

Model-Understanding-Report-MM_05.doc (written by Chuck)

~11/05

Project will be completed in phases. With each phase project team members will formally review progress, revise workplan, and identify experiments and modifications to write-ups.

- 1) Develop work plan which identifies model experiments, objectives and timetable.
 - a. The work plan should reduce the experiments to the simplest possible simulations.
 - i. The model study area should be limited such that a full review of system hydraulics, model input, and impacts can be completed.
 - ii. Possibly Upper Republican Basin (e.g. 50% QWR and 15% Upland)
 - iii. Possibly Mound Credit
 - b. Team members should meet at the beginning of the project to outline the project phases, first set of experiments in workplan, identify reporting requirements, naming conventions, etc.
- 2) Perform experiments.
 - a. Experiments will be performed as a cooperative effort between MMA and Nebraska DNR.
 - b. All specifications to models will be written up and displayed in figures.
e.g.,
 - i. Pumping
 - ii. ET
 - iii. Recharge (Precipitation, GW return flow, SW return flow, Canal Seepage)
 - iv. Aquifer Transmissivity, Hydraulic Conductivity
 - v. Aquifer Storage
 - vi. Constant head elevations
 - vii. Etc.
 - c. Experiments should include at a minimum all simulations normally required for calculating impacts, i.e. pumping and non-pumping.
 - d. The first set of analyses should strive to provide a **complete understanding** of the groundwater/surfacewater system as specified in the model. The understanding should be achieved before any other analyses are completed.
 - e. Subsequent to this first set of analysis the tools and understanding developed in the simple model case could be expanded to the remainder of the basin.
- 3) Analyze results (to be further detailed in work plan)
 - a. Create water table and drawdown maps that are focused on the model study area and regions.
 - b. Compare stream level elevation with groundwater elevation along streams
 - c. Complete mass balance calculations on local and regional scale to analyze flow components under pumping and non-pumping conditions
 - d. Complete particle tracking to identify groundwater capture zones and identify time of travel.

- 4) Report on the results.
 - a. After each phase of study a formal report should be prepared including figures
 - b. The audience for the reports should be Republican River groundwater user.
 - c. Results of the first phase of experiments should be presented both in a report and in a meeting in Nebraska.
 - d. Results of the final experiments should be presented in a report and a meeting in Nebraska.
- 5) Resources
 - a. It is important to dedicate the time and resources for this project. All programs and tools developed for this project will be useful in analyzing the complete compact model as well as that of other models in Nebraska.