

GRANTS RECLAMATION PROJECT

Public Meeting – October 20, 2005

- **Project Update**
 - **Proposed Background Water Quality Standards**
-

Joint presentation by:

**U.S. Nuclear Regulatory Commission
Region VI USEPA**

**New Mexico Environment Department
– Ground Water Bureau**

Homestake Mining Co. of California



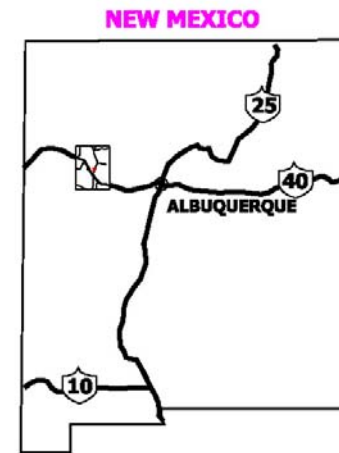
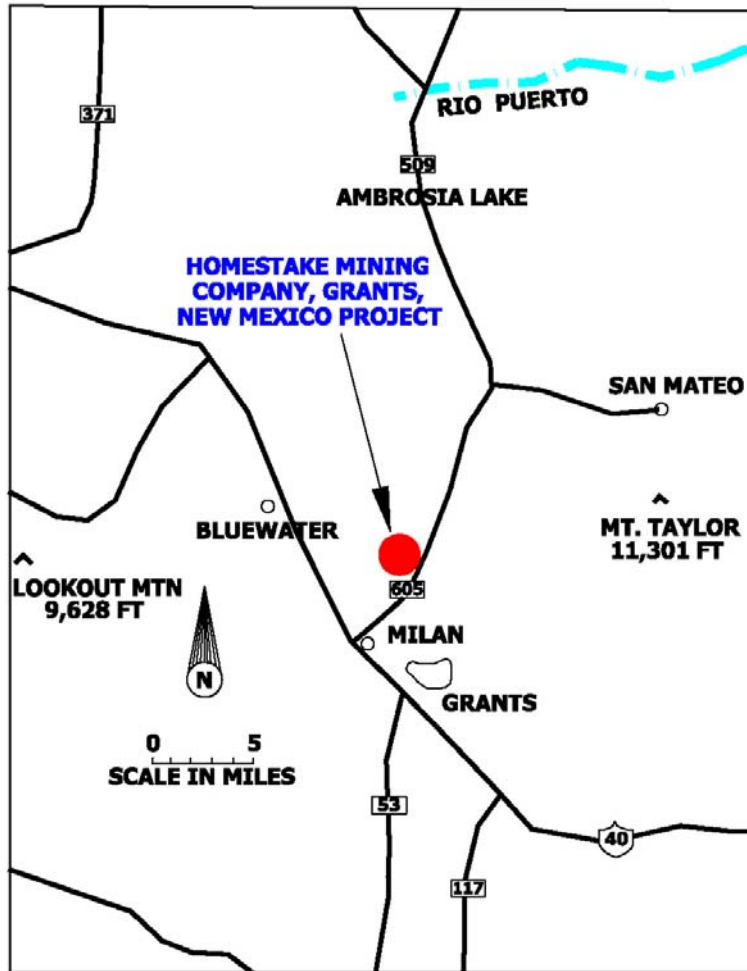
Homestake Background Groundwater Quality Review

William von Till

Senior Project Manager/Hydrogeologist

Nuclear Regulatory Commission

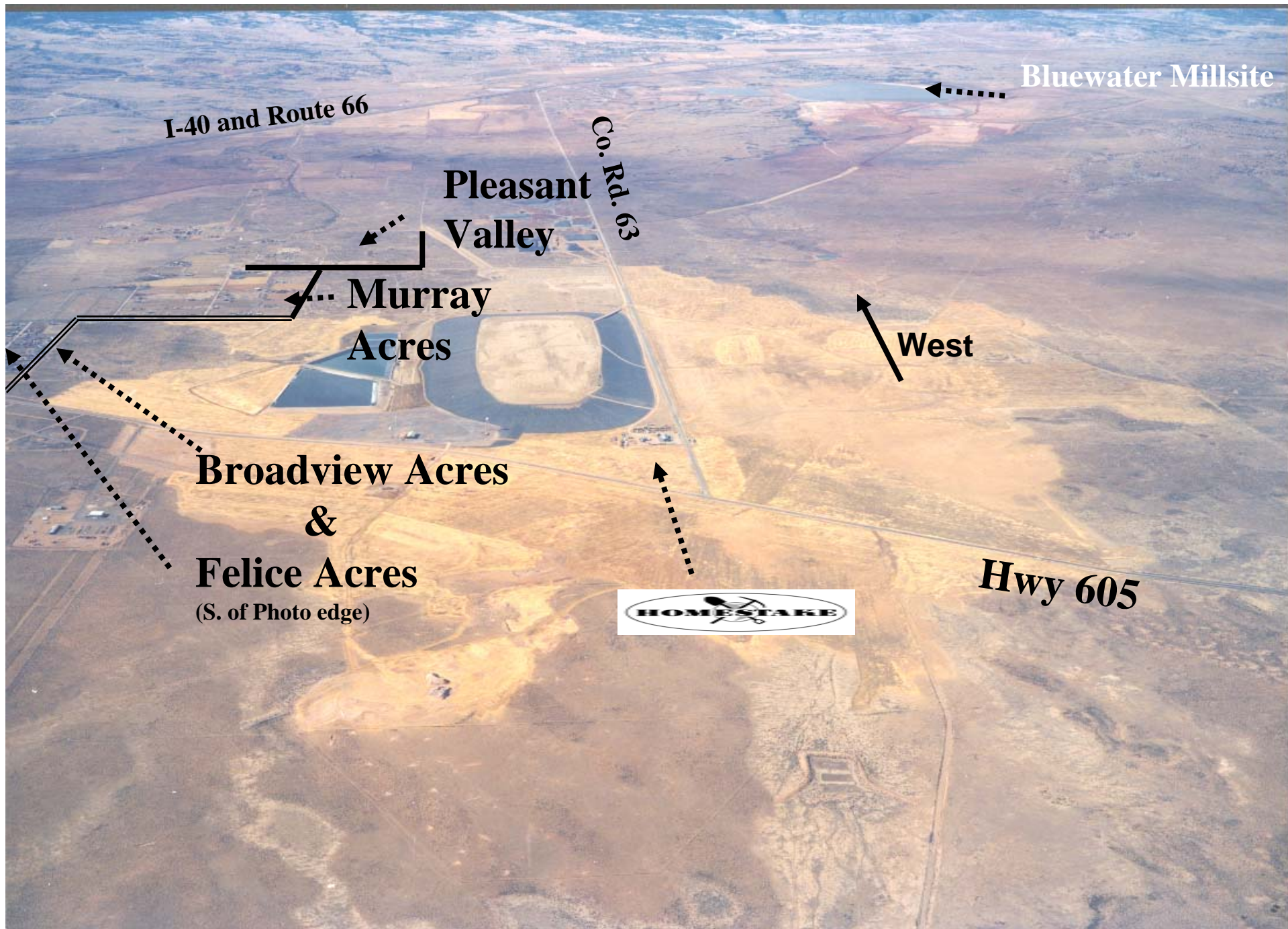
Office of Nuclear Material Safety and
Safeguards



**HOMESTAKE MINING
COMPANY, GRANTS,
NEW MEXICO PROJECT**

DATE: 02/13/03
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Location of Grants Reclamation Project



Regulatory Process

- NRC – Primary Agency with regulatory oversight of Homestake mill via Atomic Energy Act
- EPA – Superfund site, MOU w/NRC regarding groundwater
- New Mexico NMED – State agency review
- Cooperation – All Agencies have reviewed and coordinated

Background Water Quality Review

REGULATORY FRAMEWORK:

10 CFR Part 40, Appendix A, Criterion 5B5

NRC Guidance NUREG-1620

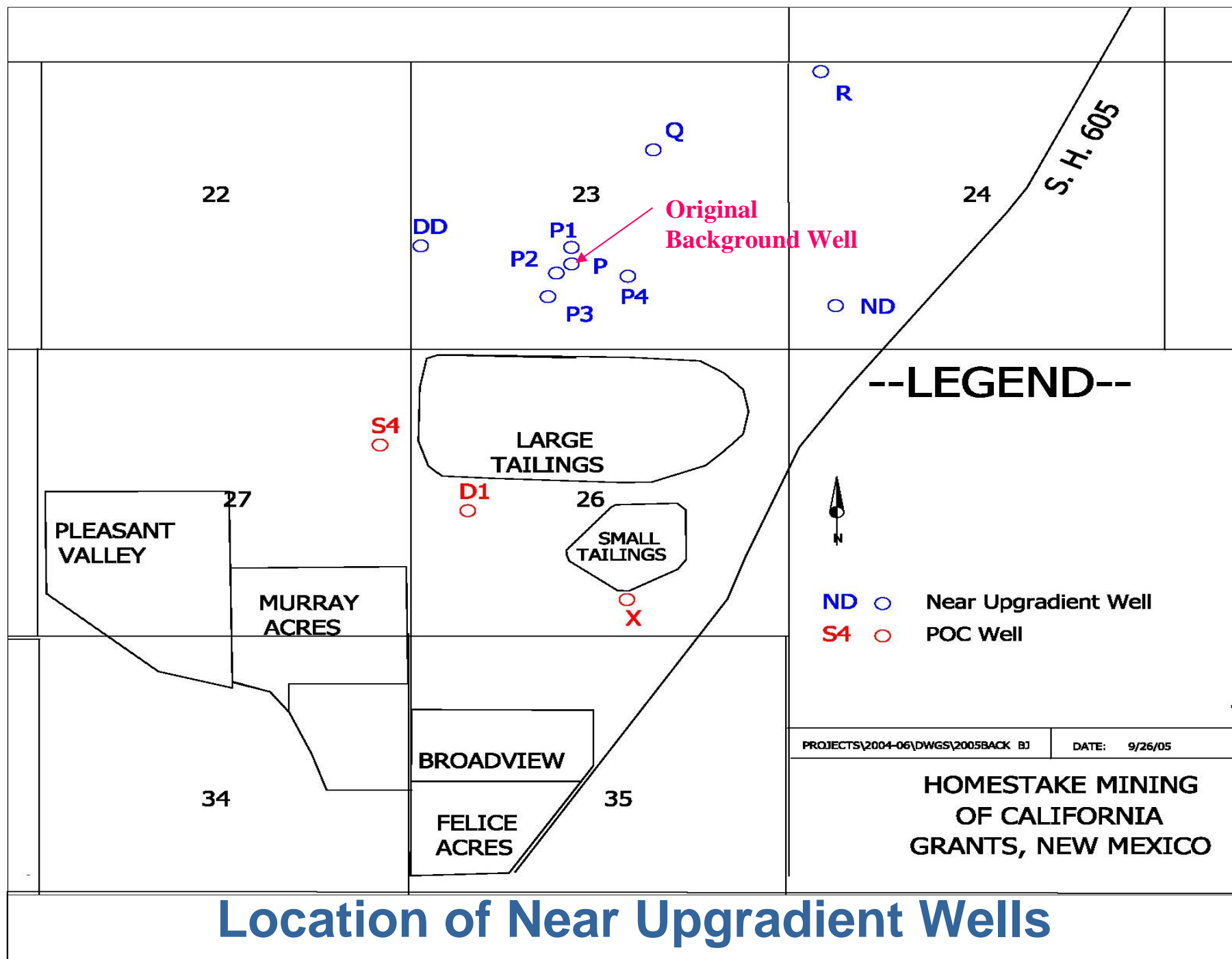
“Background water quality is defined as the chemical quality of water that would be expected at a site if contamination had not occurred from the uranium milling operation” (page 4-12).

Background Review

- Proper well locations
- Proper statistical methodology
- Separate zones of differing background
- Adequate sampling time period
- Not a review of corrective action plan
- Groundwater not associated with site not considered

Complex Site

- Multiple aquifers
 - Alluvial
 - Upper Chinle
 - Middle Chinle
 - Lower Chinle
- Wells used for background depicted in next slide
- Original background calculation on limited data



HOMESTAKE GRANTS BACKGROUND WATER QUALITY CONCENTRATIONS

PROPOSED BACKGROUND VALUES						
CONSTITUENTS		ALLUVIAL AQUIFER	CHINLE MIXING ZONE	UPPER CHINLE NON-MIXING ZONE	MIDDLE CHINLE NON-MIXING ZONE	LOWER CHINLE NON-MIXING ZONE
SELENIUM		0.32	0.14	0.06	0.07	0.32
URANIUM		0.16	0.18	0.09	0.07	0.02
MOLYBDENUM		0.04	0.10	0.08	0.05	0.03
SULFATE		1500	1750	914	857	2000
CHLORIDE		71	96	412	63	634
TDS		2734	3140	2010	1560	4140
NITRATE		12	15	--	--	--

Status

- NMED letter of August 18
- Homestake response to NMED letter
- Public Meeting
- EPA review
- NRC review
- Next steps at site – revision of groundwater corrective action program, reclamation

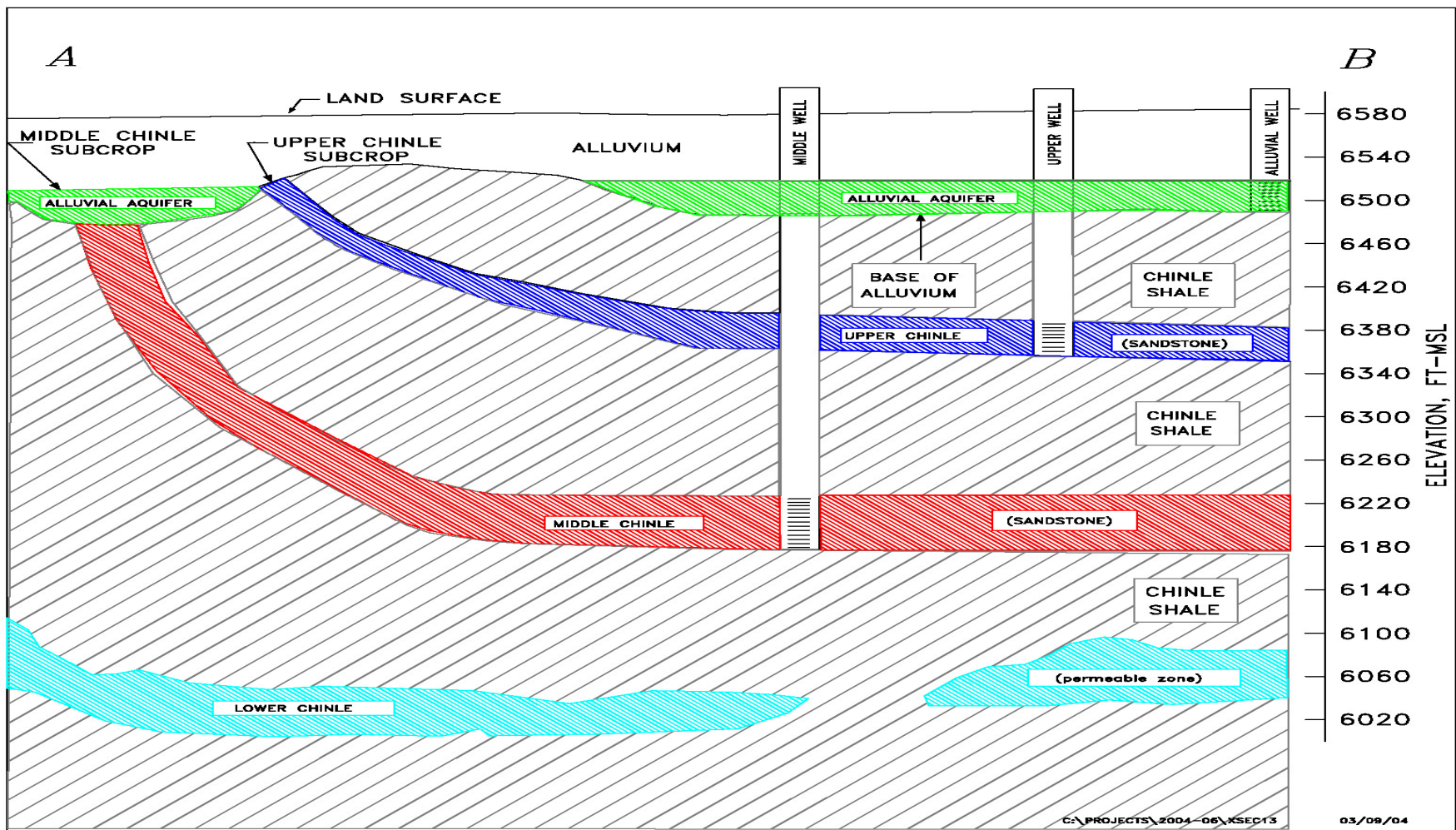
Project Briefing Remarks

Homestake Mining Co. – Grants, NM
Alan Cox, Project Manager

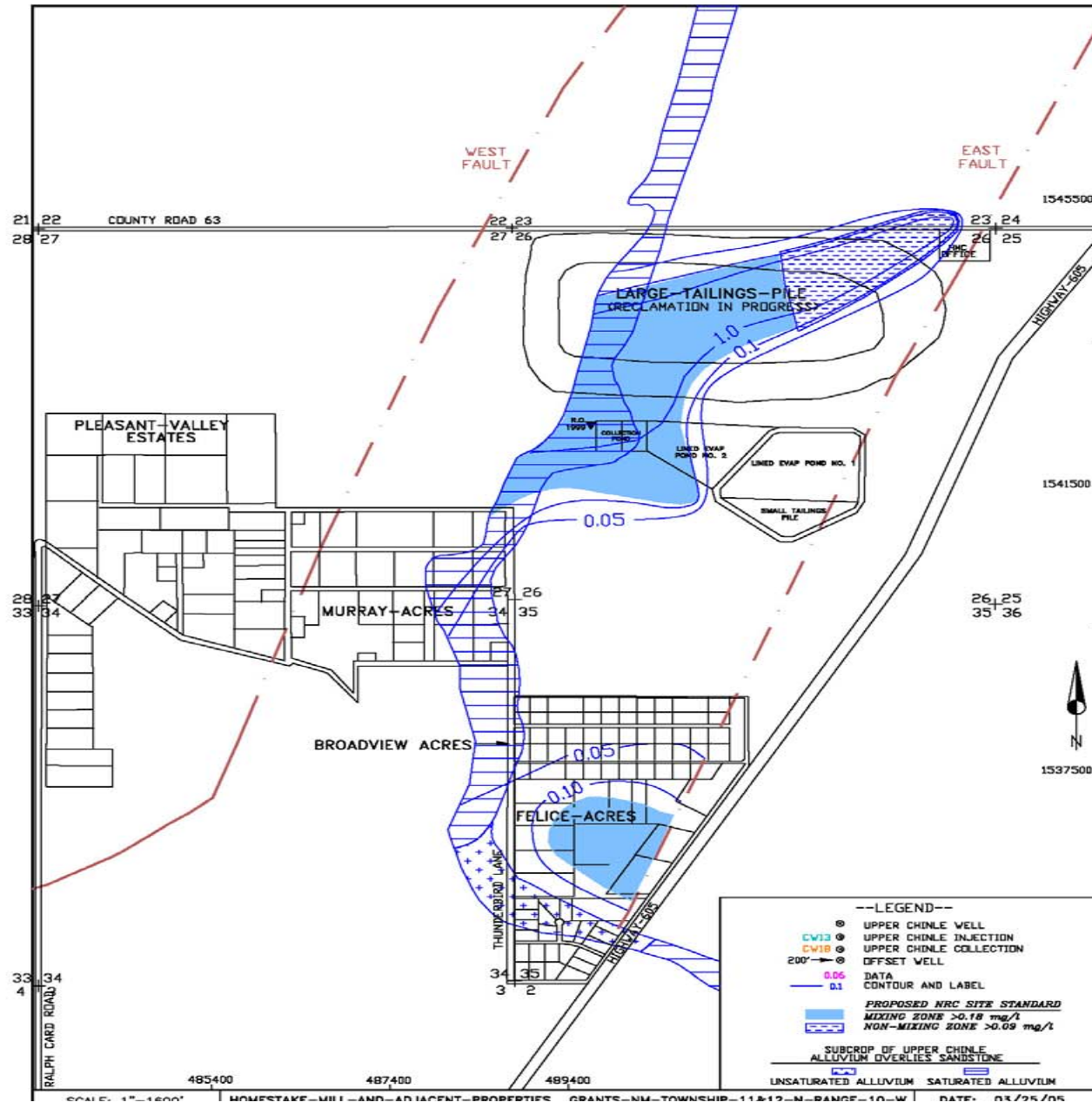
Project Update

Groundwater Restoration Progress

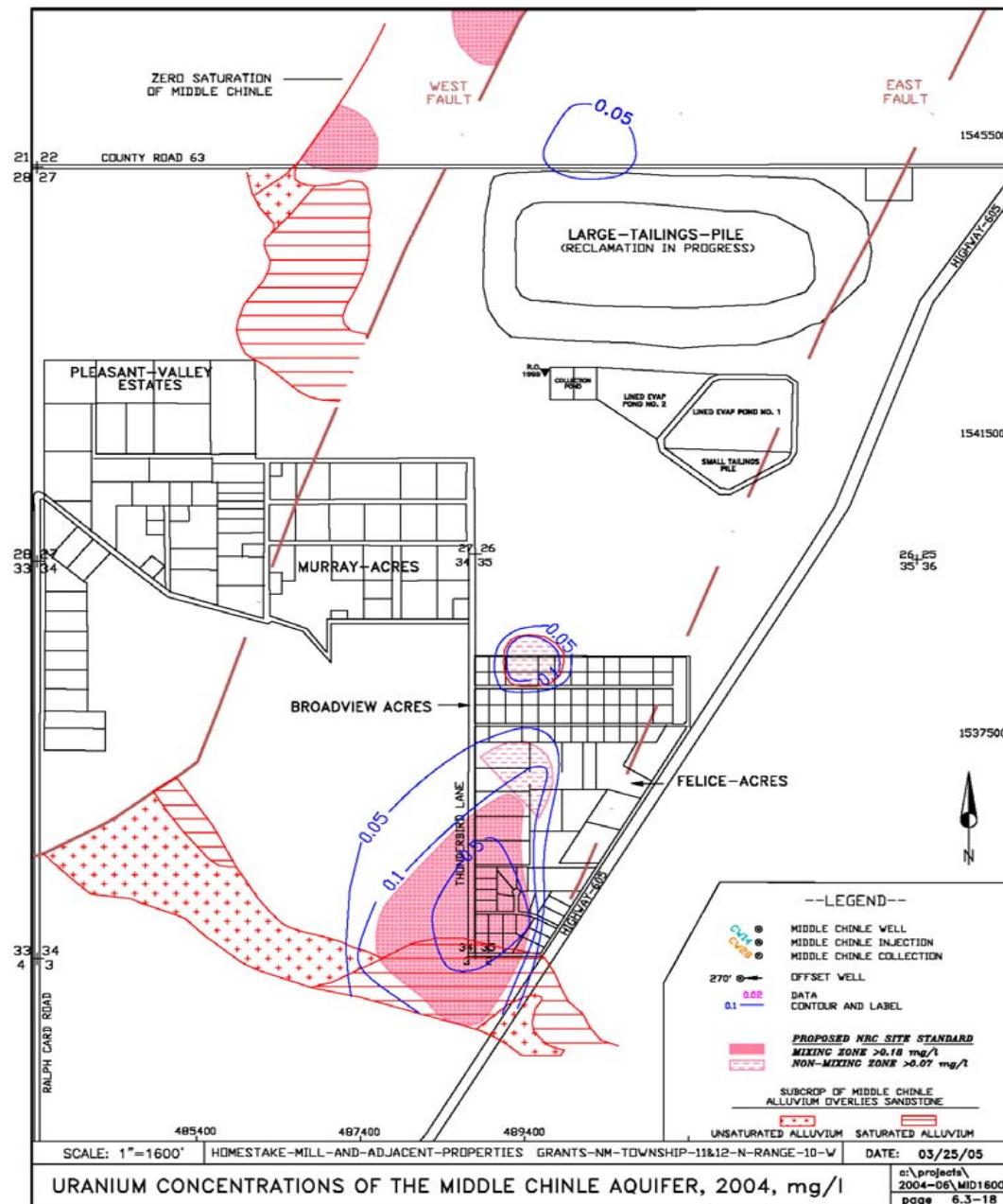
- »Alluvial aquifer
- »Upper Chinle aquifer
- »Middle Chinle aquifer
- »Lower Chinle aquifer



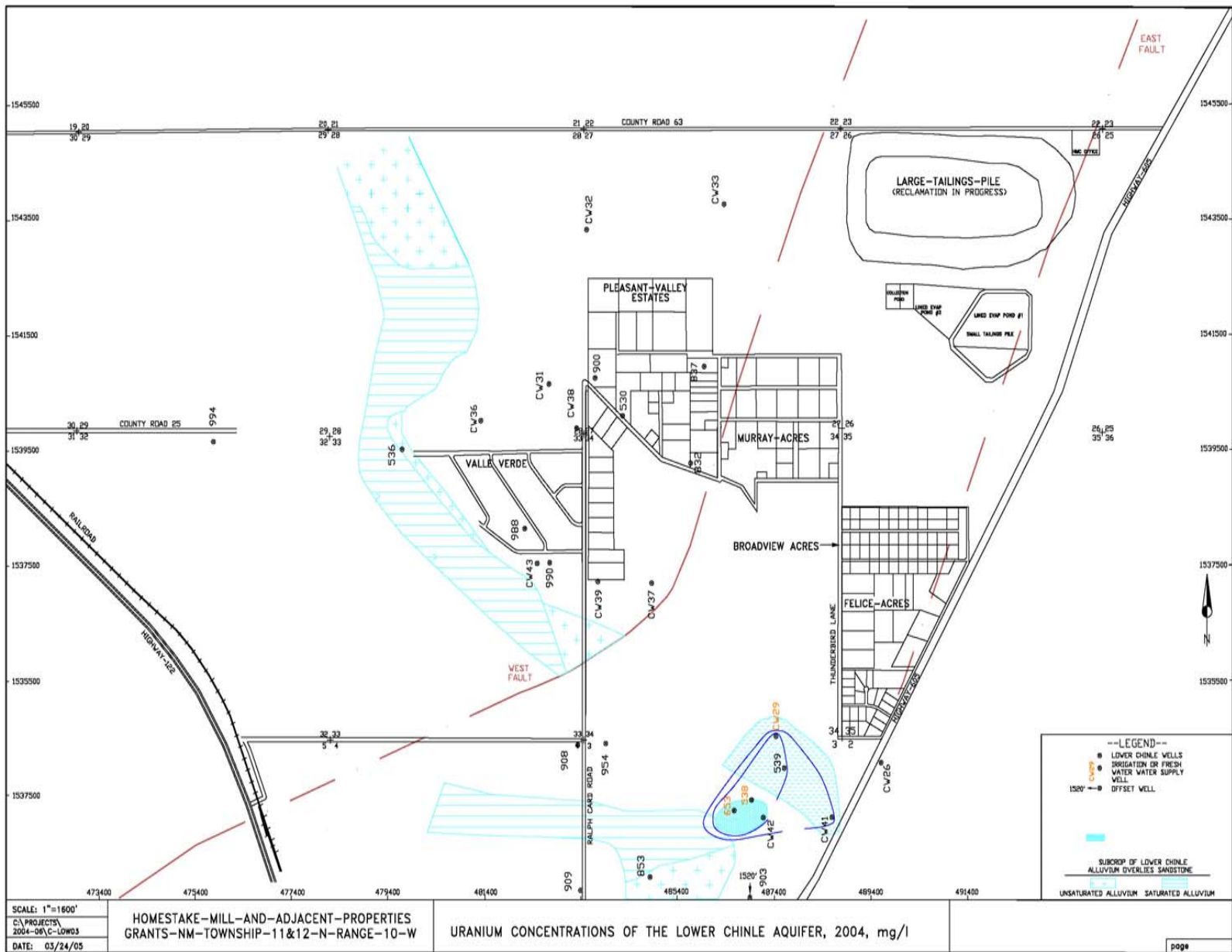
Typical Geologic Cross Section



Upper Chinle Aquifer Uranium Limits



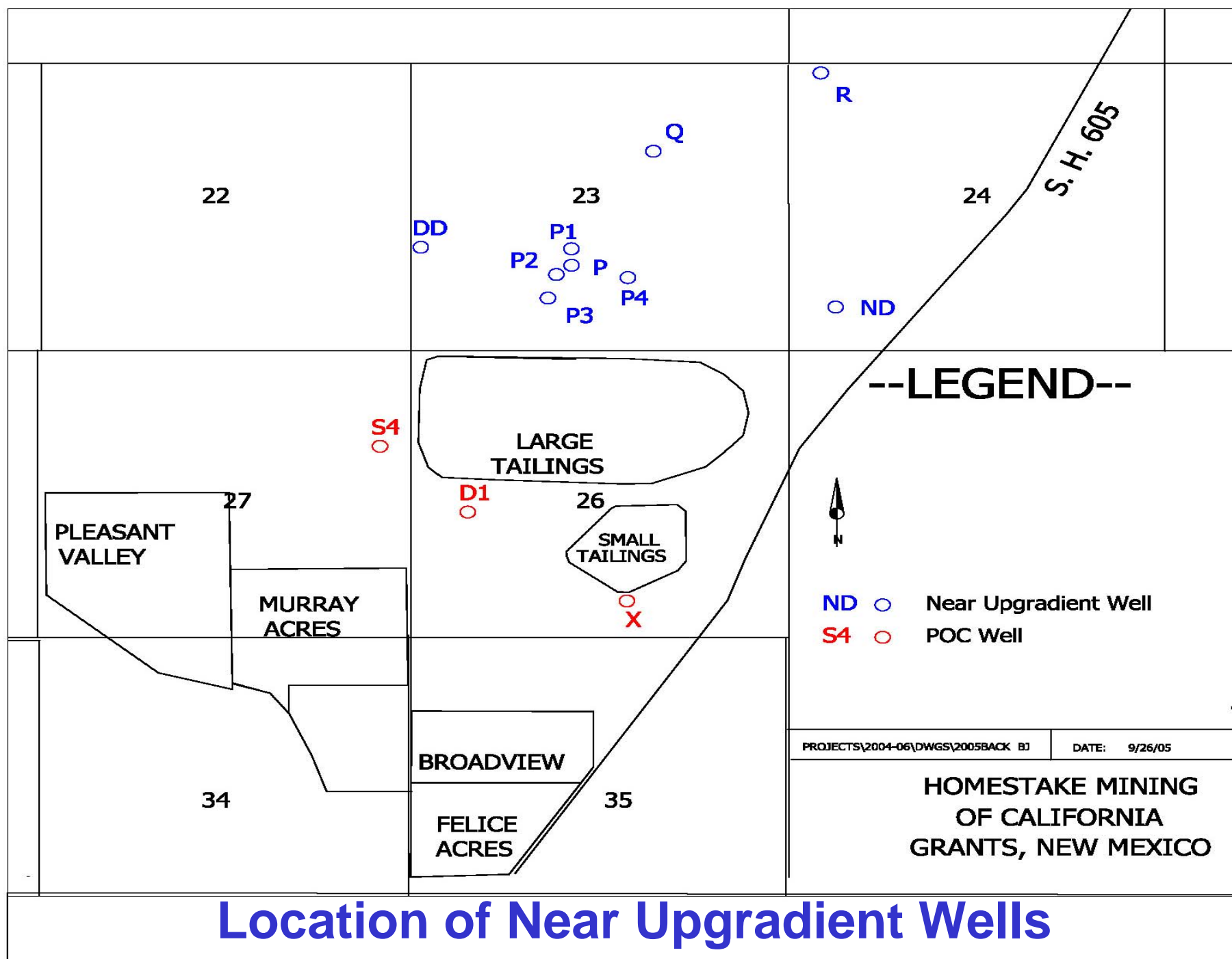
Middle Chinle Aquifer Uranium Limits



Lower Chinle Uranium Limits

Background Water Quality Determination

- **Location of Wells utilized for background / upgradient water quality data**



Statistical Analyses of Background Water Quality Data Set

- Statistical evaluation and analysis of background water quality well data is based on current EPA Guidance
- Statistical analysis was performed individually for each data set for the Alluvial aquifer and each of the Chinle aquifers related to the Site.



Proposed Groundwater Background Values at the Homestake Uranium Mill & Tailings Site, Grants, New Mexico

Public Meeting
October 20, 2005

Jerry Schoeppner
Geologist

New Mexico Environment Department
Ground Water Quality Bureau
Mining Environmental Compliance Section





Review of Background Proposal

Regulatory History

Clean Water Act – 1972

NPDES Permit

Water Quality Act and NMWQCC Regulations – 1977

Background definition (NMWQCC) – “means...the amount of ground-water contaminants naturally occurring from undisturbed geologic sources or water contaminants which the responsible person establishes are occurring from a source other than the responsible person’s facility...”

Homestake Mining Company’s Proposal

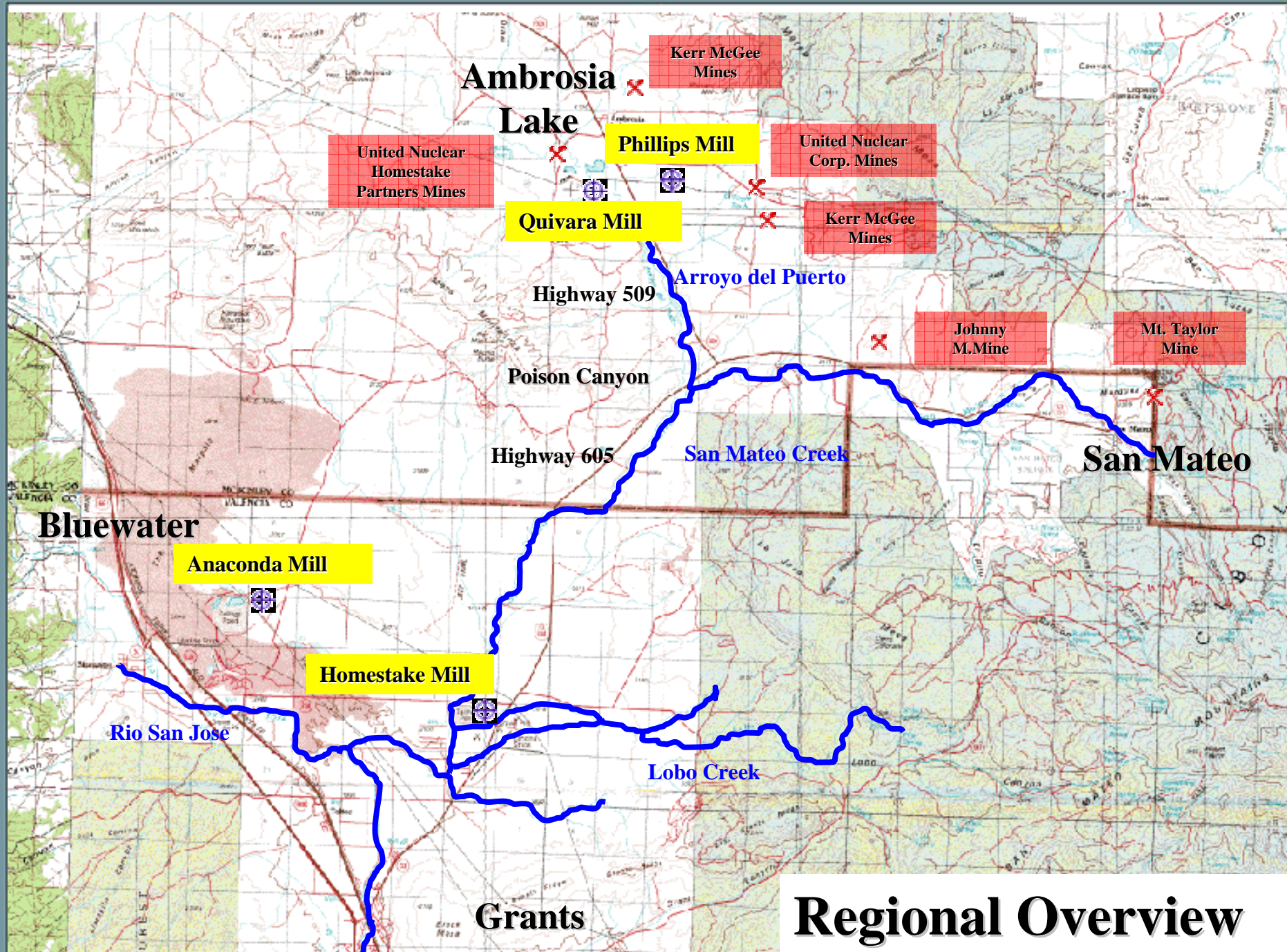
Statistical Methodologies

Data set

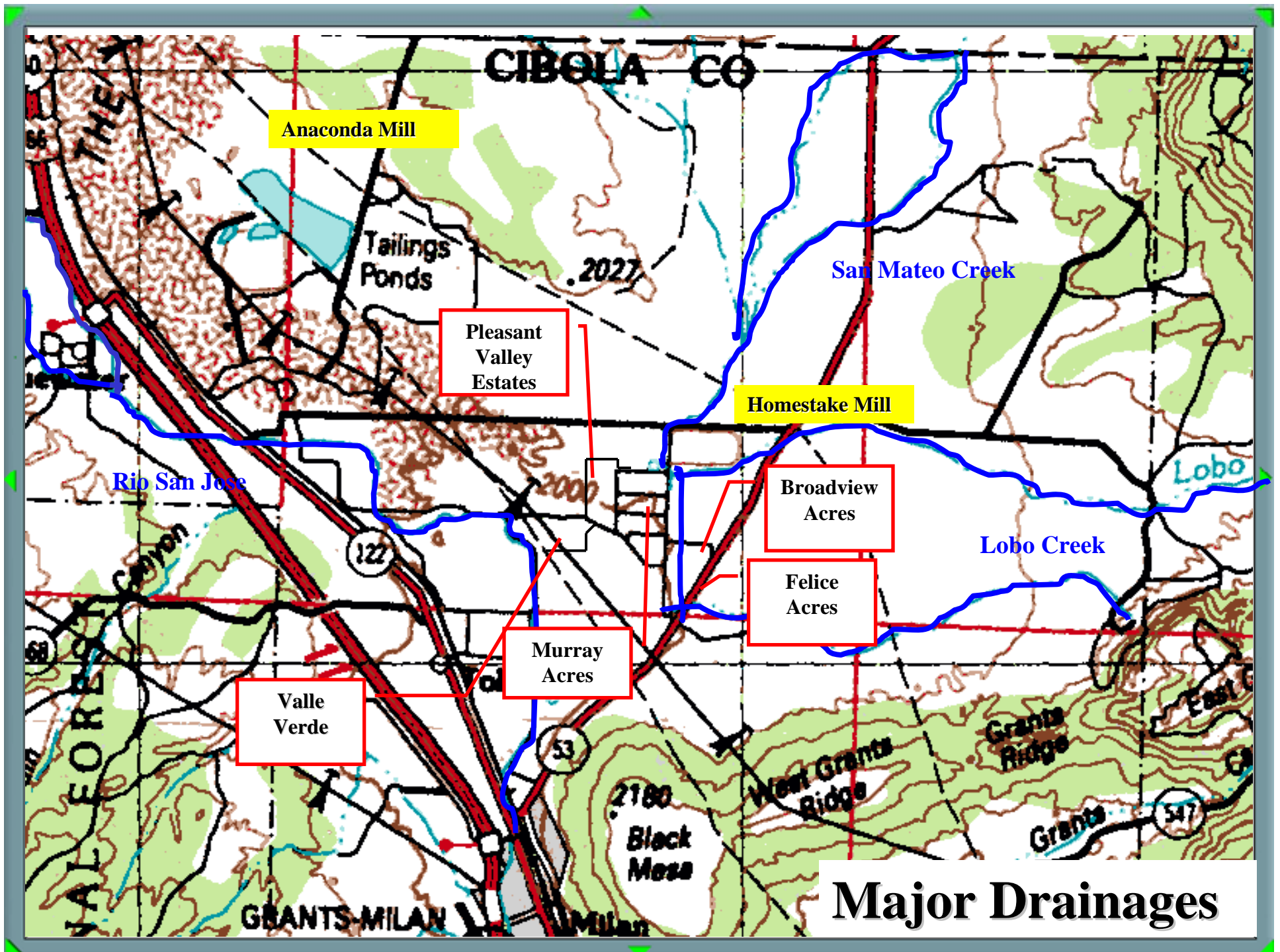
Proposed wells

Other data in the Region



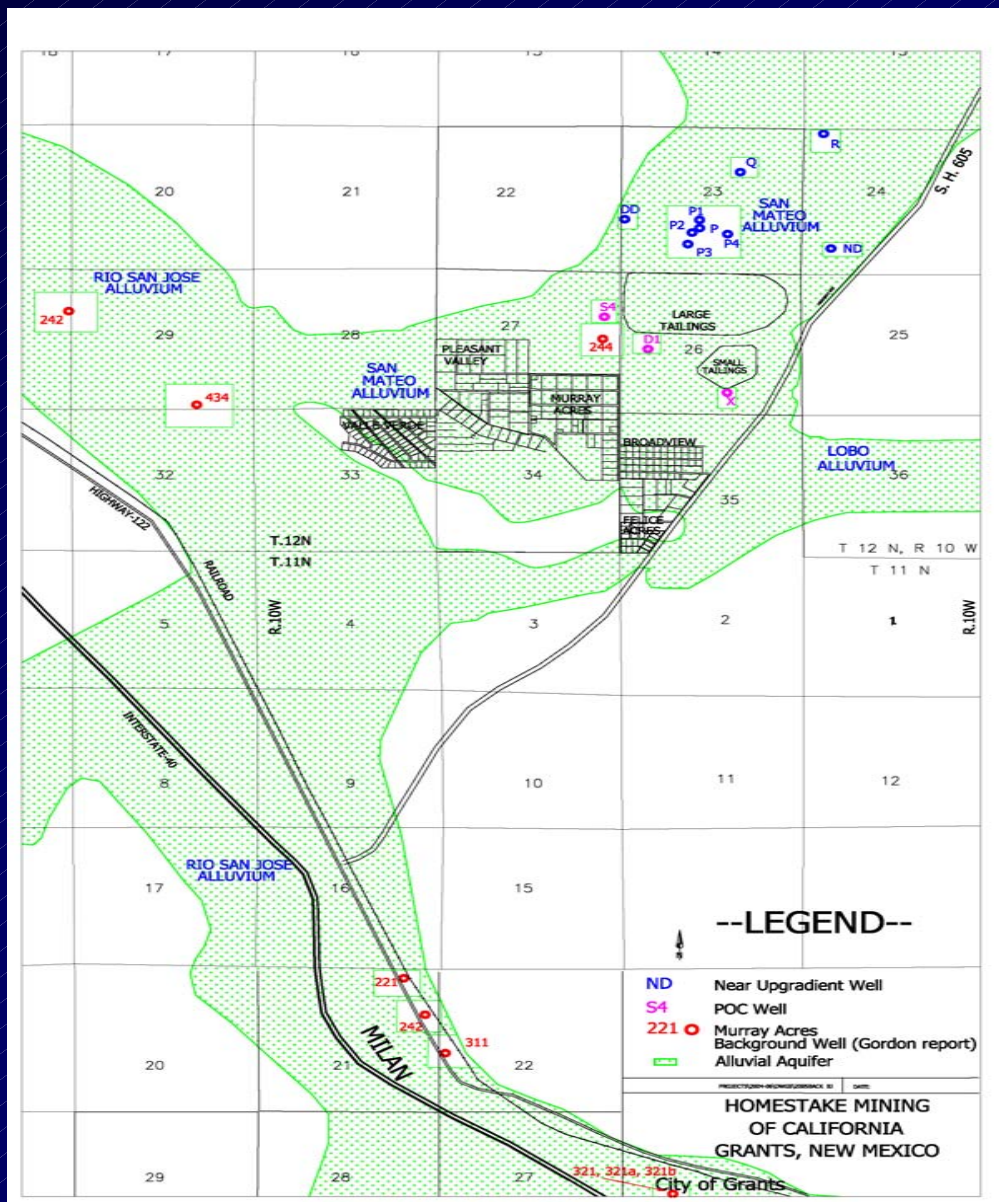


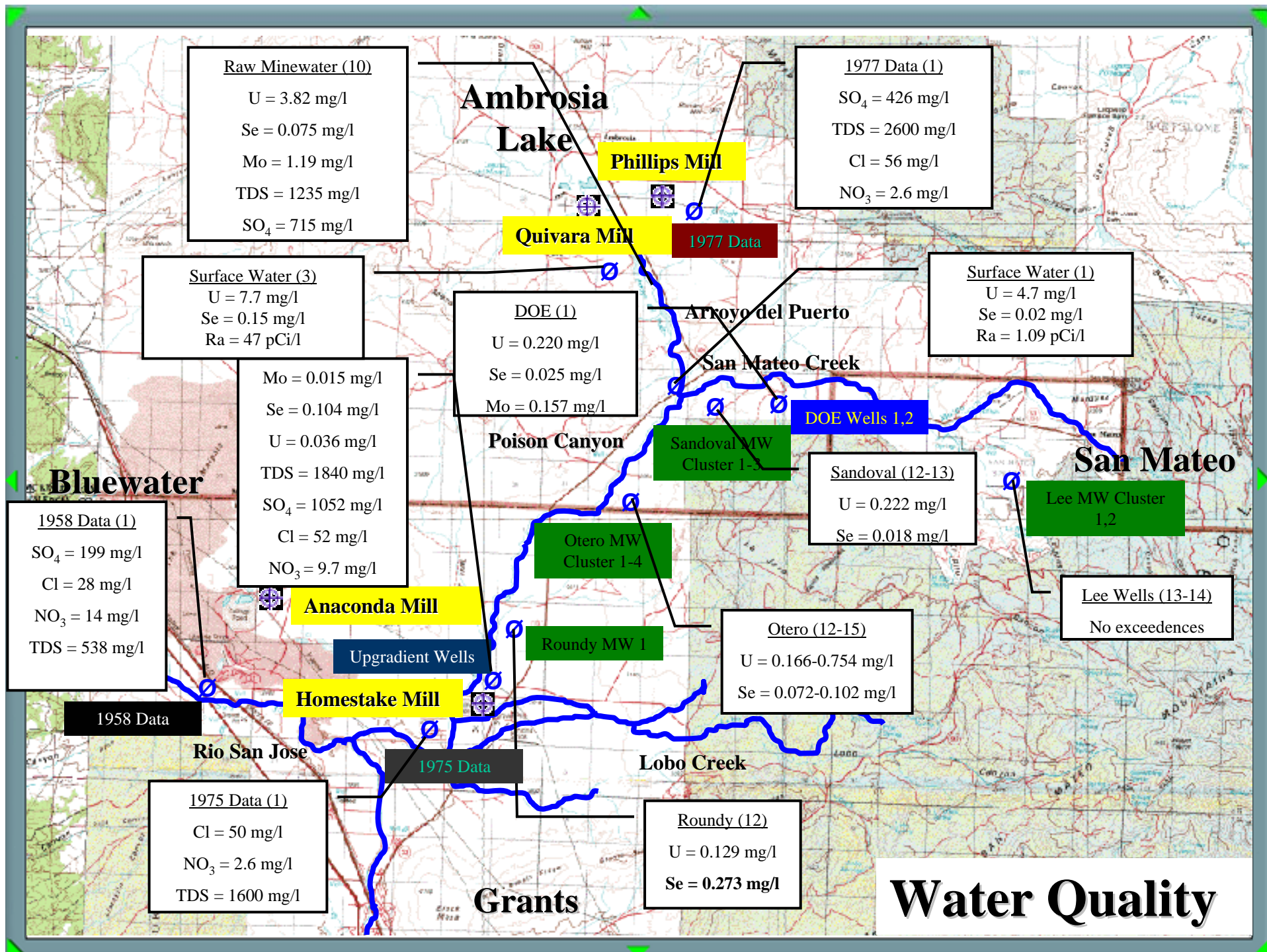
Regional Overview





Major Drainages







Quality of Mine Water, Surface Water & Groundwater

Source	Arsenic	Barium	Cadmium	Lead	Molybdenum	Selenium	Uranium	Va	Zinc	*Ra-226	TDS	Sulfate	Chloride	Nitrate
¹ Natural Runoff	0.13	7.7	0.01	0.52	<0.01	0.03	0.10	0.61	1.5	15				
² Waste Pile Runoff	0.21	5.9	0.01	0.56	0.02	0.03	0.58	1.10	1.7	650				
³ Raw Minewater	0.02				1.19	0.08	3.82			280+/-7	1235	715		
⁴ Treated Minewater	0.01	0.2			0.80	0.09	1.56	0.03		6.4+/-1.2	1610	755		
⁵ MW Above Mine Dis.	0.00	0.1	ND	ND	0.00	ND	ND	0.01	ND	0.04+/-0.02				
⁶ MW Below Mine Dis.	0.00	0.1	ND	ND	0.15	0.09	0.37	ND	ND	0.13+/-0.02				
⁷ Surface Water						0.07	6.07	0.63		18.12				
⁸ Upgradient Wells					0.02	0.10	0.04				1840	1052	52	9.7
⁹ Far Upgradient Wells					0.02	0.34	0.05				2388	1400	68	11.7
¹⁰ DOE Wells					0.16	0.03	0.20							
¹¹ 1958 Data											538	199	28	14
¹² 1975 Data											1600		50	2.6
¹³ 1977 Data											2600	426	56	2.6
HMC Proposed					0.05	0.27	0.15				3060	1870	71	23
10 Year Data					0.04	0.32	0.16				2734	1500	71	12
WQCC	0.1	1	0.01	0.05	1	0.05	0.03		10	30	1000	600	250	10
¹ Impacts of Uranium Mining on Surface and Shallow Groundwaters, Grants Mineral Belt, NM, NMEID, Sept. 1986, 1982 Data (6 Sampling Events), Median														
² Impacts of Uranium Mining on Surface and Shallow Groundwaters, Grants Mineral Belt, NM, NMEID, Sept. 1986 (Old San Mateo Mine, 15 events), Median														
³ Impacts of Uranium Mining on Surface and Shallow Groundwaters, Grants Mineral Belt, NM, NMEID, Sept. 1986 (1980-1982 Data, 10 events), Median														
⁴ Impacts of Uranium Mining on Surface and Shallow Groundwaters, Grants Mineral Belt, NM, NMEID, Sept. 1986 (1977-1982 Data, 21-27 events), Median														
⁵ Impacts of Uranium Mining on Surface and Shallow Groundwaters, Grants Mineral Belt, NM, NMEID, Sept. 1986 (1977-1982 Data, 12-15 events (Lee MWs), Mean														
⁶ Averaged Mean of 6 Wells - Concentrations Vary based on Location of Monitoring Wells (Otero, Sandoval & Roundy Wells)														
⁷ Water Quality Impacts of Uranium Mining and Milling Activities in the Grants Mineral Belt, NM, EPA906/9/75-002, September 1975, 1-3 Sampling Events, Average														
⁸ Statistical Evaluation of Alluvial GW Quality Upgradient of Homestake Site Near Grants, Environmental Restoration Group, Dec. 2001 (1976-2001 data), Median														
⁹ Statistical Evaluation of Alluvial GW Quality Upgradient of Homestake Site Near Grants, Environmental Restoration Group, Dec. 2001 (1981-2001 data), Median														
¹⁰ Single sampling event per well, 1980-1982, Well 594 & 595 averaged														
¹¹ Geology & GW Resources of the Grants-Bluewater Area, Valencia County, NM, NM State Engineer Technical Report 20, 1961, Median of 15 wells														
¹² Water Quality Impacts of Uranium Mining and Milling Activities in the Grants Mineral Belt, NM, EPA906/9/75-002, September 1975, Median of 31 wells														
¹³ Hydrogeology of Water Resources of the Ambrosia Lake-San Mateo Area McKinley & Valencia Co., NM Health & Envir. Dept., June 1979, Median of 18 wells														
Values in mg/l unless otherwise noted														
*pCi/l														





Summary

- *Statistical Methods
- *Background Monitoring Well Network
- *Minewater Chemistry
- *Surface Water Chemistry
- *Groundwater Chemistry
- *Natural sources of contamination





Residential Well Survey & Sampling

Homestake Mining Company
Public Meeting
October 20, 2005

Jake Ingram
Geoscientist
New Mexico Environment Department





Objectives

- Identify domestic wells near Homestake Superfund site.
- Determine use of domestic well water
 - E.g., consumption, landscape, garden, livestock, etc.
- Conduct water quality assessment in communities
- Public Outreach
- Distribute results to well owners – NO DATA YET





Activities

- Door-To-Door Survey (August 15-19, 2005)
 - NMED & EPA staff
 - Identify wells for sampling
 - Gain consent for sampling
 - Approximately 30 wells were selected for sampling
- Well Sampling (September 18-22, 2005)
 - NMED & EPA staff
 - 34 Wells sampled

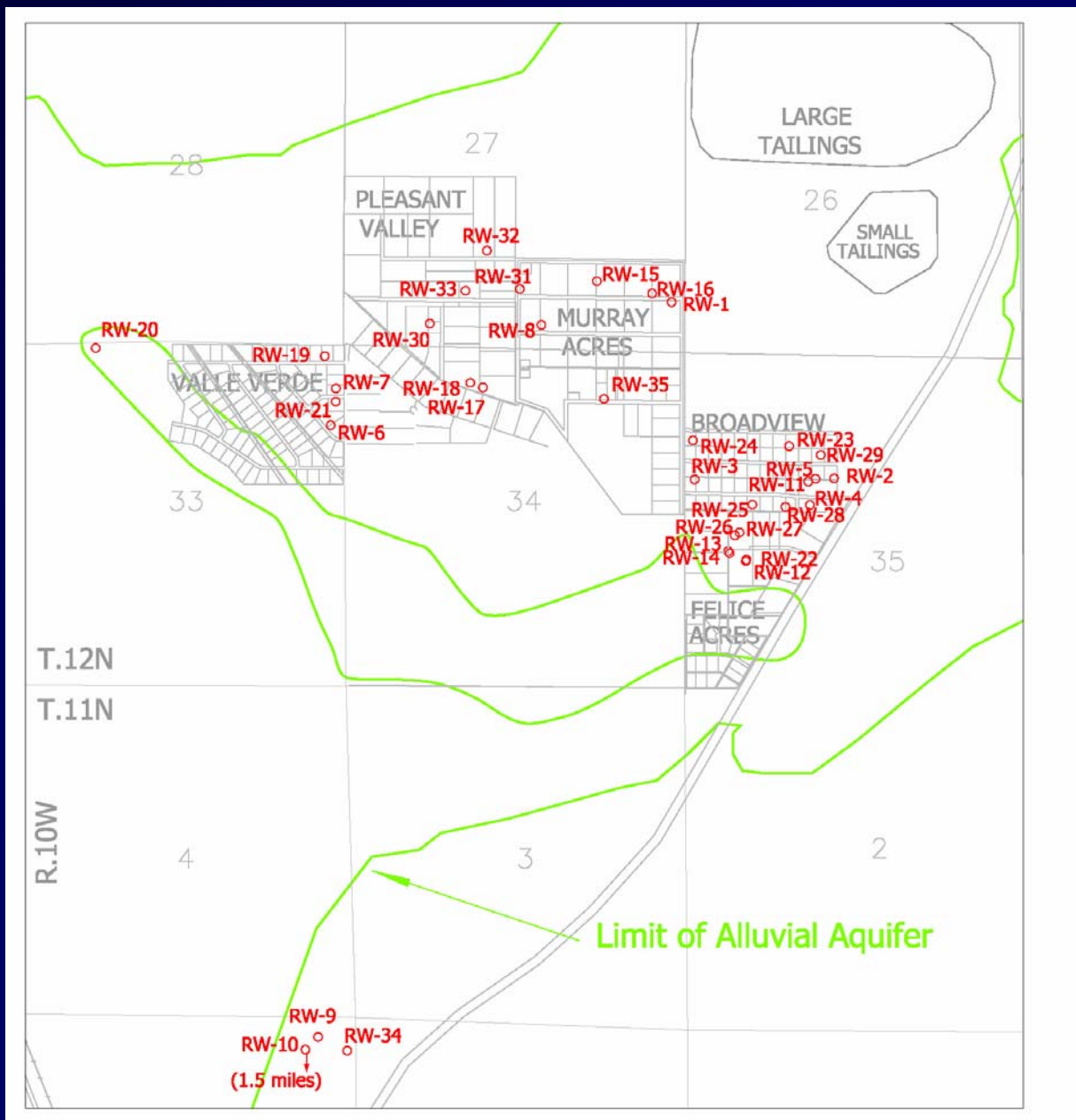




Details

- Sampled wells with working pumps
- Analytes included Uranium, Selenium, Thorium, Ra –226, Ra – 228, metals, water chemistry, VOC's
- Energy Labs and Pinnacle Labs







Findings

- Various uses of water
 - Irrigation, landscape, livestock, pets, vegetable garden, consumption
- Wells completed in different aquifers
 - Alluvial
 - Chinle
- Awaiting results from labs





Conclusion

- Lab Results Pending
- Mail results to well owners
- Compile data in a report
- Additional sampling in the future

Thank you

Jake Ingram (505-827-0039)





Homestake Background Groundwater Quality Review

Comments / Questions
From
Public