

Data Validation Package

**June 2013
Groundwater and Surface Water
Sampling at the
Monument Valley, Arizona,
Processing Site**

August 2013



U.S. DEPARTMENT OF
ENERGY

Legacy
Management

FSuE20

Data Validation Package for the Monument Valley, Arizona, Processing Site, June 2013

The U.S. Department of Energy (DOE) has prepared a Data Validation Package containing the groundwater sampling data generated from the June 2013 sampling event at the Monument Valley, Arizona, Processing Site. This package includes worksheets and reports that document the sampling activities and validation procedures conducted. **At your request, you are receiving a hard copy of the report.**

The report is also available for your review on the Internet at the DOE Office of Legacy Management (LM) website – <http://energy.gov/lm>. From the LM website home page, select the LM SITES MAP. Then select Monument Valley Site from the LM SITES list in the right column. The report will be available on the Monument Valley Site page of the LM website under Site Documents and Links.



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Sampling Event Summary

Site: Monument Valley, Arizona, Processing Site

Sampling Period: June 3-5, 2013

Forty-six groundwater samples and one surface water sample were collected at the Monument Valley, Arizona, Processing Site to monitor groundwater contaminants for evaluating the effectiveness of the proposed compliance strategy as specified in the 1999 *Final Site Observational Work Plan for the UMTRA Project Site at Monument Valley, Arizona*. Sampling and analysis were conducted as specified in the *Sampling and Analysis Plan for U.S. Department of Energy Office of Legacy Management Sites (LMS/PRO/S04351, continually updated)*. Samples were collected for metals, anions, nitrate + nitrite as N, and ammonia as N at all locations.

Wells with analyte concentrations that exceeded U.S. Environmental Protection Agency groundwater standards are listed in Table 1.

Table 1. Monument Valley Locations That Exceed Standards

Analyte	Standard ^a (mg/L)	Site Code	Location	Concentration (mg/L)
Nitrate + Nitrite as Nitrogen	10	MON01	0606	280
			0648	110
			0653	48
			0655	210
			0656	15
			0669	23
			0735	16
			0740	23
			0741	110
			0742	110
			0743	71
			0744	160
			0761	34
			0762	100
			0764	40
			Uranium	0.044
0662	0.13			
0734	0.16			
0735	0.20			

^a Standards are listed in 40 CFR 192.02 Table 1 to Subpart A.
mg/L = milligrams per liter.

The Navajo Nation's proposed cleanup standard for sulfate is 250 milligrams per liter (mg/L). The ratios of sulfate-to-chloride concentrations vary depending on whether the source of the sulfate is related to past millsite activities or if it is from natural sources. Tailings fluids were enriched in nitrate and sulfate but had relatively low chloride concentrations. A sulfate-to-chloride ratio greater than 10 usually is an indication of groundwater contamination resulting from milling activities. The proposed sulfate treatment goal for Monument Valley will incorporate both criteria. The treatment goal will be achieved when the sulfate concentration is less than 250 mg/L *or* the sulfate-to-chloride ratio is less than 10. Table 2 lists sulfate concentrations and sulfate-to-chloride ratios.

Table 2. Sulfate Results

Location	Sulfate Concentration (mg/L)	Sulfate/Chloride Ratio	Treatment Goal Achieved?
0402	17	1	Yes
0602	100	8	Yes
0603	100	8	Yes
0604	110	9	Yes
0605	160	6	Yes
0606	580	8	Yes
0618	14	4	Yes
0619	28	5	Yes
0623	33	7	Yes
0648	1100	30	No
0650	350	18	No
0651	110	8	Yes
0652	63	4	Yes
0653	990	37	No
0655	700	29	No
0656	140	9	Yes
0657	380	39	No
0662	180	16	Yes
0669	120	13	Yes
0711	120	8	Yes
0715	67	7	Yes
0719	120	8	Yes
0727	80	8	Yes
0733	83	12	Yes
0734	72	13	Yes
0735	1300	302	No
0738	180	11	Yes
0739	160	10	Yes
0740	1200	35	No
0741	490	23	No
0742	490	23	No
0743	530	27	No
0744	420	22	No
0760	85	9	Yes
0761	420	30	No
0762	1400	21	No
0764	220	20	Yes
0765	570	27	No
0766	380	22	No

Table 2 (continued). Sulfate Results

Location	Sulfate Concentration (mg/L)	Sulfate/Chloride Ratio	Treatment Goal Achieved?
0767	32	6	Yes
0768	85	6	Yes
0770	180	12	Yes
0771	1500	75	No
0772	130	8	Yes
0774	30	6	Yes
0775	25	4	Yes
0776	33	6	Yes

Time-concentration plots for ammonia as nitrogen, chloride, nitrate + nitrite as nitrogen, sulfate, uranium, and vanadium are included with the results data.



 David Miller
 Site Lead, S.M. Stoller Corporation

8/29/13

 Date

(DATE) 08/13/13 (TIME) 10:00 AM (LOCATION) Monument Valley, AZ (PROJECT) DVP		(TITLE)
(DESCRIPTION)		(PREPARED BY)
(CHECKED BY)		(APPROVED BY)
(DATE)		(SCALE)
(SHEET NO.)		(TOTAL SHEETS)

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LEGEND ● WELL TO BE SAMPLED ■ SURFACE LOCATION TO BE SAMPLED - - - SITE BOUNDARY		U.S. DEPARTMENT OF ENERGY <small>GRAND JUNCTION, COLORADO</small>	<small>Work Performed by</small> S.M. Stoller Corporation <small>Under DOE Contract No. DE-AM01-07LM00060</small>
		Planned Sampling Map Monument Valley, AZ, Processing Site June 2013	
		<small>DATE PREPARED:</small> May 7, 2013	<small>FILENAME:</small> S1019500

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Monument Valley, Arizona, Processing Site Sample Location Map

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Data Assessment Summary

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Water Sampling Field Activities Verification Checklist

Project	Monument Valley, Arizona	Date(s) of Water Sampling	June 3-5, 2013
Date(s) of Verification	July 31, 2013	Name of Verifier	Gretchen Baer

	Response (Yes, No, NA)	Comments
1. Is the SAP the primary document directing field procedures? List any Program Directives or other documents, SOPs, instructions.	Yes	Work Order letter dated May 13, 2013.
2. Were the sampling locations specified in the planning documents sampled?	Yes	
3. Were calibrations conducted as specified in the above-named documents?	Yes	
4. Was an operational check of the field equipment conducted daily? Did the operational checks meet criteria?	Yes	
5. Were the number and types (alkalinity, temperature, specific conductance, pH, turbidity, DO, ORP) of field measurements taken as specified?	Yes	At a few locations, alkalinity was inadvertently measured and recorded although it was not required.
6. Were wells categorized correctly?	Yes	
7. Were the following conditions met when purging a Category I well: Was one pump/tubing volume purged prior to sampling?	Yes	
Did the water level stabilize prior to sampling?	Yes	
Did pH, specific conductance, and turbidity measurements meet criteria prior to sampling?	Yes	
Was the flow rate less than 500 mL/min?	Yes	

Water Sampling Field Activities Verification Checklist (continued)

	Response (Yes, No, NA)	Comments
8. Were the following conditions met when purging a Category II well:		
Was the flow rate less than 500 mL/min?	Yes	
Was one pump/tubing volume removed prior to sampling?	Yes	
9. Were duplicates taken at a frequency of one per 20 samples?	Yes	Duplicate samples were collected from locations 0653, 0760, and 0776.
10. Were equipment blanks taken at a frequency of one per 20 samples that were collected with non-dedicated equipment?	NA	An equipment blank was not required.
11. Were trip blanks prepared and included with each shipment of VOC samples?	NA	
12. Were the true identities of the QC samples documented?	Yes	
13. Were samples collected in the containers specified?	Yes	
14. Were samples filtered and preserved as specified?	Yes	
15. Were the number and types of samples collected as specified?	Yes	
16. Were chain of custody records completed and was sample custody maintained?	Yes	
17. Was all 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?	Yes	

Laboratory Performance Assessment

General Information

Report Numbers (RINs): 13055367
Sample Event: June 3-5, 2013
Site(s): Monument Valley, Arizona
Laboratory: ALS Laboratory Group, Fort Collins, Colorado
Work Order No.: 1306095
Analysis: Metals and Wet Chemistry
Validator: Gretchen Baer
Review Date: July 31, 2013

This validation was performed according to the *Environmental Procedures Catalog*, (LMS/POL/S04325, continually updated) "Standard Practice for Validation of Environmental Data." The procedure was applied at Level 3, Data Validation. All analyses were successfully completed. The samples were prepared and analyzed using accepted procedures based on methods specified by line item code, which are listed in Table 3.

Table 3. Analytes and Methods

Analyte	Line Item Code	Prep Method	Analytical Method
Ammonia as Nitrogen	WCH-A-005	EPA 350.1	EPA 350.1
Chloride, Sulfate	MIS-A-045	SW-856 9056	SW-856 9056
Nitrite + Nitrate as Nitrogen	WCH-A-022	EPA 353.2	EPA 353.2
Uranium, Vanadium	LMM-02	SW-846 3005A	SW-846 6020A

Data Qualifier Summary

Analytical results were qualified as listed in Table 4. Refer to the sections below for an explanation of the data qualifiers applied.

Table 4. Data Qualifier Summary

Sample Number	Location	Analyte	Flag	Reason
1306095-1	0402	Uranium	J	Laboratory replicate range > PQL
1306095-14	0653	Nitrate + Nitrite as N	R	Preservation error
1306095-41	0768	Uranium	J	Laboratory replicate RPD > 20%

Sample Shipping/Receiving

ALS Laboratory Group in Fort Collins, Colorado, received 50 water samples on June 7, 2013, accompanied by a Chain of Custody form. Copies of the air bills were included in the receiving documentation. The Chain of Custody was checked to confirm that all of the samples were listed with sample collection dates and times, and that signatures and dates were present indicating sample relinquishment and receipt. The Chain of Custody was complete with no errors or omissions.

Preservation and Holding Times

The sample shipment was received intact with the temperature inside the iced cooler at 0.6 °C, which complies with requirements. All samples were analyzed within the applicable holding times. All samples were received in the correct container types and had been preserved correctly for the requested analyses with one exception. A nitrate + nitrite as N result for location 0653 was much higher than the historical values and the result for the associated field duplicate. The ion chromatography spectrum for 0653 did not contain a large nitrate peak, which suggests that a preservation error was made (nitric acid was added rather than sulfuric acid). The nitrate + nitrite as N result for 0653 is qualified with an "R" flag as rejected.

Detection and Quantitation Limits

The method detection limit (MDL) was reported for all analytes as required. The MDL, as defined in 40 CFR 136, is the minimum concentration of an analyte that can be measured and reported with 99 percent confidence that the analyte concentration is greater than zero. The practical quantitation limit (PQL) for these analytes is the lowest concentration that can be reliably measured, and is defined as 5 times the MDL. The reported MDLs for all analytes demonstrate compliance with contractual requirements.

Laboratory Instrument Calibration

Compliance requirements for satisfactory instrument calibration are established to ensure that the instrument is capable of producing acceptable qualitative and quantitative data for all analytes. Initial calibration demonstrates that the instrument is capable of acceptable performance in the beginning of the analytical run and of producing a linear curve. Compliance requirements for continuing calibration checks are established to ensure that the instrument continues to be capable of producing acceptable qualitative and quantitative data. All laboratory instrument calibrations were performed correctly in accordance with the cited methods. All calibration and laboratory spike standards were prepared from independent sources.

Method EPA 350.1, Ammonia as Nitrogen

Calibrations were performed using six calibration standards on June 19, 2013. The calibration curve correlation coefficient values were greater than 0.995 and the absolute values of the intercepts were less than 3 times the MDL. Initial and continuing calibration verification checks were made at the required frequency with all calibration checks meeting the acceptance criteria.

Method EPA 353.2, Nitrite + Nitrate as Nitrogen

Calibrations were performed using seven calibration standards on June 20, 2013. The calibration curve correlation coefficient values were greater than 0.995 and the absolute values of the intercepts were less than 3 times the MDL. Initial and continuing calibration verification checks were made at the required frequency with all calibration checks meeting the acceptance criteria.

Method SW-846 6020A, Uranium, Vanadium

Calibrations were performed on June 11, 2013, using three standards. The calibration curve correlation coefficient values were greater than 0.995 and the absolute values of the intercepts were less than 3 times the MDL. Initial and continuing calibration verification checks were made at the required frequency with all calibration checks meeting the acceptance criteria. Reporting

limit verification checks were made at the required frequency to verify the linearity of the calibration curve near the PQL and all results were within the acceptance range. Mass calibration and resolution verifications were performed at the beginning of each analytical run in accordance with the analytical procedure. Internal standard recoveries associated with requested analytes were stable and within acceptable ranges.

Method SW-846 9056, Chloride, Sulfate

Calibrations were performed using six calibration standards on April 3, 2013. The calibration curve correlation coefficient values were greater than 0.995 and the absolute values of the intercepts were less than 3 times the MDL. Initial and continuing calibration verification checks were made at the required frequency with all calibration checks meeting the acceptance criteria.

Method and Calibration Blanks

Method blanks are analyzed to assess any contamination that may have occurred during sample preparation. Calibration blanks are analyzed to assess instrument contamination prior to and during sample analysis. All method blank and calibration blank results were below the MDLs and PQLs for all analytes with the following exception. Two calibration blank results for sulfate were above the PQL. The samples associated with these blanks had sulfate concentrations greater than 10 times the blank.

Inductively Coupled Plasma Interference Check Sample Analysis

Interference check samples were analyzed at the required frequency to verify the instrumental interelement and background correction factors. All check sample results met the acceptance criteria.

Matrix Spike Analysis

Matrix spike and matrix spike duplicate (MS/MSD) samples are used to measure method performance in the sample matrix. The MS/MSD data are not evaluated when the concentration of the unspiked sample is greater than 4 times the spike. The spike recoveries met the acceptance criteria for all analytes evaluated.

Laboratory Replicate Analysis

Laboratory replicate analyses are used to determine laboratory precision for each sample matrix. The relative percent difference for replicate results that are greater than 5 times the PQL should be less than 20 percent. For results that are less than 5 times the PQL, the range should be no greater than the PQL. All replicate results met these criteria, with the exception of two uranium replicate results. The associated results are qualified with a "J" flag (estimated).

Laboratory Control Sample

Laboratory control samples were analyzed at the correct frequency to provide information on the accuracy of the analytical method and the overall laboratory performance, including sample preparation. All control sample results were acceptable.

Metals Serial Dilution

Serial dilutions were prepared and analyzed for the metals analyses to monitor chemical or physical interferences in the sample matrix. Serial dilution data are evaluated when the concentration of the undiluted sample is greater than 50 times the MDL. All evaluated serial dilution data were acceptable.

Completeness

Results were reported in the correct units for all analytes requested using contract-required laboratory qualifiers.

Chromatography Peak Integration

The integration of analyte peaks was reviewed for all ion chromatography data. All peak integrations were satisfactory.

Electronic Data Deliverable (EDD) File

The EDD file arrived on June 28, 2013. The Sample Management System EDD validation module was used to verify that the EDD file was complete and in compliance with requirements. The module compares the contents of the file to the requested analyses to ensure that all and only the requested data are delivered. The contents of the EDD were manually examined to verify that the sample results accurately reflect the data contained in the sample data package.

Sampling Quality Control Assessment

The following information summarizes and assesses quality control for this sampling event.

Sampling Protocol

The surface water location was sampled by container immersion. Wells were sampled with a peristaltic pump and dedicated tubing or a dedicated bladder pump. A bladder pump was installed in well 0618 the day before sample collection. All sample results for monitoring wells were qualified with an "F" flag in the database, indicating the wells were purged and sampled using the low-flow sampling method. Wells 0402, 0602, 0606, 0735, 0764, and 0771 were qualified with a "Q" flag, indicating the data are qualitative because these wells were classified as Category II.

Equipment Blank Assessment

No equipment blanks were taken because all samples were collected using dedicated equipment.

Field Duplicate Assessment

Field duplicate samples are collected and analyzed as an indication of overall precision of the measurement process. The precision observed includes both field and laboratory precision and has more variability than laboratory duplicates, which measure only laboratory performance. The relative percent difference for duplicate results that are greater than 5 times the PQL should be less than 20 percent. For results that are less than 5 times the PQL, the range should be no greater than the PQL. Duplicate samples were collected from locations 0653, 0760, and 0776. With one exception, the duplicate results met the criteria, demonstrating acceptable overall precision. At location 0653, the nitrate + nitrite as N result was higher than the associated duplicate. This nitrate + nitrite as N result has been qualified with an "R" flag (rejected) due to preservation error.

Certification

All laboratory analytical quality control criteria were met except as qualified in this report. The data qualifiers listed on the SEEPro database reports are defined on the last page of each report. All data in this package are considered validated and available for use.

Laboratory Coordinator: Steve Donovan 8-28-2013
Steve Donovan Date

Data Validation Lead: Gretchen Baer 8-28-2013
Gretchen Baer Date

Attachment 1
Assessment of Anomalous Data

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Potential Outliers Report

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Potential Outliers Report

Potential outliers are measurements that are extremely large or small relative to the rest of the data and, therefore, are suspected of misrepresenting the population from which they were collected. Potential outliers may result from transcription errors, data-coding errors, or measurement system problems. However, outliers may also represent true extreme values of a distribution and indicate more variability in the population than was expected.

Statistical outlier tests give probabilistic evidence that an extreme value does not "fit" with the distribution of the remainder of the data and is therefore a statistical outlier. These tests should only be used to identify data points that require further investigation. The tests alone cannot determine whether a statistical outlier should be discarded or corrected within a data set.

There are three steps involved in identifying extreme values or outliers:

1. Identify extreme values that may be potential outliers by generating the Outliers Report using the Sample Management System from data in the environmental database. The application compares the new data set (in standard environmental database units) with historical data and lists the new data that fall outside the historical data range. A determination is also made if the data are normally distributed using the Shapiro-Wilk Test.
2. Apply the appropriate statistical test. Dixon's Extreme Value test is used to test for statistical outliers when the sample size is less than or equal to 25. This test considers both extreme values that are much smaller than the rest of the data (case 1) and extreme values that are much larger than the rest of the data (case 2). This test is valid only if the data without the suspected outlier are normally distributed. Rosner's Test is a parametric test that is used to detect outliers for sample sizes of 25 or more. This test also assumes that the data without the suspected outliers are normally distributed.
3. Scientifically review statistical outliers and decide on their disposition. The review should include an evaluation of any notable trends in the data that may indicate the outliers represent true extreme values.

Eight laboratory results were identified as potentially anomalous. Results for chloride, nitrite + nitrate as N, and sulfate for 0606; chloride for 0648; and vanadium for 0772 were higher than previously observed. Recent results may indicate upward trending at these locations. Results for vanadium for 0669 and uranium for 0772 and 0775 were identified as potential outliers because of the low variability of the historical data. There were no laboratory data errors indicated from the review of these potential outliers and the data from this event are acceptable as qualified. Potential anomalies in the field parameters were also examined for patterns of repeated high or low bias, which suggest a systematic error due to instrument malfunction. No such patterns were found and all field data from this event are acceptable as qualified. There were no anomalies identified in the previous report (December 2012) that required further review.

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Data Validation Outliers Report - No Field Parameters

Comparison: All historical Data Beginning 1/1/2003

Laboratory: ALS Laboratory Group

RIN: 13055367

Report Date: 8/1/2013

Site Code	Location Code	Sample ID	Sample Date	Analyte	Current	Qualifiers		Historical Maximum			Historical Minimum			Number of Data Points		Statistical Outlier
					Result	Lab	Data	Result	Lab	Data	Result	Lab	Data	N	N Below Detect	
MON01	0402	0001	06/05/2013	Vanadium	0.000018	B	FQ	0.015	U	FQ	0.000067	U	FQ	9	6	NA
MON01	0603	N001	06/05/2013	Nitrate + Nitrite as Nitrogen	0.42		F	0.393		F	0.34		F	9	0	No
MON01	0606	N001	06/04/2013	Chloride	74		FQ	32		F	13		F	13	0	Yes
MON01	0606	N001	06/04/2013	Nitrate + Nitrite as Nitrogen	280		FQ	260		FQ	160		F	16	0	Yes
MON01	0606	N001	06/04/2013	Sulfate	580		FQ	443		F	360		F	17	0	Yes
MON01	0618	N001	06/04/2013	Uranium	0.0051		F	0.046			0.00522			5	0	No
MON01	0623	N001	06/05/2013	Chloride	4.5			15			7.6			9	0	No
MON01	0623	N001	06/05/2013	Sulfate	33			51			35			9	0	No
MON01	0648	N001	06/05/2013	Ammonia Total as N	0.1	U	F	9.2		F	0.64		F	10	0	No
MON01	0648	N001	06/05/2013	Chloride	37		F	30		F	21		F	10	0	Yes
MON01	0648	N001	06/05/2013	Nitrate + Nitrite as Nitrogen	110		F	90		F	40		F	10	0	No
MON01	0648	N001	06/05/2013	Uranium	0.013		F	0.012		F	0.0097		F	10	0	No
MON01	0650	N001	06/04/2013	Nitrate + Nitrite as Nitrogen	4.5		F	4.3		F	0.53		F	12	0	No
MON01	0651	N001	06/05/2013	Nitrate + Nitrite as Nitrogen	0.16		F	0.157	J	F	0.11		F	9	0	No
MON01	0656	N001	06/04/2013	Ammonia Total as N	40		F	59		F	40.1		F	16	0	No
MON01	0662	N001	06/04/2013	Nitrate + Nitrite as Nitrogen	6.9		F	26		F	7.2		F	19	0	No
MON01	0662	N001	06/04/2013	Sulfate	180		F	630		F	210		F	20	0	NA

Data Validation Outliers Report - No Field Parameters

Comparison: All historical Data Beginning 1/1/2003

Laboratory: ALS Laboratory Group

RIN: 13055367

Report Date: 8/1/2013

Site Code	Location Code	Sample ID	Sample Date	Analyte	Current	Qualifiers		Historical Maximum			Historical Minimum			Number of Data Points		Statistical Outlier
					Result	Lab	Data	Result	Lab	Data	Result	Lab	Data	N	N Below Detect	
MON01	0662	N001	06/04/2013	Vanadium	0.032		F	0.03		F	0.021		F	20	0	No
MON01	0669	N001	06/03/2013	Nitrate + Nitrite as Nitrogen	23		F	21		F	5.5		F	19	0	NA
MON01	0669	N001	06/03/2013	Uranium	0.0056		F	0.0078		F	0.0058		F	20	0	No
MON01	0669	N001	06/03/2013	Vanadium	0.042		F	0.057		F	0.048		F	19	0	Yes
MON01	0711	N001	06/05/2013	Uranium	0.0042		F	0.0041		F	0.00378		F	9	0	NA
MON01	0715	N001	06/05/2013	Uranium	0.0032		F	0.00315		F	0.0027		F	9	0	No
MON01	0733	0001	06/04/2013	Chloride	6.8		F	6.5		F	4.58		F	5	0	No
MON01	0733	0001	06/04/2013	Nitrate + Nitrite as Nitrogen	5.5		F	5.3		F	4.15		F	5	0	No
MON01	0733	0001	06/04/2013	Sulfate	83		F	81		FQ	56.4		F	5	0	No
MON01	0733	0001	06/04/2013	Vanadium	0.053		F	0.047		FQ	0.0322		F	5	0	No
MON01	0734	0001	06/04/2013	Nitrate + Nitrite as Nitrogen	2.8		F	5.4		F	2.9		F	5	0	No
MON01	0735	0001	06/04/2013	Chloride	4.3		FQ	3.2		FQ	1.55		F	5	0	No
MON01	0735	0001	06/04/2013	Nitrate + Nitrite as Nitrogen	16		FQ	14		FQ	4.8		FQ	5	0	No
MON01	0738	N001	06/04/2013	Uranium	0.00027		F	0.00035		F	0.00028		F	5	0	No
MON01	0738	N001	06/04/2013	Vanadium	0.00058		F	0.003	U	F	0.00075		JF	5	2	No
MON01	0739	N001	06/05/2013	Nitrate + Nitrite as Nitrogen	0.99		F	2.2		F	1.1		F	5	0	No
MON01	0739	N001	06/05/2013	Sulfate	160		F	220		F	180		F	5	0	No

MON01 0739 N001 06/05/2013 Sulfate 160 F 220 F 180 F 5 0 No

Data Validation Outliers Report - No Field Parameters

Comparison: All historical Data Beginning 1/1/2003

Laboratory: ALS Laboratory Group

RIN: 13055367

Report Date: 8/1/2013

Site Code	Location Code	Sample ID	Sample Date	Analyte	Current Result	Qualifiers		Historical Maximum Qualifiers			Historical Minimum Qualifiers			Number of Data Points		Statistical Outlier
						Lab	Data	Result	Lab	Data	Result	Lab	Data	N	N Below Detect	
MON01	0739	N001	06/05/2013	Uranium	0.0039		F	0.00508	F		0.00391	F		5	0	No
MON01	0739	N001	06/05/2013	Vanadium	0.0098		F	0.0096	F		0.00683	B	FJ	5	0	No
MON01	0740	N001	06/04/2013	Chloride	34		F	44	F		38	F		6	0	No
MON01	0740	N001	06/04/2013	Nitrate + Nitrite as Nitrogen	23		F	19	F		12	F		6	0	No
MON01	0743	0001	06/05/2013	Nitrate + Nitrite as Nitrogen	71		F	57	F		0.012	F		5	0	No
MON01	0743	0001	06/05/2013	Vanadium	0.00024	B	F	0.015	U	F	0.00028	B	F	5	2	No
MON01	0744	0001	06/05/2013	Chloride	19		F	18	F		13.8	F		5	0	No
MON01	0764	N001	06/05/2013	Sulfate	220		FQ	381	FQ		250	FQ		16	0	No
MON01	0765	N001	06/05/2013	Ammonia Total as N	98		F	150	F		100	F		16	0	No
MON01	0771	N001	06/03/2013	Nitrate + Nitrite as Nitrogen	200		FQ	190	F		150	F		16	0	No
MON01	0772	N001	06/05/2013	Uranium	0.0094		F	0.0085	F		0.0058	F		21	0	Yes
MON01	0772	N001	06/05/2013	Vanadium	0.048		F	0.027	F		0.0086	F		20	2	Yes
MON01	0774	N001	06/04/2013	Sulfate	30		F	86	F		32	F		17	0	NA
MON01	0774	N001	06/04/2013	Vanadium	0.022		F	0.021	F		0.015	F		16	0	NA
MON01	0775	N001	06/04/2013	Nitrate + Nitrite as Nitrogen	0.63		F	0.605	F		0.56	F		8	0	No
MON01	0775	N001	06/04/2013	Uranium	0.0035		F	0.003	F		0.0028	F		8	0	Yes
MON01	0776	N002	06/04/2013	Chloride	6		F	5.7	F		4.8	F		8	0	No

Data Validation Outliers Report - No Field Parameters

Comparison: All historical Data Beginning 1/1/2003

Laboratory: ALS Laboratory Group

RIN: 13055367

Report Date: 8/1/2013

Site Code	Location Code	Sample ID	Sample Date	Analyte	Current	Qualifiers		Historical Maximum			Historical Minimum			Number of Data Points		Statistical Outlier
					Result	Lab	Data	Result	Lab	Data	Result	Lab	Data	N	N Below Detect	
MON01	0776	N001	06/04/2013	Chloride	6		F	5.7		F	4.8		F	8	0	No
MON01	0776	N001	06/04/2013	Nitrate + Nitrite as Nitrogen	0.88		F	0.86		F	0.74		F	8	0	No

STATISTICAL TESTS:

The distribution of the data is tested for normality or lognormality using the Shapiro-Wilk Test

Outliers are identified using Dixon's Test when there are 25 or fewer data points.

Outliers are identified using Rosner's Test when there are 26 or more data points.

See Data Quality Assessment: Statistical Methods for Practitioners, EPA QC/G-9S, February 2006.

NA: Data are not normally or lognormally distributed.

Attachment 2
Data Presentation

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Groundwater Quality Data

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Groundwater Quality Data by Location (USEE100) FOR SITE MON01, Monument Valley Processing Site

REPORT DATE: 8/1/2013

Location: 0402 WELL Tribal Well No. 08-0643.

Parameter	Units	Sample		Depth Range (Ft BLS)	Result	Qualifiers			Detection Limit	Uncertainty
		Date	ID			Lab	Data	QA		
Ammonia Total as N	mg/L	06/05/2013	0001	5.17 - 9.63	0.1	U	FQ	#	0.1	
Chloride	mg/L	06/05/2013	0001	5.17 - 9.63	14		FQ	#	1	
Nitrate + Nitrite as Nitrogen	mg/L	06/05/2013	0001	5.17 - 9.63	0.01	U	FQ	#	0.01	
Oxidation Reduction Potential	mV	06/05/2013	N001	5.17 - 9.63	64.4		FQ	#		
pH	s.u.	06/05/2013	N001	5.17 - 9.63	7.96		FQ	#		
Specific Conductance	umhos/cm	06/05/2013	N001	5.17 - 9.63	583		FQ	#		
Sulfate	mg/L	06/05/2013	0001	5.17 - 9.63	17		FQ	#	2.5	
Temperature	C	06/05/2013	N001	5.17 - 9.63	19.86		FQ	#		
Turbidity	NTU	06/05/2013	N001	5.17 - 9.63	14.9		FQ	#		
Uranium	mg/L	06/05/2013	0001	5.17 - 9.63	0.0000029	U	FQJ	#	0.0000029	
Vanadium	mg/L	06/05/2013	0001	5.17 - 9.63	0.000018	B	FQ	#	0.000015	

Groundwater Quality Data by Location (USEE100) FOR SITE MON01, Monument Valley Processing Site

REPORT DATE: 8/1/2013

Location: 0602 WELL

Parameter	Units	Sample		Depth Range (Ft BLS)	Result	Qualifiers			Detection Limit	Uncertainty
		Date	ID			Lab	Data	QA		
Ammonia Total as N	mg/L	06/05/2013	N001	19.5 - 29.5	0.1	U	FQ	#	0.1	
Chloride	mg/L	06/05/2013	N001	19.5 - 29.5	13		FQ	#	1	
Nitrate + Nitrite as Nitrogen	mg/L	06/05/2013	N001	19.5 - 29.5	0.75		FQ	#	0.01	
Oxidation Reduction Potential	mV	06/05/2013	N001	19.5 - 29.5	115.9		FQ	#		
pH	s.u.	06/05/2013	N001	19.5 - 29.5	7.47		FQ	#		
Specific Conductance	umhos/cm	06/05/2013	N001	19.5 - 29.5	648		FQ	#		
Sulfate	mg/L	06/05/2013	N001	19.5 - 29.5	100		FQ	#	2.5	
Temperature	C	06/05/2013	N001	19.5 - 29.5	17.44		FQ	#		
Turbidity	NTU	06/05/2013	N001	19.5 - 29.5	4.49		FQ	#		
Uranium	mg/L	06/05/2013	N001	19.5 - 29.5	0.004		FQ	#	0.0000029	
Vanadium	mg/L	06/05/2013	N001	19.5 - 29.5	0.00078		FQ	#	0.000015	

Groundwater Quality Data by Location (USEE100) FOR SITE MON01, Monument Valley Processing Site

REPORT DATE: 8/1/2013

Location: 0603 WELL

Parameter	Units	Sample		Depth Range			Result	Qualifiers			Detection Limit	Uncertainty
		Date	ID	(Ft BLS)				Lab	Data	QA		
Ammonia Total as N	mg/L	06/05/2013	N001	43	-	53	0.15		F	#	0.1	
Chloride	mg/L	06/05/2013	N001	43	-	53	13		F	#	1	
Nitrate + Nitrite as Nitrogen	mg/L	06/05/2013	N001	43	-	53	0.42		F	#	0.01	
Oxidation Reduction Potential	mV	06/05/2013	N001	43	-	53	37.2		F	#		
pH	s.u.	06/05/2013	N001	43	-	53	7.49		F	#		
Specific Conductance	umhos/cm	06/05/2013	N001	43	-	53	628		F	#		
Sulfate	mg/L	06/05/2013	N001	43	-	53	100		F	#	2.5	
Temperature	C	06/05/2013	N001	43	-	53	18.81		F	#		
Turbidity	NTU	06/05/2013	N001	43	-	53	3.33		F	#		
Uranium	mg/L	06/05/2013	N001	43	-	53	0.003		F	#	0.0000029	
Vanadium	mg/L	06/05/2013	N001	43	-	53	0.00067		F	#	0.000015	

Groundwater Quality Data by Location (USEE100) FOR SITE MON01, Monument Valley Processing Site

Groundwater Quality Data by Location (USEE100) FOR SITE MON01, Monument Valley Processing Site

REPORT DATE: 8/1/2013

Location: 0604 WELL

Parameter	Units	Sample		Depth Range (Ft BLS)	Result	Qualifiers			Detection Limit	Uncertainty
		Date	ID			Lab	Data	QA		
Ammonia Total as N	mg/L	06/05/2013	N001	13 - 28	0.1	U	F	#	0.1	
Chloride	mg/L	06/05/2013	N001	13 - 28	12		F	#	1	
Nitrate + Nitrite as Nitrogen	mg/L	06/05/2013	N001	13 - 28	0.032		F	#	0.01	
Oxidation Reduction Potential	mV	06/05/2013	N001	13 - 28	48.3		F	#		
pH	s.u.	06/05/2013	N001	13 - 28	7.77		F	#		
Specific Conductance	umhos/cm	06/05/2013	N001	13 - 28	605		F	#		
Sulfate	mg/L	06/05/2013	N001	13 - 28	110		F	#	2.5	
Temperature	C	06/05/2013	N001	13 - 28	17.89		F	#		
Turbidity	NTU	06/05/2013	N001	13 - 28	2.54		F	#		
Uranium	mg/L	06/05/2013	N001	13 - 28	0.0023		F	#	0.000029	
Vanadium	mg/L	06/05/2013	N001	13 - 28	0.0022		F	#	0.000015	

Groundwater Quality Data by Location (USEE100) FOR SITE MON01, Monument Valley Processing Site

REPORT DATE: 8/1/2013

Location: 0605 WELL

Parameter	Units	Sample		Depth Range			Result	Qualifiers			Detection Limit	Uncertainty
		Date	ID	(Ft BLS)				Lab	Data	QA		
Ammonia Total as N	mg/L	06/04/2013	N001	14	-	29	0.37		F	#	0.1	
Chloride	mg/L	06/04/2013	N001	14	-	29	25		F	#	1	
Nitrate + Nitrite as Nitrogen	mg/L	06/04/2013	N001	14	-	29	0.01	U	F	#	0.01	
Oxidation Reduction Potential	mV	06/04/2013	N001	14	-	29	-132		F	#		
pH	s.u.	06/04/2013	N001	14	-	29	8.01		F	#		
Specific Conductance	umhos/cm	06/04/2013	N001	14	-	29	647		F	#		
Sulfate	mg/L	06/04/2013	N001	14	-	29	160		F	#	2.5	
Temperature	C	06/04/2013	N001	14	-	29	18.63		F	#		
Turbidity	NTU	06/04/2013	N001	14	-	29	4.28		F	#		
Uranium	mg/L	06/04/2013	N001	14	-	29	0.00019		F	#	0.000029	
Vanadium	mg/L	06/04/2013	N001	14	-	29	0.00018	B	F	#	0.000015	

Groundwater Quality Data by Location (USEE100) FOR SITE MON01, Monument Valley Processing Site

REPORT DATE: 8/1/2013

Location: 0606 WELL

Parameter	Units	Sample		Depth Range (Ft BLS)	Result	Qualifiers			Detection Limit	Uncertainty
		Date	ID			Lab	Data	QA		
Ammonia Total as N	mg/L	06/04/2013	N001	32 - 42	110		FQ	#	10	
Chloride	mg/L	06/04/2013	N001	32 - 42	74		FQ	#	10	
Nitrate + Nitrite as Nitrogen	mg/L	06/04/2013	N001	32 - 42	280		FQ	#	2	
Oxidation Reduction Potential	mV	06/04/2013	N001	32 - 42	159.4		FQ	#		
pH	s.u.	06/04/2013	N001	32 - 42	6.78		FQ	#		
Specific Conductance	umhos/cm	06/04/2013	N001	32 - 42	3227		FQ	#		
Sulfate	mg/L	06/04/2013	N001	32 - 42	580		FQ	#	25	
Temperature	C	06/04/2013	N001	32 - 42	19.53		FQ	#		
Turbidity	NTU	06/04/2013	N001	32 - 42	4.12		FQ	#		
Uranium	mg/L	06/04/2013	N001	32 - 42	0.01		FQ	#	0.000029	
Vanadium	mg/L	06/04/2013	N001	32 - 42	0.00029	B	FQ	#	0.000015	

Groundwater Quality Data by Location (USEE100) FOR SITE MON01, Monument Valley Processing Site

REPORT DATE: 8/1/2013

Location: 0618 WELL 12" DIA Steel CSG. Old Mill Well??

Parameter	Units	Sample		Depth Range (Ft BLS)	Result	Qualifiers			Detection Limit	Uncertainty
		Date	ID			Lab	Data	QA		
Ammonia Total as N	mg/L	06/04/2013	N001	-	0.1	U	F	#	0.1	
Chloride	mg/L	06/04/2013	N001	-	3.8		F	#	0.2	
Nitrate + Nitrite as Nitrogen	mg/L	06/04/2013	N001	-	1		F	#	0.01	
Oxidation Reduction Potential	mV	06/04/2013	N001	-	134.4		F	#		
pH	s.u.	06/04/2013	N001	-	7.49		F	#		
Specific Conductance	umhos/cm	06/04/2013	N001	-	320		F	#		
Sulfate	mg/L	06/04/2013	N001	-	14		F	#	0.5	
Temperature	C	06/04/2013	N001	-	18.9		F	#		
Turbidity	NTU	06/04/2013	N001	-	2.77		F	#		
Uranium	mg/L	06/04/2013	N001	-	0.0051		F	#	0.000029	
Vanadium	mg/L	06/04/2013	N001	-	0.053		F	#	0.00015	

Groundwater Quality Data by Location (USEE100) FOR SITE MON01, Monument Valley Processing Site

REPORT DATE: 8/1/2013

Location: 0619 WELL Water Use Permit No. 92-082.

Parameter	Units	Sample		Depth Range (Ft BLS)	Result	Qualifiers			Detection Limit	Uncertainty
		Date	ID			Lab	Data	QA		
Ammonia Total as N	mg/L	06/04/2013	N001	103.9 - 153.9	0.1	U	F	#	0.1	
Chloride	mg/L	06/04/2013	N001	103.9 - 153.9	5.4		F	#	0.2	
Nitrate + Nitrite as Nitrogen	mg/L	06/04/2013	N001	103.9 - 153.9	0.85		F	#	0.01	
Oxidation Reduction Potential	mV	06/04/2013	N001	103.9 - 153.9	117.5		F	#		
pH	s.u.	06/04/2013	N001	103.9 - 153.9	7.49		F	#		
Specific Conductance	umhos /cm	06/04/2013	N001	103.9 - 153.9	386		F	#		
Sulfate	mg/L	06/04/2013	N001	103.9 - 153.9	28		F	#	0.5	
Temperature	C	06/04/2013	N001	103.9 - 153.9	19.41		F	#		
Turbidity	NTU	06/04/2013	N001	103.9 - 153.9	1.54		F	#		
Uranium	mg/L	06/04/2013	N001	103.9 - 153.9	0.0068		F	#	0.0000029	
Vanadium	mg/L	06/04/2013	N001	103.9 - 153.9	0.022		F	#	0.000015	

Groundwater Quality Data by Location (USEE100) FOR SITE MON01, Monument Valley Processing Site

REPORT DATE: 8/1/2013

Location: 0648 WELL

Parameter	Units	Sample		Depth Range (Ft BLS)	Result	Qualifiers			Detection Limit	Uncertainty
		Date	ID			Lab	Data	QA		
Ammonia Total as N	mg/L	06/05/2013	N001	38.5 - 88.5	0.1	U	F	#	0.1	
Chloride	mg/L	06/05/2013	N001	38.5 - 88.5	37		F	#	10	
Nitrate + Nitrite as Nitrogen	mg/L	06/05/2013	N001	38.5 - 88.5	110		F	#	1	
Oxidation Reduction Potential	mV	06/05/2013	N001	38.5 - 88.5	90		F	#		
pH	s.u.	06/05/2013	N001	38.5 - 88.5	7.47		F	#		
Specific Conductance	umhos/cm	06/05/2013	N001	38.5 - 88.5	2888		F	#		
Sulfate	mg/L	06/05/2013	N001	38.5 - 88.5	1100		F	#	25	
Temperature	C	06/05/2013	N001	38.5 - 88.5	18.49		F	#		
Turbidity	NTU	06/05/2013	N001	38.5 - 88.5	0.19		F	#		
Uranium	mg/L	06/05/2013	N001	38.5 - 88.5	0.013		F	#	0.000029	
Vanadium	mg/L	06/05/2013	N001	38.5 - 88.5	0.012		F	#	0.000015	

Groundwater Quality Data by Location (USEE100) FOR SITE MON01, Monument Valley Processing Site

REPORT DATE: 8/1/2013

Location: 0650 WELL

Parameter	Units	Sample		Depth Range (Ft BLS)	Result	Qualifiers			Detection Limit	Uncertainty
		Date	ID			Lab	Data	QA		
Ammonia Total as N	mg/L	06/04/2013	N001	77.5 - 97.5	0.1	U	F	#	0.1	
Chloride	mg/L	06/04/2013	N001	77.5 - 97.5	20		F	#	2	
Nitrate + Nitrite as Nitrogen	mg/L	06/04/2013	N001	77.5 - 97.5	4.5		F	#	0.05	
Oxidation Reduction Potential	mV	06/04/2013	N001	77.5 - 97.5	131.6		F	#		
pH	s.u.	06/04/2013	N001	77.5 - 97.5	7.75		F	#		
Specific Conductance	umhos/cm	06/04/2013	N001	77.5 - 97.5	1117		F	#		
Sulfate	mg/L	06/04/2013	N001	77.5 - 97.5	350		F	#	5	
Temperature	C	06/04/2013	N001	77.5 - 97.5	18.73		F	#		
Turbidity	NTU	06/04/2013	N001	77.5 - 97.5	1.15		F	#		
Uranium	mg/L	06/04/2013	N001	77.5 - 97.5	0.0023		F	#	0.000029	
Vanadium	mg/L	06/04/2013	N001	77.5 - 97.5	0.0031		F	#	0.000015	

Groundwater Quality Data by Location (USEE100) FOR SITE MON01, Monument Valley Processing Site

REPORT DATE: 8/1/2013

Location: 0651 WELL

Parameter	Units	Sample		Depth Range			Result	Qualifiers			Detection Limit	Uncertainty
		Date	ID	(Ft BLS)				Lab	Data	QA		
Ammonia Total as N	mg/L	06/05/2013	N001	20	-	80	0.1	U	F	#	0.1	
Chloride	mg/L	06/05/2013	N001	20	-	80	13		F	#	1	
Nitrate + Nitrite as Nitrogen	mg/L	06/05/2013	N001	20	-	80	0.16		F	#	0.01	
Oxidation Reduction Potential	mV	06/05/2013	N001	20	-	80	128		F	#		
pH	s.u.	06/05/2013	N001	20	-	80	8.15		F	#		
Specific Conductance	umhos/cm	06/05/2013	N001	20	-	80	641		F	#		
Sulfate	mg/L	06/05/2013	N001	20	-	80	110		F	#	2.5	
Temperature	C	06/05/2013	N001	20	-	80	16.5		F	#		
Turbidity	NTU	06/05/2013	N001	20	-	80	4.73		F	#		
Uranium	mg/L	06/05/2013	N001	20	-	80	0.0023		F	#	0.0000029	
Vanadium	mg/L	06/05/2013	N001	20	-	80	0.012		F	#	0.000015	

Groundwater Quality Data by Location (USEE100) FOR SITE MON01, Monument Valley Processing Site

REPORT DATE: 8/1/2013

Location: 0652 WELL

Parameter	Units	Sample		Depth Range (Ft BLS)	Result	Qualifiers			Detection Limit	Uncertainty
		Date	ID			Lab	Data	QA		
Ammonia Total as N	mg/L	06/05/2013	N001	34 - 54	0.1	U	F	#	0.1	
Chloride	mg/L	06/05/2013	N001	34 - 54	15		F	#	1	
Nitrate + Nitrite as Nitrogen	mg/L	06/05/2013	N001	34 - 54	4.6		F	#	0.05	
Oxidation Reduction Potential	mV	06/05/2013	N001	34 - 54	125		F	#		
pH	s.u.	06/05/2013	N001	34 - 54	7.91		F	#		
Specific Conductance	umhos/cm	06/05/2013	N001	34 - 54	563		F	#		
Sulfate	mg/L	06/05/2013	N001	34 - 54	63		F	#	2.5	
Temperature	C	06/05/2013	N001	34 - 54	16.73		F	#		
Turbidity	NTU	06/05/2013	N001	34 - 54	0.17		F	#		
Uranium	mg/L	06/05/2013	N001	34 - 54	0.0045		F	#	0.0000029	
Vanadium	mg/L	06/05/2013	N001	34 - 54	0.013		F	#	0.000015	

Groundwater Quality Data by Location (USEE100) FOR SITE MON01, Monument Valley Processing Site

REPORT DATE: 8/1/2013

Location: 0653 WELL

Parameter	Units	Sample		Depth Range			Result	Qualifiers			Detection Limit	Uncertainty
		Date	ID	(Ft BLS)				Lab	Data	QA		
Ammonia Total as N	mg/L	06/05/2013	N001	56	-	76	0.1	U	F	#	0.1	
Ammonia Total as N	mg/L	06/05/2013	N002	56	-	76	0.1	U	F	#	0.1	
Chloride	mg/L	06/05/2013	N001	56	-	76	27		F	#	4	
Chloride	mg/L	06/05/2013	N002	56	-	76	28		F	#	4	
Nitrate + Nitrite as Nitrogen	mg/L	06/05/2013	N001	56	-	76	2400		RF	#	20	
Nitrate + Nitrite as Nitrogen	mg/L	06/05/2013	N002	56	-	76	48		F	#	0.5	
Oxidation Reduction Potential	mV	06/05/2013	N001	56	-	76	93		F	#		
pH	s.u.	06/05/2013	N001	56	-	76	7.39		F	#		
Specific Conductance	umhos/cm	06/05/2013	N001	56	-	76	2362		F	#		
Sulfate	mg/L	06/05/2013	N001	56	-	76	990		F	#	10	
Sulfate	mg/L	06/05/2013	N002	56	-	76	1000		F	#	10	
Temperature	C	06/05/2013	N001	56	-	76	18.01		F	#		
Turbidity	NTU	06/05/2013	N001	56	-	76	0.56		F	#		
Uranium	mg/L	06/05/2013	N001	56	-	76	0.01		F	#	0.0000029	
Uranium	mg/L	06/05/2013	N002	56	-	76	0.011		F	#	0.0000029	
Vanadium	mg/L	06/05/2013	N001	56	-	76	0.0084		F	#	0.000015	
Vanadium	mg/L	06/05/2013	N002	56	-	76	0.0084		F	#	0.000015	

Groundwater Quality Data by Location (USEE100) FOR SITE MON01, Monument Valley Processing Site

REPORT DATE: 8/1/2013

Location: 0655 WELL

Parameter	Units	Sample		Depth Range			Result	Qualifiers			Detection Limit	Uncertainty
		Date	ID	(Ft BLS)				Lab	Data	QA		
Alkalinity, Total (as CaCO ₃)	mg/L	06/03/2013	N001	38	-	58	226		F	#		
Ammonia Total as N	mg/L	06/03/2013	N001	38	-	58	130		F	#	10	
Chloride	mg/L	06/03/2013	N001	38	-	58	24		F	#	10	
Nitrate + Nitrite as Nitrogen	mg/L	06/03/2013	N001	38	-	58	210		F	#	2	
Oxidation Reduction Potential	mV	06/03/2013	N001	38	-	58	167.1		F	#		
pH	s.u.	06/03/2013	N001	38	-	58	7.03		F	#		
Specific Conductance	umhos/cm	06/03/2013	N001	38	-	58	3247		F	#		
Sulfate	mg/L	06/03/2013	N001	38	-	58	700		F	#	25	
Temperature	C	06/03/2013	N001	38	-	58	20.46		F	#		
Turbidity	NTU	06/03/2013	N001	38	-	58	1.45		F	#		
Uranium	mg/L	06/03/2013	N001	38	-	58	0.013		F	#	0.000029	
Vanadium	mg/L	06/03/2013	N001	38	-	58	0.008		F	#	0.000015	

Groundwater Quality Data by Location (USEE100) FOR SITE MON01, Monument Valley Processing Site

REPORT DATE: 8/1/2013

Location: 0656 WELL

Parameter	Units	Sample		Depth Range			Result	Qualifiers			Detection Limit	Uncertainty
		Date	ID	(Ft BLS)				Lab	Data	QA		
Ammonia Total as N	mg/L	06/04/2013	N001	38	-	58	40		F	#	2	
Chloride	mg/L	06/04/2013	N001	38	-	58	15		F	#	2	
Nitrate + Nitrite as Nitrogen	mg/L	06/04/2013	N001	38	-	58	15		F	#	0.1	
Oxidation Reduction Potential	mV	06/04/2013	N001	38	-	58	164		F	#		
pH	s.u.	06/04/2013	N001	38	-	58	7.65		F	#		
Specific Conductance	umhos/cm	06/04/2013	N001	38	-	58	946		F	#		
Sulfate	mg/L	06/04/2013	N001	38	-	58	140		F	#	5	
Temperature	C.	06/04/2013	N001	38	-	58	17.65		F	#		
Turbidity	NTU	06/04/2013	N001	38	-	58	0.68		F	#		
Uranium	mg/L	06/04/2013	N001	38	-	58	0.0056		F	#	0.0000029	
Vanadium	mg/L	06/04/2013	N001	38	-	58	0.0006		F	#	0.000015	

Groundwater Quality Data by Location (USEE100) FOR SITE MON01, Monument Valley Processing Site

REPORT DATE: 8/1/2013

Location: 0657 WELL

Parameter	Units	Sample		Depth Range			Result	Qualifiers			Detection Limit	Uncertainty
		Date	ID	(Ft BLS)				Lab	Data	QA		
Alkalinity, Total (as CaCO ₃)	mg/L	06/04/2013	N001	121	-	136	178		F	#		
Ammonia Total as N	mg/L	06/04/2013	N001	121	-	136	0.1	U	F	#	0.1	
Chloride	mg/L	06/04/2013	N001	121	-	136	9.8		F	#	2	
Nitrate + Nitrite as Nitrogen	mg/L	06/04/2013	N001	121	-	136	8.3		F	#	0.1	
Oxidation Reduction Potential	mV	06/04/2013	N001	121	-	136	138.9		F	#		
pH	s.u.	06/04/2013	N001	121	-	136	7.14		F	#		
Specific Conductance	umhos/cm	06/04/2013	N001	121	-	136	1088		F	#		
Sulfate	mg/L	06/04/2013	N001	121	-	136	380		F	#	5	
Temperature	C	06/04/2013	N001	121	-	136	18.1		F	#		
Turbidity	NTU	06/04/2013	N001	121	-	136	3.37		F	#		
Uranium	mg/L	06/04/2013	N001	121	-	136	0.2		F	#	0.00015	
Vanadium	mg/L	06/04/2013	N001	121	-	136	0.055		F	#	0.00076	

Groundwater Quality Data by Location (USEE100) FOR SITE MON01, Monument Valley Processing Site

REPORT DATE: 8/1/2013

Location: 0662 WELL

Parameter	Units	Sample		Depth Range (Ft BLS)	Result	Qualifiers			Detection Limit	Uncertainty
		Date	ID			Lab	Data	QA		
Alkalinity, Total (as CaCO ₃)	mg/L	06/04/2013	N001	37.5 - 67.5	170		F	#		
Ammonia Total as N	mg/L	06/04/2013	N001	37.5 - 67.5	0.1	U	F	#	0.1	
Chloride	mg/L	06/04/2013	N001	37.5 - 67.5	11		F	#	1	
Nitrate + Nitrite as Nitrogen	mg/L	06/04/2013	N001	37.5 - 67.5	6.9		F	#	0.05	
Oxidation Reduction Potential	mV	06/04/2013	N001	37.5 - 67.5	144.4		F	#		
pH	s.u.	06/04/2013	N001	37.5 - 67.5	7.22		F	#		
Specific Conductance	umhos/cm	06/04/2013	N001	37.5 - 67.5	772		F	#		
Sulfate	mg/L	06/04/2013	N001	37.5 - 67.5	180		F	#	2.5	
Temperature	C	06/04/2013	N001	37.5 - 67.5	18.85		F	#		
Turbidity	NTU	06/04/2013	N001	37.5 - 67.5	1.15		F	#		
Uranium	mg/L	06/04/2013	N001	37.5 - 67.5	0.13		F	#	0.000029	
Vanadium	mg/L	06/04/2013	N001	37.5 - 67.5	0.032		F	#	0.00015	

Groundwater Quality Data by Location (USEE100) FOR SITE MON01, Monument Valley Processing Site

REPORT DATE: 8/1/2013

Location: 0669 WELL

Parameter	Units	Sample		Depth Range			Result	Qualifiers			Detection Limit	Uncertainty
		Date	ID	(Ft BLS)				Lab	Data	QA		
Ammonia Total as N	mg/L	06/03/2013	N001	34	-	54	4.4		F	#	0.1	
Chloride	mg/L	06/03/2013	N001	34	-	54	9.4		F	#	1	
Nitrate + Nitrite as Nitrogen	mg/L	06/03/2013	N001	34	-	54	23		F	#	0.2	
Oxidation Reduction Potential	mV	06/03/2013	N001	34	-	54	123.1		F	#		
pH	s.u.	06/03/2013	N001	34	-	54	7.2		F	#		
Specific Conductance	umhos/cm	06/03/2013	N001	34	-	54	804		F	#		
Sulfate	mg/L	06/03/2013	N001	34	-	54	120		F	#	2.5	
Temperature	C	06/03/2013	N001	34	-	54	19.67		F	#		
Turbidity	NTU	06/03/2013	N001	34	-	54	1.06		F	#		
Uranium	mg/L	06/03/2013	N001	34	-	54	0.0056		F	#	0.000029	
Vanadium	mg/L	06/03/2013	N001	34	-	54	0.042		F	#	0.00015	

Groundwater Quality Data by Location (USEE100) FOR SITE MON01, Monument Valley Processing Site

REPORT DATE: 8/1/2013

Location: 0711 WELL

Parameter	Units	Sample		Depth Range (Ft BLS)	Result	Qualifiers			Detection Limit	Uncertainty
		Date	ID			Lab	Data	QA		
Ammonia Total as N	mg/L	06/05/2013	N001	25.5 - 30.5	0.1	U	F	#	0.1	
Chloride	mg/L	06/05/2013	N001	25.5 - 30.5	15		F	#	1	
Nitrate + Nitrite as Nitrogen	mg/L	06/05/2013	N001	25.5 - 30.5	0.58		F	#	0.01	
Oxidation Reduction Potential	mV	06/05/2013	N001	25.5 - 30.5	71.9		F	#		
pH	s.u.	06/05/2013	N001	25.5 - 30.5	7.47		F	#		
Specific Conductance	umhos/cm	06/05/2013	N001	25.5 - 30.5	685		F	#		
Sulfate	mg/L	06/05/2013	N001	25.5 - 30.5	120		F	#	2.5	
Temperature	C	06/05/2013	N001	25.5 - 30.5	17.16		F	#		
Turbidity	NTU	06/05/2013	N001	25.5 - 30.5	3.06		F	#		
Uranium	mg/L	06/05/2013	N001	25.5 - 30.5	0.0042		F	#	0.000029	
Vanadium	mg/L	06/05/2013	N001	25.5 - 30.5	0.0012		F	#	0.000015	

Groundwater Quality Data by Location (USEE100) FOR SITE MON01, Monument Valley Processing Site

REPORT DATE: 8/1/2013

Location: 0715 WELL

Parameter	Units	Sample		Depth Range (Ft BLS)	Result	Qualifiers			Detection Limit	Uncertainty
		Date	ID			Lab	Data	QA		
Ammonia Total as N	mg/L	06/05/2013	N001	16 - 21	0.1	U	F	#	0.1	
Chloride	mg/L	06/05/2013	N001	16 - 21	9.7		F	#	1	
Nitrate + Nitrite as Nitrogen	mg/L	06/05/2013	N001	16 - 21	0.77		F	#	0.01	
Oxidation Reduction Potential	mV	06/05/2013	N001	16 - 21	118.5		F	#		
pH	s.u.	06/05/2013	N001	16 - 21	7.51		F	#		
Specific Conductance	umhos /cm	06/05/2013	N001	16 - 21	530		F	#		
Sulfate	mg/L	06/05/2013	N001	16 - 21	67		F	#	2.5	
Temperature	C	06/05/2013	N001	16 - 21	16.74		F	#		
Turbidity	NTU	06/05/2013	N001	16 - 21	1.06		F	#		
Uranium	mg/L	06/05/2013	N001	16 - 21	0.0032		F	#	0.0000029	
Vanadium	mg/L	06/05/2013	N001	16 - 21	0.00077		F	#	0.000015	

Groundwater Quality Data by Location (USEE100) FOR SITE MON01, Monument Valley Processing Site

REPORT DATE: 8/1/2013

Location: 0719 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)	Result	Qualifiers			Detection Limit	Uncertainty
						Lab	Data	QA		
Ammonia Total as N	mg/L	06/05/2013	N001	19.35 - 24.35	0.1	U	F	#	0.1	
Chloride	mg/L	06/05/2013	N001	19.35 - 24.35	15		F	#	1	
Nitrate + Nitrite as Nitrogen	mg/L	06/05/2013	N001	19.35 - 24.35	0.8		F	#	0.01	
Oxidation Reduction Potential	mV	06/05/2013	N001	19.35 - 24.35	102.6		F	#		
pH	s.u.	06/05/2013	N001	19.35 - 24.35	7.4		F	#		
Specific Conductance	umhos/cm	06/05/2013	N001	19.35 - 24.35	710		F	#		
Sulfate	mg/L	06/05/2013	N001	19.35 - 24.35	120		F	#	2.5	
Temperature	C	06/05/2013	N001	19.35 - 24.35	16.95		F	#		
Turbidity	NTU	06/05/2013	N001	19.35 - 24.35	6.05		F	#		
Uranium	mg/L	06/05/2013	N001	19.35 - 24.35	0.0038		F	#	0.0000029	
Vanadium	mg/L	06/05/2013	N001	19.35 - 24.35	0.0045		F	#	0.000015	

Groundwater Quality Data by Location (USEE100) FOR SITE MON01, Monument Valley Processing Site

REPORT DATE: 8/1/2013

Location: 0727 WELL

Parameter	Units	Sample		Depth Range (Ft BLS)	Result	Qualifiers			Detection Limit	Uncertainty
		Date	ID			Lab	Data	QA		
Ammonia Total as N	mg/L	06/05/2013	N001	23.73 - 28.78	0.1	U	F	#	0.1	
Chloride	mg/L	06/05/2013	N001	23.73 - 28.78	10		F	#	1	
Nitrate + Nitrite as Nitrogen	mg/L	06/05/2013	N001	23.73 - 28.78	0.86		F	#	0.01	
Oxidation Reduction Potential	mV	06/05/2013	N001	23.73 - 28.78	59.8		F	#		
pH	s.u.	06/05/2013	N001	23.73 - 28.78	7.47		F	#		
Specific Conductance	umhos/cm	06/05/2013	N001	23.73 - 28.78	557		F	#		
Sulfate	mg/L	06/05/2013	N001	23.73 - 28.78	80		F	#	2.5	
Temperature	C	06/05/2013	N001	23.73 - 28.78	18.7		F	#		
Turbidity	NTU	06/05/2013	N001	23.73 - 28.78	7.4		F	#		
Uranium	mg/L	06/05/2013	N001	23.73 - 28.78	0.002		F	#	0.000029	
Vanadium	mg/L	06/05/2013	N001	23.73 - 28.78	0.0026		F	#	0.000015	

Groundwater Quality Data by Location (USEE100) FOR SITE MON01, Monument Valley Processing Site

REPORT DATE: 8/1/2013

Location: 0733 WELL

Parameter	Units	Sample		Depth Range			Result	Qualifiers			Detection Limit	Uncertainty
		Date	ID	(Ft BLS)				Lab	Data	QA		
Alkalinity, Total (as CaCO ₃)	mg/L	06/04/2013	0001	49	-	54	174		F	#		
Ammonia Total as N	mg/L	06/04/2013	0001	49	-	54	0.1	U	F	#	0.1	
Chloride	mg/L	06/04/2013	0001	49	-	54	6.8		F	#	1	
Nitrate + Nitrite as Nitrogen	mg/L	06/04/2013	0001	49	-	54	5.5		F	#	0.05	
Oxidation Reduction Potential	mV	06/04/2013	N001	49	-	54	138.3		F	#		
pH	s.u.	06/04/2013	N001	49	-	54	7.37		F	#		
Specific Conductance	umhos/cm	06/04/2013	N001	49	-	54	580		F	#		
Sulfate	mg/L	06/04/2013	0001	49	-	54	83		F	#	2.5	
Temperature	C	06/04/2013	N001	49	-	54	20.17		F	#		
Turbidity	NTU	06/04/2013	N001	49	-	54	54.3		F	#		
Uranium	mg/L	06/04/2013	0001	49	-	54	0.0057		F	#	0.000029	
Vanadium	mg/L	06/04/2013	0001	49	-	54	0.053		F	#	0.00015	

Groundwater Quality Data by Location (USEE100) FOR SITE MON01, Monument Valley Processing Site

REPORT DATE: 8/1/2013

Location: 0734 WELL

Parameter	Units	Sample		Depth Range (Ft BLS)	Result	Qualifiers			Detection Limit	Uncertainty
		Date	ID			Lab	Data	QA		
Alkalinity, Total (as CaCO ₃)	mg/L	06/04/2013	0001	50 - 80	150		F	#		
Ammonia Total as N	mg/L	06/04/2013	0001	50 - 80	0.1	U	F	#	0.1	
Chloride	mg/L	06/04/2013	0001	50 - 80	5.6		F	#	1	
Nitrate + Nitrite as Nitrogen	mg/L	06/04/2013	0001	50 - 80	2.8		F	#	0.05	
Oxidation Reduction Potential	mV	06/04/2013	N001	50 - 80	134.2		F	#		
pH	s.u.	06/04/2013	N001	50 - 80	7.42		F	#		
Specific Conductance	umhos/cm	06/04/2013	N001	50 - 80	503		F	#		
Sulfate	mg/L	06/04/2013	0001	50 - 80	72		F	#	2.5	
Temperature	C	06/04/2013	N001	50 - 80	21		F	#		
Turbidity	NTU	06/04/2013	N001	50 - 80	20.3		F	#		
Uranium	mg/L	06/04/2013	0001	50 - 80	0.16		F	#	0.000029	
Vanadium	mg/L	06/04/2013	0001	50 - 80	0.022		F	#	0.00015	

Groundwater Quality Data by Location (USEE100) FOR SITE MON01, Monument Valley Processing Site

REPORT DATE: 8/1/2013

Location: 0735 WELL

Parameter	Units	Sample		Depth Range (Ft BLS)	Result	Qualifiers			Detection Limit	Uncertainty
		Date	ID			Lab	Data	QA		
Alkalinity, Total (as CaCO ₃)	mg/L	06/04/2013	0001	53.5 - 58.5	82		FQ	#		
Ammonia Total as N	mg/L	06/04/2013	0001	53.5 - 58.5	0.1	U	FQ	#	0.1	
Chloride	mg/L	06/04/2013	0001	53.5 - 58.5	4.3		FQ	#	1	
Nitrate + Nitrite as Nitrogen	mg/L	06/04/2013	0001	53.5 - 58.5	16		FQ	#	0.1	
Oxidation Reduction Potential	mV	06/04/2013	N001	53.5 - 58.5	141		FQ	#		
pH	s.u.	06/04/2013	N001	53.5 - 58.5	7.26		FQ	#		
Specific Conductance	umhos/cm	06/04/2013	N001	53.5 - 58.5	2168		FQ	#		
Sulfate	mg/L	06/04/2013	0001	53.5 - 58.5	1300		FQ	#	10	
Temperature	C	06/04/2013	N001	53.5 - 58.5	19.73		FQ	#		
Turbidity	NTU	06/04/2013	N001	53.5 - 58.5	36		FQ	#		
Uranium	mg/L	06/04/2013	0001	53.5 - 58.5	0.2		FQ	#	0.000029	
Vanadium	mg/L	06/04/2013	0001	53.5 - 58.5	0.024		FQ	#	0.00015	

Groundwater Quality Data by Location (USEE100) FOR SITE MON01, Monument Valley Processing Site

REPORT DATE: 8/1/2013

Location: 0738 WELL

Parameter	Units	Sample		Depth Range (Ft BLS)	Result	Qualifiers			Detection Limit	Uncertainty
		Date	ID			Lab	Data	QA		
Ammonia Total as N	mg/L	06/04/2013	N001	26 - 31	0.1	U	F	#	0.1	
Chloride	mg/L	06/04/2013	N001	26 - 31	16		F	#	1	
Nitrate + Nitrite as Nitrogen	mg/L	06/04/2013	N001	26 - 31	0.01	U	F	#	0.01	
Oxidation Reduction Potential	mV	06/04/2013	N001	26 - 31	-16		F	#		
pH	s.u.	06/04/2013	N001	26 - 31	8.02		F	#		
Specific Conductance	umhos /cm	06/04/2013	N001	26 - 31	775		F	#		
Sulfate	mg/L	06/04/2013	N001	26 - 31	180		F	#	2.5	
Temperature	C	06/04/2013	N001	26 - 31	20.91		F	#		
Turbidity	NTU	06/04/2013	N001	26 - 31	6.73		F	#		
Uranium	mg/L	06/04/2013	N001	26 - 31	0.00027		F	#	0.000029	
Vanadium	mg/L	06/04/2013	N001	26 - 31	0.00058		F	#	0.000015	

Groundwater Quality Data by Location (USEE100) FOR SITE MON01, Monument Valley Processing Site

REPORT DATE: 8/1/2013

Location: 0739 WELL

Parameter	Units	Sample		Depth Range			Result	Qualifiers			Detection Limit	Uncertainty
		Date	ID	(Ft BLS)				Lab	Data	QA		
Ammonia Total as N	mg/L	06/05/2013	N001	33	-	38	0.63		F	#	0.1	
Chloride	mg/L	06/05/2013	N001	33	-	38	16		F	#	1	
Nitrate + Nitrite as Nitrogen	mg/L	06/05/2013	N001	33	-	38	0.99		F	#	0.01	
Oxidation Reduction Potential	mV	06/05/2013	N001	33	-	38	1.6		F	#		
pH	s.u.	06/05/2013	N001	33	-	38	7.95		F	#		
Specific Conductance	umhos/cm	06/05/2013	N001	33	-	38	787		F	#		
Sulfate	mg/L	06/05/2013	N001	33	-	38	160		F	#	2.5	
Temperature	C	06/05/2013	N001	33	-	38	18.63		F	#		
Turbidity	NTU	06/05/2013	N001	33	-	38	5.84		F	#		
Uranium	mg/L	06/05/2013	N001	33	-	38	0.0039		F	#	0.000029	
Vanadium	mg/L	06/05/2013	N001	33	-	38	0.0098		F	#	0.00015	

Groundwater Quality Data by Location (USEE100) FOR SITE MON01, Monument Valley Processing Site

REPORT DATE: 8/1/2013

Location: 0740 WELL

Parameter	Units	Sample		Depth Range (Ft BLS)	Result	Qualifiers			Detection Limit	Uncertainty
		Date	ID			Lab	Data	QA		
Ammonia Total as N	mg/L	06/04/2013	N001	30 - 35	0.1	U	F	#	0.1	
Chloride	mg/L	06/04/2013	N001	30 - 35	34		F	#	4	
Nitrate + Nitrite as Nitrogen	mg/L	06/04/2013	N001	30 - 35	23		F	#	0.2	
Oxidation Reduction Potential	mV	06/04/2013	N001	30 - 35	141.5		F	#		
pH	s.u.	06/04/2013	N001	30 - 35	7.4		F	#		
Specific Conductance	umhos/cm	06/04/2013	N001	30 - 35	2496		F	#		
Sulfate	mg/L	06/04/2013	N001	30 - 35	1200		F	#	10	
Temperature	C	06/04/2013	N001	30 - 35	20.23		F	#		
Turbidity	NTU	06/04/2013	N001	30 - 35	2.78		F	#		
Uranium	mg/L	06/04/2013	N001	30 - 35	0.029		F	#	0.000029	
Vanadium	mg/L	06/04/2013	N001	30 - 35	0.021		F	#	0.00015	

Groundwater Quality Data by Location (USEE100) FOR SITE MON01, Monument Valley Processing Site

REPORT DATE: 8/1/2013

Location: 0741 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)	Result	Qualifiers			Detection Limit	Uncertainty
						Lab	Data	QA		
Ammonia Total as N	mg/L	06/05/2013	0001	50 - 80	110		F	#	10	
Chloride	mg/L	06/05/2013	0001	50 - 80	21		F	#	4	
Nitrate + Nitrite as Nitrogen	mg/L	06/05/2013	0001	50 - 80	110		F	#	1	
Oxidation Reduction Potential	mV	06/05/2013	N001	50 - 80	142		F	#		
pH	s.u.	06/05/2013	N001	50 - 80	7.18		F	#		
Specific Conductance	umhos /cm	06/05/2013	N001	50 - 80	2376		F	#		
Sulfate	mg/L	06/05/2013	0001	50 - 80	490		F	#	10	
Temperature	C	06/05/2013	N001	50 - 80	20.3		F	#		
Turbidity	NTU	06/05/2013	N001	50 - 80	631		F	#		
Uranium	mg/L	06/05/2013	0001	50 - 80	0.011		F	#	0.000015	
Vanadium	mg/L	06/05/2013	0001	50 - 80	0.0075		F	#	0.000076	

Groundwater Quality Data by Location (USEE100) FOR SITE MON01, Monument Valley Processing Site

REPORT DATE: 8/1/2013

Location: 0742 WELL

Parameter	Units	Sample		Depth Range (Ft BLS)	Result	Qualifiers			Detection Limit	Uncertainty
		Date	ID			Lab	Data	QA		
Ammonia Total as N	mg/L	06/05/2013	N001	50 - 80	120		F	#	10	
Chloride	mg/L	06/05/2013	N001	50 - 80	21		F	#	4	
Nitrate + Nitrite as Nitrogen	mg/L	06/05/2013	N001	50 - 80	110		F	#	1	
Oxidation Reduction Potential	mV	06/05/2013	N001	50 - 80	69		F	#		
pH	s.u.	06/05/2013	N001	50 - 80	7.21		F	#		
Specific Conductance	umhos/cm	06/05/2013	N001	50 - 80	2421		F	#		
Sulfate	mg/L	06/05/2013	N001	50 - 80	490		F	#	10	
Temperature	C	06/05/2013	N001	50 - 80	21.14		F	#		
Turbidity	NTU	06/05/2013	N001	50 - 80	8.63		F	#		
Uranium	mg/L	06/05/2013	N001	50 - 80	0.0093		F	#	0.000015	
Vanadium	mg/L	06/05/2013	N001	50 - 80	0.0082		F	#	0.000076	

Groundwater Quality Data by Location (USEE100) FOR SITE MON01, Monument Valley Processing Site

REPORT DATE: 8/1/2013

Location: 0743 WELL

Parameter	Units	Sample		Depth Range (Ft BLS)	Result	Qualifiers			Detection Limit	Uncertainty
		Date	ID			Lab	Data	QA		
Ammonia Total as N	mg/L	06/05/2013	0001	45 - 75	85		F	#	10	
Chloride	mg/L	06/05/2013	0001	45 - 75	20		F	#	4	
Nitrate + Nitrite as Nitrogen	mg/L	06/05/2013	0001	45 - 75	71		F	#	0.5	
Oxidation Reduction Potential	mV	06/05/2013	N001	45 - 75	103.3		F	#		
pH	s.u.	06/05/2013	N001	45 - 75	7.27		F	#		
Specific Conductance	umhos /cm	06/05/2013	N001	45 - 75	2138		F	#		
Sulfate	mg/L	06/05/2013	0001	45 - 75	530		F	#	10	
Temperature	C	06/05/2013	N001	45 - 75	22.23		F	#		
Turbidity	NTU	06/05/2013	N001	45 - 75	17.6		F	#		
Uranium	mg/L	06/05/2013	0001	45 - 75	0.029		F	#	0.0000029	
Vanadium	mg/L	06/05/2013	0001	45 - 75	0.00024	B	F	#	0.000015	

Groundwater Quality Data by Location (USEE100) FOR SITE MON01, Monument Valley Processing Site

REPORT DATE: 8/1/2013

Location: 0744 WELL

Parameter	Units	Sample		Depth Range (Ft BLS)	Result	Qualifiers			Detection Limit	Uncertainty
		Date	ID			Lab	Data	QA		
Ammonia Total as N	mg/L	06/05/2013	0001	31 - 61	140		F	#	10	
Chloride	mg/L	06/05/2013	0001	31 - 61	19		F	#	4	
Nitrate + Nitrite as Nitrogen	mg/L	06/05/2013	0001	31 - 61	160		F	#	1	
Oxidation Reduction Potential	mV	06/05/2013	N001	31 - 61	51		F	#		
pH	s.u.	06/05/2013	N001	31 - 61	7.11		F	#		
Specific Conductance	umhos/cm	06/05/2013	N001	31 - 61	2739		F	#		
Sulfate	mg/L	06/05/2013	0001	31 - 61	420		F	#	10	
Temperature	C	06/05/2013	N001	31 - 61	20.16		F	#		
Turbidity	NTU	06/05/2013	N001	31 - 61	39.5		F	#		
Uranium	mg/L	06/05/2013	0001	31 - 61	0.01		F	#	0.0000029	
Vanadium	mg/L	06/05/2013	0001	31 - 61	0.0081		F	#	0.000015	

Groundwater Quality Data by Location (USEE100) FOR SITE MON01, Monument Valley Processing Site

REPORT DATE: 8/1/2013

Location: 0760 WELL

Parameter	Units	Sample		Depth Range			Result	Qualifiers			Detection Limit	Uncertainty
		Date	ID	(Ft BLS)				Lab	Data	QA		
Ammonia Total as N	mg/L	06/04/2013	0001	55	-	75	0.1	U	F	#	0.1	
Ammonia Total as N	mg/L	06/04/2013	0002	55	-	75	0.1	U	F	#	0.1	
Chloride	mg/L	06/04/2013	0001	55	-	75	9.9		F	#	0.4	
Chloride	mg/L	06/04/2013	0002	55	-	75	9.8		F	#	0.4	
Nitrate + Nitrite as Nitrogen	mg/L	06/04/2013	0001	55	-	75	0.016		F	#	0.01	
Nitrate + Nitrite as Nitrogen	mg/L	06/04/2013	0002	55	-	75	0.014		F	#	0.01	
Oxidation Reduction Potential	mV	06/04/2013	N001	55	-	75	-139.7		F	#		
pH	s.u.	06/04/2013	N001	55	-	75	7.95		F	#		
Specific Conductance	umhos/cm	06/04/2013	N001	55	-	75	527		F	#		
Sulfate	mg/L	06/04/2013	0001	55	-	75	85		F	#	1	
Sulfate	mg/L	06/04/2013	0002	55	-	75	84		F	#	1	
Temperature	C	06/04/2013	N001	55	-	75	18.8		F	#		
Turbidity	NTU	06/04/2013	N001	55	-	75	40.6		F	#		
Uranium	mg/L	06/04/2013	0001	55	-	75	0.00025		F	#	0.000029	
Uranium	mg/L	06/04/2013	0002	55	-	75	0.00025		F	#	0.000029	
Vanadium	mg/L	06/04/2013	0001	55	-	75	0.0001	B	F	#	0.000015	
Vanadium	mg/L	06/04/2013	0002	55	-	75	0.00011	B	F	#	0.000015	

Groundwater Quality Data by Location (USEE100) FOR SITE MON01, Monument Valley Processing Site

REPORT DATE: 8/1/2013

Location: 0761 WELL

Parameter	Units	Sample		Depth Range (Ft BLS)	Result	Qualifiers			Detection Limit	Uncertainty
		Date	ID			Lab	Data	QA		
Ammonia Total as N	mg/L	06/04/2013	N001	39 - 49	0.1	U	F	#	0.1	
Chloride	mg/L	06/04/2013	N001	39 - 49	14		F	#	2	
Nitrate + Nitrite as Nitrogen	mg/L	06/04/2013	N001	39 - 49	34		F	#	0.2	
Oxidation Reduction Potential	mV	06/04/2013	N001	39 - 49	119.6		F	#		
pH	s.u.	06/04/2013	N001	39 - 49	7.13		F	#		
Specific Conductance	umhos/cm	06/04/2013	N001	39 - 49	1357		F	#		
Sulfate	mg/L	06/04/2013	N001	39 - 49	420		F	#	5	
Temperature	C	06/04/2013	N001	39 - 49	19.09		F	#		
Turbidity	NTU	06/04/2013	N001	39 - 49	5.87		F	#		
Uranium	mg/L	06/04/2013	N001	39 - 49	0.028		F	#	0.000029	
Vanadium	mg/L	06/04/2013	N001	39 - 49	0.002		F	#	0.000015	

Groundwater Quality Data by Location (USEE100) FOR SITE MON01, Monument Valley Processing Site

REPORT DATE: 8/1/2013

Location: 0762 WELL

Parameter	Units	Sample		Depth Range			Result	Qualifiers			Detection Limit	Uncertainty
		Date	ID	(Ft BLS)				Lab	Data	QA		
Ammonia Total as N	mg/L	06/04/2013	N001	29	-	49	0.1	U	F	#	0.1	
Chloride	mg/L	06/04/2013	N001	29	-	49	68		F	#	10	
Nitrate + Nitrite as Nitrogen	mg/L	06/04/2013	N001	29	-	49	100		F	#	1	
Oxidation Reduction Potential	mV	06/04/2013	N001	29	-	49	23		F	#		
pH	s.u.	06/04/2013	N001	29	-	49	7.35		F	#		
Specific Conductance	umhos/cm	06/04/2013	N001	29	-	49	3861		F	#		
Sulfate	mg/L	06/04/2013	N001	29	-	49	1400		F	#	25	
Temperature	C	06/04/2013	N001	29	-	49	18.57		F	#		
Turbidity	NTU	06/04/2013	N001	29	-	49	8.3		F	#		
Uranium	mg/L	06/04/2013	N001	29	-	49	0.013		F	#	0.0000029	
Vanadium	mg/L	06/04/2013	N001	29	-	49	0.0081		F	#	0.000015	

Groundwater Quality Data by Location (USEE100) FOR SITE MON01, Monument Valley Processing Site

REPORT DATE: 8/1/2013

Location: 0764 WELL

Parameter	Units	Sample		Depth Range			Result	Qualifiers			Detection Limit	Uncertainty
		Date	ID	(Ft BLS)				Lab	Data	QA		
Ammonia Total as N	mg/L	06/05/2013	N001	47	-	52	0.1	U	FQ	#	0.1	
Chloride	mg/L	06/05/2013	N001	47	-	52	11		FQ	#	2	
Nitrate + Nitrite as Nitrogen	mg/L	06/05/2013	N001	47	-	52	40		FQ	#	0.5	
Oxidation Reduction Potential	mV	06/05/2013	N001	47	-	52	105		FQ	#		
pH	s.u.	06/05/2013	N001	47	-	52	7.64		FQ	#		
Specific Conductance	umhos/cm	06/05/2013	N001	47	-	52	1122		FQ	#		
Sulfate	mg/L	06/05/2013	N001	47	-	52	220		FQ	#	5	
Temperature	C	06/05/2013	N001	47	-	52	20.76		FQ	#		
Turbidity	NTU	06/05/2013	N001	47	-	52	8.56		FQ	#		
Uranium	mg/L	06/05/2013	N001	47	-	52	0.012		FQ	#	0.000029	
Vanadium	mg/L	06/05/2013	N001	47	-	52	0.013		FQ	#	0.000015	

Groundwater Quality Data by Location (USEE100) FOR SITE MON01, Monument Valley Processing Site

REPORT DATE: 8/1/2013

Location: 0765 WELL

Parameter	Units	Sample		Depth Range (Ft BLS)	Result	Qualifiers			Detection Limit	Uncertainty
		Date	ID			Lab	Data	QA		
Ammonia Total as N	mg/L	06/05/2013	N001	58.6 - 88.7	98		F	#	10	
Chloride	mg/L	06/05/2013	N001	58.6 - 88.7	21		F	#	4	
Nitrate + Nitrite as Nitrogen	mg/L	06/05/2013	N001	58.6 - 88.7	59		F	#	0.5	
Oxidation Reduction Potential	mV	06/05/2013	N001	58.6 - 88.7	-40.2		F	#		
pH	s.u.	06/05/2013	N001	58.6 - 88.7	7.1		F	#		
Specific Conductance	umhos/cm	06/05/2013	N001	58.6 - 88.7	2248		F	#		
Sulfate	mg/L	06/05/2013	N001	58.6 - 88.7	570		F	#	10	
Temperature	C	06/05/2013	N001	58.6 - 88.7	19		F	#		
Turbidity	NTU	06/05/2013	N001	58.6 - 88.7	1.92		F	#		
Uranium	mg/L	06/05/2013	N001	58.6 - 88.7	0.011		F	#	0.0000029	
Vanadium	mg/L	06/05/2013	N001	58.6 - 88.7	0.0031		F	#	0.000015	

Groundwater Quality Data by Location (USEE100) FOR SITE MON01, Monument Valley Processing Site

REPORT DATE: 8/1/2013

Location: 0766 WELL

Parameter	Units	Sample		Depth Range			Result	Qualifiers		Detection Limit	Uncertainty
		Date	ID	(Ft BLS)				Lab	Data QA		
Ammonia Total as N	mg/L	06/05/2013	N001	47.2	-	57.2	120	F	#	10	
Chloride	mg/L	06/05/2013	N001	47.2	-	57.2	17	F	#	4	
Nitrate + Nitrite as Nitrogen	mg/L	06/05/2013	N001	47.2	-	57.2	120	F	#	1	
Oxidation Reduction Potential	mV	06/05/2013	N001	47.2	-	57.2	70.2	F	#		
pH	s.u.	06/05/2013	N001	47.2	-	57.2	7.31	F	#		
Specific Conductance	umhos/cm	06/05/2013	N001	47.2	-	57.2	2301	F	#		
Sulfate	mg/L	06/05/2013	N001	47.2	-	57.2	380	F	#	10	
Temperature	C	06/05/2013	N001	47.2	-	57.2	18.63	F	#		
Turbidity	NTU	06/05/2013	N001	47.2	-	57.2	2.6	F	#		
Uranium	mg/L	06/05/2013	N001	47.2	-	57.2	0.01	F	#	0.0000029	
Vanadium	mg/L	06/05/2013	N001	47.2	-	57.2	0.0043	F	#	0.000015	

Groundwater Quality Data by Location (USEE100) FOR SITE MON01, Monument Valley Processing Site

REPORT DATE: 8/1/2013

Location: 0767 WELL

Parameter	Units	Sample		Depth Range (Ft BLS)	Result	Qualifiers			Detection Limit	Uncertainty
		Date	ID			Lab	Data	QA		
Ammonia Total as N	mg/L	06/04/2013	N001	43.5 - 63.5	0.1	U	F	#	0.1	
Chloride	mg/L	06/04/2013	N001	43.5 - 63.5	5.8		F	#	0.2	
Nitrate + Nitrite as Nitrogen	mg/L	06/04/2013	N001	43.5 - 63.5	0.01	U	F	#	0.01	
Oxidation Reduction Potential	mV	06/04/2013	N001	43.5 - 63.5	-48		F	#		
pH	s.u.	06/04/2013	N001	43.5 - 63.5	7.79		F	#		
Specific Conductance	umhos/cm	06/04/2013	N001	43.5 - 63.5	408		F	#		
Sulfate	mg/L	06/04/2013	N001	43.5 - 63.5	32		F	#	0.5	
Temperature	C	06/04/2013	N001	43.5 - 63.5	18.49		F	#		
Turbidity	NTU	06/04/2013	N001	43.5 - 63.5	0.6		F	#		
Uranium	mg/L	06/04/2013	N001	43.5 - 63.5	0.00068		F	#	0.000029	
Vanadium	mg/L	06/04/2013	N001	43.5 - 63.5	0.000067	B	F	#	0.000015	

Groundwater Quality Data by Location (USEE100) FOR SITE MON01, Monument Valley Processing Site

REPORT DATE: 8/1/2013

Location: 0768 WELL

Parameter	Units	Sample		Depth Range		Result	Qualifiers			Detection Limit	Uncertainty
		Date	ID	(Ft BLS)	Lab		Data	QA			
Ammonia Total as N	mg/L	06/04/2013	N001	24.4	- 44.4	0.5		F	#	0.1	
Chloride	mg/L	06/04/2013	N001	24.4	- 44.4	15		F	#	0.4	
Nitrate + Nitrite as Nitrogen	mg/L	06/04/2013	N001	24.4	- 44.4	0.01	U	F	#	0.01	
Oxidation Reduction Potential	mV	06/04/2013	N001	24.4	- 44.4	-191		F	#		
pH	s.u.	06/04/2013	N001	24.4	- 44.4	8.02		F	#		
Specific Conductance	umhos/cm	06/04/2013	N001	24.4	- 44.4	509		F	#		
Sulfate	mg/L	06/04/2013	N001	24.4	- 44.4	85		F	#	1	
Temperature	C	06/04/2013	N001	24.4	- 44.4	18.47		F	#		
Turbidity	NTU	06/04/2013	N001	24.4	- 44.4	9.43		F	#		
Uranium	mg/L	06/04/2013	N001	24.4	- 44.4	0.00022	*	FJ	#	0.0000029	
Vanadium	mg/L	06/04/2013	N001	24.4	- 44.4	0.00048		F	#	0.000015	

Groundwater Quality Data by Location (USEE100) FOR SITE MON01, Monument Valley Processing Site

REPORT DATE: 8/1/2013

Location: 0770 WELL

Parameter	Units	Sample		Depth Range (Ft BLS)	Result	Qualifiers			Detection Limit	Uncertainty
		Date	ID			Lab	Data	QA		
Ammonia Total as N	mg/L	06/03/2013	N001	54.9 - 64.9	29		F	#	2	
Chloride	mg/L	06/03/2013	N001	54.9 - 64.9	15		F	#	2	
Nitrate + Nitrite as Nitrogen	mg/L	06/03/2013	N001	54.9 - 64.9	17		F	#	0.1	
Oxidation Reduction Potential	mV	06/03/2013	N001	54.9 - 64.9	119.1		F	#		
pH	s.u.	06/03/2013	N001	54.9 - 64.9	7.39		F	#		
Specific Conductance	umhos /cm	06/03/2013	N001	54.9 - 64.9	969		F	#		
Sulfate	mg/L	06/03/2013	N001	54.9 - 64.9	180		F	#	5	
Temperature	C	06/03/2013	N001	54.9 - 64.9	17.96		F	#		
Turbidity	NTU	06/03/2013	N001	54.9 - 64.9	2.69		F	#		
Uranium	mg/L	06/03/2013	N001	54.9 - 64.9	0.0057		F	#	0.000029	
Vanadium	mg/L	06/03/2013	N001	54.9 - 64.9	0.00077		F	#	0.000015	

Groundwater Quality Data by Location (USEE100) FOR SITE MON01, Monument Valley Processing Site

REPORT DATE: 8/1/2013

Location: 0771 WELL

Parameter	Units	Sample		Depth Range (Ft BLS)	Result	Qualifiers			Detection Limit	Uncertainty
		Date	ID			Lab	Data	QA		
Alkalinity, Total (as CaCO ₃)	mg/L	06/03/2013	N001	57.4 - 77.4	263		FQ	#		
Ammonia Total as N	mg/L	06/03/2013	N001	57.4 - 77.4	230		FQ	#	10	
Chloride	mg/L	06/03/2013	N001	57.4 - 77.4	20		FQ	#	4	
Nitrate + Nitrite as Nitrogen	mg/L	06/03/2013	N001	57.4 - 77.4	200		FQ	#	1	
Oxidation Reduction Potential	mV	06/03/2013	N001	57.4 - 77.4	162.7		FQ	#		
pH	s.u.	06/03/2013	N001	57.4 - 77.4	7.07		FQ	#		
Specific Conductance	umhos/cm	06/03/2013	N001	57.4 - 77.4	4575		FQ	#		
Sulfate	mg/L	06/03/2013	N001	57.4 - 77.4	1500		FQ	#	10	
Temperature	C	06/03/2013	N001	57.4 - 77.4	19.01		FQ	#		
Turbidity	NTU	06/03/2013	N001	57.4 - 77.4	2.3		FQ	#		
Uranium	mg/L	06/03/2013	N001	57.4 - 77.4	0.017		FQ	#	0.0000029	
Vanadium	mg/L	06/03/2013	N001	57.4 - 77.4	0.0088		FQ	#	0.000015	

Groundwater Quality Data by Location (USEE100) FOR SITE MON01, Monument Valley Processing Site

REPORT DATE: 8/1/2013

Location: 0772 WELL

Parameter	Units	Sample		Depth Range (Ft BLS)	Result	Qualifiers			Detection Limit	Uncertainty
		Date	ID			Lab	Data	QA		
Ammonia Total as N	mg/L	06/05/2013	N001	7.4 - 27.4	1.2		F	#	0.1	
Chloride	mg/L	06/05/2013	N001	7.4 - 27.4	16		F	#	1	
Nitrate + Nitrite as Nitrogen	mg/L	06/05/2013	N001	7.4 - 27.4	2.6		F	#	0.02	
Oxidation Reduction Potential	mV	06/05/2013	N001	7.4 - 27.4	130.2		F	#		
pH	s.u.	06/05/2013	N001	7.4 - 27.4	7.25		F	#		
Specific Conductance	umhos/cm	06/05/2013	N001	7.4 - 27.4	806		F	#		
Sulfate	mg/L	06/05/2013	N001	7.4 - 27.4	130		F	#	2.5	
Temperature	C	06/05/2013	N001	7.4 - 27.4	16		F	#		
Turbidity	NTU	06/05/2013	N001	7.4 - 27.4	1.51		F	#		
Uranium	mg/L	06/05/2013	N001	7.4 - 27.4	0.0094		F	#	0.000029	
Vanadium	mg/L	06/05/2013	N001	7.4 - 27.4	0.048		F	#	0.00015	

Groundwater Quality Data by Location (USEE100) FOR SITE MON01, Monument Valley Processing Site

REPORT DATE: 8/1/2013

Location: 0774 WELL

Parameter	Units	Sample		Depth Range			Result	Qualifiers			Detection Limit	Uncertainty
		Date	ID	(Ft BLS)				Lab	Data	QA		
Ammonia Total as N	mg/L	06/04/2013	N001	45	-	55	0.1	U	F	#	0.1	
Chloride	mg/L	06/04/2013	N001	45	-	55	5.1		F	#	0.2	
Nitrate + Nitrite as Nitrogen	mg/L	06/04/2013	N001	45	-	55	1.5		F	#	0.01	
Oxidation Reduction Potential	mV	06/04/2013	N001	45	-	55	129.7		F	#		
pH	s.u.	06/04/2013	N001	45	-	55	7.44		F	#		
Specific Conductance	umhos/cm	06/04/2013	N001	45	-	55	380		F	#		
Sulfate	mg/L	06/04/2013	N001	45	-	55	30		F	#	0.5	
Temperature	C	06/04/2013	N001	45	-	55	19.81		F	#		
Turbidity	NTU	06/04/2013	N001	45	-	55	6.01		F	#		
Uranium	mg/L	06/04/2013	N001	45	-	55	0.03		F	#	0.000029	
Vanadium	mg/L	06/04/2013	N001	45	-	55	0.022		F	#	0.00015	

Groundwater Quality Data by Location (USEE100) FOR SITE MON01, Monument Valley Processing Site

REPORT DATE: 8/1/2013

Location: 0775 WELL

Parameter	Units	Sample		Depth Range (Ft BLS)	Result	Qualifiers			Detection Limit	Uncertainty
		Date	ID			Lab	Data	QA		
Ammonia Total as N	mg/L	06/04/2013	N001	142 - 167	0.1	U	F	#	0.1	
Chloride	mg/L	06/04/2013	N001	142 - 167	5.8		F	#	0.2	
Nitrate + Nitrite as Nitrogen	mg/L	06/04/2013	N001	142 - 167	0.63		F	#	0.01	
Oxidation Reduction Potential	mV	06/04/2013	N001	142 - 167	111.2		F	#		
pH	s.u.	06/04/2013	N001	142 - 167	7.52		F	#		
Specific Conductance	umhos/cm	06/04/2013	N001	142 - 167	395		F	#		
Sulfate	mg/L	06/04/2013	N001	142 - 167	25		F	#	0.5	
Temperature	C	06/04/2013	N001	142 - 167	18.59		F	#		
Turbidity	NTU	06/04/2013	N001	142 - 167	3.21		F	#		
Uranium	mg/L	06/04/2013	N001	142 - 167	0.0035		F	#	0.000029	
Vanadium	mg/L	06/04/2013	N001	142 - 167	0.00082		F	#	0.000015	

Groundwater Quality Data by Location (USEE100) FOR SITE MON01, Monument Valley Processing Site

REPORT DATE: 8/1/2013

Location: 0776 WELL

Parameter	Units	Sample		Depth Range		Result	Qualifiers			Detection Limit	Uncertainty
		Date	ID	(Ft BLS)	Lab		Data	QA			
Alkalinity, Total (as CaCO ₃)	mg/L	06/04/2013	N001	99.5	- 149.5	159		F	#		
Ammonia Total as N	mg/L	06/04/2013	N001	99.5	- 149.5	0.1	U	F	#	0.1	
Ammonia Total as N	mg/L	06/04/2013	N002	99.5	- 149.5	0.1	U	F	#	0.1	
Chloride	mg/L	06/04/2013	N001	99.5	- 149.5	6		F	#	0.2	
Chloride	mg/L	06/04/2013	N002	99.5	- 149.5	6		F	#	0.2	
Nitrate + Nitrite as Nitrogen	mg/L	06/04/2013	N001	99.5	- 149.5	0.88		F	#	0.01	
Nitrate + Nitrite as Nitrogen	mg/L	06/04/2013	N002	99.5	- 149.5	0.86		F	#	0.01	
Oxidation Reduction Potential	mV	06/04/2013	N001	99.5	- 149.5	119		F	#		
pH	s.u.	06/04/2013	N001	99.5	- 149.5	7.45		F	#		
Specific Conductance	umhos/cm	06/04/2013	N001	99.5	- 149.5	400		F	#		
Sulfate	mg/L	06/04/2013	N001	99.5	- 149.5	33		F	#	0.5	
Sulfate	mg/L	06/04/2013	N002	99.5	- 149.5	33		F	#	0.5	
Temperature	C	06/04/2013	N001	99.5	- 149.5	18.1		F	#		
Turbidity	NTU	06/04/2013	N001	99.5	- 149.5	1.19		F	#		
Uranium	mg/L	06/04/2013	N001	99.5	- 149.5	0.0079		F	#	0.0000029	
Uranium	mg/L	06/04/2013	N002	99.5	- 149.5	0.0079		F	#	0.0000029	
Vanadium	mg/L	06/04/2013	N001	99.5	- 149.5	0.018		F	#	0.000015	
Vanadium	mg/L	06/04/2013	N002	99.5	- 149.5	0.018		F	#	0.000015	

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

LAB QUALIFIERS:

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

DATA QUALIFIERS:

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

QA QUALIFIER:

- # Validated according to quality assurance guidelines.

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Surface Water Quality Data

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Surface Water Quality Data by Location (USEE102) FOR SITE MON01, Monument Valley Processing Site

REPORT DATE: 8/1/2013

Location: 0623 SURFACE LOCATION

Parameter	Units	Sample		Result	Qualifiers			Detection Limit	Uncertainty
		Date	ID		Lab	Data	QA		
Ammonia Total as N	mg/L	06/05/2013	N001	0.1	U		#	0.1	
Chloride	mg/L	06/05/2013	N001	4.5			#	0.2	
Nitrate + Nitrite as Nitrogen	mg/L	06/05/2013	N001	0.01			#	0.01	
Oxidation Reduction Potential	mV	06/05/2013	N001	98.5			#		
pH	s.u.	06/05/2013	N001	7.21			#		
Specific Conductance	umhos/cm	06/05/2013	N001	577			#		
Sulfate	mg/L	06/05/2013	N001	33			#	0.5	
Temperature	C	06/05/2013	N001	24			#		
Turbidity	NTU	06/05/2013	N001	8.27			#		
Uranium	mg/L	06/05/2013	N001	0.00092			#	0.000029	
Vanadium	mg/L	06/05/2013	N001	0.00062			#	0.000015	

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

LAB QUALIFIERS:

- * Replicate analysis not within control limits.
- > Result above upper detection limit.
- A TIC is a suspected aldol-condensation product.
- B Inorganic: Result is between the IDL and CRDL. Organic: Analyte also found in method blank.
- C Pesticide result confirmed by GC-MS.
- D Analyte determined in diluted sample.
- E Inorganic: Estimate value because of interference, see case narrative. Organic: Analyte exceeded calibration range of the GC-MS.
- H Holding time expired, value suspect.
- I Increased detection limit due to required dilution.
- J Estimated
- N Inorganic or radiochemical: Spike sample recovery not within control limits. Organic: Tentatively identified compound (TIC).
- P > 25% difference in detected pesticide or Aroclor concentrations between 2 columns.

U Analytical result below detection limit.
W Post-digestion spike outside control limits while sample absorbance < 50% of analytical spike absorbance.
.X,Y,Z Laboratory defined qualifier, see case narrative.

DATA QUALIFIERS:

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

QA QUALIFIER:

Validated according to quality assurance guidelines.

Static Water Level Data

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STATIC WATER LEVELS (USEE700) FOR SITE MON01, Monument Valley Processing Site
REPORT DATE: 8/1/2013

Location Code	Flow Code	Top of Casing Elevation (Ft)	Measurement Date	Measurement Time	Depth From Top of Casing (Ft)	Water Elevation (Ft)	Water Level Flag
0402	U	4840.30	06/05/2013	12:40:17	5.03	4835.27	
0602	U	4864.43	06/05/2013	10:20:24	9.88	4854.55	
0603	U	4849.41	06/05/2013	11:25:16	11.40	4838.01	
0604	C	4840.42	06/05/2013	11:45:19	9.51	4830.91	
0605	C	4835.07	06/04/2013	13:50:01	11.19	4823.88	
0606	D	4864.73	06/04/2013	15:10:01	36.75	4827.98	
0618	O	4924.81	06/04/2013	14:30:58	95.32	4829.49	
0619	O	4888.63	06/04/2013	13:25:52	59.63	4829.00	
0648	N	4835.14	06/05/2013	15:15:56	35.18	4799.96	
0650	D	4794.28	06/04/2013	17:25:04	20.71	4773.57	
0651	C	4787.88	06/05/2013	09:40:30	9.02	4778.86	
0652	C	4808.93	06/05/2013	10:15:25	19.07	4789.86	
0653	D	4837.08	06/05/2013	14:45:24	36.99	4800.09	
0655	D	4862.06	06/03/2013	16:50:50	41.18	4820.88	
0656	D	4856.33	06/04/2013	09:20:39	37.73	4818.60	
0657	O	4878.99	06/04/2013	11:30:17	52.23	4826.76	
0662	D	4878.56	06/04/2013	12:00:47	51.63	4826.93	
0669	D	4867.19	06/03/2013	16:05:17	51.38	4815.81	
0711			06/05/2013	11:05:05	11.66		
0715			06/05/2013	10:35:14	11.20		
0719			06/05/2013	09:35:38	21.81		
0727			06/05/2013	10:00:56	14.92		
0733		4875.16	06/04/2013	10:15:13	51.00	4824.16	
0734		4877.97	06/04/2013	10:55:32	52.93	4825.04	
0735		4881.85	06/04/2013	09:35:44	53.00	4828.85	
0738		4810.86	06/04/2013	16:10:25	16.84	4794.02	
0739		4823.58	06/05/2013	13:20:56	23.25	4800.33	
0740		4810.28	06/04/2013	16:50:34	28.00	4782.28	

STATIC WATER LEVELS (USEE700) FOR SITE MON01, Monument Valley Processing Site
REPORT DATE: 8/1/2013

Location Code	Flow Code	Top of Casing Elevation (Ft)	Measurement Date	Measurement Time	Depth From Top of Casing (Ft)	Water Elevation (Ft)	Water Level Flag
0741		4846.98	06/05/2013	13:25:37	37.11	4809.87	
0742		4847.02	06/05/2013	15:05:58	37.28	4809.74	
0743		4846.92	06/05/2013	13:55:03	36.68	4810.24	
0744		4847.19	06/05/2013	14:45:14	37.11	4810.08	
0760	D	4814.80	06/04/2013	11:55:45	26.33	4788.47	
0761	D	4835.02	06/04/2013	16:20:20	44.70	4790.32	
0762	D	4820.74	06/04/2013	15:20:19	33.35	4787.39	
0764	D	4851.53	06/05/2013	11:25:34	51.32	4800.21	
0765	D	4848.45	06/05/2013	14:20:00	36.85	4811.60	
0766	D	4847.97	06/05/2013	15:30:18	37.38	4810.59	
0767	D	4808.25	06/04/2013	16:50:09	7.33	4800.92	
0768	D	4820.73	06/04/2013	14:35:24	14.88	4805.85	
0770	D	4857.26	06/03/2013	17:00:40	34.13	4823.13	
0771	D	4863.26	06/03/2013	17:05:18	43.18	4820.08	
0772	O	4847.60	06/05/2013	09:00:51	12.21	4835.39	
0774	O	4880.14	06/04/2013	13:50:20	51.38	4828.76	
0775	D	4879.68	06/04/2013	15:45:32	51.88	4827.80	
0776	O	4883.33	06/04/2013	09:10:38	55.39	4827.94	

FLOW CODES: B BACKGROUND C CROSS GRADIENT D DOWN GRADIENT F OFF SITE
 N UNKNOWN O ON SITE U UPGRADIENT

WATER LEVEL FLAGS: D Dry F Flowing B Below top of pump

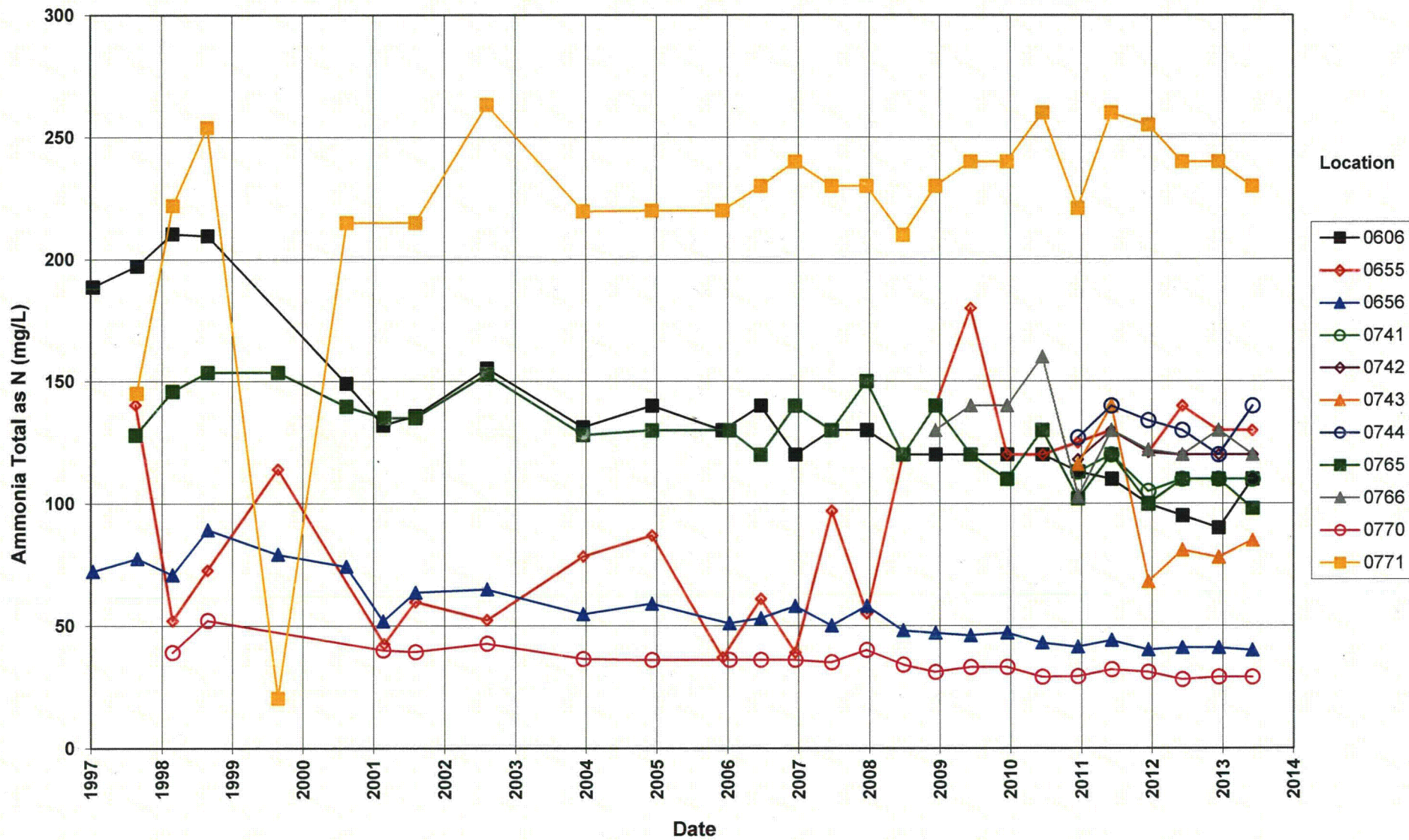
RESEARCH REPORT ON THE EFFECTS OF ...

...
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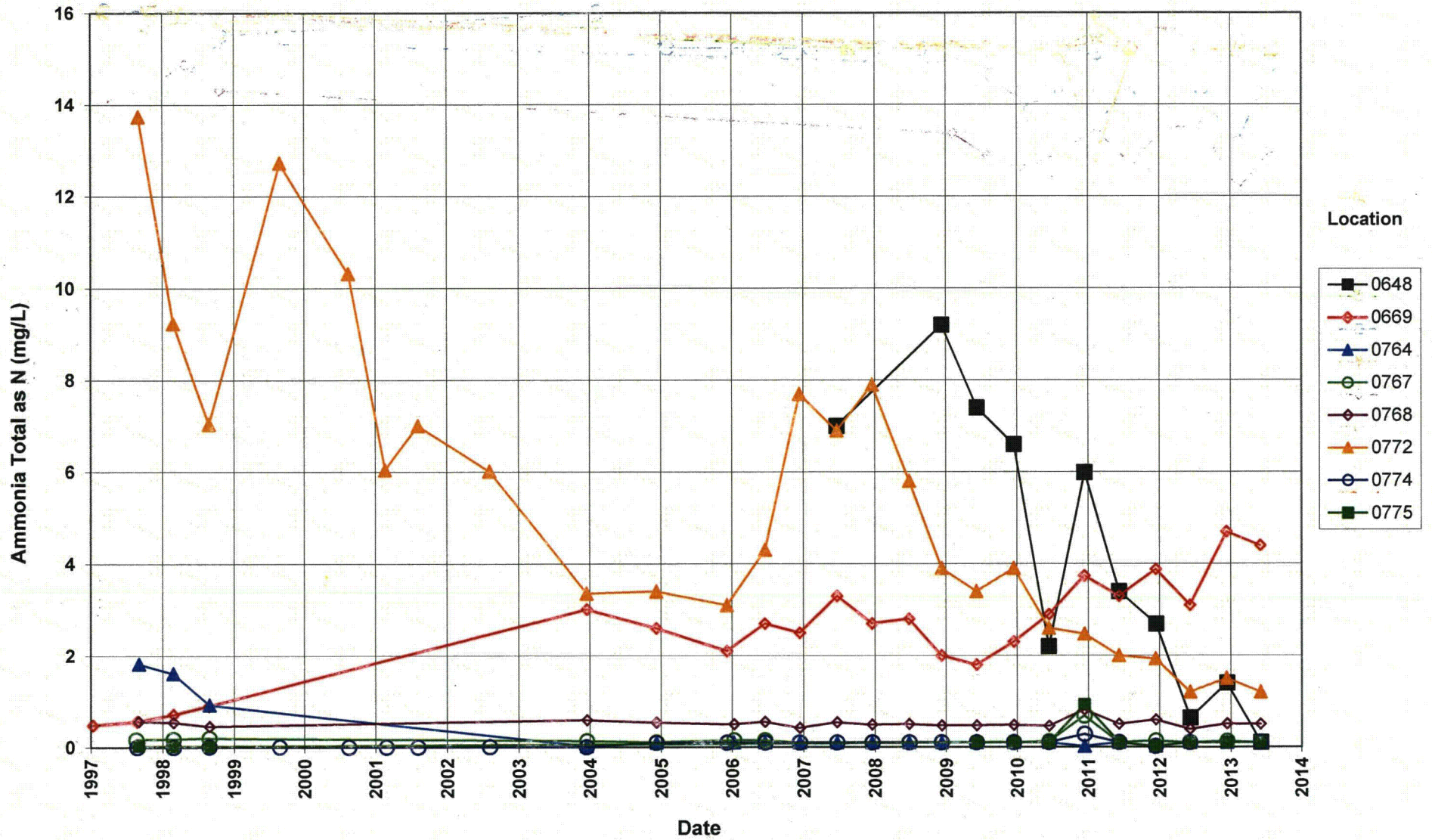
Time-Concentration Graphs

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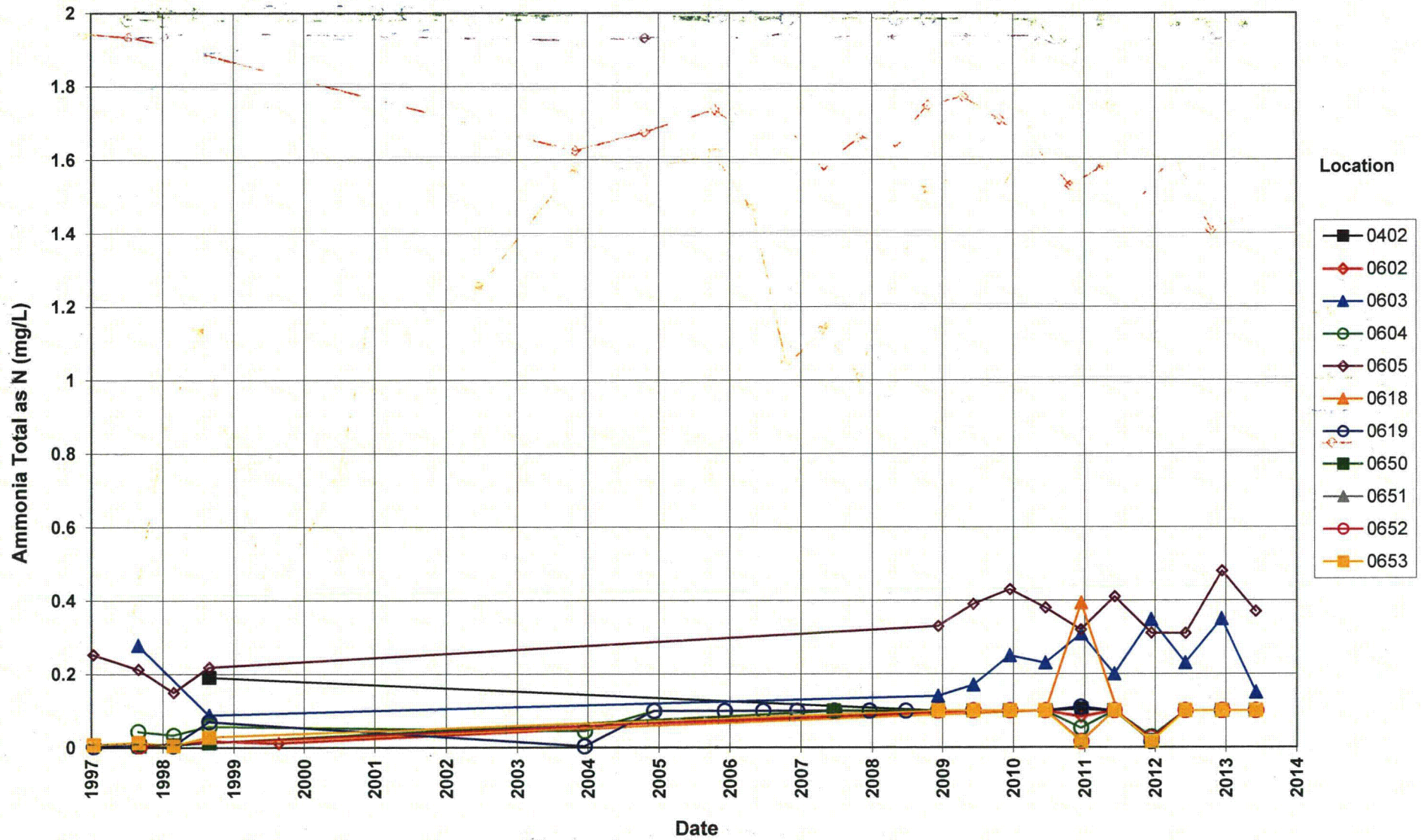
Monument Valley Processing Site Ammonia Total as N Concentration



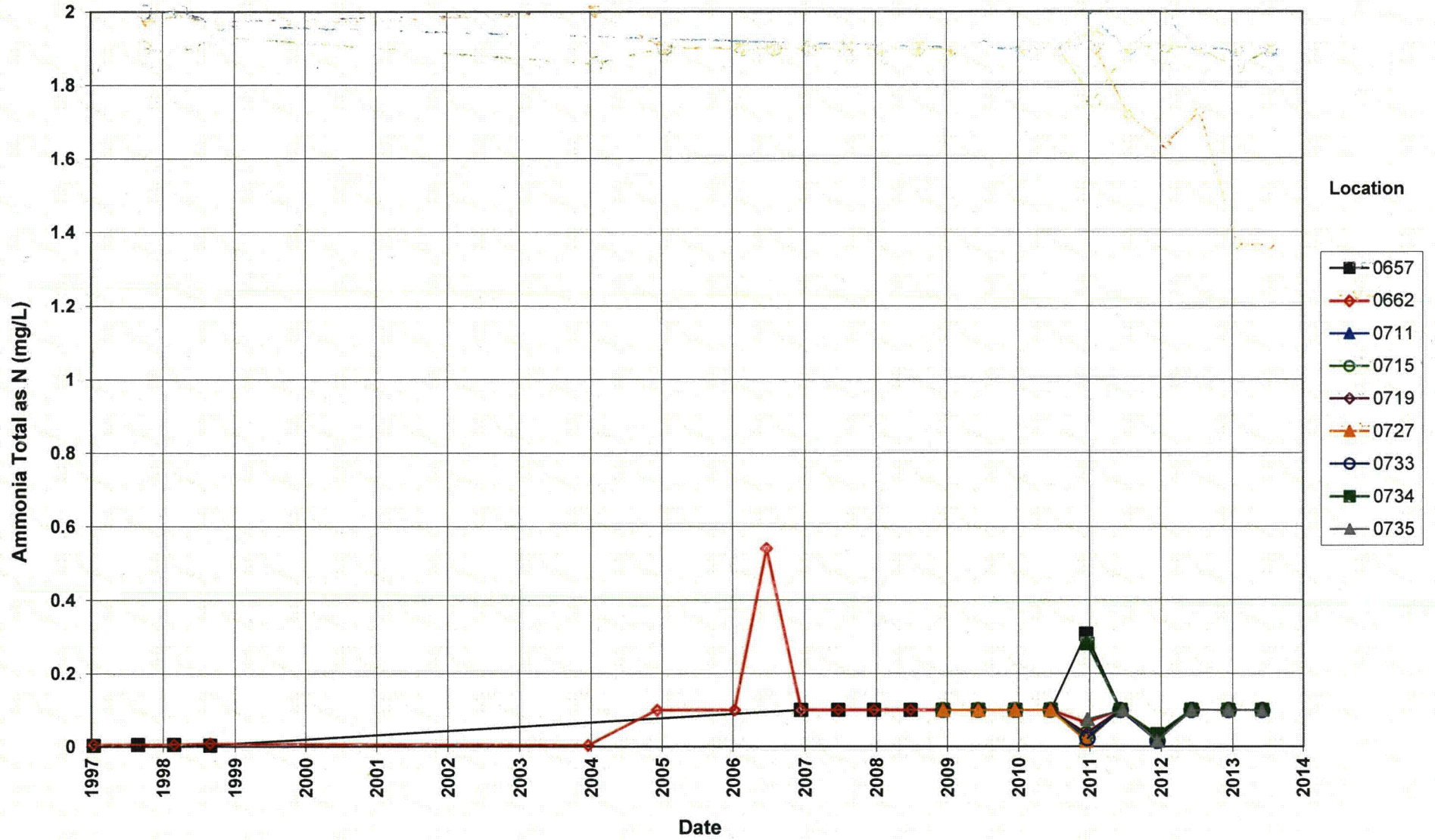
Monument Valley Processing Site Ammonia Total as N Concentration



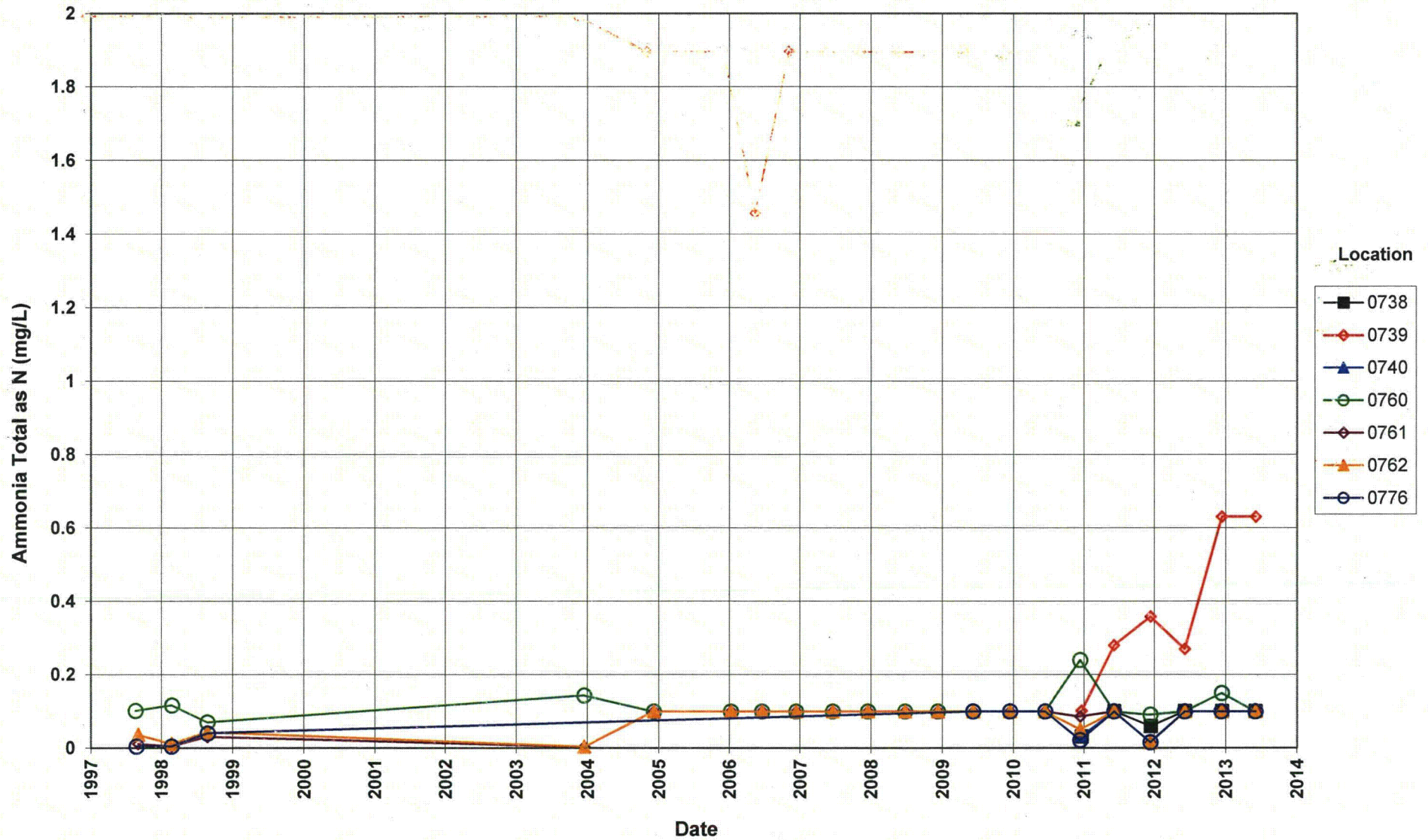
Monument Valley Processing Site Ammonia Total as N Concentration



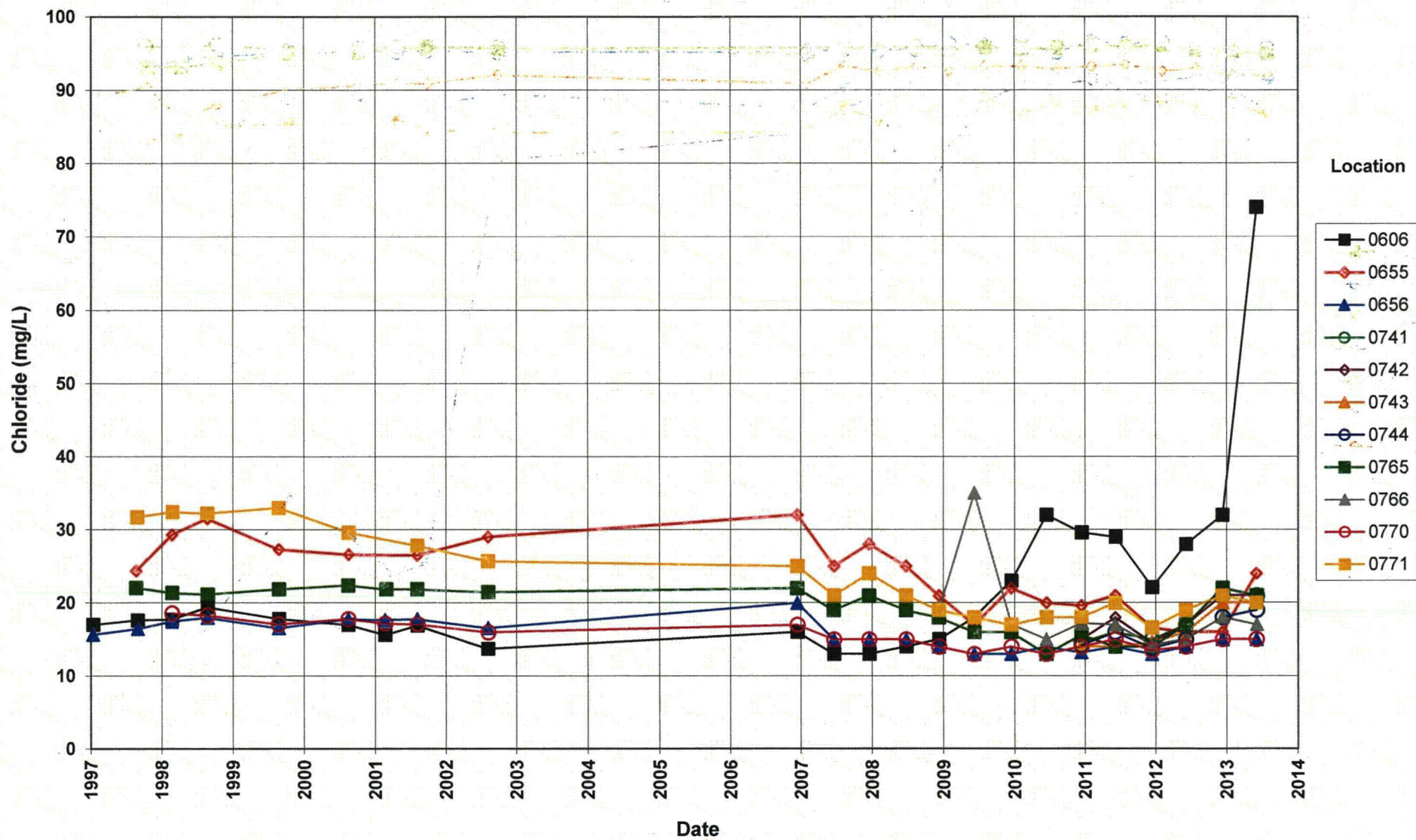
Monument Valley Processing Site Ammonia Total as N Concentration



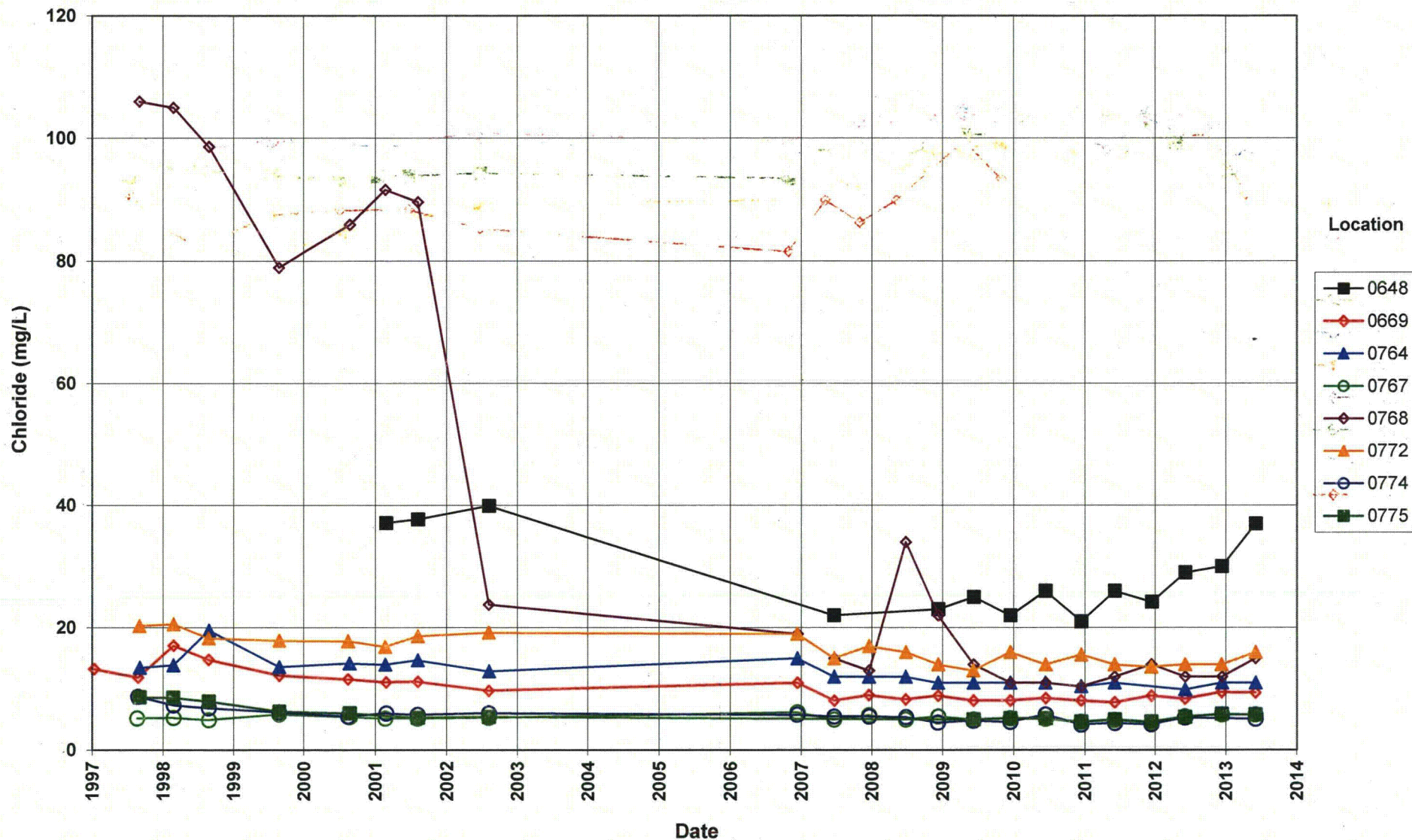
Monument Valley Processing Site Ammonia Total as N Concentration



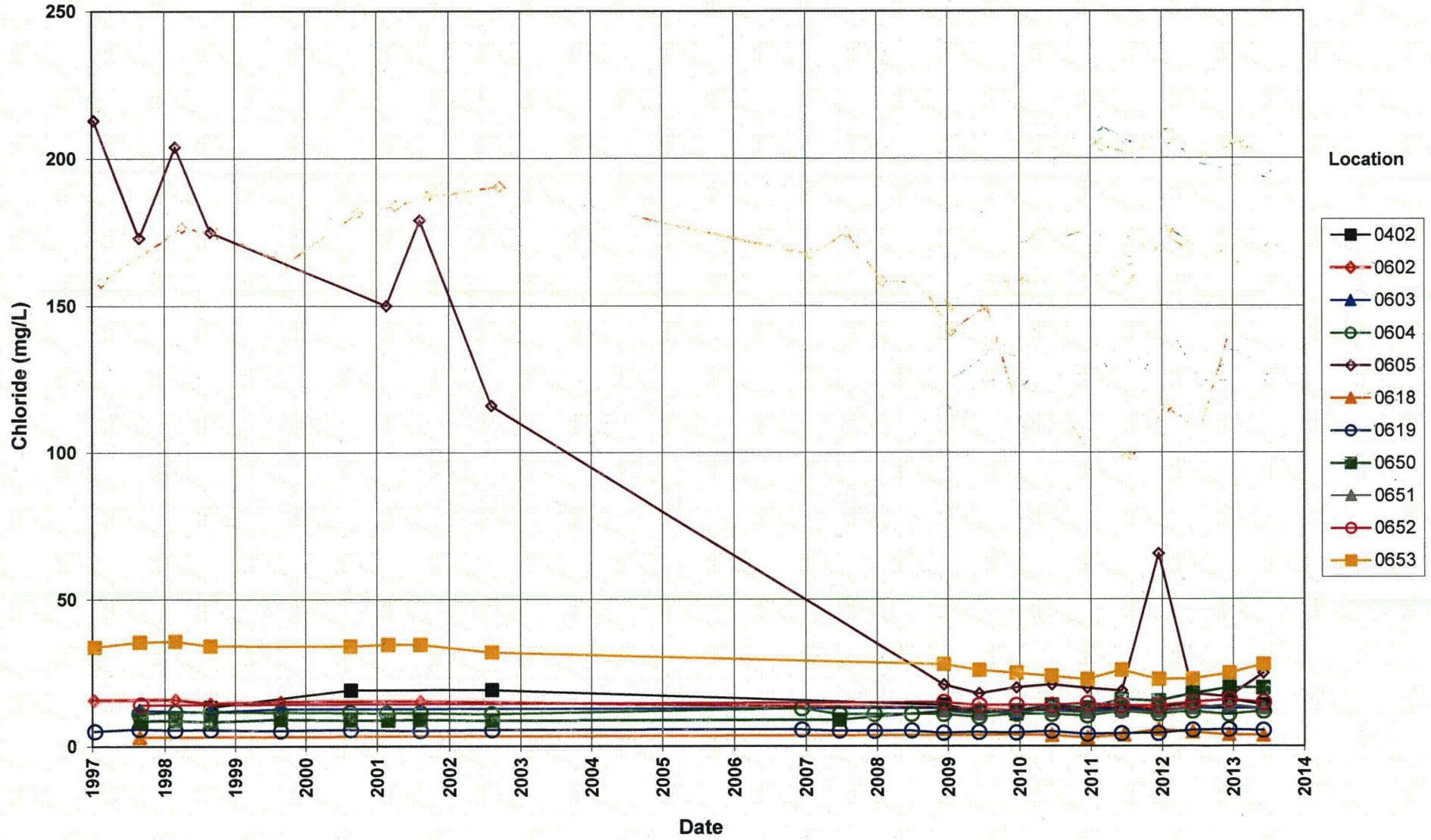
Monument Valley Processing Site Chloride Concentration



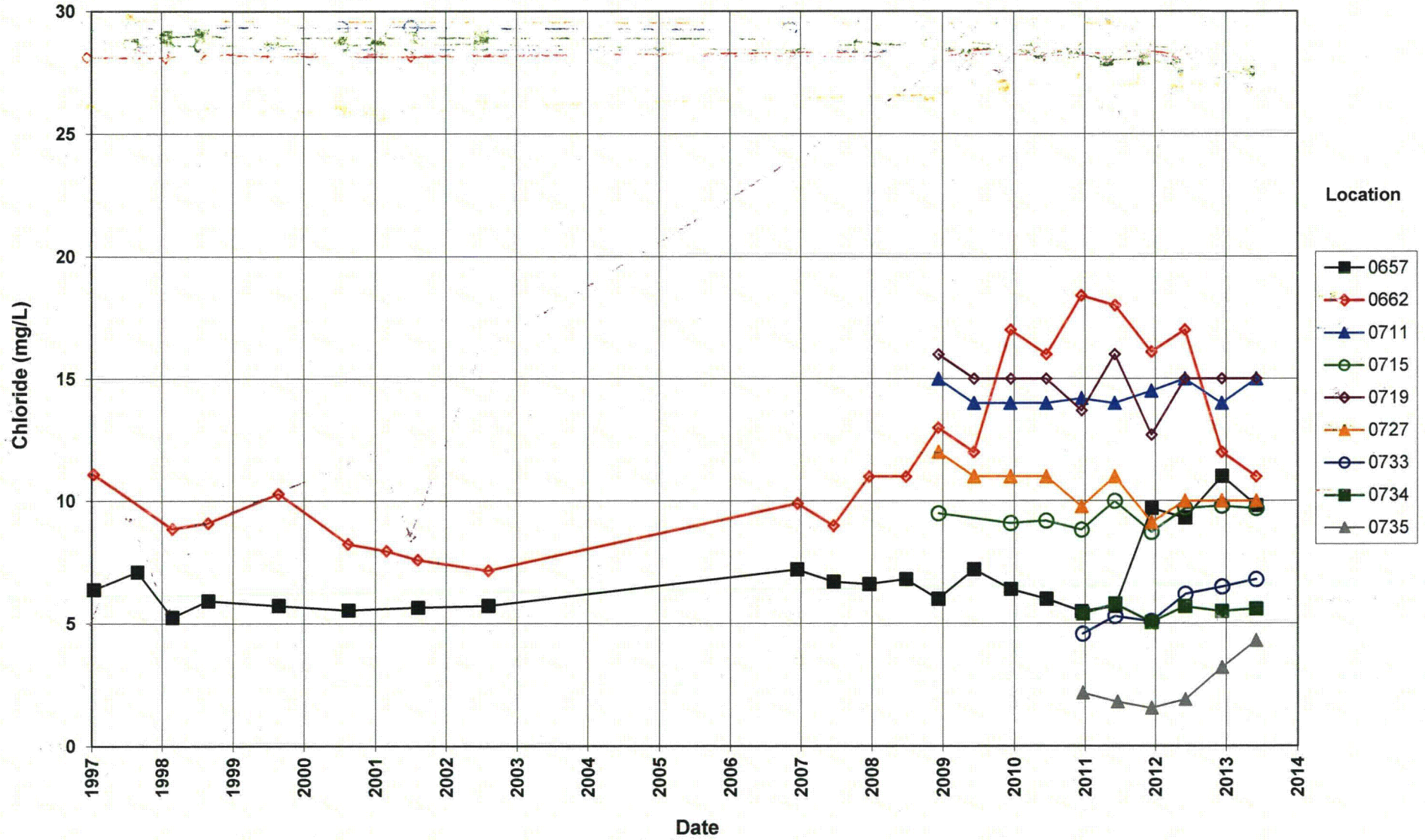
Monument Valley Processing Site Chloride Concentration



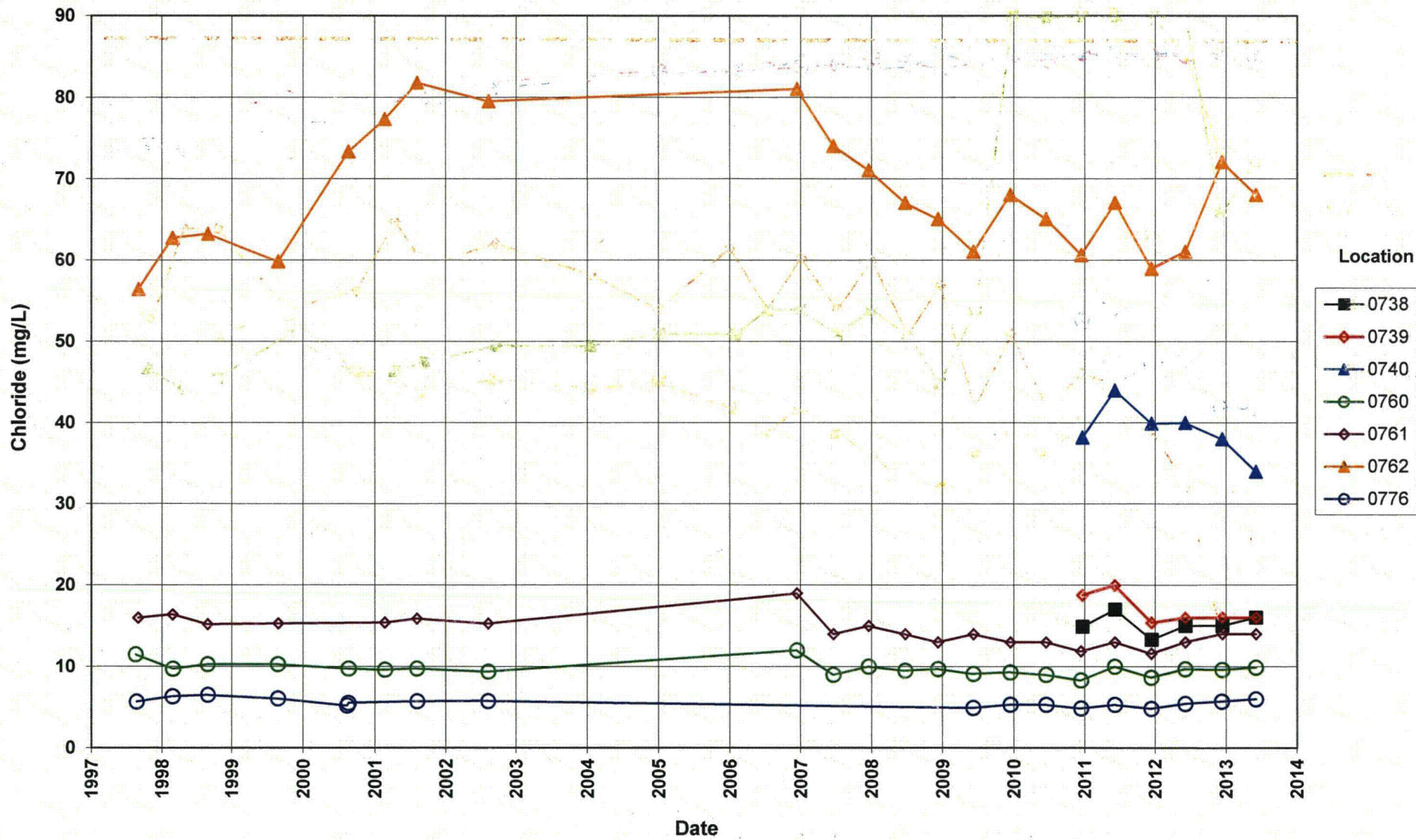
Monument Valley Processing Site Chloride Concentration



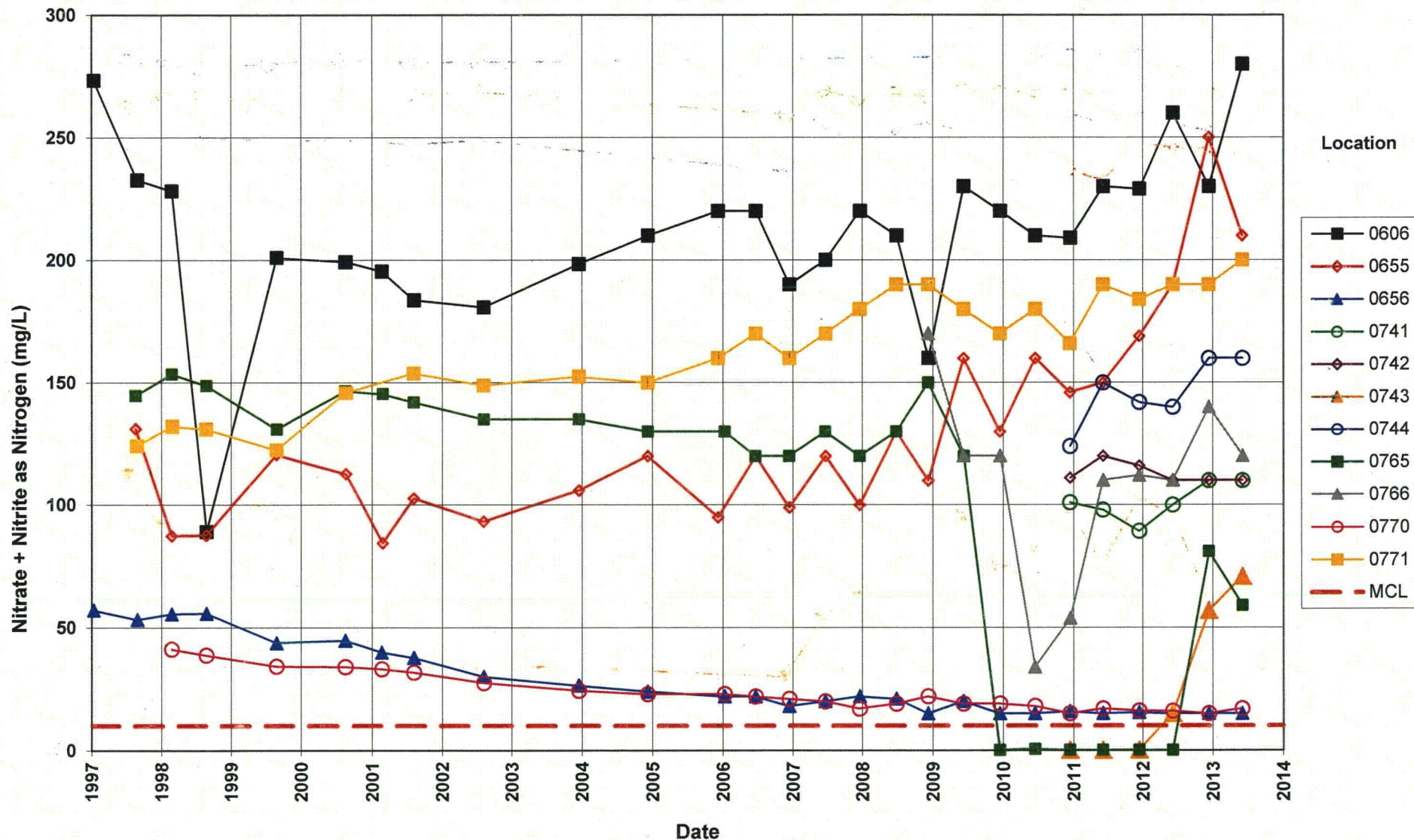
Monument Valley Processing Site Chloride Concentration



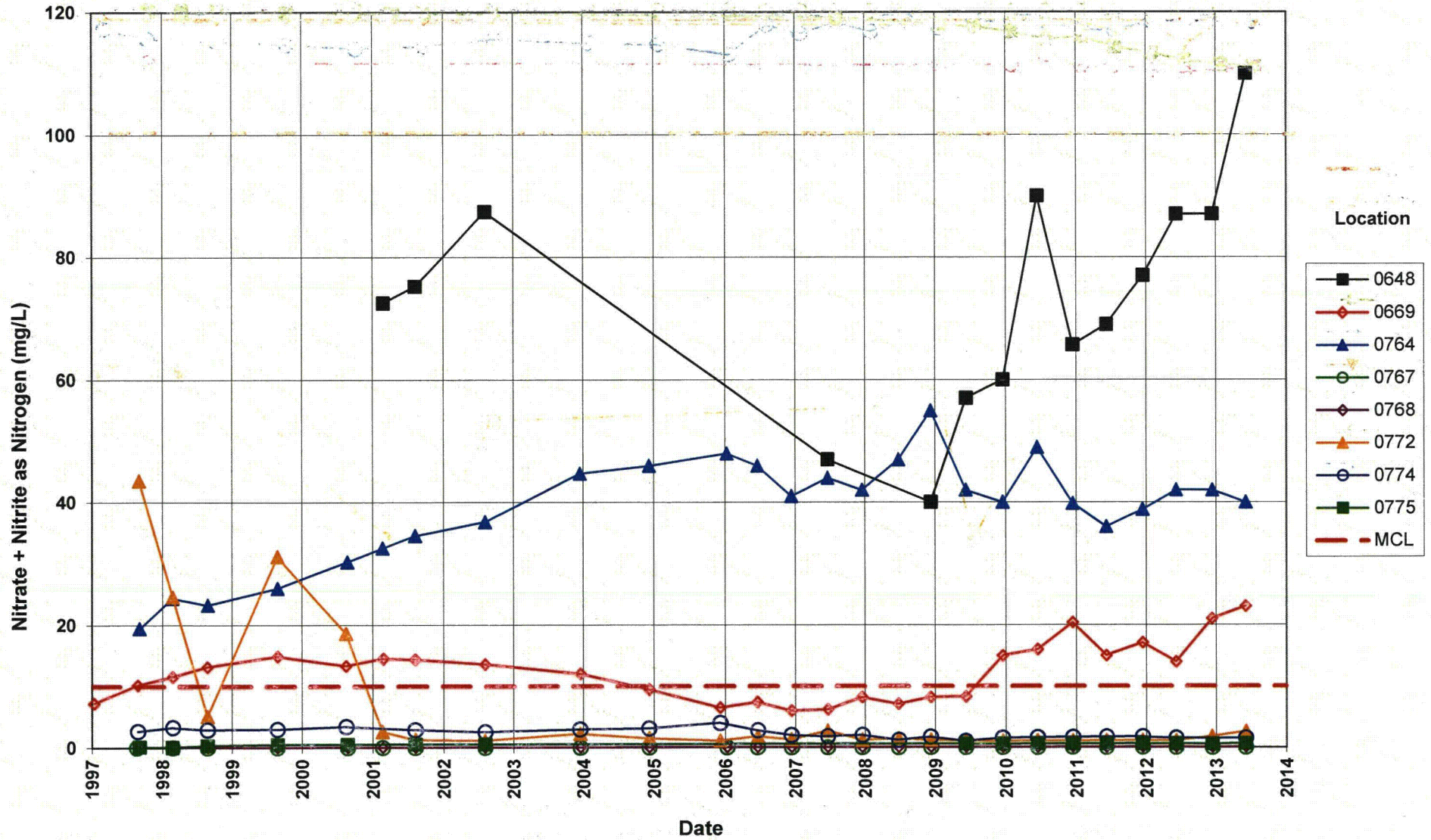
Monument Valley Processing Site Chloride Concentration



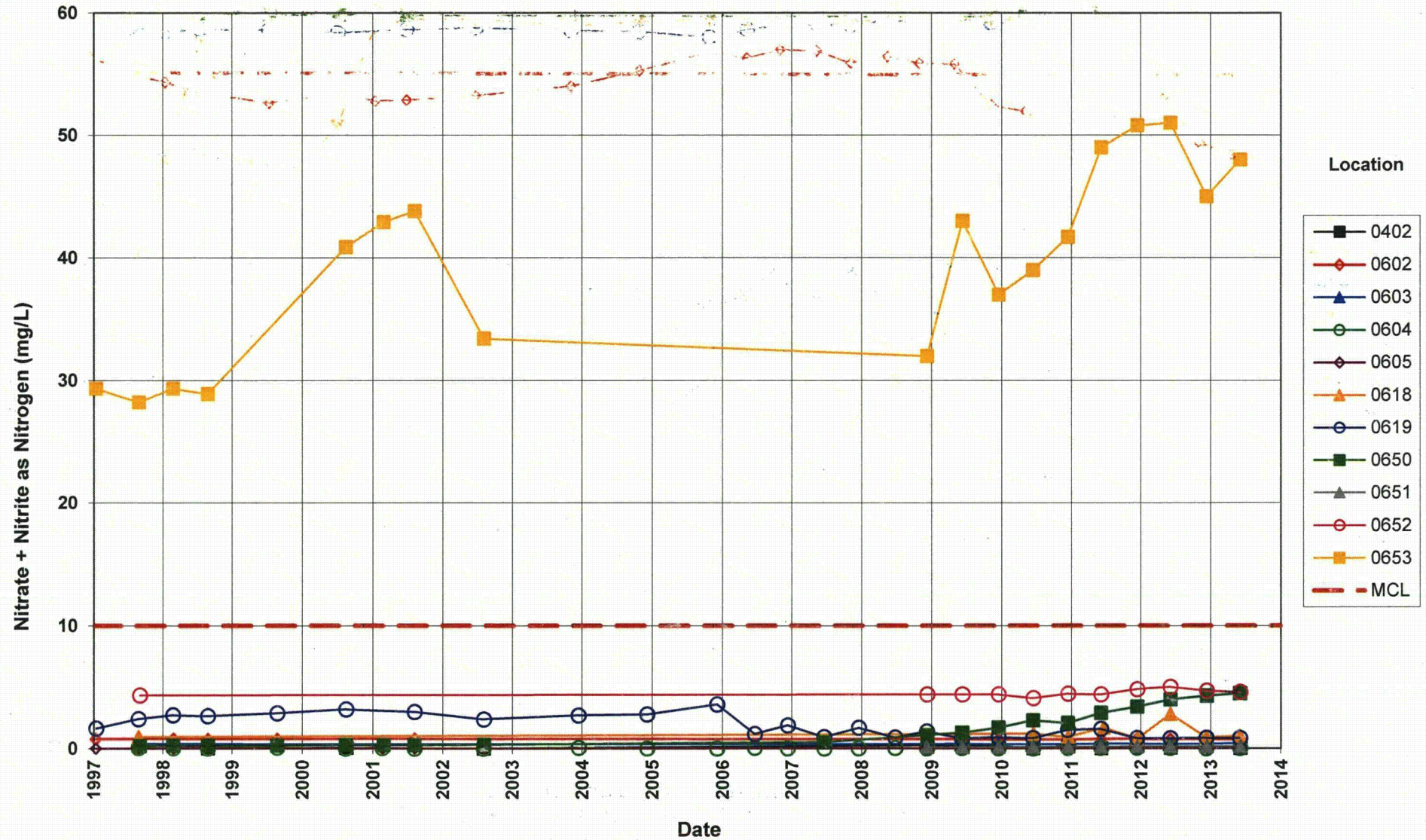
Monument Valley Processing Site
Nitrate + Nitrite as Nitrogen Concentration
 Maximum Concentration Limit (MCL) = 10 mg/L



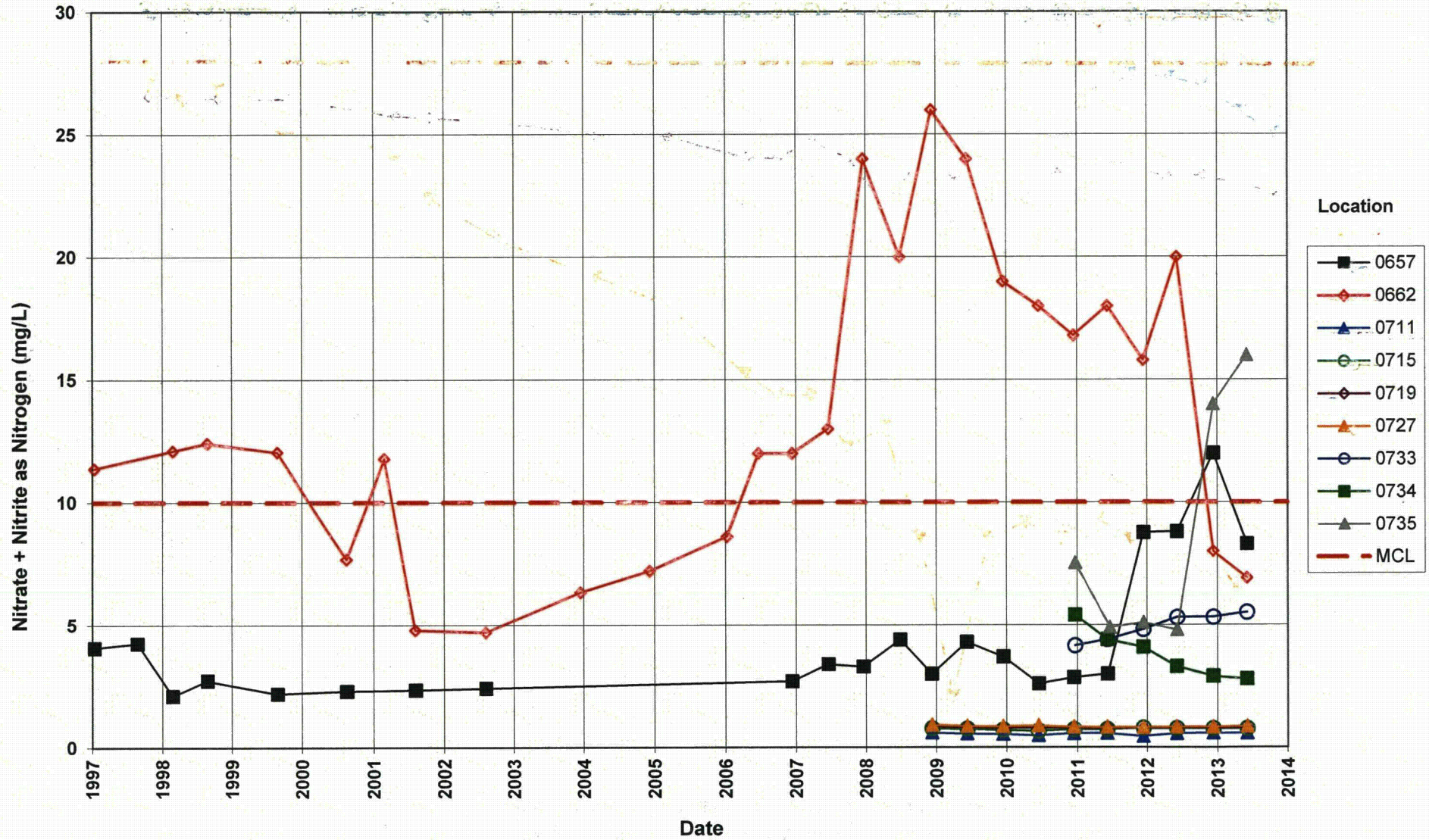
Monument Valley Processing Site
Nitrate + Nitrite as Nitrogen Concentration
 Maximum Concentration Limit (MCL) = 10 mg/L



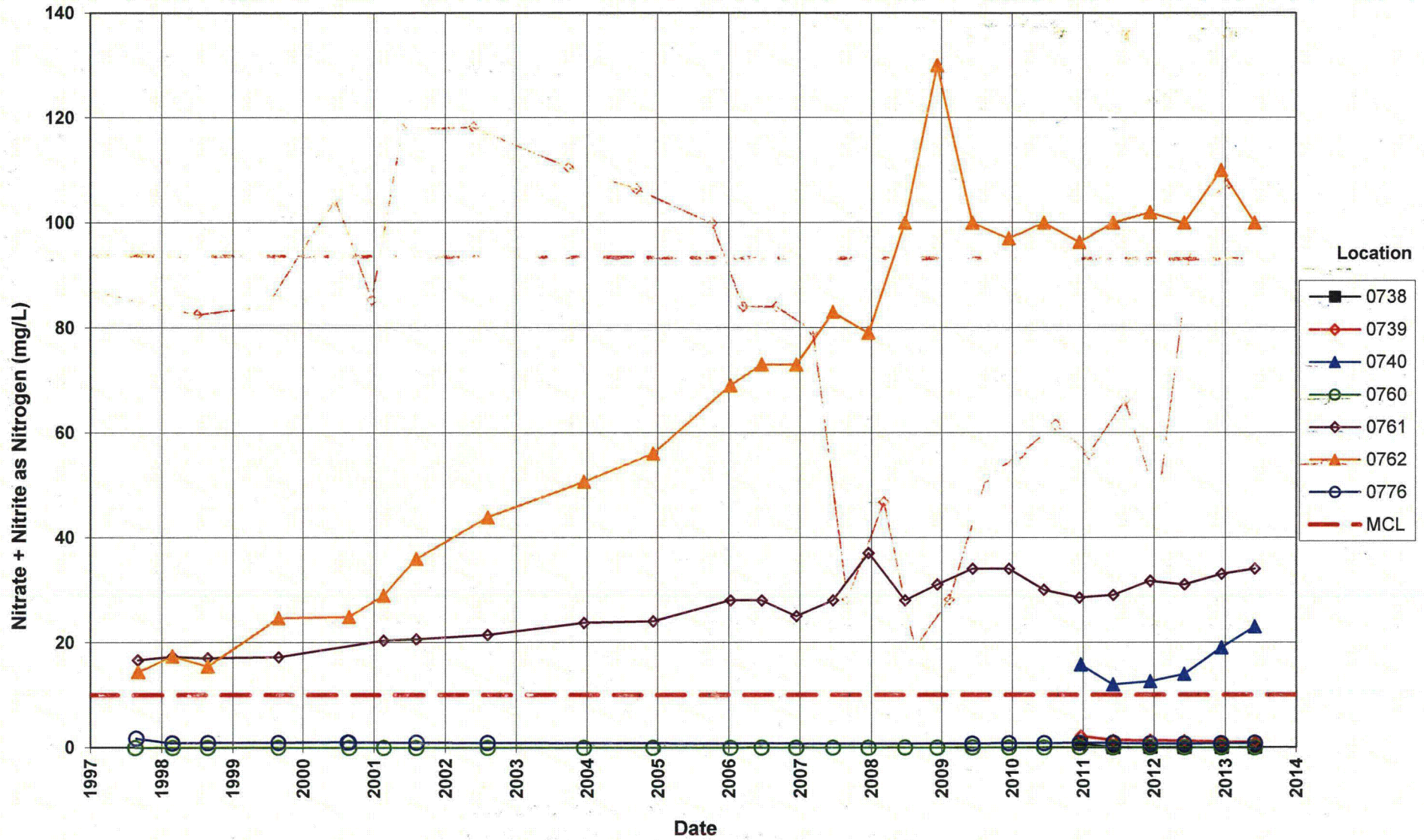
Monument Valley Processing Site
Nitrate + Nitrite as Nitrogen Concentration
 Maximum Concentration Limit (MCL) = 10 mg/L



Monument Valley Processing Site
Nitrate + Nitrite as Nitrogen Concentration
 Maximum Concentration Limit (MCL) = 10 mg/L

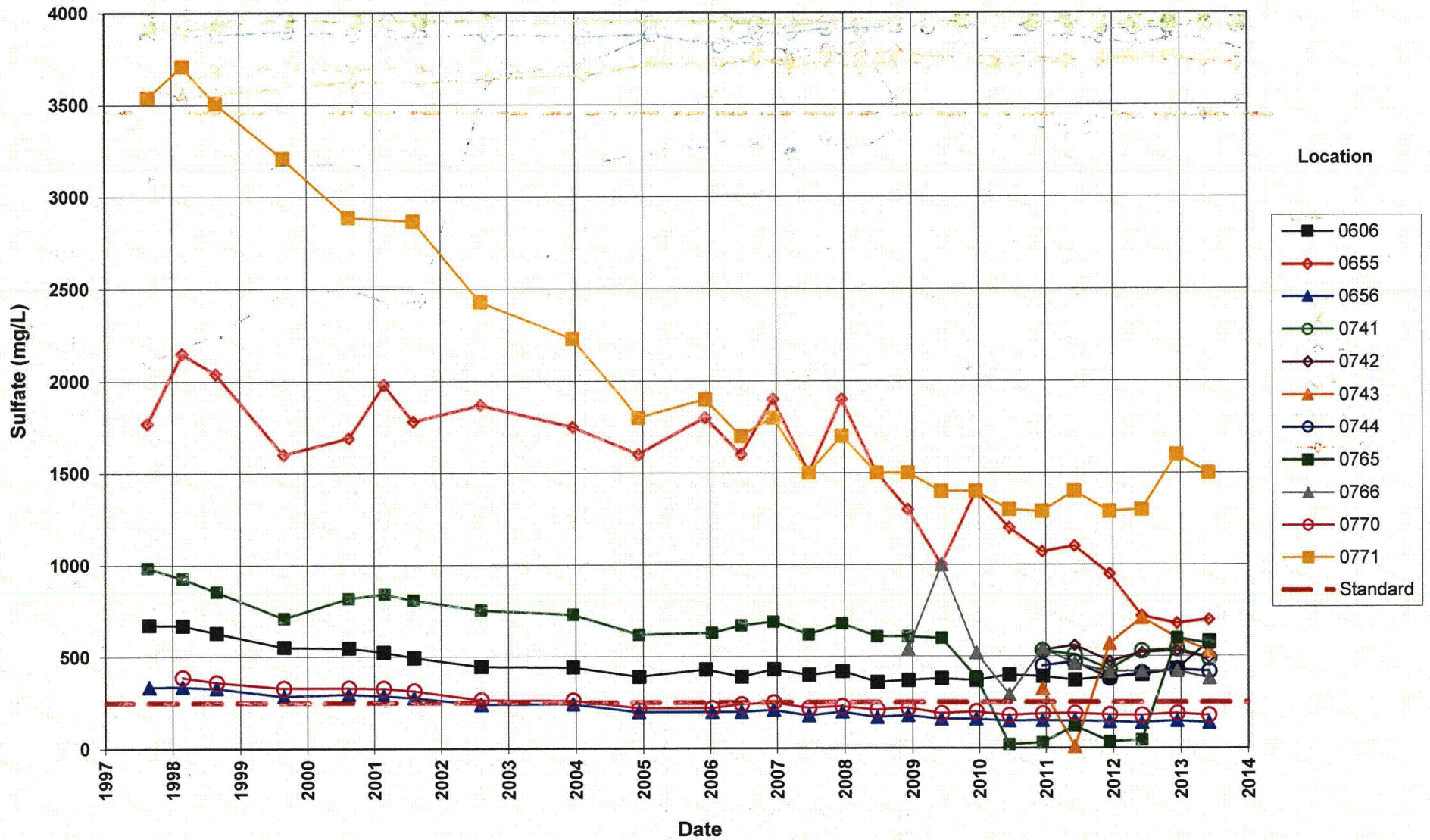


Monument Valley Processing Site
Nitrate + Nitrite as Nitrogen Concentration
 Maximum Concentration Limit (MCL) = 10 mg/L

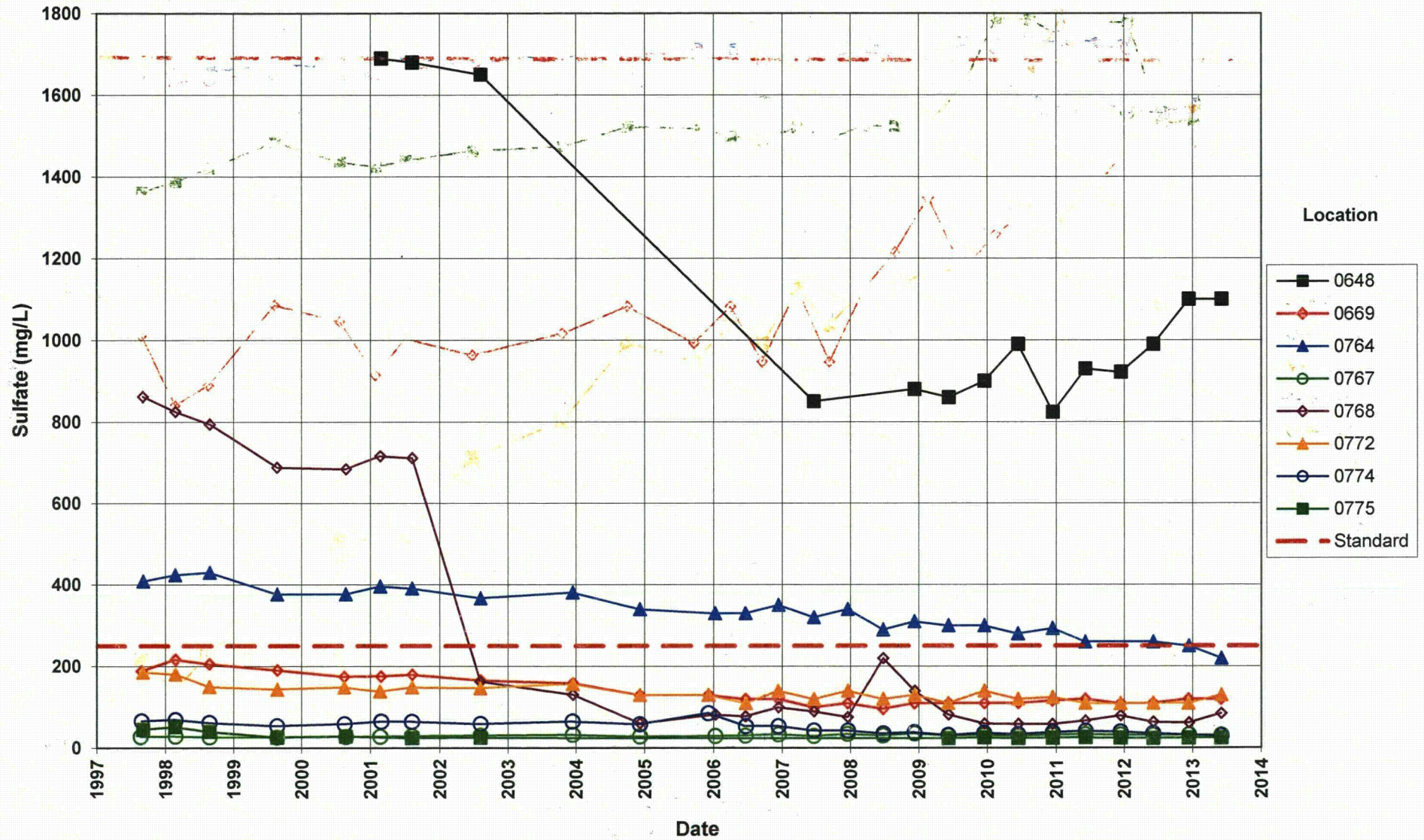


Monument Valley Processing Site Sulfate Concentration

Proposed Cleanup Standard = 250 mg/L

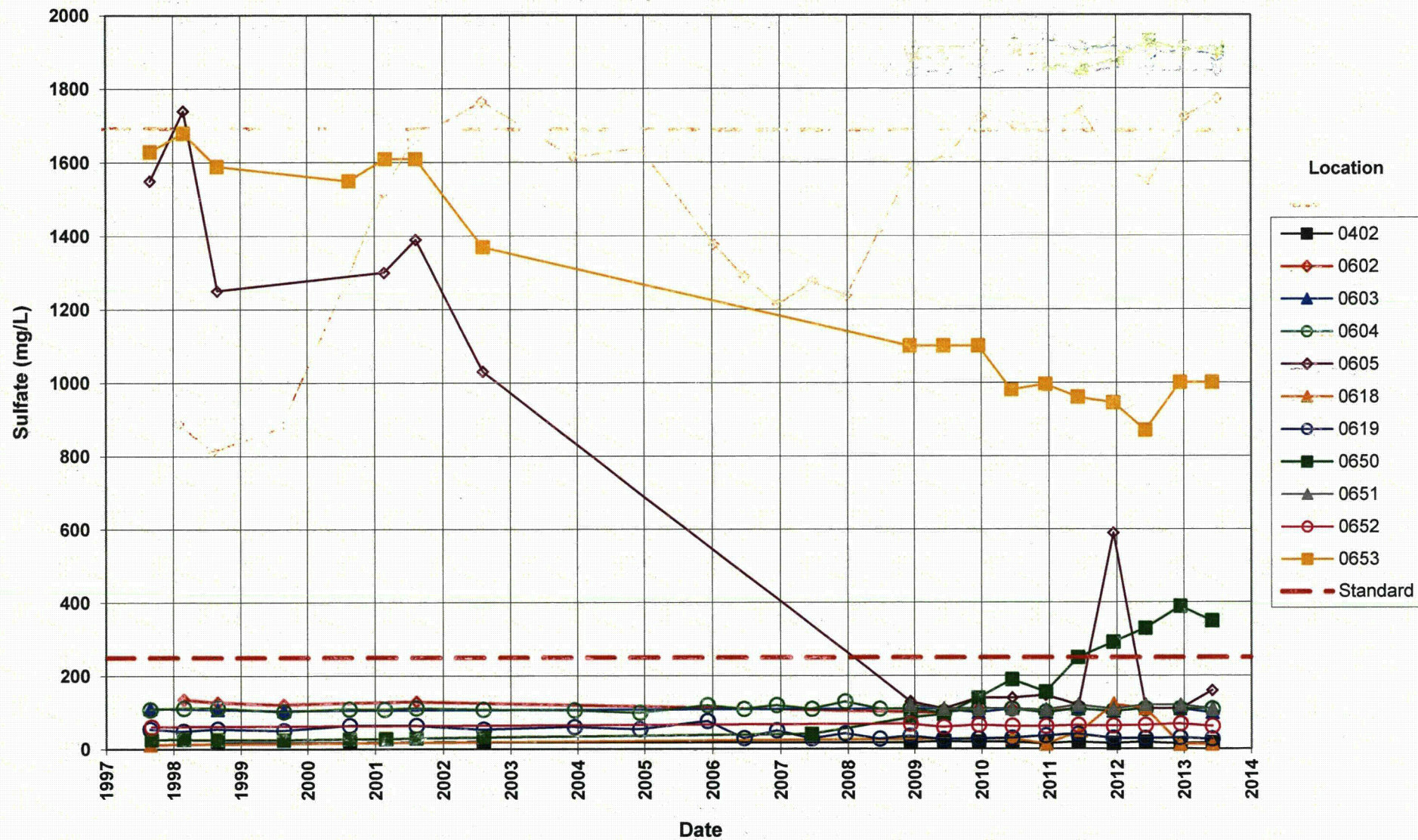


**Monument Valley Processing Site
Sulfate Concentration**
Proposed Cleanup Standard = 250 mg/L

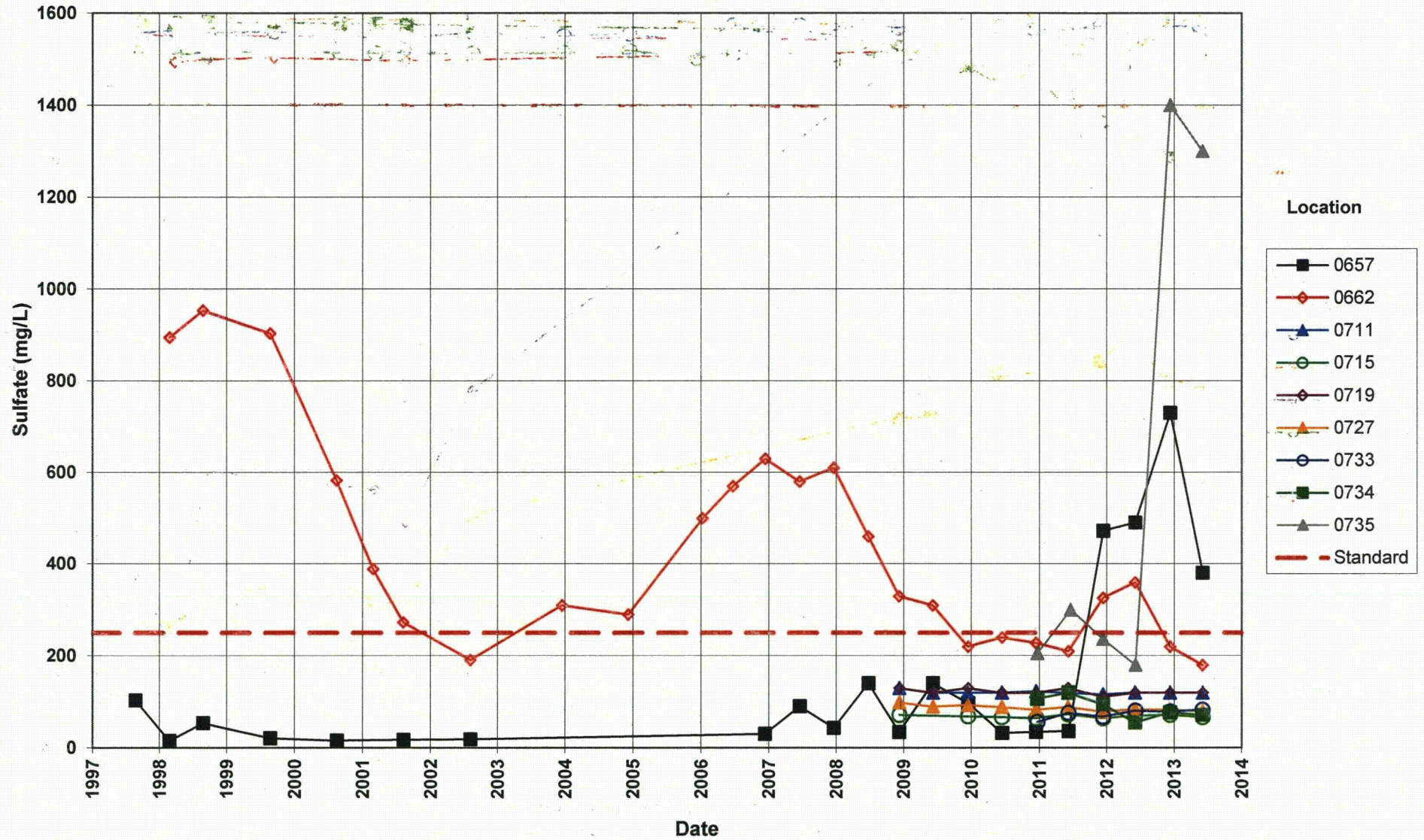


Monument Valley Processing Site Sulfate Concentration

Proposed Cleanup Standard = 250 mg/L

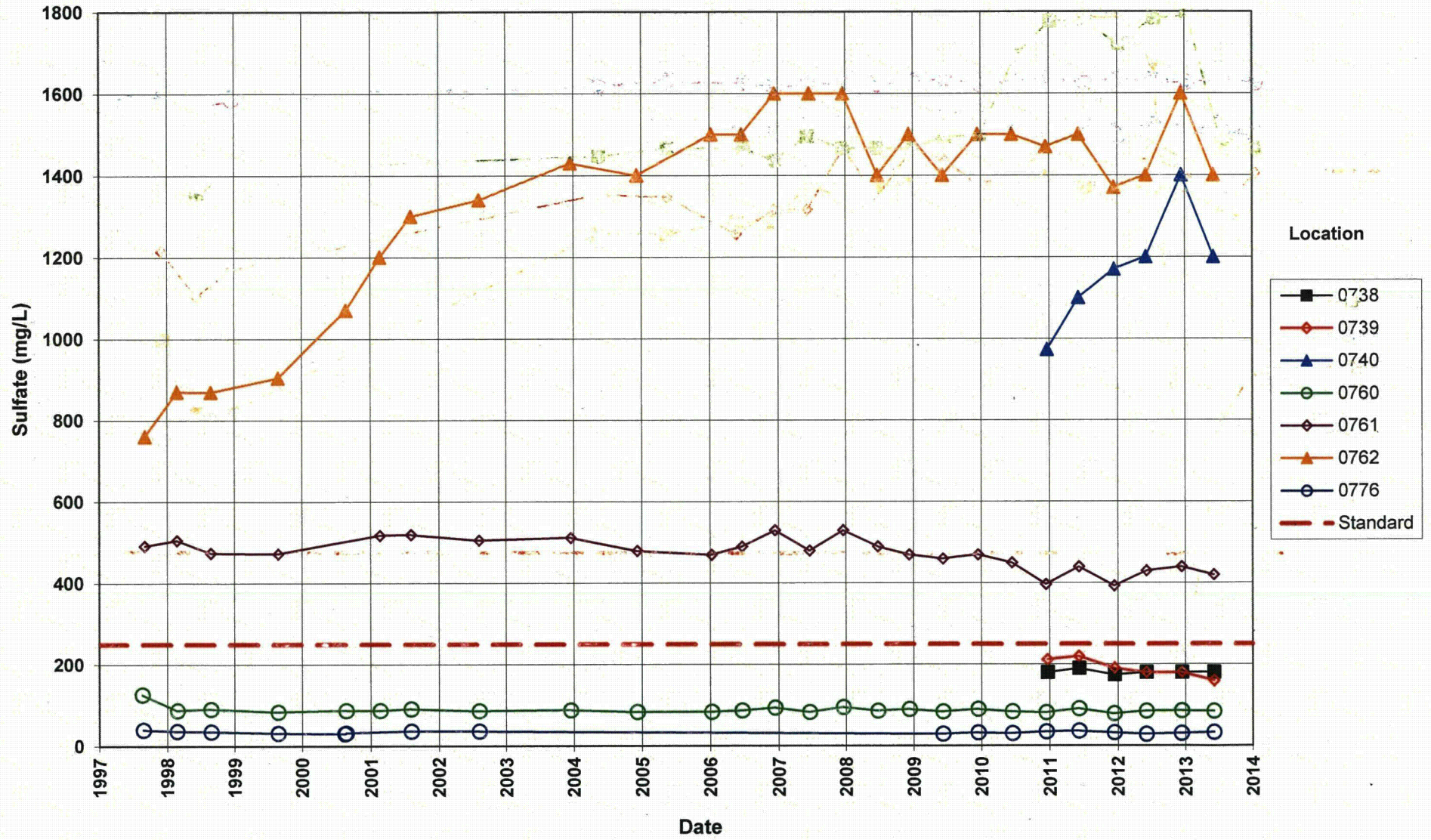


Monument Valley Processing Site
Sulfate Concentration
 Proposed Cleanup Standard = 250 mg/L

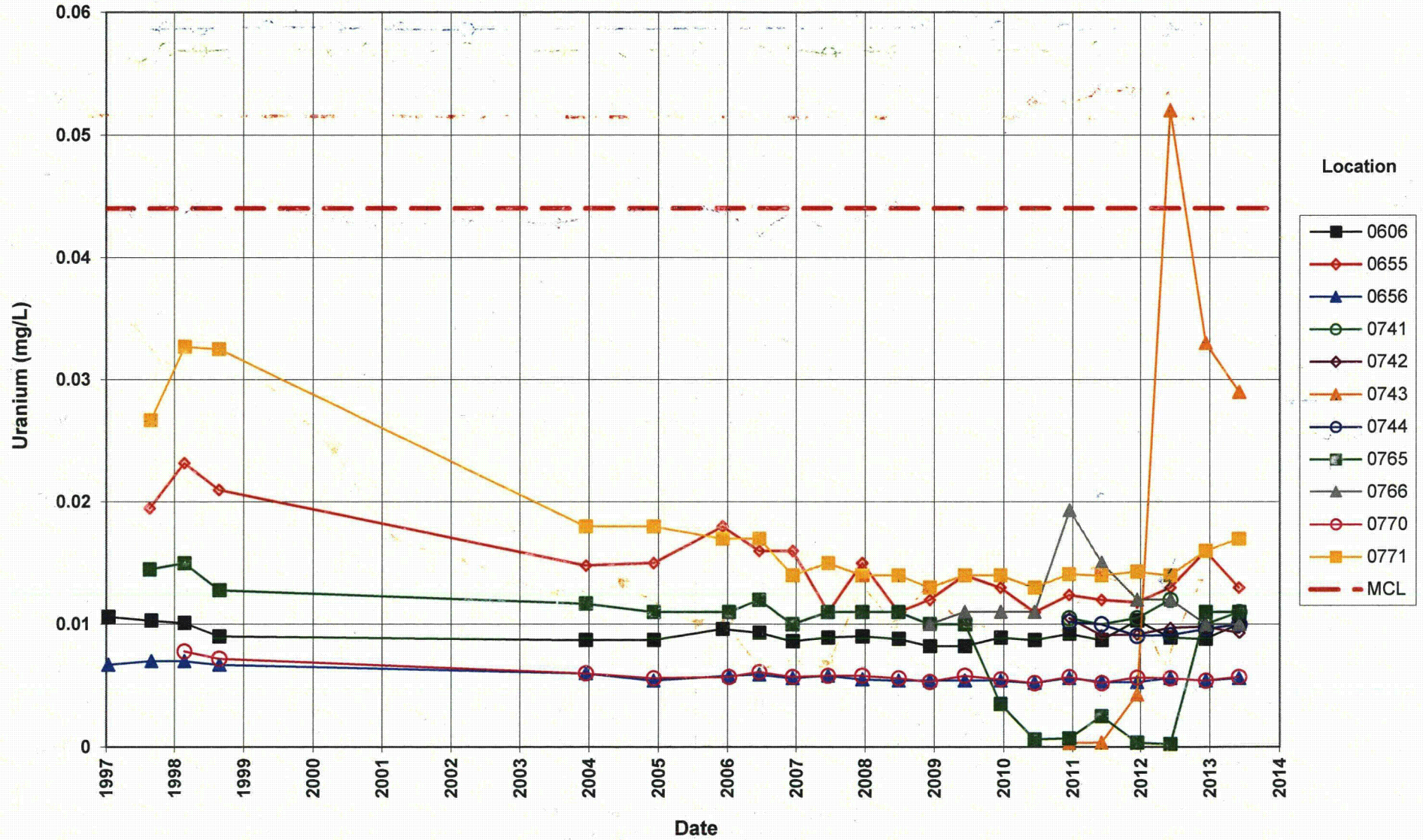


Monument Valley Processing Site Sulfate Concentration

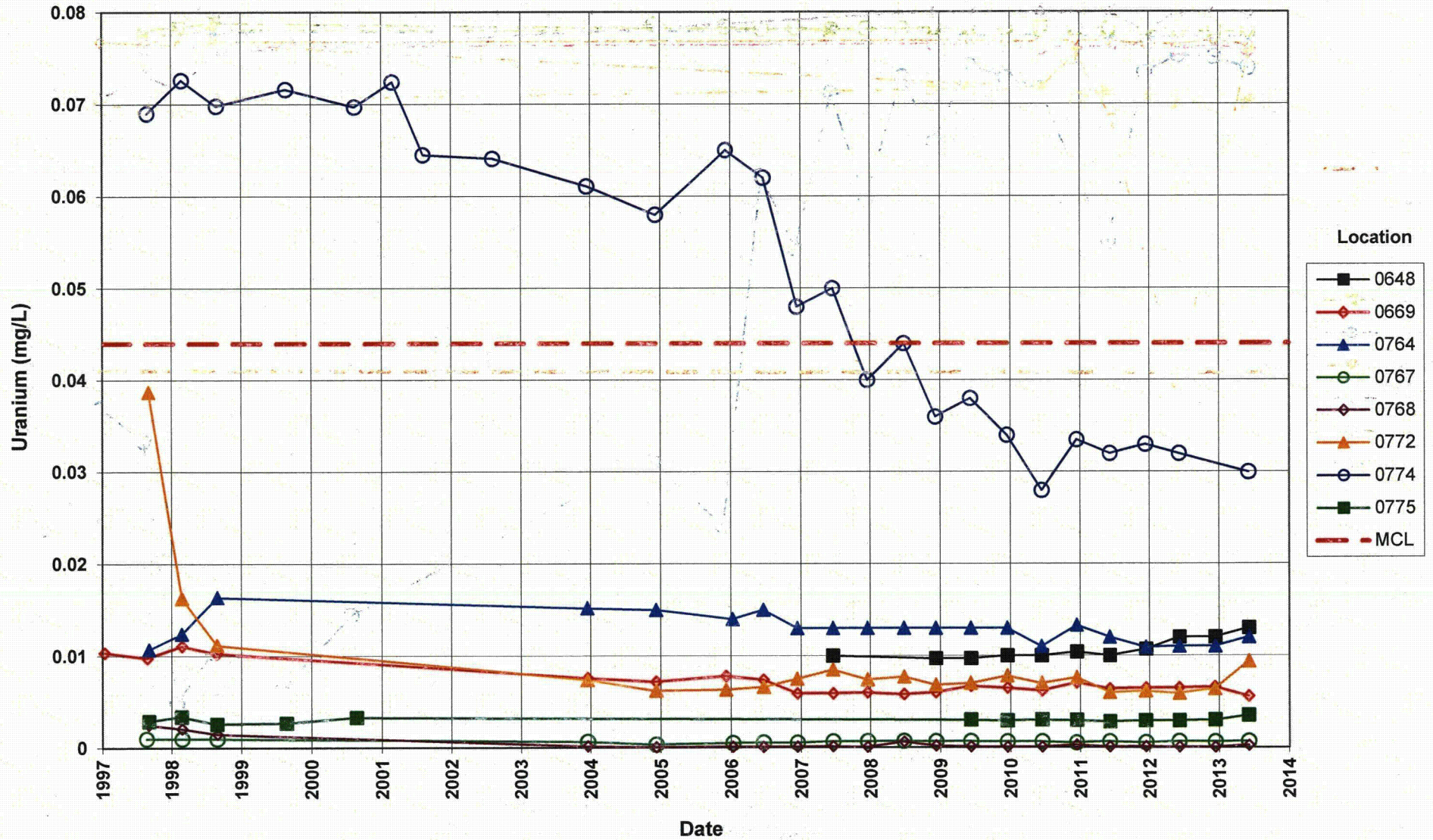
Proposed Cleanup Standard = 250 mg/L



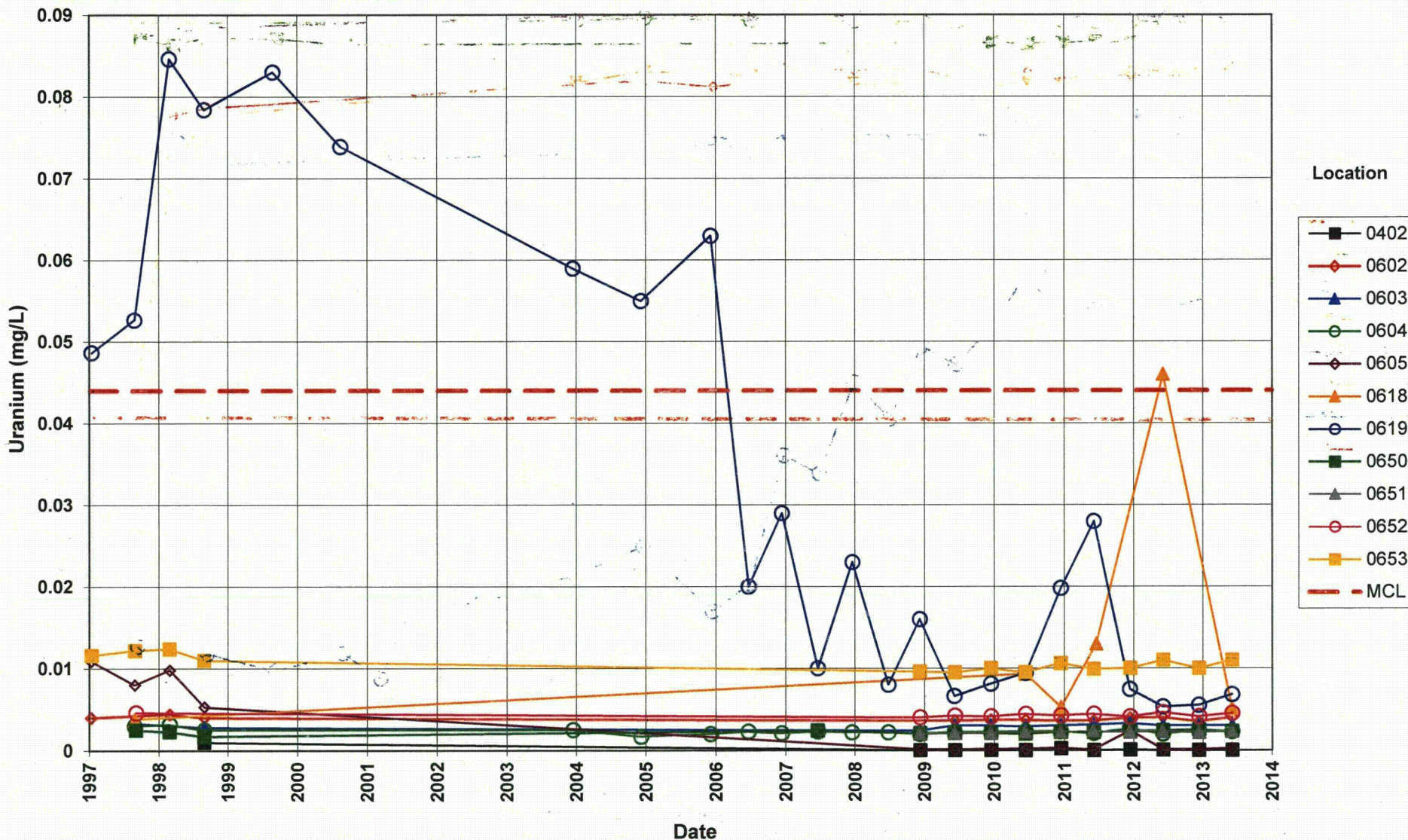
Monument Valley Processing Site
Uranium Concentration
Maximum Concentration Limit (MCL) = 0.044 mg/L



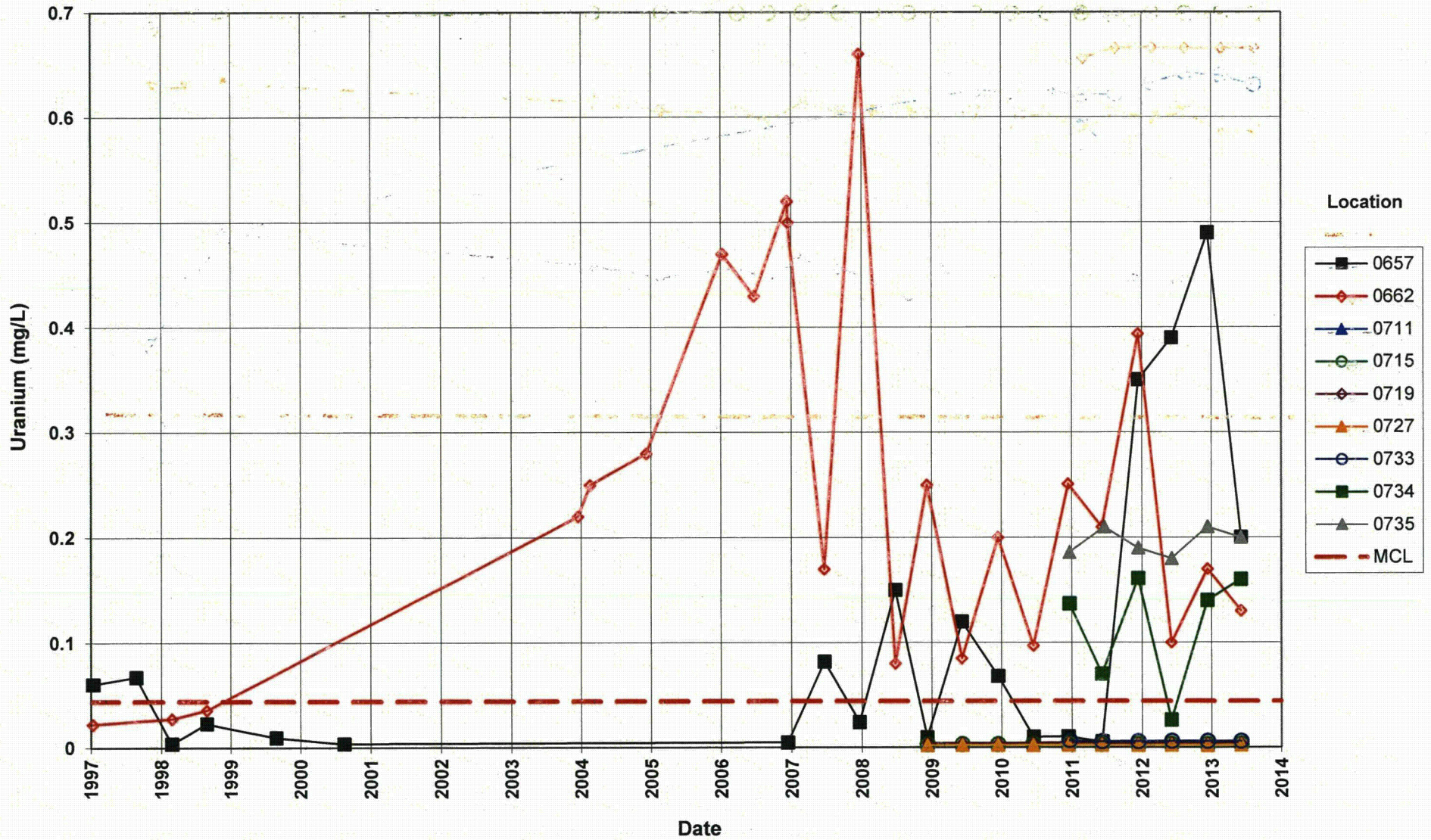
**Monument Valley Processing Site
Uranium Concentration**
Maximum Concentration Limit (MCL) = 0.044 mg/L



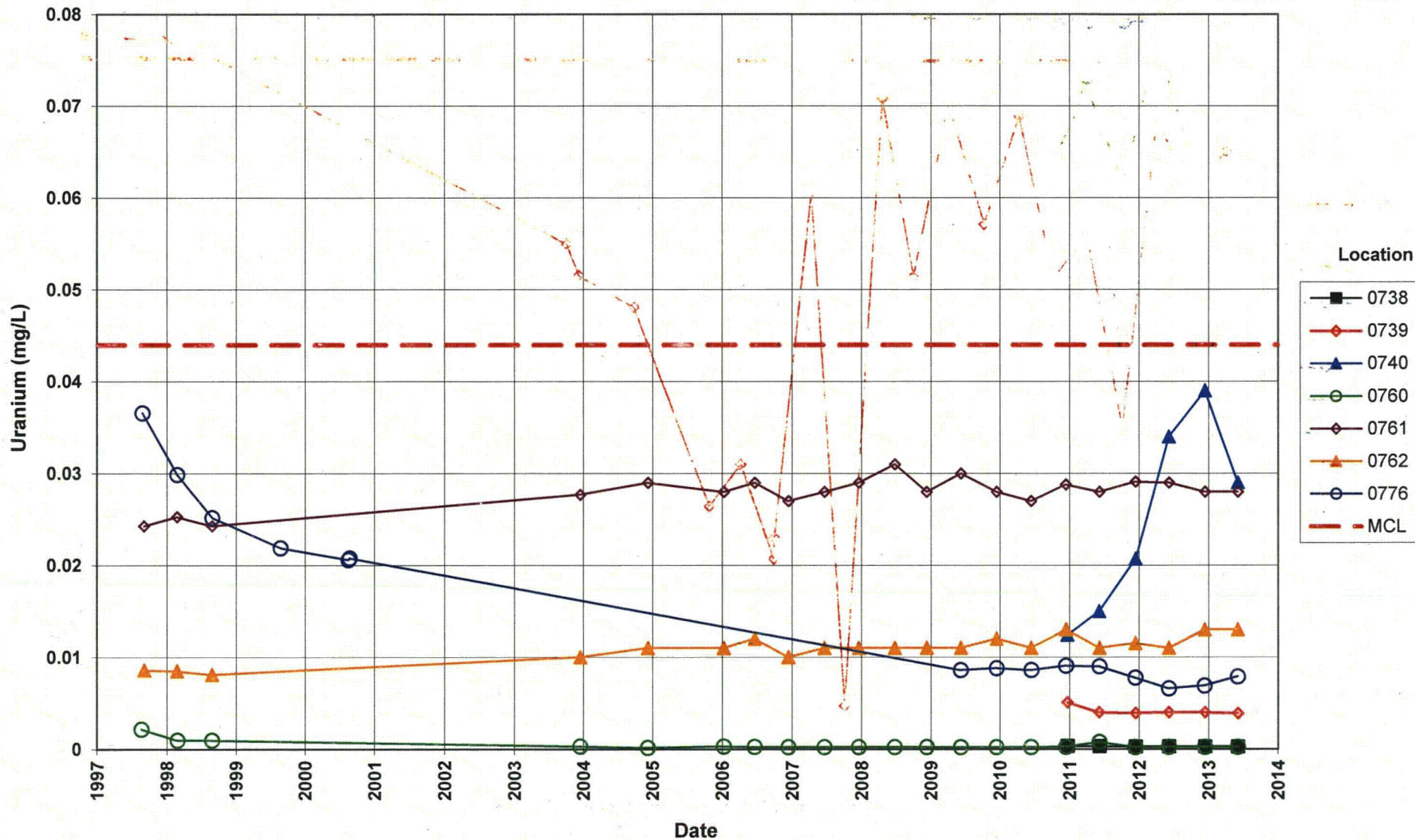
**Monument Valley Processing Site
Uranium Concentration**
Maximum Concentration Limit (MCL) = 0.044 mg/L



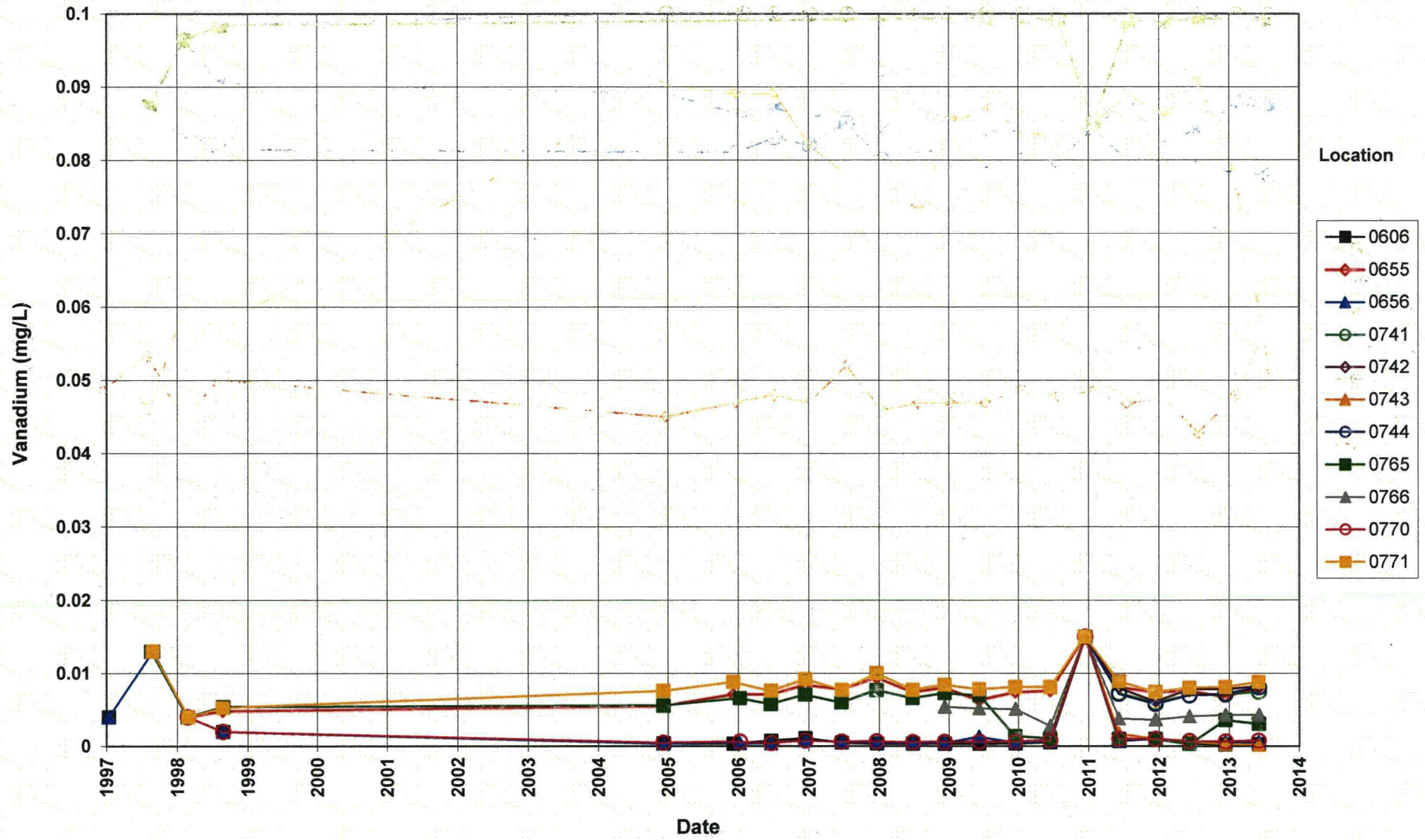
**Monument Valley Processing Site
Uranium Concentration**
Maximum Concentration Limit (MCL) = 0.044 mg/L



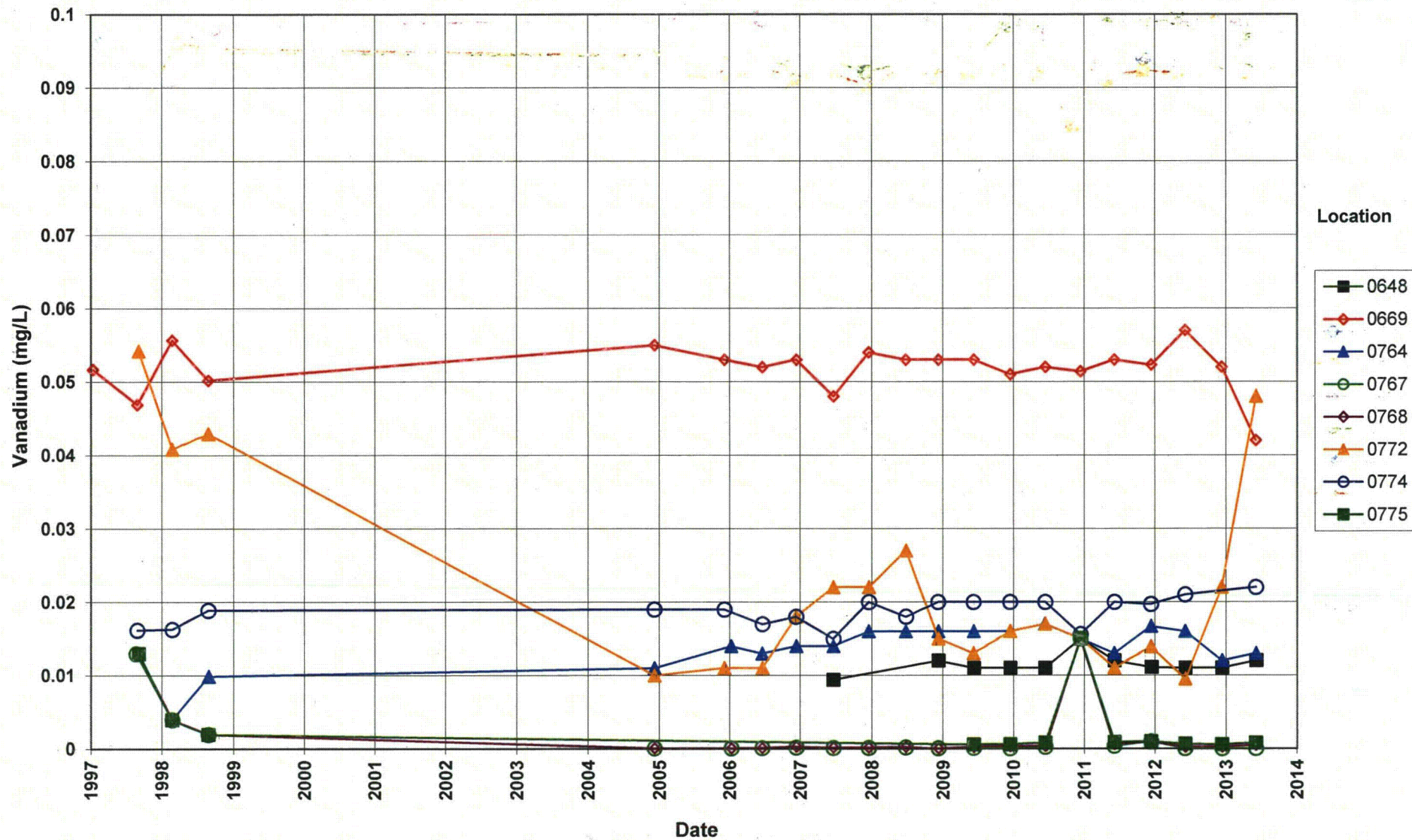
**Monument Valley Processing Site
Uranium Concentration**
Maximum Concentration Limit (MCL) = 0.044 mg/L



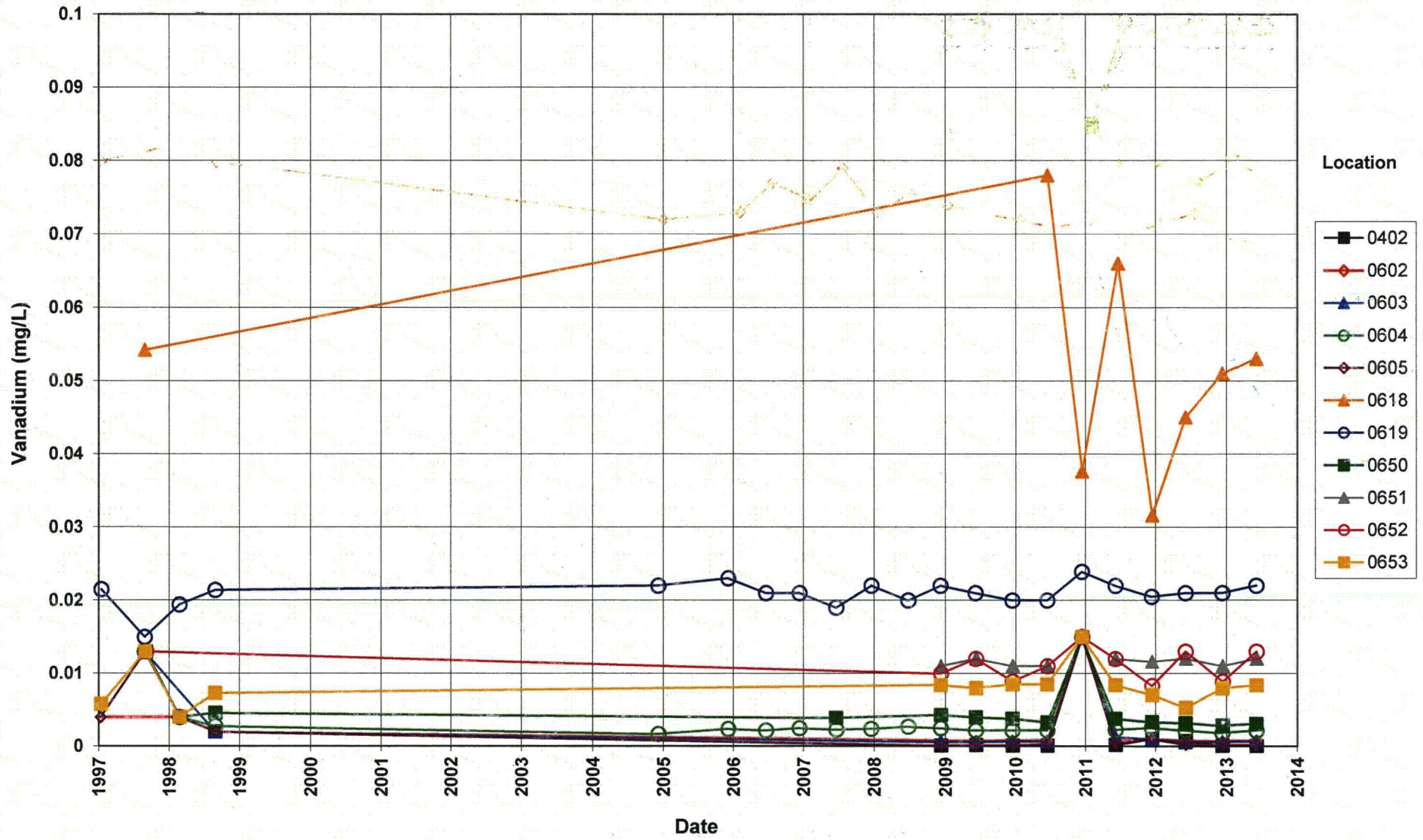
Monument Valley Processing Site Vanadium Concentration



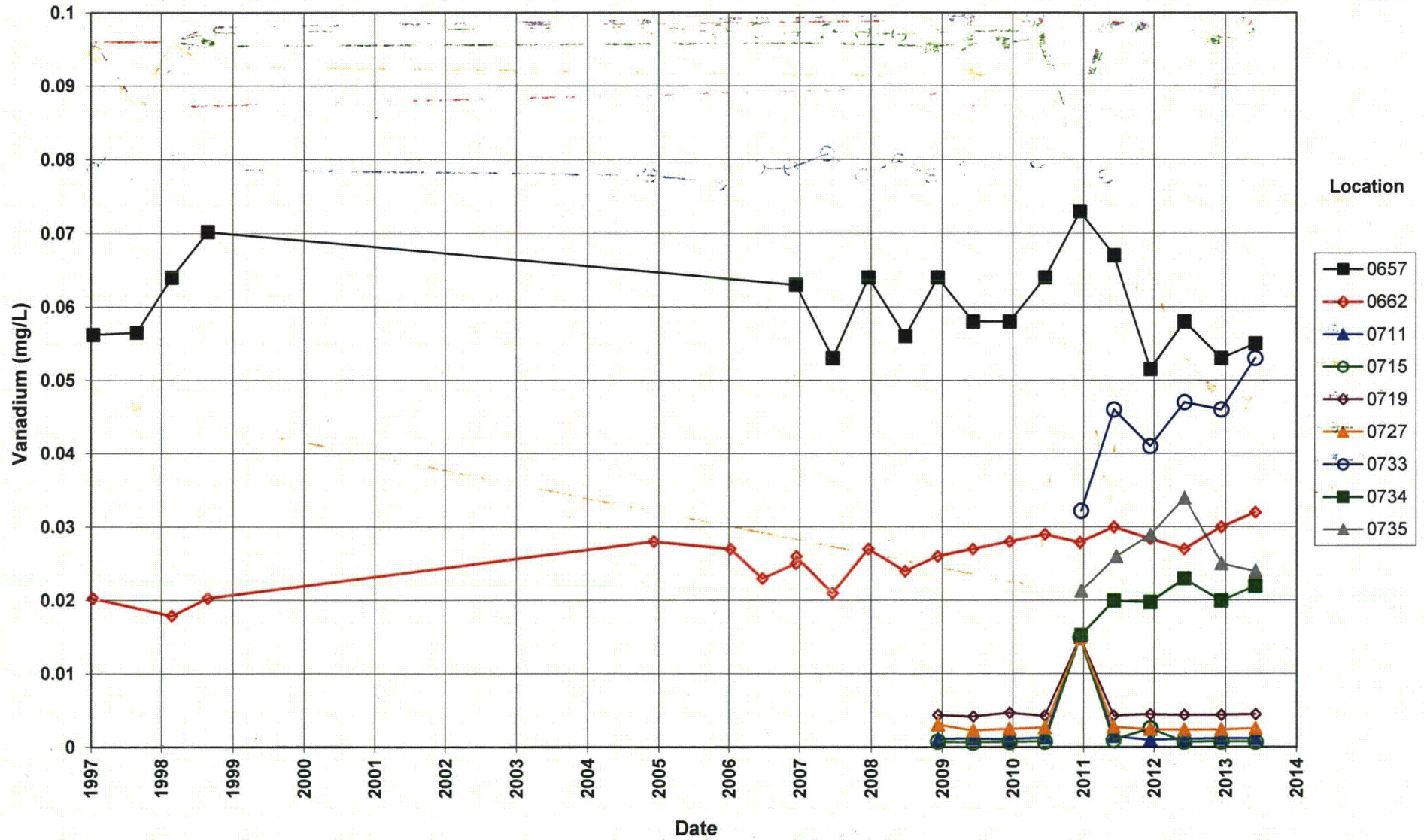
Monument Valley Processing Site Vanadium Concentration



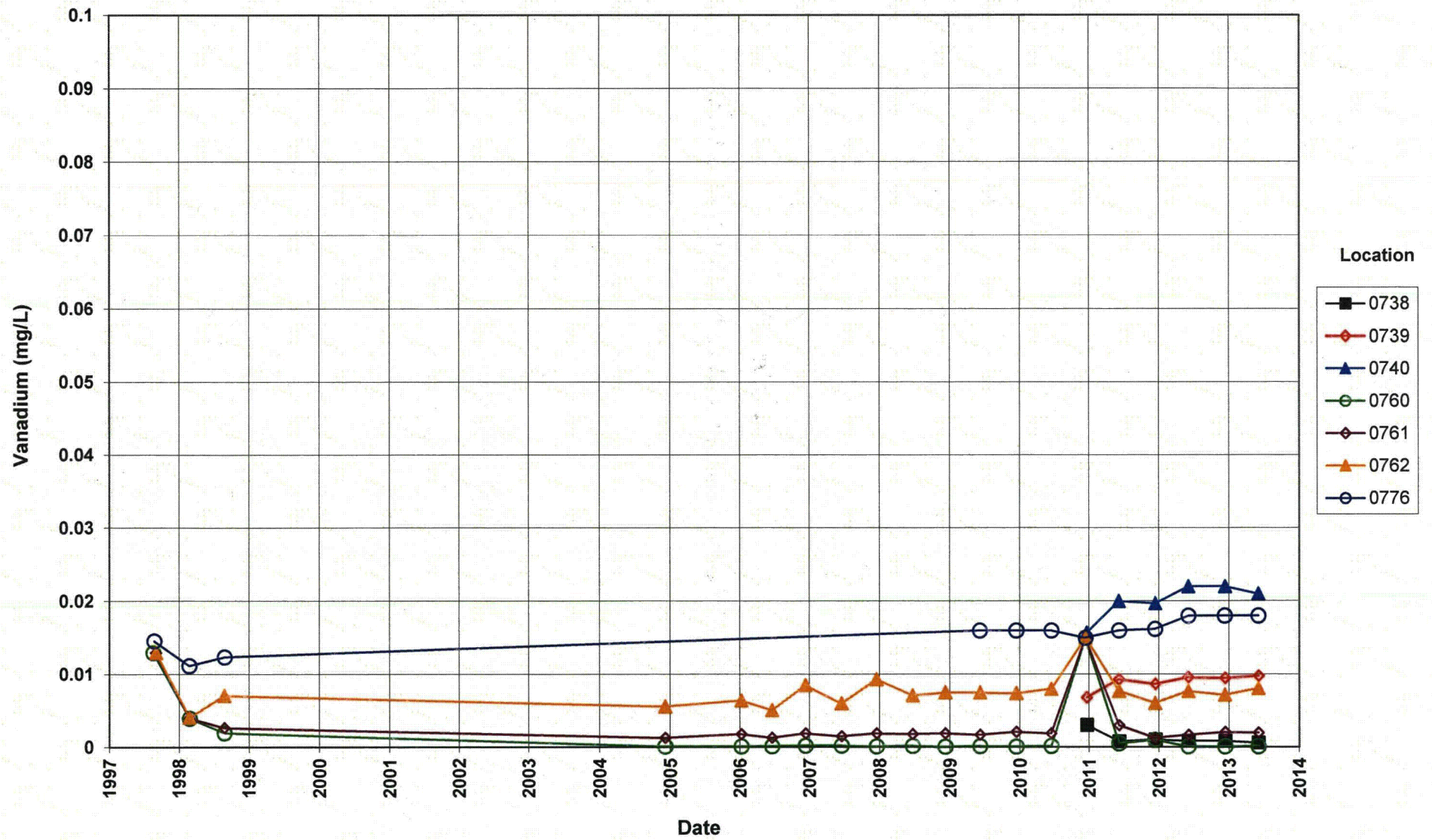
Monument Valley Processing Site Vanadium Concentration



Monument Valley Processing Site Vanadium Concentration



Monument Valley Processing Site Vanadium Concentration



Attachment 3
Sampling and Analysis Work Order

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200	200	200	200	200	200	200
300	300	300	300	300	300	300
400	400	400	400	400	400	400
500	500	500	500	500	500	500
600	600	600	600	600	600	600
700	700	700	700	700	700	700
800	800	800	800	800	800	800
900	900	900	900	900	900	900

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Stoller

established 1959

Task Order LM-501
Control Number 13-0556

May 13, 2013

U.S. Department of Energy
Office of Legacy Management
ATTN: Richard Bush
Site Manager
2597 Legacy Way
Grand Junction, CO 81503

SUBJECT: Contract No. DE-AM01-07LM00060, S.M. Stoller Corporation (Stoller)
June 2013 Environmental Sampling at the Monument Valley, Arizona
Processing Site

REFERENCE: Task Order LM-501-02-114-402, Monument Valley, Arizona, Processing Site

Dear Mr. Bush:

The purpose of this letter is to inform you of the upcoming sampling event at Monument Valley, Arizona. Enclosed are the map and tables specifying sample locations and analytes for monitoring at the Monument Valley site. Water quality data will be collected from monitoring wells and surface locations at this site as part of the routine environmental sampling currently scheduled to begin the week of June 3, 2013.

The following lists show the monitoring wells (with zone of completion) and surface location scheduled to be sampled during this event.

Monitoring Wells*

402 Al	619 Dc	656 Al	727 Nr	741 Al	762 Al	770 Al
602 Al	648 Al	657 Dc	733 Al	742 Al	764 Al	771 Al
603 Al	650 Al	662 Al	734 Al	743 Al	765 Al	772 Al
604 Al	651 Al	669 Al	735 Al	744 Al	766 Al	774 Al
605 Al	652 Al	711 Nr	738 Al	760 Al	767 Al	775 Dc
606 Al	653 Al	715 Nr	739 Al	761 Al	768 Al	776 Dc
618 Al	655 Al	719 Nr	740 Al			

*NOTE: Al = Alluvium; Dc = Dechelly Member of the Cutler Formation; Nr = no recovery of data for classifying

Surface Location

623

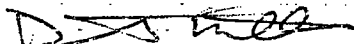
The S.M. Stoller Corporation 2597 Legacy Way Grand Junction, CO 81503 (970) 248-6000 Fax (970) 248-6040

Richard Bush
Control Number 13-0556
Page 2

All samples will be collected as directed in the *Sampling and Analysis Plan for U.S. Department of Energy Office of Legacy Management Sites*. Access agreements are covered under the cooperative agreement.

Please contact me at (970) 248-6652 if you have any questions.

Sincerely,



Dave Miller
Site Lead

DM/lcg/lb

Enclosures (3)

cc: (electronic)

Karl Stoeckle, DOE
Steve Donovan, Stoller
Lauren Goodknight, Stoller
David Miller, Stoller
EDD Delivery
re-grand junction
File: MON 410.02 (A)

**Sampling Frequencies for Locations at
Monument Valley, Arizona**

Location ID	Quarterly	Semiannually	Annually	Biennially	Not Sampled	Notes
Monitoring Wells						
402		X				
602		X				
603		X				
604		X				
605		X				
606		X				
618		X				
619		X				
648		X				
650		X				
651		X				
652		X				
653		X				
655		X				
656		X				
657		X				
662		X				
669		X				
711		X				
715		X				
719		X				
727		X				
733		X				
734		X				
735		X				
738		X				
739		X				
740		X				
741		X				
742		X				
743		X				
744		X				
760		X				
761		X				
762		X				
764		X				
765		X				
766		X				
767		X				
768		X				
770		X				
771		X				
772		X				
774		X				
775		X				
776		X				
Surface Locations						
623		X				

Sampling conducted in December and June

Constituent Sampling Breakdown

Site	Monument Valley		Required Detection Limit (mg/L)	Analytical Method	Line Item Code
	Groundwater	Surface Water			
Analyte					
Approx. No. Samples/yr	68	1			
Field Measurements					
Alkalinity					
Dissolved Oxygen					
Redox Potential	X				
pH	X				
Specific Conductance	X				
Turbidity	X				
Temperature	X				
Laboratory Measurements					
Aluminum					
Ammonia as N (NH3-N)	X	X	0.1	EPA 350.1	WCH-A-005
Arsenic			0.0001	SW-846 6020	LMM-02
Calcium			5	SW-846 6010	LMM-01
Chloride	X	X	0.5	SW-846 9056	MIS-A_039
Chromium					
Iron			0.05	SW-846 6020	LMM-02
Lead					
Magnesium			5	SW-846 6010	LMM-01
Manganese			0.005	SW-846 6010	LMM-01
Molybdenum			0.003	SW-846 6020	LMM-02
Nickel					
Nitrate + Nitrite as N (NO3-NO2)-N	X	X	0.05	EPA 353.1	WCH-A-022
Potassium			1	SW-846 6010	LMM-01
Selenium					
Silica					
Sodium			1	SW-846 6010	LMM-01
Strontium					
Sulfate	X	X	0.5	SW-846 9056	MIS-A-044
Sulfide					
Uranium	X	X	0.0001	SW-846 6020	LMM-02
Vanadium	X	X	0.0003	SW-846 6020	LMM-02
Zinc					
Total No. of Analytes	6	6			

Note: All private well samples are to be unfiltered. The total number of analytes does not include field parameters.

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Memorandum

DATE: June 18, 2013
TO: David Miller
FROM: Gretchen Baer
SUBJECT: Sampling Trip Report

Site: Monument Valley, Arizona, Processing Site

Dates of Sampling Event: June 3-5, 2013

Team Members: Gretchen Baer, Lauren Goodknight, Jeff Price, and Joe Treviño

Number of Locations Sampled: Water samples for metals, anions, nitrate + nitrite as N, and ammonia as N were collected from 46 monitoring wells and one surface location.

Locations Not Sampled/Reason: All scheduled locations were sampled.

Location Specific Information:

Location IDs	Comments
0402, 0735	Category II wells with turbidity >10 NTUs.
0605, 0767, 0768	Purge water has sulfur odor (ORP was <0).
0733, 0734, 0741, 0743, 0744, 0760	Category I wells with turbidity >10 NTUs.

Sampling Method: Samples were collected according to the *Sampling and Analysis Plan for the U. S. Department of Energy Office of Legacy Management Sites*.

Field Variance: Turbidity requirements could not be met at these Category I wells: 0733, 0734, 0741, 0743, 0744, and 0760. These samples were filtered.

Requisition Identification Number (RIN) Assigned: Samples were assigned to RIN 13055367. Field data sheets can be found in the sample management system on Crow under requisition number 13055367 in the Field Data folder.

Sample Shipment: Samples were shipped from Grand Junction to ALS Laboratory Group on June 6, 2013.

Water Level Measurements: Water levels were measured at all sampled wells.

David Miller
June 18, 2013
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Quality Control Sample Cross Reference: The following are the false identifications assigned to the quality control samples.

False ID	True ID	Ticket Number	Sample Type	Associated Matrix
2079	0760	LGV 107	Duplicate	Groundwater
2251	0653	LGV 129	Duplicate	Groundwater
2711	0776	LGV 098	Duplicate	Groundwater

Duplicates were collected by filling all bottles labeled with the location number first, then filling all bottles labeled with the false ID second.

Well Inspection Summary: Wind erosion has undermined the pads at several wells including: 0605, 0651, 0734, 0764, 0766, and 0767.

Equipment: Wells were sampled with a peristaltic pump and dedicated tubing or a dedicated bladder pump. The surface water location was sampled by container immersion. Because all equipment was dedicated, equipment blanks were not required. All equipment functioned properly.

Institutional Controls:

Fences, Gates, Locks: All were in good condition.

Signs: Not applicable.

Trespassing/Site Disturbances: None.

Site Issues: Cell phone service was weak but available at the site.

Disposal Cell/Drainage Structure Integrity: Not applicable.

Vegetation/Noxious Weed Concerns: None observed.

Maintenance Requirements:

- Well pads mentioned above.
- Routine well development should be completed, particularly at wells where turbidity requirements could not be met (listed in table above).
- The air fitting on the bladder pump at 0652 may be leaking slightly (the tubing is blue & white). Did not adversely affect the purging or sampling, however.

Access Issues: None.

Safety Issues: None.

Maintenance Actions:

- Monitoring well 0618: A bladder pump was installed at 117 feet on 06/03/13. (Samples were collected 06/04/13.)
- Monitoring well 0741: The bladder pump was replaced on 06/03/13. (Samples were collected 06/05/13.)

Corrective Action Taken: Not applicable.

GB/lcg

cc: (electronic)
Rich Bush, DOE
David Miller, Stoller

Steve Donivan, Stoller
EDD Delivery