



May 8, 2008

Ms. Donna Wilson
Environmental Engineer II
NC DENR - Division of Waste Management
401 Oberlin Road, Suite 150
Raleigh, NC 27605

**Re: Construction Quality Assurance Report
Red Rock Disposal C&D Landfill (Phase 1C-2 Construction)
(Solid Waste Permit No. 92-28)
Holly Springs, North Carolina**

Dear Ms. Wilson:

On Behalf of Red Rock Disposal C&D Landfill, Richardson Smith Gardner & Associates (RSGA) would like to submit for your review the two (2) enclosed Construction Quality Assurance (CQA) Report (one (1) hard copy and one (1) electronic) for the Phase 1C-2 Construction at the Red Rock Disposal C&D Landfill.

Should you have any questions or require clarification, please contact us at (919) 828-0577 or by email below.

Sincerely,
Richardson Smith Gardner & Associates, Inc.

Bryan Johnson, E.I.
Staff Engineer
bryan@rsgengineers.com

Stacey A. Smith, P.E.
Project Manager
stacey@rsgengineers.com

Att.

Cc: Don Plessinger, Red Rock Disposal
David Pepper, Waste Industries USA
Rachel Kirkman, P.G., Golder
Bradley Bailey, NCDENR (cover letter)
File

**Construction Quality Assurance Report
Phase 1C-2 Construction C&D Landfill
Red Rock Disposal, LLC
NC Solid Waste Permit No. 92-28**

Prepared For:



**Red Rock Disposal, LLC
7130 New Landfill Road
Holly Springs, North Carolina 27540**

Prepared By:



May 2008

**RED ROCK DISPOSAL, LLC C&D LANDFILL
PHASE 1C-2 CONSTRUCTION**

CONSTRUCTION QUALITY ASSURANCE REPORT

TABLE OF CONTENTS

	<u>Page</u>
1.0 INTRODUCTION	1
2.0 REFERENCE DOCUMENTS	1
3.0 SCOPE OF PROJECT	1
4.0 PROJECT PARTICIPANTS	2
5.0 CONSTRUCTION SUMMARY	4
5.1 Monitoring Well Abandonment	4
5.2 Site Clearing and Grubbing	4
5.3 Erosion and Sedimentation Control Measures	4
5.4 General Earthwork	4
5.5 Photographic Documentation	5
6.0 CQA PROGRAM	5
6.1 Scope of Services	5
6.2 Earthwork CQA	5
7.0 MODIFICATIONS	5
8.0 RECORD DRAWINGS	6
9.0 PROJECT CERTIFICATION	6
9.1 Engineer's Certification	6
9.2 Geologist's Certification	6

FIGURES

Figure 1 Limits of Certification

TABLES

Table 1 Major Milestones

Table 2 Summary of Material Control and Record Tests - Structural Fill

APPENDICES

Appendix A Facility Permits

A.1 NCDENR Permit to Construct

A.2 Wake Land Disturbance Permit

Appendix B Geologist Inspection and Monitoring Well Abandonment

Appendix C As-Built Surveys

Appendix D Construction Photographs

Appendix E Earthwork Data

E.1 Moisture Density Relationship

E.2 Daily Activity Logs and In-Place Density Testing

E.3 Soil Classification

1.0 INTRODUCTION

This Construction Quality Assurance (CQA) Report has been prepared to document the CQA activities performed during the construction of Phase 1C - 2 at the Red Rock Disposal, LLC (Red Rock) Construction and Demolition (C&D) landfill in Holly Springs, North Carolina. This certification report is based on work associated with Phase 1C-2 cell construction and erosion and sedimentation control activities.

The facility is located on the south side of Rex Road approximately one (1) mile southeast of the intersection of Avent Ferry Road and Rex Road; further described as 7130 New Landfill Road in the Holly Springs Township, Wake County, North Carolina. The facility is owned and operated by Red Rock Disposal, LLC, a wholly-owned subsidiary of Waste Industries USA, a North Carolina Corporation, under State Solid Waste Permit No. 92-28. The most current Permit To Construct a Construction and Demolition Landfill unit was issued on June 4, 2004 (Permit No. 92-28). A copy of the current Permit to Construct is provided in **Appendix A.1**.

2.0 REFERENCE DOCUMENTS

Phase 1C-2 was constructed in accordance with the following documents with modifications provided herein as **Appendix A**.

1. **Construction Permit - Red Rock Disposal, LLC - Permit 92-28 - Permit To Construct C&D Landfill Phase 1** by NCDENR dated on June 4, 2004. **(A copy of the permit is provided in Appendix A.1)**
2. **Revised Permit to Construct Application - Red Rock Disposal, LLC - Phase 1 - Wake County, North Carolina** prepared by G. N. Richardson and Associates (GNRA) dated October 2003.
3. **Construction & Demolition Debris (C&D) Landfill - Phase 1 Engineering Drawings** prepared by GNRA dated May 2001 with revisions through April 2004.
4. **Erosion and Sedimentation Control Plan - Red Rock Disposal, LLC C&D Landfill - Phase 1** prepared by GNRA dated January 2004 and approved March 11, 2004 by Wake County Environmental Services. **(A copy of the permit is provided in Appendix A.2)**

3.0 SCOPE OF PROJECT

The Red Rock Disposal, LLC facility permit for Phase 1 includes three (3) disposal cells (or sub-phases) over a total footprint of approximately 35 acres. (Sub) Phases 1A, 1B, and 1C cover approximately 7 acres, 13 acres, and 15 acres, respectively. In October, 2003, Phase 1C was further sub-divided (**Reference 2**) into (Sub) Phases 1C-1 and 1C-2 to coincide with wetland/stream impacts in accordance with the facility's Nationwide 18 Permit. Phase 1C-1 covers approximately 12 acres and Phase 1C-2 covers approximately 13 acres.

The initial phase of the facility, Cell 1A, was constructed and certified in November 2001 and

began receiving waste on or about November 20, 2001. The second phase, Cell 1B, of construction was completed and certified in May 2002 and began receiving waste on or about June 6, 2002.

This report documents activities for (Sub) Cell 1C-2 in Phase 1 of the facility. Cell 1C-2 is north-northwest of (Sub) Phase 1C-1A. Cell 1C-2 was constructed using soils obtained from on-site sources located within the limits of the facility, as well as, from neighboring Hanson quarry. Detailed descriptions of construction activity, monitoring and testing activities for the construction of this cell is provided in this report.

A summary of major milestones associated with the construction of Cell 1C-2 is provided in **Table 1** (below).

Table 1 - Major Milestones

Date	Task
February 15, 2008	Monitoring Well Abandonment
February 20, 2008	Pre-Construction Meeting (on-site)
February 20, 2008	Clearing and Grubbing
February 26, 2008	Earthwork (Excavation & Embankment)
March 3, 2008	Soil Erosion & Sediment Control
April 23, 2008	Final Completion

4.0 PROJECT PARTICIPANTS

The following major parties were involved in the Cell 1C-2 construction:

Owner Waste Industries USA, Inc.
 3301 Benson Drive, Suite 601
 Raleigh, NC 27609
 Phone: (919) 325-3000
 Fax: (919) 325-3012
 Contact: David Pepper, Division Operations Manager

Operator Red Rock Disposal, LLC.
 7130 New Landfill Road
 Holly Springs, NC 27540
 Phone: (919) 557-9583
 Contact: Donald Plessinger, Landfill Manager

Engineer Richardson Smith Gardner & Associates, Inc.

14 N. Boylan Avenue
Raleigh, NC 27603
Phone: (919) 828-0577
Fax: (919) 828-3899
Contacts: Bryan Johnson, E.I., Staff Engineer
Stacey Smith, P.E., Project Manager
Joan Smyth, P.G., Senior Hydrogeologist

Contractor

Glover Construction, Inc.
P.O. Box 40 / Highway 301 North
Pleasant Hill, NC 27866
Phone: (252) 536-2660
Fax: (252) 536-4600
Contacts: Ed Martin, P.E., Project Manager
Wayne Clements, Superintendent

Surveying

Surveying Solutions, P.C.
5401 Hillsborough Street
Raleigh, NC 27636
Phone: (919) 854-4833
Fax: (919) 854-4834
Contacts: John Thompson, P.L.S.
Dwayne Kroeze, P.L.S.

Soil Testing

Geotechnics
2200 Westinghouse Blvd, Suite 105
Raleigh, NC 27604
Phone: (919) 876-0405
Fax: (919) 846-0460
Contacts: Mike Smith, P.G., Project Manager

Regulatory Agency

North Carolina Department of Environment and Natural
Resources - Solid Waste Section
401 Oberlin Road, Suite 150
Raleigh, NC 27605
Phone: (919) 733-0692
Fax: (919) 733-4810
Contacts: Donna Wilson, Environmental Engineer II

5.0 CONSTRUCTION SUMMARY

5.1 Monitoring Well Abandonment

Two ground water monitoring wells, MW-2 and MW-9, required abandonment prior to Cell 1C-2 construction. MW-2 had been driven over by a piece of equipment but was located outside of the Cell 1C-2 footprint. Monitoring well MW-9 was within the construction area. There are no other wells or piezometers within the footprint area. Both wells were abandoned in order to prevent the well from becoming a possible conduit from the surface to the aquifer. Grout was tremie-piped to fill each well from the bottom to the top after the metal casings and concrete pads were removed in accordance with NCDENR regulations and guidelines. The abandonment took place on February 15, 2008 and was performed by Engineering Tectonics, P.A. with oversight from Richardson Smith Gardner and Associates, Inc. (RSGA). Documentation is provided in **Appendix B**.

5.2 Site Clearing and Grubbing

The construction of Cell 1C-2 began in February 2008 with the surveying/staking of clearing limits and the initiation of clearing and grubbing activities by Glover Construction Company.

5.3 Erosion and Sedimentation Control Measures

The construction of erosion and sedimentation control measures began in conjunction with site preparation activities and under site permits issued by Wake County Environmental Services Department for the Phase 1 landfill area. A copy of the permit is included in **Appendix A.2**. Initial erosion and control measures consisted of diversion ditches and drainage channels placed around the perimeter of the cell limits and sediment basins.

5.4 General Earthwork

Once portions of the site were cleared and grubbed and secured with erosion and sediment control measures, all of the topsoil and unsuitable soils were removed and placed in the soil stockpile outside the cell area to be used for vegetative soil layer. Embankment activities began with placement of soil at the southern end of the cell to construct the perimeter berm. All materials used in the structural fill for the cell were excavated from within the cell limits and/or obtained from the neighboring Hanson quarry. Fill placement activities were conducted from February 2008 through April 2008. Once fill placement reached plan grades and elevations, the cell area was surveyed by Surveying Solutions to document final grading conditions. An as-built drawing showing completed elevations is provided in **Appendix C**.

5.5 Photographic Documentation

Photos documenting the construction of Cell 1C-2 can be found in **Appendix D**.

6.0 CQA PROGRAM

6.1 Scope of Services

In satisfying the requirements of the Project CQA Manual for the construction project, the following activities were performed:

- C Observation and documentation of construction of erosion and sediment control measures, excavation and structural fill activities.
- Field and/or laboratory testing of structural fill.
- C Review of submittals from the Contractor for conformance with project specification and CQA requirements.
- C Review/preparation of record drawings.
- C Preparation of the final CQA report.

6.2 Earthwork CQA

The criteria for construction of structural fill per the project specifications included the following:

- Materials: SM, SP, SC, ML, MH, CL-ML, CL, or CH (ASTM D 2488) with no topsoil or other deleterious material and no stones or rocks in excess of one half the lift thickness as compacted;
- Density: Minimum 95% Maximum Standard Proctor Dry Density (98% under roads and structures) (ASTM D 698);
- Moisture Content: As necessary for compaction; and
- Lift Thickness: 8-inch max. (compactd).

The number and results of material control and record tests performed on the structural fill is summarized in **Table 2 (Structural Fill)**. Other tests performed on an on-going basis during construction included a visual classification of soils (ASTM D 2488) and monitoring of loose lift thickness. Note that the number of tests required was based on an approximate quantity of 62,800 CY of material placed (in-place measure). The results of field and laboratory testing of structural fill can be found in **Appendix E**.

7.0 MODIFICATIONS

During construction, it is typically necessary to make modifications to the design and construction documents to accommodate field conditions and/or improve constructability based on practical considerations. Two (2) such modifications were made during the construction of Phase 1C-2. Design Modification No. 1 involved the taking the road out going from the berm starting at Sediment Basin T2 and head west around the cell. The contractor was running low on fill and in an effort to reduce the volume needed, the berm was reduced to only eight (8) feet

Phase 1C-2. Design Modification No. 1 involved the taking the road out going from the berm starting at Sediment Basin T2 and head west around the cell. The contractor was running low on fill and in an effort to reduce the volume needed, the berm was reduced to only eight (8) feet wide in this area. Design Modification No. 2 was an enlargement of Sediment Basin T1. A volume of 82,500 cubic feet was needed, however only 21,000 cubic feet was able to be excavated due to rock features. The modification enlarged Sediment Basin T1 by 63,500 cubic feet.

8.0 RECORD DRAWINGS

After the completion of construction, an as-built survey was conducted by Surveying Solutions, Inc. and compared with permitted contours. All final grading, within the limits of certification, were within tolerances (± 0.15 feet). As-built drawings are provided in **Appendix C**.

9.0 PROJECT CERTIFICATION

9.1 Engineer's Certification

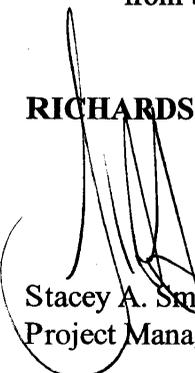
Based on the observations and results of the CQA program documented herein, it is our professional opinion that the construction of Cell 1C-2 of Phase 1 of the Red Rock Disposal, LLC C&D Landfill was completed in accordance with the following:

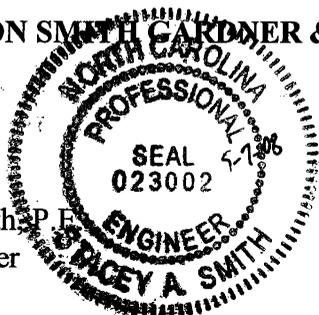
- i. The Project CQA Manual
- ii. The conditions of the Permit to Construct Phase 1;
- iii. Acceptable engineering practices.

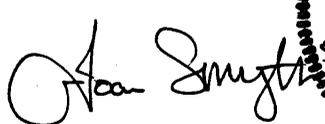
9.2 Geologist's Certification

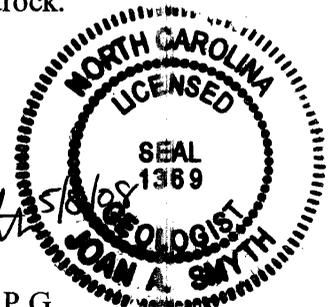
Based upon my inspection of the completed subgrade of Cell 1C-2 of Phase 1 of the Red Rock Disposal LLC C&D Landfill, I certify that no unusual geologic conditions were encountered with the exception of a small area of bedrock that extends approximately 15 feet into the cell from the southeast corner of the site. The bedrock observed was the same red brown conglomerate previously observed during drilling and typical of the Triassic Basin in this area. This bedrock was encountered approximately 2 feet above design subgrade. To comply with NCDENR requirements for four (4) feet of separation from bedrock, this area was backfilled with four (4) feet of soil over the bedrock.

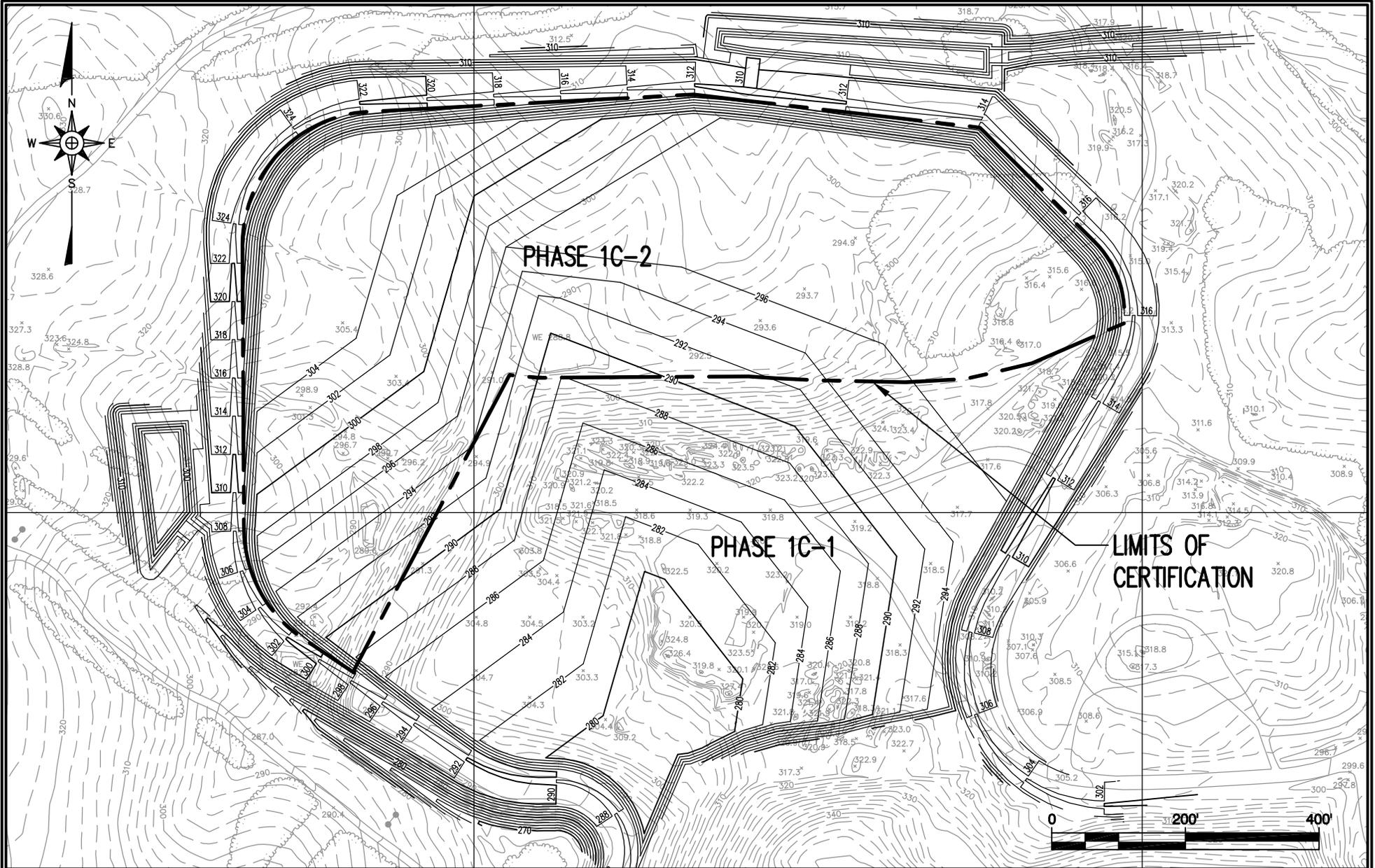
RICHARDSON SMITH GARDNER & ASSOCIATES, INC.


Stacey A. Smith, P.E.
Project Manager




Joan A. Smyth, P.G.
Senior Hydrogeologist





**RED ROCK DISPOSAL, LLC
C&D LANDFILL
PHASE 1C-2
LIMITS OF CERTIFICATION**

DRAWN BY: C.T.J.	CHECKED BY: S.A.S.	SCALE: AS SHOWN	FIGURE NO. 1
DATE: May. 2008	PROJECT NO. REDROCK 08-1	FILE NAME REDROCK-A0076	


**RICHARDSON SMITH GARDNER
& ASSOCIATES**

14 N. Boylan Ave.
Raleigh, N.C. 27603

ph: 919-528-0577
 fax: 919-528-3899
www.rsgengineers.com

**TABLE 2
SUMMARY OF MATERIAL CONTROL
AND RECORD TESTS
STRUCTURAL FILL**

	Property		
	Control Tests	Record Tests	
	Moisture-Density Relationship (Proctor)	In-Place Density	In-Place Moisture Content
Units	-----	% Std. Proctor	%
Test Method	ASTM D 698	ASTM D 2922	ASTM D 3017
Required Test Frequency	5,000 CY per each soil	20,000 ft ² per lift & 1 per 500 LF of Berms (<200 ft. base width)	20,000 ft ² per lift & 1 per 500 LF of Berms < 200 base width)
No. of Tests Required	13	46	46
No. of Tests Performed	6 (See Note 1)	47	47
Specified Value	-----	≥ 95% Std. Proctor	As Required for Density
Minimum Value	-----	95.2	-5.2
Maximum Value	-----	106.7	+7.5
Average Value	-----	99.4	-0.3
Quantity of Structural Fill (In-Place):		62,800 CY	

Notes:

1. Due to the uniformity in the materials used as structural fill, fewer tests were performed.

APPENDIX A
FACILITY PERMITS

APPENDIX A.1

NCDENR PERMIT TO CONSTRUCT



North Carolina Department of Environment and Natural Resources

Dexter R. Matthews, Director

Division of Waste Management

Michael F. Easley, Governor
William G. Ross Jr., Secretary

June 4, 2004

Mr. Jerry Johnson, Disposal Operations Manager
Red Rock Disposal, LLC
3301 Benson Drive
Raleigh, North Carolina 27609

Subject: Solid Waste Permit No. 92-28
Red Rock Disposal, LLC Construction and Demolition(C&D) Landfill
7130 New Landfill Drive, Holly Springs, Wake County, North Carolina.
Modification #2: Re-design and construction of Phase 1 (Cell 1C).

Dear Mr. Johnson:

The referenced PERMIT TO CONSTRUCT is issued in accordance with N.C.G.S. 130A-294 and the N.C. Solid Waste Management Rules, 15A NCAC 13B, .0201(b)(1)&(2) and .203(c)&(d). Enclosed is attachment 1, which lists documents included in the Approved Plan. The approved facility description includes the area described in the attached legal description, as part of the original Permit to Construct. Within the approved facility, the area identified for this Permit to Construct is Phase 1, (sub-phases 1A , 1B and 1C revised; consistent with drawings noted as sheet No. 6/Drawing E5, Sheet No. 8/Drawing X1, and Sheet No. 9/Drawing X2 dated October 2003. The specific drawings that were reviewed are sealed by Pieter K. Scheer dated 11/23/03 (full size and half size drawings) and 4/23/04 by John M. Gardner (full size and half size drawings).

This permit is for the construction of the first five-year phase, Phase 1 (sub- phase 1A, 1B and 1C revised) consistent with consistent with drawings noted as sheet No. 6/Drawing E5, Sheet No. 8/Drawing X1, and Sheet No. 9/Drawing X2 dated October 2003. At the end of the first five-year operational period, Red Rock Disposal, LLC may apply for an expansion into and construction of Phase 2, but will be subject to all rules in effect at that time. This permit is issued to Red Rock Disposal, LLC as the owner and operator of the facility.

Mr. Johnson
Page 2
June 4, 2004

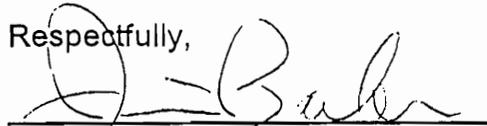
Please refer to the **GENERAL CONDITIONS** of this permit for the definition of the approved plan, and for general terms of the Solid Waste Permit. The **CONSTRUCTION AND OPERATION** conditions describe permitted fill areas, acceptable waste types, landfill operation, and requirements which must be satisfied prior to operation of the facility as a Construction & Demolition landfill. Specific requirements for groundwater monitoring and facility record keeping and reporting are described in the **MONITORING AND REPORTING** conditions.

Please review the Conditions of Permit thoroughly, especially the following specific conditions:

- A. Monitoring and Reporting Requirement No. 12(e) requires that the groundwater quality monitoring wells must be installed and sampled prior to accepting waste at this landfill. Please consult with Ms. Ellen Lorscheider, Solid Waste Section Project Hydrogeologist at (919) 733-0692, Ext. 345 just prior to well construction to help ensure that completed wells meet well construction standards and will be acceptable for monitoring purposes. **ONCE ON-SITE SURFACE WATER FEATURES HAVE SUFFICIENT FLOW THAT ALLOWS SAMPLING; RED ROCK DISPOSAL SHALL SAMPLE ALL SURFACE WATER POINTS (SW-1, SW-2 AND SW-3) AND SUBMIT A COPY OF THE TRANSMITTAL LETTER WITH DATE SAMPLES AND SAMPLE RESULTS IN FUTURE UPON RECEIPT FROM YOUR CONTRACT LAB.**

Again, please review the Conditions of Permit thoroughly and contact me if you have any questions or if you require further clarification. Mr. Flint Worrell is the Solid Waste Section Waste Management Specialist for this area and can be contacted at the DENR Fayetteville Regional Office by phone at (910) 486-1541 or contact Mark Fry at the same number. Jim Barber can be contacted at the Raleigh Central Office at (919) 733-0692 Extension 255.

Respectfully,



Jim Barber
Eastern Area Engineer
Solid Waste Section
enclosure

cc: Jim Coffey Mark Fry
 Flint Worrell Ellen Lorscheider
 John Gardner Raleigh Central File: Wake County; 92-28 Permit File

PERMIT NO.: 92-28
DATE ISSUED(PTC mod #2): 06/04/2004

STATE OF NORTH CAROLINA
DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES
DIVISION OF WASTE MANAGEMENT
1646 MAIL SERVICE CENTER; RALEIGH, NC 27699-1646

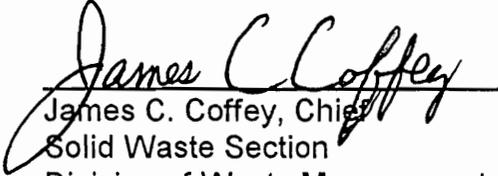
SOLID WASTE PERMIT

RED ROCK DISPOSAL, LLC

is hereby issued a PERMIT TO CONSTRUCT a

Construction and Demolition Landfill unit, PHASE 1 (sub-phases 1A, 1B & 1C revised)

located on the south side of Rex Road and further described as 7130 New Landfill Road in Holly Springs Township, Raleigh, Wake County, North Carolina in accordance with Article 9, Chapter 130A, of the General Statutes of North Carolina and all rules promulgated thereunder and subject to the conditions set forth in this permit. The facility is located and described by the legal description of the site included with this permit and further identified on the deed recorded for this property in Book: 8101 and Page(s): 0854 - 0586 in the Wake County Register of Deeds for Red Rock Disposal, LLC.


James C. Coffey, Chief
Solid Waste Section
Division of Waste Management

PERMIT NO.: 92-28
DATE ISSUED(PTC mod #2): 06/04/2004

SOLID WASTE PERMIT
PERMIT TO CONSTRUCT - RED ROCK DISPOSAL, LLC
Construction and Demolition Debris Landfill Unit
PHASE 1(phases 1A, 1B & 1C revised)

CONDITIONS OF PERMIT:

GENERAL

1. This PERMIT TO CONSTRUCT will be in effect for eighteen months from date of issuance and may be reviewed under rules in effect at that time if the facility is not constructed within this time frame. Modifications to the facility may be required in accordance with rules in effect at the time of review. This permit shall not be effective unless the PERMIT TO CONSTRUCT along with the certified copy is filed in the Register of Deeds Office, in the grantor index under the name of the owner of the land in the county or counties in which the land is located. The certified copy shall be returned to the Solid Waste Section and shall have indicated on it the page, book number, date of recordation and the Register's seal. When this property is sold, leased, transferred or conveyed, the deed or other instrument of transfer shall contain in the description section in no smaller type than that used in the body of the deed or instrument, a statement that the property has been used as a sanitary landfill.
2. The approved plan is described by Attachment 1, "List of Documents for Approved Plan". Where discrepancies may exist, the most recent submittal and the Conditions of Permit shall govern. Some components of the approved plan are reiterated in the Conditions of Permit.
3. This permit is not transferable.
4. This permit is for a period of five years from the date of the PERMIT TO OPERATE and is subject to review on or before the date of the PERMIT TO OPERATE as per 15A NCAC 13B .0201(c). Modifications to the facility may be required in accordance with the rules in effect at the time of the review.
5. The service area for this facility consists of the following counties: CHATHAM, DURHAM, FRANKLIN, GRANVILLE, HARNETT, JOHNSTON, NASH AND WAKE. The disposal capacity for the facility (PHASE 1) is approximately 3,450,000 cubic yards(sheet 2 of 4 analysis of life expectancy) and consistent with the final contours as shown on SHEET NO. 4/DRAWING E3 in the revised construction application dated 11/26/03. This capacity is based the receipt of 200 trucks/day and/or an average disposal rate of 2000 tons/day based on a 286 operating days per year, with a maximum variance in accordance with GS 130A-294(b1)(1).

CONSTRUCTION

6. This permit is for the construction of Red Rock Disposal, LLC Construction and Demolition(C&D) Landfill unit denoted as Phase 1(phases 1A, 1B & 1C revised) in accordance with the site plan SHEET NO. 6/DRAWING E5, titled " Phase 1 FINAL GRADING AND DRAINAGE PLAN" dated 11/26/03. Prior to placing waste in areas of Phase 1C revised, consistent with the above mentioned drawing, certification that Phase 1C revised has been constructed and graded in accordance with the approved plans will be required.
7. All sedimentation/erosion control activities will be conducted in accordance with the Sedimentation Control Act codified at 15 NCAC 4. Native vegetation shall be established on the completed C&D landfill unit in accordance with 15A NCAC 13B .0505 (3)(b)(c).
8. The following requirements shall be met prior to operation of PHASE 1(i.e. Prior to the issuance of a PERMIT TO OPERATE):
 - a. PHASE 1C revised preparation shall be in accordance with the construction plan, SHEET NO. 6/DRAWING E5 dated 11/16/03, and the conditions specified herein; and construction of PHASE 1C revised shall be certified by the design engineer to be constructed in accordance with the approved plans.
 - b. PHASE 1C revised unit inspection shall be made by a representative of the Division of Waste Management (DWM) with the owner/operator.
 - c. Signs shall be posted at the entrance of Red Rock Disposal, LLC landfill, in accordance with the Access and Safety Requirements under Operation Condition .0505(8).
 - d. Groundwater monitoring wells (see Monitoring and Reporting Requirements) shall be installed consistent with condition 14(a) thru (g). A baseline sampling for water quality shall be performed. Well construction records, soil boring logs and sample analysis results shall be submitted to the Section Hydrogeologist for review and approval prior to operation of the C&D unit. Additional interim ground water monitoring well(s) shall be installed to the south and east of the PHASE 1 footprint, within the review boundary for PHASE 1, at the design hydrogeologist recommended locations. A proposed location plan for the additional well(s) shall be submitted to the Solid Waste Section for review and concurrence.
 - e. Inspection and certification of the PHASE 1C revised subgrade, by the project hydrogeologist, to determine if subgrade conditions are consistent with the observations made during the initial site investigations and information provided in the site hydrogeology report. If conditions found are different than conditions stated in the hydrogeologic report or that would impact or have an effect on the proposed ground water monitoring system; then a revised ground watering monitoring plan will be required.

- f. Sedimentation basin SB-B needs to be relocated so that SB-B is not between the waste boundary and MW-5, as shown on Figure 1 - Phase 1; GROUND WATER MONITORING NETWORK drawing dated May 2001.
- g. No blasting shall take place on the site unless a pre-blast survey is performed and a blasting plan is submitted to the Solid Waste Section for review and concurrence.
- h. All well construction records and soil boring logs(for existing and new wells), along with sample analysis results shall be submitted to the Section Hydrogeologist for review and approval prior to operation of the C&D unit.

OPERATION:

- 9. This C&D unit (PHASE 1, sub-phases 1A, 1B and 1C revised) is permitted to receive the following waste types:
 - a. Land-clearing debris as defined in G.S. 130A-290, specifically, solid waste which is generated solely from land-clearing activities, such as stumps, trees;
 - b. Inert debris defined as solid waste which consists solely of material that is virtually inert, such as brick, concrete, rock and clean soil; and
 - c. Asphalt in accordance with G.S. 130-294(m).
 - d. Construction and demolition debris defined as solid waste resulting solely from construction, remodeling, repair or demolition operations on pavement, buildings, or other structures.

Yard trash as defined in G.S. 130A-290, shall not be disposed in the landfill area. However, yard trash, along with land-clearing debris, may be accepted for processing in the Yard Waste Composting Area or disposed of in a LCID landfill.
- 10. Operation of the C&D landfill unit shall conform to the operating procedures described in the approved plan, in accordance with Section .0505 of the Solid Waste Management Rules, and in accordance with the following requirements: Waste Acceptance and Disposal.
 - a. The C&D unit shall accept only those solid wastes which it is permitted to receive as outlined in condition 9.
 - b. No municipal solid waste, hazardous waste, or liquid waste shall be accepted for disposal in the C&D unit.
 - c. The permittee shall implement a program for the C&D unit for detecting and preventing the disposal of MSW, hazardous or liquid wastes. The program shall include, at a minimum:
 - (i) Random inspections of incoming loads or other comparable procedures;
 - (ii) Records of any inspections;
 - (iii) Training of personnel to recognize hazardous and liquid wastes;
 - (iv) Development of a contingency plan to properly manage any identified hazardous, liquid or MSW wastes; The plan must address identification, removal, storage, and final disposition of waste.

Cover Material Requirements

- d. Operational soil cover of at least six inches shall be placed at least once per week or when the active area reaches ½ acre in size, or more often as necessitated by the nature of the waste, as to prevent the site from becoming a visual nuisance and to prevent fire, windblown materials, vectors, or excessive water infiltration.
- e. Areas which will not have additional waste placed on them for 12 months or more, but where final termination of operations has not occurred, shall be covered with a minimum of one foot of soil cover [15A NCAC 13B .0505(3)(b)].
- f. After final termination of disposal operations at the C&D unit or major part thereof, or upon revocation of a permit, the fill areas shall be covered with at least two feet of suitable compacted earth [15A NCAC 13B .0505(3)(c)] or a cap as specified by the rules in effect at the time of closure.

Access and Safety

- g. The C&D unit shall be adequately secured by means of gates, chains, berms, fences, or other security measures approved by the DWM to prevent unauthorized entry.
- h. An attendant shall be on duty at the RED ROCK DISPOSAL, LLC landfill at all times while it is open for public use to ensure compliance with operational requirements.
- i. The access road from Rex Road to the C&D unit shall be of all-weather construction and maintained in good condition.
- j. Dust control measures shall be implemented when necessary.
- k. Signs providing information on dumping procedures, the hours of operation, the permit number, and other pertinent information shall be posted at the entrance to the RED ROCK DISPOSAL, LLC landfill.
- l. Signs shall be posted stating that no MSW, hazardous waste or liquid waste can be received in the C&D unit.
- m. Traffic signs or markers shall be provided as necessary to promote an orderly traffic pattern to and from the discharge area and to maintain efficient operating conditions.
- n. The removal of solid waste from the facility is prohibited unless the owner/operator approves and the removal is not performed on the working face. If C&D recycling is to take place in the future; amendment of the operations plan shall be submitted to the Solid Waste Section for approval.
- o. Barrels and drums shall not be disposed of unless they are empty and perforated sufficiently to ensure that no liquid or hazardous waste is contained therein, except fiber drums containing asbestos. Asbestos waste shall be managed in accordance with 40 CFR 61.

- p. Open burning of solid waste is prohibited. Fires shall be reported to the Solid Waste Section by phone within 24 hours of an incident and written notification shall be submitted within 14 working days addressing the events at the site and future actions to be taken in the future to avoid and or mitigate potential fire hazards.
- q. The concentration of explosive gases generated by the C&D unit shall not exceed:
 - i. twenty-five percent of the lower explosive limit(1.25% of CH₄) for gases in site structures (excluding gas control or recovery system components if necessary; and
 - ii. One hundred percent of the lower explosive limit(5% CH₄) for gases at the property boundary. Installation of permanent gas monitoring wells may be required in the future to demonstrate compliance.

Erosion and Sedimentation Control

- r. Adequate sedimentation and erosion control measures shall be practiced to prevent silt from leaving the site of the C&D unit.
- s. Adequate sedimentation and erosion control measures shall be practiced to prevent excessive on-site erosion.
- t. Provisions for a vegetative ground cover sufficient to restrain erosion must be accomplished within 30 working days or 120 calendar days upon completion of any phase of C&D landfill unit development or as addressed in the approved Sedimentation and Erosion Control permit.

Drainage Control and Water Protection Requirements

- u. Surface water shall be diverted from the operational area.
 - v. Surface water shall not be impounded over or in waste.
 - w. A separation distance of at least four feet shall be maintained between the C&D waste and the groundwater table; as addressed in the site suitability application, hydrologic assessment section.
 - x. Solid waste(C&D) shall not be disposed of in water.
 - y. Leachate shall be contained on site or properly treated prior to discharge. An NPDES permit may be required prior to discharge of leachate to surface waters and or for land disturbing activities greater than one acre.
11. All pertinent landfill operating personnel will receive training and supervision necessary to properly operate this C&D landfill unit in accordance with G.S. 130A-309.25 and addressed by memorandum dated 29 November 2000(enclosed).
 12. Ground water quality for the C&D landfill unit is subject to the classification and remedial action provisions referenced in Rule .0503 (2)(d) of 15A NCAC 13B.

13. A closure and post-closure plan must be submitted for approval at least 90 days prior to closure or partial closure of any landfill unit. The plan must include all steps and measures necessary to close and maintain the C&D unit in accordance with all rules in effect at that time. At a minimum, the plan shall address the following:
 - a. Design of a final cover system as required by the solid waste management rules in effect at the time of closure;
 - b. Construction and maintenance/operation of the final cover system and erosion control structures;
 - c. Surface water, ground water, and explosive gas monitoring.

MONITORING AND REPORTING REQUIREMENTS

14. Ground-water monitoring wells and monitoring requirements for the C&D landfill unit:
 - a. Monitoring well design and construction shall conform to the specifications outlined in, "North Carolina Water Quality Monitoring Guidance Document for Solid Waste Facilities-DRAFT" and water quality sampling and analysis shall be done in accordance with Construction and Demolition landfills and Closed Sanitary Landfills
 - b. A total of ten locations for ground water wells(MW-2T, MW-3, MW-4, MW-5, MW-6T, MW-10, MW-11, MW-12, MW-13 and MW-14) and three surface water locations(SW-1, SW-2, SW-3) [in accordance with the approved Groundwater Monitoring Plan dated 26 November 2003 by Joan A. Smyth, P.G.] as outlined in Attachment G of the water quality monitoring plan located in the permit to construct application.
 - c. A geologist shall be in the field to supervise well installation. The exact locations, screened intervals, and nesting of the wells shall be established after consultation with the SWS Hydrogeologist at the time of well installation.
 - d. For each monitoring well constructed, a well completion record shall be submitted to DWM within 30 days upon completion.
 - e. Prior to the acceptance of any waste at the C&D unit, a baseline sampling event shall be completed and analysis submitted to the SWS Hydrogeologist.
 - f. Sampling equipment, procedures, and parameters shall conform to specifications outlined in the above-referenced guidance document,[Monitoring and Reporting Requirements, condition 14(a) pg. 9] or the current guidelines established by DWM at the time of sampling.
 - g. In order to determine ground-water flow directions and rates, each monitoring well shall be surveyed, and hydraulic conductivity values and effective porosity values shall be established for the screened intervals for each monitoring well.

- h. The permittee shall sample the monitoring wells semi-annually or as directed by the SWS Hydrogeologist. In addition to the wells described in condition 14(b); surface water locations SW-1, SW-2 and SW-3 shall, as shown on the Water Quality Monitoring Plan dated 26 November 2003, also be sampled semi-annually as part of the monitoring system.
 - i. A readily accessible unobstructed path shall be initially cleared and maintained so that four-wheel drive vehicles may access the monitoring wells at all times.
- 15. The permittee shall maintain a record of all monitoring events and analytical data. Reports of the analytical data for each water quality monitoring sampling event shall be submitted to DWM in a timely manner.
- 16. The permittee shall maintain a record of the amount of solid waste received at the C&D unit, compiled on a monthly basis. Scales shall be used to weigh the amount of waste received.
- 17. On or before 01 August 2004, and each year thereafter, the permittee shall report the amount of waste received (in tons) at the C&D unit and disposed of in the C&D landfill unit to the Solid Waste Section and to all counties from which waste was accepted, on forms prescribed by the Section. This report shall include the following information:
 - a. The reporting period shall be for the previous year, beginning 01 July and ending on 30 June;
 - b. The amount of waste received and landfilled in tons, compiled on a monthly basis, and;
 - c. Documentation that a copy of the report has been forwarded to all counties from which waste was accepted.
- 18. All records shall be maintained on-site and made available to the SWS upon request, specifically records generated by conditions 10, 11, 13, 14, 15, 16 & 17.

ATTACHMENTS

RED ROCK DISPOSAL, LLC

List of Documents for the Approved Plan

SITE SUITABILITY:

1. Report - Site Application - Red Rock Disposal, LLC - Construction & Demolition Landfill - Wake County, North Carolina; application dated 25 January 2001 and received 25 January 2001 from GNRA;
2. Response to Comments - Site Suitability Permit Application - Red Rock Disposal, LLC - Construction & Demolition Landfill - Wake County, North Carolina; application dated 15 May 2001 and received 17 May 2001 from GNRA;
3. Second Response to Comments - Site Suitability Permit Application - Red Rock Disposal, LLC - Construction & Demolition Landfill - Wake County, North Carolina; application dated June 2001 and received 13 June 2001 from GNRA;
4. Documents received on 19 September 2001 from Thomas C. Worth, Jr. addressing the franchise for Red Rock Disposal, LLC to include a affidavit from the Clerk to the Board of Commissioners, Ms. Gwendolyn I. Reynolds, and the agenda package from the January 22, 2002 Wake Board of Commissioners meeting;
5. Letter dated 29 August 2001 received on 4 September 2001 from Curtis Jones via fax addressing the issue of portable toilets at the site instead of a on-site septic system;
6. Transmittal document - Wake County BOA Documents, Red Rock Disposal, LLC cover letter dated 29 May 2001 from GNRA, received 29 May 2001;
7. E-mail dated 23 May 2001 from Ellen Lorscheider to Joan Smyth addressing site geologic and hydrogeologic issues for site suitability;
8. Letter dated 14 May 2001 from Thomas C. Worth, Jr. to John M. Gardner (w/GNRA) addressing Franchise granted to Red Rock Disposal, LLC on 5 February 2001, received 15 May 2001;
9. Certified minutes from Wake County dated 5 February 2001 and 22 January 2001 indicating the vote of the Wake County Commissioners in approving the franchise for Red Rock Disposal, LLC, received on 26 April 2001;
10. Transmittal letter dated 15 February 2001 from GNRA - Supplemental information - Site Suitability Report - Red Rock Disposal, LLC, received 15 February 2001;

11. Special Use Permit Petition and Wake County Ordinances obtained from Wake County web site on 15 March 2001;
12. Transmittal letter dated 15 September 2000 from GNRA - Supplemental information associated with the Special Use Petition - Site Suitability Report - Red Rock Disposal, LLC;
13. Transmittal letter dated 30 August 2000 from GNRA - Petition of Special Use Permit application - Proposed modification by expansion of C&D landfill - Site Suitability Report - Red Rock Disposal, LLC;

CONSTRUCTION APPLICATION:

14. Permit to Construct Application - Red Rock Disposal, LLC C&D Landfill - Phase 1; Wake County, North Carolina dated 27 June 2001, received 27 June 2001;
15. Erosion and Sedimentation control approval, received by fax dated 1 October 2001;
16. Access agreements for Red Rock Disposal, LLC provided with letter dated 13 September 2001, received 13 September 2001.
17. Construction site drawings dated 23 April 2004 by Pieter K. Scheer and John M. Gardner - C&D Landfill Phase 1 Engineering Drawings May 2001, revised October 2003 and April 2004.
18. Revised Permit to Construct Application, Red Rock Disposal LLC C&D Landfill - Phase 1 dated October 2003 and subsequent revisions included.
19. Policy review request letter dated 29 March 2004, concerning Erosion and Sedimentation Control, to Wake County Division of Water Quality.
20. Revised calculations for E&S design, transmittal form dated 23 April 2004.

APPENDIX A.2

**WAKE COUNTY
LAND DISTURBANCE PERMIT**



Environmental Services

TEL 919 856 7449
FAX 919 856 5855

Erosion, Flood and Stormwater
336 Fayetteville St. • P.O. Box 550 • Raleigh, NC 27602

D. Stephen Grissom
3301 Benson Drive, Suite 600
Raleigh, NC 27603
Phone #: 919-325-3000
Fax #: 919-872-1474
ATTN: Mr.D. Stephen Grissom

RE: Sedimentation & Erosion Control Letter of Approval, March 11, 2004

Project Name: Redrock Disposal, LLC C&D Landfill Phase 1C	Submitted By: G.N. Richardson & Associates, Inc.
Project #: S412	14 N. Boylan Avenue
Date Received: 01/23/2004	Raleigh, NC 27603
Date Processing Initiated: 01/23/2004	Phone #: 919-828-0577 Fax #: 919-828-3899
Disturbed Acres: 38	Submittal <input checked="" type="checkbox"/> Revision <input type="checkbox"/>
Plan Review Fee: \$2500.00	
Land Disturbance Fee: \$2500.00	Watershed: : Neuse River Basin-1, 03-04-03

Dear Mr. Grissom:

This office has reviewed the subject Erosion and Sedimentation Control Plan. We find the plan to be acceptable and hereby issue this letter of approval. If any modifications, performance reservations, or recommendation are applicable, a list is enclosed and is incorporated as a part of this letter of approval. If any modifications are not incorporated into the plan and implemented in the field, the site will be in violation of the Erosion and Sedimentation Control Ordinance of Wake County. ***In addition, Effective July 1, 2000 all projects issued Land-Disturbing Permits will have Article II Section 5(2) 5 (3), (4),(5) and (6) of the Ordinance applied. It should be noted that this plan approval shall expire two (2) years following the date of approval in accordance with Section 5.PERMITS, of the Ordinance. In summary permits over 2 years old may need to be renewed to avoid substantial civil penalties. For details consult the Erosion & Sedimentation Control Ordinance.***

Plan Approval is limited to construction, maintenance and stabilization of both temporary and permanent sedimentation and erosion control devices only. Wake County Erosion, Flood and Stormwater Section is not responsible for subject approvals of other Local, State or Federal Agencies. The subject approvals are (but not limited to) Federal Emergency Management Area Flood regulations/requirements, Division of Water Quality under stormwater or other water quality regulations/requirements, U.S. Army Corps of Engineers under Article 404 (Wetlands) jurisdiction/requirements, and/or any Federal, State, County and Local municipal regulations or permit requirements. The approval issued in this letter cannot supersede any other required permit or approval.

Performance Reservations Are:

1. All temporary erosion control devices shall be removed and the site stabilized within two (2) years.
2. Any land disturbance outside of permitted area is prohibited.

Since this project disturbs five or more acres, one such approval relates to the Stormwater that will discharge from your project. This runoff is permitted pursuant to the National Pollutant Discharge Elimination System (NPDES) administered in North Carolina by the Division of Water Quality (DWQ). Attached is the General Stormwater NPDES Permit, NCG01000, as revised October 1, 2001, covering your activity. You are responsible for

complying with the General Permit requirements and are subject to enforcement by DWQ for any violations of the General Permit.

Wake County's sedimentation pollution control program is performance oriented, requiring protection of the natural resources and adjoining properties. If at any time during this project it is determined that the Erosion and Sedimentation Control Plan is inadequate to meet the requirements of the Erosion and Sedimentation Control Ordinance of Wake County, this office may require revisions in the plan and its implementation to ensure compliance with the Ordinance. Also, please consider this letter as notice in accordance with the requirements for Approval of Plans, Section 4(8), this office may require revisions in the plan and its implementation to ensure compliance with the Ordinance.

Please note that this approval is based in part on the accuracy of the information provided concerning financial responsibility. You are requested to file an amended Financial Responsibility Form if any changes become necessary.

Your cooperation is appreciated and we look forward to working with you on this project. If there are any questions, please do not hesitate to contact this office.

Sincerely,

David R. Parnell, 856-7549
Environmental Engineer/Planner I

cc:G.N. Richardson & Associates, Inc.
Mr. Ken Schuster, P.E.



Environmental Services

TEL 919 856 7449
FAX 919 856 5855

Erosion, Flood and Stormwater
336 Fayetteville St. • P.O. Box 550 • Raleigh, NC 27602

03/26/2004 14:41:00 EROSION/FLOOD/STORMWATER PERMIT WIS039
 ASSGND TO: LAST UPDATED BY: DAVE PARNELL 856-7549
 PERMIT#: S000412 STS: A APP DATE: 01/23/2004 COMP DATE:
 PROJECT: REDROCK DISPOSAL, LANDFILL P1C DAY PHONE: (919) 828 - 0577
 ADDRESS: 14 N BOYLAN AVE FAX#: (919) 828 - 3899
 CITY: RALEIGH STATE: NC ZIP: 27603
 OWNER: RED ROCK DISPOSAL LLC DAY PHONE: (919) 557 - 9583
 ADDRESS: 7130 NEW LANDFILL DR FAX#: (919) 557 - 9523
 CITY: HOLLY SPRINGS STATE: NC ZIP: 27540
 HD USE: 600 GRADING PERMIT BLDG PRMT: WW PRMT:
 EXIST USE: ORIG PERMIT#: REC?: Y
 WATER: I WASTEWTR: I BK/PG: 9999 9999 TAX MAP#: 0833 0007
 TOWNSHIP: 06 HOLLY SPRINGS JURIS: WC ZON: R80 PIN: 0627.04 94 6153 000
 SUBD#: 000 000 00 SUBD NAME: LOT-SEC: ACRE: 51.00
 %IMPERV: 15.00 LIMIT: 15.00 TYPE USE: C NEW?: Y DISTURB ACRE: 38.00
 WATERSHED: C FLOOD STUDY REQ?: N COMP DATE:
 RECEIPT#: 0006877 FEE: 2500.00

ST#: 7130 MI: DIR: NAME: NEW LANDFILL DIR: TYP: DR
 DIRECTIONS: PLAN APPROVED BY DAVE PARNELL ON MAR. 11, 04 RCPT DAT:
 03/26/2004

Name: FRED L. Counts

Signature: [Handwritten Signature]

Date: MARCH 26, 2004

Phone #: 919-557-9583

RENEWAL OF LAND DISTURBING PERMIT:

*This policy does not apply to projects approved prior to July 1, 2000. The client was not notified during approval as was the case from July 1, 2000 to the present.

*This policy does not apply to Landfills. Landfills are seldom closed out within two years and the erosion control measures are to remain in place for several years.

*Land Disturbing Permits expire 2 (two) years from the date of issuance. The project is to be renewed 30 days before the expiration date by re-applying in the same procedure as the original application. If the Engineer/Planner discovers the permit for a project has expired, a site visit is required to determine the status of the site. If the project is *not* at a point that it can be closed out, the permit is to be renewed for one year by re-paying the plan review fee and the land disturbing permit fee. Until the Ordinance is changed, the renewal is for one year **only** (*This is the policy, which reflects the current ordinance. A change of the ordinance will be proposed to the Commissioners.*). Notify Katy Chen (or first floor support staff) by giving or e-mailing her a copy of the renewal letter so she knows what the fees are for when it has been submitted. The mainframe is now set up with a “tickler” which will alert the engineer/planner when the two-year limit is about to expire. It does not help with expiring permits that we are closing out now, however.

*An inspection of the project is required to assess what is required to be done in order to close out the project. If the project can be closed out, close it out; if not, send a letter demanding payment of the fees, citing Section 5(3), 5(4), 5(5) and 12(1)a of the Wake County Soil Erosion and Sediment Control Ordinance. Depending on seasonal growing conditions and the condition of easements and ditches, etc., a short time extension may be granted.

*When the renewal fees are paid (in a time required by the renewal letter), a submission of one copy of the most up to date construction plan, Form 101 and a Financial Responsibility Form (if there are changes since approval) is required. The Environmental Engineer/Planner will review the construction plan to make sure it agrees with what has been constructed.

*Upon receipt of the payment of fees and required documents, a renewal receipt form is issued to the owner by the first floor support staff. A copy is put in the file, as well. This form states the final date for close out. If the project is not issued a Certificate of Completion within the one year renewal period the project is in violation of Section 12(1)a and is subject to a civil penalty.

Effective May 6, 2004

APPENDIX A.2

USACOE NATIONWIDE PERMIT NO. 18 – SECTION 404



September 10, 2002
DWQ# 02-0128
Wake County

Red Rock Disposal, LLC
C/o Jennifer Burdette
7130 New Landfill Drive
Holly Springs, NC, 27540

APPROVAL of 401 Water Quality Certification with Additional Condition

Dear Ms. Burdette:

You have our approval, in accordance with the attached conditions, to place fill in 1,009 linear feet of intermittent and perennial streams in order to construct the Red Rock Landfill Expansion in Wake County, as described in your application received by the Division of Water Quality on January 28, 2002. After reviewing your application, we have determined that this fill is covered by General Water Quality Certification Number 3362, which can be downloaded from our web site at <http://h2o.enr.state.nc.us/ncwetlands>. This Certification allows you to use Nationwide Permit Number 18 when issued by the U.S. Army Corps of Engineers. In addition, you should get any other federal, state or local permits before you go ahead with your project including (but not limited to) Sediment and Erosion Control, Non-Discharge and Water Supply Watershed regulations. Also this approval will expire when the accompanying 404 permit expires unless otherwise specified in the General Certification. This Certification replaces the one issued to you on August 20, 2002.

This approval is only valid for the purpose and design that you described in your application. If you change your project, you must notify us in writing and you may be required to send us a new application for a new certification. If the property is sold, the new owner must be given a copy of the Certification and approval letter and is thereby responsible for complying with all conditions. If total wetland fills for this project (now or in the future) exceed one acre, compensatory mitigation may be required as described in 15A NCAC 2H .0506 (h). For this approval to be valid, you must follow the conditions listed in the attached certification as well as the additional condition listed below:

1. We understand that you have contributed to the Wetland Restoration Program in order to compensate for these impacts to streams. In accordance with 15A NCAC 2R .0402 and 15A NCAC 2B .0242(7), this contribution will satisfy our compensatory mitigation requirements under 15A NCAC 2H .0506(h) and 15A NCAC 2B .0233(10). Mr. Ron Ferrell should be contacted at (919) 733-5208 if you have any questions concerning the Wetland Restoration Program. For accounting purposes, this Certification authorizes the fill of 1,009 linear feet of streams, in the Cape Fear river and sub-basin and 516 feet of stream mitigation are required. Please be aware that the Wetland Restoration Program (WRP) rules require rounding of stream impact amounts to one-foot increments (15A NCAC 2R .0503(b))."

If you do not accept any of the conditions of this certification, you may ask for an adjudicatory hearing. You must act within 60 days of the date that you receive this letter. To ask for a hearing, send a written petition which conforms to Chapter 150B of the North Carolina General Statutes to the Office of Administrative Hearings, 6714 Mail Service Center, Raleigh, N.C. 27699-6714. This certification and its conditions are final and binding unless you ask for a hearing.

This letter completes the review of the Division of Water Quality under Section 401 of the Clean Water Act. If you have any questions, please telephone Steve Mitchell in our Raleigh Regional Office at 919-571-4700 or Cyndi Karoly in the Central Office at 919-733-9721.

Sincerely,

Alan W. Klimek, P.E.



NORTH CAROLINA-DIVISION OF WATER QUALITY
401 WATER QUALITY CERTIFICATION
SUMMARY OF PERMITTED IMPACTS AND MITIGATION REQUIREMENTS

In accordance with 15A NCAC 2H .0500, the Red Rock Landfill, care of Ms. Jennifer Burdette, has permission as outlined below for the purpose of constructing an expansion to the Red Rock Landfill in Wake County, North Carolina. All activities associated with these authorized impacts must be conducted with the conditions listed in the attached certification. THIS CERTIFICATION IS NOT VALID WITHOUT THE ATTACHMENTS.

**COMPENSATORY MITIGATION REQUIREMENT
WETLAND RESTORATION PROGRAM**

LOCATION: Red Rock Landfill Expansion
COUNTY: Wake
BASIN/SUBBASIN Cape Fear (03-06-07)

Impacts:

1,009 linear feet of intermittent and perennial streams

As required by 15A NCAC 2H .0506, and the conditions of this certification, you are required to compensate for the above impacts through the restoration, creation, enhancement or preservation of surface waters as outlined below prior to conducting any activities that impact or degrade the waters of the state.

Mitigation:

516 linear feet of perennial streams by WRP

Note: Linear foot requirements proposed to be mitigated through the Wetland Restoration Program must be rounded to the nearest foot and acreage requirements must be rounded to one-quarter acre increments according to 15 2r .0503(b).

One of the options you have available to satisfy the compensatory mitigation requirements is through the payment of a fee to the Wetlands Restoration Fund per NCAC 2R .0503. If you choose this option, please sign this form and mail it to the Wetlands Restoration Fund at the address listed below. An invoice for the appropriate amount of payment will be sent to you upon receipt of this form. PLEASE NOTE, THE ABOVE IMPACTS ARE NOT AUTHORIZED UNTIL YOU RECEIVE NOTIFICATION THAT YOUR PAYMENT HAS BEEN PROCESSED BY THE WETLANDS RESTORATION PROGRAM.

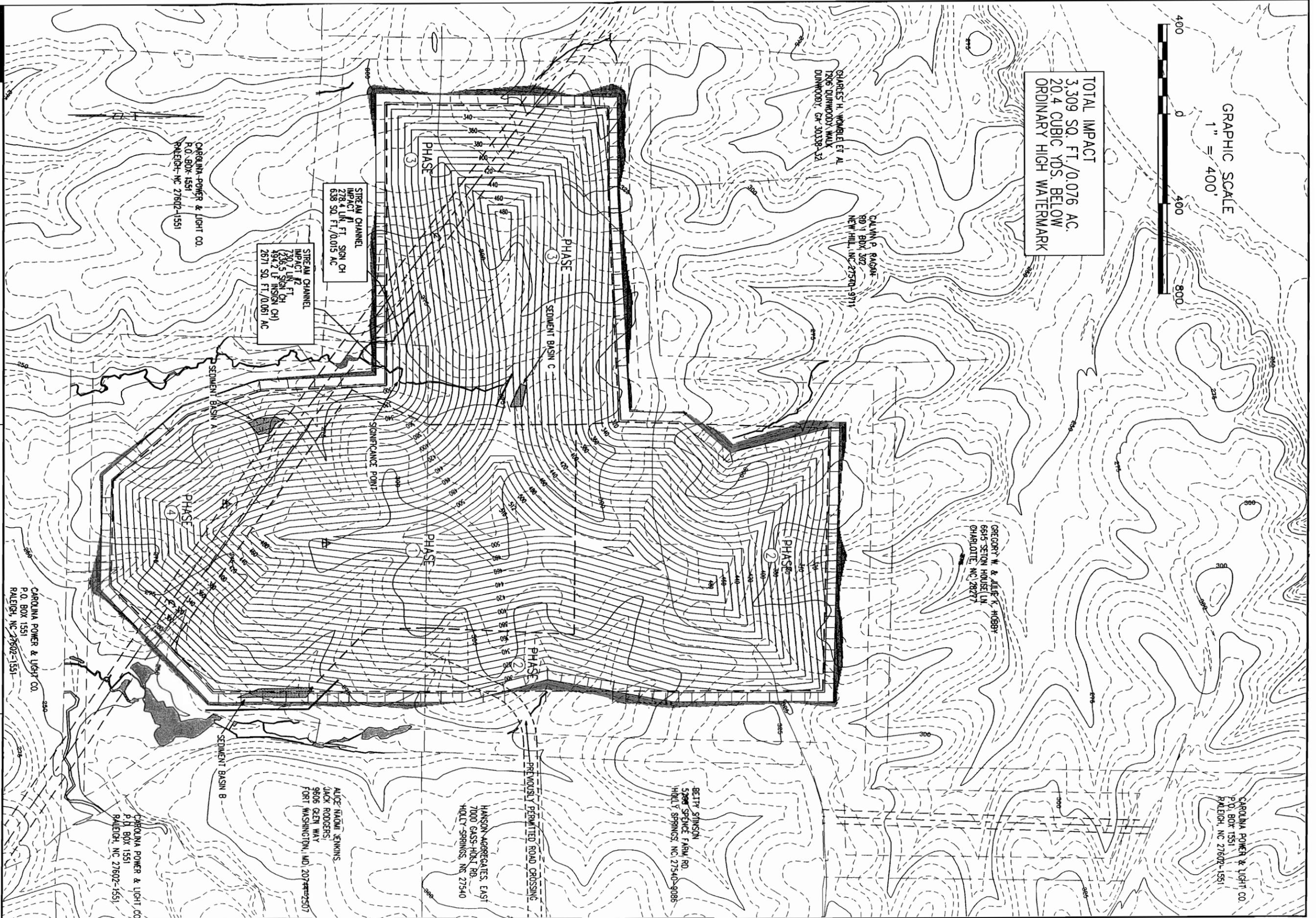
Signature

Date

WETLANDS RESTORATION PROGRAM
DIVISION OF WATER QUALITY
1619 Mail Service Center
RALEIGH, N.C. 27669-1619
(919) 733-5208

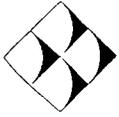
GRAPHIC SCALE
1" = 400'

TOTAL IMPACT
3,309 SQ. FT./0.076 AC.
20.4 CUBIC YDS. BELOW
ORDINARY HIGH WATERMARK



APPENDIX B

**MONITORING WELL
ABANDONMENT**



RICHARDSON SMITH GARDNER & ASSOCIATES

Engineering and Geological Services

February 25, 2008

Mr. Donald Herndon
Environmental Specialist
NCDENR Division of Waste Management -Solid Waste Section
401 Oberlin Road, Suite 150
Raleigh, North Carolina 27605

RE: Well Abandonment Report – MW-2 and MW-9
Red Rock Disposal, LLC C&D Landfill, Permit No. 92-28
Holly Springs, Wake County, North Carolina

Dear Mr. Herndon:

Richardson, Smith, Gardner, and Associates Inc. is submitting this letter on behalf of Red Rock Disposal, LLC (Red Rock), a subsidiary of Waste Industries USA, Inc. (Waste Industries), to document the well abandonment conducted on February 15th, 2008.

Two monitoring wells, MW-2 and MW-9, required abandonment. Their locations are shown on **Figure 1**. Well MW-2, located south of the landfill, was a permitting piezometer that was not part of the monitoring well network. This well had been driven over by a piece of heavy equipment. Well MW-9 was located in the Phase 1C-2 construction area. Construction of Phase 1C-2 began approximately three (3) days after the well abandonment.

Observations of well MW-2 showed the metal casing was flattened and the concrete pad was broken. Well MW-9 was found to be in good condition. A back hoe was used to remove the steel well casings and concrete pads at each location. Upon removal of the well casing of MW-2 measurements of the depth to water and depth to well bottom were taken. These measurements were also taken at MW-9 prior to abandonment. These measurements are included in **Table 1**.

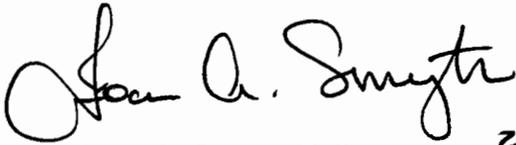
Well sites MW-2 and MW-9 were abandoned in accordance with the State procedures for permanent abandonment of wells. Grout was tremie-piped to fill both wells from bottom to top after the metal casing and concrete pad were removed. David Barron, a licensed driller with Engineering Tectonics, P.A, performed the abandonment services under the supervision of Joan Smyth, P.G. of RSG. The well abandonment record and original boring logs are included in **Attachment 1**.

Mr. Herndon
2/25/08
Page 2 of 2

If you have any questions or require any additional information, please contact me at your earliest convenience (919) 828-0577 ext. 122 or by email at joan@rsgengineers.com.

Sincerely,

Richardson Smith Gardner & Associates, Inc.



Joan A. Smyth, P.G.
Senior Hydrogeologist

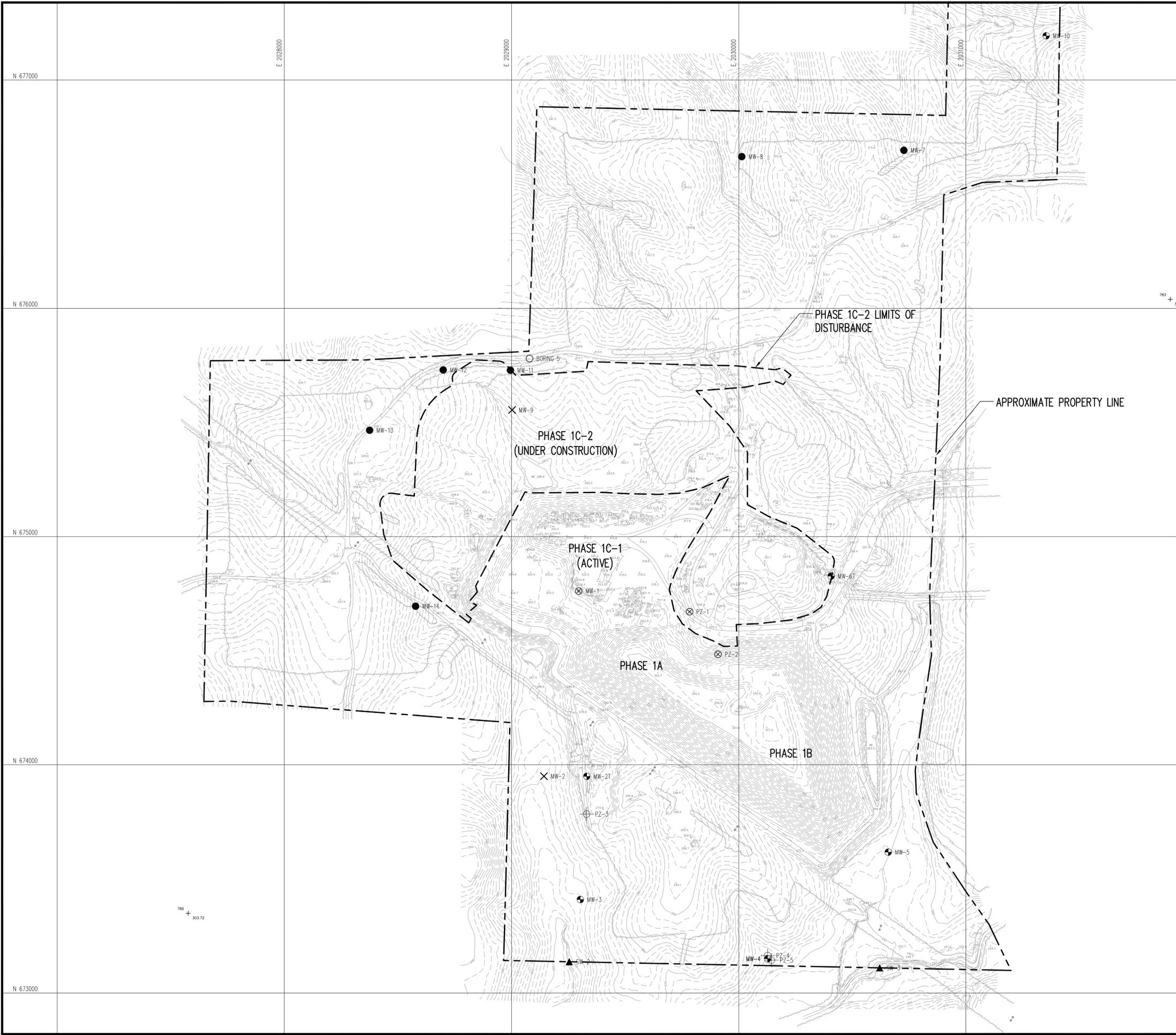


Attachments

cc: Don Plessinger – Red Rock Disposal
David Pepper – Waste Industries
Shawn Carrol – Waste Industries

Figure 1

G:\CAD\Red Rock\Red Rock.dwg - 11/15/2008 11:00 AM



LEGEND

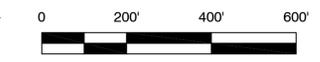
- 300 EXISTING 10' CONTOUR
- EXISTING 2' CONTOUR
- PROPERTY LINE (SEE REFERENCE 2)
- APPROXIMATE LIMITS OF DISTURBANCE
- MW-1 MONITORING WELLS INSTALLED BY THE HUTCHINSON GROUP, LTD. OCT.-NOV. 2000
- PZ-2 PIEZOMETER
- MW-7 WELLS NOT IN MONITORING NETWORK
- SW-2 SURFACE WATER MONITORING POINT
- BORING 5 BORING
- MW-9 ABANDONED WELL/PIEZOMETER
- MW-1 PREVIOUSLY ABANDONED WELL/PIEZOMETER

NOTES:

1. ELEVATIONS REFERENCE U.S.G.S. VERTICAL DATUM (MSL).
2. GRID COORDINATES REFERENCE NC STATE PLANE SYSTEM (NAD 1983).

REFERENCES:

1. OVERALL SITE TOPOGRAPHY PREPARED BY GEODATA CORP., BASED ON AERIAL PHOTOGRAPHY DATED FEBRUARY 15, 2007.
2. THE PROPERTY LINE SHOWN REFERENCES DRAWING TITLED, "BOUNDARY SURVEY FOR WASTE INDUSTRIES, INC.", PREPARED BY SURVEY SOLUTIONS, P.C. DATED 12/27/00, SCALE 1"=400'.



DATE	NO.	REVISION

RICHARDSON SMITH GARDNER & ASSOCIATES
 14 N. Boylan Ave.
 Raleigh, N.C. 27603
 www.regengineers.com
 ph: 919-228-0577
 fax: 919-228-3889

PROJECT TITLE:
 RED ROCK DISPOSAL, LLC
 C&D LANDFILL
 HOLLY SPRINGS, NC

DRAWING TITLE:
FIGURE 1
WELL ABANDONEMENT LOCATIONS

DESIGNED BY: J.A.S.	DRAWN BY: J.A.L.
CHECKED BY:	PROJECT NO.: RED ROCK 08-1
SCALE: AS SHOWN	DATE: FEB. 2008
FILE NAME: REDROCK-D0072	SHEET NO.:
	DRAWING NO. 1

Table 1



Table 1
Well Abandonment Data
Red Rock C&D Landfill
Holly Springs, North Carolina

Well	Depth to Water	Depth to Bottom
MW-2	3.47	20.02
MW-9	10.65	32

Measurements (in feet) collected at time of abandonment on 2/15/08

Measurements for MW-2 collected after removal of steel casing and concrete pad and are approximately from ground surface.

Attachment 1



WELL ABANDONMENT RECORD

North Carolina Department of Environment and Natural Resources- Division of Water Quality

WELL CONTRACTOR CERTIFICATION # 2089

1. WELL CONTRACTOR:

David Barron

Well Contractor (Individual) Name

Eng. Tectonics

Well Contractor Company Name

STREET ADDRESS 1720 VARGRAVE ST.

W-Salem N.C. 27107

City or Town State Zip Code

336 - 724-6994

Area code - Phone number

2. WELL INFORMATION:

SITE WELL ID # (if applicable) MW# 2

STATE WELL PERMIT # (if applicable) _____

COUNTY WELL PERMIT # (if applicable) _____

DWQ or OTHER PERMIT # (if applicable) _____

WELL USE (Circle applicable use): Monitoring Residential
Municipal/Public Industrial/Commercial Agricultural
Recovery Injection Irrigation
Other (list use) _____

3. WELL LOCATION:

COUNTY Wake QUADRANGLE NAME _____

NEAREST TOWN: Holly Springs
7130 New Landfill Dr. 27540

(Street/Road Name, Number, Community, Subdivision, Lot No., Parcel, Zip Code)

TOPOGRAPHIC / LAND SETTING:

Slope Valley Flat Ridge Other _____
(Circle appropriate setting)

LATITUDE _____

LONGITUDE _____

May be in degrees, minutes, seconds, or in a decimal format

Latitude/longitude source: GPS Topographic map

(Location of well must be shown on a USGS topo map and attached to this form if not using GPS.)

4a. FACILITY- The name of the business where the well is located. Complete 4a and 4b. (If a residential well, skip 4a; complete 4b, well owner information only.)

FACILITY ID # (if applicable) _____

NAME OF FACILITY _____

STREET ADDRESS _____

City or Town State Zip Code

4b. CONTACT PERSON/WELL OWNER:

NAME Don Plessinger

STREET ADDRESS 7130 New Landfill Dr.

Holly Springs N.C. 27540

City or Town State Zip Code

919 - 557-9583

Area code - Phone number

5. WELL DETAILS:

a. Total Depth: 20' ft. Diameter: 2" in.

b. Water Level (Below Measuring Point): 3.47 ft.

Measuring point is 6.5 ft. above land surface.

6. CASING:

a. Casing Depth (if known): 20' ft. 2" in.

b. Casing Removed: _____ ft. _____ in.

7. DISINFECTION: N.A.

(Amount of 65%-75% calcium hypochlorite used)

8. SEALING MATERIAL:

Neat Cement

Cement _____ lb.
Water _____ gal.

Sand Cement

Cement _____ lb.
Water _____ gal.

Bentonite

Bentonite _____ lb.
Type: Slurry _____ Pellets _____
Water _____ gal.

Other

Type material EASY GROUT
Amount 40lbs 27 gals water

9. EXPLAIN METHOD OF EMPLACEMENT OF MATERIAL:

Tremie Grout well from Bottom to Top, Remove Metal casing a top 3' of 2" PVC

10. WELL DIAGRAM: Draw a detailed sketch of the well on the back of this form showing total depth, depth and diameter of screens (if any) remaining in the well, gravel interval, intervals of casing perforations, and depths and types of fill materials used.

11. DATE WELL ABANDONED 2-15-08

I DO HEREBY CERTIFY THAT THIS WELL WAS ABANDONED IN ACCORDANCE WITH 15A NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

David Barron

2-15-08

SIGNATURE OF CERTIFIED WELL CONTRACTOR

DATE

SIGNATURE OF PRIVATE WELL OWNER ABANDONING THE WELL DATE

(The private well owner must be an individual who personally abandons his/her residential well in accordance with 15A NCAC 2C .0113.)

DAVID BARRON

PRINTED NAME OF PERSON ABANDONING THE WELL



MONITORING WELL LOG

WELL NO. MW-2

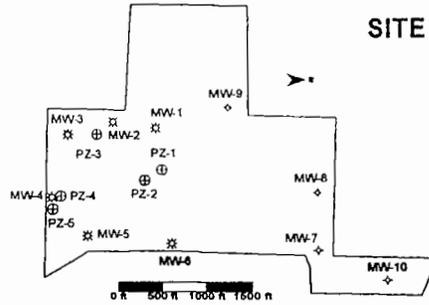
TOTAL DEPTH 25'

PROJECT INFORMATION

PROJECT Red Rock Landfill
SITE LOCATION Holly Springs, North Carolina
ADDRESS Rex Road (State Route 1127)
ELEVATION GS 260.46 PVC 262.13 ft amsl
LOGGED BY Peter Weir
DRILLING DATES October 3, 2000
DRILLER & CO. Richard Simmons Drlg.
RIG TYPE Canterra 250
DRILLING METHOD HSA 4.25, Air Rotary
SAMPLING METHOD Split-spoon
NOTES: Drilled dry; WL 10/13/00 20' bgs

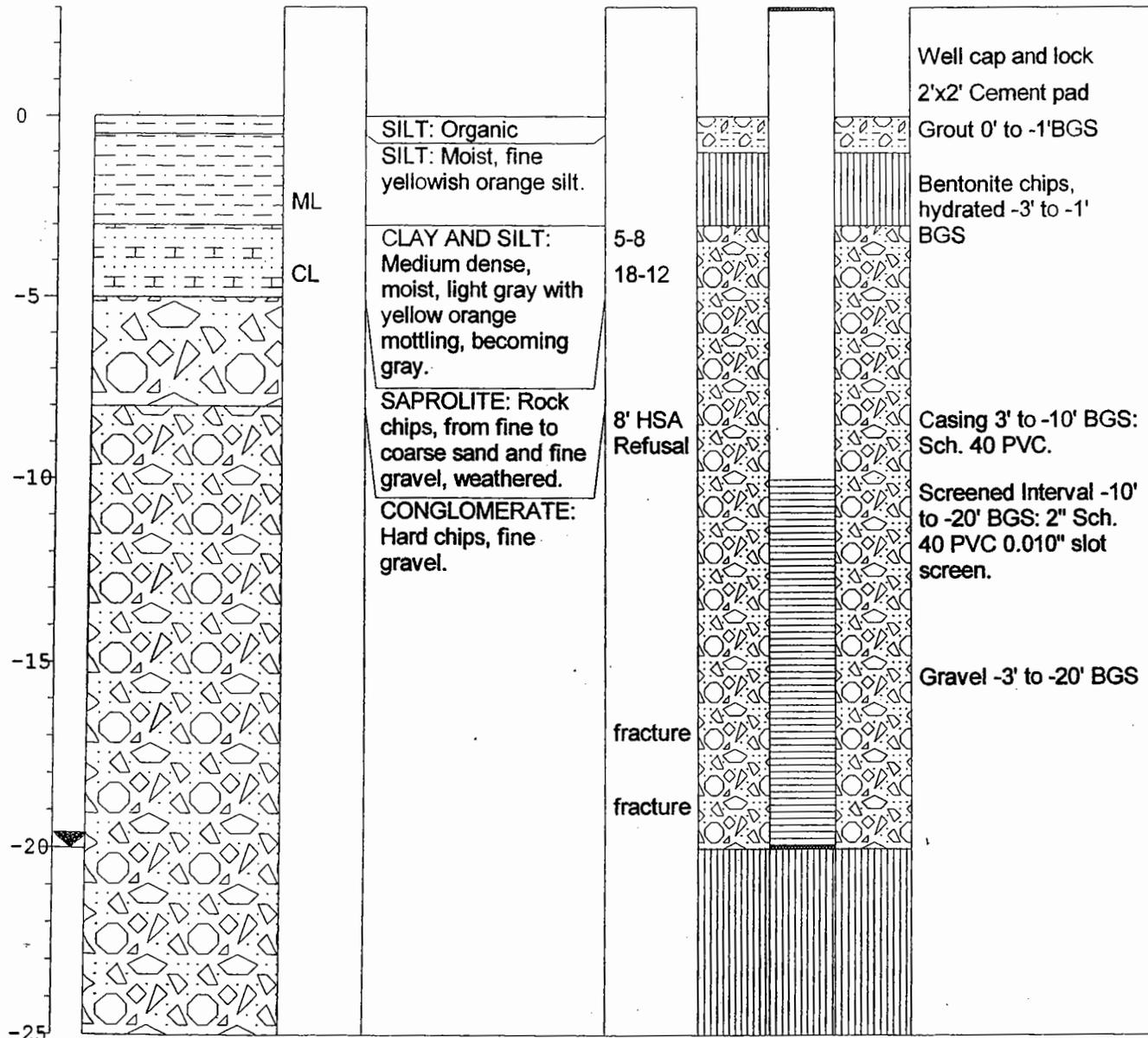
DRILLING INFORMATION

SITE LOCATION



▽ Water level during drilling
 ▼ Water level in completed well

DEPTH	SOIL SYMBOLS	USCS	SOIL DESCRIPTION	BLOWS/6"	WELL COMPLETION	WELL DESCRIPTION
-------	--------------	------	------------------	----------	-----------------	------------------





WELL ABANDONMENT RECORD

North Carolina Department of Environment and Natural Resources- Division of Water Quality

WELL CONTRACTOR CERTIFICATION # 2089

1. WELL CONTRACTOR:

DAVID BARRON

Well Contractor (Individual) Name

ENG. TECTONICS

Well Contractor Company Name

STREET ADDRESS 1720 VARGRAVE ST.

W-Salem N.C. 27107

City or Town State Zip Code

336 - 724-6994

Area code - Phone number

2. WELL INFORMATION:

SITE WELL ID # (if applicable) MW#9

STATE WELL PERMIT # (if applicable) _____

COUNTY WELL PERMIT # (if applicable) _____

DWQ or OTHER PERMIT # (if applicable) _____

WELL USE (Circle applicable use): Monitoring Residential
Municipal/Public Industrial/Commercial Agricultural
Recovery Injection Irrigation
Other (list use) _____

3. WELL LOCATION:

COUNTY WAKE QUADRANGLE NAME _____

NEAREST TOWN: Holly Springs

7130 New Landfill Dr. 27540

(Street/Road Name, Number, Community, Subdivision, Lot No., Parcel, Zip Code)

TOPOGRAPHIC / LAND SETTING:

Slope Valley Flat Ridge Other _____
(Circle appropriate setting)

LATITUDE _____

LONGITUDE _____

May be in degrees, minutes, seconds, or in a decimal format

Latitude/longitude source: GPS Topographic map

(Location of well must be shown on a USGS topo map and attached to this form if not using GPS.)

4a. FACILITY - The name of the business where the well is located. Complete 4a and 4b. (If a residential well, skip 4a; complete 4b, well owner information only.)

FACILITY ID # (if applicable) _____

NAME OF FACILITY _____

STREET ADDRESS _____

City or Town State Zip Code

4b. CONTACT PERSON/WELL OWNER:

NAME Don Plessinger

STREET ADDRESS 7130 New Landfill Dr.

Holly Springs N.C. 27540

City or Town State Zip Code

919 - 557-9583

Area code - Phone number

5. WELL DETAILS:

a. Total Depth: 32.0 ft. Diameter: 2" in.

b. Water Level (Below Measuring Point): 10.65 ft.
Measuring point is 3' ft. above land surface.

6. CASING:

a. Casing Depth (if known): 32' ft. 2" in.

b. Casing Removed: _____ ft. _____ in.

7. DISINFECTION: M, A

(Amount of 65%-75% calcium hypochlorite used)

8. SEALING MATERIAL:

Neat Cement

Cement _____ lb.
Water _____ gal.

Sand Cement

Cement _____ lb.
Water _____ gal.

Bentonite

Bentonite _____ lb.
Type: Slurry _____ Pellets _____
Water _____ gal.

Other

Type material EASY GROUT
Amount 40 lbs 27 gals water

9. EXPLAIN METHOD OF EMPLACEMENT OF MATERIAL:

Tremie Grout Well from Bottom to Top. Remove Metal Casing + top 3' of 2" PVC

10. WELL DIAGRAM: Draw a detailed sketch of the well on the back of this form showing total depth, depth and diameter of screens (if any) remaining in the well, gravel interval, intervals of casing perforations, and depths and types of fill materials used.

11. DATE WELL ABANDONED 2-15-08

I DO HEREBY CERTIFY THAT THIS WELL WAS ABANDONED IN ACCORDANCE WITH 15A NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

David Barron

2-15-08

SIGNATURE OF CERTIFIED WELL CONTRACTOR

DATE

SIGNATURE OF PRIVATE WELL OWNER ABANDONING THE WELL DATE

(The private well owner must be an individual who personally abandons his/her residential well in accordance with 15A NCAC 2C .0113.)

DAVID BARRON

PRINTED NAME OF PERSON ABANDONING THE WELL



the HUTCHINSON GROUP, Ltd.
Consulting Earth Scientists

Murrysville, PA

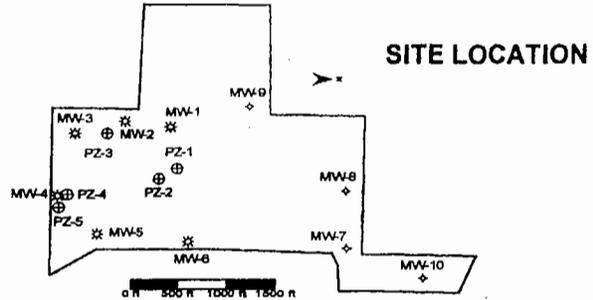
PIEZOMETER LOG

WELL NO. MW-9
TOTAL DEPTH 37'

PROJECT INFORMATION

DRILLING INFORMATION

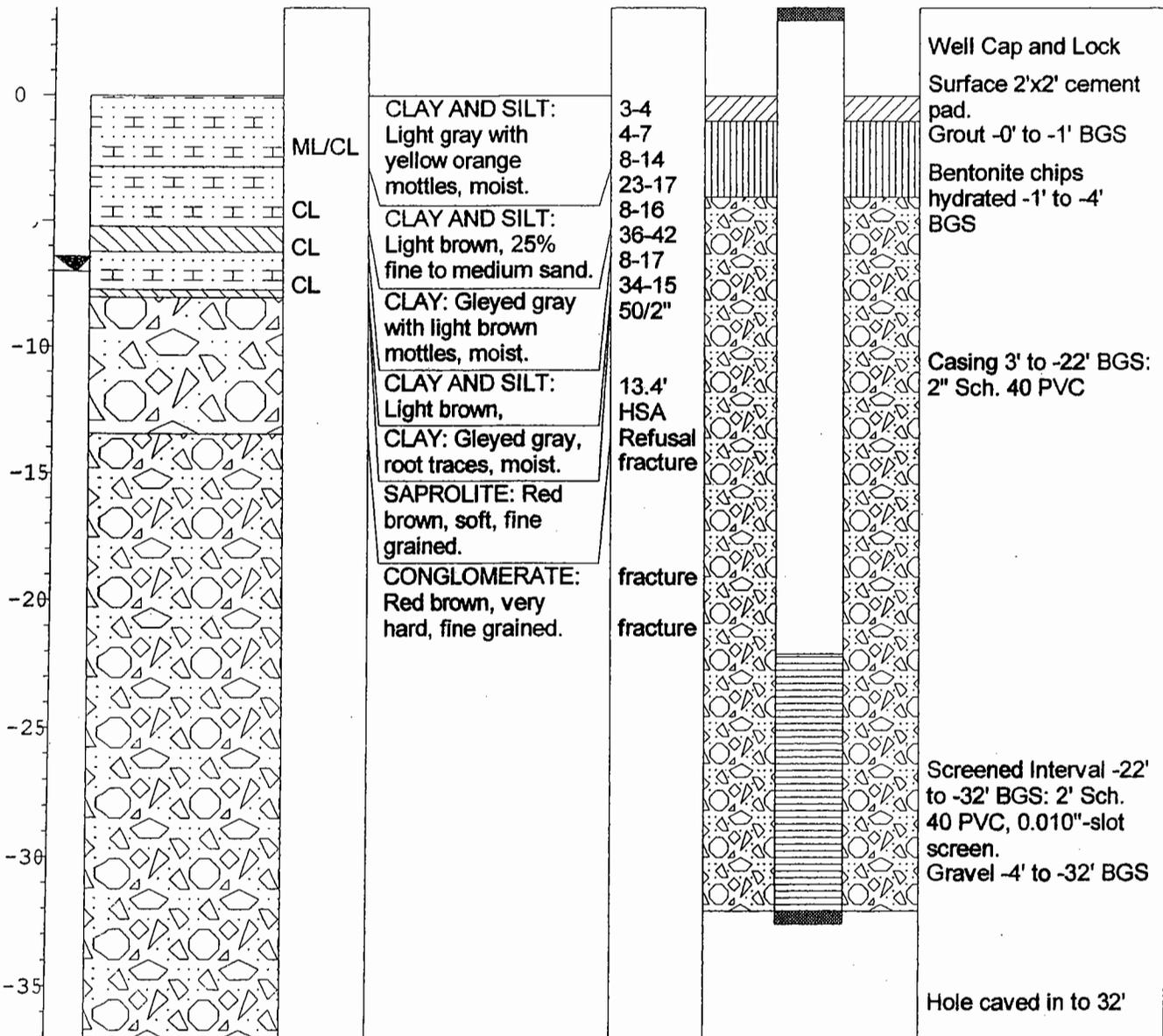
PROJECT Red Rock Landfill
SITE LOCATION Holly Springs, North Carolina
ADDRESS Rex Road (State Route 1127)
ELEVATION GS 298.44 ft, PVC 300.69 ft amsl
LOGGED BY Peter Weir
DRILLING DATES October 16, 2000
DRILLER & CO. R. Simmons Drlg. T. Tryhuba
RIG TYPE Canterra 250
DRILLING METHOD HSA Air Rotary 6.875"
SAMPLING METHOD Split-spoon
NOTES: Drilled dry; WL 10/17/00 7.00' bgs



▽ Water level during drilling
▼ Water level in completed well

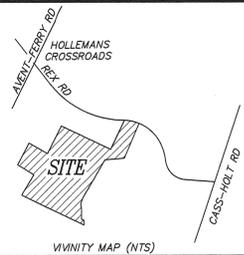
Page 1 of 1

DEPTH	SOIL SYMBOLS	USCS	SOIL DESCRIPTION	BLOWS/6"	WELL COMPLETION	WELL DESCRIPTION
-------	--------------	------	------------------	----------	-----------------	------------------

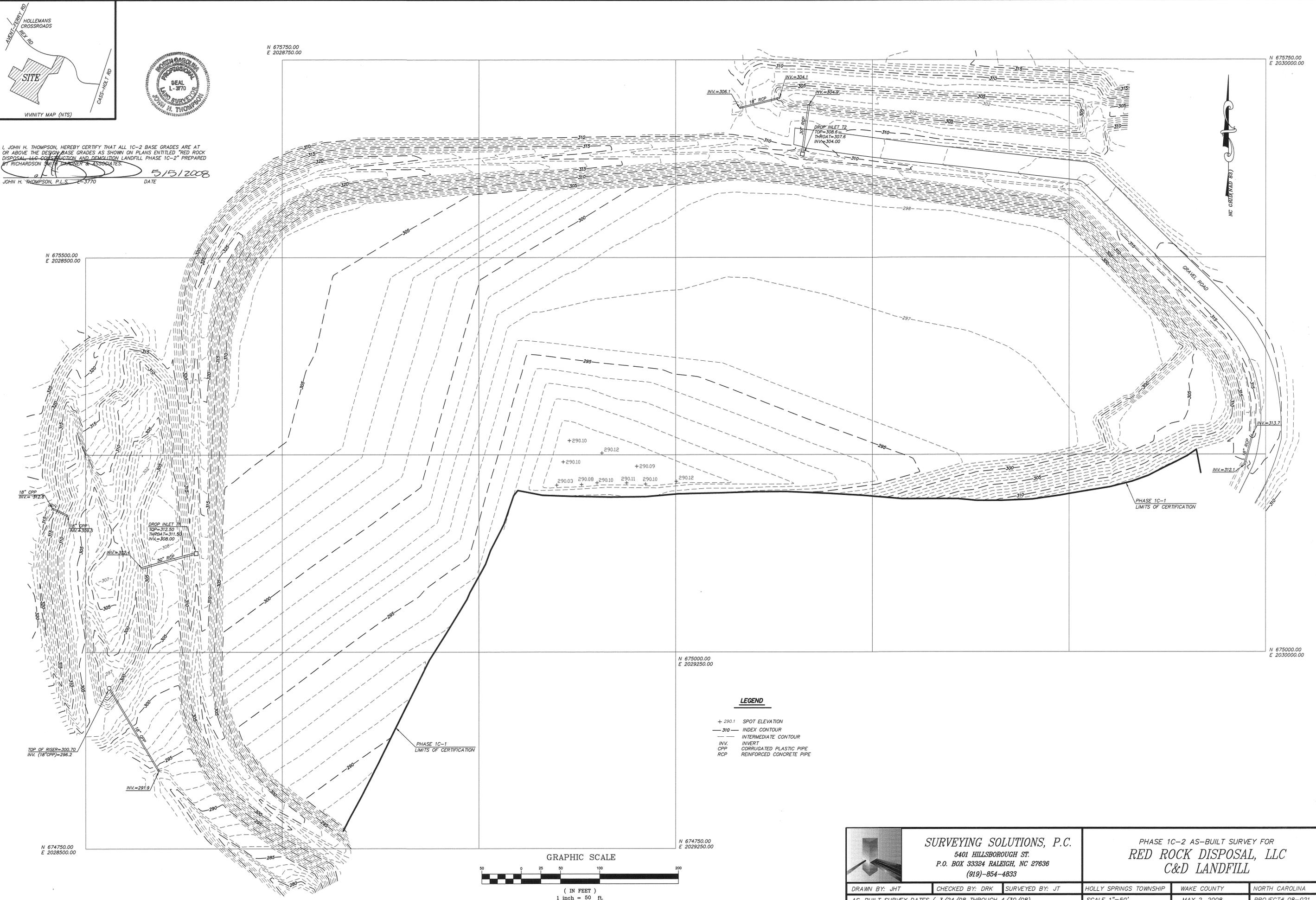


APPENDIX C

AS-BUILT SURVEYS

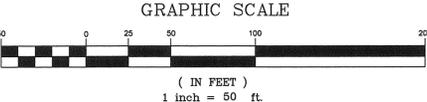


I, JOHN H. THOMPSON, HEREBY CERTIFY THAT ALL 1C-2 BASE GRADES ARE AT OR ABOVE THE DESIGN BASE GRADES AS SHOWN ON PLANS ENTITLED "RED ROCK DISPOSAL, LLC CONSTRUCTION AND DEMOLITION LANDFILL PHASE 1C-2" PREPARED BY RICHARDSON SMITH GARDNER & ASSOCIATES.
 JOHN H. THOMPSON, P.L.S. 5/15/2008 DATE



+290.10 +290.12
 +290.10 +290.09
 290.03 290.08 290.10 290.11 290.10 290.12

- LEGEND**
- + 290.1 SPOT ELEVATION
 - 310 - INDEX CONTOUR
 - - - INTERMEDIATE CONTOUR
 - INV. INVERT
 - CPP CORRUGATED PLASTIC PIPE
 - RCP REINFORCED CONCRETE PIPE



		SURVEYING SOLUTIONS, P.C. 5401 HILLSBOROUGH ST. P.O. BOX 33324 RALEIGH, NC 27636 (919)-854-4833		PHASE 1C-2 AS-BUILT SURVEY FOR RED ROCK DISPOSAL, LLC C&D LANDFILL	
		DRAWN BY: JHT AS-BUILT SURVEY DATES (3/24/08 THROUGH 4/30/08)	CHECKED BY: DRK	SURVEYED BY: JT	HOLLY SPRINGS TOWNSHIP SCALE 1"=50'

APPENDIX D

CONSTRUCTION PHOTOGRAPHS



Photo 1 – Cell area after clearing view to southwest (March 4, 2008)



Photo 2 – Sediment Basin T2 Outlet during construction (March 4, 2008)



Photo 3 – Cell area view to west (March 7, 2008)



Photo 4 – Cell Area view to east (March 11, 2008)



Photo 5 – Construction of Sediment Basin T2 (March 11, 2008)



Photo 6 – Embankment on northeastern corner (March 25, 2008)



Photo 7 – Berm along north end of the cell (March 25, 2008)



Photo 8 – Western cell area view to the southwest (April 1, 2008)



Photo 9 – Berm along southwest end of the cell (April 1, 2008)



Photo 10 – View of drainage ditch D-1 (April 7, 2008)



Photo 11 – View of Sediment Basin T1 (April 7, 2008)



Photo 12 – View to west across the cell (April 15, 2008)



Photo 13 – View of Sediment Basin T1 (April 15, 2008)



Photo 14 – Berm along west end of the cell (April 15, 2008)



Photo 15 – View of Drainage Channel Lining (May 2, 2008)



Photo 16 – Lined Drainage Channel (May 2, 2008)

APPENDIX E
EARTHWORK DATA

APPENDIX E.1

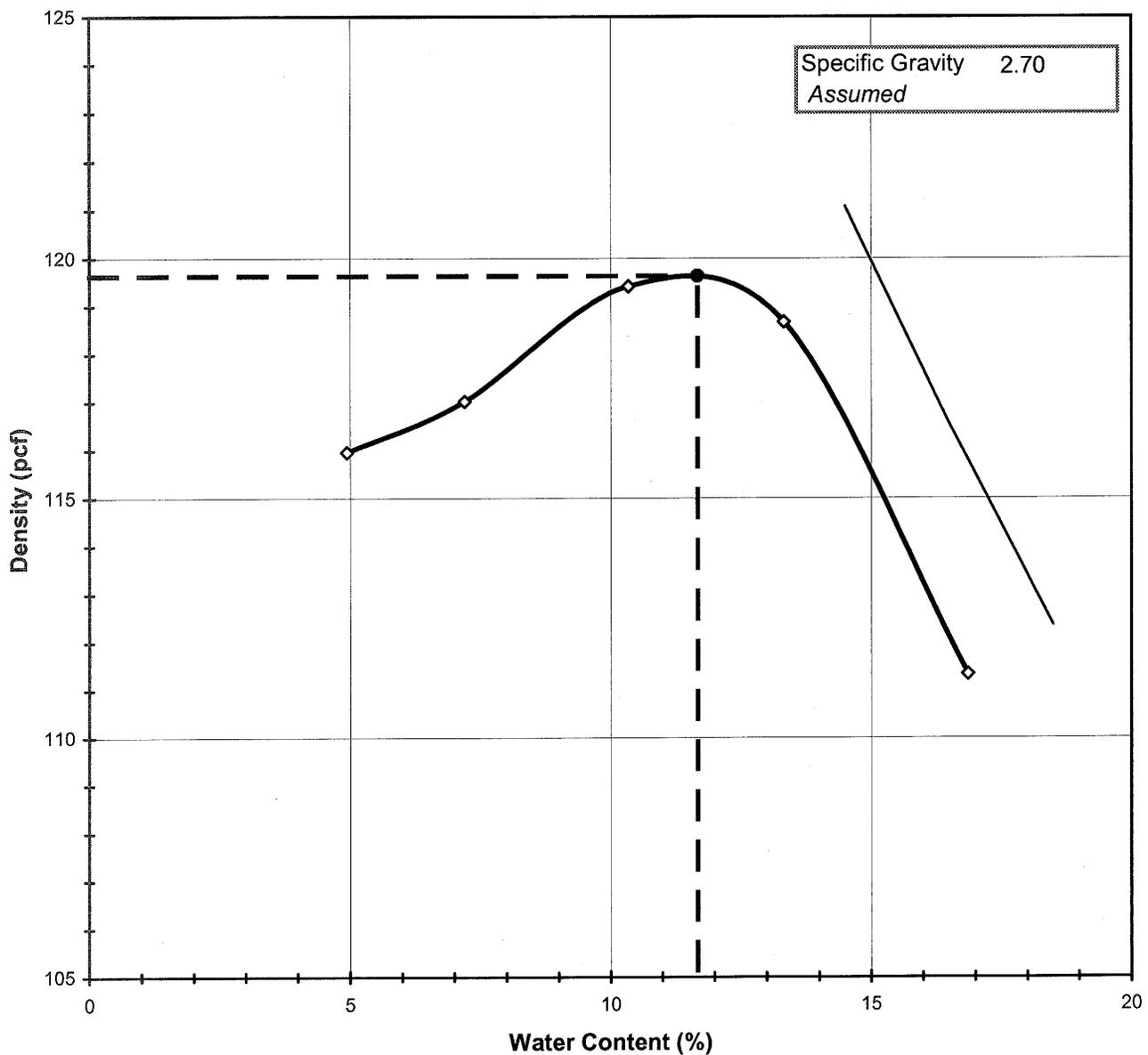
MOISTURE DENSITY RELATIONSHIP

MOISTURE DENSITY RELATIONSHIP

ASTM D698-91 SOP-S12

Client	RSG & ASSOCIATES	Boring No.	B-1
Client Reference	RED ROCK C&D LF PH. 1C-2	Depth (ft)	3-8
Project No.	2008-532-01	Sample No.	EMBK-01
Lab ID	2008-532-01-01	Test Method	STANDARD
Visual Description	LIGHT BROWN CLAYEY SAND W/ GRAVEL		

Optimum Water Content 11.7
Maximum Dry Density 119.6



Tested By JBD Date 2/29/2008 Checked By GEM Date 3-4-08

MOISTURE - DENSITY RELATIONSHIP

ASTM D698-91 SOP-S12

Client	RSG & ASSOCIATES	Boring No.	B-1
Client Reference	RED ROCK C&D LF PH. 1C-2	Depth (ft)	3-8
Project No.	2008-532-01	Sample No.	EMBK-01
Lab ID	2008-532-01-01		

Visual Description LIGHT BROWN CLAYEY SAND W/ GRAVEL

Total Weight of the Sample (gm)	NA
As Received Water Content(%)	NA
Assumed Specific Gravity	2.70
Percent Retained on 3/4"	NA
Percent Retained on 3/8"	NA
Percent Retained on #4	NA
Oversize Material	Not included
Procedure Used	A

TestType	STANDARD	
Rammer Weight (lbs)		5.5
Rammer Drop (in)		12
Rammer Type	MECHANICAL	
Machine ID	R	174
Mold ID	R	172
Mold diameter		4"
Weight of the Mold		4204
Volume of the Mold(cc)		943

Mold / Specimen

Point No.	1	2	3	4	5
Wt. of Mold & WS (gm)	6043	6100	6195	6237	6170
Wt. of Mold (gm)	4204	4204	4204	4204	4204
Wt. of WS	1839	1896	1992	2033	1967
Mold Volume (cc)	943	943	943	943	943

Moisture Content / Density

Tare Number	B-1	F-4	A-5	B-2	SS-4
Wt. of Tare & WS (gm)	391.03	518.93	508.42	487.02	693.01
Wt. of Tare & DS (gm)	377.34	490.68	470.03	441.28	607.51
Wt. of Tare (gm)	100.34	98.07	98.92	98.15	100.34
Wt. of Water (gm)	13.69	28.25	38.39	45.74	85.50
Wt. of DS (gm)	277.00	392.61	371.11	343.13	507.17

Wet Density (gm/cc)	1.95	2.01	2.11	2.16	2.09
Wet Density (pcf)	121.7	125.4	131.8	134.5	130.1
Moisture Content (%)	4.9	7.2	10.3	13.3	16.9
Dry Density (pcf)	116.0	117.0	119.4	118.7	111.3

Zero Air Voids

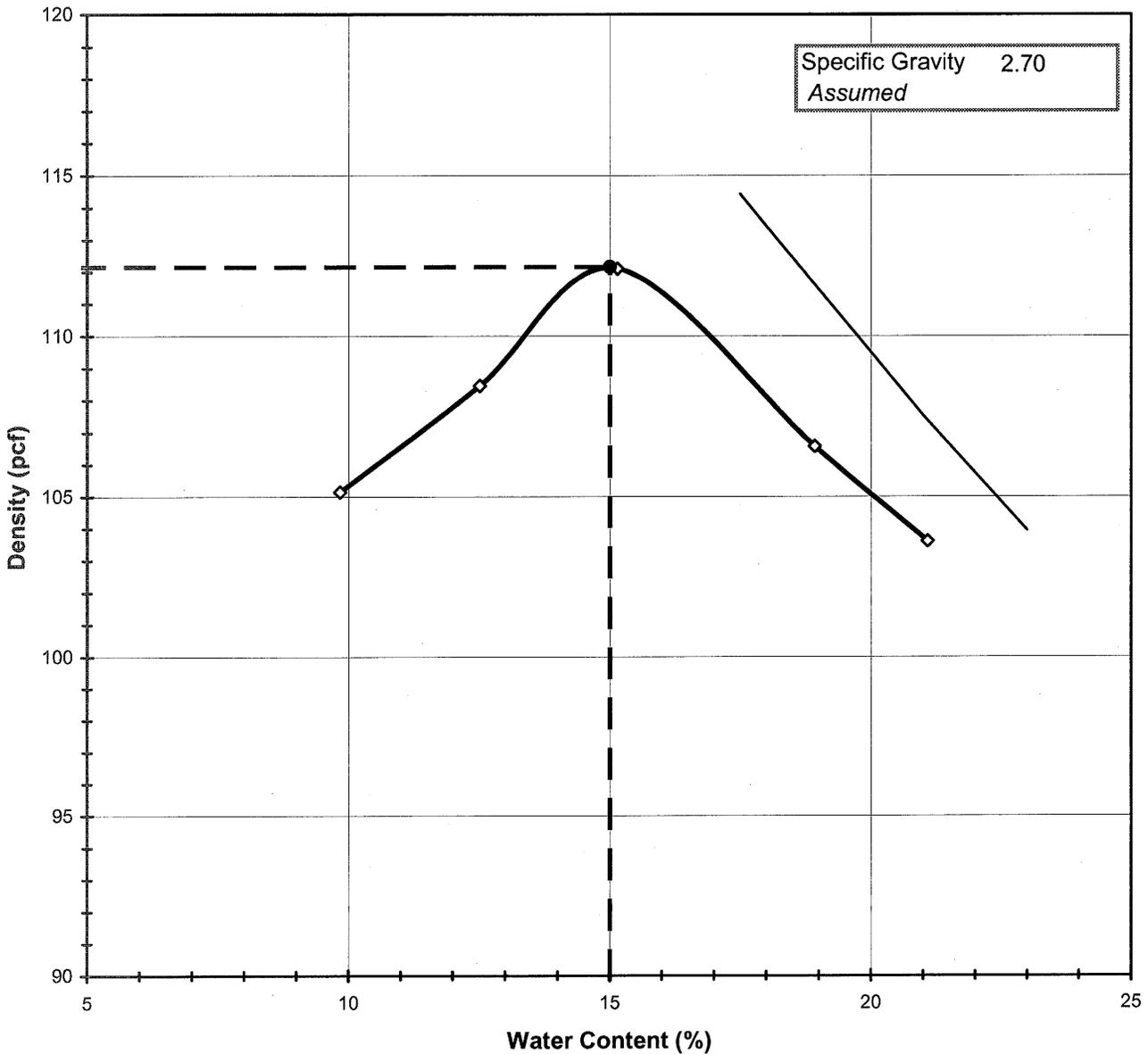
Moisture Content (%)	14.5	16.5	18.5
Dry Unit Weight (pcf)	121.1	116.6	112.4

Tested By JBD Date 2/29/2008 Checked By GEN Date 3-4-08

MOISTURE DENSITY RELATIONSHIP
ASTM D698-91 SOP-S12

Client	RSG & ASSOCIATES	Boring No.	B-2
Client Reference	RED ROCK C&D LF PH. 1C-2	Depth (ft)	0-5
Project No.	2008-532-01	Sample No.	EMBK-02
Lab ID	2008-532-01-02	Test Method	STANDARD
Visual Description	TAN LEAN CLAY		

Optimum Water Content 15.0
Maximum Dry Density 112.2



Tested By TMS Date 3/3/2008 Checked By GAM Date 3-5-08

MOISTURE - DENSITY RELATIONSHIP

ASTM D698-91 SOP-S12

Client	RSG & ASSOCIATES	Boring No.	B-2
Client Reference	RED ROCK C&D LF PH. 1C-2	Depth (ft)	0-5
Project No.	2008-532-01	Sample No.	EMBK-02
Lab ID	2008-532-01-02		

Visual Description TAN LEAN CLAY

Total Weight of the Sample (gm)	NA
As Received Water Content(%)	NA
Assumed Specific Gravity	2.70
Percent Retained on 3/4"	NA
Percent Retained on 3/8"	NA
Percent Retained on #4	NA
Oversize Material	Not included
Procedure Used	A

TestType	STANDARD	
Rammer Weight (lbs)		5.5
Rammer Drop (in)		12
Rammer Type	MECHANICAL	
Machine ID	R	174
Mold ID	R	172
Mold diameter		4"
Weight of the Mold		4204
Volume of the Mold(cc)		943

Mold / Specimen

Point No.	1	2	3	4	5
Wt. of Mold & WS (gm)	5949	6048	6155	6120	6100
Wt. of Mold (gm)	4204	4204	4204	4204	4204
Wt. of WS	1746	1844	1951	1916	1896
Mold Volume (cc)	943	943	943	943	943

Moisture Content / Density

Tare Number	314	301	312	399	315
Wt. of Tare & WS (gm)	717.44	687.62	759.15	553.62	627.25
Wt. of Tare & DS (gm)	660.78	620.50	670.37	479.27	537.33
Wt. of Tare (gm)	84.73	84.18	84.26	86.47	110.75
Wt. of Water (gm)	56.66	67.12	88.78	74.35	89.92
Wt. of DS (gm)	576.05	536.32	586.11	392.80	426.58

Wet Density (gm/cc)	1.85	1.96	2.07	2.03	2.01
Wet Density (pcf)	115.5	122.0	129.1	126.7	125.4
Moisture Content (%)	9.8	12.5	15.1	18.9	21.1
Dry Density (pcf)	105.1	108.4	112.1	106.6	103.6

Zero Air Voids

Moisture Content (%)	17.5	21.0	23.0
Dry Unit Weight (pcf)	114.4	107.5	103.9

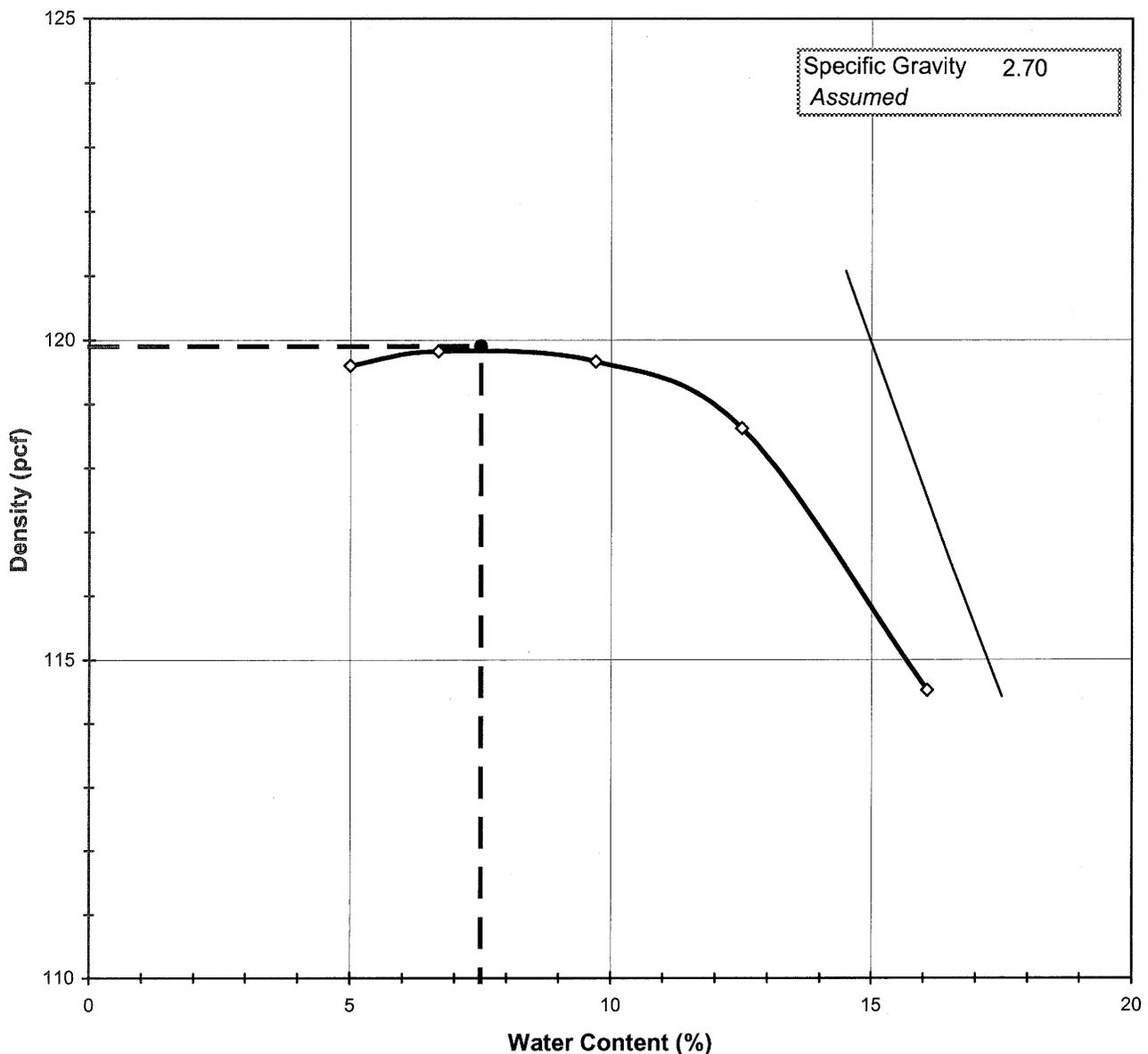
Tested By TMS Date 3/3/2008 Checked By GAM Date 3-5-08

MOISTURE DENSITY RELATIONSHIP

ASTM D698-91 SOP-S12

Client	RSG & ASSOCIATES	Boring No.	B-3
Client Reference	RED ROCK C&D LF PH. 1C-2	Depth (ft)	5-10
Project No.	2008-532-01	Sample No.	EMBK-03
Lab ID	2008-532-01-03	Test Method	STANDARD
Visual Description		REDDISH BROWN LEAN CLAY	

Optimum Water Content 7.5
Maximum Dry Density 119.9



Tested By TMS Date 3/6/08 Checked By [Signature] Date 3-7-08

MOISTURE - DENSITY RELATIONSHIP

ASTM D698-91 SOP-S12

Client	RSG & ASSOCIATES	Boring No.	B-3
Client Reference	RED ROCK C&D LF PH. 1C-2	Depth (ft)	5-10
Project No.	2008-532-01	Sample No.	EMBK-03
Lab ID	2008-532-01-03		

Visual Description REDDISH BROWN LEAN CLAY

Total Weight of the Sample (gm)	NA
As Received Water Content(%)	NA
Assumed Specific Gravity	2.70
Percent Retained on 3/4"	NA
Percent Retained on 3/8"	NA
Percent Retained on #4	NA
Oversize Material	Not included
Procedure Used	A

TestType	STANDARD	
Rammer Weight (lbs)		5.5
Rammer Drop (in)		12
Rammer Type	MECHANICAL	
Machine ID	R	174
Mold ID	R	172
Mold diameter		4"
Weight of the Mold		4204
Volume of the Mold(cc)		943

Mold / Specimen

Point No.	1	2	3	4	5
Wt. of Mold & WS (gm)	6102	6136	6188	6221	6213
Wt. of Mold (gm)	4204	4204	4204	4204	4204
Wt. of WS	1898	1932	1984	2017	2009
Mold Volume (cc)	943	943	943	943	943

Moisture Content / Density

Tare Number	K-7	309	B-1	K-7	K-7
Wt. of Tare & WS (gm)	552.45	641.85	588.29	591.77	641.61
Wt. of Tare & DS (gm)	531.39	608.52	545.11	538.25	568.04
Wt. of Tare (gm)	110.11	109.60	100.32	110.21	110.26
Wt. of Water (gm)	21.06	33.33	43.18	53.52	73.57
Wt. of DS (gm)	421.28	498.92	444.79	428.04	457.78

Wet Density (gm/cc)	2.01	2.05	2.10	2.14	2.13
Wet Density (pcf)	125.6	127.8	131.3	133.5	132.9
Moisture Content (%)	5.0	6.7	9.7	12.5	16.1
Dry Density (pcf)	119.6	119.8	119.7	118.6	114.5

Zero Air Voids

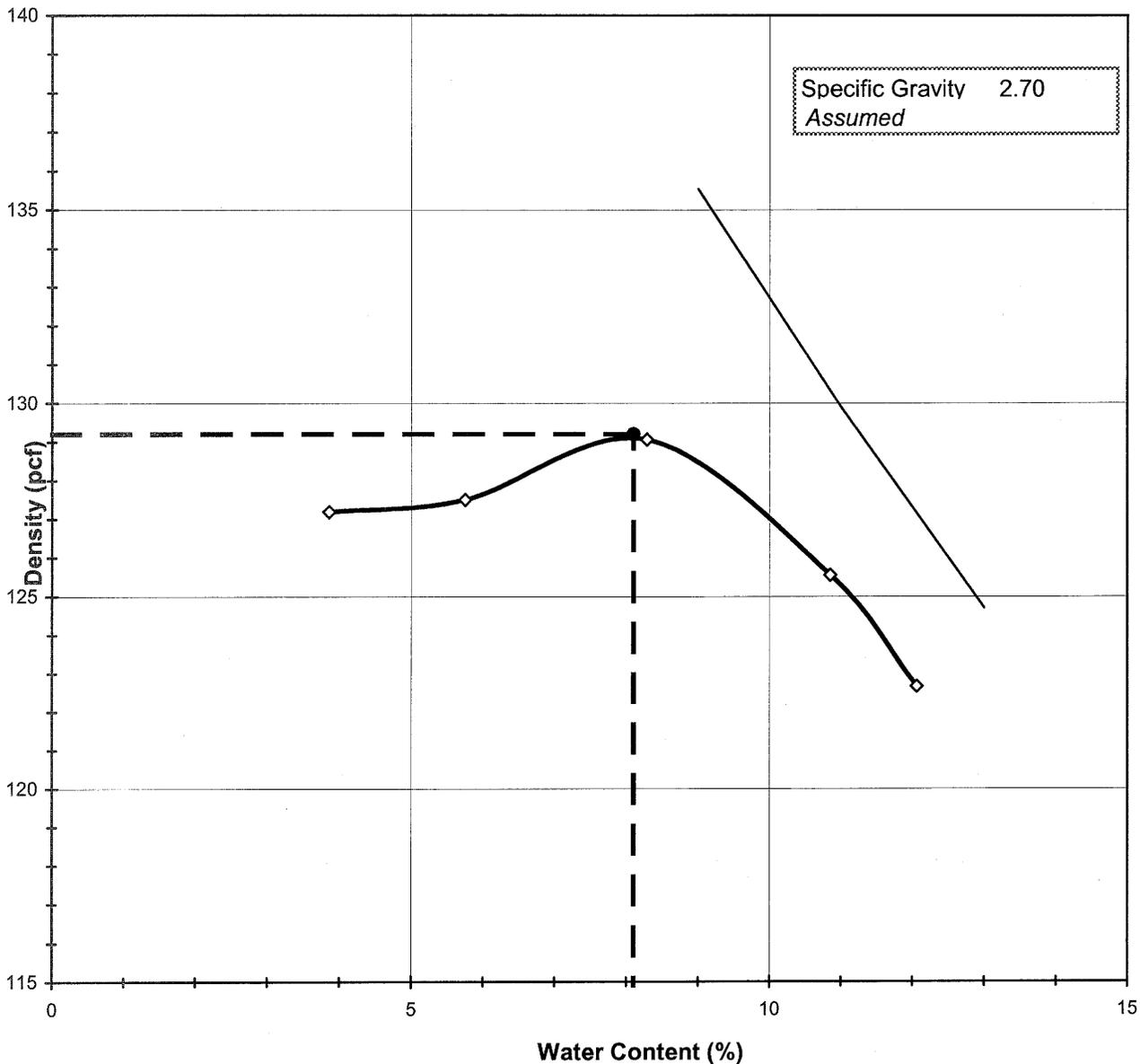
Moisture Content (%)	14.5	16.5	17.5
Dry Unit Weight (pcf)	121.1	116.6	114.4

Tested By TMS Date 3/6/08 Checked By MW Date 3-7-08

MOISTURE DENSITY RELATIONSHIP
ASTM D698-91 SOP-S12

Client	RSG & ASSOCIATES	Boring No.	E6
Client Reference	RED ROCK C&D LF PHS. 1C-2	Depth (ft)	LIFT 2
Project No.	2008-532-03	Sample No.	EMBK-05
Lab ID	2008-532-03-01	Test Method	STANDARD
Visual Description	RED BROWN CLAYEY SAND W/ ROCK FRAGMENTS		

Optimum Water Content 8.1
Maximum Dry Density 129.2



Tested By TMS Date 3/6/08 Checked By GAM Date 3-24-08



MOISTURE - DENSITY RELATIONSHIP

ASTM D698-91 SOP-S12

Client	RSG & ASSOCIATES	Boring No.	E6
Client Reference	RED ROCK C&D LF PHS. 1C-2	Depth (ft)	LIFT 2
Project No.	2008-532-03	Sample No.	EMBK-05
Lab ID	2008-532-03-01		

Visual Description RED BROWN CLAYEY SAND W/ ROCK FRAGMENTS

Total Weight of the Sample (gm)	NA	TestType	STANDARD
As Received Water Content(%)	NA	Rammer Weight (lbs)	5.5
Assumed Specific Gravity	2.70	Rammer Drop (in)	12
Percent Retained on 3/4"	NA	Rammer Type	MECHANICAL
Percent Retained on 3/8"	NA	Machine ID	R 174
Percent Retained on #4	NA	Mold ID	R 173
Oversize Material	Not included	Mold diameter	6"
Procedure Used	C	Weight of the Mold	5562
		Volume of the Mold(cc)	2124

Mold / Specimen

Point No.	1	2	3	4	5
Wt. of Mold & WS (gm)	10059	10152	10319	10300	10241
Wt. of Mold (gm)	5562	5562	5562	5562	5562
Wt. of WS	4497	4590	4757	4738	4679
Mold Volume (cc)	2124	2124	2124	2124	2124

Moisture Content / Density

Tare Number	306	399	314	301	317
Wt. of Tare & WS (gm)	520.90	617.68	626.39	656.89	679.22
Wt. of Tare & DS (gm)	504.82	588.78	584.95	600.83	615.20
Wt. of Tare (gm)	88.24	86.46	84.77	84.19	84.29
Wt. of Water (gm)	16.08	28.90	41.44	56.06	64.02
Wt. of DS (gm)	416.58	502.32	500.18	516.64	530.91

Wet Density (gm/cc)	2.12	2.16	2.24	2.23	2.20
Wet Density (pcf)	132.1	134.8	139.8	139.2	137.5
Moisture Content (%)	3.9	5.8	8.3	10.9	12.1
Dry Density (pcf)	127.2	127.5	129.1	125.6	122.7

Zero Air Voids

Moisture Content (%)	9.0	11.0	13.0
Dry Unit Weight (pcf)	135.5	129.9	124.7

Tested By TMS Date 3/6/08 Checked By *GEM* Date 3-24-08



ONE POINT PROCTOR

Client	R.S.G & ASSOCIATES	Boring No.	QUARRY
Client Reference	RED ROCK C&D LF PHASE IC-2	Depth (ft)	NA
Project No.	2008-532-04	Sample No.	EMK-06
Lab ID	2008-5332-04-01	Test Type	STANDARD
Visual Description	LIGHT BROWN SILT		

MOLD

Weight of Mold (gm)	4202
Volume of Mold(cc)	943

SPECIMEN

Wt. of Mold & WS (gm)	5945
Wt. of Mold (gm)	4202
Wt. of WS	1742
Mold Volume (cc)	943

MOISTURE/DENSITY

Tare Number	P-12
Wt. of Tare & WS (gm)	595.60
Wt. of Tare & DS (gm)	535.11
Wt. of Tare (gm)	196.70
Wt. of Water (gm)	60.49
Wt. of DS (gm)	338.41
Wet Density (gm/cc)	1.85
Wet Density (pcf)	115.3
Moisture Content (%)	17.9
Dry Density (pcf)	97.8

Tested By S.D Date 3/27/2008 Checked By *GEM* Date *3-27-08*

ONE POINT PROCTOR

Client	R.S.G & ASSOCIATES	Boring No.	QUARRY
Client Reference	RED ROCK C&D LF PHASE IC-2	Depth (ft)	NA
Project No.	2008-532-04	Sample No.	EMK-06
Lab ID	2008-532-04-01	Test Type	STANDARD

Visual Description TAN SANDY SILT (Near optimum moisture)

MOLD

Weight of Mold (gm)	4202
Volume of Mold(cc)	943

SPECIMEN

Wt. of Mold & WS (gm)	5945
Wt. of Mold (gm)	4202
Wt. of WS	1742
Mold Volume (cc)	943

MOISTURE/DENSITY

Tare Number	P-12
Wt. of Tare & WS (gm)	595.6
Wt. of Tare & DS (gm)	535.11
Wt. of Tare (gm)	196.7
Wt. of Water (gm)	60.49
Wt. of DS (gm)	338.41

Wet Density (gm/cc)	1.847273
Wet Density (pcf)	115.3

Moisture Content (%)	17.9
Dry Density (pcf)	97.8

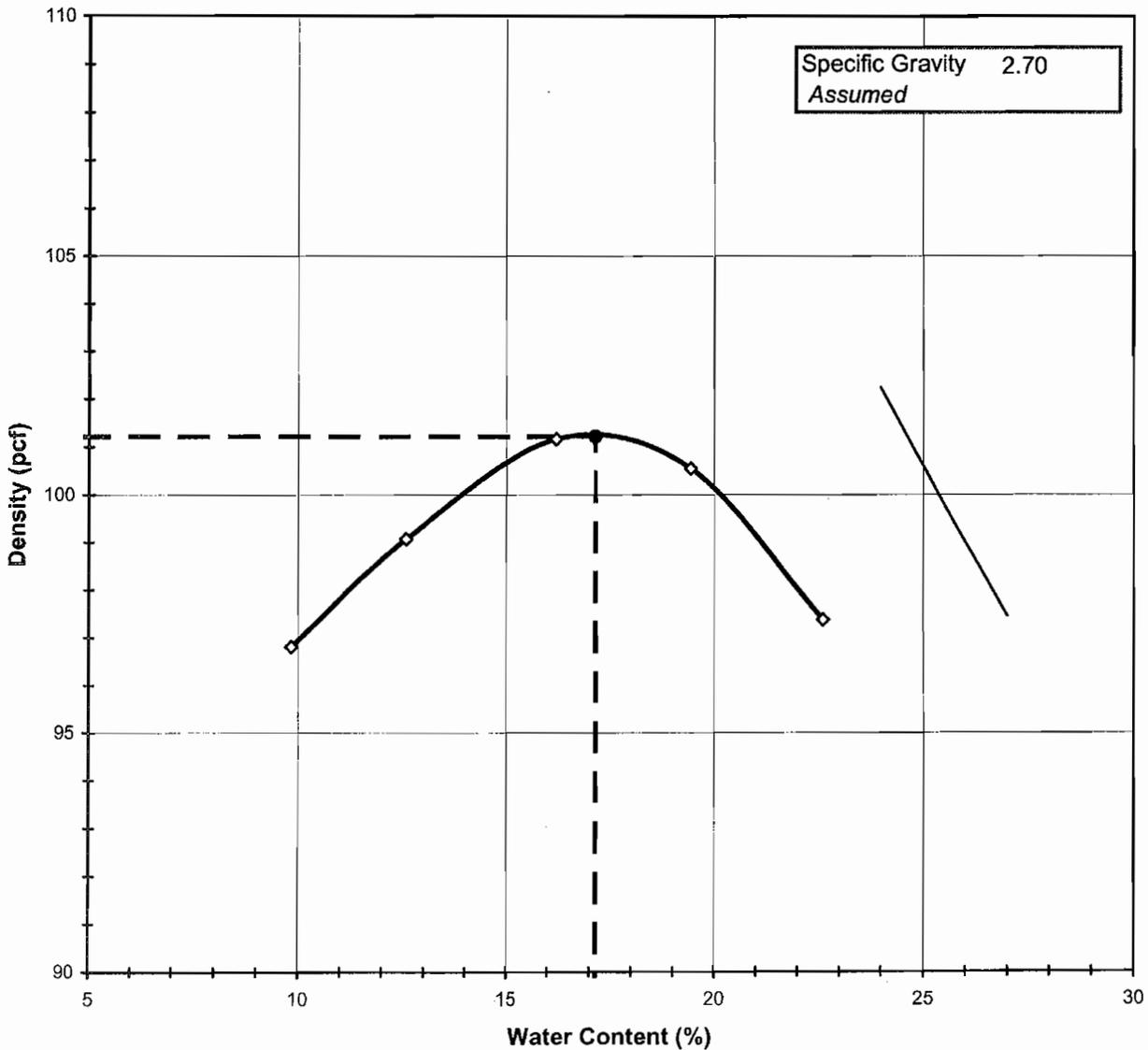
Tested By S.D Date 3/27/08 Checked By *MMS* Date 4-1-08



MOISTURE DENSITY RELATIONSHIP ASTM D698-91 SOP-S12

Client	RSG & ASSOCIATES	Boring No.	QUARRY
Client Reference	RED ROCK C&D LF PHS. 1C-2	Depth (ft)	NA
Project No.	2008-532-04	Sample No.	EMBK-06
Lab ID	2008-532-04-01	Test Method	STANDARD
Visual Description	LIGHT BROWN SILT		

Optimum Water Content 17.2
Maximum Dry Density 101.2



Tested By SD Date 4/1/2008 Checked By EAM Date 4-2-08



MOISTURE - DENSITY RELATIONSHIP

ASTM D698-91 SOP-S12

Client	RSG & ASSOCIATES	Boring No.	QUARRY
Client Reference	RED ROCK C&D LF PHS. 1C-2	Depth (ft)	NA
Project No.	2008-532-04	Sample No.	EMBK-06
Lab ID	2008-532-04-01		

Visual Description LIGHT BROWN SILT

Total Weight of the Sample (gm)	20960
As Received Water Content(%)	22
Assumed Specific Gravity	2.70
Percent Retained on 3/4"	8
Percent Retained on 3/8"	12
Percent Retained on #4	14
Oversize Material	Not included
Procedure Used	B

TestType	STANDARD	
Rammer Weight (lbs)		5.5
Rammer Drop (in)		12
Rammer Type	MECHANICAL	
Machine ID	R	174
Mold ID	R	172
Mold diameter		4"
Weight of the Mold		4202
Volume of the Mold(cc)		943

Mold / Specimen

Point No.	1	2	3	4	5
Wt. of Mold & WS (gm)	5810	5888	5979	6017	6007
Wt. of Mold (gm)	4202	4202	4202	4202	4202
Wt. of WS	1607	1686	1777	1815	1805
Mold Volume (cc)	943	943	943	943	943

Moisture Content / Density

	318	301	314	300	307
Tare Number	318	301	314	300	307
Wt. of Tare & WS (gm)	573.90	608.70	746.60	736.00	883.60
Wt. of Tare & DS (gm)	530.26	550.06	654.29	634.14	741.15
Wt. of Tare (gm)	86.70	84.10	85.00	110.00	111.20
Wt. of Water (gm)	43.64	58.64	92.31	101.86	142.45
Wt. of DS (gm)	443.56	465.96	569.29	524.14	629.95

Wet Density (gm/cc)	1.70	1.79	1.88	1.92	1.91
Wet Density (pcf)	106.3	111.5	117.6	120.1	119.4
Moisture Content (%)	9.8	12.6	16.2	19.4	22.6
Dry Density (pcf)	96.8	99.1	101.2	100.5	97.4

Zero Air Voids

Moisture Content (%)	24.0	25.5	27.0
Dry Unit Weight (pcf)	102.2	99.8	97.4

Tested By SD Date 4/1/2008 Checked By CEM Date 4-2-08

APPENDIX E.2

DAILY ACTIVITY LOGS AND IN- PLACE DENSITY TESTING

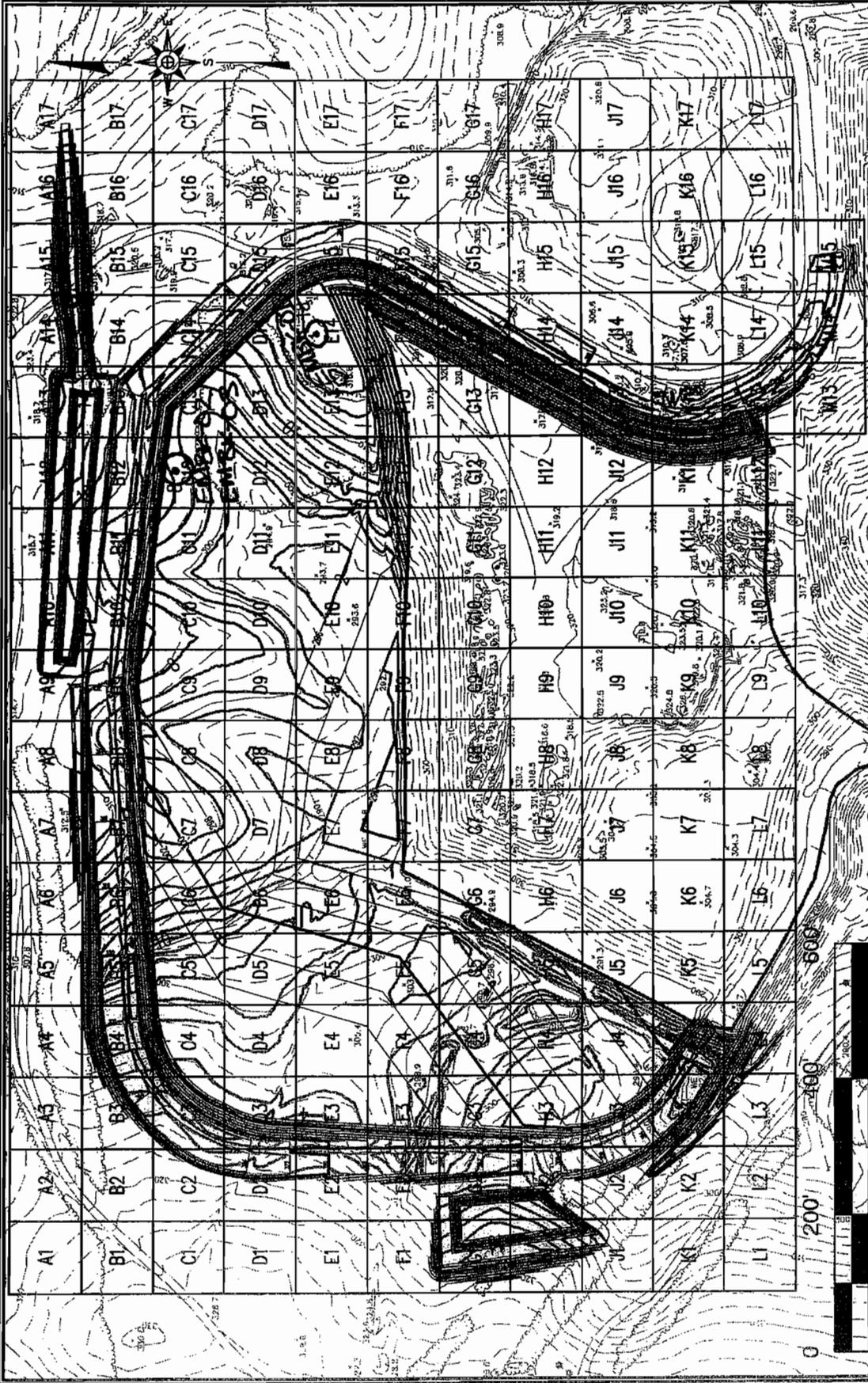
Day: Tues.
 Date: 2.26.08
 Log No.: 01
 Page: 1 of 3



Daily Field Activity Log

Project Name:	Red Rock C&D LF Phase 1C-2	Project No.:	2008-532
Client Name:	RSG & Associates	Client Contact:	Stacey Smith
Site Location:	Holly Springs, NC	Time on Site:	Arrived: 9:45am Departed: 10:45am
General Contractor:	Glover Construction	Superintendent:	Wayne Clemmons
Other Firms / Sub-Contractors Represented on Site			
Firm / Sub-Contractor		Representative's Name and Title	
Weather Conditions:	Overcast, Rain	Temperature:	40's - 50's
Contractor's Equipment:	1 CAT 385 Trackhoe, 1 CAT 320C Trackhoe, 4 Volvo Off-Road Trucks, 2 CAT D6 Dozers, 1 CAT D8 Dozer w/ Ripper Arm, 1 CAT 815 Sheepsfoot Compactor, 1 IR Smoothdrum Roller, 1 CASE 9280 Tractor w/ Boxblade, and 1 CAT 938G Frontend Loader		
Contractor's Personnel:	1 Superintendent, and approx. 10 Operators / Laborers		
Description of Daily Activities & Events			
<ul style="list-style-type: none"> ▪ Geotechnics Representative arrived on site and made contact with Mr. Wayne Clemmons of Glover Construction. ▪ Glover has begun fill placement in the North West corner of the site outside the Phase 1C-2 limits. According to the project drawings this area is to be filled to an Elevation of 307.0 for drainage purposes. ▪ Glover continued clearing and grubbing operations inside Phase 1C-2 near the existing sediment basin. ▪ Glover excavated Test Pits to allow Geotechnics Rep. to obtain bulk samples of proposed Embankment material (see attached drawing for Test Pit locations). ▪ Geotechnics Rep. obtained three bulk samples (EMBK-01, EMBK-02, and EMBK-03) for CQA Laboratory Classification and Moisture / Density Relationship testing. ▪ Mr. Wayne Clemmons (Glover Construction) informed Geotechnics Rep. that Glover intends to begin Embankment placement inside Phase 1C-2 Thursday 2.28.07 (weather pending). ▪ Geotechnics Representative departed site. 			
Prepared By:	JRB	Date:	2.26.08
		Checked By:	<i>MMB</i>
		Date:	3-1-08

C:\CAD\Red Rock\Red_Rock_08-1\sheet\REDROCK-A0073.dwg -- 2/27/2008 8:47 AM



<p>RED ROCK DISPOSAL, LLC C&D LANDFILL PHASE 1C-2 SOIL TEST GRID EMBANKMENT SAMPLE LOCATIONS Page 3 of 3</p>		<p>RICHARDSON SMITH GARDNER & ASSOCIATES 14 N. Boylan Ave. Raleigh, N.C. 27603 www.rsgengineering.com PH: 919-428-8077 FAX: 919-428-8088</p>	
<p>DRAWN BY: J.A.L.</p>	<p>CHECKED BY:</p>	<p>SCALE: AS SHOWN</p>	<p>FIGURE NO. 1</p>
<p>DATE: Feb. 2008</p>	<p>PROJECT NO. REDROCK 08-1</p>	<p>FILE NAME REDROCK-A0073</p>	

Day: Fri.
 Date: 2.29.08
 Log No.: 02
 Page: 2 of 3



Daily Field Activity Log

Project Name:	Red Rock C&D LF Phase 1C-2	Project No.:	2008-532
Client Name:	RSG & Associates	Client Contact:	Stacey Smith
Site Location:	Holly Springs, NC	Time on Site:	Arrived: 3:45pm Departed: 4:30pm
General Contractor:	Glover Construction	Superintendent:	Wayne Clemmons
Other Firms / Sub-Contractor Represented on Site			
Firm / Sub-Contractor		Representative's Name and Title	
Weather Conditions:	Sunny, Windy	Temperature:	40's - 50's
Contractor's Equipment:	1 CAT 385 Trackhoe, 1 CAT 320C Trackhoe, 4 Volvo Off-Road Trucks, 2 CAT D6 Dozers, 1 CAT D8 Dozer w/ Ripper Arm, 1 CAT 815 Sheepsfoot Compactor, 1 IR Smoothdrum Roller, 1 CASE 9280 Tractor w/ Boxblade, and 1 CAT 938G Frontend Loader		
Contractor's Personnel:	1 Superintendent, and approx. 10 Operators / Laborers		
Description of Daily Activities & Events			
<ul style="list-style-type: none"> ▪ Geotechnics Representative arrived on site and made contact with Mr. Wayne Clemmons of Glover Construction. ▪ Glover Construction has begun placement of Embankment material inside Phase 1C-2. Embankment material was being placed in B5, B6, C5 and C6. ▪ Geotechnics Rep. observed Embankment material placement. Embankment material is a Red Silty Clay w/ Rock Fragment and appears consistent with Embankment material samples obtained Tues. 2.26.08. ▪ Geotechnics Rep. will perform CQA Moisture / Density testing of Embankment material once Laboratory testing is completed. ▪ A Sub-Contractor for Glover began installation of perimeter Silt Fence ▪ Geotechnics Representative departed site. 			
Prepared By:	JRB	Date:	2.29.08
Checked By:	<i>WMS</i>	Date:	3-7-08

Day: Mon.
 Date: 3.3.08
 Log No.: 03
 Page: 1 of 4



Daily Field Activity Log

Project Name:	Red Rock C&D LF Phase 1C-2	Project No.:	2008-532
Client Name:	RSG & Associates	Client Contact:	Stacey Smith
Site Location:	Holly Springs, NC	Time on Site:	Arrived: 9:45am Departed: 10:30am
General Contractor:	Glover Construction	Superintendent:	Wayne Clemmons
Other Firms / Sub-Contractor Represented On Site			
<u>Firm / Sub-Contractor</u>		<u>Representative's Name and Title</u>	
Weather Conditions:	Sunny, Windy	Temperature:	50's - 60's
Contractor's Equipment:	1 CAT 385 Trackhoe, 1 CAT 320C Trackhoe, 4 Volvo Off-Road Trucks, 2 CAT D6 Dozers, 1 CAT D8 Dozer w/ Ripper Arm, 1 CAT 815 Sheepsfoot Compactor, 1 IR Smoothdrum Roller, 1 CASE 9280 Tractor w/ Boxblade, and 1 CAT 938G Frontend Loader		
Contractor's Personnel:	1 Superintendent, and approx. 10 Operators / Laborers		
Description of Daily Activities & Events			
<ul style="list-style-type: none"> ▪ Geotechnics Representative Jacob R. Buda arrived on site. ▪ Glover Construction continued placement of Embankment Material inside Phase 1C-2. Embankment Material was being placed in D4, D5, and D6. ▪ Glover began excavating material from Sediment Basin SB-T2 outlet channel. Excavated material was hauled and placed as Embankment material inside Phase 1C-D.. Excavated material is consistent with Embankment Material submitted by Glover for Laboratory testing. ▪ A Sub-Contractor for Glover continued installation of perimeter Silt Fence ▪ Geotechnics Rep. obtained a bulk sample of Embankment material being placed for Laboratory testing from D5. ▪ Geotechnics Representative departed site. 			
Prepared By:	JRB	Date:	3.3.08
Checked By:	<i>MM</i>	Date:	3-18-08

Day: Tues.
 Date: 3.4.08
 Log No.: 04
 Page: 2 of 4



Daily Field Activity Log

Project Name:	Red Rock C&D LF Phase 1C-2	Project No.:	2008-532
Client Name:	RSG & Associates	Client Contact:	Stacey Smith
Site Location:	Holly Springs, NC	Time on Site:	Arrived: 9:30am Departed: 10:45am
General Contractor:	Glover Construction	Superintendent:	Wayne Clemmons

Other Firms / Sub-Contractor Represented On Site

<u>Firm / Sub-Contractor</u>	<u>Representative's Name and Title</u>

Weather Conditions: Overcast, Windy **Temperature:** 50's - 60's

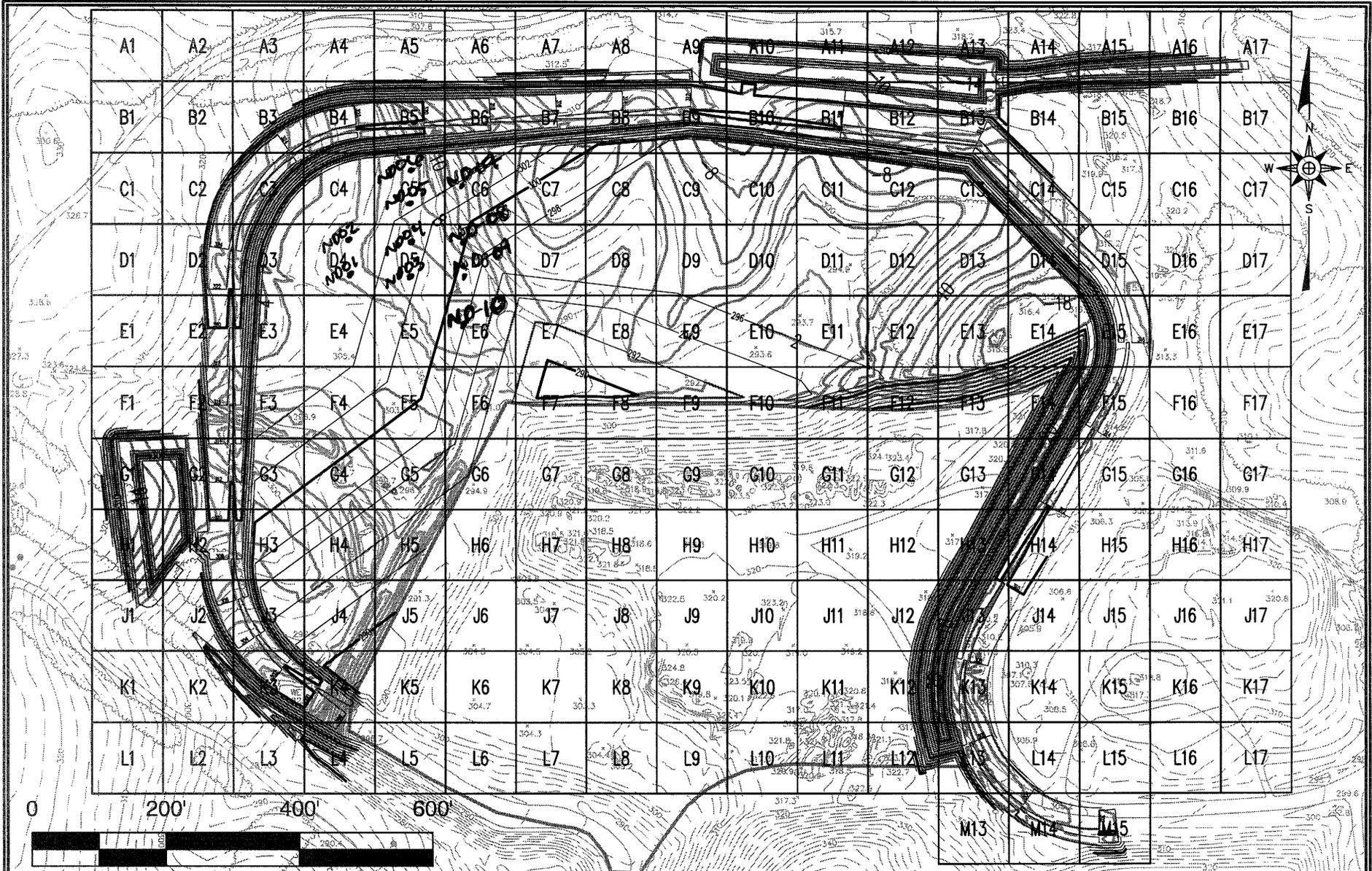
Contractor's Equipment: 1 CAT 385 Trackhoe, 1 CAT 320C Trackhoe, 4 Volvo Off-Road Trucks, 2 CAT D6 Dozers, 1 CAT D8 Dozer w/ Ripper Arm, 1 CAT 815 Sheepsfoot Compactor, 1 IR Smoothdrum Roller, 1 CASE 9280 Tractor w/ Boxblade, and 1 CAT 938G Frontend Loader

Contractor's Personnel: 1 Superintendent, and approx. 10 Operators / Laborers

Description of Daily Activities & Events

- Geotechnics Representative Jacob R. Buda arrived on site.
- Glover Construction continued placement of Embankment Material inside Phase 1C-2. Embankment Material was being placed in E5 and E6.
- Glover Construction continued excavation of SB-T2 outlet channel. Excavated material continued to be hauled and placed as Embankment material inside Phase 1C-2.
- Geotechnics Representative performed CQA Moisture / Density testing of previously placed and compacted Embankment material in D4, D5 and C5 (see EMBKFDR-01).
- Geotechnics Representative departed site.

Prepared By: JRB **Date:** 3.4.08 **Checked By:** JRB **Date:** 3-18-08



<p>RED ROCK DISPOSAL, LLC C&D LANDFILL PHASE 1C-2 SOIL TEST GRID</p> <p><i>*DENSITY TEST LOCATIONS WEEKEND 3.20.08*</i></p>	DRAWN BY:	CHECKED BY:	SCALE:	FIGURE NO.
	J.A.L.		AS SHOWN	1
	DATE:	PROJECT NO.	FILE NAME	
	Feb. 2008	REDROCK 08-1	REDROCK-A0073	

RICHARDSON SMITH GARDNER
 & ASSOCIATES

14 N. Boylan Ave.
 Raleigh, N.C. 27603
 www.regengineers.com

ph: 919-828-0577
 fax: 919-828-3899

PAGE 4 OF 4

Day: Mon.
 Date: 3.10.08
 Log No.: 05
 Page: 1 of 7



Daily Field Activity Log

Project Name:	Red Rock C&D LF Phase 1C-2	Project No.:	2008-532
Client Name:	RSG & Associates	Client Contact:	Stacey Smith
Site Location:	Holly Springs, NC	Time on Site:	Arrived: 3:45pm Departed: 4:30pm
General Contractor:	Glover Construction	Superintendent:	Wayne Clemmons
Other Firms / Sub-Contractor Represented On Site			
<u>Firm / Sub-Contractor</u>		<u>Representative's Name and Title</u>	
Weather Conditions:	Sunny, Windy	Temperature:	60's - 70's
Contractor's Equipment:	1 CAT 385 Trackhoe, 1 CAT 320C Trackhoe, 4 Volvo Off-Road Trucks, 2 CAT D6 Dozers, 1 CAT D8 Dozer w/ Ripper Arm, 1 CAT 815 Sheepsfoot Compactor, 1 IR Smoothdrum Roller, 1 CASE 9280 Tractor w/ Boxblade, and 1 CAT 938G Frontend Loader		
Contractor's Personnel:	1 Superintendent, and approx. 10 Operators / Laborers		
Description of Daily Activities & Events			
<ul style="list-style-type: none"> ▪ Geotechnics Representative Jacob R. Buda arrived on site. ▪ Glover Construction continued placement of Embankment Material inside Phase 1C-2. ▪ Glover continued excavation of Sediment Basin SB-T2 and Drainage Channel D-2. ▪ Geotechnics Representative departed site. 			
Prepared By:	JRB	Date:	3.10.08
		Checked By:	<i>MWS</i>
		Date:	<i>3-21-08</i>

Day: Tues.
 Date: 3.11.08
 Log No.: 06
 Page: 2 of 7



Daily Field Activity Log

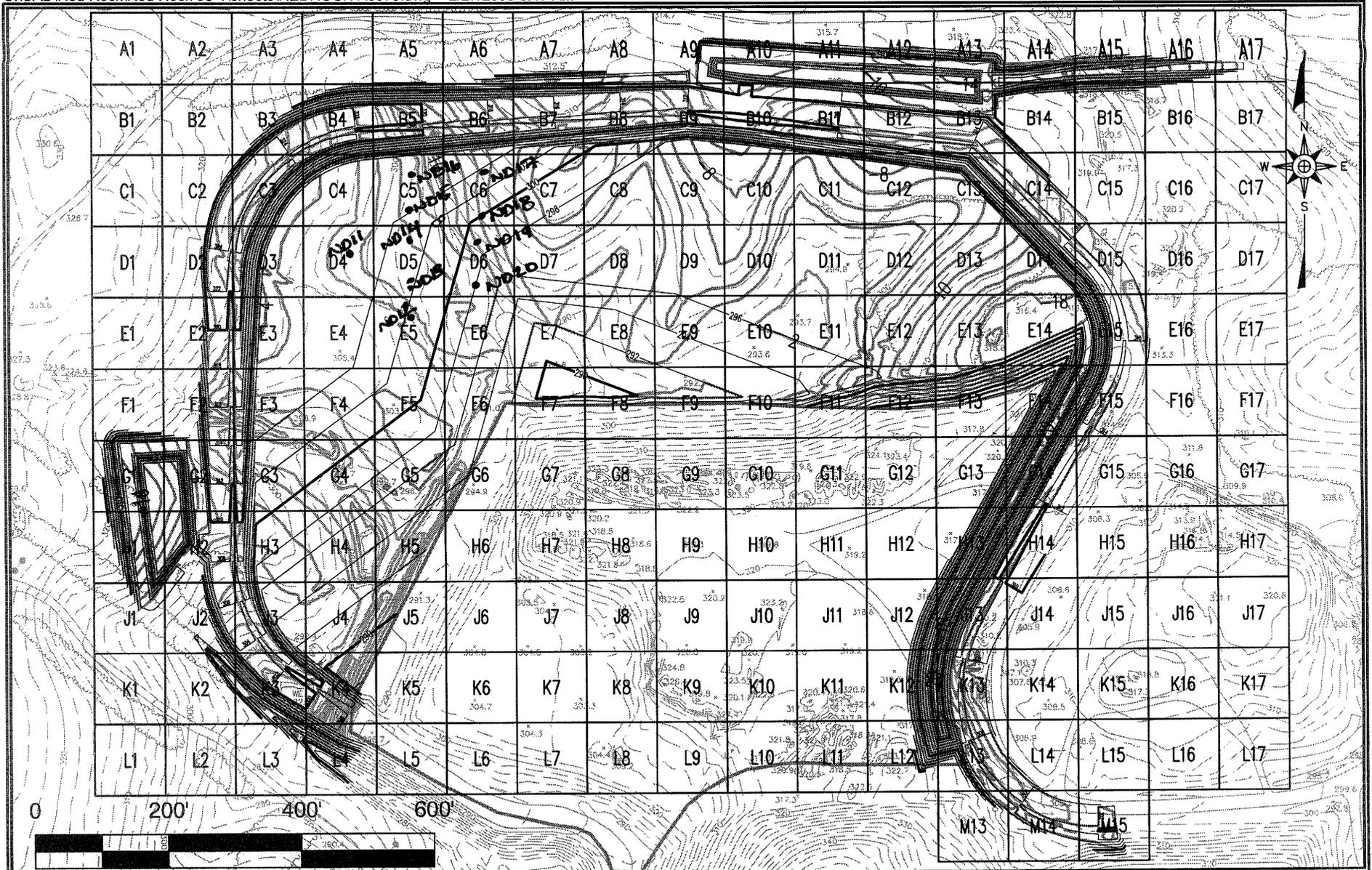
Project Name:	Red Rock C&D LF Phase 1C-2	Project No.:	2008-532
Client Name:	RSG & Associates	Client Contact:	Stacey Smith
Site Location:	Holly Springs, NC	Time on Site:	Arrived: 10:30am Departed: 11:30am
General Contractor:	Glover Construction	Superintendent:	Wayne Clemmons
Other Firms / Sub-Contractor Represented On Site			
<u>Firm / Sub-Contractor</u>		<u>Representative's Name and Title</u>	
Weather Conditions:	Overcast, Windy	Temperature:	50's - 60's
Contractor's Equipment:	1 CAT 385 Trackhoe, 1 CAT 320C Trackhoe, 4 Volvo Off-Road Trucks, 2 CAT D6 Dozers, 1 CAT D8 Dozer w/ Ripper Arm, 1 CAT 815 Sheepsfoot Compactor, 1 IR Smoothdrum Roller, 1 CASE 9280 Tractor w/ Boxblade, and 1 CAT 938G Frontend Loader		
Contractor's Personnel:	1 Superintendent, and approx. 10 Operators / Laborers		
Description of Daily Activities & Events			
<ul style="list-style-type: none"> ▪ Geotechnics Representative Jacob R. Buda arrived on site. ▪ Glover Construction continued placement of Embankment Material inside Phase 1C-2. ▪ Glover Construction continued excavation of Sediment Basin SB-T2. Excavated material continued to be hauled and placed as Embankment material inside Phase 1C-2. ▪ Geotechnics Representative performed CQA Moisture / Density testing of previously placed and compacted Embankment material. ▪ Geotechnics Representative departed site. 			
Prepared By:	JRB	Date:	3.11.08
		Checked By:	<i>MM</i>
		Date:	3-21-08

Day: Friday
 Date: 3.14.08
 Log No.: 07
 Page: 3 of 7

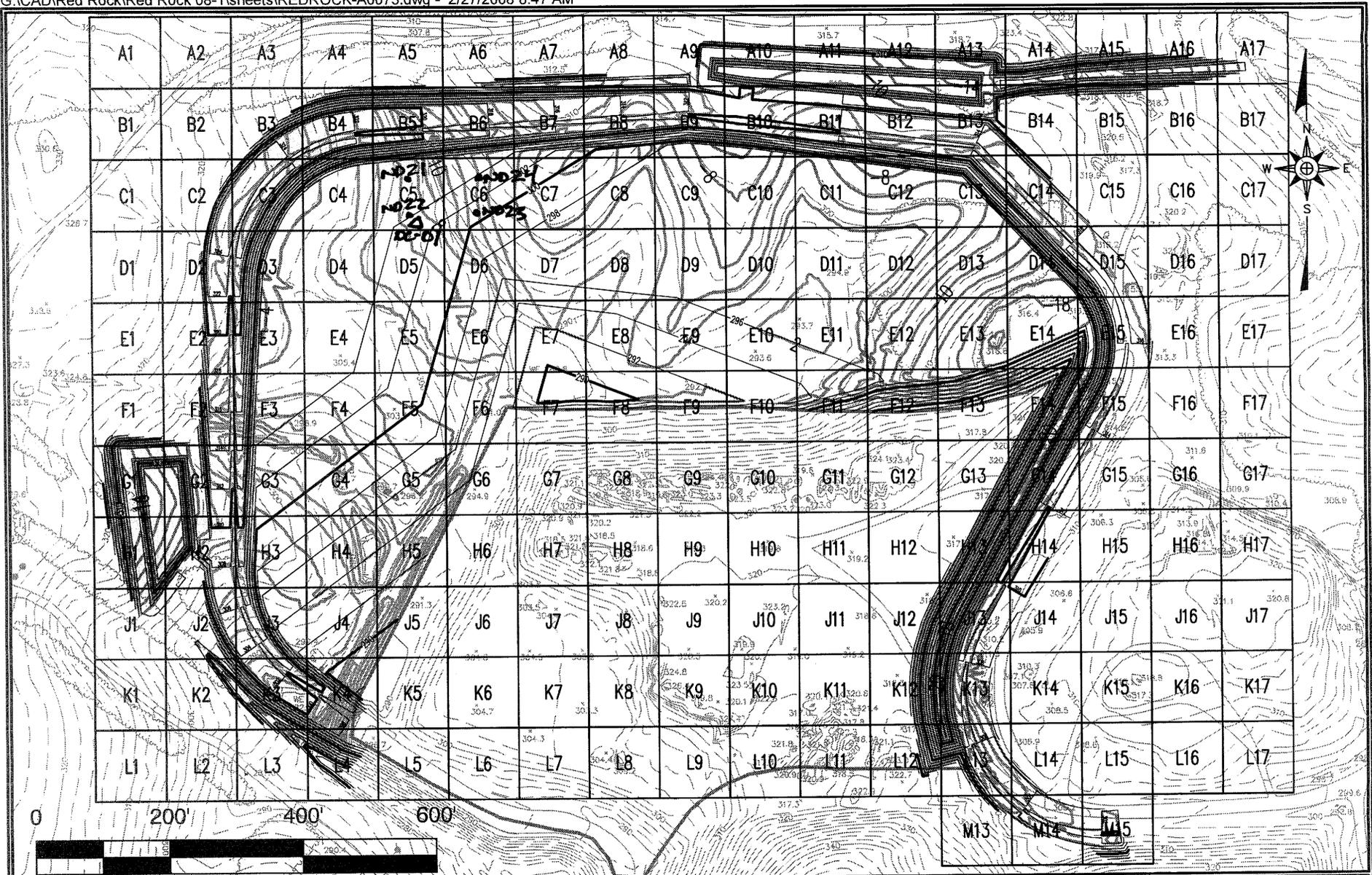


Daily Field Activity Log

Project Name:	Red Rock C&D LF Phase 1C-2	Project No.:	2008-532
Client Name:	RSG & Associates	Client Contact:	Stacey Smith
Site Location:	Holly Springs, NC	Time on Site:	Arrived: 9:30am Departed: 11:30am
General Contractor:	Glover Construction	Superintendent:	Wayne Clemmons
Other Firms / Sub-Contractor Represented On Site			
<u>Firm / Sub-Contractor</u>		<u>Representative's Name and Title</u>	
Weather Conditions:	Overcast, Windy	Temperature:	50's - 60's
Contractor's Equipment:	1 CAT 385 Trackhoe, 1 CAT 320C Trackhoe, 4 Volvo Off-Road Trucks, 2 CAT D6 Dozers, 1 CAT D8 Dozer w/ Ripper Arm, 1 CAT 815 Sheepsfoot Compactor, 1 IR Smoothdrum Roller, 1 CASE 9280 Tractor w/ Boxblade, and 1 CAT 938G Frontend Loader		
Contractor's Personnel:	1 Superintendent, and approx. 10 Operators / Laborers		
Description of Daily Activities & Events			
<ul style="list-style-type: none"> ▪ Geotechnics Representative Jacob R. Buda arrived on site. ▪ Glover Construction continued placement of Embankment Material in B5, B6, B10, B11, B12 and B13. ▪ Glover continued excavating the eastern half of Phase 1C-2. Excavated material continued to hauled and placed as Embankment material. ▪ Glover has completed excavation and grading of Sediment Basin SB-T2. Glover has also has completed installation of erosion features SB-T2 Weir, SB-T2 Outlet Channel Rip-Rap Protection, and culvert C-T3. ▪ Glover continued installation of Drop Inlet DI-T2 and culverts C-T2. ▪ Geotechnics Representative departed site. 			
Prepared By:	JRB	Date:	3.14.08
		Checked By:	<i>WMS</i>
		Date:	3-21-08



<p>RED ROCK DISPOSAL, LLC C&D LANDFILL PHASE 1C-2 SOIL TEST GRID</p> <p><i>EMBKFDR-02 PAGE 6 OF 7</i></p>	<p>DRAWN BY: J.A.L.</p>	<p>CHECKED BY:</p>	<p>SCALE: AS SHOWN</p>	<p>FIGURE NO. 1</p>	<p>RICHARDSON SMITH GARDNER & ASSOCIATES</p> <p>14 N. Boylan Ave. Raleigh, N.C. 27603 www.regengineers.com</p> <p>ph: 919-828-0577 fax: 919-828-3899</p>
	<p>DATE: Feb. 2008</p>	<p>PROJECT NO. REDROCK 08-1</p>	<p>FILE NAME REDROCK-A0073</p>		



RED ROCK DISPOSAL, LLC
 C&D LANDFILL PHASE 1C-2
 SOIL TEST GRID

EMBLFDE-02 PAGE 7 OF 7

DRAWN BY:

J.A.L.

CHECKED BY:

DATE:

Feb. 2008

SCALE:

AS SHOWN

PROJECT NO.

REDROCK 08-1

FIGURE NO.

1

FILE NAME

REDROCK-A0073

RICHARDSON SMITH GARDNER
 & ASSOCIATES

14 N. Boylan Ave.
 Raleigh, N.C. 27603

www.rsgengineers.com

ph: 919-828-0577
 fax: 919-828-3899

Client: RSG & Associates
Project Name : Red Rock C&D LF Phase 1C-2
Project Number : 2008-532



Report Number : EMBKFDR-02
Date (s) : 3.11.08 - 3.14.08

Drive Cylinder - ASTM D 2937

Test Information

Test Number : DC-01
Nuclear Test Number : EMBKND-22
Location: E5
Depth (ft): LIFT 2
Date : 3.14.08

Mold

Cylinder ID 3
Weight of Cylinder (lbs.) 1.32
Volume of Cylinder (ft³) 0.033

Specimen

Wt. of Cylinder & WS (lbs.) 5.63
Wt. of Cylinder (lbs.) 1.32
Wt. of WS 4.31
Cylinder Volume (ft³) 0.033

Moisture / Density

Tare Number 315
Wt. of Tare & WS (gm) 569.80
Wt. of Tare & DS (gm) 511.59
Wt. of Tare (gm) 110.70
Wt. of Water (gm) 58.21
Wt. of DS (gm) 400.89

Wet Density (pcf): 130.6

Moisture Content (%): 14.5
Dry Density (pcf): 114.0

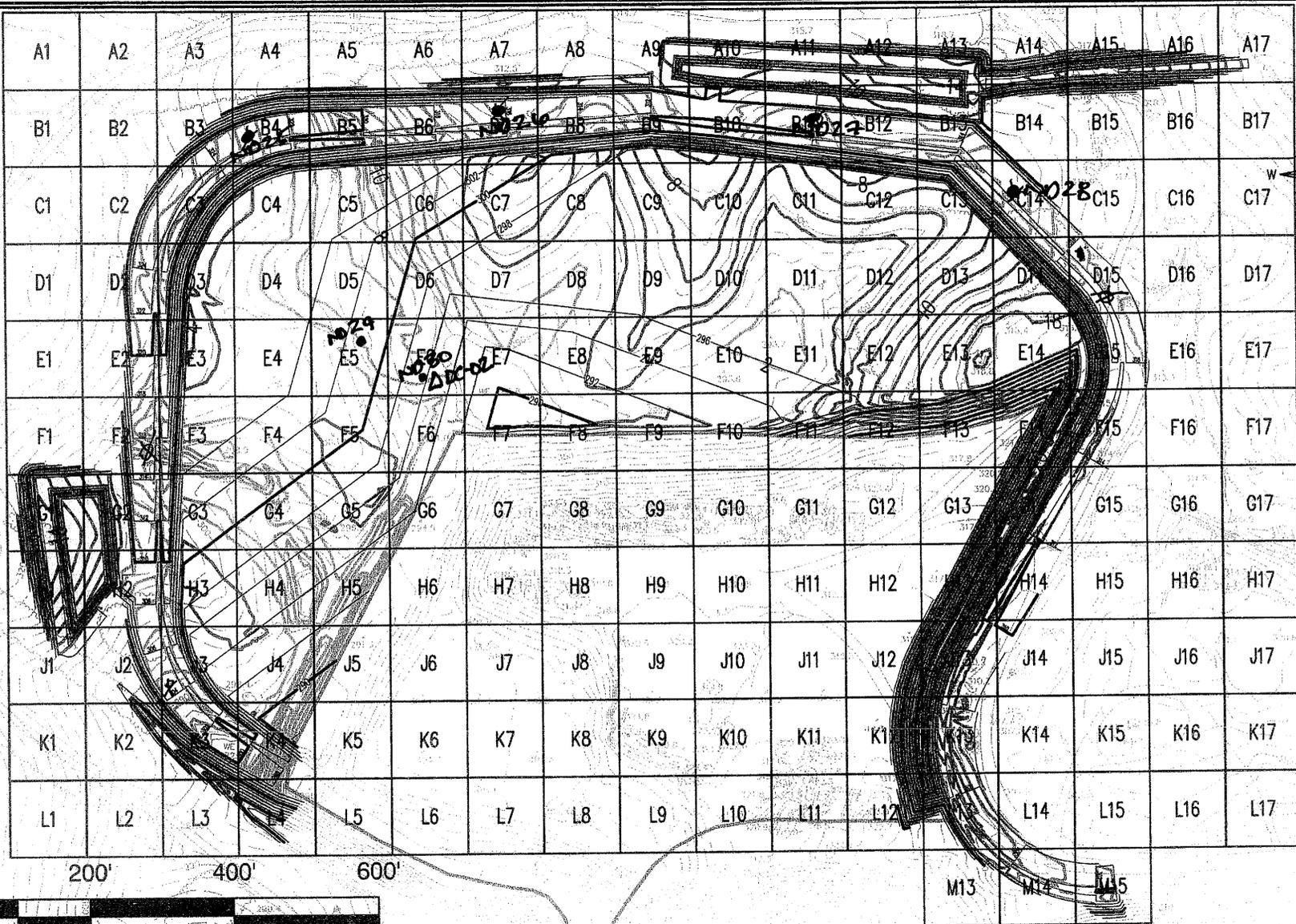
Geotechnics Representative : JACOB R. BUDA

Day: Mon.
 Date: 3.17.08
 Log No.: 08
 Page: 1 of 4



Daily Field Activity Log

Project Name:	Red Rock C&D LF Phase 1C-2	Project No.:	2008-532
Client Name:	RSG & Associates	Client Contact:	Stacey Smith
Site Location:	Holly Springs, NC	Time on Site:	Arrived: 12:30pm Departed: 1:30pm
General Contractor:	Glover Construction	Superintendent:	Wayne Clemmons
Other Firms / Sub-Contractor Represented On Site			
<u>Firm / Sub-Contractor</u>		<u>Representative's Name and Title</u>	
Weather Conditions:	Sunny	Temperature:	60's - 70's
Contractor's Equipment:	1 CAT 385 Trackhoe, 1 CAT 320C Trackhoe, 4 Volvo Off-Road Trucks, 2 CAT D6 Dozers, 1 CAT D8 Dozer w/ Ripper Arm, 1 CAT 815 Sheepsfoot Compactor, 1 IR Smoothdrum Roller, 1 CASE 9280 Tractor w/ Boxblade, and 1 CAT 938G Frontend Loader		
Contractor's Personnel:	1 Superintendent, and approx. 10 Operators / Laborers		
Description of Daily Activities & Events			
<ul style="list-style-type: none"> ▪ Geotechnics Representative Jacob R. Buda arrived on site. ▪ Glover Construction continued placement of Embankment Material inside Phase 1C-2. ▪ Glover began grubbing topsoil in South West Corner of Phase 1C-2. ▪ Geotechnics Rep. performed CQA Moisture / Density testing of the Phase 1C-2 perimeter access road. ▪ Geotechnics Representative departed site. 			
Prepared By:	JRB	Date:	3.17.08
		Checked By:	<i>[Signature]</i>
		Date:	3-24-08



RED ROCK DISPOSAL, LLC
 C&D LANDFILL PHASE 1C-2
 SOIL TEST GRID

EMBKFDR-03 Page 4 of 4 3-17-08

DRAWN BY: J.A.L.	CHECKED BY:	SCALE: AS SHOWN	FIGURE NO. 1
DATE: Feb. 2008	PROJECT NO. REDROCK 08-1	FILE NAME REDROCK-A0073	

RICHARDSON SMITH GARDNER & ASSOCIATES

14 N. Boylan Ave.
 Raleigh, N.C. 27603
 www.ragengineers.com

ph: 919-828-0577
 fax: 919-828-3899



Client: RSG & Associates
Project Name : Red Rock C&D LF Phase 1C-2
Project Number : 2008-532

Report Number : EMBKFDR-03
Date (s) : 3.17.08

Drive Cylinder - ASTM D 2937

Test Information

Test Number : DC-02
Nuclear Test Number : EMBKND-30
Location: E6
Depth (ft): LIFT 3
Date : 3.17.08

Mold

Cylinder ID 3
Weight of Cylinder (lbs.) 1.32
Volume of Cylinder (ft³) 0.033

Specimen

Wt. of Cylinder & WS (lbs.) 5.75
Wt. of Cylinder (lbs.) 1.32
Wt. of WS 4.43
Cylinder Volume (ft³) 0.033

Moisture / Density

Tare Number 314
Wt. of Tare & WS (gm) 744.65
Wt. of Tare & DS (gm) 689.78
Wt. of Tare (gm) 84.30
Wt. of Water (gm) 54.87
Wt. of DS (gm) 605.48

Wet Density (pcf): 134.2

Moisture Content (%): 9.1
Dry Density (pcf): 123.1

Geotechnics Representative : JACOB R. BUDA

Day: Wed.
 Date: 3.19.08
 Log No.: 9
 Page: 1 of 1



Daily Field Activity Log

Project Name:	Red Rock C & D LF Phase 1C-2	Project No.:	2008-532
Client Name:	RSG & Associates	Client Contact:	Stacey Smith
Site Location:	Holly Springs	Time on Site:	Arrived: 11:30 Departed: 1:00
General Contractor:	Glover Construction	Superintendent:	Wayne Clemmons
Visitors and Other Firms Representatives On Site			
<u>Firm Names</u>		<u>Representative's Name and Title</u>	
Weather Conditions:	P. Cloudy/ Windy	Temperature:	70
Contractor's Equipment:	1 CAT 385 Trackhoe, 1 CAT 320C Trackhoe, 4 Volvo Offroad Trucks 2 CAT D6 Bulldozers, 1 CAT D8 w/ Ripper, 1 CAT 815 Sheepsfoot Compactor, 1 IR Smoothdrum Compactor 1 CASE 9280 Tractor w/ Boxblade, 1 CAT 938G Front End Loader		
Contractor's Personnel:	1 Superintendent, Approx. 10 Operators/ Laborers		
Description of Daily Activities & Events			
<ul style="list-style-type: none"> • Geotechnics Representative David Wright arrived on-site. • Glover Construction continued placement of Embankment material inside Phase 1C-2. Embankment material was placed in E4, E5, F4, and F5 from C9, C10, D9, and D10. • Geotechnics Representative performed CQA moistures/ densities on B7, B8, B9, B10, B11, B12, B13, C14, D15, D10, D11, E10, and E11 of previously placed and compacted material. (see EMBKFDR--04). • Several areas were encountered where density tests could not be performed due to over compaction. These areas were recorded and mapped. • Geotechnics Representative departed site. 			
Prepared By:	DAW	Date:	3.19.08
		Checked By:	<i>MWJ</i>
		Date:	<i>3-25-08</i>



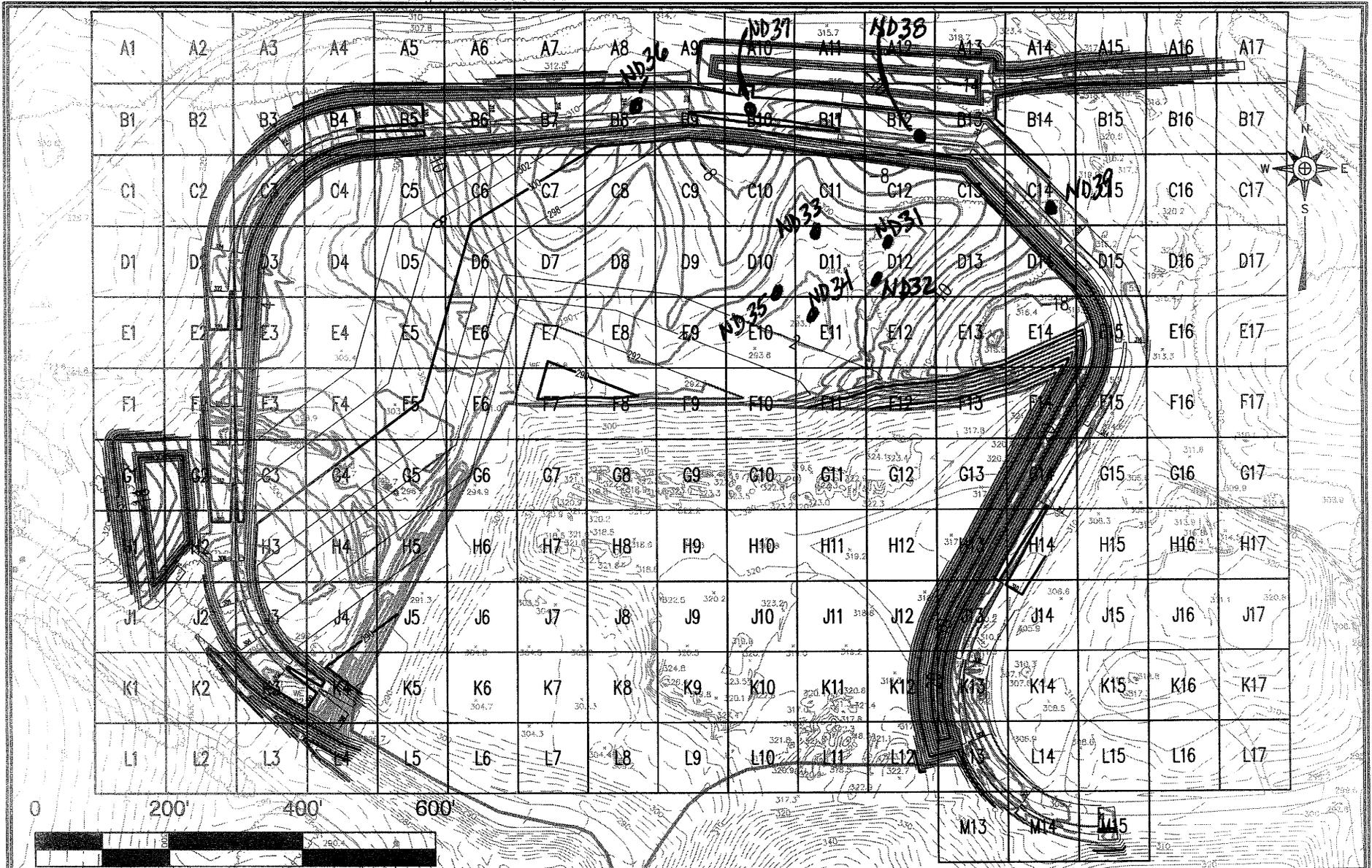
FIELD DENSITY TEST REPORT

Project Information					
Client:	RSG & Associates	Report No.:	EMBKFDR-04	Page:	1
Client Project:	Red Rock C & D LF Phase 1C-2	Tested By:	David Wright	Date:	3.19.08
Project No.:	2008-532	Reviewed By:	<i>MMS</i>	Date:	<i>3-25-08</i>

Material & Equipment	
Borrow Source:	On-Site Excavated Embankment Material
Compaction Equipment:	1 CAT 815 Sheepsfoot Compactor, 1 Ingersoll Rand Smoothdrum Compactor

Density Test Data													
Test No.	Test Location	Elevation/ Lift	Rod Depth	Proctor ID Number	Proctor		Measured In-Place			Compaction		MC% Dev. F/ OMC	Comments
					MDD pcf	OMC %	WD pcf	MC %	DD pcf	%C	% Req.		
EMBKND 31	D12	GRD	6"	532-03-01	129.2	8.1	134.7	5.6	127.6	98.7%	95.0%	-2.5	
EMBKND 32	D12	GRD	6"	532-01-03	119.9	7.9	135.0	9.7	123.1	102.6%	95.0%	1.8	
EMBKND 33	D11	GRD	6"	532-01-03	119.9	7.9	129.5	6.2	121.9	101.7%	95.0%	-1.7	
EMBKND 34	E11	GRD	6"	532-03-01	129.2	8.1	141.3	6.2	133.1	103.0%	95.0%	-1.9	
EMBKND 35	D10	GRD	6"	532-03-01	129.2	8.1	140.1	5.9	132.3	102.4%	95.0%	-2.2	
EMBKND 36	B8	~ 310	6"	532-03-01	129.2	8.1	135.9	7.2	126.8	98.1%	95.0%	-0.9	
EMBKND 37	B10	~ 310	6"	532-03-01	129.2	8.1	141.2	6.8	132.2	102.3%	95.0%	-1.3	
EMBKND 38	B12	~ 312	6"	532-03-01	129.2	8.1	134.9	5.7	127.6	98.8%	95.0%	-2.4	
EMBKND 39	C14	~ 314	6"	532-03-01	129.2	8.1	140.2	6.3	131.9	102.1%	95.0%	-1.8	

Gauge #	Density Standard	Moisture Standard
33577	2635	633



RED ROCK DISPOSAL, LLC
 C&D LANDFILL PHASE 1C-2
 SOIL TEST GRID

EMBK FDR-04 3-19-08

DRAWN BY:

J.A.L.

CHECKED BY:

DATE:

Feb. 2008

SCALE:

AS SHOWN

PROJECT NO.

REDROCK 08-1

FIGURE NO.

1

FILE NAME

REDROCK-A0073

RICHARDSON SMITH GARDNER
 & ASSOCIATES

14 N. Boylan Ave.
 Raleigh, N.C. 27603

www.rsgengineers.com

ph: 910-828-0577
 fax: 910-828-3899

Day: Tues
 Date: 3/25/08
 Log No.: 10
 Page: 1 of 1



Daily Field Activity Log

Project Name:	Red Rock C&D LF Phase 1C-2	Project No.:	2008-532
Client Name:	RSG & Associates	Client Contact:	Stacey Smith
Site Location:	Holly Springs, NC	Time on Site:	Arrived: 10:00 AM Departed: 11:00 AM
General Contractor:	Glover Construction	Superintendent:	Wayne Clemmons
Other Firms / Sub-Contractor Represented On Site			
<u>Firm / Sub-Contractor</u>		<u>Representative's Name and Title</u>	
Weather Conditions:	Sunny, Windy	Temperature:	60's
Contractor's Equipment:	1 CAT 385 Trackhoe, 1 CAT 320C Trackhoe, 4 Volvo Off-Road Trucks, 2 CAT D6 Dozers, 1 CAT D8 Dozer w/ Ripper Arm, 1 CAT 815 Sheepsfoot Compactor, 1 IR Smoothdrum Roller, 1 CASE 9280 Tractor w/ Boxblade, and 1 CAT 938G Frontend Loader		
Contractor's Personnel:	1 Superintendent, and approx. 10 Operators / Laborers		
Description of Daily Activities & Events			
<ul style="list-style-type: none"> ▪ Geotechnics Representative arrived on site and made contact with Mr. Wayne Clemmons of Glover Construction. ▪ Glover Construction has run out of on-site borrow and is contacting the adjacent quarry to secure the remainder of the embankment fill. ▪ Geotechnics Rep. Spoke to Mr. Wayne Clemmons with Glover who indicated little to no embankment had been placed since 3-20-08. He also stated he was preparing to haul fill from the quarry and would place embankment after logistics and quarry safety training was completed. ▪ Geotechnics Rep. notified Mr. Clemmons that a sample will be needed to verify maximum dry density of new embankment material. He stated he would obtain a sample later, once safety training was completed. ▪ No testing as performed today. Geotechnics representative departed site. 			
Prepared By:	mps	Date:	3/25/08
Checked By:	<i>mps</i>	Date:	4-1-08

Day: Thurs
 Date: 3/27/08
 Log No.: 11
 Page: 1 of 3



Daily Field Activity Log

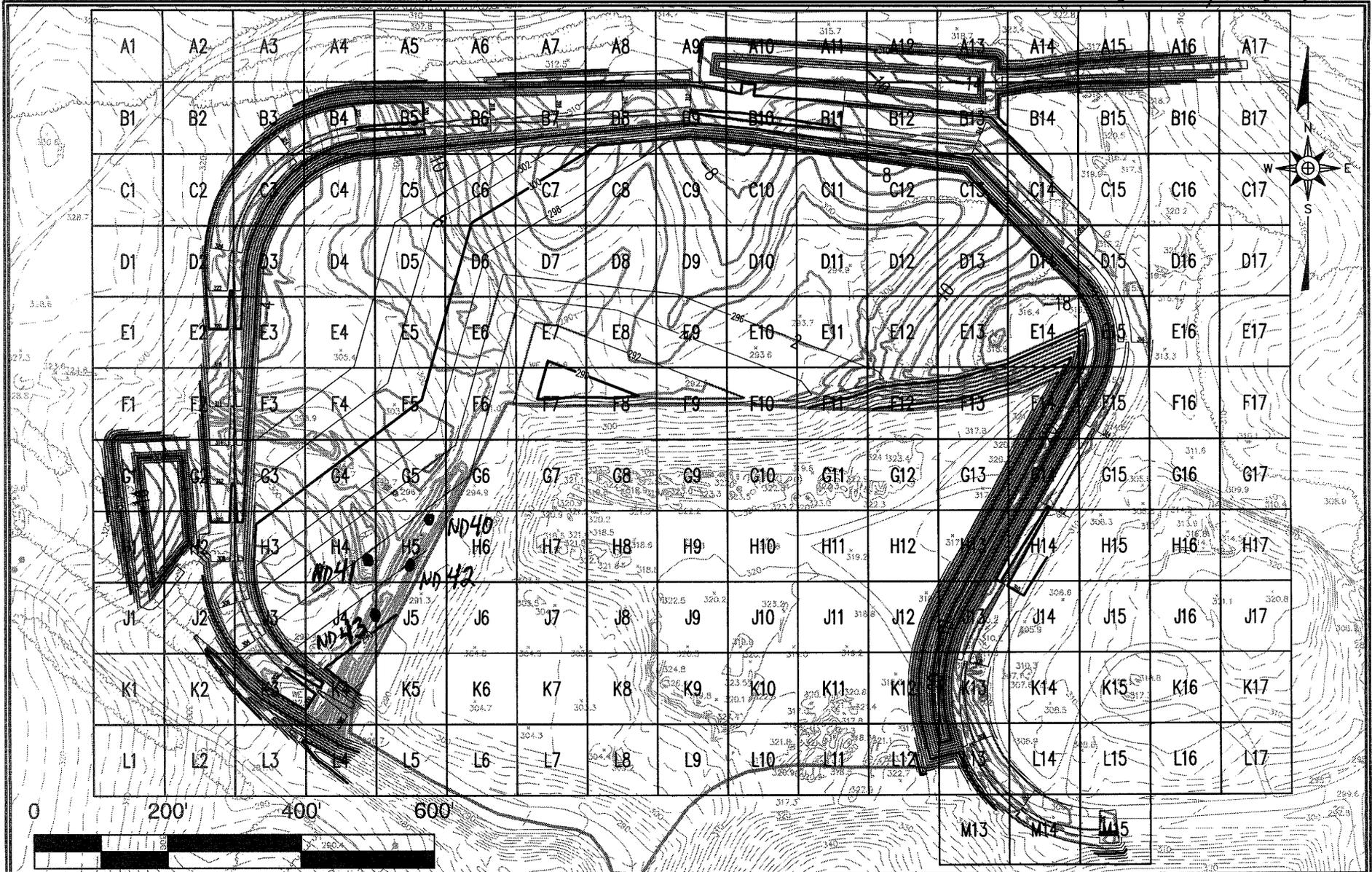
Project Name:	Red Rock C&D LF Phase 1C-2	Project No.:	2008-532
Client Name:	RSG & Associates	Client Contact:	Stacey Smith
Site Location:	Holly Springs, NC	Time on Site:	Arrived: 8:00 AM Departed: 9:00 AM
General Contractor:	Glover Construction	Superintendent:	Wayne Clemmons
Other Firms / Sub-Contractor Represented On Site			
<u>Firm / Sub-Contractor</u>		<u>Representative's Name and Title</u>	
Weather Conditions:	sunny	Temperature:	60's
Contractor's Equipment:	1 CAT 385 Trackhoe, 1 CAT 320C Trackhoe, 4 Volvo Off-Road Trucks, 2 CAT D6 Dozers, 1 CAT D8 Dozer w/ Ripper Arm, 1 CAT 815 Sheepsfoot Compactor, 1 IR Smoothdrum Roller, 1 CASE 9280 Tractor w/ Boxblade, and 1 CAT 938G Frontend Loader		
Contractor's Personnel:	1 Superintendent, and approx. 10 Operators / Laborers		
Description of Daily Activities & Events			
<ul style="list-style-type: none"> ▪ Geotechnics Representative arrived on site and made contact with Mr. Wayne Clemmons of Glover Construction. ▪ Glover has begun placement of new embankment fill source in the southwest section of floor Phase 1C-2. Material appears to be sandy silt with tan color. ▪ Geotechnics Rep. obtained samples from the fill for moisture checks and density check. Laboratory Moisture / Density Relationship testing. ▪ Geotechnics Rep. Performed compaction testing on new embankment material. Compaction will be verified once density checks (one point) can be performed on sample obtained. Material placed was observed to be well compacted and no deflection or pumping evident. ▪ Geotechnics Representative departed site. <p>Moisture checks revealed nuclear gauge reading accurately.</p>			
Prepared By:	mps	Date:	3/27/08
Checked By:	<i>[Signature]</i>	Date:	4-1-08

Day: Fri.
 Date: 3/28/08
 Log No.: 12
 Page: 1 of 3



Daily Field Activity Log

Project Name:	Red Rock C&D LF Phase 1C-2	Project No.:	2008-532
Client Name:	RSG & Associates	Client Contact:	Stacey Smith
Site Location:	Holly Springs, NC	Time on Site:	Arrived: 11:00 AM Departed: 12:00 PM
General Contractor:	Glover Construction	Superintendent:	Wayne Clemmons
Other Firms / Sub-Contractor Represented On Site			
Firm / Sub-Contractor		Representative's Name and Title	
surveyor		John Tompson	
Weather Conditions:	sunny	Temperature:	60's-70's
Contractor's Equipment:	1 CAT 385 Trackhoe, 1 CAT 320C Trackhoe, 4 Volvo Off-Road Trucks, 2 CAT D6 Dozers, 1 CAT D8 Dozer w/ Ripper Arm, 1 CAT 815 Sheepsfoot Compactor, 1 IR Smoothdrum Roller, 1 CASE 9280 Tractor w/ Boxblade, and 1 CAT 938G Frontend Loader		
Contractor's Personnel:	1 Superintendent, and approx. 10 Operators / Laborers		
Description of Daily Activities & Events			
<ul style="list-style-type: none"> ▪ Geotechnics Representative arrived on site and observed Glover Construction placing fill in the berm area of the southwest corner of phase 1C-2. ▪ Geotechnics Rep. Performed compaction testing on embankment material in the floor, southwest corner of pahse 1C-2. Mr. Clemmons of Glover construction stated the area tested was up to grade. Surveyor was on site. ▪ Geotechnics Rep. observed large rock present in fill material being placed in the lower lifts of the southwest sections of berm. Material was from the quarry and contained large rock (1 - 2 ft size), sand and silt. This material was not tested due to the presence of large rock. The material is being spread with a dozer and rolled in with an 815 compactor. No pumping or rutting was observed, the material placed looked stable and well compacted. ▪ Geotechnics Representative departed site. 			
Prepared By:	mps	Date:	3/28/08
Checked By:	<i>[Signature]</i>	Date:	4-1-08



**RED ROCK DISPOSAL, LLC
C&D LANDFILL PHASE 1C-2
SOIL TEST GRID**

EMBKR-05 3-27-08, 3-28-08

DRAWN BY:

J.A.L.

CHECKED BY:

SCALE:

AS SHOWN

FIGURE NO.

1

DATE:

Feb. 2008

PROJECT NO.

REDROCK 08-1

FILE NAME

REDROCK-A0073

**RICHARDSON SMITH GARDNER
& ASSOCIATES**

14 N. Boylan Ave.
Raleigh, N.C. 27603

www.regengineers.com

ph: 919-828-0577
fax: 919-828-3890

Day: Thurs.
 Date: 4.3.08
 Log No.: 13
 Page: 1 of 1



Daily Field Activity Log

Project Name:	Red Rock C & D LF 1C-2	Project No.:	2008-532
Client Name:	RSG & Assoc.	Client Contact:	Stacey Smith
Site Location:	Holly Springs, NC	Time on Site:	Arrived: 10:00 Departed: 10:30
General Contractor:	Glover Construction	Superintendent:	Wayne Clemmons
Visitors and Other Firms Representatives On Site			
<u>Firm Names</u>		<u>Representative's Name and Title</u>	
Weather Conditions:	Lt. Rain	Temperature:	65
Contractor's Equipment:	1 CAT 385 Trackhoe, 1 CAT 320C Trackhoe, 4 Volvo Off-Road trucks, 2 CAT D6 bulldozers, 1 CAT D8 Bulldozer w/ Ripper, 1 CAT 815 Compactor, 1 IR smooth drum, 1 CAT 983G Loader, 1 CASE 9280 Tractor w/ Boxblade.		
Contractor's Personnel:			
Description of Daily Activities & Events			
<ul style="list-style-type: none"> • Geotechnics Representative arrived on-site. • Glover Construction was hauling structural fill from the Hanson quarry to onsite by offroad truck. • Material was composed of course sand with 3" to 24" rock throughout the material. No compaction testing performed due to rock content of material being placed. • Geotechnics Rep. observed loaded offroad trucks driving over the material, and noticed no movement or pumping in the material. • Glover construction spread the material with a D-6 CAT bulldozer, then was compacted using a CAT 815 penetrating compactor. • Material was placed on the burm / roadway area on K3, K4, J2, J3, and H2. • Geotechnics Rep left site. 			
Prepared By:	DAW	Date:	4.3.08
Checked By:	<i>[Signature]</i>	Date:	4-16-08

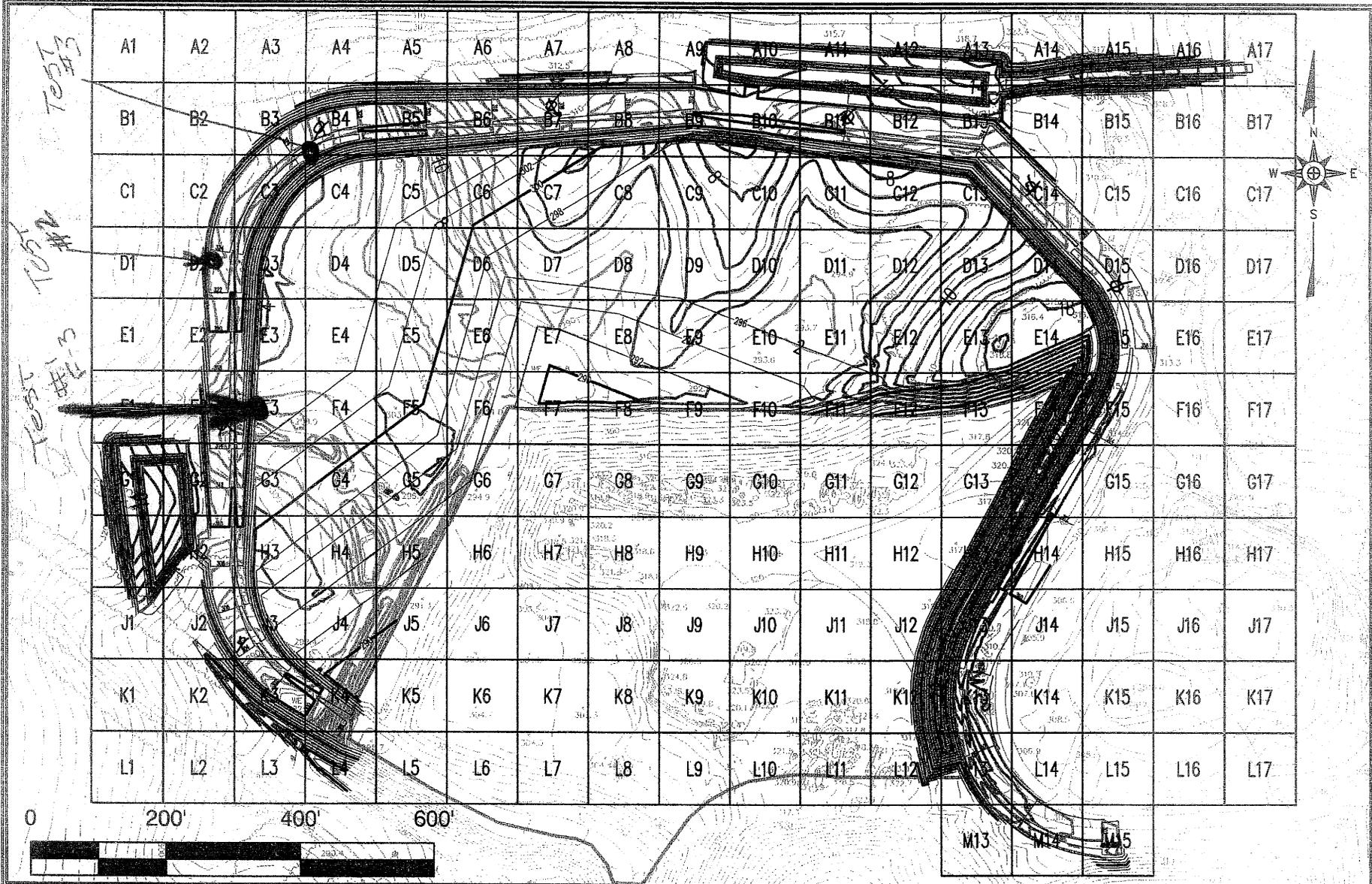
Day: Wed.
 Date: 4/16/08
 Log No.: 14
 Page: 1



Daily Field Activity Log

Project Name:	Red Rock C&D Phs 1c-2	Project No.:	2008-532
Client Name:	RSG & Associates	Client Contact:	Stacey Smith
Site Location:	Hollysprings, NC	Time on Site:	Arrived: 10:00 Departed: 12:00
General Contractor:	Glover Const.	Superintendent:	Wayne Clemmons
Other Firms / Sub-Contractor Represented On Site			
<u>Firm / Sub-Contractor</u>		<u>Representative's Name and Title</u>	
na		na	
Weather Conditions:	sunny	Temperature:	65
Contractor's Equipment:	Dozer, 815 Compacter, Off road trucks		
Contractor's Personnel:	7		
Description of Daily Activities & Events			
<ul style="list-style-type: none"> ▪ Geotechnics rep. observed Glover placing topsoil on berms near grid B8. Glover also placing some structural fill near grid B12. ▪ Compaction Testing was performed along the NW corner of the perimeter berm. Some fill contained large rock within the material. All material appeared to be well compacted and showed no signs of rutting or pumping under construction traffic. 			
Prepared By:	SD	Date:	4/16/08
		Checked By:	<i>MDS</i>
		Date:	<i>4-21-08</i>

2008 532-
 Red rock C&D L&P
 N.D. Testing 4/16/08
 S.D.



**RED ROCK DISPOSAL, LLC
 C&D LANDFILL PHASE 1C-2
 SOIL TEST GRID**

DRAWN BY: J.A.L.	CHECKED BY:	SCALE: AS SHOWN	FIGURE NO. 1
DATE: Feb. 2008	PROJECT NO. REDROCK 08-1	FILE NAME REDROCK-A0073	


**RICHARDSON SMITH GARDNER
 & ASSOCIATES**

14 N. Boylan Ave.
 Raleigh, N.C. 27603
 www.rsgengineers.com
 ph: 919-828-0577
 fax: 919-828-3889

APPENDIX E.3
SOIL CLASSIFICATION

ATTERBERG LIMITS

ASTM D 4318-98 / AASHTO T89 (SOP - S4A)

Client	RSG & ASSOCIATES	Boring No.	B-1
Client Reference	RED ROCK C&D LF PH. 1C-2	Depth (ft)	3-8
Project No.	2008-532-01	Sample No.	EMBK-01
Lab ID	2008-532-01-01	Soil Description	LIGHT BROWN LEAN CLAY

Note: The USCS symbol used with this test refers only to the minus No. 40 sieve material. See the "Sieve and Hydrometer Analysis" graph page for the complete material description. (Minus No. 40 sieve material, Airdried)

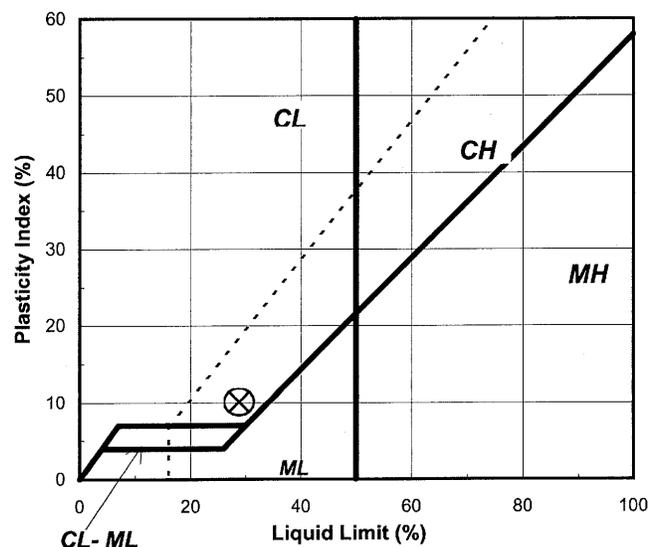
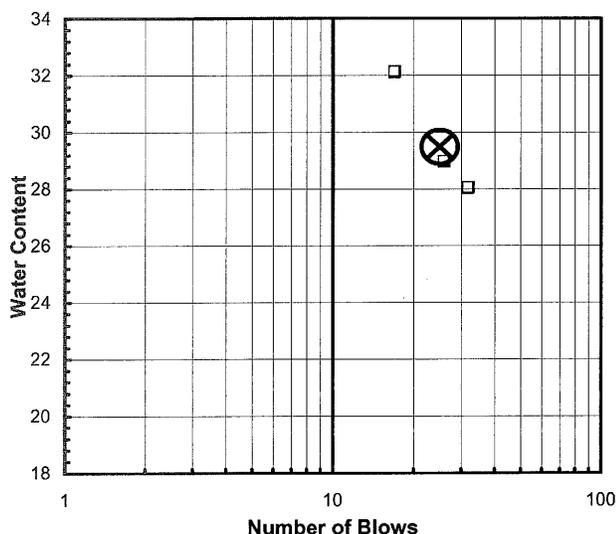
Liquid Limit Test	1	2	3	
Tare Number	A-K	A-L	A-C	M
Wt. of Tare & WS (gm)	31.47	32.08	33.29	U
Wt. of Tare & DS (gm)	27.60	28.37	29.41	L
Wt. of Tare (gm)	15.55	15.56	15.57	T
Wt. of Water (gm)	3.9	3.7	3.9	I
Wt. of DS (gm)	12.1	12.8	13.8	P
				O
				I
Moisture Content (%)	32.1	29.0	28.0	N
Number of Blows	17	26	32	T

Plastic Limit Test	1	2	Range	Test Results
Tare Number	A-H	A-Q		Liquid Limit (%) 29
Wt. of Tare & WS (gm)	23.43	22.96		Plastic Limit (%) 19
Wt. of Tare & DS (gm)	22.19	21.80		Plasticity Index (%) 10
Wt. of Tare (gm)	15.59	15.55		USCS Symbol CL
Wt. of Water (gm)	1.2	1.2		
Wt. of DS (gm)	6.6	6.3		
Moisture Content (%)	18.8	18.6	0.2	

Note: The acceptable range of the two Moisture contents is ± 2.6

Flow Curve

Plasticity Chart



Tested By SGH Date 3/3/2008 Checked By GM Date 3-4-08

ATTERBERG LIMITS

ASTM D 4318-98 / AASHTO T89 (SOP - S4A)

Client	RSG & ASSOCIATES	Boring No.	B-2
Client Reference	RED ROCK C&D LF PH. 1C-2	Depth (ft)	0-5
Project No.	2008-532-01	Sample No.	EMBK-02
Lab ID	2008-532-01-02	Soil Description	TAN LEAN CLAY

Note: The USCS symbol used with this test refers only to the minus No. 40 sieve material. See the "Sieve and Hydrometer Analysis" graph page for the complete material description. (Minus No. 40 sieve material, Airdried)

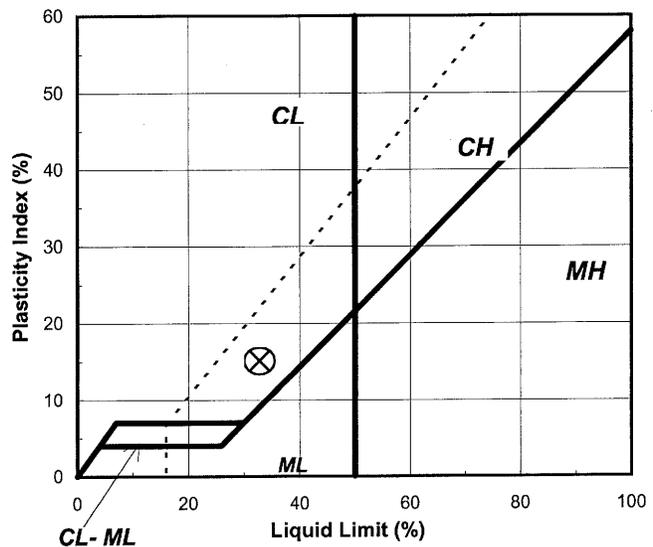
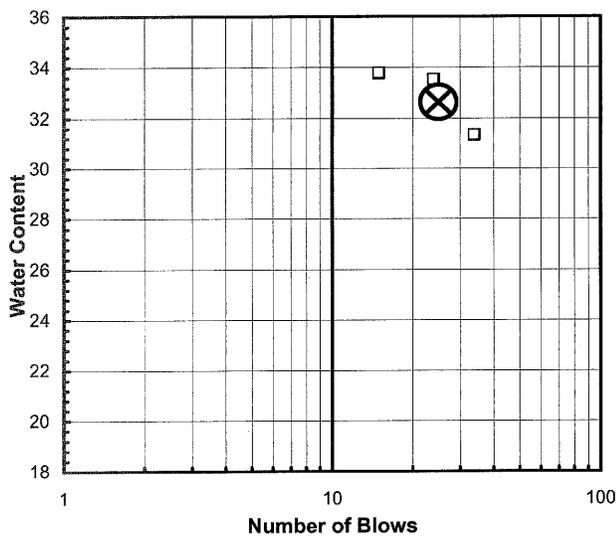
Liquid Limit Test	1	2	3	
Tare Number	A-O	P	A-B	M U L T I P O I N T
Wt. of Tare & WS (gm)	34.17	35.95	37.39	
Wt. of Tare & DS (gm)	29.46	30.75	32.19	
Wt. of Tare (gm)	15.51	15.23	15.59	
Wt. of Water (gm)	4.7	5.2	5.2	
Wt. of DS (gm)	14.0	15.5	16.6	
Moisture Content (%)	33.8	33.5	31.3	
Number of Blows	15	24	34	

Plastic Limit Test	1	2	Range	Test Results
Tare Number	Y	M		Liquid Limit (%) 33 Plastic Limit (%) 18 Plasticity Index (%) 15 USCS Symbol CL
Wt. of Tare & WS (gm)	22.49	24.05		
Wt. of Tare & DS (gm)	21.46	22.72		
Wt. of Tare (gm)	15.63	15.17		
Wt. of Water (gm)	1.0	1.3		
Wt. of DS (gm)	5.8	7.6		
Moisture Content (%)	17.7	17.6	0.1	

Note: The acceptable range of the two Moisture contents is ± 2.6

Flow Curve

Plasticity Chart



Tested By SGH Date 2/29/2008 Checked By GEM Date 3-3-08

page 1 of 1 DCN: CT-S4B DATE: 10/8/2001 REVISION: 2

ATTERBERG LIMITS

ASTM D 4318-98 / AASHTO T89 (SOP - S4A)

Client	RSG & ASSOCIATES	Boring No.	B-3
Client Reference	RED ROCK C&D LF PHS. 1C-2	Depth (ft)	5-10
Project No.	2008-532-01	Sample No.	EMBK-03
Lab ID	2008-531-01-03	Soil Description	REDDISH BROWN LEAN CLAY

Note: The USCS symbol used with this test refers only to the minus No. 40 sieve material. See the "Sieve and Hydrometer Analysis" graph page for the complete material description. (Minus No. 40 sieve material, Airdried)

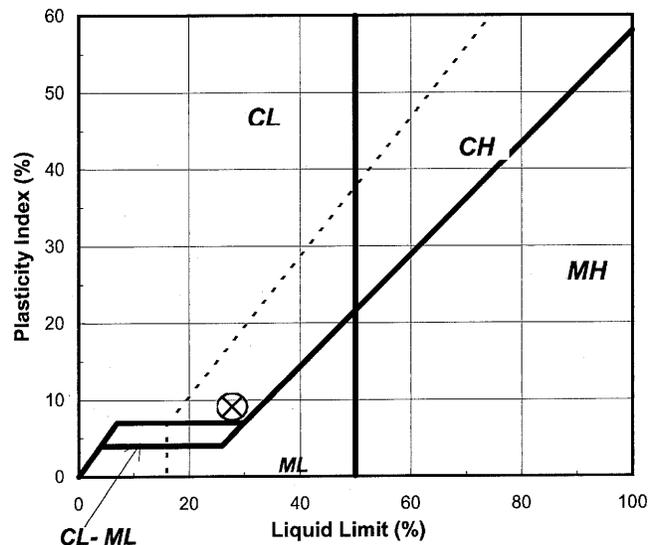
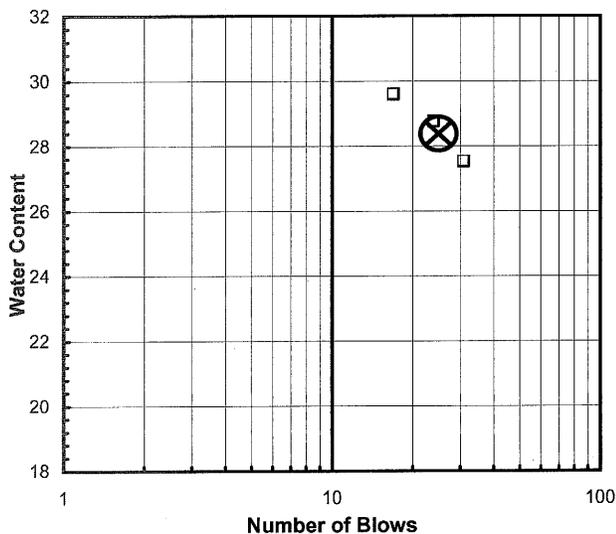
Liquid Limit Test	1	2	3	
Tare Number	P	M	V	M U L T I P O I N T
Wt. of Tare & WS (gm)	29.56	33.69	33.52	
Wt. of Tare & DS (gm)	26.29	29.55	29.66	
Wt. of Tare (gm)	15.24	15.16	15.63	
Wt. of Water (gm)	3.3	4.1	3.9	
Wt. of DS (gm)	11.1	14.4	14.0	
Moisture Content (%)	29.6	28.8	27.5	
Number of Blows	17	24	31	

Plastic Limit Test	1	2	Range	Test Results
Tare Number	A-B	A-O		Liquid Limit (%) 28 Plastic Limit (%) 19 Plasticity Index (%) 9 USCS Symbol CL
Wt. of Tare & WS (gm)	24.35	23.93		
Wt. of Tare & DS (gm)	22.99	22.57		
Wt. of Tare (gm)	15.59	15.52		
Wt. of Water (gm)	1.4	1.4		
Wt. of DS (gm)	7.4	7.1		
Moisture Content (%)	18.4	19.3	-0.9	

Note: The acceptable range of the two Moisture contents is ± 2.6

Flow Curve

Plasticity Chart

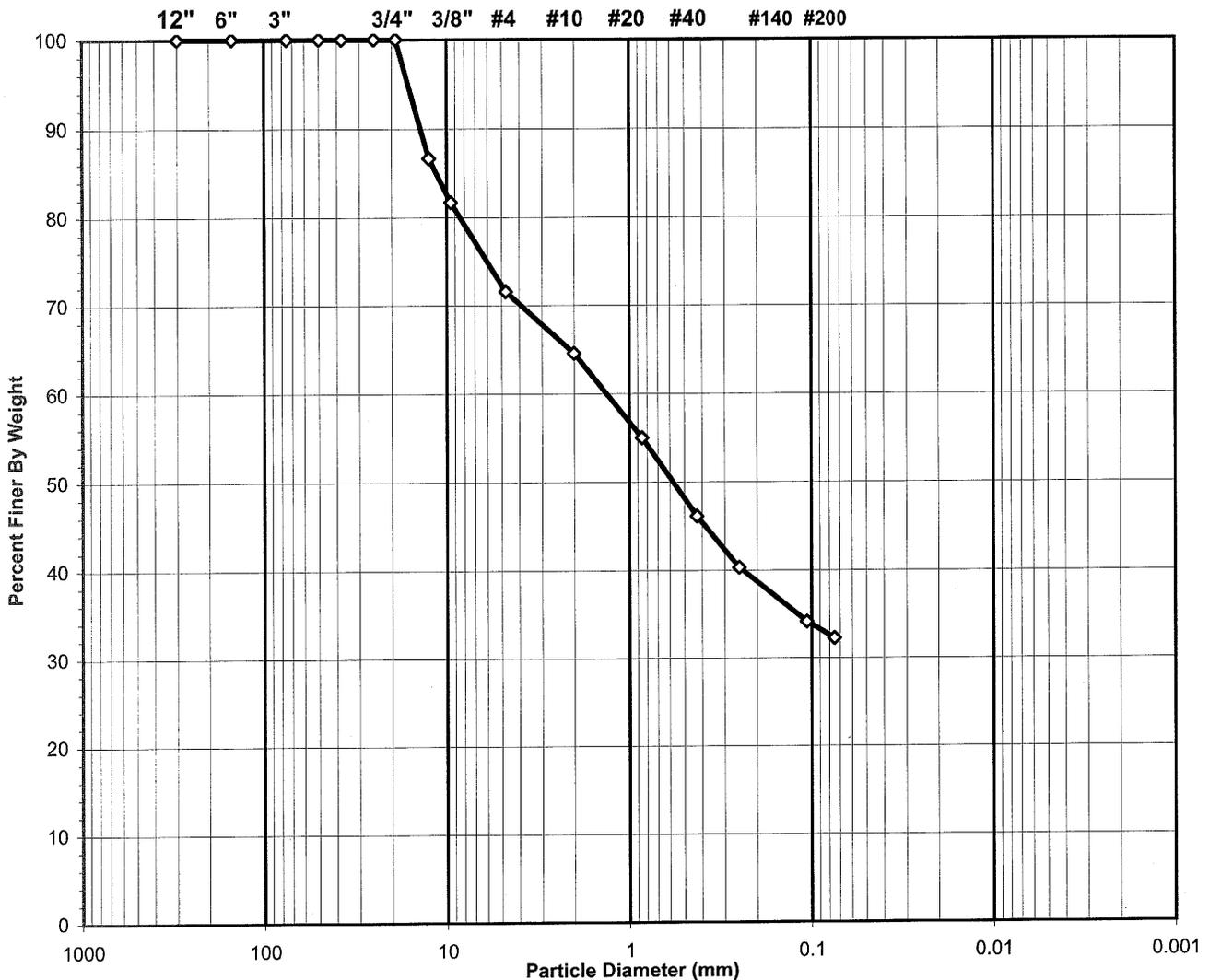


Tested By **SGH** Date **3/4/2008** Checked By **GEM** Date **3-5-08**

SIEVE ANALYSIS
ASTM D 422-63 (SOP-S3)

Client	RSG & ASSOCIATES	Boring No.	B-1
Client Reference	RED ROCK C&D LF PH. 1C-2	Depth (ft)	3-8
Project No.	2008-532-01	Sample No.	EMBK-01
Lab ID	2008-532-01-01	Soil Color	LIGHT BROWN

USCS	SIEVE ANALYSIS		HYDROMETER
	gravel	sand	silt and clay



USCS Symbol **SC, TESTED**

USCS Classification **CLAYEY SAND WITH GRAVEL**

Tested By **TMS** Date **2/29/2008** Checked By **GDM** Date **3-4-08**

WASH SIEVE ANALYSIS

ASTM D 422-63 (SOP-S3)

Client	RSG & ASSOCIATES	Boring No.	B-1
Client Reference	RED ROCK C&D LF PH. 1C-2	Depth (ft)	3-8
Project No.	2008-532-01	Sample No.	EMBK-01
Lab ID	2008-532-01-01	Soil Color	LIGHT BROWN

Moisture Content of Passing 3/4" Material		Water Content of Retained 3/4" Material	
Tare No.	208	Tare No.	NA
Wgt.Tare + Wet Specimen (gm)	652.53	Wgt.Tare + Wet Specimen (gm)	NA
Wgt.Tare + Dry Specimen (gm)	620.66	Wgt.Tare + Dry Specimen (gm)	NA
Weight of Tare (gm)	169.77	Weight of Tare (gm)	NA
Weight of Water (gm)	31.87	Weight of Water (gm)	NA
Weight of Dry Soil (gm)	450.89	Weight of Dry Soil (gm)	NA
Moisture Content (%)	7.1	Moisture Content (%)	NA

Wet Weight -3/4" Sample (gm)	NA	Weight of the Dry Specimen (gm)	450.89
Dry Weight - 3/4" Sample (gm)	305.5	Weight of minus #200 material (gm)	145.39
Wet Weight +3/4" Sample (gm)	NA	Weight of plus #200 material (gm)	305.50
Dry Weight + 3/4" Sample (gm)	0.00		
Total Dry Weight Sample (gm)	NA		

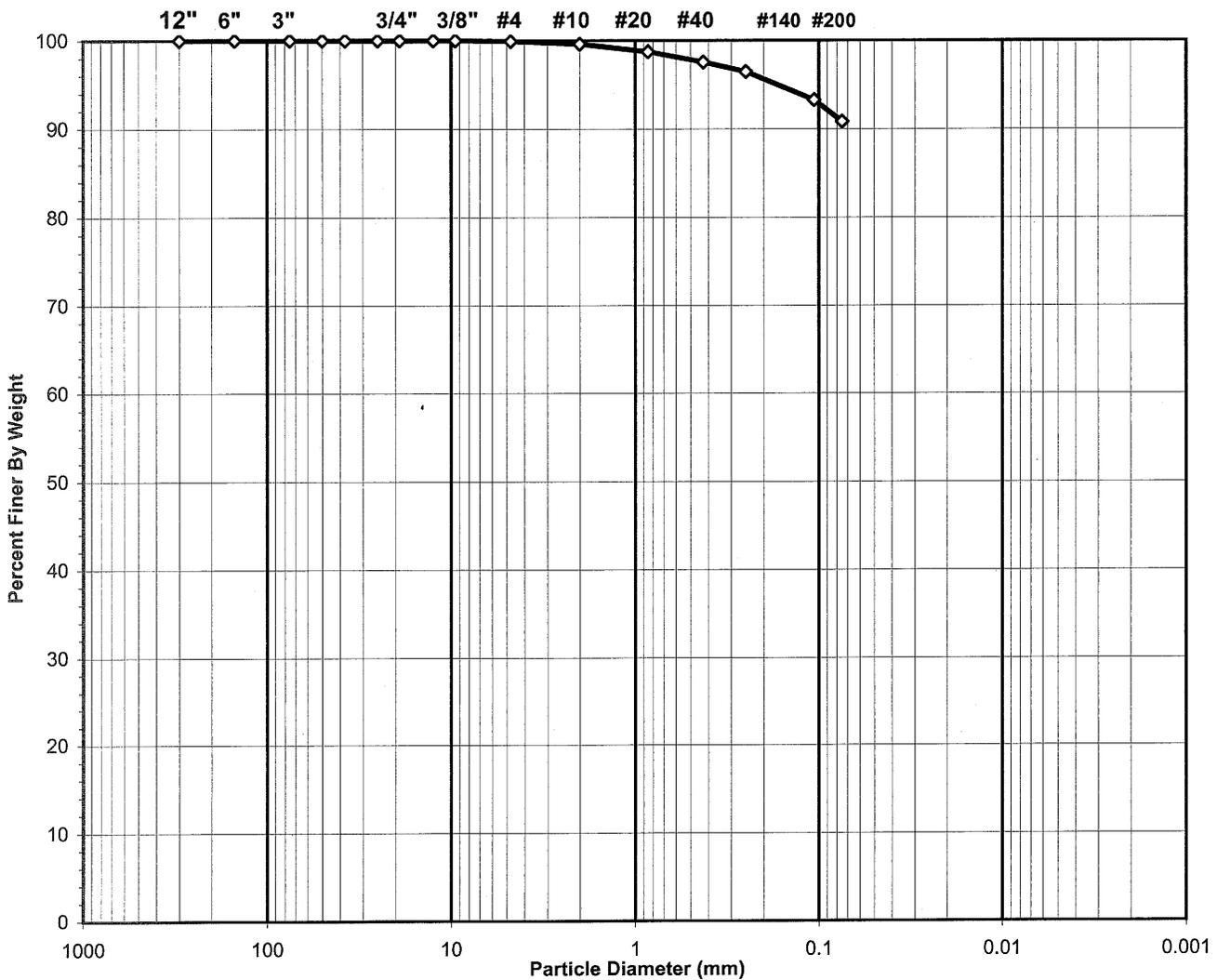
Sieve Size	Sieve Opening (mm)	Wgt.of Soil Retained (gm)	Percent Retained (%)	Accumulated Percent Retained (%)	Percent Finer (%)	Accumulated Percent Finer (%)
12"	300	0.00	0.0	0.0	100.0	100.0
6"	150	0.00	0.0	0.0	100.0	100.0
3"	75	0.00	0.0	0.0	100.0	100.0
2"	50	0.00	0.0	0.0	100.0	100.0
1 1/2"	37.5	0.00	0.0	0.0	100.0	100.0
1"	25.0	0.00	0.0	0.0	100.0	100.0
3/4"	19.0	0.00	0.0	0.0	100.0	100.0
1/2"	12.50	60.18	13.3	13.3	86.7	86.7
3/8"	9.50	22.23	4.9	18.3	81.7	81.7
#4	4.75	45.83	10.2	28.4	71.6	71.6
#10	2.00	31.49	7.0	35.4	64.6	64.6
#20	0.850	43.25	9.6	45.0	55.0	55.0
#40	0.425	39.99	8.9	53.9	46.1	46.1
#60	0.250	26.22	5.8	59.7	40.3	40.3
#140	0.106	27.82	6.2	65.9	34.1	34.1
#200	0.075	8.49	1.9	67.8	32.2	32.2
Pan	-	145.39	32.2	100.0	-	-

Tested By TMS Date 2/29/2008 Checked By *GEM* Date 3-4-08

SIEVE ANALYSIS
ASTM D 422-63 (SOP-S3)

Client	RSG & ASSOCIATES	Boring No.	B-2
Client Reference	RED ROCK C&D LF PH. 1C-2	Depth (ft)	0-5
Project No.	2008-532-01	Sample No.	EMBK-02
Lab ID	2008-532-01-02	Soil Color	TAN

USCS	SIEVE ANALYSIS		HYDROMETER
	gravel	sand	silt and clay



USCS Symbol **CL, TESTED**

USCS Classification **LEAN CLAY**

Tested By TMS Date 2/29/2008 Checked By *GEM* Date 3-3-08

WASH SIEVE ANALYSIS

ASTM D 422-63 (SOP-S3)

Client	RSG & ASSOCIATES	Boring No.	B-2
Client Reference	RED ROCK C&D LF PH. 1C-2	Depth (ft)	0-5
Project No.	2008-532-01	Sample No.	EMBK-02
Lab ID	2008-532-01-02	Soil Color	TAN

Moisture Content of Passing 3/4" Material		Water Content of Retained 3/4" Material	
Tare No.	P-12	Tare No.	NA
Wgt. Tare + Wet Specimen (gm)	674.96	Wgt. Tare + Wet Specimen (gm)	NA
Wgt. Tare + Dry Specimen (gm)	611.21	Wgt. Tare + Dry Specimen (gm)	NA
Weight of Tare (gm)	196.49	Weight of Tare (gm)	NA
Weight of Water (gm)	63.75	Weight of Water (gm)	NA
Weight of Dry Soil (gm)	414.72	Weight of Dry Soil (gm)	NA
Moisture Content (%)	15.4	Moisture Content (%)	NA

Wet Weight -3/4" Sample (gm)	NA	Weight of the Dry Specimen (gm)	414.72
Dry Weight - 3/4" Sample (gm)	38.1	Weight of minus #200 material (gm)	376.64
Wet Weight +3/4" Sample (gm)	NA	Weight of plus #200 material (gm)	38.08
Dry Weight + 3/4" Sample (gm)	0.00		
Total Dry Weight Sample (gm)	NA		

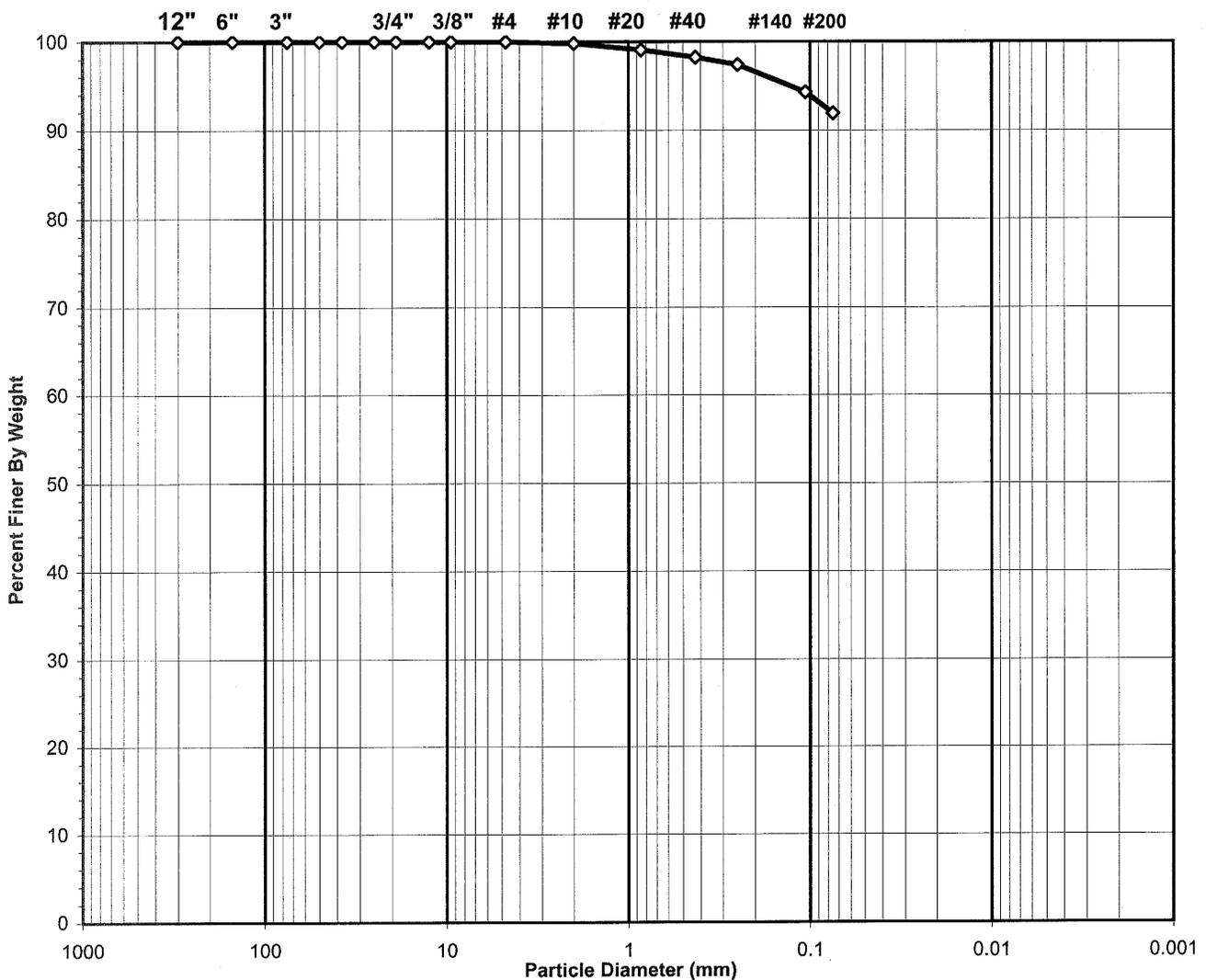
Sieve Size	Sieve Opening (mm)	Wgt. of Soil Retained (gm)	Percent Retained (%)	Accumulated Percent Retained (%)	Percent Finer (%)	Accumulated Percent Finer (%)
12"	300	0.00	0.0	0.0	100.0	100.0
6"	150	0.00	0.0	0.0	100.0	100.0
3"	75	0.00	0.0	0.0	100.0	100.0
2"	50	0.00	0.0	0.0	100.0	100.0
1 1/2"	37.5	0.00	0.0	0.0	100.0	100.0
1"	25.0	0.00	0.0	0.0	100.0	100.0
3/4"	19.0	0.00	0.0	0.0	100.0	100.0
1/2"	12.50	0.00	0.0	0.0	100.0	100.0
3/8"	9.50	0.00	0.0	0.0	100.0	100.0
#4	4.75	0.40	0.1	0.1	99.9	99.9
#10	2.00	1.31	0.3	0.4	99.6	99.6
#20	0.850	3.65	0.9	1.3	98.7	98.7
#40	0.425	4.81	1.2	2.5	97.5	97.5
#60	0.250	4.50	1.1	3.5	96.5	96.5
#140	0.106	13.26	3.2	6.7	93.3	93.3
#200	0.075	10.15	2.4	9.2	90.8	90.8
Pan	-	376.64	90.8	100.0	-	-

Tested By TMS Date 2/29/2008 Checked By *GJM* Date 3-3-08

SIEVE ANALYSIS
ASTM D 422-63 (SOP-S3)

Client	RSG & ASSOCIATES	Boring No.	B-3
Client Reference	RED ROCK C&D LF PH. 1C-2	Depth (ft)	5-10
Project No.	2008-532-01	Sample No.	EMBK-03
Lab ID	2008-532-01-03	Soil Color	REDDISH BROWN

USCS	SIEVE ANALYSIS		HYDROMETER
	gravel	sand	silt and clay



USCS Symbol **CL, TESTED**

USCS Classification **LEAN CLAY**

Tested By **TMS** Date **2/29/2008** Checked By **GEM** Date **3-7-08**

WASH SIEVE ANALYSIS

ASTM D 422-63 (SOP-S3)

Client	RSG & ASSOCIATES	Boring No.	B-3
Client Reference	RED ROCK C&D LF PH. 1C-2	Depth (ft)	5-10
Project No.	2008-532-01	Sample No.	EMBK-03
Lab ID	2008-532-01-03	Soil Color	REDDISH BROWN

Moisture Content of Passing 3/4" Material		Water Content of Retained 3/4" Material	
Tare No.	250	Tare No.	NA
Wgt. Tare + Wet Specimen (gm)	780.39	Wgt. Tare + Wet Specimen (gm)	NA
Wgt. Tare + Dry Specimen (gm)	736.58	Wgt. Tare + Dry Specimen (gm)	NA
Weight of Tare (gm)	169.60	Weight of Tare (gm)	NA
Weight of Water (gm)	43.81	Weight of Water (gm)	NA
Weight of Dry Soil (gm)	566.98	Weight of Dry Soil (gm)	NA
Moisture Content (%)	7.7	Moisture Content (%)	NA

Wet Weight -3/4" Sample (gm)	NA	Weight of the Dry Specimen (gm)	566.98
Dry Weight - 3/4" Sample (gm)	46.0	Weight of minus #200 material (gm)	520.96
Wet Weight +3/4" Sample (gm)	NA	Weight of plus #200 material (gm)	46.02
Dry Weight + 3/4" Sample (gm)	0.00		
Total Dry Weight Sample (gm)	NA		

Sieve Size	Sieve Opening (mm)	Wgt. of Soil Retained (gm)	Percent Retained (%)	Accumulated Percent Retained (%)	Percent Finer (%)	Accumulated Percent Finer (%)
12"	300	0.00	0.0	0.0	100.0	100.0
6"	150	0.00	0.0	0.0	100.0	100.0
3"	75	0.00	0.0	0.0	100.0	100.0
2"	50	0.00	0.0	0.0	100.0	100.0
1 1/2"	37.5	0.00	0.0	0.0	100.0	100.0
1"	25.0	0.00	0.0	0.0	100.0	100.0
3/4"	19.0	0.00	0.0	0.0	100.0	100.0
1/2"	12.50	0.00	0.0	0.0	100.0	100.0
3/8"	9.50	0.00	0.0	0.0	100.0	100.0
#4	4.75	0.00	0.0	0.0	100.0	100.0
#10	2.00	1.18	0.2	0.2	99.8	99.8
#20	0.850	4.14	0.7	0.9	99.1	99.1
#40	0.425	4.78	0.8	1.8	98.2	98.2
#60	0.250	4.71	0.8	2.6	97.4	97.4
#140	0.106	17.65	3.1	5.7	94.3	94.3
#200	0.075	13.56	2.4	8.1	91.9	91.9
Pan	-	520.96	91.9	100.0	-	-

Tested By **TMS** Date **2/29/2008** Checked By **GEM** Date **3-7-08**