

**Texas Commission on Environmental Quality
Underground Injection Control**

Ground Water Analysis Report In Situ Uranium Mining

Permit Number: _____
 Well Number: _____
 Sample Number: _____
 Production Area Number: _____
 Submitted By: _____
 Date Collected: _____ By: _____
 Company: _____
 Mine: _____

Sample Methods: Calibrate Ec Meter (1) Page 71; Pump Well Until Ec is Approx. Constant

Sample	Date	Temp (C)	pH	Specific Conductivity. (µmhos/cm)	Specific Conductivity. at Well:
1					Normal Water Level: µmhos/cm
2					Pump: Set at msl msl
3					Bottom of: Casing msl;screen gpm
4					Land Surface Datum : msl msl

Container: 1 Gal. Plastic for *Items; 1 Liter Plastic for all other items.

Preservation Methods: Filter and Acidify * Item to < 2 pH (HNO₃); Cool all other items to 4°C.

Analysis: Lab Name: _____

Date Received: _____

Date Reported: _____

Major and Secondary Constituents (Group No. 1)

Reference	Item	STORET	Mg/l (F)	factor	epm	Ecf	Conductivity factor multiplied by epm	%epm
A.	Calcium (Ca)	00915		÷20.04=		x 52.0=		
B.	Magnesium (Mg)	00925		÷12.16=		x 46.6=		
C.	Sodium (Na)	00930		÷22.99=		x 48.9=		

Reference	Item	STORET	Mg/l (F)	factor	e _{pm}	E _{cf}	Conductivity factor multiplied by e _{pm}	%e _{pm}
D.	Potassium (K)	00935		÷39.10=		x 72.0=		

E. Total Cation _____

Reference	Item	STORET	Mg/l (F)	factor	e _{pm}	E _{cf}	Conductivity factor multiplied by e _{pm}	%e _{pm}
F.	Carbonate (CO ₃)	00445		÷30.00=		x 84.6=		
G.	Bicarbonate (HCO ₃)	00440		÷61.02=		x 43.6=		
H.	Sulfate (SO ₄)	00945		÷48.03=		x 73.9=		
I.	Chloride (Cl)	00940		÷35.45=		x 75.9=		

Reference	Item	STORET	Mg/l (F)
J.	Nitrate-Nitrogen (NO3-N)	00620	
K.	Fluoride (F)	00950	
L.	Silica (SiO2)	00955	

M. Total Anion: _____

N. Total Ion: _____

Reference	Item	STORET	Mg/l (F)
P.	TDS (180°C)	70300	
Q.	TDS = N-.5G	=	
R.	EC (25°C)	00095	µmhos/cm
S.	Ec(Dilute)= *	=	µmhos/cm
U.	Alk. as CaCO ³	00410	
V.	pH	00403	Standard Unit

T. Total _____ =T. See STD Methods - 15th Edition

Accuracy Check (Range)

Ion (E:M) _____ 0.96 to 1.04

TDS (P:Q) _____ 0.90 to 1.10

Ec (S:T) _____ 0.95 to 1.05



Minor and Trace Constituents (Group No. 2)

Item	Mg/l
Arsenic (As)	
Cadmium (Cd)	
Iron (Fe)	
Lead (Pb)	
Manganese (Mn)	
Mercury (Hg)	
Molybdenum (Mo)	
Selenium (Se)	
Uranium (U)	
Ammonia-N	
Radium 226	

Analyst Remarks: _____

Checked By _____

Groundwater Lab Analysis Report And Explanation
Texas Commission on Environmental Quality
Underground Injection Control Section

Item

1. **Permit No.:**
If the report is for a permit already approved, enter the permit number. If a permit has not been issued, enter the appropriate TDWR file number.
2. **Well No.:**
Enter the well identification number. The well identification should distinguish whether the well is completed in a production zone or a non-production zone.
3. **Sample No.:**
Enter the number identifying the sample taken and analyzed to develop the report.
4. **Production Area No.:**
If the well sampled is for determining baseline for particular production area, enter the identification for the production area. If the well sampled is for defining baseline of the general permit area, enter "Permit".
5. **Submitted by:**
Enter the name of the person responsible for the validity of the sample and its analysis.
6. **Date Collected:**
Enter the date the sample was taken.
7. **By:**
Enter the name of the person taking the sample.
8. **Company:**
Enter the name of the company that has applied for or has obtained the subject permit.
9. **Mine:**
Enter the official name of the mine.
10. **Sample (1, 2, 3, & 4):**
Enter temperature, pH, and specific conductivity determined at the wellhead after the well has been pumped until conductivity is essentially stable as determined by at least four samples measured at five-minute intervals. (This general pre-sampling procedure should be used for all baseline and routine monitor samples.)
11. **Spec. Cond. at Well:**
Enter the stable conductivity value determined in 10. above.
12. **Normal Water Level:**
Enter the normal, stable water level elevation.
13. **Pump:**
Enter the elevation at which the pump is set and enter the pump capacity in gallons per minute.
14. **Bottom of:**
Enter the elevation at which the bottom of casing is set and enter the elevation of the screened interval.

15. Analysis:

Enter name of the laboratory completing the analysis, the date the sample was received and the date the analysis was completed by the laboratory.

16. Storet:

These numbers reference specific sampling and analysis procedures approved by EPA in the current issues of Methods for Chemical Analysis of Water and Waste (EPA – Technology Transfer). If an operator wants to use procedures other than these, approval should be obtained from the TCEQ.

17. mg/l:

Enter laboratory analysis results.

18. F:

Divide by this factor to obtain equivalent parts per million (epm).

19. Ecf:

Multiply this conductivity factor by epm to obtain the value entered in the next column (c x d).

20. % epm:

Divide the individual epm values by the total indicated on line "E" for cations and the total indicated on line "M" for anions and multiply by 100 to obtain percent of each anion and cation.

21. Accuracy Check:

- a. Ion; divide line "E" value by line "M" value and enter in this space.
- b. TDS; divide line "P" value by line "Q" value and enter in this space.
- c. Ec; divide line "S" value by the total obtained for "T"; the sum of the values in the column labeled "(c) x (d)".

These results should generally fall within the range indicated. If they do not, the sample should be re-analyzed or adequate explanation for variance from these ranges should be provided.

Diagram:

Mark the % values on the appropriate line for either cation or anion and connect the marks. For any one aquifer, the proportion of cations and anions as indicated by this diagram will typically be the same or similar even when there is a significant difference in conductivity or TDS values.

Significant variance of the diagram configuration from one analysis report to another for adjacent wells completed in the same aquifer may, therefore, indicate a contaminated sample that is not representative of the aquifer sampled. Another sample should be taken from the well in question and re-analyzed or adequate explanation of the variance should be provided.

22. Line "S":

The value for this line is obtained by diluting the sample to a value between 90 and 120 μmhos . Enter this value in one of the spaces provided and the number of dilutions in the second space. Multiply these two values to obtain the derived μmho value. These values should compare favorably (within 5%) if the analysis is accurate. See page 31 of the 15 Edition of Standard Methods for further explanation.

23. Line "Q":

The value for this line is obtained by subtracting one half of the Bicarbonate value on line "G" from the total ion value on line "N". This value should compare favorably with the TDS value on line "P".

24. Remarks:

Indicate whether the report is for a well to be used for monitoring, production injection, production recovery, or for baseline only.

The following parameters will be analyzed at least to the levels indicated. These levels will be considered the minimum acceptable detection limits in mg/l.

As 0.01
Hg 0.0002
Cd 0.01
Se 0.002
Fe 0.10
U 0.05
Pb 0.05
Mo 0.50
Mn 0.05