

Field

8/22/2022

- John signed in contractor 1 dosimeter at 8:15 AM.
- Parked both trailers at 8:50-ish by high concentration area at Church Rock.
- 11:05 CR-L-0-SL-unscreened collected in 2 buckets. XRF Readings for uranium concentration:
 - o Just below removed vegetation: 6 ppm
 - o 6-inch depth: 105 ppm, 399 ppm
 - o 10–12-inch depth: 43 ppm
- 11:30 CR-M-0-SL unscreened collected.
- 11:51 CR-H-0-SL unscreened collected.
- 1:32 PM, all unscreened (raw sample) masses recorded. Table below from lab notes:

Bucket	Tare [lb]	Gross [lb]
CR-L-01 Unscreened	2.2	51.8
CR-L-02 Unscreened	2.2	48.8
CR-M-01 Unscreened	2.2	61.2
CR-M-02 Unscreened	2.4	55.8
CR-H-01 Unscreened	2.2	64.4
CR-H-02 Unscreened	2.4	60.2

- All screened and crushed by 5 PM.
- Tables for each of the screened masses:

Bucket	Tare [lb]	Gross [lb]
CR-L-0->1/4-inch-01	2.2	2.6
CR-L-0-<1/4-inch-01	2.2	45.8
CR-L-0-<1/4-inch-01	2.2	54.2
CR-M-0->1/4-inch-01	2.2	4.2
CR-M-0-<1/4-inch-01	2.2	54.2
CR-M-0-<1/4-inch-01	2.2	60.0
CR-H-0->1/4-inch-01	2.2	3.8
CR-H-0-<1/4-inch-01	2.2	59.2
CR-H-0-<1/4-inch-01	2.2	63.6

- Day concluded 5:20 PM

8/23/2022

- Samples coned and quartered for CR-0-SL-01
- L:

- Tare: 5.00 g
 - Gross: 1466.34 g
- M:
 - Tare: 4.99 g
 - Gross: 1389.38 g
- H:
 - 5.00 g
 - 1768.06 g
- Double bagged, placed in gallon bags
- Gallon bags placed in cooler.
- Pre-cutting:
 - L finished at 12:15 PM
 - M finished at 2:20 PM
 - H finished at 4 PM
- Coarse feed stored in trailer due to chance of rain.

8/24/2022

- Water calibration with flow gauge on first day of CR testing:
 - 5-gallon bucket filled for all trials
 - First, Total flow gauge start: 10.193 m³
 - First, End: 10.214 m³, 33.83 seconds
 - Second, start: 10.2145 m³
 - Second, end: 10.2335 m³, 32.71 seconds
 - Third, start: 10.2335 m³
 - Third, end: 10.2525 m³, 33.86 seconds
- Field calculations from above:
 - First: 0.021 m³ = 5.547 gallons
 - Second: 0.019 m³ = 5.019 gallons
 - Third: .019 m³ = 5.019 gallons
- Second bucket will sample used for CR-MU-WT-01 and third bucket used for CR-MU-WT-02.
- Average flow meter records: 5.195 gal, 33.47 seconds, 0.115 gal/sec
- 80 gallons = 516 seconds = 8 min 36 seconds, determined that we needed 0.3028 m³ reading for proper fill.
- CR-L Test
 - Total flow start: 10.2525 m³
 - Total flow end: 8:36.80, switched totes at 5 minutes and 21 seconds (stopwatch paused)
 - VFDs set at 94.7 and 94.3 Hz.
 - Time to load CR-L 3 minutes 20 seconds.

- Flow meter noise level set too high. As a result, the doppler flow meter did not record for beginning of the test. Dropped the noise level about halfway through the test to get reading of 56-58 gpm.
- Screen record stopped at 11 minutes of processing time. Amperage hovered around 5.9-6.0 amps for the remainder of the test.
- Used 3-5 gallons of makeup water to spray wet solids into open top of HPSA tank.
- Test concluded, everything rinsed at 11:37 AM.
- CR-M Test conditions
- Total flow meter:
 - o Start: 10.6345 m³
 - o End: 10.9540 m³
 - o Time: 8:36.28
- Quick Mass of still wet solids recorded prior to adding to system:
 - o Noted as visually moister than when collected prior to screening.
 - o Net: 53.2 lb for bucket 1 and 52.0 lb for bucket 2.
- Pump VFD settings of 94.3 and 95.0 Hz.
- Time to load material: 1:34.37. Test time started after all material added at about 12:17 PM.
- Screen record stopped after 15 minutes of processing. Amperage hovered around 6.2-6.35 A for the remainder of the test.
- Test concluded around 12:50 PM.
- CR-H Test conditions
- Total flow meter:
 - o Start: 11.0252 m³
 - o End: 11.3413 m³
 - o Time: 8:36.55
- Quick mass recorded on still wet solids:
 - o Noted as moister than when collected.
 - o Quick mass: 50.6 lb for bucket 1 and 59.6 lb for bucket 2.
- Time to load material into the system of 2 minutes and 10 seconds.
- Screen record stopped after 15 minutes. Amperage range from 6.4-6.6 for the remainder of the test.
- Tests and rinses completed at 3:30 PM.
- Began breaking down for mobilization to next site.
- Day ended 5:10 PM.

8/25/2022

- Day started at Old Church Rock Mine site and began moving to Quivira. Andrew arrived at 9:30 AM while Jordan remained with Bitco to finish cleaning and breaking down site.
- At the Quivira site, the previous medium sample location was covered in a swamp. A picture was taken.

- Braden was assigned to find a new medium sample.
- The low and high sample areas were the same as identified during recon.
- Collected masses from individual areas in table below:

<u>Bucket</u>	<u>Tare [lb]</u>	<u>Gross [lb]</u>
QV-L-0-Unscreened-01	2.2	61.0
QV-L-0-Unscreened-02	2.2	58.4
QV-M-0-Unscreened-01	2.2	56.4
QV-M-0-Unscreened-02	2.2	56.0
QV-H-0-Unscreened-01	2.2	56.8
QV-H-0-Unscreened-02	2.2	55.6

- Rained out during ¼-inch material screening at 4:00 PM.

8/26/2022

- (Some illegibility of recorded masses on first page of field notes for this day due to raindrops blotting ink)
- Tables for screened masses:

<u>Bucket</u>	<u>Tare [lb]</u>	<u>Gross [lb]</u>
QV-L-0->1/4-inch-01	2.2	6.8
QV-L-0-<1/4-inch-01	2.2	59.8
QV-L-0-<1/4-inch-01	2.2	54.6
QV-M-0->1/4-inch-01	2.2	7.8
QV-M-0-<1/4-inch-01	2.2	55.4
QV-M-0-<1/4-inch-01	2.2	50.4
QV-H-0->1/4-inch-01	2.2	4.6
QV-H-0-<1/4-inch-01	2.2	58.0
QV-H-0-<1/4-inch-01	2.2	51.8

- XRF readings of the material collected in buckets, screened, crushed, and mixed together were as follows:
 - o QV-L: 115 ppm
 - o QV-M: 80-140 ppm
 - o QV-H: 160-200 ppm
- Rain and lightning delays happened twice during the workday.
- Decided with the close grouping of concentrations, that the originally collected QV-H-0 sample would be re-named and re-classified as the medium concentration sample and that the new high concentration sample would be collected by digging deeper at the same high concentration spot.
- Day end 4:20 PM due to lighting/rain.

8/27/2022

- Medium returned to sample point.
- Covid test taken. Result: negative.
- Scale broke on 8/26, rerecorded mass for previous high sample and re-recorded as table below:

<u>Bucket</u>	<u>Tare [lb]</u>	<u>Gross [lb]</u>
QV-M-0-SL-01	2.2	55.4
QV-M-0-SL-02	2.2	56.2

- New high unscreened sample collected as in table below:

<u>Bucket</u>	<u>Tare [lb]</u>	<u>Gross [lb]</u>
QV-H-0-Unscreened-01	2.2	68.6
QV-H-0-Unscreened-02	2.2	69.2

- Screened masses as shown in table below:

<u>Bucket</u>	<u>Tare [lb]</u>	<u>Gross [lb]</u>
QV-H-0->1/4-inch-01	2.2	5.6
QV-H-0-<1/4-inch-01	2.2	62.0
QV-H-0-<1/4-inch-02	2.2	57.8
QV-H-0-<1/4-inch-03	2.2	15.6

- Recorded XRF reading after crushing oversize and recombining/mixing in the wheelbarrow as 340-427 ppm U.
- High sample taken 1:30 PM
- (No time recorded for pre-cut finish on low bulk sample)
- Medium pre-cut finished 12:05 PM
- High pre-cut finished 4:15 PM
- Day end 4:30 PM

8/28/2022

- 5-gallon bucket total flow meter calibration:
 - o First
 - Start: 11.4875 m³
 - End: 11.5066 m³
 - Net: 0.0191 m³
 - Time 30.57 seconds
 - o Second

- Start: 11.5066 m³
 - End: 11.5279 m³
 - Net: 0.0213 m³
 - Time: 29.63 seconds
 -
- Third
 - Start: 11.5279 m³
 - End: 11.5471 m³
 - Net: 0.0192 m³
 - Time: 30.32 seconds
- Average: 0.0199 m³ over 30.17 seconds for 0.174 gallons per second
- For 80 gallons of water volume in HPSA tank, determined a required fill time of 7 minutes 40 seconds.
- QV-L Test conditions:
 - Total flow meter:
 - Start: 11.5471 m³
 - End: 11.5644 m³
 - Time: 7:40.47
 - Close pump VFD set at 94.7 Hz and far pump VFD set at 94.3 Hz.
 - Quick masses recorded for coarse feed samples loaded into system:
 - Noted as moister than when collected.

<u>Bucket</u>	<u>Tare</u>	<u>Gross</u>
QV-L-0-Coarse Feed-01	2.2	46.0
QV-L-0-Coarse Feed-02	2.2	64.2

- 55.61 seconds to load all material for processing.
- Screen recording stopped after 15:30-15:45 of test time. Amperage ranged from 6.3-6.5 for the remainder of the test.
- Test completed and unit rinsed by 10:56 AM
- QV-M Test conditions (originally written as CR-M in lab notes, crossed out and corrected):
 - Total flow meter:
 - Start: 11.6611 m³
 - End: 11.9361 m³
 - Time: 7:40.10
 - Quick mass recorded for coarse feed samples loaded into the system:
 - Noted as more moist than when collected

<u>Bucket</u>	<u>Tare [lb]</u>	<u>Gross [lb]</u>
QV-M-0-Coarse Feed-01	2.2	63.8
QV-M-0-Coarse Feed-02	2.2	35.8

- Close pump VFD set at 94.8 Hz and far pump VFD set at 94.3 Hz.
- Time to add material prior to starting test time of 54.98 seconds.
- During test, 8-minute sample splashed when collecting sample. Made this note during the test in case results for QV-H-8-SY had fewer fines in the PSD as a possible explanation.
- Screen record stopped after 15 minutes of test time. Amperage ranged from 6.3-6.6 for the remainder of the test.
- Noise level of flow meter set to 44 for testing at Old Church Rock Mine site
- (Left a space for noise level set of flow meter at Quivira but did not fill it in at the site).
- Test completed and HPSA unit rinsed out by 11:55 AM
- CR-H Test conditions:
 - Total Flow meter:
 - Start: 12.1165 m³
 - End: 12.3912 m³
 - Time: 7:40.33
 - Quick mass recorded for coarse feed material prior to processing in HPSA:
 - Noted as moister than when collected.

<u>Bucket</u>	<u>Tare [lb]</u>	<u>Gross [lb]</u>
QV-H-0-Coarse Feed-01	2.2	65.6
QV-H-0-Coarse Feed-02	2.2	58.2

- Time to add material from buckets prior to HPSA processing time recorded as: 1:03.15
- Stopped screen recording after 15 minutes of processing time. Amperage ranged from 6.4-6.8 for the remainder of the test.
- Test completed and HPSA unit rinsed by 2:02 PM.
- Cleaned up and broke down site, prepped to mobilize to the next site.
- Braden took pictures of all CoCs.
- Day ended around 6 PM

8/29/2022

- Arrived at Cove Transfer Station 2 at 9 AM
- Wanted to test the theory that the red dirt at the site may be a cap. Loader dug down 3 feet. No change in scintillator reading. Decided not to dig any further into pile for samples.
- Shoveled 3 buckets each of low, medium, and high concentration bulk samples.
- CTS-L:

- Unscreened 1, 2, and 3 all read ND for uranium concentration from XRF in-situ measurement with a 3σ of 13 ppm.
- One dark clump at the top of one of the buckets was measured to have a concentration of 238 ppm U.
- CTS-M:
 - Unscreened 1: 18 ppm U
 - Unscreened 2: 25 ppm U
 - Unscreened 3: 39 ppm U
 - An XRF measurement was performed on a black rock sitting at the top of the bucket which read 931 ppm U
- CTS-H:
 - Unscreened 1: 50 ppm U
 - Unscreened 2: 30 ppm U
 - Unscreened 3: 44 ppm U
 - Dark clump in top of bucket: 10 ppm U
- (Error in original recording of unscreened masses resolved while on-site)
- Unscreened bucket masses were recorded as in the table below:

<u>Bucket</u>	<u>Tare [lb]</u>	<u>Gross [lb]</u>
CTS-L-0-Unscreened-01	2.2	54.2
CTS-L-0-Unscreened-02	2.2	58.8
CTS-L-0-Unscreened-03	2.2	58.4
CTS-M-0-Unscreened-01	2.2	54.0
CTS-M-0-Unscreened-02	2.2	51.4
CTS-M-0-Unscreened-03	2.2	50.2
CTS-H-0-Unscreened-01	2.2	54.2
CTS-H-0-Unscreened-02	2.2	53.4
CTS-H-0-Unscreened-03	2.2	56.2

- Bucket masses after screening through a ¼-inch mesh screen were as recorded below:

<u>Bucket</u>	<u>Tare [lb]</u>	<u>Gross [lb]</u>
CTS-L-0->1/4-inch-01	2.2	7.4
CTS-L-0-<1/4-inch-01	2.2	55.2
CTS-L-0-<1/4-inch-02	2.4	56.8
CTS-L-0-<1/4-inch-03	2.4	52.4
CTS-M-0->1/4-inch-01	2.2	6.2
CTS-M-0-<1/4-inch-01	2.4	52.2
CTS-M-0-<1/4-inch-02	2.2	54.6
CTS-M-0-<1/4-inch-03	2.4	44.8
CTS-H-0->1/4-inch-01	2.2	9.0
CTS-H-0-<1/4-inch-01	2.2	58.2

CTS-H-0-<1/4-inch-02	2.2	55.8
CTS-H-0-<1/4-inch-03	2.2	42.6

8/30/2022

- After screening and crushing of the oversize, in-situ XRF measurements were made of the buckets of material retained on ¼-inch mesh and buckets of material passing ¼-inch mesh. Readings are as summarized in the table below:

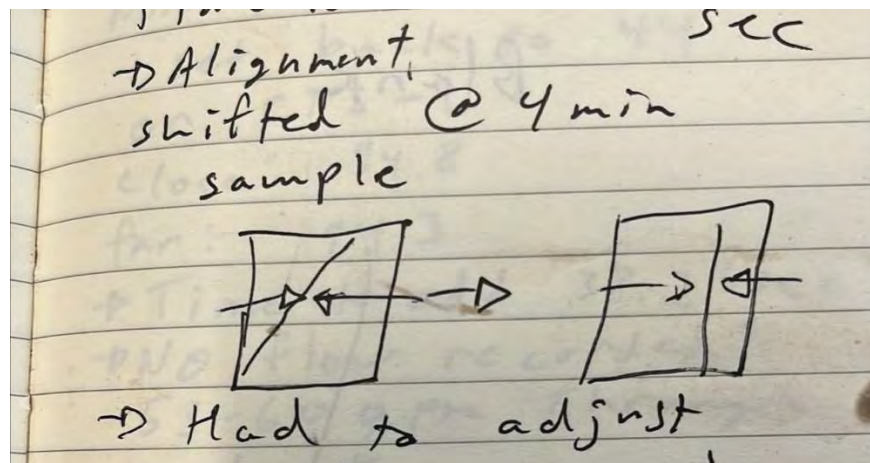
<u>Bucket</u>	<u>XRF U concentration</u>
CTS-L-0->1/4-inch-01	4
CTS-L-0-<1/4-inch-01	ND, 3σ<10
CTS-L-0-<1/4-inch-02	ND, 3σ<10
CTS-L-0-<1/4-inch-03	ND, 3σ<10
CTS-M-0->1/4-inch-01	406
CTS-M-0-<1/4-inch-01	42
CTS-M-0-<1/4-inch-02	44
CTS-M-0-<1/4-inch-03	229 on coarser rock, 28 on finer red dirt
CTS-H-0->1/4-inch-01	522
CTS-H-0-<1/4-inch-01	57
CTS-H-0-<1/4-inch-02	41
CTS-H-0-<1/4-inch-03	Two readings: 36 and 34

- Subsample of material retained on 1/4-inch was taken back to Disa Laboratory for analysis. This ¼-inch retained material was not mixed back in with the material passing ¼-inch for HPSA processing, but returned to the high concentration location. (Not written down as a deviation in laboratory notebook, but recorded in field CoCs).
- No pre-cut for material at CTS site.
- Decided to run 2 buckets of homogenized passing ¼-inch material for each test.
- Processed mass in table below:

<u>Bucket</u>	<u>Tare [lb]</u>	<u>Gross [lb]</u>
CTS-L-0-SL-01	2.4	53.8
CTS-L-0-SL-02	2.4	51.0
CTS-M-0-SL-01	2.2	50.8
CTS-M-0-SL-02	2.4	49.4
CTS-H-0-SL-01	2.2	58.4
CTS-H-0-SL-02	2.2	60.8

- Total flow meter calibration:
 - o First

- Start: 12.5061 m³
- End: 12.5266 m³
- Net: 0.0205 m³
- Time: 31.79 seconds
- Second
 - Start: 12.5226 m³
 - End: 12.5472 m³
 - Net: 0.0206 m³
 - Time: 32.67 seconds
- Third
 - Start: 12.5472 m³
 - End: 12.5671 m³
 - Net: 0.0199 m³
 - Time: 31.39 seconds
- Average of 0.0203 m³ over 31.95 seconds for a rate of 0.168 gallons per second.
- To achieve 80 gallons of water in HPSA system, determined fill time of 7 minutes and 56 seconds.
- CTS-L Test conditions:
 - Total flow meter start: 12.5671 m³
 - Total flow meter end: 12.8594 m³
 - Time: 8:06.90
 - Close pump VFD set to 94.8 Hz and far pump VFD set to 94.3 Hz
 - Time required to add material of 32.88 seconds prior to starting processing time.
 - After four-minute sample, jet alignment was perceived to shift as shown in the drawing from the field notebook below:



- Had to adjust VFDs to get back to balance. (Likely reflected by recorded pressure data)
- Screen recording stopped after 15 minutes of processing time. Amperage ranged from 5.8-6.2 for the remainder of the test.

- Test completed and rinsed by 2:31 PM
- CTS-M Test conditions:
 - Total flow meter start: 13.1277 m³
 - Total flow meter end: 13.1286 m³, noted as not working and does not serve as a means to approximate true volume of water used in test.
 - Time to fill: 7:56.03
 - Doppler flow meter noise set back to 44 as noise level too high to record data for CTS-L test.
 - Close pump VFD set to 94.8 Hz and far pump VFD set to 94.3 Hz
 - Time to add material prior to starting HPSA processing time of 38.23 seconds
 - No flow recorded during test. Written in lab notes that doppler flow meter readout showed 53-60 gpm.
 - Some adjustment in VFD frequency required throughout test to balance flow between nozzles.
 - Screen record stopped after 15 minutes of HPSA processing time. Amperage ranged from 6-6.2 for the remainder of the test.
 - Test concluded and system rinsed by 3:32 PM
- CTS-H Test conditions:
 - Total flow meter start: 13.3078 m³
 - Total flow meter end: 13.5950 m³
 - Time: 7:56.67
 - Close pump VFD set to 94.8 Hz and far pump VFD set to 94.3 Hz
 - Time to add material took: 40.43 seconds.
 - Flow meter noise level set adjusted 2 minutes and 20 seconds into the test
 - Screen recording stopped at 15 minutes of HPSA processing time. Amperage ranged between 6-6.2 for the remainder of the test.
 - Test completed and system rinsed out by 4:36 PM
 - Day concluded at 5:10 PM

Laboratory

9/6/2022

- Sample processing at Disa HQ begins.
- CR-L-4-SY Tab ripped open 4 PM
- 300 mL of shop water used to rinse some sample for filtration separation of solids and water for assay. (Noted as error for any dilution seen in CR-L-4-WT).
- CR-L-4-SY bucket: Remaining gross of 3.8 pounds, bucket tare mass of 1.2 pounds. Sample approximated as 2.6 pounds, assuming no moisture, and split into 3 PSDs.
 - CR-L-4-WT took a long time to filter, noted as pulling off pressure filter on 9/7.

9/7/2022

- CR-L-4-WT separated completely from solids on filter paper by 10 AM.
- CR-L-4-SY filtered solids still wet on 5-micron filter paper:
 - o Tare: 2.13 g tare
 - o Gross: 74.81 g gross
- CR-L-8-SY tab ripped 2 PM
 - o Remaining solids in bucket: 4.0 pounds gross, 1.2 pounds tare, 2.8 pounds net, divided into 3 PSDs
- CR-L-8-WT water filtered 4 PM. Filter paper still wet:
 - o 8.84 g gross
 - o 2.09 g tare
 - o Ran with second PSD

9/8/2022

- CR-L-30-SY Tab ripped open at 8 AM
- Moist mass in bucket: 4.0 pounds gross, 1.2 pounds tare, 2.8 pounds net, split into 3 PSDs
- CR-L-30-WT: No appreciable mass on filter paper

9/9/2022

- CR-M-4-SY tab ripped at 9 AM. Bucket mass after decanting into pressure filter: 4.4 pounds gross, 1.2 pounds tare, 3.2 pounds net, split into 3 PSDs. No appreciable mass retained on filter paper for CR-M-4-WT

9/12/2022

- Tab ripped on CR-M-8-SY at 10 AM. Bucket mass after decanting: 5.0 pounds gross, 1.2 pounds tare, 3.8 pounds net, split into four PSDs.
- CR-M-8-WT (misabeled as SY in laboratory notes). Still wet masses:
 - o 16.03 g gross
 - o 2.07 g tare
 - o Combined with PSD 2 of 4

9/13/2022

- Tab ripped at 9:45 AM for CR-M-30-SY. Bucket mass after decanting: 4.8 pounds gross, 1.2 pounds tare, 3.6 pounds net, split into 4 PSDs.
- Some leaking of pressure filtered water for CR-M-30-SY, may have lost some water mass in cleanup around the pressure filter.
- CR-M-30-WT filtered solids still wet mass on filter paper (not recorded in laboratory notes, but sample finished filtering at 2:30 PM):
 - o 66.70 g gross
 - o 2.11 g tare
 - o Combined with PSD 1 of 4

9/14/2022

- Started bottling up water samples. Table below summarizes recorded masses:

<u>Sample ID/Bucket</u>	<u>Tare [lb]</u>	<u>Gross [lb]</u>
CR-L-4-WT	1.2	15.0
CR-L-8-WT	1.2	14.2
CR-L-30-WT	1.2	15.2
CR-M-4-WT	1.2	15.0
CR-M-8-WT	1.2	15.8
CR-M-30-WT	1.2	15.0

- Pictures taken of each water sample and bottle.
- Some solids settled in bottom of CR-L-30-WT. These were rinsed into cup for drying and combination with CR-L-30-SY -270 fractionated solids, since these solids had already passed the 5-micron filter paper during the dewatering step. It was decided that these solids should not be rinsed into the CR-L-30-WT water bottle shipped to Pace as it would have diluted the sample in a similar manner to CR-L-4-WT.

9/15/2022

- CR-H-4-SY tab ripped at 7:45 AM
- Switched to total and dissolved analytes on aqueous samples.
- CR-H-4-WT (written in error in laboratory notes as SY) filtered 10:30 AM, no appreciable mass retained on filter paper.
- Wet solids in CR-H-4-SY bucket: 6.0 pounds gross, 1.2 pounds tare, 4.8 pounds net, split into 5 PSDs.
- CR-M-0-SL-01 PSD first time through pressure filter finished at 4:30 PM. (This generated two buckets of pressure filter effluent water used CR-M-0-SL-0-0.45 Filtrate Pre-Rec)
- 6:20 PM, buckets mixed with drill.
 - o Video taken and saved.
 - o 30 mL syringe used to filter through 0.45-micron filters into 250 mL sample cup.
 - o As noted on CR-M-0-SL-01 PSD sheet, filter masses recorded, used in the following fashion for water sampling prior to recycle of pressure filter water:
 - Filter 1 used for:
 - 1st: Syringe taken from Bucket 1, 30 mL aliquot, 30 mL in sample cup total.
 - 2nd: Syringe taken from Bucket 2, 30 mL aliquot, 60 mL in sample cup total.
 - 3rd: Syringe taken from Bucket 1, 30 mL aliquot, 90 mL in sample cup total.

- 4th: Syringe taken from Bucket 2, 30 mL aliquot, 120 mL in sample cup total.
 - 5th: Syringe taken from Bucket 1, 30 mL aliquot, 150 mL in sample cup total.
- Filter 2 used for:
 - 6th: Syringe taken from Bucket 2, 30 mL aliquot, 180 mL in sample cup total.
 - 7th: Syringe taken from Bucket 1, 30 mL aliquot, 210 mL in sample cup total.
 - 8th: Syringe taken from Bucket 2, 30 mL aliquot, 240 mL in sample cup total.
 - 9th: Syringe taken from Bucket 1, 5 mL aliquot, 245 mL in sample cup total.
 - 10th: Syringe taken from Bucket 2, 5 mL aliquot, 250 mL in sample cup total.
- Sample preserved with nitric acid in sample cup as noted in Pace CoC
- CR-M-0-SL-01 filter effluent recycled.
- CR-H-4-WT
 - Tare: 1.2 lb
 - Gross: 15.8 lb
 - Stored on ice with preserved 0.45-micron filtrate sample.

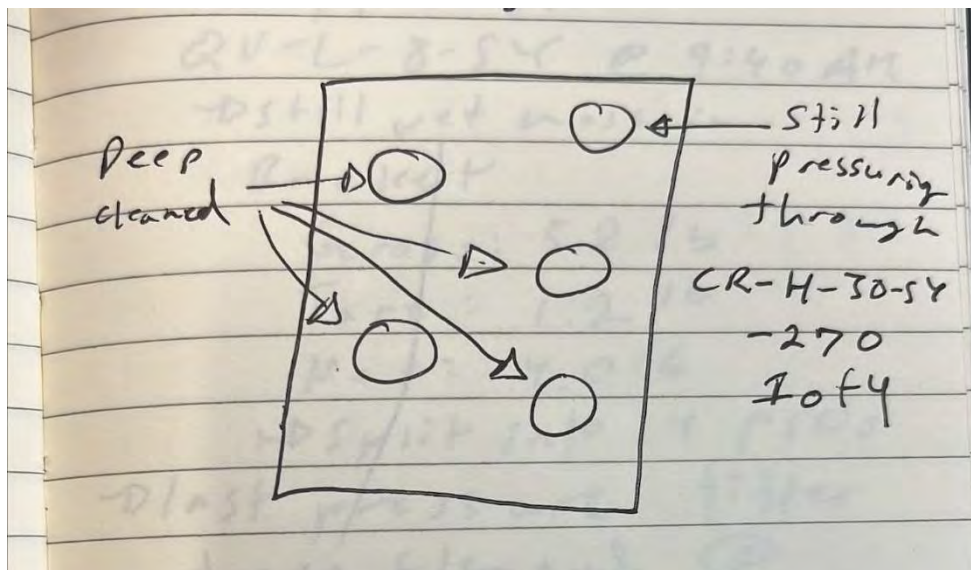
9/17/2022

- CR-H-8-SY Tab ripped at 2:40 PM, still wet mass of material in bucket: gross 6.0 pounds, tare 1.2 pounds, net 4.8 pounds, split into 5 PSDs
- No appreciable mass retained on CR-H-8-WT filtered solids paper

9/19/2022

- CR-M-0-SL-01 recycle finished. Mixed water in buckets with drill again.
- 30 mL syringe used. Same 0.45-micron filter used for all aliquots:
 - 1st: Syringe taken from Bucket 1, 30 mL aliquot, 30 mL in sample cup total.
 - 2nd: Syringe taken from Bucket 2, 30 mL aliquot, 60 mL in sample cup total.
 - 3rd: Syringe taken from Bucket 1, 30 mL aliquot, 90 mL in sample cup total.
 - 4th: Syringe taken from Bucket 2, 30 mL aliquot, 120 mL in sample cup total.
 - 5th: Syringe taken from Bucket 1, 30 mL aliquot, 150 mL in sample cup total.
 - 6th: Syringe taken from Bucket 2, 30 mL aliquot, 180 mL in sample cup total.
 - 7th: Syringe taken from Bucket 1, 30 mL aliquot, 210 mL in sample cup total.

- 8th: Syringe taken from Bucket 2, 30 mL aliquot, 240 mL in sample cup total.
- 9th: Syringe taken from Bucket 1, 5 mL aliquot, 245 mL in sample cup total.
- 10th: Syringe taken from Bucket 2, 5 mL aliquot, 250 mL in sample cup total.
- Preserved and stored in cooler with ice and other 0.45-micron pre-recycle sample.
- Post-recycle buckets saved for dup if needed.
- CR-H-30-SY Tab ripped 8:20 AM. Still wet mass of solids in bucket recorded: gross 5.2 pounds, tare 1.2 pounds, net 4.0 pounds, split into 4 PSDs.
- CR-H-30-WT (incorrectly written in lab notes as SY) finished 10:50 AM. Still wet filter paper mass:
 - 2.07 g tare
 - 17.78 g gross
- CR completed.
- Deep clean on equipment prior to starting QV
 - Sieves
 - Soap and water scrub and ultrasonic cleaner per SOP x2 for deep clean
 - Pressure filters
 - Tube scrubbed with soap and water (SOP between samples)
 - Cloth scrubbed with soap and water (SOP between samples)
 - Mesh scrubbed with soap and water
 - Gasket scrubbed with soap and water
 - Base under wire mesh scrubbed with soap and water
 - Soapy water pressured through apparatus
 - (At the time of writing in the lab notes, this picture was drawn to indicate which filters had been deep cleaned)



9/20/2022

- Tab ripped on QV-L-4-SY at 7 AM. Still wet mass in bucket recorded: gross 4.2 pounds, tare 1.2 pounds, net 3.0 pounds, split into 3 PSDs
- Tab ripped on QV-L-8-SY at 9:40 AM. Still wet mass in bucket recorded: gross 5.2 pounds, tare 1.2 pounds, net 4.0 pounds, split into 4 PSDs
- Last pressure filter deep cleaned at 9:50 AM
- Tab ripped on QV-L-30-SY at 2 PM. Still wet solids mass in bucket: gross 5.0 pounds, tare 1.2 pounds, net 3.8 pounds, split into 4 PSDs.
- Due to long pressure filtering time on dewatering solids, QV-L-8-SY and QV-L-30-SY wetted with shop water to avoid drying and precipitation.
- QV-L-4-WT finished filtering 4:50 PM
- QV-L-8-WT finished filtering at 6:20 PM

9/21/2022

- QV-L-30-WT checked at 7 AM. Water completely through filter.
- Water sample masses as bottled up:
 - QV-L-4-WT:
 - Gross: 14.8 lb
 - Tare: 1.2 lb
 - QV-L-8-WT:
 - Gross: 16.4 lb
 - Tare: 1.2 lb
 - QV-L-30-WT:
 - Gross: 15.8 lb
 - Tare: 1.2 lb
- Matt audit:
 - Note that no water left over
 - Make note in write up/report about sealed 2-gallon buckets and rip tabs.
 - SPLP is more important
 - Log all deviations in a word file
 - Keep receipts from FedEx, upload BOL pictures
 - Add Purchase order: Matt will email to you (on Pace CoCs)
 - Sign over tape on custody seal
- Called Pace about required masses for analyses:
 - Metals: 1 gram
 - TCLP: 200 grams
 - SPLP: 200 grams
 - Ra 226: 300 grams
- CR-M-30-SY +25 XRF reading unusually high at 454 ppm U. Likely will have to redo CR-M-30-SY PSDs and check again with XRF.
- Called Yohji. He said:
 - No mercury for solid samples

- Mercury for TCLP samples
- Need to pull apart pressure filter for Matt picture.

9/22/2022

- Matt took picture of pressure filter pulled apart
- QV-L-4-WT filtered solids still damp mass:
 - Gross: 51.74 g
 - Tare: 2.11 g
 - Combined with QV-L-4-SY PSD 3 of 3
- QV-L-4-SY PSD 3 of 3 lasted slightly longer time due to conversation with Matt on mechanics of method.
- Matt wanted QV-L-4-WT filtered solids paper dried to determine remaining mass after rinsing onto screen.

9/28/2022

- QV-L-8-WT filtered solids combined with PSD 1 of 4. Still damp mass:
 - Gross: 47.40 grams
 - Tare: 2.16 grams

9/29/2022

- QV-L-30-WT filtered solids still damp:
 - Gross: 103.88 grams
 - Tare: 2.12 grams
 - Combined with PSD 1 of 4
- QV-M-4-SY Tab ripped at 6 PM. Still wet mass: gross 5.2 pounds, tare 1.0 pounds, net 4.2 pounds, split into 4 PSDs.
- QV-M-8-SY Tab ripped at 6 PM. Small leak from pressure filter for QV-M-8-WT. Still wet mass: gross 5.6 pounds, tare 1.2 pounds, net 4.4 pounds, split into 4 PSDs.
- QV-M-8-WT finished filtering at 7 PM.

9/30/2022

- QV-M-4-WT finished filtering at 6:30 AM. Water mass:
 - Gross: 15.6 pounds
 - Tare: 1.2 pounds
- QV-M-8-WT:
 - Gross: 15.6 pounds
 - Tare: 1.2 pounds
- QV-M-4-WT filtered solids still wet:
 - Gross: 23.86 grams
 - Tare: 2.19 grams
 - Combined with PSD 1 of 4

- Filter paper placed in drier for mass after rinsing
- Error in splitting CR-M-8-SY +50-mesh fraction due to incorrect logging.
 - Will affect SPLP charge and MLA charge results.
- Still damp QV-M-8-WT filtered solids
 - Gross: 21.71 grams
 - Tare: 2.10 grams

10/01/2022

- QV-L-4-WT filtered solids saved paper
 - Gross: 2.37 grams dry
 - Tare: 2.11 grams
 - Disposed in trash
- Tab ripped on QV-M-30-SY at 3:30 PM
- QV-M-30-SY still damp solids in bucket: gross 5.2 pounds, tare 1.2 pounds, net 4.0 pounds, split into 4 PSDs
- QV-M-30-WT finished filtering at 4 PM. Still wet solids on filter paper:
 - Gross: 16.22 grams
 - Tare: 2.15 grams
 - Combined with PSD 1 of 4
- Tab ripped on QV-H-4-SY at 10 PM. Leaks from pressure filter for QV-H-4-WT. Still wet mass in bucket of QV-H-4-SY: gross 7.2 pounds, tare 1.2 pounds, net 6 pounds, split into 6 PSDs.

10/02/2022

- QV-H-4-WT finished filtering when check at 8 AM
- Tab ripped on QV-H-8-SY at 11:45 AM
- QV-H-8-SY still wet solids in bucket: gross 7.0 pounds, tare 1.2 pounds, 5.8 pounds net, split into 6 PSDs.
- QV-M-4-WT filtered solids paper weighed:
 - 2.19 g tare
 - 2.53 g gross
- QV-H-8-WT filtered through at 4 PM
- QV-H-4-WT filtered solids still wet:
 - Gross: 21.31 grams
 - Tare 2.13 grams
 - Combined with PSD 1 of 6

10/03/2022

- Tab ripped on QV-H-30-SY at 9 AM. Still wet solids in bucket after decanting: gross 6.2 pounds, tare 1.0 pounds, net 5.2 pounds, split into 5 PSDs.
- QV-H-30-WT finished filtering at 10 AM.
- QV-H-8-WT filtered solids, still wet:
 - o Gross: 35.53 grams
 - o Tare: 2.16 grams
 - o Combined with PSD 1 of 6
- QV-H-30-WT filtered solids, still wet:
 - o Gross: 52.30 grams
 - o Tare: 2.13 grams
 - o Added to PSD 1 of 5

10/04/2022

- CTS fractionation handed off to Jordan Dick
- QV-0-F samples well settled
 - o Water decanted and combined with fractionation water
- Pictures taken
- QV-L-0-F split into 4 pans with yellow tape labels
- QV-M-0-F split into 3 pans with neon yellow tape labels
- QV-H-0-F split into 3 pans with bright green tape labels

10/05/2022

- QV-0-F samples dried at 105 degrees Celsius in Despatch Oven
- Madeline Orrell bottled up water samples and took pictures. Masses in table below:

<u>Sample ID/Bucket</u>	<u>Gross [lb]</u>	<u>Tare [lb]</u>
QV-M-4-WT	15.6	1.2
QV-M-8-WT	15.6	1.2
QV-M-30-WT	16.0	1.2
QV-H-4-WT	15.4	1.2
QV-H-8-WT	15.0	1.2
QV-H-30-WT	15.0	1.2

- Shop water sample taken directly from spray hose/head used for fractionation. Pictures taken.

10/06/2022

- Package survey higher than usual. Wiped cooler with samples thoroughly with Clorox prior to release.

10/08/2022

- QV-0-F water poured into QV fractionation tote. Not enough space in tote. Poured into 55-gallon drum with remaining fractionation water that wouldn't fit in tote.
- CTS-L-4-WT sample:
 - o Collected: 10/05/2022 10:00
 - o Gross: 14.8 lb
 - o Tare: 1.2 lb
- CTS-L-8-WT sample:
 - o Collected 10/05/2022 16:30
 - o Gross: 14.4 lb
 - o Tare: 1.2 lb

10/09/2022

- QV-M-4-SY +50 bag had a tear. May contribute to some lost mass
 - o Transferred to new bag prior to splitting
- QV-H-8-SY +140 and +200 fractions off by about 7 grams. Noted as logging error on sheet. This was likely a mixup of an XRF cup. Will have some effect on metals results for both fractions.

10/10/2022

- Dried masses in pans for QV-0-F samples in table below:

<u>Sample/Pan ID</u>	<u>Tare [lb]</u>	<u>Gross [lb]</u>
QV-L-0-F 1 of 4	2.8	3.0
QV-L-0-F 2 of 4	2.8	8.0
QV-L-0-F 3 of 4	2.8	5.8
QV-L-0-F 4 of 4	2.8	6.4
QV-M-0-F 1 of 3	3.0	4.0
QV-M-0-F 2 of 3	2.8	8.0
QV-M-0-F 3 of 3	3.0	9.8
QV-H-0-F 1 of 3	2.8	11.2
QV-H-0-F 2 of 3	2.8	4.4
QV-H-0-F 3 of 3	2.8	5.8

- As recorded in buckets after scraping out of paper in pans:

<u>Sample/Bucket ID</u>	<u>Tare [lb]</u>	<u>Gross [lb]</u>	<u>Net [lb]</u>
QV-L-0-F	1.8	13.2	11.4
QV-M-0-F	1.4	14.4	13.0
QV-H-0-F	1.6	14.2	12.6

- Discrepancies between weights could be due to scale used. No pictures taken. Pans and paper cleaned well into buckets.

10/11/2022

- CR-F water settled
 - o Pictures taken, poured off into fractionation water tote for Church Rock
- CR and QV-F-WT samples well settled, water poured off and combined with respective fractionation water totes
- Samples in drier in cooking pans with cooking paper. Dried at 105 degrees Celsius:
 - o CR-H-0-F, CR-M-0-F, CR-L-0-F, CR-L-0-F-WT, CR-M-0-F-WT, QV-H-0-F-WT, QV-M-0-F-WT, QV-L-0-F-WT

10/13/2022

- CR-M-0-SL-01 Fractionation water used in filtrate analysis combined with fractionation water tote
- CTS-M-4-WT originally labeled incorrectly.
 - o Labeled as CTS-M-0-F-WT
 - o Renamed, pictures taken, will not propagate any error in sample analysis.
- Water samples table:

<u>Sample/Bucket ID</u>	<u>Tare [lb]</u>	<u>Gross [lb]</u>	<u>Date/Time</u>
CTS-M-4-WT	1.2	15.4	10/11 9:24 AM
CTS-M-8-WT	1.2	14.8	10/12 2:06 PM
CTS-M-30-WT	1.2	14.8	10/13 8 AM
CTS-H-4-WT	1.2	13.6	10/13 7:40 AM

- Lab tech recorded masses for dried CR fines samples.

10/24/2022

- Crushing order for fines buckets based on XRF reading inside the bucket of uncrushed material. Table below illustrates justification:

<u>Sample/Bucket ID</u>	<u>XRF U concentration [ppm]</u>	<u>Crushing Order</u>
CR-L-0-F	171	1
QV-L-0-F	250	2
QV-M-0-F	944	3
CR-M-0-F	1023	4
QV-H-0-F	1559	5
CR-H-0-F	4840	6

- Samples put back into same bucket after crushing. Table below shows pre- and post-crushed recorded masses:

<u>Sample ID</u>	<u>Tare [lb]</u>	<u>Gross [lb]</u>	<u>Notes</u>
CR-L-0-F Pre-Crush	2.0	16.0	
CR-L-0-F Post-Crush	2.0	16.0	
QV-L-0-F Pre-Crush	1.8	13.2	
QV-L-0-F Post-Crush	1.8	13.2	
QV-M-0-F Pre-Crush	1.4	14.4	
QV-M-0-F Post-Crush	1.8	14.4	Discrepancy likely due to being incorrectly written by lab tech. Original pan mass used for mass balance
CR-M-0-F Pre-Crush	2.2	14.6	
CR-M-0-F Post-Crush	2.2	14.4	
QV-H-0-F Pre-Crush	1.6	14.2	
QV-H-0-F Post-Crush	1.6	14.2	
CR-H-0-F Pre-Crush	2.2	16.0	
CR-H-0-F Post-Crush	2.2	15.8	

- After crushing, put samples into XRF pucks and analyzed again. Summarized in table below:

<u>Sample ID</u>	<u>XRF U Reading [ppm]</u>
U Standard	1958
CR-L-0-F	192
QV-L-0-F	313
QV-M-0-F	994
CR-M-0-F	1326
QV-H-0-F	1510
CR-H-0-F	5414

- True mass balance mixing of fines and concentrate should include F-WT suspended samples. Not enough mass to accurately mix and XRF on 0-F and 0-F-WT suspended solids not significantly different. As a result, just mixed 0-F samples since plenty of mass was available to meet the mass balance requirements.

10/25/2022

- Combined and pulverized concentrate fraction samples analyzed with the XRF again.
- Fractionation water inventory:

- CR:
 - Last combination from notes 10/13, time not recorded.
 - Pictures taken.
 - Tote 1: about 1000 L
 - Tote 2: about 50 gallons/200 L
- QV:
 - Last combination from notes 10/11, time not recorded.
 - Tote 1: about 330 gallons
 - Drum 2: small volume, not recorded
- CTS:
 - Last PSD completed on 10/17 from field forms. Last water combined in tote likely 10/18. No time recorded.
 - Tote 1 volume >700 L, <200 gallons
- CR fractionation water totes:
 - Tote 1 pumped into tote 2 for roughly equal volume
 - After equal volume reached between the two totes, around 1 gallon was pumped from each for a representative sample. Pictures taken.
- QV fractionation water tote and drum:
 - Water pumped from tote into drum until drum full at a volume of 55 gallons which roughly equates to 208 L.
 - The tote contained a remaining 1100 L for 1308 L total between the tote and the drum. For a representative sample of the water to be discharged, Disa mixed the sample in the proportions below:
 - Tote: $(16 \text{ lb})(1100/1308) = 13.5 \text{ lb goal}$
 - Goal tote water sample on tare with bucket tare of 1.2 pounds = 14.7 pounds
 - Drum: $(16 \text{ lb})(208/1308) = 2.5 \text{ lb goal}$
- Actual samples taken:
 - CR Fractionation:
 - Tare: 1.2 lb
 - Tote 1: 9.2 lb gross
 - Tote 2: 17.4 gross
 - QV Fractionation:
 - Tare: 1.2 lb
 - Tote: 14.4 lb gross
 - Tote plus Drum: 17.6 lb gross
 - CTS fractionation: since only one tote, space for masses entered into log book, but not filled in since there was no need.
- Duplicates on remaining bulk sample analyses. Bag tared when on scale, follows data in table below:

<u>Sample ID</u>	<u>Net [g]</u>
QV-H-30-SY Combined +25/+270-01	414.54
QV-H-30-SY Combined +25/+270-02	413.32
CTS-H-4-SY -270-01	304.81
CTS-H-4-SY -270-02	301.03
CTS-L-8-SY -270-01	303.14
CTS-L-8-SY -270-02	297.70

- These samples attempted to meet the goals of the table as shown below:

<u>Sample</u>	<u>Split Goal [g]</u>
QV-H-30-SY Combined +25/+270	414.66
CTS-H-4-SY -270	303.02
CTS-L-8-SY -270	300.77

10/26/2022

- Water sampled from totes on 10/25 poured from buckets into Ra and Metals bottles only.
 - o CR: All water from bucket poured into bottles
 - o QV: All water from bucket poured into bottles
 - o Some water remaining in CTS bucket, recombined remaining in bucket with water in CTS fractionation water tote

Jordan Dick Laboratory Notes

10/04/2022

- CTS-L-4-SY tab ripped at 2:52 PM. Filter solids paper still wet:
 - o Tare: 2.16 g
 - o Gross: 10.53 g
- CTS-L-4-SY still wet solids in bucket: tare 1.2 pounds, gross 6.2 pounds, net 5.0 pounds, split into 5 PSDs

10/5/2022

- CTS-L-4-SY PSD 1/5 -270 fraction split between 2 pressure filters to make faster.
- CTS-L-8-SY tab ripped at 11:56 AM. Filter paper still wet solids:
 - o Tare: 2.18 g
 - o Gross: 10.18 g
- CTS-L-8-SY still wet solids in bucket: tare 1.2 pounds, gross 6.0 pounds, net 4.8 PSDs, split into 4 PSDs

10/6/2022

- CTS-L-30-SY tab ripped at 10:24 AM. Filter paper still wet solids:
 - o Tare: 2.14 g
 - o Gross: 10.00 g
- CTS-L-30-SY still wet solids in bucket: tare 1.2 pounds, gross 6.8 pounds, net 5.6 pounds, split into 5 PSDs.

10/11/2022

- CTS-M-4-SY tab ripped at 8:15 AM. Filter paper still wet solids:
 - o Tare: 2.10 g
 - o Gross: 9.66 g
 - o Combined with PSD 3 of 3
- CTS-M-4-SY still wet solids in bucket: tare 1.2 pounds, gross 4.8 pounds, net 3.6 pounds, split into three PSDs.
- CTS-M-8-SY tab ripped at 2:06 PM. Filter paper still wet solids:
 - o Tare: 2.12 g
 - o Gross: 9.77 g
 - o Combined with PSD 3 of 3
- CTS-M-8-SY still wet solids in bucket: tare 1.2 pounds, gross 5.6 pounds, net 4.4 pounds, noted originally as split into 4 PSDs, then switched to only performing 3 PSDs.

10/12/2022

- CTS-M-30-SY tab ripped at 1:40 PM. Filter paper still wet solids:
 - o Tare: 2.12 g
 - o Gross: 12.63 g
 - o Combined with 1 of 4
- CTS-M-30-SY still wet solids in bucket: tare 1.2 pounds, gross 6.2 pounds, net 5.0 pounds, split into 4 PSDs.
- CTS-H-4-SY tab ripped 1:50 PM. Still wet filtered solids:
 - o Tare: 2.10 g
 - o Gross: 10.60 g
 - o Combined with PSD 1 of 3
- CTS-H-4-SY still wet solids in bucket: tare 1.2 pounds, gross 5.8 pounds, net 4.6 pounds, split into 3 PSDs.

10/13/2022

- CTS-H-8-SY tab ripped at 10 AM. Still wet solids on filter paper:
 - o Tare: 2.11 g
 - o Gross: 9.34 g
 - o Combined with PSD 1 of 4
- CTS-H-8-SY still wet solids in bucket: tare 1.0 pounds, gross 6.6 pounds, net 5.6 pounds, split into 4 PSDs.
- CTS-H-30-SY tab ripped 3:37 PM. Still wet filtered solids:
 - o Tare: 2.12 g
 - o Wet Weight not filled in
- CTS-H-30-SY still wet solids in bucket: tare 1.2 pounds, gross 6.8 pounds, net 5.6 pounds, split into 4 PSDs.
- (It should be noted that many of these did not get split per the 500 grams per deck rule used for the others. This is because of the large portion of fine material and its tendency to all report to the first PSD, leaving little for the remaining PSDs to be retained on fractions greater than 270-mesh, negating the need to split the samples further than they were).