Evaporation Pond Design and Lining Requirements
Commercial Exploration and Production Impoundments
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Agenda
- Background on Solid Waste Program
- Background on Section 17
- Some Specifics on Section 17
- Q + A

Solid Waste Program

Solid Waste Sites and Facilities

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Solid Wastes Disposal Sites and Facilities Act, CRS 30-20-100.5, et. seq. (The Solid Waste Act)

Applicable Statutes and Regulations

- Regulations Pertaining to Solid Waste Sites and Facilities, 6 CCR 1007-2 (The Solid Waste Regulations)
  - Section 1 – Administrative Info / Definitions
  - Section 2 – Minimum Standards
  - Section 3 – Landfill Standards
  - Section 9 – Waste Impoundment Standards
  - Section 17 – Commercial E&P Impoundment Standards

Why Section 17?
- Old Section 9 regulated all impoundments.
- Had been on the books since 1984.
- Outdated regulation caused implementation problems.

Process
- House Bill (HB) 08-1414, enacted by the Legislature in 2008, directed the promulgation of regulations specifically applicable to Commercial E&P Impoundments.
- Convened a stakeholder group in July 2008 to develop a new Section 17, with the new Section 17 effective on December 30, 2008.
The New Section 17:
- HB 08-1414 prescribed several provisions that Section 17 must contain to protect the public health and the environment.
- Those provisions included set-backs, fabricated liners, monitoring to prevent migration to ground water, waste analysis and reporting, fencing and netting, contingency plans, and financial assurance.

History and Purpose

Section 17 Specifics:
- Section 17.1 – General Provisions
- Section 17.2 – EDOP
- Section 17.3 – Design, Construction, and Operation Requirements
- Section 17.4 – Record-Keeping and Reporting Requirements
- Section 17.5 – Closure
- Section 17.6 – Post-Closure Care and Maintenance

General Provisions:
Scope and Applicability:
- Section 17 applies to commercial solid waste disposal sites and facilities with waste impoundments that accept E&P wastes for treatment, storage, or disposal.
- Includes discrete impoundment units, containment systems, ancillary equipment, and other associated operations at the facility.
- Sections 1 and 2 of the Solid Waste Regulations are directly applicable to all such facilities unless specifically otherwise noted herein.
- Does not apply to E&P impoundments regulated by COGCC.
Section 17.2 – Engineering Design and Operations Plan (EDOP):

- Prior to commencing impoundment construction, storage, treatment, or disposal operations, Owner/Operator submits an EDOP to the Department and the Local Governing Authority for review and approval.

- The EDOP describes how the site and facility will comply with all applicable requirements in the Solid Waste Regulations.

Section 17.3 – Design, Construction, and Operation:

- A liner system is required by statute for all commercial solid waste disposal sites and facilities managing E&P waste.

Section 17.4 – Record-Keeping and Reporting:

- Records Availability.
- Evaporative Treatment.
- Incoming Waste Shipments.
- Records Retention.
- Annual Report.
- Routine Monitoring.
- Measuring Points.
- Fluid-Level Measuring Points.
- Mass Balance.
- Waste Characterization.
- Contingency.
- Inspections.

Section 17.5 – Closure:

- The Owner/Operator must develop a Closure Plan that meets the minimum criteria of Section 17.5.1 of the Solid Waste Regulations.
Section 17.6 – Post-Closure Care and Maintenance:
- Following closure the Owner/Operator must conduct Post-Closure Care and Maintenance consisting of at least the following:
  - Nuisance condition prevention.
  - Maintaining integrity and effectiveness of final cover (waste closed in place).
  - Monitoring ground water in accordance with Section 2.2 and maintaining the ground water monitoring system, if applicable.

Post-Closure Care and Maintenance

Section 17.6 – Post-Closure Care and Maintenance:
- Contact information during the post-closure period.
- Description of the planned uses of the property during the post-closure period. Post-closure use of the property shall not disturb the function of the monitoring systems unless reviewed and approved by the Department.

Post-Closure Care and Maintenance

Section 17.6 – Post-Closure Care and Maintenance:
- Following completion of the post-closure care period the Owner/Operator must submit a certification signed by an independent professional engineer for approval by the Department and the local governing authority. The certification must verify that post-closure care has been completed in accordance with the post-closure plan and a copy of the certification has been placed in the operating record.

Post-Closure Care and Maintenance

Section 17.6 – Post-Closure Care and Maintenance:
- Post-closure care must be conducted for a minimum of thirty (30) years. The length of the post-closure care period may be:
  - Decreased by the Department after consultation with the local governing authority if the Owner/Operator demonstrates that the reduced period is sufficient to protect human health and the environment; or
  - Increased by the Department after consultation with the local governing authority if it is determined that the lengthened period is necessary to protect human health and the environment.

Post-Closure Care and Maintenance
• The statutory performance requirement for E&P waste disposal facilities is to prevent migration of E&P waste to ground water.

• Therefore, each Section 17 impoundment must be lined with
  ➢ Composite liner – Section 17.3.1 (A) (1), or
  ➢ Double liner system – Section 17.3.1 (A) (3).

• Design must include leak detection monitoring to prevent migration of E&P waste or E&P waste constituents to ground water. The Owner/Operator must demonstrate to the Department and the local governing authority that the design will comply with Section 12 and Sections 2.1.16 and 2.2 of the Solid Waste Regulations and with Regulation 41 (5 CCR 1002-41). Such demonstration is subject to Department approval.

**Section 17.3.1 – Liner Systems**

• The facility must ensure a minimum separation of twenty (20) feet between the bottom of the liner system and the uppermost occurrence of ground water.

• Alternate liner designs that perform in a manner equivalent to the composite or double liner systems might be approved by the Department and the local governing authority based on a demonstration of alternate liner design’s equivalent performance, the waste type, and site specific technical information. At a minimum, the upper liner component shall be a 60-mil HDPE or equivalent synthetic liner. Proposals for alternate designs also must demonstrate that the facility can comply with Sections 2.1.16 and 2.2 of the Solid Waste Regulations and Regulation 41 (5 CCR 1002-41).

**Section 17.3.1 – Liner Systems**

• Access Control – Section 17.3.1 (E): Fencing, netting, or Department-approving effective artificial barriers or natural barriers to prevent the public and wildlife from accessing the waste disposal facility. Facilities must control public access, prevent unauthorized access, and provide for site security during and after business hours, and prevent illegal dumping of wastes.

• Storm Water Control – Section 17.3.1 (F): Each waste impoundment shall be designed, constructed, and maintained to provide
  ➢ Run-on control and diversion structures to prevent flow into the unit from a 25-year, 24-hour storm.
  ➢ Run-off control system to collect run-off from a 25-year, 24-hour storm and control run-off from a 100-year, 24-hour storm.

**Section 17.3.1 – Liner Systems**

• Mandatory Set-Backs – Section 17.3.1 (B) of one-half (1/2) mile from all residences, educational facilities, day-care centers, hospitals, nursing homes, jails, hotels, motels, other occupied structures, or outside activity areas such as parks and playing fields.

• Leak Detection Monitoring System – Section 17.3.1 (C) consistent with the liner design specific to that impoundment.

• Continuous Freeboard Monitoring – Section 17.3.1 (D): At all times quickly and accurately determine the total volume of waste and amount of freeboard in each impoundment.
Precipitation that cannot be diverted from the impoundment, and therefore comes in contact with impounded waste, shall be managed as solid waste. Each impoundment shall be designed, constructed and maintained to prevent damage to the containment structure from erosion.

Embankment Durability – Section 17.3.1 (G): Embankments must be designed to eliminate erosion and to withstand deterioration caused by the impounded waste.

**Section 17.3.1 – Liner Systems**

**Section 17.3.1 (A) (2) – Composite Liner System**

**Section 17.3.1 (A) (2) – Double Liner System**

**Section 17.3.1 (A) (5) – Alternate Liner System**
Waste impoundments must be constructed in accordance with Department-approved documents including design plans, specifications, Quality Assurance/Quality Control (QA/QC) Plans, manufacturer requirements, and all other relevant criteria including local criteria.

Section 17.3.2 – Construction Requirements

Prior to accepting waste, the construction must be certified by an independent professional engineer registered in the State of Colorado, and the Department must review and approve the certification.

Section 17.3.2 – Construction Requirements

Multiple Requirements for a Section 17 Facility
- General Provisions
- EDOP
- Design, Construction, and Operation
- Record-Keeping and Reporting
- Closure
- Post-Closure Care and Maintenance

Three Main Options for Liner Design
- Composite Liner System
- Double Liner System
- Alternate Liner Design

Summary

The Department is available to provide guidance.

Available Resources

Two Free Meetings During the Document Preparation and Review Phase of the Submittal Process.
• Draft EDOP Guidance (as of January 11, 2013)

• Can be found on the Department Web Site: [www.colorado.gov/cdphe/solidwaste](http://www.colorado.gov/cdphe/solidwaste) (a short cut)

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www.colorado.gov/cdphe/solidwaste

(a short cut)

Available Resources

Contact Information

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