



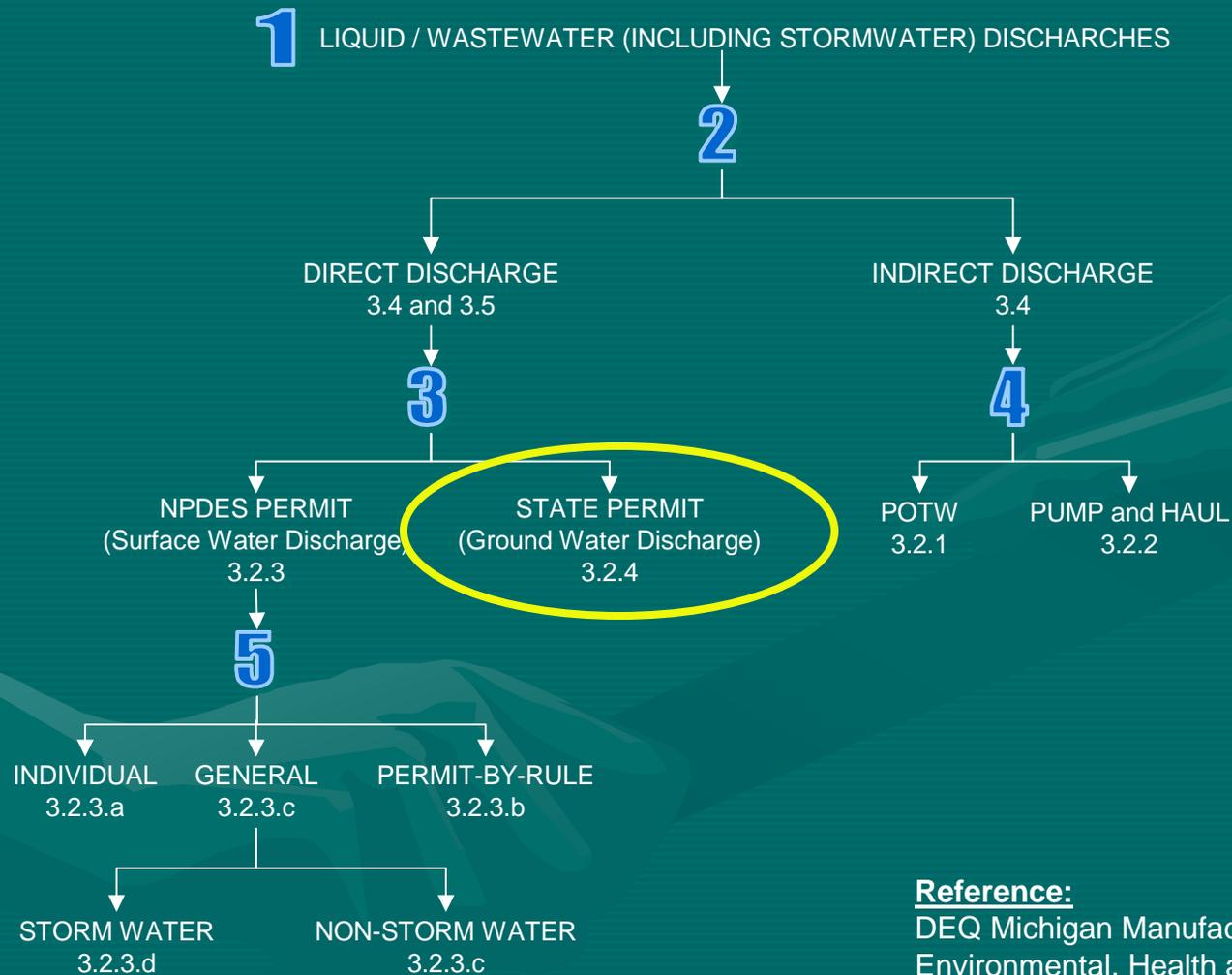
Groundwater Discharge Compliance Inspections



Presented by
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DEQ - Water Bureau
Lansing District Office

Regulatory Programs

Wastewater Destinations (3.1)



Reference:

DEQ Michigan Manufacturer's Guidebook to Environmental, Health and Safety Regulations
Chapter 3: Wastewater, Section 3.2.4
Groundwater Discharge

Regulatory Authority

- State of Michigan Program
 - Self Monitoring Program, DEQ Verifies Compliance
- Groundwater Discharge Permits Issued Pursuant to Part 31 (“Water Resources Protection”) of the Natural Resources and Environmental Protection Act (NREPA), Public Act 451 of 1994, As Amended (Act 451)
- Rules Promulgated As Part 22 (“Groundwater Quality”)
- Part 201 (“Environmental Remediation”)



Permitting vs. Compliance

Division of Responsibilities

Permits Unit Role

- Administrative processing
- Basis of Design (general)
- Technical review
 - Hydro-geological
 - ✓ Hydro-geological Studies
 - ✓ Sampling and Analysis Plans (SAP)
 - ✓ Monitoring Well Networks
 - Soils
 - ✓ Slow Rate and Rapid Infiltration Discharge Beds
 - ✓ Permeability Test Review
 - ✓ Discharge Management Plan (DMP) Review
 - ✓ Phosphorus Adsorption Analysis
 - ✓ Sodium Adsorption Analysis
- Permit generation and issuance

District Office Role

- Compliance
 - Permit Conditions
 - Overall Facility Operations
 - Compliance Monitoring Reports
 - Groundwater Concentrations
 - Schedules of Compliance
 - Administrative Consent Orders
 - Compliance and Enforcement Action
- Part 41 Construction Permitting and Review
- Basis of Design (technical review)
- Facility Classification
- Provide Application Comments and Schedule of Compliance (SOC) Recommendations

Groundwater Discharge Authorization (Permit) Application

- For Most Dischargers, Generally Only a Minimal Number of Pages is Applicable
- Pages 1-13 Contains **Guidance** on Completing the Forms of the Application
- Pages 14-17 Must Be Filled Out by Everyone (general information)
- Index on page 18 Which Directs the Applicant to the Appropriate **Additional Pages** That Must be Included in the Application
- Larger Discharges May Require:
 - Hydro-geological Studies
 - Soils Data
 - Toxicological Data
- Application and Guidance Documents are Located on the DEQ Website or You Can Contact Permits Unit Staff at (517) 373-8148

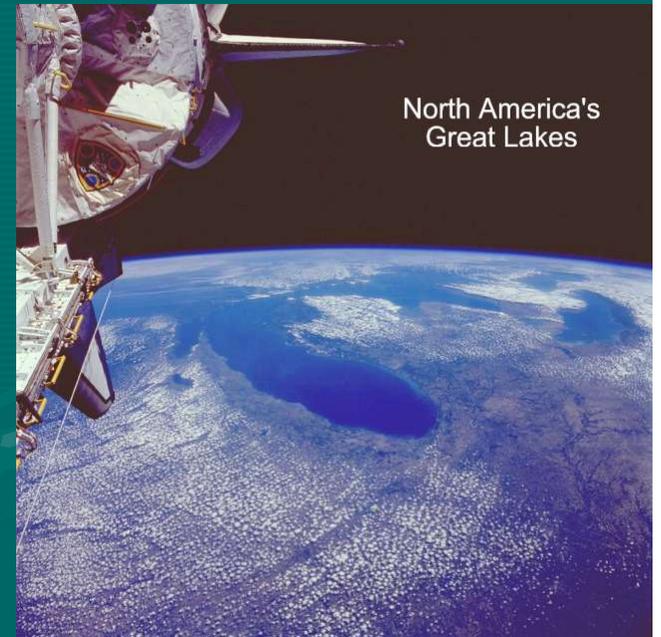
STATE OF MICHIGAN
**GROUNDWATER DISCHARGE AUTHORIZATION
APPLICATION**
for
the disposal of wastewater
to the ground or groundwater


Permits Section
Groundwater Discharge Unit
Water Bureau
Michigan Department of Environmental Quality

Jennifer M. Granholm, Governor
Steven E. Chester, Director

Why is Permit Compliance Important?

- DEQ Records Estimate 40 Billion Gallons of Wastewater is Discharged into the Groundwater on an Annual Basis
- ~1.1 Million Household Wells and Public Water Supplies (~ 4 million people) Rely on Groundwater for Drinking Water
- 11,000+ Inland Lakes Receive a Percentage of Water from Recharge by Groundwater



Discharge General Requirements

- Cannot Be Injurious or Cause Nuisance Conditions
- Maintain Adequate Isolation Distance
- Be Protective of Groundwater Quality
- Cannot Create Site of Environmental Contamination (i.e. Rule 2204 of Part 22 and Part 201)
- Groundwater Discharges in Close Proximity to Available Sanitary Sewer Service is Not Recommended



Groundwater Discharge Compliance Inspection

All Permittees Are Subject To A Compliance
Inspection

Types of Inspections:

Reconnaissance – Surveillance of Discharge

Time: Typically 1-2 Hours



Compliance Evaluation Inspection - High Level
Inspection

Time: Typically 4-8 Hours

We Follow the Water Flow:

Water into the facility  where it leaves the
facility and  every point in between.

Compliance Inspection Objectives

- Overall Condition of the Facility
- Evaluate Operation and Maintenance Activities
- Completeness and Accuracy of Compliance Records
- Is the System Achieving Required Treatment
- Is Permittee Compliant
- If Non-compliant, How Can We Assist in Returning to Compliance



How Do You (Permitee) Prepare For An Inspection?

Common Compliance Inspection Elements:

- Permit Review
- Compliance Monitoring Reports
- Records Retention and Reporting
- Operator Certification
- Physical Plant Inspection
- Facility Operations and Maintenance
- Operation and Maintenance Manual
- Site Security and Signage
- Sampling Policies and Procedures
- Effluent Discharge
- Biosolids/Residual Solids Management



Permit Review



- Copy of the Permit or Administrative Consent Order (ACO)
- Is the Permit Current
- If the Permit Is Expired, Was Re-application Made
- Does the Information in the Permit, Adequately Reflect Current Operations (e.g. Flows, Discharge Location, Monitoring Points, etc.)
- Meeting Permit Required Schedules of Compliance (SOC)

Compliance Monitoring Reports (CMRs)

- If CMRs are required for the Facility, Have They Been Submitted in Accordance With Permit Requirements
- Are the CMRs Complete
 - Flow, Sampling Parameters, Sampling
 - Location (s), and Signed by Certified Operator
 - Timely Submittals
 - Permit Exceedances
 - Report Exceedances and Follow Rule 2227 of Part 22
 - ✓ Evaluate the nature of the exceedances
- Records Retention (minimum of 3 years)



Operator Certification

- Verify Facility Classification
 - District Staff to Classify Facility Operations/Certification Required
- Does the Operator Have a Current Certification Covering All Aspects of the Facility Operations
- Has the Wastewater System Operators Received Critical Training in Addition to Required CECs
- Is There a Copy of the Certification On-site
 - Does the DEQ Have a Copy on File



Facility Operation and Maintenance Review

- Influent Characteristics
- Unit Operations and Process Control
- Water Treatment Additives (WTAs)
 - Use Requires Prior Approval From DEQ Water Toxics Unit
- Equipment Condition and Maintenance
- Operation Staff
- Safety Controls
- Effluent Characteristics
- Disposal Area
- Monitoring Wells



Facility Operation and Maintenance Review

- Review of Collection System
 - Service Area Map(s)
 - Who Maintains the System
 - Inspect Pump Stations
 - ✓ System Operation
 - ✓ Alarm System
 - ✓ Back-up Power
 - ✓ Integrity

Dedicated Back-up Power



Alarms and Back-up Power Port



Pump Station

Improper System Operations



**Low Water and
Excessive Duckweed**



**Improperly Located and Secured
Electrical Disconnect Box**



Excessive Algae Growth

Proper System Operations

**Chemical Feed
Secondary Containment**



Color, Foam, Odors



Floats and Slide Rails



D.O. Fixed Meter and Probe



Operation & Maintenance Manual

- Is the O&M Manual Current and Does it Adequately Reflect Facility Operations
 - Suggested Minimum Content:
 - Background Information (History and Service Area Map)
 - Maps (Site, Flow Pattern, Collection System, etc.)
 - Basis of Design
 - Copy of Permit and Operator Certification
 - Start-Up and Shut-Down Procedures
 - Maintenance Schedule and Procedures
 - Emergency Procedures and Contacts, Including Back-up Power
 - Field Data Collection Forms
 - Monitoring Program
 - Sampling and Laboratory Procedures
 - Biosolids/Residual Solids Management
 - Staff and Mock Exercise Training
- Refer to DEQ Part 22 Guide Sheet VI “Operations and Maintenance Manual”, Accessible on the DEQ Website



Site Security and Signage

Appropriate Site Security and Signage:

- Facility
- Pump Stations
- Disposal Area



Monitoring Well



11/14/2005

Pump Station



03/08/2006

Secured Entrance



05/09/2006

Site Security and Signage

Improper Signage and Security



Improper Security (fencing)



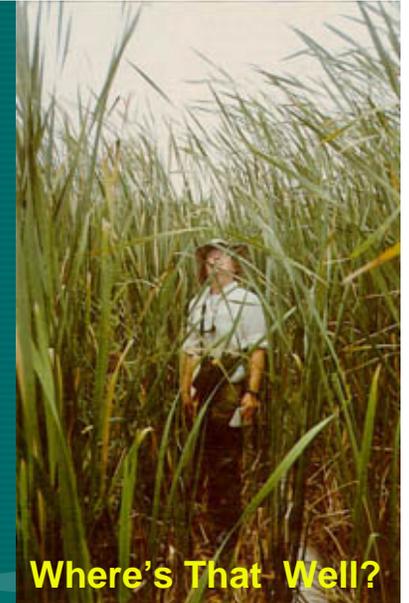
Proper Warning Labels - Chemical Feed Storage



Proper Warning Label - Confined Space Entry

Sampling Policies and Procedures

- Formal Policies and/or Written Procedures
 - Documented in O&M Manual
 - Approved Sampling and Analysis Plan (SAP) on file with DEQ
- Sample Location(s) Conducted in Accordance With Permit
 - Influent, Effluent and Monitoring Wells
 - Flow Measurement Method and Calibration Records
- How Are Staff Trained to Collect Samples
- Sample Collection Containers
 - Laboratory Supplied or Sanitized On-site
- Is the Appropriate PPE Utilized





Sampling Policies and Procedures

- Influent and/or Effluent Sampling
 - Representative Sample Location
 - Composite or Grab Samples
 - Adhere to Approved Sampling Procedures



- Groundwater Sampling
 - Monitoring Well Location(s) and Integrity
 - Depth to Water Measurements, Well Purging and Sample Collection
 - Are Monitoring Wells and Staff Gauges Surveyed
 - Verify Groundwater Flow Direction for Proper Placement of MWs
 - Any Potential Part 201 Compliance Issues

Bench Testing and Analytical Protocol



Clean and Organized
Laboratory Area



Jar Testing

Sampling and Flow Measurement



05/16/2006

Depth to Water Measurements



04/17/2006

Secured Monitoring Well



10/12/2005

Flow Meter



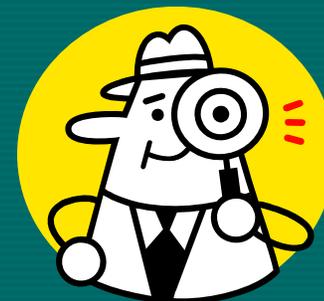
03/08/2006

Staff Gauge

Disposal Area Review

- Discharge Management Plan (DMP)

- Copy Retained On-site
- Is the DMP Being Followed
- Overall Condition of Disposal Area
- No Ponding or Runoff
- System Components Operating Correctly
- Entire Disposal Area Being Utilized
- General Maintenance
- Nuisance Concerns (odors or overspray)



- Biosolids/Residual Solids Management

- Approved Pursuant to Part 24 for Land Application
- Proper Notification to DEQ Biosolids Staff
- Quantity, Location, Frequency of Applications
- Isolation Distance to Nearest Sensitive Receptors

Disposal Area Review

Spray Irrigation



Properly Maintained Rapid Infiltration Sand Beds



Improperly Maintained Sand Bed



Biosolids/Residual Solids Management

Lagoon Cleaning



Loading Biosolids to Tanker



Transferring to Sub-Surface Injector



Sub-Surface Injection

So How Can You Stay in Compliance With Your Permit?

- Read and Understand Your Permit
- Educate Your Employees So They Don't Unknowingly Create a Problem or Violation
- If You Aren't Sure If We Need To Be Called For a Problem, Call Anyway
- Get To Know Your Compliance Person So You Can Work Together When Problems Arise

We Both Share the Same Goal - Maintaining Compliance and Protection of Public Health and the Environment



What Happens Next?

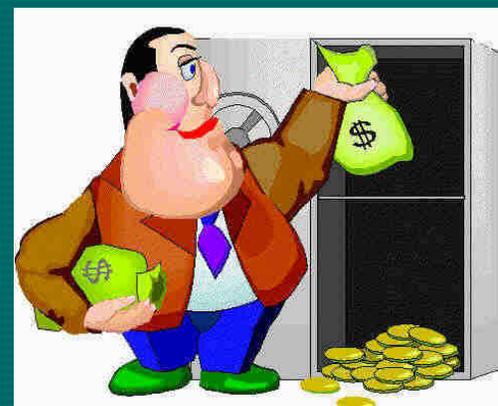
At the Closing Conference, Discussion Elements May Include:

- Areas in Compliance
- Areas That Need Improvement
- Areas/Items of Noncompliance Identified
- Additional Information We May Need
- Information We Will Be Providing to the Facility
- What Our Next Steps Are
(e-mail, letter, another inspection)



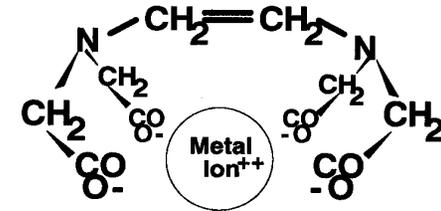
Common Non-compliance Issues

- Unauthorized Discharges
 - Has the Facility Failed to Report Their Noncompliance
- Unreported Permit Noncompliance
- The Facility Does Not Have a Properly Certified Operator
- The Facility Failed to Send us Something That Was Required or it Was Not Sent Timely
- The Facility is Not Collecting and/or Maintaining All the Required Data
- Asset Management
 - Growth, Infrastructure Upgrades and O&M, Customer Rates, Future Upgrades Based on Rules and Standards Changes



EDTA

- Ethylene diamine tetra acetic acid
- Problematic last 3-5 years
- Extensively used (over 100,000 metric tons produced annually)
 - Boiler Additive
 - Cleaners / Detergents
 - Preservative in Packaged Food Items
 - Dairy and Beverage Industry
 - Cosmetics Additive
 - Medical and Dental



Ethylenediaminetetraacetic acid (EDTA) chelates a metal ion



EDTA

- Complex Interaction of pH, BOD and EDTA
- Very Persistent
- Chelates Metals (mobilizes them) Which Are Normally Bound to Soil and Leaches into Groundwater
 - “Aesthetic” Metals Such as Fe and Mn
 - Toxic Metals Including Co, Pb, Ni, Cr



- Observed at Several Food Processor Sites
- Problematic in High BOD Situations
- Not Degraded or Removed During Conventional Wastewater Treatment. Adjustment of pH and Sludge Residence Time May Result in Improved Mineralization of EDTA.
- Science Has Yet to Determine How Much EDTA May Be Land Applied Without Causing Metals to Leach

Environmental Science and Services Division Operator Training and Certification Unit

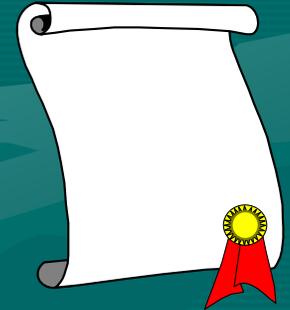
TRAINING WORKSHOPS

- Activated Sludge
- Oxidation Ditches
- Sequencing Batch Reactors
- Attached Growth
- Waste Stabilization Lagoons
- Anaerobic Digestion
- Laboratory (I, II, III)
- Phosphorus Removal
- Industrial Wastewater (I & II)
- Biosolids



CERTIFICATION EXAMS

- Industrial/Commercial (Nov.)
- Municipal (May)
 - ✓ Apply at least 45 days prior



TECHNICAL ON-SITE ASSISTANCE

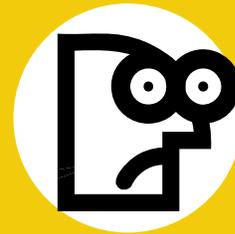
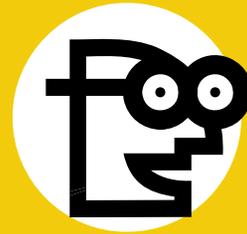
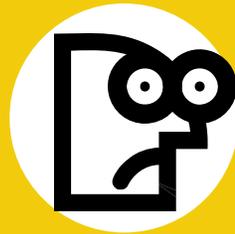


CONTACT:

Phone: 517-241-7199 or

www.michigan.gov/deqoperatortraining

Questions



It's QUESTION TIME !!