



## Applied Soil Water Technologies

56 Coney Island Drive  
Sparks, NV 89431

775.284.5500 Phone  
775.284.5504 Fax

[www.appliedsoilwater.com](http://www.appliedsoilwater.com)

June 11, 2015

Truckee Meadows Water Reclamation Facility  
8500 Cleanwater Way  
Reno, NV 89502

Attn: Mr. Michael A. Drinkwater, P.E.  
Treatment Plant Manager

RE: **Proposal for RIB Field Investigation  
Boneyard Flat Detention Facility  
North Spanish Springs, Nevada  
Proposal P15.174**

Mr. Drinkwater

Applied Soil Water Technologies, a dba of Geo-Logic Associates, Inc., (GLA-ASW) appreciates the opportunity to submit this proposal to perform a field investigation of Truckee Meadows Water Reclamation Facility's (TMWRF) Boneyard Flat Detention Facility (Boneyard Flat), north of Sparks, Nevada. The field investigation will support the ongoing effort to evaluate Boneyard Flat for potential rapid infiltration basin (RIB) suitability. This proposal outlines our understanding of the project, the necessary scope of services, and provides an estimate of the fee for our services, including subcontractors.

### A. PROJECT INFORMATION

TMWRF is searching for a suitable RIB location capable of infiltrating approximately 2,500 acre-feet of treated effluent annually over an approximate four (4) month period, December through March. Boneyard Flat in North Spanish Springs, is a potential RIB location that is located nearly adjacent to an existing TMWRF treated effluent pipeline. It is understood that the RIB would likely operate for only two years, however, the design needs to consider the potential for operation of a much longer duration.

GLA-ASW has already completed a desktop preliminary evaluation of Boneyard Flat, which is discussed in a letter report dated January 21, 2015, titled *Preliminary Infiltration Evaluation, Boneyard Flat Detention Facility, North Spanish Springs, Nevada, Project No. 2015.R001*. The preliminary evaluation utilized data obtained from the Boneyard Flat design report, in addition to, data obtained from

desktop research, to assess the site for potential RIB suitability and estimate the amount of water that could be infiltrated.

Various meetings have taken place subsequent to the preliminary evaluation letter report. A meeting with Nevada Department of Environmental Protection-Bureau of Water Pollution Control (NDEP-BWPC) on April 03, 2015, during which it was inquired whether a Temporary Discharge Permit could be obtained to perform a large-scale infiltration test within Boneyard Flat. NDEP-BWPC responded that a test could be conducted under a Temporary Discharge Permit, however, there could be no outfall from the basin and TMWRF would need to ensure that a known nitrate contamination plume to the south of Boneyard Flat would not be affected. A subsequent meeting was held on April 24, 2015 with representatives of Truckee Meadows Water Authority (TMWA) and Washoe County to discuss the plan and obtain additional details concerning the known nitrate contamination. Upon completion of the meeting it was agreed that GLA-ASW would prepare a scope of work to perform a field investigation to further evaluate Boneyard Flat for RIB suitability and to assist TMWA in estimating potential effects on the known nitrate contamination plume and other wells in the area. More specifically, GLA-ASW would perform drilling, sampling, and laboratory testing to obtain parameters that TMWA would utilize in their groundwater model.

## **B. GENERAL APPROACH**

GLA-ASW will perform a subsurface investigation of Boneyard Flat, in order to, confirm geologic and hydrogeologic observations presented in the design report, collect samples for laboratory testing, perform downhole infiltration testing, and coordinate and manage laboratory testing, including column attenuation tests utilizing effluent provided by TMWRF:

- Five (5) borings (estimated to be between 45-60 feet each);
- Three (3) falling-head hydraulic conductivity tests (TMWRF to provide access to water);
- Laboratory tests including:
  - Fifteen (15) material classification; Grain-Size-Distribution (ASTM D422) and Atterberg Limits (ASTM D4318);
  - Thirty-three (33) moisture/density tests;
  - Ten (10) flexible wall hydraulic conductivity tests (ASTM D5084); and,
- Coordinate and manage column attenuation tests simulating three (3) borings and utilizing effluent provided by TMWRF;
- As a minimum, six (6) pore volumes from each column will be analyzed for NDEP Profile II parameters;
- Provide a letter report, including:
  - i. A description of the subsurface investigation and laboratory testing;



- ii. Results of downhole hydraulic conductivity tests;
- iii. Results of laboratory tests, including column attenuation tests;
- iv. Discussion of the subsurface stratigraphy and evaluation of NDEP Profile II analyses in the context of proposed RIB operation;
- v. Conclusions and recommendations concerning the suitability of Boneyard Flat for RIB operation.

GLA-ASW proposes teaming with TKT Consulting, LLC (TKT) who would provide an evaluation of the pore volume Profile II analyses and an opinion regarding geochemical considerations with respect to RIB suitability.

GLA-ASW will plot the location of each boring based on field measurements, however, this proposal does not provide for an accurate survey by a licensed land surveyor.

#### D. COST ESTIMATE

The estimated total fees for the scope of services described above are \$105,550. The estimated total cost break down is presented below:

Task	Cost Estimate
<b>Task 1 Field Investigation*</b>	
GLA-ASW Engineering and Management	\$10,310
Drilling Subcontractor	\$15,190
<b>Subtotal Task 1</b>	<b>\$25,500</b>
<b>Task 2 Laboratory Testing**</b>	
Management	\$2,520
Geotechnical Laboratory Testing	\$11,000
Column Testing	\$15,530
<b>Subtotal Task 2</b>	<b>\$29,050</b>
<b>Task 3 Project Management, Data Evaluation, and Letter Report</b>	
Project Management	\$1,890
Data Evaluation	\$19,115
Letter Report	\$15,190
External Meetings (1 TMWRF, 1 NDEP)	\$2,805
<b>Subtotal Task 3</b>	<b>\$39,000</b>
<b>Estimated Project Subtotal</b>	<b>\$93,550</b>
<b>Contingency***</b>	<b>\$12,000</b>
<b>Estimated Project Total</b>	<b>\$105,550</b>

\* The field investigation assumes five (5) borings for an estimated total combined depth of 275 feet. Should it be necessary to drill deeper additional costs will be applicable.

\*\* The column test cost estimate assumes only six (6) pore volumes from each of the three (3) column tests would be analyzed. This number may increase based on the subsurface variability observed in the borings. The unit cost for a Profile II analysis is \$390. Once the borings have been completed a more detailed column test plan will be developed, including revised cost estimate, and submitted for approval.

\*\*\* Contingency will only be used after prior written approval from TMWRF.



All work will be billed on a time and materials basis in accordance with the rates presented below. Should it be necessary to expand our services beyond those outlined in this proposal you will be notified immediately and a supplemental proposal stating the additional services and fee will be issued. GLA-ASW will not proceed without approval of TMWRF.

GLA-ASW Rate and Price Schedule

Senior Engineer, Rob Valceschini, P.E.	\$ 170.00/hour
Senior Hydrogeologist	\$ 200.00/hour
Project Engineer	\$ 125.00/hour
CAD Design	\$ 125.00/hour
Staff Professional	\$ 90.00/hour
Geotechnical Clerk	\$ 65.00/hour
Lab Tech	\$ 65.00/hour
Per Diem	Cost
Vehicle	IRS std. mileage rate
Subcontractors	Cost + 15%
Equipment	Cost
Field/Lab Supplies	Cost
Copies/Photos/Permits	Cost
Delivery charges	Cost
Travel Expenses	Cost
Communication Charges	0.75% of labor

TKT Rate and Price Schedule

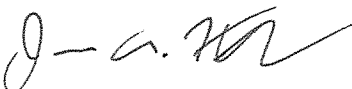
Principal Chemist, Tim Tsukamoto, Ph.D.	\$ 150.00/hour
Per Diem	Cost
Vehicle	IRS std. mileage rate
Subcontractors	Cost + 15%
Equipment	Cost
Field/Lab Supplies	Cost
Copies/Photos/Permits	Cost
Delivery charges	Cost
Travel Expenses	Cost
Communication Charges	0.75% of labor

**E. CLOSURE**

We appreciate the opportunity to provide this proposal and look forward to the opportunity of working with you. Should you have any questions or wish to discuss this proposal please do not hesitate to contact us at (775) 284-5500.

Very respectfully,

**Applied Soil Water Technologies**



Jason A. Hefner, P.E.  
Project Engineer



Robert B. Valceschini, P.E.  
Principal/Senior Engineer

