

1. Amy Cross-Smiecinski: Harry Reid Center for Environmental Studies
  2. Yucca Mountain Site Characterization Project  
Harry Reid Center Quality Assurance Support
  3. For the cooperative agreement quarters 1/1/95 through 3/31/95, HRC QA staff performed the following:
    - **Quality Assurance Program.** Feb. 24 scoping visit with Yucca Mountain Project U.S. Geological Survey QA personnel. Based on recommendations generated from that meeting HRC is to participate as a USGS vendor rather than a YMSCP participant for the Tracer study. QA plan was revised again this time as a compilation of QA procedures. Document was submitted to USGS and reviewed.
    - **Certification.** State of NV clean water (U.S.EPA water pollution performance sample set, WP-033) certification samples scores were received. All inorganic analyses met acceptance criteria except for fluoride. Corrective action is being pursued to correct this.  
 U.S.GS (Fall 1994 round-robin) inorganic and VOC (5.94) certification samples scores were received. These were very good - an improvement in inorganic results since the last sample set and a good start for the first VOC samples set performed by HRC. The Ba value was misreported to U.S.GS and the value actually measured by HRC was well within acceptance limits. If it were possible to correct this value in the U.S.GS data evaluation, HRC's overall score would increase slightly. The results are attached.  
 HRC data for State of NV drinking water (U.S.EPA water supply performance sample set, WS-035) was submitted to EMSL-CIN for scoring Jan. 27.
    - **Quality Control.** This quarter data verification was performed for Fingerprinting and Ground Water Quality Monitoring data. Data sets were verified based on complete recordkeeping, software verification, and calculations spot-checks. Data verified within this report period are listed.  
 Ash Meadows Six-week Study - all analytes  
 Ash Meadows Sampling #6 - anions  
 EFAP Sampling #1 - trace metals standard 2  
 Death Valley Sampling #6 - anions  
 Coffey Ranch Sampling #1 - anions  
 NTS Springs Sampling #1 - anions  
 NTS Well ER-30 Sampling #1 at two depths - anions
- QA staff performed sample control and data management functions.
- QA staff provided independent reference materials for the volatiles,

trace metals and anions analyses.

- **Safety.** Waste satellite areas were inspected weekly. A standard waste disposal procedure was written and distributed to HRC personnel. The ICP-MS lab was wipe-tested monthly. Right-to-know safety training was provided for untrained personnel.
- **Upcoming quarter.** HRC is anticipating the approval of the Tracer study QA procedure compilation document. HRC is preparing a final ground water quality report for YMSCP on the Ash Meadows Samplings #1-5 and other sites. The next sets of State and U.S.GS certification samples are expected to arrive at HRC. Safety tasks are ongoing.

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Performance Evaluation Report  
USEPA Water Pollution Study WP033

Page: 1  
Date: 10FEB95

Participant ID: NV00049

Type: OTHER

Requesting Office: NV

Sample Number	Reported Value	True Value*	Acceptance Limits	Warning Limits	Performance Evaluation
MINERALS IN MG/LITER (EXCEPT AS NOTED)					
19-PH-UNITS					
03	5.30	5.26	5.21- 5.36	5.23- 5.35	Accept.
04	4.09	4.11	4.02- 4.16	4.04- 4.14	Accept.
20-SPEC. COND. (UMHOS/CM AT 25 C)					
01	315	309	284- 337	291- 330	Accept.
02	948	937	873- 1020	892- 1010	Accept.
21-TDS AT 180 C					
01	159	184	124- 200	133- 190	Accept.
02	473	561	441- 701	473- 668	Accept.
23-CALCIUM					
01	11.9	12.0	10.7- 13.6	11- 13.2	Accept.
02	88.8	89.0	77.7- 98.1	80.3- 95.5	Accept.
24-MAGNESIUM					
01	12.6	13.0	11.4- 14.9	11.8- 14.4	Accept.
02	4.10	4.10	3.57- 4.74	3.72- 4.59	Accept.
25-SODIUM					
01	15.5	15.7	13.7- 18.2	14.3- 17.6	Accept.
02	95.5	94.2	85.7- 101	87.6- 99	Accept.
26-POTASSIUM					
01	13.4	14.0	12.1- 16	12.6- 15.5	Accept.
02	5.3	5.20	4.24- 6.23	4.40- 5.98	Accept.
27-TOTAL ALKALINITY (AS CaCO3)					
01	27.3	28.5	24.2- 33.1	25.3- 32	Accept.
02	85.6	86.4	76.9- 95	79.2- 92.7	Accept.
28-CHLORIDE					
01	58.4	59.2	53.5- 64.1	54.8- 62.7	Accept.
02	165	170	155- 182	159- 178	Accept.
29-FLUORIDE					
01	0.18	0.240	0.168- 0.31	0.186- 0.292	Ck. for Err.
02	3.30	4.00	3.5- 4.46	3.62- 4.34	Not Accept.
30-SULFATE					
01	20.3	22.0	17.6- 25.4	18.6- 24.4	Accept.
02	104	110	88.6- 127	93.4- 122	Accept.

NUTRIENTS IN MILLIGRAMS/LITER  
32-NITRATE-NITROGEN

01	0.84	0.860	0.654- 1.05	0.703- 1.01	Accept.
02	0.26	0.270	0.177- 0.362	0.199- 0.34	Accept.

33-ORTHOPHOSPHATE

01	4.86	5.00	4.28- 5.67	4.46- 5.5	Accept.
02	0.10	0.120	0.0883- 0.152	0.0963- 0.145	Accept.

\*\*\*\*\* END OF DATA FOR NV00049 \*\*\*\*\*

OTE: FOR LIMITS AND TRUE VALUES, ASSUME THREE SIGNIFICANT DIGITS.

\*\*\*\*\* END OF REPORT FOR NV00049 \*\*\*\*\*

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Based on gravimetric calculations, or a reference value when necessary.

## HRC PERFORMANCE IN USGS ROUND ROBIN

	OLRs				
	Fall '92	Spr '93	Fall '93	Spr '94	Fall '94
Trace Metals	T-121/T-123	T-125	T-127	T-129	T-131
ICP-MS	2.9	3.7	3.3	3.5	3.6
AA	2.8	2.3	3	2.8	AA+ICP-MS
ICP-MS	3.7				
AA	3.2				
Majors	M-124	M-126	M-128	M-130	M-132
	0.9	1.6	2.7	2.8	2.9
Nutrients-nonpreserved		N-38	N-40	N-42	N-44
		1.5	4	3	4
Nutrients-preserved	N-37	N-39	N-41		
	1	3.5	3.5		
Precipitation	P-19	P-20	P-21	P-22	P-23
	4	3	3.8	2.8	2.3
Mercury					Hg-19
	0				3
OWRs (inorganic)				3.1	3.2
Volatile Organics					VOC 5.94
					2.9

OLRs-overall laboratory ratings for that sample

OWRs-overall weighted laboratory ratings for entire sample set

## HRC PERFORMANCE IN USGS ROUND ROBIN Precipitation

	Fall '93		Spr '94		Fall '94	
	P-21*score	HRC/MPV**	P-22*score	HRC/MPV**	P-23*score	HRC/MPV**
CaCO3			4	1.05/1.79 mg/l		
Ca	4	.44/.45 mg/l	3	.758/.725 mg/l	3	1.21/1.13 mg/l
Chloride	4	4.07/3.9 mg/l	4	2.81/2.92 mg/l	4	.291/.310 mg/l
Fluoride			NR	<.5/.028 mg/l	0	.085/.120 mg/l
K	3	.074/.088 mg/l	4	.190/.203 mg/l	4	.504/.483 mg/l
Mg	4	.053/.055 mg/l	2	.107/.098 mg/l	3	.336/.317 mg/l
Na	4	.12/.117 mg/l	3	1.77/1.70 mg/l	3	.540/.500 mg/l
pH			1	5.44/5.81	0	7.31/6.40 mg/l
PO4 as P			NR	<0.1/.008 mg/l	3	.138/.133 mg/l
SO4	4	.49/.5 mg/l	4	.700/.728 mg/l	3	1.40/1.28 mg/l
Spec Cond			0	20.8/17.0 uS	0	139.7/14.2 uS
	OLR 3.8		OLR 1.77		OLR 2.3	

OLR-overall lab rating

\* performance ratings: 0=poor, 1=questionable, 2=satisfactory, 3=good, 4=excellent

\*\* most probable value

## HRC PERFORMANCE IN USGS ROUND ROBIN - Mercury

	Fall '92	HRC/ MPV	Spr '93	HRC/ MPV	Fall '93	HRC/ MPV	Fall '94	HRC/ MPV
Hg	0	1.2/.41					3	1.10/1.01 ug/l

OLR-overall lab rating

\* performance ratings: 0=poor, 1=questionable , 2=satisfactory , 3=good , 4=excellent

\*\* most probable value

## HRC PERFORMANCE IN USGS ROUND ROBIN - Nutrient (low)

Nonpreserved Nutrients	Spr '94	HRC/MPV**	Fall '94	HRC/MPV**
	N-42*score		N-44*score	
NH3 as N				
NH3+Org N as N				
NO3 + NO2 as N	3	1.87/1.93 mg/l	4	.810/.800 mg/l
total P as P				
PO4 as P				

OLR 3.0

OLR 4.0

OLR-overall lab rating

\* performance ratings: 0=poor, 1=questionable, 2=satisfactory, 3=good, 4=excellent

\*\* most probable value



# HRC PERFORMANCE IN USGS ROUND ROBIN - Majors

Spr '94 M-130* scores		HRC/MPV**	Fall '94 M-132* scores		HRC/MPV**
			NR		90.5/94.0 mg/l
	Alkalinity				
	B				
3		21.7/21.2 mg/l	3		38.9/38.0 mg/l
3	Ca	22.4/21.4 mg/l	4		55.0/55.7 mg/l
	Chloride				
	DSRD				
3	Fluoride	1.18/1.23 mg/l	0		.350/.480 mg/l
4	K	2.93/3.00 ug/l	4		2.04/2.00 ug/l
4	Mg	6.02/5.90 mg/l	4		8.60/8.49 mg/l
3	Na	37.0/35.8 mg/l	4		48.3/47.9 mg/l
	P-total				
2	pH	8.17/8.02	2		8.31/8.09
	SiO2				
3	SO4	55.4/58.0 mg/l	2		56.3/60.0 mg/l
0	Sp cond	436/335 uS	3		500/493 uS
	Sr				
	V				
OLR 2.8			OLR 2.9		

OLR-overall lab rating

\* performance ratings: 0=poor, 1=questionable, 2=satisfactory, 3=good, 4=excellent

\*\* USGS most probable value

# HRC PERFORMANCE IN USGS ROUND ROBIN - Trace Metals

(page 3)

	Spr '94		T-129b*		Fall '94		T-131b*		T-131b*	
	scores	GFAA HRC/MP	scores	ICP-MS HRC/MP	scores	T-131A* HRC/MPV**	scores	ICP-MS HRC/MPV**	scores	ICP-MS HRC/MPV**
Ag			4	.02/.37 ug			4	1.20/1.26 ug/l	4	1.20/1.26 ug/l
Al			4	51.4/50.0			3	119/132 ug/l	3	119/132 ug/l
As			4	.19/.55 ug			4	55.5/56.6 ug/l	4	55.5/56.6 ug/l
B										
Ba			4	34.7/34.0			0	5/507 ug/l	0	5/507 ug/l
Be			3	.03/.12 ug			4	12.0/12.2 ug/l	4	12.0/12.2 ug/l
Ca	2	22.2/21.1			4	31.1/30.6 ug/l				
Cd			4	.32/.34 ug			4	6.15/6.10 ug/l	4	6.15/6.10 ug/l
Co			3	.10/.74 ug			3	25.2/24.6 ug/l	3	25.2/24.6 ug/l
Cr	4	.42/.68 ug		.39/.68 ug			4	19.1/18.6 ug/l	4	19.1/18.6 ug/l
Cu			3	3.2/2.7 ug			4	20.8/20.2 ug/l	4	20.8/20.2 ug/l
Fe										
K	4	3.06/3.00			4	2.46/2.39 mg				
Li			4	18.8/18.0			4	16.9/17.0 ug/l	4	16.9/17.0 ug/l
Mg	2	6.12/5.83			3	8.27/8.00 mg				
Mn			2	28.2/25.2			4	38.0/37.8 ug/l	4	38.0/37.8 ug/l
Mo			4	21.0/20.3			4	113/112 ug/l	4	113/112 ug/l
Na	2	37.3/35.5			3	22.1/21.4 mg				
Ni			4	1.5/1.7 ug			3	58.7/56.3 ug/l	3	58.7/56.3 ug/l
Pb			3	.06/1.00 u			4	17.4/18.1 ug/l	4	17.4/18.1 ug/l
Sb			4	.23/.55 ug			4	55.8/56.2 ug/l	4	55.8/56.2 ug/l
Se			3	.20/1.60 u			4	11.1/11.2 ug/l	4	11.1/11.2 ug/l
SiO2										
Sr			3	191/181 u			4	293/295 ug/l	4	293/295 ug/l
V			4	.1/1.0 ug/l			3	36.1/34.2 ug/l	3	36.1/34.2 ug/l
Zn							3	67.7/72.0 ug/l	3	67.7/72.0 ug/l
OLR 2.8		OLR 3.5		T-131 OLR 3.6						

OLR-overall lab rating

\* performance ratings: 0=poor, 1=questionable, 2=satisfactory, 3=good, 4=excellent

\*\* most probable value

## HRC PERFORMANCE IN USGS ROUND ROBIN - VOCs

Analytes	Fall '94 VOC 5.94		True Expected
	scores	HRC/MPV*	values
trichlorofluoromethane		NR/95	1.1
vinyl Chloride	4	8.31/7.4	8.3
1,1,1-trichloroethane	4	10.9/10.5	11
1,1-dichloroethane		NR/1.06	1.1
1,1-dichloroethene	4	8.29/8.24	8.7
dichloromethane	3	1.83/1.50	1.2
chloroform	4	11.7/11.8	12
carbon tetrachloride	3	11.1/10	10
benzene	3	11.3/10.9	11
1,2-dichloroethane	3	11.5/11.0	11.2
trichloroethene	4	12.1/11.4	11.5
1,2-dichloropropane	2	1.39/1.20	1.1
bromodichloromethane	4	10.6/10.3	11
toluene		0.27/0	0
dibromochloromethane	3	11.9/10.9	10.6
chlorobenzene	1	1.47/1.12	1.2
xylene		0.57/0	0
bromoform	3	9.63/8.92	9.5
tetrachloroethene	2	1.29/1.06	1.1
1,1,2-trichloroethane	0	1.51/1.19	1.1
1,4-dichlorobenzene	3	11.7/10.8	10.9
1,2-dichlorobenzene		0.51/0	0
mean**	2.9		

\* "most probable value" = median of all reported values

\*\* mean is based on values reported; not penalized for