Scope of Work

2015 Ambient HCl near the Great Salt Lake
Project Period: June 15, 2015 – December 31, 2015

Investigators:
Randal S. Martin, Utah State University-

Project Background

In addition to the potential of the meteorology and spatial dynamics of the Great Salt Lake (GSL) to modify the behavior of tropospheric ozone (O_3), it has been speculated that atmospheric chlorine, either from the GSL or nearby industrial sources, may significantly add to the oxidative capacity of the local atmosphere. Atmospheric chlorine is a strong oxidant and well known to initiate photochemistry via reactions with various common hydrocarbons. However, there are little recent observations of atmospheric chlorides along the Wasatch Front. Stutz et al (2002) measured chlorine oxide (ClO), as well as bromine oxide (BrO), on the southeast shore of the GSL during October 2000, and suggested potential atmospheric hydrochloric acid (HCl) concentrations of around two parts per billion (2 ppb). Establishing a network of passive samplers, specific to HCl, would allow the mapping and determination of HCl around the GSL and may give insight to its contribution to local ozone photochemistry. As such, and related to the 2015 Great Salt Lake Summertime Ozone Study (GSL SO_3S), the overall objective of the proposed study is:

- Using an array of passive samplers, assess the ambient concentrations of gas-phase hydrochloric (HCl) acid near the Great Salt Lake for up to three (3) separate sampling periods throughout the summer and early fall of 2015.

Investigators from USU and the Utah Water Research Laboratory (UWRL) will collaborate with UDAQ/AMC personnel in the study by organizing the final study plan, preparing, deploying/collecting the samplers, conducting laboratory analysis, and compiling the results.

Task Descriptions

1) Dr. Martin will attend and participate in all associated project planning, data, and report meetings;

2) The Dr. Martin will oversee the purchase of the required materials and supplies and the pre-deployment development of the required analytical protocols,
    a. Including development of the sample elution and ion chromatographic analytical techniques ;

3) Dr. Martin, USU/UWRL team, and UDAQ personnel will cooperatively deploy and recover 10-12 passive samplers from the chosen sampling locations for up to three (3) individual sampling periods (as chosen in consultation with UDAQ investigators);

4) Samples from the tests will be analyzed, compiled, and included in the interim and final reports, as desired by UDAQ;

Deliverables

Dr. Martin and the USU/UWRL student will compile and prepare a final report describing the overall experiment and the analyzed results no later than December 31, 2015. As to be determined by the collected data, suggestions for "next steps" and potential for follow on research will be discussed.

Schedule, Cost, and Team Roles

The overall proposed schedule is approximately 6 months (June 15, 2015 – December 31, 2015) at a total cost of $9,878. Projected milestones are:

- June/July 2015 Logistic/organizational meeting with DAQ personnel
  - development of sampling and laboratory protocols
- July-Sept. 2015 Up to three (3) deployments of approximately one (1) week each
  - Including subsequent sampling and analysis
- Oct. 15, 2015: Preliminary results from 2015 field deployments summarized to UDAQ.
- Dec. 31, 2015: Final report to UDAQ

The budgetary breakdown for the USU requested funds is shown below in Table 1. Dr. Randy Martin (USU) will service as the USU PI and a USU undergraduate graduate student will also be involved with equipment preparation, deployment, and data analysis and compilation.

Table 1. USU Budget June 15, 2015 – December 31, 2015**6**

Personnel: PI (Dr. Randy Martin; 0.25 months)	$2,287
Personnel: Students (Undergraduate, 118 hrs)	$1,475
Benefits: Faculty 45%, Student 8.2%, Student Insurance	$1,150
Travel: multiple trips to SLC and around GSL	$1,050
Materials & Supplies	$2,346
Env. Quality Lab Usage & Tuition	$664
Allowable Indirect Costs (10% of all non-equipment costs)	$897
Total Direct Costs	$8,971
Total Budget	**$9,868**