Briefing Paper for the
Utah Legislature Executive Appropriations Committee
Regarding
Ground Water Management Planning in Beryl -Enterprise Utah
April 7, 2008

Beryl-Enterprise Ground Water System

The Beryl-Enterprise area that contributes to the ground water flow system is shown in Figure 1. The USGS has a long-term water level monitoring program that reports on 48 wells[i], numerous hydrologic studies have been conducted, and a ground water numerical model exists which reasonably predicts conditions of the basin[ii]. The long-term average annual recharge to the Beryl-Enterprise area is estimated to be 34,000 acre-feet per year[iii]. Withdrawals for the period 1995-2004 averaged about 85,000 acre-feet (see Figure 2). There are currently over 1,900 underground water rights approved in the area permitting over 110,000 acre-feet of diversion and 63,000 acre-feet of depletion per year. Well (C-36-16) 31acc-1, located about 4 miles northeast of Enterprise, has experienced a water level decline of over 120 feet since 1941[iv], (see Figure 3). Subsidence and earth fissures as shown in Figure 4 formed in the valley in 2005 as a result of ground water level decline[v].

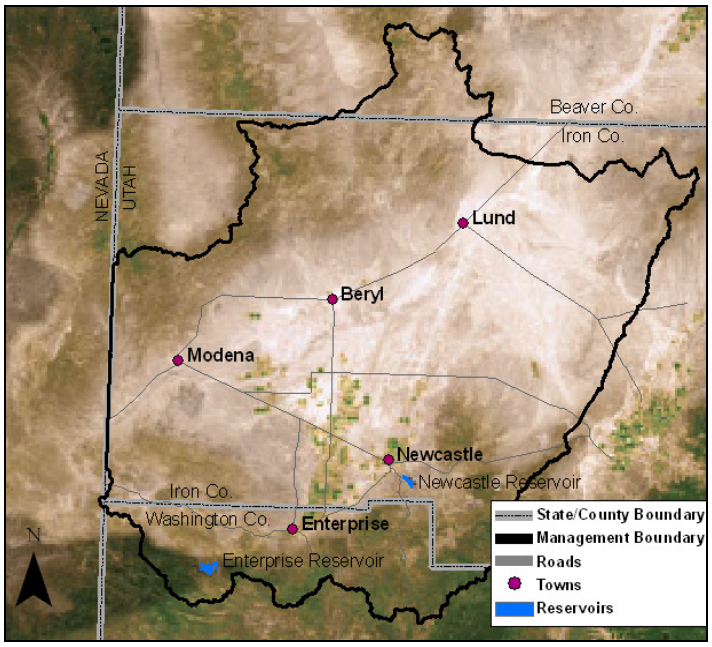

Figure 1 - Beryl- Enterprise Ground Water Management Plan Area

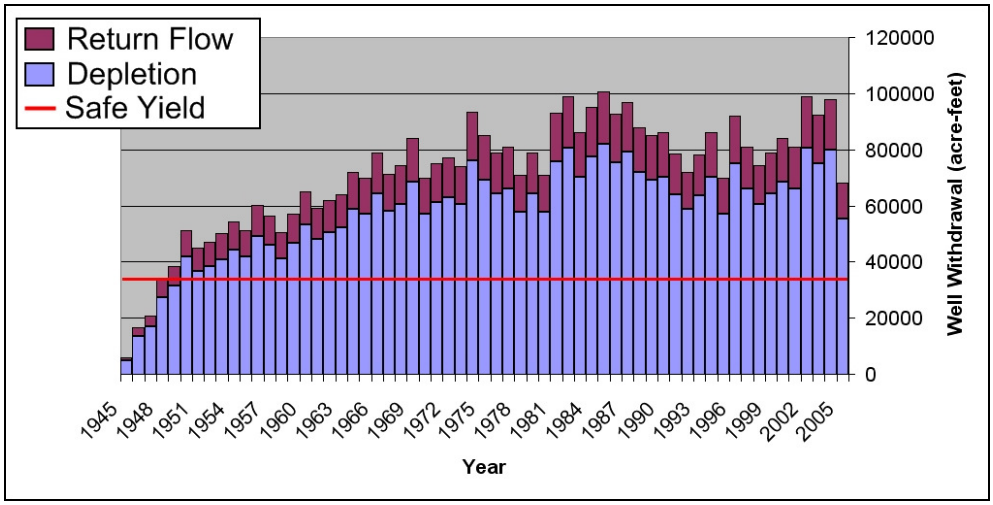

Figure 2 - Estimated Well Withdrawals, Depletion, and Safe Yield in the Beryl-Enterprise Area.

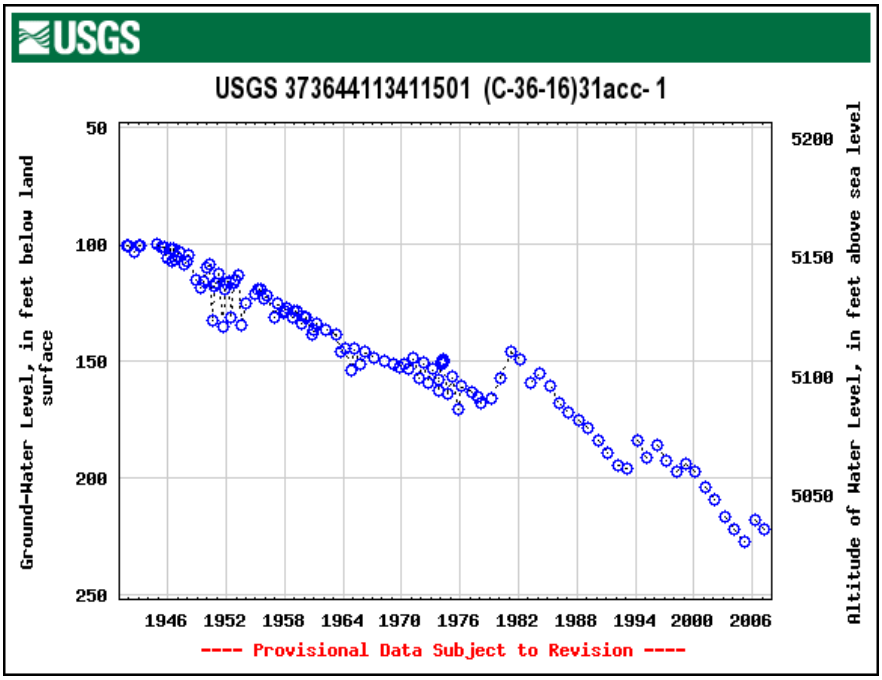

Figure 3 – Water level well (C-36-16)31acc-1, located 4 miles northeast of Enterprise, from 1941 to 2006.

Figure 4 - Earth Fissures in the Beryl – Enterprise area as a result of ground water level decline (2005)

Legislation Background

In 2003 the state engineer took the issue of ground water mining (Withdrawals which exceed recharge to the system) to the legislature to get clarification of the law and provide public policy as to how Utah would address this sensitive and far-reaching issue. Currently in the State there are 6 basins experiencing mining and 7 basins that are over appropriated based on the amount of paper water rights approved. When the amount of water withdrawn exceeds recharge, ground water levels decline, water quality generally decreases, the potential for land subsidence increases, wells need to be drilled deeper, and pumping costs increase. A legislative Water Issues Task Force was created to study and recommend legislation to deal with this issue (and several other water issues). The Task Force spent the 2005 Interim period studying this issue, held numerous meetings and visited the Beryl Enterprise area. The result of the task force's efforts was House Bill 228 introduced in the 2006 General Session. The legislation passed in 2006 (unanimously in both the House and Senate) set forth the policy that Utah wants to manage it's ground water resources on a safe yield basis (sustainable) and set forth the guidelines for the state engineer to adopt ground water management plans. The legislation gives the state engineer clear directives to manage ground water and flexibility to deal with basins that are already experiencing overdrafts.

House Bill 228 amended section 73-5-1 and enacted section 73-5-15 of the Utah State Code. This section of the code titled "Groundwater Management Plan" indicates the objective is to limit ground water withdrawals to safe yield[vi], protect the physical integrity of the aquifer, and protect water quality. The key components in developing a ground water management plan as stated in statute are as follows:

- Notice is to be provided inviting water users and the public to participate in the development process.
- The state engineer is to use the best scientific method available to determine safe yield.
- If withdrawals exceed the safe yield the state engineer is to regulate based on priority date regardless of the nature of use unless a voluntary arrangement exists.
- The state engineer is to allow for **gradual implementation** based on economics or other impacts to an individual water user or a local community if a plan is required to bring diversions back to safe yield.
- Water users may participate in voluntary arrangements rather than have their water rights distributed strictly by priority.
- A ground water management plan adopted by the State Engineer before this legislation remains in force.

Beryl-Enterprise Ground Water Management Plan Work Activities

There are 11 existing ground water management plans throughout the state. The Beryl-Enterprise ground water system is the first area of the state where a new management plan is being developed under the legislation enacted in 2006. The following steps have been taken in the development of the management plan:

- Notice was sent to all water users and other entities identified in the ground water management plan statute inviting them to participate in the development of a plan.
- A website was created where information on the planning process can be obtained.
- Safe yield was estimated for the area as 34,000 acre-feet / year.
- The water right records have been and continue to be reviewed for accuracy. A priority listing of water rights was created.
- The division of water rights contracted with Dr. John Keith, a professor of economics at USU, to consult and provide expertise on the economic impacts of potential management scenarios.

Public Meetings Held

Three local public meetings have been held to present data and information, inform the public of issues, and solicit comments, public debate and questions from the local water user community.

- March 13, 2007 Public Meeting Topics Covered:
    - Key components of code titled "Groundwater Management Plan" (73-5-15);
    - Identified hydrologic data and information that will be reviewed;
    - General methodology that would be employed for assessing the economic consequences of a Ground water Management Plan.
- August 6, 2007 Public Meeting Topics Covered:

    - Definitions of ground water management terms and issues;
    - Presentation of 5 alternative management scenarios;
    - Discussion of status and use of water right records in management planning;
    - Safe yield estimate of 34,000 acft /year calculations.
- January 10, 2008 Public Meeting Topics Covered
    - Economic impacts / alternatives of implementing ground water management plan;
    - Draft phased implementation schedule (see Table 1);
    - Proposed an adaptive management approach by continually metering / monitoring data;
    - Discussed that nature of voluntary arrangements;
- Comments have been received from all meetings and responses to the questions and clarifications were or will be mailed to the water users.

Voluntary Arrangement Discussions

The Escalante Water Users Association (EWUA) has proposed a voluntary arrangement. Recognizing their interest, the State Engineer is working with the EWUA on the details of the arrangement. The discussion has included 8 conference calls and 7 meetings. The following has been discussed:

- Protection of existing domestic and municipal uses by redistributing the cuts across the irrigation uses, with financial compensation to those affected;
- Creating a special water district to manage the water rights within the voluntary arrangement that also has the authority to assess water users;
- Requesting financial assistance from the government for the redevelopment of the rural economy and the stabilization of land taken out of production;
- Water regulation phased implementation schedule which represents a gradual implementation;
- Purchase and retirement of water rights as a mechanism for reduction in diversion.

Preliminary Proposed Plan

The state engineer has proposed some basic elements of a plan and continues to seek public comment and discussion on the overall issue and specifically on the following items:

- The timeframe for the gradual implementation of any proposed plan (Table 1 represents the proposal);
- An adaptive monitoring and management approach that adjusts regulation as physical evidence suggests success reaching the safe yield objective;
- Any other data and information that the public believes should be taken into account;
- Economic impacts and how they might be further addressed in implementation of a plan.

Planned Activities

- Additional meetings to continue discussing economics, elements of a potential management plan, voluntary arrangements and other related topics;
- Implementation of surface water monitoring to better understand existing depletions;
- Continued discussions with EWUA to develop a voluntary arrangement;
- Refinement of and general adoption of final management plan;
- Drafting of legislation to allow for the creation of a special ground water district.

Conclusion

No date has been set for the plan to be completed and we are committed to work through this issue with the community. The water users in the Beryl Enterprise area followed the law in making water right applications, investing their money and efforts in making their farms productive, and they are very effective and efficient farmers who have large investments in their land and water. This is a difficult issue. Hopefully we can work with the water community to develop a plan to mitigate the impacts on individuals, families and the community and still solve the ground water mining issue. If we leave this problem for the next generation to resolve it will only get worse.

Table 1 - Proposed Draft Plan Implementation Schedule

Phase	Percent Reduction	Acre Feet Reduction*	Cumulative Percent Reduction	Cumulative Acre Feet Reduction*	Time Frame	Cumulative Years	Date From January 1, 2008
1	5%	3,181 acft	5%	3,181 acft	20 yr	20 yr	Jan. 1, 2028
	5%	3,181 acft	10%	6,362 acft	20 yr	40 yr	Jan. 1, 2048
2	5%	3,181 acft	15%	9,544 acft	10 yr	50 yr	Jan. 1, 2058
	5%	3,181 acft	20%	12,725 acft	10 yr	60 yr	Jan. 1, 2068
	5%	3,181 acft	25%	15,906 acft	10 yr	70 yr	Jan. 1, 2078
3	10%	6,362 acft	35%	22,268 acft	10 yr	80 yr	Jan. 1, 2088
	10%	6,362 acft	45%	28,631 acft	10 yr	90 yr	Jan. 1, 2098

* Reductions based on percent of total depletion. There is currently an estimated value of 63,624 acft of total depletion for the area.
** If safe yield is reached during any phase of the plan then future phases will not be implemented.

[i] Burden. C.B., and others, 2007, Ground-water conditions in Utah, spring of 2007: Utah Division of Water Resources Cooperative Investigations Report no. 48, 129p

[ii] Reference list for hydrologic reports: , online: <http://www.waterrights.utah.gov/groundwater/ManagementReports/BerylEnt/Reference%20List.htm>

[iii] Greer, James, 2008, online: <http://www.waterrights.utah.gov/groundwater/ManagementReports/BerylEnt/SYEstimate.pdf>, Safe Yield Estimate for the Beryl-Enterprise Area, April, 2008

[iv] USGS Ground-Water Data for Utah, 2006, online: <http://waterdata.usgs.gov/ut/nwis/gw>, United States Geological Survey, accessed during October, 2007.

[v] Lund, William R, DuRoss, Christopher B, Kirby, Stefan M, McDonald, Greg N, Hunt, Gary, Vice, Garrett S., 2005, The Origin And Extent Of Earth Fissures In Escalante Valley, Southern Escalante Desert, Iron County, Utah, Special Study 115 Utah Geological Survey - Utah Department Of Natural Resources

[vi] "Safe yield" means the amount of groundwater that can be withdrawn from a groundwater basin over a period of time without exceeding the long-term recharge of the basin or unreasonably affecting the basin's physical and chemical integrity.