

October 4, 2011

Ms. Donna Wilson, Environmental Engineer
North Carolina Department of Environmental and Natural Resources
Permitting Branch, Solid Waste Section
1646 Mail Service Center
Raleigh, NC 27699

RE: Construction Quality Assurance Certification Report
WCA Waste Corporation Brownfield Road Landfill, Phase 2 A Expansion
NC DENR Permit #92-31
Wake County, North Carolina
JEI Project 824.1102.21, Task 01

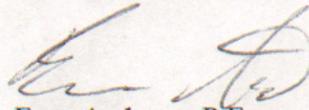
Dear Donna:

This letter is to certify that to the best of my knowledge and belief, the Phase 2A expansion of the WCA Waste Corporation Brownfield Road C&D Landfill has been constructed in conformance with the WCA Material Recovery, LLC, Permit #92-31, CDLF Phase 2A Permit to Construct Application.

The enclosed Certification Report presents an accumulation of field, laboratory, and other quality assurance data for the Phase 2A construction. It is our understanding that the enclosed construction quality assurance documentation was compiled in accordance with North Carolina Solid Waste Regulations, 15A NCAC 13B .0540 for C&D landfills and fulfills the submittal requirements listed in the Permit to Construct Application of Permit 92-31.

On behalf of WCA Waste Corporation of North Carolina, we would like to thank you in advance for your assistance in reviewing this Construction Quality Assurance Certification Report.

Sincerely,
JOYCE ENGINEERING, INC.

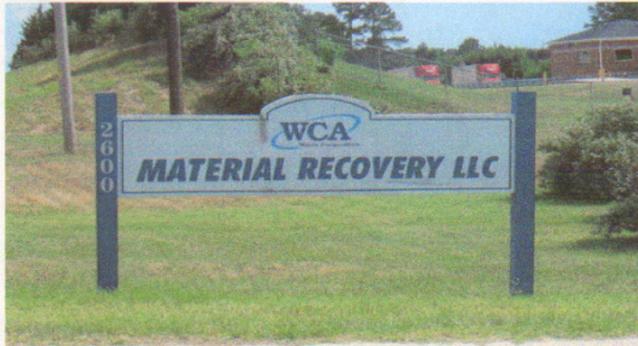


Evan Andrews, P.E.
Project Manager

Enclosure

Cc: Mr, Dennis Gehle, General Manager and Nick Marotta, Regional Engineer, w/ enclosure (WCA),
Hannu Kempainen, P.G., w/ enclosure (Joyce Engineering, Inc.)

Prepared for:
WCA Waste Corporation, Inc. of North Carolina
421 Raleigh View Road
Raleigh, North Carolina 27610



CONSTRUCTION QUALITY ASSURANCE CERTIFICATION REPORT

PHASE 2A CONSTRUCTION
BROWNFIELD ROAD C&D LANDFILL
NCDENR PERMIT # 92-31

September 2011

Prepared by:

JOYCE
ENGINEERING

2211 West Meadowview Road, Suite 101
Greensboro, NC 27407

JEI PROJECT NO. 824.1102.21, TASK 01

NC Corporate License: C-0782

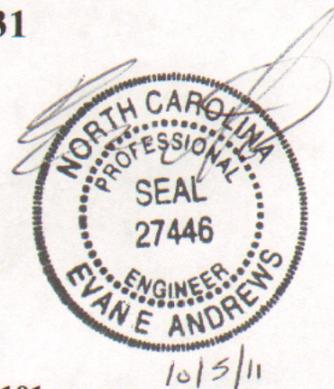


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1.0 INTRODUCTION

This report, prepared by Joyce Engineering, Inc. (JEI) on behalf of WCA Waste Corporation, Inc. of North Carolina (WCA), addresses the quality assurance procedures and activities performed during construction of the Phase 2A expansion at the Brownfield Road, Wake County, North Carolina Material Recovery facility. The documents comprising this report were compiled for the C&D landfill construction with North Carolina Solid Waste Management Regulations, 15A NCAC 13B and the Phase 2 Permit Modifications # 92-31.

Bentley Development Company, Inc. of Bentleyville, Pennsylvania was selected as the General Contractor and performed earthwork in the summer 2011 for the proposed Phase 2A excavation.

JEI provided third party construction quality assurance observations, basegrade soil materials laboratory testing and basegrade inspection. The soil testing was conducted at Geotechnics, Inc. laboratory in Raleigh, NC.

At the completion of the excavation and grading the constructed basegrade was surveyed on a 50-foot grid.

2.0 PROJECT DESCRIPTION

WCA had retained Bentley Development to construct the proposed Phase 2A C&D landfill expansion. The earthwork included clearing and grubbing the work area, excavating and hauling the material to a stockpile. Approximately 140,000 cubic yards (CY) of material was cut of which nearly 30,000 CY was rock.

Joyce Engineering, Inc. conducted periodic site visits to observe construction progress and keep WCA informed of the progress. The CQA site visit reports and photographic record are included in Appendix I; preconstruction meeting minutes are in Appendix II. At the end of the construction, a soil sample of the basegrade material was collected for laboratory analyses to classify and characterize the soil properties. The basegrade CQA record test results are included in Appendix III; and the Basegrade Inspection letter is in Appendix IV.

At the completion of the construction, Boundary Zone, Inc. of Apex North Carolina conducted a final basegrade survey. The survey record drawing is included in Appendix V.

3.0 CONSTRUCTION QUALITY ASSURANCE PROGRAM

3.1 Scope of Work

The scope of the work was to attend preconstruction meeting, provide periodic site visits to observe progress and document the construction activities. Basegrade soil sampling and laboratory testing of the soils for classification was conducted at the completion of the basegrade construction to meet the State regulatory requirements for C&D landfills.

3.2 Personnel

WCA had retained Joyce Engineering, Inc. to provide construction quality assurance during the Phase 2A expansion. A senior project consultant (Hannu Kemppinen) attended the preconstruction meeting, and visited the site in two week intervals to observe and document the work progress. A construction field representative (David Wright) of Geotechnics, Inc. collected the basegrade soil sample for laboratory testing for classification.

3.3 Earthwork

Bentley Development began the construction in early May 2011 by first clearing the nearly 5 acre Phase 2A expansion area and then grubbed the roots and stumps from the site. Bentley had mobilized a Volvo 460 excavator, two Volvo 40 articulated dump trucks and a CAT D8 dozer for the work. Rocks and boulders were excavated and hauled to a separate stockpile from the excavated soil. Resistant rocky material was drilled and blasted and the fragmented material stockpiled with the rest of the boulders. By end of July, 12 weeks after the beginning of the work, Bentley had excavated and graded the majority of the Phase 2A area. At this point in time, resistant rock remained in the middle of Phase 2A. WCA evaluated the cost of drilling and blasting the remaining rocky material and decided to leave this portion of rocky material in place. Soil from the stockpile was returned back to the excavated cell to cover the remaining rock. The soil was placed, compacted, and graded to form a modified floor and provide the required separation to rock.

The Phase 2A construction plan was for excavation with no fill anticipated. The areas where rock was encountered, and removed, were backfilled with the excavated site soil. The soil was placed in lifts and compacted. Proofrolling of the constructed cell floor was conducted to demonstrate the adequacy of compaction. A representative sample of the landfill foundation soil was collected in late July for laboratory index testing. The laboratory soil testing included: sieving analysis for grain size distribution and classification of the material; Atterberg Limits to analyze plasticity of the soil; specific gravity and standard Proctor to determine compaction characteristics of the soil. The CQA record test results are included in Appendix III.

DEVIATIONS FROM THE CONTRACT DOCUMENTS

4.1 General

The purpose of this section is to identify any deviation from the contract documents, which occurred during construction.

4.2 Adjustments to Basegrade Elevations

Bentley Development excavated and removed loose rocks and boulders during the landfill cell expansion construction. Resistant bedrock was drilled and blasted, and the fragmented rock hauled to a stockpile. By late July all of the Phase 2A area was cut and graded with the exception of some bedrock remaining in the middle of the cell. The rock was resistant to ripping and required drilling and blasting. WCA evaluated the cost benefits of removing the remaining rock against loss of landfill airspace, and a decision was made to leave the rock in place. Bentley hauled soil from the stockpile of excavated material back to the Phase 2A and covered the rock with soil. Soil was placed over the rock to provide the required four foot separation between rock and basegrade. Bentley Development further explored the mid-cell area for limits of the bedrock with the use of their drill rig. The exploration was conducted to verify depth to rock so that the final basegrade elevations would provide the required separation to bedrock. For the majority of the constructed Phase 2A the grades follow the original design elevations with the exception of the rock remaining above design basegrade elevations in the center of the cell. Grades that vary slightly on the east and west side slopes deviate from the design from a fraction of a foot but comply with the rules to provide separation to bedrock and groundwater.

The final survey record drawing included in Appendix V shows the modification to the basegrade.

END

APPENDIX I

SITE VISIT REPORTS AND PHOTOGRAPHIC RECORD



1. May 1, 2011 - South side access road to Phase 2A.



2. Phase 2A expansion area view from south side access road.



3. Phase 2A expansion area from south side access road.



4. Phase 2A expansion area seen from the north side.



1. May 10, 2011 - Phase 2A area cleared and grubbed and Bentley has begun excavation.



2. West end of Phase 2A after clearing and grubbing.



3. May 25, 2011 – Bentley excavating Phase 2A.



4. Survey stakes on Phase 2A floor indicate 14 to 16 foot cut.



5. Resistant bedrock requires drilling to remove rock within Phase 2A.



6. Rock stockpile from Phase 2A excavation.



1. June 8, 2011 Bentley Development continues Phase 2A excavation.



2. Contractor excavating southeast quadrant of Phase 2A.



3. Bentley estimates 9 feet of cut remains on the Phase 2A floor on the fore ground.



4. Challenges in rock removal.



5. Drilling of resistant bedrock continues.



6. Southwest corner of Phase 2A. At drilling location approximately 18 feet remains to cut.



1. June 23, 2011 – East end of Phase 2A excavation.



2. West end of Phase 2A.



3. East Slope Phase 2A graded.



4. North side of Phase 2A excavation continues.



1. Site visit July 7, 2011. Phase 2A floor appears to be at grade.



2. No survey stakes to read, but much of cell floor is near grade.



3. East Slope Phase 2A graded.



4. Work remaining includes rock removal, backfill and survey of final grades.



1. Site visit July 20, 2011. Phase 2A south side and floor appear to be at grade.



2. Rock removal remaining in the bottom of the new cell.



1. Site visit September 21, 2011. Proofrolling subgrade.



2. Fully loaded articulated truck enters the Phase 2A.



3. WCA demonstrated the constructed subgrade firmness.



4. Subgrade was observed firm without pumping.

APPENDIX II
MEETING MINUTES

WCA Waste Corporation, Raleigh Brownfield Road Landfill, Permit Number 92-31

April 6, 2011

Pre-Construction Meeting for the construction of phase 2 cell A.

Attendees:

WCA:

Nick Marotta

Dennis Gehle

NC DENR

Donna Wilson

Elizabeth Werner

John Patrone

Jason Watkins

Bentley Development

Phil Shumaker

John Brink

John Lee

Joyce Engineering, CQA

Hannu Kemppinen

Boundary Zone, Inc., Survey

Anthony DiBona

Discussion Items:

Safety

Bentley will supply a copy of Health and Safety Plan, Bentley will supply blasting plan; Nick Marotta will forward blasting plan to Elizabeth Werner for her review and approval. All chemicals brought on site will require an MSDS. Best Management practices will apply to storage of petroleum products and to prevention of stormwater pollution.

Permitting:

Donna Wilson reviewed with WCA personnel permit required items to commence construction and what is require for CQA report to obtain Permit to Operate for cell. WCA is responsible for following all permit conditions. Pictures will be included in the CQA report. WCA must update financial assurance before submitting the CQA report.

WCA is in the process of obtaining erosions and sediment (E&S) permit from Wake County. Permit is required before actual construction.

Schedule:

Bentley anticipates mobilization during the week of April 25, 2011. The project is expected to be about 12 weeks in duration.

CQA report consisting of as-built survey and appropriate soils testing will be submitted to NC-DENR.

Action Items:

Nick Marotta will obtain drawing in CADD and forward to surveyor and Bentley.

Nick Marotta will forward blasting plan to Elizabeth Werner.

Nick Marotta will send the revised plan drawing to Donna Wilson.

Questions or comments regarding this construction should be directed to Dennis Gehle, General Manager, or Nick Marotta, Region Engineer.

APPENDIX III
CQA RECORD TEST RESULTS

ATTERBERG LIMITS

ASTM D 4318-10 / AASHTO T89 (SOP - S4A)

Client	JOYCE ENGINEERING, INC.	Boring No.	NA
Client Reference	BROWNFIELD RD C&D LF PH2 PERMIT	Depth (ft)	NA
Project No.	2011-807-01	Sample No.	1
Lab ID	2011-807-01-01	Soil Description	TAN SILT

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

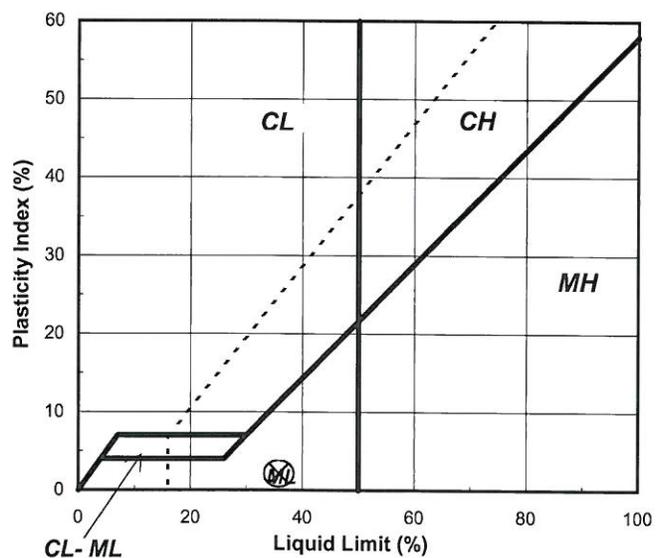
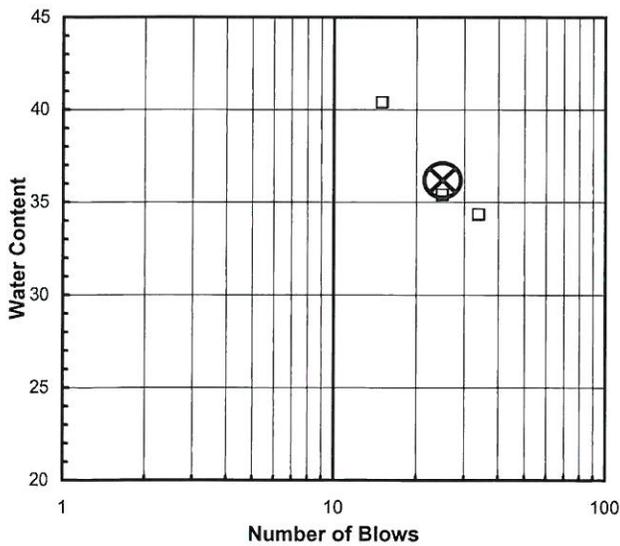
Liquid Limit Test	1	2	3	M U L T I P O I N T
Tare Number	V	O	Y	
Wt. of Tare & WS (gm)	25.70	24.03	25.42	
Wt. of Tare & DS (gm)	23.04	21.72	22.59	
Wt. of Tare (gm)	15.29	15.19	15.58	
Wt. of Water (gm)	2.7	2.3	2.8	
Wt. of DS (gm)	7.8	6.5	7.0	
Moisture Content (%)	34.3	35.4	40.4	
Number of Blows	34	25	15	

Plastic Limit Test	1	2	Range	Test Results
Tare Number	A-Q	A-M		Liquid Limit (%) 36
Wt. of Tare & WS (gm)	21.78	21.94		Plastic Limit (%) 34
Wt. of Tare & DS (gm)	20.18	20.23		Plasticity Index (%) 2
Wt. of Tare (gm)	15.45	15.33		USCS Symbol ML
Wt. of Water (gm)	1.6	1.7		
Wt. of DS (gm)	4.7	4.9		
Moisture Content (%)	33.8	34.9	-1.1	

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

Flow Curve

Plasticity Chart



Tested By SD Date 7/22/2011 Checked By GAM Date 7-25-11

page 1 of 1 DCN: CT-S4B DATE: 12/20/2006 REVISION: 3

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

Client	JOYCE ENGINEERING, INC.	Boring No.	NA
Client Reference	BROWNFIELD RD C&D LF PH2 PERMIT	Depth (ft)	NA
Project No.	2011-807-01	Sample No.	1
Lab ID	2011-807-01-01	Soil Color	TAN

USCS	SIEVE ANALYSIS		HYDROMETER
	gravel	sand	silt and clay



USCS Symbol SM, TESTED

USCS Classification SILTY SAND

Tested By SD Date 7/25/2011 Checked By *GAM* Date *7-25-11*

WASH SIEVE ANALYSIS

ASTM D 422-63 (SOP-S3)

Client	JOYCE ENGINEERING, INC.	Boring No.	NA
Client Reference	BROWNFIELD RD C&D LF PH2 PERMIT	Depth (ft)	NA
Project No.	2011-807-01	Sample No.	1
Lab ID	2011-807-01-01	Soil Color	TAN

Moisture Content of Passing 3/4" Material		Water Content of Retained 3/4" Material	
Tare No.	830	Tare No.	NA
Wgt. Tare + Wet Specimen (gm)	591.78	Wgt. Tare + Wet Specimen (gm)	NA
Wgt. Tare + Dry Specimen (gm)	564.02	Wgt. Tare + Dry Specimen (gm)	NA
Weight of Tare (gm)	258.30	Weight of Tare (gm)	NA
Weight of Water (gm)	27.76	Weight of Water (gm)	NA
Weight of Dry Soil (gm)	305.72	Weight of Dry Soil (gm)	NA
Moisture Content (%)	9.1	Moisture Content (%)	NA

Wet Weight - 3/4" Sample (gm)	NA	Weight of the Dry Specimen (gm)	305.72
Dry Weight - 3/4" Sample (gm)	217.2	Weight of minus #200 material (gm)	88.51
Wet Weight + 3/4" Sample (gm)	NA	Weight of plus #200 material (gm)	217.21
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	0.73	0.2	0.2	99.8	99.8
#10	2.00	16.21	5.3	5.5	94.5	94.5
#20	0.850	58.02	19.0	24.5	75.5	75.5
#40	0.425	49.89	16.3	40.8	59.2	59.2
#60	0.250	32.74	10.7	51.5	48.5	48.5
#140	0.106	46.65	15.3	66.8	33.2	33.2
#200	0.075	12.97	4.2	71.0	29.0	29.0
Pan	-	88.51	29.0	100.0	-	-

Tested By SD Date 7/25/2011 Checked By GEM Date 7-25-11

MOISTURE - DENSITY RELATIONSHIP

ASTM D698-07 SOP-S12

Client	JOYCE ENGINEERING, INC.	Boring No.	NA
Client Reference	BROWNFIELD RD C&D LF PH2 PERMIT	Depth (ft)	NA
Project No.	2011-807-01	Sample No.	1
Lab ID	2011-807-01-01		

Visual Description TAN SILTY SAND

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		4298
Volume of the Mold(cc)		941

Mold / Specimen

Point No.	1	2	3	4	5
Wt. of Mold & WS (gm)	6094	6161	6213	6219	6181
Wt. of Mold (gm)	4298	4298	4298	4298	4298
Wt. of WS	1796	1863	1915	1921	1883
Mold Volume (cc)	941	941	941	941	941

Moisture Content / Density

Tare Number	314	308	317	399	398
Wt. of Tare & WS (gm)	391.00	456.50	426.70	516.70	443.40
Wt. of Tare & DS (gm)	365.49	420.67	385.15	457.25	387.92
Wt. of Tare (gm)	84.50	111.40	85.70	86.70	84.30
Wt. of Water (gm)	25.51	35.83	41.55	59.45	55.48
Wt. of DS (gm)	280.99	309.27	299.45	370.55	303.62

Wet Density (gm/cc)	1.91	1.98	2.03	2.04	2.00
Wet Density (pcf)	119.1	123.5	127.0	127.4	124.8
Moisture Content (%)	9.1	11.6	13.9	16.0	18.3
Dry Density (pcf)	109.1	110.7	111.5	109.8	105.5

Zero Air Voids

Moisture Content (%)	18.0	20.0	23.0
Dry Unit Weight (pcf)	113.4	109.4	103.9

Tested By SD Date 7/22/2011 Checked By *GJM* Date 7-25-11

APPENDIX IV
BASEGRADE INSPECTION



Waste Industry Experts

Joyce Engineering, Inc.
2211 West Meadowview Rd
Suite 101
Greensboro, NC 27407

tel: **336/323-0092**
fax: **336/323-0093**

www.JoyceEngineering.com

September 22, 2011

Ms. Elizabeth Werner, Hydrogeologist
DENR-Division of Waste Management, Solid Waste Section
401 Oberlin Road, Suite 150
1646 Mail Service Center
Raleigh, NC 27611-1646

RE: WCA Waste Corporation Subtitle D Landfill
NCDENR Landfill Permit No. 92-31
Phase 2A Construction –Base Grade Inspection
JEI Project No. 824.1102.21.01

Dear Elizabeth:

On behalf of WCA Waste Corporation, Inc., Joyce Engineering is submitting this response to the solid waste Rule .0540(5) Construction Requirements for C&DLF Facilities which requires the Owner's engineer or geologist to inspect the base grade. WCA Landfill Permit, No. 92-31, Phase 2A was constructed during the summer of 2011. The purpose of this letter is to make the required notification on behalf of WCA.

On September 21, 2011 Hannu Kemppinen, P.G. (NC # 1490) conducted an inspection of the constructed Phase 2A base grades. The subgrade was prepared substantially in accordance with the design with the exception of resistant bedrock that was left in place and covered with soil to provide the required four foot separation between the base grade and rock. Beside the rock, the site exhibited no unusual geologic conditions that would be judged to impact the long-term stability of the waste disposal cell, or potential flow of Vadose waters and or groundwater.

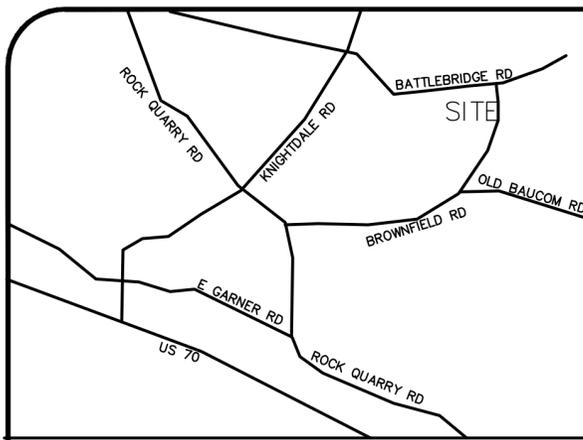
Sincerely,
JOYCE ENGINEERING, INC.

A handwritten signature in blue ink that reads "Hannu Kemppinen".

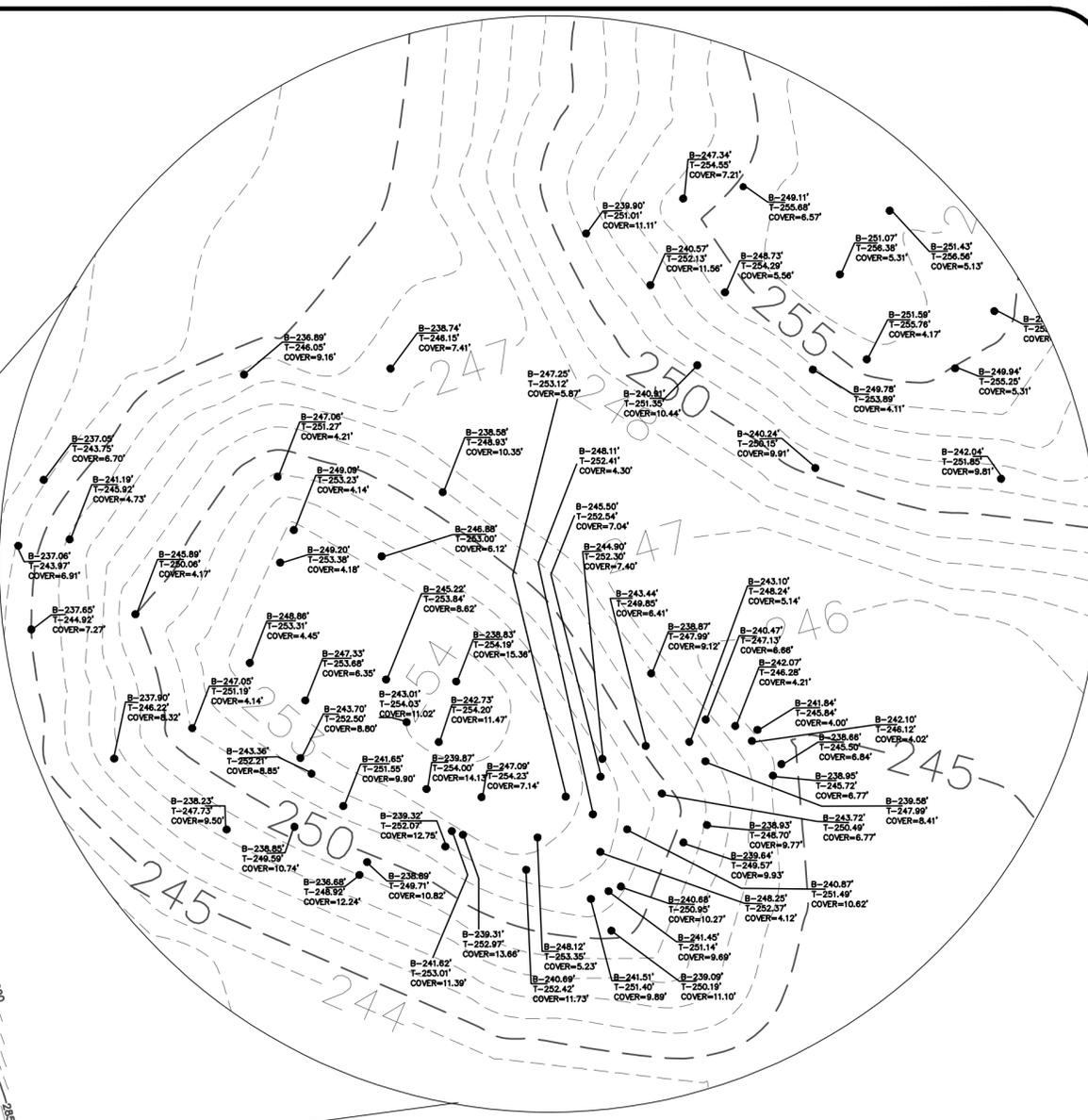
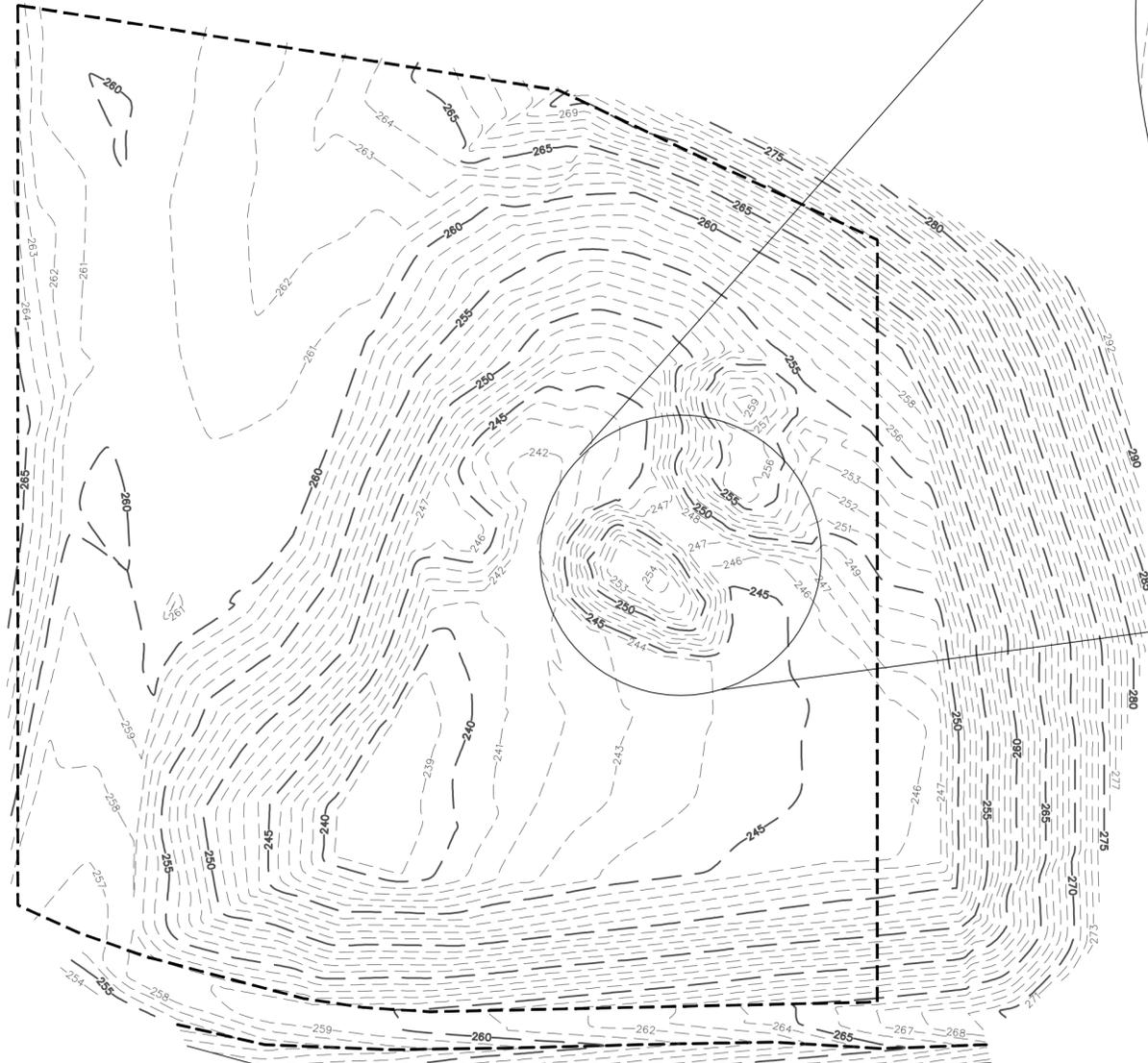
Hannu Kemppinen, P.G.
Senior Project Consultant

C: Dennis Gehle and Nick Marotta, WCA
Matt Fountain, JEI

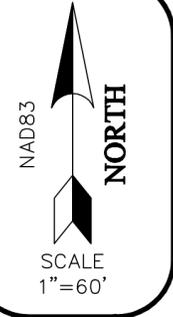
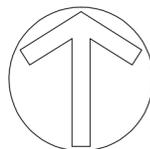
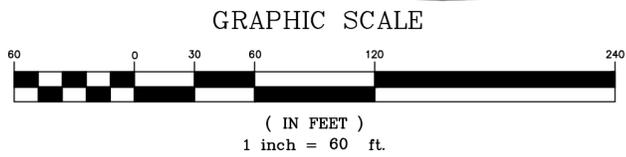
APPENDIX V
RECORD SURVEY DRAWING



VICINITY MAP
(NOT TO SCALE)



BLOW UP
NTS



FINAL TOPOGRAPHICAL SURVEY
 PREPARED FOR MATERIAL RECOVERY, LLC
 ST MARY'S TOWNSHIP,
 WAKE COUNTY, NORTH CAROLINA -8/25/11

I, ANTHONY S. DIBONA, CERTIFY THAT THIS PLAT WAS DRAWN UNDER MY SUPERVISION FROM AN ACTUAL SURVEY MADE UNDER MY SUPERVISION. WITNESS MY ORIGINAL SIGNATURE, REGISTRATION NUMBER AND SEAL THIS 25th DAY OF AUGUST, A.D., 2011.

SURVEYOR: ANTHONY S. DIBONA, PLS



FOR THE FIRM
 BOUNDARY ZONE, INC.
 FIRM NUMBER: C-3534

THIS SURVEY WAS MADE WITHOUT THE BENEFIT OF A CURRENT TITLE COMMITMENT. EASEMENTS AND ENCUMBRANCES MAY EXIST WHICH BENEFIT AND BURDEN THIS PROPERTY.

BOUNDARY
 zone, inc. LAND SURVEYING SERVICES
 APEX, NORTH CAROLINA: (919) 363-9226
 FAX: (919) 363-9228 WWW.BOUNDARYZONE.COM

APEX
 2205 CANDUN DRIVE SUITE C
 APEX, NORTH CAROLINA 27523
 ATLANTA
 235 PEACHTREE ST. NE, SUITE 800
 ATLANTA, GEORGIA 30303
BUFORD
 4195 SOUTH LEE STREET, SUITE 1
 BUFORD, GEORGIA 30518

PROJECT
 11033-01

SHEET
 1 OF 1