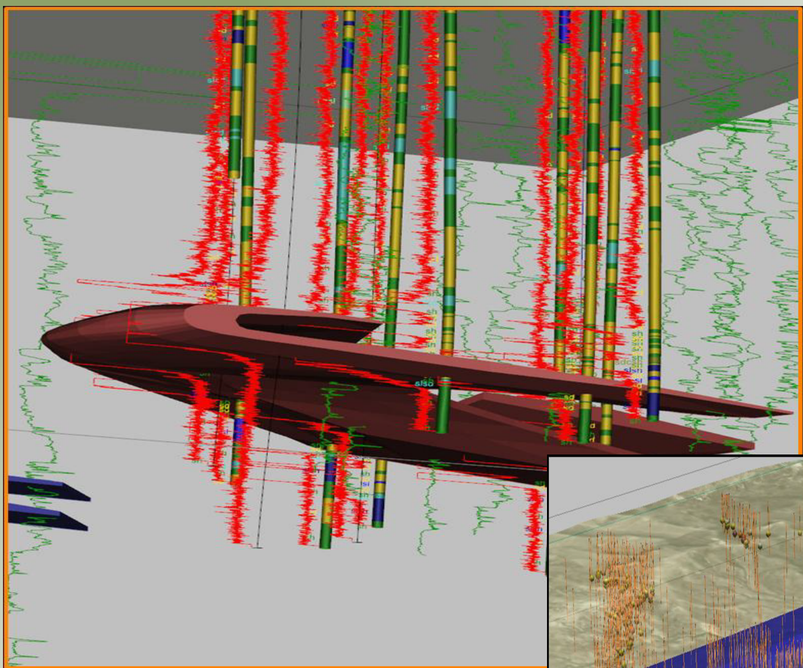
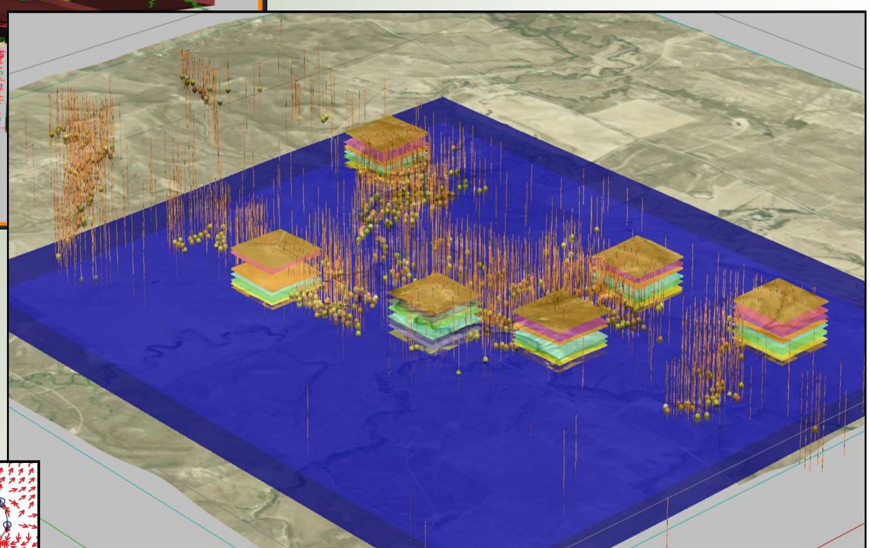
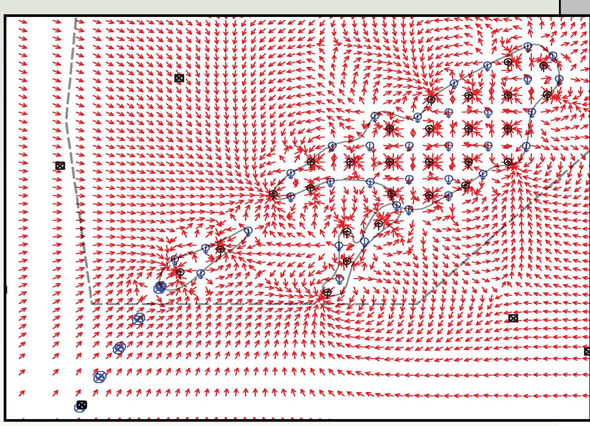
Ross ISR Project USNRC License Application
Crook County, Wyoming





December 2010



Technical Report
Volume 3 of 6
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STRATA ENERGY

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ADDENDUM 1.2-A

NUBETH R&D

(NUCLEAR DYNAMICS/SUNDANCE PROJECT)

SITE DECOMMISSIONING DOCUMENTS

THE STATE OF WYOMING

ED HERSCHLER
GOVERNOR

Department of Environmental Quality

LAND QUALITY DIVISION
DISTRICT IV OFFICE
·0 EAST GRINNELL STREET TELEPHONE 307-672-6488 SHERIDAN, WYOMING 82801

April 25, 1983

Mr. Albert F. Stoick
Manager, Nubeth Joint Venture
ND Resources, Inc.
P.O.B ox 1449
Glenrock, Wyoming 82637

RE: Sundance Project, License to Explore No. 19

Dear Mr. Stoick:

On the basis of information supplied by your company and on the basis of confirmation water samples taken November 24, 1983, the Land and Water Quality Divisions concur that restoration of the groundwater at the Sundance Project has been done to meet applicable water quality standards.

Accordingly, ND Resources and the Nubeth Joint Venture are released from any further aquifer and groundwater restoration requirements for this area.

At your request, the reclamation bonding requirements will be reduced to reflect the elimination of bond coverage for groundwater restoration.

Reclamation bond coverage for the surface disturbances, including the well field, plant building, evaporation ponds and access road will continue to be required until either the area is reclaimed or the site is converted to an approved non-mining use.

If you have any questions, please contact the District IV Engineer, Richard Chancellor.

Sincerely,

Nancy Freudenthal
Acting Land Quality Administrator

William Garland
Water Quality Administrator

Robert E. Sundin
Director, Dept. of Environmental Quality

CM:kn

UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION IV
URANIUM RECOVERY FIELD OFFICE
BOX 25325
DENVER, COLORADO 80225

JUL 1 1 1983

URFO:TLJ
Docket No. 40-8663

ND Resources
ATTN: Mr. Albert F. Stoick
P. O. Box 1449
Glenrock, Wyoming 82637

Gentlemen:

We have reviewed available ground-water restoration data for your Oshoto site project. Based on this review, we have concluded that the ground water has been adequately restored. Our review memorandum is attached.

Please note that the NRC staff must approve the adequacy of your decontamination and decommissioning before your license can be terminated. If you have any questions, please contact Mr. T. L. Johnson (301-427-4319) of my staff.

Sincerely,

John J. Linehan, Chief
Licensing Branch 2
Uranium Recovery Field Office, RIV

Enclosure:
As stated

DISTRIBUTION
Docket 40-8663
DCS/PDR
Region IV
URFO PM/f
URFO r/f
WDEQ (2)

JUN 9 1983

URFO:TLJ
Docket File 40-8663
04008663011E

MEMORANDUM FOR: Docket File No. 40-8663

FROM: Ted L. Johnson, Project Manager
Licensing Branch I
Uranium Recovery Field Office, RIV

SUBJECT: ND RESOURCES - REVIEW OF GROUNDWATER RESTORATION ACTIVITIES

Background

On April 14, 1978, License SUA-1331 was issued to ND Resources (formerly Nuclear Dynamics, Inc.). The five-spot wellfield was leached with a carbonate-based lixiviant from November 1978 to April 1979. Restoration activities utilizing groundwater sweep and fresh water injection techniques were initiated immediately following shutdown. On September 19, 1979, these restoration activities were terminated. After a stabilizing period of about seven months, post-restoration sampling began on April 30, 1980. A restoration report summarizing the 1980 sampling was reviewed by the NRC staff, who concluded that additional restoration would be necessary, principally because levels of arsenic, molybdenum, selenium, vanadium, and uranium exceeded baseline values.

Additional sampling was performed by ND Resources in 1981, and final confirmation sampling was performed by DEQ in 1982. This memorandum constitutes my review of DEQ's analysis of the 1982 confirmation sampling and my review of the overall adequacy of restoration.

Discussion

In order to evaluate the effectiveness of groundwater restoration at the NDR site, I reviewed the 1) DEQ 1982 sampling data, 2) NDR 1981 sampling data, and 3) NDR 1980 sampling data. Several wells that were sampled by DEQ did not have any baseline data. The wells with baseline data were compared to that baseline data and to quality-of-use standards. Wells without baseline data were compared to average well-field baseline data and the quality-of-use standards. The quality-of-use standards used were the State of Wyoming Class I (domestic), Class II (irrigation), and Class III (livestock) standards.

Following is a summary of parameters which exceed high baseline values or quality-of-use standards for each well sampled. All other parameters were restored to below these values.

Well	Parameters Exceeding High Baseline or Quality-of-Use Standard	Concentration (11/24/82 Samples)(mg/l)	High Baseline Value (mg/l)	Quality-of-Use Standard (mg/l)
3X	HCO_3	614	603	No Standard
	Mo	0.02	0.005	" "
	Gross Alpha	1260 pCi/l	340	" "
	Gross Beta	533 pCi/l	340	" "
7X	F	0.81	N/A	1.4-2.4
	Ba	<0.5	<0.1	1.0
	Cr	<0.02	<0.01	0.05
	V	<0.1	<0.005	0.1
	U	0.016	0.008	5.0
	Mo	<0.02	<0.005	N/S
	Co_3	189	23	N/S
	Gross Alpha	10 pCi/l	3.9 pCi/l	N/S
	Gross Beta	25 pCi/l	22 pCi/l	N/S
	Ra-226	2.3 pCi/l	0.5 pCi/l	5 pCi/l

40-8663/mne/83/05/27/0

OFC	:URFO	:URFO	:URFO	:	:	:	:
NAME	:TJohnson:me	:BFisher	:HPettengill	:	:	:	:
DATE	:83/06/09	:	:	:	:	:	:

Well	Parameter	Concentration (mg/l, except pH)	High Baseline (mg/l, except pH)	Quality-of-Use Standard (mg/l, except pH)
19XX	HCO_3	619	171	N/S
	Na	643	272	N/S
	TDS	1800	1031	500*
	pH	8.9	8.7	6.5-8.5
	SO_4	790	598	200*
77XX	HCO_3	628	171	N/S
	Na	669	272	N/S
	TDS	1850	1031	500*
	pH	9.1	8.7	6.5-8.5
	SO_4	802	598	200*

*Based on mean baseline values. Standard would be higher if based on high baseline values.

1. Well 3X

All parameters, except those listed in the preceding table, were restored to values less than the high baseline value. Bicarbonate slightly exceeds its high baseline value; this increase (603 to 614 mg/l) is insignificant. Molybdenum increased from .005 to .02 mg/l; this incrase is also felt to be insignificant since some baseline data had a detection limit of 0.05, and no standard has been set for this parameter. Based on an examination of other data, the gross alpha and gross beta increases are unimportant since (1) no quality-of-use standard exists, (2) levels are much lower in other parts of the wellfield, and (3) other parameters were fully restored to acceptable limits.

40-8663/mne/83/05/27/0

OFC	:URFO	:URFO	:URFO	:	:	:	:
NAME	:TJohnson:me	:BFisher	:HPettengill	:	:	:	:
DATE	:83/06/09	:	:	:	:	:	:

2. Well 7X (Upper Aquifer Monitor Well)

All parameters which exceeded the high baseline value are either 1) below the quality-of-use standard, or 2) no quality-of-use standard exists. All other parameters meet their respective standards.

3. Wells 19XX and 77XX

Bicarbonate and sodium for both wells, and carbonate for 77XX, exceeded their baseline values. Since no quality-of-use standard is set, no detrimental effects can be determined to be caused by these parameters.

TDS, pH and sulfate exceeded their quality-of-use standards as determined by mean baseline data. However, all of these parameters had high-range baseline values that were above the quality-of-use standard (as determined from the mean values). If the quality-of-use standard had been set using high baseline values, TDS and sulfate standards would have been 2000 and 3000 mg/l, respectively; these values are well above existing concentrations. I agree with WDEQ that while these parameters do reflect some water quality degradation, they do not represent a significant deviation from the overall quality of use for which the water was suitable for prior to mining.

Conclusions

The method of restoration utilized (groundwater sweep-fresh water injection) is not considered to be the state-of-the-art method. However, based on an examination of the most recent water quality data available, I conclude that the groundwater quality at this site has been stabilized and adequately restored to a level which meets the minimum quality-of-use standard. Many parameters were restored to lower levels than those

40-8663/mne/83/05/27/0

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existing prior to mining. Overall, the groundwater restoration is considered adequate to terminate operations at this site.

ORIGINAL SIGNED BY

Terry L. Johnson, Project Manager
Licensing Branch 1
Uranium Recovery Field Office, RIV

ORIGINAL SIGNED BY

Approved by:

Harry J. Pettengill, Chief
Licensing Branch 2
Uranium Recovery Field Office, RIV

Case Closed: 04008663011E

40-8663/mne/83/05/27/0

OFC	:URFO	:URFO	:URFO	:	:	:	:
NAME	:TJohnson:me	:BFisher	:HPettengill	:	:	:	:
DATE	:83/06/09	:	: 6/9/83	:	:	:	:

UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION IV
URANIUM RECOVERY FIELD OFFICE
BOX 25325
DENVER, COLORADO 80225

JAN 10 198?

URFO:RFB
Docket No. 40-8663

N D Resources, Inc.
ATTN: A. F. Stoick
213 West Birch
P.O. Box 1449
Glenrock, Wyoming 82637

Gentlemen:

On November 26, 1984, Mr. R. F. Brich of this office visited the Sundance Project to review records associated with the decommissioning activities and to make independent gamma measurements to verify that cleanup efforts were sufficient. Enclosed is a copy of the trip report which describes the findings of this visit and also staff review of the pond decommissioning report. As discussed in the enclosed report, license termination will be contingent upon final notification by the licensee that all pertinent WDEQ requirements have been or will be met.

By letter dated December 28, 1984, Resource Technologies Group (RTG) submitted a report on the pond decommissioning work on behalf of NDR. Based on staff review of this report, we conclude that cleanup of the ponds is adequate.

If you have any questions, please contact Mr. Brich at (303) 236-2814.

Sincerely,

Edward F. Hawkins, Chief
Licensing Branch 1
Uranium Recovery Field Office
Region IV

Enclosure: As stated

UNITED STATES

NUCLEAR REGULATORY COMMISSION

REGION IV

URANIUM RECOVERY FIELD OFFICE
BOX 25325
DENVER, COLORADO 80225

JAN 10 1985

URFO:RFB
Docket NO. 40-8663

MEMORANDUM FOR: Docket File No. 40-8663

FROM: Randall F. Brich, Project Manager
Licensing Branch 1
Uranium Recovery Field Office, Region IV

SUBJECT: TRIP REPORT ON NOVEMBER 26, 1984 SITE VISIT - N D RESOURCES, INC., SUNDANCE ISL PROJECT

Background

On November 26, 1984, Mr. Al Stoick of N D Resources, Inc. (NDR), Mr. Bart Conroy of Resources Technology Group, Inc. (RTG), who acted as NDR's consultant and Radiation Safety Officer (RSO), and Mr. R. F. Brich of NRC/URFO met in Gillette, Wyoming, to discuss the status of the nearly completed decommissioning of the Sundance ISL project. After record review, we motored to the ISL site and observed the status of decontamination and decommissioning (D&D) of the site amidst a +40 mph cold, north wind. A slight covering of blown and drifted snow had recently accumulated in the leeward areas of the ponds, dikes, ditches, building, etc.

Discussion

I reviewed all records associated with the D&D of the site pertaining to personnel safety training, personnel monitoring, air particulate monitoring, gross alpha contamination monitoring and baseline soil radium-226 values. The records were found to be a true and accurate account of the D&D activity. Mr. Stoick stated that a decommissioning final report would be prepared and furnished to the agency.

All liners, piping and leak detection systems for the ponds had been previously removed. We walked the entire site from North to South making contact gamma measurements at the following preselected locations: north pond, middle pond, south pond, influent ditch to north pond, effluent ditch, open portions of the gravity delivery ditch, overflow pond (never used), wellfield drainage ditch on north side of building and the interior of the building. All measurements were found to be essentially equivalent to the natural background for the area (approximately 11-13 microRoentgens per hour (uR/hr)) with one exception. A small area in the northwest portion of the middle pond (Pond #2) appeared to contain about a 1-inch thick black residue that read approximately 40 uR/hr.

NDR had collected the required number of soil samples at all three ponds (three from each pond) and reported that all contained less than 15 pCi/g Ra-226 above background. NDR also collected soil samples at other locations in the delivery ditch and wellfield, and the results will be reported in the final decommissioning report. After returning to Denver, I informed RTG that we would require D&D of the ponds to 5 pCi/g (plus background) instead of 15 pCi/g.

In addition, NDR collected three soil samples from the base of Pond #2, four soil samples from the base of Pond #1, and two soil samples from the base of Pond #3, and analyzed them for Ra-226. Based on the results shown in Table 1, NDR elected to remove additional material from Ponds #1 and #2. A total of nine additional truck loads (approximately 108 cubic yards) of material were removed and shipped to a licensed mill for disposal.

Table 1

BEFORE ADDITIONAL SOIL REMOVAL

Pond	Location	pCi/g Ra-226
#2	West (sludge)	55 ± 1.0
#2	South (sludge)	31 ± 0.9
#2	Center	0.9 ± 0.2
#1	Northwest corner	60 ± 1.3
#1	Center	0.9 ± 0.2
#1	Center	0.9 ± 0.2
#1	Southeast corner	0.8 ± 0.2
#3	Northeast	1.3 ± 0.2
#3	Southeast	1.6 ± 0.2

Table 2 shows the Ra-226 activity in the soil after removal of the additional material.

Table 2

AFTER SOIL REMOVAL

Pond	Location	Ra-226 (pCi/g)
#1	Northwest corner	2.6 ± 0.5
#1	Southeast corner	1.1 ± 0.9
#2	West side	0.7 ± 0.3
#2	Southeast corner	0.5 ± 0.3
#2	Northwest corner	2.7 ± 1.0
#2	Northeast corner	2.1 ± 0.9

Conclusions

Based on my review of the associated records, pond decommissioning report and independent gamma measurements, I conclude that the site has been decommissioned properly. Therefore, I recommend that the licensee be notified by letter that URFO staff has concluded that cleanup of ponds is sufficient and the license will be terminated upon final notification by NDR that all pertinent WDEQ requirements have been or will be met.

Randall F. Brich

Randall F. Brich, Project Manager
Licensing Branch 1
Uranium Recovery Field Office
Region IV

Approved by: Edward F. Hawkins
Edward F. Hawkins, Chief
Licensing Branch 1
Uranium Recovery Field Office, Region IV

THE STATE OF WYOMING

ED HERSCHLER
GOVERNOR

Department of Environmental Quality

LAND QUALITY DIVISION

DISTRICT III OFFICE

30 EAST GRINNELL STREET TELEPHONE 307-672-6488 SHERIDAN, WYOMING 82801

December 19, 1986

Mr. Albert F. Stoik
Manager
ND Resources, Inc.
P. O. Box 1449
Glenrock, Wyoming 82637

RE: Annual Inspection ND Resources, Inc., LE19

Dear Mr. Stoik:

Enclosed is a copy of my Annual Inspection Report for LE19. Any written comments you submit will be incorporated into the permit file.

I am recommending that your license to explore be terminated and the associated surety bond be released. Should you have any questions, please call me.

Sincerely,

C. L. Preston
Environmental Specialist

CLP/mw
Enclosure

12-19-80
Bla

ANNUAL INSPECTION REPORT

LICENSE: Exploration License No. 19, ND Resources, Inc.

DATE: 29 August 1986 1000 hrs.

INSPECTOR: C. L. Preston, Environmental Specialist, LQD District III

CONTACT: Al Stoik, ND Resources, Inc.

Reclamation activities are outlined in Mr. Glenn Mooney's 25 June 1985 inspection report. Restoration of the well-field was accepted by DEQ on 25 April 1983 and the NRC on 11 June 1983. Surface reclamation has been completed. Two small buildings cover the two wells that have been transferred to Milestone Petroleum.

Bond Evaluation

ND Resources' current bond is surety No. BD 19S35723 for $50,000. ND Resources was authorized to reduce the bond amount to $12,500 on 27 August 1985. No action was taken by the company to reduce the bond.

CLP/mw

CLP

12-19-86

ADDENDUM 1.9-A

RAI/COMMENT TABLES

ADAMS Document Accession No.	Document Description	Document Date	Applicant	Facility	Document Type	Comment No.	Comment Category	Comment Sub-category	Comment Summary	Comment Response	Planned Response	Report	Section	Page	Complete	Report 2	Section	Page	Complete
ML082060527	Moore Ranch 1st Response to RAI TR	7/11/2008	Uranium One	Moore Ranch	Request for Additional Information	32	Background RADS	Ground Water Sampling	Of the wells sampled for the baseline program, Identify which are considered upgradient and which are considered down gradient. Also identify a background groundwater sampling location and include the dates when all groundwater samples were taken.	The applicant referred to the hydrology section of the TR which contains a figure which shows the hydraulic gradient and tables which have the sampling dates.	Provided.	TR	2.9.2.1		Y	ER	3.4.3		
ML082060527	Moore Ranch 1st Response to RAI TR	7/11/2008	Uranium One	Moore Ranch	Request for Additional Information	33	Background RADS	Vegetation Sampling	Describe the basis of the selection process for each vegetation sampling location and how this meets the guidance regarding location in NRC R.G. 4.14.	The applicant explained the location selection process.	Provided.	TR	2.9.2.8		Y	ER	3.5.4.1		
ML082060527	Moore Ranch 1st Response to RAI TR	7/11/2008	Uranium One	Moore Ranch	Request for Additional Information	35	Description of the Proposed Facility	Excursion Detection	Identify the locations for the underlying and overlying aquifer monitoring wells.	The applicant described the monitor well density but deferred to give final locations until the well field packages were submitted.	Approximate locations for the monitor wells are discussed in Section 3.1.6 and shown on Figure 3.1-14.	TR	3.1.6		Y	ER	1.2		
ML090820538	Nichols Ranch Response to RAIs TR	3/11/2009	Uranerz Energy	Nichols Ranch	Request for Additional Information	257	Description of the Proposed Facility	In Situ Recovery Process and Equipment	Provide the design, operation, and monitoring of the wellfield header houses where fluids will be injected and recovered from wellfields.	The applicant inserted text which addressed the RAI.	Design details of the module buildings is provided in Section 3.1.4. Monitoring and instrumentation details are included in Section 3.1.7.	TR	3.1.4 and 3.1.7		Y	ER	1.2		
ML090820538	Nichols Ranch Response to RAIs TR	3/11/2009	Uranerz Energy	Nichols Ranch	Request for Additional Information	258	Description of the Proposed Facility	In Situ Recovery Process and Equipment	Provide general locations for the underlying and overlying aquifer monitoring wells.	The applicant inserted text which addressed the RAI.	Approximate locations for the monitor wells are discussed in Section 3.1.6 and shown on Figure 3.1-14.	TR	3.1.6		Y	ER	1.2		
ML090820538	Nichols Ranch Response to RAIs TR	3/11/2009	Uranerz Energy	Nichols Ranch	Request for Additional Information	259	Description of the Proposed Facility	In Situ Recovery Process and Equipment	Provide methods for timely detection and remediation of leaks in the wellfield at wellheads and in surface and buried lines in the wellfield.	The applicant inserted text which addressed the RAI.	Provided.	TR	3.1.7, 4.2.4.1, and 7.5.1		Y	ER	1.2		
ML101460286	Dewey-Burdock TR RAIs	5/28/2010	PowerTech	Dewey-Burdock	TR RAIs	952	Description of the Proposed Facility	In Situ Recovery Process and Equipment	Include a water balance diagram consistent with the guidance in Section 3.1.2 of NUREG-1569.		Provided.	TR	3.1.5		Y	ER	1.2		
ML100740111	Nichols Ranch Response to SER Open Issues	2/24/2010	Uranerz Energy	Nichols Ranch	SER Open Issue	417	Description of the Proposed Facility	ISR Process and Equipment	Discuss that screw and glue joints have experienced many failures in ISR operations. Describe how the casing would be joined in the well completions.	The applicant stated that the casing for the well completions will be joined using an O-ring and spline locking system. Screw and glue joints will not be used for well completions.	Provided.	TR	3.1.2.1		Y	ER	1.2	1.2.5.1.1	Y
ML100740111	Nichols Ranch Response to SER Open Issues	2/24/2010	Uranerz Energy	Nichols Ranch	SER Open Issue	418	Description of the Proposed Facility	ISR Process and Equipment	Regarding that during wellfield operations, injection pressures at the wellheads would not exceed 90 percent of the mechanical integrity test (MIT) pressure. Provide the MIT pressure value or a fracture gradient.	The applicant inserted text which addressed the open issue.	The MIT pressure value is defined in Section 3.1.2.3 and the fracture gradient is discussed in Section 3.1.4.	TR	3.1.2.3 and 3.1.4		Y	ER	1.2		
ML082060527	Moore Ranch 1st Response to RAI TR	7/11/2008	Uranium One	Moore Ranch	Request for Additional Information	36	Description of the Proposed Facility	Process Fluid Spills and Leaks	Present methods for timely detection and cleanup of leaks in the well field, at the well heads, and in surface and buried lined in the well field.	The applicant inserted text in the TR which addressed the issues.	Provided.	TR	3.1.7, 4.2.4.1, and 7.5.1		Y				
ML091610140	Nichols Ranch Response to RAIs ER	5/8/2009	Uranerz Energy	Nichols Ranch	Request for Additional Information	359	Description of the Proposed Facility	Recovery Plant, Processing, and Chem. Storage Facilities	Provide information on where the fuel may be stored and what leak protection would be available for the fuel storage.	The applicant inserted text which addressed the RAI.	Provided.	TR	3.2.8.2		Y				
ML090080451	Lost Creek Response to RAIs TR	12/12/2008	Lost Creek	Lost Creek	Request for Additional Information	534	Description of the Proposed Facility	Recovery Plant, Processing, and Chem. Storage Facilities	Provide a clarification and explanation for how selective completion of the mine unit monitoring well ring in specific sands in the HJ horizon will be sufficient to capture horizontal excursions outside the extraction zone. Furthermore, please justify the use of 500 feet for the monitoring well ring spacing.	The applicant inserted text which addressed the RAI.	Addendum 2.7-H presents analysis used to determine monitor well offset and spacing.	TR	3.1		Y				
ML090080451	Lost Creek Response to RAIs TR	12/12/2008	Lost Creek	Lost Creek	Request for Additional Information	535	Description of the Proposed Facility	Recovery Plant, Processing, and Chem. Storage Facilities	Provide a monitoring strategy (number, location of wells)for detecting excursions.	The applicant inserted text which addressed the RAI.	Provided.	TR	5.7.8		Y				

ADAMS Document Accession No.	Document Description	Document Date	Applicant	Facility	Document Type	Comment No.	Comment Category	Comment Sub-category	Comment Summary	Comment Response	Planned Response	Report	Section	Page	Complete	Report 2	Section	Page	Complete
ML090080451	Lost Creek Response to RAIs TR	12/12/2008	Lost Creek	Lost Creek	Request for Additional Information	536	Description of the Proposed Facility	Recovery Plant, Processing, and Chem. Storage Facilities	Provide a description of which sands will be used to provide water for well drilling and completions and the total volume anticipated to be withdrawn. Provide an evaluation of whether the water use in these sands will impact water levels in the overlying extraction or underlying aquifers.	The applicant inserted text which addressed the RAI.	Water for well drilling and completion will most likely come from the Oshoto Reservoir. Impacts from these activities are discussed in ER Section 4.4.2.	TR	3.1		Y	ER	4.4.2		
ML090080451	Lost Creek Response to RAIs TR	12/12/2008	Lost Creek	Lost Creek	Request for Additional Information	538	Description of the Proposed Facility	Recovery Plant, Processing, and Chem. Storage Facilities	Provide methods for timely detection and cleanup of leaks in the wellfield at wellheads and in surface and buried lines in the wellfield.	The applicant stated that several methods will be used for timely detection of leaks in the wellfield, including 'on-the-ground' inspections, flow and pressure instrumentation; and fluid detection systems. Cleanup methods will include measures to stop the leak and reconnaissance to determine the extent of cleanup and required safety measures, as well as treatment, removal, and/or disposal needs.	Provided.	TR	3.1.7, 4.2.4.1, and 7.5.1		Y				
ML093500010	Lost Creek SER Open Issues	12/18/2009	Lost Creek	Lost Creek	SER Open Issue	699	Description of the Proposed Facility	Recovery Plant, Processing, and Chem. Storage Facilities	Provide the MIT pressure or maximum well casing pressures.	The applicant indicated that they would address this issue.	Provided.	TR	3.1.2.3		Y	ER	1.2		
ML093500010	Lost Creek SER Open Issues	12/18/2009	Lost Creek	Lost Creek	SER Open Issue	712	Description of the Proposed Facility	Recovery Plant, Processing, and Chem. Storage Facilities	Include a schematic of header house piping and instrumentation and a statement on the frequency of header house inspections.	The applicant indicated that they would address this issue. Condifdential Schematic	A schematic of the module building and piping is included in Section 3.1.4. Module building inspections are outlined in Section 5.3.3.	TR	3.1.4 and 5.3.3		Y	ER	1.2		
ML082060527	Moore Ranch 1st Response to RAI TR	7/11/2008	Uranium One	Moore Ranch	Request for Additional Information	34	Description of the Proposed Facility	Well field Design	Provide information on the number, design, operation, and monitoring of the well field header houses where fluids will be injected and recovered from the well fields.	The applicant inserted text in the TR which addressed the issues.	Design details of the Module buildings is provided in Section 3.1.4. Monitoring and instrumentation details are included in Section 3.1.7.	TR	3.1.4 and 3.1.7		Y	ER	1.2		
ML100740111	Nichols Ranch Response to SER Open Issues	2/24/2010	Uranerz Energy	Nichols Ranch	SER Open Issue	423	Description of the Proposed Facility	Wellfield Monitor Wells	Demonstrate how the monitoring well ring will intercept an excursion to support the 500 foot spacing.	The applicant inserted text which addressed the open issue.	Addendum 2.7-H presents analysis used to determine monitor well offset and spacing.	TR	3.1		Y				
ML101460286	Dewey-Burdock TR RAIs	5/28/2010	PowerTech	Dewey-Burdock	TR RAIs	1035	Description of the Proposed Facility	Wellfield Monitor Wells	Justify the spacing for the perimeter monitoring ring based on site-specific hydrogeological and geochemical conditions.		Addendum 2.7-H presents analysis used to determine monitor well offset and spacing.	TR	3.1		Y				
ML100740111	Nichols Ranch Response to SER Open Issues	2/24/2010	Uranerz Energy	Nichols Ranch	SER Open Issue	420	Description of the Proposed Facility	Wellfield Operation	Demonstrate an adequate plan or methodology to maintain wellfield bleed rates, given the possibility that either or both disposal wells may become inoperable or have reduced capacity for more than 22 or 24 hours.	The applicant commited to having 2 deep disposal wells drilled prior to start-up, and to having the critical spare parts for the deep disposal injection system on site. The applicant provided an estimate of the time it would take to get a drill rig and fix one of the wells. Provided Frac tank availability and rental information. Conducted an analysis regarding shutting in the wellfield and not having a bleed during the time the deep disposal well is down.	Sections 4.2.2.1.5 and 4.2.2.2.3 discuss the water storage and disposal capacities in case of upset conditions.	TR	4.2.2.1.5 and 4.2.2.2.3		Y				
ML100740111	Nichols Ranch Response to SER Open Issues	2/24/2010	Uranerz Energy	Nichols Ranch	SER Open Issue	421	Description of the Proposed Facility	Wellfield Operation	Revise the simulations and include extraction and injection wells operating at true rates to show that the gradient reversal will still be adequate.	The applicant inserted text which addressed the open issue.	Addendum 2.7-h presents recovery simulations and results.	TR	3.1		Y				
ML101460286	Dewey-Burdock TR RAIs	5/28/2010	PowerTech	Dewey-Burdock	TR RAIs	951	Description of the Proposed Facility	Wellfield Operation	Include information regarding the manner in which hydraulic control will be maintained throughout the life of a wellfield, from the first injection of lixiviant to the end of restoration.		Provided.	TR	3.1.4		Y	ER	1.2		
ML090080451	Lost Creek Response to RAIs TR	12/12/2008	Lost Creek	Lost Creek	Request for Additional Information	566	Effluent Control Systems	Liquid Wastes	Provide the results of the preoperational monitoring program to provide a determination of the baseline groundwater quality data in the vicinity of the storage ponds.	The applicant inserted text which addressed the RAI.	Provided.	TR	2.7		Y	ER	3.4.3		
ML082060527	Moore Ranch 1st Response to RAI TR	7/11/2008	Uranium One	Moore Ranch	Request for Additional Information	39	Effluent Control Techniques	Gaseous and Airborne Particulates	Describe the locations of discharge stacks and demonstrate how the locations of the stacks will prevent introducing radon into the ventilation intakes.	The applicant inserted text which addressed the RAI.	Provided.	TR	4.1.2		Y				
ML082060527	Moore Ranch 1st Response to RAI TR	7/11/2008	Uranium One	Moore Ranch	Request for Additional Information	48	Effluent Control Techniques	Liquid Waste	Provide information on the ability of the sump system to handle the volume of the largest hazardous material source.	The applicant described the containment structure which will be used at the central plant.	Provided.	TR	4.2.4.2, 7.5.2		Y	TR	4.2		

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ML090820538	Nichols Ranch Response to RAIs TR	3/11/2009	Uranerz Energy	Nichols Ranch	Request for Additional Information	268	Effluent Controls System	Gaseous and Airborne Particulates	Provide a map or diagram that shows the ventilation system.	The applicant inserted text which addressed the RAI.	Figure 5.7-1 shows the plant ventilation system.	TR	5.7.1		Y				
ML093570297	Moore Ranch Response to SER Open Issues Part 2	7/27/2009	Uranium One	Moore Ranch	SER Open Issue	177	Groundwater Hydrology	Wellfield Monitor Wells	Provide evidence that the spacing of monitoring ring wells is sufficient to detect an excursion.	The applicant inserted text which addressed the RAI.	Addendum 2.7-H presents analysis used to determine monitor well spacing.	TR	3.1		Y				
ML090820538	Nichols Ranch Response to RAIs TR	3/11/2009	Uranerz Energy	Nichols Ranch	Request for Additional Information	331	Radiation Safety and Monitoring	Monitoring Ring Wells	Provide a technical basis for the method used to determine the distances between monitoring wells, including information about the groundwater model used.	The applicant inserted text which addressed the RAI.	Addendum 2.7-H presents analysis used to determine monitor well spacing.	TR	3.1		Y	ER	3.4.3		
ML090820538	Nichols Ranch Response to RAIs TR	3/11/2009	Uranerz Energy	Nichols Ranch	Request for Additional Information	332	Radiation Safety and Monitoring	Monitoring Ring Wells	Provide a clear definition or illustration of "monitoring ring wells".	The applicant inserted text which addressed the RAI.	Figure 3.1-14 illustrates the perimter monitor well rings.	TR	3.1.6		Y	ER	3.4.3		
ML090820538	Nichols Ranch Response to RAIs TR	3/11/2009	Uranerz Energy	Nichols Ranch	Request for Additional Information	253	Site Characterization	Background Radiological Characteristics	Describe the type of vegetation sampled and demonstrate that the vegetation samples collected by the applicant, as suggested in Regulatory Guide 4.14, Revision 1. Regulatory Guide 4.14, Revision 1, Table 1 states that three vegetation samples should be collected near the site in different sectors that will have the highest predicted air particulate concentrations.	The applicant inserted text which addressed the RAI. For the reasons described in this response regarding the differences between potential impacts from conventional mining vs. modern ISR operations, the applicant does not believe that three sets of samples are needed from three sectors of highest predicted airborne concentrations.	Provided.	TR	2.9.2.8		Y	ER	3.5.4		
ML090080451	Lost Creek Response to RAIs TR	12/12/2008	Lost Creek	Lost Creek	Request for Additional Information	523	Site Characterization	Background Radiological Characteristics	Preoperational radionuclide air particulate samples are not discussed. Provide sufficient regulatory or technical justification to relieve them from the requirement of 10 CFR 40 Appendix A, Criterion 7. Please submit radionuclide air particulate sampling in accordance with 10 CFR 40, Appendix A, Criterion 7, for NRC review prior to any major site construction.	The applicant stated that this application does not include information on installation of a yellow cake drying facility. Therefore, the collection of radionuclide air particulate samples was not considered necessary.	Provided.	TR	2.9.2.3		Y	ER	3.6		
ML090080451	Lost Creek Response to RAIs TR	12/12/2008	Lost Creek	Lost Creek	Request for Additional Information	524	Site Characterization	Background Radiological Characteristics	Discuss preoperational surface water and sediment sampling.	The applicant inserted text which addressed the RAI.	Provided.	TR	2.9.2.2		Y	ER	3.4.1		
ML082060527	Moore Ranch 1st Response to RAI TR	7/11/2008	Uranium One	Moore Ranch	Request for Additional Information	20	Site Characterization	Site Location and Layout	Provide the coordinates of the central processing plant and the distance to major population centers.	The applicant inserted text in the TR addressing the RAI.	Provided.	TR	2.1		Y	ER	1.2		
ML082060527	Moore Ranch 1st Response to RAI TR	7/11/2008	Uranium One	Moore Ranch	Request for Additional Information	21	Site Characterization	Site Location and Layout	Provide the total area within both the proposed license area and the restricted area.	The applicant inserted text in the TR addressing the RAI.	Section 2.1 defines the total permit area as well as the area of the secure area.	TR	2.1		Y	ER	1.2		
ML082060527	Moore Ranch 1st Response to RAI TR	7/11/2008	Uranium One	Moore Ranch	Request for Additional Information	23	Site Characterization	Site Location and Layout	Provide a map of the main processing area showing the topography, site drainage, layout of and access to buildings, and proposed roads.	A figure was added to the TR showing the requested information.	Provided.	TR	3.1.8		Y	ER	1.2		
ML093440306	Moore Ranch Response to SER Open Issues Part 1	12/4/2009	Uranium One	Moore Ranch	SER Open Issue	137	Waste Management	11(e).2 Waste	Provide the location of and plans for storage of 11(e).2 byproduct material that is awaiting shipment to a disposal facility.	The applicant inserted text which addressed the RAI.	11e.(2) solid waste storage is addressed.	TR	4.3.1		Y	ER	4.13	4.13.2	Yes
ML092450317	Moore Ranch 2nd Response to RAI ER_TR Part 1 of 2	8/27/2009	Uranium One	Moore Ranch	Request for Additional Information	119	Wetlands	Wetlands	Provide documentation supporting the recommendation of the status of wetlands identified during the wetlands survey that was made to the USACE (e.g., description of vegetation, soils, etc.). If any wetlands are determined to be jurisdictional, describe what mitigation methods will be applied.	The applicant committed to provide NRC with the USACE determinations when available.	Documentation provided in report in Wetlands Appendix.	ER	3.4.2.2		Y	ER	6.2.6		
ML091610140	Nichols Ranch Response to RAIs ER	5/8/2009	Uranerz Energy	Nichols Ranch	Request for Additional Information	360	Air Quality	Dust	Provide information on the method of dust suppression during construction.	The applicant inserted text which addressed the RAI.	Dust control measures provided.	ER	5.6	5.6	Yes				
ML091900402	Moore Ranch 1st Response to RAI ER 1	6/19/2009	Uranium One	Moore Ranch	Request for Additional Information	1	Alternatives	Plant Siting	Provide information on other areas that were evaluated prior to confirming the project site. Also include information on alternative sites for the plant and building locations and routes for roads and pipelines.	The applicant provided a summary of plant siting iterations and updated text and inserted a figure in the ER.	Alternative plant site comparision included.	ER	2.0	2.2.2	Yes				

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ML091610140	Nichols Ranch Response to RAIs ER	5/8/2009	Uranerz Energy	Nichols Ranch	Request for Additional Information	361	Alternatives	Plant Siting	Provide background information to justify the selection of the locations of the central processing plant, satellite facility, and roads. If other locations were considered, provide details on those locations and a justification for why those locations were less preferable to the chosen location.	The applicant inserted text which addressed the RAI.	Alternative plant site comparision included.	ER	2.0	2.2.2	Yes				
ML090370542	Moore Ranch 2nd Response to RAI_TR_4.1-7.1	10/27/2008	Uranium One	Moore Ranch	Request for Additional Information	102	Groundwater Restoration	Analogs	Justify in detail using comparable field experience, analytical methods or numerical modeling the estimated number of pore volumes which will be required for restoration of each well field.	The applicant provided justification of their estimate of pore volumes.	Restoration analogs support pore volume estimates.	TR	6.1	6.1.6	Yes				
ML090820538	Nichols Ranch Response to RAIs TR	3/11/2009	Uranerz Energy	Nichols Ranch	Request for Additional Information	324	Groundwater Restoration	Analogs	Provide a technical basis demonstrating the applicant's ability to meet the standards in Criterion 5B(5) of 10 CFR Part 40, Appendix A. Generally such demonstrations may be based on either experience with previous ISL operations, research and development investigations in similar host rock, computations, or pilot tests.	The applicant inserted text which addressed the RAI.	Restoration analogs provide basis for ability to meet target restoration goals.	TR	6.1	6.1.6	Yes				
ML100740111	Nichols Ranch Response to SER Open Issues	2/24/2010	Uranerz Energy	Nichols Ranch	SER Open Issue	480	Groundwater Restoration	Analogs	Provide additional details of how sites within close proximity to the proposed site are analogs for the proposed project area when comparing the restoration methods.	The applicant inserted text which addressed the open issue. Inserted a table outlining transmissivity, hydraulic conductivity, storage coefficient, and specifice yield for other ISR facilities in the area.	Restoration analogs provide basis for ability to meet target restoration goals.	TR	6.1	6.1.6	Yes				
ML100740111	Nichols Ranch Response to SER Open Issues	2/24/2010	Uranerz Energy	Nichols Ranch	SER Open Issue	483	Groundwater Restoration	Analogs	Clearly explain (i) the relevancy of the analog sites to the Nichols Ranch Project and (ii) why seven pore volumes was an appropriate estimate for restoring the operating Production Area 1 in the first year of operation.	The applicant inserted text which addressed the open issue.	Restoration analogs provide basis for ability to meet target restoration goals.	TR	6.1	6.1.6	Yes				
ML090080451	Lost Creek Response to RAIs TR	12/12/2008	Lost Creek	Lost Creek	Request for Additional Information	601	Groundwater Restoration	Analogs	Provide a technical basis for the applicants ability to meet the standards in Criterion 5B(5) of 10 CFR Part 40, Appendix A, through restoration.	The applicant inserted text which addressed the RAI.	Restoration analogs provide basis for ability to meet target restoration goals.	TR	6.1	6.1.6	Yes				
ML090820538	Nichols Ranch Response to RAIs TR	3/11/2009	Uranerz Energy	Nichols Ranch	Request for Additional Information	323	Groundwater Restoration	Goal	Provide a statement that the applicant will return the groundwater quality to the standards listed in Criterion 5B(5) of 10 CFR Part 40, Appendix A.	The applicant stated they will return the groundwater quality to the restoration standards that are specified in NUREG-1569.	Discuss that restoration will be conducted in accordance with Criterion 5(B)(5).	TR	6.1	6.1.1	Yes				
ML090080451	Lost Creek Response to RAIs TR	12/12/2008	Lost Creek	Lost Creek	Request for Additional Information	600	Groundwater Restoration	Goal	Provide a statement that the applicant will return the groundwater quality to the standards listed in Criterion 5B(5) of 10 CFR Part 40, Appendix A, and a revised pore volume estimate to meet these standards as necessary.	The applicant inserted text which addressed the RAI.	Discuss that restoration will be conducted in accordance with Criterion 5(B)(5).	TR	6.1	6.1.1	Yes				
ML101460286	Dewey-Burdock TR RAIs	5/28/2010	PowerTech	Dewey-Burdock	TR RAIs	1044	Groundwater Restoration	Goal	Discuss restoration of the production zone aquifer, ensuring that goals are consistent with the regulatory requirements. The goals, as documented in RIS-09-05, are Commission-approved background levels, MCLs or ACLs as specified in Criterion 5B(5) of Appendix A of 10 CFR Part 40.		Discuss that restoration will be conducted in accordance with Criterion 5(B)(5).	TR	6.1	6.1.1	Yes				
ML101460286	Dewey-Burdock TR RAIs	5/28/2010	PowerTech	Dewey-Burdock	TR RAIs	1045	Groundwater Restoration	Goal	Ensure the target restoration goals (TRGs) will be based on a statistical analysis following ASTM D6312-98 (Re-approved 2005).		Note that statistical methods used to calculated TRVs will be in accordance with ASTM D6312.	TR	6.1	6.1.2.1	Yes				
ML100740111	Nichols Ranch Response to SER Open Issues	2/24/2010	Uranerz Energy	Nichols Ranch	SER Open Issue	479	Groundwater Restoration	Groundwater Sweep	Primary and secondary restoration standards presented in NUREG-1 569 are inconsistent with the restoration standards in 10 CFR Part 40, Appendix A, Criterion 5B(5). NRC has notified licensees and applicants in Regulatory Information Summary, RIS 09-05, dated April 29, 2009, that the restoration standards listed in NUREG-1569, Section 6.1.3 (4) are not consistent with those listed in 10 CFR Part 40, Appendix A. Commit to achieve restoration standards in Appendix A, Criterion 5B(5).	Although Uranerz does not agree with the NRC that 10 CFR 40, Appendix A, Criterion 5(B)(5) applies to groundwater restoration standards at ISR facilities (as previously stated by both NMA and the Wyoming Mining Association). Uranerz will accept the license condition stated above by the NRC unless future ISR groundwater restoration rulemaking results in different standards.	Discuss that restoration will be conducted in accordance with Criterion 5(B)(5).	TR	6.1	6.1.1	Yes				
ML100610158	Lost Creek Oct 2009 WDEQ Comment Responses	10/22/2009	Lost Creek	Lost Creek	Response to WDEQ Comments	802	Groundwater Restoration	GWS	The use of ground water sweep with direct disposal of the produced water, is no longer considered to be BPT due to excessive consumption of ground water and resultant impacts to ground water resources. This section should be revised to clarify that ground water sweep will only be employed when the produced water can be treated and re-injected	The applicant inserted text which addressed the RAI.	Detailed strategy to avoid groundwater sweep with direct discharge of produced water.	TR	6.1	6.1.2.1	Yes				

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ML100610158	Lost Creek Oct 2009 WDEQ Comment Responses	10/22/2009	Lost Creek	Lost Creek	Response to WDEQ Comments	882	Groundwater Restoration	GWS	The use of ground water sweep with direct disposal of the produced water, is not considered to be BPT due to excessive consumption of ground water and resultant impacts to ground water resources. This section should be revised to clarify that ground water sweep will only be employed when the produced water can be treated and re-injected.	The applicant inserted text which addressed the RAI.	Detailed strategy to avoid groundwater sweep with direct discharge of produced water.	TR	6.1	6.1.2.1	Yes				
ML100610158	Lost Creek Oct 2009 WDEQ Comment Responses	10/22/2009	Lost Creek	Lost Creek	Response to WDEQ Comments	881	Groundwater Restoration	Hydraulic Impacts	Please provide a hydrologic impact assessment (surface and ground water) of the final anticipated conditions. This should include recovery times ground water, potential changes in water chemistry, etc.	The applicant inserted text which addressed the RAI.	In regard to water chemistry at end of mining, estimate is provided in groundwater restoration discussion in TR	TR	6.1	6.1.6	Yes				
ML090820538	Nichols Ranch Response to RAIs TR	3/11/2009	Uranerz Energy	Nichols Ranch	Request for Additional Information	335	Groundwater Restoration	Impacts to Surrounding Aquifers	Provide an explanation of why the groundwater restoration operations will not adversely affect groundwater used outside the production zone.	The applicant inserted text which addressed the RAI.	Bleed rate will be maintained all the time. Only impact will be drawdown effects that are addressed elsewhere.	TR	6.1	6.1.8	Yes				
ML090820538	Nichols Ranch Response to RAIs TR	3/11/2009	Uranerz Energy	Nichols Ranch	Request for Additional Information	336	Groundwater Restoration	Impacts to Surrounding Aquifers	Provide additional description about impacts to nearby domestic wells in terms of water table drawdown during restoration and justification as to why the groundwater restoration will not affect those wells.	The applicant inserted text which addressed the RAI.	Reference another section in TR describing potential drawdown impacts to nearby domestic wells.	TR	6.1	6.1.8	Yes				
ML090820538	Nichols Ranch Response to RAIs TR	3/11/2009	Uranerz Energy	Nichols Ranch	Request for Additional Information	328	Groundwater Restoration	Reductants	Provide a description of the biological reduction method(s) to be used to achieve restoration for targeted constituents in the proposed wellfield mining zone including: the efficacy of the chosen method; additives and rates; how progress will be monitored; estimates of pore volumes required when using biological reductants; and how the stability of water quality in zones treated with biological reductants will be monitored and established.	The applicant stated that the biological reduction method has not been determined at this time since biological reduction is only going through the experimentation and testing phase at another ISR site. If biological reduction does become a viable technique that is commercially available the NRC will be informed of this decision with a plan submitted to the NRC with details. The applicant removed text which addressed "biological reductant."	Prior to applying any reductant, Strata will submit plan for safe use to LQD and NRC.	TR	6.1	6.1.2.5	Yes				
ML090820538	Nichols Ranch Response to RAIs TR	3/11/2009	Uranerz Energy	Nichols Ranch	Request for Additional Information	329	Groundwater Restoration	Reductants	Provide a description of how the mining zone will be monitored during restoration to track the success of any restoration phase or techniques such as the addition of chemical or biological reductants.	The applicant stated that the production area will be monitored no differently with the addition of a chemical or biological reductant than it would be with normal restoration techniques. The applicant inserted text which addressed the RAI.	Prior to applying any reductant, Strata will submit plan for safe use to LQD and NRC.	TR	6.1	6.1.2.5	Yes				
ML090820538	Nichols Ranch Response to RAIs TR	3/11/2009	Uranerz Energy	Nichols Ranch	Request for Additional Information	330	Groundwater Restoration	Reductants	Provide a rationale for selecting wells for monitoring groundwater quality during restoration, the efficiency of the restoration techniques, and whether additional or alternate techniques are necessary.	The applicant inserted text which addressed the RAI.	Prior to applying any reductant, Strata will submit plan for safe use to LQD and NRC.	TR	6.1	6.1.2.5	Yes				
ML090080451	Lost Creek Response to RAIs TR	12/12/2008	Lost Creek	Lost Creek	Request for Additional Information	610	Groundwater Restoration	Reductants	Provide a description of the biological reduction method(s) to be used to achieve restoration for targeted constituents in the proposed wellfield extraction zone including: the efficacy of the chosen method; additives and rates; how progress will be monitored; estimates of pore volumes required when using biological reductants; and how the stability of water quality in zones treated with biological reductants will be monitored and established.	The applicant stated that the use of biological reductant as a restoration method is speculative at this time in the application process. If the biological method is used a description will be provided.	Prior to applying any reductant, Strata will submit plan for safe use to LQD and NRC.	TR	6.1	6.1.2.5	Yes				
ML090080451	Lost Creek Response to RAIs TR	12/12/2008	Lost Creek	Lost Creek	Request for Additional Information	611	Groundwater Restoration	Reductants	Provide a detailed description about the comprehensive safety plan regarding any reductant use.	The applicant commited to developing a comprehensive safety plan for any reductant used.	Prior to applying any reductant, Strata will submit plan for safe use to LQD and NRC.	TR	6.1	6.1.2.5	Yes				
ML100610158	Lost Creek Oct 2009 WDEQ Comment Responses	10/22/2009	Lost Creek	Lost Creek	Response to WDEQ Comments	878	Groundwater Restoration	Reductants	Please provide greater detail including chemical equations to explain the processes that the groundwater will undergo to create the reducing conditions. The chemistry that will take place in the ion exchange and RO circuits should be presented. Further explanation of the how possible reductants or bioremediation additives will affect the chemistry of the groundwater should also be provided	The applicant inserted text which addressed the RAI.	Prior to applying any reductant, Strata will submit plan for safe use to LQD and NRC.	TR	6.1	6.1.2.5	Yes				

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ML090820538	Nichols Ranch Response to RAIs TR	3/11/2009	Uranerz Energy	Nichols Ranch	Request for Additional Information	333	Groundwater Restoration	Restoration Monitoring	Provide a description of how the water quality data from the horizontal wells will be combined with the data from the vertical monitoring wells to determine restoration progress.	The applicant stated that the water quality data from the horizontal monitoring wells will be used to track the progress of groundwater restoration for the production area that is being restored. These data are independent of the water quality data that is collected for the vertical monitoring wells since the vertical monitoring wells are used to verify that there is no communication between the production unit and the overlying and underlying sands.	Propose to sample all production wells monthly during active restoration to identify hot spots.	TR	6.1	6.1.3	Yes				
ML100740111	Nichols Ranch Response to SER Open Issues	2/24/2010	Uranerz Energy	Nichols Ranch	SER Open Issue	485	Groundwater Restoration	Restoration Monitoring	Clarify the sampling frequency of monitor ring wells and production wells.	The applicant inserted text which addressed the open issue.	During production and active restoration, proposed to sample monitor wells biweekly. During stability monitoring, proposed to sample all wells every 3 months.	TR	6.1	6.1.3	Yes				
ML101460286	Dewey-Burdock TR RAIs	5/28/2010	PowerTech	Dewey-Burdock	TR RAIs	1050	Groundwater Restoration	Restoration Monitoring	Propose a monitoring program to document the effectiveness of the restoration program. The monitoring program should include a detailed description of the monitoring of the mining zone during restoration, including sampling density, parameters, and frequency to substantiate that it will be able to closely monitor and optimize their restoration strategy or to determine whether or not any flare or hot spots have been effectively captured during the restoration process.		Propose to sample all production wells monthly during active restoration to identify hot spots.	TR	6.1	6.1.3	Yes				
ML090820538	Nichols Ranch Response to RAIs TR	3/11/2009	Uranerz Energy	Nichols Ranch	Request for Additional Information	327	Groundwater Restoration	Schedule	Provide a statement that NRC will be informed when a transition from production to restoration occurs in a mine unit and an acknowledgement that the applicant will adhere to the timeliness in decommissioning regulations of 10 CFR Part 40.42.	The applicant inserted text which addressed the RAI.	A statement has been included that NRC and LQD will be informed of transition from production to restoration. In addition, commitment to adhere to 10 CFR 40.42 has been included.	TR	6.1	6.1.5	Yes				
ML100740111	Nichols Ranch Response to SER Open Issues	2/24/2010	Uranerz Energy	Nichols Ranch	SER Open Issue	426	Groundwater Restoration	Schedule	Explain the duration of restoration for the production areas, which ranged from one year to five years. In particular, if restoration is going to take longer than 2 years, an explanation and alternate schedule should be provided.	The applicant inserted text which addressed the open issue.	Indicated that a restoration schedule will be established for each module. If it will take longer than 2 years, an explanation and alternate schedule will be provided.	TR	6.1	6.1.5	Yes				
ML100740111	Nichols Ranch Response to SER Open Issues	2/24/2010	Uranerz Energy	Nichols Ranch	SER Open Issue	491	Groundwater Restoration	Schedule	For wellfield restoration schedules expected to take longer than two years, justification is required as per 10 CFR 40.42.	The applicant inserted text which addressed the open issue.	Indicated that a restoration schedule will be established for each module. If it will take longer than 2 years, an explanation and alternate schedule will be provided.	TR	6.1	6.1.5	Yes				
ML090080451	Lost Creek Response to RAIs TR	12/12/2008	Lost Creek	Lost Creek	Request for Additional Information	599	Groundwater Restoration	Schedule	State that the applicant is requesting an alternate schedule and acknowledge that changes to the restoration schedule must be requested through a license amendment application	The applicant inserted text which addressed the RAI.	Statement that if restorationi takes longer than 24 months Strata will request alternate schedule as license amendment.	TR	6.1	6.1.5	Yes				
ML090080451	Lost Creek Response to RAIs TR	12/12/2008	Lost Creek	Lost Creek	Request for Additional Information	603	Groundwater Restoration	Schedule	Provide an explanation of the timeline for restoration of nine months for sweep, nine months of RO, and one month for homogenization considering the low conductivity of the HJ horizon and the described stacked sand restoration approach.	The applicant inserted text which addressed the RAI.	A discussion on restoring stacked roll fronts has been included.	TR	6.1	6.1.7	Yes				
ML090080451	Lost Creek Response to RAIs TR	12/12/2008	Lost Creek	Lost Creek	Request for Additional Information	608	Groundwater Restoration	Schedule	Provide a description of the criteria that will be used to determine when well fields will be taken out of production and started in restoration to meet the regulatory requirements of timeliness of decommissioning as outlined in 10 CFR 40.42.	The decision to take a mine unit out of production and place it into restoration will be based solely on economic and technical considerations.	Provided criteria (uranium recovery and production plant capacity).	TR	6.1	6.1.5	Yes				
ML090080451	Lost Creek Response to RAIs TR	12/12/2008	Lost Creek	Lost Creek	Request for Additional Information	609	Groundwater Restoration	Schedule	Provide a statement that NRC will be informed when a transition from production to restoration occurs in a mine unit.	The applicant inserted text which addressed the RAI.	Provided statement that NRC and LQD will be informed of transition.	TR	6.1	6.1.5	Yes				
ML093500010	Lost Creek SER Open Issues	12/18/2009	Lost Creek	Lost Creek	SER Open Issue	709	Groundwater Restoration	Schedule	Provide a commitment to maintain hydraulic control on a wellfield for the period between operation and restoration	The applicant indicated that they would address this issue.	Commitment is made for hydrologic bleed sufficient to control mining solutions between production and restoration.	TR	6.1	6.1.5	Yes				

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ML100610158	Lost Creek Oct 2009 WDEQ Comment Responses	10/22/2009	Lost Creek	Lost Creek	Response to WDEQ Comments	799	Groundwater Restoration	Schedule	How is the amount of time for mine unit development, production, ground water sweep, reverse osmosis etc. determined. Calculations should be presented which indicate the time it will take to perform each step, based on the hydrologic conditions of the ore body.	The applicant inserted text which addressed the RAI.	A comparison between production flow rate (715 gpm) and active restoration flow rate was included to support the restoration schedule.	TR	6.1	6.1.5	Yes				
ML100610158	Lost Creek Oct 2009 WDEQ Comment Responses	10/22/2009	Lost Creek	Lost Creek	Response to WDEQ Comments	800	Groundwater Restoration	Schedule	What are the criteria to move from production into restoration, and restoration to stability monitoring? This should be specified.	The applicant inserted text which addressed the RAI.	Section 6.1.3 addresses the transition from active restoration to stabilization monitoring and Section 6.1.5 addresses the transition from production to restoration.	TR	6.1	6.1.5	Yes				
ML100610158	Lost Creek Oct 2009 WDEQ Comment Responses	10/22/2009	Lost Creek	Lost Creek	Response to WDEQ Comments	801	Groundwater Restoration	Schedule	The project schedule should demonstrate that reclamation will be contemporaneous with mining operations. Since the schedule presented in Figure OP-4a is considered to be somewhat conceptual and subject to change, definitive commitments such as the following should be provided, for example: 1) seamless transition from production to restoration with no wellfield down time 2) no inactive wellfields for periods exceeding 30 days 3) specified minimum restoration flow rates 4) no more than two well fields in production at any given time 5) complete restoration of the first well field, through stabilization, before initiating production from the 5th well field.	The applicant inserted text which addressed the RAI.	The schedule demonstrates that restoration is contemporaneous with mining.	TR	6.1	6.1.5	Yes				
ML100610158	Lost Creek Oct 2009 WDEQ Comment Responses	10/22/2009	Lost Creek	Lost Creek	Response to WDEQ Comments	803	Groundwater Restoration	Schedule	The applicant should understand that they are obligated to follow the approved mine and reclamation schedule (refer to W.S. 35-11-415). If the applicant plans to revise the approved schedule then it must be submitted as a permit revision for review and approval by LQD. An updated schedule submitted with an annual report would be informational, (and would probably trigger a request for a permit revision from LQD) but would not replace the schedule in the approved permit. Please revise these sections to reflect this understanding	The applicant inserted text which addressed the RAI.	It is noted that NRC and LQD will be informed if restoration schedule changes and approval of a revised restoration schedule will be requested.	TR	6.1	6.1.5	Yes				
ML101460286	Dewey-Burdock TR RAIs	5/28/2010	PowerTech	Dewey-Burdock	TR RAIs	950	Groundwater Restoration	Schedule	Provide a timetable for restoration of individual wellfields. This detailed information as well as other information such as the requirement for NRC notification of the termination of principal activities or an alternate schedule, needs to be included in the TR consistent with Section 3.1.1(4) of NUREG-1569 and in accordance with requirements of 10 CFR 40.42.		Indicated that a restoration schedule will be established for each module. If it will take longer than 2 years, an explanation and alternate schedule will be provided.	TR	6.1	6.1.5	Yes				
ML090820538	Nichols Ranch Response to RAIs TR	3/11/2009	Uranerz Energy	Nichols Ranch	Request for Additional Information	337	Groundwater Restoration	Stability Monitoring	Provide a justification for the selection of a six-month stability monitoring time period to determine restoration success. Additionally, provide the criteria which will be used to establish that the water quality in the restored zone is stable.	The applicant stated that the six month stability monitoring period is specified in WDEQ-LQD Guideline 4. The criteria to establish restoration stability will be based on wellfield averages for water quality. A determination of aquifer stability should be made upon the "trends" in the data; i.e., a stable aquifer should not exhibit rapid upward or downward trends or be oscillating back and forth over a wide range of values. The data are evaluated against baseline quality and variability to determine if the restoration goal is met and if the water is restored at a minimum to within the class of use.	12 month stability monitoring is proposed and parameter list is provided.	TR	6.1	6.1.2	Yes				
ML100740111	Nichols Ranch Response to SER Open Issues	2/24/2010	Uranerz Energy	Nichols Ranch	SER Open Issue	489	Groundwater Restoration	Stability Monitoring	Provide a methodology how to evaluate areas with higher concentrations (i.e., "hot spots") if they occur in a set of data used to show restoration is complete. These "hot spots" can act as point sources of contamination and may require specific attention if they remain.	The applicant inserted text which addressed the open issue.	Text has been added addressing hot spots and excursions during stabilization monitoring.	TR	6.1	6.1.2	Yes				
ML100740111	Nichols Ranch Response to SER Open Issues	2/24/2010	Uranerz Energy	Nichols Ranch	SER Open Issue	490	Groundwater Restoration	Stability Monitoring	The monitoring duration should be extended to 4 sampling events on a quarter-year basis rather than 3 events spaced two months apart (6 months).	Uranerz will provide 4 sampling events on a quarter-year basis during restoration stability monitoring.	12 month stability monitoring is proposed and parameter list is provided.	TR	6.1	6.1.2	Yes				

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ML090080451	Lost Creek Response to RAIs TR	12/12/2008	Lost Creek	Lost Creek	Request for Additional Information	614	Groundwater Restoration	Stability Monitoring	Provide a justification for the selection of a six month stability monitoring time period to determine restoration success. Additionally, the criteria which will be used to establish that the water quality in the restored zone is stable.	The applicant inserted text which addressed the RAI.	12 month stability monitoring is proposed and parameter list is provided.	TR	6.1	6.1.2	Yes				
ML093500010	Lost Creek SER Open Issues	12/18/2009	Lost Creek	Lost Creek	SER Open Issue	703	Groundwater Restoration	Stability Monitoring	Provide NRC with a plan on how it will correct any excursions at monitoring wells during restoration and stability monitoring and restore water quality near these wells to ensure that groundwater outside the exempt zone is protected.	The applicant indicated that they would address this issue.	Text has been added addressing excursions during stabilization monitoring.	TR	6.1	6.1.2	Yes				
ML093500010	Lost Creek SER Open Issues	12/18/2009	Lost Creek	Lost Creek	SER Open Issue	705	Groundwater Restoration	Stability Monitoring	State how many wells will be sampled during stability monitoring. NRC Staff notes that NUREG-1569, Section 6.1.3(5) recommends that the number of wells used for stability monitoring be provided.	The applicant indicated that they would address this issue.	Noted that wellfield baseline packages will specify wells to be sampled during stability monitoring.	TR	6.1	6.1.2	Yes				
ML093500010	Lost Creek SER Open Issues	12/18/2009	Lost Creek	Lost Creek	SER Open Issue	706	Groundwater Restoration	Stability Monitoring	State what constituents will be measured, in monthly samples that will be collected during stabilization, to ensure oxidation/reduction conditions do not fluctuate significantly	The applicant indicated that they would address this issue.	Redox sensitive parameters are included in stabilization monitoring (Table 6.1-2).	TR	6.1	6.1.2	Yes				
ML093500010	Lost Creek SER Open Issues	12/18/2009	Lost Creek	Lost Creek	SER Open Issue	707	Groundwater Restoration	Stability Monitoring	Provide a description of how the stability trends will be evaluated statistically or otherwise and describe what actions would be taken if trends are determined to be significantly increasing.	The applicant indicated that they would address this issue.	Description of statistics provided under Restoration Success Criteria and trends are discussed with hot spots.	TR	6.1	6.1.2	Yes				
ML093500010	Lost Creek SER Open Issues	12/18/2009	Lost Creek	Lost Creek	SER Open Issue	708	Groundwater Restoration	Stability Monitoring	Propose a strategy to address how "hot spots" will be identified and how they will be treated during restoration stability monitoring.	The applicant indicated that they would address this issue.	Text has been added addressing hot spots and excursions during stabilization monitoring.	TR	6.1	6.1.2	Yes				
ML093500010	Lost Creek SER Open Issues	12/18/2009	Lost Creek	Lost Creek	SER Open Issue	710	Groundwater Restoration	Stability Monitoring	Specifically state how often it would monitor for excursions in the overlying/underlying and well ring monitoring wells during restoration and stability monitoring.	The applicant indicated that they would address this issue.	Excusion monitoring schedule is provided.	TR	6.1	6.1.3	Yes				
ML100610158	Lost Creek Oct 2009 WDEQ Comment Responses	10/22/2009	Lost Creek	Lost Creek	Response to WDEQ Comments	883	Groundwater Restoration	Stability Monitoring	The ground water stability monitoring phase should be 12 months with quarterly sampling (i.e. a total of 5 sampling events).	WDEQ-LQD Guideline 4 Section D(I)(d) recommends a stabilization period of at least six months. The applicant has already exceeded the minimum LQD recommendation by stating that stabilization will last nine months. Samples will be collected at the beginning of the nine-month period and once every three months for nine months. This will result in a total of four sampling rounds.	12 month stability monitoring is proposed and parameter list is provided.	TR	6.1	6.1.2	Yes				
ML100610158	Lost Creek Oct 2009 WDEQ Comment Responses	10/22/2009	Lost Creek	Lost Creek	Response to WDEQ Comments	884	Groundwater Restoration	Stability Monitoring	Specify that during the stability monitoring period all monitoring wells (inside and outside of the pattern, including underlying, overlying and perimeter wells) will be individually sampled and analyzed for the complete suite of parameters, including water levels.	The applicant stated that, during stability monitoring, all overlying, underlying and perimeter monitor wells will be analyzed for all UCL parameters once every three months. If groundwater restoration has not been successful and an excursion occurs during stabilization then the sampling will revert to weekly for affected monitor wells.	State that all monitoring wells will be sampled for excursion parameters and static water level during stability monitoring period.	TR	6.1	6.1.2	Yes				
ML101460286	Dewey-Burdock TR RAIs	5/28/2010	PowerTech	Dewey-Burdock	TR RAIs	1049	Groundwater Restoration	Stability Monitoring	The excursion monitoring program should continue during restoration similar to that conducted during operations but will accept a frequency of monitoring greater than once every two weeks. However, should the levels indicate an excursion status for a well during restoration, the applicant must document corrective actions to be undertaken.		Excursion monitoring during restoration is addressed as well as corrective actions.	TR	6.1	6.1.2	Yes				
ML101460286	Dewey-Burdock TR RAIs	5/28/2010	PowerTech	Dewey-Burdock	TR RAIs	1051	Groundwater Restoration	Stability Monitoring	Discuss the stability monitoring program to demonstrate that the restoration goal has been maintained. The monitoring program should consist of four quarterly events using a full suite of parameters for each sampling event. Discuss statistical methods to be used to determine whether or not a trend is observed or hot spots exist.		The stabilization monitoring program includes 5 rounds of monitoring with a full suite of analytes. Statistical methods to determine stability are discussed.	TR	6.1	6.1.2	Yes				
ML090370542	Moore Ranch 2nd Response to RAI_TR_4.1-7.1	10/27/2008	Uranium One	Moore Ranch	Request for Additional Information	101	Groundwater Restoration	Volumes	Report the specific pore volume for each well field and show the calculations and assumptions.	The applicant inserted text which addressed the RAI.	Pore volume calculations are presented for a typical wellfield module.	TR	6.1	6.1.4.1	Yes				

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ML090820538	Nichols Ranch Response to RAIs TR	3/11/2009	Uranerz Energy	Nichols Ranch	Request for Additional Information	325	Groundwater Restoration	Volumes	Provide a physical justification (cores, logs, etc.) for porosity values for the production ore zones.	The applicant inserted text which addressed the RAI.	Porosity was obtained from core samples.	TR	6.1	6.1.4.1	Yes				
ML090080451	Lost Creek Response to RAIs TR	12/12/2008	Lost Creek	Lost Creek	Request for Additional Information	604	Groundwater Restoration	Volumes	Provide an estimate of porosity for each mine unit and an explanation of how this value is to be determined. (A valid justification for this number (e.g., wireline logs, core measurements) is needed as this value is critical for pore volume calculations).	The applicant inserted text which addressed the RAI.	Porosity was obtained from core samples.	TR	6.1	6.1.4.1	Yes				
ML090080451	Lost Creek Response to RAIs TR	12/12/2008	Lost Creek	Lost Creek	Request for Additional Information	606	Groundwater Restoration	Volumes	Provide a comprehensive discussion and justification for the estimate of six pore volumes (1 sweep, 5 RO) for restoration of MU1, which appears very low, using a basis of comparable field experience.	The applicant inserted text which addressed the RAI.	Provided in restoration analogs.	TR	6.1	6.1.6	Yes				
ML090080451	Lost Creek Response to RAIs TR	12/12/2008	Lost Creek	Lost Creek	Request for Additional Information	607	Groundwater Restoration	Volumes	Provide a substantial justification using analytical methods or numerical modeling regarding the estimate of six pore volumes for restoration. These estimates should also take into account unique issues presented by the sequential stacked sand restoration approach and address any difference in pore volumes needed if biological reductants are used.	The applicant inserted text which addressed the RAI.	Analogs are used as justification. A note was added to address possible future reduction in pore volumes if reductants are used. Still need to address restoring stacked roll fronts.	TR	6.1	6.1.4.2	Yes				
ML090080451	Lost Creek Response to RAIs TR	12/12/2008	Lost Creek	Lost Creek	Request for Additional Information	612	Groundwater Restoration	Volumes	Provide an estimate, with supporting analysis, of how much waste water would be produced during restoration and the ability of the disposal wells to handle the rates and volumes.	The applicant inserted text which addressed the RAI.	TR section is referenced discussing waste fluid disposal capacity and mitigation measures to be implemented if one or more systems are interrupted.	TR	6.1	6.1.4.4	Yes				
ML102100241	Response to Dec 2009 RAIs	4/22/2010	Lost Creek	Lost Creek	SER Open Issue	702	Groundwater Restoration	Volumes	Provide supporting evidence that the use of average completion thickness in lieu of thickness of the ore sand is appropriate in the pore volume calculation.	The applicant included a discussion on how other ISRs use average completion thickness, how flare factors account for flulid migration outside the ore zone, and how the horizontal permeability is typicaly much higher than the vertical permeability.	Provide reference to Lost Creek response that indicates average completion thicknes is typical for other ISRs.	TR	6.1	6.1.4.1	Yes				
ML100610158	Lost Creek Oct 2009 WDEQ Comment Responses	10/22/2009	Lost Creek	Lost Creek	Response to WDEQ Comments	858	Groundwater Restoration	Volumes	Provide an explanation for why the restoration flow rates are so low in comparison to production flow rates (i.e. less than 10%). Would it not be feasible to have higher restoration flow rates, perhaps equal to production flow rates?	The applicant inserted text which addressed the RAI.	The restoration plant capacity is described as 15% of production plant capacity to keep pace with mining.	TR	6.1	6.1.4.3	Yes				
ML100610158	Lost Creek Oct 2009 WDEQ Comment Responses	10/22/2009	Lost Creek	Lost Creek	Response to WDEQ Comments	879	Groundwater Restoration	Volumes	Please cite where the number of pore volumes used is documented to be BMP. Is it based on any real life success of an existing well field?	The applicant inserted text which addressed the RAI.	Restoration analogs support pore volume estimates.	TR	6.1	6.1.6	Yes				
ML101460286	Dewey-Burdock TR RAIs	5/28/2010	PowerTech	Dewey-Burdock	TR RAIs	1048	Groundwater Restoration	Volumes	Include estimates on the pore volume for a wellfield, porosity or flare factors.		Porosity was obtained from core samples.	TR	6.1	6.1.4.1	Yes				
N/A	Moore Ranch WDEQ/LQD 1st Comment Response	3/14/2008	Uranium One	Nichols Ranch	Comment Response	1302	Mine Plan	General Comment	Add discussions providing clear assessments of the impact to water resources (i.e., water quantity and quality) within the permit area and on adjacent lands during mining and reclamation. These assessment must discuss what may be reasonably expected and provide mitigation plans (ref: W.S.§35-11-428(a)(iii)(E).	The applicant revised the text to address this comment.	A separate TR section is addressed assessing impacts on water resources during restoration.	TR	6.1	6.1.8	Yes				
ML091900402	Moore Ranch 1st Response to RAI ER 1	6/19/2009	Uranium One	Moore Ranch	Request for Additional Information	13	Noise	Noise Impacts	Provide existing daily or peak hour traffic volumes and truck percentages on any of the local roadways to be utilized by daily activities at the proposed facility.	The applicant inserted text in the ER relating to noise impacts from traffic. The applicant referred to information in the transportation impacts section of the ER for information concerning traffic volumes.	Traffic study results provided for local roads, including trucks.	ER	3.2	3.2.2	Yes				
ML091900402	Moore Ranch 1st Response to RAI ER 1	6/19/2009	Uranium One	Moore Ranch	Request for Additional Information	14	Noise	Noise Impacts	Provide any future projections of traffic volumes and the percentage of trucks on these roadways.	The applicant inserted text in the ER to address the noise impacts related to projected traffic increases.	Traffic projections provided (5% annually)	ER	4.7	3.2.2	Yes	ER	4.2		
ML091900402	Moore Ranch 1st Response to RAI ER 1	6/19/2009	Uranium One	Moore Ranch	Request for Additional Information	15	Noise	Noise Impacts	Provide information on the noise impacts of the project during construction. Specifically, provide projections of typical machinery to be used at the project and the reference sound levels associated with construction activities. Also provide the projected truck traffic associated with construction on the roadways leading to the proposed facility.	The applicant revised the Noise Impacts of Construction Section (Section 7) in the TR to address the RAI.	Equipment sound levels provided, Table 4.7-1.	ER	4.7	4.7.1.1	Yes	TR	7.2		

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ML091610140	Nichols Ranch Response to RAIs ER	5/8/2009	Uranerz Energy	Nichols Ranch	Request for Additional Information	382	Noise	Noise Impacts	Provide projections of typical equipment and their reference sound levels that would be associated with activities during each phase of the proposed project.	The applicant inserted text which addressed the RAI.	Equipment sound levels provided, Table 4.7-1.	ER	4.7	4.7.1.1	Yes				
ML091680400	Lost Creek Response to RAIs ER	6/11/2009	Lost Creek	Lost Creek	Request for Additional Information	656	Public and Occupational Health	Public and Occupational Health and Safety Impacts	Provide information on non-radiological effluents, stating that such effluents would not be released into pathways that could impact public health and safety. However, no discussion is provided to substantiate this position.	The applicant inserted text which addressed the RAI.	Provided	ER	4.12	4.12.1	Yes				
N/A	Moore Ranch WDEQ/LQD 1st Comment Response	3/14/2008	Uranium One	Moore Ranch	Comment Response	1194	Reclamation	Reclamation Plan	Provide a commitment to report all sampling results on a quarterly basis.		Noted that sampling resutls would be reported to LQD quarterly or as required.	TR	6.1	6.1.2	Yes				
N/A	Moore Ranch WDEQ/LQD 1st Comment Response	3/14/2008	Uranium One	Moore Ranch	Comment Response	1195	Reclamation	Reclamation Plan	Commit to providing LQD with a minimum oftwelve month of monitoring during the groundwater stabilization period.		12 month stability monitoring is proposed and parameter list is provided.	TR	6.1	6.1.2	Yes				
N/A	Moore Ranch WDEQ/LQD 1st Comment Response	3/14/2008	Uranium One	Nichols Ranch	Comment Response	1271	Reclamation	Reclamation Plan	Removal of well heads, wellfield piping and other equipment cannot begin after conclusion of wellfield stability period until after a wellfield restoration report has been prepared and submitted to both the WDEQ/LQD and the NRC and Uranerz has received approval of the wellfield restoration from both agencies. Only then may abandonment of the wellfield begin.	The applicant revised the text to address this comment.	It is noted that P&A won't occur until approval of final restoration report by both NRC and LQD.	TR	6.1	6.1.2	Yes				
N/A	Moore Ranch WDEQ/LQD 1st Comment Response	3/14/2008	Uranium One	Nichols Ranch	Comment Response	1331	Reclamation Plan	General Comment	This entire section needs to be updated and revised to provide clear groundwater restoration standards specific to the initial wellfield.	Groundwater restoration standards (i.e. Restoration Target Values) will be established for the entire first mining units after the completion of all sampling of the production zone monitoring wells. This information will be included in the first wellfield package submittal for each unit.	It was noted that TRVs would be established for entire first mine unit.	TR	6.1	6.1.1.1	Yes				
N/A	Moore Ranch WDEQ/LQD 1st Comment Response	3/14/2008	Uranium One	Nichols Ranch	Comment Response	1332	Reclamation Plan	Groundwater Restoration Methods	Please commit to providing LQD with a minimum of twelve months of monitoring during the groundwater stabilization period.	The applicant revised the text to address this comment.	12 month stability monitoring is proposed and parameter list is provided.	TR	6.1	6.1.2	Yes				
N/A	Moore Ranch WDEQ/LQD 1st Comment Response	3/14/2008	Uranium One	Nichols Ranch	Comment Response	1334	Reclamation Plan	Restoration Monitoring	Please provide a commitment to report all sampling results on a quarterly basis.	The applicant revised the text to address this comment.	Noted that sampling resutls would be reported to LQD quarterly or as required.	TR	6.1	6.1.2	Yes				
N/A	Moore Ranch WDEQ/LQD 1st Comment Response	3/14/2008	Uranium One	Nichols Ranch	Comment Response	1333	Reclamation Plan	Restoration Target Values Parameters	Please change "Ammonium" to "Ammonia". In addition, please add zinc, Radium-228, gross alpha and gross beta to the list of constituents.	The applicant revised the text to address this comment.	These constituents are included in Table 6.1-2.	TR	6.1	6.1.2	Yes				
ML100770383	Dewey-Burdock ER RAIs	4/14/2010	PowerTech	Dewey-Burdock	ER RAIs	1093	Socioeconomics	Environmental justice	Provide updated race characteristics (e.g., 2008 data) for the counties and towns surrounding the proposed project location.		Updated through 7/1/09 (most current data)	ER	3.10	3.10.2	Yes				
ML100770383	Dewey-Burdock ER RAIs	4/14/2010	PowerTech	Dewey-Burdock	ER RAIs	1105	Socioeconomics	Environmental justice	Provide additional data from the most recent source available on low-income characteristics for counties surrounding the proposed project location.		No low income areas, no significant minority populations	ER	3.10	3.10.4	Yes	ER	4.11	4.11	Yes
ML100770383	Dewey-Burdock ER RAIs	4/14/2010	PowerTech	Dewey-Burdock	ER RAIs	1099	Socioeconomics	Health and social services	Provide information on medical treatment personnel, facilities (e.g., doctors and hospitals), and emergency services in the vicinity of the proposed project location and their ability to provide accident response.		Provided in 4.10	ER	4.10	4.10.1.2.7	Yes				
ML100770383	Dewey-Burdock ER RAIs	4/14/2010	PowerTech	Dewey-Burdock	ER RAIs	1104	Socioeconomics	Health and social services	Provide information on impacts to health and social services for counties and towns surrounding the proposed project location. Discuss impacts to health and social services during the construction, aquifer restoration, and decommissioning phases of the proposed project.		Provided	ER	4.10	4.10.1.1.7	Yes				
ML100770383	Dewey-Burdock ER RAIs	4/14/2010	PowerTech	Dewey-Burdock	ER RAIs	1097	Socioeconomics	Housing	Provide updated housing unit statistics (e.g., 2008 data) for the counties and towns surrounding the proposed project location. In addition, provide housing unit statistics for affected towns within the region of interest, if available.		Updated through FY2008	ER	3.10	3.10.3.4	Yes				

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ML100770383	Dewey-Burdock ER RAIs	4/14/2010	PowerTech	Dewey-Burdock	ER RAIs	1102	Socioeconomics	Housing	Provide information on impacts to housing for counties and towns surrounding the proposed project location. Discuss housing impacts during the construction, aquifer restoration, and decommissioning phases of the proposed project.		Provided	ER	4.10	4.10.1.2.3	Yes				
ML091610140	Nichols Ranch Response to RAIs ER	5/8/2009	Uranerz Energy	Nichols Ranch	Request for Additional Information	392	Socioeconomics	Labor force	Provide an estimated breakdown in the number of employees needed for each phase of the proposed project (construction, operation, decommissioning, and aquifer restoration).	The applicant inserted text which addressed the RAI.	Provided	ER	4.10	4.10.1.1	Yes				
ML100770383	Dewey-Burdock ER RAIs	4/14/2010	PowerTech	Dewey-Burdock	ER RAIs	1094	Socioeconomics	Labor force	Provide annual average labor, employment, and income characteristics for direct social zones within the region of interest		Provided	ER	3.10	3.10.3.1	Yes				
ML100770383	Dewey-Burdock ER RAIs	4/14/2010	PowerTech	Dewey-Burdock	ER RAIs	1100	Socioeconomics	Labor force	Provide labor force and employment information for the aquifer restoration and decommissioning phases of the proposed project.		Provided	ER	4.10	4.10.1.2	Yes				
ML100770383	Dewey-Burdock ER RAIs	4/14/2010	PowerTech	Dewey-Burdock	ER RAIs	1098	Socioeconomics	Local finance	Provide additional data on mining and mineral resource development in the vicinity of the proposed project area and information on the amount of revenue mining generates and note whether any state ad valorem taxes are levied.		Provided for Wyoming and Crook County	ER	4.10	4.10.1.2.5	Yes				
ML100770383	Dewey-Burdock ER RAIs	4/14/2010	PowerTech	Dewey-Burdock	ER RAIs	1101	Socioeconomics	Local finance	Provide information on impacts to local finance for counties and towns surrounding the proposed project location.		Provided - Crook County	ER	4.10	4.10.1.2.5	Yes				
ML100770383	Dewey-Burdock ER RAIs	4/14/2010	PowerTech	Dewey-Burdock	ER RAIs	1095	Socioeconomics	Schools	Provide school information for the direct social zones of influence.		Provided	ER	3.10	3.10.2.1	Yes				
ML100770383	Dewey-Burdock ER RAIs	4/14/2010	PowerTech	Dewey-Burdock	ER RAIs	1103	Socioeconomics	Schools	Provide information on educational impacts for counties and towns surrounding the proposed project location. Discuss educational impacts during the construction, aquifer restoration, and decommissioning phases of the proposed project.		Provided	ER	4.10	4.10.1.1.6	Yes				
ML100770383	Dewey-Burdock ER RAIs	4/14/2010	PowerTech	Dewey-Burdock	ER RAIs	1096	Socioeconomics	Tax base	Provide tax information for the direct social zones of influence.		Provided in tax base section	ER	3.10	3.10.3.3	Yes				
ML091680400	Lost Creek Response to RAIs ER	6/11/2009	Lost Creek	Lost Creek	Request for Additional Information	659	Surface Water Hydrology	Storm Water	Provide how storm water would be managed.	The applicant inserted text which addressed the RAI.	Storm water controls are described	ER	4.4	4.4.1.1.1	Yes				
ML100610158	Lost Creek 3rd Round WDEQ Comment Responses	10/22/2009	Lost Creek	Lost Creek	Response to WDEQ Comments	812	Transportation	Road Construction	Discuss and/or depict the roads that will be needed to access monitoring wells (sometimes referred to as "tertiary" roads). These roads must be discussed in the text and must depicted on a figure. Tertiary roads must also be depicted on any other figures depicting the project's roads.	The applicant inserted text which addressed the RAI.	Tertiary roads shown on Figure 4.2-1 and described in text.	ER	4.2	4.2.1	Yes				
ML100610158	Lost Creek 3rd Round WDEQ Comment Responses	10/22/2009	Lost Creek	Lost Creek	Response to WDEQ Comments	813	Transportation	Road Construction	All of the site's roads, two-tracks, and travel routes must be accounted for in the text as well as site maps.	The applicant inserted text which addressed the RAI.	Tertiary roads shown on Figure 4.2-1 and described in text.	ER	4.2	4.2.1	Yes				
ML100610158	Lost Creek 3rd Round WDEQ Comment Responses	10/22/2009	Lost Creek	Lost Creek	Response to WDEQ Comments	815	Transportation	Speed Limits	Discuss speed limits on the various roads, including signage, employee training and enforcement policies, specifically in regards to minimizing vehicle collisions with wildlife and livestock.	The applicant inserted text which addressed the RAI.	Strata will develop a speed limit policy as described in Section 5.2.	ER	5.2	5.2.2	Yes				
ML091610140	Nichols Ranch Response to RAIs ER	5/8/2009	Uranerz Energy	Nichols Ranch	Request for Additional Information	383	Transportation	Traffic	Provide estimated daily or peak hour traffic volumes and number of trucks on local roadways that will be utilized daily during each phase of the proposed project.	The applicant inserted text which addressed the RAI.	Background traffic described from county traffic counts and WWC traffic counts.	ER	3.2	3.2.2	Yes				
ML091900402	Moore Ranch 1st Response to RAI ER 1	6/19/2009	Uranium One	Moore Ranch	Request for Additional Information	9	Transportation	Traffic Impact	What is the anticipated increase in traffic? What will be the estimated increase in traffic from current activities at the site to traffic during construction and operation? Provide the information in approximate # of vehicles associated with each stage and differentiate between the size and types of vehicles. Also address impacts to wildlife (collisions).	The applicant revised the text of the ER to address the RAI.	Table 4.2-2 provides estimated traffic impacts during all phases.	ER	4.2	4.2.2	Yes	ER	4.5		

ADAMS Document Accession No.	Document Description	Document Date	Applicant	Facility	Document Type	Comment No.	Comment Category	Comment Sub-category	Comment Summary	Comment Response	Planned Response	Report	Section	Page	Complete	Report 2	Section	Page	Complete
ML091680400	Lost Creek Response to RAIs ER	6/11/2009	Lost Creek	Lost Creek	Request for Additional Information	644	Transportation	Traffic Impact	Provide the approximate number of vehicle trips (per day) that are expected for construction and operation.	The applicant inserted text which addressed the RAI.	Table 4.2-2 provides estimated traffic impacts during all phases.	ER	4.2	4.2.2	Yes				
ML100770383	Dewey-Burdock ER RAIs	4/14/2010	PowerTech	Dewey-Burdock	ER RAIs	1083	Transportation	Traffic Impact	Provide an estimate of the daily or annual trucking activity during the construction phase		Table 4.2-2 provides estimated traffic impacts during all phases.	ER	4.2	4.2.2	Yes				
ML100610158	Lost Creek 3rd Round WDEQ Comment Responses	10/22/2009	Lost Creek	Lost Creek	Response to WDEQ Comments	814	Transportation	Transportation Routes	Discuss the primary access road to the plant and secondary access roads to the mine units. Clarification is needed relative to road classifications and widths.	The applicant inserted text which addressed the RAI.	Access road construction is described, including road widths.	ER	4.2	4.2.1	Yes				
ML100770383	Dewey-Burdock ER RAIs	4/14/2010	PowerTech	Dewey-Burdock	ER RAIs	1067	Transportation	Transportation Routes	Provide information on the main highways and/or county roads that workers would potentially use to access the site from the towns of Custer and Newcastle. This information is needed to complete the description of the proposed action and determine the potential environmental impacts of traffic leading to and from the site.		Baseline traffic is provided for highways and county roads used to access site.	ER	3.2	3.2.2	Yes				
ML091900402	Moore Ranch 1st Response to RAI ER 1	6/19/2009	Uranium One	Moore Ranch	Request for Additional Information	7	Transportation	Waste Shipment	Provide information about the final destination of the radioactive waste, mixed waste, and nonradioactive waste. If this has not yet been decided, provide information on the most likely disposal sites and the proposed transportation routes to these sites.	The applicant inserted text which described the likely facilities, routes that would be used, and equipment that would be used.	Four options provided for 11e.(2) solid waste. Three options are provided for non-hazardous, non-11e.(2) solid waste.	ER	4.2	4.2.3.4	Yes	ER	4.13	4.13.3	Yes
ML091610140	Nichols Ranch Response to RAIs ER	5/8/2009	Uranerz Energy	Nichols Ranch	Request for Additional Information	401	Transportation	Waste Shipment	Specify the potential destinations of the dried yellowcake, the radioactive waste, and the non-radioactive waste.	The applicant inserted text which addressed the RAI.	Metropolis, IL is identified as the receiving facility for yellowcake. Waste facilities are addressed in 4.13.	ER	4.2	4.2.3.1	Yes	ER	4.13	4.13.3	Yes
ML091610140	Nichols Ranch Response to RAIs ER	5/8/2009	Uranerz Energy	Nichols Ranch	Request for Additional Information	402	Transportation	Waste Shipment	Specify the approximate transportation routes for shipment of the dried yellowcake, radioactive waste, and non-radioactive waste to be used during construction, operation, aquifer restoration, and decommissioning.	The applicant inserted text which addressed the RAI.	Transportation routes provided in transportation impacts and destinations provided in waste management impacts.	ER	4.2	4.2.3	Yes	ER	4.13	4.13.3	Yes
ML100770383	Dewey-Burdock ER RAIs	4/14/2010	PowerTech	Dewey-Burdock	ER RAIs	1111	Transportation	Waste Shipment	Provide the names and locations of facilities where it plans to send its nonradioactive, nonhazardous solid wastes. If no such plans have yet been formulated provide a list of facilities it believes are likely candidates for receipt of this waste.		Candidate facilities include Moorcroft, Sundance or Gillette.	ER	4.13	4.13.4	Yes	ER	4.2	4.2.3.5	Yes
ML091900402	Moore Ranch 1st Response to RAI ER 1	6/19/2009	Uranium One	Moore Ranch	Request for Additional Information	10	Transportation	Yellowcake Shipment	An assessment of the increase in truck traffic transporting yellowcake.	The applicant revised the text of the ER to address the RAI.	No. of shipments of yellowcake provided. Transportation route also provided.	ER	4.2	4.2.3.1	Yes	TR	7.2		
ML100770383	Dewey-Burdock ER RAIs	4/14/2010	PowerTech	Dewey-Burdock	ER RAIs	1109	Waste Management	Permeate	Provide additional description of the treatment and disposal methods that would be applied to waste streams before disposal.		Indicated that radium reduction might be needed using BaCl2 or zeolite (WRT)	ER	4.13	4.13.1	Yes				
ML092450317	Moore Ranch 2nd Response to RAI ER_TR Part 1 of 2	8/27/2009	Uranium One	Moore Ranch	Request for Additional Information	132	Waste Management	Quantities	Provide information showing that there is sufficient capacity at the proposed waste disposal sites to be used for hazardous, mixed, and radioactive wastes.	The applicant inserted text which addressed the RAI.	Capacities of 4 potential disposal facilities is compared to anticipated quantity generated from Ross.	ER	4.13	4.13.2	Yes				
ML091610140	Nichols Ranch Response to RAIs ER	5/8/2009	Uranerz Energy	Nichols Ranch	Request for Additional Information	387	Waste Management	Quantities	Provide additional information on anticipated generation of liquid and solid radioactive wastes, chemical wastes, and mixed wastes, including wastes from potential site-contaminating events.	The applicant inserted text which addressed the RAI.	Quantity of each waste stream is estimated.	ER	4.13	4.13	Yes	ER	4.12		
ML100610158	Lost Creek 3rd Round WDEQ Comment Responses	10/22/2009	Lost Creek	Lost Creek	Response to WDEQ Comments	868	Waste Management	Quantities	Please provide a table which lists each of the facilities solid and liquid waste streams, the estimated monthly predicted volume to be generated, the storage location, and the disposal location.	The applicant inserted text which addressed the RAI.	Table 4.13-1 provides waste management summary.	ER	4.13	4.13	Yes				
ML091610140	Nichols Ranch Response to RAIs ER	5/8/2009	Uranerz Energy	Nichols Ranch	Request for Additional Information	404	Waste Management	Septic System	Provide the approximate location and size of the septic system leach field.	The applicant inserted text which addressed the RAI.	Domestic waste permitting and disposal are addressed.	ER	4.13	4.13.5	Yes				
ML091680400	Lost Creek Response to RAIs ER	6/11/2009	Lost Creek	Lost Creek	Request for Additional Information	660	Waste Management	Septic System	Provide the type of septic system being proposed. If collected in a tank, provide final disposal site.	The applicant inserted text which addressed the RAI.	Domestic waste permitting and disposal are addressed.	ER	4.13	4.13.5	Yes				
ML100610158	Lost Creek 3rd Round WDEQ Comment Responses	10/22/2009	Lost Creek	Lost Creek	Response to WDEQ Comments	871	Waste Management	Septic System	Include the permit for the domestic sewage/septic system in the mine permit application. Additionally the disposal of domestic waste must be addressed.	The applicant inserted text which addressed the RAI. WDEQ will be updated as to the status of the various permits required.	Domestic waste permitting and disposal are addressed.	ER	4.13	4.13.5	Yes				

ADAMS Document Accession No.	Document Description	Document Date	Applicant	Facility	Document Type	Comment No.	Comment Category	Comment Sub-category	Comment Summary	Comment Response	Planned Response	Report	Section	Page	Complete	Report 2	Section	Page	Complete
ML091680400	Lost Creek Response to RAIs ER	6/11/2009	Lost Creek	Lost Creek	Request for Additional Information	661	Waste Management	Solid Waste	Provide how solid wastes would be managed, including storage location and disposal location.	The applicant inserted text which addressed the RAI.	Non-hazardous waste quantity, storage, and disposal is addressed.	ER	4.13	4.13.3	Yes				
ML100770383	Dewey-Burdock ER RAIs	4/14/2010	PowerTech	Dewey-Burdock	ER RAIs	1110	Waste Management	Solid Waste	Describe the types and expected volume of solid wastes generated during construction.		Non-hazardous waste quantity, storage, and disposal is addressed.	ER	4.13	4.13.3	Yes				
ML100770383	Dewey-Burdock ER RAIs	4/14/2010	PowerTech	Dewey-Burdock	ER RAIs	1112	Waste Management	Solid Waste	Describe the types and expected volume of solid wastes generated during operations.		Non-hazardous waste quantity, storage, and disposal is addressed.	ER	4.13	4.13.3	Yes				
ML100610158	Lost Creek 3rd Round WDEQ Comment Responses	10/22/2009	Lost Creek	Lost Creek	Response to WDEQ Comments	870	Waste Management	Storage	Discuss specifically where petroleum and chemical products, or hazardous and non-hazardous waste streams will be stored. Preferably these containers will be stored in-doors where they are not subjected to the elements and have adequate secondary containment. If they are to be stored outdoors, please indicate whether there will be roofing, locked fencing, and secondary containment.	The applicant inserted text which addressed the RAI.	Hazardous waste storage is addressed.	ER	4.13	4.13.4	Yes				
ML100770383	Dewey-Burdock ER RAIs	4/14/2010	PowerTech	Dewey-Burdock	ER RAIs	1115	Waste Management	Volumes	Clarify whether the estimate of byproduct material includes excavated soil and, if soil is not included in that estimate, provide the expected amount of excavated soil from decommissioning that would need to be disposed of as 11e.(2) byproduct waste and the basis for the estimate.		Contaminated soil is included in 11e.(2) solid waste est.	ER	4.13	4.13.2	Yes				

ADDENDUM 2.6-A

MIKE BUSWELL THESIS

SUBSURFACE GEOLOGY

OF THE OSHOTO URANIUM DEPOSIT,

CROOK COUNTY, WYOMING

A Thesis
Submitted to the Faculty of the Graduate School
of the Department of Geology and Geological Engineering,
South Dakota School of Mines and Technology

by

Micheal Douglas Buswell

In Partial Fulfillment of the Requirements
for the Degree of
Master of Science in Geology

May, 1982

Approved by:

Major Professor

Chairman, Department of Geology
and Geological Engineering

Dean, Graduate Division

ABSTRACT

Uranium in the Oshoto area was deposited as complex epigenetic roll fronts that paralleled the sand geometry of Upper Cretaceous Fox Hills and Lance Formations. Depositional environments changed upward from the deep marine Pierre Shale, to the offshore and nearshore marine Fox Hills Formation, to the fluvio-deltaic Lance Formation.

Offshore marine bars parallel the north-south Lower Fox Hills Formation strandline and are overlain by an extensive sequence of seaward dipping nearshore marine sediments. Regression of the Interior Cretaceous sea deposited shoreface, foreshore, and barrier island sequences in the region which were eroded and reworked. Sediments deposited on the scour surface display a complex pattern of dip- and strike-oriented sand bodies.

Lance Formation distributary channels flowed primarily southward, reflecting favorable stream gradients developed by a subsiding basin to the south. Distributary channels and crevasse splays form the clastic framework of the Lower Lance Formation.

Uranium was introduced into Upper Cretaceous sediments after the Black Hills uplift had exposed the Fox Hills and Lance Formations to oxidizing uranyl-bearing ground water. Uranium transportation and concentration in a roll front system was influenced by variations in ground-water migration due to the complex stratigraphic setting and premineral faulting.

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ACKNOWLEDGEMENTS

I wish to acknowledge the following people, without whom this project would not have been completed: Mr. Albert Stoick of ND Resources, who provided data as well as professional and economic support throughout this study, and Harry Dodge of the U. S. Geological Survey for his insight into Fox Hills Formation paleoenvironments.

Finally, I would like to specially thank Joyce Fry, my wife, who was invaluable from this study's inception to its conclusion by assisting data reduction, providing geologic discussions, editing drafts and typing this manuscript.

INTRODUCTION

Statement of Problem

Uranium-bearing roll fronts occur in Upper Cretaceous sandstones in the Oshoto area at a depth between 450 ft and 750 ft. The orientation of alteration salients associated with roll front migration trend along strike to slightly up dip. Geometry of the alteration tongue provides a record of direction and rate of the paleogroundwater flow. Both rate and direction of groundwater flow are controlled by permeability and transmissivity of host sediments. Permeability and transmissivity are governed by paleo-depositional environments (Galloway, et al., 1979, p. 177).

The goals of this thesis were to determine the sand body geometry of the depositional system active in Upper Cretaceous time, and to present a model for local and regional uranium deposition.

Location and Accessibility

The study area comprises 3000 acres in the west-central portion of the Oshoto 15' topographic quadrangle. It is located 25 miles north of Moorcroft in northeastern Wyoming (Fig. 1). Access to the property is gained by the Crook County 'D' road and numerous oil field roads. The community of Oshoto is located on the eastern edge of the study area (Fig. 1).

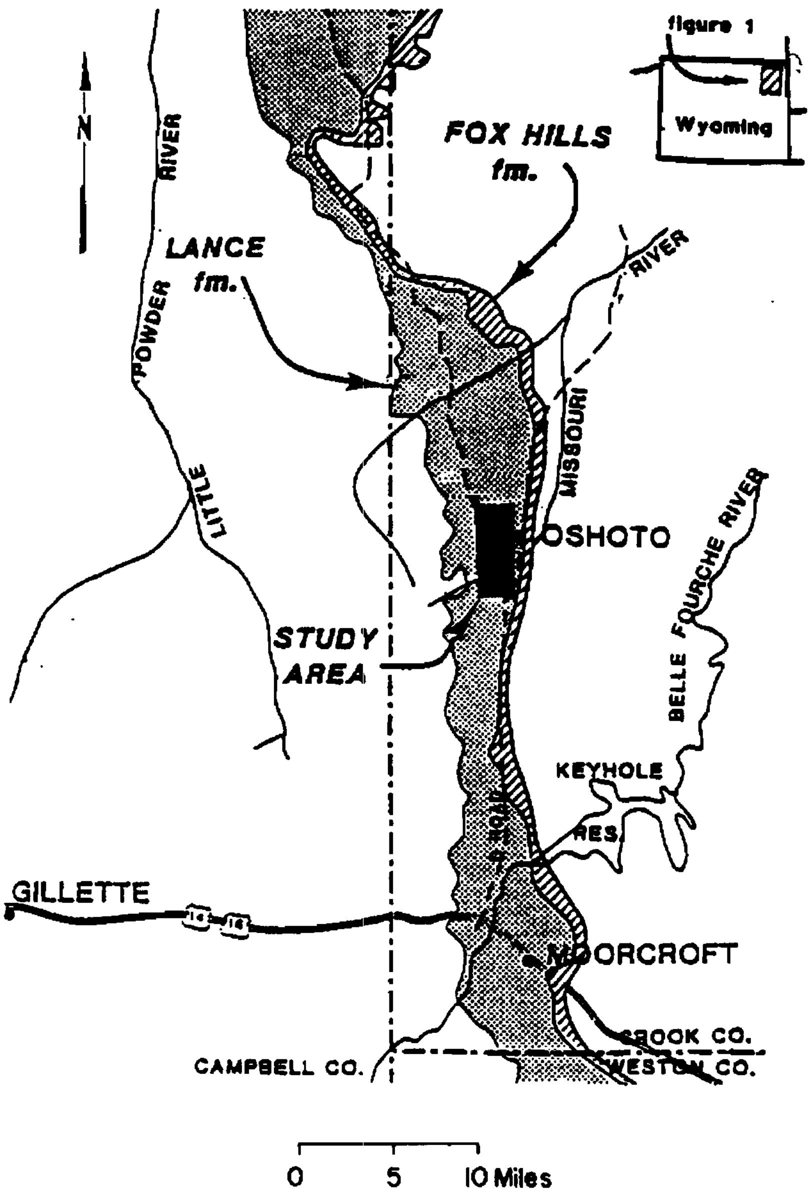


Figure 1. Location and outcrop patterns of Upper Cretaceous Fox Hills and Lance Formations (Adapted from Love, et al., 1955).

Regional Setting

Structural Geology

Oshoto is situated on the margin of two major tectonic elements, the Black Hills uplift and the Powder River Basin (Fig. 2). Both features are related to the Laramide Orogeny, the Black Hills being the easternmost and least deformed uplift of the Rocky Mountain Foreland Tectonic Province (Lisenbee, 1978, p. 166). The Black Hills is a broad north-trending domal uplift bounded on the east and west by monoclinal flexures. The uplift extends north and south as a series of plunging folds (Darton and Paige, 1925, p. 17-23; Noble, 1952, p. 31-37). The northeast-trending Little Missouri fault zone is located near the study area (Fig. 3). These steeply dipping normal faults have less than 100 ft displacement and limited areal extent (Robinson et al., 1964, p. 108).

Boardering the western flank of the Black Hills uplift is the Powder River Basin. The synclinal axis of the structurally asymmetric Tertiary intermontane basin is located along the western margin. In this area, sedimentary units dip steeply eastward. On the eastern flank of the basin, the structural dip is 1^{o} to 2^{o} basinward in the study area (Pl. 1). Immediately east of the area, the rocks have been rotated to near vertical as a result of flexure on the steeply inclined limb of the Black Hills monocline.

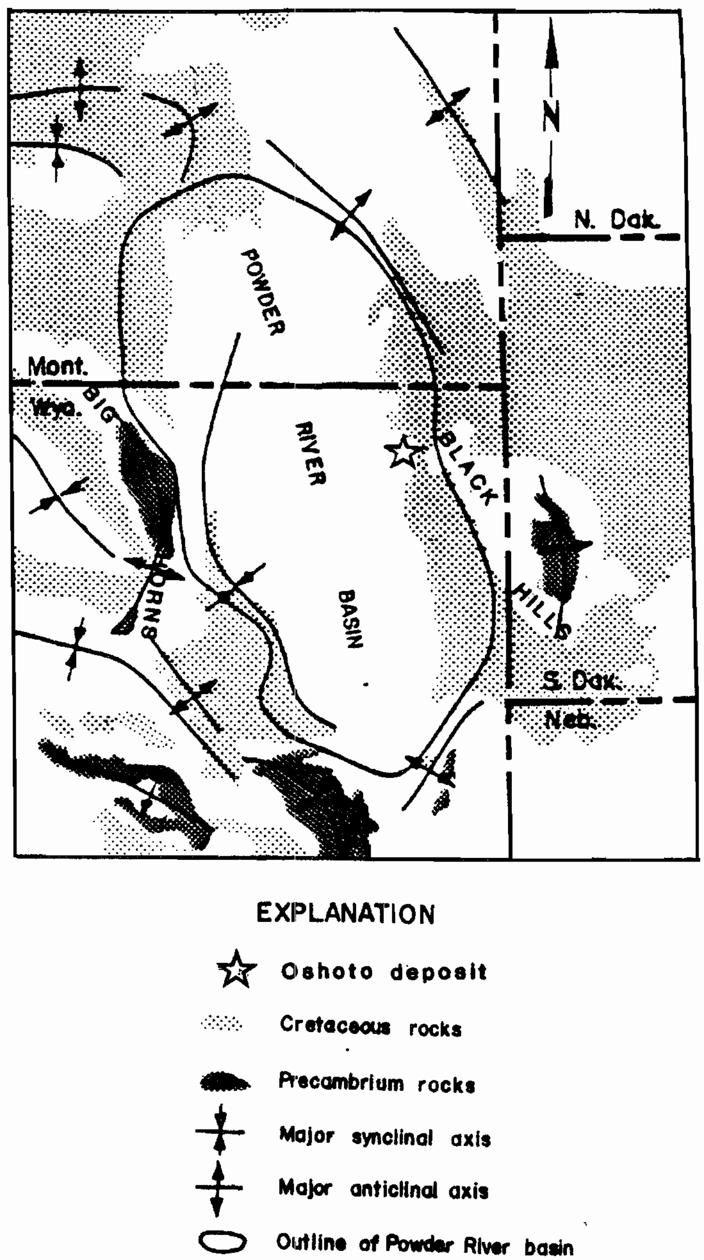


Figure 2. Location of Oshoto deposit and major tectonic elements.

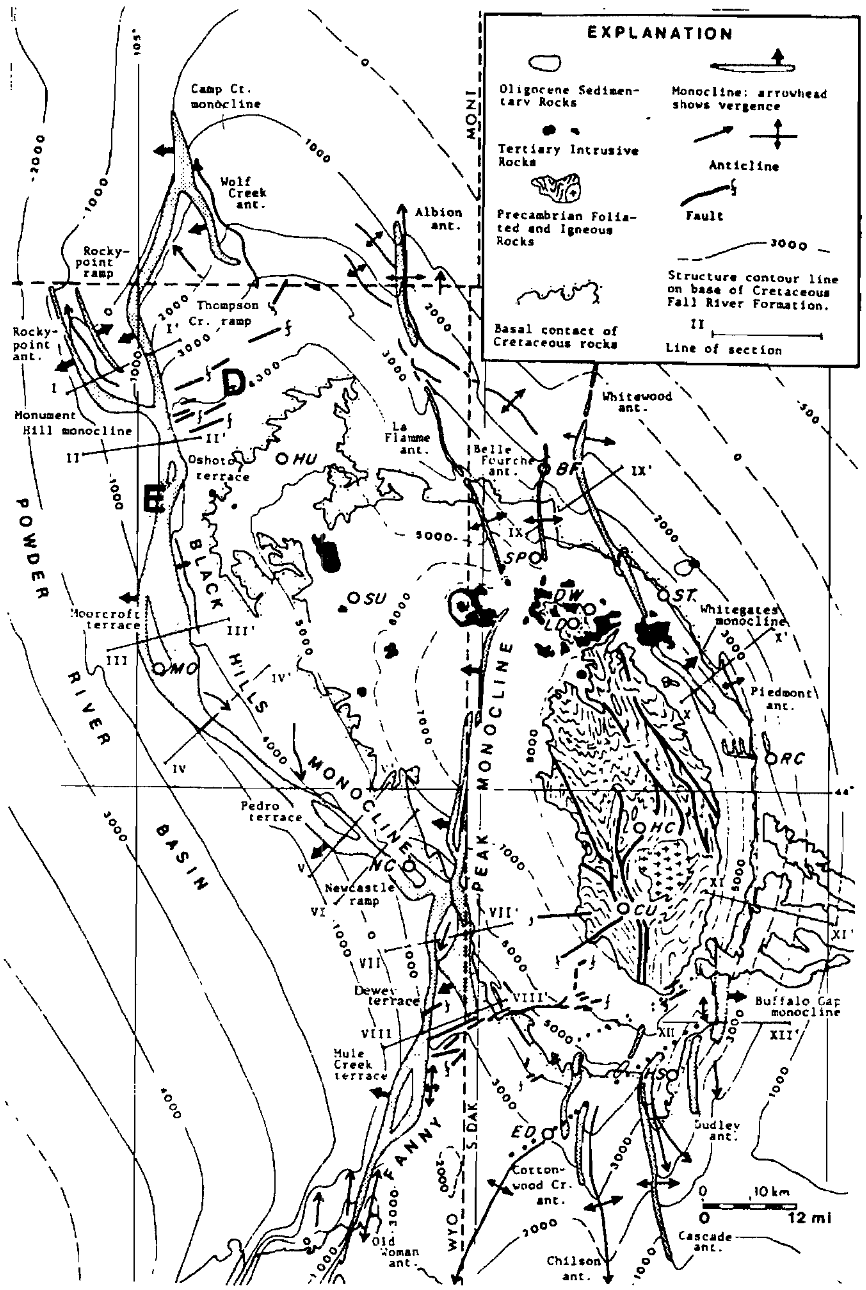


Figure 3. Tectonic map of the Black Hills uplift showing location of the Oshoto deposit (E), and Little Missouri fault zone (D) (From Lisenbee, 1978).

Regional Stratigraphy

Strata exposed in the vicinity of the study area record the last major regression of the Western Interior Cretaceous Seaway (Figs. 4 and 5). Offshore marine Pierre Shale grades upward into transition marine sediments of the Fox Hills Formation. The Fox Hills Formation has been divided by Dodge and Spencer (1977, p. 50) into a lower and an upper unit. Lower Fox Hills Formation sandstones were deposited in marginal marine, foreshore, and shoreface environments (Dodge and Spencer, 1980, p. 7). Above a local unconformity, Upper Fox Hills Formation estuarine sediments were deposited (Dodge and Spencer, 1977 and 1980). Marine influence on sediment distribution terminated with the deposition of the Lance Formation. The Lance Formation was deposited on a relatively stable platform in North-eastern Wyoming (West, 1964, p. 26). Resulting environments of deposition have been interpreted as being fluvio-deltaic in origin (Dodge and Powell, 1975, p. 4; Dodge and Spencer, 1977, p. 50; Dodge and Spencer, 1980, p. 7). Deposition of fluvial sandstones, flood plain mudstones and coals document continued continental influence on sedimentation through the Paleocene Fort Union Formation (Curry, 1971, p. 49-56; West, 1964, p. 27).

Various criteria, both on the outcrop and in the subsurface, have been used to determine boundaries between the Fox Hills, Lance and Fort Union Formations. Robinson and others, 1964, p. 98) used the lowest brown carbonaceous

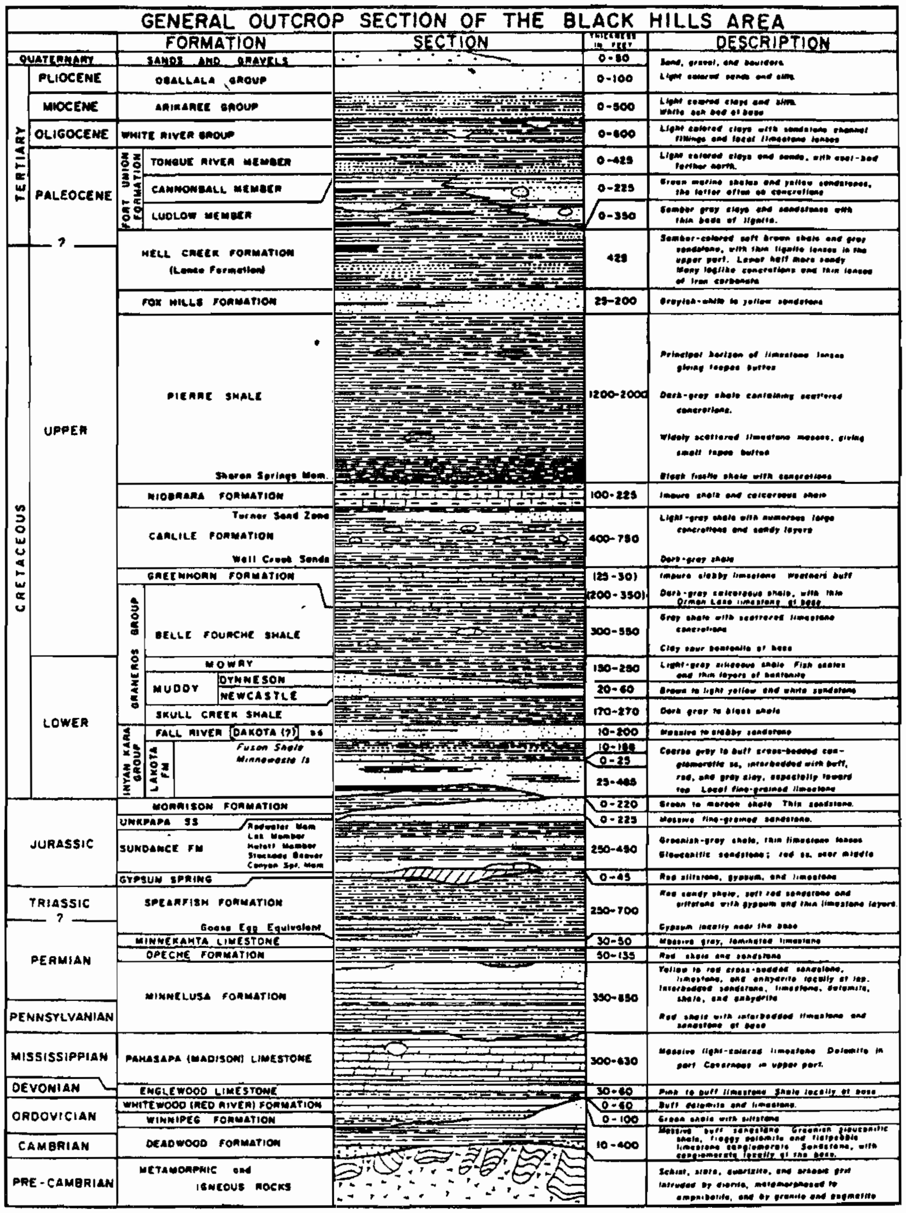


Figure 4. Stratigraphic section of the Black Hills area (From the Department of Geology and Geological Engineering, South Dakota School of Mines and Technology, Rapid City, SD, 1963. Muddy sandstone revised by G. Wulf, 1968).

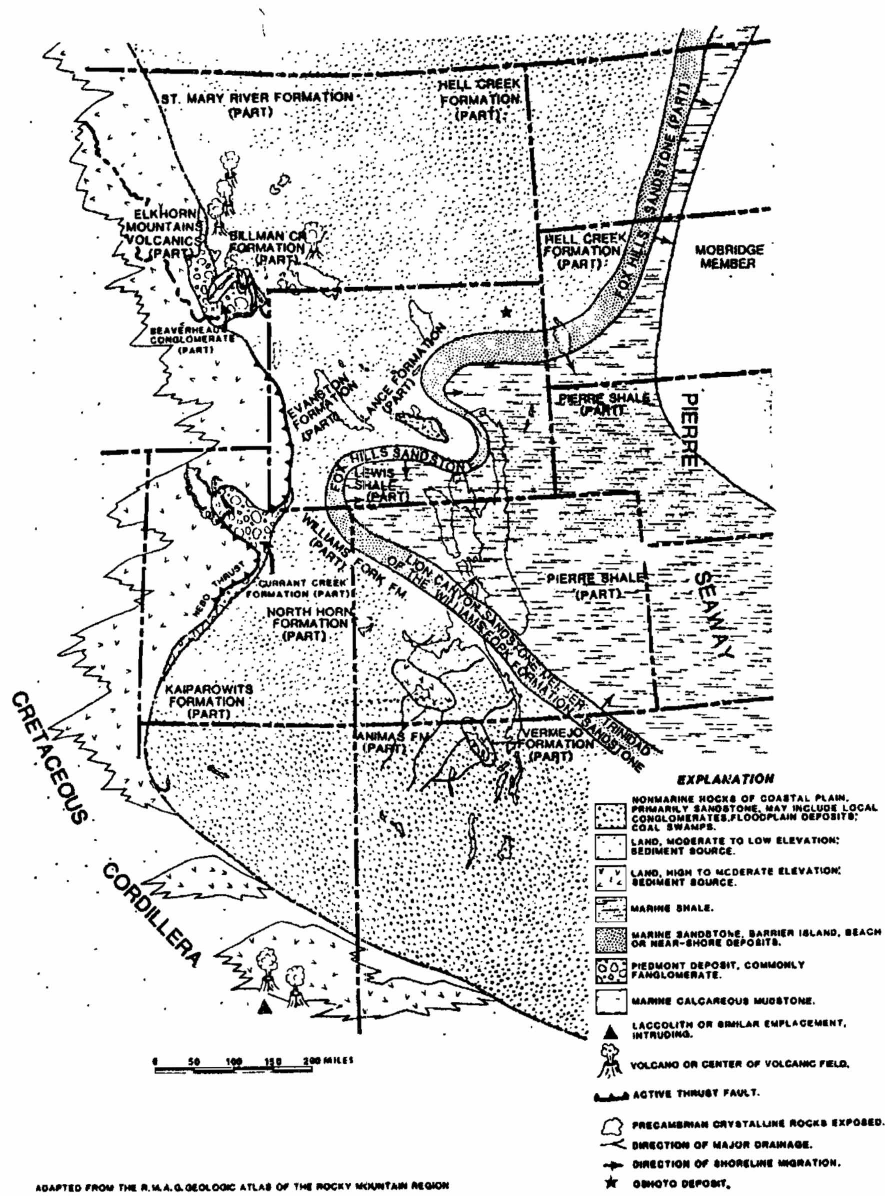


Figure 5. Paleoenvironments in the Rocky Mountain Region during early Fox Hills Formation deposition.

shale or swelling clay bed as the Fox Hills-Lance contact. Dodge and Powell (1975, p. 4), Tschudy (1975, p. 25-35), and Dodge (person. comm. 1980) demonstrated that the contact can be determined by distinguishing marine-fresh water palynologic, microfossil, trace fossil, and invertebrate fossil assemblages. In an area west of the study area Dodge and Powell (1975, Fig. 2, p. 9-10) picked the Fox Hills-Lance Formation contact from electric logs at the base of the first high resistivity sand above a coarsening upward Fox Hills sequence. Curry (1971, p. 49), in an overview of the Powder River Basin, could find "no consistent difference" in electric log curves between the marine Fox Hills Formation and the continental Lance Formation.

The Cretaceous Lance Formation and Tertiary Fort Union Formation contact is discernable by changes in the paleontologic record (Tschudy, 1975, p. 32). Brown (1958, p. 112) placed the Lance Formation contact above the last dinosaur fossil and below the first coal bed. In the subsurface, Curry (1971, p. 49) calls the Tullock Member of the Fort Union the "most distinctive and widespread" unit in the Powder River Basin. The Lance-Fort Union Formation contact is picked at the top of low resistivity Lance Formation mudstones and the base of high resistivity Fort Union Tullock sandstone (Curry, 1971, Figs. 2-5, p. 51-54).

Exploration History

In 1952, uranium was discovered in Lance Formation sandstones on the east-central flank of the Powder River Basin. Exploration drilling, conducted between 1971 - 1977, by Nuclear Dynamics, Inc., (now ND Resources) discovered approximately 6 million pounds of indicated and inferred uranium reserves and an estimated 34 million pounds of potential resources in the region (Stoick et al., 1981, p. 293). Grade and thickness of these reserves and resources are proprietary information. Improving economic conditions prompted ND Resources to conduct economic, engineering, and geologic feasibility studies on a uranium deposit near Oshoto, Wyoming by in-situ leaching methods. Environmental restoration of the pilot leach field is currently nearing completion.

Initial Discovery

Uranium was discovered near Oshoto in 1952 by flying the area with a hand held scintillometer (Stoick, et al., 1981). A small low grade anomaly was found 3 mi west of Oshoto in the Lance Formation. During a field check of the area, light pink- and green-colored sands were noted on a small outcrop. Chemical assays, from grab samples, ranged from .01% to .02% uranium. Due to unfavorable marketing during 1952, in the Black Hills, additional exploration was not warranted. Not until 1970 was the potential of this occurrence evaluated.

Reconnaissance Exploration

In a joint venture with Bethleham Steel Corporation, Nuclear Dynamics initiated a reconnaissance exploration program utilizing existing oil well gamma logs and systematic airborne radiometric surveys. Checks of oil well logs in the area showed significant radioactive anomalies in the Lance Formation from north of Moorcroft to Oshoto. Concurrently, an airborne survey flying 1/3 mi spaced east-west lines, discovered several extensive low intensity anomalies. One of the airborne anomalies was field checked and verified that the radioactivity was due to uranium decay. At this time, approximately 70,000 acres of state, federal and fee land was acquired for exploration. This exploration program, designated the Sundance Project, expanded to include over 114,000 acres by 1974.

Drilling Programs

Drilling on the Sundance Project was separated into four distinct phases: Phase I, stratigraphic; Phase II, delineation; Phase III, development; and Phase IV, production drilling. Each drilling phase was initiated sequentially upon the completion of the goals set by the prededing program. Because of the large area involved in the Sundance Project, however, no single phase was completely terminated. In the course of continued exploration, two or more drilling phases ran concurrently as new areas of mineralization were discovered.

<u>Phase I</u>. Widespaced stratigraphic drilling began in 1970. Holes were placed on 1 to 2 mile centers on fences 4 to 5 miles apart. These holes provided information on sub-surface extension of airborne anomalies, stratigraphic correlations of the Lance Formation, and structure of the Lance Formation. In addition, the 42 stratigraphic holes in Phase I bracketed several oxidation-reduction boundaries and mineral intercepts, providing impetus for expanded drilling.

<u>Phase II</u>. From 1971 to 1975, approximately 4,000 holes were drilled to delineate roll front boundaries (Fig. 6). A variety of drill spacings and patterns were tried in an effort to taylor the drilling program to the deposits and to provide information needed for economic evaluation of the deposits. The drilling was separated into three categories on the basis of offset distances: 1) 400-1000, 2) 100-400, and 3) 10-100 ft centers.

Widespaced exploration holes (400-1000 ft centers) were drilled primarily on grid patterns to explore and identify previously unknown oxidation-reduction boundaries. These boundaries were then targeted for closer spaced drilling (100-400 ft centers). Delineation of roll fronts, at this spacing, was conducted utilizing diamond patterns. Very close-spaced drilling (10 to 100 ft centers) on fence or diamond patterns, was used to test ore width, grade and continuity.

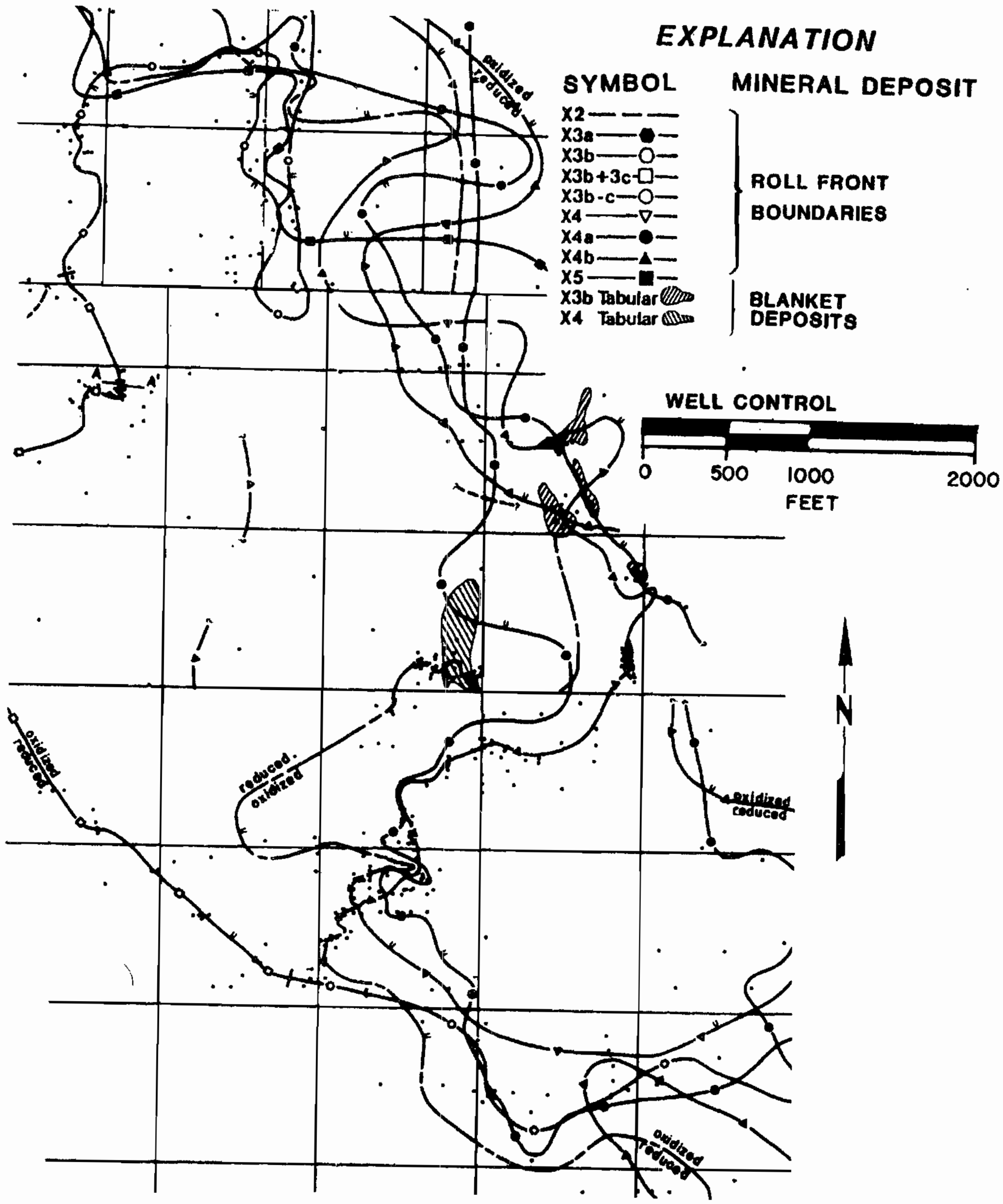


Figure 6. Roll front boundaries and drill patterns near the study area (adapted from Stoick, et al., 1981).

The second phase of exploration located 22 horizons, delineated over 150 linear miles of roll fronts, discovered approximately 34 million pounds in resources and located 12 areas targeted for developmental drilling (Stoick et al., 1981).

Phase III. From 1975 to 1977, exploration efforts were directed toward developing the Oshoto area into a mineable ore deposit. Approximately 1500 holes, drilled principally on 100 ft centers, delineated 4 million pounds of U_3O_8 within the study area. Improving economic conditions of the uranium market prompted ND Resources to proceed with an in-situ leach research and development program.

Phase IV. Feasibility studies of in-situ mining of the Oshoto deposit began in 1976 with a single well push-pull test of the leach chemistry. By mid 1977, ND Resources and its joint venture partners had conducted the engineering, hydrologic and environmental studies necessary for the licensing and building of a research and development in-situ leach facility. The initial test area consisted of 1 recovery well, 4 injection wells, 4 buffer wells, and 5 monitor wells. A sixth monitor well was installed when a hydrologic barrier in the mining horizon isolated one of the original monitor wells from the producing field.

Early in 1979, ND Resources completed the test and initiated restoration. Evaluation of the results indicated that an expanded well field was needed to determine the economic feasibility of in-situ mining of the Oshoto deposit. To date, restoration of the affected aquifer is nearly completed.

Subsurface Mapping Methods

Analysis of subsurface geology at Oshoto was divided into two categories: sedimentation and mineralization. Data for each division was obtained from approximately 1500 exploration drill holes. Each hole was probed with an electric sonde that recorded resistivity, self potential, and gamma radioactivity. Alteration and lithology characteristics were obtained from cuttings and core.

Sedimentation Analysis

Eight cores provided detailed lithologic data for stratigraphic correlations throughout the study area (Fig. 7). Sixty-four panel diagrams with east-west cross sections were constructed utilizing all available exploration logs. Stratigraphic divisions illustrated on Figure 7 were correlated on the panel diagrams to surrounding exploration logs. Three hundred and forty of these logs were considered representative and displayed sufficient resolution for construction of stratigraphic and structural cross sections (Pl. 2). Thirty-nine dip-oriented (east-west) stratigraphic and two strike-oriented (north-south) structural sections were prepared.

Six stratigraphic and two structural cross sections were used to illustrate subsurface facies (Pls. 3 and 4).

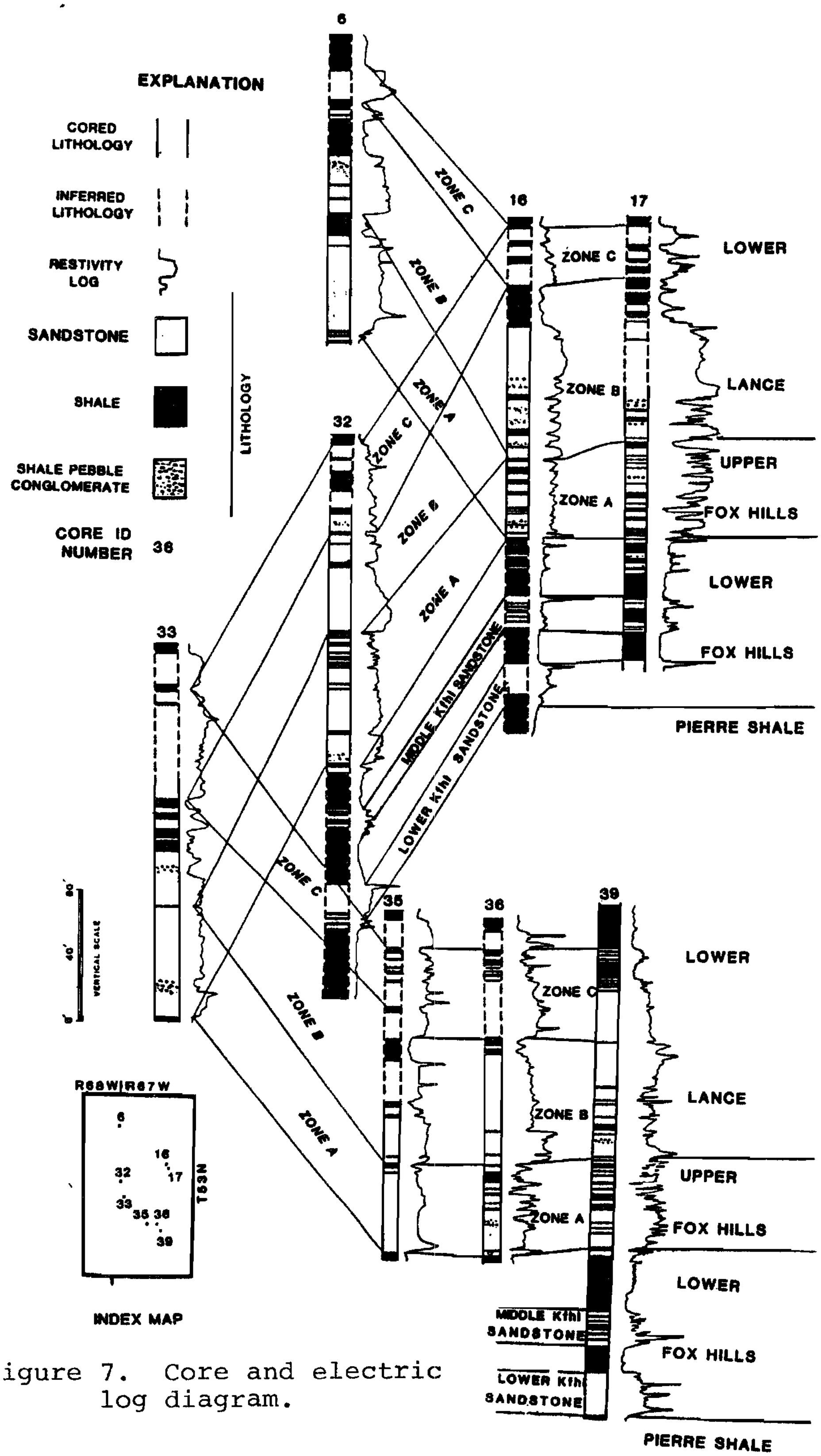


Figure 7. Core and electric log diagram.

Correlation of core to electric log curves (Fig. 7) provided the foundation for quantifying the lithology of adjacent exploration drill holes. Self-potential logs were not used for correlation because drilling fluids used in coring tended to reverse log responses. A similar study of Fox Hills and Laramie Formations in the Cheyenne Basin also used resistivity logs to distinguish stratigraphic units and to aid in interpretation of depositional systems (Ethridge, et al.,1979, p. 8). In this study, data for lithofacies analysis was obtained from the three hundred and forty resistivity curves.

Lithofacies Mapping

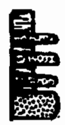
Cross sections and log diagrams illustrate qualitative facies changes, but do not present a complete picture of complex environments. To quantify and map rapidly alternating sediments, a variety of lithofacies maps were constructed. Included in this study are: 1) isopach, 2) paleotopographic, 3) effective sand isolith, 4) percent sand, 5) alternation rate and 6) isofacies maps. Definition and method of construction for each type of map are discussed in following sections.

Bates and Jackson (1980) define an isopach as a line of equal thickness. In this study, an isopach map was constructed for the Lower Fox Hills Formation basal sand (Fig. 7 and Pl. 5). By mapping the thickness of this interval, depositional patterns and paleodrainage are revealed.

Paleotopography of the stratigraphic divisions were mapped by methods outlined by Anderson (1961) and Busch (1959). Anderson called the technique "datum plane-valley floor isopach method". The upper contact of the lower Fox Hills Formation basal sandstone was used as the datum plane. Paleotopography represents the thickness of the interval between datum plane and the depositional surface.

Effective sand isoliths were constructed for the mineralized stratigraphic units: zones A, B, and C. An isolith as defined by Bates and Jackson (1980) is an: "Imaginary line of equal aggregate thickness of a given lithologic facies or particular class of material within a formation". In effective sand isoliths, sands that meet a minimum bed thickness are the class of material contoured. By setting minimum thickness criteria, thin sands deposited with interbeds of silt and shale are eliminated (Fig. 8 and Sedimentary sections II, III, and IV). Only sand deposited under persistent high energy environments are mapped (Fig. 8 and Sedimentary sections I and II).

Percentage maps show contours of the "...percentage value of any one lithology in the total aggregate thickness..." (Low, 1977, p. 261) of the stratigraphic interval. Areas of high and low percent sand are distinguishable in this type of map, but there are variations in sand occurrences that are not discernable using percent sand maps alone (Fig. 8, Sedimentary sections I, II, and III).

SEDIMENTARY SECTION		PERCENT SAND	ALTERNATION RATE *	EFFECTIVE SAND ISOLITH **
I		50%	2	50′
II		50%	8	25′
III		50%	10	0′
IV		10%	2	0′

*NUMBER OF ALTERNATING LITHOLOGIES PER 100 FEET.

**MINIMUM SAND THICKNESS – 25FEET: IF SAND THICKNESS IS LESS THAN 25 FEET THE EFFECTIVE SAND ISOLITH IS 0 FEET

VERTICAL SCALE
100 ft.

Figure 8. Sedimentary sections and corresponding lithofacies values.

Alternation rate maps show the frequency of lithologic variations within a uniform stratigraphic interval (Low, 1977, p. 267). To calculate the alternation rate of a stratigraphic unit, multiply the number of lithologic changes by the unit thickness and divide by a uniform reference interval. In this study, a hundred ft reference interval was used (Fig. 8).

Alternation rate maps illustrate, in plan view, the manner of sedimentation from alternating lithologically diverse, to stable, uniform deposition (Fig. 8, Sedimentary sections I and III). Low alternation rates are not an absolute indicator of sand channels (Fig. 8, Sedimentary section IV), but only an indicator of depositional environments with stable, nonvariable sedimentation.

To distinguish variations in the mode of sand occurrence, alternation rate maps can be compared to percent sand maps. Overlying a complex alternation rate map on an equally complex percent sand map becomes cumbersome. A solution to this problem lies in a hybrid isofacies map that combines the attributes and eliminates the ambiguities of the singular maps.

Bates and Jackson (1980) define isofacies as a map that shows "...the distribution of one or more facies within a designated stratigraphic unit". Percent sand and alternation maps were combined to synthesize four facies based on sand content and alternation rate. Faces divisions are: 1) low percent sand, 2) high alternation rates, 3) median percent sand and median alternation rates, and 4) high percent sand and low alternation rates.

A goal of mapping subsurface geology is to determine lithologic variations and to illustrate these changes in plan view. Cross sections and log diagrams show, qualitatively, internal configurations of the stratigraphic units in two dimensions. They do not exemplify the complete and continuous quantitative picture of rapidly changing facies.

To quantify and to map sedimentation patterns, several lithofacies maps are used. Percent sand and alternation rate maps depict complex sedimentation data in simplified form. Combining both maps to create an isofacies map provided a representative portrayal of lithologic diversity within a stratigraphic interval. Effective sand isoliths purvey channel geometry in terms of width, length, thickness, location and trend. Paleotopographic maps illustrate depositional patterns by isopaching intervals between the datum plane and basal contacts. Isopaching the Lower Fox Hills Formation basal sand interval provided a means to verify paleodrainage interpretations and to determine the basal sand geometry.

These maps and cross sections represent the subsurface geology at Oshoto in three dimensions. They provide the means to map lithology changes and to quantify the geometry of the sand bodies.

SUBSURFACE SAND BODY GEOMETRY

Geometric characteristics of sand deposition used for interpretation of depositional environments include: 1) geographic location, 2) trend, 3) length, 4) width, 5) thickness and 6) boundary conditions (Shelton, 1967, p. 117; Shelton, 1973, p. 3). Geographic location and trend describe the areal extent of the sand body. Length, width and thickness measurements portray physical dimensions of sand deposits, including width to thickness ratios, to aid in estimating sand genesis (Shelton, 1973, p. 4). Boundary conditions include contacts with overlying, underlying and laterally equivalent facies.

Stratigraphic Divisions

Within the study area, Upper Cretaceous sedimentary rocks include: the Pierre Shale, Fox Hills Formation and Lance Formation. The Pierre Shale conformably underlies the Fox Hills Formation, which is divisible into upper and lower units (Dodge and Spencer, 1980, p. 7). Upper Fox Hills Formation strata comprise the lower mineralized horizon, designated Zone A. Overlying the Fox Hills Formation is the Lower Lance Formation. Contacts between these formations are conformable, except where local scouring occurs. Two mineral horizons, Zones B and C, are differentiated in the Lower Lance Formation within the Oshoto deposit.

In the following discussion and tables, reference numbers are used to locate areas on lithofacies maps cited in the text.

Pierre Shale

Outcrops of Pierre Shale are poorly exposed, but are distinguishable in the subsurface by electric logs and core. Comprised of dark gray to black silty shales, the upper portion of the formation is highly bioturbated. Siphonites trace fossils identified in core, give indication of a marine environment of deposition (Dodge and Spencer, 1980, p. 4).

Lower Fox Hills Formation

In the vicinity of Oshoto, Dodge and Spencer (1980) have divided the Fox Hills Formation into lower and upper units, based on differences in color, bedding, trace fossils, lithology and texture. The Lower Fox Hills Formation consists of lower and middle sand members separated by interbedded shales and silts. An upper interbedded shale, silt, and very fine-grained sandstone interval is truncated by Upper Fox Hills Formation sandstone (Fig. 7).

The lowest sand interval is comprised of sandstones with thin interbeds of shale and siltstone, capped by a calcareous-cemented sandstone. Isopachs of the interval outline multiple, narrow north-south ridges and swales, bisected by an east-west sand ridge (Pl. 5). Physical dimensions of individual sandstone ridges are noted on Table 1. The total areal extent of some of the sandstone bodies is not known because the sandstone trends extend beyond study area boundaries. Sandstone deposits present within the confines of the Oshoto deposit, but which extend beyond the boundaries, are noted by a plus sign (+) on Table 1.

Boundary contacts between the Pierre Shale and the basal Lower Fox Hills Formation sandstone interval are gradational. The basal sandstone unit typically exhibits a coarsening upward sequence with a very sharp upper contact with overlying shales and siltstones.

Between the basal and middle sandstone unit of the Lower Fox Hills Formation is an interval comprised of slightly bioturbated dark gray to black shale. Isopachs of this interval (Pl. 6) reveal the paleotopography of the middle sandstone depositional surface. Sand was deposited on a gently undulating surface, dipping eastward approximately 20 ft per mile. The interval consists of thin bedded sandstones and interbeds of shales, siltstones, and calcareous-cemented sandstones (Fig. 7). Fining upward sequences with sharp basal and gradational upper contacts are typical of the Lower Fox Hills Formation middle sandstone unit (Pls. 3 and 4; Fig. 7).

Conformably overlying the middle sandstone is an interval comprised of thin interbeds of bioturbated, black to dark gray shales, siltstones and thin-bedded, graded

Table 1. Lower Fox Hills Formation basal sand geometry.

Area	Trend	Length (ft)	Width (ft)	Thickness (ft)	Width / Thickness	Boundaries: Upper	Boundaries: Lower	Boundaries: Lateral
LB1-LB2	N-S	12,000+	2000-3000+	25	80:1-120:1	Sharp	Coarsen Upward	Grada-tional
LB3-LB4	N-S	12,000+	3000+	20-34	90+:1	Sharp	Coarsen Upward	Grada-tional
LB4-LB5	E-W	5,000+	2100	20-29	70:1	Sharp	Coarsen Upward	Grada-tional
LB6	N-S	5,000+	2500	16-20	---	Sharp	Coarsen Upward	Grada-tional
LB7	N-S	4,000+	1000-2000	16-20	---	Sharp	Coarsen Upward	Grada-tional
LB8	N-S	5,500+	1000-1500	12-20	---	Sharp	Coarsen Upward	Grada-tional

+ Denotes extension beyond mapped boundary, indicating minimum values

sandstones. In the Oshoto area, the marine trace fossil Thalassinoides is the only identified trace fossil found in the Lower Fox Hills (Dodge and Spencer, 1980, p. 7). South of the area, Ophiomorpha and Arenicolites are found in equivalent facies (Dodge, 1980, p. 25).

Upper Fox Hills Formation

Two types of sandstone deposits are prevalent within the Upper Fox Hills Formation: 1) thick-bedded, blocky sandstones and 2) thin, interbedded sandstones, siltstones and shales (Pls. 3 and 4). Blocky sandstones are light gray to gray, well- to moderately well-sorted, and fine grained. Intraformational shale pebble conglomerates commonly occur at, or slightly above the basal contact between Upper and Lower Fox Hills Formations, in areas with sandstones greater than 25 ft thick (Fig. 7, hole numbers 16, 32, 33, and 39). Shale clasts are well rounded and have been found in core to range up to 6 inches in diameter.

Deposits of interbedded sandstones, siltstones, and shales are illustrated on Plate 8 by either a low percentage sand or a high alternation rate area. Sandstones range from olive green to gray, fine- to very fine-grained, and moderately to poorly sorted. Black shales to dark gray siltstones are slightly bioturbated. Horizontal, inclined, and vertical burrows are present in Upper Fox Hills Formation core in southeastern area A9

(Pl. 7). Dodge and Spencer (1980, p. 7) identified brackish-water pelecypods in the same unit. Coalified leafy matter and small carbonaceous fragments are present in core. Leafy material occurs as thin laminae along bedding planes and the small fragments are found as detrital grains in sandstones.

Two major sand trends are present in the study area: east-west and north-south sand bodies (Pl. 7). Physical parameters of individual sand bodies are summarized on Table 2. Thick-bedded sandstones are delineated by effective sand isolith contours greater than 25 ft thick (Pl. 7). Sandstones in areas A4-A5 and A6-A7-A10 display sharp upper and lower contacts. Fining upward sequences, near the top of thick-bedded sandstones occur in area A7-A4 (Pls. 7 and 8). Lateral boundary conditions range from abrupt contacts in the northern portion to gradational contacts in the southern portion of the study area (Pl. 7).

Sand deposits in area A8-A1 form minor, north-south, bifurcating sand channels (Pl. 8). Boundary conditions are abrupt for both lower and lateral contacts and grade upward into finer, interbedded sediments towards the top of the interval.

Areas that contain primarily thin-bedded sandstones, siltstones, and shales are outlined as interchannel in areas A9, northeastern A3, and eastern A8 and A1 (Pl. 8).

Table 2. Upper Fox Hills Formation sand geometry.

Area	Trend	Length (ft)	Width (ft)	Thickness (ft)	Width / Thickness	Boundaries: Upper	Lower	Lateral
A4-A5	E-W	4500+	1000-4500	25-45	40:1-100-1	Sharp	Sharp	North-Abrupt South-Grada-tional
A6-A7-A2-A10	N-S	14,500+	4500+-7000+	25-65	100+:1-180+:1	Sharp to fine up-ward	Sharp	Northeast-Abrupt Southeast-Gradational Western-Unknown
A8-A1	N-S	7000+	500-1200	20-45	25:1	Fine upward	Sharp	Abrupt
A9	N-S	4400	5000+	1-25	---	Fine upward	Sharp	Abrupt
NE A3	E-W	600+	1400	1-25	---	Fine upward	Sharp	Grada-tional

+ Denotes extension beyond mapped boundary, indicating minimum values

sediments are characterized by a basal sandstone with sharp lower contacts and a fining upward sequence with a diminishing sand content.

Paleotopography of this unit is illustrated by isopaching the interval between the basal Lower Fox Hills Formation sandstone and the base of the Upper Fox Hills Formation. Topographic lows trend north-south and east-west as illustrated on Plate 9. Relief within the topographic lows varies from 5 ft per 1000 ft in the east-west A4-A5 area to 20 ft per 1000 ft in the north-south A6-A2-A10 area.

Lower Lance Formation

Lower Lance Formation sediments are poorly exposed at the surface, but are distinguishable in the subsurface core and electric logs (Fig. 7). In the study area, sediments of interest lie within the lower 100 to 150 ft of the Lance Formation. Two depositional sandstone packages are discernable in this interval based on sand body geometry. They correspond to a lower, Zone B, and an upper, Zone C, mineralized horizon.

Zone B. In the subsurface, sandstone deposits are divided into thick bedded sandstones and thin, interbedded sandstone, siltstone, and shale (Fig. 7). Thick sand sequences are outlined on Plate 10 by effective sand isolith contours greater than 25 ft. Well-rounded, intraformational shale pebble conglomerates generally occur as basal channel lag. Multiple scour surfaces with accompanying shale clasts are locally abundant in area Bl (Pl. 10). Detrital carbonaceous fragments and coalified woody material occur locally as clasts within the thick-bedded sand sequences. Interbedded sediments are depicted on Plate 11 as areas of low sand percentages and high alternation rates. The sediment sequence consists of interbedded dark brown organic-rich shales, black lignitic shales and gray, very fine to fine sandstones overlain by organic-rich shales. Palynomorphs indicate a predominately fresh-water environment of deposition for Lower Lance Formation sediments (Tschudy, 1975).

Lower Lance Formation Zone B sand bodies form narrow, straight, rejoining channels that trend roughly north-south (Pl. 10, areas Bl, B2-B7, B4 and B6). Physical dimensions of the strata of Zone B are summarized on Table 3. Sand trends extend both north and south out of the Oshoto area. Upper and lower boundary conditions of the thick-bedded sandstones are predominantly abrupt, except for the lateral gradational boundary on the western flank of area B4 sand body (Pl. 10).

Interbedded strata also exhibit sharp basal contacts, except in the northeastern Bl, southern Bl, and western B2 areas. Upward fining sequences are common in the thinly bedded sediments.

Paleotopography of Zone B is illustrated by iso-paching the interval between the basal Lower Fox Hills

Table 3. Lower Lance Formation Zone B sand geometry.

Area	Trend	Length (ft)	Width (ft)	Thickness (ft)	Width / Thickness	Boundaries: Upper	Boundaries: Lower	Boundaries: Lateral
B1	N-S	6500+	1000-1500	25-65	40:1-60:1	Sharp-Gradational	Sharp	Abrupt
B2-B7	NW-SE	7000+	1000-1500	25-65	40:1-60:1	Sharp	Sharp	Abrupt
B4	NE-SW	7500+	2500	25-45	55:1-100:1	Sharp	Sharp	Western-Gradational Eastern-Abrupt
B3-B8	NW-SE	5500+	4000+	1-25	---	Sharp Fine Upward	Sharp	Eastern-Abrupt Western-Unknown
B6	NW-SE	6500+	500-2000	45-65	11:1-30:1	Sharp	Sharp	Abrupt
E-B9	E-W	1000	1300	25-45	30:1-50:1	Sharp	Sharp	Abrupt
B9	N-S	2500+	1700	25-65	25:1-70:1	Sharp	Sharp	Abrupt
B10	NE-SW	4500+	2000+	1-25	---	Fine Upward	Sharp	Eastern-Abrupt Western-Unknown

+ Denotes extension beyond mapped boundary, indicating minimum values

Table 3. Lower Lance Formation Zone B sand geometry (continued).

Area	Trend	Length (ft)	Width (ft)	Thickness (ft)	Width / Thickness	Boundaries: Upper	Lower	Lateral
B5-B11	N-S	5500	400-1200	1-25	---	Fine Upward	Sharp	Abrupt
NE-B1	N-S	3500	400-1400	1-25	---	Fine Upward	Grada-tional	Western-Abrupt Eastern-Unknown
S-B1	E-W	2500+	1200	1-25	---	Fine Upward	Grada-tional	Abrupt
W-B2	N-S	3300	1500+	1-25	---	Sharp Fine Upward	Sharp	Abrupt

\+ Denotes extension beyond mapped boundary, indicating minimum values

Formation sandstone and the basal sandstone of the Lance Formation. Topographic lows trend approximately north-south. Maximum relief observed is approximately 20 ft per 1000 ft in the B2 area (Pl. 12).

Zone C. Lower Lance Formation Zone C sediments are comprised of multiple sand bodies bounded by abundant shales and siltstones (Pl. 3 and 4). Thick-bedded sandstones are gray to light gray, very fine to fine grained with thin interbeds of very fine-grained sandstones and dark gray siltstones.

Zone C sandstones form narrow, east trending deposits. Two types of sand bodies are illustrated on Plate 14: 1) east-trending, shoestring sandstones in areas C1, C3, and C4; and 2) the broad, wedge-shaped distributary deposit at area C2. The sand geometry is summarized in Table 4. Sand trends extend east and west out of the study area. Zone C sands, outlined on Plate 14 by contours greater than 25 ft, display sharp lower contacts. In areas C1 and C2, upper boundaries are sharp to gradational, and in area C3 the sands form a fining upward sequence. Lateral boundaries for individual sand bodies are abrupt.

Interbedded sediments, areas C5 and C6, exhibit sharp lower contacts and commonly display fining upward sequences.

Table 4. Lower Lance Formation Zone C sand geometry.

Area	Trend	Length (ft)	Width (ft)	Thickness (ft)	Width / Thickness	Boundaries: Upper	Boundaries: Lower	Boundaries: Lateral
C1	E-W	3000+	300	25-35	8:1-12:1	Sharp Gradational	Sharp	Abrupt
C2	NW-SE	5000+	4500	25-45	100:1-180:1	Sharp Gradational	Sharp	Abrupt
C3	E-W	4500+	600	25-35	15:1-24:1	Fine Upward	Sharp	Abrupt
C4	E-W	7000	1000	25-45	20:1-40:1	Sharp	Sharp	Abrupt
C5	E-W	7000+	6000+	1-25	---	Fine Upward	Sharp	Abrupt
C6	NW-SE	7000+	1500+	1-25	---	Fine Upward	Sharp	Northern-Abrupt Southern-Unknown

\+ Denotes extension beyond mapped boundary, indicates minimum values

STRUCTURAL GEOLOGY

Structural features illustrated on Plate 1 are mapped on the base of the Upper Fox Hills Formation. Within the study area, sedimentary units dip 1° to 2° basinward. In the northeast corner the dip increases in response to folding on the Black Hills monocline. Immediately east of the area, strata is nearly vertical.

Subsurface faults in the area trend predominantly northeast, east and southeast. Displacement on faults ranged between 10 and 30 ft. In addition to faulting illustrated on the structural contour map, faults were observed in core, and inferred by pump tests in area S4 (Pl. 1). Core from hole number 36 (Pl. 2) intersected a high angle fault in the Lower Lance Formation. Sandstone was displaced against shale and slickensides were present on the fault surface. A hydrologic barrier, discovered by a series of pump tests in area B6 (Pls. 10 and 17) coincided with the northeast trending fault in area S4 (Pl. 1).

ROLL FRONT GEOLOGY

Ground water entering and flowing through an aquifer chemically modifies the host rock and through interaction with the host rock is modified in turn. A record of chemically reactive, migrating ground water is preserved by diagenetic mineralogy changes and epigenetic metal enrichment. Various types of ground water are capable of mobilizing, transporting, and concentrating uranium through mechanisms active in roll front deposits.

Roll front deposits result from oxidizing ground water migrating down-flow through regionally reduced sediments (Rackley, et al., 1968, p. 23). Subsequent geochemical cells, produced by migrating ground water, formed ore deposits through a dynamic process of oxidation, dissolution, transportation, reduction and precipitation of uranium. Shape and position of the roll front is determined by sand body geometry (gross permeability), reductant concentration, and ground water flow. Profiles of individual roll fronts are convex up-flow in vertical section; a shape that approximates the velocity gradient of flow through a uniform sand bed (Germanov, 1960, p. 79).

Rubin (1970, p. 5-8) has demonstrated a definite zonation across Powder River Basin roll fronts. Divisible into eight zones, from unaltered to altered, these are: 1) unaltered; 2) remote seepage; 3) near seepage; 4) ore;

5) interface; 6) near barren interior; 7) remote barren interior; and 8) barren interior. Sandstone characteristics and radiometric configuration typical of the Oshoto deposit are described below and summarized on Figure 9.

1. Unaltered sediments are light gray to gray; carbonaceous matter is vitreous and firm; pyrite is brass yellow and metallic.

2. Remote seepage assemblages are akin to unaltered sediments, except that a radioactive anomaly occurs at the base of the sandstone.

3. In near seepage zones, radioactivity becomes stronger and the first traces of limonite staining may occur.

4. Ore zone radioactivity reaches peak thickness and grade; pyrite is pitted and tarnished, and limonite stain increases slightly in abundance.

5. The interface zone is the geochemical boundary between regionally reduced and epigenetically oxidized sediments. Alteration, evidenced by presence of limonite, occurs in sandstone between multiple gamma log anomalies. Carbon becomes dull and flaky with pyrite showing increased pitting and tarnishing.

6. Sandstones within the near barren interior take on a grayish yellow color in response to increased oxidation. Pyrite is pitted and dull, or completely destroyed and carbonaceous material is dull and sooty in appearance. Radioactive anomalies commonly occur as pairs: an upper, and a lower gamma "spike".

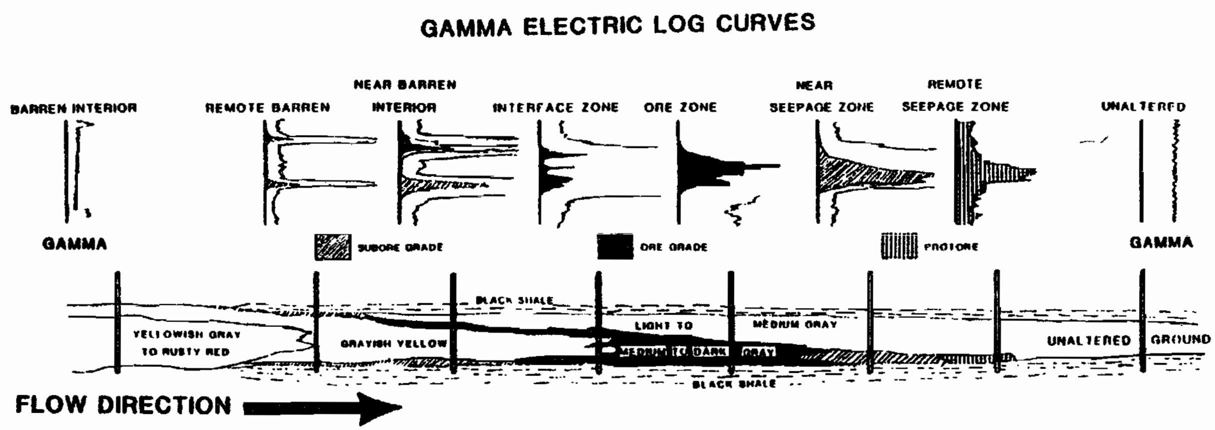


Figure 9. Roll front zonation at Oshoto (adapted from Rubin, 1970).

7. Remote barren interior zones are characterized by twin, low intensity gamma spikes. Alteration increases in intensity and hematite staining may be present. Pyrite and carbon are almost destroyed.

8. Barren interior zonation is distinguished from other altered zones by the lack of anomalous gamma radioactivity. Limonite and hematite staining is prevalent enough to color sandstone yellow gray to rusty red.

In this study, this scheme was modified and five divisions were used to map the Oshoto ore deposit. They are: 1) barren interior; 2) near barren interior; 3) interface; 4) ore to near seepage; and 5) unaltered zones. For each mineralized stratigraphic subdivision, Upper Fox Hills Formation (Zone A) and Lower Lance Formation (Zones B and C). roll fronts were mapped and are illustrated on Plates 16, 17, and 18.

Roll Front Geometry

Position of oxidation-reduction boundaries is determined by variations in ground water flow. Ground water migration is modified by inherent physical attributes of host aquifers. Permeability, transmissivity, flow boundaries, and hydrologic gradients, all contribute to alter ground-water flow. Migration of oxidizing geochemical cells is tempered by the relative abundance of reductants, such as organic material, reduced iron and sulfide materials and by the physical parameters of aquifers. Alteration salients form in areas of relatively high ground-water flow in sediments (Galloway, et al., 1979, p. 177).

Roll front geometry provides information concerning paleoflow direction and relative volume of ground-water flow during the ore forming episode. By classifying and mapping position of roll fronts and mineralization patterns, insight into physical aspects of host aquifers is obtained. Using a classification system presented by Galloway, and others (1979, p. 177-180), roll front deposits are segregated into passive, active and stagnant fronts (Fig. 10).

The classification scheme outlined by Galloway integrates the uneven migration of roll fronts with ground-water flow lines. A passive front forms parallel to ground-water flow lines. Little circulation occurs across the geochemical interface, resulting in a stationary front composed of narrow, discontinuous, low grade uranium deposits. In active fronts, oxidizing ground water continually passes the oxidation-reduction boundary, producing a dynamic ore body. Through protracted oxidation, transportation, reduction, and enrichment of uranium, broad, high grade, continuous deposits are produced. Stagnant fronts occur as isolated islands or embayments of reduced sediments within altered interiors of migrating roll fronts. Mineralization typically occurs as small, discontinuous

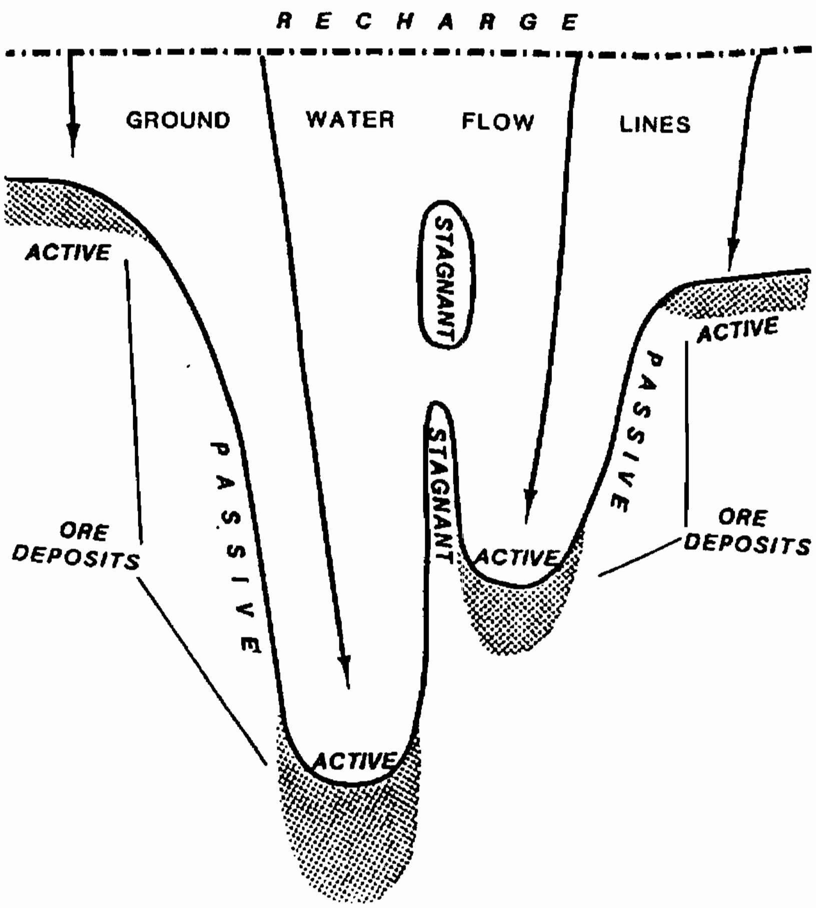


Figure 10. Roll front geometry as seen in map view (after Galloway, 1979).

pods. Mineral grade and thickness of stagnant fronts is higher along oxidation-reduction boundaries oriented normal to the ground-water flow.

Zone A

Zone A uranium distribution is associated with two major alteration tongues that are separated by a narrow, elongate embayment of unaltered ground (Pl. 16). Paleo-groundwater flow is illustrated by the orientation of alteration projections in areas A1 and A2. Oxidizing ground water entered the Upper Fox Hills Formation aquifer, migrated westward down dip, then flowed from south to north in the Oshoto area. Active, passive, and stagnant roll fronts formed in response to the differential migration of the oxidation geochemical cell. Uranium roll front characteristics are summarized in Table 5.

At the terminus of each alteration tongue, active fronts pervade. In area A1, a single active front is present; in area A2, the active front consists of multiple, narrow alteration projections (Pl. 16). Mineralization associated with the two alteration salients exemplifies the characteristics of active roll front uranium deposition in the Oshoto area. Active ore zone mineralization is consistently thicker, wider, and maintains higher grades than flanking passive roll fronts (Table 5). An exception is illustrated by the passive ore roll in the southern A2 area (Cross section L-L'; Pl. 19). In this instance,

Table 5. Upper Fox Hills Formation Zone A mineralization.

Area	Type	Ore to Near Seepage Width (ft)	Ore to Near Seepage Thickness (ft)	Near Barren Interior Width (ft)	Near Barren Interior Thickness (ft)	Orientation	Cross Section	Continuity
A1	Active	100-300	5-20	2000	1-10	NW-SE	J-J'	Excellent
A2	Active	100-600	5-45	100-700	1-10	NW-SE	---	Excellent
A1	Passive	50-100	1-20	300-700	1-10	NE-SW	---	Good
N A2	Passive	50	1-20	50-100	1-5	NE-SW	---	Good
S A2	Passive	100-200	5-45	100-200	1-10	N-S	L-L'	Excellent
A1	Stagnant	25-50	5-30	25-100	1-5	NE-SW	K-K'	Poor
A3	Stagnant	100-200	5-20	50-300	1-5	E-W	N-N'	Excellent
S A4	Stagnant	50-200	1-20	100-900	1-5	E-W	---	Good
N A4	Stagnant	50-150	1-10	50-200	1-5	N-S	---	Poor
A6	Stagnant	50-150	1-10	50-1000	1-5	N-S	---	Poor
A5	Isolated	---	---	50-100	1-5	NW-SE	---	Very Poor
A7	Isolated	---	---	100-600	1-5	NE-SW	---	Very Poor

uranium is being contributed to the deposit from two opposing directions, creating a thick, high grade, continuous uranium deposit.

Oxidizing ground water migrating northward through the Upper Fox Hills Formation aquifer, left remnants of reduced ground and isolated mineralization behind the advancing geochemical cell. Orientation of oxidation-reduction boundaries, with respect to ground-water flow, determines the tenor of mineralization associated with stagnant fronts. Uranium deposited along east-west oriented fronts typically contains thicker, higher grade (Table 5), and more continuous mineralization (Pl. 16) than stagnant fronts oriented north-south, parallel to ground-water flow (Table 5). Isolated remnant mineralization, not associated with crescent-shaped roll fronts forms thin, low grade, and very discontinuous deposits.

Zone B

Ground water entering the Lower Lance Formation Zone B sediments was channeled along multiple, narrow flow paths. Projection of alteration into reduced areas (Areas B1, B3, and B4; Pl. 17) formed in response to variable ground-water flow. In the Oshoto deposit, roll fronts migrated from south to north, or northeast. Uranium mineralization associated with both active and passive fronts is highly diversified (Table 6). Area B1 contains roll fronts that produced relatively high grade, continuous deposits. The active front associated with passive fronts

Table 6. Lower Lance Formation Zone B mineralization.

Area	Type	Ore to near Seepage Width (ft)	Ore to near Seepage Thickness (ft)	Near Barren Interior Width (ft)	Near Barren Interior Thickness (ft)	Orientation	Cross Section	Continuity
B1	Active	100-500	5-20	700-1000	1-10	E-W	J-J'	Excellent
B2	Active	50-100	5-10	400	1-5	E-W	---	Excellent
B3	Active	25-50	5-10	400	1-5	E-W	L-L'	Good
NW B1	Passive	50-150	1-20	50-500	1-10	NE-SW	---	Good
B2	Passive	50-100	1-10	200	1-5	NW-SE	---	Very Poor
B3	Passive	25-100	1-10	50-200	1-5	NW-SE N-S	---	Very Poor
SE B4	Passive	50-250	1-20	50-300	1-5	NE-SW	---	Very Poor
NW B4	Passive	50-400	5-30	50-300	1-10	NE-SW	I-I'	Excellent
B5	Passive	50-100	1-10	50-100	1-5	N-S	---	Very Poor
SE B1	Stagnant	25-150	1-30	25-300	1-5	NE-SW	---	Good to very poor
B6	Stagnant	10-100	1-15	10-200	1-10	E-W	K-K'	Poor
B7	Stagnant	50-100	1-10	50-100	1-5	NW-SE	---	Very Poor
B8	Stagnant	100-250	5-25	50-200	1-10	N-S	M-M'	Good
B9	Stagnant	50-300	1-10	50-100	1-5	NE-SW	---	Poor
B9	Isolated	---	---	50-1100	1-5	N-S	---	Very Poor

near area B4 has not been discovered, to date, but the northwestern passive B4 roll front exhibits exceptionally well developed uranium deposits. Roll fronts in areas B2 and B3 produce thin, low grade, discontinuous mineralization (Plate 17 and Table 6).

Stagnant fronts in Zone B are varied and numerous. Uranium in area B6 was deposited on the southern interface between remnant islands of reduced ground and encircling altered sediments of the roll front interior (Pl. 15). Mineralization can be high grade, but often is very thin and narrow (Table 6). Stagnant fronts associated with unaltered embayments in B7 and southeastern B1 areas, contain poorly developed mineralized roll fronts. A well developed front occurs in area B8 (Pl. 17). In this case, uranium was deposited at the oxidation-reduction boundary from two directions (Cross section M-M'; Pl. 19). Mineralization isolated in the near barren interior, located in area B9, is typically thin, low grade and very discontinuous.

Zone C

Roll fronts in Lower Lance Formation Zone C sediments are poorly developed. Only a single down-dip alteration tongue contains any known mineralization within the study area (Pl. 18). The resultant deposit stradles the oxidation-reduction boundary and is thin, low grade and severely limited (Table 7).

Table 7. Lower Lance Formation Zone C mineralization.

Area	Type	Ore to Near Seepage Width (ft)	Ore to Near Seepage Thickness (ft)	Near Barren Interior Width (ft)	Near Barren Interior Thickness (ft)	Orientation	Cross Section	Continuity
C1	Active	50-100	5-15	50-100	1-5	N-S	---	Good
C1	Passive	---	---	---	---	E-W	---	None

DEPOSITIONAL ENVIRONMENTS

Recognition of ancient depositional environments requires the integration of a variety of characteristics inherent within the rocks. This study investigates the sand body geometry, lithologic variability, and vertical and lateral relationships of the Fox Hills and Lower Lance Formations in a local area. The depositional models proposed in the following text also incorporate work published primarily by Harry Dodge and Charles Spencer of the U. S. Geological Survey.

In northeastern Wyoming, sedimentary rocks record the last major regression of the Western Interior Cretaceous Sea. Depositional environments change upward from offshore marine Pierre Shale, to the nearshore marine Fox Hills Formation, including local estuarine sedimentation, to the fluvio-deltaic Lance Formation. During the time of deposition of the Fox Hills Formation in the study area, the strandline strike was north-south. With time, the shoreline prograded eastward.

A change in the depositional dip occurred during Lance sedimentation. The shallow stream gradient developed to the south. Regional isopachs of the Fox Hills Formation indicate a basin was developing south of the area (Dodge, 1980, Pl.7).

Lower Fox Hills Formation

Sand geometry of the Lower Fox Hills Formation basal sandstone is comprised of multiple sand ridges crosscut by a transverse sand channel (Pl. 5). The basal sandstone exhibits an overall coarsening upward sequence from a gradational and conformable contact with the underlying marine Pierre Shale, to abrupt upper contacts with overlying marine strata of the Lower Fox Hills Formation.

In a regressional sequence, vertical stratigraphic relationships place the linear sand ridges landward of the marine Pierre Shale and seaward of the continental Lance Formation. Environments located in this range include offshore, nearshore, shore face, and foreshore. In studies of ancient environments within interior seaways, several authors have described linear offshore bars that parallel the strandline (Ryer, 1976, p. 1082; Brenner and Davies, 1974, p. 427; Brenner, 1978, p. 195).

Offshore linear sand ridges with coarsening upward sequences, have been described in Upper Cretaceous strata from central Wyoming. Brenner's study of the Sussex Sandstone (1978, p. 195) and Asquith's work on the Shannon Sandstone (1974, p. 2279) place the formation of these sand bars on the outer continental shelf. Gill and Cobban (1973, p. 31) place the deposition of the Shannon Sandstone approximately 100 km offshore. The depositional model proposed by Harms, and others (1975, p. 113) for the Shannon Sandstone and by Brenner (1978, p. 197) for the

Sussex Sandstone consists of an initial progradation of the continental shelf and slope. Shelf sediments were then subjected to periodic storms which winnowed out shelf deposited mud and piled sand into bars or shoals. As the sand bars built vertically, the deposits coarsened upward in response to increased shoaling energy. Sand bar geometry is further modified by regional and tidal currents (Brenner, 1978, p. 197).

Similar marine bar sands have been described as forming during the Jurassic in a regressive shallow interior seaway (Brenner and Davies, 1974, p. 426). Transverse channels cutting bar sands were also noted. Brenner and Davies (1973, p. 1685) attributed these to surge channels that cut through the bars by storm induced currents under shallow marine conditions.

Modern investigations of shelf topography of the North Atlantic Ocean have identified the presence of offshore and nearshore bar sands (Duane, et al., 1972, p. 447; Swift, et al., 1972, p. 499). Multiple nearshore sandbars are actively forming in response to normal tidal, storm and regional circulatory currents. Nearshore bars, deposited on the inner continental shelf, trend parallel or subparallel to the strandline. The actively forming ridge and swale topography of the inner Atlantic shelf lies in water depths within the zone of wave surge in the nearshore zone (Duane, et al., 1972, p. 447). The bar sands of the outershelf are termed relict deposits formed in the nearshore environment during the earlier stages of transgression (Swift, et al., 1972, p. 569).

In the study area, overlying the marine bars is 70 ft to 90 ft of gently dipping interbedded shales, siltstones, and sandstones that contain marine trace fossils. Local erosion may have removed an additional 90 to 120 ft of section (Dodge and Spencer, 1980; Fig. 11). The only mappable subsurface marker bed within this unit is a sandstone, located roughly in the middle of the sequence. Paleotopography of the depositional surface exhibits a slightly undulatory, 20 ft per mi eastward dipping slope. The shallowness of the depositional slope corresponds to the low gradients of the nearshore area (Hoyt and Henry, 1967, p. 81). Dodge (1980, p. 7) reports predominantly east, southeast and south paleoflow directions for gently inclined bedding surfaces, from surface exposures of the Lower Fox Hills Formation south of the study area.

Considering the depositional history of the basin, regional stratigraphy, vertical relationships, well profiles and sand geometry, a depositional model can be developed for the Lower Fox Hills Formation. The regression of the Interior Cretaceous Sea began with the progradational shelf deposits of the offshore marine Pierre Shale.

Increased energy, supplied by periodic storms, began winnowing out shelf-deposited mud and started piling

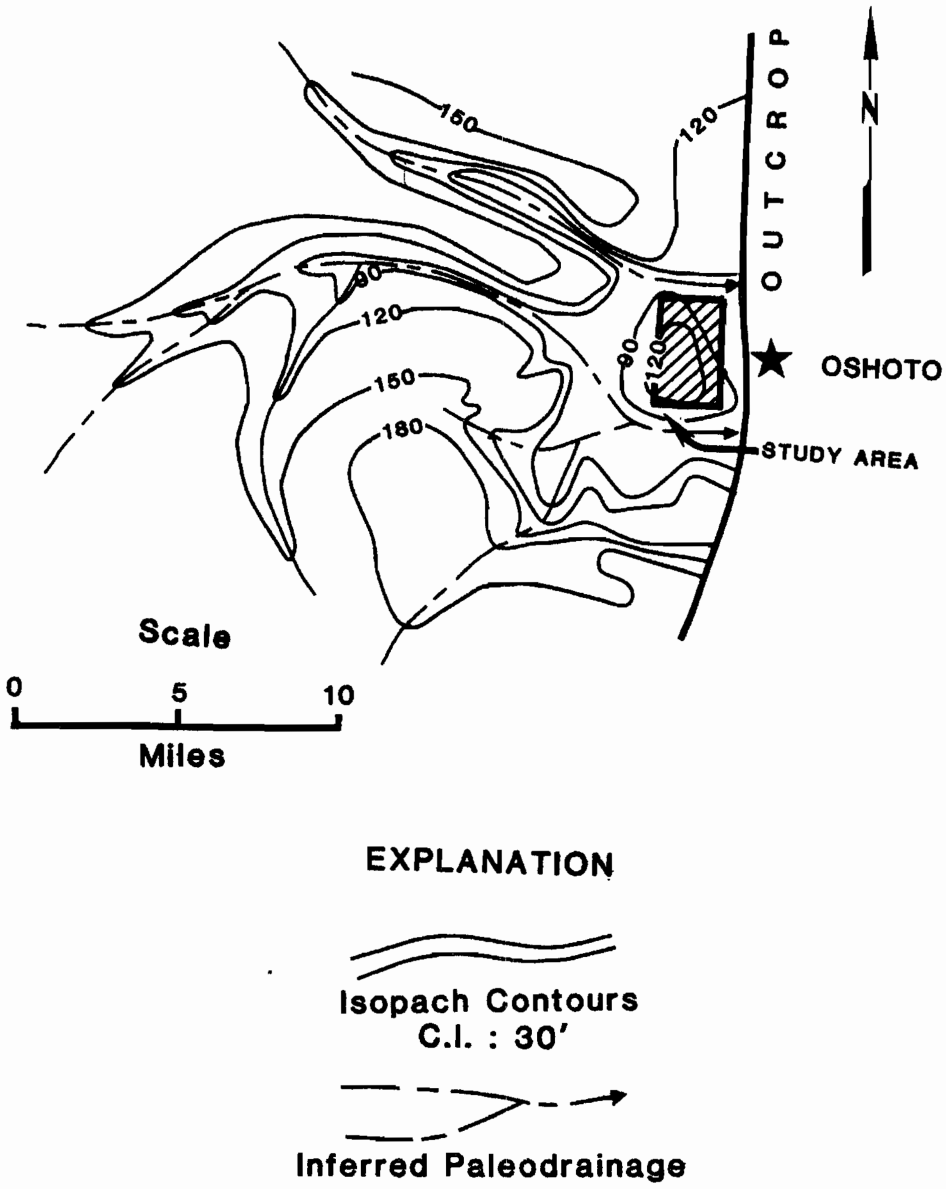


Figure 11. Subregional Upper Fox Hills Formation paleo-drainage pattern as derived from isopach lines (modified from Dodge and Spencer, 1980).

sand into submarine bars. Through increased shoaling energy, the sand bars developed a coarsening upward sequence. The sand bars were further modified by storm, regional and tidal currents. A storm induced surge channel oriented normal to the bar strike is observed in the Oshoto area.

Because the basal sand bars of the Lower Fox Hills Formation conformably overlie offshore marine Pierre Shale, and underlie marine shales and siltstones, it is postulated that these sand bars were deposited as offshore bars on the continental shelf. Without additional paleontological information, a definitive determination of the water depth of sand bar sedimentation cannot be made. Overlying these sand bars is an extensive sequence of marine shales, siltstones and sandstones. Within this unit there is a sandstone that exhibits an eastward-dipping paleotopography, typical of the nearshore marine environment.

Coastline orientation during deposition of the Lower Fox Hills Formation can be inferred from sand body geometry, paleoflow directions and paleotopography of the sediments. In modern and ancient environments, marine bars, both offshore and nearshore, can form roughly parallel to the coastline. The north-south strike of the marine bars, the easterly to southerly paleoflow directions, and the easterly sloping paleotopography of nearshore marine strata indicate that the strandline was approximately north-south and prograding eastward.

Upper Fox Hills Formation

Sand body geometry of the Upper Fox Hills Formation is complex and varied, with many cross-cutting trends (Pl. 7). The coastline was probably oriented north-south, normal to the depositional dip, indicated by the paleotopography of the Upper Fox Hills Formation (Fig. 9). Two prominent trends are present: north-south, strike oriented, and east-west, dip oriented sand bodies. Areas of preserved interchannel sediments are oriented parallel to the sand trends. Both strike and dip oriented remnants are present.

The contact between Upper and Lower Fox Hills Formation is marked by an abrupt increase in grain size with shale pebble conglomerates occurring at, or near the basal contact. Within the study area, sand channels generally correspond to paleotopographic depressions which are superimposed on the dendritic paleotopography indicated by Lower Fox Hills thinning. It appears that Upper Fox Hills Formation channels deeply eroded the underlying sediments and deposited both strike and dip oriented sediments.

Local erosional thinning is superimposed on a regional thinning pattern (Dodge, 1980, p. 26). Fox Hills Formation sediments become thicker and younger to the south. Regional thinning in northeastern Wyoming reflects the relatively stable nature of the area during Fox Hills time with respect to the subsiding basin south of the area.

A relatively stable coastline implies that rates of deposition are greater than subsidence. As a result, lateral migration is the principal process for channel accretion, both normal to and parallel to the depositional strike, as the entire depositional sequence progrades eastward.

A Fox Hills coastal sequence is exposed along the Rock Springs and Wamsutter Arches in Sweetwater County, Wyoming. Land (1972, p. 60) and Weimer and Land (1975, p. 662) describe an ancient depositional environment that also produced strike and dip oriented sand bodies. Facies present include barrier island, tidal river and estuary depositional environments. Sandstone bodies are 6 to 12 mi wide and are oriented parallel to the coastline. Tidal rivers or large estuarine meander loops that parallel the shoreline, migrated laterally, reworking upper barrier island sequences as the shoreline prograded seaward (Weimer and Land, 1975, p. 662). Sandstones 20 to 35 ft thick were described disconformably overlying shoreface and foreshore sandstones. Depth of scour averaged 25 ft, but major estuary channels scoured as deep as 60 ft (Land, 1972, p. 63).

Environmental settings proposed by Weimer and Land (1972, p. 662) are illustrated on Figure 12. Initial submergence of the Fox Hills coastline built up beach and dune ridge deposits. During submergence, the area behind the backshore ridges was flooded. Small estuaries, tidal rivers, lagoons and marshes formed landward of the barrier islands. At some time, submergence stopped and progradation began. As the estuaries and tidal rivers migrated seaward, channel processes began reworking barrier island sediments. Some channel sediments were deposited parallel to the shoreline as the channels prograded seaward. This postulated model for barrier island - estuary - tidal river regressional coastline complex closely approximates processes similar to those active along the modern Georgia coast (Land, 1972, p. 59).

Hoyt and Henry (1967, p. 77) describe the processes of migrating tidal inlets and the depositional responses along the modern barrier island coast of Georgia. Oomkens and Terwindt (1960, p. 701) describe similar process-response relationships in a migrating estuary on the coast of the Netherlands. On the coast of Georgia, inlet channels vary between 1 to 4 mi in width and 40 to 100 ft in depth. As the inlets migrate southward, parallel to longshore drift, sediments of the barrier island and underlying sequences are eroded and reworked to varying degrees, dependent upon channel depth. Hoyt and Henry (1967, p. 78) found that scour depths were generally 2 to

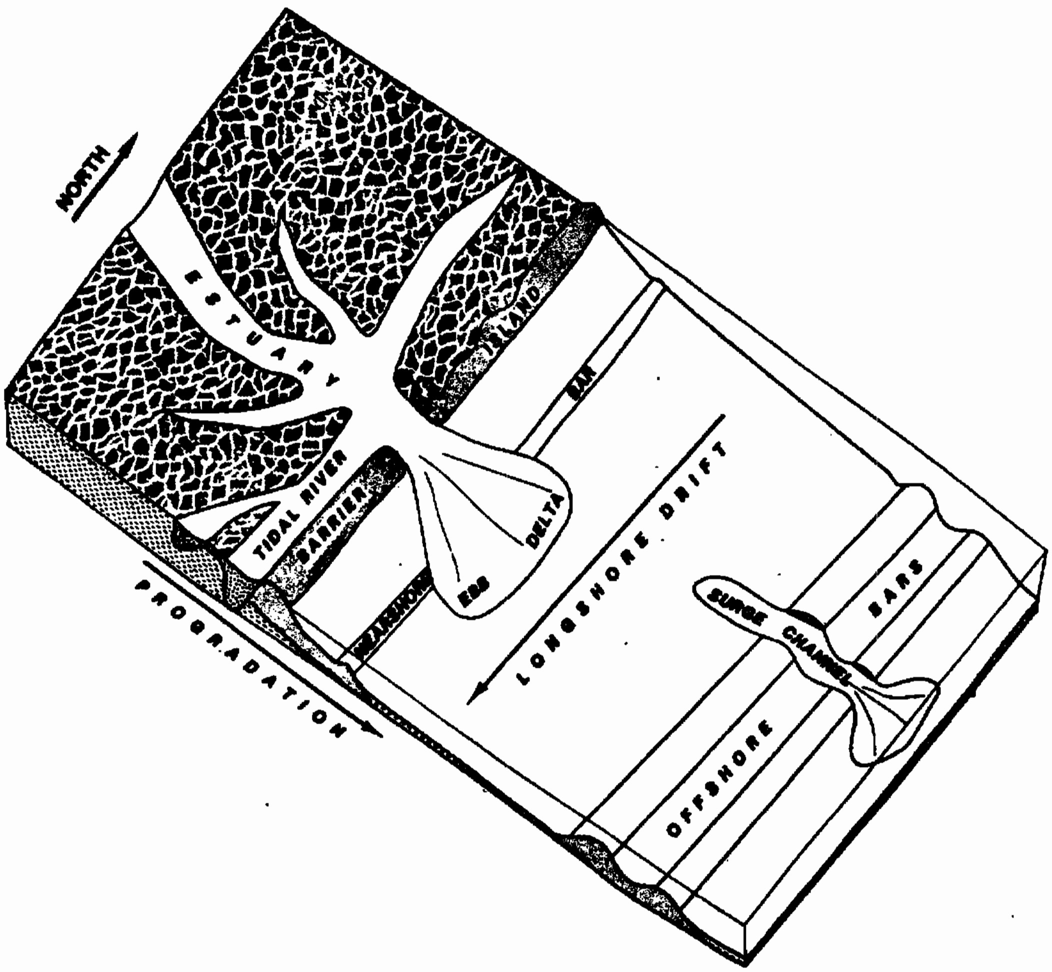


Figure 12. Estuary - tidal river - barrier island progradational sequence (modified from Land, 1972; Brenner and Davies, 1973; and Weimer and Land, 1975).

three times the depth of barrier island sequences. As a result, migrating tidal inlet sandstones were deposited unconformably on nearshore marine sediments.

Channel deposits formed by migrating inlets produce elongate sand lenses that parallel the depositional strike of the coastline. The sand bodies thin both landward and seaward (Hoyt and Henry, 1967, p. 82). Length of the deposit depends on the migration rate and changes in sea level. Width and thickness vary with channel depth and sea bottom characteristics (Hoyt and Henry, 1967, p. 85). Within the overall estuary sequence, dip oriented sand bodies form in response to tidal currents (Greer, 1975, p. 105). These deposits would also be incorporated in a laterally migrating tidal inlet deposit.

Subregional drainage patterns, paleontology and sand body geometry aid in the reconstruction of the depositional history of the Upper Fox Hills Formation. Evidence of preserved shoreface, foreshore, and barrier island sequences have been described at locations on outcrop north, south and east of the study area by Dodge and Spencer (1980, p. 7), Cuancara (1976, p.11), Feldman (1972), and Waage (1968). In the area mapped by Dodge (1980, Fig. 11), much of the high energy shoreface, foreshore and barrier deposits were removed by erosion and sediments with a brackish water fauna were deposited (Dodge, 1980, p. 26). As much as 120 ft of section has been removed in the deeper portions of the channel scour.

Regression of the Cretaceous Seaway during deposition of the Lower Fox Hills Formation produced a sequence of seaward prograding offshore, nearshore, shoreface and foreshore environments. At some point in time, either due to a rise in sea level or an increase in subsidence, a barrier island - estuary - tidal river complex was formed. Hoyt (1967, p. 1125) indicates that a slow transgression is necessary to form barrier islands. Once formed, barrier islands can migrage along the depositional strike, or dip, or remain stationary. Estuary, tidal river, and brackish marsh water environments formed behind the barrier islands.

The submergence trend ceased and seaward progradation of the coastal environments was initiated. Estuary channels scoured deeply into underlying barrier island, foreshore, and shoreface sediments, forming the dendritic drainage pattern mapped by Dodge and Spencer (1980, p. 13). Sediments of the barrier island sequence were probably eroded and reworked by deeply scouring estuary channels. A lateral migration from north to south by estuarine tidal inlets may account for the broad scour surface centered at Oshoto (Fig. 11). Complete removal of the entire barrier island sequence, foreshore, and shoreface sediments within this area is related to the amount of erosional thinning of the Lower Fox Hills Formation corresponding with the reported channel depths of modern tidal inlets on the Georgia coast.

Superimposed on the deposits produced by strike migrating tidal inlets are the deposits formed by a prograding coastline. Tidal rivers that formed behind and parallel to barrier islands aided in the reworking of marsh and barrier island sediments. The abrupt lateral contacts of the major strike oriented sand body with the interbedded, presumably, marsh sediments, represents the leading erosional edge of an easterly prograding strike oriented tidal river. Various channel sizes and degrees of lateral migration are evident on Plate 7.

Erosion and sedimentation patterns near Oshoto closely approximate the response produced by prograding barrier island - estuary - tidal river processes (Fig. 12). In addition to producing elongate sandstone lenses parallel to the shoreline by lateral migration, estuaries also contain dip oriented sand bodies that form in response to ebb and flow tidal currents (Areas A4 and A5; Pl. 7). Tidal rivers, parallel to the strandline, and prograding seaward also eroded and reworked portions of the lagoonal and barrier island sequences. Sediments were either deposited as strike oriented channel sands or transported farther down the depositional dip.

Lower Lance Formation

Only the lower 100 to 150 ft of the Lance Formation has been investigated. Within this section, there are two depositional sand packages, with opposing geometry. The two deposits are related in that deposition had occurred in a continental setting but was influenced by varied local processes active in a progradational coastal sequence.

The lowest sand package of the Lance Formation is comprised of narrow, rejoining channel deposits (Pl. 10). Sand trends indicate a general south to southeast depositional dip. Channel sandstones form sharp upper and lower contacts and display abrupt boundaries with laterally equivalent interchannel sediments. Lance-Fox Hills Formation contacts are generally disconformable within the study area, resulting from numerous local scours by individual channels (Pls. 10 and 12).

Located above the Lower Lance Formation channel-interchannel deposits, are sediments comprised of small east-west-trending sandstones. Two types of sand bodies occur in the area: multiple shoestring sandstones, and a singular wedge shape sandstone that grades easterly into multiple shoestring sand channels (Pl. 14). Sandstones exhibit a sharp upper and lower contact, with either a constant or slightly coarsening upward sequence.

Stream flow, throughout Lance sedimentation, was dominated by the subsiding basin south of the study area and the overall regression of the Interior Cretaceous Sea (Fig. 5). Paleoflow directions for the Lance Formation sequence in northeastern Wyoming are predominantly south to southeast (Dodge and Powell, 1975, Figs. 6-13, p. 14-

21) indicating a shift in the depositional dip between Fox Hills and Lance Formations.

Paleontology studies by Tschudy (1975) indicate that the lower portions of Lance Formation contain evidence of minor marine influence in a predominantly fresh water environment. Organic-rich shales and root casts are common in interchannel sediments and upper channel sequences. The change in fauna and flora to an increasingly fresh-water system reflects the continued progradation of continental depositional environments to the south.

Characteristics of Lower Lance Formation channel sands have been noted in like deposits associated with ancient coastal and delta plain environments by numerous authors. Shelton (1973) has compiled information describing distributary channel sandstones. Fisher and McGowen (1969, p. 30) described narrow elongate sandstones occurring in the Rockdale delta system, Wilcox Group, Texas. Laterally equivalent mudstones and lignites were interpreted to represent interdistributary deposition in lakes, swamps, or flood palins. Casey and Cantrell (1971) noted that the Davies sand, Yegua Formation, Texas, was a narrow, elongate sand body with abrupt upper and lower contacts and sharp lateral boundaries. Small width to thickness ratios, abrupt contacts, and fresh-water fauna in laterally adjacent sediments indicate a distributary depositional environment (Shelton, 1973, p. 59).

In each case described by Shelton (1973), distributary channel sands characteristically contain: 1) sharp upper and lower contacts; 2) abrupt lateral boundaries; 3) small width to thickness ratios; 4) unidirectional stream flow; and 5) laterally equivalent flood plain, lake or swamp sediments.

Studies of modern delta plain sedimentation have described processes of distributary channel formation. Channels commonly display low sinuosity and unidirectional currents (Fisher, et al., 1969, p. 15). Small width to thickness ratios result from limited lateral migration.

According to Fisher, and others (1969, p. 15), active channels are filled with the coarsest sediments. Channel lag commonly is found on numerous internal erosional surfaces. Channel abandonment may be either gradual or abrupt. If channel diversion is rapid, upper channels are in sharp contact with overlying channel fill shales and siltstones. Fining upward sequences are characteristic of gradual abandonments (Fisher, et al., 1969, p. 16).

Kolb and van Lopik (1966) note that the stability of the natural levees flanking the distributary channels decreases downstream. In areas of poor levee development, crevasse splays are more apt to form on the lower delta plain (Fisher, et al., 1969, p. 12). Splays often form in interdistributary bays open to the sea. Coleman and Prior (1980, p. 48) also note that open water on the delta plain can be completely surrounded by marsh or distributary levees, forming a fresh-water environment.

Coleman and Prior (1980, p. 53) describe crevasse splays extending into shallow bays by radial, bifurcating channels. Splay deposits generally coarsen upward. Lower contacts are either gradational or sharp (Coleman and Prior, 1980, p. 57, Fig. 20). The sand geometry forms an overall wedge-shaped deposit that thins away from the levee breech by multiple, radially bifurcating channel sands.

A depositional model for the Lower Lance Formation can be postulated using stratigraphic sequences, well profiles, sand body geometry, and paleontology. Sandstones of the lowest Lance Formation were deposited in distributary channels (Fig. 13). Lateral migration was small, but channel abandonment was rapid. The rejoining distributary channel pattern probably resulted from rapid and repeated channel diversions. Minor marine incursions indicate the distributary system at Oshoto was located relatively near the coast, in areas on the lower delta, or coastal plain.

Higher in the section, and perhaps farther inland, crevasse splays were present. The deposits were derived from a distributary channel located to the west. A local break in the channel levee diverted water and sediment into an interdistributary bay or flood plain (Fig. 13). Although crevasse splays commonly occur in the lower delta plain, they do not form exclusively in that environment.

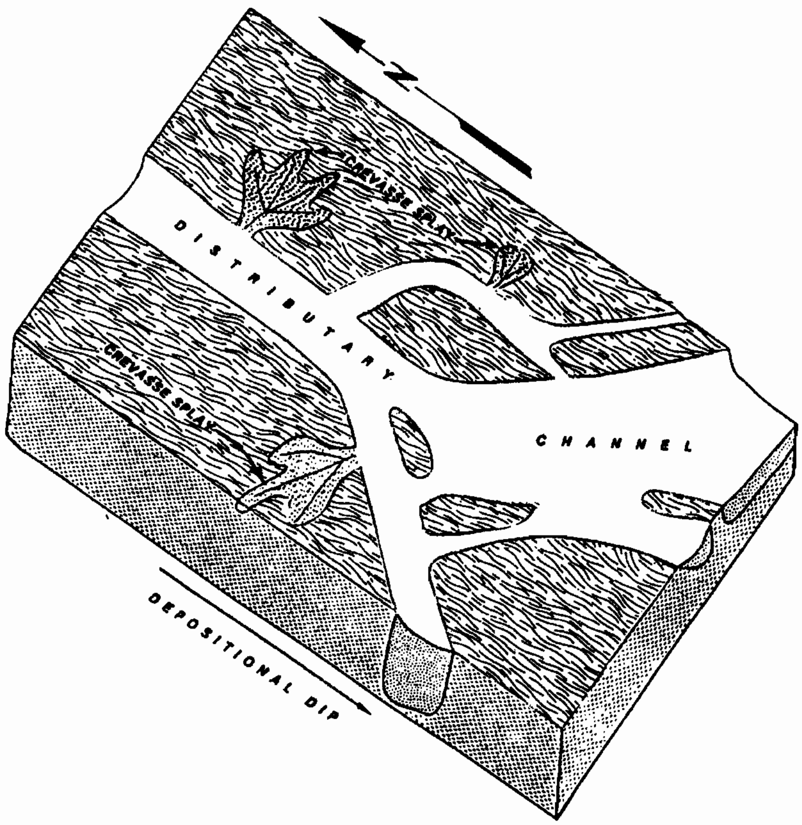


Figure 13. Distributary-crevasse splay depositional environments.

URANIUM DEPOSITIONAL RELATIONSHIPS

Sedimentation Controls

Roll front development and migration is governed primarily by the sedimentary environments of deposition. Each stratigraphic unit consists of an internal framework of permeable sandstones surrounded by a body of impermeable shales and siltstones. These sandstones act as a conduit for ground water. The heterogeneous permeability and transmissivity of the host sediments modifies the migration of ground water. To a certain extent, the alteration projections formed in response to increased flow through the more permeable channel sandstones.

Migration rates between ground-water flow and roll front development are not equal. Roll fronts are geochemical cells and migrate in response not only to groundwater flow, but also to concentrations of reductants within the host sediments and the amount of oxygen in the ground water. It is the process of continuous migration of ground water across the oxidation-reduction boundary that advances roll fronts.

Zone A

Orientation of roll front projections and location of ore deposits indicate an initial westerly flow of ground water down the stratigraphic dip from the recharge area. Further down dip, ground water was flowing predominantly northward, along a separate alteration tongue (Pl. 16).

Relationships between sedimentation patterns and roll front distribution is exemplified by comparing the alternation rate map to the mineralization map of the Upper Fox Hills Formation Zone A (Pls. 16 and 20). The oxidation-reduction boundary, located in areas A5, A6, and A3 displays a broad, flat alteration projection bounded by embayments of reduced sediments (Pl. 16). The alteration tongue is closely related to the east-west oriented Fox Hills Formation estuary channels. Stagnant islands in area A4, and the embayment northeast of area A1 occur in areas of high lithologic variability (Pls. 16 and 20).

Where interchannel sediments occur, advancing geochemical cells do not readily penetrate and oxidize host sediments. The low permeability and transmissivity of the interbedded sediments, coupled with a higher incidence of organic and inorganic reductants, observed in cores, contributed to the precipitation and preservation of uranium in these areas.

The embayment between the westward and northward migrating geochemical cells is not related to sedimentary patterns (Area A6, Pls. 16 and 20). The poor quality of mineralization associated with the embayment indicates that the boundary resulted from an undetermined low flow barrier to ground water migration. Mineralization associated with this westward oriented projection is best developed in a north-trending branch of the roll front (Area A1, Pl. 16). Roll front orientation generally parallels a minor channel sand, but is offset to the west. The mouth of the A1 alteration tongue corresponds with an area containing a low percent sand and a high alternation rate (Pls. 16 and 20). Extensive near barren interior deposits formed as a result of the passage of roll fronts through the interbedded sediments. Ground water flowing down dip was probably funneled into the low permeable sediments by low flow boundaries located in areas A5 and A6. These flow boundaries are probably related to faulting and will be discussed in a later section.

Westward, across the narrow embayment of reduced ground, roll fronts are oriented north-south, parallel to the major strike oriented channel (Pls. 16 and 20). Roll front tongues are closely related to the thicker channel sequences. Ore deposited along these active fronts is very well developed (Areas A2 and southern A2, Pls. 16 and 20).

Isolated near barren interior mineralization is common in area A7. The area is characterized by a sedimentary sequence consisting of a thick basal channel sandstone capped by interbedded channel fill shales, siltstones, and sandstones. As the northward migrating roll front developed in the A7 area, uranium was not only being deposited in the channel sands, but also in the channel fill sediments. Continued roll front migration redeposited the ore zone further down flow, but left isolated remnant mineralization in the interbedded sediments. Ground water had apparently entered the study area from two different recharge areas. Recharge for the westerly migrating roll front (Areas A1, A3, A4, and A5, Pls. 16 and 20), was located directly up dip, along the east-west oriented estuary channels. Ground water had to enter the northerly migrating roll front (Areas A2 and A7, Pls. 16 and 20) at some distance to the southeast.

Zone B

Orientation and distribution of Lower Lance Formation Zone B ore deposits, indicates an overall down dip migration, but within the study area, ground-water flow is predominantly to the north (Pl. 17). Relationships between depositional patterns and roll front development are illustrated by comparing the alternation rate map to the mineralization map (Pls. 17 and 22).

There are four main alteration projections in the study area. All roll fronts are migrating northward, but exhibit widely variable characteristics.

Two roll front projections in areas B1 and B2 have migrated along the prominent eastern, north-south distributary channel (Pl. 22). Mineralization is better developed in area B1. The difference is related to the volume of oxidizing, uranyl-bearing ground water diverted into the individual roll front projections. The oxidized ground behind the B1 roll front is the most extensive and implies that a higher volume of ground water passed through this area. Because uranium deposition in the study area results from a mass transfer of very dilute, uranyl-bearing ground water across a geochemical interface, a large volume of ground water funneled into an alteration projection will produce a large uranium deposit with high grades. This appears to be the situation with the B1 roll front. Roll fronts that have a small volume of ground water flowing across the geochemical interface will produce discontinuous, low grade deposits (Area B2, Pl. 17).

Stagnant islands in area B6 and isolated near barren interior mineralization in area B9 are primarily related to areas of moderate to high alternation rates. These areas contain interbedded low permeability shales, siltstones, and sandstones which trapped and preserved the relict mineralization as the roll front migrated down flow.

The B3 roll front is poorly developed even in areas of active roll front migration (Pl. 17). Sediments are moderately to highly interbedded with few sandstones thicker than 25 ft (Pl. 10). Inferior transmissivity of the host aquifer retarded the influx of uranyl-bearing ground water, resulting in poor roll front development.

The alteration tongue in the B4 area formed an asymmetric ore deposit with mineralization occurring primarily on the down-dip flank of a north-northeast trending distributary channel (Pls. 17 and 22). Alteration boundaries correspond with channel margins on the western flank, but on the barren eastern flank the roll front boundary is located in thick channel sandstones.

Mineralization on the western flank roughly parallels the sedimentary trend illustrated by the alternation rate map (Pl. 22). In this area, portions of the host sediment reach and maintain a 25 ft minimum effective sand thickness. These sandstones were able to transmit uranyl-bearing ground water into areas with increasing lithologic variability, and presumably a higher reductant content. As the geochemical cell migrated northward, uranium was probably still being contributed to the deposit, resulting in a well developed passive roll front ore deposit.

The eastern flank of the B4 alteration tongue contains little or no known mineralization. Oxidation-reduction boundaries correspond with thicker sandstones of the distributary channel (Pls. 10 and 17). It is probable that uranium mineralization associated with the northward migrating geochemical cell was not preserved. The uranium was oxidized and transported down flow with the advancing roll front. Apparently, reductants were not in sufficient quantities to trap and preserve mineralization from being flushed out of the permeable channel sandstones.

Zone C

Mineralization associated with the crevasse splay sandstones is very poorly developed. Only one alteration projection is observed on Plate 18. The roll front in area C1 corresponds to one of the radially bifurcating channel sands (Pl. 14). The overall narrow, shoestring geometry of the thicker channel deposits (Areas C1, C3, and C4, Pl. 14) is primarily responsible for the lack of roll front development. In addition, the divergent nature of the channels in areas C1 and C3 (Pl. 14) does not allow funneling of large volumes of uranyl-bearing ground water into the subsurface.

Structural Controls

Premineral faulting in the Oshoto area also influenced ground-water flow and roll front migration. Fault effectiveness as a barrier to ground-water flow is dependent on the ratio of fault displacement to bedding thickness. Faults with a small displacement can be flow barriers if the sediments are highly interbedded. Effectiveness of a fault to influence ground-water flow diminishes as sandstone beds thicken and dominate a stratigraphic sequence. Fault barriers to ground water may also result if fault gouge is present.

Presence of hydrologic barriers in the area was discovered by a pump test during Phase IV production drilling. The barrier is fault related, with a displacement between 10 and 20 ft. Associated with the fault zone was a narrow stagnant front, directly north of area B6 (Pl. 17). Other areas associated with low flow fault zones are illustrated by comparing mineralization patterns to the structural contour maps (Pls. 1, 17, and 18).

Upper Fox Hills Formation roll fronts associated with fault zones are exemplified by the unaltered embayment in area A5 (Pls. 1 and 16). Ground water migrating east and north was diverted into sediments at the mouth of the A1 alteration tongue. This fault system also affected ground water migration in Zone B. Mineralization associated with fault related unaltered embayments is generally low grade and very discontinuous (Cross section K-K', Pl. 19).

Other areas that are possibly related to fault zones include the small unaltered islands in area B6 (Pl. 17) and the southern flank of the A4 unaltered island (Pl. 16).

An unaltered, north-trending embayment in the area around A6 (Pl. 16) and a vertically identical embayment north of area B8 (Pl. 17) are areas of restricted low ground water flow. A north-trending fault may be present and affecting ground-water migration. Because displacement is generally small, and the fault trace parallels strike, a fault is not distinguishable from the regional stratigraphic dip. The only evidence that a fault may be present, is a flattening of the dip contours in areas S3 and S4 (Pl. 1).

The majority of the roll fronts that cross fault traces have migrated preferentially along thick channel sandstones. As a result, faulting in these areas exhibits little or no effect on ground-water flow.

SUMMARY

Depositional Environments

Upper Cretaceous sediments were deposited in response to the overall regression of the Interior Cretaceous Sea. Vertical stratigraphic sequences record the lateral succession of depositional environments from the marine Pierre Shale to the marine Fox Hills Formation to the continental Lance Formation.

Sandstones of the basal Fox Hills Formation grade upward from the underlying conformable offshore marine Pierre Shale to overlying low energy marine deposits of the Lower Fox Hills Formation. The basal sandstones were shaped into submarine bars by periodic storm, regional and tidal currents. In the study area, a transverse, storm induced surge channel cuts the north-south oriented sand bars. The coarsening upward sequences observed in these sandstones corresponds to increased shoaling energy. The water depth of formation of these submarine bars is not discernable without additional paleontological study.

Overlying the offshore marine bar-interbar interval is a progradational sequence of offshore to nearshore low energy shales, siltstones, and sandstones. The paleo-depositional surface of prominent sandstone within the unit dips gently to the east. The Lower Fox Hills Formation strandline strike remained north-south and was located west of the study area.

A slow transgression, probably related to either increased subsidence, variable sediment influx, or a rise in sea level occurred at some point in time to initiate barrier island development.

Submergence ceased and a seaward progradation of coastal environments began. Estuarys and tidal rivers that formed behind the barrier islands, scoured deeply into the barrier, foreshore, and shoreface sediments. Erosion of underlying Lower Fox Hills Formation strata, by strike migrating estuary inlets, and dip prograding tidal rivers, scoured a dendritic drainage pattern, indicating a continued eastward regression of the interior sea. Erosion and redistribution of the clastic sediments formed complex depositional patterns. Both strike and dip oriented sand bodies are preserved in the Upper Fox Hills Formation.

Throughout deposition of the Lance Formation, paleocurrent directions were predominantly south to southeast. A favorable stream gradient developed, prior to deposition of the Lower Lance Formation distributary channels, in response to a subsiding basin located south of the area.

Sandstones were deposited as distributary channels and crevasse splays on a lower coastal or delta plain. Basal Lance Formation distributaries formed a complex rejoining channel pattern. Channel rejoining patterns probably resulted from rapid and repeated channel diversions (Fig. 13). Sandstones form a net of north-south oriented sand bodies.

Crevasse splays deposited coarse clastic sediments into the low energy environments of the interdistributary areas. Splay deposits form radially bifurcating channels that eminate from a breech in the distributary levee. Sand bodies form an overall wedge-shaped sedimentary prism that thins away from the distributary.

Uranium Deposition

Roll fronts in the Oshoto area developed when Upper Cretaceous sediments were uplifted and exposed to oxidizing, uranyl-bearing ground water. Ground water entering the system initially migrated down the stratigraphic dip. When strike oriented sand channels were encountered, ground water was diverted primarily northward.

Active, passive, and stagnant roll fronts formed in response to the differential migration of ground water through a heterogeneous aquifer. Active alteration tongues coincide with thick, permeable, transmissive channel sands of the Fox Hills and Lance Formations. Passive and stagnant fronts tend to be associated with channel flanks or low permeability, organic rich interchannel sediments.

Uranium grade and thickness of roll front deposits is dependent upon the rate and volume of uranyl-bearing ground water crossing the geochemical interface. Orientation of the roll front to ground-water flow and the size of the channel sand have a direct bearing on uranium deposition.

The richest ore deposits are found at the terminous of alteration projections associated with large channel systems.

Premineral faulting also contributes to the modification of roll front migration. Fault zones also act as barriers to ground-water flow. The process either diverts the roll fronts elsewhere, or traps mineralization as stagnant fronts.

Exploration in the region using the concepts of sand body, and roll front geometry will aid in the location of other ore deposits. In the region, over 150 linear miles of roll front boundaries have been discovered to date. As much as a 1400 ft thickness of Fox Hills and Lance Formation sediments covering approximately 300 sq mi has the potential of containing uranium deposits.

To discover economic ore bodies, large channels which funneled substantial volumes of uranyl-bearing ground water into the subsurface must be located.

A regional investigation of Fox Hills and Lance Formation sand geometry, using effective sand isoliths, will provide the means to locate and map major channel sand trends. The combination of sand geometry with roll front geometry identifies potentially productive areas for exploration.

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VITA

Micheal D. Buswell was born in Canton, South Dakota September 1, 1952. He graduated from Harrisburg High School in 1970. In 1974, Mike graduated from South Dakota School of Mines and Technology with a Bachelor of Science degree in Geological Engineering, and in 1982, received his Master of Science degree in Geology.

From 1974 to 1976, Mr. Buswell worked as an exploration geologist and again from 1978 to 1980 as project geologist for Nuclear Dynamics (now ND Resources) in Moorcroft and Casper, Wyoming.

In mid 1980, Mike began work for Union Energy Mining Division of Union Oil of California as staff geologist, and later as an exploration staff geologist. Late in 1981, he was transferred to the Oil and Gas Division of Union Oil of California in southwest Louisiana as a development geologist.

Mike has co-authored a paper on the history of uranium exploration in the Oshoto, Wyoming area for the International Atomic Energy Agency in 1980.

Additionally, Mr. Buswell has presented the methods and conclusions of this thesis to the Geological Society of America and the Wyoming Geological Association.

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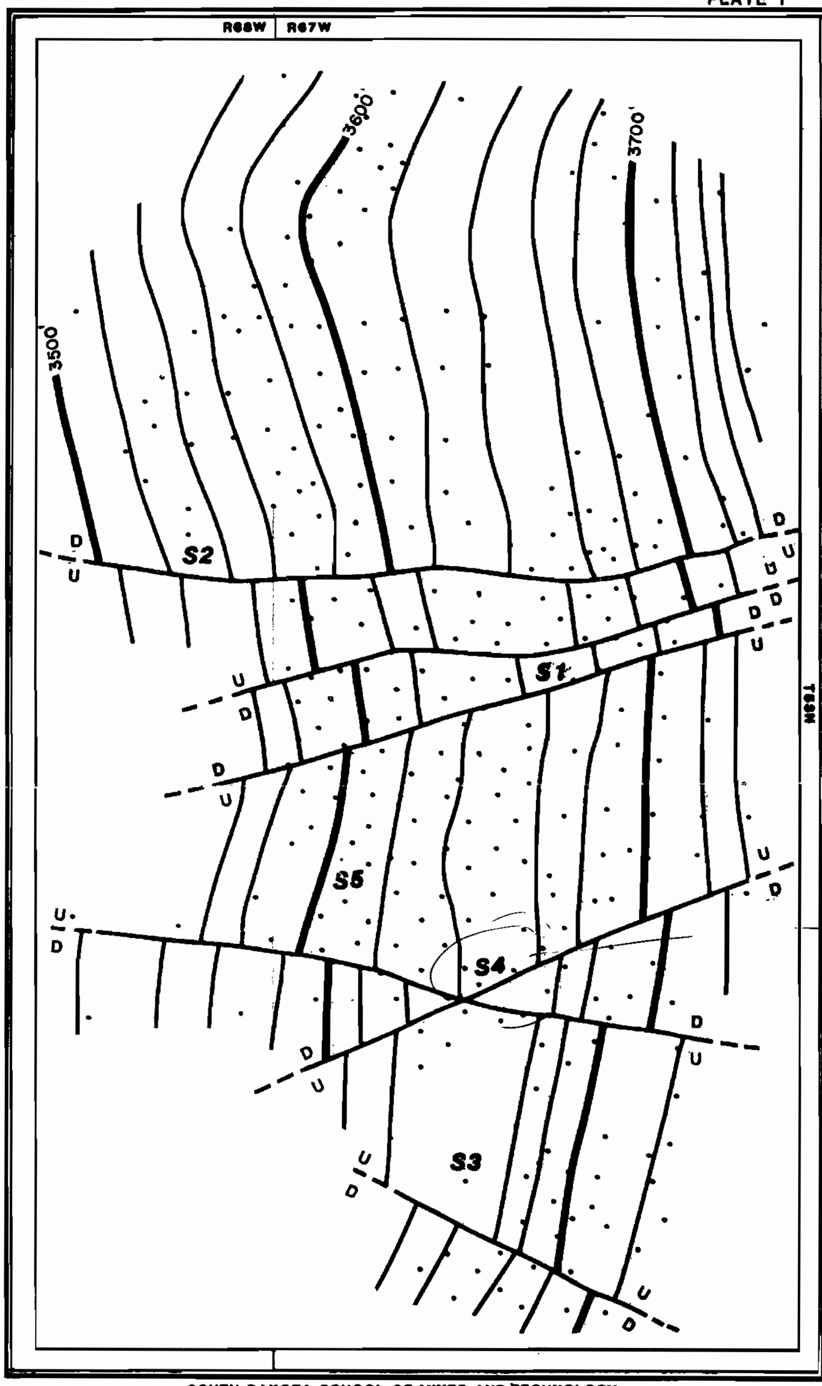
**SUBSURFACE GEOLOGY OF THE OSHOTO URANIUM DEPOSIT,
CROOK COUNTY, WYOMING**

PLATE 1



EXPLANATION

3500'

STRUCTURAL CONTOUR

U
D

SUBSURFACE FAULT

WELL CONTROL

S3
REFERENCE NUMBER

789V + RoD 5-SPOT ?

SOUTH DAKOTA SCHOOL OF MINES AND TECHNOLOGY
DEPARTMENT OF GEOLOGY AND GEOLOGICAL ENGINEERING
RAPID CITY, SOUTH DAKOTA

GEOLOGY BY: M.D. BUSWELL

STRUCTURAL CONTOURS ON BASE OF UPPER FOX HILLS

SCALE 1:24000

1000 500 0 1000 2000 3000 4000 FEET

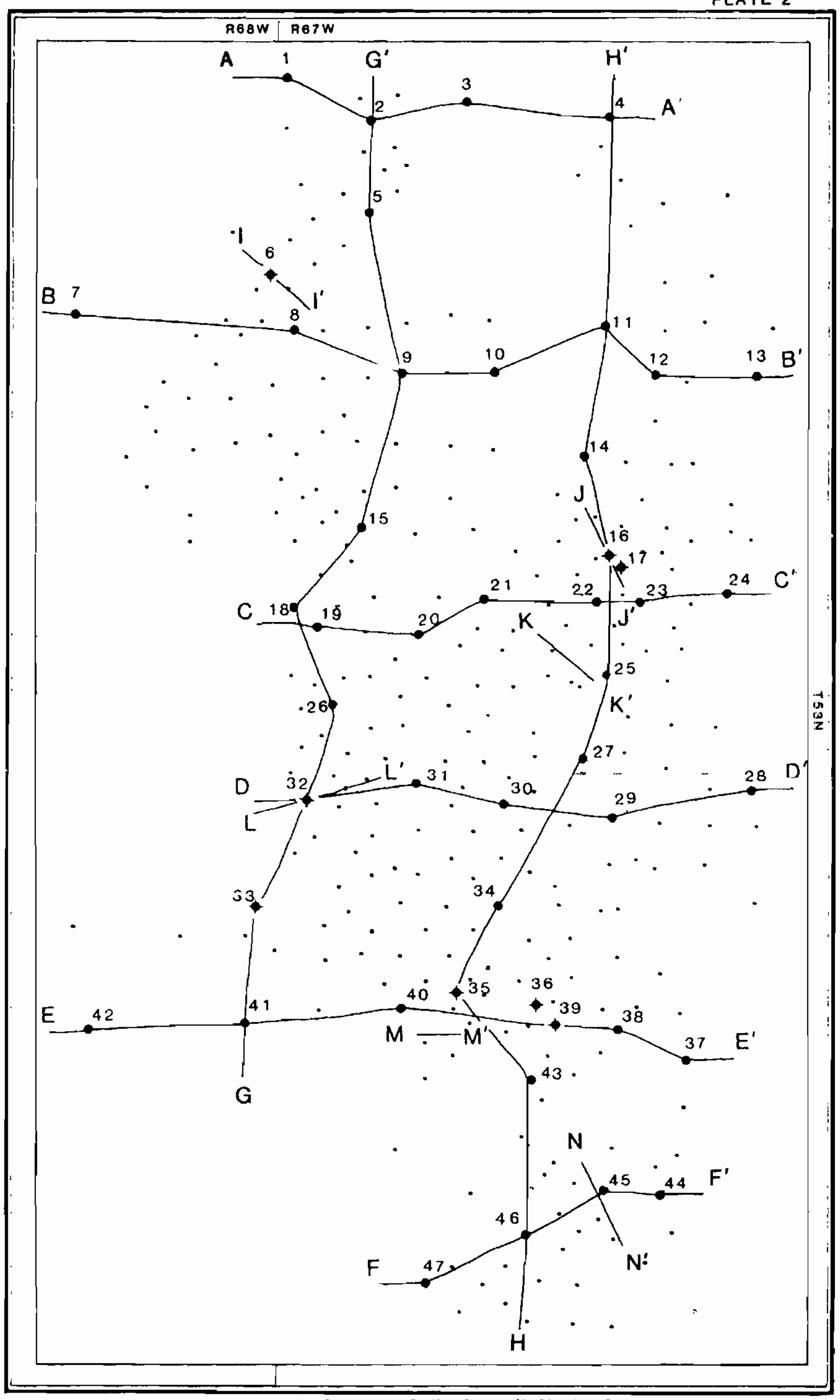
500 250 0 500 1000 1500 METERS

TRUE NORTH
MAGNETIC NORTH

CONTOUR INTERVAL 20'
DATUM IS MEAN SEA LEVEL
1982

SUBSURFACE GEOLOGY OF THE OSHOTO URANIUM DEPOSIT,
CROOK COUNTY, WYOMING

PLATE 2



EXPLANATION

CORE HOLE

CROSS SECTION HOLE

EXPLORATION HOLE

H ———— H'
CROSS SECTION LINE

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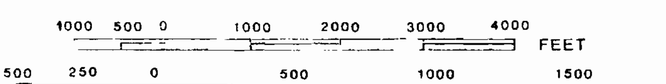
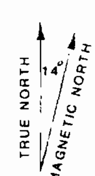
HOLE LOCATION AND
CROSS SECTION INDEX MAP

SCALE 1:24000





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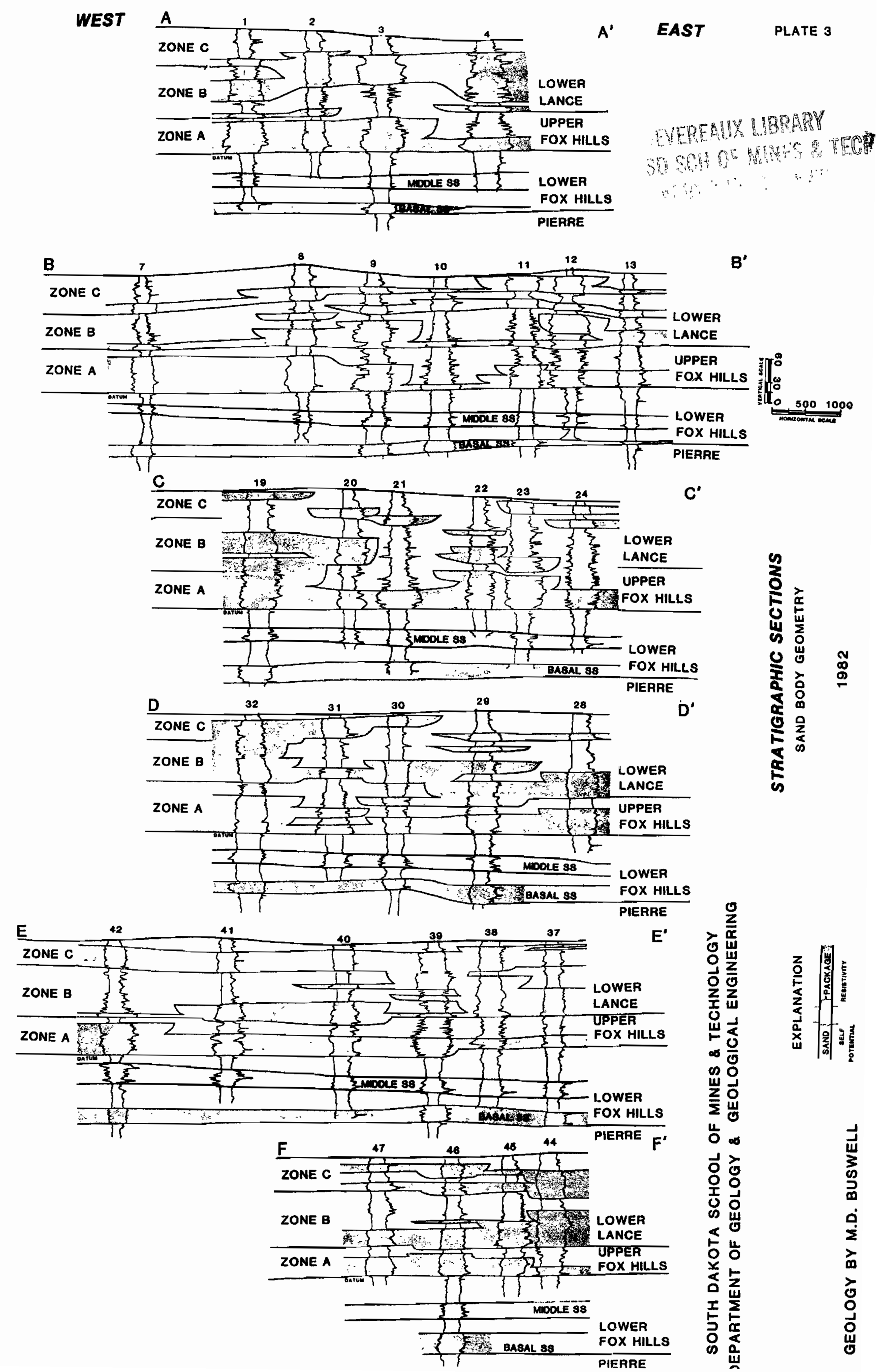
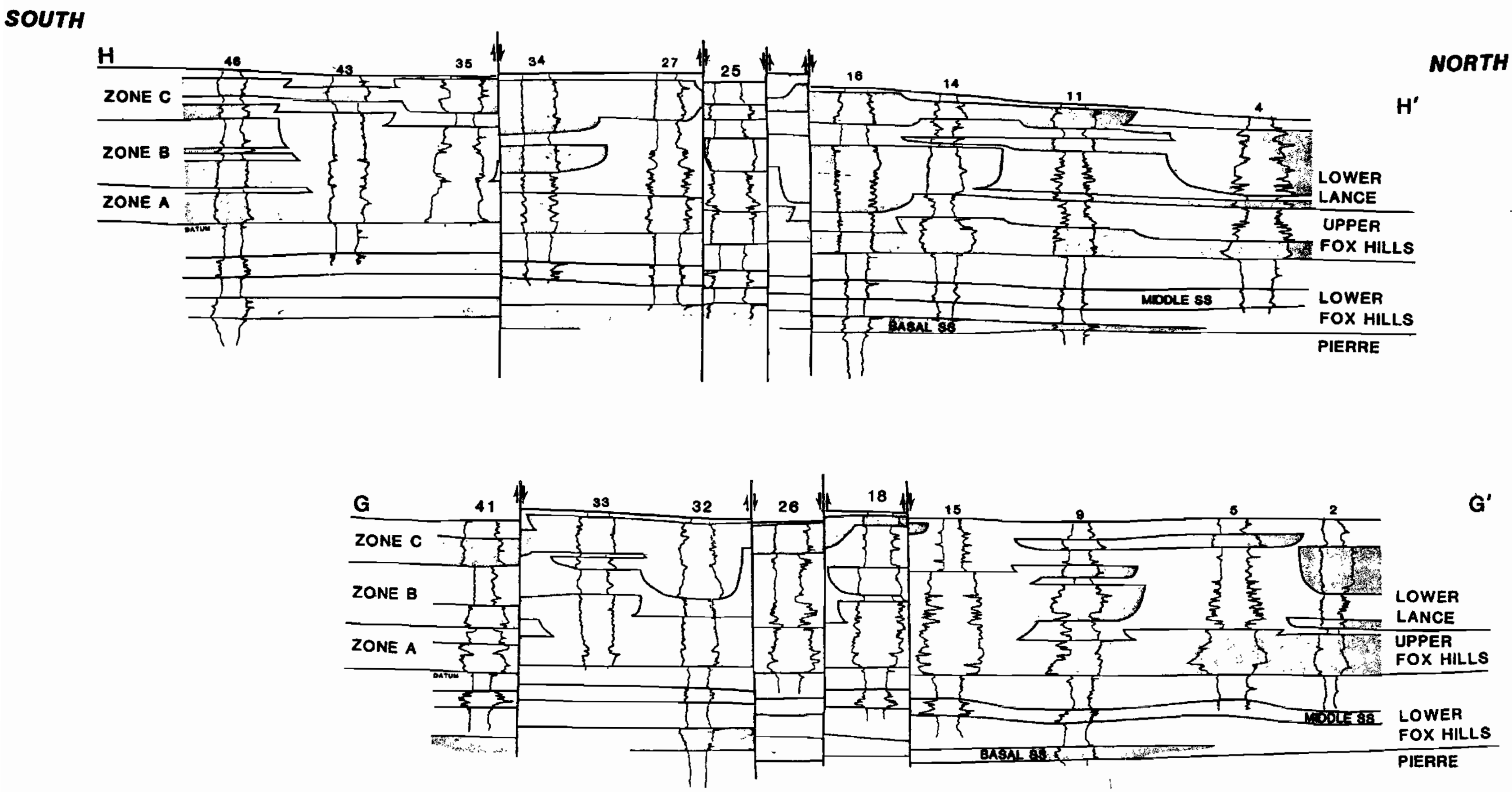

WEST
EAST
PLATE 3
A
A'
B
B'
C
C'
D
D'
E
E'
F
F'
ZONE C
ZONE B
ZONE A
DATUM
LOWER LANCE
UPPER FOX HILLS
LOWER FOX HILLS
PIERRE
MIDDLE SS
BASAL SS
VERTICAL SCALE
0 30 60
0 500 1000
HORIZONTAL SCALE
STRATIGRAPHIC SECTIONS
SAND BODY GEOMETRY
1982
SOUTH DAKOTA SCHOOL OF MINES & TECHNOLOGY
DEPARTMENT OF GEOLOGY & GEOLOGICAL ENGINEERING
EXPLANATION
SAND
PACKAGE
SELF POTENTIAL
RESISTIVITY
GEOLOGY BY M.D. BUSWELL

PLATE 4



EXPLANATION

SAND PACKAGE

SELF POTENTIAL

RESISTIVITY

FAULT

GEOLOGY BY M.D. BUSWELL

STRATIGRAPHIC AND STRUCTURAL SECTIONS

SAND BODY GEOMETRY

1982

SOUTH DAKOTA SCHOOL OF MINES & TECHNOLOGY

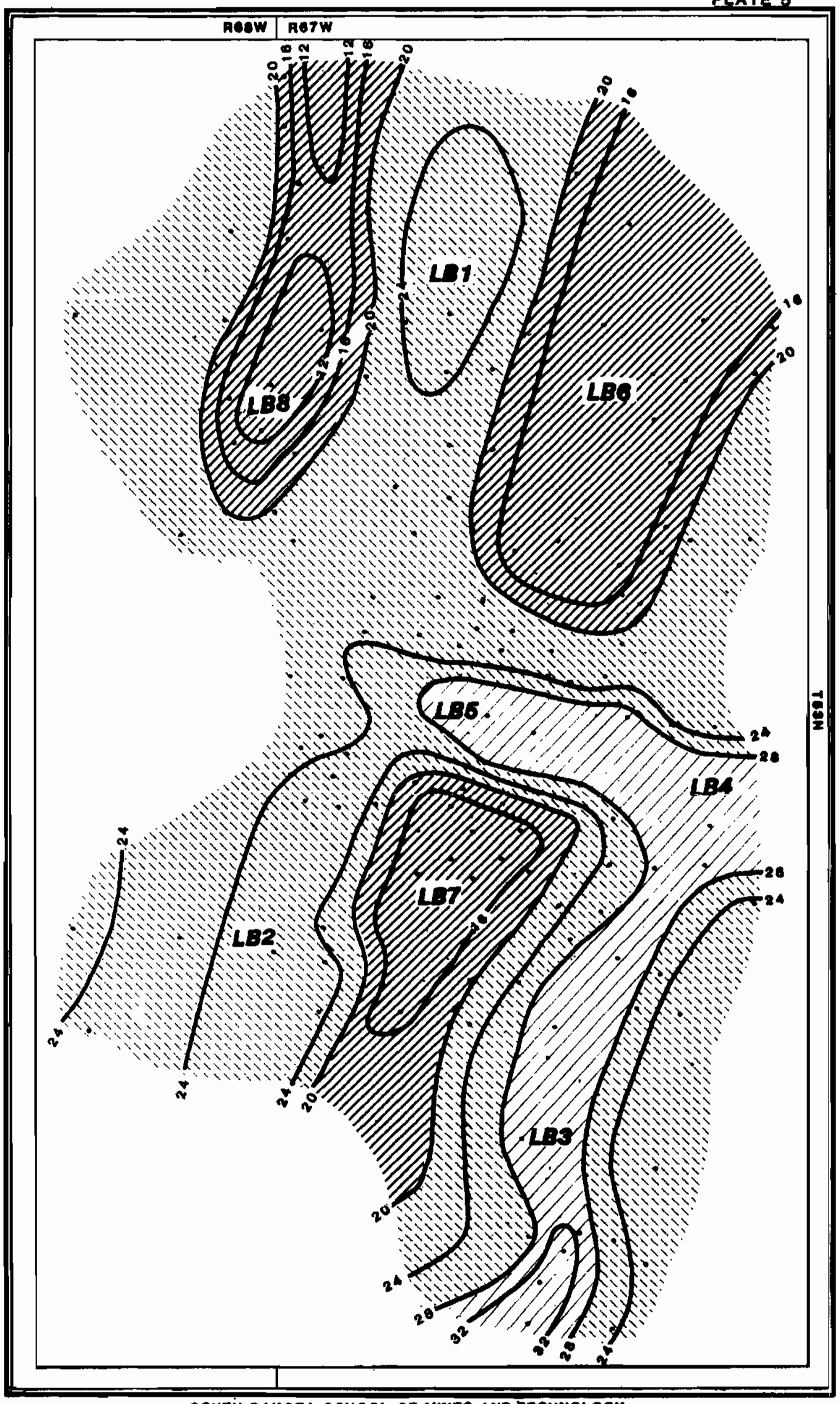
DEPARTMENT OF GEOLOGY & GEOLOGICAL ENGINEERING

VERTICAL SCALE 60 30 0

0 500 1000 HORIZONTAL SCALE

SUBSURFACE GEOLOGY OF THE OSHOTO URANIUM DEPOSIT,
CROOK COUNTY, WYOMING

PLATE 5



EXPLANATION

CONTOUR INTERVALS

12-20

20-28

28-34 (ft)

WELL CONTROL

LB5
REFERENCE NUMBER

ISOPACHOUS LINES

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RAPID CITY, SOUTH DAKOTA

GEOLOGY BY: M.D. BUSWELL

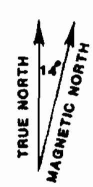
LOWER FOX HILLS BASAL SANDSTONE ISOPACH

SCALE 1:24000

1000 500 0 1000 2000 3000 4000 FEET

500 250 0 500 1000 1500 METERS

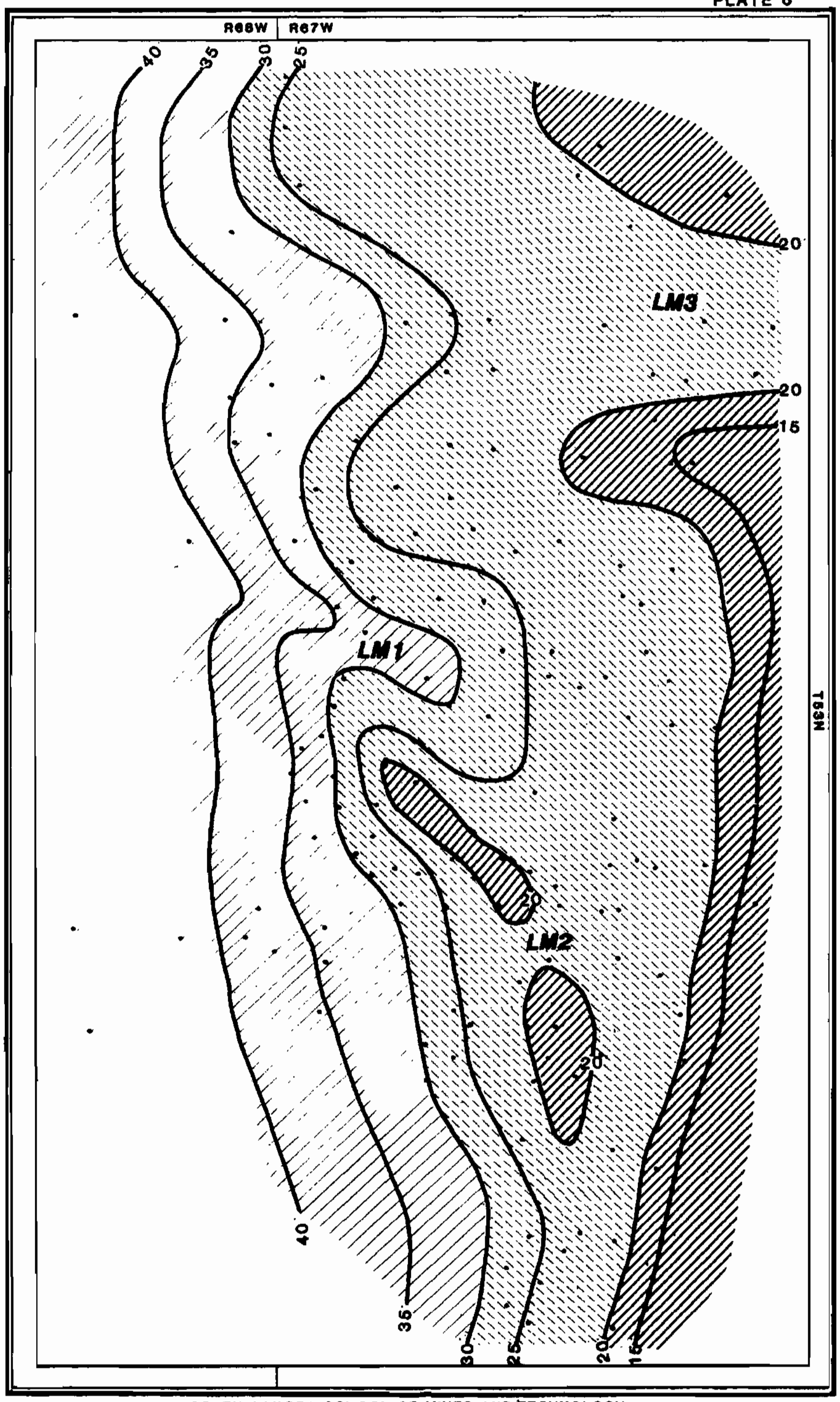
CONTOUR INTERVAL 4'



1982

SUBSURFACE GEOLOGY OF THE OSHOTO URANIUM DEPOSIT, CROOK COUNTY, WYOMING

PLATE 6



EXPLANATION

CONTOUR INTERVALS

45-30

30-20

20-10 (ft)

WELL CONTROL

LM2
REFERENCE NUMBER

ISOPACHOUS LINES

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RAPID CITY, SOUTH DAKOTA

GEOLOGY BY: M.D. BUSWELL

LOWER FOX HILLS MIDDLE SANDSTONE PALEOTOPOGRAPHY

SCALE 1:24000

1000 500 0 1000 2000 3000 4000 FEET

500 250 0 500 1000 1500 METERS

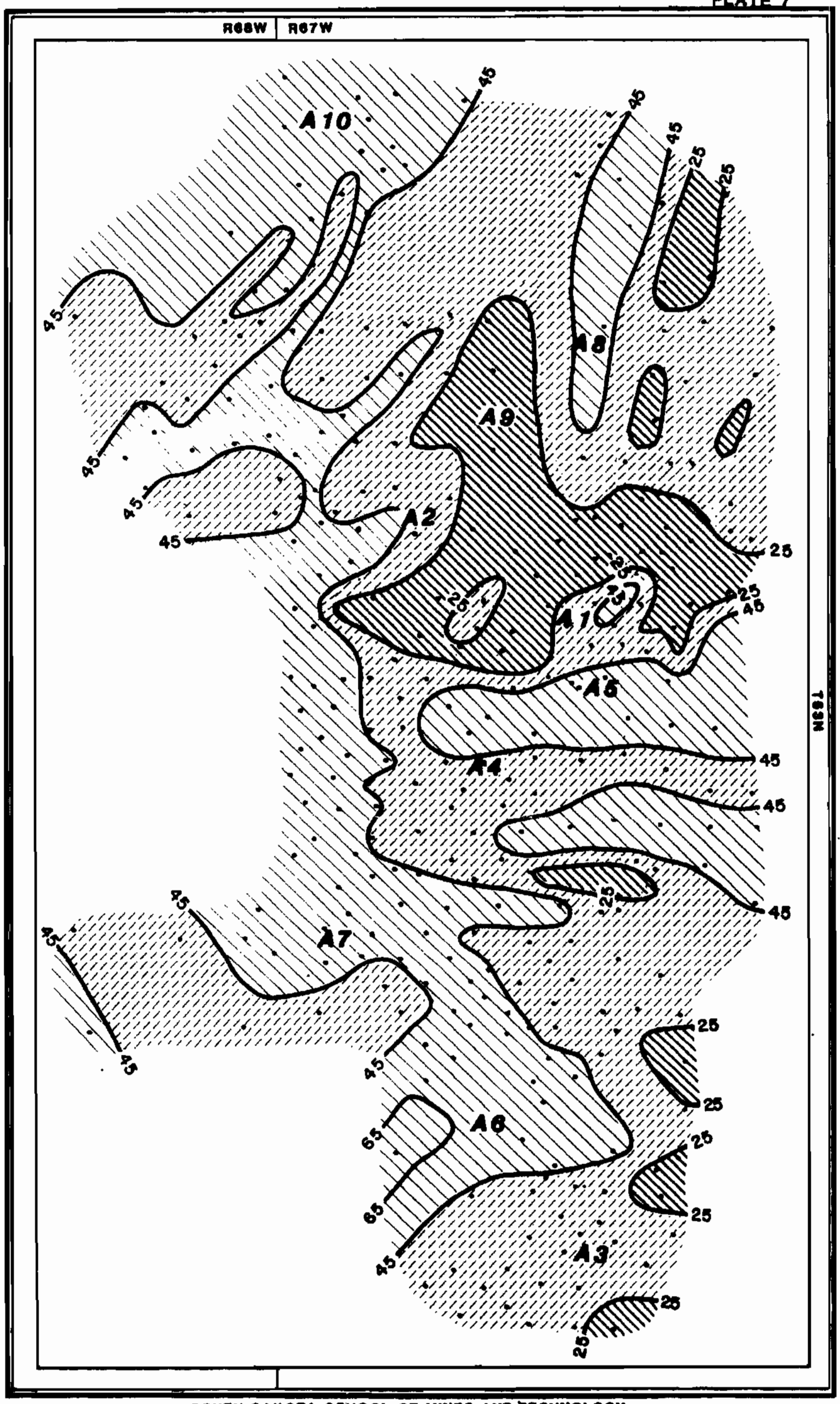
TRUE NORTH
MAGNETIC NORTH
14°

CONTOUR INTERVAL 5'

1982

SUBSURFACE GEOLOGY OF THE OSHOTO URANIUM DEPOSIT,
CROOK COUNTY, WYOMING

PLATE 7



EXPLANATION

CONTOUR INTERVALS

0-25

25-45

45-65 (ft)

WELL CONTROL

A6
REFERENCE NUMBER

ISOLITHIC LINES

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RAPID CITY, SOUTH DAKOTA

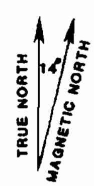
GEOLOGY BY: M.D. BUSWELL

UPPER FOX HILLS
ZONE A EFFECTIVE SAND ISOLITH

SCALE 1:24000

1000 500 0 1000 2000 3000 4000 FEET

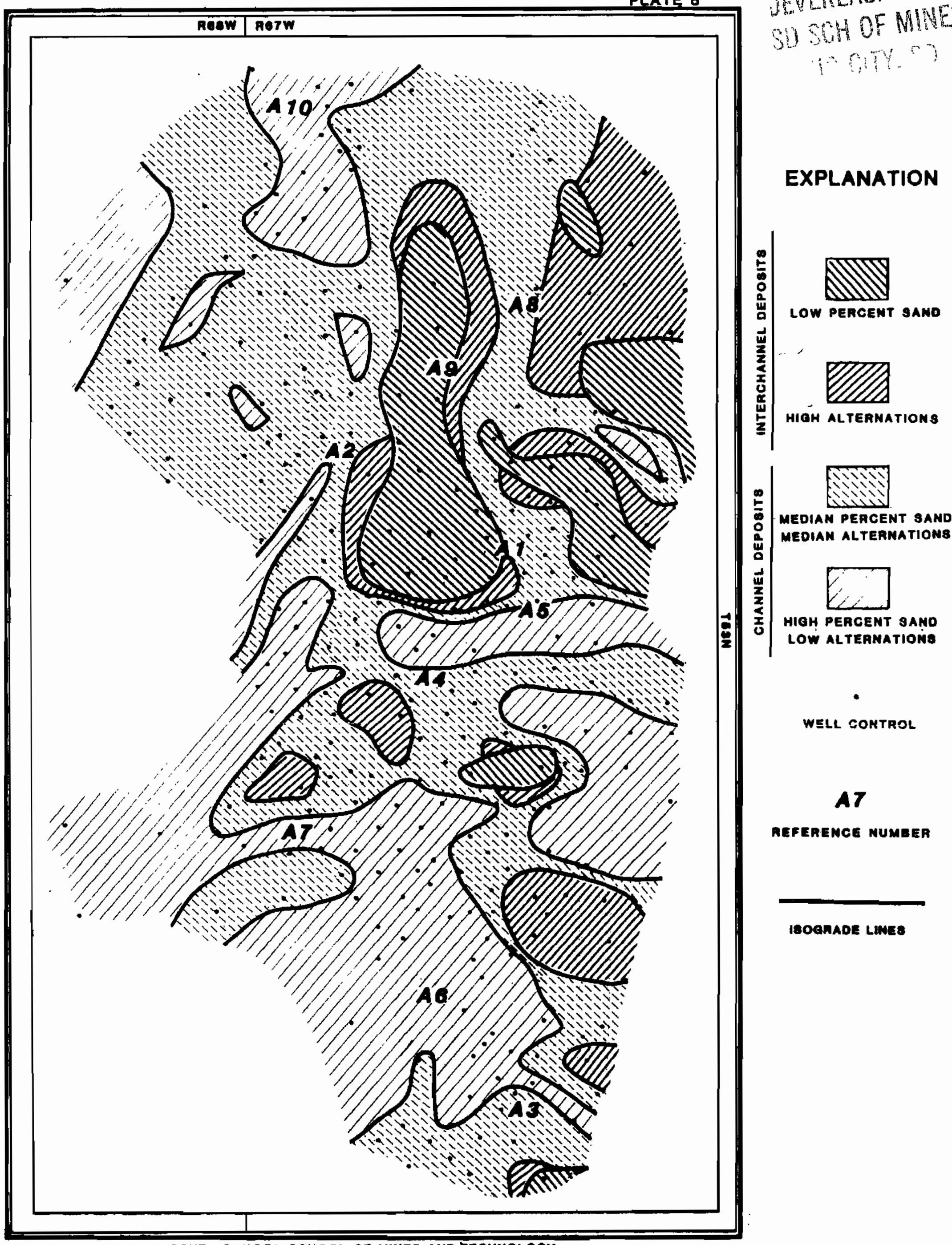
500 250 0 500 1000 1500 METERS



CONTOUR INTERVAL 20'
EFFECTIVE SAND ≥ 25'
1982

SUBSURFACE GEOLOGY OF THE OSHOTO URANIUM DEPOSIT, CROOK COUNTY, WYOMING

PLATE 8



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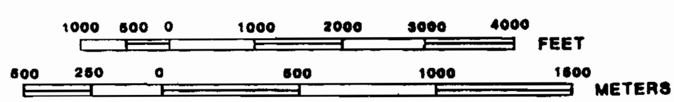
RAPID CITY, SOUTH DAKOTA

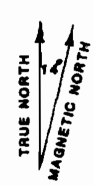
GEOLOGY BY: M.D. BUSWELL

UPPER FOX HILLS

ZONE A ISOFACIES

SCALE 1:24000

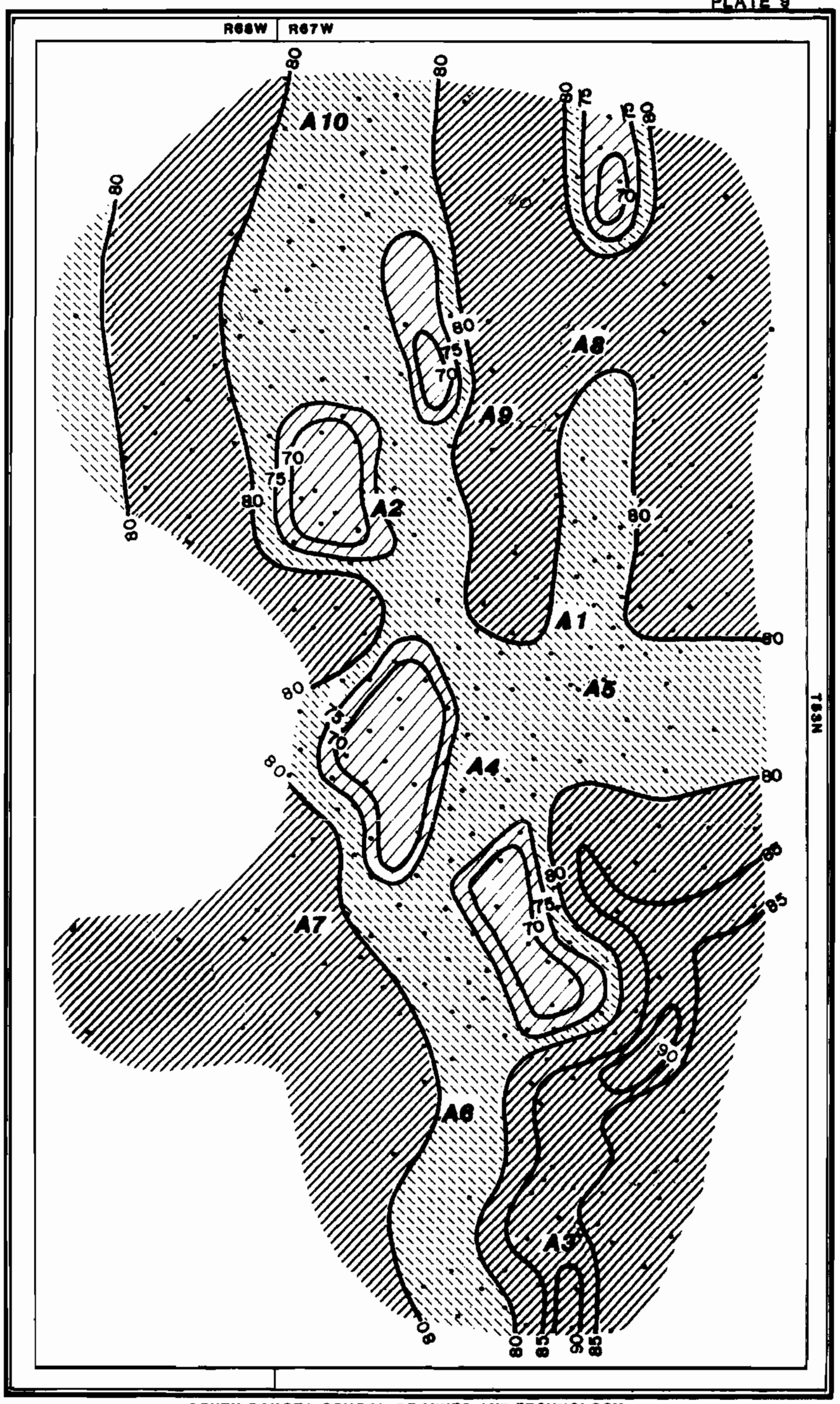




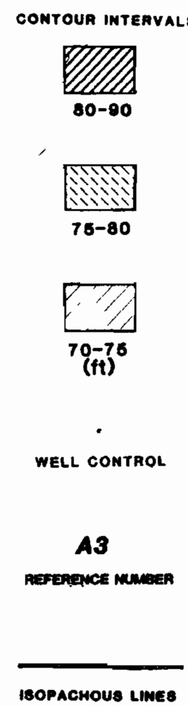
1982

SUBSURFACE GEOLOGY OF THE OSHOTO URANIUM DEPOSIT,
CROOK COUNTY, WYOMING

PLATE 9



EXPLANATION



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RAPID CITY, SOUTH DAKOTA

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ZONE A
UPPER FOX HILLS PALEOTOPOGRAPHY

SCALE 1:24000

1000 500 0 1000 2000 3000 4000 FEET

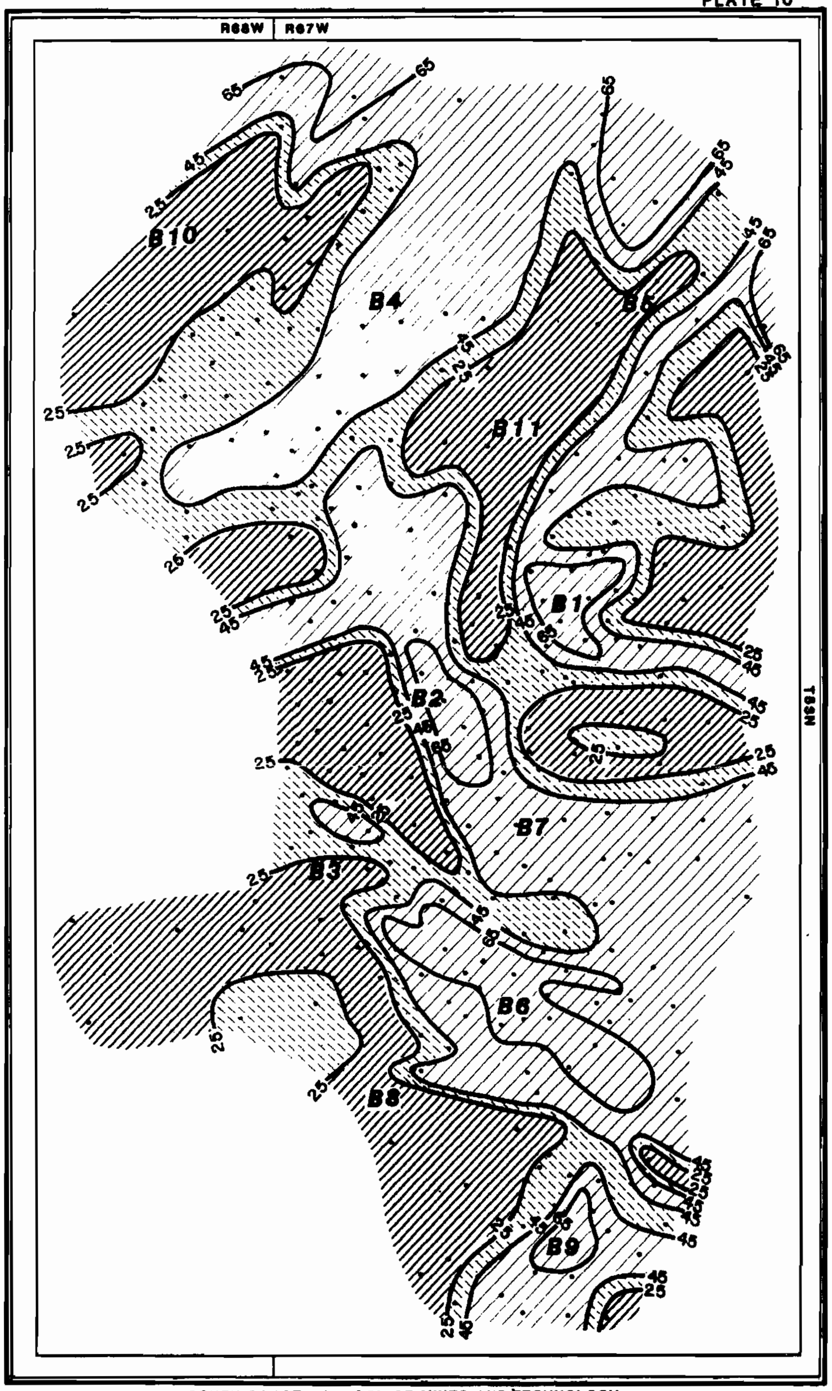
500 250 0 500 1000 1500 METERS

CONTOUR INTERVAL 5'

1982

SUBSURFACE GEOLOGY OF THE OSHOTO URANIUM DEPOSIT,
CROOK COUNTY, WYOMING

PLATE 10



EXPLANATION

CONTOUR INTERVALS

0-25

25-45

45-75 (ft)

• WELL CONTROL

B3 REFERENCE NUMBER

ISOLITHIC LINES

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LOWER LANCE
ZONE B EFFECTIVE SAND ISOLITH

SCALE 1:24000

1000 500 0 1000 2000 3000 4000 FEET

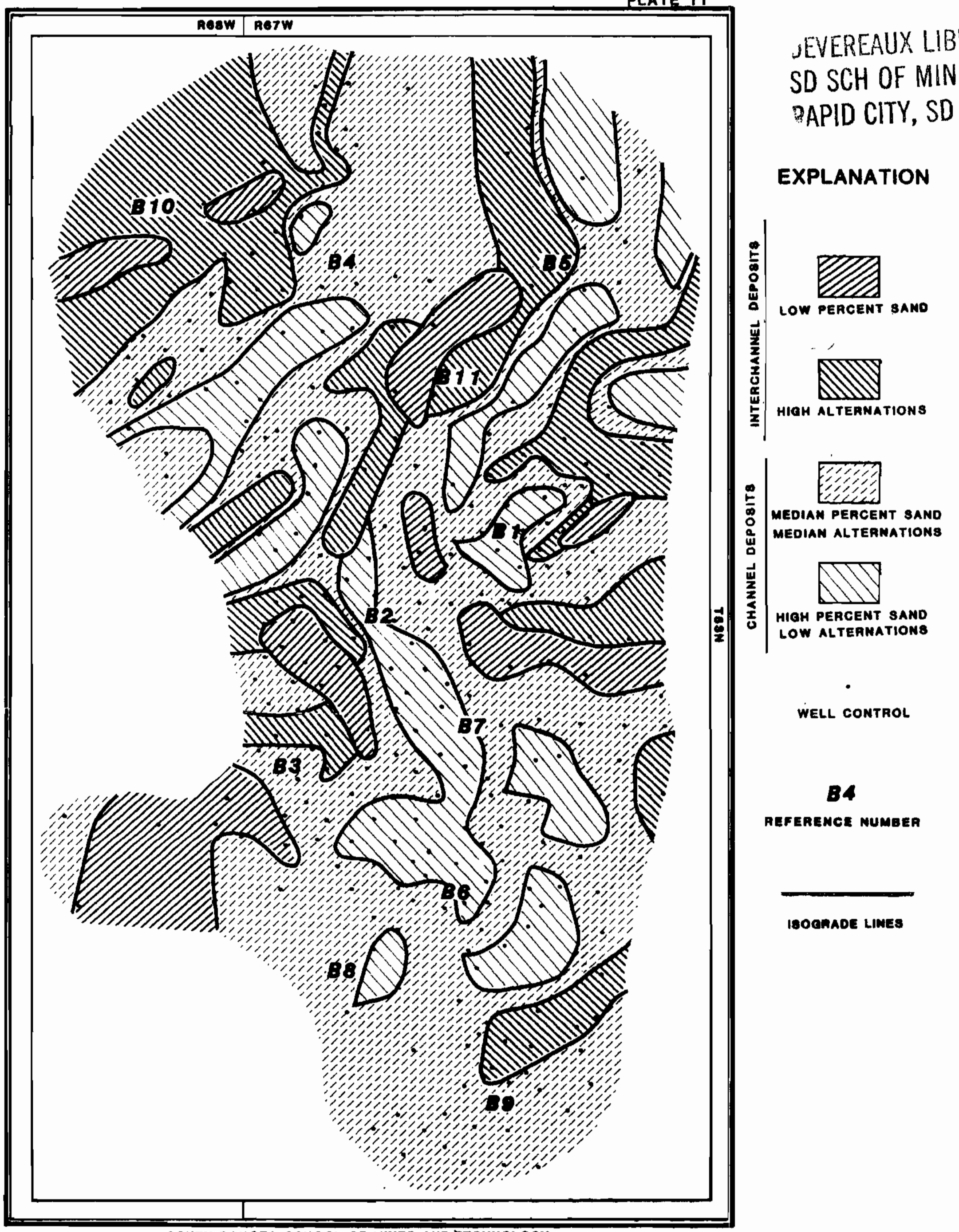
500 250 0 500 1000 1500 METERS

TRUE NORTH 14° MAGNETIC NORTH

CONTOUR INTERVAL 20'
EFFECTIVE SAND ≥ 25'
1982

SUBSURFACE GEOLOGY OF THE OSHOTO URANIUM DEPOSIT,
CROOK COUNTY, WYOMING

PLATE 11



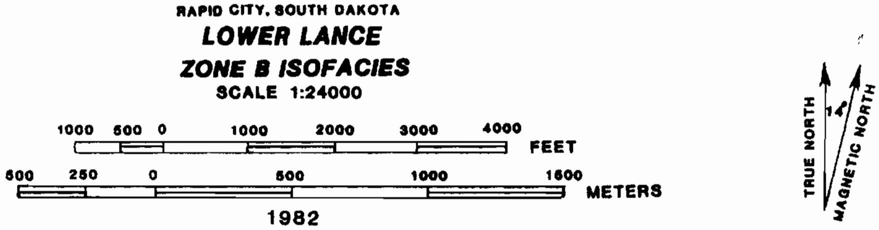
SOUTH DAKOTA SCHOOL OF MINES AND TECHNOLOGY
DEPARTMENT OF GEOLOGY AND GEOLOGICAL ENGINEERING
RAPID CITY, SOUTH DAKOTA

GEOLOGY BY: M.D. BUSWELL

LOWER LANCE

ZONE B ISOFACIES

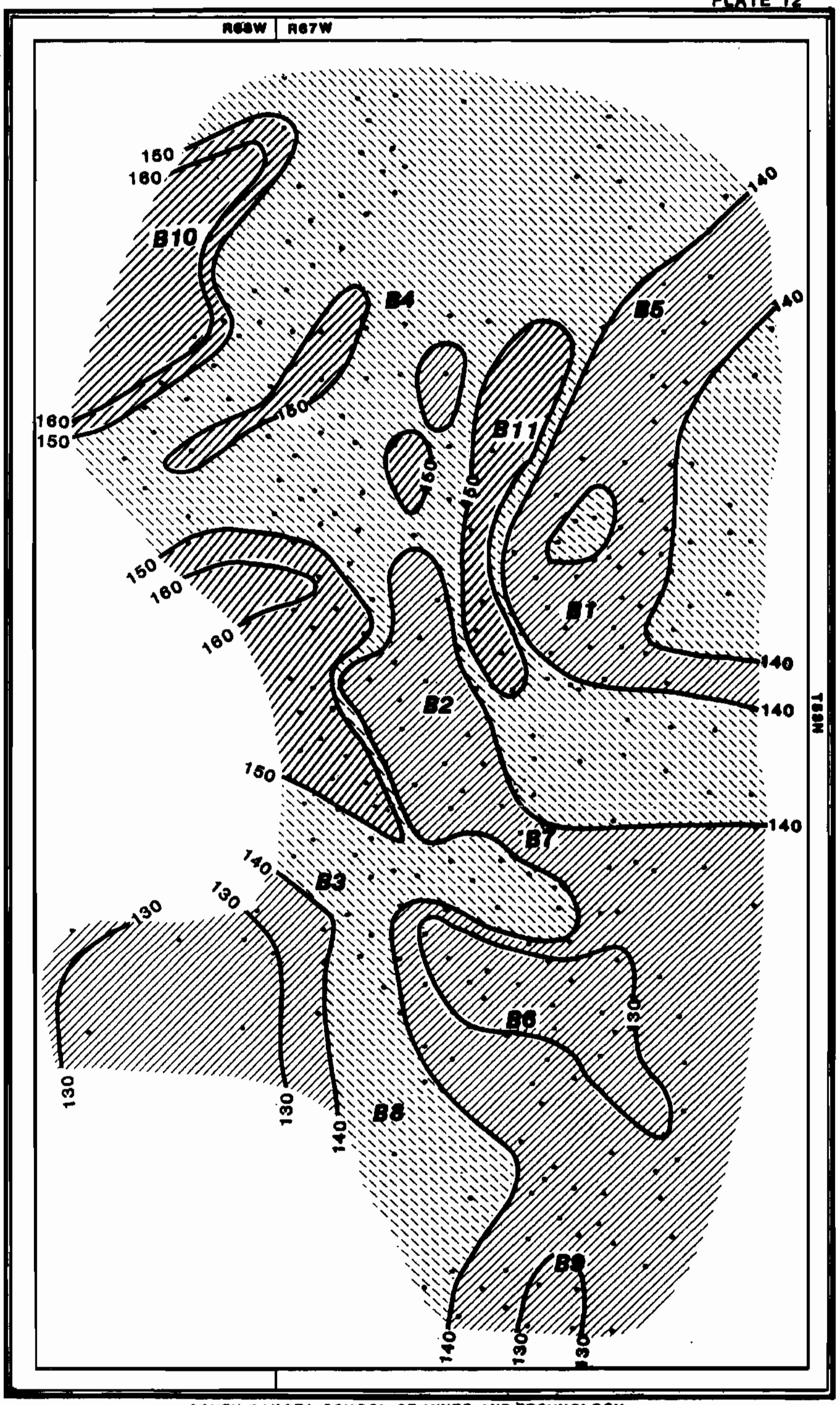
SCALE 1:24000

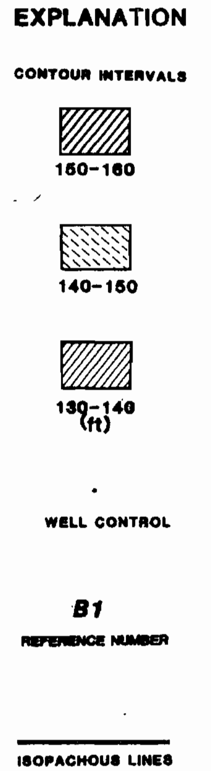


1982

SUBSURFACE GEOLOGY OF THE OSHOTO URANIUM DEPOSIT,
CROOK COUNTY, WYOMING

PLATE 12





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DEPARTMENT OF GEOLOGY AND GEOLOGICAL ENGINEERING
RAPID CITY, SOUTH DAKOTA

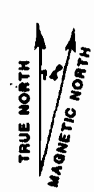
GEOLOGY BY: M.D. BUSWELL

LOWER LANCE
ZONE B PALEOTOPOGRAPHY

SCALE 1:24000

1000 500 0 1000 2000 3000 4000 FEET

500 250 0 500 1000 1500 METERS

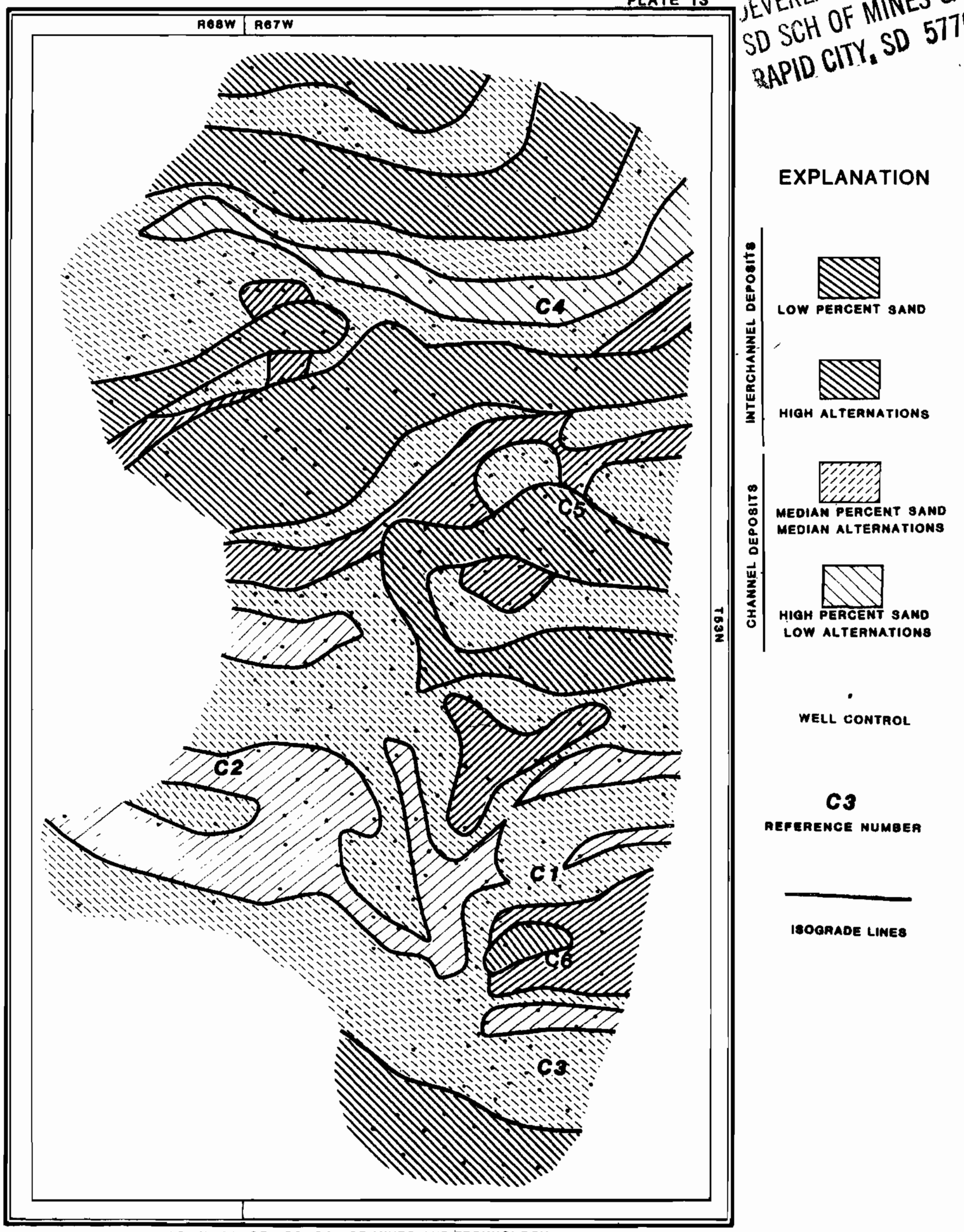


CONTOUR INTERVAL 10'

1982

SUBSURFACE GEOLOGY OF THE OSHOTO URANIUM DEPOSIT, CROOK COUNTY, WYOMING

PLATE 13



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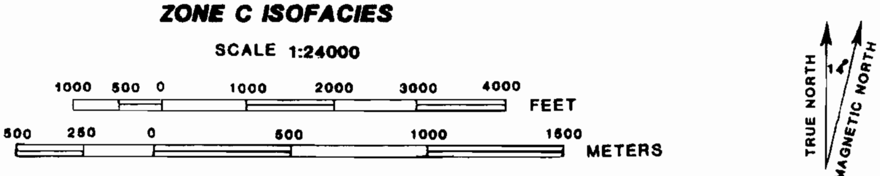
DEPARTMENT OF GEOLOGY AND GEOLOGICAL ENGINEERING
RAPID CITY, SOUTH DAKOTA

GEOLOGY BY: M.D. BUSWELL

LOWER LANCE
ZONE C ISOFACIES

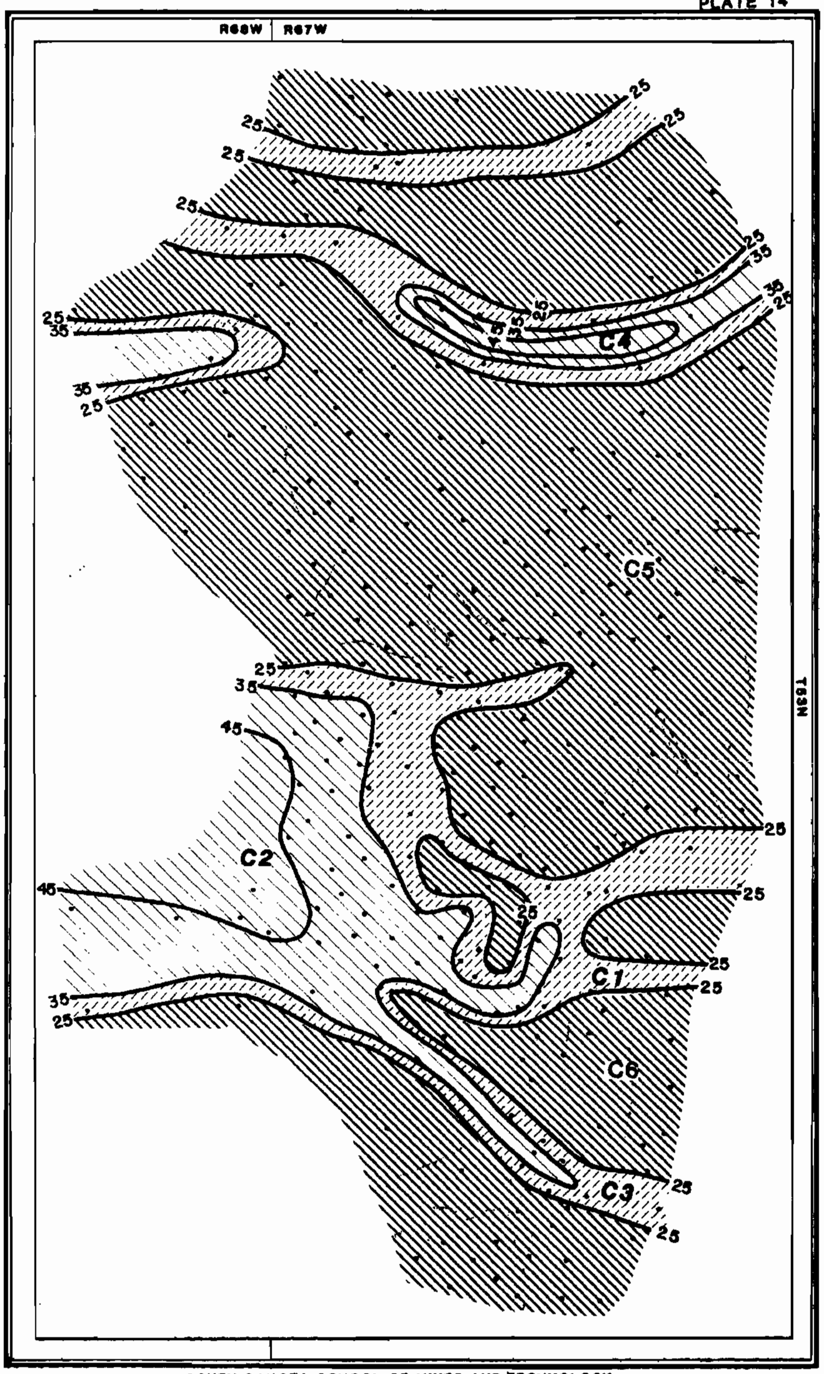
SCALE 1:24000



1982

SUBSURFACE GEOLOGY OF THE OSHOTO URANIUM DEPOSIT,
CROOK COUNTY, WYOMING

PLATE 14



EXPLANATION

CONTOUR INTERVALS

0-25

25-35

35-55 (ft)

WELL CONTROL

C2
REFERENCE NUMBER

ISOLITHIC LINES

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RAPID CITY, SOUTH DAKOTA

GEOLOGY BY: M.D. BUSWELL

LOWER LANCE
ZONE C EFFECTIVE SAND ISOLITH

SCALE 1:24000

1000 500 0 1000 2000 3000 4000 FEET

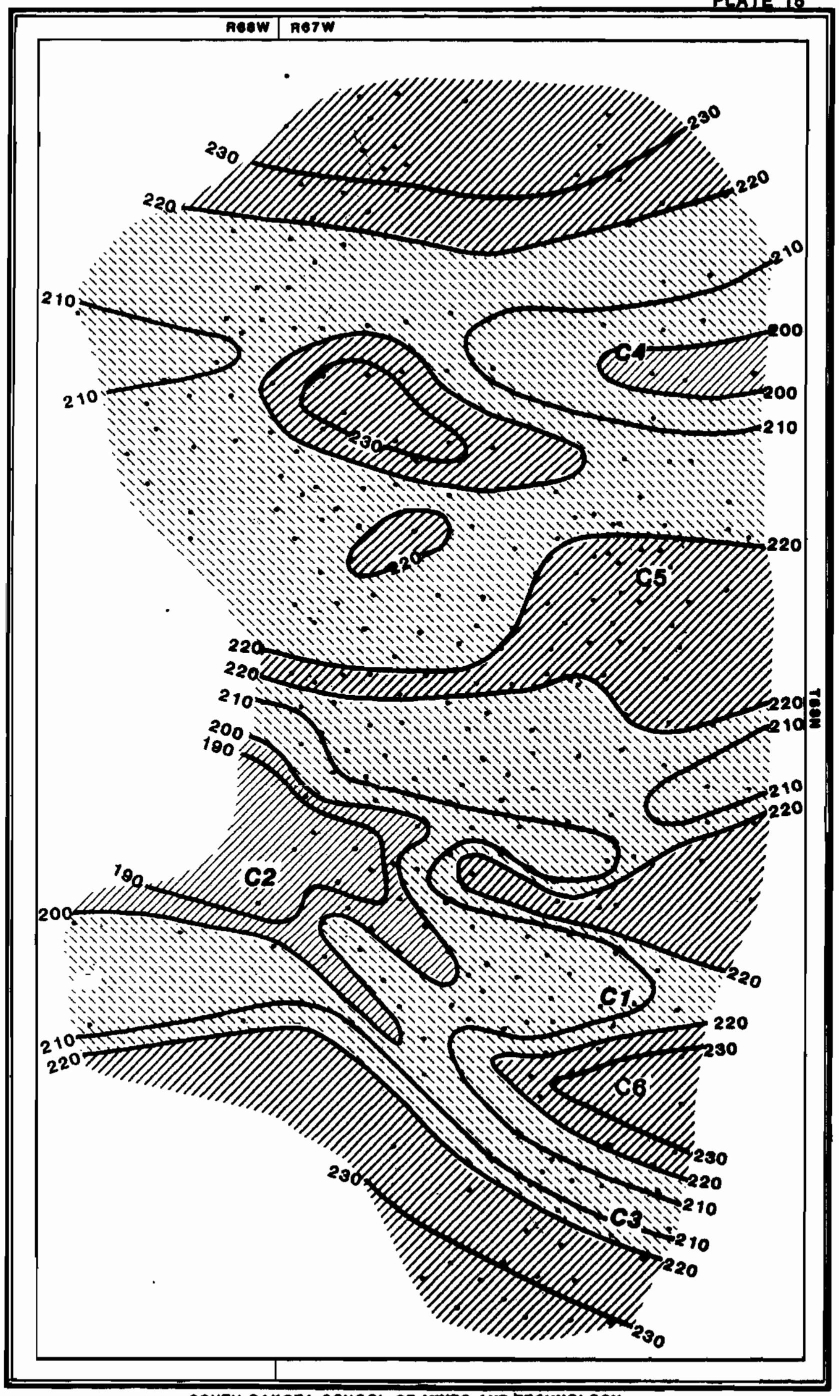
500 250 0 500 1000 1500 METERS

TRUE NORTH
MAGNETIC NORTH
14°

CONTOUR INTERVAL 10'
EFFECTIVE SAND ≥25'
1982

SUBSURFACE GEOLOGY OF THE OSHOTO URANIUM DEPOSIT, CROOK COUNTY, WYOMING

PLATE 15



EXPLANATION

CONTOUR INTERVALS

220–230

200–220

190–200 (ft)

WELL CONTROL

REFERENCE NUMBER

ISOPACHOUS LINES

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LOWER LANCE

ZONE C PALEOTOPOGRAPHY

SCALE 1:24000

1000 500 0 1000 2000 3000 4000 FEET

500 250 0 500 1000 1500 METERS

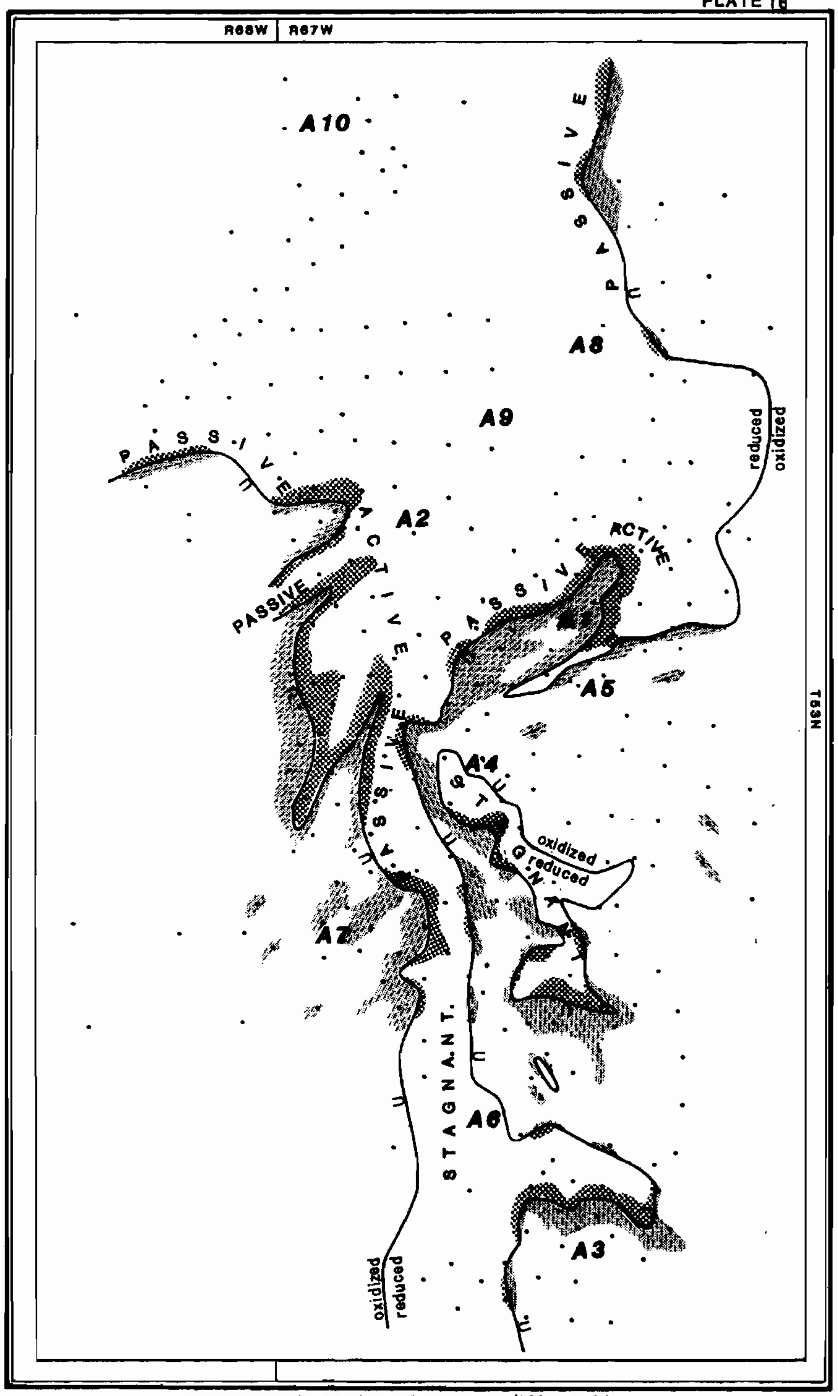
TRUE NORTH / MAGNETIC NORTH 14°

CONTOUR INTERVAL 10'

1982

SUBSURFACE GEOLOGY OF THE OSHOTO URANIUM DEPOSIT,
CROOK COUNTY, WYOMING

PLATE 16



EXPLANATION

MINERALIZATION

ORE+NEAR SEEPAGE

NEAR BARREN INTERIOR

ROLL FRONT

WELL CONTROL

A5

REFERENCE NUMBER

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DEPARTMENT OF GEOLOGY AND GEOLOGICAL ENGINEERING
RAPID CITY, SOUTH DAKOTA

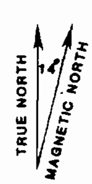
GEOLOGY BY: M.D. BUSWELL

UPPER FOX HILLS
ZONE A MINERALIZATION

SCALE 1:24000

1000 500 0 1000 2000 3000 4000 FEET

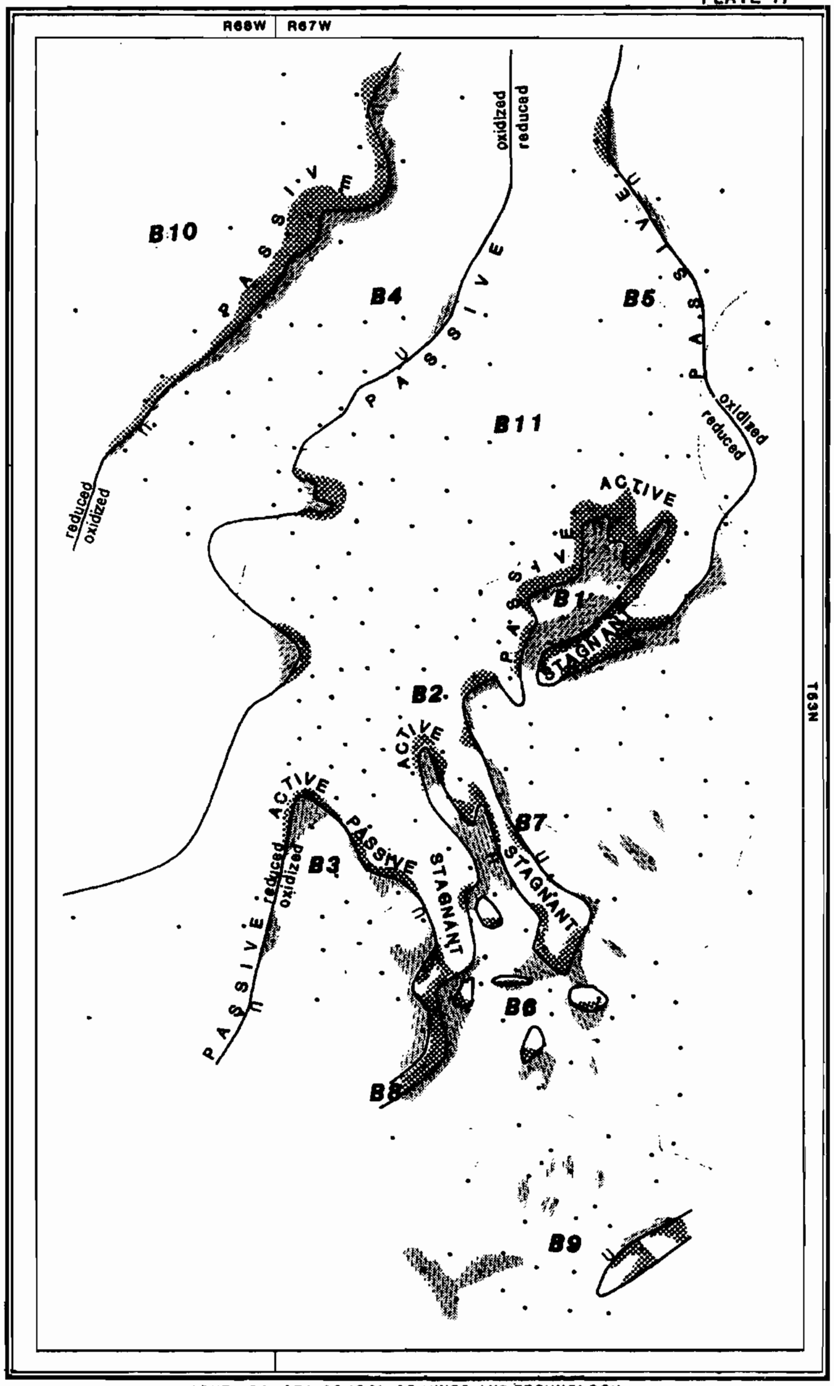
500 250 0 500 1000 1500 METERS



1982

SUBSURFACE GEOLOGY OF THE OSHOTO URANIUM DEPOSIT,
CROOK COUNTY, WYOMING

PLATE 17



EXPLANATION

MINERALIZATION

ORE+NEAR SEEPAGE

NEAR BARREN INTERIOR

ROLL FRONT

WELL CONTROL

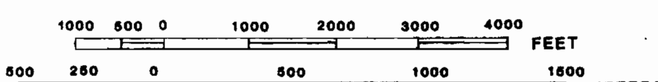
B2
REFERENCE NUMBER

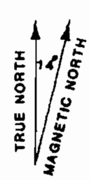
SOUTH DAKOTA SCHOOL OF MINES AND TECHNOLOGY
DEPARTMENT OF GEOLOGY AND GEOLOGICAL ENGINEERING
RAPID CITY, SOUTH DAKOTA

GEOLOGY BY: M.D. BUSWELL

LOWER LANCE
ZONE B MINERALIZATION

SCALE 1:24000

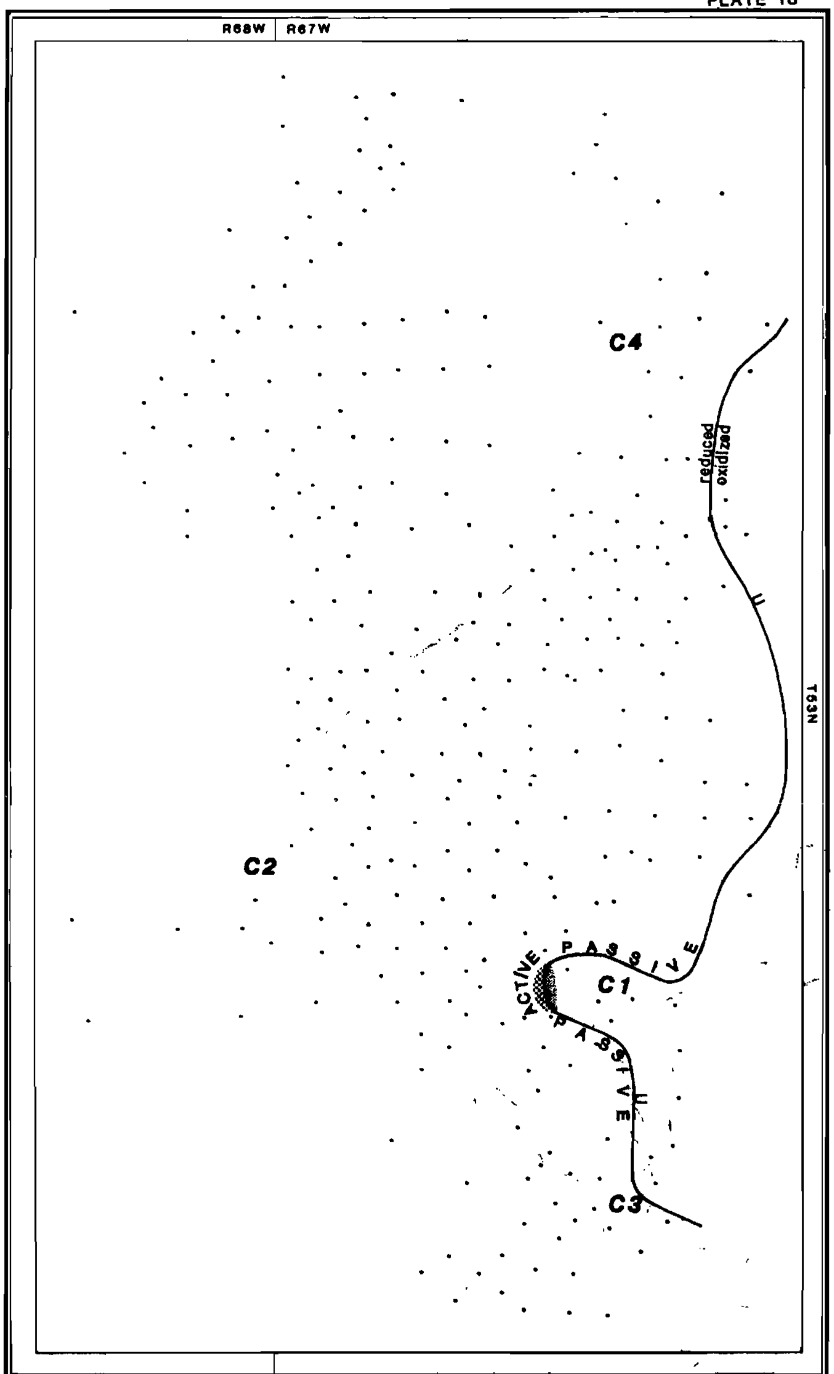




1982

SUBSURFACE GEOLOGY OF THE OSHOTO URANIUM DEPOSIT,
CROOK COUNTY, WYOMING

PLATE 18



EXPLANATION

MINERALIZATION

ORE+NEAR SEEPAGE

NEAR BARREN INTERIOR

ROLL FRONT

WELL CONTROL

C1
REFERENCE NUMBER

GEOLOGY BY: M.D. BUSWELL

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DEPARTMENT OF GEOLOGY AND GEOLOGICAL ENGINEERING
RAPID CITY, SOUTH DAKOTA

LOWER LANCE
ZONE C MINERALIZATION

SCALE 1:24000

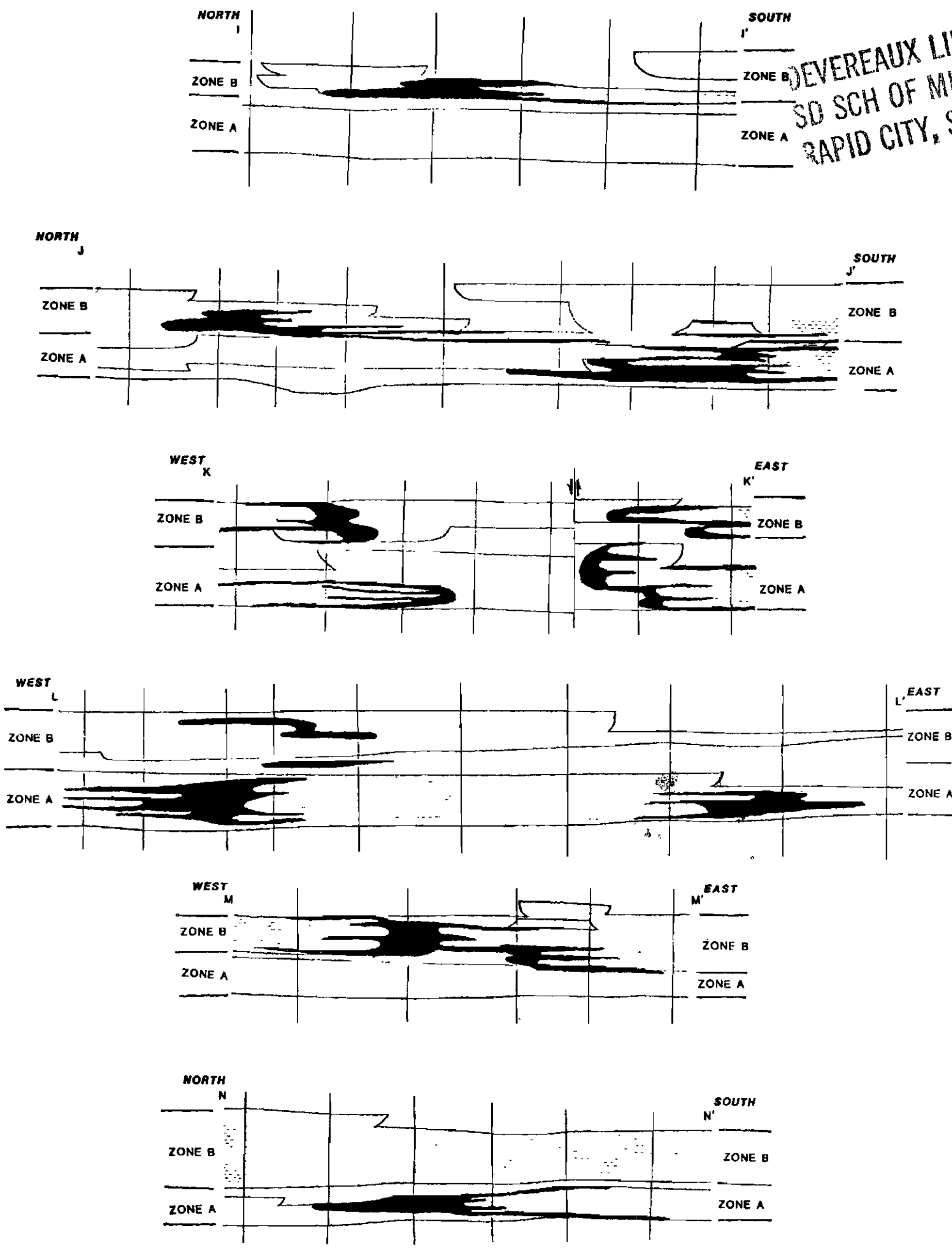
1000 500 0 1000 2000 3000 4000 FEET

500 250 0 500 1000 1500 METERS

TRUE NORTH, MAGNETIC NORTH, 14°

1982

PLATE 19



GEOLOGY BY M.D. BUSWELL

EXPLANATION

MINERALIZATION
OXIDIZED SEDIMENTS
REDUCED SEDIMENTS

VERTICAL SCALE 0 30' 60'
HORIZONTAL SCALE 0 30' 60'

MINERALIZED SECTIONS

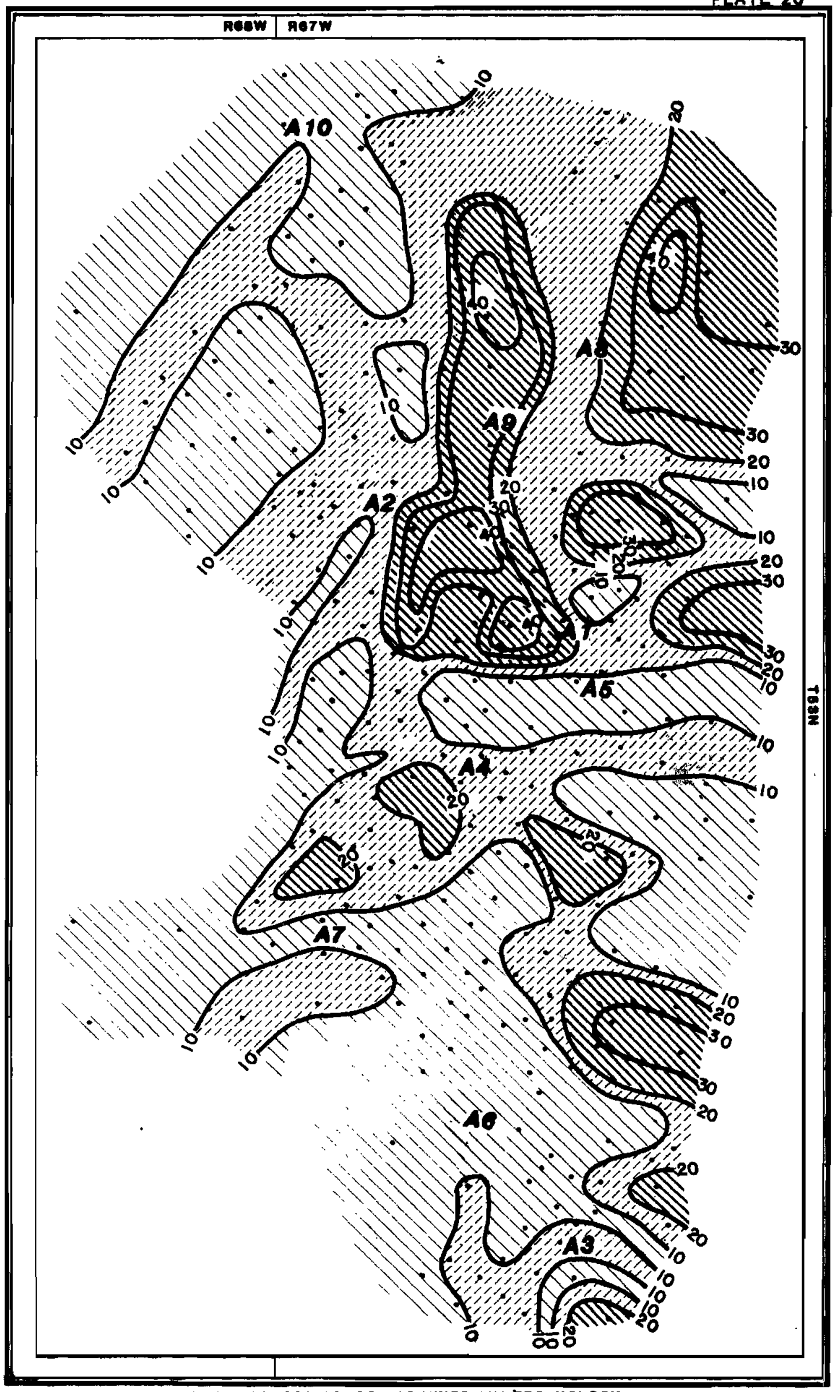
ROLL FRONT DEVELOPMENT

SOUTH DAKOTA SCHOOL OF MINES & TECHNOLOGY
DEPARTMENT OF GEOLOGY & GEOLOGICAL ENGINEERING

1982

SUBSURFACE GEOLOGY OF THE OSHOTO URANIUM DEPOSIT,
CROOK COUNTY, WYOMING

PLATE 20



EXPLANATION

CONTOUR INTERVALS

20–40

10–20

0–10

WELL CONTROL

A1

REFERENCE NUMBER

ISOPLETH LINES

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DEPARTMENT OF GEOLOGY AND GEOLOGICAL ENGINEERING
RAPID CITY, SOUTH DAKOTA

GEOLOGY BY: M.D. BUSWELL

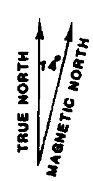
UPPER FOX HILLS

ZONE A ALTERNATION RATE

SCALE 1:24000

1000 500 0 1000 2000 3000 4000 FEET

500 250 0 500 1000 1500 METERS

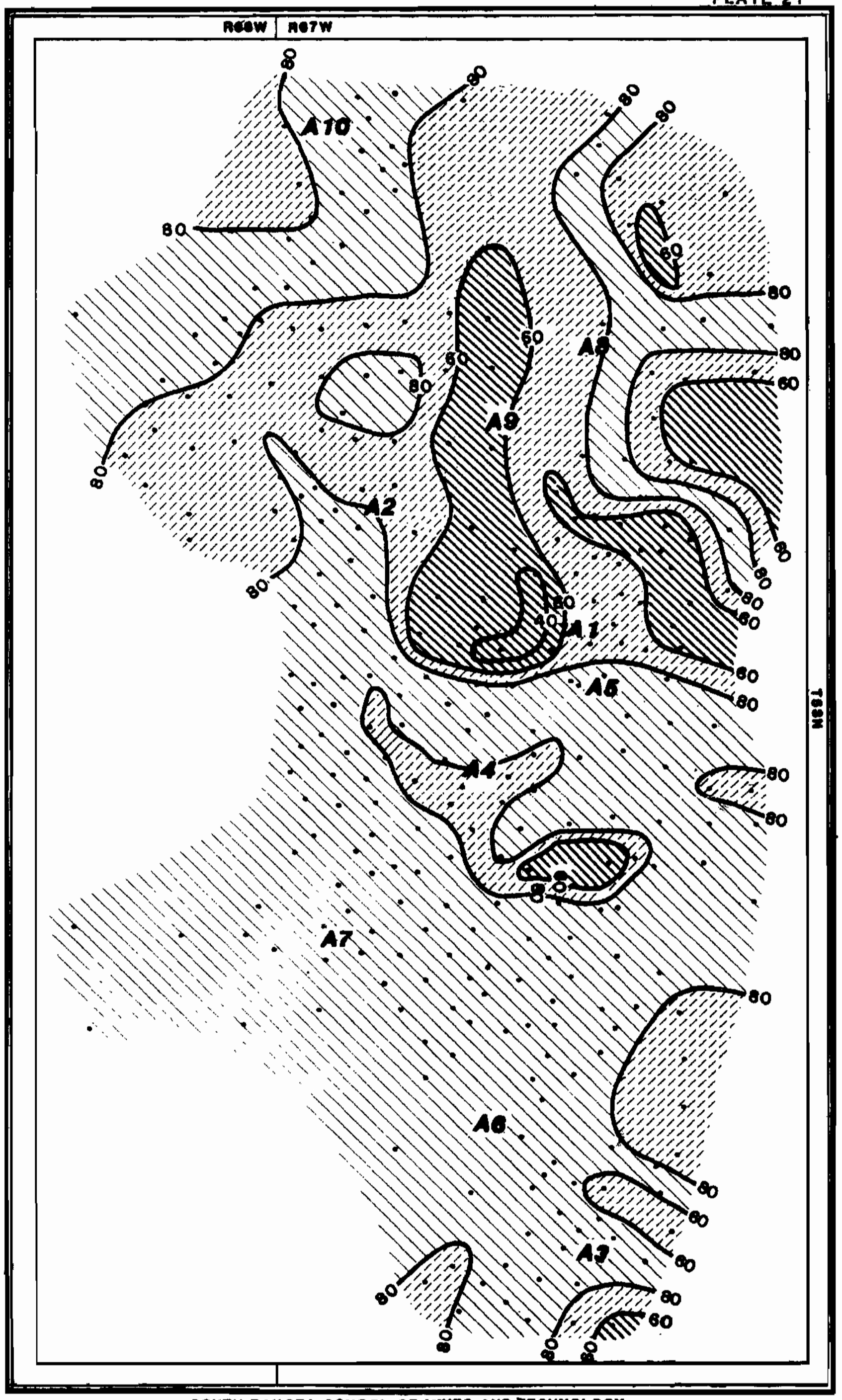


CONTOUR INTERVAL 10'
REFERENCE INTERVAL 100'

1982

SUBSURFACE GEOLOGY OF THE OSHOTO URANIUM DEPOSIT, CROOK COUNTY, WYOMING

PLATE 21



EXPLANATION

CONTOUR INTERVALS

20–60

60–80

80–100

WELL CONTROL

A4 REFERENCE NUMBER

ISOPLETH LINES

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RAPID CITY, SOUTH DAKOTA

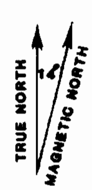
GEOLOGY BY: M.D. BUSWELL

UPPER FOX HILLS
ZONE A PERCENT SAND

SCALE 1:24000

1000 500 0 1000 2000 3000 4000 FEET

500 250 0 500 1000 1500 METERS

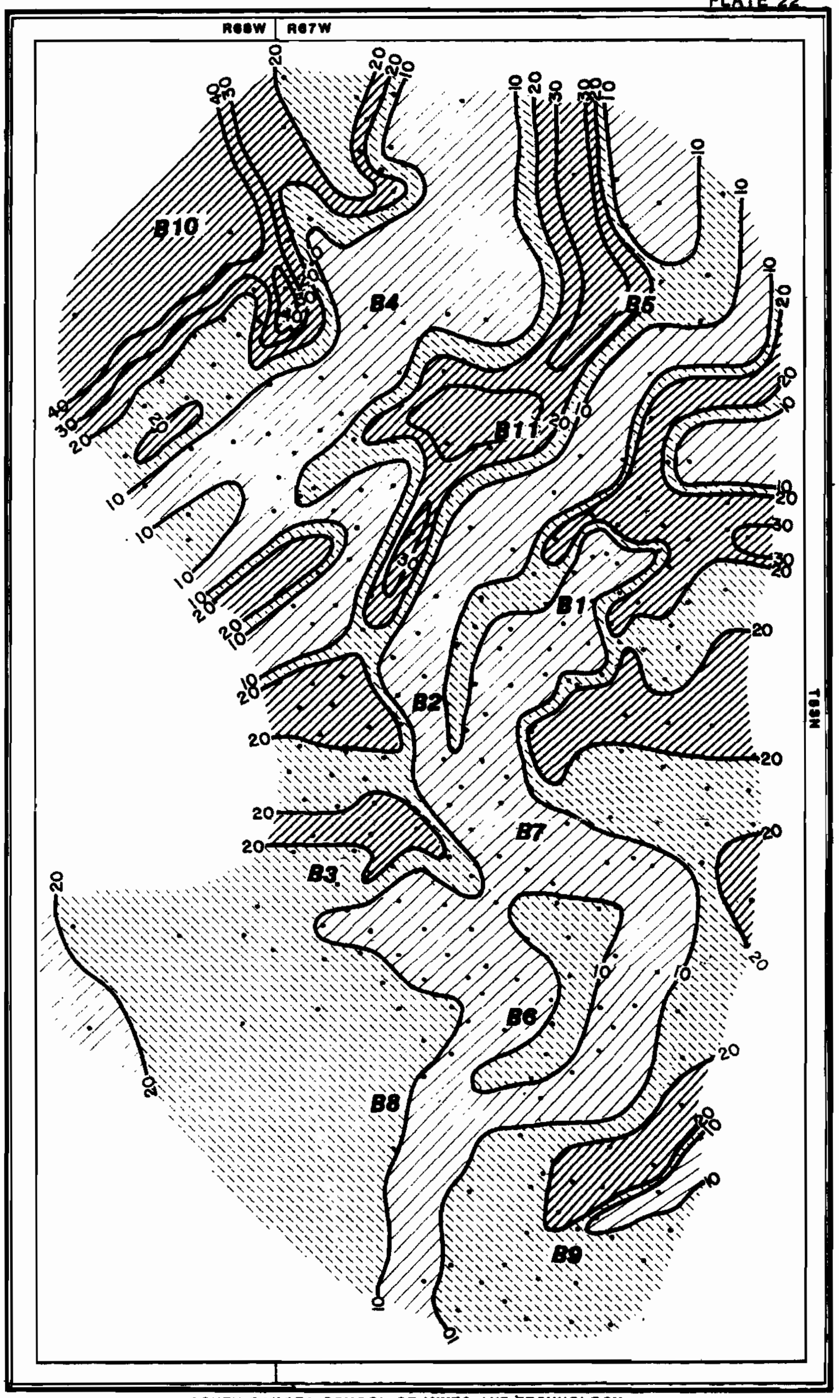


CONTOUR INTERVAL 20 %

1982

SUBSURFACE GEOLOGY OF THE OSHOTO URANIUM DEPOSIT,
CROOK COUNTY, WYOMING

PLATE 22



EXPLANATION

CONTOUR INTERVALS

20-50

10-20

0-10

WELL CONTROL

B8
REFERENCE NUMBER

ISOPLETH LINES

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RAPID CITY, SOUTH DAKOTA

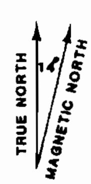
GEOLOGY BY: M.D. BUSWELL

LOWER LANCE
ZONE B ALTERNATION RATE

SCALE 1:24000

1000 500 0 1000 2000 3000 4000 FEET

500 250 0 500 1000 1500 METERS

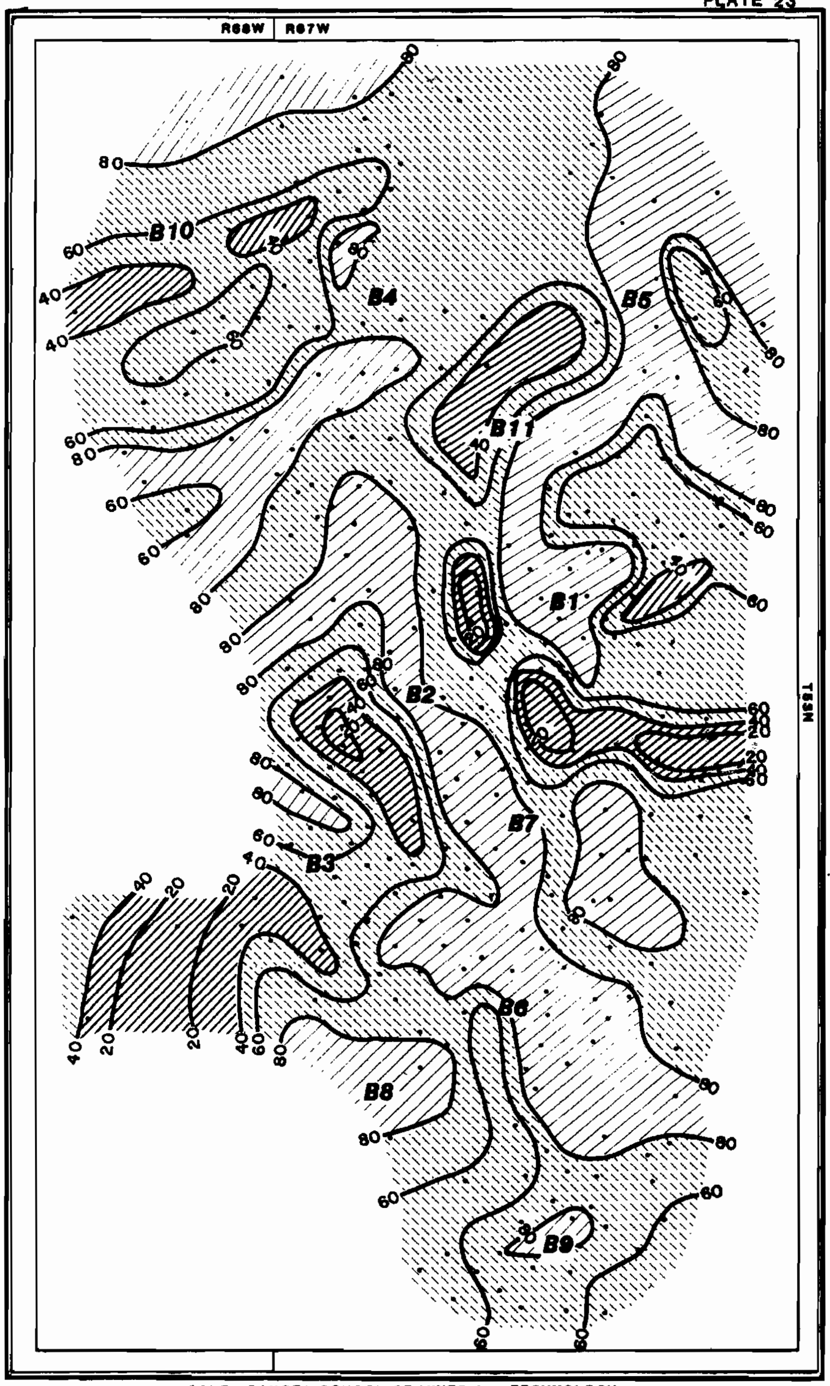


CONTOUR INTERVAL 10'
REFERENCE INTERVAL 100'

1982

SUBSURFACE GEOLOGY OF THE OSHOTO URANIUM DEPOSIT,
CROOK COUNTY, WYOMING

PLATE 23



EXPLANATION

CONTOUR INTERVALS

0-40

40-80

80-100

WELL CONTROL

B7
REFERENCE NUMBER

ISOPLETH LINES

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RAPID CITY, SOUTH DAKOTA

GEOLOGY BY: M.D. BUSWELL

LOWER LANCE
ZONE B PERCENT SAND

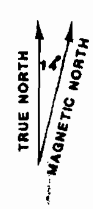
SCALE 1:24000

1000 500 0 1000 2000 3000 4000 FEET

500 250 0 500 1000 1500 METERS

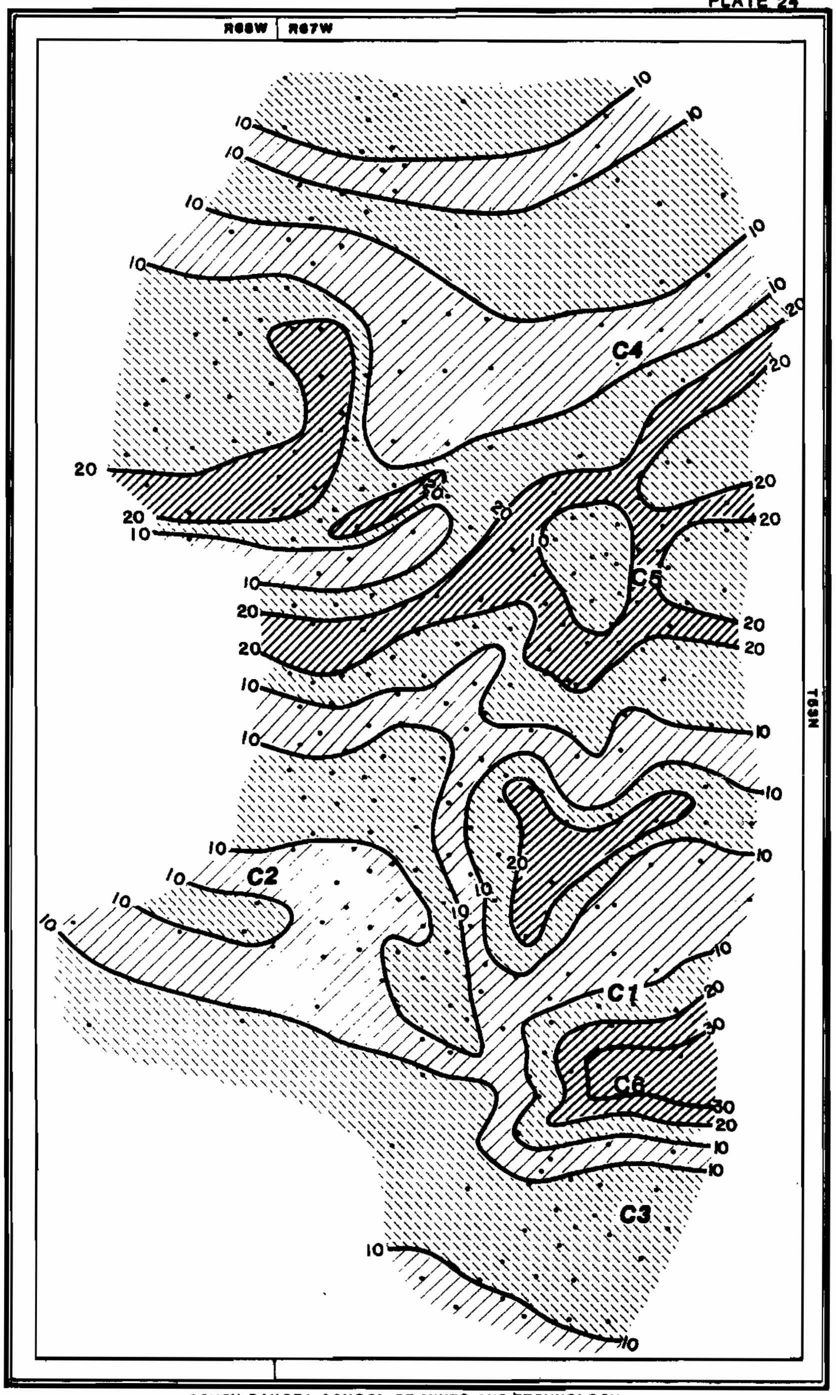
CONTOUR INTERVAL

1982



SUBSURFACE GEOLOGY OF THE OSHOTO URANIUM DEPOSIT, CROOK COUNTY, WYOMING

PLATE 24



EXPLANATION

CONTOUR INTERVALS

20-40

10-20

0-10

WELL CONTROL

C3 REFERENCE NUMBER

ISOPLETH LINES

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DEPARTMENT OF GEOLOGY AND GEOLOGICAL ENGINEERING
RAPID CITY, SOUTH DAKOTA

GEOLOGY BY: M.D. BUSWELL

LOWER LANCE
ZONE C ALTERNATION RATE

SCALE 1:24000

1000 500 0 1000 2000 3000 4000 FEET

500 250 0 500 1000 1500 METERS

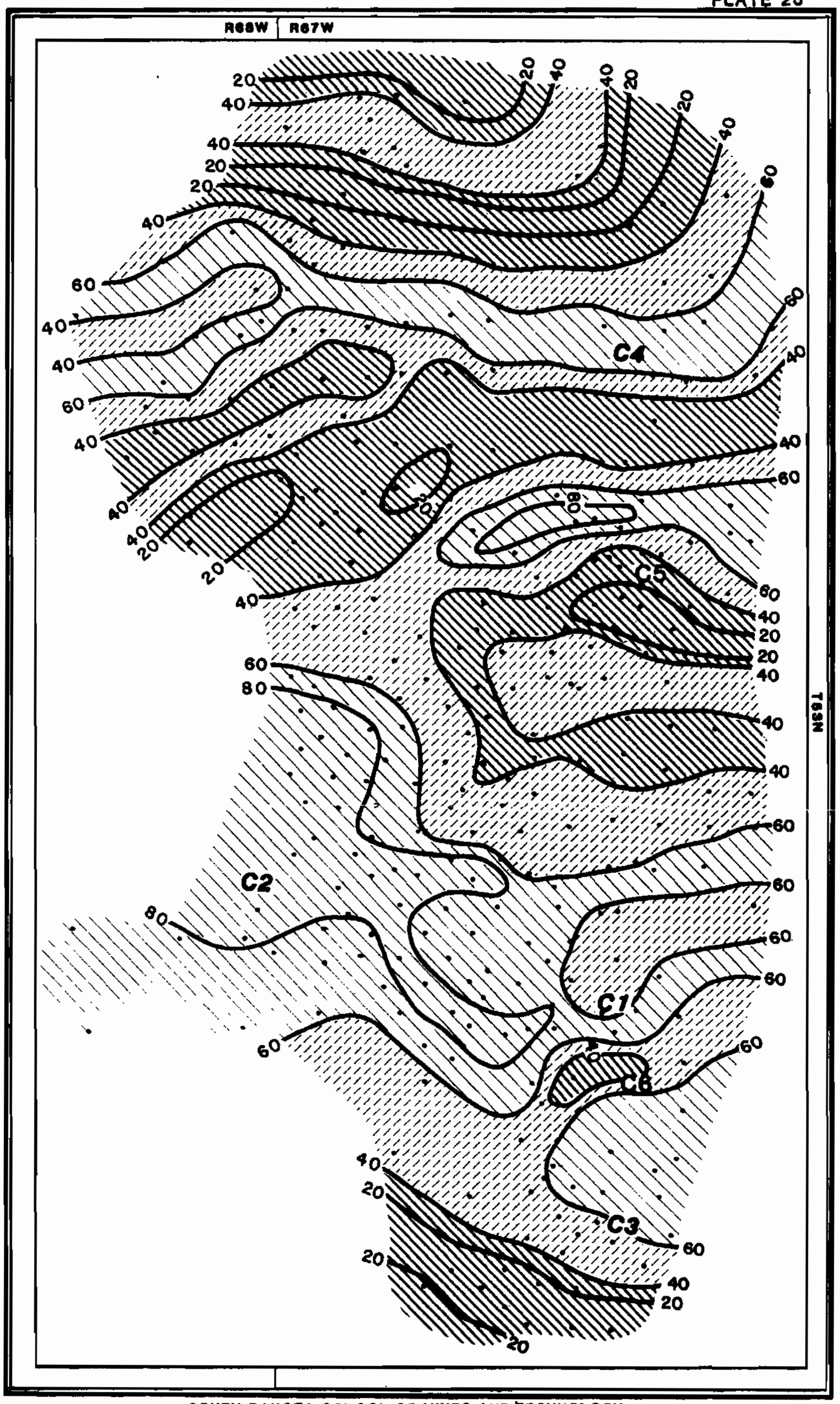
TRUE NORTH 14° MAGNETIC NORTH

CONTOUR INTERVAL 10'
REFERENCE INTERVAL 100'

1982

SUBSURFACE GEOLOGY OF THE OSHOTO URANIUM DEPOSIT,
CROOK COUNTY, WYOMING

PLATE 25



EXPLANATION

CONTOUR INTERVALS

0-40

40-60

60-100

WELL CONTROL

C2
REFERENCE NUMBER

ISOPLETH LINES

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DEPARTMENT OF GEOLOGY AND GEOLOGICAL ENGINEERING
RAPID CITY, SOUTH DAKOTA

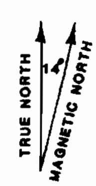
GEOLOGY BY: M.D. BUSWELL

LOWER LANCE
ZONE C PERCENT SAND

SCALE 1:24000

1000 500 0 1000 2000 3000 4000 FEET

500 250 0 500 1000 1500 METERS



CONTOUR INTERVAL 20 %

1982

ADDENDUM 2.6-B

EXPLORATION/DELINEATION

DRILLHOLE TABULATION

Table1. Exploration/Delineation Hole Finding , Surveying and Abandonment Summary

Statistic	**Number Within Permit Area/ $^1/_2$ Mile Buffer**
Total Number of Holes Drilled[1]	1952/270
Number of Exploration Holes (Nubeth)	1483/199
Number of Delineation Holes (Strata)	467/73
Number of Nubeth Exploratory Holes Found	625/134
Number of Nubeth Exploratory Holes to be Found	858/65
Number of Holes Plugged with Cement[1]	341/57
Number of Holes Plugged with Plug Gel[1]	192/16
Number of Holes Plugged Unknown[1]	1419/197

[1] Includes Exploration and Delineation Holes

Note: Statistics are based on information as of October 2010

Drill Hole Tabulation

Hole Name	North	East	Township	Range	Section	QtrQtr	Located Within Permit Area or 1/2 Mile Buffer	Type of Plugging	Date Plugged	Exploration/Delineation
RMR0281	709063.64	1487863.83	T53N	R68W	13	NWNW	1/2 Mile Buffer	Cement	5/18/2010	Delineation
RMR0284	709069.13	1488018.09	T53N	R68W	13	NWNW	1/2 Mile Buffer	Cement	5/19/2010	Delineation
RMR0323	712870.84	1483675.62	T53N	R67W	19	SWSE	1/2 Mile Buffer	Cement	4/22/2010	Delineation
RMR0369	709062.74	1487819.42	T53N	R68W	13	NWNW	1/2 Mile Buffer	Cement	3/27/2010	Delineation
RMR0375	707190.79	1490256.07	T53N	R68W	12	NWSE	1/2 Mile Buffer	Cement	3/27/2010	Delineation
RMR0430			T53N	R68W	12	NESE	1/2 Mile Buffer	Cement	6/4/2010	Delineation
RMR0431			T53N	R68W	12	NWSE	1/2 Mile Buffer	Cement	6/4/2010	Delineation
RMR0432			T53N	R68W	12	SENE	1/2 Mile Buffer	Cement	6/3/2010	Delineation
RMR0433			T53N	R68W	12	NESE	1/2 Mile Buffer	Cement	6/2/2010	Delineation
RMR0434			T53N	R68W	12	SENE	1/2 Mile Buffer	Cement	6/2/2010	Delineation
RMR0435	708826.37	1491940.41	T53N	R68W	12	SENE	1/2 Mile Buffer	Cement	6/1/2010	Delineation
RMR0436	708927.87	1492058.77	T53N	R68W	12	SENE	1/2 Mile Buffer	Cement	5/31/2010	Delineation
RMR0437	707939.18	1490839.13	T53N	R68W	12	NESE	1/2 Mile Buffer	Cement	5/30/2010	Delineation
RMR0438	708427.24	1491312.73	T53N	R68W	12	NESE	1/2 Mile Buffer	Cement	5/29/2010	Delineation
RMR0440	709727.96	1492736.49	T53N	R67W	7	SWNW	1/2 Mile Buffer	Cement	5/20/2010	Delineation
RMR0442	708440.87	1491384.96	T53N	R68W	12	NESE	1/2 Mile Buffer	Cement	5/17/2010	Delineation
RMR0443	708680.34	1491605.35	T53N	R68W	12	NESE	1/2 Mile Buffer	Cement	5/17/2010	Delineation
RMR0445	709571.95	1492788.68	T53N	R67W	7	SWNW	1/2 Mile Buffer	Cement	7/20/2010	Delineation
RMR0446			T53N	R67W	7	SWNW	1/2 Mile Buffer	Cement	4/29/2010	Delineation
RMR0447	708960.23	1491979.11	T53N	R68W	12	SENE	1/2 Mile Buffer	Cement	4/29/2010	Delineation
RMR0449	708739.64	1491671.44	T53N	R68W	12	SENE	1/2 Mile Buffer	Cement	4/28/2010	Delineation
RMR0450	708083.20	1490948.42	T53N	R68W	12	NESE	1/2 Mile Buffer	Cement	4/23/2010	Delineation
RMR0451	708497.25	1491355.77	T53N	R68W	12	NESE	1/2 Mile Buffer	Cement	4/26/2010	Delineation
RMR0452	708601.24	1491509.06	T53N	R68W	12	NESE	1/2 Mile Buffer	Cement	4/28/2010	Delineation
RMR0454	709055.93	1488264.28	T53N	R68W	13	NWNW	1/2 Mile Buffer	Cement	4/22/2010	Delineation
RMR0455	709069.50	1488288.27	T53N	R68W	13	NWNW	1/2 Mile Buffer	Cement	4/21/2010	Delineation
RMR0462			T53N	R68W	12	NESE	1/2 Mile Buffer	Cement	6/6/2010	Delineation
RMR0463			T53N	R68W	12	NESE	1/2 Mile Buffer	Cement	6/6/2010	Delineation
RMR0464			T53N	R67W	19	SWSE	1/2 Mile Buffer	Cement	6/6/2010	Delineation
RMR0465			T53N	R68W	12	SENE	1/2 Mile Buffer	Cement	6/7/2010	Delineation
RMR0466			T53N	R67W	7	SWNW	1/2 Mile Buffer	Cement	6/9/2010	Delineation
RMR0467			T53N	R67W	7	SWNW	1/2 Mile Buffer	Cement	6/9/2010	Delineation
RMR0502			T53N	R68W	13	NENW	1/2 Mile Buffer	Cement	6/4/2010	Delineation
RMR0503			T53N	R68W	13	NENW	1/2 Mile Buffer	Cement	6/3/2010	Delineation
RMR0504			T53N	R68W	13	NENW	1/2 Mile Buffer	Cement	6/4/2010	Delineation
RMR0505			T53N	R68W	13	NENW	1/2 Mile Buffer	Cement	6/5/2010	Delineation
RMR0506			T53N	R68W	13	NENW	1/2 Mile Buffer	Cement	6/5/2010	Delineation
RMR0507			T53N	R68W	13	NENW	1/2 Mile Buffer	Cement	6/6/2010	Delineation
RMR0508			T53N	R68W	13	NENW	1/2 Mile Buffer	Cement	6/7/2010	Delineation
RMR0509			T53N	R68W	13	NENW	1/2 Mile Buffer	Cement	6/8/2010	Delineation
RMR0510			T53N	R68W	12	SESW	1/2 Mile Buffer	Cement	6/9/2010	Delineation
RMR0511			T53N	R68W	12	SESW	1/2 Mile Buffer	Cement	6/10/2010	Delineation
RMR0512			T53N	R68W	12	SESW	1/2 Mile Buffer	Cement	6/10/2010	Delineation
RMR0518			T53N	R67W	7	SWNW	1/2 Mile Buffer	Cement	6/10/2010	Delineation

Note: Coordinate Projections are set in State Plane NAD 83 East Feet

Drill Hole Tabulation

Hole Name	North	East	Township	Range	Section	QtrQtr	Located Within Permit Area or 1/2 Mile Buffer	Type of Plugging	Date Plugged	Exploration/Delineation
RMR0520			T53N	R67W	7	SWNE	1/2 Mile Buffer	Cement	6/10/2010	Delineation
RMR0538			T53N	R68W	12	NENE	1/2 Mile Buffer	Cement	6/26/2010	Delineation
RMR0569			T53N	R67W	7	SWNW	1/2 Mile Buffer	Cement	6/22/2010	Delineation
RMR0570			T53N	R67W	7	SWNW	1/2 Mile Buffer	Cement	6/22/2010	Delineation
RMR0571			T53N	R67W	7	SWNW	1/2 Mile Buffer	Cement	6/25/2010	Delineation
RMR0583			T53N	R68W	13	NENW	1/2 Mile Buffer	Cement	6/30/2010	Delineation
RMR0587			T53N	R68W	12	SWSW	1/2 Mile Buffer	Cement	6/28/2010	Delineation
RMR0594			T53N	R68W	13	NENW	1/2 Mile Buffer	Cement	6/30/2010	Delineation
RMR0601			T53N	R68W	13	NENW	1/2 Mile Buffer	Cement	7/1/2010	Delineation
RMR0602			T53N	R68W	13	NENW	1/2 Mile Buffer	Cement	7/20/2010	Delineation
RMR0689			T53N	R68W	13	NESW	1/2 Mile Buffer	Cement	9/14/2010	Delineation
RMR0690			T53N	R68W	13	NESW	1/2 Mile Buffer	Cement	9/14/2010	Delineation
RMR0702			T53N	R68W	13	NESW	1/2 Mile Buffer	Cement	9/13/2010	Delineation
RMR0039	709381.87	1487695.55	T53N	R67W	18	NWNW	Permit Area	Cement	5/17/2010	Delineation
RMR0042	709168.76	1487878.25	T53N	R67W	18	NWNW	Permit Area	Cement	5/16/2010	Delineation
RMR0043	709186.17	1487676.51	T53N	R67W	18	NWNW	Permit Area	Cement	4/28/2010	Delineation
RMR0044	709388.05	1487870.56	T53N	R67W	18	NWNW	Permit Area	Cement	5/16/2010	Delineation
RMR0045	709096.94	1487481.64	T53N	R67W	18	SWNW	Permit Area	Cement	6/10/2010	Delineation
RMR0056	709503.48	1487269.44	T53N	R67W	18	SWNW	Permit Area	Cement	6/9/2010	Delineation
RMR0073	709337.34	1487338.61	T53N	R67W	18	SWNW	Permit Area	Cement	5/29/2010	Delineation
RMR0074	709244.43	1487482.66	T53N	R67W	18	SWNW	Permit Area	Cement	6/9/2010	Delineation
RMR0215	712948.59	1481609.00	T53N	R67W	19	SWNE	Permit Area	Cement	4/22/2010	Delineation
RMR0216	711663.31	1480370.74	T53N	R67W	19	NESW	Permit Area	Cement	4/22/2010	Delineation
RMR0218	712632.53	1481640.55	T53N	R67W	19	SWNE	Permit Area	Cement	4/23/2010	Delineation
RMR0219	711905.22	1481749.74	T53N	R67W	19	SWNE	Permit Area	Cement	4/26/2010	Delineation
RMR0220	711863.01	1483997.40	T53N	R67W	18	SWSE	Permit Area	Cement	4/22/2010	Delineation
RMR0221	712089.12	1484456.39	T53N	R67W	18	SWSE	Permit Area	Cement	4/27/2010	Delineation
RMR0223	711069.35	1486728.70	T53N	R67W	18	SENW	Permit Area	Cement	4/27/2010	Delineation
RMR0224	711435.06	1485726.34	T53N	R67W	18	NESW	Permit Area	Cement	4/29/2010	Delineation
RMR0225	712577.01	1484205.82	T53N	R67W	18	SWSE	Permit Area	Cement	7/21/2010	Delineation
RMR0255	711148.73	1480691.85	T53N	R67W	19	NESW	Permit Area	Cement	4/22/2010	Delineation
RMR0263	710705.24	1485987.41	T53N	R67W	18	NESW	Permit Area	Cement	7/21/2010	Delineation
RMR0264	713262.17	1481603.08	T53N	R67W	19	SENE	Permit Area	Cement	4/27/2010	Delineation
RMR0265	712665.28	1484275.97	T53N	R67W	18	SWSE	Permit Area	Cement	4/28/2010	Delineation
RMR0266	711940.35	1483213.35	T53N	R67W	19	NWNE	Permit Area	Cement	5/16/2010	Delineation
RMR0267	711845.76	1482924.35	T53N	R67W	19	NWNE	Permit Area	Cement	5/5/2010	Delineation
RMR0269	712019.77	1483374.33	T53N	R67W	19	NWNE	Permit Area	Cement	5/17/2010	Delineation
RMR0271	709039.89	1487918.62	T53N	R68W	13	NENE	Permit Area	Cement	5/19/2010	Delineation
RMR0272	709041.16	1487973.11	T53N	R68W	13	NENE	Permit Area	Cement	5/19/2010	Delineation
RMR0273	709042.91	1488018.93	T53N	R68W	13	NENE	Permit Area	Cement	6/11/2010	Delineation
RMR0274	712170.46	1483190.85	T53N	R67W	19	NWNE	Permit Area	Cement	7/20/2010	Delineation
RMR0276	711879.29	1484090.64	T53N	R67W	18	SWSE	Permit Area	Cement	4/27/2010	Delineation
RMR0278	709035.60	1487719.99	T53N	R68W	13	NENE	Permit Area	Cement	5/18/2010	Delineation
RMR0279	712353.85	1483793.70	T53N	R67W	18	SWSE	Permit Area	Cement	4/29/2010	Delineation

Note: Coordinate Projections are set in State Plane NAD 83 East Feet

Drill Hole Tabulation

Hole Name	North	East	Township	Range	Section	QtrQtr	Located Within Permit Area or 1/2 Mile Buffer	Type of Plugging	Date Plugged	Exploration/Delineation
RMR0280	709038.27	1487816.09	T53N	R68W	13	NENE	Permit Area	Cement	6/10/2010	Delineation
RMR0282	709013.65	1487862.22	T53N	R68W	13	NENE	Permit Area	Cement	3/27/2010	Delineation
RMR0287	710145.69	1487248.33	T53N	R67W	18	SWNW	Permit Area	Cement	7/15/2010	Delineation
RMR0289	710313.43	1487653.37	T53N	R67W	18	NWNW	Permit Area	Cement	2/15/2010	Delineation
RMR0290	710109.21	1487368.34	T53N	R67W	18	SWNW	Permit Area	Cement	7/14/2010	Delineation
RMR0292	710571.89	1485986.09	T53N	R67W	18	NESW	Permit Area	Cement	7/13/2010	Delineation
RMR0293	711274.19	1486077.74	T53N	R67W	18	NESW	Permit Area	Cement	7/14/2010	Delineation
RMR0295	711239.14	1486398.22	T53N	R67W	18	SENW	Permit Area	Cement	7/14/2010	Delineation
RMR0296	709098.87	1487372.42	T53N	R67W	18	SWNW	Permit Area	Cement	5/17/2010	Delineation
RMR0297	709179.05	1487969.91	T53N	R67W	18	NWNW	Permit Area	Cement	5/18/2010	Delineation
RMR0298	709149.04	1488199.59	T53N	R67W	18	NWNW	Permit Area	Cement	5/19/2010	Delineation
RMR0299	710352.14	1487855.46	T53N	R67W	18	NENW	Permit Area	Cement	7/15/2010	Delineation
RMR0300			T53N	R67W	18	NESW	Permit Area	Cement	7/14/2010	Delineation
RMR0303	710723.14	1485769.19	T53N	R67W	18	NESW	Permit Area	Cement	7/13/2010	Delineation
RMR0304	710542.43	1485913.92	T53N	R67W	18	NESW	Permit Area	Cement	7/13/2010	Delineation
RMR0305	710429.75	1488037.64	T53N	R67W	18	NENW	Permit Area	Cement	3/15/2010	Delineation
RMR0307	710920.29	1485994.02	T53N	R67W	18	NESW	Permit Area	Cement	7/12/2010	Delineation
RMR0308	710931.81	1485900.47	T53N	R67W	18	NESW	Permit Area	Cement	7/12/2010	Delineation
RMR0311	710924.06	1485786.11	T53N	R67W	18	NESW	Permit Area	Cement	7/13/2010	Delineation
RMR0314	711245.82	1486694.14	T53N	R67W	18	SENW	Permit Area	Cement	7/13/2010	Delineation
RMR0315	710913.55	1486373.83	T53N	R67W	18	SENW	Permit Area	Cement	7/14/2010	Delineation
RMR0316	711315.05	1486027.84	T53N	R67W	18	NESW	Permit Area	Cement	7/13/2010	Delineation
RMR0317	708645.10	1488048.11	T53N	R68W	13	NENE	Permit Area	Cement	3/22/2010	Delineation
RMR0318	708668.43	1488242.88	T53N	R68W	13	NENE	Permit Area	Cement	3/21/2010	Delineation
RMR0319	708681.39	1488441.08	T53N	R68W	13	NENE	Permit Area	Cement	3/24/2010	Delineation
RMR0320	708768.72	1487685.02	T53N	R68W	13	NENE	Permit Area	Cement	3/24/2010	Delineation
RMR0321	708623.74	1487850.85	T53N	R68W	13	NENE	Permit Area	Cement	3/24/2010	Delineation
RMR0322	711078.75	1484862.44	T53N	R67W	18	SESW	Permit Area	Cement	5/19/2010	Delineation
RMR0324	712635.48	1483309.69	T53N	R67W	19	NWNE	Permit Area	Cement	4/23/2010	Delineation
RMR0325	711367.17	1486013.47	T53N	R67W	18	NESW	Permit Area	Cement	3/26/2010	Delineation
RMR0326	710338.89	1487654.87	T53N	R67W	18	NWNW	Permit Area	Cement	7/15/2010	Delineation
RMR0327	711364.57	1485902.53	T53N	R67W	18	NESW	Permit Area	Cement	3/26/2010	Delineation
RMR0328	711345.45	1486119.47	T53N	R67W	18	NESW	Permit Area	Cement	3/22/2010	Delineation
RMR0329	711407.26	1486115.85	T53N	R67W	18	NESW	Permit Area	Cement	3/20/2010	Delineation
RMR0330	711266.53	1486178.84	T53N	R67W	18	NESW	Permit Area	Cement	3/20/2010	Delineation
RMR0332	710539.73	1480913.79	T53N	R67W	19	NESW	Permit Area	Cement	7/12/2010	Delineation
RMR0333	710585.44	1480837.31	T53N	R67W	19	NESW	Permit Area	Cement	7/12/2010	Delineation
RMR0334	711731.02	1481773.80	T53N	R67W	19	SWNE	Permit Area	Cement	4/16/2010	Delineation
RMR0335	710497.80	1483119.01	T53N	R67W	19	NENW	Permit Area	Cement	4/15/2010	Delineation
RMR0336	710550.22	1483114.23	T53N	R67W	19	NENW	Permit Area	Cement	4/15/2010	Delineation
RMR0338	710618.44	1483217.36	T53N	R67W	19	NENW	Permit Area	Cement	4/14/2010	Delineation
RMR0339	710663.94	1483199.79	T53N	R67W	19	NENW	Permit Area	Cement	4/14/2010	Delineation
RMR0340	711379.73	1485339.90	T53N	R67W	18	NESW	Permit Area	Cement	3/20/2010	Delineation
RMR0341	711420.95	1485239.95	T53N	R67W	18	NESW	Permit Area	Cement	3/20/2010	Delineation

Note: Coordinate Projections are set in State Plane NAD 83 East Feet

Drill Hole Tabulation

Hole Name	North	East	Township	Range	Section	QtrQtr	Located Within Permit Area or 1/2 Mile Buffer	Type of Plugging	Date Plugged	Exploration/Delineation
RMR0342	711386.28	1485152.38	T53N	R67W	18	NESW	Permit Area	Cement	3/20/2010	Delineation
RMR0343	708846.07	1485651.09	T53N	R68W	13	NESE	Permit Area	Cement	3/25/2010	Delineation
RMR0344	708835.47	1485552.80	T53N	R68W	13	NESE	Permit Area	Cement	3/25/2010	Delineation
RMR0345	708859.20	1485748.98	T53N	R68W	13	NESE	Permit Area	Cement	3/26/2010	Delineation
RMR0346	708870.52	1485847.20	T53N	R68W	13	NESE	Permit Area	Cement	4/23/2010	Delineation
RMR0347	709217.05	1485741.51	T53N	R67W	18	NWSW	Permit Area	Cement	5/16/2010	Delineation
RMR0348	710555.97	1483873.50	T53N	R67W	18	SESW	Permit Area	Cement	5/18/2010	Delineation
RMR0349	710843.80	1483549.17	T53N	R67W	19	NENW	Permit Area	Cement	5/17/2010	Delineation
RMR0350	711573.56	1480524.26	T53N	R67W	19	NESW	Permit Area	Cement	4/10/2010	Delineation
RMR0351	711627.47	1480482.52	T53N	R67W	19	NESW	Permit Area	Cement	4/11/2010	Delineation
RMR0353	711578.75	1480474.58	T53N	R67W	19	NESW	Permit Area	Cement	7/13/2010	Delineation
RMR0354	710721.25	1483292.92	T53N	R67W	19	NENW	Permit Area	Cement	5/18/2010	Delineation
RMR0355	710671.60	1482849.75	T53N	R67W	19	NENW	Permit Area	Cement	5/18/2010	Delineation
RMR0356	710100.88	1484778.40	T53N	R67W	18	SWSW	Permit Area	Cement	5/20/2010	Delineation
RMR0357	709203.35	1485538.00	T53N	R67W	18	NWSW	Permit Area	Cement	5/19/2010	Delineation
RMR0358	711052.49	1484219.12	T53N	R67W	18	SESW	Permit Area	Cement	5/20/2010	Delineation
RMR0359	710829.38	1484993.22	T53N	R67W	18	NESW	Permit Area	Cement	5/30/2010	Delineation
RMR0360	711203.93	1486749.55	T53N	R67W	18	SENW	Permit Area	Cement	3/21/2010	Delineation
RMR0361	711110.12	1484124.06	T53N	R67W	18	SESW	Permit Area	Cement	5/31/2010	Delineation
RMR0362	710954.88	1484606.20	T53N	R67W	18	SESW	Permit Area	Cement	5/30/2010	Delineation
RMR0363	711678.64	1481018.02	T53N	R67W	19	SENW	Permit Area	Cement	4/15/2010	Delineation
RMR0364	711722.41	1481021.29	T53N	R67W	19	SWNE	Permit Area	Cement	4/16/2010	Delineation
RMR0365	711632.39	1481016.90	T53N	R67W	19	SENW	Permit Area	Cement	4/15/2010	Delineation
RMR0366	708908.16	1488014.39	T53N	R68W	13	NENE	Permit Area	Cement	3/24/2010	Delineation
RMR0368	708910.04	1487863.22	T53N	R68W	13	NENE	Permit Area	Cement	3/26/2010	Delineation
RMR0370	709013.19	1487816.76	T53N	R68W	13	NENE	Permit Area	Cement	3/27/2010	Delineation
RMR0371	711323.66	1485891.75	T53N	R67W	18	NESW	Permit Area	Cement	3/26/2010	Delineation
RMR0372	710952.48	1486339.35	T53N	R67W	18	SENW	Permit Area	Cement	3/26/2010	Delineation
RMR0373	707221.74	1490060.85	T53N	R68W	12	SWSE	Permit Area	Cement	7/16/2010	Delineation
RMR0374	707198.70	1490157.16	T53N	R68W	12	SWSE	Permit Area	Cement	3/27/2010	Delineation
RMR0376	712625.81	1484415.96	T53N	R67W	18	SWSE	Permit Area	Cement	6/1/2010	Delineation
RMR0377	707197.06	1490206.19	T53N	R68W	12	SWSE	Permit Area	Cement	7/16/2010	Delineation
RMR0380	709969.41	1486648.87	T53N	R67W	18	SWNW	Permit Area	Cement	5/29/2010	Delineation
RMR0381	709955.62	1486973.76	T53N	R67W	18	SWNW	Permit Area	Cement	5/20/2010	Delineation
RMR0382	708785.98	1485551.49	T53N	R68W	13	NESE	Permit Area	Cement	3/25/2010	Delineation
RMR0383	708790.06	1485501.41	T53N	R68W	13	NESE	Permit Area	Cement	3/25/2010	Delineation
RMR0384	708841.39	1485500.93	T53N	R68W	13	NESE	Permit Area	Cement	3/25/2010	Delineation
RMR0385	708961.15	1487841.60	T53N	R68W	13	NENE	Permit Area	Cement	3/26/2010	Delineation
RMR0386	708955.71	1487740.73	T53N	R68W	13	NENE	Permit Area	Cement	3/27/2010	Delineation
RMR0387	713494.23	1488889.39	T53N	R67W	18	NENE	Permit Area	Cement	3/27/2010	Delineation
RMR0388	713497.03	1488839.58	T53N	R67W	18	NENE	Permit Area	Cement	3/27/2010	Delineation
RMR0389	713499.42	1488790.48	T53N	R67W	18	NENE	Permit Area	Cement	3/27/2010	Delineation
RMR0390	713182.40	1489250.53	T53N	R67W	7	SESE	Permit Area	Cement	4/11/2010	Delineation
RMR0391	713209.65	1489291.64	T53N	R67W	7	SESE	Permit Area	Cement	4/11/2010	Delineation

Note: Coordinate Projections are set in State Plane NAD 83 East Feet

Drill Hole Tabulation

Hole Name	North	East	Township	Range	Section	QtrQtr	Located Within Permit Area or 1/2 Mile Buffer	Type of Plugging	Date Plugged	Exploration/Delineation
RMR0392	713290.89	1489253.67	T53N	R67W	7	SESE	Permit Area	Cement	4/11/2010	Delineation
RMR0393	713013.94	1489458.96	T53N	R67W	7	SESE	Permit Area	Cement	3/27/2010	Delineation
RMR0396	711668.27	1480674.30	T53N	R67W	19	NESW	Permit Area	Cement	4/13/2010	Delineation
RMR0397	711674.38	1480171.09	T53N	R67W	19	NESW	Permit Area	Cement	7/12/2010	Delineation
RMR0398	711529.62	1480427.31	T53N	R67W	19	NESW	Permit Area	Cement	4/11/2010	Delineation
RMR0399	711630.16	1480421.61	T53N	R67W	19	NESW	Permit Area	Cement	4/11/2010	Delineation
RMR0400	712780.03	1484435.97	T53N	R67W	18	SWSW	Permit Area	Cement	6/1/2010	Delineation
RMR0401	712395.61	1484645.23	T53N	R67W	18	SWSW	Permit Area	Cement	6/1/2010	Delineation
RMR0402	710584.12	1481016.87	T53N	R67W	19	SENW	Permit Area	Cement	4/12/2010	Delineation
RMR0403	710532.27	1481015.58	T53N	R67W	19	SENW	Permit Area	Cement	7/11/2010	Delineation
RMR0404	710683.64	1481010.84	T53N	R67W	19	SENW	Permit Area	Cement	4/11/2010	Delineation
RMR0405			T53N	R67W	18	SWSE	Permit Area	Cement	6/2/2010	Delineation
RMR0406	711254.52	1480524.69	T53N	R67W	19	NESW	Permit Area	Cement	4/10/2010	Delineation
RMR0407	710991.10	1480529.76	T53N	R67W	19	NESW	Permit Area	Cement	4/14/2010	Delineation
RMR0408	710998.94	1480691.98	T53N	R67W	19	NESW	Permit Area	Cement	4/10/2010	Delineation
RMR0409			T53N	R67W	18	SWSE	Permit Area	Cement	6/3/2010	Delineation
RMR0410	711128.36	1486454.32	T53N	R67W	18	SENW	Permit Area	Cement	6/1/2010	Delineation
RMR0411			T53N	R67W	18	SENW	Permit Area	Cement	6/2/2010	Delineation
RMR0412	711180.80	1486490.52	T53N	R67W	18	SENW	Permit Area	Cement	6/1/2010	Delineation
RMR0413			T53N	R67W	18	SESW	Permit Area	Cement	6/3/2010	Delineation
RMR0414			T53N	R67W	18	SWSE	Permit Area	Cement	6/3/2010	Delineation
RMR0415			T53N	R67W	19	SENW	Permit Area	Cement	6/2/2010	Delineation
RMR0416			T53N	R67W	18	SENW	Permit Area	Cement	6/4/2010	Delineation
RMR0417			T53N	R67W	18	NESW	Permit Area	Cement	6/3/2010	Delineation
RMR0418			T53N	R67W	18	NESW	Permit Area	Cement	6/3/2010	Delineation
RMR0419			T53N	R67W	18	SESW	Permit Area	Cement	6/5/2010	Delineation
RMR0420			T53N	R67W	19	SWNE	Permit Area	Cement	6/18/2010	Delineation
RMR0421			T53N	R67W	18	SESW	Permit Area	Cement	6/5/2010	Delineation
RMR0422			T53N	R67W	18	SESW	Permit Area	Cement	6/8/2010	Delineation
RMR0423			T53N	R67W	18	SESW	Permit Area	Cement	6/18/2010	Delineation
RMR0424	709432.13	1487738.12	T53N	R67W	18	NWNW	Permit Area	Cement	4/12/2010	Delineation
RMR0425	709422.94	1487838.04	T53N	R67W	18	NWNW	Permit Area	Cement	4/12/2010	Delineation
RMR0426	709428.85	1487786.72	T53N	R67W	18	NWNW	Permit Area	Cement	4/14/2010	Delineation
RMR0427	709064.19	1487912.11	T53N	R67W	18	NWNW	Permit Area	Cement	4/15/2010	Delineation
RMR0428	709065.75	1487969.28	T53N	R67W	18	NWNW	Permit Area	Cement	4/15/2010	Delineation
RMR0429	709069.16	1488117.24	T53N	R67W	18	NWNW	Permit Area	Cement	4/15/2010	Delineation
RMR0448			T53N	R68W	13	NESE	Permit Area	Cement	6/5/2010	Delineation
RMR0453	709045.54	1488240.47	T53N	R68W	13	NENE	Permit Area	Cement	4/16/2010	Delineation
RMR0457			T53N	R67W	18	SWNE	Permit Area	Cement	6/8/2010	Delineation
RMR0458			T53N	R67W	18	SWNE	Permit Area	Cement	6/9/2010	Delineation
RMR0459			T53N	R67W	18	SENW	Permit Area	Cement	6/9/2010	Delineation
RMR0460			T53N	R67W	18	SWNE	Permit Area	Cement	6/7/2010	Delineation
RMR0461			T53N	R67W	18	NESW	Permit Area	Cement	6/30/2010	Delineation
RMR0468			T53N	R67W	18	SWSE	Permit Area	Cement	6/9/2010	Delineation

Note: Coordinate Projections are set in State Plane NAD 83 East Feet

Drill Hole Tabulation

Hole Name	North	East	Township	Range	Section	QtrQtr	Located Within Permit Area or 1/2 Mile Buffer	Type of Plugging	Date Plugged	Exploration/Delineation
RMR0469	710748.90	1481005.13	T53N	R67W	19	SENW	Permit Area	Cement	4/10/2010	Delineation
RMR0470	710796.42	1480409.25	T53N	R67W	19	NESW	Permit Area	Cement	4/28/2010	Delineation
RMR0471	711619.62	1480650.61	T53N	R67W	19	NESW	Permit Area	Cement	4/14/2010	Delineation
RMR0472	711558.57	1480168.29	T53N	R67W	19	NESW	Permit Area	Cement	4/16/2010	Delineation
RMR0473	711476.05	1480169.83	T53N	R67W	19	NESW	Permit Area	Cement	4/22/2010	Delineation
RMR0474	711597.35	1481886.83	T53N	R67W	19	SENW	Permit Area	Cement	4/21/2010	Delineation
RMR0475	708707.00	1487238.50	T53N	R68W	13	SENE	Permit Area	Cement	4/27/2010	Delineation
RMR0476	708719.25	1486945.41	T53N	R68W	13	SENE	Permit Area	Cement	4/27/2010	Delineation
RMR0477	708919.59	1486961.22	T53N	R68W	13	SENE	Permit Area	Cement	4/27/2010	Delineation
RMR0478	708717.27	1486645.01	T53N	R68W	13	SENE	Permit Area	Cement	4/21/2010	Delineation
RMR0479	708711.77	1486346.96	T53N	R68W	13	SENE	Permit Area	Cement	4/26/2010	Delineation
RMR0480	708702.15	1486042.40	T53N	R68W	13	NESE	Permit Area	Cement	4/29/2010	Delineation
RMR0481	708609.66	1486009.39	T53N	R68W	13	NESE	Permit Area	Cement	4/29/2010	Delineation
RMR0482	708564.93	1486219.35	T53N	R68W	13	NESE	Permit Area	Cement	7/14/2010	Delineation
RMR0483	708315.17	1486540.48	T53N	R68W	13	SENE	Permit Area	Cement	7/14/2010	Delineation
RMR0484	708455.45	1486957.58	T53N	R68W	13	SENE	Permit Area	Cement	5/5/2010	Delineation
RMR0485	708306.47	1487754.80	T53N	R68W	13	NENE	Permit Area	Cement	5/15/2010	Delineation
RMR0486	707905.43	1487744.14	T53N	R68W	13	NENE	Permit Area	Cement	5/16/2010	Delineation
RMR0487	707904.60	1487343.73	T53N	R68W	13	SENE	Permit Area	Cement	5/16/2010	Delineation
RMR0488	708299.08	1487351.10	T53N	R68W	13	SENE	Permit Area	Cement	5/17/2010	Delineation
RMR0489	707910.65	1486949.90	T53N	R68W	13	SENE	Permit Area	Cement	5/18/2010	Delineation
RMR0490	707910.77	1486569.19	T53N	R68W	13	SENE	Permit Area	Cement	5/18/2010	Delineation
RMR0491	707504.85	1487346.20	T53N	R68W	13	SWNE	Permit Area	Cement	5/19/2010	Delineation
RMR0492	707509.95	1487743.33	T53N	R68W	13	NWNE	Permit Area	Cement	5/19/2010	Delineation
RMR0493	707508.48	1488143.73	T53N	R68W	13	NWNE	Permit Area	Cement	5/20/2010	Delineation
RMR0494	707905.25	1488157.67	T53N	R68W	13	NENE	Permit Area	Cement	5/20/2010	Delineation
RMR0495	707504.04	1488550.69	T53N	R68W	13	NWNE	Permit Area	Cement	5/29/2010	Delineation
RMR0496	707103.60	1488569.57	T53N	R68W	13	NWNE	Permit Area	Cement	5/29/2010	Delineation
RMR0497	707111.02	1488149.49	T53N	R68W	13	NWNE	Permit Area	Cement	5/29/2010	Delineation
RMR0498	707111.85	1487739.24	T53N	R68W	13	NWNE	Permit Area	Cement	5/30/2010	Delineation
RMR0499	706711.41	1487758.11	T53N	R68W	13	NWNE	Permit Area	Cement	5/31/2010	Delineation
RMR0500	706710.59	1488161.80	T53N	R68W	13	NWNE	Permit Area	Cement	6/1/2010	Delineation
RMR0501			T53N	R68W	13	NWNE	Permit Area	Cement	6/3/2010	Delineation
RMR0513			T53N	R68W	13	NWNE	Permit Area	Cement	6/10/2010	Delineation
RMR0514			T53N	R68W	12	SWSE	Permit Area	Cement	6/19/2010	Delineation
RMR0516			T53N	R67W	18	SWSE	Permit Area	Cement	6/10/2010	Delineation
RMR0517			T53N	R67W	18	NWSW	Permit Area	Cement	6/22/2010	Delineation
RMR0519			T53N	R67W	18	SESW	Permit Area	Cement	6/10/2010	Delineation
RMR0521			T53N	R68W	13	SENE	Permit Area	Cement	6/10/2010	Delineation
RMR0522			T53N	R68W	13	NESE	Permit Area	Cement	6/10/2010	Delineation
RMR0524			T53N	R67W	19	SWNE	Permit Area	Cement	6/19/2010	Delineation
RMR0531			T53N	R67W	18	SWNW	Permit Area	Cement	6/19/2010	Delineation
RMR0532			T53N	R67W	18	SWNW	Permit Area	Cement	6/20/2010	Delineation
RMR0534			T53N	R67W	19	SWNE	Permit Area	Cement	6/19/2010	Delineation

Note: Coordinate Projections are set in State Plane NAD 83 East Feet

Drill Hole Tabulation

Hole Name	North	East	Township	Range	Section	QtrQtr	Located Within Permit Area or 1/2 Mile Buffer	Type of Plugging	Date Plugged	Exploration/Delineation
RMR0535			T53N	R67W	19	SWNE	Permit Area	Cement	6/19/2010	Delineation
RMR0537			T53N	R68W	13	NENE	Permit Area	Cement	6/25/2010	Delineation
RMR0539			T53N	R68W	13	NENE	Permit Area	Cement	6/26/2010	Delineation
RMR0540			T53N	R67W	18	SESW	Permit Area	Cement	7/11/2010	Delineation
RMR0541			T53N	R67W	19	SWNE	Permit Area	Cement	6/25/2010	Delineation
RMR0542			T53N	R67W	19	SWNE	Permit Area	Cement	6/25/2010	Delineation
RMR0543			T53N	R67W	19	SENE	Permit Area	Cement	6/25/2010	Delineation
RMR0545			T53N	R67W	19	SENE	Permit Area	Cement	6/26/2010	Delineation
RMR0546			T53N	R67W	19	SENE	Permit Area	Cement	6/27/2010	Delineation
RMR0551			T53N	R67W	18	SESW	Permit Area	Cement	6/27/2010	Delineation
RMR0552			T53N	R67W	18	SESW	Permit Area	Cement	6/27/2010	Delineation
RMR0554			T53N	R68W	12	SESE	Permit Area	Cement	7/15/2010	Delineation
RMR0555			T53N	R68W	13	SENE	Permit Area	Cement	7/15/2010	Delineation
RMR0556			T53N	R68W	13	NESE	Permit Area	Cement	6/27/2010	Delineation
RMR0557			T53N	R67W	19	NENW	Permit Area	Cement	6/27/2010	Delineation
RMR0564			T53N	R67W	19	SWNE	Permit Area	Cement	7/11/2010	Delineation
RMR0565			T53N	R67W	18	SESW	Permit Area	Cement	6/21/2010	Delineation
RMR0566			T53N	R67W	18	SWSE	Permit Area	Cement	6/28/2010	Delineation
RMR0567			T53N	R67W	18	SWNW	Permit Area	Cement	7/14/2010	Delineation
RMR0568			T53N	R67W	18	SWNW	Permit Area	Cement	6/20/2010	Delineation
RMR0572			T53N	R67W	19	SWNW	Permit Area	Cement	6/22/2010	Delineation
RMR0573			T53N	R67W	19	SWNW	Permit Area	Cement	6/22/2010	Delineation
RMR0575			T53N	R67W	18	SWNW	Permit Area	Cement	6/25/2000	Delineation
RMR0576			T53N	R67W	18	NWNW	Permit Area	Cement	6/25/2010	Delineation
RMR0577			T53N	R67W	18	SWNW	Permit Area	Cement	6/25/2010	Delineation
RMR0578			T53N	R68W	13	SENE	Permit Area	Cement	6/26/2010	Delineation
RMR0579			T53N	R67W	19	NESW	Permit Area	Cement	7/12/2010	Delineation
RMR0584			T53N	R68W	12	SESE	Permit Area	Cement	6/28/2010	Delineation
RMR0588			T53N	R68W	13	NESE	Permit Area	Cement	6/28/2010	Delineation
RMR0589			T53N	R68W	13	NESE	Permit Area	Cement	6/29/2010	Delineation
RMR0592			T53N	R67W	19	NENW	Permit Area	Cement	6/28/2010	Delineation
RMR0593			T53N	R67W	19	NENW	Permit Area	Cement	7/13/2010	Delineation
RMR0599			T53N	R67W	18	SWSE	Permit Area	Cement	6/30/2010	Delineation
RMR0604			T53N	R67W	18	NESW	Permit Area	Cement	6/30/2010	Delineation
RMR0609			T53N	R67W	19	NENW	Permit Area	Cement	7/1/2010	Delineation
RMR0610			T53N	R67W	18	SESW	Permit Area	Cement	7/11/2010	Delineation
RMR0652			T53N	R68W	13	NWNE	Permit Area	Cement	8/24/2010	Delineation
RMR0653			T53N	R68W	13	NWNE	Permit Area	Cement	8/24/2010	Delineation
RMR0654			T53N	R67W	18	NWSW	Permit Area	Cement	8/23/2010	Delineation
RMR0661			T53N	R67W	18	NWSW	Permit Area	Cement	8/23/2010	Delineation
RMR0662			T53N	R67W	18	NWSW	Permit Area	Cement	8/23/2010	Delineation
RMR0663			T53N	R67W	18	SWSW	Permit Area	Cement	8/23/2010	Delineation
RMR0668			T53N	R67W	7	SWSW	Permit Area	Cement	8/25/2010	Delineation
RMR0669			T53N	R67W	7	SWSW	Permit Area	Cement	8/25/2010	Delineation

Note: Coordinate Projections are set in State Plane NAD 83 East Feet

Drill Hole Tabulation

Hole Name	North	East	Township	Range	Section	QtrQtr	Located Within Permit Area or 1/2 Mile Buffer	Type of Plugging	Date Plugged	Exploration/Delineation
RMR0670			T53N	R67W	7	SWSW	Permit Area	Cement	8/25/2010	Delineation
RMR0671			T53N	R67W	7	SWSW	Permit Area	Cement	8/24/2010	Delineation
RMR0672			T53N	R68W	12	SESE	Permit Area	Cement	8/24/2010	Delineation
RMR0673			T53N	R68W	12	SESE	Permit Area	Cement	8/25/2010	Delineation
RMR0674			T53N	R67W	7	SWSW	Permit Area	Cement	8/25/2010	Delineation
RMR0675			T53N	R68W	12	SESE	Permit Area	Cement	8/24/2010	Delineation
RMR0677			T53N	R68W	13	NESE	Permit Area	Cement	8/23/2010	Delineation
RMR0678			T53N	R67W	18	SWSW	Permit Area	Cement	8/23/2010	Delineation
RMR0679			T53N	R67W	18	SWSW	Permit Area	Cement	8/24/2010	Delineation
RMR0682			T53N	R67W	18	SWNW	Permit Area	Cement	9/14/2010	Delineation
RMR0683			T53N	R67W	18	NWSW	Permit Area	Cement	9/14/2010	Delineation
RMR0686			T53N	R68W	13	NWSE	Permit Area	Cement	9/14/2010	Delineation
RMR0687			T53N	R68W	12	SWSE	Permit Area	Cement	9/13/2010	Delineation
RMR0688			T53N	R67W	18	SWSW	Permit Area	Cement	9/15/2010	Delineation
RMR0691			T53N	R68W	13	SENE	Permit Area	Cement	9/10/2010	Delineation
RMR0692			T53N	R67W	19	NENW	Permit Area	Cement	9/15/2010	Delineation
RMR0693			T53N	R67W	19	NENW	Permit Area	Cement	9/15/2010	Delineation
RMR0694			T53N	R67W	19	NWSE	Permit Area	Cement	9/15/2010	Delineation
RMR0695			T53N	R67W	19	NWSE	Permit Area	Cement	9/15/2010	Delineation
RMR0696			T53N	R67W	18	NESW	Permit Area	Cement	9/15/2010	Delineation
RMR0697			T53N	R67W	18	NWSW	Permit Area	Cement	9/15/2010	Delineation
RMR0698			T53N	R67W	18	SWNW	Permit Area	Cement	9/14/2010	Delineation
RMR0701			T53N	R67W	18	SWNW	Permit Area	Cement	9/13/2010	Delineation
RMR0703			T53N	R68W	13	SENE	Permit Area	Cement	9/9/2010	Delineation
008	709092.38	1486287.55	T53N	R67W	18		Permit Area	Cement		Exploration
SP1063R	711152.01	1483989.68	T53N	R67W	18		Permit Area	Cement		Exploration
SP1068R	711257.03	1483989.89	T53N	R67W	18		Permit Area	Cement		Exploration
SP1069R	711053.55	1483986.20	T53N	R67W	18		Permit Area	Cement		Exploration
SP1095R	711151.91	1484035.63	T53N	R67W	18		Permit Area	Cement		Exploration
SP1096R	711099.51	1483983.01	T53N	R67W	18		Permit Area	Cement		Exploration
SP114R	709096.46	1487557.23	T53N	R67W	18		Permit Area	Cement		Exploration
SP120R	709119.39	1487043.38	T53N	R67W	18		Permit Area	Cement		Exploration
SP124R	709703.41	1487502.93	T53N	R67W	18		Permit Area	Cement		Exploration
SP126R	709484.51	1487948.02	T53N	R67W	18		Permit Area	Cement		Exploration
SP180V	711670.28	1483854.11	T53N	R67W	18		Permit Area	Cement		Exploration
SP194V	710774.46	1484047.99	T53N	R67W	18		Permit Area	Cement		Exploration
SP19Y	709317.41	1486388.92	T53N	R67W	18		Permit Area	Cement		Exploration
SP1V	711191.03	1484166.99	T53N	R67W	18		Permit Area	Cement		Exploration
SP227V	710964.62	1484143.55	T53N	R67W	18		Permit Area	Cement		Exploration
SP2V	711253.57	1484075.22	T53N	R67W	18		Permit Area	Cement		Exploration
SP321R	709285.51	1486454.47	T53N	R67W	18		Permit Area	Cement		Exploration
SP324R	709278.11	1486346.18	T53N	R67W	18		Permit Area	Cement		Exploration
SP325R	709177.22	1486444.40	T53N	R67W	18		Permit Area	Cement		Exploration
SP327R	709387.23	1486464.52	T53N	R67W	18		Permit Area	Cement		Exploration

Note: Coordinate Projections are set in State Plane NAD 83 East Feet

Drill Hole Tabulation

Hole Name	North	East	Township	Range	Section	QtrQtr	Located Within Permit Area or 1/2 Mile Buffer	Type of Plugging	Date Plugged	Exploration/Delineation
SP328R	709166.53	1486345.95	T53N	R67W	18		Permit Area	Cement		Exploration
SP380R	709364.19	1486253.57	T53N	R67W	18		Permit Area	Cement		Exploration
SP383R	709275.61	1486240.26	T53N	R67W	18		Permit Area	Cement		Exploration
SP421R	709369.42	1486394.61	T53N	R67W	18		Permit Area	Cement		Exploration
SP422R	709189.22	1487566.11	T53N	R67W	18		Permit Area	Cement		Exploration
SP423R	709101.01	1487657.83	T53N	R67W	18		Permit Area	Cement		Exploration
SP424R	709197.27	1487466.95	T53N	R67W	18		Permit Area	Cement		Exploration
SP470R	709303.13	1487070.01	T53N	R67W	18		Permit Area	Cement		Exploration
SP471R	709289.72	1487577.57	T53N	R67W	18		Permit Area	Cement		Exploration
SP472R	709209.33	1487667.90	T53N	R67W	18		Permit Area	Cement		Exploration
SP473R	709394.97	1487096.45	T53N	R67W	18		Permit Area	Cement		Exploration
SP474R	709289.46	1487175.99	T53N	R67W	18		Permit Area	Cement		Exploration
SP475R	709229.28	1487781.16	T53N	R67W	18		Permit Area	Cement		Exploration
SP476R	709110.44	1487782.47	T53N	R67W	18		Permit Area	Cement		Exploration
SP477R	709256.21	1487885.19	T53N	R67W	18		Permit Area	Cement		Exploration
SP477V	711102.64	1484055.22	T53N	R67W	18		Permit Area	Cement		Exploration
SP478R	709309.97	1487676.40	T53N	R67W	18		Permit Area	Cement		Exploration
SP479R	709328.44	1487778.71	T53N	R67W	18		Permit Area	Cement		Exploration
SP4V	710958.38	1483986.00	T53N	R67W	18		Permit Area	Cement		Exploration
SP500R	709387.88	1487192.60	T53N	R67W	18		Permit Area	Cement		Exploration
SP501R	709187.73	1487169.22	T53N	R67W	18		Permit Area	Cement		Exploration
SP502R	709489.51	1487199.37	T53N	R67W	18		Permit Area	Cement		Exploration
SP503R	709256.76	1487279.60	T53N	R67W	18		Permit Area	Cement		Exploration
SP504R	709361.75	1487296.22	T53N	R67W	18		Permit Area	Cement		Exploration
SP505R	709341.73	1487437.70	T53N	R67W	18		Permit Area	Cement		Exploration
SP506R	709101.47	1487432.19	T53N	R67W	18		Permit Area	Cement		Exploration
SP506V	711292.86	1484124.53	T53N	R67W	18		Permit Area	Cement		Exploration
SP507R	709150.28	1487895.05	T53N	R67W	18		Permit Area	Cement		Exploration
SP508R	709351.36	1487901.80	T53N	R67W	18		Permit Area	Cement		Exploration
SP517V	709591.84	1487492.86	T53N	R67W	18		Permit Area	Cement		Exploration
SP518V	709693.78	1487394.61	T53N	R67W	18		Permit Area	Cement		Exploration
SP53R	710866.12	1484163.04	T53N	R67W	18		Permit Area	Cement		Exploration
SP552R	709266.38	1487371.91	T53N	R67W	18		Permit Area	Cement		Exploration
SP554R	709181.24	1487292.57	T53N	R67W	18		Permit Area	Cement		Exploration
SP571R	709167.31	1486236.76	T53N	R67W	18		Permit Area	Cement		Exploration
SP600R	709201.54	1487674.90	T53N	R67W	18		Permit Area	Cement		Exploration
SP601R	709251.84	1487677.96	T53N	R67W	18		Permit Area	Cement		Exploration
SP72R	711080.00	1483894.36	T53N	R67W	18		Permit Area	Cement		Exploration
SP774V	709429.06	1487492.03	T53N	R67W	18		Permit Area	Cement		Exploration
SP775V	709453.60	1487319.39	T53N	R67W	18		Permit Area	Cement		Exploration
SP776V	709589.52	1487216.02	T53N	R67W	18		Permit Area	Cement		Exploration
SP777V	709496.02	1487098.76	T53N	R67W	18		Permit Area	Cement		Exploration
SP792V	711092.80	1484055.20	T53N	R67W	18		Permit Area	Cement		Exploration
SP793V	711214.23	1484055.45	T53N	R67W	18		Permit Area	Cement		Exploration

Note: Coordinate Projections are set in State Plane NAD 83 East Feet

Drill Hole Tabulation

Hole Name	North	East	Township	Range	Section	QtrQtr	Located Within Permit Area or 1/2 Mile Buffer	Type of Plugging	Date Plugged	Exploration/Delineation
SP8V	710846.77	1483992.34	T53N	R67W	18		Permit Area	Cement		Exploration
SPD611M	711670.11	1483936.16	T53N	R67W	18		Permit Area	Cement		Exploration
RMR0035	712388.37	1483667.58	T53N	R67W	19	SWSE	1/2 Mile Buffer	Plug Gel		Delineation
RMR0210	711631.44	1479193.23	T53N	R67W	19	SESW	1/2 Mile Buffer	Plug Gel		Delineation
RMR0211	711863.39	1479447.82	T53N	R67W	19	SWSE	1/2 Mile Buffer	Plug Gel		Delineation
RMR0212	711634.13	1479242.99	T53N	R67W	19	SESW	1/2 Mile Buffer	Plug Gel		Delineation
RMR0213	711863.94	1479499.45	T53N	R67W	19	SWSE	1/2 Mile Buffer	Plug Gel		Delineation
RMR0529			T53N	R67W	7	SWNE	1/2 Mile Buffer	Plug Gel	7/14/2010	Delineation
RMR0635			T53N	R68W	12	NESE	1/2 Mile Buffer	Plug Gel	7/24/2010	Delineation
RMR0636			T53N	R68W	12	NWSE	1/2 Mile Buffer	Plug Gel	7/25/2010	Delineation
RMR0637			T53N	R68W	12	NWSE	1/2 Mile Buffer	Plug Gel	7/25/2010	Delineation
RMR0638			T53N	R68W	12	NWSE	1/2 Mile Buffer	Plug Gel	7/26/2010	Delineation
RMR0639			T53N	R68W	12	NWSE	1/2 Mile Buffer	Plug Gel	7/27/2010	Delineation
RMR0640			T53N	R68W	12	NWSE	1/2 Mile Buffer	Plug Gel	7/27/2010	Delineation
RMR0642			T53N	R68W	12	NWSE	1/2 Mile Buffer	Plug Gel	7/28/2010	Delineation
RMR0643			T53N	R68W	12	SESW	1/2 Mile Buffer	Plug Gel	8/16/2010	Delineation
RMR0644			T53N	R68W	12	NWSE	1/2 Mile Buffer	Plug Gel	8/16/2010	Delineation
RMR0655			T53N	R68W	13	NENW	1/2 Mile Buffer	Plug Gel	8/6/2010	Delineation
RMR0001	711948.96	1484384.23	T53N	R67W	18	SWSE	Permit Area	Plug Gel		Delineation
RMR0002	712121.04	1483914.43	T53N	R67W	18	NWNE	Permit Area	Plug Gel		Delineation
RMR0003	711871.34	1483935.42	T53N	R67W	18	SWSE	Permit Area	Plug Gel		Delineation
RMR0004	711951.59	1484385.28	T53N	R67W	18	SWSE	Permit Area	Plug Gel		Delineation
RMR0005	712708.32	1487920.62	T53N	R67W	18	NWNE	Permit Area	Plug Gel		Delineation
RMR0006	711969.84	1483898.04	T53N	R67W	18	SWSE	Permit Area	Plug Gel		Delineation
RMR0007	712916.56	1487954.55	T53N	R67W	18	NWNE	Permit Area	Plug Gel		Delineation
RMR0008	712825.94	1488815.37	T53N	R67W	18	NWNE	Permit Area	Plug Gel		Delineation
RMR0009	712475.78	1488477.07	T53N	R67W	18	NWNE	Permit Area	Plug Gel		Delineation
RMR0010	712661.24	1488525.66	T53N	R67W	18	NWNE	Permit Area	Plug Gel		Delineation
RMR0011	712679.42	1488623.96	T53N	R67W	18	NWNE	Permit Area	Plug Gel		Delineation
RMR0012	712779.05	1488630.20	T53N	R67W	18	NWNE	Permit Area	Plug Gel		Delineation
RMR0013	712826.89	1488717.50	T53N	R67W	18	NWNE	Permit Area	Plug Gel		Delineation
RMR0014	712540.96	1488361.18	T53N	R67W	18	NWNE	Permit Area	Plug Gel		Delineation
RMR0015	712724.66	1488814.41	T53N	R67W	18	NWNE	Permit Area	Plug Gel		Delineation
RMR0016	712622.02	1488817.51	T53N	R67W	18	NWNE	Permit Area	Plug Gel		Delineation
RMR0017	712633.35	1488912.97	T53N	R67W	18	NWNE	Permit Area	Plug Gel		Delineation
RMR0018	712463.84	1488987.06	T53N	R67W	18	NWNE	Permit Area	Plug Gel		Delineation
RMR0019	711758.43	1484148.71	T53N	R67W	18	SWSE	Permit Area	Plug Gel		Delineation
RMR0020	712713.86	1481689.72	T53N	R67W	19	SWNE	Permit Area	Plug Gel		Delineation
RMR0021	712167.76	1481775.22	T53N	R67W	19	SWNE	Permit Area	Plug Gel		Delineation
RMR0022	712859.79	1488871.79	T53N	R67W	18	NWNE	Permit Area	Plug Gel		Delineation
RMR0023	712862.12	1488482.74	T53N	R67W	18	NWNE	Permit Area	Plug Gel		Delineation
RMR0024	712892.36	1488364.56	T53N	R67W	18	NWNE	Permit Area	Plug Gel		Delineation
RMR0025	712887.59	1487803.72	T53N	R67W	18	NWNE	Permit Area	Plug Gel		Delineation
RMR0026	712452.29	1488052.95	T53N	R67W	18	NWNE	Permit Area	Plug Gel		Delineation

Note: Coordinate Projections are set in State Plane NAD 83 East Feet

Drill Hole Tabulation

Hole Name	North	East	Township	Range	Section	QtrQtr	Located Within Permit Area or 1/2 Mile Buffer	Type of Plugging	Date Plugged	Exploration/Delineation
RMR0027	712272.89	1488069.72	T53N	R67W	18	NWNE	Permit Area	Plug Gel		Delineation
RMR0028	712464.18	1488642.49	T53N	R67W	18	NWNE	Permit Area	Plug Gel		Delineation
RMR0029	712065.90	1484527.89	T53N	R67W	18	SWSE	Permit Area	Plug Gel		Delineation
RMR0030	712172.83	1484526.76	T53N	R67W	18	NWNE	Permit Area	Plug Gel		Delineation
RMR0031			T53N	R67W	18	SWSE	Permit Area	Plug Gel		Delineation
RMR0032	712174.12	1484623.32	T53N	R67W	18	SWSE	Permit Area	Plug Gel		Delineation
RMR0033	711866.55	1483789.19	T53N	R67W	18	SWSE	Permit Area	Plug Gel		Delineation
RMR0034	711959.61	1483764.31	T53N	R67W	18	SWSE	Permit Area	Plug Gel		Delineation
RMR0036	712267.69	1484346.31	T53N	R67W	18	SWSE	Permit Area	Plug Gel		Delineation
RMR0037	711725.58	1488183.01	T53N	R67W	18	NWNE	Permit Area	Plug Gel		Delineation
RMR0038	712985.80	1483761.81	T53N	R67W	18	SWSE	Permit Area	Plug Gel		Delineation
RMR0040	709186.73	1488080.63	T53N	R67W	18	NWNW	Permit Area	Plug Gel		Delineation
RMR0041	709296.48	1488063.91	T53N	R67W	18	NWNW	Permit Area	Plug Gel		Delineation
RMR0046	709267.78	1486296.27	T53N	R67W	18	SWNW	Permit Area	Plug Gel		Delineation
RMR0047	709294.02	1486302.89	T53N	R67W	18	SWNW	Permit Area	Plug Gel		Delineation
RMR0048	709277.51	1486355.37	T53N	R67W	18	SWNW	Permit Area	Plug Gel		Delineation
RMR0049	709238.47	1486184.62	T53N	R67W	18	NWSW	Permit Area	Plug Gel		Delineation
RMR0050			T53N	R67W	18	SWNW	Permit Area	Plug Gel		Delineation
RMR0051	710008.48	1486223.93	T53N	R67W	18	NWSW	Permit Area	Plug Gel		Delineation
RMR0052	710037.47	1486280.61	T53N	R67W	18	NWSW	Permit Area	Plug Gel		Delineation
RMR0053	709435.59	1486086.56	T53N	R67W	18	NWSW	Permit Area	Plug Gel		Delineation
RMR0054	709447.72	1486575.61	T53N	R67W	18	SWNW	Permit Area	Plug Gel		Delineation
RMR0055	709664.04	1486690.65	T53N	R67W	18	SWNW	Permit Area	Plug Gel		Delineation
RMR0057	709699.62	1488461.23	T53N	R67W	18	NWNW	Permit Area	Plug Gel		Delineation
RMR0058	709775.03	1488759.92	T53N	R67W	18	NWNW	Permit Area	Plug Gel		Delineation
RMR0059	710004.58	1488544.66	T53N	R67W	18	NWNW	Permit Area	Plug Gel		Delineation
RMR0060	709224.94	1488353.08	T53N	R67W	18	NWNW	Permit Area	Plug Gel		Delineation
RMR0061	709474.08	1488592.58	T53N	R67W	18	NWNW	Permit Area	Plug Gel		Delineation
RMR0062	709361.03	1488487.26	T53N	R67W	18	NWNW	Permit Area	Plug Gel		Delineation
RMR0063	709355.22	1488488.82	T53N	R67W	18	NWNW	Permit Area	Plug Gel		Delineation
RMR0064	709403.41	1488257.15	T53N	R67W	18	NWNW	Permit Area	Plug Gel		Delineation
RMR0065	709895.06	1488770.17	T53N	R67W	18	NWNW	Permit Area	Plug Gel		Delineation
RMR0066	710543.17	1487730.67	T53N	R67W	18	NENW	Permit Area	Plug Gel		Delineation
RMR0067	711288.25	1488072.77	T53N	R67W	18	NENW	Permit Area	Plug Gel		Delineation
RMR0068	710773.92	1487864.98	T53N	R67W	18	NENW	Permit Area	Plug Gel		Delineation
RMR0069	710661.91	1487796.92	T53N	R67W	18	NENW	Permit Area	Plug Gel		Delineation
RMR0070	711361.01	1488169.14	T53N	R67W	18	NENW	Permit Area	Plug Gel		Delineation
RMR0071	710566.36	1487789.76	T53N	R67W	18	NENW	Permit Area	Plug Gel		Delineation
RMR0072	709597.42	1487075.40	T53N	R67W	18	SWNW	Permit Area	Plug Gel		Delineation
RMR0075	710821.88	1487763.04	T53N	R67W	18	NENW	Permit Area	Plug Gel		Delineation
RMR0076	711593.24	1488218.98	T53N	R67W	18	NENW	Permit Area	Plug Gel		Delineation
RMR0077	710851.56	1487628.21	T53N	R67W	18	NENW	Permit Area	Plug Gel		Delineation
RMR0078	711462.26	1488156.15	T53N	R67W	18	NENW	Permit Area	Plug Gel		Delineation
RMR0079	711579.23	1488301.98	T53N	R67W	18	NENW	Permit Area	Plug Gel		Delineation

Note: Coordinate Projections are set in State Plane NAD 83 East Feet

Drill Hole Tabulation

Hole Name	North	East	Township	Range	Section	QtrQtr	Located Within Permit Area or 1/2 Mile Buffer	Type of Plugging	Date Plugged	Exploration/Delineation
RMR0080	711218.13	1487920.57	T53N	R67W	18	NENW	Permit Area	Plug Gel		Delineation
RMR0081	709456.80	1486953.78	T53N	R67W	18	SWNW	Permit Area	Plug Gel		Delineation
RMR0082	709926.55	1486536.41	T53N	R67W	18	SWNW	Permit Area	Plug Gel		Delineation
RMR0083	709956.70	1486442.77	T53N	R67W	18	SWNW	Permit Area	Plug Gel		Delineation
RMR0084	710846.84	1486578.98	T53N	R67W	18	SWNW	Permit Area	Plug Gel		Delineation
RMR0085	711209.13	1486305.41	T53N	R67W	18	NESW	Permit Area	Plug Gel		Delineation
RMR0086	710937.93	1486745.63	T53N	R67W	18	SENW	Permit Area	Plug Gel		Delineation
RMR0090	711987.93	1481778.10	T53N	R67W	19	SWNE	Permit Area	Plug Gel		Delineation
RMR0091	712092.79	1481828.89	T53N	R67W	19	SWNE	Permit Area	Plug Gel		Delineation
RMR0092	713168.12	1481561.43	T53N	R67W	19	SWNE	Permit Area	Plug Gel		Delineation
RMR0093	713257.60	1481200.99	T53N	R67W	19	SWNE	Permit Area	Plug Gel		Delineation
RMR0094	712622.02	1488189.83	T53N	R67W	18	NWNE	Permit Area	Plug Gel		Delineation
RMR0095	712877.09	1488773.07	T53N	R67W	18	NWNE	Permit Area	Plug Gel		Delineation
RMR0096	712927.55	1488622.46	T53N	R67W	18	NWNE	Permit Area	Plug Gel		Delineation
RMR0097	712881.64	1488717.12	T53N	R67W	18	NWNE	Permit Area	Plug Gel		Delineation
RMR0098	710340.96	1487592.02	T53N	R67W	18	SWNW	Permit Area	Plug Gel		Delineation
RMR0099	710189.87	1487422.36	T53N	R67W	18	SWNW	Permit Area	Plug Gel		Delineation
RMR0171	711429.89	1486900.95	T53N	R67W	18	NESW	Permit Area	Plug Gel		Delineation
RMR0172	711525.63	1486878.90	T53N	R67W	18	NESW	Permit Area	Plug Gel		Delineation
RMR0173	711326.39	1486955.45	T53N	R67W	18	NESW	Permit Area	Plug Gel		Delineation
RMR0174	711623.25	1486857.60	T53N	R67W	18	NESW	Permit Area	Plug Gel		Delineation
RMR0214	710588.92	1480915.53	T53N	R67W	19	NESW	Permit Area	Plug Gel		Delineation
RMR0217	712468.63	1481658.76	T53N	R67W	19	SWNE	Permit Area	Plug Gel		Delineation
RMR0222			T53N	R67W	18	SENW	Permit Area	Plug Gel		Delineation
RMR0226	711786.95	1486702.60	T53N	R67W	18	SWNE	Permit Area	Plug Gel		Delineation
RMR0227	711703.01	1486725.43	T53N	R67W	18	SENW	Permit Area	Plug Gel		Delineation
RMR0228	711830.60	1486686.63	T53N	R67W	18	SWNE	Permit Area	Plug Gel		Delineation
RMR0229	711642.05	1486747.95	T53N	R67W	18	SENW	Permit Area	Plug Gel		Delineation
RMR0230	711809.00	1486783.48	T53N	R67W	18	SWNE	Permit Area	Plug Gel		Delineation
RMR0231	711293.13	1486704.12	T53N	R67W	18	SENW	Permit Area	Plug Gel		Delineation
RMR0232	711694.95	1486527.48	T53N	R67W	18	SENW	Permit Area	Plug Gel		Delineation
RMR0233	711596.81	1486543.06	T53N	R67W	18	SENW	Permit Area	Plug Gel		Delineation
RMR0234	711693.21	1486430.95	T53N	R67W	18	SENW	Permit Area	Plug Gel		Delineation
RMR0235	711702.16	1486624.90	T53N	R67W	18	SENW	Permit Area	Plug Gel		Delineation
RMR0236	710890.50	1486509.66	T53N	R67W	18	SENW	Permit Area	Plug Gel		Delineation
RMR0237	710893.76	1486452.00	T53N	R67W	18	SENW	Permit Area	Plug Gel		Delineation
RMR0238	710653.69	1486206.08	T53N	R67W	18	NESW	Permit Area	Plug Gel		Delineation
RMR0239	710621.34	1486090.82	T53N	R67W	18	NESW	Permit Area	Plug Gel		Delineation
RMR0240	710621.74	1486314.13	T53N	R67W	18	SENW	Permit Area	Plug Gel		Delineation
RMR0241	710726.26	1486303.11	T53N	R67W	18	SENW	Permit Area	Plug Gel		Delineation
RMR0243	711235.46	1486302.02	T53N	R67W	18	NESW	Permit Area	Plug Gel		Delineation
RMR0244	711192.36	1486567.74	T53N	R67W	18	SENW	Permit Area	Plug Gel		Delineation
RMR0245	711146.68	1486774.05	T53N	R67W	18	SENW	Permit Area	Plug Gel		Delineation
RMR0246	709980.33	1488929.46	T53N	R67W	18	NWNW	Permit Area	Plug Gel		Delineation

Note: Coordinate Projections are set in State Plane NAD 83 East Feet

Drill Hole Tabulation

Hole Name	North	East	Township	Range	Section	QtrQtr	Located Within Permit Area or 1/2 Mile Buffer	Type of Plugging	Date Plugged	Exploration/Delineation
RMR0247	710083.91	1488930.92	T53N	R67W	18	NWNW	Permit Area	Plug Gel		Delineation
RMR0248	710642.96	1487968.66	T53N	R67W	18	NENW	Permit Area	Plug Gel		Delineation
RMR0249	710705.80	1486035.85	T53N	R67W	18	NESW	Permit Area	Plug Gel		Delineation
RMR0250	710621.01	1485990.75	T53N	R67W	18	NESW	Permit Area	Plug Gel		Delineation
RMR0251	711850.04	1486486.28	T53N	R67W	18	SWNE	Permit Area	Plug Gel		Delineation
RMR0252	711950.20	1486489.53	T53N	R67W	18	SWNE	Permit Area	Plug Gel		Delineation
RMR0253	711598.56	1486426.82	T53N	R67W	18	SENW	Permit Area	Plug Gel		Delineation
RMR0254	711585.90	1486324.69	T53N	R67W	18	SENW	Permit Area	Plug Gel		Delineation
RMR0256	710677.38	1486305.48	T53N	R67W	18	SENW	Permit Area	Plug Gel		Delineation
RMR0257	711243.31	1486718.88	T53N	R67W	18	SENW	Permit Area	Plug Gel		Delineation
RMR0258	710676.06	1486082.33	T53N	R67W	18	NESW	Permit Area	Plug Gel		Delineation
RMR0259	710571.16	1486104.30	T53N	R67W	18	NESW	Permit Area	Plug Gel		Delineation
RMR0260	710511.89	1486022.13	T53N	R67W	18	NESW	Permit Area	Plug Gel		Delineation
RMR0261	710886.08	1486371.51	T53N	R67W	18	SENW	Permit Area	Plug Gel		Delineation
RMR0262	710876.43	1486275.06	T53N	R67W	18	NESW	Permit Area	Plug Gel		Delineation
RMR0268	711944.37	1483009.88	T53N	R67W	19	NWNE	Permit Area	Plug Gel		Delineation
RMR0270	709039.02	1487863.88	T53N	R68W	13	NENE	Permit Area	Plug Gel		Delineation
RMR0275	709044.68	1488116.54	T53N	R68W	13	NENE	Permit Area	Plug Gel		Delineation
RMR0277	709047.10	1488215.30	T53N	R68W	13	NENE	Permit Area	Plug Gel		Delineation
RMR0283	709018.16	1488019.76	T53N	R68W	13	NENE	Permit Area	Plug Gel		Delineation
RMR0285	709932.80	1486917.99	T53N	R67W	18	SWNW	Permit Area	Plug Gel		Delineation
RMR0286	710056.96	1487140.56	T53N	R67W	18	SWNW	Permit Area	Plug Gel		Delineation
RMR0288	710153.89	1487524.69	T53N	R67W	18	SWNW	Permit Area	Plug Gel		Delineation
RMR0291	711243.05	1486769.00	T53N	R67W	18	SENW	Permit Area	Plug Gel		Delineation
RMR0294	710637.81	1485896.46	T53N	R67W	18	NESW	Permit Area	Plug Gel		Delineation
RMR0301	710631.06	1485795.23	T53N	R67W	18	NESW	Permit Area	Plug Gel		Delineation
RMR0302	710728.95	1485867.20	T53N	R67W	18	NESW	Permit Area	Plug Gel	7/13/2010	Delineation
RMR0306	710805.23	1485990.37	T53N	R67W	18	NESW	Permit Area	Plug Gel	7/14/2010	Delineation
RMR0309	710831.75	1485880.64	T53N	R67W	18	NESW	Permit Area	Plug Gel	7/13/2010	Delineation
RMR0310	710823.58	1485779.08	T53N	R67W	18	NESW	Permit Area	Plug Gel	7/13/2010	Delineation
RMR0312	710096.37	1487856.22	T53N	R67W	18	NWNW	Permit Area	Plug Gel		Delineation
RMR0313	710047.58	1487802.43	T53N	R67W	18	NWNW	Permit Area	Plug Gel		Delineation
RMR0331	710585.83	1480967.28	T53N	R67W	19	NESW	Permit Area	Plug Gel		Delineation
RMR0337	710598.25	1483110.55	T53N	R67W	19	NENW	Permit Area	Plug Gel		Delineation
RMR0352	711674.50	1480486.00	T53N	R67W	19	NESW	Permit Area	Plug Gel		Delineation
RMR0367	708911.76	1488116.92	T53N	R68W	13	NENE	Permit Area	Plug Gel		Delineation
RMR0378			T53N	R67W	18	NWSW	Permit Area	Plug Gel		Delineation
RMR0379			T53N	R67W	18	SWNW	Permit Area	Plug Gel		Delineation
RMR0394	713168.63	1489613.66	T53N	R67W	7	SESE	Permit Area	Plug Gel		Delineation
RMR0395	713164.00	1489662.52	T53N	R67W	7	SESE	Permit Area	Plug Gel		Delineation
RMR0456			T53N	R67W	18	NESW	Permit Area	Plug Gel		Delineation
RMR0515			T53N	R67W	18	NWSW	Permit Area	Plug Gel		Delineation
RMR0533			T53N	R67W	18	SWNW	Permit Area	Plug Gel		Delineation
RMR0574			T53N	R68W	13	SENE	Permit Area	Plug Gel		Delineation

Note: Coordinate Projections are set in State Plane NAD 83 East Feet

Drill Hole Tabulation

Hole Name	North	East	Township	Range	Section	QtrQtr	Located Within Permit Area or 1/2 Mile Buffer	Type of Plugging	Date Plugged	Exploration/Delineation
RMR0641			T53N	R68W	12	SWSE	Permit Area	Plug Gel	7/29/2010	Delineation
RMR0645			T53N	R68W	12	SWSE	Permit Area	Plug Gel	8/17/2010	Delineation
RMR0646			T53N	R68W	12	SWSE	Permit Area	Plug Gel	8/18/2010	Delineation
RMR0676			T53N	R68W	12	SWSE	Permit Area	Plug Gel	8/18/2010	Delineation
RMR0680			T53N	R67W	18	NWSW	Permit Area	Plug Gel	8/20/2010	Delineation
RMR0681			T53N	R67W	18	NWSW	Permit Area	Plug Gel	8/20/2010	Delineation
RMR0704			T53N	R68W	13	SENE	Permit Area	Plug Gel	9/16/2010	Delineation
RMR0705			T53N	R68W	13	SENE	Permit Area	Plug Gel	9/16/2010	Delineation
RMR0706			T53N	R67W	18	NWSW	Permit Area	Plug Gel	9/16/2010	Delineation
RMR0709			T53N	R67W	18	NWSW	Permit Area	Plug Gel	9/17/2010	Delineation
RMR0710			T53N	R67W	18	SWSW	Permit Area	Plug Gel	9/17/2010	Delineation
RMR0711			T53N	R67W	18	NWSW	Permit Area	Plug Gel	9/17/2010	Delineation
RMR0712			T53N	R67W	18	NWSW	Permit Area	Plug Gel	9/19/2010	Delineation
RMR0713			T53N	R67W	18	SWNW	Permit Area	Plug Gel	9/19/2010	Delineation
RMR0722			T53N	R67W	18	NWSW	Permit Area	Plug Gel		Delineation
RMR0723			T53N	R67W	18	NWSW	Permit Area	Plug Gel		Delineation
RMR0724			T53N	R67W	18	NWSW	Permit Area	Plug Gel		Delineation
RMR0725			T53N	R68W	13	NESE	Permit Area	Plug Gel		Delineation
RMR0726			T53N	R67W	19	NWNW	Permit Area	Plug Gel		Delineation
RMR0727			T53N	R67W	19	NWNW	Permit Area	Plug Gel		Delineation
RMR0728			T53N	R67W	18	NWSW	Permit Area	Plug Gel		Delineation
RMR0729			T53N	R67W	19	NWNW	Permit Area	Plug Gel		Delineation
RMR0730			T53N	R67W	19	NWNW	Permit Area	Plug Gel		Delineation
RMR0731			T53N	R68W	13	SENE	Permit Area	Plug Gel		Delineation
RMR0732			T53N	R68W	13	SENE	Permit Area	Plug Gel		Delineation
RMR0733			T53N	R67W	18	NWSW	Permit Area	Plug Gel		Delineation
RMR0734			T53N	R67W	18	NWSW	Permit Area	Plug Gel		Delineation
RMR0735			T53N	R67W	18	NESW	Permit Area	Plug Gel		Delineation
RMRD0001	711973.38	1484012.59	T53N	R67W	18	SWSE	Permit Area	Plug Gel		Delineation
RMRD0002	712828.55	1487932.81	T53N	R67W	18	NWNE	Permit Area	Plug Gel		Delineation
RMRD0003	712485.52	1488577.22	T53N	R67W	18	NWNE	Permit Area	Plug Gel		Delineation
RMRD0004	712674.29	1483721.33	T53N	R67W	18	SWSE	Permit Area	Plug Gel		Delineation
RMRD0005	712644.63	1488158.89	T53N	R67W	18	NWNE	Permit Area	Plug Gel		Delineation
RMRD0007C	712809.78	1488819.70	T53N	R67W	18	NWNE	Permit Area	Plug Gel		Delineation
004	709073.87	1490252.44	T53N	R67W	7	NWSW	1/2 Mile Buffer	Unknown		Exploration
SP100V	707419.00	1490442.56	T53N	R68W	12		1/2 Mile Buffer	Unknown		Exploration
SP101V	707293.70	1490199.14	T53N	R68W	12		1/2 Mile Buffer	Unknown		Exploration
SP1029R	710264.21	1492685.92	T53N	R67W	7	SWNW	1/2 Mile Buffer	Unknown		Exploration
SP102V	707586.53	1490563.71	T53N	R68W	12		1/2 Mile Buffer	Unknown		Exploration
SP1030R	709237.83	1492248.87	T53N	R67W	7	SWNW	1/2 Mile Buffer	Unknown		Exploration
SP1031R	709591.42	1492736.77	T53N	R67W	7	SWNW	1/2 Mile Buffer	Unknown		Exploration
SP1032R	709347.82	1492745.82	T53N	R67W	7	SWNW	1/2 Mile Buffer	Unknown		Exploration
SP1033R	709524.79	1492496.95	T53N	R67W	7	SWNW	1/2 Mile Buffer	Unknown		Exploration
SP1037R	707797.90	1490735.59	T53N	R68W	12		1/2 Mile Buffer	Unknown		Exploration

Note: Coordinate Projections are set in State Plane NAD 83 East Feet

Drill Hole Tabulation

Hole Name	North	East	Township	Range	Section	QtrQtr	Located Within Permit Area or 1/2 Mile Buffer	Type of Plugging	Date Plugged	Exploration/Delineation
SP103V	707700.10	1490702.44	T53N	R68W	12		1/2 Mile Buffer	Unknown		Exploration
SP108V	709456.06	1490230.78	T53N	R67W	7	NWSW	1/2 Mile Buffer	Unknown		Exploration
SP109V	709694.74	1490384.67	T53N	R67W	7	NWSW	1/2 Mile Buffer	Unknown		Exploration
SP11R	708972.99	1477926.57	T53N	R68W	25	NENE	1/2 Mile Buffer	Unknown		Exploration
SP140V	713420.85	1490840.79	T53N	R67W	7	NESE	1/2 Mile Buffer	Unknown		Exploration
SP141V	713540.17	1490831.31	T53N	R67W	7	NESE	1/2 Mile Buffer	Unknown		Exploration
SP142V	713802.98	1490837.95	T53N	R67W	7	NESE	1/2 Mile Buffer	Unknown		Exploration
SP143V	713398.82	1491393.10	T53N	R67W	7	NESE	1/2 Mile Buffer	Unknown		Exploration
SP146V	713572.42	1490966.73	T53N	R67W	7	NESE	1/2 Mile Buffer	Unknown		Exploration
SP147V	713494.71	1491434.45	T53N	R67W	7	NESE	1/2 Mile Buffer	Unknown		Exploration
SP148V	713304.46	1491379.09	T53N	R67W	7	NESE	1/2 Mile Buffer	Unknown		Exploration
SP149R	708371.16	1492385.97	T53N	R68W	12		1/2 Mile Buffer	Unknown		Exploration
SP149V	713571.01	1490967.09	T53N	R67W	7	NESE	1/2 Mile Buffer	Unknown		Exploration
SP150V	710038.76	1490888.96	T53N	R67W	7	NWSW	1/2 Mile Buffer	Unknown		Exploration
SP151V	710182.12	1491404.53	T53N	R67W	7	NWSW	1/2 Mile Buffer	Unknown		Exploration
SP152V	710100.94	1490974.42	T53N	R67W	7	NWSW	1/2 Mile Buffer	Unknown		Exploration
SP154V	708365.84	1491213.46	T53N	R68W	12		1/2 Mile Buffer	Unknown		Exploration
SP155V	708236.93	1491060.06	T53N	R68W	12		1/2 Mile Buffer	Unknown		Exploration
SP156V	707608.54	1490664.81	T53N	R68W	12		1/2 Mile Buffer	Unknown		Exploration
SP157V	708147.43	1491012.29	T53N	R68W	12		1/2 Mile Buffer	Unknown		Exploration
SP158V	708335.23	1491042.93	T53N	R68W	12		1/2 Mile Buffer	Unknown		Exploration
SP159V	707854.15	1490817.99	T53N	R68W	12		1/2 Mile Buffer	Unknown		Exploration
SP166R	708844.59	1490709.79	T53N	R68W	12		1/2 Mile Buffer	Unknown		Exploration
SP167R	708867.25	1491299.42	T53N	R68W	12		1/2 Mile Buffer	Unknown		Exploration
SP169R	709017.45	1491775.06	T53N	R68W	12		1/2 Mile Buffer	Unknown		Exploration
SP183R	709009.33	1492316.24	T53N	R68W	12		1/2 Mile Buffer	Unknown		Exploration
SP184R	709384.77	1491327.42	T53N	R67W	7	NWSW	1/2 Mile Buffer	Unknown		Exploration
SP185R	709431.75	1490805.68	T53N	R67W	7	NWSW	1/2 Mile Buffer	Unknown		Exploration
SP186R	709901.04	1490826.33	T53N	R67W	7	NWSW	1/2 Mile Buffer	Unknown		Exploration
SP187R	709893.34	1491384.25	T53N	R67W	7	NWSW	1/2 Mile Buffer	Unknown		Exploration
SP188R	708499.63	1491759.20	T53N	R68W	12		1/2 Mile Buffer	Unknown		Exploration
SP200V	708046.55	1490992.65	T53N	R68W	12		1/2 Mile Buffer	Unknown		Exploration
SP202V	708007.04	1490892.90	T53N	R68W	12		1/2 Mile Buffer	Unknown		Exploration
SP203V	708220.58	1490950.11	T53N	R68W	12		1/2 Mile Buffer	Unknown		Exploration
SP205V	707511.22	1490639.14	T53N	R68W	12		1/2 Mile Buffer	Unknown		Exploration
SP206V	707494.62	1490536.18	T53N	R68W	12		1/2 Mile Buffer	Unknown		Exploration
SP208V	708576.57	1491441.99	T53N	R68W	12		1/2 Mile Buffer	Unknown		Exploration
SP209V	708701.37	1491547.40	T53N	R68W	12		1/2 Mile Buffer	Unknown		Exploration
SP211R	710355.11	1491430.84	T53N	R67W	7	NESW	1/2 Mile Buffer	Unknown		Exploration
SP212R	710844.84	1491524.03	T53N	R67W	7	NESW	1/2 Mile Buffer	Unknown		Exploration
SP213R	711284.72	1491478.98	T53N	R67W	7	NESW	1/2 Mile Buffer	Unknown		Exploration
SP214R	711354.83	1490894.93	T53N	R67W	7	NESW	1/2 Mile Buffer	Unknown		Exploration
SP215R	710826.46	1490880.72	T53N	R67W	7	NESW	1/2 Mile Buffer	Unknown		Exploration
SP216R	710307.92	1490869.82	T53N	R67W	7	NWSW	1/2 Mile Buffer	Unknown		Exploration

Note: Coordinate Projections are set in State Plane NAD 83 East Feet

Drill Hole Tabulation

Hole Name	North	East	Township	Range	Section	QtrQtr	Located Within Permit Area or 1/2 Mile Buffer	Type of Plugging	Date Plugged	Exploration/Delineation
SP240V	708919.15	1491663.76	T53N	R68W	12		1/2 Mile Buffer	Unknown		Exploration
SP241V	708960.21	1491856.20	T53N	R68W	12		1/2 Mile Buffer	Unknown		Exploration
SP242V	708387.82	1491359.65	T53N	R68W	12		1/2 Mile Buffer	Unknown		Exploration
SP243V	708314.41	1491292.81	T53N	R68W	12		1/2 Mile Buffer	Unknown		Exploration
SP244V	708202.12	1491167.83	T53N	R68W	12		1/2 Mile Buffer	Unknown		Exploration
SP245V	708907.65	1491770.04	T53N	R68W	12		1/2 Mile Buffer	Unknown		Exploration
SP246V	709027.33	1491904.88	T53N	R68W	12		1/2 Mile Buffer	Unknown		Exploration
SP247V	709356.72	1492289.91	T53N	R67W	7	SWNW	1/2 Mile Buffer	Unknown		Exploration
SP248V	709296.72	1492179.77	T53N	R67W	7	SWNW	1/2 Mile Buffer	Unknown		Exploration
SP249V	709261.35	1492106.97	T53N	R67W	7	SWNW	1/2 Mile Buffer	Unknown		Exploration
SP258R	708329.26	1490944.82	T53N	R68W	12		1/2 Mile Buffer	Unknown		Exploration
SP259R	707886.55	1490398.94	T53N	R68W	12		1/2 Mile Buffer	Unknown		Exploration
SP25Y	708832.74	1491808.16	T53N	R68W	12		1/2 Mile Buffer	Unknown		Exploration
SP280R	707976.86	1491278.60	T53N	R68W	12		1/2 Mile Buffer	Unknown		Exploration
SP281R	707319.18	1490295.94	T53N	R68W	12		1/2 Mile Buffer	Unknown		Exploration
SP290V	709537.54	1492346.00	T53N	R67W	7	SWNW	1/2 Mile Buffer	Unknown		Exploration
SP291V	709609.06	1492472.60	T53N	R67W	7	SWNW	1/2 Mile Buffer	Unknown		Exploration
SP292V	709706.56	1492590.50	T53N	R67W	7	SWNW	1/2 Mile Buffer	Unknown		Exploration
SP293V	709849.05	1492709.69	T53N	R67W	7	SWNW	1/2 Mile Buffer	Unknown		Exploration
SP294V	709770.83	1492780.39	T53N	R67W	7	SWNW	1/2 Mile Buffer	Unknown		Exploration
SP295V	709700.46	1492813.10	T53N	R67W	7	SWNW	1/2 Mile Buffer	Unknown		Exploration
SP298V	709516.62	1492708.10	T53N	R67W	7	SWNW	1/2 Mile Buffer	Unknown		Exploration
SP299V	709463.59	1492624.50	T53N	R67W	7	SWNW	1/2 Mile Buffer	Unknown		Exploration
SP330V	709282.94	1492693.05	T53N	R67W	7	SWNW	1/2 Mile Buffer	Unknown		Exploration
SP331V	709242.71	1492625.36	T53N	R67W	7	SWNW	1/2 Mile Buffer	Unknown		Exploration
SP332V	709279.95	1492548.64	T53N	R67W	7	SWNW	1/2 Mile Buffer	Unknown		Exploration
SP333V	709340.74	1492531.26	T53N	R67W	7	SWNW	1/2 Mile Buffer	Unknown		Exploration
SP334V	709432.46	1492536.67	T53N	R67W	7	SWNW	1/2 Mile Buffer	Unknown		Exploration
SP335V	709916.20	1492744.29	T53N	R67W	7	SWNW	1/2 Mile Buffer	Unknown		Exploration
SP336V	710001.44	1492790.41	T53N	R67W	7	SWNW	1/2 Mile Buffer	Unknown		Exploration
SP36R	708358.07	1490562.98	T53N	R68W	12		1/2 Mile Buffer	Unknown		Exploration
SP370R	714329.21	1490942.38	T53N	R67W	7	NESE	1/2 Mile Buffer	Unknown		Exploration
SP371R	714880.44	1490932.05	T53N	R67W	8	NWSW	1/2 Mile Buffer	Unknown		Exploration
SP372R	714429.79	1491433.27	T53N	R67W	7	NESE	1/2 Mile Buffer	Unknown		Exploration
SP373R	713142.92	1491395.76	T53N	R67W	7	NESE	1/2 Mile Buffer	Unknown		Exploration
SP374R	713719.76	1491495.96	T53N	R67W	7	NESE	1/2 Mile Buffer	Unknown		Exploration
SP375R	712645.51	1491423.57	T53N	R67W	7	NWSE	1/2 Mile Buffer	Unknown		Exploration
SP375V	710086.67	1492839.82	T53N	R67W	7	SWNW	1/2 Mile Buffer	Unknown		Exploration
SP376R	713226.10	1492810.47	T53N	R67W	7	SENE	1/2 Mile Buffer	Unknown		Exploration
SP377R	712887.62	1492539.74	T53N	R67W	7	SWNE	1/2 Mile Buffer	Unknown		Exploration
SP457V	711800.31	1479445.73	T53N	R67W	19	SWSE	1/2 Mile Buffer	Unknown		Exploration
SP458V	711790.56	1479237.86	T53N	R67W	19	SWSE	1/2 Mile Buffer	Unknown		Exploration
SP459V	711885.22	1479299.36	T53N	R67W	19	SWSE	1/2 Mile Buffer	Unknown		Exploration
SP47R	713189.86	1490391.30	T53N	R67W	7	NESE	1/2 Mile Buffer	Unknown		Exploration

Note: Coordinate Projections are set in State Plane NAD 83 East Feet

Drill Hole Tabulation

Hole Name	North	East	Township	Range	Section	QtrQtr	Located Within Permit Area or 1/2 Mile Buffer	Type of Plugging	Date Plugged	Exploration/Delineation
SP48R	713163.90	1490891.92	T53N	R67W	7	NESE	1/2 Mile Buffer	Unknown		Exploration
SP490V	711792.67	1479136.09	T53N	R67W	19	SWSE	1/2 Mile Buffer	Unknown		Exploration
SP491V	711869.93	1479201.79	T53N	R67W	19	SWSE	1/2 Mile Buffer	Unknown		Exploration
SP49R	713687.75	1490823.57	T53N	R67W	7	NESE	1/2 Mile Buffer	Unknown		Exploration
SP577V	711699.29	1479269.24	T53N	R67W	19	SESW	1/2 Mile Buffer	Unknown		Exploration
SP578V	711706.15	1479364.99	T53N	R67W	19	SESW	1/2 Mile Buffer	Unknown		Exploration
SP579V	711709.30	1479462.28	T53N	R67W	19	SESW	1/2 Mile Buffer	Unknown		Exploration
SP608R	709033.39	1492090.00	T53N	R68W	12		1/2 Mile Buffer	Unknown		Exploration
SP609R	709014.03	1492681.54	T53N	R68W	12		1/2 Mile Buffer	Unknown		Exploration
SP630R	709024.81	1491577.10	T53N	R68W	12		1/2 Mile Buffer	Unknown		Exploration
SP631R	709073.15	1491321.14	T53N	R67W	7	NWSW	1/2 Mile Buffer	Unknown		Exploration
SP632R	708685.77	1491280.05	T53N	R68W	12		1/2 Mile Buffer	Unknown		Exploration
SP633R	708896.47	1491942.26	T53N	R68W	12		1/2 Mile Buffer	Unknown		Exploration
SP634R	708608.56	1490849.55	T53N	R68W	12		1/2 Mile Buffer	Unknown		Exploration
SP635R	708453.40	1491263.33	T53N	R68W	12		1/2 Mile Buffer	Unknown		Exploration
SP636R	708821.77	1491762.61	T53N	R68W	12		1/2 Mile Buffer	Unknown		Exploration
SP637R	709264.84	1491539.78	T53N	R67W	7	SWNW	1/2 Mile Buffer	Unknown		Exploration
SP638R	708120.35	1490916.20	T53N	R68W	12		1/2 Mile Buffer	Unknown		Exploration
SP639R	708484.73	1491462.51	T53N	R68W	12		1/2 Mile Buffer	Unknown		Exploration
SP750R	708686.39	1491909.57	T53N	R68W	12		1/2 Mile Buffer	Unknown		Exploration
SP751R	708827.95	1492129.19	T53N	R68W	12		1/2 Mile Buffer	Unknown		Exploration
SP752R	708821.56	1491578.36	T53N	R68W	12		1/2 Mile Buffer	Unknown		Exploration
SP753R	708622.45	1491586.62	T53N	R68W	12		1/2 Mile Buffer	Unknown		Exploration
SP754R	707924.91	1490966.11	T53N	R68W	12		1/2 Mile Buffer	Unknown		Exploration
SP755R	708644.32	1491741.38	T53N	R68W	12		1/2 Mile Buffer	Unknown		Exploration
SP756R	708298.34	1491141.77	T53N	R68W	12		1/2 Mile Buffer	Unknown		Exploration
SP757R	708104.65	1491104.13	T53N	R68W	12		1/2 Mile Buffer	Unknown		Exploration
SP759R	708033.65	1490789.70	T53N	R68W	12		1/2 Mile Buffer	Unknown		Exploration
SP781V	709007.68	1478622.43	T53N	R68W	24	SESE	1/2 Mile Buffer	Unknown		Exploration
SP790R	708473.09	1491085.71	T53N	R68W	12		1/2 Mile Buffer	Unknown		Exploration
SP791R	709136.64	1492766.10	T53N	R67W	7	SWNW	1/2 Mile Buffer	Unknown		Exploration
SP792R	709150.81	1492528.81	T53N	R67W	7	SWNW	1/2 Mile Buffer	Unknown		Exploration
SP793R	709146.02	1491981.30	T53N	R67W	7	SWNW	1/2 Mile Buffer	Unknown		Exploration
SP794R	709182.01	1492163.23	T53N	R67W	7	SWNW	1/2 Mile Buffer	Unknown		Exploration
SP795R	709166.98	1491793.18	T53N	R67W	7	SWNW	1/2 Mile Buffer	Unknown		Exploration
SP796R	709310.25	1492058.82	T53N	R67W	7	SWNW	1/2 Mile Buffer	Unknown		Exploration
SP797R	709314.72	1491863.29	T53N	R67W	7	SWNW	1/2 Mile Buffer	Unknown		Exploration
SP798R	709311.38	1492345.71	T53N	R67W	7	SWNW	1/2 Mile Buffer	Unknown		Exploration
SP799R	709332.44	1492622.98	T53N	R67W	7	SWNW	1/2 Mile Buffer	Unknown		Exploration
SP81X	707511.50	1490418.82	T53N	R68W	12		1/2 Mile Buffer	Unknown		Exploration
SP820R	709278.14	1492826.98	T53N	R67W	7	SWNW	1/2 Mile Buffer	Unknown		Exploration
SP821R	709458.03	1492455.07	T53N	R67W	7	SWNW	1/2 Mile Buffer	Unknown		Exploration
SP822R	709431.02	1492227.40	T53N	R67W	7	SWNW	1/2 Mile Buffer	Unknown		Exploration
SP823R	709609.53	1492273.59	T53N	R67W	7	SWNW	1/2 Mile Buffer	Unknown		Exploration

Note: Coordinate Projections are set in State Plane NAD 83 East Feet

Drill Hole Tabulation

Hole Name	North	East	Township	Range	Section	QtrQtr	Located Within Permit Area or 1/2 Mile Buffer	Type of Plugging	Date Plugged	Exploration/Delineation
SP824R	709443.43	1492755.60	T53N	R67W	7	SWNW	1/2 Mile Buffer	Unknown		Exploration
SP825R	709578.54	1492582.07	T53N	R67W	7	SWNW	1/2 Mile Buffer	Unknown		Exploration
SP826R	709716.68	1492699.94	T53N	R67W	7	SWNW	1/2 Mile Buffer	Unknown		Exploration
SP827R	709703.39	1492439.32	T53N	R67W	7	SWNW	1/2 Mile Buffer	Unknown		Exploration
SP82X	708852.01	1491853.39	T53N	R68W	12		1/2 Mile Buffer	Unknown		Exploration
SP890R	709907.67	1492627.80	T53N	R67W	7	SWNW	1/2 Mile Buffer	Unknown		Exploration
SP891R	710067.27	1492695.37	T53N	R67W	7	SWNW	1/2 Mile Buffer	Unknown		Exploration
SP90V	707764.90	1490605.36	T53N	R68W	12		1/2 Mile Buffer	Unknown		Exploration
SP91V	707707.39	1490572.95	T53N	R68W	12		1/2 Mile Buffer	Unknown		Exploration
SP92V	707713.81	1490402.85	T53N	R68W	12		1/2 Mile Buffer	Unknown		Exploration
SP93V	708221.51	1491269.45	T53N	R68W	12		1/2 Mile Buffer	Unknown		Exploration
SP944R	717018.02	1487214.61	T53N	R67W	17	SENW	1/2 Mile Buffer	Unknown		Exploration
SP94V	708705.45	1491428.53	T53N	R68W	12		1/2 Mile Buffer	Unknown		Exploration
SP95V	707567.43	1490337.21	T53N	R68W	12		1/2 Mile Buffer	Unknown		Exploration
SP969R	709602.88	1490364.79	T53N	R67W	7	NWSW	1/2 Mile Buffer	Unknown		Exploration
SP96V	707578.62	1490214.42	T53N	R68W	12		1/2 Mile Buffer	Unknown		Exploration
SP97V	707882.25	1490719.16	T53N	R68W	12		1/2 Mile Buffer	Unknown		Exploration
SP98V	707600.96	1490763.81	T53N	R68W	12		1/2 Mile Buffer	Unknown		Exploration
SP990R	710069.08	1490852.92	T53N	R67W	7	NWSW	1/2 Mile Buffer	Unknown		Exploration
SP991R	710671.07	1491435.07	T53N	R67W	7	NESW	1/2 Mile Buffer	Unknown		Exploration
SP995R	709050.03	1491975.42	T53N	R67W	7	SWNW	1/2 Mile Buffer	Unknown		Exploration
SP996R	709157.17	1492065.60	T53N	R67W	7	SWNW	1/2 Mile Buffer	Unknown		Exploration
SP997R	709231.09	1491994.86	T53N	R67W	7	SWNW	1/2 Mile Buffer	Unknown		Exploration
SP999R	709124.46	1492332.16	T53N	R67W	7	SWNW	1/2 Mile Buffer	Unknown		Exploration
SPD11E	705408.37	1479982.19	T53N	R68W	24	NESW	1/2 Mile Buffer	Unknown		Exploration
SPD122E	713221.71	1491887.42	T53N	R67W	7	SENE	1/2 Mile Buffer	Unknown		Exploration
SPD124E	713120.31	1491719.83	T53N	R67W	7	SENE	1/2 Mile Buffer	Unknown		Exploration
SPD126E	713533.56	1491858.52	T53N	R67W	7	SENE	1/2 Mile Buffer	Unknown		Exploration
SPD128E	714180.85	1492804.64	T53N	R67W	7	SENE	1/2 Mile Buffer	Unknown		Exploration
SPD141E	713143.29	1491719.88	T53N	R67W	7	SENE	1/2 Mile Buffer	Unknown		Exploration
SPD143E	713136.61	1491772.38	T53N	R67W	7	SENE	1/2 Mile Buffer	Unknown		Exploration
SPD145E	713865.86	1492764.62	T53N	R67W	7	SENE	1/2 Mile Buffer	Unknown		Exploration
SPD15E	708283.73	1480496.10	T53N	R68W	24	NESE	1/2 Mile Buffer	Unknown		Exploration
SPD17E	708774.45	1480777.33	T53N	R68W	24	NESE	1/2 Mile Buffer	Unknown		Exploration
SPD23E	712323.99	1492045.38	T53N	R67W	7	SWNE	1/2 Mile Buffer	Unknown		Exploration
SPD27E	714489.36	1492801.99	T53N	R67W	8	SWNW	1/2 Mile Buffer	Unknown		Exploration
SPD29E	713979.24	1491881.99	T53N	R67W	7	SENE	1/2 Mile Buffer	Unknown		Exploration
SPD31E	713478.00	1491743.54	T53N	R67W	7	SENE	1/2 Mile Buffer	Unknown		Exploration
SPD33E	713162.87	1491772.43	T53N	R67W	7	SENE	1/2 Mile Buffer	Unknown		Exploration
SPD341M	706532.43	1491449.60	T53N	R68W	12		1/2 Mile Buffer	Unknown		Exploration
SPD342M	708304.74	1491436.81	T53N	R68W	12		1/2 Mile Buffer	Unknown		Exploration
SPD35E	713051.32	1491752.51	T53N	R67W	7	SWNE	1/2 Mile Buffer	Unknown		Exploration
SPD37E	713071.32	1491601.58	T53N	R67W	7	SENE	1/2 Mile Buffer	Unknown		Exploration
SPD476M	709561.60	1492589.08	T53N	R67W	7	SWNW	1/2 Mile Buffer	Unknown		Exploration

Note: Coordinate Projections are set in State Plane NAD 83 East Feet

Drill Hole Tabulation

Hole Name	North	East	Township	Range	Section	QtrQtr	Located Within Permit Area or 1/2 Mile Buffer	Type of Plugging	Date Plugged	Exploration/Delineation
SPD528	705689.86	1480576.54	T53N	R68W	24	NESW	1/2 Mile Buffer	Unknown		Exploration
SPD592M	711794.61	1479343.78	T53N	R67W	19	SWSE	1/2 Mile Buffer	Unknown		Exploration
SPD593M	711709.46	1478283.32	T53N	R67W	30	NENW	1/2 Mile Buffer	Unknown		Exploration
SPD594M	711881.84	1477440.20	T53N	R67W	30	NWNE	1/2 Mile Buffer	Unknown		Exploration
SPD758M	712828.41	1479339.51	T53N	R67W	19	SWSE	1/2 Mile Buffer	Unknown		Exploration
SPD759M	712841.65	1478334.86	T53N	R67W	30	NWNE	1/2 Mile Buffer	Unknown		Exploration
SPD772M	705166.17	1481007.18	T53N	R68W	24	SENW	1/2 Mile Buffer	Unknown		Exploration
SPD790M	712820.71	1477333.80	T53N	R67W	30	NWNE	1/2 Mile Buffer	Unknown		Exploration
SPD796M	712280.43	1479282.60	T53N	R67W	19	SWSE	1/2 Mile Buffer	Unknown		Exploration
SPD797M	711816.57	1478843.22	T53N	R67W	19	SWSE	1/2 Mile Buffer	Unknown		Exploration
unknown	713181.84	1491736.22	T53N	R67W	7	SENE	1/2 Mile Buffer	Unknown		Exploration
005	711751.51	1483675.72	T53N	R67W	18		Permit Area	Unknown		Exploration
R14E13	712172.87	1484526.76	T53N	R67W	18		Permit Area	Unknown		Exploration
SP1000R	712649.24	1487582.52	T53N	R67W	18		Permit Area	Unknown		Exploration
SP1001R	712204.49	1487780.30	T53N	R67W	18		Permit Area	Unknown		Exploration
SP1002R	712024.24	1487655.22	T53N	R67W	18		Permit Area	Unknown		Exploration
SP1003R	712583.44	1487664.43	T53N	R67W	18		Permit Area	Unknown		Exploration
SP1004R	712083.14	1487737.39	T53N	R67W	18		Permit Area	Unknown		Exploration
SP1005R	711948.88	1487589.43	T53N	R67W	18		Permit Area	Unknown		Exploration
SP1006R	712501.52	1487598.63	T53N	R67W	18		Permit Area	Unknown		Exploration
SP1007R	713536.05	1487903.63	T53N	R67W	18		Permit Area	Unknown		Exploration
SP1008R	713847.38	1488130.72	T53N	R67W	18		Permit Area	Unknown		Exploration
SP1009R	712148.84	1487711.27	T53N	R67W	18		Permit Area	Unknown		Exploration
SP1010R	708991.69	1489406.05	T53N	R68W	12	SESE	Permit Area	Unknown		Exploration
SP1011R	708893.01	1489510.91	T53N	R68W	12	SESE	Permit Area	Unknown		Exploration
SP1012R	709716.75	1489704.84	T53N	R67W	7		Permit Area	Unknown		Exploration
SP1013R	709815.26	1489678.78	T53N	R67W	7		Permit Area	Unknown		Exploration
SP1014R	711243.64	1480744.13	T53N	R67W	19		Permit Area	Unknown		Exploration
SP1015R	711364.41	1480631.22	T53N	R67W	19		Permit Area	Unknown		Exploration
SP1016R	711463.09	1480734.50	T53N	R67W	19		Permit Area	Unknown		Exploration
SP1017R	711322.42	1480734.58	T53N	R67W	19		Permit Area	Unknown		Exploration
SP1018R	711255.28	1480652.16	T53N	R67W	19		Permit Area	Unknown		Exploration
SP1019R	711152.18	1480739.29	T53N	R67W	19		Permit Area	Unknown		Exploration
SP1034R	709891.78	1489601.29	T53N	R67W	7		Permit Area	Unknown		Exploration
SP1038R	708909.56	1489437.53	T53N	R68W	12	SESE	Permit Area	Unknown		Exploration
SP1039R	708854.77	1489590.72	T53N	R68W	12	SESE	Permit Area	Unknown		Exploration
SP1040R	712152.47	1485227.36	T53N	R67W	18		Permit Area	Unknown		Exploration
SP1041R	711579.17	1486076.84	T53N	R67W	18		Permit Area	Unknown		Exploration
SP1042R	711581.85	1486346.15	T53N	R67W	18		Permit Area	Unknown		Exploration
SP1043R	710701.94	1486511.73	T53N	R67W	18		Permit Area	Unknown		Exploration
SP1044R	710738.20	1486433.04	T53N	R67W	18		Permit Area	Unknown		Exploration
SP1045R	710685.86	1486347.60	T53N	R67W	18		Permit Area	Unknown		Exploration
SP1046R	710353.25	1485677.95	T53N	R67W	18		Permit Area	Unknown		Exploration
SP1047R	710587.43	1486334.27	T53N	R67W	18		Permit Area	Unknown		Exploration

Note: Coordinate Projections are set in State Plane NAD 83 East Feet

Drill Hole Tabulation

Hole Name	North	East	Township	Range	Section	QtrQtr	Located Within Permit Area or 1/2 Mile Buffer	Type of Plugging	Date Plugged	Exploration/Delineation
SP1048R	710735.53	1486157.17	T53N	R67W	18		Permit Area	Unknown		Exploration
SP1049R	710678.80	1486593.74	T53N	R67W	18		Permit Area	Unknown		Exploration
SP104V	708972.06	1489790.50	T53N	R68W	12	SESE	Permit Area	Unknown		Exploration
SP1050R	711839.73	1487617.63	T53N	R67W	18		Permit Area	Unknown		Exploration
SP1051R	712488.14	1487723.31	T53N	R67W	18		Permit Area	Unknown		Exploration
SP1052R	713226.27	1487931.09	T53N	R67W	18		Permit Area	Unknown		Exploration
SP1053R	713434.08	1488015.01	T53N	R67W	18		Permit Area	Unknown		Exploration
SP1054R	713531.31	1488313.51	T53N	R67W	18		Permit Area	Unknown		Exploration
SP1055R	712701.60	1487658.11	T53N	R67W	18		Permit Area	Unknown		Exploration
SP1056R	712429.46	1487529.56	T53N	R67W	18		Permit Area	Unknown		Exploration
SP1057R	712007.56	1487786.47	T53N	R67W	18		Permit Area	Unknown		Exploration
SP1058R	712366.93	1487614.76	T53N	R67W	18		Permit Area	Unknown		Exploration
SP1059R	712294.74	1487608.05	T53N	R67W	18		Permit Area	Unknown		Exploration
SP105V	709151.38	1489964.31	T53N	R67W	7		Permit Area	Unknown		Exploration
SP1060R	711247.52	1480836.66	T53N	R67W	19		Permit Area	Unknown		Exploration
SP1061R	711310.23	1480564.94	T53N	R67W	19		Permit Area	Unknown		Exploration
SP1062R	710976.08	1483590.82	T53N	R67W	19		Permit Area	Unknown		Exploration
SP1064R	710882.80	1483595.03	T53N	R67W	19		Permit Area	Unknown		Exploration
SP1065R	710967.41	1483495.13	T53N	R67W	19		Permit Area	Unknown		Exploration
SP1066R	711080.27	1483581.61	T53N	R67W	19		Permit Area	Unknown		Exploration
SP106V	708953.36	1489704.58	T53N	R68W	12	SESE	Permit Area	Unknown		Exploration
SP1070R	712262.10	1487516.09	T53N	R67W	18		Permit Area	Unknown		Exploration
SP1071R	713601.53	1488581.00	T53N	R67W	18		Permit Area	Unknown		Exploration
SP1072R	714032.45	1488532.55	T53N	R67W	18		Permit Area	Unknown		Exploration
SP1073R	712337.52	1487552.34	T53N	R67W	18		Permit Area	Unknown		Exploration
SP1074R	712172.17	1487537.37	T53N	R67W	18		Permit Area	Unknown		Exploration
SP1075R	712219.62	1487427.39	T53N	R67W	18		Permit Area	Unknown		Exploration
SP1076R	712406.17	1487683.76	T53N	R67W	18		Permit Area	Unknown		Exploration
SP1077R	712587.07	1487490.49	T53N	R67W	18		Permit Area	Unknown		Exploration
SP1078R	714139.37	1488183.83	T53N	R67W	18		Permit Area	Unknown		Exploration
SP1079R	714051.71	1488745.92	T53N	R67W	18		Permit Area	Unknown		Exploration
SP107V	709173.71	1490015.90	T53N	R67W	7		Permit Area	Unknown		Exploration
SP1080R	711845.21	1486926.25	T53N	R67W	18		Permit Area	Unknown		Exploration
SP1081R	712042.13	1486926.65	T53N	R67W	18		Permit Area	Unknown		Exploration
SP1082R	711565.25	1486441.29	T53N	R67W	18		Permit Area	Unknown		Exploration
SP1083R	711027.74	1486105.26	T53N	R67W	18		Permit Area	Unknown		Exploration
SP1084R	711480.02	1486391.89	T53N	R67W	18		Permit Area	Unknown		Exploration
SP1085R	711024.44	1486111.82	T53N	R67W	18		Permit Area	Unknown		Exploration
SP1086R	710570.45	1484306.85	T53N	R67W	18		Permit Area	Unknown		Exploration
SP1087R	710454.15	1484411.96	T53N	R67W	18		Permit Area	Unknown		Exploration
SP1088R	713489.82	1488639.85	T53N	R67W	18		Permit Area	Unknown		Exploration
SP1089R	714082.36	1489473.77	T53N	R67W	7		Permit Area	Unknown		Exploration
SP1097R	714156.38	1488920.08	T53N	R67W	18		Permit Area	Unknown		Exploration
SP10R	710552.41	1485828.60	T53N	R67W	18		Permit Area	Unknown		Exploration

Note: Coordinate Projections are set in State Plane NAD 83 East Feet

Drill Hole Tabulation

Hole Name	North	East	Township	Range	Section	QtrQtr	Located Within Permit Area or 1/2 Mile Buffer	Type of Plugging	Date Plugged	Exploration/Delineation
SP10V	710665.59	1484323.45	T53N	R67W	18		Permit Area	Unknown		Exploration
SP10X	709591.86	1487109.98	T53N	R67W	18		Permit Area	Unknown		Exploration
SP10Y	711854.17	1483805.25	T53N	R67W	18		Permit Area	Unknown		Exploration
SP1100R	710366.98	1484299.87	T53N	R67W	18		Permit Area	Unknown		Exploration
SP110V	711266.65	1484782.16	T53N	R67W	18		Permit Area	Unknown		Exploration
SP111V	711493.14	1484766.21	T53N	R67W	18		Permit Area	Unknown		Exploration
SP112V	711463.50	1484862.28	T53N	R67W	18		Permit Area	Unknown		Exploration
SP113V	711499.92	1484657.92	T53N	R67W	18		Permit Area	Unknown		Exploration
SP114V	710959.87	1483394.49	T53N	R67W	19		Permit Area	Unknown		Exploration
SP115V	711069.38	1483479.46	T53N	R67W	19		Permit Area	Unknown		Exploration
SP116V	710864.49	1483496.01	T53N	R67W	19		Permit Area	Unknown		Exploration
SP117V	710962.35	1483288.85	T53N	R67W	19		Permit Area	Unknown		Exploration
SP118V	711069.59	1483376.57	T53N	R67W	19		Permit Area	Unknown		Exploration
SP119V	710861.24	1483412.51	T53N	R67W	19		Permit Area	Unknown		Exploration
SP11V	710457.22	1484513.71	T53N	R67W	18		Permit Area	Unknown		Exploration
SP11Y	711989.78	1483838.51	T53N	R67W	18		Permit Area	Unknown		Exploration
SP120V	713429.57	1488313.30	T53N	R67W	18		Permit Area	Unknown		Exploration
SP121R	709091.90	1486440.94	T53N	R67W	18		Permit Area	Unknown		Exploration
SP121V	713626.35	1488379.34	T53N	R67W	18		Permit Area	Unknown		Exploration
SP122R	709568.77	1486489.18	T53N	R67W	18		Permit Area	Unknown		Exploration
SP122V	713323.27	1489214.22	T53N	R67W	7		Permit Area	Unknown		Exploration
SP123R	709638.93	1486995.99	T53N	R67W	18		Permit Area	Unknown		Exploration
SP123V	713425.93	1489021.58	T53N	R67W	7		Permit Area	Unknown		Exploration
SP124V	713440.17	1488846.52	T53N	R67W	18		Permit Area	Unknown		Exploration
SP125R	709532.10	1485994.63	T53N	R67W	18		Permit Area	Unknown		Exploration
SP125V	713246.15	1488530.89	T53N	R67W	18		Permit Area	Unknown		Exploration
SP126V	713128.02	1488520.80	T53N	R67W	18		Permit Area	Unknown		Exploration
SP127R	709415.81	1488436.53	T53N	R67W	18		Permit Area	Unknown		Exploration
SP127V	713438.05	1489208.12	T53N	R67W	7		Permit Area	Unknown		Exploration
SP128R	709377.12	1489019.11	T53N	R67W	7		Permit Area	Unknown		Exploration
SP128V	713264.76	1489305.15	T53N	R67W	7		Permit Area	Unknown		Exploration
SP129R	709341.89	1489592.99	T53N	R67W	7		Permit Area	Unknown		Exploration
SP129V	713607.50	1489936.58	T53N	R67W	7		Permit Area	Unknown		Exploration
SP12R	712128.88	1483690.02	T53N	R67W	18		Permit Area	Unknown		Exploration
SP12V	710545.98	1484441.69	T53N	R67W	18		Permit Area	Unknown		Exploration
SP12Y	712051.58	1483725.15	T53N	R67W	18		Permit Area	Unknown		Exploration
SP130V	712201.07	1488510.74	T53N	R67W	18		Permit Area	Unknown		Exploration
SP131V	712327.90	1488796.92	T53N	R67W	18		Permit Area	Unknown		Exploration
SP132V	712463.84	1488987.06	T53N	R67W	18		Permit Area	Unknown		Exploration
SP133V	712629.84	1489265.68	T53N	R67W	7		Permit Area	Unknown		Exploration
SP134V	713266.03	1487632.71	T53N	R67W	18		Permit Area	Unknown		Exploration
SP135V	713348.34	1487504.88	T53N	R67W	18		Permit Area	Unknown		Exploration
SP136V	713489.24	1487616.75	T53N	R67W	18		Permit Area	Unknown		Exploration
SP137V	713370.85	1487731.38	T53N	R67W	18		Permit Area	Unknown		Exploration

Note: Coordinate Projections are set in State Plane NAD 83 East Feet

Drill Hole Tabulation

Hole Name	North	East	Township	Range	Section	QtrQtr	Located Within Permit Area or 1/2 Mile Buffer	Type of Plugging	Date Plugged	Exploration/Delineation
SP138V	712657.44	1489362.40	T53N	R67W	7		Permit Area	Unknown		Exploration
SP139V	712571.91	1489184.60	T53N	R67W	7		Permit Area	Unknown		Exploration
SP13R	711983.89	1483912.08	T53N	R67W	18		Permit Area	Unknown		Exploration
SP13V	710570.68	1484191.98	T53N	R67W	18		Permit Area	Unknown		Exploration
SP13Y	712031.01	1483918.12	T53N	R67W	18		Permit Area	Unknown		Exploration
SP144V	713389.49	1489302.12	T53N	R67W	7		Permit Area	Unknown		Exploration
SP145V	713505.71	1489106.82	T53N	R67W	7		Permit Area	Unknown		Exploration
SP14R	710557.33	1485318.01	T53N	R67W	18		Permit Area	Unknown		Exploration
SP14V	710664.18	1484422.24	T53N	R67W	18		Permit Area	Unknown		Exploration
SP14Y	712026.63	1483845.91	T53N	R67W	18		Permit Area	Unknown		Exploration
SP150R	712138.51	1483651.68	T53N	R67W	19		Permit Area	Unknown		Exploration
SP151R	712801.91	1488786.40	T53N	R67W	18		Permit Area	Unknown		Exploration
SP152R	711969.84	1483898.04	T53N	R67W	18		Permit Area	Unknown		Exploration
SP153V	707411.30	1489562.67	T53N	R68W	12	SWSE	Permit Area	Unknown		Exploration
SP15R	710551.81	1484806.00	T53N	R67W	18		Permit Area	Unknown		Exploration
SP15V	710767.33	1484326.94	T53N	R67W	18		Permit Area	Unknown		Exploration
SP15Y	712036.53	1483769.55	T53N	R67W	18		Permit Area	Unknown		Exploration
SP160R	709298.77	1490112.31	T53N	R67W	7		Permit Area	Unknown		Exploration
SP160V	710374.93	1484634.98	T53N	R67W	18		Permit Area	Unknown		Exploration
SP161R	709099.92	1488549.64	T53N	R67W	18		Permit Area	Unknown		Exploration
SP161V	710207.82	1484500.08	T53N	R67W	18		Permit Area	Unknown		Exploration
SP162R	709136.61	1488085.15	T53N	R67W	18		Permit Area	Unknown		Exploration
SP162V	710132.54	1484398.18	T53N	R67W	18		Permit Area	Unknown		Exploration
SP163R	709112.57	1489010.63	T53N	R67W	7		Permit Area	Unknown		Exploration
SP163V	710255.38	1484302.93	T53N	R67W	18		Permit Area	Unknown		Exploration
SP164R	708949.70	1489633.12	T53N	R68W	12	SESE	Permit Area	Unknown		Exploration
SP164V	710790.73	1485118.18	T53N	R67W	18		Permit Area	Unknown		Exploration
SP165R	708819.47	1490173.69	T53N	R68W	12	SESE	Permit Area	Unknown		Exploration
SP165V	710879.24	1484972.18	T53N	R67W	18		Permit Area	Unknown		Exploration
SP166V	710876.37	1484868.07	T53N	R67W	18		Permit Area	Unknown		Exploration
SP167V	710692.45	1485026.09	T53N	R67W	18		Permit Area	Unknown		Exploration
SP168R	708401.25	1490085.32	T53N	R68W	12	SESE	Permit Area	Unknown		Exploration
SP168V	710363.95	1484171.87	T53N	R67W	18		Permit Area	Unknown		Exploration
SP169V	710770.99	1484139.88	T53N	R67W	18		Permit Area	Unknown		Exploration
SP16V	710665.75	1484244.69	T53N	R67W	18		Permit Area	Unknown		Exploration
SP16Y	711882.31	1483881.58	T53N	R67W	18		Permit Area	Unknown		Exploration
SP170V	710863.49	1483318.27	T53N	R67W	19		Permit Area	Unknown		Exploration
SP171V	710742.87	1483457.33	T53N	R67W	19		Permit Area	Unknown		Exploration
SP172V	710737.79	1483632.44	T53N	R67W	19		Permit Area	Unknown		Exploration
SP173V	710897.02	1483216.22	T53N	R67W	19		Permit Area	Unknown		Exploration
SP174V	710721.83	1483360.89	T53N	R67W	19		Permit Area	Unknown		Exploration
SP175V	710646.05	1483456.74	T53N	R67W	19		Permit Area	Unknown		Exploration
SP176V	710741.58	1483545.02	T53N	R67W	19		Permit Area	Unknown		Exploration
SP177V	710644.09	1483629.59	T53N	R67W	19		Permit Area	Unknown		Exploration

Note: Coordinate Projections are set in State Plane NAD 83 East Feet

Drill Hole Tabulation

Hole Name	North	East	Township	Range	Section	QtrQtr	Located Within Permit Area or 1/2 Mile Buffer	Type of Plugging	Date Plugged	Exploration/Delineation
SP178V	710774.59	1483257.71	T53N	R67W	19		Permit Area	Unknown		Exploration
SP179V	710769.96	1483078.54	T53N	R67W	19		Permit Area	Unknown		Exploration
SP17R	711096.25	1484825.20	T53N	R67W	18		Permit Area	Unknown		Exploration
SP17V	710342.59	1484398.61	T53N	R67W	18		Permit Area	Unknown		Exploration
SP180R	711973.32	1483962.11	T53N	R67W	18		Permit Area	Unknown		Exploration
SP181R	711990.54	1483835.99	T53N	R67W	18		Permit Area	Unknown		Exploration
SP181V	711768.75	1483851.03	T53N	R67W	18		Permit Area	Unknown		Exploration
SP182R	712097.89	1483436.33	T53N	R67W	19		Permit Area	Unknown		Exploration
SP182V	711897.97	1483845.18	T53N	R67W	18		Permit Area	Unknown		Exploration
SP183V	712088.96	1483859.16	T53N	R67W	18		Permit Area	Unknown		Exploration
SP184V	712154.46	1484005.61	T53N	R67W	18		Permit Area	Unknown		Exploration
SP185V	712127.51	1484220.92	T53N	R67W	18		Permit Area	Unknown		Exploration
SP186V	712029.22	1484231.55	T53N	R67W	18		Permit Area	Unknown		Exploration
SP187V	711950.46	1484228.10	T53N	R67W	18		Permit Area	Unknown		Exploration
SP188V	712050.03	1484392.05	T53N	R67W	18		Permit Area	Unknown		Exploration
SP189V	712030.61	1484485.35	T53N	R67W	18		Permit Area	Unknown		Exploration
SP18R	710043.18	1484765.58	T53N	R67W	18		Permit Area	Unknown		Exploration
SP18V	710760.17	1484425.06	T53N	R67W	18		Permit Area	Unknown		Exploration
SP18Y	709475.00	1486491.38	T53N	R67W	18		Permit Area	Unknown		Exploration
SP190V	710590.72	1485039.10	T53N	R67W	18		Permit Area	Unknown		Exploration
SP191V	710711.95	1485121.30	T53N	R67W	18		Permit Area	Unknown		Exploration
SP192V	710927.54	1484428.68	T53N	R67W	18		Permit Area	Unknown		Exploration
SP193V	710911.34	1484326.91	T53N	R67W	18		Permit Area	Unknown		Exploration
SP195V	710255.59	1484197.90	T53N	R67W	18		Permit Area	Unknown		Exploration
SP196V	710754.45	1485219.95	T53N	R67W	18		Permit Area	Unknown		Exploration
SP197V	710659.25	1485229.60	T53N	R67W	18		Permit Area	Unknown		Exploration
SP198V	710424.02	1484704.00	T53N	R67W	18		Permit Area	Unknown		Exploration
SP199V	710273.18	1484638.05	T53N	R67W	18		Permit Area	Unknown		Exploration
SP19R	710462.13	1484309.91	T53N	R67W	18		Permit Area	Unknown		Exploration
SP19V	710764.22	1484241.60	T53N	R67W	18		Permit Area	Unknown		Exploration
SP1R	712825.94	1488815.37	T53N	R67W	18		Permit Area	Unknown		Exploration
SP201V	707307.67	1489715.73	T53N	R68W	12	SWSE	Permit Area	Unknown		Exploration
SP204V	707262.75	1489809.17	T53N	R68W	12	SWSE	Permit Area	Unknown		Exploration
SP207V	707186.31	1489889.95	T53N	R68W	12	SWSE	Permit Area	Unknown		Exploration
SP20V	713637.17	1488807.53	T53N	R67W	18		Permit Area	Unknown		Exploration
SP20Y	711678.49	1483972.61	T53N	R67W	18		Permit Area	Unknown		Exploration
SP210V	712508.70	1489072.72	T53N	R67W	7		Permit Area	Unknown		Exploration
SP211V	712524.25	1489254.93	T53N	R67W	7		Permit Area	Unknown		Exploration
SP212V	712552.49	1489329.36	T53N	R67W	7		Permit Area	Unknown		Exploration
SP213V	712322.65	1489005.65	T53N	R67W	7		Permit Area	Unknown		Exploration
SP214V	712457.14	1489153.12	T53N	R67W	7		Permit Area	Unknown		Exploration
SP215V	712394.15	1489107.50	T53N	R67W	7		Permit Area	Unknown		Exploration
SP216V	712427.86	1489300.42	T53N	R67W	7		Permit Area	Unknown		Exploration
SP217R	709793.72	1490128.88	T53N	R67W	7		Permit Area	Unknown		Exploration

Note: Coordinate Projections are set in State Plane NAD 83 East Feet

Drill Hole Tabulation

Hole Name	North	East	Township	Range	Section	QtrQtr	Located Within Permit Area or 1/2 Mile Buffer	Type of Plugging	Date Plugged	Exploration/Delineation
SP217V	712570.65	1489433.77	T53N	R67W	7		Permit Area	Unknown		Exploration
SP218R	710256.52	1490110.13	T53N	R67W	7		Permit Area	Unknown		Exploration
SP218V	712393.98	1489209.70	T53N	R67W	7		Permit Area	Unknown		Exploration
SP219R	710870.33	1490071.99	T53N	R67W	7		Permit Area	Unknown		Exploration
SP219V	712469.23	1489389.97	T53N	R67W	7		Permit Area	Unknown		Exploration
SP21R	713318.97	1484254.00	T53N	R67W	18		Permit Area	Unknown		Exploration
SP21V	713157.71	1488947.68	T53N	R67W	18		Permit Area	Unknown		Exploration
SP21Y	711669.41	1483944.64	T53N	R67W	18		Permit Area	Unknown		Exploration
SP220V	710768.63	1483163.82	T53N	R67W	19		Permit Area	Unknown		Exploration
SP221V	710673.23	1483271.94	T53N	R67W	19		Permit Area	Unknown		Exploration
SP222V	710997.60	1483191.25	T53N	R67W	19		Permit Area	Unknown		Exploration
SP223V	710745.72	1483134.24	T53N	R67W	19		Permit Area	Unknown		Exploration
SP224V	710929.53	1483124.77	T53N	R67W	19		Permit Area	Unknown		Exploration
SP225V	710682.48	1483036.81	T53N	R67W	19		Permit Area	Unknown		Exploration
SP226V	711540.92	1483585.61	T53N	R67W	19		Permit Area	Unknown		Exploration
SP228V	710342.30	1482245.16	T53N	R67W	19		Permit Area	Unknown		Exploration
SP229V	713682.23	1485488.86	T53N	R67W	18		Permit Area	Unknown		Exploration
SP22R	713553.70	1483805.17	T53N	R67W	18		Permit Area	Unknown		Exploration
SP22V	713154.63	1488845.94	T53N	R67W	18		Permit Area	Unknown		Exploration
SP22Y	711912.62	1485787.20	T53N	R67W	18		Permit Area	Unknown		Exploration
SP230V	711787.06	1484241.39	T53N	R67W	18		Permit Area	Unknown		Exploration
SP231V	711885.69	1484318.78	T53N	R67W	18		Permit Area	Unknown		Exploration
SP232V	711773.03	1483146.36	T53N	R67W	19		Permit Area	Unknown		Exploration
SP233V	711894.99	1483018.44	T53N	R67W	19		Permit Area	Unknown		Exploration
SP234V	711892.91	1483219.16	T53N	R67W	19		Permit Area	Unknown		Exploration
SP235V	711992.03	1483216.28	T53N	R67W	19		Permit Area	Unknown		Exploration
SP236V	712067.32	1483215.68	T53N	R67W	19		Permit Area	Unknown		Exploration
SP237V	712344.49	1489367.63	T53N	R67W	7		Permit Area	Unknown		Exploration
SP238V	712307.37	1489269.98	T53N	R67W	7		Permit Area	Unknown		Exploration
SP239V	712295.63	1489153.71	T53N	R67W	7		Permit Area	Unknown		Exploration
SP23R	713600.67	1483299.84	T53N	R67W	19		Permit Area	Unknown		Exploration
SP23V	713187.68	1488734.41	T53N	R67W	18		Permit Area	Unknown		Exploration
SP23Y	712279.22	1483276.93	T53N	R67W	19		Permit Area	Unknown		Exploration
SP24R	713598.43	1482787.84	T53N	R67W	19		Permit Area	Unknown		Exploration
SP24V	713223.48	1488882.18	T53N	R67W	18		Permit Area	Unknown		Exploration
SP250R	711362.71	1490033.61	T53N	R67W	7		Permit Area	Unknown		Exploration
SP250V	710348.91	1484516.77	T53N	R67W	18		Permit Area	Unknown		Exploration
SP251R	710891.18	1489500.97	T53N	R67W	7		Permit Area	Unknown		Exploration
SP251V	710278.77	1484099.49	T53N	R67W	18		Permit Area	Unknown		Exploration
SP252R	710273.96	1489601.45	T53N	R67W	7		Permit Area	Unknown		Exploration
SP252V	710662.86	1484051.04	T53N	R67W	18		Permit Area	Unknown		Exploration
SP253R	709772.78	1489586.80	T53N	R67W	7		Permit Area	Unknown		Exploration
SP253V	711139.38	1484420.88	T53N	R67W	18		Permit Area	Unknown		Exploration
SP254R	709863.14	1489158.16	T53N	R67W	7		Permit Area	Unknown		Exploration

Note: Coordinate Projections are set in State Plane NAD 83 East Feet

Drill Hole Tabulation

Hole Name	North	East	Township	Range	Section	QtrQtr	Located Within Permit Area or 1/2 Mile Buffer	Type of Plugging	Date Plugged	Exploration/Delineation
SP254V	710580.65	1485150.67	T53N	R67W	18		Permit Area	Unknown		Exploration
SP255R	710496.47	1489121.69	T53N	R67W	7		Permit Area	Unknown		Exploration
SP255V	710309.05	1484749.71	T53N	R67W	18		Permit Area	Unknown		Exploration
SP256R	711126.51	1489172.20	T53N	R67W	7		Permit Area	Unknown		Exploration
SP256V	710171.51	1484601.74	T53N	R67W	18		Permit Area	Unknown		Exploration
SP257R	710018.39	1488404.61	T53N	R67W	18		Permit Area	Unknown		Exploration
SP257V	710367.44	1484070.13	T53N	R67W	18		Permit Area	Unknown		Exploration
SP258V	710518.12	1485232.59	T53N	R67W	18		Permit Area	Unknown		Exploration
SP259V	710177.86	1484706.78	T53N	R67W	18		Permit Area	Unknown		Exploration
SP25R	712727.22	1485460.66	T53N	R67W	18		Permit Area	Unknown		Exploration
SP25V	713231.89	1489010.88	T53N	R67W	7		Permit Area	Unknown		Exploration
SP260V	713787.06	1485580.97	T53N	R67W	18		Permit Area	Unknown		Exploration
SP261V	713885.76	1485463.02	T53N	R67W	18		Permit Area	Unknown		Exploration
SP262V	713794.05	1485370.94	T53N	R67W	18		Permit Area	Unknown		Exploration
SP263V	714371.62	1485404.94	T53N	R67W	18		Permit Area	Unknown		Exploration
SP264V	714362.43	1485080.00	T53N	R67W	18		Permit Area	Unknown		Exploration
SP265V	714776.92	1485349.15	T53N	R67W	17	NWSW	Permit Area	Unknown		Exploration
SP266V	714367.31	1485910.36	T53N	R67W	18		Permit Area	Unknown		Exploration
SP267V	714355.14	1486335.55	T53N	R67W	18		Permit Area	Unknown		Exploration
SP268V	713855.30	1485919.16	T53N	R67W	18		Permit Area	Unknown		Exploration
SP269V	713294.06	1485927.86	T53N	R67W	18		Permit Area	Unknown		Exploration
SP26R	712765.60	1485956.32	T53N	R67W	18		Permit Area	Unknown		Exploration
SP26V	713173.14	1488608.03	T53N	R67W	18		Permit Area	Unknown		Exploration
SP26Y	708712.57	1484952.80	T53N	R68W	13		Permit Area	Unknown		Exploration
SP270V	713859.59	1486318.13	T53N	R67W	18		Permit Area	Unknown		Exploration
SP271V	714821.76	1485890.77	T53N	R67W	17	NWSW	Permit Area	Unknown		Exploration
SP272V	715305.45	1485284.59	T53N	R67W	17	NWSW	Permit Area	Unknown		Exploration
SP273V	714550.39	1485381.51	T53N	R67W	17	NWSW	Permit Area	Unknown		Exploration
SP274V	714496.85	1485886.83	T53N	R67W	17	NWSW	Permit Area	Unknown		Exploration
SP276V	714459.23	1485900.70	T53N	R67W	17	NWSW	Permit Area	Unknown		Exploration
SP277V	714684.99	1485365.37	T53N	R67W	17	NWSW	Permit Area	Unknown		Exploration
SP278V	712933.98	1485464.36	T53N	R67W	18		Permit Area	Unknown		Exploration
SP279V	714619.90	1485092.84	T53N	R67W	17	NWSW	Permit Area	Unknown		Exploration
SP27R	711272.28	1488390.30	T53N	R67W	18		Permit Area	Unknown		Exploration
SP27V	713269.62	1488790.38	T53N	R67W	18		Permit Area	Unknown		Exploration
SP27Y	709307.57	1486142.62	T53N	R67W	18		Permit Area	Unknown		Exploration
SP280V	712783.83	1489526.29	T53N	R67W	7		Permit Area	Unknown		Exploration
SP281V	712928.19	1489613.17	T53N	R67W	7		Permit Area	Unknown		Exploration
SP282V	713062.80	1489507.79	T53N	R67W	7		Permit Area	Unknown		Exploration
SP283R	710152.94	1487556.36	T53N	R67W	18		Permit Area	Unknown		Exploration
SP283V	713059.83	1489293.83	T53N	R67W	7		Permit Area	Unknown		Exploration
SP284R	709951.79	1488021.99	T53N	R67W	18		Permit Area	Unknown		Exploration
SP284V	713061.77	1489613.87	T53N	R67W	7		Permit Area	Unknown		Exploration
SP285R	710043.94	1486118.59	T53N	R67W	18		Permit Area	Unknown		Exploration

Note: Coordinate Projections are set in State Plane NAD 83 East Feet

Drill Hole Tabulation

Hole Name	North	East	Township	Range	Section	QtrQtr	Located Within Permit Area or 1/2 Mile Buffer	Type of Plugging	Date Plugged	Exploration/Delineation
SP285V	713151.13	1489552.64	T53N	R67W	7		Permit Area	Unknown		Exploration
SP286R	710081.28	1486690.98	T53N	R67W	18		Permit Area	Unknown		Exploration
SP286V	713149.56	1489452.70	T53N	R67W	7		Permit Area	Unknown		Exploration
SP287R	710183.66	1487039.77	T53N	R67W	18		Permit Area	Unknown		Exploration
SP287V	713327.02	1489354.50	T53N	R67W	7		Permit Area	Unknown		Exploration
SP288R	709176.42	1485855.71	T53N	R67W	18		Permit Area	Unknown		Exploration
SP288V	712039.12	1488681.17	T53N	R67W	18		Permit Area	Unknown		Exploration
SP289R	709505.65	1486093.04	T53N	R67W	18		Permit Area	Unknown		Exploration
SP289V	711873.42	1488643.84	T53N	R67W	18		Permit Area	Unknown		Exploration
SP28R	711135.77	1487730.34	T53N	R67W	18		Permit Area	Unknown		Exploration
SP28V	713170.87	1489092.12	T53N	R67W	7		Permit Area	Unknown		Exploration
SP29V	713331.09	1489029.73	T53N	R67W	7		Permit Area	Unknown		Exploration
SP2R	712717.56	1488915.15	T53N	R67W	18		Permit Area	Unknown		Exploration
SP300R	709633.70	1486067.05	T53N	R67W	18		Permit Area	Unknown		Exploration
SP300V	710449.03	1485314.50	T53N	R67W	18		Permit Area	Unknown		Exploration
SP301R	710065.09	1486582.64	T53N	R67W	18		Permit Area	Unknown		Exploration
SP301V	710400.48	1483965.17	T53N	R67W	18		Permit Area	Unknown		Exploration
SP302R	709979.69	1486612.00	T53N	R67W	18		Permit Area	Unknown		Exploration
SP302V	710626.99	1483939.38	T53N	R67W	18		Permit Area	Unknown		Exploration
SP303R	710059.96	1486797.63	T53N	R67W	18		Permit Area	Unknown		Exploration
SP303V	710086.04	1484670.49	T53N	R67W	18		Permit Area	Unknown		Exploration
SP304R	709672.95	1486487.81	T53N	R67W	18		Permit Area	Unknown		Exploration
SP304V	710138.27	1484808.44	T53N	R67W	18		Permit Area	Unknown		Exploration
SP305V	710337.43	1485320.84	T53N	R67W	18		Permit Area	Unknown		Exploration
SP306V	709871.36	1485333.02	T53N	R67W	18		Permit Area	Unknown		Exploration
SP307R	709581.21	1486586.61	T53N	R67W	18		Permit Area	Unknown		Exploration
SP307V	710298.61	1484027.33	T53N	R67W	18		Permit Area	Unknown		Exploration
SP308R	709658.16	1486367.79	T53N	R67W	18		Permit Area	Unknown		Exploration
SP308V	710285.67	1483935.40	T53N	R67W	18		Permit Area	Unknown		Exploration
SP309R	709557.34	1486286.92	T53N	R67W	18		Permit Area	Unknown		Exploration
SP309V	710666.56	1483847.57	T53N	R67W	18		Permit Area	Unknown		Exploration
SP30V	709620.10	1489246.28	T53N	R67W	7		Permit Area	Unknown		Exploration
SP310V	713042.02	1488447.07	T53N	R67W	18		Permit Area	Unknown		Exploration
SP311V	712953.33	1488354.21	T53N	R67W	18		Permit Area	Unknown		Exploration
SP312V	712907.79	1488171.38	T53N	R67W	18		Permit Area	Unknown		Exploration
SP313V	712540.96	1488361.18	T53N	R67W	18		Permit Area	Unknown		Exploration
SP314V	712458.96	1488272.63	T53N	R67W	18		Permit Area	Unknown		Exploration
SP315V	712430.30	1488115.66	T53N	R67W	18		Permit Area	Unknown		Exploration
SP316V	712341.10	1488064.47	T53N	R67W	18		Permit Area	Unknown		Exploration
SP317V	712317.15	1488160.42	T53N	R67W	18		Permit Area	Unknown		Exploration
SP318V	712376.85	1488302.00	T53N	R67W	18		Permit Area	Unknown		Exploration
SP319V	712216.26	1488013.71	T53N	R67W	18		Permit Area	Unknown		Exploration
SP31V	709878.85	1489506.08	T53N	R67W	7		Permit Area	Unknown		Exploration
SP320R	709471.13	1486411.23	T53N	R67W	18		Permit Area	Unknown		Exploration

Note: Coordinate Projections are set in State Plane NAD 83 East Feet

Drill Hole Tabulation

Hole Name	North	East	Township	Range	Section	QtrQtr	Located Within Permit Area or 1/2 Mile Buffer	Type of Plugging	Date Plugged	Exploration/Delineation
SP320V	714958.68	1486347.25	T53N	R67W	17	SWNW	Permit Area	Unknown		Exploration
SP321V	711898.21	1483322.92	T53N	R67W	19		Permit Area	Unknown		Exploration
SP322R	709958.23	1486787.58	T53N	R67W	18		Permit Area	Unknown		Exploration
SP322V	711988.56	1483312.04	T53N	R67W	19		Permit Area	Unknown		Exploration
SP323R	709830.36	1486550.49	T53N	R67W	18		Permit Area	Unknown		Exploration
SP323V	711891.81	1482918.96	T53N	R67W	19		Permit Area	Unknown		Exploration
SP324V	712098.55	1482915.67	T53N	R67W	19		Permit Area	Unknown		Exploration
SP325V	712681.33	1483100.35	T53N	R67W	19		Permit Area	Unknown		Exploration
SP326R	709282.02	1486556.20	T53N	R67W	18		Permit Area	Unknown		Exploration
SP326V	712595.85	1483202.22	T53N	R67W	19		Permit Area	Unknown		Exploration
SP327V	712787.41	1483208.65	T53N	R67W	19		Permit Area	Unknown		Exploration
SP328V	712676.56	1482991.58	T53N	R67W	19		Permit Area	Unknown		Exploration
SP329R	709183.59	1486539.59	T53N	R67W	18		Permit Area	Unknown		Exploration
SP329V	712589.03	1483088.68	T53N	R67W	19		Permit Area	Unknown		Exploration
SP32R	707800.85	1484616.18	T53N	R68W	13		Permit Area	Unknown		Exploration
SP32V	709652.71	1489348.08	T53N	R67W	7		Permit Area	Unknown		Exploration
SP331R	706612.61	1484692.53	T53N	R68W	13		Permit Area	Unknown		Exploration
SP33V	709511.19	1489258.97	T53N	R67W	7		Permit Area	Unknown		Exploration
SP340V	712054.62	1488143.48	T53N	R67W	18		Permit Area	Unknown		Exploration
SP341V	711770.61	1488120.85	T53N	R67W	18		Permit Area	Unknown		Exploration
SP342V	711836.68	1488039.39	T53N	R67W	18		Permit Area	Unknown		Exploration
SP343V	712205.53	1487885.39	T53N	R67W	18		Permit Area	Unknown		Exploration
SP344V	711797.62	1487733.53	T53N	R67W	18		Permit Area	Unknown		Exploration
SP345V	711741.70	1487940.74	T53N	R67W	18		Permit Area	Unknown		Exploration
SP346V	713051.82	1488341.28	T53N	R67W	18		Permit Area	Unknown		Exploration
SP347V	711813.15	1488489.04	T53N	R67W	18		Permit Area	Unknown		Exploration
SP348V	711534.83	1488394.12	T53N	R67W	18		Permit Area	Unknown		Exploration
SP349V	710786.29	1487590.47	T53N	R67W	18		Permit Area	Unknown		Exploration
SP34V	708899.90	1489332.32	T53N	R68W	12	SESE	Permit Area	Unknown		Exploration
SP350V	711178.56	1484519.42	T53N	R67W	18		Permit Area	Unknown		Exploration
SP351V	710235.67	1485330.48	T53N	R67W	18		Permit Area	Unknown		Exploration
SP352V	710065.93	1484873.94	T53N	R67W	18		Permit Area	Unknown		Exploration
SP353V	709996.86	1484946.00	T53N	R67W	18		Permit Area	Unknown		Exploration
SP354V	710997.83	1484805.30	T53N	R67W	18		Permit Area	Unknown		Exploration
SP355V	710281.78	1485248.52	T53N	R67W	18		Permit Area	Unknown		Exploration
SP356V	711230.33	1484887.11	T53N	R67W	18		Permit Area	Unknown		Exploration
SP357V	711201.15	1484709.82	T53N	R67W	18		Permit Area	Unknown		Exploration
SP358V	710032.77	1485041.25	T53N	R67W	18		Permit Area	Unknown		Exploration
SP359V	709917.98	1485004.91	T53N	R67W	18		Permit Area	Unknown		Exploration
SP35V	709442.36	1489212.88	T53N	R67W	7		Permit Area	Unknown		Exploration
SP360V	712774.52	1483109.60	T53N	R67W	19		Permit Area	Unknown		Exploration
SP361V	712103.15	1482816.66	T53N	R67W	19		Permit Area	Unknown		Exploration
SP362V	711798.41	1482935.51	T53N	R67W	19		Permit Area	Unknown		Exploration
SP363V	712566.00	1483714.54	T53N	R67W	18		Permit Area	Unknown		Exploration

Note: Coordinate Projections are set in State Plane NAD 83 East Feet

Drill Hole Tabulation

Hole Name	North	East	Township	Range	Section	QtrQtr	Located Within Permit Area or 1/2 Mile Buffer	Type of Plugging	Date Plugged	Exploration/Delineation
SP364V	712535.34	1483830.50	T53N	R67W	18		Permit Area	Unknown		Exploration
SP365V	712182.81	1484382.24	T53N	R67W	18		Permit Area	Unknown		Exploration
SP366V	712674.29	1483721.33	T53N	R67W	18		Permit Area	Unknown		Exploration
SP367V	712667.94	1483613.01	T53N	R67W	19		Permit Area	Unknown		Exploration
SP368V	712292.69	1483607.91	T53N	R67W	19		Permit Area	Unknown		Exploration
SP369V	712657.68	1483816.47	T53N	R67W	18		Permit Area	Unknown		Exploration
SP36V	709315.15	1488825.34	T53N	R67W	18		Permit Area	Unknown		Exploration
SP37V	709827.44	1488874.17	T53N	R67W	18		Permit Area	Unknown		Exploration
SP380V	710612.01	1487757.50	T53N	R67W	18		Permit Area	Unknown		Exploration
SP381R	709758.15	1486550.34	T53N	R67W	18		Permit Area	Unknown		Exploration
SP381V	710360.22	1487304.07	T53N	R67W	18		Permit Area	Unknown		Exploration
SP382R	709219.88	1486628.67	T53N	R67W	18		Permit Area	Unknown		Exploration
SP382V	710061.94	1487177.37	T53N	R67W	18		Permit Area	Unknown		Exploration
SP383V	710019.73	1486954.10	T53N	R67W	18		Permit Area	Unknown		Exploration
SP384R	709833.81	1486642.92	T53N	R67W	18		Permit Area	Unknown		Exploration
SP384V	710074.70	1487293.64	T53N	R67W	18		Permit Area	Unknown		Exploration
SP385R	710317.16	1487497.62	T53N	R67W	18		Permit Area	Unknown		Exploration
SP385V	710121.51	1486934.62	T53N	R67W	18		Permit Area	Unknown		Exploration
SP386R	709316.26	1486649.84	T53N	R67W	18		Permit Area	Unknown		Exploration
SP386V	710166.97	1487177.58	T53N	R67W	18		Permit Area	Unknown		Exploration
SP387R	709202.57	1486732.48	T53N	R67W	18		Permit Area	Unknown		Exploration
SP387V	709966.40	1487293.42	T53N	R67W	18		Permit Area	Unknown		Exploration
SP388R	709329.73	1486746.01	T53N	R67W	18		Permit Area	Unknown		Exploration
SP388V	710064.63	1487405.21	T53N	R67W	18		Permit Area	Unknown		Exploration
SP389R	709431.11	1486676.36	T53N	R67W	18		Permit Area	Unknown		Exploration
SP389V	709998.72	1487536.35	T53N	R67W	18		Permit Area	Unknown		Exploration
SP38V	710997.93	1487730.06	T53N	R67W	18		Permit Area	Unknown		Exploration
SP390V	709977.39	1484837.65	T53N	R67W	18		Permit Area	Unknown		Exploration
SP391V	710095.28	1484969.17	T53N	R67W	18		Permit Area	Unknown		Exploration
SP392V	710272.14	1485150.04	T53N	R67W	18		Permit Area	Unknown		Exploration
SP393V	710390.10	1485242.18	T53N	R67W	18		Permit Area	Unknown		Exploration
SP394V	710278.31	1485408.68	T53N	R67W	18		Permit Area	Unknown		Exploration
SP395V	710183.44	1485189.25	T53N	R67W	18		Permit Area	Unknown		Exploration
SP396V	710373.93	1485127.28	T53N	R67W	18		Permit Area	Unknown		Exploration
SP397V	710255.94	1485044.99	T53N	R67W	18		Permit Area	Unknown		Exploration
SP398V	709895.21	1484903.13	T53N	R67W	18		Permit Area	Unknown		Exploration
SP399V	709816.19	1485024.40	T53N	R67W	18		Permit Area	Unknown		Exploration
SP39V	711007.46	1487884.33	T53N	R67W	18		Permit Area	Unknown		Exploration
SP3R	712925.04	1488918.26	T53N	R67W	18		Permit Area	Unknown		Exploration
SP3Y	711784.88	1483985.62	T53N	R67W	18		Permit Area	Unknown		Exploration
SP400V	710087.06	1487674.38	T53N	R67W	18		Permit Area	Unknown		Exploration
SP401V	710199.40	1487300.46	T53N	R67W	18		Permit Area	Unknown		Exploration
SP402V	710192.52	1487457.98	T53N	R67W	18		Permit Area	Unknown		Exploration
SP403V	710251.32	1487595.94	T53N	R67W	18		Permit Area	Unknown		Exploration

Note: Coordinate Projections are set in State Plane NAD 83 East Feet

Drill Hole Tabulation

Hole Name	North	East	Township	Range	Section	QtrQtr	Located Within Permit Area or 1/2 Mile Buffer	Type of Plugging	Date Plugged	Exploration/Delineation
SP404V	710265.52	1487131.83	T53N	R67W	18		Permit Area	Unknown		Exploration
SP405V	710353.02	1487615.84	T53N	R67W	18		Permit Area	Unknown		Exploration
SP406V	710293.76	1487707.62	T53N	R67W	18		Permit Area	Unknown		Exploration
SP407V	710205.00	1487776.36	T53N	R67W	18		Permit Area	Unknown		Exploration
SP408V	710346.08	1487799.62	T53N	R67W	18		Permit Area	Unknown		Exploration
SP409V	710103.21	1487802.41	T53N	R67W	18		Permit Area	Unknown		Exploration
SP40R	712367.28	1487440.82	T53N	R67W	18		Permit Area	Unknown		Exploration
SP40V	710765.01	1483851.05	T53N	R67W	18		Permit Area	Unknown		Exploration
SP410V	712762.90	1483721.51	T53N	R67W	18		Permit Area	Unknown		Exploration
SP411V	711993.61	1482809.02	T53N	R67W	19		Permit Area	Unknown		Exploration
SP412V	712000.14	1482911.27	T53N	R67W	19		Permit Area	Unknown		Exploration
SP413V	712765.97	1483826.54	T53N	R67W	18		Permit Area	Unknown		Exploration
SP414V	712867.92	1483725.00	T53N	R67W	18		Permit Area	Unknown		Exploration
SP415V	712980.50	1482249.09	T53N	R67W	19		Permit Area	Unknown		Exploration
SP416V	712854.57	1483833.28	T53N	R67W	18		Permit Area	Unknown		Exploration
SP417V	712912.76	1483720.76	T53N	R67W	18		Permit Area	Unknown		Exploration
SP418V	712959.58	1483840.06	T53N	R67W	18		Permit Area	Unknown		Exploration
SP419V	713154.30	1483759.92	T53N	R67W	18		Permit Area	Unknown		Exploration
SP41R	713411.74	1487055.67	T53N	R67W	18		Permit Area	Unknown		Exploration
SP41V	711320.08	1484326.07	T53N	R67W	18		Permit Area	Unknown		Exploration
SP420R	709208.36	1486835.48	T53N	R67W	18		Permit Area	Unknown		Exploration
SP425R	709172.08	1486987.33	T53N	R67W	18		Permit Area	Unknown		Exploration
SP426R	709106.78	1486854.73	T53N	R67W	18		Permit Area	Unknown		Exploration
SP427R	709304.62	1486838.93	T53N	R67W	18		Permit Area	Unknown		Exploration
SP428R	709295.01	1486964.21	T53N	R67W	18		Permit Area	Unknown		Exploration
SP429R	709458.65	1486880.76	T53N	R67W	18		Permit Area	Unknown		Exploration
SP42R	713353.70	1486546.84	T53N	R67W	18		Permit Area	Unknown		Exploration
SP42V	710752.09	1483749.28	T53N	R67W	18		Permit Area	Unknown		Exploration
SP430V	709957.93	1484722.74	T53N	R67W	18		Permit Area	Unknown		Exploration
SP431V	710236.46	1484943.20	T53N	R67W	18		Permit Area	Unknown		Exploration
SP432V	710357.72	1485025.50	T53N	R67W	18		Permit Area	Unknown		Exploration
SP433V	710478.94	1485130.77	T53N	R67W	18		Permit Area	Unknown		Exploration
SP434V	709720.94	1485060.31	T53N	R67W	18		Permit Area	Unknown		Exploration
SP435V	709848.82	1485119.64	T53N	R67W	18		Permit Area	Unknown		Exploration
SP436V	709786.84	1484932.44	T53N	R67W	18		Permit Area	Unknown		Exploration
SP437V	709635.56	1485083.11	T53N	R67W	18		Permit Area	Unknown		Exploration
SP438V	709733.90	1485142.38	T53N	R67W	18		Permit Area	Unknown		Exploration
SP439V	709688.32	1484961.78	T53N	R67W	18		Permit Area	Unknown		Exploration
SP43R	713897.56	1487013.99	T53N	R67W	18		Permit Area	Unknown		Exploration
SP43V	710647.08	1483742.50	T53N	R67W	18		Permit Area	Unknown		Exploration
SP448R	712727.39	1488710.27	T53N	R67W	18		Permit Area	Unknown		Exploration
SP449R	712338.24	1488667.27	T53N	R67W	18		Permit Area	Unknown		Exploration
SP44R	713371.08	1487619.79	T53N	R67W	18		Permit Area	Unknown		Exploration
SP44V	710364.51	1483896.18	T53N	R67W	18		Permit Area	Unknown		Exploration

Note: Coordinate Projections are set in State Plane NAD 83 East Feet

Drill Hole Tabulation

Hole Name	North	East	Township	Range	Section	QtrQtr	Located Within Permit Area or 1/2 Mile Buffer	Type of Plugging	Date Plugged	Exploration/Delineation
SP450V	713071.16	1483846.85	T53N	R67W	18		Permit Area	Unknown		Exploration
SP451V	712949.53	1483941.78	T53N	R67W	18		Permit Area	Unknown		Exploration
SP452V	711886.51	1482817.30	T53N	R67W	19		Permit Area	Unknown		Exploration
SP453V	711983.89	1482556.19	T53N	R67W	19		Permit Area	Unknown		Exploration
SP454V	712158.00	1482102.91	T53N	R67W	19		Permit Area	Unknown		Exploration
SP455V	712204.07	1481540.66	T53N	R67W	19		Permit Area	Unknown		Exploration
SP456V	712440.22	1480780.11	T53N	R67W	19		Permit Area	Unknown		Exploration
SP45R	713823.11	1488461.79	T53N	R67W	18		Permit Area	Unknown		Exploration
SP45V	710381.31	1483705.86	T53N	R67W	18		Permit Area	Unknown		Exploration
SP460V	710257.31	1487878.21	T53N	R67W	18		Permit Area	Unknown		Exploration
SP461V	710041.01	1487720.23	T53N	R67W	18		Permit Area	Unknown		Exploration
SP462V	710477.37	1487793.32	T53N	R67W	18		Permit Area	Unknown		Exploration
SP463V	710568.90	1487977.30	T53N	R67W	18		Permit Area	Unknown		Exploration
SP464V	709239.53	1488890.83	T53N	R67W	18		Permit Area	Unknown		Exploration
SP465V	709340.45	1489294.72	T53N	R67W	7		Permit Area	Unknown		Exploration
SP466V	708831.61	1489394.84	T53N	R68W	12	SESE	Permit Area	Unknown		Exploration
SP467V	709724.97	1489318.69	T53N	R67W	7		Permit Area	Unknown		Exploration
SP468V	709754.27	1489436.91	T53N	R67W	7		Permit Area	Unknown		Exploration
SP469V	713342.63	1489153.32	T53N	R67W	7		Permit Area	Unknown		Exploration
SP46R	714235.58	1488710.20	T53N	R67W	18		Permit Area	Unknown		Exploration
SP46V	710748.41	1483946.19	T53N	R67W	18		Permit Area	Unknown		Exploration
SP478V	712441.91	1481464.41	T53N	R67W	19		Permit Area	Unknown		Exploration
SP479V	712344.53	1481371.27	T53N	R67W	19		Permit Area	Unknown		Exploration
SP47V	711336.31	1484414.71	T53N	R67W	18		Permit Area	Unknown		Exploration
SP480R	712622.02	1488817.51	T53N	R67W	18		Permit Area	Unknown		Exploration
SP480V	713294.80	1489153.89	T53N	R67W	7		Permit Area	Unknown		Exploration
SP481R	712779.05	1488630.20	T53N	R67W	18		Permit Area	Unknown		Exploration
SP481V	713244.21	1489154.11	T53N	R67W	7		Permit Area	Unknown		Exploration
SP482R	712924.51	1488824.26	T53N	R67W	18		Permit Area	Unknown		Exploration
SP482V	713189.22	1489152.98	T53N	R67W	7		Permit Area	Unknown		Exploration
SP483R	712679.42	1488623.96	T53N	R67W	18		Permit Area	Unknown		Exploration
SP483V	712405.88	1489153.02	T53N	R67W	7		Permit Area	Unknown		Exploration
SP484R	712869.71	1488625.43	T53N	R67W	18		Permit Area	Unknown		Exploration
SP484V	712507.95	1489152.60	T53N	R67W	7		Permit Area	Unknown		Exploration
SP485R	712633.35	1488912.97	T53N	R67W	18		Permit Area	Unknown		Exploration
SP485V	712766.97	1489179.98	T53N	R67W	7		Permit Area	Unknown		Exploration
SP486R	712935.58	1488721.76	T53N	R67W	18		Permit Area	Unknown		Exploration
SP486V	712814.34	1489161.20	T53N	R67W	7		Permit Area	Unknown		Exploration
SP487R	713000.10	1488775.19	T53N	R67W	18		Permit Area	Unknown		Exploration
SP487V	709711.43	1486851.73	T53N	R67W	18		Permit Area	Unknown		Exploration
SP488R	712976.19	1488620.75	T53N	R67W	18		Permit Area	Unknown		Exploration
SP488V	709806.61	1486848.65	T53N	R67W	18		Permit Area	Unknown		Exploration
SP489R	713064.83	1488607.81	T53N	R67W	18		Permit Area	Unknown		Exploration
SP489V	709905.08	1486845.56	T53N	R67W	18		Permit Area	Unknown		Exploration

Note: Coordinate Projections are set in State Plane NAD 83 East Feet

Drill Hole Tabulation

Hole Name	North	East	Township	Range	Section	QtrQtr	Located Within Permit Area or 1/2 Mile Buffer	Type of Plugging	Date Plugged	Exploration/Delineation
SP48V	711391.43	1484749.59	T53N	R67W	18		Permit Area	Unknown		Exploration
SP492V	712101.91	1481536.84	T53N	R67W	19		Permit Area	Unknown		Exploration
SP493V	712197.03	1481439.07	T53N	R67W	19		Permit Area	Unknown		Exploration
SP494V	712328.86	1481472.98	T53N	R67W	19		Permit Area	Unknown		Exploration
SP495V	712003.89	1481545.31	T53N	R67W	19		Permit Area	Unknown		Exploration
SP496V	711969.74	1481476.12	T53N	R67W	19		Permit Area	Unknown		Exploration
SP497V	711898.70	1481563.74	T53N	R67W	19		Permit Area	Unknown		Exploration
SP498V	712090.78	1481444.10	T53N	R67W	19		Permit Area	Unknown		Exploration
SP499V	711990.72	1481679.68	T53N	R67W	19		Permit Area	Unknown		Exploration
SP49V	711273.84	1484473.66	T53N	R67W	18		Permit Area	Unknown		Exploration
SP4R	712826.89	1488717.50	T53N	R67W	18		Permit Area	Unknown		Exploration
SP4Y	711794.91	1483897.03	T53N	R67W	18		Permit Area	Unknown		Exploration
SP500V	710755.28	1483795.23	T53N	R67W	18		Permit Area	Unknown		Exploration
SP501V	710187.21	1483935.20	T53N	R67W	18		Permit Area	Unknown		Exploration
SP502V	710190.15	1484102.59	T53N	R67W	18		Permit Area	Unknown		Exploration
SP503V	710531.48	1484100.00	T53N	R67W	18		Permit Area	Unknown		Exploration
SP504V	710167.60	1484910.24	T53N	R67W	18		Permit Area	Unknown		Exploration
SP505V	709589.87	1484958.30	T53N	R67W	18		Permit Area	Unknown		Exploration
SP507V	711345.24	1484190.28	T53N	R67W	18		Permit Area	Unknown		Exploration
SP508V	711366.11	1484290.06	T53N	R67W	18		Permit Area	Unknown		Exploration
SP509R	709245.29	1487996.69	T53N	R67W	18		Permit Area	Unknown		Exploration
SP509V	709560.52	1484866.34	T53N	R67W	18		Permit Area	Unknown		Exploration
SP50R	710770.13	1488389.28	T53N	R67W	18		Permit Area	Unknown		Exploration
SP50V	710672.53	1484139.68	T53N	R67W	18		Permit Area	Unknown		Exploration
SP510R	713033.29	1488948.02	T53N	R67W	18		Permit Area	Unknown		Exploration
SP510V	709384.25	1486739.73	T53N	R67W	18		Permit Area	Unknown		Exploration
SP511R	713080.00	1488718.77	T53N	R67W	18		Permit Area	Unknown		Exploration
SP511V	709258.35	1486735.87	T53N	R67W	18		Permit Area	Unknown		Exploration
SP512R	712585.80	1488568.04	T53N	R67W	18		Permit Area	Unknown		Exploration
SP512V	709130.37	1486729.05	T53N	R67W	18		Permit Area	Unknown		Exploration
SP513R	712485.52	1488577.22	T53N	R67W	18		Permit Area	Unknown		Exploration
SP513V	709865.88	1489427.29	T53N	R67W	7		Permit Area	Unknown		Exploration
SP514R	713066.39	1489051.11	T53N	R67W	7		Permit Area	Unknown		Exploration
SP514V	709826.67	1489338.59	T53N	R67W	7		Permit Area	Unknown		Exploration
SP515R	712926.13	1489029.75	T53N	R67W	7		Permit Area	Unknown		Exploration
SP516R	712727.34	1489025.57	T53N	R67W	7		Permit Area	Unknown		Exploration
SP516V	709795.30	1487506.40	T53N	R67W	18		Permit Area	Unknown		Exploration
SP517R	712627.51	1489024.16	T53N	R67W	7		Permit Area	Unknown		Exploration
SP518R	712717.85	1489193.79	T53N	R67W	7		Permit Area	Unknown		Exploration
SP519R	712976.49	1489119.00	T53N	R67W	7		Permit Area	Unknown		Exploration
SP519V	711188.20	1484624.46	T53N	R67W	18		Permit Area	Unknown		Exploration
SP51R	713239.25	1485442.01	T53N	R67W	18		Permit Area	Unknown		Exploration
SP51V	710227.71	1484401.66	T53N	R67W	18		Permit Area	Unknown		Exploration
SP520V	711259.67	1484985.63	T53N	R67W	18		Permit Area	Unknown		Exploration

Note: Coordinate Projections are set in State Plane NAD 83 East Feet

Drill Hole Tabulation

Hole Name	North	East	Township	Range	Section	QtrQtr	Located Within Permit Area or 1/2 Mile Buffer	Type of Plugging	Date Plugged	Exploration/Delineation
SP521V	711135.11	1484909.89	T53N	R67W	18		Permit Area	Unknown		Exploration
SP522V	711093.20	1484713.60	T53N	R67W	18		Permit Area	Unknown		Exploration
SP523V	711293.12	1484673.90	T53N	R67W	18		Permit Area	Unknown		Exploration
SP524V	711341.07	1484996.88	T53N	R67W	18		Permit Area	Unknown		Exploration
SP525V	711252.93	1485070.94	T53N	R67W	18		Permit Area	Unknown		Exploration
SP526V	711157.88	1485008.39	T53N	R67W	18		Permit Area	Unknown		Exploration
SP527R	709562.55	1486402.29	T53N	R67W	18		Permit Area	Unknown		Exploration
SP527V	710997.60	1484920.17	T53N	R67W	18		Permit Area	Unknown		Exploration
SP528R	709519.71	1486489.14	T53N	R67W	18		Permit Area	Unknown		Exploration
SP528V	711364.95	1484904.74	T53N	R67W	18		Permit Area	Unknown		Exploration
SP529R	709614.48	1486317.13	T53N	R67W	18		Permit Area	Unknown		Exploration
SP529V	711548.85	1484852.60	T53N	R67W	18		Permit Area	Unknown		Exploration
SP52R	713787.30	1485466.10	T53N	R67W	18		Permit Area	Unknown		Exploration
SP52V	710667.24	1484527.27	T53N	R67W	18		Permit Area	Unknown		Exploration
SP530V	712082.63	1481673.30	T53N	R67W	19		Permit Area	Unknown		Exploration
SP531R	713040.01	1488869.27	T53N	R67W	18		Permit Area	Unknown		Exploration
SP531V	712164.67	1481680.03	T53N	R67W	19		Permit Area	Unknown		Exploration
SP532R	712618.37	1488709.30	T53N	R67W	18		Permit Area	Unknown		Exploration
SP532V	712246.73	1481673.64	T53N	R67W	19		Permit Area	Unknown		Exploration
SP533R	712562.40	1488938.04	T53N	R67W	18		Permit Area	Unknown		Exploration
SP533V	711819.72	1481556.58	T53N	R67W	19		Permit Area	Unknown		Exploration
SP534R	712531.52	1488857.07	T53N	R67W	18		Permit Area	Unknown		Exploration
SP534V	711892.19	1481715.58	T53N	R67W	19		Permit Area	Unknown		Exploration
SP535R	712531.47	1488754.67	T53N	R67W	18		Permit Area	Unknown		Exploration
SP535V	711993.64	1481765.18	T53N	R67W	19		Permit Area	Unknown		Exploration
SP536R	712533.14	1488656.61	T53N	R67W	18		Permit Area	Unknown		Exploration
SP536V	712089.01	1481765.21	T53N	R67W	19		Permit Area	Unknown		Exploration
SP537R	712413.41	1488708.48	T53N	R67W	18		Permit Area	Unknown		Exploration
SP537V	712167.76	1481775.22	T53N	R67W	19		Permit Area	Unknown		Exploration
SP538R	712446.06	1488793.88	T53N	R67W	18		Permit Area	Unknown		Exploration
SP538V	712340.63	1481677.16	T53N	R67W	19		Permit Area	Unknown		Exploration
SP539R	712440.88	1489901.42	T53N	R67W	7		Permit Area	Unknown		Exploration
SP539V	712246.54	1481768.81	T53N	R67W	19		Permit Area	Unknown		Exploration
SP53V	710792.96	1484518.24	T53N	R67W	18		Permit Area	Unknown		Exploration
SP540R	712491.43	1481762.80	T53N	R67W	19		Permit Area	Unknown		Exploration
SP540V	709661.58	1485201.31	T53N	R67W	18		Permit Area	Unknown		Exploration
SP541V	709491.45	1484938.40	T53N	R67W	18		Permit Area	Unknown		Exploration
SP542V	709658.96	1484876.39	T53N	R67W	18		Permit Area	Unknown		Exploration
SP543V	709688.83	1484712.35	T53N	R67W	18		Permit Area	Unknown		Exploration
SP544V	709805.40	1485555.40	T53N	R67W	18		Permit Area	Unknown		Exploration
SP545V	709719.93	1485624.15	T53N	R67W	18		Permit Area	Unknown		Exploration
SP546V	709897.18	1485614.67	T53N	R67W	18		Permit Area	Unknown		Exploration
SP547V	710176.52	1485431.44	T53N	R67W	18		Permit Area	Unknown		Exploration
SP548V	710042.01	1485339.93	T53N	R67W	18		Permit Area	Unknown		Exploration

Note: Coordinate Projections are set in State Plane NAD 83 East Feet

Drill Hole Tabulation

Hole Name	North	East	Township	Range	Section	QtrQtr	Located Within Permit Area or 1/2 Mile Buffer	Type of Plugging	Date Plugged	Exploration/Delineation
SP549V	709976.08	1485545.91	T53N	R67W	18		Permit Area	Unknown		Exploration
SP54R	710978.45	1483795.69	T53N	R67W	18		Permit Area	Unknown		Exploration
SP54V	710858.73	1484376.03	T53N	R67W	18		Permit Area	Unknown		Exploration
SP54X	708805.14	1483003.48	T53N	R68W	24	NENE	Permit Area	Unknown		Exploration
SP550R	709239.62	1488103.05	T53N	R67W	18		Permit Area	Unknown		Exploration
SP550V	711910.10	1481803.57	T53N	R67W	19		Permit Area	Unknown		Exploration
SP551R	709346.56	1488003.53	T53N	R67W	18		Permit Area	Unknown		Exploration
SP551V	711993.62	1481870.04	T53N	R67W	19		Permit Area	Unknown		Exploration
SP552V	712070.65	1481868.29	T53N	R67W	19		Permit Area	Unknown		Exploration
SP553R	709352.04	1488085.36	T53N	R67W	18		Permit Area	Unknown		Exploration
SP553V	712425.98	1481667.49	T53N	R67W	19		Permit Area	Unknown		Exploration
SP554V	712341.71	1481772.29	T53N	R67W	19		Permit Area	Unknown		Exploration
SP555R	709235.70	1488207.77	T53N	R67W	18		Permit Area	Unknown		Exploration
SP555V	712160.98	1481880.23	T53N	R67W	19		Permit Area	Unknown		Exploration
SP556R	709420.66	1488343.93	T53N	R67W	18		Permit Area	Unknown		Exploration
SP556V	712263.06	1481863.88	T53N	R67W	19		Permit Area	Unknown		Exploration
SP557R	709310.20	1488435.20	T53N	R67W	18		Permit Area	Unknown		Exploration
SP557V	712527.72	1481670.98	T53N	R67W	19		Permit Area	Unknown		Exploration
SP558R	709411.77	1488535.38	T53N	R67W	18		Permit Area	Unknown		Exploration
SP558V	712266.13	1481968.91	T53N	R67W	19		Permit Area	Unknown		Exploration
SP559R	709507.33	1488428.71	T53N	R67W	18		Permit Area	Unknown		Exploration
SP559V	712370.87	1481877.11	T53N	R67W	19		Permit Area	Unknown		Exploration
SP55R	710364.69	1483810.85	T53N	R67W	18		Permit Area	Unknown		Exploration
SP55V	710865.88	1484281.20	T53N	R67W	18		Permit Area	Unknown		Exploration
SP55X	708664.32	1482855.51	T53N	R68W	24	NENE	Permit Area	Unknown		Exploration
SP560V	711456.82	1485015.47	T53N	R67W	18		Permit Area	Unknown		Exploration
SP561V	711217.04	1485289.71	T53N	R67W	18		Permit Area	Unknown		Exploration
SP562V	711243.49	1485194.59	T53N	R67W	18		Permit Area	Unknown		Exploration
SP563V	711155.04	1485115.64	T53N	R67W	18		Permit Area	Unknown		Exploration
SP564V	713523.56	1489136.52	T53N	R67W	7		Permit Area	Unknown		Exploration
SP565V	713480.74	1489198.36	T53N	R67W	7		Permit Area	Unknown		Exploration
SP566V	713442.75	1489285.39	T53N	R67W	7		Permit Area	Unknown		Exploration
SP567V	711390.85	1485082.02	T53N	R67W	18		Permit Area	Unknown		Exploration
SP568V	711338.64	1485207.91	T53N	R67W	18		Permit Area	Unknown		Exploration
SP569V	711056.54	1485131.85	T53N	R67W	18		Permit Area	Unknown		Exploration
SP56R	710459.66	1483912.78	T53N	R67W	18		Permit Area	Unknown		Exploration
SP56V	710660.48	1484625.71	T53N	R67W	18		Permit Area	Unknown		Exploration
SP56X	708565.68	1482940.64	T53N	R68W	24	NENE	Permit Area	Unknown		Exploration
SP570R	709370.01	1486103.37	T53N	R67W	18		Permit Area	Unknown		Exploration
SP570V	712409.80	1481278.03	T53N	R67W	19		Permit Area	Unknown		Exploration
SP571V	712498.80	1481342.05	T53N	R67W	19		Permit Area	Unknown		Exploration
SP572R	709433.84	1488238.96	T53N	R67W	18		Permit Area	Unknown		Exploration
SP572V	712262.65	1481400.84	T53N	R67W	19		Permit Area	Unknown		Exploration
SP573R	709272.88	1488342.48	T53N	R67W	18		Permit Area	Unknown		Exploration

Note: Coordinate Projections are set in State Plane NAD 83 East Feet

Drill Hole Tabulation

Hole Name	North	East	Township	Range	Section	QtrQtr	Located Within Permit Area or 1/2 Mile Buffer	Type of Plugging	Date Plugged	Exploration/Delineation
SP573V	712199.73	1481351.02	T53N	R67W	19		Permit Area	Unknown		Exploration
SP574R	709205.18	1488434.99	T53N	R67W	18		Permit Area	Unknown		Exploration
SP574V	712537.80	1481443.04	T53N	R67W	19		Permit Area	Unknown		Exploration
SP575R	709303.86	1488533.68	T53N	R67W	18		Permit Area	Unknown		Exploration
SP575V	712330.91	1481270.39	T53N	R67W	19		Permit Area	Unknown		Exploration
SP576R	709407.64	1488629.99	T53N	R67W	18		Permit Area	Unknown		Exploration
SP576V	712246.20	1481243.30	T53N	R67W	19		Permit Area	Unknown		Exploration
SP57R	710564.88	1483817.82	T53N	R67W	18		Permit Area	Unknown		Exploration
SP57V	710797.89	1484614.77	T53N	R67W	18		Permit Area	Unknown		Exploration
SP57X	708605.21	1482871.79	T53N	R68W	24	NENE	Permit Area	Unknown		Exploration
SP580R	712872.20	1489112.35	T53N	R67W	7		Permit Area	Unknown		Exploration
SP580V	712615.41	1481682.95	T53N	R67W	19		Permit Area	Unknown		Exploration
SP581R	712770.99	1489110.21	T53N	R67W	7		Permit Area	Unknown		Exploration
SP581V	712491.43	1481762.80	T53N	R67W	19		Permit Area	Unknown		Exploration
SP582R	712675.82	1489106.73	T53N	R67W	7		Permit Area	Unknown		Exploration
SP582V	712095.03	1481344.07	T53N	R67W	19		Permit Area	Unknown		Exploration
SP583R	712810.24	1489224.91	T53N	R67W	7		Permit Area	Unknown		Exploration
SP583V	712256.92	1481148.08	T53N	R67W	19		Permit Area	Unknown		Exploration
SP584R	712919.41	1489217.50	T53N	R67W	7		Permit Area	Unknown		Exploration
SP584V	712713.86	1481689.72	T53N	R67W	19		Permit Area	Unknown		Exploration
SP585R	713006.46	1489197.46	T53N	R67W	7		Permit Area	Unknown		Exploration
SP585V	712622.67	1481779.48	T53N	R67W	19		Permit Area	Unknown		Exploration
SP586R	712975.45	1489299.83	T53N	R67W	7		Permit Area	Unknown		Exploration
SP586V	712609.81	1481538.36	T53N	R67W	19		Permit Area	Unknown		Exploration
SP587R	712870.35	1489312.45	T53N	R67W	7		Permit Area	Unknown		Exploration
SP587V	713051.22	1481509.67	T53N	R67W	19		Permit Area	Unknown		Exploration
SP588R	712740.09	1489296.33	T53N	R67W	7		Permit Area	Unknown		Exploration
SP588V	712720.63	1481587.99	T53N	R67W	19		Permit Area	Unknown		Exploration
SP589R	712763.39	1489423.43	T53N	R67W	7		Permit Area	Unknown		Exploration
SP589V	712818.90	1481683.37	T53N	R67W	19		Permit Area	Unknown		Exploration
SP58R	710469.91	1483712.60	T53N	R67W	18		Permit Area	Unknown		Exploration
SP58V	710894.55	1484513.95	T53N	R67W	18		Permit Area	Unknown		Exploration
SP590V	711483.11	1486483.79	T53N	R67W	18		Permit Area	Unknown		Exploration
SP591V	711394.70	1486385.15	T53N	R67W	18		Permit Area	Unknown		Exploration
SP592V	711685.58	1486072.27	T53N	R67W	18		Permit Area	Unknown		Exploration
SP593V	710180.40	1485071.09	T53N	R67W	18		Permit Area	Unknown		Exploration
SP594V	710173.65	1485162.97	T53N	R67W	18		Permit Area	Unknown		Exploration
SP595V	709766.31	1485345.93	T53N	R67W	18		Permit Area	Unknown		Exploration
SP596V	709815.03	1485663.73	T53N	R67W	18		Permit Area	Unknown		Exploration
SP597V	709985.72	1485650.95	T53N	R67W	18		Permit Area	Unknown		Exploration
SP598V	710977.53	1485249.84	T53N	R67W	18		Permit Area	Unknown		Exploration
SP599V	711358.84	1486289.72	T53N	R67W	18		Permit Area	Unknown		Exploration
SP59R	711209.77	1481858.99	T53N	R67W	19		Permit Area	Unknown		Exploration
SP59V	710568.68	1484576.30	T53N	R67W	18		Permit Area	Unknown		Exploration

Note: Coordinate Projections are set in State Plane NAD 83 East Feet

Drill Hole Tabulation

Hole Name	North	East	Township	Range	Section	QtrQtr	Located Within Permit Area or 1/2 Mile Buffer	Type of Plugging	Date Plugged	Exploration/Delineation
SP5R	712830.83	1489024.01	T53N	R67W	7		Permit Area	Unknown		Exploration
SP5Y	711821.04	1483959.44	T53N	R67W	18		Permit Area	Unknown		Exploration
SP600V	711474.45	1480636.76	T53N	R67W	19		Permit Area	Unknown		Exploration
SP601V	711569.26	1480734.98	T53N	R67W	19		Permit Area	Unknown		Exploration
SP602R	709104.29	1487657.84	T53N	R67W	18		Permit Area	Unknown		Exploration
SP602V	711405.57	1480808.59	T53N	R67W	19		Permit Area	Unknown		Exploration
SP603V	711219.26	1480560.46	T53N	R67W	19		Permit Area	Unknown		Exploration
SP604V	711156.36	1480652.78	T53N	R67W	19		Permit Area	Unknown		Exploration
SP605V	710957.54	1480747.69	T53N	R67W	19		Permit Area	Unknown		Exploration
SP606R	707915.59	1490048.23	T53N	R68W	12	SESE	Permit Area	Unknown		Exploration
SP606V	711404.12	1480908.69	T53N	R67W	19		Permit Area	Unknown		Exploration
SP607R	707942.03	1489956.39	T53N	R68W	12	SESE	Permit Area	Unknown		Exploration
SP607V	711506.90	1480820.09	T53N	R67W	19		Permit Area	Unknown		Exploration
SP608V	711664.68	1480731.17	T53N	R67W	19		Permit Area	Unknown		Exploration
SP609V	711688.21	1481637.38	T53N	R67W	19		Permit Area	Unknown		Exploration
SP60R	710466.42	1483814.34	T53N	R67W	18		Permit Area	Unknown		Exploration
SP60V	713351.54	1488852.90	T53N	R67W	18		Permit Area	Unknown		Exploration
SP610V	712769.48	1481775.16	T53N	R67W	19		Permit Area	Unknown		Exploration
SP611V	712624.17	1481881.99	T53N	R67W	19		Permit Area	Unknown		Exploration
SP612V	713057.52	1481608.20	T53N	R67W	19		Permit Area	Unknown		Exploration
SP613V	712955.56	1481537.60	T53N	R67W	19		Permit Area	Unknown		Exploration
SP614V	713047.00	1481408.57	T53N	R67W	19		Permit Area	Unknown		Exploration
SP615V	712879.06	1481761.24	T53N	R67W	19		Permit Area	Unknown		Exploration
SP616V	712914.11	1481667.15	T53N	R67W	19		Permit Area	Unknown		Exploration
SP617V	712826.37	1481565.06	T53N	R67W	19		Permit Area	Unknown		Exploration
SP618V	712728.09	1481486.00	T53N	R67W	19		Permit Area	Unknown		Exploration
SP619V	713174.15	1481488.22	T53N	R67W	19		Permit Area	Unknown		Exploration
SP61R	709957.74	1483800.17	T53N	R67W	18		Permit Area	Unknown		Exploration
SP61V	713279.66	1488691.94	T53N	R67W	18		Permit Area	Unknown		Exploration
SP620R	712964.54	1489411.92	T53N	R67W	7		Permit Area	Unknown		Exploration
SP620V	711384.64	1486490.15	T53N	R67W	18		Permit Area	Unknown		Exploration
SP621R	712884.49	1489510.12	T53N	R67W	7		Permit Area	Unknown		Exploration
SP621V	711010.15	1486660.05	T53N	R67W	18		Permit Area	Unknown		Exploration
SP622R	712974.06	1489522.97	T53N	R67W	7		Permit Area	Unknown		Exploration
SP622V	711238.00	1486944.71	T53N	R67W	18		Permit Area	Unknown		Exploration
SP623R	712708.32	1487920.62	T53N	R67W	18		Permit Area	Unknown		Exploration
SP623V	711218.50	1486846.21	T53N	R67W	18		Permit Area	Unknown		Exploration
SP624R	713083.89	1489405.50	T53N	R67W	7		Permit Area	Unknown		Exploration
SP624V	711193.90	1486680.12	T53N	R67W	18		Permit Area	Unknown		Exploration
SP625R	712374.31	1488567.15	T53N	R67W	18		Permit Area	Unknown		Exploration
SP625V	710846.49	1486439.83	T53N	R67W	18		Permit Area	Unknown		Exploration
SP626R	712289.49	1488559.39	T53N	R67W	18		Permit Area	Unknown		Exploration
SP626V	711043.77	1486292.36	T53N	R67W	18		Permit Area	Unknown		Exploration
SP627R	712707.73	1488259.52	T53N	R67W	18		Permit Area	Unknown		Exploration

Note: Coordinate Projections are set in State Plane NAD 83 East Feet

Drill Hole Tabulation

Hole Name	North	East	Township	Range	Section	QtrQtr	Located Within Permit Area or 1/2 Mile Buffer	Type of Plugging	Date Plugged	Exploration/Delineation
SP627V	711546.96	1485778.12	T53N	R67W	18		Permit Area	Unknown		Exploration
SP628R	712763.83	1488354.74	T53N	R67W	18		Permit Area	Unknown		Exploration
SP628V	711564.97	1485668.34	T53N	R67W	18		Permit Area	Unknown		Exploration
SP629R	712732.81	1488438.24	T53N	R67W	18		Permit Area	Unknown		Exploration
SP629V	711584.84	1485576.49	T53N	R67W	18		Permit Area	Unknown		Exploration
SP62R	709442.48	1483792.56	T53N	R67W	18		Permit Area	Unknown		Exploration
SP62V	713271.19	1489114.44	T53N	R67W	7		Permit Area	Unknown		Exploration
SP630V	711671.64	1480873.95	T53N	R67W	19		Permit Area	Unknown		Exploration
SP631V	711662.46	1480610.36	T53N	R67W	19		Permit Area	Unknown		Exploration
SP632V	711046.44	1480704.02	T53N	R67W	19		Permit Area	Unknown		Exploration
SP633V	711048.90	1480798.09	T53N	R67W	19		Permit Area	Unknown		Exploration
SP634V	710973.62	1480844.31	T53N	R67W	19		Permit Area	Unknown		Exploration
SP635V	710886.70	1480816.92	T53N	R67W	19		Permit Area	Unknown		Exploration
SP636V	710858.07	1480740.16	T53N	R67W	19		Permit Area	Unknown		Exploration
SP637V	710900.20	1480669.03	T53N	R67W	19		Permit Area	Unknown		Exploration
SP638V	711693.93	1480972.07	T53N	R67W	19		Permit Area	Unknown		Exploration
SP639V	711597.06	1480959.82	T53N	R67W	19		Permit Area	Unknown		Exploration
SP63R	710025.74	1484256.51	T53N	R67W	18		Permit Area	Unknown		Exploration
SP63V	713214.25	1489193.65	T53N	R67W	7		Permit Area	Unknown		Exploration
SP640V	712973.01	1481755.89	T53N	R67W	19		Permit Area	Unknown		Exploration
SP641V	713292.43	1481488.23	T53N	R67W	19		Permit Area	Unknown		Exploration
SP642R	709600.07	1488418.43	T53N	R67W	18		Permit Area	Unknown		Exploration
SP642V	713177.68	1481266.47	T53N	R67W	19		Permit Area	Unknown		Exploration
SP643R	709503.00	1488523.06	T53N	R67W	18		Permit Area	Unknown		Exploration
SP643V	713309.81	1481590.57	T53N	R67W	19		Permit Area	Unknown		Exploration
SP644R	709511.10	1488334.99	T53N	R67W	18		Permit Area	Unknown		Exploration
SP644V	713395.66	1481496.65	T53N	R67W	19		Permit Area	Unknown		Exploration
SP645R	709691.62	1488411.89	T53N	R67W	18		Permit Area	Unknown		Exploration
SP645V	713273.68	1481357.09	T53N	R67W	19		Permit Area	Unknown		Exploration
SP646R	709091.63	1485847.03	T53N	R67W	18		Permit Area	Unknown		Exploration
SP646V	713277.44	1481257.38	T53N	R67W	19		Permit Area	Unknown		Exploration
SP647R	707924.29	1488998.01	T53N	R68W	12	SESE	Permit Area	Unknown		Exploration
SP647V	713112.88	1481340.31	T53N	R67W	19		Permit Area	Unknown		Exploration
SP648R	709603.28	1488536.66	T53N	R67W	18		Permit Area	Unknown		Exploration
SP648V	713376.13	1481353.02	T53N	R67W	19		Permit Area	Unknown		Exploration
SP649R	707920.47	1489260.56	T53N	R68W	12	SESE	Permit Area	Unknown		Exploration
SP649V	713375.77	1481255.41	T53N	R67W	19		Permit Area	Unknown		Exploration
SP64R	710114.20	1485346.64	T53N	R67W	18		Permit Area	Unknown		Exploration
SP64V	713117.66	1489168.20	T53N	R67W	7		Permit Area	Unknown		Exploration
SP650V	709862.76	1484719.27	T53N	R67W	18		Permit Area	Unknown		Exploration
SP651V	709958.13	1484624.28	T53N	R67W	18		Permit Area	Unknown		Exploration
SP652V	709432.71	1484770.90	T53N	R67W	18		Permit Area	Unknown		Exploration
SP653V	710091.08	1485483.78	T53N	R67W	18		Permit Area	Unknown		Exploration
SP654V	710005.81	1485454.07	T53N	R67W	18		Permit Area	Unknown		Exploration

Note: Coordinate Projections are set in State Plane NAD 83 East Feet

Drill Hole Tabulation

Hole Name	North	East	Township	Range	Section	QtrQtr	Located Within Permit Area or 1/2 Mile Buffer	Type of Plugging	Date Plugged	Exploration/Delineation
SP655V	709458.81	1484849.72	T53N	R67W	18		Permit Area	Unknown		Exploration
SP656V	709882.25	1484817.77	T53N	R67W	18		Permit Area	Unknown		Exploration
SP657V	709528.33	1484557.77	T53N	R67W	18		Permit Area	Unknown		Exploration
SP658V	709709.02	1484469.52	T53N	R67W	18		Permit Area	Unknown		Exploration
SP659V	709912.58	1484430.55	T53N	R67W	18		Permit Area	Unknown		Exploration
SP65R	709654.71	1485352.27	T53N	R67W	18		Permit Area	Unknown		Exploration
SP65V	713386.59	1489112.38	T53N	R67W	7		Permit Area	Unknown		Exploration
SP660R	712780.98	1488520.35	T53N	R67W	18		Permit Area	Unknown		Exploration
SP660V	711598.00	1480872.36	T53N	R67W	19		Permit Area	Unknown		Exploration
SP661R	712924.34	1488455.86	T53N	R67W	18		Permit Area	Unknown		Exploration
SP661V	711565.57	1480600.38	T53N	R67W	19		Permit Area	Unknown		Exploration
SP662R	712881.85	1488530.01	T53N	R67W	18		Permit Area	Unknown		Exploration
SP662V	711621.14	1480531.38	T53N	R67W	19		Permit Area	Unknown		Exploration
SP663R	712661.24	1488525.66	T53N	R67W	18		Permit Area	Unknown		Exploration
SP663V	711699.37	1480523.53	T53N	R67W	19		Permit Area	Unknown		Exploration
SP664R	712567.27	1488272.85	T53N	R67W	18		Permit Area	Unknown		Exploration
SP664V	711157.95	1480804.41	T53N	R67W	19		Permit Area	Unknown		Exploration
SP665R	712662.43	1488344.72	T53N	R67W	18		Permit Area	Unknown		Exploration
SP665V	711089.07	1480896.30	T53N	R67W	19		Permit Area	Unknown		Exploration
SP666R	712585.26	1488479.88	T53N	R67W	18		Permit Area	Unknown		Exploration
SP666V	710997.07	1480943.96	T53N	R67W	19		Permit Area	Unknown		Exploration
SP667R	712757.50	1488141.53	T53N	R67W	18		Permit Area	Unknown		Exploration
SP667V	710914.00	1480915.90	T53N	R67W	19		Permit Area	Unknown		Exploration
SP668R	712650.26	1488148.63	T53N	R67W	18		Permit Area	Unknown		Exploration
SP668V	710817.13	1480878.52	T53N	R67W	19		Permit Area	Unknown		Exploration
SP669R	712850.24	1488257.05	T53N	R67W	18		Permit Area	Unknown		Exploration
SP669V	710783.02	1480801.09	T53N	R67W	19		Permit Area	Unknown		Exploration
SP66R	709515.62	1484350.98	T53N	R67W	18		Permit Area	Unknown		Exploration
SP66V	713387.47	1488938.31	T53N	R67W	18		Permit Area	Unknown		Exploration
SP670R	707934.84	1489661.74	T53N	R68W	12	SESE	Permit Area	Unknown		Exploration
SP670V	711312.14	1485326.01	T53N	R67W	18		Permit Area	Unknown		Exploration
SP671R	707498.87	1489609.58	T53N	R68W	12	SWSE	Permit Area	Unknown		Exploration
SP671V	710944.95	1486443.31	T53N	R67W	18		Permit Area	Unknown		Exploration
SP672R	707941.04	1489861.69	T53N	R68W	12	SESE	Permit Area	Unknown		Exploration
SP672V	710777.78	1486337.94	T53N	R67W	18		Permit Area	Unknown		Exploration
SP673R	709601.07	1488314.56	T53N	R67W	18		Permit Area	Unknown		Exploration
SP673V	710992.14	1486799.80	T53N	R67W	18		Permit Area	Unknown		Exploration
SP674R	709699.40	1488505.57	T53N	R67W	18		Permit Area	Unknown		Exploration
SP674V	710719.33	1486055.40	T53N	R67W	18		Permit Area	Unknown		Exploration
SP675R	709179.79	1488363.42	T53N	R67W	18		Permit Area	Unknown		Exploration
SP675V	710919.43	1486105.04	T53N	R67W	18		Permit Area	Unknown		Exploration
SP676R	709260.15	1485898.48	T53N	R67W	18		Permit Area	Unknown		Exploration
SP676V	710846.96	1486236.17	T53N	R67W	18		Permit Area	Unknown		Exploration
SP677V	711237.50	1486246.81	T53N	R67W	18		Permit Area	Unknown		Exploration

Note: Coordinate Projections are set in State Plane NAD 83 East Feet

Drill Hole Tabulation

Hole Name	North	East	Township	Range	Section	QtrQtr	Located Within Permit Area or 1/2 Mile Buffer	Type of Plugging	Date Plugged	Exploration/Delineation
SP678R	709355.45	1485872.94	T53N	R67W	18		Permit Area	Unknown		Exploration
SP678V	710690.02	1485943.75	T53N	R67W	18		Permit Area	Unknown		Exploration
SP679R	709125.31	1488283.10	T53N	R67W	18		Permit Area	Unknown		Exploration
SP67R	709514.82	1484744.81	T53N	R67W	18		Permit Area	Unknown		Exploration
SP67V	713374.72	1488751.21	T53N	R67W	18		Permit Area	Unknown		Exploration
SP680V	710962.38	1485967.28	T53N	R67W	18		Permit Area	Unknown		Exploration
SP681V	710965.84	1485878.67	T53N	R67W	18		Permit Area	Unknown		Exploration
SP682V	710951.09	1485736.01	T53N	R67W	18		Permit Area	Unknown		Exploration
SP683V	713537.89	1489305.28	T53N	R67W	7		Permit Area	Unknown		Exploration
SP684V	713585.71	1489224.83	T53N	R67W	7		Permit Area	Unknown		Exploration
SP685V	713611.28	1489063.38	T53N	R67W	7		Permit Area	Unknown		Exploration
SP686V	710869.46	1485532.36	T53N	R67W	18		Permit Area	Unknown		Exploration
SP687V	710721.79	1485522.22	T53N	R67W	18		Permit Area	Unknown		Exploration
SP688V	711519.73	1485228.24	T53N	R67W	18		Permit Area	Unknown		Exploration
SP689V	711646.58	1485132.36	T53N	R67W	18		Permit Area	Unknown		Exploration
SP68V	713493.23	1488574.22	T53N	R67W	18		Permit Area	Unknown		Exploration
SP690R	712986.87	1488533.64	T53N	R67W	18		Permit Area	Unknown		Exploration
SP690V	710776.51	1480695.69	T53N	R67W	19		Permit Area	Unknown		Exploration
SP691R	712612.76	1488060.93	T53N	R67W	18		Permit Area	Unknown		Exploration
SP691V	710822.58	1480602.97	T53N	R67W	19		Permit Area	Unknown		Exploration
SP692R	712542.45	1488145.42	T53N	R67W	18		Permit Area	Unknown		Exploration
SP692V	710911.49	1480570.30	T53N	R67W	19		Permit Area	Unknown		Exploration
SP693R	712824.79	1488395.76	T53N	R67W	18		Permit Area	Unknown		Exploration
SP693V	710987.01	1480620.01	T53N	R67W	19		Permit Area	Unknown		Exploration
SP694R	712475.78	1488477.07	T53N	R67W	18		Permit Area	Unknown		Exploration
SP694V	711072.37	1480602.36	T53N	R67W	19		Permit Area	Unknown		Exploration
SP695R	712383.48	1488466.70	T53N	R67W	18		Permit Area	Unknown		Exploration
SP695V	711125.77	1480537.95	T53N	R67W	19		Permit Area	Unknown		Exploration
SP696R	712281.75	1488459.93	T53N	R67W	18		Permit Area	Unknown		Exploration
SP696V	711182.10	1480468.39	T53N	R67W	19		Permit Area	Unknown		Exploration
SP697R	712284.87	1488361.58	T53N	R67W	18		Permit Area	Unknown		Exploration
SP697V	711055.75	1480467.50	T53N	R67W	19		Permit Area	Unknown		Exploration
SP698R	712270.39	1488249.76	T53N	R67W	18		Permit Area	Unknown		Exploration
SP698V	710686.00	1480788.88	T53N	R67W	19		Permit Area	Unknown		Exploration
SP699R	712136.39	1488057.10	T53N	R67W	18		Permit Area	Unknown		Exploration
SP699V	710719.04	1480874.67	T53N	R67W	19		Permit Area	Unknown		Exploration
SP69V	713511.39	1488425.06	T53N	R67W	18		Permit Area	Unknown		Exploration
SP6R	712724.66	1488814.41	T53N	R67W	18		Permit Area	Unknown		Exploration
SP6V	711276.23	1484232.80	T53N	R67W	18		Permit Area	Unknown		Exploration
SP6Y	711850.68	1483910.27	T53N	R67W	18		Permit Area	Unknown		Exploration
SP700R	709513.26	1488643.07	T53N	R67W	18		Permit Area	Unknown		Exploration
SP700V	709714.08	1484190.23	T53N	R67W	18		Permit Area	Unknown		Exploration
SP701R	709605.79	1488624.39	T53N	R67W	18		Permit Area	Unknown		Exploration
SP701V	711616.45	1484260.41	T53N	R67W	18		Permit Area	Unknown		Exploration

Note: Coordinate Projections are set in State Plane NAD 83 East Feet

Drill Hole Tabulation

Hole Name	North	East	Township	Range	Section	QtrQtr	Located Within Permit Area or 1/2 Mile Buffer	Type of Plugging	Date Plugged	Exploration/Delineation
SP702R	709707.17	1488609.30	T53N	R67W	18		Permit Area	Unknown		Exploration
SP702V	712041.07	1482423.98	T53N	R67W	19		Permit Area	Unknown		Exploration
SP703R	709627.95	1488719.64	T53N	R67W	18		Permit Area	Unknown		Exploration
SP703V	711860.26	1483440.90	T53N	R67W	19		Permit Area	Unknown		Exploration
SP704R	709798.18	1488480.37	T53N	R67W	18		Permit Area	Unknown		Exploration
SP704V	711891.26	1483545.88	T53N	R67W	19		Permit Area	Unknown		Exploration
SP705R	709726.77	1488702.32	T53N	R67W	18		Permit Area	Unknown		Exploration
SP705V	711950.98	1482468.16	T53N	R67W	19		Permit Area	Unknown		Exploration
SP706R	709806.92	1488587.81	T53N	R67W	18		Permit Area	Unknown		Exploration
SP706V	712078.29	1482517.52	T53N	R67W	19		Permit Area	Unknown		Exploration
SP707R	709759.74	1488791.07	T53N	R67W	18		Permit Area	Unknown		Exploration
SP707V	711908.56	1481333.13	T53N	R67W	19		Permit Area	Unknown		Exploration
SP708R	709823.15	1488677.90	T53N	R67W	18		Permit Area	Unknown		Exploration
SP708V	711774.29	1481415.66	T53N	R67W	19		Permit Area	Unknown		Exploration
SP709R	709907.77	1488556.15	T53N	R67W	18		Permit Area	Unknown		Exploration
SP709V	711804.75	1481232.95	T53N	R67W	19		Permit Area	Unknown		Exploration
SP70R	710968.40	1483897.41	T53N	R67W	18		Permit Area	Unknown		Exploration
SP70V	714097.24	1487921.18	T53N	R67W	18		Permit Area	Unknown		Exploration
SP710V	713280.93	1481155.38	T53N	R67W	19		Permit Area	Unknown		Exploration
SP711V	713177.17	1481164.95	T53N	R67W	19		Permit Area	Unknown		Exploration
SP712V	713466.06	1481254.65	T53N	R67W	19		Permit Area	Unknown		Exploration
SP713V	713386.91	1481151.89	T53N	R67W	19		Permit Area	Unknown		Exploration
SP714V	713278.17	1481044.31	T53N	R67W	19		Permit Area	Unknown		Exploration
SP715V	713316.85	1481793.90	T53N	R67W	19		Permit Area	Unknown		Exploration
SP716V	713477.35	1481355.43	T53N	R67W	19		Permit Area	Unknown		Exploration
SP717V	713381.34	1481049.48	T53N	R67W	19		Permit Area	Unknown		Exploration
SP718V	713277.72	1480944.43	T53N	R67W	19		Permit Area	Unknown		Exploration
SP719V	713180.44	1481039.72	T53N	R67W	19		Permit Area	Unknown		Exploration
SP71R	711073.84	1483694.14	T53N	R67W	18		Permit Area	Unknown		Exploration
SP71V	711161.49	1487996.23	T53N	R67W	18		Permit Area	Unknown		Exploration
SP720V	711715.83	1485049.86	T53N	R67W	18		Permit Area	Unknown		Exploration
SP721V	711617.45	1485013.56	T53N	R67W	18		Permit Area	Unknown		Exploration
SP722V	711349.43	1486079.66	T53N	R67W	18		Permit Area	Unknown		Exploration
SP723V	711712.34	1485822.90	T53N	R67W	18		Permit Area	Unknown		Exploration
SP724V	711722.15	1485416.84	T53N	R67W	18		Permit Area	Unknown		Exploration
SP725V	711709.51	1484931.70	T53N	R67W	18		Permit Area	Unknown		Exploration
SP726V	711719.10	1485727.73	T53N	R67W	18		Permit Area	Unknown		Exploration
SP727V	711824.16	1485708.25	T53N	R67W	18		Permit Area	Unknown		Exploration
SP728V	711803.41	1483269.13	T53N	R67W	19		Permit Area	Unknown		Exploration
SP729V	711813.19	1484929.06	T53N	R67W	18		Permit Area	Unknown		Exploration
SP72V	711223.67	1488084.97	T53N	R67W	18		Permit Area	Unknown		Exploration
SP730R	712023.48	1488042.59	T53N	R67W	18		Permit Area	Unknown		Exploration
SP730V	710748.74	1480955.01	T53N	R67W	19		Permit Area	Unknown		Exploration
SP731R	711984.26	1487943.95	T53N	R67W	18		Permit Area	Unknown		Exploration

Note: Coordinate Projections are set in State Plane NAD 83 East Feet

Drill Hole Tabulation

Hole Name	North	East	Township	Range	Section	QtrQtr	Located Within Permit Area or 1/2 Mile Buffer	Type of Plugging	Date Plugged	Exploration/Delineation
SP731V	710830.78	1480975.92	T53N	R67W	19		Permit Area	Unknown		Exploration
SP732R	711889.39	1487941.04	T53N	R67W	18		Permit Area	Unknown		Exploration
SP732V	710930.85	1480460.06	T53N	R67W	19		Permit Area	Unknown		Exploration
SP733R	711738.62	1487842.27	T53N	R67W	18		Permit Area	Unknown		Exploration
SP733V	710802.16	1480507.72	T53N	R67W	19		Permit Area	Unknown		Exploration
SP734R	711578.64	1487832.98	T53N	R67W	18		Permit Area	Unknown		Exploration
SP734V	710725.17	1480601.79	T53N	R67W	19		Permit Area	Unknown		Exploration
SP735R	711928.22	1488085.06	T53N	R67W	18		Permit Area	Unknown		Exploration
SP735V	710604.34	1480885.17	T53N	R67W	19		Permit Area	Unknown		Exploration
SP736R	711855.83	1488173.53	T53N	R67W	18		Permit Area	Unknown		Exploration
SP736V	710652.21	1480957.24	T53N	R67W	19		Permit Area	Unknown		Exploration
SP737R	711679.55	1488240.16	T53N	R67W	18		Permit Area	Unknown		Exploration
SP737V	711633.86	1481183.96	T53N	R67W	19		Permit Area	Unknown		Exploration
SP738R	711597.64	1488171.07	T53N	R67W	18		Permit Area	Unknown		Exploration
SP738V	711726.08	1485520.98	T53N	R67W	18		Permit Area	Unknown		Exploration
SP739R	711502.48	1488164.31	T53N	R67W	18		Permit Area	Unknown		Exploration
SP739V	711823.90	1485410.48	T53N	R67W	18		Permit Area	Unknown		Exploration
SP73R	710873.63	1483697.02	T53N	R67W	18		Permit Area	Unknown		Exploration
SP73V	711322.03	1488131.12	T53N	R67W	18		Permit Area	Unknown		Exploration
SP740R	709821.44	1488772.55	T53N	R67W	18		Permit Area	Unknown		Exploration
SP740V	713183.86	1482151.08	T53N	R67W	19		Permit Area	Unknown		Exploration
SP741R	709912.25	1488678.18	T53N	R67W	18		Permit Area	Unknown		Exploration
SP741V	713179.95	1480939.88	T53N	R67W	19		Permit Area	Unknown		Exploration
SP742R	709380.62	1488910.81	T53N	R67W	18		Permit Area	Unknown		Exploration
SP742V	713494.97	1481146.79	T53N	R67W	19		Permit Area	Unknown		Exploration
SP743R	709472.28	1489025.87	T53N	R67W	7		Permit Area	Unknown		Exploration
SP743V	712020.34	1481965.63	T53N	R67W	19		Permit Area	Unknown		Exploration
SP744R	709339.97	1488208.31	T53N	R67W	18		Permit Area	Unknown		Exploration
SP744V	713080.06	1482194.51	T53N	R67W	19		Permit Area	Unknown		Exploration
SP745R	709582.30	1489022.41	T53N	R67W	7		Permit Area	Unknown		Exploration
SP745V	712710.38	1481835.24	T53N	R67W	19		Permit Area	Unknown		Exploration
SP746R	709499.06	1488769.92	T53N	R67W	18		Permit Area	Unknown		Exploration
SP746V	712084.42	1482294.92	T53N	R67W	19		Permit Area	Unknown		Exploration
SP747R	709508.21	1489111.27	T53N	R67W	7		Permit Area	Unknown		Exploration
SP747V	713159.58	1482066.12	T53N	R67W	19		Permit Area	Unknown		Exploration
SP748R	709447.87	1489586.14	T53N	R67W	7		Permit Area	Unknown		Exploration
SP748V	713262.14	1482085.33	T53N	R67W	19		Permit Area	Unknown		Exploration
SP749R	709328.96	1489494.50	T53N	R67W	7		Permit Area	Unknown		Exploration
SP749V	713315.45	1481691.70	T53N	R67W	19		Permit Area	Unknown		Exploration
SP74R	711178.68	1483786.25	T53N	R67W	18		Permit Area	Unknown		Exploration
SP74V	711440.51	1487970.55	T53N	R67W	18		Permit Area	Unknown		Exploration
SP750V	711957.40	1485027.81	T53N	R67W	18		Permit Area	Unknown		Exploration
SP751V	711722.58	1485629.28	T53N	R67W	18		Permit Area	Unknown		Exploration
SP752V	711785.97	1484832.27	T53N	R67W	18		Permit Area	Unknown		Exploration

Note: Coordinate Projections are set in State Plane NAD 83 East Feet

Drill Hole Tabulation

Hole Name	North	East	Township	Range	Section	QtrQtr	Located Within Permit Area or 1/2 Mile Buffer	Type of Plugging	Date Plugged	Exploration/Delineation
SP753V	711914.94	1484925.98	T53N	R67W	18		Permit Area	Unknown		Exploration
SP754V	712816.18	1484864.41	T53N	R67W	18		Permit Area	Unknown		Exploration
SP755V	713081.68	1485458.10	T53N	R67W	18		Permit Area	Unknown		Exploration
SP756V	712756.73	1485048.08	T53N	R67W	18		Permit Area	Unknown		Exploration
SP757V	713002.75	1485536.71	T53N	R67W	18		Permit Area	Unknown		Exploration
SP758R	712783.63	1488364.99	T53N	R67W	18		Permit Area	Unknown		Exploration
SP758V	712828.95	1485467.43	T53N	R67W	18		Permit Area	Unknown		Exploration
SP759V	711858.97	1485014.48	T53N	R67W	18		Permit Area	Unknown		Exploration
SP75R	710837.07	1483920.12	T53N	R67W	18		Permit Area	Unknown		Exploration
SP75V	711299.55	1487888.21	T53N	R67W	18		Permit Area	Unknown		Exploration
SP760V	713098.89	1481098.89	T53N	R67W	19		Permit Area	Unknown		Exploration
SP761V	713231.60	1481751.56	T53N	R67W	19		Permit Area	Unknown		Exploration
SP762V	713398.01	1481747.53	T53N	R67W	19		Permit Area	Unknown		Exploration
SP763V	713171.22	1482248.16	T53N	R67W	19		Permit Area	Unknown		Exploration
SP764V	712419.80	1481589.51	T53N	R67W	19		Permit Area	Unknown		Exploration
SP765V	712517.92	1481595.91	T53N	R67W	19		Permit Area	Unknown		Exploration
SP766V	712159.84	1481211.72	T53N	R67W	19		Permit Area	Unknown		Exploration
SP767V	713405.31	1481855.65	T53N	R67W	19		Permit Area	Unknown		Exploration
SP768V	713539.82	1482232.93	T53N	R67W	19		Permit Area	Unknown		Exploration
SP769V	713641.84	1481205.35	T53N	R67W	19		Permit Area	Unknown		Exploration
SP76R	708897.39	1484444.47	T53N	R68W	13		Permit Area	Unknown		Exploration
SP76V	711521.96	1488266.09	T53N	R67W	18		Permit Area	Unknown		Exploration
SP770R	709383.99	1486201.10	T53N	R67W	18		Permit Area	Unknown		Exploration
SP770V	711454.51	1486050.33	T53N	R67W	18		Permit Area	Unknown		Exploration
SP771R	709246.71	1489592.80	T53N	R67W	7		Permit Area	Unknown		Exploration
SP771V	712989.44	1485202.81	T53N	R67W	18		Permit Area	Unknown		Exploration
SP772R	709362.31	1489697.55	T53N	R67W	7		Permit Area	Unknown		Exploration
SP772V	712917.79	1484926.97	T53N	R67W	18		Permit Area	Unknown		Exploration
SP773R	712435.09	1488393.00	T53N	R67W	18		Permit Area	Unknown		Exploration
SP773V	712884.41	1485202.59	T53N	R67W	18		Permit Area	Unknown		Exploration
SP774R	709549.57	1489602.76	T53N	R67W	7		Permit Area	Unknown		Exploration
SP775R	709204.23	1489500.81	T53N	R67W	7		Permit Area	Unknown		Exploration
SP776R	709526.80	1489504.25	T53N	R67W	7		Permit Area	Unknown		Exploration
SP777R	709000.11	1489519.14	T53N	R68W	12	SESE	Permit Area	Unknown		Exploration
SP778R	709711.89	1489207.62	T53N	R67W	7		Permit Area	Unknown		Exploration
SP778V	709389.51	1486988.92	T53N	R67W	18		Permit Area	Unknown		Exploration
SP779R	710310.81	1487392.58	T53N	R67W	18		Permit Area	Unknown		Exploration
SP779V	709363.43	1486903.54	T53N	R67W	18		Permit Area	Unknown		Exploration
SP77R	711175.59	1483691.07	T53N	R67W	18		Permit Area	Unknown		Exploration
SP77V	711966.77	1488559.42	T53N	R67W	18		Permit Area	Unknown		Exploration
SP780R	711639.97	1488338.54	T53N	R67W	18		Permit Area	Unknown		Exploration
SP780V	709464.24	1486775.82	T53N	R67W	18		Permit Area	Unknown		Exploration
SP781R	711410.55	1488180.53	T53N	R67W	18		Permit Area	Unknown		Exploration
SP782R	711420.60	1488078.81	T53N	R67W	18		Permit Area	Unknown		Exploration

Note: Coordinate Projections are set in State Plane NAD 83 East Feet

Drill Hole Tabulation

Hole Name	North	East	Township	Range	Section	QtrQtr	Located Within Permit Area or 1/2 Mile Buffer	Type of Plugging	Date Plugged	Exploration/Delineation
SP783R	711345.23	1488022.86	T53N	R67W	18		Permit Area	Unknown		Exploration
SP784R	711263.26	1487980.03	T53N	R67W	18		Permit Area	Unknown		Exploration
SP785R	711197.78	1487904.41	T53N	R67W	18		Permit Area	Unknown		Exploration
SP786R	711142.16	1487815.68	T53N	R67W	18		Permit Area	Unknown		Exploration
SP787R	710638.76	1487511.40	T53N	R67W	18		Permit Area	Unknown		Exploration
SP788R	711624.16	1488043.12	T53N	R67W	18		Permit Area	Unknown		Exploration
SP789R	712204.65	1488298.86	T53N	R67W	18		Permit Area	Unknown		Exploration
SP78R	711280.42	1483783.18	T53N	R67W	18		Permit Area	Unknown		Exploration
SP78V	712065.98	1488433.76	T53N	R67W	18		Permit Area	Unknown		Exploration
SP79R	711181.74	1483891.28	T53N	R67W	18		Permit Area	Unknown		Exploration
SP79V	712140.32	1488204.96	T53N	R67W	18		Permit Area	Unknown		Exploration
SP7R	711943.65	1486933.02	T53N	R67W	18		Permit Area	Unknown		Exploration
SP7V	711247.77	1484381.71	T53N	R67W	18		Permit Area	Unknown		Exploration
SP7Y	711956.94	1483948.95	T53N	R67W	18		Permit Area	Unknown		Exploration
SP802V	708518.34	1483626.48	T53N	R68W	18	SESE	Permit Area	Unknown		Exploration
SP80V	710801.43	1484714.62	T53N	R67W	18		Permit Area	Unknown		Exploration
SP810R	712115.31	1488319.22	T53N	R67W	18		Permit Area	Unknown		Exploration
SP811R	712018.05	1488324.18	T53N	R67W	18		Permit Area	Unknown		Exploration
SP812R	711830.93	1488346.77	T53N	R67W	18		Permit Area	Unknown		Exploration
SP813R	711759.65	1488281.18	T53N	R67W	18		Permit Area	Unknown		Exploration
SP814R	711962.67	1487685.49	T53N	R67W	18		Permit Area	Unknown		Exploration
SP815R	711100.45	1486796.74	T53N	R67W	18		Permit Area	Unknown		Exploration
SP816R	711098.88	1486601.16	T53N	R67W	18		Permit Area	Unknown		Exploration
SP817R	711105.87	1486391.12	T53N	R67W	18		Permit Area	Unknown		Exploration
SP818R	711155.51	1486213.82	T53N	R67W	18		Permit Area	Unknown		Exploration
SP819R	711292.95	1486391.51	T53N	R67W	18		Permit Area	Unknown		Exploration
SP81V	710906.03	1484615.38	T53N	R67W	18		Permit Area	Unknown		Exploration
SP828R	709870.14	1492799.99	T53N	R67W	7		Permit Area	Unknown		Exploration
SP829R	709366.60	1486165.72	T53N	R67W	18		Permit Area	Unknown		Exploration
SP82V	710899.48	1484752.59	T53N	R67W	18		Permit Area	Unknown		Exploration
SP83V	710794.44	1484808.83	T53N	R67W	18		Permit Area	Unknown		Exploration
SP840R	710459.09	1486501.39	T53N	R67W	18		Permit Area	Unknown		Exploration
SP841R	710636.43	1486445.96	T53N	R67W	18		Permit Area	Unknown		Exploration
SP842R	710623.13	1486531.27	T53N	R67W	18		Permit Area	Unknown		Exploration
SP843R	711162.31	1487043.01	T53N	R67W	18		Permit Area	Unknown		Exploration
SP844R	711279.64	1486480.09	T53N	R67W	18		Permit Area	Unknown		Exploration
SP845R	711424.68	1486191.40	T53N	R67W	18		Permit Area	Unknown		Exploration
SP846R	711482.69	1485353.99	T53N	R67W	18		Permit Area	Unknown		Exploration
SP847R	709752.52	1485735.81	T53N	R67W	18		Permit Area	Unknown		Exploration
SP848R	710875.86	1486525.22	T53N	R67W	18		Permit Area	Unknown		Exploration
SP849R	710423.48	1486258.45	T53N	R67W	18		Permit Area	Unknown		Exploration
SP84V	710715.69	1484802.10	T53N	R67W	18		Permit Area	Unknown		Exploration
SP850R	710360.98	1486994.18	T53N	R67W	18		Permit Area	Unknown		Exploration
SP851R	710171.65	1486745.35	T53N	R67W	18		Permit Area	Unknown		Exploration

Note: Coordinate Projections are set in State Plane NAD 83 East Feet

Drill Hole Tabulation

Hole Name	North	East	Township	Range	Section	QtrQtr	Located Within Permit Area or 1/2 Mile Buffer	Type of Plugging	Date Plugged	Exploration/Delineation
SP852R	709965.05	1486180.79	T53N	R67W	18		Permit Area	Unknown		Exploration
SP853R	709876.55	1486121.53	T53N	R67W	18		Permit Area	Unknown		Exploration
SP854R	710043.69	1486240.02	T53N	R67W	18		Permit Area	Unknown		Exploration
SP855R	709964.83	1486285.81	T53N	R67W	18		Permit Area	Unknown		Exploration
SP856R	709810.75	1486203.45	T53N	R67W	18		Permit Area	Unknown		Exploration
SP857R	709758.34	1486103.40	T53N	R67W	18		Permit Area	Unknown		Exploration
SP858R	709872.94	1486282.34	T53N	R67W	18		Permit Area	Unknown		Exploration
SP859R	709968.71	1486363.90	T53N	R67W	18		Permit Area	Unknown		Exploration
SP85V	710797.31	1484912.94	T53N	R67W	18		Permit Area	Unknown		Exploration
SP85X	712649.19	1483150.21	T53N	R67W	19		Permit Area	Unknown		Exploration
SP860R	711615.38	1485256.95	T53N	R67W	18		Permit Area	Unknown		Exploration
SP861R	711085.52	1486716.00	T53N	R67W	18		Permit Area	Unknown		Exploration
SP862R	711731.18	1485172.45	T53N	R67W	18		Permit Area	Unknown		Exploration
SP863R	711621.20	1485451.84	T53N	R67W	18		Permit Area	Unknown		Exploration
SP864R	711103.41	1485392.31	T53N	R67W	18		Permit Area	Unknown		Exploration
SP865R	711172.33	1486013.66	T53N	R67W	18		Permit Area	Unknown		Exploration
SP866R	711623.77	1485377.25	T53N	R67W	18		Permit Area	Unknown		Exploration
SP867R	709916.69	1485700.04	T53N	R67W	18		Permit Area	Unknown		Exploration
SP868R	710015.05	1485749.47	T53N	R67W	18		Permit Area	Unknown		Exploration
SP869R	711542.46	1485438.56	T53N	R67W	18		Permit Area	Unknown		Exploration
SP86V	710653.73	1484717.60	T53N	R67W	18		Permit Area	Unknown		Exploration
SP873R	712916.56	1487954.55	T53N	R67W	18		Permit Area	Unknown		Exploration
SP874R	713021.53	1487981.02	T53N	R67W	18		Permit Area	Unknown		Exploration
SP875R	712978.69	1488066.27	T53N	R67W	18		Permit Area	Unknown		Exploration
SP876R	712821.89	1487982.03	T53N	R67W	18		Permit Area	Unknown		Exploration
SP877R	712891.43	1487851.84	T53N	R67W	18		Permit Area	Unknown		Exploration
SP878R	712737.67	1488015.86	T53N	R67W	18		Permit Area	Unknown		Exploration
SP879R	713073.85	1488076.31	T53N	R67W	18		Permit Area	Unknown		Exploration
SP87V	710479.96	1484631.91	T53N	R67W	18		Permit Area	Unknown		Exploration
SP880R	710090.21	1486331.32	T53N	R67W	18		Permit Area	Unknown		Exploration
SP881R	710055.57	1486421.80	T53N	R67W	18		Permit Area	Unknown		Exploration
SP882R	709840.56	1486439.12	T53N	R67W	18		Permit Area	Unknown		Exploration
SP883R	710053.97	1486030.00	T53N	R67W	18		Permit Area	Unknown		Exploration
SP884R	709999.61	1486503.74	T53N	R67W	18		Permit Area	Unknown		Exploration
SP885R	709143.61	1486073.37	T53N	R67W	18		Permit Area	Unknown		Exploration
SP886R	709167.23	1485755.06	T53N	R67W	18		Permit Area	Unknown		Exploration
SP887R	710176.63	1486605.84	T53N	R67W	18		Permit Area	Unknown		Exploration
SP888R	709925.81	1486478.68	T53N	R67W	18		Permit Area	Unknown		Exploration
SP889R	709759.25	1486302.65	T53N	R67W	18		Permit Area	Unknown		Exploration
SP88V	710695.54	1484929.14	T53N	R67W	18		Permit Area	Unknown		Exploration
SP89V	710790.93	1485016.44	T53N	R67W	18		Permit Area	Unknown		Exploration
SP8R	712828.55	1487932.81	T53N	R67W	18		Permit Area	Unknown		Exploration
SP8X	709478.17	1486969.41	T53N	R67W	18		Permit Area	Unknown		Exploration
SP8Y	712052.82	1483875.50	T53N	R67W	18		Permit Area	Unknown		Exploration

Note: Coordinate Projections are set in State Plane NAD 83 East Feet

Drill Hole Tabulation

Hole Name	North	East	Township	Range	Section	QtrQtr	Located Within Permit Area or 1/2 Mile Buffer	Type of Plugging	Date Plugged	Exploration/Delineation
SP900R	711215.03	1485468.97	T53N	R67W	18		Permit Area	Unknown		Exploration
SP901R	711197.31	1485372.51	T53N	R67W	18		Permit Area	Unknown		Exploration
SP902R	711073.00	1487384.16	T53N	R67W	18		Permit Area	Unknown		Exploration
SP903R	710899.37	1487229.55	T53N	R67W	18		Permit Area	Unknown		Exploration
SP904R	711322.51	1487348.56	T53N	R67W	18		Permit Area	Unknown		Exploration
SP905R	711177.91	1487440.16	T53N	R67W	18		Permit Area	Unknown		Exploration
SP906R	710886.64	1487032.60	T53N	R67W	18		Permit Area	Unknown		Exploration
SP907R	710833.95	1487121.11	T53N	R67W	18		Permit Area	Unknown		Exploration
SP908R	711158.40	1487351.51	T53N	R67W	18		Permit Area	Unknown		Exploration
SP909R	711119.22	1487252.97	T53N	R67W	18		Permit Area	Unknown		Exploration
SP90R	711351.39	1480741.33	T53N	R67W	19		Permit Area	Unknown		Exploration
SP910R	712897.86	1487726.18	T53N	R67W	18		Permit Area	Unknown		Exploration
SP911R	712613.17	1487910.58	T53N	R67W	18		Permit Area	Unknown		Exploration
SP912R	712828.35	1488031.27	T53N	R67W	18		Permit Area	Unknown		Exploration
SP913R	712809.03	1487798.57	T53N	R67W	18		Permit Area	Unknown		Exploration
SP914R	712973.19	1487805.11	T53N	R67W	18		Permit Area	Unknown		Exploration
SP915R	712500.88	1487899.12	T53N	R67W	18		Permit Area	Unknown		Exploration
SP916R	712661.27	1487835.52	T53N	R67W	18		Permit Area	Unknown		Exploration
SP917R	712790.45	1487881.40	T53N	R67W	18		Permit Area	Unknown		Exploration
SP918R	712980.17	1487904.34	T53N	R67W	18		Permit Area	Unknown		Exploration
SP919R	712993.08	1487706.69	T53N	R67W	18		Permit Area	Unknown		Exploration
SP91R	711365.14	1480128.58	T53N	R67W	19		Permit Area	Unknown		Exploration
SP920R	709836.88	1486747.95	T53N	R67W	18		Permit Area	Unknown		Exploration
SP921R	709744.98	1486751.04	T53N	R67W	18		Permit Area	Unknown		Exploration
SP922R	709859.12	1486848.75	T53N	R67W	18		Permit Area	Unknown		Exploration
SP923R	709954.23	1486885.05	T53N	R67W	18		Permit Area	Unknown		Exploration
SP924R	711871.42	1486949.28	T53N	R67W	18		Permit Area	Unknown		Exploration
SP925R	711763.31	1486850.60	T53N	R67W	18		Permit Area	Unknown		Exploration
SP926R	711871.22	1487047.74	T53N	R67W	18		Permit Area	Unknown		Exploration
SP927R	709776.85	1486956.89	T53N	R67W	18		Permit Area	Unknown		Exploration
SP928R	709665.49	1486845.08	T53N	R67W	18		Permit Area	Unknown		Exploration
SP929R	709963.74	1487049.17	T53N	R67W	18		Permit Area	Unknown		Exploration
SP92R	710259.67	1483807.35	T53N	R67W	18		Permit Area	Unknown		Exploration
SP930R	712659.64	1487733.61	T53N	R67W	18		Permit Area	Unknown		Exploration
SP931R	712580.78	1487776.11	T53N	R67W	18		Permit Area	Unknown		Exploration
SP932R	712483.99	1488020.26	T53N	R67W	18		Permit Area	Unknown		Exploration
SP933R	713013.60	1488204.51	T53N	R67W	18		Permit Area	Unknown		Exploration
SP934R	712409.04	1487869.40	T53N	R67W	18		Permit Area	Unknown		Exploration
SP935R	712307.35	1487846.22	T53N	R67W	18		Permit Area	Unknown		Exploration
SP936R	713193.26	1488022.92	T53N	R67W	18		Permit Area	Unknown		Exploration
SP937R	713118.12	1487855.39	T53N	R67W	18		Permit Area	Unknown		Exploration
SP938R	712389.57	1487775.63	T53N	R67W	18		Permit Area	Unknown		Exploration
SP939R	712438.39	1487961.36	T53N	R67W	18		Permit Area	Unknown		Exploration
SP93R	710542.16	1484710.81	T53N	R67W	18		Permit Area	Unknown		Exploration

Note: Coordinate Projections are set in State Plane NAD 83 East Feet

Drill Hole Tabulation

Hole Name	North	East	Township	Range	Section	QtrQtr	Located Within Permit Area or 1/2 Mile Buffer	Type of Plugging	Date Plugged	Exploration/Delineation
SP940R	710916.39	1486930.92	T53N	R67W	18		Permit Area	Unknown		Exploration
SP941R	710823.94	1487203.14	T53N	R67W	18		Permit Area	Unknown		Exploration
SP942R	711696.67	1487342.76	T53N	R67W	18		Permit Area	Unknown		Exploration
SP943R	711588.08	1487480.38	T53N	R67W	18		Permit Area	Unknown		Exploration
SP945R	711129.74	1486921.51	T53N	R67W	18		Permit Area	Unknown		Exploration
SP946R	710893.05	1487111.38	T53N	R67W	18		Permit Area	Unknown		Exploration
SP947R	711624.33	1487408.25	T53N	R67W	18		Permit Area	Unknown		Exploration
SP948R	711427.21	1487509.59	T53N	R67W	18		Permit Area	Unknown		Exploration
SP949R	710502.01	1486380.05	T53N	R67W	18		Permit Area	Unknown		Exploration
SP94R	710440.14	1484845.16	T53N	R67W	18		Permit Area	Unknown		Exploration
SP950R	709871.65	1487147.44	T53N	R67W	18		Permit Area	Unknown		Exploration
SP951R	709770.10	1487048.77	T53N	R67W	18		Permit Area	Unknown		Exploration
SP952R	709565.73	1487050.85	T53N	R67W	18		Permit Area	Unknown		Exploration
SP954R	709966.84	1487141.07	T53N	R67W	18		Permit Area	Unknown		Exploration
SP955R	709728.78	1486645.99	T53N	R67W	18		Permit Area	Unknown		Exploration
SP956R	709661.17	1489599.70	T53N	R67W	7		Permit Area	Unknown		Exploration
SP957R	709638.40	1489497.91	T53N	R67W	7		Permit Area	Unknown		Exploration
SP958R	709520.44	1489402.50	T53N	R67W	7		Permit Area	Unknown		Exploration
SP959R	709425.05	1489507.32	T53N	R67W	7		Permit Area	Unknown		Exploration
SP95R	710545.08	1484884.76	T53N	R67W	18		Permit Area	Unknown		Exploration
SP960R	711140.80	1485306.40	T53N	R67W	18		Permit Area	Unknown		Exploration
SP961R	711074.05	1485924.84	T53N	R67W	18		Permit Area	Unknown		Exploration
SP962R	710430.57	1486025.27	T53N	R67W	18		Permit Area	Unknown		Exploration
SP963R	710869.09	1486626.95	T53N	R67W	18		Permit Area	Unknown		Exploration
SP964R	710557.64	1486458.93	T53N	R67W	18		Permit Area	Unknown		Exploration
SP965R	709269.19	1485763.31	T53N	R67W	18		Permit Area	Unknown		Exploration
SP966R	709157.70	1485600.79	T53N	R67W	18		Permit Area	Unknown		Exploration
SP967R	709204.16	1489833.14	T53N	R67W	7		Permit Area	Unknown		Exploration
SP968R	709026.59	1490138.47	T53N	R68W	12	SESE	Permit Area	Unknown		Exploration
SP96R	710650.29	1484796.36	T53N	R67W	18		Permit Area	Unknown		Exploration
SP970R	712326.39	1487985.84	T53N	R67W	18		Permit Area	Unknown		Exploration
SP971R	712293.18	1487744.38	T53N	R67W	18		Permit Area	Unknown		Exploration
SP972R	712736.40	1487816.60	T53N	R67W	18		Permit Area	Unknown		Exploration
SP973R	712764.71	1487707.57	T53N	R67W	18		Permit Area	Unknown		Exploration
SP974R	713298.34	1487885.49	T53N	R67W	18		Permit Area	Unknown		Exploration
SP975R	713430.58	1488123.31	T53N	R67W	18		Permit Area	Unknown		Exploration
SP976R	712204.76	1487645.74	T53N	R67W	18		Permit Area	Unknown		Exploration
SP977R	713624.28	1488090.88	T53N	R67W	18		Permit Area	Unknown		Exploration
SP978R	713282.04	1488230.95	T53N	R67W	18		Permit Area	Unknown		Exploration
SP979R	712109.64	1487619.29	T53N	R67W	18		Permit Area	Unknown		Exploration
SP97R	710879.99	1483795.49	T53N	R67W	18		Permit Area	Unknown		Exploration
SP980R	710993.88	1486591.10	T53N	R67W	18		Permit Area	Unknown		Exploration
SP981R	711050.90	1486010.13	T53N	R67W	18		Permit Area	Unknown		Exploration
SP982R	711447.02	1486480.43	T53N	R67W	18		Permit Area	Unknown		Exploration

Note: Coordinate Projections are set in State Plane NAD 83 East Feet

Drill Hole Tabulation

Hole Name	North	East	Township	Range	Section	QtrQtr	Located Within Permit Area or 1/2 Mile Buffer	Type of Plugging	Date Plugged	Exploration/Delineation
SP983R	711680.56	1485287.11	T53N	R67W	18		Permit Area	Unknown		Exploration
SP984R	711830.80	1485243.11	T53N	R67W	18		Permit Area	Unknown		Exploration
SP985R	711102.38	1486492.86	T53N	R67W	18		Permit Area	Unknown		Exploration
SP986R	711534.30	1486222.94	T53N	R67W	18		Permit Area	Unknown		Exploration
SP987R	711599.17	1485925.91	T53N	R67W	18		Permit Area	Unknown		Exploration
SP988R	711510.14	1486132.50	T53N	R67W	18		Permit Area	Unknown		Exploration
SP989R	711854.01	1485131.57	T53N	R67W	18		Permit Area	Unknown		Exploration
SP98R	710975.38	1483693.94	T53N	R67W	18		Permit Area	Unknown		Exploration
SP992R	709376.19	1485729.20	T53N	R67W	18		Permit Area	Unknown		Exploration
SP993R	709256.04	1485660.06	T53N	R67W	18		Permit Area	Unknown		Exploration
SP994R	709150.50	1485915.84	T53N	R67W	18		Permit Area	Unknown		Exploration
SP998R	709149.61	1491892.62	T53N	R67W	7		Permit Area	Unknown		Exploration
SP99R	711091.08	1483802.38	T53N	R67W	18		Permit Area	Unknown		Exploration
SP99V	707332.66	1490129.44	T53N	R68W	12	SWSE	Permit Area	Unknown		Exploration
SP9R	712014.63	1487537.05	T53N	R67W	18		Permit Area	Unknown		Exploration
SP9X	709404.61	1486828.66	T53N	R67W	18		Permit Area	Unknown		Exploration
SP9Y	711949.84	1483724.94	T53N	R67W	18		Permit Area	Unknown		Exploration
SPD13E	706692.76	1483772.25	T53N	R68W	13		Permit Area	Unknown		Exploration
SPD147E	712129.75	1488559.46	T53N	R67W	18		Permit Area	Unknown		Exploration
SPD343M	712135.47	1489057.78	T53N	R67W	7		Permit Area	Unknown		Exploration
SPD344M	712219.96	1488132.85	T53N	R67W	18		Permit Area	Unknown		Exploration
SPD345M	712043.53	1487852.18	T53N	R67W	18		Permit Area	Unknown		Exploration
SPD346M	712332.69	1488907.21	T53N	R67W	18		Permit Area	Unknown		Exploration
SPD347M	712163.81	1488418.63	T53N	R67W	18		Permit Area	Unknown		Exploration
SPD348M	711849.91	1487841.94	T53N	R67W	18		Permit Area	Unknown		Exploration
SPD349M	712145.65	1483722.55	T53N	R67W	18		Permit Area	Unknown		Exploration
SPD380M	712099.71	1483719.17	T53N	R67W	18		Permit Area	Unknown		Exploration
SPD381M	712288.58	1484081.82	T53N	R67W	18		Permit Area	Unknown		Exploration
SPD382M	712121.97	1483751.49	T53N	R67W	18		Permit Area	Unknown		Exploration
SPD383M	711810.81	1485819.81	T53N	R67W	18		Permit Area	Unknown		Exploration
SPD384M	711705.57	1485924.62	T53N	R67W	18		Permit Area	Unknown		Exploration
SPD385M	711286.38	1485477.42	T53N	R67W	18		Permit Area	Unknown		Exploration
SPD386M	711274.47	1485820.23	T53N	R67W	18		Permit Area	Unknown		Exploration
SPD387M	712048.91	1484687.82	T53N	R67W	18		Permit Area	Unknown		Exploration
SPD388M	712107.76	1484770.27	T53N	R67W	18		Permit Area	Unknown		Exploration
SPD389M	712084.17	1484803.46	T53N	R67W	18		Permit Area	Unknown		Exploration
SPD39E	711316.03	1489697.72	T53N	R67W	7		Permit Area	Unknown		Exploration
SPD410M	711787.47	1483049.21	T53N	R67W	19		Permit Area	Unknown		Exploration
SPD411M	712127.18	1484776.06	T53N	R67W	18		Permit Area	Unknown		Exploration
SPD412M	712110.08	1484816.73	T53N	R67W	18		Permit Area	Unknown		Exploration
SPD413M	712101.15	1484837.09	T53N	R67W	18		Permit Area	Unknown		Exploration
SPD414M	712050.26	1484909.35	T53N	R67W	18		Permit Area	Unknown		Exploration
SPD415M	712165.26	1484809.35	T53N	R67W	18		Permit Area	Unknown		Exploration
SPD416M	712005.38	1484480.34	T53N	R67W	18		Permit Area	Unknown		Exploration

Note: Coordinate Projections are set in State Plane NAD 83 East Feet

Drill Hole Tabulation

Hole Name	North	East	Township	Range	Section	QtrQtr	Located Within Permit Area or 1/2 Mile Buffer	Type of Plugging	Date Plugged	Exploration/Delineation
SPD417M	712123.16	1484746.68	T53N	R67W	18		Permit Area	Unknown		Exploration
SPD418M	712108.70	1483766.44	T53N	R67W	18		Permit Area	Unknown		Exploration
SPD419M	712005.34	1484500.03	T53N	R67W	18		Permit Area	Unknown		Exploration
SPD41E	712079.01	1488558.28	T53N	R67W	18		Permit Area	Unknown		Exploration
SPD442M	712104.65	1484598.92	T53N	R67W	18		Permit Area	Unknown		Exploration
SPD443M	712028.02	1484726.80	T53N	R67W	18		Permit Area	Unknown		Exploration
SPD460M	712380.55	1484045.91	T53N	R67W	18		Permit Area	Unknown		Exploration
SPD461M	712108.84	1483748.17	T53N	R67W	18		Permit Area	Unknown		Exploration
SPD462M	711993.33	1483576.98	T53N	R67W	19		Permit Area	Unknown		Exploration
SPD463M	712174.55	1483862.49	T53N	R67W	18		Permit Area	Unknown		Exploration
SPD464M	713030.34	1483615.22	T53N	R67W	19		Permit Area	Unknown		Exploration
SPD465M	712129.99	1483679.49	T53N	R67W	18		Permit Area	Unknown		Exploration
SPD466M	712034.56	1483606.66	T53N	R67W	19		Permit Area	Unknown		Exploration
SPD467M	712165.61	1483638.64	T53N	R67W	19		Permit Area	Unknown		Exploration
SPD468M	711979.06	1484513.10	T53N	R67W	18		Permit Area	Unknown		Exploration
SPD469M	711987.95	1483625.80	T53N	R67W	19		Permit Area	Unknown		Exploration
SPD470M	712385.11	1484560.14	T53N	R67W	18		Permit Area	Unknown		Exploration
SPD471M	712226.66	1484751.03	T53N	R67W	18		Permit Area	Unknown		Exploration
SPD472M	712487.98	1484586.38	T53N	R67W	18		Permit Area	Unknown		Exploration
SPD473M	712254.86	1484909.21	T53N	R67W	18		Permit Area	Unknown		Exploration
SPD474check	712289.97	1484816.17	T53N	R67W	18		Permit Area	Unknown		Exploration
SPD474M	712153.87	1484717.57	T53N	R67W	18		Permit Area	Unknown		Exploration
SPD475M	712421.09	1484622.57	T53N	R67W	18		Permit Area	Unknown		Exploration
SPD477M	711772.49	1483375.92	T53N	R67W	19		Permit Area	Unknown		Exploration
SPD478M	711774.18	1482780.40	T53N	R67W	19		Permit Area	Unknown		Exploration
SPD490M	712066.29	1483661.37	T53N	R67W	19		Permit Area	Unknown		Exploration
SPD491M	712113.11	1483631.96	T53N	R67W	19		Permit Area	Unknown		Exploration
SPD492M	711937.16	1483620.45	T53N	R67W	19		Permit Area	Unknown		Exploration
SPD493M	712169.52	1483910.49	T53N	R67W	18		Permit Area	Unknown		Exploration
SPD494M	712226.13	1483559.07	T53N	R67W	19		Permit Area	Unknown		Exploration
SPD495M	712181.41	1483683.57	T53N	R67W	18		Permit Area	Unknown		Exploration
SPD496M	711947.75	1483768.03	T53N	R67W	18		Permit Area	Unknown		Exploration
SPD497M	712121.04	1483914.43	T53N	R67W	18		Permit Area	Unknown		Exploration
SPD498M	712228.93	1483991.78	T53N	R67W	18		Permit Area	Unknown		Exploration
SPD499M	711836.23	1483622.31	T53N	R67W	19		Permit Area	Unknown		Exploration
SPD530	708003.70	1483613.47	T53N	R68W	18	SESE	Permit Area	Unknown		Exploration
SPD530M	711846.02	1483764.54	T53N	R67W	18		Permit Area	Unknown		Exploration
SPD531M	712310.03	1483504.66	T53N	R67W	19		Permit Area	Unknown		Exploration
SPD532M	712267.36	1483638.84	T53N	R67W	19		Permit Area	Unknown		Exploration
SPD533M	711956.99	1483484.71	T53N	R67W	19		Permit Area	Unknown		Exploration
SPD534M	712130.12	1483531.24	T53N	R67W	19		Permit Area	Unknown		Exploration
SPD535M	712247.38	1483729.32	T53N	R67W	18		Permit Area	Unknown		Exploration
SPD536M	712243.55	1483917.47	T53N	R67W	18		Permit Area	Unknown		Exploration
SPD537M	711973.81	1483912.00	T53N	R67W	18		Permit Area	Unknown		Exploration

Note: Coordinate Projections are set in State Plane NAD 83 East Feet

Drill Hole Tabulation

Hole Name	North	East	Township	Range	Section	QtrQtr	Located Within Permit Area or 1/2 Mile Buffer	Type of Plugging	Date Plugged	Exploration/Delineation
SPD538M	711805.02	1483765.77	T53N	R67W	18		Permit Area	Unknown		Exploration
SPD539M	711973.38	1484012.59	T53N	R67W	18		Permit Area	Unknown		Exploration
SPD560M	711871.34	1483935.42	T53N	R67W	18		Permit Area	Unknown		Exploration
SPD561M	712343.75	1483918.99	T53N	R67W	18		Permit Area	Unknown		Exploration
SPD562M	712276.37	1483820.03	T53N	R67W	18		Permit Area	Unknown		Exploration
SPD563M	712218.88	1483459.74	T53N	R67W	19		Permit Area	Unknown		Exploration
SPD564M	712441.03	1483917.71	T53N	R67W	18		Permit Area	Unknown		Exploration
SPD565M	711954.52	1484134.34	T53N	R67W	18		Permit Area	Unknown		Exploration
SPD566M	711771.86	1483936.36	T53N	R67W	18		Permit Area	Unknown		Exploration
SPD567M	712075.22	1484011.06	T53N	R67W	18		Permit Area	Unknown		Exploration
SPD568M	712532.11	1483947.86	T53N	R67W	18		Permit Area	Unknown		Exploration
SPD569M	712058.75	1484138.73	T53N	R67W	18		Permit Area	Unknown		Exploration
SPD570M	711785.29	1482379.08	T53N	R67W	19		Permit Area	Unknown		Exploration
SPD571M	711788.01	1485308.67	T53N	R67W	18		Permit Area	Unknown		Exploration
SPD572M	711777.82	1485901.80	T53N	R67W	18		Permit Area	Unknown		Exploration
SPD573M	711767.24	1486262.80	T53N	R67W	18		Permit Area	Unknown		Exploration
SPD574M	712185.80	1484977.99	T53N	R67W	18		Permit Area	Unknown		Exploration
SPD575M	711166.16	1485820.01	T53N	R67W	18		Permit Area	Unknown		Exploration
SPD576M	711261.12	1485925.22	T53N	R67W	18		Permit Area	Unknown		Exploration
SPD577M	711366.30	1485853.23	T53N	R67W	18		Permit Area	Unknown		Exploration
SPD578M	711057.85	1485819.79	T53N	R67W	18		Permit Area	Unknown		Exploration
SPD579M	711165.96	1485918.47	T53N	R67W	18		Permit Area	Unknown		Exploration
SPD590M	711798.96	1481339.14	T53N	R67W	19		Permit Area	Unknown		Exploration
SPD591M	711821.95	1480347.04	T53N	R67W	19		Permit Area	Unknown		Exploration
SPD595M	712053.56	1483463.97	T53N	R67W	19		Permit Area	Unknown		Exploration
SPD596M	712236.48	1484282.74	T53N	R67W	18		Permit Area	Unknown		Exploration
SPD597M	712075.85	1483314.65	T53N	R67W	19		Permit Area	Unknown		Exploration
SPD598M	711983.51	1483388.37	T53N	R67W	19		Permit Area	Unknown		Exploration
SPD599M	712100.34	1483120.64	T53N	R67W	19		Permit Area	Unknown		Exploration
SPD610M	711953.07	1484286.46	T53N	R67W	18		Permit Area	Unknown		Exploration
SPD612M	711696.72	1483765.55	T53N	R67W	18		Permit Area	Unknown		Exploration
SPD613M	711732.24	1484051.15	T53N	R67W	18		Permit Area	Unknown		Exploration
SPD614M	712169.73	1484117.06	T53N	R67W	18		Permit Area	Unknown		Exploration
SPD615M	711578.23	1483932.69	T53N	R67W	18		Permit Area	Unknown		Exploration
SPD616M	711792.50	1484325.29	T53N	R67W	18		Permit Area	Unknown		Exploration
SPD617M	711951.59	1484385.28	T53N	R67W	18		Permit Area	Unknown		Exploration
SPD618M	712061.33	1484306.38	T53N	R67W	18		Permit Area	Unknown		Exploration
SPD619M	711945.27	1484488.45	T53N	R67W	18		Permit Area	Unknown		Exploration
SPD630M	712454.41	1483711.03	T53N	R67W	18		Permit Area	Unknown		Exploration
SPD631M	712214.03	1483102.59	T53N	R67W	19		Permit Area	Unknown		Exploration
SPD632M	712106.00	1483016.02	T53N	R67W	19		Permit Area	Unknown		Exploration
SPD633M	712000.01	1483116.66	T53N	R67W	19		Permit Area	Unknown		Exploration
SPD634M	712218.61	1483012.44	T53N	R67W	19		Permit Area	Unknown		Exploration
SPD635M	712340.45	1483102.65	T53N	R67W	19		Permit Area	Unknown		Exploration

Note: Coordinate Projections are set in State Plane NAD 83 East Feet

Drill Hole Tabulation

Hole Name	North	East	Township	Range	Section	QtrQtr	Located Within Permit Area or 1/2 Mile Buffer	Type of Plugging	Date Plugged	Exploration/Delineation
SPD636M	712218.75	1482912.93	T53N	R67W	19		Permit Area	Unknown		Exploration
SPD637M	711898.83	1483118.42	T53N	R67W	19		Permit Area	Unknown		Exploration
SPD638M	711996.15	1483013.00	T53N	R67W	19		Permit Area	Unknown		Exploration
SPD639M	712315.90	1483007.29	T53N	R67W	19		Permit Area	Unknown		Exploration
SPD640M	711844.72	1484499.57	T53N	R67W	18		Permit Area	Unknown		Exploration
SPD641M	711940.57	1484588.74	T53N	R67W	18		Permit Area	Unknown		Exploration
SPD642M	711839.20	1484599.76	T53N	R67W	18		Permit Area	Unknown		Exploration
SPD643M	711981.55	1484804.41	T53N	R67W	18		Permit Area	Unknown		Exploration
SPD644M	711881.20	1484802.93	T53N	R67W	18		Permit Area	Unknown		Exploration
SPD645M	712302.96	1484612.49	T53N	R67W	18		Permit Area	Unknown		Exploration
SPD646M	712390.91	1484453.13	T53N	R67W	18		Permit Area	Unknown		Exploration
SPD647M	712316.41	1484179.88	T53N	R67W	18		Permit Area	Unknown		Exploration
SPD648M	711371.45	1483935.55	T53N	R67W	18		Permit Area	Unknown		Exploration
SPD649M	711637.05	1484054.24	T53N	R67W	18		Permit Area	Unknown		Exploration
SPD660M	712133.63	1483404.63	T53N	R67W	19		Permit Area	Unknown		Exploration
SPD661M	712304.79	1483404.58	T53N	R67W	19		Permit Area	Unknown		Exploration
SPD662M	712196.18	1483327.33	T53N	R67W	19		Permit Area	Unknown		Exploration
SPD663M	712457.90	1483609.30	T53N	R67W	19		Permit Area	Unknown		Exploration
SPD664M	712458.83	1483510.02	T53N	R67W	19		Permit Area	Unknown		Exploration
SPD665M	712562.93	1483609.51	T53N	R67W	19		Permit Area	Unknown		Exploration
SPD666M	712559.06	1483510.95	T53N	R67W	19		Permit Area	Unknown		Exploration
SPD667M	712533.25	1484050.03	T53N	R67W	18		Permit Area	Unknown		Exploration
SPD668M	712525.71	1484156.15	T53N	R67W	18		Permit Area	Unknown		Exploration
SPD669M	712655.27	1483537.23	T53N	R67W	19		Permit Area	Unknown		Exploration
SPD671M	711692.50	1484324.72	T53N	R67W	18		Permit Area	Unknown		Exploration
SPD672M	711509.04	1484060.54	T53N	R67W	18		Permit Area	Unknown		Exploration
SPD673M	711630.28	1484156.89	T53N	R67W	18		Permit Area	Unknown		Exploration
SPD674M	711407.86	1484062.41	T53N	R67W	18		Permit Area	Unknown		Exploration
SPD675M	711733.13	1484502.63	T53N	R67W	18		Permit Area	Unknown		Exploration
SPD676M	711683.51	1484803.65	T53N	R67W	18		Permit Area	Unknown		Exploration
SPD677M	712277.75	1484951.93	T53N	R67W	18		Permit Area	Unknown		Exploration
SPD678M	711868.98	1486263.00	T53N	R67W	18		Permit Area	Unknown		Exploration
SPD679M	711668.78	1486262.59	T53N	R67W	18		Permit Area	Unknown		Exploration
SPD690M	712560.74	1483409.50	T53N	R67W	19		Permit Area	Unknown		Exploration
SPD691M	712675.39	1483387.78	T53N	R67W	19		Permit Area	Unknown		Exploration
SPD692M	712568.72	1483311.98	T53N	R67W	19		Permit Area	Unknown		Exploration
SPD693M	712220.61	1484208.17	T53N	R67W	18		Permit Area	Unknown		Exploration
SPD694M	712315.25	1484279.62	T53N	R67W	18		Permit Area	Unknown		Exploration
SPD695M	712413.81	1484182.51	T53N	R67W	18		Permit Area	Unknown		Exploration
SPD696M	712732.91	1483944.62	T53N	R67W	18		Permit Area	Unknown		Exploration
SPD697M	712818.98	1483583.78	T53N	R67W	19		Permit Area	Unknown		Exploration
SPD698M	712713.83	1484340.26	T53N	R67W	18		Permit Area	Unknown		Exploration
SPD699M	712727.59	1484577.02	T53N	R67W	18		Permit Area	Unknown		Exploration
SPD710M	712710.95	1484962.65	T53N	R67W	18		Permit Area	Unknown		Exploration

Note: Coordinate Projections are set in State Plane NAD 83 East Feet

Drill Hole Tabulation

Hole Name	North	East	Township	Range	Section	QtrQtr	Located Within Permit Area or 1/2 Mile Buffer	Type of Plugging	Date Plugged	Exploration/Delineation
SPD711M	712716.12	1484437.78	T53N	R67W	18		Permit Area	Unknown		Exploration
SPD712M	712812.29	1484340.69	T53N	R67W	18		Permit Area	Unknown		Exploration
SPD713M	712718.99	1484238.07	T53N	R67W	18		Permit Area	Unknown		Exploration
SPD714M	712613.16	1484341.17	T53N	R67W	18		Permit Area	Unknown		Exploration
SPD715M	712721.01	1484860.93	T53N	R67W	18		Permit Area	Unknown		Exploration
SPD716M	712619.06	1484962.47	T53N	R67W	18		Permit Area	Unknown		Exploration
SPD717M	712822.55	1484959.60	T53N	R67W	18		Permit Area	Unknown		Exploration
SPD718M	712596.22	1484619.42	T53N	R67W	18		Permit Area	Unknown		Exploration
SPD719M	712815.99	1484438.18	T53N	R67W	18		Permit Area	Unknown		Exploration
SPD720M	711263.76	1486041.06	T53N	R67W	18		Permit Area	Unknown		Exploration
SPD721M	711366.09	1485954.98	T53N	R67W	18		Permit Area	Unknown		Exploration
SPD722M	711468.04	1485853.44	T53N	R67W	18		Permit Area	Unknown		Exploration
SPD723M	711387.56	1485756.59	T53N	R67W	18		Permit Area	Unknown		Exploration
SPD724M	711270.56	1486125.44	T53N	R67W	18		Permit Area	Unknown		Exploration
SPD725M	711566.52	1485843.80	T53N	R67W	18		Permit Area	Unknown		Exploration
SPD726M	711469.63	1485746.91	T53N	R67W	18		Permit Area	Unknown		Exploration
SPD727M	711368.09	1485644.97	T53N	R67W	18		Permit Area	Unknown		Exploration
SPD728M	711279.32	1485723.55	T53N	R67W	18		Permit Area	Unknown		Exploration
SPD729M	711467.84	1485951.90	T53N	R67W	18		Permit Area	Unknown		Exploration
SPD735M	711633.54	1488951.73	T53N	R67W	18		Permit Area	Unknown		Exploration
SPD736M	711761.92	1488392.58	T53N	R67W	18		Permit Area	Unknown		Exploration
SPD737M	711483.44	1487842.64	T53N	R67W	18		Permit Area	Unknown		Exploration
SPD738M	712826.65	1488916.36	T53N	R67W	18		Permit Area	Unknown		Exploration
SPD739M	712768.59	1488446.55	T53N	R67W	18		Permit Area	Unknown		Exploration
SPD740M	711374.85	1485549.80	T53N	R67W	18		Permit Area	Unknown		Exploration
SPD741M	711473.12	1485645.18	T53N	R67W	18		Permit Area	Unknown		Exploration
SPD742M	711272.97	1485615.23	T53N	R67W	18		Permit Area	Unknown		Exploration
SPD743M	711381.63	1485444.79	T53N	R67W	18		Permit Area	Unknown		Exploration
SPD744M	711473.32	1485546.72	T53N	R67W	18		Permit Area	Unknown		Exploration
SPD745M	711524.82	1485068.74	T53N	R67W	18		Permit Area	Unknown		Exploration
SPD746M	712286.56	1485889.71	T53N	R67W	18		Permit Area	Unknown		Exploration
SPD747M	711269.51	1486617.92	T53N	R67W	18		Permit Area	Unknown		Exploration
SPD750M	712820.73	1484236.83	T53N	R67W	18		Permit Area	Unknown		Exploration
SPD751M	712457.54	1484270.36	T53N	R67W	18		Permit Area	Unknown		Exploration
SPD752M	712834.67	1483934.98	T53N	R67W	18		Permit Area	Unknown		Exploration
SPD753M	712458.70	1483408.90	T53N	R67W	19		Permit Area	Unknown		Exploration
SPD754M	712684.49	1483204.47	T53N	R67W	19		Permit Area	Unknown		Exploration
SPD755M	712794.78	1482281.30	T53N	R67W	19		Permit Area	Unknown		Exploration
SPD756M	712808.09	1481275.52	T53N	R67W	19		Permit Area	Unknown		Exploration
SPD757M	712812.22	1480317.26	T53N	R67W	19		Permit Area	Unknown		Exploration
SPD773M	708549.15	1484614.42	T53N	R68W	13		Permit Area	Unknown		Exploration
SPD780M	712919.28	1487133.43	T53N	R67W	18		Permit Area	Unknown		Exploration
SPD781M	712893.84	1486732.98	T53N	R67W	18		Permit Area	Unknown		Exploration
SPD782M	712388.61	1486633.49	T53N	R67W	18		Permit Area	Unknown		Exploration

Note: Coordinate Projections are set in State Plane NAD 83 East Feet

Drill Hole Tabulation

Hole Name	North	East	Township	Range	Section	QtrQtr	Located Within Permit Area or 1/2 Mile Buffer	Type of Plugging	Date Plugged	Exploration/Delineation
SPD783M	711886.41	1486662.00	T53N	R67W	18		Permit Area	Unknown		Exploration
SPD784M	711332.83	1487112.28	T53N	R67W	18		Permit Area	Unknown		Exploration
SPD785M	712864.96	1489414.21	T53N	R67W	7		Permit Area	Unknown		Exploration
SPD786M	713289.02	1488934.82	T53N	R67W	18		Permit Area	Unknown		Exploration
SPD787M	713314.44	1488437.78	T53N	R67W	18		Permit Area	Unknown		Exploration
SPD788M	713369.53	1489433.36	T53N	R67W	7		Permit Area	Unknown		Exploration
SPD789M	712138.85	1489574.34	T53N	R67W	7		Permit Area	Unknown		Exploration
SPD791M	711787.62	1479844.89	T53N	R67W	19		Permit Area	Unknown		Exploration
SPD792M	712330.99	1480326.61	T53N	R67W	19		Permit Area	Unknown		Exploration
SPD793M	711943.96	1480837.00	T53N	R67W	19		Permit Area	Unknown		Exploration
SPD794M	712440.60	1481352.30	T53N	R67W	19		Permit Area	Unknown		Exploration
SPD795M	711807.24	1481836.42	T53N	R67W	19		Permit Area	Unknown		Exploration
SPD798M	712726.33	1483292.77	T53N	R67W	19		Permit Area	Unknown		Exploration
SPD802M	713959.55	1488877.02	T53N	R67W	18		Permit Area	Unknown		Exploration
SPD803M	712864.21	1489925.25	T53N	R67W	7		Permit Area	Unknown		Exploration
SPD804M	713882.20	1489453.67	T53N	R67W	7		Permit Area	Unknown		Exploration
SPD805M	712360.49	1489958.46	T53N	R67W	7		Permit Area	Unknown		Exploration
SPD806M	713379.57	1489918.82	T53N	R67W	7		Permit Area	Unknown		Exploration
SPD807M	714073.79	1489185.76	T53N	R67W	7		Permit Area	Unknown		Exploration
SPV275	714853.66	1486347.04	T53N	R67W	17	SWNW	Permit Area	Unknown		Exploration
unknown1	712841.44	1488128.87	T53N	R67W	18		Permit Area	Unknown		Exploration
unknown2	712806.48	1488213.64	T53N	R67W	18		Permit Area	Unknown		Exploration

Note: Coordinate Projections are set in State Plane NAD 83 East Feet