Overview of the Third Quarter 2008 Surveillance and Maintenance Report for the LM Rocky Flats Site

U.S. DEPARTMENT OF ENERGY | Office of Legacy Management

Surface Water Monitoring and Operations

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Pond Operations – Third Quarter 2008

- Terminal Pond Discharges:
  - None
- Transfers:
  - None
- Pond Levels:
  - As of September 30, 2008, Ponds A-3, A-4, B-5, and C-2 and the Landfill Pond were holding approximately 14.4 MG (14.4% of capacity).

Recent Pond Levels (January 27, 2009):

- Landfill (22.5%)
- A-3 (11.5%)
- A-4 (8.3%)
- B-5 (22.1%)
- C-2 (16.2%)

Dam Breach Phase 1

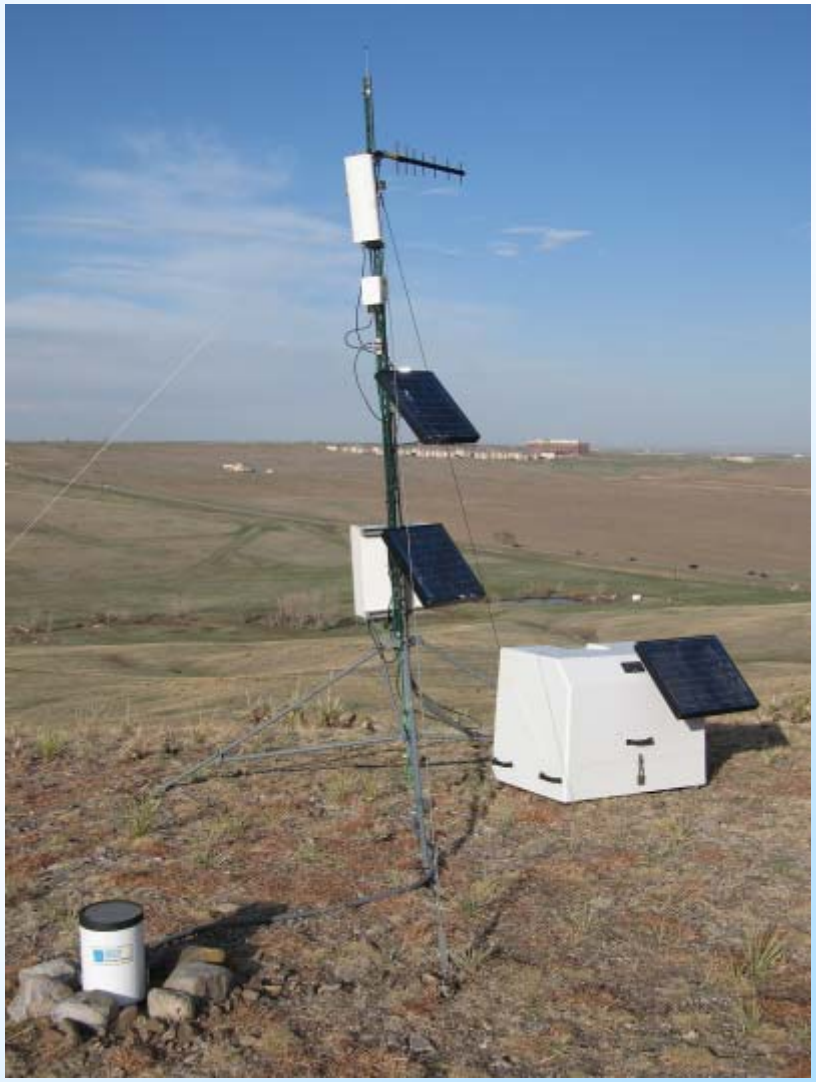
- Dams A-1 and A-2 are nearly complete.
- Dams B-1, B-2, B-3, and B-4 are ongoing.
- All construction and erosion controls are expected to be installed by mid-March 2009.

Dam A-1: October 8, 2008

Dam A-1: January 8, 2009

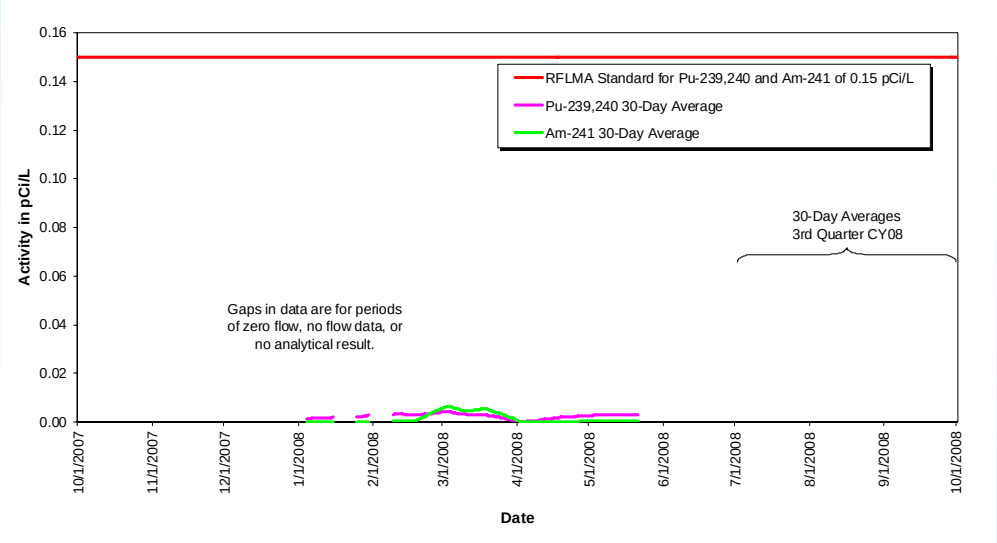
Hydrologic Data – Third Quarter 2008

- Precipitation:
  - 4.3 inches total precipitation
  - 107% of WY 93–07 average
- Flow rates (percentage of average):
  - GS01 (no flow)
  - GS03 (no flow)
  - GS10 (9%)
  - SW027 (no flow)
  - SW093 (15%)

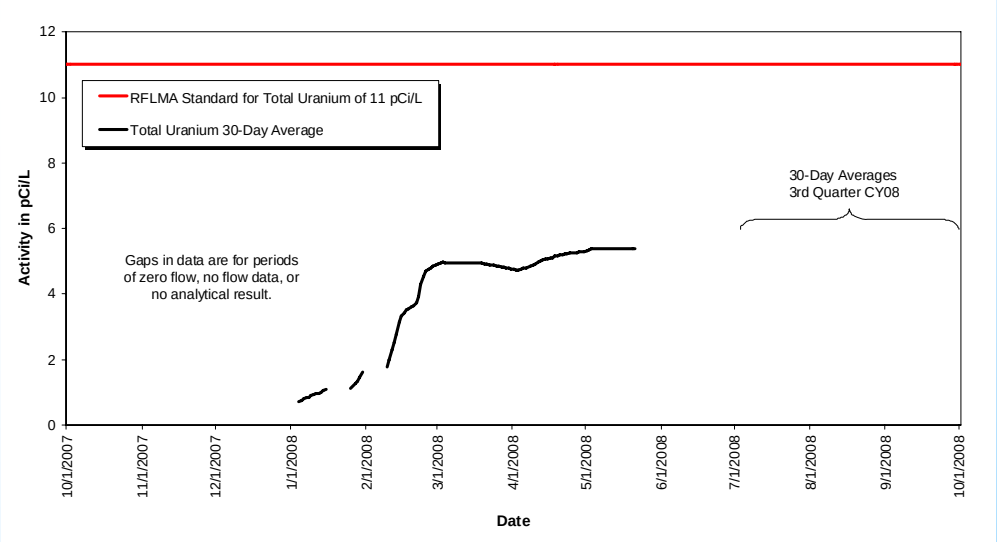


POC GS01

- Plutonium and Americium

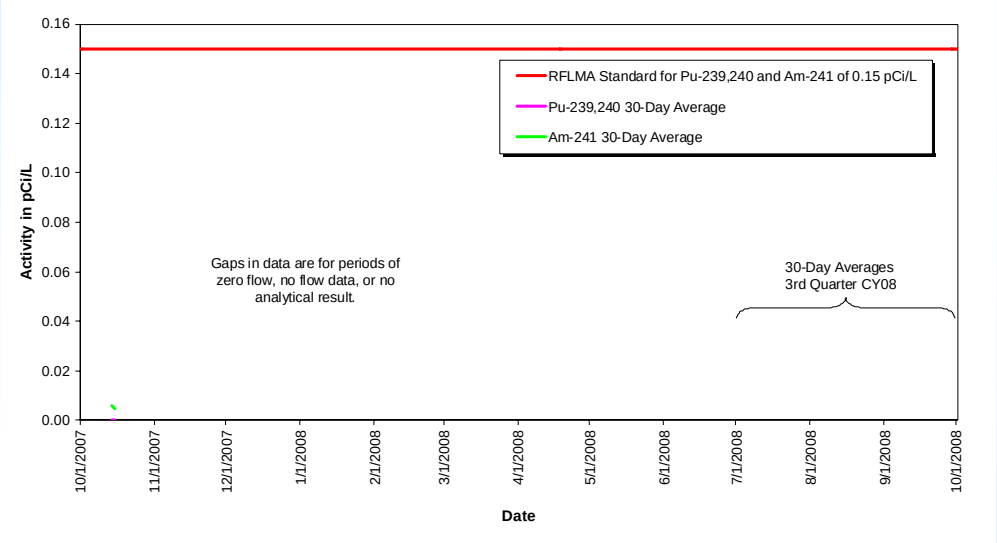


- Total Uranium

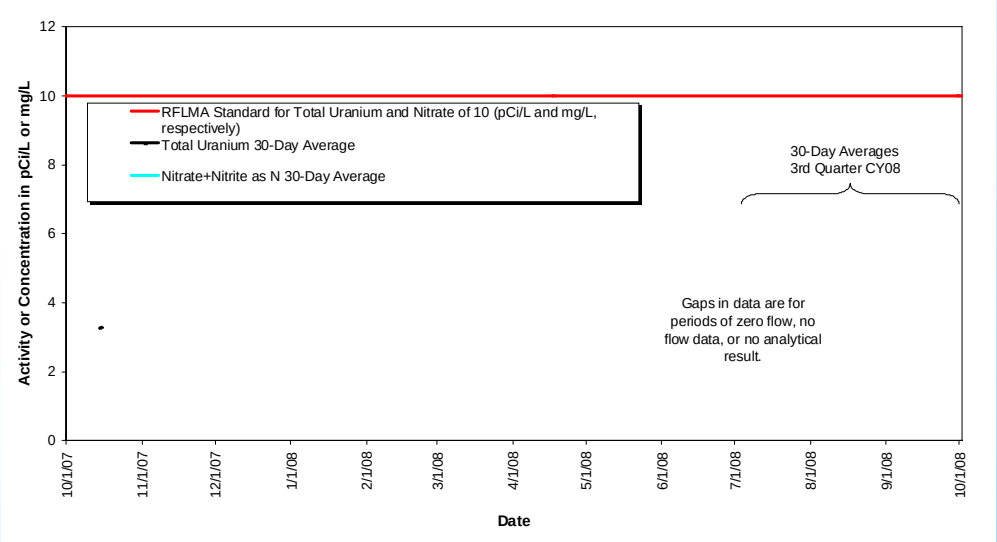


POC GS03

- Plutonium and Americium

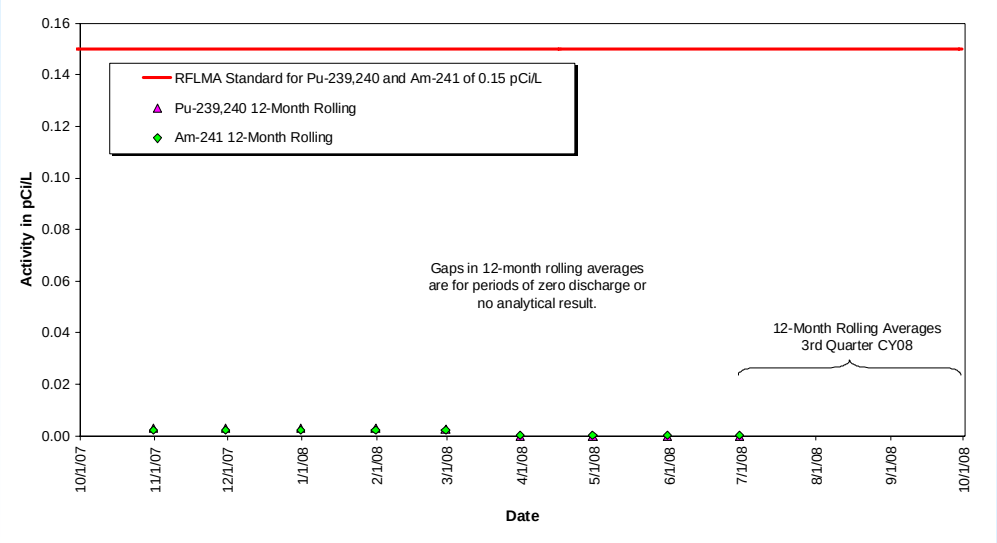


- Total Uranium and Nitrate + Nitrite as Nitrogen

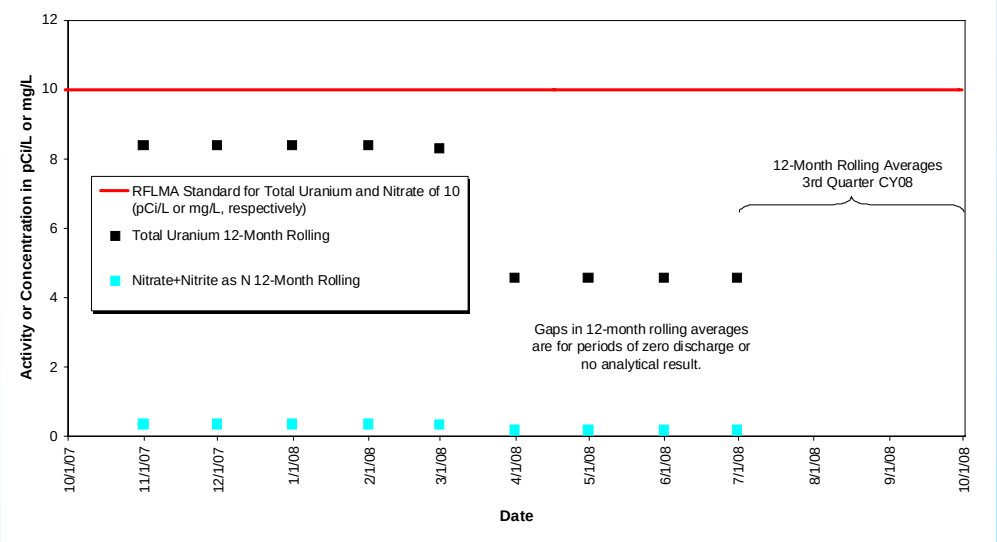


POC GS08

- Plutonium and Americium

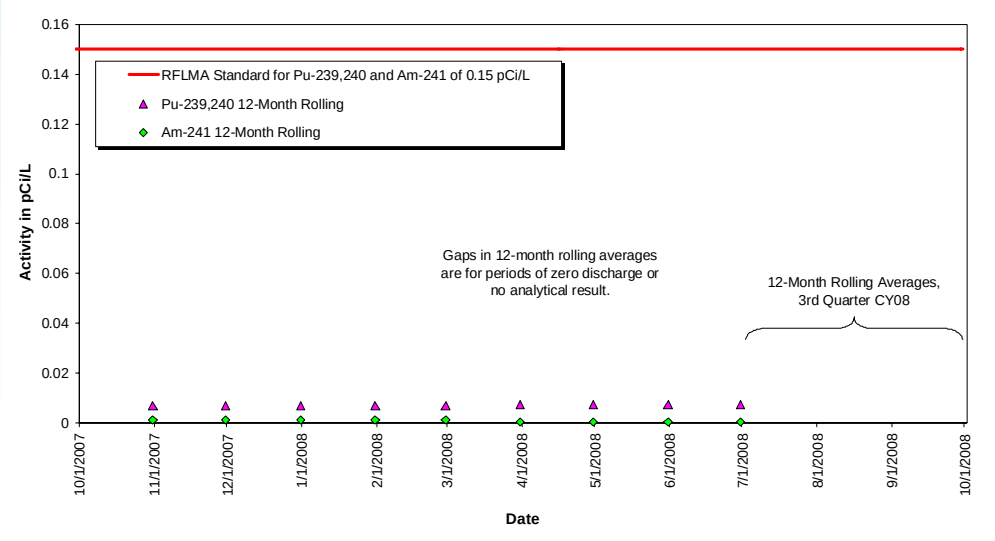


- Total Uranium and Nitrate + Nitrite as Nitrogen

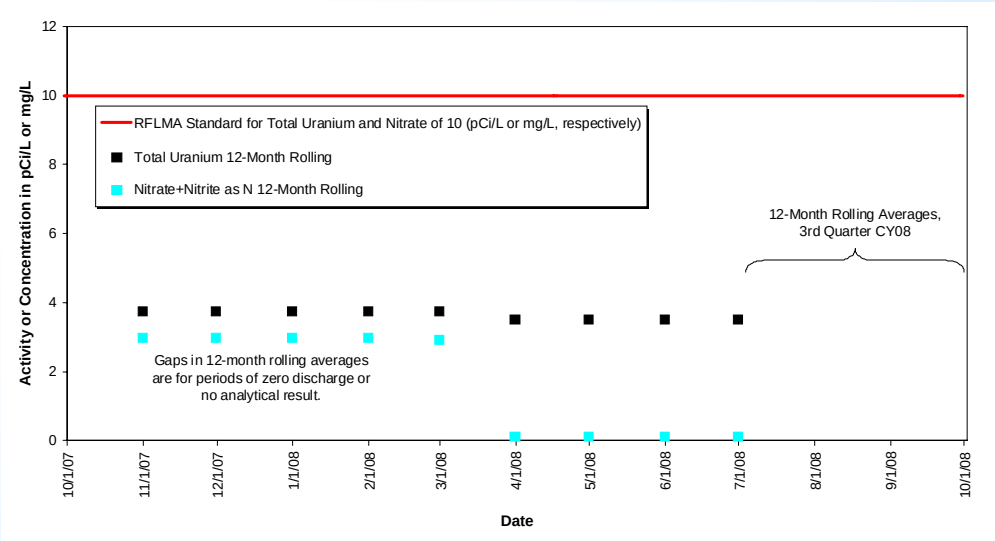


POC GS11

- Plutonium and Americium



- Total Uranium and Nitrate + Nitrite as Nitrogen



POC GS31

- Plutonium and Americium

No pond C-2 discharge during the last 12 months

- Total Uranium

Point of Evaluation Monitoring – Third Quarter 2008

- Water quality at all points of evaluation, except GS10, was below applicable standards.
  - Reportable values for total uranium at GS10 continue to be observed and are probably caused by groundwater contributions of naturally occurring uranium to South Walnut Creek.

Performance Monitoring – Third Quarter 2008 Original and Present Landfills

- Original Landfill: Surface water quality results during the second quarter of 2008 triggered monthly sampling for selenium.
  - Selenium was not detected in the third monthly sample collected during the third quarter of 2008; monthly sampling was discontinued.
- Present Landfill: Surface water quality results triggered monthly sampling for vinyl chloride.
  - Vinyl chloride was not detected in the first monthly sample; monthly sampling was discontinued.

Questions?

Groundwater Monitoring and Operations

Third Quarter 2008

RFLMA Monitoring

- All RCRA wells were monitored.
- Results will be evaluated in the 2008 Annual Report.

SPPTS Update

- SPPTS effluent is now monitored at “SPOUT”.
- The effects of Phase I upgrades on effluent water quality include the following:
  - Flow to the SPPTS has approximately doubled, reducing residence time within the media.
  - Concentrations of nitrate have doubled to tripled (load has increased approximately 4 to 6 times).
  - Concentrations of uranium have increased by approximately 50% (load has increased approximately 2 times).

SPPTS Update (continued)

- Based on original treatment studies and SPPTS performance data, reduced treatment was anticipated.
  - Nitrate levels are now approximately 20 times those of University of Waterloo studies (which removed approximately 60% of nitrate).
  - We target approximately 98% removal.
  - Heavy snowmelt in winter 2006–2007 increased flow, thereby reducing treatment.
  - Current conditions include higher flow and higher concentrations.

SPPTS Update (continued)

- As a result of increased nitrate and uranium load and shortened treatment time:
  - Treatment effectiveness is reduced.
  - Effluent concentrations are above target levels.
- System effluent and discharge gallery water quality are essentially the same (effluent is no longer re-contaminated before discharge).
- DOE has consulted with the regulators.
- The phased path forward continues to be followed.
- The rejuvenation of existing media is being evaluated.

SPPTS Update (continued)

- The SPPTS phased path forward consists of four phases:
  - Phase I: Collect additional contaminated groundwater, and route it through treatment cells.
    - Status: Completed.
  - Phase II: Install new uranium treatment cell as first treatment step (so future downstream nitrate treatment media will not be “rad waste”).
    - Status: Construction to begin in mid-February and be completed by March 31, 2009.

SPPTS Update (continued)

- Phase III: Define and perform a pilot-scale study to identify preferred nitrate treatment media.
  - Current sawdust/ZVI media would require a treatment cell of at least 5 times the current quantity to achieve adequate treatment.
  - The study will evaluate two pilot-scale cells: inert (plastic) media with brewery byproduct as carbon source, and walnut shells infused with vegetable oil.
  - Status: Construction to begin in March and be completed in late April.
- Phase IV: Combine findings from Phase III (media) and flows measured since the completion of Phase I to design and construct a full-scale nitrate treatment cell.

Questions?

Update on WQCC Rulemaking

- Petition to adopt the statewide basic uranium standard (MCL 30 μg/L approximately 20 pCi/L). Hearing: January 12, 2009
  - WQCC recognized that changed conditions warranted revision.
  - WQCD said that a mistake was made in promulgating uranium's statewide standard in 2005:
    - The range should be from 16.8 to 30 μg/L ("hyphenated standard").
    - Many analytes have the hyphenated standard.
    - The statewide uranium standard will be clarified.
  - The higher number applies as the end-of-pipe limit for discharge permits.

Update on WQCC Rulemaking (continued)

- The lower number is a health-based goal value derived using WQCC methodology per Policy 96-2.
  - 10-6 incremental lifetime cancer risk
  - 2 liters drunk per day over a lifetime
- WQCC revised the site-specific uranium standard to the 16.8 μg/L (approximately 11.5 pCi/L) health-based standard.
- A higher ambient-based standard may be addressed in the future, based on data and what is practical.
- Gross alpha and gross beta standards were removed; specific radionuclides (uranium, plutonium, and americium) are being monitored.

Update on WQCC Rulemaking (continued)

- Expiring Temporary Modifications (TMs) Annual Review—Hearing: December 2008
  - Current Rocky Flats TMs (six VOCs, nitrate/nitrite) and the expiration date (December 31, 2009) were retained.
- Triennial Review South Platte River Basin
  - Issues Formulation Hearing: November 10, 2008; Rulemaking Hearing: June 2009
  - Potential Rocky Flats Issues:
    - Rocky Flats TMs expire on December 31, 2009.
    - The SPPTS upgrade should reduce nitrate loading to North Walnut Creek, but it may not meet 10 μg/L by December 31, 2009.
    - New statewide basic standard for arsenic (0.02–10 μg/L) below site-specific standard (50 μg/L).

Site Operations

Site Operations – Third Quarter 2008

Original Landfill – Inspections

Landfill inspections were completed on July 30, 2008, August 25, 2008, and September 30, 2008.

A vegetation inspection was completed on August 8, 2008.

Site Operations – Third Quarter 2008 (continued)

Original Landfill – Seeps

Seep #7 was dry throughout the third quarter.

Seep #4 was saturated during July and August and showed a surface flow of approximately 1 gpm during September.

Seep #8 showed a surface flow of approximately 1–2 gpm throughout the third quarter.

Site Operations – Third Quarter 2008 (continued)

Original Landfill Seep #7 Drain Extension

CDPHE approved the design on September 2, 2008.

The project was started on September 3, 2008, and completed on September 10, 2008.

The Seep #7 drain was extended and tied in with the existing drain.

Site Operations – Third Quarter 2008 (continued)

Original Landfill Seep #7 Drain Extension

Site Operations – Third Quarter 2008 (continued)

- Original Landfill Berm Regrade Project
- Rocky Flats Alluvium was added to the tops of berms to obtain minimum berm height requirements.
- Troughs of berms, where ponding was occurring, were regraded.
- The project was started on September 16, 2008, and finished on September 24, 2008.

Site Operations – Third Quarter 2008 (continued)

- Original Landfill – Settlement Monuments and Inclinometers
- Settlement monument E was installed on September 11, 2008.
- Settlement monuments were surveyed on September 11, 2008; data are within the expected range per the Original Landfill Monitoring and Maintenance Plan.
- Consolidation monitors were removed in July.
- Inclinometers were measured on July 17, 2008, on August 27, 2008, and from September 25, 2008 through September 30, 2008. No significant displacement was observed.

Site Operations – Third Quarter 2008 (continued)

- Present Landfill – Inspections and Surveys
- The quarterly inspection was completed on August 24, 2008.
- The vegetation inspection was completed on August 18, 2008.
- The settlement monument surveys were completed on June 21, 2008.

Questions?