

Permit No.	Date	DIN
02-01	October 31, 2016	26950

RECEIVED

October 28, 2016

Solid Waste Section
Asheville Regional Office

**PERMIT APPLICATION
FOR
CONTINUED OPERATION**

**Alexander County
Construction and Demolition
Landfill Facility**

Permit Number: 02-01

**Site Location: 2500 Paynes Dairy Road
Taylorsville, NC 28681**

Applicant: Alexander County

**Applicant's Address:
621 Liledoun Road
Taylorsville, NC 28681**

G16134

October 2016

Submitted by the Garner Office of:

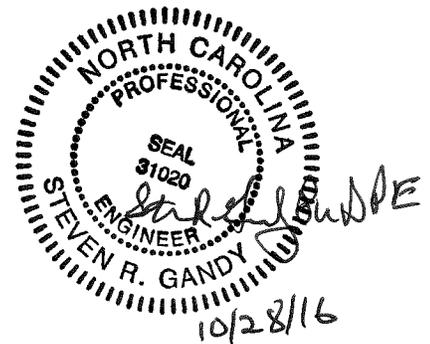


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SECTION 1.0

FACILITY PLAN

FACILITY PLAN

The Alexander County Construction and Demolition Landfill will be operated within and are covered under the Transition Plan. Groundwater and Gas will be monitored according to Subtitle D regulations through the existing monitoring systems.

The total air space available for Phases 2-9 is approximately 302,609 cubic yards.

SECTION 2.0

ENGINEERING PLAN

1.1 Analysis of the Facility Design and Landfill Capacity

The existing C&DLF unit is located a minimum of 50' from the property lines, 500' from existing wells, and 50' from any stream, river or lake, and the post settlement subbase elevation was prepared a minimum of four feet above the seasonal high groundwater table and bedrock.

The County will cap their landfill within 180 days after the final receipt of solid waste. The cap system will consist of 12 inches bridging material (temporary cover), 18 inches of soil liner with a permeability no greater than 1.0×10^{-5} cm/sec, and 18 inches of protective/erosive layer.

The cap contains gas venting system consisting of a series of washed stone trenches below the soil liner that will be vented through pipes that penetrate the cap. The cap system will also include the proper seeding and mulching of the erosive layer and other erosion control devices.

Landfill Capacity

The C&DLF Phase 2 will be a lateral expansion.

The Life Expectancy calculations were calculated for Phase 2 (3.6 acres) of development. The footprint of Phases 1-6 is approximately 10.6 acres in size and the footprint of Phases 7-9 is approximately 5.4 acres in size. Phases will vary in size due to the vertical expansion above the previously filled areas.

LIFE EXPECTANCY CALCULATIONS PHASE 2

Given:

Life expectancy based on actual air space used from FY 2015-2016, which was 5,629 cubic yards.

Life expectancy based on using 5,629 cubic yards the first year and the waste stream growing at a 2.1% rate which is the same annual rate the population had grown between 1990 and 2000.

Phase 2 = 38,304 cubic yards available = 6.80 years

Soil requirements for daily cover and final cap for Phase 2

Soil needed for Daily Cover (10:1, trash:soil) = 3,483 cubic yards
Soil needed for Closure Phases 1-2 (10.6 acres) = 68,405 cubic yards

Soil requirements for daily cover and final cap for Phases 3-9 (Proposed 264,393 cubic yards of waste)

Soil needed for Daily Cover (10:1, trash:soil) = 24,036 cubic yards
Soil needed for Closure Phases 3-9 (8.8 acres) = 56,789 cubic yards

Overall Soil Requirements = 152,713 cubic yards (soil needed for closure, and daily cover)

C & D - ACTIVE/INACTIVE PHASING TABLE

PHASE	WASTE FOOTPRINT (ACRE)	GROSS CAPACITY (CUBIC YARDS)	STATUS
1	4	130,296 **	ACTIVE AND PERMITTED
2	3.6*	38,304	NEW PTO REQUESTED
3	3.42	37,345	TO BE DEVELOPED
4	VERTICAL EXPANSION	34,907	TO BE DEVELOPED
5	VERTICAL EXPANSION	43,012	TO BE DEVELOPED
6	VERTICAL EXPANSION	49,597	TO BE DEVELOPED
7	1.59	40,500	TO BE DEVELOPED
8	1.76	36,250	TO BE DEVELOPED
9	2.08	22,782	TO BE DEVELOPED
TOTAL	16	373,961	
<p>* Phase 2 acreage overlaps Phase 1 by 0.45 acres due to tie-in with existing fill. ** Total waste in place as of 2014-2015 F.Y.</p>			

Note: All air space and soil calculation were determined by Autodesk Land Development computer program.

The estimate of maximum inventory of C&D wastes on-site over the life to date of the landfill facility is 50,009 tons.

Estimated schedule of closure will be approximately 47 years (Phases 1-9).

SECTION 3.0

**OPERATION
PLAN**

3.1 Introduction

Alexander County will continue to operate a Construction and Demolition Landfill (C&DLF) within the permitted boundaries and upon closed sections of the present municipal solid waste landfill. The section are limited to areas that stopped receiving waste in 1998 and have two feet of final cover.

The C&D Landfill will receive the following solid waste:

1. 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, etc.;
2. Inert debris from any source that is defined as solid waste which consists solely of material that is virtually inert, such as brick, concrete, rock and clean soil;
3. Asphalt in accordance with G.S. 130-294(m);
4. Construction and demolition debris defined as solid waste resulting solely from construction, remodeling, repair or demolition operations on pavement, buildings or other structures (includes glass, vinyl, plastic, laminates, plumbing fixtures, etc.);
5. Construction materials, that could or would be part of any construction, remodeling, repair or demolition of pavement, buildings or other structures, from industrial and/or commercial sources within the County such as, but not limited to, shingles from shingle manufacturers, mobile home debris from mobile home manufacturers, lumber from lumber yards, scrap materials from cabinet manufacturing facilities and furniture, pre-fabricated building structure components such as joists and any other scrap materials; and,
6. Pallets from any source.

Yard Waste 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 a permitted Yard Waste Composting Area.

Soil cover will be placed at least once a week. (See cover requirements under operational requirements).

The County will implement a program at the landfill for detecting and preventing the disposal of hazardous and liquid wastes. The program consists of random inspection of incoming loads at a minimum of 1% of the weekly traffic. Landfill personnel will be trained to recognize hazardous and liquid wastes. Records will be kept on the training and the inspections.

The County will monitor for explosive gases at landfill structures and the perimeter of the landfill. The concentration of methane gases generated by the landfill cannot exceed 25 percent of the lower explosive limit for methane in the structures, and it cannot exceed 100 percent of the lower explosive limit for methane of the landfill property boundary. If methane gas is found to exceed the acceptable limits at either the property boundary or landfill structures, it is the County's responsibility to do the following:

1. Immediately take all necessary steps to ensure protection of human health, i.e. no smoking, temporarily abandon the structure and notify the Division of Solid Waste Management.
2. Within seven days of detection, place in the operating record the methane gas levels detected and a description of the steps taken to protect human health; and
3. Within 60 days of detection, implement a remediation plan for the methane gas releases, place a copy of the plan in the operating record, and notify the Division of Solid Waste management that the plan has been implemented. The plan will describe the nature and extent of the problem and the proposed remedy.

Off and on site erosion will be controlled through erosion control structures and devices. Provisions for a vegetative ground cover sufficient to restrain erosion will be accomplished within 30 working days or 120 calendar days upon completion of any phase of landfill development.

The County will record and retain at the landfill an operating record of the following information:

- (1) Inspection records, waste determination records, and training procedures;
- (2) Amounts by weight of solid waste received at the landfill;
- (3) Gas monitoring results and any remediation plans;
- (4) Any demonstration, certification, findings, monitoring, testing or analytical data required for surface and groundwater monitoring;
- (5) Any monitoring, testing or analytical data required for closure or post-closure;
- (6) Any cost estimates and financial assurance documentation.

All information contained in the operating record will be furnished upon request to the Division of Solid Waste Management or be made available at all reasonable times for inspection by the Division.

Ground and surface water will be sampled and analyzed according to Subtitle D Appendix I detection monitoring requirements. The monitoring frequency for all Appendix I detection monitoring constituents will be at least semiannual during the life of the facility (including closure) and the post-closure period. A minimum of four independent samples from each well (background and downgradient) will be collected and analyzed for the Appendix I constituents during the first semiannual sampling event. At least one sample from each well (background and downgradient) will be collected and analyzed during subsequent semiannual sampling events.

If the County determines that there is a statistically significant increase over background for one or more of the constituents listed in Appendix I at any monitoring well at the relevant point of compliance, the County will, within 14 days of the finding, report to the Division of Solid Waste and place a notice in the operating record indicating which constituents have shown statistically significant changes from background levels. The County will establish an assessment monitoring program within 90 days. The County may demonstrate that a source other than the landfill caused the contamination or that the statistically significant increase resulted from an error in sampling, analysis, statistical evaluation, or natural variation in ground-water quality. A report documenting these demonstrations will be certified by a Licensed Geologist or Professional Engineer and approved by the Division of Solid Waste. A copy of this report will be placed in the operating record. If a successful demonstration is made, documented, and approved by the Division, the County may continue detection monitoring. If after 90 days, a successful demonstration is not made, the County will initiate an assessment monitoring program.

3.2 Operational Requirements

1. Waste Acceptance and Disposal Requirements
 - a. The Construction and Demolition Landfill (C&DLF) will only accept those solid wastes which it is permitted to receive. The County will notify the Division within 24 hours of attempted disposal of any waste the landfill is not permitted to receive.
 - b. Asbestos waste will be managed in accordance with 40 CFR 61. The regulated asbestos waste will be covered immediately with soil in a manner that will not cause airborne conditions and will be disposed of separate and apart from other solid waste, as:
 - i. in a defined isolated area within the foot print of the landfill, or
 - ii. in an area not contiguous with other disposal areas. Separate areas will be designated so that asbestos will not be exposed by future land-disturbing activities.
 - c. Wastewater treatment sludges may be accepted, with the approval of the Division, either as a soil conditioner incorporated into or applied onto vegetative growth layer. The wastewater treatment sludge will neither be applied at greater than agronomic rates nor to a depth greater than six inches.
 - d. The following wastes are prohibited from disposal at the C&DLF:
 - i. Containers such as tubes, drums, barrels, tanks, cans, and bottles unless they are empty and perforated to ensure that no liquid, hazardous or municipal solid waste is contained therein.
 - ii. Garbage as defined in G.S. 130A-290(a)(7).
 - iii. Hazardous waste as defined in G.S. 130A-290(a)(8), to also include hazardous waste from conditionally exempt small quantity generators.
 - iv. Industrial solid waste unless a demonstration has been made and approved by the Division that the landfill meets the requirements of Rule .0503(2)(d)(ii)(A).
 - v. Liquid wastes.
 - vi. Medical waste as defined in G.S. 130A-290(a)(18)
 - vii. Municipal solid waste as defined in G.S. 130A-290(a)(18a)
 - viii. Polychlorinated biphenyls (PCB) wastes as defined in 40 CFR 761
 - ix. Radioactive waste as defined in G.S. 104E-5(14)
 - x. Septage as defined in G.S. 130A-290(a)(32)
 - xi. Sludge as defined in G.S. 130A-290(a)(34)
 - xii. Special waste as defined in G.S. 130A-290(a)(40)
 - xiii. White goods as defined in G.S. 130A-290(a)(44)
 - xiv. Yard trash as defined in G.S. 130A-290(a)(45)

- e. The following waste will not be received if separate from C&DLF waste: lamps or light bulbs including but not limited to halogen, incandescent, neon or fluorescent; lighting ballast or fixtures; thermostats and light switches; batteries including but not limited to those from exit and emergency lights and smoke detectors; lead pipes; lead roof flashing; transformers; capacitors; and copper chrome arsenate (CCA) and creosote treated woods.
- f. Waste accepted for disposal in the C&DLF unit shall be readily identifiable as C&D waste and must not have been shredded, pulverized, or processed to such an extent that the composition of the original waste cannot be readily ascertained except in the case where the waste has come from a permitted recycling and reuse facility.
- g. The County will not knowingly dispose any type or form of C&D waste that is generated within the boundaries of a unit of local government that by ordinance:
 - i. Prohibits generators or collectors of C&D waste from disposing that type or form of C&D waste.
 - ii. Requires generators or collectors of C&D waste to recycle that type or form of C&D waste.

2. Cover material requirements.

- a. Except as in Subparagraph (c), the County must cover the solid waste with six inches of earthen material when the waste disposal area exceeds one-half acre and at least once weekly. Cover must be placed at more frequent intervals if necessary to control disease vectors, fires, odors, blowing litter and scavenging. A notation of the date and time of the cover placement must be recorded in the operating record, as specified in Paragraph 10 in this section.
- b. Except as in Subparagraph (c), areas which will not have additional wastes placed on them for three months or more, but where final termination of disposal operations has not occurred, will be covered and stabilized with vegetative ground cover or other stabilizing material.
- c. Alternative material or an alternative thickness of cover may be used, if the County demonstrates that the alternative material or thickness controls disease vectors, fires, odors, blowing litter, and scavenging without presenting a threat to human health and the environment, and is approved by the Division.

3. Spreading and compacting requirements.

- a. C&DLF units will restrict solid waste to the smallest area feasible.
- b. Solid waste will be compacted as densely as practical into cells.
- c. Fencing and/or diking will be provided within the area to confine solid waste which is subject to be blown by the wind. At the conclusion of each operating day, all windblown material resulting from the operation will be collected and disposed of by the County.

4. Disease vector control
 - a. The County will prevent or control on-site populations of disease vectors using techniques appropriate for protection of human health and the environment.
 - b. "Disease vectors" means any rodents, flies, mosquitoes, or other animals, including insects, capable of transmitting disease to humans.
5. Air Criteria and Fire Control
 - a. The County will ensure that the units do not violate any applicable requirements developed under a State Implementation Plan (SIP) approved or promulgated by the U.S. EPA Administrator pursuant to Section 110 of the Clean Air Act, as amended.
 - b. Open burning of solid waste, except for the approved burning of land clearing debris generated on-site or debris from emergency clean-up operations, is prohibited at all C&DLF facilities. Prior to any burning a request will be sent to the Division for review. The Division will determine the burning to be approved if it is one of two types of burning previously referenced. A notation of the date of approval and the name of the Division personnel who approved the burning must be included in the operating record.
 - c. Equipment will be provided to control accidental fires and arrangements will be made with the local fire protection agency to immediately provide fire-fighting services when needed.
 - d. Fires and explosions that occur at the C&DLF require verbal notice to the Division within 24 hours and written notification within 15 days. Written notification must include the suspected cause of fire or explosion, the response taken to manage the incident, and the action(s) to be taken to prevent the future occurrence of fire or explosion.
6. Access and safety requirements
 - a. The C&DLF will be adequately secured by means of gates, chains, beams, fences and other security measures approved by the Division of Solid Waste Management to prevent unauthorized entry.
 - b. An attendant will be on duty at the site at all times while it is open for public use to ensure compliance with operational requirements.
 - c. The access road to the site will be of all-weather construction and maintained in good condition.
 - d. Dust control measures will be implemented when necessary. If dust problems should arise, the County will use any reasonable means necessary to reduce it. At a minimum the County will spray water on necessary areas.
 - e. Signs providing information on tipping or disposal procedures, the hours during which the site is open for public use, the permit number and other pertinent information will be posted at the site entrance.
 - f. Signs will be posted stating that no hazardous or liquid waste can be received.
 - g. Traffic signs or markers will be provided as necessary to promote an orderly traffic pattern to and from the discharge area and to maintain efficient operating conditions.
 - h. The removal of solid waste from the C&DLF will be prohibited unless the County has included in its operational plan a recycling program which has been approved by the Division. The general public is prohibited from removal activities on the working face.

7. Erosion and Sedimentation Control Requirements

- a. Adequate sediment control measures (structures or devices), will be utilized to prevent silt from leaving the landfill.
- b. Adequate sediment control measures (structures or devices), will be utilized to prevent excessive on-site erosion.
- c. Provisions for a vegetative ground cover sufficient to restrain erosion will be accomplished within 30 working days or 120 calendar days upon completion of any phase of landfill development.

8. Drainage Control and Water Protection Requirements

- a. Surface water will be diverted from the operational area and will not be impounded over waste.
- b. Solid waste will not be disposed of in water.
- c. Leachate will be contained on site and properly treated prior to discharge.
- d. The landfill will not:
 - (i) Cause a discharge of pollutants into waters of the United States, including wetlands, that violates any requirements of the Clean Water Act, including, but not limited to, the National Pollutant Discharge Elimination System (NPDES) requirements pursuant to Section 402.
 - (ii) Cause the discharge of a nonpoint source of pollution to waters of the United States, including wetlands, that violates any requirements of an area-wide or state-wide water quality management plan that has been approved under Section 208 or 319 of the Clean Water Act, as amended.

9. Survey for Compliance

Within 60 days of a permittee's receipt of the Division's written request, the permittee will have a survey conducted of active and/or closed portions of the unit(s) at the facility in order to determine whether operations are being conducted in accordance with the approved design and operation plans. The permittee must report the results of the survey, including a map produced by the survey, to the Division within 90 days of receipt of the Division's request.

- a. A survey shall be required by the division:
 - (i) If there is reason to believe that the operations are being conducted in a manner that deviates from the plan listed in the effective permit, or
 - (ii) As verification that operations are being conducted in accordance with the plan listed in the effective permit.
- b. Any survey pursuant to this Paragraph must be performed by a professional land surveyor duly authorized under North Carolina law to conduct such activities.

10. Record keeping Requirements

- a. The County will record and retain at the facility, or an alternative location near the facility approved by the Division of Solid Waste Management, in an operating record the following information as it becomes available.
 - (i) Inspection records, waste determination records, and training procedures;
 - (ii) Amounts by weight of solid waste received at the landfill to include source of generation.
 - (iii) Any demonstration, certification, findings, monitoring, testing or analytical data required for surface, groundwater and gas monitoring;
 - (iv) Any monitoring, testing, or analytical data required for closure or post-closure;
 - (v) Any cost estimates and financial assurance documentation;
 - (vi) Notation of date and time of placement of cover material; and,
 - (vii) All audit records, compliance records and inspection reports.
- b. All information contained in the operating record will be furnished to the Division of Solid Waste Management according to the permit or upon request, or be made available for inspection by the Division.
- c. The operating record will also include a copy of the approved operation plan and all required permits.

SECTION 4.0

**CLOSURE
PLAN**

4.1 Closure Costs

The largest area to be closed within the permitted life will be 7.15 Ac. Post Closure will be 30 years after closure.

Closure Costs:

Closure will consist of the following which costs are estimated as being done by a third party.

1. 18" of 1×10^{-5} cm/sec. soil cover;
2. Erosion Control Devices;
3. 18" Erosive layer;
4. Seeding and Mulching;
5. Mobilization/Demobilization;
6. Labor Costs; and
7. Stone for methane gas collection.
8. Geotextile for methane gas collection.
9. Vent pipes for methane gas collection.
10. Engineering Costs and QA/QC of the Composite liner and certification of closure.

Estimate of Probable Costs:

1. 18" of 1×10^{-5} cm/sec. soil cover for 7.15 acres:
Total yardage + 15% = 19,898 yd³ @ a cost of \$10.00/yd³
∴ Cost = \$198,980
2. Erosion Control devices
Estimated costs @ \$84,000
∴ Cost = \$84,000
3. 18" Erosive soil layer for 7.15 acres.
Total yardage + 15% = 19,898 yd³ @ a cost of \$4.50/yd³
∴ Cost = \$89,541
4. Seeding and Mulching for 7.15 acres.
Estimated cost of \$2,235/acre
∴ Cost = \$15,980
5. Mobilization/Demobilization.
Estimated cost of \$195,000
6. Labor Costs.
Estimated cost of \$223,500
∴ Cost = \$223,500

7. Stone for methane gas collection.

Total estimated linear feet =905 ft.

Total estimated volume for a 2'x1' trench = 1,810 ft³

with a density of 120 lbs/ft³ total weight =109 tons @ a cost of \$28.00/ton

∴ Cost = \$2,725

8. Geotextile for methane gas collection.

Total estimated linear feet = 320 ft.

Total estimated perimeter for a 2'x1' trench =

(320 ft × 6 ft)=1,920 ft² @ a cost of \$0.25/ ft²

∴ Cost = \$480

9. Vent pipes for methane gas collection.

Estimated cost @ \$600.00 each (4 vents).

∴ Cost = \$2,400

10. Engineering Costs and QA/QC of the Composite liner and certification of closure.

Estimated cost = \$223,500

∴ Cost = \$223,500

Total of Estimated Closure Costs:

1.	\$	198,980
2.	\$	84,000
3.	\$	89,541
4.	\$	15,980
5.	\$	195,000
6.	\$	223,500
7.	\$	2,725
8.	\$	480
9.	\$	2,400
10.	\$	223,500
Total:		\$ 1,036,106

SECTION 5.0

**POST-CLOSURE
PLAN**

5.1 Post Closure Costs

The largest closed area, to be monitored within the post closure life will be 7.15 acres.

Post Closure Costs:

Methane gas, ground water and surface water will be monitored for 30 years after closure. The cap will also have to be monitored for the 30 year period. All costs include reports, data analysis, and certifications.

1. Ground and Surface Water monitoring semiannually for 30 years for appendix I constituents and statistical analysis.
Estimated cost/sample = \$940.00/sample
Total annual samples = 2(15 wells + 3 surface) = 36 samples/year
Estimated cost = 30 years x 36 samples/year x \$940.00/sample =

∴ Cost = \$1,015,200

2. Methane Gas monitoring quarterly for 30 years.
Estimate \$600.00/quarter = \$2,680.00/year
Estimated cost = 30 year x \$2,680.00 = \$80,400.00

∴ Cost = \$80,400.00

3. Cap Monitoring and repairing any problems.
Estimate \$111,750 for the 30 years.

∴ Cost = \$111,750

4. Closure of sedimentation and erosion control devices.
Estimate \$26,820.00 for closure

∴ Cost = \$26,820

5. Maintenance of gas vents, monitoring wells, etc.
Estimate \$67,000

Total of Estimated Post Closure Costs:

1.	\$1,015,200
2.	\$ 80,400
3.	\$ 111,750
4.	\$ 26,820
5.	<u>\$ 67,000</u>

Total: \$1,301,170

Potential Assessment and Corrective Action (PACA) = \$2,256,619.00

5.2 Corrective Action Plan Cost Estimate for C&D Landfill on top of the Closed MSW Landfill

The corrective action plan consisted of buying adjoining property to expand the buffer, plant hybrid willow trees and install methane extraction system to remediate the contaminate plume. The adjoining property has been purchased, willow trees planted and methane gas extraction system installed. Additional sampling is being done at the same time as the semiannual sampling. The remaining costs are maintenance and continued sampling.

Corrective Action Plan Costs:

1. Purchase of adjacent property - \$0
2. Hybrid Willow Trees - \$0
3. Installation and maintenance of willow trees - \$1,000
4. Additional Sampling and Analysis of Groundwater - \$40,000
5. Installation and Operation of a Methane Extraction System - \$5,000

Total Estimated Corrective Action Plan Costs:

1.	\$0
2.	\$0
3.	\$1,000
4.	\$40,000
5.	<u>\$5,000</u>
Total:	\$46,000

APPENDIX A

FACILITY/OPERATION/CLOSURE DRAWINGS

ALEXANDER COUNTY CONSTRUCTION AND DEMOLITION LANDFILL FACILITY FACILITY / OPERATION / CLOSURE PLAN

Permit Number: 02-01

Site Location: 2500 Paynes Dairy Road
Taylorsville, NC 28681

Applicant: Alexander County

Applicant's Address: 621 Liledoun Road
Taylorsville, NC 28681

BOARD OF COMMISSIONERS

Ryan Mayberry - Chairman
Milton Campbell
Josh Hail
Ronnie Reese
Larry Yoder

COUNTY MANAGER

Rick French

SOLID WASTE DIRECTOR

Josh Mitchell

Engineer
Municipal Engineering Services Company, P.A.
Garner, NC - Boone, NC



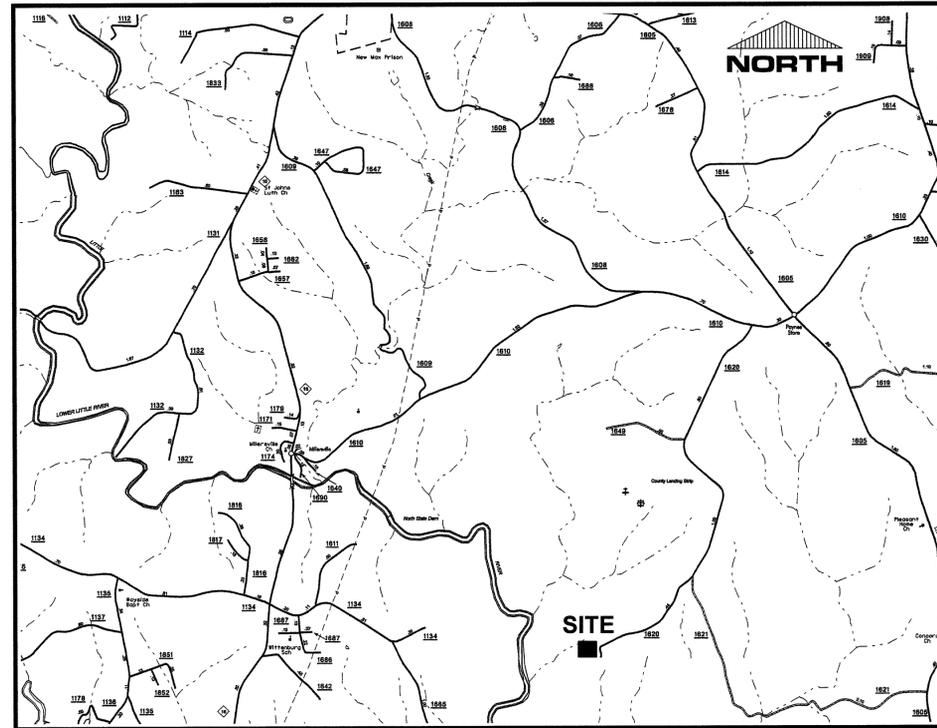
by _____
Professional Engineer
(Garner Office)



SCALE:	1:1
DATE:	10/7/2016
DRWN BY:	L. CRAWFORD
CHKD BY:	S. GANDY
PROJECT NUMBER	G16134
DRAWING NO.	T1
SHEET NO.	1 OF 8

INDEX

SHEET NO.	DRAWING NO.	DESCRIPTION
1	T1	TITLE SHEET
2	T2	INDEX AND VICINITY MAP
3	P1	EXISTING CONDITIONS AS OF 6/10/2016
4	P2	PHASES 2 AND 3 FILL PLAN
5	P3	PHASES 4 AND 5 FILL PLAN
6	P4	PHASES 4 AND 5 FILL PLAN
7	P5	PHASES 6-9 FILL PLAN
8	D1	CLOSURE DETAILS



VICINITY MAP



CONSTRUCTION & DEMOLITION
LANDFILL FACILITY
ALEXANDER COUNTY
NORTH CAROLINA

Municipal Services
P.O. BOX 87, GARNER, N.C. 27539
(919) 772-5393
LICENSE NUMBER: C-0281

Engineering Company, P.A.
P.O. BOX 349, BOONE, N.C. 28607
(828) 262-1767
LICENSE NUMBER: C-0281

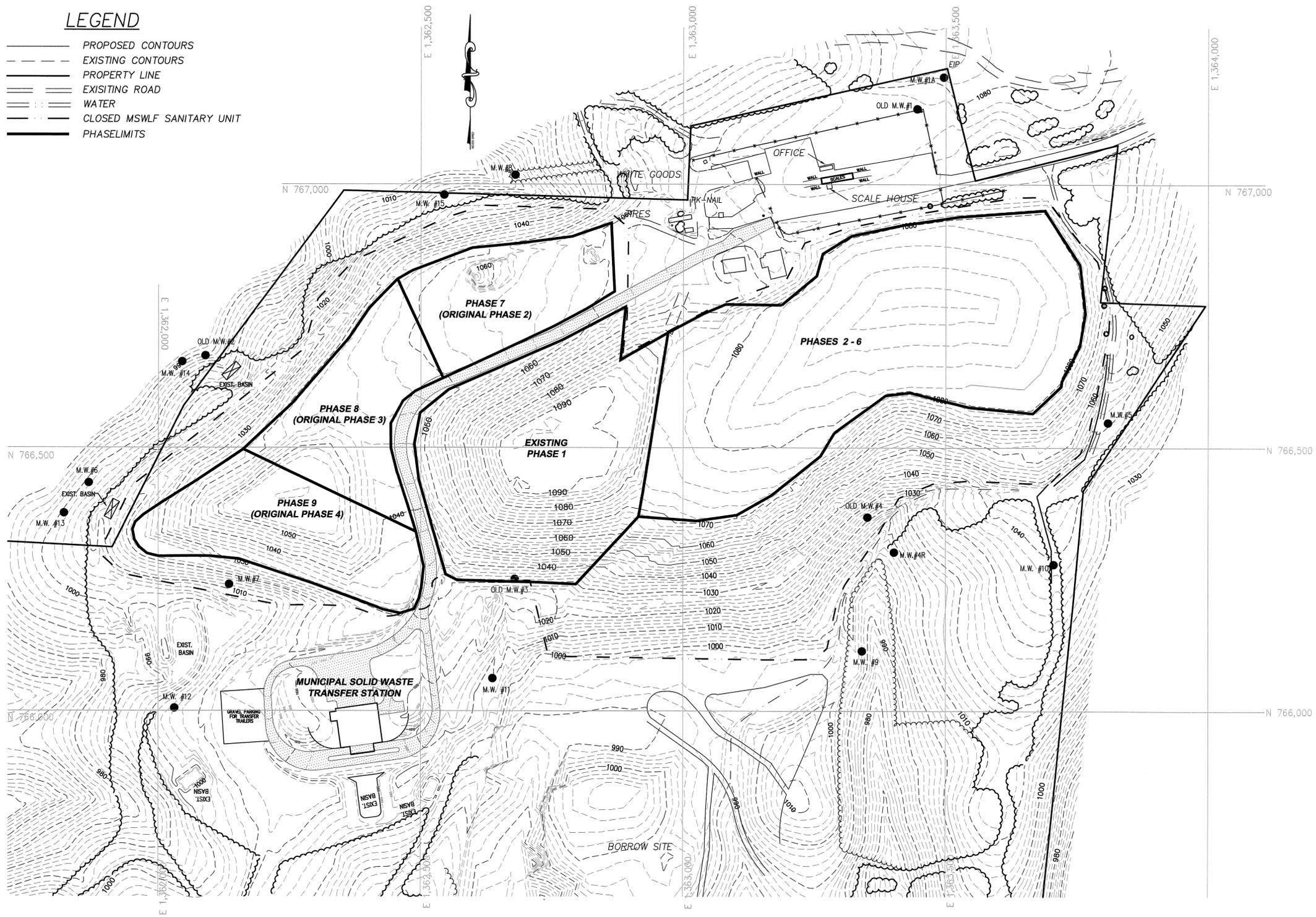
DATE	BY	REV.	DESCRIPTION

SCALE: 1:1
DATE: 10/7/2016
DRWN. BY: L. CRAWFORD
CHKD. BY: S. GANDY
PROJECT NUMBER: G16134
DRAWING NO. T2 SHEET NO. 2 OF 8

INDEX AND VICINITY MAP

LEGEND

- PROPOSED CONTOURS
- - - EXISTING CONTOURS
- PROPERTY LINE
- EXISTING ROAD
- WATER
- CLOSED MSWLF SANITARY UNIT
- PHASE LIMITS



10/28/16

Engineering Company, P.A.

P.O. BOX 349 ROONE, N.C. 28607
(828) 262-1767

Municipal Services

P.O. BOX 97 GARNER, N.C. 27539
(919) 772-5393

LICENSE NUMBER: C-0281

**CONSTRUCTION & DEMOLITION
LANDFILL FACILITY
ALEXANDER COUNTY
NORTH CAROLINA**

DATE	BY	REV.	DESCRIPTION

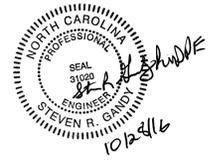
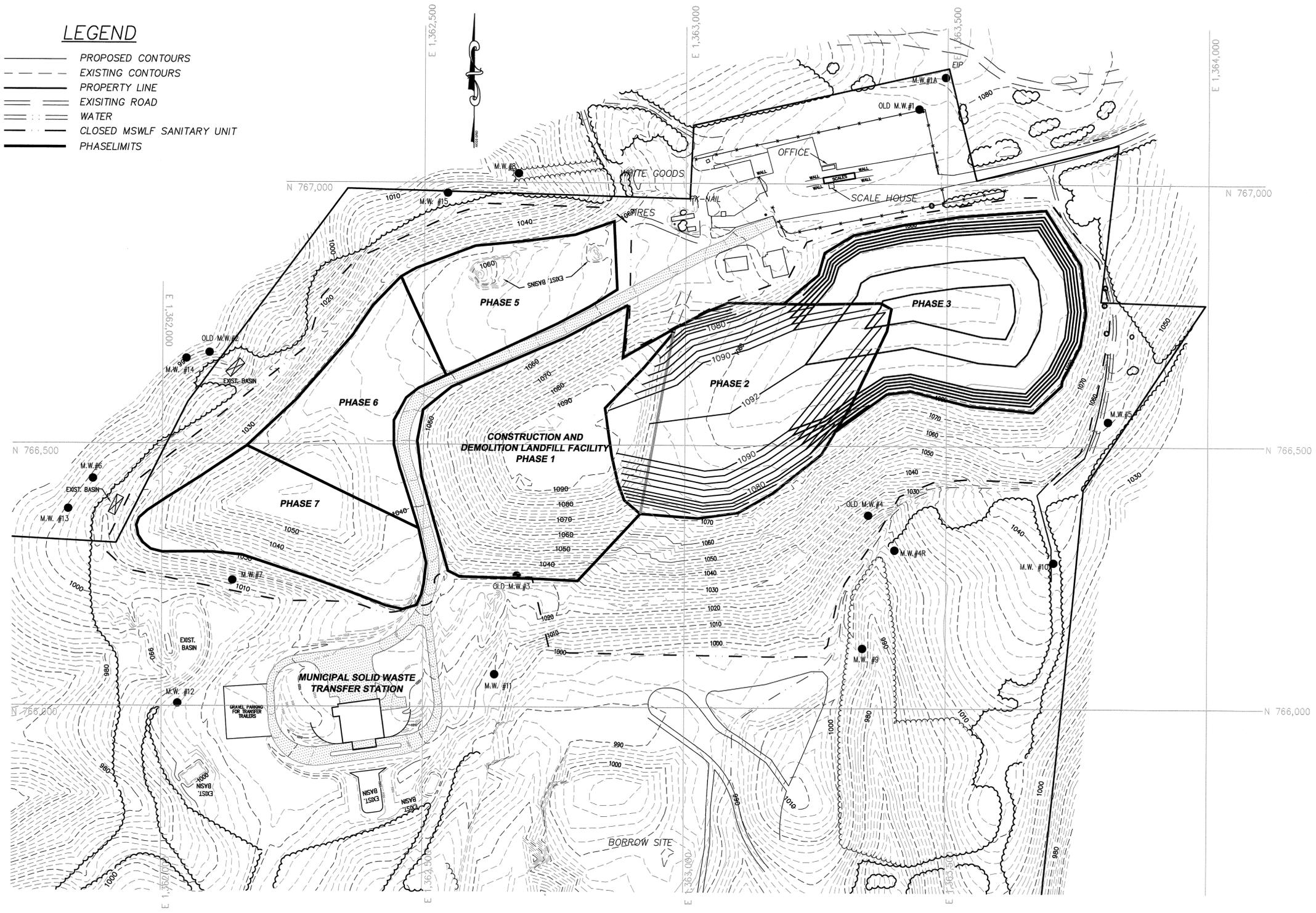
FACILITY/OPERATION/CLOSURE PLANS
EXISTING CONDITIONS AS OF 6/7/2016

SCALE: 1" = 100'
DATE: 10/13/2016
DRWN. BY: L. CRAWFORD
CHKD. BY: S. GANDY

PROJECT NUMBER
G16134

DRAWING NO. P1 SHEET NO. 3 OF 8

- LEGEND**
- PROPOSED CONTOURS
 - - - EXISTING CONTOURS
 - PROPERTY LINE
 - EXISTING ROAD
 - WATER
 - CLOSED MSWLF SANITARY UNIT
 - PHASE LIMITS



**CONSTRUCTION & DEMOLITION
LANDFILL FACILITY
ALEXANDER COUNTY
NORTH CAROLINA**

FACILITY/OPERATION/CLOSURE PLAN
PHASES 2 AND 3 FILL PLAN

SCALE:	1" = 100'
DATE:	10/13/2016
DRWN. BY:	L. CRAWFORD
CHKD. BY:	S. GANDY
PROJECT NUMBER:	G16134
DRAWING NO.:	P2
SHEET NO.:	4 OF 8

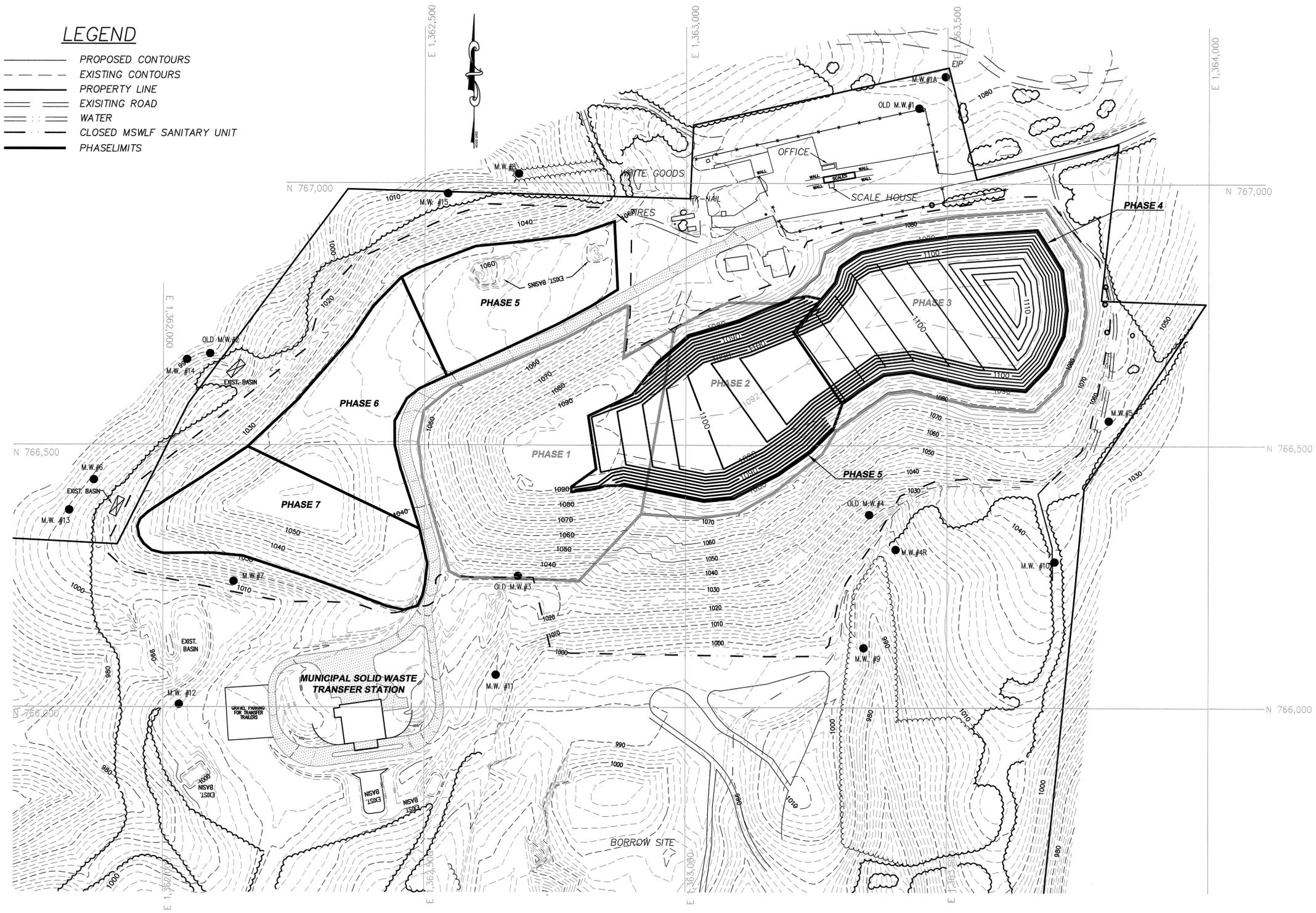
Municipal Services

Engineering Company, P.A.

P.O. BOX 97 GARNER, N.C. 27529
P.O. BOX 349 BOONE, N.C. 28607
(919) 772-5393
(828) 262-1767
LICENSE NUMBER: C-0281

P:\SolidWaste\G16134-Alexander Co C&D Permit Renewal.dwg\G16134-04.dwg, 10/24/2016 2:27:47 PM, l.crawford, HP, DesignJet T830 MFP PCL3

- LEGEND**
- PROPOSED CONTOURS
 - - - EXISTING CONTOURS
 - PROPERTY LINE
 - EXISTING ROAD
 - WATER
 - CLOSED MSWLF SANITARY UNIT
 - PHASE LIMITS



Engineering Company, P.A.
 P.O. BOX 349 BOONE, N.C. 28607
 (828) 262-1767
 LICENSE NUMBER: C-0281

Municipal Services
 P.O. BOX 97 GARNER, N.C. 27539
 (919) 772-5393

**CONSTRUCTION & DEMOLITION
 LANDFILL FACILITY
 ALEXANDER COUNTY
 NORTH CAROLINA**

DATE	BY	REV.	DESCRIPTION

FACILITY OPERATION/CLOSURE PLAN
 PHASES 4 AND 5 FILL PLAN

SCALE: 1" = 100'
 DATE: 10/13/2016
 DRWN BY: L. CRAWFORD
 CHKD BY: S. GANDY

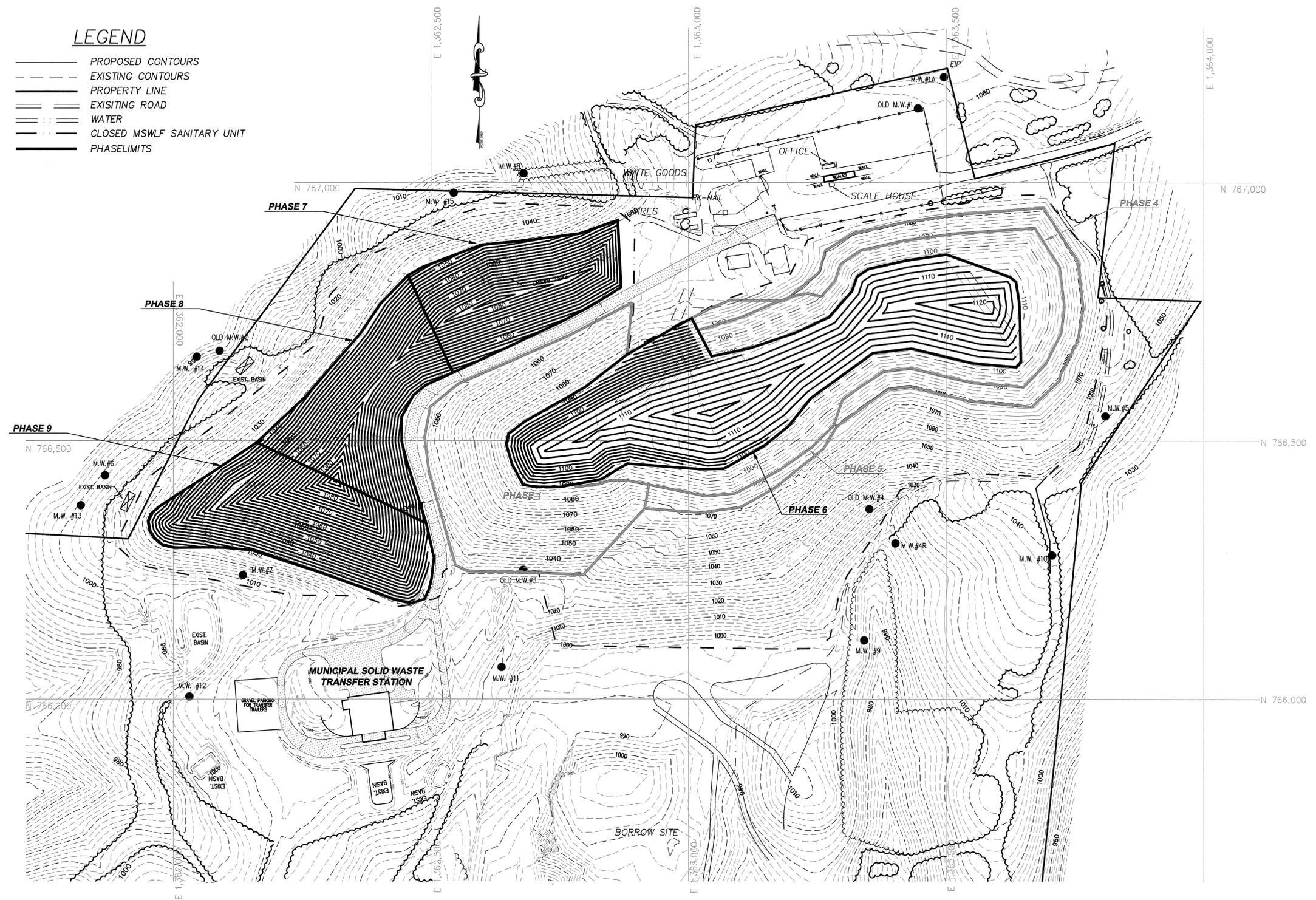
PROJECT NUMBER: **G16134**

DRAWING NO: **P3** SHEET NO: **5 OF 8**



10/28/16

- LEGEND**
- PROPOSED CONTOURS
 - - - EXISTING CONTOURS
 - PROPERTY LINE
 - EXISTING ROAD
 - WATER
 - CLOSED MSWLF SANITARY UNIT
 - PHASE LIMITS



STEVEN R. GANDY

 10/26/16

Municipal Engineering Services

 Company, P.A.

P.O. BOX 97, CARNER, N.C. 27529
 (919) 772-5395
 LICENSE NUMBER: C-0281

P.O. BOX 349, BOONE, N.C. 28607
 (828) 262-1787

CONSTRUCTION & DEMOLITION
LANDFILL FACILITY
ALEXANDER COUNTY
NORTH CAROLINA

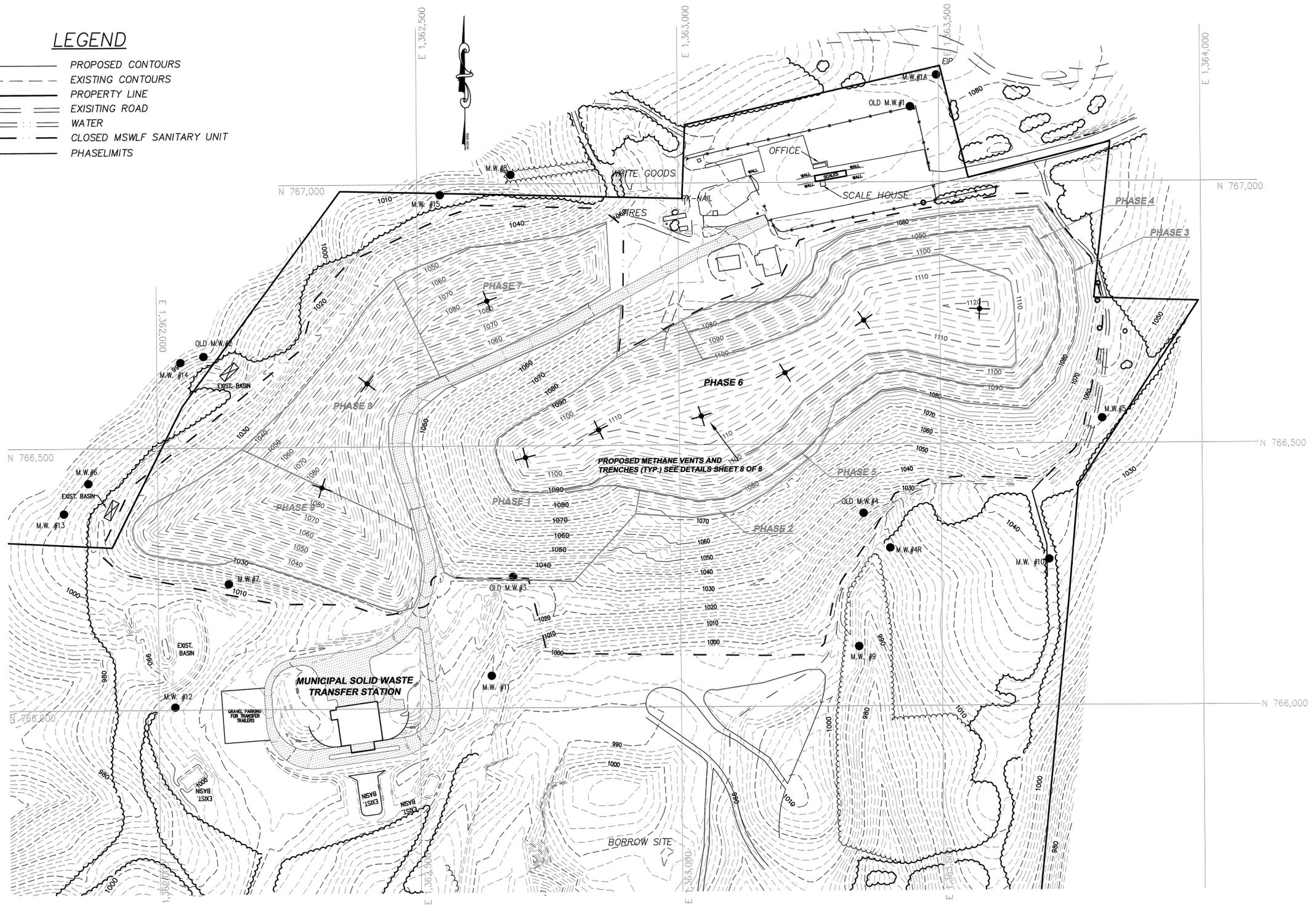
DATE	BY	REV.	DESCRIPTION

FACILITY/OPERATION PLAN
PHASES 6-9 FILL PLAN

SCALE: 1" = 100'
DATE: 10/13/2016
DRWN. BY: L. CRAWFORD
CHKD. BY: S. GANDY
PROJECT NUMBER: G16134
DRAWING NO. P4 SHEET NO. 6 OF 8

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- LEGEND**
- PROPOSED CONTOURS
 - - - EXISTING CONTOURS
 - PROPERTY LINE
 - == EXISTING ROAD
 - WATER
 - CLOSED MSWLF SANITARY UNIT
 - PHASE LIMITS



Municipal Services
Engineering Company, P.A.
 P.O. BOX 97 GARNER, N.C. 27529 (919) 772-5393
 P.O. BOX 349 BOONE, N.C. 28607 (828) 262-1767
 LICENSE NUMBER: C-0281

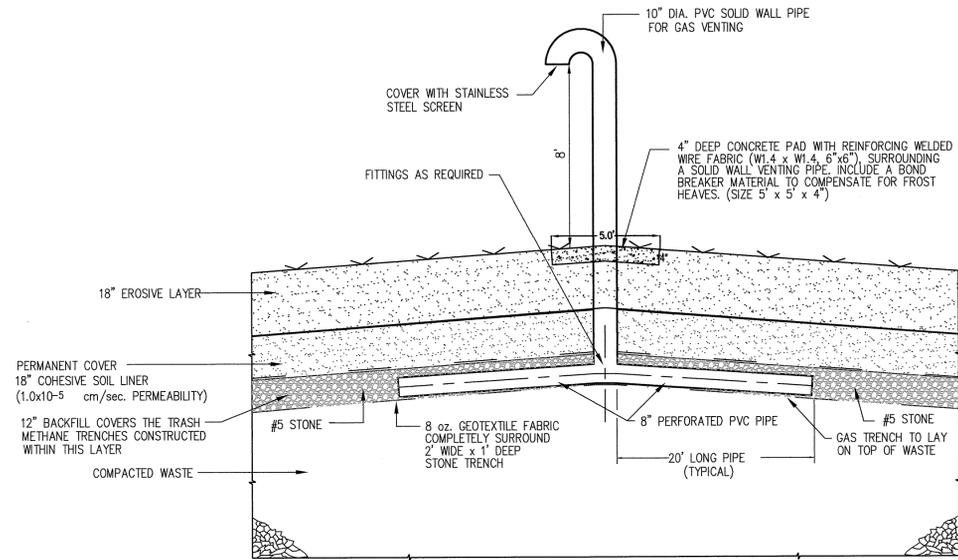
**CONSTRUCTION & DEMOLITION
 LANDFILL FACILITY
 ALEXANDER COUNTY
 NORTH CAROLINA**

DATE	BY	REV.	DESCRIPTION

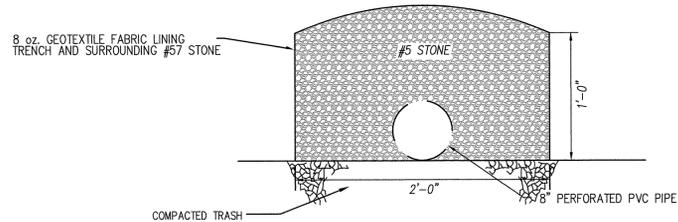
FACILITY/OPERATION/CLOSURE PLAN
 METHANE VENTING SYSTEM

SCALE: 1" = 100'
 DATE: 10/13/2016
 DRAWN BY: L. CRAWFORD
 CHKD. BY: S. GANDY
 PROJECT NUMBER: G16134
 DRAWING NO. P5 SHEET NO. 7 OF 8

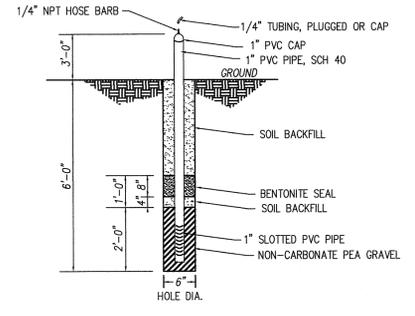
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**TYPICAL METHANE VENTING AND
CAP CLOSURE DETAIL**
N.T.S.



PERMANENT METHANE TRENCH DETAIL
N.T.S.



METHANE GAS MONITORING PROBE
N.T.S.



**CONSTRUCTION & DEMOLITION
LANDFILL FACILITY
ALEXANDER COUNTY
NORTH CAROLINA**

**FACILITY/OPERATION/CLOSURE PLANS
CLOSURE DETAILS**

SCALE:	1:1
DATE:	10/21/2016
DRWN. BY:	L. CRAWFORD
CHKD. BY:	S. GANDY
PROJECT NUMBER	G16134
DRAWING NO.	P6
SHEET NO.	8 OF 8

Municipal Services
Engineering Company, P.A.
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