

February 16, 2012

**Memorandum for the Record**

**Subject:** Lower Susquehanna River Watershed Assessment (LSRWA)  
Quarterly Team Meeting  
**Location:** MDE, Montgomery Park Building, Aqua Conference Room  
**Date:** January 23, 2012

**Attendees:**

Agency	Name	Email	Phone
Bay Journal	Tom Horton	<a href="mailto:swanfull@gmail.com">swanfull@gmail.com</a>	410-726-7282
Coastal Conservation	Bob Fantom	Bobthefantom@verizon.net	
Exelon	Bob Matty	Robert.matty@exeloncorp.com	610765-5514
Exelon	Mary Helen Marsh	<a href="mailto:MaryHelen.Marsh@exeloncorp.com">MaryHelen.Marsh@exeloncorp.com</a>	
Gomez and Sullivan	Gary Lemay	<a href="mailto:glemay@gomezandsullivan.com">glemay@gomezandsullivan.com</a>	603-428-4960
Gomez and Sullivan	Tom Sullivan	tsullivan@gomezandsullivan.com	603-428-4960
Lower Susquehanna RiverKeeper	Michael Helfrich	<a href="mailto:LowSusRiver@hotmail.com">LowSusRiver@hotmail.com</a>	717-779-7915
MDE	Herb Sachs	hsachs@mde.state.md.us	410-537-4499
MDE	John Smith	<a href="mailto:jsmith@mde.state.md.us">jsmith@mde.state.md.us</a>	410-537-4109
MDE	Matt Rowe	mrowe@mde.state.md.us	410-537-3578
MDE	Tim Fox	tfox@mde.state.md.us	410-537-3958
MDNR	Bruce Michael	bmichael@dnr.state.md.us	410-260-8627
MDNR	Shawn Seaman	sseaman@dnr.state.md.us	410-260-8662
MGS	Jeff Halka	jhalka@dnr.state.md.us	410-554-5503
SRBC	Dave Ladd	dladd@srbc.net	717-238-0425x204
SRBC	John Balay	jbalay@srbc.net	717-238-0423 x217
SRBC	Andy Gavin	<a href="mailto:agavin@srbc.net">agavin@srbc.net</a>	717-238-0423 x107
URS	Marjorie Zeff	Marjorie.zeff@urs.com	215-367-2549
USACE	Andrea Takash	<a href="mailto:Andrea.M.Takash@usace.army.mil">Andrea.M.Takash@usace.army.mil</a>	410-962-2626

USACE	Anna Compton	Anna.M.Compton@usace.army.mil	410-962-4633
USACE	Bob Blama	Robert.N.Blama@usace.army.mil	410-962-6068
USACE	Chris Spaur	Christopher.C.Spaur@usace.army.mil	410-962-6134
USACE	Claire O'Neill	Claire.D.O'Neill@usace.army.mil	410-962-0876
USACE-ERDC	Carl Cerco	Carl.F.Cerco@erdc.usace.army.mil	601-634-4207
USACE-ERDC	Steve Scott	Steve.H.Scott@usace.army.mil	601-634-2371
USGS	Mike Langland	langland@usgs.gov	717-730-6953

The meeting agenda is provided as an enclosure to this memorandum.

**Action Items:**

- A. Bruce will integrate comments from the team to refine the LSRWA (public) website.
- B. Steve will coordinate with Bruce to obtain digitized maps of SAV data in the Susquehanna flats area.
- C. Bruce will share results of the suspended sediment sampling taken at Conowingo outfall (taken during high flow events this year) with the team. [Update: MDNR provided the data to Carl Cerco]
- D. Anna will update the map in the LSRWA PowerPoint presentation to remove the York Haven Dam.
- E. Bruce will send the LSRWA website link to the team.
- F. Bruce will update the LSRWA website with recommended changes from the team.
- G. The team will send Bruce documents and links that should be posted on the LSRWA website.
- H. The MDE FTP website will be utilized to share internal draft documents within the team; Matt will be the point of contact for this FTP site.
- I. Dave will send a hyperlink to the SRBC publication 239 (the 2006 sediment analysis report) to the team. [Update: Link sent January 24, 2012]
- J. Claire will coordinate monthly conference calls to discuss modeling activities.
- K. Shawn will notify team when most recent Exelon study reports are released.
- L. Claire will work with Mike Langland to execute funding for USGS for LSRWA efforts.

*Ongoing Action Items*

- A. Anna will update PowerPoint slides after each quarterly meeting to be utilized by anyone on the team providing updates to other Chesapeake Bay groups.
- B. Anna will send out an update via the large email distribution list that started with the original Sediment Task Force (includes academia, general public, federal, non-government organization (NGO), and state and counties representatives) notifying the group of updates from the quarterly meeting.
- C. Mark and Anna will coordinate to conduct a literature search providing info on best management practices around the nation and world for reservoir sedimentation.
- D. Matt will keep team informed on Innovative re-use committee findings to potentially incorporate ideas/innovative techniques into LSRWA strategies.

## Discussion:

### 1. Welcome and Opening Remarks:

Herb Sachs welcomed the group. He noted that after the press release (September 2011) announcing that the study has started, feedback has been positive and there has been a lot of interest. The name of the study changed to the Lower Susquehanna River Watershed Assessment in order to communicate more effectively that this study is a more comprehensive evaluation of sediment management within the lower Susquehanna River watershed versus just a Conowingo reservoir sediment study. There have been questions in regard to how this effort, looking at the issue of sedimentation, the dams, and the Chesapeake Bay, will be different this time around. Herb said that his response to this question is that the atmosphere is different this time around because of the ongoing regulatory actions being taken through the total maximum daily load (TMDL) process and all of the other ongoing efforts and investments being made in Chesapeake Bay restoration. More recently there has not been much interest or inquiry in regard to the LSRWA and it is important (for future funding and support of this study's recommendations) that we continue to communicate our efforts to all stakeholders and get feedback.

Herb provided a copy of the latest issue of the *Chesapeake Bay Quarterly* which has two articles discussing sedimentation, the Conowingo Dam, implications to the Chesapeake Bay and the LSRWA effort.

Discussion ensued about the status of federal funding for this study. Claire summarized that we should know if the study received funding for FY12 by mid-February. [**Update:** \$300,000 received in February 2012.] The FY13 budget will be coming out in a few weeks and then we will know if there if there will be funding available for next FY. [**Update:** This project is not in the president's FY13 budget.]

### 2. Review of Action Items from November 2011 Meeting:

The team reviewed action items from the last quarterly meeting:

- A. Claire will email the team the "Roles and Responsibilities" spreadsheet to get input; compile and send out to team once completed.

*Status Complete- Spreadsheet is finalized and can be posted to website.*

- B. Anna will send the LSRWA Team email distribution list to all team members.

*Status Complete.*

- C. Shawn Seaman will contact Michael Helfrich to notify him of quarterly meetings to see if he can attend.

*Status Complete. Michael will be added to the distribution list so he will automatically be invited to future quarterly meetings.*

- D. Bruce Michael will have the lead in coordinating with SRBC, MDE, and MGS to set up a website where any products of the assessment can be kept to keep stakeholders informed.

*Status Ongoing. The website has been set up at the following address: <http://bit.ly/LowerSusquehannaRiver>. See discussion on website in meeting summary below.*

- E. Anna will prepare a brief public involvement plan to layout how the LSRWA will be coordinated with stakeholders and will send out the team for review.

*Status Ongoing. See discussion on public involvement plan in meeting summary below.*

- F. Anna will send out revised goals to the team for one final review and team approval.

*Status Complete. Goals have been finalized and can be posted to website.*

- G. Steve will coordinate with Bruce to obtain digitized maps of SAV data in the Susquehanna flats area.

*Status Ongoing. SAV mapping was not done until November 2011 due to sediment plumes that obstructed visibility from the large storms that occurred earlier in 2011. Maps should be available for download from the “Eyes on the Bay” website by the end of February. Anecdotal evidence shows that SAV beds are still intact and were not damaged from storm events.*

- H. Bruce will share results of the suspended sediment sampling taken at Conowingo outfall (taken during high flow events this year) with the team.

*Status Ongoing. The data is being reviewed and formatted by USGS. Data should be available by mid-February.*

- I. Claire will follow up with individual team members to develop a schedule for work to be conducted this year.

*Status Complete. The team has provided input on schedule. As tasks are completed and progress on the study continues the schedule will be updated. See discussion on schedule in meeting summary below.*

- J. Shawn will provide a summary of Exelon study findings.

*Status Complete. Exelon was able to attend meeting so they provided an update at the quarterly meeting. See discussion on Exelon study findings in meeting summary below.*

### 3. Communication and Coordination:

#### A. Public Involvement Plan

At the previous quarterly meeting there was much discussion on public involvement/communicating to stakeholders outside of the team. Based on this discussion, Anna drafted a public involvement plan to capture how the LSRWA team would engage the public and agencies. The team reviewed the plan and provided the following comments:

- Add a general timeline of when the team anticipates public meetings;

- The terms “public” and “stakeholders” should be clearly defined;
- Funding sources for recommendations that are developed during the assessment should be added as a public concern;
- NY, PA, and MD state offices should be added to the list of groups likely to be interested in project;
- The final public involvement plan document should be added to the LSRWA website; and
- Clearly define how the public involvement will be documented in the LSRWA report (lay out a chronology of all activities).

Dave added that it is important as we finalize the watershed assessment that we make sure refer back to the public outreach plan, and follow what we have laid out to engage the public in the LSRWA.

Tom Horton commented that with the 40-year anniversary of Tropical Storm Agnes occurring this year, the media would most likely be interested in running a story on that storm event and the current efforts going on now. This represents a good opportunity for the assessment to get some publicity.

Herb mentioned that he, Secretary Summers (MDE) and Paul Swartz (executive director of SRBC) met with the Maryland delegation from the Eastern Shore. He noted that feedback from these meetings was that there is a lot of interest in water quality in the Bay; farmers feel like they are being picked on (it will be important to engage agriculture groups in study); and the costs of the implementation of the TMDL and the proposed “flush tax” to cover the cost of implementation of TMDL.

Bruce noted that the MD legislature is in session now (through April 9, 2012) and there will be many opportunities to present where we are in this study to MD legislators.

#### B. LSRWA Presentation Feedback from Recent Meetings

Jeff presented an update of the study to the Chesapeake Bay Program (CBP) Modeling Subcommittee on November 30, 2011. No specific feedback was received. Jeff noted that this is a good group to stay in touch with and they were very receptive to the study. Jeff also presented at the Citizens Advisory Committee for the Dredged Material Management Program as well.

Bruce presented an update of the study at the CBP Scientific and Technical Advisory quarterly committee meeting in January 2012. The group wants to be kept informed. Also a copy of the LSRWA PowerPoint presentation was sent to Ann Swanson of the Chesapeake Bay Commission for her use.

There was discussion on the map in the presentation showing the study area for the LSRWA. There is a system of four hydroelectric dams on the lower Susquehanna River. The northernmost dam is the York Haven Dam which is not included in the modeling scopes for the assessment due to the fact that it is a “run of the river” dam that does not trap sediments in any significant way. The consensus was to remove this dam from the map in the presentation to clarify this point. However, in background discussion in the

LSRWA report, this dam should be mentioned and the reason why it is not included in the study/area scope of the assessment.

#### C. Public MDNR Website Demo

Bruce pulled up the newly developed website for the LSRWA and requested feedback from the team. Below are team recommendations for website:

- Shorten the URL address;  
    [Update: Address is now <http://bit.ly/LowerSusquehannaRiver>]
- Add legal cost-sharing agreement;
- Add project management plan;
- Add a link to MDNR's "Eyes on the Bay" website;
- Add a link to the historical Sediment Task Force website
- Add a link to historical Sediment Task Force documents (but add caveat noting evolution of thought on sediment management and that these are "historic"; ;
- Add links to specific related efforts going on in the Bay (i.e. TMDL, SRBC WQ efforts, etc.);
- Add LSRWA PowerPoint presentation;
- Add LSRWA team roles and responsibilities spreadsheet;
- Add LSRWA goals and objectives;
- Add media articles/press releases discussing LSRWA;
- Add calendar of events;
- Add all quarterly meeting agendas and meeting minutes;
- Add stakeholder outreach plan; and
- Add a tab for technical reports

All appropriate materials (in list above) will be sent to Bruce by the LSRWA team to be uploaded onto website.

#### D. Need for Internal Website for Sharing

Claire mentioned that the primary purpose of the LSRWA website is to share information with the public. She asked the team if there is a need to have an internal website to share draft documents and information that are not ready to be posted on the public website but are too large to email to team members. Matt noted that MDE has an ftp website that can be used for this purpose; he will send a link out for the team's use.

#### 4. Summary of Exelon Studies

Shawn explained to the group that the Conowingo Dam has been undergoing the 5-year Federal Energy Regulatory Commission (FERC) relicensing process. Out of this relicensing process, Exelon (owner and operator of Conowingo Dam) was required to conduct several studies that relate to sediment accumulation and transport. Year 2 study reports are due by January 23, 2012. Several contractors of Exelon attended the quarterly meeting and provided results of these studies to the LSRWA team.

Marjie from URS explained that the objective of the sediment transport and accumulation study they conducted was to provide data that will be useful in the future development of an overall sediment management strategy for the Susquehanna River and Chesapeake Bay.

Three tasks conducted to meet this objective were: (1) review and compile existing information; (2) quantitatively assess sediment-related impacts of Conowingo dam on downstream habitat; and (3) evaluate options to manage sediment at Conowingo (completed, but not discussed at this meeting).

Under Task 1, Exelon determined that the underlying assumptions of previous studies which warrant reevaluation were: (1) that flood events of 400,000 cubic feet per second (cfs) trigger scour in the lower Susquehanna reservoirs; (2) that Lake Clarke and Lake Aldred are at steady-state equilibrium with respect to sediment trapping; and (3) Tropical Storm Agnes was associated with major scour event in Conowingo reservoir.

Under Task 2, a HEC-6 analysis of scour (and trapping efficiency) during major storm events was conducted. Findings were that the Conowingo and Clarke reservoirs trap sand received from upstream; Lake Aldred passes sand received from two major tributaries down to the Conowing Pond; silt/clay passes through the reservoir system; and minor scour occurs in Lakes Aldred and Clarke. Conclusions drawn from this HEC-6 analysis were: (1) the Exelon findings do not support the conclusions in scientific literature that the catastrophic impact to Chesapeake Bay from Agnes was due to scour from Conowingo reservoir; (2) Lake Clarke is not in equilibrium (i.e., it is still trapping sediment), though Lake Aldred is in equilibrium; and (3) the Exelon analysis contradicts the scour regression model which utilizes a 400,000-cfs scour threshold.

Mike Langland noted that in general he concurred with the findings of the second conclusion in that in the short term these upper reservoirs are not at steady state (year to year). However, in the long term (20 years), they are at steady state (trapping of sediments is negligible). It is still important to incorporate the upper two reservoirs into the modeling and ensure that the time frame (long term or short term) is well communicated. Tom noted that public perception is important in regards to short-term, episodic events.

Michael Helfrich added that the HEC-6 model utilized by Exelon in the analysis has shortfalls (recognized by USGS in their own reports). These shortfalls are important to keep in mind when using HEC-6 as a tool and extrapolating results to sedimentation within this system. Mike Langland added that as part of this study, the HEC-6 model will be updated and calibrated with better data to allow for more accurate predictions for the watershed assessment.

Marjie added that it is important to think about the sedimentary record when conducting sediment analysis and accumulation studies; for example, are the large quantities of reservoir bottom scour recognized as a source of suspended sediment at Conowingo Dam by grain size distribution?

Gary went over the findings from the recent bathymetric surveys that were conducted in the Conowingo Reservoir. The objectives of these surveys were: (1) create a thorough bed elevation map of Conowingo Pond; (2) determine where and to what extent Conowingo Pond's sediment/bathymetric profile has changed since the 2008 USGS survey; and (3)

establish a physical “baseline” benchmark to better inform future sediment management decisions.

Bathymetric and water velocity data were collected in Conowingo Pond in October 2011 (< 6 weeks after flows receded from Tropical Storm Lee). The same (26) transects surveyed by past USGS surveys were utilized as well as 33 additional transects and 5 longitudinal profiles. This 2011 data was plotted against 2008 data (most recent USGS bathymetric survey) for each transect.

In general, findings of this survey are: (1) upstream areas of Conowingo reservoir are in dynamic equilibrium; (2) in downstream areas of Conowingo Reservoir, deposition outweighed scour; (3) average cross-section depths generally decreased by 1 foot to 3.5 feet; (4) deposition occurred around banks/edges and scour occurred in the main channel; (5) the river appeared to shift toward the dam’s spillway in the farthest downstream cross-sections; (6) Conowingo Reservoir accumulated approximately 5,870 acre-ft of sediment between the fall 2008 survey and the 2011 survey; and (7) net sediment deposition between the 2008 and 2011 surveys was 8.67 million tons. This net sediment deposition translates to approximately 2.9 million tons of deposition per year; historic deposition rates have ranged from 3.1 million tons/yr from 1929-1958, to 2.5 million tons/yr from 1958-1993, to 1.5 million tons/yr from 1996-2008 (Langland 2009). **[Update:** Exelon has since identified some QA-QC changes that alter the total water volume deposition changes. The revised numbers will be released in a memo to the LRWSA group and Exelon relicensing stakeholders in the near future. The updated numbers resulted in less deposition than previously estimated, but did not change the conclusion that there was net deposition between 2008 and 2011.]

Bruce added that Tropical Storm Lee scoured approximately 4 million tons of sediments. If this event had not occurred then deposition measured in these surveys would have been much higher this year.

## 5. LSRWA Technical Analysis Updates

### A. Chesapeake Bay Program Partnership Model (Chesapeake Bay Environmental Modeling Package – CBEMP)

Carl gave a briefing on data assembly for the CBEMP application to the Bay downstream of Conowingo Dam. Carl explained that he was searching primarily for data that would help with the water quality modeling effort as this is the primary application of this model to the LSRWA. He described several datasets he has located and several known datasets that are missing; a summary of his findings was handed out at the meeting (enclosure 2). The largest missing piece is the data collected in 2011 (suspended solids flowing over Conowingo Dam, sampled for particulate nitrogen and phosphorus). Bruce noted that data was collected by USGS, and is currently being reviewed and formatted. It will be available by the end of the January.

Dave mentioned the SRBC publication 239, a 2006 report, which contains a full physical examination and chemical analyses of the sediments behind three dams on the lower



Susquehanna River in 2000. Dave noted that he would be sure to get a link for the report to the team.

B. Sediment Transport Modeling Update

Steve noted that the his scope for the LSRWA currently lays out a plan to utilize a 2D adaptive hydrodynamic (ADH) model to model the Conowingo Reservoir and Susquehanna flats. One of his first tasks is to conduct a desktop analysis to determine if there are any significant 3D effects in the system, which would require the need for a 3D model. He has started this analysis. He is also building the mesh for the models which will include a hydrodynamics component and a sediment transport model. Another task that will commence soon (May 2012) is the SedFlume analysis which will consist of a team going out and collecting data (sediment bed samples) from the Conowingo Reservoir. This analysis will determine the erodability of the sediments in this area. Due to limited initial funding, approximately half of the planned samples will be collected (\$60K vs. \$120K worth of effort) unless further funds are provided this fiscal year.

C. HEC-RAS Modeling Update

Mike Langland provided an update on his efforts which include constructing and calibrating an updated 1D HEC-RAS model that will route inflowing sediment through the reservoirs, accounting for both sediment deposition and erosion. The output of this model will provide boundary conditions for the 2D model simulations that Steve will be conducting as part of his scope in the Conowingo Reservoir.

The HEC-6 model was constructed and utilized in 1990 to model the lower Susquehanna reservoirs. The model was used to estimate 1987 annual and monthly sediment loads and trap efficiency and the model was also used to simulate sediment transport during the June 1972 storm event (Tropical Storm Agnes). The model was calibrated and performed poorly in both scenarios.

For the LSRWA effort, a HEC-RAS model will need to calibrate transport of sediment and sediment size classes to a base year and also will need to simulate transport of sediment and sediment size classes over high-flow event hydrograph(s) and sediment reduction scenarios, incorporating total maximum daily load data from the watershed implementation plan.

The original HEC-6 model had 13 sediment size classes. Based on review of particle size results, this new model will simulate 1 sand, 2 silt and 2 clay sizes. There is very little sand movement so there is no need to simulate sand transport at a very refined level.

In the literature, there is no documentation on the selection of sediment computation algorithms. Thus, algorithm selection will need to be revisited in this effort to simulate high-flow event transport functions.

Mike noted that he has looked at the feasibility of using data for the new HEC-RAS model. Geometric data (e.g., channel cross-sections 2008 and 2011) will likely be used.

The 2011 data has greater resolution. Sediment particle size distribution and transport data collected since 1990 will also be utilized.

In coordination with Steve and his modeling efforts the HEC-RAS output will be an hourly time step, which suits the needs of the 2D ADH model. This effort will model all three reservoirs (Aldred, Clarke, and Conowingo) and the simulation period will cover the September 2011 high flow event and yet-to-be specified period(s) for annual loads.

In regards to reservoir sediment, Mike has pulled all historical sediment concentrations, loads and particle size data from Harrisburg, Marietta, Conestoga Creek, Pequea Creek, and Conowingo. The data will be used to build the QC model input files. He is also building a geospatial data base that will contain the locational data and results of sediment cores analyzed by USGS.

Tom Sullivan asked how this HEC-RAS modeling effort will improve upon the HEC-6 effort done in the past. Mike explained that we will have new data with the bathymetric surveys and updated algorithms. Steve added that the models will all be validated and we are working in relative changes (relative effects over time of increasing capacity) vs. absolute change at one point in time. Tom noted that it will be important to communicate the calibration process.

Claire said that with all the modeling efforts going on it will be important for modelers to communicate often to keep on task. She will coordinate monthly (teleconference) meetings to discuss modeling activities.

6. Review Schedule for 2012

Claire provided a handout of the most updated schedule for the study. Prior to the meeting she received input from the team in order to update the schedule. A few of the activities were revised based on meeting discussions; enclosure 3 represents the project schedule as of the team meeting.

7. Wrap Up The next meeting will be April 30, 2012, 10-12:30, at MDE.

Anna Compton

Study Manager

- Enclosures:
1. Meeting Agenda
  2. Summary of Water Quality Data
  3. Project Schedule dated 23 January 2012

**LOWER SUSQUEHANNA RIVER WATERSHED ASSESSMENT  
QUARTERLY TEAM MEETING**

**MDE, Montgomery Park Building, Aqua Conference Room  
January 23, 2012**

**Meeting Agenda**

**Lead**

10:00	Welcome and Opening Remarks.....	Sachs
10:05	Introductions.....	All
10:10	Review of Action Items from November Meeting.....	O'Neill
10:30	Communication and Coordination	
	Public Involvement Plan.....	Compton
	PowerPoint Presentation – Feedback from Recent Meetings.....	Halka, Michael
	Public MDNR Website Demo.....	Michael
	Include PowerPoint presentation, goals and objectives, roles and responsibilities, meeting notes?	
	Need for Internal Website for Sharing.....	O'Neill
11:00	Summary of Exelon Study.....	Seaman/Exelon
11:10	LSRWA Technical Analyses	
(10 min)	CBEMP Modeling Update.....	Cerco
(15 min)	Sediment Transport Modeling Update.....	Scott
(10 min)	HEC-RAS Modeling Update.....	Langland
11:45	Review Schedule for 2012.....	O'Neill
11:55	Wrap Up.....	Compton
	Action Items/Summary	
	Next Meeting	

**Call-In Information:** (410) 537- 4281 (no password required)

**Expected Attendees:**

MDE: Herb Sachs; Matt Rowe, Tim Fox, Adam Rettig  
MDNR: Bruce Michael, Shawn Seaman  
MGS: Jeff Halka  
SRBC: John Balay, David Ladd, Andrew Gavin  
USACE: Anna Compton, Bob Blama, Carey Nagoda, Chris Spaur, Claire O'Neill, Dan Bierly  
ERDC: Carl Cerco, Steve Scott  
USEPA: Gary Shenk  
USGS: Mike Langland, Ed Koerkle

Exelon: Gary LeMay, Mary Helen Marsh, Robert Matty, Margie Zeff  
Lower Susquehanna Riverkeeper: Michael Helfrich

Unable to attend = TNC

### **Action Items from November Meeting:**

- A. Claire will email the team the “Roles and Responsibilities” spreadsheet to get input; compile and send out to team once completed.
- B. Anna will send the LSRWA Team email distribution list to all team members.
- C. Shawn Seaman will contact Michael Helfrich to notify him of quarterly meetings to see if he can attend.
- D. Bruce Michael will have the lead in coordinating with SRBC, MDE, and MGS to set up a website where any products of the assessment can be kept to keep stakeholders informed.
- E. Anna will prepare a brief public involvement plan to layout how the LSRWA will be coordinated with stakeholders and will send out the team for review.
- F. Anna will update PowerPoint slides after each quarterly meeting to be utilized by anyone on the team providing updates to other Chesapeake Bay groups.
- G. Anna will send out an update to via the large email distribution list that started with the original Sediment Task Force (includes academia, general public, federal, non-government organization (NGO), and state and counties representatives) notifying the group of LSRWA kick-off meeting and study start and will periodically update this group as the LSRWA progresses.
- H. Anna will send out revised goals to the team for one final review and team approval.
- I. Steve will coordinate with Bruce to obtain digitized maps of SAV data in the Susquehanna flats area.
- J. Bruce will share results of the suspended sediment sampling taken at Conowingo outfall (taken during high flow events this year) with the team.
- K. Mark and Anna will coordinate to conduct a literature search providing info on best management practices around the nation and world for reservoir sedimentation.
- L. Matt will keep team informed on Innovative re-use committee findings to potentially incorporate ideas/innovative techniques into LSRWA strategies.
- M. Claire will follow up with individual team members to develop a schedule for work to be conducted this year.
- N. Shawn will provide a summary of Exelon study findings.

Data Description	Collected	Source
Summary of sediment cores from Conowingo. Includes particle size, nitrogen, phosphorus, and iron	Oct. 1990 - April 1991	Hainly, R., Reed, L., Flippo, H., and Barton, G. (1995). Deposition and simulation of sediment transport in the lower Susquehanna River reservoir system. Water-Resources Investigations Report 95-4122. US Geological Survey, Denver CO.
Summary of sediment cores from Conowingo. Includes total N, total P, plant-available P.	Summer and fall 1996	Langland, M., and Hainly, R. 1997. Changes in bottom-surface elevations in three reservoirs on the lower Susquehanna River, Pennsylvania and Maryland, following the January 1996 flood - Implications for nutrient and sediment loads to US Geological Survey, Lemoyne, PA. Chesapeake Bay. Water-Resources Investigations Report 97-4138.
Individual observations of sediment cores in Conowingo. Complete suite of nitrogen and phosphorus data. Some data for size distribution	Aug-96	Durlin, R., and Schaffstall, W. (1997). "Water Resources Data Pennsylvania Water Year 1996," Vol. 2 Susquehanna and Potomac River Basins. US Geological Survey, Lemoyne PA.
Particle size distribution of material flowing over Conowingo Dam	1980 to 1984	# USGS 01578310 SUSQUEHANNA RIVER AT CONOWINGO, MD
Phosphorus suite including PIP in water flowing over Conowingo dam (6 observations)	1994	1578310
PIP and PP in water flowing over Conowingo Dam	2004 and 2005	CBL? Site identified as 1578310
PIP in Chesapeake Bay water column	1994	CBP Monitoring Program data base
<b>Known to exist but not yet accessed</b>		
Individual observations of sediment cores in Conowingo. Complete suite of nitrogen and phosphorus data. Some data for size distribution	1990 to 1991	Water Resources Investigations Water year 1991
River Input Monitoring for Susquehanna River. Particulate N and P observations.	1985 to date	On line data base
Particulate N and P observations collected for this study	2011	
Chesapeake Bay sediment cores. Percent N and P	circa 1990	CBL SONE program. Not known if data is from stations relevant to this study (turbidity max and Susquehanna Flats).

# Lower Susquehanna River Watershed Assessment

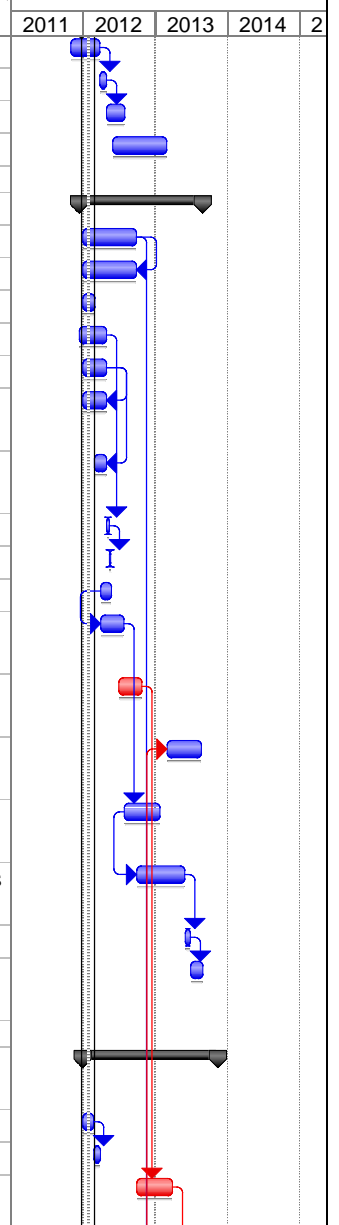
Schedule is dependent upon receipt of adequate funding

ID	Task Name	Resource Names	Duration	Start	Finish	Predecessors	2011					2
							2011	2012	2013	2014	2	
1	<b>Lower Susquehanna River Watershed Assessment</b>		156.2 wks	9/23/11	9/19/14							
2	<b>Execute Assessment Cost-Sharing Agreement</b>		0 wks	9/23/11	9/23/11							
3	<b>Assessment Kick-Off Meeting</b>	Team	0 wks	11/2/11	11/2/11							
4	<b>Project Coordination</b>		25.6 wks	11/2/11	4/30/12	3						
5	Develop project website	MDNR	21 wks	11/2/11	3/27/12	3						
6	Presentation to CBP modeling subcommittee	MGS	0 wks	11/30/11	11/30/11							
7	Presentation to DMMP citizens advisory group	MGS	0 wks	1/11/12	1/11/12							
8	January 2012 team meeting	Team	0 wks	1/23/12	1/23/12							
9	May 2012 team meeting	Team	0 wks	4/30/12	4/30/12							
10												
11	<b>Data Collection</b>		69 wks	11/2/11	2/26/13	3						
12	Provide schedule of lower Susquehanna flow recommendations	TNC	4 wks	11/2/11	11/29/11							
13	Summarize Exelon report	MDNR	4 wks	11/2/11	11/29/11							
14	Year 2 Exelon licensing report	Exelon	0 wks	1/23/12	1/23/12							
15	Licensing report -- sediment addendum	Exelon	1.2 wks	1/23/12	1/30/12	14						
16	Water Year 2011 water quality report	MDNR	8 wks	1/2/12	2/24/12							
17	Water Year 2012 water quality report	MDNR	8 wks	1/2/13	2/26/13							
18	Collect sediment grab samples	MGS	21.6 wks	2/1/12	6/29/12							
19	Sampling/analysis of suspended sediments at Conowingo outflow	USGS	57 wks	11/2/11	12/4/12							
20	Collect sediment cores in Conowingo and do initial analysis with SEDflume	ERDC	9 wks	4/2/12	6/1/12							
21	Do remaining analysis with SEDflume	ERDC	4 wks	5/7/12	6/1/12	20FF						
22	Complete and summarize literature search on reservoir sedimentation management	NAB	13 wks	11/2/11	1/31/12							
23	Review of literature search summary	Team	1 wk	2/1/12	2/7/12	22						
24												
25	<b>Modeling and Documentation of Modeling</b>		106.6 wks	11/2/11	11/15/13	3						
26	Complete literature search to compile data for boundary conditions	ERDC	4 wks	1/2/12	1/27/12							
27	Use available information to build model boundary conditions	ERDC	6 wks	1/23/12	3/2/12	26FS-1 wk						
28	<b>Sediment Deposition and Transport Simulation</b>	USGS	69.4 wks	11/2/11	2/28/13							
29	Develop and process interagency agreement	USGS	15 wks	11/2/11	2/14/12	2						
30	Execute interagency agreement	USGS	1 wk	2/15/12	2/21/12	29						
31	Locate sediment cores	USGS	9 wks	12/1/11	2/1/12							
32	Collect or analyze additionally bathymetry	USGS	17 wks	1/2/12	4/27/12							

# Lower Susquehanna River Watershed Assessment

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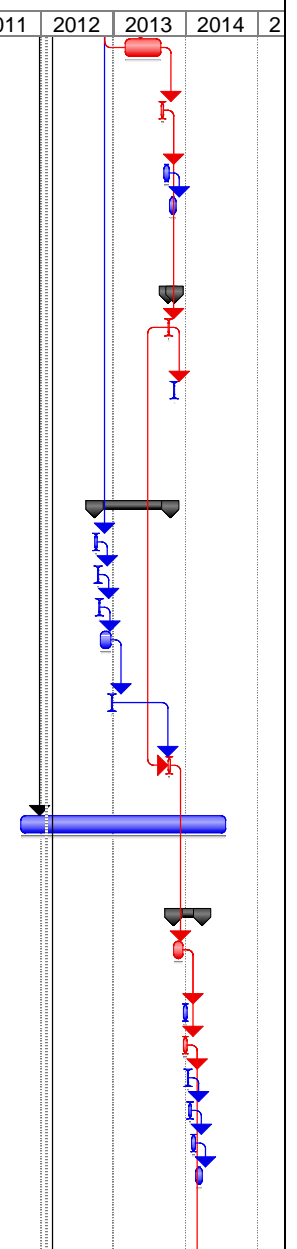
ID	Task Name	Resource Names	Duration	Start	Finish	Predecessors	Year				
							2011	2012	2013	2014	2015
33	Complete initial HEC-RAS hydraulic model	USGS	21 wks	11/2/11	3/27/12	2					
34	Refine HEC-RAS hydraulic model	USGS-HEC	4.8 wks	3/28/12	4/30/12	33					
35	Validate 1D HEC-RAS model	USGS	13.2 wks	5/1/12	7/31/12	34					
36	Draft modeling report and finalize	USGS	39 wks	6/1/12	2/28/13						
37											
38	<b>1D/2D/3D Reservoir Model Development</b>	<b>ERDC</b>	<b>89.4 wks</b>	<b>12/15/11</b>	<b>8/30/13</b>						
39	Decide on initial modeling scenarios	Team	39 wks	1/2/12	9/28/12						
40	Selects management measures to be modeled	Team	39 wks	1/2/12	9/28/12	39FF					
41	Gather model input data	ERDC	9 wks	1/2/12	3/2/12						
42	Prepare 2D vs. 3D model comparison draft report	ERDC	19.6 wks	12/15/11	4/30/12						
43	Construct 2D/3D reservoir numerical model	ERDC	17.2 wks	1/2/12	4/30/12						
44	Modify codes for gate release scenarios for 2D/3D reservoir numerical model	ERDC	17.2 wks	1/2/12	4/30/12	43FF					
45	Develop initial 2D/3D hydrodynamic model and proofs mesh	ERDC	8.8 wks	2/29/12	4/30/12	43FF					
46	Review 2D vs. 3D comparison report	Team	2 wks	5/1/12	5/14/12	42					
47	Make decision on 2D vs. 3D	Team	1 wk	5/15/12	5/21/12	46					
48	Validate hydrodynamics of reservoir model	ERDC	8 wks	4/2/12	5/25/12						
49	Construct sediment reservoir model and proofs mesh	ERDC	17 wks	4/2/12	7/27/12	48SS					
50	Validate sediment model (model vs. SEDflume data) to assess risk	ERDC	17 wks	7/2/12	10/26/12						
51	Conduct CBEMP model simulations of scenarios and prepare draft report	ERDC-USGS	25 wks	3/4/13	8/23/13	61SS					
52	Conduct sediment transport simulations to input CBEMP model	ERDC-USGS	26 wks	7/30/12	1/25/13	49					
53	Conduct watershed / reservoir sediment transport simulations, prepare draft report	ERDC	35 wks	10/1/12	5/31/13	52SS+9 wks					
54	Review watershed / reservoir modeling report	Team	4 wks	6/3/13	6/28/13	53					
55	Technical review of watershed / reservoir modeling report	ECO-PCX	9 wks	7/1/13	8/30/13	54					
56											
57	<b>Chesapeake Bay Environmental Model Package (CBEMP) -- Model Development</b>		<b>98 wks</b>	<b>1/2/12</b>	<b>11/15/13</b>						
58	Assemble data for CBEMP model	ERDC	8 wks	1/2/12	2/24/12						
59	Prepare CBEMP data report	ERDC	5 wks	2/27/12	3/30/12	58					
60	CBEMP set-up; refine with sediment and water quality data; coordinate with reservoir modeling	ERDC	26 wks	10/1/12	3/29/13	50FS-4 wks					



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ID	Task Name	Resource Names	Duration	Start	Finish	Predecessors					
							2011	2012	2013	2014	2
61	Conduct CBEMP model simulations of scenarios, prepare draft report	ERDC	26 wks	3/4/13	8/30/13	60FS-4 wks					
62	Review draft CBEMP model simulations of scenarios report	Team	2 wks	9/2/13	9/13/13	61					
63	Agency technical review of CBEMP	ECO-PCX	4 wks	9/16/13	10/11/13	62					
64	Address/resolve ATR comments	Team	5 wks	10/14/13	11/15/13	63					
65											
66	<b>Development of Recommendations</b>		<b>5 wks</b>	<b>10/7/13</b>	<b>11/8/13</b>						
67	Meeting to view model results and determine preliminary recommendations	Team	1 wk	10/7/13	10/11/13	62FS+3 wks					
68	Agency coordination meeting to discuss model results and recommendations	Team	1 wk	11/4/13	11/8/13	67FS+3 wks					
69											
70	<b>Dredging Placement Site Evaluation</b>		<b>55 wks</b>	<b>10/1/12</b>	<b>10/18/13</b>						
71	Complete dredging placement desktop site evaluation	EN-OP	2 wks	10/1/12	10/12/12	39					
72	Site visit to potential placement sites	EN-OP	1 wk	10/15/12	10/19/12	71					
73	Develop dredging plan and bypassing options	EN-OP	1 wk	10/22/12	10/26/12	72					
74	Develop schematics and cost estimates for dredging and bypassing options	EN-OP	8 wks	10/29/12	12/21/12	73					
75	Review dredging plan and bypassing options, schematics, and cost estimates	Team	1 wk	12/24/12	12/28/12	74					
76	Refine schematics and cost estimates using model results	EN-OP	2 wks	10/7/13	10/18/13	75,67SS					
77											
78	<b>Technical Integration and Coordination with Exelon, TMDLs, and WIPs</b>	<b>Team</b>	<b>148 wks</b>	<b>9/23/11</b>	<b>7/24/14</b>	<b>2</b>					
79	<b>Draft Report Preparation</b>		<b>21 wks</b>	<b>11/4/13</b>	<b>3/28/14</b>						
80	Prepare draft report containing team's tentative recommendations	PL	7 wks	11/4/13	12/20/13	76FS+2 wks					
81	Review draft report	Team	3 wks	12/23/13	1/10/14	80					
82	Resolve comments and incorporate into report	Team	3 wks	12/23/13	1/10/14	80					
83	Finalize draft report for upper management review	PL	1 wk	1/13/14	1/17/14	82					
84	Upper management review of draft report	Team	2 wks	1/20/14	1/31/14	83					
85	Finalize draft report for agency technical review	PL	3 wks	2/3/14	2/21/14	84					
86	Agency technical review of draft report	ECO-PCX	5 wks	2/24/14	3/28/14	85					
87											





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ID	Task Name	Resource Names	Duration	Start	Finish	Predecessors	Year				
							2011	2012	2013	2014	2
88	<b>Quality Assurance / Quality Control Activities</b>		<b>123.2 wks</b>	<b>3/2/12</b>	<b>7/11/14</b>						
89	Coordinate agency technical review for initial in-progress review meeting	PL	4 wks	3/2/12	3/29/12	2FS+23 wks					
90	Prepare read-ahead materials for initial in-progress review meeting	PL	8 wks	7/6/12	8/30/12	89FS+14 wks					
91	Review initial in-progress review read-ahead materials	Team	2 wks	8/31/12	9/13/12	90					
92	Agency technical review of read-ahead materials	ECO-PCX	4 wks	9/14/12	10/11/12	91					
93	Resolve comments and incorporate into read-ahead materials	Team	5 wks	10/12/12	11/15/12	92					
94	Initial in-progress review meeting with CENAD and HQUSACE	Team	1 wk	12/28/12	1/3/13	93FS+6 wks					
95	Prepare read-ahead materials for final in-progress review meeting	PL	8 wks	1/13/14	3/7/14	82					
96	Review final in-progress review read-ahead materials	Team	2 wks	3/10/14	3/21/14	95					
97	Agency technical review of read-ahead materials	ECO-PCX	4 wks	3/24/14	4/18/14	96					
98	Resolve comments and incorporate into read-ahead materials	Team	5 wks	4/21/14	5/23/14	97					
99	Final in-progress review meeting with CENAD and HQUSACE	Team	1 wk	7/7/14	7/11/14	98FS+6 wks					
100	Secure concurrence to release draft report with recommendations	Team	0 wks	7/11/14	7/11/14	99					
101											
102	<b>Final Report Preparation</b>		<b>9 wks</b>	<b>7/21/14</b>	<b>9/19/14</b>						
103	Public review of draft final report	PL	4 wks	7/21/14	8/15/14	100FS+1 wk					
104	Public meeting for draft final report	PL	1 wk	8/4/14	8/8/14	103FF-1 wk					
105	Prepare final report after public review	PL	2 wks	8/18/14	8/29/14	103					
106	Route to Baltimore District Engineer for signature	PM	1 wk	9/1/14	9/5/14	105					
107	Transmit report to CENAD	PM	2 wks	9/8/14	9/19/14	106					