

TABLE 1
Column Study Test Matrix

Column Test Number	Initial Soil Perchlorate Concentration (mg/kg) ¹	Rate of Water Addition (mL/min) ²	Test Description
1	100-1000	2	Percolation Test
2	less than 100	2	Continuous soil flushing test
3	100 -- 1000	2	Continuous soil flushing test
4	more than 1000	2	Continuous soil flushing test

Notes:

- 1 All soil samples will be taken from the alluvium formation at the site.
- 2 All water used in column tests will be stabilized Lake Mead water provided from site.

TABLE 2
Soil Sampling and Analysis Plan

Phase	Sample Description	Location	Physical Properties ¹	Perchlorate (EPA 314.0)	Metals ²	Hex Cr (EPA 7199)
Column Studies	Pre-Column Test Low Perchlorate Concentration Soil	Near SA189	x	x	x	x
	Pre-Column Test Medium Perchlorate Concentration Soil	Near RSAM6	x	x	x	x
	Pre-Column Test High Perchlorate Concentration Soil	Near SA179	x	x	x	x
	Post Column Test	Column 1	--	x	x	x
	Post Column Test	Column 2	--	x	x	x
	Post Column Test	Column 3	--	x	x	x
Pilot Scale Demonstration	Pre-Test Soil - Location 1	TBD	--	x	x	x
	Pre-Test Soil - Location 1	TBD	--	x	x	x
	Pre-Test Soil - Location 1	TBD	--	x	x	x
	Pre-Test Soil - Location 2	TBD	--	x	x	x
	Pre-Test Soil - Location 2	TBD	--	x	x	x
	Pre-Test Soil - Location 2	TBD	--	x	x	x
	Pre-Test Soil - Location 3	TBD	--	x	x	x
	Pre-Test Soil - Location 3	TBD	--	x	x	x
	Pre-Test Soil - Location 3	TBD	--	x	x	x
	Pre-Test Soil - Location 4	TBD	--	x	x	x
	Pre-Test Soil - Location 4	TBD	--	x	x	x
	Pre-Test Soil - Location 4	TBD	--	x	x	x
	Post Pilot Test - Location 1	TBD	--	x	x	x
	Post Pilot Test - Location 1	TBD	--	x	x	x
	Post Pilot Test - Location 1	TBD	--	x	x	x
	Post Pilot Test - Location 2	TBD	--	x	x	x
	Post Pilot Test - Location 2	TBD	--	x	x	x
	Post Pilot Test - Location 2	TBD	--	x	x	x
	Post Pilot Test - Location 3	TBD	--	x	x	x
	Post Pilot Test - Location 3	TBD	--	x	x	x
	Post Pilot Test - Location 3	TBD	--	x	x	x
	Post Pilot Test - Location 4	TBD	--	x	x	x
	Post Pilot Test - Location 4	TBD	--	x	x	x
	Post Pilot Test - Location 4	TBD	--	x	x	x

Notes:

- 1 Physical Properties to be measured to include dry bulk density via ASTM D2937; grain density by ASTM D854; moisture content by ASTM D2216 and grain size by ASTM D422 using both sieve and hydrometer for soil particles finer than No. 200 sieve.
- 2 Metals Analyses includes arsenic, boron, chromium, cobalt, iron, lead, magnesium, manganese, and uranium.

**TABLE 3
Water Sampling and Analysis Plan**

Phase	Sample Description	Location	Field Measurements ¹	Perchlorate (EPA 314.0)	Metals ²	Wet Chem ³
Column Studies	Pre-Column Test Water Analysis	Stabilized Lake Mead water	x	x	x	x
	Column Leachate Water Analysis (daily sample)	Column 1	x	x	x	x
	Column Leachate Water Analysis (daily sample)	Column 2	x	x	x	x
	Column Leachate Water Analysis (daily sample)	Column 3	x	x	x	x
Pilot Scale Demonstration	Pilot Test -- Pre-Test Groundwater	TBD	x	x	x	x
	Pilot Test -- Pre-Test Groundwater	TBD	x	x	x	x
	Pilot Test -- Pre-Test Groundwater	TBD	x	x	x	x
	Pilot Test -- Pre-Test Percolation Water	Stabilized Lake Mead water	x	x	x	x
	Bi-weekly Pilot Test Groundwater	TBD	x	x	x	x
	Bi-weekly Pilot Test Groundwater	TBD	x	x	x	x
	Bi-weekly Pilot Test Groundwater	TBD	x	x	x	x
	Bi-weekly Pilot Test Leachate	LC 1 (various depths)	x	x	x	x
	Bi-weekly Pilot Test Leachate	LC 2 (various depths)	x	x	x	x
	Bi-weekly Pilot Test Leachate	LC 3 (various depths)	x	x	x	x
	Bi-weekly Pilot Test Leachate	LC 4 (various depths)	x	x	x	x

Notes:

1 Field measurements will include ORP and DO.

2 Metals Analyses includes arsenic, boron, calcium, chromium, cobalt, iron, lead, magnesium, manganese, potassium, sodium, and uranium.

3 Wet chemistry parameters include ammonia, alkalinity (Total CO₃, HCO₃, hydroxide for pH>10), bromide, chlorate, chloride, conductivity, fluoride, nitrate, pH, phosphate (total), sulfate, TDS, Total Organic Carbon, and TSS.