

2019 UDOT RESEARCH PROBLEM STATEMENT

*** Problem statement deadline is Feb. 6, 2019. Submit statements to UTRAC@utah.gov. ***

Title: Brine Pond Filtration

No. (Office Use): 19.02.02

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Select **ONE** Subject Area Materials/Pavements Maintenance Traffic Mgmt/Safety Structures/Geotech
 Planning Perf Mgmt/Data Analytics Public Transportation Other

1. Describe the problem to be addressed:

Remove contaminants that settle in UDOT maintenance station retention ponds such that the water can be used for making brine or possibly discharged into Municipal sewer systems.

2. Write the project objective (25 words or less):

Investigate a low cost solution to skimming and vacuuming retention ponds using sand or composite filtration. Other considerations such as a hydrodynamic separator could be also used.

3. Explain why this research is important:

(In response, consider addressing specific UDOT goals, applicability in Utah or other states, etc.)

Currently UDOT has issues with contamination in retention ponds that inhibit the use of the water for other purposes. Contaminates come from decanting highway sweeping, washing snow plow trucks and other equipment. It may be possible to use a low cost sand filtration system to remove contaminants.

4. List the major tasks:

1. Research existing swimming pool technology, including filtration, skimmers and vacuum technology that could easily be adapted to existing system pumps (at stations with brine making operations).
2. Research possible fixed and mobile containers that would be suitable to hold filtration medium
3. Set up an automated skimming project at a station to demonstrate feasibility. Preferably a station with a membrane liner
4. Determine best gradation and or composite filtration setup that can be either removed from the site or "vactor'd" out and disposed of.
5. Test before and after conditions in the pond (Sediment removal and/or water testing)

5. List the expected deliverables (reports, manual, specification, design method, training, etc.):

1. Design of filtration solution that can be both fixed and build on a mobile platform.
2. Before and after contamination/sedimentation measurements
3. Cost estimate and ROI calculations.
4. Final Report and recommendations

6. Describe how the research results will be implemented:

(In response, consider addressing UDOT leader support, process or standard improvement, etc.)

If successful, this low cost approach to cleaning detention ponds can help UDOT maintain ponds in a cost effective way. It could also be an effective method to remove contaminants from the pond and water.

**7. Requested from UDOT: \$65,000
(or UTA for Public Transportation)**

Other/Matching Funds: \$

Total Cost: \$65000

8. Outline the proposed schedule, including start and major event dates:

- Task 1: June-July
- Task 2: June-July
- Task 3: July – September
- Task 4: July – November
- Task 5: July – January 2020

Material Costs:

- Poly Tank
- Pumps, Valves
- Dump Trailer
- Pool Skimming Equipment
- Sand/medium
- Carbon filter
- Water Testing
- Sediment Testing
- Sand Filter Testing