

# SUPPORT FOR CONTRACTOR REQUEST

**CONTRACTOR:**

David Groeneveld

**RATE:**

(unchanged from previous contract)

**PERIOD OF PERFORMANCE:**

November 30, 1999 through November 30, 2000

**STATEMENT OF WORK:**

David Groeneveld's contribution to CNWRA's evaluation of data and models that DOE is developing for the Yucca Mountain license application lies in the area of hydrologic effects related to vegetation both under present day and under future climatic conditions. His tasks fall into three categories: (1) contribute to the vegetation and future analog portions of the shallow infiltration compendium report for Yucca Mountain; (2) contribute to the work on future recharge estimates for the saturated zone regional groundwater flow model; (3) retain a scientific notebook as appropriate; and, (4) review documents used by DOE for the YM license application that are related to vegetation and its effect on hydrology.

1. For the shallow infiltration report, David is collecting and organizing DOE and CNWRA work on past and present day vegetation. This work has been ongoing over the past few years and will culminate in four reports that will be used as input to various sections of the shallow infiltration report:

- A description of past, present, and likely future vegetation assemblages for YM;
- The effects of plants on soil moisture and infiltration including a discussion of parameters used in the vegetation model being developed by CNWRA and recommended parameter values, ranges, and their basis;
- A discussion of future climate analog sites for YM including features needed for their incorporation into the future infiltration estimates for YM;
- Input to the evaluation of environments of focused infiltration at YM including a review of CNWRA shallow infiltration field work at YM and analyses of air photographs.

In addition, David will be the lead author on at least one journal article pertaining to the hydrologic effects of vegetation on infiltration at YM.

Deliverables: Draft versions of these reports due January 31, 2000 in Word Perfect format.  
Final version of journal article due April 30, 2000 in journal format.

2. For regional recharge, David will contribute as needed to the work on bounding estimates of future recharge for the regional saturated zone scale model for YM. His contribution to this work is currently limited to analysis of satellite and air photographs to delineate areas of potential vegetation changes that will effect recharge.

Deliverable: Letter report (Word Perfect format) and map (digital format) due June 30, 2000.

3. For the scientific notebook, David will maintain his notebook following the instructions in QAP-001. At the end of any project, his scientific notebook will be turned in for QA approval.

4. For the review of documents, David's expertise on plants and their effect on hydrologic processes and his familiarity with government regulations in regards to natural resources will be called upon as needed to assist CNWRA. No deliverables are currently scheduled.

Additional activities may be identified in the future.

**ESTIMATED UTILIZATION:**

200 hours

**PRIOR CONTRACTOR WORK EXPERIENCE WITH SWRI:**

This contract will be an extension of an existing consulting agreement.

**PROGRAMMATIC NEED FOR CONTRACTOR WORK:**

This work supports the Unsaturated and Saturated Flow Under Isothermal Conditions KTI program and will provide an independent basis for evaluating related work being conducted by the DOE in support of their TSPA, SR, PMRs and AMRs.

**LIST OF ELIGIBLE CONSULTANTS CONSIDERED:**

Dr. Groeneveld has extensive experience mapping and analyzing vegetation in arid to semi-arid regions of the Great Basin Desert of California, Nevada, and Utah, as well as in semi-arid regions of Colorado and New Mexico. In particular, Dr. Groeneveld has evaluated re-vegetation programs for riparian habitats in the lower Owens Valley, conducted a detailed groundwater discharge survey in the Carbonate Aquifer Province of Nevada and Utah using aerial photographs and LANDSAT data, and studied how plant growth may be used to stabilize those portions of the lakebed of Mono Lake exposed by diversion of inflows. There are relatively few natural resource consultants who have specific expertise in the plant ecology of the southern Great Basin and norther Mojave Deserts.

**RATIONALE FOR SOLE/SINGLE SOURCE SELECTION:**

This is a continuation of prior work. Dr. Groeneveld's work for us on earlier phases of this project has been excellent, therefore, we have not sought other eligible consultants.

**RATIONALE FOR NOT USING SwRI RESOURCES:**

There are no resources at SwRI that can accomplish this work.

**PROJECT NUMBER:**

20-01402.861