FAX

Municipal Services Garner, N.C. — Engineering Company, P.A. Boone, N.C.

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Date 10/26/98

Number of pages including cover sheet: 2

TO: Mr. Matt Gamble
NC DENR - Solid Waste Section

Phone 733-0692 (x344)
Fax Phone 733-4810

FROM: Nathan Nallainath
Municipal Engineering Services Company
Garner, NC 27529

Phone (919) 772-5393
Fax Phone (919) 772-1176

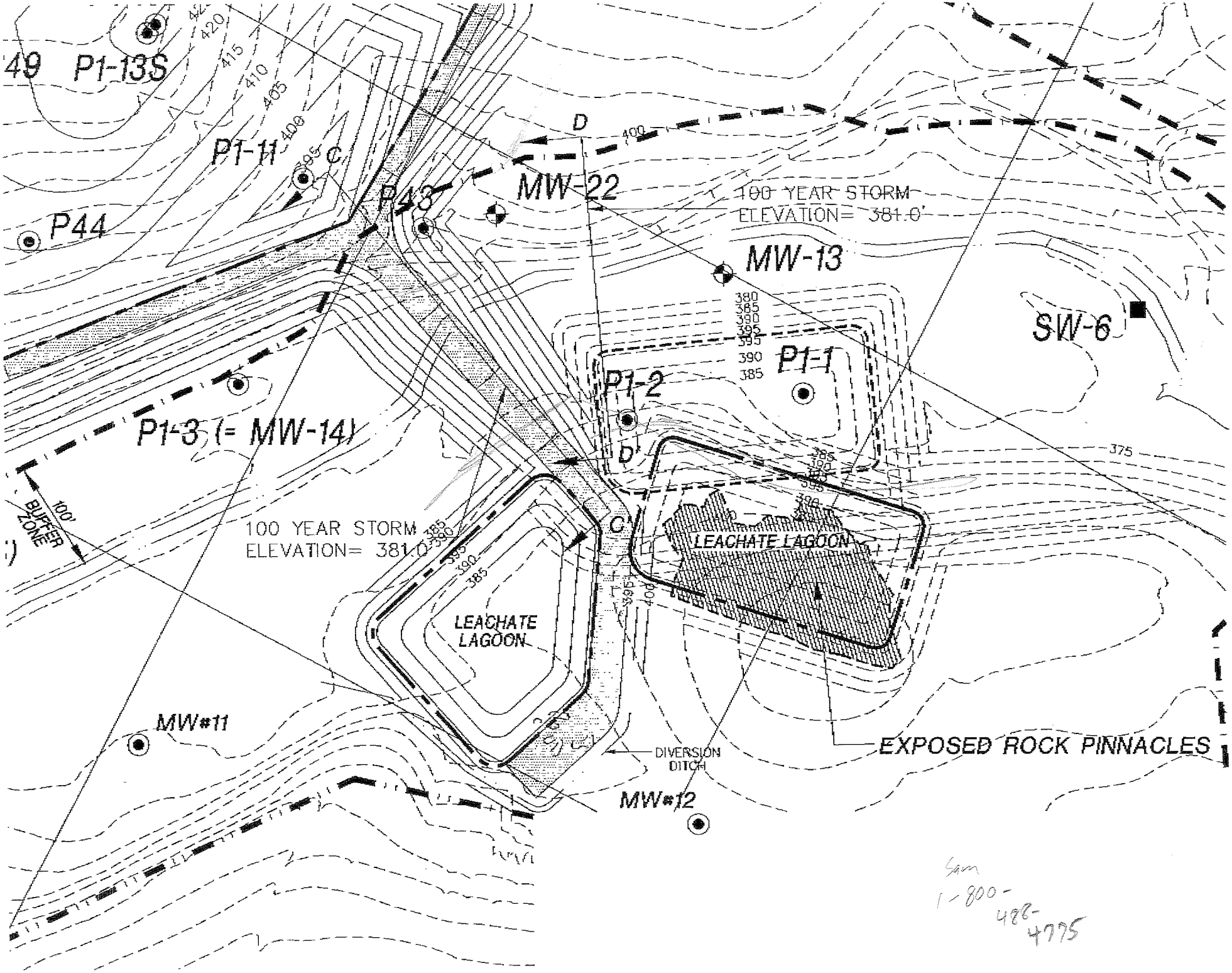
CC:

REMARKS: ☐ Urgent ☒ For your review ☐ Reply ASAP ☒ Please Comment

Attached pls. find the proposed new location for the leachate lagoon at City of Albemarle Landfill. Bill Sessoms & Wayne Sullivan suggested to fax this location for you review at this time. Please let us know if this is an acceptable/suitable location based on your review at this time.

Thx.

Nat



Sam
1-800-
488-
4775

OPERATION/CONSTRUCTION MANAGERS

Municipal Services

PO Box 97, Garner, North Carolina 27529 (919) 772-5393

CIVIL/SANITARY ENGINEERS

Engineering Company, P.A.

PO Box 349, Boone, North Carolina 28607 (828) 262-1767

October 9, 1998

OCT 1998
Received
Solid Waste
Section

Mr. Matt Gamble, P.G.
NC DENR
Division of Waste Management
Solid Waste Section
401 Oberlin Road, Suite 150
Raleigh, North Carolina 27605-1350
Phone: (919) 733-0692 (x344)
Fax: (919) 733-4810

Re: **Blasting Plan for Rock Pinnacle Excavation - Leachate Lagoon Area**
City of Albemarle Municipal Solid Waste Landfill
Albemarle, North Carolina
MESCO Project No. G96021.7

Dear Matt:

We are submitting the following information as part of the blasting plan for the rock pinnacle excavation within the leachate lagoon area for the above referenced project.

1. An overall plan showing the leachate lagoon location and the limits of exposed rock pinnacles.

2. A map showing top of rock pinnacle elevations. Based on these elevations and the proposed subgrade minus four (4) feet elevations, we have estimated a volume of approximately 6,930 cubic yards of rock pinnacles to be removed from this area.

3. Letters, dated September 13, 1998 and October 8, 1998, from the Professional Geologist for the leachate lagoon area.

4. A map showing approximate area of rock pinnacles blasted on October 7, 1998.

5. The blast report for the rock pinnacles blasted on October 7, 1998.

Please review the attached information as soon as possible and advise us accordingly. If you have questions or comments, please contact us at 919-772-5393.

Very truly yours,
MUNICIPAL ENGINEERING SERVICES COMPANY, P.A.

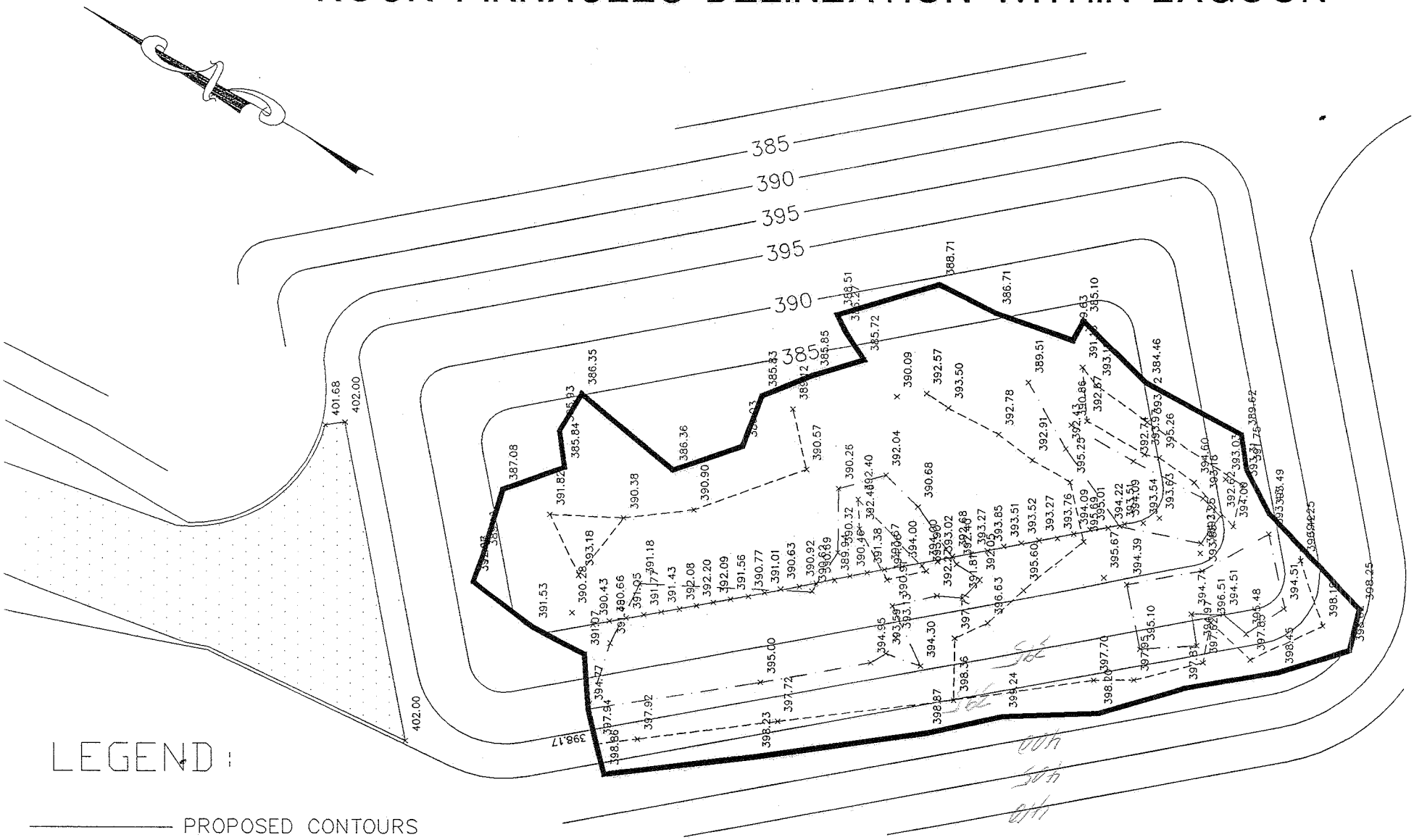
C. Nallainathan

C. (Nathan) Nallainathan, P.E.

cc:
James Coble, City of Albemarle
Jimmy Woodie/Wayne Sullivan, MESCO

CITY OF ALBEMARLE

ROCK PINNACLES DELINEATION WITHIN LAGOON



LEGEND:

- PROPOSED CONTOURS
- TOE OF EXPOSED ROCK PINNACLES
- TOP OF EXPOSED ROCK PINNACLES
- LIMITS OF EXPOSED ROCK PINNACLES

September 13, 1998
730 Elm Street
Barboursville, WV 25504

Municipal Engineering Services Company, P.A.
Attn: Mr. Wayne Sullivan
P.O. Box 97
1140 Benson Highway, Suite 220
Garner, NC 27529

Dear Mr. Sullivan:

On September 10, 1998, I visited the excavation at the leachate lagoon for the new Albemarle Landfill in order to observe hard rock encountered during the excavation. The following observations were made:

The material exposed consists of beds of saprolite of argillite (mudstone or siltstone) interbedded with beds of saprolite of vitric and crystal vitric tuff;

The saprolite of the argillite was softer and could be removed easier than the beds of the tuffaceous material, that could not be removed by ripping due to its hardness;

The saprolite exhibited a strike of N65°E with a dip of 45°NW;

Joint directions of N15°W vertical dip, N65°E dip of 70°SE, and N65°E with a dip of 45 to 50°NW were measured; and

Not all the material within the leachate lagoon had been removed to grade.

The following suggestions were made to the excavation foreman and the GIT representative:

The aerial extent of the hard rock be surveyed including elevations on the top of the rock;

That a line of drill holes be drilled in the area of the hard rock on five foot centers to a depth of at least four feet below grade;

The drilling can be undertaken by a blast hole driller, provided they record the depths for the difference in hardness of the material encountered;

The locations of the drill holes are surveyed, including elevations; and

That blasting **is not** to be attempted or undertaken until approval is obtained from the state.

Based on my observations of the leachate lagoon site and my geologic knowledge of the site, it appears that the rock encountered in the excavation is probably an area of pinnacles of slightly weathered Cid Formation. The observed differences in hardness of the material is due to variation in the amount of vitric material present. The softer, weathered argillite, contains mostly silt and clay sized ash, while the harder material reflects increasing vitric (silica) content. The vitric material is apparently more resistant to weathering than the silt and clay size material and this has resulted in pinnacles of unweathered rock. The interbedding of the different rock types results in alternating zones of hard and softer material. Furthermore, dip of the bedding toward the Northwest compounds the problem, because when excavation starts in soft material it will encounter hard material at depth. The one positive observation made is the presence of the jointing. The joints continue along and across the different rock types and thus when blasting occurs, the rock will be broken up into small blocks due to the joints.

It is recommended that the volume of hard material be estimated based on the surveyed location of this material and the drilling results. After this is undertaken, consideration should be given to either removal of all the harder material by blasting and/or a slight relocation of the leachate lagoon to minimize the amount of blasting required. One possible problem with any significant relocation is the nearby presence of a 100 year floodplain.

Depending on what course of action is taken concerning the removal of the pinnacles, their presence may require some adjustment to the groundwater monitoring plan, since their presence was not considered in its development. Further observations of the area below and adjacent to the pinnacles will be undertaken after their removal, to determine if any heavy ripping or blasting has caused any significant structural disturbance to the underlying material and how the groundwater monitoring plan may need to be modified.

Sincerely,

Edward S. Custer Jr

Edward S. Custer, Jr., Ph.D., P.G.

October 8, 1998
730 Elm Street
Barboursville, WV 25504

Municipal Engineering Services Company, P.A.
Attn: Mr. Wayne Sullivan
P.O. Box 97
1140 Benson Highway, Suite 220
Garner, NC 27529

Dear Mr. Sullivan:

On October 5, 1998, I made a follow up visit to the excavation at the leachate lagoon for the new Albemarle Landfill. The purpose of this visit was to obtain additional information since my visit of September 10. The following information was obtained:

The suggested drilling on five foot centers was almost complete;

The line of holes were located along the western edge of the leachate lagoon at the edge of the toe of the excavation;

The driller reported that the locations had been staked by the surveyors;

The depth of the holes were drilled to approximately eight feet below subgrade and varied in depth from approximately 20 feet in the south to 14 feet in the north;

Hard rock had been encountered in each hole with it generally occurring at the top of the southern holes and at depth in the northern holes; and

The outline of the exposed hard rock had been surveyed including spot elevations.

I told the blast hole driller that blasting was not to be undertaken until approval is obtained from the state.

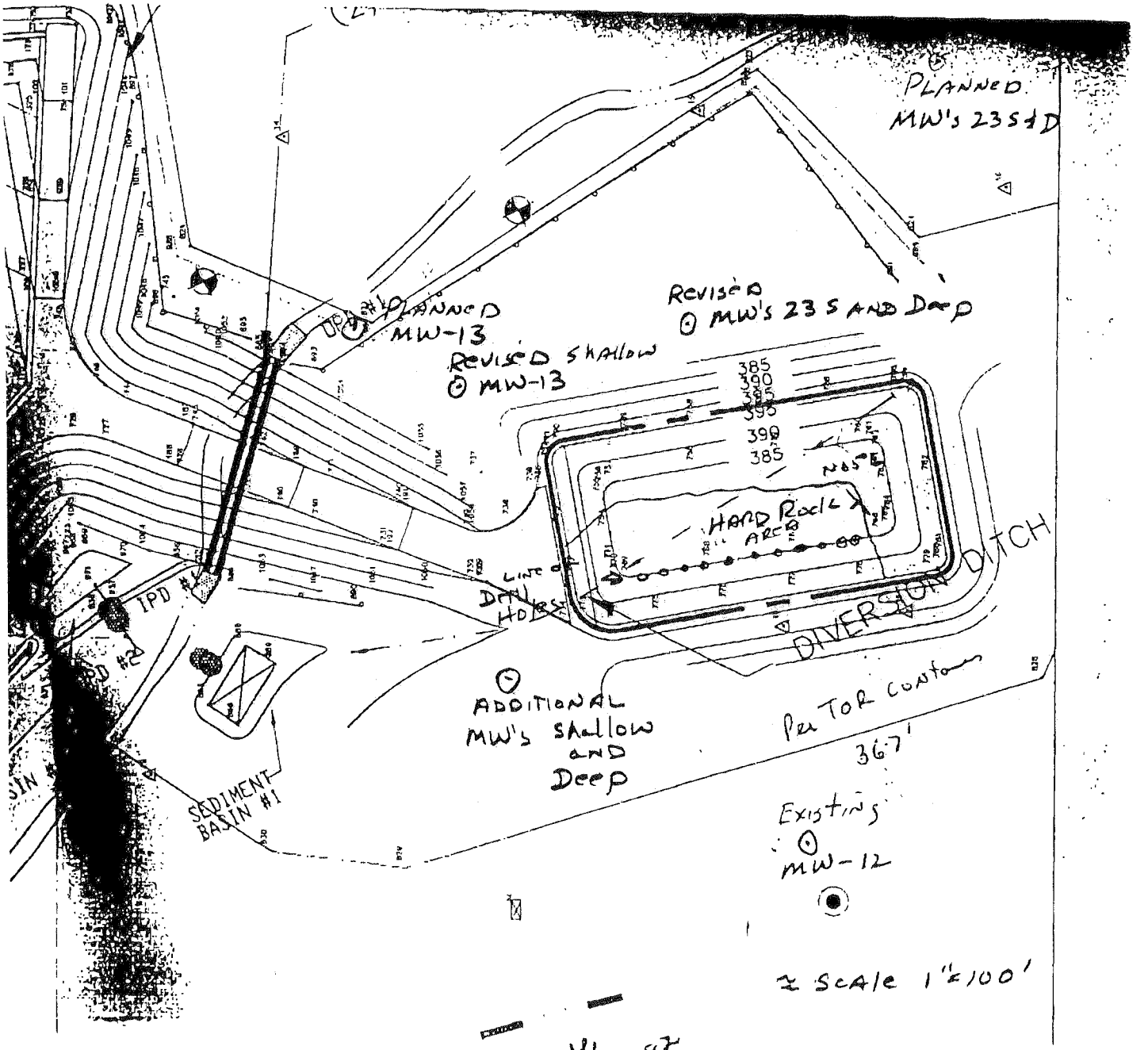
After my visit, I compared the estimated elevation of the top of the rock to the projected top of rock contours included in the Design Study. The top of the rock encountered in the leachate lagoon is approximately 20 feet higher than the projected elevation. Although no borings were drilled in this area, MW-12 was drilled nearby and up slope from the excavation and two borings were drilled down slope from the excavation. These borings would have provided sufficient data to estimate the top of rock surface except for pinnacles. Based on my observations of the leachate lagoon site, the general drilling results and the estimate of elevation of the top of hard rock encountered during the excavation, it appears that the rock encountered

during the excavation is an area of pinnacles of slightly weathered Cid Formation. The observed differences in hardness of the material and this area of rock pinnacles are due to the increased amount of vitric (silica) material present at this location. The vitric material is more resistant to weathering than the argillite and this has resulted in this area of pinnacles of rock.

The presence of the pinnacles of rock will require some adjustment to the groundwater monitoring plan, since their existence was not contemplated in the development of the groundwater monitoring plan. The modification to the ground water monitoring plan will probably consist of relocating proposed MW-23S&D closer to the lagoon along its eastern margin. Two additional Monitoring Wells (a nested pair) will probably be suggested for the area North or Northwest of the lagoon. These two additional monitoring wells may be needed to monitor any potential leaks that could move downward along the observed bedding plane fractures. The suggested locations of North or Northwest of the lagoon reflects the Northwest dip of the bedding. Further observations of the area below and adjacent to the pinnacles will be undertaken, if rock removal is approved, to determine if the heavy ripping and/or blasting has caused any significant structural disturbance to the underlying and adjacent material. The full recommended adjustments to the groundwater monitoring plan will be made after all rock is removed to at least four feet below subgrade.

Sincerely,

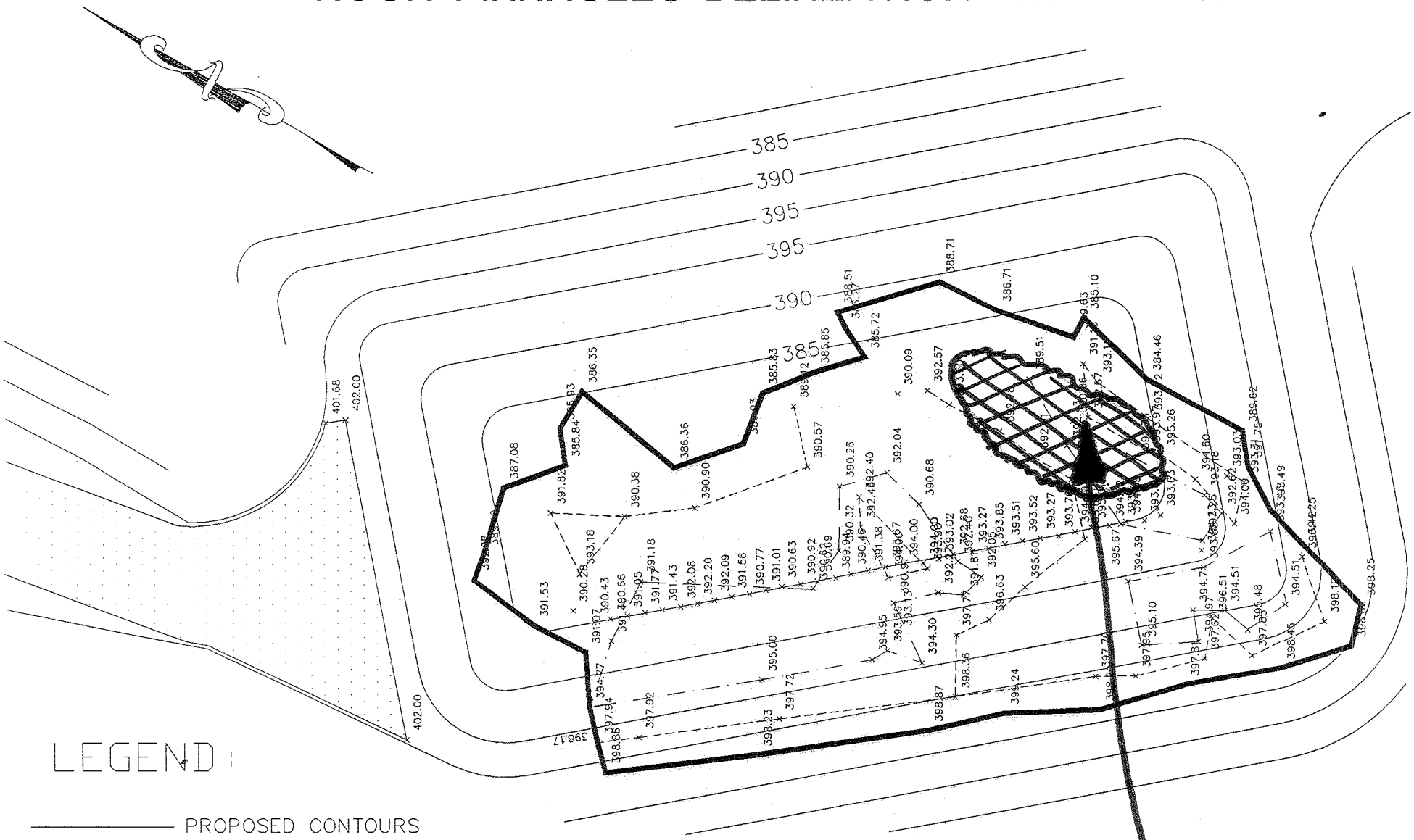
Edward S. Custer, Jr., Ph.D., P.G.



Matt Bantle
919-733-0692
ext 344

CITY OF ALBEMARLE

ROCK PINNACLES DELINEATION WITHIN LAGOON



LEGEND:

- PROPOSED CONTOURS
- TOE OF EXPOSED ROCK PINNACLES
- TOP OF EXPOSED ROCK PINNACLES
- LIMITS OF EXPOSED ROCK PINNACLES

Approximate Area of Rock Pinnacles Blasted on October 7, 1998

CDB

CAROLINA DRILLING, INC.

Drilling • Blasting • Consultation

326 Railroad Street • Mocksville, NC 27028
Phone 704-634-2961

BLAST REPORT

Job No. _____ Job Name Albemarle Landfill Date 10-7-98

Job Location: City Albemarle County Stanly State NC

BLAST DATA

Shot No. 4
Time 5:20 Pm
No. Holes 44
Diameter 3 in.
Depth 12 - 18 ft.
Subdrilling 3 ft.
Spacing 5 X 5 ft.
Burden 5 ft.
Stemming 8 ft.

Specific Blast Location Pond
Material Blasted Rock
Distance to Nearest Building* 2000 ft.
Distance to Nearest Building* _____
Weather Cloudy Wind Direction _____
Wind Speed _____ mph
* Non-owned building
Stemming Material Cuttings

EXPLOSIVES USED

2 X 16 Unimax 40%	125	lbs.
Tovex Boostrite 2X8	165	lbs.
Tovex Blastrite 2X16	160	lbs.
Tremite TX 2X8	55	lbs.
		lbs.
		lbs.
Total Weight	505	lbs.

FIRING INFORMATION

EB Det. (Brand) Insign Dickford EZ 8 No. 44
Non-electric (Brand) _____ No. _____
Blasting Machine (Check One)
Conventional ✓ Sequential _____
Name of Blasting Machine Scorpion
Type os Series Straight No. Series 1
Sequential Timer Setting(s) _____

Amount of Material Blasted _____ (tons) (cu.yds.)
Powder Factor _____ (Tons/lb.) (lbs./cu.yd.)
Maximum Pounds Per Delay 11.4 Number of Holes Per Delay 1
Scaled Distance 50 ft. Were Mats or Other Protection Used? Yes _____ No ✓

SEISMOGRAPH DATA

Location of seismograph Mont. Well & Stale House
Direction and Distance from Blast _____
Date Calibrated 8-1-98 Readings 0 ppv 0 air overpressure
Name of Operator Jerry Sharpe Brand of Seismograph _____

Blaster's Signature Jerry Sharpe
Blaster's License No. _____ State _____

Jobsite Supervisor _____

FROM : G I T ALBEMARLE PHONE NO. : 704 983 8858 Oct. 07 1998 06:00PM P1

730 Elm St.
Barboursville, WV 25504
304-736-2573

THE ROCK DOKTOR

Fax

To: Matt Gamble **From:** Edward S. Custer, Jr., Ph.D., P.G.

Fax: 919-733-4810 **Pages:** 5

Phone: 919-~~499~~733-4996 **Date:** 9/14/1998

Re: Albemarle **CC:** Wayne Sullivan/NATHAN

☐ **Urgent** ☒ **For Review** ☐ **Please Comment** ☐ **Please Reply** ☐ **Please Recycle**

• **Comments:**

I will call as soon as I receive your page

Pager # 304-691-6220

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September 13, 1998
730 Elm Street
Barboursville, WV 25504

Municipal Engineering Services Company, P.A.
Attn: Mr. Wayne Sullivan
P.O. Box 97
1140 Benson Highway, Suite 220
Garner, NC 27529

Dear Mr. Sullivan:

On 28 August, 1998 and again on September 10, 1998, I made follow up visits to the excavation at the new Albemarle Landfill in order to observe overall excavation at the Phase 1 cell site, and how the blasting and removal of the vitric crystal tuff boulders had affected the adjacent rock. The following observations were made:

August 28:

Blasting had occurred at all six areas of boulders observed during my August 21 visit;

The original boulders had been removed and the material below these boulders had been exposed to a depth at least two feet below grade;

The material adjacent to and below the former boulders primarily consists of saprolite of argillite (mudstone or siltstone) with some saprolite of the tuff ;

The saprolite did not exhibit any significant disturbance and original joint directions of N5°W, N85°E, N55-60°W, and N40-60°E were easily observed and measured;

Not all the material between the original rock mass locations had been removed; and

Several new boulders of vitric tuff had been encountered during the excavation adjacent to the original rock masses in areas 1, 3, and 4.

September 10:

No additional blasting had occurred on the rock masses since my August 28 site visit;

Excavation was continuing on the new boulders and material between the boulders; and

Tops of the new boulders were protruding approximately one to two feet above grade.

Discussions with the excavation foreman provided the following additional information:

The boulders observed during the August 21 visit had been removed by a combination of blasting and ripping;

Removal had been difficult because the boulders had not been blasted into small pieces because the blaster used small charges in order to keep the seismic velocity low; and

New boulders had been encountered in the area adjacent to the original boulders.

The following suggestions were given to the excavation foreman concerning the removal of the new boulders and the material between the boulders:

Blasting of the new boulders should be performed with the same amount of blasting force, however the spacing of the blast holes should be decreased from four foot centers to two to three foot centers in order to more easily disaggregate the boulders;

That test holes be drilled adjacent to the boulders to a depth of at least four feet below grade to identify the presence of any additional boulders;

The material between the boulders should be excavated to grade; and

The areas where the boulders are located must be excavated to at least two feet, but preferably four feet below grade.

I am still of the opinion, based on my most recent and previous observations, that proper blasting and removal of the rock masses should not require any changes in the groundwater monitoring plan, since the location of the crystal vitric tuff unit and the orientations of the joints were considered when the groundwater monitoring plan was developed. Further observations of the area below and adjacent to boulders will be undertaken after their removal to confirm that these new rock masses are boulders and not pinnacles, and to determine if the blasting has caused any significant structural disturbance to the underlying material.

Sincerely,

Edward S. Custer, Jr., Ph.D., P.G.

September 13, 1998
730 Elm Street
Barboursville, WV 25504

Municipal Engineering Services Company, P.A.
Attn: Mr. Wayne Sullivan
P.O. Box 97
1140 Benson Highway, Suite 220
Garner, NC 27529

Dear Mr. Sullivan:

On September 10, 1998, I visited the excavation at the leachate lagoon for the new Albemarle Landfill in order to observe hard rock encountered during the excavation. The following observations were made:

The material exposed consists of beds of saprolite of argillite (mudstone or siltstone) interbedded with beds of saprolite of vitric and crystal vitric tuff;

The saprolite of the argillite was softer and could be removed easier than the beds of the tuffaceous material, that could not be removed by ripping due to its hardness;

The saprolite exhibited a strike of N65°E with a dip of 45°NW;

Joint directions of N15°W vertical dip, N65°E dip of 70°SE, and N65°E with a dip of 45 to 50°NW were measured; and

Not all the material within the leachate lagoon had been removed to grade.

The following suggestions were made to the excavation foreman and the GIT representative:

The aerial extent of the hard rock be surveyed including elevations on the top of the rock;

That a line of drill holes be drilled in the area of the hard rock on five foot centers to a depth of at least four feet below grade;

The drilling can be undertaken by a blast hole driller, provided they record the depths for the difference in hardness of the material encountered;

The locations of the drill holes are surveyed, including elevations; and

That blasting **is not** to be attempted or undertaken until approval is obtained from the state.

Based on my observations of the leachate lagoon site and my geologic knowledge of the site, it appears that the rock encountered in the excavation is probably an area of pinnacles of slightly weathered Cid Formation. The observed differences in hardness of the material is due to variation in the amount of vitric material present. The softer, weathered argillite, contains mostly silt and clay sized ash, while the harder material reflects increasing vitric (silica) content. The vitric material is apparently more resistant to weathering than the silt and clay size material and this has resulted in pinnacles of unweathered rock. The interbedding of the different rock types results in alternating zones of hard and softer material. Furthermore, dip of the bedding toward the Northwest compounds the problem, because when excavation starts in soft material it will encounter hard material at depth. The one positive observation made is the presence of the jointing. The joints continue along and across the different rock types and thus when blasting occurs, the rock will be broken up into small blocks due to the joints.

It is recommended that the volume of hard material be estimated based on the surveyed location of this material and the drilling results. After this is undertaken, consideration should be given to either removal of all the harder material by blasting and/or a slight relocation of the leachate lagoon to minimize the amount of blasting required. One possible problem with any significant relocation is the nearby presence of a 100 year floodplain.

Depending on what course of action is taken concerning the removal of the pinnacles, their presence may require some adjustment to the groundwater monitoring plan, since their presence was not considered in its development. Further observations of the area below and adjacent to the pinnacles will be undertaken after their removal, to determine if any heavy ripping or blasting has caused any significant structural disturbance to the underlying material and how the groundwater monitoring plan may need to be modified.

Sincerely,

Edward S. Custer, Jr., Ph.D., P.G.

August 24, 1998
730 Elm Street
Barboursville, WV 25504

Municipal Engineering Services Company, P.A.
Attn: Mr. Wayne Sullivan
P.O. Box 97
1140 Benson Highway, Suite 220
Garner, NC 27529

Post-it® Fax Note 7671	Date	# of pages ▶
To Matt Gamble	From Wayne Sullivan	
Co./Dept.	Co.	
Phone #	Phone #	
Fax # 715-3605	Fax #	

Dear Mr. Sullivan:

On 21 August, 1998, I visited the excavation at the new Albemarle Landfill in order to observe overall excavation of the site and the reported presence of pinnacles of rock encountered during the excavation of the landfill site. The following observations were made:

Six areas of rock masses were visible at the site,

Numerous boulders were also present adjacent to the excavation that reportedly had been removed during the excavation,

The boulders and rock masses consisted of a crystal vitric tuff,

The rock masses appeared to be in a zone approximately 200 feet wide that has a strike of approximately N40°E,

The material adjacent to the zone of rock masses consists of saprolite of argillite (mudstone or siltstone),

The rock masses appeared to be rectilinear in shape and bounded by joint surfaces, and

The measured joint directions in the rock masses were N5°W, N85°E, N55-60°W, and N40°E.

Discussions with the excavation foreman and the blast hole driller resulted in the following additional information:

The boulders observed adjacent to the excavation had all been removed during excavation of the site from the general area where the rock masses are located, and

The blast holes drilled in the rock masses generally encountered soil or saprolite at a depth of 6 to 8 feet with the deepest penetration being 12 feet in the largest rock mass.

The fact that the drilling penetrated through the rock masses to weathered material suggests the these rock masses are not pinnacles of unweathered rock projecting upward from the top of the rock surface, but are remnant boulders of the crystal vitric tuff unit identified in the Site and Design Geologic and Hydrologic Report. Rock masses of similar size were observed on the surface in the same general area during the exploration conducted for the Design report. The crystal vitric tuff unit was identified in the Design report as being more resistant to weathering than the adjacent argillite (siltstone or mudstone) unit and thus more likely to leave boulders surrounded by saprolite than the argillite.

Proper blasting and removal of the rock masses should not require any changes in the groundwater monitoring plan, since the location of the crystal vitric tuff unit and the orientations of the joints were considered when the groundwater monitoring plan was developed. Further observations of the area of the rock masses will be undertaken after their removal to confirm that these rock masses are boulders and not pinnacles, and to determine if the blasting has caused any significant structural disturbance to the underlying material.

Sincerely,

Edward S. Custer, Jr., Ph.D., P.G.

NORTH CAROLINA LICENSED SEAL 730 GEOLOGIST EDWARD S. CUSTER, JR.

Post-it® Fax Note 7671	Date 6-19-98	# of pages ▶ 2
To Nathan	From Matt Gamble	
Co./Dept. Municipal Eng.	Co. Solid Waste Section	
Phone #	Phone # 733-0692 x344	
Fax # 722-1176	Fax #	

DRAFT

ROCK E
AT LINED LA

The Solid Waste Section allows blasting for rock removal only a... all other options have been explored, including the viability of adjusting base grades.

Generally, the base grades must be designed to maintain four foot of vertical separation from the top of rock as established by the Design Hydrogeologic Study. This study requires a boring density of about one boring per acre for the area of investigation, which includes the footprint for the planned landfill phase of development and the area around the footprint that will be subject to ground-water monitoring. For the purposes of the Design Study the top of rock is defined by auger refusal or a Standard Penetration Resistance blow count of about 50/.2'. The base grades are then designed to maintain four foot of vertical separation from the top of bedrock datum plane as established in the Design Hydrogeologic Study.

If during excavation of the disposal cell, rock pinnacles are found that are above the top of rock datum plane established in the Design Hydrogeologic Study, then the Solid Waste Section will consider authorizing some rock removal. If blasting is necessary the landfill owner/operator or their consultants should submit a blasting plan. This blasting plan should show the location and size of the rock pinnacles, the elevations of the rock, and an estimate of the volume of rock that needs to be removed. The blasting plan must be designed so as to minimize the impact to underlying rock and nearby structures.

If rock removal is determined to be necessary, the Solid Waste Section may authorize blasting with the following conditions:

- Effort shall be made to minimize the amount of blasting necessary, and to minimize the effects of the blasting that is required.

- Blast monitoring shall be conducted at appropriate locations. Monitoring may be required at the edge of the proposed cell, at the location of monitoring wells, at the edge of clay liner of nearby landfill cells, at the edge of nearby structures, etc. Every effort shall be made to limit the peak particle velocity to 1 inch per second at the blast monitoring locations.

DRAFT

- A full, detailed report of the rock blasting activities shall be submitted to the Solid Waste Section within 30 days of the completion of the rock removal. The Licensed Blaster shall certify that the drill hole pattern, charge weights, and delays were selected in such a manner as to minimize the amount of energy which may impact underlying rock.

- A Professional Engineer shall certify that rock blasting was kept to a minimum and that controlled blasting techniques were used to minimize the effects of blasting to the underlying bedrock.

- The report of blasting activities shall also include a discussion by a Licensed Professional Geologist on the effect of heavy ripping and/or blasting on the ground-water flow regime at the site. Additional subsurface investigation may be required to determine the effect of heavy ripping and/or blasting on the hydrogeology of the area.

- During and after excavation of the area and prior to backfilling with soil, the Licensed Professional Geologist shall evaluate the excavation for any evidence of structural features that could influence ground-water flow (fractures, dikes, pegmatites, etc.) The Solid Waste Section shall be informed of when the excavation will be completed, so a Section Hydrogeologist may schedule a site visit to inspect the area. The report of blasting activities shall include a report by the Licensed Professional Geologist on the evaluation of the excavated area and recommendations of any modifications that may be needed to the ground-water monitoring system based on this evaluation.

- If modifications to the water quality monitoring plan are necessary, based upon the evaluation of the excavation area or additional subsurface investigation, a revised monitoring plan shall be submitted by the Licensed Professional Geologist to the Solid Waste Section for review.

- The Professional Engineer shall include a discussion in the CQA Report of the location and nature of the rock blasting and the backfill of the over-excavation. This shall be included as part of the certification of the subgrade.

MEMO

DATE: 3-25-98

TO: Mair

SUBJECT: Albemarle

☐ Copy of Hearing Transcript

☐ For our response to comments - Please mark up in red where & what to respond to.

Thanks,

From: Bill

North Carolina Department of Environment, Health, and Natural Resources

Printed on Recycled Paper

Stanly Citizens Opposed to Toxic Chemical Hazards
SCOTCH

28836 Canton Road
Albemarle, NC 28001

Thanks matt

APR 1998
Received
Solid Waste Section

March 30, 1998

William D. Sessoms,PE
NC Department of Environment and Natural Resources
Division of Solid Waste Section
401 Oberlin Road Suite 150
Raleigh, NC 27605-1350

Re: Permit Number 84-01

The statement "We all live down stream" is so true! Studies reveal all landfills leak, even those using the best available liners. Landfill liners may slow the release of contaminants into the groundwater but they cannot prevent it. There is no such thing as a secure landfill.

Comments concerning the referenced draft permit.

1.3 General
The wording "but is not limited to" leaves a big loophole. Please remove this phrase. I also object to animal waste being allowed in a landfill. This can be recycled.

Characterization studies:

The leachate collection system:
It's time to stop deceiving ourselves and the public! It's time to own up to the realities of groundwater monitoring programs at lined landfills and of their ability to provide assurance of groundwater quality protection, and to shake loose shroud of the false sense of security they provide. A groundwater monitoring program in very important here. The inevitable leakage from lined landfills is likely to be first detected in production wells downgradient of the landfill after widespread groundwater pollution has occurred. → Groundwater monitoring is required at all MSWLF facilities. A groundwater monitoring well network will be installed concurrently w/ cell construction.

Such materials in municipal solid waste landfills represent a threat to domestic water supply water quality for thousands of years, effectively forever, as long as they remain in the landfill. Therefore, if lined landfills of the type being constructed today are to be located in areas hydraulically connected to groundwater that could ever be used for domestic purposes, it is imperative that groundwater quality monitoring programs be developed that will, in reality, detect leachate-pollution at the earliest possible time and long before off-site groundwater pollution occurs. It seems reasonable to require that a groundwater

This is one of the primary goals of the monitoring system.

Phone: 704-982-3300 *Fax: 704-982-9286* *jalmond231@aol*

monitoring program for a waste management unit, such as a landfill, be designed and operated in such a manner that incipient groundwater contamination by the landfill can be detected with high probability; it is suggested that the system be required to provide at least a 95% probability of detecting a leak from any point in the landfill liner, at the point of compliance. *The groundwater monitoring system must consist of a sufficient number of appropriately located wells able to yield groundwater samples from the uppermost aquifer that represents the quality of background ground water and the quality of ground water passing the relevant point of compliance as specified by the Director of an approved State.* Wells used for monitoring must be close enough together at the point of compliance to detect fingers of leachate.

Because of the inevitable failure of landfill containment systems of the type used today and the irreplaceable nature of groundwater resources, the best approach would be to not site municipal solid waste and certain industrial solid waste landfills in areas where groundwater hydraulically connected to the area is or could be used for domestic supply under plausible worst-case water-need scenarios. If that approach is not followed , it is recommended that landfill permit applicants be required to provide, with the application, a proposed groundwater monitoring plan that it can demonstrate has at least 95% probability of detecting groundwater contamination when it first crosses the plane through the point of compliance.

This is already the point of the monitoring system

Under no circumstance should landfills be allowed to *contaminate* groundwaters under adjacent property owners' lands. The contamination of groundwater beneath another's property should carry severe penalties for the owner/operator of the landfill. In addition, the landfill applicant should be required to develop a trust fund of sufficient magnitude that once a leak is detected sufficient monies will be available to prevent further migration of contaminants, remediate the groundwater that became contaminated prior to detection, clean up the aquifer to the maximum extent possible, and, if the groundwater pollution cannot be stopped, exhume the waste and properly treat them. That trust fund must be maintained for as long as the waste represent a threat to groundwater quality, which would normally be effectively forever.

financial assurance must be made before landfills can operate

The pre-permitting, critical evaluation of the reliability of groundwater quality monitoring programs proposed for new landfill should have a pronounced impact on the siting of new landfills. It is essential that applicants for a proposed landfill or landfill expansion examine the hydrogeological characteristics of the aquifer system(s) that could be impacted by the landfill in sufficient detail and breadth to reliably assess the potential for leachate transport from the landfill to the groundwater of the area.

2.1 Regional Characterization Study

I don't agree with this section the information it contains is not correct and needs to be re-addressed.

with what don't you agree

2.1.2 Public Water Wells, Surface Water Intakes and Service Areas

This section also contains incorrect information. The state should re-visit this section and correct it.

It is the applicants responsibility to provide correct info.

2.2 Local Characterization Study

44 residences with wells located within 2000 perimeter. The state should conduct a study to confirm this information.

there is no reason to doubt this information

2.2.3 Potential Sources of Contamination

This can't be correct information. Please take another look.

[redacted] Be more specific

February 16, 1998

Mr. Ned Stallings
44022 Stoney Gap Road
Albemarle, NC 28001

Re: City of Albemarle Landfill
Stanly County, NC

Dear Mr. Stallings:

Mr. Bill Sessoms of the Solid Waste Section has forwarded your letter dated February 5, 1998 to me. The Solid Waste Section is aware of the carbon dust disposal to which you referred. Laboratory tests required before the material was allowed in the landfill determined it to be non-hazardous. The Solid Waste Section however, required that the material be disposed of separately from other wastes. Thus trenches were prepared for this waste specifically. File documents suggest that these trenches are located in the area you indicated in you letter. If the trench locations are accurate, then the material is located too far from the proposed new cells to affect their operation and monitoring.

The disposition of petroleum products, if present, is unknown. Do you have more specific information about the material? If we knew where the material originated, what the nature of it is, and an estimate of how much was disposed at the landfill, we may be able to determine if the activity was permitted. Disposal of the material may have been permitted through the waste determination process.

If you have any additional questions or information, please feel free to contact me at (919) 733-0692 ext. 344 or at the letterhead address. you may also contact Mr. Bill Sessoms at extension 266 or the letterhead address.

Sincerely,

James M. Gamble, P.G.
Hydrogeologist
Solid Waste Section

Attachment: Letter from Mr. Ned Stallings

Cc: Mr. Bill Sessoms, Solid Waste Section
Mr. Jim Coffey, Permitting Branch Head