	Brunswic	ck GA	
15 Hand cleared to 5 ft. Installed with a stick up above ground surface. pH is 7 20	Easting (Elevation	ft): 86190 (ft): 10.4	5.21 2	Meth Cons	od: Mud R sultant: PA	Rotary RSONS		Coord NAD 1	Datum: NAVD88 Coordinate Syste NAD 1983 State Plan Georgia East / FIPS 1	
15 15 Hand cleared to 5 ft. Installed with a stick up above ground surface. pH is 7 20 PH is 7.		1211 / 1 / 1 / 1 / 1 / 1 / 1 / 1 / 1 / 1		-	Mercury	USCS			Well Constructio Diagram	
	20						pH is 7.			
	25									

			le	yM	Page 3 of 4	E	Site Name: _{LCP} Chemicals Site, Brunswick GA Boring No: SW-64 Diameter: 8 in Date: 08/07/2013 - 08/08/2013			
Easting Elevation	g (ft): on (ft)	432393. 861905.2 : 10.42 53.5 Ft		Meth Cons	er: Groundv od: Mud R sultant: PA ect No: 448	totary RSONS	Protection Inc	Datum: NAVD88 Coordinate System NAD 1983 State Plane Georgia East / FIPS 10		
Depth	Recov	Sample	Blow	PID	Mercury	USCS			Well Construction Diagram	
Ft 30	Re	ID	Count	(ppm)	(mg/m3)	Code	Soil Description		Diagram	
35 +										
35 +			15	0.0	0.000		Gray medium to coarse SAND, trace silt and cl	ay		
-			15 15	0.0	0.000	QM	Gray medium to coarse SAND, trace silt and cl in thin lenses at top, wet.	ay		
-			15 16	0.0	0.000	SM	Gray medium to coarse SAND, trace silt and cl in thin lenses at top, wet.	ay		
-			15 16 20			SM	in thin lenses at top, wet.			
-			15 16 20 16	0.0	0.000	SM	Gray medium to coarse SAND, trace silt and cl in thin lenses at top, wet. Gray medium to coarse SAND, grading to med bottom 1/2 of sample, wet.			
-			15 16 20 16 17			SM	in thin lenses at top, wet. Gray medium to coarse SAND, grading to med			
-			15 16 20 16				in thin lenses at top, wet. Gray medium to coarse SAND, grading to med			
-			15 16 20 16 17 19				in thin lenses at top, wet. Gray medium to coarse SAND, grading to med			

Northir Easting Elevati	ng (ft) g (ft): ion (ft	: 432393. 861905.2): 10.42 : 53.5 Ft	53	Drille Meth Cons	er: Groundwood: Mud R sultant: PA	water Protocology Rotary RSONS	rotection Inc	Datum: NAVD88 Coordinate Syste NAD 1983 State Plat Georgia East / FIPS
Depth	Recov	Sample	Blow	PID	Mercury	USCS		Well
Ft	Re	ID	Count	(ppm)	(mg/m3)	Code	Soil Description	Diagram
45			6			SM	Gray fine to medium SAND, wet.	
-	/		14		1.25	-	Greenish gray fine to medium SAND, little clay,	
			13	0.0	0.000		cohesive, wet.	
+			15 14			SM/CL		
		1.0	24				a strange har and	
÷			6	0.0	0.000	-	Light gray fine to medium SAND, no clay, wet.	
			16	0.0	0.000			
÷			21			SM		2444
_	7		23		·		the state of the state of	
50 +			7	0.0	0.000	-	Greenish gray CLAY interbedded with tan brow fine SAND, fishy odor bottom 6 inches over tan	n fine
			6			-	to medium sand, wet.	
Ĩ			9	1		SM/CL		-+++
	/]	7					
			15	0.0	0.000		Light gray fine SAND, over 8 inches of gray SAI and CLAY, and gray weathered sandstone in tip	ND o, wet.
4		1.1	16			SM/CL		
53.5			50/5	Vell Set at 5	· · · · · ·			

BORING LOG	
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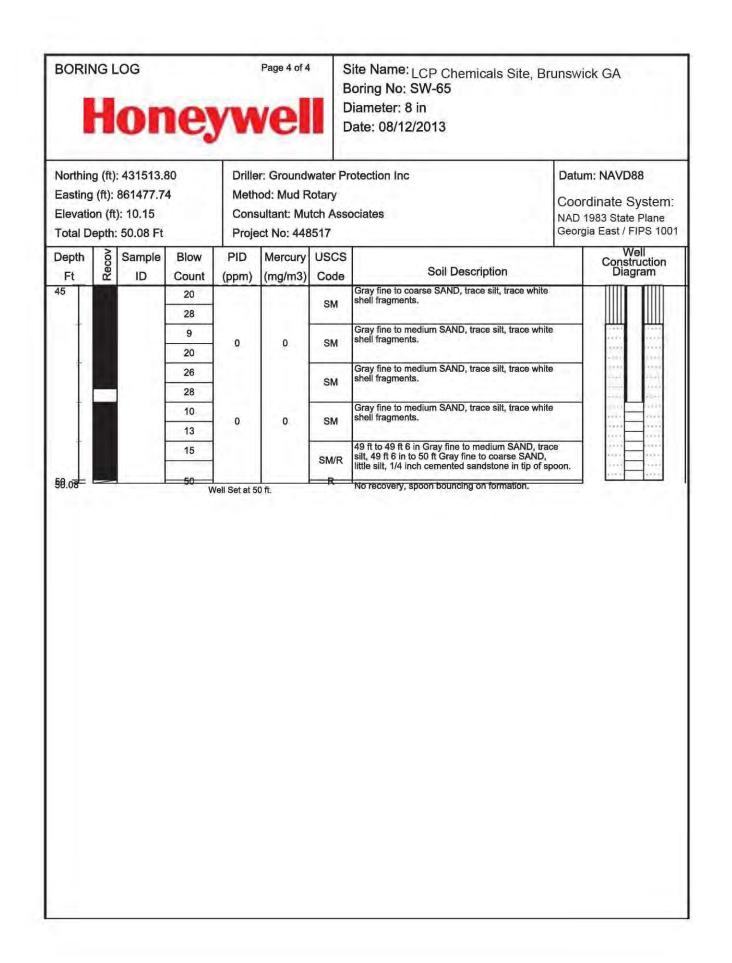
Honeywell

Site Name: LCP Chemicals Site, Brunswick GA Boring No: SW-65 Diameter: 8 in Date: 08/12/2013

Easting Elevatio	(ft): on (ft	: 431513.8 861477.7): 10.15 : 50.08 Ft	4	Meth Cons	r: Ground od: Mud R sultant: Mu ect No: 448	totary tch Asso	otection Inc	Cool	m: NAVD88 rdinate System: 1983 State Plane jia East / FIPS 1007
Depth Ft	Recov	Sample ID	Blow Count	PID (ppm)	Mercury (mg/m3)		Soil Description		Well Construction Diagram
0			Count			SM	Hand cleared to 5 ft. Installed with a stick ug ground surface. Brown fine to medium SAN silt.	o above D, trace	
5				0.0	0.000		Brown gray drilling MUD, pH 7 to 8.		
10				7.8	D				
15									

Easting Elevation) (ft): on (ft	: 431513.8 861477.7): 10.15 : 50.08 Ft	4	Meth Cons	er: Ground od: Mud R sultant: Mu ect No: 448	Datum: NAVD88 Coordinate System NAD 1983 State Plane Georgia East / FIPS 100			
Depth Ft	Recov	Sample ID	Blow Count	PID (ppm)	Mercury (mg/m3)	USCS	Soil Description		Well Construction Diagram
20 -				0.0	0.000				
+				7.8	0				

			le	yw	Page 3 of 4	E	Site Name: _{LCP} Chemicals Site, I Boring No: SW-65 Diameter: 8 in Date: 08/12/2013	Brunsw	ick GA	
Eastin Elevat	ng (ft): ition (ff	: 431513.8 861477.7): 10.15 : 50.08 Ft	4	Meth Cons	er: Groundv od: Mud R sultant: Mu ect No: 448	totary tch Ass	rotection Inc	Coo NAD	Datum: NAVD88 Coordinate System NAD 1983 State Plane Georgia East / FIPS 10	
Depth	Recov	Sample	Blow	PID	Mercury	USCS			Well Constructior Diagram	
Ft 30	Re	ID	Count	(ppm)	(mg/m3)	Code	Soil Description Brown gray drilling MUD, pH 7 to 8.		Diagram	
-										
35				7.8	D					
				7.8	D					
35 -			6	7.8	0	SM	Gray fine to coarse SAND, trace silt.			
						SM	Gray fine to coarse SAND, trace silt. Gray fine to coarse SAND, trace silt.			
			7 9 12			78.7				
			7 9			78.7	Gray fine to coarse SAND, trace silt. Gray fine to coarse SAND, trace silt.			
			7 9 12 2 9 22	0	0	SM	Gray fine to coarse SAND, trace silt.	nch		
			7 9 12 2 9	0	0	SM SM	Gray fine to coarse SAND, trace silt. Gray fine to coarse SAND, trace silt. Gray fine to coarse SAND, trace silt, layer 7 in			

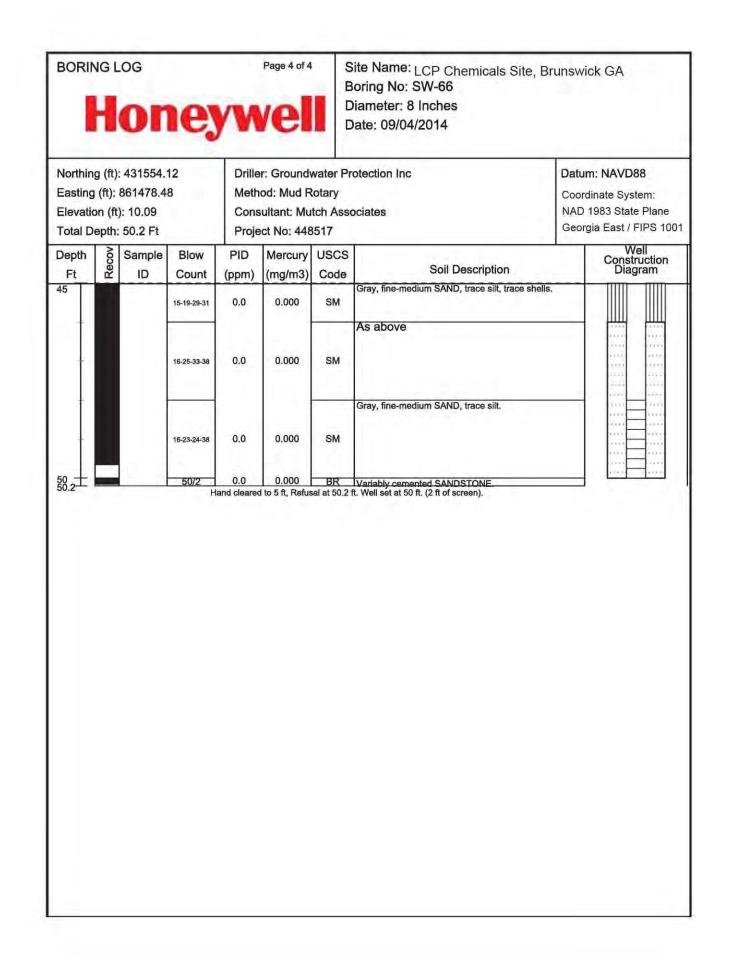


Phase 2 Sparge Well Boring Logs

Easting Elevation	g (ft): on (ft	: 431554. 861478.4): 10.09 50.2 Ft		Meth Cons	er: Groundv od: Mud R sultant: Mu ect No: 448	otection Inc	Datum: NAVD88 Coordinate System: NAD 1983 State Plane Georgia East / FIPS 10		
Depth Ft	Recov	Sample ID	Blow Count	PID (ppm)	Mercury (mg/m3)	USCS	Soil Description	1	Well Construction Diagram
5 + + +						SM			
10				0.0	0.000				

Easting Elevatio	(ft): on (ft)	: 431554. 861478.4): 10.09 50.2 Ft		Driller: Groundwater Protection Inc Method: Mud Rotary Consultant: Mutch Associates Project No: 448517					Datum: NAVD88 Coordinate System: NAD 1983 State Plane Georgia East / FIPS 10	
Depth Ft	Recov	Sample ID	Blow Count	PID (ppm)	Mercury (mg/m3)		Well Construction Diagram			
20				0.0	0.000					

Northing Easting Elevatio	g (ft): (ft): on (ft)	431554. ⁻ 861478.4): 10.09 50.2 Ft	12	Drille Meth Cons	r: Ground od: Mud R sultant: Mu ect No: 448	water P Rotary Itch Ass	Diameter: 8 Inches Date: 09/04/2014 Protection Inc	Coor NAD	Datum: NAVD88 Coordinate System: NAD 1983 State Plane Georgia East / FIPS 100 ⁻		
Depth Ft	Recov	Sample ID	Blow Count	PID (ppm)	Mercury (mg/m3)	USCS	s		Well Construction Diagram		
40			15-19-29-31	0.0	0.000	SM	Gray, fine-medium SAND, trace silt, trace she	əlis.			



Easting Elevation	(ft): on (ft)	: 431635.: 861478.3): 9.50 49.5 Ft		Driller: Groundwater Method: Mud Rotary Consultant: Mutch A Project No: 448517			ry Associates		Datum: NAVD88 Coordinate System: NAD 1983 State Plane Georgia East / FIPS 10	
Depth Ft	Recov	Sample ID	Blow Count	PID (ppm)	Mercury (mg/m3)	USCS	Soil Description		Well Construction Diagram	
5 +						SM				
10				0.0	0.000					

Northing (ft): 431635.36 Easting (ft): 861478.33 Elevation (ft): 9.50 Total Depth: 49.5 Ft Depth & Sample Blow Ft dr ID Count (ppm) (mg/m3) Code 15 20 - 1 0 0.000 25 - 25 - 25 - 25 - 25 - 25 - 25 - 25 -	hes	tite Name: _{LCP} Chemica Boring No: SW-67 Diameter: 8 Inches Date: 09/03/2015	B	Page 2 of 4	ym	e					
	Datum: NAVD88 Coordinate System: NAD 1983 State Plane Georgia East / FIPS 100		otary tch Asso	Method: Mud Rotary Consultant: Mutch A			Easting (ft): 861478.33 Elevation (ft): 9.50				
20 - 0.0 0.000	oil Description Well Diagram	Soil Descripti	121212	100000000000000000000000000000000000000		1 Contract 1		Recov	Ft		
*				0.000	0.0				*		

			le	yw	Page 3 of 4		Site Name: _{LCP} Chemicals Site, Boring No: SW-67 Diameter: 8 Inches Date: 09/03/2015	Brunswi	ck GA
Easting Elevation	g (ft): on (ft	: 431635.: 861478.3): 9.50 49.5 Ft		Driller: Groundwater Method: Mud Rotary Consultant: Mutch A Project No: 448517				Datum: NAVD88 Coordinate System: NAD 1983 State Plane Georgia East / FIPS 10	
Depth Ft 30	Recov	Sample ID	Blow Count	PID (ppm)	Mercury (mg/m3)		Out Develotion		Well Construction Diagram
35 —				0.0	0.000				
40 +									

	HO	neţ	yM	Page 4 of 4	E	Site Name: _{LCP} Chemicals Site, B Boring No: SW-67 Diameter: 8 Inches Date: 09/03/2015	runsw	vick GA
Easting Elevati	ng (ft): 431639 g (ft): 861478 on (ft): 9.50 Depth: 49.5 Ft	.33	Meth Cons	er: Ground nod: Mud R sultant: Mu ect No: 448	totary	rotection Inc ociates	Coor	Im: NAVD88 rdinate System: 9 1983 State Plane rgia East / FIPS 100
Depth Ft	Sample	e Blow Count	PID (ppm)	Mercury (mg/m3)		Soil Description		Well Construction Diagram
45		13-11-14-19	0.0	0.000	SM	Gray, fine-medium SAND, trace silt, trace shells		
-		16-24-26-32	0.0	0.000	SM	As above.		
ļ		11-39-50/6	0.0	0.000	SM-BR	As above over gray fine-medium SAND, some s pieces of mudstone, variably cemented sandsto Bedrock in tip.	ilt, trace ne	

Easting Elevation	(ft): on (ft)	: 431714.3 861478.08): 9.08 51.0 Ft		Meth Cons	er: Groundv od: Mud R sultant: Mu ect No: 448	totary tch Asso	rotection Inc	Coord NAD	n : NAVD88 linate System: 1983 State Plane gia East / FIPS 100
Depth Ft	Recov	Sample ID	Blow Count	PID (ppm)	Mercury (mg/m3)	USCS Code	Soil Description		Well Construction Diagram
5 -						SM			
10				0.0	0.000				

		.og O	Ie,	yM	Page 2 of 4	Borin	Name: _{LCP} Chemicals g No: SW-68 eter: 8 Inches 09/03/2014	Site, Brunsw	vick GA
Easting Elevation	(ft): on (ft)	: 431714.: 861478.0): 9.08 51.0 Ft		Meth Cons	od: Mud R	tch Associate		Cool	um: NAVD88 rdinate System:) 1983 State Pla rgia East / FIPS
Depth Ft	Recov	Sample ID	Blow Count	PID (ppm)	Mercury (mg/m3)		Soil Description		Well Constructi Diagram
*				0.0	0.000				
25 +					1 1				

Easting Elevati	g (ft): on (ft	: 431714. 861478.0): 9.08 : 51.0 Ft		Meth Cons	r: Groundv od: Mud R sultant: Mu oct No: 448	totary	otection Inc	Datum: NAVD88 Coordinate System: NAD 1983 State Plane Georgia East / FIPS 10
Depth Ft	Recov	Sample ID	Blow Count	PID (ppm)	Mercury (mg/m3)	10.000	Soil Description	Well Construction Diagram
35 +				0.0	0.000			
-								

Northing (ft): 431714.34 Easting (ft): 861478.08 Elevation (ft): 9.08 Total Depth: 51.0 Ft Driller: Groundwater Protection Inc Method: Mud Rotary Consultant: Mutch Associates Project No: 448517 Datum: NAVD88 Coordinate System: NAD 1933 State Plane Gergia East / FIPS att 2232738 Depth of Ft of Bt Blow (ppm) PID (mg/m3) Mercury Coss USCS Soil Description Orstruction Diagram 45 2232738 0.0 0.000 SM Gray fine-medium SAND, trace silt, trace shells. Image: Cost of the state of th		H	or	le	M	vel		Boring No: SW-68 Diameter: 8 Inches Date: 09/03/2014		
Ft g Salitype Blow Fib Wercury OSOS Ft g Salitype Blow Fib Wercury OSOS 45 ID Count (ppm) (mg/m3) Code Soil Description Construction Diagram 45 ID Z2:23:27:30 0.0 0.000 SM Gray fine-medium SAND, trace silt, trace shells. Image: Construction Diagram 45 Image: Construction Diagram As above As above 21:23:28:38 0.0 0.000 SM 50 50/6 0.0 0.000 SM 50 50/6 0.0 0.000 SM 50 50/6 0.0 0.000 SM	Easting Elevation	g (ft): on (ft	861478.0): 9.08		Meth Cons	od: Mud R aultant: Mu	otary tch Ass		Coord NAD	linate System: 1983 State Plane
45 22-23-27-30 0.0 0.000 SM Gray fine-medium SAND, trace silt, trace shells. 21-23-28-38 0.0 0.000 SM As above 21-23-28-38 0.0 0.000 SM As above 18-16-X-X 0.0 0.000 SM As above 50 50/6 0.0 0.000 SM	Depth	0	Sample	Blow	PID	Mercury	USCS		- T	Well
22-23-27-30 0.0 0.000 SM 21-23-28-38 0.0 0.000 SM 21-23-28-38 0.0 0.000 SM 18-16-X-X 0.0 0.000 SM 50 50/6 0.0 0.000 SM 50 50/6 0.0 0.000 SM-BR Grey, fine to coarse SAND, some silt, variably cemented SANDSTONe bedrock in tip of spoon.	Ft	Rec		Count	(ppm)	100000000000000000000000000000000000000		Soil Description		Diagram
As above 21-23-28-38 0.0 0.000 SM 18-16-X-X 0.0 0.000 SM 50 50/6 0.0 0.000 SM 50 50/6 0.0 0.000 SM	45			22-23-27-30	0.0	0.000	SM	Gray fine-medium SAND, trace silt, trace shells.		
21-23-28-38 0.0 0.000 SM 18-16-X-X 0.0 0.000 SM 50 50/6 0.0 0.000 50 50/6 0.0 0.000 50 50/6 0.0 0.000 51.0 50/6 0.0 0.000	+				0.0	0.000	SIII			
50 50/6 0.0 0.000 SM 50 50/6 0.0 0.000 SM-BR Grey, fine to coarse SAND, some silt, variably cemented SANDSTONe bedrock in tip of spoon.	4			21-23-28-38	0.0	0.000	SM			
50/6 0.0 0.000 SM-BR Grey, line to coarse SAND, some sit, variably cemented SANDSTONe bedrock in tip of spoon.				18-16-X-X	0.0	0.000	SM	As above		
54 0	50 —			50/6	0.0	0.000	SM-BR	Grey, fine to coarse SAND, some silt, variably cemented SANDSTONe bedrock in tip of spoon.		1 10 10 10 10 10 10 10 10 10 10 10 10 10
51.0 Hand cleared to 5 ft, Refusal at 51 ft. Well set at 51 ft. (2 ft of screen).		10								++++ ****

Easting Elevation	(ft): 8 on (ft)	431794.0 361478.0 : 9.49 51.5 Ft		Meth Cons	r: Groundv od: Mud R sultant: Mu oct No: 448	totary tch Ass	rotection Inc ociates	Coor NAD	m : NAVD88 dinate System: 1983 State Plane gia East / FIPS 100
Depth Ft	Recov	Sample ID	Blow Count	PID (ppm)	Mercury (mg/m3)		Soil Description		Well Construction Diagram
5 + + + + + + + + + + + + + + + + + + +				0.0	0.000	SM			
+									

			le	yw	Page 2 of 4	Bor	Name: _{LCP} Chemicals Site ng No: SW-69 neter: 8 Inches e: 09/02/2014 - 09/03/2014		ick GA
Easti Eleva	ing (ft) ation (f): 431794. : 861478.0 ft): 9.49 h: 51.5 Ft		Meth Cons	od: Mud F	tch Associa		Coor NAD	m: NAVD88 dinate System: 1983 State Plane gia East / FIPS 1
Depti Ft	1.5		Blow Count	PID (ppm)	Mercury (mg/m3)	USCS	Soil Description		Well Constructior Diagram
20 -	-			0.0	0.000				
25 -									
	2								

Eastin Elevat	g (ft): ion (ft	: 431794. 861478.0): 9.49 : 51.5 Ft		Meth Cons	r: Groundv od: Mud R ultant: Mu ct No: 448	totary tch Ass	rotection Inc ociates	Datum: NAVD88 Coordinate System: NAD 1983 State Plan Georgia East / FIPS 1
Depth Ft	Recov	Sample ID	Blow Count	PID (ppm)	Mercury (mg/m3)	10.000	Soil Description	Well Construction Diagram
35				0.0	0.000			
40 -								

BORING LOG	ne	M	Page 4 of 4	E	Site Name: _{LCP} Chemicals Site, Br Boring No: SW-69 Diameter: 8 Inches Date: 09/02/2014 - 09/03/2014	runswick GA
Northing (ft): 43179 Easting (ft): 861470 Elevation (ft): 9.49 Total Depth: 51.5 F	8.05	Meth Cons	r: Groundv od: Mud R sultant: Mu ect No: 448	totary tch Ass	rotection Inc ociates	Datum: NAVD88 Coordinate System: NAD 1983 State Plane Georgia East / FIPS 10
Depth Samp Ft & ID	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	PID	Mercury	USCS	Call Departmention	Well Construction Diagram
Ft 🗹 ID	Count	(ppm)	(mg/m3)	Code	Gray, fine-medium SAND, trace silt, trace shells.	in the second second second second
+	17-25-33-34	0.0	0.000	SM	Gray, fine to coarse SAND, trace silt, trace shells	
*	30-30-50+	0.0	0.000	SM	at bottom.	
	17-16-17-X	0.0	0.000	SM	Gray, fine to medium SAND, trace silt, trace shel	IS.
50 +	13-20-50/2	0.0	0.000	SM-BR	Gray fine-medium SAND, trace-little silt, trace shells. Variably cemented SANDSTONE in tip.	(1)44 (1)4) (1)4(1)4)(1)4)

Easting Elevati	g (ft): on (ft	: 431874. 861477.7): 8.44 48.9 Ft		Meth Cons	er: Ground od: Mud R sultant: PA ect No: 448	Rotary RSONS	otection Inc	Coord NAD	n: NAVD88 linate System: 1983 State Plane gia East / FIPS 10
Depth Ft	Recov	Sample ID	Blow Count	PID (ppm)	Mercury (mg/m3)	USCS	Soil Description		Well Construction Diagram
5 +						SM			
10				0.1	0.000				

		.og O	Ie,	yM	Page 2 of 4	Borir	Name: _{LCP} Chemicals Site ng No: SW-70 neter: 8 Inches : 09/10/2014	e, Brunsw	ick GA
Easting Elevation	g (ft): on (ft	: 431874. 861477.7): 8.44 : 48.9 Ft		Meth Cons	er: Groundv lod: Mud R sultant: PA lect No: 448	RSONS	tion Inc	Coor NAD	m: NAVD88 dinate System: 1983 State Pla rgia East / FIPS
Depth Ft	Recov	Sample ID	Blow Count	PID (ppm)	Mercury (mg/m3)		Soil Description		Well Constructi Diagram
20 -									
25 -				0.1	0.000				
-									

		og On	Ie,	yw	Page 3 of 4	F	Site Name: _{LCP} Chemicals Site, E Boring No: SW-70 Diameter: 8 Inches Date: 09/10/2014	3runswi	ick GA
	(ft): 1 n (ft)			Meth Cons	r: Ground od: Mud R sultant: PA ect No: 448	totary RSONS	rotection Inc	Coord	m : NAVD88 dinate System: 1983 State Plane gia East / FIPS 10
Depth Ft	Recov	Sample ID	Blow Count	PID (ppm)	Mercury (mg/m3)		0.10		Well Construction Diagram
35				0.1	0.000				
			3-6-10-15	0.1	0.000	SC	Wet, fine-medium SAND, trace clay. Clay in 2-i lenses at base of sample. Hg=0.0 mg/m3 VOC:	inch s= 0.0 ppn	n

	NG LOG	16	yM	Page 4 of 4	E	Site Name: _{LCP} Chemicals Site, Br Boring No: SW-70 Diameter: 8 Inches Date: 09/10/2014	unswick GA
Easting Elevation	ng (ft): 431874 g (ft): 861477. on (ft): 8.44 Depth: 48.9 Ft	72	Meth Cons	r: Ground od: Mud R sultant: PA oct No: 448	Datum: NAVD88 Coordinate System: NAD 1983 State Plane Georgia East / FIPS 100		
Depth Ft	Sample	Blow Count	PID (ppm)	Mercury (mg/m3)	USCS Code	Soil Description	Well Construction Diagram
45		7-9-17-17	0.0	0.000	SC	Wet, fine-medium SAND, trace clay, widely scatt thin clay lenses. Hg= 0.0 mg/m3, VOCs= 0.0 ppn	n
-		3-4-7-6	0.0	0.000	SM	Wet, fine SAND, little medium sand, trace clay. Hg= 0.0 mg/m3, VOCs= 0.0 ppm	
÷		30-50/5	0.0	0.000	SM	Wet, fine-medium SAND, over gray fine sand, tra fine gravel, trace shells, trace silt. Hg= 0.0 mg/m3	
48.9		<u>+</u>	and cleared	to 5 ft. Refus	al at 48.9	VOCs= 0.0 ppm ft. Well set at 48.5 ft. (2 ft of screen).	

Easting Elevati	g (ft): ion (ft	: 431434. 861547.3): 9.87 49.75 Ft	3	Meth Cons	r: Groundv od: Mud R ultant: PA ct No: 448	totary RSONS	otection Inc	Datum: NAVD88 Coordinate System: NAD 1983 State Pla Georgia East / FIPS		
Depth Ft	Recov	Sample ID	Blow Count	PID (ppm)	Mercury (mg/m3)	USCS Code	Soil Description		Well Constructio Diagram	
5 +			Hand Dug			SM				
10 -										

BORING LOG	
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Page 2 of 4

Honeywell

Site Name: LCP Chemicals Site, Brunswick GA Boring No: SW-71 Diameter: 8 Inches Date: 09/05/2015

Easting Elevatio	(ft): on (ft	: 431434.(861547.3): 9.87 : 49.75 Ft	3	Meth Cons	er: Groundv od: Mud R sultant: PA ect No: 448	Datum: NAVD88 Coordinate System: NAD 1983 State Plane Georgia East / FIPS 1001			
Depth Ft 15	Recov	Sample ID	Blow Count	PID (ppm)	Mercury (mg/m3)	1	Soil Description		Well Construction Diagram
+									
+									
+									
30									

BORIN			ıe,	yM	Page 3 of 4	Page 3 of 4 Site Name: LCP Chemicals Site, Brunswick GA Boring No: SW-71 Diameter: 8 Inches Date: 09/05/2015 Date: 09/05/2015					
Easting Elevatio	(ft): 8 on (ft)	431434.(361547.3 : 9.87 49.75 Ft	3	Meth Cons	er: Ground od: Mud R sultant: PA ect No: 448	totary RSONS	SONS NAD 1983 State 17 Georgia East / Fl				
Depth Ft	Recov	Sample ID	Blow Count	PID (ppm)	Mercury (mg/m3)	USCS Code	Soil Description		Well Constructio Diagram		
35											

Easting Elevation) (ft): (on (ft)	431434. 361547.3 : 9.87 49.75 Ft	3	Meth Cons	er: Groundv od: Mud R sultant: PA ect No: 448	totary RSONS	rotection Inc	Datum: NAVD88 Coordinate System: NAD 1983 State Pla Georgia East / FIPS		
Depth Ft	Recov	Sample ID	Blow Count	PID	Mercury		Soil Description		Well Construction Diagram	
45	Œ	0	6-3-7-16	(ppm) 0.0	(mg/m3) 0.000	SM	Wet, gray medium to fine SAND, little shells, tra- silt. Hg=0.0 VOCs= 0.0	ce		
+				0.0	0.000		As above. Hg= 0.0 VOCs=0.0		iero iero	
÷			13-24-40-50	0.0	0.000	SM	As above. Fig- 0.5 YOUS-0.0		***** ***** ***** ***** ***** ***** ****	
+			13-15-24-50/3	0.0	0.000	SM	As above, less shells (trace) over black/gray me to fine SAND, little silt, little coarse sand. Hg= 0. VOCs= 0.0.	dium O		

Northing (ft): 431514.43 Easting (ft): 861547.22 Elevation (ft): 9.53 Total Depth: 50.0 Ft Depth & Sample Blow				Meth Cons	r: Groundv od: Mud R ultant: PA ct No: 448	totary RSONS	rotection Inc	Datum: NAVD88 Coordinate System: NAD 1983 State Plan Georgia East / FIPS 1		
Depth Ft	Recov	Sample ID	Blow Count	PID (ppm)	Mercury (mg/m3)		Soil Description		Well Construction Diagram	
5			Hand Dug			SM	SAND 5-20 Hg= 0.0 mg/m3, VOCs= 0.0, SAND 20-40 ft Hg= 0.0m VOCs= 0.0, pH=8			
10				0.0	0.000					
+										

H	or	le,	yM	e	Diame Date:	y No: SW-72 eter: 8 Inches 09/04/2014		
Northing (ft Easting (ft): Elevation (f Total Depth	861547.2 t): 9.53		Meth Cons	r: Ground od: Mud R sultant: PA oct No: 448	RSONS	on Inc	Coor NAD	m: NAVD88 dinate System: 1983 State Plane rgia East / FIPS 100
Depth or of the second	Sample ID	Blow Count	PID (ppm)	Mercury (mg/m3)		Soil Description		Well Construction Diagram
20			0.0	0.000				

ł		ne	ум	Page 3 of 4	E	Site Name: _{LCP} Chemicals Site Boring No: SW-72 Diameter: 8 Inches Date: 09/04/2014	e, Brunsw	ick GA	
Northing Easting (Elevation Total De	ft): 8615 1 (ft): 9.53	47.22 3	Meth Con	Driller: Groundwater Protection IncDatum: NAVD8Method: Mud RotaryCoordinate SystemConsultant: PARSONSNAD 1983 StateProject No: 448517Georgia East / F					
Depth Ft	Sam	a second s	PID (ppm)	Mercury (mg/m3)	11.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1	Out Development		Well Construction Diagram	
35			0.0	0.000					
÷									
40			0.0	0.000				mm mm	

Easting (ft): 861547.22 Elevation (ft): 9.53 Total Depth: 50.0 Ft Depth g Sample Blow): 9.53		Meth Cons	Driller: Groundwater Protection IncDatum: NAMethod: Mud RotaryCoordinateConsultant: PARSONSNAD 1983Project No: 448517Georgia Ea					
	ecov		1.000	PID	Mercury		Soil Description		Well Construction Diagram	
Ft 15	2	ID	Count	(ppm)	(mg/m3)	Code	Wet, gray medium to fine SAND, little to trace silt, trace shells. Hg= 0.0 mg/m3 VOCs= 0.0, pH=	9		
÷			10-10-14-16	0.0	0.000	SM	As above	-	ini ini ini ini	
÷			6-15-20-23	0.0	0.000	SM				
			10-17-15-50/6	0.0	0.000	SM	As above 48-48.5. Weathered bedrock, dark gray medium to fine SAND, some silt, little coarse grav Hg= 0.0 mg/m3 VOCs= 0.0			

Easting Elevation	(ft): on (ft)	431594.8 861546.6 : 9.43 50.75 ft		Meth Cons	r: Groundv od: Mud R sultant: PA ect No: 448	totary RSONS	otection Inc	Datum: NAVD88 Coordinate System: NAD 1983 State Pla Georgia East / FIPS			
Depth ft	Recov	Sample ID	Blow Count	PID (ppm)	Mercury (mg/m3)		Soil Description		Well Construction Diagram		
5						SM	0.0, Hg= 0.0, pH=8 SAND 20-44 ft VOCs=0.0, Hg= 0.0, pH= 8				
10				0.0	0.000						

BORING	O	le	yw	Page 2 of 4	E	Site Name: _{LCP} Chemicals Site Boring No: SW-73 Diameter: 8 Inches Date: 09/04/2014	e, Brunsw	ick GA		
Northing (ft Easting (ft): Elevation (f Total Depth	861546.6 t): 9.43		Meth Cons	r: Groundv od: Mud R sultant: PA ect No: 448	totary RSONS	rotection Inc	Datum: NAVD88 Coordinate System: NAD 1983 State Plane Georgia East / FIPS 1			
Depth og ft 22 15	Sample ID	Blow Count	PID (ppm)	Mercury (mg/m3)	10.000	0.10		Well Construction Diagram		
20			0.0	0.000						

BORING LOG	
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Page 3 of 4

Honeywell

Site Name: LCP Chemicals Site, Brunswick GA Boring No: SW-73 Diameter: 8 Inches Date: 09/04/2014

Easting (i Elevation Total Dep	ft): 8 (ft) oth:	: 9.43		Meth Cons	r: Groundv od: Mud R sultant: PA oct No: 448	otary RSONS	rotection Inc	Datum: NAVD88 Coordinate System: NAD 1983 State Plane Georgia East / FIPS 100			
Depth ft 30	Recov	Sample ID	Blow Count	PID (ppm)	Mercury (mg/m3)		Soil Description		Well Construction Diagram		
35 -				0.0	0.000						
			13-7-7-6	0.0	0.000	SM	Wet, gray fine to medium SAND, trace silt and trace shells.	l clay,			

BORIN			le,	yM	Page 4 of 4 Site Name: LCP Chemicals Site, Brunswice Boring No: SW-73 Diameter: 8 Inches Date: 09/04/2014							
	(ft): 8 on (ft)			Meth Cons	er: Groundv od: Mud R sultant: PA ect No: 448	otary RSONS	rotection Inc	Datum: NAVD88 Coordinate System: NAD 1983 State Plane Georgia East / FIPS 10				
Depth	Recov	Sample	Blow	PID	Mercury	USCS			Well Construction Diagram			
ft 45	Re	ID	Count 13-7-7-6	(ppm) 0.0	(mg/m3) 0.000	Code SM	Soil Description Wet, gray fine to medium SAND, trace silt and trace shells.	clay,				
+			3-2-3-5	0.0	0.000	SM	As above		0 0			
-			4-3-5-6	0.0	0,000	SM	Wet gray, fine to medium SAND, trace-little silt.					
50 —			40-50/3	0.0	0.000	SM	Wet brown-gray, fine to medium SAND, little co sand, some silt.	arse	000			

Easting Elevation	g (ft): on (ft)	431674. 861547.6 : 9.20 52.0 Ft		Meth Cons	Driller: Groundwater Protection Inc Datum: NAVD8 Method: Mud Rotary Consultant: PARSONS Coordinate Syst Project No: 448517						
Depth Ft	Recov	Sample ID	Blow Count	PID (ppm)	Mercury (mg/m3)	10.010.00	Soil Description		Well Construction Diagram		
5						SM					
10				0.0	0.000						

Northing Easting Elevatio	(ft): 431674. (ft): 861547.6 (ft): 9.20 opth: 52.0 Ft	12	Drille Meth Cons		water Protectio Rotary RSONS	n Inc	Coor	Datum: NAVD88 Coordinate System: NAD 1983 State Plane Georgia East / FIPS 10		
Depth Ft	Sample	Blow Count	PID (ppm)	Mercury (mg/m3)		Soil Description		Well Construction Diagram		
20			0.0	0.000						

	BORIN			le,	yM	Page 3 of 4		Site Name: _{LCP} Chemicals Site, Bruns Boring No: SW-74 Diameter: 8 Inches Date: 09/03/2014	swick GA			
	Easting Elevatio) (ft): on (ft	861547.6): 9.20		Meth Cons	Method: Mud Rotary Coordin Consultant: PARSONS NAD 19						
	1.	Recov	1. S.	and the second sec	1.1000			Out Development	Well Construc Diagra			
Wet, gray fine to medium SAND, trace to little												

Northin Eastin Elevat	ng (ft) g (ft): ion (ff	: 431674. 861547.6	12	Drille Meth Cons	er: Groundwind: Mud R sultant: PA	water Pr totary RSONS	Date: 09/03/2014 rotection Inc	Datum: NAVD88 Coordinate System: NAD 1983 State Plan Georgia East / FIPS 1		
Depth			Blow	PID	Mercury			-	Well	
Ft	Recov	ID	Count	(ppm)	(mg/m3)	Code	Soil Description		Construction Diagram	
45			14-24-28-33			SM	Wet, gray fine to medium SAND, trace to little silt, little shells.			
-							As above			
÷		1.1	11-21-44-48			SM				
		C						1	14-04-0 17-04-0 17-04-0 17-04-0 17-04-0	
Ť							As above		000 (00 0 1000 (000	
÷e		1.1	20-24-30-28			SM				
50 +	-				6		Wet-moist, black-gray fine-medium SAND, some	e	1044 - 10144	
100							silt, trace coarse sand, lense of silt.	-	1000	
÷		1.0	13-16-15-50/5			SM	1.0 million in the second		VIII+	
		1			1000			1.5		
52.0			H:	and cleared	to 5 ft, Refus	al at 52 ft.	Well set at 51.5 ft. (2 ft of screen).			
				ano Ciearei	1 10 5 TL, Keilus	ian at 52 it.	. Weil set at 51.5 It. (2 It of screen).			

Easting Elevation	g (ft): on (ft	: 431752.8 861547.6): 8.92 50.0 Ft		Meth Cons	er: Ground od: Mud R sultant: PA ect No: 448	Rotary RSONS	rotection Inc	Coor NAD	Datum: NAVD88 Coordinate System: NAD 1983 State Plane Georgia East / FIPS 10	
Depth Ft	Recov	Sample ID	Blow Count	PID (ppm)	Mercury (mg/m3)	USCS	Soil Description		Well Construction Diagram	
5 + + + + + + + + + + + + + + + + + + +						SM	to 44 feet. pH= 8.			

BORIN			le	yM	Page 2 of 4		Site Name: _{LCP Chemic} Boring No: SW-75 Diameter: 8 Inches Date: 09/03/2014	als Site, Brunsw	vick GA		
	(ft): 8 on (ft)			Meth Cons	er: Ground od: Mud R sultant: PA ect No: 448	Rotary RSON	Protection Inc	Coo	Datum: NAVD88 Coordinate System: NAD 1983 State Plane Georgia East / FIPS 10		
Depth Ft	Recov	Sample ID	Blow Count	PID (ppm)	Mercury (mg/m3)	11.00110	0.10	otion	Well Construction Diagram		
20											

		on	le,	M	vel		Boring No: SW-75 Diameter: 8 Inches Date: 09/03/2014			
	(ft): 8 on (ft):			Meth Cons	r: Ground od: Mud R sultant: PA oct No: 448	totary RSONS	rotection Inc	Datum: NAVD88 Coordinate System: NAD 1983 State Plane Georgia East / FIPS 1		
Depth Ft 30	Recov	Sample ID	Blow Count	PID (ppm)	Mercury (mg/m3)	11.11.1.1.1	Soil Description		Well Construction Diagram	
35 -							Wet, gray, fine-medium SAND, trace-little si			
		1	17-41-42-47	0.0	0.000	SM	little shells.			

BORI			le	yM	Page 4 of 4 Site Name: LCP Chemicals Site, Brunswick GA Boring No: SW-75 Diameter: 8 Inches Date: 09/03/2014							
Easting Elevation	g (ft): on (ft	: 431752. 861547.6): 8.92 : 50.0 Ft		Meth Cons	Driller: Groundwater Protection IncDatumMethod: Mud RotaryCoordiConsultant: PARSONSNAD 1Project No: 448517Georgi							
Depth Ft	Recov	Sample ID	Blow Count	PID	Mercury (mg/m3)		O-II D		Well Construction Diagram			
45	L.		17-41-42-47	(ppm) 0.0	0.000	SM	Wet, gray, fine-medium SAND, trace-little silt, little shells.					
+						-	As above	_				
÷			36-38-36-31	0.0	0.000	SM			- 6 6 6 - 6 6 7 - 7 7			
			18-20-29-50	0.0	0,000	SM	As above					

Easting Elevati	g (ft): ion (ft	: 431834.9 861545.7): 8.87 47.75 Ft	3	Meth	Driller: Groundwater Protection Inc Datum: NAVD Method: Mud Rotary Coordinate Sys Consultant: PARSONS NAD 1983 State Project No: 448517 Georgia East / I					
Depth Ft	Recov	Sample ID	Blow Count	PID (ppm)	Mercury (mg/m3)	USCS	Soil Description		Well Construction Diagram	
5 +						SM				
10				0.0	0.000					

Northing (ft): 431834.99 Easting (ft): 861545.73 Elevation (ft): 8.87 Total Depth: 47.75 Ft			Drille Meth Cons		water Protectotary RSONS	NS		Datum: NAVD88 Coordinate System: NAD 1983 State Plane Georgia East / FIPS 10	
Depth Ft	Recov	Sample ID	Blow Count	PID (ppm)	Mercury (mg/m3)	USCS	Soil Description		Well Construction Diagram
20				0.0	0.000				

Ho	ne	ym	Page 3 of 4		Site Name: _{LCP} Chemicals Site, E Boring No: SW-76 Diameter: 8 Inches Date: 09/02/2014 - 09/03/2014	Brunsw	ick GA
Northing (ft): 43183 Easting (ft): 861545 Elevation (ft): 8.87 Total Depth: 47.75 I	Driller: Groundwater Method: Mud Rotary Consultant: PARSON Project No: 448517					Datum: NAVD88 Coordinate System: NAD 1983 State Plan Georgia East / FIPS	
Depth Sample	e Blow Count	PID (ppm)	Mercury (mg/m3)		O-U D		Well Constructio Diagram
35		0.0	0.000				
		0.0	0.000				

Easting Elevatio	l l l l l l l l l l l l l l l l l l l			Meth Cons	er: Groundv od: Mud R sultant: PA ect No: 448	totary RSONS	rotection Inc	Coo	Datum: NAVD88 Coordinate System: NAD 1983 State Plane Georgia East / FIPS 10	
Depth	BCOV		1.000	PID	Mercury				Well Construction	
Ft 45	Re	ID	Count 6-12-13-48	(ppm) 0.0	(mg/m3) 0.000	Code SM	Soil Description Wet, gray , fine-medium SAND, little she silt. Shells increasing with depth.	lls, trace	Diagram	
*			40-42-60-60/0				As above.			
47.75			H	0.0	0.000 I to 5 ft, Refus	SM	5 ft. Well set at 47.75 ft. (3 ft of screen).			
47.75			H				5 ft. Well set at 47.75 ft. (3 ft of screen).			
47.75			H				5 ft. Well set at 47.75 ft. (3 ft of screen).			

Easting Elevatio) (ft): on (ft)	431915.0 861545.7): 8.75 48.3 Ft		Meth Cons	r: Ground od: Mud R sultant: Mu oct No: 448	Rotary Itch Asso	otection Inc	Datum: NAVD88 Coordinate System: NAD 1983 State Plane Georgia East / FIPS 10
Depth Ft	Recov	Sample ID	Blow Count	PID (ppm)	Mercury (mg/m3)		Soil Description Hand cleared to 5 feet. Brown organic soil and w road packed GRAVEL over gray-brown fine-med SAND, trace silt. 5-44 ft. pH=8, VOCs= 0.0, Hg=	um
5 + +						GP-SM		
10				0.0	0.000			

BORIN			le,	yw	Page 2 of 4	E	ite Name: _{LCP} Chemicals Sit oring No: SW-77 iameter: 8 Inches ate: 08/26/2014	e, Brunsw	ick GA		
Easting Elevatio	(ft): 8 on (ft)	431915.0 361545.7 : 8.75 48.3 Ft		Meth Cons	er: Groundv od: Mud R sultant: Mu ect No: 448	totary tch Ass	otection Inc	Coor	Datum: NAVD88 Coordinate System: NAD 1983 State Plane Georgia East / FIPS 100		
Depth Ft	Recov	Sample ID	Blow Count	PID (ppm)	Well Construction Diagram						
20 +				0.0	0.000						

BORING LOG	ey		Page 3 of 4		Site Name: _{LCP} Chemicals Site, Boring No: SW-77 Diameter: 8 Inches Date: 08/26/2014	Brunswi	ck GA	
Northing (ft): 431915.06 Easting (ft): 861545.71 Elevation (ft): 8.75 Total Depth: 48.3 Ft		Meth Cons	r: Groundv od: Mud R ultant: Mu ct No: 448	otary tch Ass	rotection Inc	Datum: NAVD88 Coordinate System: NAD 1983 State Pla Georgia East / FIPS		
	Blow Count	PID Mercury US (ppm) (mg/m3) Co			0.10 1.0	Well Constructio Diagram		
35		0.0	0.000					
40								

Northing (ft): 431915.06 Driller: Groundwater Protection Inc Datum: NAVD88 Easting (ft): 861545.71 Method: Mud Rotary Consultant: Mutch Associates Dordinate System: Total Depth: 48.3 Ft Project No: 448517 Soil Description Construction Diagram Pepth § Sample Blow PID Mercury USCS Soil Description Construction Diagram 45 50:e4 0.0 0.000 SM shells. Mud rotary 45-46 ft. Image: SAMD, trace sill, trace-little Image: SAMD, t				eyv	Page 4 of 4	E	Site Name: LCP Chemicals Site, Brunswick GA Boring No: SW-77 Diameter: 8 Inches Date: 08/26/2014			
Depth g Sample Blow PTD Mercury 0303 Ft m ID Count (ppm) (mg/m3) Code Soil Description Construction Diagram 45 50-64- 0.0 0.000 SM Gray fine-medium SAND, trace silt, trace little shells. Mud rotary 45-46 ft. Image: Soil Description Image: Soil Description 45 51-48-58- 0.0 0.000 SM Gray fine-medium SAND, trace silt, trace-little shells. Image: Soil Description Image: Soil Description 40.0 50/4 0.0 0.000 SM Gray fine-medium SAND, trace silt, trace-little Image: Soil Description 40.0 50/4 0.0 0.000 SM Gray fine-medium SAND, trace silt, trace-little Image: Soil Description 40.0 50/4 0.0 0.000 SM Gray fine-medium SAND. Sandstone bedrock in tip of speon.	Easting Elevation	g (ft): 8615 on (ft): 8.7	45.71 5	Meti Con	nod: Mud F sultant: Mu	Rotary Itch Ass		Coo	Coordinate System: NAD 1983 State Plane Georgia East / FIPS 10	
50-64- 0,0 0,000 SM shells. Mud rotary 45-46 ft. 51-48-58- 0.0 0.000 SM Gray tine-medium SAND, trace silt, trace-little 51-48-58- 0.0 0.000 SM SM	- C - C - I	Sam Sam	10 IN 10 IN		1.1.1.1.1.1.1.1.1		Soil Description		Construction	
51-48-58- 0.0 0.000 SM Gray tine-medium SAND, trace silt, trace-little 51-48-58- 0.0 0.000 SM 50/4 0.0 0.000 SM-BR Gray,fine-medium SAND. Sandstone bedrock in tip of spon.	45		50-	4- 0.0	0.000	SM	Gray fine-medium SAND, trace silt, trace litt shells. Mud rotary 45-46 ft.	tle		
	-		51-44	-58- 0.0	0.000	SM	Gray tine-medium SAND, trace silt, trace-lit shells.	tle		
Hand cleared to 5 ft, Refusal at 48.3 ft Well set at 48 ft. (2 ft. of screen).	19 2		50	1 A				ck in tip of s	spoon.	

Easting Elevati	g (ft): on (ft	: 431394.0 861617.0): 10.10 : 50.0 Ft		Meth Cons	er: Ground od: Mud R sultant: Mu ect No: 448	totary	rotection Inc ociates	Datum: NAVD88 Coordinate System: NAD 1983 State Plane Georgia East / FIPS 100	
Depth Ft	Recov	Sample ID	Blow Count	PID (ppm)	Mercury (mg/m3)	USCS	Soil Description		Well Construction Diagram
5 +						SM			
10				0.0	0.000				

Easting Elevation	(ft): on (ft)	: 431394.(861617.0)): 10.10 50.0 Ft		Meth Cons	od: Mud R sultant: Mu	tch Associa		Coor	Datum: NAVD88 Coordinate System: NAD 1983 State Plane Georgia East / FIPS 10		
Depth & Sample Blow			Blow Count	Project No: 448517 PID Mercury USCS (ppm) (mg/m3) Code Soil Description					Well Construction Diagram		
20 +				0.0	0.000						

			le	yM	Page 3 of 4	E	Site Name: _{LCP} Chemicals Site, Boring No: SW-78 Diameter: 8 Inches Date: 09/04/2014 - 09/05/2014	Brunsw	ick GA
Eastin Eleva	ng (ft): ition (f): 431394. : 861617.0 t): 10.10 h: 50.0 Ft		Meth Cons	er: Ground od: Mud R sultant: Mu ect No: 448	totary tch Ass	rotection Inc ociates	Coor NAD	m: NAVD88 dinate System 1983 State Pla gia East / FIPS
Depth Ft	Recov	Sample ID	Blow Count	PID (ppm)	Mercury (mg/m3)	1.	Soil Description		Well Construct Diagrar
35 -				0.0	0.000				
45			14-17-23-21	0.0	0.000	SM	Gray, fine-medium SAND, trace silt 44-45.5 fl Gray silt and clay , little sand 45.5-46 ft.		

			le	yw	Page 4 of 4		Site Name: _{LCP} Chemicals Site, Boring No: SW-78 Diameter: 8 Inches Date: 09/04/2014 - 09/05/2014	Brunswi	ck GA		
Easting Elevation	Northing (ft): 431394.06 Easting (ft): 861617.02 Elevation (ft): 10.10 Fotal Depth: 50.0 Ft Depth & Sample Blow Ft & UD Count				r: Groundv od: Mud R sultant: Mu oct No: 448	otary tch As	Protection Inc	Coord NAD	Datum: NAVD88 Coordinate System: NAD 1983 State Plane Georgia East / FIPS 100		
Depth	BCOV	Contract of the	1.000	PID	Mercury	USCS	Call Decedetion		Well Construction Diagram		
Ft 45	Å	ID	Count	(ppm)	(mg/m3)	Code	Gray, fine-medium SAND, trace silt 44-45.5	ft.			
+			14-17-23-21	0.0	0.000	SM	Gray silt and clay , little sand 45.5-46 ft. As above 46-46.5 ft. 46.5 -47 ft. Gray fine-m SAND, SILT, and CLAY. 47-48 ft. Gray fine t SAND, trace silt.	edium to medium			
			13-25-35-50	0.0	0.000	SM	Gray fine-medium SAND, trace silt, trace she trace mudstone bedrock in bottom of sample	ells, 9.			

Easting Elevation	(ft): on (ft)	431482.4 861619.3 : 9.90 51.7 Ft		Meth Cons	er: Groundv od: Mud R sultant: Mu ect No: 448	totary	rotection Inc ociates	Datum: NAVD88 Coordinate System: NAD 1983 State Plane Georgia East / FIPS 100	
Depth Ft	Recov	Sample ID	Blow Count	PID (ppm)	Mercury (mg/m3)	USCS Code	Soil Description		Well Construction Diagram
5						SM			
10 +				0.0	0.000				

	(ft): 80 on (ft):			Meth Cons	r: Ground od: Mud R sultant: Mu oct No: 448	Rotary Itch Ass		Coor NAD	Datum: NAVD88 Coordinate System: NAD 1983 State Plane Georgia East / FIPS 100	
Depth Ft	Recov	Sample ID	Blow Count	PID (ppm)	Mercury (mg/m3)	1.1.1.1.1.1.1	Soil Description		Well Construction Diagram	
20 -				0.0	0.000					

BORIN			le,	M	Page 3 of 4	Bo	Name: LCP Chemicals Site, ing No: SW-79 meter: 8 Inches e: 09/04/2014	Brunswi	CK GA	
1.1	(ft): 8 n (ft):			Meth Cons	r: Groundv od: Mud R sultant: Mu oct No: 448	otary tch Asso		Datum: NAVD88 Coordinate System: NAD 1983 State Plane Georgia East / FIPS 10		
Depth Ft 30	Ft 🕰 ID Count				Mercury (mg/m3)		Well Construction Diagram			
				0.0	0.000					

Easting Elevati	g (ft): (on (ft)	431482.4 861619.3 : 9.90 51.7 Ft		Meth Cons	r: Groundv od: Mud R sultant: Mu ect No: 448	totary tch Ass	rotection Inc	Coordinate		
Depth	Recov	Sample	Blow	PID	Mercury		Call Decedeties		Well Construction Diagram	
45	R	ID	Count 8-8-11-17	(ppm) 0.0	(mg/m3) 0.000	Code	Gray SILT and CLAY, little fine to medium sand. Lower sample gray fine-medium SAND, trace silt			
+			12-18-21-22	0.0	0.000	SM	Gray, fine-medium SAND, trace silt.			
50 —			12-17-18-17	0.0	0.000	SM	As above.			
Ť			30-50/2	0.0	0.000	BR	Sand as above. 1 inch of variably cemented SAN	DSTON	E.	

Easting Elevation	(ft): on (ft)	: 431555.6 861614.3): 10.23 51.5 Ft		Meth Cons	er: Groundv od: Mud R sultant: Mu ect No: 448	totary tch Ass	rotection Inc	Coord NAD	Datum: NAVD88 Coordinate System: NAD 1983 State Plane Georgia East / FIPS 100	
Depth Ft	Recov	Sample ID	Blow Count	PID (ppm)	Mercury (mg/m3)	USCS Code	Soil Description		Well Construction Diagram	
5						SM				
10				0.0	0.000					

Easting Elevation) (ft): on (ft)	431555.6 861614.3): 10.23 51.5 Ft		Meth Cons	od: Mud R	tch Associates		Datum: NAVD88 Coordinate System: NAD 1983 State Plane Georgia East / FIPS 100		
Depth Ft	Recov	Sample ID	Blow Count	PID (ppm)	Mercury (mg/m3)	USCS	Soil Description		Well Construction Diagram	
20 -				0.0	0.000					

	(ft): 8 on (ft):			Meth Cons	od: Mud R	tch Associates		Coor	Datum: NAVD88 Coordinate System: NAD 1983 State Plane Georgia East / FIPS 10	
Depth Ft	Recov	Sample ID	Blow Count	PID (ppm)	Mercury (mg/m3)	1	Soil Description		Wəll Construction Diagram	
40 -				0.0	0.000					

BORIN			Ie,	yw	Page 4 of 4	1	Site Name: _{LCP} Chemicals Site, Boring No: SW-80 Diameter: 8 Inches Date: 09/05/2014	Brunsw	ick GA	
Easting Elevatio	(ft): on (ft)	431555.0 861614.3 10.23 51.5 Ft		Meth Cons	r: Groundv od: Mud R sultant: Mu oct No: 448	totary tch Ass	rotection Inc	Coor NAD	um: NAVD88 rdinate System:) 1983 State Plane orgia East / FIPS 100	
Depth Ft	Recov	Sample ID	Blow Count	PID (ppm)	Mercury (mg/m3)	USCS Code	0-11 D		Well Construction Diagram	
45			25-26-34-34	0.0	0.000	SM	Gray, fine to medium SAND, trace silt, trace s	hells.		
50 -			17-20-29-27	0.0	0,000	SM	As above			
50			17-25-50/6	0.0	0.000	SM	As above, trace mudstone near bottom of san	nple.		
51.5			H	and cleared	to 5 ft, Refus	al at 51.5	i ft. Well set at 51.5 ft. (2 ft of screen).		4+++ 4+++	

Northin Easting Elevatio	g (ft): (ft): 8 (ft)	431634.8 361617.11 : 9.92 50.8 Ft	32	Meth Cons	r: Groundv od: Mud R sultant: Mu oct No: 448	totary tch Ass	rotection Inc ociates	Datum: NAVD88 Coordinate System: NAD 1983 State Plane Georgia East / FIPS 1007		
Depth Ft	Recov	Sample ID	Blow Count	PID (ppm)	Mercury (mg/m3)		Soil Description		Well Construction Diagram	
5						SM				
10				0.0	0.000					

Northin Easting Elevatio	g (ft): (ft): on (ft)	431634.8 861617.1	82	Drille Meth Cons	od: Mud R	water Prote totary tch Associa		Datum: NAVD88 Coordinate System: NAD 1983 State Plane Georgia East / FIPS 100		
Depth Ft	Recov	Sample ID	Blow Count	PID (ppm)	Mercury (mg/m3)	USCS	Soil Description		Well Construction Diagram	
20				0.0	0.000					

Northing	g (ft): 4 (ft): 80 on (ft):	131634.8 51617.18 9.92	32	Drille Meth Cons	r: Groundwod: Mud Rultant: Mu ct No: 448	water P totary tch Ass	oate: 09/05/2014 - 09/06/2014	Datu Coo NAE	Datum: NAVD88 Coordinate System: NAD 1983 State Plane Georgia East / FIPS 100	
Depth Ft	Recov	Sample ID	Blow Count	PID (ppm)	Mercury (mg/m3)	10.000	Soil Description		Well Construction Diagram	
40 +				0.0	0.000					

			le į	M	Page 4 of 4	B	Site Name: _{LCP} Chemicals Site, Brunswick GA Boring No: SW-81 Diameter: 8 Inches Date: 09/05/2014 - 09/06/2014				
Easting Elevation) (ft): on (ft	: 431634.) 861617.1): 9.92 50.8 Ft		Meth Cons	er: Groundv od: Mud R sultant: Mu ect No: 448	totary tch Asso	otection Inc	Coo NAE	Datum: NAVD88 Coordinate System: NAD 1983 State Plane Georgia East / FIPS 100		
Depth Ft	Recov	Sample ID	Blow Count	PID (ppm)	Mercury (mg/m3)	USCS Code	Soil Description		Well Construction Diagram		
45			50+	0.0 0.0	0.000	SM	Gray, fine to medium SAND, trace silt, trace Very dense at bottom. No recovery.	shells.			
-			14-13-16-17	0.0	0,000	SM	Gray, fine to medium SAND, trace silt, trace	shells.			
50 —			20-50/4	0.0	0.000	SM-BR	Gray fine to medium SAND, trace silt, trace Bottom 4 inches variably cemented SANDS	shells. TONE.	1000 0000 00000 10000 00000 444000 46000		

Easting Elevation	g (ft): on (ft	: 431714. 861613.4): 9.72 : 51.1 Ft		Meth Cons	er: Ground od: Mud R sultant: Mu ect No: 448	Rotary Itch Ass	rotection Inc	Datum: NAVD88 Coordinate System: NAD 1983 State Plane Georgia East / FIPS 10	
Depth Ft	Recov	Sample ID	Blow Count	PID (ppm)	Mercury (mg/m3)	USCS	Soil Description		Well Construction Diagram
5 +						SM			
10 -				0.0	0.000	2			

BORIN			le,	yw	Page 2 of 4	В	te Name: _{LCP} Chemicals Sit pring No: SW-82 ameter: 8 Inches ate: 09/06/2014	e, Brunswi	ick GA		
Easting Elevatio	(ft): 8	431714.4 361613.4 : 9.72 51.1 Ft		Meth Cons	er: Ground od: Mud R sultant: Mu ect No: 448	totary	tection Inc	Coor	Datum: NAVD88 Coordinate System: NAD 1983 State Plane Georgia East / FIPS 100		
Depth Ft	Recov	Sample ID	Blow Count	PID (ppm)	Mercury (mg/m3)	10.000	Soil Description		Well Construction Diagram		
20				0.0	0.000						
30		_	_								

Easting Elevation	g (ft): on (ft	: 431714. 861613.4): 9.72 : 51.1 Ft		Meth Cons	r: Ground od: Mud R sultant: Mu ect No: 448	totary	otection Inc	Datum: NAVD88 Coordinate System: NAD 1983 State Plane Georgia East / FIPS 100		
Depth Ft	Recov	Sample ID	Blow Count	PID (ppm)	Mercury (mg/m3)	10.001	Soil Description	Well Construction Diagram		
35 +				0.0	0.000					

	H	or	lej	M	vel		Boring No: SW-82 Diameter: 8 Inches Date: 09/06/2014		
Easting Elevation	(ft): 8 on (ft)	431714. 361613.4 : 9.72 51.1 Ft		Meth Cons	r: Groundv od: Mud R sultant: Mut ect No: 448	otary tch Ass	rotection Inc	Coordina NAD 198	NAVD88 ite System: 3 State Plan East / FIPS 1
Depth Ft 45	Recov	Sample ID	Blow Count	PID (ppm)	Mercury (mg/m3)	USCS Code	Soil Description Gray, fine to medium SAND, trace silt, trace she		Well Construction Diagram
÷			9-10-50/6	0.0 0.0	0.000	SM	As above		
÷			33-23-25-29	0.0	0,000	SM	As above		
50 —			34-X-50/1	0.0	0.000	SM	As above. Bottom 2 inches variably cemented S	SANDSTONE.	• • • • • • • • • • • • • • • • • • •

Northing (ft): 431795.22 Easting (ft): 861619.54 Elevation (ft): 9.32 Total Depth: 45.5 Ft			Driller: Groundwater Method: Mud Rotary Consultant: Mutch A Project No: 448517			ary n Associates		Datum: NAVD88 Coordinate System: NAD 1983 State Plane Georgia East / FIPS 100	
Depth Ft	Recov	Sample ID	Blow Count	PID (ppm)	Mercury (mg/m3)	USCS Code	Soil Description		Well Construction Diagram
5						SM			
10				0.0	0.000				

Easting Elevation	g (ft): on (ft)	431795.2 861619.5 9:32 45.5 Ft		Meth Cons	od: Mud R	tch Associa		Coor	Datum: NAVD88 Coordinate System: NAD 1983 State Plane Georgia East / FIPS 100	
Depth Ft	Recov	Sample ID	Blow Count	PID (ppm)	Mercury (mg/m3)	USCS	Soil Description		Well Construction Diagram	
20 -				0.0	0.000					

BORIN			le	yM	Page 3 of 4	E	ite Name: _{LCP} Chemicals Site, oring No: SW-83 iameter: 8 Inches eate: 09/06/2014	Brunsw	ick GA
Easting Elevatio	(ft): n (ft)	: 431795.2 861619.5): 9.32 45.5 Ft		Meth Cons	er: Groundv ood: Mud R sultant: Mu ect No: 448	totary tch Ass	otection Inc	Coor	m : NAVD88 dinate System: 1983 State Plan rgia East / FIPS 1
Depth Ft	Recov	Sample ID	Blow Count	PID (ppm)	Mercury (mg/m3)		Soil Description		Well Construction Diagram
35 + 40 + 40 +				0.0	0.000				
45			4-50+-50/6	0.0	0.000	SM-BR	Gray, fine to medium SAND, trace silt, trace very dense. Trace of SANDSTONE in shoe.	shells,	

BORING L		le,	M	Page 4 of 4		Site Name: _{LCP} Chemicals Site, Brunswick GA Boring No: SW-83 Diameter: 8 Inches Date: 09/06/2014			
Northing (ft) Easting (ft): Elevation (ft Total Depth:	861619.5): 9.32		Meth Cons	er: Ground nod: Mud F sultant: Mu ect No: 448	Rotary Itch As			Datum: NAVD88 Coordinate System: NAD 1983 State Plane Georgia East / FIPS 10	
Depth og Ft 2	Sample ID	Blow Count	PID (ppm)	Mercury (mg/m3)	10.040	Call Department	lion		Well Construction Diagram

Easting Elevatio	g (ft): (on (ft)	431875.6 861616.18 : 9.13 48.5 Ft		Driller: Groundwater Method: Mud Rotary Consultant: Mutch A Project No: 448517				Datum: NAVD88 Coordinate System: NAD 1983 State Plane Georgia East / FIPS 100	
Depth	Recov	Sample ID	Blow	PID	Mercury	USCS	Soil Description		Well Construction Diagram
Ft 0	Ľ		Count	(ppm)	(mg/m3)	Code SM	White road gravel, little brown organic soil.		
5						SM	Dark gray, fine-medium SAND, trace silt. Drilling with mud rotary. pH= 7		
10 +				0.0	0.000				

BORIN			le	yw	Page 2 of 4	В	ite Name: _{LCP} Chemicals Site oring No: SW-84 iameter: 8 Inches ate: 08/26/2014	e, Brunswi	ick GA	
Easting Elevatio	(ft): 8 on (ft)	431875.6 361616.1 : 9.13 48.5 Ft		Meth Cons	r: Groundv od: Mud R sultant: Mu ect No: 448	totary tch Asso	otection Inc	Coor NAD	Datum: NAVD88 Coordinate System: NAD 1983 State Plane Georgia East / FIPS 100	
Depth Ft	Recov	Sample ID	Blow Count	PID (ppm)	Mercury (mg/m3)	1.1.1.1.1.1.1	Soil Description		Well Construction Diagram	
20				0.0	0.000					

ł	GLOG	le	yw	Page 3 of 4		Site Name: _{LCP} Chemicals Sit Boring No: SW-84 Diameter: 8 Inches Date: 08/26/2014	te, Brunsw	ick GA	
Easting Elevation	(ft): 431875 (ft): 861616. n (ft): 9.13 pth: 48.5 Ft		Driller: Groundwater Method: Mud Rotary Consultant: Mutch As Project No: 448517				Coor	Datum: NAVD88 Coordinate System: NAD 1983 State Plane Georgia East / FIPS 1	
Depth Ft	Sample	Blow Count	PID (ppm)	Mercury (mg/m3)		O-II D		Well Construction Diagram	
35 -			0.0	0.000					
-									

	NG LOG	le	M	Page 4 of 4	E	Site Name: _{LCP} Chemicals Site, Brunswick GA Boring No: SW-84 Diameter: 8 Inches Date: 08/26/2014			
Easting Elevation	g (ft): 431875.0 g (ft): 861616.1 on (ft): 9.13 eepth: 48.5 Ft		Meth Cons	od: Mud R	totary tch Ass	Associates		Datum: NAVD88 Coordinate System: NAD 1983 State Plane Georgia East / FIPS 100	
Depth	Sample	Blow	PID	Mercury	USCS	Soil Description		Well Construction Diagram	
Ft 45	αŭ ID	Count 4-8-12-17	(ppm) 0.0	(mg/m3) 0.000	Code	Gray fine-medium SAND, little silty clay, trace silt.			
Ŧ		12-50+	0.0	0.000	SM	Gray fine-medium SAND, trace silt. Mud rotary 48 feet.	to		
48.5		50/6	0.0	0.000	SM	Gray fine-medium SAND, trace silt, trace shells Piece of bedrock in tip of split spoon.	5.		

Northing (ft): 431954.78 Easting (ft): 861614.76 Elevation (ft): 9.15 Total Depth: 49.6 Ft			Driller: Groundwater Method: Mud Rotary Consultant: PARSOI Project No: 448517			ary SONS		Datum: NAVD88 Coordinate System: NAD 1983 State Plane Georgia East / FIPS 100	
Depth Ft	Recov	Sample ID	Blow Count	PID (ppm)	Mercury (mg/m3)		Soil Description		Well Construction Diagram
5						SM	feet. 5-20 feet pH=7, VOCs= 0.0, Hg= NÁ 20-40 feet pH=7, VOCs= 0.0, Hg= NA		
10				0.0					

BORING LOG	
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Page 2 of 4

Honeywell

Site Name: LCP Chemicals Site, Brunswick GA Boring No: SW-85 Diameter: 8 Inches Date: 08/26/2014

Northing (ft): 431954.78 Easting (ft): 861614.76 Elevation (ft): 9.15 Total Depth: 49.6 Ft				Meth Cons	r: Groundv od: Mud R sultant: PA ect No: 448	RSONS	Datum: NAVD88 Coordinate System: NAD 1983 State Plane Georgia East / FIPS 100		
Depth Ft 15	Recov	Sample ID	Blow Count	PID (ppm)	Mercury (mg/m3)		Soil Description		Well Construction Diagram
-				0.0					
-									
25				0.0					
₀ ⊥									

BORING LOG				yM	Page 3 of 4	E	Site Name: _{LCP} Chemicals Site, Brunswick GA Boring No: SW-85 Diameter: 8 Inches Date: 08/26/2014			
Northing (ft): 431954.78 Easting (ft): 861614.76 Elevation (ft): 9.15 Total Depth: 49.6 Ft				Driller: Groundwater F Method: Mud Rotary Consultant: PARSON Project No: 448517					Datum: NAVD88 Coordinate System: NAD 1983 State Plan Georgia East / FIPS	
Dep Ft	th	Recov	Sample ID	Blow Count	PID (ppm)	Mercury (mg/m3)	1.1.1.1.1.1.1.1	Soil Description	-	Well Constructi Diagram
35 -					0.0					
40 -	*					1				

BORING LOG Page 4 of 4 Honeywell							Site Name: _{LCP} Chemicals Site, Brunswick GA Boring No: SW-85 Diameter: 8 Inches Date: 08/26/2014			
Northing (ft): 431954.78 Easting (ft): 861614.76 Elevation (ft): 9.15 Total Depth: 49.6 Ft				Driller: Groundwater F Method: Mud Rotary Consultant: PARSON Project No: 448517					Datum: NAVD88 Coordinate System: NAD 1983 State Plane Georgia East / FIPS 10	
Depth Ft	Recov	Sample ID	Blow Count	PID (ppm)	Mercury (mg/m3)	10.000 201	Soil Description		Well Construction Diagram	
45	L.		6-6-8-15	0.0	(ing/ino/	SM	Wet, greenish gray, fine-medium SAND over der fine SAND, little silt, little clay, trace shells.	nse		
			7-8-8-13	0.0		SM	Wet, greenish gray, fine-medium SAND, trace-lit shells, trace silt. pH=7.5	tle		
+			20-33-28-50/1	0.0		SM	As above.			