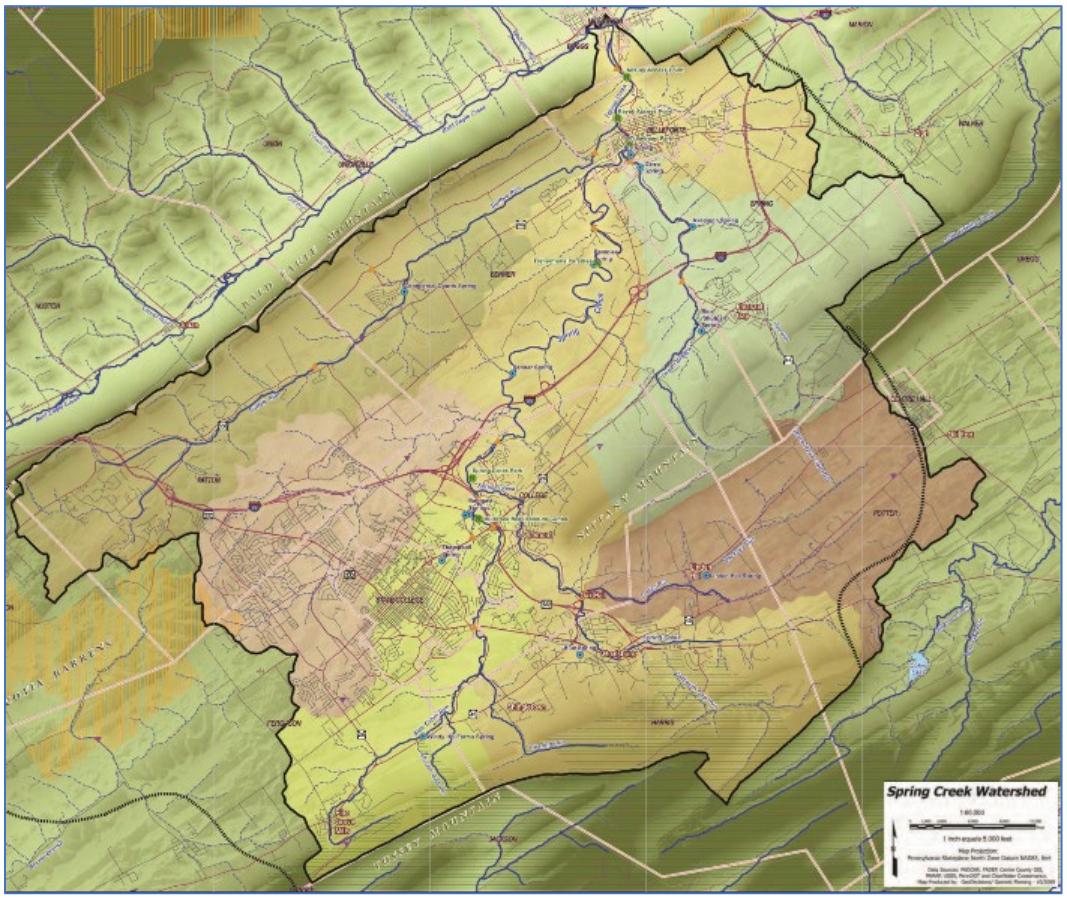
Managing all Water as One: The Spring Creek Watershed Approach



White Paper

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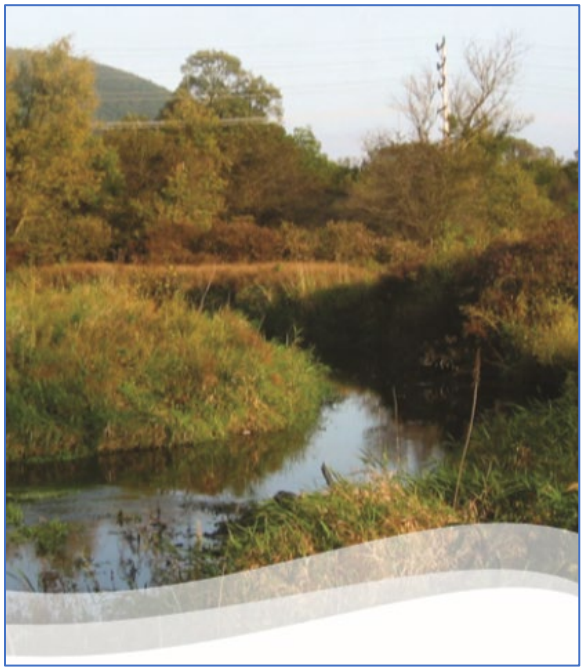


EXECUTIVE SUMMARY

In most communities, different types of water (stormwater, drinking water, sewage, etc.) are managed separately. A drinking water authority keeps the groundwater or surface water clean enough to be potable, a wastewater authority maintains the sewage treatment plant and miles of pipeline, and a host of entities are responsible for managing how much stormwater runoff goes into streams, detention basins, and other conveyance systems. This disconnected way of managing water does not take into consideration the fact that most water, whether from precipitation or the sewer system, ends up in the same place: our rivers and streams. Managing water under separate distinctions costs communities extra money, time and resources, and is ineffective at keeping those water resources clean and abundant. A new way of managing all water as one in needed.

This white paper is intended primarily for water authorities and municipal officials in Pennsylvania who are looking for this new way of thinking about and managing water – although others within a given watershed (both inside and outside of the state) can and should play a part in this new way of thinking and can therefore benefit from reading this white paper as well.

This new way of thinking is called One Water, and this white paper will describe what the One Water concept entails, provide a case study of the process from the Spring Creek watershed in Centre County, Pennsylvania, and provide guidance on how other municipalities in Pennsylvania and beyond can use the experiences from Spring Creek to shape their own One Water planning process. While each One Water process is unique and should be tailored to the individual conditions, stakeholders, challenges, and opportunities within a given watershed, this is a great starting point for those new to the concept or those who have considered it in the past and are looking for a new reason to give it a try.

Please Note: in the print version of this white paper, appendices 5-16 (meeting minutes) are not included. These can be found in the online version at http://riverstewards.info.

ABOUT RIVERSTEWARDS

RiverStewards was created in 2017 to bring together the disparate organizations and individuals currently working to protect and enhance the Susquehanna River watershed within Pennsylvania to work collaboratively on mutually beneficial solutions. We came across the Water Research Federation's One Water concept in our research of innovative ways to protect and enhance water quality and quantity and new it could benefit Pennsylvania communities greatly. In 2018 we began working with the University Area Joint Authority (UAJA) in Centre County to bring the concept to the region, and thus sprang the impetus for the creation of this white paper. Thanks to a grant from the Chesapeake Bay Trust Fund, the hope became a reality.

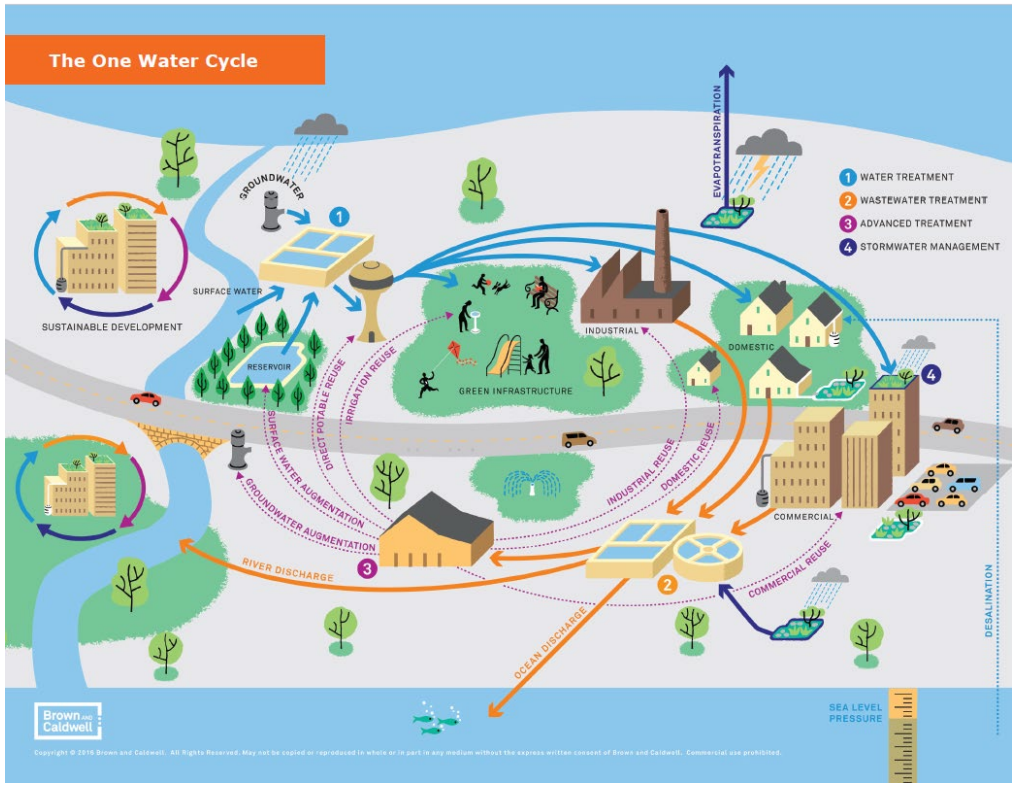
RiverStewards is made up of two separate entities, a 501(c)(3) nonprofit called RiverStewards Collaborative, and a for-profit called RiverStewards Benefit Corporation. All profits from the benefit corporation will be put toward the work of the nonprofit. In that way, the work of the nonprofit will become self-sustaining and not reliant on grant funding (*see graphic below*).

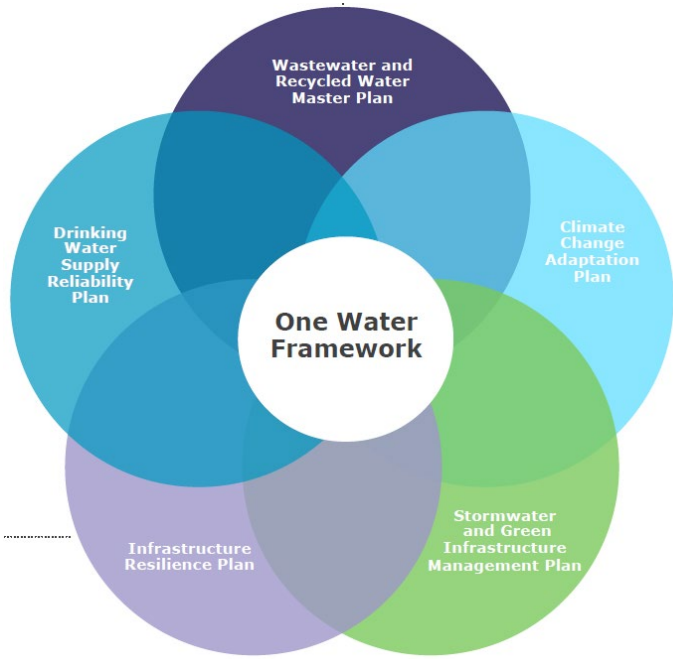
To learn more about us, please visit https://riverstewards.info.

BACKGROUND

What is "One Water"?

The One Water concept was developed by the Water Research Foundation (WRF)[i] as "an integrated planning and implementation approach to managing finite water resources for long-term resilience and reliability, meeting both community and ecosystem needs". The concept uses a collaborative approach to manage all forms of water in a sustainable and resilient manner. The WRF developed a "Blueprint for One Water"[ii], which outlines the planning processes recommended for the implementation of a One Water plan that can be used by utilities, cities, counties, municipalities, water professionals, and other stakeholders.





The One Water Cycle and Framework

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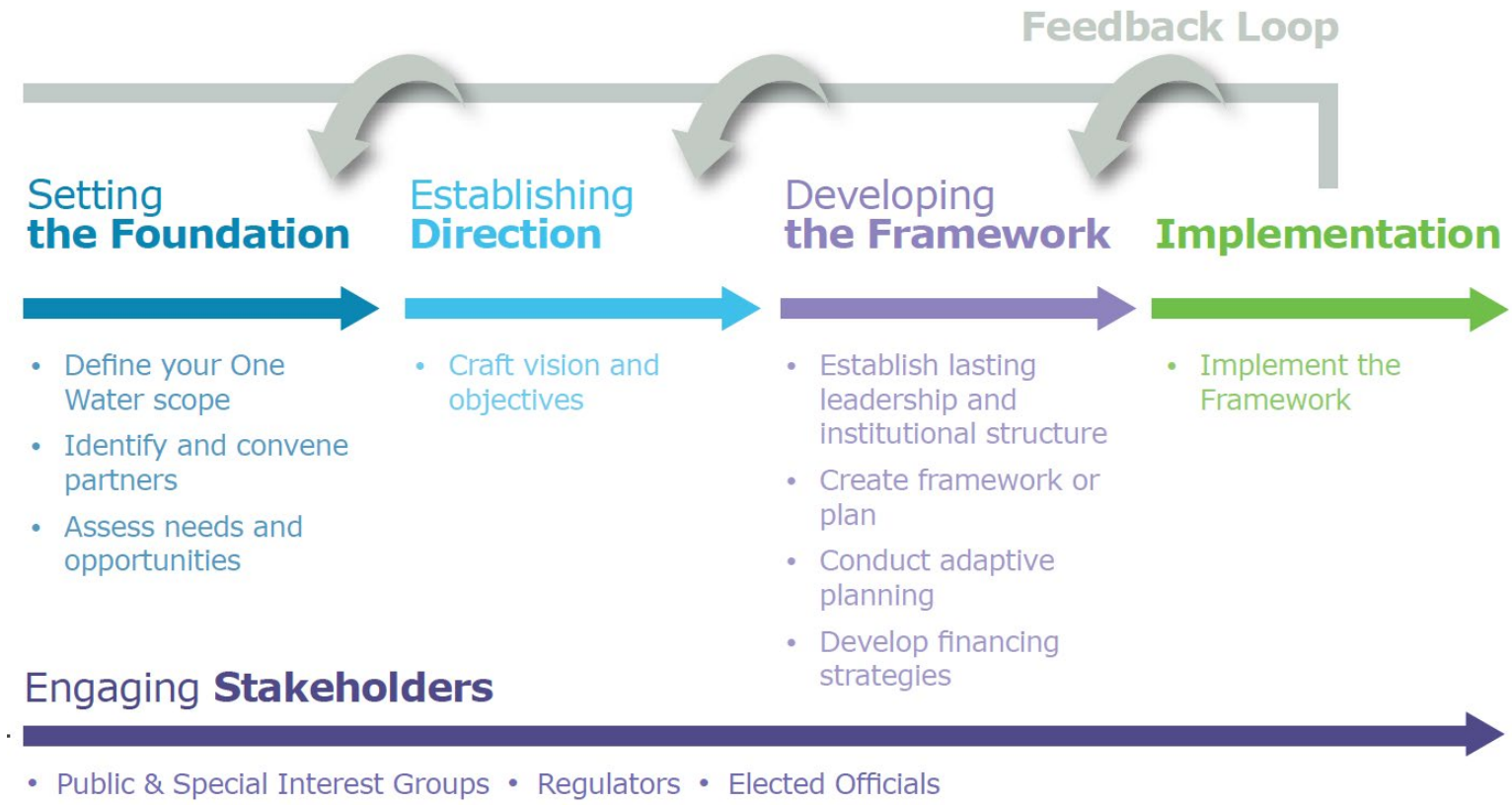
Source 2: Paulson et al. 2017. Reprinted with permission. © Water Research Foundation

A One Water framework, or plan, builds upon existing plans, processes, and partnerships within a community to provide the framework for collaborative actions among multiple separate but connected entities, such as a water utility, several municipalities, and various water end user groups.

No individual One Water plan will look like the next one due to regional/watershed/municipal differences and requirements. However, five elements of every plan should be the same, and are depicted in the graphic below. These elements are described generally here but will be described in more detail within the "Process" and "Recommendation" sections; we also highly recommend reviewing the WRF's *Blueprint for One Water* for additional information.



Blueprint for a One Water Approach

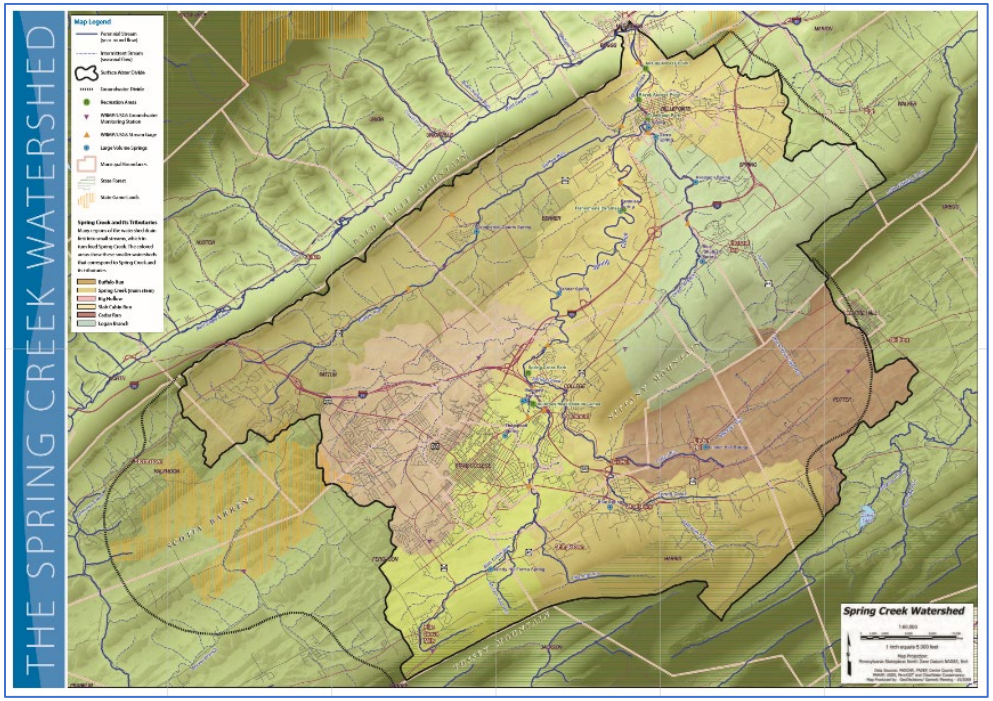
Source: Paulson et al. 2017. Reprinted with permission. © Water Research Foundation

The first phase, *Setting the Foundation*, starts by defining what "One Water" means to the initial entity/entities involved, identifies the critical partners, and assesses the needs and opportunities that the One Water plan will address. In the *Establishing Direction* phase, the partners work together to create a vision and objectives to be used to develop and implement the One Water approach for their community. The *Developing a Framework* phase creates the structure to ensure long-lasting success for the One Water plan. This included determining leadership and roles, identifying and securing funding, and creating short- and long-term strategies. The *Implementation* phase is where the steps of the plan are put in place and modified as needed. Throughout the first four phases, the partners will *Engage Stakeholders* from across a wide spectrum of interest groups and backgrounds to gain buy-in and support for the One Water plan.

The Spring Creek Watershed[iii]

The Spring Creek watershed (*see map below*) lies within 14 municipalities within Centre County (the boroughs of Bellefonte, Centre Hall, Milesburg, and State College, and the townships of Benner, College, Ferguson, Halfmoon, Hamilton, Harris, Patton, Potter, Spring, and Walker), which is the fifth largest county in Pennsylvania by land area and home to 153,990 people according to the 2010 US Census. Between 2000 and 2017, nearly 27,000 residents were added to the region. From a management perspective, there are as many as 31 different entities - including municipal and county governments, planning commissions, water and sewage authorities, and state and federal management agencies - making decisions about the region's land use and water resources.

The watershed lies within the Ridge and Valley Physiographic Province of the Appalachian Mountains and is characterized by a prominent northeast-southwest aligned succession of steep-sided, narrow ridges and valleys. Karst geology – a landscape underlain by limestone that has been eroded, producing ridges, fissures, sinkholes – is present in the valleys. Soils tend to be well drained and underlaid by either limestone or sandstone.



The Spring Creek Watershed
Courtesy of the Spring Creek Watershed Commission

The Spring Creek Watershed is a tributary of Bald Eagle Creek, which flows into the West Branch of the Susquehanna River and then eventually to the Chesapeake Bay. The Spring Creek watershed has a surface drainage area of approximately 146 square miles, but when the groundwater basin is factored in, the area is approximately 175 square miles, or 23% larger than the surface water alone. Tributaries of Spring Creek include Big Hollow, Buffalo Run, Slab Cabin Run, Cedar Run, and Logan Branch.

The vast majority of streams within the watershed are perched above the groundwater table. Large springs are located throughout course of Spring Creek and are fed primarily by diffuse groundwater flow, with some sinkhole and closed depression recharge. Most of the small tributaries in the valley are naturally dry except during significant storms and snow melt periods, due to the carbonate geology. Due to the nature of this carbonate rock, many typical best management practices for stormwater are not practical in the watershed.

Looking at the watershed as a whole, it is approximately 14% impervious surfaces. However, when looking closely at the Borough of State College where the Penn State campus is located, the area is approximately 50% impervious, with growth expected to continue.

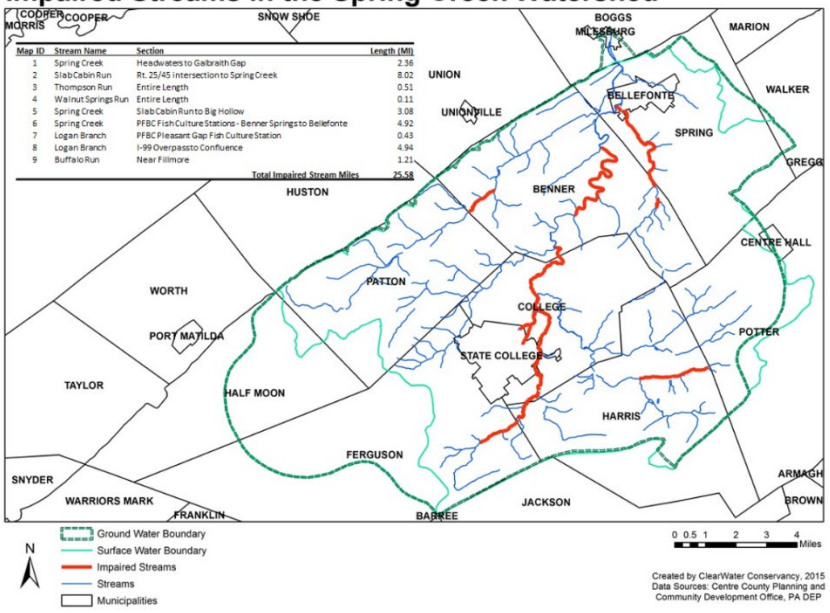
Communities within the Spring Creek watershed are largely dependent – 99% in fact – on groundwater as their primary source of potable water. Currently 99% of the region's drinking water comes from groundwater. To date, available data for the Spring Creek watershed shows that groundwater recharge is stable, if not increasing, due to the region's highly infiltrative soils.

The Spring Creek watershed is unique in several ways, one of which being its world class wild trout streams (designated Class A by the PA Fish and Boat Commission), which are used heavily by locals as well as anglers from afar. The watershed's karst geology, characterized by numerous limestone springs that provide year-round temperature regulation, allows for the continued survival of the wild trout, but temperatures can be negatively affected by warmer urban runoff.

There are nine impaired streams in the Spring Creek watershed according to the PA Department of Environmental Protection (DEP) (*see map on right*), including the headwaters of the main stem and five of its tributaries, for a total of 25.58 impaired stream miles. Listed impairments include siltation, organic enrichment, low dissolved oxygen, thermal modifications, and metals.[iv]

Other plans and resources related to wastewater, geology, water recharge, fisheries, and pollutant reductions for the Spring Creek watershed can be found at https://www.springcreekwatershedcommission.org/technical-reports.

Impaired Streams in the Spring Creek Watershed



The One Water Plan Process for Spring Creek

The Spring Creek Watershed Commission (SCWC)[v] is the governing body responsible for managing the future of the watershed. It is made up of elected officials from 12 of the 14 municipalities within the watershed (Centre Hall Borough and Hamilton Township have opted out). Formed in 1997, the Commission's mission is "to establish a long-range vision for the watershed that represents a consensus of thoughts and ideals that are commonly shared by the people of the Spring Creek Watershed; to establish a leadership role within the watershed to advance and coordinate projects and programs that are consistent with the long-range vision of the Spring Creek Watershed; and to develop a long-range comprehensive Watershed Management Plan and a program of meaningful associated projects to protect and enhance the quality of life within the Spring Creek Watershed."

Setting the Foundation Phase

The first watershed plan for Spring Creek, *Phase 1 of the Spring Creek Watershed Management Plan*, was developed in 2003. This plan can be accessed at https://www.placespeak.com/uploads/5684/Clearwater_SCW_Plan.pdf.

On January 23, 2018, Janie French, Executive Director of the Headwaters Charitable Trust, met with several members of the SCWC (Dennis Hameister, Bill Sharp, Joanne Tosti-Vasey, Mark Stevens) and the UAJA (Cory Miller) to understand the scope of the Spring Creek Phase 2 effort, which focuses on the natural water cycle as an integrated system, recognizing the interconnectedness of surface water and groundwater supply, stormwater, wastewater, and energy, and to determine if Ms. French's organization could provide those services.

This part of the process is defined by the Water Research Foundation as "defining the One Water scope". The outcome of integrated water management is to break down the silos of how water is currently managed, thereby creating collaboration among local municipalities, state and federal agencies, water utilities, business and industry leaders, academia, nonprofits, and residents. The Spring Creek Phase 2 plan will build the framework for a One Water plan by establishing primary goals with an outcome-based approach. Once the Phase 2 process is complete (*slated for spring 2019*), Phase 3 will document the road map with specific actions and milestones to achieve outcomes identified in Phase 2 over a determined time period. Phase 3 is scheduled to begin in late spring/summer 2019.

On March 21, Ms. French attended a monthly SCWC meeting in Bellefonte to provide them with an overview of her experience with watershed management planning. The SCWC approved of her qualifications and hired her to facilitate the One Water planning process and update and/or redo the existing watershed plan. The SCWC received approximately $3,000 (or 25% of total cost) from local partners to hire Ms. French to facilitate input from several subcommittees and stakeholder meetings and compile the findings in a report. Ms. French committed to a "verbal Memorandum of Understanding (MOU)" with the SCWC for this project, with a flat fee rate and no set hours. The partners also collaborated to pay $8,000 to hire a part-time communications staff person to record meeting minutes, send out related emails, and help organize the forums and workgroup meetings.

Before any public forums or workgroup meetings could take place, Ms. French researched other examples of One Water efforts and similarly organized processes to gain a better understanding of what this entails. For instance, the Water Environment Federation did a case study on Allegheny County in Pennsylvania, where ALCOSAN, the Allegheny County Sanitary Authority, was issued a consent decree by the EPA for releasing pollutants such as sewage into navigable waters and thus violating their NPDES permit. This affects the 83 municipalities within its service area. The consent decree and related regulations drove the water management process, but to Ms. French the process wasn't really an integrated plan because ALCOSAN did not consider water quality, drinking water or flooding. What this example did show was that personalities came into play, creating mistrust between ALCOSAN and the affected municipalities. Ms. French said broad case studies like this one don't get to the heart of what it really takes to do integrated water management in a place like the Spring Creek watershed. With the water management fragmentation that currently exists in the Spring Creek watershed (as well as many other watersheds in Pennsylvania and beyond), getting to an integrated water plan is going to be a challenge.

One technical committee member mentioned that there are better examples of integrated water plans in the western United States because it is easier to convince people there that water is an issue, due to the many droughts, wildfires, and other challenges. Their opinion is that the One Water model is the only way they will be able to survive in the future, relying on 100% water reuse. The challenge in more water rich places like the Spring Creek watershed specifically, and Pennsylvania generally, is how to show people they can intervene before water quality/quantity becomes a huge problem.

As part of the "identify and convene partners" process, a public forum was held on April 18, 2018 at the Central Pennsylvania Institute for Science and Technology by SCWC and Penn State law students to better understand the more than 100 participating stakeholders' concerns about water quality and quantity in the watershed, to identify their visions for the watershed, and to identify potential next steps for developing a watershed plan. People were invited to attend this forum via a Facebook page, newspaper ads, and other public notices that reached thousands of people in the region. Unfortunately, according to Ms. French, the tone set by the forum was one that "everything is bad in the watershed", rather than one where there are ways to work toward a positive vision. Following the forum, the law students compiled their notes from the event and other interviews into a report, which can be accessed at https://drive.google.com/file/d/0B0Bltg2PmrNyNzZDNTVkYXJZNUZnSHkweVc2X01BOGw5RkN3/view. The report results were presented to the SCWC at their monthly meeting on May 16.

Establishing Direction and Engaging Stakeholders Phases

After this public forum, Janie met with the subcommittee on May 14, June 4, and June 18 to begin the formal planning process, discuss desired outcomes and a proposed timeline, and plan for the next public forum. They also completed a site visit of the public meeting's location to decide where breakout sessions would take place. These meetings kicked off the "establishing direction" phase of the One Water planning process, where the vision and objectives are created and refined.

The first Phase 2 public forum was announced to the public on June 8 and took place on July 10 at the Calvary Church in Boalsburg, PA, a community within the State College region. Of approximately 200 people on the email invitation list for the meeting (based on those invited to the April 18 forum at Penn State), 50 people were in attendance. These stakeholders represented industries like Coca Cola and Hansen Aggregates, as well as Penn State University, nonprofits like Clearwater Conservancy, most of the municipalities in the watershed, and interested local homeowners. The purpose of the meeting was to introduce attendees to the watershed and previous planning efforts, describe the One Water approach, and gain their input through facilitated breakout sessions. Thus began the "assess needs and opportunities" portion of the planning effort, where all participants were brought to the same level of knowledge about the challenges and opportunities involved with integrated water management for the Spring Creek watershed. This assessment continued throughout many of the individual workgroup meetings, as different stakeholders shared their knowledge and concerns.

Each of the four breakout groups involved 12-15 participants and one facilitator from among the technical committee members. Participants were asked "How would you reimagine the Spring Creek Watershed if you could?" and "What actions are needed to achieve that vision?". Answers were recorded on flipcharts and the facilitators asked clarifying questions to be sure to accurately capture people's input. The meeting adjourned with a summary of the breakout groups input and next steps for the process (*see Appendix 5 for the meeting notes*).

Janie used the comments she heard during the first public forum to create draft documents, which she would then share with members of the SCWC and workgroups to refine and finalize. The "engaging stakeholders" phase also ramped up here, as Janie invited representatives from various local and statewide interest groups to participate in the water quality and water quantity workgroups. Outreach and engagement are continuous, however, taking place throughout the planning process and flowing into the work of Phase 3 in 2019 and beyond.

Those meetings began on July 19 and 26 at the Ferguson Township Building in the State College region. Each of the meetings consisted of members of two of the breakout groups from the July 10 meeting. The purpose of the meetings was to address the challenges within the watershed and develop solutions for the future. During the July 26 meeting there were 16 participants as well as Janie French and two members of the SCWC. Janie began the meeting by showing the group a draft mission statement that she crafted from input given during the July 26 meeting and asking for feedback. She then showed eight examples of "guiding principles" that came from other communities across the country working on their own One Water plan. Her twenty minutes of introductory slides also included information from the Environmental Protection Agency's preliminary healthy watershed assessment of 2017.

After the introductory presentation, Janie handed out two matrices (*see Appendix 3*), one on Challenges and one on Environmental Controls. The challenges came from the Spring Creek Phase 1 report. The groups discussed how relevant they thought these challenges and solutions still are, if at all. Data availability and accessibility came up several times as significant needs. Janie acknowledged that there is a lot of data collected on the Spring Creek Watershed but not all of it is readily accessible or is scattered in many different places.

After these two meetings, Janie met with the subcommittee members on August 2 to determine which organizations should participate in one or both of the technical workgroups – one to discuss water quality challenges and opportunities in the watershed and one to do the same for water quantity. Janie and members of the SCWC subcommittee reached out directly to these organizations to gauge their interest, then the

SCWC communications staffer sent an email invitation on August 18 to those who responded positively. The first joint meeting of the committees took place on August 23 at the Ferguson Township Building. There were 16 people in attendance from various agencies, industries, and nonprofits, as well as Janie and two members of the SCWC. After a brief recap of the July forum and subsequent meeting by the SCWC, Janie showed a presentation that was similar in content to the July forum, showing watershed and population statistics, problems identified in the Phase 1 plan, and issued identified during the July forum.

Janie then asked meeting participants several questions:

- Is there enough data (and if so, who has it?) and how recent does it need to be to still be relevant?
- What are the indicators used to measure overall watershed health?
- What steps need to be taken to track measurable outcomes to address water quantity and quality issues?

While Spring Creek is a data-rich and well-studied watershed, not all watersheds in Pennsylvania are so lucky. Even still, participants identified data gaps that would make Phase 2 planning a challenge. Janie noted that any data that doesn't currently exist will be identified in the Phase 2 plan as a data gap that needs to be filled and will outline how to fill it. Janie asked all participants to send their organization's related data sets to the SCWC email address to be added to the Commission's Phase 2 website. See Appendix 7 for meeting notes.

The two technical committees then met individually on August 30 for water quantity and September 6 for water quality. The author of this white paper was not in attendance at the August 30 meeting but did attend the September 6 meeting (both had the same agenda and goals) to showcase what was discussed and how the meetings were run.

During the September 6 water quality meeting, where 10 stakeholders were there plus Janie and two members of the SCWC, there was discussion about pollutant reduction plans (PRPs) and how they are used to meet Municipal Separate Storm Sewer System (MS4) requirements for many of the watershed's municipalities. Janie handed out several documents including a map of Best Management Practices (BMPs) in the region and a map of targeted areas in the watershed that could be used to meet MS4 targets. These and other handouts are available at the SCWC website www.springcreekwatershedcommission.org and/or in the appendices of this white paper.

The meeting then focused back on data – how to go about looking for it and then managing it all. Prioritizing the existing data and data gaps will be an important component for Phases 2 and 3 of the One Water planning process. One use for the data would be to get the Spring Creek watershed off DEP's 303 D impairment list, which is based on data that is at least 15 years old. The accuracy and reliability of the data sources will be critical in that case, however, as the DEP does not accept citizen science data for items related to regulatory requirements. See Appendix 8 for meeting notes.

Developing the Framework Phase

According to the Water Research Foundation (WRF), this phase involves creating the structure that will ensure long-term success of the One Water planning process. This can take different forms depending on the makeup of the watershed/region, but typically involves the creation of a plan or framework with strategies to achieve the goals and objectives developed during the previous phase. It also outlines how the steps of the plan/framework will be funded, who will lead the effort, and how adaptations will be made along the way, if needed.

A second joint technical workgroup meeting took place at the Ferguson Township Building on September 20 to begin this phase of the process and discuss water budgets. Twelve people were in attendance, including Janie and three SCWC members. Janie opened the meeting with a recap of the past technical workgroup meetings and discussed what a water budget is. She asked the group a few questions:

- How do you determine at what level to focus on for the budget?
- How much risk do you plan for?
- What does existing policy say?
- Where does climate change factor in?

Participants asked if a model could be made, knowing what water is going into and coming out of the watershed. This could be used to predict what might happen in the future. One was done in the past, but it isn't very accurate. Janie passed out several handouts related to the existing model including some pie charts and a map of well withdrawal and recharge.

There was much discussion about impervious surfaces and infiltration in the watershed, as well as the role of stream biota in determining water quality, particularly related to key indicators like nutrients and temperature. Participants were asked to think about not just how much water there is in the watershed but where it is located within the watershed.

The next portion of the meeting was to work on developing goals and objectives for the Phase 2 plan. Participants asked questions such as:

- How many years ahead will this plan look?
- Will it be developed for what they want the watershed to look like 20 years from now, and then the plan will be updated?

Janie responded that the objectives will have a timeline for how long each activity will take. Goals are broader and you cannot set a time constraint on them. The meeting ended with Janie giving a wrap-up and overview of the next steps. See Appendix 5 for meeting notes.

Another joint working group meeting was held on October 4 at the Ferguson Township Building. There were nine people in attendance, including Ms. French and one SCWC member. Janie passed out three handouts: a technical recommendations document, a Phase 2 draft table of contents, and a goals document (*see Appendix 3*). Ms. French began with an overview of One Water plans and a summary of what is next for Phases 2 and 3. The group then discussed critical recharge areas that have not been identified for the Spring Creek watershed except for land related to Penn State.

The group then went into a step-by-step review of the various goals on the handout. Goal 1 discussion included specific targets they want to meet, points and metrics, instream metrics to measure in-stream conditions, determining baseflow and mapping, and thermal imaging. Goal 2 discussion included the feasibility of a water budget that is broken into sub-watersheds and determines the needs of people and the environment. Goal 3 discussion included how to get all the utilities and municipalities under a resiliency agreement, and the importance of involving the public in every step of the One Water process.

Ms. French concluded the meeting by saying she would take all comments from the meeting and revise the goals document, then send out via email for them to react to within one week. This would be followed by 1-2 public meetings where those stakeholders' input would be gathered. See Appendix 10 for meeting notes.

Another meeting took place on October 4 to discuss goals, objectives and metrics. The author of the white paper was not in attendance during this meeting, but the agenda was similar in scope to that of the next meeting.

On October 24, 10 attendees from both workgroups, including Janie and one SCWC member, met at the Boalsburg Fire Hall. Janie passed out two handouts: a revised goals document with comments from Trout Unlimited, SRBC, and the Fish and Boat Commission added in, as well as a table on flow recommendations for the Susquehanna River ecosystem, of which Spring Creek is a tributary. Ms. French began the meeting by reviewing the purpose of the One Water plan – to break down silos. She decided to limit the effort to three goals to keep the process manageable, with two to four objectives per goal. The majority of participant comments were related to the metrics and targets for each of the goals.

There was some confusion about the differences between metrics and strategies. Janie said that strategies will be included in Phase 3, so they are not relevant at this point. One participant disagreed, saying strategies help flesh out what they are discussion and makes them more tangible. Discussion shifted to the content of goals 1 and 2 and how they were similar. They also discussed the technical language and how some should be changed since the Phase 2 report is geared toward the public, while Phase 3 will be more technical and scientific. Data management was a component that was missing from the goals document that participants felt was needed, so Janie created a new objective. An objective about a governance structure for regional water management was also added. A lot of wordsmithing and back-and-forth dialogue took place during this meeting. Janie concluded by saying she would revise the goals document once more, send to the workgroups for review, and then share with the public prior to the next public meeting. See Appendix 11 for meeting notes.

Nine members of the joint workgroups, including Janie and one member of the SCWC, convened again at the Boalsburg Fire Hall on November 13. Ms. French began the meeting by handing out a revised goals document and discussing the need to bring in other organizations like regional planning organizations in the future. She quickly reviewed the changes made to the goals document, then opened the floor to discussion, including changes to the watershed's vision, mission, and value statements. Participants discussed the level of growth in the watershed and how it could be done in a way that improves the environment. They also discussed the archaic structure of water pricing and how to ensure that no single water user is left out of the goals and objectives document so that all users are accountable. There were several concerns about how long Phase 3 is going to take and the need for urgency to keep up interest and momentum. Money will be a contributing factor in determining when

that process begins and how long it takes. A lot of wordsmithing took place as happened during the previous meeting. Janie concluded the meeting by reviewing her next steps (revising the goals document once more, advertising the public meeting, etc.). See Appendix 13 for meeting notes.

Also, on November 13, Janie met with members of the SCWC to discuss the next public forum: content, how it would be run, date and location, and other details. Their plan was to do an overview of the watershed and the technical workgroup process to-date, followed by a review of the most recent Phase 2 report, which incorporates the goals and objectives, mission and vision statements, and other content. The possibility of breakout sessions was discussed, but due to the space limitations of the Boalsburg Fire Hall and the number and level of expertise of available facilitators this idea was scrapped. Instead, participants would be allowed the chance to comment verbally or write their thoughts on 3x5 cards that would then be collected and incorporated into the final document. An online method for collecting public comments would also be set up. See Appendix 12 for meeting notes.

Email notification about the public meeting went out to the nearly 200 people on the One Water email list on November 20, with a reminder the day prior to the event. Ms. French met with members of the SCWC on December 3 to review the set-up and agenda for that meeting, and the following evening 38 people showed up at the Boalsburg Fire Hall for the final Phase 2 public forum. Mr. Hameister kicked off the meeting by welcoming everyone, introducing the SCWC members (approximately half were in attendance), then the technical workgroup members (approximately 25% were there), and then an overview of the One Water process to-date. Ms. French then took over, providing an overview of the purpose of the public forum and how the open discussion portion would occur. She showed a PowerPoint presentation that included a map of the watershed, a map of the impaired streams in the watershed, population change between 2000 and 2010, urbanized areas map with the change between 2000 and 2010, a table of water and wastewater suppliers in the region, highlights on the PA Water Law and how it affects the One Water process, and the major themes from the Penn State law student forum in July (*see Appendix 15 for a copy of the presentation*).

She then transitioned into a graphic of the One Water Cycle and a flow chart of the One Water Planning Process, followed by the vision and mission statements that were developed as part of the Spring Creek One Water effort. Subsequent slides showed six value statements and what they mean for the process, followed by four guiding principles for decision-making. She then reviewed the framework for the watershed's One Water plan, which included the goals, objectives, metrics and outcomes, as well as what Phase 3's short term actions will look like. Janie estimated that it will take approximately two years and $500,000 to write the Phase 3 plan, not included funds for a staff person to assist the SCWC with making sure the process keeps going. Total presentation time was approximately 40 minutes.

Janie then opened the floor for audience participation. Answers were typed into a Word document that was projected on a screen so all attendees could see. In the beginning people seemed hesitant to provide their input, but once conversation was flowing there were many suggestions for each of Janie's three questions, which were:

(1) What key steps need to be taken to ensure clean, plentiful and affordable water in the Spring Creek Watershed?

(2) Some steps will require funding to be completed, particularly for Phase 3, which is estimated at $500,000. How should key steps be paid for?

(3) Information will be needed to manage water differently. Key information needs to be obtained and new ways of coordinating across local and regional entities will be critical in future watershed management. How should this occur?

The meeting wrapped up with Janie saying the comments would be incorporated into the final Phase 2 report, which she will present to the SCWC during their monthly meeting on January 16 in Bellefonte. Any other comments can be submitted via email prior to that meeting. The Phase 3 portion of the planning process will finalize the leadership structure, determine how adaptive planning will occur, and figure out how the plan's strategies will be paid for – all of which are pieces of the "developing the framework" phase that could not be accomplished given the time and funding constraints places upon the Spring Creek One Water planning process. See Appendix 14 for forum notes.

And while the final phase in the Blueprint for One Water, "implementing the framework," cannot officially begin until Phase 3 is completed, the Spring Creek team does not want to lose the momentum they have built over the course of 2018, and so Janie has created what she calls "quick start actions" outlined in the Phase 2 report that can be implemented while the Phase 3 plan is being developed, to show stakeholders and the public that work is underway to protect and enhance water resources within the watershed (*see Appendix 2 for the draft Phase 2 plan).* Keeping all stakeholders informed of progress being made and adjusting the framework/plan along the way is essential for a successful One Water planning process.

In preparation for the January 16 SCWC monthly meeting, Janie met with all members of the subcommittee on January 10. During this meeting, they discussed what Janie would present during her allotted 45 minutes (30 minutes for presentation and 15 minutes for Q&A), which consisted primarily of getting the smaller municipalities up to speed on the process to date and get their buy-in. The members of the SCWC will consider and approve/reject the Phase 2 report, but not until the March 2019 meeting to give adequate time for public comment and review by members of the SCWC (and account for the snow and other bad winter weather in the region). The presentation during the January 16 meeting educated them on the process and the contents of the report, to prepare them for their upcoming vote.

During this preparatory meeting, Janie and the subcommittee also discussed next steps for the One Water Planning process to ensure adequate momentum. One step is to create a fundraising task force / capital campaign committee that will develop ways to pay for Phase 3 work. Potential members of this task force to include water authorities, one or more advocacy groups, a couple members of the SCWC, at least one planner (perhaps from the Centre Region Planning Authority), one or more businesses that are large water users, and someone from Penn State University with grant writing skills.

This task force will develop a funding plan and help write the RFP that will eventually hire a consulting firm to develop and write the Phase 3 plan. One committee member mentioned that it would be helpful to have the $50,000+ before the RFP is finished, but that it is unlikely that local partners will commit funds until they see the contents of the RFP. Participants discussed whether the majority of funds would come from grants, commitments from local authorities and municipalities, company donations, and/or a combination. Some mentioned that work on Phase

1 fizzled because grant money didn't materialize as expected and that had been the only source of funds for it. That issue has to be avoided for Phase 3 to succeed.

Regardless of where the funds come from, participants need to know that no one will have to pay more for their water and/or sewer bills once the Phase 3 plan is in place and that all authorities and municipalities know that they will retain their autonomy throughout this process. Knowing this will help bring and keep them involved and provide piece of mind for their rate payers / constituents.

Other committees / task forces involved in the lead-up to Phase 3 will include a continuation of the technical committee (a combination of the existing water quality and water quantity groups), an RFP task force to actually write and administer the RFP that will consist of some members of the technical committee plus a few others, and the SCWC Speakers Bureau, which will handle the public outreach and engagement efforts.

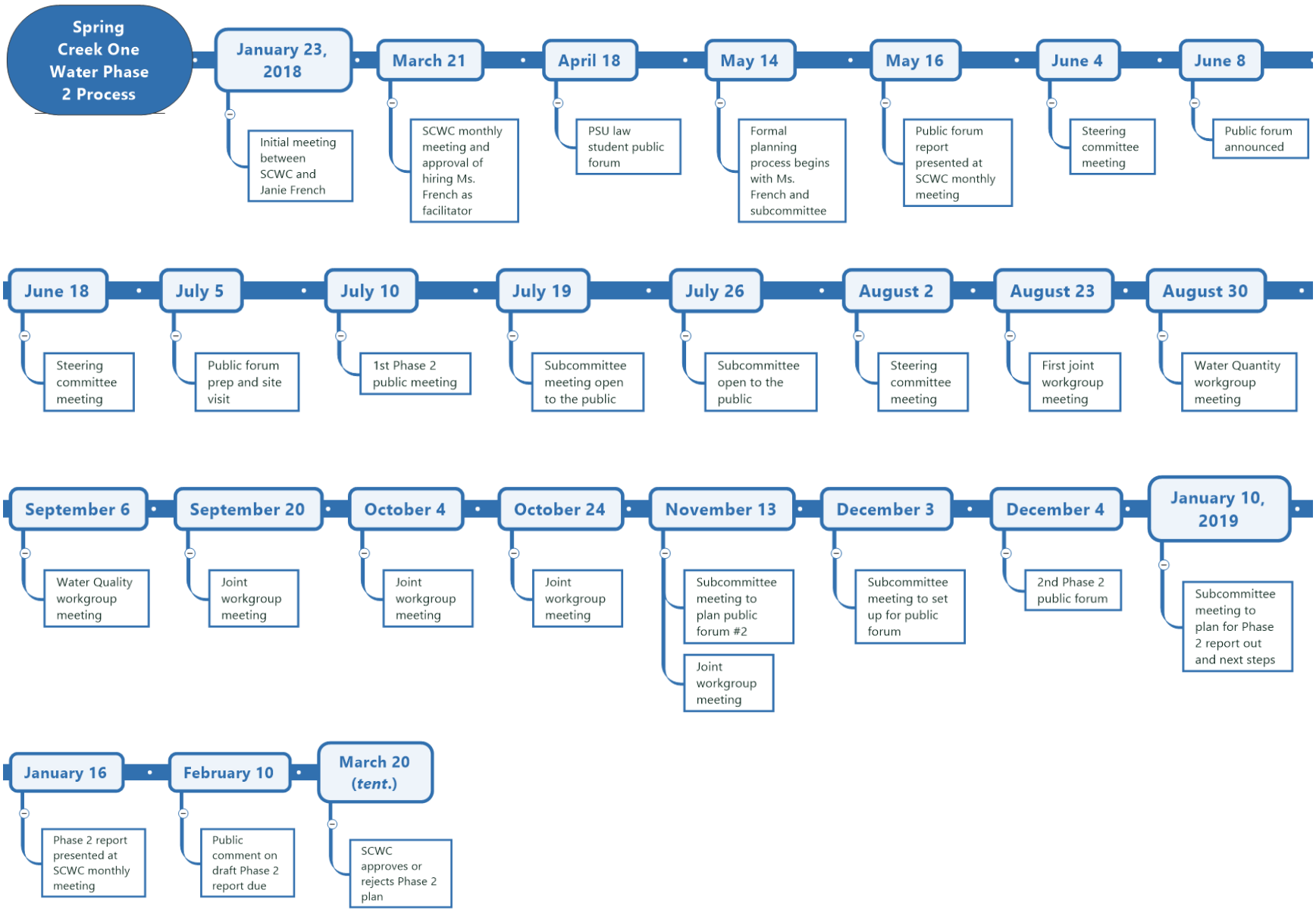
All members of the SCWC subcommittee agreed that Phase 3 will be designated a project of the SCWC like the Spring Creek Watershed Atlas (https://www.springcreekwatershedatlas.org). Otherwise, they were not sure what other entity in the watershed would have the interest and capacity to lead the effort. Whichever group oversees the One Water planning effort (here and for other watersheds considering this work), it needs to be seen as credible and neutral (in terms of their stance on population growth, environmental protection, etc.).

The length of time for Phase 3 completion was also discussed. Two to five years has been the average for other communities working on their One Water plans. However, a longer time frame can spread the financial burden across more years, making it more manageable, especially for smaller municipalities. And yet, the longer the process takes, the greater the chance of losing people's interest and having momentum stall. The subcommittee decided to aim for a 3-year process, knowing it may take an additional year or two, but that will be ok.

At the January 16 SCWC monthly meeting, representatives from 10 of the 12 member municipalities were in attendance. During the public comment period that preceded Ms. French's presentation, several members of the Nittany Valley Environmental Coalition (NVEC), which has participated regularly in the Phase 2 meetings, commented that they were concerned that if elements of the Phase 2 report (and subsequent Phase 3 plan) were strictly voluntary on the part of municipal involvement, it was "unlikely to be successful". They suggest the use of a revised Municipal Planning Code: Act 247 as the authority for the implementation of enforceable standards. As part of York County's Comprehensive Plan, they did something similar and the NVEC recommends that the SCWC use this as a model for the Spring Creek Watershed Phase 3 effort.

During Janie's presentation, she gave an overview of why the One Water process is useful here, how it has worked to-date in the watershed, the findings of the Phase 1 plan and the draft Phase 2 report, and what Phase 3 would look like should funding be obtained. She mentioned that public comment on the Phase 2 report will be accepted until February 10, and that the SCWC will then vote to approve the plan as written during their March monthly meeting. Full minutes of the January 16 SCWC meeting can be found in Appendix 16.

A timeline of the complete Phase 2 process in the Spring Creek watershed is included on the next page.


Spring Creek One Water Phase 2 Process
January 23, 2018
Initial meeting between SCWC and Janie French
March 21
SCWC monthly meeting and approval of hiring Ms. French as facilitator
April 18
PSU law student public forum
May 14
Formal planning process begins with Ms. French and subcommittee
May 16
Public forum report presented at SCWC monthly meeting
June 4
Steering committee meeting
June 8
Public forum announced
June 18
Steering committee meeting
July 5
Public forum prep and site visit
July 10
1st Phase 2 public meeting
July 19
Subcommittee meeting open to the public
July 26
Subcommittee open to the public
August 2
Steering committee meeting
August 23
First joint workgroup meeting
August 30
Water Quantity workgroup meeting
September 6
Water Quality workgroup meeting
September 20
Joint workgroup meeting
October 4
Joint workgroup meeting
October 24
Joint workgroup meeting
November 13
Subcommittee meeting to plan public forum #2
Joint workgroup meeting
December 3
Subcommittee meeting to set up for public forum
December 4
2nd Phase 2 public forum
January 10, 2019
Subcommittee meeting to plan for Phase 2 report out and next steps
January 16
Phase 2 report presented at SCWC monthly meeting
February 10
Public comment on draft Phase 2 report due
March 20 (tent.)
SCWC approves or rejects Phase 2 plan

RECOMMENDATIONS AND LESSONS LEARNED

Getting Started

In the Spring Creek watershed, a sense of urgency was created when Nestle began looking at the Centre County region (specifically in Spring and Benner townships) in early 2018 as a potential site to build a new $50 million water bottling facility by 2020. According to the Centre Daily Times, Nestle would purchase approximately 300 gallons of water per minute from the Spring Township Water Authority, which would support two bottling lines. And while a spokesperson for Nestle said, "We ensure withdrawals of water won't have a negative impact on the environment or residents' ability to access water," not all residents believed that to be true and attended public meetings to share their concerns.[vi]

By April of 2018, Nestle publicly issued a statement that they were no longer considering Spring and Benner townships for the site of the bottling facility, but that northern Centre County was still a possibility.[vii] Members of the Nittany Valley Environmental Coalition (NVEC) said that they will continue to follow the situation and help other citizens learn the process and know what questions to ask local government leaders. The group also petitioned the Centre County Commissioners to "stand with us in opposing water bottling companies coming into our area."[viii]

The One Water process for Spring Creek grew in part from these concerns and builds upon the *Phase 1 of the Spring Creek Watershed Management Plan* that already existed for the watershed.

Regardless of where you are located, the One Water planning process must be built on a structure of positivity and possibilities. As Janie French said, "When you have something to aspire to, you look at the possibilities and how to achieve the vision [of a One Water plan]." Something that slowed the process down in Spring Creek was the fact that a vision for the watershed had not been created prior to One Water, so some of the time that could have been spent developing in integrated water management solutions was spent getting everyone to buy-in to a newly created, shared vision.

How the process begins in your watershed/region will invariably be different from what happened in the Spring Creek watershed, but some factors remain true for all. The *Blueprint for One Water* starts by recommending you "Define Your One Water Scope." This process involves visioning for the future of the watershed/region – brainstorming ways to manage water differently. This big picture, out of the box thinking can be one of the most challenges parts of the One Water planning process but is also one of the most important. Without new ways of thinking and working together, integrated water management is out of the question.

Building Support

The first step in making sure the One Water planning process will succeed is to ensure that everyone involved understands what the One Water process entails. Focus considerable time on this education up-front to avoid time wasted later on. Use the *Blueprint for One Water*, this white paper, and other resources from the Water Research Foundation (WRF) as materials to guide your outreach efforts.

The number and makeup of the stakeholders involved in a One Water planning process will differ from one locale to another, but may include state and federal agencies, local government officials, universities, nonprofits, large water using industries, and water utilities.

The push for a One Water plan should come from the water utilities, according to Janie French. They are the people working each day to ensure a clean and abundant supply of water exists for their ratepayers, and they have the budgets to make things happen. They need to be seen as environmental clean-up organizations rather than just a sewer or drinking water authority. However, they have to be on the same page, working together, and that was not the case before the One Water planning process began. Each utility worked independently and sometimes their goals compete with each other, especially as the State College region grows. The utilities were under the false assumption that their ratepayers only care about how much they are paying for their water and sewer, when in fact these ratepayers want to get their money's worth, which is different. By showing the utilities this new way of thinking, they can become leaders of the One Water effort.

But although the utilities could do it on their own, having a regional entity like the Spring Creek Watershed Commission (SCWC) backing the effort helps get buy-in from all municipalities within. Ultimately, says Janie, environmental controls (one example is ordinances) will need to be created within those municipalities to implement the recommendations of the One Water plan. See one of the handouts in Appendix 16 for those that exist within each municipality in the Spring Creek watershed as of 8-17-16.

The *Blueprint for One Water* recommends developing a one-page high-level agreement that leaders of each organization involved in the process would sign, enabling their representatives to devote time toward plan development with a shared understanding of the work involved, the key tasks, responsibilities, and timelines. For the Spring Creek effort, participants were not bound to a written agreement, and perhaps that was evident in the shrinking number of participants as the process continued? There was discussion that an agreement document will be needed to get all 14 municipalities onboard when the time comes to implement Phase 3, but as of the writing of this white paper, a draft agreement has not been written.

Data Needs

Those involved in a One Water planning process need to have a general understanding of the water needs and opportunities in a watershed/region to make integrated water resource management work. One of the first things you should do after convening the stakeholders is to ask the group the following questions:

1. What types of data do we need (baseline, metrics, ordinances, etc.) and how recent does it need to be?
2. Where can the data be obtained?
3. What do participants think about citizen science versus professionally collected data? Can both be used, and if so, what considerations need to be considered?
4. What will the data be used for?
5. What is the ultimate goal of the data collection?

Only by answering those questions can you begin to develop goals, objectives and strategies for your One Water plan. As was the case in the Spring Creek watershed, and most likely for others involved in this process, you might not be able to answer each of these questions in full from the beginning. Throughout the One Water process the team will work together to determine what is and isn't important for their plan and seek out answers accordingly. In the Spring Creek scenario, data gaps were identified during Phase 2, but will not be filled in until Phase 3, when more monetary resources will be available for a deeper dive into existing data resources.

The wider net you cast for participants in the One Water planning process, the better equipped you will be for knowing what data exists and where to find it. But before you even start the data gathering process you need to know what parameters are important for your individual One Water planning process. This may vary from watershed to watershed depending on types of impairments, the level of development, the population density, the local geology, and so much more.

If you focus solely on water chemistry, you will miss important things related to biology like the role that habitats play in cleaning up pollution problems. People tend to focus on what they see rather than what something could be. The sensitivity of macroinvertebrates to pollutants shows good and bad changes immediately.

All data means something, but whatever you are measuring should show what is improving through your actions. "Figuring out the right things to measure is more important than measuring a lot of things," said one committee member. For data rich communities like the Spring Creek watershed, it is fine to continue monitoring what is being monitored but know that there can be a lot of ups and downs in the data. It is what happens over the long-term that really matters.

"Science and data can lead people down into the minutia," the committee member went on to say. "Scientists want to be able to show that all data leads to how we should be doing things, but for One Water you can't get into the weeds like that." Therefore, you need to plan from the beginning the level of data detail you will need for One Water planning purposes and set the rest to the side. Otherwise, meetings can get mired in tiny details that are not relevant to the end goal of developing a One Water plan. This happened at times during Spring Creek meetings, particularly those of the technical workgroups. You need a facilitator who is not afraid to interrupt and end conversations that are not leading toward the ultimate goal.

The Facilitator

There are two schools of thought on the background of the person or persons selected to facilitate the One Water planning process. One says that having someone with in-depth knowledge of the specific watershed and who the key players are will be most effective because they will be seen as one of the team, not an outsider. However, the flip side is that someone from the outside can have the benefit that no one knows them, and they will not have preconceived ideas about how things have always been done. As one participant noted, "The hardest part of the One Water process is getting people to see beyond what they already think and know."

Regardless of whether the facilitator is new to the watershed or not, they will need to quickly become familiar with who everyone in the room is – who do they work for, what do they care about, what knowledge do they bring to the table, etc. – to be able to effectively gather information, manage personalities, and diffuse any potential conflicts.

The facilitator will also need to be an effective writer, as they should be the entity responsible for writing the One Water plan. "You can't team write it," said one committee member. Janie French was responsible for writing each iteration of the Phase 2 report, although she sought committee members' and the public's input at several points in the process to be transparent and inclusive. Without that frequent participation, buy-in and interest will quickly dissipate.

Who to Invite

The *Blueprint for One Water* breaks stakeholder engagement into several categories: the public and special interest groups, regulators, and elected officials. How each of these groups is educated about the One Water process and asked to participate and/or contribute will be different. The number of participants within each category will also vary depending on the makeup of the watershed/region and the breadth and severity of the associated challenges and opportunities. In the Spring Creek watershed, participants were invited to the table through multiple means – social media posts, advertisements in newspapers, existing email lists of the SCWC, personal invitations to stakeholders based on their expertise, etc. Communications with these invitees via email (both mass and individual in type) and updates on the SCWC website were regular enough to retain interest and keep everyone informed.

There will most likely be organizations that are overlooked initially in any One Water planning process, whether due to oversight, difficulties in contacting them, lack of interest, or internal politics. However, for a One Water effort to be successful, the full representation of the watershed/region must be present. If certain organizations cannot participate initially, it is never too late to bring them to the table. Organizers in Spring Creek recognized that one or more representatives from the Environmental Protection Agency (EPA) Region 3 office should be brought in at some point, but not in the early planning stages. Their higher level view of the situation will become more important in Phase 3. Some of the smaller water utilities in the watershed will become involved in the process as it involves as well. They were not involved from the beginning due to lack of financial resources, but it will be important for them to buy into the process as the One Water model will save them money in the long-run.

Some might think that looking for participants outside of the given watershed/region is not necessary but involving organizations and individuals that have a reach beyond the watershed like the US Geologic Survey (USGS), Susquehanna River Basin Commission (SRBC), and PA Fish and Boat Commission (PFBC) can encourage innovative solutions, and in some cases can encourage participation from a watershed entity that might not have participated otherwise.

However, having regulatory agencies as participants can complicate things as well. In the Spring Creek situation, meetings ran smoothly, even with representatives from agencies that don't always see eye to eye. The absence of one key state agency from all meetings (they did participate via email comments at times) was chalked up to those inter-agency tensions. A skilled facilitator should be able to identify potential conflicts

between organizations and know how to diffuse the situation in as politically-correct a manner as possible. Above all, the facilitator (and the organization charged with overseeing the One Water process) should remain neutral and not express their personal and/or organizational interests/feelings throughout the process.

Where Will the Funds Come From?

Aside from the initial funds contributed to hiring Janie French as a facilitator and hiring a part-time communications assistant for the SCWC, the question of where the money would come from to actually implement the Phase 2 plan and complete the Phase 3 process was left somewhat unanswered by the time the writing of this white paper came to a close, although the subcommittee recognized that funds will need to come from a variety of sources (grants, funds from authorities and municipalities, donations from local businesses, etc.) to be successful. During the Phase 1 effort in Spring Creek, momentum came to a halt when anticipated grant funds did not materialize.

The workgroups identified a need of approximately $500,000 over a two-year period to hire a consulting firm to write and implement the Phase 3 plan, as well as the need for additional funds to hire someone to work with the SCWC to make sure implementation went according to plan. The hope of the group is that each water utility in the watershed, as well as perhaps some or all of the municipalities and maybe even some businesses, will contribute funds to make that happen, but only time will tell on the success of that measure.

The cost of the One Water planning process will vary considerably from watershed to watershed, depending on how detailed the plan/framework is, how many stakeholders are involved, how many water management challenges exist, etc. Where those funds come from will also vary from traditional bonds and taxes, to grants, to public-private partnerships and cost-sharing, to fees placed on developers, and other methods. It is key that ratepayers know that right now they are not paying the true cost of water, so that as rates increase, they see value for the money spent.

Over the long-term, using a One Water planning process for integrated water resource management should save utilities, municipalities, and ratepayers money. It is up to those involved in the One Water planning process to demonstrate how money spent up front will save considerable resources later on, while also protecting and enhancing water resources and the environment for current and future generations, to ensure buy-in from all involved.

What's Next?

In the Spring Creek Watershed, the One Water planning process will continue throughout 2019 and beyond, as the SCWC and the various stakeholders in the watershed work together to find funds to start and complete Phase 3. That process may take three years or more to reach the implementation phase, so members of the SCWC will need to ensure that they communicate regularly with all participants to know that progress is being made and that One Water planning remains an integral focus for all municipalities and water users in the watershed.

CONCLUSIONS

The One Water planning process began in the Spring Creek watershed in January of 2018, and this white paper has documented the process from then through February 2019. Over the course of those 13 months, the SCWC, Janie French, and other stakeholders have taken the contents of the Phase 1 report and generated a draft Phase 2 plan that includes considerable public input and stakeholder insights. While the One Water process for Spring Creek will not be complete until the Phase 3 report has been written and implemented, we believe that a lot can still be learned from the process they went through over the course of 2018 to kick start other One Water planning processes across Pennsylvania and beyond.

If you are considering your own One Water plan, be sure to:

- "Define Your One Water Scope" by working on a collective vision for the future of the watershed/region. Brainstorm ways to manage water differently.
- Build support for the One Water concept with multiple forms of education and engagement, then invite all interested parties to participate in the process.
- Consider developing a one-page high-level agreement that leaders of each organization involved in the process would sign, enabling their representatives to devote time toward plan development with a shared understanding of the work involved, the key tasks, responsibilities, and timelines.
- Think about the various types of data that will be needed to write the plan, where it will come from, how it will be used, etc.
- Find a facilitator who is familiar with the One Water process, can remain neutral, is fluent in good interpersonal and negotiation skills, and is an effective writer.
- Determine where the money will come from, not just to facilitate the planning process, but to implement the steps and ensure sustainability of the effort. This can be grant funds, contributions from water utilities and municipalities, donations from local businesses, etc.

And should you require additional assistance, RiverStewards is happy to offer our services in One Water planning, facilitation, and technical guidance support. You may reach us via the contact information on our website at https://riverstewards.info.

Please help us advance the One Water planning process across Pennsylvania. If you could let us know the following, we would appreciate it! Please send to Jessica at jessica@riverstewards.info.

- Where did hear about this white paper?
- Did you read a hard copy or on the internet?
- Do you plan on starting your own One Water planning process?
- If so, why, when, and for what watershed / municipality(s)?
- If not, what resources / needs would help you reconsider?

REFERENCES

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[ii] The Water Research Foundation, *Blueprint for One Water*, http://www.waterrf.org/PublicReportLibrary/4660.pdf

[iii] MS4 Partners, *About the Watershed*, http://www.ms4partners.org/about-the-watershed.html

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[v] The Spring Creek Watershed Commission, https://www.springcreekwatershedcommission.org

[vi] Centre Daily Times, *Nestle Waters considering Centre County for $50 million manufacturing facility*, 1/3/2018, https://www.centredaily.com/news/local/article192725104.html

[vii] Centre Daily Times, *Nestle Waters makes decision about proposed facility in Centre County*, 4/16/2018, https://www.centredaily.com/news/local/article209047794.html

[viii] Centre Daily Times, *The community's reaction to Nestle Waters' decision varies. Here's why*, 4/17/2018, https://www.centredaily.com/news/local/article209113584.html

APPENDICES

Appendix 1: Spring Creek One Water Plan - Technical Workgroup List

SCWC Technical Workgroup: Overarching duty of the sub workgroup is to provide guidance on the development, collection and dissemination of information and technology for integrated water resource management and protection. Information developed by the workgroup will be an integral part of the Spring Creek Phase 2 Action Plan report. Members are selected for their technical abilities.

Workgroup Membership
3 members from the Spring Creek Watershed Commission (SCWC)
Dave Yoxtheimer, Water Resource Monitoring Project
PA Rural Water Association and Bellefonte Borough Water Authority
Andy Gavin and John Balay, Susquehanna River Basin Commission (SRBC)
Jason Deter, PA Fish and Boat Commission
Cory Miller and Dave Smith, University Area Joint Authority (UAJA)
Dennis W. Risser, USGS
Kerry Tyson, Centre Hall Water Authority
Ted Reigh, Mid Centre Authority
Brian Heiser, State College Water Authority
Dave Robert, Nittany Valley Environmental Coalition
Dave Swisher, Penn State University Physical Plant
Jim Gazz, Coca-Cola Company
Lee McDonnell, PA Department of Environmental Protection (DEP)
Jason Wert, University Area Joint Authority (UAJA)
Ford Stryker, Spring Creek Chapter of Trout Unlimited
Betsie Blumber, PA Senior Environmental Corps
Deb Nardone, Clearwater Conservancy
Terry Melton, Nittany Valley Environmental Coalition
Brian Walker, Bellefonte Borough Water Authority
Dave Kristine, PA Fish and Boat Commission
Scott Heidel, PA DEP

Appendix 2 - Spring Creek Watershed Phase 2 Report (*draft 11-16-18*) - Our One Water Plan for Integrated Watershed Leadership

Executive Summary

Full report can be reviewed at www.springcreekwatershedcommission.org

In early 2018 the Spring Creek Watershed Commission embarked on updating the Spring Creek Watershed Plan. Phase 1 of the Spring Creek Watershed Management Plan entitled "Our Challenges and a Direction for the Future" was completed in 2003 and primarily focused on environmental challenges and solutions. Phase 2 addresses a new way to address watershed challenges. These challenges can encompass many different aspects from environmental, socio economic, watershed scale, utility management, land use, political, population growth and climate change factors.

According to the Susquehanna River Basin Commission, groundwater resources maybe approaching or exceeding the sustainable limit of the resource. Spring Creek has an abundance of water, but it is unevenly dispersed throughout the watershed causing loss of flow in headwater areas and low to no flow in some tributaries. State College area is undergoing rapid growth and the nature of the growth has changed from residential and industrial to dominantly residential, educational, and commercial, with a more diverse employment base. On average the population in the watershed has increased by 6.5% between 2010 and 2017 with a population reaching almost 131,000. From a management perspective, there are many players (as many as 31 different entities) making decisions about land use and water.

Phase 2 takes a proactive approach to solving the fragmented management of Spring Creek's water resources. The method, known as One Water" manages water resources for long-term resilience and reliability to meet both community and ecosystem needs. The One Water approach views all water—drinking water, wastewater, stormwater, grey water, watersheds and more—as resources that must be managed holistically and sustainably. Doing so builds strong economies, vibrant communities, and healthy environments.

Governance, regulations, finance, culture, and industry knowledge/capacity are often cited as barriers to achieving integrated water management. In addition, findings indicate that lack of a common vision, political will, urgency, systems thinking, and lack of ability to collect and share data are underlying causes that can stagnate an integrated management approach. The One Water approach relies heavily on partnerships and inclusion, recognizing that progress will only be made when all stakeholders have a seat at the table. A diverse workgroup was established to develop guiding principles, goals, objectives and metrics for outcome-based solutions.

Phase 2 builds the framework for One Water by establishing goals leading to Phase 3 which will document the road map with specific actions and milestones to achieve outcomes over a time period ranging from short term to long term efforts. The three goals are as follows:

Goals 1: Protect, Enhance and Sustain Healthy and Resilient Coldwater Stream Ecosystems.

Goal 2: Maintain and improve water quality and quantity to sustainably meet the needs of the human community.

Goal 3: Integrate and Coordinate Management for Sustainability, Economic Growth, Recreation and Quality of Life.

Next steps leading to Phase 3 include: continue to convene the workgroup to begin drafting an RFP for technical services and a funding strategy for Phase 3. Implement a speaker's educational series; use the SCWC website as a centralized information center and continue using the communications contractor for administrative support.

Introduction:

Early in 2018, the Spring Creek Watershed Commission (SCWC) embarked on Phase 2 of the Spring Creek Watershed Management Plan. Phase 1 of the Plan was completed in 2003 and primarily focused on environmental challenges and solutions. In the spring of 2018, the Spring Creek Watershed Commission worked with Penn State law students through the "Mediation of Environmental and Public Conflicts" course and the Sustainable Communities Program to host an open public forum which stakeholders shared their thoughts on issues affecting the watershed and opportunities to address issues and holistic management. Over 100 people attended the forum. As an outcome of the public dialogue, substantive sector-based issues, process related issues, a vision for the future, and opportunities for integrated water resource management were identified. *(https://www.springcreekwatershedcommission.org/april-public-forum).*

The Forum helped set the stage for Phase 2, which is taking a more proactive approach through establishing integration of management by focusing on the natural water cycle as an integrated system, recognizing the interconnectedness of surface water and groundwater supply, stormwater, wastewater, and energy. Rooted in a "One Water" approach as promoted by the US Water Alliance, the outcome of integrated management is to break down silos of how water is currently managed, ultimately creating collaboration among local municipalities, state and federal agencies, water utilities, business and industry leaders, Penn State University, nonprofits, and residents. While the focus is WATER, the goals lead to a thriving local economy, community vitality, and healthy ecosystem, which are the pillars from Phase 1. Phase 2 builds the framework for One Water by establishing primary goals with an outcome-based approach. **Phase 3 will document the road map with specific actions and milestones to achieve outcomes identified in Phase 2 over a determined time period. Phase 3 will begin in early 2019.**

In July 2018, Spring Creek Watershed Commission hosted a second public forum which provided an overview of a One Water approach and tasked the over 90 participants to envision "What would the **ideal** Spring Creek Watershed look like?" *(Appendix 1 - Stakeholder vision comments)*

The One Water Approach relies on this vision and determines how decisions will be made through the establishment of "Guiding Principles". The Spring Creek Watershed Commission, which was established in 1997, had already drafted their mission statement, but hadn't included a vision for the watershed or guiding principles for decision making. These are included in Phase 2 of the plan update.

Spring Creek One Water
Plan Vision Statement

- The vision for the Spring Creek Watershed is an integrated management of water resources in an environmentally, economically, and socially beneficial manner. This will foster a vibrant, prosperous watershed where natural and human communities thrive, and citizens embrace the value of our assets and sustain our resources now and for future generations. This vision, developed collaboratively with stakeholders, is accomplished through the mission of the Spring Creek Watershed Commission.

Spring Creek Watershed Commission
One Water Plan
Mission Statement

- To implement the long-range vision for the watershed that represents a consensus of thoughts and ideals that are commonly shared by the people of the Spring Creek Watershed.

- To establish a leadership role within the watershed to advance and coordinate projects and programs that are consistent with the long-range vision of the Spring Creek Watershed, including conservation and enhancement of the exceptional wild trout resources it supports.

- To develop a long-range comprehensive Integrated Watershed Management Plan that relies on quality scientific data and a program of meaningful associated projects to conserve and enhance the quality of life within the Spring Creek Watershed.

Spring Creek Watershed Commission
One Water Plan Value Statements

Spring Creek's One Water Plan values are the core principles that the watershed communities' governments, residents, water utilities, businesses and industry wish to maintain. They must be acknowledged and honored to ensure that change and development occur in accordance with these core principles.

1. Recognizes that the Spring Creek Watershed is worthy of conservation and careful stewardship.

2. Conserve Spring Creek's cold-water ecosystem including its exceptional wild trout fishery.

3. Provides a clear visual image of the watershed community that reflects the highest standards of design quality for public and private commercial, residential, institutional, and industrial development in Spring Creek, resulting in the conservation of water and the conservation and enhancement of its natural beauty, natural features, and cultural heritage.

4. Promote buildings and public infrastructure development that are practical, sustainable, and in harmony with the environment and surrounding landscape.

5. Fosters a feeling of community spirit, community identity, and promotes a sense of full citizen participation, guaranteeing an opportunity for everyone to share in the duties and responsibilities that benefit the Spring Creek Watershed.

6. Provides cultural, recreational, and educational opportunities for the residents and visitors to the Spring Creek Watershed.

Guiding Principles

Guiding Principles are statements that articulate shared or common values and expectations that support decision-making and actions. These are draft principles that should be vetted by the Spring Creek Watershed Commission.

Spring Creek – Our One Water Plan is not an effort to change local governance, but to integrate management and leadership.

Our One Water Plan envisions an approach that will pull parties together in every aspect of the water arena in a way that goes beyond the interests of any one government agency or stakeholder and in a way that has never been done before. Decision-making that spans political boundaries is essential to fully implement watershed management and achieve established goals for the watershed; therefore, formal agreements outlining the means and methods for this decision-making are also essential.

Spring Creek - Our One Water Plan will strive for a systematic, watershed-wide, science-based approach to watershed management; driven by the participating local governments, state and federal governments, water utilities, planning commissions, Penn State University, citizens, businesses and industry.

It will involve a broad range of stakeholders to ensure an integrated approach to watershed management. A “bottom up” approach for water management—allowing the key discussions of major water resource issues, concerns, problems, goals and objectives, and potential solutions to originate and be first fully vetted at the stakeholder level—is envisioned. Expanding involvement and collaboration at the ground-level creates greater buy-in and support at all levels of government.

Spring Creek – Our One Water Plan planning and implementation efforts will recognize local commitment and contribution.

History shows us that when local water management programs and projects rely almost entirely on outside funding, they are unable to sustain themselves over time. Locally supported and funded technical, administrative, and outreach activities that leverage funding from multiple sources, including local, state and federal sources, will be key to ensuring local government capabilities and long-term success on both the local level and watershed scale.

Spring Creek – our One Water Plan will embrace the concept of multiple benefits based on measures of social, economic, and environmental outcomes in the development and prioritization of implementation strategies and actions.

Phase 1 Review

Phase 1 of the Spring Creek Watershed Management Plan entitled "Our Challenges and a Direction for the Future" was completed in 2003 and primarily focused on environmental challenges and solutions. The Phase 1 report documented 17 watershed plans and studies specific to the Spring Creek Watershed and included an appendix of 39 additional watershed plans and integrated water resource plans from other regions in Pennsylvania and nationally. A Challenge and Solutions Matrix outlined 4 major focus areas: surface water, ground water, water supply, and land use/water resource planning. In 1998, the Water Resource Monitoring Project started as part of the strategic planning effort of the Spring Creek Watershed Community, which includes over 2,000 broad-based stakeholders to promote actions that protect and enhance the quality of life, the environment, and the economy throughout the watershed. Annual reports have been developed through the resource monitoring project from 1999 to current year *(http://springcreekmonitoring.org).*

Additionally, the Spring Creek Watershed Commission, which has been meeting the third Wednesday of every month Since 1997, began establishing environmental controls to address some of the identified issues in the plan (*Appendix 2-Spring Creek Watershed-Environmental Controls).*

Phase 2 – One Water

In order to establish science-based outcomes, a technical work group was formed (*Appendix – 3 Technical workgroup members)*. Through the course of several meetings, the workgroup identified relevant information, set metrics, and defined outcomes. For example, the Susquehanna River Basin Commission's 2016 Cumulative Water

Use and Availability Study for the Susquehanna River Basin identified the Spring Creek Watershed as a sensitive area in the Commission's Groundwater Management Plan and the PA State Water Plan.

Also, in the 2017 Centre Region MS4 Partner Pollution Reduction Plan, there are specific BMP recommendations that quantify Pollution reduction goals. In review of technical documents, there is good news and still some concerns. Spring Creek has a lot of ground water. However, the water is unevenly dispersed throughout the watershed. Also, the primary pollutants identified in the 2003 report are: sedimentation, nitrogen and phosphorus. These pollutants remain as concerns even after the many restoration projects that have been implemented since the 2003 plan.

Ecological conditions that are measurable will be used to track the health of the Spring Creek Watershed. Metrics have been established to measure how we are meeting the desired outcomes. These metrics include water quality, habitat, hydrology and biological conditions.

As indicated previously, Phase 2 builds the framework which will be followed by Phase 3, which will begin in 2019. Phase 3 will document the road map with specific actions and milestones to achieve outcomes over a determined time period ranging from short term actions to long term efforts over a 50-year period. A major emphasis for Phase 3, beyond addressing ecosystem and water supply concerns, will be a process for integration of water management. Currently, there are six separate water authorities, two water/sewer authorities, and 3 sewer authorities, and two state, one interstate, and one federal agency all working to manage water in the Spring Creek watershed, often times in an unorganized manner. Additionally, there are four regional planning commissions along with the Centre County Planning Commission and the Centre County Metropolitan Planning Organization, which address land use and transportation. Coordination amongst all these entities is imperative. The potential to build an informal network to facilitate communication and work across political boundaries will be needed. This may be a role for Penn State University to research and convene. Additional financial resources will also need to be secured to facilitate science-driven milestones and outcomes and to add staffing capacity to the Spring Creek Watershed Commission.

Multiple benefits balance environmental, economic, and societal goals. There are many strategies for ensuring a reliable, high-quality water supply, including stormwater capture, source water protection, water reuse, and efficiency improvements. Many of these strategies also provide additional benefits, such as reducing greenhouse gas emissions, improving water quality, and enhancing community livability. Incorporating the value of these benefits into investment decisions will be established.

Framework for Spring Creek One Water Plan
Goals, Objectives, Metrics and Desired Outcomes

Goals are statements that describe the fundamental endpoints or outcomes we are aiming to achieve through activities across all sectors of management. Goal statements are expressed in broad aspirational terms.

Objectives are statements about desired outcomes and support the high-level goals.

Metrics can be considered performance indicators. They can be considered benchmarks that can be measured to track how well we are achieving our desired outcomes. For example, "tons of sediment eliminated".

Outcomes are specific changes we are trying to achieve. They should be measurable and realistic but challenging. If outcomes are unrealistic and too difficult to achieve, they may discourage people rather than motivate them. On the other hand, outcomes that are too easy to achieve can lead to complacency.

Goals 1: Protect, Enhance, and Sustain Healthy and Resilient Cold-water Stream Ecosystems

Objective	Description	Suggested Metric (s)	Outcome(s)
Objective 1A: Protect Ecosystem Flows	Rivers, streams, wetlands, and springs need certain amounts of water to support healthy aquatic ecosystems. Improve water quality and quantity for resiliency to ensure the capacity of the ecosystem to respond to a disturbance by resisting damage and recovering quickly. This is especially critical given the unique cold-water ecosystem supported by the Spring Creek Watershed and highlighted by the exceptional wild trout populations and fishery, which require cold, clean water to flourish. Management must consider the impacts of point and nonpoint	• The Nature Conservancy Ecosystem Flow Recommendations (See Appendix X) • Acres of impervious surface • Lbs of nitrogen, phosphorus, and sediment reduced • Number of miles of riparian buffers installed • Miles of stream improved that meet criteria to be delisted from impairment	Restore High, Seasonal, and Low Stream Flows Maintain and improve existing hydrology Impaired stream sections improved to meet criteria for removal from impairment designation on 303D list Voluntary Total maximum Daily Loads Met

	discharges, development, stormwater, and water withdrawals.	• Development of a proactive TMDL to determine maximum amount of pollutants allowed to occur in spring creek and tributaries in the future.	
Objective 1B: Create Resilient Habitats	Stream habitat is one of the important factors that affect aquatic communities. This includes physical habitat and water quality. Based on the macroinvertebrate diversity and sensitivity to pollution, wild trout population dynamics, and densities, we gain an understanding of our streams' health. Degraded in-stream habitat often result from uncontrolled storm water runoff and uncontrolled runoff from cultivated agricultural land. Other reasons for poor stream habitat include altered stream flows, excess sediment, and a loss of surrounding trees and shrubs that help slow the erosion of the stream banks and provide shade to help maintain cool water temperatures during critical summer months. Chemicals and pollutants also negatively impact stream habitat/water quality.	• Index of Biological Integrity Scores • DO, water temperature, sediment loads, stream channel surveys (fluvial geomorphology) • Number of trout, biomass, sizes and redds • Acres of Impervious surface reduced • Miles of riparian buffers installed • % of impervious surface	Diversity of macroinvertebrates Improved water quality and thermal regime Wild trout populations at or above current levels. Maintain and improve existing water quality, including water temperature and D.O. Acres and/or # of Green Infrastructure
Goal 2: Maintain and improve water quality and quantity to sustainably meet the needs of the human community.			
Objective 2A: Maintain a reliable water supply for residents, agriculture, and industry	Protecting, maintaining, improving and developing new water supply sources and recharge/storage areas ensures a supply for future uses. Water	• % loss from water systems • # gallons of drinking water from new sources	% water use served by recycled water, # new large-scale storage areas developed

	management must consider the multiple uses of groundwater to ensure reliability. Recycled water can offer a reliable source that can displace a portion of the need for additional surface or groundwater withdrawals	• % stormwater volume directed to recharge areas • % reduction in treatment costs	
Objective 2B: Implement a water demand strategy	Water demand management involves the adoption of policies and investments by water utilities to achieve efficient water use by all members of the watershed community. This strategy requires a major paradigm shift from conventional supply management to the management of demand. The aim is to promote the use of the right quantity of water on the farm, industry, household, and by the watershed community as a whole.	• # of tributaries with water budgets • # of critical supply areas identified • % critical contribution areas with practices/policies in place to support sustainable yield/withdrawal scenarios • # of effective ordinances/policies • Gallons of water from natural systems, withdrawals per capita	No exceedance of sustainable withdrawal rates Number of new sources to mitigate impact. % public water supply loss reduced. Drinking water needs met Maintain low flows at or above long-term monthly median flows at each of the Three USGS gages on Spring Creek and on tributaries while meeting daily drinking water needs
Objective 2C: Sustain and protect groundwater	Groundwater accounts for 88% water supply in the Spring Creek Watershed. Aquifers provide critical storage to meet needs during droughts. The amount of groundwater in storage in each basin is dependent on the precipitation, recharge, and the total extraction of all the wells. A groundwater management	• # of BMP's to minimize recharge loss • # of source water plans updated • # of emergency water supply plans developed • % change in well levels	Sustained well yields, ground water management plan % attainment on meeting historic base flows

	plan that is designed for the political, institutional, legal, and technical specifics of the basin can help maintain the quality and quantity of the groundwater supply.	• % flow in and out of the watershed • % deviation from historic baseflows	
Goal 3: Integrate and Coordinate Management for Sustainability, Economic Growth, Recreation and Quality of Life			
Objective 3A: Implement an Integrated Water Management Network/Governance Model	This network would promote the coordinated development and management of water, land, and related resources, to maximize environmental, economic, and social results in an equitable manner without compromising the sustainability of the watershed. Participation would involve applying knowledge from various disciplines as well as the insights from diverse stakeholders to devise and implement efficient, equitable, and sustainable solutions to water and development problems. Network members could include the Spring Creek Watershed Commission, municipal governments, water utilities, Penn State, state and federal agencies, industry, and planning organizations. Political will and commitment will help unite all stakeholders and move the process forward.	• Build capacity of Spring Creek Watershed Commission to administer the network • Utilize Penn State to evaluate existing networks in other states or other governance options • Include MS4 Partnership and Central PA Source Water Protection Partnership	Cross agency and cross scale interaction and communication Administrative process implemented Network charter in place
Objective 3B: Implement network subcommittee for technical support, data driven science, education and information exchange.	Diversity of membership includes utility personnel, academia, government employees (federal, state, local), non-governmental organizations, industry representatives and consultants. Review, evaluate, and	• # of members representing diverse capabilities • # of educational events • Data driven science metrics • % economic growth	Science-based collaboration Land Use plans coordinated Online searchable data base

	disseminate information on best practices on integrated watershed management. Encourage adoption of new advances and applications for watershed management, develop workshops, and organize/moderate technical discussion and educational events.	• % biological growth • Centralized data sets	
Objective 3C: Promote the value of the watershed's recreation, aesthetic and cultural assets	Ecosystems provide recreational opportunities, cultural, and aesthetic value. Communities rely on clean air, water, green space, and other natural amenities for economic sustainability and quality of life, yet their benefits are not always fully understood or considered in local decisions. Recreation and tourism associated with outdoor environments can play a huge role in local economies. Many citizens place high value on historically or culturally important landscapes because of their significance. However, human activities can stress natural areas where people recreate or visit cultural sites.	• # of clean up events • # of recreational users • # cultural sites • # of groups involved • % value of ecosystem services • Reenergize "Spring Creek Day" • Recreational growth and economic value	Stewardship

Phase 3 Short Term Actions:

- Convene technical workgroup to begin capturing ideas for Phase 3.
- Engage PSU to begin evaluating informal networks through literature review of other watersheds with fragmented management structures and how they resolved coordination of overlapping authorities.
- Implement a speaker series based on the 10 substantive based issues.
- SCWC to continue to improve their website to serve as a centralized data base and document storage.
- Develop a funding plan and raise funds to hire professional team to draft final plan - $250,000/year at 2 years estimated.
- SCWC to hire staff for coordination, website, and grant applications to raise funds for professional support – estimated cost $30,000.

Appendix 3 – Spring Creek One Water Process Handouts

1. **One Water Process Objectives**

2. **Challenges in the Spring Creek Watershed**

3. **Flow Recommendations for the Susquehanna River**

ONE WATER OBJECTIVES			
Objective Icon		**Objective Statement**	**Objective Description**
	A	**Reliable Water Supply:** Reliable Current and Future Water Supply for Urban, Rural, Agricultural, and Environmental Needs	A diverse mix of water supplies, demand management, and a flexible and reliable interconnected water supply and infrastructure system.
	B	**Sustainable Groundwater:** Sustainable Groundwater Sub-basins	Groundwater sub-basins provide critical storage to meet demands during water shortages. The coordinated use of multiple supply sources maintains and augments groundwater. Conservation and the use of surface water supplies and recycled water provides in-lieu recharge by offsetting demands on groundwater. Sustainable groundwater management supports urban, rural, agricultural, and environmental water supply needs.
	C	**Water Quality:** High Quality Surface Water and Groundwater	Water in the reservoirs, creeks, Bay and groundwater sub-basins is of high quality.
	D	**Flood Risk Reduction:** Reliable and Effective Flood Risk Reduction Using an Integrated Approach	Promote and practice flood management that reduces flood risk to people and property and maintains and enhances natural creek corridor and floodplain functions using an integrated approach that values flow and the land that conveys, absorbs and relies on it.
	E	**Expanded Floodplains:** Expanded and Protected Buffer Lands Adjacent to Water Bodies	Buffer lands adjacent to creeks, reservoirs, the bay, and other water bodies that allow for natural creek meanders, periodic safe and appropriate overbanking, support natural processes, provide for water-to-land habitat transitions, and encourage resource-sensitive recreation opportunities where appropriate.
	F	**Supportive Stream Flows:** Stream Flows Support Natural Processes	A regionally-, climate- and locationally-appropriate variety of surface flow patterns – in magnitude, timing and duration – to support native habitat complexity and diversity, transport sediment and maintain natural life-cycle cues for fish and other aquatic and riparian organisms.
	G	**Resilient Habitats:** Resilient Habitats and Resources for Native Species	Enhance and maintain natural environments in and around creeks, wetlands, baylands, and other water bodies.
	H	**Climate Change:** Adapt to and Prepare for Climate Change	Climate change/global warming effects include temperature increases, precipitation changes and sea level rise. The effects may decrease water supply and increase droughts, increase flooding, increase wildfires, and cause biological stress.
	I	**Emergency Preparedness:** Anticipate and Prepare for Emergencies	Water resource emergencies of concern include: flooding, drought, earthquake, fire, other natural hazards, contamination of drinking water supply, failure of infrastructure, and attack or accident. Emergencies can provide an opportunity to improve water resource conditions.
	J	**Community Engagement:** Active and Ongoing Community and Tribal Engagement	Carry out effective community engagement by inviting public participation in District Board decision-making processes and showing respect for all communities including Native American tribes and disadvantaged communities.

1. Challenge: Declining Stream Base Flow - Surface Water- Natural

Solution	Action Step	Is solution still relevant based on data or current plan document (Y/N)	Ordinance or Plan that addresses solution or action step	Additional Comments
A. Decrease Well Withdrawal	Implement water conservation measures			
	Encourage more well fields			
B. Increase Groundwater Recharge	Encourage BMP's for stormwater recharge			
	Beneficial reuse of wastewater			
C. Protect Sinkhole Recharge Areas	Overlay Zoning			
	Modify subdivision and land development processes			
D. Restore and Protect Riparian Areas	Plant trees to increase stream cover and reduce evaporation Same as 3.1			
	Implement voluntary landowner management programs (also mentioned under sedimentation challenge)			
	Discourage removal and encourage restoration buffer in subdivision and land development process			
	Establish buffer widths to filter sediments			
	Establish riparian buffer conservation zone			

1. Challenge: Declining Stream Base Flow -Surface Water - Natural				page 2 of 3
Solution	**Action Step**	**Is solution still relevant based on data or current plan document (Y/N)**	**Ordinance or Plan that addresses solution or action step**	**Additional Comments**
	Create municipal ordinance or overlay zone to protect buffers			
	Explore municipal conservation options			
	Purchase or acquire riparian buffers			
	Works with Clearwater Conservancy or other land trust to discuss easement options			
	Acquire trees through CBF and Conservation District			
	Organize volunteer groups to help plant (Boy scouts, schools, civic clubs)			
E. Educate individual landowners	Establish educational series through newspapers			
	Identify riparian landowners and create mailing			
	Hold public meetings about riparian importance			
	Utilize school system to spread the word through students			
	Educate landowners about sinkholes (groundwater)			

1. Challenge: Declining Stream Base Flow -Surface Water - Natural				page 3 of 3
Solution	**Action Step**	**Is solution still relevant based on data or current plan document (Y/N)**	**Ordinance or Plan that addresses solution or action step**	**Additional Comments**
F. Educate land developers	Offer workshops for developers			
	Initiate an Open Space trading program in the watershed			
	Establish density trading for riparian protection during development			
G. Stabilize Stream banks	Moved to 2.C			
H. Encourage Ground Water Recharge -Marshes and Springs (Moved from Natural discharge challenges)	Beneficial reuse of treated wastewater			
	Stormwater management			
New Solution				

2. Challenge: Increased Sedimentation – Surface Water – Natural

Solution	Action Step	Is solution still relevant based on data or current plan document (Y/N)	Ordinance or Plan that addresses solution or action step	Additional Comments
A. Manage Stormwater more effectively	Encourage onsite recharge instead of retention and discharge Same as #1 B			
	Encourage BMP's in new developments			
B. Manage Agricultural Lands more effectively	Encourage streambank fencing on agricultural lands			
	Promote contour farming			
	Work with Conservation District to acquire funding supplies and plants for projects			
	Work with PVCA to establish a program like theirs			
C. Stabilize Streambanks	Plant native woody species with deep roots to stabilize soil.			
Restore and Protect Riparian Buffers Moved to 1.D				

3. Challenge: Thermal Modifications – Surface Water Natural

Solution	Action Step	Is solution still relevant based on data or current plan document (Y/N)	Ordinance or Plan that addresses solution or action step	Additional Comments
A. Decrease heated stormwater and impervious surface	Encourage Smart Growth Patterns over sprawl			
	Decrease parking requirements & encourage shared parking through ordinances			
	Infiltrate stormwater Same as 2. A			
B. Identify and Fix warm point sources	Review NPDES 1 permits and to determine permit discharges			
	Identify other non-permitted point source discharges			
	Identify funding for retrofits			
New Solution				

4. Challenge: Declining Biotic Community – Surface Water Natural

Restore and protect Riparian buffers moved to 1.D				
Reduce and/ or remove sediment from streams Moved to 2.				
Create Instream habitat	Add riprap, boulders, woody debris to streams			
New Solutions				

5. Challenge: Riparian Buffer Removal moved to 1.D and 2.B and 6.Challenge Riparian Buffer Protection moved to 1.D

Solution	Action Step	Is solution still relevant based on data or current plan document (Y/N)	Ordinance or Plan that addresses solution or action step	Additional Comments
A. Implement Act 167 Stormwater Management Plan by Municipal Ordinance				
B, Offer incentives for BMP Use	Tax Breaks			
	Higher density open space development			
C. Devise innovative technologies for better stormwater management				
D. Encourage Stormwater BMP's (moved from Groundwater 4. A)	Utilize Act 167 ordinance guidelines			
	Educate developers about varieties of BMP's and express environmental benefits			
Offer incentives to reduce Impervious cover in new development (moved from Groundwater 4.A)	Tax incentives, lower costs, higher densities, etc.			
Create municipal ordinance requiring specific percentage of open space in new developments (moved from Groundwater 4.A)	Work with municipalities that already have one or more: Patton – 50% in RPA; 35% for Gray's Woods			
Retrofit existing highly impervious developments (moved from Groundwater 4.A and Natural discharges Marshes and Springs)				

Surface Water – Engineered Design 1. Challenge: Ineffective Stormwater Management				page 2 of 2
Solution	**Action Step**	**Is solution still relevant based on data or current plan document (Y/N)**	**Ordinance or Plan that addresses solution or action step**	**Additional comment**
Reduce Impervious surface in new developments (moved from Natural Recharge Marshes and Springs)				
New Solutions				

Solution	Action Step	Is solution still relevant based on data or current plan document (Y/N)	Ordinance or Plan that addresses solution or action step	Additional Comments
A. Identify priority basins & stormwater problems through GIS and onsite analysis	Identify sources of problems and affected areas			
	Develop a ranking system to prioritize projects			
Secure funding for retrofit projects	Determine cost of retrofit for specific priority areas			
	Identify sources of funding to retrofit problem areas			
Find available technical assistance	Volunteer experts in the community			
	Organizations with expertise			
	Other communities with similar problems/experiences			
Work through the municipalities	Use municipal engineers to identify and prioritize problem areas			
	Municipalities may be elidable for funding to retrofit problem areas through DCED.			
New Solutions				

Groundwater – Natural Recharge

Sinkhole- Point Recharge

1. Challenge: Sinkhole Protection

Solution	Action Step	Is solution still relevant based on data or current plan document (Y/N)	Ordinance or Plan that addresses solution or action step	Additional Comments
A. Create municipal zoning or subdivision through non-disturbance and buffers				
B. Educate Landowners	ID landowners with sinkholes on their property and inform on best care and keeping clean			
C. Discourage use of sinkholes for stormwater management	Identify the connection of specific sinkholes from source to mouth to determine groundwater flow and impact on drinking water.			
	Encourage BMP's for streams and swales discharging to sinkholes			

2. Challenge: Sinkhole Cleanup

A. Organize Cleanup Days	Build upon Clearwater Conservancy's annual watershed clean up day			
	Partner with PA Cleanways to develop Centre County Chapter			
	Focus municipal attention on sinkholes, potentially through MS 4public involvement and outreach			

Solution	Action Step	Is solution still relevant based on data or current plan document (Y/N)	Ordinance or Plan that addresses solution or action step	Additional Comments
Educate landowners about Sinkholes (moved to 1.E surface flow) and reference groundwater in education				
B. Fine illegal dumpers	Monitor known problem areas			
	Work with Centre County Solid Waste Authority			

Groundwater 3. Challenge: Sponge Recharge

A. Identify sponge areas using GIS and onsite analysis	Works with local engineers and hydrologists to identify specific criteria for identifying critical recharge areas			
	US GIS to map these areas			
B. Educate Landowners	Meet with landowners when necessary to discuss GIS findings and ground truth the information for potential protection			
C. Develop methods to protect sponge areas	Municpal overlay ordinance on subdivision and land development ordinance			
	Place conservation easement on identified sponge areas			
	Purchase or acquire critical recharge areas through land trusts or similar groups			
New Solution				

Groundwater Diffuse Recharge

4. Challenge: Increased Impervious surface

Solution	Action Step	Is solution still relevant based on data or current plan document (Y/N)	Ordinance or Plan that addresses solution or action step	Additional Comments
Encourage use of stormwater recharge BMP's (moved to Surface Water – Engineered Design 1. Challenge: Ineffective Stormwater Management				
New solution				

5. Challenge: Groundwater Contamination

A. USE GIS to Map known contamination sites	DEP is examining contamination and may have this available			
B. Identify sources of contamination				
C. Cleanup known contamination				
D. Continue to monitor contamination sites				
New Solution				

Natural Discharge

1. Challenge- Springs

Solution	Action Step	Is solution still relevant based on data or current plan document (Y/N)	Ordinance or Plan that addresses solution, action step	Additional Comments
A. Identify all contaminated spring sources				
B. Cleanup contaminated springs	Identification will require historical knowledge of previous industries and the geologic system			
C. Continue monitoring contaminated springs after cleanup	Ground water monitoring will be necessary to trace the potential flow of contaminants			
D. Establish an alert system for unacceptable changes				

2. Challenge: groundwater recharge -Wetland and Marshes

A. Encroachment from Development	Identify and prioritize wetland and March areas using GIS and onsite analysis			
	Place conservation easements on priority wetlands, marshes and buffering properties where appropriate.			
Encourage groundwater recharge (moved to 1.H Declining stream base flow)				
Reduce Impervious surfaces in new developments (moved to Surface Water – Engineered Design 1. D Ineffective stormwater management				
Retrofit existing highly impervious development (moved to Surface Water – Engineered Design 1. D Ineffective stormwater management				
New Solution				

Table 5.2 Flow recommendations for the Susquehanna River ecosystem.

Season	Flow Component	Flow Statistic	Flow Recommendations		
			Headwater streams < 50 sq mi	**Streams and small rivers (50 – 200 sq mi)**	**Major tributaries and mainstream (>200 sq mi)**
Annual and Interannual Events	High Flows	Large flood	Maintain magnitude and frequency of 20-yr flood	Same for all streams	Same for all streams
		Small flood	Maintain magnitude and frequency of 5-yr flood	Same for all streams	Same for all streams
		Bankfull	Maintain magnitude and frequency of 1 to 2-yr high flow event	Same for all streams	Same for all streams
All Months	High flows	Monthly Q10	< 10% change to magnitude of monthly Q10	Same for all streams	Same for all streams
	Seasonal flows	Monthly Median	Between 45th and 55th percentiles	Same for all streams	Same for all streams
		Monthly Range	≤ 20% change to area under curve between Q10 and Q75	Same for all streams	Same for all streams
	Low flows	Monthly Low Flow Range	No change to area under curve between Q75 and Q99	≤ 10% change to area under curve between Q75 and Q99	≤ 10% change to area under curve between Q75 and Q99
		Monthly Q75 Monthly Q95	No change	No change	No change
Fall	High flows	Frequency of events > Monthly Q10	NA	NA	Maintain 1-5 events
Summer		Frequency of events > Monthly Q10	Maintain 2-8 events	Maintain 2-8 events	Maintain 2-8 events

Appendix 4 - Notes from Other One Water Planning Processes

One Water Planning Workshop
New York, NY
June 15 – June 17

NYCDEP

- $17 billion planned in stormwater project spending over the next 10 years
- Affordability
    - Senior rates for water
    - Affordable rate associated with low income housing pending
- State of Good Repair (SOGR)
- Partnerships with BWT and Waste Management and National Grid
    - Newtown Creek is the first for this type of food waste co-digestion program. Will consider expanding to other facilities
- Interested in where trash removal (in regard to storm water) is addressed, who is doing it and what are they doing about it (Pinar)

Richmond Virginia (RVA)

- Current director (Patrick) worked on the watershed permitting guidance at EPA
- RVA has developed community outreach materials using a local firm

City of Tucson

- Pima County handles their WW treatment
- Looking at stormwater as a resource – potentially for groundwater recharge in the future
- Focused on a 50+ year long-range plan

SFPUC

- Potential for zero discharge as a future regulation to San Francisco Bay
- Onsite systems for large building
    - Took time to get buy-in across the organization, particularly building department
    - *But did they really get buy-in?* b/c of drought legislation was passed in 2013 making this mandatory
- There is focus on the application of the One Water approach in the built environment.
- Right water for the right use

LA Water One Water Top Goals

1. Groundwater recharge

2. Recycled water use
3. WW facilities – upgrade plants
4. Partnerships
5. Stormwater funding

- Their current One Water plan focuses on multi beneficial uses

LASAN

- Look into "Utility Branding Network" (John Rutton – spelling)
    - Consultant used to survey, focus groups, polling to see how effective utility branding is
- Water Cabinet concept → Part of the Mayor's office made up of residential users, professionals, and officials.

What is the "why" for doing "One Water"

- How do organizations adjust to their changing purpose?
- Regulations can force the "why"
- Customers can force the "why"
- Climate can force the "why"

City of Toronto

- Customer service as an approach for public outreach and also maintenance/leak check
- Customer experience important
- Customers can view daily water use at www.mytorontowater.com
- Conducted a campaign to support water infrastructure improvements "9% increase for 9 years".

Philadelphia Water

- When they think about "One Water" they consider it more of a water quality topic as opposed to water quantity topic

SA Water

- Offline conversation → working on integrated modeling of systems
    - Interested in systems integration research we discussed during lunch

- Lots of discussion about → the cost of doing nothing

- Also focused on treating water for "fit for purpose"
- Water security and livability are focuses of their IWM plans

Minneapolis (Twin City Region)

- One Water is currently siloed regionally
- The regional overarching plan focuses on livable region

City of Austin

- Water Supply, wastewater reuse coordinate with watershed protection on green infrastructure
- Focus of One Water plan
    - Resiliency & Redundancy
    - Plan for floods and drought
    - Looking at a 100 year forward plan

City of Seattle

- Focus of their IWM plan include:
    - Stormwater Management
    - Green Infrastructure
    - Pedestrian Safety with regards to CSOs
    - Aesthetics for the city

Miami-Dade

- Currently developing an office of resiliency

Cincinnati

- Currently does not have a diversified water portfolio-relies heavily on the river
- Looking at how to integrate source water protection (SDWA) and watershed protection (CWA)
- Looking at how to diversify water supply moving into the future

Denver Water

- Also focused on the right water for the right use
- Conducts scenario planning rather than linear deterministic modeling (can't predict the future)

Blueprint for One Water Workshop

June 15 – 16, 2016; New York City

Workshop Objectives:

- Access the state of science and practical experience in One Water and Integrated Water Management to develop a blueprint for the practical application of a One Water framework.
- Identify the critical steps to take in the development of a One Water framework including potential challenges, available tools, and key outcomes or milestones to work toward.

Day 1

7:30 – 8:00 a.m.	Breakfast
8:00 – 8:15 a.m.	Welcome and Workshop Background (Steve LaWitts, NYCDEP and Katie Henderson, WRF) Workshop Agenda and Objectives (Cindy Paulson, BC)
8:15 – 9:15 a.m.	Attendee Introductions/ Answer to Questions (Tweet Version): 1. *How does your organization define One Water, what's included?* 2. *What are the tangible benefits you have experienced or hope to achieve as a result of implementing a One Water Framework?*
9:15 – 10:00 a.m.	Summarize Preview Draft and Discuss Themes from Survey Findings and One-on-One Interviews (Wendy Broley and Lynn Williams Stephens, BC)
10:00 – 10:15 a.m.	Networking Break
10:15 – 12:00 a.m.	Facilitated Panel Discussion: Highlight Successful IWM Efforts – What Worked? • Contra Costa Water District – Bay Area Regional Reliability Partnership • LADWP/LASAN – One Water LA Plan 2040 • Tucson Water – Water for Tucson's Future: Long Range Water Plan 2000 - 2050 • Seattle Public Utilities – Integrated Plan: Protecting Seattle's Waterways
12:15 – 1:15 p.m.	Networking Lunch
1:15 – 2:00 p.m.	Roundtable Discussion: Identify Common Steps Taken in IWM Planning
2:00 – 3:30 p.m.	Breakout Session to Confirm the Steps and Discuss What they Include (4 groups, 2-3 steps each, 20 minutes per round)

Blueprint for One Water Workshop

June 15 – 16, 2016; New York City

3:30 – 3:45 p.m.	Networking Break
3:45 – 5:00 p.m.	Group Presentations on Breakout Session Findings
6:00 – 8:00 p.m.	Dinner

Day 2

7:30 – 8:00 a.m.	Breakfast
8:00 – 8:30 a.m.	Day 1 Recap (Cindy Paulson and Wendy Broley, BC)
8:30 – 9:15 a.m.	Facilitated Panel Discussion: Digging Deeper on the Steps - Overcoming Obstacles, Available Tools (NYC DEP, SFPUC, Denver Water, Hampton Roads Sanitation District, SA Water) • Engaging Regulators • Assessing and Addressing the Needs • Developing Financing Strategies • Scenario Planning – Managing Uncertainty • Creating an Institutional Framework
9:15 – 10:30 a.m.	Breakout Session: Digging Deeper on the Steps – Discuss Key Outcomes/Milestones, Potential Challenges, and Available Tools (4 groups, 2-3 steps per group, 15 minutes per round)
10:30 – 10:45 a.m.	Networking Break
10:45 – 11:30 a.m.	Group Presentation and Discussion on Breakout Session Findings
11:30 – 12:00 p.m.	Summary and Next Steps (Cindy Paulson, BC)
12:00 p.m.	Lunch (to-go boxes if needed)

Tour of the Newtown Wastewater Treatment Plant from 1 to 5 p.m.
BC Reception on the Hyatt Place rooftop from 6 to 9 p.m.

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Appendix 5 – Spring Creek Watershed Action Plan – Phase 2 Meeting – July 10, 2018

- Meeting on July 10, 2018 at Calvary Church in Boalsburg, PA
- Started the meeting in one large room. Broke into 4 breakout groups later in the meeting
- Approximate # of people in attendance: 76 people registered but 50 were there. There were approx. 125 at the last forum (in spring at Penn State U.) and there are approx. 200 on the SCWC email list
- From the following industries/organizations: Local homeowners, reps from all but one of the municipalities in the watershed, water groups, UAJA, commission members, Cocoa cola and Hansen Aggregate, Clearwater Conservancy, environmental commission, professor at PSU, etc.
- Dennis Hameister is the commission chair of the Spring Creek Watershed Commission. He gave the introduction and talked about:
    - Overview of the watershed, the commission and its accomplishments, and the first phase of the plan done in 1996
    - 14 municipalities in the watershed (2 others opted out of the planning process)
    - Www.springcreekwatersgedatlas.org – resource on the watershed
    - The original plan addressed surface water, groundwater, water supply, and land use as separate subjects
- Janie French from the Headwaters Charitable Trust spoke about the One Water Approach, including:
    - Discussed the water cycle, the use of pieces of One Water by Philadelphia Water Dept., all water is water
    - 6 arenas of action for One Water plan -she provided local examples for some and how this could make the watershed a national model for collaboration
    - Provided examples from across the country, but primarily out west
    - Showed the steps of the planning process and where they currently stand – between the 1st two
    - There are 3 options for the effort – a detailed and long term One Water Plan, a framework, or a simple scope with prioritized set of initiatives to achieve goals and objectives
    - Went into what is expected of the commission and of the participants

- Meetings will take place every Thursday for 2 months (4 total times). The 4 subcommittees will alternate every other week (2 each week). There will be some way for people to participate via the web if they cannot make all those meetings. There will also be 2 community forums in mid to late September

- Breakout (approx. 12-15 people in each group sitting in a circle) questions included
  - 1. Vision – how would you reimagine spring creek watershed if you could? Facilitator went around the circle person by person to get their answers. Facilitator took summarized notes on flipcharts and asked for clarification. "What I'm hearing you say is…" Then went around the circle again for those with additional thoughts. Here are some ideas that are given:
    - Balance between water in and out
    - Water neutrality
    - Collectively reducing the water footprint
    - Informed public to reduce water waste / consumption
    - Regenerative purity
    - Remove the fragmentation
    - Common understanding of priorities and collaborative approach
    - Everyone communicates to understand common interest for the watershed
    - Common use beyond municipal boundaries
  - The second group had very different answers, which makes me wonder how the facilitator framed the question to start with. Although there was some overlap with quality and quantity, education, etc. they also had a volunteer taking notes, rather than the facilitator doing it, which has its benefits and drawbacks. Answers included:
    - 2050-2100 have a master plan
    - Fewer roads, less driving
    - Policies to achieve goals
    - Impact of agriculture

- 2. What actions do they need to take to achieve the vision?
    - Need to know what data exists and what data needs are
    - Knowing what each of the municipalities regulations and policies are to see how they impact the watershed
    - Restrictions on development
    - Bringing all the stakeholders together (and knowing which groups to involve and how to get them to come), but you need enforcement or it's pointless. Would be better to have a county-wide integrated plan, but this is a good start
    - Advertise the effort and all the good work via the press
- A question came up about whether or not we know if the watershed has improved, been degraded, or is the same. Janie said they don't know the answer and that won't truly be addressed until Phase 3
- 3 of the breakouts were held in the main lobby of the church, so there was some vocal overlap. Would be better to have 4 small rooms to use

- The wrap-up consisted of:
    - Janie updating people on how they will follow-up – notes posted on commission website, groups 1&2 to meet next Thursday
    - A debrief with all the groups in the room of high-level thoughts (one person held up the flipcharts while someone else reported out)
        - Planning is a verb – how do we get there? Beating the frustration
        - This is bigger than just the Centre region. It can't be just us

Appendix 6 – Spring Creek One Water Small Group Meeting (#2 of 2) – July 26, 2018

- This was the 2nd of the first small group meetings (first was a week earlier on July 19 with Groups 1 and 2), composed of Groups 3 and 4.
- There were 16 participants as well as Janie French and 2 members of the SCWC.
- The purpose was to address the watershed's challenges and solutions for the future.
- Started the meeting with everyone giving their name and organization.
- Then showed the draft mission statement on a slide. People can weigh in on it at www.springcreekwatershedcommission.org.
- Then Janie showed 8 examples of Guiding Principles and the purpose of them. These came from other communities across the US. One was "Embrace the concept of multiple benefits in the development and prioritization of implementation strategies and actions."
- Janie talked about the recent flooding and how we tend to get caught up in worrying about water chemistry and ignore the interactions between water and the land.
- She showed the EPA's preliminary health watershed assessment from 2017 – flow chart as well as the watershed vulnerability indicators flow chart from 2017, as well as the disclaimer statements. The healthiest watershed is the one in the Appalachians where Allegheny National Forest is, so it relies on undeveloped land with a lot of forest. She said that is unrealistic as a baseline for Spring Creek.
- The total time on slides was 20 minutes.
- Then Janie focused on the One Water Objectives handout, which will be the basis of how the group wants to manage water in Spring Creek watershed.
- There were two matrices as handouts – one was on Challenges and the other was on Environmental Controls.
    - The challenges came from the Phase 1 report. The point of the group exercise was to see if people still think these challenges and solutions are relevant. Janie went one by one through the items and asked for input.
    - One person said it was difficult to answer some of the questions without having data in hand. Janie acknowledged a way to get the relevant data in the future. Another said it is challenging with all the sub-watersheds within Spring Creek and not knowing all of them as well as others. Should the focus be put on sub-watersheds? People downstream not as active as those in the headwaters.

- Data accessibility is a need – there's a lot that is available but no place to hold it all online. They need data interpretation / assessment as well. The amount of data seems to be unique as far as watersheds in PA go.
- The MS4 program was not in existence when the Phase 1 plan was developed, so that creates additional challenges and solutions related to it that will need to be considered.

- General thoughts on how the session was set up and run:
  - Could have sent the handouts out ahead of time so people could think about their answers ahead of time and submit them to Janie.
  - The number of participants was a bit large for constructive conversation – consider sticking with each of the 4 groups working on their own.
  - For future communities doing their own One Water plan, their facilitators should have a good grasp of the watershed, the issues/challenges there, etc. and know some of the bigger players in the region/watershed. Need to be firm to stop people who are going off topic and good at getting new people to share their thoughts, so the conversation isn't dominated by a few people.
  - Using a white board or flipchart to capture some main points could have been useful.
  - Make sure the room is the right size and layout for the estimated # of people coming to the meeting.

Appendix 7 – Spring Creek One Water Joint Technical Committee Meeting on August 23, 2018

- There were 19 people in attendance, including Janie and 2 from SCWC. Local government, SRBC, different environmental nonprofits, Fish & Boat Commission, Coca-Cola, Penn State, USGS, UAJA, and an engineering firm. DEP will provide guidance via email but not come to the meetings. This could be opened up as an option for others too.
- SCWC Commissioner gave a recap and overview of project and next steps, followed by more detail from Janie.
- The Phase 2 report will be created with the technical input from the 2 workgroups to create an implementation plan. Will need to be written in a language that the general public will understand.
- Janie then she showed overview slides (similar to the ones from the public meeting but with some changes) about the watershed, population, the problems identified in and the plans included in the Phase 1 plan, issues identified during a Watershed Forum, then her questions for the group: is there enough data, what are the indicators to use to measure overall watershed health, and what steps need to be taken to track measurable outcomes to address quantity and quality issues?
- How recent does data need to be to still be relevant – that's a question the group will need to answer, according to Janie. Any group working on the One Water plan will need to consider.
- Another question was what % of what is extracted does not get back into the watershed? Need a water balance budget for that.
- Then Janie opened up for the group to answer the questions, particularly do they have data already that will help with the Phase 2 report? Some provided input, others asked other data gaps they see that may or may not have existing data (macroinvertebrate studies, amount of impervious surfaces, hydrogeology, thermal imaging)
- One of the FBC guys said that Spring Creek is a data-rich watershed… it is also the most studied watershed in the state and one of the most studied in the country…what happens in one that is not so lucky?
- The data that doesn't exist will become a part of the Phase 2 plan as a data gap that needs to be filled and how to achieve that
- Process moving forward: one person suggested to determine the metrics to gauge water quality/quantity and then see what data fits that and where it is. Another said the opposite.
- Janie asked people if they have datasets relative to the watershed, send to the commission's website. Send the link if it's already on the web or upload to the Google Drive if it's not.
- Janie will create a matrix to show the metrics and where we have data, where we don't, with descriptions of what these entail.
- They identified a few other groups that were not there but should be invited. People like the conservation district want to be involved but night meetings are challenging for them.

Appendix 8 - One Water Plan Water Quality Technical Committee Meeting on September 6, 2018

- A dozen people in attendance, including Janie and 2 members of SCWC. Includes senior environmental corp. UAJA, Coca-Cola, Clearwater Conservancy, Fish & Boat Commission, Trout Unlimited, and other environmental nonprofits, Penn State.
- Janie talked about pollutant reduction plans (PRPs) and how they meet Municipal Separate Storm Sewer System (MS4) requirements and Chesapeake Bay requirements, then highlighted some relevant information from the Centre Region, including one that was approved this fall (she passed out a one page summary of some important pieces) – this can be found online.
- Also handed out a map of the Best Management Practices (BMPs) they got credit for. Then handed out a map of targeted areas to meet their targets.
- All handouts will be uploaded to the SCWC website.
- Asked people, because she wasn't sure, how to go about looking at and dealing with all the data.
- She said the Water Quantity committee last week had good discussion along those lines.
- People talked about the different types of data being collected. Someone asked if there is prioritization of the data? Fish & Boat Commission shared what they have for Spring Creek. Trout Unlimited agreed.
- Janie said they would collect nitrogen, phosphorus, and total dissolved solids at a minimum for the watershed, plus biologics/macroinvertebrates.
- What is the goal of all this data collection? This is a question that should be answered well ahead of where we are today.
- Getting the watershed off the DEP 303 D list is one goal. Having a plan could cause DEP to do a reassessment of the watershed, but they won't use citizen data. The data is 15 years old now. One action item is to ask DEP to do a reassessment.
- No measurement of the impact of the 3,100 septic tanks in the Centre region, so what impact do they have and how will the plan deal with them?
- Code enforcement offices are another possible source of data.
- Janie then summarized what she heard as parameters to measure and places to look for data.
- Need to be clear up front about what this data in the report is going to be used for and who's going to use it. This stemmed from a question about what would happen if DEP did not agree with the content of the report?

Appendix 9 - Spring Creek One Water Joint Water Quality/Quantity Meeting Minutes – 9/20/18

- 12 people in attendance including Janie and 3 SCWC members. Others included Coca-Cola, local environmental group, etc.
- Janie opened up w/ recap of last 2 meetings and several handouts including a water use plan (focus on water availability). Water budget definition. How do you determine what level? How much risk do you plan for? What does policy say? And where does climate change factor in? Participant asked if a model could be made, knowing what water is going in and coming out. Could be used to predict what might happen in the future. One was already done but isn't very accurate. Person passed around pie charts developed from the model as well as a map of well withdrawal and recharge.
- Baseline and metrics needed.
- Focus on the stream biota for water quality perspective. Some Key indicators like nutrients and temp.
- Long talk about impervious surfaces and infiltration.
- Need to think not just about how much water there is the watershed but where it is in the watershed.
- Janie introduced the fact that we will be working on developing goals and objectives. One member brought up, "we're going to be spending taxpayers' money. How do we show them that it was worth it?"
- Person asked how many years ahead will this plan look? Will it be developed for what they want the region/watershed to look like 20 years from now? Then the plan will be updated? Janie said the objectives will have the timeline for how long each activity will take. Goals are broader and you can't set a time on them.
- One participant likes a 50 year plan that is updated every 10.
- Meeting adjourned. Janie gave a wrap-up and overview of the next steps for the meeting 2 weeks from now to develop goals and possibly objectives. They will be in draft form with the commission making the final determination on them. Janie will meet with the commission guys next week to start planning the 2 public input meetings, where they will get to see the goals/objectives and help weigh in.

Appendix 10 - Spring Creek One Water Joint Working Group Meeting Minutes – October 4, 2018

- Janie handed out 3 handouts that she also emailed to everyone earlier that day: a Technical Recommendations document, a Phase 2 Table of Contents, and Goals document.
- 9 people in attendance – many of the utility guys – as well as Janie and one person from SCWC.
- Janie gave an overview of One Water plans and integration / summary of what's next for Phases 2 & 3. Breaking down silos.
- Discussion of critical recharge areas that haven't been identified for Spring Creek except for PSU.
- Goal1: Discussion of specific targets we want to meet. Destination. Points and metrics. DEP rapid assessments and instream metrics to measure instream conditions. Determining baseflow and mapping the areas. Thermal imaging.
- Goal 2: Water budget; is it feasible? Yes, people think so. State water plan did a simplistic version. Need to break it up into subwatersheds. Need to determine the needs first both for people and the environment.
- To moderate this process you have to know who everyone is in the room, what their organization does, their interests, etc.
- People expressed their concerns about up and coming contaminants like endocrine disruptors and nanoparticles.
- Goal 3: Trying to get all the utilities and municipalities under a resiliency agreement, but she asked Cory if this could work. Very unlikely in his estimation. Could the SCWC get an EPA grant to make this happen? Yes. Need to maintain independence away from any politics. But needs to be public and involve the public every step if the way.
- Need to think outside the box and not rely on solutions and technologies of the past and present.
- Next step is that Janie will put together everything for them to react to and then will have 2 public meetings in October. The 2 meetings will be exactly the same, just to give people 2 days of the week as options.
- One guy mentioned that stormwater is not addressed in the goals, but Janie said it is covered in water quality. Someone else clarified that we don’t want to talk about water in its usual boxes any more. Groundwater, drinking water, etc. will be addressed.
- Asked people to provide input on the goals doc within the week.

Appendix 11 - Spring Creek One Water Joint Workgroup Meeting – October 24, 2018

- There were 10 people in attendance including Janie and 1 SCWC member.
- Meeting was held at Boalsburg Fire Hall, which is a new location.
- Janie passed out 2 handouts: revised goals that had everyone's comments in there as Table 5.2 on flow recommendations for the Susquehanna River ecosystem.
- Comments were given from Spring Creek TU, Jim Gazza (sp?), SRBC, and FBC on the Goals document. People reviewed the Goals document while Janie was doing her introductions.
- Janie started by reviewing the purpose of the One Water Plan / integrated water resource management plan. Breaking down silos. She mentioned that many people who commented want to jump ahead to Phase 3 (how we get to the targets), but she was tasked to get through Phase 2.
- Limited the Goals to 3 to keep it manageable. 2-4 objectives per goal. Most comments were on the Metrics and Targets for each of the goals.
- Discussion on difference between metrics and strategies. There is some confusion among members of what constitutes a metric. Strategies will be included in Phase 3. One team member recommends removing the Metrics and Targets from the document now because they are really more a part of Phase 3. Another person disagreed because he thinks they help flesh out what we're talking about and makes them more tangible. Janie is concerned that without those in this phase she thinks the 3rd phase might struggle to start.
- One committee member cautioned everyone not to get too specific in the metrics because it doesn't allow for creative thinking and coming up with new solutions. Keeping an open mind. Not planning for just what we know is happening but what could happen in the future. And go beyond what is already required by DEP and other regulatory bodies (no reason to include what is already required) but what can we do to go above and beyond?
- Need to make sure that the objectives do not fall into the usual way of thinking of water in boxes or silos. Right now, the Goals document does not always do that.
- One person said Goals 1 and 2 are very similar. She thinks Goal 1 should just be rolled into Goal 2. FBC guy and others disagreed: wants to keep them separate. Others said perhaps the language could be made clearer to show the focus on the land and water (ecosystem) for Goal 1 and something else for Goal 2 (more human side of things). Take out "natural" from Goal 2.

- She also didn't like the tabular set-up of the document.
- Discussion on how much science / technical language should be here. Is "resilient stream ecosystems" too technical? Phase 3 will be technical, but this is closer to a general public document.
- Janie defined what "consensus" is – that it's not total agreement on everything but that people are ok with something enough to move forward. The definition will go into the report. One person said they would rather have it where everyone wins but that's not very likely.
- Concern over a compliance date of 2050 because if it's that far out it will never get done. Could metric and target be combined into a "desired outcome" or similar? Could remove the compliance date then. Or we could get to the target in 10 years but then retain compliance through 2050. Wanted the compliance removed completely related to the Bay because that is required and only relates to MS4s not non-point sources like agriculture.
- Lot of wordsmithing going on. Some of it more substantive than others.
- Target dates need to be more open-ended, like "10 years from plan creation" because we don't know when Phase 3 will be created yet.
- Data management is a key component that is missing from the Goals document, so Janie will create a 3E objective related to some sort of dashboard with peer-reviewed data. Another person wanted to add a new 3A (or modify existing 3A) to create some sort of governance structure for the management of water that is somewhat related to what's in 3D but that is related more to education. It may or may not be the existing Commission. Would be best to have at least 1 staff person to oversee all the work and implementation of the plan. Start working on that in 2019. All other objectives will be moved down the list.
- There will always be the issue of data quality – citizen science collected versus professionally collected.
- Need to send the final draft version of the Goals doc and other items to all participants of the previous public meetings, as well as advertise it via PSAs on the radio, etc. so that people will view the docs on the website with at least a week for them to review it.
- Discussed some of what will happen during the public meeting(s) and in Phase 3.
- Concern about whether or not this plan will have any teeth. Other member says this is not about stopping things that we don't want, it's more about moving in the direction of what we do want, so teeth are not so important.
- The group will get back together the week after Halloween to give people time to review the revised Goals document.

Appendix 12 - Spring Creek One Water Public Forum Prep Meeting Minutes – Nov 13, 2018

- 2 SCWC members (Dennis & Bill) and Janie
- Started by discussing the public meeting(s) – plan is to do an overview of the most recent document Janie sent out and a general overview of the watershed. One person wants breakout sessions but that will require moderators and space for that. Concern about the knowledge and background of the moderators – won't necessarily be equal given their participation in previous meetings. Talked about using the fire hall (can accommodate up to 120 in chairs or 90 at tables).
- Want to set up an online way to collect public comments. That way there can be just one in person public meeting and everyone else can comment online. Give attendees 3x5 cards so that if they don't feel comfortable commenting aloud, they can write out their thoughts. Can be anonymous if they want.
- Debates about timing given the Thanksgiving holiday, then hunting, then if we wait too long Christmas will be upon us. December 4 is the best, so they'll go with that, from 7 to 8:30.
- Format will be – talking about the process, who's been involved in the technical workgroup, the goals for Phase 2, next steps for Phase 3. Also talk about a quick action strategy that can be worked on now, which will lead into the management document that Janie sent out recently. Need for some kind of team/formal structure to lead the charge.
- Janie hopes to have the final report by the 12/4 meeting. She already has the outline developed, she just needs the final comments from tonight's technical meeting. Going to create a timeline to show the watershed's quality quantity over time, using existing documents combined into it. Last chapter of the report will be Final Recommendations, including Quick Start Ideas to keep the ball rolling and retain motivation.
- Identifying and filling data gaps is part of Phase 3. There is a lot of data for the watershed, but it is scattered, and no one has a handle on who is using it and for what.
- All the other One Water plans that have been done involved just one authority, so in this watershed, where there are multiple ones, it is going to be more difficult. How to have everyone get involved, stay involved, and work together successfully? Some kind of agreement showing roles, responsibilities, etc.
- There is an effort in either Wilkes-Barre or Scranton that has 12-17+ municipalities working together on all forms of water management.
- Janie asked if the SCWC would lead the new group and Dennis said, not with the current members of the commission (which there was talk about reconstituting it perhaps in the future). So, Janie said it will be its own entity, but who does it report to and who is it composed of? Technical committee members? There's a question about whether or not state agencies like the Fish and Boat Commission can participate as a board member… Janie thinks not. UAJA, PSU, etc. might be an advisory role, but they might not like that. Need an intergovernmental agreement for all parties involved. Getting all these groups together would be a completely new thing for the watershed.

Appendix 13 – Spring Creek One Water Joint Workgroup Meeting Minutes - 11-13-18

- 9 people in attendance including Janie, Bill, SRBC, FBC, UAJA, PSU, TU, etc.
- Janie kicked it off by handing out the document with the one set of comments (from TU) she had received from a technical committee member. She then discussed the need to bring in other organizations like regional planning committees into future discussions. She told them that the next public meeting will take place 12/4 and what their next steps may be.
- After 5 minute or so overview Janie got into the purpose of tonight's meeting, which is to get back into the Goals and Objectives document. She gave high level overview of each of the goals and then described what the new entity may look like (revamped Commission, intergovernmental agreement, etc.) but that will be a longer term effort after the report is done.
- Meeting then opened up to comments from members on the Goals and Objectives document, including changes to the Vision, Mission, and Value statements, clarifying what was mentioned during the last meeting that may or may not have been included in the revised document and adding new info. Change "stormwater and wastewater" to "point and nonpoint sources" to make sure we're capturing all sources of water. A lot of wordsmithing was done like during the previous meeting.
- Will there be deadlines for the outcomes? That will be part of Phase 3, but the Quick Start Strategies will keep the momentum going.
- The region is going to grow, whether people want it to or not, so how can growth be done in a way that improves the environment? That is the ultimate question.
- The pricing of water is archaic strategy – we will go above and beyond that to encourage appropriate use of water (Objective 2B). The issue is not also the # of gallons per day a person is using in general, it is how many gallons from the natural environment are they using. They can use recycled/reclaimed water as much as they want and that wouldn't be an issue.
- Do not single any one water user out in the Goals and Objectives… make sure all water users are accountable to all because they all have a significant role to play.
- Split Objective 3B into two objectives to go into more detail about what the 2 subcommittees will be responsible for.
- Meeting ended with Janie's next steps for herself.
- Many concerns about how long Phase 3 is going to take and a need for urgency to get the plan written as soon as possible. Need to take this into consideration from the start to make sure the work doesn't drag on and on. Question of where they money is going to come from to pay for the consultant to work through Phase 3 is another question – right now UAJA is the only one that's contributed funds. Will need a budget to show how the money will spent to get agencies and others to contribute funds.

Appendix 14 - Spring Creek One Water Public Forum Minutes – December 4, 2018

- Took place at Boalsburg Fire Hall with chairs set up classroom style facing the screen on the wall. SCWC communications staffer was at registration table passing out handouts (Intro & report – updated since last tech mtg, and interactive discussion questions).
- Approximately 38 people in attendance including some from the SCWC, Janie, Cory and the technical work group. Much smaller crowd than the spring meeting. How to keep up interest for people doing something like this in the future?
- Dennis kicked it off by welcoming everyone, introducing the committee members (~ half who were there), then the steering committee members, then the technical workgroup members (maybe ¼ to 1/3 who were there). Overview of the meeting process to-date, then introduced Janie.
- Janie continued by quick overview of the One Water process and the layout for tonight's meeting, including the interactive portion with 3 questions. Offered index cards for those who didn't want to share their comment/question out loud to the whole group.
- Quick overview of the watershed with a map and stats on the slide, followed by map with all impaired streams in the watershed and why they are still impaired. Change in population chart by township/borough and change between 2000 and 2010. Urbanized area map with change between 2000 and 2010. Table of water suppliers and wastewater suppliers (8 of each but not 100% complete). Slide of PA Water Law highlights and how it is outdated and difficult to follow. Graphic of the One Water Cycle. Flow chart of One Water Planning Process – said we are in step 3. Slide of major themes from the PSU student forum that took place last spring. Vision and Mission statements for the effort. Value Statements (6 of them) and she described what that means. Guiding Principles for Decision Making (4 of them) slide. Framework for the One Water Plan that talks about goals, objectives, metrics, and outcomes. Then a slide for each of the goals and objectives. Phase 3 Short Term Actions (7 items). She estimates it will take 2 years and $250K per year to write the plan, as well as $30K a year for the staff person for the Commission to keep things rolling (one person said he thought that seemed way too low… that a professional needs to be hired, not just an admin staff). Total presentation took ~40 minutes.
- Then she asked if anyone had any questions/comments on the presentation but there were none – initially, but then a few came up (took ~15 minutes). Then went into the discussion questions. Communications staffer typed people's comments into the Word doc that was projected on the screen. First question took 14 minutes. Good discussion overall. Second question and 3rd one sort of ran together and took almost 30 minutes. One guy said the Centre Region Planning Commission has on their agenda for next year to do an integrated water plan – he asked how/if these 2 efforts will dovetail? Spring Creek is just a portion of Centre County region, but it will make sense to coordinate the 2 efforts.
- Janie wrapped up by saying the comments will be incorporated into the final report, which will be presented to the Commission on January 16 in Bellefonte. Any other comments/ideas can be sent to the Commission's email address.

Appendix 15 December 4 Public Forum Presentation

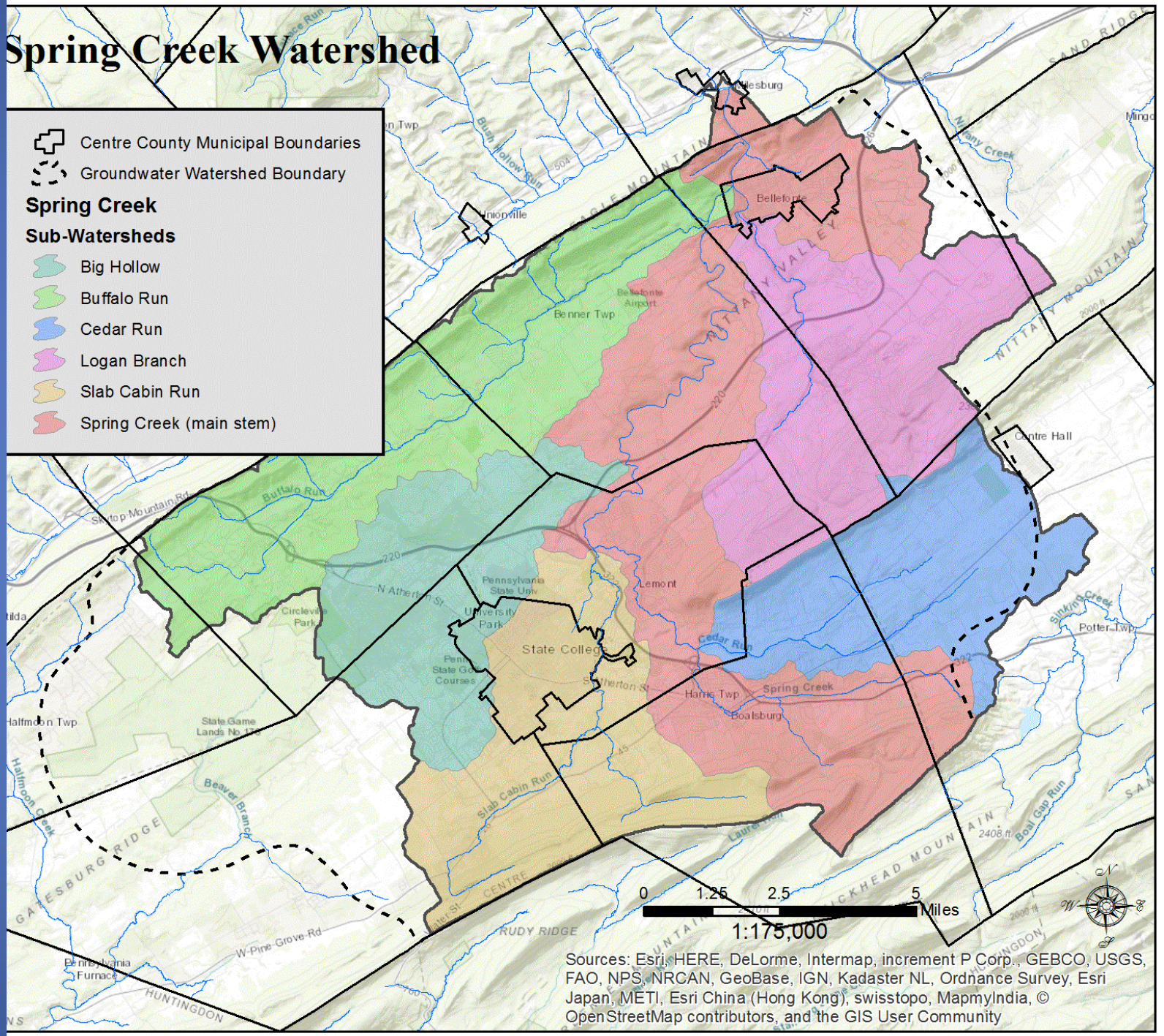
Spring Creek Watershed Phase 2

Our One Water Plan for Integrated Watershed Leadership

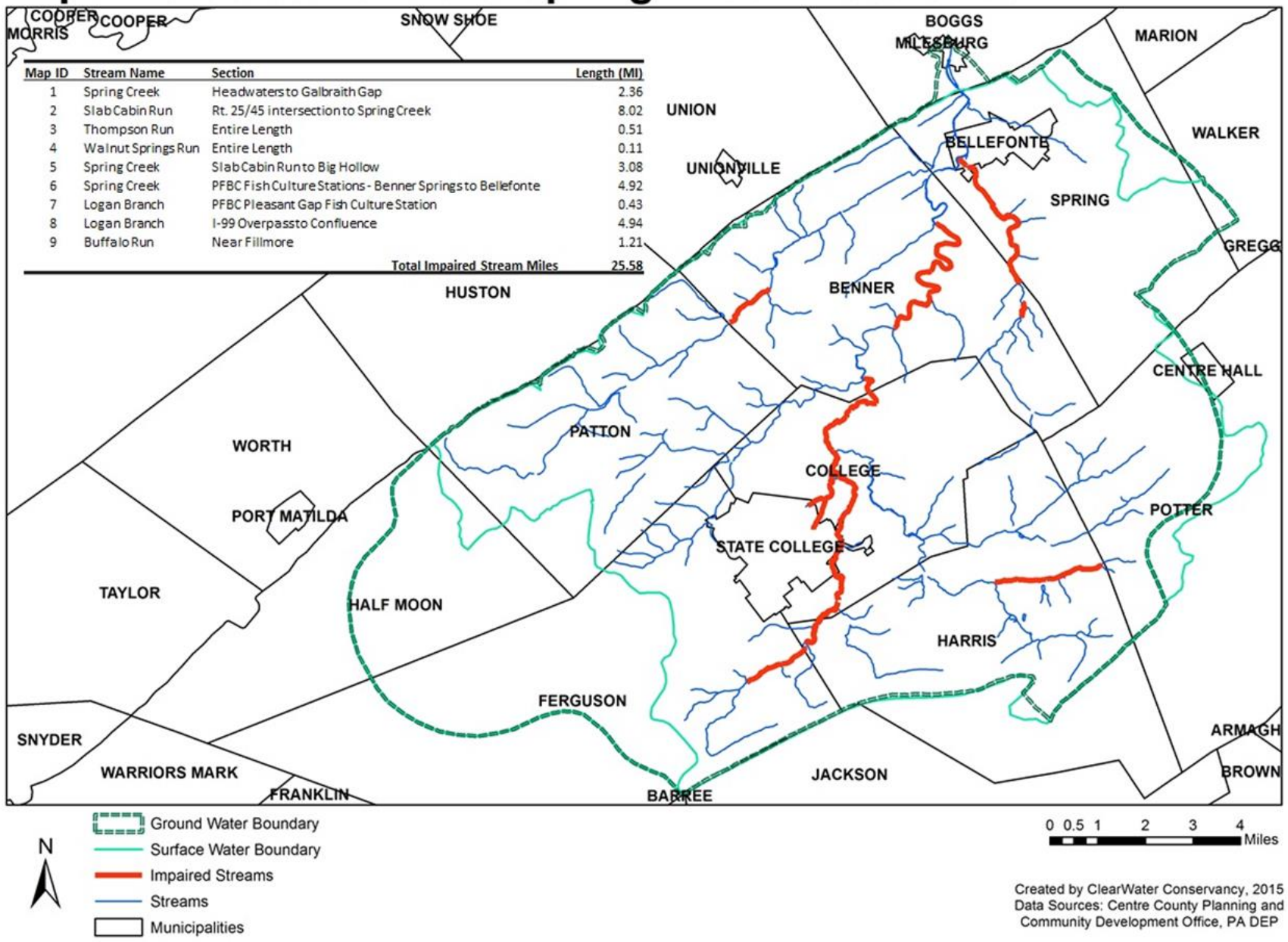
Spring Creek Watershed Overview

- 146 Sq Miles
- 93,440 acres
- Landuse
  - 28% Agriculture
  - 45% forested
  - 27% urban
- Municipalities: Bellefonte Borough, Benner Township, Centre Hall Borough, College Township, Ferguson Township, Halfmoon Township, Harris Township, Milesburg Borough, Patton Township, Potter Township, Spring Township, State College Borough, Walker Township

- Tributary to Bald Eagle Creek, which drains into the West Branch Susquehanna River



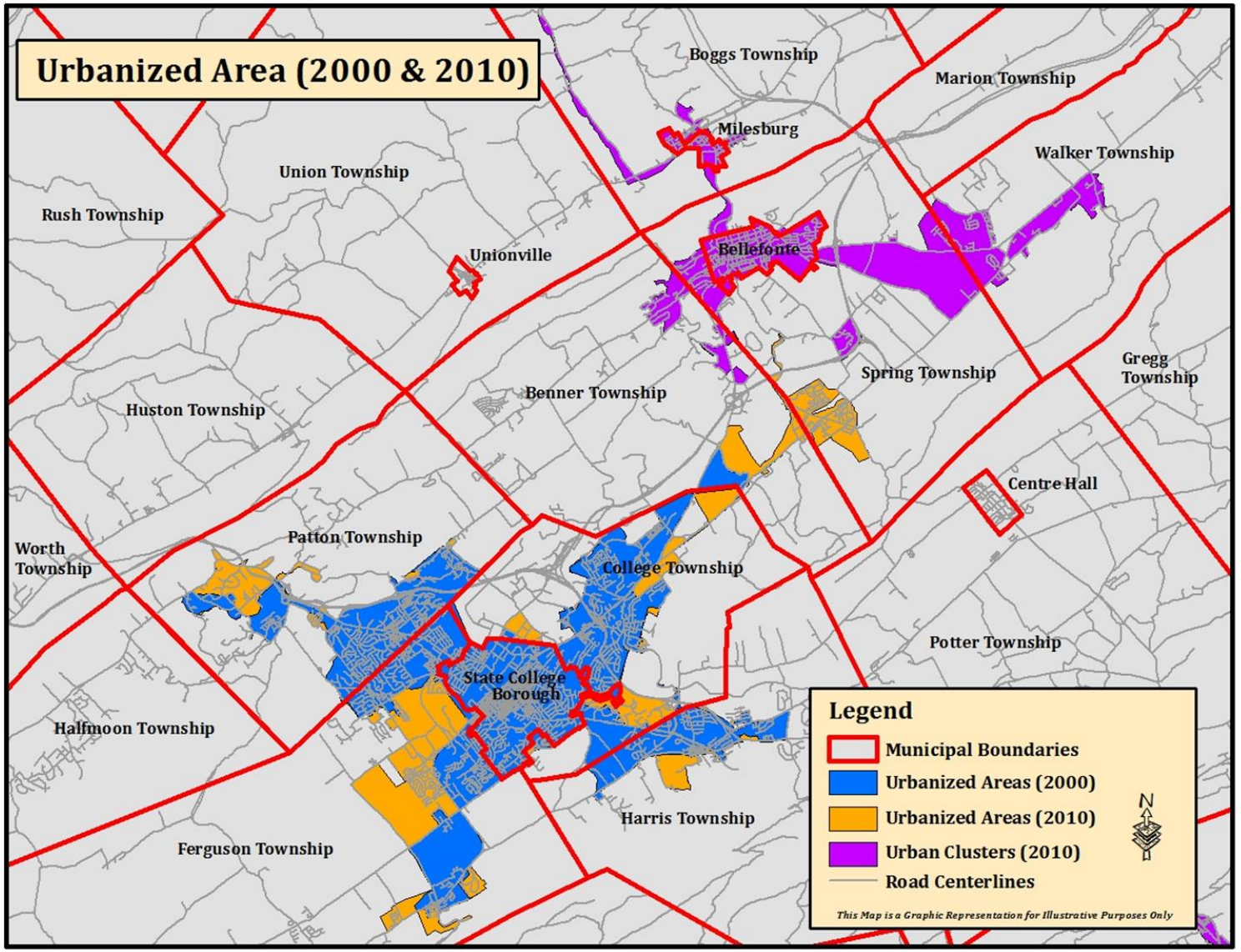
Impaired Streams in the Spring Creek Watershed



Map ID	Stream Name	Section	Length (MI)
1	Spring Creek	Headwaters to Galbraith Gap	2.36
2	Slab Cabin Run	Rt. 25/45 intersection to Spring Creek	8.02
3	Thompson Run	Entire Length	0.51
4	Walnut Springs Run	Entire Length	0.11
5	Spring Creek	Slab Cabin Run to Big Hollow	3.08
6	Spring Creek	PFBC Fish Culture Stations - Benner Springs to Bellefonte	4.92
7	Logan Branch	PFBC Pleasant Gap Fish Culture Station	0.43
8	Logan Branch	I-99 Overpass to Confluence	4.94
9	Buffalo Run	Near Fillmore	1.21
		Total Impaired Stream Miles	25.58

Population Change

Municipality	2017	2000	% change 2010-17
Bellefonte Borough	6,308	6,424	2%
Benner Township	9,309	5,219	50.7%
Centre Hall Borough	1,251	1076	-1.1%
College Township	10,245	8,522	7.6%
Ferguson Township	19,316	14,100	9.2%
Halfmoon Township	2,793	2,359	4.7%
Harris Township	5,803	4,655	19.1%
Milesburg Borough	1,088	1,156	-3.1%
Patten Township	16,038	11,301	4.7%
Potter Township	3,593	3,333	2.2%
Spring Township	7,853	6,233	5.1%
State College Borough	42,430	38,434	.09%
Walker Township	4,721	3,194	6.5%
Total	**130,748**	**106,006**	


Urbanized Area (2000 & 2010)
Boggs Township
Marion Township
Milesburg
Walker Township
Union Township
Rush Township
Unionville
Bellefonte
Spring Township
Gregg Township
Benner Township
Huston Township
Centre Hall
Patton Township
Worth Township
College Township
Potter Township
State College Borough
Halfmoon Township
Harris Township
Ferguson Township
Legend
Municipal Boundaries
Urbanized Areas (2000)
Urbanized Areas (2010)
Urban Clusters (2010)
Road Centerlines
N
This Map is a Graphic Representation for Illustrative Purposes Only

Challenge: New Ways of Coordinating Across Local and Regional Entities

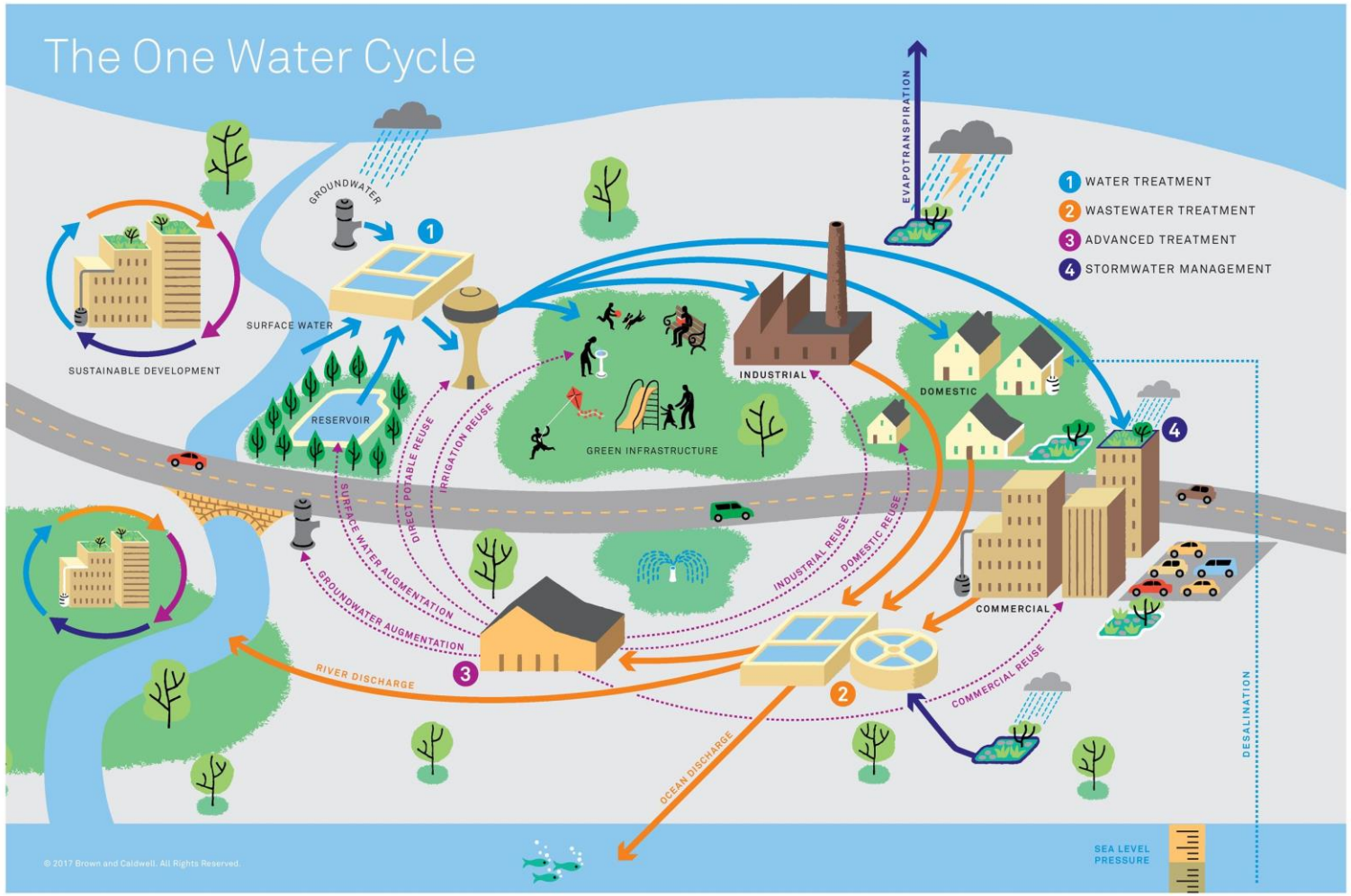
Water Suppliers	Wastewater
State College Borough Water Authority	University Area Joint Authority
Bellefonte Borough Water and Sewer Authority	Spring Benner Walker Joint Authority
College Township Water Authority	Centre Potter Sewer Authority
Benner Township Water Authority	Regional Planning
PSU (Water and Sewer)	Centre Region Planning
Walker Township Water Association	Nittany Valley Joint Planning Commission
Milesburg Borough Water Authority	Lower Bald Eagle Planning
Centre Hall Borough Water Authority	Penns Valley Region Planning

Challenge: PA Water Law

- Various pieces of law interwoven together to manage water.
- Not well designed for future demands and emergency situations.
- Sources of PA water law include common law, interstate compacts regulating some parts of the Commonwealth, and statutes targeting specific water topics.
- Both surface and groundwater are legally managed separately under riparian law. Act 220 tries to address this issue.

https://www.springcreekwatershedatlas.org/single-post/2018/01/16/An-Overview-of-Pennsylvania-Water-Law

Managing Water Resources and Water Services



One Water Planning Process

Forum Major Themes

- OVERALL WATERSHED CONSIDERATIONS – 17 ISSUES
- GROWTH, DEVELOPMENT, EXISTING & NEW IMPACTS
- INFRASTRUCTURE
- TOURISM AND RECREATION
- AGRICULTURE
- DRINKING WATER
- WASTEWATER
- MINING
- TRANSPORTATION
- PENN STATE UNIVERSITY

Vison and Mission

One Water Plan Vison Statement

The vision for the Spring Creek Watershed is an integrated management of water resources in an environmentally, economically, and socially beneficial manner. This will foster a vibrant, prosperous watershed where natural and human communities thrive, and citizens embrace the value of our assets and sustain our resources now and for future generations. This vison, developed collaboratively with stakeholders, is accomplished through the mission of the Spring Creek Watershed Commission.

SCWC Mission Statement

- To implement the long-range vision for the watershed that represents a consensus of thoughts and ideals that are commonly shared by the people of the Spring Creek Watershed.
- To establish a leadership role within the watershed to advance and coordinate projects and programs that are consistent with the long-range vision of the Spring Creek Watershed, including conservation and enhancement of the exceptional wild trout resources it supports.
- To develop a long-range comprehensive Integrated Watershed Management Plan that relies on quality scientific data and a program of meaningful associated projects to conserve and enhance the quality of life within the Spring Creek Watershed.

Value Statements

1. Recognizes that the Spring Creek Watershed is worthy of conservation and careful stewardship.

2. Conserve Spring Creek's cold water ecosystem including its exceptional wild trout fishery.

3. Provides a clear visual image of the watershed community that reflects the highest standards of design quality for public and private commercial, residential, institutional and industrial development in Spring Creek resulting in the conservation of water and the conservation and enhancement of its natural beauty, natural features and cultural heritage.

4. Promote buildings and public infrastructure development that are practical, sustainable, and in harmony with the environment and surrounding landscape.

5. Fosters a feeling of community spirit, community identity, and promotes a sense of full citizen participation, guaranteeing an opportunity for everyone to share in the duties and responsibilities that benefit the Spring Creek Watershed.

6. Provides cultural, recreational, and educational opportunities for the residents and visitors to the Spring Creek Watershed.

Guiding Principles For Decision Making

- Is not an effort to change local governance but to integrate management and leadership.
- Strives for a systematic, watershed-wide, science-based approach to watershed management; driven by the participating local governments, state and federal governments, water utilities, planning commissions, Penn State University, citizens, businesses and industry.
- Planning and implementation efforts will recognize local commitment and contribution.
- Will embrace the concept of multiple benefits based on measures of social, economic and environmental outcomes in the development and prioritization of implementation strategies and actions.

Framework for Spring Creek One Water Plan

- Goals are statements that describe the fundamental endpoints or outcomes we are aiming to achieve through activities across all sectors of management. Goal statements are expressed in broad aspirational terms.

- Objectives are statements about desired outcomes and support the high-level goals.

- Metrics can be considered performance indicators. They can be considered benchmarks that can be measured to track how well we are achieving our desired outcomes. For example, “tons of sediment eliminated”.

- Outcomes are specific changes we are trying to achieve. They should be measurable and realistic but challenging. If outcomes are unrealistic and too difficult to achieve, they may discourage people rather than motivate them. On the other hand, outcomes that are too easy to achieve can lead to complacency.

Goals 1: Protect, Enhance and Sustain Healthy and Resilient Coldwater Stream Ecosystems

Objective	Description	Suggested Metric (s)	Outcome(s)
Objective 1A: Protect Ecosystem Flows	Rivers, streams, wetlands and springs need certain amounts of water to support healthy aquatic ecosystems. Improve water quality and quantity for resiliency to ensure the capacity of the ecosystem to respond to a disturbance by resisting damage and recover quickly. This is especially critical given the unique and coldwater ecosystem supported by the Spring Creek Watershed and highlighted by the exceptional wild trout populations and fishery, which require cold, clean water to flourish. Management must consider the impacts of point and nonpoint discharges, development, stormwater, and water withdrawals.	• The Nature Conservancy Ecosystem Flow Recommendations • Acres of impervious surface • Lbs of nitrogen, phosphorus and sediment reduced • Number of miles of riparian buffers installed • Miles of stream improved that meet criteria to be delisted from impairment • Development of a proactive TMDL to determine maximum amount of pollutants allowed to occur in spring creek and tributaries in the future.	Restore High, Seasonal and Low Stream Flows Maintain and improve existing hydrology Impaired stream sections improved to meet criteria for removal from impairment designation on 303D list Voluntary Total maximum Daily Loads Met.

Goals 1: Protect, Enhance and Sustain Healthy and Resilient Coldwater Stream Ecosystems

Objective 1B: Create Resilient Habitats	**Stream habitat is one of the important factors that affect aquatic communities. This includes physical habitat and water quality. Based on the macroinvertebrate diversity and sensitivity to pollution, and wild trout population dynamics and densities, we gain an understanding of our streams' health. Degraded in-stream habitat often results from uncontrolled storm water runoff and uncontrolled runoff from cultivated agricultural land. Other reasons for poor stream habitat include altered stream flows, excess sediment, and a loss of surrounding trees and shrubs that help slow the erosion of the stream banks and provide shade to help maintain cool water temperatures during critical summer months. Chemicals and pollutants also negatively impact stream habitat/water quality.**	• **Index of Biological Integrity Scores** • **DO, water temperature, sediment loads, stream channel surveys (fluvial geomorphology)** • **Number of trout, biomass, sizes and redds** • **Acres of Impervious surface reduced** • **Miles of riparian buffers installed** • **% of impervious surface**	**Diversity of macroinvertebrates.** **Improved water quality and thermal regime** **Wild trout populations at or above current levels.** **Maintain and improve existing water quality, including water temperature and D.O.** **Acres and/or # of Green Infrastructure**

Goal 2: Maintain and improve water quality and quantity to sustainably meet the needs of the human community.

Objective2A: Maintain a reliable water supply for residents, agriculture, and industry	**Protecting, maintaining, improving and developing new water supply sources and recharge/storage areas ensures a supply for future uses. Water management must consider the multiple uses of groundwater to ensure reliability. Recycled water can offer a reliable source that can displace a portion of the need for additional surface or groundwater withdrawals**	**% loss from water systems, #gallons of drinking water from new sources, % stormwater volume directed to recharge areas; % reduction in treatment costs**	**% water use served by recycled water, # new large-scale storage areas developed**
Objective 2B: Implement a water demand strategy	Water demand management involves the adoption of policies and investments by water utilities to achieve efficient water use by all members of the watershed community. This strategy requires a major paradigm shift from conventional supply management to the management of demand. The aim is to promote the use of the right quantity of water on the farm, industry, household, and by the watershed community as a whole.	# of tributaries with water budgets, # of critical supply areas identified, % critical contribution areas with practices/policies in place to support sustainable yield/withdrawal scenarios, # of effective ordinances/policies Gallons of water from natural systems, withdrawals per capita	No exceedance of sustainable withdrawal rates. Number of new sources to mitigate impact. % public water supply loss reduced. Drinking water needs met Maintain low flows at or above long-term monthly median flows at each of the Three USGS gages on Spring Creek and on tributaries while meeting daily drinking water needs

Goal 2: Maintain and improve water quality and quantity to sustainably meet the needs of the human community.

Objective 2C: Sustain and protect groundwater	**Groundwater accounts for 88% water supply in the Spring Creek Watershed. Aquifers provide critical storage to meet needs during droughts. The amount of groundwater in storage in each basin is dependent on the precipitation, recharge and the total extraction of all the wells. A groundwater management plan that is designed for the political, institutional, legal and technical specifics of the basin can help maintain the quality and quantity of the groundwater supply.**	**# of BMP's to minimize recharge loss, # of source water plans updated,** **# of emergency water supply plans developed,** **% change in well levels;** **% flow in and out of the watershed** **% deviation from historic baseflows**	**sustained well yields, ground water management plan** **% attainment on meeting historic base flows**

Goal 3: Integrate and Coordinate Management for Sustainability, Economic Growth, Recreation and Quality of Life

Objective3A: Implement an Integrated Water Management Network/Governance Model	**This network would promote the coordinated development and management of water, land and related resources, to maximize environmental, economic and social results in an equitable manner without compromising the sustainability of the watershed. Participation would involve applying knowledge from various disciplines as well as the insights from diverse stakeholders to devise and implement efficient, equitable and sustainable solutions to water and development problems. Network members could include the Spring Creek Watershed Commission, municipal governments, water utilities, Penn State, state and federal agencies, industry, and planning organizations. Political will and commitment will help unite all stakeholders and move the process forward.**	**Build capacity of Spring Creek Watershed Commission to administer the network** **Utilize Penn State to evaluate existing networks in other states or other governance options** **Include MS4 Partnership and Central PA Source Water Protection Partnership**	**Cross agency and cross scale interaction and communication** **Administrative process implemented** **Network charter in place**

Goal 3: Integrate and Coordinate Management for Sustainability, Economic Growth, Recreation and Quality of Life

Objective 3B: Implement network subcommittee for technical support, data driven science, education and information exchange.	**Diversity of membership includes utility personnel, academia, government employees (federal, state, local), non-governmental organizations, industry representatives and consultants. Review, evaluate, and disseminate information on best practices on integrated watershed management. Encourage adoption of new advances and applications for watershed management, develop workshops and organize/moderate technical discussion and educational events.**	**#of members representing diverse capabilities** **#of educational events** **Data driven science metrics** **% economic growth** **% biological growth** **Centralized data sets**	**Science based collaboration** **Land Use plans coordinated** **Online searchable data base**

Goal 3: Integrate and Coordinate Management for Sustainability, Economic Growth, Recreation and Quality of Life

Objective 3C: Promote the value of the watershed's recreation, aesthetic and cultural assets	**Ecosystems provide recreational opportunities and cultural and aesthetic value. Communities rely on clean air, water, green space, and other natural amenities for economic sustainability and quality of life, yet their benefits are not always fully understood or considered in local decisions. Recreation and tourism associated with outdoor environments can play a huge role in local economies. Many citizens place high value on historically or culturally important landscapes because of their significance. However, human activities can stress natural areas where people recreate or visit cultural sites.**	**#of clean up events** **# of recreational users** **# cultural sites** **# of groups involved** **% value of ecosystem services** **Reenergize "Spring Creek Day"** **Recreational growth and economic value**	**Stewardship**

Phase 3 Short Term Actions

- Continue to convene technical workgroup to begin capturing ideas for phase 3 milestones and actions
- Engage PSU to begin evaluating informal networks through literature review of other watersheds with fragmented management structures and how they resolved coordination of overlapping authorities.
- Implement a speaker series based on the 10 substantive law forum issues.
- SCWC to continue to improve their website to serve as a centralized data base and document storage.
- Develop a funding plan and raise funds to hire professional team to draft final integrated water management plan - $250,000/yr for 2 years estimated.
- SCWC to hire staff for coordination, website and grant applications to raise funds for professional support – estimated cost $30,000.
- Internship to compile historic data over time.

Appendix 16 - Spring Creek Watershed Commission Meeting Minutes – January 16, 2019

(*edited to remove non-One Water process content*)
Bellefonte Council Chambers
236 West Lamb Street
7:00 PM

1. **CALL TO ORDER:** 7:00 PM
2. **ATTENDEES:** Chris Hurley (Patton Township), David Whiteman (Potter Township), Bill Sharp (College Township), Joanne Tosti-Vasey (Bellefonte Borough), Dennis Hameister (Harris Township), Peter Buckland (Ferguson Township), Bob Strouse (Halfmoon Township), Bill MacMath (Spring Township), Tim Robinson (Benner Township), (State College Borough)
3. **NOT PRESENT:** Milesburg Borough, Walker Township
4. **ELECTION OF OFFICERS:**
5. **MEETING TIMES AND LOCATION:**
6. **APPROVAL OF MINUTES:**
7. **CITIZEN COMMENTS:** The public is invited to address the Commission on items not on the agenda, (5 minutes per commentary)
    a. Mike Costello, on behalf of the Nittany Valley Environmental Coalition
        i. Since citizen comment portion of meeting is limited to 5 minutes, additional written comments are attached below
        ii. Would like to address several concerns on the direction of the Spring Creek Watershed Update Project
            1. During public meeting on Phase II report in December, the SCWC announced it does not intend to impose mandatory and enforceable standards applied across township boundaries and that participation by local authorities would be voluntary
            2. Nittany Valley Environmental Coalition believes that if the Commission limits the scope of the plan to strictly voluntary with no enforceable standards, the project is unlikely to result in a successful plan
            3. Suggestion was made during Phase II meeting to utilize Municipal planning code: Act 247 as authority for the implementation of enforceable standards, but was met with resistance due to the act needing revisions for it to be used this way
                a. However, the act's stated purpose gives municipalities power to govern through zoning / ordinances and to ensure access to clean water through action
            4. Zoning and other zoning measures through Act 247 can be used to develop an enforceable and effective water plan

    b. David Roberts, on behalf of the Nittany Valley Environmental Coalition

i. It is the view of the Nittany Environmental Coalition that Phase III should include a framework to adopt enforceable provisions for the protection of Spring Creek water resources
ii. Under Pennsylvania Code Act 247, the Spring Creek Watershed Commission can develop an enforceable plan and no amendments to the act are needed
    1. York County's integrated water management plan is based on Article III of the act and was adopted as part of the York County Comprehensive Plan
iii. Nittany Valley Environmental Coalition recommends that the Commission structures the Update Project process based on the York County plan moving forward and present it for adoption to the Centre County Commissioners
iv. Nittany Valley Environmental Coalition requests the Commission's response on the following questions:
    1. The commission is currently underfunded and understaffed. Does the Commission plan to seek funding to support their mission?
    2. A key fact of our watershed is that all water comes from rain and snow that falls and infiltrates into the karst landscape and no river to bring water into the valley. How will voluntary participation by a multitude of water and sewer authorities, townships, and other political organizations result in a successful water management plan for all?
    3. Proposals have been made by members of the Update Project technical workgroups to utilize underground mines as reservoirs to store water to protect against extreme drought and also to rely on beneficial reuse of wastewater for the rapid development in the watershed. There are many unanswered questions around these ideas, such as time and infrastructure costs. Will the commission members keep an open mind to more green measures that have proven to be effective in other watersheds?
    4. Will the Commission be open to help from established water resource planning organizations?
    5. Pennsylvania Environmental Council will be holding a watershed seminar, "Watershed Connections: Leveraging Our Power for Watershed Health" in State College on February 24th and 25th. Does the Commission plan to send representatives to participate in this important state conference?
v. The Nittany Valley Environmental Coalition is relying on the Commission to remain open to public input concerning the development and the implementation of the plan.

c. Michal Stump, on behalf of the Nittany Valley Environmental Coalition
    i. Why does the Phase II plan state that there will be no changes in governance?
        1. If there's no change in governance, no legal jurisdiction, and no means to enforce the plan, what obligation will local authorities have to follow the plan?
    ii. How can the public have any confidence that the watershed plan, at a huge cost, will be followed?

d. Dorothy Blair, President of the Nittany Valley Environmental Coalition

i. Reinforces what other coalition members said
ii. Absolutely need reinforceable standards for the protection of watershed and streams
iii. Too many different municipalities and water authorities involved, some are conscientious of water needs and some are not.
    1. There needs to be coordination and regulation at the county level
    2. Currently impossible for authorities to act in ways that are beneficial to their own water supplies
iv. Reinforce that we need municipal code Act 247 to empower municipalities

8. **EDUCATIONAL TOPIC**: *Janie French,* **<u>Presentation on final report of "Phase II-One Water Plan" and Discussion: Where do we go from here?</u>**

A) Spring Creek Phase 2 One Water Integrated Management Plan
    a. This Phase 2 document is a draft because we want everyone's comments
    b. The Commission will adopt or reject the Phase II plan in February and then look at moving forward at Phase III
        i. Dennis: If there is no meeting in February, voting will be moved to March
B) Janie extended thanks to the Spring Creek Watershed Commission for inviting Headwaters Charitable Trust to help facilitate Phase II
C) Why one water?
    a. The water is an integrated system. Recognizing the interconnectedness of surface water, groundwater, stormwater, wastewater, and energy is the key to a successful watershed management plan
    b. Spring Creek Watershed Commission is unique and is leading the charge in proactive water management
    c. One water requires collaboration of water utilities, community and business leaders, industry, policy makers, academics, environmental advocates, and conservationists
    d. Other goals of a one water plan are: thriving local economies, community vitality, and healthy ecosystems
    e. Resiliency is key with probable upcoming droughts
    f. Integrated Water Management: "The coordinated planning, development, protection, and management of water, land, and related resources in a manner that fosters sustainable economic activity, improves or sustains environmental quality, ensures public health and safety, and provides for the sustainability of communities and ecosystems" American Water Resources Association
D) One water planning process
    a. A clearly defined vision of the watershed is imperative to creating an effective one water plan
    b. The steps for planning a one water plan are as follows: Define One Water scope – Craft Vision and Objectives (assess needs and opportunities, and convene partners) – Establish leadership and structure (create framework and develop financial strategies) – Implement the plan
    c. Everyone needs to agree that a one water approach is the right approach for success

E) Spring Creek Watershed Overview
    a. Unique due to groundwater and surface water boundary are different
    b. Spring Creek Watershed is very valuable: coldwater fisheries
        i. An asset to Pennsylvania
    c. Population change: increased from about 24,000 residents from 2010 to 2017 (6.5 percent growth)
F) Phase I identified issues
    a. Declining stream base flow
    b. Increased sedimentation
    c. Thermal modifications
    d. Riparian buffer removal
    e. Declining biotic community
    f. Ineffective stormwater management
    g. Malfunctioning stormwater basins
    h. Lack of sinkhole and wellhead protection
    i. No sponge recharge area protection
    j. Increased impervious cover
    k. Declining groundwater levels
    l. Poor water quality / spring contamination
G) Actions after Phase I
    a. SCWC adopted environmental controls
    b. USGS Hydrogeologic Setting and Conceptual Hydrologic Model (2005) with suggested future actions
    c. Water Budget and Recharge Area Simulations for Spring Creek (2000-2006)
    d. Water Resource Monitoring Project (ongoing)
    e. Source Water and Wellhead Protection Plans in: State College Borough, College Township, Walker Township, Bellefonte Borough
H) The watershed management plan will be a living document to continually meet one water goals
I) 2016 Integrated Report from DEP shows some impaired stream within the watershed
J) Substantive issues from April Public Forum mirror the issues mentioned in the Phase I report
    a. Unique nature of watershed, growth/development, infrastructure, tourism/recreation, agriculture, drinking water, wastewater, mining, transportation, and PSU's role
K) Challenges moving forward
    a. Coordinating across local, county, regional, state, and federal entities
        i. 31 total entities that can manage water in the Spring Creek Watershed
    b. PA Water Law

    c. Headwater streams

L) Public and Technical Process in 2018
    a. April 18th: PSU Law Public Forum
    b. July 10th: 2nd Public Forum to Introduce One Water Concept and begin visioning
    c. August to November: Technical workgroup meetings to establish goals, metrics, and desired outcomes
    d. December 4th: 3rd public forum to review draft plan and gather input on the plan's implementation

M) If decision is made to proceed with Phase III, technical workgroups will reconvene
    a. More industry will need to be brought into technical workgroups

N) Vision statement crafted that aligns with Spring Creek Watershed Commission's mission

O) Value statements: core principles the watershed communities' governments, residents, water utilities, and businesses wish to maintain

P) Goals
    a. Protect, enhance, and sustain healthy and resilient coldwater stream ecosystems
    b. Maintain and improve water quality and quantity to sustainably meet the needs of the human community
    c. Integrate and coordinate management for sustainability, economic growth, recreation, and quality of life

Q) Phase III concept
    a. Complete the final planning document with specific actions, milestones, and timelines.
    b. Continue to convene technical workgroup and expand participation to begin drafting an RFP for technical services
        i. Also develop a funding strategy
    c. Implement a speakers information series to begin addressing the 10 substantive issues identified through the law forum
    d. Continue to improve the SCWC website to serve as a central clearinghouse for information
    e. Continue to use the SCWC Communications Coordinator to manage the website, coordinate speaker series logistics and additional services as needed

R) Discussion
    a. Intent of presentation was to present report and move forward to act on the report.
    b. This meeting receive input from commissioners and community on report
    c. Phase II document is available on the commission website: https://www.springcreekwatershedcommission.org/phase-ii-report
    d. Any public comment should be received by Sunday, February 10th to springcreekwatershedcommission@gmail.com
    e. Peter Buckland: Advised commission members to take the plan to councils and boards of supervisors to allow them to comment during public meeting to gauge interest
        i. Bill Sharp: Believed they are unlikely to comment until Phase III
        ii. Dennis Hameister: Document should also be brought to planning commissions

iii. Peter Buckland: We need the involvement of the elected officials and planning commission; all that needs done is to ask if they can put it on their agenda and comment on it. It is not required
iv. Getting comments from these entities by February 10th would be tough.
v. Bill Sharp: Does everyone understand the background of this from these entities?
vi. Peter Buckland: We've set ourselves up on a timeline to adopt this report, but we might not have the buy-in from these entities to credibly do so. We do not want to rush this so that the people who make decisions support it.
vii. Bob Strouse: Proposed waiting until March to vote on moving forward with Phase III to allow more public comment on Phase II report
viii. Janie French: Willing to help explain the plan to any interested parties
ix. Joanne Tosti-Vasey: It would be helpful if Janie wrote up an executive summary on the plan to share at meetings
x. Dennis Hameister: The voting on Phase II report will be done during the March meeting and commission members will take the report to the planning commissions, water authorities, and councils/boards of supervisors for comment as they feel needed
xi. Caitlin Teti will distribute the executive summary to commission members