

Subject: Blasting Plan for CMS Landfill Cell 2G

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Date: Mon, 14 Apr 2008 09:30:39 -0500 (GMT-05:00)

To: brian.wootton@ncmail.net, john.murray@ncmail.net, Ed Mussler <Ed.Mussler@ncmail.net>

CC: Mike Gurley <mike.gurley@awin.com>, Fred Brown <fred@earnhardtgrading.com>, aglenn@browncaldwell.com

Gentlemen, please see the attached. Call me if you have questions or discussion. I will contact Mr. Wootton this Mon-Tue if possible to discuss. Thank you.

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| CMS Rock Outlier Delineation-Blasting Plan.pdf | Content-Type: application/pdf Content-Encoding: base64 |
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| B30456D_2-R1104_FIGURE 1 SITE OVERVIEW.pdf | Content-Type: application/pdf Content-Encoding: base64 |
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| CMS-D0001A_FIGURE 2 CELL 2G ROCK DELINEATION PLAN.pdf | Content-Type: application/pdf Content-Encoding: base64 |
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April 14, 2008

Messrs. Brian Wootton and John Murray
NCDENR – Division of Waste Management
Solid Waste Section
401 Oberlin Road, Suite 150
Raleigh, NC 27605

**RE: Rock Outlier Delineation and Blasting Plan
CMS Landfill-V (MSWLF) – Cell 2G
NCDENR Solid Waste Permit #13-04 (Cabarrus County)**

Dear Sirs:

On behalf of Allied Waste Industries, I am pleased to present this plan for delineating and blasting rock outliers found within four feet below the approved base liner subgrade elevations in Cell 2G at the referenced site (see **Figure 1**). Similar work was approved by the Division within Cell 2F in late 2006 for the removal of rock outliers, i.e., isolated “pinnacles” of seyenite, a resistant igneous rock found to exhibit a differential weathering profile, expressed as boulders in a matrix of partially weathered rock – these were believed to be rippable based on the Phase 2 Design Hydrogeologic Investigation (Cells 2F, 2G, and 2H). Test borings had indicated variable rock depths (based on auger refusal) but none were within 4 feet of the planned subgrade elevations – in fact, auger refusal depths were several tens of feet deeper than the planned subgrade elevations, becoming deeper to the southeast, toward Cells 2G and 2H.

Rock outliers that could not be ripped were discovered during the construction of Cell 2F – during which time, the outliers were delineated by test drilling on a 50-foot grid pattern extending into a portion of the adjacent Cell 2G. Two relatively small, isolated rock bodies were blasted, in accordance with a blasting plan approved by the Division, to facilitate excavation to a depth of 4 feet below approved subgrade elevations and backfilled with structural fill. Following the blasting and excavation work, the rock was surveyed to demonstrate the required 4 feet of separation, as reported in June 2007. Recent construction activities for Cell 2G uncovered more rock outliers along the edge of previously delineated areas, extending into previously uninvestigated portions of that cell. These newly revealed outliers are the same material and extend approximately 2 feet above the approved subgrade within a small area (see **Figure 2**).

Allied Waste Industries seeks the Division's approval to conduct another delineation of rock outliers within Cell 2G and to blast the rock (after attempting to remove the material by ripping) found within 4 feet beneath the approved base liner subgrade. This work will be conducted without disturbing the liner or subgrade in the adjacent cells or near the monitoring wells via carefully controlled blasting with "shaped charges," lightly loaded shots, stemming the shots, and using multiple delays to extract maximum lift by directing the blast energy upward, not downward into the subgrade (mats may be used to avoid generating flyrock). The work will be conducted as before, using much the same techniques and personnel for drilling, setting charges, blast monitoring, and professional oversight. A brief summary of the proposed work follows:

- 1) A licensed surveyor will lay out a grid area covering the proposed blast area at a maximum 50-foot grid interval – ground elevations are to be acquired at each grid node for comparison with the approved grading plan;
- 2) Test drilling will be conducted at each grid node, extending a depth of four feet below the base liner subgrade – these activities will be professionally supervised;
- 3) Rock excavation quantities will be documented and a map of the areas requiring blasting to reach a depth of 4 feet below approved base liner subgrades will be reviewed with the Division – it is our intention to delineate and blast in one continuous operation;
- 4) Blasting will be performed by a licensed blasting contractor, and seismic monitoring will be performed by an experienced technician – prior to the work, the blasting contractor will be apprised of the objectives of the blasting plan, i.e., minimizing potential damage to adjacent liners, subgrades, and monitoring wells;
- 5) In areas where rock is encountered within 4 feet below the approved base liner subgrade, a tighter drilling pattern will be utilized to facilitate the actual blasting work – the spacing of drill holes cannot be determined at this time, as it will depend on prevailing field conditions – multiple shots may be required – typically, shots will be loaded and fired within 24 hours of the drilling;
- 6) Division officials will be kept apprised of the progress of these activities to promote effective communication between Allied Waste and the Division – Divisions officials will be invited to observe the shots first-hand;

- 7) Locations for blast monitoring will focus at the closest edge of the currently active landfill cell (2F) and the nearest monitoring wells – the blast pattern will be constructed to limit the peak particle velocities to 1 inch per second at the blast monitoring locations (typically this is adequate to protect even vibration-sensitive structures);
- 8) All blasting activities will be observed by experienced engineers/technicians – afterward the blast area will be inspected to confirm no visible blast-induced damage that might influence groundwater flow; and
- 9) A detailed report of the blasting activities (including the seismic readings) will be submitted to the SWS within 30 days of the blasting.

This work is justified because the rock outliers were not discovered until after the base liner subgrade was approved by the Division. The rock outliers revealed during the grading activities in Cell 2G are small (less than 50 feet across) and are located along the surface (anticipated blasting depths are 6 feet) – the outliers are surrounded by deep soil, based on the original test boring investigation, that will dampen vibrations moving away from the blast site. Prior blasting work at this site was approved by the Division and was demonstrated to impart no detrimental effects to the liners and monitoring wells (which themselves are not particularly vibration-sensitive structures) – particle velocities within the previous blasting work were less than 1 inch per second at the monitored locations. No potential damage to existing liners and monitoring wells is anticipated under the planned carefully controlled blasting conditions.

Thank you for your attention on this matter, and I look forward to your response. On behalf of Allied and its contractors, we would appreciate a reply at your earliest convenience. Please contact me if you have any questions.

Cordially yours,



G. David Garrett, P.G., P.E.

cc: Mike Gurley, Environmental Manager – Allied Waste Industries
Fred Brown, Superintendent – Earnhardt Grading, Inc.
Albert Glenn, P.E., Design Engineer – Brown and Caldwell, Inc.
Ed Mussler, P.E., Permitting Branch – NCDENR Division of Waste Management

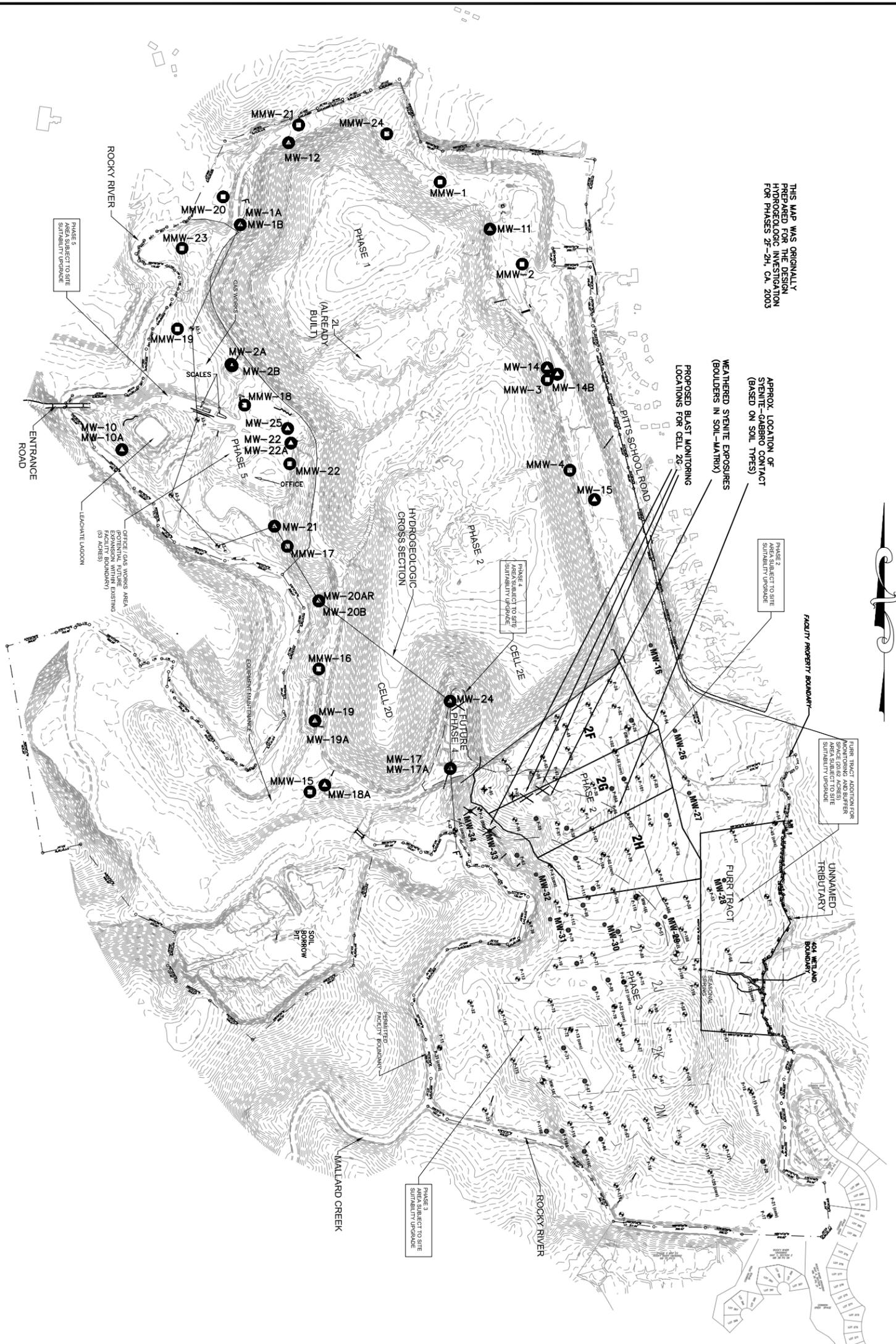
Attachments – Figures 1 and 2

THIS MAP WAS ORIGINALLY PREPARED FOR THE DESIGN HYDROGEOLOGIC INVESTIGATION FOR PHASES 2F-2H, CA, 2003

APPROX. LOCATION OF STENITE-GABBRO CONTACT (BASED ON SOIL TYPES)

WEATHERED STENITE EXPOSURES (BOULDERS IN SOIL-MATRIX)

PROPOSED BLAST MONITORING LOCATIONS FOR CELL 2G



| LINE | LENGTH | BEARING | LINE | LENGTH | BEARING |
|------|---------|-------------|------|---------|-------------|
| L1 | 20.56' | S04°30'22"W | L59 | 69.98' | N1°37'29"E |
| L2 | 15.62' | S21°48'07"W | L60 | 104.42' | N47°30'29"W |
| L3 | 16.86' | S03°29'29"E | L61 | 24.70' | N09°40'22"W |
| L4 | 18.67' | S10°44'26"W | L62 | 64.03' | N72°20'05"W |
| L5 | 14.84' | S04°27'34"W | L63 | 107.70' | S89°28'24"W |
| L6 | 27.10' | S06°03'26"E | L64 | 39.01' | N06°03'46"E |
| L7 | 32.60' | S05°47'35"W | L65 | 107.53' | N16°42'28"W |
| L8 | 30.00' | S08°53'07"W | L66 | 122.15' | N37°11'18"W |
| L9 | 13.05' | S27°44'33"W | L67 | 72.92' | S72°54'36"W |
| L10 | 17.50' | S28°26'19"E | L68 | 82.90' | N77°41'08"W |
| L11 | 30.86' | S07°21'17"W | L69 | 42.77' | N52°21'6"E |
| L12 | 28.19' | S02°19'19"E | L70 | 72.75' | N82°29'45"E |
| L13 | 21.41' | S32°27'17"E | L71 | 97.63' | S82°26'21"E |
| L14 | 33.51' | S42°41'41"W | L72 | 111.30' | N20°26'43"E |
| L15 | 21.87' | S00°00'31"W | L73 | 93.86' | S74°51'01"E |
| L16 | 23.59' | S05°57'02"E | L74 | 86.10' | S25°50'50"W |
| L17 | 19.20' | S09°05'37"W | L75 | 115.53' | S05°46'58"W |
| L18 | 8.79' | S89°05'13"E | L76 | 105.53' | S33°07'31"E |
| L19 | 26.32' | S38°15'16"E | L77 | 117.18' | S42°42'52"E |
| L20 | 56.67' | S11°44'41"W | L78 | 77.42' | S64°22'29"E |
| L21 | 23.14' | S12°17'00"E | L79 | 93.76' | S57°25'31"E |
| L22 | 75.06' | S25°58'25"E | L80 | 35.09' | N77°49'31"E |
| L23 | 70.70' | S29°27'17"E | L81 | 46.09' | N63°28'41"E |
| L24 | 107.82' | S30°38'21"W | L82 | 142.27' | S80°28'52"W |
| L25 | 94.60' | S27°02'24"W | L83 | 125.24' | N24°37'28"E |
| L26 | 33.93' | S43°09'41"W | L84 | 36.19' | N15°50'28"E |
| L27 | 40.06' | S51°17'54"W | L85 | 78.20' | N41°19'28"E |
| L28 | 35.15' | S27°48'21"E | L86 | 82.77' | N31°41'31"E |
| L29 | 26.81' | S18°54'52"W | L87 | 86.11' | N19°21'48"E |
| L30 | 77.24' | S00°22'10"E | L88 | 77.44' | N31°36'03"E |
| L31 | 32.66' | S13°20'43"W | L89 | 93.77' | N30°25'34"E |
| L32 | 19.56' | S26°17'29"E | L90 | 88.98' | N05°11'56"E |
| L33 | 39.83' | S35°55'20"E | L91 | 65.87' | N03°19'54"W |
| L34 | 52.38' | S16°51'54"E | L92 | 49.59' | N02°02'02"W |
| L35 | 77.44' | S10°07'51"W | L93 | 49.59' | N21°50'14"W |
| L36 | 57.64' | S41°27'19"E | L94 | 57.89' | N25°29'24"E |
| L37 | 31.11' | S21°38'25"E | L95 | 63.70' | N39°19'27"E |
| L38 | 28.02' | S11°27'09"E | L96 | 72.37' | N63°15'50"E |
| L39 | 21.97' | S02°22'29"E | L97 | 21.97' | N65°11'24"E |
| L40 | 80.83' | S85°57'22"E | L98 | 50.02' | N65°11'07"E |
| L41 | 16.16' | S52°43'36"W | L99 | 70.32' | N19°31'08"E |
| L42 | 20.03' | S08°25'43"E | L100 | 50.80' | N71°33'31"E |
| L43 | 7.00' | S44°33'01"E | L101 | 89.57' | S05°27'39"E |
| L44 | 20.05' | S20°13'43"E | L102 | 20.17' | S04°31'30"E |
| L45 | 28.21' | S11°56'15"W | L103 | 100.15' | S04°44'44"E |
| L46 | 7.21' | S04°30'22"W | L104 | 90.50' | S01°10'09"W |
| L47 | 26.58' | N18°07'35"E | L105 | 57.50' | S38°45'06"W |
| L48 | 52.84' | S88°02'30"E | L106 | 84.19' | S07°46'04"W |
| L49 | | | L107 | 87.48' | S32°28'48"E |

LEGEND

- PROPERTY BOUNDARY
- EXISTING TOPOGRAPHY
- TREE LINE
- PROPOSED MONITORING WELL
- EXISTING MONITORING WELL
- EXISTING METHANE MONITORING WELL
- SURFACE WATER MONITORING LOCATIONS
- 100 YEAR FLOODPLAIN AE ZONE
- 100 YEAR FLOODPLAIN A ZONE
- PROPOSED CELL
- FUTURE CELLS (TENTATIVE LOCATIONS)

NOTES:

TOPOGRAPHIC CONTOURS BASED ON AERIAL SURVEY CONDUCTED IN MAY 2003.
 BASE GRADES, EXISTING TOPO AND FLOODPLAIN DELINEATION PROVIDED BY ESP ASSOCIATES.
 CONCEPTUAL CELL LAYOUT PROVIDED BY ESP ASSOCIATES.

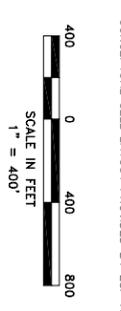


FIGURE 1

