**Project Title:** West Virginia Watershed Assessment Pilot Project

**Project Applicant:** West Virginia Department of Environmental Protection

**Geographic Location:** This assessment will occur in five (5) HUC 8 watersheds within West Virginia including: Lower Monongahela (05020005), Elk (05050007), Upper Guyandotte (05070101), Little Kanawha (05030203), and Gauley (05050005)

## Project Goals

1. Advance the science and protection of aquatic headwater resources within watersheds which link to the Mid-Atlantic Highlands.
2. Achieve a net increase in the quantity and quality of wetlands and other aquatic resources, and their resource function, within the watershed.
3. Protect, sustain, and restore the health of people, communities, and ecosystems using integrated and comprehensive approaches and partnerships.

## Project Objectives

1. Design and test a process that assesses the condition of aquatic resources and the impacts to those resources within a watershed, including an assessment of cumulative impacts and integration of information with multiple sources within and outside of government agencies.
2. Provide relevant data, strategies, and a dynamic, updateable decision support matrix to assist regulatory staff and state and local officials with decisions affecting aquatic resources.
3. Establish priorities for protection and restoration of aquatic resources, with the goal of a net increase in functional wetland acres in the watershed.
4. Develop common and consistent strategies for various government agencies and non-governmental organizations to partner and utilize various protection and restoration tools to achieve goals established for the watershed.
5. Focus attention on headwater aquatic resources in areas where impacts to these resources are significant and potentially increasing.
6. Establish protocols for monitoring and assessment of aquatic resources to track changes within a watershed and provide an adaptive feedback loop to the decision making, protection, and restoration functions.

## Proposed Planning Outline

I. Define and characterize the natural resources within the watershed.
   a. Characterize the wetland, stream, and upland natural resources within the watershed.
   b. Identify, describe, and locate unique and/or sensitive species (and their habitat requirements) and natural communities within the watershed.
   c. Where data allows, characterize the functional values and ecological services provided by the natural resources in the watershed (surface water use, flood storage/abatement, groundwater use, sediment retention, pollutant assimilation, recreational benefits, etc.)

d. Identify existing conservation investments on the ground (local, state, federal, and private conservation lands; conservation easements; mitigation sites)
e. Document identified government and private conservation priorities within the watershed (protection and/or restoration priorities identified by conservation organizations and government agencies)
f. Characterize and assess hydrologic connections within the watershed, and connections upstream and downstream of the watershed (where appropriate), to determine how these affect watershed condition.

II. Assess the current condition of the watershed
a. Identify areas of high ecological value within the watershed (based on important species, natural communities, intactness, functional value, connectivity).
b. Where data allows, determine the extent and location of wetland, stream, and upland loss compared to historic conditions, including the loss of any species or natural communities.
c. Where data allows determine what natural resources, functions and/or services have been lost or degraded, where they area, and how significantly they have been impacted.
d. Identify impacts and stresses to natural resources and functions, and unique and/or sensitive species and natural communities in the watershed.
e. Document current and past land use changes in the watershed, and evaluate their cumulative impacts to natural resource value and function. (Mining, oil and gas development, residential/commercial development, agricultural conversion, road construction, etc.)
f. Document other sources of natural resource and function loss and their cumulative impacts (dams, facilities that discharge to water, etc.)
g. Document water quality impairments including 303d stream listings within the watershed and issues affecting hydrology and environmental flows.
h. Where data allows, assess the contribution of consumptive water use on resource quantity and function.
i. Identify areas of high restoration need and potential in the watershed.
j. Derive a spatially explicit characterization of conditions in the watershed

III. Assess Future Conditions
a. Evaluate land development/conversion trends in the watershed.
b. Evaluate permit trends
c. Assess trends in water quality, flow, water use (if data is available)
d. Evaluate how projected trends could impact current watershed condition or the success of restoration/protection projects.

IV. Establish Priorities for the Protection and Restoration of Aquatic Resources
a. Based on the assessment work completed, develop a collaborative vision for protecting or improving watershed condition, functionality, and ecological services with stakeholders, and target the goals and strategies to accomplish the overall vision.
b. Define appropriate metrics for parameters used to evaluate the importance or value/contribution of potential actions
    i. Condition metrics – aquatic habitat type and quality, hydrology, flows, water quality, land use, connectivity, adjacent land use, watershed position, etc

ii. Ecosystem functions/services metrics – flood storage, surface water use, sediment retention
iii. Biodiversity metrics – aquatic and terrestrial habitat diversity, unique or sensitive species

c. Develop a prioritization matrix utilizing the above referenced metrics to rank potential actions.
i. Protection of high conservation value sites.
ii. Restoration needs, opportunities, and probability of success.
iii. Projects that abate or mitigate water quality, diversion, or water use issues.
iv. Projects that restore or maintain ecosystem functions/services.

V. Develop Strategies Designed to Address Issues within the Watershed (within the context of the project goals and objectives).
a. Develop strategies designed to accomplish the collaborative vision for the watershed and address specific issues identified through the assessment process.
b. Define success or improvement, and develop specific metrics to evaluate the agreed upon measure of success.
c. Establish an adaptive evaluation and management process.

VI. Host a workshop with decision makers and potential end users to obtain their input on the process utilized and the watershed assessment product.

## Project Description

The proposed watershed assessment is designed around a multi-step process which includes the following steps.

1. Define the watershed **assessment methodology**.
2. Complete a **Baseline analysis** that describes watershed resources, impacts, and condition.
3. Conduct **expert workshop 1** to review the assessment process, evaluate the data collected, obtain local information on watershed specific resources, issues, and other relevant information, and define appropriate metrics for parameters used to evaluate the importance or value/contribution of potential actions.
4. Complete a **Consolodated analysis** using results from the expert workshop to incorporate local data and apply prioritization metrics to rank potential actions and sites within the watershed.
5. Conduct **expert workshop 2** to review the data collected, evaluate the conclusions of the prioritization process, and develop strategies designed to address issues within the watershed.
6. Complete **draft watershed assessment**.
7. Conduct a **decision maker/end user workshop**.
8. Complete **final assessment**

**Assessment Methodology**
To assist in developing the assessment methodology, the project team will identify and assemble a technical advisory team comprised of agency personnel, academic researchers, and individuals from the non-profit or private sector with relevant expertise. The advisory team will provide the project team with guidance on structuring the assessments, data and data limitations, technical or scientific questions, or other technical issues that arise during the course of the project. They will also provide

peer review of the products developed. Listed above is the draft planning process for the watershed assessment that will be presented to the technical advisory committee for review and input. The planning outline was compiled from an amalgam of watershed planning efforts from several states and is intended to address the specific goals and objectives of this project, and the potential data availability and limitations.

There are specific questions that will be posed to the technical advisory team during their review of this outline:

1. Will the planning outline capture the information necessary to achieve the proposed goals, outcomes, and outputs for the project?
2. What information, if any is missing?
3. What is the most effective planning unit to assess and prioritize information in the HUC 8 (e.g. HUC 12, HUC 14, NHD Plus catchments, other)?
4. What are the data needs and limitations?
5. Are there specific technical or scientific issues that will need to be addressed in the assessment?
6. Are you aware of other projects that might contribute to, or provide information into this process?

**Baseline Analysis**

The Baseline Analysis will include identifying, collecting, and conducting quality control of existing data sets describing watershed resources, impacts, and condition. This is a desk level assessment to capture and organize data characterizing items in Sections I, II, and III in the planning outline above. The following is a draft list of data considerations for the Baseline Analysis.

1. Identifying and characterizing upland, wetland, and stream resources in the watershed.
2. Identifying existing conservation lands (fee ownership, easement, other)
3. Identifying multi-partner conservation objectives.
4. Identifying rare or sensitive species and their habitats (may use habitat suitability modeling if available), and natural communities.
5. Documenting land use and habitat loss or conversion trends from multiple sources.
6. Information describing historic (where possible) and current wetland extent, location, and type.
7. Physical parameters such as hydrology, soils, slope.
8. Identifying chronic environmental problems such as flooding and poor water quality.
9. Identifying sources of watershed impairment.
10. Hydrologic connections and flow
11. Cumulative impacts
12. Water use
13. Requirements of other regulatory and non-regulatory programs (storm water management or habitat conservation plans).
14. Potential sites for protection and/or restoration of aquatic resources.

The project team will coordinate with multiple partners to identify and obtain the necessary datasets, including coordinating with ongoing projects at the West Virginia Department of Natural Resources to characterize and assess wetlands in West Virginia, document rare and sensitive species, and habitat suitability modeling; West Virginia University in their project to develop an Alternative Futures Modeling System to Support Decisions for Mountaintop Removal which includes a cumulative hydrological impact assessment and an updated statewide landscape characterization of land use/cover classification and

land forms; and within the Department of Environmental Protection with their watershed assessment work already completed on the Coal River Watershed and the methodology used to evaluate water quality impairment, total maximum daily load, and mine drainage issues. The Nature Conservancy will also integrate several of its new data products relating to landscape resiliency and connectivity. These include regional evaluations of land form diversity, connectivity at local and regional scales, analysis of intact functional forest blocks and aquatic systems, and circuitscape analysis of multiple connectivity pathways and pinch points between landscapes.

Products from this step will include maps and data that provide a spatially explicit characterization of the resources, impacts, and condition in the watershed, including cumulative impacts, trend information, and historical comparisons where possible. The products will be based on available data, but will also attempt to identify and fill data gaps where possible.

**Expert Workshop 1**

Information compiled during the Baseline analysis will be evaluated during the first of two workshops with local experts. During the workshop, experts will review the assessment process and data collected, and provide input on watershed specific resources, issues, or other relevant information; recommendations to the process; and identify any new data needs. The intent of this workshop is to obtain more specific local information addressing the data considerations defined above. Field assessments will be limited; however, there may be circumstances where field visits facilitated by local experts are conducted to verify or assess specific sites, issues, or opportunities. Experts will also help develop a collaborative vision for protecting or improving watershed condition, functionality, and ecological services; and define appropriate metrics for parameters used to evaluate the importance or value/contribution of potential actions.

**Consolidated Analysis**

The Consolidated analysis will incorporate information collected during the Level 1 analysis and add local information collected during the first expert workshop, incorporate changes or additions suggested by experts, and attempt to fill in any data gaps identified. The analysis will include:

1. A more detailed spatially explicit characterization of natural resources and resource conditions in the watershed, including a cumulative impacts analysis, that includes local information and knowledge that may not be available in statewide data sets.
2. An inventory and assessment of impacts and stresses to aquatic systems in the watershed, including any local information on flooding, stream condition, erosion and sedimentation, mine drainage, or other perturbations that may affect resource quality
3. Identification of high value ecological resources, landscape linkages, or other conservation objectives and where these occur in the watershed.
4. An inventory of potential protection and restoration sites and/or measures to eliminate, abate, or mitigate for impacts or stresses to the aquatic systems.

The overall vision and metrics defined in the expert workshop will be used to develop a prioritization matrix to rank potential actions in the watershed. These actions may include identifying key parcels for protection, identifying priority stream reaches for restoration, identifying mine drainage issues that may be addressed by AML/AMD programs, or identifying problematic water quality issues that may be addressed through other programs; all contributing to improving the condition of the watershed. The prioritization process will also form the basis for a decision support tool, that will provide information

and potential strategies to decision makers, regulatory staff, watershed groups, and others working to improve watershed conditions.

**Expert Workshop 2**
Information compiled during the Consolidated analysis, including the results of the prioritization process will be presented to experts and the advisory team for peer review during the second expert workshop. The objectives of the workshop will be to review the data collected and the conclusions made, review the results of the prioritization process and modify the process if necessary, and develop strategies designed to address issues within the watershed. In addition, participants in the workshop will work to define success and develop specific metrics to evaluate the agreed upon measure of success, and establish adaptive evaluation and management protocols that may be implemented by DEP or other regulatory agencies to determine what impact decisions and actions are having on the watershed.

**Draft Watershed Assessment**
The draft watershed assessment will include a compilation of all of the items defined in the proposed planning outline above, along with specific strategies and priorities developed to accomplish the goals and objectives (defined above) for the project. The draft assessment will also describe the methodology and references used to complete the assessments, and lessons learned during the process. It will include detailed descriptions of the prioritization process used to evaluate protection and restoration opportunities. One key aspect will be the protocols developed to integrate and use monitoring and assessment to provide an adaptive feedback loop to the regulatory and restoration decision making process.

The draft watershed assessment will also present a framework for an interactive decision support tool targeted to regulatory personnel, state and local decision makers and planning staff, government and non-government conservation organizations, watershed groups, and other potential partner organizations. The framework will present a web or server based interactive GIS application that allows a user to search data and information presented in the watershed assessment. The framework will also include the prioritization process utilized in the assessment. The prioritization matrix will be structured so that an end user can change or filter the priorities evaluated or the weighting of attributes in order to evaluate other specific objectives (for example evaluating stream restoration opportunities based on stream order and available water quality information). The framework format will be determined based on recommendations from the technical advisory committee and input from partners and end users involved with the project. The supporting information will present the data sources, methods used to organize and analyze the data, and strategies for how the data and results can be maintained and updated; including recommendations on other data sources to incorporate and integrate once available and recommendations on collection and analysis of existing data that will allow better integration between data sources. The framework will be provided as an interactive GIS application on a DVD or other suitable external storage device for each watershed. Making the tool live on the web or a server, or maintaining and updating the tool is outside of the scope of the current proposal.

**Decision Maker/End User Workshop**
The project team will them host a workshop with decision makers and potential end users to obtain their input on the process utilized and the watershed assessment product. This group may include decision makers at all levels of government, potential partners in protection and restoration efforts, industry representatives, watershed groups, or other interested public. The primary objectives of this step are to find the best method to make this a usable product by the target audience and make them aware of the assessment methodology and end products.

**Final Watershed Assessment**
The completed watershed assessment will include all of the specific items described in the Draft Watershed section above. However, it will reflect input obtained during the Decision Maker/End User Workshop. The assessment methodology and products will be shared through peer to peer networks, at scientific or technical conferences, and published on the DEP website or in other venues as determined appropriate. The information will be targeted to regulatory personnel, state and local decision makers and planning staff, government and non-government conservation organizations, watershed groups, and other potential partner organizations.

The Final Watershed Assessment will provide the methodology, information and tools necessary to meet the project objectives stated above. The intent is to provide a tested, peer reviewed assessment process that can be duplicated in other watersheds throughout West Virginia along with the other listed outcomes (see Outcomes section below). The information and tools presented in the assessment will provide guidance to regulatory agencies, decision makers, non-governmental organizations, and other partners on key strategies and places to work within the watersheds that contribute to the protection and restoration of critical aquatic resources. A few examples would include: identifying areas of high conservation value for protection by state government or NGO's, identifying high priority sites for conducting mitigation activities, and identifying cumulative impacts contributing to the degradation of aquatic resources.

The project will coordinate with other new or ongoing stream, wetland, or watershed related efforts in West Virginia. If the proposed Green Infrastructure planning effort moves forward in West Virginia, the process, information, results and strategies provided by this project can be incorporated into the Green Infrastructure process to evaluate freshwater aquatic resources at a watershed scale. WV DNR is working on several projects intended to conserve wetlands in the state including: completing assessments of wetlands, developing functional assessment indices, re-mapping wetlands, and identifying unique or exceptional wetlands. This project can utilize data and tools developed by DNR (when available) and incorporate them into the watershed level planning framework defined above. In addition, this project can coordinate with and assist DNR to meet part of their project goals such as identifying unique or exceptional aquatic resources and assisting with the development of strategies for assessing and protecting streams and wetlands, and their overarching goal of conserving wetlands in the state.

## Project Implementation

This assessment will occur in five (5) HUC 8 watersheds within West Virginia including: Lower Monongahela (05020005), Elk (05050007), Upper Guyandotte (05070101), Little Kanawha (05030203), and Gauley (05050005). One watershed in this list (the Upper Guyandotte) overlaps with the Alternative Futures Modeling project recently initiated by researchers at West Virginia University. However, this provides a unique opportunity to compare and evaluate the results of the two different processes, and perhaps determine where to integrate the two to achieve the best outcomes.

Watershed assessments will be completed in two of the five identified watersheds first, the Lower Monongahela and the Elk. After these watersheds are completed, the project team will utilize the assessment methodology to complete assessments in the final three watersheds. The intent is to ensure, through replication, that the process is transferable to other watersheds and that we have more fully evaluated the potential variability from one watershed to the next. These watersheds will be

evaluated using the same general process, with adjustments made based on lessons learned completing the earlier watersheds. The project team will complete a final report on each of the last three watersheds.

## Project Outputs

| Project Outputs | Completion Date |
|---|---|
| Interim Product: Draft assessment methodology (reviewed by advisory team) | July 1, 2011 |
| Interim Product: Draft QAP Plan | July 1, 2011 |
| Interim Product: GIS based geodatabase containing maps and data reflecting results of Baseline Analysis (watersheds 1 and 2) | Nov. 1, 2011 |
| Final Product: QAP Plan | Nov 1, 2011 |
| Interim Product: GIS based geodatabase containing maps and data reflecting results of Consolidated Analysis (watersheds 1 and 2) | Mar 1, 2012 |
| Interim Product: Prioritization matrix | Mar 1, 2012 |
| Interim Product: Draft assessment for watersheds 1 and 2 | Apr 1, 2012 |
| Final Products: Final Watershed Assessments for watersheds 1 and 2 | July 1, 2012 |
| Interim Product: GIS based geodatabase containing maps and data reflecting results of Baseline Analysis (watersheds 3, 4, and 5) | Oct 1, 2012 |
| Interim Product: GIS based geodatabase containing maps and data reflecting results of Consolidated Analysis (watersheds 3, 4, and 5) | Jan 1, 2013 |
| Interim Product: Draft assessment for watersheds 3, 4, and 5 | Feb 1, 2013 |
| Final Products: Final Watershed Assessments for watersheds 3, 4, and 5 | May 1, 2013 |

## Project Outcomes

| Project Outcomes | Completion Date |
|---|---|
| A tested and peer reviewed watershed assessment process that integrates information from multiple sources within and outside of government agencies and documents the condition of aquatic resources and the impacts to those resources within a watershed, including an assessment of cumulative impacts. | May 1, 2013 |
| Relevant data, strategies, and a model decision support tool to assist regulatory staff and state and local officials with decisions affecting aquatic resources within the watersheds. | May 1, 2013 |
| Priorities for protection and restoration of aquatic resources, with the goal of a net increase in functional wetland acres in the watersheds. | May 1, 2013 |
| Common and consistent strategies for use by various government agencies and non-governmental organizations to partner and utilize various protection and restoration tools to achieve goals established for the watersheds. | May 1, 2013 |
| Increased focus on headwater aquatic resources within the watersheds through targeted regulatory, protection, and restoration strategies; including consideration of landscape integrity strategies that work to protect surrounding forestland. | May 1, 2013 |
| Monitoring and assessment protocols that track the changes in watershed condition through time and provide an adaptive feedback loop to regulatory or land use decisions, and protection and restoration efforts. | May 1, 2013 |
| Incorporation of watershed assessments into the regulatory decision making | Long-term |

| | |
|---|---|
| process, and in other decisions by state and local officials affecting environmental issues. | |
| Integration of information and establishment of consistent goals relating to aquatic resources protection and restoration across relevant agencies and non-governmental partners | Long term |

## Project Timeline

| Month | Activity |
|---|---|
| May 1, 2011 | Award date |
| June 1, 2011 | Technical Advisory Team 1st meeting |
| July 1, 2011 | Draft assessment methodology completed, Baseline data set identification and compilation begins for 2 watersheds, QAP Plan developed and submitted for review |
| Aug 31, 2011 | Quarterly report (1) for May, June, July submitted |
| Nov 1, 2011 | QAP plan completed, Baseline data collection completed |
| Nov 30, 2011 | Quarterly Report (2) for August, September, October submitted |
| Dec 1, 2011 | 1st Expert Workshop on 2 watersheds completed, Consolidated analysis data development and revisions begin |
| Feb 29, 2012 | Quarterly Report (3) for November, December, January submitted |
| Mar 1, 2012 | Consolidated analysis data development and revisions completed, 2nd expert workshop held, strategy development completed in 2 watersheds |
| Apr 1, 2012 | Draft assessments completed in 2 watersheds |
| May 1, 2012 | Decision maker and end user workshops held. Final revisions made and sent out for peer review. |
| May 31, 2012 | Quarterly Report (4) for February, March, April submitted |
| July 1, 2012 | Peer review completed. Final assessment reports on 2 watersheds completed, assessment methodology report completed. Begin Baseline data collection on remaining 3 watersheds. |
| Aug 31, 2012 | Quarterly Report (5) for May, June, July submitted |
| Oct 1, 2012 | Baseline data collection completed on remaining 3 watersheds |
| Nov 1, 2012 | 1st expert workshops on remaining watersheds, Consolidated analysis data development and revisions begin. |
| Nov 30, 2012 | Quarterly Report (6) for August, September, October submitted |
| Jan 1, 2013 | Consolidated analysis data development and revisions completed in remaining watersheds, 2nd expert workshops held, strategy development completed |
| Feb 1, 2013 | Draft assessments completed in remaining 3 watersheds |
| Feb 28, 2013 | Quarterly Report (7) for November, December, January submitted |

| | |
|---|---|
| Mar 1, 2013 | Decision maker and end user workshops held. Final revisions made and sent out for peer review on 3 watersheds. |
| May 1, 2013 | Peer review completed. Final assessment reports on 3 watersheds completed, assessment methodology report revisions made. Final report and all completed deliverables submitted. Report published on DEP website. |
| | Dissemination of results |

## Project Budget

**Budget Overview**
**EPA Wetland Program Development Grant Application with WVDEP**
**The Nature Conservancy**

| | |
|---|---|
| **Salary and Benefits** | **$249,617.85** |
| **Meetings/Workshops** | **$7,500.00** |
| **Supplies** | **$8,870.00** |
| **Contracts** | **$1,000.00** |
| **Travel** | **$9,000.00** |
| **Occupancy** | **$14,400.00** |
| **Communications** | **$1,600.00** |
| **Direct Cost Total** | **$291,987.85** |
| **Indirect 23.13%** | **$67,536.79** |
| **Total** | **$359,524.64** |
| **Grant Application Total** | **$359,525** |

EPA Wetland Program Development Grant Application with WVDEP
Budget Detail

| **LINE ITEM** | | | | | **REQUESTED** |
|---|---|---|---|---|---|
| **Salary and Benefits** | | | | | |
| | Annual Salary Yr 1 | Benefits @42%/approved fy federal rate | Annual Salary Yr 2 (includes 3% annual increase) | Benefits @42%/approved fy federal rate | **Total Salary and Benefits** |
| *2 Cons Info Mgr II positions at midpoint salary range* | $34,262.73 | $14,390.35 | $35,290.61 | $14,822.06 | $197,531.49 |
| *Director of Conservation Programs 10% FTE (26 days /yr)* | $6,615.88 | $2,778.67 | $6,814.35 | $2,862.03 | $19,070.93 |
| *Conservation Information Mgr. III 20% FTE (52 days/yr)* | $8,304.55 | $3,487.91 | $8,553.68 | $3,592.55 | $23,938.69 |
| *Director of Science and Stewardship 6.5% FTE (16 days/yr)* | $3,148.81 | $1,322.50 | $3,243.27 | $1,362.17 | $9,076.75 |
| **TOTAL Salary and Benefits** | | | | | **$249,617.85** |
| **Meetings/Workshop** | | | | | |
| *Cost per Workshop $500.00 * 15 workshops(3 workshops per watershed, facility rental and light refreshments, @ 5 Watersheds)= $7500.00* | | | | | |
| **TOTAL Meetings/Workshop** | | | | | **$7,500.00** |
| **Supplies**** | | | | | |
| 2 Laptop computers | | | | 5,000.00 | |
| *Detail : Computers: 2 Smart Strip LCG3 Power Strip Standard (10 outlets)$40 each=$80* | | | | | |
| *2 Laptops with GIS Power with (bundles) $2,355 each= $4,710.00* | | | | | |
| *2 TNC Standard Windows Applications Software license@ $105.00 each = $210.00* | | | | | |
| Multifunction printer/copier/fax machine | | | | 1,670.00 | |
| Office Supplies | | | | 2,200.00 | |
| *Desktop supplies for 2 staff @ $200 each person for two years= $500; 300 reams of copy paper @ $4.00 per ream over two year period= $1,200.00; $200.00 plotter paper for printing maps on plotter; Meeting supplies for workshops $150 per year per staff person=$300.00* | | | | | |
| **TOTAL Supplies** | | | | | **$8,870.00** |

**Contracts**

*GIS Mapping and Analysis Technical Assistance*

**Total Contracts** **$1,000.00**

**Travel**

| | Per day Cost | Number Days | Total |
|---|---|---|---|
| *Travel Estimated @ 200.00 per day per staff @ 1 day per Workshop* | 200 | 30 | 6,000.00 |
| *Incidental Travel-TNC Vehicle Mileage Cost- average per day* | 200 | 15 | 3,000.00 |

**Total Travel** **$9,000.00**

**Occupancy**

*Rent $600.00 per month for two years includes utility costs*

**Total Occupancy** **$14,400.00**

**Communications**

| | |
|---|---|
| Printing and Photo | 1,600.00 |

*5 copies of aerial photographs @ 120.00 each= 500.00; Copies of historical digital data and/models for 5 watersheds estimation $200.00 per watershed = $1000.00*

**Total Other/Communications** **$1,600.00**

| | |
|---|---|
| DIRECT COST TOTAL | **$291,987.85** |
| INDIRECT | **$67,536.79** |
| TOTAL | **$359,524.64** |

**Direct Cost Total**

**Indirect 23.13%**

**TOTAL BUDGET**