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# Red Dog Mine Dust Update
# October, 2007

# Bons Drainage Monitoring




2004 - 2006 Water Quality Monitoring of 10 locations in Bons Drainage

sample and monitor flow at 2 collection sumps and water quality at 8 stream locations.

Program designed to monitor drainage from the Overburden Stockpile (Kivalina Stockpile)

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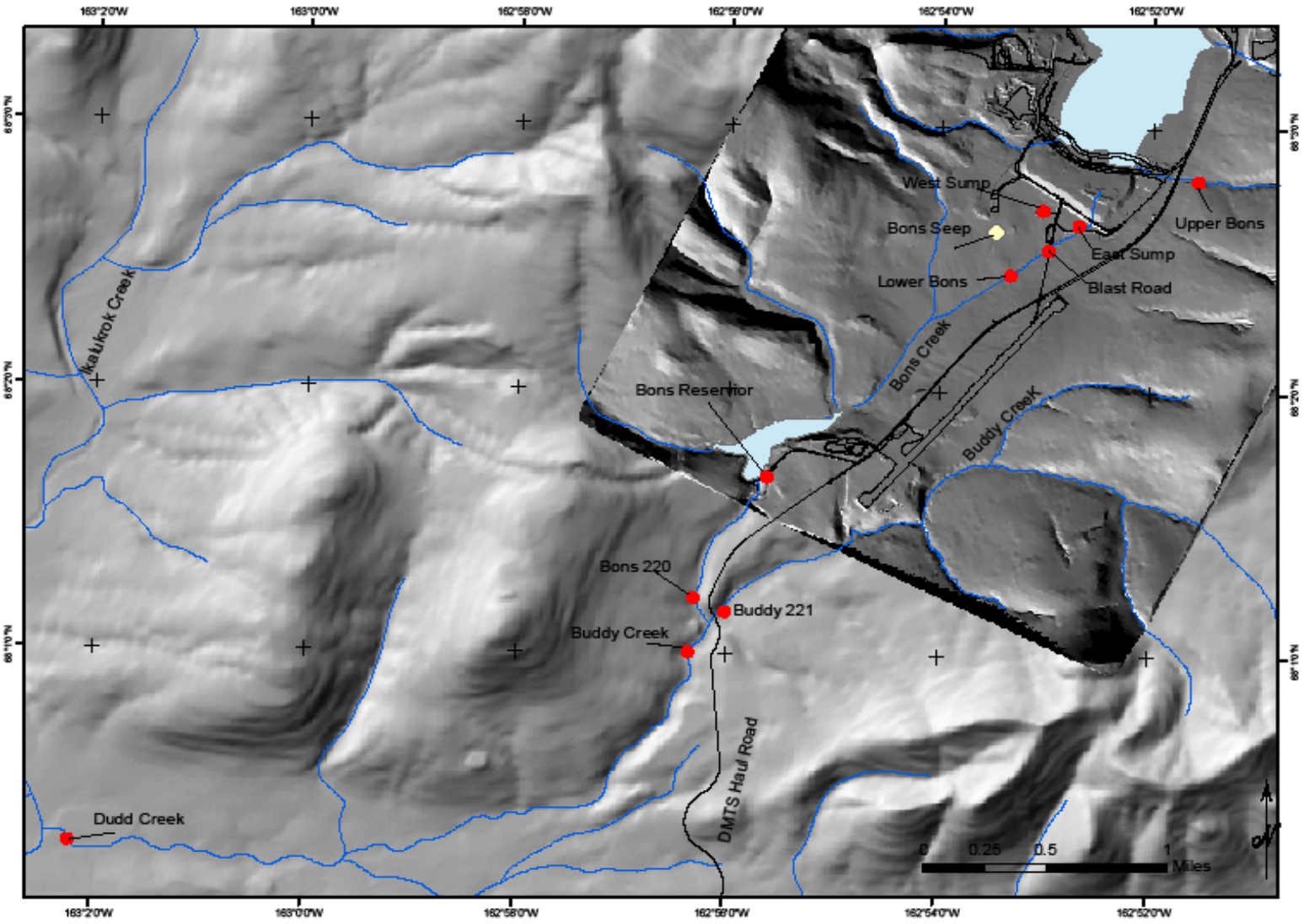
# Bons Drainage Monitoring Locations

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# Bons Seep June 21, 2005

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# Peak Concentrations

- Generally occur during Freshet
- Increased turbidity (suspended solids) correlates to increased total metal concentrations
- During low flow periods soluble metal concentrations (zinc, cadmium), and total dissolved solids are more prevalent
- Occur regionally as well as in the Mine area including Ickalukrok, Evaingiknuk

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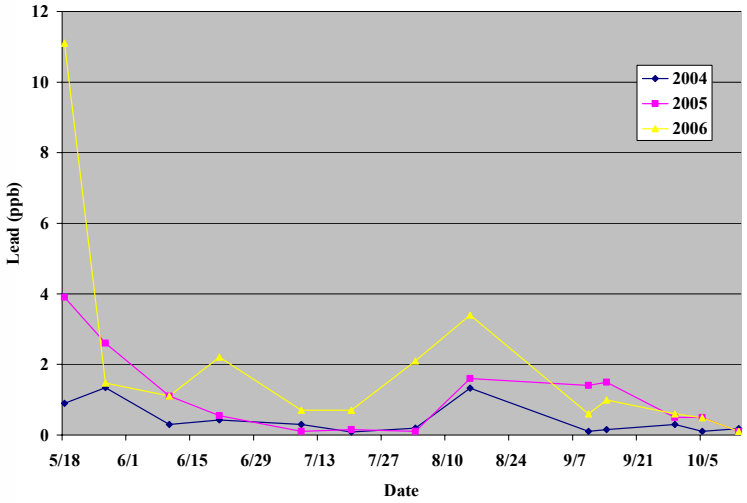
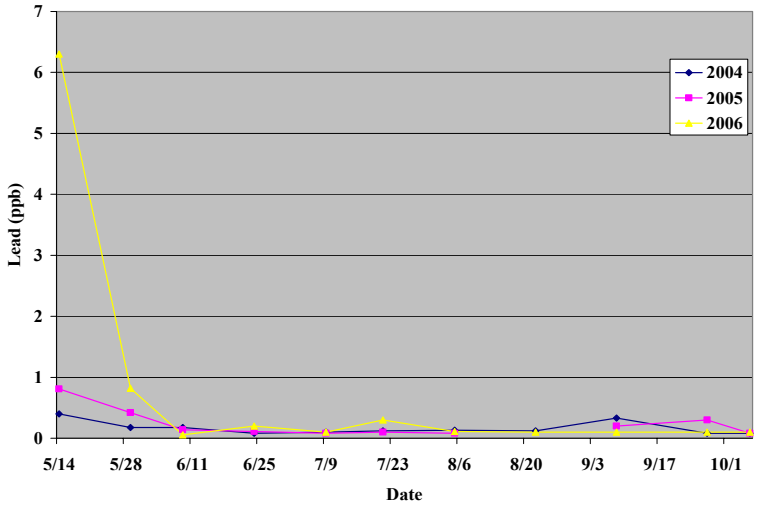
# Ickalukrok and Evaingiknuk



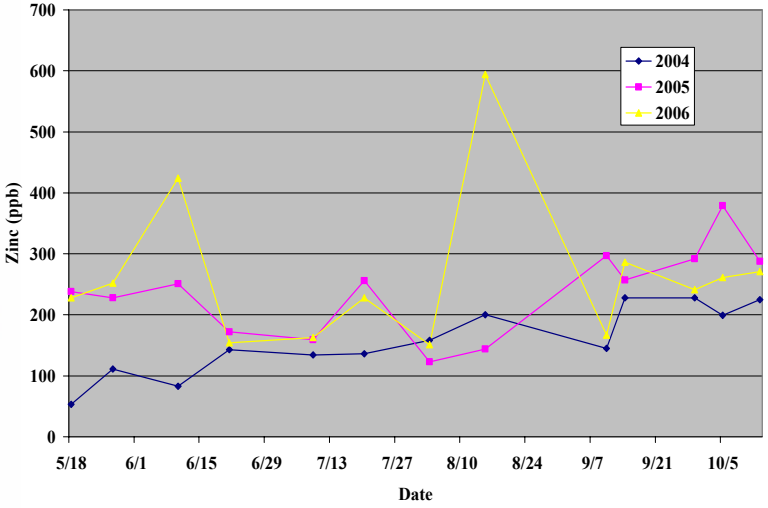

Ikalukrok @ Station 9



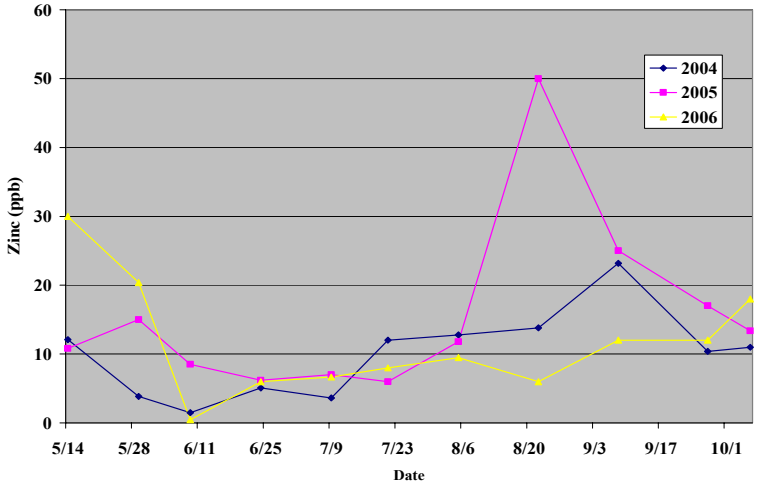

Evaingiknuk @ Eva 11




Ickalukrok @ Station 9




Evaingiknuk @ Eva 11

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# Risk Assessment and Risk Management Plan Update

# Risk Assessment Status




- Review by ADEC and their contractor is complete.
- Making final text revisions to the RA based on comment resolution with ADEC and their contractor.
- Final RA to be submitted in November
- Layman's summary being developed

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# Summary of Risk Assessment Results




- Ecological Risk Assessment
  - Observed changes in plant communities (differences in plant species mixture near the road, port, and mine; reduced lichen cover as much as 1 to 2 km from road)
  - Possible effects to ptarmigan from lead near the mine and port
  - Effects to other wildlife populations are unlikely
  - No effects predicted for marine, coastal lagoon, and freshwater stream habitats
- Human Health Risk Assessment
  - Safe to continue subsistence harvesting
  - No changes to subsistence lifestyle needed

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# Risk Management Plan

- Beginning to develop a frame work for the Risk Management Plan

- Considering ways to involve stake holders in the development of the RMP (meetings, workshops, etc).

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# 2007 Fugitive Dust Control Initiatives

- Coarse ore storage building (COSB) baghouse installation
- Purchase of back-up water truck
- Mine concentrate storage building (CSB) baghouse design
- Evaluation of alternative concentrate load-out technology

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# Mine Site Fugitive Dust Control

# Red Dog Minesite




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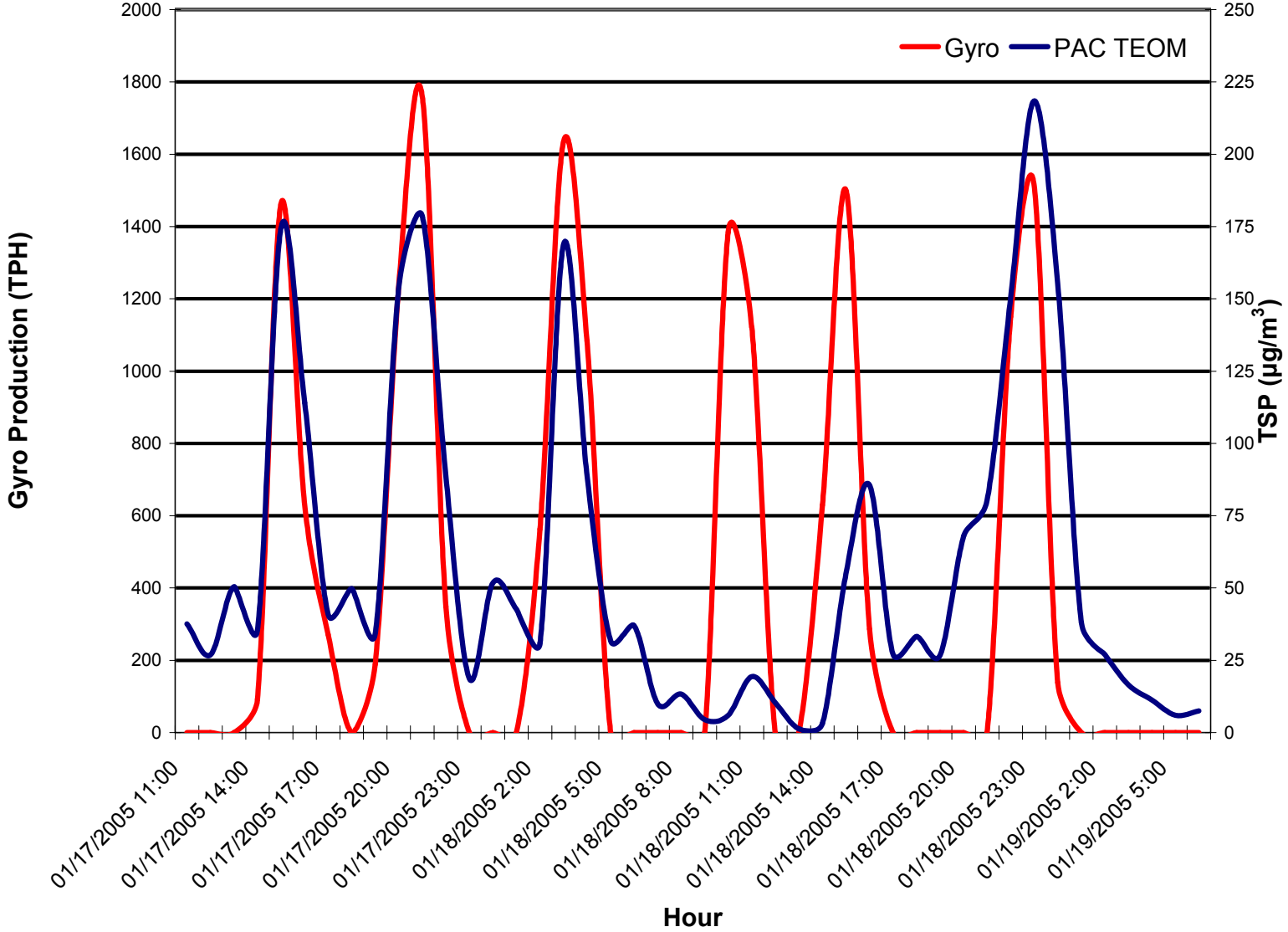
# TSP Concentration vs. Gyro Production

## 11 AM January 17 to 6 AM January 19, 2005

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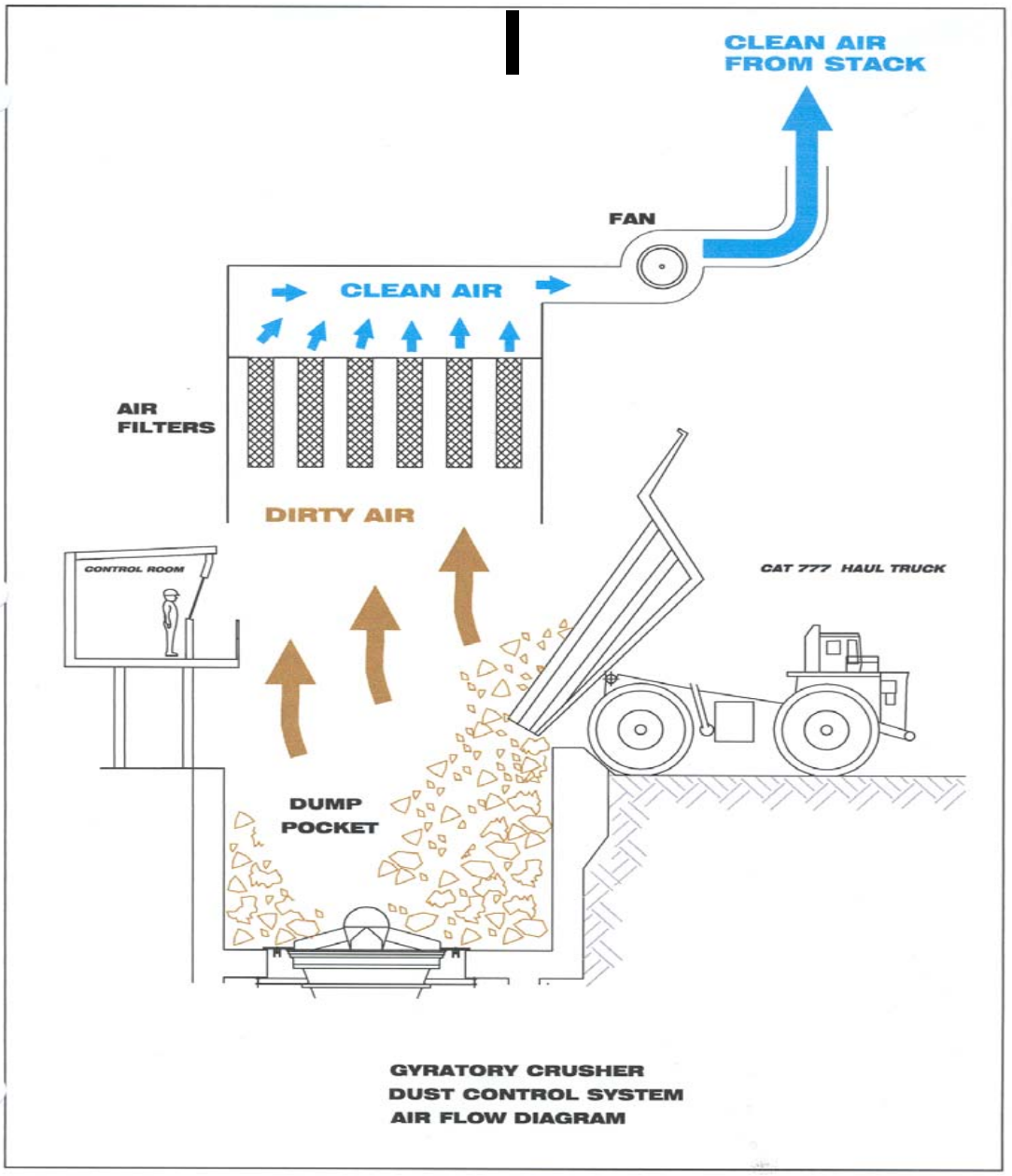


GYRATORY CRUSHER
DUST CONTROL SYSTEM
AIR FLOW DIAGRAM

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# Completed Gyratory Crusher

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# Completed Jaw Crusher

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# View of PAC to Crusher & COSB

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# Coarse Ore Stockpile Building Baghouse


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# Coarse Ore Stockpile Building Baghouse




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# COSB Fan / Compressor Building

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# COSB Fan / Compressor Building

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# 2008 Minesite Fugitive Dust Projects

- Concentrate storage building baghouse installation
- Concentrate load-out system evaluation
- Relocation of in-pit stockpiles

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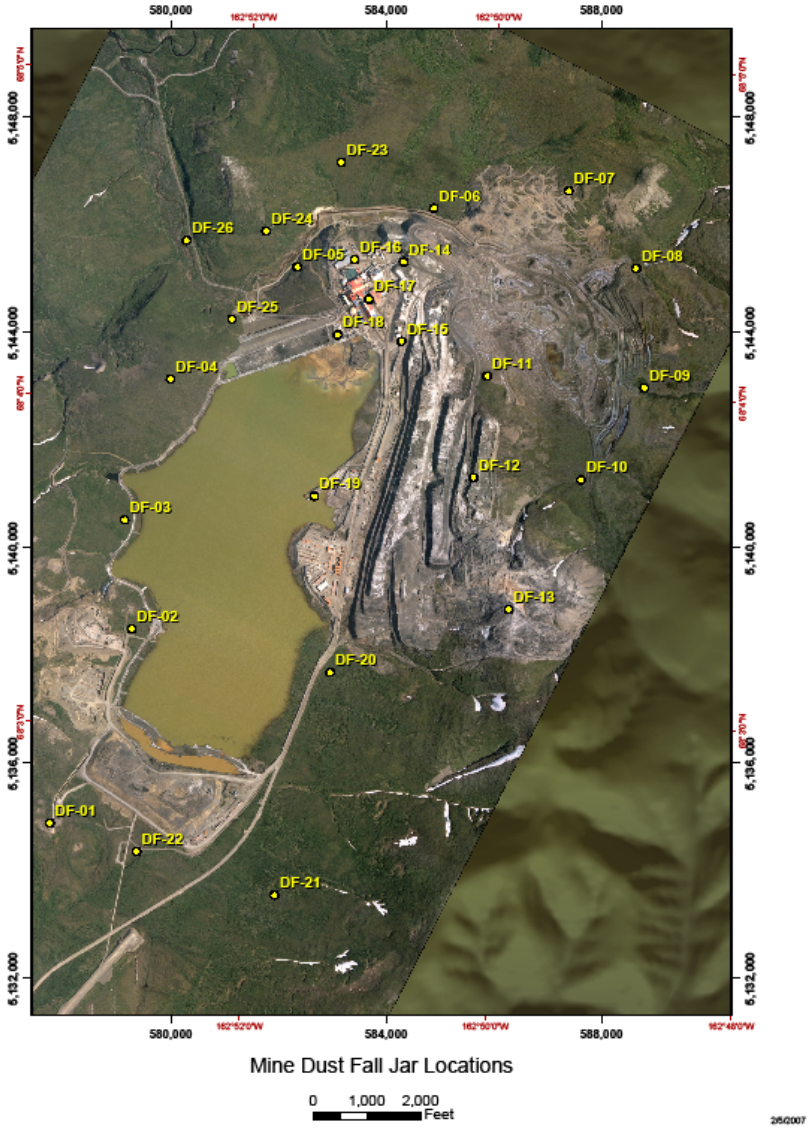
# Fugitive Dust Monitoring

# Mine Dust Fall Jar Locations




Mine Dust Fall Jar Locations

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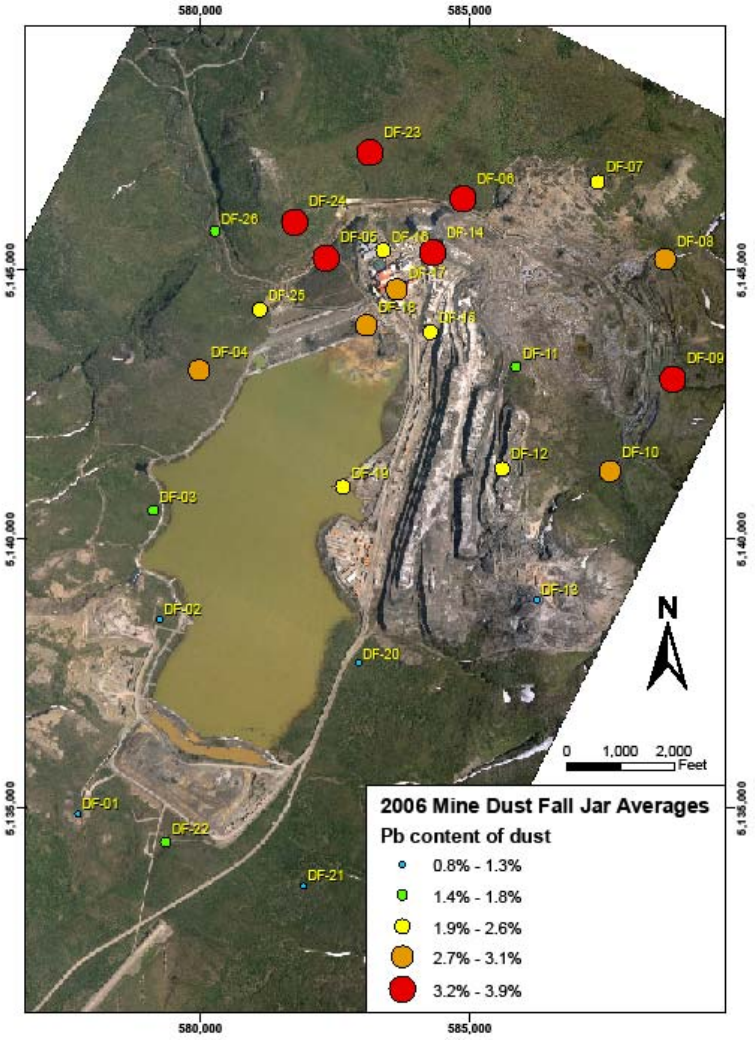
# 2006 Lead Deposition in Jars

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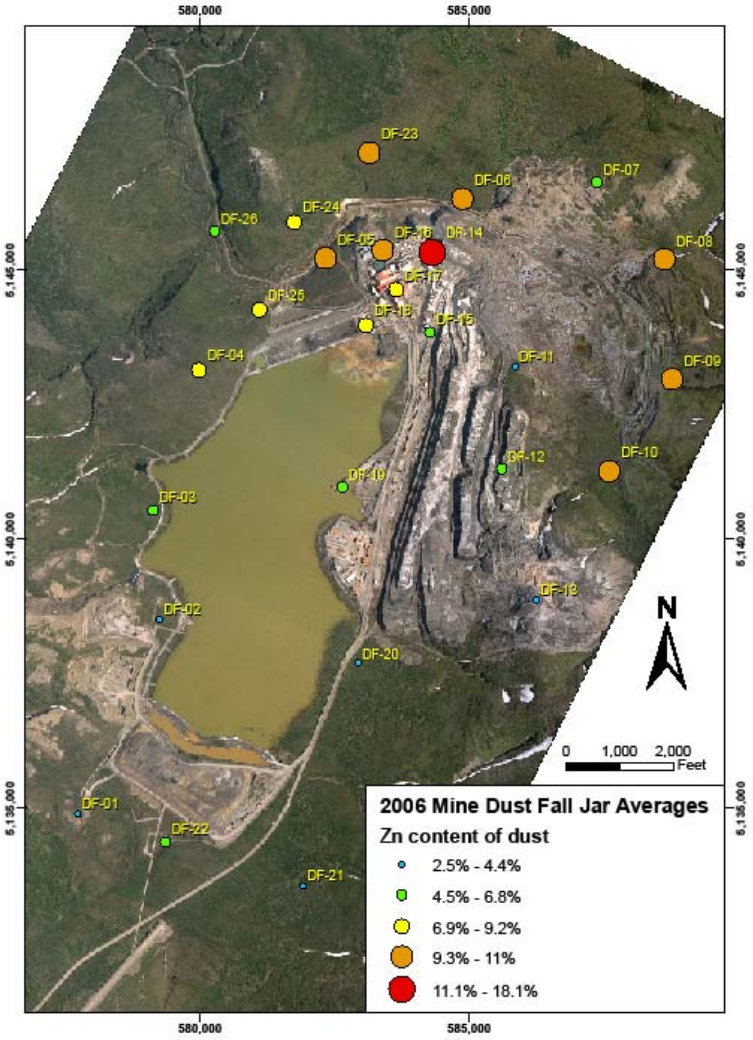
# 2006 Zinc Deposition in Jars

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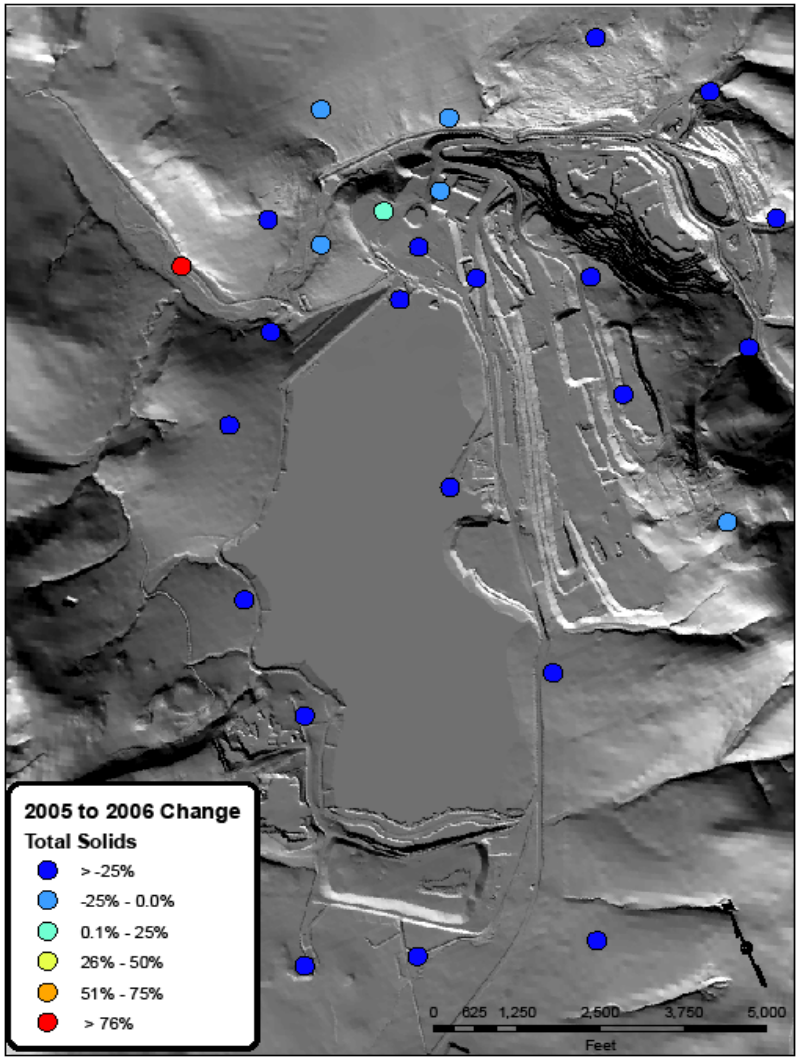
# Total Dust Deposition Comparison 2005 to 2006

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# Red Dog Mine TEOMS




- PAC TEOM and the Crusher Baghouses
- T- DAM TEOM
- Peak Analysis
  - Haulage from the Course Ore Stockpile Building
  - Tailings Beach Dust Event

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# Monthly TSP, Before Crusher Baghouses and After Crusher Baghouses




**PAC 24 Hour Average TSP**

| | Before Baghouses | After Baghouse |
|---|---|---|
| Monthly Average+ | 61.6 | 34.1 |
| Days* | 503.0 | 377.0 |
| Average Maxumum | 250.4 | 122.5 |
| Average Minimum | 9.2 | 7.4 |
| Average Standard Deviation | 61.1 | 33.2 |

January 2005 to June 2006 = Before Baghouse
July 2006 to September 2007 = After Baghouses

**T-Dam 24 Hour Average TSP**

| | |
|---|---|
| Monthly from January 2005 to June 2006 | 23.8 |
| Monthly From July 06 to August 2007 | 28.8 |

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* Valid 24 hour Average = > 20 individual 1 hour readings

+ Monthly Average of 24 Hour Averages