NOTES FROM

Swatara Creek Watershed Water Supply Study

An In-Progress Workshop
March 25, 2003

Notes Compiled By
SUSQUEHANNA RIVER BASIN COMMISSION

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PARTICIPANTS' RESPONSES TO FIRST SESSION

Data Collection and Analysis

1. Have we missed any important data element(s)?

Verbal Responses (as captured by facilitators):

- Increasing amounts of water used by farms/CAFOs.
- No reference to commercial development in Lickdale area.
- Phase II stormwater management implementation—has it been included?
- Difference between gross water supply/demand and net supply/demand (accounting for wastewater treatment plant losses for example).
- Has ground-water storage component been included, or just recharge vs. demand?
- Daily per capita consumption—is there a disparity/relationship between what it was vs. what it is?
- Diversion—threshold—fringe of watershed diversions are not known/available—will these be evaluated?

Written Responses (as submitted by participants):

- Quarry water management; diversions out of watershed; increasing use of water by CAFOs; assess failure of ground-water wells in drought; commercial development in Lickdale area; impact of industrial consumptive use upstream of Jonestown.

- Will the recent PA water legislation provide any gaps of information on current usage in the watershed not available in the preliminary data? POTW inventory of Swatara Watershed to see water discharge. Are food processors/agricultural processes included?

- Yes, I would like to see some discussion of economic and environmental thresholds that strive to achieve balance to maintain a quality of life. Ecological principles: carry capacity, loss of species, congestion, and taxes (cost of services).

- Farms/CAFOs; increased development in Lickdale; Phase II stormwater.

- Does your protected peak demand include conservation during drought? Could be up to 10-20% during severe drought. Need to at least address/discuss conservation (demand-side reduction).

- Diversions that are authorized or planned, but not currently reflected in base flows.

- CAFOs; Phase II stormwater; Lickdale development.

- The suggested regulation change. Comprehensive plan.

- CAFOs take tremendous quantities of water and apparently have not been calculated into the projections. Two of these CAFOs, to my knowledge, also propose to draw well water for bottling.

- Documentation of ground-water users who experience problems during recent droughts would seem to be useful/relevant additional data.

- Variability of water well performance suggests a highly complex ground-water system. How has this uncertainty of data used in the study been presented? What is the precision of the study? Can an accuracy statement be presented? Have reaches of creeks and streams been identified as gaining or losing reaches? Rumor has it that several major industrial users commissioned extensive inventories/ supply studies. Have these been researched for inclusion into this study?

Additional Written Responses (post-workshop comments):

- Small public water systems water use data and self-supplied water use data.
- If 30% of the population falls into these categories today, part of the increase in population by 2030 will also fall into these categories (and should not be included in the increased demand on the Lebanon Authority system).
- If the population is projected to increase 17% by 2030, and not all of the population increase will be connected to the Lebanon Authority system, why is the water demand on the Lebanon Authority system projected to increase by 32%? What data support this prediction?
- The information that has been gathered and the recommendations that will be made are critical to the community and economic vitality of Lebanon County and the surrounding areas.

2. <u>The analysis of the data shows that: (1) during normal hydrologic conditions, water supplies for public use in the Swatara watershed exceed current and projected demands; and (2) the Swatara watershed experiences water supply shortages only during times of drought. Do you understand the basis of these findings?</u>

Verbal Responses (as captured by facilitators):

- What does "projected demands" mean? <u>Answer</u>: Timeframe is 2030.

Written Responses (as submitted by participants):

- Yes (3 people submitted "yes" as their single-word response). Ok. Clear!
- Response to part #1: not entirely; Response to part #2: yes.
- Yes, barring leaks or breaks in water mains (terrorism).

Additional Written Responses (post-workshop comments):

- Statement #2 needs to be clarified that it refers mainly to surface-water systems. A survey by the U.S. Army Corps of Engineers in 1992 of small water systems in Lebanon and Cumberland County found that 90% of the small public systems that use ground water did not experience shortages during droughts. The two systems that did experience shortages were able to adjust.

3. <u>If the drought of record were repeated today, study results suggest that the Lebanon Water Authority, which depends on the Siegrist Reservoir and its intake on the Swatara Creek, may need additional water to that available from Siegrist Reservoir to meet the overall demand between now and 2030 during the months that adequate natural flows from Swatara Creek are not available. Deficits also may result for PA-American and United Water. Do you believe these findings are compelling enough to explore alternatives for the watershed?</u>

Verbal Responses (as captured by facilitators):

- Yes, undoubtedly.
- Are we looking for proposals?
- Individual water well failures—is there merit on looking at this issue during drought? How do you deal with that? What happens in the future? Are well driller records available?
- Drought conditions for individual well owners are just as important as drought conditions for public water suppliers.

Written Responses (as submitted by participants):

- Yes! Agricultural lands can continue to provide recharge viable to any water system. Discharges from POTWs need to continue to be factored into the volumes to stream discharge versus reclaimed water. This will in turn increase ground water and stream flows. Private well failure!!
- Absolutely—data speaks for itself! Unless growth can be stopped. Lebanon needs more water.
- Yes (3 people submitted "yes" as their single-word response).
- Pump back to Siegrist Reservoir during reasonable abundance on Swatara Creek to "bridge" low flow conditions.
- This sounds like a pitch for the proposed dam. What's the cost of pump-back from Jonestown to Siegrist?
- Yes. Wells fail in drought but they also fail (yes) when the cone of depression around a CAFO or water bottling operation depletes the normal flow. Were ground and surface water amounts combined when slides [power point slides] 25, 27 and 28 were made?

- Yes, however, ground-water problems, albeit localized, should not be overlooked. A good starting point, as suggested by Ed Deaton, would be to map where well-related problems were manifested in recent droughts.

Additional Written Responses (post-workshop comments):

- Does this mean a deficit of 940 million gallons over and above what would be available from the Siegrist Reservoir? If not, what would be the deficit after calculating how much would be available from Siegrist Reservoir? How many days did the 1932 Drought of Record cover? Are there ways to take more water from Jonestown early in the season to preserve the storage at the reservoir for a longer period of time? The "findings" as stated in this question are not "compelling" because they were not thoroughly explained. Whether or not the "findings" are accurate, the whole purpose of this study is to explore alternatives.

4. <u>At the April 2001 Swatara study workshop, participants suggested that "ground-water use and protection" should be the top water-related focus for the Swatara watershed. The current data analysis shows that ground-water supplies are generally sufficient across the entire watershed and that current and projected 2030 ground-water usage is relatively small compared to the volume of recharge during normal conditions. Knowing this, would you still list ground-water use and protection as the highest priority today? If yes, why?</u>

Verbal Responses (as captured by facilitators):

- Ground water provides baseflow to streams, and ground water is the larger resource in this watershed; ground-water quality is important; if industrial use goes to ground water, they could be very large users of this resource.

- If we consider using ground-water storage, we need to protect the area where it's stored.

- If industry uses a lot of ground water, wouldn't they need to deal with treatment of discharge, water quality, etc.?

- Concerns re: impacts to domestic well owners show that we need to address ground water, but not that it's necessarily the No. 1 priority.

Written Responses (as submitted by participants):

- How much quality ground water is available? Does acid mine discharge come into factor here? Wells continue to require focus!

- It is a critical resource to be protected!

- I think this should be downgraded in importance (not necessarily highest priority).
- Yes, maybe. Areas of large residential dependence on ground water need close review on impervious cover and ground-water recharge versus quality/quantity.
- Yes. It is critical to protect the ground-water supply. With increasing development, population growth, etc., we are losing precious ground in which our ground water is infiltrated. With the loss of these areas, we are also affecting the amount of our ground-water supply.
- Yes, because of the relationship between ground water and stream flow, for example.
- Is the ground-water table negatively impacted when low-head dams are breached? I still don't know how much water we have available and what is a safe withdrawal number that would still allow streams to flow? Put another way, at what point must planners say "no new development?"
- Ground-water use and protection has implicate water quality issues not just volume. Surface water has a finite longevity in the surface conveyance, e.g. stream whereas ground water may have a decade or century in the system before discharge. If a problem is created in the ground water, it will be with us for at least a generation versus a week or so.

Additional Written Responses (post-workshop comments):

- Yes, I would consider it a high priority because ground water is the largest water resource in the Swatara watershed and we may need to depend on it in the future. Protection of ground-water quality is very important because cleaning up ground-water pollution is costly and time consuming compared to prevention of ground-water pollution.

PARTICIPANTS' RESPONSES TO SECOND SESSION

Alternative Water Supply Sources

- **Ground-Water (gw)**
- **Augmentation—Susquehanna River, Quarries, Other**
- **Additional Reservoir Storage**
- **Infrastructure Improvements**
- **Conservation During Drought**
- **Regulatory or Operational Changes**

1. Have we missed any possible alternatives? Would you eliminate any from consideration?

Verbal Responses (as captured by facilitators):

- Reuse or recycling of water, not only during droughts especially for industrial uses.
- Increased impervious surfaces, less ground-water recharges occurs, preserve ground-water recharge with increased development.
- New Phase II NPDES permits will minimize affects of impervious surfaces/ pre-post projects.
- With increased water lines, ground water is recharged—is this used in analysis – future impacts.
- Look at year-round conservation, not just during drought situations or low reservoir levels.
- Adequate impact been given to biodiversity/aesthetics.
- Secondary impacts, i.e. sinkholes, geologic impacts on ground water– looked at? De minimus recharge criteria.
- Are we assuming ground-water usage affects streamflow?
- Low-head dams scheduled to breach, lower ground-water levels affecting study – surface water does not affect ground water.

Written Responses (as submitted by participants):

- POTW discharges—with additional N&P reduction requirements, water quality will increase and may be more appropriate for reuse—contact and non-contact!

- The conservation perspective needs to be expanded to preservation. We should not be building homes or adding animals if our water budget does not allow it. Large water consuming industries or uses should not be encouraged. Also, water polluting uses should be discouraged, i.e. new zinc-plating industry located in north Lebanon County.

- New reservoirs or increased capacity in existing ones.

- I'd love to see more creative solutions to minimizing impervious surfaces. Also, what about rainfall collection systems (cisterns, etc.)

- Reuse/recycle; alternative by-pass/conservation release (reduce the by-pass, use alternate source such as a quarry, re-pipe the WWTP discharge to just downstream of intake).

- Infiltration enhancement in areas of high impervious cover (in excess of 15%).

- Emphasis on year-round conservation. It is important to teach the public that water is not an endless resource and we should be conservative <u>all the time</u>, not just in times of drought.

- Comprehensive plan, work with Green Team at DEP, PEMA's Hazard Mitigation Plan.

- Has adequate weight been given to aesthetic and biodiversity considerations?

- Are any more low-head dams scheduled for breaching in the Swatara watershed?
- Irrigation with treated waste water. Grey water use.

Additional Written Responses (post-workshop comments):

- Additional possible alternatives:
  a) Attention to, and minimization of, consumptive use of water upstream and in the upper watershed from the Jonestown intake.
  b) Conservation of water at all times, not just during droughts.

- I would not eliminate any alternatives.

2. <u>Would an aggressive water conservation program be a preferred alternative to compensate for the shortfall induced by an extended drought? Why/why not?</u>

Verbal Responses (as captured by facilitators):

- Aggressive program better, based upon not having information for the future, stick to what we know now.

- What would an aggressive water program yield?
- Private wells going dry, when active conservation is implemented it maintains the water.
- Year round conservation is necessary, need to wait to see what the alternatives provide in the analysis, based upon not enough analysis.
- Look to other states for their procedures to see where they had successes/failures.
- Public water supplies vs. private water supplies – need to distinguish between quality vs. quantity, look to alternative sources when not needed for drinking water.
- Education on how drinking water is used.
- York Water Company suppliers saw 20% reduction when conservation was called for.
- Look at future development with water conservation included with mandatory considerations – can be applied to use with gray water.

Written Responses (as submitted by participants):

- Yes. Many aspects of conservation should be explored, not only during droughts—reuse, recycling of water, especially industrial uses. Are all the uses of "treated drinking water" necessary?
- There would need to be a massive education effort made—people freak when they can't wash cars, rinse driveways, power-wash houses. How do we instill sacrifice for the future? Matching quality of water with proper uses.
- Yes, but it needs to be an inherent part of planning processes such as the new comprehensive planning process taking place in Lebanon County.
- I think we must be realistic here and consider that conservation will only take us so far. Therefore, I don't think conservation is a <u>preferred</u> alternative—we are already beyond that.
- It should be a <u>component</u>, because one participant noted that it must be genuinely realistic. (Reductions may be too costly and/or unsustainable.)
- Media/education needs to be fostered for public and private water users.
- Water conservation should definitely be implemented at all times. Even with future "projections" or "estimates" we really cannot predict what the future

conditions will be. Water conservation should be practiced by everyone: residential, industrial, agriculture, etc., everyone!

- Yes.
- The explanation of water release requirements at Jonestown versus Siegrist suggests strongly to me the relaxation of standards for Siegrist at least to the current inflow to Siegrist.
- Should be implemented in coordination with additional water supply. Use cisterns and abandoned sewer systems for recharge. The water that leaks from aging systems also recharges the ground water.
- Cost/benefit analysis need to follow OMB guidance that suggests the inclusion of societal values into the cost/benefit analysis. Our communities need to look toward future sustainability during the analysis of alternatives.

Additional Written Responses (post-workshop comments):

- YES, water conservation to reduce demand is a preferred alternative. The York Water Company reported a 20% reduction in demand during the last drought. In your question the term "aggressive" is not defined. An aggressive campaign to reduce "unaccounted water loss" in delivery systems would be a preferred alternative.
- The increased demand during the summer months is attributed to watering lawns and other outdoor uses. Educating the public about water saving landscaping, infiltration of water from roofs and gutters, use of rain barrels, etc. can be very effective during the most drought-prone months. Also, education of consumers about eliminating leaks and wasting of water is important at all times.
- So that the public is not confused, 'conservation storage' and 'conservation releases' should not be considered in the same category as 'conservation to reduce demand'.
- The study partners are to be commended for the number of alternatives that have been put forth and for providing the opportunity to comment on the best solution to ensure that there is an adequate supply of water available to all users within the watershed. Based on the information that has been gathered, and the alternatives that have been presented, it is my strong belief that the study partners should carefully consider the option of creating additional reservoir storage.

PARTICIPANTS' RESPONSES TO THIRD SESSION

Criteria for Evaluating Alternatives

- **Cost**
- **Benefits**
- **Ground-water: quality; impacts from use**
- **Sustainability**
- **Environmental impacts**

1. Have we missed any criteria for evaluating the stated alternatives? (i.e.; have we considered all the important issues or values that are vital for water management)?

Verbal Responses (as captured by facilitators):

- RE: ground water—need to include impacts on stream flows (this is a primary reason for protecting stream flows).

- Stream flows: conservation flow requirements—some are artificially designed to enhance non-indigenous habitats—we need to evaluate this/consider this (are flows established based on natural flows, or elevated to enhance species not normally in the ecosystem—e.g. trout?).

- Additional reservoir/surface-water impoundments—if constructed, it would benefit flows in creek and enhance stream life during times of drought; cost could be shared by various entities.

- Use triple bottom line—cost/social aspect/environment: Weigh each aspect carefully.

- Factor in risk associated with certain yield (i.e., look at unknowns).

- Evaluation of effectiveness/potential for improvement should be included in the analysis (e.g., conservation goals—will they be met/honored by citizens?).

- Life cycle for reservoir may be 100 years; 25-year window is shorter and should be taken into account.

- Is additional reservoir a quick fix? Will improvement of infrastructure and conservation be set aside and not implemented as effectively?

- Will evaluation of alternatives go beyond watershed boundary? (i.e., downstream)? Will certain alternatives be of benefit to basins downstream (Chesapeake Bay, for example)?

Written Responses (as submitted by participants):

- I believe firmly we need to be more foresightful than 30 years, looking way into the future at the basic ecological principle of "carry capacity." What is the carrying capacity of people for this watershed before quality of life plummets? We need to be working backward to some degree. Do we just say, for instance, our historical population growth has been "x," so we should be completely reactive in our planning processes and continue to tap resources unabated to meet these projected demands? I look at a small county like Lebanon and my vision is not to achieve and attract an ultimate population of one million people as has happened in similar-sized Delaware County. Respected economists of world-wide note have said that to have a healthy economy, you do not need population growth. This uncontrolled growth taxes systems. We can control our population and direct it/plan it to go elsewhere. These decisions are rooted in planning from a different approach. I would like to see an economic and a population ecologist perspective on this approach that's being taken.

- All of this is governed by what quality of life we want. If we want to maintain our current standard (and growth is not deterred), we must plan for more water. These are all social criteria which are needed.

- Ground-water impacts from use. Water bottling companies—have we considered their usage? Are there limitations, regulations, and restrictions? When do we say no more springs can be used for private water bottling and resale?

- Flow-by levels should be set to protect indigenous species. What is the impact of any action on local residents?

- Social Aspect.

- Benefits and costs need to be holistically analyzed and include both direct and indirect aspects; for example, an environmental impact may have both costs and benefits. FEMA has developed a methodology to address evaluating alternative in the recent FEMA publication series (386-X). Perhaps this should be used as a model for this analysis.

- Triple bottom line.

Additional Written Responses (post-workshop comments):

- "Use of Ground Water" is not a criterion for comparing alternatives. Change this item to "Quality and Quantity of the Source Water."

2. <u>Should any of the criteria presented be weighted or given additional emphasis over other criteria?</u>

Verbal Responses (as captured by facilitators):

- Timing and conditions—need to look at these when weighing criteria (necessities vs. luxuries); e.g., high-quality water preservation would mean strict conservation; trigger points for supply and quality of water; different weighing in different conditions.
- Look at secondary benefits—e.g., when constructing a reservoir, look into open space and other activities; something with secondary benefits should be weighted more heavily.
- We need water, first and foremost… in Lebanon during the study period established.

Written Responses (as submitted by participants):

- Absolutely. Sustainability and environmental impacts are paramount to our future quality of life.
- Having worked with building farm dams, water table is reused in the local area. How far the raise of water table occurs varies with the geology and sub geology. How can anyone weigh anything if, at this time, they do not know all the particulars. Sustainability should be the bottom line and needs to be the bottom line of the triple bottom line.
- Certainly environmental impacts should be high on this list. We do not want to be detrimental in one area or aspect while trying to improve another.
- Why is DAM a dirty word. I think a dam would save problems until 2050. We need to push to put a dam in Swatara State Park, and not just for recreation but most of all for water supply.
- We should concentrate on regulatory and operational changes.
- Yes. Environmental impacts.
- Benefits (social), Sustainability (social), Public Good—adequate water supply. To make an analogy: We have a wonderfully high recycling rate only to have waste from other states forced upon us for permanent storage in our watershed. Leachate leaks have the potential to pollute area ground water. We're in a double-jeopardy from negative effects of outside garbage. To use some of our ground water, we may have to extensively treat leachate-contaminated water. Likewise, residents of the Swatara watershed are becoming increasingly aware of and implementing

water conservation methods. Thus, we are considered a water-rich area. Do we allow "for-profit" entities that transport our water outside of our watershed to deplete our water budget for residents and businesses and farms in the watershed? Again, that would increase double jeopardy to triple jeopardy. We need to know how much water we have and when to say no to the demands of outside interests. The "Baltimore" situation is a perfect example.

- Benefits of various alternatives beyond the Swatara Creek Watershed, if any, should be considered/evaluated (e.g., flow augmentation benefits to lower Susquehanna River? Chesapeake Bay?). Agree with comment from gentleman that secondary benefits of various alternatives should be considered.

- Pennsylvania undertook an analysis of environmental and social values in the 21st Century Commission Report—consideration should be made to use the values experience as weighting.

Relative Weights (combined tally from participants who submitted charts)

Criterion	**Relative Weight**		
	High	Medium	Low
Benefits	✓✓✓✓✓		
Costs	✓✓✓✓		✓
Ground-Water	✓✓✓✓	✓	
Sustainability	✓	✓✓✓✓	
Environmental Impacts	✓✓✓	✓	

A rendition of original chart:

Environmental Impacts (warm-water creek)		✓	
Environmental Impacts (cold-water, High Quality and Exceptional Value)	✓		

Rendition of original chart (ranked by order):

1. Cost to the Water Supplier (Lebanon and Others)
2. Environmental Impact
3. Benefits (multi-use)
4. Sustainability
5. Ground-water Impacts

Rendition of original chart (ranked by order):

1. Environmental Impacts
2. Ground-Water; Quality; Impacts from Use
3. Benefits
4. Sustainability
5. Cost

Additional Written Responses (post-workshop comments):

- All should be given equal weight:
  1) Cost and Benefits of Alternative; 2) Quality and Quantity of Source Water; 3) Sustainability of Alternative; 4) Environmental Impacts

- The following is offered with respect to the weighting of the criteria to be used to evaluate the alternatives identified. Obviously, the cost associated with any alternative must be considered in light of the fact that the ultimate implementation of the recommendations will more than likely fall to state and local officials. However caution should be given to costs being the most heavily weighted criteria. Clearly other criteria must be given due consideration such as the ultimate benefit that will be brought to the entire watershed. A benefits analysis should include all benefits of a potential alternative including options that may have multiple benefits in addition to providing water storage; such as recreation, habitat, economic development and the like. Sustainability is also a critical criterion to which all the alternatives should be weighed. A long term, viable supply is again necessary for the area to have long term economic growth.

- Sustainability is listed as an evaluation criterion, along with costs, benefits, ground-water impacts, and environmental impacts. I am pleased to see it listed, but I believe it is in the wrong position in the evaluation process. I suggest that sustainability be considered for each alternative after they are evaluated with respect to the other criteria. Treating sustainability in this manner might allow alternatives that would not "rise to the top" under a traditional evaluation process to get some serious consideration. For instance, Lebanon MWA's concern that they might not be able to fulfill future customer water expectations, and that a shortfall in supply might pinch economic development might provide strong motivation for a new reservoir. But if sustainable water management is incorporated into future development (and perhaps into existing developments), this alternative might compete effectively in the evaluation (I was the meeting participant who suggested this approach). Sustainability might be considered by adopting the four principles defined in the book, *Natural Capitalism*, by Hawkens, Lovin, and Lovin: 1. Radically increase resource efficiency; 2. Eliminate the concept of waste; 3. Shift from producing "things" to providing services; 4. Restore natural capital. My point is that, if sustainability is seriously considered, it will transform traditional water resource planning, which usually focuses on how to find more water, while making the best effort to not harm the environment too badly. This transformation—turning the question around to, "If we need this much water, where should it come from to have the least impact on the natural order?" will not necessarily cost us more money. (Cost will come out in the evaluation process.) It will certainly require us as a society to change the way we think about water, and to adopt practices that differ from the convenient ones our (formerly) abundant water resources allowed us to indulge ourselves in.

MISCCELLANEOUS COMMENTS

Verbal Comments (as captured by facilitators):

- Has Lebanon looked at taking water from Jonestown and bringing back to Siegrist Reservoir?
  Can be looked at
  Comment on costs may not be cost effective, evaluate
  Cut back on conservation release, see if feasible with nominal impact

- Is conservation an alternative? Has it been factored in?
  Yes it has. Needs to be factored in – absolutely

- Conservation Release requirement – what is it and why do we use it?
  Water supplier needs to maintain current level at all times, protection of downstream users, instream aquatic life
  Relaxing requirements – thoughts:
  Shouldn't relax need to maintain quality of life
  Need a good understanding/analysis of current criteria before you can answer relaxing requirement
  Pass by needs reviewed and an alternative looking at worst case scenario

- Projections for lower Susquehanna River Basin suggest a severe drought mode—how would that study address this area of the basin? Is there a role for Swatara Creek in the greater Susquehanna River Basin, to help the SRBC augment water volumes?

- At what point do we say we can't handle any additional water demands? Do we have a more concrete way of addressing this? Things are still vague re: this issue.

Written Comment (as submitted by participant):

- Larger residential developers would be interested in alternatives to payment of hook-up fees and possible marketing of future savings on water use fees and sewage fees by homeowners—this could also be factored into mortgage eligibility because the savings enhance mortgage payment capability.