Duke Energy®

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LY Frost	**February 29, 2008**	**4076**

December 6, 2007

North Carolina Department of Environment and Natural Resources
Division of Waste Management
Solid Waste Section
401 Oberlin Road
Raleigh, N.C. 27605

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DEC 11 2007

SOLID WASTE SECTION
ASHEVILLE REGIONAL OFFICE

Attention: Mr. Edward F. Mussler, III, P.E.

Subject: Duke Energy - Marshall Steam Station
FGD Landfill
Solid Waste Facility Permit No: 18-09
Operational Plan Modification

Dear Mr. Mussler:

Attached for your review is the revised Operations and Maintenance Plan for Duke Energy's FGD Landfill at Marshall Steam Station. This submittal includes a second minor revision to the O&M Plan that was submitted under letter dated November 13, 2007. As recently discussed with Larry Frost, the attached O&M Plan includes a change to page 4 in Section 1.6 of the Plan. This modification alters wording to include "fly ash, as needed" as a waste stream and replaces "fly ash for short-term, near emergency conditions." This change is requested to allow use of the Marshall FGD landfill for flyash disposal in the event that the proposed CCP landfill for the Marshall site is not operable when needed in 2010 for continued plant operation.

The attached Plan is submitted primarily in response to our request of May 30, 2007 and your letter of July 6, 2007 granting approval for certain uses and changes to this landfill. The attached Plan is submitted in response to Requests #2, #3, and #4 from the July 6, 2007 letter. As required for Request #1, as-built drawings and CQA information will be forwarded upon completion of the concrete lined basin.

Thank you for your time and assistance with this matter. If there are any questions, please contact me at 980-373-7892.

Sincerely,

Christopher D. Hallman

Christopher D. Hallman, P.E.
Waste and Remediation Management
Duke Energy Corporate EHS

Attachments

cc: Mr. Larry Frost, NCDENR – Asheville Regional Office

cc (w/o att) Donna Burrell - Marshall
Aaron Kitzmiller – Marshall
Mark Baker
Bill McCabe

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OPERATIONS AND MAINTENANCE PLAN
DUKE ENERGY
MARSHALL STEAM STATION
FLUE GAS DESULFURIZATION (FGD) GYPSUM LANDFILL PHASE 1
CATAWBA COUNTY, NC

Revised September 4, 2007

NORTH CAROLINA PROFESSIONAL SEAL 17582 ENGINEER DAN E. BREWER
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1.0 LANDFILL OPERATIONS AND MAINTENANCE

1.1 Introduction

The Marshall Steam Station Flue Gas Desulfurization (FGD) system will create a residue generally comprising of gypsum. Residue that cannot meet beneficial use will be landfilled in the proposed FGD Gypsum Landfill located just west of the Marshall Steam Station Plant. The landfill footprint encompasses approximately 33 acres. Phase 1 will be developed in two cells with a minimum capacity of five years.

This Operations and Maintenance Plan has been prepared in accordance with Section 0.0505 of the North Carolina Solid Waste Management Rules.

1.2 Hours of Operation

The FGD landfill will be open seven days a week, as required.

1.3 Landfill Development

The landfill will be developed within the areas shown on the Grading Plan. A 200-foot buffer will be maintained around the entire perimeter. A 500-foot buffer will be maintained from existing residences and water supply wells. The majority of the areas within the buffer will remain in its current condition.

The FGD gypsum landfill will be constructed so that excavated soil can be used for intermediate and final cover. The landfill will be developed in one 5-year phase with two cells. The site will be graded in accordance with the Grading Plan which will provide a minimum of four foot separation from waste to the estimated seasonal high groundwater level or top of bedrock (whichever is shallower). The erosion control devices for each cell as shown on the Erosion and Sediment Control Plan will be constructed prior to excavation within each cell.

Waste will be placed initially from the upgradient to the downgradient end of each cell. An initial 10-foot thickness of waste, placed in 1-foot lifts, will be placed across half the landfill cell floor working from upgradient to downgradient areas. After the initial 10 foot thickness of waste has been placed and intermediate cover installed, subsequent lifts will also proceed from the upgradient end toward the downgradient end. This procedure will continue within a permitted cell until proposed final contours are reached. The downgradient half of the cell will be placed in the same manner as the first half, using ten foot layers in 1 foot lifts from upgradient to downgradient. The final cover will consist of a minimum of 2 feet of vegetative cover soil, a geocomposite drainage layer, a 40 mil textured LLDPE geomembrane, and 18-inch thick compacted soil layer on top of the waste. The final cover will be vegetated with native grasses within six months following closure. Operational phasing diagrams for each phase of development are presented in the appendix of this Plan.

1.4 Training of Facility Personnel

Due to the diversity of job tasks required at landfills and the critical nature of the landfill components, personnel are properly trained to handle the operation and maintenance of the facility. Some of the critical tasks include:

- Equipment operations;
- Inspection and maintenance of storm water and erosion control devices;
- Accurate records of waste loading (quantitative and qualitative);
- Identification of hazardous and liquid wastes;
- Control of accidental fires; and
- Control of dust.

The proposed staff for this facility is properly trained for operation and maintenance of this type of landfill.

1.5 Waste Placement

1.5.1 Gypsum and Ash Waste

A conveyor system will transport the gypsum waste and stockpile it adjacent to the landfill. The waste will then be loaded onto dump trucks and hauled to the landfill active face. The ash waste is loaded at the plant in dump trucks and hauled to the landfill. As waste is dumped from trucks, the waste shall be spread with a dozer in lifts no greater than 12 inches. Landfilling shall proceed until half of a cell is filled to the proposed final cover elevation for that cell. The downgradient end of each cell will then be landfilled in the same manner. Soil berms will be constructed as necessary to divert run-on from entering the working face or allowing runoff to drain from active areas.

Waste shall be compacted in thin lifts with a dozer and placed on the smallest active face as feasible. The FGD and ash waste shall be covered with a compacted layer of eight inches of intermediate cover soil at the completion of each ten feet in vertical thickness, or as specified by the Division of Waste Management.

Loads of waste that exhibit higher moisture content than anticipated shall be placed no closer than 50 feet from the active face in thin lifts and dozed into place. No waste shall be placed in areas of accumulated water.

Areas that will not have waste placed for 30 days or more shall be covered with a minimum of eight inches of intermediate soil cover, placed and compacted by a dozer. Areas not filled for 12 months or more shall be seeded with temporary seeding in accordance with the seeding specifications presented in the Erosion and Sediment Control Plan. The seeding will be provided as necessary to stabilize the cover.

1.5.2 Clarifier Sludge

The waste is loaded onto dump trucks and hauled to the landfill active face. The waste is end dumped on the active face and allowed to dry a few days before it is spread with a dozer. The clarifier sludge should be mixed in with ash during the spreading operations in lifts no greater than 12 inches. The sludge should be mixed so that at least one part sludge to one part bottom ash is mixed.

1.5.3 Asbestos

Asbestos is brought in dump trucks and dumped in the appropriate area of the landfill. Asbestos waste must be managed in accordance with 40 CFR 61.

Asbestos waste must be covered immediately with soil in a manner that will not cause airborne conditions and must be separate and apart from other solid wastes. Two areas are designated as asbestos fill areas as shown on the Phasing Diagrams in the Appendix.

Areas that will not have waste placed for 30 days or more shall be covered with a minimum of eight inches of intermediate soil cover, placed and compacted by a dozer. Areas not filled for 3 months or more shall be seeded with temporary seeding in accordance with the seeding specifications presented in the Erosion and Sediment Control Plan. The seeding will be provided as necessary to stabilize the cover.

1.5.4 C&D Waste

C&D waste is brought in dump trucks and dumped on the active face of the landfill. Waste shall be compacted with a dozer and placed on the smallest active face as feasible. The location of the C&D waste shall be placed in the operating record.

The compacted C&D waste shall be covered with six inches of earthen material when the waste disposal area exceeds one-half acre and at least once weekly. Soil cover must be placed at more frequent intervals if necessary to control disease vectors, fires, odors, blowing litter, and scavenging. The soil cover placement date and time shall be recorded in the operating record.

Areas that will not have waste placed for 30 days or more shall be covered with a minimum of eight inches of intermediate soil cover, placed and compacted by a dozer. Areas not filled for 3 months or more shall be seeded with temporary seeding in accordance with the seeding specifications presented in the Erosion and Sediment Control Plan. The seeding will be provided as necessary to stabilize the cover.

1.6 Waste Acceptance

The permit requirements for the FGD gypsum landfill will allow the facility to accept the following waste types:

1. FGD residue material that is not needed to meet the production needs of any beneficial use options.
2. FGD residue material that does not meet the specifications required for beneficial use.
3. FGD residue material that is removed from settling or clarifier stages of the associated waste water treatment facility.
4. Fly ash as needed.
5. Asbestos waste from Marshall and other Duke plant operations and maintenance.
6. C&D waste from plant construction and demolition projects.
7. Bottom ash as needed for the transportation and mixing for disposal of clarifier sludge.

The Operations Manager shall notify the Division within 24 hours of attempt to dispose of any other waste products. No hazardous, liquid, or infectious waste shall be accepted or disposed of in the FGD residue landfill.

2.0 SITE OPERATIONS AND MAINTENANCE

The Duke Energy Marshall Steam Station FGD Gypsum Landfill is owned and operated by Duke Energy Corporation. Operation and maintenance of the landfill will be the responsibility of the Plant Supervisor, Mr. Monte Neill.

2.1 Access and Security Requirements

The site lies entirely within Duke Energy property. Security is currently in place that includes fencing, wooded buffers and security check stations.

Access roads to the site shall be of all weather construction and maintained in good condition.

Directional signs shall be placed along the access road to the landfill. A sign shall also be posted at the landfill that includes the permit number, hours of operation, and a statement reading, "NO HAZARDOUS OR LIQUID WASTE PERMITTED."

2.2 Erosion/Sedimentation Control Maintenance

The site is designed with erosion and sedimentation control in accordance with the requirements of the Sedimentation Pollution Control Law (15A NCAC4). Erosion/sedimentation control structures include sediment basins, outlet protection aprons and diversion ditches. Sediment basins shall be checked after periods of significant runoff and as specified in the Technical Specifications and Erosion and Sedimentation Control Plans. Sediment shall be removed to its original dimensions when the sediment accumulates to one half of the design depth. Excavated sediment shall be transported to the soil stockpile area. The sediment basins, embankments, and outlets

shall also be inspected for erosion damage after each significant rainfall event. All necessary repairs shall be made immediately.

The sediment basin within the downgradient end of the landfill will be lined with a concrete liner to assist in cleanout operations when the basin is silted with ash or gypsum. The concrete liner will also protect the underlying geomembrance from damage during cleanout operations.

Diversion ditches shall be inspected for damage after each significant rainfall event, as specified on the Erosion and Sediment Control Plan. Riprap channels and outlet protection aprons shall be inspected for wash outs. Riprap shall be added to these areas as needed.

Embankment slopes shall be periodically inspected for erosion. These areas shall be mowed at least twice a year. The embankment slopes shall be refertilized in the second year unless vegetation growth is fully adequate. Reseed, fertilize, and mulch damaged areas immediately. Seeding, fertilizing and mulching shall be in accordance with the seeding specifications in the Erosion and Sediment Control Plan.

2.3 Stormwater Structures

All culverts and inlets shall be inspected quarterly for signs of damage, settlement, clogging, siltation build-up or washouts. Repairs to the stormwater structures shall be made as soon as possible.

2.4 Dust, Litter, Odors and Vectors

Dust generated due to landfill activities will be controlled through the application of water by truck or other approved dust control products, if necessary. Additionally, final cover will be vegetated as soon as is practical in order to minimize the blowing of dust on-site. Odors and vectors are typically not a problem at FGD gypsum landfills.

Due to the possibility of minor hydrogen sulfide (H_2S) gas production at the gypsum/soil interface, a passive gas system has been designed for the final cover system of the FGD gypsum landfills. During landfilling activities H_2S gas measurements will be taken at the leachate collection cleanout pipes located along the landfill perimeter and the sump discharge pipe inverts in the stormwater basin. In the event that H_2S gas is detected, the levels will be evaluated and the necessary mitigation measures will be undertaken.

Following landfill closure activities, H_2S gas measurements may also be taken from the gas vents. In the event that H_2S gas is detected, the proposed passive gas system can be converted into an active gas system with gas control devices if required.

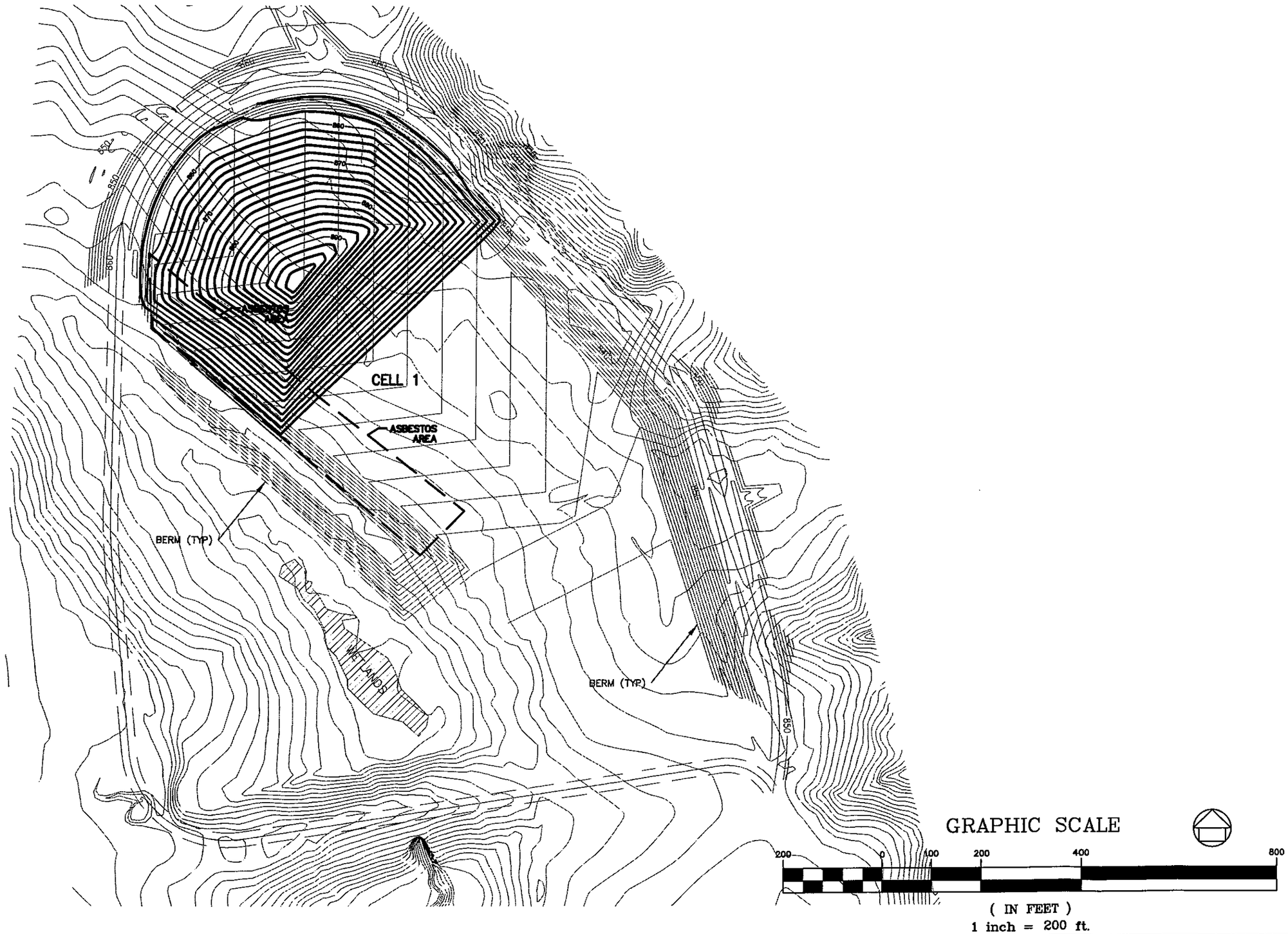
2.5 Fire Control

There are no explosive gas concerns with the gypsum or ash waste. Any C&D waste that is placed in the landfill is covered with a soil cover on a routine basis.

The Marshall Steam Station has employees trained in fire control at the plant. In the event of fire to equipment at the landfill site, Duke's fire control personnel will be immediately dispatched.

2.6 Groundwater Monitoring Wells

Groundwater monitoring wells will be located around the landfill perimeter. Care must be taken around the wells to prevent any damage to the wells. The proposed groundwater monitoring plan including well locations, screened intervals, depths and construction details is included in the Groundwater Monitoring Plan.



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9/4/07

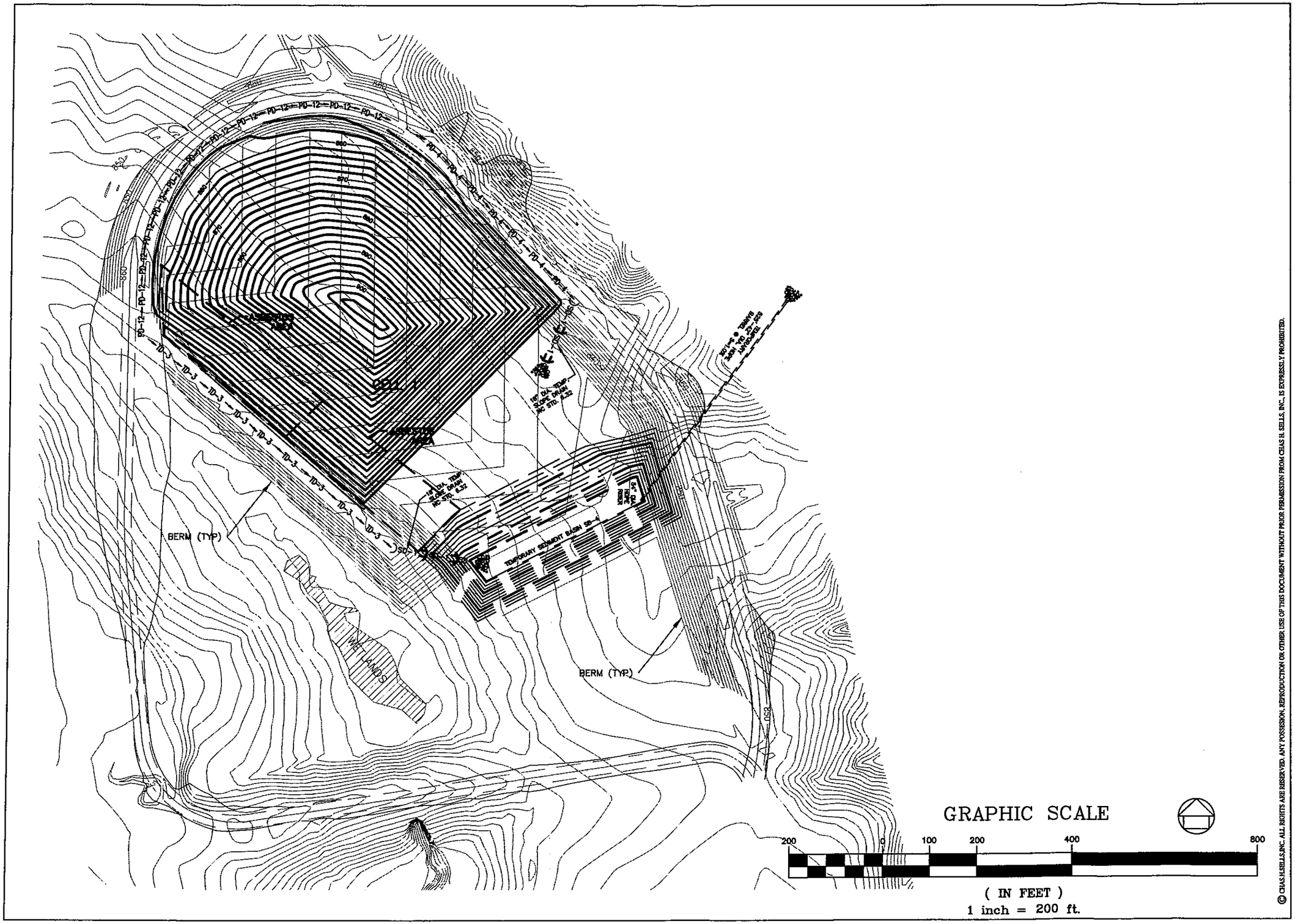
MARSHALL STEAM STATION

FGD GYPSUM LANDFILL
CATAWBA COUNTY
NORTH CAROLINA

PROJECT #: 046003 DATE: 02/17/04
DRAWN BY: TCS CHECKED BY: DB

TITLE
CELL 1
PHASING DIAGRAM

SHEET
C 2



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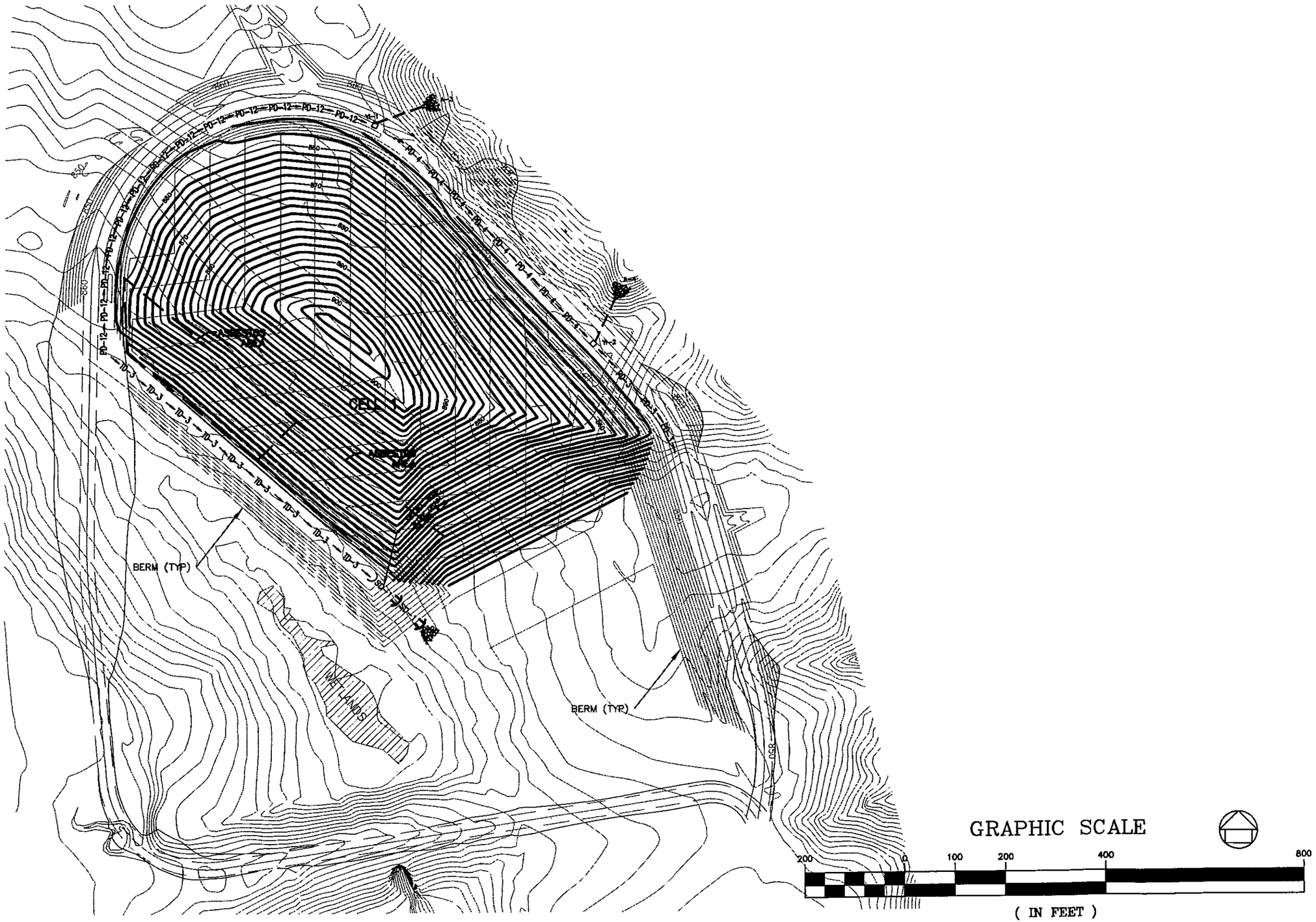
TITLE

CELL 1
PHASING DIAGRAM

SHEET

C 3



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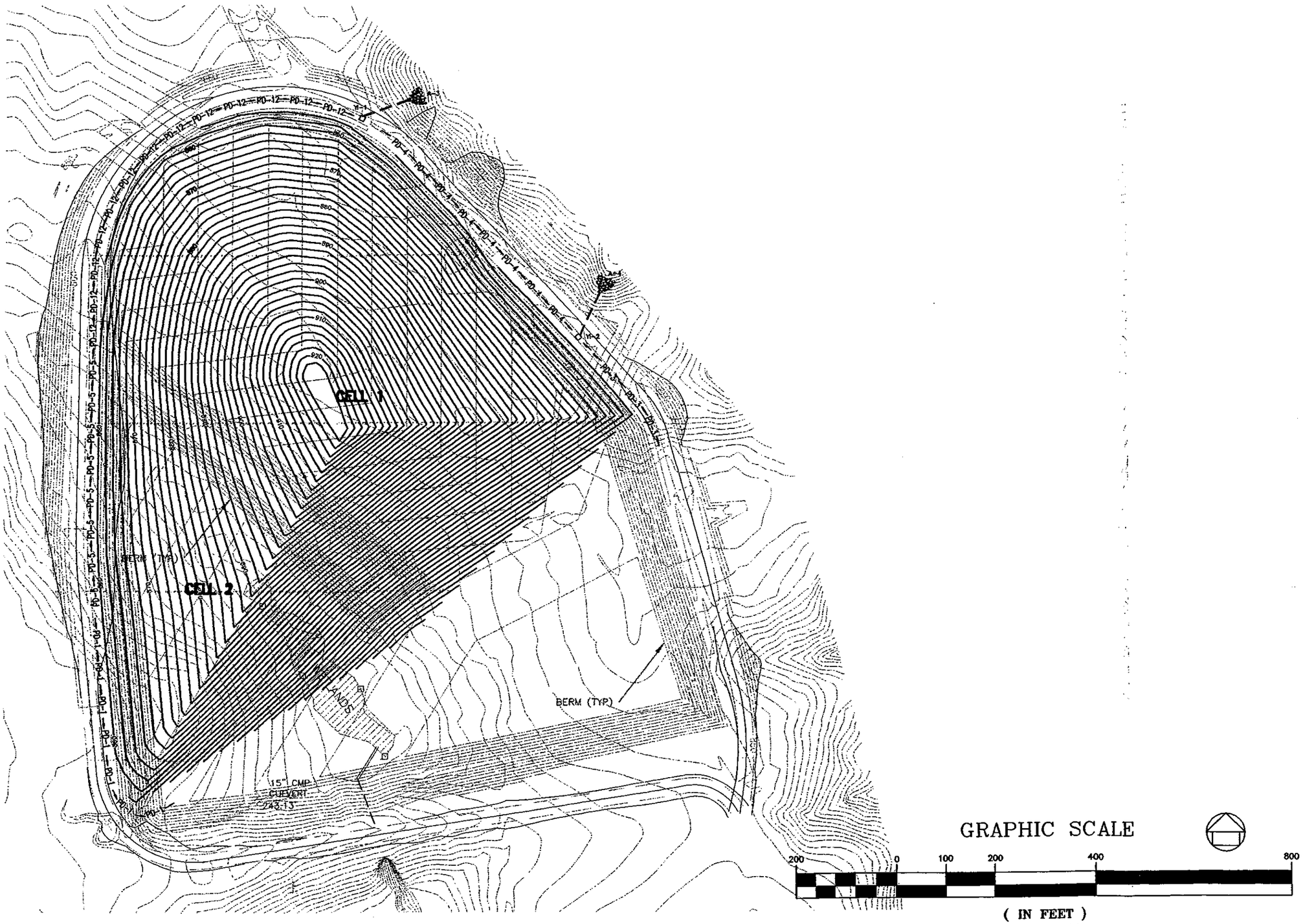

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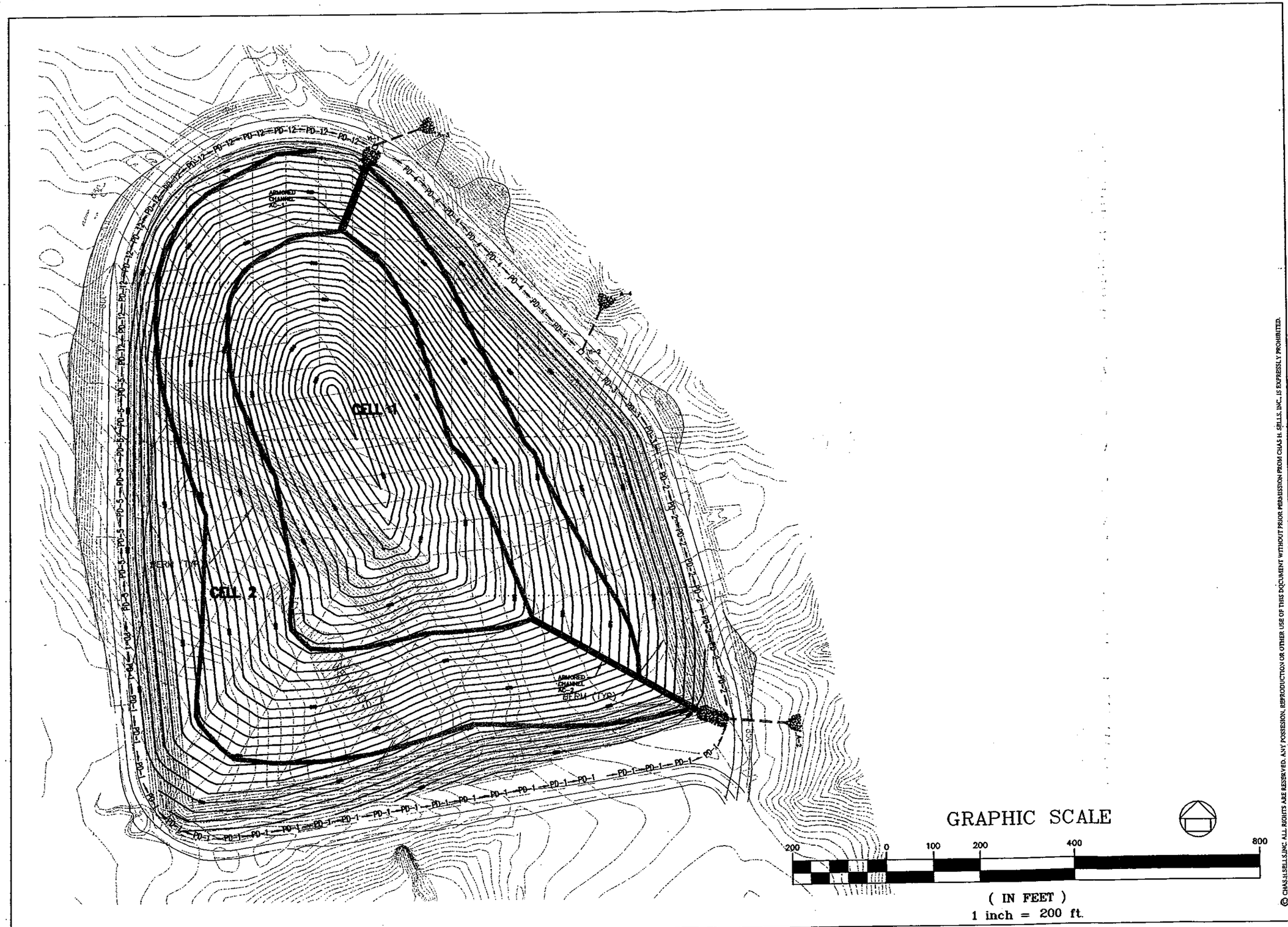
TITLE

CELL 2
PHASING DIAGRAM

SHEET

C 5



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