Quanta Resource Corporation Superfund Site
New Jersey
Soil Solidification/Stabilization Bench Scale Treatability Study
SH-0460

Final Report

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1.0 INTRODUCTION

KEMRON Environmental Services, Inc. (KEMRON) is pleased to present Envirocon with this report of the stabilization bench scale treatability study performed on materials sampled from the Quanta Resource Corporation Superfund Site (the Site), located in Edgewater, New Jersey. Testing was conducted in accordance with information provided to KEMRON by Envirocon in a Request For Proposal (RFP) dated March 13, 2012, and subsequent conversations, change orders and weekly status conferences. The scope of work for the study evolved significantly throughout the course of the study and included a considerable increase in testing from that originally planned.

The treatability study was initially designed to evaluate potential reagents and reagent addition rates capable of reducing the leachability of Arsenic (As), and Total Petroleum Hydrocarbons (TPHs) by ninety (90) percent (%). Additional treatment criteria included the improvement of the physical characteristics of the site soils, specifically achieving a treated Unconfined Compressive Strength (UCS) greater than forty (40) pounds per square inch (psi) and hydraulic conductivity of less than $1x\ 10^{-6}$ centimeters per second (cm/sec). For the purposes of this report, hydraulic conductivity and permeability should be considered synonymous.

The site was identified to contain three primary zones or areas of impact. The “N” zone was identified as containing soils impacted with Non-Aqueous Phase Liquid (NAPL),the “A” zone soils contain elevated concentrations of arsenic, and the “A-N” zone soils exhibit both NAPL and elevated arsenic, with the majority of the site being comprised of the NAPL impacted or “N” zone soils. The initial mixture designs were based on previous testing information that was provided by Envirocon, and included the use of Type I Portland cement (PC) and Ground Granulated Blast Furnace Slag (GGBFS) for the NAPL only soils. Mixtures applied to the elevated arsenic soils included the use of PC, and GGBFS combined with sodium bisulfide and EnviroBlend HX, a proprietary reagent manufactured by Premier Magnesia intended for the reduction of arsenic leaching.

Throughout the study, the scope of work for testing was significantly modified to provide additional information regarding the effectiveness of alternative reagents. Supplementary testing was also performed to evaluate the American Nuclear Society (ANS) 16.1 leaching method which was determined to be more indicative of actual post treatment conditions.

The following sections of this report provide the methodology and protocols used as well as relevant results of testing performed on the untreated and treated site materials. This report consists of modified or abbreviated tables embedded within the text to assist the reader in evaluating significant findings. Complete summary tables are included at the end of text in the Tables Section. The reader should review the information in this report in its entirety, included the complete summary Tables and Appendix.

2.0 UNTREATED WASTE RECIEPT

KEMRON received eleven 5-gallon containers of soil from the site in November 2012. The following is a presentation of the materials received for the study.

Location ID	Date Collected	Depth	Sample Container
NAPL Areas			
N-1A-1012	12-Oct	7-13’	5 Gallon Bucket
N-1B-1012	12-Oct	15-17.5’	5 Gallon Bucket
N-2A-1012	12-Oct	7-13’	5 Gallon Bucket
N-2B-1012	24-Oct	15-18’	5 Gallon Bucket
N-3A-1012	24-Oct	0-5’	5 Gallon Bucket
N-4A-1012	8-Oct	5-12’	5 Gallon Bucket
NAPL/Arsenic Comingled Areas			
AN-1A-1012	11-Oct	15-22’	5 Gallon Bucket
AN-2A-1012	12-Oct	0-8’	5 Gallon Bucket
AN-3-1012	25-Oct	14-21’	5 Gallon Bucket
Arsenic Areas			
A-1A-1012	11-Oct	1-2’	5 Gallon Bucket
A-2A-1012	9-Oct	5-16’	5 Gallon Bucket

These samples represented soil materials from the three zones at the site. Immediately following sample receipt, KEMRON logged the materials into a sample tracking database and placed the materials in secure temperature controlled storage maintained at 4˚ Celsius (˚C). A copy of the material Chain of Custody Record (COC) is included in Appendix A.

3.0 UNTREATED SOIL PREPARATION AND CHARACTERIZATION

Based on visual and olfactory observations, and baseline analytical testing conducted by CH2M Hill, KEMRON prepared 5 distinct materials for the study. These materials were judged to adequately represent the various conditions and concentrations in the areas of concern at the site. The 5 materials included:

- N1/N3 Composite – Prepared by compositing the N-1A, N-1B and N-3A site materials (NAPL Zone Material)
- N2 Composite – Prepared by compositing the N-2A and N-2B site materials (NAPL Zone Material)
- N4-A – The N-4A-1012 only material (NAPL Zone Material)
- A-2A – The A-2A-1012 only material (Arsenic Zone Material)
- AN-2A – The AN-2A-1012 only material (Arsenic and NAPL Zone Material)

Preparation of the two composite materials was conducted by combining the appropriate site soils then homogenizing until visually uniform. The remaining soils used in the study were individually homogenized. Homogenization was conducted on each material type by placing the material from the original shipping containers into pre-cleaned plastic mixing pans. The samples were gently blended by hand using stainless steel utensils until visually homogenous. Any large pieces or agglomerated material were broken down into representative particle sizes or removed. Aggregates or particles greater than 0.5 inches were screened from the material and not used in the study. Immediately following homogenization, the materials were placed into labeled, clean containers.

KEMRON performed characterization testing on each of the untreated materials for the study to establish a baseline of contamination and to ensure that the materials are similar to that anticipated at the site. The following physical and chemical properties testing were performed on each of the untreated materials:

PARAMETER	METHOD
Moisture Content	ASTM D 2216
Particle Size Analysis	ASTM D 422
Material pH	EPA 9045
Total Arsenic	EPA Method 6010
Total TPH (GRO and DRO)	EPA Method 8015
SPLP Arsenic	EPA Methods 1312/6010
SPLP TPH (GRO and DRO)	EPA Methods 1312/8015

The results of untreated material characterization testing are presented in Tables 1 and 2, which are summarized below. Complete tabulated data can be found in the Tables section of this report.

TABLE 1 – Untreated Material Physical Properties Testing Results

TESTING PARAMETER	TEST METHOD	UNIT	SAMPLE				
			N1/N3 Composite	N2 Composite	N4-A	A-2A	AN-2A
Moisture Content	ASTM D2216						
Moisture		%	25.22	38.44	51.40	29.31	44.20
Percent Solids		%	79.89	72.26	66.06	77.33	69.43
Particle Size Distribution	ASTM D422						
Gravel		%	9.6	33.4	22.9	17.9	14.0
Sand		%	80.6	56.2	48.8	62.9	49.6
Silt		%	6.6	7.4	24.3	17.0	30.0
Clay		%	3.2	3.0	4.0	2.2	6.4
Material pH	EPA 9045	s.u.	6.31	7.02	9.30	6.76	6.22
Sample Description	USCS D2487		Very dark grayish brown well-graded sand with silt. Light to moderate NAPL present	Black well-graded sand with silt and gravel. Light to moderate NAPL present	Dark gray silty sand with gravel. Very light NAPL present	Very dark grayish brown silty sand with gravel. No NAPL observed	Dark reddish brown silty sand. No NAPLP observe d
Sample Classification	USCS D2487		SW-SM	SW-SM	SM	SM	SM

Notes
% = Percent
pcf = pounds per cubic foot
Sample descriptions based on the Unified Classification System.
Sample color determined by the Munsell Soil Color Charts.
s.u. - Standard Units

Review of the data presented in TABLE 1 shows that the untreated test samples exhibited variability between the different materials types, specifically in the moisture content and grain or particle size distribution. Complete untreated physical properties data sheets are included in Appendix B of this report

TABLE 2 – Untreated Material Analytical Results

TESTING PARAMETER	SAMPLE				
	N1/N3 Composite	N2 Composite	N4-A	A-2A	AN-2A
	Result	Result	Result	Result	Result
Total Arsenic (6020A) ug/Kg					
Arsenic	25,800	6,730	3,880	716,000	924,000
Total TPH (8015C) ug/Kg					
Diesel Range Organics	11,900,000	30,200,000	90,200,000	1,410,000	3,330,000
Gasoline Range Organics	500,000	338,000	1,090,000	14,800	22,200
SPLP Arsenic (1312/6020A) ug/L					
Arsenic	127	27.7	3.25	2,590	661
SPLP TPH (1312/8015C) ug/L					
Diesel Range Organics	34.60	23.20	115	3.58	3.83
Gasoline Range Organics	8.85	4.13	22.20	0.50	0.36

ug/Kg - Micrograms per kilogram
ug/L - Micrograms per liter

Table 2 shows that all five of the untreated test samples exhibited varying concentrations of arsenic and TPHs on total mass basis, with higher concentrations of arsenic displayed in the arsenic area sample (A-2A), and comingled arsenic and NAPL zone sample (AN-2A). The highest TPH values were found in the NAPL-only zone materials (N1/N3 Composite, N2 Composite, and N4-A).These results indicate that the samples were consistent with the zones identified from the site. Complete analytical data reports for analyses performed on the untreated site materials are included in Appendix C.

4.0 STABILIZATION TREATMENT

4.1 Preliminary Stabilization Evaluations

After evaluating the untreated characterizations, KEMRON and Envirocon presented mix design recommendations to CH2M Hill. These preliminary mix designs were based on Envirocon's experience with similar ISS MGP remediation sites, KEMRON's experience with similar site materials and contaminants, and CH2M Hills input. The preliminary stabilization testing of the site materials was performed using mixture

designs provided by Envirocon. The following table is a summary of the mixture designs prepared by KEMRON.

TABLE 3A- Preliminary Mixture Designs

Kemron Sample Number	Untreated Material Type	Reagent Type	Reagent Addition % by Wet Soil wt.	Water Addition % by Reagent wt.
0460-001	N1/N3 Composite	Lafarge Type I Cement/Lafarge Newcem Slag Cement	2.0/8.0	100
0460-002	N1/N3 Composite	Lafarge Type I Cement/Lafarge Newcem Slag Cement	3.0/12.0	100
0460-003	N1/N3 Composite	Lafarge Type I Cement/Lafarge Newcem Slag Cement	4.0/16.0	100
0460-004	N2 Composite	Lafarge Type I Cement/Lafarge Newcem Slag Cement	2.0/8.0	100
0460-005	N2 Composite	Lafarge Type I Cement/Lafarge Newcem Slag Cement	4.0/16.0	100
0460-006	N4-A	Lafarge Type I Cement/Lafarge Newcem Slag Cement	2.0/8.0	150
0460-007	N4-A	Lafarge Type I Cement/Lafarge Newcem Slag Cement	3.0/12.0	150
0460-008	A-2A	Lafarge Type I Cement/Lafarge Newcem Slag Cement, EnviroBlend HX, Sodium Bisulfide	2.0/8.0/5.0/1.0	100
0460-009	AN-2A	Lafarge Type I Cement/Lafarge Newcem Slag Cement, EnviroBlend HX, Sodium Bisulfide	2.0/8.0/5.0/1.0	100
0460-010	AN-2A	Lafarge Type I Cement/Lafarge Newcem Slag Cement, EnviroBlend HX, Sodium Bisulfide	3.0/12.0/5.0/1.0	100

Each mixture was developed by placing an aliquot of untreated material into a blending

chamber. The appropriate reagent or combination of reagents were blended together then slurried with potable tap water then added to the untreated material. The mixture was then blended at a rate of approximately 30 to 40 rotations per minute (rpm) until visually homogeneous, approximately 60 to 90 seconds. Immediately following mixture development, the mixtures were placed into cylindrical molds for curing. The treated materials were allowed to cure in a humid environment maintained at a temperature of 18 to 24°C.

Note that the reagent addition rates applied on a by-weight basis and were based on the wet weight of the aliquot of untreated site soil being treated. The water addition rate was based on the weight of the reagents being utilized in the mixture and also applied on a by-weight basis. The objective was to develop a pumpable grout mix. For example in the treatment of the N1/N3 Composite (N1/N3) using a 2% addition of PC, and 8% GGBFS with a 100% water addition rate, 2 grams of PC were blended with 8 grams of GGBFS then slurried with 10 grams of potable water. This slurry mixture was then added to every 100 grams of untreated material being treated. Copies of the preliminary mixture development data sheets are included in Appendix D.

Throughout the curing process, KEMRON evaluated the potential setting characteristics of the mixtures via pocket penetrometer testing. The results of penetrometer testing are presented in comprehensive Table 3 in the Tables Section of this report.). Review of this data shows that all of the mixtures, with the exception of 008, 009, and 010 exceeded the maximum penetrometer reading of 4.5 tons per square foot (TSF) at the 14 day cure. Mixtures 008, 009, and 010 did not achieve any measurable strength gain through 28 days of curing.

At a cure interval of 28 days, mixtures 001 through 007 were subjected to UCS testing in accordance with the American Society of Testing and Measures (ASTM) Method D2166. Mixtures 008, 009, and 010 were not tested due to lack of sample cohesion and strength. The results of UCS testing is presented in Table 3 at the end of this report and summarized below.

TABLE 3B – Preliminary Mixture Evaluations – Summary of UCS Testing

KEMRON Sample Number	Untreated Material Type	Reagent Type	Reagent Addition % by Wet Soil wt.	Water Addition % by Reagent wt.	Cure Days	UCS	
						Moisture Content (%)	UCS (lb/in^2)
0460-001	N1/N3 Composite	PC / Slag	2.0/8.0	100	28	27.23	142.4
0460-002	N1/N3 Composite	PC / Slag	3.0/12.0	100	28	30.73	267.4
0460-003	N1/N3 Composite	PC / Slag	4.0/16.0	100	28	31.17	193.8
0460-004	N2 Composite	PC / Slag	2.0/8.0	100	28	35.93	53.9
0460-005	N2 Composite	PC / Slag	4.0/16.0	100	28	39.65	227.3
0460-006	N4-A	PC / Slag	2.0/8.0	150	28	50.43	96.3
0460-007	N4-A	PC / Slag	3.0/12.0	150	28	50.68	125.2

The results of UCS testing performed on the preliminary mixture designs show that all of the treated materials achieved a 28-day strength value in excess of the 40 psi treatment criteria. Note that mixture 004 had the lowest strength value at 53.9 psi.

In addition to UCS testing mixtures 001 through 007 underwent permeability testing, in accordance with ASTM Method D5084, at the 28 day cure interval. The results of hydraulic conductivity testing, also included in comprehensive Table 3 at the end of text and are summarized below.

TABLE 3C – Preliminary Mixture Evaluations – Hydraulic Conductivity Results

KEMRON Sample Number	Untreated Material Type	Reagent Type	Reagent Addition % by Wet Soil wt.	Water Addition % by Reagent wt.	Cure Days	Hydraulic Conductivity (k)	
						Moisture Content (%)	Perm (cm/sec)
0460-001	N1/N3	PC / Slag	2.0/8.0	100	28	31.0	9.90E-09
0460-002	N1/N3	PC / Slag	3.0/12.0	100	28	33.9	1.20E-09
0460-003	N1/N3	PC / Slag	4.0/16.0	100	28	36.1	7.3E-05
0460-004	N2	PC / Slag	2.0/8.0	100	28	38.7	3.5E-07
0460-005	N2	PC / Slag	4.0/16.0	100	28	37.5	4.70E-09
0460-006	N4-A	PC / Slag	2.0/8.0	150	28	52.8	1.20E-08
0460-007	N4-A	PC / Slag	3.0/12.0	150	28	36.7	6.50E-09

The results of permeability testing performed on the treated mixtures show that all of the mixtures with the exception of mixture 003, surpassed the treatment criteria of 1×10^{-6} cm/sec. While testing results indicate that mixture 003 did not meet the criteria, KEMRON believes that this result may be inaccurate. Treatments on the N1/N3 composite at lower reagent addition rates resulted in permeability values significantly lower than that achieved in the 003 treated material. KEMRON was unable to determine a likely reason for the anomalous reading in mixture 003.

In addition to penetrometer, UCS, and permeability testing, the comprehensive Table 3 also presents the results of volumetric expansion testing performed on the treated mixtures. Volumetric expansion is an estimate of the increase in soil volume created by the various treatment processes. This information provides an estimate of increased soil volumes during full-scale treatment that may be expected due to the different treatments.

Volumetric expansion testing was performed by physically measuring the height of an aliquot of untreated site soil which has been compacted into a cylindrical mold. This aliquot of soil was then treated using the appropriate mixture design and placed into the curing mold. At 7 and 28 days of curing the height of the treated material was again measured and the volumetric expansion was calculated using the following formula.

$$\% \text{ Volumetric Expansion} = \frac{(\text{Final height} - \text{Initial height})}{\text{Initial height}} \times 100$$

The following is a summary of the volumetric expansion results presented in comprehensive Table 3 at the end of the text.:

TABLE 3D – Preliminary Mixture Evaluations – Volumetric Expansion Results

KEMRON Sample Number	Untreated Material Type	Reagent Type	Reagent Addition % by Wet Soil wt.	Water Addition % by Reagent wt.	Cure Days	Volumetric Expansion (%)
0460-001	N1/N3	PC / Slag	2.0/8.0	100	7	12.06
					28	12.63
0460-002	N1/N3	PC / Slag	3.0/12.0	100	7	28.56
					28	28.65
0460-003	N1/N3	PC / Slag	4.0/16.0	100	7	36.57
					28	37.52
0460-004	N2	PC / Slag	2.0/8.0	100	7	22.26
					28	22.42
0460-005	N2	PC / Slag	4.0/16.0	100	7	37.57
					28	37.88
0460-006	N4-A	PC / Slag	2.0/8.0	150	7	32.66
					28	32.88
0460-007	N4-A	PC / Slag	3.0/12.0	150	7	37.19
					28	37.47
0460-008	A-2A	PC / Slag / Enviroblend HX / Sodium Bisulfide	2.0/8.0/5.0/1.0	100	7	37.41
					28	38.50
0460-009	AN-2A	PC / Slag / Enviroblend HX / Sodium Bisulfide	2.0/8.0/5.0/1.0	100	7	15.82
					28	16.80
0460-010	AN-2A	PC / Slag / Enviroblend HX / Sodium Bisulfide	3.0/12/.0/5.0/1.0	100	7	34.76
					28	35.97

As anticipated the volumetric expansion estimates show that the volume increase is dependent on the quantity of reagent added as well as the characteristics of the untreated material. For instance, a mixture developed with a 2 and 8% addition of PC and slag, respectively, applied to the N1/N3 composite resulted in an increase of approximately 13%, while the same mixture applied to the N2 composite showed a volume increase of 22%. Variability in the particle size distribution and moisture content can affect the volume increase of samples with the same mixture designs. Testing also

indicated that very little volume change was noted in the mixtures between the 7 and 28 day cure intervals. Testing data sheets for the information provided in the comprehensive Table 3 are included in Appendix E.

To evaluate the effectiveness of the different treatments, aliquots of each treated material was then forwarded for SPLP arsenic and THP analyses. The results of these analyses are presented in the comprehensive TABLE 4 at the end of this text and are summarized below.

TABLE 4 – Preliminary Mixture Evaluations - SPLP Arsenic and TPH Analyses

Parameter	Units	460-001 Result	460-002 Result	460-003 Result	460-004 Result	460-005 Result
SPLP Arsenic (1312 / 6020A)						
Arsenic	µg/L	4.65	2.15	3.31	4.96	3.02
SPLP TPH (1312 / 8015C)						
Diesel Range Organics	mg/L	4.15	2.99	2.18	2.40	2.38
Gasoline Range Organics	mg/L	15.3	12.9	13.0	21.5	19.6

Parameter	Units	460-006 Result	460-007 Result	460-008 Result	460-009 Result	460-010 Result
SPLP Arsenic (1312 / 6020A)						
Arsenic	µg/L	1.08	1.00	285	669	559
SPLP TPH (1312 / 8015C)						
Diesel Range Organics	mg/L	16.0	14.6	0.21	0.25	0.63
Gasoline Range Organics	mg/L	38.5	32.5	1.24	2.84	2.89

The results of analytical testing indicate that mixtures 001 through 007 showed relatively similar analytical results for the treated materials. These mixtures were developed on the three different materials taken from the NAPL zone at the site. Note that mixtures 006 and 007, which were prepared on the N-4 material (NAPL-only), resulted in higher SPLP TPH concentrations than the mixture developed with the N1/N3 (NAPL-only, 001, 002 and 003), and N2 composites (NAPL-only, 004 and 005). Mixtures 008 through 010, which were developed on the higher arsenic zone materials, showed significant reductions in the leachable arsenic concentrations compared to the untreated materials. However, mixes 008 through 010 did not develop measurable compressive strength.

As previously stated the purpose for analytical testing of the preliminary mixture designs was to evaluate potential effectiveness of the different reagent combinations. A

comparison of the SPLP analytical results between the untreated material characterization testing and the analyses performed on the treated materials indicates that concentrations of SPLP TPHs actually increased in the treated materials. SPLP of the treated soils was intended to be used to select mixes to carry forward in the treatability testing. However, SPLP does not appear to be effective for that purpose. Therefore, ANS 16.1 leachability testing was included to provide better information on the selection of reagent mixes. The ANS 16.1 testing procedure is discussed a little later in this section of the report.

Because the original arsenic and TPH analyses did not provide the necessary information to determine treatment effectiveness, more extensive analytical testing would be utilized in subsequent testing. Specifically it was requested that polycyclic aromatic hydrocarbons (PAHs) would be utilized to evaluate treatment performance. PAH analyses were conducted in accordance with EPA method 8270.

After significant consideration by KEMRON and Envirocon, it was determined that the SPLP leaching procedure does not sufficiently simulate leaching anticipated in an in-situ treatment scenario. The SPLP procedure is performed by initially selecting one of two leaching fluids for the extraction procedure. The method for selection of the appropriate leaching fluid is chosen based on the region of the country that the sample was obtained. Specifically, samples obtained from sites east of the Mississippi require the use of Leaching Fluid #1 (LF 1), and sites west of the Mississippi require the use of Leaching Fluid #2 (LF 2). LF 1 is composed of deionized water adjusted to a pH value of 4.20 ± 0.05 standard units (s.u.) with a 60/40 mixture of sulfuric and nitric acids. LF 2 consists of deionized water adjusted to a pH value of 5.00 ± 0.05 s.u. with a 60/40 mixture of sulfuric and nitric acids. The pH values for each of the two leaching fluids are based on the average pH values of rain water for the eastern and western United States. The eastern United States typically experiences more acidic precipitation due to air pollution impacts from heavy industrialization and coal utilization. The precipitation in the western United States is typically less acidic since there is less industrialization and smaller population densities, thereby less automobiles. For the SPLP procedure the test specimen is crushed to a maximum particle size of less than 0.5 inches in diameter. The crushed sample is then physically tumbled in the presence of an inorganic acid leaching fluid for a period of approximately 18 hours prior to being filtered and analyzed.

An alternative leaching procedure known as the ANS 16.1 test was selected for evaluation because it more closely represents potential leaching that may be anticipated at full-scale solidification / stabilization sites. The ANS 16.1 procedure is a static leaching test that was developed by the American Nuclear Society (ANS) to measure the leachability of solidified low level radioactive wastes at ambient temperatures over a period of time. This procedure has been accepted at many sites by regulators as suitable for evaluating the leaching of environmental samples, and has been adopted and slightly modified by the ASTM in ASTM Method C1308, and the Environmental Protection Agency (EPA) in EPA Method 1315. The ANS test is performed by suspending a solidified material in deionized water over various periods of time. The

standard procedure specifies that at cumulative time intervals of 2 hours, 7 hours, 1 day, 2 days, 3 days, 4 days, 5 days, 19 days, 47 days and 90 days, the specimen is removed from the water bath and placed in a new deionized water bath. At this time the water bath that the sample was removed from is monitored for material pH, conductivity and temperature, and is sampled for the constituents of concern. Because of the significant time involved in performing the standard test method a 5-day modified procedure has been accepted for screening and evaluation purposes. The 5-Day Modified ANS 16.1 test follows the same procedures for set-up, sampling and analyses as the standard procedure with the modification focusing on the leaching intervals used. The 5-day modified procedure utilizes the first seven time intervals of 2 hours, 7 hours, 1 day, 2 days, 3 days, 4 days and 5 days used in the standard method. Note that the time intervals presented above are cumulative time intervals, meaning the sample is removed at these intervals in relation to the initial start date and time, and not the start of each particular interval. The ANS 16.1 procedure maintains the integrity of the treated material and retains the physical properties which more accurately reflect leaching at the site, primarily the reduced permeability of an intact monolithic material.

Four of the treated preliminary mixtures were selected for ANS 16.1 5-day modified testing. These materials included mixtures 001, 005, 006, and 007. Each of the treated samples were subjected to the ANS leaching procedure followed by PAH analyses. As a budget reduction only four (4) of the seven (7) ANS leaching intervals were analyzed. These leaching intervals included 2, and 7 hours, and 1 and 5 days. Additionally aliquots of the treated materials were subjected to SPLP PAH analyses in order to provide a comparison between the ANS and SPLP leaching method. Note that due to an inadequate sample volume, mixture 001 was not analyzed for SPLP PAH compounds.

The results of SPLP and ANS arsenic and PAH analyses performed on the candidate treated materials are presented in Table 5 at the end of the text. The table is too large to embed in the text. A general summary of the results show that the ANS static leaching procedure resulted in significantly lower compound concentrations than the SPLP testing results for the majority of the compounds analyzed. Complete analytical data reports for the SPLP and ANS 16.1 analyses are included in Appendix E.

In addition to the preliminary treatment testing performed by KEMRON, aliquots of the site materials were forwarded to three proprietary reagent vendor laboratories for testing using specialized additives capable of reducing the leachability of arsenic. The vendors that performed testing include:

1) Terra Materials
Heritage Research Group
Kurek Lab Bldg
7901 West Morris St.
Indianapolis, IN 46231

2) Free Flow Technologies, Ltd.
9918 North Alpine Road
Machesney Park, IL 61115

3) Premier Magnesia
URSUS RT&T
200 E. Lincoln St.
Mount Horeb, WI 53572

As outlined in the original SOW, it was intended that these vendor laboratories would provide information that would allow KEMRON and Envirocon to determine the capability of the various proprietary additives at effectively treating the site materials. Because the proprietary material vendors performed testing at no charge to the treatability study, the information from the independent testing provided very limited data regarding the performance of the treatment designs. A summary of the results of vendor testing is provided in Table 6. Note that all of the mixtures prepared by the vendors were developed using no additional water.

TABLE 6 – Independent Vendor Testing and Results

Vendor	Untreated Material Type	Reagent Type	Reagent Addition % by Wet Soil wt.	Pocket Penetrometer PSI			Total Arsenic (mg/kg)	Arsenic SPLP (mg/l)	Arsenic TCLP (mg/l)
				7 Day	14 Day	28 Day			
Premier	N1/N3	Untreated	0.0	31	28	71			
Premier	N1/N3	EnviroBlend ® 93 HR	5.0	36	78	37			
Premier	N1/N3	EnviroBlend ® 93 HR	10.0	105	148	102			
Premier	N1/N3	EnviroBlend ® 93 HR	15.0	242	135	82			
Premier	A-2A	Untreated	0.0				624	0.28	1.84
Premier	A-2A	Untreated (duplicate)	0.0					0.40	0.68
Premier	A-2A	EnviroBlend ® 93 HR	6.0						0.023
Premier	A-2A	EnviroBlend ® 93 HR	8.0						<0.020
Premier	A-2A	EnviroBlend ® 93 HR	10.0						<0.020
Terra Materials	A-2 (5-16')	TerraBond Mg / FerroBlack	10.0/3.0	>75					
Terra Materials	AN-2 (0-8')	TerraBond Mg / FerroBlack	10.0/3.0	>75					
Terra Materials	N4 (5-12')	TerraBond Mg	10.0	>75					
Vendor	Untreated Material Type	Reagent Type	Reagent Addition % by Wet Soil wt.	Pocket Penetrometer (PSI)				Arsenic SPLP (mg/l)	
Free Flow	A-2A	Untreated	0.0					0.35	
Free Flow	A-2A	FF400	1.0					0.093	
Free Flow	A-2A	FF400	2.0					0.068	
Free Flow	A-2A	FF400	3.0					0.047	
Free Flow	AN-2A	Untreated	0.0					0.44	
Free Flow	AN-2A	FF400	1.0					0.21	
Free Flow	AN-2A	FF400	2.0					<0.13	

Free Flow	AN-2A	FF400	3.0					<0.13	

TABLE 6 – Independent Vendor Testing and Results (cont)

Vendor	Untreated Material Type	Reagent Type	Reagent Addition % by Wet Soil wt.	7 Day	14 Day	28 Day	Total Arsenic (mg/kg)	Arsenic SPLP (mg/l)	Arsenic TCLP (mg/l)
Free Flow	A-2A	Lafarge Type I Cement / Lafarge Newcem Slag Cement/FF400	2.0/8.0 / 3.0						
Free Flow	AN-2A	Lafarge Type I Cement / Lafarge Newcem Slag Cement/FF401	2.0/8.0 / 3.0						
Free Flow	A-2A	Lafarge Type I Cement / Lafarge Newcem Slag Cement/FF400	2.0/8.0 / 3.0						
Free Flow	AN-2A	Lafarge Type I Cement / Lafarge Newcem Slag Cement/FF401	2.0/8.0/3.0		35 psi @ 10 days				

As shown in Table 6, the vendor data had numerous data gaps, represented by the shaded areas, which symbolizes testing that was not performed. The significant data gaps in the information provided by the different vendors generated little useable information. Vendor testing that was useful and applicable to the treatability study included evidence that the Enviroblend 93 HR, provided by Premier Magnesia, displayed the ability to reduce arsenic leaching as determined by the Toxicity Characteristic Leaching Procedure (TCLP), and the FF400 material, manufactured by Free Flow, showed a reduction in arsenic via SPLP testing. The other limited information indicated that many of the materials had the ability to provide an increase in strength as determined by pocket penetrometer testing, however, this data was not confirmed by UCS testing.

Based on the results of preliminary mixture testing performed by KEMRON and the various proprietary reagent vendors, it was determined by KEMRON and Envirocon that additional treatment evaluations would be performed which were outside the original scope of work to confirm some of the claims made by the vendors.

KEMRON prepared additional six (6) cup mixtures to evaluate strength gain as determined by UCS testing. These mixtures were prepared using only the untreated N2 Composite material to help evaluate if selected proprietary reagent vendor mixtures had the capability of meeting the site strength criteria, and to evaluate potential alternative mixture designs. The cup mixtures were developed according to information provided by the specific vendors, and were subjected to UCS testing at the 7-day curing interval. To evaluate an alternative mixture preparation, CUP E and CUP F were prepared using a two stage mixture preparation. Specifically for CUP E the EnviroBlend 93 HR material was hydrated with approximately 40% of the outlined water addition and blended with the untreated material. Following an approximately 24 hour reaction period, the PC and slag were slurried with the remaining water amount and blended with the pretreated material. This process was also utilized in CUP F where the untreated material was pretreated with ferrous sulfate and 40% of the water prior to adding the PC and slag slurry. The results of testing performed on the alternative cup mixtures are presented in Table 7 outlined below.

TABLE 7 – Vendor Treatment Confirmation Mixtures – Summary of UCS Testing

Kemron Sample Number	Reagent Type	Reagent Addition % by Wet Soil wt.	Water Addition % by Reagent wt.	Cure Days	Unconfined Compressive Strength		Pocket Penetrometer TSF			
					Moisture Content %	UCS (lb/in^2)	1 Day	2 Day	5 Day	7 Day
Cup A	Terra Bond Mg	10.0	75	7	26.95	4.5	0	0	1.00	1.75
Cup B	Terra Bond Mg / Enviroblend HR 93	10.0/2.0	75	7	25.77	6.6	0.25	0.25	2.00	2.50
Cup C	PC / Slag / Enviroblend HR 93	3.0/12.0/2.0	100	7	32.74	39.5	0	0.75	4.00	>4.5
Cup D	Terra Bond Mg / FerroBlack-Hybrid	10.0/3.0	75	7	30.27	7.2	0	0.25	1.00	1.50
Cup E	PC / Slag / Ferrous Sulfate	3.0/12.0/1.0	100	7	32.93	62.5	0	1.75	4.00	>4.5
Cup F	PC / Slag / Enviroblend HR 93	3.0/12.0/2.0	100	7	30.83	127.1	0.75	>4.5	>4.5	>4.5

Results of the testing performed on the cup mixtures indicated that only samples Cup E and F exceeded the site strength criteria.

4.2 Optimization Evaluations

Based on the physical and chemical results of all testing performed in the preliminary evaluation phase of the study, 14 mixture designs were outlined during discussions between KEMRON and Envirocon. These mixtures represented replicate preparations of previously tested mixtures, optimized versions of previous mixtures, or alternative treatment designs. The mixtures were designed to provide further reductions in organic contaminants for the NAPL zone materials as well as added reductions in arsenic leachability in the elevated arsenic zone materials. The following is a summary of the mixture designs developed during the optimization phase of the study and is presented in comprehensive Table 8at the end of the text. A summary of this information is provided in the table below.

TABLE 8A – Optimization Mixture Evaluations –

Kemron Sample Number	Untreated Material Type	Reagent Type	Reagent Addition % by Wet Soil wt.	Water Addition % by Reagent wt.
0460-011	N1/N3	PC / Slag	2.0/8.0	100
0460-012	N2	PC / Slag	2.0/8.0	100
0460-013	N2	PC / Slag	3.0/12.0	100
0460-014	N2	PC / Slag / Hydrated Lime	3.0/12.0/3.0	100
0460-015	N2	PC / Slag / Activated Carbon	3.0/12.0/0.5	100
0460-016	N2	PC / Slag / Activated Carbon	3.0/12.0/1.0	100
0460-017	N4-A	PC / Slag	2.0/8.0	100
0460-018	N4-A	PC / Slag / Activated Carbon	2.0/8.0/1.0	100
0460-019	A-2A	PC / Slag	3.0/12.0	100
0460-020	A-2A	PC / Slag / EnviroBlend® 93 HR	3.0/12.0/2.0	100
0460-021	A-2A	PC / Slag / Ferrous Sulfate	3.0/12.0/2.0	100
0460-022	AN-2A	PC / Slag	3.0/12.0	100
0460-023	AN-2A	PC / Slag / EnviroBlend® 93 HR	3.0/12.0/2.0	100
0460-024	AN-2A	PC / Slag / Ferrous Sulfate	3.0/12.0/2.0	100

Note that for the mixtures utilizing Enviroblend 93 HR or Ferrous sulfate, the mixtures were developed using the 2-step preparation process previously described. All other mixtures were prepared in a single treatment step. Copies of the optimization mixture development data sheets are included in Appendix F.

Throughout the curing process KEMRON evaluated the potential setting characteristics of each treated material through pocket penetrometer testing. The results of penetrometer testing are presented in the comprehensive Table 8.at the end of the text. Review of the penetrometer data shows that the majority of the treated materials exceeded a penetrometer maximum value of 4.5 tsf within 5 days of curing. Mixtures which displayed a retarded setting included the N2 material treated with PC and Slag at addition rates of 2 and 8%, and 3 and 12%, respectively. Additionally, the mixtures

prepared using ferrous sulfate showed significantly retarded, or minimal strength gain. At 28 days of curing each of the treated materials were subjected to UCS testing. The results of UCS testing are also presented in comprehensive Table 8 at the end of the text and are presented below.

TABLE 8B – Optimization Mixture Evaluations – Summary of UCS Testing

Kemron Sample Number	Untreated Material Type	Reagent Type	Reagent Addition % by Wet Soil wt.	Water Addition % by Reagent wt.	Unconfined Compressive Strength	
					Moisture Content %	UCS (lb/in^2)
0460-011	N1/N3	PC / Slag	2.0/8.0	100	25.03	191.2
0460-012	N2	PC / Slag	2.0/8.0	100	29.47	21.8
0460-013	N2	PC / Slag	3.0/12.0	100	36.72	119.7
0460-014	N2	PC / Slag / Hydrated Lime	3.0/12.0/3.0	100	35.67	171.4
0460-015	N2	PC / Slag / Activated Carbon	3.0/12.0/0.5	100	37.02	184
0460-016	N2	PC / Slag / Activated Carbon	3.0/12.0/1.0	100	33.41	184.6
0460-017	N4-A	PC / Slag	2.0/8.0	100	49.85	171.2
0460-018	N4-A	PC / Slag / Activated Carbon	2.0/8.0/1.0	100	55.86	95.6
0460-019	A-2A	PC / Slag	3.0/12.0	100	37.77	359.3
0460-020	A-2A	PC / Slag / EnviroBlend® 93 HR	3.0/12.0/2.0	100	44.9	242.3
0460-021	A-2A	PC / Slag / Ferrous Sulfate	3.0/12.0/2.0	100	43.24	26.0
0460-022	AN-2A	PC / Slag	3.0/12.0	100	22.54	352.4
0460-023	AN-2A	PC / Slag / EnviroBlend® 93 HR	3.0/12.0/2.0	100	41.34	338
0460-024	AN-2A	PC / Slag / Ferrous Sulfate	3.0/12.0/2.0	100	F	F

The results of UCS testing showed that all but three of the treated materials exceeded the treatment criteria. These three mixtures included samples 012, 021, and 024. Mixture 012 was a replicate of mixture 004 which was prepared during the preliminary testing phase of the study and utilized a 2% PC and 8% Slag addition rate. Review of previous data shows that mixture 004 achieved a UCS value of 53.9 psi while mixture 012 only attained strength of 21.8 psi. While these mixtures were prepared in an identical manner, mixture 012 was prepared using a different container of the previously homogenized N2 composite site material. The difference in UCS values may indicate a significant variability in the site materials. The other two mixtures which did not meet the strength criteria were those including the use of ferrous sulfate which was added in a two phase treatment process.

Based on the UCS results, all of the treated materials except those prepared using ferrous sulfate were subjected to hydraulic conductivity testing at the 28-day cure interval. The results of permeability testing, summarized below, are presented in also included in the comprehensive Table 8 at the end of the text.

TABLE 8C – Optimization Mixture Evaluations – Summary of Permeability Testing

Kemron Sample Number	Untreated Material Type	Reagent Type	Reagent Addition % by Wet Soil wt.	Water Addition % by Reagent wt.	Hydraulic Conductivity (K)	
					Moisture Content (%)	K (cm/sec)
0460-011	N1/N3	PC / Slag	2.0/8.0	100	24.0	3.30E-08
0460-012	N2	PC / Slag	2.0/8.0	100	31.2	8.10E-07
0460-013	N2	PC / Slag	3.0/12.0	100	31.0	1.60E-08
0460-014	N2	PC / Slag / Hydrated Lime	3.0/12.0/3.0	100	36.5	2.20E-08
0460-015	N2	PC / Slag / Activated Carbon	3.0/12.0/0.5	100	32.1	2.50E-08
0460-016	N2	PC / Slag / Activated Carbon	3.0/12.0/1.0	100	32.5	2.20E-08
0460-017	N4-A	PC / Slag	2.0/8.0	100	52.1	2.00E-08
0460-018	N4-A	PC / Slag / Activated Carbon	2.0/8.0/1.0	100	46.5	2.50E-08
0460-019	A-2A	PC / Slag	3.0/12.0	100	41.9	4.10E-09

0460-020	A-2A	PC / Slag / EnviroBlend® 93 HR	3.0/12.0/2.0	100	46.5	2.00E-08
0460-022	AN-2A	PC / Slag	3.0/12.0	100	35.3	1.40E-08
0460-023	AN-2A	PC / Slag / EnviroBlend® 93 HR	3.0/12.0/2.0	100	35.3	1.50E-08

The results of permeability testing show that all of the tested mixtures had permeability values significantly lower than the site treatment criteria. Complete data sheets for testing presented in the comprehensive Table 8 are included in Appendix G.

Aliquots of selected treated materials were subjected to SPLP analyses at the 28-day cure interval. These analyses included arsenic, TPH, benzene, toluene, ethylbenzene, and total xylenes (BTEX), and PAHs. The results of these analyses are presented in Table 9. The following is a summary of this table.

TABLE 9 – Optimization Mixture Evaluations – Summary of SPLP Analyses

		011	013	014	015	016
		N1/N3 Composite	N2 Composite	N2 Composite	N2 Composite	N2 Composite
		2%PC / 8% Slag	3%PC / 12% Slag	3%PC / 12% Slag / 3.0% H-Lime	3%PC / 12% Slag / 0.5% AC	3%PC / 12% Slag / 1.0% AC
Analyte	Units	Result	Result	Result	Result	Result
Arsenic	ug/L	4.94	3.47	2.8	3.64	3.67
BTEX						
Benzene	ug/L	< 5.55	33.6	118	91.2	58.6
Ethylbenzene	ug/L	286	63.5	131	120	89.8
Toluene	ug/L	94.8	91.8	239	203	146
Xylene (total)	ug/L	810	263	372	355	313
TPH						
Gasoline Range	mg/L	4.07	2.29	2.13	2.97	2.35
Diesel Range Organics	mg/L	24.8	24.8	34.8	25.9	21.2
PAHs						
2-Methylnaphthalene	ug/L	886	417	486	505	399
Acenaphthene	ug/L	251	207	170	217	177
Acenaphthylene	ug/L	16.5	16.4	18.8	17.2	14.6
Anthracene	ug/L	40.4	33.8	33.4	33.8	28.2
Benzo(a)anthracene	ug/L	0.978	< 0.019	< 0.019	< 0.019	< 0.019
Benzo(b)fluoranthene	ug/L	< 0.0085	< 0.0085	0.415	< 0.0085	< 0.0085
Chrysene	ug/L	1.00	< 0.017	< 0.017	< 0.017	< 0.017
Fluoranthene	ug/L	14.9	19.5	20.2	20.9	17.9
Fluorene	ug/L	130	101	104	116	84.5
Indeno(1,2,3-cd)pyrene	ug/L	0.005	< 0.005	< 0.005	< 0.005	< 0.005
Naphthalene	ug/L	7,280	4,320	6,670	6,710	5,170
Phenanthrene	ug/L	142	140	147	150	126
Pyrene	ug/L	10.5	11.6	12.1	12.3	10.4

TABLE 9 Continued

Analyte	Uni	017	018	019	020	022	023
		N4-A	N4-A	A-2A	A-2A	AN-2A	AN-2A
		2%PC / 8% Slag	2%PC / 8% Slag / 1.0% AC	3%PC / 12% Slag	3%PC / 12% Slag / 2% EB 93HR	3%PC / 12% Slag	3%PC / 12% Slag / 2% EB 93HR
		Result	Result	Result	Result	Result	Result
Arsenic	ug/	1.47	0.95J	67.3	37.8	138	122
BTEX							
Benzene	ug/	792	892	49.9	1.59	16.8	7.64
Ethylbenzene	ug/	287	291	54.4	4.31	22.6	8.65
Toluene	ug/	1,380	1,530	92	12.5	22.8	31.1
Xylene (total)	ug/	905	927	43.6	19.3	41.1	36.4
TPH							
Gasoline Range	mg	11.5	13	1.25	0.279	0.386	0.527
Diesel Range	mg	50.6	33	1.03	1.01	2.79	2.77
PAHs							
2-Methylnaphthalene	ug/	560	588	55.8	99.1	119	121
Acenaphthene	ug/	93.8	116	30.6	38.4	88.1	90
Acenaphthylene	ug/	52.5	51.1	3.17	8.57	10.1	9.97
Anthracene	ug/	37.3	30.1	7.92	8.53	16.9	15.5
Benzo(a)anthracene	ug/	< 0.019	< 0.019	0.625	0.578	0.644	0.581
Benzo(b)fluoranthene	ug/	0.126	<	< 0.0085	< 0.0085	< 0.0085	< 0.0085
Chrysene	ug/	< 0.017	< 0.017	0.842	0.647	0.767	0.735
Fluoranthene	ug/	10.6	9.37	10.5	8.85	12.3	9.82
Fluorene	ug/	68.6	68.7	23.2	31.7	52.5	54.3
Indeno(1,2,3-	ug/	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Naphthalene	ug/	9,700	9,450	192	341	648	716
Phenanthrene	ug/	91.6	85.6	46	47.5	80.1	72.9
Pyrene	ug/	9.43	8.12	6.85	5.89	8.91	7.18

The SPLP data presented in Table 9 indicates that the use of hydrated lime and activated carbon did not provide a significant reduction in organic contaminants compared to the cement and slag only mixtures. The use of the Enviroblend 93HR material did provide a decrease in arsenic leaching, however this was only significant in the treatment of the A-2A site material. The results of SPLP BTEX showed the highest concentrations of compounds present in the treated N4-A materials. The results of SPLP PAH analyses indicate that naphthalene was detected at the highest concentration in the treated materials, and were substantially higher in the treated NAPL zone site materials.

In addition to SPLP analyses, five candidate mixtures were selected for ANS 16.1 leach testing. The results of arsenic, BTEX and PAH analyses performed on the ANS leachates are presented in Table 10. Note that the leaching intervals analyzed included 2, 7, 24 hours and 5 days. Because two PAH samples were damaged at the analytical laboratory, the 24 hour leachates for mixtures 013 and 014 were replaced with the 48 hour ANS samples for these materials. The following is a summary of the results presented in the comprehensive Table 10 at the end of the text.

TABLE 10 – Optimization Mixture Evaluations – Summary of ANS Testing

Analysis Name	Units	460-013 - N2 Soil - 3.0% PC / 12.0% Slag							
		2-Hour ANS		7-Hour ANS		24-Hour ANS		5-Day ANS	
		Result	Qual	Result	Qual	Result	Qual	Result	Qual
Arsenic	ug/L	0.40	J	0.20	J	0.42	J	0.44	J
Benzene	ug/L	<0.111	U	0.831	J	2.49		1.04	
Ethylbenzene	ug/L	<0.109	U	<0.109	U	4.06		1.73	
Toluene	ug/L	<0.122	U	1.28		3.7		0.962	J
Xylene (total)	ug/L	<0.179	U	9.33		15.3		3.86	
Acenaphthene	ug/L	4.23	J	10.3	J	15.5		17.5	
Acenaphthylene	ug/L	0.411	J	0.738	J	<0.369	U	<0.369	U
Anthracene	ug/L	1.65	J	2.24	J	3.92	J	5.00	J
Benzo(a)anthracene	ug/L	0.886	J	0.902	J	0.336	J	0.419	J
Benzo(b)fluoranthene	ug/L	0.613	J	<0.298	U	<0.185	U	<0.185	U
Benzo(k)fluoranthene	ug/L	0.306	J	<0.444	U	<0.275	U	<0.275	U
Chrysene	ug/L	0.929	J	0.699	J	0.309	J	0.313	J
Fluoranthene	ug/L	3.17	J	3.08	J	4.36	J	5.54	J
Fluorene	ug/L	3.40	J	6.20	J	12.10		13.7	
Naphthalene	ug/L	49.5		121		253		139	
Phenanthrene	ug/L	8.90	J	13.5	J	26.3		32.3	
Pyrene	ug/L	2.68	J	2.99	J	4.02	J	4.74	J

Analysis Name	Units	460-014 - N2 Soil - 3.0% PC / 12.0% Slag / 3.0% Hydrated Lime							
		2-Hour ANS		7-Hour ANS		24-Hour ANS		5-Day ANS	
		Result	Qual	Result	Qual	Result	Qual	Result	Qual
Arsenic	ug/L	0.18	J	0.12	J	0.29	J	0.43	J
Benzene	ug/L	0.527	J	1.09		3.22		1.120	
Ethylbenzene	ug/L	<0.109	U	3.18		5.48		<0.122	U
Toluene	ug/L	0.983	J	1.89		5.40		1.430	
Xylene (total)	ug/L	<0.179	U	10.0		16.9		3.98	
Acenaphthene	ug/L	3.37	J	7.29	J	25.7		14.9	
Acenaphthylene	ug/L	0.302	U	0.635	J	<0.369	U	<0.369	U
Anthracene	ug/L	0.602	J	1.43	J	5.69	J	4.12	J
Benzo(a)anthracene	ug/L	<0.31	U	<0.246	U	<0.246	U	0.424	J
Chrysene	ug/L	<0.306	U	<0.129	U	<0.129	U	0.342	J
Fluoranthene	ug/L	0.690	J	1.69	J	6.19	J	5.15	J
Fluorene	ug/L	2.22	J	4.95	J	18.7		12.1	
Naphthalene	ug/L	71.1		149		243		194	
Phenanthrene	ug/L	4.54	J	10.1		39.2		30.5	
Pyrene	ug/L	0.586	J	1.46	J	5.06	J	4.35	J

Analysis Name	Units	460-016 - N2 Soil - 3.0% PC / 12.0% Slag / 1.0% Activated Carbon							
		2-Hour ANS		7-Hour ANS		24-Hour ANS		5-Day ANS	
		Result	Qual	Result	Qual	Result	Qual	Result	Qual
Arsenic	ug/L	0.32	J	0.32	J	0.51	J	0.530	J
Benzene	ug/L	<0.111	U	0.703	J	1.71		0.9	J
Ethylbenzene	ug/L	<0.109	U	<0.109	U	4.14		1.58	
Toluene	ug/L	<0.122	U	1.44		3.06		1.2	
Xylene (total)	ug/L	<0.179	U	9.57		13.2		3.9	
Acenaphthene	ug/L	5.61	J	9.29	J	25.8		17.2	
Acenaphthylene	ug/L	0.509	J	0.722	J	1.82	J	<0.369	U
Anthracene	ug/L	1.18	J	1.5	J	4.5	J	3.86	J
Benzo(a)anthracene	ug/L	<0.31	U	<0.246	U	<0.246	U	0.303	J
Chrysene	ug/L	<0.306	U	<0.129	U	<0.129	U	0.396	J
Fluoranthene	ug/L	1.95	J	2.16	J	4.69	J	4.58	J
Fluorene	ug/L	3.49	J	6.01	J	17.3		12.9	
Naphthalene	ug/L	97.4		163		468		195	
Phenanthrene	ug/L	7.93	J	11.8		31.2		27.8	
Pyrene	ug/L	2.08	J	1.84	J	4.09	J	4.09	J

Analysis Name	Units	460-019 - A2A Soil - 3.0% PC / 12.0% Slag							
		2-Hour ANS		7-Hour ANS		24-Hour ANS		5-Day ANS	
		Result	Qual	Result	Qual	Result	Qual	Result	Qual
Arsenic	ug/L	3.04		7.37		16.8		16.1	
Acenaphthene	ug/L	<0.438	U	<0.365	U	0.542	J	<0.379	J
Fluoranthene	ug/L	<0.22	U	<0.235	U	0.261	J	<0.235	U
Naphthalene	ug/L	1.34	J	2.34	J	5.05	J	2.82	J
Phenanthrene	ug/L	0.458	J	0.565	J	1.00	J	1.050	J
Pyrene	ug/L	<0.334	U	<0.406	U	<0.406	U	0.406	U

Analysis Name	Unit	460-020 - A-2A Soil - 3.0% PC / 12.0% Slag / 2.0% EnviroBlend 93 HR							
		2-Hour ANS		7-Hour ANS		24-Hour ANS		5-Day ANS	
		Result	Qual	Result	Qual	Result	Qual	Result	Qual
Arsenic	ug/L	1.24		2.57		6.59		7.84	
Acenaphthene	ug/L	<0.438	U	<0.365	U	0.516	J	<0.365	U
Fluoranthene	ug/L	<0.220	U	<0.235	U	0.272	J	<0.235	U
Naphthalene	ug/L	<0.267	U	1.52	J	3.48	J	1.71J	J
Phenanthrene	ug/L	<0.266	U	0.522	J	1.02	J	0.781J	J
Pyrene	ug/L	<0.334	U	<0.406	U	<0.406	U	0.406	U

Notes:
ug/L = micrograms per liter
U = Not detected above the analytical MDL (Results are shown as less than "<" the MDL).
MDL = Method Detection Limit
J = Estimated concentration detected below the analytical Reporting Limit but above the MDL

Results are from the 48-hour ANS leachate.

5.0 DISCUSSION OF RESULTS

KEMRON performed testing on 5 materials prepared for the treatability study. These materials were representative of three specific zones of impact at the site, including a NAPL zone, a high arsenic impact zone, and a zone impacted with NAPL and arsenic. The study was performed to determine additives and additive addition rates capable of reducing leachable concentrations of arsenic as well as organic constituents and

improving the physical properties of the site materials.

Testing was conducted in multiple phases and the scope of work changed significantly throughout the study. It was determined that ANS 16.1 testing of the treated material would be added to the scope to provide information on the leaching of compounds of concern using a procedure which would more closely simulated the in-situ solidification conditions at the site. Additionally, more comprehensive analytical testing was requested which included arsenic, BTEX, and PAHs instead of the arsenic and TPH parameters initially outlined in the SOW.

Various proprietary additives were evaluated during the study but testing indicated that these materials did not provide a significant reduction in contaminant leaching when compared to treatments using only Type I Portland cement (PC) and Ground Granulated Blast Furnace Slag (GGBFS).

The results of testing showed that treatment simulations performed on the site materials tested during the treatability study which included the use of Type I Portland cement combined with GGBFS at addition rates ranging from 2% PC + 8% GGBFS to 3% PC + 12% GGBFS produced treated materials which passed the physical criteria outlined for the study. Analytical testing showed that the materials which were subjected to more comprehensive testing, mixtures 011, 013, 016, 019, and 020, achieved SPLP arsenic reductions ranging from approximately 87 to 99% compared to the untreated materials. Furthermore, in mixtures where both SPLP and modified ANS 16.1 analyses were performed the modified ANS 16.1 procedure showed significant reductions in the analyte concentrations compared to the SPLP results for the same mixtures. While not all of the analyses were conducted on the untreated site materials, it is anticipated that because of the marked reductions observed between the SPLP and the ANS 16.1 leaching procedures, meeting the treatment criteria when utilizing the ANS 16.1 leaching procedure should not be problematic.

After review of the data for the treatability study, KEMRON and Envirocon selected potential mixture designs to be applied to the different site zones. These mixtures include:

- N1/N3 composite material-- 2% PC / 8% Slag;
- N2 Composite-- 3% PC / 12% Slag;
- N4A material-- 2% PC / 8% Slag;
- A2A soil-- 3% PC / 12% Slag;
- AN2A soil-- 3% PC / 12% Slag;

6.0 VERIFICATION OF SELECTED MIXTURES

KEMRON prepared verification batches of selected potential mixture designs outlined above and forwarded them for additional evaluations and confirmation by CH2M Hill. In addition, KEMRON performed UCS and permeability testing on the selected mixtures

and are provided in the comprehensive Table 11 at the end of the text. A summary of the UCS results are provided in the table below. The verification mixtures are indicated with “DUP” in the sample ID number.

TABLE 11A – Verification Mixture Evaluations – Summary of UCS Testing

Kemron Sample Number	Untreated Material Type	Reagent Type	Reagent Addition % by Wet Soil wt.	Water Addition % by Reagent wt.	UCS	
					Moisture Content %	UCS (lb/in^2)
0460-011 DUP	N1/N3 Composite	Lafarge Type I Cement/Lafarge Newcem Slag Cement	2.0/8.0	100	28.85	128.9
0460-011	N1/N3 Composite	Lafarge Type I Cement/Lafarge Newcem Slag Cement	2.0/8.0	100	25.03	191.2
0460-013 DUP	N2 Composite	Lafarge Type I Cement/Lafarge Newcem Slag Cement	3.0/12.0	100	34.64	124.9
0460-013	N2 Composite	Lafarge Type I Cement/Lafarge Newcem Slag Cement	3.0/12.0	100	36.72	119.7
0460-017 DUP	N4-A	Lafarge Type I Cement/Lafarge Newcem Slag Cement	2.0/8.0	100	56.51	90.9
0460-017	N4-A	Lafarge Type I Cement/Lafarge Newcem Slag Cement	2.0/8.0	100	49.85	171.2
0460-019 DUP	A-2A	Lafarge Type I Cement/Lafarge Newcem Slag Cement	3.0/12.0	100	32.03	431.3
0460-019	A-2A	Lafarge Type I Cement/Lafarge Newcem Slag Cement	3.0/12.0	100	37.77	359.3
0460-022 DUP	AN-2A	Lafarge Type I Cement/Lafarge Newcem Slag Cement	3.0/12.0	100	29.51	568.9
0460-022	AN-2A	Lafarge Type I Cement/Lafarge Newcem Slag Cement	3.0/12.0	100	22.54	352.4

TABLE 11B – Verification Mixture Evaluations – Summary of Hydraulic Conductivity Testing

Kemron Sample Number	Untreated Material Type	Reagent Type	Reagent Addition % by Wet Soil wt.	Water Addition % by Reagent wt.	Hydraulic Conductivity (K)	
					Moisture Content (%)	K (cm/sec)
0460-011 DUP	N1/N3 Composite	Lafarge Type I Cement/Lafarge Newcem Slag Cement	2.0/8.0	100	32.0	2.00E-09
0460-011	N1/N3 Composite	Lafarge Type I Cement/Lafarge Newcem Slag Cement	2.0/8.0	100	24.0	3.30E-08
0460-013 DUP	N2 Composite	Lafarge Type I Cement/Lafarge Newcem Slag Cement	3.0/12.0	100	31.9	2.90E-09
0460-013	N2 Composite	Lafarge Type I Cement/Lafarge Newcem Slag Cement	3.0/12.0	100	31.0	1.60E-08
0460-017 DUP	N4-A	Lafarge Type I Cement/Lafarge Newcem Slag Cement	2.0/8.0	100	58.2	2.60E-09
0460-017	N4-A	Lafarge Type I Cement/Lafarge Newcem Slag Cement	2.0/8.0	100	52.1	2.00E-08
0460-019 DUP	A-2A	Lafarge Type I Cement/Lafarge Newcem Slag Cement	3.0/12.0	100	30.0	<1.0E-09*
0460-019	A-2A	Lafarge Type I Cement/Lafarge Newcem Slag Cement	3.0/12.0	100	41.90	4.10E-09
0460-022 DUP	AN-2A	Lafarge Type I Cement/Lafarge Newcem Slag Cement	3.0/12.0	100	28.1	9.30E-09
0460-022	AN-2A	Lafarge Type I Cement/Lafarge Newcem Slag Cement	3.0/12.0	100	35.30	1.40E-08

Review of the UCS and permeability results presented in the above tables reveals that the mixture designs confirm that the UCS criteria of 40 psi and hydraulic conductivity of E -6 are met. The material remaining for the treatability study and used for the verification mixtures were very low. Variability in the results of the optimization mixtures and verification mixtures are primarily due to varying degrees of moisture content, NAPL content, and heterogeneity of the soil matrix as a result of the low volume of remaining material.

This report should be reviewed in its entirety including all attachments prior to making decisions concerning a remedial approach. This study is intended to suggest what will occur in the field but does not guarantee the same results.

If you have any questions concerning the data provided in this report, please do not hesitate to call us at 404-636-0928.

Sincerely,

KEMRON Environmental Services, Inc.

Mark Clark
Senior Technologist

Tommy A. Jordan, P.G.
Program Manager

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TABLE 1

UNTREATED PHYSICAL PROPERTIES TESTING

TESTING PARAMETER	TEST METHOD	UNIT	SAMPLE				
			N1/N3 Composite	N2 Composite	N4-A	A-2A	AN-2A
Moisture Content	ASTM D2216						
ASTM Moisture Content		%	25.22	38.44	51.40	29.31	44.20
Percent Solids		%	79.89	72.26	66.06	77.33	69.43
Particle Size Distribution	ASTM D422						
Gravel		%	9.6	33.4	22.9	17.9	14.0
Sand		%	80.6	56.2	48.8	62.9	49.6
Silt		%	6.6	7.4	24.3	17.0	30.0
Clay		%	3.2	3.0	4.0	2.2	6.4
pH	EPA 9045	s.u.	6.31	7.02	9.30	6.76	6.22
Sample Description	USCS (D2487)		Very dark grayish brown well-graded sand with silt	Black well-graded sand with silt and gravel	Dark gray silty sand with gravel	Very dark grayish brown silty sand with gravel	Dark reddish brown silty sand
Sample Classification	USCS (D2487)		SW-SM	SW-SM	SM	SM	SM

Notes
% = Percent
pcf = pounds per cubic foot
Sample descriptions based on the Unified Classification System.
Sample color determined by the Munsell Soil Color Charts.
s.u. - Standard Units

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Table 2

UNTREATED ANALYTICAL RESULTS

TESTING PARAMETER	Unit	SAMPLE									
		N1/N3 Composite		N2 Composite		N4-A		A-2A		AN-2A	
		Result	MDL	Result	MDL	Result	MDL	Result	MDL	Result	MDL
Total Arsenic (6020A)											
Arsenic	ug/Kg	25,800	113	6,730	118	3,880	134	716,000	6,130	924,000	5,900
Total TPH (8015C)											
Diesel Range Organics	ug/Kg	11,900,000	321,000	30,200,000	9,100,000	90,200,000	1,910,000	1,410,000	87,400	3,330,000	84,000
Gasoline Range Organics	ug/Kg	500,000	5,890	338,000	6,180	1,090,000	71,000	14,800	649	22,200	627
SPLP Arsenic (1312/6020A)											
Arsenic	ug/L	127	0.19	27.7	0.09	3.25	0.09	2,590	4.71	661	0.94
SPLP TPH (1312/8015C)											
Diesel Range Organics	ug/L	34.60	2.21	23.2	0.88	115	4.42	3.58	0.09	3.83	0.09
Gasoline Range Organics	ug/L	8.85	0.13	4.13	0.13	22.2	0.65	0.50	0.01	0.36	0.01

ug/Kg - Micrograms per kilogram
ug/L - Micrograms per liter
MDL - Analytical Method Detection Limit

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TABLE 3

INITIAL STABILIZATION MIXTURE DESIGNS RESULTS
Mixture Designs, UCS, Permeability, Pocket Penetrometer, and Volumetric Expansion Testing

Kemron Sample Number	Untreated Material Type	Reagent Type	Reagent Addition % by Wet Soil wt.	Water Addition % by Reagent wt.	Pocket Penetrometer TSF						Cure Days	Volumetric Expansion %	Unconfined Compressive Strength				Hydraulic Conductivity (k) (cm/sec)			
					1 Day	3 Day	5 Day	7 Day	14 Day	28 Day			Moisture Content %	Bulk Density (lb/ft$^{3)}$	Dry Density (lb/ft$^{3)}$	UCS (lb/in^2)	Moisture Content (%)	Bulk Density (lb/ft³)	Dry Density (lb/ft³)	Perm (cm/sec)
0460-001	N1/N3 Composite	Lafarge Type I Cement/Lafarge Newcem Slag Cement	2.0/8.0	100	2.75	4.00	>4.5	>4.5	>4.5	NT	7	12.06								
											28	12.63	27.23	116.9	91.9	142.4	31.0	112.9	86.2	9.90E-09
0460-002	N1/N3 Composite	Lafarge Type I Cement/Lafarge Newcem Slag Cement	3.0/12.0	100	1.25	4.5	>4.5	>4.5	>4.5	NT	7	28.56								
											28	28.65	30.73	116.30	89.00	267.4	33.9	111.3	83.2	1.20E-09
0460-003	N1/N3 Composite	Lafarge Type I Cement/Lafarge Newcem Slag Cement	4.0/16.0	100	0.50	>4.5	>4.5	>4.5	>4.5	NT	7	36.57								
											28	37.52	31.17	113.4	86.4	193.8	36.1	109.9	80.7	7.3E-05
0460-004	N2 Composite	Lafarge Type I Cement/Lafarge Newcem Slag Cement	2.0/8.0	100	0	1.25	1.25	2.00	>4.5	NT	7	22.26								
											28	22.42	35.93	92.90	68.30	53.9	38.7	94.2	67.9	3.5E-07
0460-005	N2 Composite	Lafarge Type I Cement/Lafarge Newcem Slag Cement	4.0/16.0	100	0.75	3.00	4.5	>4.5	>4.5	NT	7	37.57								
											28	37.88	39.65	98.1	70.3	227.3	37.5	102.5	74.6	4.70E-09
0460-006	N4-A	Lafarge Type I Cement/Lafarge Newcem Slag Cement	2.0/8.0	150	1.00	4.25	>4.5	>4.5	>4.5	NT	7	32.66								
											28	32.88	50.43	81.00	53.80	96.3	52.8	84.1	55.1	1.20E-08
0460-007	N4-A	Lafarge Type I Cement/Lafarge Newcem Slag Cement	3.0/12.0	150	3.5	>4.5	>4.5	>4.5	>4.5	NT	7	37.19								
											28	37.47	50.68	86.6	57.4	125.2	36.7	87.9	64.3	6.50E-09
0460-008	A-2A	Lafarge Type I Cement/Lafarge Newcem Slag Cement, Enviroblen HX, Sodium Bisulfide	2.0/8.0/5.0/1.0	100	0	0	0	0	0	0	7	37.41								
											28	38.50	F	F	F	F	F	F	F	F
0460-009	AN-2A	Lafarge Type I Cement/Lafarge Newcem Slag Cement, Enviroblen HX, Sodium Bisulfide	2.0/8.0/5.0/1.0	100	0	0	0	0	0	0	7	15.82								
											28	16.80	F	F	F	F	F	F	F	F
0460-010	AN-2A	Lafarge Type I Cement/Lafarge Newcem Slag Cement, Enviroblen HX, Sodium Bisulfide	3.0/12/.0/5.0/1.0	100	0	0	0	0	0	0	7	34.76								
											28	35.97	F	F	F	F	F	F	F	F

Notes:
F = Sample did not cure. Sample fails under it's own weight
TIP = Testing in Progress
lb/ft^3 = pounds per square feet
lb/in^2 = pounds per square inch

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Table 4

Preliminary Mixture Designs
Summary of SPLP Arsenic and TPH Analyses

Parameter	Units	460-001 Result	460-002 Result	460-003 Result	460-004 Result	460-005 Result
SPLP Arsenic (1312 / 6020A)						
Arsenic	µg/L	4.65	2.15	3.31	4.96	3.02
SPLP TPH (1312 / 8015C)						
Diesel Range Organics	mg/L	4.15	2.99	2.18	2.40	2.38
Gasoline Range Organics	mg/L	15.3	12.9	13.0	21.5	19.6

Parameter	Units	460-006 Result	460-007 Result	460-008 Result	460-009 Result	460-010 Result
SPLP Arsenic (1312 / 6020A)						
Arsenic	µg/L	1.08	1.00	285	669	559
SPLP TPH (1312 / 8015C)						
Diesel Range Organics	mg/L	16.0	14.6	0.21	0.25	0.63
Gasoline Range Organics	mg/L	38.5	32.5	1.24	2.84	2.89

Notes:
µg/L = microgram per Liter
mg/L = milligram per Liter
MDL = Method Detection Limit

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TABLE 5

PRELIMINARY MIXTURE EVALUATIONS
SPLP and ANS 16.1 Modified 5-Day Testing

Analysis Name	Units	0460-001														
		SPLP			2-Hour ANS			7-Hour ANS			24-Hour ANS			5-Day ANS		
		Result	Qual.	MDL	Result	Qual.	MDL	Result	Qual.	MDL	Result	Qual.	MDL	Result	Qual.	MDL
Arsenic	ug/L	4.65			**1.27**		0.094	**1.23**		0.094	**2.16**		0.094	**3.65**		0.094
Benzene	ug/L	NT	NT	NT	< 0.111	U	0.111	< 0.111	U	0.111	**21.6**		0.111	**0.344**	**J**	0.111
Ethylbenzene	ug/L	NT	NT	NT	< 0.109	U	0.109	< 0.109	U	0.109	**4.07**		0.109	**0.959**	**J**	0.109
Toluene	ug/L	NT	NT	NT	< 0.122	U	0.122	< 0.122	U	0.122	**19.100**		0.122	**1.07**		0.122
Xylene (total)	ug/L	NT	NT	NT	**7.87**		0.179	< 0.179	U	0.179	**17.1**		0.179	**8.06**		0.179
Acenaphthene	ug/L	NT	NT	NT	**2.29**	**J**	0.389	**3.44**	**J**	0.393	**7.18**	**J**	0.389	**5.75**	**J**	0.393
Acenaphthylene	ug/L	NT	NT	NT	< 0.311	U	0.311	< 0.315	U	0.315	< 0.311	U	0.311	< 0.315	U	0.315
Anthracene	ug/L	NT	NT	NT	**1.57**	**J**	0.257	**2.90**	**J**	0.259	**5.10**	**J**	0.257	**3.43**	**J**	0.259
Benzo(a)anthracene	ug/L	NT	NT	NT	< 0.320	U	0.320	**0.405**	**J**	0.323	**0.485**	**J**	0.320	**0.436**	**J**	0.323
Benzo(a)pyrene	ug/L	NT	NT	NT	< 0.053	U	0.053	< 0.053	U	0.053	< 0.053	U	0.053	< 0.053	U	0.053
Benzo(b)fluoranthene	ug/L	NT	NT	NT	< 0.287	U	0.287	< 0.290	U	0.290	< 0.287	U	0.287	< 0.290	U	0.290
Benzo(g,h,i)perylene	ug/L	NT	NT	NT	< 0.177	U	0.177	< 0.179	U	0.179	< 0.177	U	0.177	< 0.179	U	0.179
Benzo(k)fluoranthene	ug/L	NT	NT	NT	< 0.177	U	0.177	< 0.179	U	0.179	< 0.177	U	0.177	< 0.179	U	0.179
Chrysene	ug/L	NT	NT	NT	< 0.315	U	0.315	**0.412**	**J**	0.319	**0.347**	**J**	0.315	**0.360**	**J**	0.319
Dibenz(a,h)anthracene	ug/L	NT	NT	NT	< 0.139	U	0.139	< 0.141	U	0.141	< 0.139	U	0.139	< 0.141	U	0.141
Fluoranthene	ug/L	NT	NT	NT	**1.10**	**J**	0.195	**2.55**	**J**	0.197	**5.39**	**J**	0.195	**4.17**	**J**	0.197
Fluorene	ug/L	NT	NT	NT	**2.83**	**J**	0.258	**4.29**	**J**	0.260	**9.00**	**J**	0.258	**6.94**	**J**	0.260
Indeno(1,2,3-cd)pyrene	ug/L	NT	NT	NT	< 0.249	U	0.249	< 0.252	U	0.252	< 0.249	U	0.249	< 0.252	U	0.252
Naphthalene	ug/L	NT	NT	NT	**10.1**	**J**	0.237	**15.7**		0.240	**36.1**		0.237	**32.8**		0.240
Phenanthrene	ug/L	NT	NT	NT	**7.21**	**J**	0.236	**12.3**		0.239	**23.9**		0.236	**19.6**		0.239
Pyrene	ug/L	NT	NT	NT	**0.845**	**J**	0.296	**2.14**	**J**	0.299	**3.75**	**J**	0.296	**3.30**	**J**	0.299

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TABLE 5

PRELIMINARY MIXTURE EVALUATIONS
SPLP and ANS 16.1 Modified 5-Day Testing

Analysis Name	Units	0460-005														
		SPLP			2-Hour ANS			7-Hour ANS			24-Hour ANS			5-Day ANS		
		Result	Qual.	MDL	Result	Qual.	MDL	Result	Qual.	MDL	Result	Qual.	MDL	Result	Qual.	MDL
Arsenic	ug/L	**3.02**			**0.520**	**J**	0.094	**0.250**	**J**	0.094	**0.570**	**J**	0.094	**1.46**		0.094
Benzene	ug/L	**8.74**		0.111	< 0.111	U	0.111	**7.26**		0.111	**6.94**		0.111	**0.540**	**J**	0.111
Ethylbenzene	ug/L	**200**		0.109	< 0.109	U	0.109	**1.17**		0.109	**1.16**		0.109	**0.524**	**J**	0.109
Toluene	ug/L	**75.6**		0.122	< 0.122	U	0.122	**6.04**		0.122	**5.97**		0.122	**0.849**	**J**	0.122
Xylene (total)	ug/L	**50.1**		0.179	**9.09**		0.179	**8.98**		0.179	**9.58**		0.179	**7.57**		0.179
Acenaphthene	ug/L	**146**		0.268	**3.22**	**J**	0.377	**5.60**	**J**	0.377	**13.0**		0.377	**12.0**		0.377
Acenaphthylene	ug/L	< 0.303	U	0.303	< 0.302	U	0.302	< 0.302	U	0.302	< 0.302	U	0.302	< 0.302	U	0.302
Anthracene	ug/L	**46.0**		0.316	**1.08**	**J**	0.249	**2.13**	**J**	0.249	**4.57**	**J**	0.249	**4.41**	**J**	0.249
Benzo(a)anthracene	ug/L	< 0.316	U	0.316	< 0.310	U	0.310	**0.418**	**J**	0.310	**0.764**	**J**	0.310	**0.470**	**J**	0.310
Benzo(a)pyrene	ug/L	< 0.125	U	0.125	< 0.051	U	0.051	< 0.051	U	0.051	< 0.051	U	0.051	< 0.051	U	0.051
Benzo(b)fluoranthene	ug/L	< 0.217	U	0.217	< 0.278	U	0.278	< 0.278	U	0.278	< 0.278	U	0.278	< 0.278	U	0.278
Benzo(g,h,i)perylene	ug/L				< 0.172	U	0.172	< 0.172	U	0.172	< 0.172	U	0.172	< 0.172	U	0.172
Benzo(k)fluoranthene	ug/L	< 0.236	U	0.236	< 0.172	U	0.172	< 0.172	U	0.172	< 0.172	U	0.172	< 0.172	U	0.172
Chrysene	ug/L	< 0.433	U	0.433	< 0.306	U	0.306	**0.489**	**J**	0.306	**0.596**	**J**	0.306	**0.354**	**J**	0.306
Dibenz(a,h)anthracene	ug/L	< 0.217	U	0.217	< 0.135	U	0.135	< 0.135	U	0.135	< 0.135	U	0.135	< 0.135	U	0.135
Fluoranthene	ug/L	**26.3**		0.267	**0.776**	**J**	0.189	**2.97**	**J**	0.189	**5.61**	**J**	0.189	**5.57**	**J**	0.189
Fluorene	ug/L	**121**		0.288	**3.03**	**J**	0.250	**5.69**	**J**	0.250	**13.2**		0.250	**11.6**		0.250
Indeno(1,2,3-cd)pyrene	ug/L	< 0.157	U	0.157	< 0.242	U	0.242	< 0.242	U	0.242	< 0.242	U	0.242	< 0.242	U	0.242
Naphthalene	ug/L	**1,740**		2.93	**29.0**		0.230	**49.9**		0.230	**111**		0.230	**105**		0.230
Phenanthrene	ug/L	**173**		0.304	**5.840**	**J**	0.229	**13.4**		0.229	**28.8**		0.229	**29.8**		0.229
Pyrene	ug/L	**17.6**		0.486	**0.601**	**J**	0.287	**2.43**	**J**	0.287	**4.26**	**J**	0.287	**4.44**	**J**	0.287

ENVIROCON
QUANTA TREATABILITY
KEMRON PROJECT No: SH-0460

TABLE 5

PRELIMINARY MIXTURE EVALUATIONS
SPLP and ANS 16.1 Modified 5-Day Testing

Analysis Name	Units	0460-006														
		SPLP			2-Hour ANS			7-Hour ANS			24-Hour ANS			5-Day ANS		
		Result	Qual.	MDL	Result	Qual.	MDL	Result	Qual.	MDL	Result	Qual.	MDL	Result	Qual.	MDL
Arsenic	ug/L	**1.08**			**0.180**	**J**	0.094	**0.290**	**J**	0.094	**0.130**	**J**	0.094	**0.430**	**J**	0.094
Benzene	ug/L	**43.3**		0.111	**1.96**		0.111	< 0.111	U	0.111	**19.1**		0.111	**22.2**		0.111
Ethylbenzene	ug/L	**11.0**		0.109	**0.501**	**J**	0.109	< 0.109	U	0.109	**3.38**		0.109	**5.79**		0.109
Toluene	ug/L	**62.2**		0.122	**1.77**		0.122	< 0.122	U	0.122	**16.0**		0.122	**23.5**		0.122
Xylene (total)	ug/L	**42.2**		0.179	**9.75**		0.179	**6.79**		0.179	**14.4**		0.179	**21.5**		0.179
Acenaphthene	ug/L	**113**		0.268	**6.31**	**J**	0.377	**10.6**		0.377	**22.9**		0.377	**20.3**		0.377
Acenaphthylene	ug/L	**60.7**		0.303	**2.81**	**J**	0.302	**4.51**	**J**	0.302	**9.53**	**J**	0.302	**7.87**	**J**	0.302
Anthracene	ug/L	**48.2**		0.316	**1.56**	**J**	0.249	**3.15**	**J**	0.249	**5.93**	**J**	0.249	**4.80**	**J**	0.249
Benzo(a)anthracene	ug/L	**1.09**	**J**	0.316	< 0.310	U	0.310	**0.795**	**J**	0.310	**0.797**	**J**	0.310	**0.616**	**J**	0.310
Benzo(a)pyrene	ug/L	< 0.125	U	0.125	< 0.051	U	0.051	**0.477**	**J**	0.051	< 0.051	U	0.051	0.051	U	0.051
Benzo(b)fluoranthene	ug/L	< 0.217	U	0.217	< 0.278	U	0.278	**0.283**	**J**	0.278	< 0.278	U	0.278	0.278	U	0.278
Benzo(g,h,i)perylene	ug/L				< 0.172	U	0.172	< 0.172	U	0.172	< 0.172	U	0.172	0.172	U	0.172
Benzo(k)fluoranthene	ug/L	< 0.236	U	0.236	< 0.172	U	0.172	**0.270**	**J**	0.172	< 0.172	U	0.172	0.172	U	0.172
Chrysene	ug/L	**0.607**	**J**	0.433	< 0.306	U	0.306	**1.05**	**J**	0.306	**0.559**	**J**	0.306	**0.512**	**J**	0.306
Dibenz(a,h)anthracene	ug/L	< 0.217	U	0.217	< 0.135	U	0.135	< 0.135	U	0.135	< 0.135	U	0.135	0.135	U	0.135
Fluoranthene	ug/L	**12.2**		0.267	**0.920**	**J**	0.189	**3.26**	**J**	0.189	**4.98**	**J**	0.189	**4.84**	**J**	0.189
Fluorene	ug/L	**85.3**		0.288	**5.59**	**J**	0.250	**9.55**	**J**	0.250	**20.5**		0.250	**18.5**		0.250
Indeno(1,2,3-cd)pyrene	ug/L	< 0.157	U	0.157	< 0.242	U	0.242	< 0.242	U	0.242	< 0.242	U	0.242	0.242	U	0.242
Naphthalene	ug/L	**7,230**		29.3	**174**		0.230	**283**		0.460	**501**		0.920	**402**		0.920
Phenanthrene	ug/L	**110**		0.304	**9.10**	**J**	0.229	**17.8**		0.229	**35.7**		0.229	**34.3**		0.229
Pyrene	ug/L	**11.1**		0.486	**1.08**	**J**	0.287	**3.68**	**J**	0.287	**5.41**	**J**	0.287	**5.00**	**J**	0.287

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QUANTA TREATABILITY
KEMRON PROJECT No: SH-0460

TABLE 5

PRELIMINARY MIXTURE EVALUATIONS
SPLP and ANS 16.1 Modified 5-Day Testing

		0460-007														
		SPLP			2-Hour ANS			7-Hour ANS			24-Hour ANS			5-Day ANS		
Analysis Name	**Units**	**Result**	**Qual.**	**MDL**	**Result**	**Qual.**	**MDL**	**Result**	**Qual.**	**MDL**	**Result**	**Qual.**	**MDL**	**Result**	**Qual.**	**MDL**
Arsenic	ug/L	**1.00**			**0.160**	**J**	0.094	**0.310**	**J**	0.094	**0.190**	**J**	0.094	**0.410**	**J**	0.094
Benzene	ug/L	**89.0**		0.111	**4.41**		0.111	**0.589**	**J**	0.111	< 0.111	U	0.111	**16.2**		0.111
Ethylbenzene	ug/L	**106**		0.109	**0.829**	**J**	0.109	**0.516**	**J**	0.109	< 0.109	U	0.109	**3.72**		0.109
Toluene	ug/L	**139**		0.122	**3.66**		0.122	**0.777**	**J**	0.122	**0.361**	**J**	0.122	**16.2**		0.122
Xylene (total)	ug/L	**77.3**		0.179	**9.15**		0.179	**8.33**		0.179	< 0.179	U	0.179	**15.2**		0.179
Acenaphthene	ug/L	**106**		0.268	**5.83**	**J**	0.377	**7.75**	**J**	0.377	**18.2**		0.377	**16.0**		0.377
Acenaphthylene	ug/L	**60.0**		0.303	**2.53**	**J**	0.302	**3.27**	**J**	0.302	**7.61**	**J**	0.302	**6.20**	**J**	0.302
Anthracene	ug/L	**46.3**		0.316	**1.81**	**J**	0.249	**2.39**	**J**	0.249	**5.42**	**J**	0.249	**3.88**	**J**	0.249
Benzo(a)anthracene	ug/L	**1.03**	**J**	0.316	**0.373**	**J**	0.310	**0.464**	**J**	0.310	**0.762**	**J**	0.310	**0.483**	**J**	0.310
Benzo(a)pyrene	ug/L	< 0.125	U	0.125	< 0.051	U	0.051	< 0.051	U	0.051	**0.233**	**J**	0.051	0.051	U	0.051
Benzo(b)fluoranthene	ug/L	< 0.217	U	0.217	< 0.278	U	0.278	< 0.278	U	0.278	< 0.278	U	0.278	0.278	U	0.278
Benzo(g,h,i)perylene	ug/L				< 0.172	U	0.172	< 0.172	U	0.172	< 0.172	U	0.172	0.172	U	0.172
Benzo(k)fluoranthene	ug/L	< 0.236	U	0.236	< 0.172	U	0.172	< 0.172	U	0.172	< 0.172	U	0.172	0.172	U	0.172
Chrysene	ug/L	**0.714**	**J**	0.433	**0.408**	**J**	0.306	**0.363**	**J**	0.306	**0.690**	**J**	0.306	**0.428**	**J**	0.306
Dibenz(a,h)anthracene	ug/L	< 0.217	U	0.217	< 0.135	U	0.135	< 0.135	U	0.135	< 0.135	U	0.135	0.135	U	0.135
Fluoranthene	ug/L	**13.2**		0.267	**1.62**	**J**	0.189	**2.16**	**J**	0.189	**5.29**	**J**	0.189	**4.63**	**J**	0.189
Fluorene	ug/L	**86.1**		0.288	**5.38**	**J**	0.250	**7.26**	**J**	0.250	**18.2**		0.250	**15.7**		0.250
Indeno(1,2,3-cd)pyrene	ug/L	< 0.157	U	0.157	< 0.242	U	0.242	< 0.242	U	0.242	< 0.242	U	0.242	0.242	U	0.242
Naphthalene	ug/L	**5,890**		14.7	**145**		0.230	**184**		0.230	**379**		0.230	**318**		0.920
Phenanthrene	ug/L	**115**		0.304	**9.65**	**J**	0.229	**14.1**		0.229	**34.0**		0.229	**30.9**		0.229
Pyrene	ug/L	**13.1**		0.486	**1.87**	**J**	0.287	**2.41**	**J**	0.287	**5.21**	**J**	0.287	**4.93**	**J**	0.287

Notes:

Data Not Available or Not Tested

ug/L = micrograms per liter

U = Not detected above the analytical MDL (Results are shown as less than "<" the MDL) .

MDL = Method Detection Limit

J = Estimated concentration detected below the analytical Reporting Limit and the MDL

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KEMRON PROJECT # SH-0460

TABLE 6

PROPRIETARY VENDOR RESULTS

Vendor Sample Number	Untreated Material Type	Reagent Type	Reagent Addition % by Wet Soil wt.	Water Addition % by Reagent wt.	Pocket Penetrometer PSI			Pretest pH	Final pH SPLP	Final pH TCLP	Arsenic (mg/kg)	Arsenic SPLP (mg/l)	Arsenic TCLP (mg/l)	Arsenic (mg/l)
					7 Day	14 Day	28 Day							
Premier	N1/N3 Composite	Untreated	0.0	0	31	28	71							
Premier	N1/N3 Composite	EnviroBlend® 93 HR	5.0	0	36	78	37							
Premier	N1/N3 Composite	EnviroBlend® 93 HR	10.0	0	105	148	102							
Premier	N1/N3 Composite	EnviroBlend® 93 HR	15.0	0	242	135	82							
Premier	A-2A	Untreated	0.0	0				2.0	8.29	4.97	624	0.28	1.84	
Premier	A-2A	Untreated (duplicate)	0.0	0					8.30	4.92		0.40	0.68	
Premier	A-2A	EnviroBlend® 93 HR	6.0	0						9.21			0.023	
Premier	A-2A	EnviroBlend® 93 HR	8.0	0						9.66			<0.020	
Premier	A-2A	EnviroBlend® 93 HR	10.0	0						9.64			<0.020	
Terra Materials	A-2 (5-16')	TerraBond Mg / FerroBlack	10.0/3.0	0	>75									
Terra Materials	AN-2 (0-8')	TerraBond Mg / FerroBlack	10.0/3.0	0	>75									
Terra Materials	N4 (5-12')	TerraBond Mg	10.0	0	>75									
Free Flow	A-2A	Pore Water	-	-										2.06
Free Flow	A-2A	Untreated	0.0	0								0.35		
Free Flow	A-2A	FF400	1.0	0								0.093		
Free Flow	A-2A	FF400	2.0	0								0.068		
Free Flow	A-2A	FF400	3.0	0								0.047		
Free Flow	AN-2A	Pore Water	-	-										6.78
Free Flow	AN-2A	Untreated	0.0	0								0.44		
Free Flow	AN-2A	FF400	1.0	0								0.21		
Free Flow	AN-2A	FF400	2.0	0								<0.13		
Free Flow	AN-2A	FF400	3.0	0								<0.13		
Free Flow	A-2A	Lafarge Type I Cement/Lafarge Newcem Slag Cement/FF400	2.0/8.0/3.0	0										
Free Flow	AN-2A	Lafarge Type I Cement/Lafarge Newcem Slag Cement/FF401	2.0/8.0/3.0	0										
Free Flow	A-2A	Lafarge Type I Cement/Lafarge Newcem Slag Cement/FF400	2.0/8.0/3.0	0										
Free Flow	AN-2A	Lafarge Type I Cement/Lafarge Newcem Slag Cement/FF401	2.0/8.0/3.0	0		35 psi @ 10 days								

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TABLE 7

VENDOR REAGENT EXPERIMENTAL MIXTURE DESIGNS
Mixture Designs, UCS, Pocket Penetrometer

Kemron Sample Number	Untreated Material Type	Reagent Type	Reagent Addition % by Wet Soil wt.	Water Addition % by Untreated wt.	Cure Days	Unconfined Compressive Strength				Pocket Penetrometer TSF			
						Moisture Content %	Bulk Density (lb/ft^3)	Dry Density (lb/ft^3)	UCS (lb/in^2)	1 Day	2 Day	5 Day	7 Day
Cup A	N2 Composite	Terra Bond Mg	10.0	75	7	26.95	105.1	82.8	4.5	0	0	1.00	1.75
Cup B	N2 Composite	Terra Bond Mg/Enviroblend HR 93	10.0/2.0	75	7	25.77	104.3	82.90	6.6	0.25	0.25	2.00	2.50
Cup C	N2 Composite	Lafarge Type I Cement/Lafarge Newcem Slag Cement/Enviroblend HR 93	3.0/12.0/2.0	100	7	32.74	103.0	77.60	39.5	0	0.75	4.00	>4.5
Cup D	N2 Composite	Terra Bond Mg/FerroBlack-Hybrid	10.0/3.0	75	7	30.27	106.3	81.60	7.2	0	0.25	1.00	1.50
Cup E	N2 Composite	Lafarge Type I Cement/Lafarge Newcem Slag Cement/Ferrous Sulfate	3.0/12.0/1.0	100	7	32.93	102.2	76.90	62.5	0	1.75	4.00	>4.5
Cup F	N2 Composite	Lafarge Type I Cement/Lafarge Newcem Slag Cement/Enviroblend HR 93	3.0/12.0/2.0	100	7	30.83	104.1	79.60	127.1	0.75	>4.5	>4.5	>4.5

Notes:
F = Sample did not cure. Sample fails under it's own weight
TIP = Testing in Progress
lb/ft^3 = pounds per square feet
lb/in^2 = pounds per square inch

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KEMRON PROJECT No. SH0460

TABLE 8

INITIAL STABILIZATION MIXTURE DESIGNS RESULTS
Mixture Designs, UCS, Permeability, Pocket Penetrometer, and Volumetric Expansion Testing

Kemron Sample Number	Untreated Material Type	Reagent Type	Reagent Addition % by Wet Soil wt.	Water Addition % by Reagent wt.	Cure Days	Volumetric Expansion %	Unconfined Compressive Strength				Pocket Penetrometer Tons per Square Foot (TSF)						Hydraulic Conductivity (K)			
							Moisture Content %	Bulk Density (lb/ft^3)	Dry Density (lb/ft^3)	UCS (lb/in^2)	1 Day	3 Day	5 Day	7 Day	14 Day	28 Day	Moisture Content (%)	Bulk Density (lb/ft³)	Dry Density (lb/ft³)	K (cm/sec)
0460-011	N1/N3 Composite	Lafarge Type I Cement/Lafarge Newcem Slag Cement	2.0/8.0	100	7	28.65					1.5	3.5	>4.5	>4.5	>4.5	>4.5				
					28	28.28	25.03	114.8	91.8	191.2							24.0	113.7	91.7	3.30E-08
0460-012	N2 Composite	Lafarge Type I Cement/Lafarge Newcem Slag Cement	2.0/8.0	100	7	13.65					1.25	2	2.75	2.75	3.25					
					28	13.10	29.47	102.4	79.1	21.8							31.2	101.5	77.4	8.10E-07
0460-013	N2 Composite	Lafarge Type I Cement/Lafarge Newcem Slag Cement	3.0/12.0	100	7	33.86					0	0.5	2.75	3.0	>4.5	>4.5				
					28	34.73	36.72	97.4	71.3	119.7							31.0	97.5	74.4	1.60E-08
0460-014	N2 Composite	Lafarge Type I Cement/Lafarge Newcem Slag Cement/Hydrated Lime	3.0/12.0/3.0	100	7	40.88					0	0.75	>4.5	>4.5	>4.5	>4.5				
					28	42.86	35.67	93.9	69.2	171.4							36.5	92.3	67.6	2.20E-08
0460-015	N2 Composite	Lafarge Type I Cement/Lafarge Newcem Slag Cement/Activated Carbon	3.0/12.0/0.5	100	7	29.20					1.25	4.3	>4.5	>4.5	>4.5	>4.5				
					28	29.36	37.02	96.4	70.4	184.0							32.1	103.2	78.1	2.50E-08
0460-016	N2 Composite	Lafarge Type I Cement/Lafarge Newcem Slag CementActivated Carbon	3.0/12.0/1.0	100	7	36.39					0.25	3.75	>4.5	>4.5	>4.5	>4.5				
					28	36.39	33.41	96.4	75.0	184.6							32.5	98.3	74.2	2.20E-08
0460-017	N4-A	Lafarge Type I Cement/Lafarge Newcem Slag Cement	2.0/8.0	100	7	39.70					3.0	>4.5	>4.5	>4.5	>4.5	>4.5				
					28	39.99	49.85	100.0	51.4	171.2							52.1	75.9	49.9	2.00E-08
0460-018	N4-A	Lafarge Type I Cement/Lafarge Newcem Slag Cement/Activated Carbon	2.0/8.0/1.0	100	7	31.30					3.0	>4.5	>4.5	>4.5	>4.5	>4.5				
					28	30.58	55.86	77.0	55.8	95.6							46.50	86.1	58.80	2.50E-08
0460-019	A-2A	Lafarge Type I Cement/Lafarge Newcem Slag Cement	3.0/12.0	100	7	45.11					4.5	>4.5	>4.5	>4.5	>4.5	>4.5				
					28	44.23	37.77	112.9	81.9	359.3							41.90	111.50	78.60	4.10E-09
0460-020	A-2A	Lafarge Type I Cement/Lafarge Newcem Slag Cement/EnviroBlend® 93 HR	3.0/12.0/2.0	100	7	49.75					1.0	>4.5	>4.5	>4.5	>4.5	>4.5				
					28	48.96	44.90	109.7	75.7	242.3							46.50	107.0	73.00	2.00E-08
0460-021	A-2A	Lafarge Type I Cement/Lafarge Newcem Slag Cement/Ferrous Sulfate	3.0/12.0/2.0	100	7	49.65					0	0	0	0	1.25	>4.5				
					28	46.20	43.24	110.5	77.1	26.0										
0460-022	AN-2A	Lafarge Type I Cement/Lafarge Newcem Slag Cement	3.0/12.0	100	7	25.20					0	3.75	>4.5	>4.5	>4.5	>4.5				
					28	25.29	22.54	130.3	106.3	352.4							35.30	111.50	82.40	1.40E-08
0460-023	AN-2A	Lafarge Type I Cement/Lafarge Newcem Slag Cement/EnviroBlend® 93 HR	3.0/12.0/2.0	100	7	25.83					>4.5	>4.5	>4.5	>4.5	>4.5	>4.5				
					28	25.38	41.34	116.3	82.3	338.0							35.30	112.80	83.40	1.50E-08
0460-024	AN-2A	Lafarge Type I Cement/Lafarge Newcem Slag Cement/Ferrous Sulfate	3.0/12.0/2.0	100	7	32.44					0	0	0	0	0	0				
					28	28.69	F	F	F	F										

Notes:
F = Sample did not cure. Sample fails under it's own weight
Shaded areas indicate no testing was preformed
lb/ft^3 = pounds per square feet
lb/in^2 = pounds per square inch

ENVIROCON
QUANTA TREATABILITY
KEMRON PROJECT No. SH0460

Table 9

OPTIMIZATION ANALYTICAL RESULTS
Summary of SPLP Leaching Results

Kemron Sample Number	Untreated Material Type	Reagent Type	Reagent Addition % by Wet Soil wt.	Arsenic		DRO		GRO		Benzene		Toluene		Ethylbenzene		Xylene(s)	
				Result	MDL	Result	MDL	Result	MDL	Result	MDL	Result	MDL	Result	MDL	Result	MDL
				(ug/L)		(mg/L)		(mg/L)		(ug/L)		(ug/L)		(ug/L)		(ug/L)	
0460-011	N1/N3 Composite	Lafarge Type I Cement/Lafarge Newcem Slag Cement	2.0/8.0	4.94	1	24.8	0.884	4.07	0.065	5.55U	5.55	94.8	6.09	286	5.45	810	8.94
0460-013	N2 Composite	Lafarge Type I Cement/Lafarge Newcem Slag Cement	3.0/12.0	3.47	1	24.8	0.884	2.29	0.065	33.6	2.78	91.8	3.05	63.5	2.73	263	4.47
0460-014	N2 Composite	Lafarge Type I Cement/Lafarge Newcem Slag Cement/Hydrated Lime	3.0/12.0/3.0	2.8	1	34.8	0.884	2.13	0.065	118	4.44	239	4.87	131	4.36	372	7.15
0460-015	N2 Composite	Lafarge Type I Cement/Lafarge Newcem Slag Cement/Activated Carbon	3.0/12.0/0.5	3.64	1	25.9	0.884	2.97	0.065	91.2	5.55	203	6.09	120	5.45	355	8.94
0460-016	N2 Composite	Lafarge Type I Cement/Lafarge Newcem Slag CementActivated Carbon	3.0/12.0/1.0	3.67	1	21.2	0.884	2.35	0.065	58.6	4.44	146	4.87	89.8	4.36	313	7.15
0460-017	N4-A	Lafarge Type I Cement/Lafarge Newcem Slag Cement	2.0/8.0	1.47	1	50.6	1.77	11.5	0.065	792	5.55	1380	6.09	287	5.45	905	8.94
0460-018	N4-A	Lafarge Type I Cement/Lafarge Newcem Slag Cement/Activated Carbon	2.0/8.0/1.0	0.95J	1	33	0.884	13	0.065	892	11.1	1530	12.2	291	10.9	927	17.9
0460-019	A-2A	Lafarge Type I Cement/Lafarge Newcem Slag Cement	3.0/12.0	67.3	1	1.03	0.044	1.25	0.065	49.9	0.222	92	0.244	54.4	0.218	43.6	0.358
0460-020	A-2A	Lafarge Type I Cement/Lafarge Newcem Slag Cement/EnviroBlend® 93 HR	3.0/12.0/2.0	37.8	1	1.01	0.044	0.279	0.013	1.59	0.111	12.5	0.122	4.31	0.109	19.3	0.179
0460-022	AN-2A	Lafarge Type I Cement/Lafarge Newcem Slag Cement	3.0/12.0	138	5	2.79	0.088	0.386	0.013	16.8	0.111	22.8	0.122	22.6	0.109	41.1	0.179
0460-023	AN-2A	Lafarge Type I Cement/Lafarge Newcem Slag Cement/EnviroBlend® 93 HR	3.0/12.0/2.0	122	5	2.77	0.088	0.527	0.013	7.64	0.222	31.1	0.244	8.65	0.218	36.4	0.358

Notes:
µg/L = microgram per Liter

mg/L = milligram per Liter
MDL = Method Detection Limit

ENVIROCON
QUANTA TREATABILITY
KEMRON PROJECT No: SH-0460

TABLE 10

OPTIMIZATION MIXTURE ANALYTICAL RESULTS
ANS 16.1 Modified 5-Day Testing

Analysis Name	Units	460-013 - N2 Soil - 3.0% PC / 12.0% Slag														
		2-Hour ANS			7-Hour ANS			24-Hour ANS			48-Hour ANS			5-Day ANS		
		Result	Qual.	MDL	Result	Qual.	MDL	Result	Qual.	MDL	Result	Qual.	MDL	Result	Qual.	MDL
Arsenic	ug/L	0.4	J	0.094	0.2	J	0.094	0.42	J	0.094				0.44	J	0.094
Benzene	ug/L	<0.111	U	0.111	0.831	J	0.111	2.49		0.111				1.040		0.111
Ethylbenzene	ug/L	<0.109	U	0.109	<0.109	U	0.109	4.06		0.109				1.730		0.122
Toluene	ug/L	<0.122	U	0.122	1.28		0.122	3.7		0.122				0.96	J	0.109
Xylene (total)	ug/L	<0.179	U	0.179	9.33		0.179	15.3		0.179				3.86		0.179
Acenaphthene	ug/L	4.23	J	0.377	10.3	J	0.589				15.50		0.365	17.50		0.365
Acenaphthylene	ug/L	0.411	J	0.302	0.738	J	0.595				<0.369	U	0.369	<0.369	U	0.369
Anthracene	ug/L	1.65	J	0.249	2.24	J	0.347				3.92	J	0.215	5.00	J	0.215
Benzo(a)anthracene	ug/L	0.886	J	0.310	0.902	J	0.397				0.336	J	0.246	0.419	J	0.246
Benzo(a)pyrene	ug/L	<0.051	U	0.051	<0.274	U	0.274				<0.17	U	0.170	<0.17	U	0.170
Benzo(b)fluoranthene	ug/L	0.613	J	0.278	<0.298	U	0.298				<0.185	U	0.185	<0.185	U	0.185
Benzo(g,h,i)perylene	ug/L	<0.172	U	0.172	<0.319	U	0.319				<0.198	U	0.198	<0.198	U	0.198
Benzo(k)fluoranthene	ug/L	0.306	J	0.172	<0.444	U	0.444				<0.275	U	0.275	<0.275	U	0.275
Chrysene	ug/L	0.929	J	0.306	0.699	J	0.208				0.309	J	0.129	0.313	J	0.129
Dibenz(a,h)anthracene	ug/L	<0.135	U	0.135	<0.345	U	0.345				<0.214	U	0.214	<0.214	U	0.214
Fluoranthene	ug/L	3.17	J	0.189	3.08	J	0.379				4.36	J	0.235	5.54	J	0.235
Fluorene	ug/L	3.40	J	0.250	6.2	J	0.577				12.10		0.358	13.70		0.358
Indeno(1,2,3-cd)pyrene	ug/L	<0.242	U	0.242	<0.256	U	0.256				<0.159	U	0.159	<0.159	U	0.159
Naphthalene	ug/L	49.5		0.230	121		0.752				253.0		0.932	139.0		0.466
Phenanthrene	ug/L	8.90	J	0.229	13.5	J	0.305				26.3		0.189	32.3		0.189
Pyrene	ug/L	2.68	J	0.287	2.99	J	0.655				4.02	J	0.406	4.74	J	0.406

ENVIROCON
QUANTA TREATABILITY
KEMRON PROJECT No: SH-0460

TABLE 10

OPTIMIZATION MIXTURE ANALYTICAL RESULTS
ANS 16.1 Modified 5-Day Testing

Analysis Name	Units	460-014 - N2 Soil - 3.0% PC / 12.0% Slag / 3.0% Hydrated Lime														
		2-Hour ANS			7-Hour ANS			24-Hour ANS			48-Hour ANS			5-Day ANS		
		Result	Qual.	MDL	Result	Qual.	MDL	Result	Qual.	MDL	Result	Qual.	MDL	Result	Qual.	MDL
Arsenic	ug/L	0.18	J	0.094	0.12	J	0.094	0.29	J	0.094				0.43	J	0.094
Benzene	ug/L	0.527	J	0.111	1.09		0.111	3.22		0.111				1.120		0.111
Ethylbenzene	ug/L	<0.109	U	0.109	3.18		0.109	5.48		0.109				<0.122U	U	0.122
Toluene	ug/L	0.983	J	0.122	1.89		0.122	5.40		0.122				1.430		0.109
Xylene (total)	ug/L	<0.179	U	0.179	10.0		0.179	16.9		0.179				3.98		0.179
Acenaphthene	ug/L	3.37	J	0.377	7.29	J	0.365				25.7		0.365	14.9		0.365
Acenaphthylene	ug/L	0.302	U	0.302	0.635	J	0.369				<0.369	U	0.369	<0.369	U	0.369
Anthracene	ug/L	0.602	J	0.249	1.43	J	0.215				5.69	J	0.215	4.12	J	0.215
Benzo(a)anthracene	ug/L	<0.31	U	0.310	<0.246	U	0.246				<0.246	U	0.246	0.424	J	0.246
Benzo(a)pyrene	ug/L	<0.051	U	0.051	<0.17	U	0.170				<0.17	U	0.170	<0.17	U	0.170
Benzo(b)fluoranthene	ug/L	<0.278	U	0.278	<0.185	U	0.185				<0.185	U	0.185	<0.185	U	0.185
Benzo(g,h,i)perylene	ug/L	<0.172	U	0.172	<0.198	U	0.198				<0.198	U	0.198	<0.198	U	0.198
Benzo(k)fluoranthene	ug/L	<0.172	U	0.172	<0.275	U	0.275				<0.275	U	0.275	<0.275	U	0.275
Chrysene	ug/L	<0.306	U	0.306	<0.129	U	0.129				<0.129	U	0.129	0.342	J	0.129
Dibenz(a,h)anthracene	ug/L	<0.135	U	0.135	<0.214	U	0.214				<0.214	U	0.214	<0.214	U	0.214
Fluoranthene	ug/L	0.69	J	0.189	1.69	J	0.235				6.19	J	0.235	5.15	J	0.235
Fluorene	ug/L	2.22	J	0.250	4.95	J	0.358				18.7		0.358	12.1		0.358
Indeno(1,2,3-cd)pyrene	ug/L	<0.242	U	0.242	<0.159	U	0.159				<0.159	U	0.159	<0.159	U	0.159
Naphthalene	ug/L	71.1		0.230	149		0.466				243		0.932	194		0.466
Phenanthrene	ug/L	4.54	J	0.229	10.1		0.189				39.2		0.189	30.5		0.189
Pyrene	ug/L	0.586	J	0.287	1.46	J	0.406				5.06	J	0.406	4.35	J	0.406

ENVIROCON
QUANTA TREATABILITY
KEMRON PROJECT No: SH-0460

TABLE 10

OPTIMIZATION MIXTURE ANALYTICAL RESULTS
ANS 16.1 Modified 5-Day Testing

Analysis Name	Units	460-016 - N2 Soil - 3.0% PC / 12.0% Slag / 1.0% Activated Carbon														
		2-Hour ANS			7-Hour ANS			24-Hour ANS			48-Hour ANS			5-Day ANS		
		Result	Qual.	MDL	Result	Qual.	MDL	Result	Qual.	MDL	Result	Qual.	MDL	Result	Qual.	MDL
Arsenic	ug/L	0.32	J	0.094	0.32	J	0.094	0.51	J	0.094				0.530	J	0.094
Benzene	ug/L	<0.111	U	0.111	0.703	J	0.111	1.71		0.111				0.9	J	0.111
Ethylbenzene	ug/L	<0.109	U	0.109	<0.109	U	0.109	4.14		0.109				1.58		0.122
Toluene	ug/L	<0.122	U	0.122	1.44		0.122	3.06		0.122				1.2		0.109
Xylene (total)	ug/L	<0.179	U	0.179	9.57		0.179	13.2		0.179				3.9		0.179
Acenaphthene	ug/L	5.61	J	0.377	9.29	J	0.365	25.8		0.365				17.2		0.365
Acenaphthylene	ug/L	0.509	J	0.302	0.722	J	0.369	1.82	J	0.369				<0.369	U	0.369
Anthracene	ug/L	1.18	J	0.249	1.5	J	0.215	4.5	J	0.215				3.86	J	0.215
Benzo(a)anthracene	ug/L	<0.31	U	0.310	<0.246	U	0.246	<0.246	U	0.246				0.303	J	0.246
Benzo(a)pyrene	ug/L	<0.051	U	0.051	<0.17	U	0.170	<0.17	U	0.170				<0.170	U	0.170
Benzo(b)fluoranthene	ug/L	<0.278	U	0.278	<0.185	U	0.185	<0.185	U	0.185				<0.185	U	0.185
Benzo(g,h,i)perylene	ug/L	<0.172	U	0.172	<0.198	U	0.198	<0.198	U	0.198				<0.198	U	0.198
Benzo(k)fluoranthene	ug/L	0.172	U	0.172	<0.275	U	0.275	<0.275	U	0.275				<0.275	U	0.275
Chrysene	ug/L	<0.306	U	0.306	<0.129	U	0.129	<0.129	U	0.129				0.396	J	0.129
Dibenz(a,h)anthracene	ug/L	<0.135	U	0.135	<0.214	U	0.214	<0.214	U	0.214				<0.214	U	0.214
Fluoranthene	ug/L	1.95	J	0.189	2.16	J	0.235	4.69	J	0.235				4.58	J	0.235
Fluorene	ug/L	3.49	J	0.250	6.01	J	0.358	17.3		0.358				12.9		0.358
Indeno(1,2,3-cd)pyrene	ug/L	<0.242	U	0.242	<0.159	U	0.159	<0.159	U	0.159				<0.159	U	0.159
Naphthalene	ug/L	97.4		0.230	163		0.466	468		1.860				195		0.466
Phenanthrene	ug/L	7.93	J	0.229	11.8		0.189	31.2		0.189				27.8		0.189
Pyrene	ug/L	2.08	J	0.287	1.84	J	0.406	4.09	J	0.406				4.09	J	0.406

ENVIROCON
QUANTA TREATABILITY
KEMRON PROJECT No: SH-0460

TABLE 10

OPTIMIZATION MIXTURE ANALYTICAL RESULTS
ANS 16.1 Modified 5-Day Testing

Analysis Name	Units	460-019 - A2A Soil - 3.0% PC / 12.0% Slag														
		2-Hour ANS			7-Hour ANS			24-Hour ANS			48-Hour ANS			5-Day ANS		
		Result	Qual.	MDL	Result	Qual.	MDL	Result	Qual.	MDL	Result	Qual.	MDL	Result	Qual.	MDL
Arsenic	ug/L	3.04		0.094	7.37		0.094	16.8		0.094				16.1		0.094
Benzene	ug/L	<0.111	U	0.111	<0.111	U	0.111	<0.111	U	0.111				<0.111	U	0.111
Ethylbenzene	ug/L	<0.109	U	0.109	<0.109	U	0.109	<0.109	U	0.109				<0.122	U	0.122
Toluene	ug/L	<0.122	U	0.122	<0.122	U	0.122	<0.122	U	0.122				<0.109	U	0.109
Xylene (total)	ug/L	<0.179	U	0.179	<0.179	U	0.179	<0.179	U	0.179				<0.179	U	0.179
Acenaphthene	ug/L	<0.438	U	0.438	<0.365	U	0.365	0.542	J	0.365				<0.379	J	0.365
Acenaphthylene	ug/L	<0.351	U	0.351	<0.369	U	0.369	<0.369	U	0.369				<0.369	U	0.369
Anthracene	ug/L	<0.29	U	0.290	<0.215	U	0.215	<0.215	U	0.215				<0.215	U	0.215
Benzo(a)anthracene	ug/L	<0.36	U	0.360	<0.246	U	0.246	<0.246	U	0.246				<0.246	U	0.246
Benzo(a)pyrene	ug/L	<0.059	U	0.059	<0.17	U	0.170	<0.17	U	0.170				<0.170	U	0.170
Benzo(b)fluoranthene	ug/L	<0.323	U	0.323	<0.185	U	0.185	<0.185	U	0.185				<0.185	U	0.185
Benzo(g,h,i)perylene	ug/L	<0.200	U	0.200	<0.198	U	0.198	<0.198	U	0.198				<0.198	U	0.198
Benzo(k)fluoranthene	ug/L	<0.200	U	0.200	<0.275	U	0.275	<0.275	U	0.275				<0.275	U	0.275
Chrysene	ug/L	<0.356	U	0.356	<0.129	U	0.129	<0.129	U	0.129				<0.129	U	0.129
Dibenz(a,h)anthracene	ug/L	<0.157	U	0.157	<0.214	U	0.214	<0.214	U	0.214				<0.214	U	0.214
Fluoranthene	ug/L	<0.22	U	0.220	<0.235	U	0.235	0.261	J	0.235				<0.235	U	0.235
Fluorene	ug/L	<0.291	U	0.291	<0.358	U	0.358	<0.358	U	0.358				<0.358	U	0.358
Indeno(1,2,3-cd)pyrene	ug/L	<0.281	U	0.281	<0.159	U	0.159	<0.159	U	0.159				<0.159	U	0.159
Naphthalene	ug/L	1.34	J	0.267	2.34	J	0.466	5.05	J	0.466				2.820	J	0.466
Phenanthrene	ug/L	0.458	J	0.266	0.565	J	0.189	1.00	J	0.189				1.050	J	0.189
Pyrene	ug/L	<0.334	U	0.334	<0.406	U	0.406	<0.406	U	0.406				<0.406	U	0.406

ENVIROCON
QUANTA TREATABILITY
KEMRON PROJECT No: SH-0460

TABLE 10

OPTIMIZATION MIXTURE ANALYTICAL RESULTS
ANS 16.1 Modified 5-Day Testing

Analysis Name	Units	460-020 - A-2A Soil - 3.0% PC / 12.0% Slag / 2.0% EnviroBlend 93 HR														
		2-Hour ANS			7-Hour ANS			24-Hour ANS			48-Hour ANS			5-Day ANS		
		Result	Qual.	MDL	Result	Qual.	MDL	Result	Qual.	MDL	Result	Qual.	MDL	Result	Qual.	MDL
Arsenic	ug/L	1.24		1.240	2.57		0.094	6.59		0.094				7.840		0.094
Benzene	ug/L	<0.111	U	0.111	<0.111	U	0.111	<0.111	U	0.111				<0.111	U	0.111
Ethylbenzene	ug/L	<0.109	U	0.109	<0.109	U	0.109	<0.109	U	0.109				<0.122	U	0.122
Toluene	ug/L	<0.122	U	0.122	<0.122	U	0.122	<0.122	U	0.122				<0.109	U	0.109
Xylene (total)	ug/L	<0.179	U	0.179	<0.179	U	0.179	<0.179	U	0.179				<0.179	U	0.179
Acenaphthene	ug/L	<0.438	U	0.438	<0.365	U	0.365	0.516	J	0.365				<0.365	U	0.365
Acenaphthylene	ug/L	<0.351	U	0.351	<0.369	U	0.369	<0.369	U	0.369				<0.369	U	0.369
Anthracene	ug/L	<0.29	U	0.290	<0.215	U	0.215	<0.215	U	0.215				<0.215	U	0.215
Benzo(a)anthracene	ug/L	<0.36	U	0.360	<0.246	U	0.246	<0.246	U	0.246				<0.246	U	0.246
Benzo(a)pyrene	ug/L	<0.059	U	0.059	<0.170	U	0.170	<0.170	U	0.170				<0.170	U	0.170
Benzo(b)fluoranthene	ug/L	<0.323	U	0.323	<0.185	U	0.185	<0.185	U	0.185				<0.185	U	0.185
Benzo(g,h,i)perylene	ug/L	<0.200	U	0.200	<0.198	U	0.198	<0.198	U	0.198				<0.198	U	0.198
Benzo(k)fluoranthene	ug/L	<0.200	U	0.200	<0.275	U	0.275	<0.275	U	0.275				<0.275	U	0.275
Chrysene	ug/L	<0.356	U	0.356	<0.129	U	0.129	<0.129	U	0.129				<0.129	U	0.129
Dibenz(a,h)anthracene	ug/L	<0.157	U	0.157	<0.214	U	0.214	<0.214	U	0.214				<0.214	U	0.214
Fluoranthene	ug/L	<0.220	U	0.220	<0.235	U	0.235	0.272	J	0.235				<0.235	U	0.235
Fluorene	ug/L	<0.291	U	0.291	<0.358	U	0.358	<0.358	U	0.358				<0.358	U	0.358
Indeno(1,2,3-cd)pyrene	ug/L	<0.281	U	0.281	<0.159	U	0.159	<0.159	U	0.159				<0.159	U	0.159
Naphthalene	ug/L	<0.267	U	0.267	1.52	J	0.466	3.48	J	0.466				1.71J	J	0.466
Phenanthrene	ug/L	<0.266	U	0.266	0.522	J	0.189	1.02	J	0.189				0.781J	J	0.189
Pyrene	ug/L	<0.334	U	0.334	<0.406	U	0.406	<0.406	U	0.406				< 0.406	U	0.406

Notes:
ug/L = micrograms per liter
U = Not detected above the analytical MDL (Results are shown as less than "<" the MDL) .
MDL = Method Detection Limit
J = Estimated concentration detected below the analytical Reporting Limit but above the MDL

ENVIROCON
QUANTA
KEMRON PROJECT No. SH0460

TABLE 11

FINAL MIXTURE VERIFICATION TESTING
Mixture Designs, UCS, and Permeability

Kemron Sample Number	Untreated Material Type	Reagent Type	Reagent Addition % by Wet Soil wt.	Water Addition % by Reagent wt.	Cure Days	Unconfined Compressive Strength				Hydraulic Conductivity (K)			
						Moisture Content %	Bulk Density (lb/ft$^{3)}$	Dry Density (lb/ft$^{3)}$	UCS (lb/in^2)	Moisture Content (%)	Bulk Density (lb/ft³)	Dry Density (lb/ft³)	K (cm/sec)
0460-011 DUP	N1/N3 Composite	Lafarge Type I Cement/Lafarge Newcem Slag Cement	2.0/8.0	100	28	28.85	113.7	88.2	128.9	32.0	112.5	85.3	2.00E-09
0460-013 DUP	N2 Composite	Lafarge Type I Cement/Lafarge Newcem Slag Cement	3.0/12.0	100	28	34.64	87.9	65.3	124.9	31.9	90.1	68.3	2.90E-09
0460-017 DUP	N4-A	Lafarge Type I Cement/Lafarge Newcem Slag Cement	2.0/8.0	100	28	56.51	83.2	53.2	90.9	58.2	85.1	53.8	2.60E-09
0460-019 DUP	A-2A	Lafarge Type I Cement/Lafarge Newcem Slag Cement	3.0/12.0	100	28	32.03	116.3	88.1	431.3	30.0	116.1	89.3	>1.0E-09*
0460-022 DUP	AN-2A	Lafarge Type I Cement/Lafarge Newcem Slag Cement	3.0/12.0	100	28	29.51	127.1	98.1	568.9	28.1	118.1	92.2	9.30E-09

Notes:
Shaded areas indicate no testing was preformed
lb/ft^3 = pounds per square feet
lb/in^2 = pounds per square inch
* = One reading obtained after 2 weeks of testing. Sample is basically impermeable.

APPENDIX A

CHAIN OF CUSTODY

SHO460-001

TO:
KEMRON Environmental Services
Attention: Tommy A. Jordan, P.G.
1359-A Ellsworth Industrial Blvd
Atlanta, Georgia
30318

FROM:
Michael Murphy
CH2M Hill
119 Cherry Hill Rd, Suite 300
Parsippany, NJ
07054
ph: 551-486-3621

RE: Quanta Superfund Site Treatability Samples

Below is a list of samples collected at the Quanta Superfund Site by CH2M Hill for the purposes of treatability analysis. Please feel free to contact me with any questions.
Thank you,
Michael Murphy

Location ID	Date Collected	Time Collected	Depth	Sample Container
NAPL Areas				
N-1A-1012	12-Oct	9:15	7-13'	5 GALLON BUCKET
N-1B-1012	12-Oct	9:20	15-17.5'	5 GALLON BUCKET
N-2A-1012	12-Oct	9:15	7-13'	5 GALLON BUCKET
N-2B-1012	24-Oct	15:15	15-18'	5 GALLON BUCKET
N-3A-1012	24-Oct	12:00	0-5'	5 GALLON BUCKET
N-4A-1012	8-Oct	12:00	5-12'	5 GALLON BUCKET
NAPL/ARSENIC COMINGLED AREAS				
AN-1A-1012	11-Oct	10:55	15-22'	5 GALLON BUCKET
AN-2A-1012	12-Oct	10:50	0-8'	5 GALLON BUCKET
AN-3-1012	25-Oct	12:00	14-21'	5 GALLON BUCKET
ARSENIC AREAS				
A-1A-1012	11-Oct	9:20	1-2'	5 GALLON BUCKET
A-2A-1012	9-Oct	14:10	5-16'	5 GALLON BUCKET

APPENDIX B

UNTREATED PHYSICAL PROPERTIES DATA SHEETS

MOISTURE CONTENT DETERMINATION

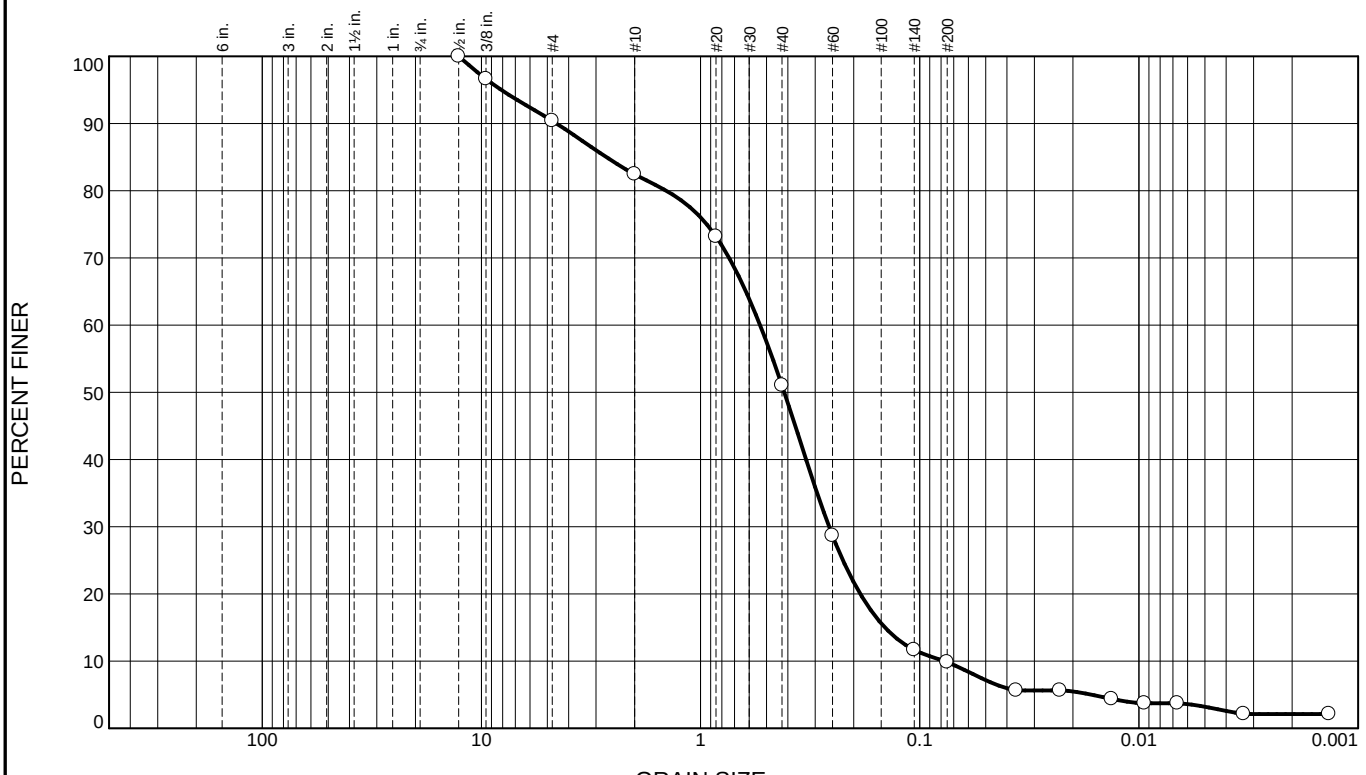
REPORT FORM

ASTM D 2216

PROJECT:	Environ Quanta
PROJECT No.:	SH0460
SAMPLE No.:	N1/N3 Composite
TESTING DATE:	12/19/12
TESTED BY:	TNR
TRACKING CODE:	8590

MOISTURE CONTENT (Dry & Wet Basis)						
1. MOISTURE TIN NO.	A		B		C	
2. WT MOISTURE TIN (tare weight)	1.2940	g	1.2963	g	1.2975	g
3. WT WET SOIL + TARE	11.0189	g	11.0453	g	10.8881	g
4. WT DRY SOIL + TARE	9.2430	g	9.1153	g	8.7532	g
5. WT WATER, Ww	1.7759	g	1.9300	g	2.1349	g
6. WT DRY SOIL, Ws	7.9490	g	7.8190	g	7.4557	g
7. ASTM MOISTURE CONTENT	22.34	%	24.68	%	28.63	%
8. PERCENT SOLIDS	81.74	%	80.20	%	77.74	%
9. AVERAGE ASTM MOISTURE CONTENT	25.22	%				
10. AVERAGE PERCENT SOLIDS	79.89	%				

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	9.6	8.0	31.4	41.2	6.6	3.2

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.5	100.0		
.375	96.6		
#4	90.4		
#10	82.4		
#20	73.2		
#40	51.0		
#60	28.7		
#140	11.7		
#200	9.8		

* (no specification provided)

Material Description

Very dark grayish brown well-graded sand with silt

Atterberg Limits

PL= LL= PI=

Coefficients

D_{90}= 4.5485 D_{85}= 2.6921 D_{60}= 0.5354
D_{50}= 0.4149 D_{30}= 0.2592 D_{15}= 0.1441
D_{10}= 0.0775 C_u= 6.91 C_c= 1.62

Classification

USCS= AASHTO=

Remarks

Sample Number: N1/N3 Composite

Date: 10/12/2012

KEMRON Environmental Services Inc.
Atlanta, Georgia

Client: Envirocon
Project: Quanta
Project No: SH0460 **Figure** 8590

Tested By: TNR **Checked By:** TAJ

MATERIAL pH

EPA METHOD 9045
DATA SHEET

PROJECT:	Environ Quanta
PROJECT No.:	SH0460
TESTING DATE:	12/19/2012
TESTED BY:	TNR
TRACKING CODE:	8590

KEMRON SAMPLE No.	MATERIAL pH
1. N1/N3 Composite	6.31
2.	
3.	
4.	
5.	
6.	
7.	
8.	
9.	
10.	
AVERAGE:	6.31

MOISTURE CONTENT DETERMINATION

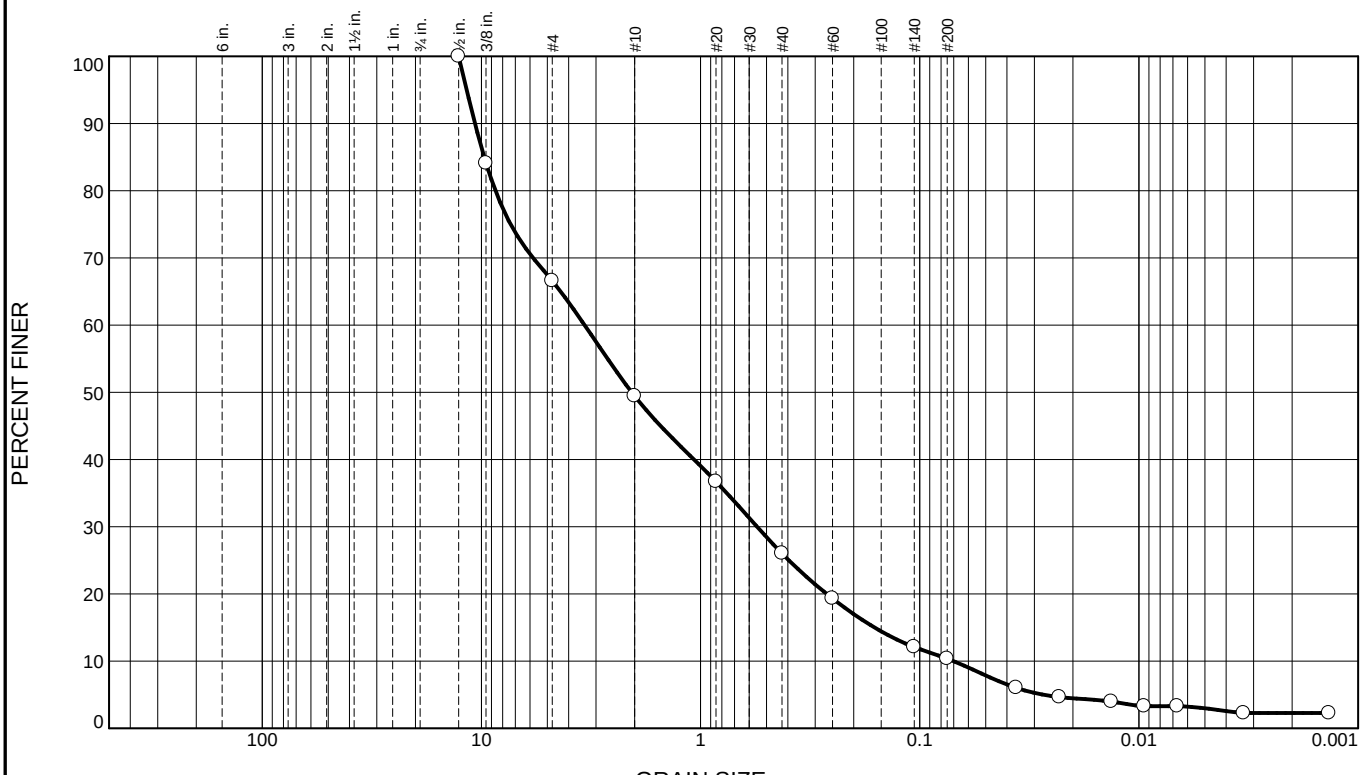
REPORT FORM

ASTM D 2216

PROJECT:	Environ Quanta
PROJECT No.:	SH0460
SAMPLE No.:	N2 Composition
TESTING DATE:	12/19/12
TESTED BY:	TNR
TRACKING CODE:	8591

MOISTURE CONTENT (Dry & Wet Basis)						
1. MOISTURE TIN NO.	A		B		C	
2. WT MOISTURE TIN (tare weight)	1.2942	g	1.2932	g	1.2931	g
3. WT WET SOIL + TARE	11.4662	g	11.2711	g	11.2645	g
4. WT DRY SOIL + TARE	8.4444	g	8.5207	g	8.6784	g
5. WT WATER, Ww	3.0218	g	2.7504	g	2.5861	g
6. WT DRY SOIL, Ws	7.1502	g	7.2275	g	7.3853	g
7. ASTM MOISTURE CONTENT	42.26	%	38.05	%	35.02	%
8. PERCENT SOLIDS	70.29	%	72.44	%	74.06	%
9. AVERAGE ASTM MOISTURE CONTENT	38.44	%				
10. AVERAGE PERCENT SOLIDS	72.26	%				

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	33.4	17.1	23.5	15.6	7.4	3.0

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.5	100.0		
.375	84.1		
#4	66.6		
#10	49.5		
#20	36.7		
#40	26.0		
#60	19.3		
#140	12.1		
#200	10.4		

* (no specification provided)

Material Description

Black well-graded sand with silt and gravel

Atterberg Limits

PL= LL= PI=

Coefficients

D_{90}= 10.7000 D_{85}= 9.7138 D_{60}= 3.3813
D_{50}= 2.0610 D_{30}= 0.5525 D_{15}= 0.1608
D_{10}= 0.0702 C_u= 48.18 C_c= 1.29

Classification

USCS= AASHTO=

Remarks

Sample Number: N2 Composite

Date: 10/12/2012

KEMRON Environmental Services Inc.
Atlanta, Georgia

Client: Envirocon
Project: Quanta
Project No: SH0460 **Figure** 8591

Tested By: TNR **Checked By:** TAJ

MATERIAL pH

EPA METHOD 9045
DATA SHEET

PROJECT:	Environ Quanta
PROJECT No.:	SH0460
TESTING DATE:	12/19/2012
TESTED BY:	TNR
TRACKING CODE:	8591

KEMRON SAMPLE No.	MATERIAL pH
1. N2 Composite	7.02
2.	
3.	
4.	
5.	
6.	
7.	
8.	
9.	
10.	
AVERAGE:	7.02

MOISTURE CONTENT DETERMINATION

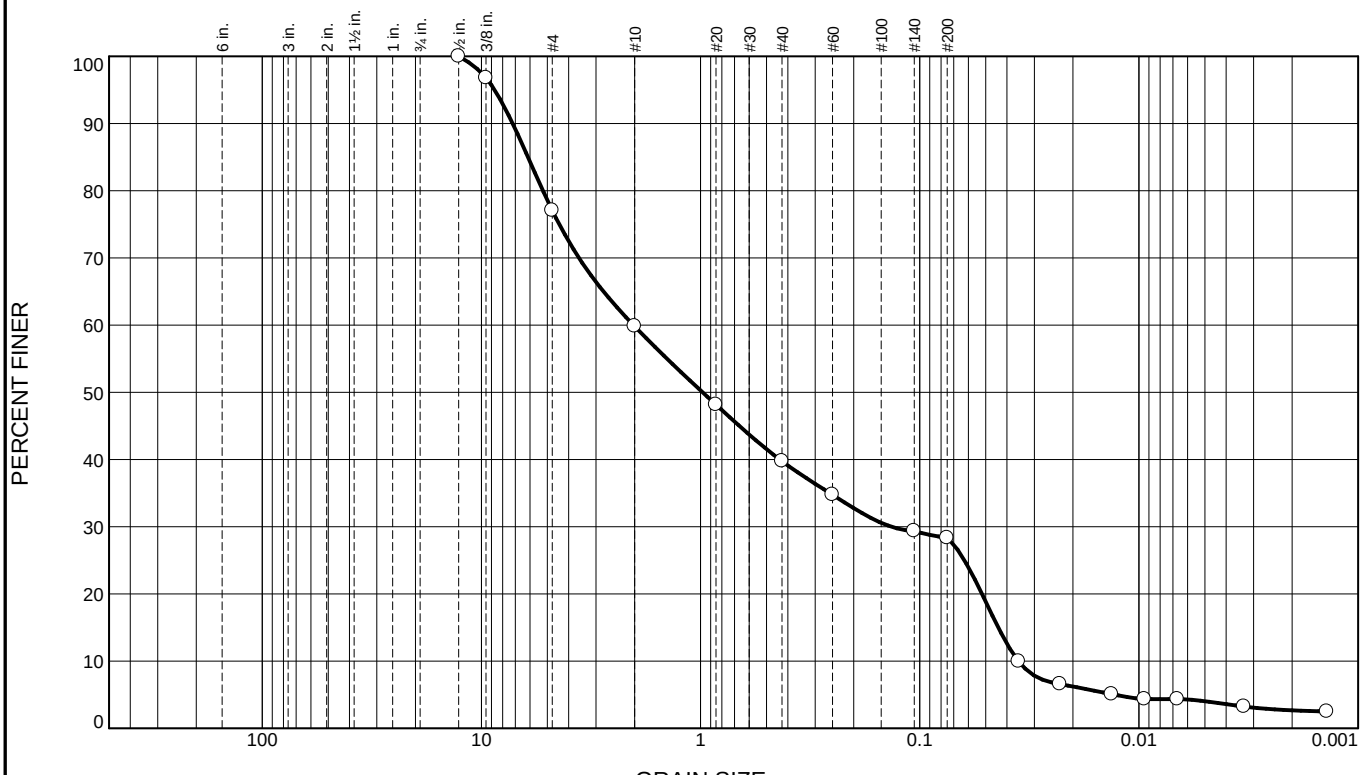
REPORT FORM

ASTM D 2216

PROJECT:	Environ Quanta
PROJECT No.:	SH0460
SAMPLE No.:	N4-A
TESTING DATE:	12/19/12
TESTED BY:	TNR
TRACKING CODE:	8592

MOISTURE CONTENT (Dry & Wet Basis)			
1. MOISTURE TIN NO.	A	B	C
2. WT MOISTURE TIN (tare weight)	1.2908 g	1.2920 g	1.2958 g
3. WT WET SOIL + TARE	11.0810 g	11.1756 g	10.8768 g
4. WT DRY SOIL + TARE	7.6763 g	7.7905 g	7.7354 g
5. WT WATER, Ww	3.4047 g	3.3851 g	3.1414 g
6. WT DRY SOIL, Ws	6.3855 g	6.4985 g	6.4396 g
7. ASTM MOISTURE CONTENT	53.32 %	52.09 %	48.78 %
8. PERCENT SOLIDS	65.22 %	65.75 %	67.21 %
9. AVERAGE ASTM MOISTURE CONTENT	51.40 %		
10. AVERAGE PERCENT SOLIDS	66.06 %		

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	22.9	17.3	20.1	11.4	24.3	4.0

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.5	100.0		
.375	96.8		
#4	77.1		
#10	59.8		
#20	48.1		
#40	39.7		
#60	34.7		
#140	29.4		
#200	28.3		

* (no specification provided)

Material Description

Dark gray silty sand with gravel

Atterberg Limits

PL= LL= PI=

Coefficients

D_{90}= 7.2026 D_{85}= 6.1316 D_{60}= 2.0241
D_{50}= 0.9795 D_{30}= 0.1349 D_{15}= 0.0438
D_{10}= 0.0355 C_u= 57.01 C_c= 0.25

Classification

USCS= AASHTO=

Remarks

Sample Number: N4-A

Date: 10/8/2012

KEMRON Environmental Services Inc.
Atlanta, Georgia

Client: Envirocon
Project: Quanta
Project No: SH0460 **Figure** 8592

Tested By: TNR **Checked By:** TAJ

MATERIAL pH

EPA METHOD 9045
DATA SHEET

PROJECT:	Environ Quanta
PROJECT No.:	SH0460
TESTING DATE:	12/19/2012
TESTED BY:	TNR
TRACKING CODE:	8592

KEMRON SAMPLE No.		MATERIAL pH
1.	N4-A	9.30
2.		
3.		
4.		
5.		
6.		
7.		
8.		
9.		
10.		
	AVERAGE:	9.30

MOISTURE CONTENT DETERMINATION

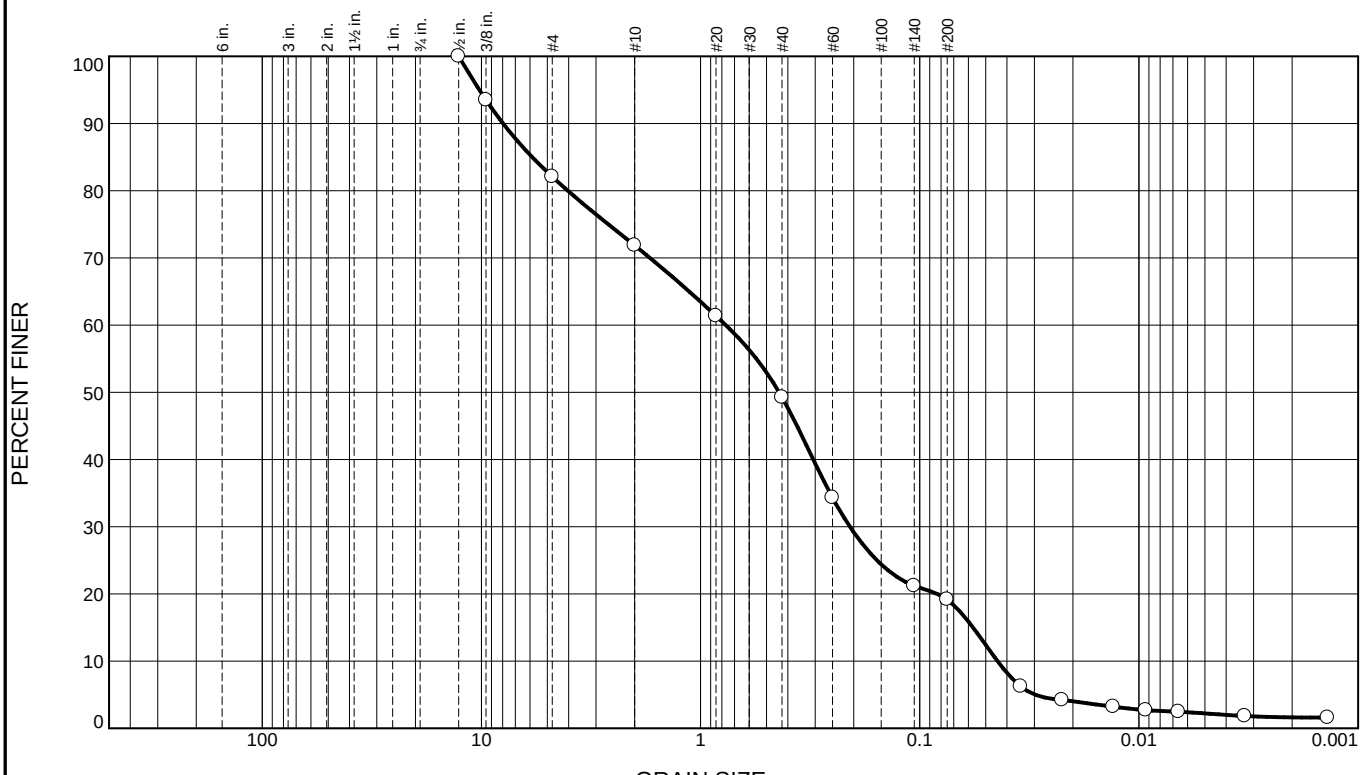
REPORT FORM

ASTM D 2216

PROJECT:	Environ Quanta
PROJECT No.:	SH0460
SAMPLE No.:	A-2A
TESTING DATE:	12/19/12
TESTED BY:	TNR
TRACKING CODE:	8593

MOISTURE CONTENT (Dry & Wet Basis)			
1. MOISTURE TIN NO.	A	B	C
2. WT MOISTURE TIN (tare weight)	1.2986 g	1.2876 g	1.2864 g
3. WT WET SOIL + TARE	11.3767 g	11.3446 g	11.3611 g
4. WT DRY SOIL + TARE	9.0949 g	9.0991 g	9.0406 g
5. WT WATER, Ww	2.2818 g	2.2455 g	2.3205 g
6. WT DRY SOIL, Ws	7.7963 g	7.8115 g	7.7542 g
7. ASTM MOISTURE CONTENT	29.27 %	28.75 %	29.93 %
8. PERCENT SOLIDS	77.36 %	77.67 %	76.97 %
9. AVERAGE ASTM MOISTURE CONTENT	29.31 %		
10. AVERAGE PERCENT SOLIDS	77.33 %		

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	17.9	10.2	22.6	30.1	17.0	2.2

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.5	100.0		
.375	93.5		
#4	82.1		
#10	71.9		
#20	61.4		
#40	49.3		
#60	34.3		
#140	21.2		
#200	19.2		

* (no specification provided)

Material Description

Very dark grayish brown silty sand with gravel

Atterberg Limits

PL= LL= PI=

Coefficients

D_{90}= 7.9704 D_{85}= 5.8663 D_{60}= 0.7680
D_{50}= 0.4381 D_{30}= 0.2083 D_{15}= 0.0571
D_{10}= 0.0442 C_u= 17.39 C_c= 1.28

Classification

USCS= AASHTO=

Remarks

Sample Number: A-2A

Date: 10/11/2012

KEMRON Environmental Services Inc.
Atlanta, Georgia

Client: Envirocon
Project: Quanta
Project No: SH0460 **Figure** 8593

Tested By: TNR **Checked By:** TAJ

MATERIAL pH

EPA METHOD 9045
DATA SHEET

PROJECT:	Environ Quanta
PROJECT No.:	SH0460
TESTING DATE:	12/19/2012
TESTED BY:	TNR
TRACKING CODE:	8593

KEMRON SAMPLE No.		MATERIAL pH
1.	A-2A	6.76
2.		
3.		
4.		
5.		
6.		
7.		
8.		
9.		
10.		
	AVERAGE:	6.76

MOISTURE CONTENT DETERMINATION

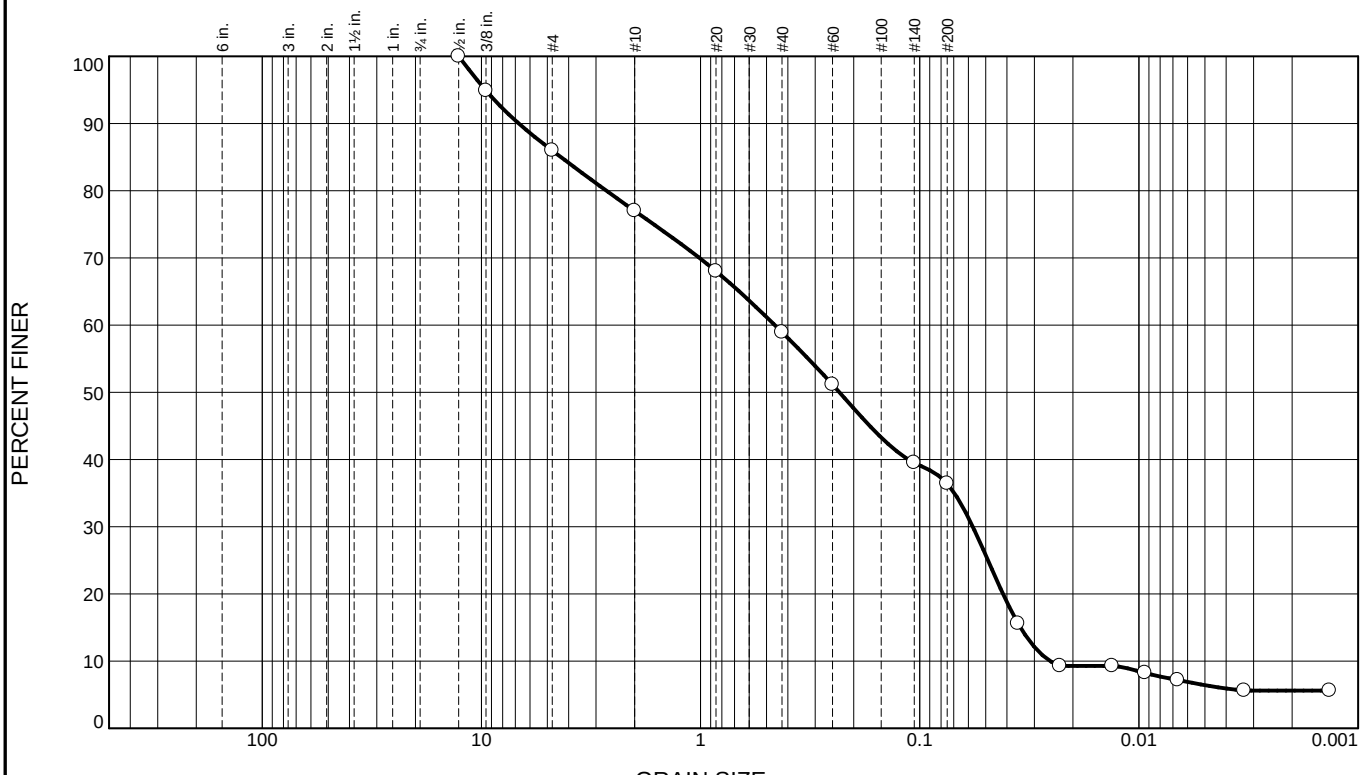
REPORT FORM

ASTM D 2216

PROJECT:	Environ Quanta
PROJECT No.:	SH0460
SAMPLE No.:	AN-2A
TESTING DATE:	12/19/12
TESTED BY:	TNR
TRACKING CODE:	8594

MOISTURE CONTENT (Dry & Wet Basis)			
1. MOISTURE TIN NO.	A	B	C
2. WT MOISTURE TIN (tare weight)	1.2825 g	1.2822 g	1.2869 g
3. WT WET SOIL + TARE	11.5146 g	11.4469 g	11.8648 g
4. WT DRY SOIL + TARE	8.0644 g	8.4413 g	8.8570 g
5. WT WATER, Ww	3.4502 g	3.0056 g	3.0078 g
6. WT DRY SOIL, Ws	6.7819 g	7.1591 g	7.5701 g
7. ASTM MOISTURE CONTENT	50.87 %	41.98 %	39.73 %
8. PERCENT SOLIDS	66.28 %	70.43 %	71.57 %
9. AVERAGE ASTM MOISTURE CONTENT	44.20 %		
10. AVERAGE PERCENT SOLIDS	69.43 %		

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	14.0	9.0	18.1	22.5	30.0	6.4

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.5	100.0		
.375	94.9		
#4	86.0		
#10	77.0		
#20	68.0		
#40	58.9		
#60	51.1		
#140	39.5		
#200	36.4		

* (no specification provided)

Material Description

Dark reddish brown silty sand

Atterberg Limits

PL= LL= PI=

Coefficients

D_{90}= 6.7553 D_{85}= 4.3386 D_{60}= 0.4589
D_{50}= 0.2326 D_{30}= 0.0573 D_{15}= 0.0347
D_{10}= 0.0254 C_u= 18.08 C_c= 0.28

Classification

USCS= AASHTO=

Remarks

Sample Number: AN-2A

Date: 10/11/2012

KEMRON Environmental Services Inc.
Atlanta, Georgia

Client: Envirocon
Project: Quanta
Project No: SH0460 **Figure** 8594

Tested By: TNR **Checked By:** TAJ

MATERIAL pH

EPA METHOD 9045
DATA SHEET

PROJECT:	Environ Quanta
PROJECT No.:	SH0460
TESTING DATE:	12/19/2012
TESTED BY:	TNR
TRACKING CODE:	8594

KEMRON SAMPLE No.		MATERIAL pH
1.	AN-2A	6.22
2.		
3.		
4.		
5.		
6.		
7.		
8.		
9.		
10.		
	AVERAGE:	6.22

APPENDIX C

UNTREATED ANALYTICAL REPORT

NELAP CERTIFICATE NUMBER 01955
DOD ELAP CERTIFICATE NUMBER ADE - 1482

ANALYTICAL RESULTS

PERFORMED BY

GULF COAST ANALYTICAL LABORATORIES, INC.

7979 GSRI Avenue

Baton Rouge, LA 70820

Report Date 01/08/2013

GCAL Report 212122422

Deliver To	KEMRON 1359A Ellsworth Industrial Blv Atlanta, GA 30318 404-601-6927
Attn	Tommy Jordan

Project Quanta

CASE NARRATIVE

Client: KEMRON **Report:** 212122422

Gulf Coast Analytical Laboratories received and analyzed the sample(s) listed on the sample cross-reference page of this report. Receipt of the sample(s) is documented by the attached chain of custody. This applies only to the sample(s) listed in this report. No sample integrity or quality control exceptions were identified unless noted below.

VOLATILES GAS CHROMATOGRAPHY

In the SW-846 1312/8015C analysis, samples 21212242201 (N1/N3 COMPOSITE (SPLP)), 21212242203 (N2 COMPOSITE (SPLP)) and 21212242205 (N4-A (SPLP)) had to be diluted to bracket the concentrations within the calibration range of the instrument.

In the SW-846 8015C GROanalysis, samples 21212242206 (N4-A), 21212242202 (N1/N3 COMPOSITE), 21212242204 (N2 COMPOSITE), 21212242208 (A-2A) and 21212242210 (AN-2A) had to be diluted to bracket the concentrations within the calibration range of the instrument.

In the SW-846 8015C GRO analysis, the recovery for the surrogate was outside control limits for samples 21212242202 (N1/N3 COMPOSITE) and 21212242204 (N2 COMPOSITE). The samples were re-analyzed yielding a similar recovery. This is attributed to matrix interference.

SEMI-VOLATILES GAS CHROMATOGRAPHY

In the SW-846 1312/8015C analysis, samples 21212242201 (N1/N3 COMPOSITE (SPLP)), 21212242203 (N2 COMPOSITE (SPLP)), 21212242205 (N4-A (SPLP)), 21212242207 (A-2A (SPLP)) and 21212242209 (AN-2A (SPLP)) had to be diluted to bracket target compounds within the calibration range of the instrument. This is reflected in elevated detection limits.

In the SW-846 8015C analysis, samples 21212242202 (N1/N3 COMPOSITE), 21212242204 (N2 COMPOSITE) and 21212242206 (N4-A) had to be diluted to bracket target compounds within the calibration range of the instrument. This is reflected in elevated detection limits.

In the SW-846 8015C analysis, a dilution was required for samples 21212242208 (A-2A) and 21212242210 (AN-2A) to eliminate interference from non-target background. This dilution is reflected in elevated detection limits.

In the 3550C extraction for the SW-846 8015C analysis, samples 21212242208 (A-2A) and 21212242210 (AN-2A) could not be concentrated to a final volume due to the sample matrix. This is reflected in elevated detection limits for this sample and as a result, the surrogate recovery is diluted out. The prep sheet is included.

In the SW-846 1312/8015C analysis, the recovery for the surrogate(s) is reported as diluted out for those analyses performed at a 10 or higher dilution.

In the SW-846 8015C analysis, the recovery for the surrogate(s) is reported as diluted out for those analyses performed at a 10 or higher dilution.

METALS

In the SW-846 6020A analysis, a chemical or physical interference necessitated a dilution for all samples.

This is reflected in the elevated reporting limits.

In the SW-846 6020A analysis, some samples had to be diluted in order to bracket the concentration of Arsenic within the calibration range of the instrument.

In the SW-846 6020A analysis, a chemical or physical interference necessitated a dilution for samples 21212242208 (A-2A) and 21212242210 (AN-2A). This is reflected in the elevated reporting limits.

In the SW-846 6020A analysis for prep batch 497748, the MS recovery is not applicable for Arsenic because the sample concentration is greater than four times the spike concentration. The Sample/Duplicate RPD for Arsenic is outside the control limits. The heterogeneous nature of the QC sample is believed to be responsible for this.

Laboratory Endorsement

Sample analysis was performed in accordance with approved methodologies provided by the Environmental Protection Agency or other recognized agencies. The samples and their corresponding extracts will be maintained for a period of 30 days unless otherwise arranged. Following this retention period the samples will be disposed in accordance with GCAL's Standard Operating Procedures.

Common Abbreviations Utilized in this Report

ND	Indicates the result was Not Detected at the specified RDL
DO	Indicates the result was Diluted Out
MI	Indicates the result was subject to Matrix Interference
TNTC	Indicates the result was Too Numerous To Count
SUBC	Indicates the analysis was Sub-Contracted
FLD	Indicates the analysis was performed in the Field
PQL	Practical Quantitation Limit
MDL	Method Detection Limit
RDL	Reporting Detection Limit
00:00	Reported as a time equivalent to 12:00 AM

Reporting Flags Utilized in this Report

J	Indicates the result is between the MDL and RDL
U	Indicates the compound was analyzed for but not detected
B	Indicates the analyte was detected in the associated Method Blank

Sample receipt at GCAL is documented through the attached chain of custody. In accordance with NELAC, this report shall be reproduced only in full and with the written permission of GCAL. The results contained within this report relate only to the samples reported. The documented results are presented within this report.

This report pertains only to the samples listed in the Report Sample Summary and should be retained as a permanent record thereof. The results contained within this report are intended for the use of the client. Any unauthorized use of the information contained in this report is prohibited.

I certify that this data package is in compliance with the NELAC standard and terms and conditions of the contract and Statement of Work both technically and for completeness, for other than the conditions in the case narrative. Release of the data contained in this hardcopy data package and in the computer-readable data submitted has been authorized by the Quality Assurance Manager or his/her designee, as verified by the following signature.

Estimated uncertainty of measurement is available upon request. This report is in compliance with the DOD QSM as specified in the contract if applicable.

_____

Robyn Migues
Technical Director
GCAL REPORT 212122422

THIS REPORT CONTAINS _____ PAGES.

Report Sample Summary

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21212242201	N1/N3 COMPOSITE (SPLP)	Solid	12/19/2012 13:20	12/22/2012 12:20
21212242202	N1/N3 COMPOSITE	Solid	12/19/2012 13:20	12/22/2012 12:20
21212242203	N2 COMPOSITE (SPLP)	Solid	12/19/2012 13:30	12/22/2012 12:20
21212242204	N2 COMPOSITE	Solid	12/19/2012 13:30	12/22/2012 12:20
21212242205	N4-A (SPLP)	Solid	12/19/2012 13:40	12/22/2012 12:20
21212242206	N4-A	Solid	12/19/2012 13:40	12/22/2012 12:20
21212242207	A-2A (SPLP)	Solid	12/19/2012 14:00	12/22/2012 12:20
21212242208	A-2A	Solid	12/19/2012 14:00	12/22/2012 12:20
21212242209	AN-2A (SPLP)	Solid	12/19/2012 14:20	12/22/2012 12:20
21212242210	AN-2A	Solid	12/19/2012 14:20	12/22/2012 12:20

Summary of Compounds Detected

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21212242201	**N1/N3 COMPOSITE (SPLP)**	Solid	12/19/2012 13:20	12/22/2012 12:20

SW-846 1312/8015C GRO

CAS#	Parameter	Result	RDL	MDL	Units
8006-61-9	Gasoline Range Organics	8.85	1.00	0.130	mg/L

SW-846 1312/6020A

CAS#	Parameter	Result	RDL	MDL	Units
7440-38-2	Arsenic	127	2.00	0.19	ug/L

SW-846 1312/8015C DRO

CAS#	Parameter	Result	RDL	MDL	Units
GCSV-00-4	Diesel Range Organics	34.6	7.50	2.21	mg/L

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21212242202	**N1/N3 COMPOSITE**	Solid	12/19/2012 13:20	12/22/2012 12:20

SW-846 8015C DRO

CAS#	Parameter	Result	RDL	MDL	Units
GCSV-00-4	Diesel Range Organics	11900000	983000	321000	ug/Kg

SW-846 6020A

CAS#	Parameter	Result	RDL	MDL	Units
7440-38-2	Arsenic	25800	493	113	ug/Kg

SW-846 8015C GRO

CAS#	Parameter	Result	RDL	MDL	Units
8006-61-9	Gasoline Range Organics	500000	60200	5890	ug/Kg

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21212242203	**N2 COMPOSITE (SPLP)**	Solid	12/19/2012 13:30	12/22/2012 12:20

SW-846 1312/8015C GRO

CAS#	Parameter	Result	RDL	MDL	Units
8006-61-9	Gasoline Range Organics	4.13	1.00	0.130	mg/L

Summary of Compounds Detected (con't)

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21212242203	**N2 COMPOSITE (SPLP)**	Solid	12/19/2012 13:30	12/22/2012 12:20

SW-846 1312/6020A

CAS#	Parameter	Result	RDL	MDL	Units
7440-38-2	Arsenic	27.7	1.00	0.094	ug/L

SW-846 1312/8015C DRO

CAS#	Parameter	Result	RDL	MDL	Units
GCSV-00-4	Diesel Range Organics	23.2	3.00	0.884	mg/L

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21212242204	**N2 COMPOSITE**	Solid	12/19/2012 13:30	12/22/2012 12:20

SW-846 8015C DRO

CAS#	Parameter	Result	RDL	MDL	Units
GCSV-00-4	Diesel Range Organics	30200000	27900000	9100000	ug/Kg

SW-846 6020A

CAS#	Parameter	Result	RDL	MDL	Units
7440-38-2	Arsenic	6730	514	118	ug/Kg

SW-846 8015C GRO

CAS#	Parameter	Result	RDL	MDL	Units
8006-61-9	Gasoline Range Organics	338000	63100	6180	ug/Kg

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21212242205	**N4-A (SPLP)**	Solid	12/19/2012 13:40	12/22/2012 12:20

SW-846 1312/6020A

CAS#	Parameter	Result	RDL	MDL	Units
7440-38-2	Arsenic	3.25	1.00	0.094	ug/L

SW-846 1312/8015C DRO

CAS#	Parameter	Result	RDL	MDL	Units
GCSV-00-4	Diesel Range Organics	115	15.0	4.42	mg/L

SW-846 1312/8015C GRO

CAS#	Parameter	Result	RDL	MDL	Units
8006-61-9	Gasoline Range Organics	22.2	5.00	0.650	mg/L

Summary of Compounds Detected (con't)

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21212242206	**N4-A**	Solid	12/19/2012 13:40	12/22/2012 12:20

SW-846 8015C GRO

CAS#	Parameter	Result	RDL	MDL	Units
8006-61-9	Gasoline Range Organics	1090000	725000	71000	ug/Kg

SW-846 8015C DRO

CAS#	Parameter	Result	RDL	MDL	Units
GCSV-00-4	Diesel Range Organics	90200000	5870000	1910000	ug/Kg

SW-846 6020A

CAS#	Parameter	Result	RDL	MDL	Units
7440-38-2	Arsenic	3880	587	134	ug/Kg

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21212242207	**A-2A (SPLP)**	Solid	12/19/2012 14:00	12/22/2012 12:20

SW-846 1312/8015C GRO

CAS#	Parameter	Result	RDL	MDL	Units
8006-61-9	Gasoline Range Organics	0.502	0.100	0.013	mg/L

SW-846 1312/6020A

CAS#	Parameter	Result	RDL	MDL	Units
7440-38-2	Arsenic	2590	50.0	4.71	ug/L

SW-846 1312/8015C DRO

CAS#	Parameter	Result	RDL	MDL	Units
GCSV-00-4	Diesel Range Organics	3.58	0.300	0.088	mg/L

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21212242208	**A-2A**	Solid	12/19/2012 14:00	12/22/2012 12:20

SW-846 8015C DRO

CAS#	Parameter	Result	RDL	MDL	Units
GCSV-00-4	Diesel Range Organics	1410000	268000	87400	ug/Kg

Summary of Compounds Detected (con't)

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21212242208	A-2A	Solid	12/19/2012 14:00	12/22/2012 12:20

SW-846 6020A

CAS#	Parameter	Result	RDL	MDL	Units
7440-38-2	Arsenic	716000	134000	6130	ug/Kg

SW-846 8015C GRO

CAS#	Parameter	Result	RDL	MDL	Units
8006-61-9	Gasoline Range Organics	14800	6630	649	ug/Kg

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21212242209	AN-2A (SPLP)	Solid	12/19/2012 14:20	12/22/2012 12:20

SW-846 1312/6020A

CAS#	Parameter	Result	RDL	MDL	Units
7440-38-2	Arsenic	661	10.0	0.94	ug/L

SW-846 1312/8015C DRO

CAS#	Parameter	Result	RDL	MDL	Units
GCSV-00-4	Diesel Range Organics	3.83	0.300	0.088	mg/L

SW-846 1312/8015C GRO

CAS#	Parameter	Result	RDL	MDL	Units
8006-61-9	Gasoline Range Organics	0.363	0.100	0.013	mg/L

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21212242210	AN-2A	Solid	12/19/2012 14:20	12/22/2012 12:20

SW-846 8015C DRO

CAS#	Parameter	Result	RDL	MDL	Units
GCSV-00-4	Diesel Range Organics	3330000	258000	84000	ug/Kg

SW-846 6020A

CAS#	Parameter	Result	RDL	MDL	Units
7440-38-2	Arsenic	924000	129000	5900	ug/Kg

SW-846 8015C GRO

CAS#	Parameter	Result	RDL	MDL	Units
8006-61-9	Gasoline Range Organics	22200	6400	627	ug/Kg

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21212242201	**N1/N3 COMPOSITE (SPLP)**	Solid	12/19/2012 13:20	12/22/2012 12:20

SW-846 1312/8015C DRO

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
12/29/2012 13:15	497854	SW-846 3510C	50	01/02/2013 18:36	SMH	498299

CAS#	Parameter	Result	RDL	MDL	Units
GCSV-00-4	**Diesel Range Organics**	**34.6**	**7.50**	**2.21**	**mg/L**

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
84-15-1	o-Terphenyl	50	Diluted Out	ug/L	**0***	60 - 140

SW-846 1312/8015C GRO

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
			10	12/28/2012 16:33	JAR	497997

CAS#	Parameter	Result	RDL	MDL	Units
8006-61-9	**Gasoline Range Organics**	**8.85**	**1.00**	**0.130**	**mg/L**

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
106-39-8	Bromochlorobenzene	300	357	ug/L	119	49 - 136

SW-846 1312/6020A

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
12/27/2012 14:35	497881	SW-846 3010A	2	01/04/2013 05:11	BNB	498380

CAS#	Parameter	Result	RDL	MDL	Units
7440-38-2	**Arsenic**	**127**	**2.00**	**0.19**	**ug/L**

RESULTS REPORTED ON A DRY WEIGHT BASIS

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21212242202	**N1/N3 COMPOSITE**	Solid	12/19/2012 13:20	12/22/2012 12:20

SW-846 8015C DRO

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
12/30/2012 09:45	497833	3550C	20	01/02/2013 16:21	SMH	498294

CAS#	Parameter	Result	RDL	MDL	Units
GCSV-00-4	**Diesel Range Organics**	**11900000**	**983000**	**321000**	**ug/Kg**

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
84-15-1	o-Terphenyl	1660	Diluted Out	ug/Kg	**0***	63 - 120

SW-846 8015C GRO

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
			500	12/27/2012 20:23	BMR	497865

CAS#	Parameter	Result	RDL	MDL	Units
8006-61-9	**Gasoline Range Organics**	**500000**	**60200**	**5890**	**ug/Kg**

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
106-39-8	Bromochlorobenzene	14600	38500	ug/Kg	**263***	47 - 164

SW-846 6020A

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
12/27/2012 11:00	497748	SW-846 3050B	10	12/29/2012 08:24	BNB	498019

CAS#	Parameter	Result	RDL	MDL	Units
7440-38-2	**Arsenic**	**25800**	**493**	**113**	**ug/Kg**

RESULTS REPORTED ON A DRY WEIGHT BASIS

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21212242203	**N2 COMPOSITE (SPLP)**	Solid	12/19/2012 13:30	12/22/2012 12:20

SW-846 1312/8015C DRO

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
12/29/2012 13:15	497854	SW-846 3510C	20	01/02/2013 18:56	SMH	498299

CAS#	Parameter	Result	RDL	MDL	Units
GCSV-00-4	**Diesel Range Organics**	**23.2**	**3.00**	**0.884**	**mg/L**

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
84-15-1	o-Terphenyl	50	Diluted Out	ug/L	**0***	60 - 140

SW-846 1312/8015C GRO

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
			10	12/28/2012 16:47	JAR	497997

CAS#	Parameter	Result	RDL	MDL	Units
8006-61-9	**Gasoline Range Organics**	**4.13**	**1.00**	**0.130**	**mg/L**

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
106-39-8	Bromochlorobenzene	300	375	ug/L	125	49 - 136

SW-846 1312/6020A

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
12/27/2012 14:35	497881	SW-846 3010A	1	01/04/2013 05:16	BNB	498380

CAS#	Parameter	Result	RDL	MDL	Units
7440-38-2	**Arsenic**	**27.7**	**1.00**	**0.094**	**ug/L**

RESULTS REPORTED ON A DRY WEIGHT BASIS

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21212242204	**N2 COMPOSITE**	Solid	12/19/2012 13:30	12/22/2012 12:20

SW-846 8015C DRO

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
12/30/2012 09:45	497833	3550C	50	01/02/2013 16:40	SMH	498294

CAS#	Parameter	Result	RDL	MDL	Units
GCSV-00-4	**Diesel Range Organics**	**30200000**	**27900000**	**9100000**	**ug/Kg**

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
84-15-1	o-Terphenyl	1640	Diluted Out	ug/Kg	**0***	63 - 120

SW-846 8015C GRO

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
			500	12/27/2012 20:43	BMR	497865

CAS#	Parameter	Result	RDL	MDL	Units
8006-61-9	**Gasoline Range Organics**	**338000**	**63100**	**6180**	**ug/Kg**

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
106-39-8	Bromochlorobenzene	14700	39600	ug/Kg	**269***	47 - 164

SW-846 6020A

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
12/27/2012 11:00	497748	SW-846 3050B	10	12/29/2012 08:47	BNB	498019

CAS#	Parameter	Result	RDL	MDL	Units
7440-38-2	**Arsenic**	**6730**	**514**	**118**	**ug/Kg**

RESULTS REPORTED ON A DRY WEIGHT BASIS

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21212242205	**N4-A (SPLP)**	Solid	12/19/2012 13:40	12/22/2012 12:20

SW-846 1312/8015C DRO

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
12/29/2012 13:15	497854	SW-846 3510C	100	01/02/2013 19:15	SMH	498299

CAS#	Parameter	Result	RDL	MDL	Units
GCSV-00-4	**Diesel Range Organics**	**115**	**15.0**	**4.42**	**mg/L**

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
84-15-1	o-Terphenyl	50	Diluted Out	ug/L	**0***	60 - 140

SW-846 1312/8015C GRO

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
			50	12/28/2012 17:01	JAR	497997

CAS#	Parameter	Result	RDL	MDL	Units
8006-61-9	**Gasoline Range Organics**	**22.2**	**5.00**	**0.650**	**mg/L**

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
106-39-8	Bromochlorobenzene	1500	1890	ug/L	126	49 - 136

SW-846 1312/6020A

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
12/27/2012 14:35	497881	SW-846 3010A	1	01/04/2013 04:29	BNB	498380

CAS#	Parameter	Result	RDL	MDL	Units
7440-38-2	**Arsenic**	**3.25**	**1.00**	**0.094**	**ug/L**

RESULTS REPORTED ON A DRY WEIGHT BASIS

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21212242206	**N4-A**	Solid	12/19/2012 13:40	12/22/2012 12:20

SW-846 8015C DRO

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
12/30/2012 09:45	497833	3550C	100	01/02/2013 16:59	SMH	498294

CAS#	Parameter	Result	RDL	MDL	Units
GCSV-00-4	**Diesel Range Organics**	**90200000**	**5870000**	**1910000**	**ug/Kg**

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
84-15-1	o-Terphenyl	1670	Diluted Out	ug/Kg	**0***	63 - 120

SW-846 8015C GRO

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
			5000	12/27/2012 18:43	BMR	497865

CAS#	Parameter	Result	RDL	MDL	Units
8006-61-9	**Gasoline Range Organics**	**1090000**	**725000**	**71000**	**ug/Kg**

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
106-39-8	Bromochlorobenzene	148000	192000	ug/Kg	130	47 - 164

SW-846 6020A

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
12/27/2012 11:00	497748	SW-846 3050B	10	12/29/2012 08:52	BNB	498019

CAS#	Parameter	Result	RDL	MDL	Units
7440-38-2	**Arsenic**	**3880**	**587**	**134**	**ug/Kg**

RESULTS REPORTED ON A DRY WEIGHT BASIS

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21212242207	**A-2A (SPLP)**	Solid	12/19/2012 14:00	12/22/2012 12:20

SW-846 1312/8015C DRO

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
12/29/2012 13:15	497854	SW-846 3510C	2	01/02/2013 19:34	SMH	498299

CAS#	Parameter	Result	RDL	MDL	Units
GCSV-00-4	**Diesel Range Organics**	**3.58**	**0.300**	**0.088**	**mg/L**

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
84-15-1	o-Terphenyl	50	56.7	ug/L	113	60 - 140

SW-846 1312/8015C GRO

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
			1	12/28/2012 17:15	JAR	497997

CAS#	Parameter	Result	RDL	MDL	Units
8006-61-9	**Gasoline Range Organics**	**0.502**	**0.100**	**0.013**	**mg/L**

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
106-39-8	Bromochlorobenzene	30	39.5	ug/L	132	49 - 136

SW-846 1312/6020A

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
12/27/2012 14:35	497881	SW-846 3010A	50	01/04/2013 05:21	BNB	498380

CAS#	Parameter	Result	RDL	MDL	Units
7440-38-2	**Arsenic**	**2590**	**50.0**	**4.71**	**ug/L**

RESULTS REPORTED ON A DRY WEIGHT BASIS

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21212242208	**A-2A**	Solid	12/19/2012 14:00	12/22/2012 12:20

SW-846 8015C DRO

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
12/30/2012 09:45	497833	3550C	5	12/31/2012 19:28	SMH	498244

CAS#	Parameter	Result	RDL	MDL	Units
GCSV-00-4	**Diesel Range Organics**	**1410000**	**268000**	**87400**	**ug/Kg**

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
84-15-1	o-Terphenyl	1670	Diluted Out	ug/Kg	**0***	63 - 120

SW-846 8015C GRO

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
			50	12/27/2012 21:03	BMR	497865

CAS#	Parameter	Result	RDL	MDL	Units
8006-61-9	**Gasoline Range Organics**	**14800**	**6630**	**649**	**ug/Kg**

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
106-39-8	Bromochlorobenzene	1490	1790	ug/Kg	121	47 - 164

SW-846 6020A

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
12/27/2012 11:00	497748	SW-846 3050B	500	01/03/2013 03:56	BNB	498203

CAS#	Parameter	Result	RDL	MDL	Units
7440-38-2	**Arsenic**	**716000**	**134000**	**6130**	**ug/Kg**

RESULTS REPORTED ON A DRY WEIGHT BASIS

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21212242209	**AN-2A (SPLP)**	Solid	12/19/2012 14:20	12/22/2012 12:20

SW-846 1312/8015C DRO

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
12/29/2012 13:15	497854	SW-846 3510C	2	01/02/2013 19:54	SMH	498299

CAS#	Parameter	Result	RDL	MDL	Units
GCSV-00-4	**Diesel Range Organics**	**3.83**	**0.300**	**0.088**	**mg/L**

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
84-15-1	o-Terphenyl	50	57.5	ug/L	115	60 - 140

SW-846 1312/8015C GRO

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
			1	12/28/2012 17:29	JAR	497997

CAS#	Parameter	Result	RDL	MDL	Units
8006-61-9	**Gasoline Range Organics**	**0.363**	**0.100**	**0.013**	**mg/L**

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
106-39-8	Bromochlorobenzene	30	37.9	ug/L	126	49 - 136

SW-846 1312/6020A

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
12/27/2012 14:35	497881	SW-846 3010A	10	01/04/2013 05:25	BNB	498380

CAS#	Parameter	Result	RDL	MDL	Units
7440-38-2	**Arsenic**	**661**	**10.0**	**0.94**	**ug/L**

RESULTS REPORTED ON A DRY WEIGHT BASIS

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21212242210	**AN-2A**	Solid	12/19/2012 14:20	12/22/2012 12:20

SW-846 8015C DRO

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
12/30/2012 09:45	497833	3550C	5	12/31/2012 19:47	SMH	498244

CAS#	Parameter	Result	RDL	MDL	Units
GCSV-00-4	**Diesel Range Organics**	**3330000**	**258000**	**84000**	**ug/Kg**

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
84-15-1	o-Terphenyl	1670	Diluted Out	ug/Kg	**0***	63 - 120

SW-846 8015C GRO

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
			50	12/27/2012 21:23	BMR	497865

CAS#	Parameter	Result	RDL	MDL	Units
8006-61-9	**Gasoline Range Organics**	**22200**	**6400**	**627**	**ug/Kg**

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
106-39-8	Bromochlorobenzene	1490	2170	ug/Kg	146	47 - 164

SW-846 6020A

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
12/27/2012 11:00	497748	SW-846 3050B	500	01/03/2013 04:01	BNB	498203

CAS#	Parameter	Result	RDL	MDL	Units
7440-38-2	**Arsenic**	**924000**	**129000**	**5900**	**ug/Kg**

RESULTS REPORTED ON A DRY WEIGHT BASIS

General Chromatography Quality Control Summary

Analytical Batch	498244	**Client ID**	MB497833			LCS497833			LCSD497833		
Prep Batch	497833	**GCAL ID**	1144849			1144850			1144851		
Prep Method	3550C	**Sample Type**	Method Blank			LCS			LCSD		
		Prep Date	12/30/2012 09:45			12/30/2012 09:45			12/30/2012 09:45		
		Analytical Date	12/31/2012 13:39			12/31/2012 13:59			12/31/2012 14:18		
		Matrix	Solid			Solid			Solid		
SW-846 8015C DRO		**Units**	**Result**	ug/Kg **RDL**	**Spike Added**	**Result**	**% R**	**Control Limits % R**	**Result**	**% R**	**RPD**	**RPD Limit**
GCSV-00-4	Diesel Range Organics		1310U	1310	33300	28300	85	50 - 124	28000	84	1	40
Surrogate												
84-15-1	o-Terphenyl		1360	82	1670	1420	85	63 - 120	1460	88		

Analytical Batch	498244	**Client ID**	FDH-DP-04-2-4			1143610MS			1143610MSD		
Prep Batch	497833	**GCAL ID**	21212213802			1144852			1144853		
Prep Method	3550C	**Sample Type**	SAMPLE			MS			MSD		
		Prep Date	12/30/2012 09:45			12/30/2012 09:45			12/30/2012 09:45		
		Analytical Date	12/31/2012 14:38			12/31/2012 14:57			12/31/2012 15:16		
		Matrix	Solid			Solid			Solid		
SW-846 8015C DRO		**Units**	**Result**	ug/Kg **RDL**	**Spike Added**	**Result**	**% R**	**Control Limits % R**	**Result**	**% R**	**RPD**	**RPD Limit**
GCSV-00-4	Diesel Range Organics		2100	1290	32900	28500	80	50 - 124	27400	76	4	40
Surrogate												
84-15-1	o-Terphenyl				1640	1250	76	63 - 120	1230	74		

General Chromatography Quality Control Summary

Analytical Batch 497865		**Client ID**	MB497865		LCS497865		
Prep Batch N/A		**GCAL ID**	1144984		1144985		
		Sample Type	Method Blank		LCS		
		Analytical Date	12/27/2012 14:17		12/27/2012 13:57		
		Matrix	Solid		Solid		
SW-846 8015C GRO		**Units**	ug/Kg	**Spike**	**Result**		**Control**
		Result	**RDL**	**Added**		**% R**	**Limits % R**
8006-61-9	Gasoline Range Organics	490U	490	25000	24300	97	67 - 127
Surrogate							
106-39-8	Bromochlorobenzene	1410	94	1500	1470	98	47 - 164

Analytical Batch 497865		**Client ID**	FDH-DP-01-0-2		1141680MS			1141680MSD			
Prep Batch N/A		**GCAL ID**	21212180601		1145052			1145053			
		Sample Type	SAMPLE		MS			MSD			
		Analytical Date	12/27/2012 14:37		12/27/2012 14:57			12/27/2012 15:17			
		Matrix	Solid		Solid			Solid			
SW-846 8015C GRO		**Units**	ug/Kg	**Spike**	**Result**		**Control**	**Result**			**RPD**
		Result	**RDL**	**Added**		**% R**	**Limits % R**		**% R**	**RPD**	**Limit**
8006-61-9	Gasoline Range Organics	140	362	18500	18000	97	67 - 127	17800	96	1	40
Surrogate											
106-39-8	Bromochlorobenzene			1110	1070	97	47 - 164	1050	95		

General Chromatography Quality Control Summary

Analytical Batch	497997	**Client ID**	MB497997			LCS497997			LCSD497997		
Prep Batch	N/A	**GCAL ID**	1145482			1145483			1145484		
		Sample Type	Method Blank			LCS			LCSD		
		Analytical Date	12/28/2012 14:05			12/28/2012 13:37			12/28/2012 13:51		
		Matrix	Water			Water			Water		
SW-846 1312/8015C GRO		**Units**	mg/L	**Spike**	**Result**		**Control**	**Result**			**RPD**
		Result	**RDL**	**Added**		**% R**	**Limits % R**		**% R**	**RPD**	**Limit**
8006-61-9	Gasoline Range Organics	0.013U	0.013	0.500	0.514	103	50 - 162	0.529	106	3	25
Surrogate											
106-39-8	Bromochlorobenzene	33.9	113	30	33.9	113	49 - 136	33.9	113		

Analytical Batch	498237	**Client ID**	MB497854			LCS497854			LCSD497854		
Prep Batch	497854	**GCAL ID**	1144921			1144922			1144923		
Prep Method	SW-846	**Sample Type**	Method Blank			LCS			LCSD		
	3510C	**Prep Date**	12/29/2012 13:15			12/29/2012 13:15			12/29/2012 13:15		
		Analytical Date	12/31/2012 13:39			12/31/2012 13:59			12/31/2012 14:18		
		Matrix	Water			Water			Water		
SW-846 1312/8015C DRO		**Units**	mg/L	**Spike**	**Result**		**Control**	**Result**			**RPD**
		Result	**RDL**	**Added**		**% R**	**Limits % R**		**% R**	**RPD**	**Limit**
GCSV-00-4	Diesel Range Organics	0.044U	0.044	1.00	0.989	99	50 - 150	1.20	120	19	40
Surrogate											
84-15-1	o-Terphenyl	45	90	50	50.5	101	60 - 140	58.7	117		

Inorganics Quality Control Summary

Analytical Batch	498019	**Client ID**	MB497748	LCS497748
Prep Batch	497748	**GCAL ID**	1144533	1144534
Prep Method	SW-846	**Sample Type**	Method Blank	LCS
	3050B	**Prep Date**	12/27/2012 11:00	12/27/2012 11:00
		Analytical Date	12/29/2012 06:25	12/29/2012 06:29
		Matrix	Solid	Solid

SW-846 6020A		**Units**	ug/Kg	**Spike**	**Result**		**Control**
		Result	**RDL**	**Added**		**% R**	**Limits % R**
7440-38-2	Arsenic	9.16U	9.16	2000	1690	84	80 - 120

Analytical Batch	498019	**Client ID**	N1/N3 COMPOSITE	1144376MS
Prep Batch	497748	**GCAL ID**	21212242202	1144536
Prep Method	SW-846	**Sample Type**	SAMPLE	MS
	3050B	**Prep Date**	12/27/2012 11:00	12/27/2012 11:00
		Analytical Date	12/29/2012 08:24	12/29/2012 08:33
		Matrix	Solid	Solid

SW-846 6020A		**Units**	ug/Kg	**Spike**	**Result**		**Control**
		Result	**RDL**	**Added**		**% R**	**Limits % R**
7440-38-2	Arsenic	20900	91.6	2000	13800	**-400***	80 - 120

Analytical Batch	498019	**Client ID**	N1/N3 COMPOSITE	1144376DUP
Prep Batch	497748	**GCAL ID**	21212242202	1144535
Prep Method	SW-846	**Sample Type**	SAMPLE	DUP
	3050B	**Prep Date**	12/27/2012 11:00	12/27/2012 11:00
		Analytical Date	12/29/2012 08:24	12/29/2012 08:28
		Matrix	Solid	Solid

SW-846 6020A		**Units**	ug/Kg	**Result**		**RPD**
		Result	**RDL**		**RPD**	**Limit**
7440-38-2	Arsenic	20900	91.6	13700	**42***	20

Inorganics Quality Control Summary

Analytical Batch	498380	**Client ID**	MB497881			LCS497881		
Prep Batch	497881	**GCAL ID**	1145070			1145071		
Prep Method	SW-846	**Sample Type**	Method Blank			LCS		
	3010A	**Prep Date**	12/27/2012 14:35			12/27/2012 14:35		
		Analytical Date	01/04/2013 04:19			01/04/2013 04:24		
		Matrix	Water			Water		
SW-846 1312/6020A			**Units**	ug/L	**Spike**	**Result**		**Control**
			Result	**RDL**	**Added**		**% R**	**Limits % R**
7440-38-2	Arsenic		0.094U	0.094	50.0	42.1	84	80 - 120

Analytical Batch	498380	**Client ID**	N4-A (SPLP)			1144379MS			1144379MSD			
Prep Batch	497881	**GCAL ID**	21212242205			1145072			1145073			
Prep Method	SW-846	**Sample Type**	SAMPLE			MS			MSD			
	3010A	**Prep Date**	12/27/2012 14:35			12/27/2012 14:35			12/27/2012 14:35			
		Analytical Date	01/04/2013 04:29			01/04/2013 04:33			01/04/2013 04:57			
		Matrix	Solid			Solid			Solid			
SW-846 1312/6020A			**Units**	ug/L	**Spike**	**Result**		**Control**	**Result**			**RPD**
			Result	**RDL**	**Added**		**% R**	**Limits % R**		**% R**	**RPD**	**Limit**
7440-38-2	Arsenic		3.25	0.094	50.0	47.4	88	80 - 120	49.5	93	4	20

GCAL

GULF COAST ANALYTICAL LABORATORIES, INC

7979 GSRI AVE, BATON ROUGE LA 70820-7402
(225) 769-4900 FAX (225) 767-5717

Chain of Custody Record

Lab use only			
Kemron	4794	2121222 2422 TSJP 12/24/12	12/28/12
Client Name	Client #	Group#	Due Date

Report to:
Client: KEMRON
Address: 1359 Ellsworth
Atlanta GA
Contact:
Phone:
Fax:

Bill to:
Client: SAME
Address:
Contact:
Phone:
Fax:

P.O. Number

Project Name/Number

Sampled By:

Analytical Requests & Methods

3.2

Matrix	Date	Time (2400)	Comp	Grab	Sample Description	Preservatives	No. Containers	Total Arsenic	Total TPH (GRO & DRO)	SPLP Arsenic	SPLP TPH (GRO & DRO)	Remarks:	Lab ID 12/24
S	12/19	1320		X	N1/N3 Composite	Ice ~~None~~	3	X	X	X	X		1, 2
S	12/19	1330		X	N2 Composite			X	X	X	X		3, 4
S	12/19	1340		X	N4-A			X	X	X	X		5, 6
S	12/19	1400		X	A-2A			X	X	X	X		7, 8
S	12/19	1420		X	AN-2A			X	X	X	X		9, 10

Turn Around Time: ___ 24 - 48 hrs ___ 3 days ___ 1 week X standard other ___

Relinquished by: (Signature)	Received by: (Signature)	Date:	Time:
[signature]		12/21/12	1455
[signature]	Fedtx Ojancier	12/22/12	1220
7943 7907 6113			

Note:

By submitting these samples, you agree to the terms and conditions contained in our most recent schedule of services.

Matrix: W = water, S=Soil, SD=Solid, L=Liquid, SL=Sludge, O=Oil, CT=Charcoal Tube, OVM=Organic Vapor Monitor, XT=XAD Tube, A=Air Bag, SUM=Summa Canister

GCAL ANALYTICAL LABORATORIES, LLC

SAMPLE RECEIVING CHECKLIST

SAMPLE DELIVERY GROUP	212122422
Client 4794 - KEMRON	**Transport Method** FEDEX
Profile 230324 - DaNang Airport Thermal	**Received By** Pfeifer, Ben J.
Line Item(s) 1 - Soil	**Receive Date(s)** 12/22/12

CHECKLIST			
Were all samples received using proper thermal preservation?	☑ Yes	☐ No	☐ NA
When used, were all custody seals intact?	☑ Yes	☐ No	☐ NA
Were all samples received in proper containers?	☑ Yes	☐ No	☐ NA
Were all samples received using proper chemical preservation?	☑ Yes	☐ No	☐ NA
Was preservative added to any container at the lab?	☐ Yes	☑ No	☐ NA
Were all containers received in good condition?	☑ Yes	☐ No	☐ NA
Were all VOA vials received with no head space?	☐ Yes	☐ No	☑ NA
Do all sample labels match the Chain of Custody?	☑ Yes	☐ No	☐ NA
Did the Chain of Custody list the sampling technician?	☐ Yes	☑ No	☐ NA
Was the COC maintained i.e. all signatures, dates and time of receipt included?	☑ Yes	☐ No	☐ NA

COOLERS

Airbill	Temp(oC)
7943 7907 6113	3.2

DISCREPANCIES

None

LABORATORY PRESERVATIONS

None

NOTES

APPENDIX D

PRELIMINARY EVALUATION MIXTURE DEVELOPMENT SHEETS

MIX DEVELOPMENT DATA SHEET

PROJECT:	Quanta	MIX No.	
PROJECT No.:	SH0460		460-001
MIXING DATE:	19-Dec-12	MIXED BY:	TNR

UNTREATED MATERIAL TYPE		**N1/N3 Composite**
WEIGHT OF UNTREATED MATERIAL		**1,200 g**
REAGENT TYPE AND LOT NUMBER	ADDITION RATE	WEIGHT
LaFarge Type I Cement	2.00 %	24.0 g
LaFarge Newcem Slag Cement	8.00 %	96.0 g
	%	0.0 g
	%	0.0 g
	%	0.0 g
Water Addition (water to reagent)	100 %	120.0 g

OBSERVATIONS / NOTES

120 g of water added to Type I Cement and Slag Cement to create slurry. The Type I Cement and Slag Cement slurry was added to the untreated soil.
Volumteric Expansion sample 120 g (calculated using 10% watter addition based on water:untreated soil ratio)

PID monitoring during mixing
UCS @ 28 days
PP @ 1,3,5,7, 14, 28 day (or until a max of 4.5 TSF)
Permeability @ 28 days
Volumetric Expansion at 7 and 28 days
SPLP Arsenic and TPH GRO-DRO @ 28 days

MONITORING ACTIVITIES

MONITORING ACTIVITIES	TIME PERIOD (s)				
	15	30	90	120	
MAXIMUM PID (ppm)	78.5	101	120	112	
Notes / Observations:					

PENETROMETER ANALYSES

CURE TIME (Days)	1	3	5	7	14
PENETROMETER (tons/ft^2)	2.75	4.0	>4.5	>4.5	

VOLUMETRIC EXPANSION 7 days

INITIAL HEIGHT (in):	1.061	FINAL HEIGHT (in):	1.189
VOLUMETRIC EXPANSION (%):	12.06		

VOLUMETRIC EXPANSION 28 days

INITIAL HEIGHT (in):	1.061	FINAL HEIGHT (in):	1.195
VOLUMETRIC EXPANSION (%):	12.63		

MIX DEVELOPMENT DATA SHEET

PROJECT:	Quanta	MIX No.	
PROJECT No.:	SH0460		460-002
MIXING DATE:	19-Dec-12	MIXED BY:	TNR

UNTREATED MATERIAL TYPE		**N1/N3 Composite**
WEIGHT OF UNTREATED MATERIAL		**1,200 g**
REAGENT TYPE AND LOT NUMBER	ADDITION RATE	WEIGHT
LaFarge Type I Cement	3.00 %	36.0 g
LaFarge Newcem Slag Cement	12.00 %	144.0 g
	%	0.0 g
	%	0.0 g
	%	0.0 g
Water Addition (water to reagent)	100 %	180.0 g

OBSERVATIONS / NOTES

180 g of water added to Type I Cement and Slag Cement to create slurry. The Type I Cement and Slag Cement slurry was added to the untreated soil.
Volumteric Expansion sample 130 g (calculated using 15% watter addition based on water:untreated soil ratio)

PID monitoring during mixing
UCS @ 28 days
PP @ 1,3,5,7, 14, 28 day (or until a max of 4.5 TSF)
Permeability @ 28 days
Volumetric Expansion at 7 and 28 days
SPLP Arsenic and TPH GRO-DRO @ 28 days

MONITORING ACTIVITIES

MONITORING ACTIVITIES	TIME PERIOD (s)				
	15	30	90	120	
MAXIMUM PID (ppm)	55.5	79.4	95.3	92.5	
Notes / Observations:					

PENETROMETER ANALYSES

CURE TIME (Days)	1	2	3	7	14
PENETROMETER (tons/ft^2)	1.25	4.5	>4.5	>4.5	

VOLUMETRIC EXPANSION 7 days

INITIAL HEIGHT (in):	1.061	FINAL HEIGHT (in):	1.364
VOLUMETRIC EXPANSION (%):	28.56		

VOLUMETRIC EXPANSION 28 days

INITIAL HEIGHT (in):	1.061	FINAL HEIGHT (in):	1.365
VOLUMETRIC EXPANSION (%):	28.65		

MIX DEVELOPMENT DATA SHEET

PROJECT:	Quanta	MIX No.	
PROJECT No.:	SH0460		460-003
MIXING DATE:	19-Dec-12	MIXED BY:	TNR

UNTREATED MATERIAL TYPE		**N1/N3 Composite**
WEIGHT OF UNTREATED MATERIAL		**1,200 g**
REAGENT TYPE AND LOT NUMBER	ADDITION RATE	WEIGHT
LaFarge Type I Cement	4.00 %	48.0 g
LaFarge Newcem Slag Cement	16.00 %	192.0 g
	%	0.0 g
	%	0.0 g
	%	0.0 g
Water Addition (water to reagent)	100 %	240.0 g

OBSERVATIONS / NOTES

240 g of water added to Type I Cement and Slag Cement to create slurry. The Type I Cement and Slag Cement slurry was added to the untreated soil.
Volumteric Expansion sample 140 g (calculated using 20% watter addition based on water:untreated soil ratio)

PID monitoring during mixing
UCS @ 28 days
PP @ 1,3,5,7, 14, 28 day (or until a max of 4.5 TSF)
Permeability @ 28 days
Volumetric Expansion at 7 and 28 days
SPLP Arsenic and TPH GRO-DRO @ 28 days

MONITORING ACTIVITIES

MONITORING ACTIVITIES	TIME PERIOD (s)				
	15	30	90	120	
MAXIMUM PID (ppm)	0	51.8	63.7	52.9	
Notes / Observations:					

PENETROMETER ANALYSES

CURE TIME (Days)	1	2	3	7	14
PENETROMETER (tons/ft^2)	0.50	>4.5	>4.5	>4.5	

VOLUMETRIC EXPANSION 7 days

INITIAL HEIGHT (in):	1.061	FINAL HEIGHT (in):	1.449
VOLUMETRIC EXPANSION (%):	36.57		

VOLUMETRIC EXPANSION 28 days

INITIAL HEIGHT (in):	1.061	FINAL HEIGHT (in):	1.457
VOLUMETRIC EXPANSION (%):	37.32		

MIX DEVELOPMENT DATA SHEET

PROJECT:	Quanta	MIX No.	
PROJECT No.:	SH0460		460-004
MIXING DATE:	19-Dec-12	MIXED BY:	TNR

UNTREATED MATERIAL TYPE		**N2 Composite**
WEIGHT OF UNTREATED MATERIAL		**1,200 g**
REAGENT TYPE AND LOT NUMBER	ADDITION RATE	WEIGHT
LaFarge Type I Cement	2.00 %	24.0 g
LaFarge Newcem Slag Cement	8.00 %	96.0 g
	%	0.0 g
	%	0.0 g
	%	0.0 g
Water Addition (water to reagent)	100 %	120.0 g

OBSERVATIONS / NOTES

120 g of water added to Type I Cement and Slag Cement to create slurry. The Type I Cement and Slag Cement slurry was added to the untreated soil.
Volumteric Expansion sample 120 g (calculated using 10% watter addition based on water:untreated soil ratio)

PID monitoring during mixing
UCS @ 28 days
PP @ 1,3,5,7, 14, 28 day (or until a max of 4.5 TSF)
Permeability @ 28 days
Volumetric Expansion at 7 and 28 days
SPLP Arsenic and TPH GRO-DRO @ 28 days

MONITORING ACTIVITIES

MONITORING ACTIVITIES	TIME PERIOD (s)				
	15	30	90	120	
MAXIMUM PID (ppm)	21.6	26.7	32.7	33.1	
Notes / Observations:					

PENETROMETER ANALYSES

CURE TIME (Days)	1	2	3	7	14
PENETROMETER (tons/ft^2)	0	1.25	1.25	2.0	

VOLUMETRIC EXPANSION 7 days

INITIAL HEIGHT (in):	1.267	FINAL HEIGHT (in):	1.549
VOLUMETRIC EXPANSION (%):	22.26		

VOLUMETRIC EXPANSION 28 days

INITIAL HEIGHT (in):	1.267	FINAL HEIGHT (in):	1.551
VOLUMETRIC EXPANSION (%):	22.42		

MIX DEVELOPMENT DATA SHEET

PROJECT:	Quanta	MIX No.	
PROJECT No.:	SH0460		460-005
MIXING DATE:	19-Dec-12	MIXED BY:	TNR

UNTREATED MATERIAL TYPE		**N2 Composite**
WEIGHT OF UNTREATED MATERIAL		**1,200 g**
REAGENT TYPE AND LOT NUMBER	ADDITION RATE	WEIGHT
LaFarge Type I Cement	4.00 %	48.0 g
LaFarge Newcem Slag Cement	16.00 %	192.0 g
	%	0.0 g
	%	0.0 g
	%	0.0 g
Water Addition (water to reagent)	100 %	240.0 g

OBSERVATIONS / NOTES

240 g of water added to Type I Cement and Slag Cement to create slurry. The Type I Cement and Slag Cement slurry was added to the untreated soil.
Volumteric Expansion sample 140 g (calculated using 20% watter addition based on water:untreated soil ratio)

PID monitoring during mixing
UCS @ 28 days
PP @ 1,3,5,7, 14, 28 day (or until a max of 4.5 TSF)
Permeability @ 28 days
Volumetric Expansion at 7 and 28 days
SPLP Arsenic and TPH GRO-DRO @ 28 days

MONITORING ACTIVITIES

MONITORING ACTIVITIES	TIME PERIOD (s)				
	15	30	90	120	
MAXIMUM PID (ppm)	10.6	13.3	15.9	16.3	
Notes / Observations:					

PENETROMETER ANALYSES

CURE TIME (Days)	1	2	3	7	14
PENETROMETER (tons/ft^2)	0.75	3.0	4.5	>4.5	

VOLUMETRIC EXPANSION 7 days

INITIAL HEIGHT (in):	1.267	FINAL HEIGHT (in):	1.743
VOLUMETRIC EXPANSION (%):	37.57		

VOLUMETRIC EXPANSION 28 days

INITIAL HEIGHT (in):	1.267	FINAL HEIGHT (in):	1.747
VOLUMETRIC EXPANSION (%):	37.88		

MIX DEVELOPMENT DATA SHEET

PROJECT:	Quanta	MIX No.	
PROJECT No.:	SH0460		460-006
MIXING DATE:	19-Dec-12	MIXED BY:	TNR

UNTREATED MATERIAL TYPE	**N4 A**	
WEIGHT OF UNTREATED MATERIAL		**1,200 g**
REAGENT TYPE AND LOT NUMBER	ADDITION RATE	WEIGHT
LaFarge Type I Cement	2.00 %	24.0 g
LaFarge Newcem Slag Cement	8.00 %	96.0 g
	%	0.0 g
	%	0.0 g
	%	0.0 g
Water Addition (water to reagent)	150 %	180.0 g

OBSERVATIONS / NOTES

180 g of water added to Type I Cement and Slag Cement to create slurry. The Type I Cement and Slag Cement slurry was added to the untreated soil.
Volumteric Expansion sample 125 g (calculated using 15% water addition based on water:untreated soil ratio)

PID monitoring during mixing
UCS @ 28 days
PP @ 1,3,5,7, 14, 28 day (or until a max of 4.5 TSF)
Permeability @ 28 days
Volumetric Expansion at 7 and 28 days
SPLP Arsenic and TPH GRO-DRO @ 28 days

MONITORING ACTIVITIES

MONITORING ACTIVITIES	TIME PERIOD (s)				
	15	30	90	120	
MAXIMUM PID (ppm)	38.8	58.1	61.2	62.0	
Notes / Observations:					

PENETROMETER ANALYSES

CURE TIME (Days)	1	2	3	7	14
PENETROMETER (tons/ft^2)	1.00	4.25	>4.5	>4.5	>4.5

VOLUMETRIC EXPANSION 7 days

INITIAL HEIGHT (in):	1.393	FINAL HEIGHT (in):	1.848
VOLUMETRIC EXPANSION (%):	32.66		

VOLUMETRIC EXPANSION 28 days

INITIAL HEIGHT (in):	1.393	FINAL HEIGHT (in):	1.851
VOLUMETRIC EXPANSION (%):	32.88		

MIX DEVELOPMENT DATA SHEET

PROJECT:	Quanta	MIX No.	
PROJECT No.:	SH0460		460-007
MIXING DATE:	19-Dec-12	MIXED BY:	TNR

UNTREATED MATERIAL TYPE	**N4 A**	
WEIGHT OF UNTREATED MATERIAL		**1,200 g**
REAGENT TYPE AND LOT NUMBER	ADDITION RATE	WEIGHT
LaFarge Type I Cement	3.00 %	36.0 g
LaFarge Newcem Slag Cement	12.00 %	144.0 g
	%	0.0 g
	%	0.0 g
	%	0.0 g
Water Addition (water to reagent)	150 %	270.0 g

OBSERVATIONS / NOTES

270 g of water added to Type I Cement and Slag Cement to create slurry. The Type I Cement and Slag Cement slurry was added to the untreated soil.
Volumteric Expansion sample 137.5 g (calculated using 22.5% water addition based on water:untreated soil rati

PID monitoring during mixing
UCS @ 28 days
PP @ 1,3,5,7, 14, 28 day (or until a max of 4.5 TSF)
Permeability @ 28 days
Volumetric Expansion at 7 and 28 days
SPLP Arsenic and TPH GRO-DRO @ 28 days

MONITORING ACTIVITIES

MONITORING ACTIVITIES	TIME PERIOD (s)				
	15	30	90	120	
MAXIMUM PID (ppm)	44.6	44.4	47.7	47.5	
Notes / Observations:					

PENETROMETER ANALYSES

CURE TIME (Days)	1	3	5	7	14
PENETROMETER (tons/ft^2)	3.50	>4.5	>4.5	>4.5	>4.4

VOLUMETRIC EXPANSION 7 days

INITIAL HEIGHT (in):	1.393	FINAL HEIGHT (in):	1.911
VOLUMETRIC EXPANSION (%):	37.19		

VOLUMETRIC EXPANSION 28 days

INITIAL HEIGHT (in):	1.393	FINAL HEIGHT (in):	1.915
VOLUMETRIC EXPANSION (%):	37.47		

MIX DEVELOPMENT DATA SHEET

PROJECT:	Quanta	MIX No.	
PROJECT No.:	SH0460		460-008
MIXING DATE:	19-Dec-12	MIXED BY:	TNR

UNTREATED MATERIAL TYPE	**A-2A**	
WEIGHT OF UNTREATED MATERIAL		**1,200 g**
REAGENT TYPE AND LOT NUMBER	ADDITION RATE	WEIGHT
LaFarge Type I Cement	2.00 %	24.0 g
LaFarge Newcem Slag Cement	8.00 %	96.0 g
Enviroblend HX (Ferrous Sulfate Blend)	5.00 %	60.0 g
Sodium Bisulfide	1.00 %	12.0 g
	%	0.0 g
Water Addition (water to reagent)	100 %	192.0 g

OBSERVATIONS / NOTES

192 g of water added to Type I Cement, Slag Cement, Enviroblend, and Sodium Bisulfide to create slurry. The Type I Cement and Slag Cement slurry was added to the untreated soil.
Volumteric Expansion sample 132 g (calculated using 16% water addition based on water:untreated soil ratio)

PID monitoring during mixing
UCS @ 28 days
PP @ 1,3,5,7, 14, 28 day (or until a max of 4.5 TSF)
Permeability @ 28 days
Volumetric Expansion at 7 and 28 days
SPLP Arsenic and TPH GRO-DRO @ 28 days

MONITORING ACTIVITIES

MONITORING ACTIVITIES	TIME PERIOD (s)				
	15	30	90	120	
MAXIMUM PID (ppm)	3.4	3.3	3.3	3.3	
Notes / Observations:					

PENETROMETER ANALYSES

CURE TIME (Days)	1	3	5	7	14
PENETROMETER (tons/ft^2)	0	0	0	0	

VOLUMETRIC EXPANSION 7 days

INITIAL HEIGHT (in):	1.013	FINAL HEIGHT (in):	1.392
VOLUMETRIC EXPANSION (%):	37.41		

VOLUMETRIC EXPANSION 28 days

INITIAL HEIGHT (in):	1.013	FINAL HEIGHT (in):	1.403
VOLUMETRIC EXPANSION (%):	38.50		

MIX DEVELOPMENT DATA SHEET

PROJECT:	Quanta	MIX No.	
PROJECT No.:	SH0460		460-009
MIXING DATE:	19-Dec-12	MIXED BY:	TNR

UNTREATED MATERIAL TYPE	**AN-2A**	
WEIGHT OF UNTREATED MATERIAL		**1,200 g**
REAGENT TYPE AND LOT NUMBER	ADDITION RATE	WEIGHT
LaFarge Type I Cement	2.00 %	24.0 g
LaFarge Newcem Slag Cement	8.00 %	96.0 g
Enviroblend HX (Ferrous Sulfate Blend)	5.00 %	60.0 g
Sodium Bisulfide	1.00 %	12.0 g
	%	0.0 g
Water Addition (water to reagent)	100 %	192.0 g

OBSERVATIONS / NOTES

192 g of water added to Type I Cement, Slag Cement, Enviroblend, and Sodium Bisulfide to create slurry. The Type I Cement and Slag Cement slurry was added to the untreated soil.
Volumteric Expansion sample 132 g (calculated using 16% water addition based on water:untreated soil ratio)

PID monitoring during mixing
UCS @ 28 days
PP @ 1,3,5,7, 14, 28 day (or until a max of 4.5 TSF)
Permeability @ 28 days
Volumetric Expansion at 7 and 28 days
SPLP Arsenic and TPH GRO-DRO @ 28 days

MONITORING ACTIVITIES

MONITORING ACTIVITIES	TIME PERIOD (s)				
	15	30	90	120	
MAXIMUM PID (ppm)	2.4	2.8	3.1	3.3	
Notes / Observations:					

PENETROMETER ANALYSES

CURE TIME (Days)	1	3	5	7	14
PENETROMETER (tons/ft^2)	0	0	0	0	

VOLUMETRIC EXPANSION 7 days

INITIAL HEIGHT (in):	1.119	FINAL HEIGHT (in):	1.296
VOLUMETRIC EXPANSION (%):	15.82		

VOLUMETRIC EXPANSION 28 days

INITIAL HEIGHT (in):	1.119	FINAL HEIGHT (in):	1.307
VOLUMETRIC EXPANSION (%):	16.80		

MIX DEVELOPMENT DATA SHEET

PROJECT:	Quanta	MIX No.	
PROJECT No.:	SH0460		460-010
MIXING DATE:	19-Dec-12	MIXED BY:	TNR

UNTREATED MATERIAL TYPE	**AN-2A**	
WEIGHT OF UNTREATED MATERIAL		**1,200 g**
REAGENT TYPE AND LOT NUMBER	ADDITION RATE	WEIGHT
LaFarge Type I Cement	3.00 %	36.0 g
LaFarge Newcem Slag Cement	12.00 %	144.0 g
Enviroblend HX (Ferrous Sulfate Blend)	5.00 %	60.0 g
Sodium Bisulfide	1.00 %	12.0 g
	%	0.0 g
Water Addition (water to reagent)	100 %	252.0 g

OBSERVATIONS / NOTES

252 g of water added to Type I Cement, Slag Cement, Enviroblend, and Sodium Bisulfide to create slurry. The Type I Cement and Slag Cement slurry was added to the untreated soil.
Volumteric Expansion sample 142 g (calculated using 21% water addition based on water:untreated soil ratio)

PID monitoring during mixing
UCS @ 28 days
PP @ 1,3,5,7, 14, 28 day (or until a max of 4.5 TSF)
Permeability @ 28 days
Volumetric Expansion at 7 and 28 days
SPLP Arsenic and TPH GRO-DRO @ 28 days

MONITORING ACTIVITIES

MONITORING ACTIVITIES	TIME PERIOD (s)				
	15	30	90	120	
MAXIMUM PID (ppm)	2.3	2.6	2.8	2.6	
Notes / Observations:					

PENETROMETER ANALYSES

CURE TIME (Days)	1	3	5	7	14
PENETROMETER (tons/ft^2)	0	0	0	0	0

VOLUMETRIC EXPANSION 7 days

INITIAL HEIGHT (in):	1.119	FINAL HEIGHT (in):	1.508
VOLUMETRIC EXPANSION (%):	34.76		

VOLUMETRIC EXPANSION 28 days

INITIAL HEIGHT (in):	1.119	FINAL HEIGHT (in):	1.5215
VOLUMETRIC EXPANSION (%):	35.97		

APPENDIX E

PRELIMINARY EVALUTAION DATA SHEETS AND ANALYTICAL REPORT

PERMEABILITY ASTM D5084

SPECIMEN CONDITIONS

PROJECT:	QUANTA	TESTED BY:	RJB
PROJECT No.:	SH0460	TRACKING CODE:	8684_PM
SAMPLE No.:	0460-001 (28 DAY)	EQUIPMENT No.:	5
TEST DATE:	1/15/13		

MOISTURE CONTENT (Dry Basis)	*INITIAL*	*FINAL*
1. MOISTURE TIN NO.		
2. WT MOISTURE TIN (tare weight)	0.00 *g*	222.35 *g*
3. WT WET SOIL + TARE	714.30 *g*	938.10 *g*
4. WT DRY SOIL + TARE	545.15 *g*	767.50 *g*
5. WT WATER, Ww	169.15 g	170.60 g
6. WT DRY SOIL, Ws	545.15 g	545.15 g
7. MOISTURE CONTENT, W	31.03 %	31.29 %

SOIL SPECIMEN DIMENSIONS				
TRIPLICATE	*DIAMETER*		*HEIGHT*	
ANALYSES	*INITIAL*	*FINAL*	*INITIAL*	*FINAL*
No. 1	*2.97 in.*	*2.97 in.*	*3.44 in.*	*3.45 in.*
No. 2	*2.99 in.*	*2.97 in.*	*3.46 in.*	*3.46 in.*
No. 3	*3.00 in.*	*3.00 in.*	*3.45 in.*	*3.46 in.*
Average	2.98 in.	2.98 in.	3.45 in.	3.46 in.

SPECIMEN CONDITIONS	*INITIAL*	*FINAL*
Specimen WT, Wo	*714.30 g*	*715.80 g*
Area, Ao	6.99 in^2	6.98 in^2
Volume, Vo	24.11 in^3	24.14 in^3
Bulk Unit Weight	112.9 lb/ft^3	113.0 lb/ft^3
Dry Unit Weight	86.2 lb/ft^3	86.0 lb/ft^3

PERMEABILITY ASTM D5084

BACK-PRESSURE SATURATION

PROJECT:	QUANTA	TESTED BY:	RJB
PROJECT No.:	SH0460	TRACKING CODE:	8684_PM
SAMPLE No.:	0460-001 (28 DAY)	EQUIPMENT No.:	5
TEST DATE:	1/15/13		

TEST	*TIME*	*TESTED*	*TEST PRESSURES (psi)*						
			APPLIED		*PORE*		*PRESSURE CHANGE*		
DATE	*(military)*	*BY*	*CELL*	*BACK*	*SAT.*	*TEST*	*CELL*	*PORE*	*B-Value*
01/15/13	14 : 45	RJB	7.0	5.0	4.9				
01/16/13	8 : 15	RJB	17.0	15.0	15.2	9.0	10.0	4.1	0.41
01/16/13	9 : 21	RJB	27.0	25.0	25.1	21.4	10.0	6.2	0.62
01/16/13	10 : 20	RJB	37.0	35.0	35.1	32.6	10.0	7.5	0.75
01/16/13	10 : 54	RJB	47.0	45.0	45.0	43.6	10.0	8.5	0.85
01/16/13	11 : 32	RJB	57.0	55.0	55.1	54.0	10.0	9.0	0.90
01/16/13	12 : 5	RJB	67.0	65.0	*	64.6	10.0	9.5	0.95
01/16/13	12 : 6	RJB	77.0	75.0	*	*	*	*	*

* Saturation check - no data available.

PERMEABILITY ASTM D5084

SPECIMEN CONSOLIDATION

PROJECT:	QUANTA		RJB
PROJECT No.:	SH0460		8684_PM
SAMPLE No.:	0460-001 (28 DAY)		5
TEST DATE:	1/15/13		

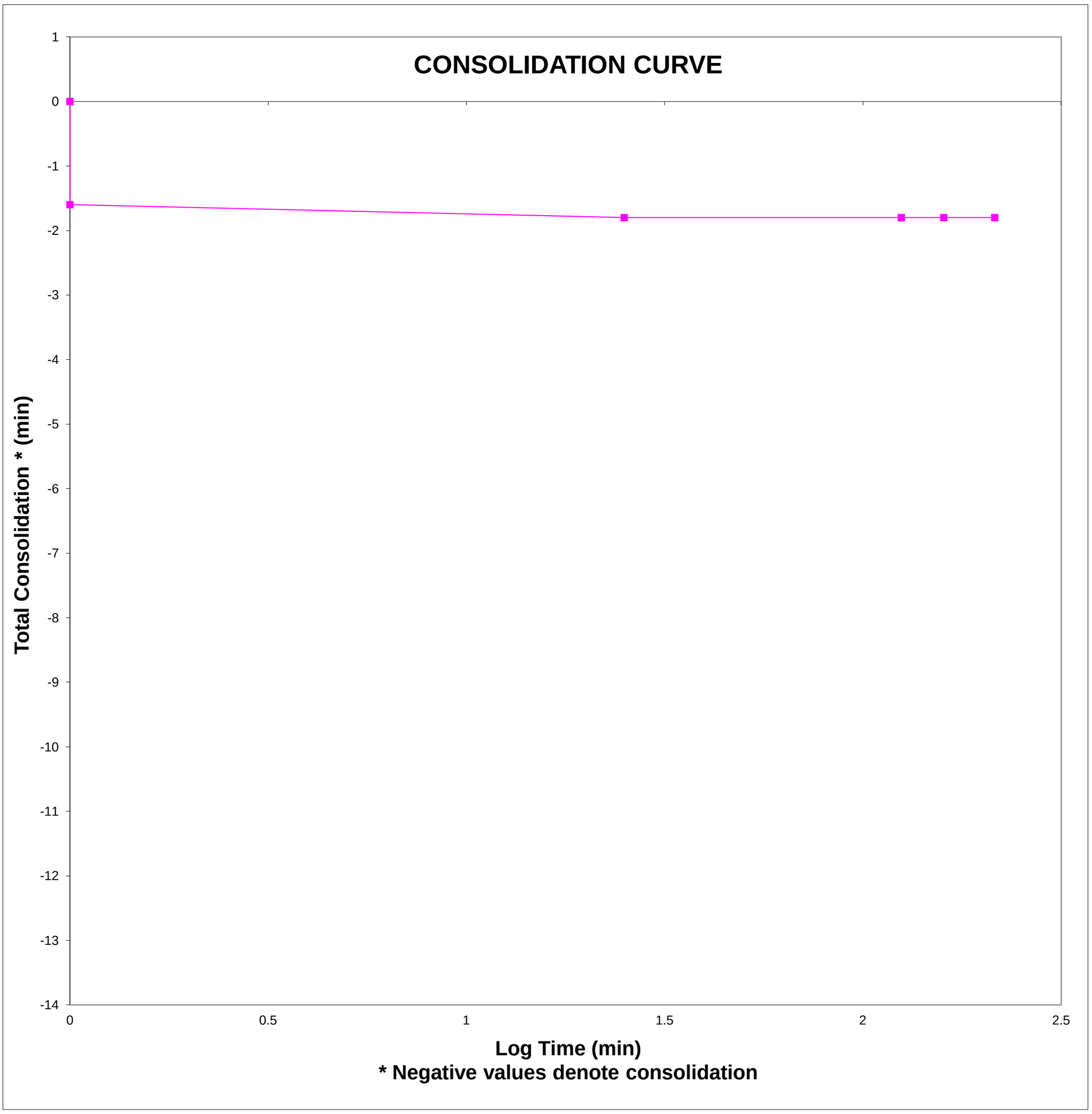
CELL PRESSURE: 65 psi **BACK PRESSURE:** 55 psi **EFFECTIVE STRESS:** 10 psi

TEST DATE	*TESTED BY*	*TIME (Military)*	*ELAPSED TIME (minutes)*	*TOTAL TIME (minutes)*	*TOTAL TIME (Log)*	*SPECIMEN CONSOLIDATION (ML)*		
						READING		*ACTUAL TOTAL (Ct)*
						BOTTOM	*TOP*	
1 / 16 / 13	RJB	12 : 10	0	0	0	25.0	25.0	0.0
1 / 16 / 13	RJB	12 : 11	1	1	0.00	24.4	24.0	1.6
1 / 16 / 13	RJB	12 : 35	24	25	1.40	24.3	23.9	1.8
1 / 16 / 13	RJB	14 : 15	100	125	2.10	24.3	23.9	1.8
1 / 16 / 13	RJB	14 : 50	35	160	2.20	24.3	23.9	1.8
1 / 16 / 13	RJB	15 : 45	55	215	2.33	24.3	23.9	1.8

PERMEABILITY ASTM D5084

CONSOLIDATION CURVE

PROJECT:	QUANTA	TESTED BY:	RJB
PROJECT No.:	SH0460	TRACKING CODE:	8684_PM
SAMPLE No.:	0460-001 (28 DAY)	EQUIPMENT No.:	5
TEST DATE:	1/15/13		



PERMEABILITY ASTM D5084

TEST DATA

PROJECT:	QUANTA	TESTED BY:	RJB
PROJECT No.:	SH0460	TRACKING CODE:	8684_PM
SAMPLE No.:	0460-001 (28 DAY)	EQUIPMENT No.:	5
TEST DATE:	1/15/2013		

DATE	*TESTED BY*	*TIME (military)*	*ELAPSED TIME (minutes)*	*HYDRAULIC HEAD (cm)*		*TEMP. C°*	*GAUGE PRESSURE (psi)*		
				INFLUENT	*EFFLUENT*		*CELL*	*INFLUENT*	*EFFLUENT*
1 / 17 / 13	RJB	10 : 35	0	0.0	25.0	20.0	65.0	55.0	53.0
1 / 18 / 13	RJB	8 : 39	1324	1.5	23.5	20.0	65.0	55.0	53.0
1 / 21 / 13	RJB	7 : 39	4260	3.7	21.3	20.0	65.0	55.0	53.0
1 / 23 / 13	RJB	7 : 29	2870	4.4	20.6	20.0	65.0	55.0	53.0
1 / 23 / 13	RJB	7 : 32	RESET	0.0	25.0	20.0	65.0	55.0	53.0
1 / 28 / 13	RJB	8 : 14	7242	0.7	24.3	20.0	65.0	55.0	53.0

PERMEABILITY ASTM D5084

TEST DATA (continued)

PROJECT:	QUANTA	TESTED BY:	RJB
PROJECT No.:	SH0460	TRACKING CODE:	8684_PM
SAMPLE No.:	0460-001 (28 DAY)	EQUIPMENT No.:	5
TEST DATE:	1/15/13		

ELAPSED TIME (minutes)	*HYDRAULIC HEAD DIFFERENCE (cm)*		*EFFLUENT - INFLUENT RATIO*	*HYDRAULIC GRADIENT (cm/cm)*	*HYDRAULIC CONDUCTIVITY (cm/sec)*	
	INFLUENT	*EFFLUENT*			*@ Temp.*	*@ 20° C*
RESET				18.928		
1324	1.5	1.5	1.00	18.585	2.23E-08	2.24E-08
4260	2.2	2.2	1.00	18.082	1.04E-08	1.05E-08
2870	0.7	0.7	1.00	17.922	5.00E-09	5.03E-09
RESET				18.928		
7242	0.7	0.7	1.00	18.768	1.89E-09	1.90E-09

PERMEABILITY ASTM D5084

SUMMARY OF RESULTS

PROJECT:	QUANTA	TESTED BY:	RJB
PROJECT No.:	SH0460	TRACKING CODE:	8684_PM
SAMPLE No.:	0460-001 (28 DAY)	EQUIPMENT No.:	5
TEST DATE:	1/15/13		

TESTING PARAMETER	INITIAL	FINAL
BULK UNIT WEIGHT	112.9 lb/ft³	113.0 lb/ft³
DRY UNIT WEIGHT	86.2 lb/ft³	86.0 lb/ft³
MOISTURE CONTENT	31.0 %	31.3 %
PERMEABILITY @ 20°C	9.9E-09 cm/sec	

UNCONFINED COMPRESSION TEST

ASTM D 2166

PROJECT:	Quanta
PROJECT No.:	SH0460
SAMPLE No.:	460-001
TESTING DATE:	16-Jan-13
TESTED BY:	TNR

LOADING RATE:	0.04 in./min.
TRACKING CODE:	8684

MOISTURE CONTENT (Dry Basis)		
1. MOISTURE TIN NO.		
2. WT MOISTURE TIN (tare weight)	167.43	g
3. WT WET SOIL + TARE	294.41	g
4. WT DRY SOIL + TARE	267.23	g
5. WT WATER, Ww	27.18	g
6. WT DRY SOIL, Ws	99.80	g
7. MOISTURE CONTENT, W	**27.23**	**%**

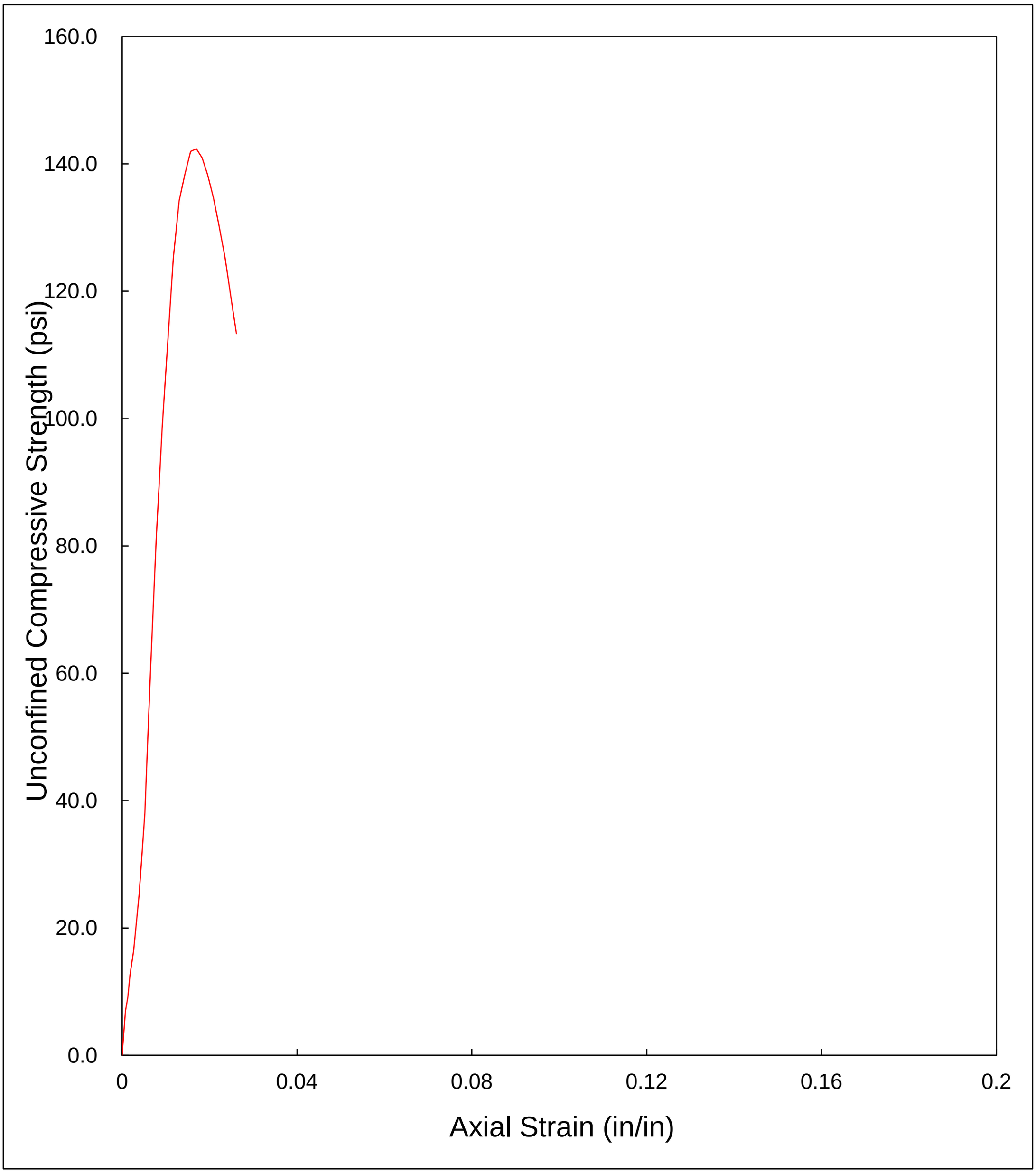
SOIL SPECIMEN DIMENSIONS				
	DIAMETER		*LENGTH*	
No. 1	2.01	in.	3.83	in.
No. 2	2.01	in.	3.82	in.
No. 3	2.00	in.	3.83	in.
Average	**2.01**	**in.**	**3.83**	**in.**

SPECIMEN CONDITIONS		
Initial Specimen WT, Wo	*371.20*	*g*
Initial Area, Ao	3.16	in²
Initial Volume, Vo	12.10	in³
Initial Bulk Unit Weight,	116.9	lb/ft³
Initial Dry Unit Weight	91.9	lb/ft³
15 % Strain (0.15 Lo)	0.57	in.
UCS	142.4	lb/in²

COMPRESSIVE LOAD (lbs.)	DIAL GAGE READING (in.)	SPECIMEN DEFORMATION (in.)	CORRECTED AREA (in²)	AXIAL STRAIN (in/in)	UNCONFINED COMPRESSIVE STRENGTH (lb/in²)
0	0.000	0.000	3.162	0.0000	0.0
22	0.003	0.003	3.165	0.0008	7.0
29	0.005	0.005	3.166	0.0013	9.2
40	0.007	0.007	3.168	0.0018	12.6
52	0.010	0.010	3.170	0.0026	16.4
80	0.015	0.015	3.174	0.0039	25.2
121	0.020	0.020	3.179	0.0052	38.1
194	0.025	0.025	3.183	0.0065	61.0
260	0.030	0.030	3.187	0.0078	81.6
314	0.035	0.035	3.191	0.0091	98.4
359	0.040	0.040	3.195	0.0105	112.3
401	0.045	0.045	3.200	0.0118	125.3
430	0.050	0.050	3.204	0.0131	134.2
444	0.055	0.055	3.208	0.0144	138.4
456	0.060	0.060	3.212	0.0157	141.9
458	0.065	0.065	3.217	0.0170	142.4
454	0.070	0.070	3.221	0.0183	141.0
446	0.075	0.075	3.225	0.0196	138.3
435	0.080	0.080	3.230	0.0209	134.7
421	0.085	0.085	3.234	0.0222	130.2
406	0.090	0.090	3.238	0.0235	125.4
387	0.095	0.095	3.243	0.0248	119.4
368	0.100	0.100	3.247	0.0261	113.3

UNCONFINED COMPRESSION TESTING

Sample No. 460-001



UNCONFINED COMPRESSION TEST

ASTM D 2166
SUMMARY OF RESULTS

PROJECT:	Quanta		
PROJECT No.:	SH0460		
SAMPLE No.:	460-001		
TESTING DATE:	1/16/2013	LOADING RATE:	0.04 in./min.
TESTED BY:	TNR	TRACKING CODE:	8684

TESTING PARAMETER AND RESULTS		
MOISTURE CONTENT	27.2	%
BULK UNIT WEIGHT	116.9	lb/ft^3
DRY UNIT WEIGHT	91.9	lb/ft^3
UCS *	142.4	lb/in^2

* UCS - UNCONFINED COMPRESSIVE STRENGTH

ANS 16.1 LEACHABILITY

SAMPLE PREPARATION

PROJECT:	Quanta	TESTED BY:	TNR
PROJECT No.:	SH0460	TRACKING CODE:	8684
SAMPLE No.:	460-001		
TEST DATE:	2/21/2013		

MOISTURE CONTENT (Dry Basis)	*RESULTS*	
1. MOISTURE TIN NO.		
2. WT MOISTURE TIN (tare weight)	167.43	*g*
3. WT WET SOIL + TARE	294.41	*g*
4. WT DRY SOIL + TARE	267.23	*g*
5. WT WATER, Ww	27.18	g
6. WT DRY SOIL, Ws	99.80	g
7. MOISTURE CONTENT, W	27.23	%

SOIL SPECIMEN DIMENSIONS				
TRIPLICATE ANALYSES	*DIAMETER RESULTS*		*LENGTH RESULTS*	
No. 1	*2.00*	*in.*	*1.83*	*in.*
No. 2	*2.00*	*in.*	*2.73*	*in.*
No. 3	*2.01*	*in.*	*2.27*	*in.*
Average	2.00	in.	2.28	in.

SPECIMEN CONDITIONS	*INITIAL*	
Specimen WT, Wo	*222.28*	*g*
Area, Ao	3.15	in^2
Volume, Vo	7.17	in^3
Bulk Unit Weight	118.1	pcf
Dry Unit Weight	92.8	pcf

ANS 16.1 LEACHABILITY

TESTING DATA

PROJECT:	Quanta
PROJECT NO.:	SH0460
SAMPLE NO:	460-001
START DATE:	2/21/2013
TRACKING CODE:	8684

LEACH INTERVAL	TESTED BY	DATE		TIME		VOLUME LEACHATE (ml)	TEMP (°C)	PID (ppm)	Conduct. (mS/cm³)	pH (s.u.)	OBSERVATIONS
		IN	OUT	IN	OUT						
Initial	TNR					1330	16.60		0.058	7.17	
1	TNR	02/21/13	02/21/13	0845	1045	1330	24.33		0.046	7.30	2 hour
2	TNR	02/21/13	02/21/13	1045	1545	1330	24.32		0.032	7.55	7 hour
3	TNR	02/21/13	02/22/13	1545	0845	1330	23.16		0.046	7.60	24 hour; particles at bottom
4	TNR	02/22/13	02/23/13	0845	0845	1330	22.03		0.095	7.36	48 hour; particles at bottom
5	TNR	02/23/13	02/24/13	0845	0845	1330	22.56		0.050	6.78	3 day
6	TNR	02/24/13	02/25/13	0845	0845	1330	23.76		0.055	7.25	4 day
7	TNR	02/25/13	02/26/13	0845	0845	1330	22.94		0.057	7.32	5 day
8											
9											
10											

PERMEABILITY ASTM D5084

SPECIMEN CONDITIONS

PROJECT:	QUANTA	TESTED BY:	RJB
PROJECT No.:	SH0460	TRACKING CODE:	8685_PM
SAMPLE No.:	0460-002 (28 DAY)	EQUIPMENT No.:	4
TEST DATE:	1/15/13		

MOISTURE CONTENT (Dry Basis)	*INITIAL*	*FINAL*
1. MOISTURE TIN NO.		
2. WT MOISTURE TIN (tare weight)	0.00 *g*	225.78 *g*
3. WT WET SOIL + TARE	793.40 *g*	1019.90 *g*
4. WT DRY SOIL + TARE	592.52 *g*	818.30 *g*
5. WT WATER, Ww	200.88 g	201.60 g
6. WT DRY SOIL, Ws	592.52 g	592.52 g
7. MOISTURE CONTENT, W	33.90 %	34.02 %

SOIL SPECIMEN DIMENSIONS				
TRIPLICATE	*DIAMETER*		*HEIGHT*	
ANALYSES	*INITIAL*	*FINAL*	*INITIAL*	*FINAL*
No. 1	*2.97 in.*	*3.00 in.*	*3.89 in.*	*3.88 in.*
No. 2	*2.98 in.*	*2.99 in.*	*3.91 in.*	*3.92 in.*
No. 3	*2.99 in.*	*2.97 in.*	*3.87 in.*	*3.88 in.*
Average	2.98 in.	2.99 in.	3.89 in.	3.89 in.

SPECIMEN CONDITIONS	*INITIAL*	*FINAL*
Specimen WT, Wo	*793.40 g*	*794.30 g*
Area, Ao	6.98 in^2	7.01 in^2
Volume, Vo	27.15 in^3	27.25 in^3
Bulk Unit Weight	111.3 lb/ft^3	111.1 lb/ft^3
Dry Unit Weight	83.2 lb/ft^3	82.9 lb/ft^3

PERMEABILITY ASTM D5084

BACK-PRESSURE SATURATION

PROJECT:	QUANTA	TESTED BY:	RJB
PROJECT No.:	SH0460	TRACKING CODE:	8685_PM
SAMPLE No.:	0460-002 (28 DAY)	EQUIPMENT No.:	4
TEST DATE:	1/15/13		

TEST	*TIME*	*TESTED*	*TEST PRESSURES (psi)*						
			APPLIED		*PORE*		*PRESSURE CHANGE*		
DATE	*(military)*	*BY*	*CELL*	*BACK*	*SAT.*	*TEST*	*CELL*	*PORE*	*B-Value*
01/15/13	14 : 52	RJB	7.0	5.0	5.0				
01/16/13	8 : 17	RJB	17.0	15.0	15.3	9.6	10.0	4.6	0.46
01/16/13	9 : 23	RJB	27.0	25.0	25.3	22.2	10.0	6.9	0.69
01/16/13	10 : 21	RJB	37.0	35.0	35.3	33.4	10.0	8.1	0.81
01/16/13	10 : 55	RJB	47.0	45.0	45.1	44.0	10.0	8.7	0.87
01/16/13	11 : 34	RJB	57.0	55.0	55.2	54.3	10.0	9.2	0.92
01/16/13	12 : 15	RJB	67.0	65.0	*	64.7	10.0	9.5	0.95
01/16/13	12 : 16	RJB	57.0	55.0	*	*	*	*	*

* Saturation check - no data available.

PERMEABILITY ASTM D5084

SPECIMEN CONSOLIDATION

PROJECT:	QUANTA		RJB
PROJECT No.:	SH0460		8685_PM
SAMPLE No.:	0460-002 (28 DAY)		4
TEST DATE:	1/15/13		

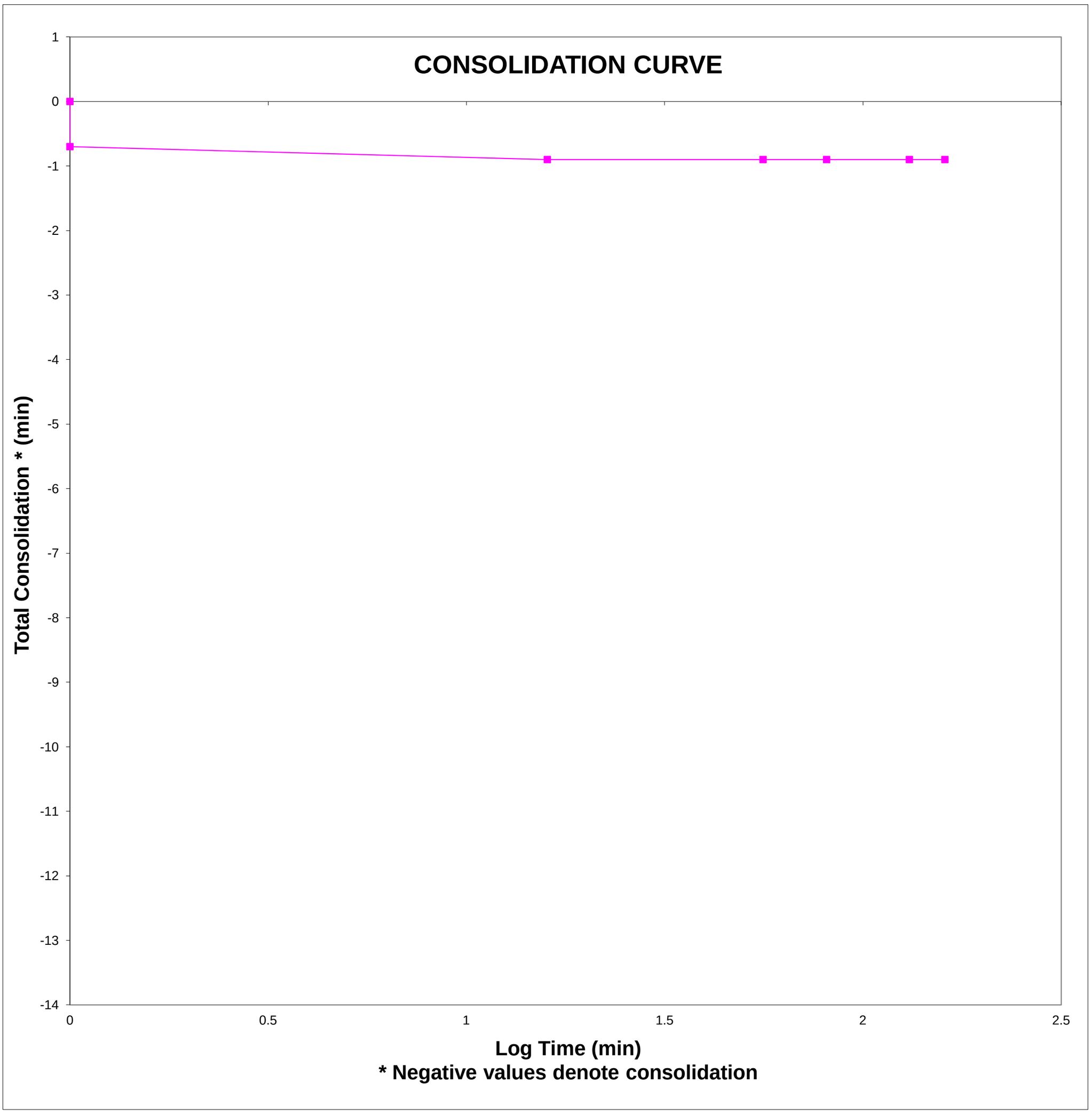
CELL PRESSURE: 65 psi **BACK PRESSURE:** 55 psi **EFFECTIVE STRESS:** 10 psi

TEST DATE	*TESTED BY*	*TIME (Military)*	*ELAPSED TIME (minutes)*	*TOTAL TIME (minutes)*	*TOTAL TIME (Log)*	*SPECIMEN CONSOLIDATION (ML)*		
						READING		*ACTUAL TOTAL (Ct)*
						BOTTOM	*TOP*	
1 / 16 / 13	RJB	12 : 19	0	0	0	25.0	25.0	0.0
1 / 16 / 13	RJB	12 : 20	1	1	0.00	24.7	24.6	0.7
1 / 16 / 13	RJB	12 : 35	15	16	1.20	24.6	24.5	0.9
1 / 16 / 13	RJB	13 : 15	40	56	1.75	24.6	24.5	0.9
1 / 16 / 13	RJB	13 : 40	25	81	1.91	24.6	24.5	0.9
1 / 16 / 13	RJB	14 : 30	50	131	2.12	24.6	24.5	0.9
1 / 16 / 13	RJB	15 : 0	30	161	2.21	24.6	24.5	0.9

PERMEABILITY ASTM D5084

CONSOLIDATION CURVE

PROJECT:	QUANTA	TESTED BY:	RJB
PROJECT No.:	SH0460	TRACKING CODE:	8685_PM
SAMPLE No.:	0460-002 (28 DAY)	EQUIPMENT No.:	4
TEST DATE:	1/15/13		



PERMEABILITY ASTM D5084

TEST DATA

PROJECT:	QUANTA	TESTED BY:	RJB
PROJECT No.:	SH0460	TRACKING CODE:	8685_PM
SAMPLE No.:	0460-002 (28 DAY)	EQUIPMENT No.:	4
TEST DATE:	1/15/2013		

DATE	*TESTED BY*	*TIME (military)*	*ELAPSED TIME (minutes)*	*HYDRAULIC HEAD (cm)*		*TEMP. C°*	*GAUGE PRESSURE (psi)*		
				INFLUENT	*EFFLUENT*		*CELL*	*INFLUENT*	*EFFLUENT*
1 / 17 / 13	RJB	10 : 22	0	0.0	25.0	20.0	65.0	55.0	53.0
1 / 21 / 13	RJB	7 : 39	5597	0.5	24.5	20.0	65.0	55.0	53.0
1 / 22 / 13	RJB	8 : 9	RESET	0.0	25.0	20.0	65.0	55.0	53.0
1 / 28 / 13	RJB	10 : 24	8775	0.3	25.0	20.0	65.0	55.0	53.0

PERMEABILITY ASTM D5084

TEST DATA (continued)

PROJECT:	QUANTA	TESTED BY:	RJB
PROJECT No.:	SH0460	TRACKING CODE:	8685_PM
SAMPLE No.:	0460-002 (28 DAY)	EQUIPMENT No.:	4
TEST DATE:	1/15/13		

ELAPSED TIME (minutes)	*HYDRAULIC HEAD DIFFERENCE (cm)*		*EFFLUENT - INFLUENT RATIO*	*HYDRAULIC GRADIENT (cm/cm)*	*HYDRAULIC CONDUCTIVITY (cm/sec)*	
	INFLUENT	*EFFLUENT*			*@ Temp.*	*@ 20° C*
RESET				16.763		
5597	0.5	0.5	1.00	16.662	1.98E-09	1.99E-09
RESET	*	*	*	16.763	*	*
8775	0.3	0.0	0.00	16.733	3.78E-10	3.80E-10

PERMEABILITY ASTM D5084

SUMMARY OF RESULTS

PROJECT:	QUANTA	TESTED BY:	RJB
PROJECT No.:	SH0460	TRACKING CODE:	8685_PM
SAMPLE No.:	0460-002 (28 DAY)	EQUIPMENT No.:	4
TEST DATE:	1/15/13		

TESTING PARAMETER	INITIAL	FINAL
BULK UNIT WEIGHT	111.3 lb/ft³	111.1 lb/ft³
DRY UNIT WEIGHT	83.2 lb/ft³	82.9 lb/ft³
MOISTURE CONTENT	33.9 %	34.0 %
PERMEABILITY @ 20°C	1.2E-09 cm/sec	

UNCONFINED COMPRESSION TEST

ASTM D 2166

PROJECT:	Quanta
PROJECT No.:	SH0460
SAMPLE No.:	460-002
TESTING DATE:	16-Jan-13
TESTED BY:	TNR

LOADING RATE:	0.04 in./min.
TRACKING CODE:	8685

MOISTURE CONTENT (Dry Basis)		
1. MOISTURE TIN NO.		
2. WT MOISTURE TIN (tare weight)	166.09	g
3. WT WET SOIL + TARE	315.57	g
4. WT DRY SOIL + TARE	280.43	g
5. WT WATER, Ww	35.14	g
6. WT DRY SOIL, Ws	114.34	g
7. MOISTURE CONTENT, W	**30.73**	**%**

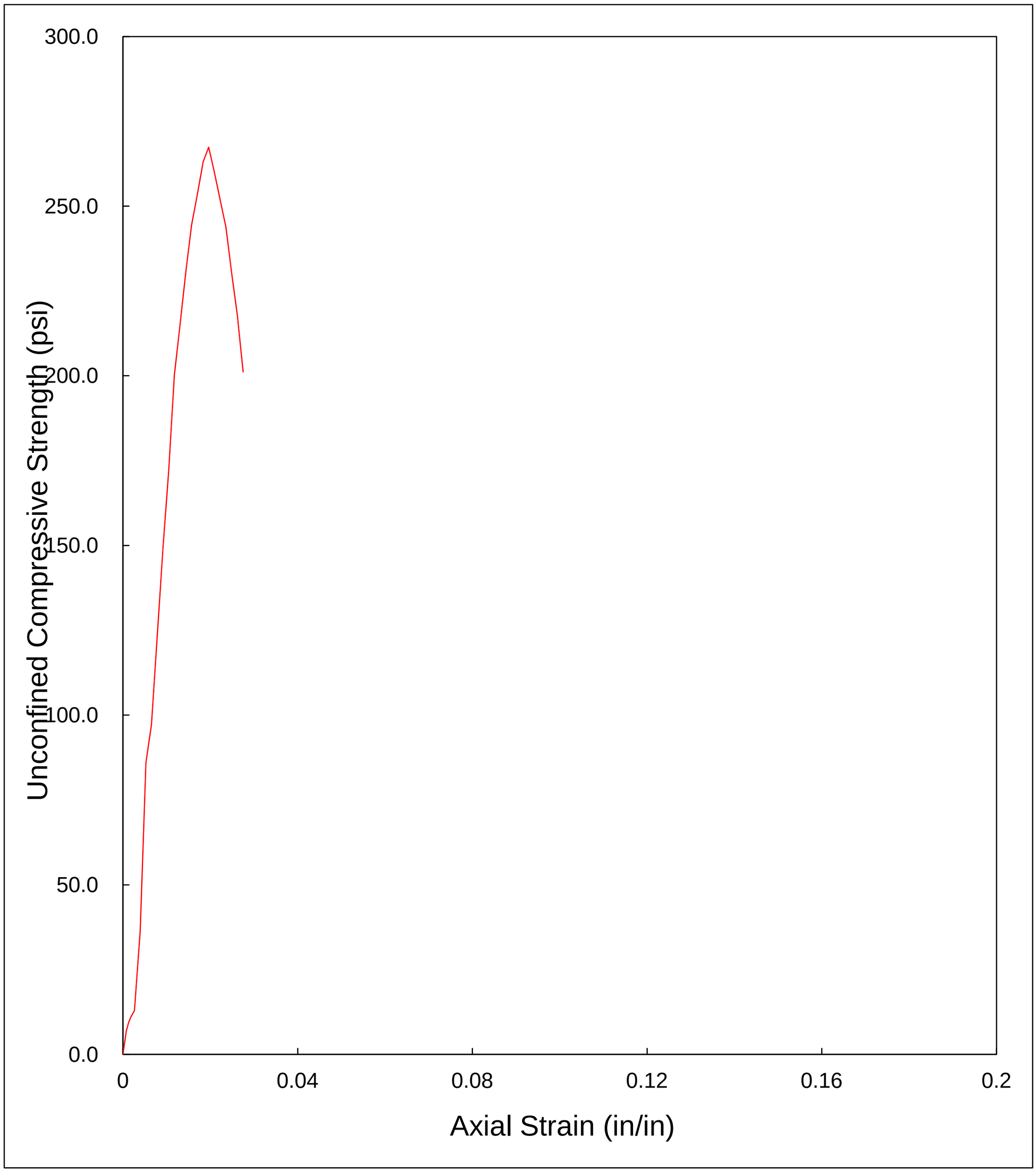
SOIL SPECIMEN DIMENSIONS				
	DIAMETER		*LENGTH*	
No. 1	2.02	in.	3.81	in.
No. 2	2.01	in.	3.82	in.
No. 3	2.00	in.	3.82	in.
Average	**2.01**	**in.**	**3.82**	**in.**

SPECIMEN CONDITIONS		
Initial Specimen WT, Wo	*369.44*	*g*
Initial Area, Ao	3.17	in²
Initial Volume, Vo	12.10	in³
Initial Bulk Unit Weight,	116.3	lb/ft³
Initial Dry Unit Weight	89.0	lb/ft³
15 % Strain (0.15 Lo)	0.57	in.
UCS	267.4	lb/in²

COMPRESSIVE LOAD (lbs.)	DIAL GAGE READING (in.)	SPECIMEN DEFORMATION (in.)	CORRECTED AREA (in²)	AXIAL STRAIN (in/in)	UNCONFINED COMPRESSIVE STRENGTH (lb/in²)
0	0.000	0.000	3.172	0.0000	0.0
22	0.003	0.003	3.174	0.0008	6.9
30	0.005	0.005	3.176	0.0013	9.4
35	0.007	0.007	3.177	0.0018	11.0
41	0.010	0.010	3.180	0.0026	12.9
115	0.015	0.015	3.184	0.0039	36.1
274	0.020	0.020	3.188	0.0052	85.9
310	0.025	0.025	3.192	0.0066	97.1
393	0.030	0.030	3.197	0.0079	122.9
477	0.035	0.035	3.201	0.0092	149.0
551	0.040	0.040	3.205	0.0105	171.9
643	0.045	0.045	3.209	0.0118	200.4
692	0.050	0.050	3.214	0.0131	215.3
743	0.055	0.055	3.218	0.0144	230.9
788	0.060	0.060	3.222	0.0157	244.6
818	0.065	0.065	3.226	0.0170	253.5
850	0.070	0.070	3.231	0.0183	263.1
865	0.075	0.075	3.235	0.0197	267.4
842	0.080	0.080	3.239	0.0210	259.9
817	0.085	0.085	3.244	0.0223	251.9
792	0.090	0.090	3.248	0.0236	243.8
749	0.095	0.095	3.252	0.0249	230.3
709	0.100	0.100	3.257	0.0262	217.7
656	0.105	0.105	3.261	0.0275	201.1

UNCONFINED COMPRESSION TESTING

Sample No. 460-002



UNCONFINED COMPRESSION TEST

ASTM D 2166
SUMMARY OF RESULTS

PROJECT:	Quanta		
PROJECT No.:	SH0460		
SAMPLE No.:	460-002		
TESTING DATE:	1/16/2013	LOADING RATE:	0.04 in./min.
TESTED BY:	TNR	TRACKING CODE:	8685

TESTING PARAMETER AND RESULTS		
MOISTURE CONTENT	30.7	%
BULK UNIT WEIGHT	116.3	lb/ft^3
DRY UNIT WEIGHT	89.0	lb/ft^3
UCS *	267.4	lb/in^2

* UCS - UNCONFINED COMPRESSIVE STRENGTH

PERMEABILITY ASTM D5084

SPECIMEN CONDITIONS

PROJECT:	Quanta	TESTED BY:	RJB
PROJECT No.:	SH0460	TRACKING CODE:	8686_PM
SAMPLE No.:	0460-003 (28 DAY)	EQUIPMENT No.:	3
TEST DATE:	1/15/13		

MOISTURE CONTENT (Dry Basis)	*INITIAL*	*FINAL*
1. MOISTURE TIN NO.		
2. WT MOISTURE TIN (tare weight)	0.00 *g*	232.75 *g*
3. WT WET SOIL + TARE	889.40 *g*	1122.90 *g*
4. WT DRY SOIL + TARE	653.35 *g*	886.10 *g*
5. WT WATER, Ww	236.05 g	236.80 g
6. WT DRY SOIL, Ws	653.35 g	653.35 g
7. MOISTURE CONTENT, W	36.13 %	36.24 %

SOIL SPECIMEN DIMENSIONS				
TRIPLICATE	*DIAMETER*		*HEIGHT*	
ANALYSES	*INITIAL*	*FINAL*	*INITIAL*	*FINAL*
No. 1	*3.00 in.*	*3.02 in.*	*4.40 in.*	*4.39 in.*
No. 2	*2.99 in.*	*2.98 in.*	*4.41 in.*	*4.41 in.*
No. 3	*2.96 in.*	*2.97 in.*	*4.41 in.*	*4.41 in.*
Average	2.98 in.	2.99 in.	4.41 in.	4.40 in.

SPECIMEN CONDITIONS	*INITIAL*	*FINAL*
Specimen WT, Wo	*889.40 g*	*890.20 g*
Area, Ao	7.00 in^2	7.03 in^2
Volume, Vo	30.84 in^3	30.94 in^3
Bulk Unit Weight	109.9 lb/ft^3	109.6 lb/ft^3
Dry Unit Weight	80.7 lb/ft^3	80.4 lb/ft^3

PERMEABILITY ASTM D5084

BACK-PRESSURE SATURATION

PROJECT:	GMH	TESTED BY:	RJB
PROJECT No.:	SH0466	TRACKING CODE:	8686_PM
SAMPLE No.:	0460-003 (28 DAY)	EQUIPMENT No.:	3
TEST DATE:	1/15/13		

TEST	*TIME*	*TESTED*	*TEST PRESSURES (psi)*						
			APPLIED		*PORE*		*PRESSURE CHANGE*		
DATE	*(military)*	*BY*	*CELL*	*BACK*	*SAT.*	*TEST*	*CELL*	*PORE*	*B-Value*
01/16/13	12 : 25	RJB	7.0	5.0	5.3				
01/16/13	12 : 57	RJB	17.0	15.0	15.4	*	10.0	#VALUE!	#VALUE!
01/16/13	13 : 39	RJB	27.0	25.0	25.3	20.4	10.0	5.0	0.50
01/16/13	14 : 15	RJB	37.0	35.0	35.1	*	10.0	#VALUE!	#VALUE!
01/16/13	15 : 22	RJB	47.0	45.0	45.1	41.1	10.0	6.0	0.60
01/17/13	8 : 3	RJB	57.0	55.0	55.1	54.9	10.0	9.8	0.98
01/17/13	9 : 5	RJB	67.0	65.0	*	*	10.0	#VALUE!	#VALUE!
01/17/13	9 : 6	RJB	57.0	55.0	*	*	*	*	*

* Saturation check - no data available.

PERMEABILITY ASTM D5084

SPECIMEN CONSOLIDATION

PROJECT:	GMH		RJB
PROJECT No.:	SH0466		8686_PM
SAMPLE No.:	0460-003 (28 DAY)		3
TEST DATE:	1/15/13		

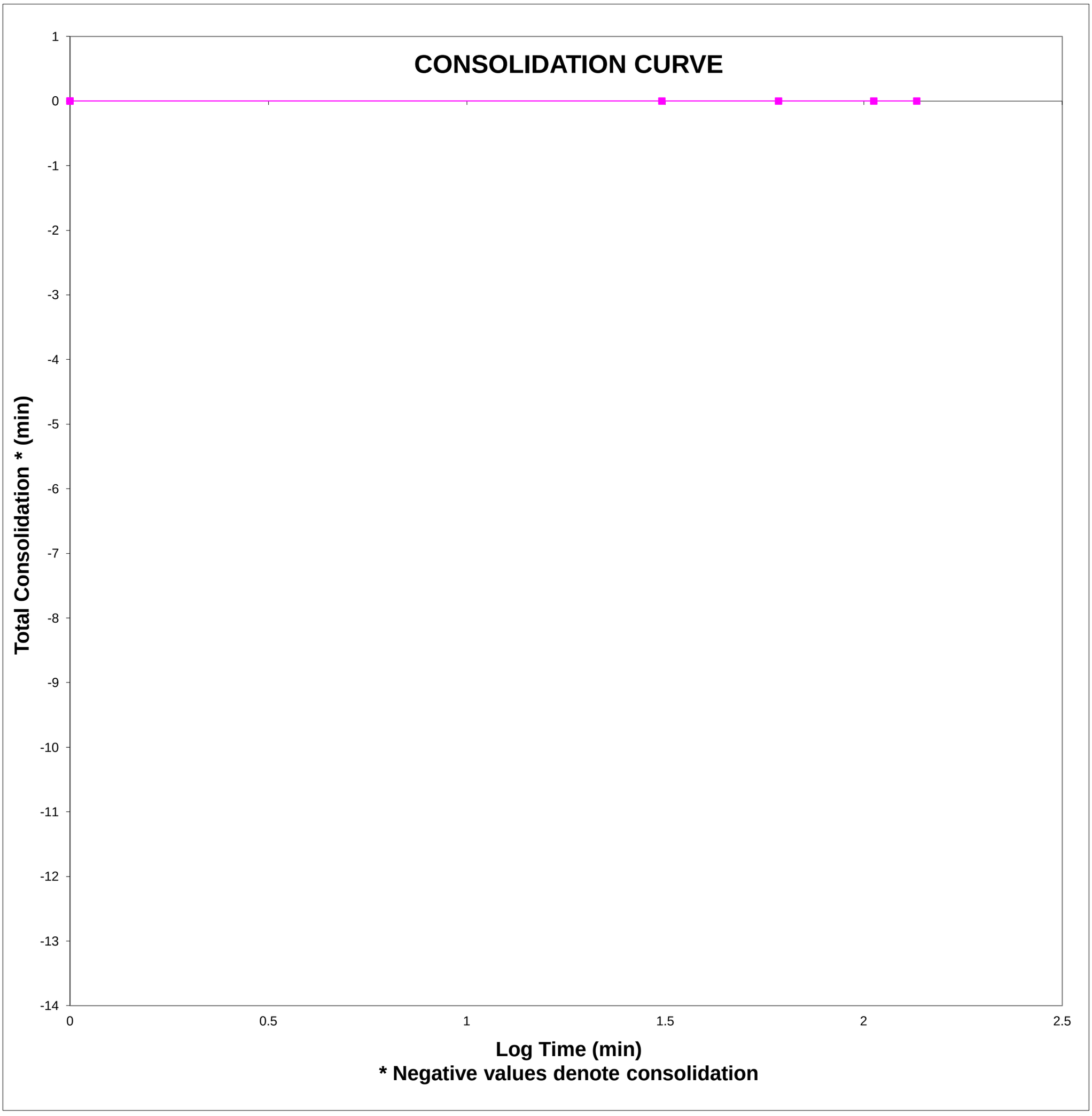
CELL PRESSURE: 65 psi **BACK PRESSURE:** 55 psi **EFFECTIVE STRESS:** 10 psi

TEST DATE	*TESTED BY*	*TIME (Military)*	*ELAPSED TIME (minutes)*	*TOTAL TIME (minutes)*	*TOTAL TIME (Log)*	*SPECIMEN CONSOLIDATION (ML)*		
						READING		*ACTUAL TOTAL (Ct)*
						BOTTOM	*TOP*	
1 / 17 / 13	RJB	9 : 14	0	0	0	24.0	24.0	0.0
1 / 17 / 13	RJB	9 : 15	1	1	0.00	24.0	24.0	0.0
1 / 17 / 13	RJB	9 : 45	30	31	1.49	24.0	24.0	0.0
1 / 17 / 13	RJB	10 : 15	30	61	1.79	24.0	24.0	0.0
1 / 17 / 13	RJB	11 : 0	45	106	2.03	24.0	24.0	0.0
1 / 17 / 13	RJB	11 : 30	30	136	2.13	24.0	24.0	0.0

PERMEABILITY ASTM D5084

CONSOLIDATION CURVE

PROJECT:	GMH	TESTED BY:	RJB
PROJECT No.:	SH0466	TRACKING CODE:	8686_PM
SAMPLE No.:	0460-003 (28 DAY)	EQUIPMENT No.:	3
TEST DATE:	1/15/13		



PERMEABILITY ASTM D5084

TEST DATA

PROJECT:	GMH	TESTED BY:	RJB
PROJECT No.:	SH0466	TRACKING CODE:	8686_PM
SAMPLE No.:	0460-003 (28 DAY)	EQUIPMENT No.:	3
TEST DATE:	1/15/2013		

DATE	*TESTED BY*	*TIME (military)*	*ELAPSED TIME (minutes)*	*HYDRAULIC HEAD (cm)*		*TEMP. C°*	*GAUGE PRESSURE (psi)*		
				INFLUENT	*EFFLUENT*		*CELL*	*INFLUENT*	*EFFLUENT*
1 / 17 / 13	RJB	11 : 39	0	0.0	24.0	20.0	65.0	55.0	55.0
1 / 17 / 13	RJB	11 : 40	1	1.1	22.9	20.0	65.0	55.0	55.0
1 / 17 / 13	RJB	11 : 41	1	1.6	22.4	20.0	65.0	55.0	55.0
1 / 17 / 13	RJB	11 : 43	2	2.2	21.8	20.0	65.0	55.0	55.0
1 / 17 / 13	RJB	11 : 45	2	2.8	21.2	20.0	65.0	55.0	55.0
1 / 17 / 13	RJB	11 : 47	2	3.4	20.6	20.0	65.0	55.0	55.0
1 / 17 / 13	RJB	11 : 49	2	4.0	20.0	20.0	65.0	55.0	55.0
1 / 17 / 13	RJB	11 : 51	2	4.6	19.4	20.0	65.0	55.0	55.0

PERMEABILITY ASTM D5084

TEST DATA (continued)

PROJECT:	Quanta	TESTED BY:	RJB
PROJECT No.:	SH0460	TRACKING CODE:	8686_PM
SAMPLE No.:	0460-003 (28 DAY)	EQUIPMENT No.:	3
TEST DATE:	1/15/13		

ELAPSED TIME (minutes)	*HYDRAULIC HEAD DIFFERENCE (cm)*		*EFFLUENT - INFLUENT RATIO*	*HYDRAULIC GRADIENT (cm/cm)*	*HYDRAULIC CONDUCTIVITY (cm/sec)*	
	INFLUENT	*EFFLUENT*			*@ Temp.*	*@ 20° C*
RESET				2.144		
1	1.1	1.1	1.00	1.947	1.99E-04	2.00E-04
1	0.5	0.5	1.00	1.858	9.71E-05	9.75E-05
2	0.6	0.6	1.00	1.751	6.14E-05	FALSE
2	0.6	0.6	1.00	1.643	6.53E-05	6.56E-05
2	0.6	0.6	1.00	1.536	6.97E-05	7.00E-05
2	0.6	0.6	1.00	1.429	7.48E-05	7.51E-05
2	0.6	0.6	1.00	1.322	8.06E-05	8.10E-05

PERMEABILITY ASTM D5084

SUMMARY OF RESULTS

PROJECT:	Quanta	TESTED BY:	RJB
PROJECT No.:	SH0460	TRACKING CODE:	8686_PM
SAMPLE No.:	0460-003 (28 DAY)	EQUIPMENT No.:	3
TEST DATE:	1/15/13		

TESTING PARAMETER	INITIAL	FINAL
BULK UNIT WEIGHT	109.9 lb/ft³	109.6 lb/ft³
DRY UNIT WEIGHT	80.7 lb/ft³	80.4 lb/ft³
MOISTURE CONTENT	36.1 %	36.2 %
PERMEABILITY @ 20°C	7.3E-05 cm/sec	

UNCONFINED COMPRESSION TEST

ASTM D 2166

PROJECT:	Quanta
PROJECT No.:	SH0460
SAMPLE No.:	460-003
TESTING DATE:	16-Jan-13
TESTED BY:	TNR

LOADING RATE:	0.04 in./min.
TRACKING CODE:	8686

MOISTURE CONTENT (Dry Basis)		
1. MOISTURE TIN NO.		
2. WT MOISTURE TIN (tare weight)	173.52	g
3. WT WET SOIL + TARE	295.81	g
4. WT DRY SOIL + TARE	266.75	g
5. WT WATER, Ww	29.06	g
6. WT DRY SOIL, Ws	93.23	g
7. MOISTURE CONTENT, W	**31.17**	**%**

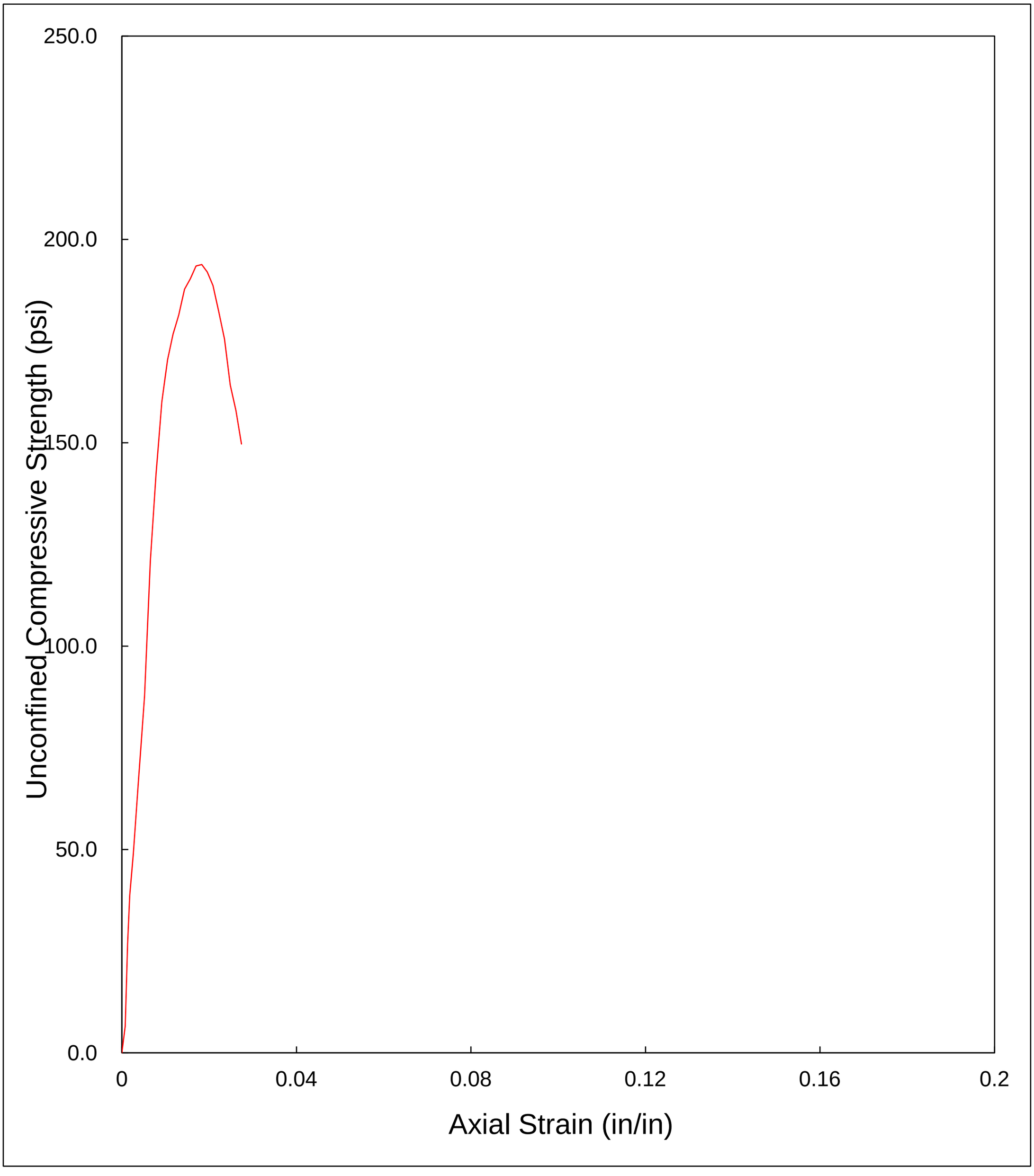
SOIL SPECIMEN DIMENSIONS				
	DIAMETER		*LENGTH*	
No. 1	2.02	in.	3.83	in.
No. 2	2.01	in.	3.83	in.
No. 3	2.00	in.	3.83	in.
Average	**2.01**	**in.**	**3.83**	**in.**

SPECIMEN CONDITIONS		
Initial Specimen WT, Wo	*361.20*	*g*
Initial Area, Ao	3.17	in²
Initial Volume, Vo	12.13	in³
Initial Bulk Unit Weight,	113.4	lb/ft³
Initial Dry Unit Weight	86.4	lb/ft³
15 % Strain (0.15 Lo)	0.57	in.
UCS	193.8	lb/in²

COMPRESSIVE LOAD (lbs.)	DIAL GAGE READING (in.)	SPECIMEN DEFORMATION (in.)	CORRECTED AREA (in²)	AXIAL STRAIN (in/in)	UNCONFINED COMPRESSIVE STRENGTH (lb/in²)
0	0.000	0.000	3.171	0.0000	0.0
21	0.003	0.003	3.173	0.0008	6.6
85	0.005	0.005	3.175	0.0013	26.8
123	0.007	0.007	3.177	0.0018	38.7
156	0.010	0.010	3.179	0.0026	49.1
217	0.015	0.015	3.183	0.0039	68.2
280	0.020	0.020	3.188	0.0052	87.8
386	0.025	0.025	3.192	0.0065	120.9
455	0.030	0.030	3.196	0.0078	142.4
512	0.035	0.035	3.200	0.0091	160.0
546	0.040	0.040	3.204	0.0105	170.4
567	0.045	0.045	3.209	0.0118	176.7
583	0.050	0.050	3.213	0.0131	181.5
604	0.055	0.055	3.217	0.0144	187.7
613	0.060	0.060	3.221	0.0157	190.3
624	0.065	0.065	3.226	0.0170	193.4
626	0.070	0.070	3.230	0.0183	193.8
621	0.075	0.075	3.234	0.0196	192.0
611	0.080	0.080	3.239	0.0209	188.7
591	0.085	0.085	3.243	0.0222	182.2
570	0.090	0.090	3.247	0.0235	175.5
534	0.095	0.095	3.252	0.0248	164.2
514	0.100	0.100	3.256	0.0261	157.9
488	0.105	0.105	3.260	0.0274	149.7

UNCONFINED COMPRESSION TESTING

Sample No. 460-003



UNCONFINED COMPRESSION TEST

ASTM D 2166
SUMMARY OF RESULTS

PROJECT:	Quanta		
PROJECT No.:	SH0460		
SAMPLE No.:	460-003		
TESTING DATE:	1/16/2013	LOADING RATE:	0.04 in./min.
TESTED BY:	TNR	TRACKING CODE:	8686

TESTING PARAMETER AND RESULTS		
MOISTURE CONTENT	31.2	%
BULK UNIT WEIGHT	113.4	lb/ft^3
DRY UNIT WEIGHT	86.4	lb/ft^3
UCS *	193.8	lb/in^2

* UCS - UNCONFINED COMPRESSIVE STRENGTH

PERMEABILITY ASTM D5084

SPECIMEN CONDITIONS

PROJECT:	QUANTA	TESTED BY:	RJB
PROJECT No.:	SH0460	TRACKING CODE:	8687_PM
SAMPLE No.:	0460-004 (28 DAY)	EQUIPMENT No.:	7B
TEST DATE:	1/15/13		

MOISTURE CONTENT (Dry Basis)	*INITIAL*	*FINAL*
1. MOISTURE TIN NO.		
2. WT MOISTURE TIN (tare weight)	0.00 *g*	230.62 *g*
3. WT WET SOIL + TARE	407.44 *g*	655.70 *g*
4. WT DRY SOIL + TARE	293.72 *g*	524.34 *g*
5. WT WATER, Ww	113.72 g	131.36 g
6. WT DRY SOIL, Ws	293.72 g	293.72 g
7. MOISTURE CONTENT, W	38.72 %	44.72 %

SOIL SPECIMEN DIMENSIONS				
TRIPLICATE	*DIAMETER*		*HEIGHT*	
ANALYSES	*INITIAL*	*FINAL*	*INITIAL*	*FINAL*
No. 1	*2.99 in.*	*3.00 in.*	*2.32 in.*	*2.34 in.*
No. 2	*2.98 in.*	*3.00 in.*	*2.37 in.*	*2.37 in.*
No. 3	*3.01 in.*	*3.00 in.*	*2.36 in.*	*2.30 in.*
Average	2.99 in.	3.00 in.	2.35 in.	2.34 in.

SPECIMEN CONDITIONS	*INITIAL*	*FINAL*
Specimen WT, Wo	*407.44 g*	*425.18 g*
Area, Ao	7.02 in^2	7.06 in^2
Volume, Vo	16.48 in^3	16.52 in^3
Bulk Unit Weight	94.2 lb/ft^3	98.1 lb/ft^3
Dry Unit Weight	67.9 lb/ft^3	67.8 lb/ft^3

PERMEABILITY ASTM D5084

BACK-PRESSURE SATURATION

PROJECT:	GMH	TESTED BY:	RJB
PROJECT No.:	SH0466	TRACKING CODE:	8687_PM
SAMPLE No.:	0460-004 (28 DAY)	EQUIPMENT No.:	7B
TEST DATE:	1/15/13		

TEST	*TIME*	*TESTED*	*TEST PRESSURES (psi)*						
			APPLIED		*PORE*		*PRESSURE CHANGE*		
DATE	*(military)*	*BY*	*CELL*	*BACK*	*SAT.*	*TEST*	*CELL*	*PORE*	*B-Value*
01/17/13	8 : 12	RJB	7.0	5.0	5.9				
01/17/13	9 : 16	RJB	17.0	15.0	15.8	9.7	10.0	3.8	0.38
01/17/13	10 : 5	RJB	27.0	25.0	25.9	22.2	10.0	6.4	0.64
01/17/13	10 : 30	RJB	37.0	35.0	35.8	32.8	10.0	6.9	0.69
01/17/13	11 : 15	RJB	47.0	45.0	45.8	44.1	10.0	8.3	0.83
01/17/13	12 : 45	RJB	57.0	55.0	*	55.3	10.0	9.5	0.95
01/17/13	12 : 46	RJB	67.0	65.0	*	*	*	*	*

* Saturation check - no data available.

PERMEABILITY ASTM D5084

SPECIMEN CONSOLIDATION

PROJECT:	GMH		RJB
PROJECT No.:	SH0466		8687_PM
SAMPLE No.:	0460-004 (28 DAY)		7B
TEST DATE:	1/15/13		

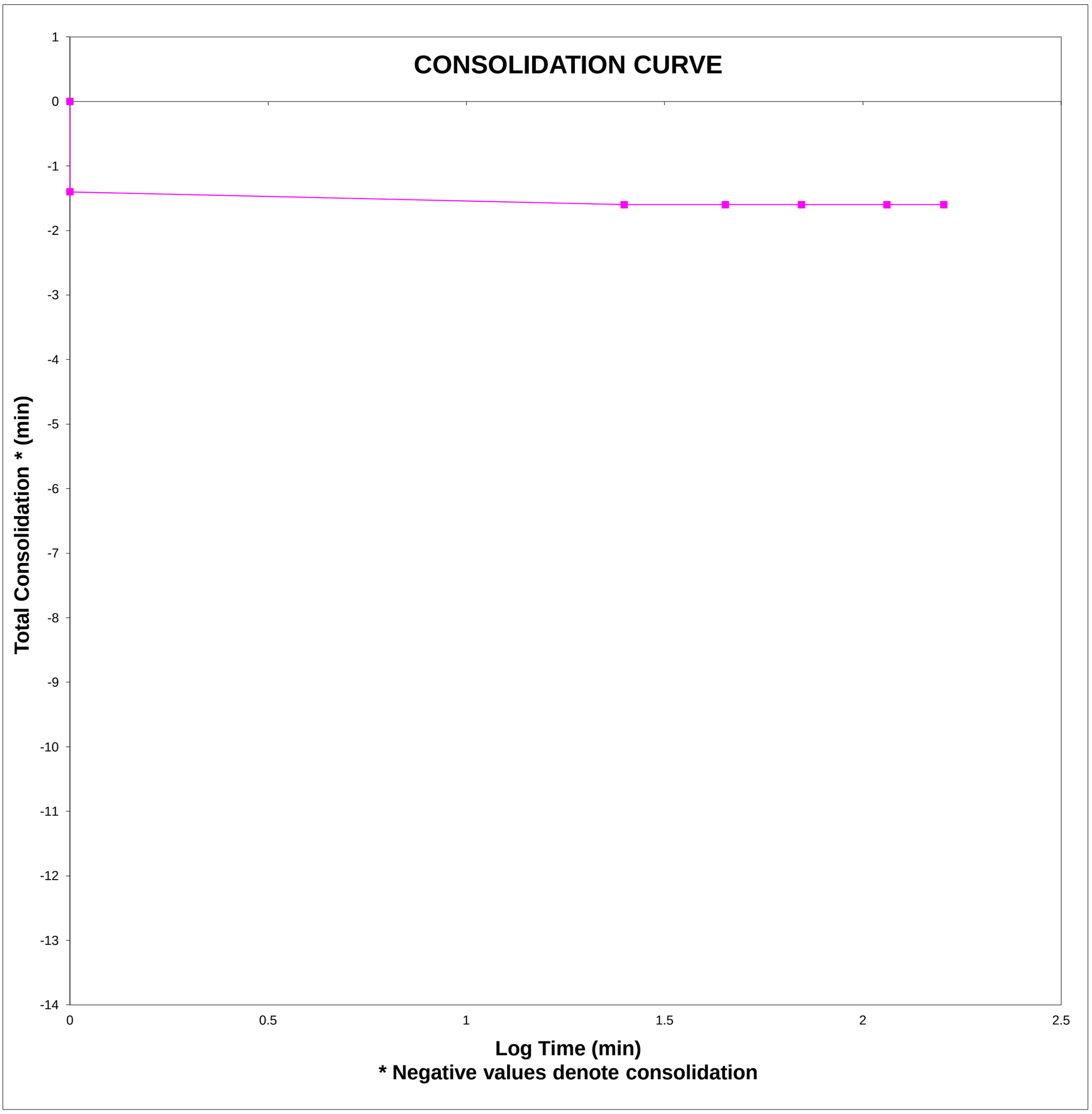
CELL PRESSURE: 55 psi **BACK PRESSURE:** 45 psi **EFFECTIVE STRESS:** 10 psi

TEST DATE	*TESTED BY*	*TIME (Military)*	*ELAPSED TIME (minutes)*	*TOTAL TIME (minutes)*	*TOTAL TIME (Log)*	*SPECIMEN CONSOLIDATION (ML)*		
						READING		*ACTUAL TOTAL (Ct)*
						BOTTOM	*TOP*	
1 / 17 / 13	RJB	12 : 50	0	0	0	25.0	25.0	0.0
1 / 17 / 13	RJB	12 : 51	1	1	0.00	24.3	24.3	1.4
1 / 17 / 13	RJB	13 : 15	24	25	1.40	24.1	24.3	1.6
1 / 17 / 13	RJB	13 : 35	20	45	1.65	24.1	24.3	1.6
1 / 17 / 13	RJB	14 : 0	25	70	1.85	24.1	24.3	1.6
1 / 17 / 13	RJB	14 : 45	45	115	2.06	24.1	24.3	1.6
1 / 17 / 13	RJB	15 : 30	45	160	2.20	24.1	24.3	1.6

PERMEABILITY ASTM D5084

CONSOLIDATION CURVE

PROJECT:	GMH	TESTED BY:	RJB
PROJECT No.:	SH0466	TRACKING CODE:	8687_PM
SAMPLE No.:	0460-004 (28 DAY)	EQUIPMENT No.:	7B
TEST DATE:	1/15/13		



PERMEABILITY ASTM D5084

TEST DATA

PROJECT:	GMH	TESTED BY:	RJB
PROJECT No.:	SH0466	TRACKING CODE:	8687_PM
SAMPLE No.:	0460-004 (28 DAY)	EQUIPMENT No.:	7B
TEST DATE:	1/15/2013		

DATE	*TESTED BY*	*TIME (military)*	*ELAPSED TIME (minutes)*	*HYDRAULIC HEAD (cm)*		*TEMP. C°*	*GAUGE PRESSURE (psi)*		
				INFLUENT	*EFFLUENT*		*CELL*	*INFLUENT*	*EFFLUENT*
1 / 18 / 13	RJB	8 : 55	0	0.0	25.0	20.0	55.0	45.0	43.0
1 / 18 / 13	RJB	9 : 36	41	1.1	23.9	20.0	55.0	45.0	43.0
1 / 18 / 13	RJB	10 : 17	41	2.1	22.9	20.0	55.0	45.0	43.0
1 / 18 / 13	RJB	11 : 3	46	3.3	21.7	20.0	55.0	45.0	43.0
1 / 18 / 13	RJB	11 : 43	40	4.3	20.7	20.0	55.0	45.0	43.0

PERMEABILITY ASTM D5084

TEST DATA (continued)

PROJECT:	QUANTA	TESTED BY:	RJB
PROJECT No.:	SH0460	TRACKING CODE:	8687_PM
SAMPLE No.:	0460-004 (28 DAY)	EQUIPMENT No.:	7B
TEST DATE:	1/15/13		

ELAPSED TIME (minutes)	*HYDRAULIC HEAD DIFFERENCE (cm)*		*EFFLUENT - INFLUENT RATIO*	*HYDRAULIC GRADIENT (cm/cm)*	*HYDRAULIC CONDUCTIVITY (cm/sec)*	
	INFLUENT	*EFFLUENT*			*@ Temp.*	*@ 20° C*
RESET				27.790		
41	1.1	1.1	1.00	27.421	3.58E-07	3.59E-07
41	1.0	1.0	1.00	27.086	3.29E-07	3.31E-07
46	1.2	1.2	1.00	26.683	3.57E-07	3.59E-07
40	1.0	1.0	1.00	26.348	3.47E-07	3.49E-07

PERMEABILITY ASTM D5084

SUMMARY OF RESULTS

PROJECT:	QUANTA	TESTED BY:	RJB
PROJECT No.:	SH0460	TRACKING CODE:	8687_PM
SAMPLE No.:	0460-004 (28 DAY)	EQUIPMENT No.:	7B
TEST DATE:	1/15/13		

TESTING PARAMETER	INITIAL	FINAL
BULK UNIT WEIGHT	94.2 lb/ft³	98.1 lb/ft³
DRY UNIT WEIGHT	67.9 lb/ft³	67.8 lb/ft³
MOISTURE CONTENT	38.7 %	44.7 %
PERMEABILITY @ 20°C	3.5E-07 cm/sec	

UNCONFINED COMPRESSION TEST

ASTM D 2166

PROJECT:	Quanta
PROJECT No.:	SH0460
SAMPLE No.:	460-004
TESTING DATE:	16-Jan-13
TESTED BY:	TNR

LOADING RATE:	0.04 in./min.
TRACKING CODE:	8687

MOISTURE CONTENT (Dry Basis)		
1. MOISTURE TIN NO.		
2. WT MOISTURE TIN (tare weight)	165.35	g
3. WT WET SOIL + TARE	267.60	g
4. WT DRY SOIL + TARE	240.57	g
5. WT WATER, Ww	27.03	g
6. WT DRY SOIL, Ws	75.22	g
7. MOISTURE CONTENT, W	**35.93**	**%**

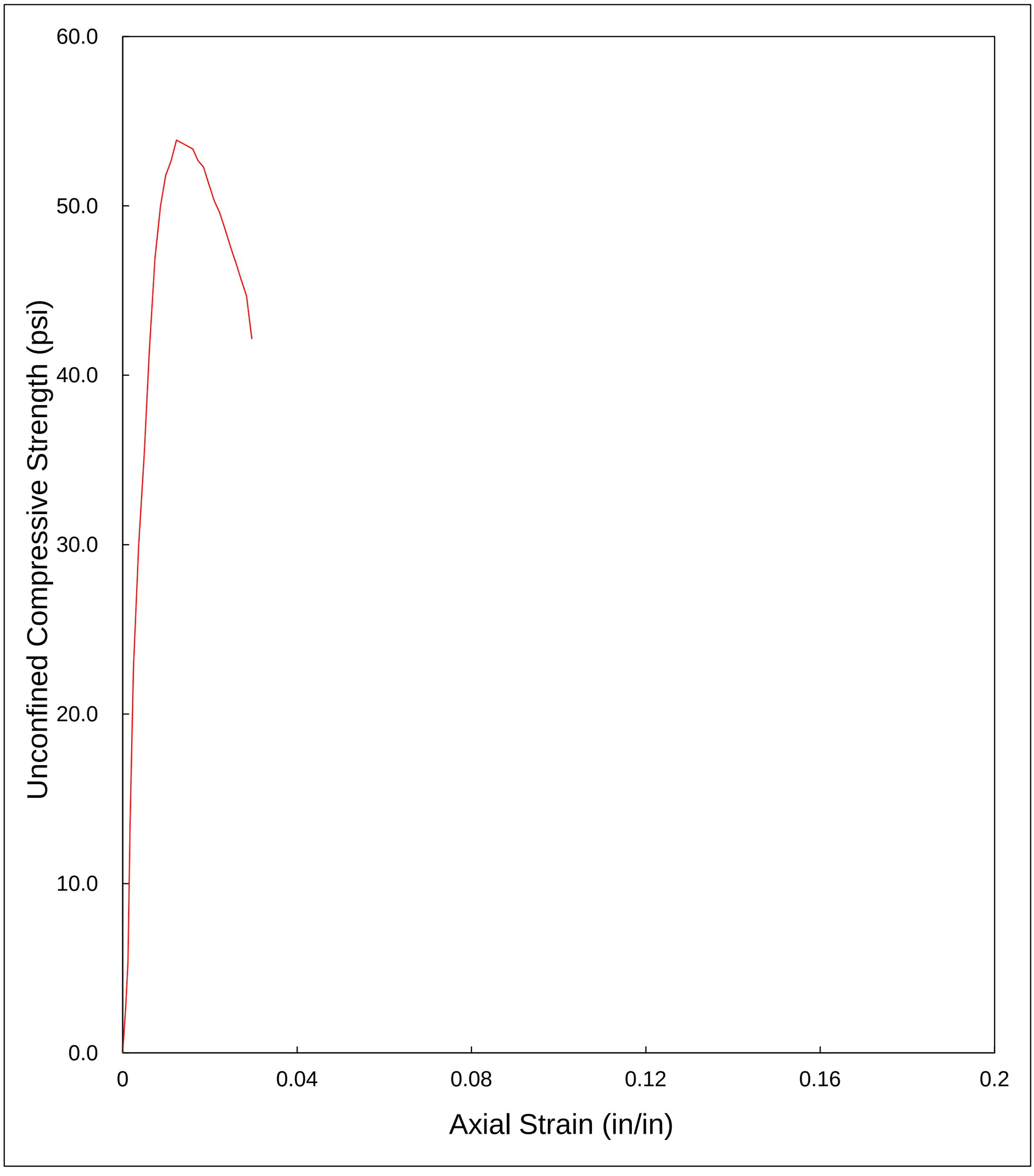
SOIL SPECIMEN DIMENSIONS				
	DIAMETER		*LENGTH*	
No. 1	2.01	in.	4.04	in.
No. 2	2.01	in.	4.06	in.
No. 3	1.99	in.	4.05	in.
Average	**2.00**	**in.**	**4.05**	**in.**

SPECIMEN CONDITIONS		
Initial Specimen WT, Wo	*311.54*	*g*
Initial Area, Ao	3.15	in²
Initial Volume, Vo	12.78	in³
Initial Bulk Unit Weight,	92.9	lb/ft³
Initial Dry Unit Weight	68.3	lb/ft³
15 % Strain (0.15 Lo)	0.61	in.
UCS	53.9	lb/in²

COMPRESSIVE LOAD (lbs.)	DIAL GAGE READING (in.)	SPECIMEN DEFORMATION (in.)	CORRECTED AREA (in²)	AXIAL STRAIN (in/in)	UNCONFINED COMPRESSIVE STRENGTH (lb/in²)
0	0.000	0.000	3.153	0.0000	0.0
9	0.003	0.003	3.155	0.0007	2.9
17	0.005	0.005	3.157	0.0012	5.4
43	0.007	0.007	3.159	0.0017	13.6
72	0.010	0.010	3.161	0.0025	22.8
95	0.015	0.015	3.165	0.0037	30.0
112	0.020	0.020	3.169	0.0049	35.3
132	0.025	0.025	3.173	0.0062	41.6
149	0.030	0.030	3.177	0.0074	46.9
159	0.035	0.035	3.181	0.0086	50.0
165	0.040	0.040	3.185	0.0099	51.8
168	0.045	0.045	3.189	0.0111	52.7
172	0.050	0.050	3.193	0.0123	53.9
171	0.065	0.065	3.205	0.0160	53.4
169	0.070	0.070	3.209	0.0173	52.7
168	0.075	0.075	3.213	0.0185	52.3
165	0.080	0.080	3.217	0.0197	51.3
162	0.085	0.085	3.221	0.0210	50.3
160	0.090	0.090	3.225	0.0222	49.6
157	0.095	0.095	3.229	0.0234	48.6
154	0.100	0.100	3.233	0.0247	47.6
151	0.105	0.105	3.237	0.0259	46.6
148	0.110	0.110	3.241	0.0271	45.7
145	0.115	0.115	3.245	0.0284	44.7
137	0.120	0.120	3.249	0.0296	42.2

UNCONFINED COMPRESSION TESTING

Sample No. 460-004



UNCONFINED COMPRESSION TEST

ASTM D 2166
SUMMARY OF RESULTS

PROJECT:	Quanta		
PROJECT No.:	SH0460		
SAMPLE No.:	460-004		
TESTING DATE:	1/16/2013	LOADING RATE:	0.04 in./min.
TESTED BY:	TNR	TRACKING CODE:	8687

TESTING PARAMETER AND RESULTS		
MOISTURE CONTENT	35.9	%
BULK UNIT WEIGHT	92.9	lb/ft^3
DRY UNIT WEIGHT	68.3	lb/ft^3
UCS *	53.9	lb/in^2

* UCS - UNCONFINED COMPRESSIVE STRENGTH

PERMEABILITY ASTM D5084

SPECIMEN CONDITIONS

PROJECT:	QUANTA	TESTED BY:	RJB
PROJECT No.:	SH0460	TRACKING CODE:	8688_PM
SAMPLE No.:	0460-005 (28 DAY)	EQUIPMENT No.:	7A
TEST DATE:	1/15/13		

MOISTURE CONTENT (Dry Basis)	*INITIAL*	*FINAL*
1. MOISTURE TIN NO.		
2. WT MOISTURE TIN (tare weight)	0.00 *g*	241.59 *g*
3. WT WET SOIL + TARE	467.65 *g*	712.40 *g*
4. WT DRY SOIL + TARE	340.22 *g*	581.81 *g*
5. WT WATER, Ww	127.43 g	130.59 g
6. WT DRY SOIL, Ws	340.22 g	340.22 g
7. MOISTURE CONTENT, W	37.46 %	38.38 %

SOIL SPECIMEN DIMENSIONS				
TRIPLICATE	*DIAMETER*		*HEIGHT*	
ANALYSES	*INITIAL*	*FINAL*	*INITIAL*	*FINAL*
No. 1	*2.98 in.*	*2.99 in.*	*2.50 in.*	*2.51 in.*
No. 2	*2.97 in.*	*2.98 in.*	*2.51 in.*	*2.51 in.*
No. 3	*2.96 in.*	*2.97 in.*	*2.51 in.*	*2.52 in.*
Average	2.97 in.	2.98 in.	2.51 in.	2.51 in.

SPECIMEN CONDITIONS	*INITIAL*	*FINAL*
Specimen WT, Wo	*467.65 g*	*470.84 g*
Area, Ao	6.93 in^2	6.97 in^2
Volume, Vo	17.38 in^3	17.52 in^3
Bulk Unit Weight	102.5 lb/ft^3	102.4 lb/ft^3
Dry Unit Weight	74.6 lb/ft^3	74.0 lb/ft^3

PERMEABILITY ASTM D5084

BACK-PRESSURE SATURATION

PROJECT:	QUANTA	TESTED BY:	RJB
PROJECT No.:	SH0460	TRACKING CODE:	8688_PM
SAMPLE No.:	0460-005 (28 DAY)	EQUIPMENT No.:	7A
TEST DATE:	1/15/13		

TEST	*TIME*	*TESTED*	*TEST PRESSURES (psi)*						
			APPLIED		*PORE*		*PRESSURE CHANGE*		
DATE	*(military)*	*BY*	*CELL*	*BACK*	*SAT.*	*TEST*	*CELL*	*PORE*	*B-Value*
01/16/13	13 : 48	RJB	7.0	5.0	5.5				
01/16/13	14 : 17	RJB	17.0	15.0	15.6	*	10.0	#VALUE!	#VALUE!
01/16/13	14 : 52	RJB	27.0	25.0	25.5	23.7	10.0	8.1	0.81
01/17/13	8 : 48	RJB	37.0	35.0	35.7	35.4	10.0	9.9	0.99
01/17/13	9 : 20	RJB	47.0	45.0	45.7	45.3	10.0	9.6	0.96
01/17/13	10 : 5	RJB	57.0	55.0	*	55.4	10.0	9.7	0.97
01/17/13	10 : 6	RJB	47.0	45.0	*	*	*	*	*

* Saturation check - no data available.

PERMEABILITY ASTM D5084

SPECIMEN CONSOLIDATION

PROJECT:	QUANTA		RJB
PROJECT No.:	SH0460		8688_PM
SAMPLE No.:	0460-005 (28 DAY)		7A
TEST DATE:	1/15/13		

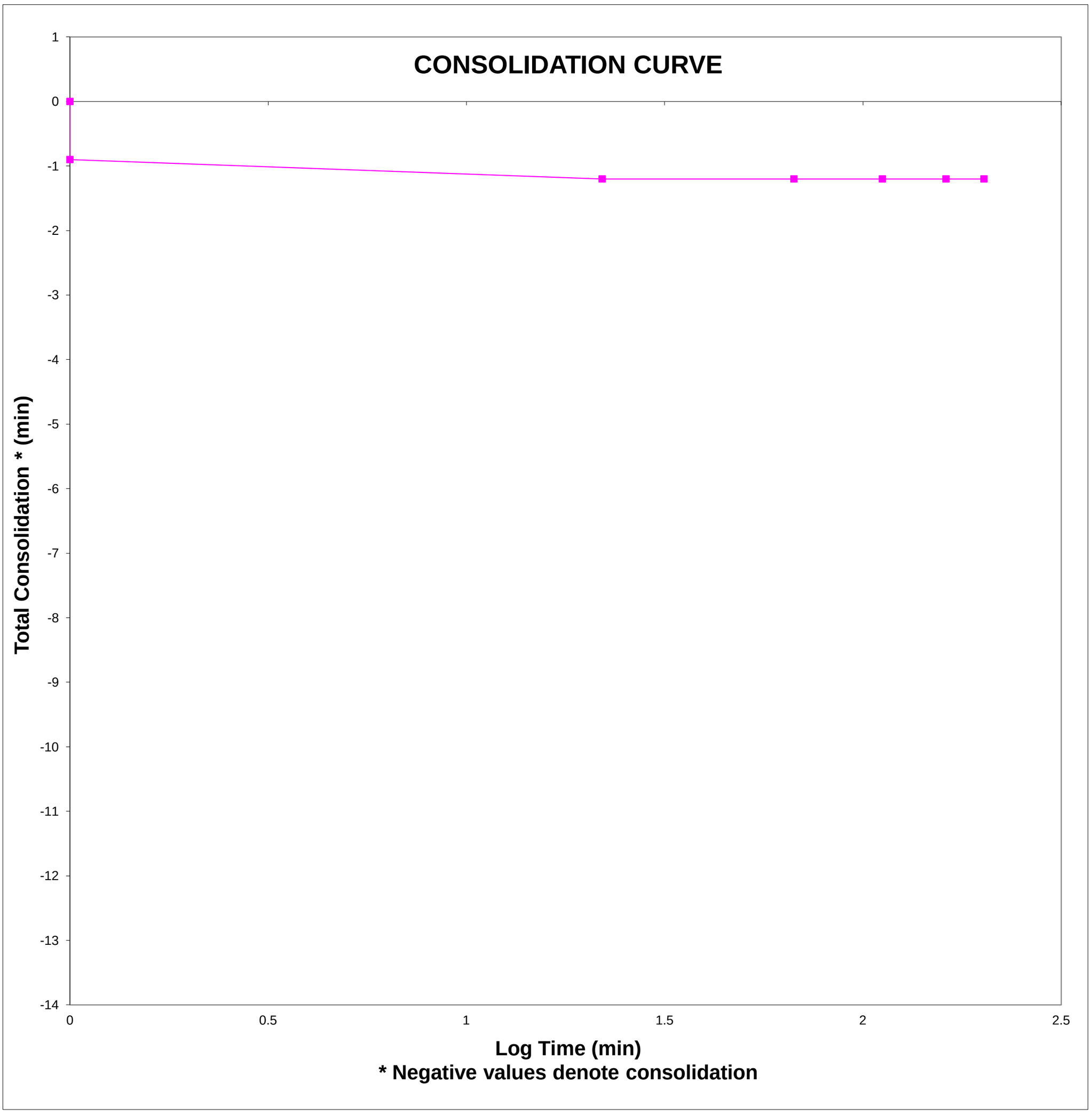
CELL PRESSURE: 55 psi **BACK PRESSURE:** 45 psi **EFFECTIVE STRESS:** 10 psi

TEST DATE	*TESTED BY*	*TIME (Military)*	*ELAPSED TIME (minutes)*	*TOTAL TIME (minutes)*	*TOTAL TIME (Log)*	*SPECIMEN CONSOLIDATION (ML)*		
						READING		*ACTUAL TOTAL (Ct)*
						BOTTOM	*TOP*	
1 / 17 / 13	RJB	10 : 8	0	0	0	25.0	25.0	0.0
1 / 17 / 13	RJB	10 : 9	1	1	0.00	24.6	24.5	0.9
1 / 17 / 13	RJB	10 : 30	21	22	1.34	24.4	24.4	1.2
1 / 17 / 13	RJB	11 : 15	45	67	1.83	24.4	24.4	1.2
1 / 17 / 13	RJB	12 : 0	45	112	2.05	24.4	24.4	1.2
1 / 17 / 13	RJB	12 : 50	50	162	2.21	24.4	24.4	1.2
1 / 17 / 13	RJB	13 : 30	40	202	2.31	24.4	24.4	1.2

PERMEABILITY ASTM D5084

CONSOLIDATION CURVE

PROJECT:	RHINELANDER	TESTED BY:	RJB
PROJECT No.:	SH0461	TRACKING CODE:	8688_PM
SAMPLE No.:	0460-005 (28 DAY)	EQUIPMENT No.:	7A
TEST DATE:	1/15/13		



PERMEABILITY ASTM D5084

TEST DATA

PROJECT:	QUANTA	TESTED BY:	RJB
PROJECT No.:	SH0460	TRACKING CODE:	8688_PM
SAMPLE No.:	0460-005 (28 DAY)	EQUIPMENT No.:	7A
TEST DATE:	1/15/2013		

DATE	*TESTED BY*	*TIME (military)*	*ELAPSED TIME (minutes)*	*HYDRAULIC HEAD (cm)*		*TEMP. C°*	*GAUGE PRESSURE (psi)*		
				INFLUENT	*EFFLUENT*		*CELL*	*INFLUENT*	*EFFLUENT*
1 / 17 / 13	RJB	13 : 38	0	0.0	25.0	20.0	55.0	45.0	43.0
1 / 18 / 13	RJB	8 : 35	1137	0.6	24.4	20.0	55.0	45.0	43.0
1 / 24 / 13	RJB	7 : 46	RESET	0.0	25.0	20.0	55.0	45.0	43.0
1 / 28 / 13	RJB	8 : 8	5782	0.7	24.3	20.0	55.0	45.0	43.0

PERMEABILITY ASTM D5084

TEST DATA (continued)

PROJECT:	QUANTA	TESTED BY:	RJB
PROJECT No.:	SH0460	TRACKING CODE:	8688_PM
SAMPLE No.:	0460-005 (28 DAY)	EQUIPMENT No.:	7A
TEST DATE:	1/15/13		

ELAPSED TIME (minutes)	*HYDRAULIC HEAD DIFFERENCE (cm)*		*EFFLUENT - INFLUENT RATIO*	*HYDRAULIC GRADIENT (cm/cm)*	*HYDRAULIC CONDUCTIVITY (cm/sec)*	
	INFLUENT	*EFFLUENT*			*@ Temp.*	*@ 20° C*
RESET				26.020		
1137	0.6	0.6	1.00	25.832	7.58E-09	7.62E-09
RESET				26.020		
5782	0.7	0.7	1.00	25.800	1.74E-09	1.75E-09

PERMEABILITY ASTM D5084

SUMMARY OF RESULTS

PROJECT:	QUANTA	TESTED BY:	RJB
PROJECT No.:	SH0460	TRACKING CODE:	8688_PM
SAMPLE No.:	0460-005 (28 DAY)	EQUIPMENT No.:	7A
TEST DATE:	1/15/13		

TESTING PARAMETER	INITIAL	FINAL
BULK UNIT WEIGHT	102.5 lb/ft³	102.4 lb/ft³
DRY UNIT WEIGHT	74.6 lb/ft³	74.0 lb/ft³
MOISTURE CONTENT	37.5 %	38.4 %
PERMEABILITY @ 20°C	4.7E-09 cm/sec	

UNCONFINED COMPRESSION TEST

ASTM D 2166

PROJECT:	Quanta
PROJECT No.:	SH0460
SAMPLE No.:	460-005
TESTING DATE:	16-Jan-13
TESTED BY:	TNR

LOADING RATE:	0.04 in./min.
TRACKING CODE:	8688

MOISTURE CONTENT (Dry Basis)		
1. MOISTURE TIN NO.		
2. WT MOISTURE TIN (tare weight)	174.57	g
3. WT WET SOIL + TARE	312.54	g
4. WT DRY SOIL + TARE	273.37	g
5. WT WATER, Ww	39.17	g
6. WT DRY SOIL, Ws	98.80	g
7. MOISTURE CONTENT, W	**39.65**	**%**

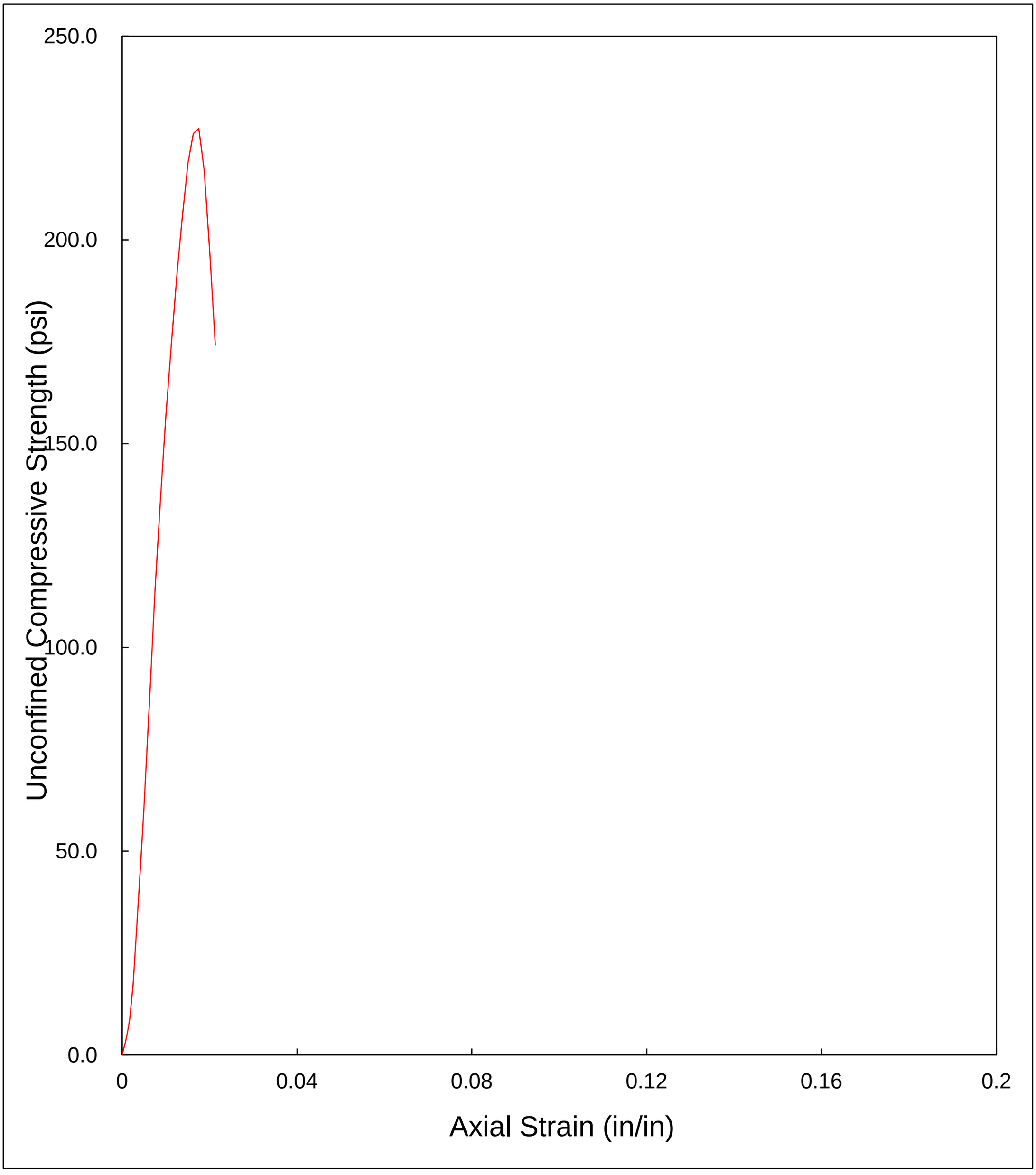
SOIL SPECIMEN DIMENSIONS				
	DIAMETER		*LENGTH*	
No. 1	2.02	in.	3.99	in.
No. 2	2.01	in.	3.99	in.
No. 3	1.99	in.	3.99	in.
Average	**2.01**	**in.**	**3.99**	**in.**

SPECIMEN CONDITIONS		
Initial Specimen WT, Wo	*324.74*	*g*
Initial Area, Ao	3.16	in²
Initial Volume, Vo	12.61	in³
Initial Bulk Unit Weight,	98.1	lb/ft³
Initial Dry Unit Weight	70.3	lb/ft³
15 % Strain (0.15 Lo)	0.60	in.
UCS	227.3	lb/in²

COMPRESSIVE LOAD (lbs.)	DIAL GAGE READING (in.)	SPECIMEN DEFORMATION (in.)	CORRECTED AREA (in²)	AXIAL STRAIN (in/in)	UNCONFINED COMPRESSIVE STRENGTH (lb/in²)
0	0.000	0.000	3.164	0.0000	0.0
10	0.003	0.003	3.166	0.0008	3.2
18	0.005	0.005	3.168	0.0013	5.7
28	0.007	0.007	3.169	0.0018	8.8
55	0.010	0.010	3.172	0.0025	17.3
123	0.015	0.015	3.176	0.0038	38.7
192	0.020	0.020	3.180	0.0050	60.4
275	0.025	0.025	3.184	0.0063	86.4
362	0.030	0.030	3.188	0.0075	113.6
435	0.035	0.035	3.192	0.0088	136.3
502	0.040	0.040	3.196	0.0100	157.1
559	0.045	0.045	3.200	0.0113	174.7
614	0.050	0.050	3.204	0.0125	191.6
661	0.055	0.055	3.208	0.0138	206.1
703	0.060	0.060	3.212	0.0151	218.9
727	0.065	0.065	3.216	0.0163	226.1
732	0.070	0.070	3.220	0.0176	227.3
699	0.075	0.075	3.224	0.0188	216.8
635	0.080	0.080	3.228	0.0201	196.7
563	0.085	0.085	3.233	0.0213	174.2

UNCONFINED COMPRESSION TESTING

Sample No. 460-005



UNCONFINED COMPRESSION TEST

ASTM D 2166
SUMMARY OF RESULTS

PROJECT:	Quanta		
PROJECT No.:	SH0460		
SAMPLE No.:	460-005		
TESTING DATE:	1/16/2013	LOADING RATE:	0.04 in./min.
TESTED BY:	TNR	TRACKING CODE:	8688

TESTING PARAMETER AND RESULTS		
MOISTURE CONTENT	39.6	%
BULK UNIT WEIGHT	98.1	lb/ft^3
DRY UNIT WEIGHT	70.3	lb/ft^3
UCS *	227.3	lb/in^2

* UCS - UNCONFINED COMPRESSIVE STRENGTH

ANS 16.1 LEACHABILITY

SAMPLE PREPARATION

PROJECT:	Quanta	TESTED BY:	TNR
PROJECT No.:	SH0460	TRACKING CODE:	8688
SAMPLE No.:	460-005		
TEST DATE:	2/21/2013		

MOISTURE CONTENT (Dry Basis)	*RESULTS*	
1. MOISTURE TIN NO.		
2. WT MOISTURE TIN (tare weight)	174.57	*g*
3. WT WET SOIL + TARE	312.54	*g*
4. WT DRY SOIL + TARE	273.37	*g*
5. WT WATER, Ww	39.17	g
6. WT DRY SOIL, Ws	98.80	g
7. MOISTURE CONTENT, W	39.65	%

SOIL SPECIMEN DIMENSIONS				
TRIPLICATE ANALYSES	*DIAMETER RESULTS*		*LENGTH RESULTS*	
No. 1	*3.01*	*in.*	*2.09*	*in.*
No. 2	*3.00*	*in.*	*2.08*	*in.*
No. 3	*2.99*	*in.*	*2.08*	*in.*
Average	3.00	in.	2.09	in.

SPECIMEN CONDITIONS	*INITIAL*	
Specimen WT, Wo	*374.43*	*g*
Area, Ao	7.07	in^2
Volume, Vo	14.74	in^3
Bulk Unit Weight	96.8	pcf
Dry Unit Weight	69.3	pcf

ANS 16.1 LEACHABILITY

TESTING DATA

PROJECT:	Quanta
PROJECT NO.:	SH0460
SAMPLE NO:	460-005
START DATE:	2/21/2013
TRACKING CODE:	8688

LEACH INTERVAL	TESTED BY	DATE		TIME		VOLUME LEACHATE (ml)	TEMP (°C)	PID (ppm)	Conduct. (mS/cm³)	pH (s.u.)	OBSERVATIONS
		IN	OUT	IN	OUT						
Initial	TNR					2180	16.60		0.058	7.17	
1	TNR	02/21/13	02/21/13	0846	1046	2180	23.20		0.031	8.55	2 hour
2	TNR	02/21/13	02/21/13	1046	1546	2180	23.92		0.060	8.77	7 hour
3	TNR	02/21/13	02/22/13	1546	0846	2180	22.96		0.085	9.13	24 hour; particles at bottom
4	TNR	02/22/13	02/23/13	0846	0846	2180	21.96		0.071	9.06	48 hour
5	TNR	02/23/13	02/24/13	0846	0846	2180	22.45		0.051	8.79	3 day
6	TNR	02/24/13	02/25/13	0846	0846	2180	23.45		0.047	8.91	4 day
7	TNR	02/25/13	02/26/13	0846	0846	2180	23.19		0.066	8.97	5 day
8											
9											
10											

PERMEABILITY ASTM D5084

SPECIMEN CONDITIONS

PROJECT:	QUANTA	TESTED BY:	RJB
PROJECT No.:	SH0460	TRACKING CODE:	8689_PM
SAMPLE No.:	0460-006 (28 DAY)	EQUIPMENT No.:	6A
TEST DATE:	1/16/13		

MOISTURE CONTENT (Dry Basis)	*INITIAL*	*FINAL*
1. MOISTURE TIN NO.		
2. WT MOISTURE TIN (tare weight)	0.00 *g*	230.65 *g*
3. WT WET SOIL + TARE	381.06 *g*	846.35 *g*
4. WT DRY SOIL + TARE	249.46 *g*	480.11 *g*
5. WT WATER, Ww	131.60 g	366.24 g
6. WT DRY SOIL, Ws	249.46 g	249.46 g
7. MOISTURE CONTENT, W	52.75 %	146.81 %

SOIL SPECIMEN DIMENSIONS				
TRIPLICATE	*DIAMETER*		*HEIGHT*	
ANALYSES	*INITIAL*	*FINAL*	*INITIAL*	*FINAL*
No. 1	*2.99 in.*	*2.98 in.*	*2.43 in.*	*2.49 in.*
No. 2	*2.99 in.*	*2.97 in.*	*2.48 in.*	*2.44 in.*
No. 3	*2.97 in.*	*2.97 in.*	*2.50 in.*	*2.44 in.*
Average	2.98 in.	2.97 in.	2.47 in.	2.46 in.

SPECIMEN CONDITIONS	*INITIAL*	*FINAL*
Specimen WT, Wo	*381.06 g*	*615.70 g*
Area, Ao	6.99 in^2	6.94 in^2
Volume, Vo	17.26 in^3	17.05 in^3
Bulk Unit Weight	84.1 lb/ft^3	137.6 lb/ft^3
Dry Unit Weight	55.1 lb/ft^3	55.7 lb/ft^3

PERMEABILITY ASTM D5084

BACK-PRESSURE SATURATION

PROJECT:	QUANTA	TESTED BY:	RJB
PROJECT No.:	SH0460	TRACKING CODE:	8689_PM
SAMPLE No.:	0460-006 (28 DAY)	EQUIPMENT No.:	6A
TEST DATE:	1/16/13		

TEST	*TIME*	*TESTED*	*TEST PRESSURES (psi)*						
			APPLIED		*PORE*		*PRESSURE CHANGE*		
DATE	*(military)*	*BY*	*CELL*	*BACK*	*SAT.*	*TEST*	*CELL*	*PORE*	*B-Value*
01/16/13	12 : 34	RJB	7.0	5.0	6.0				
01/16/13	12 : 58	RJB	17.0	15.0	15.9	9.8	10.0	3.8	0.38
01/16/13	13 : 43	RJB	27.0	25.0	26.0	22.0	10.0	6.1	0.61
01/16/13	14 : 16	RJB	37.0	35.0	36.1	33.6	10.0	7.6	0.76
01/16/13	14 : 55	RJB	47.0	45.0	46.0	44.6	10.0	8.5	0.85
01/17/13	8 : 50	RJB	57.0	55.0	*	55.6	10.0	9.6	0.96
01/17/13	8 : 51	RJB	67.0	65.0	*	*	*	*	*

* Saturation check - no data available.

PERMEABILITY ASTM D5084

SPECIMEN CONSOLIDATION

PROJECT:	QUANTA		RJB
PROJECT No.:	SH0460		8689_PM
SAMPLE No.:	0460-006 (28 DAY)		6A
TEST DATE:	1/16/13		

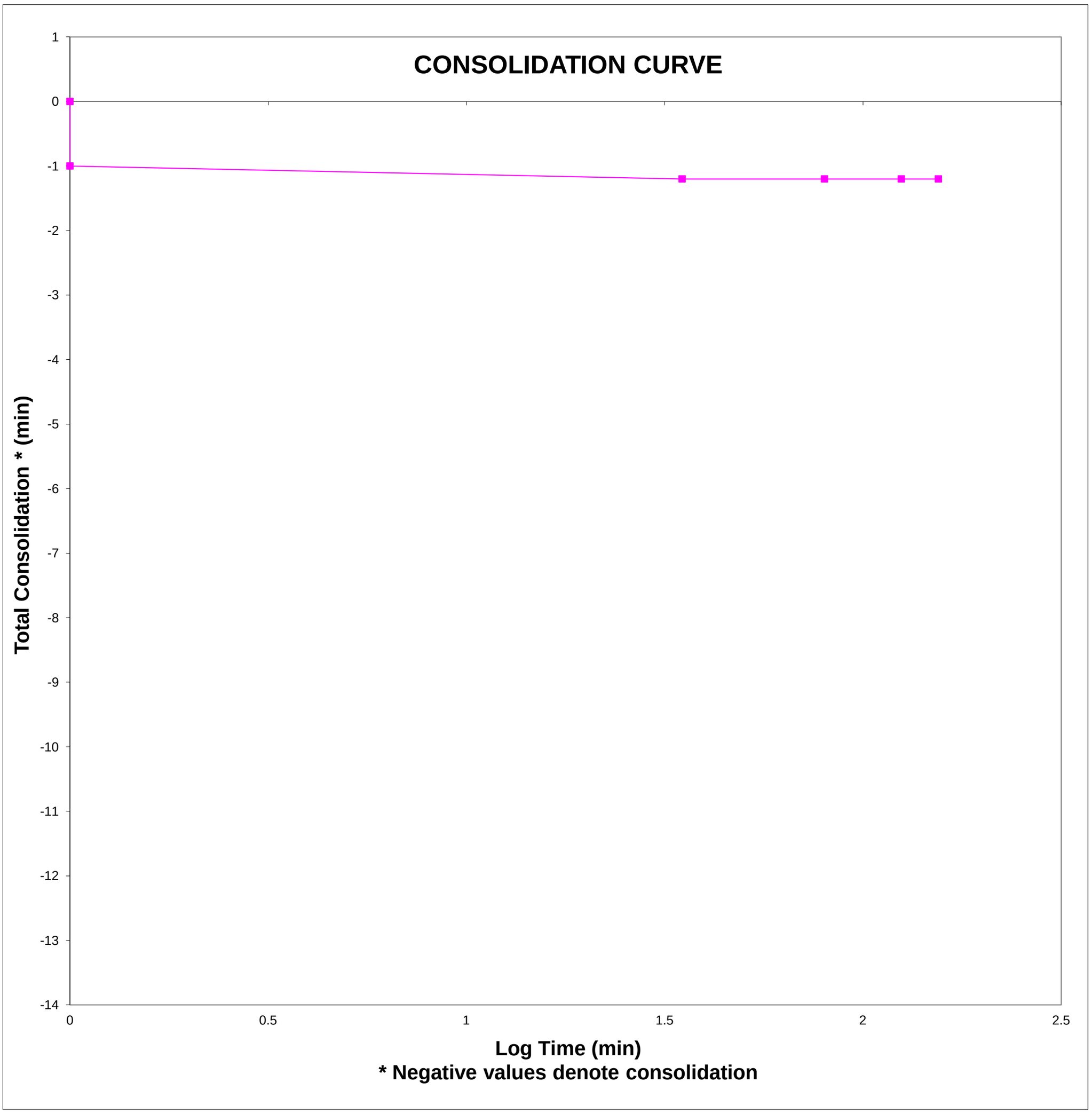
CELL PRESSURE: 55 psi **BACK PRESSURE:** 45 psi **EFFECTIVE STRESS:** 10 psi

TEST DATE	*TESTED BY*	*TIME (Military)*	*ELAPSED TIME (minutes)*	*TOTAL TIME (minutes)*	*TOTAL TIME (Log)*	*SPECIMEN CONSOLIDATION (ML)*		
						READING		*ACTUAL TOTAL (Ct)*
						BOTTOM	*TOP*	
1 / 16 / 13	RJB	7 : 55	0	0	0	25.0	25.0	0.0
1 / 16 / 13	RJB	7 : 56	1	1	0.00	24.5	24.5	1.0
1 / 16 / 13	RJB	8 : 30	34	35	1.54	24.3	24.5	1.2
1 / 16 / 13	RJB	9 : 15	45	80	1.90	24.3	24.5	1.2
1 / 16 / 13	RJB	10 : 0	45	125	2.10	24.3	24.5	1.2
1 / 16 / 13	RJB	10 : 30	30	155	2.19	24.3	24.5	1.2

PERMEABILITY ASTM D5084

CONSOLIDATION CURVE

PROJECT:	QUANTA	TESTED BY:	RJB
PROJECT No.:	SH0460	TRACKING CODE:	8689_PM
SAMPLE No.:	0460-006 (28 DAY)	EQUIPMENT No.:	6A
TEST DATE:	1/16/13		



PERMEABILITY ASTM D5084

TEST DATA

PROJECT:	QUANTA	TESTED BY:	RJB
PROJECT No.:	SH0460	TRACKING CODE:	8689_PM
SAMPLE No.:	0460-006 (28 DAY)	EQUIPMENT No.:	6A
TEST DATE:	1/16/2013		

DATE	*TESTED BY*	*TIME (military)*	*ELAPSED TIME (minutes)*	*HYDRAULIC HEAD (cm)*		*TEMP. C°*	*GAUGE PRESSURE (psi)*		
				INFLUENT	*EFFLUENT*		*CELL*	*INFLUENT*	*EFFLUENT*
1 / 17 / 13	RJB	11 : 18	0	0.0	25.0	20.0	55.0	45.0	43.0
1 / 18 / 13	RJB	8 : 36	1278	1.8	23.2	20.0	55.0	45.0	43.0
1 / 18 / 13	RJB	15 : 16	400	2.3	22.7	20.0	55.0	45.0	43.0
1 / 21 / 13	RJB	7 : 45	RESET	0.0	25.0	20.0	55.0	45.0	43.0
1 / 22 / 13	RJB	8 : 17	1472	1.1	23.9	20.0	55.0	45.0	43.0
1 / 23 / 13	RJB	7 : 33	1396	2.0	23.0	20.0	55.0	45.0	43.0
1 / 24 / 13	RJB	7 : 30	1437	2.9	22.1	20.0	55.0	45.0	43.0

PERMEABILITY ASTM D5084

TEST DATA (continued)

PROJECT:	QUANTA	TESTED BY:	RJB
PROJECT No.:	SH0460	TRACKING CODE:	8689_PM
SAMPLE No.:	0460-006 (28 DAY)	EQUIPMENT No.:	6A
TEST DATE:	1/16/13		

ELAPSED TIME (minutes)	*HYDRAULIC HEAD DIFFERENCE (cm)*		*EFFLUENT - INFLUENT RATIO*	*HYDRAULIC GRADIENT (cm/cm)*	*HYDRAULIC CONDUCTIVITY (cm/sec)*	
	INFLUENT	*EFFLUENT*			*@ Temp.*	*@ 20° C*
RESET				26.403		
1278	1.8	1.8	1.00	25.829	1.99E-08	2.00E-08
400	0.5	0.5	1.00	25.670	1.80E-08	1.80E-08
RESET				26.403		
1472	1.1	1.1	1.00	26.052	1.05E-08	1.06E-08
1396	0.9	0.9	1.00	25.765	9.20E-09	9.24E-09
1437	0.9	0.9	1.00	25.479	9.04E-09	9.08E-09

PERMEABILITY ASTM D5084

SUMMARY OF RESULTS

PROJECT:	QUANTA	TESTED BY:	RJB
PROJECT No.:	SH0460	TRACKING CODE:	8689_PM
SAMPLE No.:	0460-006 (28 DAY)	EQUIPMENT No.:	6A
TEST DATE:	1/16/13		

TESTING PARAMETER	INITIAL	FINAL
BULK UNIT WEIGHT	84.1 lb/ft³	137.6 lb/ft³
DRY UNIT WEIGHT	55.1 lb/ft³	55.7 lb/ft³
MOISTURE CONTENT	52.8 %	146.8 %
PERMEABILITY @ 20°C	1.2E-08 cm/sec	

UNCONFINED COMPRESSION TEST

ASTM D 2166

PROJECT:	Quanta
PROJECT No.:	SH0460
SAMPLE No.:	460-006
TESTING DATE:	16-Jan-13
TESTED BY:	TNR

LOADING RATE:	0.04 in./min.
TRACKING CODE:	8689

MOISTURE CONTENT (Dry Basis)		
1. MOISTURE TIN NO.		
2. WT MOISTURE TIN (tare weight)	168.17	g
3. WT WET SOIL + TARE	290.71	g
4. WT DRY SOIL + TARE	249.63	g
5. WT WATER, Ww	41.08	g
6. WT DRY SOIL, Ws	81.46	g
7. MOISTURE CONTENT, W	**50.43**	**%**

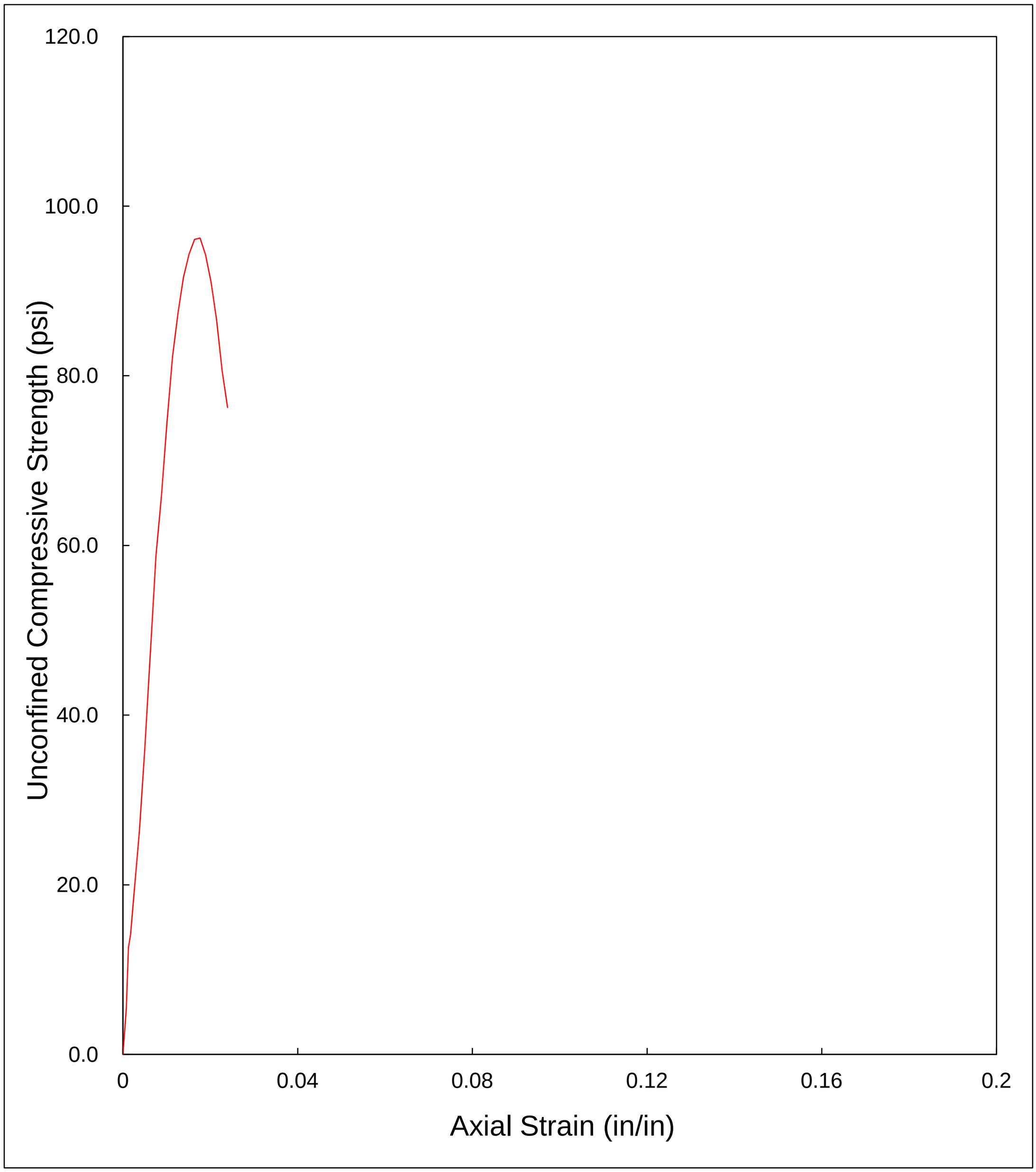
SOIL SPECIMEN DIMENSIONS				
	DIAMETER		*LENGTH*	
No. 1	2.02	in.	3.96	in.
No. 2	2.02	in.	3.96	in.
No. 3	1.99	in.	3.98	in.
Average	**2.01**	**in.**	**3.97**	**in.**

SPECIMEN CONDITIONS		
Initial Specimen WT, Wo	*267.67*	*g*
Initial Area, Ao	3.17	in²
Initial Volume, Vo	12.59	in³
Initial Bulk Unit Weight,	81.0	lb/ft³
Initial Dry Unit Weight	53.8	lb/ft³
15 % Strain (0.15 Lo)	0.60	in.
UCS	96.3	lb/in²

COMPRESSIVE LOAD (lbs.)	DIAL GAGE READING (in.)	SPECIMEN DEFORMATION (in.)	CORRECTED AREA (in²)	AXIAL STRAIN (in/in)	UNCONFINED COMPRESSIVE STRENGTH (lb/in²)
0	0.000	0.000	3.174	0.0000	0.0
17	0.003	0.003	3.177	0.0008	5.4
40	0.005	0.005	3.178	0.0013	12.6
45	0.007	0.007	3.180	0.0018	14.2
60	0.010	0.010	3.182	0.0025	18.9
84	0.015	0.015	3.186	0.0038	26.4
116	0.020	0.020	3.190	0.0050	36.4
152	0.025	0.025	3.194	0.0063	47.6
188	0.030	0.030	3.198	0.0076	58.8
211	0.035	0.035	3.202	0.0088	65.9
239	0.040	0.040	3.206	0.0101	74.5
264	0.045	0.045	3.211	0.0113	82.2
281	0.050	0.050	3.215	0.0126	87.4
295	0.055	0.055	3.219	0.0139	91.7
304	0.060	0.060	3.223	0.0151	94.3
310	0.065	0.065	3.227	0.0164	96.1
311	0.070	0.070	3.231	0.0176	96.3
305	0.075	0.075	3.235	0.0189	94.3
295	0.080	0.080	3.239	0.0202	91.1
281	0.085	0.085	3.244	0.0214	86.6
262	0.090	0.090	3.248	0.0227	80.7
248	0.095	0.095	3.252	0.0239	76.3

UNCONFINED COMPRESSION TESTING

Sample No. 460-006



UNCONFINED COMPRESSION TEST

ASTM D 2166
SUMMARY OF RESULTS

PROJECT:	Quanta		
PROJECT No.:	SH0460		
SAMPLE No.:	460-006		
TESTING DATE:	1/16/2013	LOADING RATE:	0.04 in./min.
TESTED BY:	TNR	TRACKING CODE:	8689

TESTING PARAMETER AND RESULTS		
MOISTURE CONTENT	50.4	%
BULK UNIT WEIGHT	81.0	lb/ft^3
DRY UNIT WEIGHT	53.8	lb/ft^3
UCS *	96.3	lb/in^2

* UCS - UNCONFINED COMPRESSIVE STRENGTH

ANS 16.1 LEACHABILITY

SAMPLE PREPARATION

PROJECT:	Quanta	TESTED BY:	TNR
PROJECT No.:	SH0460	TRACKING CODE:	8689
SAMPLE No.:	460-006		
TEST DATE:	2/21/2013		

MOISTURE CONTENT (Dry Basis)	*RESULTS*	
1. MOISTURE TIN NO.		
2. WT MOISTURE TIN (tare weight)	168.17	*g*
3. WT WET SOIL + TARE	290.71	*g*
4. WT DRY SOIL + TARE	249.63	*g*
5. WT WATER, Ww	41.08	g
6. WT DRY SOIL, Ws	81.46	g
7. MOISTURE CONTENT, W	50.43	%

SOIL SPECIMEN DIMENSIONS				
TRIPLICATE ANALYSES	*DIAMETER RESULTS*		*LENGTH RESULTS*	
No. 1	*2.99*	*in.*	*2.08*	*in.*
No. 2	*3.00*	*in.*	*2.08*	*in.*
No. 3	*3.01*	*in.*	*2.12*	*in.*
Average	3.00	in.	2.09	in.

SPECIMEN CONDITIONS	*INITIAL*	
Specimen WT, Wo	*320.34*	*g*
Area, Ao	7.06	in^2
Volume, Vo	14.76	in^3
Bulk Unit Weight	82.7	pcf
Dry Unit Weight	54.9	pcf

ANS 16.1 LEACHABILITY

TESTING DATA

PROJECT:	Quanta
PROJECT NO.:	SH0460
SAMPLE NO:	460-006
START DATE:	2/21/2013
TRACKING CODE:	8689

LEACH INTERVAL	TESTED BY	DATE		TIME		VOLUME LEACHATE (ml)	TEMP (°C)	PID (ppm)	Conduct. (mS/cm³)	pH (s.u.)	OBSERVATIONS
		IN	OUT	IN	OUT						
Initial	TNR					2182	16.60		0.058	7.17	
1	TNR	02/21/13	02/21/13	0847	1047	2182	23.14		0.021	8.41	2 hour
2	TNR	02/21/13	02/21/13	1047	1547	2182	23.38		0.029	8.66	7 hour
3	TNR	02/21/13	02/22/13	1547	0847	2182	22.90		0.056	9.01	24 hour; particles at bottom
4	TNR	02/22/13	02/23/13	0847	0847	2182	22.00		0.054	8.90	48 hour
5	TNR	02/23/13	02/24/13	0847	0847	2182	22.37		0.038	8.65	3 day
6	TNR	02/24/13	02/25/13	0847	0847	2182	23.38		0.038	8.67	4 day
7	TNR	02/25/13	02/26/13	0847	0847	2182	22.91		0.039	9.02	5 day
8											
9											
10											

PERMEABILITY ASTM D5084

SPECIMEN CONDITIONS

PROJECT:	QUANTA	TESTED BY:	RJB
PROJECT No.:	SH0460	TRACKING CODE:	8690_PM
SAMPLE No.:	0460-007 (28 DAY)	EQUIPMENT No.:	1
TEST DATE:	1/17/13		

MOISTURE CONTENT (Dry Basis)	*INITIAL*	*FINAL*
1. MOISTURE TIN NO.		
2. WT MOISTURE TIN (tare weight)	0.00 *g*	208.56 *g*
3. WT WET SOIL + TARE	385.43 *g*	596.59 *g*
4. WT DRY SOIL + TARE	281.86 *g*	490.42 *g*
5. WT WATER, Ww	103.57 g	106.17 g
6. WT DRY SOIL, Ws	281.86 g	281.86 g
7. MOISTURE CONTENT, W	36.75 %	37.67 %

SOIL SPECIMEN DIMENSIONS				
TRIPLICATE	*DIAMETER*		*HEIGHT*	
ANALYSES	*INITIAL*	*FINAL*	*INITIAL*	*FINAL*
No. 1	*3.00 in.*	*2.99 in.*	*2.41 in.*	*2.41 in.*
No. 2	*2.98 in.*	*2.99 in.*	*2.39 in.*	*2.39 in.*
No. 3	*2.97 in.*	*2.97 in.*	*2.37 in.*	*2.36 in.*
Average	2.98 in.	2.98 in.	2.39 in.	2.39 in.

SPECIMEN CONDITIONS	*INITIAL*	*FINAL*
Specimen WT, Wo	*385.43 g*	*388.21 g*
Area, Ao	6.99 in^2	6.98 in^2
Volume, Vo	16.71 in^3	16.65 in^3
Bulk Unit Weight	87.9 lb/ft^3	88.8 lb/ft^3
Dry Unit Weight	64.3 lb/ft^3	64.5 lb/ft^3

PERMEABILITY ASTM D5084

BACK-PRESSURE SATURATION

PROJECT:	QUANTA	TESTED BY:	RJB
PROJECT No.:	SH0460	TRACKING CODE:	8690_PM
SAMPLE No.:	0460-007 (28 DAY)	EQUIPMENT No.:	1
TEST DATE:	1/17/13		

TEST	*TIME*	*TESTED*	*TEST PRESSURES (psi)*						
			APPLIED		*PORE*		*PRESSURE CHANGE*		
DATE	*(military)*	*BY*	*CELL*	*BACK*	*SAT.*	*TEST*	*CELL*	*PORE*	*B-Value*
01/17/13	13 : 32	RJB	7.0	5.0	5.3				
01/17/13	14 : 2	RJB	17.0	15.0	15.5	10.1	10.0	4.8	0.48
01/17/13	14 : 28	RJB	27.0	25.0	25.3	22.7	10.0	7.2	0.72
01/18/13	11 : 0	RJB	37.0	35.0	35.4	33.2	10.0	7.9	0.79
01/18/13	11 : 50	RJB	47.0	45.0	45.2	44.0	10.0	8.6	0.86
01/18/13	12 : 33	RJB	57.0	55.0	55.4	54.4	10.0	9.2	0.92
01/18/13	13 : 40	RJB	67.0	65.0	*	64.9	10.0	9.5	0.95
01/18/13	13 : 41	RJB	57.0	55.0	*	*	*	*	*

* Saturation check - no data available.

PERMEABILITY ASTM D5084

SPECIMEN CONSOLIDATION

PROJECT:	QUANTA		RJB
PROJECT No.:	SH0460		8690_PM
SAMPLE No.:	0460-007 (28 DAY)		1
TEST DATE:	1/17/13		

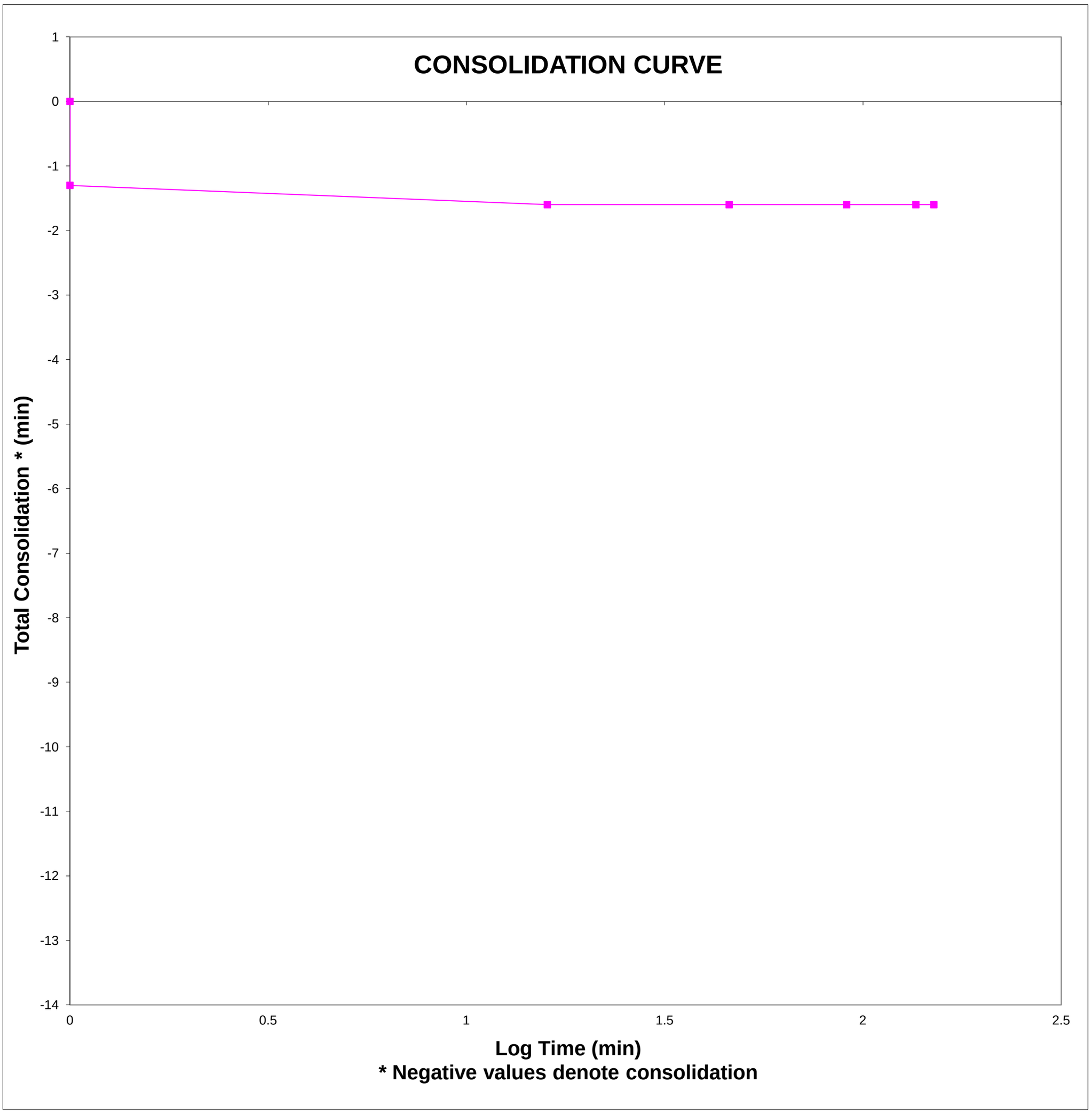
CELL PRESSURE: 65 psi **BACK PRESSURE:** 55 psi **EFFECTIVE STRESS:** 10 psi

TEST DATE	*TESTED BY*	*TIME (Military)*	*ELAPSED TIME (minutes)*	*TOTAL TIME (minutes)*	*TOTAL TIME (Log)*	*SPECIMEN CONSOLIDATION (ML)*		
						READING		*ACTUAL TOTAL (Ct)*
						BOTTOM	*TOP*	
1 / 18 / 13	RJB	13 : 44	0	0	0	25.0	25.0	0.0
1 / 18 / 13	RJB	13 : 45	1	1	0.00	24.4	24.3	1.3
1 / 18 / 13	RJB	14 : 0	15	16	1.20	24.2	24.2	1.6
1 / 18 / 13	RJB	14 : 30	30	46	1.66	24.2	24.2	1.6
1 / 18 / 13	RJB	15 : 15	45	91	1.96	24.2	24.2	1.6
1 / 18 / 13	RJB	16 : 0	45	136	2.13	24.2	24.2	1.6
1 / 18 / 13	RJB	16 : 15	15	151	2.18	24.2	24.2	1.6

PERMEABILITY ASTM D5084

CONSOLIDATION CURVE

PROJECT:	QUANTA	TESTED BY:	RJB
PROJECT No.:	SH0460	TRACKING CODE:	8690_PM
SAMPLE No.:	0460-007 (28 DAY)	EQUIPMENT No.:	1
TEST DATE:	1/17/13		



PERMEABILITY ASTM D5084

TEST DATA

PROJECT:	QUANTA	TESTED BY:	RJB
PROJECT No.:	SH0460	TRACKING CODE:	8690_PM
SAMPLE No.:	0460-007 (28 DAY)	EQUIPMENT No.:	1
TEST DATE:	1/17/2013		

DATE	*TESTED BY*	*TIME (military)*	*ELAPSED TIME (minutes)*	*HYDRAULIC HEAD (cm)*		*TEMP. C°*	*GAUGE PRESSURE (psi)*		
				INFLUENT	*EFFLUENT*		*CELL*	*INFLUENT*	*EFFLUENT*
1 / 21 / 13	RJB	7 : 55	0	0.0	25.0	20.0	65.0	55.0	53.0
1 / 22 / 13	RJB	8 : 10	1455	1.0	24.0	20.0	65.0	55.0	53.0
1 / 23 / 13	RJB	7 : 32	1402	1.8	23.2	20.0	65.0	55.0	53.0
1 / 24 / 13	RJB	7 : 32	1440	2.5	22.5	20.0	65.0	55.0	53.0
1 / 25 / 13	RJB	7 : 59	1467	3.1	21.9	20.0	65.0	55.0	53.0
1 / 26 / 13	RJB	8 : 2	RESET	0.0	25.0	20.0	65.0	55.0	53.0
1 / 28 / 13	RJB	8 : 13	2891	1.2	23.8	20.0	65.0	55.0	53.0

PERMEABILITY ASTM D5084

TEST DATA (continued)

PROJECT:	QUANTA	TESTED BY:	RJB
PROJECT No.:	SH0460	TRACKING CODE:	8690_PM
SAMPLE No.:	0460-007 (28 DAY)	EQUIPMENT No.:	1
TEST DATE:	1/17/13		

ELAPSED TIME (minutes)	*HYDRAULIC HEAD DIFFERENCE (cm)*		*EFFLUENT - INFLUENT RATIO*	*HYDRAULIC GRADIENT (cm/cm)*	*HYDRAULIC CONDUCTIVITY (cm/sec)*	
	INFLUENT	*EFFLUENT*			*@ Temp.*	*@ 20° C*
RESET				27.296		
1455	1.0	1.0	1.00	26.966	9.36E-09	9.40E-09
1402	0.8	0.8	1.00	26.703	7.85E-09	7.89E-09
1440	0.7	0.7	1.00	26.472	6.75E-09	6.78E-09
1467	0.6	0.6	1.00	26.275	5.73E-09	5.75E-09
RESET				27.296		
2891	1.2	1.2	1.00	26.901	5.66E-09	5.68E-09

PERMEABILITY ASTM D5084

SUMMARY OF RESULTS

PROJECT:	QUANTA	TESTED BY:	RJB
PROJECT No.:	SH0460	TRACKING CODE:	8690_PM
SAMPLE No.:	0460-007 (28 DAY)	EQUIPMENT No.:	1
TEST DATE:	1/17/13		

TESTING PARAMETER	INITIAL	FINAL
BULK UNIT WEIGHT	87.9 lb/ft³	88.8 lb/ft³
DRY UNIT WEIGHT	64.3 lb/ft³	64.5 lb/ft³
MOISTURE CONTENT	36.7 %	37.7 %
PERMEABILITY @ 20°C	6.5E-09 cm/sec	

UNCONFINED COMPRESSION TEST

ASTM D 2166

PROJECT:	Quanta
PROJECT No.:	SH0460
SAMPLE No.:	460-007
TESTING DATE:	16-Jan-13
TESTED BY:	TNR

LOADING RATE:	0.04 in./min.
TRACKING CODE:	8690

MOISTURE CONTENT (Dry Basis)		
1. MOISTURE TIN NO.		
2. WT MOISTURE TIN (tare weight)	162.54	g
3. WT WET SOIL + TARE	261.16	g
4. WT DRY SOIL + TARE	227.99	g
5. WT WATER, Ww	33.17	g
6. WT DRY SOIL, Ws	65.45	g
7. MOISTURE CONTENT, W	**50.68**	**%**

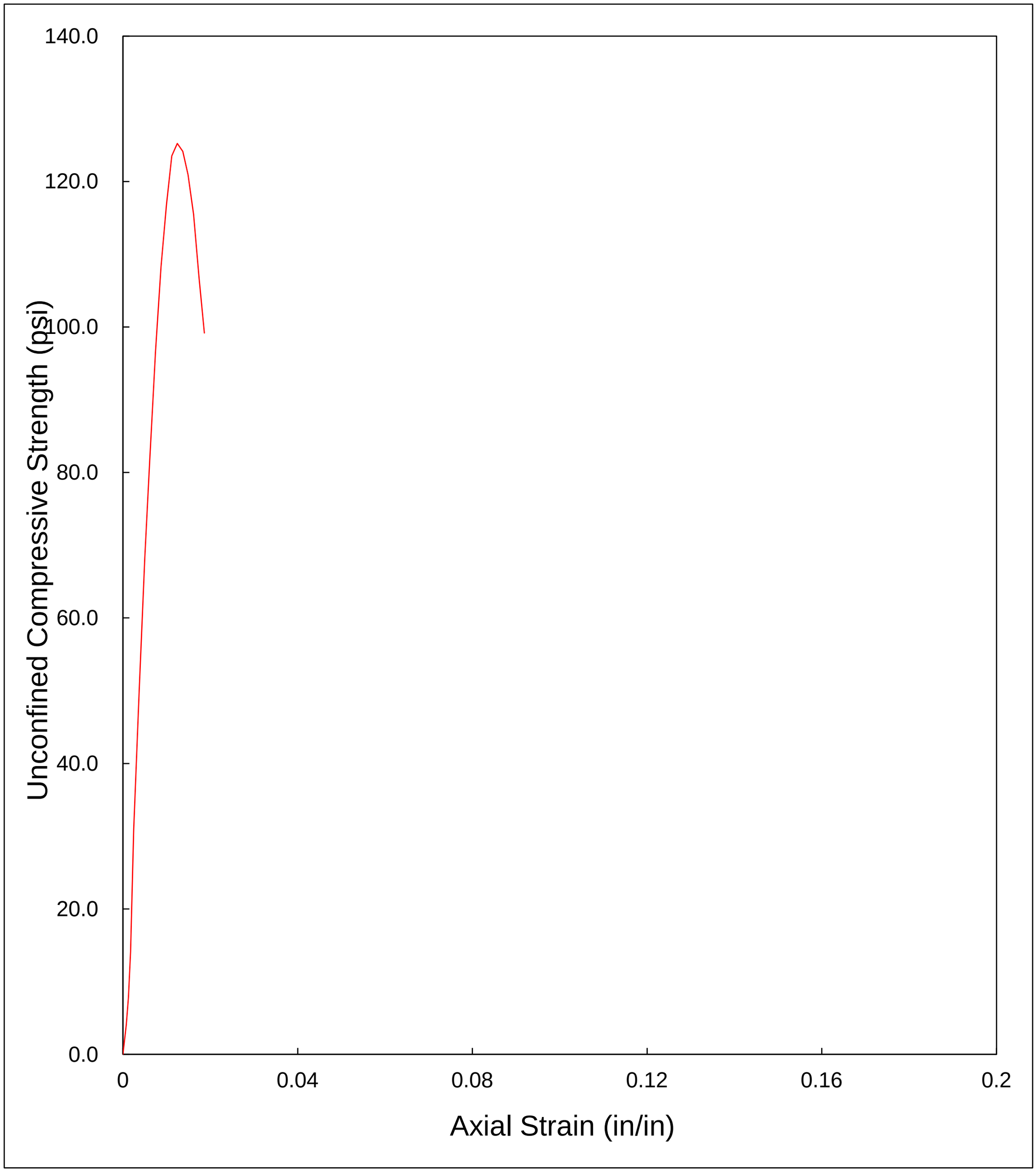
SOIL SPECIMEN DIMENSIONS				
	DIAMETER		*LENGTH*	
No. 1	2.03	in.	4.02	in.
No. 2	2.02	in.	4.02	in.
No. 3	1.99	in.	4.01	in.
Average	**2.01**	**in.**	**4.02**	**in.**

SPECIMEN CONDITIONS		
Initial Specimen WT, Wo	*290.80*	*g*
Initial Area, Ao	3.19	in²
Initial Volume, Vo	12.80	in³
Initial Bulk Unit Weight,	86.6	lb/ft³
Initial Dry Unit Weight	57.4	lb/ft³
15 % Strain (0.15 Lo)	0.60	in.
UCS	125.2	lb/in²

COMPRESSIVE LOAD (lbs.)	DIAL GAGE READING (in.)	SPECIMEN DEFORMATION (in.)	CORRECTED AREA (in²)	AXIAL STRAIN (in/in)	UNCONFINED COMPRESSIVE STRENGTH (lb/in²)
0	0.000	0.000	3.186	0.0000	0.0
13	0.003	0.003	3.188	0.0007	4.1
25	0.005	0.005	3.190	0.0012	7.8
45	0.007	0.007	3.191	0.0017	14.1
99	0.010	0.010	3.194	0.0025	31.0
160	0.015	0.015	3.198	0.0037	50.0
218	0.020	0.020	3.202	0.0050	68.1
264	0.025	0.025	3.206	0.0062	82.4
310	0.030	0.030	3.210	0.0075	96.6
348	0.035	0.035	3.214	0.0087	108.3
376	0.040	0.040	3.218	0.0100	116.9
398	0.045	0.045	3.222	0.0112	123.5
404	0.050	0.050	3.226	0.0124	125.2
401	0.055	0.055	3.230	0.0137	124.2
391	0.060	0.060	3.234	0.0149	120.9
374	0.065	0.065	3.238	0.0162	115.5
346	0.070	0.070	3.242	0.0174	106.7
322	0.075	0.075	3.246	0.0187	99.2

UNCONFINED COMPRESSION TESTING

Sample No. 460-007



UNCONFINED COMPRESSION TEST

ASTM D 2166
SUMMARY OF RESULTS

PROJECT:	Quanta		
PROJECT No.:	SH0460		
SAMPLE No.:	460-007		
TESTING DATE:	1/16/2013	LOADING RATE:	0.04 in./min.
TESTED BY:	TNR	TRACKING CODE:	8690

TESTING PARAMETER AND RESULTS		
MOISTURE CONTENT	50.7	%
BULK UNIT WEIGHT	86.6	lb/ft^3
DRY UNIT WEIGHT	57.4	lb/ft^3
UCS *	125.2	lb/in^2

* UCS - UNCONFINED COMPRESSIVE STRENGTH

ANS 16.1 LEACHABILITY

SAMPLE PREPARATION

PROJECT:	Quanta	TESTED BY:	TNR
PROJECT No.:	SH0460	TRACKING CODE:	8690
SAMPLE No.:	460-007		
TEST DATE:	2/21/2013		

MOISTURE CONTENT (Dry Basis)	*RESULTS*	
1. MOISTURE TIN NO.		
2. WT MOISTURE TIN (tare weight)	162.54	*g*
3. WT WET SOIL + TARE	261.16	*g*
4. WT DRY SOIL + TARE	227.99	*g*
5. WT WATER, Ww	33.17	g
6. WT DRY SOIL, Ws	65.45	g
7. MOISTURE CONTENT, W	50.68	%

SOIL SPECIMEN DIMENSIONS				
TRIPLICATE ANALYSES	*DIAMETER RESULTS*		*LENGTH RESULTS*	
No. 1	*3.01*	*in.*	*2.17*	*in.*
No. 2	*3.00*	*in.*	*2.17*	*in.*
No. 3	*2.99*	*in.*	*2.17*	*in.*
Average	3.00	in.	2.17	in.

SPECIMEN CONDITIONS	*INITIAL*	
Specimen WT, Wo	*344.93*	*g*
Area, Ao	7.06	in^2
Volume, Vo	15.31	in^3
Bulk Unit Weight	85.8	pcf
Dry Unit Weight	57.0	pcf

ANS 16.1 LEACHABILITY

TESTING DATA

PROJECT:	Quanta
PROJECT NO.:	SH0460
SAMPLE NO:	460-006
START DATE:	2/21/2013
TRACKING CODE:	8690

LEACH INTERVAL	TESTED BY	DATE		TIME		VOLUME LEACHATE (ml)	TEMP (°C)	PID (ppm)	Conduct. (mS/cm³)	pH (s.u.)	OBSERVATIONS
		IN	OUT	IN	OUT						
Initial	TNR					2230	16.60		0.058	7.17	
1	TNR	02/21/13	02/21/13	0848	1048	2230	23.52		0.053	8.77	2 hour
2	TNR	02/21/13	02/21/13	1048	1548	2230	23.18		0.038	8.86	7 hour
3	TNR	02/21/13	02/22/13	1548	0848	2230	22.82		0.060	8.90	24 hour; particles at bottom
4	TNR	02/22/13	02/23/13	0848	0848	2230	22.12		0.060	9.20	48 hour
5	TNR	02/23/13	02/24/13	0848	0848	2230	22.56		0.047	8.99	3 day
6	TNR	02/24/13	02/25/13	0848	0848	2230	23.29		0.045	7.41	4 day
7	TNR	02/25/13	02/26/13	0848	0848	2230	22.77		0.044	8.95	5 day
8											
9											
10											

NELAP CERTIFICATE NUMBER 01955
DOD ELAP CERTIFICATE NUMBER ADE - 1482

ANALYTICAL RESULTS

PERFORMED BY

GULF COAST ANALYTICAL LABORATORIES, INC.

7979 GSRI Avenue

Baton Rouge, LA 70820

Report Date 02/07/2013

GCAL Report 213013142

Deliver To	KEMRON 1359A Ellsworth Industrial Blv Atlanta, GA 30318 404-601-6927
Attn	Tommy Jordan

Project Quanta

CASE NARRATIVE

Client: KEMRON **Report:** 213013142

Gulf Coast Analytical Laboratories received and analyzed the sample(s) listed on the sample cross-reference page of this report. Receipt of the sample(s) is documented by the attached chain of custody. This applies only to the sample(s) listed in this report. No sample integrity or quality control exceptions were identified unless noted below.

VOLATILES GAS CHROMATOGRAPHY

In the SW-846 1312/8015C analysis, samples 21301314206 (460-006), 21301314207 (460-007), 21301314201 (460-001), 21301314202 (460-002), 21301314203 (460-003), 21301314204 (460-004), 21301314205 (460-005) and 21301314210 (460-010) had to be diluted to bracket the concentrations within the calibration range of the instrument.

In the SW-846 1312/8015C analysis, the recovery for the surrogate was outside control limits for samples 21301314206 (460-006), 21301314207 (460-007) and 21301314210 (460-010). The samples were re-analyzed yielding a similar recovery. This is attributed to matrix interference.

SEMI-VOLATILES GAS CHROMATOGRAPHY

In the SW-846 1312/8015C analysis, samples 21301314201 (460-001), 21301314202 (460-002), 21301314203 (460-003), 21301314205 (460-005), 21301314204 460-004), 21301314206 (460-006), 21301314207 (460-007), 21301314209 (460-009) and 21301314210 (460-010) had to be diluted to bracket target compounds within the calibration range of the instrument. This is reflected in elevated detection limits.

In the SW-846 1312/8015C analysis, the recovery for the surrogate(s) is reported as diluted out for those analyses performed at a 10 or higher dilution.

METALS

In the SW-846 1312/6020A analysis, samples 21301314208 (460-008) and 21301314209 (460-009) had to be diluted in order to bracket the concentration of a target analyte within the linear dynamic range of the instrument.

In the SW-846 1312/6020A analysis, sample 21301314210 (460-010) had to be diluted in order to bracket the concentration within the calibration range of the instrument.

Laboratory Endorsement

Sample analysis was performed in accordance with approved methodologies provided by the Environmental Protection Agency or other recognized agencies. The samples and their corresponding extracts will be maintained for a period of 30 days unless otherwise arranged. Following this retention period the samples will be disposed in accordance with GCAL's Standard Operating Procedures.

Common Abbreviations Utilized in this Report

ND	Indicates the result was Not Detected at the specified RDL
DO	Indicates the result was Diluted Out
MI	Indicates the result was subject to Matrix Interference
TNTC	Indicates the result was Too Numerous To Count
SUBC	Indicates the analysis was Sub-Contracted
FLD	Indicates the analysis was performed in the Field
PQL	Practical Quantitation Limit
MDL	Method Detection Limit
RDL	Reporting Detection Limit
00:00	Reported as a time equivalent to 12:00 AM

Reporting Flags Utilized in this Report

J	Indicates the result is between the MDL and RDL
U	Indicates the compound was analyzed for but not detected
B	Indicates the analyte was detected in the associated Method Blank

Sample receipt at GCAL is documented through the attached chain of custody. In accordance with NELAC, this report shall be reproduced only in full and with the written permission of GCAL. The results contained within this report relate only to the samples reported. The documented results are presented within this report.

This report pertains only to the samples listed in the Report Sample Summary and should be retained as a permanent record thereof. The results contained within this report are intended for the use of the client. Any unauthorized use of the information contained in this report is prohibited.

I certify that this data package is in compliance with the NELAC standard and terms and conditions of the contract and Statement of Work both technically and for completeness, for other than the conditions in the case narrative. Release of the data contained in this hardcopy data package and in the computer-readable data submitted has been authorized by the Quality Assurance Manager or his/her designee, as verified by the following signature.

Estimated uncertainty of measurement is available upon request. This report is in compliance with the DOD QSM as specified in the contract if applicable.

_____

Robyn Migues
Technical Director
GCAL REPORT 213013142

THIS REPORT CONTAINS _____ PAGES.

Report Sample Summary

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21301314201	460-001	Solid	01/30/2013 10:30	01/31/2013 10:15
21301314202	460-002	Solid	01/30/2013 10:40	01/31/2013 10:15
21301314203	460-003	Solid	01/30/2013 11:00	01/31/2013 10:15
21301314204	460-004	Solid	01/30/2013 11:05	01/31/2013 10:15
21301314205	460-005	Solid	01/30/2013 11:14	01/31/2013 10:15
21301314206	460-006	Solid	01/30/2013 11:20	01/31/2013 10:15
21301314207	460-007	Solid	01/30/2013 11:25	01/31/2013 10:15
21301314208	460-008	Solid	01/30/2013 11:30	01/31/2013 10:15
21301314209	460-009	Solid	01/30/2013 11:33	01/31/2013 10:15
21301314210	460-010	Solid	01/30/2013 11:35	01/31/2013 10:15

Summary of Compounds Detected

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21301314201	**460-001**	Solid	01/30/2013 10:30	01/31/2013 10:15

SW-846 1312/8015C DRO

CAS#	Parameter	Result	RDL	MDL	Units
GCSV-00-4	**Diesel Range Organics**	**15.3**	**1.50**	**0.442**	**mg/L**

SW-846 1312/6020A

CAS#	Parameter	Result	RDL	MDL	Units
7440-38-2	**Arsenic**	**4.65**	**1.00**	**0.094**	**ug/L**

SW-846 1312/8015C GRO

CAS#	Parameter	Result	RDL	MDL	Units
8006-61-9	**Gasoline Range Organics**	**4.15**	**1.00**	**0.130**	**mg/L**

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21301314202	**460-002**	Solid	01/30/2013 10:40	01/31/2013 10:15

SW-846 1312/8015C GRO

CAS#	Parameter	Result	RDL	MDL	Units
8006-61-9	**Gasoline Range Organics**	**2.99**	**1.00**	**0.130**	**mg/L**

SW-846 1312/8015C DRO

CAS#	Parameter	Result	RDL	MDL	Units
GCSV-00-4	**Diesel Range Organics**	**12.9**	**1.50**	**0.442**	**mg/L**

SW-846 1312/6020A

CAS#	Parameter	Result	RDL	MDL	Units
7440-38-2	**Arsenic**	**2.15**	**1.00**	**0.094**	**ug/L**

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21301314203	**460-003**	Solid	01/30/2013 11:00	01/31/2013 10:15

SW-846 1312/8015C DRO

CAS#	Parameter	Result	RDL	MDL	Units
GCSV-00-4	**Diesel Range Organics**	**13.0**	**1.50**	**0.442**	**mg/L**

Summary of Compounds Detected (con't)

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21301314203	**460-003**	Solid	01/30/2013 11:00	01/31/2013 10:15

SW-846 1312/6020A

CAS#	Parameter	Result	RDL	MDL	Units
7440-38-2	**Arsenic**	**3.31**	**1.00**	**0.094**	**ug/L**

SW-846 1312/8015C GRO

CAS#	Parameter	Result	RDL	MDL	Units
8006-61-9	**Gasoline Range Organics**	**2.18**	**1.00**	**0.130**	**mg/L**

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21301314204	**460-004**	Solid	01/30/2013 11:05	01/31/2013 10:15

SW-846 1312/8015C DRO

CAS#	Parameter	Result	RDL	MDL	Units
GCSV-00-4	**Diesel Range Organics**	**21.5**	**3.00**	**0.884**	**mg/L**

SW-846 1312/6020A

CAS#	Parameter	Result	RDL	MDL	Units
7440-38-2	**Arsenic**	**4.96**	**1.00**	**0.094**	**ug/L**

SW-846 1312/8015C GRO

CAS#	Parameter	Result	RDL	MDL	Units
8006-61-9	**Gasoline Range Organics**	**2.40**	**1.00**	**0.130**	**mg/L**

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21301314205	**460-005**	Solid	01/30/2013 11:14	01/31/2013 10:15

SW-846 1312/8015C GRO

CAS#	Parameter	Result	RDL	MDL	Units
8006-61-9	**Gasoline Range Organics**	**2.38**	**1.00**	**0.130**	**mg/L**

SW-846 1312/8015C DRO

CAS#	Parameter	Result	RDL	MDL	Units
GCSV-00-4	**Diesel Range Organics**	**19.6**	**1.50**	**0.442**	**mg/L**

SW-846 1312/6020A

CAS#	Parameter	Result	RDL	MDL	Units
7440-38-2	**Arsenic**	**3.02**	**1.00**	**0.094**	**ug/L**

Summary of Compounds Detected (con't)

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21301314206	**460-006**	Solid	01/30/2013 11:20	01/31/2013 10:15

SW-846 1312/8015C DRO

CAS#	Parameter	Result	RDL	MDL	Units
GCSV-00-4	**Diesel Range Organics**	**38.5**	**3.00**	**0.884**	**mg/L**

SW-846 1312/6020A

CAS#	Parameter	Result	RDL	MDL	Units
7440-38-2	**Arsenic**	**1.08**	**1.00**	**0.094**	**ug/L**

SW-846 1312/8015C GRO

CAS#	Parameter	Result	RDL	MDL	Units
8006-61-9	**Gasoline Range Organics**	**16.0**	**5.00**	**0.650**	**mg/L**

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21301314207	**460-007**	Solid	01/30/2013 11:25	01/31/2013 10:15

SW-846 1312/8015C DRO

CAS#	Parameter	Result	RDL	MDL	Units
GCSV-00-4	**Diesel Range Organics**	**32.5**	**3.00**	**0.884**	**mg/L**

SW-846 1312/6020A

CAS#	Parameter	Result	RDL	MDL	Units
7440-38-2	**Arsenic**	**1.00**	**1.00**	**0.094**	**ug/L**

SW-846 1312/8015C GRO

CAS#	Parameter	Result	RDL	MDL	Units
8006-61-9	**Gasoline Range Organics**	**14.6**	**5.00**	**0.650**	**mg/L**

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21301314208	**460-008**	Solid	01/30/2013 11:30	01/31/2013 10:15

SW-846 1312/8015C GRO

CAS#	Parameter	Result	RDL	MDL	Units
8006-61-9	**Gasoline Range Organics**	**0.207**	**0.100**	**0.013**	**mg/L**

Summary of Compounds Detected (con't)

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21301314208	**460-008**	Solid	01/30/2013 11:30	01/31/2013 10:15

SW-846 1312/8015C DRO

CAS#	Parameter	Result	RDL	MDL	Units
GCSV-00-4	Diesel Range Organics	1.24	0.150	0.044	mg/L

SW-846 1312/6020A

CAS#	Parameter	Result	RDL	MDL	Units
7440-38-2	Arsenic	285	5.00	0.47	ug/L

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21301314209	**460-009**	Solid	01/30/2013 11:33	01/31/2013 10:15

SW-846 1312/8015C GRO

CAS#	Parameter	Result	RDL	MDL	Units
8006-61-9	Gasoline Range Organics	0.249	0.100	0.013	mg/L

SW-846 1312/8015C DRO

CAS#	Parameter	Result	RDL	MDL	Units
GCSV-00-4	Diesel Range Organics	2.84	0.300	0.088	mg/L

SW-846 1312/6020A

CAS#	Parameter	Result	RDL	MDL	Units
7440-38-2	Arsenic	669	10.0	0.94	ug/L

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21301314210	**460-010**	Solid	01/30/2013 11:35	01/31/2013 10:15

SW-846 1312/8015C DRO

CAS#	Parameter	Result	RDL	MDL	Units
GCSV-00-4	Diesel Range Organics	2.89	0.300	0.088	mg/L

SW-846 1312/6020A

CAS#	Parameter	Result	RDL	MDL	Units
7440-38-2	Arsenic	559	10.0	0.94	ug/L

SW-846 1312/8015C GRO

CAS#	Parameter	Result	RDL	MDL	Units
8006-61-9	Gasoline Range Organics	0.633	0.500	0.065	mg/L

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21301314201	**460-001**	Solid	01/30/2013 10:30	01/31/2013 10:15

SW-846 1312/8015C GRO

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
			10	02/04/2013 19:50	BMR	500256

CAS#	Parameter	Result	RDL	MDL	Units
8006-61-9	**Gasoline Range Organics**	**4.15**	**1.00**	**0.130**	**mg/L**

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
106-39-8	Bromochlorobenzene	300	403	ug/L	134	49 - 136

SW-846 1312/8015C DRO

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
02/04/2013 11:00	500170	SW-846 3510C	10	02/04/2013 21:46	SMH	500266

CAS#	Parameter	Result	RDL	MDL	Units
GCSV-00-4	**Diesel Range Organics**	**15.3**	**1.50**	**0.442**	**mg/L**

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
84-15-1	o-Terphenyl	50	Diluted Out	ug/L	**0***	60 - 140

SW-846 1312/6020A

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
02/03/2013 08:10	500192	SW-846 3010A	1	02/04/2013 18:07	AWG	500268

CAS#	Parameter	Result	RDL	MDL	Units
7440-38-2	**Arsenic**	**4.65**	**1.00**	**0.094**	**ug/L**

RESULTS REPORTED ON A WET WEIGHT BASIS

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21301314202	**460-002**	Solid	01/30/2013 10:40	01/31/2013 10:15

SW-846 1312/8015C GRO

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
			10	02/04/2013 20:04	BMR	500256

CAS#	Parameter	Result	RDL	MDL	Units
8006-61-9	**Gasoline Range Organics**	**2.99**	**1.00**	**0.130**	**mg/L**

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
106-39-8	Bromochlorobenzene	300	405	ug/L	135	49 - 136

SW-846 1312/8015C DRO

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
02/04/2013 11:00	500170	SW-846 3510C	10	02/04/2013 22:06	SMH	500266

CAS#	Parameter	Result	RDL	MDL	Units
GCSV-00-4	**Diesel Range Organics**	**12.9**	**1.50**	**0.442**	**mg/L**

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
84-15-1	o-Terphenyl	50	Diluted Out	ug/L	**0***	60 - 140

SW-846 1312/6020A

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
02/03/2013 08:10	500192	SW-846 3010A	1	02/04/2013 18:30	AWG	500268

CAS#	Parameter	Result	RDL	MDL	Units
7440-38-2	**Arsenic**	**2.15**	**1.00**	**0.094**	**ug/L**

RESULTS REPORTED ON A WET WEIGHT BASIS

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21301314203	**460-003**	Solid	01/30/2013 11:00	01/31/2013 10:15

SW-846 1312/8015C GRO

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
			10	02/04/2013 20:18	BMR	500256

CAS#	Parameter	Result	RDL	MDL	Units
8006-61-9	**Gasoline Range Organics**	**2.18**	**1.00**	**0.130**	**mg/L**

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
106-39-8	Bromochlorobenzene	300	330	ug/L	110	49 - 136

SW-846 1312/8015C DRO

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
02/04/2013 11:00	500170	SW-846 3510C	10	02/04/2013 23:04	SMH	500266

CAS#	Parameter	Result	RDL	MDL	Units
GCSV-00-4	**Diesel Range Organics**	**13.0**	**1.50**	**0.442**	**mg/L**

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
84-15-1	o-Terphenyl	50	Diluted Out	ug/L	**0***	60 - 140

SW-846 1312/6020A

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
02/03/2013 08:10	500192	SW-846 3010A	1	02/04/2013 18:35	AWG	500268

CAS#	Parameter	Result	RDL	MDL	Units
7440-38-2	**Arsenic**	**3.31**	**1.00**	**0.094**	**ug/L**

RESULTS REPORTED ON A WET WEIGHT BASIS

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21301314204	**460-004**	Solid	01/30/2013 11:05	01/31/2013 10:15

SW-846 1312/8015C GRO

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
			10	02/04/2013 20:32	BMR	500256

CAS#	Parameter	Result	RDL	MDL	Units
8006-61-9	**Gasoline Range Organics**	**2.40**	**1.00**	**0.130**	**mg/L**

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
106-39-8	Bromochlorobenzene	300	276	ug/L	92	49 - 136

SW-846 1312/8015C DRO

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
02/04/2013 11:00	500170	SW-846 3510C	20	02/05/2013 16:02	SMH	500348

CAS#	Parameter	Result	RDL	MDL	Units
GCSV-00-4	**Diesel Range Organics**	**21.5**	**3.00**	**0.884**	**mg/L**

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
84-15-1	o-Terphenyl	50	Diluted Out	ug/L	**0***	60 - 140

SW-846 1312/6020A

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
02/03/2013 08:10	500192	SW-846 3010A	1	02/04/2013 18:41	AWG	500268

CAS#	Parameter	Result	RDL	MDL	Units
7440-38-2	**Arsenic**	**4.96**	**1.00**	**0.094**	**ug/L**

RESULTS REPORTED ON A WET WEIGHT BASIS

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21301314205	**460-005**	Solid	01/30/2013 11:14	01/31/2013 10:15

SW-846 1312/8015C GRO

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
			10	02/04/2013 20:46	BMR	500256

CAS#	Parameter	Result	RDL	MDL	Units
8006-61-9	**Gasoline Range Organics**	**2.38**	**1.00**	**0.130**	**mg/L**

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
106-39-8	Bromochlorobenzene	300	302	ug/L	101	49 - 136

SW-846 1312/8015C DRO

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
02/04/2013 11:00	500170	SW-846 3510C	10	02/04/2013 23:43	SMH	500266

CAS#	Parameter	Result	RDL	MDL	Units
GCSV-00-4	**Diesel Range Organics**	**19.6**	**1.50**	**0.442**	**mg/L**

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
84-15-1	o-Terphenyl	50	Diluted Out	ug/L	**0***	60 - 140

SW-846 1312/6020A

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
02/03/2013 08:10	500192	SW-846 3010A	1	02/04/2013 18:47	AWG	500268

CAS#	Parameter	Result	RDL	MDL	Units
7440-38-2	**Arsenic**	**3.02**	**1.00**	**0.094**	**ug/L**

RESULTS REPORTED ON A WET WEIGHT BASIS

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21301314206	**460-006**	Solid	01/30/2013 11:20	01/31/2013 10:15

SW-846 1312/8015C GRO

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
			50	02/04/2013 18:10	BMR	500256

CAS#	Parameter	Result	RDL	MDL	Units
8006-61-9	**Gasoline Range Organics**	**16.0**	**5.00**	**0.650**	**mg/L**

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
106-39-8	Bromochlorobenzene	1500	2280	ug/L	**152***	49 - 136

SW-846 1312/8015C DRO

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
02/04/2013 11:00	500170	SW-846 3510C	20	02/05/2013 16:21	SMH	500348

CAS#	Parameter	Result	RDL	MDL	Units
GCSV-00-4	**Diesel Range Organics**	**38.5**	**3.00**	**0.884**	**mg/L**

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
84-15-1	o-Terphenyl	50	Diluted Out	ug/L	**0***	60 - 140

SW-846 1312/6020A

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
02/03/2013 08:10	500192	SW-846 3010A	1	02/04/2013 18:52	AWG	500268

CAS#	Parameter	Result	RDL	MDL	Units
7440-38-2	**Arsenic**	**1.08**	**1.00**	**0.094**	**ug/L**

RESULTS REPORTED ON A WET WEIGHT BASIS

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21301314207	**460-007**	Solid	01/30/2013 11:25	01/31/2013 10:15

SW-846 1312/8015C GRO

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
			50	02/04/2013 18:24	BMR	500256

CAS#	Parameter	Result	RDL	MDL	Units
8006-61-9	**Gasoline Range Organics**	**14.6**	**5.00**	**0.650**	**mg/L**

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
106-39-8	Bromochlorobenzene	1500	2210	ug/L	**147***	49 - 136

SW-846 1312/8015C DRO

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
02/04/2013 11:00	500170	SW-846 3510C	20	02/05/2013 16:40	SMH	500348

CAS#	Parameter	Result	RDL	MDL	Units
GCSV-00-4	**Diesel Range Organics**	**32.5**	**3.00**	**0.884**	**mg/L**

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
84-15-1	o-Terphenyl	50	Diluted Out	ug/L	**0***	60 - 140

SW-846 1312/6020A

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
02/03/2013 08:10	500192	SW-846 3010A	1	02/04/2013 18:58	AWG	500268

CAS#	Parameter	Result	RDL	MDL	Units
7440-38-2	**Arsenic**	**1.00**	**1.00**	**0.094**	**ug/L**

RESULTS REPORTED ON A WET WEIGHT BASIS

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21301314208	**460-008**	Solid	01/30/2013 11:30	01/31/2013 10:15

SW-846 1312/8015C GRO

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
			1	02/04/2013 21:00	BMR	500256

CAS#	Parameter	Result	RDL	MDL	Units
8006-61-9	**Gasoline Range Organics**	**0.207**	**0.100**	**0.013**	**mg/L**

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
106-39-8	Bromochlorobenzene	30	39.7	ug/L	132	49 - 136

SW-846 1312/8015C DRO

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
02/04/2013 11:00	500170	SW-846 3510C	1	02/05/2013 17:00	SMH	500348

CAS#	Parameter	Result	RDL	MDL	Units
GCSV-00-4	**Diesel Range Organics**	**1.24**	**0.150**	**0.044**	**mg/L**

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
84-15-1	o-Terphenyl	50	41	ug/L	82	60 - 140

SW-846 1312/6020A

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
02/03/2013 08:10	500192	SW-846 3010A	5	02/06/2013 14:59	AWG	500471

CAS#	Parameter	Result	RDL	MDL	Units
7440-38-2	**Arsenic**	**285**	**5.00**	**0.47**	**ug/L**

RESULTS REPORTED ON A WET WEIGHT BASIS

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21301314209	**460-009**	Solid	01/30/2013 11:33	01/31/2013 10:15

SW-846 1312/8015C GRO

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
			1	02/04/2013 21:14	BMR	500256

CAS#	Parameter	Result	RDL	MDL	Units
8006-61-9	**Gasoline Range Organics**	**0.249**	**0.100**	**0.013**	**mg/L**

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
106-39-8	Bromochlorobenzene	30	33.7	ug/L	112	49 - 136

SW-846 1312/8015C DRO

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
02/04/2013 11:00	500170	SW-846 3510C	2	02/05/2013 17:19	SMH	500348

CAS#	Parameter	Result	RDL	MDL	Units
GCSV-00-4	**Diesel Range Organics**	**2.84**	**0.300**	**0.088**	**mg/L**

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
84-15-1	o-Terphenyl	50	49.6	ug/L	99	60 - 140

SW-846 1312/6020A

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
02/03/2013 08:10	500192	SW-846 3010A	10	02/06/2013 15:04	AWG	500471

CAS#	Parameter	Result	RDL	MDL	Units
7440-38-2	**Arsenic**	**669**	**10.0**	**0.94**	**ug/L**

RESULTS REPORTED ON A WET WEIGHT BASIS

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21301314210	**460-010**	Solid	01/30/2013 11:35	01/31/2013 10:15

SW-846 1312/8015C GRO

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
			5	02/04/2013 21:28	BMR	500256

CAS#	Parameter	Result	RDL	MDL	Units
8006-61-9	**Gasoline Range Organics**	**0.633**	**0.500**	**0.065**	**mg/L**

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
106-39-8	Bromochlorobenzene	150	206	ug/L	**137***	49 - 136

SW-846 1312/8015C DRO

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
02/04/2013 11:00	500170	SW-846 3510C	2	02/05/2013 17:39	SMH	500348

CAS#	Parameter	Result	RDL	MDL	Units
GCSV-00-4	**Diesel Range Organics**	**2.89**	**0.300**	**0.088**	**mg/L**

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
84-15-1	o-Terphenyl	50	46.2	ug/L	92	60 - 140

SW-846 1312/6020A

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
02/03/2013 08:10	500192	SW-846 3010A	10	02/04/2013 19:15	AWG	500268

CAS#	Parameter	Result	RDL	MDL	Units
7440-38-2	**Arsenic**	**559**	**10.0**	**0.94**	**ug/L**

RESULTS REPORTED ON A WET WEIGHT BASIS

General Chromatography Quality Control Summary

Analytical Batch	500256	**Client ID**	MB500256			LCS500256			LCSD500256		
Prep Batch	N/A	**GCAL ID**	1156658			1156659			1156660		
		Sample Type	Method Blank			LCS			LCSD		
		Analytical Date	02/04/2013 16:18			02/04/2013 16:32			02/04/2013 16:46		
		Matrix	Water			Water			Water		
SW-846 1312/8015C GRO		**Units**	mg/L	**Spike**	**Result**		**Control**	**Result**			**RPD**
		Result	**RDL**	**Added**		**% R**	**Limits % R**		**% R**	**RPD**	**Limit**
8006-61-9	Gasoline Range Organics	0.013U	0.013	0.500	0.516	103	50 - 162	0.536	107	4	25
Surrogate											
106-39-8	Bromochlorobenzene	38.4	128	30	37	123	49 - 136	38.7	129		

Analytical Batch	500266	**Client ID**	MB500170			LCS500170			LCSD500170		
Prep Batch	500170	**GCAL ID**	1156285			1156286			1156287		
Prep Method	SW-846	**Sample Type**	Method Blank			LCS			LCSD		
	3510C	**Prep Date**	02/04/2013 11:00			02/04/2013 11:00			02/04/2013 11:00		
		Analytical Date	02/04/2013 19:31			02/04/2013 19:50			02/04/2013 20:48		
		Matrix	Water			Water			Water		
SW-846 1312/8015C DRO		**Units**	mg/L	**Spike**	**Result**		**Control**	**Result**			**RPD**
		Result	**RDL**	**Added**		**% R**	**Limits % R**		**% R**	**RPD**	**Limit**
GCSV-00-4	Diesel Range Organics	0.044U	0.044	1.00	0.619	62	50 - 150	0.733	73	17	40
Surrogate											
84-15-1	o-Terphenyl	37.6	75	50	39.5	79	60 - 140	43.8	88		

Inorganics Quality Control Summary

Analytical Batch	500268	**Client ID**	MB500192		LCS500192		
Prep Batch	500192	**GCAL ID**	1156392		1156393		
Prep Method	SW-846	**Sample Type**	Method Blank		LCS		
	3010A	**Prep Date**	02/03/2013 08:10		02/03/2013 08:10		
		Analytical Date	02/04/2013 17:56		02/04/2013 18:02		
		Matrix	Water		Water		
SW-846 1312/6020A		**Units**	ug/L	**Spike**	**Result**		**Control**
		Result	**RDL**	**Added**		**% R**	**Limits % R**
7440-38-2	Arsenic	0.16J	0.094	50.0	44.7	89	80 - 120

Analytical Batch	500268	**Client ID**	460-010		1155340MS			1155340MSD			
Prep Batch	500192	**GCAL ID**	21301314210		1156394			1156395			
Prep Method	SW-846	**Sample Type**	SAMPLE		MS			MSD			
	3010A	**Prep Date**	02/03/2013 08:10		02/03/2013 08:10			02/03/2013 08:10			
		Analytical Date	02/04/2013 19:15		02/04/2013 19:20			02/04/2013 19:43			
		Matrix	Solid		Solid			Solid			
SW-846 1312/6020A		**Units**	ug/L	**Spike**	**Result**		**Control**	**Result**			**RPD**
		Result	**RDL**	**Added**		**% R**	**Limits % R**		**% R**	**RPD**	**Limit**
7440-38-2	Arsenic	559	0.94	50.0	616	113	80 - 120	619	119	0.5	20

GCAL

7979 GSRI Avenue, Baton Rouge, Louisiana 70820-7402
Phone 225.769.4900 • Fax 225.767.5717

Chain of Custody Record

Client Name	Client #	Workorder #	Due Date
Kemron	4794	2130314 2	2/5/13

Report to:
Client: Kemron
Address: 1359-A Ellsworth Ind. Blvd
Atlanta, Ga. 30318
Contact: Tommy Jordan
Phone: 404-516-3172
Fax:

Bill to:
Client: Kemron
Address: 1359-A Ellsworth Ind. Blvd
Atlanta, Ga. 30318
Contact: Tommy Jordan
Phone: 404-516-3172
Fax:

P.O. Number: SH0460
Project Name/Number: Quanta
Sampled By: Tomecia Riley

Lab use only:
Custody Seal used ☐ yes ☐ no
intact ☐ yes ☐ no
Temperature °C 2.8

Matrix[1]	Date	Time (2400)	Comp	Grab	Sample Description	Preservatives	No Containers	SPLP Arsenic 1312/6010	SPLP TPH GRO 1312/8015	SPLP TPH DRO 1312/8015	Remarks:	Lab ID 1/31
S	1-30-13	1030		X	460-001	None	2	X	X	X		1
S	1-30-13	1040		X	460-002			X	X	X		2
S		1100		X	460-003			X	X	X		3
S		1105		X	460-004			X	X	X		4
S		1114		X	460-005			X	X	X		5
S		1120		X	460-006			X	X	X		6
S		1125		X	460-007			X	X	X		7
S		1130		X	460-008			X	X	X		8
S		1133		X	460-009			X	X	X		9
S		1135		X	460-010			X	X	X		10

Turn Around Time: ☐ 24-48 hrs. ☐ 3 Days ☐ 1 week ☐ Standard ☒ Other 3 Day 7946 3969 0344

Relinquished by: (Signature)	Received by: (Signature)	Date:	Time:
Tomecia Riley	Fedex	1-30-12	1251
Relinquished by: (Signature)	Received by: (Signature)	Date:	Time:
FEDEX	[illegible]	1.31.13	10:15
Relinquished by: (Signature)	Received by: (Signature)	Date:	Time:

Note: Due ~~[illegible]~~ Feb 5 Tue

By submitting these samples, you agree to the terms and conditions contained in our most recent schedule of services.

WHITE: CLIENT FINAL REPORT — CANARY: LABORATORY — PINK: CLIENT

GCAL-06 11/98

GCAL ANALYTICAL LABORATORIES, LLC

SAMPLE RECEIVING CHECKLIST

213013142

SAMPLE DELIVERY GROUP	213013142
Client 4794 - KEMRON	**Transport Method** FEDEX
Profile 238840 - SPLP	**Received By** Pfeifer, Ben J.
Line Item(s) 1 - Soil	**Receive Date(s)** 01/31/13

CHECKLIST

	Yes	No	NA
Were all samples received using proper thermal preservation?	☑	☐	☐
When used, were all custody seals intact?	☑	☐	☐
Were all samples received in proper containers?	☑	☐	☐
Were all samples received using proper chemical preservation?	☑	☐	☐
Was preservative added to any container at the lab?	☐	☑	☐
Were all containers received in good condition?	☑	☐	☐
Were all VOA vials received with no head space?	☐	☐	☑
Do all sample labels match the Chain of Custody?	☐	☑	☐
Did the Chain of Custody list the sampling technician?	☑	☐	☐
Was the COC maintained i.e. all signatures, dates and time of receipt included?	☑	☐	☐

COOLERS

Airbill	Temp(oC)
7946 3969 6344	2.8

DISCREPANCIES

21301314208 - 460-008
- Sample Discrepancy

21301314209 - 460-009
- Sample Discrepancy

LABORATORY PRESERVATIONS

None

NOTES

460-008 was labeled 11:33 although the COC stated 11:30. 460-009 was labeled 11:30 although the COC stated 11:33.

NELAP CERTIFICATE NUMBER 01955
DOD ELAP CERTIFICATE NUMBER ADE - 1482

ANALYTICAL RESULTS

PERFORMED BY

GULF COAST ANALYTICAL LABORATORIES, INC.

7979 GSRI Avenue

Baton Rouge, LA 70820

Report Date 03/07/2013

GCAL Report 213022735

Deliver To	KEMRON 1359A Ellsworth Industrial Blv Atlanta, GA 30318 404-601-6927
Attn	Tommy Jordan

Project Quanta/SH0460

CASE NARRATIVE

Client: KEMRON **Report:** 213022735

Gulf Coast Analytical Laboratories received and analyzed the sample(s) listed on the sample cross-reference page of this report. Receipt of the sample(s) is documented by the attached chain of custody. This applies only to the sample(s) listed in this report. No sample integrity or quality control exceptions were identified unless noted below.

SEMI-VOLATILES MASS SPECTROMETRY

In the SW-846 1312/8270C analysis, samples 21302273501 (460-005), 21302273502 (460-006) and 21302273503 (460-007) had to be diluted to bracket the concentration of target compounds within the calibration range of the instrument. This is reflected in elevated detection limits.

In the SW-846 1312/8270C analysis, the recoveries for the surrogates are reported as diluted out for those analyses performed at a 10 or higher dilution.

Laboratory Endorsement

Sample analysis was performed in accordance with approved methodologies provided by the Environmental Protection Agency or other recognized agencies. The samples and their corresponding extracts will be maintained for a period of 30 days unless otherwise arranged. Following this retention period the samples will be disposed in accordance with GCAL's Standard Operating Procedures.

Common Abbreviations Utilized in this Report

ND	Indicates the result was Not Detected at the specified RDL
DO	Indicates the result was Diluted Out
MI	Indicates the result was subject to Matrix Interference
TNTC	Indicates the result was Too Numerous To Count
SUBC	Indicates the analysis was Sub-Contracted
FLD	Indicates the analysis was performed in the Field
PQL	Practical Quantitation Limit
MDL	Method Detection Limit
RDL	Reporting Detection Limit
00:00	Reported as a time equivalent to 12:00 AM

Reporting Flags Utilized in this Report

J	Indicates the result is between the MDL and RDL
U	Indicates the compound was analyzed for but not detected
B	Indicates the analyte was detected in the associated Method Blank

Sample receipt at GCAL is documented through the attached chain of custody. In accordance with NELAC, this report shall be reproduced only in full and with the written permission of GCAL. The results contained within this report relate only to the samples reported. The documented results are presented within this report.

This report pertains only to the samples listed in the Report Sample Summary and should be retained as a permanent record thereof. The results contained within this report are intended for the use of the client. Any unauthorized use of the information contained in this report is prohibited.

I certify that this data package is in compliance with the NELAC standard and terms and conditions of the contract and Statement of Work both technically and for completeness, for other than the conditions in the case narrative. Release of the data contained in this hardcopy data package and in the computer-readable data submitted has been authorized by the Quality Assurance Manager or his/her designee, as verified by the following signature.

Estimated uncertainty of measurement is available upon request. This report is in compliance with the DOD QSM as specified in the contract if applicable.

_____

Robyn Migues
Technical Director
GCAL REPORT 213022735

THIS REPORT CONTAINS _____ PAGES.

Report Sample Summary

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21302273501	460-005	Solid	02/26/2013 10:00	02/27/2013 09:45
21302273502	460-006	Solid	02/26/2013 10:05	02/27/2013 09:45
21302273503	460-007	Solid	02/26/2013 10:10	02/27/2013 09:45

Summary of Compounds Detected

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21302273501	**460-005**	Solid	02/26/2013 10:00	02/27/2013 09:45

SW-846 1312/8260B

CAS#	Parameter	Result	RDL	MDL	Units
71-43-2	Benzene	8.74	5	0.111	ug/L
100-41-4	Ethylbenzene	200	5	0.109	ug/L
108-88-3	Toluene	75.6	5	0.122	ug/L
1330-20-7	Xylene (total)	50.1	10	0.179	ug/L

SW-846 1312/8270C

CAS#	Parameter	Result	RDL	MDL	Units
83-32-9	Acenaphthene	146	10.0	0.268	ug/L
120-12-7	Anthracene	46.0	10.0	0.316	ug/L
206-44-0	Fluoranthene	26.3	10.0	0.267	ug/L
86-73-7	Fluorene	121	10.0	0.288	ug/L
85-01-8	Phenanthrene	173	10.0	0.304	ug/L
129-00-0	Pyrene	17.6	10.0	0.486	ug/L

SW-846 1312/8270C

CAS#	Parameter	Result	RDL	MDL	Units
91-57-6	2-Methylnaphthalene	278	100	2.55	ug/L
91-20-3	Naphthalene	1740	100	2.93	ug/L

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21302273502	**460-006**	Solid	02/26/2013 10:05	02/27/2013 09:45

SW-846 1312/8270C

CAS#	Parameter	Result	RDL	MDL	Units
83-32-9	Acenaphthene	113	10.0	0.268	ug/L
208-96-8	Acenaphthylene	60.7	10.0	0.303	ug/L
120-12-7	Anthracene	48.2	10.0	0.316	ug/L
56-55-3	Benzo(a)anthracene	1.09J	10.0	0.316	ug/L
218-01-9	Chrysene	0.607J	10.0	0.433	ug/L
206-44-0	Fluoranthene	12.2	10.0	0.267	ug/L
86-73-7	Fluorene	85.3	10.0	0.288	ug/L
85-01-8	Phenanthrene	110	10.0	0.304	ug/L
129-00-0	Pyrene	11.1	10.0	0.486	ug/L

SW-846 1312/8270C

CAS#	Parameter	Result	RDL	MDL	Units
91-57-6	2-Methylnaphthalene	630J	1000	25.5	ug/L
91-20-3	Naphthalene	7230	1000	29.3	ug/L

Summary of Compounds Detected (con't)

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21302273502	**460-006**	Solid	02/26/2013 10:05	02/27/2013 09:45

SW-846 1312/8260B

CAS#	Parameter	Result	RDL	MDL	Units
71-43-2	Benzene	43.3	5	0.111	ug/L
100-41-4	Ethylbenzene	11.0	5	0.109	ug/L
108-88-3	Toluene	62.2	5	0.122	ug/L
1330-20-7	Xylene (total)	42.2	10	0.179	ug/L

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21302273503	**460-007**	Solid	02/26/2013 10:10	02/27/2013 09:45

SW-846 1312/8260B

CAS#	Parameter	Result	RDL	MDL	Units
71-43-2	Benzene	89.0	5	0.111	ug/L
100-41-4	Ethylbenzene	106	5	0.109	ug/L
108-88-3	Toluene	139	5	0.122	ug/L
1330-20-7	Xylene (total)	77.3	10	0.179	ug/L

SW-846 1312/8270C

CAS#	Parameter	Result	RDL	MDL	Units
83-32-9	Acenaphthene	106	10.0	0.268	ug/L
208-96-8	Acenaphthylene	60.0	10.0	0.303	ug/L
120-12-7	Anthracene	46.3	10.0	0.316	ug/L
56-55-3	Benzo(a)anthracene	1.03J	10.0	0.316	ug/L
218-01-9	Chrysene	0.714J	10.0	0.433	ug/L
206-44-0	Fluoranthene	13.2	10.0	0.267	ug/L
86-73-7	Fluorene	86.1	10.0	0.288	ug/L
85-01-8	Phenanthrene	115	10.0	0.304	ug/L
129-00-0	Pyrene	13.1	10.0	0.486	ug/L

SW-846 1312/8270C

CAS#	Parameter	Result	RDL	MDL	Units
91-57-6	2-Methylnaphthalene	581	500	12.8	ug/L
91-20-3	Naphthalene	5890	500	14.7	ug/L

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21302273501	**460-005**	Solid	02/26/2013 10:00	02/27/2013 09:45

SW-846 1312/8260B

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
			1	03/06/2013 12:32	LBH	502457

CAS#	Parameter	Result	RDL	MDL	Units
71-43-2	**Benzene**	**8.74**	**5**	**0.111**	**ug/L**
100-41-4	**Ethylbenzene**	**200**	**5**	**0.109**	**ug/L**
108-88-3	**Toluene**	**75.6**	**5**	**0.122**	**ug/L**
1330-20-7	**Xylene (total)**	**50.1**	**10**	**0.179**	**ug/L**

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
460-00-4	4-Bromofluorobenzene	50	62.1	ug/L	124	78 - 130
1868-53-7	Dibromofluoromethane	50	45.6	ug/L	91	77 - 127
2037-26-5	Toluene d8	50	51.9	ug/L	104	76 - 134
17060-07-0	1,2-Dichloroethane-d4	50	48.9	ug/L	98	71 - 127

SW-846 1312/8270C

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
03/05/2013 08:00	502309	SW-846 3510C	1	03/05/2013 19:08	JWM	502364

CAS#	Parameter	Result	RDL	MDL	Units
83-32-9	**Acenaphthene**	**146**	**10.0**	**0.268**	**ug/L**
208-96-8	Acenaphthylene	0.303U	10.0	0.303	ug/L
120-12-7	**Anthracene**	**46.0**	**10.0**	**0.316**	**ug/L**
56-55-3	Benzo(a)anthracene	0.316U	10.0	0.316	ug/L
50-32-8	Benzo(a)pyrene	0.125U	10.0	0.125	ug/L
205-99-2	Benzo(b)fluoranthene	0.217U	10.0	0.217	ug/L
207-08-9	Benzo(k)fluoranthene	0.236U	10.0	0.236	ug/L
218-01-9	Chrysene	0.433U	10.0	0.433	ug/L
53-70-3	Dibenz(a,h)anthracene	0.217U	10.0	0.217	ug/L
206-44-0	**Fluoranthene**	**26.3**	**10.0**	**0.267**	**ug/L**
86-73-7	**Fluorene**	**121**	**10.0**	**0.288**	**ug/L**
193-39-5	Indeno(1,2,3-cd)pyrene	0.157U	10.0	0.157	ug/L
85-01-8	**Phenanthrene**	**173**	**10.0**	**0.304**	**ug/L**
129-00-0	**Pyrene**	**17.6**	**10.0**	**0.486**	**ug/L**

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
4165-60-0	Nitrobenzene-d5	50	45	ug/L	90	52 - 120
321-60-8	2-Fluorobiphenyl	50	38.5	ug/L	77	16 - 128
1718-51-0	Terphenyl-d14	50	40.2	ug/L	80	43 - 138

SW-846 1312/8270C

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
03/05/2013 08:00	502309	SW-846 3510C	10	03/06/2013 14:51	EDS	502459

CAS#	Parameter	Result	RDL	MDL	Units
91-57-6	**2-Methylnaphthalene**	**278**	**100**	**2.55**	**ug/L**
91-20-3	**Naphthalene**	**1740**	**100**	**2.93**	**ug/L**

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
4165-60-0	Nitrobenzene-d5	50	Diluted Out	ug/L	**0***	52 - 120

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21302273501	**460-005**	Solid	02/26/2013 10:00	02/27/2013 09:45

SW-846 1312/8270C

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
03/05/2013 08:00	502309	SW-846 3510C	10	03/06/2013 14:51	EDS	502459

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
321-60-8	2-Fluorobiphenyl	50	Diluted Out	ug/L	**0***	16 - 128
1718-51-0	Terphenyl-d14	50	Diluted Out	ug/L	**0***	43 - 138

RESULTS REPORTED ON A DRY WEIGHT BASIS

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21302273502	**460-006**	Solid	02/26/2013 10:05	02/27/2013 09:45

SW-846 1312/8260B

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
			1	03/06/2013 12:54	LBH	502457

CAS#	Parameter	Result	RDL	MDL	Units
71-43-2	**Benzene**	**43.3**	**5**	**0.111**	**ug/L**
100-41-4	**Ethylbenzene**	**11.0**	**5**	**0.109**	**ug/L**
108-88-3	**Toluene**	**62.2**	**5**	**0.122**	**ug/L**
1330-20-7	**Xylene (total)**	**42.2**	**10**	**0.179**	**ug/L**

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
460-00-4	4-Bromofluorobenzene	50	57.9	ug/L	116	78 - 130
1868-53-7	Dibromofluoromethane	50	44.4	ug/L	89	77 - 127
2037-26-5	Toluene d8	50	55.3	ug/L	111	76 - 134
17060-07-0	1,2-Dichloroethane-d4	50	49.1	ug/L	98	71 - 127

SW-846 1312/8270C

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
03/05/2013 08:00	502309	SW-846 3510C	1	03/05/2013 19:26	JWM	502364

CAS#	Parameter	Result	RDL	MDL	Units
83-32-9	**Acenaphthene**	**113**	**10.0**	**0.268**	**ug/L**
208-96-8	**Acenaphthylene**	**60.7**	**10.0**	**0.303**	**ug/L**
120-12-7	**Anthracene**	**48.2**	**10.0**	**0.316**	**ug/L**
56-55-3	**Benzo(a)anthracene**	**1.09J**	**10.0**	**0.316**	**ug/L**
50-32-8	Benzo(a)pyrene	0.125U	10.0	0.125	ug/L
205-99-2	Benzo(b)fluoranthene	0.217U	10.0	0.217	ug/L
207-08-9	Benzo(k)fluoranthene	0.236U	10.0	0.236	ug/L
218-01-9	**Chrysene**	**0.607J**	**10.0**	**0.433**	**ug/L**
53-70-3	Dibenz(a,h)anthracene	0.217U	10.0	0.217	ug/L
206-44-0	**Fluoranthene**	**12.2**	**10.0**	**0.267**	**ug/L**
86-73-7	**Fluorene**	**85.3**	**10.0**	**0.288**	**ug/L**
193-39-5	Indeno(1,2,3-cd)pyrene	0.157U	10.0	0.157	ug/L
85-01-8	**Phenanthrene**	**110**	**10.0**	**0.304**	**ug/L**
129-00-0	**Pyrene**	**11.1**	**10.0**	**0.486**	**ug/L**

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
4165-60-0	Nitrobenzene-d5	50	54.6	ug/L	109	52 - 120
321-60-8	2-Fluorobiphenyl	50	37.9	ug/L	76	16 - 128
1718-51-0	Terphenyl-d14	50	37.7	ug/L	75	43 - 138

SW-846 1312/8270C

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
03/05/2013 08:00	502309	SW-846 3510C	100	03/06/2013 16:18	EDS	502459

CAS#	Parameter	Result	RDL	MDL	Units
91-57-6	**2-Methylnaphthalene**	**630J**	**1000**	**25.5**	**ug/L**
91-20-3	**Naphthalene**	**7230**	**1000**	**29.3**	**ug/L**

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
4165-60-0	Nitrobenzene-d5	50	Diluted Out	ug/L	**0***	52 - 120

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21302273502	**460-006**	Solid	02/26/2013 10:05	02/27/2013 09:45

SW-846 1312/8270C

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
03/05/2013 08:00	502309	SW-846 3510C	100	03/06/2013 16:18	EDS	502459

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
321-60-8	2-Fluorobiphenyl	50	Diluted Out	ug/L	**0***	16 - 128
1718-51-0	Terphenyl-d14	50	Diluted Out	ug/L	**0***	43 - 138

RESULTS REPORTED ON A DRY WEIGHT BASIS

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21302273503	**460-007**	Solid	02/26/2013 10:10	02/27/2013 09:45

SW-846 1312/8260B

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
			1	03/06/2013 13:16	LBH	502457

CAS#	Parameter	Result	RDL	MDL	Units
71-43-2	**Benzene**	**89.0**	**5**	**0.111**	**ug/L**
100-41-4	**Ethylbenzene**	**106**	**5**	**0.109**	**ug/L**
108-88-3	**Toluene**	**139**	**5**	**0.122**	**ug/L**
1330-20-7	**Xylene (total)**	**77.3**	**10**	**0.179**	**ug/L**

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
460-00-4	4-Bromofluorobenzene	50	58.7	ug/L	117	78 - 130
1868-53-7	Dibromofluoromethane	50	42.2	ug/L	84	77 - 127
2037-26-5	Toluene d8	50	54.3	ug/L	109	76 - 134
17060-07-0	1,2-Dichloroethane-d4	50	47.9	ug/L	96	71 - 127

SW-846 1312/8270C

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
03/05/2013 08:00	502309	SW-846 3510C	1	03/05/2013 19:43	JWM	502364

CAS#	Parameter	Result	RDL	MDL	Units
83-32-9	**Acenaphthene**	**106**	**10.0**	**0.268**	**ug/L**
208-96-8	**Acenaphthylene**	**60.0**	**10.0**	**0.303**	**ug/L**
120-12-7	**Anthracene**	**46.3**	**10.0**	**0.316**	**ug/L**
56-55-3	**Benzo(a)anthracene**	**1.03J**	**10.0**	**0.316**	**ug/L**
50-32-8	Benzo(a)pyrene	0.125U	10.0	0.125	ug/L
205-99-2	Benzo(b)fluoranthene	0.217U	10.0	0.217	ug/L
207-08-9	Benzo(k)fluoranthene	0.236U	10.0	0.236	ug/L
218-01-9	**Chrysene**	**0.714J**	**10.0**	**0.433**	**ug/L**
53-70-3	Dibenz(a,h)anthracene	0.217U	10.0	0.217	ug/L
206-44-0	**Fluoranthene**	**13.2**	**10.0**	**0.267**	**ug/L**
86-73-7	**Fluorene**	**86.1**	**10.0**	**0.288**	**ug/L**
193-39-5	Indeno(1,2,3-cd)pyrene	0.157U	10.0	0.157	ug/L
85-01-8	**Phenanthrene**	**115**	**10.0**	**0.304**	**ug/L**
129-00-0	**Pyrene**	**13.1**	**10.0**	**0.486**	**ug/L**

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
4165-60-0	Nitrobenzene-d5	50	54	ug/L	108	52 - 120
321-60-8	2-Fluorobiphenyl	50	40.6	ug/L	81	16 - 128
1718-51-0	Terphenyl-d14	50	42.8	ug/L	86	43 - 138

SW-846 1312/8270C

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
03/05/2013 08:00	502309	SW-846 3510C	50	03/06/2013 16:36	EDS	502459

CAS#	Parameter	Result	RDL	MDL	Units
91-57-6	**2-Methylnaphthalene**	**581**	**500**	**12.8**	**ug/L**
91-20-3	**Naphthalene**	**5890**	**500**	**14.7**	**ug/L**

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
4165-60-0	Nitrobenzene-d5	50	Diluted Out	ug/L	**0***	52 - 120

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21302273503	**460-007**	Solid	02/26/2013 10:10	02/27/2013 09:45

SW-846 1312/8270C

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
03/05/2013 08:00	502309	SW-846 3510C	50	03/06/2013 16:36	EDS	502459

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
321-60-8	2-Fluorobiphenyl	50	Diluted Out	ug/L	**0***	16 - 128
1718-51-0	Terphenyl-d14	50	Diluted Out	ug/L	**0***	43 - 138

RESULTS REPORTED ON A DRY WEIGHT BASIS

GC/MS Volatiles Quality Control Summary

Analytical Batch	502457	**Client ID**	MB502457			LCS502457			LCSD502457		
Prep Batch	N/A	**GCAL ID**	1168172			1168173			1168174		
		Sample Type	Method Blank			LCS			LCSD		
		Analytical Date	03/06/2013 11:01			03/06/2013 09:29			03/06/2013 09:51		
		Matrix	Water			Water			Water		
SW-846 1312/8260B		**Units**	**Result**	ug/L **RDL**	**Spike Added**	**Result**	**% R**	**Control Limits % R**	**Result**	**% R**	**RPD**	**RPD Limit**
100-41-4	Ethylbenzene		0.109U	0.109	50.0	49.2	98	74 - 126	49.4	99	0.4	30
1330-20-7	Xylene (total)		0.179U	0.179	150	153	102	74 - 127	149	99	3	30
71-43-2	Benzene		0.111U	0.111	50.0	48.2	96	70 - 129	47.7	95	1	21
108-88-3	Toluene		0.122U	0.122	50.0	46.7	93	72 - 120	45.9	92	2	21
Surrogate												
460-00-4	4-Bromofluorobenzene		50.9	102	50	47	94	78 - 130	48.4	97		
1868-53-7	Dibromofluoromethane		49.5	99	50	49	98	77 - 127	48.9	98		
2037-26-5	Toluene d8		55.4	111	50	46.5	93	76 - 134	47.4	95		
17060-07-0	1,2-Dichloroethane-d4		48.9	98	50	48.6	97	71 - 127	47.7	95		

GC/MS Semi-Volatiles Quality Control Summary

Analytical Batch	502364	**Client ID**	MB502309	LCS502309	LCSD502309
Prep Batch	502309	**GCAL ID**	1167395	1167396	1167397
Prep Method	SW-846	**Sample Type**	Method Blank	LCS	LCSD
	3510C	**Prep Date**	03/05/2013 08:00	03/05/2013 08:00	03/05/2013 08:00
		Analytical Date	03/05/2013 18:16	03/05/2013 18:33	03/05/2013 18:50
		Matrix	Water	Water	Water

SW-846 1312/8270C		**Units**	ug/L	**Spike**	**Result**		**Control**	**Result**			**RPD**
		Result	**RDL**	**Added**		**% R**	**Limits % R**		**% R**	**RPD**	**Limit**
208-96-8	Acenaphthylene	0.303U	0.303	100	89.0	89	57 - 123	85.9	86	4	50
120-12-7	Anthracene	0.316U	0.316	100	94.3	94	59 - 120	90.7	91	4	50
56-55-3	Benzo(a)anthracene	0.316U	0.316	100	94.8	95	57 - 121	91.2	91	4	50
205-99-2	Benzo(b)fluoranthene	0.217U	0.217	100	101	101	41 - 127	101	101	0	50
207-08-9	Benzo(k)fluoranthene	0.236U	0.236	100	84.5	85	37 - 136	76.4	76	10	50
50-32-8	Benzo(a)pyrene	0.125U	0.125	100	90.1	90	47 - 124	86.0	86	5	50
218-01-9	Chrysene	0.433U	0.433	100	78.3	78	60 - 120	83.1	83	6	50
53-70-3	Dibenz(a,h)anthracene	0.217U	0.217	100	90.5	91	31 - 143	86.0	86	5	50
206-44-0	Fluoranthene	0.267U	0.267	100	97.3	97	60 - 120	85.1	85	13	50
86-73-7	Fluorene	0.288U	0.288	100	91.8	92	58 - 120	87.5	88	5	50
193-39-5	Indeno(1,2,3-cd)pyrene	0.157U	0.157	100	86.7	87	40 - 154	84.7	85	2	50
91-57-6	2-Methylnaphthalene	0.255U	0.255	100	98.2	98	45 - 121	91.0	91	8	50
91-20-3	Naphthalene	0.293U	0.293	100	80.6	81	55 - 120	77.4	77	4	50
85-01-8	Phenanthrene	0.304U	0.304	100	88.1	88	65 - 120	84.6	85	4	50
83-32-9	Acenaphthene	0.268U	0.268	100	81.3	81	56 - 120	78.9	79	3	32
129-00-0	Pyrene	0.486U	0.486	100	85.1	85	50 - 120	91.9	92	8	30
Surrogate											
4165-60-0	Nitrobenzene-d5	43	86	50	46.8	94	52 - 120	44.2	88		
321-60-8	2-Fluorobiphenyl	35.5	71	50	39.4	79	16 - 128	39.9	80		
1718-51-0	Terphenyl-d14	40	80	50	40.8	82	43 - 138	42.1	84		

GCAL

GULF COAST ANALYTICAL LABORATORIES, INC

7979 GSRI AVE, BATON ROUGE LA 70820-7402
(225) 769-4900 FAX (225) 767-5717

Chain of Custody Record

Lab use only			
KEMRON	4794	213022735	03/04/13
Client Name	Client #	Group#	Due Date

Report to:
Client: Kemron Environmental Inc.
Address: 1359-A Ellsworth Ind. Blvd. Atlanta, Ga. 30318
Contact: Tommy Jordan
Phone: 404-601-6927
Fax: 404-636-7162

Bill to:
Client: Kemron Environmental Inc.
Address: 1359-A Ellsworth Ind. Blvd. Atlanta, Ga. 30318
Contact: Tommy Jordan
Phone: 404-601-6927
Fax: 404-636-7162

P.O. Number:

Project Name/Number: Quanta / SH0460

Sampled By: Tomecia Riley

Analytical Requests & Methods

Matrix	Date	Time (2400)	Comp	Grab	Sample Description	Preservatives	No. Containers	SPLP VOC 1312 / 8260	SPLP PAH 1312 / 8270	Remarks:	Lab ID 02/27
S	2/26/13	1000		X	460-005	None	1	X	X		1
S	↓	1005		X	460-006	↓	1	X	X		2
S	↓	1010		X	460-007	↓	1	X	X		3

Turn Around Time: ___ 24 - 48 hrs ___ 3 days ___ 1 week X standard other ___

Relinquished by: (Signature)	Received by: (Signature)	Date:	Time:
Tomecia Riley		2/26/13	1356
Fed Ex	M Compagna	2/27/13	09:45

Note: 0.3 7948 3898 0705
1.1

By submitting these samples, you agree to the terms and conditions contained in our most recent schedule of services.

Matrix: W = water, S=Soil, SD=Solid, L=Liquid, SL=Sludge, O=Oil, CT=Charcoal Tube, OVM=Organic Vapor Monitor, XT=XAD Tube, A=Air Bag, SUM=Summa Canister

GCAL ANALYTICAL LABORATORIES, LLC

SAMPLE RECEIVING CHECKLIST

213022735

SAMPLE DELIVERY GROUP	213022735
Client 4794 - KEMRON	**Transport Method** FEDEX
Profile Number 238840	**Received By** Law, Brittany P.
Line Item(s) 1 - *Soil*	**Receive Date(s)** *02/27/13*

CHECKLIST

Were all samples received using proper thermal preservation?	☑ Yes	☐ No	☐ NA
When used, were all custody seals intact?	☑ Yes	☐ No	☐ NA
Were all samples received in proper containers?	☑ Yes	☐ No	☐ NA
Were all samples received using proper chemical preservation?	☑ Yes	☐ No	☐ NA
Was preservative added to any container at the lab?	☐ Yes	☑ No	☐ NA
Were all containers received in good condition?	☑ Yes	☐ No	☐ NA
Were all VOA vials received with no head space?	☐ Yes	☐ No	☑ NA
Do all sample labels match the Chain of Custody?	☑ Yes	☐ No	☐ NA
Did the Chain of Custody list the sampling technician?	☑ Yes	☐ No	☐ NA
Was the COC maintained i.e. all signatures, dates and time of receipt included?	☑ Yes	☐ No	☐ NA

COOLERS

Airbill	Temp(oC)
7948 3898 0765	0.3 1.1

DISCREPANCIES

None

LABORATORY PRESERVATIONS

None

NOTES

NELAP CERTIFICATE NUMBER 01955
DOD ELAP CERTIFICATE NUMBER ADE - 1482

ANALYTICAL RESULTS

PERFORMED BY

GULF COAST ANALYTICAL LABORATORIES, INC.

7979 GSRI Avenue

Baton Rouge, LA 70820

Report Date 03/01/2013

GCAL Report 213022715

Deliver To	KEMRON 1359A Ellsworth Industrial Blv Atlanta, GA 30318 404-601-6927
Attn	Tommy Jordan

Project Quanta/SH0460

Case Narrative

Client: KEMRON **Report:** 213022715

Gulf Coast Analytical Laboratories received and analyzed the sample(s) listed on the sample cross-reference page of this report. Receipt of the sample(s) is documented by the attached chain of custody. This applies only to the sample(s) listed in this report. No sample integrity or quality control exceptions were identified unless noted below.

SEMI-VOLATILES MASS SPECTROMETRY

In the SW-846 8270D analysis, samples 21302271507 (460-006 7 HR), 21302271511 (460-006 24 HR), 21302271512 (460-007 24 HR), 21302271515 (460-006 5 DAY) and 21302271516 (460-007 5 DAY) had to be diluted to bracket the concentration of target compounds within the calibration range of the instrument. This is reflected in elevated detection limits.

In the SW-846 8270D analysis, samples 21302271501 (460-001 2 HR) and 21302271516 (460-007 5 DAY) had one surrogate recovery outside control limits in the base-neutral fraction.

Laboratory Endorsement

Sample analysis was performed in accordance with approved methodologies provided by the Environmental Protection Agency or other recognized agencies. The samples and their corresponding extracts will be maintained for a period of 30 days unless otherwise arranged. Following this retention period the samples will be disposed in accordance with GCAL's Standard Operating Procedures.

Common Abbreviations Utilized in this Report

ND	Indicates the result was Not Detected at the specified RDL
DO	Indicates the result was Diluted Out
MI	Indicates the result was subject to Matrix Interference
TNTC	Indicates the result was Too Numerous To Count
SUBC	Indicates the analysis was Sub-Contracted
FLD	Indicates the analysis was performed in the Field
PQL	Practical Quantitation Limit
MDL	Method Detection Limit
RDL	Reporting Detection Limit
00:00	Reported as a time equivalent to 12:00 AM

Reporting Flags Utilized in this Report

J	Indicates the result is between the MDL and RDL
U	Indicates the compound was analyzed for but not detected
B	Indicates the analyte was detected in the associated Method Blank

Sample receipt at GCAL is documented through the attached chain of custody. In accordance with NELAC, this report shall be reproduced only in full and with the written permission of GCAL. The results contained within this report relate only to the samples reported. The documented results are presented within this report.

This report pertains only to the samples listed in the Report Sample Summary and should be retained as a permanent record thereof. The results contained within this report are intended for the use of the client. Any unauthorized use of the information contained in this report is prohibited.

I certify that this data package is in compliance with the NELAC standard and terms and conditions of the contract and Statement of Work both technically and for completeness, for other than the conditions in the case narrative. Release of the data contained in this hardcopy data package and in the computer-readable data submitted has been authorized by the Quality Assurance Manager or his/her designee, as verified by the following signature.

Estimated uncertainty of measurement is available upon request. This report is in compliance with the DOD QSM as specified in the contract if applicable.

_____

Robyn Migues
Technical Director
GCAL REPORT 213022715

THIS REPORT CONTAINS _____ PAGES.

Report Sample Summary

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21302271501	460-001 2 HR	Water	02/21/2013 11:20	02/27/2013 09:45
21302271502	460-005 2 HR	Water	02/21/2013 11:40	02/27/2013 09:45
21302271503	460-006 2 HR	Water	02/21/2013 11:55	02/27/2013 09:45
21302271504	460-007 2 HR	Water	02/21/2013 12:05	02/27/2013 09:45
21302271505	460-001 7 HR	Water	02/21/2013 15:55	02/27/2013 09:45
21302271506	460-005 7 HR	Water	02/21/2013 16:05	02/27/2013 09:45
21302271507	460-006 7 HR	Water	02/21/2013 16:15	02/27/2013 09:45
21302271508	460-007 7 HR	Water	02/21/2013 16:25	02/27/2013 09:45
21302271509	460-001 24 HR	Water	02/22/2013 09:00	02/27/2013 09:45
21302271510	460-005 24 HR	Water	02/22/2013 09:15	02/27/2013 09:45
21302271511	460-006 24 HR	Water	02/22/2013 09:25	02/27/2013 09:45
21302271512	460-007 24 HR	Water	02/22/2013 09:40	02/27/2013 09:45
21302271513	460-001 5 DAY	Water	02/26/2013 09:05	02/27/2013 09:45
21302271514	460-005 5 DAY	Water	02/26/2013 09:15	02/27/2013 09:45
21302271515	460-006 5 DAY	Water	02/26/2013 09:25	02/27/2013 09:45
21302271516	460-007 5 DAY	Water	02/26/2013 09:40	02/27/2013 09:45

Summary of Compounds Detected

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21302271501	**460-001 2 HR**	Water	02/21/2013 11:20	02/27/2013 09:45

SW-846 6020A

CAS#	Parameter	Result	RDL	MDL	Units
7440-38-2	Arsenic	1.27	1.00	0.094	ug/L

SW-846 8270D

CAS#	Parameter	Result	RDL	MDL	Units
83-32-9	Acenaphthene	2.29J	10.3	0.389	ug/L
120-12-7	Anthracene	1.57J	10.3	0.257	ug/L
206-44-0	Fluoranthene	1.10J	10.3	0.195	ug/L
86-73-7	Fluorene	2.83J	10.3	0.258	ug/L
91-20-3	Naphthalene	10.1J	10.3	0.237	ug/L
85-01-8	Phenanthrene	7.21J	10.3	0.236	ug/L
129-00-0	Pyrene	0.845J	10.3	0.296	ug/L

SW-846 8260B

CAS#	Parameter	Result	RDL	MDL	Units
1330-20-7	Xylene (total)	7.87	3.00	0.179	ug/L

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21302271502	**460-005 2 HR**	Water	02/21/2013 11:40	02/27/2013 09:45

SW-846 6020A

CAS#	Parameter	Result	RDL	MDL	Units
7440-38-2	Arsenic	0.52J	1.00	0.094	ug/L

SW-846 8270D

CAS#	Parameter	Result	RDL	MDL	Units
83-32-9	Acenaphthene	3.22J	10.0	0.377	ug/L
120-12-7	Anthracene	1.08J	10.0	0.249	ug/L
206-44-0	Fluoranthene	0.776J	10.0	0.189	ug/L
86-73-7	Fluorene	3.03J	10.0	0.250	ug/L
91-20-3	Naphthalene	29.0	10.0	0.230	ug/L
85-01-8	Phenanthrene	5.84J	10.0	0.229	ug/L
129-00-0	Pyrene	0.601J	10.0	0.287	ug/L

SW-846 8260B

CAS#	Parameter	Result	RDL	MDL	Units
1330-20-7	Xylene (total)	9.09	3.00	0.179	ug/L

Summary of Compounds Detected (con't)

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21302271503	**460-006 2 HR**	Water	02/21/2013 11:55	02/27/2013 09:45

SW-846 6020A

CAS#	Parameter	Result	RDL	MDL	Units
7440-38-2	Arsenic	0.18J	1.00	0.094	ug/L

SW-846 8270D

CAS#	Parameter	Result	RDL	MDL	Units
83-32-9	Acenaphthene	6.31J	10.0	0.377	ug/L
208-96-8	Acenaphthylene	2.81J	10.0	0.302	ug/L
120-12-7	Anthracene	1.56J	10.0	0.249	ug/L
206-44-0	Fluoranthene	0.920J	10.0	0.189	ug/L
86-73-7	Fluorene	5.59J	10.0	0.250	ug/L
91-20-3	Naphthalene	174	10.0	0.230	ug/L
85-01-8	Phenanthrene	9.10J	10.0	0.229	ug/L
129-00-0	Pyrene	1.08J	10.0	0.287	ug/L

SW-846 8260B

CAS#	Parameter	Result	RDL	MDL	Units
71-43-2	Benzene	1.96	1.00	0.111	ug/L
108-88-3	Toluene	1.77	1.00	0.122	ug/L
100-41-4	Ethylbenzene	0.501J	1.00	0.109	ug/L
1330-20-7	Xylene (total)	9.75	3.00	0.179	ug/L

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21302271504	**460-007 2 HR**	Water	02/21/2013 12:05	02/27/2013 09:45

SW-846 6020A

CAS#	Parameter	Result	RDL	MDL	Units
7440-38-2	Arsenic	0.16J	1.00	0.094	ug/L

SW-846 8270D

CAS#	Parameter	Result	RDL	MDL	Units
83-32-9	Acenaphthene	5.83J	10.0	0.377	ug/L
208-96-8	Acenaphthylene	2.53J	10.0	0.302	ug/L
120-12-7	Anthracene	1.81J	10.0	0.249	ug/L
56-55-3	Benzo(a)anthracene	0.373J	10.0	0.310	ug/L
218-01-9	Chrysene	0.408J	10.0	0.306	ug/L
206-44-0	Fluoranthene	1.62J	10.0	0.189	ug/L
86-73-7	Fluorene	5.38J	10.0	0.250	ug/L
91-20-3	Naphthalene	145	10.0	0.230	ug/L
85-01-8	Phenanthrene	9.65J	10.0	0.229	ug/L
129-00-0	Pyrene	1.87J	10.0	0.287	ug/L

Summary of Compounds Detected (con't)

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21302271504	**460-007 2 HR**	Water	02/21/2013 12:05	02/27/2013 09:45

SW-846 8260B

CAS#	Parameter	Result	RDL	MDL	Units
71-43-2	Benzene	4.41	1.00	0.111	ug/L
108-88-3	Toluene	3.66	1.00	0.122	ug/L
100-41-4	Ethylbenzene	0.829J	1.00	0.109	ug/L
1330-20-7	Xylene (total)	9.15	3.00	0.179	ug/L

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21302271505	**460-001 7 HR**	Water	02/21/2013 15:55	02/27/2013 09:45

SW-846 6020A

CAS#	Parameter	Result	RDL	MDL	Units
7440-38-2	Arsenic	1.23	1.00	0.094	ug/L

SW-846 8270D

CAS#	Parameter	Result	RDL	MDL	Units
83-32-9	Acenaphthene	3.44J	10.4	0.393	ug/L
120-12-7	Anthracene	2.90J	10.4	0.259	ug/L
56-55-3	Benzo(a)anthracene	0.405J	10.4	0.323	ug/L
218-01-9	Chrysene	0.412J	10.4	0.319	ug/L
206-44-0	Fluoranthene	2.55J	10.4	0.197	ug/L
86-73-7	Fluorene	4.29J	10.4	0.260	ug/L
91-20-3	Naphthalene	15.7	10.4	0.240	ug/L
85-01-8	Phenanthrene	12.3	10.4	0.239	ug/L
129-00-0	Pyrene	2.14J	10.4	0.299	ug/L

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21302271506	**460-005 7 HR**	Water	02/21/2013 16:05	02/27/2013 09:45

SW-846 6020A

CAS#	Parameter	Result	RDL	MDL	Units
7440-38-2	Arsenic	0.25J	1.00	0.094	ug/L

SW-846 8270D

CAS#	Parameter	Result	RDL	MDL	Units
83-32-9	Acenaphthene	5.60J	10.0	0.377	ug/L
120-12-7	Anthracene	2.13J	10.0	0.249	ug/L
56-55-3	Benzo(a)anthracene	0.418J	10.0	0.310	ug/L
218-01-9	Chrysene	0.489J	10.0	0.306	ug/L
206-44-0	Fluoranthene	2.97J	10.0	0.189	ug/L
86-73-7	Fluorene	5.69J	10.0	0.250	ug/L
91-20-3	Naphthalene	49.9	10.0	0.230	ug/L
85-01-8	Phenanthrene	13.4	10.0	0.229	ug/L

Summary of Compounds Detected (con't)

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21302271506	**460-005 7 HR**	Water	02/21/2013 16:05	02/27/2013 09:45

SW-846 8270D

CAS#	Parameter	Result	RDL	MDL	Units
129-00-0	Pyrene	2.43J	10.0	0.287	ug/L

SW-846 8260B

CAS#	Parameter	Result	RDL	MDL	Units
71-43-2	Benzene	7.26	1.00	0.111	ug/L
108-88-3	Toluene	6.04	1.00	0.122	ug/L
100-41-4	Ethylbenzene	1.17	1.00	0.109	ug/L
1330-20-7	Xylene (total)	8.98	3.00	0.179	ug/L

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21302271507	**460-006 7 HR**	Water	02/21/2013 16:15	02/27/2013 09:45

SW-846 6020A

CAS#	Parameter	Result	RDL	MDL	Units
7440-38-2	Arsenic	0.29J	1.00	0.094	ug/L

SW-846 8270D

CAS#	Parameter	Result	RDL	MDL	Units
83-32-9	Acenaphthene	10.6	10.0	0.377	ug/L
208-96-8	Acenaphthylene	4.51J	10.0	0.302	ug/L
120-12-7	Anthracene	3.15J	10.0	0.249	ug/L
56-55-3	Benzo(a)anthracene	0.795J	10.0	0.310	ug/L
50-32-8	Benzo(a)pyrene	0.477J	10.0	0.051	ug/L
205-99-2	Benzo(b)fluoranthene	0.283J	10.0	0.278	ug/L
207-08-9	Benzo(k)fluoranthene	0.270J	10.0	0.172	ug/L
218-01-9	Chrysene	1.05J	10.0	0.306	ug/L
206-44-0	Fluoranthene	3.26J	10.0	0.189	ug/L
86-73-7	Fluorene	9.55J	10.0	0.250	ug/L
85-01-8	Phenanthrene	17.8	10.0	0.229	ug/L
129-00-0	Pyrene	3.68J	10.0	0.287	ug/L

SW-846 8270D

CAS#	Parameter	Result	RDL	MDL	Units
91-20-3	Naphthalene	283	20.0	0.460	ug/L

SW-846 8260B

CAS#	Parameter	Result	RDL	MDL	Units
1330-20-7	Xylene (total)	6.79	3.00	0.179	ug/L

Summary of Compounds Detected (con't)

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21302271508	**460-007 7 HR**	Water	02/21/2013 16:25	02/27/2013 09:45

SW-846 6020A

CAS#	Parameter	Result	RDL	MDL	Units
7440-38-2	Arsenic	0.31J	1.00	0.094	ug/L

SW-846 8270D

CAS#	Parameter	Result	RDL	MDL	Units
83-32-9	Acenaphthene	7.75J	10.0	0.377	ug/L
208-96-8	Acenaphthylene	3.27J	10.0	0.302	ug/L
120-12-7	Anthracene	2.39J	10.0	0.249	ug/L
56-55-3	Benzo(a)anthracene	0.464J	10.0	0.310	ug/L
218-01-9	Chrysene	0.363J	10.0	0.306	ug/L
206-44-0	Fluoranthene	2.16J	10.0	0.189	ug/L
86-73-7	Fluorene	7.26J	10.0	0.250	ug/L
91-20-3	Naphthalene	184	10.0	0.230	ug/L
85-01-8	Phenanthrene	14.1	10.0	0.229	ug/L
129-00-0	Pyrene	2.41J	10.0	0.287	ug/L

SW-846 8260B

CAS#	Parameter	Result	RDL	MDL	Units
71-43-2	Benzene	0.589J	1.00	0.111	ug/L
108-88-3	Toluene	0.777J	1.00	0.122	ug/L
100-41-4	Ethylbenzene	0.516J	1.00	0.109	ug/L
1330-20-7	Xylene (total)	8.33	3.00	0.179	ug/L

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21302271509	**460-001 24 HR**	Water	02/22/2013 09:00	02/27/2013 09:45

SW-846 6020A

CAS#	Parameter	Result	RDL	MDL	Units
7440-38-2	Arsenic	2.16	1.00	0.094	ug/L

SW-846 8270D

CAS#	Parameter	Result	RDL	MDL	Units
83-32-9	Acenaphthene	7.18J	10.3	0.389	ug/L
120-12-7	Anthracene	5.10J	10.3	0.257	ug/L
56-55-3	Benzo(a)anthracene	0.485J	10.3	0.320	ug/L
218-01-9	Chrysene	0.347J	10.3	0.315	ug/L
206-44-0	Fluoranthene	5.39J	10.3	0.195	ug/L
86-73-7	Fluorene	9.00J	10.3	0.258	ug/L
91-20-3	Naphthalene	36.1	10.3	0.237	ug/L
85-01-8	Phenanthrene	23.9	10.3	0.236	ug/L
129-00-0	Pyrene	3.75J	10.3	0.296	ug/L

Summary of Compounds Detected (con't)

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21302271509	**460-001 24 HR**	Water	02/22/2013 09:00	02/27/2013 09:45

SW-846 8260B

CAS#	Parameter	Result	RDL	MDL	Units
71-43-2	Benzene	21.6	1.00	0.111	ug/L
108-88-3	Toluene	19.1	1.00	0.122	ug/L
100-41-4	Ethylbenzene	4.07	1.00	0.109	ug/L
1330-20-7	Xylene (total)	17.1	3.00	0.179	ug/L

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21302271510	**460-005 24 HR**	Water	02/22/2013 09:15	02/27/2013 09:45

SW-846 6020A

CAS#	Parameter	Result	RDL	MDL	Units
7440-38-2	Arsenic	0.57J	1.00	0.094	ug/L

SW-846 8270D

CAS#	Parameter	Result	RDL	MDL	Units
83-32-9	Acenaphthene	13.0	10.0	0.377	ug/L
120-12-7	Anthracene	4.57J	10.0	0.249	ug/L
56-55-3	Benzo(a)anthracene	0.764J	10.0	0.310	ug/L
218-01-9	Chrysene	0.596J	10.0	0.306	ug/L
206-44-0	Fluoranthene	5.61J	10.0	0.189	ug/L
86-73-7	Fluorene	13.2	10.0	0.250	ug/L
91-20-3	Naphthalene	111	10.0	0.230	ug/L
85-01-8	Phenanthrene	28.8	10.0	0.229	ug/L
129-00-0	Pyrene	4.26J	10.0	0.287	ug/L

SW-846 8260B

CAS#	Parameter	Result	RDL	MDL	Units
71-43-2	Benzene	6.94	1.00	0.111	ug/L
108-88-3	Toluene	5.97	1.00	0.122	ug/L
100-41-4	Ethylbenzene	1.16	1.00	0.109	ug/L
1330-20-7	Xylene (total)	9.58	3.00	0.179	ug/L

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21302271511	**460-006 24 HR**	Water	02/22/2013 09:25	02/27/2013 09:45

SW-846 6020A

CAS#	Parameter	Result	RDL	MDL	Units
7440-38-2	Arsenic	0.13J	1.00	0.094	ug/L

Summary of Compounds Detected (con't)

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21302271511	**460-006 24 HR**	Water	02/22/2013 09:25	02/27/2013 09:45

SW-846 8270D

CAS#	Parameter	Result	RDL	MDL	Units
83-32-9	Acenaphthene	22.9	10.0	0.377	ug/L
208-96-8	Acenaphthylene	9.53J	10.0	0.302	ug/L
120-12-7	Anthracene	5.93J	10.0	0.249	ug/L
56-55-3	Benzo(a)anthracene	0.797J	10.0	0.310	ug/L
218-01-9	Chrysene	0.559J	10.0	0.306	ug/L
206-44-0	Fluoranthene	4.98J	10.0	0.189	ug/L
86-73-7	Fluorene	20.5	10.0	0.250	ug/L
85-01-8	Phenanthrene	35.7	10.0	0.229	ug/L
129-00-0	Pyrene	5.41J	10.0	0.287	ug/L

SW-846 8270D

CAS#	Parameter	Result	RDL	MDL	Units
91-20-3	Naphthalene	501	40.0	0.920	ug/L

SW-846 8260B

CAS#	Parameter	Result	RDL	MDL	Units
71-43-2	Benzene	19.1	1.00	0.111	ug/L
108-88-3	Toluene	16.0	1.00	0.122	ug/L
100-41-4	Ethylbenzene	3.38	1.00	0.109	ug/L
1330-20-7	Xylene (total)	14.4	3.00	0.179	ug/L

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21302271512	**460-007 24 HR**	Water	02/22/2013 09:40	02/27/2013 09:45

SW-846 6020A

CAS#	Parameter	Result	RDL	MDL	Units
7440-38-2	Arsenic	0.19J	1.00	0.094	ug/L

SW-846 8270D

CAS#	Parameter	Result	RDL	MDL	Units
83-32-9	Acenaphthene	18.2	10.0	0.377	ug/L
208-96-8	Acenaphthylene	7.61J	10.0	0.302	ug/L
120-12-7	Anthracene	5.42J	10.0	0.249	ug/L
56-55-3	Benzo(a)anthracene	0.762J	10.0	0.310	ug/L
50-32-8	Benzo(a)pyrene	0.233J	10.0	0.051	ug/L
218-01-9	Chrysene	0.690J	10.0	0.306	ug/L
206-44-0	Fluoranthene	5.29J	10.0	0.189	ug/L
86-73-7	Fluorene	18.2	10.0	0.250	ug/L
85-01-8	Phenanthrene	34.0	10.0	0.229	ug/L
129-00-0	Pyrene	5.21J	10.0	0.287	ug/L

Summary of Compounds Detected (con't)

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21302271512	**460-007 24 HR**	Water	02/22/2013 09:40	02/27/2013 09:45

SW-846 8270D

CAS#	Parameter	Result	RDL	MDL	Units
91-20-3	Naphthalene	379	40.0	0.920	ug/L

SW-846 8260B

CAS#	Parameter	Result	RDL	MDL	Units
108-88-3	Toluene	0.361J	1.00	0.122	ug/L

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21302271513	**460-001 5 DAY**	Water	02/26/2013 09:05	02/27/2013 09:45

SW-846 6020A

CAS#	Parameter	Result	RDL	MDL	Units
7440-38-2	Arsenic	3.65	1.00	0.094	ug/L

SW-846 8270D

CAS#	Parameter	Result	RDL	MDL	Units
83-32-9	Acenaphthene	5.75J	10.4	0.393	ug/L
120-12-7	Anthracene	3.43J	10.4	0.259	ug/L
56-55-3	Benzo(a)anthracene	0.436J	10.4	0.323	ug/L
218-01-9	Chrysene	0.360J	10.4	0.319	ug/L
206-44-0	Fluoranthene	4.17J	10.4	0.197	ug/L
86-73-7	Fluorene	6.94J	10.4	0.260	ug/L
91-20-3	Naphthalene	32.8	10.4	0.240	ug/L
85-01-8	Phenanthrene	19.6	10.4	0.239	ug/L
129-00-0	Pyrene	3.30J	10.4	0.299	ug/L

SW-846 8260B

CAS#	Parameter	Result	RDL	MDL	Units
71-43-2	Benzene	0.344J	1.00	0.111	ug/L
108-88-3	Toluene	1.07	1.00	0.122	ug/L
100-41-4	Ethylbenzene	0.959J	1.00	0.109	ug/L
1330-20-7	Xylene (total)	8.06	3.00	0.179	ug/L

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21302271514	**460-005 5 DAY**	Water	02/26/2013 09:15	02/27/2013 09:45

SW-846 6020A

CAS#	Parameter	Result	RDL	MDL	Units
7440-38-2	Arsenic	1.46	1.00	0.094	ug/L

Summary of Compounds Detected (con't)

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21302271514	**460-005 5 DAY**	Water	02/26/2013 09:15	02/27/2013 09:45

SW-846 8270D

CAS#	Parameter	Result	RDL	MDL	Units
83-32-9	Acenaphthene	12.0	10.0	0.377	ug/L
120-12-7	Anthracene	4.41J	10.0	0.249	ug/L
56-55-3	Benzo(a)anthracene	0.470J	10.0	0.310	ug/L
218-01-9	Chrysene	0.354J	10.0	0.306	ug/L
206-44-0	Fluoranthene	5.57J	10.0	0.189	ug/L
86-73-7	Fluorene	11.6	10.0	0.250	ug/L
91-20-3	Naphthalene	105	10.0	0.230	ug/L
85-01-8	Phenanthrene	29.8	10.0	0.229	ug/L
129-00-0	Pyrene	4.44J	10.0	0.287	ug/L

SW-846 8260B

CAS#	Parameter	Result	RDL	MDL	Units
71-43-2	Benzene	0.540J	1.00	0.111	ug/L
108-88-3	Toluene	0.849J	1.00	0.122	ug/L
100-41-4	Ethylbenzene	0.524J	1.00	0.109	ug/L
1330-20-7	Xylene (total)	7.57	3.00	0.179	ug/L

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21302271515	**460-006 5 DAY**	Water	02/26/2013 09:25	02/27/2013 09:45

SW-846 6020A

CAS#	Parameter	Result	RDL	MDL	Units
7440-38-2	Arsenic	0.43J	1.00	0.094	ug/L

SW-846 8270D

CAS#	Parameter	Result	RDL	MDL	Units
83-32-9	Acenaphthene	20.3	10.0	0.377	ug/L
208-96-8	Acenaphthylene	7.87J	10.0	0.302	ug/L
120-12-7	Anthracene	4.80J	10.0	0.249	ug/L
56-55-3	Benzo(a)anthracene	0.616J	10.0	0.310	ug/L
218-01-9	Chrysene	0.512J	10.0	0.306	ug/L
206-44-0	Fluoranthene	4.84J	10.0	0.189	ug/L
86-73-7	Fluorene	18.5	10.0	0.250	ug/L
85-01-8	Phenanthrene	34.3	10.0	0.229	ug/L
129-00-0	Pyrene	5.00J	10.0	0.287	ug/L

SW-846 8270D

CAS#	Parameter	Result	RDL	MDL	Units
91-20-3	Naphthalene	402	40.0	0.920	ug/L

Summary of Compounds Detected (con't)

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21302271515	**460-006 5 DAY**	Water	02/26/2013 09:25	02/27/2013 09:45

SW-846 8260B

CAS#	Parameter	Result	RDL	MDL	Units
71-43-2	Benzene	22.2	1.00	0.111	ug/L
108-88-3	Toluene	23.5	1.00	0.122	ug/L
100-41-4	Ethylbenzene	5.79	1.00	0.109	ug/L
1330-20-7	Xylene (total)	21.5	3.00	0.179	ug/L

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21302271516	**460-007 5 DAY**	Water	02/26/2013 09:40	02/27/2013 09:45

SW-846 6020A

CAS#	Parameter	Result	RDL	MDL	Units
7440-38-2	Arsenic	0.41J	1.00	0.094	ug/L

SW-846 8270D

CAS#	Parameter	Result	RDL	MDL	Units
83-32-9	Acenaphthene	16.0	10.0	0.377	ug/L
208-96-8	Acenaphthylene	6.20J	10.0	0.302	ug/L
120-12-7	Anthracene	3.88J	10.0	0.249	ug/L
56-55-3	Benzo(a)anthracene	0.483J	10.0	0.310	ug/L
218-01-9	Chrysene	0.428J	10.0	0.306	ug/L
206-44-0	Fluoranthene	4.63J	10.0	0.189	ug/L
86-73-7	Fluorene	15.7	10.0	0.250	ug/L
85-01-8	Phenanthrene	30.9	10.0	0.229	ug/L
129-00-0	Pyrene	4.93J	10.0	0.287	ug/L

SW-846 8270D

CAS#	Parameter	Result	RDL	MDL	Units
91-20-3	Naphthalene	318	40.0	0.920	ug/L

SW-846 8260B

CAS#	Parameter	Result	RDL	MDL	Units
71-43-2	Benzene	16.2	1.00	0.111	ug/L
108-88-3	Toluene	16.2	1.00	0.122	ug/L
100-41-4	Ethylbenzene	3.72	1.00	0.109	ug/L
1330-20-7	Xylene (total)	15.2	3.00	0.179	ug/L

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21302271501	**460-001 2 HR**	Water	02/21/2013 11:20	02/27/2013 09:45

SW-846 8260B

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
			1	02/27/2013 14:13	CGC	501911

CAS#	Parameter	Result	RDL	MDL	Units
71-43-2	Benzene	0.111U	1.00	0.111	ug/L
108-88-3	Toluene	0.122U	1.00	0.122	ug/L
100-41-4	Ethylbenzene	0.109U	1.00	0.109	ug/L
1330-20-7	**Xylene (total)**	**7.87**	**3.00**	**0.179**	**ug/L**

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
460-00-4	4-Bromofluorobenzene	50	48	ug/L	96	78 - 130
1868-53-7	Dibromofluoromethane	50	53.7	ug/L	107	77 - 127
2037-26-5	Toluene d8	50	47.4	ug/L	95	76 - 134
17060-07-0	1,2-Dichloroethane-d4	50	54	ug/L	108	71 - 127

SW-846 8270D

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
02/28/2013 08:30	501924	SW-846 3510C	1	02/28/2013 12:37	EDS	501992

CAS#	Parameter	Result	RDL	MDL	Units
83-32-9	**Acenaphthene**	**2.29J**	**10.3**	**0.389**	**ug/L**
208-96-8	Acenaphthylene	0.311U	10.3	0.311	ug/L
120-12-7	**Anthracene**	**1.57J**	**10.3**	**0.257**	**ug/L**
56-55-3	Benzo(a)anthracene	0.320U	10.3	0.320	ug/L
50-32-8	Benzo(a)pyrene	0.053U	10.3	0.053	ug/L
205-99-2	Benzo(b)fluoranthene	0.287U	10.3	0.287	ug/L
191-24-2	Benzo(g,h,i)perylene	0.177U	10.3	0.177	ug/L
207-08-9	Benzo(k)fluoranthene	0.177U	10.3	0.177	ug/L
218-01-9	Chrysene	0.315U	10.3	0.315	ug/L
53-70-3	Dibenz(a,h)anthracene	0.139U	10.3	0.139	ug/L
206-44-0	**Fluoranthene**	**1.10J**	**10.3**	**0.195**	**ug/L**
86-73-7	**Fluorene**	**2.83J**	**10.3**	**0.258**	**ug/L**
193-39-5	Indeno(1,2,3-cd)pyrene	0.249U	10.3	0.249	ug/L
91-20-3	**Naphthalene**	**10.1J**	**10.3**	**0.237**	**ug/L**
85-01-8	**Phenanthrene**	**7.21J**	**10.3**	**0.236**	**ug/L**
129-00-0	**Pyrene**	**0.845J**	**10.3**	**0.296**	**ug/L**

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
4165-60-0	Nitrobenzene-d5	51.5	47.3	ug/L	92	40 - 110
321-60-8	2-Fluorobiphenyl	51.5	41.9	ug/L	81	50 - 110
1718-51-0	Terphenyl-d14	51.5	17.2	ug/L	**33***	50 - 135

SW-846 6020A

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
02/27/2013 16:00	501931	SW-846 3010A	1	02/27/2013 20:59	AWG	501960

CAS#	Parameter	Result	RDL	MDL	Units
7440-38-2	**Arsenic**	**1.27**	**1.00**	**0.094**	**ug/L**

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21302271502	**460-005 2 HR**	Water	02/21/2013 11:40	02/27/2013 09:45

SW-846 8260B

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
			1	02/27/2013 14:34	CGC	501911

CAS#	Parameter	Result	RDL	MDL	Units
71-43-2	Benzene	0.111U	1.00	0.111	ug/L
108-88-3	Toluene	0.122U	1.00	0.122	ug/L
100-41-4	Ethylbenzene	0.109U	1.00	0.109	ug/L
1330-20-7	**Xylene (total)**	**9.09**	**3.00**	**0.179**	**ug/L**

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
460-00-4	4-Bromofluorobenzene	50	48.6	ug/L	97	78 - 130
1868-53-7	Dibromofluoromethane	50	52.5	ug/L	105	77 - 127
2037-26-5	Toluene d8	50	48.3	ug/L	97	76 - 134
17060-07-0	1,2-Dichloroethane-d4	50	52.5	ug/L	105	71 - 127

SW-846 8270D

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
02/28/2013 08:30	501924	SW-846 3510C	1	02/28/2013 12:54	EDS	501992

CAS#	Parameter	Result	RDL	MDL	Units
83-32-9	**Acenaphthene**	**3.22J**	**10.0**	**0.377**	**ug/L**
208-96-8	Acenaphthylene	0.302U	10.0	0.302	ug/L
120-12-7	**Anthracene**	**1.08J**	**10.0**	**0.249**	**ug/L**
56-55-3	Benzo(a)anthracene	0.310U	10.0	0.310	ug/L
50-32-8	Benzo(a)pyrene	0.051U	10.0	0.051	ug/L
205-99-2	Benzo(b)fluoranthene	0.278U	10.0	0.278	ug/L
191-24-2	Benzo(g,h,i)perylene	0.172U	10.0	0.172	ug/L
207-08-9	Benzo(k)fluoranthene	0.172U	10.0	0.172	ug/L
218-01-9	Chrysene	0.306U	10.0	0.306	ug/L
53-70-3	Dibenz(a,h)anthracene	0.135U	10.0	0.135	ug/L
206-44-0	**Fluoranthene**	**0.776J**	**10.0**	**0.189**	**ug/L**
86-73-7	**Fluorene**	**3.03J**	**10.0**	**0.250**	**ug/L**
193-39-5	Indeno(1,2,3-cd)pyrene	0.242U	10.0	0.242	ug/L
91-20-3	**Naphthalene**	**29.0**	**10.0**	**0.230**	**ug/L**
85-01-8	**Phenanthrene**	**5.84J**	**10.0**	**0.229**	**ug/L**
129-00-0	**Pyrene**	**0.601J**	**10.0**	**0.287**	**ug/L**

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
4165-60-0	Nitrobenzene-d5	50	44.1	ug/L	88	40 - 110
321-60-8	2-Fluorobiphenyl	50	38.9	ug/L	78	50 - 110
1718-51-0	Terphenyl-d14	50	29.3	ug/L	59	50 - 135

SW-846 6020A

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
02/27/2013 16:00	501931	SW-846 3010A	1	02/27/2013 21:04	AWG	501960

CAS#	Parameter	Result	RDL	MDL	Units
7440-38-2	**Arsenic**	**0.52J**	**1.00**	**0.094**	**ug/L**

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21302271503	**460-006 2 HR**	Water	02/21/2013 11:55	02/27/2013 09:45

SW-846 8260B

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
			1	02/27/2013 14:57	CGC	501911

CAS#	Parameter	Result	RDL	MDL	Units
71-43-2	**Benzene**	**1.96**	**1.00**	**0.111**	**ug/L**
108-88-3	**Toluene**	**1.77**	**1.00**	**0.122**	**ug/L**
100-41-4	**Ethylbenzene**	**0.501J**	**1.00**	**0.109**	**ug/L**
1330-20-7	**Xylene (total)**	**9.75**	**3.00**	**0.179**	**ug/L**

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
460-00-4	4-Bromofluorobenzene	50	48.2	ug/L	96	78 - 130
1868-53-7	Dibromofluoromethane	50	52.7	ug/L	105	77 - 127
2037-26-5	Toluene d8	50	47	ug/L	94	76 - 134
17060-07-0	1,2-Dichloroethane-d4	50	52.3	ug/L	105	71 - 127

SW-846 8270D

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
02/28/2013 08:30	501924	SW-846 3510C	1	02/28/2013 13:11	EDS	501992

CAS#	Parameter	Result	RDL	MDL	Units
83-32-9	**Acenaphthene**	**6.31J**	**10.0**	**0.377**	**ug/L**
208-96-8	**Acenaphthylene**	**2.81J**	**10.0**	**0.302**	**ug/L**
120-12-7	**Anthracene**	**1.56J**	**10.0**	**0.249**	**ug/L**
56-55-3	Benzo(a)anthracene	0.310U	10.0	0.310	ug/L
50-32-8	Benzo(a)pyrene	0.051U	10.0	0.051	ug/L
205-99-2	Benzo(b)fluoranthene	0.278U	10.0	0.278	ug/L
191-24-2	Benzo(g,h,i)perylene	0.172U	10.0	0.172	ug/L
207-08-9	Benzo(k)fluoranthene	0.172U	10.0	0.172	ug/L
218-01-9	Chrysene	0.306U	10.0	0.306	ug/L
53-70-3	Dibenz(a,h)anthracene	0.135U	10.0	0.135	ug/L
206-44-0	**Fluoranthene**	**0.920J**	**10.0**	**0.189**	**ug/L**
86-73-7	**Fluorene**	**5.59J**	**10.0**	**0.250**	**ug/L**
193-39-5	Indeno(1,2,3-cd)pyrene	0.242U	10.0	0.242	ug/L
91-20-3	**Naphthalene**	**174**	**10.0**	**0.230**	**ug/L**
85-01-8	**Phenanthrene**	**9.10J**	**10.0**	**0.229**	**ug/L**
129-00-0	**Pyrene**	**1.08J**	**10.0**	**0.287**	**ug/L**

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
4165-60-0	Nitrobenzene-d5	50	46.3	ug/L	93	40 - 110
321-60-8	2-Fluorobiphenyl	50	41.2	ug/L	82	50 - 110
1718-51-0	Terphenyl-d14	50	30.8	ug/L	62	50 - 135

SW-846 6020A

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
02/27/2013 16:00	501931	SW-846 3010A	1	02/27/2013 21:10	AWG	501960

CAS#	Parameter	Result	RDL	MDL	Units
7440-38-2	**Arsenic**	**0.18J**	**1.00**	**0.094**	**ug/L**

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21302271504	**460-007 2 HR**	Water	02/21/2013 12:05	02/27/2013 09:45

SW-846 8260B

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
			1	02/27/2013 15:17	CGC	501911

CAS#	Parameter	Result	RDL	MDL	Units
71-43-2	**Benzene**	**4.41**	**1.00**	**0.111**	**ug/L**
108-88-3	**Toluene**	**3.66**	**1.00**	**0.122**	**ug/L**
100-41-4	**Ethylbenzene**	**0.829J**	**1.00**	**0.109**	**ug/L**
1330-20-7	**Xylene (total)**	**9.15**	**3.00**	**0.179**	**ug/L**

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
460-00-4	4-Bromofluorobenzene	50	48.1	ug/L	96	78 - 130
1868-53-7	Dibromofluoromethane	50	52.6	ug/L	105	77 - 127
2037-26-5	Toluene d8	50	48.5	ug/L	97	76 - 134
17060-07-0	1,2-Dichloroethane-d4	50	52.9	ug/L	106	71 - 127

SW-846 8270D

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
02/28/2013 08:30	501924	SW-846 3510C	1	02/28/2013 13:28	EDS	501992

CAS#	Parameter	Result	RDL	MDL	Units
83-32-9	**Acenaphthene**	**5.83J**	**10.0**	**0.377**	**ug/L**
208-96-8	**Acenaphthylene**	**2.53J**	**10.0**	**0.302**	**ug/L**
120-12-7	**Anthracene**	**1.81J**	**10.0**	**0.249**	**ug/L**
56-55-3	**Benzo(a)anthracene**	**0.373J**	**10.0**	**0.310**	**ug/L**
50-32-8	Benzo(a)pyrene	0.051U	10.0	0.051	ug/L
205-99-2	Benzo(b)fluoranthene	0.278U	10.0	0.278	ug/L
191-24-2	Benzo(g,h,i)perylene	0.172U	10.0	0.172	ug/L
207-08-9	Benzo(k)fluoranthene	0.172U	10.0	0.172	ug/L
218-01-9	**Chrysene**	**0.408J**	**10.0**	**0.306**	**ug/L**
53-70-3	Dibenz(a,h)anthracene	0.135U	10.0	0.135	ug/L
206-44-0	**Fluoranthene**	**1.62J**	**10.0**	**0.189**	**ug/L**
86-73-7	**Fluorene**	**5.38J**	**10.0**	**0.250**	**ug/L**
193-39-5	Indeno(1,2,3-cd)pyrene	0.242U	10.0	0.242	ug/L
91-20-3	**Naphthalene**	**145**	**10.0**	**0.230**	**ug/L**
85-01-8	**Phenanthrene**	**9.65J**	**10.0**	**0.229**	**ug/L**
129-00-0	**Pyrene**	**1.87J**	**10.0**	**0.287**	**ug/L**

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
4165-60-0	Nitrobenzene-d5	50	45.3	ug/L	91	40 - 110
321-60-8	2-Fluorobiphenyl	50	41.7	ug/L	83	50 - 110
1718-51-0	Terphenyl-d14	50	32.9	ug/L	66	50 - 135

SW-846 6020A

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
02/27/2013 16:00	501931	SW-846 3010A	1	02/27/2013 21:16	AWG	501960

CAS#	Parameter	Result	RDL	MDL	Units
7440-38-2	**Arsenic**	**0.16J**	**1.00**	**0.094**	**ug/L**

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21302271505	**460-001 7 HR**	Water	02/21/2013 15:55	02/27/2013 09:45

SW-846 8260B

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
			1	02/27/2013 15:41	CGC	501911

CAS#	Parameter	Result	RDL	MDL	Units
71-43-2	Benzene	0.111U	1.00	0.111	ug/L
108-88-3	Toluene	0.122U	1.00	0.122	ug/L
100-41-4	Ethylbenzene	0.109U	1.00	0.109	ug/L
1330-20-7	Xylene (total)	0.179U	3.00	0.179	ug/L

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
460-00-4	4-Bromofluorobenzene	50	46.7	ug/L	93	78 - 130
1868-53-7	Dibromofluoromethane	50	52.5	ug/L	105	77 - 127
2037-26-5	Toluene d8	50	47.8	ug/L	96	76 - 134
17060-07-0	1,2-Dichloroethane-d4	50	54.3	ug/L	109	71 - 127

SW-846 8270D

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
02/28/2013 08:30	501924	SW-846 3510C	1	02/28/2013 13:46	EDS	501992

CAS#	Parameter	Result	RDL	MDL	Units
83-32-9	**Acenaphthene**	**3.44J**	**10.4**	**0.393**	**ug/L**
208-96-8	Acenaphthylene	0.315U	10.4	0.315	ug/L
120-12-7	**Anthracene**	**2.90J**	**10.4**	**0.259**	**ug/L**
56-55-3	**Benzo(a)anthracene**	**0.405J**	**10.4**	**0.323**	**ug/L**
50-32-8	Benzo(a)pyrene	0.053U	10.4	0.053	ug/L
205-99-2	Benzo(b)fluoranthene	0.290U	10.4	0.290	ug/L
191-24-2	Benzo(g,h,i)perylene	0.179U	10.4	0.179	ug/L
207-08-9	Benzo(k)fluoranthene	0.179U	10.4	0.179	ug/L
218-01-9	**Chrysene**	**0.412J**	**10.4**	**0.319**	**ug/L**
53-70-3	Dibenz(a,h)anthracene	0.141U	10.4	0.141	ug/L
206-44-0	**Fluoranthene**	**2.55J**	**10.4**	**0.197**	**ug/L**
86-73-7	**Fluorene**	**4.29J**	**10.4**	**0.260**	**ug/L**
193-39-5	Indeno(1,2,3-cd)pyrene	0.252U	10.4	0.252	ug/L
91-20-3	**Naphthalene**	**15.7**	**10.4**	**0.240**	**ug/L**
85-01-8	**Phenanthrene**	**12.3**	**10.4**	**0.239**	**ug/L**
129-00-0	**Pyrene**	**2.14J**	**10.4**	**0.299**	**ug/L**

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
4165-60-0	Nitrobenzene-d5	52.1	50.9	ug/L	98	40 - 110
321-60-8	2-Fluorobiphenyl	52.1	44.1	ug/L	85	50 - 110
1718-51-0	Terphenyl-d14	52.1	49.3	ug/L	95	50 - 135

SW-846 6020A

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
02/27/2013 16:00	501931	SW-846 3010A	1	02/27/2013 21:21	AWG	501960

CAS#	Parameter	Result	RDL	MDL	Units
7440-38-2	**Arsenic**	**1.23**	**1.00**	**0.094**	**ug/L**

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21302271506	**460-005 7 HR**	Water	02/21/2013 16:05	02/27/2013 09:45

SW-846 8260B

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
			1	02/27/2013 16:41	CGC	501911

CAS#	Parameter	Result	RDL	MDL	Units
71-43-2	**Benzene**	**7.26**	**1.00**	**0.111**	**ug/L**
108-88-3	**Toluene**	**6.04**	**1.00**	**0.122**	**ug/L**
100-41-4	**Ethylbenzene**	**1.17**	**1.00**	**0.109**	**ug/L**
1330-20-7	**Xylene (total)**	**8.98**	**3.00**	**0.179**	**ug/L**

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
460-00-4	4-Bromofluorobenzene	50	48.6	ug/L	97	78 - 130
1868-53-7	Dibromofluoromethane	50	53.9	ug/L	108	77 - 127
2037-26-5	Toluene d8	50	47.3	ug/L	95	76 - 134
17060-07-0	1,2-Dichloroethane-d4	50	55.2	ug/L	110	71 - 127

SW-846 8270D

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
02/28/2013 08:30	501924	SW-846 3510C	1	02/28/2013 14:03	EDS	501992

CAS#	Parameter	Result	RDL	MDL	Units
83-32-9	**Acenaphthene**	**5.60J**	**10.0**	**0.377**	**ug/L**
208-96-8	Acenaphthylene	0.302U	10.0	0.302	ug/L
120-12-7	**Anthracene**	**2.13J**	**10.0**	**0.249**	**ug/L**
56-55-3	**Benzo(a)anthracene**	**0.418J**	**10.0**	**0.310**	**ug/L**
50-32-8	Benzo(a)pyrene	0.051U	10.0	0.051	ug/L
205-99-2	Benzo(b)fluoranthene	0.278U	10.0	0.278	ug/L
191-24-2	Benzo(g,h,i)perylene	0.172U	10.0	0.172	ug/L
207-08-9	Benzo(k)fluoranthene	0.172U	10.0	0.172	ug/L
218-01-9	**Chrysene**	**0.489J**	**10.0**	**0.306**	**ug/L**
53-70-3	Dibenz(a,h)anthracene	0.135U	10.0	0.135	ug/L
206-44-0	**Fluoranthene**	**2.97J**	**10.0**	**0.189**	**ug/L**
86-73-7	**Fluorene**	**5.69J**	**10.0**	**0.250**	**ug/L**
193-39-5	Indeno(1,2,3-cd)pyrene	0.242U	10.0	0.242	ug/L
91-20-3	**Naphthalene**	**49.9**	**10.0**	**0.230**	**ug/L**
85-01-8	**Phenanthrene**	**13.4**	**10.0**	**0.229**	**ug/L**
129-00-0	**Pyrene**	**2.43J**	**10.0**	**0.287**	**ug/L**

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
4165-60-0	Nitrobenzene-d5	50	47.1	ug/L	94	40 - 110
321-60-8	2-Fluorobiphenyl	50	40.3	ug/L	81	50 - 110
1718-51-0	Terphenyl-d14	50	47	ug/L	94	50 - 135

SW-846 6020A

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
02/27/2013 16:00	501931	SW-846 3010A	1	02/27/2013 21:27	AWG	501960

CAS#	Parameter	Result	RDL	MDL	Units
7440-38-2	**Arsenic**	**0.25J**	**1.00**	**0.094**	**ug/L**

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21302271507	**460-006 7 HR**	Water	02/21/2013 16:15	02/27/2013 09:45

SW-846 8260B

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
			1	02/27/2013 17:42	CGC	501911

CAS#	Parameter	Result	RDL	MDL	Units
71-43-2	Benzene	0.111U	1.00	0.111	ug/L
108-88-3	Toluene	0.122U	1.00	0.122	ug/L
100-41-4	Ethylbenzene	0.109U	1.00	0.109	ug/L
1330-20-7	**Xylene (total)**	**6.79**	**3.00**	**0.179**	**ug/L**

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
460-00-4	4-Bromofluorobenzene	50	47.3	ug/L	95	78 - 130
1868-53-7	Dibromofluoromethane	50	53	ug/L	106	77 - 127
2037-26-5	Toluene d8	50	47.1	ug/L	94	76 - 134
17060-07-0	1,2-Dichloroethane-d4	50	54.7	ug/L	109	71 - 127

SW-846 8270D

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
02/28/2013 08:30	501924	SW-846 3510C	1	02/28/2013 14:20	EDS	501992

CAS#	Parameter	Result	RDL	MDL	Units
83-32-9	**Acenaphthene**	**10.6**	**10.0**	**0.377**	**ug/L**
208-96-8	**Acenaphthylene**	**4.51J**	**10.0**	**0.302**	**ug/L**
120-12-7	**Anthracene**	**3.15J**	**10.0**	**0.249**	**ug/L**
56-55-3	**Benzo(a)anthracene**	**0.795J**	**10.0**	**0.310**	**ug/L**
50-32-8	**Benzo(a)pyrene**	**0.477J**	**10.0**	**0.051**	**ug/L**
205-99-2	**Benzo(b)fluoranthene**	**0.283J**	**10.0**	**0.278**	**ug/L**
191-24-2	Benzo(g,h,i)perylene	0.172U	10.0	0.172	ug/L
207-08-9	**Benzo(k)fluoranthene**	**0.270J**	**10.0**	**0.172**	**ug/L**
218-01-9	**Chrysene**	**1.05J**	**10.0**	**0.306**	**ug/L**
53-70-3	Dibenz(a,h)anthracene	0.135U	10.0	0.135	ug/L
206-44-0	**Fluoranthene**	**3.26J**	**10.0**	**0.189**	**ug/L**
86-73-7	**Fluorene**	**9.55J**	**10.0**	**0.250**	**ug/L**
193-39-5	Indeno(1,2,3-cd)pyrene	0.242U	10.0	0.242	ug/L
85-01-8	**Phenanthrene**	**17.8**	**10.0**	**0.229**	**ug/L**
129-00-0	**Pyrene**	**3.68J**	**10.0**	**0.287**	**ug/L**

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
4165-60-0	Nitrobenzene-d5	50	46.7	ug/L	93	40 - 110
321-60-8	2-Fluorobiphenyl	50	41.2	ug/L	82	50 - 110
1718-51-0	Terphenyl-d14	50	44.8	ug/L	90	50 - 135

SW-846 8270D

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
02/28/2013 08:30	501924	SW-846 3510C	2	02/28/2013 14:55	EDS	501992

CAS#	Parameter	Result	RDL	MDL	Units
91-20-3	**Naphthalene**	**283**	**20.0**	**0.460**	**ug/L**

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
4165-60-0	Nitrobenzene-d5	50	45.6	ug/L	91	40 - 110

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21302271507	**460-006 7 HR**	Water	02/21/2013 16:15	02/27/2013 09:45

SW-846 8270D

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
02/28/2013 08:30	501924	SW-846 3510C	2	02/28/2013 14:55	EDS	501992

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
321-60-8	2-Fluorobiphenyl	50	42.6	ug/L	85	50 - 110
1718-51-0	Terphenyl-d14	50	44.7	ug/L	89	50 - 135

SW-846 6020A

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
02/27/2013 16:00	501931	SW-846 3010A	1	02/27/2013 20:14	AWG	501960

CAS#	Parameter	Result	RDL	MDL	Units
7440-38-2	**Arsenic**	**0.29J**	**1.00**	**0.094**	**ug/L**

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21302271508	**460-007 7 HR**	Water	02/21/2013 16:25	02/27/2013 09:45

SW-846 8260B

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
			1	02/27/2013 17:01	CGC	501911

CAS#	Parameter	Result	RDL	MDL	Units
71-43-2	**Benzene**	**0.589J**	**1.00**	**0.111**	**ug/L**
108-88-3	**Toluene**	**0.777J**	**1.00**	**0.122**	**ug/L**
100-41-4	**Ethylbenzene**	**0.516J**	**1.00**	**0.109**	**ug/L**
1330-20-7	**Xylene (total)**	**8.33**	**3.00**	**0.179**	**ug/L**

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
460-00-4	4-Bromofluorobenzene	50	48.9	ug/L	98	78 - 130
1868-53-7	Dibromofluoromethane	50	53.9	ug/L	108	77 - 127
2037-26-5	Toluene d8	50	47.1	ug/L	94	76 - 134
17060-07-0	1,2-Dichloroethane-d4	50	54.9	ug/L	110	71 - 127

SW-846 8270D

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
02/28/2013 08:30	501924	SW-846 3510C	1	02/28/2013 14:38	EDS	501992

CAS#	Parameter	Result	RDL	MDL	Units
83-32-9	**Acenaphthene**	**7.75J**	**10.0**	**0.377**	**ug/L**
208-96-8	**Acenaphthylene**	**3.27J**	**10.0**	**0.302**	**ug/L**
120-12-7	**Anthracene**	**2.39J**	**10.0**	**0.249**	**ug/L**
56-55-3	**Benzo(a)anthracene**	**0.464J**	**10.0**	**0.310**	**ug/L**
50-32-8	Benzo(a)pyrene	0.051U	10.0	0.051	ug/L
205-99-2	Benzo(b)fluoranthene	0.278U	10.0	0.278	ug/L
191-24-2	Benzo(g,h,i)perylene	0.172U	10.0	0.172	ug/L
207-08-9	Benzo(k)fluoranthene	0.172U	10.0	0.172	ug/L
218-01-9	**Chrysene**	**0.363J**	**10.0**	**0.306**	**ug/L**
53-70-3	Dibenz(a,h)anthracene	0.135U	10.0	0.135	ug/L
206-44-0	**Fluoranthene**	**2.16J**	**10.0**	**0.189**	**ug/L**
86-73-7	**Fluorene**	**7.26J**	**10.0**	**0.250**	**ug/L**
193-39-5	Indeno(1,2,3-cd)pyrene	0.242U	10.0	0.242	ug/L
91-20-3	**Naphthalene**	**184**	**10.0**	**0.230**	**ug/L**
85-01-8	**Phenanthrene**	**14.1**	**10.0**	**0.229**	**ug/L**
129-00-0	**Pyrene**	**2.41J**	**10.0**	**0.287**	**ug/L**

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
4165-60-0	Nitrobenzene-d5	50	45.1	ug/L	90	40 - 110
321-60-8	2-Fluorobiphenyl	50	39.8	ug/L	80	50 - 110
1718-51-0	Terphenyl-d14	50	45.8	ug/L	92	50 - 135

SW-846 6020A

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
02/27/2013 16:00	501931	SW-846 3010A	1	02/27/2013 21:33	AWG	501960

CAS#	Parameter	Result	RDL	MDL	Units
7440-38-2	**Arsenic**	**0.31J**	**1.00**	**0.094**	**ug/L**

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21302271509	**460-001 24 HR**	Water	02/22/2013 09:00	02/27/2013 09:45

SW-846 8260B

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
			1	02/27/2013 18:02	CGC	501911

CAS#	Parameter	Result	RDL	MDL	Units
71-43-2	**Benzene**	**21.6**	**1.00**	**0.111**	**ug/L**
108-88-3	**Toluene**	**19.1**	**1.00**	**0.122**	**ug/L**
100-41-4	**Ethylbenzene**	**4.07**	**1.00**	**0.109**	**ug/L**
1330-20-7	**Xylene (total)**	**17.1**	**3.00**	**0.179**	**ug/L**

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
460-00-4	4-Bromofluorobenzene	50	51.3	ug/L	103	78 - 130
1868-53-7	Dibromofluoromethane	50	52.3	ug/L	105	77 - 127
2037-26-5	Toluene d8	50	47.3	ug/L	95	76 - 134
17060-07-0	1,2-Dichloroethane-d4	50	54.5	ug/L	109	71 - 127

SW-846 8270D

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
02/28/2013 08:30	501924	SW-846 3510C	1	02/28/2013 15:12	EDS	501992

CAS#	Parameter	Result	RDL	MDL	Units
83-32-9	**Acenaphthene**	**7.18J**	**10.3**	**0.389**	**ug/L**
208-96-8	Acenaphthylene	0.311U	10.3	0.311	ug/L
120-12-7	**Anthracene**	**5.10J**	**10.3**	**0.257**	**ug/L**
56-55-3	**Benzo(a)anthracene**	**0.485J**	**10.3**	**0.320**	**ug/L**
50-32-8	Benzo(a)pyrene	0.053U	10.3	0.053	ug/L
205-99-2	Benzo(b)fluoranthene	0.287U	10.3	0.287	ug/L
191-24-2	Benzo(g,h,i)perylene	0.177U	10.3	0.177	ug/L
207-08-9	Benzo(k)fluoranthene	0.177U	10.3	0.177	ug/L
218-01-9	**Chrysene**	**0.347J**	**10.3**	**0.315**	**ug/L**
53-70-3	Dibenz(a,h)anthracene	0.139U	10.3	0.139	ug/L
206-44-0	**Fluoranthene**	**5.39J**	**10.3**	**0.195**	**ug/L**
86-73-7	**Fluorene**	**9.00J**	**10.3**	**0.258**	**ug/L**
193-39-5	Indeno(1,2,3-cd)pyrene	0.249U	10.3	0.249	ug/L
91-20-3	**Naphthalene**	**36.1**	**10.3**	**0.237**	**ug/L**
85-01-8	**Phenanthrene**	**23.9**	**10.3**	**0.236**	**ug/L**
129-00-0	**Pyrene**	**3.75J**	**10.3**	**0.296**	**ug/L**

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
4165-60-0	Nitrobenzene-d5	51.5	46.7	ug/L	91	40 - 110
321-60-8	2-Fluorobiphenyl	51.5	43.9	ug/L	85	50 - 110
1718-51-0	Terphenyl-d14	51.5	42.3	ug/L	82	50 - 135

SW-846 6020A

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
02/27/2013 16:00	501931	SW-846 3010A	1	02/27/2013 21:38	AWG	501960

CAS#	Parameter	Result	RDL	MDL	Units
7440-38-2	**Arsenic**	**2.16**	**1.00**	**0.094**	**ug/L**

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21302271510	**460-005 24 HR**	Water	02/22/2013 09:15	02/27/2013 09:45

SW-846 8260B

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
			1	02/27/2013 17:21	CGC	501911

CAS#	Parameter	Result	RDL	MDL	Units
71-43-2	**Benzene**	**6.94**	**1.00**	**0.111**	**ug/L**
108-88-3	**Toluene**	**5.97**	**1.00**	**0.122**	**ug/L**
100-41-4	**Ethylbenzene**	**1.16**	**1.00**	**0.109**	**ug/L**
1330-20-7	**Xylene (total)**	**9.58**	**3.00**	**0.179**	**ug/L**

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
460-00-4	4-Bromofluorobenzene	50	49.5	ug/L	99	78 - 130
1868-53-7	Dibromofluoromethane	50	53.3	ug/L	107	77 - 127
2037-26-5	Toluene d8	50	47	ug/L	94	76 - 134
17060-07-0	1,2-Dichloroethane-d4	50	54	ug/L	108	71 - 127

SW-846 8270D

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
02/28/2013 08:30	501924	SW-846 3510C	1	02/28/2013 15:30	EDS	501992

CAS#	Parameter	Result	RDL	MDL	Units
83-32-9	**Acenaphthene**	**13.0**	**10.0**	**0.377**	**ug/L**
208-96-8	Acenaphthylene	0.302U	10.0	0.302	ug/L
120-12-7	**Anthracene**	**4.57J**	**10.0**	**0.249**	**ug/L**
56-55-3	**Benzo(a)anthracene**	**0.764J**	**10.0**	**0.310**	**ug/L**
50-32-8	Benzo(a)pyrene	0.051U	10.0	0.051	ug/L
205-99-2	Benzo(b)fluoranthene	0.278U	10.0	0.278	ug/L
191-24-2	Benzo(g,h,i)perylene	0.172U	10.0	0.172	ug/L
207-08-9	Benzo(k)fluoranthene	0.172U	10.0	0.172	ug/L
218-01-9	**Chrysene**	**0.596J**	**10.0**	**0.306**	**ug/L**
53-70-3	Dibenz(a,h)anthracene	0.135U	10.0	0.135	ug/L
206-44-0	**Fluoranthene**	**5.61J**	**10.0**	**0.189**	**ug/L**
86-73-7	**Fluorene**	**13.2**	**10.0**	**0.250**	**ug/L**
193-39-5	Indeno(1,2,3-cd)pyrene	0.242U	10.0	0.242	ug/L
91-20-3	**Naphthalene**	**111**	**10.0**	**0.230**	**ug/L**
85-01-8	**Phenanthrene**	**28.8**	**10.0**	**0.229**	**ug/L**
129-00-0	**Pyrene**	**4.26J**	**10.0**	**0.287**	**ug/L**

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
4165-60-0	Nitrobenzene-d5	50	43.8	ug/L	88	40 - 110
321-60-8	2-Fluorobiphenyl	50	42.3	ug/L	85	50 - 110
1718-51-0	Terphenyl-d14	50	40.8	ug/L	82	50 - 135

SW-846 6020A

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
02/27/2013 16:00	501931	SW-846 3010A	1	02/27/2013 22:01	AWG	501960

CAS#	Parameter	Result	RDL	MDL	Units
7440-38-2	**Arsenic**	**0.57J**	**1.00**	**0.094**	**ug/L**

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21302271511	**460-006 24 HR**	Water	02/22/2013 09:25	02/27/2013 09:45

SW-846 8260B

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
			1	02/27/2013 18:22	CGC	501911

CAS#	Parameter	Result	RDL	MDL	Units
71-43-2	**Benzene**	**19.1**	**1.00**	**0.111**	**ug/L**
108-88-3	**Toluene**	**16.0**	**1.00**	**0.122**	**ug/L**
100-41-4	**Ethylbenzene**	**3.38**	**1.00**	**0.109**	**ug/L**
1330-20-7	**Xylene (total)**	**14.4**	**3.00**	**0.179**	**ug/L**

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
460-00-4	4-Bromofluorobenzene	50	50.3	ug/L	101	78 - 130
1868-53-7	Dibromofluoromethane	50	51.9	ug/L	104	77 - 127
2037-26-5	Toluene d8	50	47.8	ug/L	96	76 - 134
17060-07-0	1,2-Dichloroethane-d4	50	52.8	ug/L	106	71 - 127

SW-846 8270D

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
02/28/2013 08:30	501924	SW-846 3510C	1	02/28/2013 15:47	EDS	501992

CAS#	Parameter	Result	RDL	MDL	Units
83-32-9	**Acenaphthene**	**22.9**	**10.0**	**0.377**	**ug/L**
208-96-8	**Acenaphthylene**	**9.53J**	**10.0**	**0.302**	**ug/L**
120-12-7	**Anthracene**	**5.93J**	**10.0**	**0.249**	**ug/L**
56-55-3	**Benzo(a)anthracene**	**0.797J**	**10.0**	**0.310**	**ug/L**
50-32-8	Benzo(a)pyrene	0.051U	10.0	0.051	ug/L
205-99-2	Benzo(b)fluoranthene	0.278U	10.0	0.278	ug/L
191-24-2	Benzo(g,h,i)perylene	0.172U	10.0	0.172	ug/L
207-08-9	Benzo(k)fluoranthene	0.172U	10.0	0.172	ug/L
218-01-9	**Chrysene**	**0.559J**	**10.0**	**0.306**	**ug/L**
53-70-3	Dibenz(a,h)anthracene	0.135U	10.0	0.135	ug/L
206-44-0	**Fluoranthene**	**4.98J**	**10.0**	**0.189**	**ug/L**
86-73-7	**Fluorene**	**20.5**	**10.0**	**0.250**	**ug/L**
193-39-5	Indeno(1,2,3-cd)pyrene	0.242U	10.0	0.242	ug/L
85-01-8	**Phenanthrene**	**35.7**	**10.0**	**0.229**	**ug/L**
129-00-0	**Pyrene**	**5.41J**	**10.0**	**0.287**	**ug/L**

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
4165-60-0	Nitrobenzene-d5	50	43.1	ug/L	86	40 - 110
321-60-8	2-Fluorobiphenyl	50	40	ug/L	80	50 - 110
1718-51-0	Terphenyl-d14	50	37.8	ug/L	76	50 - 135

SW-846 8270D

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
02/28/2013 08:30	501924	SW-846 3510C	4	02/28/2013 17:49	EDS	501992

CAS#	Parameter	Result	RDL	MDL	Units
91-20-3	**Naphthalene**	**501**	**40.0**	**0.920**	**ug/L**

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
4165-60-0	Nitrobenzene-d5	50	36.7	ug/L	73	40 - 110

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21302271511	**460-006 24 HR**	Water	02/22/2013 09:25	02/27/2013 09:45

SW-846 8270D

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
02/28/2013 08:30	501924	SW-846 3510C	4	02/28/2013 17:49	EDS	501992

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
321-60-8	2-Fluorobiphenyl	50	33.2	ug/L	66	50 - 110
1718-51-0	Terphenyl-d14	50	27.7	ug/L	55	50 - 135

SW-846 6020A

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
02/27/2013 16:00	501931	SW-846 3010A	1	02/27/2013 22:06	AWG	501960

CAS#	Parameter	Result	RDL	MDL	Units
7440-38-2	**Arsenic**	**0.13J**	**1.00**	**0.094**	**ug/L**

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21302271512	**460-007 24 HR**	Water	02/22/2013 09:40	02/27/2013 09:45

SW-846 8260B

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
			1	02/27/2013 18:42	CGC	501911

CAS#	Parameter	Result	RDL	MDL	Units
71-43-2	Benzene	0.111U	1.00	0.111	ug/L
108-88-3	**Toluene**	**0.361J**	**1.00**	**0.122**	**ug/L**
100-41-4	Ethylbenzene	0.109U	1.00	0.109	ug/L
1330-20-7	Xylene (total)	0.179U	3.00	0.179	ug/L

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
460-00-4	4-Bromofluorobenzene	50	47.9	ug/L	96	78 - 130
1868-53-7	Dibromofluoromethane	50	52.6	ug/L	105	77 - 127
2037-26-5	Toluene d8	50	47.6	ug/L	95	76 - 134
17060-07-0	1,2-Dichloroethane-d4	50	53.7	ug/L	107	71 - 127

SW-846 8270D

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
02/28/2013 08:30	501924	SW-846 3510C	1	02/28/2013 16:05	EDS	501992

CAS#	Parameter	Result	RDL	MDL	Units
83-32-9	**Acenaphthene**	**18.2**	**10.0**	**0.377**	**ug/L**
208-96-8	**Acenaphthylene**	**7.61J**	**10.0**	**0.302**	**ug/L**
120-12-7	**Anthracene**	**5.42J**	**10.0**	**0.249**	**ug/L**
56-55-3	**Benzo(a)anthracene**	**0.762J**	**10.0**	**0.310**	**ug/L**
50-32-8	**Benzo(a)pyrene**	**0.233J**	**10.0**	**0.051**	**ug/L**
205-99-2	Benzo(b)fluoranthene	0.278U	10.0	0.278	ug/L
191-24-2	Benzo(g,h,i)perylene	0.172U	10.0	0.172	ug/L
207-08-9	Benzo(k)fluoranthene	0.172U	10.0	0.172	ug/L
218-01-9	**Chrysene**	**0.690J**	**10.0**	**0.306**	**ug/L**
53-70-3	Dibenz(a,h)anthracene	0.135U	10.0	0.135	ug/L
206-44-0	**Fluoranthene**	**5.29J**	**10.0**	**0.189**	**ug/L**
86-73-7	**Fluorene**	**18.2**	**10.0**	**0.250**	**ug/L**
193-39-5	Indeno(1,2,3-cd)pyrene	0.242U	10.0	0.242	ug/L
85-01-8	**Phenanthrene**	**34.0**	**10.0**	**0.229**	**ug/L**
129-00-0	**Pyrene**	**5.21J**	**10.0**	**0.287**	**ug/L**

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
4165-60-0	Nitrobenzene-d5	50	44.5	ug/L	89	40 - 110
321-60-8	2-Fluorobiphenyl	50	41.7	ug/L	83	50 - 110
1718-51-0	Terphenyl-d14	50	42.3	ug/L	85	50 - 135

SW-846 8270D

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
02/28/2013 08:30	501924	SW-846 3510C	4	02/28/2013 18:06	EDS	501992

CAS#	Parameter	Result	RDL	MDL	Units
91-20-3	**Naphthalene**	**379**	**40.0**	**0.920**	**ug/L**

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
4165-60-0	Nitrobenzene-d5	50	38.3	ug/L	77	40 - 110

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21302271512	**460-007 24 HR**	Water	02/22/2013 09:40	02/27/2013 09:45

SW-846 8270D

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
02/28/2013 08:30	501924	SW-846 3510C	4	02/28/2013 18:06	EDS	501992

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
321-60-8	2-Fluorobiphenyl	50	34.8	ug/L	70	50 - 110
1718-51-0	Terphenyl-d14	50	36.2	ug/L	72	50 - 135

SW-846 6020A

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
02/27/2013 16:00	501931	SW-846 3010A	1	02/27/2013 22:12	AWG	501960

CAS#	Parameter	Result	RDL	MDL	Units
7440-38-2	**Arsenic**	**0.19J**	**1.00**	**0.094**	**ug/L**

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21302271513	**460-001 5 DAY**	Water	02/26/2013 09:05	02/27/2013 09:45

SW-846 8260B

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
			1	02/27/2013 20:34	CGC	501911

CAS#	Parameter	Result	RDL	MDL	Units
71-43-2	**Benzene**	**0.344J**	**1.00**	**0.111**	**ug/L**
108-88-3	**Toluene**	**1.07**	**1.00**	**0.122**	**ug/L**
100-41-4	**Ethylbenzene**	**0.959J**	**1.00**	**0.109**	**ug/L**
1330-20-7	**Xylene (total)**	**8.06**	**3.00**	**0.179**	**ug/L**

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
460-00-4	4-Bromofluorobenzene	50	50.1	ug/L	100	78 - 130
1868-53-7	Dibromofluoromethane	50	52.8	ug/L	106	77 - 127
2037-26-5	Toluene d8	50	45.7	ug/L	91	76 - 134
17060-07-0	1,2-Dichloroethane-d4	50	55.3	ug/L	111	71 - 127

SW-846 8270D

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
02/28/2013 08:30	501924	SW-846 3510C	1	02/28/2013 16:39	EDS	501992

CAS#	Parameter	Result	RDL	MDL	Units
83-32-9	**Acenaphthene**	**5.75J**	**10.4**	**0.393**	**ug/L**
208-96-8	Acenaphthylene	0.315U	10.4	0.315	ug/L
120-12-7	**Anthracene**	**3.43J**	**10.4**	**0.259**	**ug/L**
56-55-3	**Benzo(a)anthracene**	**0.436J**	**10.4**	**0.323**	**ug/L**
50-32-8	Benzo(a)pyrene	0.053U	10.4	0.053	ug/L
205-99-2	Benzo(b)fluoranthene	0.290U	10.4	0.290	ug/L
191-24-2	Benzo(g,h,i)perylene	0.179U	10.4	0.179	ug/L
207-08-9	Benzo(k)fluoranthene	0.179U	10.4	0.179	ug/L
218-01-9	**Chrysene**	**0.360J**	**10.4**	**0.319**	**ug/L**
53-70-3	Dibenz(a,h)anthracene	0.141U	10.4	0.141	ug/L
206-44-0	**Fluoranthene**	**4.17J**	**10.4**	**0.197**	**ug/L**
86-73-7	**Fluorene**	**6.94J**	**10.4**	**0.260**	**ug/L**
193-39-5	Indeno(1,2,3-cd)pyrene	0.252U	10.4	0.252	ug/L
91-20-3	**Naphthalene**	**32.8**	**10.4**	**0.240**	**ug/L**
85-01-8	**Phenanthrene**	**19.6**	**10.4**	**0.239**	**ug/L**
129-00-0	**Pyrene**	**3.30J**	**10.4**	**0.299**	**ug/L**

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
4165-60-0	Nitrobenzene-d5	52.1	44.7	ug/L	86	40 - 110
321-60-8	2-Fluorobiphenyl	52.1	40.8	ug/L	78	50 - 110
1718-51-0	Terphenyl-d14	52.1	39.4	ug/L	76	50 - 135

SW-846 6020A

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
02/27/2013 16:00	501931	SW-846 3010A	1	02/27/2013 22:18	AWG	501960

CAS#	Parameter	Result	RDL	MDL	Units
7440-38-2	**Arsenic**	**3.65**	**1.00**	**0.094**	**ug/L**

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21302271514	**460-005 5 DAY**	Water	02/26/2013 09:15	02/27/2013 09:45

SW-846 8260B

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
			1	02/27/2013 20:54	CGC	501911

CAS#	Parameter	Result	RDL	MDL	Units
71-43-2	**Benzene**	**0.540J**	**1.00**	**0.111**	**ug/L**
108-88-3	**Toluene**	**0.849J**	**1.00**	**0.122**	**ug/L**
100-41-4	**Ethylbenzene**	**0.524J**	**1.00**	**0.109**	**ug/L**
1330-20-7	**Xylene (total)**	**7.57**	**3.00**	**0.179**	**ug/L**

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
460-00-4	4-Bromofluorobenzene	50	47.9	ug/L	96	78 - 130
1868-53-7	Dibromofluoromethane	50	53.1	ug/L	106	77 - 127
2037-26-5	Toluene d8	50	46.7	ug/L	93	76 - 134
17060-07-0	1,2-Dichloroethane-d4	50	53.8	ug/L	108	71 - 127

SW-846 8270D

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
02/28/2013 08:30	501924	SW-846 3510C	1	02/28/2013 16:57	EDS	501992

CAS#	Parameter	Result	RDL	MDL	Units
83-32-9	**Acenaphthene**	**12.0**	**10.0**	**0.377**	**ug/L**
208-96-8	Acenaphthylene	0.302U	10.0	0.302	ug/L
120-12-7	**Anthracene**	**4.41J**	**10.0**	**0.249**	**ug/L**
56-55-3	**Benzo(a)anthracene**	**0.470J**	**10.0**	**0.310**	**ug/L**
50-32-8	Benzo(a)pyrene	0.051U	10.0	0.051	ug/L
205-99-2	Benzo(b)fluoranthene	0.278U	10.0	0.278	ug/L
191-24-2	Benzo(g,h,i)perylene	0.172U	10.0	0.172	ug/L
207-08-9	Benzo(k)fluoranthene	0.172U	10.0	0.172	ug/L
218-01-9	**Chrysene**	**0.354J**	**10.0**	**0.306**	**ug/L**
53-70-3	Dibenz(a,h)anthracene	0.135U	10.0	0.135	ug/L
206-44-0	**Fluoranthene**	**5.57J**	**10.0**	**0.189**	**ug/L**
86-73-7	**Fluorene**	**11.6**	**10.0**	**0.250**	**ug/L**
193-39-5	Indeno(1,2,3-cd)pyrene	0.242U	10.0	0.242	ug/L
91-20-3	**Naphthalene**	**105**	**10.0**	**0.230**	**ug/L**
85-01-8	**Phenanthrene**	**29.8**	**10.0**	**0.229**	**ug/L**
129-00-0	**Pyrene**	**4.44J**	**10.0**	**0.287**	**ug/L**

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
4165-60-0	Nitrobenzene-d5	50	43.1	ug/L	86	40 - 110
321-60-8	2-Fluorobiphenyl	50	40	ug/L	80	50 - 110
1718-51-0	Terphenyl-d14	50	35.6	ug/L	71	50 - 135

SW-846 6020A

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
02/27/2013 16:00	501931	SW-846 3010A	1	02/27/2013 22:23	AWG	501960

CAS#	Parameter	Result	RDL	MDL	Units
7440-38-2	**Arsenic**	**1.46**	**1.00**	**0.094**	**ug/L**

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21302271515	**460-006 5 DAY**	Water	02/26/2013 09:25	02/27/2013 09:45

SW-846 8260B

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
			1	02/27/2013 21:17	CGC	501911

CAS#	Parameter	Result	RDL	MDL	Units
71-43-2	**Benzene**	**22.2**	**1.00**	**0.111**	**ug/L**
108-88-3	**Toluene**	**23.5**	**1.00**	**0.122**	**ug/L**
100-41-4	**Ethylbenzene**	**5.79**	**1.00**	**0.109**	**ug/L**
1330-20-7	**Xylene (total)**	**21.5**	**3.00**	**0.179**	**ug/L**

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
460-00-4	4-Bromofluorobenzene	50	50.5	ug/L	101	78 - 130
1868-53-7	Dibromofluoromethane	50	53.7	ug/L	107	77 - 127
2037-26-5	Toluene d8	50	46.7	ug/L	93	76 - 134
17060-07-0	1,2-Dichloroethane-d4	50	53.1	ug/L	106	71 - 127

SW-846 8270D

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
02/28/2013 08:30	501924	SW-846 3510C	1	02/28/2013 17:14	EDS	501992

CAS#	Parameter	Result	RDL	MDL	Units
83-32-9	**Acenaphthene**	**20.3**	**10.0**	**0.377**	**ug/L**
208-96-8	**Acenaphthylene**	**7.87J**	**10.0**	**0.302**	**ug/L**
120-12-7	**Anthracene**	**4.80J**	**10.0**	**0.249**	**ug/L**
56-55-3	**Benzo(a)anthracene**	**0.616J**	**10.0**	**0.310**	**ug/L**
50-32-8	Benzo(a)pyrene	0.051U	10.0	0.051	ug/L
205-99-2	Benzo(b)fluoranthene	0.278U	10.0	0.278	ug/L
191-24-2	Benzo(g,h,i)perylene	0.172U	10.0	0.172	ug/L
207-08-9	Benzo(k)fluoranthene	0.172U	10.0	0.172	ug/L
218-01-9	**Chrysene**	**0.512J**	**10.0**	**0.306**	**ug/L**
53-70-3	Dibenz(a,h)anthracene	0.135U	10.0	0.135	ug/L
206-44-0	**Fluoranthene**	**4.84J**	**10.0**	**0.189**	**ug/L**
86-73-7	**Fluorene**	**18.5**	**10.0**	**0.250**	**ug/L**
193-39-5	Indeno(1,2,3-cd)pyrene	0.242U	10.0	0.242	ug/L
85-01-8	**Phenanthrene**	**34.3**	**10.0**	**0.229**	**ug/L**
129-00-0	**Pyrene**	**5.00J**	**10.0**	**0.287**	**ug/L**

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
4165-60-0	Nitrobenzene-d5	50	42.3	ug/L	85	40 - 110
321-60-8	2-Fluorobiphenyl	50	41	ug/L	82	50 - 110
1718-51-0	Terphenyl-d14	50	40.9	ug/L	82	50 - 135

SW-846 8270D

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
02/28/2013 08:30	501924	SW-846 3510C	4	02/28/2013 18:23	EDS	501992

CAS#	Parameter	Result	RDL	MDL	Units
91-20-3	**Naphthalene**	**402**	**40.0**	**0.920**	**ug/L**

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
4165-60-0	Nitrobenzene-d5	50	31.2	ug/L	62	40 - 110

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21302271515	**460-006 5 DAY**	Water	02/26/2013 09:25	02/27/2013 09:45

SW-846 8270D

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
02/28/2013 08:30	501924	SW-846 3510C	4	02/28/2013 18:23	EDS	501992

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
321-60-8	2-Fluorobiphenyl	50	30.8	ug/L	62	50 - 110
1718-51-0	Terphenyl-d14	50	28.4	ug/L	57	50 - 135

SW-846 6020A

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
02/27/2013 16:00	501931	SW-846 3010A	1	02/27/2013 22:29	AWG	501960

CAS#	Parameter	Result	RDL	MDL	Units
7440-38-2	**Arsenic**	**0.43J**	**1.00**	**0.094**	**ug/L**

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21302271516	**460-007 5 DAY**	Water	02/26/2013 09:40	02/27/2013 09:45

SW-846 8260B

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
			1	02/27/2013 21:37	CGC	501911

CAS#	Parameter	Result	RDL	MDL	Units
71-43-2	**Benzene**	**16.2**	**1.00**	**0.111**	**ug/L**
108-88-3	**Toluene**	**16.2**	**1.00**	**0.122**	**ug/L**
100-41-4	**Ethylbenzene**	**3.72**	**1.00**	**0.109**	**ug/L**
1330-20-7	**Xylene (total)**	**15.2**	**3.00**	**0.179**	**ug/L**

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
460-00-4	4-Bromofluorobenzene	50	50	ug/L	100	78 - 130
1868-53-7	Dibromofluoromethane	50	53.2	ug/L	106	77 - 127
2037-26-5	Toluene d8	50	47.1	ug/L	94	76 - 134
17060-07-0	1,2-Dichloroethane-d4	50	52.5	ug/L	105	71 - 127

SW-846 8270D

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
02/28/2013 08:30	501924	SW-846 3510C	1	02/28/2013 17:31	EDS	501992

CAS#	Parameter	Result	RDL	MDL	Units
83-32-9	**Acenaphthene**	**16.0**	**10.0**	**0.377**	**ug/L**
208-96-8	**Acenaphthylene**	**6.20J**	**10.0**	**0.302**	**ug/L**
120-12-7	**Anthracene**	**3.88J**	**10.0**	**0.249**	**ug/L**
56-55-3	**Benzo(a)anthracene**	**0.483J**	**10.0**	**0.310**	**ug/L**
50-32-8	Benzo(a)pyrene	0.051U	10.0	0.051	ug/L
205-99-2	Benzo(b)fluoranthene	0.278U	10.0	0.278	ug/L
191-24-2	Benzo(g,h,i)perylene	0.172U	10.0	0.172	ug/L
207-08-9	Benzo(k)fluoranthene	0.172U	10.0	0.172	ug/L
218-01-9	**Chrysene**	**0.428J**	**10.0**	**0.306**	**ug/L**
53-70-3	Dibenz(a,h)anthracene	0.135U	10.0	0.135	ug/L
206-44-0	**Fluoranthene**	**4.63J**	**10.0**	**0.189**	**ug/L**
86-73-7	**Fluorene**	**15.7**	**10.0**	**0.250**	**ug/L**
193-39-5	Indeno(1,2,3-cd)pyrene	0.242U	10.0	0.242	ug/L
85-01-8	**Phenanthrene**	**30.9**	**10.0**	**0.229**	**ug/L**
129-00-0	**Pyrene**	**4.93J**	**10.0**	**0.287**	**ug/L**

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
4165-60-0	Nitrobenzene-d5	50	3.62	ug/L	**7***	40 - 110
321-60-8	2-Fluorobiphenyl	50	40.9	ug/L	82	50 - 110
1718-51-0	Terphenyl-d14	50	43.7	ug/L	87	50 - 135

SW-846 8270D

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
02/28/2013 08:30	501924	SW-846 3510C	4	02/28/2013 18:40	EDS	501992

CAS#	Parameter	Result	RDL	MDL	Units
91-20-3	**Naphthalene**	**318**	**40.0**	**0.920**	**ug/L**

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
4165-60-0	Nitrobenzene-d5	50	36.4	ug/L	73	40 - 110

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21302271516	**460-007 5 DAY**	Water	02/26/2013 09:40	02/27/2013 09:45

SW-846 8270D

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
02/28/2013 08:30	501924	SW-846 3510C	4	02/28/2013 18:40	EDS	501992

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
321-60-8	2-Fluorobiphenyl	50	36.1	ug/L	72	50 - 110
1718-51-0	Terphenyl-d14	50	33.6	ug/L	67	50 - 135

SW-846 6020A

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
02/27/2013 16:00	501931	SW-846 3010A	1	02/27/2013 22:34	AWG	501960

CAS#	Parameter	Result	RDL	MDL	Units
7440-38-2	**Arsenic**	**0.41J**	**1.00**	**0.094**	**ug/L**

GC/MS Volatiles Quality Control Summary

Analytical Batch 501911	**Client ID**	MB501911	LCS501911	LCSD501911	
Prep Batch N/A	**GCAL ID**	1165426	1165427	1165428	
	Sample Type	Method Blank	LCS	LCSD	
	Analytical Date	02/27/2013 12:35	02/27/2013 11:12	02/27/2013 11:32	
	Matrix	Water	Water	Water	

SW-846 8260B		**Units**	ug/L	**Spike**	**Result**		**Control**	**Result**			**RPD**
		Result	**RDL**	**Added**		**% R**	**Limits % R**		**% R**	**RPD**	**Limit**
100-41-4	Ethylbenzene	0.109U	0.109	50.0	55.9	112	74 - 126	51.0	102	9	30
75-69-4	Trichlorofluoromethane	0.157U	0.157	50.0	59.1	118	72 - 136	58.3	117	1	30
96-12-8	1,2-Dibromo-3-chloropropane	0.194U	0.194	50.0	43.6	87	57 - 121	46.3	93	6	30
1330-20-7	Xylene (total)	0.179U	0.179	150	152	101	74 - 127	137	91	10	30
76-13-1	Trichlorotrifluoroethane	0.158U	0.158	50.0	54.7	109	72 - 136	50.3	101	8	30
71-43-2	Benzene	0.111U	0.111	50.0	55.7	111	70 - 129	54.1	108	3	20
108-88-3	Toluene	0.122U	0.122	50.0	49.8	100	72 - 120	47.7	95	4	20
Surrogate											
460-00-4	4-Bromofluorobenzene	47.9	96	50	49.6	99	78 - 130	49.7	99		
1868-53-7	Dibromofluoromethane	52.9	106	50	51.4	103	77 - 127	52	104		
2037-26-5	Toluene d8	48.6	97	50	46.9	94	76 - 134	46.6	93		
17060-07-0	1,2-Dichloroethane-d4	52.1	104	50	51.8	104	71 - 127	51.8	104		

GC/MS Semi-Volatiles Quality Control Summary

Analytical Batch	501992	**Client ID**	MB501924	LCS501924	LCSD501924
Prep Batch	501924	**GCAL ID**	1165498	1165499	1165500
Prep Method	SW-846	**Sample Type**	Method Blank	LCS	LCSD
	3510C	**Prep Date**	02/28/2013 08:30	02/28/2013 08:30	02/28/2013 08:30
		Analytical Date	02/28/2013 11:44	02/28/2013 12:02	02/28/2013 16:22
		Matrix	Water	Water	Water

SW-846 8270D		**Units**	ug/L	**Spike**	**Result**		**Control**	**Result**			**RPD**
		Result	**RDL**	**Added**		**% R**	**Limits % R**		**% R**	**RPD**	**Limit**
208-96-8	Acenaphthylene	0.302U	0.302	100	90.6	91	55 - 120	87.2	87	4	30
120-12-7	Anthracene	0.249U	0.249	100	95.0	95	58 - 120	87.4	87	8	30
56-55-3	Benzo(a)anthracene	0.310U	0.310	100	94.5	95	56 - 120	83.0	83	13	30
205-99-2	Benzo(b)fluoranthene	0.278U	0.278	100	98.8	99	55 - 120	88.4	88	11	30
207-08-9	Benzo(k)fluoranthene	0.172U	0.172	100	96.6	97	49 - 121	84.6	85	13	30
191-24-2	Benzo(g,h,i)perylene	0.172U	0.172	100	89.8	90	44 - 132	82.4	82	9	30
50-32-8	Benzo(a)pyrene	0.051U	0.051	100	93.4	93	56 - 120	84.8	85	10	30
218-01-9	Chrysene	0.306U	0.306	100	88.1	88	58 - 120	79.9	80	10	30
53-70-3	Dibenz(a,h)anthracene	0.135U	0.135	100	97.1	97	50 - 138	86.6	87	11	30
206-44-0	Fluoranthene	0.189U	0.189	100	102	102	55 - 120	88.9	89	14	30
86-73-7	Fluorene	0.250U	0.250	100	92.8	93	54 - 120	86.9	87	7	30
193-39-5	Indeno(1,2,3-cd)pyrene	0.242U	0.242	100	93.4	93	43 - 133	85.7	86	9	30
91-20-3	Naphthalene	0.230U	0.230	100	90.3	90	44 - 120	81.3	81	10	30
85-01-8	Phenanthrene	0.229U	0.229	100	90.0	90	58 - 120	84.2	84	7	30
83-32-9	Acenaphthene	0.377U	0.377	100	88.7	89	52 - 120	84.0	84	5	30
129-00-0	Pyrene	0.287U	0.287	100	89.8	90	54 - 120	77.9	78	14	30
Surrogate											
4165-60-0	Nitrobenzene-d5	42.5	85	50	45.9	92	40 - 110	41.1	82		
321-60-8	2-Fluorobiphenyl	39.9	80	50	40.3	81	50 - 110	38.4	77		
1718-51-0	Terphenyl-d14	37.8	76	50	36.8	74	50 - 135	35.3	71		

Inorganics Quality Control Summary

Analytical Batch	501960	**Client ID**	MB501931			LCS501931		
Prep Batch	501931	**GCAL ID**	1165539			1165540		
Prep Method	SW-846	**Sample Type**	Method Blank			LCS		
	3010A	**Prep Date**	02/27/2013 16:00			02/27/2013 16:00		
		Analytical Date	02/27/2013 20:03			02/27/2013 20:08		
		Matrix	Water			Water		
SW-846 6020A			**Units**	ug/L	**Spike**	**Result**		**Control**
			Result	**RDL**	**Added**		**% R**	**Limits % R**
7440-38-2	Arsenic		0.094U	0.094	50.0	49.4	99	80 - 120

Analytical Batch	501960	**Client ID**	460-006 7 HR			1165399MS			1165399MSD			
Prep Batch	501931	**GCAL ID**	21302271507			1165541			1165542			
Prep Method	SW-846	**Sample Type**	SAMPLE			MS			MSD			
	3010A	**Prep Date**	02/27/2013 16:00			02/27/2013 16:00			02/27/2013 16:00			
		Analytical Date	02/27/2013 20:14			02/27/2013 20:19			02/27/2013 20:25			
		Matrix	Water			Water			Water			
SW-846 6020A			**Units**	ug/L	**Spike**	**Result**		**Control**	**Result**			**RPD**
			Result	**RDL**	**Added**		**% R**	**Limits % R**		**% R**	**RPD**	**Limit**
7440-38-2	Arsenic		0.29	0.094	50.0	49.4	98	80 - 120	48.4	96	2	20

GCAL

7979 GSRI Avenue, Baton Rouge, Louisiana 70820-7402
Phone 225.769.4900 • Fax 225.767.5717

CHAIN OF CUSTODY RECORD

Lab use only			
KEMRON	4794	213022715	03/01/13
Client Name	Client #	Workorder #	Due Date

Report to:
Client: Kemron Environmental Inc.
Address: 1359-A Ellsworth Ind. Blvd
Atlanta, Ga 30318
Contact: Tommy Jordan
Phone: 404-601-6927
Fax: 404-636-7162

Bill to:
Client: Kemron Environmental Inc
Address: 1359-A Ellsworth Ind. Blvd
Atlanta, Ga 30318
Contact: Tommy Jordan
Phone: 404-601-6927
Fax: 404-636-7162

P.O. Number:
Project Name/Number: Quanta / SH0460
Sampled By: Tomecia Riley

Analytical Requests & Method

Lab use only:
Custody Seal
used ☑ yes ☐ no
intact ☑ yes ☐ no
Temperature °C 0.3, 1.1

Matrix[1]	Date	Time (2400)	Comp	Grab	Sample Description	Preservatives	No Containers	BTEX 8260	PAH 8270	Total Arsenic ~~6010~~ 6020	SMC 2/27/13	Remarks:	Lab ID 02/27
W	2/21/13	1120		X	460-001 2 hr	None/HCl/HNO3	5	X	X	X		RUSH 48 hr	1
		1140		X	460-005 2 hr			X	X	X			2
		1155		X	460-006 2 hr			X	X	X			3
		1205		X	460-007 2 hr			X	X	X			4
		1555		X	460-001 7 hr			X	X	X			5
		1605		X	460-005 7 hr			X	X	X			6
		1615		X	460-006 7 hr			X	X	X			7
		1625		X	460-007 7 hr			X	X	X			8
	2/22/13	0900		X	460-001 24 hr			X	X	X			9
		0915		X	460-005 24 hr			X	X	X			10
		0925		X	460-006 24 hr			X	X	X			11
		0940		X	460-007 24 hr			X	X	X			12
	2/26/13	0905		X	460-001 5 day			X	X	X			13
		0915		X	460-005 5 day			X	X	X			14

Turn Around Time: ☑ 24-48 hrs. ☐ 3 days ☐ 1 week ☐ Standard ☐ Other

Relinquished by: (Signature)	Received by: (Signature)	Date:	Time:
Tomecia Riley		2/26/13	1356
Fed Ex	M Campagne	2/27/13	09:45

Note: 0.3, 1.1 7948 3898 0765

By submitting these samples, you agree to the terms and conditions contained in our most recent schedule of services.

Matrix[1]: W = water, S = soil, SD = solid, L = liquid, SL = sludge, o = oil, CT = charcoal tube, A = air bag

We cannot accept verbal changes. Please fax written changes to (225) 767-5717

WHITE: CLIENT FINAL REPORT — CANARY: LABORATORY — PINK: CLIENT

GCAL-06 11/98

GCAL

7979 GSRI Avenue, Baton Rouge, Louisiana 70820-7402
Phone 225.769.4900 • Fax 225.767.5717

CHAIN OF CUSTODY RECORD

Lab use only	Client Name	Client #	Workorder #	Due Date
	KEMRON	4794	213022715	03/01/13

Report to:
Client: Kemron Environmental Inc.
Address: 1359-A Ellsworth Ind. Blvd
Atlanta, Ga. 30318
Contact: Tommy Jordan
Phone: 404-601-6927
Fax: 404-636-7162

Bill to:
Client: Kemron Environmental Inc.
Address: 1359-A Ellsworth Ind. Blvd
Atlanta, Ga. 30318
Contact: Tommy Jordan
Phone: 404-601-6927
Fax: 404-636-7162

P.O. Number:
Project Name/Number: Quanta / SH6460

Sampled By: Tomecia Riley

Analytical Requests & Method

Lab use only:
Custody Seal used ☑ yes ☐ no
intact ☑ yes ☐ no
Temperature °C 0.3, 1.1

Matrix[1]	Date	Time (2400)	Comp	Grab	Sample Description	Preservatives	No Containers	BTEX 8260	PAH 8270	Total Arsenic 6010	SPLP VOC 1312/8260	SPLP PAH 1312/8270	Remarks	Lab ID 02/27
W	2/26/13	0925		X	460-006 5 day	None/HCl/HNO3	5	X	X	X			RUSH 48 hr	15
W	2/26/13	0940		X	460-007 5 day	↓	5	X	X	X			↓	16
~~S~~	~~2/26/13~~	~~1000~~		~~X~~	~~460-005~~	~~None~~	~~1~~				~~X~~	~~X~~	~~Std TAT * PAT~~	
~~S~~	~~2/26/13~~	~~1005~~		~~X~~	~~460-006~~	~~↓~~	~~1~~				~~X~~	~~X~~	~~Std TAT * PAT~~	
~~S~~	~~2/26/13~~	~~1010~~		~~X~~	~~460-007~~	~~↓~~	~~1~~				~~X~~	~~X~~	~~Std TAT * PAT~~	

Turn Around Time: ☒ 24-48 hrs. ☐ 3 days ☐ 1 week ☐ Standard ☐ Other

Relinquished by: (Signature)	Received by: (Signature)	Date:	Time:
Tomecia Riley		2/26/13	1356
Relinquished by: (Signature)	Received by: (Signature)	Date:	Time:
Fed Ex	M Campagna	2/27/13	09:45
Relinquished by: (Signature)	Received by: (Signature)	Date:	Time:

Note: 7948 3898 0765
0.3, 1.1

By submitting these samples, you agree to the terms and conditions contained in our most recent schedule of services.

Matrix[1]: W = water, S = soil, SD = solid, L = liquid, SL = sludge, o = oil, CT = charcoal tube, A = air bag

We cannot accept verbal changes. Please fax written changes to (225) 767-5717

WHITE: CLIENT FINAL REPORT — CANARY: LABORATORY — PINK: CLIENT

GCAL-06 11/98

GCAL ANALYTICAL LABORATORIES, LLC

SAMPLE RECEIVING CHECKLIST

213022715

SAMPLE DELIVERY GROUP	213022715
Client 4794 - KEMRON	**Transport Method** FEDEX
Profile Number 238840	**Received By** Law, Brittany P.
Line Item(s) 2 - Water BTEX/PAH/RCRA	**Receive Date(s)** 02/27/13

CHECKLIST

	Yes	No	NA
Were all samples received using proper thermal preservation?	☑	☐	☐
When used, were all custody seals intact?	☑	☐	☐
Were all samples received in proper containers?	☑	☐	☐
Were all samples received using proper chemical preservation?	☑	☐	☐
Was preservative added to any container at the lab?	☐	☑	☐
Were all containers received in good condition?	☑	☐	☐
Were all VOA vials received with no head space?	☑	☐	☐
Do all sample labels match the Chain of Custody?	☐	☑	☐
Did the Chain of Custody list the sampling technician?	☑	☐	☐
Was the COC maintained i.e. all signatures, dates and time of receipt included?	☑	☐	☐

COOLERS

Airbill	Temp(oC)
7948 3898 0765	0.3 1.1

DISCREPANCIES

21302271501 - 460-001 2 HR
- Sample Discrepancy

21302271503 - 460-006 2 HR
- Sample Discrepancy

21302271504 - 460-007 2 HR
- Sample Discrepancy

LABORATORY PRESERVATIONS

None

NOTES	SAMPLE ID'S ON CONTAINER DO NOT MATCH SAMPLE ID'S LISTED ON COC.

APPENDIX F

OPTIMIZATION EVALUATION MIXTURE DEVELOPMENT SHEETS

MIX DEVELOPMENT DATA SHEET

PROJECT:	Quanta	MIX No.	
PROJECT No.:	SH0460		460-011
MIXING DATE:	25-Mar-13	MIXED BY:	TNR/RPH

UNTREATED MATERIAL TYPE		**N1/N3 Composite**
WEIGHT OF UNTREATED MATERIAL		**1,500 g**
REAGENT TYPE AND LOT NUMBER	ADDITION RATE	WEIGHT
LaFarge Type I Cement	2.00 %	30.0 g
LaFarge Newcem Slag Cement	8.00 %	120.0 g
	%	0.0 g
	%	0.0 g
	%	0.0 g
Water Addition (water to reagent)	100 %	150.0 g

OBSERVATIONS / NOTES

150 g of water added to Type I Cement and Slag Cement to create slurry. The Type I Cement and Slag Cement slurry was added to the untreated soil.
Volumteric Expansion sample 120 g (calculated using 10% watter addition based on water:untreated soil ratio)

UCS @ 28 days
PP @ 1,3,5,7, 14, 28 day (or until a max of 4.5 TSF)
Permeability @ 28 days
Volumetric Expansion at 7 and 28 days
SPLP Arsenic and TPH GRO-DRO @ 28 days

MONITORING ACTIVITIES

MONITORING ACTIVITIES	TIME PERIOD (s)				
MAXIMUM PID (ppm)					
Notes / Observations:					

PENETROMETER ANALYSES

CURE TIME (Days)	1	3	5	7	14
PENETROMETER (tons/ft^2)	1.50	3.5	>4.5	>4.5	>4.5

VOLUMETRIC EXPANSION 7 days

INITIAL HEIGHT (in):	1.061	FINAL HEIGHT (in):	1.365
VOLUMETRIC EXPANSION (%):	28.65		

VOLUMETRIC EXPANSION 28 days

INITIAL HEIGHT (in):	1.061	FINAL HEIGHT (in):	1.361
VOLUMETRIC EXPANSION (%):	28.28		

MIX DEVELOPMENT DATA SHEET

PROJECT:	Quanta	MIX No.	
PROJECT No.:	SH0460		460-012
MIXING DATE:	25-Mar-13	MIXED BY:	TNR/RPH

UNTREATED MATERIAL TYPE		**N2 Composite**
WEIGHT OF UNTREATED MATERIAL		**1,500 g**
REAGENT TYPE AND LOT NUMBER	ADDITION RATE	WEIGHT
LaFarge Type I Cement	2.00 %	30.0 g
LaFarge Newcem Slag Cement	8.00 %	120.0 g
	%	0.0 g
	%	0.0 g
	%	0.0 g
Water Addition (water to reagent)	100 %	150.0 g

OBSERVATIONS / NOTES

50 g of water added to Type I Cement and Slag Cement to create slurry. The Type I Cement and Slag Cement slurry was added to the untreated soil.
Volumteric Expansion sample 120 g (calculated using 10% watter addition based on water:untreated soil ratio)
The mixture was extremely dry, but the reagents seem to mix well with the untreated soil.

UCS @ 28 days
PP @ 1,3,5,7, 14, 28 day (or until a max of 4.5 TSF)
Permeability @ 28 days
Volumetric Expansion at 7 and 28 days
SPLP Arsenic and TPH GRO-DRO @ 28 days

MONITORING ACTIVITIES

MONITORING ACTIVITIES	TIME PERIOD (s)				
MAXIMUM PID (ppm)					
Notes / Observations:					

PENETROMETER ANALYSES

CURE TIME (Days)	1	3	5	7	14
PENETROMETER (tons/ft^2)	1.25	2.0	2.75	2.75	

VOLUMETRIC EXPANSION 7 days

INITIAL HEIGHT (in):	1.267	FINAL HEIGHT (in):	1.44
VOLUMETRIC EXPANSION (%):	13.65		

VOLUMETRIC EXPANSION 28 days

INITIAL HEIGHT (in):	1.267	FINAL HEIGHT (in):	1.433
VOLUMETRIC EXPANSION (%):	13.10		

MIX DEVELOPMENT DATA SHEET

PROJECT:	Quanta	MIX No.	
PROJECT No.:	SH0460		460-013
MIXING DATE:	25-Mar-13	MIXED BY:	TNR/RPH

UNTREATED MATERIAL TYPE		**N2 Composite**
WEIGHT OF UNTREATED MATERIAL		**1,500 g**
REAGENT TYPE AND LOT NUMBER	ADDITION RATE	WEIGHT
LaFarge Type I Cement	3.00 %	45.0 g
LaFarge Newcem Slag Cement	12.00 %	180.0 g
	%	0.0 g
	%	0.0 g
	%	0.0 g
Water Addition (water to reagent)	100 %	225.0 g

OBSERVATIONS / NOTES

225 g of water added to Type I Cement and Slag Cement to create slurry. The Type I Cement and Slag Cement slurry was added to the untreated soil.
Volumteric Expansion sample 130 g (calculated using 15% watter addition based on water:untreated soil ratio)

UCS @ 28 days
PP @ 1,3,5,7, 14, 28 day (or until a max of 4.5 TSF)
Permeability @ 28 days
Volumetric Expansion at 7 and 28 days
SPLP Arsenic and TPH GRO-DRO @ 28 days

MONITORING ACTIVITIES

MONITORING ACTIVITIES	TIME PERIOD (s)				
MAXIMUM PID (ppm)					
Notes / Observations:					

PENETROMETER ANALYSES

CURE TIME (Days)	1	3	5	7	14
PENETROMETER (tons/ft^2)	0.00	0.5	2.8	3.0	

VOLUMETRIC EXPANSION 7 days

INITIAL HEIGHT (in):	1.267	FINAL HEIGHT (in):	1.696
VOLUMETRIC EXPANSION (%):	33.86		

VOLUMETRIC EXPANSION 28 days

INITIAL HEIGHT (in):	1.267	FINAL HEIGHT (in):	1.707
VOLUMETRIC EXPANSION (%):	34.73		

MIX DEVELOPMENT DATA SHEET

PROJECT:	Quanta	MIX No.	
PROJECT No.:	SH0460		460-014
MIXING DATE:	26-Mar-13	MIXED BY:	TNR/RPH

UNTREATED MATERIAL TYPE		**N2 Composite**
WEIGHT OF UNTREATED MATERIAL		**1,500 g**
REAGENT TYPE AND LOT NUMBER	ADDITION RATE	WEIGHT
LaFarge Type I Cement	3.00 %	45.0 g
LaFarge Newcem Slag Cement	12.00 %	180.0 g
Hydrated Lime	3.00 %	45.0 g
	%	0.0 g
	%	0.0 g
Water Addition (water to reagent)	100 %	270.0 g

OBSERVATIONS / NOTES

270 g of water added to Type I Cement, Slag Cement, and Hydrated Lime to create slurry. The Type I Cement , Slag Cement, Hydrated Lime, and water slurry was added to the untreated soil.
Volumteric Expansion sample 136 g (calculated using 18% watter addition based on water:untreated soil ratio)

UCS @ 28 days
PP @ 1,3,5,7, 14, 28 day (or until a max of 4.5 TSF)
Permeability @ 28 days
Volumetric Expansion at 7 and 28 days
SPLP Arsenic and TPH GRO-DRO @ 28 days

MONITORING ACTIVITIES

MONITORING ACTIVITIES	TIME PERIOD (s)				
MAXIMUM PID (ppm)					
Notes / Observations:					

PENETROMETER ANALYSES

CURE TIME (Days)	1	3	5	7	14
PENETROMETER (tons/ft^2)	0	0.75	>4.5	>4.5	>4.5

VOLUMETRIC EXPANSION 7 days

INITIAL HEIGHT (in):	1.267	FINAL HEIGHT (in):	1.785
VOLUMETRIC EXPANSION (%):	40.88		

VOLUMETRIC EXPANSION 28 days

INITIAL HEIGHT (in):	1.267	FINAL HEIGHT (in):	1.81
VOLUMETRIC EXPANSION (%):	42.86		

MIX DEVELOPMENT DATA SHEET

PROJECT:	Quanta	MIX No.	
PROJECT No.:	SH0460		460-015
MIXING DATE:	3+-25-13	MIXED BY:	TNR/RPH

UNTREATED MATERIAL TYPE		**N2 Composite**
WEIGHT OF UNTREATED MATERIAL		**1,500 g**
REAGENT TYPE AND LOT NUMBER	ADDITION RATE	WEIGHT
LaFarge Type I Cement	3.00 %	45.0 g
LaFarge Newcem Slag Cement	12.00 %	180.0 g
Activated Carbon	0.50 %	7.5 g
	%	0.0 g
	%	0.0 g
Water Addition (water to reagent)	100 %	232.5 g

OBSERVATIONS / NOTES

232.5 g of water added to Type I Cement, Slag Cement, and Activated Carbon to create slurry. The Type I Cement, Slag Cement, Activated Carbon, and water slurry was added to the untreated soil.
Volumteric Expansion sample 131 g (calculated using 15.5% watter addition based on water:untreated soil ratio)

UCS @ 28 days
PP @ 1,3,5,7, 14, 28 day (or until a max of 4.5 TSF)
Permeability @ 28 days
Volumetric Expansion at 7 and 28 days
SPLP Arsenic and TPH GRO-DRO @ 28 days

MONITORING ACTIVITIES

MONITORING ACTIVITIES	TIME PERIOD (s)				
MAXIMUM PID (ppm)					
Notes / Observations:					

PENETROMETER ANALYSES

CURE TIME (Days)	1	3	5	7	14
PENETROMETER (tons/ft^2)	1.25	4.3	>4.5	>4.5	>4.5

VOLUMETRIC EXPANSION 7 days

INITIAL HEIGHT (in):	1.267	FINAL HEIGHT (in):	1.637
VOLUMETRIC EXPANSION (%):	29.20		

VOLUMETRIC EXPANSION 28 days

INITIAL HEIGHT (in):	1.267	FINAL HEIGHT (in):	1.639
VOLUMETRIC EXPANSION (%):	29.36		

MIX DEVELOPMENT DATA SHEET

PROJECT:	Quanta	MIX No.	
PROJECT No.:	SH0460		460-016
MIXING DATE:	25-Mar-13	MIXED BY:	TNR/RPH

UNTREATED MATERIAL TYPE		**N2 Composite**
WEIGHT OF UNTREATED MATERIAL		**1,500 g**
REAGENT TYPE AND LOT NUMBER	ADDITION RATE	WEIGHT
LaFarge Type I Cement	3.00 %	45.0 g
LaFarge Newcem Slag Cement	12.00 %	180.0 g
Activated Carbon	1.00 %	15.0 g
	%	0.0 g
	%	0.0 g
Water Addition (water to reagent)	100 %	240.0 g

OBSERVATIONS / NOTES

240 g of water added to Type I Cement, Slag Cement, and Activated Carbon to create slurry. The Type I Cement, Slag Cement, Activated Carbon, and water slurry was added to the untreated soil.
Volumteric Expansion sample 132 g (calculated using 16% watter addition based on water:untreated soil ratio)

UCS @ 28 days
PP @ 1,3,5,7, 14, 28 day (or until a max of 4.5 TSF)
Permeability @ 28 days
Volumetric Expansion at 7 and 28 days
SPLP Arsenic and TPH GRO-DRO @ 28 days

MONITORING ACTIVITIES

MONITORING ACTIVITIES	TIME PERIOD (s)				
MAXIMUM PID (ppm)					
Notes / Observations:					

PENETROMETER ANALYSES

CURE TIME (Days)	1	3	5	7	14
PENETROMETER (tons/ft^2)	0.25	3.8	>4.25	>4.25	>4.25

VOLUMETRIC EXPANSION 7 days

INITIAL HEIGHT (in):	1.267	FINAL HEIGHT (in):	1.728
VOLUMETRIC EXPANSION (%):	36.39		

VOLUMETRIC EXPANSION 28 days

INITIAL HEIGHT (in):	1.267	FINAL HEIGHT (in):	1.728
VOLUMETRIC EXPANSION (%):	36.39		

MIX DEVELOPMENT DATA SHEET

PROJECT:	Quanta	MIX No.	
PROJECT No.:	SH0460		460-017
MIXING DATE:	25-Mar-13	MIXED BY:	TNR/RPH

UNTREATED MATERIAL TYPE	**N4-A**	
WEIGHT OF UNTREATED MATERIAL		**1,500 g**
REAGENT TYPE AND LOT NUMBER	ADDITION RATE	WEIGHT
LaFarge Type I Cement	2.00 %	30.0 g
LaFarge Newcem Slag Cement	8.00 %	120.0 g
	%	0.0 g
	%	0.0 g
	%	0.0 g
Water Addition (water to reagent)	100 %	150.0 g

OBSERVATIONS / NOTES

150 g of water added to Type I Cement and Slag Cement to create slurry. The Type I Cement and Slag Cement slurry was added to the untreated soil.
Volumteric Expansion sample 120 g (calculated using 10% watter addition based on water:untreated soil ratio)

UCS @ 28 days
PP @ 1,3,5,7, 14, 28 day (or until a max of 4.5 TSF)
Permeability @ 28 days
Volumetric Expansion at 7 and 28 days
SPLP Arsenic and TPH GRO-DRO @ 28 days

MONITORING ACTIVITIES

MONITORING ACTIVITIES	TIME PERIOD (s)				
MAXIMUM PID (ppm)					
Notes / Observations:					

PENETROMETER ANALYSES

CURE TIME (Days)	1	3	5	7	14
PENETROMETER (tons/ft^2)	3.00	>4.5	>4.5	>4.5	>4.5

VOLUMETRIC EXPANSION 7 days

INITIAL HEIGHT (in):	1.393	FINAL HEIGHT (in):	1.946
VOLUMETRIC EXPANSION (%):	39.70		

VOLUMETRIC EXPANSION 28 days

INITIAL HEIGHT (in):	1.393	FINAL HEIGHT (in):	1.950
VOLUMETRIC EXPANSION (%):	39.99		

MIX DEVELOPMENT DATA SHEET

PROJECT:	Quanta	MIX No.	
PROJECT No.:	SH0460		460-018
MIXING DATE:	25-Mar-13	MIXED BY:	TNR/RPH

UNTREATED MATERIAL TYPE	**N4-A**	
WEIGHT OF UNTREATED MATERIAL		**1,500 g**
REAGENT TYPE AND LOT NUMBER	ADDITION RATE	WEIGHT
LaFarge Type I Cement	2.00 %	30.0 g
LaFarge Newcem Slag Cement	8.00 %	120.0 g
Activated Carbon	1.00 %	15.0 g
	%	0.0 g
	%	0.0 g
Water Addition (water to reagent)	100 %	165.0 g

OBSERVATIONS / NOTES

165 g of water added to Type I Cement, Slag Cement, and Activated Carbon to create slurry. The Type I Cement, Slag Cement, Activated Carbon, and water slurry was added to the untreated soil.
Volumteric Expansion sample 122 g (calculated using 11% watter addition based on water:untreated soil ratio)

UCS @ 28 days
PP @ 1,3,5,7, 14, 28 day (or until a max of 4.5 TSF)
Permeability @ 28 days
Volumetric Expansion at 7 and 28 days
SPLP Arsenic and TPH GRO-DRO @ 28 days

MONITORING ACTIVITIES

MONITORING ACTIVITIES	TIME PERIOD (s)				
MAXIMUM PID (ppm)					
Notes / Observations:					

PENETROMETER ANALYSES

CURE TIME (Days)	1	3	5	7	14
PENETROMETER (tons/ft^2)	3.00	>4.5	>4.5	>4.5	>4.5

VOLUMETRIC EXPANSION 7 days

INITIAL HEIGHT (in):	1.393	FINAL HEIGHT (in):	1.829
VOLUMETRIC EXPANSION (%):	31.30		

VOLUMETRIC EXPANSION 28 days

INITIAL HEIGHT (in):	1.393	FINAL HEIGHT (in):	1.819
VOLUMETRIC EXPANSION (%):	30.58		

MIX DEVELOPMENT DATA SHEET

PROJECT:	Quanta	MIX No.	
PROJECT No.:	SH0460		460-019
MIXING DATE:		MIXED BY:	TNR/RPH

UNTREATED MATERIAL TYPE	**A-2A**	
WEIGHT OF UNTREATED MATERIAL		**1,500 g**
REAGENT TYPE AND LOT NUMBER	ADDITION RATE	WEIGHT
LaFarge Type I Cement	3.00 %	45.0 g
LaFarge Newcem Slag Cement	12.00 %	180.0 g
	%	0.0 g
	%	0.0 g
	%	0.0 g
Water Addition (water to reagent)	100 %	225.0 g

OBSERVATIONS / NOTES

225 g of water added to Type I Cement and Slag Cement to create slurry. The Type I Cement and Slag Cement slurry was added to the untreated soil.
Volumteric Expansion sample 130 g (calculated using 15% watter addition based on water:untreated soil ratio)

UCS @ 28 days
PP @ 1,3,5,7, 14, 28 day (or until a max of 4.5 TSF)
Permeability @ 28 days
Volumetric Expansion at 7 and 28 days
SPLP Arsenic and TPH GRO-DRO @ 28 days

MONITORING ACTIVITIES

MONITORING ACTIVITIES	TIME PERIOD (s)				
MAXIMUM PID (ppm)					
Notes / Observations:					

PENETROMETER ANALYSES

CURE TIME (Days)	1	3	5	7	14
PENETROMETER (tons/ft^2)	4.50	>4.5	>4.5	>4.5	>4.5

VOLUMETRIC EXPANSION 7 days

INITIAL HEIGHT (in):	1.013	FINAL HEIGHT (in):	1.47
VOLUMETRIC EXPANSION (%):	45.11		

VOLUMETRIC EXPANSION 28 days

INITIAL HEIGHT (in):	1.013	FINAL HEIGHT (in):	1.461
VOLUMETRIC EXPANSION (%):	44.23		

MIX DEVELOPMENT DATA SHEET

PROJECT:	Quanta	MIX No.	
PROJECT No.:	SH0460		460-020
MIXING DATE:	26-Mar-13	MIXED BY:	TNR/RPH

UNTREATED MATERIAL TYPE	**A-2A**	
WEIGHT OF UNTREATED MATERIAL		**1,500 g**
REAGENT TYPE AND LOT NUMBER	ADDITION RATE	WEIGHT
LaFarge Type I Cement	3.00 %	45.0 g
LaFarge Newcem Slag Cement	12.00 %	180.0 g
EnviroBlend® 93 HR	2.00 %	30.0 g
	%	0.0 g
	%	0.0 g
Water Addition (water to reagent)	100 %	255.0 g

OBSERVATIONS / NOTES

EnviroBlend® 93 HR mixed with 102 g of soil to create slurry. The EnviroBlend® 93 HR and water slurry was added to the untreated soil. This mixture was allowed to react for 24 hours.
Mixture day 153g of water added to Type I Cement and Slag Cement to create slurry. The Type I Cement, Slag Cement, and water slurry was added to the previously prepared mixture.
Volumteric Expansion sample 134 g (calculated using 17% watter addition based on water:untreated soil ratio)

UCS @ 28 days
PP @ 1,3,5,7, 14, 28 day (or until a max of 4.5 TSF)
Permeability @ 28 days
Volumetric Expansion at 7 and 28 days
SPLP Arsenic and TPH GRO-DRO @ 28 days

MONITORING ACTIVITIES

MONITORING ACTIVITIES	TIME PERIOD (s)				
MAXIMUM PID (ppm)					
Notes / Observations:					

PENETROMETER ANALYSES

CURE TIME (Days)	1	3	5	7	14
PENETROMETER (tons/ft^2)	1.00	>4.5	>4.5	>4.5	>4.5

VOLUMETRIC EXPANSION 7 days

INITIAL HEIGHT (in):	1.013	FINAL HEIGHT (in):	1.517
VOLUMETRIC EXPANSION (%):	49.75		

VOLUMETRIC EXPANSION 28 days

INITIAL HEIGHT (in):	1.013	FINAL HEIGHT (in):	1.509
VOLUMETRIC EXPANSION (%):	48.96		

MIX DEVELOPMENT DATA SHEET

PROJECT:	Quanta	MIX No.	
PROJECT No.:	SH0460		460-021
MIXING DATE:	26-Mar-13	MIXED BY:	TNR/RPH

UNTREATED MATERIAL TYPE	**A-2A**	
WEIGHT OF UNTREATED MATERIAL		**1,500 g**
REAGENT TYPE AND LOT NUMBER	ADDITION RATE	WEIGHT
LaFarge Type I Cement	3.00 %	45.0 g
LaFarge Newcem Slag Cement	12.00 %	180.0 g
Ferrous Sulfate	2.00 %	30.0 g
	%	0.0 g
	%	0.0 g
Water Addition (water to reagent)	100 %	255.0 g

OBSERVATIONS / NOTES

Ferrous Sulfate mixed with 102 g of soil to create slurry. The Ferrous Sulfate and water slurry was added to the untreated soil. This mixture was allowed to react for 24 hours.
Mixture day 153g of water added to Type I Cement and Slag Cement to create slurry. The Type I Cement, Slag Cement, and water slurry was added to the previously prepared mixture.
Volumteric Expansion sample 134 g (calculated using 17% watter addition based on water:untreated soil ratio)

UCS @ 28 days
PP @ 1,3,5,7, 14, 28 day (or until a max of 4.5 TSF)
Permeability @ 28 days
Volumetric Expansion at 7 and 28 days
SPLP Arsenic and TPH GRO-DRO @ 28 days

MONITORING ACTIVITIES

MONITORING ACTIVITIES	TIME PERIOD (s)				
MAXIMUM PID (ppm)					
Notes / Observations:					

PENETROMETER ANALYSES

CURE TIME (Days)	1	3	5	7	14
PENETROMETER (tons/ft^2)	0	0	0	0	

VOLUMETRIC EXPANSION 7 days

INITIAL HEIGHT (in):	1.013	FINAL HEIGHT (in):	1.516
VOLUMETRIC EXPANSION (%):	49.65		

VOLUMETRIC EXPANSION 28 days

INITIAL HEIGHT (in):	1.013	FINAL HEIGHT (in):	1.481
VOLUMETRIC EXPANSION (%):	46.20		

MIX DEVELOPMENT DATA SHEET

PROJECT:	Quanta	MIX No.	
PROJECT No.:	SH0460		460-022
MIXING DATE:	26-Mar-13	MIXED BY:	TNR/RPH

UNTREATED MATERIAL TYPE		**AN-2A**
WEIGHT OF UNTREATED MATERIAL		**1,500 g**
REAGENT TYPE AND LOT NUMBER	ADDITION RATE	WEIGHT
LaFarge Type I Cement	3.00 %	45.0 g
LaFarge Newcem Slag Cement	12.00 %	180.0 g
	%	0.0 g
	%	0.0 g
	%	0.0 g
Water Addition (water to reagent)	100 %	225.0 g

OBSERVATIONS / NOTES

225 g of water added to Type I Cement and Slag Cement to create slurry. The Type I Cement and Slag Cement slurry was added to the untreated soil.
Volumteric Expansion sample 130 g (calculated using 15% watter addition based on water:untreated soil ratio)

UCS @ 28 days
PP @ 1,3,5,7, 14, 28 day (or until a max of 4.5 TSF)
Permeability @ 28 days
Volumetric Expansion at 7 and 28 days
SPLP Arsenic and TPH GRO-DRO @ 28 days

MONITORING ACTIVITIES

MONITORING ACTIVITIES	TIME PERIOD (s)				
MAXIMUM PID (ppm)					
Notes / Observations:					

PENETROMETER ANALYSES

CURE TIME (Days)	1	3	5	7	14
PENETROMETER (tons/ft^2)	0.00	3.8	>4.5	>4.5	>4.5

VOLUMETRIC EXPANSION 7 days

INITIAL HEIGHT (in):	1.119	FINAL HEIGHT (in):	1.401
VOLUMETRIC EXPANSION (%):	25.20		

VOLUMETRIC EXPANSION 28 days

INITIAL HEIGHT (in):	1.119	FINAL HEIGHT (in):	1.402
VOLUMETRIC EXPANSION (%):	25.29	.	

MIX DEVELOPMENT DATA SHEET

PROJECT:	Quanta	MIX No.	
PROJECT No.:	SH0460		460-023
MIXING DATE:	27-Mar-13	MIXED BY:	TNR/RPH

UNTREATED MATERIAL TYPE	**AN-2A**	
WEIGHT OF UNTREATED MATERIAL		**1,500 g**
REAGENT TYPE AND LOT NUMBER	ADDITION RATE	WEIGHT
LaFarge Type I Cement	3.00 %	45.0 g
LaFarge Newcem Slag Cement	12.00 %	180.0 g
Enviroblend® 93 HR	2.00 %	30.0 g
	%	0.0 g
	%	0.0 g
Water Addition (water to reagent)	100 %	255.0 g

OBSERVATIONS / NOTES

EnviroBlend® 93 HR mixed with 102 g of soil to create slurry. The EnviroBlend® 93 HR and water slurry was added to the untreated soil. This mixture was allowed to react for 24 hours.
Mixture day 153g of water added to Type I Cement and Slag Cement to create slurry. The Type I Cement, Slag Cement, and water slurry was added to the previously prepared mixture.
Volumteric Expansion sample 134 g (calculated using 17% watter addition based on water:untreated soil ratio)

UCS @ 28 days
PP @ 1,3,5,7, 14, 28 day (or until a max of 4.5 TSF)
Permeability @ 28 days
Volumetric Expansion at 7 and 28 days
SPLP Arsenic and TPH GRO-DRO @ 28 days

MONITORING ACTIVITIES

MONITORING ACTIVITIES	TIME PERIOD (s)				
MAXIMUM PID (ppm)					
Notes / Observations:					

PENETROMETER ANALYSES

CURE TIME (Days)	1	3	5	7	14
PENETROMETER (tons/ft^2)	>4.5	>4.5	>4.5	>4.5	>4.5

VOLUMETRIC EXPANSION 7 days

INITIAL HEIGHT (in):	1.119	FINAL HEIGHT (in):	1.408
VOLUMETRIC EXPANSION (%):	25.83		

VOLUMETRIC EXPANSION 28 days

INITIAL HEIGHT (in):	1.119	FINAL HEIGHT (in):	1.403
VOLUMETRIC EXPANSION (%):	25.38		

MIX DEVELOPMENT DATA SHEET

PROJECT:	Quanta	MIX No.	
PROJECT No.:	SH0460		460-024
MIXING DATE:	26-Mar-13	MIXED BY:	TNR/RPH

UNTREATED MATERIAL TYPE	**AN-2A**	
WEIGHT OF UNTREATED MATERIAL		**1,500 g**
REAGENT TYPE AND LOT NUMBER	ADDITION RATE	WEIGHT
LaFarge Type I Cement	3.00 %	45.0 g
LaFarge Newcem Slag Cement	12.00 %	180.0 g
Ferrous Sulfate	2.00 %	30.0 g
	%	0.0 g
	%	0.0 g
Water Addition (water to reagent)	100 %	255.0 g

OBSERVATIONS / NOTES

Ferrous Sulfate mixed with 102 g of soil to create slurry. The Ferrous Sulfate and water slurry was added to the untreated soil. This mixture was allowed to react for 24 hours.
Mixture day 153g of water added to Type I Cement and Slag Cement to create slurry. The Type I Cement, Slag Cement, and water slurry was added to the previously prepared mixture.
Volumteric Expansion sample 134 g (calculated using 17% watter addition based on water:untreated soil ratio)

UCS @ 28 days
PP @ 1,3,5,7, 14, 28 day (or until a max of 4.5 TSF)
Permeability @ 28 days
Volumetric Expansion at 7 and 28 days
SPLP Arsenic and TPH GRO-DRO @ 28 days

MONITORING ACTIVITIES

MONITORING ACTIVITIES	TIME PERIOD (s)				
MAXIMUM PID (ppm)					
Notes / Observations:					

PENETROMETER ANALYSES

CURE TIME (Days)	1	3	5	7	14
PENETROMETER (tons/ft^2)	0	0	0	0	0

VOLUMETRIC EXPANSION 7 days

INITIAL HEIGHT (in):	1.119	FINAL HEIGHT (in):	1.482
VOLUMETRIC EXPANSION (%):	32.44		

VOLUMETRIC EXPANSION 28 days

INITIAL HEIGHT (in):	1.119	FINAL HEIGHT (in):	1.44
VOLUMETRIC EXPANSION (%):	28.69		

APPENDIX G

OPTIMIZATION EVALUATION DATA SHEETS AND ANALYTICAL REPORT

PERMEABILITY ASTM D5084

SPECIMEN CONDITIONS

PROJECT:	Quanta	TESTED BY:	RJB
PROJECT No.:	SH0460	TRACKING CODE:	8854_PM
SAMPLE No.:	0460-011 (28 Day)	EQUIPMENT No.:	3
TEST DATE:	4/22/13		

MOISTURE CONTENT (Dry Basis)	*INITIAL*	*FINAL*
1. MOISTURE TIN NO.		
2. WT MOISTURE TIN (tare weight)	0.00 *g*	5.18 *g*
3. WT WET SOIL + TARE	641.30 *g*	651.10 *g*
4. WT DRY SOIL + TARE	517.09 *g*	522.27 *g*
5. WT WATER, Ww	124.21 g	128.83 g
6. WT DRY SOIL, Ws	517.09 g	517.09 g
7. MOISTURE CONTENT, W	24.02 %	24.91 %

SOIL SPECIMEN DIMENSIONS				
TRIPLICATE	*DIAMETER*		*HEIGHT*	
ANALYSES	*INITIAL*	*FINAL*	*INITIAL*	*FINAL*
No. 1	*2.99 in.*	*3.00 in.*	*3.06 in.*	*3.09 in.*
No. 2	*2.99 in.*	*2.98 in.*	*3.07 in.*	*3.08 in.*
No. 3	*2.97 in.*	*2.97 in.*	*3.07 in.*	*3.06 in.*
Average	2.99 in.	2.98 in.	3.07 in.	3.07 in.

SPECIMEN CONDITIONS	*INITIAL*	*FINAL*
Specimen WT, Wo	*641.30 g*	*646.10 g*
Area, Ao	7.01 in^2	7.00 in^2
Volume, Vo	21.49 in^3	21.51 in^3
Bulk Unit Weight	113.7 lb/ft^3	114.4 lb/ft^3
Dry Unit Weight	91.7 lb/ft^3	91.6 lb/ft^3

PERMEABILITY ASTM D5084

BACK-PRESSURE SATURATION

PROJECT:	Quanta	TESTED BY:	RJB
PROJECT No.:	SH0460	TRACKING CODE:	8854_PM
SAMPLE No.:	0460-011 (28 Day)	EQUIPMENT No.:	3
TEST DATE:	4/22/13		

TEST	*TIME*	*TESTED*	*TEST PRESSURES (psi)*						
			APPLIED		*PORE*		*PRESSURE CHANGE*		
DATE	*(military)*	*BY*	*CELL*	*BACK*	*SAT.*	*TEST*	*CELL*	*PORE*	*B-Value*
04/22/13	11 : 0	RJB	7.0	5.0	5.1				
04/22/13	11 : 45	RJB	17.0	15.0	15.1	10.8	10.0	5.7	0.57
04/22/13	12 : 35	RJB	27.0	25.0	25.2	22.5	10.0	7.4	0.74
04/22/13	13 : 25	RJB	37.0	35.0	35.2	33.6	10.0	8.4	0.84
04/22/13	14 : 10	RJB	47.0	45.0	45.3	44.2	10.0	9.0	0.90
04/23/13	8 : 40	RJB	57.0	55.0	*	55.0	10.0	9.7	0.97
04/23/13	8 : 41	RJB	47.0	45.0	*	*	*	*	*

* Saturation check - no data available.

PERMEABILITY ASTM D5084

SPECIMEN CONSOLIDATION

PROJECT:	Quanta		RJB
PROJECT No.:	SH0460		8854_PM
SAMPLE No.:	0460-011 (28 Day)		3
TEST DATE:	4/22/13		

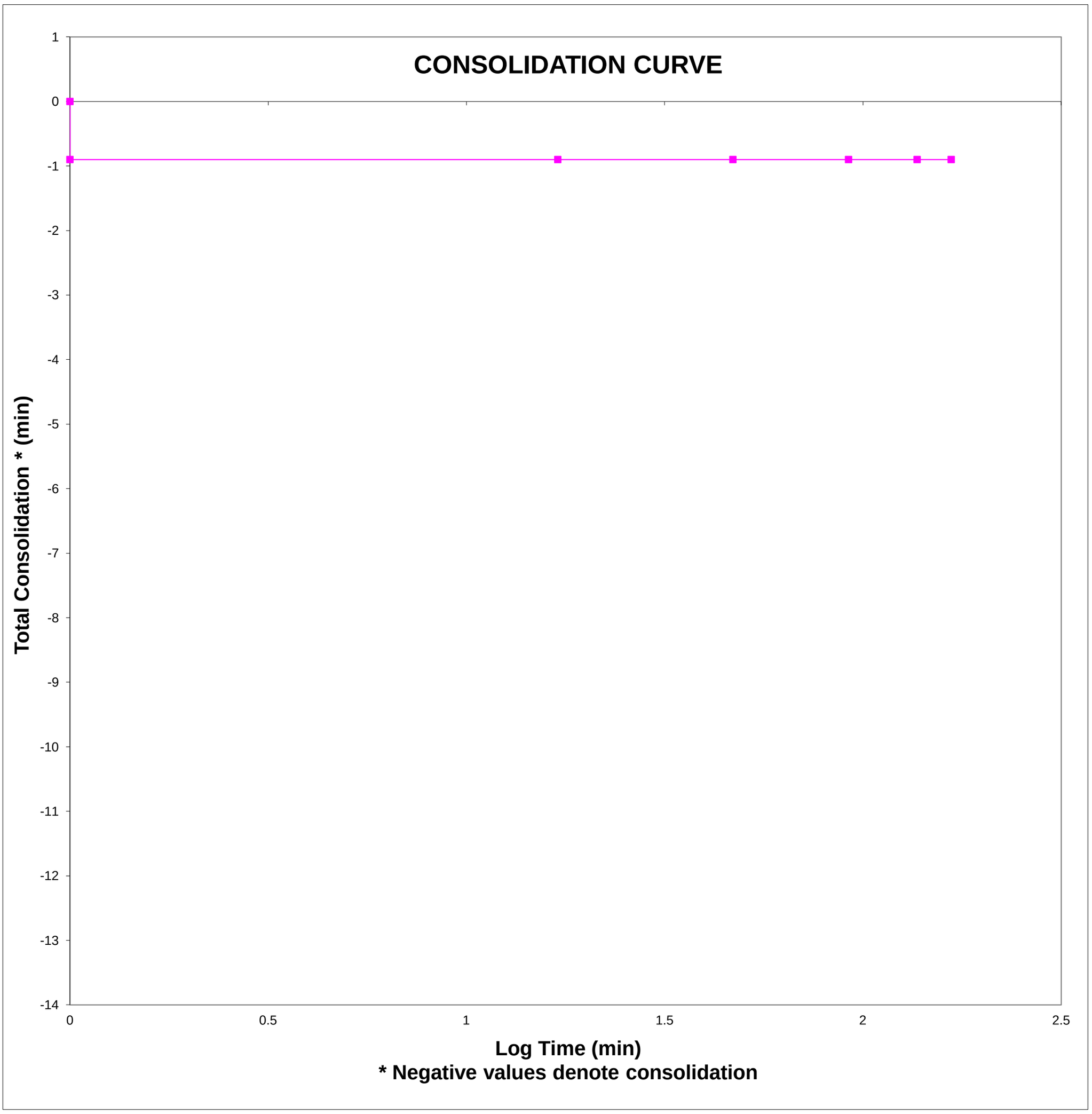
CELL PRESSURE: 55 psi **BACK PRESSURE:** 45 psi **EFFECTIVE STRESS:** 10 psi

TEST DATE	*TESTED BY*	*TIME (Military)*	*ELAPSED TIME (minutes)*	*TOTAL TIME (minutes)*	*TOTAL TIME (Log)*	*SPECIMEN CONSOLIDATION (ML)*		
						READING		*ACTUAL TOTAL (Ct)*
						BOTTOM	*TOP*	
4 / 23 / 13	RJB	8 : 43	0	0	0	25.0	25.0	0.0
4 / 23 / 13	RJB	8 : 44	1	1	0.00	24.5	24.6	0.9
4 / 23 / 13	RJB	9 : 0	16	17	1.23	24.5	24.6	0.9
4 / 23 / 13	RJB	9 : 30	30	47	1.67	24.5	24.6	0.9
4 / 23 / 13	RJB	10 : 15	45	92	1.96	24.5	24.6	0.9
4 / 23 / 13	RJB	11 : 0	45	137	2.14	24.5	24.6	0.9
4 / 23 / 13	RJB	11 : 30	30	167	2.22	24.5	24.6	0.9

PERMEABILITY ASTM D5084

CONSOLIDATION CURVE

PROJECT:	Quanta	TESTED BY:	RJB
PROJECT No.:	SH0460	TRACKING CODE:	8854_PM
SAMPLE No.:	0460-011 (28 Day)	EQUIPMENT No.:	3
TEST DATE:	4/22/13		



PERMEABILITY ASTM D5084

TEST DATA

PROJECT:	Quanta	TESTED BY:	RJB
PROJECT No.:	SH0460	TRACKING CODE:	8854_PM
SAMPLE No.:	0460-011 (28 Day)	EQUIPMENT No.:	3
TEST DATE:	4/22/2013		

DATE	*TESTED BY*	*TIME (military)*	*ELAPSED TIME (minutes)*	*HYDRAULIC HEAD (cm)*		*TEMP. C°*	*GAUGE PRESSURE (psi)*		
				INFLUENT	*EFFLUENT*		*CELL*	*INFLUENT*	*EFFLUENT*
4 / 24 / 13	RJB	9 : 6	0	0.0	25.0	20.0	55.0	45.0	45.0
4 / 25 / 13	RJB	9 : 42	1476	0.6	24.4	20.0	55.0	45.0	45.0
4 / 26 / 13	RJB	11 : 52	1570	1.1	23.9	20.0	55.0	45.0	45.0
4 / 27 / 13	RJB	12 : 39	RESET	0.0	25.0	20.0	55.0	45.0	43.0
4 / 29 / 13	RJB	8 : 22	2623	1.6	23.4	20.0	55.0	45.0	43.0
5 / 1 / 13	RJB	8 : 29	RESET	0.0	25.0	20.0	55.0	45.0	43.0
5 / 6 / 13	RJB	7 : 52	7163	0.7	24.3	20.0	55.0	45.0	43.0

PERMEABILITY ASTM D5084

TEST DATA (continued)

PROJECT:	Quanta	TESTED BY:	RJB
PROJECT No.:	SH0460	TRACKING CODE:	8854_PM
SAMPLE No.:	0460-011 (28 Day)	EQUIPMENT No.:	3
TEST DATE:	4/22/13		

ELAPSED TIME (minutes)	*HYDRAULIC HEAD DIFFERENCE (cm)*		*EFFLUENT - INFLUENT RATIO*	*HYDRAULIC GRADIENT (cm/cm)*	*HYDRAULIC CONDUCTIVITY (cm/sec)*	
	INFLUENT	*EFFLUENT*			*@ Temp.*	*@ 20° C*
RESET				3.210		
1476	0.6	0.6	1.00	3.056	4.78E-08	4.81E-08
1570	0.5	0.5	1.00	2.927	3.93E-08	3.94E-08
RESET				21.271		
2623	1.6	1.6	1.00	20.860	1.07E-08	1.07E-08
RESET				21.271		
7163	0.7	0.7	1.00	21.092	1.70E-09	1.71E-09

PERMEABILITY ASTM D5084

SUMMARY OF RESULTS

PROJECT:	Quanta	TESTED BY:	RJB
PROJECT No.:	SH0460	TRACKING CODE:	8854_PM
SAMPLE No.:	0460-011 (28 Day)	EQUIPMENT No.:	3
TEST DATE:	4/22/13		

TESTING PARAMETER	INITIAL	FINAL
BULK UNIT WEIGHT	113.7 lb/ft³	114.4 lb/ft³
DRY UNIT WEIGHT	91.7 lb/ft³	91.6 lb/ft³
MOISTURE CONTENT	24.0 %	24.9 %
PERMEABILITY @ 20°C	3.3E-08 cm/sec	

UNCONFINED COMPRESSION TEST

ASTM D 2166

PROJECT:	Quanta
PROJECT No.:	SH0460
SAMPLE No.:	460-011
TESTING DATE:	22-Apr-13
TESTED BY:	TNR

LOADING RATE:	0.04 in./min.
TRACKING CODE:	8854

MOISTURE CONTENT (Dry Basis)		
1. MOISTURE TIN NO.		
2. WT MOISTURE TIN (tare weight)	166.09	g
3. WT WET SOIL + TARE	300.82	g
4. WT DRY SOIL + TARE	273.85	g
5. WT WATER, Ww	26.97	g
6. WT DRY SOIL, Ws	107.76	g
7. MOISTURE CONTENT, W	**25.03**	**%**

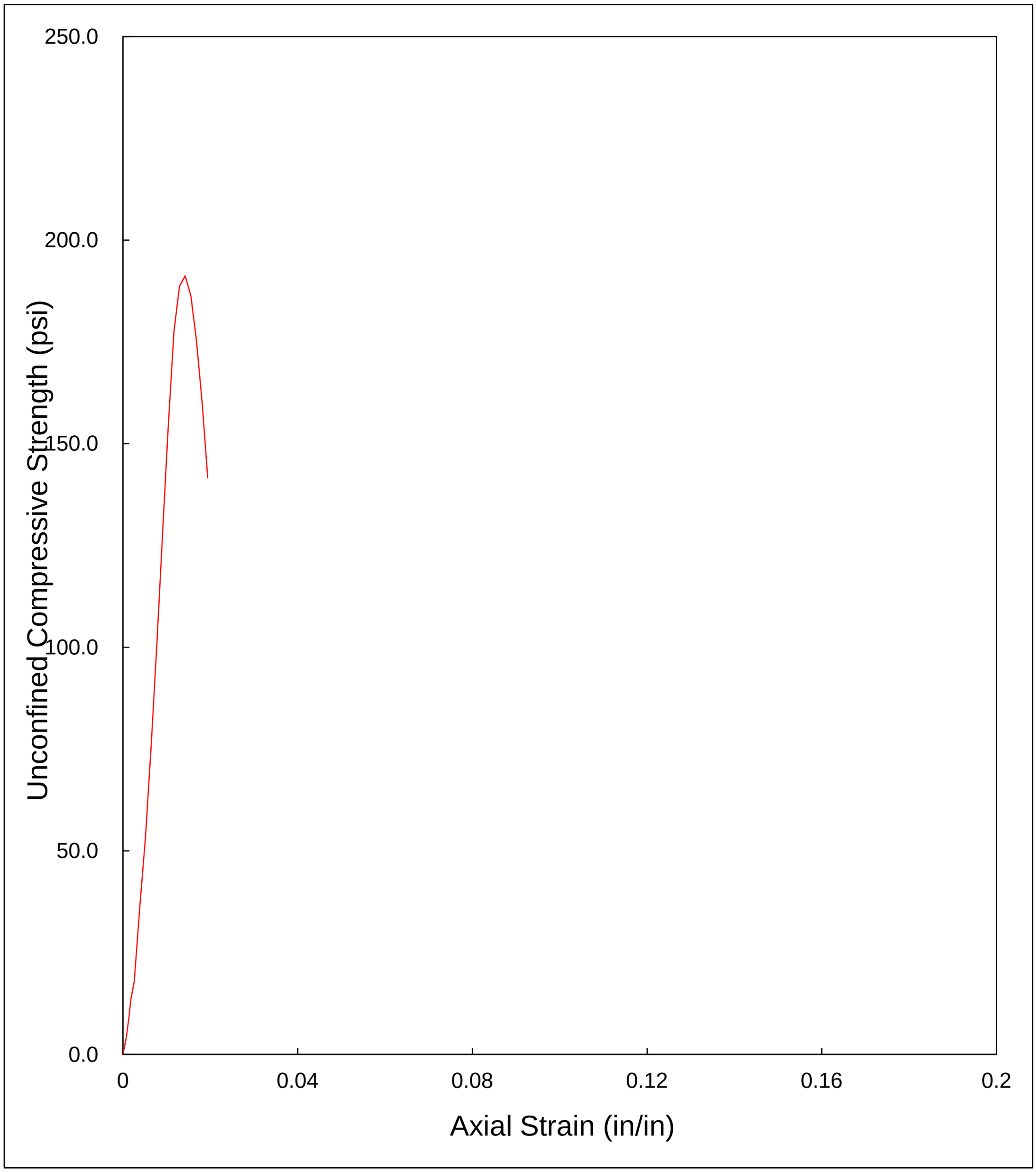
SOIL SPECIMEN DIMENSIONS				
	DIAMETER		*LENGTH*	
No. 1	2.00	in.	3.85	in.
No. 2	2.00	in.	3.85	in.
No. 3	1.99	in.	3.87	in.
Average	**2.00**	**in.**	**3.86**	**in.**

SPECIMEN CONDITIONS		
Initial Specimen WT, Wo	*363.79*	*g*
Initial Area, Ao	3.13	in²
Initial Volume, Vo	12.08	in³
Initial Bulk Unit Weight,	114.8	lb/ft³
Initial Dry Unit Weight	91.8	lb/ft³
15 % Strain (0.15 Lo)	0.58	in.
UCS	191.2	lb/in²

COMPRESSIVE LOAD (lbs.)	DIAL GAGE READING (in.)	SPECIMEN DEFORMATION (in.)	CORRECTED AREA (in²)	AXIAL STRAIN (in/in)	UNCONFINED COMPRESSIVE STRENGTH (lb/in²)
0	0.000	0.000	3.130	0.0000	0.0
13	0.003	0.003	3.132	0.0008	4.2
27	0.005	0.005	3.134	0.0013	8.6
42	0.007	0.007	3.135	0.0018	13.4
56	0.010	0.010	3.138	0.0026	17.8
115	0.015	0.015	3.142	0.0039	36.6
170	0.020	0.020	3.146	0.0052	54.0
239	0.025	0.025	3.150	0.0065	75.9
319	0.030	0.030	3.154	0.0078	101.1
402	0.035	0.035	3.158	0.0091	127.3
487	0.040	0.040	3.162	0.0104	154.0
562	0.045	0.045	3.166	0.0117	177.5
598	0.050	0.050	3.171	0.0130	188.6
607	0.055	0.055	3.175	0.0143	191.2
592	0.060	0.060	3.179	0.0155	186.2
558	0.065	0.065	3.183	0.0168	175.3
510	0.070	0.070	3.187	0.0181	160.0
452	0.075	0.075	3.192	0.0194	141.6

UNCONFINED COMPRESSION TESTING

Sample No. 460-011



UNCONFINED COMPRESSION TEST

ASTM D 2166
SUMMARY OF RESULTS

PROJECT:	Quanta		
PROJECT No.:	SH0460		
SAMPLE No.:	460-011		
TESTING DATE:	4/22/2013	LOADING RATE:	0.04 in./min.
TESTED BY:	TNR	TRACKING CODE:	8854

TESTING PARAMETER AND RESULTS		
MOISTURE CONTENT	25.0	%
BULK UNIT WEIGHT	114.8	lb/ft^3
DRY UNIT WEIGHT	91.8	lb/ft^3
UCS *	191.2	lb/in^2

* UCS - UNCONFINED COMPRESSIVE STRENGTH

PERMEABILITY ASTM D5084

SPECIMEN CONDITIONS

PROJECT:	Quanta	TESTED BY:	RJB
PROJECT No.:	SH0460	TRACKING CODE:	8855_PM
SAMPLE No.:	0460-012 (28 Day)	EQUIPMENT No.:	7A
TEST DATE:	4/22/13		

MOISTURE CONTENT (Dry Basis)	*INITIAL*	*FINAL*
1. MOISTURE TIN NO.		
2. WT MOISTURE TIN (tare weight)	0.00 *g*	236.43 *g*
3. WT WET SOIL + TARE	385.39 *g*	625.10 *g*
4. WT DRY SOIL + TARE	293.72 *g*	530.15 *g*
5. WT WATER, Ww	91.67 g	94.95 g
6. WT DRY SOIL, Ws	293.72 g	293.72 g
7. MOISTURE CONTENT, W	31.21 %	32.33 %

SOIL SPECIMEN DIMENSIONS				
TRIPLICATE	*DIAMETER*		*HEIGHT*	
ANALYSES	*INITIAL*	*FINAL*	*INITIAL*	*FINAL*
No. 1	*3.00 in.*	*2.98 in.*	*2.04 in.*	*2.05 in.*
No. 2	*2.99 in.*	*2.99 in.*	*2.08 in.*	*2.06 in.*
No. 3	*2.95 in.*	*2.97 in.*	*2.10 in.*	*2.03 in.*
Average	2.98 in.	2.98 in.	2.07 in.	2.05 in.

SPECIMEN CONDITIONS	*INITIAL*	*FINAL*
Specimen WT, Wo	*385.39 g*	*388.80 g*
Area, Ao	6.98 in^2	6.97 in^2
Volume, Vo	14.46 in^3	14.27 in^3
Bulk Unit Weight	101.5 lb/ft^3	103.8 lb/ft^3
Dry Unit Weight	77.4 lb/ft^3	78.4 lb/ft^3

PERMEABILITY ASTM D5084

BACK-PRESSURE SATURATION

PROJECT:	Quanta	TESTED BY:	RJB
PROJECT No.:	SH0460	TRACKING CODE:	8855_PM
SAMPLE No.:	0460-012 (28 Day)	EQUIPMENT No.:	7A
TEST DATE:	4/22/13		

TEST	*TIME*	*TESTED*	*TEST PRESSURES (psi)*						
			APPLIED		*PORE*		*PRESSURE CHANGE*		
DATE	*(military)*	*BY*	*CELL*	*BACK*	*SAT.*	*TEST*	*CELL*	*PORE*	*B-Value*
04/22/13	11 : 45	RJB	7.0	5.0	6.1				
04/22/13	12 : 35	RJB	17.0	15.0	16.0	10.3	10.0	4.2	0.42
04/22/13	13 : 25	RJB	27.0	25.0	25.9	21.0	10.0	5.0	0.50
04/22/13	14 : 10	RJB	37.0	35.0	36.0	33.7	10.0	7.8	0.78
04/23/13	8 : 50	RJB	47.0	45.0	46.1	45.3	10.0	9.3	0.93
04/23/13	10 : 5	RJB	57.0	55.0	*	55.6	10.0	9.5	0.95
04/23/13	10 : 6	RJB	47.0	45.0	*	*	*	*	*

* Saturation check - no data available.

PERMEABILITY ASTM D5084

SPECIMEN CONSOLIDATION

PROJECT:	Quanta		RJB
PROJECT No.:	SH0460		8855_PM
SAMPLE No.:	0460-012 (28 Day)		7A
TEST DATE:	4/22/13		

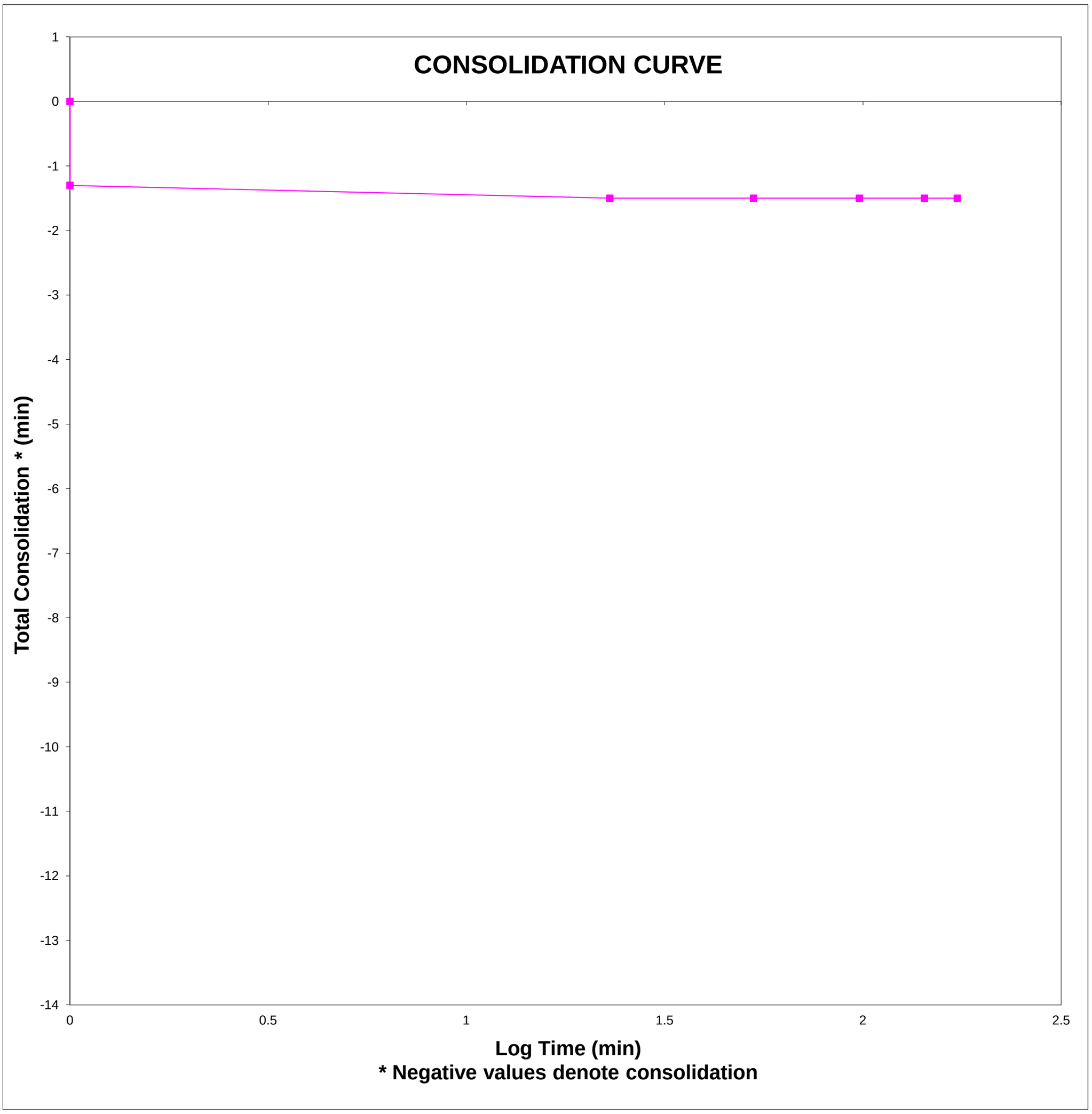
CELL PRESSURE: 55 psi **BACK PRESSURE:** 45 psi **EFFECTIVE STRESS:** 10 psi

TEST DATE	*TESTED BY*	*TIME (Military)*	*ELAPSED TIME (minutes)*	*TOTAL TIME (minutes)*	*TOTAL TIME (Log)*	*SPECIMEN CONSOLIDATION (ML)*		
						READING		*ACTUAL TOTAL (Ct)*
						BOTTOM	*TOP*	
4 / 23 / 13	RJB	10 : 7	0	0	0	25.0	25.0	0.0
4 / 23 / 13	RJB	10 : 8	1	1	0.00	24.5	24.2	1.3
4 / 23 / 13	RJB	10 : 30	22	23	1.36	24.4	24.1	1.5
4 / 23 / 13	RJB	11 : 0	30	53	1.72	24.4	24.1	1.5
4 / 23 / 13	RJB	11 : 45	45	98	1.99	24.4	24.1	1.5
4 / 23 / 13	RJB	12 : 30	45	143	2.16	24.4	24.1	1.5
4 / 23 / 13	RJB	13 : 0	30	173	2.24	24.4	24.1	1.5

PERMEABILITY ASTM D5084

CONSOLIDATION CURVE

PROJECT:	Quanta	TESTED BY:	RJB
PROJECT No.:	SH0460	TRACKING CODE:	8855_PM
SAMPLE No.:	0460-012 (28 Day)	EQUIPMENT No.:	7A
TEST DATE:	4/22/13		



PERMEABILITY ASTM D5084

TEST DATA

PROJECT:	Quanta	TESTED BY:	RJB
PROJECT No.:	SH0460	TRACKING CODE:	8855_PM
SAMPLE No.:	0460-012 (28 Day)	EQUIPMENT No.:	7A
TEST DATE:	4/22/2013		

DATE	*TESTED BY*	*TIME (military)*	*ELAPSED TIME (minutes)*	*HYDRAULIC HEAD (cm)*		*TEMP. C°*	*GAUGE PRESSURE (psi)*		
				INFLUENT	*EFFLUENT*		*CELL*	*INFLUENT*	*EFFLUENT*
4 / 24 / 13	RJB	9 : 33	0	0.0	25.0	20.0	55.0	45.0	45.0
4 / 24 / 13	RJB	10 : 18	45	0.5	24.5	20.0	55.0	45.0	45.0
4 / 24 / 13	RJB	11 : 27	69	1.2	23.8	20.0	55.0	45.0	45.0
4 / 24 / 13	RJB	13 : 25	118	2.2	22.8	20.0	55.0	45.0	45.0
4 / 24 / 13	RJB	14 : 45	80	2.8	22.2	20.0	55.0	45.0	45.0

PERMEABILITY ASTM D5084

TEST DATA (continued)

PROJECT:	Quanta	TESTED BY:	RJB
PROJECT No.:	SH0460	TRACKING CODE:	8855_PM
SAMPLE No.:	0460-012 (28 Day)	EQUIPMENT No.:	7A
TEST DATE:	4/22/13		

ELAPSED TIME (minutes)	*HYDRAULIC HEAD DIFFERENCE (cm)*		*EFFLUENT - INFLUENT RATIO*	*HYDRAULIC GRADIENT (cm/cm)*	*HYDRAULIC CONDUCTIVITY (cm/sec)*	
	INFLUENT	*EFFLUENT*			*@ Temp.*	*@ 20° C*
RESET				4.748		
45	0.5	0.5	1.00	4.558	8.84E-07	8.88E-07
69	0.7	0.7	1.00	4.292	8.49E-07	8.53E-07
118	1.0	1.0	1.00	3.912	7.65E-07	7.69E-07
80	0.6	0.6	1.00	3.684	7.31E-07	7.35E-07

PERMEABILITY ASTM D5084

SUMMARY OF RESULTS

PROJECT:	Quanta	TESTED BY:	RJB
PROJECT No.:	SH0460	TRACKING CODE:	8855_PM
SAMPLE No.:	0460-012 (28 Day)	EQUIPMENT No.:	7A
TEST DATE:	4/22/13		

TESTING PARAMETER	INITIAL	FINAL
BULK UNIT WEIGHT	101.5 lb/ft³	103.8 lb/ft³
DRY UNIT WEIGHT	77.4 lb/ft³	78.4 lb/ft³
MOISTURE CONTENT	31.2 %	32.3 %
PERMEABILITY @ 20°C	8.1E-07 cm/sec	

UNCONFINED COMPRESSION TEST

ASTM D 2166

PROJECT:	Quanta
PROJECT No.:	SH0460
SAMPLE No.:	460-012
TESTING DATE:	22-Apr-13
TESTED BY:	TNR

LOADING RATE:	0.04 in./min.
TRACKING CODE:	8855

MOISTURE CONTENT (Dry Basis)		
1. MOISTURE TIN NO.		
2. WT MOISTURE TIN (tare weight)	173.47	g
3. WT WET SOIL + TARE	277.89	g
4. WT DRY SOIL + TARE	254.12	g
5. WT WATER, Ww	23.77	g
6. WT DRY SOIL, Ws	80.65	g
7. MOISTURE CONTENT, W	**29.47**	**%**

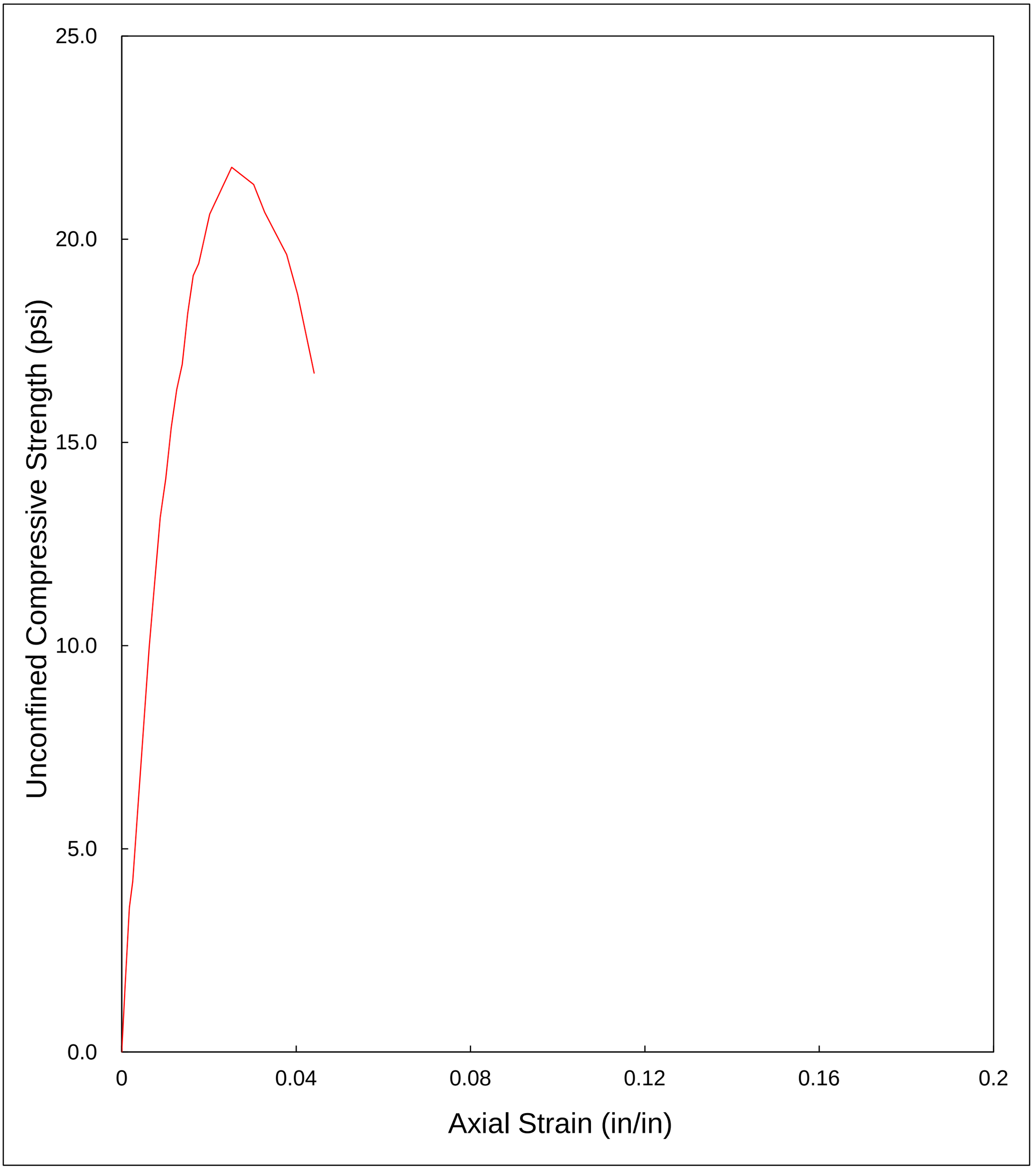
SOIL SPECIMEN DIMENSIONS				
	DIAMETER		*LENGTH*	
No. 1	1.99	in.	3.96	in.
No. 2	1.99	in.	3.97	in.
No. 3	1.97	in.	3.97	in.
Average	**1.98**	**in.**	**3.97**	**in.**

SPECIMEN CONDITIONS		
Initial Specimen WT, Wo	*329.31*	*g*
Initial Area, Ao	3.09	in²
Initial Volume, Vo	12.25	in³
Initial Bulk Unit Weight,	102.4	lb/ft³
Initial Dry Unit Weight	79.1	lb/ft³
15 % Strain (0.15 Lo)	0.59	in.
UCS	21.8	lb/in²

COMPRESSIVE LOAD (lbs.)	DIAL GAGE READING (in.)	SPECIMEN DEFORMATION (in.)	CORRECTED AREA (in²)	AXIAL STRAIN (in/in)	UNCONFINED COMPRESSIVE STRENGTH (lb/in²)
0	0.000	0.000	3.089	0.0000	0.0
5	0.003	0.003	3.092	0.0008	1.6
8	0.005	0.005	3.093	0.0013	2.6
11	0.007	0.007	3.095	0.0018	3.6
13	0.010	0.010	3.097	0.0025	4.2
19	0.015	0.015	3.101	0.0038	6.1
25	0.020	0.020	3.105	0.0050	8.1
31	0.025	0.025	3.109	0.0063	10.0
36	0.030	0.030	3.113	0.0076	11.6
41	0.035	0.035	3.117	0.0088	13.2
44	0.040	0.040	3.121	0.0101	14.1
48	0.045	0.045	3.125	0.0113	15.4
51	0.050	0.050	3.129	0.0126	16.3
53	0.055	0.055	3.133	0.0139	16.9
57	0.060	0.060	3.137	0.0151	18.2
60	0.065	0.065	3.141	0.0164	19.1
61	0.070	0.070	3.145	0.0177	19.4
63	0.075	0.075	3.149	0.0189	20.0
65	0.080	0.080	3.153	0.0202	20.6
66	0.085	0.085	3.157	0.0214	20.9
67	0.090	0.090	3.161	0.0227	21.2
68	0.095	0.095	3.165	0.0240	21.5
69	0.100	0.100	3.169	0.0252	21.8
68	0.120	0.120	3.186	0.0303	21.3
67	0.125	0.125	3.190	0.0315	21.0
66	0.130	0.130	3.194	0.0328	20.7
63	0.150	0.150	3.211	0.0378	19.6
60	0.160	0.160	3.219	0.0403	18.6
58	0.165	0.165	3.224	0.0416	18.0
56	0.170	0.170	3.228	0.0429	17.3
54	0.175	0.175	3.232	0.0441	16.7

UNCONFINED COMPRESSION TESTING

Sample No. 460-012



UNCONFINED COMPRESSION TEST

ASTM D 2166
SUMMARY OF RESULTS

PROJECT:	Quanta		
PROJECT No.:	SH0460		
SAMPLE No.:	460-012		
TESTING DATE:	4/22/2013	LOADING RATE:	0.04 in./min.
TESTED BY:	TNR	TRACKING CODE:	8855

TESTING PARAMETER AND RESULTS		
MOISTURE CONTENT	29.5	%
BULK UNIT WEIGHT	102.4	lb/ft^3
DRY UNIT WEIGHT	79.1	lb/ft^3
UCS *	21.8	lb/in^2

* UCS - UNCONFINED COMPRESSIVE STRENGTH

PERMEABILITY ASTM D5084

SPECIMEN CONDITIONS

PROJECT:	Quanta	TESTED BY:	RJB
PROJECT No.:	SH0460	TRACKING CODE:	8856_PM
SAMPLE No.:	0460-013 (28 Day)	EQUIPMENT No.:	5
TEST DATE:	4/26/13		

MOISTURE CONTENT (Dry Basis)	*INITIAL*	*FINAL*
1. MOISTURE TIN NO.		
2. WT MOISTURE TIN (tare weight)	0.00 *g*	5.59 *g*
3. WT WET SOIL + TARE	347.16 *g*	365.44 *g*
4. WT DRY SOIL + TARE	264.93 *g*	270.52 *g*
5. WT WATER, Ww	82.23 g	94.92 g
6. WT DRY SOIL, Ws	264.93 g	264.93 g
7. MOISTURE CONTENT, W	31.04 %	35.83 %

SOIL SPECIMEN DIMENSIONS				
TRIPLICATE	*DIAMETER*		*HEIGHT*	
ANALYSES	*INITIAL*	*FINAL*	*INITIAL*	*FINAL*
No. 1	*2.99 in.*	*2.97 in.*	*1.96 in.*	*1.95 in.*
No. 2	*2.98 in.*	*2.98 in.*	*1.94 in.*	*1.96 in.*
No. 3	*2.97 in.*	*2.97 in.*	*1.95 in.*	*1.93 in.*
Average	2.98 in.	2.97 in.	1.95 in.	1.94 in.

SPECIMEN CONDITIONS	*INITIAL*	*FINAL*
Specimen WT, Wo	*347.16 g*	*359.94 g*
Area, Ao	6.97 in^2	6.95 in^2
Volume, Vo	13.56 in^3	13.51 in^3
Bulk Unit Weight	97.5 lb/ft^3	101.5 lb/ft^3
Dry Unit Weight	74.4 lb/ft^3	74.7 lb/ft^3

PERMEABILITY ASTM D5084

BACK-PRESSURE SATURATION

PROJECT:	Quanta	TESTED BY:	RJB
PROJECT No.:	SH0460	TRACKING CODE:	8856_PM
SAMPLE No.:	0460-013 (28 Day)	EQUIPMENT No.:	5
TEST DATE:	4/26/13		

TEST	*TIME*	*TESTED*	*TEST PRESSURES (psi)*						
			APPLIED		*PORE*		*PRESSURE CHANGE*		
DATE	*(military)*	*BY*	*CELL*	*BACK*	*SAT.*	*TEST*	*CELL*	*PORE*	*B-Value*
04/27/13	12 : 25	RJB	7.0	5.0	5.0				
04/27/13	13 : 30	RJB	17.0	15.0	15.0	10.5	10.0	5.5	0.55
04/27/13	14 : 10	RJB	27.0	25.0	24.9	21.8	10.0	6.8	0.68
04/27/13	15 : 5	RJB	37.0	35.0	35.0	33.1	10.0	8.2	0.82
04/27/13	15 : 55	RJB	47.0	45.0	45.0	*	*	*	*
04/29/13	8 : 32	RJB	57.0	55.0	*	54.7	10.0	9.7	0.97
04/29/13	8 : 33	RJB	47.0	45.0	*	*	*	*	*

* Saturation check - no data available.

PERMEABILITY ASTM D5084

SPECIMEN CONSOLIDATION

PROJECT:	Quanta		RJB
PROJECT No.:	SH0460		8856_PM
SAMPLE No.:	0460-013 (28 Day)		5
TEST DATE:	4/26/13		

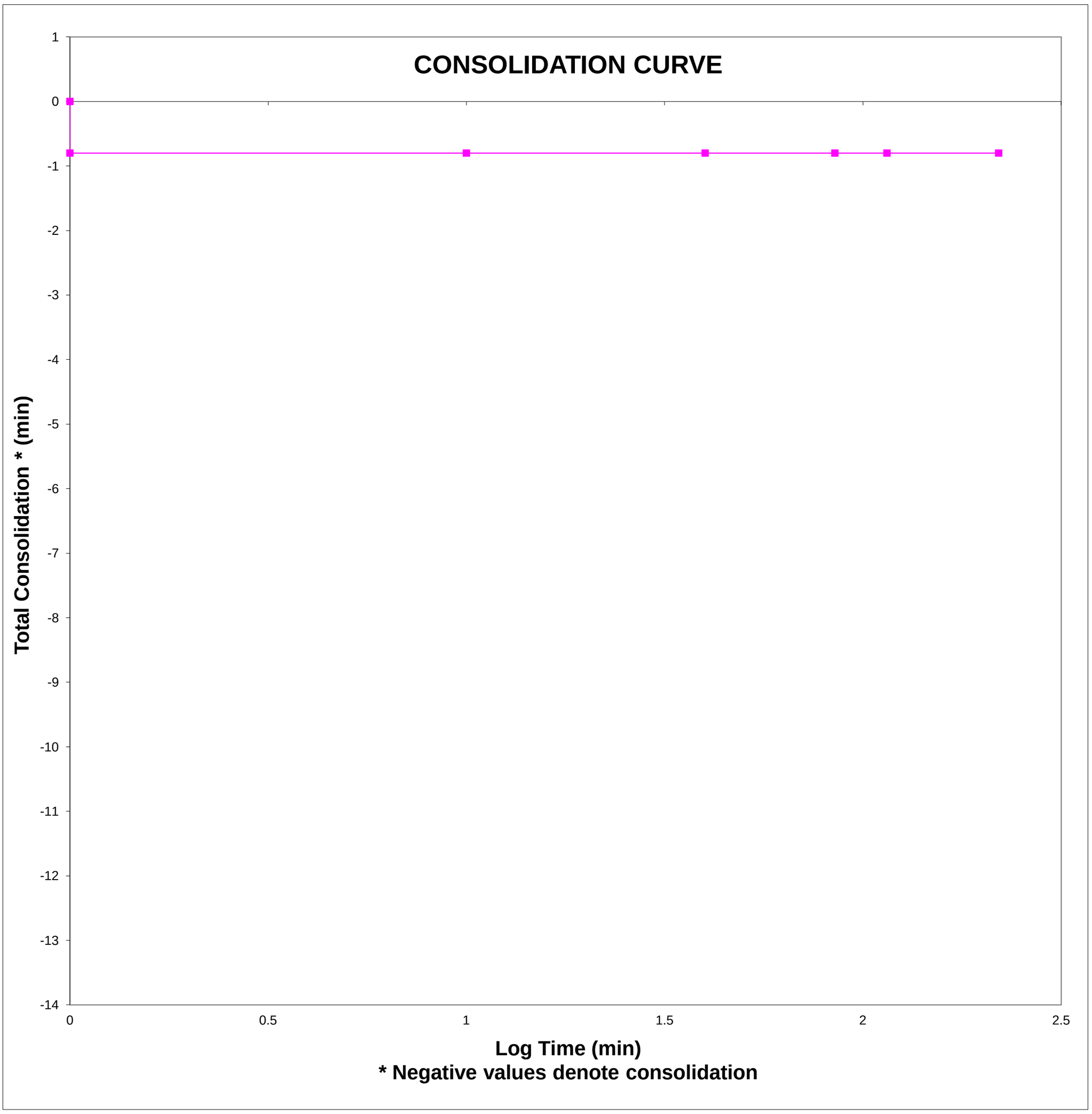
CELL PRESSURE: 55 psi **BACK PRESSURE:** 45 psi **EFFECTIVE STRESS:** 10 psi

TEST DATE	*TESTED BY*	*TIME (Military)*	*ELAPSED TIME (minutes)*	*TOTAL TIME (minutes)*	*TOTAL TIME (Log)*	*SPECIMEN CONSOLIDATION (ML)*		
						READING		*ACTUAL TOTAL (Ct)*
						BOTTOM	*TOP*	
4 / 29 / 13	RJB	8 : 35	0	0	0	25.0	25.0	0.0
4 / 29 / 13	RJB	8 : 36	1	1	0.00	24.6	24.6	0.8
4 / 29 / 13	RJB	8 : 45	9	10	1.00	24.6	24.6	0.8
4 / 29 / 13	RJB	9 : 15	30	40	1.60	24.6	24.6	0.8
4 / 29 / 13	RJB	10 : 0	45	85	1.93	24.6	24.6	0.8
4 / 29 / 13	RJB	10 : 30	30	115	2.06	24.6	24.6	0.8
4 / 29 / 13	RJB	12 : 15	105	220	2.34	24.6	24.6	0.8

PERMEABILITY ASTM D5084

CONSOLIDATION CURVE

PROJECT:	Quanta	TESTED BY:	RJB
PROJECT No.:	SH0460	TRACKING CODE:	8856_PM
SAMPLE No.:	0460-013 (28 Day)	EQUIPMENT No.:	5
TEST DATE:	4/26/13		



PERMEABILITY ASTM D5084

TEST DATA

PROJECT:	Quanta	TESTED BY:	RJB
PROJECT No.:	SH0460	TRACKING CODE:	8856_PM
SAMPLE No.:	0460-013 (28 Day)	EQUIPMENT No.:	5
TEST DATE:	4/26/2013		

DATE	*TESTED BY*	*TIME (military)*	*ELAPSED TIME (minutes)*	*HYDRAULIC HEAD (cm)*		*TEMP. C°*	*GAUGE PRESSURE (psi)*		
				INFLUENT	*EFFLUENT*		*CELL*	*INFLUENT*	*EFFLUENT*
4 / 29 / 13	RJB	15 : 10	0	0.0	25.0	20.0	55.0	45.0	43.0
4 / 29 / 13	RJB	21 : 5	355	0.5	24.5	20.0	55.0	45.0	43.0
4 / 30 / 13	RJB	3 : 32	387	1.0	24.0	20.0	55.0	45.0	43.0
4 / 30 / 13	RJB	10 : 12	400	1.6	23.4	20.0	55.0	45.0	43.0
5 / 1 / 13	RJB	9 : 26	RESET	0.0	25.0	20.0	55.0	45.0	43.0
5 / 2 / 13	RJB	8 : 23	1377	1.0	24.0	20.0	55.0	45.0	43.0
5 / 3 / 13	RJB	8 : 16	1433	1.8	23.2	20.0	55.0	45.0	43.0
5 / 6 / 13	RJB	7 : 51	4295	3.3	21.7	20.0	55.0	45.0	43.0

PERMEABILITY ASTM D5084

TEST DATA (continued)

PROJECT:	Quanta	TESTED BY:	RJB
PROJECT No.:	SH0460	TRACKING CODE:	8856_PM
SAMPLE No.:	0460-013 (28 Day)	EQUIPMENT No.:	5
TEST DATE:	4/26/13		

ELAPSED TIME (minutes)	*HYDRAULIC HEAD DIFFERENCE (cm)*		*EFFLUENT - INFLUENT RATIO*	*HYDRAULIC GRADIENT (cm/cm)*	*HYDRAULIC CONDUCTIVITY (cm/sec)*	
	INFLUENT	*EFFLUENT*			*@ Temp.*	*@ 20° C*
RESET				33.505		
355	0.5	0.5	1.00	33.303	1.56E-08	1.57E-08
387	0.5	0.5	1.00	33.100	1.44E-08	1.45E-08
400	0.6	0.6	1.00	32.858	1.69E-08	1.69E-08
RESET				33.505		
1377	1.0	1.0	1.00	33.100	8.09E-09	8.12E-09
1433	0.8	0.8	1.00	32.777	6.28E-09	6.31E-09
4295	1.5	1.5	1.00	32.170	3.99E-09	4.01E-09

PERMEABILITY ASTM D5084

SUMMARY OF RESULTS

PROJECT:	Quanta	TESTED BY:	RJB
PROJECT No.:	SH0460	TRACKING CODE:	8856_PM
SAMPLE No.:	0460-013 (28 Day)	EQUIPMENT No.:	5
TEST DATE:	4/26/13		

TESTING PARAMETER	INITIAL	FINAL
BULK UNIT WEIGHT	97.5 lb/ft³	101.5 lb/ft³
DRY UNIT WEIGHT	74.4 lb/ft³	74.7 lb/ft³
MOISTURE CONTENT	31.0 %	35.8 %
PERMEABILITY @ 20°C	1.6E-08 cm/sec	

UNCONFINED COMPRESSION TEST

ASTM D 2166

PROJECT:	Quanta
PROJECT No.:	SH0460
SAMPLE No.:	460-013
TESTING DATE:	22-Apr-13
TESTED BY:	TNR

LOADING RATE:	0.04 in./min.
TRACKING CODE:	8856

MOISTURE CONTENT (Dry Basis)		
1. MOISTURE TIN NO.		
2. WT MOISTURE TIN (tare weight)	164.81	g
3. WT WET SOIL + TARE	274.31	g
4. WT DRY SOIL + TARE	244.90	g
5. WT WATER, Ww	29.41	g
6. WT DRY SOIL, Ws	80.09	g
7. MOISTURE CONTENT, W	**36.72**	**%**

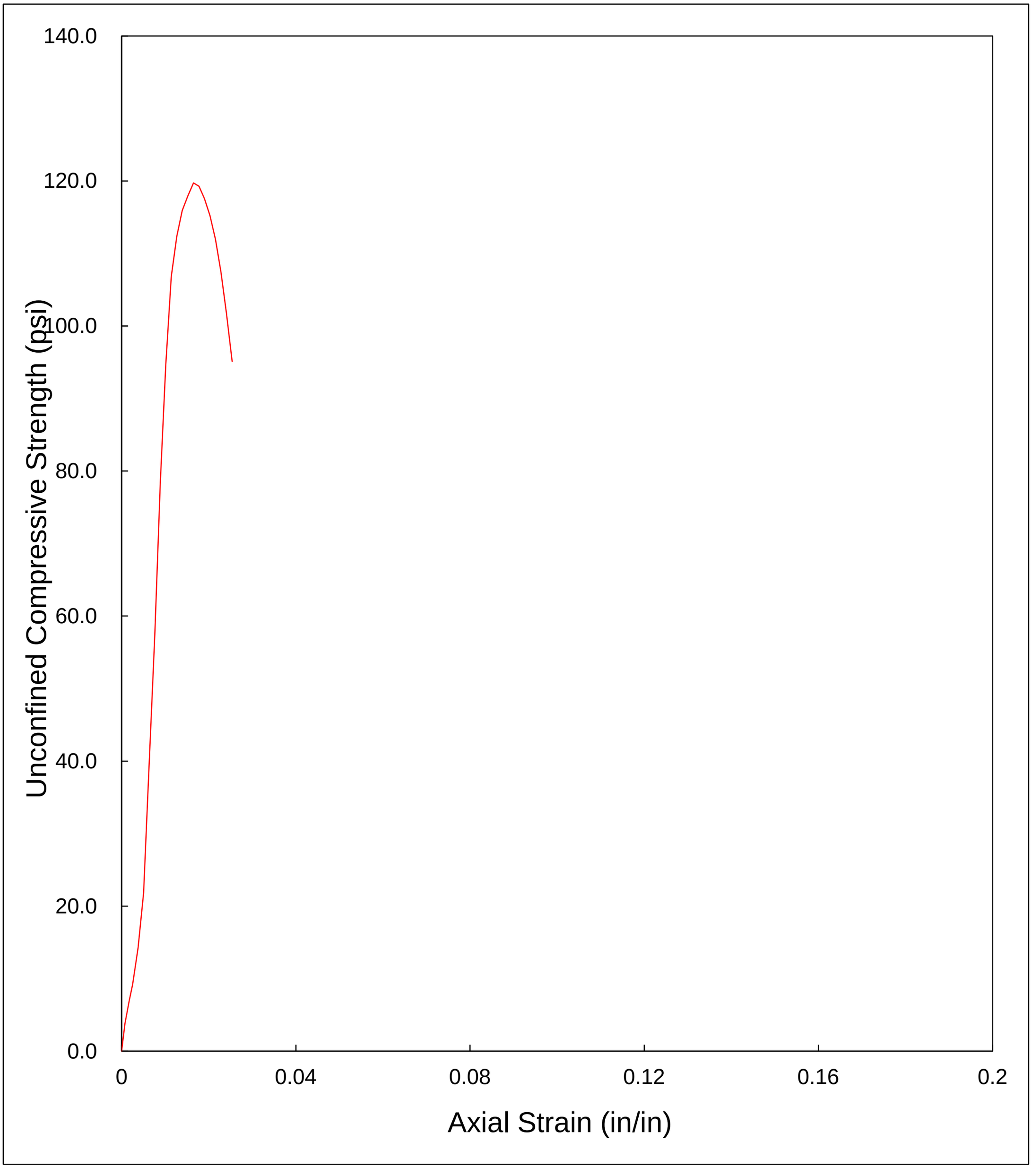
SOIL SPECIMEN DIMENSIONS				
	DIAMETER		*LENGTH*	
No. 1	2.01	in.	3.94	in.
No. 2	2.00	in.	3.93	in.
No. 3	1.99	in.	3.95	in.
Average	**2.00**	**in.**	**3.94**	**in.**

SPECIMEN CONDITIONS		
Initial Specimen WT, Wo	*317.36*	*g*
Initial Area, Ao	3.15	in²
Initial Volume, Vo	12.41	in³
Initial Bulk Unit Weight,	97.4	lb/ft³
Initial Dry Unit Weight	71.3	lb/ft³
15 % Strain (0.15 Lo)	0.59	in.
UCS	119.7	lb/in²

COMPRESSIVE LOAD (lbs.)	DIAL GAGE READING (in.)	SPECIMEN DEFORMATION (in.)	CORRECTED AREA (in²)	AXIAL STRAIN (in/in)	UNCONFINED COMPRESSIVE STRENGTH (lb/in²)
0	0.000	0.000	3.146	0.0000	0.0
12	0.003	0.003	3.149	0.0008	3.8
17	0.005	0.005	3.150	0.0013	5.4
22	0.007	0.007	3.152	0.0018	7.0
29	0.010	0.010	3.154	0.0025	9.2
45	0.015	0.015	3.158	0.0038	14.2
69	0.020	0.020	3.162	0.0051	21.8
127	0.025	0.025	3.166	0.0063	40.1
182	0.030	0.030	3.170	0.0076	57.4
249	0.035	0.035	3.174	0.0089	78.4
301	0.040	0.040	3.179	0.0101	94.7
340	0.045	0.045	3.183	0.0114	106.8
358	0.050	0.050	3.187	0.0127	112.3
370	0.055	0.055	3.191	0.0139	116.0
377	0.060	0.060	3.195	0.0152	118.0
383	0.065	0.065	3.199	0.0165	119.7
382	0.070	0.070	3.203	0.0178	119.3
377	0.075	0.075	3.207	0.0190	117.5
370	0.080	0.080	3.211	0.0203	115.2
360	0.085	0.085	3.216	0.0216	112.0
346	0.090	0.090	3.220	0.0228	107.5
328	0.095	0.095	3.224	0.0241	101.7
307	0.100	0.100	3.228	0.0254	95.1

UNCONFINED COMPRESSION TESTING

Sample No. 460-013



UNCONFINED COMPRESSION TEST

ASTM D 2166
SUMMARY OF RESULTS

PROJECT:	Quanta		
PROJECT No.:	SH0460		
SAMPLE No.:	460-013		
TESTING DATE:	4/22/2013	LOADING RATE:	0.04 in./min.
TESTED BY:	TNR	TRACKING CODE:	8856

TESTING PARAMETER AND RESULTS		
MOISTURE CONTENT	36.7	%
BULK UNIT WEIGHT	97.4	lb/ft^3
DRY UNIT WEIGHT	71.3	lb/ft^3
UCS *	119.7	lb/in^2

* UCS - UNCONFINED COMPRESSIVE STRENGTH

ANS 16.1 LEACHABILITY

SAMPLE PREPARATION

PROJECT:	Quanta	TESTED BY:	TNR
PROJECT No.:	SH0460	TRACKING CODE:	8856.00
SAMPLE No.:	460-013		
TEST DATE:	5/2/2013		

MOISTURE CONTENT (Dry Basis)	*RESULTS*	
1. MOISTURE TIN NO.	406-013	
2. WT MOISTURE TIN (tare weight)	164.81	*g*
3. WT WET SOIL + TARE	274.31	*g*
4. WT DRY SOIL + TARE	244.90	*g*
5. WT WATER, Ww	29.41	g
6. WT DRY SOIL, Ws	80.09	g
7. MOISTURE CONTENT, W	36.72	%

SOIL SPECIMEN DIMENSIONS				
TRIPLICATE ANALYSES	*DIAMETER RESULTS*		*LENGTH RESULTS*	
No. 1	*2.00*	*in.*	*3.93*	*in.*
No. 2	*2.00*	*in.*	*3.95*	*in.*
No. 3	*1.99*	*in.*	*3.98*	*in.*
Average	2.00	in.	3.95	in.

SPECIMEN CONDITIONS	*INITIAL*	
Specimen WT, Wo	*308.08*	*g*
Area, Ao	3.13	in^2
Volume, Vo	12.39	in^3
Bulk Unit Weight	94.7	pcf
Dry Unit Weight	69.3	pcf

ANS 16.1 LEACHABILITY

TESTING DATA

PROJECT:	Quanta
PROJECT NO.:	SH0460
SAMPLE NO:	460-013
START DATE:	5/2/2013
TRACKING CODE:	8856

LEACH INTERVAL	TESTED BY	DATE		TIME		VOLUME LEACHATE (ml)	TEMP (°C)	PID (ppm)	Conduct. (mS/cm³)	pH (s.u.)	OBSERVATIONS
		IN	OUT	IN	OUT						
Initial	TNR					2006	22.15		0.042	6.98	
1	TNR	05/02/13	05/02/13	900	1100	2006	22.74		0.090	7.61	2 hr
2	TNR	05/02/13	05/02/13	1100	1600	2006	22.47		0.105	6.94	7 hr
3	TNR	05/02/13	05/03/13	1600	900	2006	22.24		0.160	9.08	24 hr; particles at bottom
4	TNR	05/03/13	05/04/13	900	900	2006	21.09		0.158	8.78	48 hr; particles at bottom
5	TNR	05/04/13	05/05/13	900	900	2006	20.48		0.149	8.88	3 day; faint brown tint in water
6	TNR	05/05/13	05/06/13	900	900	2006	20.63		0.124	8.60	4 day
7	TNR	05/06/13	05/07/13	900	900	2006	21.33		0.120	8.60	5 day
8											
9											
10											

PERMEABILITY ASTM D5084

SPECIMEN CONDITIONS

PROJECT:	Quanta	TESTED BY:	RJB
PROJECT No.:	SH0460	TRACKING CODE:	8857_PM
SAMPLE No.:	0460-014 (28 Day)	EQUIPMENT No.:	6B
TEST DATE:	4/26/13		

MOISTURE CONTENT (Dry Basis)	*INITIAL*	*FINAL*
1. MOISTURE TIN NO.		
2. WT MOISTURE TIN (tare weight)	0.00 *g*	12.64 *g*
3. WT WET SOIL + TARE	207.93 *g*	231.42 *g*
4. WT DRY SOIL + TARE	152.31 *g*	164.95 *g*
5. WT WATER, Ww	55.62 g	66.47 g
6. WT DRY SOIL, Ws	152.31 g	152.31 g
7. MOISTURE CONTENT, W	36.52 %	43.64 %

SOIL SPECIMEN DIMENSIONS				
TRIPLICATE	*DIAMETER*		*HEIGHT*	
ANALYSES	*INITIAL*	*FINAL*	*INITIAL*	*FINAL*
No. 1	*3.00 in.*	*3.01 in.*	*1.25 in.*	*1.16 in.*
No. 2	*3.01 in.*	*3.01 in.*	*1.17 in.*	*1.17 in.*
No. 3	*3.00 in.*	*3.00 in.*	*1.21 in.*	*1.22 in.*
Average	3.01 in.	3.01 in.	1.21 in.	1.18 in.

SPECIMEN CONDITIONS	*INITIAL*	*FINAL*
Specimen WT, Wo	*207.93 g*	*218.81 g*
Area, Ao	7.09 in^2	7.10 in^2
Volume, Vo	8.58 in^3	8.40 in^3
Bulk Unit Weight	92.3 lb/ft^3	99.2 lb/ft^3
Dry Unit Weight	67.6 lb/ft^3	69.1 lb/ft^3

PERMEABILITY ASTM D5084

BACK-PRESSURE SATURATION

PROJECT:	Quanta	TESTED BY:	RJB
PROJECT No.:	SH0460	TRACKING CODE:	8857_PM
SAMPLE No.:	0460-014 (28 Day)	EQUIPMENT No.:	6B
TEST DATE:	4/26/13		

TEST	*TIME*	*TESTED*	*TEST PRESSURES (psi)*						
			APPLIED		*PORE*		*PRESSURE CHANGE*		
DATE	*(military)*	*BY*	*CELL*	*BACK*	*SAT.*	*TEST*	*CELL*	*PORE*	*B-Value*
04/27/13	13 : 15	RJB	7.0	5.0	6.3				
04/27/13	14 : 30	RJB	17.0	15.0	16.6	12.7	10.0	6.4	0.64
04/27/13	15 : 5	RJB	27.0	25.0	26.6	24.4	10.0	7.8	0.78
04/27/13	16 : 0	RJB	37.0	35.0	36.6	35.4	10.0	8.8	0.88
04/29/13	8 : 40	RJB	47.0	45.0	46.6	46.4	10.0	9.8	0.98
04/29/13	9 : 20	RJB	57.0	55.0	*	56.4	10.0	9.8	0.98
04/29/13	9 : 21	RJB	47.0	45.0	*	*	*	*	*

* Saturation check - no data available.

PERMEABILITY ASTM D5084

SPECIMEN CONSOLIDATION

PROJECT:	Quanta	RJB
PROJECT No.:	SH0460	8857_PM
SAMPLE No.:	0460-014 (28 Day)	6B
TEST DATE:	4/26/13	

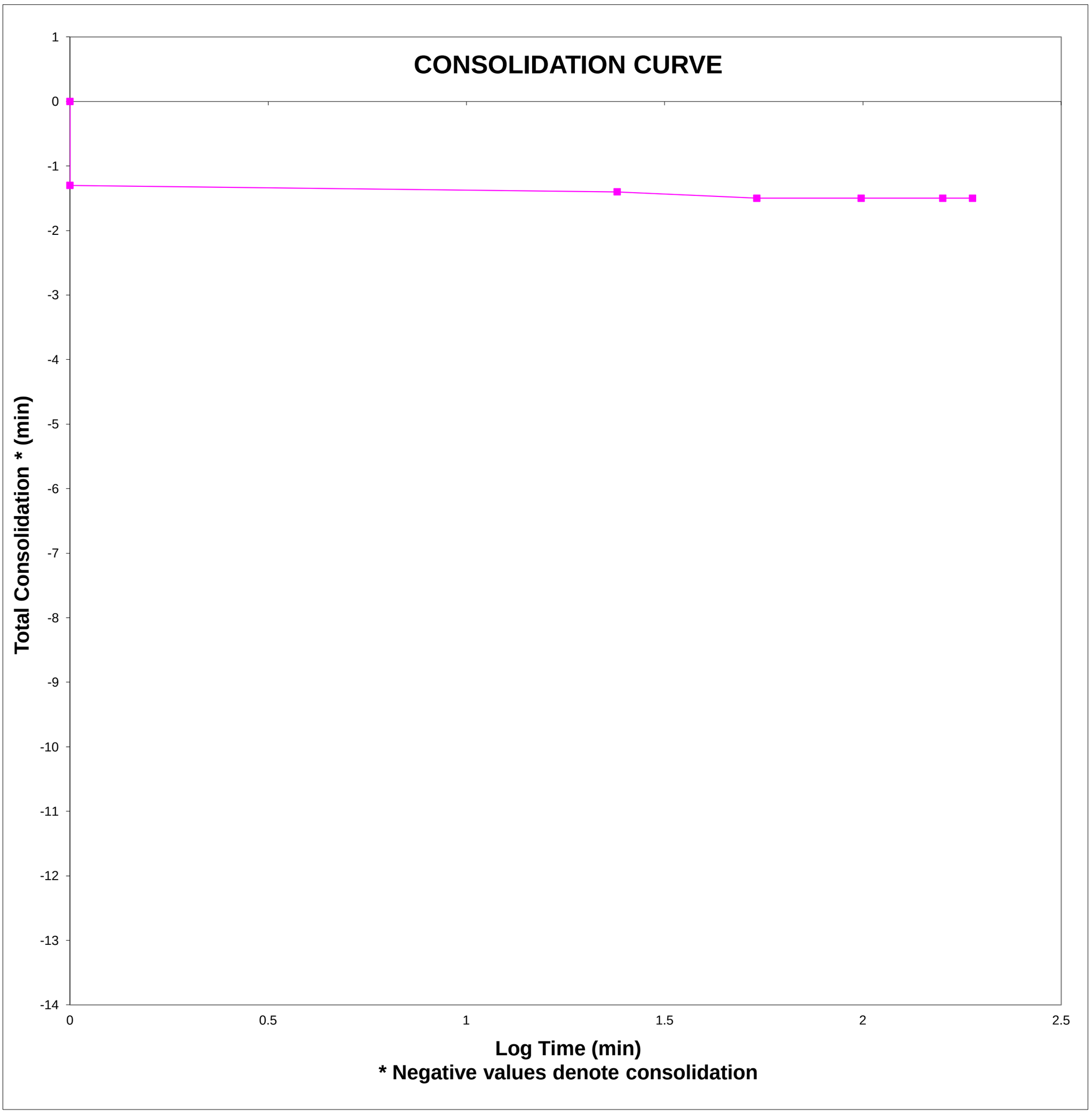
CELL PRESSURE: 55 psi **BACK PRESSURE:** 45 psi **EFFECTIVE STRESS:** 10 psi

TEST DATE	*TESTED BY*	*TIME (Military)*	*ELAPSED TIME (minutes)*	*TOTAL TIME (minutes)*	*TOTAL TIME (Log)*	*SPECIMEN CONSOLIDATION (ML)*		
						READING		*ACTUAL TOTAL (Ct)*
						BOTTOM	*TOP*	
4 / 29 / 13	RJB	9 : 21	0	0	0	25.0	25.0	0.0
4 / 29 / 13	RJB	9 : 22	1	1	0.00	24.3	24.4	1.3
4 / 29 / 13	RJB	9 : 45	23	24	1.38	24.2	24.4	1.4
4 / 29 / 13	RJB	10 : 15	30	54	1.73	24.1	24.4	1.5
4 / 29 / 13	RJB	11 : 0	45	99	2.00	24.1	24.4	1.5
4 / 29 / 13	RJB	12 : 0	60	159	2.20	24.1	24.4	1.5
4 / 29 / 13	RJB	12 : 30	30	189	2.28	24.1	24.4	1.5

PERMEABILITY ASTM D5084

CONSOLIDATION CURVE

PROJECT:	Quanta	TESTED BY:	RJB
PROJECT No.:	SH0460	TRACKING CODE:	8857_PM
SAMPLE No.:	0460-014 (28 Day)	EQUIPMENT No.:	6B
TEST DATE:	4/26/13		



PERMEABILITY ASTM D5084

TEST DATA

PROJECT:	Quanta	TESTED BY:	RJB
PROJECT No.:	SH0460	TRACKING CODE:	8857_PM
SAMPLE No.:	0460-014 (28 Day)	EQUIPMENT No.:	6B
TEST DATE:	4/26/2013		

DATE	*TESTED BY*	*TIME (military)*	*ELAPSED TIME (minutes)*	*HYDRAULIC HEAD (cm)*		*TEMP. C°*	*GAUGE PRESSURE (psi)*		
				INFLUENT	*EFFLUENT*		*CELL*	*INFLUENT*	*EFFLUENT*
4 / 29 / 13	RJB	20 : 50	0	0.0	25.0	20.0	55.0	45.0	45.0
4 / 29 / 13	RJB	23 : 10	RESET	0.0	25.0	20.0	55.0	45.0	43.0
4 / 30 / 13	RJB	3 : 32	262	0.9	24.1	20.0	55.0	45.0	43.0
4 / 30 / 13	RJB	7 : 11	219	1.5	23.5	20.0	55.0	45.0	43.0
4 / 30 / 13	RJB	9 : 26	RESET	0.0	25.0	20.0	55.0	45.0	43.0
4 / 30 / 13	RJB	13 : 28	242	0.9	24.1	20.0	55.0	45.0	43.0
4 / 30 / 13	RJB	16 : 30	RESET	0.0	25.0	20.0	55.0	45.0	43.0
4 / 30 / 13	RJB	19 : 16	166	0.5	24.5	20.0	55.0	45.0	43.0

PERMEABILITY ASTM D5084

TEST DATA (continued)

PROJECT:	Quanta	TESTED BY:	RJB
PROJECT No.:	SH0460	TRACKING CODE:	8857_PM
SAMPLE No.:	0460-014 (28 Day)	EQUIPMENT No.:	6B
TEST DATE:	4/26/13		

ELAPSED TIME (minutes)	*HYDRAULIC HEAD DIFFERENCE (cm)*		*EFFLUENT - INFLUENT RATIO*	*HYDRAULIC GRADIENT (cm/cm)*	*HYDRAULIC CONDUCTIVITY (cm/sec)*	
	INFLUENT	*EFFLUENT*			*@ Temp.*	*@ 20° C*
RESET				8.137		
RESET	0.0	0.0	#DIV/0!	53.923	#VALUE!	#VALUE!
262	0.9	0.9	1.00	53.337	2.33E-08	2.34E-08
219	0.6	0.6	1.00	52.946	1.88E-08	1.89E-08
RESET	-1.5	-1.5	1.00	53.923	#VALUE!	#VALUE!
242	0.9	0.9	1.00	53.337	2.53E-08	2.54E-08
RESET	-0.9	-0.9	1.00	53.923	#VALUE!	#VALUE!
166	0.5	0.5	1.00	53.597	2.04E-08	2.05E-08

PERMEABILITY ASTM D5084

SUMMARY OF RESULTS

PROJECT:	Quanta	TESTED BY:	RJB
PROJECT No.:	SH0460	TRACKING CODE:	8857_PM
SAMPLE No.:	0460-014 (28 Day)	EQUIPMENT No.:	6B
TEST DATE:	4/26/13		

TESTING PARAMETER	INITIAL	FINAL
BULK UNIT WEIGHT	92.3 lb/ft³	99.2 lb/ft³
DRY UNIT WEIGHT	67.6 lb/ft³	69.1 lb/ft³
MOISTURE CONTENT	36.5 %	43.6 %
PERMEABILITY @ 20°C	2.2E-08 cm/sec	

UNCONFINED COMPRESSION TEST

ASTM D 2166

PROJECT:	Quanta
PROJECT No.:	SH0460
SAMPLE No.:	460-014
TESTING DATE:	23-Apr-13
TESTED BY:	TNR/RPH

LOADING RATE:	0.04 in./min.
TRACKING CODE:	8857

MOISTURE CONTENT (Dry Basis)		
1. MOISTURE TIN NO.		
2. WT MOISTURE TIN (tare weight)	3.83	g
3. WT WET SOIL + TARE	129.61	g
4. WT DRY SOIL + TARE	96.54	g
5. WT WATER, Ww	33.07	g
6. WT DRY SOIL, Ws	92.71	g
7. MOISTURE CONTENT, W	**35.67**	**%**

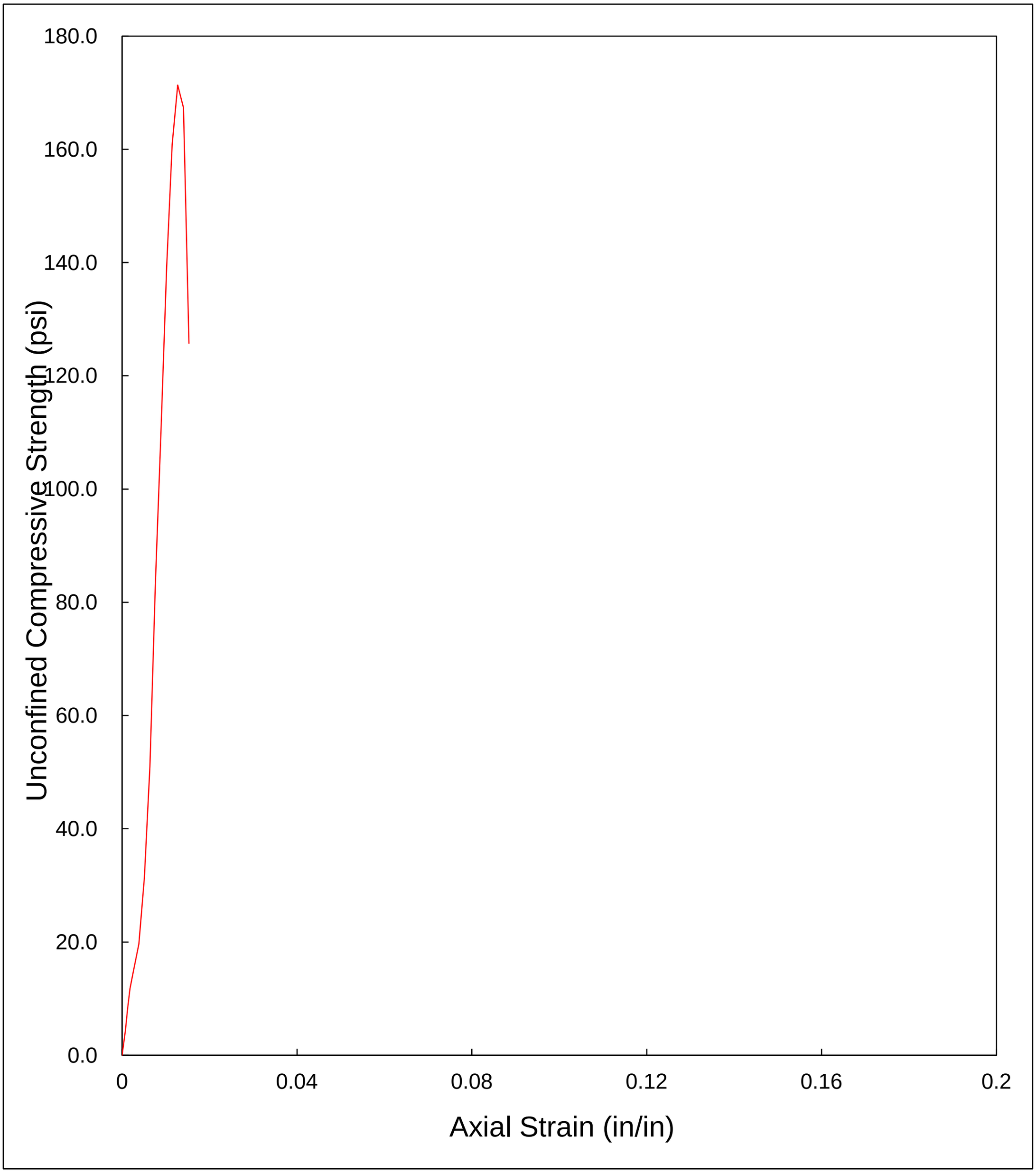
SOIL SPECIMEN DIMENSIONS				
	DIAMETER		*LENGTH*	
No. 1	2.00	in.	3.94	in.
No. 2	2.01	in.	3.92	in.
No. 3	1.99	in.	3.91	in.
Average	**2.00**	**in.**	**3.92**	**in.**

SPECIMEN CONDITIONS		
Initial Specimen WT, Wo	*303.70*	*g*
Initial Area, Ao	3.14	in²
Initial Volume, Vo	12.32	in³
Initial Bulk Unit Weight,	93.9	lb/ft³
Initial Dry Unit Weight	69.2	lb/ft³
15 % Strain (0.15 Lo)	0.59	in.
UCS	171.4	lb/in²

COMPRESSIVE LOAD (lbs.)	DIAL GAGE READING (in.)	SPECIMEN DEFORMATION (in.)	CORRECTED AREA (in²)	AXIAL STRAIN (in/in)	UNCONFINED COMPRESSIVE STRENGTH (lb/in²)
0	0.000	0.000	3.140	0.0000	0.0
14	0.003	0.003	3.142	0.0008	4.5
26	0.005	0.005	3.144	0.0013	8.3
37	0.007	0.007	3.146	0.0018	11.8
46	0.010	0.010	3.148	0.0025	14.6
62	0.015	0.015	3.152	0.0038	19.7
99	0.020	0.020	3.156	0.0051	31.4
161	0.025	0.025	3.160	0.0064	50.9
264	0.030	0.030	3.164	0.0076	83.4
352	0.035	0.035	3.168	0.0089	111.1
442	0.040	0.040	3.172	0.0102	139.3
511	0.045	0.045	3.176	0.0115	160.9
545	0.050	0.050	3.181	0.0127	171.4
533	0.055	0.055	3.185	0.0140	167.4
401	0.060	0.060	3.189	0.0153	125.8

UNCONFINED COMPRESSION TESTING

Sample No. 460-014



UNCONFINED COMPRESSION TEST

ASTM D 2166
SUMMARY OF RESULTS

PROJECT:	Quanta		
PROJECT No.:	SH0460		
SAMPLE No.:	460-014		
TESTING DATE:	4/23/2013	LOADING RATE:	0.04 in./min.
TESTED BY:	TNR/RPH	TRACKING CODE:	8857

TESTING PARAMETER AND RESULTS		
MOISTURE CONTENT	35.7	%
BULK UNIT WEIGHT	93.9	lb/ft^3
DRY UNIT WEIGHT	69.2	lb/ft^3
UCS *	171.4	lb/in^2

* UCS - UNCONFINED COMPRESSIVE STRENGTH

ANS 16.1 LEACHABILITY

SAMPLE PREPARATION

PROJECT:	Quanta	TESTED BY:	TNR
PROJECT No.:	SH0460	TRACKING CODE:	8857
SAMPLE No.:	460-014		
TEST DATE:	5/2/2013		

MOISTURE CONTENT (Dry Basis)	*RESULTS*	
1. MOISTURE TIN NO.	460-014	
2. WT MOISTURE TIN (tare weight)	3.83	*g*
3. WT WET SOIL + TARE	129.61	*g*
4. WT DRY SOIL + TARE	96.54	*g*
5. WT WATER, Ww	33.07	g
6. WT DRY SOIL, Ws	92.71	g
7. MOISTURE CONTENT, W	35.67	%

SOIL SPECIMEN DIMENSIONS				
TRIPLICATE ANALYSES	*DIAMETER RESULTS*		*LENGTH RESULTS*	
No. 1	*2.00*	*in.*	*3.96*	*in.*
No. 2	*2.01*	*in.*	*3.95*	*in.*
No. 3	*2.00*	*in.*	*3.98*	*in.*
Average	2.00	in.	3.97	in.

SPECIMEN CONDITIONS	*INITIAL*	
Specimen WT, Wo	*310.93*	*g*
Area, Ao	3.15	in^2
Volume, Vo	12.48	in^3
Bulk Unit Weight	94.9	pcf
Dry Unit Weight	69.9	pcf

ANS 16.1 LEACHABILITY

TESTING DATA

Sheet 2 of 2

PROJECT:	Quanta
PROJECT NO.:	SH0460
SAMPLE NO:	460-014
START DATE:	5/2/2013
TRACKING CODE:	8857

LEACH INTERVAL	TESTED BY	DATE		TIME		VOLUME LEACHATE (ml)	TEMP (°C)	PID (ppm)	Conduct. (mS/cm³)	pH (s.u.)	OBSERVATIONS
		IN	OUT	IN	OUT						
Initial	TNR					2016	22.15		0.042	6.98	
1	TNR	05/02/13	05/02/13	901	1101	2016	22.57		0.064	8.59	2 hr
2	TNR	05/02/13	05/02/13	1101	1601	2016	22.42		0.084	7.89	7 hr; particles at bottom
3	TNR	05/02/13	05/03/13	1601	901	2016	21.88		0.214	9.44	24 hr; particles at bottom
4	TNR	05/03/13	05/04/13	901	901	2016	20.63		0.124	8.93	48 hr; particles at bottom
5	TNR	05/04/13	05/05/13	901	901	2016	20.51		0.160	9.06	3 day
6	TNR	05/05/13	05/06/13	901	901	2016	20.36		0.101	8.84	4 day
7	TNR	05/06/13	05/07/13	901	900	2016	20.59		0.093	8.86	5 day
8											
9											
10											

PERMEABILITY ASTM D5084

SPECIMEN CONDITIONS

PROJECT:	Quanta	TESTED BY:	RJB
PROJECT No.:	Sh0460	TRACKING CODE:	8858_PM
SAMPLE No.:	0460-015 (28 Day)	EQUIPMENT No.:	6A
TEST DATE:	4/27/13		

MOISTURE CONTENT (Dry Basis)	*INITIAL*	*FINAL*
1. MOISTURE TIN NO.		
2. WT MOISTURE TIN (tare weight)	0.00 *g*	8.39 *g*
3. WT WET SOIL + TARE	227.85 *g*	238.07 *g*
4. WT DRY SOIL + TARE	172.44 *g*	180.83 *g*
5. WT WATER, Ww	55.41 g	57.24 g
6. WT DRY SOIL, Ws	172.44 g	172.44 g
7. MOISTURE CONTENT, W	32.13 %	33.19 %

SOIL SPECIMEN DIMENSIONS				
TRIPLICATE	*DIAMETER*		*HEIGHT*	
ANALYSES	*INITIAL*	*FINAL*	*INITIAL*	*FINAL*
No. 1	*2.98 in.*	*2.98 in.*	*1.22 in.*	*1.22 in.*
No. 2	*2.98 in.*	*2.98 in.*	*1.20 in.*	*1.19 in.*
No. 3	*2.98 in.*	*2.97 in.*	*1.21 in.*	*1.20 in.*
Average	2.98 in.	2.98 in.	1.21 in.	1.20 in.

SPECIMEN CONDITIONS	*INITIAL*	*FINAL*
Specimen WT, Wo	*227.85 g*	*229.83 g*
Area, Ao	6.96 in^2	6.96 in^2
Volume, Vo	8.41 in^3	8.35 in^3
Bulk Unit Weight	103.2 lb/ft^3	104.9 lb/ft^3
Dry Unit Weight	78.1 lb/ft^3	78.8 lb/ft^3

PERMEABILITY ASTM D5084

BACK-PRESSURE SATURATION

PROJECT:	Quanta	TESTED BY:	RJB
PROJECT No.:	Sh0460	TRACKING CODE:	8858_PM
SAMPLE No.:	0460-015 (28 Day)	EQUIPMENT No.:	6A
TEST DATE:	4/27/13		

TEST	*TIME*	*TESTED*	*TEST PRESSURES (psi)*						
			APPLIED		*PORE*		*PRESSURE CHANGE*		
DATE	*(military)*	*BY*	*CELL*	*BACK*	*SAT.*	*TEST*	*CELL*	*PORE*	*B-Value*
04/27/13	14 : 25	RJB	7.0	5.0	7.2				
04/27/13	15 : 10	RJB	17.0	15.0	16.4	13.9	10.0	6.7	0.67
04/27/13	16 : 0	RJB	27.0	25.0	26.1	23.2	10.0	6.8	0.68
04/29/13	8 : 40	RJB	37.0	35.0	36.1	34.9	10.0	8.8	0.88
04/29/13	9 : 20	RJB	47.0	45.0	46.0	45.3	10.0	9.2	0.92
04/29/13	10 : 49	RJB	57.0	55.0	*	55.6	10.0	9.6	0.96
04/29/13	10 : 50	RJB	47.0	45.0	*	*	*	*	*

* Saturation check - no data available.

PERMEABILITY ASTM D5084

SPECIMEN CONSOLIDATION

PROJECT:	Quanta		RJB
PROJECT No.:	Sh0460		8858_PM
SAMPLE No.:	0460-015 (28 Day)		6A
TEST DATE:	4/27/13		

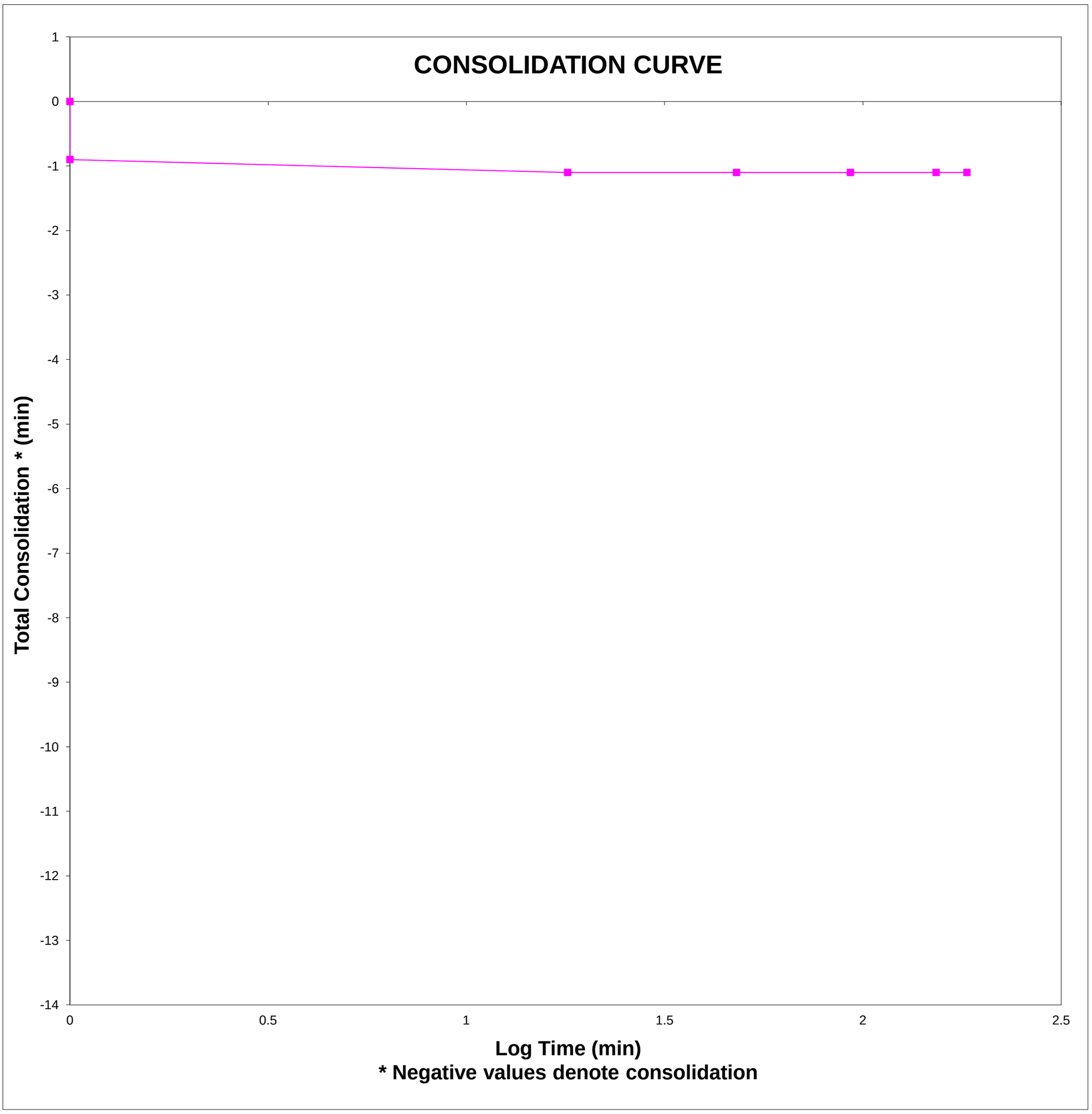
CELL PRESSURE: 55 psi **BACK PRESSURE:** 45 psi **EFFECTIVE STRESS:** 10 psi

TEST DATE	*TESTED BY*	*TIME (Military)*	*ELAPSED TIME (minutes)*	*TOTAL TIME (minutes)*	*TOTAL TIME (Log)*	*SPECIMEN CONSOLIDATION (ML)*		
						READING		*ACTUAL TOTAL (Ct)*
						BOTTOM	*TOP*	
4 / 29 / 13	RJB	10 : 57	0	0	0	25.0	25.0	0.0
4 / 29 / 13	RJB	10 : 58	1	1	0.00	24.6	24.5	0.9
4 / 29 / 13	RJB	11 : 15	17	18	1.26	24.6	24.3	1.1
4 / 29 / 13	RJB	11 : 45	30	48	1.68	24.6	24.3	1.1
4 / 29 / 13	RJB	12 : 30	45	93	1.97	24.6	24.3	1.1
4 / 29 / 13	RJB	13 : 30	60	153	2.18	24.6	24.3	1.1
4 / 29 / 13	RJB	14 : 0	30	183	2.26	24.6	24.3	1.1

PERMEABILITY ASTM D5084

CONSOLIDATION CURVE

PROJECT:	Quanta	TESTED BY:	RJB
PROJECT No.:	SH0460	TRACKING CODE:	8858_PM
SAMPLE No.:	0460-015 (28 Day)	EQUIPMENT No.:	6A
TEST DATE:	4/27/13		



PERMEABILITY ASTM D5084

TEST DATA

PROJECT:	Quanta	TESTED BY:	RJB
PROJECT No.:	SH0460	TRACKING CODE:	8858_PM
SAMPLE No.:	0460-015 (28 Day)	EQUIPMENT No.:	6A
TEST DATE:	4/27/2013		

DATE	*TESTED BY*	*TIME (military)*	*ELAPSED TIME (minutes)*	*HYDRAULIC HEAD (cm)*		*TEMP. C°*	*GAUGE PRESSURE (psi)*		
				INFLUENT	*EFFLUENT*		*CELL*	*INFLUENT*	*EFFLUENT*
4 / 29 / 13	RJB	20 : 57	0	0.0	25.0	20.0	55.0	45.0	45.0
4 / 29 / 13	RJB	23 : 12	RESET	0.0	25.0	20.0	55.0	45.0	43.0
4 / 30 / 13	RJB	3 : 32	260	0.9	24.1	20.0	55.0	45.0	43.0
4 / 30 / 13	RJB	7 : 12	220	1.7	23.3	20.0	55.0	45.0	43.0
4 / 30 / 13	RJB	10 : 13	181	2.3	22.7	20.0	55.0	45.0	43.0
4 / 30 / 13	RJB	12 : 32	139	2.8	22.2	20.0	55.0	45.0	43.0

PERMEABILITY ASTM D5084

TEST DATA (continued)

PROJECT:	Quanta	TESTED BY:	RJB
PROJECT No.:	Sh0460	TRACKING CODE:	8858_PM
SAMPLE No.:	0460-015 (28 Day)	EQUIPMENT No.:	6A
TEST DATE:	4/27/13		

ELAPSED TIME (minutes)	*HYDRAULIC HEAD DIFFERENCE (cm)*		*EFFLUENT - INFLUENT RATIO*	*HYDRAULIC GRADIENT (cm/cm)*	*HYDRAULIC CONDUCTIVITY (cm/sec)*	
	INFLUENT	*EFFLUENT*			*@ Temp.*	*@ 20° C*
RESET				8.147		
RESET	0.0	0.0	#DIV/0!	53.990	#VALUE!	#VALUE!
260	0.9	0.9	1.00	53.403	2.39E-08	2.40E-08
220	0.8	0.8	1.00	52.882	2.54E-08	2.55E-08
181	0.6	0.6	1.00	52.491	2.34E-08	2.35E-08
139	0.5	0.5	1.00	52.165	2.55E-08	2.56E-08

PERMEABILITY ASTM D5084

SUMMARY OF RESULTS

PROJECT:	Quanta	TESTED BY:	RJB
PROJECT No.:	Sh0460	TRACKING CODE:	8858_PM
SAMPLE No.:	0460-015 (28 Day)	EQUIPMENT No.:	6A
TEST DATE:	4/27/13		

TESTING PARAMETER	INITIAL	FINAL
BULK UNIT WEIGHT	103.2 lb/ft³	104.9 lb/ft³
DRY UNIT WEIGHT	78.1 lb/ft³	78.8 lb/ft³
MOISTURE CONTENT	32.1 %	33.2 %
PERMEABILITY @ 20°C	2.5E-08 cm/sec	

UNCONFINED COMPRESSION TEST

ASTM D 2166

PROJECT:	Quanta
PROJECT No.:	SH0460
SAMPLE No.:	460-015
TESTING DATE:	22-Apr-13
TESTED BY:	TNR

LOADING RATE:	0.04 in./min.
TRACKING CODE:	8858

MOISTURE CONTENT (Dry Basis)		
1. MOISTURE TIN NO.		
2. WT MOISTURE TIN (tare weight)	168.16	g
3. WT WET SOIL + TARE	284.76	g
4. WT DRY SOIL + TARE	253.26	g
5. WT WATER, Ww	31.50	g
6. WT DRY SOIL, Ws	85.10	g
7. MOISTURE CONTENT, W	**37.02**	**%**

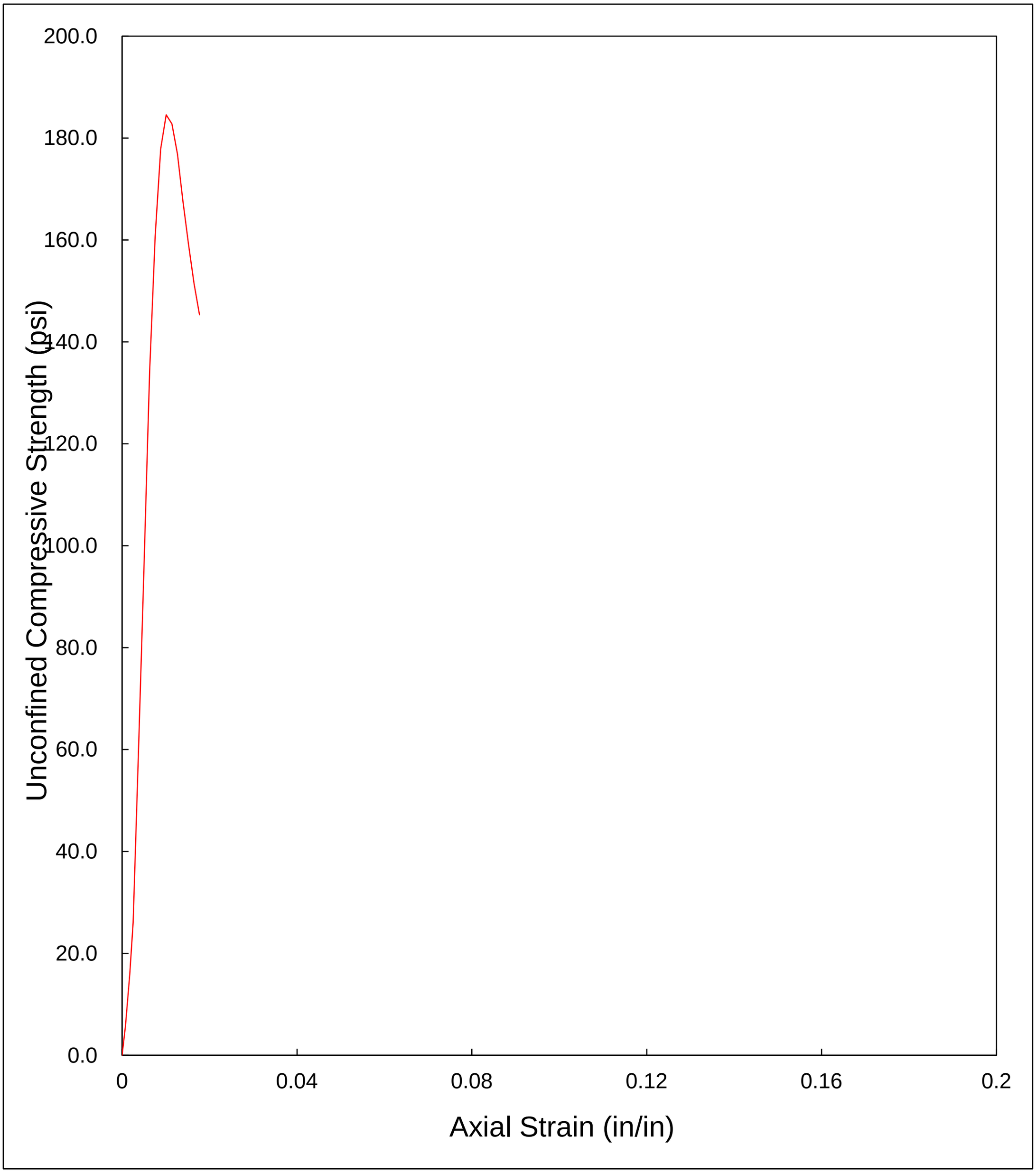
SOIL SPECIMEN DIMENSIONS				
	DIAMETER		*LENGTH*	
No. 1	2.01	in.	3.96	in.
No. 2	2.00	in.	3.96	in.
No. 3	1.99	in.	3.95	in.
Average	**2.00**	**in.**	**3.96**	**in.**

SPECIMEN CONDITIONS		
Initial Specimen WT, Wo	***314.54***	***g***
Initial Area, Ao	3.14	in²
Initial Volume, Vo	12.43	in³
Initial Bulk Unit Weight,	96.4	lb/ft³
Initial Dry Unit Weight	70.4	lb/ft³
15 % Strain (0.15 Lo)	0.59	in.
UCS	184.6	lb/in²

COMPRESSIVE LOAD (lbs.)	DIAL GAGE READING (in.)	SPECIMEN DEFORMATION (in.)	CORRECTED AREA (in²)	AXIAL STRAIN (in/in)	UNCONFINED COMPRESSIVE STRENGTH (lb/in²)
0	0.000	0.000	3.143	0.0000	0.0
18	0.003	0.003	3.146	0.0008	5.7
34	0.005	0.005	3.147	0.0013	10.8
50	0.007	0.007	3.149	0.0018	15.9
82	0.010	0.010	3.151	0.0025	26.0
191	0.015	0.015	3.155	0.0038	60.5
306	0.020	0.020	3.159	0.0051	96.9
425	0.025	0.025	3.163	0.0063	134.4
509	0.030	0.030	3.167	0.0076	160.7
564	0.035	0.035	3.171	0.0088	177.8
586	0.040	0.040	3.175	0.0101	184.6
581	0.045	0.045	3.179	0.0114	182.7
563	0.050	0.050	3.183	0.0126	176.9
534	0.055	0.055	3.187	0.0139	167.5
508	0.060	0.060	3.192	0.0152	159.2
484	0.065	0.065	3.196	0.0164	151.5
465	0.070	0.070	3.200	0.0177	145.3

UNCONFINED COMPRESSION TESTING

Sample No. 460-015



UNCONFINED COMPRESSION TEST

ASTM D 2166
SUMMARY OF RESULTS

PROJECT:	Quanta		
PROJECT No.:	SH0460		
SAMPLE No.:	460-015		
TESTING DATE:	4/22/2013	LOADING RATE:	0.04 in./min.
TESTED BY:	TNR	TRACKING CODE:	8858

TESTING PARAMETER AND RESULTS		
MOISTURE CONTENT	37.0	%
BULK UNIT WEIGHT	96.4	lb/ft^3
DRY UNIT WEIGHT	70.4	lb/ft^3
UCS *	184.6	lb/in^2

* UCS - UNCONFINED COMPRESSIVE STRENGTH

PERMEABILITY ASTM D5084

SPECIMEN CONDITIONS

PROJECT:	Quanta	TESTED BY:	RJB
PROJECT No.:	SH0460	TRACKING CODE:	8859_PM
SAMPLE No.:	0460-016 (28 Day)	EQUIPMENT No.:	7A
TEST DATE:	4/27/13		

MOISTURE CONTENT (Dry Basis)	*INITIAL*	*FINAL*
1. MOISTURE TIN NO.		
2. WT MOISTURE TIN (tare weight)	0.00 *g*	216.16 *g*
3. WT WET SOIL + TARE	273.67 *g*	491.75 *g*
4. WT DRY SOIL + TARE	206.48 *g*	422.64 *g*
5. WT WATER, Ww	67.19 g	69.11 g
6. WT DRY SOIL, Ws	206.48 g	206.48 g
7. MOISTURE CONTENT, W	32.54 %	33.47 %

SOIL SPECIMEN DIMENSIONS				
TRIPLICATE	*DIAMETER*		*HEIGHT*	
ANALYSES	*INITIAL*	*FINAL*	*INITIAL*	*FINAL*
No. 1	*2.98 in.*	*2.98 in.*	*1.56 in.*	*1.52 in.*
No. 2	*2.97 in.*	*2.97 in.*	*1.51 in.*	*1.50 in.*
No. 3	*2.97 in.*	*2.97 in.*	*1.52 in.*	*1.53 in.*
Average	2.97 in.	2.97 in.	1.53 in.	1.52 in.

SPECIMEN CONDITIONS	*INITIAL*	*FINAL*
Specimen WT, Wo	*273.67 g*	*275.62 g*
Area, Ao	6.94 in^2	6.94 in^2
Volume, Vo	10.61 in^3	10.51 in^3
Bulk Unit Weight	98.3 lb/ft^3	99.9 lb/ft^3
Dry Unit Weight	74.2 lb/ft^3	74.8 lb/ft^3

PERMEABILITY ASTM D5084

BACK-PRESSURE SATURATION

PROJECT:	Quanta	TESTED BY:	RJB
PROJECT No.:	SH0460	TRACKING CODE:	8859_PM
SAMPLE No.:	0460-016 (28 Day)	EQUIPMENT No.:	7A
TEST DATE:	4/27/13		

TEST	*TIME*	*TESTED*	*TEST PRESSURES (psi)*						
			APPLIED		*PORE*		*PRESSURE CHANGE*		
DATE	*(military)*	*BY*	*CELL*	*BACK*	*SAT.*	*TEST*	*CELL*	*PORE*	*B-Value*
04/27/13	15 : 5	RJB	7.0	5.0	6.0				
04/29/13	16 : 0	RJB	17.0	15.0	16.0	10.8	10.0	4.8	0.48
04/29/13	8 : 45	RJB	27.0	25.0	26.0	*	*	*	*
04/29/13	9 : 30	RJB	37.0	35.0	36.0	34.8	10.0	8.8	0.88
04/29/13	11 : 5	RJB	47.0	45.0	46.0	45.2	10.0	9.2	0.92
04/29/13	12 : 5	RJB	57.0	55.0	56.0	55.3	10.0	9.3	0.93
04/29/13	12 : 40	RJB	67.0	65.0	*	65.6	10.0	9.6	0.96
04/29/13	12 : 41	RJB	57.0	55.0	*	*	*	*	*

* Saturation check - no data available.

PERMEABILITY ASTM D5084

SPECIMEN CONSOLIDATION

PROJECT:	Quanta		RJB
PROJECT No.:	SH0460		8859_PM
SAMPLE No.:	0460-016 (28 Day)		7A
TEST DATE:	4/27/13		

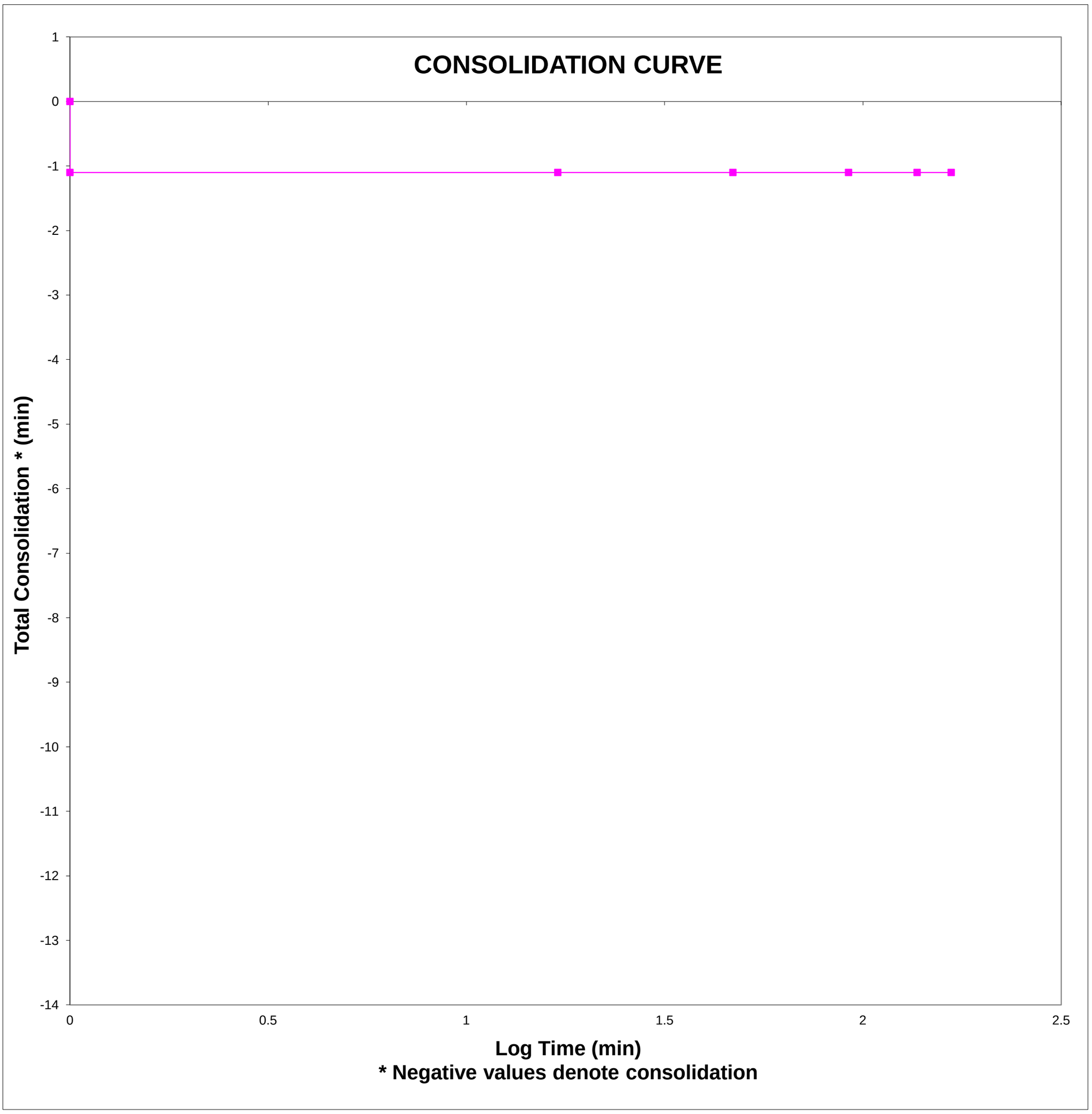
CELL PRESSURE: 65 psi **BACK PRESSURE:** 55 psi **EFFECTIVE STRESS:** 10 psi

TEST DATE	*TESTED BY*	*TIME (Military)*	*ELAPSED TIME (minutes)*	*TOTAL TIME (minutes)*	*TOTAL TIME (Log)*	*SPECIMEN CONSOLIDATION (ML)*		
						READING		*ACTUAL TOTAL (Ct)*
						BOTTOM	*TOP*	
4 / 29 / 13	RJB	12 : 43	0	0	0	25.0	25.0	0.0
4 / 29 / 13	RJB	12 : 44	1	1	0.00	24.5	24.4	1.1
4 / 29 / 13	RJB	13 : 0	16	17	1.23	24.5	24.4	1.1
4 / 29 / 13	RJB	13 : 30	30	47	1.67	24.5	24.4	1.1
4 / 29 / 13	RJB	14 : 15	45	92	1.96	24.5	24.4	1.1
4 / 29 / 13	RJB	15 : 0	45	137	2.14	24.5	24.4	1.1
4 / 29 / 13	RJB	15 : 30	30	167	2.22	24.5	24.4	1.1

PERMEABILITY ASTM D5084

CONSOLIDATION CURVE

PROJECT:	Quanta	TESTED BY:	RJB
PROJECT No.:	SH0460	TRACKING CODE:	8859_PM
SAMPLE No.:	0460-016 (28 Day)	EQUIPMENT No.:	7A
TEST DATE:	4/27/13		



PERMEABILITY ASTM D5084

TEST DATA

PROJECT:	Quanta	TESTED BY:	RJB
PROJECT No.:	SH0460	TRACKING CODE:	8859_PM
SAMPLE No.:	0460-016 (28 Day)	EQUIPMENT No.:	7A
TEST DATE:	4/27/2013		

DATE	*TESTED BY*	*TIME (military)*	*ELAPSED TIME (minutes)*	*HYDRAULIC HEAD (cm)*		*TEMP. C°*	*GAUGE PRESSURE (psi)*		
				INFLUENT	*EFFLUENT*		*CELL*	*INFLUENT*	*EFFLUENT*
4 / 29 / 13	RJB	21 : 4	0	0.0	25.0	20.0	65.0	55.0	55.0
4 / 29 / 13	RJB	22 : 15	RESET	0.0	24.0	20.0	65.0	55.0	53.0
4 / 30 / 13	RJB	3 : 33	318	0.7	23.3	20.0	65.0	55.0	53.0
4 / 30 / 13	RJB	7 : 13	220	1.2	22.8	20.0	65.0	55.0	53.0
4 / 30 / 13	RJB	11 : 16	243	1.8	22.2	20.0	65.0	55.0	53.0
4 / 30 / 13	RJB	14 : 0	164	2.3	21.7	20.0	65.0	55.0	53.0

PERMEABILITY ASTM D5084

TEST DATA (continued)

PROJECT:	Quanta	TESTED BY:	RJB
PROJECT No.:	SH0460	TRACKING CODE:	8859_PM
SAMPLE No.:	0460-016 (28 Day)	EQUIPMENT No.:	7A
TEST DATE:	4/27/13		

ELAPSED TIME (minutes)	*HYDRAULIC HEAD DIFFERENCE (cm)*		*EFFLUENT - INFLUENT RATIO*	*HYDRAULIC GRADIENT (cm/cm)*	*HYDRAULIC CONDUCTIVITY (cm/sec)*	
	INFLUENT	*EFFLUENT*			*@ Temp.*	*@ 20° C*
RESET				6.441		
RESET	0.0	1.0	#DIV/0!	42.431	#VALUE!	#VALUE!
318	0.7	0.7	1.00	42.070	1.94E-08	1.95E-08
220	0.5	0.5	1.00	41.813	2.02E-08	2.03E-08
243	0.6	0.6	1.00	41.503	2.21E-08	2.22E-08
164	0.5	0.5	1.00	41.246	2.74E-08	2.75E-08

PERMEABILITY ASTM D5084

SUMMARY OF RESULTS

PROJECT:	Quanta	TESTED BY:	RJB
PROJECT No.:	SH0460	TRACKING CODE:	8859_PM
SAMPLE No.:	0460-016 (28 Day)	EQUIPMENT No.:	7A
TEST DATE:	4/27/13		

TESTING PARAMETER	INITIAL	FINAL
BULK UNIT WEIGHT	98.3 lb/ft³	99.9 lb/ft³
DRY UNIT WEIGHT	74.2 lb/ft³	74.8 lb/ft³
MOISTURE CONTENT	32.5 %	33.5 %
PERMEABILITY @ 20°C	2.2E-08 cm/sec	

UNCONFINED COMPRESSION TEST

ASTM D 2166

PROJECT:	Quanta
PROJECT No.:	SH0460
SAMPLE No.:	460-016
TESTING DATE:	22-Apr-13
TESTED BY:	TNR

LOADING RATE:	0.04 in./min.
TRACKING CODE:	8859

MOISTURE CONTENT (Dry Basis)		
1. MOISTURE TIN NO.		
2. WT MOISTURE TIN (tare weight)	167.45	g
3. WT WET SOIL + TARE	274.54	g
4. WT DRY SOIL + TARE	247.72	g
5. WT WATER, Ww	26.82	g
6. WT DRY SOIL, Ws	80.27	g
7. MOISTURE CONTENT, W	**33.41**	**%**

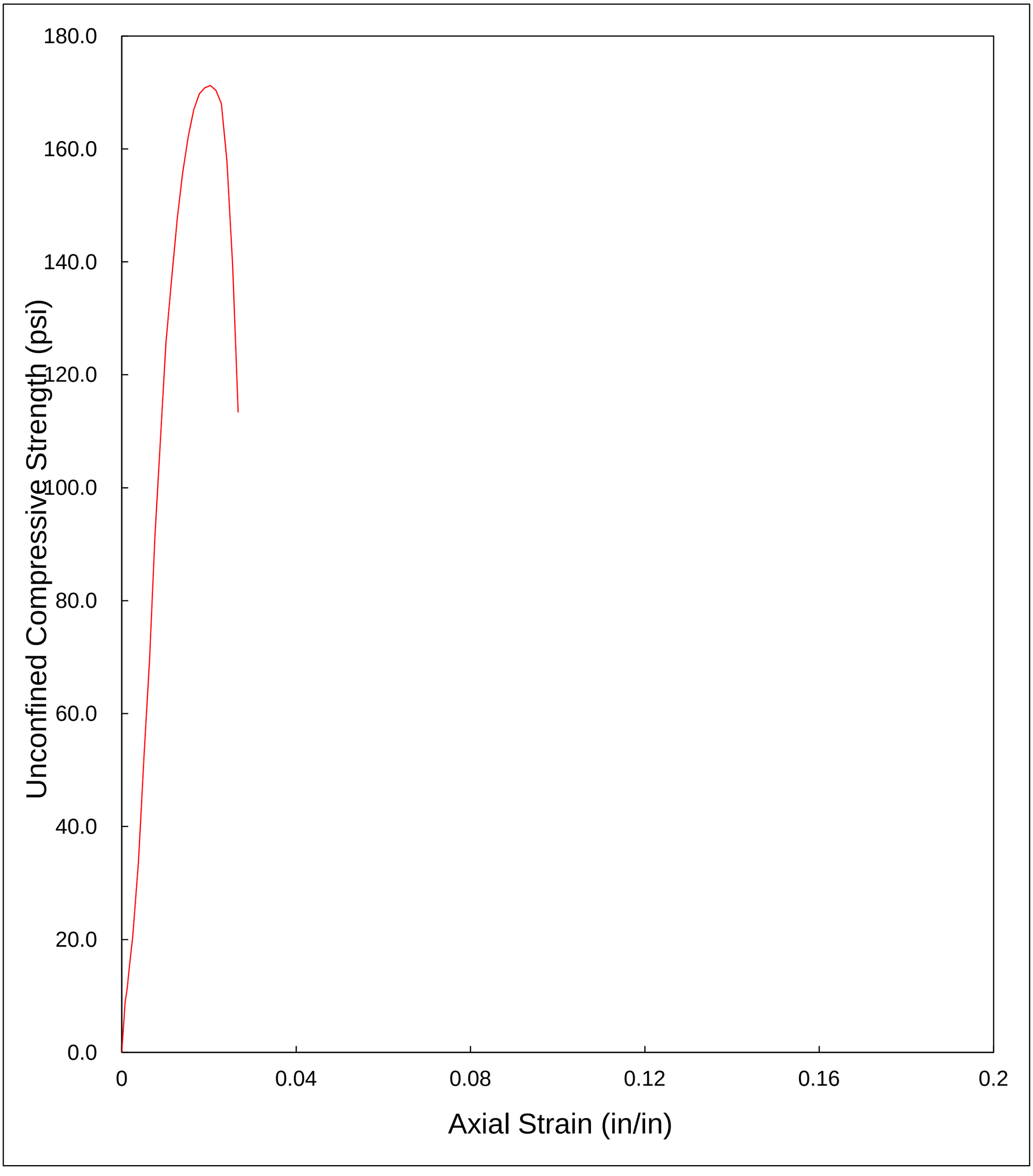
SOIL SPECIMEN DIMENSIONS				
	DIAMETER		*LENGTH*	
No. 1	2.02	in.	3.94	in.
No. 2	2.00	in.	3.93	in.
No. 3	1.99	in.	3.93	in.
Average	**2.01**	**in.**	**3.93**	**in.**

SPECIMEN CONDITIONS		
Initial Specimen WT, Wo	*326.24*	*g*
Initial Area, Ao	3.16	in²
Initial Volume, Vo	12.43	in³
Initial Bulk Unit Weight,	100.0	lb/ft³
Initial Dry Unit Weight	75.0	lb/ft³
15 % Strain (0.15 Lo)	0.59	in.
UCS	171.2	lb/in²

COMPRESSIVE LOAD (lbs.)	DIAL GAGE READING (in.)	SPECIMEN DEFORMATION (in.)	CORRECTED AREA (in²)	AXIAL STRAIN (in/in)	UNCONFINED COMPRESSIVE STRENGTH (lb/in²)
0	0.000	0.000	3.158	0.0000	0.0
28	0.003	0.003	3.161	0.0008	8.9
36	0.005	0.005	3.162	0.0013	11.4
48	0.007	0.007	3.164	0.0018	15.2
65	0.010	0.010	3.166	0.0025	20.5
107	0.015	0.015	3.170	0.0038	33.7
166	0.020	0.020	3.175	0.0051	52.3
220	0.025	0.025	3.179	0.0064	69.2
291	0.030	0.030	3.183	0.0076	91.4
346	0.035	0.035	3.187	0.0089	108.6
401	0.040	0.040	3.191	0.0102	125.7
438	0.045	0.045	3.195	0.0114	137.1
472	0.050	0.050	3.199	0.0127	147.5
499	0.055	0.055	3.203	0.0140	155.8
520	0.060	0.060	3.207	0.0153	162.1
536	0.065	0.065	3.211	0.0165	166.9
546	0.070	0.070	3.216	0.0178	169.8
550	0.075	0.075	3.220	0.0191	170.8
552	0.080	0.080	3.224	0.0203	171.2
550	0.085	0.085	3.228	0.0216	170.4
543	0.090	0.090	3.232	0.0229	168.0
511	0.095	0.095	3.237	0.0241	157.9
452	0.100	0.100	3.241	0.0254	139.5
368	0.105	0.105	3.245	0.0267	113.4

UNCONFINED COMPRESSION TESTING

Sample No. 460-016



UNCONFINED COMPRESSION TEST

ASTM D 2166
SUMMARY OF RESULTS

PROJECT:	Quanta		
PROJECT No.:	SH0460		
SAMPLE No.:	460-016		
TESTING DATE:	4/22/2013	LOADING RATE:	0.04 in./min.
TESTED BY:	TNR	TRACKING CODE:	8859

TESTING PARAMETER AND RESULTS		
MOISTURE CONTENT	33.4	%
BULK UNIT WEIGHT	100.0	lb/ft^3
DRY UNIT WEIGHT	75.0	lb/ft^3
UCS *	171.2	lb/in^2

* UCS - UNCONFINED COMPRESSIVE STRENGTH

ANS 16.1 LEACHABILITY

SAMPLE PREPARATION

PROJECT:	Quanta	TESTED BY:	TNR
PROJECT No.:	SH0460	TRACKING CODE:	8859
SAMPLE No.:	460-016		
TEST DATE:	5/2/2013		

MOISTURE CONTENT (Dry Basis)	*RESULTS*	
1. MOISTURE TIN NO.	460-016	
2. WT MOISTURE TIN (tare weight)	167.45	*g*
3. WT WET SOIL + TARE	274.54	*g*
4. WT DRY SOIL + TARE	247.72	*g*
5. WT WATER, Ww	26.82	g
6. WT DRY SOIL, Ws	80.27	g
7. MOISTURE CONTENT, W	33.41	%

SOIL SPECIMEN DIMENSIONS				
TRIPLICATE ANALYSES	*DIAMETER RESULTS*		*LENGTH RESULTS*	
No. 1	*2.01*	*in.*	*4.01*	*in.*
No. 2	*2.00*	*in.*	*4.05*	*in.*
No. 3	*1.99*	*in.*	*4.04*	*in.*
Average	2.00	in.	4.03	in.

SPECIMEN CONDITIONS	*INITIAL*	
Specimen WT, Wo	*323.36*	*g*
Area, Ao	3.14	in^2
Volume, Vo	12.67	in^3
Bulk Unit Weight	97.2	pcf
Dry Unit Weight	72.9	pcf

ANS 16.1 LEACHABILITY

TESTING DATA

Sheet 2 of 2

PROJECT:	Quanta
PROJECT NO.:	SH0460
SAMPLE NO:	460-016
START DATE:	5/2/2013
TRACKING CODE:	8859

LEACH INTERVAL	TESTED BY	DATE		TIME		VOLUME LEACHATE (ml)	TEMP (°C)	PID (ppm)	Conduct. (mS/cm³)	pH (s.u.)	OBSERVATIONS
		IN	OUT	IN	OUT						
Initial	TNR					2039	22.15		0.042	6.98	
1	TNR	05/02/13	05/02/13	902	1102	2039	22.57		0.061	8.43	2 hr
2	TNR	05/02/13	05/02/13	1102	1602	2039	22.37		0.059	7.95	7 hr
3	TNR	05/02/13	05/03/13	1602	902	2039	21.78		0.113	9.29	24 hr
4	TNR	05/03/13	05/04/13	902	902	2039	20.29		0.101	8.77	48 hr
5	TNR	05/04/13	05/05/13	902	902	2039	20.49		0.112	8.98	3 day
6	TNR	05/05/13	05/06/13	902	902	2039	20.53		0.084	8.77	4 day
7	TNR	05/06/13	05/07/13	902	902	2039	21.21		0.070	8.78	5 day
8											
9											
10											

PERMEABILITY ASTM D5084

SPECIMEN CONDITIONS

PROJECT:	Quanta	TESTED BY:	RJB
PROJECT No.:	SH0460	TRACKING CODE:	8860_PM
SAMPLE No.:	0460-017 (28 Day)	EQUIPMENT No.:	2
TEST DATE:	4/27/13		

MOISTURE CONTENT (Dry Basis)	*INITIAL*	*FINAL*
1. MOISTURE TIN NO.		
2. WT MOISTURE TIN (tare weight)	0.00 *g*	9.96 *g*
3. WT WET SOIL + TARE	140.66 *g*	153.81 *g*
4. WT DRY SOIL + TARE	92.46 *g*	102.42 *g*
5. WT WATER, Ww	48.20 g	51.39 g
6. WT DRY SOIL, Ws	92.46 g	92.46 g
7. MOISTURE CONTENT, W	52.13 %	55.58 %

SOIL SPECIMEN DIMENSIONS				
TRIPLICATE	*DIAMETER*		*HEIGHT*	
ANALYSES	*INITIAL*	*FINAL*	*INITIAL*	*FINAL*
No. 1	*2.97 in.*	*2.98 in.*	*1.00 in.*	*0.98 in.*
No. 2	*2.98 in.*	*2.99 in.*	*1.03 in.*	*0.96 in.*
No. 3	*2.99 in.*	*2.99 in.*	*1.00 in.*	*0.99 in.*
Average	2.98 in.	2.99 in.	1.01 in.	0.98 in.

SPECIMEN CONDITIONS	*INITIAL*	*FINAL*
Specimen WT, Wo	*140.66 g*	*143.87 g*
Area, Ao	6.98 in^2	7.00 in^2
Volume, Vo	7.06 in^3	6.83 in^3
Bulk Unit Weight	75.9 lb/ft^3	80.2 lb/ft^3
Dry Unit Weight	49.9 lb/ft^3	51.6 lb/ft^3

PERMEABILITY ASTM D5084

BACK-PRESSURE SATURATION

PROJECT:	Quanta	TESTED BY:	RJB
PROJECT No.:	SH0460	TRACKING CODE:	8860_PM
SAMPLE No.:	0460-017 (28 Day)	EQUIPMENT No.:	2
TEST DATE:	4/27/13		

TEST	*TIME*	*TESTED*	*TEST PRESSURES (psi)*						
			APPLIED		*PORE*		*PRESSURE CHANGE*		
DATE	*(military)*	*BY*	*CELL*	*BACK*	*SAT.*	*TEST*	*CELL*	*PORE*	*B-Value*
04/27/13	15 : 30	RJB	7.0	5.0	5.2				
04/27/13	16 : 0	RJB	17.0	15.0	15.2	11.8	10.0	6.6	0.66
04/29/13	8 : 25	RJB	27.0	25.0	25.3	24.0	10.0	8.8	0.88
04/29/13	9 : 20	RJB	37.0	35.0	35.3	34.3	10.0	9.0	0.90
04/29/13	10 : 55	RJB	47.0	45.0	45.1	44.6	10.0	9.3	0.93
04/29/13	12 : 0	RJB	57.0	55.0	*	54.9	10.0	9.8	0.98
04/29/13	12 : 1	RJB	47.0	45.0	*	*	*	*	*

* Saturation check - no data available.

PERMEABILITY ASTM D5084

SPECIMEN CONSOLIDATION

PROJECT:	Quanta		RJB
PROJECT No.:	SH0460		8860_PM
SAMPLE No.:	0460-017 (28 Day)		2
TEST DATE:	4/27/13		

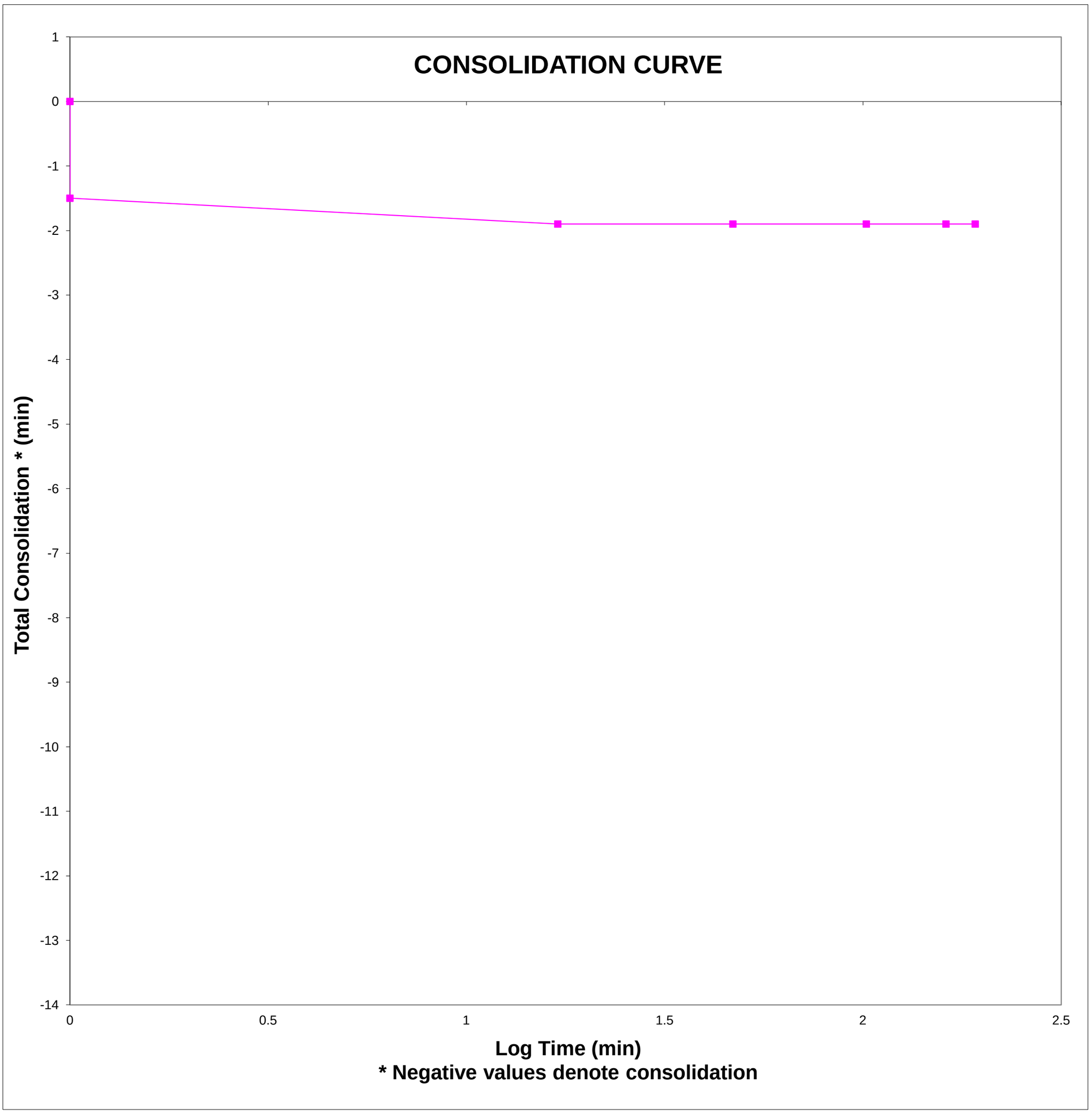
CELL PRESSURE: 55 psi **BACK PRESSURE:** 45 psi **EFFECTIVE STRESS:** 10 psi

TEST DATE	*TESTED BY*	*TIME (Military)*	*ELAPSED TIME (minutes)*	*TOTAL TIME (minutes)*	*TOTAL TIME (Log)*	*SPECIMEN CONSOLIDATION (ML)*		
						READING		*ACTUAL TOTAL (Ct)*
						BOTTOM	*TOP*	
4 / 29 / 13	RJB	12 : 3	0	0	0	24.0	25.0	0.0
4 / 29 / 13	RJB	12 : 4	1	1	0.00	23.0	24.5	1.5
4 / 29 / 13	RJB	12 : 20	16	17	1.23	22.8	24.3	1.9
4 / 29 / 13	RJB	12 : 50	30	47	1.67	22.8	24.3	1.9
4 / 29 / 13	RJB	13 : 45	55	102	2.01	22.8	24.3	1.9
4 / 29 / 13	RJB	14 : 45	60	162	2.21	22.8	24.3	1.9
4 / 29 / 13	RJB	15 : 15	30	192	2.28	22.8	24.3	1.9

PERMEABILITY ASTM D5084

CONSOLIDATION CURVE

PROJECT:	Quanta	TESTED BY:	RJB
PROJECT No.:	SH0460	TRACKING CODE:	8860_PM
SAMPLE No.:	0460-017 (28 Day)	EQUIPMENT No.:	2
TEST DATE:	4/27/13		



PERMEABILITY ASTM D5084

TEST DATA

PROJECT:	Quanta	TESTED BY:	RJB
PROJECT No.:	SH0460	TRACKING CODE:	8860_PM
SAMPLE No.:	0460-017 (28 Day)	EQUIPMENT No.:	2
TEST DATE:	4/27/2013		

DATE	*TESTED BY*	*TIME (military)*	*ELAPSED TIME (minutes)*	*HYDRAULIC HEAD (cm)*		*TEMP. C°*	*GAUGE PRESSURE (psi)*		
				INFLUENT	*EFFLUENT*		*CELL*	*INFLUENT*	*EFFLUENT*
4 / 29 / 13	RJB	20 : 49	0	0.0	25.0	20.0	55.0	45.0	45.0
4 / 30 / 13	RJB	3 : 30	RESET	0.0	25.0	20.0	55.0	45.0	43.0
4 / 30 / 13	RJB	7 : 15	225	0.9	24.1	20.0	55.0	45.0	43.0
4 / 30 / 13	RJB	9 : 23	128	1.4	23.6	20.0	55.0	45.0	43.0
4 / 30 / 13	RJB	12 : 52	209	2.0	23.0	20.0	55.0	45.0	43.0
4 / 30 / 13	RJB	16 : 28	RESET	0.0	25.0	20.0	55.0	45.0	43.0
4 / 30 / 13	RJB	19 : 37	189	0.5	24.5	20.0	55.0	45.0	43.0

PERMEABILITY ASTM D5084

TEST DATA (continued)

PROJECT:	Quanta	TESTED BY:	RJB
PROJECT No.:	SH0460	TRACKING CODE:	8860_PM
SAMPLE No.:	0460-017 (28 Day)	EQUIPMENT No.:	2
TEST DATE:	4/27/13		

ELAPSED TIME (minutes)	*HYDRAULIC HEAD DIFFERENCE (cm)*		*EFFLUENT - INFLUENT RATIO*	*HYDRAULIC GRADIENT (cm/cm)*	*HYDRAULIC CONDUCTIVITY (cm/sec)*	
	INFLUENT	*EFFLUENT*			*@ Temp.*	*@ 20° C*
RESET				9.729		
RESET				64.476		
225	0.9	0.9	1.00	63.776	2.31E-08	2.32E-08
128	0.5	0.5	1.00	63.386	2.27E-08	2.29E-08
209	0.6	0.6	1.00	62.919	1.68E-08	1.69E-08
RESET				64.476		
189	0.5	0.5	1.00	64.087	1.52E-08	1.53E-08

PERMEABILITY ASTM D5084

SUMMARY OF RESULTS

PROJECT:	Quanta	TESTED BY:	RJB
PROJECT No.:	SH0460	TRACKING CODE:	8860_PM
SAMPLE No.:	0460-017 (28 Day)	EQUIPMENT No.:	2
TEST DATE:	4/27/13		

TESTING PARAMETER	INITIAL	FINAL
BULK UNIT WEIGHT	75.9 lb/ft³	80.2 lb/ft³
DRY UNIT WEIGHT	49.9 lb/ft³	51.6 lb/ft³
MOISTURE CONTENT	52.1 %	55.6 %
PERMEABILITY @ 20°C	2.0E-08 cm/sec	

UNCONFINED COMPRESSION TEST

ASTM D 2166

PROJECT:	Quanta
PROJECT No.:	SH0460
SAMPLE No.:	460-17
TESTING DATE:	22-Apr-13
TESTED BY:	TNR

LOADING RATE:	0.04 in./min.
TRACKING CODE:	8860

MOISTURE CONTENT (Dry Basis)		
1. MOISTURE TIN NO.		
2. WT MOISTURE TIN (tare weight)	162.54	g
3. WT WET SOIL + TARE	275.42	g
4. WT DRY SOIL + TARE	237.87	g
5. WT WATER, Ww	37.55	g
6. WT DRY SOIL, Ws	75.33	g
7. MOISTURE CONTENT, W	**49.85**	**%**

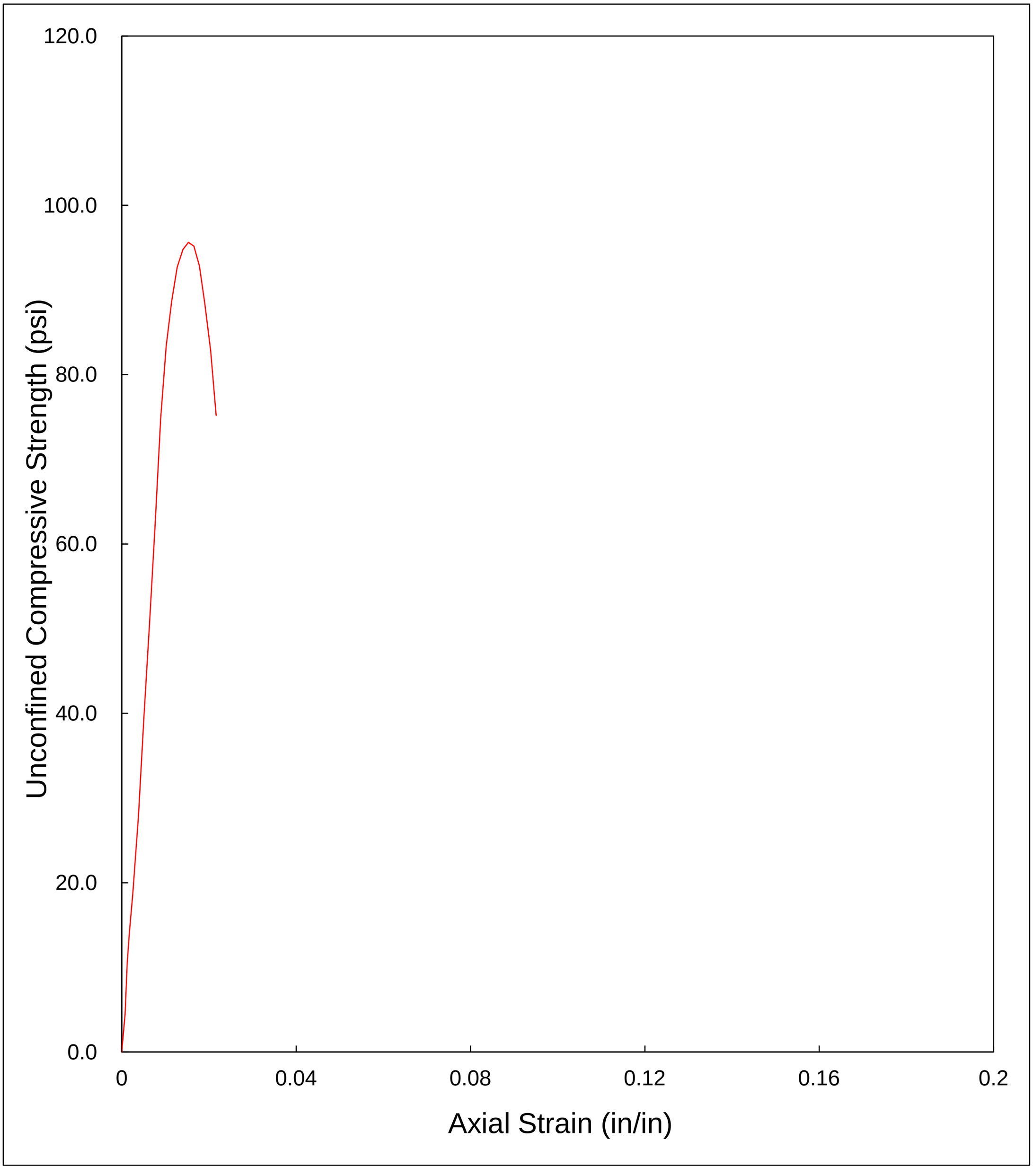
SOIL SPECIMEN DIMENSIONS				
	DIAMETER		*LENGTH*	
No. 1	2.00	in.	3.93	in.
No. 2	1.99	in.	3.93	in.
No. 3	1.99	in.	3.92	in.
Average	**1.99**	**in.**	**3.93**	**in.**

SPECIMEN CONDITIONS		
Initial Specimen WT, Wo	***246.79***	***g***
Initial Area, Ao	3.11	in²
Initial Volume, Vo	12.21	in³
Initial Bulk Unit Weight,	77.0	lb/ft³
Initial Dry Unit Weight	51.4	lb/ft³
15 % Strain (0.15 Lo)	0.59	in.
UCS	95.6	lb/in²

COMPRESSIVE LOAD (lbs.)	DIAL GAGE READING (in.)	SPECIMEN DEFORMATION (in.)	CORRECTED AREA (in²)	AXIAL STRAIN (in/in)	UNCONFINED COMPRESSIVE STRENGTH (lb/in²)
0	0.000	0.000	3.110	0.0000	0.0
14	0.003	0.003	3.113	0.0008	4.5
33	0.005	0.005	3.114	0.0013	10.6
44	0.007	0.007	3.116	0.0018	14.1
58	0.010	0.010	3.118	0.0025	18.6
87	0.015	0.015	3.122	0.0038	27.9
124	0.020	0.020	3.126	0.0051	39.7
158	0.025	0.025	3.130	0.0064	50.5
194	0.030	0.030	3.134	0.0076	61.9
235	0.035	0.035	3.138	0.0089	74.9
262	0.040	0.040	3.142	0.0102	83.4
279	0.045	0.045	3.146	0.0115	88.7
292	0.050	0.050	3.150	0.0127	92.7
299	0.055	0.055	3.154	0.0140	94.8
302	0.060	0.060	3.159	0.0153	95.6
301	0.065	0.065	3.163	0.0166	95.2
294	0.070	0.070	3.167	0.0178	92.8
280	0.075	0.075	3.171	0.0191	88.3
263	0.080	0.080	3.175	0.0204	82.8
239	0.085	0.085	3.179	0.0217	75.2

UNCONFINED COMPRESSION TESTING

Sample No. 460-17



UNCONFINED COMPRESSION TEST

ASTM D 2166
SUMMARY OF RESULTS

PROJECT:	Quanta		
PROJECT No.:	SH0460		
SAMPLE No.:	460-17		
TESTING DATE:	4/22/2013	LOADING RATE:	0.04 in./min.
TESTED BY:	TNR	TRACKING CODE:	8860

TESTING PARAMETER AND RESULTS		
MOISTURE CONTENT	49.8	%
BULK UNIT WEIGHT	77.0	lb/ft^3
DRY UNIT WEIGHT	51.4	lb/ft^3
UCS *	95.6	lb/in^2

* UCS - UNCONFINED COMPRESSIVE STRENGTH

PERMEABILITY ASTM D5084

SPECIMEN CONDITIONS

PROJECT:	Quanta	TESTED BY:	RJB
PROJECT No.:	SH0460	TRACKING CODE:	8861_PM
SAMPLE No.:	0460-018 (28 Day)	EQUIPMENT No.:	7B
TEST DATE:	4/27/13		

MOISTURE CONTENT (Dry Basis)	*INITIAL*	*FINAL*
1. MOISTURE TIN NO.		
2. WT MOISTURE TIN (tare weight)	0.00 *g*	5.57 *g*
3. WT WET SOIL + TARE	213.81 *g*	221.16 *g*
4. WT DRY SOIL + TARE	145.95 *g*	151.52 *g*
5. WT WATER, Ww	67.86 g	69.64 g
6. WT DRY SOIL, Ws	145.95 g	145.95 g
7. MOISTURE CONTENT, W	46.50 %	47.71 %

SOIL SPECIMEN DIMENSIONS				
TRIPLICATE	*DIAMETER*		*HEIGHT*	
ANALYSES	*INITIAL*	*FINAL*	*INITIAL*	*FINAL*
No. 1	*2.98 in.*	*2.98 in.*	*1.36 in.*	*1.34 in.*
No. 2	*2.97 in.*	*2.98 in.*	*1.36 in.*	*1.35 in.*
No. 3	*2.97 in.*	*2.97 in.*	*1.36 in.*	*1.36 in.*
Average	2.97 in.	2.97 in.	1.36 in.	1.35 in.

SPECIMEN CONDITIONS	*INITIAL*	*FINAL*
Specimen WT, Wo	*213.81 g*	*215.65 g*
Area, Ao	6.95 in^2	6.95 in^2
Volume, Vo	9.46 in^3	9.38 in^3
Bulk Unit Weight	86.1 lb/ft^3	87.6 lb/ft^3
Dry Unit Weight	58.8 lb/ft^3	59.3 lb/ft^3

PERMEABILITY ASTM D5084

BACK-PRESSURE SATURATION

PROJECT:	Quanta	TESTED BY:	RJB
PROJECT No.:	SH0460	TRACKING CODE:	8861_PM
SAMPLE No.:	0460-018 (28 Day)	EQUIPMENT No.:	7B
TEST DATE:	4/27/13		

TEST	*TIME*	*TESTED*	*TEST PRESSURES (psi)*						
			APPLIED		*PORE*		*PRESSURE CHANGE*		
DATE	*(military)*	*BY*	*CELL*	*BACK*	*SAT.*	*TEST*	*CELL*	*PORE*	*B-Value*
04/29/13	9 : 0	RJB	7.0	5.0	6.1				
04/29/13	9 : 25	RJB	17.0	15.0	*	*	*	*	*
04/29/13	11 : 5	RJB	27.0	25.0	26.5	*	*	*	*
04/29/13	12 : 5	RJB	37.0	35.0	36.3	32.9	10.0	6.4	0.64
04/29/13	13 : 30	RJB	47.0	45.0	46.6	*	*	*	*
04/29/13	14 : 0	RJB	57.0	55.0	56.5	56.0	10.0	9.4	0.94
04/29/13	14 : 38	RJB	67.0	65.0	*	66.4	10.0	9.9	0.99
04/29/13	14 : 39	RJB	57.0	55.0	*	*	*	*	*

* Saturation check - no data available.

PERMEABILITY ASTM D5084

SPECIMEN CONSOLIDATION

PROJECT:	Quanta		RJB
PROJECT No.:	SH0460		8861_PM
SAMPLE No.:	0460-018 (28 Day)		7B
TEST DATE:	4/27/13		

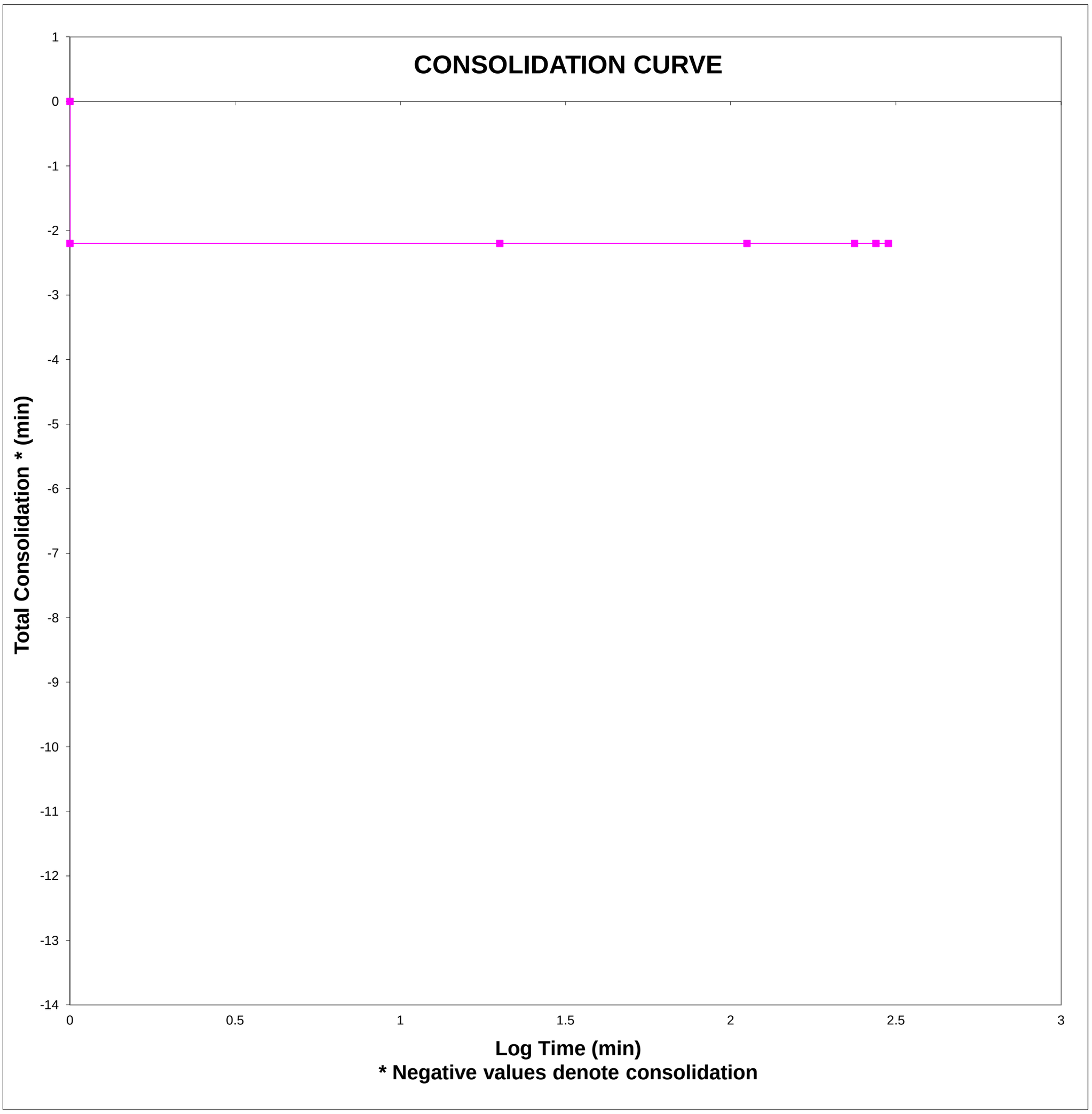
CELL PRESSURE: 65 psi **BACK PRESSURE:** 55 psi **EFFECTIVE STRESS:** 10 psi

TEST DATE	*TESTED BY*	*TIME (Military)*	*ELAPSED TIME (minutes)*	*TOTAL TIME (minutes)*	*TOTAL TIME (Log)*	*SPECIMEN CONSOLIDATION (ML)*		
						READING		*ACTUAL TOTAL (Ct)*
						BOTTOM	*TOP*	
4 / 30 / 13	RJB	14 : 40	0	0	0	25.0	25.0	0.0
4 / 30 / 13	RJB	14 : 41	1	1	0.00	23.9	23.9	2.2
4 / 30 / 13	RJB	15 : 0	19	20	1.30	23.9	23.9	2.2
4 / 30 / 13	RJB	16 : 32	92	112	2.05	23.9	23.9	2.2
4 / 30 / 13	RJB	18 : 37	125	237	2.37	23.9	23.9	2.2
4 / 30 / 13	RJB	19 : 15	38	275	2.44	23.9	23.9	2.2
4 / 30 / 13	RJB	19 : 40	25	300	2.48	23.9	23.9	2.2

PERMEABILITY ASTM D5084

CONSOLIDATION CURVE

PROJECT:	Quanta	TESTED BY:	RJB
PROJECT No.:	SH0460	TRACKING CODE:	8861_PM
SAMPLE No.:	0460-018 (28 Day)	EQUIPMENT No.:	7B
TEST DATE:	4/27/13		



PERMEABILITY ASTM D5084

TEST DATA

PROJECT:	Quanta	TESTED BY:	RJB
PROJECT No.:	SH0460	TRACKING CODE:	8861_PM
SAMPLE No.:	0460-018 (28 Day)	EQUIPMENT No.:	7B
TEST DATE:	4/27/2013		

DATE	*TESTED BY*	*TIME (military)*	*ELAPSED TIME (minutes)*	*HYDRAULIC HEAD (cm)*		*TEMP. C°*	*GAUGE PRESSURE (psi)*		
				INFLUENT	*EFFLUENT*		*CELL*	*INFLUENT*	*EFFLUENT*
4 / 30 / 13	RJB	20 : 12	0	0.0	25.0	20.0	65.0	55.0	55.0
5 / 1 / 13	RJB	8 : 47	RESET	0.0	25.0	20.0	65.0	55.0	53.0
5 / 1 / 13	RJB	11 : 25	158	0.6	24.4	20.0	65.0	55.0	53.0
5 / 1 / 13	RJB	14 : 58	213	1.2	23.8	20.0	65.0	55.0	53.0
5 / 2 / 13	RJB	8 : 26	1048	3.6	21.4	20.0	65.0	55.0	53.0
5 / 2 / 13	RJB	12 : 49	263	4.1	20.1	20.0	65.0	55.0	53.0

PERMEABILITY ASTM D5084

TEST DATA (continued)

PROJECT:	Quanta	TESTED BY:	RJB
PROJECT No.:	SH0460	TRACKING CODE:	8861_PM
SAMPLE No.:	0460-018 (28 Day)	EQUIPMENT No.:	7B
TEST DATE:	4/27/13		

ELAPSED TIME (minutes)	*HYDRAULIC HEAD DIFFERENCE (cm)*		*EFFLUENT - INFLUENT RATIO*	*HYDRAULIC GRADIENT (cm/cm)*	*HYDRAULIC CONDUCTIVITY (cm/sec)*	
	INFLUENT	*EFFLUENT*			*@ Temp.*	*@ 20° C*
RESET				7.227		
RESET				47.897		
158	0.6	0.6	1.00	47.551	2.96E-08	2.97E-08
213	0.6	0.6	1.00	47.204	2.21E-08	2.22E-08
1048	2.4	2.4	1.00	45.816	1.83E-08	1.84E-08
263	0.5	1.3	2.60	45.296	2.79E-08	2.81E-08

PERMEABILITY ASTM D5084

SUMMARY OF RESULTS

PROJECT:	Quanta	TESTED BY:	RJB
PROJECT No.:	SH0460	TRACKING CODE:	8861_PM
SAMPLE No.:	0460-018 (28 Day)	EQUIPMENT No.:	7B
TEST DATE:	4/27/13		

TESTING PARAMETER	INITIAL	FINAL
BULK UNIT WEIGHT	86.1 lb/ft³	87.6 lb/ft³
DRY UNIT WEIGHT	58.8 lb/ft³	59.3 lb/ft³
MOISTURE CONTENT	46.5 %	47.7 %
PERMEABILITY @ 20°C	2.5E-08 cm/sec	

UNCONFINED COMPRESSION TEST

ASTM D 2166

PROJECT:	Quanta
PROJECT No.:	SH0460
SAMPLE No.:	460-18
TESTING DATE:	22-Apr-13
TESTED BY:	TNR

LOADING RATE:	0.04 in./min.
TRACKING CODE:	8861

MOISTURE CONTENT (Dry Basis)		
1. MOISTURE TIN NO.		
2. WT MOISTURE TIN (tare weight)	173.50	g
3. WT WET SOIL + TARE	258.13	g
4. WT DRY SOIL + TARE	227.80	g
5. WT WATER, Ww	30.33	g
6. WT DRY SOIL, Ws	54.30	g
7. MOISTURE CONTENT, W	**55.86**	**%**

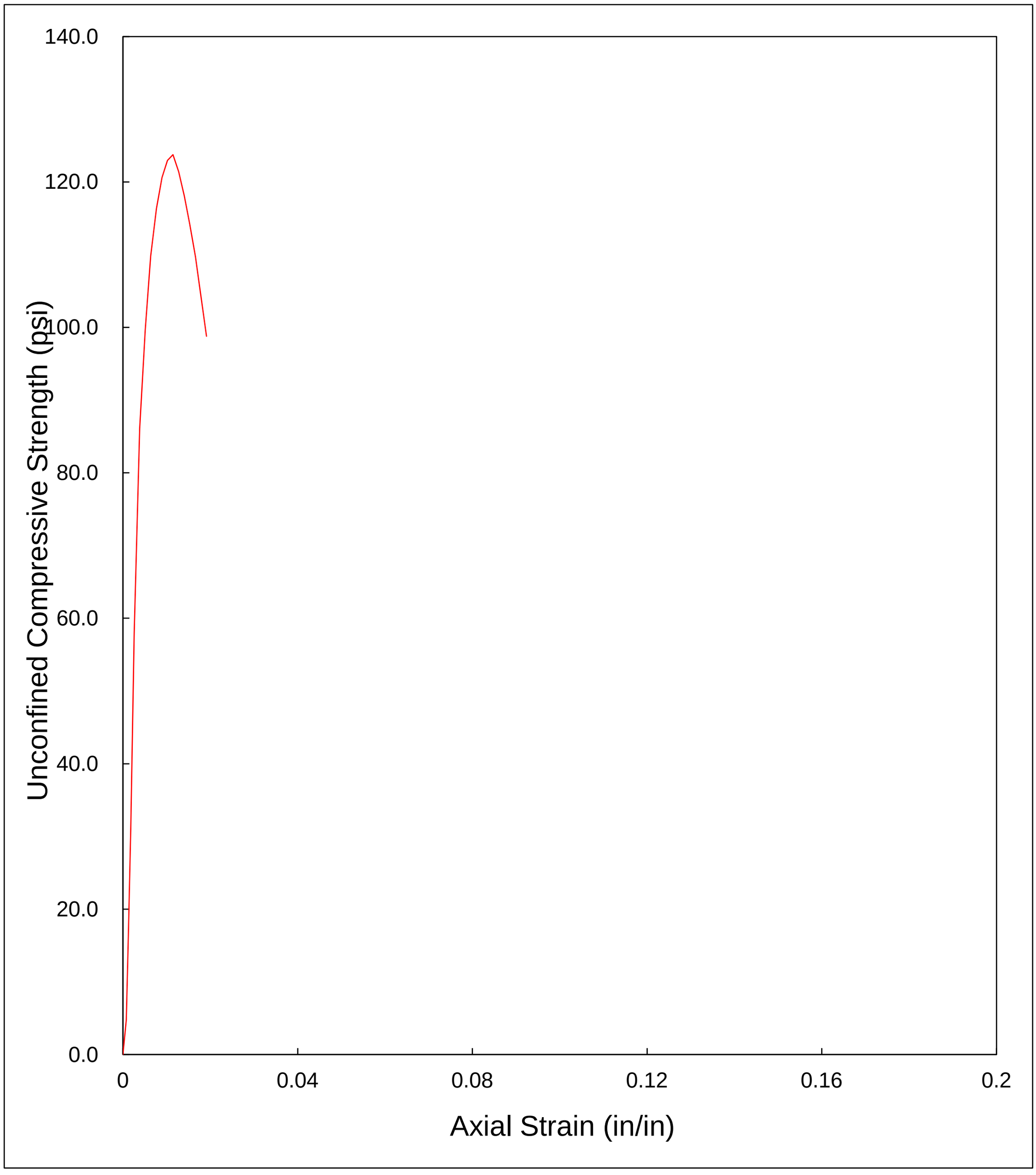
SOIL SPECIMEN DIMENSIONS				
	DIAMETER		*LENGTH*	
No. 1	2.01	in.	3.92	in.
No. 2	2.00	in.	3.92	in.
No. 3	1.99	in.	3.92	in.
Average	**2.00**	**in.**	**3.92**	**in.**

SPECIMEN CONDITIONS		
Initial Specimen WT, Wo	*281.57*	*g*
Initial Area, Ao	3.15	in^2
Initial Volume, Vo	12.33	in^3
Initial Bulk Unit Weight,	87.0	lb/ft^3
Initial Dry Unit Weight	55.8	lb/ft^3
15 % Strain (0.15 Lo)	0.59	in.
UCS	123.7	lb/in^2

COMPRESSIVE LOAD (lbs.)	DIAL GAGE READING (in.)	SPECIMEN DEFORMATION (in.)	CORRECTED AREA (in^2)	AXIAL STRAIN (in/in)	UNCONFINED COMPRESSIVE STRENGTH (lb/in^2)
0	0.000	0.000	3.147	0.0000	0.0
15	0.003	0.003	3.150	0.0008	4.8
53	0.005	0.005	3.151	0.0013	16.8
99	0.007	0.007	3.153	0.0018	31.4
183	0.010	0.010	3.155	0.0026	58.0
272	0.015	0.015	3.159	0.0038	86.1
315	0.020	0.020	3.164	0.0051	99.6
348	0.025	0.025	3.168	0.0064	109.9
369	0.030	0.030	3.172	0.0077	116.3
383	0.035	0.035	3.176	0.0089	120.6
391	0.040	0.040	3.180	0.0102	123.0
394	0.045	0.045	3.184	0.0115	123.7
387	0.050	0.050	3.188	0.0128	121.4
377	0.055	0.055	3.192	0.0140	118.1
365	0.060	0.060	3.196	0.0153	114.2
351	0.065	0.065	3.200	0.0166	109.7
334	0.070	0.070	3.205	0.0179	104.2
317	0.075	0.075	3.209	0.0191	98.8

UNCONFINED COMPRESSION TESTING

Sample No. 460-18



UNCONFINED COMPRESSION TEST

ASTM D 2166
SUMMARY OF RESULTS

PROJECT:	Quanta		
PROJECT No.:	SH0460		
SAMPLE No.:	460-18		
TESTING DATE:	4/22/2013	LOADING RATE:	0.04 in./min.
TESTED BY:	TNR	TRACKING CODE:	8861

TESTING PARAMETER AND RESULTS		
MOISTURE CONTENT	55.9	%
BULK UNIT WEIGHT	87.0	lb/ft^3
DRY UNIT WEIGHT	55.8	lb/ft^3
UCS *	123.7	lb/in^2

* UCS - UNCONFINED COMPRESSIVE STRENGTH

PERMEABILITY ASTM D5084

SPECIMEN CONDITIONS

PROJECT:	Quanta	TESTED BY:	RJB
PROJECT No.:	SH0460	TRACKING CODE:	8832_PM
SAMPLE No.:	0460-019 (28 Day)	EQUIPMENT No.:	1
TEST DATE:	4/30/13		

MOISTURE CONTENT (Dry Basis)	*INITIAL*	*FINAL*
1. MOISTURE TIN NO.		
2. WT MOISTURE TIN (tare weight)	0.00 *g*	1.00 *g*
3. WT WET SOIL + TARE	759.50 *g*	761.70 *g*
4. WT DRY SOIL + TARE	535.35 *g*	536.35 *g*
5. WT WATER, Ww	224.15 g	225.35 g
6. WT DRY SOIL, Ws	535.35 g	535.35 g
7. MOISTURE CONTENT, W	41.87 %	42.09 %

SOIL SPECIMEN DIMENSIONS				
TRIPLICATE	*DIAMETER*		*HEIGHT*	
ANALYSES	*INITIAL*	*FINAL*	*INITIAL*	*FINAL*
No. 1	*3.00 in.*	*2.99 in.*	*3.66 in.*	*3.73 in.*
No. 2	*2.98 in.*	*2.98 in.*	*3.74 in.*	*3.74 in.*
No. 3	*2.97 in.*	*2.98 in.*	*3.73 in.*	*3.66 in.*
Average	2.98 in.	2.99 in.	3.71 in.	3.71 in.

SPECIMEN CONDITIONS	*INITIAL*	*FINAL*
Specimen WT, Wo	*759.50 g*	*760.70 g*
Area, Ao	6.99 in^2	7.00 in^2
Volume, Vo	25.94 in^3	25.99 in^3
Bulk Unit Weight	111.5 lb/ft^3	111.5 lb/ft^3
Dry Unit Weight	78.6 lb/ft^3	78.5 lb/ft^3

PERMEABILITY ASTM D5084

BACK-PRESSURE SATURATION

PROJECT:	Quanta	TESTED BY:	RJB
PROJECT No.:	SH0460	TRACKING CODE:	8832_PM
SAMPLE No.:	0460-019 (28 Day)	EQUIPMENT No.:	1
TEST DATE:	4/30/13		

TEST	*TIME*	*TESTED*	*TEST PRESSURES (psi)*						
			APPLIED		*PORE*		*PRESSURE CHANGE*		
DATE	*(military)*	*BY*	*CELL*	*BACK*	*SAT.*	*TEST*	*CELL*	*PORE*	*B-Value*
04/30/13	11 : 45	RJB	7.0	5.0	5.3				
04/30/13	12 : 50	RJB	17.0	15.0	15.6	10.4	10.0	5.1	0.51
04/30/13	13 : 35	RJB	27.0	25.0	25.4	23.8	10.0	8.2	0.82
04/30/13	14 : 20	RJB	37.0	35.0	35.3	33.7	10.0	8.3	0.83
04/30/13	14 : 50	RJB	47.0	45.0	45.3	44.1	10.0	8.8	0.88
04/30/13	16 : 26	RJB	57.0	55.0	55.2	54.5	10.0	9.2	0.92
04/30/13	18 : 29	RJB	67.0	65.0	65.3	64.5	10.0	9.3	0.93
04/30/13	19 : 30	RJB	77.0	75.0	*	74.8	10.0	9.5	0.95
04/30/13	19 : 31	RJB	67.0	65.0	*	*	*	*	*

* Saturation check - no data available.

PERMEABILITY ASTM D5084

SPECIMEN CONSOLIDATION

PROJECT:	Quanta		RJB
PROJECT No.:	SH0460		8832_PM
SAMPLE No.:	0460-019 (28 Day)		1
TEST DATE:	4/30/13		

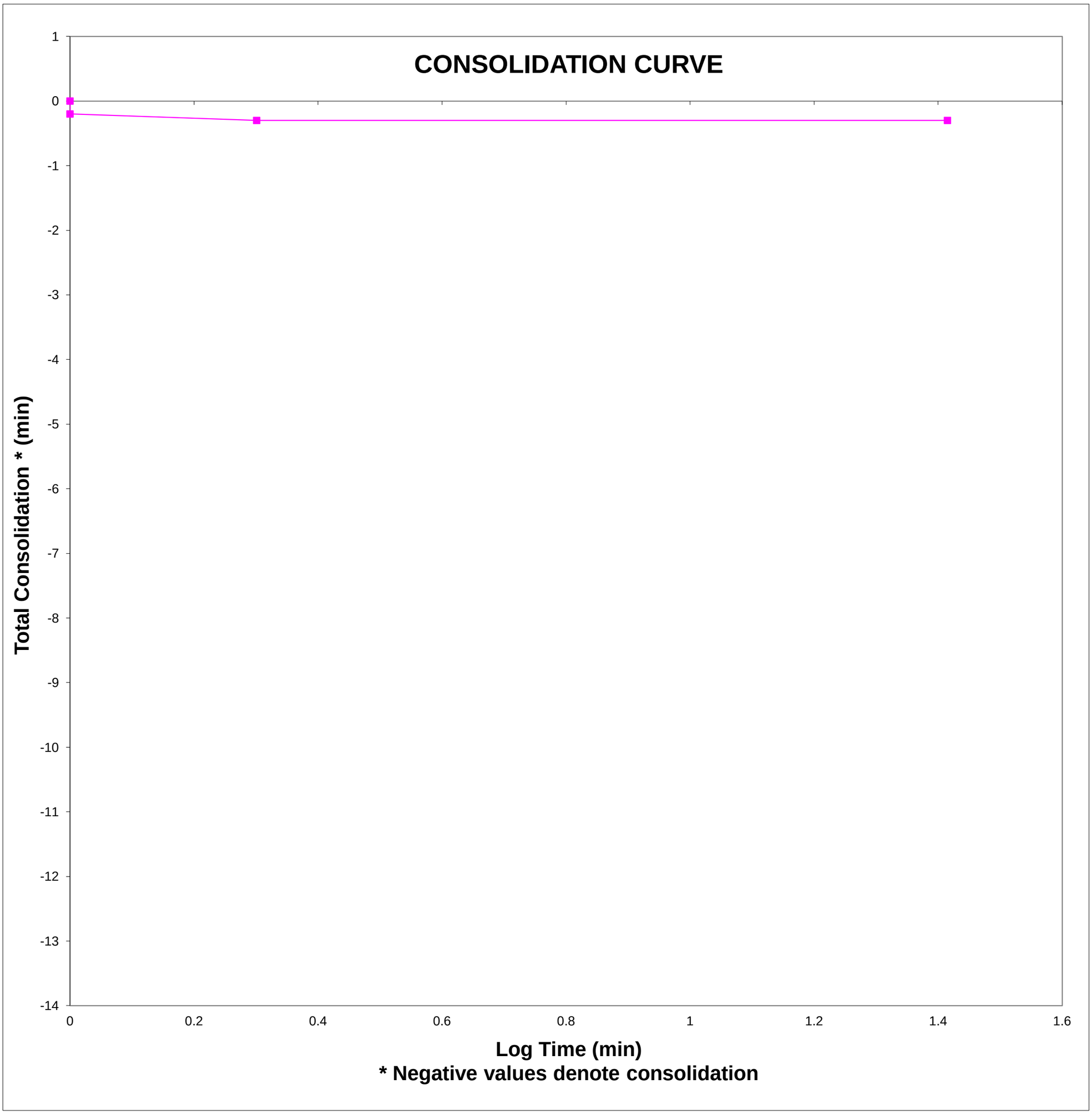
CELL PRESSURE: 65 psi **BACK PRESSURE:** 55 psi **EFFECTIVE STRESS:** 10 psi

TEST DATE	*TESTED BY*	*TIME (Military)*	*ELAPSED TIME (minutes)*	*TOTAL TIME (minutes)*	*TOTAL TIME (Log)*	*SPECIMEN CONSOLIDATION (ML)*		
						READING		*ACTUAL TOTAL (Ct)*
						BOTTOM	*TOP*	
4 / 30 / 13	RJB	19 : 34	0	0	0	25.0	25.0	0.0
4 / 30 / 13	RJB	19 : 35	1	1	0.00	24.9	24.9	0.2
4 / 30 / 13	RJB	19 : 36	1	2	0.30	24.9	24.8	0.3
4 / 30 / 13	RJB	20 : 0	24	26	1.41	24.9	24.8	0.3

PERMEABILITY ASTM D5084

CONSOLIDATION CURVE

PROJECT:	Quanta	TESTED BY:	RJB
PROJECT No.:	SH0460	TRACKING CODE:	8832_PM
SAMPLE No.:	0460-019 (28 Day)	EQUIPMENT No.:	1
TEST DATE:	4/30/13		



PERMEABILITY ASTM D5084

TEST DATA

PROJECT:	Quanta	TESTED BY:	RJB
PROJECT No.:	SH0460	TRACKING CODE:	8832_PM
SAMPLE No.:	0460-019 (28 Day)	EQUIPMENT No.:	1
TEST DATE:	4/30/2013		

DATE	*TESTED BY*	*TIME (military)*	*ELAPSED TIME (minutes)*	*HYDRAULIC HEAD (cm)*		*TEMP. C°*	*GAUGE PRESSURE (psi)*		
				INFLUENT	*EFFLUENT*		*CELL*	*INFLUENT*	*EFFLUENT*
4 / 30 / 13	RJB	20 : 0	0	0.0	25.0	20.0	65.0	55.0	55.0
4 / 30 / 13	RJB	23 : 44	RESET	0.0	25.0	20.0	65.0	55.0	53.0
5 / 2 / 13	RJB	8 : 25	1961	0.5	24.5	20.0	65.0	55.0	53.0
5 / 6 / 13	RJB	7 : 51	5726	1.7	23.3	20.0	65.0	55.0	53.0
5 / 9 / 13	RJB	7 : 47	4316	2.2	22.8	20.0	65.0	55.0	53.0

PERMEABILITY ASTM D5084

TEST DATA (continued)

PROJECT:	Quanta	TESTED BY:	RJB
PROJECT No.:	SH0460	TRACKING CODE:	8832_PM
SAMPLE No.:	0460-019 (28 Day)	EQUIPMENT No.:	1
TEST DATE:	4/30/13		

ELAPSED TIME (minutes)	*HYDRAULIC HEAD DIFFERENCE (cm)*		*EFFLUENT - INFLUENT RATIO*	*HYDRAULIC GRADIENT (cm/cm)*	*HYDRAULIC CONDUCTIVITY (cm/sec)*	
	INFLUENT	*EFFLUENT*			*@ Temp.*	*@ 20° C*
RESET				2.652		
RESET				17.576		
1961	0.5	0.5	1.00	17.470	5.38E-09	5.40E-09
5726	1.2	1.2	1.00	17.216	4.47E-09	4.49E-09
4316	0.5	0.5	1.00	17.109	2.49E-09	2.51E-09

PERMEABILITY ASTM D5084

SUMMARY OF RESULTS

PROJECT:	Quanta	TESTED BY:	RJB
PROJECT No.:	SH0460	TRACKING CODE:	8832_PM
SAMPLE No.:	0460-019 (28 Day)	EQUIPMENT No.:	1
TEST DATE:	4/30/13		

TESTING PARAMETER	INITIAL	FINAL
BULK UNIT WEIGHT	111.5 lb/ft³	111.5 lb/ft³
DRY UNIT WEIGHT	78.6 lb/ft³	78.5 lb/ft³
MOISTURE CONTENT	41.9 %	42.1 %
PERMEABILITY @ 20°C	4.1E-09 cm/sec	

UNCONFINED COMPRESSION TEST

ASTM D 2166

PROJECT:	Quanta
PROJECT No.:	SH0460
SAMPLE No.:	460-019
TESTING DATE:	23-Apr-13
TESTED BY:	TNR/RPH

LOADING RATE:	0.04 in./min.
TRACKING CODE:	8862

MOISTURE CONTENT (Dry Basis)		
1. MOISTURE TIN NO.		
2. WT MOISTURE TIN (tare weight)	3.31	g
3. WT WET SOIL + TARE	157.07	g
4. WT DRY SOIL + TARE	114.92	g
5. WT WATER, Ww	42.15	g
6. WT DRY SOIL, Ws	111.61	g
7. MOISTURE CONTENT, W	**37.77**	**%**

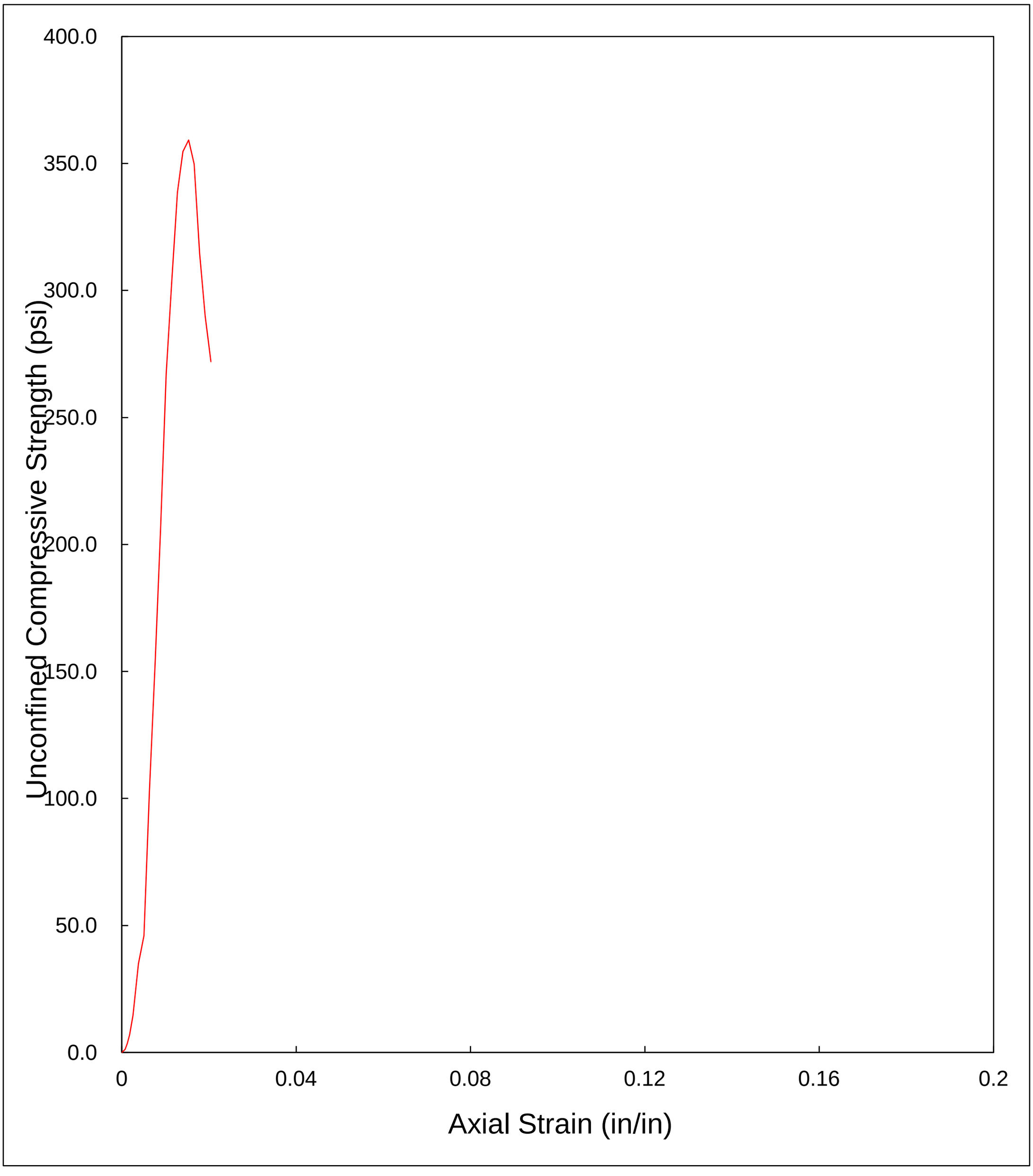
SOIL SPECIMEN DIMENSIONS				
	DIAMETER		*LENGTH*	
No. 1	2.02	in.	3.90	in.
No. 2	2.00	in.	3.94	in.
No. 3	1.99	in.	3.90	in.
Average	**2.00**	**in.**	**3.91**	**in.**

SPECIMEN CONDITIONS		
Initial Specimen WT, Wo	*365.81*	*g*
Initial Area, Ao	3.15	in²
Initial Volume, Vo	12.35	in³
Initial Bulk Unit Weight,	112.9	lb/ft³
Initial Dry Unit Weight	81.9	lb/ft³
15 % Strain (0.15 Lo)	0.59	in.
UCS	359.3	lb/in²

COMPRESSIVE LOAD (lbs.)	DIAL GAGE READING (in.)	SPECIMEN DEFORMATION (in.)	CORRECTED AREA (in²)	AXIAL STRAIN (in/in)	UNCONFINED COMPRESSIVE STRENGTH (lb/in²)
0	0.000	0.000	3.155	0.0000	0.0
4	0.003	0.003	3.157	0.0008	1.3
11	0.005	0.005	3.159	0.0013	3.5
22	0.007	0.007	3.160	0.0018	7.0
46	0.010	0.010	3.163	0.0026	14.5
111	0.015	0.015	3.167	0.0038	35.1
146	0.020	0.020	3.171	0.0051	46.0
328	0.025	0.025	3.175	0.0064	103.3
489	0.030	0.030	3.179	0.0077	153.8
660	0.035	0.035	3.183	0.0089	207.3
852	0.040	0.040	3.187	0.0102	267.3
972	0.045	0.045	3.191	0.0115	304.6
1082	0.050	0.050	3.196	0.0128	338.6
1135	0.055	0.055	3.200	0.0141	354.7
1151	0.060	0.060	3.204	0.0153	359.3
1122	0.065	0.065	3.208	0.0166	349.8
1010	0.070	0.070	3.212	0.0179	314.4
933	0.075	0.075	3.216	0.0192	290.1
876	0.080	0.080	3.221	0.0204	272.0

UNCONFINED COMPRESSION TESTING

Sample No. 460-019



UNCONFINED COMPRESSION TEST

ASTM D 2166
SUMMARY OF RESULTS

PROJECT:	Quanta		
PROJECT No.:	SH0460		
SAMPLE No.:	460-019		
TESTING DATE:	4/23/2013	LOADING RATE:	0.04 in./min.
TESTED BY:	TNR/RPH	TRACKING CODE:	8862

TESTING PARAMETER AND RESULTS		
MOISTURE CONTENT	37.8	%
BULK UNIT WEIGHT	112.9	lb/ft^3
DRY UNIT WEIGHT	81.9	lb/ft^3
UCS *	359.3	lb/in^2

* UCS - UNCONFINED COMPRESSIVE STRENGTH

ANS 16.1 LEACHABILITY

SAMPLE PREPARATION

PROJECT:	Quanta	TESTED BY:	TNR
PROJECT No.:	SH0460	TRACKING CODE:	8862
SAMPLE No.:	460-019		
TEST DATE:	5/2/2013		

MOISTURE CONTENT (Dry Basis)	*RESULTS*	
1. MOISTURE TIN NO.	460-019	
2. WT MOISTURE TIN (tare weight)	3.31	*g*
3. WT WET SOIL + TARE	157.07	*g*
4. WT DRY SOIL + TARE	114.92	*g*
5. WT WATER, Ww	42.15	g
6. WT DRY SOIL, Ws	111.61	g
7. MOISTURE CONTENT, W	37.77	%

SOIL SPECIMEN DIMENSIONS				
TRIPLICATE ANALYSES	*DIAMETER RESULTS*		*LENGTH RESULTS*	
No. 1	*2.01*	*in.*	*3.87*	*in.*
No. 2	*2.00*	*in.*	*3.87*	*in.*
No. 3	*1.99*	*in.*	*3.87*	*in.*
Average	2.00	in.	3.87	in.

SPECIMEN CONDITIONS	*INITIAL*	
Specimen WT, Wo	*369.98*	*g*
Area, Ao	3.15	in^2
Volume, Vo	12.18	in^3
Bulk Unit Weight	115.8	pcf
Dry Unit Weight	84.0	pcf

ANS 16.1 LEACHABILITY

TESTING DATA

Sheet 2 of 2

PROJECT:	Quanta
PROJECT NO.:	SH0460
SAMPLE NO:	460-019
START DATE:	5/2/2013
TRACKING CODE:	8862

LEACH INTERVAL	TESTED BY	DATE		TIME		VOLUME LEACHATE (ml)	TEMP (°C)	PID (ppm)	Conduct. (mS/cm³)	pH (s.u.)	OBSERVATIONS
		IN	OUT	IN	OUT						
Initial	TNR					1976	22.15		0.042	6.98	
1	TNR	05/02/13	05/02/13	903	1103	1976	22.22		0.054	8.56	2 hr
2	TNR	05/02/13	05/02/13	1103	1603	1976	22.38		0.061	7.87	7 hr
3	TNR	05/02/13	05/03/13	1603	903	1976	21.87		0.149	9.17	24 hr
4	TNR	05/03/13	05/04/13	903	903	1976	20.55		0.104	8.83	48 hr; particles at bottom
5	TNR	05/04/13	05/05/13	903	903	1976	20.33		0.122	8.95	3 day; faint brown tint
6	TNR	05/05/13	05/06/13	903	903	1976	20.36		0.089	8.71	4 day
7	TNR	05/06/13	05/07/13	903	903	1976	21.23		0.073	8.81	5 day
8											
9											
10											

PERMEABILITY ASTM D5084

SPECIMEN CONDITIONS

PROJECT:	Quanta	TESTED BY:	RJB
PROJECT No.:	SH0460	TRACKING CODE:	8863_PM
SAMPLE No.:	0460-020 (28 Day)	EQUIPMENT No.:	4
TEST DATE:	4/30/13		

MOISTURE CONTENT (Dry Basis)	*INITIAL*	*FINAL*
1. MOISTURE TIN NO.		
2. WT MOISTURE TIN (tare weight)	0.00 *g*	1.00 *g*
3. WT WET SOIL + TARE	814.00 *g*	824.40 *g*
4. WT DRY SOIL + TARE	555.50 *g*	556.50 *g*
5. WT WATER, Ww	258.50 g	267.90 g
6. WT DRY SOIL, Ws	555.50 g	555.50 g
7. MOISTURE CONTENT, W	46.53 %	48.23 %

SOIL SPECIMEN DIMENSIONS				
TRIPLICATE	*DIAMETER*		*HEIGHT*	
ANALYSES	*INITIAL*	*FINAL*	*INITIAL*	*FINAL*
No. 1	*3.01 in.*	*2.99 in.*	*4.13 in.*	*4.13 in.*
No. 2	*2.98 in.*	*2.99 in.*	*4.13 in.*	*4.13 in.*
No. 3	*2.97 in.*	*2.98 in.*	*4.14 in.*	*4.16 in.*
Average	2.99 in.	2.98 in.	4.13 in.	4.14 in.

SPECIMEN CONDITIONS	*INITIAL*	*FINAL*
Specimen WT, Wo	*814.00 g*	*823.40 g*
Area, Ao	7.01 in^2	6.99 in^2
Volume, Vo	28.99 in^3	28.94 in^3
Bulk Unit Weight	107.0 lb/ft^3	108.4 lb/ft^3
Dry Unit Weight	73.0 lb/ft^3	73.1 lb/ft^3

PERMEABILITY ASTM D5084

BACK-PRESSURE SATURATION

PROJECT:	Quanta	TESTED BY:	RJB
PROJECT No.:	SH0460	TRACKING CODE:	8863_PM
SAMPLE No.:	0460-020 (28 Day)	EQUIPMENT No.:	4
TEST DATE:	4/30/13		

TEST DATE	*TIME (military)*	*TESTED BY*	*TEST PRESSURES (psi)*						
			APPLIED		*PORE*		*PRESSURE CHANGE*		
			CELL	*BACK*	*SAT.*	*TEST*	*CELL*	*PORE*	*B-Value*
04/30/13	12 : 45	RJB	7.0	5.0	5.3				
04/30/13	13 : 40	RJB	17.0	15.0	15.4	12.2	10.0	6.9	0.69
04/30/13	14 : 50	RJB	27.0	25.0	25.6	23.6	10.0	8.2	0.82
04/30/13	16 : 24	RJB	37.0	35.0	35.7	34.5	10.0	8.9	0.89
04/30/13	18 : 24	RJB	47.0	45.0	45.5	44.7	10.0	9.0	0.90
04/30/13	19 : 29	RJB	57.0	55.0	*	55.1	10.0	9.6	0.96
04/30/13	19 : 30	RJB	47.0	45.0	*	*	*	*	*

* Saturation check - no data available.

PERMEABILITY ASTM D5084

SPECIMEN CONSOLIDATION

PROJECT:	Quanta		RJB
PROJECT No.:	SH0460		8863_PM
SAMPLE No.:	0460-020 (28 Day)		4
TEST DATE:	4/30/13		

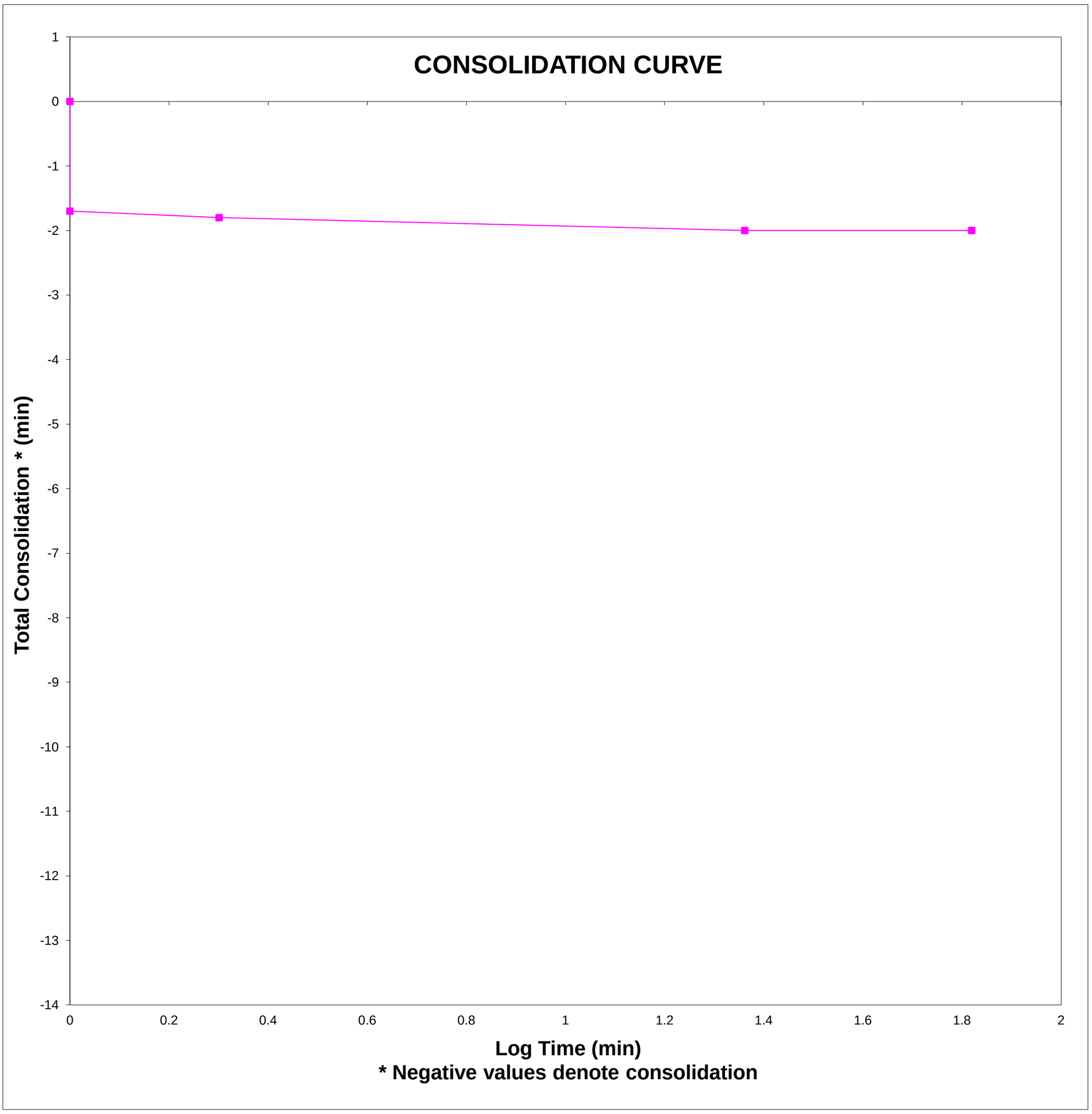
CELL PRESSURE: 55 psi **BACK PRESSURE:** 45 psi **EFFECTIVE STRESS:** 10 psi

TEST DATE	*TESTED BY*	*TIME (Military)*	*ELAPSED TIME (minutes)*	*TOTAL TIME (minutes)*	*TOTAL TIME (Log)*	*SPECIMEN CONSOLIDATION (ML)*		
						READING		*ACTUAL TOTAL (Ct)*
						BOTTOM	*TOP*	
4 / 30 / 13	RJB	19 : 37	0	0	0	25.0	25.0	0.0
4 / 30 / 13	RJB	19 : 38	1	1	0.00	24.0	24.3	1.7
4 / 30 / 13	RJB	19 : 39	1	2	0.30	23.9	24.3	1.8
4 / 30 / 13	RJB	20 : 0	21	23	1.36	23.8	24.2	2.0
4 / 30 / 13	RJB	20 : 43	43	66	1.82	23.8	24.2	2.0

PERMEABILITY ASTM D5084

CONSOLIDATION CURVE

PROJECT:	Quanta	TESTED BY:	RJB
PROJECT No.:	SH0460	TRACKING CODE:	8863_PM
SAMPLE No.:	0460-020 (28 Day)	EQUIPMENT No.:	4
TEST DATE:	4/30/13		



PERMEABILITY ASTM D5084

TEST DATA

PROJECT:	Quanta	TESTED BY:	RJB
PROJECT No.:	SH0460	TRACKING CODE:	8863_PM
SAMPLE No.:	0460-020 (28 Day)	EQUIPMENT No.:	4
TEST DATE:	4/30/2013		

DATE	*TESTED BY*	*TIME (military)*	*ELAPSED TIME (minutes)*	*HYDRAULIC HEAD (cm)*		*TEMP. C°*	*GAUGE PRESSURE (psi)*		
				INFLUENT	*EFFLUENT*		*CELL*	*INFLUENT*	*EFFLUENT*
4 / 30 / 13	RJB	20 : 44	0	0.0	25.0	20.0	55.0	45.0	45.0
5 / 1 / 13	RJB	10 : 2	RESET	0.0	25.0	20.0	55.0	45.0	43.0
5 / 2 / 13	RJB	8 : 24	1342	1.4	23.6	20.0	55.0	45.0	43.0
5 / 3 / 13	RJB	8 : 17	1433	2.3	22.7	20.0	55.0	45.0	43.0
5 / 6 / 13	RJB	7 : 51	4294	3.7	21.3	20.0	55.0	45.0	43.0
5 / 6 / 13	RJB	8 : 11	20	0.0	25.0	20.0	55.0	45.0	43.0
5 / 9 / 13	RJB	9 : 48	4417	0.6	24.4	20.0	55.0	45.0	43.0

PERMEABILITY ASTM D5084

TEST DATA (continued)

PROJECT:	Quanta	TESTED BY:	RJB
PROJECT No.:	SH0460	TRACKING CODE:	8863_PM
SAMPLE No.:	0460-020 (28 Day)	EQUIPMENT No.:	4
TEST DATE:	4/30/13		

ELAPSED TIME (minutes)	*HYDRAULIC HEAD DIFFERENCE (cm)*		*EFFLUENT - INFLUENT RATIO*	*HYDRAULIC GRADIENT (cm/cm)*	*HYDRAULIC CONDUCTIVITY (cm/sec)*	
	INFLUENT	*EFFLUENT*			*@ Temp.*	*@ 20° C*
RESET				2.381		
RESET				15.780		
1342	1.4	1.4	1.00	15.514	2.46E-08	2.47E-08
1433	0.9	0.9	1.00	15.342	1.50E-08	1.51E-08
4294	1.4	1.4	1.00	15.076	7.90E-09	7.93E-09
20				15.780		
4417	0.6	0.6	1.00	15.666	3.18E-09	3.20E-09

PERMEABILITY ASTM D5084

SUMMARY OF RESULTS

PROJECT:	Quanta	TESTED BY:	RJB
PROJECT No.:	SH0460	TRACKING CODE:	8863_PM
SAMPLE No.:	0460-020 (28 Day)	EQUIPMENT No.:	4
TEST DATE:	4/30/13		

TESTING PARAMETER	INITIAL	FINAL
BULK UNIT WEIGHT	107.0 lb/ft³	108.4 lb/ft³
DRY UNIT WEIGHT	73.0 lb/ft³	73.1 lb/ft³
MOISTURE CONTENT	46.5 %	48.2 %
PERMEABILITY @ 20°C	2.0E-08 cm/sec	

UNCONFINED COMPRESSION TEST

ASTM D 2166

PROJECT:	Quanta
PROJECT No.:	SH0460
SAMPLE No.:	460-020
TESTING DATE:	23-Apr-13
TESTED BY:	TNR/RPH

LOADING RATE:	0.04 in./min.
TRACKING CODE:	8863

MOISTURE CONTENT (Dry Basis)		
1. MOISTURE TIN NO.		
2. WT MOISTURE TIN (tare weight)	3.28	g
3. WT WET SOIL + TARE	132.56	g
4. WT DRY SOIL + TARE	92.50	g
5. WT WATER, Ww	40.06	g
6. WT DRY SOIL, Ws	89.22	g
7. MOISTURE CONTENT, W	**44.90**	**%**

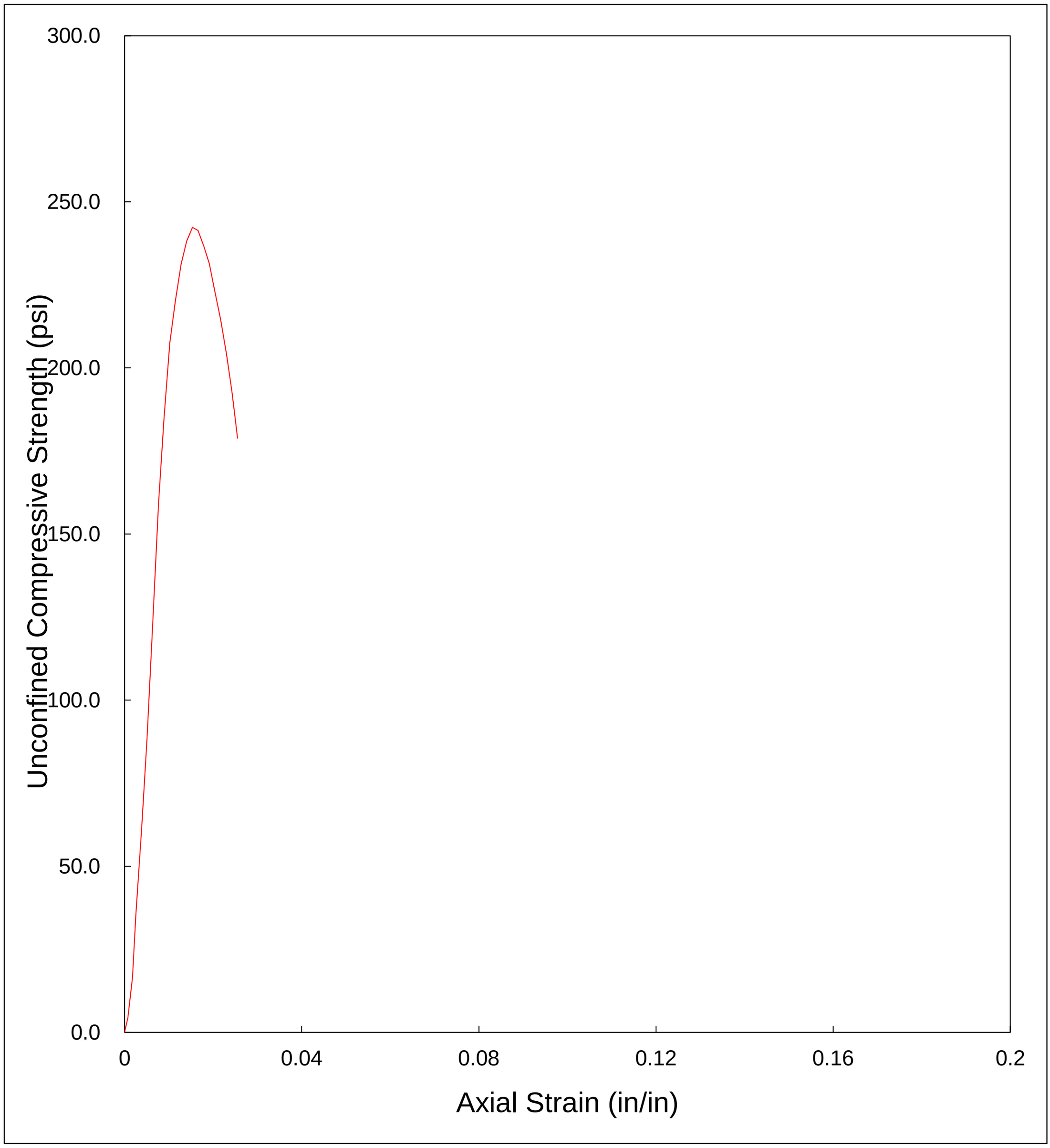
SOIL SPECIMEN DIMENSIONS				
	DIAMETER		*LENGTH*	
No. 1	2.01	in.	3.91	in.
No. 2	2.00	in.	3.93	in.
No. 3	1.99	in.	3.91	in.
Average	**2.00**	**in.**	**3.92**	**in.**

SPECIMEN CONDITIONS		
Initial Specimen WT, Wo	*353.33*	*g*
Initial Area, Ao	3.13	in²
Initial Volume, Vo	12.27	in³
Initial Bulk Unit Weight,	109.7	lb/ft³
Initial Dry Unit Weight	75.7	lb/ft³
15 % Strain (0.15 Lo)	0.59	in.
UCS	242.3	lb/in²

COMPRESSIVE LOAD (lbs.)	DIAL GAGE READING (in.)	SPECIMEN DEFORMATION (in.)	CORRECTED AREA (in²)	AXIAL STRAIN (in/in)	UNCONFINED COMPRESSIVE STRENGTH (lb/in²)
0	0.000	0.000	3.133	0.0000	0.0
14	0.003	0.003	3.136	0.0008	4.5
34	0.005	0.005	3.137	0.0013	10.8
52	0.007	0.007	3.139	0.0018	16.6
111	0.010	0.010	3.141	0.0026	35.3
193	0.015	0.015	3.145	0.0038	61.4
281	0.020	0.020	3.149	0.0051	89.2
393	0.025	0.025	3.153	0.0064	124.6
502	0.030	0.030	3.157	0.0077	159.0
585	0.035	0.035	3.161	0.0089	185.0
657	0.040	0.040	3.166	0.0102	207.5
698	0.045	0.045	3.170	0.0115	220.2
734	0.050	0.050	3.174	0.0128	231.3
757	0.055	0.055	3.178	0.0140	238.2
771	0.060	0.060	3.182	0.0153	242.3
769	0.065	0.065	3.186	0.0166	241.4
755	0.070	0.070	3.190	0.0179	236.7
739	0.075	0.075	3.194	0.0191	231.3
712	0.080	0.080	3.199	0.0204	222.6
687	0.085	0.085	3.203	0.0217	214.5
655	0.090	0.090	3.207	0.0230	204.2
619	0.095	0.095	3.211	0.0243	192.8
575	0.100	0.100	3.215	0.0255	178.8

UNCONFINED COMPRESSION TESTING

Sample No. 460-020



UNCONFINED COMPRESSION TEST

ASTM D 2166

SUMMARY OF RESULTS

PROJECT:	Quanta		
PROJECT No.:	SH0460		
SAMPLE No.:	460-020		
TESTING DATE:	4/23/2013	LOADING RATE:	0.04 in./min.
TESTED BY:	TNR/RPH	TRACKING CODE:	8863

TESTING PARAMETER AND RESULTS		
MOISTURE CONTENT	44.9	%
BULK UNIT WEIGHT	109.7	lb/ft^3
DRY UNIT WEIGHT	75.7	lb/ft^3
UCS *	242.3	lb/in^2

* UCS - UNCONFINED COMPRESSIVE STRENGTH

ANS 16.1 LEACHABILITY

SAMPLE PREPARATION

PROJECT:	Quanta	TESTED BY:	TNR
PROJECT No.:	SH0460	TRACKING CODE:	8863
SAMPLE No.:	460-020		
TEST DATE:	5/2/2013		

MOISTURE CONTENT (Dry Basis)	*RESULTS*	
1. MOISTURE TIN NO.	460-020	
2. WT MOISTURE TIN (tare weight)	3.28	*g*
3. WT WET SOIL + TARE	132.56	*g*
4. WT DRY SOIL + TARE	92.50	*g*
5. WT WATER, Ww	40.06	g
6. WT DRY SOIL, Ws	89.22	g
7. MOISTURE CONTENT, W	44.90	%

SOIL SPECIMEN DIMENSIONS				
TRIPLICATE ANALYSES	*DIAMETER RESULTS*		*LENGTH RESULTS*	
No. 1	*2.00*	*in.*	*3.93*	*in.*
No. 2	*2.00*	*in.*	*3.95*	*in.*
No. 3	*1.99*	*in.*	*3.93*	*in.*
Average	2.00	in.	3.94	in.

SPECIMEN CONDITIONS	*INITIAL*	
Specimen WT, Wo	*359.59*	*g*
Area, Ao	3.13	in^2
Volume, Vo	12.33	in^3
Bulk Unit Weight	111.1	pcf
Dry Unit Weight	76.7	pcf

ANS 16.1 LEACHABILITY

TESTING DATA

Sheet 2 of 2

PROJECT:	Quanta
PROJECT NO.:	SH0460
SAMPLE NO:	460-020
START DATE:	5/2/2013
TRACKING CODE:	8863

LEACH INTERVAL	TESTED BY	DATE		TIME		VOLUME LEACHATE (ml)	TEMP (°C)	PID (ppm)	Conduct. (mS/cm³)	pH (s.u.)	OBSERVATIONS
		IN	OUT	IN	OUT						
Initial	TNR					1998	22.15		0.042	6.98	
1	TNR	05/02/13	05/02/13	904	1104	1998	21.96		0.051	8.77	2 hr
2	TNR	05/02/13	05/02/13	1104	1604	1998	22.25		0.058	7.82	7 hr
3	TNR	05/02/13	05/03/13	1604	904	1998	21.79		0.105	9.11	24 hr; particles at bottom
4	TNR	05/03/13	05/04/13	904	904	1998	20.63		0.083	8.65	48 hr; particles at bottom
5	TNR	05/04/13	05/05/13	904	904	1998	20.24		0.097	8.89	3 day; particles at bottom
6	TNR	05/05/13	05/06/13	904	904	1998	20.22		0.070	8.39	4 day
7	TNR	05/06/13	05/07/13	904	904	1998	22.06		0.061	9.03	5 day
8											
9											
10											

UNCONFINED COMPRESSION TEST

ASTM D 2166

PROJECT:	Quanta
PROJECT No.:	SH0460
SAMPLE No.:	460-021
TESTING DATE:	23-Apr-13
TESTED BY:	TNR/RPH

LOADING RATE:	0.04 in./min.
TRACKING CODE:	8864

MOISTURE CONTENT (Dry Basis)		
1. MOISTURE TIN NO.		
2. WT MOISTURE TIN (tare weight)	3.26	g
3. WT WET SOIL + TARE	124.86	g
4. WT DRY SOIL + TARE	88.15	g
5. WT WATER, Ww	36.71	g
6. WT DRY SOIL, Ws	84.89	g
7. MOISTURE CONTENT, W	**43.24**	**%**

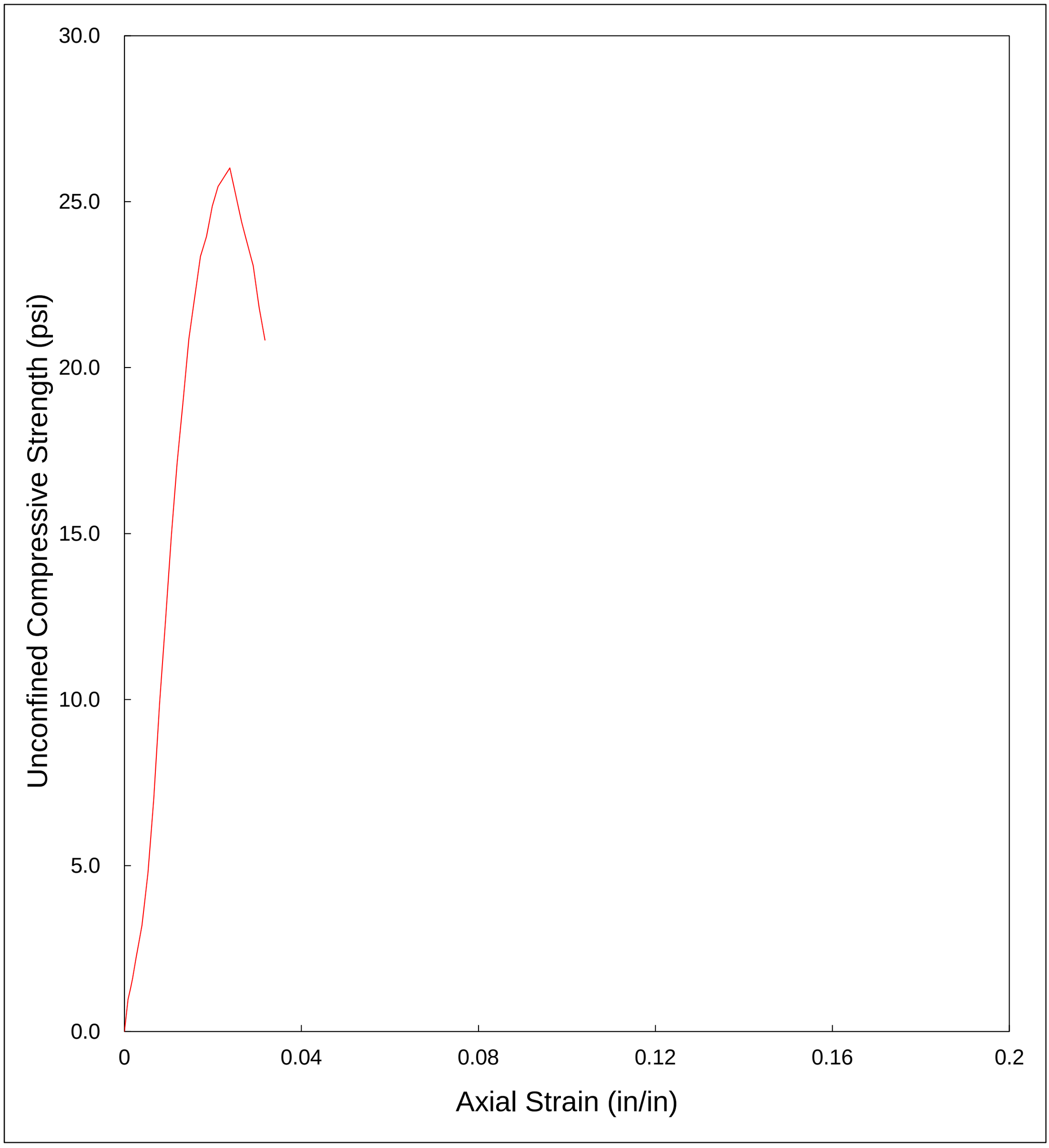
SOIL SPECIMEN DIMENSIONS				
	DIAMETER		*LENGTH*	
No. 1	2.00	in.	3.77	in.
No. 2	1.99	in.	3.80	in.
No. 3	1.98	in.	3.77	in.
Average	**1.99**	**in.**	**3.78**	**in.**

SPECIMEN CONDITIONS		
Initial Specimen WT, Wo	*341.32*	*g*
Initial Area, Ao	3.11	in²
Initial Volume, Vo	11.77	in³
Initial Bulk Unit Weight,	110.5	lb/ft³
Initial Dry Unit Weight	77.1	lb/ft³
15 % Strain (0.15 Lo)	0.57	in.
UCS	26.0	lb/in²

COMPRESSIVE LOAD (lbs.)	DIAL GAGE READING (in.)	SPECIMEN DEFORMATION (in.)	CORRECTED AREA (in²)	AXIAL STRAIN (in/in)	UNCONFINED COMPRESSIVE STRENGTH (lb/in²)
0	0.000	0.000	3.114	0.0000	0.0
3	0.003	0.003	3.117	0.0008	1.0
4	0.005	0.005	3.119	0.0013	1.3
5	0.007	0.007	3.120	0.0019	1.6
7	0.010	0.010	3.123	0.0026	2.2
10	0.015	0.015	3.127	0.0040	3.2
15	0.020	0.020	3.131	0.0053	4.8
22	0.025	0.025	3.135	0.0066	7.0
31	0.030	0.030	3.139	0.0079	9.9
39	0.035	0.035	3.144	0.0093	12.4
47	0.040	0.040	3.148	0.0106	14.9
54	0.045	0.045	3.152	0.0119	17.1
60	0.050	0.050	3.156	0.0132	19.0
66	0.055	0.055	3.160	0.0146	20.9
70	0.060	0.060	3.165	0.0159	22.1
74	0.065	0.065	3.169	0.0172	23.4
76	0.070	0.070	3.173	0.0185	24.0
79	0.075	0.075	3.178	0.0199	24.9
81	0.080	0.080	3.182	0.0212	25.5
83	0.090	0.090	3.190	0.0238	26.0
78	0.100	0.100	3.199	0.0265	24.4
76	0.105	0.105	3.203	0.0278	23.7
74	0.110	0.110	3.208	0.0291	23.1
70	0.115	0.115	3.212	0.0304	21.8
67	0.120	0.120	3.217	0.0318	20.8

UNCONFINED COMPRESSION TESTING

Sample No. 460-021



UNCONFINED COMPRESSION TEST

ASTM D 2166

SUMMARY OF RESULTS

PROJECT:	Quanta		
PROJECT No.:	SH0460		
SAMPLE No.:	460-021		
TESTING DATE:	4/23/2013	LOADING RATE:	0.04 in./min.
TESTED BY:	TNR/RPH	TRACKING CODE:	8864

TESTING PARAMETER AND RESULTS		
MOISTURE CONTENT	43.2	%
BULK UNIT WEIGHT	110.5	lb/ft^3
DRY UNIT WEIGHT	77.1	lb/ft^3
UCS *	26.0	lb/in^2

* UCS - UNCONFINED COMPRESSIVE STRENGTH

PERMEABILITY ASTM D5084

SPECIMEN CONDITIONS

PROJECT:	Quanta	TESTED BY:	RJB
PROJECT No.:	SH0460	TRACKING CODE:	8865_PM
SAMPLE No.:	0460-022 (28 Day)	EQUIPMENT No.:	6A
TEST DATE:	4/30/13		

MOISTURE CONTENT (Dry Basis)	*INITIAL*	*FINAL*
1. MOISTURE TIN NO.		
2. WT MOISTURE TIN (tare weight)	0.00 *g*	231.00 *g*
3. WT WET SOIL + TARE	683.40 *g*	921.00 *g*
4. WT DRY SOIL + TARE	505.10 *g*	736.10 *g*
5. WT WATER, Ww	178.30 g	184.90 g
6. WT DRY SOIL, Ws	505.10 g	505.10 g
7. MOISTURE CONTENT, W	35.30 %	36.61 %

SOIL SPECIMEN DIMENSIONS				
TRIPLICATE	*DIAMETER*		*HEIGHT*	
ANALYSES	*INITIAL*	*FINAL*	*INITIAL*	*FINAL*
No. 1	*3.00 in.*	*3.00 in.*	*3.33 in.*	*3.33 in.*
No. 2	*2.98 in.*	*2.99 in.*	*3.33 in.*	*3.35 in.*
No. 3	*2.98 in.*	*2.98 in.*	*3.36 in.*	*3.35 in.*
Average	2.98 in.	2.99 in.	3.34 in.	3.34 in.

SPECIMEN CONDITIONS	*INITIAL*	*FINAL*
Specimen WT, Wo	*683.40 g*	*690.00 g*
Area, Ao	6.99 in^2	7.02 in^2
Volume, Vo	23.36 in^3	23.47 in^3
Bulk Unit Weight	111.5 lb/ft^3	112.0 lb/ft^3
Dry Unit Weight	82.4 lb/ft^3	82.0 lb/ft^3

PERMEABILITY ASTM D5084

BACK-PRESSURE SATURATION

PROJECT:	Quanta	TESTED BY:	RJB
PROJECT No.:	SH0460	TRACKING CODE:	8865_PM
SAMPLE No.:	0460-022 (28 Day)	EQUIPMENT No.:	6A
TEST DATE:	4/30/13		

TEST	*TIME*	*TESTED*	*TEST PRESSURES (psi)*						
			APPLIED		*PORE*		*PRESSURE CHANGE*		
DATE	*(military)*	*BY*	*CELL*	*BACK*	*SAT.*	*TEST*	*CELL*	*PORE*	*B-Value*
04/30/13	13 : 35	RJB	7.0	5.0	6.2				
04/30/13	14 : 15	RJB	17.0	15.0	16.2	12.3	10.0	6.1	0.61
04/30/13	14 : 50	RJB	27.0	25.0	26.4	24.3	10.0	8.1	0.81
04/30/13	16 : 31	RJB	37.0	35.0	36.4	35.3	10.0	8.9	0.89
04/30/13	17 : 0	RJB	47.0	45.0	*	45.9	10.0	9.5	0.95
04/30/13	17 : 30	RJB	57.0	55.0	*	*	*	*	*
04/30/13	17 : 31	RJB	47.0	45.0	*	*	*	*	*

* Saturation check - no data available.

PERMEABILITY ASTM D5084

SPECIMEN CONSOLIDATION

PROJECT:	Quanta		RJB
PROJECT No.:	SH0460		8865_PM
SAMPLE No.:	0460-022 (28 Day)		6A
TEST DATE:	4/30/13		

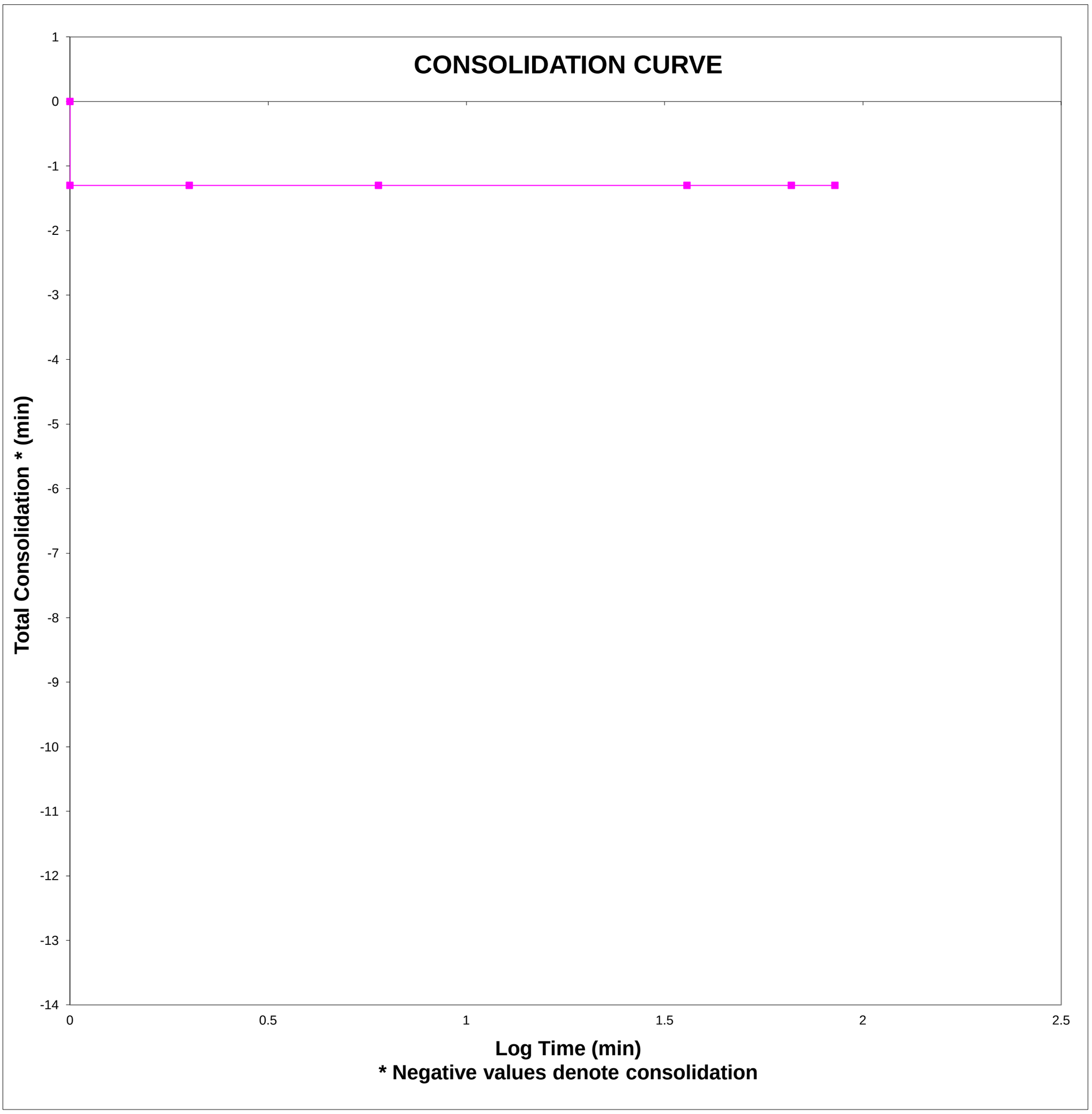
CELL PRESSURE: 55 psi **BACK PRESSURE:** 45 psi **EFFECTIVE STRESS:** 10 psi

TEST DATE	*TESTED BY*	*TIME (Military)*	*ELAPSED TIME (minutes)*	*TOTAL TIME (minutes)*	*TOTAL TIME (Log)*	*SPECIMEN CONSOLIDATION (ML)*		
						READING		*ACTUAL TOTAL (Ct)*
						BOTTOM	*TOP*	
4 / 30 / 13	RJB	18 : 36	0	0	0	25.0	25.0	0.0
4 / 30 / 13	RJB	18 : 37	1	1	0.00	24.4	24.3	1.3
4 / 30 / 13	RJB	18 : 38	1	2	0.30	24.4	24.3	1.3
4 / 30 / 13	RJB	18 : 42	4	6	0.78	24.4	24.3	1.3
4 / 30 / 13	RJB	19 : 12	30	36	1.56	24.4	24.3	1.3
4 / 30 / 13	RJB	19 : 42	30	66	1.82	24.4	24.3	1.3
4 / 30 / 13	RJB	20 : 1	19	85	1.93	24.4	24.3	1.3

PERMEABILITY ASTM D5084

CONSOLIDATION CURVE

PROJECT:	Quanta	TESTED BY:	RJB
PROJECT No.:	SH0460	TRACKING CODE:	8865_PM
SAMPLE No.:	0460-022 (28 Day)	EQUIPMENT No.:	6A
TEST DATE:	4/30/13		



PERMEABILITY ASTM D5084

TEST DATA

PROJECT:	Quanta	TESTED BY:	RJB
PROJECT No.:	SH0460	TRACKING CODE:	8865_PM
SAMPLE No.:	0460-022 (28 Day)	EQUIPMENT No.:	6A
TEST DATE:	4/30/2013		

DATE	*TESTED BY*	*TIME (military)*	*ELAPSED TIME (minutes)*	*HYDRAULIC HEAD (cm)*		*TEMP. C°*	*GAUGE PRESSURE (psi)*		
				INFLUENT	*EFFLUENT*		*CELL*	*INFLUENT*	*EFFLUENT*
4 / 30 / 13	RJB	20 : 10	0	0.0	25.0	20.0	55.0	45.0	45.0
5 / 1 / 13	RJB	8 : 36	RESET	0.0	25.0	20.0	55.0	45.0	43.0
5 / 2 / 13	RJB	8 : 26	1430	1.2	23.8	20.0	55.0	45.0	43.0
5 / 3 / 13	RJB	8 : 18	1432	2.2	22.8	20.0	55.0	45.0	43.0
5 / 6 / 13	RJB	7 : 52	4294	4.9	20.1	20.0	55.0	45.0	43.0
5 / 6 / 13	RJB	8 : 23	RESET	0.0	25.0	20.0	55.0	45.0	43.0
5 / 7 / 13	RJB	7 : 56	1413	0.9	24.1	20.0	55.0	45.0	43.0

PERMEABILITY ASTM D5084

TEST DATA (continued)

PROJECT:	Quanta	TESTED BY:	RJB
PROJECT No.:	SH0460	TRACKING CODE:	8865_PM
SAMPLE No.:	0460-022 (28 Day)	EQUIPMENT No.:	6A
TEST DATE:	4/30/13		

ELAPSED TIME (minutes)	*HYDRAULIC HEAD DIFFERENCE (cm)*		*EFFLUENT - INFLUENT RATIO*	*HYDRAULIC GRADIENT (cm/cm)*	*HYDRAULIC CONDUCTIVITY (cm/sec)*	
	INFLUENT	*EFFLUENT*			*@ Temp.*	*@ 20° C*
RESET				2.947		
RESET	0.0	0.0	#DIV/0!	19.530	#VALUE!	#VALUE!
1430	1.2	1.2	1.00	19.248	1.60E-08	1.61E-08
1432	1.0	1.0	1.00	19.012	1.35E-08	1.35E-08
4294	2.7	2.7	1.00	18.375	1.24E-08	1.25E-08
RESET				19.530		
1413	0.9	0.9	1.00	19.318	1.21E-08	1.22E-08

PERMEABILITY ASTM D5084

SUMMARY OF RESULTS

PROJECT:	Quanta	TESTED BY:	RJB
PROJECT No.:	SH0460	TRACKING CODE:	8865_PM
SAMPLE No.:	0460-022 (28 Day)	EQUIPMENT No.:	6A
TEST DATE:	4/30/13		

TESTING PARAMETER	INITIAL	FINAL
BULK UNIT WEIGHT	111.5 lb/ft³	112.0 lb/ft³
DRY UNIT WEIGHT	82.4 lb/ft³	82.0 lb/ft³
MOISTURE CONTENT	35.3 %	36.6 %
PERMEABILITY @ 20°C	1.4E-08 cm/sec	

UNCONFINED COMPRESSION TEST

ASTM D 2166

PROJECT:	Quanta
PROJECT No.:	SH0460
SAMPLE No.:	460-022
TESTING DATE:	23-Apr-13
TESTED BY:	TNR/RPH

LOADING RATE:	0.04 in./min.
TRACKING CODE:	8865

MOISTURE CONTENT (Dry Basis)		
1. MOISTURE TIN NO.		
2. WT MOISTURE TIN (tare weight)	3.40	g
3. WT WET SOIL + TARE	169.00	g
4. WT DRY SOIL + TARE	138.54	g
5. WT WATER, Ww	30.46	g
6. WT DRY SOIL, Ws	135.14	g
7. MOISTURE CONTENT, W	**22.54**	**%**

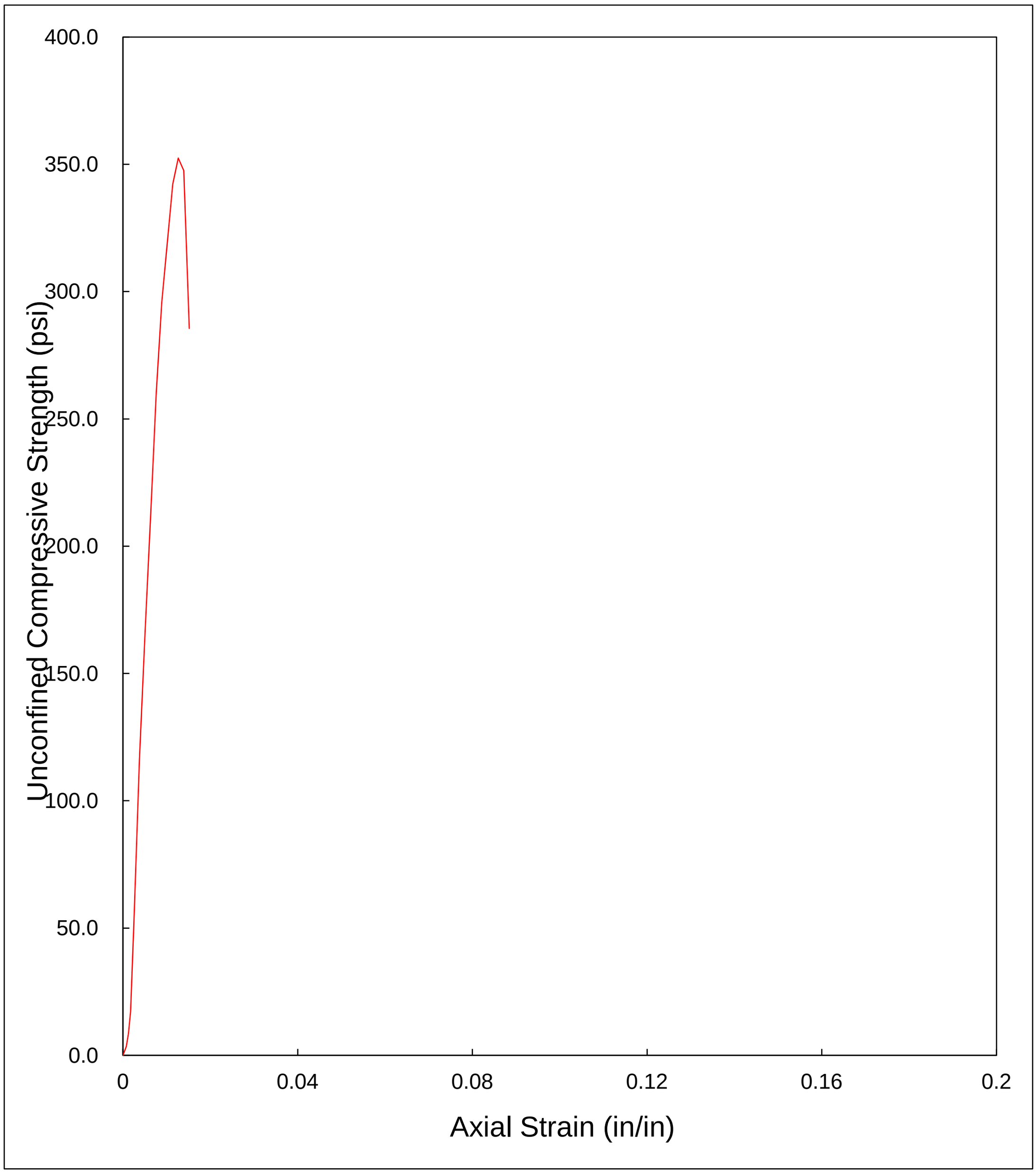
SOIL SPECIMEN DIMENSIONS				
	DIAMETER		*LENGTH*	
No. 1	2.01	in.	3.94	in.
No. 2	2.00	in.	3.95	in.
No. 3	1.99	in.	3.94	in.
Average	**2.00**	**in.**	**3.94**	**in.**

SPECIMEN CONDITIONS		
Initial Specimen WT, Wo	***422.78***	***g***
Initial Area, Ao	3.13	in²
Initial Volume, Vo	12.36	in³
Initial Bulk Unit Weight,	130.3	lb/ft³
Initial Dry Unit Weight	106.3	lb/ft³
15 % Strain (0.15 Lo)	0.59	in.
UCS	352.4	lb/in²

COMPRESSIVE LOAD (lbs.)	DIAL GAGE READING (in.)	SPECIMEN DEFORMATION (in.)	CORRECTED AREA (in²)	AXIAL STRAIN (in/in)	UNCONFINED COMPRESSIVE STRENGTH (lb/in²)
0	0.000	0.000	3.135	0.0000	0.0
11	0.003	0.003	3.137	0.0008	3.5
27	0.005	0.005	3.139	0.0013	8.6
54	0.007	0.007	3.140	0.0018	17.2
166	0.010	0.010	3.143	0.0025	52.8
366	0.015	0.015	3.147	0.0038	116.3
521	0.020	0.020	3.151	0.0051	165.4
671	0.025	0.025	3.155	0.0063	212.7
821	0.030	0.030	3.159	0.0076	259.9
935	0.035	0.035	3.163	0.0089	295.6
1010	0.040	0.040	3.167	0.0101	318.9
1085	0.045	0.045	3.171	0.0114	342.2
1119	0.050	0.050	3.175	0.0127	352.4
1105	0.055	0.055	3.179	0.0139	347.6
909	0.060	0.060	3.183	0.0152	285.6

UNCONFINED COMPRESSION TESTING

Sample No. 460-022



UNCONFINED COMPRESSION TEST

ASTM D 2166
SUMMARY OF RESULTS

PROJECT:	Quanta		
PROJECT No.:	SH0460		
SAMPLE No.:	460-022		
TESTING DATE:	4/23/2013	LOADING RATE:	0.04 in./min.
TESTED BY:	TNR/RPH	TRACKING CODE:	8865

TESTING PARAMETER AND RESULTS		
MOISTURE CONTENT	22.5	%
BULK UNIT WEIGHT	130.3	lb/ft^3
DRY UNIT WEIGHT	106.3	lb/ft^3
UCS *	352.4	lb/in^2

* UCS - UNCONFINED COMPRESSIVE STRENGTH

PERMEABILITY ASTM D5084

SPECIMEN CONDITIONS

PROJECT:	Quanta	TESTED BY:	RJB
PROJECT No.:	SH0460	TRACKING CODE:	8866_PM
SAMPLE No.:	0460-023 (28 Day)	EQUIPMENT No.:	7A
TEST DATE:	4/30/13		

MOISTURE CONTENT (Dry Basis)	*INITIAL*	*FINAL*
1. MOISTURE TIN NO.		
2. WT MOISTURE TIN (tare weight)	0.00 *g*	218.32 *g*
3. WT WET SOIL + TARE	835.60 *g*	1059.50 *g*
4. WT DRY SOIL + TARE	617.68 *g*	836.00 *g*
5. WT WATER, Ww	217.92 g	223.50 g
6. WT DRY SOIL, Ws	617.68 g	617.68 g
7. MOISTURE CONTENT, W	35.28 %	36.18 %

SOIL SPECIMEN DIMENSIONS				
TRIPLICATE	*DIAMETER*		*HEIGHT*	
ANALYSES	*INITIAL*	*FINAL*	*INITIAL*	*FINAL*
No. 1	*3.01 in.*	*3.00 in.*	*3.99 in.*	*4.00 in.*
No. 2	*2.98 in.*	*2.98 in.*	*4.02 in.*	*4.07 in.*
No. 3	*2.97 in.*	*2.98 in.*	*4.05 in.*	*4.04 in.*
Average	2.99 in.	2.99 in.	4.02 in.	4.04 in.

SPECIMEN CONDITIONS	*INITIAL*	*FINAL*
Specimen WT, Wo	*835.60 g*	*841.20 g*
Area, Ao	7.02 in^2	7.02 in^2
Volume, Vo	28.22 in^3	28.34 in^3
Bulk Unit Weight	112.8 lb/ft^3	113.1 lb/ft^3
Dry Unit Weight	83.4 lb/ft^3	83.0 lb/ft^3

PERMEABILITY ASTM D5084

BACK-PRESSURE SATURATION

PROJECT:	Quanta	TESTED BY:	RJB
PROJECT No.:	SH0460	TRACKING CODE:	8866_PM
SAMPLE No.:	0460-023 (28 Day)	EQUIPMENT No.:	7A
TEST DATE:	4/30/13		

TEST	*TIME*	*TESTED*	*TEST PRESSURES (psi)*						
			APPLIED		*PORE*		*PRESSURE CHANGE*		
DATE	*(military)*	*BY*	*CELL*	*BACK*	*SAT.*	*TEST*	*CELL*	*PORE*	*B-Value*
04/30/13	14 : 50	RJB	7.0	5.0	5.2				
04/30/13	16 : 34	RJB	17.0	15.0	16.4	12.2	10.0	7.0	0.70
04/30/13	18 : 38	RJB	27.0	25.0	26.5	23.3	10.0	6.9	0.69
04/30/13	19 : 16	RJB	37.0	35.0	36.6	33.4	10.0	6.9	0.69
04/30/13	19 : 41	RJB	47.0	45.0	46.6	45.9	10.0	9.3	0.93
04/30/13	20 : 0	RJB	57.0	55.0	56.6	56.1	10.0	9.5	0.95
04/30/13	20 : 30	RJB	67.0	65.0	*	*	*	*	*
04/30/13	20 : 31	RJB	57.0	55.0	*	*	*	*	*

* Saturation check - no data available.

PERMEABILITY ASTM D5084

SPECIMEN CONSOLIDATION

PROJECT:	Quanta		RJB
PROJECT No.:	SH0460		8866_PM
SAMPLE No.:	0460-023 (28 Day)		7A
TEST DATE:	4/30/13		

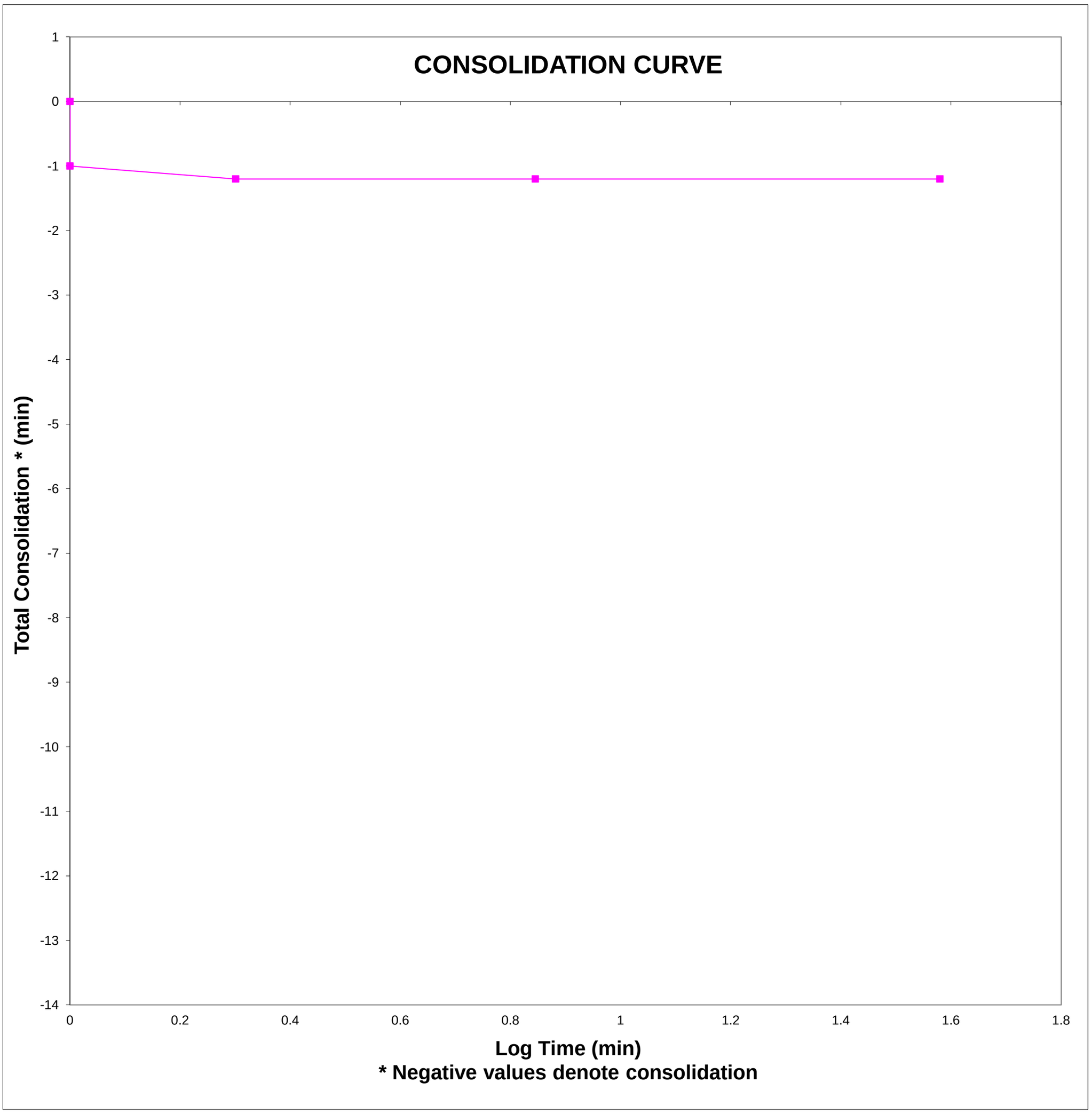
CELL PRESSURE: 65 psi **BACK PRESSURE:** 55 psi **EFFECTIVE STRESS:** 10 psi

TEST DATE	*TESTED BY*	*TIME (Military)*	*ELAPSED TIME (minutes)*	*TOTAL TIME (minutes)*	*TOTAL TIME (Log)*	*SPECIMEN CONSOLIDATION (ML)*		
						READING		*ACTUAL TOTAL (Ct)*
						BOTTOM	*TOP*	
4 / 30 / 13	RJB	20 : 37	0	0	0	25.0	25.0	0.0
4 / 30 / 13	RJB	20 : 38	1	1	0.00	24.6	24.4	1.0
4 / 30 / 13	RJB	20 : 39	1	2	0.30	24.5	24.3	1.2
4 / 30 / 13	RJB	20 : 44	5	7	0.85	24.5	24.3	1.2
4 / 30 / 13	RJB	21 : 15	31	38	1.58	24.5	24.3	1.2

PERMEABILITY ASTM D5084

CONSOLIDATION CURVE

PROJECT:	Quanta	TESTED BY:	RJB
PROJECT No.:	SH0460	TRACKING CODE:	8866_PM
SAMPLE No.:	0460-023 (28 Day)	EQUIPMENT No.:	7A
TEST DATE:	4/30/13		



PERMEABILITY ASTM D5084

TEST DATA

PROJECT:	Quanta	TESTED BY:	RJB
PROJECT No.:	SH0460	TRACKING CODE:	8866_PM
SAMPLE No.:	0460-023 (28 Day)	EQUIPMENT No.:	7A
TEST DATE:	4/30/2013		

DATE	*TESTED BY*	*TIME (military)*	*ELAPSED TIME (minutes)*	*HYDRAULIC HEAD (cm)*		*TEMP. C°*	*GAUGE PRESSURE (psi)*		
				INFLUENT	*EFFLUENT*		*CELL*	*INFLUENT*	*EFFLUENT*
5 / 1 / 13	RJB	8 : 49	0	0.0	25.0	20.0	65.0	55.0	53.0
5 / 2 / 13	RJB	8 : 28	1419	1.1	23.9	20.0	65.0	55.0	53.0
5 / 3 / 13	RJB	13 : 20	1732	2.5	22.5	20.0	65.0	55.0	53.0
5 / 6 / 13	RJB	7 : 53	3993	4.7	20.3	20.0	65.0	55.0	53.0
5 / 6 / 13	RJB	8 : 31	RESET	0.0	25.0	20.0	65.0	55.0	53.0
5 / 7 / 13	RJB	7 : 40	1389	0.7	24.3	20.0	65.0	55.0	53.0

PERMEABILITY ASTM D5084

TEST DATA (continued)

PROJECT:	Quanta	TESTED BY:	RJB
PROJECT No.:	SH0460	TRACKING CODE:	8866_PM
SAMPLE No.:	0460-023 (28 Day)	EQUIPMENT No.:	7A
TEST DATE:	4/30/13		

ELAPSED TIME (minutes)	*HYDRAULIC HEAD DIFFERENCE (cm)*		*EFFLUENT - INFLUENT RATIO*	*HYDRAULIC GRADIENT (cm/cm)*	*HYDRAULIC CONDUCTIVITY (cm/sec)*	
	INFLUENT	*EFFLUENT*			*@ Temp.*	*@ 20° C*
RESET				16.233		
1419	1.1	1.1	1.00	16.017	1.77E-08	1.78E-08
1732	1.4	1.4	1.00	15.743	1.87E-08	1.88E-08
3993	2.2	2.2	1.00	15.312	1.31E-08	1.31E-08
RESET				16.233		
1389	0.7	0.7	1.00	16.096	1.15E-08	1.15E-08

PERMEABILITY ASTM D5084

SUMMARY OF RESULTS

PROJECT:	Quanta	TESTED BY:	RJB
PROJECT No.:	SH0460	TRACKING CODE:	8866_PM
SAMPLE No.:	0460-023 (28 Day)	EQUIPMENT No.:	7A
TEST DATE:	4/30/13		

TESTING PARAMETER	INITIAL	FINAL
BULK UNIT WEIGHT	112.8 lb/ft³	113.1 lb/ft³
DRY UNIT WEIGHT	83.4 lb/ft³	83.0 lb/ft³
MOISTURE CONTENT	35.3 %	36.2 %
PERMEABILITY @ 20°C	1.5E-08 cm/sec	

UNCONFINED COMPRESSION TEST

ASTM D 2166

PROJECT:	Quanta
PROJECT No.:	SH0460
SAMPLE No.:	460-023
TESTING DATE:	23-Apr-13
TESTED BY:	TNR/RPH

LOADING RATE:	0.04 in./min.
TRACKING CODE:	8866

MOISTURE CONTENT (Dry Basis)		
1. MOISTURE TIN NO.		
2. WT MOISTURE TIN (tare weight)	3.54	g
3. WT WET SOIL + TARE	123.93	g
4. WT DRY SOIL + TARE	88.72	g
5. WT WATER, Ww	35.21	g
6. WT DRY SOIL, Ws	85.18	g
7. MOISTURE CONTENT, W	**41.34**	**%**

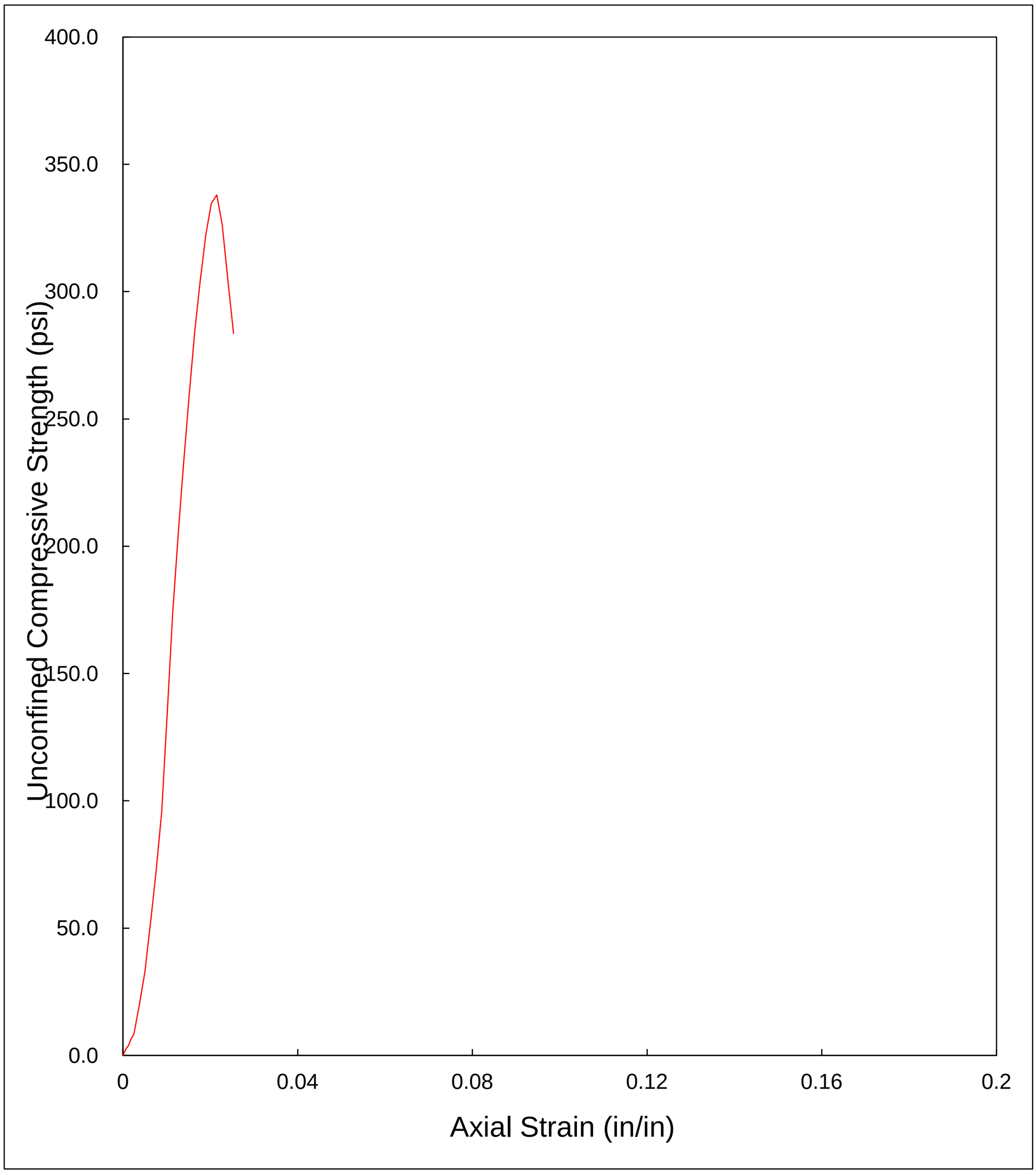
SOIL SPECIMEN DIMENSIONS				
	DIAMETER		*LENGTH*	
No. 1	2.00	in.	3.95	in.
No. 2	2.00	in.	3.95	in.
No. 3	1.99	in.	3.95	in.
Average	**2.00**	**in.**	**3.95**	**in.**

SPECIMEN CONDITIONS		
Initial Specimen WT, Wo	*378.12*	*g*
Initial Area, Ao	3.14	in^2
Initial Volume, Vo	12.39	in^3
Initial Bulk Unit Weight,	116.3	lb/ft^3
Initial Dry Unit Weight	82.3	lb/ft^3
15 % Strain (0.15 Lo)	0.59	in.
UCS	338.0	lb/in^2

COMPRESSIVE LOAD (lbs.)	DIAL GAGE READING (in.)	SPECIMEN DEFORMATION (in.)	CORRECTED AREA (in^2)	AXIAL STRAIN (in/in)	UNCONFINED COMPRESSIVE STRENGTH (lb/in^2)
0	0.000	0.000	3.135	0.0000	0.0
9	0.003	0.003	3.138	0.0008	2.9
12	0.005	0.005	3.139	0.0013	3.8
19	0.007	0.007	3.141	0.0018	6.0
27	0.010	0.010	3.143	0.0025	8.6
63	0.015	0.015	3.147	0.0038	20.0
104	0.020	0.020	3.151	0.0051	33.0
164	0.025	0.025	3.155	0.0063	52.0
227	0.030	0.030	3.159	0.0076	71.9
303	0.035	0.035	3.163	0.0089	95.8
426	0.040	0.040	3.167	0.0101	134.5
552	0.045	0.045	3.171	0.0114	174.1
651	0.050	0.050	3.176	0.0127	205.0
742	0.055	0.055	3.180	0.0139	233.4
827	0.060	0.060	3.184	0.0152	259.8
907	0.065	0.065	3.188	0.0165	284.5
972	0.070	0.070	3.192	0.0177	304.5
1030	0.075	0.075	3.196	0.0190	322.3
1071	0.080	0.080	3.200	0.0202	334.7
1083	0.085	0.085	3.204	0.0215	338.0
1046	0.090	0.090	3.208	0.0228	326.0
976	0.095	0.095	3.213	0.0240	303.8
912	0.100	0.100	3.217	0.0253	283.5

UNCONFINED COMPRESSION TESTING

Sample No. 460-023



UNCONFINED COMPRESSION TEST

ASTM D 2166
SUMMARY OF RESULTS

PROJECT:	Quanta		
PROJECT No.:	SH0460		
SAMPLE No.:	460-023		
TESTING DATE:	4/23/2013	LOADING RATE:	0.04 in./min.
TESTED BY:	TNR/RPH	TRACKING CODE:	8866

TESTING PARAMETER AND RESULTS		
MOISTURE CONTENT	41.3	%
BULK UNIT WEIGHT	116.3	lb/ft^3
DRY UNIT WEIGHT	82.3	lb/ft^3
UCS *	338.0	lb/in^2

* UCS - UNCONFINED COMPRESSIVE STRENGTH

NELAP CERTIFICATE NUMBER 01955
DOD ELAP CERTIFICATE NUMBER ADE - 1482

ANALYTICAL RESULTS

PERFORMED BY

GULF COAST ANALYTICAL LABORATORIES, INC.

7979 GSRI Avenue

Baton Rouge, LA 70820

Report Date 05/01/2013

GCAL Report 213042711

Deliver To	KEMRON 1359A Ellsworth Industrial Blv Atlanta, GA 30318 404-601-6927
Attn	Tommy Jordan

Project Quanta / SH0460

CASE NARRATIVE

Client: KEMRON **Report:** 213042711

Gulf Coast Analytical Laboratories received and analyzed the sample(s) listed on the sample cross-reference page of this report. Receipt of the sample(s) is documented by the attached chain of custody. This applies only to the sample(s) listed in this report. No sample integrity or quality control exceptions were identified unless noted below.

SEMI-VOLATILES MASS SPECTROMETRY

In the SW-846 1312/8270D SIM SPLP analysis, samples 21304271101 (0460-011), 21304271102 (0460-013), 21304271103 (0460-014), 21304271104 (0460-015), 21304271105 (0460-016), 21304271106 (0460-017), 21304271107 (0460-018), 21304271109 (0460-020), 21304271110 (0460-022) and 21304271111 (0460-023) had to be diluted to bracket the concentration of target compounds within the calibration range of the instrument. This is reflected in elevated detection limits.

In the SW-846 1312/8270D SIM SPLP analysis, the recoveries for the surrogates are reported as diluted out for those analyses performed at a 10 or higher dilution.

Laboratory Endorsement

Sample analysis was performed in accordance with approved methodologies provided by the Environmental Protection Agency or other recognized agencies. The samples and their corresponding extracts will be maintained for a period of 30 days unless otherwise arranged. Following this retention period the samples will be disposed in accordance with GCAL's Standard Operating Procedures.

Common Abbreviations Utilized in this Report

ND	Indicates the result was Not Detected at the specified RDL
DO	Indicates the result was Diluted Out
MI	Indicates the result was subject to Matrix Interference
TNTC	Indicates the result was Too Numerous To Count
SUBC	Indicates the analysis was Sub-Contracted
FLD	Indicates the analysis was performed in the Field
PQL	Practical Quantitation Limit
MDL	Method Detection Limit
RDL	Reporting Detection Limit
00:00	Reported as a time equivalent to 12:00 AM

Reporting Flags Utilized in this Report

J	Indicates the result is between the MDL and RDL
U	Indicates the compound was analyzed for but not detected
B	Indicates the analyte was detected in the associated Method Blank

Sample receipt at GCAL is documented through the attached chain of custody. In accordance with NELAC, this report shall be reproduced only in full and with the written permission of GCAL. The results contained within this report relate only to the samples reported. The documented results are presented within this report.

This report pertains only to the samples listed in the Report Sample Summary and should be retained as a permanent record thereof. The results contained within this report are intended for the use of the client. Any unauthorized use of the information contained in this report is prohibited.

I certify that this data package is in compliance with the NELAC standard and terms and conditions of the contract and Statement of Work both technically and for completeness, for other than the conditions in the case narrative. Release of the data contained in this hardcopy data package and in the computer-readable data submitted has been authorized by the Quality Assurance Manager or his/her designee, as verified by the following signature.

Estimated uncertainty of measurement is available upon request. This report is in compliance with the DOD QSM as specified in the contract if applicable.

_____

Authorized Signature
GCAL REPORT 213042711

THIS REPORT CONTAINS _____ PAGES.

Report Sample Summary

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21304271101	0460-011	Solid	04/26/2013 13:30	04/27/2013 09:35
21304271102	0460-013	Solid	04/26/2013 13:40	04/27/2013 09:35
21304271103	0460-014	Solid	04/26/2013 13:50	04/27/2013 09:35
21304271104	0460-015	Solid	04/26/2013 14:00	04/27/2013 09:35
21304271105	0460-016	Solid	04/26/2013 14:10	04/27/2013 09:35
21304271106	0460-017	Solid	04/26/2013 14:20	04/27/2013 09:35
21304271107	0460-018	Solid	04/26/2013 14:30	04/27/2013 09:35
21304271108	0460-019	Solid	04/26/2013 14:40	04/27/2013 09:35
21304271109	0460-020	Solid	04/26/2013 14:50	04/27/2013 09:35
21304271110	0460-022	Solid	04/26/2013 15:00	04/27/2013 09:35
21304271111	0460-023	Solid	04/26/2013 15:10	04/27/2013 09:35

Summary of Compounds Detected

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21304271101	**0460-011**	Solid	04/26/2013 13:30	04/27/2013 09:35

SW-846 1312/8270D SIM

CAS#	Parameter	Result	RDL	MDL	Units
208-96-8	Acenaphthylene	16.5	0.100	0.025	ug/L
120-12-7	Anthracene	40.4	0.100	0.040	ug/L
56-55-3	Benzo(a)anthracene	0.978	0.100	0.019	ug/L
218-01-9	Chrysene	1.00	0.100	0.017	ug/L
206-44-0	Fluoranthene	14.9	0.100	0.00690	ug/L
86-73-7	Fluorene	130	0.100	0.039	ug/L
85-01-8	Phenanthrene	142	0.100	0.00690	ug/L
129-00-0	Pyrene	10.5	0.100	0.014	ug/L

SW-846 1312/8270D SIM

CAS#	Parameter	Result	RDL	MDL	Units
91-57-6	2-Methylnaphthalene	886	5.00	1.43	ug/L
83-32-9	Acenaphthene	251	5.00	0.395	ug/L
91-20-3	Naphthalene	7280	5.00	0.465	ug/L

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21304271102	**0460-013**	Solid	04/26/2013 13:40	04/27/2013 09:35

SW-846 1312/8270D SIM

CAS#	Parameter	Result	RDL	MDL	Units
208-96-8	Acenaphthylene	16.4	0.100	0.025	ug/L
120-12-7	Anthracene	33.8	0.100	0.040	ug/L
206-44-0	Fluoranthene	19.5	0.100	0.00690	ug/L
86-73-7	Fluorene	101	0.100	0.039	ug/L
85-01-8	Phenanthrene	140	0.100	0.00690	ug/L
129-00-0	Pyrene	11.6	0.100	0.014	ug/L

SW-846 1312/8270D SIM

CAS#	Parameter	Result	RDL	MDL	Units
91-57-6	2-Methylnaphthalene	417	5.00	1.43	ug/L
83-32-9	Acenaphthene	207	5.00	0.395	ug/L
91-20-3	Naphthalene	4320	5.00	0.465	ug/L

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21304271103	**0460-014**	Solid	04/26/2013 13:50	04/27/2013 09:35

SW-846 1312/8270D SIM

CAS#	Parameter	Result	RDL	MDL	Units
208-96-8	Acenaphthylene	18.8	0.100	0.025	ug/L
120-12-7	Anthracene	33.4	0.100	0.040	ug/L
205-99-2	Benzo(b)fluoranthene	0.415	0.100	0.00850	ug/L

Summary of Compounds Detected (con't)

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21304271103	**0460-014**	Solid	04/26/2013 13:50	04/27/2013 09:35

SW-846 1312/8270D SIM

CAS#	Parameter	Result	RDL	MDL	Units
206-44-0	Fluoranthene	20.2	0.100	0.00690	ug/L
86-73-7	Fluorene	104	0.100	0.039	ug/L
85-01-8	Phenanthrene	147	0.100	0.00690	ug/L
129-00-0	Pyrene	12.1	0.100	0.014	ug/L

SW-846 1312/8270D SIM

CAS#	Parameter	Result	RDL	MDL	Units
91-57-6	2-Methylnaphthalene	486	5.00	1.43	ug/L
83-32-9	Acenaphthene	170	5.00	0.395	ug/L
91-20-3	Naphthalene	6670	5.00	0.465	ug/L

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21304271104	**0460-015**	Solid	04/26/2013 14:00	04/27/2013 09:35

SW-846 1312/8270D SIM

CAS#	Parameter	Result	RDL	MDL	Units
208-96-8	Acenaphthylene	17.2	0.100	0.025	ug/L
120-12-7	Anthracene	33.8	0.100	0.040	ug/L
206-44-0	Fluoranthene	20.9	0.100	0.00690	ug/L
86-73-7	Fluorene	116	0.100	0.039	ug/L
85-01-8	Phenanthrene	150	0.100	0.00690	ug/L
129-00-0	Pyrene	12.3	0.100	0.014	ug/L

SW-846 1312/8270D SIM

CAS#	Parameter	Result	RDL	MDL	Units
91-57-6	2-Methylnaphthalene	505	5.00	1.43	ug/L
83-32-9	Acenaphthene	217	5.00	0.395	ug/L
91-20-3	Naphthalene	6710	5.00	0.465	ug/L

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21304271105	**0460-016**	Solid	04/26/2013 14:10	04/27/2013 09:35

SW-846 1312/8270D SIM

CAS#	Parameter	Result	RDL	MDL	Units
208-96-8	Acenaphthylene	14.6	0.100	0.025	ug/L
120-12-7	Anthracene	28.2	0.100	0.040	ug/L
206-44-0	Fluoranthene	17.9	0.100	0.00690	ug/L
86-73-7	Fluorene	84.5	0.100	0.039	ug/L
85-01-8	Phenanthrene	126	0.100	0.00690	ug/L
129-00-0	Pyrene	10.4	0.100	0.014	ug/L

Summary of Compounds Detected (con't)

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21304271105	**0460-016**	Solid	04/26/2013 14:10	04/27/2013 09:35

SW-846 1312/8270D SIM

CAS#	Parameter	Result	RDL	MDL	Units
91-57-6	2-Methylnaphthalene	399	5.00	1.43	ug/L
83-32-9	Acenaphthene	177	5.00	0.395	ug/L
91-20-3	Naphthalene	5170	5.00	0.465	ug/L

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21304271106	**0460-017**	Solid	04/26/2013 14:20	04/27/2013 09:35

SW-846 1312/8270D SIM

CAS#	Parameter	Result	RDL	MDL	Units
208-96-8	Acenaphthylene	52.5	0.100	0.025	ug/L
120-12-7	Anthracene	37.3	0.100	0.040	ug/L
205-99-2	Benzo(b)fluoranthene	0.126	0.100	0.00850	ug/L
206-44-0	Fluoranthene	10.6	0.100	0.00690	ug/L
86-73-7	Fluorene	68.6	0.100	0.039	ug/L
85-01-8	Phenanthrene	91.6	0.100	0.00690	ug/L
129-00-0	Pyrene	9.43	0.100	0.014	ug/L

SW-846 1312/8270D SIM

CAS#	Parameter	Result	RDL	MDL	Units
91-57-6	2-Methylnaphthalene	560	5.00	1.43	ug/L
83-32-9	Acenaphthene	93.8	5.00	0.395	ug/L

SW-846 1312/8270D SIM

CAS#	Parameter	Result	RDL	MDL	Units
91-20-3	Naphthalene	9700	10.0	0.930	ug/L

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21304271107	**0460-018**	Solid	04/26/2013 14:30	04/27/2013 09:35

SW-846 1312/8270D SIM

CAS#	Parameter	Result	RDL	MDL	Units
208-96-8	Acenaphthylene	51.1	0.100	0.025	ug/L
120-12-7	Anthracene	30.1	0.100	0.040	ug/L
206-44-0	Fluoranthene	9.37	0.100	0.00690	ug/L
86-73-7	Fluorene	68.7	0.100	0.039	ug/L
85-01-8	Phenanthrene	85.6	0.100	0.00690	ug/L
129-00-0	Pyrene	8.12	0.100	0.014	ug/L

Summary of Compounds Detected (con't)

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21304271107	**0460-018**	Solid	04/26/2013 14:30	04/27/2013 09:35

SW-846 1312/8270D SIM

CAS#	Parameter	Result	RDL	MDL	Units
91-57-6	2-Methylnaphthalene	588	5.00	1.43	ug/L
83-32-9	Acenaphthene	116	5.00	0.395	ug/L
91-20-3	Naphthalene	9450	5.00	0.465	ug/L

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21304271108	**0460-019**	Solid	04/26/2013 14:40	04/27/2013 09:35

SW-846 1312/8270D SIM

CAS#	Parameter	Result	RDL	MDL	Units
91-57-6	2-Methylnaphthalene	55.8	0.100	0.029	ug/L
83-32-9	Acenaphthene	30.6	0.100	0.00790	ug/L
208-96-8	Acenaphthylene	3.17	0.100	0.025	ug/L
120-12-7	Anthracene	7.92	0.100	0.040	ug/L
56-55-3	Benzo(a)anthracene	0.625	0.100	0.019	ug/L
218-01-9	Chrysene	0.842	0.100	0.017	ug/L
206-44-0	Fluoranthene	10.5	0.100	0.00690	ug/L
86-73-7	Fluorene	23.2	0.100	0.039	ug/L
91-20-3	Naphthalene	192	0.100	0.00930	ug/L
85-01-8	Phenanthrene	46.0	0.100	0.00690	ug/L
129-00-0	Pyrene	6.85	0.100	0.014	ug/L

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21304271109	**0460-020**	Solid	04/26/2013 14:50	04/27/2013 09:35

SW-846 1312/8270D SIM

CAS#	Parameter	Result	RDL	MDL	Units
208-96-8	Acenaphthylene	8.57	0.100	0.025	ug/L
120-12-7	Anthracene	8.53	0.100	0.040	ug/L
56-55-3	Benzo(a)anthracene	0.578	0.100	0.019	ug/L
218-01-9	Chrysene	0.647	0.100	0.017	ug/L
206-44-0	Fluoranthene	8.85	0.100	0.00690	ug/L
86-73-7	Fluorene	31.7	0.100	0.039	ug/L
85-01-8	Phenanthrene	47.5	0.100	0.00690	ug/L
129-00-0	Pyrene	5.89	0.100	0.014	ug/L

SW-846 1312/8270D SIM

CAS#	Parameter	Result	RDL	MDL	Units
91-57-6	2-Methylnaphthalene	99.1	0.400	0.114	ug/L
83-32-9	Acenaphthene	38.4	0.400	0.032	ug/L
91-20-3	Naphthalene	341	0.400	0.037	ug/L

Summary of Compounds Detected (con't)

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21304271110	**0460-022**	Solid	04/26/2013 15:00	04/27/2013 09:35

SW-846 1312/8270D SIM

CAS#	Parameter	Result	RDL	MDL	Units
208-96-8	Acenaphthylene	10.1	0.100	0.025	ug/L
120-12-7	Anthracene	16.9	0.100	0.040	ug/L
56-55-3	Benzo(a)anthracene	0.644	0.100	0.019	ug/L
218-01-9	Chrysene	0.767	0.100	0.017	ug/L
206-44-0	Fluoranthene	12.3	0.100	0.00690	ug/L
86-73-7	Fluorene	52.5	0.100	0.039	ug/L
85-01-8	Phenanthrene	80.1	0.100	0.00690	ug/L
129-00-0	Pyrene	8.91	0.100	0.014	ug/L

SW-846 1312/8270D SIM

CAS#	Parameter	Result	RDL	MDL	Units
91-57-6	2-Methylnaphthalene	119	1.00	0.286	ug/L
83-32-9	Acenaphthene	88.1	1.00	0.079	ug/L
91-20-3	Naphthalene	648	1.00	0.093	ug/L

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21304271111	**0460-023**	Solid	04/26/2013 15:10	04/27/2013 09:35

SW-846 1312/8270D SIM

CAS#	Parameter	Result	RDL	MDL	Units
208-96-8	Acenaphthylene	9.97	0.100	0.025	ug/L
120-12-7	Anthracene	15.5	0.100	0.040	ug/L
56-55-3	Benzo(a)anthracene	0.581	0.100	0.019	ug/L
218-01-9	Chrysene	0.735	0.100	0.017	ug/L
206-44-0	Fluoranthene	9.82	0.100	0.00690	ug/L
86-73-7	Fluorene	54.3	0.100	0.039	ug/L
85-01-8	Phenanthrene	72.9	0.100	0.00690	ug/L
129-00-0	Pyrene	7.18	0.100	0.014	ug/L

SW-846 1312/8270D SIM

CAS#	Parameter	Result	RDL	MDL	Units
91-57-6	2-Methylnaphthalene	121	1.00	0.286	ug/L
83-32-9	Acenaphthene	90.0	1.00	0.079	ug/L
91-20-3	Naphthalene	716	1.00	0.093	ug/L

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21304271101	**0460-011**	Solid	04/26/2013 13:30	04/27/2013 09:35

SW-846 1312/8270D SIM

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
04/29/2013 07:15	506220	SW-846 3510C	1	04/30/2013 09:36	KCB	506329

CAS#	Parameter	Result	RDL	MDL	Units
208-96-8	**Acenaphthylene**	**16.5**	**0.100**	**0.025**	**ug/L**
120-12-7	**Anthracene**	**40.4**	**0.100**	**0.040**	**ug/L**
56-55-3	**Benzo(a)anthracene**	**0.978**	**0.100**	**0.019**	**ug/L**
50-32-8	Benzo(a)pyrene	0.011U	0.100	0.011	ug/L
205-99-2	Benzo(b)fluoranthene	0.00850U	0.100	0.00850	ug/L
207-08-9	Benzo(k)fluoranthene	0.016U	0.100	0.016	ug/L
218-01-9	**Chrysene**	**1.00**	**0.100**	**0.017**	**ug/L**
53-70-3	Dibenz(a,h)anthracene	0.016U	0.100	0.016	ug/L
206-44-0	**Fluoranthene**	**14.9**	**0.100**	**0.00690**	**ug/L**
86-73-7	**Fluorene**	**130**	**0.100**	**0.039**	**ug/L**
193-39-5	Indeno(1,2,3-cd)pyrene	0.00500U	0.100	0.00500	ug/L
85-01-8	**Phenanthrene**	**142**	**0.100**	**0.00690**	**ug/L**
129-00-0	**Pyrene**	**10.5**	**0.100**	**0.014**	**ug/L**

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
4165-60-0	Nitrobenzene-d5	50	49.4	ug/L	99	43 - 110
321-60-8	2-Fluorobiphenyl	50	35.3	ug/L	71	16 - 128
1718-51-0	Terphenyl-d14	50	36.2	ug/L	72	47 - 121

SW-846 1312/8270D SIM

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
04/29/2013 07:15	506220	SW-846 3510C	50	04/30/2013 13:29	KCB	506329

CAS#	Parameter	Result	RDL	MDL	Units
91-57-6	**2-Methylnaphthalene**	**886**	**5.00**	**1.43**	**ug/L**
83-32-9	**Acenaphthene**	**251**	**5.00**	**0.395**	**ug/L**
91-20-3	**Naphthalene**	**7280**	**5.00**	**0.465**	**ug/L**

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
4165-60-0	Nitrobenzene-d5	50	Diluted Out	ug/L	**0***	43 - 110
321-60-8	2-Fluorobiphenyl	50	Diluted Out	ug/L	**0***	16 - 128
1718-51-0	Terphenyl-d14	50	Diluted Out	ug/L	**0***	47 - 121

RESULTS REPORTED ON A WET WEIGHT BASIS

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21304271102	**0460-013**	Solid	04/26/2013 13:40	04/27/2013 09:35

SW-846 1312/8270D SIM

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
04/29/2013 07:15	506220	SW-846 3510C	1	04/30/2013 09:53	KCB	506329

CAS#	Parameter	Result	RDL	MDL	Units
208-96-8	**Acenaphthylene**	**16.4**	**0.100**	**0.025**	**ug/L**
120-12-7	**Anthracene**	**33.8**	**0.100**	**0.040**	**ug/L**
56-55-3	Benzo(a)anthracene	0.019U	0.100	0.019	ug/L
50-32-8	Benzo(a)pyrene	0.011U	0.100	0.011	ug/L
205-99-2	Benzo(b)fluoranthene	0.00850U	0.100	0.00850	ug/L
207-08-9	Benzo(k)fluoranthene	0.016U	0.100	0.016	ug/L
218-01-9	Chrysene	0.017U	0.100	0.017	ug/L
53-70-3	Dibenz(a,h)anthracene	0.016U	0.100	0.016	ug/L
206-44-0	**Fluoranthene**	**19.5**	**0.100**	**0.00690**	**ug/L**
86-73-7	**Fluorene**	**101**	**0.100**	**0.039**	**ug/L**
193-39-5	Indeno(1,2,3-cd)pyrene	0.00500U	0.100	0.00500	ug/L
85-01-8	**Phenanthrene**	**140**	**0.100**	**0.00690**	**ug/L**
129-00-0	**Pyrene**	**11.6**	**0.100**	**0.014**	**ug/L**

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
4165-60-0	Nitrobenzene-d5	50	40.3	ug/L	81	43 - 110
321-60-8	2-Fluorobiphenyl	50	31	ug/L	62	16 - 128
1718-51-0	Terphenyl-d14	50	28.6	ug/L	57	47 - 121

SW-846 1312/8270D SIM

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
04/29/2013 07:15	506220	SW-846 3510C	50	04/30/2013 13:46	KCB	506329

CAS#	Parameter	Result	RDL	MDL	Units
91-57-6	**2-Methylnaphthalene**	**417**	**5.00**	**1.43**	**ug/L**
83-32-9	**Acenaphthene**	**207**	**5.00**	**0.395**	**ug/L**
91-20-3	**Naphthalene**	**4320**	**5.00**	**0.465**	**ug/L**

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
4165-60-0	Nitrobenzene-d5	50	Diluted Out	ug/L	**0***	43 - 110
321-60-8	2-Fluorobiphenyl	50	Diluted Out	ug/L	**0***	16 - 128
1718-51-0	Terphenyl-d14	50	Diluted Out	ug/L	**0***	47 - 121

RESULTS REPORTED ON A WET WEIGHT BASIS

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21304271103	**0460-014**	Solid	04/26/2013 13:50	04/27/2013 09:35

SW-846 1312/8270D SIM

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
04/29/2013 07:15	506220	SW-846 3510C	1	04/30/2013 10:10	KCB	506329

CAS#	Parameter	Result	RDL	MDL	Units
208-96-8	**Acenaphthylene**	**18.8**	**0.100**	**0.025**	**ug/L**
120-12-7	**Anthracene**	**33.4**	**0.100**	**0.040**	**ug/L**
56-55-3	Benzo(a)anthracene	0.019U	0.100	0.019	ug/L
50-32-8	Benzo(a)pyrene	0.011U	0.100	0.011	ug/L
205-99-2	**Benzo(b)fluoranthene**	**0.415**	**0.100**	**0.00850**	**ug/L**
207-08-9	Benzo(k)fluoranthene	0.016U	0.100	0.016	ug/L
218-01-9	Chrysene	0.017U	0.100	0.017	ug/L
53-70-3	Dibenz(a,h)anthracene	0.016U	0.100	0.016	ug/L
206-44-0	**Fluoranthene**	**20.2**	**0.100**	**0.00690**	**ug/L**
86-73-7	**Fluorene**	**104**	**0.100**	**0.039**	**ug/L**
193-39-5	Indeno(1,2,3-cd)pyrene	0.00500U	0.100	0.00500	ug/L
85-01-8	**Phenanthrene**	**147**	**0.100**	**0.00690**	**ug/L**
129-00-0	**Pyrene**	**12.1**	**0.100**	**0.014**	**ug/L**

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
4165-60-0	Nitrobenzene-d5	50	46.4	ug/L	93	43 - 110
321-60-8	2-Fluorobiphenyl	50	34.5	ug/L	69	16 - 128
1718-51-0	Terphenyl-d14	50	31.5	ug/L	63	47 - 121

SW-846 1312/8270D SIM

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
04/29/2013 07:15	506220	SW-846 3510C	50	04/30/2013 14:03	KCB	506329

CAS#	Parameter	Result	RDL	MDL	Units
91-57-6	**2-Methylnaphthalene**	**486**	**5.00**	**1.43**	**ug/L**
83-32-9	**Acenaphthene**	**170**	**5.00**	**0.395**	**ug/L**
91-20-3	**Naphthalene**	**6670**	**5.00**	**0.465**	**ug/L**

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
4165-60-0	Nitrobenzene-d5	50	Diluted Out	ug/L	**0***	43 - 110
321-60-8	2-Fluorobiphenyl	50	Diluted Out	ug/L	**0***	16 - 128
1718-51-0	Terphenyl-d14	50	Diluted Out	ug/L	**0***	47 - 121

RESULTS REPORTED ON A WET WEIGHT BASIS

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21304271104	**0460-015**	Solid	04/26/2013 14:00	04/27/2013 09:35

SW-846 1312/8270D SIM

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
04/29/2013 07:15	506220	SW-846 3510C	1	04/30/2013 10:26	KCB	506329

CAS#	Parameter	Result	RDL	MDL	Units
208-96-8	**Acenaphthylene**	**17.2**	**0.100**	**0.025**	**ug/L**
120-12-7	**Anthracene**	**33.8**	**0.100**	**0.040**	**ug/L**
56-55-3	Benzo(a)anthracene	0.019U	0.100	0.019	ug/L
50-32-8	Benzo(a)pyrene	0.011U	0.100	0.011	ug/L
205-99-2	Benzo(b)fluoranthene	0.00850U	0.100	0.00850	ug/L
207-08-9	Benzo(k)fluoranthene	0.016U	0.100	0.016	ug/L
218-01-9	Chrysene	0.017U	0.100	0.017	ug/L
53-70-3	Dibenz(a,h)anthracene	0.016U	0.100	0.016	ug/L
206-44-0	**Fluoranthene**	**20.9**	**0.100**	**0.00690**	**ug/L**
86-73-7	**Fluorene**	**116**	**0.100**	**0.039**	**ug/L**
193-39-5	Indeno(1,2,3-cd)pyrene	0.00500U	0.100	0.00500	ug/L
85-01-8	**Phenanthrene**	**150**	**0.100**	**0.00690**	**ug/L**
129-00-0	**Pyrene**	**12.3**	**0.100**	**0.014**	**ug/L**

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
4165-60-0	Nitrobenzene-d5	50	46.3	ug/L	93	43 - 110
321-60-8	2-Fluorobiphenyl	50	34.6	ug/L	69	16 - 128
1718-51-0	Terphenyl-d14	50	31.1	ug/L	62	47 - 121

SW-846 1312/8270D SIM

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
04/29/2013 07:15	506220	SW-846 3510C	50	04/30/2013 14:20	KCB	506329

CAS#	Parameter	Result	RDL	MDL	Units
91-57-6	**2-Methylnaphthalene**	**505**	**5.00**	**1.43**	**ug/L**
83-32-9	**Acenaphthene**	**217**	**5.00**	**0.395**	**ug/L**
91-20-3	**Naphthalene**	**6710**	**5.00**	**0.465**	**ug/L**

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
4165-60-0	Nitrobenzene-d5	50	Diluted Out	ug/L	**0***	43 - 110
321-60-8	2-Fluorobiphenyl	50	Diluted Out	ug/L	**0***	16 - 128
1718-51-0	Terphenyl-d14	50	Diluted Out	ug/L	**0***	47 - 121

RESULTS REPORTED ON A WET WEIGHT BASIS

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21304271105	**0460-016**	Solid	04/26/2013 14:10	04/27/2013 09:35

SW-846 1312/8270D SIM

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
04/29/2013 07:15	506220	SW-846 3510C	1	04/30/2013 10:43	KCB	506329

CAS#	Parameter	Result	RDL	MDL	Units
208-96-8	**Acenaphthylene**	**14.6**	**0.100**	**0.025**	**ug/L**
120-12-7	**Anthracene**	**28.2**	**0.100**	**0.040**	**ug/L**
56-55-3	Benzo(a)anthracene	0.019U	0.100	0.019	ug/L
50-32-8	Benzo(a)pyrene	0.011U	0.100	0.011	ug/L
205-99-2	Benzo(b)fluoranthene	0.00850U	0.100	0.00850	ug/L
207-08-9	Benzo(k)fluoranthene	0.016U	0.100	0.016	ug/L
218-01-9	Chrysene	0.017U	0.100	0.017	ug/L
53-70-3	Dibenz(a,h)anthracene	0.016U	0.100	0.016	ug/L
206-44-0	**Fluoranthene**	**17.9**	**0.100**	**0.00690**	**ug/L**
86-73-7	**Fluorene**	**84.5**	**0.100**	**0.039**	**ug/L**
193-39-5	Indeno(1,2,3-cd)pyrene	0.00500U	0.100	0.00500	ug/L
85-01-8	**Phenanthrene**	**126**	**0.100**	**0.00690**	**ug/L**
129-00-0	**Pyrene**	**10.4**	**0.100**	**0.014**	**ug/L**

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
4165-60-0	Nitrobenzene-d5	50	42.4	ug/L	85	43 - 110
321-60-8	2-Fluorobiphenyl	50	30.9	ug/L	62	16 - 128
1718-51-0	Terphenyl-d14	50	30.3	ug/L	61	47 - 121

SW-846 1312/8270D SIM

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
04/29/2013 07:15	506220	SW-846 3510C	50	04/30/2013 14:36	KCB	506329

CAS#	Parameter	Result	RDL	MDL	Units
91-57-6	**2-Methylnaphthalene**	**399**	**5.00**	**1.43**	**ug/L**
83-32-9	**Acenaphthene**	**177**	**5.00**	**0.395**	**ug/L**
91-20-3	**Naphthalene**	**5170**	**5.00**	**0.465**	**ug/L**

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
4165-60-0	Nitrobenzene-d5	50	Diluted Out	ug/L	**0***	43 - 110
321-60-8	2-Fluorobiphenyl	50	Diluted Out	ug/L	**0***	16 - 128
1718-51-0	Terphenyl-d14	50	Diluted Out	ug/L	**0***	47 - 121

RESULTS REPORTED ON A WET WEIGHT BASIS

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21304271106	**0460-017**	Solid	04/26/2013 14:20	04/27/2013 09:35

SW-846 1312/8270D SIM

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
04/29/2013 07:15	506220	SW-846 3510C	1	04/30/2013 11:00	KCB	506329

CAS#	Parameter	Result	RDL	MDL	Units
208-96-8	**Acenaphthylene**	**52.5**	**0.100**	**0.025**	**ug/L**
120-12-7	**Anthracene**	**37.3**	**0.100**	**0.040**	**ug/L**
56-55-3	Benzo(a)anthracene	0.019U	0.100	0.019	ug/L
50-32-8	Benzo(a)pyrene	0.011U	0.100	0.011	ug/L
205-99-2	**Benzo(b)fluoranthene**	**0.126**	**0.100**	**0.00850**	**ug/L**
207-08-9	Benzo(k)fluoranthene	0.016U	0.100	0.016	ug/L
218-01-9	Chrysene	0.017U	0.100	0.017	ug/L
53-70-3	Dibenz(a,h)anthracene	0.016U	0.100	0.016	ug/L
206-44-0	**Fluoranthene**	**10.6**	**0.100**	**0.00690**	**ug/L**
86-73-7	**Fluorene**	**68.6**	**0.100**	**0.039**	**ug/L**
193-39-5	Indeno(1,2,3-cd)pyrene	0.00500U	0.100	0.00500	ug/L
85-01-8	**Phenanthrene**	**91.6**	**0.100**	**0.00690**	**ug/L**
129-00-0	**Pyrene**	**9.43**	**0.100**	**0.014**	**ug/L**

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
4165-60-0	Nitrobenzene-d5	50	42	ug/L	84	43 - 110
321-60-8	2-Fluorobiphenyl	50	33.1	ug/L	66	16 - 128
1718-51-0	Terphenyl-d14	50	30.3	ug/L	61	47 - 121

SW-846 1312/8270D SIM

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
04/29/2013 07:15	506220	SW-846 3510C	50	04/30/2013 14:53	KCB	506329

CAS#	Parameter	Result	RDL	MDL	Units
91-57-6	**2-Methylnaphthalene**	**560**	**5.00**	**1.43**	**ug/L**
83-32-9	**Acenaphthene**	**93.8**	**5.00**	**0.395**	**ug/L**

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
4165-60-0	Nitrobenzene-d5	50	Diluted Out	ug/L	**0***	43 - 110
321-60-8	2-Fluorobiphenyl	50	Diluted Out	ug/L	**0***	16 - 128
1718-51-0	Terphenyl-d14	50	Diluted Out	ug/L	**0***	47 - 121

SW-846 1312/8270D SIM

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
04/29/2013 07:15	506220	SW-846 3510C	100	04/30/2013 16:17	KCB	506329

CAS#	Parameter	Result	RDL	MDL	Units
91-20-3	**Naphthalene**	**9700**	**10.0**	**0.930**	**ug/L**

RESULTS REPORTED ON A WET WEIGHT BASIS

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21304271107	**0460-018**	Solid	04/26/2013 14:30	04/27/2013 09:35

SW-846 1312/8270D SIM

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
04/29/2013 07:15	506220	SW-846 3510C	1	04/30/2013 11:16	KCB	506329

CAS#	Parameter	Result	RDL	MDL	Units
208-96-8	**Acenaphthylene**	**51.1**	**0.100**	**0.025**	**ug/L**
120-12-7	**Anthracene**	**30.1**	**0.100**	**0.040**	**ug/L**
56-55-3	Benzo(a)anthracene	0.019U	0.100	0.019	ug/L
50-32-8	Benzo(a)pyrene	0.011U	0.100	0.011	ug/L
205-99-2	Benzo(b)fluoranthene	0.00850U	0.100	0.00850	ug/L
207-08-9	Benzo(k)fluoranthene	0.016U	0.100	0.016	ug/L
218-01-9	Chrysene	0.017U	0.100	0.017	ug/L
53-70-3	Dibenz(a,h)anthracene	0.016U	0.100	0.016	ug/L
206-44-0	**Fluoranthene**	**9.37**	**0.100**	**0.00690**	**ug/L**
86-73-7	**Fluorene**	**68.7**	**0.100**	**0.039**	**ug/L**
193-39-5	Indeno(1,2,3-cd)pyrene	0.00500U	0.100	0.00500	ug/L
85-01-8	**Phenanthrene**	**85.6**	**0.100**	**0.00690**	**ug/L**
129-00-0	**Pyrene**	**8.12**	**0.100**	**0.014**	**ug/L**

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
4165-60-0	Nitrobenzene-d5	50	43.9	ug/L	88	43 - 110
321-60-8	2-Fluorobiphenyl	50	33.4	ug/L	67	16 - 128
1718-51-0	Terphenyl-d14	50	32.1	ug/L	64	47 - 121

SW-846 1312/8270D SIM

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
04/29/2013 07:15	506220	SW-846 3510C	50	04/30/2013 15:10	KCB	506329

CAS#	Parameter	Result	RDL	MDL	Units
91-57-6	**2-Methylnaphthalene**	**588**	**5.00**	**1.43**	**ug/L**
83-32-9	**Acenaphthene**	**116**	**5.00**	**0.395**	**ug/L**
91-20-3	**Naphthalene**	**9450**	**5.00**	**0.465**	**ug/L**

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
4165-60-0	Nitrobenzene-d5	50	Diluted Out	ug/L	**0***	43 - 110
321-60-8	2-Fluorobiphenyl	50	Diluted Out	ug/L	**0***	16 - 128
1718-51-0	Terphenyl-d14	50	Diluted Out	ug/L	**0***	47 - 121

RESULTS REPORTED ON A WET WEIGHT BASIS

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21304271108	**0460-019**	Solid	04/26/2013 14:40	04/27/2013 09:35

SW-846 1312/8270D SIM

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
04/29/2013 07:15	506220	SW-846 3510C	1	04/30/2013 13:13	KCB	506329

CAS#	Parameter	Result	RDL	MDL	Units
91-57-6	**2-Methylnaphthalene**	**55.8**	**0.100**	**0.029**	**ug/L**
83-32-9	**Acenaphthene**	**30.6**	**0.100**	**0.00790**	**ug/L**
208-96-8	**Acenaphthylene**	**3.17**	**0.100**	**0.025**	**ug/L**
120-12-7	**Anthracene**	**7.92**	**0.100**	**0.040**	**ug/L**
56-55-3	**Benzo(a)anthracene**	**0.625**	**0.100**	**0.019**	**ug/L**
50-32-8	Benzo(a)pyrene	0.011U	0.100	0.011	ug/L
205-99-2	Benzo(b)fluoranthene	0.00850U	0.100	0.00850	ug/L
207-08-9	Benzo(k)fluoranthene	0.016U	0.100	0.016	ug/L
218-01-9	**Chrysene**	**0.842**	**0.100**	**0.017**	**ug/L**
53-70-3	Dibenz(a,h)anthracene	0.016U	0.100	0.016	ug/L
206-44-0	**Fluoranthene**	**10.5**	**0.100**	**0.00690**	**ug/L**
86-73-7	**Fluorene**	**23.2**	**0.100**	**0.039**	**ug/L**
193-39-5	Indeno(1,2,3-cd)pyrene	0.00500U	0.100	0.00500	ug/L
91-20-3	**Naphthalene**	**192**	**0.100**	**0.00930**	**ug/L**
85-01-8	**Phenanthrene**	**46.0**	**0.100**	**0.00690**	**ug/L**
129-00-0	**Pyrene**	**6.85**	**0.100**	**0.014**	**ug/L**

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
4165-60-0	Nitrobenzene-d5	50	35.1	ug/L	70	43 - 110
321-60-8	2-Fluorobiphenyl	50	35.6	ug/L	71	16 - 128
1718-51-0	Terphenyl-d14	50	35.5	ug/L	71	47 - 121

RESULTS REPORTED ON A WET WEIGHT BASIS

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21304271109	**0460-020**	Solid	04/26/2013 14:50	04/27/2013 09:35

SW-846 1312/8270D SIM

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
04/29/2013 07:15	506220	SW-846 3510C	1	04/30/2013 11:49	KCB	506329

CAS#	Parameter	Result	RDL	MDL	Units
208-96-8	**Acenaphthylene**	**8.57**	**0.100**	**0.025**	**ug/L**
120-12-7	**Anthracene**	**8.53**	**0.100**	**0.040**	**ug/L**
56-55-3	**Benzo(a)anthracene**	**0.578**	**0.100**	**0.019**	**ug/L**
50-32-8	Benzo(a)pyrene	0.011U	0.100	0.011	ug/L
205-99-2	Benzo(b)fluoranthene	0.00850U	0.100	0.00850	ug/L
207-08-9	Benzo(k)fluoranthene	0.016U	0.100	0.016	ug/L
218-01-9	**Chrysene**	**0.647**	**0.100**	**0.017**	**ug/L**
53-70-3	Dibenz(a,h)anthracene	0.016U	0.100	0.016	ug/L
206-44-0	**Fluoranthene**	**8.85**	**0.100**	**0.00690**	**ug/L**
86-73-7	**Fluorene**	**31.7**	**0.100**	**0.039**	**ug/L**
193-39-5	Indeno(1,2,3-cd)pyrene	0.00500U	0.100	0.00500	ug/L
85-01-8	**Phenanthrene**	**47.5**	**0.100**	**0.00690**	**ug/L**
129-00-0	**Pyrene**	**5.89**	**0.100**	**0.014**	**ug/L**

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
4165-60-0	Nitrobenzene-d5	50	33	ug/L	66	43 - 110
321-60-8	2-Fluorobiphenyl	50	37	ug/L	74	16 - 128
1718-51-0	Terphenyl-d14	50	32.4	ug/L	65	47 - 121

SW-846 1312/8270D SIM

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
04/29/2013 07:15	506220	SW-846 3510C	4	04/30/2013 15:27	KCB	506329

CAS#	Parameter	Result	RDL	MDL	Units
91-57-6	**2-Methylnaphthalene**	**99.1**	**0.400**	**0.114**	**ug/L**
83-32-9	**Acenaphthene**	**38.4**	**0.400**	**0.032**	**ug/L**
91-20-3	**Naphthalene**	**341**	**0.400**	**0.037**	**ug/L**

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
4165-60-0	Nitrobenzene-d5	50	30.9	ug/L	62	43 - 110
321-60-8	2-Fluorobiphenyl	50	37.1	ug/L	74	16 - 128
1718-51-0	Terphenyl-d14	50	33.8	ug/L	68	47 - 121

RESULTS REPORTED ON A WET WEIGHT BASIS

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21304271110	**0460-022**	Solid	04/26/2013 15:00	04/27/2013 09:35

SW-846 1312/8270D SIM

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
04/29/2013 07:15	506220	SW-846 3510C	1	04/30/2013 12:06	KCB	506329

CAS#	Parameter	Result	RDL	MDL	Units
208-96-8	**Acenaphthylene**	**10.1**	**0.100**	**0.025**	**ug/L**
120-12-7	**Anthracene**	**16.9**	**0.100**	**0.040**	**ug/L**
56-55-3	**Benzo(a)anthracene**	**0.644**	**0.100**	**0.019**	**ug/L**
50-32-8	Benzo(a)pyrene	0.011U	0.100	0.011	ug/L
205-99-2	Benzo(b)fluoranthene	0.00850U	0.100	0.00850	ug/L
207-08-9	Benzo(k)fluoranthene	0.016U	0.100	0.016	ug/L
218-01-9	**Chrysene**	**0.767**	**0.100**	**0.017**	**ug/L**
53-70-3	Dibenz(a,h)anthracene	0.016U	0.100	0.016	ug/L
206-44-0	**Fluoranthene**	**12.3**	**0.100**	**0.00690**	**ug/L**
86-73-7	**Fluorene**	**52.5**	**0.100**	**0.039**	**ug/L**
193-39-5	Indeno(1,2,3-cd)pyrene	0.00500U	0.100	0.00500	ug/L
85-01-8	**Phenanthrene**	**80.1**	**0.100**	**0.00690**	**ug/L**
129-00-0	**Pyrene**	**8.91**	**0.100**	**0.014**	**ug/L**

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
4165-60-0	Nitrobenzene-d5	50	36.2	ug/L	72	43 - 110
321-60-8	2-Fluorobiphenyl	50	29.8	ug/L	60	16 - 128
1718-51-0	Terphenyl-d14	50	35.8	ug/L	72	47 - 121

SW-846 1312/8270D SIM

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
04/29/2013 07:15	506220	SW-846 3510C	10	04/30/2013 15:43	KCB	506329

CAS#	Parameter	Result	RDL	MDL	Units
91-57-6	**2-Methylnaphthalene**	**119**	**1.00**	**0.286**	**ug/L**
83-32-9	**Acenaphthene**	**88.1**	**1.00**	**0.079**	**ug/L**
91-20-3	**Naphthalene**	**648**	**1.00**	**0.093**	**ug/L**

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
4165-60-0	Nitrobenzene-d5	50	Diluted Out	ug/L	**0***	43 - 110
321-60-8	2-Fluorobiphenyl	50	Diluted Out	ug/L	**0***	16 - 128
1718-51-0	Terphenyl-d14	50	Diluted Out	ug/L	**0***	47 - 121

RESULTS REPORTED ON A WET WEIGHT BASIS

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21304271111	**0460-023**	Solid	04/26/2013 15:10	04/27/2013 09:35

SW-846 1312/8270D SIM

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
04/29/2013 07:15	506220	SW-846 3510C	1	04/30/2013 12:22	KCB	506329

CAS#	Parameter	Result	RDL	MDL	Units
208-96-8	**Acenaphthylene**	**9.97**	**0.100**	**0.025**	**ug/L**
120-12-7	**Anthracene**	**15.5**	**0.100**	**0.040**	**ug/L**
56-55-3	**Benzo(a)anthracene**	**0.581**	**0.100**	**0.019**	**ug/L**
50-32-8	Benzo(a)pyrene	0.011U	0.100	0.011	ug/L
205-99-2	Benzo(b)fluoranthene	0.00850U	0.100	0.00850	ug/L
207-08-9	Benzo(k)fluoranthene	0.016U	0.100	0.016	ug/L
218-01-9	**Chrysene**	**0.735**	**0.100**	**0.017**	**ug/L**
53-70-3	Dibenz(a,h)anthracene	0.016U	0.100	0.016	ug/L
206-44-0	**Fluoranthene**	**9.82**	**0.100**	**0.00690**	**ug/L**
86-73-7	**Fluorene**	**54.3**	**0.100**	**0.039**	**ug/L**
193-39-5	Indeno(1,2,3-cd)pyrene	0.00500U	0.100	0.00500	ug/L
85-01-8	**Phenanthrene**	**72.9**	**0.100**	**0.00690**	**ug/L**
129-00-0	**Pyrene**	**7.18**	**0.100**	**0.014**	**ug/L**

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
4165-60-0	Nitrobenzene-d5	50	33.8	ug/L	68	43 - 110
321-60-8	2-Fluorobiphenyl	50	31.9	ug/L	64	16 - 128
1718-51-0	Terphenyl-d14	50	30.1	ug/L	60	47 - 121

SW-846 1312/8270D SIM

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
04/29/2013 07:15	506220	SW-846 3510C	10	04/30/2013 16:00	KCB	506329

CAS#	Parameter	Result	RDL	MDL	Units
91-57-6	**2-Methylnaphthalene**	**121**	**1.00**	**0.286**	**ug/L**
83-32-9	**Acenaphthene**	**90.0**	**1.00**	**0.079**	**ug/L**
91-20-3	**Naphthalene**	**716**	**1.00**	**0.093**	**ug/L**

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
4165-60-0	Nitrobenzene-d5	50	Diluted Out	ug/L	**0***	43 - 110
321-60-8	2-Fluorobiphenyl	50	Diluted Out	ug/L	**0***	16 - 128
1718-51-0	Terphenyl-d14	50	Diluted Out	ug/L	**0***	47 - 121

RESULTS REPORTED ON A WET WEIGHT BASIS

GC/MS Semi-Volatiles Quality Control Summary

Analytical Batch	506329	**Client ID**	MB506220	LCS506220	LCSD506220
Prep Batch	506220	**GCAL ID**	1186489	1186490	1186491
Prep Method	SW-846	**Sample Type**	Method Blank	LCS	LCSD
	3510C	**Prep Date**	04/29/2013 07:15	04/29/2013 07:15	04/29/2013 07:15
		Analytical Date	04/30/2013 08:46	04/30/2013 09:02	04/30/2013 09:19
		Matrix	Water	Water	Water

SW-846 1312/8270D SIM		**Units**	ug/L	**Spike**	**Result**		**Control**	**Result**			**RPD**
		Result	**RDL**	**Added**		**% R**	**Limits % R**		**% R**	**RPD**	**Limit**
83-32-9	Acenaphthene	0.00790U	0.00790	100	71.6	72	30 - 120	68.3	68	5	30
208-96-8	Acenaphthylene	0.025U	0.025	100	79.7	80	30 - 130	75.4	75	6	30
120-12-7	Anthracene	0.040U	0.040	100	80.5	81	50 - 120	77.4	77	4	30
56-55-3	Benzo(a)anthracene	0.019U	0.019	100	75.9	76	44 - 123	74.4	74	2	30
205-99-2	Benzo(b)fluoranthene	0.00850U	0.00850	100	76.5	77	43 - 129	73.6	74	4	30
207-08-9	Benzo(k)fluoranthene	0.016U	0.016	100	89.9	90	46 - 126	88.8	89	1	30
50-32-8	Benzo(a)pyrene	0.011U	0.011	100	87.3	87	42 - 128	84.9	85	3	30
218-01-9	Chrysene	0.017U	0.017	100	81.0	81	47 - 120	82.1	82	1	30
53-70-3	Dibenz(a,h)anthracene	0.016U	0.016	100	79.8	80	36 - 131	76.7	77	4	30
206-44-0	Fluoranthene	0.00690U	0.00690	100	80.9	81	37 - 129	77.7	78	4	30
86-73-7	Fluorene	0.039U	0.039	100	78.0	78	30 - 125	74.3	74	5	30
193-39-5	Indeno(1,2,3-cd)pyrene	0.00500U	0.00500	100	81.0	81	35 - 138	77.3	77	5	30
91-20-3	Naphthalene	0.00930U	0.00930	100	71.9	72	30 - 120	68.3	68	5	30
85-01-8	Phenanthrene	0.00690U	0.00690	100	77.9	78	43 - 120	74.5	75	4	30
129-00-0	Pyrene	0.014U	0.014	100	73.8	74	47 - 120	76.7	77	4	30
91-57-6	2-Methylnaphthalene	0.029U	0.029	100	68.1	68	30 - 120	65.0	65	5	30
Surrogate											
4165-60-0	Nitrobenzene-d5	36.4	73	50	40.4	81	43 - 110	37.1	74		
321-60-8	2-Fluorobiphenyl	38	76	50	39.2	78	16 - 128	35	70		
1718-51-0	Terphenyl-d14	38.7	77	50	38.1	76	47 - 121	37.5	75		

GCAL

GULF COAST ANALYTICAL LABORATORIES, INC

7979 GSRI AVE, BATON ROUGE LA 70820-7402
(225) 769-4900 FAX (225) 767-5717

Chain of Custody Record

Lab use only			
KEMRON	4794	213042711	05/01/13
Client Name	Client #	Group#	Due Date

1 of 2

Report to:
Client: Kemron Environmental Svcs
Address: 1359-A Ellsworth Ind. Blvd. Atlanta, Ga. 30318
Contact: Tommy Jordan
Phone: 404-601-6908
Fax: 404-636-7162

Bill to:
Client: Kemron Environmental Services
Address: 1359-A Ellsworth Ind. Blvd. Atlanta, Ga. 30318
Contact: Tommy Jordan
Phone: 404-601-6908
Fax: 404-636-7162

P.O. Number: SH0460
Project Name/Number: Quanta / SH0460
Sampled By: Tomecia Riley

Analytical Requests & Methods

TEMP 3.1
E20

Matrix	Date	Time (2400)	Comp	Grab	Sample Description	Preservatives	No. Containers	SPLP PAH 1312/8270	Remarks:	Lab ID 04/27
S	4/26/13	1330		X	0460-011	None	1	X		1
S		1340		X	0460-013			X		2
S		1350		X	0460-014			X		3
S		1400		X	0460-015			X		4
S		1410		X	0460-016			X		5
S		1420		X	0460-017			X		6
S		1430		X	0460-018			X		7
S		1440		X	0460-019			X		8
S		1450		X	0460-020			X		9
S		1500		X	0460-022			X		10

Turn Around Time: ___ 24 - 48 hrs X 3 days ___ 1 week ___ standard other ___

Relinquished by: (Signature)	Received by: (Signature)	Date:	Time:
Tomecia Riley		4-26-13	1530
FEDEX	[illegible]	4.27.13	09:35

Note: Results due May 1, 2013
799627070986

By submitting these samples, you agree to the terms and conditions contained in our most recent schedule of services.

Matrix: W = water, S=Soil, SD=Solid, L=Liquid, SL=Sludge, O=Oil, CT=Charcoal Tube, OVM=Organic Vapor Monitor, XT=XAD Tube, A=Air Bag, SUM=Summa Canister

GCAL

GULF COAST ANALYTICAL LABORATORIES, INC

7979 GSRI AVE, BATON ROUGE LA 70820-7402
(225) 769-4900 FAX (225) 767-5717

Chain of Custody Record

Lab use only			
KEMRON	4794	213042711	05/01/13
Client Name	Client #	Group#	Due Date

2 of 2

Report to:
Client: Kemron Environmental Services
Address: 1359-A Ellsworth Ind. Blvd. Atlanta, Ga 30318
Contact: Tommy Jordan
Phone: 404-601-6908
Fax: 404-636-7162

Bill to:
Client: Kemron Environmental Services
Address: 1359-A Ellsworth Ind. Blvd. Atlanta, Ga 30318
Contact: Tommy Jordan
Phone: 404-601-6908
Fax: 404-636-7162

P.O. Number: SH0460
Project Name/Number: Quanta/SH0460
Sampled By: Tomecia Riley

Analytical Requests & Methods

Matrix	Date	Time (2400)	Comp	Grab	Sample Description	Pre-servatives	No. Containers	SPLP PAH 1312/8270	Remarks:	Lab ID
S	4/26/13 ~~1510~~	1510		X	0460-023	None	1	X		04/27 11

Turn Around Time: 24 - 48 hrs X 3 days 1 week standard other

Relinquished by: (Signature)	Received by: (Signature)	Date:	Time:
Tomecia Riley		4-26-13	1530
FEDEX	[illegible]	4.27.13	09:35

Note: Results due May 1, 2013

By submitting these samples, you agree to the terms and conditions contained in our most recent schedule of services.

Matrix: W = water, S=Soil, SD=Solid, L=Liquid, SL=Sludge, O=Oil, CT=Charcoal Tube, OVM=Organic Vapor Monitor, XT=XAD Tube, A=Air Bag, SUM=Summa Canister

GCAL ANALYTICAL LABORATORIES, LLC

SAMPLE RECEIVING CHECKLIST

213042711

SAMPLE DELIVERY GROUP	213042711
Client 4794 - KEMRON	**Transport Method** FEDEX
Profile Number 238840	**Received By** Law, Brittany P.
Line Item(s) 1 - Soil	**Receive Date(s)** 04/27/13

CHECKLIST			
Were all samples received using proper thermal preservation?	☑ Yes	☐ No	☐ NA
When used, were all custody seals intact?	☑ Yes	☐ No	☐ NA
Were all samples received in proper containers?	☑ Yes	☐ No	☐ NA
Were all samples received using proper chemical preservation?	☑ Yes	☐ No	☐ NA
Was preservative added to any container at the lab?	☐ Yes	☑ No	☐ NA
Were all containers received in good condition?	☑ Yes	☐ No	☐ NA
Were all VOA vials received with no head space?	☐ Yes	☐ No	☑ NA
Do all sample labels match the Chain of Custody?	☑ Yes	☐ No	☐ NA
Did the Chain of Custody list the sampling technician?	☑ Yes	☐ No	☐ NA
Was the COC maintained i.e. all signatures, dates and time of receipt included?	☑ Yes	☐ No	☐ NA

COOLERS

Airbill	Temp(oC)
7996 2707 0986	3.1 (E20)

DISCREPANCIES

None

LABORATORY PRESERVATIONS

None

NOTES

NELAP CERTIFICATE NUMBER 01955
DOD ELAP CERTIFICATE NUMBER ADE - 1482

ANALYTICAL RESULTS

PERFORMED BY

GULF COAST ANALYTICAL LABORATORIES, INC.

7979 GSRI Avenue

Baton Rouge, LA 70820

Report Date 05/01/2013

GCAL Report 213042419

Deliver To	KEMRON 1359A Ellsworth Industrial Blv Atlanta, GA 30318 404-601-6927
Attn	Tommy Jordan

Project Quanta / SH0460

CASE NARRATIVE

Client: KEMRON **Report:** 213042419

Gulf Coast Analytical Laboratories received and analyzed the sample(s) listed on the sample cross-reference page of this report. Receipt of the sample(s) is documented by the attached chain of custody. This applies only to the sample(s) listed in this report. No sample integrity or quality control exceptions were identified unless noted below.

VOLATILES MASS SPECTROMETRY

In the SW-846 1312/8260B analysis, sample 21304241901 (460-011) had to be diluted due to the presence of non-target background. This dilution is reflected in the elevated reporting limits.

In the SW-846 1312/8260B analysis, samples 21304241903 (460-013), 21304241904 (460-014), 21304241905 (460-015), 21304241906 (460-016), 21304241907 (460-017), 21304241908 (460-018), 21304241913 (460-023) and 21304241909 (460-019) had to be diluted to bracket the concentration of target compounds within the calibration range of the instrument. The dilution is reflected in elevated detection limits.

VOLATILES GAS CHROMATOGRAPHY

In the SW-846 1312/8015C analysis, samples 21304241901(460-011), 21304241903(460-013), 21304241904(460-014), 21304241905(460-015), 21304241906(460-016), 21304241907(460-017), 21304241908(460-018) and 21304241909(460-019) had to be diluted to bracket the concentrations within the calibration range of the instrument.

In the SW-846 1312/8015C analysis, the recovery for the surrogate was outside control limits for samples 21304241901 (460-011), 21304241903 (460-013), 21304241904 (460-014), 21304241905 (460-015), 21304241906 (460-016), 21304241907 (460-017) and 21304241908 (460-018). The samples were re-analyzed yielding a similar recovery. This is attributed to matrix interference.

SEMI-VOLATILES GAS CHROMATOGRAPHY

In the SW-846 1312/8015C analysis, samples 21304241904 (460-014), 21304241901 (460-011), 21304241903 (460-013), 21304241905 (460-015), 21304241906 (460-016), 21304241908 (460-018), 21304241912 (460-022), 21304241913 (460-023) and 21304241907 (460-017) had to be diluted to bracket target compounds within the calibration range of the instrument. This is reflected in elevated detection limits.

In the SW-846 1312/8015C analysis, the recovery for the surrogate(s) is reported as diluted out for those analyses performed at a 10 or higher dilution.

METALS

In the SW-846 1312/6020A analysis, samples 21304241912 (460-022) and 21304241913 (460-023) had to be diluted in order to bracket the concentration within the calibration range of the instrument.

Laboratory Endorsement

Sample analysis was performed in accordance with approved methodologies provided by the Environmental Protection Agency or other recognized agencies. The samples and their corresponding extracts will be maintained for a period of 30 days unless otherwise arranged. Following this retention period the samples will be disposed in accordance with GCAL's Standard Operating Procedures.

Common Abbreviations Utilized in this Report

ND	Indicates the result was Not Detected at the specified RDL
DO	Indicates the result was Diluted Out
MI	Indicates the result was subject to Matrix Interference
TNTC	Indicates the result was Too Numerous To Count
SUBC	Indicates the analysis was Sub-Contracted
FLD	Indicates the analysis was performed in the Field
PQL	Practical Quantitation Limit
MDL	Method Detection Limit
RDL	Reporting Detection Limit
00:00	Reported as a time equivalent to 12:00 AM

Reporting Flags Utilized in this Report

J	Indicates the result is between the MDL and RDL
U	Indicates the compound was analyzed for but not detected
B	Indicates the analyte was detected in the associated Method Blank

Sample receipt at GCAL is documented through the attached chain of custody. In accordance with NELAC, this report shall be reproduced only in full and with the written permission of GCAL. The results contained within this report relate only to the samples reported. The documented results are presented within this report.

This report pertains only to the samples listed in the Report Sample Summary and should be retained as a permanent record thereof. The results contained within this report are intended for the use of the client. Any unauthorized use of the information contained in this report is prohibited.

I certify that this data package is in compliance with the NELAC standard and terms and conditions of the contract and Statement of Work both technically and for completeness, for other than the conditions in the case narrative. Release of the data contained in this hardcopy data package and in the computer-readable data submitted has been authorized by the Quality Assurance Manager or his/her designee, as verified by the following signature.

Estimated uncertainty of measurement is available upon request. This report is in compliance with the DOD QSM as specified in the contract if applicable.

_____

Authorized Signature
GCAL REPORT 213042419

THIS REPORT CONTAINS _____ PAGES.

Report Sample Summary

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21304241901	460-011	Solid	04/23/2013 10:15	04/24/2013 09:35
21304241903	460-013	Solid	04/23/2013 10:35	04/24/2013 09:35
21304241904	460-014	Solid	04/23/2013 10:45	04/24/2013 09:35
21304241905	460-015	Solid	04/23/2013 10:55	04/24/2013 09:35
21304241906	460-016	Solid	04/23/2013 11:05	04/24/2013 09:35
21304241907	460-017	Solid	04/23/2013 11:15	04/24/2013 09:35
21304241908	460-018	Solid	04/23/2013 11:25	04/24/2013 09:35
21304241909	460-019	Solid	04/23/2013 12:15	04/24/2013 09:35
21304241910	460-020	Solid	04/23/2013 12:25	04/24/2013 09:35
21304241912	460-022	Solid	04/23/2013 12:45	04/24/2013 09:35
21304241913	460-023	Solid	04/23/2013 12:55	04/24/2013 09:35

Summary of Compounds Detected

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21304241901	**460-011**	Solid	04/23/2013 10:15	04/24/2013 09:35

SW-846 1312/8015C GRO

CAS#	Parameter	Result	RDL	MDL	Units
8006-61-9	Gasoline Range Organics	4.07	0.500	0.065	mg/L

SW-846 1312/8260B

CAS#	Parameter	Result	RDL	MDL	Units
100-41-4	Ethylbenzene	286	50	5.45	ug/L
108-88-3	Toluene	94.8	50	6.09	ug/L
1330-20-7	Xylene (total)	810	150	8.94	ug/L

SW-846 1312/8015C DRO

CAS#	Parameter	Result	RDL	MDL	Units
GCSV-00-4	Diesel Range Organics	24.8	3.00	0.884	mg/L

SW-846 1312/6020A SPLP

CAS#	Parameter	Result	RDL	MDL	Units
7440-38-2	Arsenic	4.94	1.00		ug/L

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21304241903	**460-013**	Solid	04/23/2013 10:35	04/24/2013 09:35

SW-846 1312/8015C DRO

CAS#	Parameter	Result	RDL	MDL	Units
GCSV-00-4	Diesel Range Organics	24.8	3.00	0.884	mg/L

SW-846 1312/6020A SPLP

CAS#	Parameter	Result	RDL	MDL	Units
7440-38-2	Arsenic	3.47	1.00		ug/L

SW-846 1312/8015C GRO

CAS#	Parameter	Result	RDL	MDL	Units
8006-61-9	Gasoline Range Organics	2.29	0.500	0.065	mg/L

SW-846 1312/8260B

CAS#	Parameter	Result	RDL	MDL	Units
71-43-2	Benzene	33.6	25	2.78	ug/L

Summary of Compounds Detected (con't)

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21304241903	**460-013**	Solid	04/23/2013 10:35	04/24/2013 09:35

SW-846 1312/8260B

CAS#	Parameter	Result	RDL	MDL	Units
100-41-4	Ethylbenzene	63.5	25	2.73	ug/L
108-88-3	Toluene	91.8	25	3.05	ug/L
1330-20-7	Xylene (total)	263	75	4.47	ug/L

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21304241904	**460-014**	Solid	04/23/2013 10:45	04/24/2013 09:35

SW-846 1312/8015C DRO

CAS#	Parameter	Result	RDL	MDL	Units
GCSV-00-4	Diesel Range Organics	34.8	3.00	0.884	mg/L

SW-846 1312/6020A SPLP

CAS#	Parameter	Result	RDL	MDL	Units
7440-38-2	Arsenic	2.80	1.00		ug/L

SW-846 1312/8015C GRO

CAS#	Parameter	Result	RDL	MDL	Units
8006-61-9	Gasoline Range Organics	2.13	0.500	0.065	mg/L

SW-846 1312/8260B

CAS#	Parameter	Result	RDL	MDL	Units
71-43-2	Benzene	118	40	4.44	ug/L
100-41-4	Ethylbenzene	131	40	4.36	ug/L
108-88-3	Toluene	239	40	4.87	ug/L
1330-20-7	Xylene (total)	372	120	7.15	ug/L

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21304241905	**460-015**	Solid	04/23/2013 10:55	04/24/2013 09:35

SW-846 1312/8015C DRO

CAS#	Parameter	Result	RDL	MDL	Units
GCSV-00-4	Diesel Range Organics	25.9	3.00	0.884	mg/L

Summary of Compounds Detected (con't)

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21304241905	**460-015**	Solid	04/23/2013 10:55	04/24/2013 09:35

SW-846 1312/6020A SPLP

CAS#	Parameter	Result	RDL	MDL	Units
7440-38-2	Arsenic	3.64	1.00		ug/L

SW-846 1312/8015C GRO

CAS#	Parameter	Result	RDL	MDL	Units
8006-61-9	Gasoline Range Organics	2.97	0.500	0.065	mg/L

SW-846 1312/8260B

CAS#	Parameter	Result	RDL	MDL	Units
71-43-2	Benzene	91.2	50	5.55	ug/L
100-41-4	Ethylbenzene	120	50	5.45	ug/L
108-88-3	Toluene	203	50	6.09	ug/L
1330-20-7	Xylene (total)	355	150	8.94	ug/L

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21304241906	**460-016**	Solid	04/23/2013 11:05	04/24/2013 09:35

SW-846 1312/8015C GRO

CAS#	Parameter	Result	RDL	MDL	Units
8006-61-9	Gasoline Range Organics	2.35	0.500	0.065	mg/L

SW-846 1312/8260B

CAS#	Parameter	Result	RDL	MDL	Units
71-43-2	Benzene	58.6	40	4.44	ug/L
100-41-4	Ethylbenzene	89.8	40	4.36	ug/L
108-88-3	Toluene	146	40	4.87	ug/L
1330-20-7	Xylene (total)	313	120	7.15	ug/L

SW-846 1312/8015C DRO

CAS#	Parameter	Result	RDL	MDL	Units
GCSV-00-4	Diesel Range Organics	21.2	3.00	0.884	mg/L

SW-846 1312/6020A SPLP

CAS#	Parameter	Result	RDL	MDL	Units
7440-38-2	Arsenic	3.67	1.00		ug/L

Summary of Compounds Detected (con't)

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21304241907	**460-017**	Solid	04/23/2013 11:15	04/24/2013 09:35

SW-846 1312/8015C DRO

CAS#	Parameter	Result	RDL	MDL	Units
GCSV-00-4	Diesel Range Organics	50.6	6.00	1.77	mg/L

SW-846 1312/6020A SPLP

CAS#	Parameter	Result	RDL	MDL	Units
7440-38-2	Arsenic	1.47	1.00		ug/L

SW-846 1312/8015C GRO

CAS#	Parameter	Result	RDL	MDL	Units
8006-61-9	Gasoline Range Organics	11.5	0.500	0.065	mg/L

SW-846 1312/8260B

CAS#	Parameter	Result	RDL	MDL	Units
71-43-2	Benzene	792	50	5.55	ug/L
100-41-4	Ethylbenzene	287	50	5.45	ug/L
108-88-3	Toluene	1380	50	6.09	ug/L
1330-20-7	Xylene (total)	905	150	8.94	ug/L

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21304241908	**460-018**	Solid	04/23/2013 11:25	04/24/2013 09:35

SW-846 1312/8015C DRO

CAS#	Parameter	Result	RDL	MDL	Units
GCSV-00-4	Diesel Range Organics	33.0	3.00	0.884	mg/L

SW-846 1312/6020A SPLP

CAS#	Parameter	Result	RDL	MDL	Units
7440-38-2	Arsenic	0.95J	1.00		ug/L

SW-846 1312/8015C GRO

CAS#	Parameter	Result	RDL	MDL	Units
8006-61-9	Gasoline Range Organics	13.0	0.500	0.065	mg/L

Summary of Compounds Detected (con't)

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21304241908	**460-018**	Solid	04/23/2013 11:25	04/24/2013 09:35

SW-846 1312/8260B

CAS#	Parameter	Result	RDL	MDL	Units
71-43-2	Benzene	892	100	11.1	ug/L
100-41-4	Ethylbenzene	291	100	10.9	ug/L
108-88-3	Toluene	1530	100	12.2	ug/L
1330-20-7	Xylene (total)	927	300	17.9	ug/L

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21304241909	**460-019**	Solid	04/23/2013 12:15	04/24/2013 09:35

SW-846 1312/8015C DRO

CAS#	Parameter	Result	RDL	MDL	Units
GCSV-00-4	Diesel Range Organics	1.03	0.150	0.044	mg/L

SW-846 1312/6020A SPLP

CAS#	Parameter	Result	RDL	MDL	Units
7440-38-2	Arsenic	67.3	1.00		ug/L

SW-846 1312/8015C GRO

CAS#	Parameter	Result	RDL	MDL	Units
8006-61-9	Gasoline Range Organics	1.25	0.500	0.065	mg/L

SW-846 1312/8260B

CAS#	Parameter	Result	RDL	MDL	Units
71-43-2	Benzene	49.9	2	0.222	ug/L
100-41-4	Ethylbenzene	54.4	2	0.218	ug/L
108-88-3	Toluene	92.0	2	0.244	ug/L
1330-20-7	Xylene (total)	43.6	6	0.358	ug/L

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21304241910	**460-020**	Solid	04/23/2013 12:25	04/24/2013 09:35

SW-846 1312/8015C GRO

CAS#	Parameter	Result	RDL	MDL	Units
8006-61-9	Gasoline Range Organics	0.279	0.100	0.013	mg/L

Summary of Compounds Detected (con't)

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21304241910	**460-020**	Solid	04/23/2013 12:25	04/24/2013 09:35

SW-846 1312/8260B

CAS#	Parameter	Result	RDL	MDL	Units
71-43-2	Benzene	1.59	1	0.111	ug/L
100-41-4	Ethylbenzene	4.31	1	0.109	ug/L
108-88-3	Toluene	12.5	1	0.122	ug/L
1330-20-7	Xylene (total)	19.3	3	0.179	ug/L

SW-846 1312/8015C DRO

CAS#	Parameter	Result	RDL	MDL	Units
GCSV-00-4	Diesel Range Organics	1.01	0.150	0.044	mg/L

SW-846 1312/6020A SPLP

CAS#	Parameter	Result	RDL	MDL	Units
7440-38-2	Arsenic	37.8	1.00		ug/L

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21304241912	**460-022**	Solid	04/23/2013 12:45	04/24/2013 09:35

SW-846 1312/8015C DRO

CAS#	Parameter	Result	RDL	MDL	Units
GCSV-00-4	Diesel Range Organics	2.79	0.300	0.088	mg/L

SW-846 1312/6020A SPLP

CAS#	Parameter	Result	RDL	MDL	Units
7440-38-2	Arsenic	138	5.00		ug/L

SW-846 1312/8015C GRO

CAS#	Parameter	Result	RDL	MDL	Units
8006-61-9	Gasoline Range Organics	0.386	0.100	0.013	mg/L

SW-846 1312/8260B

CAS#	Parameter	Result	RDL	MDL	Units
71-43-2	Benzene	16.8	1	0.111	ug/L
100-41-4	Ethylbenzene	22.6	1	0.109	ug/L
108-88-3	Toluene	22.8	1	0.122	ug/L
1330-20-7	Xylene (total)	41.1	3	0.179	ug/L

Summary of Compounds Detected (con't)

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21304241913	**460-023**	Solid	04/23/2013 12:55	04/24/2013 09:35

SW-846 1312/8015C GRO

CAS#	Parameter	Result	RDL	MDL	Units
8006-61-9	Gasoline Range Organics	0.527	0.100	0.013	mg/L

SW-846 1312/8260B

CAS#	Parameter	Result	RDL	MDL	Units
71-43-2	Benzene	7.64	2	0.222	ug/L
100-41-4	Ethylbenzene	8.65	2	0.218	ug/L
108-88-3	Toluene	31.1	2	0.244	ug/L
1330-20-7	Xylene (total)	36.4	6	0.358	ug/L

SW-846 1312/8015C DRO

CAS#	Parameter	Result	RDL	MDL	Units
GCSV-00-4	Diesel Range Organics	2.77	0.300	0.088	mg/L

SW-846 1312/6020A SPLP

CAS#	Parameter	Result	RDL	MDL	Units
7440-38-2	Arsenic	122	5.00		ug/L

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21304241901	**460-011**	Solid	04/23/2013 10:15	04/24/2013 09:35

SW-846 1312/8260B

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
			50	04/28/2013 00:59	CEK	506196

CAS#	Parameter	Result	RDL	MDL	Units
71-43-2	Benzene	5.55U	50	5.55	ug/L
100-41-4	**Ethylbenzene**	**286**	**50**	**5.45**	**ug/L**
108-88-3	**Toluene**	**94.8**	**50**	**6.09**	**ug/L**
1330-20-7	**Xylene (total)**	**810**	**150**	**8.94**	**ug/L**

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
460-00-4	4-Bromofluorobenzene	2500	2460	ug/L	98	78 - 130
1868-53-7	Dibromofluoromethane	2500	2460	ug/L	98	77 - 127
2037-26-5	Toluene d8	2500	2550	ug/L	102	76 - 134
17060-07-0	1,2-Dichloroethane-d4	2500	2430	ug/L	97	71 - 127

SW-846 1312/8015C DRO

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
04/26/2013 06:45	506049	SW-846 3510C	20	04/26/2013 15:12	PMM	506301

CAS#	Parameter	Result	RDL	MDL	Units
GCSV-00-4	**Diesel Range Organics**	**24.8**	**3.00**	**0.884**	**mg/L**

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
84-15-1	o-Terphenyl	50	Diluted Out	ug/L	**0***	60 - 140

SW-846 1312/8015C GRO

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
			5	04/29/2013 19:40	BMR	506243

CAS#	Parameter	Result	RDL	MDL	Units
8006-61-9	**Gasoline Range Organics**	**4.07**	**0.500**	**0.065**	**mg/L**

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
106-39-8	Bromochlorobenzene	150	385	ug/L	**257***	49 - 136

SW-846 1312/6020A SPLP

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
04/26/2013 15:50	506107	SW-846 3010A	1	04/30/2013 01:10	MEM	506282

CAS#	Parameter	Result	RDL	MDL	Units
7440-38-2	**Arsenic**	**4.94**	**1.00**		**ug/L**

RESULTS REPORTED ON A WET WEIGHT BASIS

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21304241903	**460-013**	Solid	04/23/2013 10:35	04/24/2013 09:35

SW-846 1312/8260B

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
			25	04/28/2013 01:39	CEK	506196

CAS#	Parameter	Result	RDL	MDL	Units
71-43-2	**Benzene**	**33.6**	**25**	**2.78**	**ug/L**
100-41-4	**Ethylbenzene**	**63.5**	**25**	**2.73**	**ug/L**
108-88-3	**Toluene**	**91.8**	**25**	**3.05**	**ug/L**
1330-20-7	**Xylene (total)**	**263**	**75**	**4.47**	**ug/L**

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
460-00-4	4-Bromofluorobenzene	1250	1230	ug/L	98	78 - 130
1868-53-7	Dibromofluoromethane	1250	1230	ug/L	98	77 - 127
2037-26-5	Toluene d8	1250	1270	ug/L	102	76 - 134
17060-07-0	1,2-Dichloroethane-d4	1250	1230	ug/L	98	71 - 127

SW-846 1312/8015C DRO

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
04/26/2013 06:45	506049	SW-846 3510C	20	04/26/2013 15:27	PMM	506301

CAS#	Parameter	Result	RDL	MDL	Units
GCSV-00-4	**Diesel Range Organics**	**24.8**	**3.00**	**0.884**	**mg/L**

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
84-15-1	o-Terphenyl	50	Diluted Out	ug/L	**0***	60 - 140

SW-846 1312/8015C GRO

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
			5	04/29/2013 20:00	BMR	506243

CAS#	Parameter	Result	RDL	MDL	Units
8006-61-9	**Gasoline Range Organics**	**2.29**	**0.500**	**0.065**	**mg/L**

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
106-39-8	Bromochlorobenzene	150	356	ug/L	**237***	49 - 136

SW-846 1312/6020A SPLP

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
04/26/2013 15:50	506107	SW-846 3010A	1	04/30/2013 01:17	MEM	506282

CAS#	Parameter	Result	RDL	MDL	Units
7440-38-2	**Arsenic**	**3.47**	**1.00**		**ug/L**

RESULTS REPORTED ON A WET WEIGHT BASIS

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21304241904	**460-014**	Solid	04/23/2013 10:45	04/24/2013 09:35

SW-846 1312/8260B

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
			40	04/28/2013 01:59	CEK	506196

CAS#	Parameter	Result	RDL	MDL	Units
71-43-2	**Benzene**	**118**	**40**	**4.44**	**ug/L**
100-41-4	**Ethylbenzene**	**131**	**40**	**4.36**	**ug/L**
108-88-3	**Toluene**	**239**	**40**	**4.87**	**ug/L**
1330-20-7	**Xylene (total)**	**372**	**120**	**7.15**	**ug/L**

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
460-00-4	4-Bromofluorobenzene	2000	1930	ug/L	97	78 - 130
1868-53-7	Dibromofluoromethane	2000	1970	ug/L	99	77 - 127
2037-26-5	Toluene d8	2000	2030	ug/L	102	76 - 134
17060-07-0	1,2-Dichloroethane-d4	2000	1990	ug/L	100	71 - 127

SW-846 1312/8015C DRO

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
04/26/2013 06:45	506049	SW-846 3510C	20	04/26/2013 14:25	PMM	506301

CAS#	Parameter	Result	RDL	MDL	Units
GCSV-00-4	**Diesel Range Organics**	**34.8**	**3.00**	**0.884**	**mg/L**

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
84-15-1	o-Terphenyl	50	Diluted Out	ug/L	**0***	60 - 140

SW-846 1312/8015C GRO

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
			5	04/29/2013 20:20	BMR	506243

CAS#	Parameter	Result	RDL	MDL	Units
8006-61-9	**Gasoline Range Organics**	**2.13**	**0.500**	**0.065**	**mg/L**

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
106-39-8	Bromochlorobenzene	150	334	ug/L	**223***	49 - 136

SW-846 1312/6020A SPLP

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
04/26/2013 15:50	506107	SW-846 3010A	1	04/30/2013 02:20	MEM	506282

CAS#	Parameter	Result	RDL	MDL	Units
7440-38-2	**Arsenic**	**2.80**	**1.00**		**ug/L**

RESULTS REPORTED ON A WET WEIGHT BASIS

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21304241905	**460-015**	Solid	04/23/2013 10:55	04/24/2013 09:35

SW-846 1312/8260B

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
			50	04/28/2013 02:19	CEK	506196

CAS#	Parameter	Result	RDL	MDL	Units
71-43-2	**Benzene**	**91.2**	**50**	**5.55**	**ug/L**
100-41-4	**Ethylbenzene**	**120**	**50**	**5.45**	**ug/L**
108-88-3	**Toluene**	**203**	**50**	**6.09**	**ug/L**
1330-20-7	**Xylene (total)**	**355**	**150**	**8.94**	**ug/L**

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
460-00-4	4-Bromofluorobenzene	2500	2470	ug/L	99	78 - 130
1868-53-7	Dibromofluoromethane	2500	2490	ug/L	100	77 - 127
2037-26-5	Toluene d8	2500	2600	ug/L	104	76 - 134
17060-07-0	1,2-Dichloroethane-d4	2500	2500	ug/L	100	71 - 127

SW-846 1312/8015C DRO

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
04/26/2013 06:45	506049	SW-846 3510C	20	04/26/2013 15:46	PMM	506301

CAS#	Parameter	Result	RDL	MDL	Units
GCSV-00-4	**Diesel Range Organics**	**25.9**	**3.00**	**0.884**	**mg/L**

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
84-15-1	o-Terphenyl	50	Diluted Out	ug/L	**0***	60 - 140

SW-846 1312/8015C GRO

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
			5	04/29/2013 20:40	BMR	506243

CAS#	Parameter	Result	RDL	MDL	Units
8006-61-9	**Gasoline Range Organics**	**2.97**	**0.500**	**0.065**	**mg/L**

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
106-39-8	Bromochlorobenzene	150	382	ug/L	**255***	49 - 136

SW-846 1312/6020A SPLP

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
04/26/2013 15:50	506107	SW-846 3010A	1	04/30/2013 02:27	MEM	506282

CAS#	Parameter	Result	RDL	MDL	Units
7440-38-2	**Arsenic**	**3.64**	**1.00**		**ug/L**

RESULTS REPORTED ON A WET WEIGHT BASIS

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21304241906	**460-016**	Solid	04/23/2013 11:05	04/24/2013 09:35

SW-846 1312/8260B

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
			40	04/28/2013 02:38	CEK	506196

CAS#	Parameter	Result	RDL	MDL	Units
71-43-2	**Benzene**	**58.6**	**40**	**4.44**	**ug/L**
100-41-4	**Ethylbenzene**	**89.8**	**40**	**4.36**	**ug/L**
108-88-3	**Toluene**	**146**	**40**	**4.87**	**ug/L**
1330-20-7	**Xylene (total)**	**313**	**120**	**7.15**	**ug/L**

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
460-00-4	4-Bromofluorobenzene	2000	1900	ug/L	95	78 - 130
1868-53-7	Dibromofluoromethane	2000	1990	ug/L	100	77 - 127
2037-26-5	Toluene d8	2000	2030	ug/L	102	76 - 134
17060-07-0	1,2-Dichloroethane-d4	2000	1990	ug/L	100	71 - 127

SW-846 1312/8015C DRO

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
04/26/2013 06:45	506049	SW-846 3510C	20	04/26/2013 16:01	PMM	506301

CAS#	Parameter	Result	RDL	MDL	Units
GCSV-00-4	**Diesel Range Organics**	**21.2**	**3.00**	**0.884**	**mg/L**

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
84-15-1	o-Terphenyl	50	Diluted Out	ug/L	**0***	60 - 140

SW-846 1312/8015C GRO

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
			5	04/29/2013 21:00	BMR	506243

CAS#	Parameter	Result	RDL	MDL	Units
8006-61-9	**Gasoline Range Organics**	**2.35**	**0.500**	**0.065**	**mg/L**

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
106-39-8	Bromochlorobenzene	150	390	ug/L	**260***	49 - 136

SW-846 1312/6020A SPLP

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
04/26/2013 15:50	506107	SW-846 3010A	1	04/30/2013 02:35	MEM	506282

CAS#	Parameter	Result	RDL	MDL	Units
7440-38-2	**Arsenic**	**3.67**	**1.00**		**ug/L**

RESULTS REPORTED ON A WET WEIGHT BASIS

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21304241907	**460-017**	Solid	04/23/2013 11:15	04/24/2013 09:35

SW-846 1312/8260B

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
			50	04/28/2013 02:58	CEK	506196

CAS#	Parameter	Result	RDL	MDL	Units
71-43-2	**Benzene**	**792**	**50**	**5.55**	**ug/L**
100-41-4	**Ethylbenzene**	**287**	**50**	**5.45**	**ug/L**
108-88-3	**Toluene**	**1380**	**50**	**6.09**	**ug/L**
1330-20-7	**Xylene (total)**	**905**	**150**	**8.94**	**ug/L**

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
460-00-4	4-Bromofluorobenzene	2500	2460	ug/L	98	78 - 130
1868-53-7	Dibromofluoromethane	2500	2460	ug/L	98	77 - 127
2037-26-5	Toluene d8	2500	2540	ug/L	102	76 - 134
17060-07-0	1,2-Dichloroethane-d4	2500	2480	ug/L	99	71 - 127

SW-846 1312/8015C DRO

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
04/26/2013 06:45	506049	SW-846 3510C	40	04/29/2013 11:01	PMM	506298

CAS#	Parameter	Result	RDL	MDL	Units
GCSV-00-4	**Diesel Range Organics**	**50.6**	**6.00**	**1.77**	**mg/L**

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
84-15-1	o-Terphenyl	50	Diluted Out	ug/L	**0***	60 - 140

SW-846 1312/8015C GRO

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
			5	04/29/2013 21:20	BMR	506243

CAS#	Parameter	Result	RDL	MDL	Units
8006-61-9	**Gasoline Range Organics**	**11.5**	**0.500**	**0.065**	**mg/L**

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
106-39-8	Bromochlorobenzene	150	590	ug/L	**393***	49 - 136

SW-846 1312/6020A SPLP

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
04/26/2013 15:50	506107	SW-846 3010A	1	04/30/2013 02:43	MEM	506282

CAS#	Parameter	Result	RDL	MDL	Units
7440-38-2	**Arsenic**	**1.47**	**1.00**		**ug/L**

RESULTS REPORTED ON A WET WEIGHT BASIS

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21304241908	**460-018**	Solid	04/23/2013 11:25	04/24/2013 09:35

SW-846 1312/8260B

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
			100	04/28/2013 03:19	CEK	506196

CAS#	Parameter	Result	RDL	MDL	Units
71-43-2	**Benzene**	**892**	**100**	**11.1**	**ug/L**
100-41-4	**Ethylbenzene**	**291**	**100**	**10.9**	**ug/L**
108-88-3	**Toluene**	**1530**	**100**	**12.2**	**ug/L**
1330-20-7	**Xylene (total)**	**927**	**300**	**17.9**	**ug/L**

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
460-00-4	4-Bromofluorobenzene	5000	5050	ug/L	101	78 - 130
1868-53-7	Dibromofluoromethane	5000	4860	ug/L	97	77 - 127
2037-26-5	Toluene d8	5000	5200	ug/L	104	76 - 134
17060-07-0	1,2-Dichloroethane-d4	5000	4830	ug/L	97	71 - 127

SW-846 1312/8015C DRO

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
04/26/2013 06:45	506049	SW-846 3510C	20	04/26/2013 16:40	PMM	506301

CAS#	Parameter	Result	RDL	MDL	Units
GCSV-00-4	**Diesel Range Organics**	**33.0**	**3.00**	**0.884**	**mg/L**

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
84-15-1	o-Terphenyl	50	Diluted Out	ug/L	**0***	60 - 140

SW-846 1312/8015C GRO

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
			5	04/29/2013 21:40	BMR	506243

CAS#	Parameter	Result	RDL	MDL	Units
8006-61-9	**Gasoline Range Organics**	**13.0**	**0.500**	**0.065**	**mg/L**

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
106-39-8	Bromochlorobenzene	150	603	ug/L	**402***	49 - 136

SW-846 1312/6020A SPLP

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
04/26/2013 15:50	506107	SW-846 3010A	1	04/30/2013 02:51	MEM	506282

CAS#	Parameter	Result	RDL	MDL	Units
7440-38-2	**Arsenic**	**0.95J**	**1.00**		**ug/L**

RESULTS REPORTED ON A WET WEIGHT BASIS

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21304241909	**460-019**	Solid	04/23/2013 12:15	04/24/2013 09:35

SW-846 1312/8260B

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
			2	04/28/2013 04:26	CEK	506196

CAS#	Parameter	Result	RDL	MDL	Units
71-43-2	**Benzene**	**49.9**	**2**	**0.222**	**ug/L**
100-41-4	**Ethylbenzene**	**54.4**	**2**	**0.218**	**ug/L**
108-88-3	**Toluene**	**92.0**	**2**	**0.244**	**ug/L**
1330-20-7	**Xylene (total)**	**43.6**	**6**	**0.358**	**ug/L**

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
460-00-4	4-Bromofluorobenzene	100	99.4	ug/L	99	78 - 130
1868-53-7	Dibromofluoromethane	100	96.8	ug/L	97	77 - 127
2037-26-5	Toluene d8	100	103	ug/L	103	76 - 134
17060-07-0	1,2-Dichloroethane-d4	100	99.3	ug/L	99	71 - 127

SW-846 1312/8015C DRO

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
04/26/2013 06:45	506049	SW-846 3510C	1	04/26/2013 15:12	PMM	506250

CAS#	Parameter	Result	RDL	MDL	Units
GCSV-00-4	**Diesel Range Organics**	**1.03**	**0.150**	**0.044**	**mg/L**

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
84-15-1	o-Terphenyl	50	43.6	ug/L	87	60 - 140

SW-846 1312/8015C GRO

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
			5	04/29/2013 22:20	BMR	506243

CAS#	Parameter	Result	RDL	MDL	Units
8006-61-9	**Gasoline Range Organics**	**1.25**	**0.500**	**0.065**	**mg/L**

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
106-39-8	Bromochlorobenzene	150	188	ug/L	125	49 - 136

SW-846 1312/6020A SPLP

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
04/26/2013 15:50	506107	SW-846 3010A	1	04/30/2013 02:59	MEM	506282

CAS#	Parameter	Result	RDL	MDL	Units
7440-38-2	**Arsenic**	**67.3**	**1.00**		**ug/L**

RESULTS REPORTED ON A WET WEIGHT BASIS

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21304241910	**460-020**	Solid	04/23/2013 12:25	04/24/2013 09:35

SW-846 1312/8260B

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
			1	04/28/2013 00:00	CEK	506196

CAS#	Parameter	Result	RDL	MDL	Units
71-43-2	**Benzene**	**1.59**	**1**	**0.111**	**ug/L**
100-41-4	**Ethylbenzene**	**4.31**	**1**	**0.109**	**ug/L**
108-88-3	**Toluene**	**12.5**	**1**	**0.122**	**ug/L**
1330-20-7	**Xylene (total)**	**19.3**	**3**	**0.179**	**ug/L**

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
460-00-4	4-Bromofluorobenzene	50	48.6	ug/L	97	78 - 130
1868-53-7	Dibromofluoromethane	50	47.3	ug/L	95	77 - 127
2037-26-5	Toluene d8	50	51.5	ug/L	103	76 - 134
17060-07-0	1,2-Dichloroethane-d4	50	49.7	ug/L	99	71 - 127

SW-846 1312/8015C DRO

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
04/26/2013 06:45	506049	SW-846 3510C	1	04/26/2013 15:27	PMM	506250

CAS#	Parameter	Result	RDL	MDL	Units
GCSV-00-4	**Diesel Range Organics**	**1.01**	**0.150**	**0.044**	**mg/L**

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
84-15-1	o-Terphenyl	50	40.5	ug/L	81	60 - 140

SW-846 1312/8015C GRO

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
			1	04/30/2013 10:32	BMR	506243

CAS#	Parameter	Result	RDL	MDL	Units
8006-61-9	**Gasoline Range Organics**	**0.279**	**0.100**	**0.013**	**mg/L**

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
106-39-8	Bromochlorobenzene	30	34	ug/L	113	49 - 136

SW-846 1312/6020A SPLP

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
04/26/2013 15:50	506107	SW-846 3010A	1	04/30/2013 03:06	MEM	506282

CAS#	Parameter	Result	RDL	MDL	Units
7440-38-2	**Arsenic**	**37.8**	**1.00**		**ug/L**

RESULTS REPORTED ON A WET WEIGHT BASIS

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21304241912	**460-022**	Solid	04/23/2013 12:45	04/24/2013 09:35

SW-846 1312/8260B

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
			1	04/28/2013 00:40	CEK	506196

CAS#	Parameter	Result	RDL	MDL	Units
71-43-2	**Benzene**	**16.8**	**1**	**0.111**	**ug/L**
100-41-4	**Ethylbenzene**	**22.6**	**1**	**0.109**	**ug/L**
108-88-3	**Toluene**	**22.8**	**1**	**0.122**	**ug/L**
1330-20-7	**Xylene (total)**	**41.1**	**3**	**0.179**	**ug/L**

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
460-00-4	4-Bromofluorobenzene	50	48	ug/L	96	78 - 130
1868-53-7	Dibromofluoromethane	50	48.3	ug/L	97	77 - 127
2037-26-5	Toluene d8	50	51	ug/L	102	76 - 134
17060-07-0	1,2-Dichloroethane-d4	50	51.2	ug/L	102	71 - 127

SW-846 1312/8015C DRO

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
04/26/2013 06:45	506049	SW-846 3510C	2	04/26/2013 16:55	PMM	506301

CAS#	Parameter	Result	RDL	MDL	Units
GCSV-00-4	**Diesel Range Organics**	**2.79**	**0.300**	**0.088**	**mg/L**

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
84-15-1	o-Terphenyl	50	49	ug/L	98	60 - 140

SW-846 1312/8015C GRO

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
			1	04/30/2013 10:52	BMR	506243

CAS#	Parameter	Result	RDL	MDL	Units
8006-61-9	**Gasoline Range Organics**	**0.386**	**0.100**	**0.013**	**mg/L**

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
106-39-8	Bromochlorobenzene	30	35	ug/L	117	49 - 136

SW-846 1312/6020A SPLP

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
04/26/2013 15:50	506107	SW-846 3010A	5	04/30/2013 00:54	MEM	506282

CAS#	Parameter	Result	RDL	MDL	Units
7440-38-2	**Arsenic**	**138**	**5.00**		**ug/L**

RESULTS REPORTED ON A WET WEIGHT BASIS

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21304241913	**460-023**	Solid	04/23/2013 12:55	04/24/2013 09:35

SW-846 1312/8260B

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
			2	04/28/2013 04:04	CEK	506196

CAS#	Parameter	Result	RDL	MDL	Units
71-43-2	**Benzene**	**7.64**	**2**	**0.222**	**ug/L**
100-41-4	**Ethylbenzene**	**8.65**	**2**	**0.218**	**ug/L**
108-88-3	**Toluene**	**31.1**	**2**	**0.244**	**ug/L**
1330-20-7	**Xylene (total)**	**36.4**	**6**	**0.358**	**ug/L**

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
460-00-4	4-Bromofluorobenzene	100	98	ug/L	98	78 - 130
1868-53-7	Dibromofluoromethane	100	97.9	ug/L	98	77 - 127
2037-26-5	Toluene d8	100	102	ug/L	102	76 - 134
17060-07-0	1,2-Dichloroethane-d4	100	97.6	ug/L	98	71 - 127

SW-846 1312/8015C DRO

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
04/26/2013 06:45	506049	SW-846 3510C	2	04/26/2013 17:40	PMM	506301

CAS#	Parameter	Result	RDL	MDL	Units
GCSV-00-4	**Diesel Range Organics**	**2.77**	**0.300**	**0.088**	**mg/L**

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
84-15-1	o-Terphenyl	50	42.7	ug/L	85	60 - 140

SW-846 1312/8015C GRO

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
			1	04/30/2013 11:12	BMR	506243

CAS#	Parameter	Result	RDL	MDL	Units
8006-61-9	**Gasoline Range Organics**	**0.527**	**0.100**	**0.013**	**mg/L**

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
106-39-8	Bromochlorobenzene	30	37.1	ug/L	124	49 - 136

SW-846 1312/6020A SPLP

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
04/26/2013 15:50	506107	SW-846 3010A	5	04/30/2013 01:02	MEM	506282

CAS#	Parameter	Result	RDL	MDL	Units
7440-38-2	**Arsenic**	**122**	**5.00**		**ug/L**

RESULTS REPORTED ON A WET WEIGHT BASIS

GC/MS Volatiles Quality Control Summary

Analytical Batch 506196		**Client ID**	MB506196			LCS506196			LCSD506196		
Prep Batch N/A		**GCAL ID**	1186426			1186427			1186428		
		Sample Type	Method Blank			LCS			LCSD		
		Analytical Date	04/27/2013 20:31			04/27/2013 19:30			04/27/2013 19:50		
		Matrix	Water			Water			Water		
SW-846 1312/8260B		**Units**		ug/L	**Spike**	**Result**		**Control**	**Result**			**RPD**
		Result		**RDL**	**Added**		**% R**	**Limits % R**		**% R**	**RPD**	**Limit**
100-41-4	Ethylbenzene	0.109U		0.109	50.0	54.5	109	74 - 126	50.5	101	8	30
1330-20-7	Xylene (total)	0.179U		0.179	150	170	113	74 - 127	154	103	10	30
71-43-2	Benzene	0.111U		0.111	50.0	54.9	110	70 - 129	50.1	100	9	21
108-88-3	Toluene	0.122U		0.122	50.0	56.9	114	72 - 120	51.9	104	9	21
Surrogate												
460-00-4	4-Bromofluorobenzene	47.4		95	50	50.4	101	78 - 130	51.2	102		
1868-53-7	Dibromofluoromethane	49.5		99	50	50.5	101	77 - 127	50.1	100		
2037-26-5	Toluene d8	50		100	50	48.9	98	76 - 134	50	100		
17060-07-0	1,2-Dichloroethane-d4	50.5		101	50	50	100	71 - 127	48.6	97		

Analytical Batch 506196		**Client ID**	W-25			W-25 MS			W-25 MSD		
Prep Batch N/A		**GCAL ID**	21304264415			21304264416			21304264417		
		Sample Type	SAMPLE			MS			MSD		
		Analytical Date	04/27/2013 20:58			04/27/2013 22:01			04/27/2013 22:20		
		Matrix	Water			Water			Water		
SW-846 1312/8260B		**Units**		ug/L	**Spike**	**Result**		**Control**	**Result**			**RPD**
		Result		**RDL**	**Added**		**% R**	**Limits % R**		**% R**	**RPD**	**Limit**
100-41-4	Ethylbenzene	0.00		0.109	50.0	54.8	110	74 - 126	48.2	96	13	30
1330-20-7	Xylene (total)	0.00		0.179	150	171	114	74 - 127	149	99	14	30
71-43-2	Benzene	0.00		0.111	50.0	55.6	111	70 - 129	49.0	98	13	21
108-88-3	Toluene	0.00		0.122	50.0	57.0	114	72 - 120	51.3	103	11	21
Surrogate												
460-00-4	4-Bromofluorobenzene				50	49	98	78 - 130	49.6	99		
1868-53-7	Dibromofluoromethane				50	50.3	101	77 - 127	51.2	102		
2037-26-5	Toluene d8				50	48.9	98	76 - 134	49.9	100		
17060-07-0	1,2-Dichloroethane-d4				50	48.4	97	71 - 127	49.4	99		

General Chromatography Quality Control Summary

Analytical Batch	506243	**Client ID**	MB506243	LCS506243	LCSD506243
Prep Batch	N/A	**GCAL ID**	1186568	1186569	1186574
		Sample Type	Method Blank	LCS	LCSD
		Analytical Date	04/29/2013 19:00	04/29/2013 18:20	04/29/2013 18:40
		Matrix	Water	Water	Water

SW-846 1312/8015C GRO		**Units**	mg/L	**Spike**	**Result**		**Control**	**Result**			
		Result	**RDL**	**Added**		**% R**	**Limits % R**		**% R**	**RPD**	**RPD Limit**
8006-61-9	Gasoline Range Organics	0.013U	0.013	0.500	0.469	94	50 - 162	0.444	89	5	25
Surrogate											
106-39-8	Bromochlorobenzene	30.6	102	30	30.3	101	49 - 136	31.4	105		

Analytical Batch	506250	**Client ID**	MB506049	LCS506049	LCSD506049
Prep Batch	506049	**GCAL ID**	1185607	1185608	1185609
Prep Method	SW-846	**Sample Type**	Method Blank	LCS	LCSD
	3510C	**Prep Date**	04/26/2013 06:45	04/26/2013 06:45	04/26/2013 06:45
		Analytical Date	04/26/2013 11:08	04/26/2013 11:23	04/26/2013 11:38
		Matrix	Water	Water	Water

SW-846 1312/8015C DRO		**Units**	mg/L	**Spike**	**Result**		**Control**	**Result**			
		Result	**RDL**	**Added**		**% R**	**Limits % R**		**% R**	**RPD**	**RPD Limit**
GCSV-00-4	Diesel Range Organics	0.044U	0.044	1.00	1.03	103	50 - 150	0.929	93	10	40
Surrogate											
84-15-1	o-Terphenyl	45.9	92	50	50.9	102	60 - 140	47.5	95		

Analytical Batch	506250	**Client ID**	SS-01 A	1184364MS
Prep Batch	506049	**GCAL ID**	21304220801	1185744
Prep Method	SW-846	**Sample Type**	SAMPLE	MS
	3510C	**Prep Date**	04/26/2013 06:45	04/26/2013 06:45
		Analytical Date	04/26/2013 16:40	04/26/2013 16:55
		Matrix	Solid	Solid

SW-846 1312/8015C DRO		**Units**	mg/L	**Spike**	**Result**		**Control**
		Result	**RDL**	**Added**		**% R**	**Limits % R**
GCSV-00-4	Diesel Range Organics	0.043	0.044	1.00	0.911	87	50 - 150
Surrogate							
84-15-1	o-Terphenyl			50	51.1	102	60 - 140

Inorganics Quality Control Summary

Analytical Batch	506282	**Client ID**	MB506107		LCS506107		
Prep Batch	506107	**GCAL ID**	1185880		1185881		
Prep Method	SW-846	**Sample Type**	Method Blank		LCS		
	3010A	**Prep Date**	04/26/2013 15:50		04/26/2013 15:50		
		Analytical Date	04/29/2013 22:33		04/29/2013 22:41		
		Matrix	Water		Water		
SW-846 1312/6020A SPLP		**Units**	ug/L	**Spike**	**Result**		**Control**
		Result	**RDL**	**Added**		**% R**	**Limits % R**
7440-38-2	Arsenic	0.094U	0.094	50.0	52.8	106	80 - 120

Analytical Batch	506282	**Client ID**	460-013		1185115MS			1185115MSD				
Prep Batch	506107	**GCAL ID**	21304241903		1186133			1186134				
Prep Method	SW-846	**Sample Type**	SAMPLE		MS			MSD				
	3010A	**Prep Date**	04/26/2013 15:50		04/26/2013 15:50			04/26/2013 15:50				
		Analytical Date	04/30/2013 01:17		04/30/2013 01:25			04/30/2013 01:56				
		Matrix	Solid		Solid			Solid				
SW-846 1312/6020A SPLP		**Units**	ug/L	**Spike**	**Result**		**Control**	**Result**				**RPD**
		Result	**RDL**	**Added**		**% R**	**Limits % R**		**% R**	**RPD**		**Limit**
7440-38-2	Arsenic	3.47		50.0	57.2	107	80 - 120	56.3	106	2		20

GCAL

GULF COAST ANALYTICAL LABORATORIES, INC

7979 GSRI AVE, BATON ROUGE LA 70820-7402
(225) 769-4900 FAX (225) 767-5717

Chain of Custody Record

Lab use only			
KEMRON	4794	213042419	04/29/13
Client Name	Client #	Group#	Due Date

1 of 2

Report to:
Client: Kemron Environmental Svcs.
Address: 1359-A Ellsworth Ind. Blvd
Atlanta, Ga. 30318
Contact: Tommy Jordan
Phone: 404-601-6908
Fax: 404-636-7162

Bill to:
Client: Kemron Environmental Svcs.
Address: 1359-A Ellsworth Ind. Blvd.
Atlanta, Ga. 30318
Contact: Tommy Jordan
Phone: 404-601-6908
Fax: 404-636-7162

P.O. Number: SH0460

Project Name/Number: Quanta / SH0460

Sampled By: Tomecia Riley

Analytical Requests & Methods

Matrix	Date	Time (2400)	Comp	Grab	Sample Description	Preservatives	No. Containers	SPLP Arsenic 1312/6010	SPLP TPH(GRO/DRO) (1312/8015)	SPLP BTEX	SPLP PAH's	Remarks:	Lab ID 04/24
S	4/23/13	1015		X	460-011	None	2	X	X	X	X		1
~~S~~		~~1025~~		~~X~~	~~460-012~~		~~2~~	~~X~~	~~X~~				2
S		1035		X	460-013		2	X	X	X	X		3
S		1045		X	460-014		2	X	X	X	X		4
S		1055		X	460-015		2	X	X	X	X		5
S		1105		X	460-016		2	X	X	X	X		6
S		1115		X	460-017		2	X	X	X	X		7
S		1125		X	460-018		2	X	X	X	X		8
S		1215		X	460-019		2	X	X	X	X		9
S		1225		X	460-020		2	X	X	X	X		10

Turn Around Time: ___ 24 - 48 hrs ___ 3 days ___ 1 week X standard other 5.4

Relinquished by: (Signature)	Received by: (Signature)	Date:	Time:
Tomecia Riley		4-23-13	1450
Relinquished by: (Signature)	Received by: (Signature)	Date:	Time:
[illegible]	[illegible]	4.24.13	09:35
Relinquished by: (Signature)	Received by: (Signature)	Date:	Time:

Note: 995 9325 3759 (E-20)

By submitting these samples, you agree to the terms and conditions contained in our most recent schedule of services.

Matrix: W = water, S=Soil, SD=Solid, L=Liquid, SL=Sludge, O=Oil, CT=Charcoal Tube, OVM=Organic Vapor Monitor, XT=XAD Tube, A=Air Bag, SUM=Summa Canister

GCAL

GULF COAST ANALYTICAL LABORATORIES, INC

7979 GSRI AVE, BATON ROUGE LA 70820-7402
(225) 769-4900 FAX (225) 767-5717

Chain of Custody Record

Lab use only			
KEMRON	4794	213042419	04/29/13
Client Name	Client #	Group#	Due Date

2 of 2

Report to:
Client: Kemron Environmental Svcs.
Address: 1359-A Ellsworth Ind. Blvd. Atlanta, Ga. 30318
Contact: Tommy Jordan
Phone: 404-601-6908
Fax: 404-636-7162

Bill to:
Client: Kemron Environmental Svcs.
Address: 1359-A Ellsworth Ind. Blvd. Atlanta, Ga. 30318
Contact: Tommy Jordan
Phone: 404-601-6908
Fax: 404-636-7162

P.O. Number: SH0460
Project Name/Number: Quanta / SH0460
Sampled By: Tomecia Riley

Analytical Requests & Methods: SPLP Arsenic 1312/6010; SPLP TPH (GRO/DRO) 1312/8015; SPLP BTEX; ~~SPLP PAHs~~ AWC 4/25/13

Matrix	Date	Time (2400)	Comp	Grab	Sample Description	Preservatives	No. Containers	SPLP Arsenic 1312/6010	SPLP TPH (GRO/DRO) 1312/8015	SPLP BTEX	~~SPLP PAHs~~	Remarks:	Lab ID 04/24
~~S~~	~~4/23/13~~	~~1235~~		~~X~~	~~460-021~~	~~None~~	~~2~~	~~X~~	~~X~~				11
S	↓	1245		X	460-022	↓	2	X	X	X	X		12
S	↓	1255		X	460-023	↓	2	X	X	X	X		13
~~S~~	~~↓~~	~~1305~~		~~X~~	~~460-024~~	~~↓~~	~~1~~	~~X~~	~~X~~				14

Turn Around Time: ___ 24 - 48 hrs ___ 3 days ___ 1 week X standard other 5.4

Relinquished by: (Signature)	Received by: (Signature)	Date:	Time:
Tomecia Riley		4-23-13	1450
Fedex	Britton [signature]	4.24.13	09:35

Note: 7995 9325 3759 (E-20)

By submitting these samples, you agree to the terms and conditions contained in our most recent schedule of services.

Matrix: W = water, S=Soil, SD=Solid, L=Liquid, SL=Sludge, O=Oil, CT=Charcoal Tube, OVM=Organic Vapor Monitor, XT=XAD Tube, A=Air Bag, SUM=Summa Canister

GCAL ANALYTICAL LABORATORIES, LLC

SAMPLE RECEIVING CHECKLIST

213042419

SAMPLE DELIVERY GROUP	213042419
Client 4794 - KEMRON	**Transport Method** FEDEX
Profile Number 238840	**Received By** Law, Brittany P.
Line Item(s) 1 - Soil	**Receive Date(s)** 04/24/13

CHECKLIST

	Yes	No	NA
Were all samples received using proper thermal preservation?	☑	☐	☐
When used, were all custody seals intact?	☑	☐	☐
Were all samples received in proper containers?	☑	☐	☐
Were all samples received using proper chemical preservation?	☑	☐	☐
Was preservative added to any container at the lab?	☐	☑	☐
Were all containers received in good condition?	☑	☐	☐
Were all VOA vials received with no head space?	☐	☐	☑
Do all sample labels match the Chain of Custody?	☑	☐	☐
Did the Chain of Custody list the sampling technician?	☑	☐	☐
Was the COC maintained i.e. all signatures, dates and time of receipt included?	☑	☐	☐

COOLERS

Airbill	Temp(oC)
7995 9325 3759	5.4 (E-20)

DISCREPANCIES

None

LABORATORY PRESERVATIONS

None

NOTES

NELAP CERTIFICATE NUMBER 01955
DOD ELAP CERTIFICATE NUMBER ADE - 1482

ANALYTICAL RESULTS

PERFORMED BY

GULF COAST ANALYTICAL LABORATORIES, INC.

7979 GSRI Avenue

Baton Rouge, LA 70820

Report Date 05/09/2013

GCAL Report 213050413

Deliver To	KEMRON 1359A Ellsworth Industrial Blv Atlanta, GA 30318 404-601-6927
Attn	Tommy Jordan

Project Quanta

CASE NARRATIVE

Client: KEMRON **Report:** 213050413

Gulf Coast Analytical Laboratories received and analyzed the sample(s) listed on the sample cross-reference page of this report. Receipt of the sample(s) is documented by the attached chain of custody. This applies only to the sample(s) listed in this report. No sample integrity or quality control exceptions were identified unless noted below.

SEMI-VOLATILES MASS SPECTROMETRY

In the SW-846 8270D analysis, samples 21305041323 (0461-020 24HR), 21305041313 (460-016 24 HR) and 21305041317 (0461-020 7 HR) had to be diluted to bracket the concentration of target compounds within the calibration range of the instrument. This is reflected in elevated detection limits.

MISCELLANEOUS

Sample 21305041306 (460-013 7 HR) was received with a minimal volume of sample.

Laboratory Endorsement

Sample analysis was performed in accordance with approved methodologies provided by the Environmental Protection Agency or other recognized agencies. The samples and their corresponding extracts will be maintained for a period of 30 days unless otherwise arranged. Following this retention period the samples will be disposed in accordance with GCAL's Standard Operating Procedures.

Common Abbreviations Utilized in this Report

ND	Indicates the result was Not Detected at the specified RDL
DO	Indicates the result was Diluted Out
MI	Indicates the result was subject to Matrix Interference
TNTC	Indicates the result was Too Numerous To Count
SUBC	Indicates the analysis was Sub-Contracted
FLD	Indicates the analysis was performed in the Field
PQL	Practical Quantitation Limit
MDL	Method Detection Limit
RDL	Reporting Detection Limit
00:00	Reported as a time equivalent to 12:00 AM

Reporting Flags Utilized in this Report

J	Indicates the result is between the MDL and RDL
U	Indicates the compound was analyzed for but not detected
B	Indicates the analyte was detected in the associated Method Blank

Sample receipt at GCAL is documented through the attached chain of custody. In accordance with NELAC, this report shall be reproduced only in full and with the written permission of GCAL. The results contained within this report relate only to the samples reported. The documented results are presented within this report.

This report pertains only to the samples listed in the Report Sample Summary and should be retained as a permanent record thereof. The results contained within this report are intended for the use of the client. Any unauthorized use of the information contained in this report is prohibited.

I certify that this data package is in compliance with the NELAC standard and terms and conditions of the contract and Statement of Work both technically and for completeness, for other than the conditions in the case narrative. Release of the data contained in this hardcopy data package and in the computer-readable data submitted has been authorized by the Quality Assurance Manager or his/her designee, as verified by the following signature.

Estimated uncertainty of measurement is available upon request. This report is in compliance with the DOD QSM as specified in the contract if applicable.

_____

Authorized Signature
GCAL REPORT 213050413

THIS REPORT CONTAINS _____ PAGES.

Report Sample Summary

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21305041301	460-013 2 HR	Water	05/02/2013 11:05	05/04/2013 09:45
21305041302	460-014 2 HR	Water	05/02/2013 11:10	05/04/2013 09:45
21305041303	460-016 2 HR	Water	05/02/2013 11:15	05/04/2013 09:45
21305041304	460-019 2 HR	Water	05/02/2013 11:20	05/04/2013 09:45
21305041305	460-020 2 HR	Water	05/02/2013 11:25	05/04/2013 09:45
21305041306	460-013 7 HR	Water	05/02/2013 16:05	05/04/2013 09:45
21305041307	460-014 7 HR	Water	05/02/2013 16:10	05/04/2013 09:45
21305041308	460-016 7 HR	Water	05/02/2013 16:15	05/04/2013 09:45
21305041309	460-019 7 HR	Water	05/02/2013 16:20	05/04/2013 09:45
21305041310	460-020 7 HR	Water	05/02/2013 16:25	05/04/2013 09:45
21305041311	460-013 24 HR	Water	05/03/2013 09:10	05/04/2013 09:45
21305041312	460-014 24 HR	Water	05/03/2013 09:15	05/04/2013 09:45
21305041313	460-016 24 HR	Water	05/03/2013 09:20	05/04/2013 09:45
21305041314	460-019 24 HR	Water	05/03/2013 09:25	05/04/2013 09:45
21305041315	460-020 24 HR	Water	05/03/2013 09:30	05/04/2013 09:45

Summary of Compounds Detected

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21305041301	**460-013 2 HR**	Water	05/02/2013 11:05	05/04/2013 09:45

SW-846 6020A

CAS#	Parameter	Result	RDL	MDL	Units
7440-38-2	Arsenic	0.40J	1.00	0.094	ug/L

SW-846 8270D

CAS#	Parameter	Result	RDL	MDL	Units
83-32-9	Acenaphthene	4.23J	10.0	0.377	ug/L
208-96-8	Acenaphthylene	0.411J	10.0	0.302	ug/L
120-12-7	Anthracene	1.65J	10.0	0.249	ug/L
56-55-3	Benzo(a)anthracene	0.886J	10.0	0.310	ug/L
205-99-2	Benzo(b)fluoranthene	0.613J	10.0	0.278	ug/L
207-08-9	Benzo(k)fluoranthene	0.306J	10.0	0.172	ug/L
218-01-9	Chrysene	0.929J	10.0	0.306	ug/L
206-44-0	Fluoranthene	3.17J	10.0	0.189	ug/L
86-73-7	Fluorene	3.40J	10.0	0.250	ug/L
91-20-3	Naphthalene	49.5	10.0	0.230	ug/L
85-01-8	Phenanthrene	8.90J	10.0	0.229	ug/L
129-00-0	Pyrene	2.68J	10.0	0.287	ug/L

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21305041302	**460-014 2 HR**	Water	05/02/2013 11:10	05/04/2013 09:45

SW-846 6020A

CAS#	Parameter	Result	RDL	MDL	Units
7440-38-2	Arsenic	0.18J	1.00	0.094	ug/L

SW-846 8270D

CAS#	Parameter	Result	RDL	MDL	Units
83-32-9	Acenaphthene	3.37J	10.0	0.377	ug/L
120-12-7	Anthracene	0.602J	10.0	0.249	ug/L
206-44-0	Fluoranthene	0.690J	10.0	0.189	ug/L
86-73-7	Fluorene	2.22J	10.0	0.250	ug/L
91-20-3	Naphthalene	71.1	10.0	0.230	ug/L
85-01-8	Phenanthrene	4.54J	10.0	0.229	ug/L
129-00-0	Pyrene	0.586J	10.0	0.287	ug/L

SW-846 8260B

CAS#	Parameter	Result	RDL	MDL	Units
71-43-2	Benzene	0.527J	1.00	0.111	ug/L
108-88-3	Toluene	0.983J	1.00	0.122	ug/L

Summary of Compounds Detected (con't)

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21305041303	**460-016 2 HR**	Water	05/02/2013 11:15	05/04/2013 09:45

SW-846 6020A

CAS#	Parameter	Result	RDL	MDL	Units
7440-38-2	Arsenic	0.32J	1.00	0.094	ug/L

SW-846 8270D

CAS#	Parameter	Result	RDL	MDL	Units
83-32-9	Acenaphthene	5.61J	10.0	0.377	ug/L
208-96-8	Acenaphthylene	0.509J	10.0	0.302	ug/L
120-12-7	Anthracene	1.18J	10.0	0.249	ug/L
206-44-0	Fluoranthene	1.95J	10.0	0.189	ug/L
86-73-7	Fluorene	3.49J	10.0	0.250	ug/L
91-20-3	Naphthalene	97.4	10.0	0.230	ug/L
85-01-8	Phenanthrene	7.93J	10.0	0.229	ug/L
129-00-0	Pyrene	2.08J	10.0	0.287	ug/L

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21305041304	**460-019 2 HR**	Water	05/02/2013 11:20	05/04/2013 09:45

SW-846 6020A

CAS#	Parameter	Result	RDL	MDL	Units
7440-38-2	Arsenic	3.04	1.00	0.094	ug/L

SW-846 8270D

CAS#	Parameter	Result	RDL	MDL	Units
91-20-3	Naphthalene	1.34J	11.6	0.267	ug/L
85-01-8	Phenanthrene	0.458J	11.6	0.266	ug/L

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21305041305	**460-020 2 HR**	Water	05/02/2013 11:25	05/04/2013 09:45

SW-846 6020A

CAS#	Parameter	Result	RDL	MDL	Units
7440-38-2	Arsenic	1.24	1.00	0.094	ug/L

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21305041306	**460-013 7 HR**	Water	05/02/2013 16:05	05/04/2013 09:45

SW-846 6020A

CAS#	Parameter	Result	RDL	MDL	Units
7440-38-2	Arsenic	0.20J	1.00	0.094	ug/L

Summary of Compounds Detected (con't)

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21305041306	**460-013 7 HR**	Water	05/02/2013 16:05	05/04/2013 09:45

SW-846 8270D

CAS#	Parameter	Result	RDL	MDL	Units
83-32-9	Acenaphthene	10.3J	16.1	0.589	ug/L
208-96-8	Acenaphthylene	0.738J	16.1	0.595	ug/L
120-12-7	Anthracene	2.24J	16.1	0.347	ug/L
56-55-3	Benzo(a)anthracene	0.902J	16.1	0.397	ug/L
218-01-9	Chrysene	0.699J	16.1	0.208	ug/L
206-44-0	Fluoranthene	3.08J	16.1	0.379	ug/L
86-73-7	Fluorene	6.20J	16.1	0.577	ug/L
91-20-3	Naphthalene	121	16.1	0.752	ug/L
85-01-8	Phenanthrene	13.5J	16.1	0.305	ug/L
129-00-0	Pyrene	2.99J	16.1	0.655	ug/L

SW-846 8260B

CAS#	Parameter	Result	RDL	MDL	Units
71-43-2	Benzene	0.831J	1.00	0.111	ug/L
108-88-3	Toluene	1.28	1.00	0.122	ug/L
1330-20-7	Xylene (total)	9.33	3.00	0.179	ug/L

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21305041307	**460-014 7 HR**	Water	05/02/2013 16:10	05/04/2013 09:45

SW-846 6020A

CAS#	Parameter	Result	RDL	MDL	Units
7440-38-2	Arsenic	0.12J	1.00	0.094	ug/L

SW-846 8270D

CAS#	Parameter	Result	RDL	MDL	Units
83-32-9	Acenaphthene	7.29J	10.0	0.365	ug/L
208-96-8	Acenaphthylene	0.635J	10.0	0.369	ug/L
120-12-7	Anthracene	1.43J	10.0	0.215	ug/L
206-44-0	Fluoranthene	1.69J	10.0	0.235	ug/L
86-73-7	Fluorene	4.95J	10.0	0.358	ug/L
91-20-3	Naphthalene	149	10.0	0.466	ug/L
85-01-8	Phenanthrene	10.1	10.0	0.189	ug/L
129-00-0	Pyrene	1.46J	10.0	0.406	ug/L

SW-846 8260B

CAS#	Parameter	Result	RDL	MDL	Units
71-43-2	Benzene	1.09	1.00	0.111	ug/L
108-88-3	Toluene	1.89	1.00	0.122	ug/L
100-41-4	Ethylbenzene	3.18	1.00	0.109	ug/L
1330-20-7	Xylene (total)	10.0	3.00	0.179	ug/L

Summary of Compounds Detected (con't)

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21305041308	**460-016 7 HR**	Water	05/02/2013 16:15	05/04/2013 09:45

SW-846 8270D

CAS#	Parameter	Result	RDL	MDL	Units
83-32-9	Acenaphthene	9.29J	10.0	0.365	ug/L
208-96-8	Acenaphthylene	0.722J	10.0	0.369	ug/L
120-12-7	Anthracene	1.50J	10.0	0.215	ug/L
206-44-0	Fluoranthene	2.16J	10.0	0.235	ug/L
86-73-7	Fluorene	6.01J	10.0	0.358	ug/L
91-20-3	Naphthalene	163	10.0	0.466	ug/L
85-01-8	Phenanthrene	11.8	10.0	0.189	ug/L
129-00-0	Pyrene	1.84J	10.0	0.406	ug/L

SW-846 8260B

CAS#	Parameter	Result	RDL	MDL	Units
71-43-2	Benzene	0.703J	1.00	0.111	ug/L
108-88-3	Toluene	1.44	1.00	0.122	ug/L
1330-20-7	Xylene (total)	9.57	3.00	0.179	ug/L

SW-846 6020A

CAS#	Parameter	Result	RDL	MDL	Units
7440-38-2	Arsenic	0.32J	1.00	0.094	ug/L

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21305041309	**460-019 7 HR**	Water	05/02/2013 16:20	05/04/2013 09:45

SW-846 8270D

CAS#	Parameter	Result	RDL	MDL	Units
91-20-3	Naphthalene	2.34J	10.0	0.466	ug/L
85-01-8	Phenanthrene	0.565J	10.0	0.189	ug/L

SW-846 6020A

CAS#	Parameter	Result	RDL	MDL	Units
7440-38-2	Arsenic	7.37	1.00	0.094	ug/L

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21305041310	**460-020 7 HR**	Water	05/02/2013 16:25	05/04/2013 09:45

SW-846 6020A

CAS#	Parameter	Result	RDL	MDL	Units
7440-38-2	Arsenic	2.57	1.00	0.094	ug/L

Summary of Compounds Detected (con't)

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21305041310	**460-020 7 HR**	Water	05/02/2013 16:25	05/04/2013 09:45

SW-846 8270D

CAS#	Parameter	Result	RDL	MDL	Units
91-20-3	Naphthalene	1.52J	10.0	0.466	ug/L
85-01-8	Phenanthrene	0.522J	10.0	0.189	ug/L

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21305041311	**460-013 24 HR**	Water	05/03/2013 09:10	05/04/2013 09:45

SW-846 6020A

CAS#	Parameter	Result	RDL	MDL	Units
7440-38-2	Arsenic	0.42J	1.00	0.094	ug/L

SW-846 8260B

CAS#	Parameter	Result	RDL	MDL	Units
71-43-2	Benzene	2.49	1.00	0.111	ug/L
108-88-3	Toluene	3.70	1.00	0.122	ug/L
100-41-4	Ethylbenzene	4.06	1.00	0.109	ug/L
1330-20-7	Xylene (total)	15.3	3.00	0.179	ug/L

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21305041312	**460-014 24 HR**	Water	05/03/2013 09:15	05/04/2013 09:45

SW-846 6020A

CAS#	Parameter	Result	RDL	MDL	Units
7440-38-2	Arsenic	0.29J	1.00	0.094	ug/L

SW-846 8260B

CAS#	Parameter	Result	RDL	MDL	Units
71-43-2	Benzene	3.22	1.00	0.111	ug/L
108-88-3	Toluene	5.40	1.00	0.122	ug/L
100-41-4	Ethylbenzene	5.48	1.00	0.109	ug/L
1330-20-7	Xylene (total)	16.9	3.00	0.179	ug/L

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21305041313	**460-016 24 HR**	Water	05/03/2013 09:20	05/04/2013 09:45

SW-846 6020A

CAS#	Parameter	Result	RDL	MDL	Units
7440-38-2	Arsenic	0.51J	1.00	0.094	ug/L

Summary of Compounds Detected (con't)

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21305041313	**460-016 24 HR**	Water	05/03/2013 09:20	05/04/2013 09:45

SW-846 8270D

CAS#	Parameter	Result	RDL	MDL	Units
83-32-9	Acenaphthene	25.8	10.0	0.365	ug/L
208-96-8	Acenaphthylene	1.82J	10.0	0.369	ug/L
120-12-7	Anthracene	4.50J	10.0	0.215	ug/L
206-44-0	Fluoranthene	4.69J	10.0	0.235	ug/L
86-73-7	Fluorene	17.3	10.0	0.358	ug/L
85-01-8	Phenanthrene	31.2	10.0	0.189	ug/L
129-00-0	Pyrene	4.09J	10.0	0.406	ug/L

SW-846 8270D

CAS#	Parameter	Result	RDL	MDL	Units
91-20-3	Naphthalene	468	40.0	1.86	ug/L

SW-846 8260B

CAS#	Parameter	Result	RDL	MDL	Units
71-43-2	Benzene	1.71	1.00	0.111	ug/L
108-88-3	Toluene	3.06	1.00	0.122	ug/L
100-41-4	Ethylbenzene	4.14	1.00	0.109	ug/L
1330-20-7	Xylene (total)	13.2	3.00	0.179	ug/L

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21305041314	**460-019 24 HR**	Water	05/03/2013 09:25	05/04/2013 09:45

SW-846 6020A

CAS#	Parameter	Result	RDL	MDL	Units
7440-38-2	Arsenic	16.8	1.00	0.094	ug/L

SW-846 8270D

CAS#	Parameter	Result	RDL	MDL	Units
83-32-9	Acenaphthene	0.542J	10.0	0.365	ug/L
206-44-0	Fluoranthene	0.261J	10.0	0.235	ug/L
91-20-3	Naphthalene	5.05J	10.0	0.466	ug/L
85-01-8	Phenanthrene	1.00J	10.0	0.189	ug/L

Summary of Compounds Detected (con't)

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21305041315	**460-020 24 HR**	Water	05/03/2013 09:30	05/04/2013 09:45

SW-846 6020A

CAS#	Parameter	Result	RDL	MDL	Units
7440-38-2	Arsenic	6.59	1.00	0.094	ug/L

SW-846 8270D

CAS#	Parameter	Result	RDL	MDL	Units
83-32-9	Acenaphthene	0.516J	10.0	0.365	ug/L
206-44-0	Fluoranthene	0.272J	10.0	0.235	ug/L
91-20-3	Naphthalene	3.48J	10.0	0.466	ug/L
85-01-8	Phenanthrene	1.02J	10.0	0.189	ug/L

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21305041301	**460-013 2 HR**	Water	05/02/2013 11:05	05/04/2013 09:45

SW-846 8260B

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
			1	05/05/2013 19:40	CGC	506692

CAS#	Parameter	Result	RDL	MDL	Units
71-43-2	Benzene	0.111U	1.00	0.111	ug/L
108-88-3	Toluene	0.122U	1.00	0.122	ug/L
100-41-4	Ethylbenzene	0.109U	1.00	0.109	ug/L
1330-20-7	Xylene (total)	0.179U	3.00	0.179	ug/L

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
460-00-4	4-Bromofluorobenzene	50	41.4	ug/L	83	78 - 130
1868-53-7	Dibromofluoromethane	50	52.1	ug/L	104	77 - 127
2037-26-5	Toluene d8	50	48.6	ug/L	97	76 - 134
17060-07-0	1,2-Dichloroethane-d4	50	59.7	ug/L	119	71 - 127

SW-846 8270D

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
05/05/2013 10:45	506663	SW-846 3510C	1	05/06/2013 13:24	JWM	506728

CAS#	Parameter	Result	RDL	MDL	Units
83-32-9	**Acenaphthene**	**4.23J**	**10.0**	**0.377**	**ug/L**
208-96-8	**Acenaphthylene**	**0.411J**	**10.0**	**0.302**	**ug/L**
120-12-7	**Anthracene**	**1.65J**	**10.0**	**0.249**	**ug/L**
56-55-3	**Benzo(a)anthracene**	**0.886J**	**10.0**	**0.310**	**ug/L**
50-32-8	Benzo(a)pyrene	0.051U	10.0	0.051	ug/L
205-99-2	**Benzo(b)fluoranthene**	**0.613J**	**10.0**	**0.278**	**ug/L**
191-24-2	Benzo(g,h,i)perylene	0.172U	10.0	0.172	ug/L
207-08-9	**Benzo(k)fluoranthene**	**0.306J**	**10.0**	**0.172**	**ug/L**
218-01-9	**Chrysene**	**0.929J**	**10.0**	**0.306**	**ug/L**
53-70-3	Dibenz(a,h)anthracene	0.135U	10.0	0.135	ug/L
206-44-0	**Fluoranthene**	**3.17J**	**10.0**	**0.189**	**ug/L**
86-73-7	**Fluorene**	**3.40J**	**10.0**	**0.250**	**ug/L**
193-39-5	Indeno(1,2,3-cd)pyrene	0.242U	10.0	0.242	ug/L
91-20-3	**Naphthalene**	**49.5**	**10.0**	**0.230**	**ug/L**
85-01-8	**Phenanthrene**	**8.90J**	**10.0**	**0.229**	**ug/L**
129-00-0	**Pyrene**	**2.68J**	**10.0**	**0.287**	**ug/L**

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
4165-60-0	Nitrobenzene-d5	50	42.5	ug/L	85	40 - 110
321-60-8	2-Fluorobiphenyl	50	44.3	ug/L	89	50 - 110
1718-51-0	Terphenyl-d14	50	50.5	ug/L	101	50 - 135

SW-846 6020A

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
05/05/2013 07:45	506674	SW-846 3010A	1	05/07/2013 00:31	MEM	506745

CAS#	Parameter	Result	RDL	MDL	Units
7440-38-2	**Arsenic**	**0.40J**	**1.00**	**0.094**	**ug/L**

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21305041302	**460-014 2 HR**	Water	05/02/2013 11:10	05/04/2013 09:45

SW-846 8260B

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
			1	05/05/2013 20:01	CGC	506692

CAS#	Parameter	Result	RDL	MDL	Units
71-43-2	**Benzene**	**0.527J**	**1.00**	**0.111**	**ug/L**
108-88-3	**Toluene**	**0.983J**	**1.00**	**0.122**	**ug/L**
100-41-4	Ethylbenzene	0.109U	1.00	0.109	ug/L
1330-20-7	Xylene (total)	0.179U	3.00	0.179	ug/L

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
460-00-4	4-Bromofluorobenzene	50	42.1	ug/L	84	78 - 130
1868-53-7	Dibromofluoromethane	50	51.6	ug/L	103	77 - 127
2037-26-5	Toluene d8	50	50.1	ug/L	100	76 - 134
17060-07-0	1,2-Dichloroethane-d4	50	56.4	ug/L	113	71 - 127

SW-846 8270D

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
05/05/2013 10:45	506663	SW-846 3510C	1	05/06/2013 13:43	JWM	506728

CAS#	Parameter	Result	RDL	MDL	Units
83-32-9	**Acenaphthene**	**3.37J**	**10.0**	**0.377**	**ug/L**
208-96-8	Acenaphthylene	0.302U	10.0	0.302	ug/L
120-12-7	**Anthracene**	**0.602J**	**10.0**	**0.249**	**ug/L**
56-55-3	Benzo(a)anthracene	0.310U	10.0	0.310	ug/L
50-32-8	Benzo(a)pyrene	0.051U	10.0	0.051	ug/L
205-99-2	Benzo(b)fluoranthene	0.278U	10.0	0.278	ug/L
191-24-2	Benzo(g,h,i)perylene	0.172U	10.0	0.172	ug/L
207-08-9	Benzo(k)fluoranthene	0.172U	10.0	0.172	ug/L
218-01-9	Chrysene	0.306U	10.0	0.306	ug/L
53-70-3	Dibenz(a,h)anthracene	0.135U	10.0	0.135	ug/L
206-44-0	**Fluoranthene**	**0.690J**	**10.0**	**0.189**	**ug/L**
86-73-7	**Fluorene**	**2.22J**	**10.0**	**0.250**	**ug/L**
193-39-5	Indeno(1,2,3-cd)pyrene	0.242U	10.0	0.242	ug/L
91-20-3	**Naphthalene**	**71.1**	**10.0**	**0.230**	**ug/L**
85-01-8	**Phenanthrene**	**4.54J**	**10.0**	**0.229**	**ug/L**
129-00-0	**Pyrene**	**0.586J**	**10.0**	**0.287**	**ug/L**

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
4165-60-0	Nitrobenzene-d5	50	38.9	ug/L	78	40 - 110
321-60-8	2-Fluorobiphenyl	50	42.9	ug/L	86	50 - 110
1718-51-0	Terphenyl-d14	50	50.8	ug/L	102	50 - 135

SW-846 6020A

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
05/05/2013 07:45	506674	SW-846 3010A	1	05/07/2013 00:37	MEM	506745

CAS#	Parameter	Result	RDL	MDL	Units
7440-38-2	**Arsenic**	**0.18J**	**1.00**	**0.094**	**ug/L**

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21305041303	**460-016 2 HR**	Water	05/02/2013 11:15	05/04/2013 09:45

SW-846 8260B

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
			1	05/05/2013 20:22	CGC	506692

CAS#	Parameter	Result	RDL	MDL	Units
71-43-2	Benzene	0.111U	1.00	0.111	ug/L
108-88-3	Toluene	0.122U	1.00	0.122	ug/L
100-41-4	Ethylbenzene	0.109U	1.00	0.109	ug/L
1330-20-7	Xylene (total)	0.179U	3.00	0.179	ug/L

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
460-00-4	4-Bromofluorobenzene	50	40.6	ug/L	81	78 - 130
1868-53-7	Dibromofluoromethane	50	51.8	ug/L	104	77 - 127
2037-26-5	Toluene d8	50	48.4	ug/L	97	76 - 134
17060-07-0	1,2-Dichloroethane-d4	50	58.3	ug/L	117	71 - 127

SW-846 8270D

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
05/05/2013 10:45	506663	SW-846 3510C	1	05/06/2013 14:23	JWM	506728

CAS#	Parameter	Result	RDL	MDL	Units
83-32-9	**Acenaphthene**	**5.61J**	**10.0**	**0.377**	**ug/L**
208-96-8	**Acenaphthylene**	**0.509J**	**10.0**	**0.302**	**ug/L**
120-12-7	**Anthracene**	**1.18J**	**10.0**	**0.249**	**ug/L**
56-55-3	Benzo(a)anthracene	0.310U	10.0	0.310	ug/L
50-32-8	Benzo(a)pyrene	0.051U	10.0	0.051	ug/L
205-99-2	Benzo(b)fluoranthene	0.278U	10.0	0.278	ug/L
191-24-2	Benzo(g,h,i)perylene	0.172U	10.0	0.172	ug/L
207-08-9	Benzo(k)fluoranthene	0.172U	10.0	0.172	ug/L
218-01-9	Chrysene	0.306U	10.0	0.306	ug/L
53-70-3	Dibenz(a,h)anthracene	0.135U	10.0	0.135	ug/L
206-44-0	**Fluoranthene**	**1.95J**	**10.0**	**0.189**	**ug/L**
86-73-7	**Fluorene**	**3.49J**	**10.0**	**0.250**	**ug/L**
193-39-5	Indeno(1,2,3-cd)pyrene	0.242U	10.0	0.242	ug/L
91-20-3	**Naphthalene**	**97.4**	**10.0**	**0.230**	**ug/L**
85-01-8	**Phenanthrene**	**7.93J**	**10.0**	**0.229**	**ug/L**
129-00-0	**Pyrene**	**2.08J**	**10.0**	**0.287**	**ug/L**

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
4165-60-0	Nitrobenzene-d5	50	37.6	ug/L	75	40 - 110
321-60-8	2-Fluorobiphenyl	50	41.8	ug/L	84	50 - 110
1718-51-0	Terphenyl-d14	50	48.7	ug/L	97	50 - 135

SW-846 6020A

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
05/05/2013 07:45	506674	SW-846 3010A	1	05/07/2013 00:44	MEM	506745

CAS#	Parameter	Result	RDL	MDL	Units
7440-38-2	**Arsenic**	**0.32J**	**1.00**	**0.094**	**ug/L**

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21305041304	**460-019 2 HR**	Water	05/02/2013 11:20	05/04/2013 09:45

SW-846 8260B

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
			1	05/05/2013 20:43	CGC	506692

CAS#	Parameter	Result	RDL	MDL	Units
71-43-2	Benzene	0.111U	1.00	0.111	ug/L
108-88-3	Toluene	0.122U	1.00	0.122	ug/L
100-41-4	Ethylbenzene	0.109U	1.00	0.109	ug/L
1330-20-7	Xylene (total)	0.179U	3.00	0.179	ug/L

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
460-00-4	4-Bromofluorobenzene	50	40.3	ug/L	81	78 - 130
1868-53-7	Dibromofluoromethane	50	51.5	ug/L	103	77 - 127
2037-26-5	Toluene d8	50	48.2	ug/L	96	76 - 134
17060-07-0	1,2-Dichloroethane-d4	50	58.6	ug/L	117	71 - 127

SW-846 8270D

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
05/05/2013 10:45	506663	SW-846 3510C	1	05/06/2013 14:42	JWM	506728

CAS#	Parameter	Result	RDL	MDL	Units
83-32-9	Acenaphthene	0.438U	11.6	0.438	ug/L
208-96-8	Acenaphthylene	0.351U	11.6	0.351	ug/L
120-12-7	Anthracene	0.290U	11.6	0.290	ug/L
56-55-3	Benzo(a)anthracene	0.360U	11.6	0.360	ug/L
50-32-8	Benzo(a)pyrene	0.059U	11.6	0.059	ug/L
205-99-2	Benzo(b)fluoranthene	0.323U	11.6	0.323	ug/L
191-24-2	Benzo(g,h,i)perylene	0.200U	11.6	0.200	ug/L
207-08-9	Benzo(k)fluoranthene	0.200U	11.6	0.200	ug/L
218-01-9	Chrysene	0.356U	11.6	0.356	ug/L
53-70-3	Dibenz(a,h)anthracene	0.157U	11.6	0.157	ug/L
206-44-0	Fluoranthene	0.220U	11.6	0.220	ug/L
86-73-7	Fluorene	0.291U	11.6	0.291	ug/L
193-39-5	Indeno(1,2,3-cd)pyrene	0.281U	11.6	0.281	ug/L
91-20-3	**Naphthalene**	**1.34J**	**11.6**	**0.267**	**ug/L**
85-01-8	**Phenanthrene**	**0.458J**	**11.6**	**0.266**	**ug/L**
129-00-0	Pyrene	0.334U	11.6	0.334	ug/L

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
4165-60-0	Nitrobenzene-d5	58.1	42.7	ug/L	73	40 - 110
321-60-8	2-Fluorobiphenyl	58.1	48.6	ug/L	84	50 - 110
1718-51-0	Terphenyl-d14	58.1	59	ug/L	101	50 - 135

SW-846 6020A

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
05/05/2013 07:45	506674	SW-846 3010A	1	05/07/2013 00:50	MEM	506745

CAS#	Parameter	Result	RDL	MDL	Units
7440-38-2	**Arsenic**	**3.04**	**1.00**	**0.094**	**ug/L**

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21305041305	**460-020 2 HR**	Water	05/02/2013 11:25	05/04/2013 09:45

SW-846 8260B

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
			1	05/05/2013 21:04	CLH	506692

CAS#	Parameter	Result	RDL	MDL	Units
71-43-2	Benzene	0.111U	1.00	0.111	ug/L
108-88-3	Toluene	0.122U	1.00	0.122	ug/L
100-41-4	Ethylbenzene	0.109U	1.00	0.109	ug/L
1330-20-7	Xylene (total)	0.179U	3.00	0.179	ug/L

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
460-00-4	4-Bromofluorobenzene	50	40.3	ug/L	81	78 - 130
1868-53-7	Dibromofluoromethane	50	52.3	ug/L	105	77 - 127
2037-26-5	Toluene d8	50	48.4	ug/L	97	76 - 134
17060-07-0	1,2-Dichloroethane-d4	50	59.4	ug/L	119	71 - 127

SW-846 8270D

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
05/05/2013 10:45	506663	SW-846 3510C	1	05/06/2013 15:02	JWM	506728

CAS#	Parameter	Result	RDL	MDL	Units
83-32-9	Acenaphthene	0.438U	11.6	0.438	ug/L
208-96-8	Acenaphthylene	0.351U	11.6	0.351	ug/L
120-12-7	Anthracene	0.290U	11.6	0.290	ug/L
56-55-3	Benzo(a)anthracene	0.360U	11.6	0.360	ug/L
50-32-8	Benzo(a)pyrene	0.059U	11.6	0.059	ug/L
205-99-2	Benzo(b)fluoranthene	0.323U	11.6	0.323	ug/L
191-24-2	Benzo(g,h,i)perylene	0.200U	11.6	0.200	ug/L
207-08-9	Benzo(k)fluoranthene	0.200U	11.6	0.200	ug/L
218-01-9	Chrysene	0.356U	11.6	0.356	ug/L
53-70-3	Dibenz(a,h)anthracene	0.157U	11.6	0.157	ug/L
206-44-0	Fluoranthene	0.220U	11.6	0.220	ug/L
86-73-7	Fluorene	0.291U	11.6	0.291	ug/L
193-39-5	Indeno(1,2,3-cd)pyrene	0.281U	11.6	0.281	ug/L
91-20-3	Naphthalene	0.267U	11.6	0.267	ug/L
85-01-8	Phenanthrene	0.266U	11.6	0.266	ug/L
129-00-0	Pyrene	0.334U	11.6	0.334	ug/L

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
4165-60-0	Nitrobenzene-d5	58.1	41.1	ug/L	71	40 - 110
321-60-8	2-Fluorobiphenyl	58.1	46.7	ug/L	80	50 - 110
1718-51-0	Terphenyl-d14	58.1	56.6	ug/L	97	50 - 135

SW-846 6020A

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
05/05/2013 07:45	506674	SW-846 3010A	1	05/07/2013 00:57	MEM	506745

CAS#	Parameter	Result	RDL	MDL	Units
7440-38-2	**Arsenic**	**1.24**	**1.00**	**0.094**	**ug/L**

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21305041306	**460-013 7 HR**	Water	05/02/2013 16:05	05/04/2013 09:45

SW-846 8260B

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
			1	05/05/2013 21:25	CLH	506692

CAS#	Parameter	Result	RDL	MDL	Units
71-43-2	**Benzene**	**0.831J**	**1.00**	**0.111**	**ug/L**
108-88-3	**Toluene**	**1.28**	**1.00**	**0.122**	**ug/L**
100-41-4	Ethylbenzene	0.109U	1.00	0.109	ug/L
1330-20-7	**Xylene (total)**	**9.33**	**3.00**	**0.179**	**ug/L**

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
460-00-4	4-Bromofluorobenzene	50	39.9	ug/L	80	78 - 130
1868-53-7	Dibromofluoromethane	50	51.8	ug/L	104	77 - 127
2037-26-5	Toluene d8	50	47.6	ug/L	95	76 - 134
17060-07-0	1,2-Dichloroethane-d4	50	56.6	ug/L	113	71 - 127

SW-846 8270D

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
05/05/2013 10:45	506663	SW-846 3510C	1	05/06/2013 15:22	JWM	506728

CAS#	Parameter	Result	RDL	MDL	Units
83-32-9	**Acenaphthene**	**10.3J**	**16.1**	**0.589**	**ug/L**
208-96-8	**Acenaphthylene**	**0.738J**	**16.1**	**0.595**	**ug/L**
120-12-7	**Anthracene**	**2.24J**	**16.1**	**0.347**	**ug/L**
56-55-3	**Benzo(a)anthracene**	**0.902J**	**16.1**	**0.397**	**ug/L**
50-32-8	Benzo(a)pyrene	0.274U	16.1	0.274	ug/L
205-99-2	Benzo(b)fluoranthene	0.298U	16.1	0.298	ug/L
191-24-2	Benzo(g,h,i)perylene	0.319U	16.1	0.319	ug/L
207-08-9	Benzo(k)fluoranthene	0.444U	16.1	0.444	ug/L
218-01-9	**Chrysene**	**0.699J**	**16.1**	**0.208**	**ug/L**
53-70-3	Dibenz(a,h)anthracene	0.345U	16.1	0.345	ug/L
206-44-0	**Fluoranthene**	**3.08J**	**16.1**	**0.379**	**ug/L**
86-73-7	**Fluorene**	**6.20J**	**16.1**	**0.577**	**ug/L**
193-39-5	Indeno(1,2,3-cd)pyrene	0.256U	16.1	0.256	ug/L
91-20-3	**Naphthalene**	**121**	**16.1**	**0.752**	**ug/L**
85-01-8	**Phenanthrene**	**13.5J**	**16.1**	**0.305**	**ug/L**
129-00-0	**Pyrene**	**2.99J**	**16.1**	**0.655**	**ug/L**

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
4165-60-0	Nitrobenzene-d5	80.6	66.7	ug/L	83	40 - 110
321-60-8	2-Fluorobiphenyl	80.6	70	ug/L	87	50 - 110
1718-51-0	Terphenyl-d14	80.6	85.9	ug/L	107	50 - 135

SW-846 6020A

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
05/05/2013 07:45	506674	SW-846 3010A	1	05/07/2013 01:03	MEM	506745

CAS#	Parameter	Result	RDL	MDL	Units
7440-38-2	**Arsenic**	**0.20J**	**1.00**	**0.094**	**ug/L**

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21305041307	**460-014 7 HR**	Water	05/02/2013 16:10	05/04/2013 09:45

SW-846 8260B

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
			1	05/05/2013 21:46	CLH	506692

CAS#	Parameter	Result	RDL	MDL	Units
71-43-2	**Benzene**	**1.09**	**1.00**	**0.111**	**ug/L**
108-88-3	**Toluene**	**1.89**	**1.00**	**0.122**	**ug/L**
100-41-4	**Ethylbenzene**	**3.18**	**1.00**	**0.109**	**ug/L**
1330-20-7	**Xylene (total)**	**10.0**	**3.00**	**0.179**	**ug/L**

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
460-00-4	4-Bromofluorobenzene	50	40.2	ug/L	80	78 - 130
1868-53-7	Dibromofluoromethane	50	51.5	ug/L	103	77 - 127
2037-26-5	Toluene d8	50	48.4	ug/L	97	76 - 134
17060-07-0	1,2-Dichloroethane-d4	50	57.3	ug/L	115	71 - 127

SW-846 8270D

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
05/05/2013 10:45	506663	SW-846 3510C	1	05/06/2013 16:01	JWM	506728

CAS#	Parameter	Result	RDL	MDL	Units
83-32-9	**Acenaphthene**	**7.29J**	**10.0**	**0.365**	**ug/L**
208-96-8	**Acenaphthylene**	**0.635J**	**10.0**	**0.369**	**ug/L**
120-12-7	**Anthracene**	**1.43J**	**10.0**	**0.215**	**ug/L**
56-55-3	Benzo(a)anthracene	0.246U	10.0	0.246	ug/L
50-32-8	Benzo(a)pyrene	0.170U	10.0	0.170	ug/L
205-99-2	Benzo(b)fluoranthene	0.185U	10.0	0.185	ug/L
191-24-2	Benzo(g,h,i)perylene	0.198U	10.0	0.198	ug/L
207-08-9	Benzo(k)fluoranthene	0.275U	10.0	0.275	ug/L
218-01-9	Chrysene	0.129U	10.0	0.129	ug/L
53-70-3	Dibenz(a,h)anthracene	0.214U	10.0	0.214	ug/L
206-44-0	**Fluoranthene**	**1.69J**	**10.0**	**0.235**	**ug/L**
86-73-7	**Fluorene**	**4.95J**	**10.0**	**0.358**	**ug/L**
193-39-5	Indeno(1,2,3-cd)pyrene	0.159U	10.0	0.159	ug/L
91-20-3	**Naphthalene**	**149**	**10.0**	**0.466**	**ug/L**
85-01-8	**Phenanthrene**	**10.1**	**10.0**	**0.189**	**ug/L**
129-00-0	**Pyrene**	**1.46J**	**10.0**	**0.406**	**ug/L**

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
4165-60-0	Nitrobenzene-d5	50	41.7	ug/L	83	40 - 110
321-60-8	2-Fluorobiphenyl	50	44.2	ug/L	88	50 - 110
1718-51-0	Terphenyl-d14	50	53.6	ug/L	107	50 - 135

SW-846 6020A

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
05/05/2013 07:45	506674	SW-846 3010A	1	05/07/2013 01:43	MEM	506745

CAS#	Parameter	Result	RDL	MDL	Units
7440-38-2	**Arsenic**	**0.12J**	**1.00**	**0.094**	**ug/L**

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21305041308	**460-016 7 HR**	Water	05/02/2013 16:15	05/04/2013 09:45

SW-846 8260B

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
			1	05/05/2013 22:07	CLH	506692

CAS#	Parameter	Result	RDL	MDL	Units
71-43-2	**Benzene**	**0.703J**	**1.00**	**0.111**	**ug/L**
108-88-3	**Toluene**	**1.44**	**1.00**	**0.122**	**ug/L**
100-41-4	Ethylbenzene	0.109U	1.00	0.109	ug/L
1330-20-7	**Xylene (total)**	**9.57**	**3.00**	**0.179**	**ug/L**

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
460-00-4	4-Bromofluorobenzene	50	40	ug/L	80	78 - 130
1868-53-7	Dibromofluoromethane	50	51.2	ug/L	102	77 - 127
2037-26-5	Toluene d8	50	49.1	ug/L	98	76 - 134
17060-07-0	1,2-Dichloroethane-d4	50	55.8	ug/L	112	71 - 127

SW-846 8270D

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
05/05/2013 10:45	506663	SW-846 3510C	1	05/06/2013 16:20	JWM	506728

CAS#	Parameter	Result	RDL	MDL	Units
83-32-9	**Acenaphthene**	**9.29J**	**10.0**	**0.365**	**ug/L**
208-96-8	**Acenaphthylene**	**0.722J**	**10.0**	**0.369**	**ug/L**
120-12-7	**Anthracene**	**1.50J**	**10.0**	**0.215**	**ug/L**
56-55-3	Benzo(a)anthracene	0.246U	10.0	0.246	ug/L
50-32-8	Benzo(a)pyrene	0.170U	10.0	0.170	ug/L
205-99-2	Benzo(b)fluoranthene	0.185U	10.0	0.185	ug/L
191-24-2	Benzo(g,h,i)perylene	0.198U	10.0	0.198	ug/L
207-08-9	Benzo(k)fluoranthene	0.275U	10.0	0.275	ug/L
218-01-9	Chrysene	0.129U	10.0	0.129	ug/L
53-70-3	Dibenz(a,h)anthracene	0.214U	10.0	0.214	ug/L
206-44-0	**Fluoranthene**	**2.16J**	**10.0**	**0.235**	**ug/L**
86-73-7	**Fluorene**	**6.01J**	**10.0**	**0.358**	**ug/L**
193-39-5	Indeno(1,2,3-cd)pyrene	0.159U	10.0	0.159	ug/L
91-20-3	**Naphthalene**	**163**	**10.0**	**0.466**	**ug/L**
85-01-8	**Phenanthrene**	**11.8**	**10.0**	**0.189**	**ug/L**
129-00-0	**Pyrene**	**1.84J**	**10.0**	**0.406**	**ug/L**

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
4165-60-0	Nitrobenzene-d5	50	42.5	ug/L	85	40 - 110
321-60-8	2-Fluorobiphenyl	50	44.1	ug/L	88	50 - 110
1718-51-0	Terphenyl-d14	50	51.7	ug/L	103	50 - 135

SW-846 6020A

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
05/10/2013 16:30	507079	SW-846 3010A	1	05/13/2013 13:51	MEM	507218

CAS#	Parameter	Result	RDL	MDL	Units
7440-38-2	**Arsenic**	**0.32J**	**1.00**	**0.094**	**ug/L**

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21305041309	**460-019 7 HR**	Water	05/02/2013 16:20	05/04/2013 09:45

SW-846 8260B

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
			1	05/05/2013 22:28	CLH	506692

CAS#	Parameter	Result	RDL	MDL	Units
71-43-2	Benzene	0.111U	1.00	0.111	ug/L
108-88-3	Toluene	0.122U	1.00	0.122	ug/L
100-41-4	Ethylbenzene	0.109U	1.00	0.109	ug/L
1330-20-7	Xylene (total)	0.179U	3.00	0.179	ug/L

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
460-00-4	4-Bromofluorobenzene	50	40.6	ug/L	81	78 - 130
1868-53-7	Dibromofluoromethane	50	51.6	ug/L	103	77 - 127
2037-26-5	Toluene d8	50	48.5	ug/L	97	76 - 134
17060-07-0	1,2-Dichloroethane-d4	50	57.7	ug/L	115	71 - 127

SW-846 8270D

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
05/05/2013 10:45	506663	SW-846 3510C	1	05/06/2013 16:40	JWM	506728

CAS#	Parameter	Result	RDL	MDL	Units
83-32-9	Acenaphthene	0.365U	10.0	0.365	ug/L
208-96-8	Acenaphthylene	0.369U	10.0	0.369	ug/L
120-12-7	Anthracene	0.215U	10.0	0.215	ug/L
56-55-3	Benzo(a)anthracene	0.246U	10.0	0.246	ug/L
50-32-8	Benzo(a)pyrene	0.170U	10.0	0.170	ug/L
205-99-2	Benzo(b)fluoranthene	0.185U	10.0	0.185	ug/L
191-24-2	Benzo(g,h,i)perylene	0.198U	10.0	0.198	ug/L
207-08-9	Benzo(k)fluoranthene	0.275U	10.0	0.275	ug/L
218-01-9	Chrysene	0.129U	10.0	0.129	ug/L
53-70-3	Dibenz(a,h)anthracene	0.214U	10.0	0.214	ug/L
206-44-0	Fluoranthene	0.235U	10.0	0.235	ug/L
86-73-7	Fluorene	0.358U	10.0	0.358	ug/L
193-39-5	Indeno(1,2,3-cd)pyrene	0.159U	10.0	0.159	ug/L
91-20-3	**Naphthalene**	**2.34J**	**10.0**	**0.466**	**ug/L**
85-01-8	**Phenanthrene**	**0.565J**	**10.0**	**0.189**	**ug/L**
129-00-0	Pyrene	0.406U	10.0	0.406	ug/L

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
4165-60-0	Nitrobenzene-d5	50	39.2	ug/L	78	40 - 110
321-60-8	2-Fluorobiphenyl	50	44.1	ug/L	88	50 - 110
1718-51-0	Terphenyl-d14	50	51	ug/L	102	50 - 135

SW-846 6020A

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
05/10/2013 16:30	507079	SW-846 3010A	1	05/13/2013 13:58	MEM	507218

CAS#	Parameter	Result	RDL	MDL	Units
7440-38-2	**Arsenic**	**7.37**	**1.00**	**0.094**	**ug/L**

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21305041310	**460-020 7 HR**	Water	05/02/2013 16:25	05/04/2013 09:45

SW-846 8260B

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
			1	05/05/2013 22:48	CLH	506692

CAS#	Parameter	Result	RDL	MDL	Units
71-43-2	Benzene	0.111U	1.00	0.111	ug/L
108-88-3	Toluene	0.122U	1.00	0.122	ug/L
100-41-4	Ethylbenzene	0.109U	1.00	0.109	ug/L
1330-20-7	Xylene (total)	0.179U	3.00	0.179	ug/L

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
460-00-4	4-Bromofluorobenzene	50	39.4	ug/L	79	78 - 130
1868-53-7	Dibromofluoromethane	50	51.5	ug/L	103	77 - 127
2037-26-5	Toluene d8	50	48	ug/L	96	76 - 134
17060-07-0	1,2-Dichloroethane-d4	50	58.3	ug/L	117	71 - 127

SW-846 8270D

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
05/05/2013 10:45	506663	SW-846 3510C	1	05/06/2013 17:00	JWM	506728

CAS#	Parameter	Result	RDL	MDL	Units
83-32-9	Acenaphthene	0.365U	10.0	0.365	ug/L
208-96-8	Acenaphthylene	0.369U	10.0	0.369	ug/L
120-12-7	Anthracene	0.215U	10.0	0.215	ug/L
56-55-3	Benzo(a)anthracene	0.246U	10.0	0.246	ug/L
50-32-8	Benzo(a)pyrene	0.170U	10.0	0.170	ug/L
205-99-2	Benzo(b)fluoranthene	0.185U	10.0	0.185	ug/L
191-24-2	Benzo(g,h,i)perylene	0.198U	10.0	0.198	ug/L
207-08-9	Benzo(k)fluoranthene	0.275U	10.0	0.275	ug/L
218-01-9	Chrysene	0.129U	10.0	0.129	ug/L
53-70-3	Dibenz(a,h)anthracene	0.214U	10.0	0.214	ug/L
206-44-0	Fluoranthene	0.235U	10.0	0.235	ug/L
86-73-7	Fluorene	0.358U	10.0	0.358	ug/L
193-39-5	Indeno(1,2,3-cd)pyrene	0.159U	10.0	0.159	ug/L
91-20-3	**Naphthalene**	**1.52J**	**10.0**	**0.466**	**ug/L**
85-01-8	**Phenanthrene**	**0.522J**	**10.0**	**0.189**	**ug/L**
129-00-0	Pyrene	0.406U	10.0	0.406	ug/L

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
4165-60-0	Nitrobenzene-d5	50	36.7	ug/L	73	40 - 110
321-60-8	2-Fluorobiphenyl	50	43.2	ug/L	86	50 - 110
1718-51-0	Terphenyl-d14	50	52	ug/L	104	50 - 135

SW-846 6020A

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
05/05/2013 07:45	506674	SW-846 3010A	1	05/07/2013 02:15	MEM	506745

CAS#	Parameter	Result	RDL	MDL	Units
7440-38-2	**Arsenic**	**2.57**	**1.00**	**0.094**	**ug/L**

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21305041311	**460-013 24 HR**	Water	05/03/2013 09:10	05/04/2013 09:45

SW-846 8260B

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
			1	05/05/2013 23:09	CLH	506692

CAS#	Parameter	Result	RDL	MDL	Units
71-43-2	**Benzene**	**2.49**	**1.00**	**0.111**	**ug/L**
108-88-3	**Toluene**	**3.70**	**1.00**	**0.122**	**ug/L**
100-41-4	**Ethylbenzene**	**4.06**	**1.00**	**0.109**	**ug/L**
1330-20-7	**Xylene (total)**	**15.3**	**3.00**	**0.179**	**ug/L**

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
460-00-4	4-Bromofluorobenzene	50	41.3	ug/L	83	78 - 130
1868-53-7	Dibromofluoromethane	50	52.1	ug/L	104	77 - 127
2037-26-5	Toluene d8	50	47.5	ug/L	95	76 - 134
17060-07-0	1,2-Dichloroethane-d4	50	58.6	ug/L	117	71 - 127

SW-846 6020A

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
05/05/2013 07:45	506674	SW-846 3010A	1	05/07/2013 02:22	MEM	506745

CAS#	Parameter	Result	RDL	MDL	Units
7440-38-2	**Arsenic**	**0.42J**	**1.00**	**0.094**	**ug/L**

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21305041312	**460-014 24 HR**	Water	05/03/2013 09:15	05/04/2013 09:45

SW-846 8260B

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
			1	05/05/2013 23:30	CLH	506692

CAS#	Parameter	Result	RDL	MDL	Units
71-43-2	**Benzene**	**3.22**	**1.00**	**0.111**	**ug/L**
108-88-3	**Toluene**	**5.40**	**1.00**	**0.122**	**ug/L**
100-41-4	**Ethylbenzene**	**5.48**	**1.00**	**0.109**	**ug/L**
1330-20-7	**Xylene (total)**	**16.9**	**3.00**	**0.179**	**ug/L**

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
460-00-4	4-Bromofluorobenzene	50	41.7	ug/L	83	78 - 130
1868-53-7	Dibromofluoromethane	50	51.2	ug/L	102	77 - 127
2037-26-5	Toluene d8	50	47.5	ug/L	95	76 - 134
17060-07-0	1,2-Dichloroethane-d4	50	57.8	ug/L	116	71 - 127

SW-846 6020A

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
05/05/2013 07:45	506674	SW-846 3010A	1	05/07/2013 02:28	MEM	506745

CAS#	Parameter	Result	RDL	MDL	Units
7440-38-2	**Arsenic**	**0.29J**	**1.00**	**0.094**	**ug/L**

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21305041313	**460-016 24 HR**	Water	05/03/2013 09:20	05/04/2013 09:45

SW-846 8260B

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
			1	05/05/2013 23:51	CLH	506692

CAS#	Parameter	Result	RDL	MDL	Units
71-43-2	**Benzene**	**1.71**	**1.00**	**0.111**	**ug/L**
108-88-3	**Toluene**	**3.06**	**1.00**	**0.122**	**ug/L**
100-41-4	**Ethylbenzene**	**4.14**	**1.00**	**0.109**	**ug/L**
1330-20-7	**Xylene (total)**	**13.2**	**3.00**	**0.179**	**ug/L**

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
460-00-4	4-Bromofluorobenzene	50	41.3	ug/L	83	78 - 130
1868-53-7	Dibromofluoromethane	50	52.1	ug/L	104	77 - 127
2037-26-5	Toluene d8	50	48	ug/L	96	76 - 134
17060-07-0	1,2-Dichloroethane-d4	50	58	ug/L	116	71 - 127

SW-846 8270D

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
05/05/2013 10:45	506663	SW-846 3510C	1	05/06/2013 17:19	JWM	506728

CAS#	Parameter	Result	RDL	MDL	Units
83-32-9	**Acenaphthene**	**25.8**	**10.0**	**0.365**	**ug/L**
208-96-8	**Acenaphthylene**	**1.82J**	**10.0**	**0.369**	**ug/L**
120-12-7	**Anthracene**	**4.50J**	**10.0**	**0.215**	**ug/L**
56-55-3	Benzo(a)anthracene	0.246U	10.0	0.246	ug/L
50-32-8	Benzo(a)pyrene	0.170U	10.0	0.170	ug/L
205-99-2	Benzo(b)fluoranthene	0.185U	10.0	0.185	ug/L
191-24-2	Benzo(g,h,i)perylene	0.198U	10.0	0.198	ug/L
207-08-9	Benzo(k)fluoranthene	0.275U	10.0	0.275	ug/L
218-01-9	Chrysene	0.129U	10.0	0.129	ug/L
53-70-3	Dibenz(a,h)anthracene	0.214U	10.0	0.214	ug/L
206-44-0	**Fluoranthene**	**4.69J**	**10.0**	**0.235**	**ug/L**
86-73-7	**Fluorene**	**17.3**	**10.0**	**0.358**	**ug/L**
193-39-5	Indeno(1,2,3-cd)pyrene	0.159U	10.0	0.159	ug/L
85-01-8	**Phenanthrene**	**31.2**	**10.0**	**0.189**	**ug/L**
129-00-0	**Pyrene**	**4.09J**	**10.0**	**0.406**	**ug/L**

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
4165-60-0	Nitrobenzene-d5	50	41.2	ug/L	82	40 - 110
321-60-8	2-Fluorobiphenyl	50	45.5	ug/L	91	50 - 110
1718-51-0	Terphenyl-d14	50	52.9	ug/L	106	50 - 135

SW-846 8270D

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
05/05/2013 10:45	506663	SW-846 3510C	4	05/07/2013 09:48	JWM	506790

CAS#	Parameter	Result	RDL	MDL	Units
91-20-3	**Naphthalene**	**468**	**40.0**	**1.86**	**ug/L**

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
4165-60-0	Nitrobenzene-d5	50	43.5	ug/L	87	40 - 110

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21305041313	**460-016 24 HR**	Water	05/03/2013 09:20	05/04/2013 09:45

SW-846 8270D

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
05/05/2013 10:45	506663	SW-846 3510C	4	05/07/2013 09:48	JWM	506790

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
321-60-8	2-Fluorobiphenyl	50	47.2	ug/L	94	50 - 110
1718-51-0	Terphenyl-d14	50	55.8	ug/L	112	50 - 135

SW-846 6020A

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
05/05/2013 07:45	506674	SW-846 3010A	1	05/07/2013 02:35	MEM	506745

CAS#	Parameter	Result	RDL	MDL	Units
7440-38-2	**Arsenic**	**0.51J**	**1.00**	**0.094**	**ug/L**

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21305041314	**460-019 24 HR**	Water	05/03/2013 09:25	05/04/2013 09:45

SW-846 8260B

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
			1	05/06/2013 00:12	CLH	506692

CAS#	Parameter	Result	RDL	MDL	Units
71-43-2	Benzene	0.111U	1.00	0.111	ug/L
108-88-3	Toluene	0.122U	1.00	0.122	ug/L
100-41-4	Ethylbenzene	0.109U	1.00	0.109	ug/L
1330-20-7	Xylene (total)	0.179U	3.00	0.179	ug/L

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
460-00-4	4-Bromofluorobenzene	50	41.7	ug/L	83	78 - 130
1868-53-7	Dibromofluoromethane	50	51.9	ug/L	104	77 - 127
2037-26-5	Toluene d8	50	48.8	ug/L	98	76 - 134
17060-07-0	1,2-Dichloroethane-d4	50	56.7	ug/L	113	71 - 127

SW-846 8270D

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
05/05/2013 10:45	506663	SW-846 3510C	1	05/06/2013 17:39	JWM	506728

CAS#	Parameter	Result	RDL	MDL	Units
83-32-9	**Acenaphthene**	**0.542J**	**10.0**	**0.365**	**ug/L**
208-96-8	Acenaphthylene	0.369U	10.0	0.369	ug/L
120-12-7	Anthracene	0.215U	10.0	0.215	ug/L
56-55-3	Benzo(a)anthracene	0.246U	10.0	0.246	ug/L
50-32-8	Benzo(a)pyrene	0.170U	10.0	0.170	ug/L
205-99-2	Benzo(b)fluoranthene	0.185U	10.0	0.185	ug/L
191-24-2	Benzo(g,h,i)perylene	0.198U	10.0	0.198	ug/L
207-08-9	Benzo(k)fluoranthene	0.275U	10.0	0.275	ug/L
218-01-9	Chrysene	0.129U	10.0	0.129	ug/L
53-70-3	Dibenz(a,h)anthracene	0.214U	10.0	0.214	ug/L
206-44-0	**Fluoranthene**	**0.261J**	**10.0**	**0.235**	**ug/L**
86-73-7	Fluorene	0.358U	10.0	0.358	ug/L
193-39-5	Indeno(1,2,3-cd)pyrene	0.159U	10.0	0.159	ug/L
91-20-3	**Naphthalene**	**5.05J**	**10.0**	**0.466**	**ug/L**
85-01-8	**Phenanthrene**	**1.00J**	**10.0**	**0.189**	**ug/L**
129-00-0	Pyrene	0.406U	10.0	0.406	ug/L

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
4165-60-0	Nitrobenzene-d5	50	35.3	ug/L	71	40 - 110
321-60-8	2-Fluorobiphenyl	50	39	ug/L	78	50 - 110
1718-51-0	Terphenyl-d14	50	53.6	ug/L	107	50 - 135

SW-846 6020A

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
05/05/2013 07:45	506674	SW-846 3010A	1	05/07/2013 02:42	MEM	506745

CAS#	Parameter	Result	RDL	MDL	Units
7440-38-2	**Arsenic**	**16.8**	**1.00**	**0.094**	**ug/L**

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21305041315	**460-020 24 HR**	Water	05/03/2013 09:30	05/04/2013 09:45

SW-846 8260B

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
			1	05/06/2013 00:33	CLH	506692

CAS#	Parameter	Result	RDL	MDL	Units
71-43-2	Benzene	0.111U	1.00	0.111	ug/L
108-88-3	Toluene	0.122U	1.00	0.122	ug/L
100-41-4	Ethylbenzene	0.109U	1.00	0.109	ug/L
1330-20-7	Xylene (total)	0.179U	3.00	0.179	ug/L

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
460-00-4	4-Bromofluorobenzene	50	39.7	ug/L	79	78 - 130
1868-53-7	Dibromofluoromethane	50	51.1	ug/L	102	77 - 127
2037-26-5	Toluene d8	50	48.1	ug/L	96	76 - 134
17060-07-0	1,2-Dichloroethane-d4	50	58.3	ug/L	117	71 - 127

SW-846 8270D

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
05/05/2013 10:45	506663	SW-846 3510C	1	05/06/2013 17:59	JWM	506728

CAS#	Parameter	Result	RDL	MDL	Units
83-32-9	**Acenaphthene**	**0.516J**	**10.0**	**0.365**	**ug/L**
208-96-8	Acenaphthylene	0.369U	10.0	0.369	ug/L
120-12-7	Anthracene	0.215U	10.0	0.215	ug/L
56-55-3	Benzo(a)anthracene	0.246U	10.0	0.246	ug/L
50-32-8	Benzo(a)pyrene	0.170U	10.0	0.170	ug/L
205-99-2	Benzo(b)fluoranthene	0.185U	10.0	0.185	ug/L
191-24-2	Benzo(g,h,i)perylene	0.198U	10.0	0.198	ug/L
207-08-9	Benzo(k)fluoranthene	0.275U	10.0	0.275	ug/L
218-01-9	Chrysene	0.129U	10.0	0.129	ug/L
53-70-3	Dibenz(a,h)anthracene	0.214U	10.0	0.214	ug/L
206-44-0	**Fluoranthene**	**0.272J**	**10.0**	**0.235**	**ug/L**
86-73-7	Fluorene	0.358U	10.0	0.358	ug/L
193-39-5	Indeno(1,2,3-cd)pyrene	0.159U	10.0	0.159	ug/L
91-20-3	**Naphthalene**	**3.48J**	**10.0**	**0.466**	**ug/L**
85-01-8	**Phenanthrene**	**1.02J**	**10.0**	**0.189**	**ug/L**
129-00-0	Pyrene	0.406U	10.0	0.406	ug/L

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
4165-60-0	Nitrobenzene-d5	50	37.6	ug/L	75	40 - 110
321-60-8	2-Fluorobiphenyl	50	42.1	ug/L	84	50 - 110
1718-51-0	Terphenyl-d14	50	52.5	ug/L	105	50 - 135

SW-846 6020A

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
05/05/2013 07:45	506674	SW-846 3010A	1	05/07/2013 03:08	MEM	506745

CAS#	Parameter	Result	RDL	MDL	Units
7440-38-2	**Arsenic**	**6.59**	**1.00**	**0.094**	**ug/L**

GC/MS Volatiles Quality Control Summary

Analytical Batch 506692	**Client ID**	MB506692	LCS506692	LCSD506692	
Prep Batch N/A	**GCAL ID**	1188871	1188872	1188873	
	Sample Type	Method Blank	LCS	LCSD	
	Analytical Date	05/05/2013 19:01	05/05/2013 17:58	05/05/2013 18:19	
	Matrix	Water	Water	Water	

SW-846 8260B		**Units**	ug/L	**Spike**	**Result**		**Control**	**Result**			**RPD**
		Result	**RDL**	**Added**		**% R**	**Limits % R**		**% R**	**RPD**	**Limit**
100-41-4	Ethylbenzene	0.109U	0.109	50.0	49.0	98	74 - 126	48.3	97	1	30
75-69-4	Trichlorofluoromethane	0.157U	0.157	50.0	58.3	117	72 - 136	61.1	122	5	30
96-12-8	1,2-Dibromo-3-chloropropane	0.194U	0.194	50.0	40.1	80	57 - 121	47.0	94	16	30
1330-20-7	Xylene (total)	0.179U	0.179	150	146	97	74 - 127	145	97	0.7	30
76-13-1	Trichlorotrifluoroethane	0.158U	0.158	50.0	54.8	110	72 - 136	54.5	109	0.5	30
71-43-2	Benzene	0.111U	0.111	50.0	52.0	104	70 - 129	53.8	108	3	20
108-88-3	Toluene	0.122U	0.122	50.0	49.4	99	72 - 120	50.5	101	2	20
Surrogate											
460-00-4	4-Bromofluorobenzene	41	82	50	45.1	90	78 - 130	43.4	87		
1868-53-7	Dibromofluoromethane	53.2	106	50	52.6	105	77 - 127	52.3	105		
2037-26-5	Toluene d8	48.9	98	50	46.2	92	76 - 134	47	94		
17060-07-0	1,2-Dichloroethane-d4	58.1	116	50	58.4	117	71 - 127	58.4	117		

GC/MS Semi-Volatiles Quality Control Summary

Analytical Batch	506728	**Client ID**	MB506663	LCS506663	LCSD506663
Prep Batch	506663	**GCAL ID**	1188749	1188750	1188751
Prep Method	SW-846	**Sample Type**	Method Blank	LCS	LCSD
	3510C	**Prep Date**	05/05/2013 10:45	05/05/2013 10:45	05/05/2013 10:45
		Analytical Date	05/06/2013 12:25	05/06/2013 12:44	05/06/2013 13:04
		Matrix	Water	Water	Water

SW-846 8270D		**Units**	ug/L	**Spike**	**Result**		**Control**	**Result**			**RPD**
		Result	**RDL**	**Added**		**% R**	**Limits % R**		**% R**	**RPD**	**Limit**
208-96-8	Acenaphthylene	0.302U	0.302	100	85.8	86	55 - 120	91.6	92	7	30
120-12-7	Anthracene	0.249U	0.249	100	92.5	93	58 - 120	93.3	93	0.9	30
56-55-3	Benzo(a)anthracene	0.310U	0.310	100	93.7	94	56 - 120	94.0	94	0.3	30
205-99-2	Benzo(b)fluoranthene	0.278U	0.278	100	94.4	94	55 - 120	97.8	98	4	30
207-08-9	Benzo(k)fluoranthene	0.172U	0.172	100	106	106	49 - 121	101	101	5	30
191-24-2	Benzo(g,h,i)perylene	0.172U	0.172	100	86.1	86	44 - 132	88.8	89	3	30
50-32-8	Benzo(a)pyrene	0.051U	0.051	100	93.7	94	56 - 120	99.6	100	6	30
218-01-9	Chrysene	0.306U	0.306	100	93.7	94	58 - 120	95.9	96	2	30
53-70-3	Dibenz(a,h)anthracene	0.135U	0.135	100	85.6	86	50 - 138	90.2	90	5	30
206-44-0	Fluoranthene	0.189U	0.189	100	94.9	95	55 - 120	97.3	97	2	30
86-73-7	Fluorene	0.250U	0.250	100	85.1	85	54 - 120	91.2	91	7	30
193-39-5	Indeno(1,2,3-cd)pyrene	0.242U	0.242	100	80.1	80	43 - 133	81.8	82	2	30
91-20-3	Naphthalene	0.466U	0.466	100	77.0	77	44 - 120	88.9	89	14	30
85-01-8	Phenanthrene	0.229U	0.229	100	92.9	93	58 - 120	95.3	95	3	30
83-32-9	Acenaphthene	0.377U	0.377	100	84.8	85	52 - 120	92.2	92	8	30
129-00-0	Pyrene	0.287U	0.287	100	104	104	54 - 120	96.3	96	8	30
Surrogate											
4165-60-0	Nitrobenzene-d5	37.8	76	50	44.1	88	40 - 110	42.8	86		
321-60-8	2-Fluorobiphenyl	41.7	83	50	46.6	93	50 - 110	46	92		
1718-51-0	Terphenyl-d14	54	108	50	55.9	112	50 - 135	49	98		

Inorganics Quality Control Summary

Analytical Batch	506745	**Client ID**	MB506674		LCS506674		
Prep Batch	506674	**GCAL ID**	1188812		1188813		
Prep Method	SW-846	**Sample Type**	Method Blank		LCS		
	3010A	**Prep Date**	05/05/2013 07:45		05/05/2013 07:45		
		Analytical Date	05/07/2013 00:17		05/07/2013 00:24		
		Matrix	Water		Water		
SW-846 6020A		**Units**	ug/L	**Spike**	**Result**		**Control**
		Result	**RDL**	**Added**		**% R**	**Limits % R**
7440-38-2	Arsenic	0.094U	0.094	50.0	51.9	104	80 - 120

Analytical Batch	506745	**Client ID**	460-014 7 HR		1188689MS			1188689MSD				
Prep Batch	506674	**GCAL ID**	21305041307		1188814			1188815				
Prep Method	SW-846	**Sample Type**	SAMPLE		MS			MSD				
	3010A	**Prep Date**	05/05/2013 07:45		05/05/2013 07:45			05/05/2013 07:45				
		Analytical Date	05/07/2013 01:43		05/07/2013 01:49			05/07/2013 01:56				
		Matrix	Water		Water			Water				
SW-846 6020A		**Units**	ug/L	**Spike**	**Result**		**Control**	**Result**				**RPD**
		Result	**RDL**	**Added**		**% R**	**Limits % R**		**% R**	**RPD**		**Limit**
7440-38-2	Arsenic	0.12	0.094	50.0	50.6	101	80 - 120	51.3	102	1		20

Analytical Batch	507218	**Client ID**	MB507079		LCS507079		
Prep Batch	507079	**GCAL ID**	1190606		1190607		
Prep Method	SW-846	**Sample Type**	Method Blank		LCS		
	3010A	**Prep Date**	05/10/2013 16:30		05/10/2013 16:30		
		Analytical Date	05/13/2013 13:36		05/13/2013 13:43		
		Matrix	Water		Water		
SW-846 6020A		**Units**	ug/L	**Spike**	**Result**		**Control**
		Result	**RDL**	**Added**		**% R**	**Limits % R**
7440-38-2	Arsenic	0.094U	0.094	50.0	52.4	105	80 - 120

Environmental Services Analysis Request/Chain of Custody

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1 of 2

KEMRON/4794/213050413/5/08/13

Acct. # _____ Group # _____ Sample # _____

Client: Kemron Environmental Services
Project Name/#: Quanta
Site ID #:
Project Manager: Tommy Jordan
P.O. #: SH0460
Sampler: Tomecia Riley
PWSID #:
Phone #: 404-601-6908
Quote #:
State where sample(s) were collected:

For Lab Use Only
SF #: _____
SCR #: _____

Preservation Codes: H = HCl, T = Thiosulfate, N = HNO_3, B = NaOH, S = H_2SO_4, P = H_3PO_4, O = Other

Sample Identification	Collection Date	Collection Time	Grab	Composite	Matrix: Soil	Matrix: Sediment	Matrix: Water (Potable / Ground / Surface / NPDES)	Matrix: Other:	Total # of Containers	Total BTEX 8260 (H)	Total PAH 8270 (H)	Total Arsenic 6010 (N)								Remarks
460-013 2hr	5/2/13	1105	X				X		5	X	X	X								1
460-014 2hr		1110	X				X		5	X	X	X								2
460-016 2hr		1115	X				X		5	X	X	X								3
460-019 2hr		1120	X				X		5	X	X	X								4
460-020 2hr		1125	X				X		5	X	X	X								5
460-013 7hr		1605	X				X		5	X	X	X								6
460-014 7hr		1610	X				X		5	X	X	X								7
460-018 7hr		1615	X				X		5	X	X	~~X~~ X	~~metals not received 5/10/13 BJM~~ *							8
460-019 7hr		1620	X				X		5	X	X	~~X~~ X	~~metals not received 5/10/13 BJM~~ *							9
460-020 7hr		1625	X				X		5	X	X	X								10

Turnaround Time Requested (TAT) (please check): Standard ☐ Rush ☒
(Rush TAT is subject to Lancaster Laboratories approval and surcharges.)

Date results are needed: ~~[illegible]~~ Wed 5/8/13

Rush results requested by (please check): E-Mail ☒ Phone ☐

E-mail Address: tjordan@kemron.com

Phone:

Data Package Options (please check if required)

Type I (Validation/non-CLP)	☐	MA MCP	☐
Type III (Reduced non-CLP)	☐	CT RCP	☐
Type IV (CLP SOW)	☐	TX TRRP-13	☐
Type VI (Raw Data Only)	☐		

EDD Required? Yes ☒ No ☐ If yes, format: Standard

Relinquished by:	Date	Time	Received by:	Date	Time
Tomecia Riley	5/3/13	1525			
Feder	5/4/13	0945	[signature]	5/4/13	0945

Relinquished by Commercial Carrier: 8758 2021 0098
UPS _____ FedEx X Other _____

Temperature upon receipt 2.8 (620) 3.4 °C

Issued by Dept. 40 Management
7045.01

* metals containers received 5/10/13 logged in per client BJM

Environmental Services Analysis Request/Chain of Custody

eurofins | Lancaster Laboratories

2 of 2

KEMRON/4794/213050413/5/18/13

Acct. # _____ Group # _____ Sample # _____

Client: Kemron Environmental

Project Name/#: Quanta | Site ID #:

Project Manager: Tommy Jordan | P.O. #: SH0460

Sampler: Tomecia Riley | PWSID #:

Phone #: 404-601-6908 | Quote #:

State where sample(s) were collected:

For Lab Use Only

SF #: _____

SCR #: _____

Preservation Codes

H = HCl, T = Thiosulfate, N = HNO_3, B = NaOH, S = H_2SO_4, P = H_3PO_4, O = Other

Sample Identification	Collection Date	Collection Time	Grab	Composite	Matrix: Soil	Matrix: Water (Potable / Ground / Surface / NPDES)	Other:	Total # of Containers	Total BTEX 8260 (H)	Total PAH 8270	Total Arsenic 6010 (N)		Remarks
460-013 24 hr	5/3/13	910	X			X		5	X	X	X	PAH broken @ receipt 5/8/13 BGM	11
460-014 24 hr	↓	915	X			X		5	X	X	X	PAH broken @ receipt 5/8/13 BGM	12
460-016 24 hr	↓	920	X			X		5	X	X	X		13
460-019 24 hr	↓	925	X			X		5	X	X	X		14
460-020 24 hr	↓	930	X			X		5	X	X	V		15

Turnaround Time Requested (TAT) (please check): Standard ☐ Rush ☒

(Rush TAT is subject to Lancaster Laboratories approval and surcharges.)

Date results are needed: [illegible] Wed 5/8/13

Rush results requested by (please check): E-Mail ☒ Phone ☐

E-mail Address: tjordan@kemron.com

Phone:

Data Package Options (please check if required)

Type I (Validation/non-CLP) ☐ MA MCP ☐

Type III (Reduced non-CLP) ☐ CT RCP ☐

Type IV (CLP SOW) ☐ TX TRRP-13 ☐

Type VI (Raw Data Only) ☐

EDD Required? Yes ☒ No ☐ If yes, format: Standard

Relinquished by:	Date	Time	Received by:	Date	Time
Tomecia Riley	5/3/13	1525			
Fedex	5/4/13	0945	[signature]	5/4/13	0945

Relinquished by Commercial Carrier: 8758 2001 0678 / 8758 2001 0656

UPS _____ FedEx X Other _____

Temperature upon receipt 2.8 3.4 (E20) °C

GCAL ANALYTICAL LABORATORIES, LLC

SAMPLE RECEIVING CHECKLIST

213050413

SAMPLE DELIVERY GROUP	213050413
Client 4794 - KEMRON	**Transport Method** FEDEX
Profile Number 238840	**Received By** Pfeifer, Ben J.
Line Item(s) 2 - Water BTEX/PAH/RCRA	**Receive Date(s)** 05/04/13

CHECKLIST

Were all samples received using proper thermal preservation?	☑ Yes	☐ No	☐ NA
When used, were all custody seals intact?	☑ Yes	☐ No	☐ NA
Were all samples received in proper containers?	☑ Yes	☐ No	☐ NA
Were all samples received using proper chemical preservation?	☑ Yes	☐ No	☐ NA
Was preservative added to any container at the lab?	☐ Yes	☑ No	☐ NA
Were all containers received in good condition?	☐ Yes	☑ No	☐ NA
Were all VOA vials received with no head space?	☐ Yes	☐ No	☑ NA
Do all sample labels match the Chain of Custody?	☑ Yes	☐ No	☐ NA
Did the Chain of Custody list the sampling technician?	☑ Yes	☐ No	☐ NA
Was the COC maintained i.e. all signatures, dates and time of receipt included?	☑ Yes	☐ No	☐ NA

COOLERS

Airbill	Temp(oC)
8758 2001 0678	2.8 (E20) 3.4 (E20)

DISCREPANCIES

21305041311 - 460-013 24 HR
- Broken Container

21305041306 - 460-013 7 HR
- Low sample volume

21305041312 - 460-014 24 HR
- Broken Container

LABORATORY PRESERVATIONS

None

NOTES	460-013 24 HR / 460-014 24 HR: 1 liter amber was broken upon receipt; none remain for PAH analysis. 4060-013 7 HR: half of a liter amber was received.

Revision 1.4

NELAP CERTIFICATE NUMBER 01955
DOD ELAP CERTIFICATE NUMBER ADE - 1482

ANALYTICAL RESULTS

PERFORMED BY

GULF COAST ANALYTICAL LABORATORIES, INC.

7979 GSRI Avenue

Baton Rouge, LA 70820

Report Date

GCAL Report 213050804

Deliver To	KEMRON 1359A Ellsworth Industrial Blv Atlanta, GA 30318 404-601-6927
Attn	Tommy Jordan

Project Quanta / SH0460

Laboratory Endorsement

Sample analysis was performed in accordance with approved methodologies provided by the Environmental Protection Agency or other recognized agencies. The samples and their corresponding extracts will be maintained for a period of 30 days unless otherwise arranged. Following this retention period the samples will be disposed in accordance with GCAL's Standard Operating Procedures.

Common Abbreviations Utilized in this Report

ND	Indicates the result was Not Detected at the specified RDL
DO	Indicates the result was Diluted Out
MI	Indicates the result was subject to Matrix Interference
TNTC	Indicates the result was Too Numerous To Count
SUBC	Indicates the analysis was Sub-Contracted
FLD	Indicates the analysis was performed in the Field
PQL	Practical Quantitation Limit
MDL	Method Detection Limit
RDL	Reporting Detection Limit
00:00	Reported as a time equivalent to 12:00 AM

Reporting Flags Utilized in this Report

J	Indicates the result is between the MDL and RDL
U	Indicates the compound was analyzed for but not detected
B	Indicates the analyte was detected in the associated Method Blank

Sample receipt at GCAL is documented through the attached chain of custody. In accordance with NELAC, this report shall be reproduced only in full and with the written permission of GCAL. The results contained within this report relate only to the samples reported. The documented results are presented within this report.

This report pertains only to the samples listed in the Report Sample Summary and should be retained as a permanent record thereof. The results contained within this report are intended for the use of the client. Any unauthorized use of the information contained in this report is prohibited.

I certify that this data package is in compliance with the NELAC standard and terms and conditions of the contract and Statement of Work both technically and for completeness, for other than the conditions in the case narrative. Release of the data contained in this hardcopy data package and in the computer-readable data submitted has been authorized by the Quality Assurance Manager or his/her designee, as verified by the following signature.

Estimated uncertainty of measurement is available upon request. This report is in compliance with the DOD QSM as specified in the contract if applicable.

_____

Authorized Signature
GCAL REPORT 213050804

THIS REPORT CONTAINS _____ PAGES.

Report Sample Summary

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21305080401	460-013 5 DAY	Water	05/07/2013 09:10	05/08/2013 09:20
21305080402	460-014 5 DAY	Water	05/07/2013 09:15	05/08/2013 09:20
21305080403	460-016 5 DAY	Water	05/07/2013 09:20	05/08/2013 09:20
21305080404	460-019 5 DAY	Water	05/07/2013 09:25	05/08/2013 09:20
21305080405	460-020 5 DAY	Water	05/07/2013 09:30	05/08/2013 09:20
21305080406	460-013 48 HR	Water	05/07/2013 15:25	05/08/2013 09:20
21305080407	460-014 48 HR	Water	05/07/2013 15:30	05/08/2013 09:20

Summary of Compounds Detected

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21305080401	**460-013 5 DAY**	Water	05/07/2013 09:10	05/08/2013 09:20

SW-846 6020A

CAS#	Parameter	Result	RDL	MDL	Units
7440-38-2	Arsenic	0.44J	1.00	0.094	ug/L

SW-846 8270D

CAS#	Parameter	Result	RDL	MDL	Units
83-32-9	Acenaphthene	17.5	10.0	0.365	ug/L
120-12-7	Anthracene	5.00J	10.0	0.215	ug/L
56-55-3	Benzo(a)anthracene	0.419J	10.0	0.246	ug/L
218-01-9	Chrysene	0.313J	10.0	0.129	ug/L
206-44-0	Fluoranthene	5.54J	10.0	0.235	ug/L
86-73-7	Fluorene	13.7	10.0	0.358	ug/L
91-20-3	Naphthalene	139	10.0	0.466	ug/L
85-01-8	Phenanthrene	32.3	10.0	0.189	ug/L
129-00-0	Pyrene	4.74J	10.0	0.406	ug/L

SW-846 8260B

CAS#	Parameter	Result	RDL	MDL	Units
71-43-2	Benzene	1.04	1.00	0.111	ug/L
108-88-3	Toluene	1.73	1.00	0.122	ug/L
100-41-4	Ethylbenzene	0.962J	1.00	0.109	ug/L
1330-20-7	Xylene (total)	3.86	3.00	0.179	ug/L

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21305080402	**460-014 5 DAY**	Water	05/07/2013 09:15	05/08/2013 09:20

SW-846 6020A

CAS#	Parameter	Result	RDL	MDL	Units
7440-38-2	Arsenic	0.43J	1.00	0.094	ug/L

SW-846 8270D

CAS#	Parameter	Result	RDL	MDL	Units
83-32-9	Acenaphthene	14.9	10.0	0.365	ug/L
120-12-7	Anthracene	4.12J	10.0	0.215	ug/L
56-55-3	Benzo(a)anthracene	0.424J	10.0	0.246	ug/L
218-01-9	Chrysene	0.342J	10.0	0.129	ug/L
206-44-0	Fluoranthene	5.15J	10.0	0.235	ug/L
86-73-7	Fluorene	12.1	10.0	0.358	ug/L
91-20-3	Naphthalene	194	10.0	0.466	ug/L
85-01-8	Phenanthrene	30.5	10.0	0.189	ug/L
129-00-0	Pyrene	4.35J	10.0	0.406	ug/L

Summary of Compounds Detected (con't)

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21305080402	**460-014 5 DAY**	Water	05/07/2013 09:15	05/08/2013 09:20

SW-846 8260B

CAS#	Parameter	Result	RDL	MDL	Units
71-43-2	Benzene	1.12	1.00	0.111	ug/L
100-41-4	Ethylbenzene	1.43	1.00	0.109	ug/L
1330-20-7	Xylene (total)	3.98	3.00	0.179	ug/L

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21305080403	**460-016 5 DAY**	Water	05/07/2013 09:20	05/08/2013 09:20

SW-846 6020A

CAS#	Parameter	Result	RDL	MDL	Units
7440-38-2	Arsenic	0.53J	1.00	0.094	ug/L

SW-846 8270D

CAS#	Parameter	Result	RDL	MDL	Units
83-32-9	Acenaphthene	17.2	10.0	0.365	ug/L
120-12-7	Anthracene	3.86J	10.0	0.215	ug/L
56-55-3	Benzo(a)anthracene	0.303J	10.0	0.246	ug/L
218-01-9	Chrysene	0.396J	10.0	0.129	ug/L
206-44-0	Fluoranthene	4.58J	10.0	0.235	ug/L
86-73-7	Fluorene	12.9	10.0	0.358	ug/L
91-20-3	Naphthalene	195	10.0	0.466	ug/L
85-01-8	Phenanthrene	27.8	10.0	0.189	ug/L
129-00-0	Pyrene	4.09J	10.0	0.406	ug/L

SW-846 8260B

CAS#	Parameter	Result	RDL	MDL	Units
71-43-2	Benzene	0.873J	1.00	0.111	ug/L
108-88-3	Toluene	1.58	1.00	0.122	ug/L
100-41-4	Ethylbenzene	1.18	1.00	0.109	ug/L
1330-20-7	Xylene (total)	3.86	3.00	0.179	ug/L

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21305080404	**460-019 5 DAY**	Water	05/07/2013 09:25	05/08/2013 09:20

SW-846 6020A

CAS#	Parameter	Result	RDL	MDL	Units
7440-38-2	Arsenic	16.1	1.00	0.094	ug/L

Summary of Compounds Detected (con't)

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21305080404	**460-019 5 DAY**	Water	05/07/2013 09:25	05/08/2013 09:20

SW-846 8270D

CAS#	Parameter	Result	RDL	MDL	Units
83-32-9	Acenaphthene	0.379J	10.0	0.365	ug/L
91-20-3	Naphthalene	2.82J	10.0	0.466	ug/L
85-01-8	Phenanthrene	1.05J	10.0	0.189	ug/L

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21305080405	**460-020 5 DAY**	Water	05/07/2013 09:30	05/08/2013 09:20

SW-846 6020A

CAS#	Parameter	Result	RDL	MDL	Units
7440-38-2	Arsenic	7.84	1.00	0.094	ug/L

SW-846 8270D

CAS#	Parameter	Result	RDL	MDL	Units
91-20-3	Naphthalene	1.71J	10.0	0.466	ug/L
85-01-8	Phenanthrene	0.781J	10.0	0.189	ug/L

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21305080406	**460-013 48 HR**	Water	05/07/2013 15:25	05/08/2013 09:20

SW-846 8270D

CAS#	Parameter	Result	RDL	MDL	Units
83-32-9	Acenaphthene	25.7	10.0	0.365	ug/L
120-12-7	Anthracene	5.69J	10.0	0.215	ug/L
206-44-0	Fluoranthene	6.19J	10.0	0.235	ug/L
86-73-7	Fluorene	18.7	10.0	0.358	ug/L
85-01-8	Phenanthrene	39.2	10.0	0.189	ug/L
129-00-0	Pyrene	5.06J	10.0	0.406	ug/L

SW-846 8270D

CAS#	Parameter	Result	RDL	MDL	Units
91-20-3	Naphthalene	243	20.0	0.932	ug/L

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21305080407	**460-014 48 HR**	Water	05/07/2013 15:30	05/08/2013 09:20

SW-846 8270D

CAS#	Parameter	Result	RDL	MDL	Units
83-32-9	Acenaphthene	15.5	10.0	0.365	ug/L
120-12-7	Anthracene	3.92J	10.0	0.215	ug/L

Summary of Compounds Detected (con't)

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21305080407	**460-014 48 HR**	Water	05/07/2013 15:30	05/08/2013 09:20

SW-846 8270D

CAS#	Parameter	Result	RDL	MDL	Units
56-55-3	Benzo(a)anthracene	0.336J	10.0	0.246	ug/L
218-01-9	Chrysene	0.309J	10.0	0.129	ug/L
206-44-0	Fluoranthene	4.36J	10.0	0.235	ug/L
86-73-7	Fluorene	12.1	10.0	0.358	ug/L
85-01-8	Phenanthrene	26.3	10.0	0.189	ug/L
129-00-0	Pyrene	4.02J	10.0	0.406	ug/L

SW-846 8270D

CAS#	Parameter	Result	RDL	MDL	Units
91-20-3	Naphthalene	253	20.0	0.932	ug/L

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21305080401	**460-013 5 DAY**	Water	05/07/2013 09:10	05/08/2013 09:20

SW-846 8260B

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
			1	05/10/2013 11:23	AMD	507039

CAS#	Parameter	Result	RDL	MDL	Units
71-43-2	**Benzene**	**1.04**	**1.00**	**0.111**	**ug/L**
108-88-3	**Toluene**	**1.73**	**1.00**	**0.122**	**ug/L**
100-41-4	**Ethylbenzene**	**0.962J**	**1.00**	**0.109**	**ug/L**
1330-20-7	**Xylene (total)**	**3.86**	**3.00**	**0.179**	**ug/L**

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
460-00-4	4-Bromofluorobenzene	50	46.2	ug/L	92	78 - 130
1868-53-7	Dibromofluoromethane	50	49.5	ug/L	99	77 - 127
2037-26-5	Toluene d8	50	51.2	ug/L	102	76 - 134
17060-07-0	1,2-Dichloroethane-d4	50	51.2	ug/L	102	71 - 127

SW-846 8270D

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
05/08/2013 14:00	506896	SW-846 3510C	1	05/09/2013 11:22	KCB	506968

CAS#	Parameter	Result	RDL	MDL	Units
83-32-9	**Acenaphthene**	**17.5**	**10.0**	**0.365**	**ug/L**
208-96-8	Acenaphthylene	0.369U	10.0	0.369	ug/L
120-12-7	**Anthracene**	**5.00J**	**10.0**	**0.215**	**ug/L**
56-55-3	**Benzo(a)anthracene**	**0.419J**	**10.0**	**0.246**	**ug/L**
50-32-8	Benzo(a)pyrene	0.170U	10.0	0.170	ug/L
205-99-2	Benzo(b)fluoranthene	0.185U	10.0	0.185	ug/L
191-24-2	Benzo(g,h,i)perylene	0.198U	10.0	0.198	ug/L
207-08-9	Benzo(k)fluoranthene	0.275U	10.0	0.275	ug/L
218-01-9	**Chrysene**	**0.313J**	**10.0**	**0.129**	**ug/L**
53-70-3	Dibenz(a,h)anthracene	0.214U	10.0	0.214	ug/L
206-44-0	**Fluoranthene**	**5.54J**	**10.0**	**0.235**	**ug/L**
86-73-7	**Fluorene**	**13.7**	**10.0**	**0.358**	**ug/L**
193-39-5	Indeno(1,2,3-cd)pyrene	0.159U	10.0	0.159	ug/L
91-20-3	**Naphthalene**	**139**	**10.0**	**0.466**	**ug/L**
85-01-8	**Phenanthrene**	**32.3**	**10.0**	**0.189**	**ug/L**
129-00-0	**Pyrene**	**4.74J**	**10.0**	**0.406**	**ug/L**

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
4165-60-0	Nitrobenzene-d5	50	34.8	ug/L	70	40 - 110
321-60-8	2-Fluorobiphenyl	50	35.7	ug/L	71	50 - 110
1718-51-0	Terphenyl-d14	50	37.7	ug/L	75	50 - 135

SW-846 6020A

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
05/08/2013 16:50	506906	SW-846 3010A	1	05/10/2013 15:06	MEM	507095

CAS#	Parameter	Result	RDL	MDL	Units
7440-38-2	**Arsenic**	**0.44J**	**1.00**	**0.094**	**ug/L**

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21305080402	**460-014 5 DAY**	Water	05/07/2013 09:15	05/08/2013 09:20

SW-846 8260B

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
			1	05/10/2013 11:43	AMD	507039

CAS#	Parameter	Result	RDL	MDL	Units
71-43-2	**Benzene**	**1.12**	**1.00**	**0.111**	**ug/L**
108-88-3	Toluene	0.122U	1.00	0.122	ug/L
100-41-4	**Ethylbenzene**	**1.43**	**1.00**	**0.109**	**ug/L**
1330-20-7	**Xylene (total)**	**3.98**	**3.00**	**0.179**	**ug/L**

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
460-00-4	4-Bromofluorobenzene	50	47.1	ug/L	94	78 - 130
1868-53-7	Dibromofluoromethane	50	49.8	ug/L	100	77 - 127
2037-26-5	Toluene d8	50	52.4	ug/L	105	76 - 134
17060-07-0	1,2-Dichloroethane-d4	50	48.9	ug/L	98	71 - 127

SW-846 8270D

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
05/08/2013 14:00	506896	SW-846 3510C	1	05/09/2013 11:39	KCB	506968

CAS#	Parameter	Result	RDL	MDL	Units
83-32-9	**Acenaphthene**	**14.9**	**10.0**	**0.365**	**ug/L**
208-96-8	Acenaphthylene	0.369U	10.0	0.369	ug/L
120-12-7	**Anthracene**	**4.12J**	**10.0**	**0.215**	**ug/L**
56-55-3	**Benzo(a)anthracene**	**0.424J**	**10.0**	**0.246**	**ug/L**
50-32-8	Benzo(a)pyrene	0.170U	10.0	0.170	ug/L
205-99-2	Benzo(b)fluoranthene	0.185U	10.0	0.185	ug/L
191-24-2	Benzo(g,h,i)perylene	0.198U	10.0	0.198	ug/L
207-08-9	Benzo(k)fluoranthene	0.275U	10.0	0.275	ug/L
218-01-9	**Chrysene**	**0.342J**	**10.0**	**0.129**	**ug/L**
53-70-3	Dibenz(a,h)anthracene	0.214U	10.0	0.214	ug/L
206-44-0	**Fluoranthene**	**5.15J**	**10.0**	**0.235**	**ug/L**
86-73-7	**Fluorene**	**12.1**	**10.0**	**0.358**	**ug/L**
193-39-5	Indeno(1,2,3-cd)pyrene	0.159U	10.0	0.159	ug/L
91-20-3	**Naphthalene**	**194**	**10.0**	**0.466**	**ug/L**
85-01-8	**Phenanthrene**	**30.5**	**10.0**	**0.189**	**ug/L**
129-00-0	**Pyrene**	**4.35J**	**10.0**	**0.406**	**ug/L**

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
4165-60-0	Nitrobenzene-d5	50	35.4	ug/L	71	40 - 110
321-60-8	2-Fluorobiphenyl	50	36.3	ug/L	73	50 - 110
1718-51-0	Terphenyl-d14	50	38.7	ug/L	77	50 - 135

SW-846 6020A

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
05/08/2013 16:50	506906	SW-846 3010A	1	05/10/2013 15:13	MEM	507095

CAS#	Parameter	Result	RDL	MDL	Units
7440-38-2	**Arsenic**	**0.43J**	**1.00**	**0.094**	**ug/L**

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21305080403	**460-016 5 DAY**	Water	05/07/2013 09:20	05/08/2013 09:20

SW-846 8260B

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
			1	05/10/2013 12:03	AMD	507039

CAS#	Parameter	Result	RDL	MDL	Units
71-43-2	**Benzene**	**0.873J**	**1.00**	**0.111**	**ug/L**
108-88-3	**Toluene**	**1.58**	**1.00**	**0.122**	**ug/L**
100-41-4	**Ethylbenzene**	**1.18**	**1.00**	**0.109**	**ug/L**
1330-20-7	**Xylene (total)**	**3.86**	**3.00**	**0.179**	**ug/L**

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
460-00-4	4-Bromofluorobenzene	50	47.4	ug/L	95	78 - 130
1868-53-7	Dibromofluoromethane	50	49.7	ug/L	99	77 - 127
2037-26-5	Toluene d8	50	52.7	ug/L	105	76 - 134
17060-07-0	1,2-Dichloroethane-d4	50	50.6	ug/L	101	71 - 127

SW-846 8270D

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
05/08/2013 14:00	506896	SW-846 3510C	1	05/09/2013 11:56	KCB	506968

CAS#	Parameter	Result	RDL	MDL	Units
83-32-9	**Acenaphthene**	**17.2**	**10.0**	**0.365**	**ug/L**
208-96-8	Acenaphthylene	0.369U	10.0	0.369	ug/L
120-12-7	**Anthracene**	**3.86J**	**10.0**	**0.215**	**ug/L**
56-55-3	**Benzo(a)anthracene**	**0.303J**	**10.0**	**0.246**	**ug/L**
50-32-8	Benzo(a)pyrene	0.170U	10.0	0.170	ug/L
205-99-2	Benzo(b)fluoranthene	0.185U	10.0	0.185	ug/L
191-24-2	Benzo(g,h,i)perylene	0.198U	10.0	0.198	ug/L
207-08-9	Benzo(k)fluoranthene	0.275U	10.0	0.275	ug/L
218-01-9	**Chrysene**	**0.396J**	**10.0**	**0.129**	**ug/L**
53-70-3	Dibenz(a,h)anthracene	0.214U	10.0	0.214	ug/L
206-44-0	**Fluoranthene**	**4.58J**	**10.0**	**0.235**	**ug/L**
86-73-7	**Fluorene**	**12.9**	**10.0**	**0.358**	**ug/L**
193-39-5	Indeno(1,2,3-cd)pyrene	0.159U	10.0	0.159	ug/L
91-20-3	**Naphthalene**	**195**	**10.0**	**0.466**	**ug/L**
85-01-8	**Phenanthrene**	**27.8**	**10.0**	**0.189**	**ug/L**
129-00-0	**Pyrene**	**4.09J**	**10.0**	**0.406**	**ug/L**

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
4165-60-0	Nitrobenzene-d5	50	40.2	ug/L	80	40 - 110
321-60-8	2-Fluorobiphenyl	50	42.3	ug/L	85	50 - 110
1718-51-0	Terphenyl-d14	50	42.9	ug/L	86	50 - 135

SW-846 6020A

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
05/08/2013 16:50	506906	SW-846 3010A	1	05/10/2013 15:20	MEM	507095

CAS#	Parameter	Result	RDL	MDL	Units
7440-38-2	**Arsenic**	**0.53J**	**1.00**	**0.094**	**ug/L**

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21305080404	**460-019 5 DAY**	Water	05/07/2013 09:25	05/08/2013 09:20

SW-846 8260B

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
			1	05/10/2013 12:23	CLH	507039

CAS#	Parameter	Result	RDL	MDL	Units
71-43-2	Benzene	0.111U	1.00	0.111	ug/L
108-88-3	Toluene	0.122U	1.00	0.122	ug/L
100-41-4	Ethylbenzene	0.109U	1.00	0.109	ug/L
1330-20-7	Xylene (total)	0.179U	3.00	0.179	ug/L

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
460-00-4	4-Bromofluorobenzene	50	46.7	ug/L	93	78 - 130
1868-53-7	Dibromofluoromethane	50	49.9	ug/L	100	77 - 127
2037-26-5	Toluene d8	50	52.6	ug/L	105	76 - 134
17060-07-0	1,2-Dichloroethane-d4	50	50.7	ug/L	101	71 - 127

SW-846 8270D

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
05/08/2013 14:00	506896	SW-846 3510C	1	05/09/2013 12:13	KCB	506968

CAS#	Parameter	Result	RDL	MDL	Units
83-32-9	**Acenaphthene**	**0.379J**	**10.0**	**0.365**	**ug/L**
208-96-8	Acenaphthylene	0.369U	10.0	0.369	ug/L
120-12-7	Anthracene	0.215U	10.0	0.215	ug/L
56-55-3	Benzo(a)anthracene	0.246U	10.0	0.246	ug/L
50-32-8	Benzo(a)pyrene	0.170U	10.0	0.170	ug/L
205-99-2	Benzo(b)fluoranthene	0.185U	10.0	0.185	ug/L
191-24-2	Benzo(g,h,i)perylene	0.198U	10.0	0.198	ug/L
207-08-9	Benzo(k)fluoranthene	0.275U	10.0	0.275	ug/L
218-01-9	Chrysene	0.129U	10.0	0.129	ug/L
53-70-3	Dibenz(a,h)anthracene	0.214U	10.0	0.214	ug/L
206-44-0	Fluoranthene	0.235U	10.0	0.235	ug/L
86-73-7	Fluorene	0.358U	10.0	0.358	ug/L
193-39-5	Indeno(1,2,3-cd)pyrene	0.159U	10.0	0.159	ug/L
91-20-3	**Naphthalene**	**2.82J**	**10.0**	**0.466**	**ug/L**
85-01-8	**Phenanthrene**	**1.05J**	**10.0**	**0.189**	**ug/L**
129-00-0	Pyrene	0.406U	10.0	0.406	ug/L

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
4165-60-0	Nitrobenzene-d5	50	29.7	ug/L	59	40 - 110
321-60-8	2-Fluorobiphenyl	50	33.8	ug/L	68	50 - 110
1718-51-0	Terphenyl-d14	50	35.5	ug/L	71	50 - 135

SW-846 6020A

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
05/08/2013 16:50	506906	SW-846 3010A	1	05/10/2013 15:28	MEM	507095

CAS#	Parameter	Result	RDL	MDL	Units
7440-38-2	**Arsenic**	**16.1**	**1.00**	**0.094**	**ug/L**

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21305080405	**460-020 5 DAY**	Water	05/07/2013 09:30	05/08/2013 09:20

SW-846 8260B

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
			1	05/10/2013 12:49	CLH	507039

CAS#	Parameter	Result	RDL	MDL	Units
71-43-2	Benzene	0.111U	1.00	0.111	ug/L
108-88-3	Toluene	0.122U	1.00	0.122	ug/L
100-41-4	Ethylbenzene	0.109U	1.00	0.109	ug/L
1330-20-7	Xylene (total)	0.179U	3.00	0.179	ug/L

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
460-00-4	4-Bromofluorobenzene	50	45.3	ug/L	91	78 - 130
1868-53-7	Dibromofluoromethane	50	50.9	ug/L	102	77 - 127
2037-26-5	Toluene d8	50	51.3	ug/L	103	76 - 134
17060-07-0	1,2-Dichloroethane-d4	50	50.9	ug/L	102	71 - 127

SW-846 8270D

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
05/08/2013 14:00	506896	SW-846 3510C	1	05/09/2013 12:31	KCB	506968

CAS#	Parameter	Result	RDL	MDL	Units
83-32-9	Acenaphthene	0.365U	10.0	0.365	ug/L
208-96-8	Acenaphthylene	0.369U	10.0	0.369	ug/L
120-12-7	Anthracene	0.215U	10.0	0.215	ug/L
56-55-3	Benzo(a)anthracene	0.246U	10.0	0.246	ug/L
50-32-8	Benzo(a)pyrene	0.170U	10.0	0.170	ug/L
205-99-2	Benzo(b)fluoranthene	0.185U	10.0	0.185	ug/L
191-24-2	Benzo(g,h,i)perylene	0.198U	10.0	0.198	ug/L
207-08-9	Benzo(k)fluoranthene	0.275U	10.0	0.275	ug/L
218-01-9	Chrysene	0.129U	10.0	0.129	ug/L
53-70-3	Dibenz(a,h)anthracene	0.214U	10.0	0.214	ug/L
206-44-0	Fluoranthene	0.235U	10.0	0.235	ug/L
86-73-7	Fluorene	0.358U	10.0	0.358	ug/L
193-39-5	Indeno(1,2,3-cd)pyrene	0.159U	10.0	0.159	ug/L
91-20-3	**Naphthalene**	**1.71J**	**10.0**	**0.466**	**ug/L**
85-01-8	**Phenanthrene**	**0.781J**	**10.0**	**0.189**	**ug/L**
129-00-0	Pyrene	0.406U	10.0	0.406	ug/L

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
4165-60-0	Nitrobenzene-d5	50	35.3	ug/L	71	40 - 110
321-60-8	2-Fluorobiphenyl	50	42.5	ug/L	85	50 - 110
1718-51-0	Terphenyl-d14	50	40.9	ug/L	82	50 - 135

SW-846 6020A

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
05/08/2013 16:50	506906	SW-846 3010A	1	05/10/2013 15:57	MEM	507095

CAS#	Parameter	Result	RDL	MDL	Units
7440-38-2	**Arsenic**	**7.84**	**1.00**	**0.094**	**ug/L**

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21305080406	**460-013 48 HR**	Water	05/07/2013 15:25	05/08/2013 09:20

SW-846 8270D

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
05/08/2013 14:00	506896	SW-846 3510C	1	05/09/2013 12:48	KCB	506968

CAS#	Parameter	Result	RDL	MDL	Units
83-32-9	**Acenaphthene**	**25.7**	**10.0**	**0.365**	**ug/L**
208-96-8	Acenaphthylene	0.369U	10.0	0.369	ug/L
120-12-7	**Anthracene**	**5.69J**	**10.0**	**0.215**	**ug/L**
56-55-3	Benzo(a)anthracene	0.246U	10.0	0.246	ug/L
50-32-8	Benzo(a)pyrene	0.170U	10.0	0.170	ug/L
205-99-2	Benzo(b)fluoranthene	0.185U	10.0	0.185	ug/L
191-24-2	Benzo(g,h,i)perylene	0.198U	10.0	0.198	ug/L
207-08-9	Benzo(k)fluoranthene	0.275U	10.0	0.275	ug/L
218-01-9	Chrysene	0.129U	10.0	0.129	ug/L
53-70-3	Dibenz(a,h)anthracene	0.214U	10.0	0.214	ug/L
206-44-0	**Fluoranthene**	**6.19J**	**10.0**	**0.235**	**ug/L**
86-73-7	**Fluorene**	**18.7**	**10.0**	**0.358**	**ug/L**
193-39-5	Indeno(1,2,3-cd)pyrene	0.159U	10.0	0.159	ug/L
85-01-8	**Phenanthrene**	**39.2**	**10.0**	**0.189**	**ug/L**
129-00-0	**Pyrene**	**5.06J**	**10.0**	**0.406**	**ug/L**

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
4165-60-0	Nitrobenzene-d5	50	41.9	ug/L	84	40 - 110
321-60-8	2-Fluorobiphenyl	50	42.1	ug/L	84	50 - 110
1718-51-0	Terphenyl-d14	50	42.3	ug/L	85	50 - 135

SW-846 8270D

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
05/08/2013 14:00	506896	SW-846 3510C	2	05/09/2013 15:26	KCB	506968

CAS#	Parameter	Result	RDL	MDL	Units
91-20-3	**Naphthalene**	**243**	**20.0**	**0.932**	**ug/L**

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
4165-60-0	Nitrobenzene-d5	50	38.7	ug/L	77	40 - 110
321-60-8	2-Fluorobiphenyl	50	41.3	ug/L	83	50 - 110
1718-51-0	Terphenyl-d14	50	38.4	ug/L	77	50 - 135

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21305080407	**460-014 48 HR**	Water	05/07/2013 15:30	05/08/2013 09:20

SW-846 8270D

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
05/08/2013 14:00	506896	SW-846 3510C	1	05/09/2013 13:06	KCB	506968

CAS#	Parameter	Result	RDL	MDL	Units
83-32-9	**Acenaphthene**	**15.5**	**10.0**	**0.365**	**ug/L**
208-96-8	Acenaphthylene	0.369U	10.0	0.369	ug/L
120-12-7	**Anthracene**	**3.92J**	**10.0**	**0.215**	**ug/L**
56-55-3	**Benzo(a)anthracene**	**0.336J**	**10.0**	**0.246**	**ug/L**
50-32-8	Benzo(a)pyrene	0.170U	10.0	0.170	ug/L
205-99-2	Benzo(b)fluoranthene	0.185U	10.0	0.185	ug/L
191-24-2	Benzo(g,h,i)perylene	0.198U	10.0	0.198	ug/L
207-08-9	Benzo(k)fluoranthene	0.275U	10.0	0.275	ug/L
218-01-9	**Chrysene**	**0.309J**	**10.0**	**0.129**	**ug/L**
53-70-3	Dibenz(a,h)anthracene	0.214U	10.0	0.214	ug/L
206-44-0	**Fluoranthene**	**4.36J**	**10.0**	**0.235**	**ug/L**
86-73-7	**Fluorene**	**12.1**	**10.0**	**0.358**	**ug/L**
193-39-5	Indeno(1,2,3-cd)pyrene	0.159U	10.0	0.159	ug/L
85-01-8	**Phenanthrene**	**26.3**	**10.0**	**0.189**	**ug/L**
129-00-0	**Pyrene**	**4.02J**	**10.0**	**0.406**	**ug/L**

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
4165-60-0	Nitrobenzene-d5	50	39.9	ug/L	80	40 - 110
321-60-8	2-Fluorobiphenyl	50	40.8	ug/L	82	50 - 110
1718-51-0	Terphenyl-d14	50	44.4	ug/L	89	50 - 135

SW-846 8270D

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
05/08/2013 14:00	506896	SW-846 3510C	2	05/09/2013 15:44	KCB	506968

CAS#	Parameter	Result	RDL	MDL	Units
91-20-3	**Naphthalene**	**253**	**20.0**	**0.932**	**ug/L**

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
4165-60-0	Nitrobenzene-d5	50	38.2	ug/L	76	40 - 110
321-60-8	2-Fluorobiphenyl	50	42.4	ug/L	85	50 - 110
1718-51-0	Terphenyl-d14	50	41.5	ug/L	83	50 - 135

GC/MS Volatiles Quality Control Summary

Analytical Batch	507039	**Client ID**	MB507039			LCS507039			LCSD507039		
Prep Batch	N/A	**GCAL ID**	1190419			1190420			1190421		
		Sample Type	Method Blank			LCS			LCSD		
		Analytical Date	05/10/2013 09:22			05/10/2013 08:00			05/10/2013 08:20		
		Matrix	Water			Water			Water		
SW-846 8260B		**Units**	**Result**	ug/L **RDL**	**Spike Added**	**Result**	**% R**	**Control Limits % R**	**Result**	**% R**	**RPD**	**RPD Limit**
100-41-4	Ethylbenzene		0.109U	0.109	50.0	50.7	101	74 - 126	48.9	98	4	30
75-69-4	Trichlorofluoromethane		0.157U	0.157	50.0	55.7	111	72 - 136	51.5	103	8	30
96-12-8	1,2-Dibromo-3-chloropropane		0.194U	0.194	50.0	44.5	89	57 - 121	46.2	92	4	30
1330-20-7	Xylene (total)		0.179U	0.179	150	157	105	74 - 127	149	99	5	30
76-13-1	Trichlorotrifluoroethane		0.158U	0.158	50.0	57.1	114	72 - 136	52.6	105	8	30
71-43-2	Benzene		0.111U	0.111	50.0	51.7	103	70 - 129	49.2	98	5	20
108-88-3	Toluene		0.122U	0.122	50.0	52.7	105	72 - 120	51.1	102	3	20
Surrogate												
460-00-4	4-Bromofluorobenzene		46.4	93	50	49.7	99	78 - 130	50.9	102		
1868-53-7	Dibromofluoromethane		51	102	50	51.2	102	77 - 127	49.8	100		
2037-26-5	Toluene d8		52.2	104	50	48.8	98	76 - 134	49.5	99		
17060-07-0	1,2-Dichloroethane-d4		51.3	103	50	50.9	102	71 - 127	49	98		

GC/MS Semi-Volatiles Quality Control Summary

Analytical Batch	506968	**Client ID**	MB506896	LCS506896	LCSD506896
Prep Batch	506896	**GCAL ID**	1189705	1189706	1189707
Prep Method	SW-846	**Sample Type**	Method Blank	LCS	LCSD
	3510C	**Prep Date**	05/08/2013 14:00	05/08/2013 14:00	05/08/2013 14:00
		Analytical Date	05/09/2013 09:00	05/09/2013 09:17	05/09/2013 09:35
		Matrix	Water	Water	Water

SW-846 8270D		**Units**	ug/L	**Spike**	**Result**		**Control**	**Result**			**RPD**
		Result	**RDL**	**Added**		**% R**	**Limits % R**		**% R**	**RPD**	**Limit**
208-96-8	Acenaphthylene	0.369U	0.369	100	91.0	91	55 - 120	93.3	93	2	30
120-12-7	Anthracene	0.215U	0.215	100	89.4	89	58 - 120	93.2	93	4	30
56-55-3	Benzo(a)anthracene	0.246U	0.246	100	86.6	87	56 - 120	90.1	90	4	30
205-99-2	Benzo(b)fluoranthene	0.185U	0.185	100	85.3	85	55 - 120	88.9	89	4	30
207-08-9	Benzo(k)fluoranthene	0.275U	0.275	100	93.4	93	49 - 121	85.8	86	8	30
191-24-2	Benzo(g,h,i)perylene	0.198U	0.198	100	85.6	86	44 - 132	96.6	97	12	30
50-32-8	Benzo(a)pyrene	0.170U	0.170	100	90.7	91	56 - 120	90.8	91	0.1	30
218-01-9	Chrysene	0.129U	0.129	100	91.9	92	58 - 120	94.8	95	3	30
53-70-3	Dibenz(a,h)anthracene	0.214U	0.214	100	89.7	90	50 - 138	97.3	97	8	30
206-44-0	Fluoranthene	0.235U	0.235	100	90.3	90	55 - 120	84.4	84	7	30
86-73-7	Fluorene	0.358U	0.358	100	90.5	91	54 - 120	90.7	91	0.2	30
193-39-5	Indeno(1,2,3-cd)pyrene	0.159U	0.159	100	93.6	94	43 - 133	102	102	9	30
91-20-3	Naphthalene	0.466U	0.466	100	84.3	84	44 - 120	86.1	86	2	30
85-01-8	Phenanthrene	0.189U	0.189	100	91.1	91	58 - 120	92.8	93	2	30
83-32-9	Acenaphthene	0.365U	0.365	100	88.0	88	52 - 120	89.4	89	2	30
129-00-0	Pyrene	0.406U	0.406	100	79.4	79	54 - 120	92.7	93	15	30
Surrogate											
4165-60-0	Nitrobenzene-d5	35.3	71	50	34.9	70	40 - 110	33.3	67		
321-60-8	2-Fluorobiphenyl	40.1	80	50	41.5	83	50 - 110	39.9	80		
1718-51-0	Terphenyl-d14	42.7	85	50	34.8	70	50 - 135	34.6	69		

Inorganics Quality Control Summary

Analytical Batch	507095	**Client ID**	MB506906	LCS506906
Prep Batch	506906	**GCAL ID**	1189776	1189777
Prep Method	SW-846	**Sample Type**	Method Blank	LCS
	3010A	**Prep Date**	05/08/2013 16:50	05/08/2013 16:50
		Analytical Date	05/10/2013 14:51	05/10/2013 14:58
		Matrix	Water	Water

SW-846 6020A		**Units**	ug/L	**Spike**	**Result**		**Control**
		Result	**RDL**	**Added**		**% R**	**Limits % R**
7440-38-2	Arsenic	0.18J	0.094	50.0	49.4	99	80 - 120

GCAL

7979 GSRI Avenue, Baton Rouge, Louisiana 70820-7402
Phone 225.769.4900 • Fax 225.767.5717

CHAIN OF CUSTODY RECORD

Lab use only	Client Name	Client #	Workorder #	Due Date
	Kemron	4794	213050804	5/10/13

Report to:
Client: Kemron Environmental Services
Address: 1359-A Ellsworth Ind. Blvd. Atlanta, Ga. 30318
Contact: Tommy Jordan
Phone: 404-601-6908
Fax:

Bill to:
Client: Kemron Environmental Services
Address: 1359-A Ellsworth Ind. Blvd. Atlanta, Ga. 30318
Contact: Tommy Jordan
Phone: 404-601-6908
Fax:

P.O. Number: SH0460
Project Name/Number: Quanta / SH0460
Sampled By: Tomecia Riley

Analytical Requests & Method

Lab use only:
Custody Seal used ☑ yes ☐ no
intact ☑ yes ☐ no
Temperature °C 4.6 (E20)

Matrix[1]	Date	Time (2400)	Comp	Grab	Sample Description	Preservatives	No Containers	Total BTEX 8260	Total PAH 8270	Total Arsenic 6010	Remarks:	Lab ID 5/8
W	5/7/13	910		X	460-013 5 day	None	5	X	X	X		1
↓	↓	915		X	460-014 5 day	↓	5	X	X	X		2
		920		X	460-016 5 day		5	X	X	X		3
		925		X	460-019 5 day		5	X	X	X		4
		930		X	460-020 5 day		5	X	X	X		5
		1525		X	460-013 48 hr		1	~~X~~	X	~~X~~ A	PAH only	6
↓	↓	1530		X	460-014 48 hr	↓	1	~~X~~	X	~~X~~ A	PAH only	7

Turn Around Time: ☒ 24-48 hrs. ☐ 3 days ☐ 1 week ☐ Standard ☐ Other 2 day TAT

Relinquished by: (Signature)	Received by: (Signature)	Date:	Time:
Tomecia Riley		5/7/13	1545
Relinquished by: (Signature)	Received by: (Signature)	Date:	Time:
Fed Ex 7999 0385 6214	[signature]	5/8/13	0920
Relinquished by: (Signature)	Received by: (Signature)	Date:	Time:

Note:

By submitting these samples, you agree to the terms and conditions contained in our most recent schedule of services.

Matrix[1]: W = water, S = soil, SD = solid, L = liquid, SL = sludge, o = oil, CT = charcoal tube, A = air bag

We cannot accept verbal changes. Please fax written changes to (225) 767-5717

WHITE: CLIENT FINAL REPORT — CANARY: LABORATORY — PINK: CLIENT

GCAL-06 11/98

GCAL ANALYTICAL LABORATORIES, LLC

SAMPLE RECEIVING CHECKLIST

213050804

SAMPLE DELIVERY GROUP	213050804
Client 4794 - KEMRON	**Transport Method** FEDEX
Profile Number 238840	**Received By** Pfeifer, Ben J.
Line Item(s) 2 - Water BTEX/PAH/RCRA	**Receive Date(s)** 05/08/13

CHECKLIST

	Yes	No	NA
Were all samples received using proper thermal preservation?	☑	☐	☐
When used, were all custody seals intact?	☑	☐	☐
Were all samples received in proper containers?	☑	☐	☐
Were all samples received using proper chemical preservation?	☑	☐	☐
Was preservative added to any container at the lab?	☐	☑	☐
Were all containers received in good condition?	☑	☐	☐
Were all VOA vials received with no head space?	☑	☐	☐
Do all sample labels match the Chain of Custody?	☑	☐	☐
Did the Chain of Custody list the sampling technician?	☑	☐	☐
Was the COC maintained i.e. all signatures, dates and time of receipt included?	☑	☐	☐

COOLERS

Airbill	Temp(oC)
7997 0385 6214	4.6 (E20)

DISCREPANCIES

None

LABORATORY PRESERVATIONS

None

NOTES

Revision 1.4

APPENDIX H

VERIFICATION EVALUATION MIXTURE AND DATA SHEETS

MIX DEVELOPMENT DATA SHEET

PROJECT:	Quanta	MIX No.	
PROJECT No.:	SH0460		0460-011 DUP
MIXING DATE:	23-May-13	MIXED BY:	TNR/RPH

UNTREATED MATERIAL TYPE		**N1/N3**
WEIGHT OF UNTREATED MATERIAL		**2,000 g**
REAGENT TYPE AND LOT NUMBER	ADDITION RATE	WEIGHT
Portland Cement	2.00 %	40.0 g
LaFarge Newcem Slag	8.00 %	160.0 g
	%	0.0 g
	%	0.0 g
	%	0.0 g
Water Addition	100 %	200.0 g

OBSERVATIONS / NOTES

UCS @ Kemron
Perm @ Kemron
(3) UCS @ CH2M Hill

MONITORING ACTIVITIES

MONITORING ACTIVITIES	TIME PERIOD				
MAXIMUM PID (ppm)					
Notes / Observations:					

PENETROMETER ANALYSES

CURE TIME (Days)		2	5	7	
PENETROMETER (tons/ft^2)					

VOLUMETRIC EXPANSION 7 days

INITIAL HEIGHT (in):	FINAL HEIGHT (in):	
VOLUMETRIC EXPANSION (%):	#DIV/0!	

VOLUMETRIC EXPANSION 28 days

INITIAL HEIGHT (in):	FINAL HEIGHT (in):	
VOLUMETRIC EXPANSION (%):	#DIV/0!	

MIX DEVELOPMENT DATA SHEET

PROJECT:	Quanta	MIX No.	
PROJECT No.:	SH0460		0460-013 DUP
MIXING DATE:	23-May-13	MIXED BY:	TNR/RPH

UNTREATED MATERIAL TYPE		**N2 Comp**
WEIGHT OF UNTREATED MATERIAL		**2,000 g**
REAGENT TYPE AND LOT NUMBER	ADDITION RATE	WEIGHT
Portland Cement	3.00 %	60.0 g
LaFarge Newcem Slag	12.00 %	240.0 g
	%	0.0 g
	%	0.0 g
	%	0.0 g
Water Addition	100 %	300.0 g

OBSERVATIONS / NOTES

UCS @ Kemron
Perm @ Kemron
(3) UCS @ CH2M Hill

MONITORING ACTIVITIES

MONITORING ACTIVITIES	TIME PERIOD				
MAXIMUM PID (ppm)					
Notes / Observations:					

PENETROMETER ANALYSES

CURE TIME (Days)		2	5	7	
PENETROMETER (tons/ft^2)					

VOLUMETRIC EXPANSION 7 days

INITIAL HEIGHT (in):	FINAL HEIGHT (in):	
VOLUMETRIC EXPANSION (%):	#DIV/0!	

VOLUMETRIC EXPANSION 28 days

INITIAL HEIGHT (in):	FINAL HEIGHT (in):	
VOLUMETRIC EXPANSION (%):	#DIV/0!	

MIX DEVELOPMENT DATA SHEET

PROJECT:	Quanta	MIX No.	
PROJECT No.:	SH0460		0460-017 DUP
MIXING DATE:	23-May-13	MIXED BY:	TNR/RPH

UNTREATED MATERIAL TYPE		**N4A**
WEIGHT OF UNTREATED MATERIAL		**2,000 g**
REAGENT TYPE AND LOT NUMBER	ADDITION RATE	WEIGHT
Portland Cement	2.00 %	40.0 g
LaFarge Newcem Slag	8.00 %	160.0 g
	%	0.0 g
	%	0.0 g
	%	0.0 g
Water Addition	100 %	200.0 g

OBSERVATIONS / NOTES

UCS @ Kemron
Perm @ Kemron
(3) UCS @ CH2M Hill

MONITORING ACTIVITIES

MONITORING ACTIVITIES	TIME PERIOD				
MAXIMUM PID (ppm)					
Notes / Observations:					

PENETROMETER ANALYSES

CURE TIME (Days)		2	5	7	
PENETROMETER (tons/ft^2)					

VOLUMETRIC EXPANSION 7 days

INITIAL HEIGHT (in):	FINAL HEIGHT (in):	
VOLUMETRIC EXPANSION (%):	#DIV/0!	

VOLUMETRIC EXPANSION 28 days

INITIAL HEIGHT (in):	FINAL HEIGHT (in):	
VOLUMETRIC EXPANSION (%):	#DIV/0!	

MIX DEVELOPMENT DATA SHEET

PROJECT:	Quanta	MIX No.	
PROJECT No.:	SH0460		0460-019 DUP
MIXING DATE:	23-May-13	MIXED BY:	TNR/RPH

UNTREATED MATERIAL TYPE		**A-2A**
WEIGHT OF UNTREATED MATERIAL		**2,000 g**
REAGENT TYPE AND LOT NUMBER	ADDITION RATE	WEIGHT
Portland Cement	3.00 %	60.0 g
LaFarge Newcem Slag	12.00 %	240.0 g
	%	0.0 g
	%	0.0 g
	%	0.0 g
Water Addition	100 %	300.0 g

OBSERVATIONS / NOTES

UCS @ Kemron
Perm @ Kemron
(3) UCS @ CH2M Hill

MONITORING ACTIVITIES

MONITORING ACTIVITIES	TIME PERIOD				
MAXIMUM PID (ppm)					
Notes / Observations:					

PENETROMETER ANALYSES

CURE TIME (Days)		2	5	7	
PENETROMETER (tons/ft^2)					

VOLUMETRIC EXPANSION 7 days

INITIAL HEIGHT (in):	FINAL HEIGHT (in):	
VOLUMETRIC EXPANSION (%):	#DIV/0!	

VOLUMETRIC EXPANSION 28 days

INITIAL HEIGHT (in):	FINAL HEIGHT (in):	
VOLUMETRIC EXPANSION (%):	#DIV/0!	

MIX DEVELOPMENT DATA SHEET

PROJECT:	Quanta	MIX No.	
PROJECT No.:	SH0460		0460-022 DUP
MIXING DATE:	23-May-13	MIXED BY:	TNR/RPH

UNTREATED MATERIAL TYPE		**AN-2A**
WEIGHT OF UNTREATED MATERIAL		**2,000 g**
REAGENT TYPE AND LOT NUMBER	ADDITION RATE	WEIGHT
Portland Cement	3.00 %	60.0 g
LaFarge Newcem Slag	12.00 %	240.0 g
	%	0.0 g
	%	0.0 g
	%	0.0 g
Water Addition	100 %	300.0 g

OBSERVATIONS / NOTES

UCS @ Kemron
Perm @ Kemron
(3) UCS @ CH2M Hill

MONITORING ACTIVITIES

MONITORING ACTIVITIES	TIME PERIOD				
MAXIMUM PID (ppm)					
Notes / Observations:					

PENETROMETER ANALYSES

CURE TIME (Days)		2	5	7	
PENETROMETER (tons/ft^2)					

VOLUMETRIC EXPANSION 7 days

INITIAL HEIGHT (in):	FINAL HEIGHT (in):	
VOLUMETRIC EXPANSION (%):	#DIV/0!	

VOLUMETRIC EXPANSION 28 days

INITIAL HEIGHT (in):	FINAL HEIGHT (in):	
VOLUMETRIC EXPANSION (%):	#DIV/0!	

PERMEABILITY ASTM D5084

SPECIMEN CONDITIONS

PROJECT:	Quanta SH0356-02	TESTED BY:	RJB
PROJECT No.:	SH0356-02	TRACKING CODE:	9097_PM
SAMPLE No.:	0460-011 DUP (28 Day)	EQUIPMENT No.:	5
TEST DATE:	6/20/13		

MOISTURE CONTENT (Dry Basis)	***INITIAL***	***FINAL***
1. MOISTURE TIN NO.		
2. WT MOISTURE TIN (tare weight)	0.00 ***g***	235.60 ***g***
3. WT WET SOIL + TARE	355.85 ***g***	592.96 ***g***
4. WT DRY SOIL + TARE	269.68 ***g***	505.28 ***g***
5. WT WATER, Ww	86.17 g	87.68 g
6. WT DRY SOIL, Ws	269.68 g	269.68 g
7. MOISTURE CONTENT, W	31.95 %	32.51 %

SOIL SPECIMEN DIMENSIONS				
TRIPLICATE	***DIAMETER***		***HEIGHT***	
ANALYSES	***INITIAL***	***FINAL***	***INITIAL***	***FINAL***
No. 1	***3.01 in.***	***3.01 in.***	***1.66 in.***	***1.67 in.***
No. 2	***3.01 in.***	***3.00 in.***	***1.71 in.***	***1.73 in.***
No. 3	***3.00 in.***	***3.00 in.***	***1.72 in.***	***1.69 in.***
Average	3.01 in.	3.00 in.	1.70 in.	1.69 in.

SPECIMEN CONDITIONS	***INITIAL***	***FINAL***
Specimen WT, Wo	***355.85 g***	***357.71 g***
Area, Ao	7.10 in^2	7.08 in^2
Volume, Vo	12.05 in^3	11.99 in^3
Bulk Unit Weight	112.5 lb/ft^3	113.6 lb/ft^3
Dry Unit Weight	85.3 lb/ft^3	85.8 lb/ft^3

PERMEABILITY ASTM D5084

BACK-PRESSURE SATURATION

PROJECT:	Quanta SH0356-02	TESTED BY:	RJB
PROJECT No.:	SH0356-02	TRACKING CODE:	9097_PM
SAMPLE No.:	0460-011 DUP (28 Day)	EQUIPMENT No.:	5
TEST DATE:	6/20/13		

TEST DATE	TIME (military)	TESTED BY	TEST PRESSURES (psi)						
			APPLIED		PORE		PRESSURE CHANGE		
			CELL	BACK	SAT.	TEST	CELL	PORE	B-Value
06/20/13	10 : 5	RJB	7.0	5.0	*				
06/20/13	12 : 10	RJB	17.0	15.0	*	*	*	*	*
06/21/13	8 : 5	RJB	27.0	25.0	25.5	*	*	*	*
06/21/13	8 : 30	RJB	37.0	35.0	35.3	35.0	10.0	9.5	0.95
06/21/13	11 : 50	RJB	47.0	45.0	45.3	45.1	10.0	9.8	0.98
06/21/13	13 : 13	RJB	57.0	55.0	*	55.1	10.0	9.8	0.98
06/21/13	13 : 14	RJB	47.0	45.0	*	*	*	*	*

* Saturation check - no data available.

PERMEABILITY ASTM D5084

SPECIMEN CONSOLIDATION

PROJECT:	Quanta SH0356-02	TESTED BY:	RJB
PROJECT No.:	SH0356-02	TRACKING CODE:	9097_PM
SAMPLE No.:	0460-011 DUP (28 Day)	EQUIPMENT No.:	5
TEST DATE:	6/20/13		

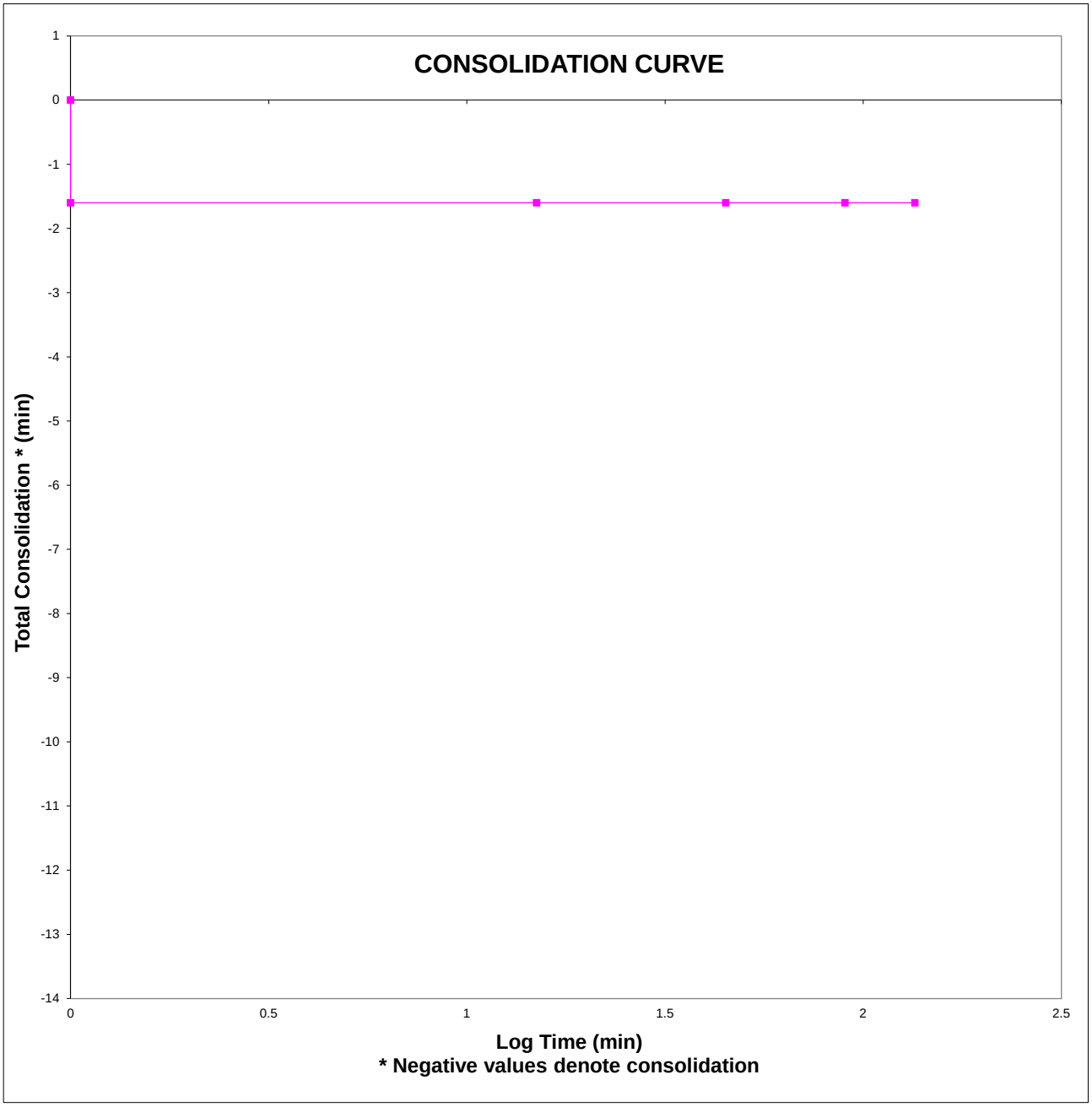
CELL PRESSURE: 55 psi **BACK PRESSURE:** 45 psi **EFFECTIVE STRESS:** 10 psi

TEST DATE	TESTED BY	TIME (Military)	ELAPSED TIME (minutes)	TOTAL TIME (minutes)	TOTAL TIME (Log)	SPECIMEN CONSOLIDATION (ML) READING BOTTOM	TOP	ACTUAL TOTAL (Ct)
6 / 21 / 13	RJB	13 : 15	0	0	0	25.0	25.0	0.0
6 / 21 / 13	RJB	13 : 16	1	1	0.00	24.1	24.3	1.6
6 / 21 / 13	RJB	13 : 30	14	15	1.18	24.1	24.3	1.6
6 / 21 / 13	RJB	14 : 0	30	45	1.65	24.1	24.3	1.6
6 / 21 / 13	RJB	14 : 45	45	90	1.95	24.1	24.3	1.6
6 / 21 / 13	RJB	15 : 30	45	135	2.13	24.1	24.3	1.6

PERMEABILITY ASTM D5084

CONSOLIDATION CURVE

PROJECT:	Quanta SH0356-02	TESTED BY:	RJB
PROJECT No.:	SH0356-02	TRACKING CODE:	9097_PM
SAMPLE No.:	0460-011 DUP (28 Day)	EQUIPMENT No.:	5
TEST DATE:	6/20/13		



PERMEABILITY ASTM D5084

TEST DATA

PROJECT:	Quanta SH0356-02	TESTED BY:	RJB
PROJECT No.:	SH0356-02	TRACKING CODE:	9097_PM
SAMPLE No.:	Final N1/N3 (28 Day)	EQUIPMENT No.:	5
TEST DATE:	6/20/13		

DATE	TESTED BY	TIME (military)	ELAPSED TIME (minutes)	HYDRAULIC HEAD (cm)		TEMP. C°	GAUGE PRESSURE (psi)		
				INFLUENT	EFFLUENT		CELL	INFLUENT	EFFLUENT
6 / 24 / 13	RJB	8 : 20	0	0.0	25.0	20.0	55.0	45.0	45.0
6 / 25 / 13	RJB	8 : 20	RESET	0.0	25.0	20.0	55.0	45.0	43.0
6 / 27 / 13	RJB	8 : 12	2872	0.6	24.4	20.0	55.0	45.0	43.0

PERMEABILITY ASTM D5084

TEST DATA (continued)

PROJECT:	Quanta SH0356-02	TESTED BY:	RJB
PROJECT No.:	SH0356-02	TRACKING CODE:	9097_PM
SAMPLE No.:	0460-011 DUP (28 Day)	EQUIPMENT No.:	5
TEST DATE:	6/20/13		

ELAPSED TIME (minutes)	***HYDRAULIC HEAD DIFFERENCE (cm)***		***EFFLUENT - INFLUENT RATIO***	***HYDRAULIC GRADIENT (cm/cm)***	***HYDRAULIC CONDUCTIVITY (cm/sec)***	
	INFLUENT	***EFFLUENT***			***@ Temp.***	***@ 20° C***
RESET				5.797		
RESET				38.415		
2872	0.6	0.6	1.00	38.137	1.99E-09	2.00E-09

PERMEABILITY ASTM D5084

SUMMARY OF RESULTS

PROJECT:	Quanta SH0356-02	TESTED BY:	RJB
PROJECT No.:	SH0356-02	TRACKING CODE:	9097_PM
SAMPLE No.:	0460-011 DUP (28 Day)	EQUIPMENT No.:	5
TEST DATE:	6/20/13		

TESTING PARAMETER	INITIAL	FINAL
BULK UNIT WEIGHT	**112.5 lb/ft³**	**113.6 lb/ft³**
DRY UNIT WEIGHT	**85.3 lb/ft³**	**85.8 lb/ft³**
MOISTURE CONTENT	**32.0 %**	**32.5 %**
PERMEABILITY @ 20°C	**2.0E-09 cm/sec**	

PERMEABILITY ASTM D5084

SPECIMEN CONDITIONS

PROJECT:	Quanta	TESTED BY:	RJB
PROJECT No.:	SH0460	TRACKING CODE:	9096_PM
SAMPLE No.:	0460-013 DUP (28 Day)	EQUIPMENT No.:	6B
TEST DATE:	7/1/13		

MOISTURE CONTENT (Dry Basis)	***INITIAL***	***FINAL***
1. MOISTURE TIN NO.		
2. WT MOISTURE TIN (tare weight)	0.00 ***g***	232.28 ***g***
3. WT WET SOIL + TARE	437.68 ***g***	688.60 ***g***
4. WT DRY SOIL + TARE	331.88 ***g***	564.16 ***g***
5. WT WATER, Ww	105.80 g	124.44 g
6. WT DRY SOIL, Ws	331.88 g	331.88 g
7. MOISTURE CONTENT, W	31.88 %	37.50 %

SOIL SPECIMEN DIMENSIONS				
TRIPLICATE	***DIAMETER***		***HEIGHT***	
ANALYSES	***INITIAL***	***FINAL***	***INITIAL***	***FINAL***
No. 1	***3.02 in.***	***3.02 in.***	***2.61 in.***	***2.59 in.***
No. 2	***3.01 in.***	***3.01 in.***	***2.60 in.***	***2.60 in.***
No. 3	***3.01 in.***	***3.00 in.***	***2.58 in.***	***2.58 in.***
Average	3.01 in.	3.01 in.	2.60 in.	2.59 in.

SPECIMEN CONDITIONS	***INITIAL***	***FINAL***
Specimen WT, Wo	***437.68 g***	***456.37 g***
Area, Ao	7.12 in^2	7.12 in^2
Volume, Vo	18.51 in^3	18.44 in^3
Bulk Unit Weight	90.1 lb/ft^3	94.3 lb/ft^3
Dry Unit Weight	68.3 lb/ft^3	68.6 lb/ft^3

PERMEABILITY ASTM D5084

BACK-PRESSURE SATURATION

PROJECT:	Quanta	TESTED BY:	RJB
PROJECT No.:	SH0460	TRACKING CODE:	9096_PM
SAMPLE No.:	0460-013 DUP (28 Day)	EQUIPMENT No.:	6B
TEST DATE:	7/1/13		

TEST DATE	TIME (military)	TESTED BY	TEST PRESSURES (psi)						
			APPLIED		PORE		PRESSURE CHANGE		
			CELL	BACK	SAT.	TEST	CELL	PORE	B-Value
07/01/13	12 : 10	RJB	7.0	5.0	5.6				
07/01/13	13 : 20	RJB	17.0	15.0	15.7	12.1	10.0	6.5	0.65
07/01/13	13 : 50	RJB	27.0	25.0	25.7	24.2	10.0	8.5	0.85
07/01/13	14 : 25	RJB	37.0	35.0	35.7	35.0	10.0	9.3	0.93
07/02/13	8 : 30	RJB	47.0	45.0	46.1	45.7	10.0	10.0	1.00
07/02/13	9 : 40	RJB	57.0	55.0	*	56.1	10.0	10.0	1.00
07/02/13	9 : 41	RJB	47.0	45.0	*	*	*	*	*

* Saturation check - no data available.

PERMEABILITY ASTM D5084

SPECIMEN CONSOLIDATION

PROJECT:	Quanta	TESTED BY:	RJB
PROJECT No.:	SH0460	TRACKING CODE:	9096_PM
SAMPLE No.:	0460-013 DUP (28 Day)	EQUIPMENT No.:	6B
TEST DATE:	7/1/13		

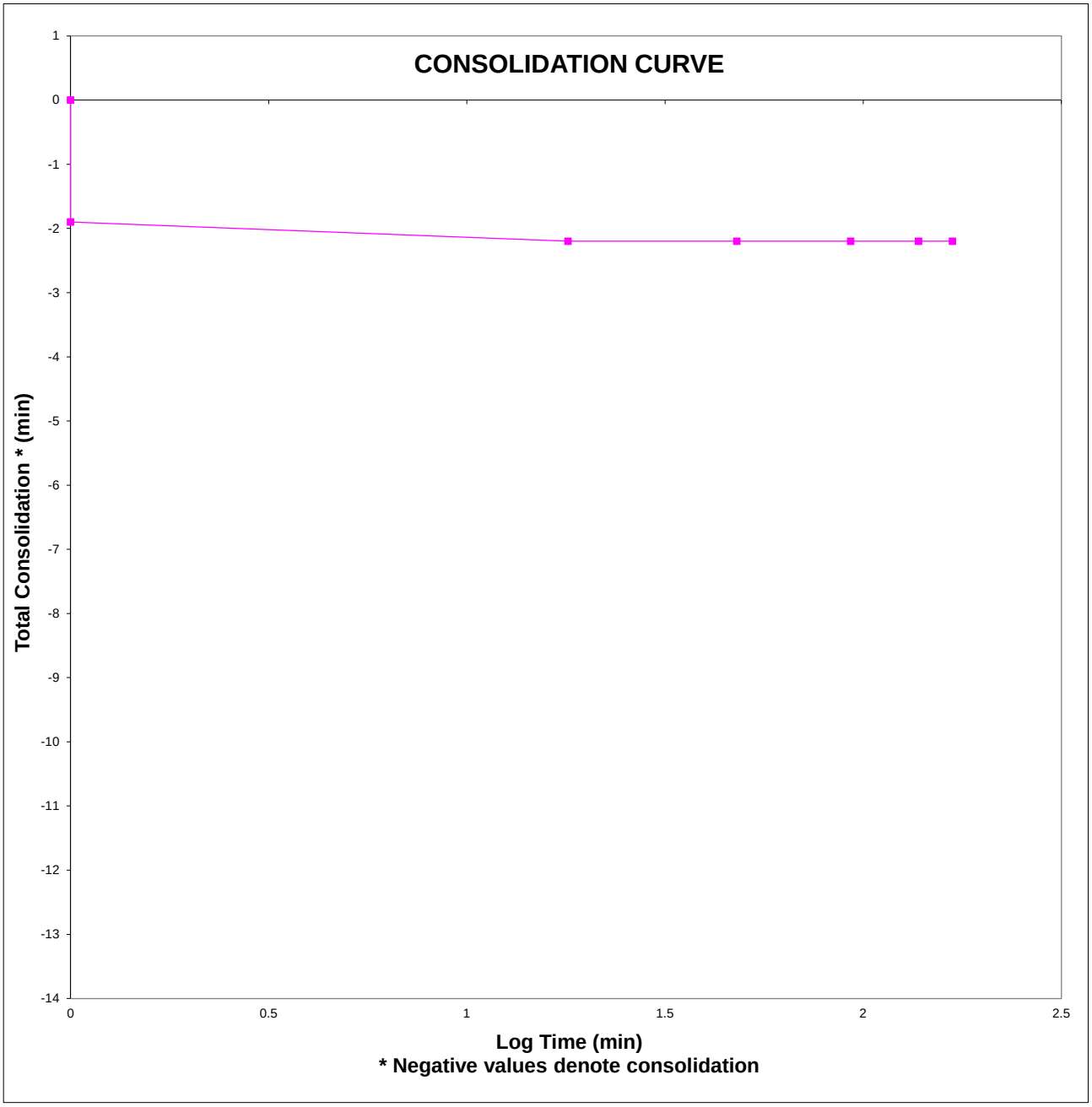
CELL PRESSURE: 55 psi **BACK PRESSURE:** 45 psi **EFFECTIVE STRESS:** 10 psi

TEST DATE	TESTED BY	TIME (Military)	ELAPSED TIME (minutes)	TOTAL TIME (minutes)	TOTAL TIME (Log)	SPECIMEN CONSOLIDATION (ML) READING BOTTOM	TOP	ACTUAL TOTAL (Ct)
7 / 2 / 13	RJB	9 : 42	0	0	0	25.0	25.0	0.0
7 / 2 / 13	RJB	9 : 43	1	1	0.00	24.1	24.0	1.9
7 / 2 / 13	RJB	10 : 0	17	18	1.26	24.0	23.8	2.2
7 / 2 / 13	RJB	10 : 30	30	48	1.68	24.0	23.8	2.2
7 / 2 / 13	RJB	11 : 15	45	93	1.97	24.0	23.8	2.2
7 / 2 / 13	RJB	12 : 0	45	138	2.14	24.0	23.8	2.2
7 / 2 / 13	RJB	12 : 30	30	168	2.23	24.0	23.8	2.2

PERMEABILITY ASTM D5084

CONSOLIDATION CURVE

PROJECT:	Quanta	TESTED BY:	RJB
PROJECT No.:	SH0460	TRACKING CODE:	9096_PM
SAMPLE No.:	0460-013 DUP (28 Day)	EQUIPMENT No.:	6B
TEST DATE:	7/1/13		



PERMEABILITY ASTM D5084

TEST DATA

PROJECT:	Quanta	TESTED BY:	RJB
PROJECT No.:	SH0460	TRACKING CODE:	9096_PM
SAMPLE No.:	Final N2 Comp	EQUIPMENT No.:	6B
TEST DATE:	7/1/13		

DATE	TESTED BY	TIME (military)	ELAPSED TIME (minutes)	HYDRAULIC HEAD (cm)		TEMP. C°	GAUGE PRESSURE (psi)		
				INFLUENT	EFFLUENT		CELL	INFLUENT	EFFLUENT
7 / 3 / 13	RJB	8 : 39	0	0.0	25.0	20.0	55.0	45.0	43.0
7 / 3 / 13	RJB	15 : 18	399	0.5	24.5	20.0	55.0	45.0	43.0
7 / 8 / 13	RJB	7 : 57	6759	2.2	22.8	20.0	55.0	45.0	43.0
7 / 8 / 13	RJB	8 : 27	RESET	0.0	25.0	20.0	55.0	45.0	43.0
7 / 11 / 13	RJB	8 : 37	4330	0.6	24.4	20.0	55.0	45.0	43.0

PERMEABILITY ASTM D5084

TEST DATA (continued)

PROJECT:	Quanta	TESTED BY:	RJB
PROJECT No.:	SH0460	TRACKING CODE:	9096_PM
SAMPLE No.:	0460-013 DUP (28 Day)	EQUIPMENT No.:	6B
TEST DATE:	7/1/13		

ELAPSED TIME (minutes)	***HYDRAULIC HEAD DIFFERENCE (cm)***		***EFFLUENT - INFLUENT RATIO***	***HYDRAULIC GRADIENT (cm/cm)***	***HYDRAULIC CONDUCTIVITY (cm/sec)***	
	INFLUENT	***EFFLUENT***			***@ Temp.***	***@ 20° C***
RESET				25.096		
399	0.5	0.5	1.00	24.944	1.82E-08	1.82E-08
6759	1.7	1.7	1.00	24.429	3.70E-09	3.71E-09
RESET				25.096		
4330	0.6	0.6	1.00	24.914	2.01E-09	2.02E-09

PERMEABILITY ASTM D5084

SUMMARY OF RESULTS

PROJECT:	Quanta	TESTED BY:	RJB
PROJECT No.:	SH0460	TRACKING CODE:	9096_PM
SAMPLE No.:	0460-013 DUP (28 Day)	EQUIPMENT No.:	6B
TEST DATE:	7/1/13		

TESTING PARAMETER	INITIAL	FINAL
BULK UNIT WEIGHT	90.1 lb/ft³	94.3 lb/ft³
DRY UNIT WEIGHT	68.3 lb/ft³	68.6 lb/ft³
MOISTURE CONTENT	31.9 %	37.5 %
PERMEABILITY @ 20°C	2.9E-09 cm/sec	

PERMEABILITY ASTM D5084

SPECIMEN CONDITIONS

PROJECT:	Quanta	TESTED BY:	RJB
PROJECT No.:	SH0356-02	TRACKING CODE:	9095_PM
SAMPLE No.:	0460-017 DUP (28 Day)	EQUIPMENT No.:	4
TEST DATE:	6/20/13		

MOISTURE CONTENT (Dry Basis)	***INITIAL***	***FINAL***
1. MOISTURE TIN NO.		
2. WT MOISTURE TIN (tare weight)	0.00 ***g***	224.73 ***g***
3. WT WET SOIL + TARE	306.78 ***g***	534.92 ***g***
4. WT DRY SOIL + TARE	193.87 ***g***	418.60 ***g***
5. WT WATER, Ww	112.91 g	116.32 g
6. WT DRY SOIL, Ws	193.87 g	193.87 g
7. MOISTURE CONTENT, W	58.24 %	60.00 %

SOIL SPECIMEN DIMENSIONS				
TRIPLICATE	***DIAMETER***		***HEIGHT***	
ANALYSES	***INITIAL***	***FINAL***	***INITIAL***	***FINAL***
No. 1	***3.03 in.***	***3.03 in.***	***1.95 in.***	***1.98 in.***
No. 2	***3.03 in.***	***3.02 in.***	***1.89 in.***	***1.89 in.***
No. 3	***3.02 in.***	***3.02 in.***	***1.89 in.***	***1.91 in.***
Average	3.02 in.	3.02 in.	1.91 in.	1.92 in.

SPECIMEN CONDITIONS	***INITIAL***	***FINAL***
Specimen WT, Wo	***306.78 g***	***310.52 g***
Area, Ao	7.18 in^2	7.18 in^2
Volume, Vo	13.73 in^3	13.81 in^3
Bulk Unit Weight	85.1 lb/ft^3	85.7 lb/ft^3
Dry Unit Weight	53.8 lb/ft^3	53.5 lb/ft^3

PERMEABILITY ASTM D5084

BACK-PRESSURE SATURATION

PROJECT:	Quanta	TESTED BY:	RJB
PROJECT No.:	SH0356-02	TRACKING CODE:	9095_PM
SAMPLE No.:	0460-017 DUP (28 Day)	EQUIPMENT No.:	4
TEST DATE:	6/20/13		

TEST DATE	TIME (military)	TESTED BY	TEST PRESSURES (psi)						
			APPLIED		PORE		PRESSURE CHANGE		
			CELL	BACK	SAT.	TEST	CELL	PORE	B-Value
06/20/13	10 : 15	RJB	7.0	5.0	*				
06/20/13	12 : 10	RJB	17.0	15.0	*	*	*	*	*
06/20/13	8 : 5	RJB	27.0	25.0	25.4	*	*	*	*
06/20/13	9 : 30	RJB	37.0	35.0	35.1	34.5	10.0	9.1	0.91
06/20/13	11 : 50	RJB	47.0	45.0	45.1	44.8	10.0	9.7	0.97
06/20/13	13 : 20	RJB	57.0	55.0	*	55.1	10.0	10.0	1.00
06/20/13	13 : 21	RJB	47.0	45.0	*	*	*	*	*

* Saturation check - no data available.

PERMEABILITY ASTM D5084

SPECIMEN CONSOLIDATION

PROJECT:	Quanta	TESTED BY:	RJB
PROJECT No.:	SH0356-02	TRACKING CODE:	9095_PM
SAMPLE No.:	0460-017 DUP (28 Day)	EQUIPMENT No.:	4
TEST DATE:	6/20/13		

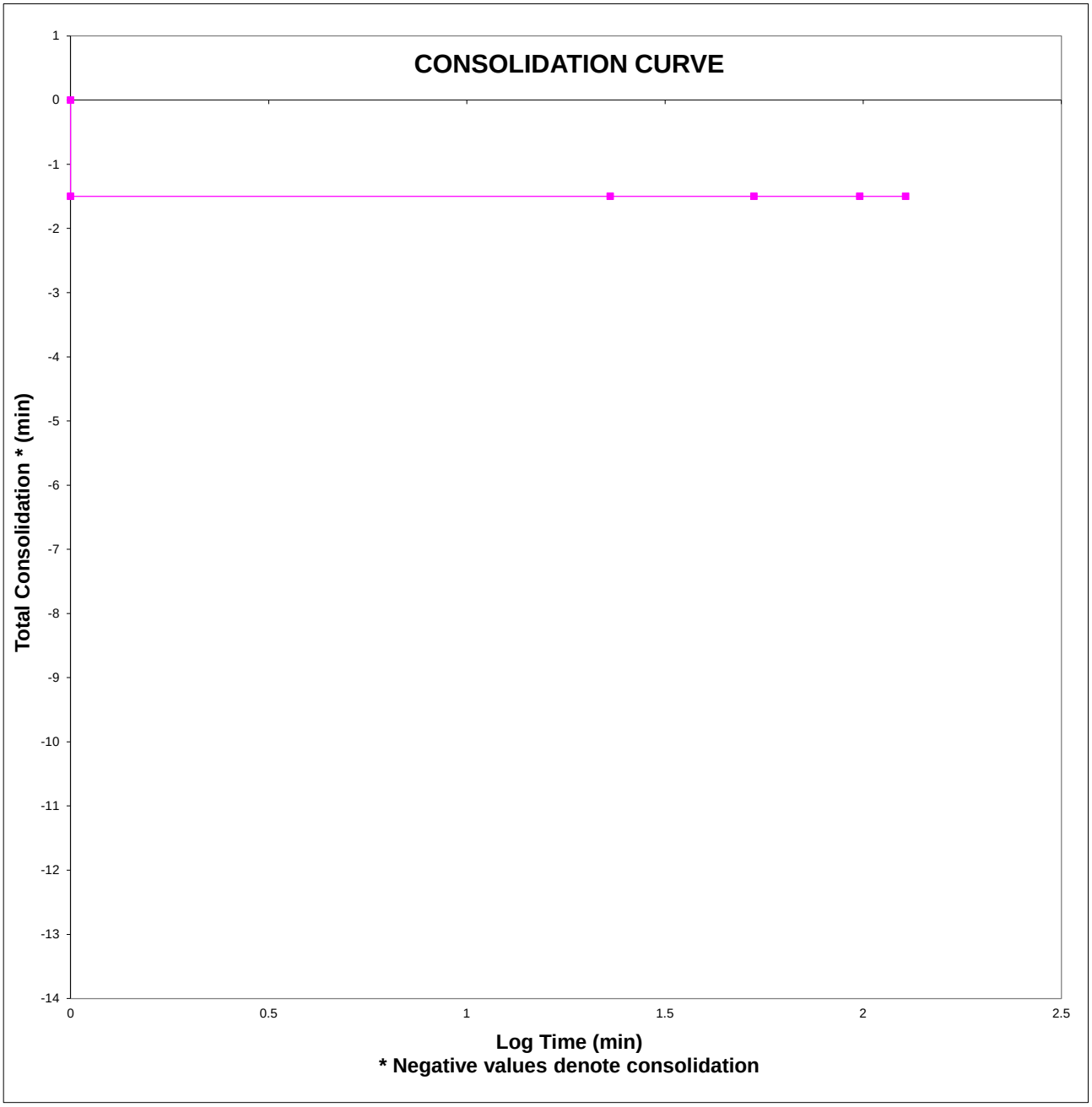
CELL PRESSURE: 55 psi **BACK PRESSURE:** 45 psi **EFFECTIVE STRESS:** 10 psi

TEST DATE	TESTED BY	TIME (Military)	ELAPSED TIME (minutes)	TOTAL TIME (minutes)	TOTAL TIME (Log)	SPECIMEN CONSOLIDATION (ML) READING BOTTOM	SPECIMEN CONSOLIDATION (ML) READING TOP	SPECIMEN CONSOLIDATION (ML) ACTUAL TOTAL (Ct)
6 / 21 / 13	RJB	13 : 22	0	0	0	25.0	25.0	0.0
6 / 21 / 13	RJB	13 : 23	1	1	0.00	24.3	24.2	1.5
6 / 21 / 13	RJB	13 : 45	22	23	1.36	24.3	24.2	1.5
6 / 21 / 13	RJB	14 : 15	30	53	1.72	24.3	24.2	1.5
6 / 21 / 13	RJB	15 : 0	45	98	1.99	24.3	24.2	1.5
6 / 21 / 13	RJB	15 : 30	30	128	2.11	24.3	24.2	1.5

PERMEABILITY ASTM D5084

CONSOLIDATION CURVE

PROJECT:	Quanta	TESTED BY:	RJB
PROJECT No.:	SH0356-02	TRACKING CODE:	9095_PM
SAMPLE No.:	0460-017 DUP (28 Day)	EQUIPMENT No.:	4
TEST DATE:	6/20/13		



PERMEABILITY ASTM D5084

TEST DATA

PROJECT:	Quanta	TESTED BY:	RJB
PROJECT No.:	SH0356-02	TRACKING CODE:	9095_PM
SAMPLE No.:	Final N4A (28 Day)	EQUIPMENT No.:	4
TEST DATE:	6/20/13		

DATE	TESTED BY	TIME (military)	ELAPSED TIME (minutes)	HYDRAULIC HEAD (cm)		TEMP. C°	GAUGE PRESSURE (psi)		
				INFLUENT	EFFLUENT		CELL	INFLUENT	EFFLUENT
6 / 24 / 13	RJB	8 : 27	0	0.0	25.0	20.0	55.0	45.0	45.0
6 / 25 / 13	RJB	8 : 19	RESET	0.0	25.0	20.0	55.0	45.0	43.0
6 / 27 / 13	RJB	8 : 12	2873	0.7	24.3	20.0	55.0	45.0	43.0
7 / 1 / 13	RJB	8 : 17	5765	1.6	23.4	20.0	55.0	45.0	43.0

PERMEABILITY ASTM D5084

TEST DATA (continued)

PROJECT:	Quanta	TESTED BY:	RJB
PROJECT No.:	SH0356-02	TRACKING CODE:	9095_PM
SAMPLE No.:	0460-017 DUP (28 Day)	EQUIPMENT No.:	4
TEST DATE:	6/20/13		

ELAPSED TIME (minutes)	***HYDRAULIC HEAD DIFFERENCE (cm)***		***EFFLUENT - INFLUENT RATIO***	***HYDRAULIC GRADIENT (cm/cm)***	***HYDRAULIC CONDUCTIVITY (cm/sec)***	
	INFLUENT	***EFFLUENT***			***@ Temp.***	***@ 20° C***
RESET				5.150		
RESET				34.130		
2873	0.7	0.7	1.00	33.842	2.58E-09	2.59E-09
5765	0.9	0.9	1.00	33.471	1.67E-09	1.68E-09

PERMEABILITY ASTM D5084

SUMMARY OF RESULTS

PROJECT:	Quanta	TESTED BY:	RJB
PROJECT No.:	SH0356-02	TRACKING CODE:	9095_PM
SAMPLE No.:	0460-017 DUP (28 Day)	EQUIPMENT No.:	4
TEST DATE:	6/20/13		

TESTING PARAMETER	INITIAL	FINAL
BULK UNIT WEIGHT	85.1 lb/ft³	85.7 lb/ft³
DRY UNIT WEIGHT	53.8 lb/ft³	53.5 lb/ft³
MOISTURE CONTENT	58.2 %	60.0 %
PERMEABILITY @ 20°C	2.6E-09 cm/sec	

PERMEABILITY ASTM D5084

SPECIMEN CONDITIONS

PROJECT:	Quanta	TESTED BY:	RJB
PROJECT No.:	SH0460	TRACKING CODE:	9098_PM
SAMPLE No.:	0460-019 DUP (28 Day)	EQUIPMENT No.:	3
TEST DATE:	7/1/13		

MOISTURE CONTENT (Dry Basis)	***INITIAL***	***FINAL***
1. MOISTURE TIN NO.		
2. WT MOISTURE TIN (tare weight)	0.00 ***g***	3.87 ***g***
3. WT WET SOIL + TARE	361.27 ***g***	366.20 ***g***
4. WT DRY SOIL + TARE	277.83 ***g***	281.70 ***g***
5. WT WATER, Ww	83.44 g	84.50 g
6. WT DRY SOIL, Ws	277.83 g	277.83 g
7. MOISTURE CONTENT, W	30.03 %	30.41 %

SOIL SPECIMEN DIMENSIONS				
TRIPLICATE	***DIAMETER***		***HEIGHT***	
ANALYSES	***INITIAL***	***FINAL***	***INITIAL***	***FINAL***
No. 1	***3.02 in.***	***3.01 in.***	***1.68 in.***	***1.69 in.***
No. 2	***3.01 in.***	***3.01 in.***	***1.67 in.***	***1.69 in.***
No. 3	***3.00 in.***	***3.00 in.***	***1.66 in.***	***1.66 in.***
Average	3.01 in.	3.01 in.	1.67 in.	1.68 in.

SPECIMEN CONDITIONS	***INITIAL***	***FINAL***
Specimen WT, Wo	***361.27 g***	***362.46 g***
Area, Ao	7.11 in^2	7.10 in^2
Volume, Vo	11.86 in^3	11.92 in^3
Bulk Unit Weight	116.1 lb/ft^3	115.8 lb/ft^3
Dry Unit Weight	89.3 lb/ft^3	88.8 lb/ft^3

PERMEABILITY ASTM D5084

BACK-PRESSURE SATURATION

PROJECT:	Quanta	TESTED BY:	RJB
PROJECT No.:	SH0460	TRACKING CODE:	9098_PM
SAMPLE No.:	0460-019 DUP (28 Day)	EQUIPMENT No.:	3
TEST DATE:	7/1/13		

TEST DATE	TIME (military)	TESTED BY	TEST PRESSURES (psi)						
			APPLIED		PORE		PRESSURE CHANGE		
			CELL	BACK	SAT.	TEST	CELL	PORE	B-Value
07/01/13	10 : 25	RJB	7.0	5.0	4.7				
07/01/13	12 : 30	RJB	17.0	15.0	16.0	11.7	10.0	7.0	0.70
07/01/13	13 : 15	RJB	27.0	25.0	25.9	24.6	10.0	8.6	0.86
07/01/13	13 : 50	RJB	37.0	35.0	35.9	35.1	10.0	9.2	0.92
07/01/13	14 : 25	RJB	47.0	45.0	45.7	45.4	10.0	9.5	0.95
07/02/13	8 : 45	RJB	57.0	55.0	*	55.7	10.0	10.0	1.00
07/02/13	8 : 46	RJB	47.0	45.0	*	*	*	*	*

* Saturation check - no data available.

PERMEABILITY ASTM D5084

SPECIMEN CONSOLIDATION

PROJECT:	Quanta	TESTED BY:	RJB
PROJECT No.:	SH0460	TRACKING CODE:	9098_PM
SAMPLE No.:	0460-019 DUP (28 Day)	EQUIPMENT No.:	3
TEST DATE:	7/1/13		

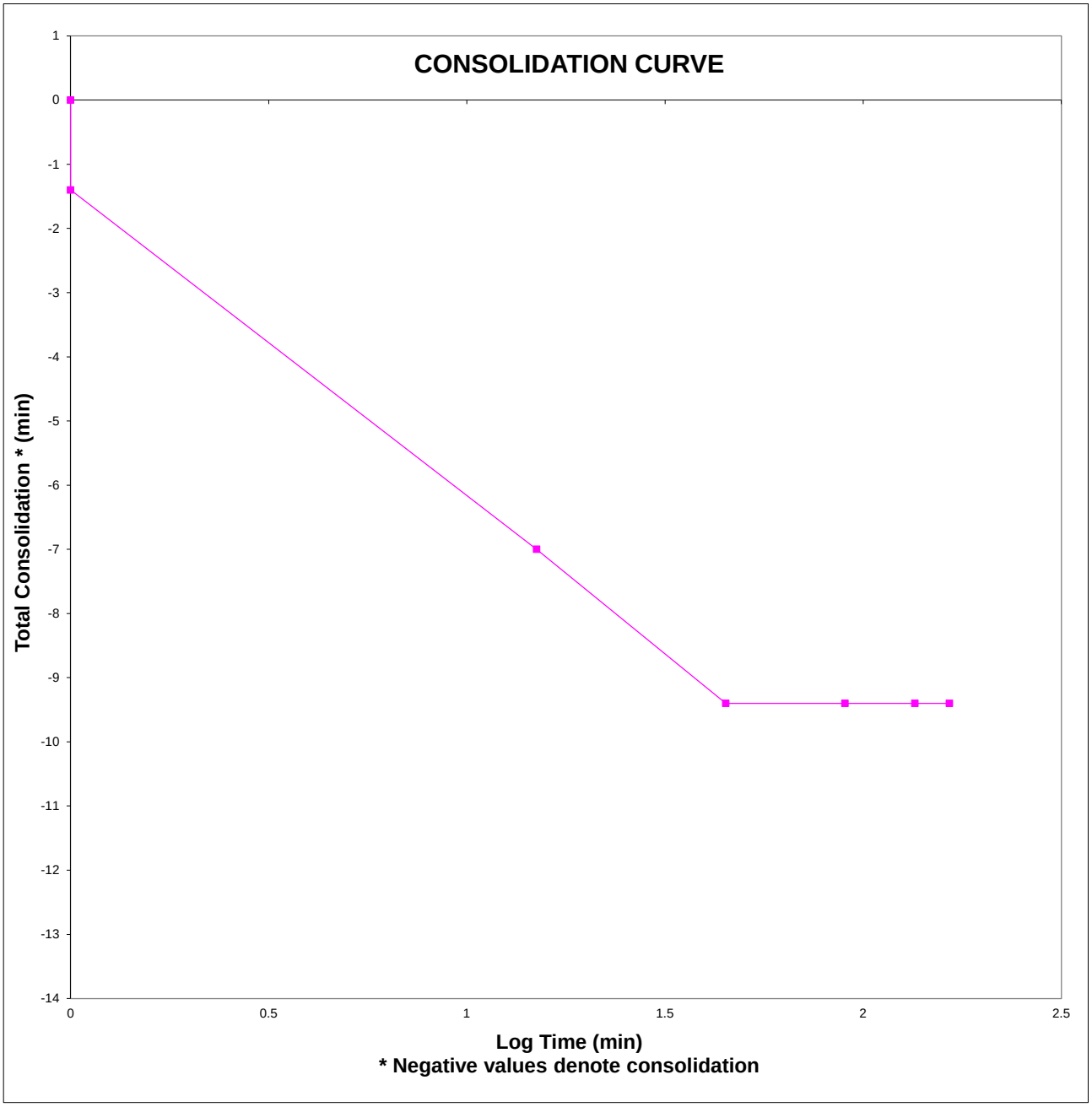
CELL PRESSURE: 55 psi **BACK PRESSURE:** 45 psi **EFFECTIVE STRESS:** 10 psi

TEST DATE	TESTED BY	TIME (Military)	ELAPSED TIME (minutes)	TOTAL TIME (minutes)	TOTAL TIME (Log)	SPECIMEN CONSOLIDATION (ML) READING BOTTOM	SPECIMEN CONSOLIDATION (ML) READING TOP	SPECIMEN CONSOLIDATION (ML) ACTUAL TOTAL (Ct)
7 / 2 / 13	RJB	9 : 30	0	0	0	25.0	25.0	0.0
7 / 2 / 13	RJB	9 : 31	1	1	0.00	24.1	24.5	1.4
7 / 2 / 13	RJB	9 : 45	14	15	1.18	21.0	22.0	7.0
7 / 2 / 13	RJB	10 : 15	30	45	1.65	19.4	21.2	9.4
7 / 2 / 13	RJB	11 : 0	45	90	1.95	19.4	21.2	9.4
7 / 2 / 13	RJB	11 : 45	45	135	2.13	19.4	21.2	9.4
7 / 2 / 13	RJB	12 : 15	30	165	2.22	19.4	21.2	9.4

PERMEABILITY ASTM D5084

CONSOLIDATION CURVE

PROJECT:	Quanta	TESTED BY:	RJB
PROJECT No.:	SH0460	TRACKING CODE:	9098_PM
SAMPLE No.:	0460-019 DUP (28 Day)	EQUIPMENT No.:	3
TEST DATE:	7/1/13		



PERMEABILITY ASTM D5084

TEST DATA

PROJECT:	Quanta	TESTED BY:	RJB
PROJECT No.:	SH0460	TRACKING CODE:	9098_PM
SAMPLE No.:	Final A-2A (28 Day)	EQUIPMENT No.:	3
TEST DATE:	7/1/13		

DATE	TESTED BY	TIME (military)	ELAPSED TIME (minutes)	HYDRAULIC HEAD (cm)		TEMP. C°	GAUGE PRESSURE (psi)		
				INFLUENT	EFFLUENT		CELL	INFLUENT	EFFLUENT
7 / 12 / 13	RJB	10 : 27	0	0.0	25.0	20.0	55.0	45.0	43.0
7 / 15 / 13	RJB	8 : 41	4214	0.6	24.8	20.0	55.0	45.0	43.0

PERMEABILITY ASTM D5084

TEST DATA (continued)

PROJECT:	Quanta	TESTED BY:	RJB
PROJECT No.:	SH0460	TRACKING CODE:	9098_PM
SAMPLE No.:	0460-019 DUP (28 Day)	EQUIPMENT No.:	3
TEST DATE:	7/1/13		

ELAPSED TIME (minutes)	***HYDRAULIC HEAD DIFFERENCE (cm)***		***EFFLUENT - INFLUENT RATIO***	***HYDRAULIC GRADIENT (cm/cm)***	***HYDRAULIC CONDUCTIVITY (cm/sec)***	
	INFLUENT	***EFFLUENT***			***@ Temp.***	***@ 20° C***
RESET				39.094		
4214	0.6	0.2	0.33	38.905	8.85E-10	8.89E-10

PERMEABILITY ASTM D5084

SUMMARY OF RESULTS

PROJECT:	Quanta	TESTED BY:	RJB
PROJECT No.:	SH0460	TRACKING CODE:	9098_PM
SAMPLE No.:	0460-019 DUP (28 Day)	EQUIPMENT No.:	3
TEST DATE:	7/1/13		

TESTING PARAMETER	INITIAL	FINAL
BULK UNIT WEIGHT	116.1 lb/ft³	115.8 lb/ft³
DRY UNIT WEIGHT	89.3 lb/ft³	88.8 lb/ft³
MOISTURE CONTENT	30.0 %	30.4 %
PERMEABILITY @ 20°C	8.9E-10 cm/sec	

PERMEABILITY ASTM D5084

SPECIMEN CONDITIONS

PROJECT:	Quanta	TESTED BY:	RJB
PROJECT No.:	SH0460	TRACKING CODE:	9094_PM
SAMPLE No.:	0460-022 DUP (28 Day)	EQUIPMENT No.:	2
TEST DATE:	7/1/13		

MOISTURE CONTENT (Dry Basis)	***INITIAL***	***FINAL***
1. MOISTURE TIN NO.		
2. WT MOISTURE TIN (tare weight)	0.00 ***g***	405.53 ***g***
3. WT WET SOIL + TARE	839.40 ***g***	1254.80 ***g***
4. WT DRY SOIL + TARE	655.17 ***g***	1060.70 ***g***
5. WT WATER, Ww	184.23 g	194.10 g
6. WT DRY SOIL, Ws	655.17 g	655.17 g
7. MOISTURE CONTENT, W	28.12 %	29.63 %

SOIL SPECIMEN DIMENSIONS				
TRIPLICATE	***DIAMETER***		***HEIGHT***	
ANALYSES	***INITIAL***	***FINAL***	***INITIAL***	***FINAL***
No. 1	***3.04 in.***	***3.03 in.***	***3.76 in.***	***3.79 in.***
No. 2	***3.02 in.***	***3.02 in.***	***3.79 in.***	***3.76 in.***
No. 3	***3.00 in.***	***3.00 in.***	***3.78 in.***	***3.71 in.***
Average	3.02 in.	3.01 in.	3.78 in.	3.75 in.

SPECIMEN CONDITIONS	***INITIAL***	***FINAL***
Specimen WT, Wo	***839.40 g***	***850.00 g***
Area, Ao	7.16 in^2	7.14 in^2
Volume, Vo	27.08 in^3	26.80 in^3
Bulk Unit Weight	118.1 lb/ft^3	120.8 lb/ft^3
Dry Unit Weight	92.2 lb/ft^3	93.2 lb/ft^3

PERMEABILITY ASTM D5084

BACK-PRESSURE SATURATION

PROJECT:	Quanta	TESTED BY:	RJB
PROJECT No.:	SH0460	TRACKING CODE:	9094_PM
SAMPLE No.:	0460-022 DUP (28 Day)	EQUIPMENT No.:	2
TEST DATE:	7/1/13		

TEST DATE	TIME (military)	TESTED BY	TEST PRESSURES (psi)						
			APPLIED		PORE		PRESSURE CHANGE		
			CELL	BACK	SAT.	TEST	CELL	PORE	B-Value
07/01/13	11 : 55	RJB	7.0	5.0	5.9				
07/01/13	12 : 30	RJB	17.0	15.0	14.8	12.2	10.0	6.3	0.63
07/01/13	13 : 20	RJB	27.0	25.0	26.2	21.8	10.0	7.0	0.70
07/01/13	13 : 50	RJB	37.0	35.0	36.0	35.1	10.0	8.9	0.89
07/01/13	14 : 25	RJB	47.0	45.0	46.8	45.0	10.0	9.0	0.90
07/02/13	8 : 25	RJB	57.0	55.0	*	56.3	10.0	9.5	0.95
07/02/13	8 : 26	RJB	47.0	45.0	*	*	*	*	*

* Saturation check - no data available.

PERMEABILITY ASTM D5084

SPECIMEN CONSOLIDATION

PROJECT:	Quanta	TESTED BY:	RJB
PROJECT No.:	SH0460	TRACKING CODE:	9094_PM
SAMPLE No.:	0460-022 DUP (28 Day)	EQUIPMENT No.:	2
TEST DATE:	7/1/13		

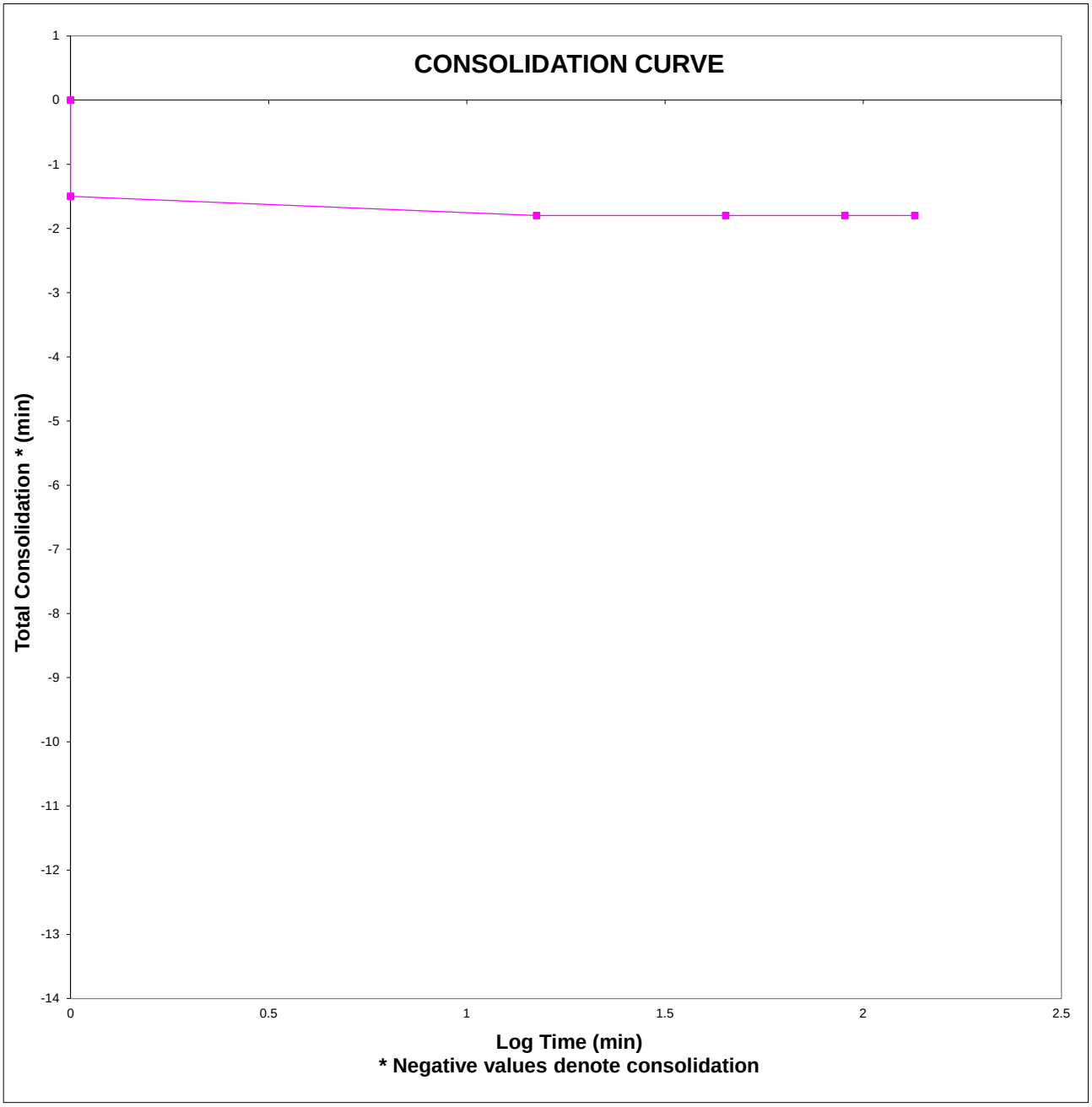
CELL PRESSURE: psi **BACK PRESSURE:** psi **EFFECTIVE STRESS:** 0 psi

TEST DATE	TESTED BY	TIME (Military)	ELAPSED TIME (minutes)	TOTAL TIME (minutes)	TOTAL TIME (Log)	SPECIMEN CONSOLIDATION (ML) READING BOTTOM	READING TOP	ACTUAL TOTAL (Ct)
7 / 2 / 13	RJB	8 : 30	0	0	0	24.0	25.0	0.0
7 / 2 / 13	RJB	8 : 31	1	1	0.00	23.2	24.3	1.5
7 / 2 / 13	RJB	8 : 45	14	15	1.18	22.9	24.3	1.8
7 / 2 / 13	RJB	9 : 15	30	45	1.65	22.9	24.3	1.8
7 / 2 / 13	RJB	10 : 0	45	90	1.95	22.9	24.3	1.8
7 / 2 / 13	RJB	10 : 45	45	135	2.13	22.9	24.3	1.8

PERMEABILITY ASTM D5084

CONSOLIDATION CURVE

PROJECT:	Quanta	TESTED BY:	RJB
PROJECT No.:	SH0460	TRACKING CODE:	9094_PM
SAMPLE No.:	0460-022 DUP (28 Day)	EQUIPMENT No.:	2
TEST DATE:	7/1/13		



PERMEABILITY ASTM D5084

TEST DATA

PROJECT:	Quanta	TESTED BY:	RJB
PROJECT No.:	SH0460	TRACKING CODE:	9094_PM
SAMPLE No.:		EQUIPMENT No.:	2
TEST DATE:	7/1/13		

DATE	TESTED BY	TIME (military)	ELAPSED TIME (minutes)	HYDRAULIC HEAD (cm)		TEMP. C°	GAUGE PRESSURE (psi)		
				INFLUENT	EFFLUENT		CELL	INFLUENT	EFFLUENT
7 / 3 / 13	RJB	8 : 34	0	0.0	25.0	20.0	55.0	45.0	43.0
7 / 8 / 13	RJB	7 : 57	7163	3.1	21.9	20.0	55.0	45.0	43.0

PERMEABILITY ASTM D5084

TEST DATA (continued)

PROJECT:	Quanta	TESTED BY:	RJB
PROJECT No.:	SH0460	TRACKING CODE:	9094_PM
SAMPLE No.:	0460-022 DUP (28 Day)	EQUIPMENT No.:	2
TEST DATE:	7/1/13		

ELAPSED TIME (minutes)	***HYDRAULIC HEAD DIFFERENCE (cm)***		***EFFLUENT - INFLUENT RATIO***	***HYDRAULIC GRADIENT (cm/cm)***	***HYDRAULIC CONDUCTIVITY (cm/sec)***	
	INFLUENT	***EFFLUENT***			***@ Temp.***	***@ 20° C***
RESET				17.260		
7163	3.1	3.1	1.00	16.614	9.21E-09	9.26E-09

PERMEABILITY ASTM D5084

SUMMARY OF RESULTS

PROJECT:	Quanta	TESTED BY:	RJB
PROJECT No.:	SH0460	TRACKING CODE:	9094_PM
SAMPLE No.:	0460-022 DUP (28 Day)	EQUIPMENT No.:	2
TEST DATE:	7/1/13		

TESTING PARAMETER	INITIAL	FINAL
BULK UNIT WEIGHT	118.1 lb/ft³	120.8 lb/ft³
DRY UNIT WEIGHT	92.2 lb/ft³	93.2 lb/ft³
MOISTURE CONTENT	28.1 %	29.6 %
PERMEABILITY @ 20°C	9.3E-09 cm/sec	

UNCONFINED COMPRESSION TEST

ASTM D 2166

PROJECT:	Quanta
PROJECT No.:	SH0460
SAMPLE No.:	0460-011 DUP
TESTING DATE:	20-Jun-13
TESTED BY:	KMA
LOADING RATE:	0.04 in./min.
TRACKING CODE:	9097_US

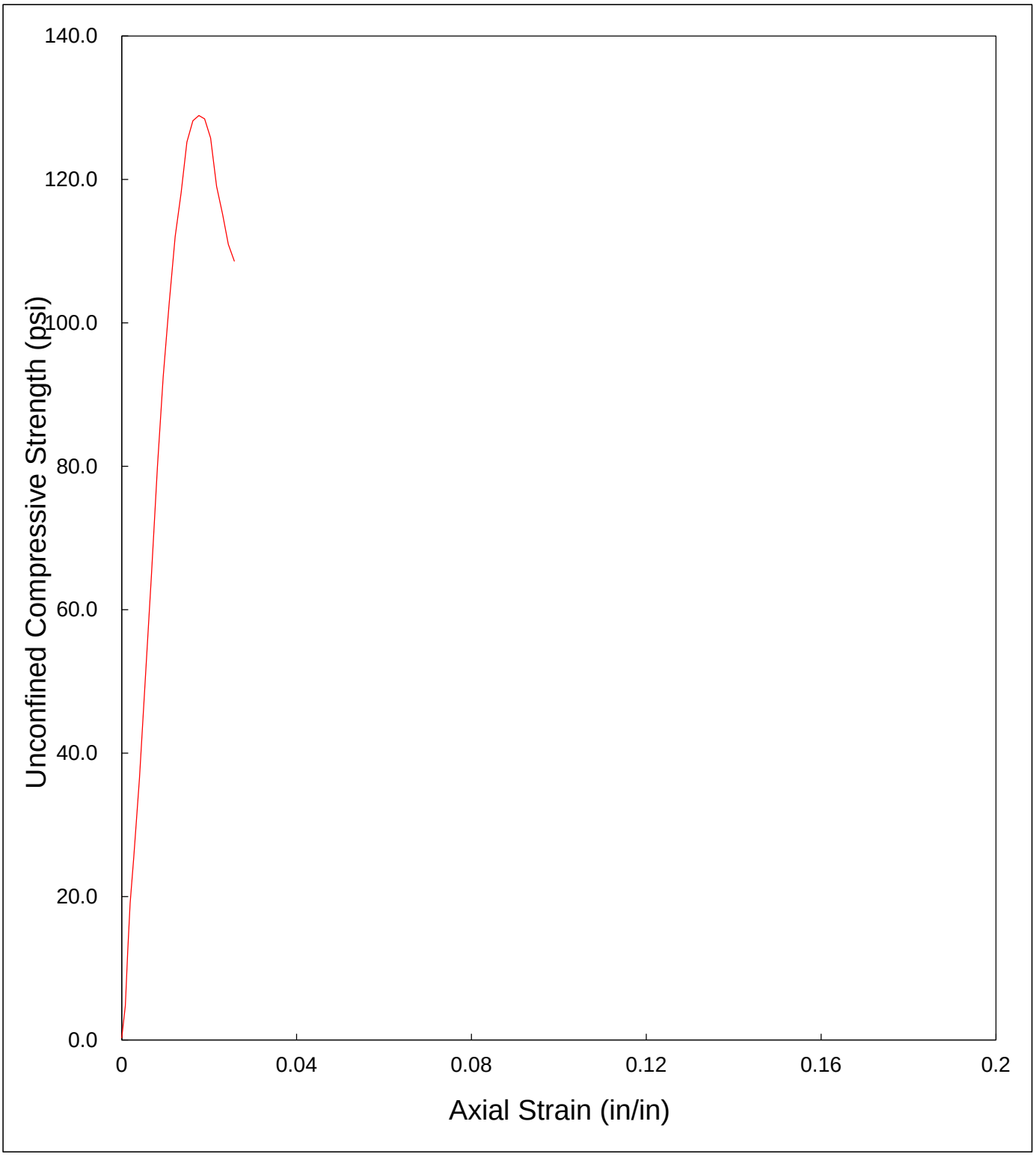
MOISTURE CONTENT (Dry Basis)		
1. MOISTURE TIN NO.		
2. WT MOISTURE TIN (tare weight)	166.11	g
3. WT WET SOIL + TARE	508.40	g
4. WT DRY SOIL + TARE	431.77	g
5. WT WATER, Ww	76.63	g
6. WT DRY SOIL, Ws	265.66	g
7. MOISTURE CONTENT, W	**28.85**	**%**

SOIL SPECIMEN DIMENSIONS	*DIAMETER*		*LENGTH*	
No. 1	2.00	in.	3.70	in.
No. 2	2.00	in.	3.68	in.
No. 3	1.99	in.	3.68	in.
Average	**2.00**	**in.**	**3.69**	**in.**

SPECIMEN CONDITIONS		
Initial Specimen WT, Wo	***345.45***	***g***
Initial Area, Ao	3.14	in^2
Initial Volume, Vo	11.57	in^3
Initial Bulk Unit Weight,	113.7	lb/ft^3
Initial Dry Unit Weight	88.2	lb/ft^3
15 % Strain (0.15 Lo)	0.55	in.
UCS	128.9	lb/in^2

COMPRESSIVE LOAD (lbs.)	DIAL GAGE READING (in.)	SPECIMEN DEFORMATION (in.)	CORRECTED AREA (in^2)	AXIAL STRAIN (in/in)	UNCONFINED COMPRESSIVE STRENGTH (lb/in^2)
1	0.000	0.000	3.139	0.0000	0.3
15	0.003	0.003	3.142	0.0008	4.8
39	0.005	0.005	3.143	0.0014	12.4
60	0.007	0.007	3.145	0.0019	19.1
80	0.010	0.010	3.148	0.0027	25.4
115	0.015	0.015	3.152	0.0041	36.5
160	0.020	0.020	3.156	0.0054	50.7
205	0.025	0.025	3.160	0.0068	64.9
253	0.030	0.030	3.165	0.0081	79.9
293	0.035	0.035	3.169	0.0095	92.5
326	0.040	0.040	3.173	0.0108	102.7
356	0.045	0.045	3.178	0.0122	112.0
376	0.050	0.050	3.182	0.0136	118.2
399	0.055	0.055	3.187	0.0149	125.2
409	0.060	0.060	3.191	0.0163	128.2
412	0.065	0.065	3.195	0.0176	128.9
411	0.070	0.070	3.200	0.0190	128.4
403	0.075	0.075	3.204	0.0203	125.8
382	0.080	0.080	3.209	0.0217	119.1
370	0.085	0.085	3.213	0.0231	115.2
357	0.090	0.090	3.218	0.0244	111.0
350	0.095	0.095	3.222	0.0258	108.6

UNCONFINED COMPRESSION TESTING
Sample No. 0460-011 DUP



UNCONFINED COMPRESSION TEST

ASTM D 2166
SUMMARY OF RESULTS

PROJECT:	Quanta		
PROJECT No.:	SH0460		
SAMPLE No.:	0460-011 DUP		
TESTING DATE:	6/20/2013	LOADING RATE:	0.04 in./min.
TESTED BY:	KMA	TRACKING CODE:	9097_US

TESTING PARAMETER AND RESULTS		
MOISTURE CONTENT	28.8	**%**
BULK UNIT WEIGHT	113.7	lb/ft^3
DRY UNIT WEIGHT	88.2	lb/ft^3
UCS *	128.9	lb/in^2

* UCS - UNCONFINED COMPRESSIVE STRENGTH

UNCONFINED COMPRESSION TEST

ASTM D 2166

PROJECT:	Quanta
PROJECT No.:	SH0460
SAMPLE No.:	Final N2 comp
TESTING DATE:	20-Jun-13
TESTED BY:	KMA

LOADING RATE:	0.04 in./min.
TRACKING CODE:	9096

MOISTURE CONTENT (Dry Basis)		
1. MOISTURE TIN NO.		
2. WT MOISTURE TIN (tare weight)	177.19	g
3. WT WET SOIL + TARE	466.99	g
4. WT DRY SOIL + TARE	392.43	g
5. WT WATER, Ww	74.56	g
6. WT DRY SOIL, Ws	215.24	g
7. MOISTURE CONTENT, W	**34.64**	**%**

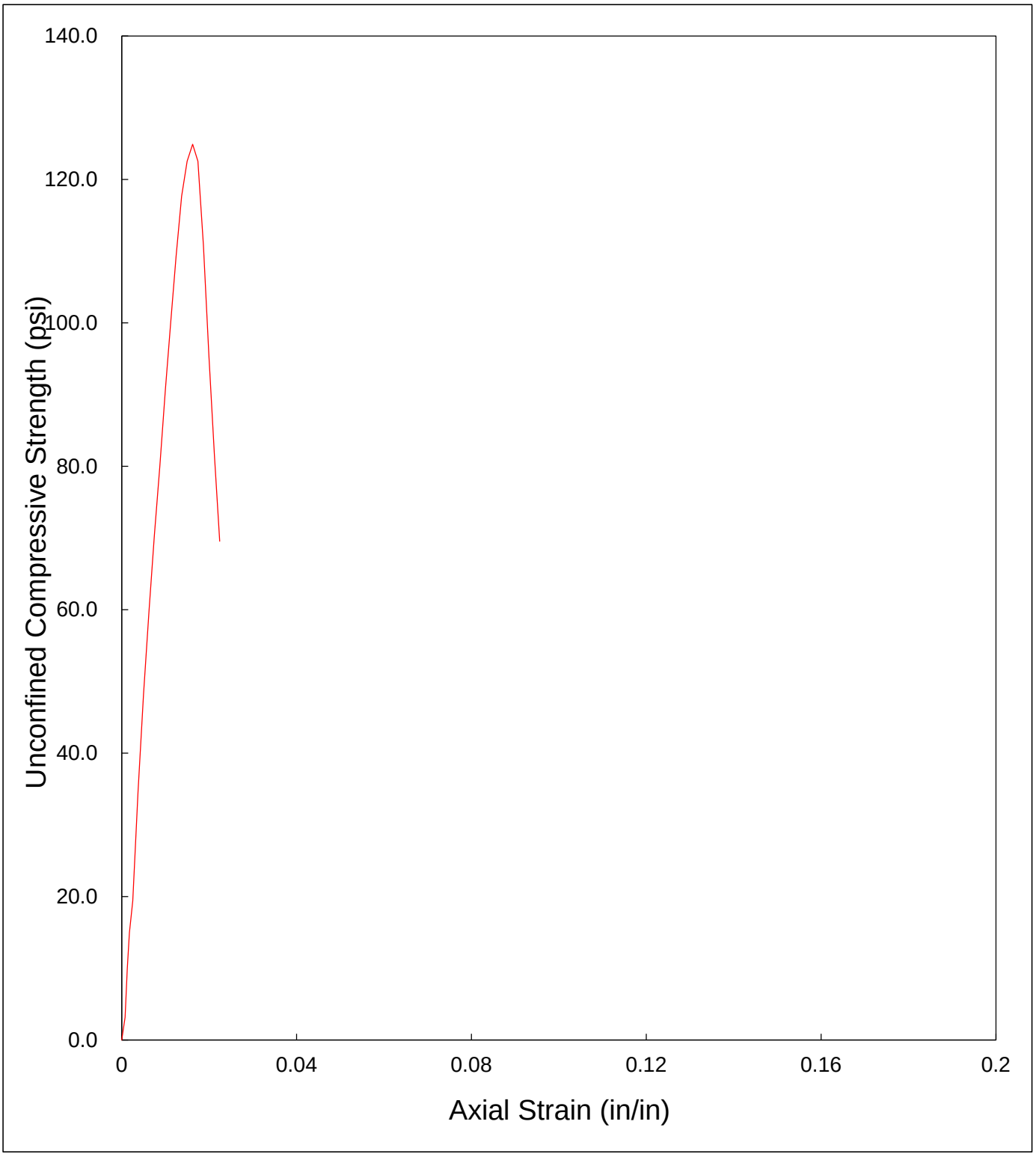
SOIL SPECIMEN DIMENSIONS	*DIAMETER*		*LENGTH*	
No. 1	2.01	in.	4.01	in.
No. 2	1.99	in.	4.00	in.
No. 3	1.99	in.	4.03	in.
Average	**2.00**	**in.**	**4.01**	**in.**

SPECIMEN CONDITIONS		
Initial Specimen WT, Wo	***290.07***	***g***
Initial Area, Ao	3.13	in^2
Initial Volume, Vo	12.58	in^3
Initial Bulk Unit Weight,	87.9	lb/ft^3
Initial Dry Unit Weight	65.3	lb/ft^3
15 % Strain (0.15 Lo)	0.60	in.
UCS	124.9	lb/in^2

COMPRESSIVE LOAD (lbs.)	DIAL GAGE READING (in.)	SPECIMEN DEFORMATION (in.)	CORRECTED AREA (in^2)	AXIAL STRAIN (in/in)	UNCONFINED COMPRESSIVE STRENGTH (lb/in^2)
0	0.000	0.000	3.135	0.0000	0.0
10	0.003	0.003	3.137	0.0007	3.2
31	0.005	0.005	3.139	0.0012	9.9
47	0.007	0.007	3.140	0.0017	15.0
61	0.010	0.010	3.143	0.0025	19.4
109	0.015	0.015	3.147	0.0037	34.6
152	0.020	0.020	3.150	0.0050	48.2
189	0.025	0.025	3.154	0.0062	59.9
222	0.030	0.030	3.158	0.0075	70.3
253	0.035	0.035	3.162	0.0087	80.0
287	0.040	0.040	3.166	0.0100	90.6
318	0.045	0.045	3.170	0.0112	100.3
347	0.050	0.050	3.174	0.0125	109.3
374	0.055	0.055	3.178	0.0137	117.7
390	0.060	0.060	3.182	0.0150	122.5
398	0.065	0.065	3.186	0.0162	124.9
391	0.070	0.070	3.190	0.0174	122.6
354	0.075	0.075	3.195	0.0187	110.8
305	0.080	0.080	3.199	0.0199	95.4
261	0.085	0.085	3.203	0.0212	81.5
223	0.090	0.090	3.207	0.0224	69.5

UNCONFINED COMPRESSION TESTING

Sample No. Final N2 comp



UNCONFINED COMPRESSION TEST

ASTM D 2166
SUMMARY OF RESULTS

PROJECT:	Quanta		
PROJECT No.:	SH0460		
SAMPLE No.:	Final N2 comp		
TESTING DATE:	6/20/2013	LOADING RATE:	0.04 in./min.
TESTED BY:	KMA	TRACKING CODE:	9096

TESTING PARAMETER AND RESULTS		
MOISTURE CONTENT	34.6	**%**
BULK UNIT WEIGHT	87.9	lb/ft^3
DRY UNIT WEIGHT	65.3	lb/ft^3
UCS *	124.9	lb/in^2

* UCS - UNCONFINED COMPRESSIVE STRENGTH

UNCONFINED COMPRESSION TEST

ASTM D 2166

PROJECT:	Quanta
PROJECT No.:	SH0460
SAMPLE No.:	0460-017 DUP
TESTING DATE:	20-Jun-13
TESTED BY:	KMA

LOADING RATE:	0.04 in./min.
TRACKING CODE:	9095

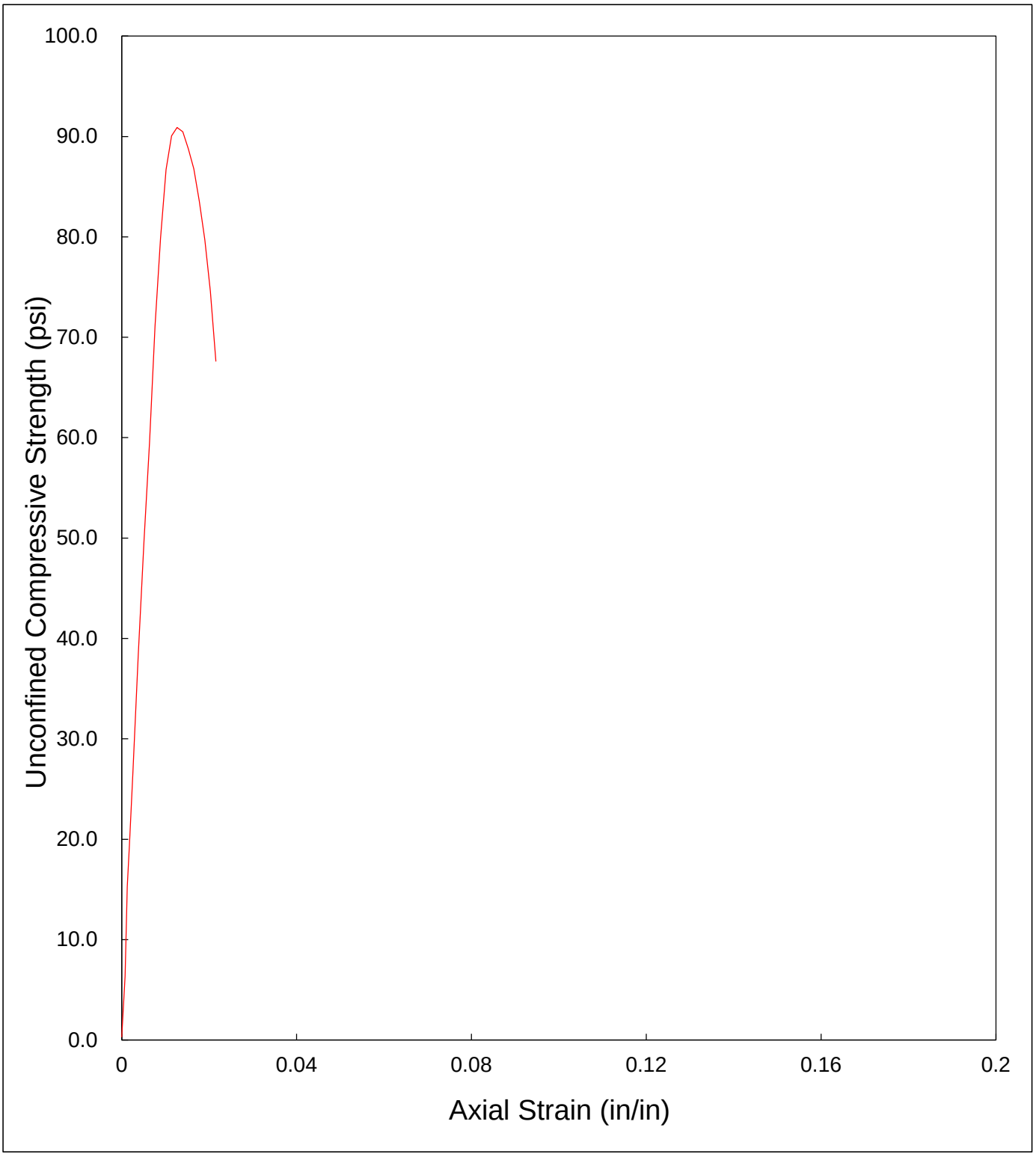
MOISTURE CONTENT (Dry Basis)		
1. MOISTURE TIN NO.		
2. WT MOISTURE TIN (tare weight)	162.62	g
3. WT WET SOIL + TARE	430.75	g
4. WT DRY SOIL + TARE	333.94	g
5. WT WATER, Ww	96.81	g
6. WT DRY SOIL, Ws	171.32	g
7. MOISTURE CONTENT, W	**56.51**	**%**

SOIL SPECIMEN DIMENSIONS	*DIAMETER*		*LENGTH*	
No. 1	2.01	in.	3.97	in.
No. 2	2.00	in.	3.98	in.
No. 3	1.99	in.	3.89	in.
Average	**2.00**	**in.**	**3.94**	**in.**

SPECIMEN CONDITIONS		
Initial Specimen WT, Wo	***270.44***	***g***
Initial Area, Ao	3.14	in^2
Initial Volume, Vo	12.38	in^3
Initial Bulk Unit Weight,	83.2	lb/ft^3
Initial Dry Unit Weight	53.2	lb/ft^3
15 % Strain (0.15 Lo)	0.59	in.
UCS	90.9	lb/in^2

COMPRESSIVE LOAD (lbs.)	DIAL GAGE READING (in.)	SPECIMEN DEFORMATION (in.)	CORRECTED AREA (in^2)	AXIAL STRAIN (in/in)	UNCONFINED COMPRESSIVE STRENGTH (lb/in^2)
1	0.000	0.000	3.139	0.0000	0.3
20	0.003	0.003	3.142	0.0008	6.4
48	0.005	0.005	3.143	0.0013	15.3
61	0.007	0.007	3.145	0.0018	19.4
83	0.010	0.010	3.147	0.0025	26.4
121	0.015	0.015	3.151	0.0038	38.4
157	0.020	0.020	3.156	0.0051	49.8
188	0.025	0.025	3.160	0.0063	59.5
225	0.030	0.030	3.164	0.0076	71.1
253	0.035	0.035	3.168	0.0089	79.9
275	0.040	0.040	3.172	0.0101	86.7
286	0.045	0.045	3.176	0.0114	90.1
289	0.050	0.050	3.180	0.0127	90.9
288	0.055	0.055	3.184	0.0139	90.5
283	0.060	0.060	3.188	0.0152	88.8
277	0.065	0.065	3.192	0.0165	86.8
267	0.070	0.070	3.196	0.0177	83.5
255	0.075	0.075	3.200	0.0190	79.7
239	0.080	0.080	3.204	0.0203	74.6
217	0.085	0.085	3.209	0.0216	67.6

UNCONFINED COMPRESSION TESTING
Sample No. 0460-017 DUP



UNCONFINED COMPRESSION TEST

ASTM D 2166
SUMMARY OF RESULTS

PROJECT:	Quanta		
PROJECT No.:	SH0460		
SAMPLE No.:	0460-017 DUP		
TESTING DATE:	6/20/2013	LOADING RATE:	0.04 in./min.
TESTED BY:	KMA	TRACKING CODE:	9095

TESTING PARAMETER AND RESULTS		
MOISTURE CONTENT	56.5	**%**
BULK UNIT WEIGHT	83.2	lb/ft^3
DRY UNIT WEIGHT	53.2	lb/ft^3
UCS *	90.9	lb/in^2

* UCS - UNCONFINED COMPRESSIVE STRENGTH

UNCONFINED COMPRESSION TEST

ASTM D 2166

PROJECT:	Quanta
PROJECT No.:	SH0460
SAMPLE No.:	0460-019 DUP
TESTING DATE:	20-Jun-13
TESTED BY:	KMA
LOADING RATE:	0.04 in./min.
TRACKING CODE:	9098_US

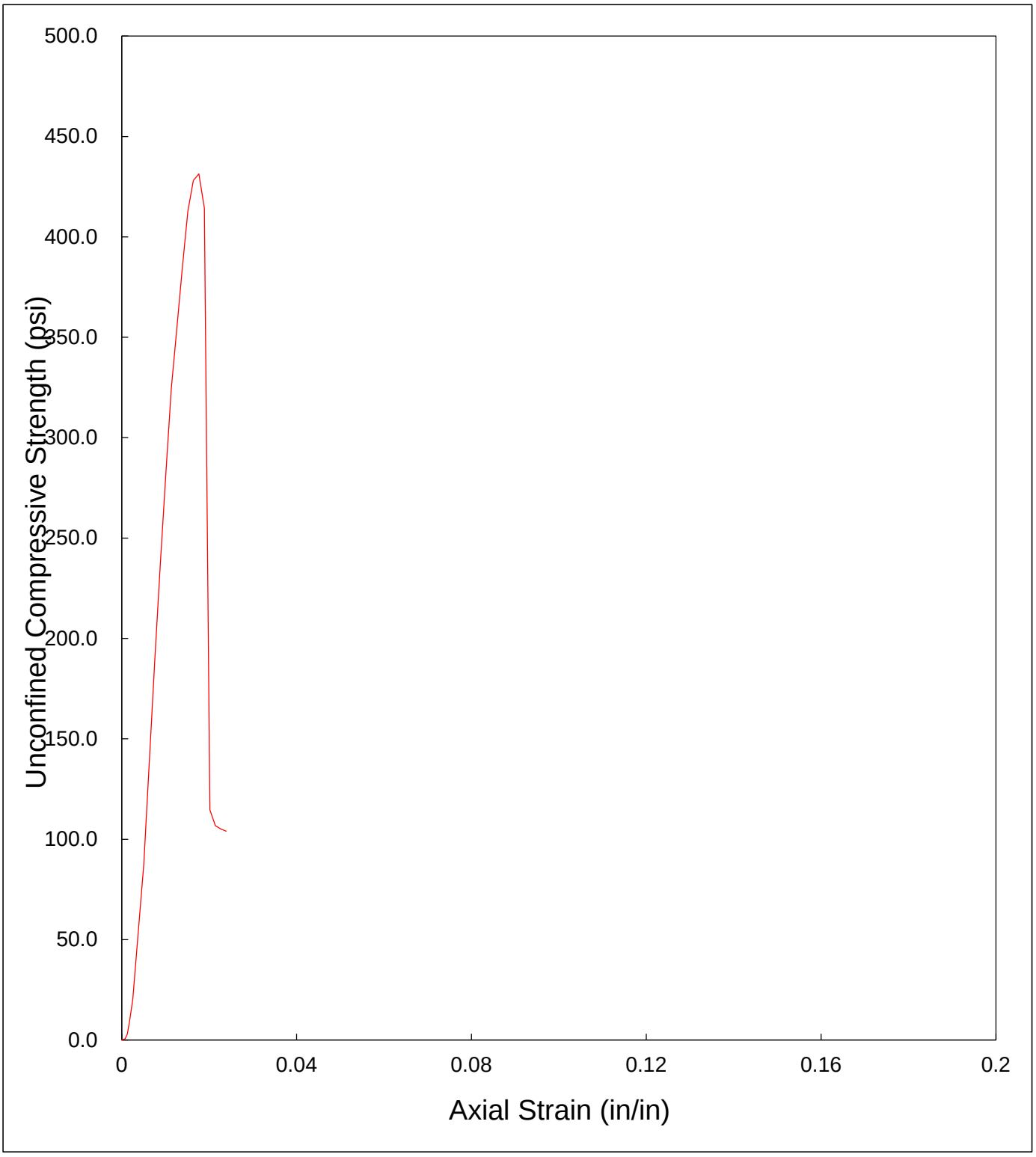
MOISTURE CONTENT (Dry Basis)		
1. MOISTURE TIN NO.		
2. WT MOISTURE TIN (tare weight)	169.76	g
3. WT WET SOIL + TARE	551.15	g
4. WT DRY SOIL + TARE	458.63	g
5. WT WATER, Ww	92.52	g
6. WT DRY SOIL, Ws	288.87	g
7. MOISTURE CONTENT, W	**32.03**	**%**

SOIL SPECIMEN DIMENSIONS	*DIAMETER*		*LENGTH*	
No. 1	2.01	in.	3.97	in.
No. 2	2.01	in.	3.98	in.
No. 3	2.00	in.	3.97	in.
Average	**2.01**	**in.**	**3.97**	**in.**

SPECIMEN CONDITIONS		
Initial Specimen WT, Wo	***383.27***	***g***
Initial Area, Ao	3.16	in^2
Initial Volume, Vo	12.56	in^3
Initial Bulk Unit Weight,	116.3	lb/ft^3
Initial Dry Unit Weight	88.1	lb/ft^3
15 % Strain (0.15 Lo)	0.60	in.
UCS	431.3	lb/in^2

COMPRESSIVE LOAD (lbs.)	DIAL GAGE READING (in.)	SPECIMEN DEFORMATION (in.)	CORRECTED AREA (in^2)	AXIAL STRAIN (in/in)	UNCONFINED COMPRESSIVE STRENGTH (lb/in^2)
0	0.000	0.000	3.162	0.0000	0.0
2	0.003	0.003	3.164	0.0008	0.6
9	0.005	0.005	3.166	0.0013	2.8
28	0.007	0.007	3.167	0.0018	8.8
64	0.010	0.010	3.169	0.0025	20.2
171	0.015	0.015	3.174	0.0038	53.9
278	0.020	0.020	3.178	0.0050	87.5
440	0.025	0.025	3.182	0.0063	138.3
603	0.030	0.030	3.186	0.0076	189.3
756	0.035	0.035	3.190	0.0088	237.0
900	0.040	0.040	3.194	0.0101	281.8
1038	0.045	0.045	3.198	0.0113	324.6
1135	0.050	0.050	3.202	0.0126	354.5
1233	0.055	0.055	3.206	0.0138	384.6
1325	0.060	0.060	3.210	0.0151	412.8
1376	0.065	0.065	3.214	0.0164	428.1
1388	0.070	0.070	3.218	0.0176	431.3
1335	0.075	0.075	3.222	0.0189	414.3
370	0.080	0.080	3.227	0.0201	114.7
345	0.085	0.085	3.231	0.0214	106.8
340	0.090	0.090	3.235	0.0227	105.1
337	0.095	0.095	3.239	0.0239	104.0

UNCONFINED COMPRESSION TESTING
Sample No. 0460-019 DUP



UNCONFINED COMPRESSION TEST

ASTM D 2166
SUMMARY OF RESULTS

PROJECT:	Quanta		
PROJECT No.:	SH0460		
SAMPLE No.:	0460-019 DUP		
TESTING DATE:	6/20/2013	LOADING RATE:	0.04 in./min.
TESTED BY:	KMA	TRACKING CODE:	9098_US

TESTING PARAMETER AND RESULTS		
MOISTURE CONTENT	32.0	**%**
BULK UNIT WEIGHT	116.3	lb/ft^3
DRY UNIT WEIGHT	88.1	lb/ft^3
UCS *	431.3	lb/in^2

* UCS - UNCONFINED COMPRESSIVE STRENGTH

UNCONFINED COMPRESSION TEST

ASTM D 2166

PROJECT:	Quanta
PROJECT No.:	SH0460
SAMPLE No.:	0460-022 DUP
TESTING DATE:	20-Jun-13
TESTED BY:	KMA
LOADING RATE:	0.04 in./min.
TRACKING CODE:	9094

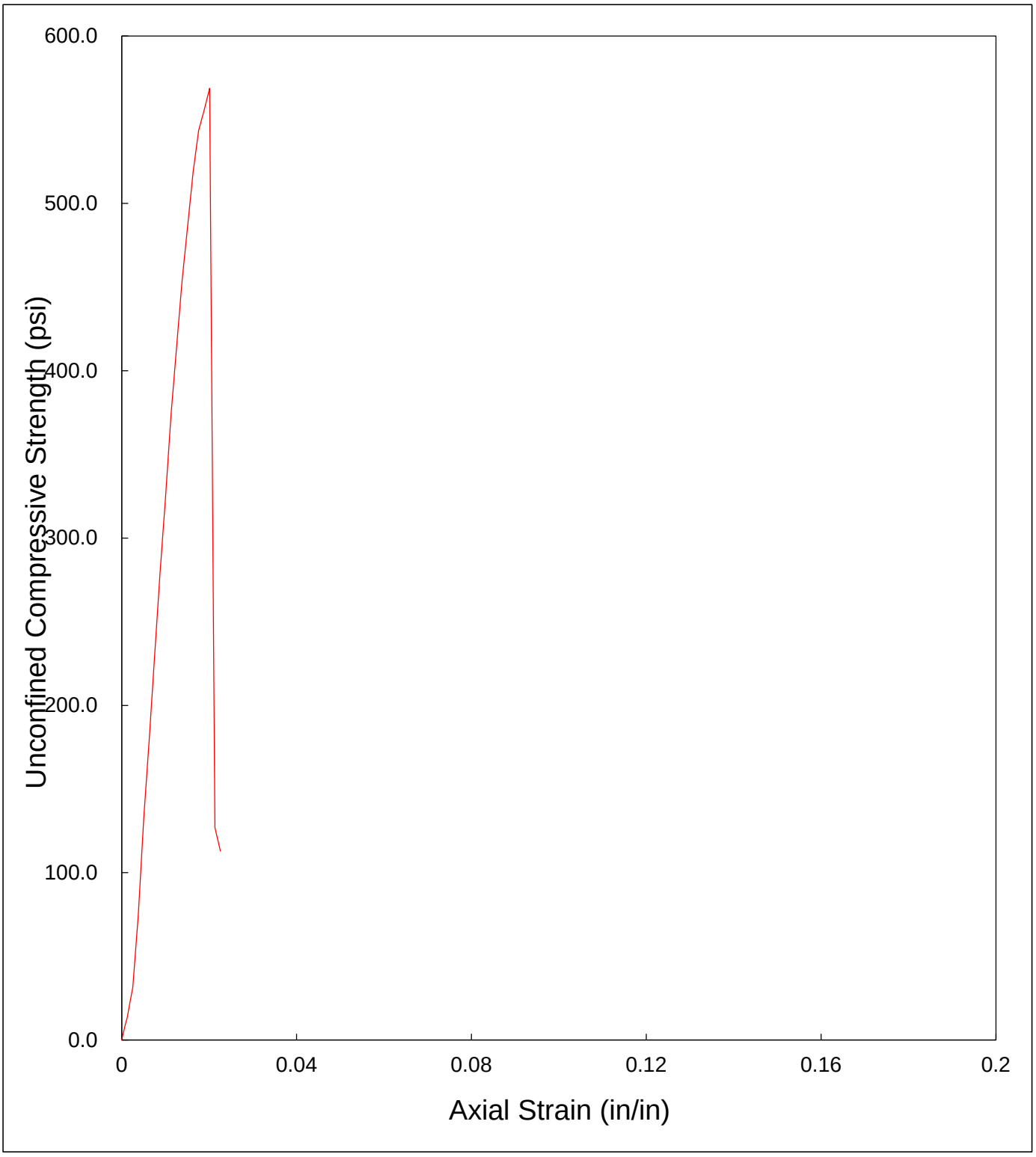
MOISTURE CONTENT (Dry Basis)		
1. MOISTURE TIN NO.		
2. WT MOISTURE TIN (tare weight)	172.28	g
3. WT WET SOIL + TARE	588.24	g
4. WT DRY SOIL + TARE	493.46	g
5. WT WATER, Ww	94.78	g
6. WT DRY SOIL, Ws	321.18	g
7. MOISTURE CONTENT, W	**29.51**	**%**

SOIL SPECIMEN DIMENSIONS	*DIAMETER*		*LENGTH*	
No. 1	2.02	in.	3.96	in.
No. 2	2.01	in.	4.00	in.
No. 3	2.00	in.	3.99	in.
Average	**2.01**	**in.**	**3.98**	**in.**

SPECIMEN CONDITIONS		
Initial Specimen WT, Wo	***422.11***	***g***
Initial Area, Ao	3.18	in^2
Initial Volume, Vo	12.65	in^3
Initial Bulk Unit Weight,	127.1	lb/ft^3
Initial Dry Unit Weight	98.1	lb/ft^3
15 % Strain (0.15 Lo)	0.60	in.
UCS	568.9	lb/in^2

COMPRESSIVE LOAD (lbs.)	DIAL GAGE READING (in.)	SPECIMEN DEFORMATION (in.)	CORRECTED AREA (in^2)	AXIAL STRAIN (in/in)	UNCONFINED COMPRESSIVE STRENGTH (lb/in^2)
0	0.000	0.000	3.176	0.0000	0.0
28	0.003	0.003	3.179	0.0008	8.8
43	0.005	0.005	3.180	0.0013	13.5
66	0.007	0.007	3.182	0.0018	20.7
100	0.010	0.010	3.184	0.0025	31.4
238	0.015	0.015	3.188	0.0038	74.6
424	0.020	0.020	3.192	0.0050	132.8
576	0.025	0.025	3.196	0.0063	180.2
740	0.030	0.030	3.200	0.0075	231.2
895	0.035	0.035	3.204	0.0088	279.3
1042	0.040	0.040	3.208	0.0100	324.8
1202	0.045	0.045	3.213	0.0113	374.2
1332	0.050	0.050	3.217	0.0126	414.1
1462	0.055	0.055	3.221	0.0138	453.9
1568	0.060	0.060	3.225	0.0151	486.2
1675	0.065	0.065	3.229	0.0163	518.7
1757	0.070	0.070	3.233	0.0176	543.4
1799	0.075	0.075	3.237	0.0188	555.7
1844	0.080	0.080	3.241	0.0201	568.9
412	0.085	0.085	3.246	0.0213	126.9
367	0.090	0.090	3.250	0.0226	112.9

UNCONFINED COMPRESSION TESTING
Sample No. 0460-022 DUP



UNCONFINED COMPRESSION TEST

ASTM D 2166
SUMMARY OF RESULTS

PROJECT:	Quanta		
PROJECT No.:	SH0460		
SAMPLE No.:	0460-022 DUP		
TESTING DATE:	6/20/2013	LOADING RATE:	0.04 in./min.
TESTED BY:	KMA	TRACKING CODE:	9094

TESTING PARAMETER AND RESULTS		
MOISTURE CONTENT	29.5	**%**
BULK UNIT WEIGHT	127.1	lb/ft^3
DRY UNIT WEIGHT	98.1	lb/ft^3
UCS *	568.9	lb/in^2

* UCS - UNCONFINED COMPRESSIVE STRENGTH