UMTRA
Ground Water Project

DATA VALIDATION
SHIPROCK, NEW MEXICO
UMTRA SITE

March 2000
Water Sampling

Prepared by the
U.S. Department of Energy
Grand Junction Office

SHIPROCK, NEW MEXICO
Sampled March 2000

DATA PACKAGE CONTENTS

This data package includes the following information:

Item No.	Description of Contents
1.	**Site Hydrologist Summary**
2.	**Data Package Assessment,** which includes the following: a. Field procedures verification checklist b. Confirmation that chain-of-custody was maintained. c. Confirmation that holding time requirements were met. d. Evaluation of the adequacy of the QC sample results.
3.	**Data Assessment Summary,** which describes problems identified in the data validation process and summarizes the validator's findings.
4.	**Anomalous Data Review Checksheets** which list the subset of data that merits explanation or follow-up action. The "Disposition" column of this report describes the evaluator's judgments on the listed anomalies.
5.	**UMTRA Database Printouts** of analytical data organized as follows: a. Surface Water Quality Data (included on disk) b. Equipment Blank Data (included on disk) c. Adjusted Gross Alpha Data
6.	**Trip Reports.**

Site Hydrologist Summary

Site: Shiprock

Sampling Period: March 14 and March 15, 2000

SUMMARY CRITERIA

1. **Did concentrations in water from any domestic wells sampled exceed a ground water standard, a primary drinking water standard, or health advisory?**

   There were no domestic wells sampled during this event

2. **Were standards exceeded at any point-of-compliance wells?**

   There are no point-of-compliance wells established at the Shiprock site because of preexisting ground water contamination (from milling operations) at the repository site.

3. **As a result of this sampling round, is there any indication of unexpected contaminated ground water movement?**

   Ground water was not sampled during this event.

Site Hydrologist Summary (continued)

4. Is there statistical evidence that UMTRA Project related contaminants were detected in a surface body of water in greater concentrations than upstream ambient water quality?

This sampling event consisted of sampling 14 new locations on the floodplain to obtain data to support an ecological risk assessment (see attached map). Filtered and unfiltered samples were collected at each location.

Surface water concentrations were compared to background values derived using data from sampling locations 888 and 898. These locations are upgradient of the site on the San Juan River, and have only been sampled four times each. Therefore, the background value used for comparison was the maximum observed value from these locations.

Floodplain surface locations 1207, 1208, 1209, 1211, 1212, and 1213 exceeded the background value for one or more of the following analytes: gross alpha, molybdenum, nitrate, selenium, and uranium. These locations are various surface water expressions (e.g. wetlands, seeps, distributary channel) located on the floodplain that receive discharge of contaminated alluvial ground water, and elevated contaminant concentrations are expected.

With the exception of gross alpha concentrations at locations 1203 (13.05 pCi/L) and 1204 (9.42 pCi/L) , and the uranium concentration at location 1206 (0.0057 mg/L), sample concentrations from locations on the San Juan River were below the respective background values.

Although the background values were exceeded at several locations on the floodplain and on the San Juan River, these concentrations are below the MCLs for UMTRA Ground Water. A calculation was made to convert the gross alpha concentrations to adjusted gross alpha concentrations, which can be compared to the UMTRA Ground Water MCL. This adjusted gross alpha data are presented as a table in the UMTRA database printout section of this report. When compared to the UMTRA MCL, no detected values for adjusted gross alpha exceeded the standard.

Craig Goodknight 7/13/2000

Craig Goodknight — Date
Site Lead

Mark Kautsky 7-13-2000

Mark Kautsky — Date
Site Hydrologist

DATA ASSESSMENT

UGW Water Sampling Field Activities Verification Checklist

Project Shiprock
Date(s) of Verification 6-30-00

Date(s) of Water Sampling 3-14-00 / 3-15-00
Name of Verifier Sam Campbell

	Response (Yes, No, N/A)	Comments
1. Is the SAP the primary document directing field procedures?	Yes	
List other documents, SOP's, instructions.	NA	
2. Were the sampling locations specified in the planning documents sampled?	Yes	Per site lead direction
3. Was field equipment calibrated as specified in the above named documents?	Yes	Except pre-trip Ec and temperature probe op checks were not documented
Were the number and types (alkalinity, temperature, Ec, pH, turbidity, DO, ORP) of field measurements taken as specified?	Yes	
Were the standard solutions used for the calibration and operational checks of the field instruments brought to within 10 degrees C of the temperature of the water to be sampled?	Yes	
Was the calibration information recorded on the field data sheets?	Yes	
4. Was depth to water measured before purging?	NA	surface water only
Was this information used to calculate purge volume?	NA	
5. If conventional purging was used, were the wells purged until **parameters stabilized and 3 casing volumes were removed, until the well was purged dry, or until 10 casing volumes were removed?**	NA	
6. **If low-flow purging was used,** was the purge rate less than **0.125 gal/min, and was the drawdown less than 0.3 ft?**	NA	

7. Were duplicates taken at a frequency of one per 20 samples?	Yes	
8. Were equipment blanks taken at a frequency of one per 20 samples that were collected with nondedicated equipment?	Yes	
9. Were trip blanks prepared and included with each shipment of VOC samples?	NA	
10. Were QC samples assigned a fictitious site identification number?	Yes	
Was the true identity of the samples recorded in the field notes?	Yes	
11. Were samples collected in the containers specified?	Yes	
Were certified pre-cleaned containers used for the sampling?	Yes	
12. Were samples filtered and preserved as specified?	Yes	Filtered and unfiltered aliquots collected at each location
13. Were the number and types of samples collected as specified?	Yes	Per site lead direction
14. Were chain of custody records completed and was sample custody maintained?	Yes	
15. Were sample ticket book numbers recorded on field data forms and on the chain of custody?	Yes	
16. Are field data sheets signed and dated by the team leader?	Yes	
17. Was all other pertinent information documented on the field data sheets?	Yes	
18. Was the presence or absence of ice in the cooler documented at every sample location?	Yes	
19. Were water levels measured at the locations specified in the planning documents?	NA	

DATA PACKAGE ASSESSMENT

REQUISITION NUMBERS: 16966 SITE: Shiprock LABORATORY: GJO ANALYSIS DATES: 3-17-00 to 4-23-00

REVIEWER: Sam Campbell (NAME print) Sam Campbell (SIGNATURE) 6-12-00 (DATE)

	ICP-MS	ICP-AES	GFAA	FAA	$NaBH_4$	AS	LSc	PC	IC	Gravimetric	Colorimetric	Other	
CHAIN OF CUSTODY	ok	OK	NA	NA	OK	NA	NA	OK	OK	NA	OK	NA	NA
HOLDING TIME	ok	OK			OK			OK	(1)		(1)		
CALIB. VERIFICATION (For AS, internal tracer)	ok	OK			OK			OK	OK	NA	OK		
PREP. BLANKS (Only if digestion)	(2)	OK			OK			OK	NA	NA	NA		
INT/CONT CAL. BLANKS	(3)	(4)			OK	NA	NA	NA	(5)	NA	OK		
ICP SERIAL DILUTION	ok	ok	NA	NA	NA	NA	NA	NA	NA	NA	NA		
ICS (ICP only)	ok	ok	NA	NA	NA	NA	NA	NA	NA	NA	NA		
LAB. CONTROL SAMPLE	ok	ok			OK			OK	OK		NA		
DUPLICATES	ok	ok			OK			OK	ok		OK		
POSTDIGEST. SPKS. (Only if MS fails)	NA	NA			NA	NA	NA	NA	NA	NA	NA		
MATRIX SPKS.	ok	ok			OK			OK	OK	NA	OK		
OVERALL ASSESS.	ok	OK			OK			OK	ok		ok		

REVIEWER COMMENTS: (1) Sample 266121 was not preserved with H_2SO_4 for NO_3 and NH_4 analyses. (5) NO_3 detected in the ICB- no samples affected.

ITEMS REQUIRING ATTENTION: (1) J flag NO_3 and NH_4 results from sample 266121 (1207) because the holding time was exceeded. (2) U flag U result 266144 because of prep blank contamination. (3) U flag U results 266128 and 266144 because of CCB contamination (4) U flag V results 266124-266128 because of CCB contamination (5) NO_3 00

6/13/00 RAD: 35 rows updated by RAD results to U flag and MDA Result
0 rows " " RAD results that get data valid U by 3-sigma.

SHIPROCK, NEW MEXICO
MARCH 2000 SAMPLING
DATA ASSESSMENT SUMMARY

The DOE-GJO Analytical Laboratory analyzed samples and reported results for this sampling event under requisition number 16966 for the UMTRA Ground Water Project.

RADIOCHEMICAL ANALYSES

The determination of gross alpha was performed using gas proportional counting (PC). Although not requested, gross beta results are included in this report because gross beta activity is determined concurrently with gross alpha activity. The detection limits for gross alpha are higher than those specified in the planning documents due to high TDS in the samples.

All gross alpha results that were less than the minimum detectable activity (MDA) and/or the 3-sigma counting statistic range were qualified with a "U" flag (nondetect) in the database, as reflected on the database printouts.

METALS/MAJOR CATIONS ANALYSES

The determination of manganese, vanadium, and zinc was performed by inductively coupled plasma-atomic emission spectrometry (ICP-AES). Molybdenum and uranium were analyzed using inductively coupled-mass spectrometry (ICP-MS). Selenium was determined by hydride generation atomic absorption spectroscopy ($NaBH_4$).

The following results were qualified with a "U" flag in the database because of prep blank or continuing calibration blank contamination: uranium results from samples 266128 (equipment blank - filtered) and 266144 (equipment blank - unfiltered); and vanadium results from samples 266124 (1209 filtered), 266125 (1213 filtered), 266126 (1210 filtered), 266127 (1211 filtered), and 266128 (equipment blank - filtered).

INORGANIC ANALYSES

Nitrate and sulfate were determined by ion chromatography (IC), and ammonium was determined by spectrophotometry (or colorimetry). The nitrate and sulfate results from sample 266121 (1207duplicate - filtered) were qualified with a "J" flag (estimated) in the database because the holding time was exceeded.

FIELD ANALYSIS/ACTIVITIES

One filtered and one unfiltered equipment blank were collected for the 14 locations where samples were collected using non-dedicated equipment. The equipment blanks were analyzed for the same constituents as the Shiprock environmental samples. Equipment blank concentrations of UMTRA related contaminants were less than the contract required detection limit (CRDL) or MDA/3-sigma; therefore, equipment blank results are considered acceptable.

One filtered and one unfiltered duplicate sample were collected during this event. Duplicate samples were collected at surface water location 1207. There are no established regulatory criteria for the evaluation of field duplicate samples; therefore, EPA guidance for laboratory duplicates (which is conservative for field duplicates) was used to assess duplicate precision. With the exception of one sulfate result (42 relative percent difference), duplicate results met the laboratory duplicate criteria (20 relative percent difference). With the exception of the sulfate duplicate (see SAR section), duplicate results are considered acceptable.

SAR

Because these locations were sampled for the first time, a suspected anomalies report (SAR), which compares current data to historical data from the same location, was not be generated for this sampling event. Instead, the evaluation of suspected anomalous data consisted of comparing filtered results with unfiltered results at each location, and comparing results to historical data from adjacent or similar locations.

On the basis of this evaluation, anomalous results were discovered. Analytical results from locations 1210 (San Juan River) and 1211 (distributary channel) were inadvertently switched during the sampling and analytical process. Field photographs show the locations were properly labeled at the location marker. Field measurements of alkalinity, pH, and electrical conductivity correspond with the expected range for these two locations, which indicates water quality has not changed substantially. However, concentrations of gross alpha, gross beta, molybdenum, nitrate, sulfate, and uranium were far from the expected range as originally reported, but there is good agreement with the expected range when the results are assigned to the appropriate location. Therefore, results from these locations were switched in the database back to the location indicated by the data.

The selenium result from location 1211 was qualified with an "R" flag in the database because the result was two orders of magnitude lower than historical results from locations 933 and 935. These locations are located in 1st Wash, which discharges into the distributary channel at location 1211. Analytical results for nitrate, sulfate, and uranium from location 1211 were similar to results from locations 933 and 935.

The filtered sulfate result of 4,850 mg/L from location 1207 was qualified with an "R" flag in the database because of poor agreement with the filtered duplicate (3,180 mg/L), the unfiltered sample (3,260 mg/L), and the unfiltered duplicate (3,180 mg/L). Anomalous results, along with the disposition, are listed on the Anomalous Data Review Checksheet.

SUMMARY

All analytical quality control criteria were met except as qualified on the Surface Water Quality by Parameter or equipment blank/trip blank database printouts. The meaning of data qualifiers is as defined on the UMTRA database printout or as defined in the USEPA Contract Laboratory Program Statement of Work for Inorganic Analysis, Multi-Media Multi-Concentration, Document Number ILMO2.0, 1991. All data in this package are considered validated and may be treated as final results.

A disk copy of the surface water and equipment blank database printouts with the qualifiers incorporated is included in this package.

Sam Campbell 6-30-00

Sam Campbell
Data Validation Lead

Date

Craig Goodknight 7/5/00

Craig Goodknight
Project Lead

Date

DATA REVIEW CHECKSHEET

ANOMALOUS DATA REVIEW CHECKSHEET

SITE: Shiprock SAMPLING DATA: Surface Water

REVIEWER(s): Sam Campbell (NAME (print)) Sam Campbell (SIGNATURE) 6-30-00 (DATE)

SITE HYDROLOGIST: RJ Weyberberg for M Hooten (NAME (print)) (SIGNATURE) 05 July 2000 (DATE)

DATE OF REVIEW: 6-30-00

LOC. NO.	ANALYTE	TYPE OF ANOMALY	DISPOSITION
1210	All lab analytes	high	Switch with results from 1211
1211	↓	low	Switch with results from 1210
1211	Se	low	"R" flag results (filtered and unfiltered)
1207	SO4	high	"R" flag the filtered result

WATER QUALITY DATA

SURFACE WATER QUALITY DATA BY PARAMETER (USEE800) FOR SITE SHP01, SHIPROCK
REPORT DATE: 6/30/2000 4:10 pm

PARAMETER	UNITS	LOCATION ID	SAMPLE: DATE	ID	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Alkalinity as CaCO3	mg/L	1200	03/14/2000	0001	121			#	-	-
	mg/L	1200	03/14/2000	N001	127			#	-	-
	mg/L	1201	03/14/2000	0001	122			#	-	-
	mg/L	1201	03/14/2000	N001	119			#	-	-
	mg/L	1202	03/14/2000	0001	119			#	-	-
	mg/L	1202	03/14/2000	N001	134			#	-	-
	mg/L	1203	03/14/2000	0001	119			#	-	-
	mg/L	1203	03/14/2000	N001	128			#	-	-
	mg/L	1204	03/14/2000	0001	124			#	-	-
	mg/L	1204	03/14/2000	N001	126			#	-	-
	mg/L	1205	03/14/2000	0001	127			#	-	-
	mg/L	1205	03/14/2000	N001	124			#	-	-
	mg/L	1206	03/14/2000	0001	133			#	-	-
	mg/L	1206	03/14/2000	N001	128			#	-	-
	mg/L	1207	03/14/2000	0001	390			#	-	-
	mg/L	1207	03/14/2000	N001	407			#	-	-
	mg/L	1208	03/14/2000	0001	135			#	-	-
	mg/L	1208	03/14/2000	N001	137			#	-	-
	mg/L	1209	03/14/2000	0001	108			#	-	-
	mg/L	1209	03/14/2000	N001	98			#	-	-
	mg/L	1210	03/14/2000	0001	117			#	-	-
	mg/L	1210	03/14/2000	N001	117			#	-	-
	mg/L	1211	03/14/2000	0001	458			#	-	-
	mg/L	1211	03/14/2000	N001	463			#	-	-
	mg/L	1212	03/14/2000	0001	464			#	-	-
	mg/L	1212	03/14/2000	N001	471			#	-	-
	mg/L	1213	03/14/2000	0001	141			#	-	-
	mg/L	1213	03/14/2000	N001	148			#	-	-
Ammonium	mg/L	1200	03/14/2000	0001	0.0154		B	#	-	-
	mg/L	1200	03/14/2000	N001	0.065		B	#	-	-
	mg/L	1201	03/14/2000	0001	0.0265		B	#	-	-
	mg/L	1201	03/14/2000	N001	0.0309		B	#	-	-
	mg/L	1202	03/14/2000	0001	0.0293		B	#	-	-
	mg/L	1202	03/14/2000	N001	0.0369		B	#	-	-
	mg/L	1203	03/14/2000	0001	0.0154		B	#	-	-
	mg/L	1203	03/14/2000	N001	0.0318		B	#	-	-
	mg/L	1204	03/14/2000	0001	0.0182		B	#	-	-

SURFACE WATER QUALITY DATA BY PARAMETER (USEE800) FOR SITE SHP01, SHIPROCK
REPORT DATE: 6/30/2000 4:10 pm

PARAMETER	UNITS	LOCATION ID	SAMPLE: DATE	ID	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonium	mg/L	1204	03/14/2000	N001	0.0318	B		#	-	-
	mg/L	1205	03/14/2000	0001	0.0237	B		#	-	-
	mg/L	1205	03/14/2000	N001	0.0262	B		#	-	-
	mg/L	1206	03/14/2000	0001	0.132			#	-	-
	mg/L	1206	03/14/2000	N001	0.126			#	-	-
	mg/L	1207	03/14/2000	0001	0.0681	B		#	-	-
	mg/L	1207	03/14/2000	0002	0.0487	B	J	#	-	-
	mg/L	1207	03/14/2000	N001	0.0734	B		#	-	-
	mg/L	1207	03/14/2000	N002	0.0623	B		#	-	-
	mg/L	1208	03/14/2000	0001	0.0459	B		#	-	-
	mg/L	1208	03/14/2000	N001	0.0456	B		#	-	-
	mg/L	1209	03/14/2000	0001	0.0376	B		#	-	-
	mg/L	1209	03/14/2000	N001	0.0401	B		#	-	-
	mg/L	1210	03/14/2000	0001	0.0265	B		#	-	-
	mg/L	1210	03/14/2000	N001	0.0373	B		#	-	-
	mg/L	1211	03/14/2000	0001	0.0265	B		#	-	-
	mg/L	1211	03/14/2000	N001	0.0428	B		#	-	-
	mg/L	1212	03/14/2000	0001	0.110			#	-	-
	mg/L	1212	03/14/2000	N001	0.102			#	-	-
	mg/L	1213	03/14/2000	0001	0.0959	B		#	-	-
	mg/L	1213	03/14/2000	N001	0.115			#	-	-
Gross Alpha	pCi/L	1200	03/14/2000	0001	7.44	U		#	7.44	± 4.09
	pCi/L	1200	03/14/2000	N001	7.59	U		#	7.59	± 3.69
	pCi/L	1201	03/14/2000	0001	7.37	U		#	7.37	± 4.24
	pCi/L	1201	03/14/2000	N001	7.43	U		#	7.43	± 4.52
	pCi/L	1202	03/14/2000	0001	7.36	U		#	7.36	± 4.70
	pCi/L	1202	03/14/2000	N001	7.77	U		#	7.77	± 4.00
	pCi/L	1203	03/14/2000	0001	13.05			#	7.42	± 5.76
	pCi/L	1203	03/14/2000	N001	5.38	U		#	5.38	± 3.71
	pCi/L	1204	03/14/2000	0001	7.65			#	7.43	± 5.06
	pCi/L	1204	03/14/2000	N001	9.42			#	5.44	± 4.53
	pCi/L	1205	03/14/2000	0001	7.31	U		#	7.31	± 4.45
	pCi/L	1205	03/14/2000	N001	6.84			#	5.46	± 4.11
	pCi/L	1206	03/14/2000	0001	7.63	U		#	7.63	± 5.09
	pCi/L	1206	03/14/2000	N001	6.27			#	5.63	± 4.10
	pCi/L	1207	03/14/2000	0001	228.91			#	44.49	± 49.8
	pCi/L	1207	03/14/2000	0002	205.86			#	44.77	± 47.9

SURFACE WATER QUALITY DATA BY PARAMETER (USEE800) FOR SITE SHP01, SHIPROCK
REPORT DATE: 6/30/2000 4:10 pm

PARAMETER	UNITS	LOCATION ID	SAMPLE: DATE	ID	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Gross Alpha	pCi/L	1207	03/14/2000	N001	164.96			#	32.83	± 41.1
	pCi/L	1207	03/14/2000	N002	241.43			#	32.6	± 48.6
	pCi/L	1208	03/14/2000	0001	36.01	U		#	36.01	± 21.2
	pCi/L	1208	03/14/2000	N001	27.04	U		#	27.04	± 14.7
	pCi/L	1209	03/14/2000	0001	35.82	U		#	35.82	± 22.0
	pCi/L	1209	03/14/2000	N001	27.36	U		#	27.36	± 15.3
	pCi/L	1210	03/14/2000	0001	7.47	U		#	7.47	± 4.43
	pCi/L	1210	03/14/2000	N001	5.69	U		#	5.69	± 3.69
	pCi/L	1211	03/14/2000	0001	45.81	U		#	45.81	± 25.9
	pCi/L	1211	03/14/2000	N001	45.22			#	34.27	± 26.1
	pCi/L	1212	03/14/2000	0001	243.03			#	46.72	± 52.5
	pCi/L	1212	03/14/2000	N001	193.1			#	34.63	± 45.4
	pCi/L	1213	03/14/2000	0001	34.61			#	29.63	± 20.7
	pCi/L	1213	03/14/2000	N001	41.81			#	25.27	± 20.7
Gross Beta	pCi/L	1200	03/14/2000	0001	12.11			#	11.6	± 7.26
	pCi/L	1200	03/14/2000	N001	11.60	U		#	11.6	± 7.10
	pCi/L	1201	03/14/2000	0001	11.60	U		#	11.6	± 7.04
	pCi/L	1201	03/14/2000	N001	11.6	U		#	11.62	± 6.84
	pCi/L	1202	03/14/2000	0001	11.62	U		#	11.62	± 7.07
	pCi/L	1202	03/14/2000	N001	11.64	U		#	11.64	± 7.13
	pCi/L	1203	03/14/2000	0001	15.32			#	11.68	± 7.47
	pCi/L	1203	03/14/2000	N001	10.11			#	8.95	± 5.61
	pCi/L	1204	03/14/2000	0001	11.65	U		#	11.65	± 7.15
	pCi/L	1204	03/14/2000	N001	9.0	U		#	9.01	± 5.33
	pCi/L	1205	03/14/2000	0001	11.6	U		#	11.61	± 6.97
	pCi/L	1205	03/14/2000	N001	8.99	U		#	8.99	± 5.50
	pCi/L	1206	03/14/2000	0001	11.67	U		#	11.67	± 7.12
	pCi/L	1206	03/14/2000	N001	9.97			#	9.01	± 5.63
	pCi/L	1207	03/14/2000	0001	162.23			#	49.37	± 36.2
	pCi/L	1207	03/14/2000	0002	177.42			#	49.28	± 36.8
	pCi/L	1207	03/14/2000	N001	149.29			#	38.54	± 28.6
	pCi/L	1207	03/14/2000	N002	117.01			#	38.99	± 27.5
	pCi/L	1208	03/14/2000	0001	36.68	U		#	36.68	± 22.6
	pCi/L	1208	03/14/2000	N001	33.38			#	28.51	± 17.9
	pCi/L	1209	03/14/2000	0001	36.68	U		#	36.68	± 22.1
	pCi/L	1209	03/14/2000	N001	33.81			#	28.57	± 17.9
	pCi/L	1210	03/14/2000	0001	11.63	U		#	11.63	± 6.65

SURFACE WATER QUALITY DATA BY PARAMETER (USEE800) FOR SITE SHP01, SHIPROCK
REPORT DATE: 6/30/2000 4:10 pm

PARAMETER	UNITS	LOCATION ID	SAMPLE: DATE	ID	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Gross Beta	pCi/L	1210	03/14/2000	N001	9.00	U		#	9	± 5.49
	pCi/L	1211	03/14/2000	0001	50.56			#	48.55	± 30.3
	pCi/L	1211	03/14/2000	N001	38.03	U		#	38.03	± 23.1
	pCi/L	1212	03/14/2000	0001	155.12			#	49.7	± 36.0
	pCi/L	1212	03/14/2000	N001	122			#	38.95	± 27.7
	pCi/L	1213	03/14/2000	0001	40.18			#	30.6	± 19.5
	pCi/L	1213	03/14/2000	N001	51.17			#	28.45	± 18.6
Manganese	mg/L	1200	03/14/2000	0001	0.0192			#	-	-
	mg/L	1200	03/14/2000	N001	0.0526			#	-	-
	mg/L	1201	03/14/2000	0001	0.0164			#	-	-
	mg/L	1201	03/14/2000	N001	0.0745			#	-	-
	mg/L	1202	03/14/2000	0001	0.0131			#	-	-
	mg/L	1202	03/14/2000	N001	0.0539			#	-	-
	mg/L	1203	03/14/2000	0001	0.0163			#	-	-
	mg/L	1203	03/14/2000	N001	0.031			#	-	-
	mg/L	1204	03/14/2000	0001	0.013			#	-	-
	mg/L	1204	03/14/2000	N001	0.0413			#	-	-
	mg/L	1205	03/14/2000	0001	0.0078	B		#	-	-
	mg/L	1205	03/14/2000	N001	0.0508			#	-	-
	mg/L	1206	03/14/2000	0001	0.0719			#	-	-
	mg/L	1206	03/14/2000	N001	0.112			#	-	-
	mg/L	1207	03/14/2000	0001	0.0061	B		#	-	-
	mg/L	1207	03/14/2000	0002	0.007	B		#	-	-
	mg/L	1207	03/14/2000	N001	0.0086	B		#	-	-
	mg/L	1207	03/14/2000	N002	0.0068	B		#	-	-
	mg/L	1208	03/14/2000	0001	0.103			#	-	-
	mg/L	1208	03/14/2000	N001	0.108			#	-	-
	mg/L	1209	03/14/2000	0001	0.018			#	-	-
	mg/L	1209	03/14/2000	N001	0.0312			#	-	-
	mg/L	1210	03/14/2000	0001	0.0191			#	-	-
	mg/L	1210	03/14/2000	N001	0.0637			#	-	-
	mg/L	1211	03/14/2000	0001	0.0203			#	-	-
	mg/L	1211	03/14/2000	N001	0.0244			#	-	-
	mg/L	1212	03/14/2000	0001	0.0013	B		#	-	-
	mg/L	1212	03/14/2000	N001	0.0036	B		#	-	-
	mg/L	1213	03/14/2000	0001	0.0226			#	-	-
	mg/L	1213	03/14/2000	N001	0.0357			#	-	-

SURFACE WATER QUALITY DATA BY PARAMETER (USEE800) FOR SITE SHP01, SHIPROCK
REPORT DATE: 6/30/2000 4:10 pm

PARAMETER	UNITS	LOCATION ID	SAMPLE: DATE	ID	RESULT	QUALIFIERS: LAB	DATA QA	DETECTION LIMIT	UN-CERTAINTY
Molybdenum	mg/L	1200	03/14/2000	0001	0.0017	B	#	-	-
	mg/L	1200	03/14/2000	N001	0.0019	B	#	-	-
	mg/L	1201	03/14/2000	0001	0.0012	B	#	-	-
	mg/L	1201	03/14/2000	N001	0.0014	B	#	-	-
	mg/L	1202	03/14/2000	0001	0.0012	B	#	-	-
	mg/L	1202	03/14/2000	N001	0.0015	B	#	-	-
	mg/L	1203	03/14/2000	0001	0.0016	B	#	-	-
	mg/L	1203	03/14/2000	N001	0.0025	B	#	-	-
	mg/L	1204	03/14/2000	0001	0.0014	B	#	-	-
	mg/L	1204	03/14/2000	N001	0.0019	B	#	-	-
	mg/L	1205	03/14/2000	0001	0.0014	B	#	-	-
	mg/L	1205	03/14/2000	N001	0.0018	B	#	-	-
	mg/L	1206	03/14/2000	0001	0.0012	B	#	-	-
	mg/L	1206	03/14/2000	N001	0.0016	B	#	-	-
	mg/L	1207	03/14/2000	0001	0.0053	B	#	-	-
	mg/L	1207	03/14/2000	0002	0.005	B	#	-	-
	mg/L	1207	03/14/2000	N001	0.0062	B	#	-	-
	mg/L	1207	03/14/2000	N002	0.0057	B	#	-	-
	mg/L	1208	03/14/2000	0001	0.012		#	-	-
	mg/L	1208	03/14/2000	N001	0.014		#	-	-
	mg/L	1209	03/14/2000	0001	0.010	B	#	-	-
	mg/L	1209	03/14/2000	N001	0.010	B	#	-	-
	mg/L	1210	03/14/2000	0001	0.0016	B	#	-	-
	mg/L	1210	03/14/2000	N001	0.0015	B	#	-	-
	mg/L	1211	03/14/2000	0001	0.006	B	#	-	-
	mg/L	1211	03/14/2000	N001	0.0062	B	#	-	-
	mg/L	1212	03/14/2000	0001	0.005	B	#	-	-
	mg/L	1212	03/14/2000	N001	0.0059	B	#	-	-
	mg/L	1213	03/14/2000	0001	0.0069	B	#	-	-
	mg/L	1213	03/14/2000	N001	0.008	B	#	-	-
Nitrate	mg/L	1200	03/14/2000	0001	1.700		#	-	-
	mg/L	1200	03/14/2000	N001	1.820		#	-	-
	mg/L	1201	03/14/2000	0001	0.950	B	#	-	-
	mg/L	1201	03/14/2000	N001	0.959	B	#	-	-
	mg/L	1202	03/14/2000	0001	0.907	B	#	-	-
	mg/L	1202	03/14/2000	N001	0.924	B	#	-	-
	mg/L	1203	03/14/2000	0001	0.526	B	#	-	-

SURFACE WATER QUALITY DATA BY PARAMETER (USEE800) FOR SITE SHP01, SHIPROCK
REPORT DATE: 6/30/2000 4:10 pm

PARAMETER	UNITS	LOCATION ID	SAMPLE: DATE	ID	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Nitrate	mg/L	1203	03/14/2000	N001	0.548	B		#	-	-
	mg/L	1204	03/14/2000	0001	0.745	B		#	-	-
	mg/L	1204	03/14/2000	N001	0.743	B		#	-	-
	mg/L	1205	03/14/2000	0001	0.796	B		#	-	-
	mg/L	1205	03/14/2000	N001	0.782	B		#	-	-
	mg/L	1206	03/14/2000	0001	2.070			#	-	-
	mg/L	1206	03/14/2000	N001	2.110			#	-	-
	mg/L	1207	03/14/2000	0001	149.000			#	-	-
	mg/L	1207	03/14/2000	0002	149.000		J	#	-	-
	mg/L	1207	03/14/2000	N001	147.000			#	-	-
	mg/L	1207	03/14/2000	N002	148.000			#	-	-
	mg/L	1208	03/14/2000	0001	0.883	B		#	-	-
	mg/L	1208	03/14/2000	N001	0.893	B		#	-	-
	mg/L	1209	03/14/2000	0001	2.090			#	-	-
	mg/L	1209	03/14/2000	N001	3.010			#	-	-
	mg/L	1210	03/14/2000	0001	1.490			#	-	-
	mg/L	1210	03/14/2000	N001	1.480			#	-	-
	mg/L	1211	03/14/2000	0001	420.000			#	-	-
	mg/L	1211	03/14/2000	N001	429.000			#	-	-
	mg/L	1212	03/14/2000	0001	159.000			#	-	-
	mg/L	1212	03/14/2000	N001	159.000			#	-	-
	mg/L	1213	03/14/2000	0001	7.890			#	-	-
	mg/L	1213	03/14/2000	N001	7.880			#	-	-
ORP of Zobell Solution	mV	1200	03/14/2000	N001	255			#	-	-
	mV	1201	03/14/2000	N001	255			#	-	-
	mV	1202	03/14/2000	N001	253			#	-	-
	mV	1203	03/14/2000	N001	253			#	-	-
	mV	1204	03/14/2000	N001	253			#	-	-
	mV	1205	03/14/2000	N001	248			#	-	-
	mV	1206	03/14/2000	N001	248			#	-	-
	mV	1207	03/14/2000	N001	248			#	-	-
	mV	1208	03/14/2000	N001	249			#	-	-
	mV	1209	03/14/2000	N001	249			#	-	-
	mV	1210	03/14/2000	N001	245			#	-	-
	mV	1211	03/14/2000	N001	245			#	-	-
	mV	1212	03/14/2000	N001	248			#	-	-
	mV	1213	03/14/2000	N001	249			#	-	-

SURFACE WATER QUALITY DATA BY PARAMETER (USEE800) FOR SITE SHP01, SHIPROCK
REPORT DATE: 6/30/2000 4:10 pm

PARAMETER	UNITS	LOCATION ID	SAMPLE: DATE	ID	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
pH	s.u.	1200	03/14/2000	N001	8.45			#	-	-
	s.u.	1201	03/14/2000	N001	8.67			#	-	-
	s.u.	1202	03/14/2000	N001	8.47			#	-	-
	s.u.	1203	03/14/2000	N001	8.59			#	-	-
	s.u.	1204	03/14/2000	N001	8.82			#	-	-
	s.u.	1205	03/14/2000	N001	8.55			#	-	-
	s.u.	1206	03/14/2000	N001	8.55			#	-	-
	s.u.	1207	03/14/2000	N001	8.03			#	-	-
	s.u.	1208	03/14/2000	N001	8.47			#	-	-
	s.u.	1209	03/14/2000	N001	8.77			#	-	-
	s.u.	1210	03/14/2000	N001	8.49			#	-	-
	s.u.	1211	03/14/2000	N001	7.49			#	-	-
	s.u.	1212	03/14/2000	N001	7.79			#	-	-
	s.u.	1213	03/14/2000	N001	7.44			#	-	-
Redox Potential	mV	1200	03/14/2000	N001	98			#	-	-
	mV	1201	03/14/2000	N001	154			#	-	-
	mV	1202	03/14/2000	N001	89			#	-	-
	mV	1203	03/14/2000	N001	53			#	-	-
	mV	1204	03/14/2000	N001	60			#	-	-
	mV	1205	03/14/2000	N001	90			#	-	-
	mV	1206	03/14/2000	N001	69			#	-	-
	mV	1207	03/14/2000	N001	113			#	-	-
	mV	1208	03/14/2000	N001	97			#	-	-
	mV	1209	03/14/2000	N001	93			#	-	-
	mV	1210	03/14/2000	N001	99			#	-	-
	mV	1211	03/14/2000	N001	107			#	-	-
	mV	1212	03/14/2000	N001	107			#	-	-
	mV	1213	03/14/2000	N001	96			#	-	-
Selenium	mg/L	1200	03/14/2000	0001	0.0001	B		#	-	-
	mg/L	1200	03/14/2000	N001	0.0001	B		#	-	-
	mg/L	1201	03/14/2000	0001	0.0001	U		#	0.0001	-
	mg/L	1201	03/14/2000	N001	0.0001	B		#	-	-
	mg/L	1202	03/14/2000	0001	0.0001	B		#	-	-
	mg/L	1202	03/14/2000	N001	0.0001	B		#	-	-
	mg/L	1203	03/14/2000	0001	0.0001	U		#	0.0001	-
	mg/L	1203	03/14/2000	N001	0.0001	B		#	-	-
	mg/L	1204	03/14/2000	0001	0.0001	U		#	0.0001	-

SURFACE WATER QUALITY DATA BY PARAMETER (USEE800) FOR SITE SHP01, SHIPROCK
REPORT DATE: 6/30/2000 4:10 pm

PARAMETER	UNITS	LOCATION ID	SAMPLE: DATE	ID	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Selenium	mg/L	1204	03/14/2000	N001	0.0001	B		#	-	-
	mg/L	1205	03/14/2000	0001	0.0001	B		#	-	-
	mg/L	1205	03/14/2000	N001	0.0001	U		#	0.00011	-
	mg/L	1206	03/14/2000	0001	0.0001	U		#	0.0001	-
	mg/L	1206	03/14/2000	N001	0.0001	B		#	-	-
	mg/L	1207	03/14/2000	0001	0.0037	B		#	-	-
	mg/L	1207	03/14/2000	0002	0.0037	B		#	-	-
	mg/L	1207	03/14/2000	N001	0.0032	B		#	-	-
	mg/L	1207	03/14/2000	N002	0.0033	B		#	-	-
	mg/L	1208	03/14/2000	0001	0.0011	B		#	-	-
	mg/L	1208	03/14/2000	N001	0.0014	B		#	-	-
	mg/L	1209	03/14/2000	0001	0.0022	B		#	-	-
	mg/L	1209	03/14/2000	N001	0.0023	B		#	-	-
	mg/L	1210	03/14/2000	0001	0.0001	B		#	-	-
	mg/L	1210	03/14/2000	N001	0.0001	U		#	0.00011	-
	mg/L	1212	03/14/2000	0001	0.0044	B		#	-	-
	mg/L	1212	03/14/2000	N001	0.0041	B		#	-	-
	mg/L	1213	03/14/2000	0001	0.001	B		#	-	-
	mg/L	1213	03/14/2000	N001	0.001	B		#	-	-
Specific Conductance	umhos/cm	1200	03/14/2000	N001	640			#	-	-
	umhos/cm	1201	03/14/2000	N001	640			#	-	-
	umhos/cm	1202	03/14/2000	N001	628			#	-	-
	umhos/cm	1203	03/14/2000	N001	604			#	-	-
	umhos/cm	1204	03/14/2000	N001	625			#	-	-
	umhos/cm	1205	03/14/2000	N001	626			#	-	-
	umhos/cm	1206	03/14/2000	N001	731			#	-	-
	umhos/cm	1207	03/14/2000	N001	4190			#	-	-
	umhos/cm	1208	03/14/2000	N001	5200			#	-	-
	umhos/cm	1209	03/14/2000	N001	5260			#	-	-
	umhos/cm	1210	03/14/2000	N001	680			#	-	-
	umhos/cm	1211	03/14/2000	N001	5590			#	-	-
	umhos/cm	1212	03/14/2000	N001	6520			#	-	-
	umhos/cm	1213	03/14/2000	N001	5160			#	-	-
Sulfate	mg/L	1200	03/14/2000	0001	164.000			#	-	-
	mg/L	1200	03/14/2000	N001	167.000			#	-	-
	mg/L	1201	03/14/2000	0001	156.000			#	-	-
	mg/L	1201	03/14/2000	N001	161.000			#	-	-

SURFACE WATER QUALITY DATA BY PARAMETER (USEE800) FOR SITE SHP01, SHIPROCK
REPORT DATE: 6/30/2000 4:10 pm

PARAMETER	UNITS	LOCATION ID	SAMPLE: DATE	ID	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Sulfate	mg/L	1202	03/14/2000	0001	159.000			#	-	-
	mg/L	1202	03/14/2000	N001	164.000			#	-	-
	mg/L	1203	03/14/2000	0001	159.000			#	-	-
	mg/L	1203	03/14/2000	N001	165.000			#	-	-
	mg/L	1204	03/14/2000	0001	146.000			#	-	-
	mg/L	1204	03/14/2000	N001	163.000			#	-	-
	mg/L	1205	03/14/2000	0001	156.000			#	-	-
	mg/L	1205	03/14/2000	N001	165.000			#	-	-
	mg/L	1206	03/14/2000	0001	202.000			#	-	-
	mg/L	1206	03/14/2000	N001	201.000			#	-	-
	mg/L	1207	03/14/2000	0002	3180.000			#	-	-
	mg/L	1207	03/14/2000	N001	3260.000			#	-	-
	mg/L	1207	03/14/2000	N002	3180.000			#	-	-
	mg/L	1208	03/14/2000	0001	3200.000			#	-	-
	mg/L	1208	03/14/2000	N001	3340.000			#	-	-
	mg/L	1209	03/14/2000	0001	3380.000			#	-	-
	mg/L	1209	03/14/2000	N001	3420.000			#	-	-
	mg/L	1210	03/14/2000	0001	191.000			#	-	-
	mg/L	1210	03/14/2000	N001	191.000			#	-	-
	mg/L	1211	03/14/2000	0001	3460.000			#	-	-
	mg/L	1211	03/14/2000	N001	3370.000			#	-	-
	mg/L	1212	03/14/2000	0001	3520.000			#	-	-
	mg/L	1212	03/14/2000	N001	3580.000			#	-	-
	mg/L	1213	03/14/2000	0001	2560.000			#	-	-
	mg/L	1213	03/14/2000	N001	2590.000			#	-	-
Temperature	C	1200	03/14/2000	N001	7.8			#	-	-
	C	1201	03/14/2000	N001	7.7			#	-	-
	C	1202	03/14/2000	N001	8.9			#	-	-
	C	1203	03/14/2000	N001	13.7			#	-	-
	C	1204	03/14/2000	N001	10			#	-	-
	C	1205	03/14/2000	N001	10.7			#	-	-
	C	1206	03/14/2000	N001	12.8			#	-	-
	C	1207	03/14/2000	N001	8			#	-	-
	C	1208	03/14/2000	N001	20.9			#	-	-
	C	1209	03/14/2000	N001	23.1			#	-	-
	C	1210	03/14/2000	N001	12			#	-	-
	C	1211	03/14/2000	N001	9			#	-	-

SURFACE WATER QUALITY DATA BY PARAMETER (USEE800) FOR SITE SHP01, SHIPROCK
REPORT DATE: 6/30/2000 4:10 pm

PARAMETER	UNITS	LOCATION ID	SAMPLE: DATE	ID	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Temperature	C	1212	03/14/2000	N001	7.3			#	-	-
	C	1213	03/14/2000	N001	5.9			#	-	-
Temperature of Zobell Soluti	C	1200	03/14/2000	N001	7.3			#	-	-
	C	1201	03/14/2000	N001	7.3			#	-	-
	C	1202	03/14/2000	N001	8.6			#	-	-
	C	1203	03/14/2000	N001	8.6			#	-	-
	C	1204	03/14/2000	N001	8.6			#	-	-
	C	1205	03/14/2000	N001	10.9			#	-	-
	C	1206	03/14/2000	N001	10.9			#	-	-
	C	1207	03/14/2000	N001	10.9			#	-	-
	C	1208	03/14/2000	N001	13.3			#	-	-
	C	1209	03/14/2000	N001	13.3			#	-	-
	C	1210	03/14/2000	N001	14.7			#	-	-
	C	1211	03/14/2000	N001	14.7			#	-	-
	C	1212	03/14/2000	N001	10.9			#	-	-
	C	1213	03/14/2000	N001	13.3			#	-	-
Turbidity	NTU	1200	03/14/2000	N001	41.6			#	-	-
	NTU	1201	03/14/2000	N001	71.4			#	-	-
	NTU	1202	03/14/2000	N001	26.1			#	-	-
	NTU	1203	03/14/2000	N001	26.2			#	-	-
	NTU	1204	03/14/2000	N001	23.5			#	-	-
	NTU	1205	03/14/2000	N001	23.5			#	-	-
	NTU	1206	03/14/2000	N001	36			#	-	-
	NTU	1207	03/14/2000	N001	3.63			#	-	-
	NTU	1208	03/14/2000	N001	17.6			#	-	-
	NTU	1209	03/14/2000	N001	15.2			#	-	-
	NTU	1210	03/14/2000	N001	38.4			#	-	-
	NTU	1211	03/14/2000	N001	10.4			#	-	-
	NTU	1212	03/14/2000	N001	5.18			#	-	-
	NTU	1213	03/14/2000	N001	538			#	-	-
Uranium	mg/L	1200	03/14/2000	0001	0.002			#	-	-
	mg/L	1200	03/14/2000	N001	0.0022			#	-	-
	mg/L	1201	03/14/2000	0001	0.002			#	-	-
	mg/L	1201	03/14/2000	N001	0.002			#	-	-
	mg/L	1202	03/14/2000	0001	0.002			#	-	-
	mg/L	1202	03/14/2000	N001	0.0021			#	-	-

SURFACE WATER QUALITY DATA BY PARAMETER (USEE800) FOR SITE SHP01, SHIPROCK
REPORT DATE: 6/30/2000 4:10 pm

PARAMETER	UNITS	LOCATION ID	SAMPLE: DATE	ID	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Uranium	mg/L	1203	03/14/2000	0001	0.002			#	-	-
	mg/L	1203	03/14/2000	N001	0.0027			#	-	-
	mg/L	1204	03/14/2000	0001	0.002			#	-	-
	mg/L	1204	03/14/2000	N001	0.0026			#	-	-
	mg/L	1205	03/14/2000	0001	0.0021			#	-	-
	mg/L	1205	03/14/2000	N001	0.0023			#	-	-
	mg/L	1206	03/14/2000	0001	0.0048			#	-	-
	mg/L	1206	03/14/2000	N001	0.0057			#	-	-
	mg/L	1207	03/14/2000	0001	0.363			#	-	-
	mg/L	1207	03/14/2000	0002	0.361			#	-	-
	mg/L	1207	03/14/2000	N001	0.371			#	-	-
	mg/L	1207	03/14/2000	N002	0.360			#	-	-
	mg/L	1208	03/14/2000	0001	0.0201			#	-	-
	mg/L	1208	03/14/2000	N001	0.0166			#	-	-
	mg/L	1209	03/14/2000	0001	0.0343			#	-	-
	mg/L	1209	03/14/2000	N001	0.0355			#	-	-
	mg/L	1210	03/14/2000	0001	0.0029			#	-	-
	mg/L	1210	03/14/2000	N001	0.0031			#	-	-
	mg/L	1211	03/14/2000	0001	0.0672			#	-	-
	mg/L	1211	03/14/2000	N001	0.0662			#	-	-
	mg/L	1212	03/14/2000	0001	0.384			#	-	-
	mg/L	1212	03/14/2000	N001	0.384			#	-	-
	mg/L	1213	03/14/2000	0001	0.0592			#	-	-
	mg/L	1213	03/14/2000	N001	0.0624			#	-	-
Vanadium	mg/L	1200	03/14/2000	0001	0.0006		B	#	-	-
	mg/L	1200	03/14/2000	N001	0.0022		B	#	-	-
	mg/L	1201	03/14/2000	0001	0.0009		B	#	-	-
	mg/L	1201	03/14/2000	N001	0.0034		B	#	-	-
	mg/L	1202	03/14/2000	0001	0.0006		B	#	-	-
	mg/L	1202	03/14/2000	N001	0.0034		B	#	-	-
	mg/L	1203	03/14/2000	0001	0.0008		B	#	-	-
	mg/L	1203	03/14/2000	N001	0.0015		B	#	-	-
	mg/L	1204	03/14/2000	0001	0.0008		B	#	-	-
	mg/L	1204	03/14/2000	N001	0.0015		B	#	-	-
	mg/L	1205	03/14/2000	0001	0.0009		B	#	-	-
	mg/L	1205	03/14/2000	N001	0.0029		B	#	-	-
	mg/L	1206	03/14/2000	0001	0.0008		B	#	-	-

SURFACE WATER QUALITY DATA BY PARAMETER (USEE800) FOR SITE SHP01, SHIPROCK
REPORT DATE: 6/30/2000 4:10 pm

PARAMETER	UNITS	LOCATION ID	SAMPLE: DATE	ID	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Vanadium	mg/L	1206	03/14/2000	N001	0.002	B		#	-	-
	mg/L	1207	03/14/2000	0001	0.0004	U		#	0.0004	-
	mg/L	1207	03/14/2000	0002	0.0004	U		#	0.0004	-
	mg/L	1207	03/14/2000	N001	0.0006	B		#	-	-
	mg/L	1207	03/14/2000	N002	0.0004	U		#	0.00044	-
	mg/L	1208	03/14/2000	0001	0.0056	B		#	-	-
	mg/L	1208	03/14/2000	N001	0.0044	B		#	-	-
	mg/L	1209	03/14/2000	0001	0.0009	B	U	#	-	-
	mg/L	1209	03/14/2000	N001	0.0046	B		#	-	-
	mg/L	1210	03/14/2000	0001	0.0007	B	U	#	-	-
	mg/L	1210	03/14/2000	N001	0.006	B		#	-	-
	mg/L	1211	03/14/2000	0001	0.0009	B	U	#	-	-
	mg/L	1211	03/14/2000	N001	0.0004	U		#	0.00044	-
	mg/L	1212	03/14/2000	0001	0.0005	B		#	-	-
	mg/L	1212	03/14/2000	N001	0.0004	U		#	0.00044	-
	mg/L	1213	03/14/2000	0001	0.0005	B	U	#	-	-
	mg/L	1213	03/14/2000	N001	0.0054	B		#	-	-
Zinc	mg/L	1200	03/14/2000	0001	0.0076	U		#	0.0076	-
	mg/L	1200	03/14/2000	N001	0.0178	B		#	-	-
	mg/L	1201	03/14/2000	0001	0.0076	U		#	0.0076	-
	mg/L	1201	03/14/2000	N001	0.0128	B		#	-	-
	mg/L	1202	03/14/2000	0001	0.0076	U		#	0.0076	-
	mg/L	1202	03/14/2000	N001	0.0084	U		#	0.0084	-
	mg/L	1203	03/14/2000	0001	0.0076	U		#	0.0076	-
	mg/L	1203	03/14/2000	N001	0.0084	U		#	0.0084	-
	mg/L	1204	03/14/2000	0001	0.0076	U		#	0.0076	-
	mg/L	1204	03/14/2000	N001	0.0163	B		#	-	-
	mg/L	1205	03/14/2000	0001	0.0076	U		#	0.0076	-
	mg/L	1205	03/14/2000	N001	0.0272	B		#	-	-
	mg/L	1206	03/14/2000	0001	0.0076	U		#	0.0076	-
	mg/L	1206	03/14/2000	N001	0.013	B		#	-	-
	mg/L	1207	03/14/2000	0001	0.0076	U		#	0.0076	-
	mg/L	1207	03/14/2000	0002	0.0076	U		#	0.0076	-
	mg/L	1207	03/14/2000	N001	0.0084	U		#	0.0084	-
	mg/L	1207	03/14/2000	N002	0.0084	U		#	0.0084	-
	mg/L	1208	03/14/2000	0001	0.0076	U		#	0.0076	-
	mg/L	1208	03/14/2000	N001	0.0084	U		#	0.0084	-

SURFACE WATER QUALITY DATA BY PARAMETER (USEE800) FOR SITE SHP01, SHIPROCK
REPORT DATE: 6/30/2000 4:10 pm

PARAMETER	UNITS	LOCATION ID	SAMPLE: DATE	ID	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Zinc	mg/L	1209	03/14/2000	0001	0.0076	U		#	0.0076	-
	mg/L	1209	03/14/2000	N001	0.0084	U		#	0.0084	-
	mg/L	1210	03/14/2000	0001	0.0076	U		#	0.0076	-
	mg/L	1210	03/14/2000	N001	0.0084	U		#	0.0084	-
	mg/L	1211	03/14/2000	0001	0.0076	U		#	0.0076	-
	mg/L	1211	03/14/2000	N001	0.0084	U		#	0.0084	-
	mg/L	1212	03/14/2000	0001	0.0076	U		#	0.0076	-
	mg/L	1212	03/14/2000	N001	0.0084	U		#	0.0084	-
	mg/L	1213	03/14/2000	0001	0.0076	U		#	0.0076	-
	mg/L	1213	03/14/2000	N001	0.0084	U		#	0.0084	-

RECORDS: SELECTED FROM USEE800 WHERE site_code='SHP01' AND quality_assurance = TRUE AND (NOT (data_validation_qualifiers LIKE "*R*" OR data_validation_qualifiers LIKE "*X*") OR IsNull(data_validation_qualifiers)) AND DATE_SAMPLED between #3/13/2000# and #3/16/2000#

SAMPLE ID CODES: 000X = Filtered sample (0.45 µm). N00X = Unfiltered sample. X = replicate number.

LAB QUALIFIERS:

- * Replicate analysis not within control limits.
- + Correlation coefficient for MSA < 0.995.
- A TIC is a suspected aldol-condensation product.
- B Inorganic: Result is between the IDL and CRDL. Organic: Analyte also found in method blank.
- E Inorganic: Estimate value because of interference, see case narrative. Organic: Analyte exceeded calibration range of the GC-MS.
- Z Laboratory defined (USEPA CLP organic) qualifier, see case narrative.
- H Holding time expired, value suspect.
- I Increased detection limit due to required dilution.
- C Pesticide result confirmed by GC-MS.
- M GFAA duplicate injection precision not met.
- N Inorganic or radiochemical: Spike sample recovery not within control limits. Organic: Tentatively identified compund (TIC).
- S Result determined by method of standard addition (MSA).
- U Analytical result below detection limit.
- W Post-digestion spike outside control limits while sample absorbance < 50% of analytical spike absorbance.
- D Analyte determined in diluted sample.
- P > 25% difference in detected pesticide or Arochlor concentrations between 2 columns.
- X Laboratory defined (USEPA CLP organic) qualifier, see case narrative.
- Y Laboratory defined (USEPA CLP organic) qualifier, see case narrative.
- > Result above upper detection limit.

DATA QUALIFIERS:

- J Estimated value.
- G Possible grout contamination, pH > 9.
- R Unusable result.
- U Parameter analyzed for but was not detected.
- F Low flow sampling method used.
- L Less than 3 bore volumes purged prior to sampling.
- X Location is undefined.

QA QUALIFIER: # = validated according to Quality Assurance guidelines.

ANALYTE	SITE_CODE	LOCATION_CODE	DATE	SAMPLE_ID	UNIT	RESULT	LAB_QUALIFIERS	DATA_VAL_QUALIFIERS	DETECTION_LIMIT	UNCERTAINTY
Ammonium	SHP01	0999	3/14/2000	0001	mg/L	0.021	B			
Ammonium	SHP01	0999	3/14/2000	N001	mg/L	0.0401	B			
Gross Alpha	SHP01	0999	3/14/2000	0001	pCi/L	1.46	U		1.46	0.82
Gross Alpha	SHP01	0999	3/14/2000	N001	pCi/L	1.08	U		1.08	0.53
Gross Beta	SHP01	0999	3/14/2000	0001	pCi/L	2.85	U		2.85	1.68
Gross Beta	SHP01	0999	3/14/2000	N001	pCi/L	2.18	U		2.18	1.26
Manganese	SHP01	0999	3/14/2000	0001	mg/L	0.0004	U		0.0004	
Manganese	SHP01	0999	3/14/2000	N001	mg/L	0.00044	U		0.00044	
Molybdenum	SHP01	0999	3/14/2000	0001	mg/L	0.0004	U		0.0004	
Molybdenum	SHP01	0999	3/14/2000	N001	mg/L	0.00044	U		0.00044	
Nitrate	SHP01	0999	3/14/2000	0001	mg/L	0.0337	B			
Nitrate	SHP01	0999	3/14/2000	N001	mg/L	0.295	B			
Selenium	SHP01	0999	3/14/2000	0001	mg/L	0.0001	U		0.0001	
Selenium	SHP01	0999	3/14/2000	N001	mg/L	0.00022	B			
Sulfate	SHP01	0999	3/14/2000	0001	mg/L	0.031	U		0.031	
Sulfate	SHP01	0999	3/14/2000	N001	mg/L	0.031	U		0.031	
Uranium	SHP01	0999	3/14/2000	0001	mg/L	0.00022	B	U		
Uranium	SHP01	0999	3/14/2000	N001	mg/L	0.00023	B	U		
Vanadium	SHP01	0999	3/14/2000	0001	mg/L	0.00067	B	U		
Vanadium	SHP01	0999	3/14/2000	N001	mg/L	0.00044	U		0.00044	
Zinc	SHP01	0999	3/14/2000	0001	mg/L	0.0076	U		0.0076	
Zinc	SHP01	0999	3/14/2000	N001	mg/L	0.0084	U		0.0084	

Adjusted Gross Alpha Data for Shiprock 03/2000 Sampling Event

ANALYTE	SITE_CODE	LOCATION_CODE	DATE	SAMPLE_ID	UNIT	RESULT	LAB_QUALIFIERS	DATA_VALIDATION_QUALIFIERS
Adjusted Gross Alpha	SHP01	1200	03/14/2000	0001	pCi/L	6.07	U	
Adjusted Gross Alpha	SHP01	1200	03/14/2000	N001	pCi/L	6.08	U	
Adjusted Gross Alpha	SHP01	1201	03/14/2000	0001	pCi/L	6	U	
Adjusted Gross Alpha	SHP01	1201	03/14/2000	N001	pCi/L	6.06	U	
Adjusted Gross Alpha	SHP01	1202	03/14/2000	0001	pCi/L	5.99	U	
Adjusted Gross Alpha	SHP01	1202	03/14/2000	N001	pCi/L	6.33	U	
Adjusted Gross Alpha	SHP01	1203	03/14/2000	0001	pCi/L	11.68		
Adjusted Gross Alpha	SHP01	1203	03/14/2000	N001	pCi/L	3.53	U	
Adjusted Gross Alpha	SHP01	1204	03/14/2000	0001	pCi/L	6.28		
Adjusted Gross Alpha	SHP01	1204	03/14/2000	N001	pCi/L	7.63		
Adjusted Gross Alpha	SHP01	1205	03/14/2000	0001	pCi/L	5.87	U	
Adjusted Gross Alpha	SHP01	1205	03/14/2000	N001	pCi/L	5.26		
Adjusted Gross Alpha	SHP01	1206	03/14/2000	0001	pCi/L	4.33	U	
Adjusted Gross Alpha	SHP01	1206	03/14/2000	N001	pCi/L	2.35		
Adjusted Gross Alpha	SHP01	1207	03/14/2000	N002	pCi/L	0[a]		
Adjusted Gross Alpha	SHP01	1207	03/14/2000	0001	pCi/L	0[a]		
Adjusted Gross Alpha	SHP01	1207	03/14/2000	N001	pCi/L	0[a]		
Adjusted Gross Alpha	SHP01	1207	03/14/2000	0002	pCi/L	0[a]		
Adjusted Gross Alpha	SHP01	1208	03/14/2000	N001	pCi/L	15.64	U	
Adjusted Gross Alpha	SHP01	1208	03/14/2000	0001	pCi/L	22.2	U	
Adjusted Gross Alpha	SHP01	1209	03/14/2000	N001	pCi/L	2.97	U	
Adjusted Gross Alpha	SHP01	1209	03/14/2000	0001	pCi/L	12.26	U	
Adjusted Gross Alpha	SHP01	1210	03/14/2000	N001	pCi/L	3.56	U	
Adjusted Gross Alpha	SHP01	1210	03/14/2000	0001	pCi/L	5.48	U	
Adjusted Gross Alpha	SHP01	1211	03/14/2000	N001	pCi/L	0[a]		
Adjusted Gross Alpha	SHP01	1211	03/14/2000	0001	pCi/L	0[a]	U	
Adjusted Gross Alpha	SHP01	1212	03/14/2000	N001	pCi/L	0[a]		
Adjusted Gross Alpha	SHP01	1212	03/14/2000	0001	pCi/L	0[a]		
Adjusted Gross Alpha	SHP01	1213	03/14/2000	N001	pCi/L	0[a]		
Adjusted Gross Alpha	SHP01	1213	03/14/2000	0001	pCi/L	0[a]		

[a]All Gross Alpha activity attributable to Uranium activity.

TRIP REPORTS

mactec-ers
MACTEC ENVIRONMENTAL RESTORATION SERVICES, LLC

CONTRACT NO.: DE-AC13-96GJ87335
TASK ORDER NO.: MAC00-05
CONTROL NO.: 3100-N/A

MEMO TO: Sam Marutzky

FROM: Dan Sellers DS

DATE: March 21, 2000

SUBJECT: UMTRA Groundwater Trip Report

Site: Shiprock

Dates of Sampling Event: March 13 through March 14, 1999

Team Members: Chuck Poland and Dan Sellers. Tim Fisher, from IT Group, was on site collecting a flow rate at each surface location identified. GPS data and water samples were collected at each location. Filtered and unfiltered water samples were collected and returned to the GJO lab for analysis. The list of analytes are: ammonium, selenium, uranium, gross alpha, sulfate, nitrate, manganese, molybdenum, vanadium, zinc. The following table (Table1) lists the location number and the type of surface location.

Table 1.

Surface Location Number	Surface Type
1200	River
1201	River
1202	River
1203	River
1204	River
1205	River
1206	Seep
1207	Seep
1208	B-Lee wash/surface
1209	B-Lee wash/surface
1210	River
1211	Tributary
1212	Seep
1213	B-Lee wash/surface

Number of Locations Sampled: Fourteen surface locations were identified and sampled.

Locations Not Sampled: None

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Location Specific Information: None

Quality Control Sample Cross Reference:

Quality Control Sample Cross Reference			
False Location ID	True Location Number	Ticket Number	Sample Type
270	1207	NDJ 909	Duplicate
271	Equipment Blank	NDJ 916	EB

Requisition Numbers: The requisition number for these samples is 16966.

Water Level Measurements: None

Well Inspection Summary: None

Equipment: None

Regulatory Issues: None

Site Issues: None

DS/lcg

Distribution:

cc: C. Bahrke
C. Goodknight
D. Metzler
K. Miller
Project Record File GWSHP 14.12 thru P. Taylor

Trip Report

Tim Fischer
IT Corporation

Trip to: **Shiprock, New Mexico**
Purpose: **Assist in Identifying Surface Water Sampling Locations for Additional Site Characterization for Ecological Risk Assessment**
Dates: March 13-14, 2000

March 13: Drove to AML Office in Shiprock and met with the sampling team, Chuck Poland and Dan Sellers, who had driven down from Grand Junction. Because it was already about 2:15pm, we decided it would be most efficient to try to first locate the sampling points, mark them with flagged stakes, and record GPS coordinates. The samples would then be collected by the team on Tuesday (March 14th).

The seven sampling locations along the San Juan River from Many Devils Wash to the midpoint of the floodplain area (sampling locations 1200 to 1206) were located and staked. The sampling points were identified by searching the section of the river bank (generally marked on the base map prior to the trip) for conditions of slower water (e.g, eddying). A flow meter was used at each location to measure the current at potential locations. A location of low current velocity was marked with a flagged stake on the shore as the sampling point. The GPS coordinates of the sampling point and the measured current were recorded, and the site was photographed. The seven river sites were located and marked by about 6:00 pm.

We went to the seep locations at the base of the escarpment. At seep location 425, a stake marking past sampling location 659 was not found. Sampling point 1207 was therefore located independently of location 659. Because a fairly permanent supply of water is indicated at an area below the seep that is vegetated with rushes (in contrast with the saltgrass cover of most of the rest of the area), this area was selected for locating the sampling point. A point along the eastern side of the rushes (associated with standing water approximately 6 inches deep) was selected. The outflow from this area appears to go to the west and collects in an area covered by saltgrass. No surface flow beyond this area was found (a low ridge of soil separates this water from the cattail wetland to the west). A second sampling location (1212) was located in the northwest corner of this area, where the water was about 6 to 8 inches deep.

We went then to the seeps on the west side of the mouth of Bob Lee Wash. Location 1208 was positioned about 50 feet below (north of) the seep area, in

shallow water that was sustaining a grow of green algae. Grasses were also starting to sprout in this area. Sampling location 1209 was located in a pool that has formed near location 908. The soil around this pool is salt-crusted. Flow from this pool goes north into an area of saltgrass, much of which is underlain by shallow standing surface water. Flow from this area continues north where it joins with flow coming from the cattail wetland area and continues along old channels that eventually reach the river. Sampling location 1213 was located at the confluence of these two surface flows in order to see what the effect of the mixing is on the quality of the surface water flowing beyond this point (toward the river).

We proceeded to the distributory channel and located sampling point 1211 in the pool of standing water at the mouth of Wash #1. The sampling point is immediately downstream of the arroyo channel, which had a small flow entering this pool. Location 1210 was placed on the river at the upstream mouth of distributory channel. This area is characterized by sand and mud bars crossed by several shallow, flowing channels. The work for the day was completed at about 7:00 pm. Too little light remained to photograph the last few sampling points (those from the seep may have been of questionable quality due to low light conditions). We decided that Chuck and Dan could begin collecting the samples from the marked locations the following day while I photographed the last sites from the previous day. I gave the samplers the list of analytes obtained from Dick Dayvault before the trip along with instructions to collect both filtered and unfiltered samples and to collect general chemistry data with each sample.

March 14: I returned to the distributory channel at about 8:15am and photographed locations 1210 and 1211. I then returned to the seep area and rephotographed 1207, 1212, 1208, 1209, and 1213. Bird activity was noted to be relatively high along the distributory channel and near the mouth of Bob Lee Wash. These were primarily juncos and white-crowned sparrows. Birds were observed on the ground near location 1208, indicating potential use of the surface water there. Chuck and Dan came through at about 10:00am, after finishing sampling 1200 and 1201. No significant problems or questions in collecting these samples were indicated. I left the site to return to Albuquerque at about 10:30am.