

Stillwater Mine DPM Sampling Strategy

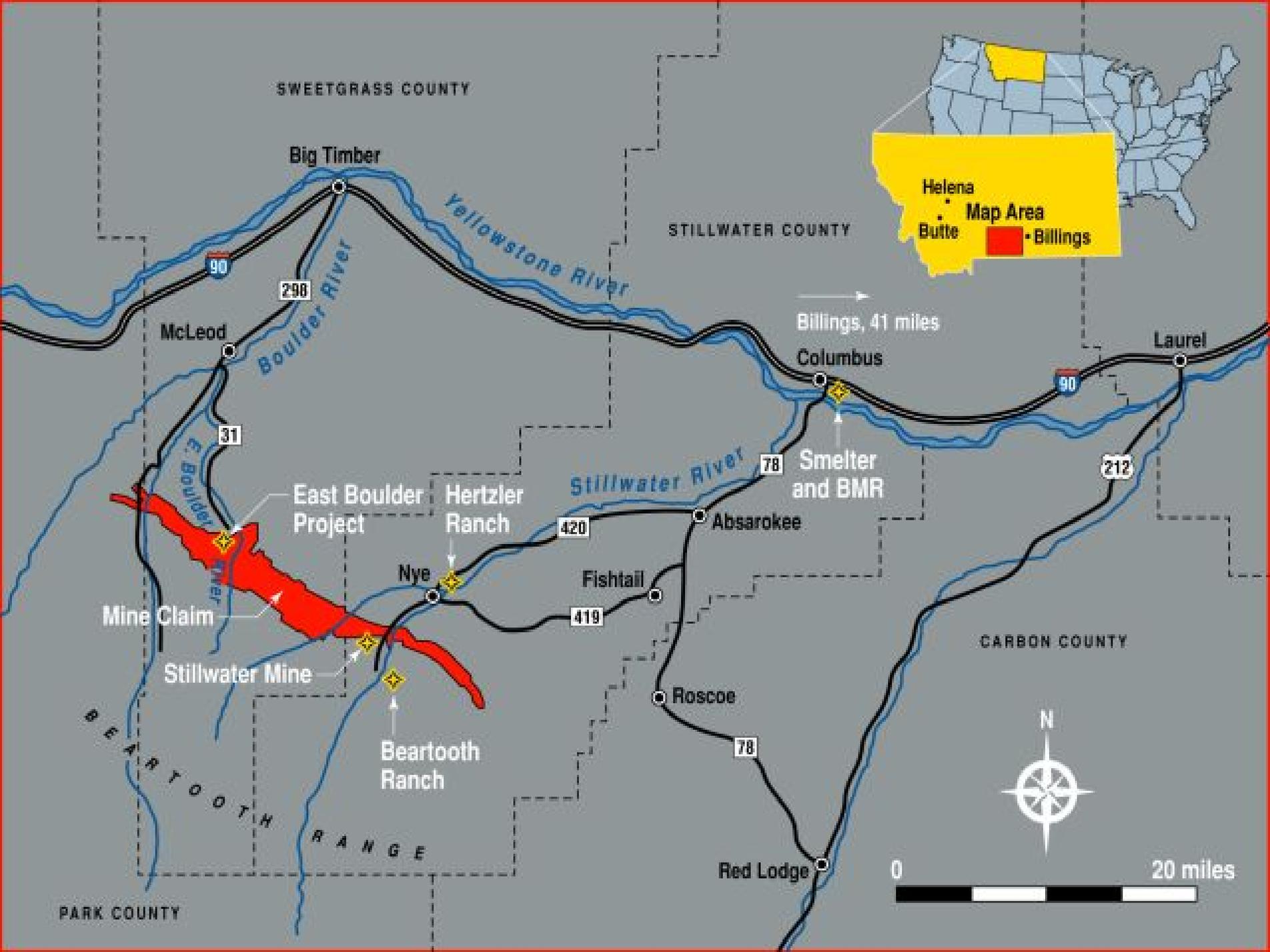
DPM Workshop
Elko, Nevada

An aerial night photograph of the Stillwater Mine processing plant. The facility is illuminated by numerous lights, highlighting its various structures, including a large cylindrical silo and a tall stack. A large parking lot in the foreground is filled with cars, also lit up. The mine is situated in a mountainous, forested area with a river visible in the lower right corner.



Topics

- Introduction
- Stillwater Mine Overview
- Sample Strategy
- Sample Preparation
- Area Sampling
- Personal Sampling
- Data Recollection



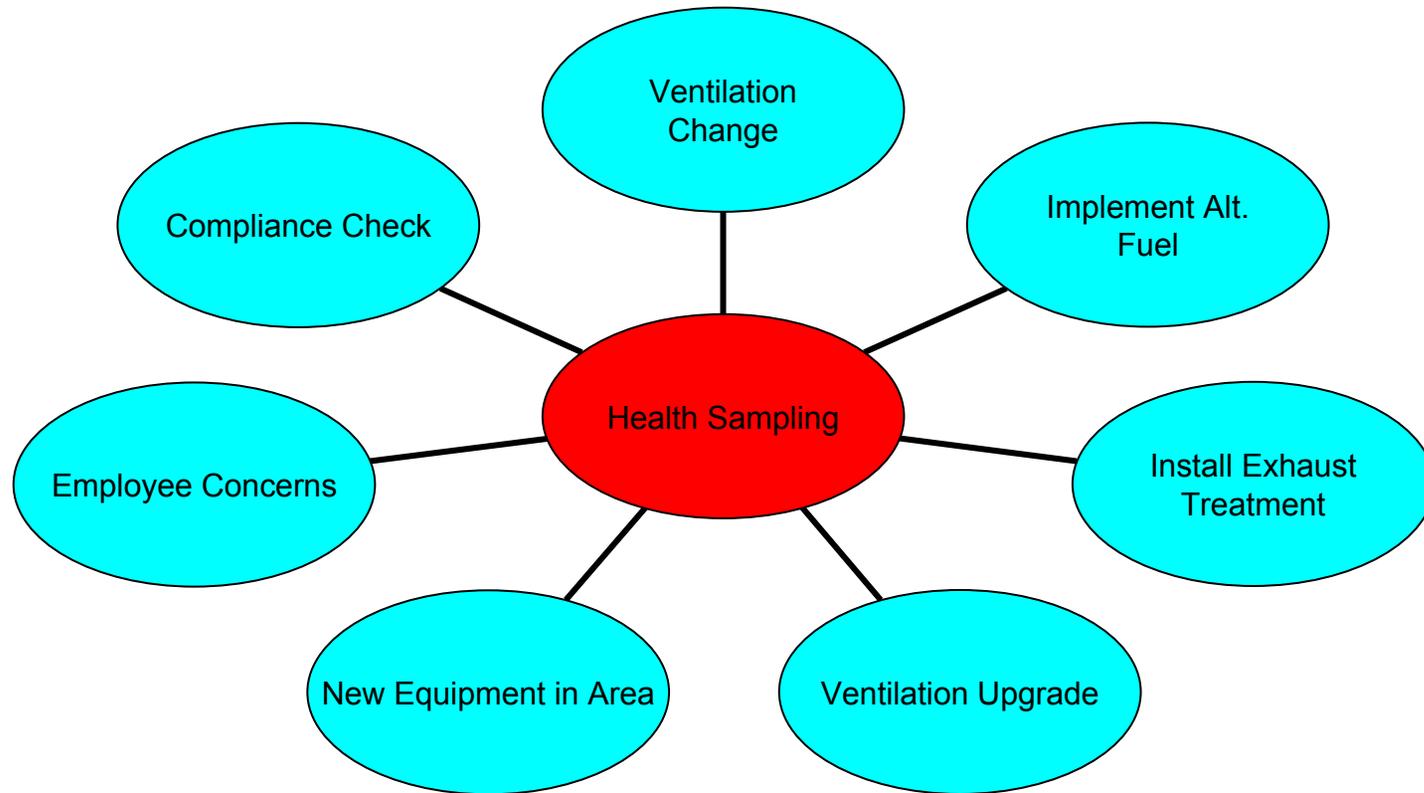


Stillwater Mine Overview

- DPM loading at Stillwater Mine made by three groups based upon horsepower and estimated utilization.
 - 1/3 of total DPM loading from 27 Unit Muckhaul fleet
(19 ea 10-ton, 4 ea 30-ton & 4 ea 20-ton loci's)
 - 1/3 of total DPM loading from 73 Unit LHD Fleet
(25 ea 4yd³, 24 ea 2yd³ & 24 ea 1.5yd³)
 - 1/3 of total DPM loading from <200 Unit Utility Fleet
(37 Mantrips, 20 Delivery, 83 Tractors/ATV's, 31 Skid Steer/Forklifts & 10 others)
- 350 Underground Diesel Equipment



Sample Strategy





Sample Strategy

- What, How are you going to sample for DPM????
 - Area
 - Personal





Sampling Strategy

- Exposure assessment is evaluated by conducting both area and personal samples
 - Area = Identify areas of concern and determine how concentrations are effected by a series of stopes. Used to evaluate newly implemented controls.
 - Personal = To determine and evaluate exposures and compliance.



Sample Preparation

- Calibration
 - Personal Sampling Pump
 - Tygon Tubing
 - 10-mm Nylon Cyclone
 - SKC DPM Cassette
 - Calibration Chamber Jar
- Calibrate pumps to 1.7 LPM





Sample Preparation

- Area Sampling
 - Sample Pump and Media
 - Gas Monitor
 - Temperature & RH Meter
 - Vein Anemometer
 - Sample Notes





Sample Preparation



- Personal Sampling
 - Sample Pump and Media
 - Gas Monitor
 - Temperature & RH Meter
 - Vein Anemometer
 - Digital Manometer
 - Pitot Tube
 - Sample Notes



Location: _____
 Date: _____
 Shift: _____

Diesel Particulate Sampling Field Notes

Sampled by: _____

INDIVIDUAL SAMPLE

Name: _____
 Occupation: _____
 Equipment: _____
 Inside Cab? Y N N/A

Reason for Sample
 ___ New location / Baseline
 ___ MSHA
 ___ Ventilation Change
 ___ Personal Sample
 ___ Other _____

Pump and Cassette Information

Pump #: _____
 Cass. #: _____
 Total Time: _____
 Pre-Cal _____
 Post-Cal _____
 AVG Flow _____

Volume: _____

AREA SAMPLE

Vent Rate: _____ (CFM)

	Initial	Final	Additional Readings?	Y / N	If so, see attachment
Temps (F)	_____	_____	Additional Readings?	Y / N	If so, see attachment
Humidity	_____	_____	Additional Readings?	Y / N	

Gas Readings

ITX / TMX # _____

	Initial	Final	Additional Readings?	Y / N	If so, see attachment
NO2	_____	_____	Additional Readings?	Y / N	If so, see attachment
CO	_____	_____			
O2	_____	_____	Was a TMX with a Hygiene Board used?	Y / N	

Analytical Results

Organic Carbon µg/sample	Elemental Carbon µg/sample	Total Carbon µg/sample	Organic Carbon µg/m ³	Elemental Carbon µg/m ³	Total Carbon µg/m ³



Area Sampling

- Identify areas of concern
- Determine how concentrations are effected by a series of stopes/work areas
- Used to evaluate newly implemented controls
- Evaluate ventilation splits
- Determine needed administrative controls



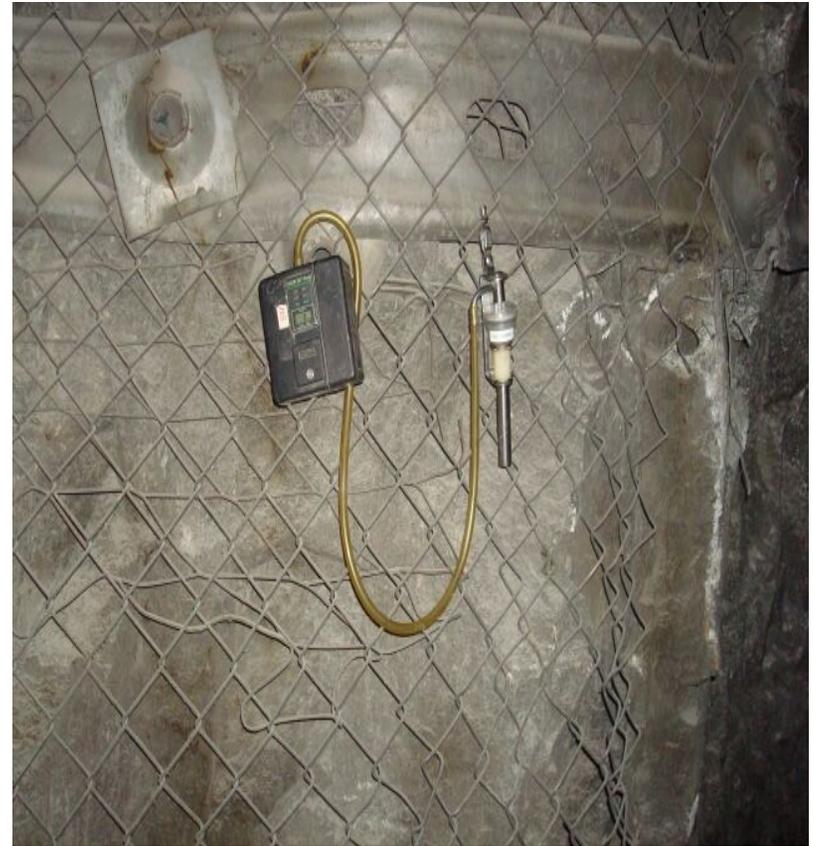
Area Sampling

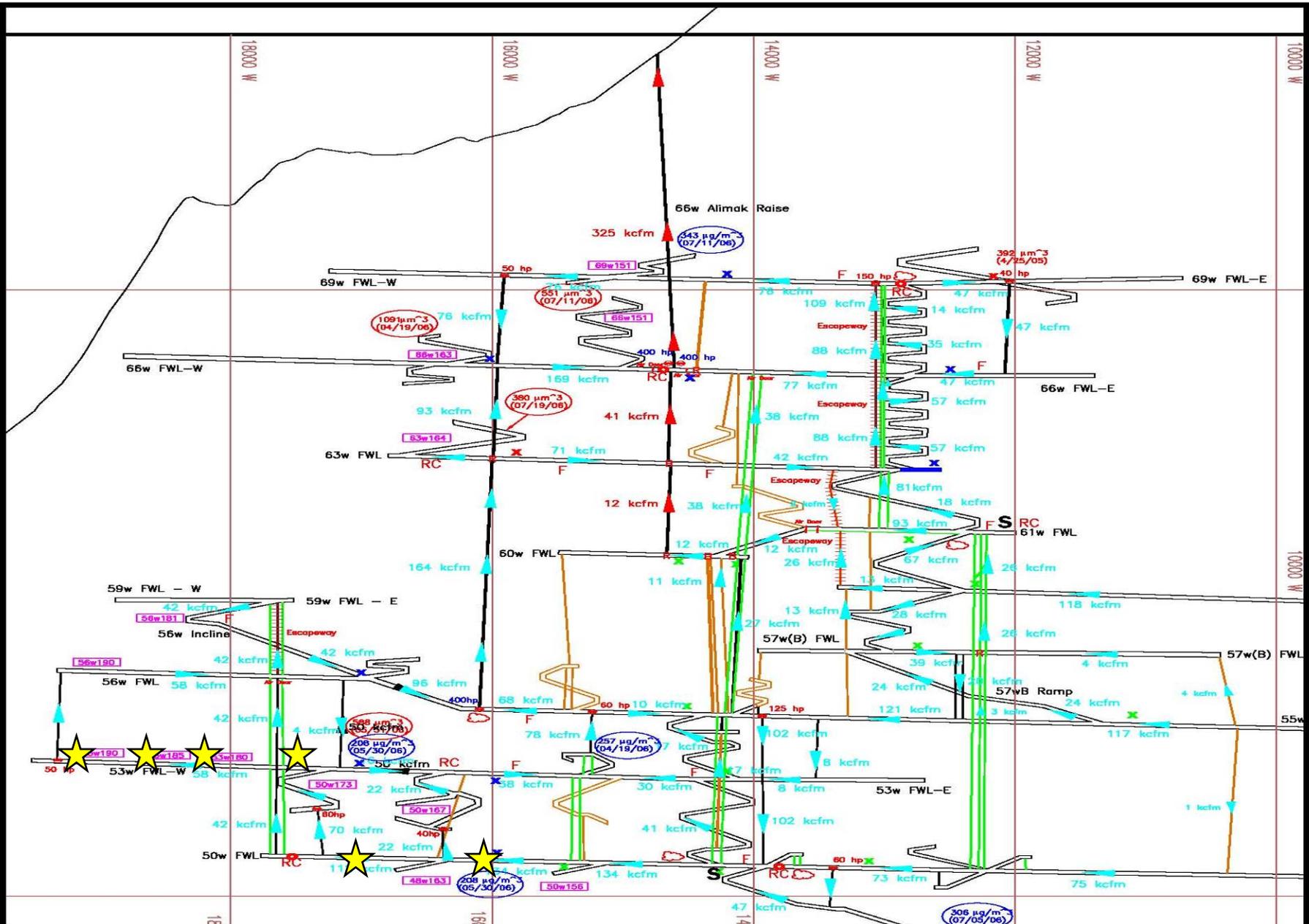


- Area Sampling
 - Sample Pump and Media
 - Gas Monitor
 - Temperature & RH Meter
 - Vein Anemometer
 - Sample Notes



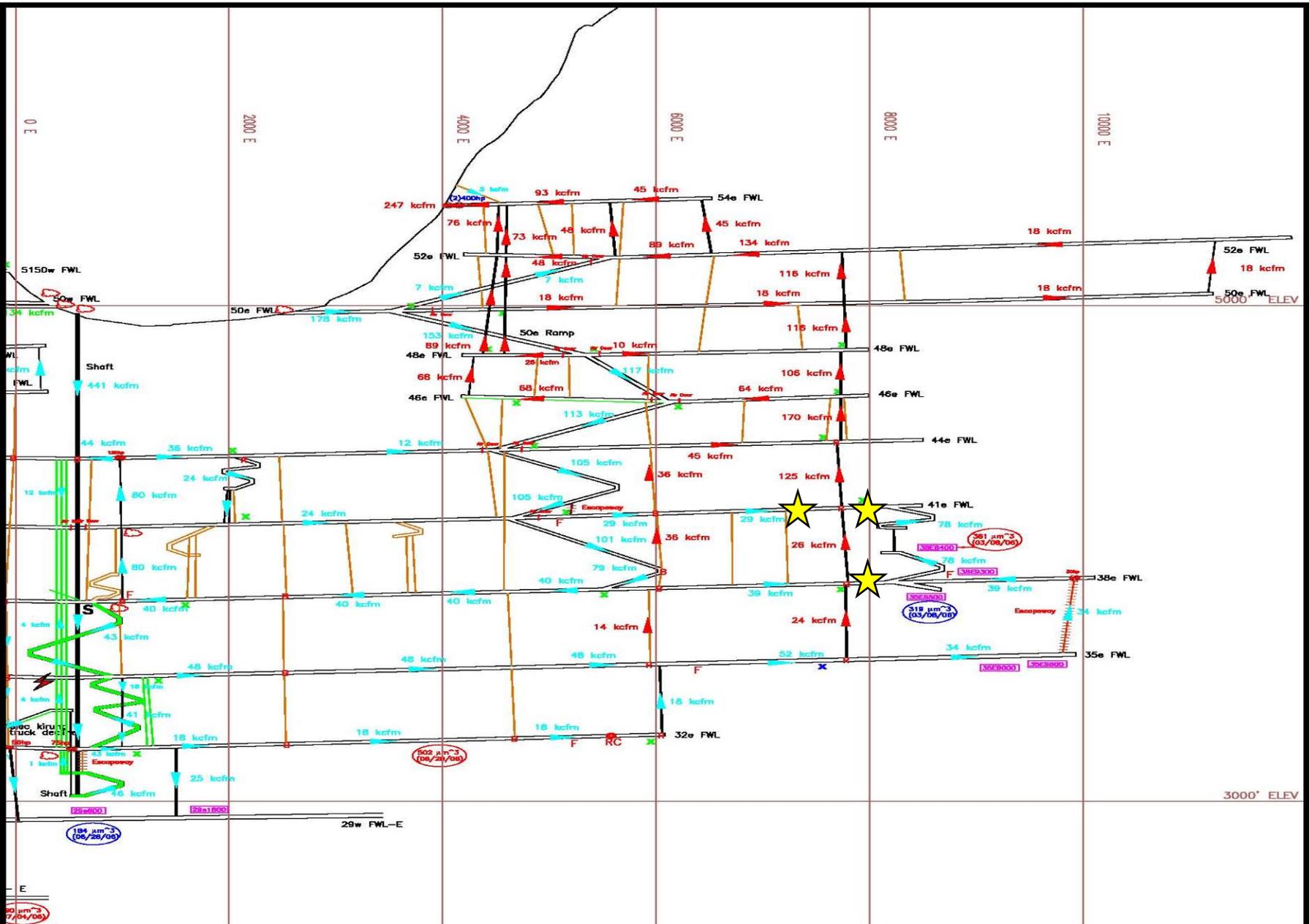
Area Sampling





STILLWATER MINING COMPANY
 HC - 54 Box 365
 Nye, MT 59061

TITLE: UPPERWEST 2007 Ventilation Plan	
DRAWN BY: RLL	SCALE: 1"=1000'
APPROVE:	NUMBER:
DATE: 03/22/2007	FILE:



STILLWATER MINING COMPANY
 HC - 54 Box 365
 Nye, MT 59061

TITLE: Off-Shaft East 2007 Ventilation Plan	
DRAWN BY: RLL	SCALE: NTS
APPROVE:	NUMBER:
DATE: 03/22/2007	FILE:



Personal Sampling

- Evaluate exposures
- Evaluate control technologies
- Evaluate regulatory compliance



Personal Sampling

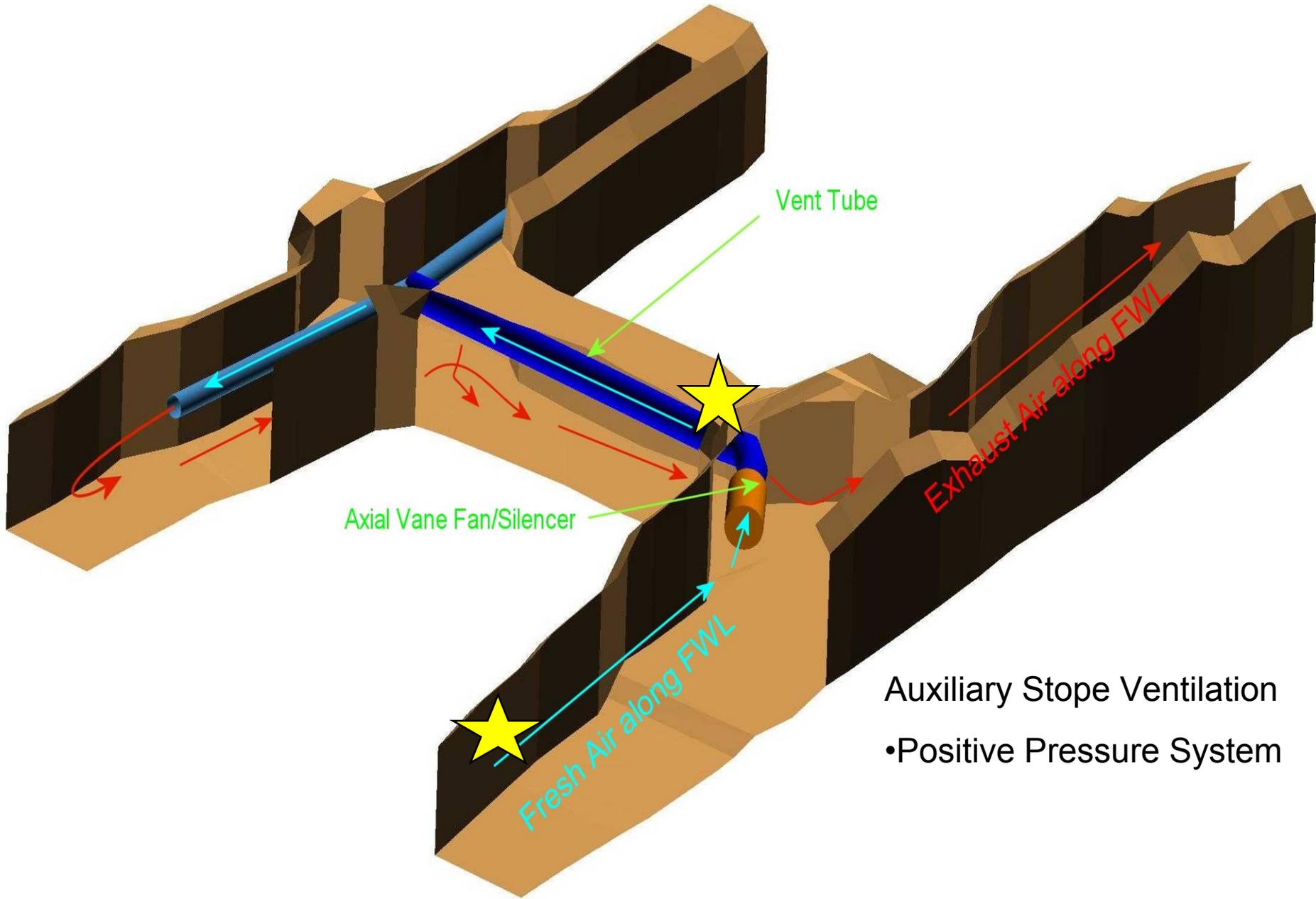
- Personal Sampling
 - Sample Pump and Media
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 - Pitot Tube
 - Sample Notes





Personal Sampling





Auxiliary Stope Ventilation

- Positive Pressure System



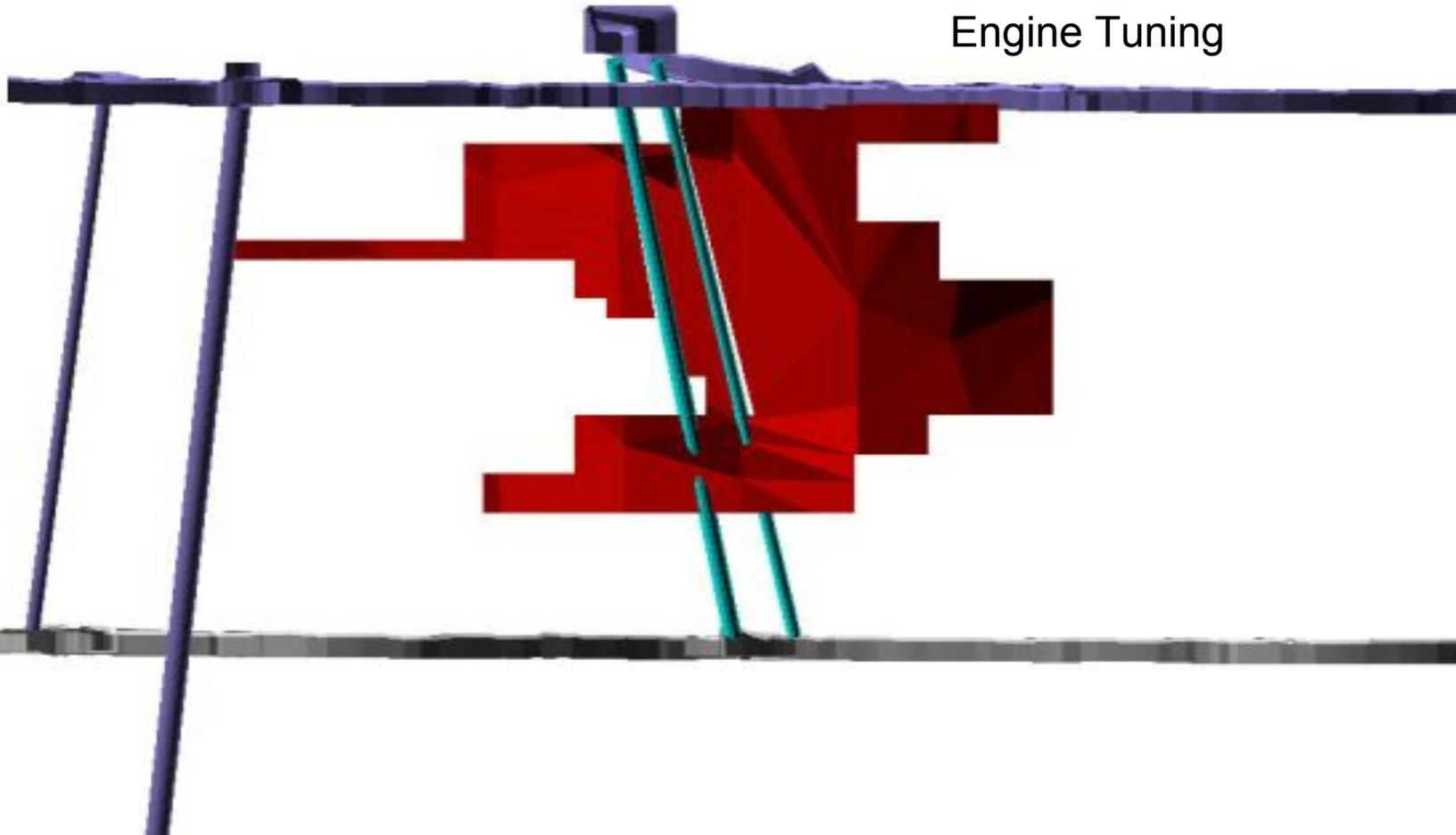
Personal/Area Sampling

41W9500 Captive Mucker
Stope

Bio-diesel

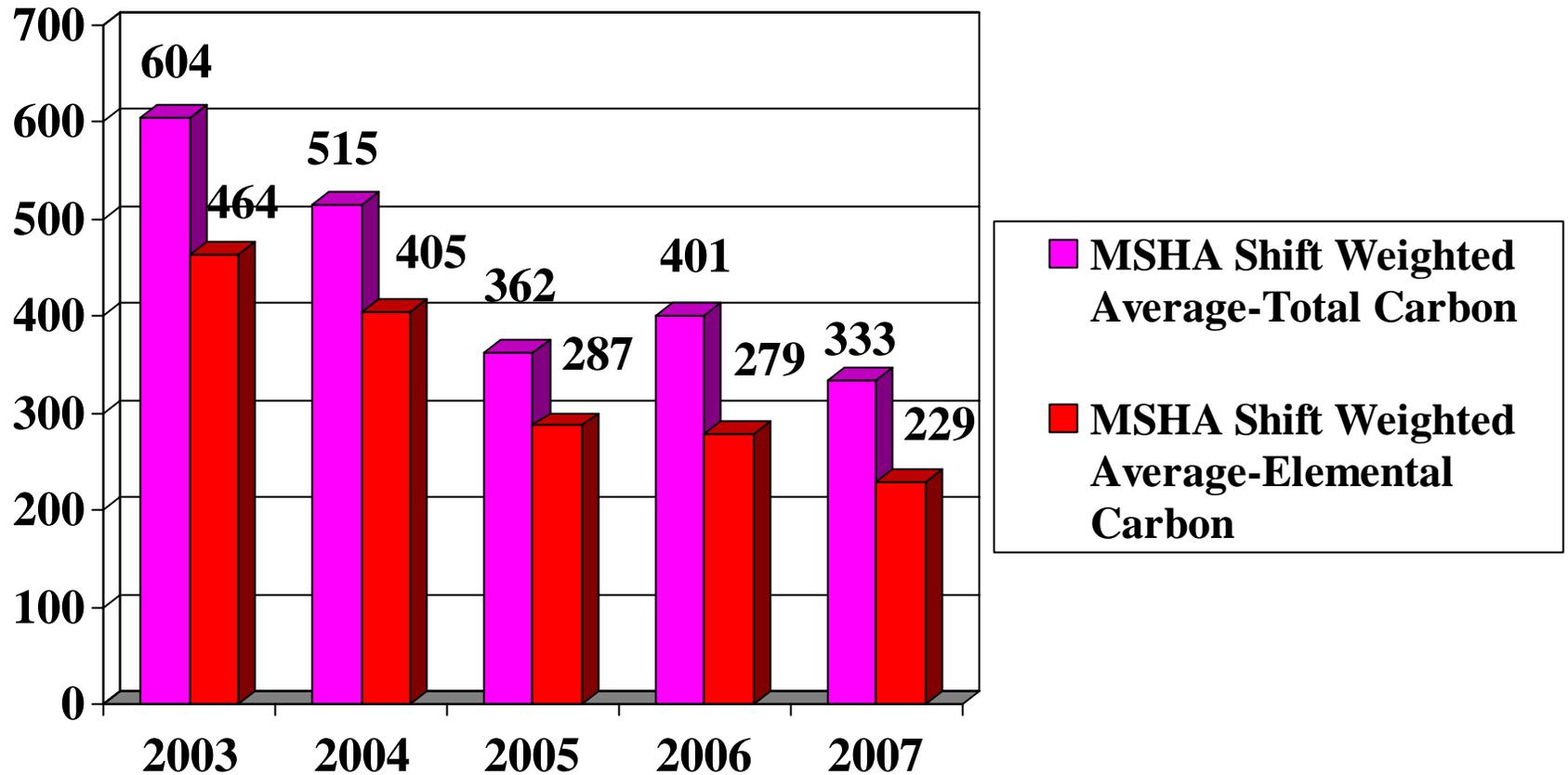
Exhaust Controls

Engine Tuning



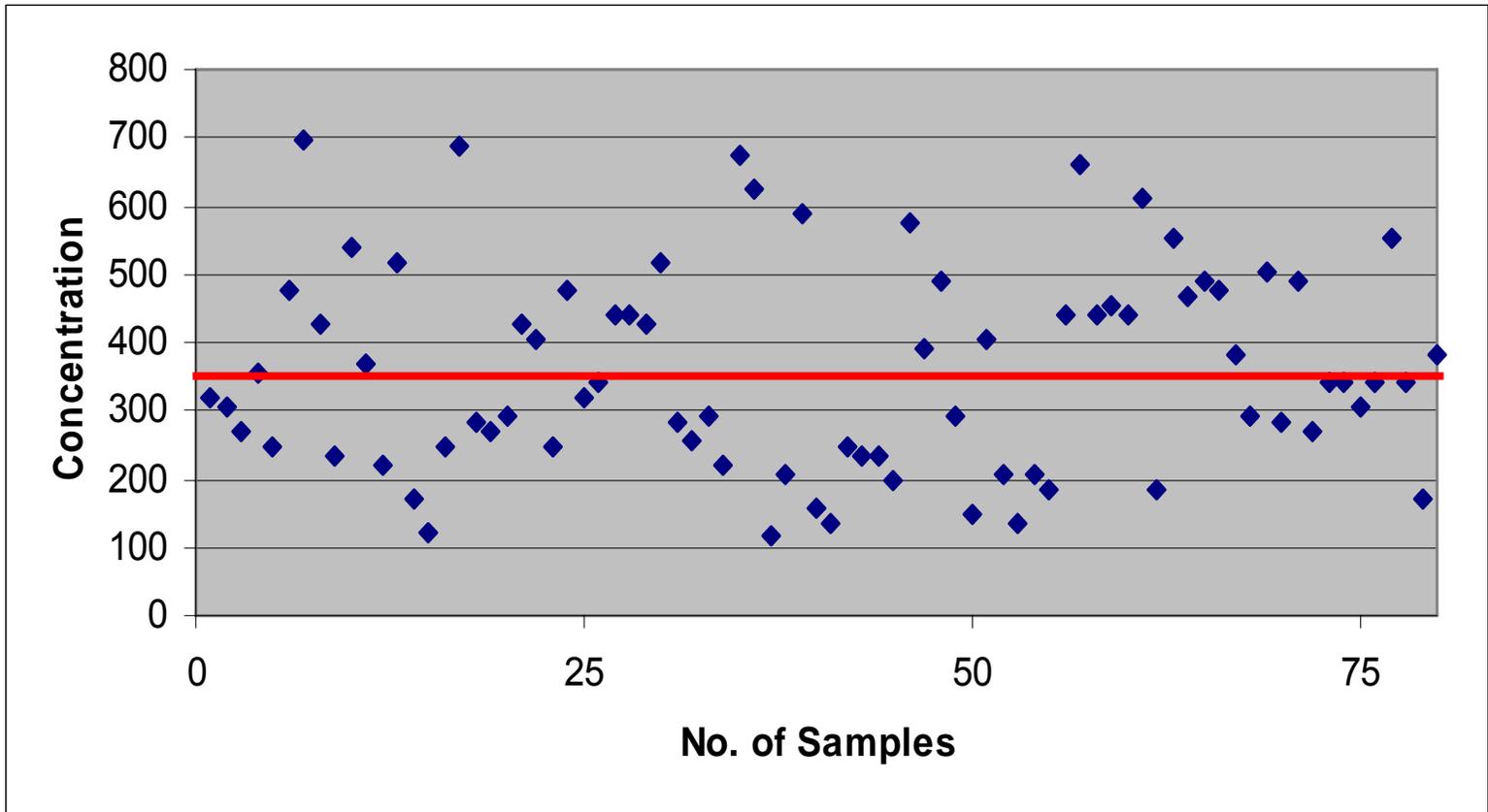


Data Recollection





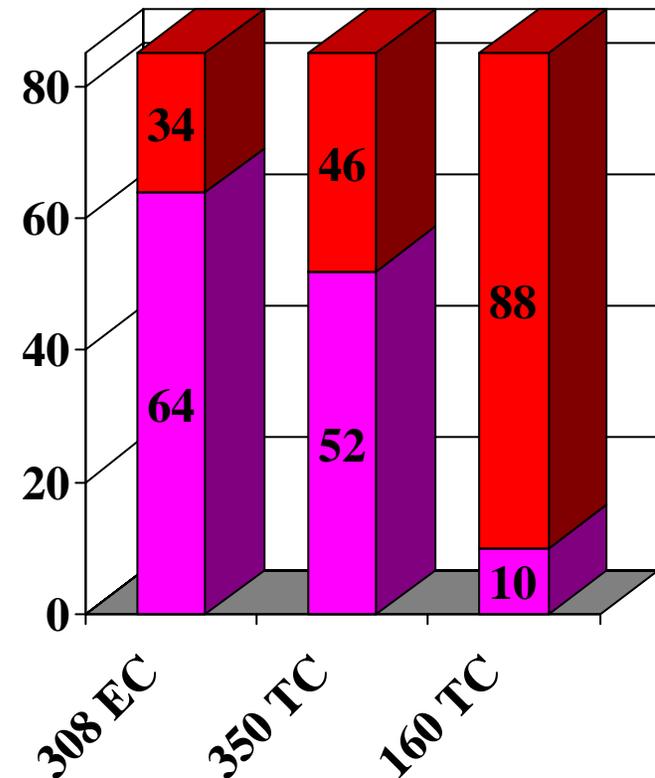
Data Recollection





Data Recollection

- 65% compliance with $308_{EC} \mu\text{g}/\text{m}^3$
- 53% compliance with $350_{TC} \mu\text{g}/\text{m}^3$
- 10% compliance with $160_{TC} \mu\text{g}/\text{m}^3$





THANK YOU

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