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NORTH CAROLINA DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES

Dexter R. Matthews, Director | Division of Waste Management | Michael F. Easley, Governor
William G. Ross Jr., Secretary

February 17, 2005

Mr. Edward J. Kreul
Manager- Environmental Performance
International Paper- Riegelwood Mill
John L. Riegel Road
Riegelwood, NC 28456

RE: International Paper, Rieglewood Mill Landfill, Permit to Operate, Cell1, Permit No. 24-02.

Dear Mr. Kreul;

The Solid Waste Section has reviewed the construction quality assurance documentation for the construction of Cell 1 of the Internatioanl Paper, Riegelwood Mill Landfill. As certified by the Project Engineer and the Quality Assurance Consultant, Cell 1have been completed in accordance with the project specifications and the conditions of the permit to construct. The Section has determined that International Paper has met the pre-operative conditions of the Permit to Construct, issued December 30, 2002 for this cell. In accordance with G.S. 130A-294, Cell 1 is hereby approved to receive waste.

If you have any questions regarding the terms of this approval, please contact me at 919.733.0692 x 343. Please review your permit carefully. According to 15A NCAC 13B .0203(d), by beginning construction and receiving waste in the cells, the applicant shall be considered to have accepted the conditions of the permit.

Sincerely,

Edward H. Mussler III, P.E.
Permitting Engineer
Solid Waste Section

cc: Greg Mills P.E. GNRA
John Crowder, DWM
Ray Williams, DWM

1646 Mail Service Center, Raleigh, North Carolina 27699-1646
Phone 919-733-0692 \ FAX 919-733-4810 \ Internet http://wastenotnc.org

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NORTH CAROLINA DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES

Dexter R. Matthews, Director | Division of Waste Management | Michael F. Easley, Governor
William G. Ross Jr., Secretary

FACILITY PERMIT NO: 24-02
Part 2-Permit to Operate
Date of Original Issue: February 17, 2005

STATE OF NORTH CAROLINA
DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES
DIVISION OF WASTE MANAGEMENT
1646 Mail Service Center, Raleigh, NC, 27699

INDUSTRIAL SOLID WASTE LANDFILL PERMIT

INTERNATIONAL PAPER, RIEGLEWOOD PULP AND PAPER MILL,
COLUMBUS COUNTY, NORTH CAROLINA
is hereby issued a PERMIT to OPERATE an
INDUSTRIAL SOLID WASTE LANDFILL FACILITY, Cell 1

located off John L. Riegel Road, Columbus County, North Carolina, in accordance with Article 9, Chapter 130A, of the General Statutes of North Carolina and all rules promulgated thereunder and subject to the conditions set forth in this permit. The facility is located and described by the legal description of the site or the property map contained within the approved application.

Donald J. Barber, Supervisor
Permitting Branch
Solid Waste Section

1646 Mail Service Center, Raleigh, North Carolina 27699-1646
Phone 919-733-0692 \ FAX 919-733-4810 \ Internet http://wastenotnc.org

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ATTACHMENT 3

Approved Documents

PART I: INDUSTRIAL LANDFILL FACILITY
PART II: INDUSTRIAL LANDFILL UNIT

1. *Construction Quality Assurance Report, International Paper-Riegelwood Mill, Industrial Landfill, Cell 1 Construction. Permit Number 24-04.* Prepared for: International Paper- Riegelwood Mill, 805 John L. Riegelwood Road, Riegelwood, North Carolina 28456. Prepared by: G.N. Richardson & Associates, Inc. Raleigh, NC. December 2003.
2. *Operations Manual. International Paper- Industrial Landfill Facility, Permit #24-02. Riegelwood, North Carolina.* Prepared by: International Paper, Engineering Technology. February 2005.

ATTACHMENT 4
Conditions of Permit to Operate

PART I: INDUSTRIAL LANDFILL FACILITY
GENERAL CONDITIONS

1. This permit shall be reviewed, pursuant to 15A NCAC 13B.0201(e). This permit expires five (5) years from the original issuance date of this permit to operate, on February 17, 2010. No later than October 17, 2009, International Paper shall submit to the Solid Waste Section, for review, a construction plan application prepared in accordance with 15A NCAC 13B.0503(2).

2. In the event of conflicts between this Permit to Operate and previously issued conditions, the conditions of this Permit to Operate shall supersede previously issued conditions.

3. Additional conditions and revision of the approved documents or changes during the operation of the landfill require approval by the North Carolina Solid Waste Section.

PART II: INDUSTRIAL LANDFILL UNIT
OPERATIONAL CONDITIONS

4. This permit approves the operation of Cell 1 as well as the on-site environmental management and protection facilities as described in the approved plans.

5. The solid waste management units within this facility shall conform to all operating requirements described in the approved plans, 15A NCAC 13B .0505, and the conditions specified herein:
    a. Closure or partial closure of any Industrial Solid Waste Landfill unit shall be in accordance with the Closure Plans described in the approved plans. Final Closure Plans shall be submitted to the Division at least 90 days prior to implementation.
    b. Wastewater treatment sludges may be disposed in accordance with approved plans.

6. Ground water quality at this facility is subject to the "Classifications and Water Quality Standards Applicable To The Groundwater of North Carolina", 15A NCAC 2L. This includes, but is not limited to provisions for detection monitoring, assessment, and corrective action. Compliance will be determined with ground water monitoring at the landfill.

MONITORING AND REPORTING

7. Ground water monitoring at this unit shall be as described in the approved monitoring plan dated December 2004, contained in Document 1, Appendix 1.

8. A readily accessible unobstructed path shall be cleared and maintained so that four-wheel drive vehicles may access monitoring well locations at all times.

9. A field log book that details all development, sampling, repair, and all other pertinent activities associated with each monitoring well and all sampling activities associated with each surface water and leachate sampling location shall be kept. Copies of the field book or a summary of the relevant data shall be kept with the ground water monitoring reports.

10. Records of all ground water, surface water, and leachate analytical data shall be kept as part of the permanent facility record.

11. Ground water monitoring wells and surface water sampling locations must be sampled at least semi-annually according to the specifications outlined in the approved water quality monitoring plan and the current policies and guidelines of the Section in effect at the time of sampling.

12. Reports of the analytical data for each water quality sampling event shall be submitted to the Section within 60 days of the respective sampling event. Analytical data shall be submitted in a manner prescribed by the Section.

13. The four independent samples which comprise the initial baseline sampling event shall be collected from each ground water monitoring well and the report shall be submitted to the Section within six months after issuance of the Permit to Operate.

14. Untreated leachate shall be sampled and analyzed at least semi-annually concurrently with the ground and surface water sampling as described in the approved monitoring plan. The leachate shall be analyzed for the same constituents as the ground and surface water and also for pH, specific conductance, BOD, COD, phosphate, nitrate and sulfate. Test results shall be submitted to the Section along with ground and surface water test results.

15. On or before August 1 of each year, the permittee shall report the amount of waste received (in tons) at this facility and disposed of in the landfill units to the Solid Waste Section, on forms prescribed by the Section. This report shall include the following information:
    a. The reporting period shall be for the previous year, beginning July 1 and ending on June 30.
    b. The amount of waste received and landfilled in tons, compiled on a monthly basis by county or transfer station of origin and by specific waste type if diverted toa specific unit within the permitted facility; and
    c. The completed report shall be forwarded to the Regional Waste Management Specialist for the facility. A copy of the completed report shall be forwarded to the County Manager of each county from which waste was received.

16. This permit is for Cell 1. Cell 1 has a gross permitted capacity of 749,000 cubic yards as identified by Document 1, Appendix 1. This is approximately to elevation 78+/- MSL as identified on drawing S6 of Document 2, Appendix 1.

17. This facility is permitted to take waste, as identified in the approved plans, from the International Paper Riegelwood Pulp and Paper Mill and the IP owned Armour Sawmill, as identified in the approved plans.

18. The Action Leakage Rate (ALR) for the secondary leachate collection system is 500 gallons per acre per day. The owner or operator shall notify the Section, in writing, with 7 days of triggering the ALR. Within 30 days of triggering the ALR, the owner or operator shall present a plan for identifying the source of the leachate and for remedial action.

North Carolina
Department of Environment and Natural Resources

Division of Waste Management

Michael F. Easley, Governor
William G. Ross Jr., Secretary
Dexter R. Matthews, Director

NCDENR

June 3, 2003

Mr. Edward J. Kreul
Environmental Services Superintendent
International Paper- Riegelwood Mill
John L. Riegel Road
Riegelwood, NC 28456

RE: Design Modification, Revised Anchor Trench and Geosynthetic Installation, International Paper, Rieglewood, NC, Cell 1, Permit Number 2402.

Dear Mr. Kreul;

The Division of Waste Management, Solid Waste Section, received correspondence dated May 27, 2003 from your Consultant, G.N. Richardson, Inc. The letter described a revision to the method by which the synthetics on the project might be installed in the anchor trench and how the initial layer of primary geocomposite would be installed with the anchor trench not perpendicular to it , as is customary. In addition the tie method of for linking the geocomposite panels has been slightly altered by increasing the frequency.

In accordance with Permit to Construct, 2402, Attachment II, Part I, Condition 11, the Section has reviewed the proposed changes and hereby accepts them. Field changes or other deviations from the approved plan, should be included on the as-built drawings and properly identified in the final CQA report as required by the rules. If you have any questions or need additional assistance, please contact the Section.

Sincerely,

James C. Coffey

James C. Coffey, Chief
Solid Waste Section

cc: Greg Mills, P.E. G. N. Richardson & Ass.
Ed Mussler, P.E. DWM

CENTRAL F.lc

Operations Manual

International Paper – Industrial Landfill Facility
Permit # 24-02

Riegelwood, North Carolina

February 2005

APPROVED
DIVISION OF WASTE MANAGEMENT
SOLID WASTE SECTION
DATE 2-17-05 BY [illegible]
2402 PTO
A3 PII DOC 2

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Appendix A EPA Method 9095 – Paint Filter Liquids Test
Appendix B Waste Screening Form
Appendix C Cell Activation Form
Appendix D Filling Sequence Diagrams and Details
Appendix E Leachate Information Spreadsheet

1 GENERAL FACILITY OPERATIONS

1.1 OVERVIEW

This Manual describes Operation of International Papers' (IP) Industrial landfill facility located at 865 John L. Riegel Road, Riegelwood, North Carolina. A Lateral Expansion Facility and Engineering Plan (Attachment A of the Permit to Construct Application) presents a detailed discussion and calculations for the individual components of the Cell 1 industrial landfill unit. This landfill facility receives industrial process residuals from the adjacent Riegelwood pulp and paper mill, and the nearby Armour sawmill.

The information contained herein is intended to provide landfill operations personnel with a clear understanding of how the Engineer and Owner expect the completed facility to be operated. While deviations from the operating procedures outlined herein may be acceptable, they shall be reviewed and approved by the Owner's designated landfill supervisor.

1.2 CONTACT INFORMATION

All correspondence and questions concerning the operation of IP's Riegelwood landfill should be directed to:

1.2.1 INTERNATIONAL PAPER

Mr. Edward Kreul, Manager-Environmental Performance
International Paper
865 John L. Riegel Road
Riegelwood, North Carolina 28456
Phone: 910-655-6229
Email: Edward.Kreul1@ipaper.com

1.2.2 NORTH CAROLINA DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES

North Carolina Department of Environment and Natural Resources
225 Green Street, Suite 714
Fayetteville, NC 28301

Phone: (910) 486-1541
Fax: (910) 486-0707

Division of Waste Management (DWM) – Solid Waste Section:
1646 Mail Service Center
Raleigh, NC 27699

Branch Head: Jim Barber (919) 733-4996

Wilmington Regional Office
127 North Cardinal Drive
Wilmington, NC 28405

Eastern Region Supervisor: John Crowder (910) 395-3900

Division of Land Resources – Land Quality Section:
Raleigh Office:
3800 Barrett Drive
Raleigh, NC 27611
Phone: (919) 571-4700
Fax: (919) 571-4718
Regional Engineer: John Holley, P.E.

1.3 ACCESS CONTROL

Limiting access to Riegelwood's landfill will effectively control:

- Unauthorized and illegal dumping of waste materials;
- Trespassing, and risk of injury resulting there from; and
- The risk of vandalism.

A combination of existing fences, and lockable gates will control access to the landfill. The landfill is situated adjacent to the operating pulp and paper mill, on a large contiguous tract of IP owned property. A significant wooded buffer, and natural barriers such as treatment impoundments also screen the site. Security personnel regularly patrol mill property after normal operating hours.

1.3.1 PHYSICAL RESTRAINTS

Riegelwood's landfill site will be accessible only from private mill roads, all having lockable gates at strategic intersections. These gates are normally locked during non-operating hours.

1.3.2 SECURITY

Mill security personnel make regular rounds both during, and especially after, normal operating hours. All roads surrounding the landfill cell, as well as the lockable gates, are in open, highly visible areas, most of which are well lit for night visibility.

1.3.3 OUTSIDE CONTRACTOR TRAINING

Outside contractors performing maintenance, construction, and demolition work in the Riegelwood mill are, under certain circumstances, granted access to the mill landfill for disposal of construction demolition rubble. Outside contractors will only use the site during normal operating hours, and then only under the direct supervision of the landfill operator/attendant. Outside contractors will only be granted permission to use the landfill cell by the mill environmental manager or by the designated landfill supervisor. These personnel will be responsible for the actions of outside contractors during use of the facility, and for their compliance with this Operations Manual, and all pertinent state and federal regulations concerning site operation. Outside contractors will complete a Waste Screening Form (**See Appendix B**) for demolition rubble, or other approved wastes, and these will be kept in the landfill operating log. Acceptable Wastes (**See Section 2.2**) are described later in this Manual. Any other materials must be pre-approved for disposal.

1.4 SIGNAGE

Since the captive landfill facility is operated only by International Paper, and is surrounded by International Paper property, additional access control gates and signs will not be necessary. Signage will be provided to promote the safe access and egress, to and from the active cell, as necessary. Service and maintenance roads for use by operations personnel will be clearly marked and barriers (e.g., traffic cones, barrels, etc.) will be provided as required.

1.5 COMMUNICATIONS

Two-way radio communication is typically maintained between operations personnel in case of emergency. The mill's emergency telephone number is published, and all contractor personnel are required to adhere to the mill's emergency response procedures. The mill maintains an on-site emergency response team that may be mobilized by calling 6222 from any mill phone or 910-655-6222 from any outside phone.

1.6 FIRE AND SAFETY

1.6.1 FIRE CONTROL

The possibility of fire within the landfill, or a piece of equipment must be anticipated during daily landfill operation. A combination of factory installed fire suppression systems and/or portable fire extinguishers will be operational on all heavy equipment at all times. For any larger, or more serious outbreaks, the mill's emergency response team may be called at extension 6222 from any mill phone, or the local fire department will respond.

Based on operating experience in the existing facility, the high moisture content of most of the residual streams has made fires rare. The most serious threat of fire results from disposing lime balls, or lime kiln waste on, or near, combustible mill trash, dry wood waste, or combustible demolition rubble. There is the potential for moisture to cause the lime to slake, which produces an exothermic reaction. This reaction, under certain conditions could ignite dry combustible materials. Hence, calcium oxide residuals shall not be mixed with, or disposed on top of combustible materials. In general, any such fires that break out close to the landfill surface may be smothered with higher moisture content residuals, dug up and thin-spread on the active fill surface, or be doused with water from either a water truck or fire truck.

Combustible materials, and any dry, calcium oxide residuals shall not be disposed near the protective cover layer on the landfill base or sideslopes as a precautionary measure to reduce the potential for fire-related heat damage to any leachate collection or liner component.

After any fire is extinguished, the landfill supervisor shall inspect the affected area to assess the potential for damage to any of the liner or leachate collection system components. Damaged sections of geosynthetics, piping, etc. must be removed and replaced with new items of the same or equivalent material. The new materials must be placed in accordance with the technical specifications and construction quality assurance (CQA) documents prepared for this facility.

International Paper will verbally notify DWM (**see Section 1.2.2**) within 24 hours of discovery of a fire within any landfill disposal area. In addition, written documentation describing the fire, the actions carried out to extinguish the fire, and a strategy for preventing future occurrences will be provided to DWM within 15 days following any such occurrence.

1.6.2 SAFETY

All aspects of the Riegelwood mill's landfill operation were developed with the health and safety of the landfill's operating staff and mill employees in mind. As part of normal operations, a member of the landfill operating staff will be designated as the site safety officer. This individual, together with the facility's management will modify the site safety and emergency response program to remain consistent with Occupational Safety and Health Administration (OSHA) guidance.

Safety equipment provided includes equipment rollover protective cabs, seat belts, audible back-up warning alarms on all rolling equipment, hard hats, safety shoes, safety glasses, and first aid kits. Landfill personnel will be encouraged to complete the American Red Cross Basic First Aid Course. Other safety requirements dictated by the Riegelwood mill's site and contractor safety policies will also be in effect at the landfill.

1.7 SEVERE WEATHER CONDITIONS

Unusual weather conditions can directly affect the operation of the landfill facility. Some of these unusual weather conditions and recommended operational responses are as follows.

1.7.1 ICE STORMS

An ice storm can make access to the landfill dangerous, prevent movement or placement of residuals, and, may therefore require temporary suspension of landfill operations until the ice is removed, or has melted.

1.7.2 HEAVY RAINS

Exposed soil may become softened to the point that it inhibits equipment travel during prolonged wet weather. Gravel, crushed stone, or wood waste, placed on unpaved roads, have successfully been used to maintain all-weather access to the mill's existing landfill site. Proper control of drainage away from critical access routes has been provided for in the site design and construction, and operations will need to provide similar controls within the active landfill cell. Where road-surfacing aggregates are washed away, or contaminated to the point of requiring replacement, care must be taken to replace aggregates by adding to the top of existing surfaces. Excavating to remove any contaminated road surfacing aggregates around the site perimeter may expose and damage the liner system, and must be avoided.

Intense rains can affect newly constructed drainage structures such as swales, diversions, cover soils, and vegetation. After an intense rain event, inspection by the landfill supervisor will be initiated and any necessary corrective measures implemented to repair any damage found, before the next rainfall event.

1.7.3 ELECTRICAL STORMS

The open area of a landfill is susceptible to the hazards of an electrical storm. If necessary, landfilling activities will temporarily be suspended during such an event. Field personnel should take shelter in rubber-tired equipment or preferably in mill buildings during electrical storms.

1.7.4 HIGH WINDS

The landfill location, and high moisture content of most residual streams, should mitigate most of the problems associated with high winds in a landfill environment. The primary concern with

windy conditions is the potential for blowing of mill trash, waste paper, roll ends, and similar lightweight materials. When high winds are prevalent, the disposal of these materials shall be avoided, or they shall be immediately covered with heavier materials, such as sludge, ash or wood waste. Any boiler ash that becomes desiccated to the point of being prone to blowing will either be wetted, regraded to bury dry materials, or be covered with higher moisture residuals to mitigate any blowing dust.

Site access roads will be watered during dry weather to prevent the formation of fugitive or nuisance dust from equipment traffic.

1.7.5 VIOLENT STORMS

In the event of hurricane, tornado, or severe winter storm warnings issued by the National Weather Service, landfill operations may be temporarily suspended until the warnings are lifted, or the storm has subsided. Auxiliary pumps, or generators are available on-site, from local rental agencies, or from local contractors, to effectively deal with heavy rains.

1.7.6 ELECTRICAL OUTAGES

The groundwater, secondary, and primary leachate removal pumps are all electrically powered. The cell 1 pump power control panel is equipped to operate from auxiliary power. Therefore, in the event of a prolonged power outage, or in preparation for severe storms, a portable generator may be used to power all the leachate collection pumps and controls by simply plugging an existing auxiliary power cord into the generator, and changing the main breaker lever from normal to auxiliary power. Figure 10 (**See Appendix D**) shows the control panel, and the location of the auxiliary power cord.

1.8 EQUIPMENT REQUIREMENTS

The Riegelwood mill, or an operating contractor, will maintain on-site equipment required to perform the necessary landfill activities. Periodic maintenance of all landfilling equipment, and minor and major repair work will be performed in designated maintenance areas outside the landfill limits.

1.9 PERSONNEL REQUIREMENTS

The Riegelwood mill's landfill supervisor will be trained in all aspects of site operations. The designated landfill supervisor will be responsible for training and supervision of all operations personnel.

1.10 UTILITIES

Electrical power is installed to leachate collection and removal pumps directly from the local utility lines. Telephone service, drinking water, and restrooms are available at the mill, or these will be provided, if an outside contractor operates the site.

1.11 RECORD KEEPING PROGRAM

The Riegelwood mill shall maintain the following records in an operating log maintained at the mill by the designated landfill supervisor:

1. Quantity, location of disposal, generator, and special handling procedures for all special wastes disposed of at the site (**see Section 2.4**);
2. Waste screening documentation (**see Section 2.4.1**)
3. Hazardous waste screening and disposition documentation, if any (**see Section 2.4.2**)
4. Employee training procedures and records of training completed;
5. Documentation of cell activation (**see Section 2.5.2.2**)
6. Leachate records (**see Section 3.3.4**);
7. Secondary collection system records (**see Section 3.3.4**);
8. Action Leakage Rate (ALR) exceedance results, response actions, and performance documentation data and correspondence, if any (**see Section 3.3.2**)
9. Groundwater underdrain collection system records (**see Section 3.3.4**) (see the current Ground Water Sampling and Analysis Plan) including;
    a. Monitoring well construction records;
    b. Sampling dates and results;
    c. Statistical analysis; and
    d. Results of inspections, repairs, etc.
10. Annual landfill reports;
11. All closure and post-closure information (see Attachment E to the Permit to Construct Application), where applicable, including:
    a. Testing;
    b. Certification; and
    c. Recordation.
12. Cost estimates or financial assurance documentation (see Attachment E to the Permit to Construct Application).

The designated landfill supervisor will keep the operating record up to date. It will be presented upon request to DWM for inspection. A copy of this Operations Manual will be kept at the landfill, or nearest convenient office location in the mill, and will be available for use at all times.

2 RESIDUALS HANDLING OPERATIONS

2.1 OVERVIEW

This section describes waste handling operations for the IP Riegelwood Mill Landfill facility.

2.2 ACCEPTABLE WASTES

Wastes disposed in the proposed industrial landfill will consist of only International Paper-generated industrial solid waste, asbestos, and construction and demolition debris.

Industrial solid waste is defined as solid waste generated by manufacturing or industrial processes that is not a hazardous waste regulated under Subtitle C of RCRA. Industrial solid wastes generated at IP-Riegelwood that will be disposed in the proposed landfill include, but are not limited to:

- Boiler Ash: The mill's power boilers generate steam for process use and electricity generation. The power boilers fire bark recovered from the debarking operation, wastewater treatment sludge, coal and fuel oil. The bottom ash recovered from the boilers, and fly ash recovered from the boiler flue gases via cyclones, and a wet scrubber system, will be landfilled. International Paper landfills approximately 45,000 cubic yards per year (cyd/yr) of boiler ash, with an average compacted moist density of 80 pounds per cubic foot (pcf) (1.08 tons/cyd).

- Wood Waste: Although much of the wood waste is burnedas part of the facility energy recovery program, a variety of wastes, including wood chip screenings too small for pulping, sawdust, scrap wood, soil-contaminated bark and other wood wastes from the on site and remote wood yards will be disposed in the landfill. International Paper estimates that approximately 7,500 cyd/yr of wood waste, with an average compacted moist density of 25-35 pcf (0.3 to 0.5 tons/cyd) will be disposed in the landfill.

- Wastewater treatment plant residuals – Comprised of:

  - Screw-pressed sludge –Screw presses are used to dewater underflow from the mill's #1 wastewater clarifier. These dewatering presses produce a solid cake composed of pulp fibers, clays, starches, sand, ash, and other similar solids. International Paper dewaters approximately 65,600 in-truck cyd/yr of primary sludge, using screw presses. In the landfill, this material compacts to a moist density of 60 pcf (0.81 tons/cyd). Ninety percent of this sludge is currently incinerated in the power boilers as part of the mill's energy recovery program, with the remaining 10% disposed in the landfill.
  - Primary sludge - Underflow from the mill's primary clarifiers, when not mechanically dewatered for burning, is pumped to gravity thickening basins . IP Riegelwood landfills an average of 150,000 in-truck cyd/yr of gravity thickened primary sludge, having an

average moist compacted density of 70 pcf (0.94 tons/cyd).

- Secondary Sludge - In order to maintain hydraulic treatment capacity in the mill's aerated stabilization basin (ASB), sediments are hydraulically dredged from the basin annually. The accumulated secondary sludge is pumped into gravity thickening basins adjacent to the ASB. These dredging operations remove approximately 125,000 cyd/yr of secondary sludge. IP Riegelwood landfills approximately 60,000 cyd/yr of gravity thickened secondary sludge, having an average moist compacted density of 68 pcf (0.92 tons/cyd).

❖ Chemical recovery by-products: International Paper landfills a combined average of 6,000 cyd/yr of chemical recovery by-products, with an average compacted moist density of 70 pcf (0.94 tons/cyd). Examples include:

- Lime mud – from excess white liquor clarifier solids unable to be reclaimed in the mill's lime kilns,
- Lime waste – Lime from the kilns not recoverable to the process.
- Dregs – solid residuals generated during green liquor clarification,
- Grits – solid residuals generated during lime slaking,

❖ Ancillary Operations Waste Streams: In addition to the process residuals discussed above, International Paper will landfill by-products generated during maintenance activities, including sediments removed from various process tanks, sewers and ditches. International Paper landfills approximately 10,000 cyd/yr of miscellaneous residuals with an average density of 55-90 pcf (0.74-1.2 tons/cyd). General office trash and putrescible materials (including all cafeteria waste) are sent offsite to a sanitary landfill via contract hauling, and will not normally be disposed in the Mill landfill.

- Any other industrial solid wastes generated by the IP-Riegelwood Mill and its ancillary facilities that meet the definition of an industrial solid waste according to section .1602 of the North Carolina Solid Waste Management Rules may be disposed in the landfill.
- Solid wood, sawdust, woodyard cleanup materials, boiler ash, and other similar byproducts from the nearby IP Armour sawmill will be included in the mill landfill.
  - Asbestos wastes are defined as mill tailings or any waste that contains commercial asbestos including filters from control devices, friable asbestos waste material, and bags or other similar packaging contaminated with commercial asbestos. Note that this also includes regulated asbestos-containing material waste and materials contaminated with asbestos including disposable equipment and clothing. Only asbestos waste generated by demolition activities at the IP-Riegelwood mill and its ancillary facilities, including the Armour sawmill, will be accepted for disposal at the landfill. This waste stream is composed primarily of insulation materials, and is contained in bags for controlled disposal; severely damaged or friable asbestos that cannot be contained will be removed and disposed of by a qualified contractor. A separate zone in the southeast corner of cell 1 is designated as the asbestos waste disposal area (**See Figures 1 through 7 in Appendix D**).
  - Construction and demolition debris is defined in the State Rules as the waste or debris resulting solely from construction, remodeling, repair, or demolition operations on pavement, buildings, or other structures. Only construction and demolition debris generated at the IP-

Riegelwood mill and its ancillary facilities, including the Armour sawmill, will be accepted for disposal at the landfill.

The acceptance of waste materials other than those described above is prohibited without written authorization from the Division of Waste Management.

2.3 PROHIBITED WASTES

In accordance with Rule .0505(11)(b) no hazardous or liquid waste may be accepted for disposal. Specifically prohibited waste materials include the following:

- Hazardous waste as defined within 15A NCAC 13A, including hazardous waste from conditionally exempt small quantity generators;
- Polychlorinated biphenyl (PCB) wastes as defined in 40 CFR 761;
- Barrels and drums unless they are empty and sufficiently perforated, except fiber drums containing asbestos;
- Wastes containing free liquids as determined by the paint filter test (**see Appendix A** for apparatus and procedure)
- Other wastes specifically banned from landfill disposal by rule or statute, such as lead acid batteries, whole tires, used oil, or aluminum cans.

2.4 WASTE SCREENING PROGRAM

In order to assure that prohibited wastes are not entering the landfill facility, visual screening programs (as further described in Section 2.4.2) will be implemented at the landfill. Landfill operating personnel will be trained to spot suspicious wastes, including: hazardous placarding or markings, liquids, powders or dusts, bright or unusual colors, drums or commercial size containers, and "chemical" odors. Wastes other than those described in section 2.2 may only be accepted with approval of the mill landfill supervisor, and must be described on the Waste Screening Form (see **Appendix B**). Over ninety percent of the by-products landfilled at Riegelwood are the uniform process residues described in section 2.2. The most likely potential sources of unapproved materials are the ancillary waste streams including:

1. Material from the Armour saw mill,
2. Construction & demolition debris (which requires prior completion of waste screening forms as prescribed in section 1.3.3), and
3. By-products from miscellaneous maintenance activities, and debris from the shipping and receiving department.

2.4.1 Waste Receiving

All vehicles delivering waste to the landfill will be owned or under direct contract to IP. No public access to the site is allowed. The following training/screening procedures will be implemented to prevent the landfilling of unapproved materials in Riegelwood's landfill.

1. Training
    a. A copy of section 2.2 ACCEPTABLE WASTES, and section 2.3 PROHIBITED WASTES, of this manual, will be provided to Armour Sawmill, and the Riegelwood mill's shipping/receiving department at a minimum. Documentation of this employee training shall be included in the operating log as prescribed in section 1.11.
    b. The designated landfill operator (either in-house, or contracted personnel) will acknowledge his/her understanding of section 2.2 ACCEPTABLE WASTES, and section 2.3 PROHIBITED WASTES, and be responsible for enforcing, and documenting that the landfill remains in compliance with same, by providing written acknowledgment in the operating log, renewed on at least an annual basis, as prescribed in section 1.11.
2. Waste Screening
    a. The designated landfill operator will perform the following screening and documentation activities on a weekly basis:
        i. At least one truck per week will be stopped prior to dumping and the box contents evaluated to look for any obviously unacceptable contents. The weekly inspections should include the following types of wastes, assuming any of them are actively using the landfill:
            1. Armour sawmill truck,
            2. Approved outside contractor, or
            3. Any non-process residual load, or
            4. Any asbestos wastes.
        ii. If the load contents appear acceptable the trucks will be permitted to dump at locations prescribed by the designated landfill operator.
            1. After tipping, contents of the load will be further evaluated visually,
            2. A waste screening form (**Appendix B**) should be completed and retained in the operating log for each inspected load..
        iii. If any questionable load contents are detected during the screening, or after the load is tipped, the mill's environmental manager or the designated landfill operator, shall immediately be notified to assess the material. Following are potential actions for questionable materials:
            1. Loads of unacceptable material will be rejected and the driver instructed to return the material to where he obtained it.
            2. Loads of acceptable materials, for which a waste screening form is unavailable, will be accepted only after a completed waste screening form has been completed.
            3. Tipped loads containing unacceptable materials will not be spread in the landfill, rather they will remain isolated until an acceptable remedy has been determined. The designated landfill operator or

the mill's environmental manager will be notified in order to determine the proper course of action.

4. Tipped loads containing suspected hazardous waste or liquid wastes shall not be spread, but should be treated as outlined below.

2.4.2 Hazardous Waste Contingency Plan

In the event that identifiable hazardous waste or waste of questionable character is detected at the landfill, appropriate equipment, personal protective equipment (PPE), personnel, and materials as necessary will be employed to isolate the wastes. The designated landfill supervisor and mill's environmental manager will be notified, and it will be their responsibility to notify the DWM (see **Section 1.2.2**) if hazardous wastes are discovered in the landfill.

IP will remove and properly dispose of any hazardous waste. The designated landfill operator will do the following in the event hazardous wastes are discovered in the landfill.

1. Cease landfill operations in the vicinity of (especially downwind) the suspect material.
2. Avoid reusing any equipment contaminated by the suspect material to prevent contaminating other material in the landfill.
3. Secure the appropriate PPE required to handle the suspect material.
4. Isolate the suspect material using red warning tape to prevent employee exposure.
5. Secure a plastic cover (or soil if appropriate) over the suspect material to isolate it from the elements.
6. Secure the necessary technical assistance to sample and characterize, or to remove the suspect material and any adjacent materials that may have been contaminated by the suspect material, as deemed appropriate for the nature of the material encountered.
7. Retain documentation of the proper disposition of any hazardous material removed from the landfill and any equipment decontamination resulting from contact with hazardous waste, in the landfill operating record.
8. Notify the personnel responsible for the source of the suspected load that such materials are prohibited in the landfill and will not be accepted.

Should hazardous waste be found in the landfill, the designated landfill operator will document the event (including all cleanup and decontamination activities) using the waste screening form provided in **Appendix B**.

2.5 WASTE DISPOSAL

2.5.1 Access

Traffic will be clearly directed to the appropriate active access road. For the active landfill cell, all vehicles entering the unit will use the active ramp to avoid damaging the liner system. Traffic

speed on the ramp should be less than 10 MPH. Rutting of the gravel roadway surfaces must be repaired by placement of additional gravel on the roadway and not solely by grading the rut. This will maintain the separator geotextile placed below all gravel roadway surfaces.

The location of access roads during waste placement will be determined by operations personnel in order to reflect waste placement strategy.

2.5.2 Waste Disposal

2.5.2.1 Cell Operations and Phasing

No leachate/stormwater separation is provided for in Cell 1. It is anticipated that Cell 1 will be covered with a minimum 10-foot lift of waste within its first year of operation. The completed cell layout is shown on Construction Application Permit Drawing S7 (Beneficially Reused Mill Byproduct Grading Plan).

Once Cell 1 is filled to its effective capacity, operations will laterally expand into future cells.

It is advantageous to begin to establish final cover grades along the perimeter berms as soon as possible. This will allow earlier construction of intermediate or final cover to promote "clean" runoff and to spread out final cover construction costs.

2.5.2.2 Cell Activation

The access ramp enters Cell 1 at the northwest corner, and filling will begin in the southwest corner of cell 1 (**See Figure 1 in Appendix D**). Any areas where erosion has reduced the protective cover thickness should be regraded prior to any vehicular traffic passage, or residuals placement. Before placing waste in a particular area, protective covers must be sequentially removed. The protective covers only need to be removed from areas to be covered with residuals on that same day. Protective covers should be left in place as long as possible to prevent water-borne sediment from clogging the gravel columns, and eroding the protective cover on the cell floor.

2.5.2.2.1 Protective geotextile

A 4-oz./sq. yd. non-woven geotextile covers all gravel columns surrounding leachate pipes on the cell floor, and around cleanout risers on the north and east landfill slopes. The 4-oz./sq. yd. geotextile was placed during construction to prevent clogging of the gravel columns by storm runoff. Prior to activating a new landfill area, the geotextile removal shall be documented by landfill staff on the cell activation form provided in **Appendix C**.

2.5.2.2.2 Geosynthetic rain cover

All landfill slopes are covered with a geosynthetic rain cover (GRC) to reduce protective cover erosion. Prior to active filling against any slopes, the GRC removal should be documented by landfill staff using the cell activation form provided in **Appendix C**.

2.5.2.3 Placement of Initial Lift

During residuals placement operations, the landfill liner systems are most vulnerable during the placement of the first lift of materials. In addition to the protective cover layer, the first lift of residuals should be comprised of select loads spread on top of the protective cover layer. These select loads must be free of long or large pieces of debris that may push through the protective cover layer and damage the liner system. The first lift should be a minimum of four (4) feet thick and provide sufficient area for at least one day's operation without placing other areas of the liner in jeopardy. This initial lift of fill should not contain wood yard cleanup materials, Armour sawmill rejects, construction demolition debris or wood debris from packing crates, or similar materials capable of puncturing the liner.

Another area of the liner system that is vulnerable during placement of the first lift of residuals is the perimeter berms. As with the bottom liner, the first lift of material against the liner sidewalls should be free of elongated materials capable of puncturing the liner system.

In the event that the landfill staff identifies any damage to any part of the landfill's liner system, they should immediately mark and report the damage to the landfill supervisor. Additionally, the damage and repair should be documented as a part of the landfill operating record.

2.5.2.4 General Procedures

Because of the high moisture content of most mill residuals, the two most important aspects of landfill operation are promoting the runoff of precipitation falling on the residuals, and maintaining vehicular access. In order to realize these goals, filling will generally progress from the highest points of the cell toward the sump. Further, higher moisture content residuals should be graded and compacted in relatively thin lifts by bulldozer tracking. Subsequent lifts of higher moisture residuals should always be placed on a gently sloping active face, and in a manner that promotes runoff of precipitation away from the landfilled residuals. Thick lifts, and uneven surfaces that trap water are two undesirable circumstances that complicate operations, are detrimental to access, consume airspace more rapidly, and result in cells reaching capacity prematurely.

To maintain vehicular access, the landfill operator must make efficient use of dryer residuals for internal roadways, and in creating access roads/containment dikes near the active filling face. Access roads may be constructed along the north dike as illustrated, or within the Cell 1 footprint

as appropriate to facilitate filling and interior landfill stabilization. Initially, drier residuals should be placed along the high points in the cell bottom to create north-south trending access roads. Higher moisture materials may then be dumped from these roads, and be spread and compacted in thin lifts sloping downward toward the gravel columns surrounding the leachate pipes on the cell floor. Figures 1 through 7 (**see Appendix D**) depict a general filling sequence. Cross-sections are provided on Figures 8 and 9 (**see Appendix D**). Adjustments to the filling sequence will be made to suit conditions at the discretion of the landfill supervisor.
Once filling has climbed in elevation, dumping and spreading operations may recommence from the dike tops. Care must be taken when spreading dumped loads, and when smoothing rutted access roads, to recall the landfill liner is covered (top down) by one foot of road gravel, a geotextile, and one foot of sand. . A perimeter ditch at least two feet in depth, should be maintained around the entire site perimeter to contain runoff from severe storm events (See Figure 8 in **Appendix D**)

Waste unloading at the landfill will be controlled to prevent disposal in locations other than those specified by designated landfill supervisor. Such control will also be used to confine the working face to a minimum width, yet allow safe and efficient operations. The width and length of the working face will be maintained as small as practical in order to maintain the appearance of the site, control windblown waste, and minimize the surface area exposed to precipitation. In order to facilitate wet weather operations, at least two primary access and filling points should be maintained.

2.5.2.5 Equipment Operations Within the Landfill Cell

Operational vehicles and residuals hauling vehicles must be restricted as follows within the lined landfill:

- Equipment operation directly on the protective cover will be limited to low ground contact pressure vehicles (tracked equipment or off-road trucks - no dump trucks unless traveling upon thickened or specially prepared (compacted) surface capable of preventing rutting or displacement of the protective cover under normal traffic conditions).
- A minimum vertical separation of 3 feet will be maintained between the geomembrane liner and all residuals hauling vehicles.

The operation of vehicles within those portions of the landfill not actively being filled should be restricted to activities associated with erosion and sedimentation control.

2.5.3 Special Waste Management

2.5.3.1 Asbestos Management

IP may dispose of asbestos within the landfill units. Asbestos will only be accepted if it has been processed and packaged in accordance with State and Federal (40 CFR 61) regulations. Asbestos will arrive at the site in vehicles that contain only the asbestos waste and only after advance notification.

Operations personnel will direct all trucks carrying asbestos to the designated asbestos disposal area as shown in Figures 1 through 7 (**see Appendix D**) or at locations pre-approved in writing by the environmental manager. Operations personnel will prepare the designated disposal area by leveling a small area using a dozer or loader. Once placed in the prepared area, the asbestos waste will be covered with a minimum of 18 inches of soil/residuals placed in a single lift.

The landfill staff will record the approximate location of the asbestos waste once cover is in-place. The landfill supervisor with assistance as needed from the mill's environmental manager will then review pertinent disposal and location information to assure compliance with regulatory requirements and enter the information into the Operating Record (**see Appendix B**).

Once disposal and recording for asbestos waste is completed, the disposal area may be covered with other residuals. No excavation into designated asbestos disposal areas will be permitted. Stakes or signs will be used to mark the lateral limits of the asbestos disposal area.

2.5.4 Intermediate Cover

Due to the high moisture content of the residuals, daily cover is not required. Soil cover will be used only if surface desiccation of the waste produces conditions that result in dust generation, or as needed to facilitate access. Paper or other materials susceptible to wind erosion will be covered with higher moisture content residuals including, ash, lime, sludge, etc. These materials are not readily blown and provide effective resistance to vectors.

2.5.5 Final Contours

Residuals placement around the site perimeter should provide for a minimum of a two-foot deep ditch to contain stormwater runoff within the lined limits of the cell (**See Figure 8 in Appendix D**). The north and east dikes have a finished top elevation of +38 msl, lower in elevation than the south and west dike tops. Residuals contouring should promote the flow of surface water runoff in these two primary directions. Perforated leachate cleanout risers, surrounded by gravel columns, rise above the perimeter dike top on the north and east sides of the landfill. These risers are constructed at approximately 200-foot intervals, and are intended to speed the transfer of surface water runoff into the leachate collection system at the landfill base. After providing for these perimeter ditches, the residuals should be graded to the final cell elevations as depicted on Permit Drawing S8 (Cell 1 Top of Waste Grading Plan). Areas along the south, east, and west perimeters of Cell 1 that reach final contours should be covered at regular intervals with final cover as prescribed in the facility's approved closure plan.

Perimeter stormwater control ditches, and containment channels will be maintained during operation in order to contain all water that has contacted landfilled residuals. Care must be exercised during perimeter ditch maintenance to avoid liner damage. Any sediment removed during ditch maintenance must be placed in the landfill. The perimeter drainage channels, shown in Figure 8, in **Appendix D**, should be maintained to properly contain contact water.

3 ENVIRONMENTAL MANAGEMENT

3.1 OVERVIEW

This section reviews the overall environmental management tasks required for the successful operation of the landfill facility. Emphasis is given to the supplemental tasks required for the planned Cell 1 industrial landfill unit. The definition of surface water, as used herein, is water that results from precipitation or site run-on that has not contacted the waste.

3.2 SURFACE WATER CONTROL

Proper control of surface water at the landfill will accomplish the following goals:

- Prevent the run-on of surface water into the lined industrial landfill units,
- Limit the run-off of surface water that has contacted landfilled residuals,
- Limit the erosion caused by surface waters, and
- Limit water-borne sediment migration.

An erosion and sedimentation control plan was provided in the Permit to Construct Application for this lined lateral landfill expansion. This plan describes both short and long term engineered features and practices for preventing erosion and controlling sedimentation at this site. The following is a brief discussion of some of these features and practices, focusing primarily on the cell 1 landfill area.

3.2.1 Surface Water Run-On Control

The perimeter berms and/or perimeter drainage channels around the landfill units are designed to prevent the run-on of surface water from adjacent land into the landfill. Additional structures such as diversion berms, channels, culverts, down pipes, etc. carry surface water away from the landfill. All surface runoff water, and contact waters are directed to the mill's NPDES permitted wastewater treatment system.

3.2.2 Active Face Run-Off Control

Particular care is required to ensure that surface water coming from the active face, e.g. having potential contact with the landfilled residuals, is captured by the leachate collection and recovery system. Only run-off from residual surfaces that have received

adequate cover may be considered "non-contact," and may be directed to the stormwater drainage system where practical.

3.2.3 Erosion Control

The serviceability of the landfill facility relies heavily on soil berms, barrier layers, and agricultural layers that are readily eroded by flowing water. Erosion control provisions incorporated in the landfill include the following:

- The slope of the working face must be no steeper than practical to limit erosion,
- Intermediate soil cover must be seeded immediately and repaired when erosion features are identified,
- Diversion berms and/or drainage swales are provided every 20 to 30 vertical feet on the final cover to limit the flow length of run-off,
- Water collected by each drainage swale is routed to stormwater drainage channels or down pipes so that the run-off volume does not accumulate going down the slope, and
- The vegetative layer placed over the final cover must be seeded immediately.

Additional erosion control measures have been taken within the drainage swales and at points of stormwater discharge. All final cover should be inspected regularly for erosion damage and promptly repaired.

3.2.4 Sedimentation Control

Stormwater run-off from the landfill units is conveyed to areas protected by turbidity curtains in the adjacent ponds, or to the wastewater treatment system near the primary clarifiers, west of the landfill. No sediment clean out of these structures is required.

3.3 LEACHATE MANAGEMENT

The leachate management system for the proposed landfill unit consists of the leachate collection and recovery (LCR) system, the secondary collection system (SCS), the leachate discharge piping, side slope risers, pumps, valves, and the existing wastewater treatment system.

Leachate from Cell 1 is collected in the leachate sump on the northeast corner of the landfill as shown on **Drawing S5** (Cell 1 Grading Plan). A side slope riser pump transmits leachate from the cell, through the forcemain, which empties into the NPDES permitted wastewater treatment system.

Liquid in the secondary collection system (SCS) is also collected in the northeast corner of the landfill as shown on **Drawing S5** (Cell 1 Grading Plan). This liquid is collected in the secondary

collection system sump, and a side-slope riser pump transmits liquid through a magnetic flow meter, and into the forcemain.

3.3.1 Leachate Collection and Recovery (LCR) System

A blanket drainage layer covers the HDPE geomembrane liner to collect and remove leachate draining from the landfilled process residuals. This blanket drain consists of two primary layers; 1) a two-foot thick soil protective cover, and 2) a geocomposite (geonet sandwiched between two layers of geotextile) drainage media. In addition, a high flow capacity network of perforated pipes and gravel drains was constructed in the protective soil cover, directly on the geocomposite drainage media. For Cell 1, this perforated pipe and gravel drainage system is shown on **Drawings L1 and L2** (Leachate Pipe and Forcemain Plan) of the Permit to Construct Application Drawings. The LCR system is designed to remove inflow from a 25-year, 24-hour rainstorm. As such, its capacity is very large compared to that required to accommodate routine leachate generation rates after closure.

The LCR system has been designed to minimize the impact of long-term biological clogging as follows:

- Cleanouts are provided on the major perforated leachate collection pipes,
- Graded aggregate filters are used between the residuals and the gravel columns instead of geotextiles, and
- The use of No. 57 stone around collection pipes allows hydro washing of the pipe and gravel to remove biological growth.

3.3.1.1 Gravel Column Maintenance

The exposed surface of the gravel columns should be inspected monthly and after each large rainstorm to monitor sediment accumulation on the aggregate columns surrounding the adjacent leachate collection pipes. Sediment buildup must be periodically removed carefully with a backhoe. Aggregate that is removed must be replaced with new material. Per **Section 2.5.2.2.1**, the Type GT-S geotextile overlying gravel columns may be left in place after removal of the GRC, but shall be removed prior to the placement of waste over that portion of gravel column. This will aid in preventing sediment from clogging the gravel columns.

3.3.1.2 Collection Pipe Cleanout

If an abnormal reduction in leachate production is observed, the major leachate collection pipes should be inspected. Based on the results of the inspection, any locations where the perforated pipe system exhibits excessive sediment

accumulation, or biological growth buildup, will be cleaned using high-pressure water jetting equipment. The water jetting system should generate greater than 2,000 psi water pressure. Use of the high-pressure water jetting equipment should be limited to only those portions of the piping system with buildup.

3.3.1.3 Leachate Removal

As constructed, leachate is collected in a sump at the low end of the landfill and is removed from landfill via a side riser pump and HDPE discharge pipe. The leachate is routed to a force main, which returns it to the Mill's wastewater treatment system.

Under normal conditions, IP handles approximately 40 million gallons of industrial wastewater daily. A maximum of 138 million gallons per day was handled during hurricane Floyd. The maximum anticipated rate of stormwater generation for Cell 1 is less than 2 million gallons per day.

The Primary LCR system initial pump settings are shown in Figure 11 in **Appendix D**. In summary these are:

Lead Pump on:	18"
Lead Pump off:	6"
Lag Pump on:	36"
High-level alarm:	36"

These two primary pumps are set up to alternate as lead and lag in order to evenly distribute pump wear.

3.3.2 Secondary Collection System

A secondary collection system (SCS) has been incorporated into the design of the liner system. The purpose of the SCS is to provide a point of leak detection/monitoring for the primary liner, and to limit the head on the secondary liner to less than the thickness of the SCS.

For Cell 1, the SCS consists of a layer of geocomposite (geonet sandwiched between two geotextiles) drainage media directly overlying the secondary geomembrane liner, and one secondary collection system side-slope riser pump placed within the sump. Flow collected in the secondary collection system sump is pumped through a metered 2-inch diameter HDPE pipe. The flow meter is shown in Figure 10 in **Appendix D**.

The SCS has been designed with an Action Leakage Rate (ALR) of 500 gallons per day per acre (see **Appendix III** in the Permit to Construct Application). The selected ALR is greater than the leakage that would be expected through a typical composite

geomembrane/GCL primary liner system. Should liquid collected in the SCS exceed the ALR, IP will take the following steps:

1. Review pump flowmeter data, transducer records, and other physical equipment to confirm that the data indicating the ALR exceedance is valid.
2. Review with landfill operations staff, and the designated landfill operator, where operating equipment might have contacted the landfill liner.
3. If the ALR exceedance data is confirmed to be valid, notify the DWM Area Supervisor of the exceedance within 7 days of the ALR exceedance.
4. IP will present a written plan to locate or isolate the source of liquid entering the SCS within 30 days of the ALR exceedance, and will immediately implement such plan, and will attempt to repair any discovered liner damage.
5. IP will report to DWM, within 60 days of confirming an ALR exceedance, the results of investigative work aimed at locating and repairing any liner damage. This report must include flowmeter and transducer data, and leakage rate calculations clearly depicting the liner performance, and summarized on a monthly basis. IP will continue providing monthly reports depicting liner performance until at least 60 days after any ALR exceedance has been rectified.

The SCS system initial pump settings are shown in Figure 11 in **Appendix D**. In summary these are:

Pump on:	12"
Pump off:	6"
High-level alarm:	24"

3.3.3 Leachate Quality Sampling

Semi-annual leachate quality sampling and analysis will be performed during operation of the landfill. Samples will be recovered as grab samples from the following locations:

- Cell 1 (Primary Leachate Collection System): Sample from side wall riser
- Cell 1 (Secondary Collection System): Sample from side wall riser
- Cell 1 (Underdrain Collection System): Sample from manhole

The parameters to be analyzed will include BOD, COD, TOX, TOC, TDS, sulfate, chloride, fluoride, nitrates, NO3-n, arsenic, barium, cadmium, chromium, copper, iron, lead, manganese, mercury, selenium, silver, vanadium, and zinc.

3.3.4 Record Keeping

Accurate records for the following will be maintained at the landfill in accordance with **Section 1.11**. A sample data collection form is included in **Appendix E**. This form

automatically calculates the action leakage rate (ALR) on a running 30-day average basis. Preliminary data gathered during startup and trouble-shooting suggests the secondary collection system is collecting less than 10 gallons/lined acre/day.

Leachate Generation (Monthly):

- Secondary Collection System pump flowmeter and action leakage rate;
- Leachate collection system pump hour meter; and
- Underdrain pump hour meter.

Leachate Quality (Quarterly and/or Semi-Annual):

- Secondary collection system pump sample port;
- Leachate collection system pump sample port; and
- Underdrain system pump sample port, or dipped from collection manhole.

3.4 LANDFILL GAS MANAGEMENT

3.4.1 Methane Gas Management

Water-filled treatment system impoundments, and effluent treatment channels, surround the landfill on the east and west sides, respectively. The south slope of the new landfill cell is also the cover for the former landfill. A drained depression, that was formerly the North Bay treatment impoundment, abuts the north edge of the new landfill cell.

Although the potential for methane gas migration from the new lined lateral landfill expansion cell is very small, the mill will implement a gas monitoring program to ensure that methane concentrations do not exceed 25 percent of the lower explosive limit (LEL) in facility structures, or 100 percent of the LEL at the landfill property boundaries. The two motor control motor control centers shown in the photo below and landfill perimeter will be sampled within 3 months of initial waste filling and twice each year thereafter. The frequency may be reduced iafter two years if all the readings are less than 50% of the LEL criteria above.

3.4.2 Record Keeping

Results of the gas monitoring program will be placed in the facility operating record as described in **Section 1.11**.

3.4.3 LFG Contingency Plan

In the event methane concentrations exceed allowable limits, the emergency response plan will be as follows:

3.4.3.1 Open Air Areas

1. For 100% LEL at distances less than 250 feet from structures:

    a. Recalibrate equipment and recheck reading.

b. Immediately take all necessary steps to ensure protection of human health (i.e. remove sources of ignition and limit access to the area).
c. Call Mill emergency response Team
d. Notify DWM (see **Section 1.2.2**).
e. Note the current weather and ground moisture conditions.
f. 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.
g. Implement a remediation plan for the control of methane gas releases, place a copy of the plan in the operating record, and notify DWM that the plan has been implemented. The plan will describe the nature and extent of the problem and the proposed remedy.

2. For 100% LEL at distances greater than 250 feet from structures:

a. Recalibrate equipment and recheck reading.
b. Immediately take all necessary steps to ensure protection of human health (i.e. remove sources of ignition and limit access to the area).
c. Notify DWM.
d. Call Mill emergency response Team
e. Note the current weather and ground moisture conditions.

3.4.3.2 Structures

1. For structures with greater than 25% LEL:

a. Recalibrate equipment and recheck reading.
b. Immediately take all necessary steps to ensure protection of human health as above - including immediate evacuation leaving all doors open.
c. Call Mill emergency response Team
d. Notify DWM.
e. Note the current weather and ground moisture conditions.
f. 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.
g. Implement a remediation plan for the control of methane gas releases, place a copy of the plan in the operating record, and notify DWM that the plan has been implemented. The plan will describe the nature and extent of the problem and the proposed remedy.

2. For structures with 0-25% LEL:

a. Recalibrate equipment and recheck reading.
b. Call Mill emergency response Team

3.5 VECTOR CONTROL

Control of insects, rodents, and birds will be accomplished by compaction of the waste and the use of cover. Spilled or wind-blown debris along the access road will be cleaned up daily and placed in the landfill. If vector control becomes a problem, additional measures will be taken to ensure the protection of human health. Based on a 50-year history of operations, vectors are not anticipated to be a problem.

3.6 ODOR CONTROL

Odorous or potentially odorous materials will be covered as soon as possible to avoid odor problems. If odor control becomes a problem, additional measures will be taken to ensure odor control.

3.7 DUST CONTROL

Dust related to waste hauler traffic on the access roads would be minimized by using a water truck to limit dust on the gravel portion of the road. Dust generated by excavation of cover soil will be limited by watering the cut soil areas if accessible to the water truck.

Appendix A

EPA Method 9095

Paint Filter Liquids Test

METHOD 9095
PAINT FILTER LIQUIDS TEST
From EPA SW-846

1.0 SCOPE AND APPLICATION

1.1 This method is used to determine the presence of free liquids in a representative sample of waste.

1.2 The method is used to determine compliance with 40 CFR 264.314 and 265.314.

2.0 SUMMARY OF METHOD

2.1 A predetermined amount of material is placed in a paint filter. If any portion of the material passes through and drops from the filter within the 5 minute test period, the material is deemed to contain free liquids.

3.0 INTERFERENCES

3.1 Filter media were observed to separate from the filter cone on exposure to alkaline materials. This development causes no problem if the sample is not disturbed.

4.0 APPARATUS AND MATERIALS

4.1 Conical paint filter: Mesh number 60 (fine meshed size). Available at local paint stores such as Sherwin-Williams and Glidden for an approximate cost of $0.07 each.

4.2 Glass funnel: If the paint filter, with the waste, cannot sustain its weight on the ring stand, then a fluted glass funnel or glass funnel with a mouth large enough to allow at least 1 inch of the filter mesh to protrude should be used to support the filter. The funnel is to be fluted or have a large open mouth in order to support the paint filter yet not interfere with the movement, to the graduated cylinder, of the liquid that passes through the filter mesh.

4.3 Ring stand and ring or tripod.

4.4 Graduated cylinder or beaker: 100-mL.

5.0 REAGENTS

5.1 None.

6.0 SAMPLE COLLECTION, PRESERVATION, AND HANDLING

6.1 All samples must be collected according to the directions in Chapter Nine of EPA SW-846.

6.2 A 100 mL or 100 g representative sample is required for the test. If it is not possible to obtain a sample of 100 mL or 100 g that is sufficiently representative of the waste, the analyst may use larger size samples in multiples of 100 mL or 100 g, i.e., 200, 300, 400 mL or g. However, when larger samples are used, analysts shall divide the sample into 100-mL or 100-g portions and test each portion separately. If any portion contains free liquids, the entire sample is considered to have free liquids.

7.0 PROCEDURE

7.1 Assemble test apparatus as shown in Figure 1.

7.2 Place sample in the filter. A funnel may be used to provide support for the paint filter.

7.3 Allow sample to drain for 5 minutes into the graduated cylinder.

7.4 If any portion of the test material collects in the graduated cylinder in the 5-min. period, then the material is deemed to contain free liquids for purposes of 40 CFR 264.314 and 265.314.

8.0 QUALITY CONTROL

8.1 Duplicate samples should be analyzed on a routine basis.

9.0 METHOD PERFORMANCE

9.1 No data provided.

10.0 REFERENCES

10.1 None required.

Appendix B

Waste Screening Form

International Paper
Riegelwood Landfill Facility
WASTE SCREENING FORM

Day / Date: _____ Time: _____

Truck Owner: _____ Driver Name: _____

Truck Type: _____ Vehicle ID / Tag No: _____

Estimated Weight _____

Waste Generator / Source: _____

Is this asbestos?____(Yes/No) IF YES, IT MUST BE PLACED IN THE APPROVED DISPOSAL AREA, COVERED WITH 18 INCHES OF SOIL / RESIDUALS.

If asbestos, Number of bags in the load _____

Description of Load: _____

Load Accepted (signature) _____ Date _____

Load Not Accepted (signature) _____ Date _____

Reason Load Not Accepted (complete only if load not accepted)

Description of Suspicious Contents:
(Check all applicable reasons)

Color _____
Texture _____
Drums Present_____
Est. Cu. Yds. Present in Load _____
Est. Tons Present in Load _____

Haz. Waste Markings_____
Smell _____

Mill Emergency Management Contacted? Yes _____ No _____

Hazardous Materials Present: _____

Mill environmental manager or landfill supervisor notified (if waste not accepted) Phone: Time Contacted:

Other Observations: _____

Final Disposition
Signed _____ Date _____
Designated Landfill Supervisor or Environmental Manager

Attach related correspondence to this form.
File completed form in Operating Record.

Appendix C

Cell Activation Form

International Paper
Riegelwood mill Landfill
Cell Activation Form

Date: _____

Cell: _____

Area of Geosynthetic Rain Cover Removed (Length/Width): _____

Length of Type GT-S Geotextile Removed from Gravel Column(s): _____

Protective Cover Erosion Free (describe method/location of any repairs): _____

_____

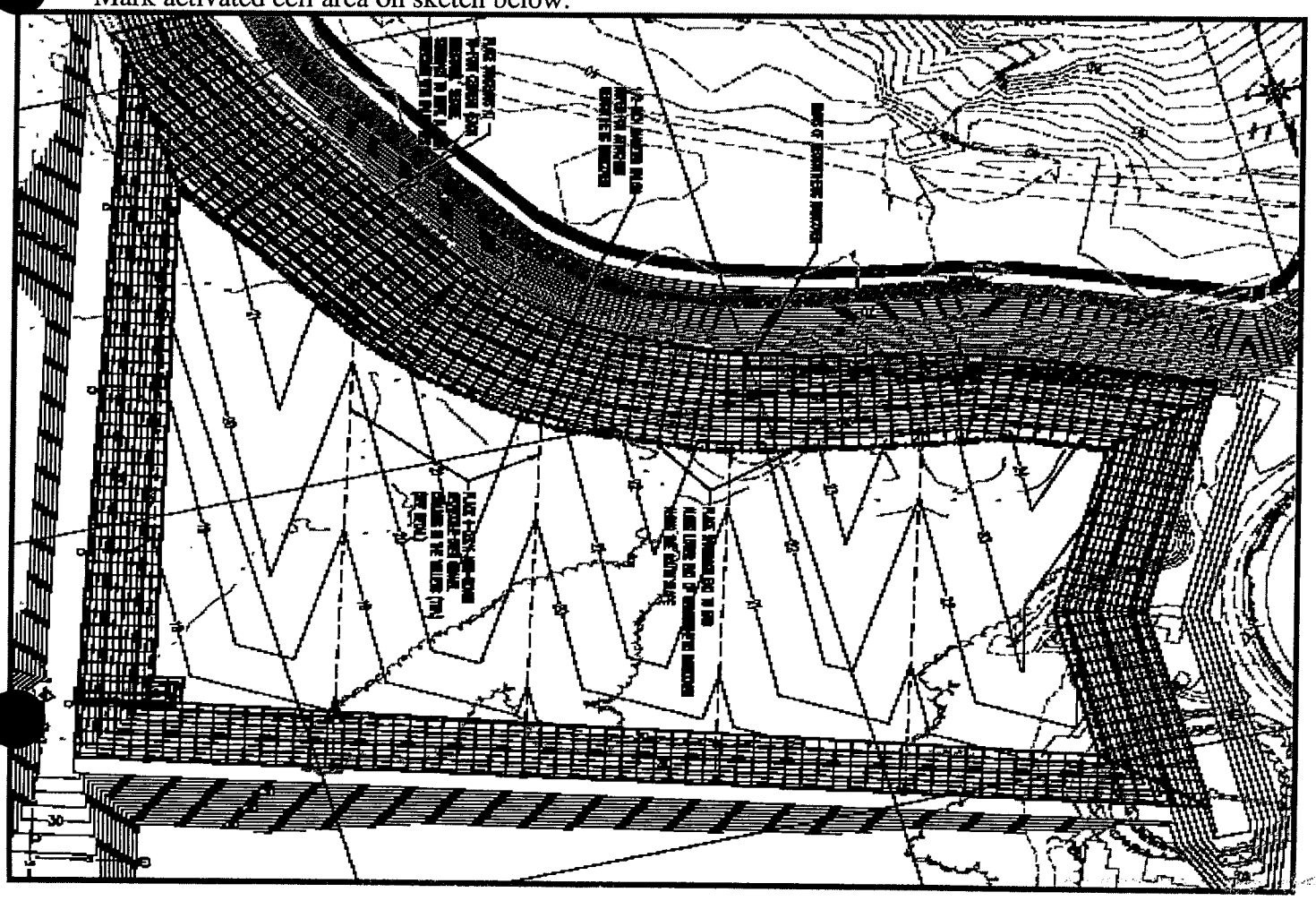
Remarks: _____

_____

_____

Signed: _____

Mark activated cell area on sketch below:



Appendix D

Filling Sequence Diagrams and Details

FIGURE 1
Cell 1 Initial Access and filling plan

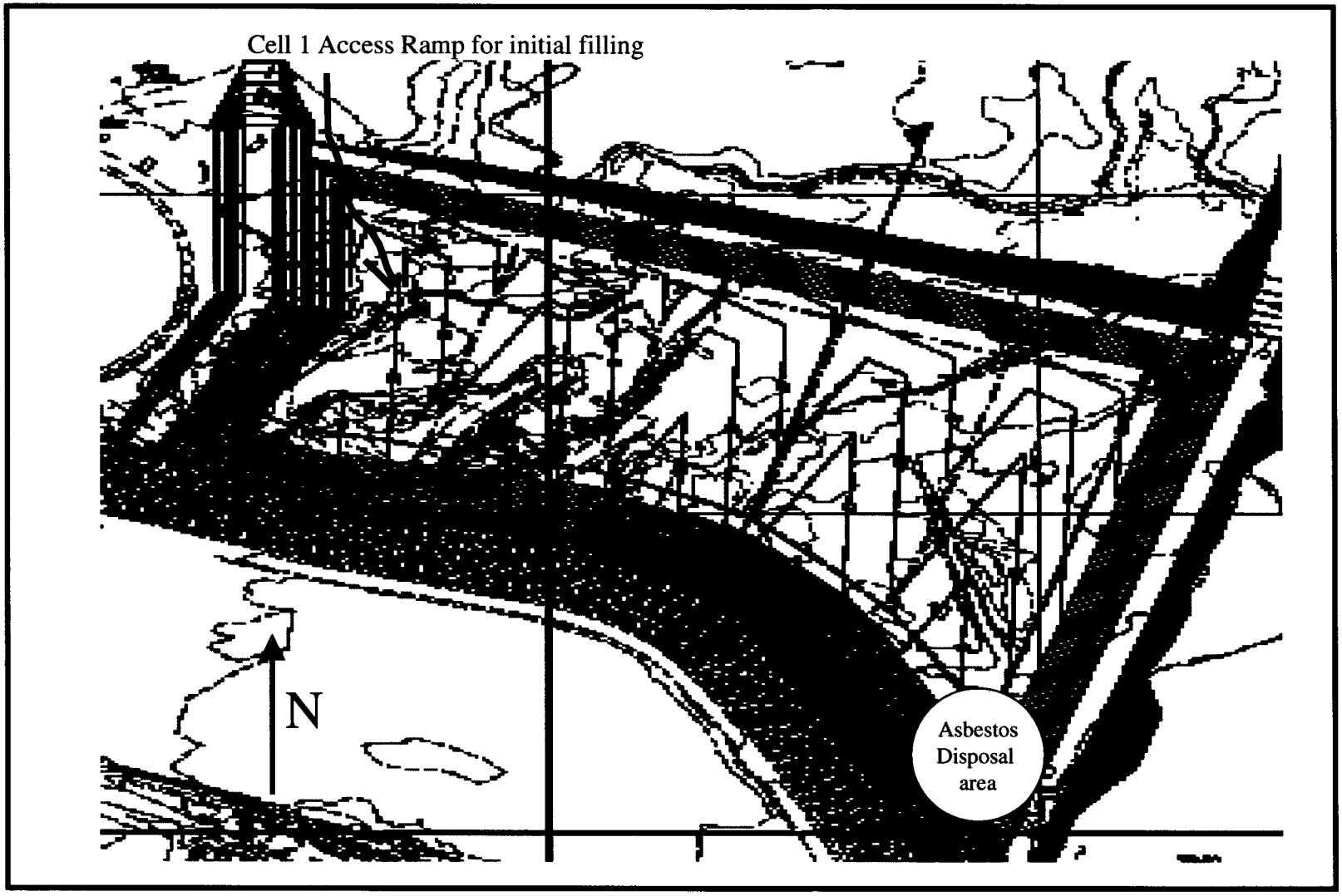


FIGURE 2
Phase 1 Filling Plan
below elevation +38

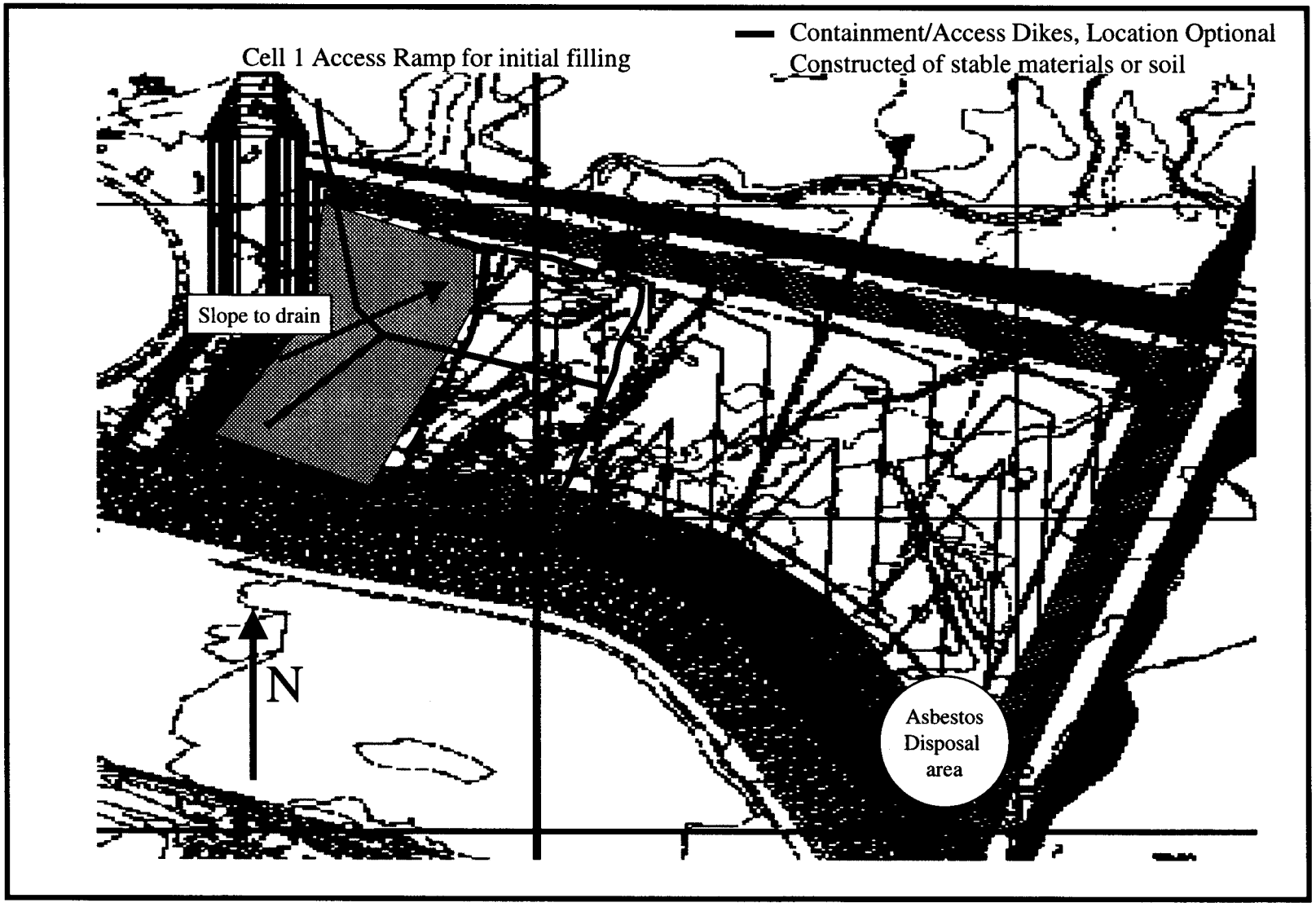


FIGURE 3
Phase 1 Filling Plan
below elevation +38

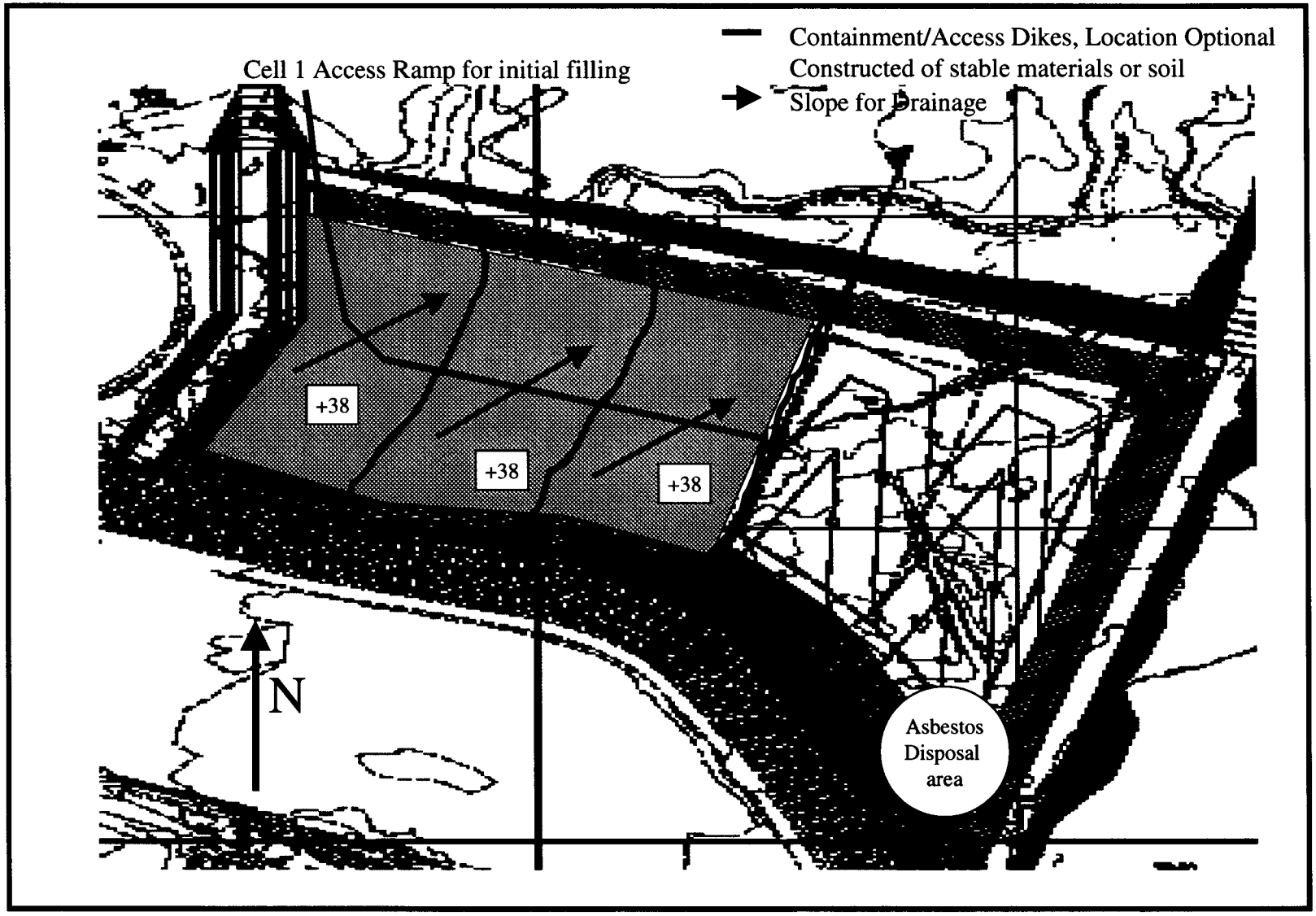


FIGURE 4
Phase 2 Filling Plan
below elevation +48

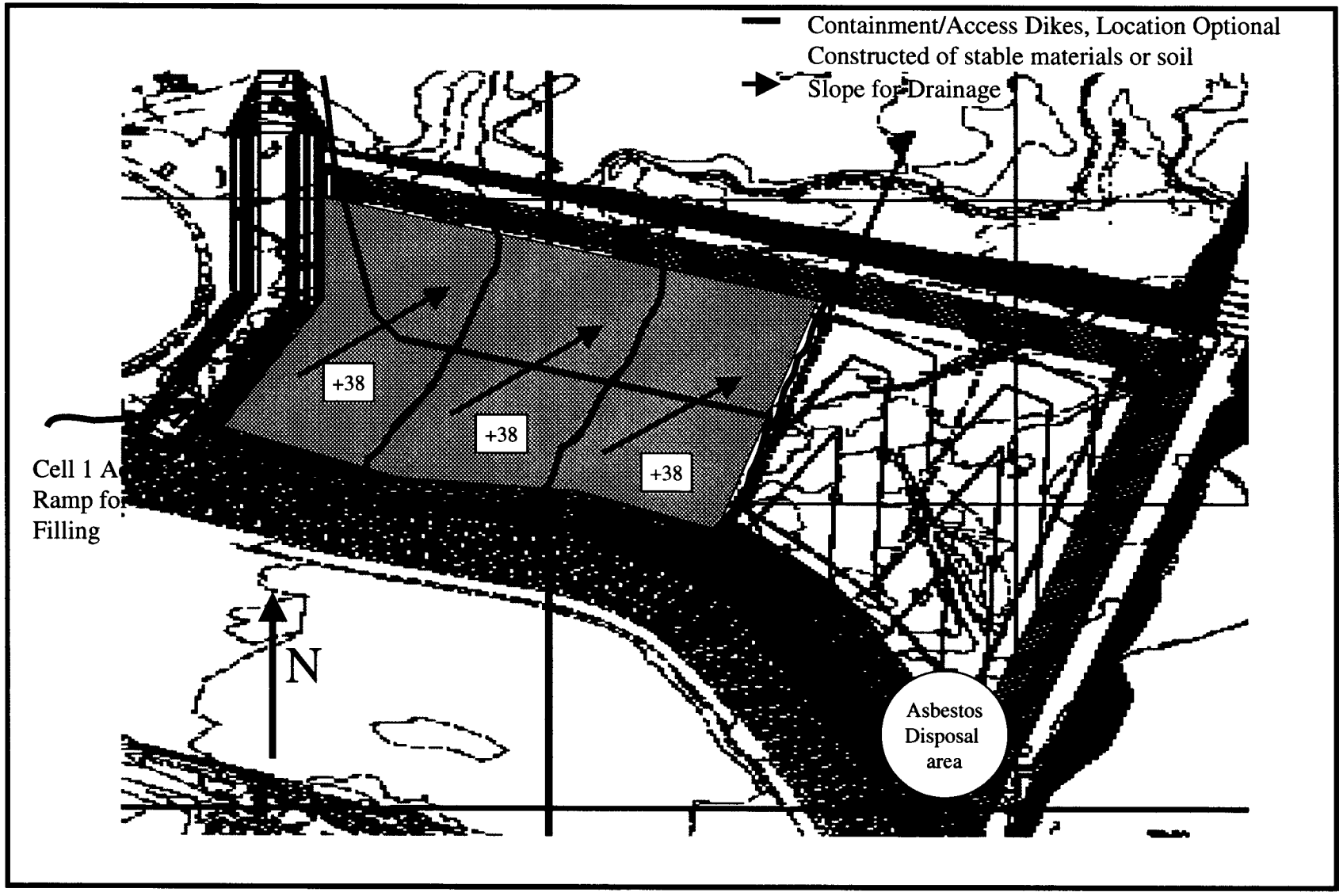


FIGURE 5
Phase 2 Filling Plan
below elevation +48

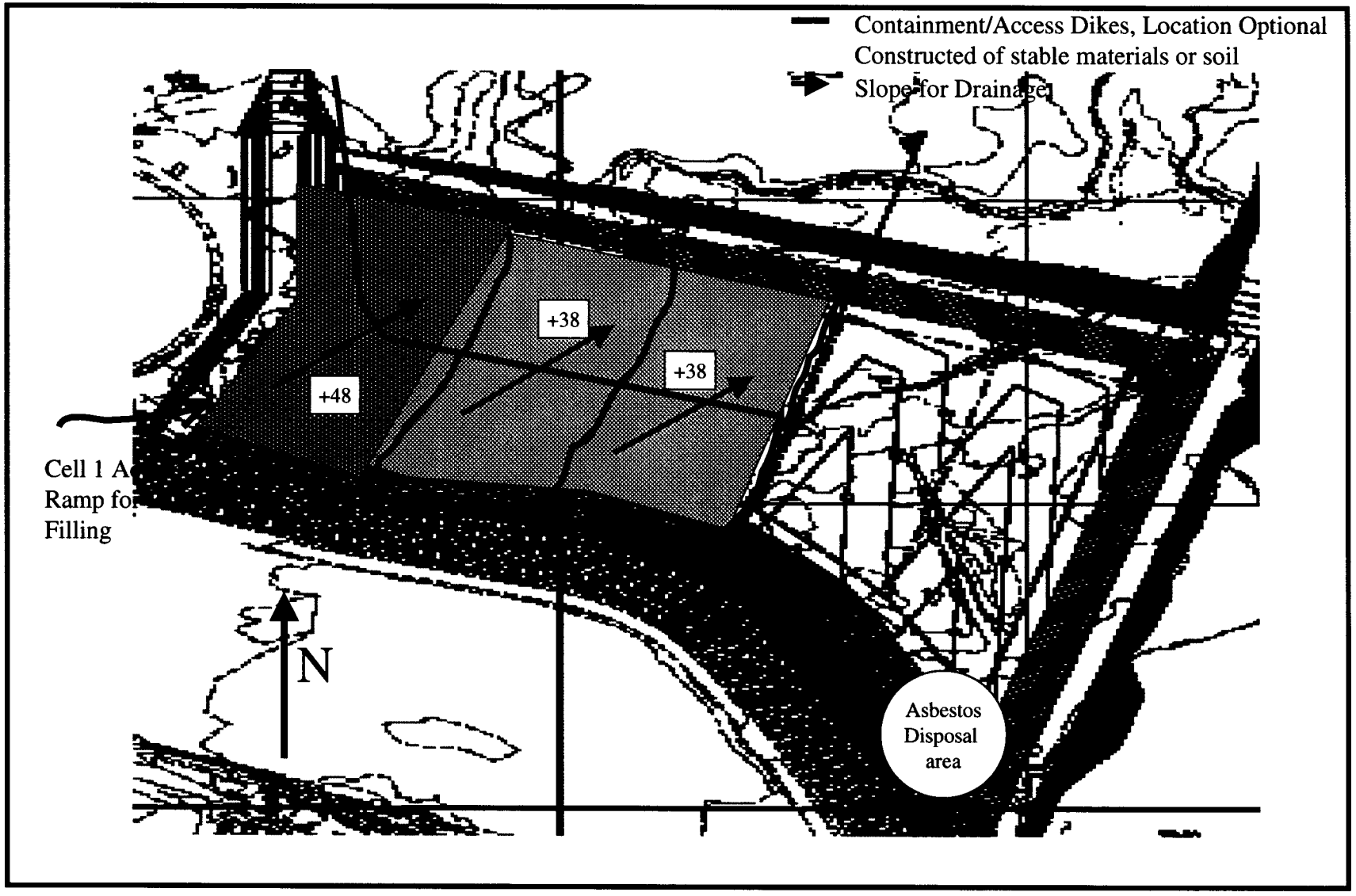


FIGURE 6
Phase 2 Filling Plan
below elevation +48

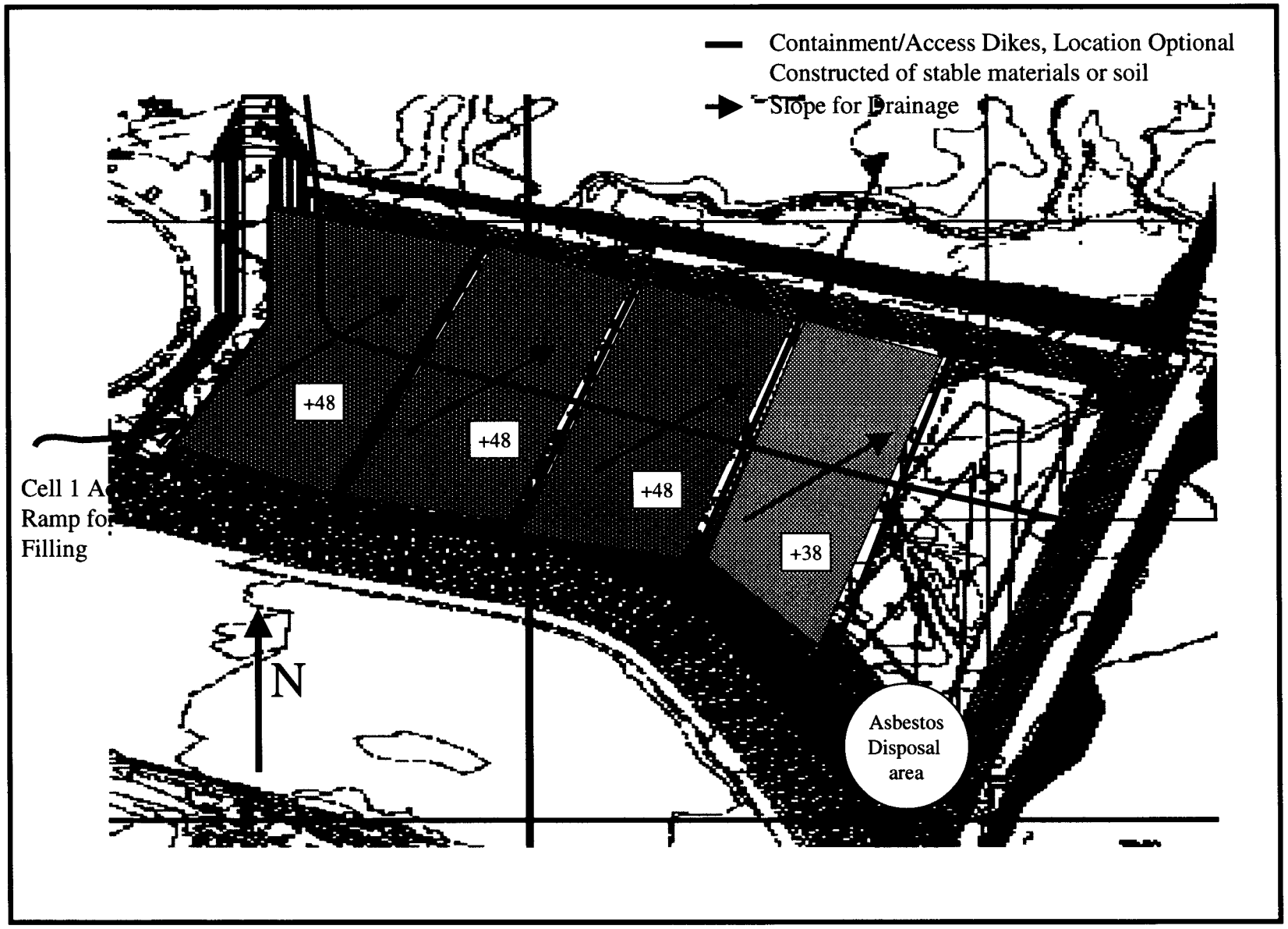


FIGURE 7
Phase 3 Filling Plan
final contours

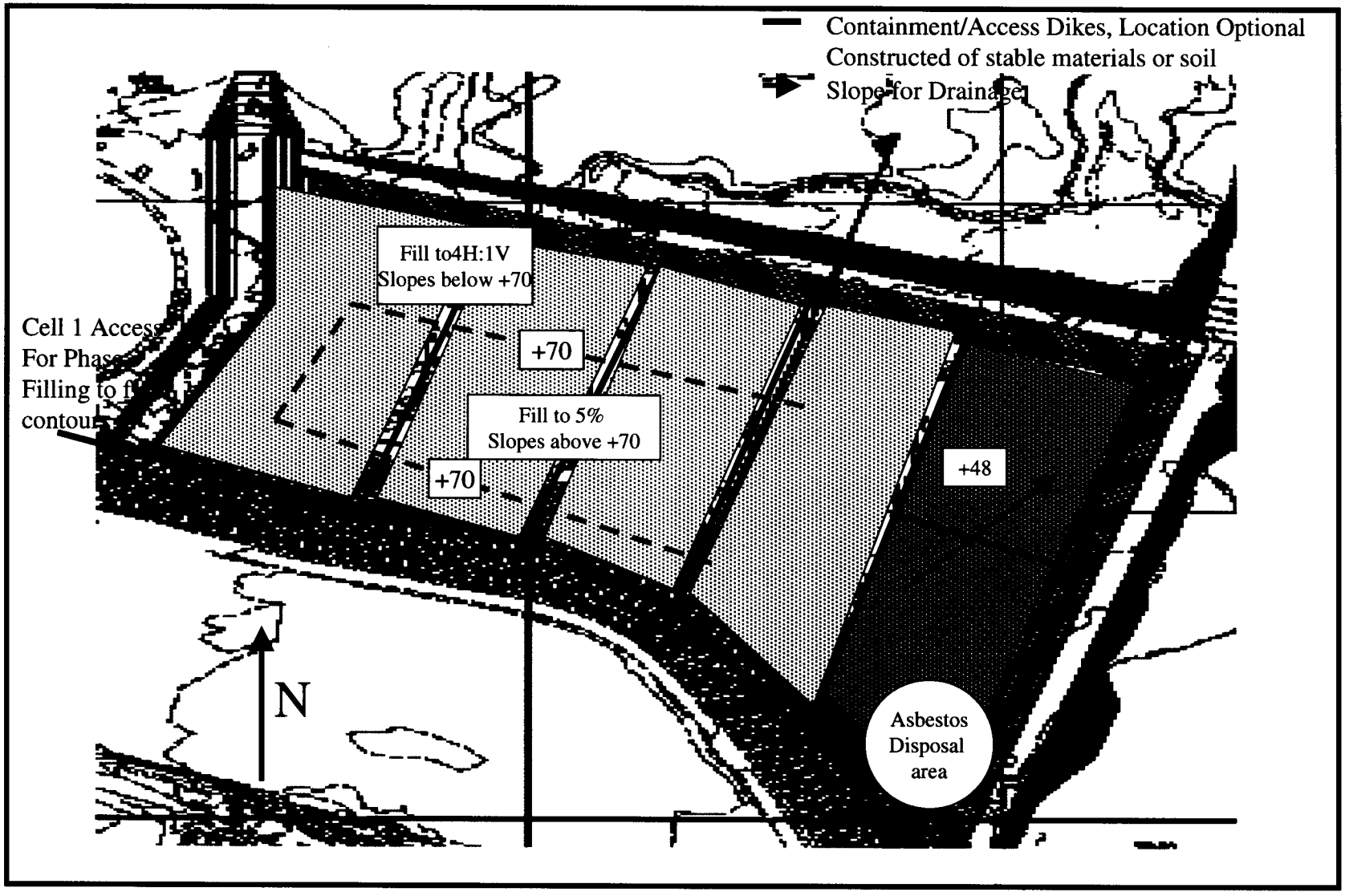


FIGURE 8
Typical Perimeter Dike Configuration

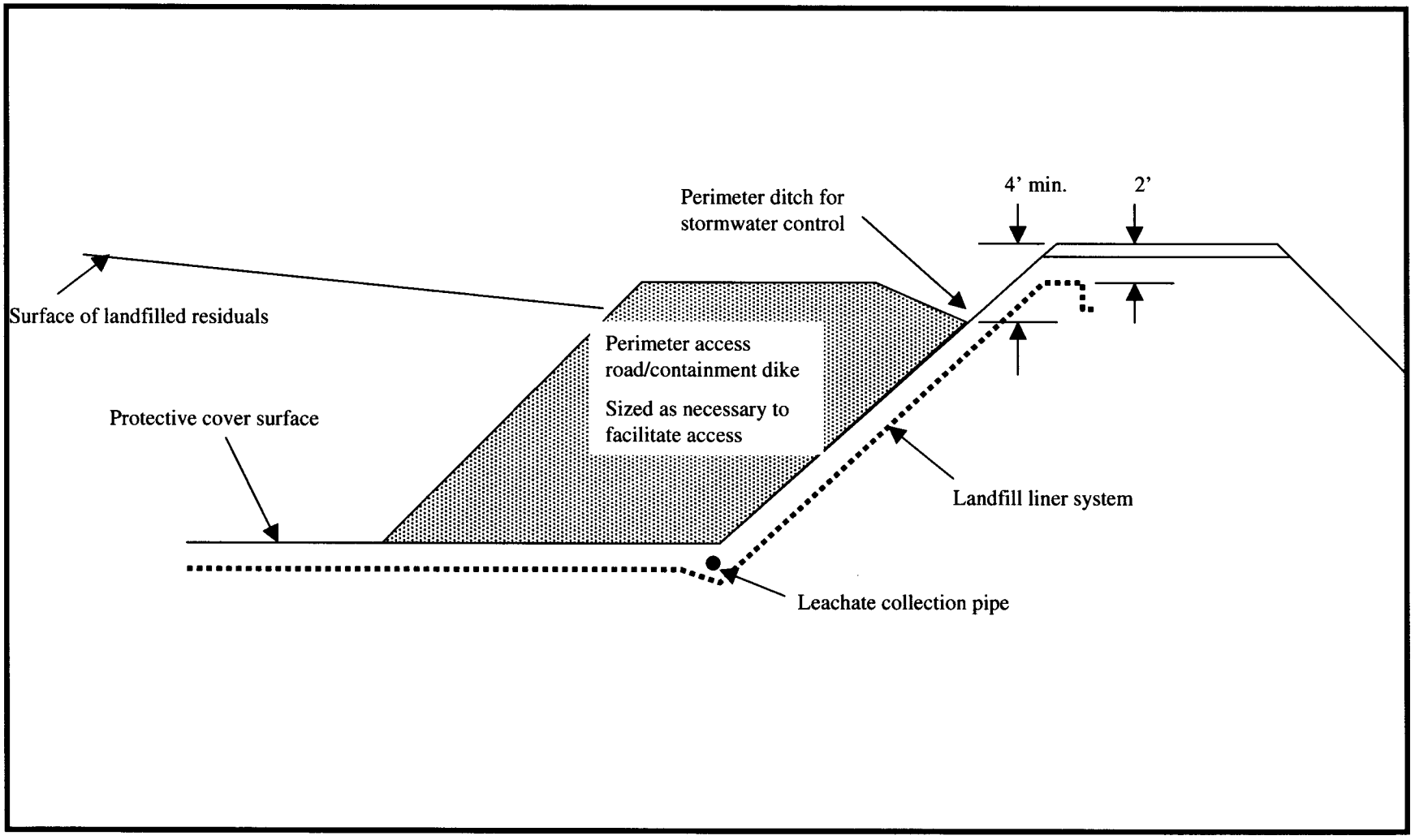


FIGURE 9
Typical Interior Containment Dike Configuration

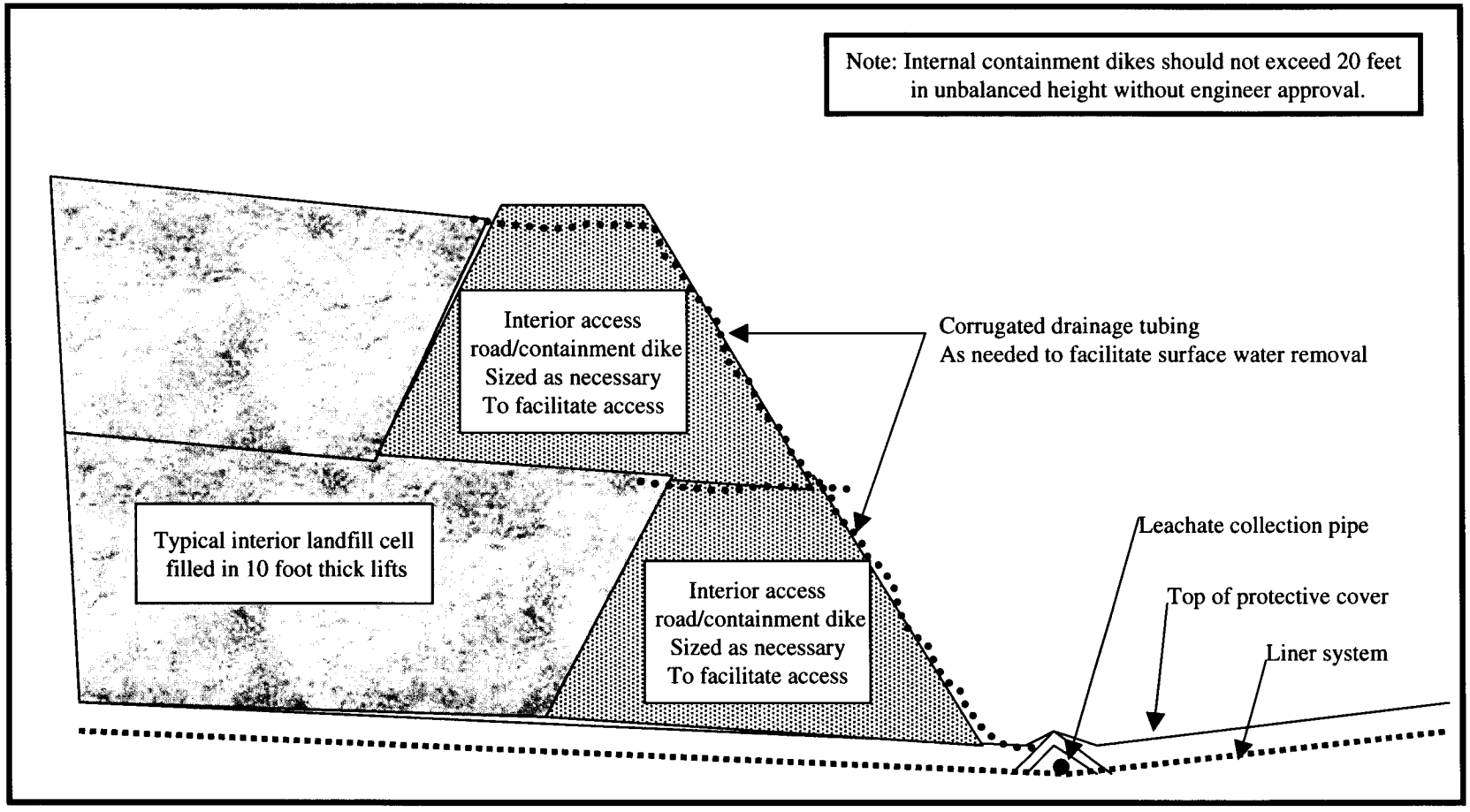


FIGURE 10
Groundwater and Leachate Collection System
Pump Control Panel

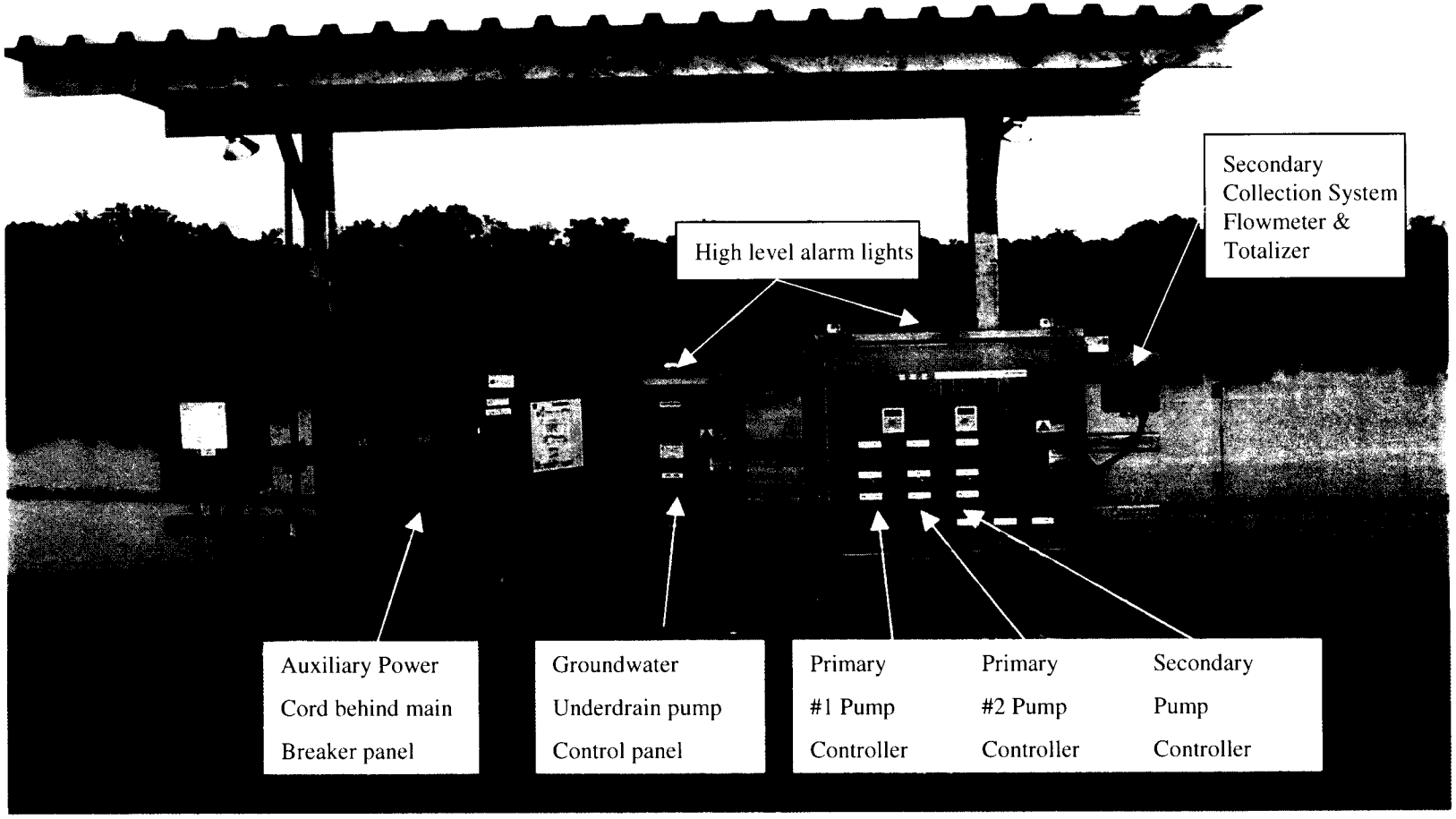


FIGURE 11
Control Panel
Primary and Secondary Collection System Transducer Presets

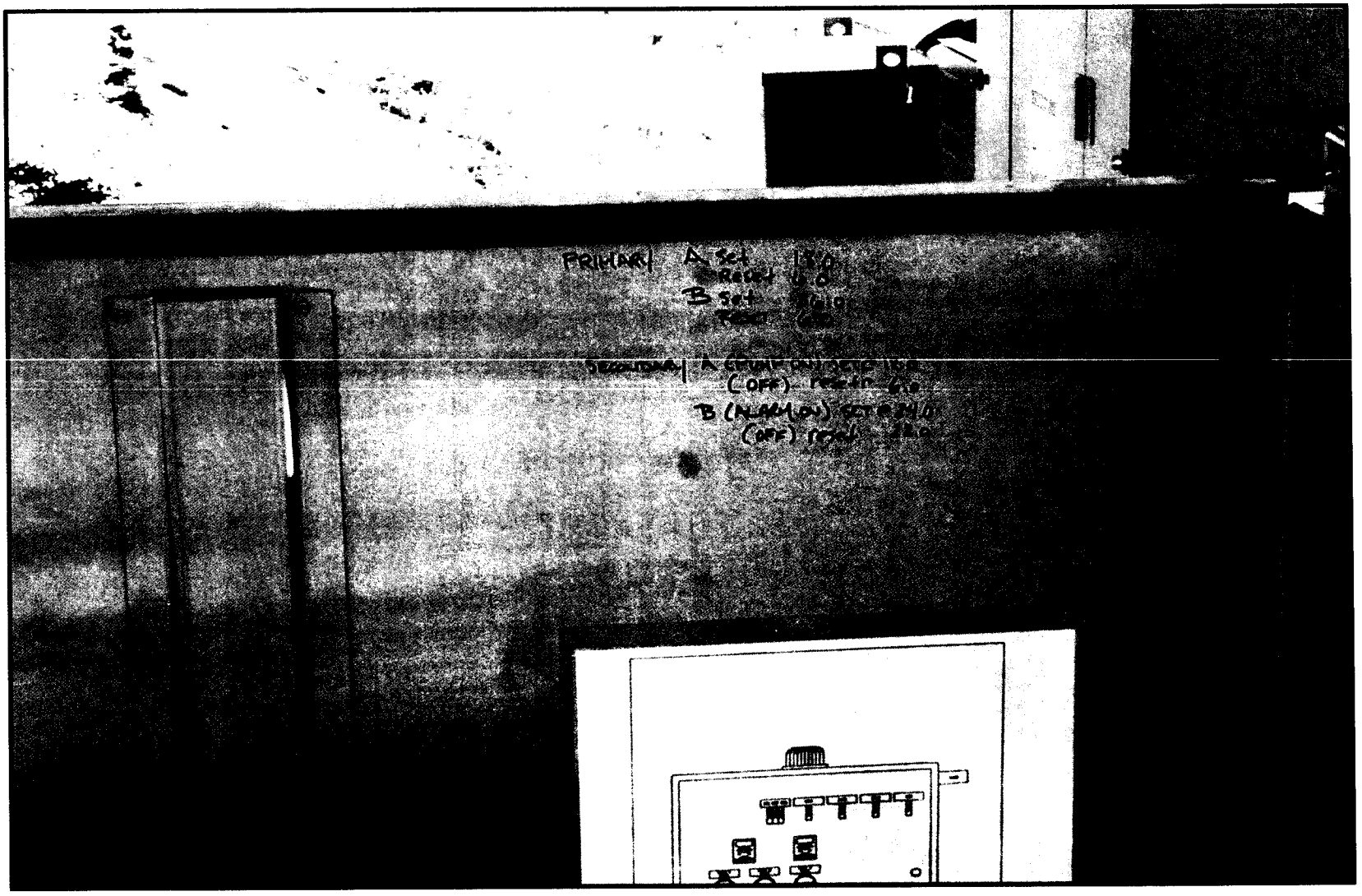


FIGURE 12
Cell Activation Location Diagram

Appendix E

Leachate Information Spreadsheet

RIEGELWOOD LANDFILL CELL NO. 1 LEACHATE INFORMATION

Month:

Initials	Day	Date	Time	Precip-itation (inches)	Primary Sump 1 Head (inches)	Secondary Sump Head (inches)	Secondary Totalizer Reading (gallons)	Secondary Daily Flow (gallons)	30 Day Run. Avg. ALR (gal/ac/day)	Hour Meter Readings				Comments
										P1 hours	P2 hours	P3 hours	UD hours	
				0.00										

Cell No 1 Acreage = Floor Elevation = Sensor Elevation =	Monthly Secondary Total Flow = Monthly ALR =	Minimum Secondary Head = Maximum Secondary Head = Average Secondary Head =