



*PUBLIC HEARING*  
**Draft Operating License**

**The Dow Chemical Company  
Salzburg Landfill  
2314 West Salzburg Road  
Midland, Michigan**

**7:00 p.m.**

**December 4, 2008**

**Grace A. Dow Memorial Library Auditorium**

# *Introductions*

## Department of Environmental Quality, Waste and Hazardous Materials Division (WHMD) Staff

- MEETING OFFICER - Steve Buda, Chief of Hazardous Waste Management Unit
- George Bruchmann - Division Chief/Decision-Maker
- Cheryl Howe - Permit Engineer/Project Manager
- Joe Rogers - Geologist
- Ginny Himich - Environmental Quality Analyst
- Dan Qian - Geotechnical Engineer
- Terry Walkington - Saginaw Bay District Supervisor and Multi-Media Coordinator
- Trisha Confer - Inspector (could not be here tonight)

# *Purpose of Meeting*

- Provide an overview of proposed licensing action for Dow Salzburg Landfill and receive public input on:
  - Increase in final elevation of cap over portions of the landfill
  - Proposed change in waste acceptance hours of operation
  - Facility application and draft operating license
  - 10 year term of license with reopener at five years
  - Determination that no corrective action is required at this time

# *Public Participation Process*

- Local Community Concerns
- Local Knowledge of Facility Operations
- Local Environmental Issues
- Local Human Health Concerns

# *Meeting Agenda*

- Public Participation Process - Steve Buda
- Overview of Facility and Draft Operating License - Cheryl Howe
- Environmental Monitoring - Joe Rogers
- Compliance History - Terry Walkington
- Public Comments - Steve Buda
- Opportunity to Ask Questions after Close of Formal Public Comment Period - Steve Buda

# *Procedure*

- Please fill out attendance card:
  - Check box to speak
  - Name will be put on Dow Mailing List
- Elected officials invited to speak first
- Public will speak in order of registration
- Please use the microphone
- State and spell your name
- Public comments are being recorded but no transcript is being made

# *Licensing Process*

- Part 111 Administrative Rules, Hazardous Waste Management, of the Michigan Natural Resources and Environmental Protection Act (1994 PA 451)
- WHMD reviews operating license application
- If deficiencies exist in the application, the applicant is requested to make the necessary modifications for technical adequacy
- When technically adequate, WHMD drafts proposed operating license and initiates public participation process

# *Public Review*

- Notice of intent to issue draft operating license was public noticed in the Midland Daily News on 11/3/08 and public service announcements broadcast on WSGW and WCMU
- Documents available for public review at:
  - Grace A. Dow Memorial Library
  - DEQ Saginaw Bay District Office in Bay City
  - Lansing Office
  - DEQ Web site
- Public comment period runs 45 days until 12/19/08

# *Public Review, Cont'd.*

Documents available for review on the DEQ Web site:

- Fact Sheet and Attachments
- Draft Operating License
- At <http://www.michigan.gov/deq>, click on WASTE > Hazardous & Liquid Industrial Waste > Hazardous and Liquid Industrial Waste Management; under Information, click on [Dow Salzburg Road Landfill Facility Operating License Information](#)
- [http://www.michigan.gov/deq/0,1607,7-135-3312\\_4118\\_4240-200344--,00.html](http://www.michigan.gov/deq/0,1607,7-135-3312_4118_4240-200344--,00.html)

*Dow Salzburg Landfill  
Overview of Facility and  
Draft Operating License*

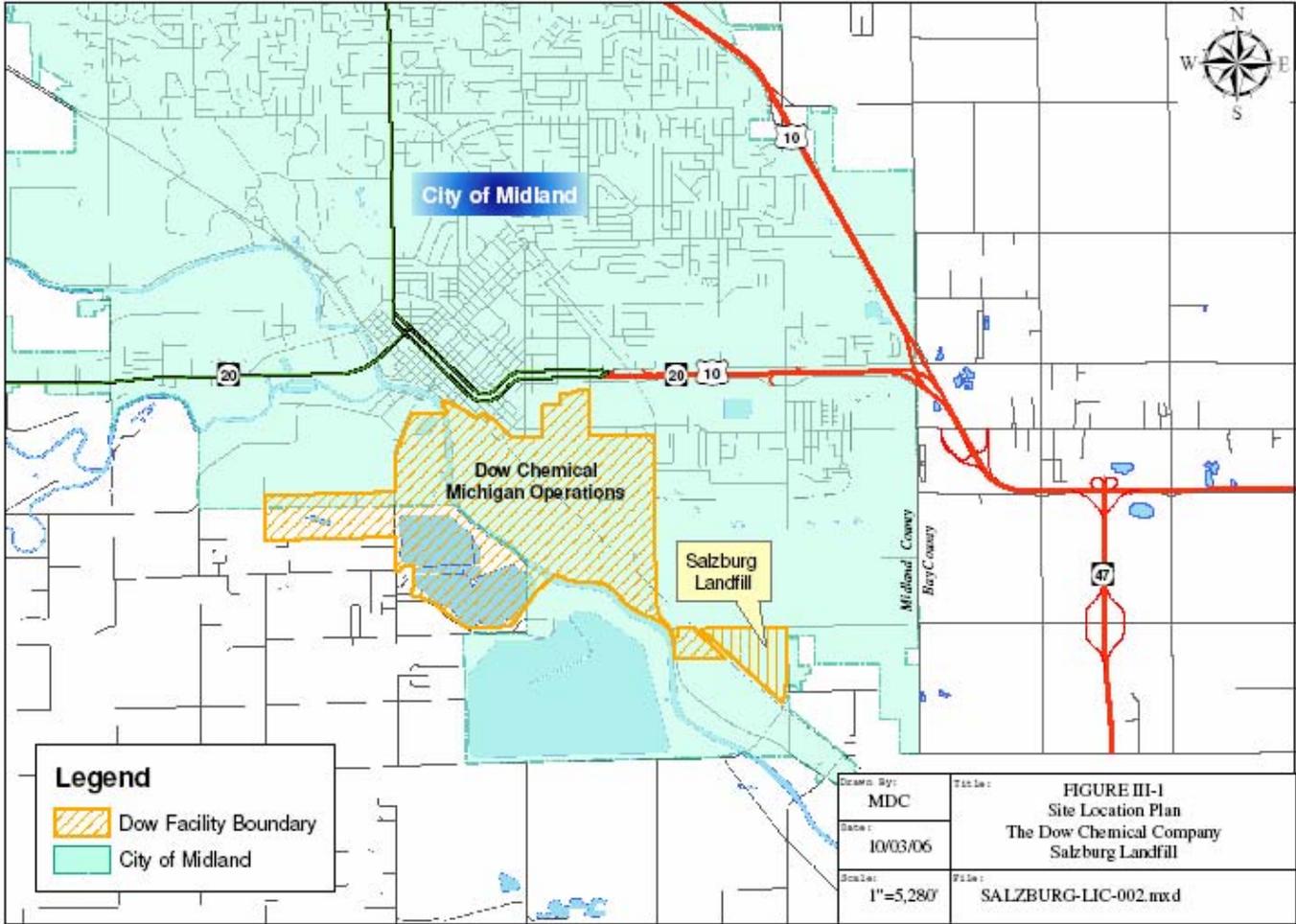
*Cheryl Howe  
Permit Engineer/Project Manager*

517-373-9881  
howec@michigan.gov

# *Location and Licensing History*

- 152-acre site located at 2314 W. Salzburg Road in Midland near intersection of Waldo/Salzburg Roads
  - Less than a mile from the 1,900-acre Dow Michigan Operations manufacturing/research facility
- Original construction permit issued by Site Review Board 9/15/81 for landfill with disposal capacity of 3,090,000 cubic yards
- Operating license issued 2/10/82; reissued 12/29/86 with effective date of 1/12/87
- Federal permit issued 12/31/86; effective date of 1/12/87
  - Federal permit not required because the state is authorized for everything under the draft License

# Dow Salzburg Landfill Location



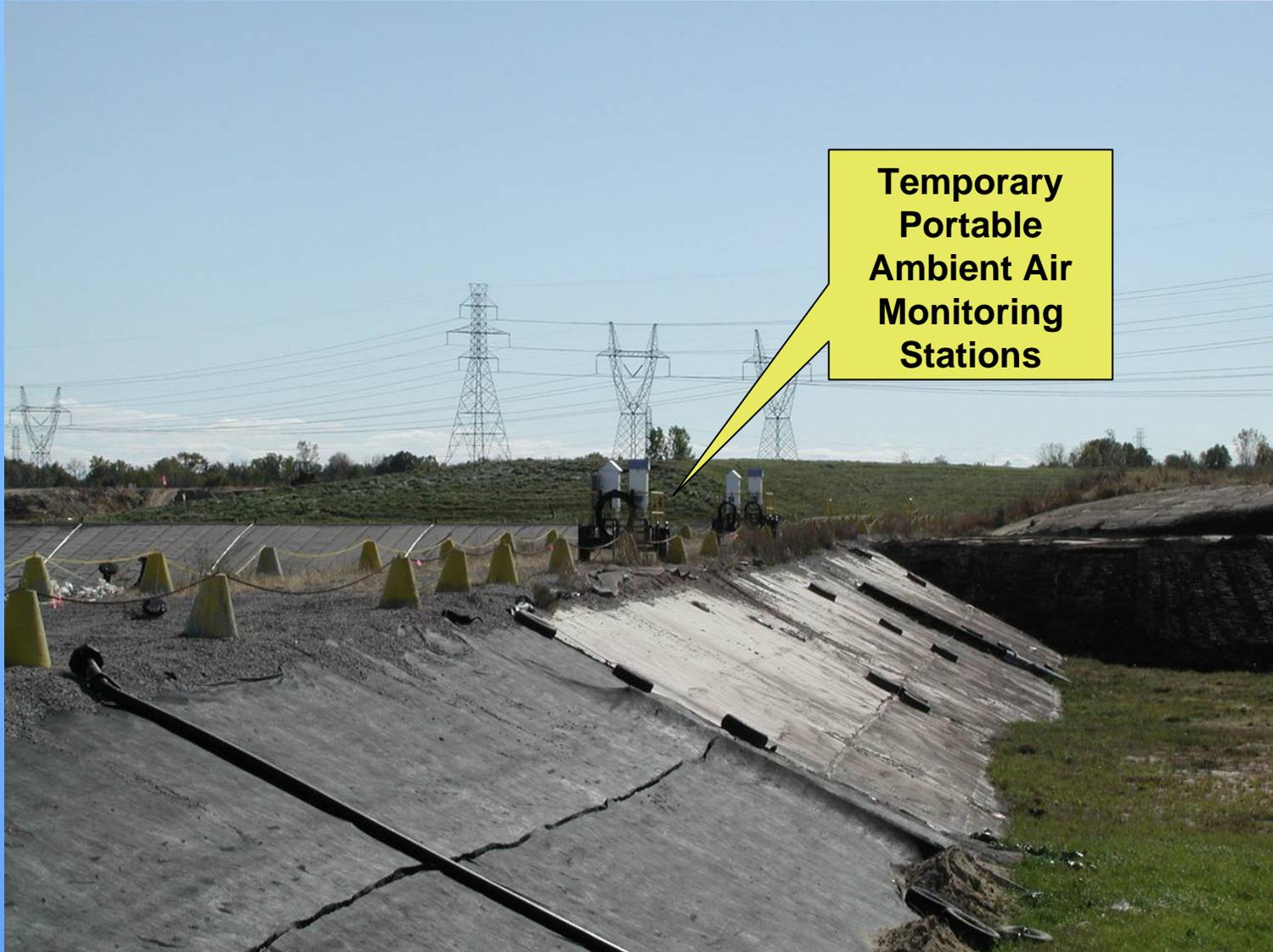
## *Licensing History, Cont'd.*

- 1987 License expired 1/12/92
- However, Dow submitted a timely reapplication and is allowed to continue operating under the Administrative Procedures Act until License reissuance
  - Lengthy delay in relicensing due to extensive work on Dow Michigan Operations Facility License, on-site/off-site corrective action, and other high priority activities
- Minor License modifications - 9/30/91 (#1), 8/21/02 (#2), and 8/8/07 (#4)
- Major License modification (#3) on 6/12/03
  - Updated acceptable hazardous waste codes to be consistent with waste codes in the 2003 Dow Michigan Operations Facility License

# *Land Disposal Restrictions Treatability Variances*

- Variances allow disposal of certain wastes in the landfill without treatment to regulatory levels to expedite remediation
- 6/10/97 - U.S. EPA approved a variance for certain dioxin contaminated soils removed as part of Revetment Groundwater Interceptor System (RGIS) upgrade projects
- 6/18/02 - U.S. EPA and DEQ jointly approved a limited variance for Tertiary Pond solids removal project when incineration proved to be infeasible
  - Extensive monitoring and operational requirements at landfill as part of variance for this remediation project
- 7/2/08 - DEQ approved a variance for contaminated soils generated during corrective action or upgrade/maintenance of corrective action management systems, including the RGIS

# *Disposal of Tertiary Pond Solids in Cells 17-19 under Variance*



**Temporary  
Portable  
Ambient Air  
Monitoring  
Stations**

# *Cells 17-19 Closed in 2005*



# *Dow Salzburg Landfill Overview*

- Landfill is designed and used for disposal of hazardous and nonhazardous waste from Dow's Michigan Operations facility and other Dow plants and subsidiaries
  - From manufacturing of plastics, agricultural chemicals, organic chemicals, inorganic chemicals, and conducts research and development activities for these products
  - Landfill primarily accepts incinerator ash and remediation waste for disposal
- About half of the 3,090,000 cubic yards of licensed disposal capacity is still available
- Wastes are transported to the landfill in closed containers and covered trucks
- Wastes are directly disposed of; no treatment or "storage" of hazardous waste at the landfill

# *Dow Salzburg Landfill Entrance*



# *Dow Salzburg Landfill Truck Wash*



**ENTRANCE**



**EXIT**

# *Landfill Perimeter Fence and Berms*



# *Landfill Development Plan*

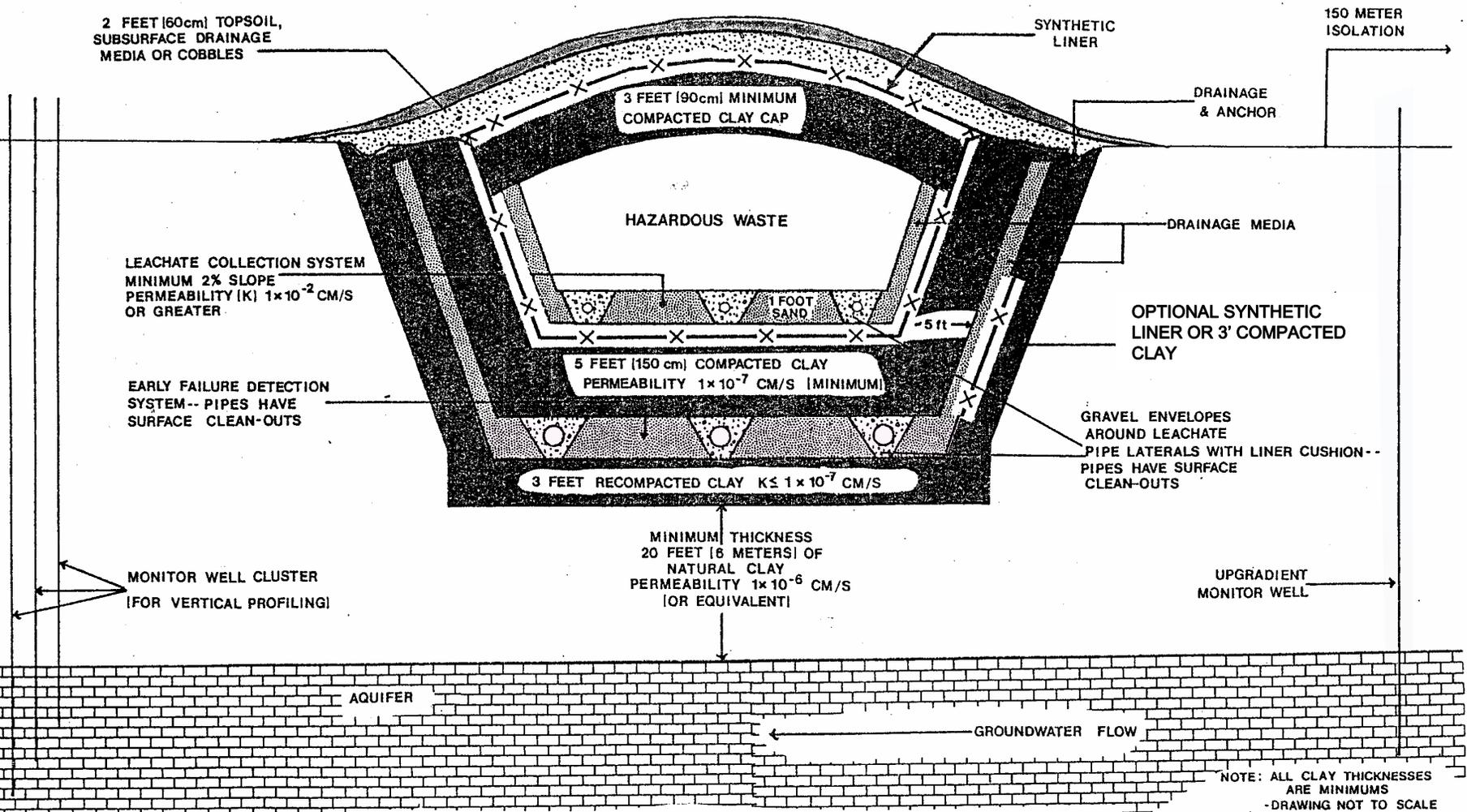
- Development plan for the landfill will be dependent upon waste generation rates
- Future cell design will be phased and may be revised based on:
  - Changes in regulations over time
  - Optimizing the construction cycle
  - Updates in landfill technology and construction materials
- Dow must obtain formal approval from the DEQ for detailed engineering design plans before constructing each set of cells
  - Consistent with past practice
  - This process has worked well to date (i.e., Dow constructs to current regulations)



# Landfill Cells

<b>Cell Designation</b>	<b>Description (Year Closed)</b>	<b>Approximate Cap Acreage</b>
Cells 1-2	Closed hazardous/solid waste cells (1984)	1.9
Cells 3-5	Closed hazardous waste cells (1984)	2.2
Cells 6-8	Closed hazardous waste cells (1986)	1.7
Cells 9-10	Closed hazardous waste cells (1986)	1.7
Cells 11-12	Closed hazardous waste cells (1986)	2.5
Cells 13-14	Closed hazardous waste cells (1988)	3.2
Cells 15-16	Closed hazardous waste cells (1991)	3.5
Cells 17-19	Closed hazardous waste cells (2005)	6.1
Cells 38-39	Closed solid waste cells (1988)	4
Cells 40-43	Closed solid waste cells (2005)	9.4
Cells 20-22	Active hazardous/solid waste cells	7.2
Cells 23-28	Under construction hazardous/solid waste cells	13.6

# Part 111 Hazardous Waste Landfill Typical Trench Cross Section



# *Dow Salzburg Landfill Design*

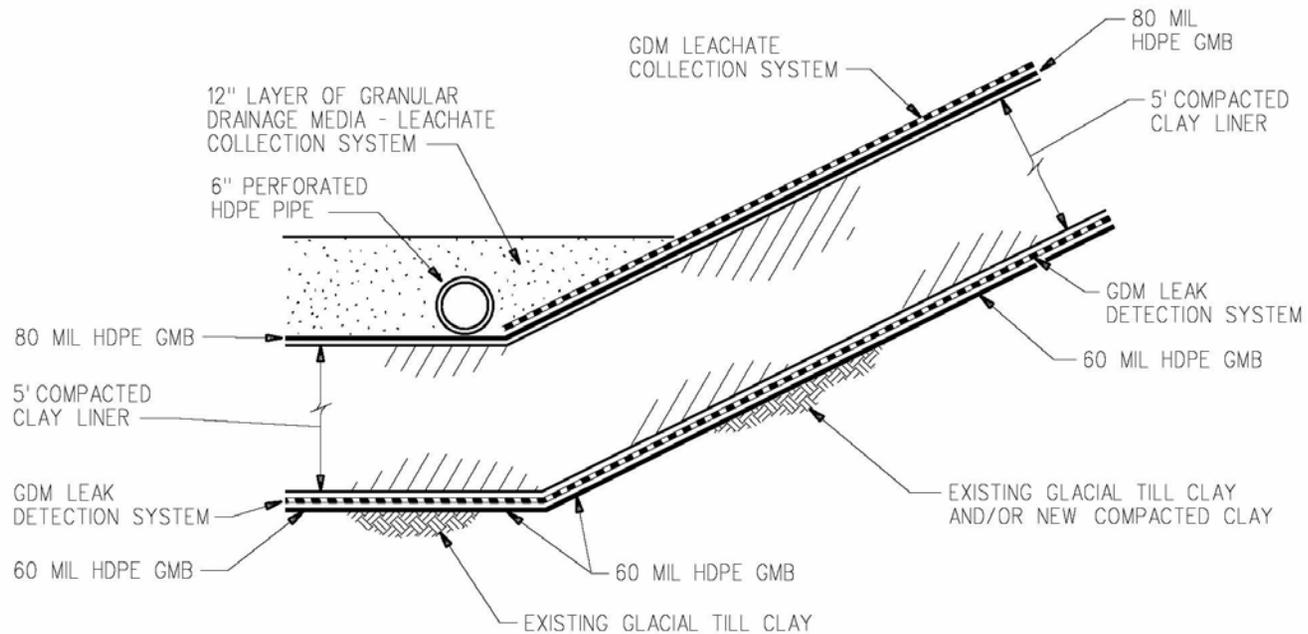
## *Bottom to Top*

- 1. Site Preparation and Subsurface Geology Determination**
- 2. 23-feet thick Secondary Clay Layer**
- 3. Secondary Synthetic Liner (60 mil HDPE geomembrane)**
- 4. Leak Detection System (geocomposite - single bonded on the cell bottom and geocomposite - double bonded on the cell walls)**
- 5. 5-feet thick Primary Compacted Clay Liner**
- 6. Primary Synthetic Liner (80 mil HDPE geomembrane)**
- 7. Leachate Collection System (geocomposite - single bonded on cell walls and granular drainage media with perforated HDPE pipes on the cell bottom)**
- 8. Lift Stations**

# Dow Salzburg Landfill Liner Design

## LEGEND:

- GMB - GEOMEMBRANE
- GDM - GEOCOMPOSITE DRAINAGE MATERIAL



CURRENT LINER CROSS SECTION  
SALZBURG LANDFILL

\\SLF\PDF-LINER-SEC-1.dgn

JJA/LEG  
9/1/05

# *Landfill Equivalency Design*

- DEQ allows an alternative equivalent design for the Part 111 requirements of:
  - 3-feet thick compacted clay secondary (bottom) liner
    - Maximum permeability of  $1 \times 10^{-7}$  cm/sec
  - 6 meters of natural soils
    - Maximum permeability of  $1 \times 10^{-6}$  cm/sec below and lateral to the bottom liner
- Approved equivalent design is a 23-feet thick layer of natural soils with an average permeability of  $4.57 \times 10^{-7}$  cm/sec immediately below the secondary synthetic liner

# *Cells 23-28 Landfill Sub-base Excavation and Equivalency Design Determination*



**4/30/08**



**10/23/08**



**10/6/08**



# *Cells 20-22 Under Construction 10/1/99*



# *Construction of Cells 20-22*



**8/25/00**

**10/3/00**



# *Waste in Cells 20-22 Currently*

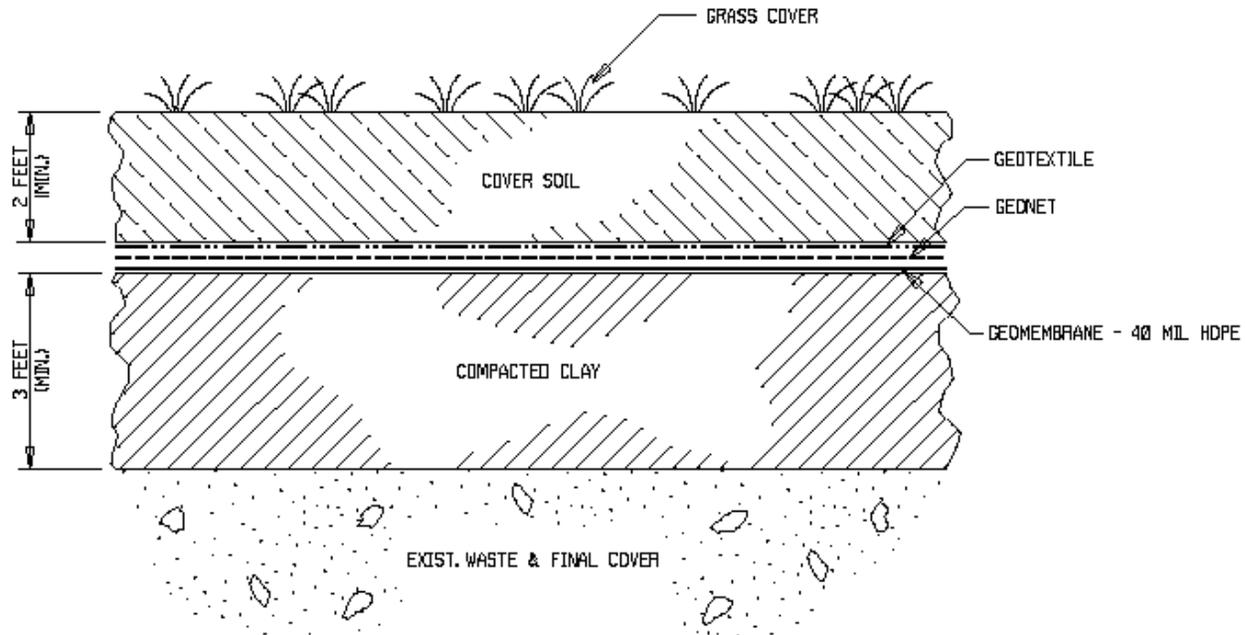


# *Dow Salzburg Cap Design*

## *Bottom to Top*

- 1. Site Grading and Sub-base Preparation** - includes 6-12 inch thick layer of sand or silty-clay soil shaped to the proper slopes/ elevations to provide sub-base for the clay liner
- 2. Clay Liner Component** - alternative equivalent design of 1-foot thick CCL single layer geosynthetic clay liner
- 3. Synthetic Liner Component** - 40 mil HDPE geomembrane or linear low density PE geomembrane
- 4. Drainage Collection Layer**
- 5. Erosion Control and Freeze Protection Layer** - 18 inch thick cover soil layer topped with 6-inch thick layer of topsoil capable of supporting grass and graded to the specified elevations/slopes to provide positive drainage at all locations on the cap

# Dow Salzburg Landfill Cap Design Example



ORIGINAL COMPOSITE CAP CROSS SECTION  
CELLS 17 THRU 19  
SALZBURG LANDFILL

\\CAP 17-19\XCAP-SEC.dgn

J.J.A./L.E.G. 5/7/04

# *Closed Landfill Cell*



# *Proposed Increased Cap Height*

- Dow has proposed changing the development plan for the landfill:
  - Increase the final elevation of current Cells 20-22 4 feet on average and 8 feet maximum
  - Increase the height of Cells 23-28 (currently under construction) by 40 feet on average and 48 feet maximum
  - Final elevation of future Cells 44-53 will not change significantly
- Will not encroach upon the rights-of-way for the high power electrical lines that cross the facility

# *High Power Lines*

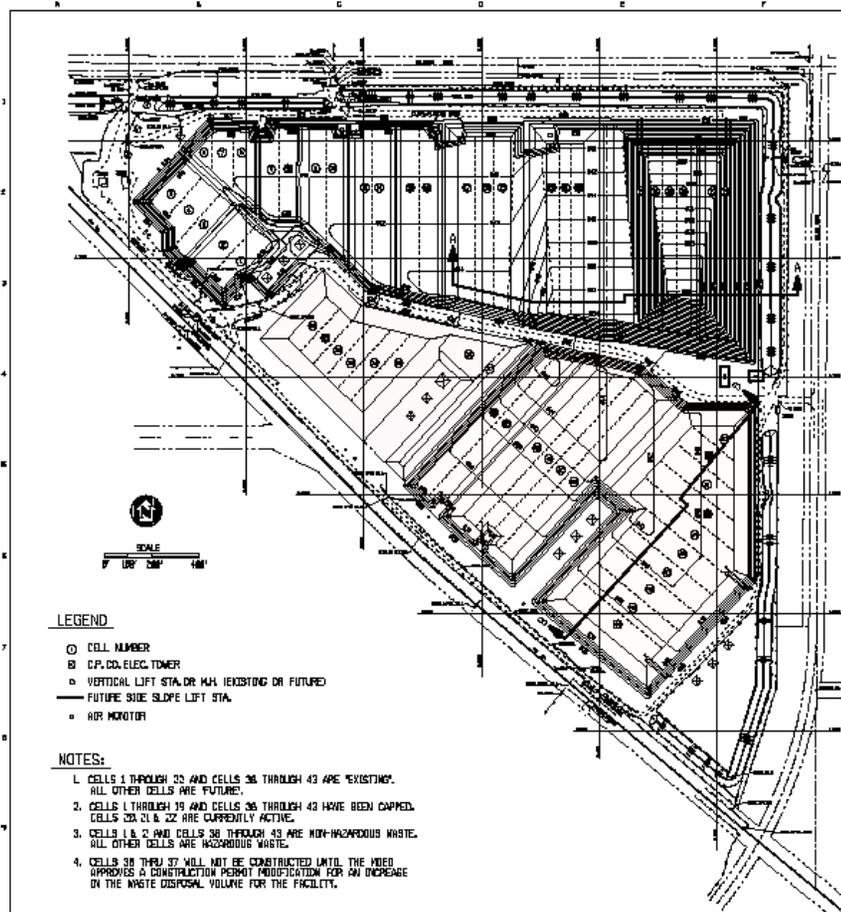


## *Proposed Increased Cap Height, Cont'd.*

- Height increases will not exceed authorized facility design capacity of 3,090,000 cubic yards
- Due to this design change, the development of future Cells 30-37 will not be allowed unless Dow is able to add disposal capacity at a later date
- Dow would need to obtain a construction permit from the DEQ to become authorized to expand the landfill beyond its currently licensed disposal capacity



# Existing and Future Capping Layout

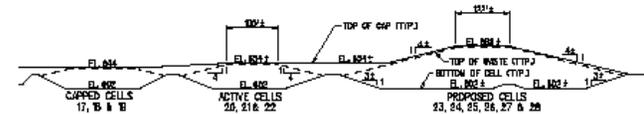


### LEGEND

- CELL NUMBER
- D.P. CO. ELEC. TOWER
- VERTICAL LIFT STA. OR M.H. (EXISTING OR FUTURED)
- FUTURE SIDE SLOPE LIFT STA.
- AIR MONITOR

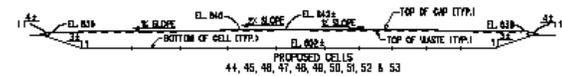
### NOTES:

1. CELLS 1 THROUGH 33 AND CELLS 36 THROUGH 43 ARE 'EXISTING'. ALL OTHER CELLS ARE 'FUTURE'.
2. CELLS 1 THROUGH 19 AND CELLS 36 THROUGH 43 HAVE BEEN CAPPED. CELLS 20, 21 & 22 ARE CURRENTLY ACTIVE.
3. CELLS 1 & 2 AND CELLS 36 THROUGH 43 ARE NON-HAZARDOUS WASTE. ALL OTHER CELLS ARE HAZARDOUS WASTE.
4. CELLS 38 THRU 37 WILL NOT BE CONSTRUCTED UNTIL THE WEDD APPROVES & CONSTRUCTION PERMIT MODIFICATION FOR AN INCREASE IN THE WASTE DISPOSAL VOLUME FOR THE FACILITY.



SECTION A-A (LOOKING NORTH)

NO SCALE



SECTION B-B (LOOKING NORTHWEST)

NO SCALE

**Cells 44-53: Little change**

**Cells 30-37: Cannot construct without construction permit**

NO.	REVISION	BY	CHK	APP	DATE	DATE	NO.	REVISION	BY	CHK	APP	DATE	DATE	NO.	REVISION	BY	CHK	APP	DATE	DATE	NO.	REVISION	BY	CHK	APP	DATE	DATE
1	REVISED DIMENSIONS OF CAPS FOR CELLS 25 THRU 30 AND CELLS 44 THRU 48																										
2	REVISED TO WASTE CELLS 30 THRU 37 WILL NOT BE BUILT UNTIL CONSTRUCTION PERMIT YIELDS AND IS APPROVED ALSO REVISED CELLS 44 THRU 48 CAP ELEV TO ACTUAL STORAGE VOLUME CELLS CURRENT DESIGN VOLUME																										

<b>THEER DOW CHEMICAL COMPANY</b> HAZARDOUS WASTE DIVISION WASTE MANAGEMENT WASTE TREATMENT WASTE STORAGE WASTE TREATMENT WASTE STORAGE WASTE TREATMENT WASTE STORAGE		PROJECT NO. 82-002-1374 SHEET NO. 2 PLAN
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# *Draft Operating License*

- Part I - Standard Conditions
  - General responsibilities/legal requirements
- Part II - General Operating Conditions
  - Covered in next few slides
- Part III - Landfill Disposal Conditions
  - Incorporates landfill regulatory requirements
- Part IV - Environmental Monitoring Conditions
  - Will be covered by Joe Rogers
- Part V - Corrective Action Conditions
  - Incorporates corrective action regulatory requirements; no corrective action required at this time
- License Attachments

# *General Operating Conditions*

## **Waste Analysis Plan Requirements**

- Generating plants within Dow complete Generator Waste Characterization Form to ensure consistent, accurate characterization and proper handling of wastes to be disposed of, including compliance with land disposal restrictions
- Characterization by knowledge of waste composition or by chemical analysis
- Wastes are re-characterized when generating processes change and are reviewed periodically to ensure accuracy

## *General Operating Conditions, Cont'd.*

### **Inspection Requirements**

- Landfill cells and ancillary equipment are inspected on a schedule appropriate to detect and remedy problems
- Items inspected **daily** include:
  - Leachate pumps, flow meters, level indicators, collection manholes, facility building, vehicle wash building, roadways, adequate daily cover of waste in active cells
  - Verify that trucks/containers are empty prior to leaving facility
  - Site security (gate and fenceline)

# *General Operating Conditions, Cont'd.*

## **Inspection Requirements**

- Items inspected **weekly and after significant storm events**:
  - Active cell cap deterioration, functioning of leachate collection/removal systems, degradation of exposed liners, safety equipment
- Items inspected **quarterly**:
  - Closed cell caps for deterioration and wildlife-related damage; spill response equipment
- Environmental monitoring equipment inspection schedule varies depending upon items inspected

## *General Operating Conditions, Cont'd.*

- **Training Requirements**

- Training employees in proper management of hazardous wastes and emergency response
- On-the-job training and annual refresher

- **Contingency Plan Requirements**

- Plan to address emergency procedures in the event of a fire, explosion or other release of hazardous waste

- **Closure/Postclosure Requirements**

- Plans/schedules for closure/postclosure of landfill cells and final closure activities
- Financial assurance to complete these activities
- Closure cost estimate: \$2,547,500
- Post-closure cost estimate: \$10,179,480

## *General Operating Conditions, Cont'd.*

- **Postclosure Care Requirements**

- For 30 years after final closure
- Environmental monitoring
- Inspections
- Maintenance
- Site security
- Post-closure use of the property
- Part 111 financial assurance for entire landfill and Part 115 Perpetual Care Fund for closed solid waste cells

# *Draft Operating License, Cont'd.*

- **Facility Specific Requirements**

- **Coverage of License:** No expansion beyond facility footprint or design capacity without a construction permit
- **Waste Identification and Quantity:**
  - 3,090,000 cubic yards; wastes specified in Attachment 8
  - Waste prohibitions (ignitables, reactives, liquids, etc.)
- **Design and Run-On, Runoff, and Containment Control:**
  - Cell design, construction, operation, and maintenance
- **Waste Placement:** Location recording; surveying
- **Closure/Postclosure:** Capping requirements
- **Additional Reporting:** Annual inspection/maintenance
- **Corrective Action:** Provisions for future remediation, if necessary

# *Proposed Changes to Site Review Board (SRB) Limitations from Construction Permit*

- **Condition II.T. - SRB Limitation on Waste Acceptance from previous Permit/License**
  - Prohibits Dow from accepting waste at the facility between 3:00 - 5:00 pm; and
  - When hazardous driving conditions exist (i.e., hazard warning issued by Midland Co. Sheriff's Office)
- **Propose to clarify in License that this prohibition only applies to hazardous wastes**
- **Clarification would allow Dow to accept remediation wastes classified as nonhazardous solid wastes during these hours**
  - DEQ has conferred with Midland Public Schools on this clarification and obtained their concurrence

# *Proposed Changes to SRB Limitations from Construction Permit, Cont'd.*

- **Rationale for this clarification**

- When construction permit was issued in 1981, SRB was the final decision-maker on whether to grant or deny construction permits and impose special conditions
- By a 1991 Executive Order, the authority to approve or deny construction permits was transferred from the SRB to Director of the DNR (now DEQ)
- Authority for License issuance is currently delegated to the WHMD Chief
- Wastes are generally only received at the Salzburg Landfill one day a week, except for remediation wastes
- No significant transportation releases have occurred
- No bus stops currently located near the landfill

## *Proposed Changes to SRB Limitations from Construction Permit, Cont'd.*

- **Rationale for this clarification**
  - Four-way stop signs now at the Waldo/Salzburg Rd. and Waldo/Saginaw Rd. intersections and left turn lane from Saginaw Rd. onto Salzburg Rd.
- **Dow has requested the DEQ to consider eliminating the prohibition on acceptance of remediation wastes that are hazardous wastes between the hours of 3:00 - 5:00 pm**
  - DEQ has not included this change in the draft License, but is accepting comment on this
  - Commenters should indicate whether DEQ should make this change or allow it on a case-by-case basis under minor License modifications

## *Proposed Changes to SRB Limitations from Construction Permit, Cont'd.*

- Previous License Condition III.J.1. included SRB limitation requiring Dow to provide alternate water supply in the event of actual or potential contamination from the landfill
  - If determined necessary by the Director of Public Health (now Department of Community Health)
- Condition is not being carried over to the draft License
  - Dow has purchased residential properties near the landfill
  - Condition II.G. requires mitigation actions if any activity at the facility may present an imminent or substantial endangerment to human health or the environment

# *Compliance History*

*Trisha Confer, Hazardous Waste Inspector  
(Environmental Quality Analyst)*

*989-686-8025, ext. 8204*

*Presented by Terry Walkington  
Saginaw Bay District Supervisor*

*989-686-8025, ext. 8200*

**DEQ, Waste and Hazardous Materials Division  
Saginaw Bay District Office, Bay City**

## *Scope of Inspection Responsibilities*

- Responsible for performing the site unannounced inspections
- Inspect the facility to determine compliance with the State operating license and State/federal regulations
- Make a determination regarding compliance with the applicable regulations and operating license conditions

# *Inspection Typical Areas of Review*

## Operating Record Documents, Including:

- Waste approval and acceptance
- Disposal records
- Scheduled internal inspection reports
- Emergency preparedness, contingency plans and incident reports
- Site security
- Personnel training records

# *Inspection Typical Areas of Review*

## Visual Site Inspection, Including:

- General facility conditions
- Overall landfill operation
- Evidence of waste trackout
- Presence of daily cover over waste

*Cells 17-19 Filled Nearly to Grade  
in 1998 and Showing Daily Cover*



# *Findings and Follow-up*

- If no violations are identified:
  - An “In Compliance” letter is issued
- If violations are identified:
  - “Violation Notice” letter is issued
  - w/possible civil action with penalties
  - w/possible criminal action with penalties
- When violations are corrected:
  - A “Return to Compliance” letter is issued

# *Compliance Status Review*

- Inspection Frequency:
  - Facility receives at least two unannounced landfill inspections per fiscal year by WHMD
  - Annual groundwater operation and maintenance inspection
  - Facility may receive additional State and Federal unannounced or announced inspections, plus other program inspections

# *Compliance Status Review*

- Inspection Results:
  - Facility written responses to identified violations have been timely
  - Facility written responses have addressed the identified violations
  - Actions taken by the facility have corrected past identified violations

# *Compliance Status Review*

- Current Compliance Status:
  - The WHMD has determined that the Salzburg Landfill facility is currently in compliance with the applicable regulatory requirements

# *ENVIRONMENTAL MONITORING*

## **Draft Operating License**

**Joe Rogers, Geologist**

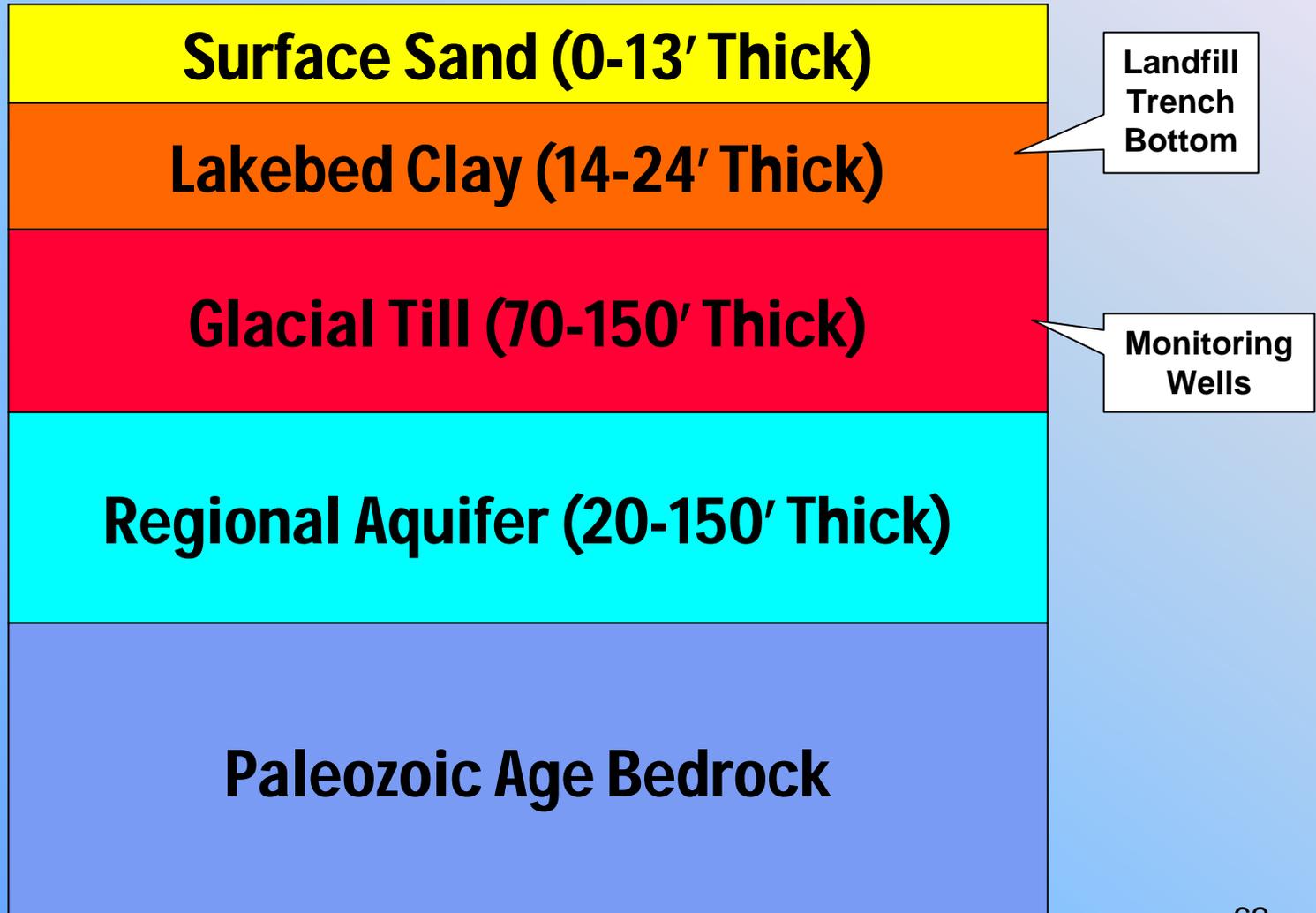
517-373-9897

rogersj5@michigan.gov

# *Presentation Overview*

- Site Geology
- Leachate Monitoring
- Leak Detection System Monitoring
- Groundwater Monitoring
- Surface Water Monitoring
- Soil Monitoring
- Ambient Air Monitoring
- Compliance Summary/History

# *Generalized Stratigraphy*

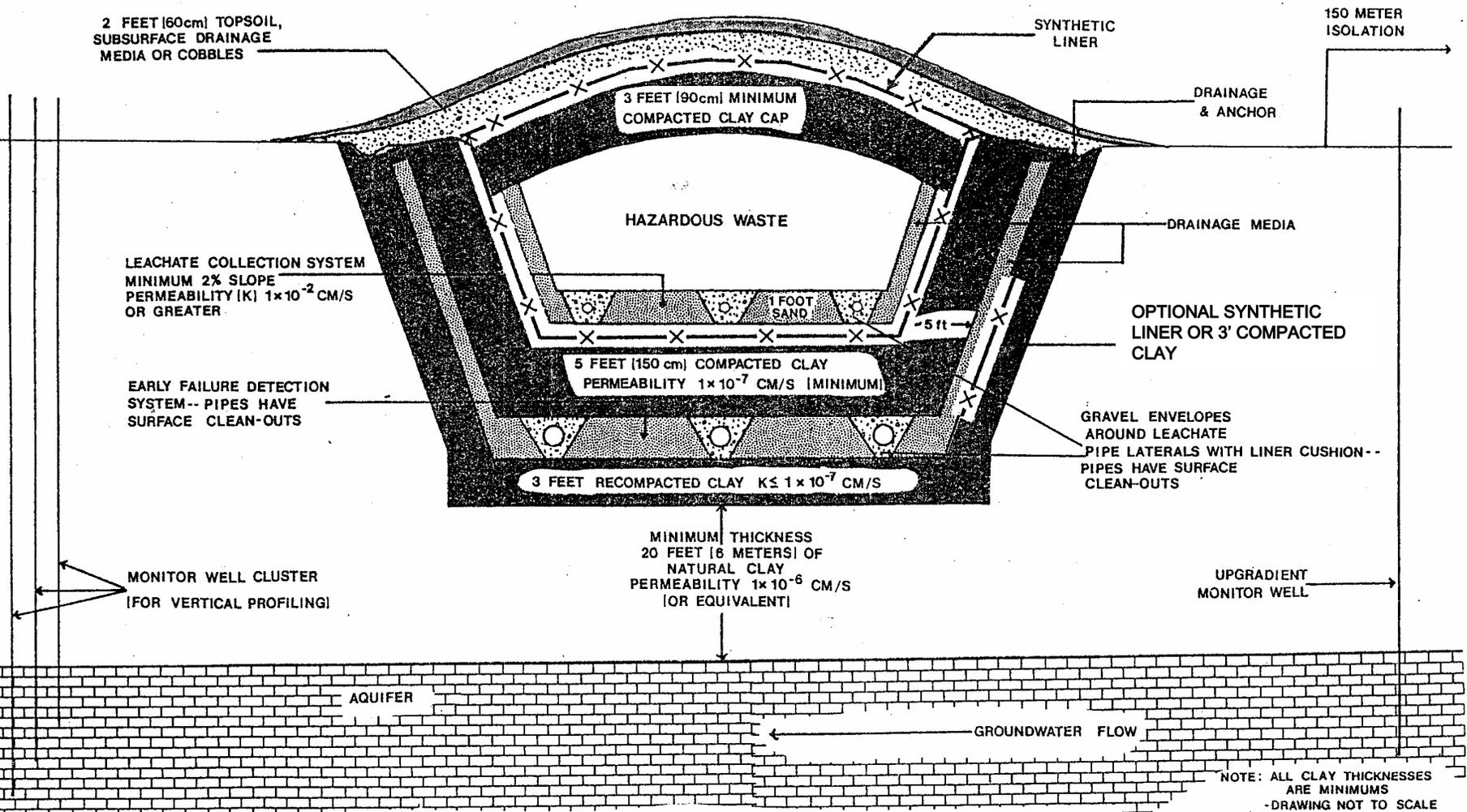


# *Leachate Monitoring*

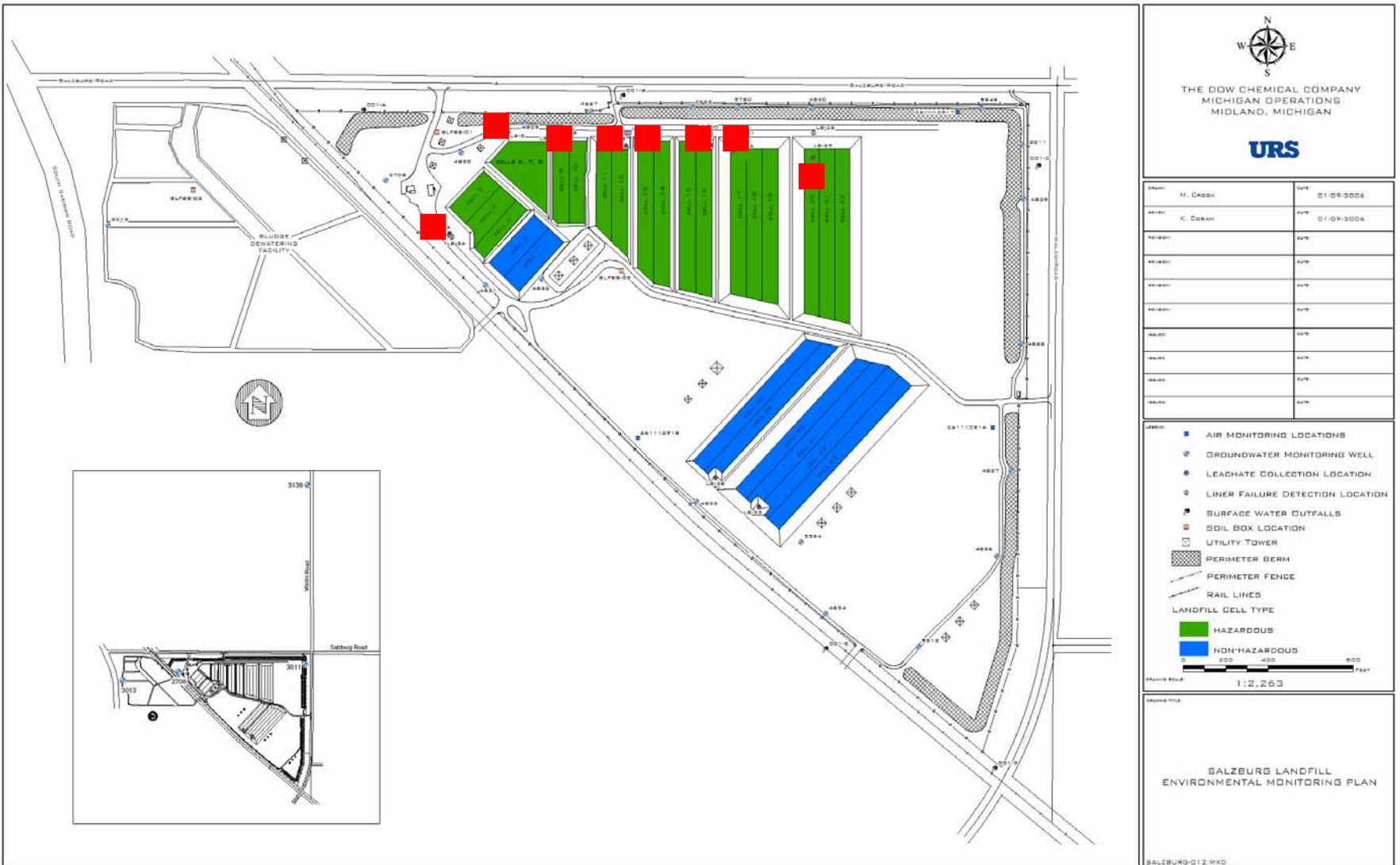
**Design/Purpose:** Collect and characterize liquid from within the cell and above the primary liner - in contact with hazardous waste (i.e., leachate)

- Monitoring program at eight locations
- Each location - lift station for combined set of cells
- All cells closed except Cells 20-22 which are currently active

# Leachate Monitoring



# Leachate Monitoring Locations



# *Leachate Sump - Cells 20-22*



# *Leachate Monitoring (Cont'd.)*

## *Sampling Parameters*

- **Appendix IX List Parameters**
  - VOCs
  - SVOCs
  - Pesticides, herbicides and PCBs
  - Dioxins and furans
  - Comprehensive list of dissolved metals
  - Comprehensive list of anions
  - **Frequency of Sampling:**
    - Active cells - annually
    - Closed cells - every five years
- **Volume of Liquid Removed**
  - Active cells - monthly
  - Closed cells - quarterly

# *Leachate Monitoring (Cont'd.) Data Evaluation and Reporting*

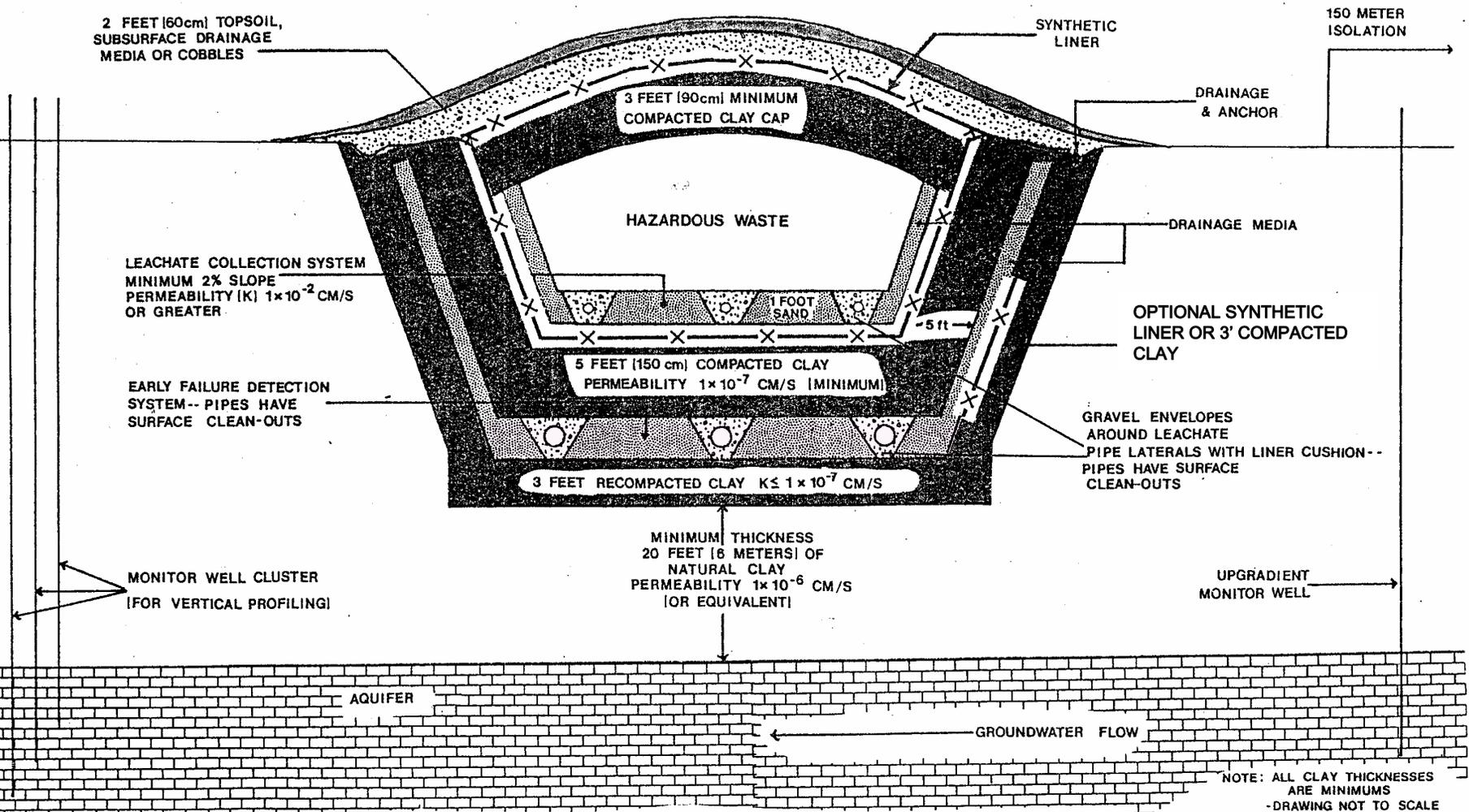
- Results used to update groundwater, surface water and leak detection monitoring parameter lists
- Reporting required within 60 days of end of quarter in which samples were collected
- More detailed Annual Report required

# *Leak Detection Monitoring*

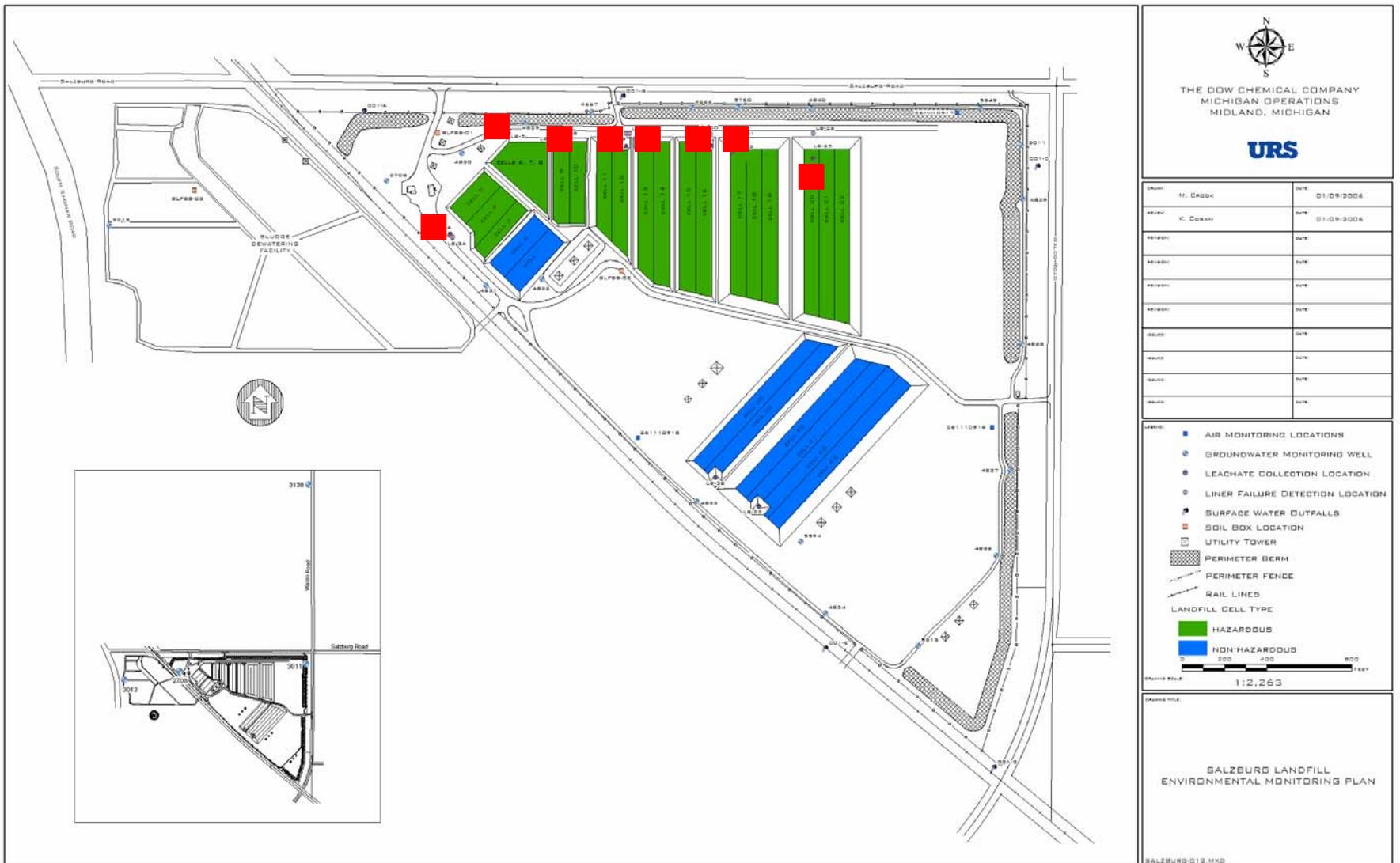
**Design/Purpose:** Collect liquid from under the primary liner and above the secondary liner – early warning leak-detection system

- Monitoring program at eight locations
- Each location - lift station for combined set of cells
- All cells closed except Cells 20-22 which are currently active
- Quarterly monitoring frequency (i.e., every three months)

# Leak Detection Monitoring



# Leak Detection Monitoring Locations



# *Leak Detection Monitoring (Cont'd.)*

## *Sampling Parameters*

- **Primary Parameters - Quarterly Monitoring**
  - VOCs
  - SVOCs
  - TOC
  - Selected dissolved metals
  - Cyanide
- **Tracking Parameters - Quarterly Monitoring**
  - Field parameters (pH, specific conductivity, temperature)
- **Volume of Liquid Removed - Monthly Monitoring**

# *Leak Detection Monitoring (Cont'd.)*

## *Data Evaluation and Reporting*

- **Primary Parameters**

- VOCs and SVOCs (non-naturally occurring) - if detected, then a significant exceedance has occurred
- Metals and anions (may be naturally occurring); concentration compared to background data at each individual monitoring location - if above the statistical limit, then a statistically significant exceedance has occurred

- **Liquid Removal Volumes**

- Develop program to determine background volumes of liquid removed for each cell; additional chemical monitoring required if volume of liquid removed is greater than background

# *Leak Detection Monitoring (Cont'd.)*

## *Data Evaluation and Reporting*

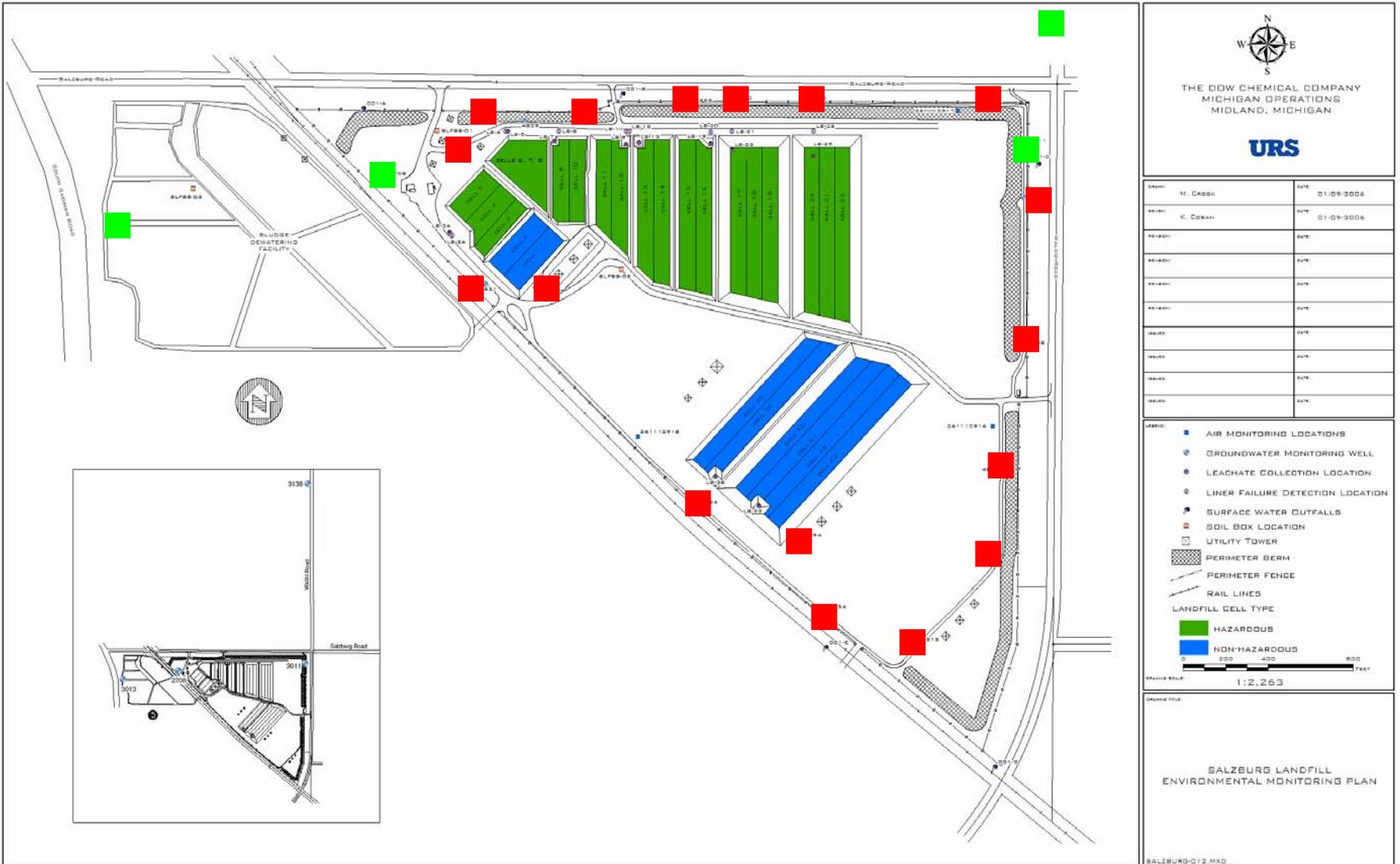
- If an exceedance is detected, then re-sampling for confirmation of the exceedance is required
  - If exceedance not confirmed - regular detection monitoring program continued
  - If exceedance confirmed - investigation/corrective action required
- Reporting required within 60 days of end of quarter in which samples were collected
- More detailed Annual Report required

# *Groundwater Monitoring*

**Design/Purpose:** Collect samples of groundwater from area surrounding the landfill to detect a potential release of contaminants to groundwater

- Detection Monitoring Program at 21 locations
  - 17 glacial till monitoring wells (defined as uppermost aquifer)
  - 4 regional aquifer monitoring wells
- Semi-annual monitoring frequency (i.e., every six months)

# Monitoring Well Locations



# *Typical Monitoring Well*



# *Groundwater Monitoring (Cont'd.)*

## *Sampling Parameters*

- **Primary Parameters**

- Volatile organic compounds (VOCs)
- Semi-volatile organic compounds (SVOCs)
- Total organic carbon (TOC)
- Selected dissolved metals
- Cyanide

- **Tracking Parameters**

- Selected dissolved metals
- Selected general chemistry anions
- Field parameters (pH, specific conductivity, temperature)

# *Groundwater Monitoring (Cont'd.)*

## *Data Evaluation and Reporting*

- **Primary Parameters**

- VOCs and SVOCs - if detected, then a significant exceedance has occurred
- Metals and anions - concentration compared to background at each individual monitoring well using a statistical test, if above the statistical limit, then a statistically significant exceedance has occurred

- **Tracking Parameters**

- Annual graphical and trend analysis

# *Groundwater Monitoring (Cont'd.)*

## *Data Evaluation and Reporting*

- If an exceedance is detected, then re-sampling for confirmation of the exceedance is required
  - If exceedance not confirmed - regular detection monitoring program continued
  - If exceedance confirmed - investigation/corrective action required
- Reporting required within 60 days of end of quarter in which samples were collected
- More detailed Annual Report required

# *Surface Water Monitoring*

**Design/Purpose:** Collect samples of stormwater from ditches adjacent to the landfill to detect potentially contaminated stormwater runoff

- Monitoring program involves duplicate samples collected at three locations
- Samples collected within 24 hours of a rain event of at least ½ inch
- Quarterly monitoring frequency (i.e., every three months)

# Surface Water Monitoring Locations



# *Surface Water Monitoring (Cont'd.)*

## *Sampling Parameters*

- TOC
- Selected total metals
- Cyanide
- Field parameters (pH, specific conductivity, temperature)

# *Surface Water Monitoring (Cont'd.)*

## *Data Evaluation and Reporting*

- Results compared to baseline data at each outfall and reviewed for increasing trends or significant changes
- An increasing trend is defined as five consecutively increasing concentrations of a parameter resulting in a net change of two standard deviations
- A significant change is defined as an increase of an order of magnitude in parameter

# *Surface Water Monitoring (Cont'd.)*

## *Data Evaluation and Reporting*

- If an increasing trend or significant change is detected at a given outfall, then duplicate sample is analyzed for confirmation
  - If exceedance not confirmed - regular monitoring program continued
  - If exceedance confirmed - investigation/corrective action required
- Reporting required within 60 days of end of quarter in which samples were collected
- More detailed Annual Report required

# *Soil Monitoring*

**Design/Purpose:** Collect samples of soil from soil boxes located in the immediate vicinity of the landfill to detect a potential release to surface soils

- Monitoring program at three locations
- Soil boxes are specially designed 10 foot square boxes constructed at dedicated locations and filled with clean soil
- Annual monitoring frequency

# Soil Monitoring Locations



# *Soil Box*



# *Soil Monitoring (Cont'd.)*

- **Sampling Parameters**

- Dioxins and furans

- **Data Evaluation and Reporting**

- Facility required to propose a process for determining whether a statistically significant increase has occurred in comparison to background levels within 60 days of license issuance

# *Ambient Air Monitoring*

**Design/Purpose:** Collect ambient air samples at monitoring stations at the perimeter of the landfill to detect a potential release to ambient air

- Monitoring program at three locations
- Program overseen by Air Quality Division
- Monitoring frequency - 24-hour sample collected every six days

# Ambient Air Monitoring Locations



# *Ambient Air Monitoring Station*



# *Ambient Air Monitoring (Cont'd.)*

- **Sampling Parameters**

- Total suspended particulate

- **Data Evaluation and Reporting**

- Data compared to National Ambient Air Quality Standards (NAAQS)
- Quarterly reporting required within 60 days of end of quarter in which samples were collected
- Notification of exceedances over NAAQS will be reported in quarterly report - notification will also include the results of the investigation and any corrective action(s) proposed

# *Compliance Summary/History of Monitoring Programs*

- No known releases from the landfill to early detection system, groundwater, surface water or soil
- Only on-going issue: groundwater along road on west side of landfill appears to be impacted by salt/brine applied to road for de-icing and dust management purposes
- Additional evaluation and tracking of this issue required as part of the facility's Annual Groundwater Report

*Public Comments*

*Steve Buda*

# *Procedure*

- Please fill out attendance card:
  - Check box to speak
  - Name will be put on Dow Mailing List
- Elected officials invited to speak first
- Public will speak in order of registration
- Please use the microphone
- State and spell your name
- Public comments are being recorded but no transcript is being made

## *Procedure, Cont'd.*

- Please limit questions and remarks for the public record to 5 minutes
- Tonight's hearing ends at 10:00 p.m.
- Formal public comments
  - May be given orally during the public hearing tonight
  - May be submitted in writing
- At a later date, a written DEQ response will be provided
  - To significant recorded public comments at public hearing tonight
  - To significant written public comments
- We are available after close of tonight's public hearing to answer questions

## *Public Comments*

- Public comment period ends 12/19/08
- Send written comments to:

Cheryl Howe  
Department of Environmental Quality  
Waste and Hazardous Materials Division  
P.O. Box 30241  
Lansing, MI 48909

- E-mail: [howec@michigan.gov](mailto:howec@michigan.gov)

## *Public Review Locations*

- DEQ, Saginaw Bay District Office  
(Trisha Confer, 989-686-8025, ext. 8204)
- Grace A. Dow Memorial Library  
(Reference Desk, 989-837-3449)
- DEQ, Lansing Office  
(Cheryl Howe, 517-373-9881)
- DEQ Internet Site

## *Conclusion:*

- DEQ is proposing to issue the License and will take into account public comments, as appropriate