Buckman Direct Diversion

Storm Water Quality Monitoring of Rio Grande at Buckman Direct Diversion

2011-2014 Report

2010 Memorandum of Understanding

Abbreviations in Presentation

- BDD – Buckman Direct Diversion
- BDDB - Buckman Direct Diversion Board
- DOE – Department of Energy
- LAC – Los Alamos Canyon
- LANL – Los Alamos National Laboratory
- MOU – Memorandum of Understanding
- NMWQCC – New Mexico Water Quality Control Commission

BDD Board & DOE/LANL MOU

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- Memorandum of Understanding signed in 2010
  - 2010 MOU – four seasons
  - 2015 MOU – three seasons
- PROGRAMS OF MOU
  - Early Notification System
  - Storm Water Quality Sampling of the Rio Grande at BDD
  - Contaminant Fate Assessment (3 sites during 1 year)

Early Notification System

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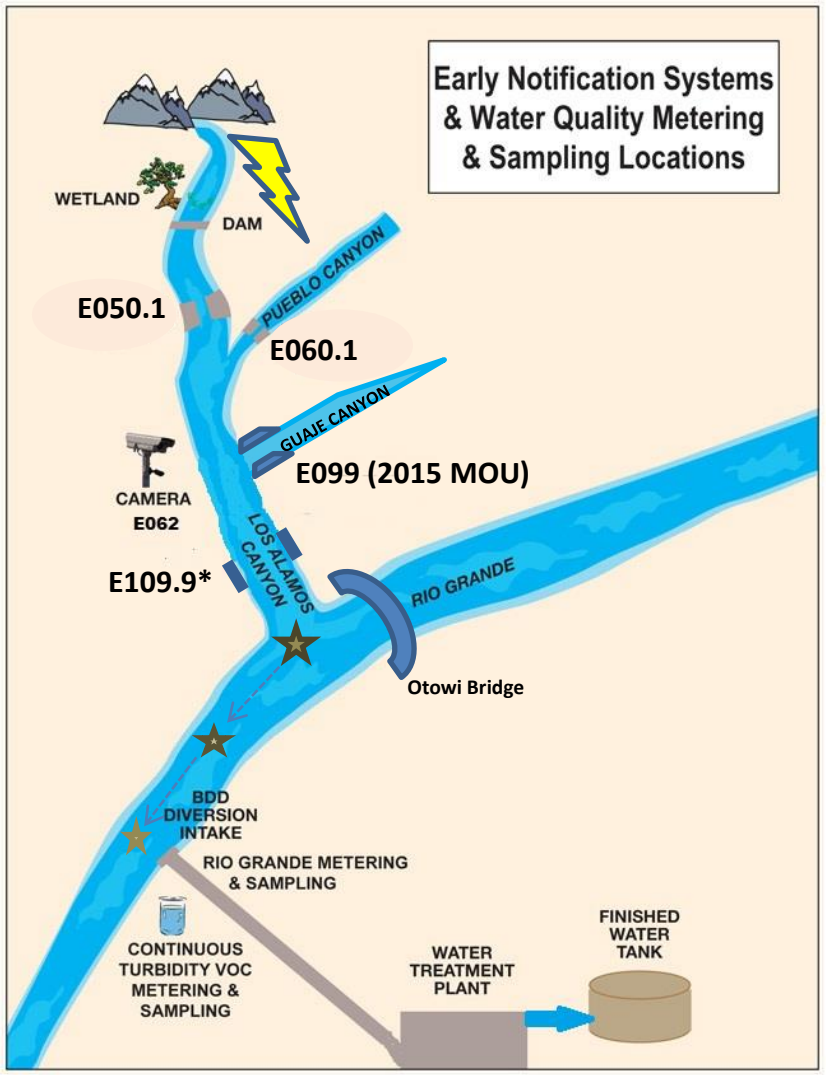
ENS

- It is a Prevention Program.
- It has been conducted since 2011.
- It has been funded jointly by BDDB & DOE/LANL.
- BDD stops diverting when storm flow was present in Los Alamos Canyon.



Early Notification System

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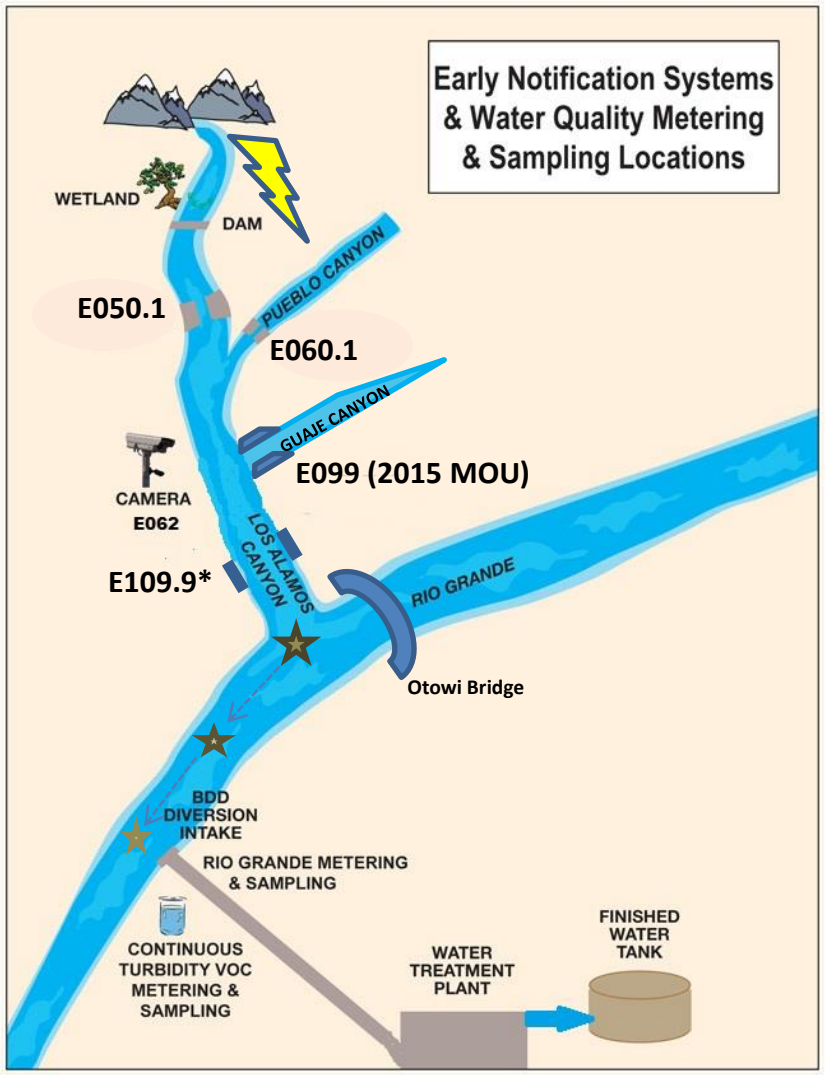
- The Los Alamos Canyon flows were monitored by E050.1, E060.1, and E109.9*. (*Non-operational since Sep 2013)

- E109.9 was a trigger to stop diverting. In 2014 – E050.1 & E060.1 became the triggers.



Storm Water Quality Sampling Program

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- It is a Monitoring Program.
- It documents contaminants in the Rio Grande during storm events in Los Alamos Canyon.
- It has been conducted since 2011.

Storm Water Quality Sampling Program

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- It has been funded by
  - DOE/LANL from 2011-2014 under 2010 MOU
  - BDDB & DOE/LANL from 2015-2017 under 2015 MOU

- Contaminants of Concern are Suspended Sediments, Radionuclides, Metals, and Organics

Storm Water Quality Sampling Results

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- During storm events, contaminants from the Los Alamos Canyons Watershed enter the Rio Grande and reach BDD Diversion.
- Dilution by Rio Grande flow lowers the contaminant concentrations from Los Alamos Canyon Watershed.

Storm Water Quality Sampling Results

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- Higher flows from Los Alamos Canyon transport more contaminants and at higher concentrations.
- Forest fires release more contaminants and at higher concentrations because the fires change the watershed properties.

Storm Water Quality Sampling Results

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Conclusion: Program needs more information and need better monitoring system.

Examples of Improvements to Program:

- Need a gage station in lower Los Alamos Canyon similar to E109.9.
- Need sampling of storm flows at lower Los Alamos Canyon.
- Need In-situ & continuous measurements of water quality parameters at BDD (Under investigation).

Analytical Results from Monitoring

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- Storm Water was monitored for Radionuclides, Metals, and Organics.
- Rio Grande sediment background levels were calculated.
  - Radionuclides background levels are from naturally occurring sources and from world wide nuclear weapons testing.
  - Metals background levels are from naturally occurring sources in rocks and soils.
  - Organics are from man-made contaminants.

Analytical Results from Monitoring

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- Concentrations of contaminants in Rio Grande Storm Water collected at BDD have:
  - Exceeded background levels
  - Exceeded some NMWQCC standards
- Source of radionuclides was predominantly Los Alamos Canyon Watershed.
- Sources of Metals and Organics were both: Los Alamos Canyon Watershed and Rio Grande Watershed.

Contaminant Fate Assessment Results

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- Results from 2010 MOU were inconclusive.
- Improved Sampling Plan is being implemented under 2015 MOU.
- 2015 MOU improved study is fully funded by BDD Board; to be conducted over 3 years.

2010 MOU Successes

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BDD staff placed large effort on meeting the MOU conditions

- Purchased part of the sampling equipment
- Ran the sampling activities and maintained equipment in working order
- Ceased diversion of water during storm events exceeding flows of 5 cfs in Los Alamos Canyon
- Produced the MOU Report – 247 pages to be posted on the BDD website with six attachments and five appendices

2010 MOU Successes

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DOE/LANL Contribution

- Provided part of the equipment for sampling effort
- Uploaded analytical data to Intellus database which is accessible and available on public web site
- Funded 24 sampling events

2010 MOU Shortcomings

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- BDD sampling plan for Contaminant Fate Assessment was not executed successfully. An improved study is underway.
- Under LANL recommendation, BDD sampled 2-3 storm events in 2012 and 2013, which did not generate sufficient data. BDD improved the Sampling Plan in 2014.
- LANL sampling budget in 2014 was limited, forced BDD to restrict sampling efforts.

2010 MOU Shortcomings

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- BDD discovered that contract laboratory for LANL "filtered" all BDD samples for radionuclides in 2014 resulting in no representative storm water data for 2014.

- LANL has not reached an agreement with San Ildefonso to restore the gage station E109.9 after Sept 2013 which has proven to be the main indicator of Los Alamos Canyon flows to the Rio Grande.

BDD Recommendations for Improved Monitoring Program

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- BDD would like to see LANL participate in restoring gage station E109.9 or build similar gage station in lower Los Alamos Canyon, so that BDD can monitor all flows from that Canyon.

- BDD would like to see LANL finance a minimum of 3 additional monitoring seasons as part of the 2015 MOU in order to obtain additional data due to limited data obtained in 2012, 2013, and 2014.

BDD Recommendations for Improved Monitoring Program

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- BDD intends to work with USGS to establish an in-situ & real time water quality equipment to improve monitoring of turbidity and sediments through a Cooperative Agreement. Funding needs to be planned for such project.

End of Presentation

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Questions? Comments? Concerns?