

GROUNDWATER RESEARCH SUBCOMMITTEE MEETING RECORD

TIME AND DATE:

9:00 AM, January 22, 2004

LOCATION:

Texas Commission on Environmental Quality Campus, Bldg. F, Room 2210, 12100 Park 35 Circle, Austin, TX 78753

PURPOSE OF MEETING:

Regular business meeting

AGENCIES/ENTITIES REPRESENTED:

Bureau of Economic Geology [BEG]
Edward Aquifer Authority [EAA]
Syngenta International AG [Syngenta]
Texas A&M University [TAMU]
Texas Commission on Environmental Quality [TCEQ]
Texas Department of Agriculture [TDA]
Texas Department of Health [TDH]
Texas State Soil & Water Conservation Board [TSSWCB]
Texas Water Development Board [TWDB]
Texas Water Resources Institute [TWRI]
United States Geological Survey [USGS]

ATTENDEES:

Bridget Scanlon	BEG, Co-chair of the GW Research Subcommittee of the TGPC
Dr. Allan Jones	TWRI, Co-chair of the GW Research Subcommittee
Mary Ambrose	TCEQ, Chairman of TGPC
Richard Eyster	TDA
Lynne Fahlquist	USGS
Ken Ofunrein	TDH
Joseph L. Peters	TCEQ
Shirley Wade	TWDB
Kevin Wagner	TSSWCB

VISITORS:

Jeff Cunningham [TAMU]
Geary Schindel [EAA]
Ed Baker [Syngenta]

MEETING SUMMARY:

Dr. Scanlon, Co-chair, started the meeting, at 9:05 AM by having everyone introduce themselves. Mr. Richard Eyster was introduced as the new representative for TDA, replacing Ms. Jeanette O'Hare.

Dr. Scanlon suggested that she forward to Mr. Eyster a number of emails from Ms. O'Hare concerning TDA's research needs, so that he could reevaluate them and perhaps resubmit them as a list of research needs for TDA. Dr. Scanlon also asked Mr. Wagner about TSSWCB's research needs. He replied that the TSSWCB had no need for any basic research, of which he was aware, but occasionally has need of monitoring aimed at evaluating the effectiveness of implemented projects.

Ms. Ambrose stated a research need, a need recently expressed at a recent meeting of the Senate Select Subcommittee on Water Quality, of mapping effective recharge with respect to the various aquifers. The Select Subcommittee has asked the TWDB to compile this map based on the GAMs. The map's usefulness would be in indicating which aquifers could be further developed and which ones have already been over developed. Dr. Scanlon brought up the fact that the BEG had recently done a recharge report for TWDB which gives tables of recharge for the various aquifers based on various techniques of determining recharge. However, the work needs to be supplemented with more field studies. The report can be found on Dr. Scanlon's website.

Discussion brought up a specific interest in knowing as much as possible about the aquifers in West Texas. Mr. Eyster indicated that the TDA is very interested in the water situation in West Texas. Dr. Jones mentioned the importance of knowing about salinity and other water quality issues in the aquifers including how salinity is affected under various scenarios. Desalinization is another important issue. The TWDB is involved with desalinization and other issues concerning groundwater in West Texas.

There was some discussion on using 319 funds for groundwater work. These funds cannot be used to do research as such, but they can be utilized for monitoring and evaluating implementations. A major example would be monitoring the effectiveness of BMPs, such as storm water BMPs. It would be useful to monitor whether the BMPs consistently remove the constituents that they were designed to remove, as well as monitoring other constituents that may also be removed. The evaluation of BMPs would be important in general, but especially important to the Edwards Aquifer.

In the subject area of storm water, Dr. Scanlon mentioned that, in responding to an EAA request for research ideas, she suggested that an investigation could be made into the use of topographical depressions, in residential areas, to intercept runoff and thereby minimizing runoff.

Another area of concern is the effectiveness of impervious covers and what are the design characteristics that they should have. Will BMPs increase the effectiveness of an impervious cover?

Dr. Scanlon mentioned that the Groundwater Monitoring Council, this May, would include a groundwater/surface water interaction short course. She went on to describe how it seems that many people don't realize that often more than half of surface water comes from groundwater. Sometimes, by using BMPs to minimize surface run-off, they may be just time-lagging the surface water input. The infiltration into the groundwater is increased, nevertheless much of it eventually reemerges into the surface water. This type of research – evaluating whether BMPs are achieving the desired result – would be a valid use of 319 funds.

Ms. Ambrose explained how EPA Region 6 had been flexible in the past in allowing the use of 319 money for monitoring and some up-front development as long as there was some type of deliverable in the end. These could be either technical guidance documents, educational materials, or recommendations, based on the research, that could be folded into an implementable program or recommendations document. Dr. Scanlon added that the results of this type of research could also be used in the development of rules such as for the Edwards Aquifer Authority. Dr. Jones pointed out that this type of evaluation of projects is important in general for the sake of accountability, to be able to say that when you do this then this is the effect, or be able to quantify the reduction of pollution or the increase in available water from a particular project.

Mr. Wagner informed the group about a couple of projects that the TSSWCB was submitting to EPA. The first is to convert to drip irrigation over the Seymour aquifer. This would be both for conservation of water and to get better control on the leaching of nutrients from the root zone, especially nitrogen. The second proposed project, which actually comes from the Blackland Research Center, is to do well plugging demonstrations within the Leon River watershed. The plan is to plug several old hand dug wells in each county along the watershed.

In commenting on the first of these proposed projects, Ms. Ambrose pointed out the large potential of leaching nutrients and pesticides from tail water ponds. Drip irrigation eliminates the need for tail water ponds. Dr. Jones brought up the need for economic and policy analysis. There is a question of whether an improved technology such as drip irrigation will be widely accepted. There will need to be an economic or other advantage to drive adoption, if the technology is to be successful. Dr. Scanlon pointed out that this has been a problem in the past in other areas, such as with low level radioactive wastes and high level radioactive wastes. There was technical development but then no local buy-in.

In commenting on the second project, Ms. Ambrose indicated that it was something that the GWPC has always been trying to encourage, the plugging of abandoned wells. Hopefully they will be able to use the guidance document and videos that were put together in the past, but these materials were primarily for drilled wells rather than the hand dug wells.

Mr. Baker, a visitor to the meeting, brought up the problem in the Panhandle concerning the contamination in some areas of the Ogallala with atrazine. Even though he agreed that probably the primary path of the contamination is through well heads, he asked about the possibility of playa lakes, in some instances, being a pathway. He asked whether much research had been

done concerning leaching from playa lakes. Dr. Scanlong indicated that there had been a number of research projects and a number of reports were available and that she would send him copies. Ms. Fahlquist recounted some research that the USGS had recently done investigating the leaching rate of a number of constituents, including nitrate, tritium, and atrazine, through the root zone. The research wasn't performed in relation to playa lakes but adjacent to irrigated cotton farms in the Southern High Plains. They found that the downward movement of water is very slow. Atrazine, which was probably applied during a corn rotation, was found in the shallow subsurface. It was not moving down very quickly even under the irrigated settings. This seems to substantiate the conclusion that the primary pathway is via well bores or playa lakes. Ms. Fahlquist went on to describe some research in which the NAWQA Team of USGS will soon be engaged, investigating well bores as possible pathways to the aquifer in the Central High Plains. The study also includes dye studies adjacent to the well bores. However, the studies will not be done in Southern High Plains. Also, the study will not reveal whether the well bores might be the primary pathway, since playas are the primary collection points for runoff.

At this point two other visitors were introduced, Mr. Geary Schindel and Dr. Jeff Cunningham. Mr. Schindel is the chief technical officer for the EAA. The EAA is initiating a task force, on which Ms. Ambrose will be sitting, which will be determining what role the EAA should have in regulating water quality in the Edwards aquifer. Dr. Cunningham is a faculty member in the Civil Engineering Department of Texas A&M University. He has an interest in groundwater issues in Texas and wants to know what the research needs are in the state.

Dr. Scanlon asked Dr. Jones about some research that was carried out by TAEX in the Seymour aquifer area over a number of years. It was primarily concerned with nitrate, but did not involve looking at the effects of drip irrigation. The project was led by Dr. Bill Harris and Dr. Art McFarland. The data is available.

Dr. Jones informed us about a large ARS project that will be starting, in which the Leon River watershed will be one of the six or twelve watershed nationwide that will be monitored and modeled in great detail. The study will be aimed primarily at surface water, but data will be collected over a period of years and the results will be incorporated into the National Water Quality Modeling effort that ARS and NRCS are beginning. This should give us a lot of information on that particular watershed.

Dr. Scanlon brought up the need for our subcommittee to put together a document that would be a compiled list of all the member agency's research needs. Ms. Wade has already presented many of the TWDB needs; this document could serve as the basis to which everyone else's needs could be added. This research-needs document can then be posted on the TGPC's website. The needs listed in the document would not be tagged according to agency but be represented as coming from the Groundwater Research Subcommittee. Ms. Ambrose asked that Dr. Peters make a compilation of research needs, discussed during the Subcommittee meetings, which then could be emailed to everyone for additions, corrections, and comments.

Dr. Scanlon moved to the next agenda item, the discussion of development of white papers. We need to consider not only the writing of the white papers but also how we will use them. Dr. Jones suggested that white papers should be developed as a joint project by those agencies interested in the research project described by the paper. From his experience, a white paper developed in this way would have a better chance of success. Ms. Fahlquist added that this would fit in with the idea that there is a need to have multiple partners in seeking funds for a research project. And Ms. Ambrose further suggested that the subcommittee should actually focus on those projects where there are multiple agencies that would benefit. A couple of initial topics of common interest suggested were regional recharge and regional ET.

Since the subject of ET came up, Dr. Jones informed the group that there now is a statewide Potential Evapotranspiration (PET) website. It will give daily PET estimates on a daily basis for the entire state. Dr. Jones also mentioned that there is an effort to give on-line estimates of runoff based on a four kilometer grid. It takes into account land use, soils, topography, rainfall, etc. It may not be available to the general public yet, but the website can be obtained. The next step will be daily river flow information based on runoff. Dr. Jones suggested that, if there was interest, he could have someone give a presentation on the whole series of products. It was suggested that the presentation could be linked up with Dr. Scanlon's on recharge. Dr. Jones commented that all these things could eventually be linked up, in some way, to get real time estimates of recharge as well as river flows. Dr. Scanlon cautioned about the need to get ground references for calibration.

The discussion turned to nitrates. Mr. Schindel informed us that the EAA has had a few wells that exceeded the MCL for nitrates. A problem, though, is that there are not any good tools for identifying sources. There seem to be a number of potential sources. These include septic tank effluent, urban application of fertilizers, agriculture, and quarrying operations. We have one of the largest quarry operations in the country between San Antonio and Austin. They use a mixture of ammonium nitrate fertilizer and fuel oil (ANFO) as an explosive. There has been some elevation of nitrates in some of the springs, but not yet above the MCL. The springs are endangered species habitats. The question is what tools can be used to help identify what the sources of the nitrates are.

Ms. Fahlquist described some of the nitrate work USGS did in the High Plains, looking at the isotopes of nitrogen to get and handle on sources. It seems that most of the nitrogen getting into the groundwater in the High Plains has the signature of soil nitrogen. It may be that applications of irrigation water are pushing down nitrogen that was originally bound in the soil. Also, a determination has been made on what was background nitrogen by sampling deep wells that have not yet been affected by modern activities. Ms. Fahlquist commented that a lot of things can be done, but it's a matter of how much you want to pay for it.

Mr. Schindel mentioned that EAA has a relatively sizable research budget. He went on to describe a couple of compounding issues in studying the Edwards: the fact that the Edwards is a karst aquifer and that there is water reuse over the aquifer. The karst nature of the aquifer makes it difficult to obtain a permeability. Very few people take into account the macro porosity, the

fractures, animal burrows, decomposed root paths, and the desiccation cracks; characteristics that enable a very rapid water migration through the soil. These are areas where EAA is looking for some research. EAA needs to determine if and where regulation might be applicable. Will they need to regulate golf courses, reuse water applications, quarries, etc. A study that the EAA is involved with right now is measuring the dripping rates in caves as related to the clearing of overlying juniper. Mr. Schindel feels that there should perhaps be a quality component added to this study.

Dr. Jones brought up the fact that a lot of the agricultural soils, because they have been cropped over such a long time, have only about half of their original organic carbon and organic nitrogen. Fortunately, probably because of changes in agricultural practices, some of these soils are starting to rebuild their organic content. In many areas, such as around New Valde, the soils were originally quite high in organic matter. These soils after 20 to 50 years are releasing nitrogen from the root zone. Dr. Charlie Kreidler had come up with the same conclusion in an earlier study on the Seymour Aquifer.

Mr. Schindel made a few more comments regarding the Edwards Aquifer. He stated that the aquifers with karst properties, the Edwards and the Trinity/Glen Rose, have been found to be much more extensive than initially recognized. He had particular concerns about research directed at aquifers that exhibit particular karst characteristics. He particularly mentioned water quality, BMP practices, well head protection. For all of these, non karst model or modeling techniques are not directly applicable. For instance the SWAP analysis for the state's aquifers is pretty much completed except for the Edwards, which is taking longer to analyze because of its unique karst properties. Mr. Schindel's opinion was that the Trinity/Glen Rose should have been treated the same way as the Edwards; there are some very large flow paths present, some very significant karst features. There's a very rapid groundwater flow, on the order of a thousand feet per day. What is probably one of the longest caves in the US is located in the Trinity/Glen Rose. But, because there aren't a lot of people living on the Trinity/Glen Rose, it hasn't yet become a big issue. Mr. Schindel also told us about a fairly extensive research effort that they have called the Optimization Technical Studies Program. The Program, which has performed about 17 research initiatives over the last five years, by seeking cooperative research projects with a number of different agencies including the BEG and TAMU. Ms. Ambrose suggested to the chairs that, if Mr. Schindel can make the next meeting, it would be of interest to cover these 17 issues. Mr. Schindel stated that he would be happy to come back and give a presentation.

Dr. Jones gave us some information on a couple of items. The first is that the TWDB will be issuing a request for proposals on agricultural water conservation in the Ogallala. This is the result of the last Legislative session. They have reorganized all their agricultural water conservation programs, which will include research and demonstration components. One of the things that will likely need to be considered is a groundwater modeling component. The main objective is to reduce total pumpage. There will be a statewide RFP. Mr. Comer Tuck and Mr. Bill Mullican would be the people to contact at the TWDB. There is an initial group, made up of Texas Tech, West Texas A&M, ARS, TAES, TCE and the various groundwater districts, that's working on putting together a proposal for the High Plains. There are other groups forming for

the Lower Valley and the Edwards areas. The moneys for these projects will come from a variety of agricultural water conservation sources that the TWDB has. Dr. Jones believes that in at least the Edwards and Ogallala areas there will be a need to link agricultural water conservation research and demonstration to something that addresses the effect on the aquifers. The RFP is expected to be out in March.

The second item is that TAMU has been brought in to a potential federal initiative to look at groundwater quality and quantity in the El Paso and adjacent Mexico and New Mexico areas. The effort is being led by the USGS Texas and Albuquerque offices. The proposal is to build on the GAM and other research that's been done in the area in the past. The need is to inform the whole process of providing future drinking water for that part of the population. There is an associated bill in the US Senate, filed by Senator Jeff Bingaman of New Mexico, to fund the project. If it is funded it will be important to involve the TWDB and perhaps the BEG. The reason that Dr. Jones is involved is that the Water Resources Institutes in both New Mexico and Texas are formal partners with the USGS in promoting this proposed project.

Dr. Scanlon moved to the next agenda item to consider the draft Operational Plan for the Subcommittee. Because of time growing short, and because some of the attendees had not brought or could not find their copies of the draft Plan, this item was postponed till the next meeting. A new copy of Plan will be emailed to everyone for their consideration.

Dr. Jones suggested that we really need to come forward as a coalition of agencies and universities. In this way our chances of having our proposed research projects finding favor would be considerably increased; any one of us alone would have a much more difficult time of selling a project. He suggested that we have some white papers – and if their too long with one page summaries – that would lay out the problem and proposed research project to investigate the problem. Dr. Jones suggested that UT and TAMU jointly with the USGS, if they had the support and involvement of the agencies, would have a 50% to 80 % chance of funding a proposed project within the first or second year. Ms. Ambrose suggested that the proposed projects would also fit into the TGPC's Report to the Legislature, which includes recommendations for research. In this way our research needs would be at least be included in a reference document.

At this point Dr Scanlon closed the meeting. The meeting ended at 10:20 AM.

Information Item: The decision was made at the TGPC meeting that the next meeting date for the TGPC, the ACS, and the GWRS will be April 15, 2004. The GWRS meeting will take place at 9:00 AM, at the same location (given above).

Action Items:

1. Dr. Allan Jones can arrange for a presentation on the Potential Evapotranspiration and Runoff websites. Dr. Bridget Scanlon would give her recharge presentation at the same meeting. These presentations would probably take place at the TGPC meeting.

2. Dr. Joseph Peters is to make a compilation of all the research needs discussed during all the GWRS meetings and then email them to all the attendees/members for additions, corrections, and comments.
3. Mr. Geary Schindel agreed to give a presentation at the next GWRS meeting on the AEE's 17 research initiatives carried out through their Optimization Technical Studies Program.
4. A copy of the draft Operational Plan needs to be emailed to everyone for their review and consideration so that action can be taken at the next meeting.

Minutes prepared by Joseph L. Peters, February 23, 2004

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